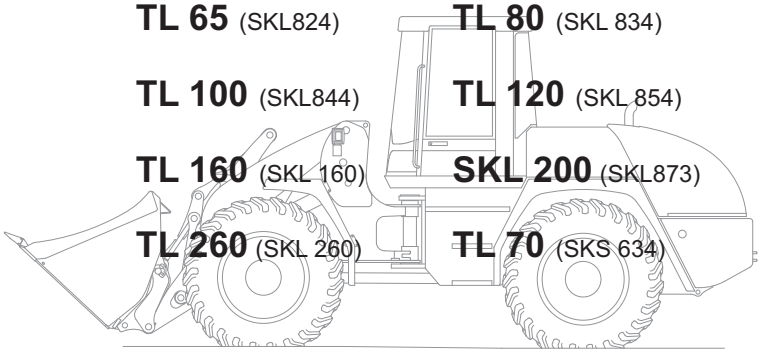
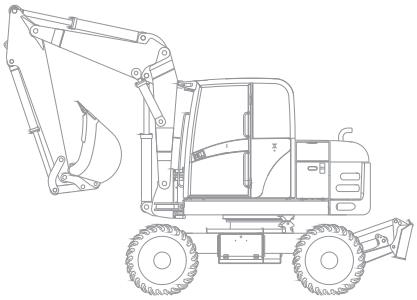
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SERVICE-MANUAL

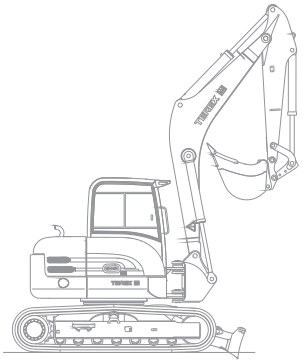
TL 65 (SKL824)
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TL 100 (SKL844)
TL 120 (SKL 854)
TL 160 (SKL 160)
SKL 200 (SKL873)
TL 260 (SKL 260)
TL 70 (SKS 634)



TW 70 (HML 23)
TW 85 (HML 32)
TW 110 (HML 42)



TC 60 (HR 20)
TC 125 (HR 42)
TC 75 (HR 32)



TC 29 (HR14)
TC 35 (HR 16)
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TC 16 (HR 1.6)
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General

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In this Service Manual the individual components of the Terex construction machinery range as well as the functions and adjustments of the aggregates installed are described.

The hydraulic and electrical diagrams as well as cut-off views in connection with the operating manual and parts catalogue are to facilitate the repair and maintenance work.

We have purposely left out assembly and working steps as major repairs are normally carried out by experienced and qualified workshop personnel familiar with these type of repairs.

When carrying out a repair, safety and cleanliness at the workplace are essential. The use of excellent tools and the replacement of sealing parts at every repair should be self-evident.

Unless any special values are indicated, screw fittings are to be tightened using correct torque specifications.

This Service Manual is issued by the Customer Service Department of Messrs. Terex. It is to develop the after-sales service of Terex construction machinery together. The Service Bulletins we issue for your information can serve as a supplement.

This Manual is kept up-to-date through periodic supplements.

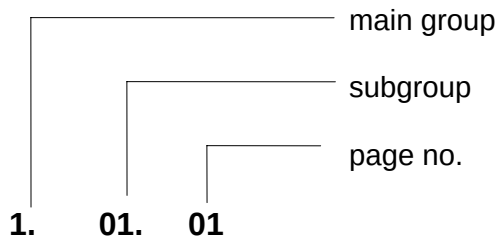
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The Service Manual is subdivided into main groups, subgroups and page numbers so that you can easily find special groups and pages.

This structuring will also facilitate the filing of revised versions and supplements within the framework of the technical alteration service.

E.g.



For the division of the main groups, please refer to the list of contents.
The subgroup division is done starting from the main group.
The page number follows the subgroup and main group number.

Please strictly follow the regulations for Accident Prevention valid in your country (see also 1.20).

The best safety measure to avoid accidents is to be careful when carrying out repairs. We therefore recommend to carefully study the corresponding information referring to the repair you intend to do.

Any maintenance and repair work on machines located in the field may only be performed when the work equipment is lowered to the ground, the engine is switched off, the machine is secured so that it cannot roll, and the hydraulic system is relieved.

If qualified personnel perform repair work in the workshop, the relevant Accident Prevention Regulations also apply.

Safety and Accident Prevention

1 Introductory remarks

Please read the operating instructions carefully before putting an earth-moving machine into operation and strictly follow the following remarks for a safe operation.

National safety regulations - e.g. the Accident Prevention Regulations, “Earth-Moving Machinery” (VBG 40) and “Vehicles” (VBG 12) in the Federal Republic of Germany - must also be complied with.

In addition to the operating instructions, legal regulations governing road traffic and road safety measures must also be observed. Such requirements could also apply in respect of handling hazardous goods or the wearing of personal safety equipment, for example.

Furthermore, safety laws governing work in particular locations (tunnels, adits, quarries, pontoons, contaminated areas, etc.) must likewise be observed.

2 Correct use

The earth-moving machine with normal shovel equipment is only to be used for work which is suitable for the machine’s functions and its attachment.

Such work includes the digging, loading, displacing and dumping out of earth, stones or other materials and the loading of these materials onto lorries, conveyor belts or other means of transportation. The transport of the loading material, however, is mainly carried out by moving the earth-moving machine.

If special attachments, such as Uni-shovel, side dump shovel, sweeper, fork lift attachment etc. are mounted, special jobs can be done with the attachment.

Another or additional application, e.g. for transportation of passengers or using the lifting device as working platform etc. is not considered as correct use. The supplier is not liable for subsequent damage. The enduser himself bears the full risk.

It is part of the correct use to follow the operating and maintenance instructions and to carry out the maintenance as well as to follow the maintenance intervals.

3 General safety notes

It is important to refrain from any working methods which impair safety.

The earth-moving machine may only be used when it is in a safe, operational condition.

The manufacturer’s operating instructions must be complied with for operation, maintenance, repair, assembly and transportation.

The plant operator must provide additional special safety instructions, wherever necessary, for specific local conditions.

The operating instructions and any information pertaining to safety must be carefully kept in the driver’s cab.

The operating instructions and safety notes must be complete and fully readable.

Safety devices on earth-moving machines must not be deactivated or removed.

during operation. Rings, scarves and unbuttoned jackets are to be avoided. Protective goggles, protective boots, helmets, gloves, reflecting jackets, ear-muffs, etc. may be required.

Before commencing work, information must be obtained on first aid and possible means of rescue (ambulance, fire brigade, helicopters).

A check must be carried out to ensure that the first aid box is at hand and that its contents comply with regulations.

Personnel must be aware of the location and method of operation of the fire extinguishers on the earth-moving machine as well as on-site fire-warning and fire-fighting equipment.

Loose parts such as tools or other accessories must be secured to the earth-moving machine.

Open doors, windows, covers, flaps, etc. must be secured so that they cannot slam shut.

4 Operation

Earth-moving machines may only be independently operated and serviced by people who

- are physically and mentally fit
- have been instructed in the operation or maintenance of the earth-moving machine and have demonstrated this ability to the plant operator
- can be expected to perform their allocated duties reliably

All these people must be of the legal minimum age.

They must be designated by the plant operator to operate or service the earth-moving machine.

Operating equipment (controls) may only be activated from the driver's seat.

The earth-moving machine may only be ascended and entered using the entrances and surfaces intended for this purpose.

The operator has to ensure that the cab, steps and other walked-on surfaces of the earth-moving machine are free of dirt, grease, oil, ice and snow.

5 Danger zone

•No one may enter the danger zone of earth-moving machines.

•The danger zone encompasses the area around the earth-moving machine in which people may be injured by movements of the earth-moving machine during operation, its working equipments and attachments, or by swinging out or falling loads, or by falling working equipment.

•The machine operator may only work with the earth-moving machine when the danger zone is free of personnel.

•The machine operator must give a warning signal to persons who may be in danger.

•The machine operator has to stop work with the earth-moving machine if anyone remains in the danger zone despite the warning.

•To ensure no danger of crushing, a sufficient safety distance (min. 500 mm) must be kept from solid objects, e.g. buildings, excavation slopes, scaffolding, other machines, etc.

If the above safety distance cannot be maintained, the area between solid objects and the working zone of the earth-moving machine must be blocked off.

•If conditions are such that the machine operator's view of the driving and working zone is restricted, he must be guided or the driving and working zone must be marked by a solid barricade.

The windows must be clean and free of ice.

Driving tracks must be designed so as to ensure smooth, safe operation, i.e. they must be sufficiently wide, on ground which has sufficient carrying capacity and as few slopes as possible.

Downhill tracks must be set out in such a way that loading machines can be braked safely.

6 Transport of passengers

Passengers must not be transported on the machine.

7 Stability

Earth-moving machines must be used, driven and operated in such a manner that their stability against overturning is ensured at all times.

The machine operator must drive at speeds which are suitable for local conditions.

The permitted payload of the earth-moving machine must not be exceeded.

Earth-moving machines must remain at a sufficient distance from the edges of quarries, pits, mounds and slopes to ensure there is no risk of falling.

Earth-moving machines must be secured so that they cannot roll or slip when in the vicinity of excavations, shafts, ditches, pits and slopes.

8 Travel operation

Before putting the earth-moving machine into operation, the driver's seat, mirrors and controls must be so adjusted as to ensure safe working.

The carrying capacity of bridges, cellar roofs, vaults, etc. must be verified before the earth-moving machine can drive over them.

The internal dimensions of constructions must be noted before entering underground passages, tunnels, etc.

On steep drops and uphill gradients, the load must be carried on the uphill side, if possible, in order to increase stability.

Before driving downhill, the appropriate gear for the terrain must be selected and the gear lever must not be moved during downhill travel (normal or crawler gear).

Earth-moving machines may only be driven on the open road when both the machine and the driver have the appropriate licence as required by the country in question.

Outside areas covered by general traffic regulations, e.g. on construction sites, traffic regulations should be applied in the proper manner. This should also apply with regard to drivers' licences.

9 Operation

The operator has to check the correct fastening of the attachments and / or lock of the quick exchange device daily before start of operation and after every attachment change. Move the attachment carefully at low height. Please ensure that nobody is in the danger zone during these checks.

The machine operator may only swing the working equipment over occupied drivers' seats, operator consoles and workplaces of other machines if these are protected by overhead guards (FOPS).

If a cab does not have the required protection, the driver of this vehicle must leave the driver's seat when the working equipment has to be slewed overhead.

The vehicles must be loaded in such a manner as to ensure that there is no overloading and no material can be lost during travel. The vehicle must be loaded from the lowest possible height.

At dumping points, earth-moving machines may only be operated when suitable measures have been taken to prevent rolling or falling.

10 Guides

Guides must be easily recognizable, e.g. by means of reflective clothing. They must remain within the machine operator's field of sight.

While guiding the machine, guides must not be given other jobs which may distract them from their task.

11 Danger of falling objects

Earth-moving machines may only be used where there is a danger of falling objects if the driver's seat and operator consoles have an overhead guard (FOPS). A front guard must be employed if there is a risk of materials breaking into the cab.

In front of walls e.g. of stacked materials, earth-moving machines must be positioned and operated in such a way that the driver's seat and entry to the driver's seat are not situated on the side facing the wall.

Demolition work may only be performed with earth-moving machines where there is no danger to personnel.

12 Working in the vicinity of underground power lines

Before commencing excavating work using earth-moving machines, it must be determined whether any underground power lines are present in the intended working zone which may present a danger to personnel.

If underground power lines are present, their exact position and course must be determined in consultation with the proprietor or operator of the lines, and the necessary safety precautions decided and implemented.

The course of power lines in the work area must be clearly marked, under supervision, before commencing any excavation work. If the position of lines cannot be determined, search ditches must be dug - manually, if needed.

If underground power lines are encountered unexpectedly or they or their protective covers are damaged, the machine operator must discontinue work immediately and notify the supervisor.

13 Working in the vicinity of overhead power lines

When the earth-moving machine is being used in the vicinity of overhead power lines and trolley wires, a safety distance which varies depending upon the nominal voltage of the overhead line must be maintained between the lines and the earth-moving machine and its working equipment, in order to prevent current overspill. This also applies to the distance between these lines and attached implements or loads.

The safety distances specified below must be complied with:

Nominal voltage	Safety distance in metres
- 1000 V	1.0 m
over 1 kV - 110 kV	3.0 m
over 110 kV - 220 kV	4.0 m
over 220 kV - 380 kV	5.0 m
nom. voltage unknown	5.0 m

In the observation of safety distances, all working movements of the earth-moving machine, e.g. positions of the boom, swinging ropes and the dimensions of attached loads must be taken into consideration. Uneven ground which would cause the earth-moving machine to be inclined and thus nearer to overhead lines must also be taken into account.

During work in windy conditions, both overhead lines and working equipment may swing out, thus reducing the safety distance.

If it is impossible to maintain sufficient distance from overhead power lines and trolley wires, the plant operator must consult with the proprietor or operator of the overhead lines to find other safety precautions to prevent current overspill. Such measures could be, e.g.

- Switching off the current
- Re-routing the overhead line
- Cabling, or
- Limiting the work zone of earth-moving machines.

14 Operation in closed rooms

If earth-moving machines are used in closed rooms, these areas must be sufficiently ventilated and special regulations observed.

15 Work stoppages

Before rest periods and at the end of the working day, the driver of the earth-moving machine must park the machine on ground with sufficient load capabilities and is as even as possible, and must secure it against movement.

Before rest periods and at the end of the working day, the driver must lower the working equipment onto the ground or secure it so that it cannot move about.

The driver must not leave the earth-moving machine if the working equipment has not been lowered to the ground or secured.

Earth-moving machines may only be parked in places where they do not present an obstacle, e.g. on the construction site or to plant traffic. Warning devices, e.g. triangles, warning cordons, flashing or hazard lights are to be used if necessary.

Before leaving the control console, the driver must bring all working equipment into home position and apply the brakes.

If the driver is leaving the earth-moving machine unattended, he must first turn off the drive motors and ensure that they cannot be started up by unauthorized persons (remove ignition key for example).

16 Crane operations

Crane operations are the hoisting, transporting and lowering of loads with the aid of a fixing device (rope, chain, etc.), whereby the assistance of personnel is required to attach and release the load.

Such work covers, for example, the lifting and lowering of pipes, heavy machine parts or containers with earth-moving machines.

Earth-moving machines may only be used for crane operations if the prescribed safety devices are present and in full working order. For earth-moving machines, these are:

- Safe fastening points for lifting device
- Table of carrying capacity
- Overload warning device*
- Hose rupture safety valve for boom cylinder*

*only in case of an admissible carrying capacity of more than 1000 kg

Loads must be attached in such a way that they cannot slip or fall out.

Personnel guiding the machine and attaching loads must always remain in the machine operator’s field of sight.

The machine operator must carry loads as close to the ground as possible and prevent them from swinging.

Earth-moving machines may only travel with an attached load if the path of travel is fairly level.

When earth-moving machines are used for crane operations, personnel attaching loads may only approach the boom from the side and with the machine operator’s permission. The machine operator may only give his permission if the earth-moving machine is standing still and the working equipment is not in motion.

Do not use fixing devices (ropes, chains) which are damaged or of inadequate dimensions. Protective gloves must always be worn when working with fixing devices.

17 Assembly, maintenance, repair

Earth-moving machines may only be assembled, converted or disassembled under the guidance of a suitable person designated by the plant operator and following the manufacturer's operating instructions.

After every change of attachment, the operator has to ensure the correct fastening and / or lock of the quick exchange device.

Work on braking, steering, hydraulic and electric systems of the earth-moving machine may only be carried out by expert personnel specially trained in these areas.

Stability must be ensured at all times during work on earth-moving machines.

The working equipment must be secured against movement by lowering them to the ground or equivalent measures, e.g. stays, trestles. When the engine is running, the insecured articulation area of loaders with articulated steering must not be entered.

When jacking up earth-moving machines, jacking devices must be positioned so that they cannot slip. Jacks must be positioned and applied absolutely straight, without tilting.

Raised earth-moving machines must be supported by suitable structures such as crosswise stacks of planks, square timbers or steel trusses.

Earth-moving machines which are raised with working equipment must be stabilized by a supporting structure immediately after lifting. Do not work under earth-moving machines which are only supported by the hydraulics.

The engine/motor must be turned off prior to all maintenance and repair work. These requirements may only be ignored in the case of maintenance or repair work which cannot be performed without the engine/ motor running.

Depressurize the hydraulic system when carrying out maintenance and repair jobs. To do this, lower the working equipment to the ground with the engine turned off and operate all hydraulic control levers until the hydraulic system is depressurized.

Before working on the electrics or when performing arc-welding on the machine, the connection to the battery must be interrupted.

When disconnecting the battery, first the negative pole then the positive pole must be disconnected. The battery must be re-connected in reverse order.

During repair work around the battery, the battery must be covered with insulating material; tools should never be placed on or near the battery.

Protective devices of moving machine parts may only be opened or removed when the drive has been switched off and cannot be switched on again by unauthorized persons. Protective devices are e.g. engine/motor covers, doors, protective grating, trim.

Upon completion of assembly, maintenance or repair work, all protective devices must once more be attached in the proper manner.

Load-bearing parts of earth-moving machines may only be welded following consultation with the manufacturer and in accordance with recognized welding principles.

Overhead guards (FOPS) must not be welded or drilled in any way which could impair their sturdiness.

Alterations, such as welding of the hydraulic system, may only be undertaken with the manufacturer's permission.

Before commencing work on the hydraulic system, the pilot pressure, back pressure and pressure inside the tank must be let off.

Lubricants cannot be taken internally and repeated skin contact should be avoided. There is no special danger to health if lubricants are used correctly. Please follow the safety recommendations issued by the mineral oil companies.

Only the hoses specified by the manufacturer may be used.

Hydraulic hoses must be routed and assembled by expert personnel.

Never smoke or handle open flames near or around the fuel tank and batteries.

18 Towing, loading, transportation

The towing of earth-moving machines may only be done with towing devices sufficiently dimensioned.

The fixing devices specified by the manufacturer must be employed.

For loading and transportation, earth-moving machines and all necessary auxiliary equipment must be secured against unwanted movement.

The travelling gear and track-laying gear of earth-moving machines must be sufficiently cleaned of mud, snow and ice to ensure that ramps can be driven up without risk of slipping.

When the earth-moving machine is transported on lorries, flat-bed trailers or by rail, it has to be carefully secured with wheel chocks and tie-downs at the fastening points.

Before setting off, the route to be taken must be examined to determine whether the roads are wide enough, entrances and passages under bridges are large enough and that roads and bridges have sufficient carrying capacity.

19 Monitoring and inspections

The machine must be thoroughly inspected by an authorized and trained person according to the safety regulations valid in your country:

- prior to the first commissioning and prior to re-commissioning after major changes
- at least once a year
- periodically according to the operating conditions and the conditions in the operator's company

The inspection report is to be put in writing and kept for future reference.

Furthermore, prior to each work shift, the machine operator must check the earth-moving machine according to the inspection chart.

Hydraulic hoses must be replaced as soon as the following damages are recognized:

- Damages to the outer layer which reach the intermediate layer
- Embrittled patches on the outer layer
- Deformations when under pressure or without pressure which differ from the original shape of the installed hose
- Leakages
- Damages to hose fittings or to the connection between the fitting and the hose

The coolant level must only be checked when it has cooled down; the cap must be turned carefully in order to bleed off excess pressure.

Prior to operations, the machine operator must check the function of the safety devices.

The machine operator must advise the supervisor immediately - and the person relieving him, should there be a change of operators - with regard to any shortcomings.

In the event of shortcomings which jeopardize the operating safety of the earth-moving machine, it must not be used until these have been eliminated.

20 Fire protection



A fire extinguisher has to be stored in the operator's cab. A fire extinguisher symbol has to be applied.

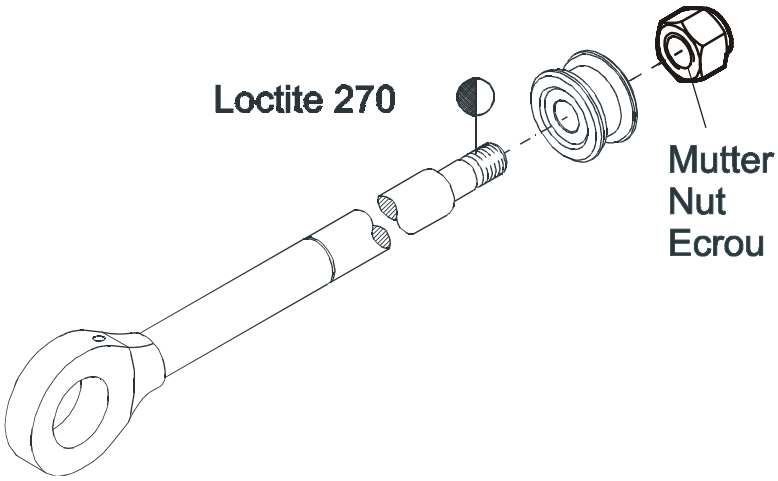
21 Emergency exit

The windscreen acts as an emergency exit. If a front guard is fitted or this exit can no longer be used for any other reason, an emergency hammer must be affixed at an easily accessible place inside the driver's cab.

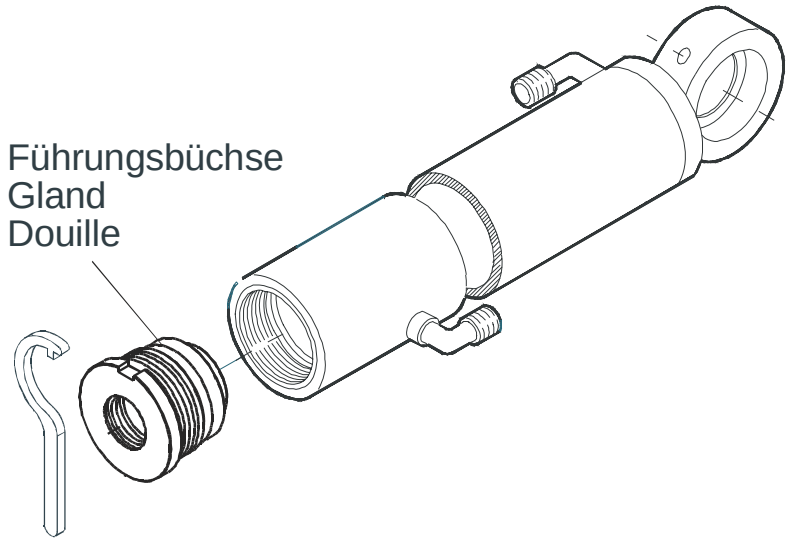
22 Other dangers

Failure of the hydraulics

If the hydraulic system fails due to a standstill of the diesel engine, a defectiveness of the hydraulic pump or a hydraulic oil leakage, only the **emergency** functions **„lower working equipment"** are possible.



Gewinde Kolbenmutter Thread of nut Filetage d'écrou	Anziehdrehmoment Nm Tightening torques Nm Couples de serrage Nm
M 18x2	200
M 20x2	260
M 22x2	410
M 24x2	450
M 27x2	810
M 30x2	1050
M 35x1,5	730
M 36x2	1075
M 36x3	1550
M 39x3	1700
M 40x1,5	730
M 42x2	1400
M 42x3	1850
M 48x3	2050
M 56x2	1600
M 60x2	1800
M 70x2	2500
M 80x2	2900
M 90x2	3200



Hydraulikzylinder ∅ Hydraulic cylinder ∅ Vérin hydraulique ∅	Gewinde - Führungsbüchse Thread - Bushing Filetage - Douille	Anziehdrehmomente Nm Tightening torques Nm Couples de serrage Nm
35/45	M50x2	200 - 230
50	M56x2	230 - 265
55	M60x2	250 - 290
63	M68x2	290 - 335
70	M75x2	330 - 380
70	M80x2	360 - 415
80	M85x2	390 - 450
90	M95x2	450 - 520
95	M100x2	480 - 550
100	M105x2	520 - 600
105	M110x2	550 - 635
110	M115x2	590 - 680
115	M120x2	630 - 725
125	M130x2	690 - 795

Pictograms

001 - 099 General control

100 - 119 Loader

120 - 139 Excavator

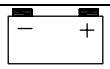
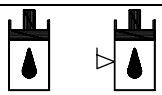
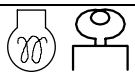
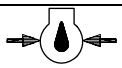
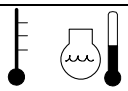
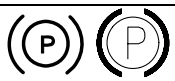
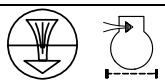
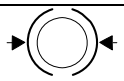
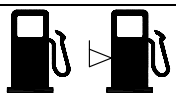
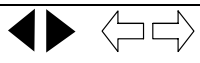
140 - 149 Backhoe excavator

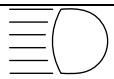
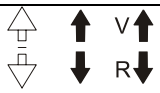
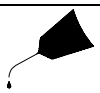
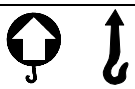
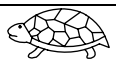
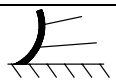
150 - 159 Universal-mounted excavator / loader

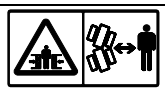
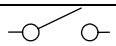
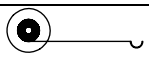
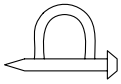
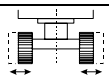
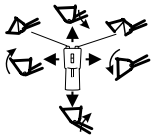
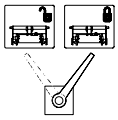
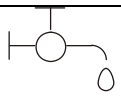
160 - 179 Walking excavator

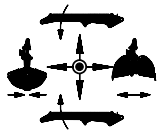
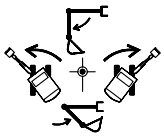
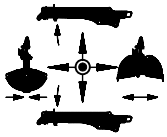
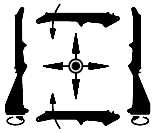
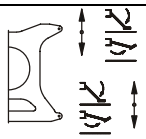
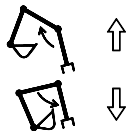
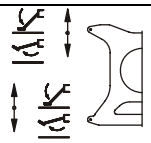
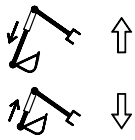
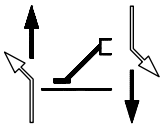
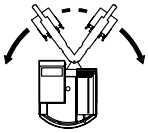
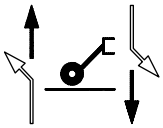
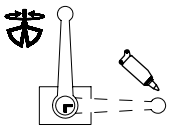
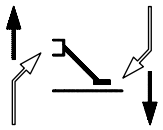
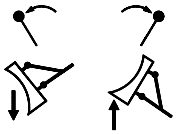
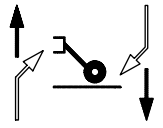
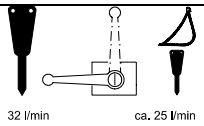
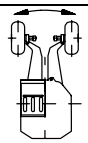
180 - 199 Tunnelling and mining machines / Rail-road excavator

200 - Maintenance, safety, etc. in general

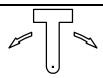
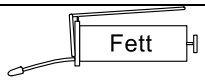
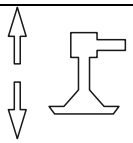
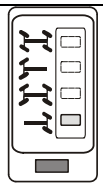
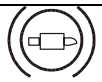
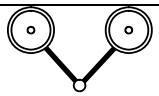
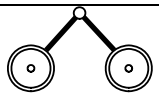
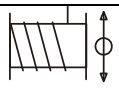
	Symbol	Description		Symbol	Description
001		Battery charge indicator	**012**		Hydraulic oil, hydraulic oil level
002		Pre-heat	**013**		Hydraulic oil temperature
003		Engine oil pressure	**014**		Hydraulic oil filter clogging indicator
004		Engine oil temperature	**015**		Horn
005		Engine oil level	**016**		Operational status, operating hours
006		Coolant temperature	**017**		Parking brake
007		Coolant level	**018**		Brake accumulator pressure
008		Air filter	**019**		Excavator brake
009		Fuel, fuel level	**020**		Service brake
010		Fan, Heater / ventilation	**021**		Hazard warning system
011		Windscreen wash/ wipe system	**022**		Direction indicator, left/right

	Symbol	Description		Symbol	Description
023		Working floodlights	**039**		Speed control
024		Upper beam indicator	**040**		Oscillating axle lock
025		Direction of travel forward/reverse	**041**		Steering inversion
026		Rotating beacon	**042**		All-wheel steering crab / round steer
027		Light, lower beam	**043**		Rocker pedal for travel
028		Central grease system	**044**		Only shift when machine is at standstill
029		Lashing points	**045**		High gear
030		Overload warning device / Overload warning indicator	**046**		Cabin lift / lower
031		Suspension point for loading by crane	**047**		Steering control display
032		Travel speed, fast	**048**		First aid kit
033		Travel speed, slow	**049**		Fire extinguisher
034		Working hydraulics cut-off, excavator; loader / crane	**050**		Switch-over monitor for operating hours and time
035		Unlocked	**051**		Swing limitation, engine stop override
036		Locked	**052**		Switch for all-wheel steering
037		Float position	**053**		Interior lighting
038		Dozer blade	**054**		Reset hydraulic pulley block (crane)

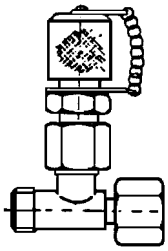
	Symbol	Description		Symbol	Description
055		Quick movement hoisting winch	**071**		Danger of crushing
056		Cable uncoil limit switch	**072**		Danger of injury
057		Auxiliary winch	**073**		Observe notes in operating instructions
058		Magnet system	**074**		
059		Hydraulic rock breaker	**075**		Linde - no load automatics
060		Electric boom height limitation	**076**		Remote control
061		Undercarriage-adjustment	**077**		Warning - general
062		Switch-over swing speed, engine speed adjustment	**078**		Temperature - General
063		Free fall mode	**079**		
064		Grab rotation	**080**		
065		Bucket return positioning, lifting frame height limitation	**100**		Control by Joystick
066		Ride control system	**101**		
067		Bucket return positioning	**102**		Quick mount-hitch lock
068		Hydraulic oil level	**103**		
070		Safety distance, see item 202	**104**		Water pump for sweeper

	Symbol	Description		Symbol	Description
105		Warning lamp gearbox	**151**		Universal-mounted excavator/ loader (AL) controls ISO control system right
120		Control ISO control system-left Schaeff control system-right	**152**		Universal-mounted excavator/ loader (AL) controls Schaeff control system left
121		Control ISO control system right	**153**		Universal-mounted excavator/ loader (AL) controls Schaeff control system right
122		Control Schaeff control system left	**154**		Universal-mounted excavator/ loader (AL) controls Outrigger right
123		Control Intermediate boom (articulated boom type)	**155**		Universal-mounted excavator/ loader (AL) controls Outrigger left
124		Control telescopic stick in / out	**160**		Control Outrigger leg left
125		Control articulation „Knickmatik“	**161**		Control Wheel outrigger - left
126		Switch-over rock breaker / grapple	**162**		Control Outrigger leg right
127		Control dozer blade	**163**		Control Wheel outrigger - right
128		Switch-over (HR 12) Bucket - rocker breaker small / rock breaker big	**164**		Steering
140		Shifting of slide bearing	**165**		Wheel lock (HS 41)
150		Universal-mounted excavator/ loader (AL) controls ISO control left	**166**		Free wheel (HS 41 M)

	Symbol	Description		Symbol	Description

167		Outriggers spread	**200**		Grease gun
168		Outriggers lift / lower	**201**		Danger
169		Steering mode switch HS 41 MM	**202**		On the machine: caution, safety distance In the operating manual: warning
170		Outrigger left	**203**		Note
171		Outrigger right	**204**	**R**	Soot filter
180	D	Switch-over diesel drive	**205**		Particle filter
181		Switch-over electric drive			
182	START	Diesel engine ignition lock			
183		Pony truck IN			
184		Pony Truck OUT			
185	START E-Motor	Electric motor START			
186	Not-Aus E-Motor	Electric motor emergency OFF			
187		Cable drum (cable winch)			

Minimum basic equipment

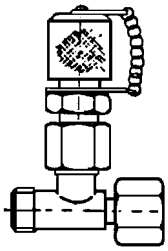


test port 8 L
part no. **5 066 234 200**

screwed fitting ELSD 8 L
part no. **1 919 060 351**

2 X

pilot pressure
“working hydraulics“
control pressure
“travel hydraulics“
etc.



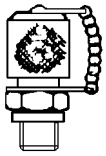
test port 10 L
part no. **5 066 234 230**

screwed fitting ELSD 10 L
part no. **1 919 060 352**

1 X

brake pressure

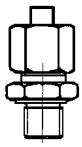
etc.



test port M 12x1,5
part no. **5 066 253 605**
seal ring 18x12x1,5
part no. **1 636 815 453**

2 X

control pressure
regulation start
housing pressure
“travel hydraulics“
etc.



nut 8 L
part no. **1 911 060 154**
plug
part no. **1 928 000 944**
screwed fitting G 8 L
part no. **1 915 000 418**

1 X

brake inching

etc.

Measuring hoses (Minimeß)

L = 2000mm part no. 5 066 253 600
L = 3200mm part no. 5 066 314 040
L = 6000mm part no. 5 066 314 070
L = 2500mm part no. 5 066 314 010
L = 5000mm part no. 5 066 314 055

Drift values in mm / minute

Machinery type				Lift cylinder	Tilt cylinder
TL 65 (SKL 824)				**3,0**	**5,5**
TL 70 (SKS 634)				**3,0**	**5,5**
TL 80 (SKL 834)				**3,0**	**5,5**
TL 100 (SKL 844)				**3,5**	**6,0**
TL 120 (SKL 854)				**3,5**	**6,0**
TL 160 (SKL 160)				**3,5**	**3,0**
SKL 200 (SKL 873)				**3,5**	**3,0**
TL 260 (SKL 260)				**3,5**	**3,0**

Machinery type	Boom cylinder	Intermediate boom cyl.	Dipperstick cylinder		
TW 70 (HML 23 GA)	**3,0**	**3,0**	**4,0**		
TW 85 (HML 32 Mono)	**3,5**		**5,5**		
TW 85 (HML 32 GA + Ci)	**3,5**	**2,5**	**5,5**		
TW 110 (HML 42 GA)	**3,0**	**2,5**	**5,0**		
TC 60 (HR 20 Mono)	**3,0**		**3,0**		
TC 75 (HR 32 Mono)	**3,5**		**5,5**		
TC 75 (HR 32 Ci)	**3,5**	**2,5**	**5,5**		
TC 125 (HR 42 GA)	**3,0**	**2,5**	**5,0**		
TC 125 (HR 42 Mono)	**3,0**		**5,0**		

Machinery type Engine/Control valve	Boom cylinder		Dipperstick-cylinder		
TC 15 (HR 1.5)	**5,0**		**6,5**		
TC 16 (HR 1.6)	**5,0**		**6,5**		
TC 20 (HR 2.0)	**5,0**		**6,5**		
TC 29 (HR 14) Mitsub./SX12	**4,0**		**7,0**		
TC 35 (HR 16) Mitsub./SX12	**4,0**		**7,0**		
TC 37 (HR 3.7)	**4,0**		**6,5**		
TC 48 (HR18) Mitsub./KVSE	**3,0**		**3,0**		
TC 50 (HR 5.0)					

Test conditions:

1. Hydraulic oil temperature approx. 50 - 60 °C.
2. Fit test port with gauge on the cylinder.
3. Retract and extend cylinder several times and operate working equipment to its maximum reach until the gauge indicates a load pressure of 100 bar (if necessary charge with weight).
4. Measure piston rod length of cylinder
5. Measure piston rod length again after 5 minutes
6. The difference converted into 1 minute is the drift of the cylinder
7. The values indicated are valid for hydraulic oil 10 W 40 (viscosity at 50°C approx. 35 mm^2/s (cST))

There may be differences if hydraulic oil with a different specification is used.

SUBGROUP LIST

Technical Data

SKL 200 (SKL 873)	**2.13**
TL 65 (SKL 824)	**2.22**
TL 80 (SKL 834)	**2.24**
TL 80 AS	**2.25**
TL 100 (SKL 844)	**2.26**
TL 120 (SKL 854)	**2.27**
TL 160 (SKL 160)	**2.28**
TL 210	**2.29**
TL 260 (SKL 260)	**2.30**
TL 420	**2.33**
TL 450	**2.35**
TL 70 (SKS 634)	**2.37**
TW 70 (HML 23)	**2.49.50**
TW 85 (HML 32)	**2.51**
TW 110 (HML 42)	**2.53**
TC 60 (HR 20)	**2.60**
TC 75 (HR 32)	**2.65**
TC 125 (HR 42)	**2.67**
TC 29 (HR 14)	**2.76**
TC 35 (HR 16)	**2.78**
TC 48 (HR 18)	**2.80**
TC 15 (HR 1.5)	**2.90**
TC 16 (HR 1.6)	**2.91**
TC 20 (HR 2.0)	**2.92**
TC 25	**2.93**
TC 37 (HR 3.7)	**2.97**
TC 50	**2.99**

DIESEL ENGINE

Manufacturer:		Perkins
Type:		1106C-E60TA
Performance acc. to DIN 70020:	kW/PS	106 / 144 at 2,200 min^{-1}
Construction:		6 cylinders in line
Cooling:		water
Injection:		direct injection
Spec. fuel consumption:	g/kWh	220
Capacity:	cm^3	6,000
High idle:	min^{-1}	2,350 $^{+50}$
Low idle:	min^{-1}	750 $^{+50}$
Tappet clearance - inlet cold:	mm	0.20
Tappet clearance - outlet cold:	mm	0.45
Further data:		see engine instruction book

ELECTRIC SYSTEM

Voltage:	V	24
Battery:	V/Ah/A	2 x 12 / 105 / 760
Alternator:	V/A	24 / 80
Starter:	V/kW/PS	24 / 4.5 / 6.1
Starting aid:		glow system
Lighting:		acc. to German motor vehicle construction and use regulation and Euronorm

TRANSMISSION

Travel pump:	type	A 4 VG 125 DA with pressure cut-off
Displacement:	max. cm^3/rev.	125
Travel motor:	type	A 6 VM 160 DA 6
Displacement:	max. cm^3/rev.	160

TRAVEL RANGE

4 pre-selectable travel ranges, electro-hydraulically operated:

SKL 200: 20 km/h - version		
Gearbox position 1, tortoise / rabbit:	km/h	0 to 7 / 0 to 15
Gearbox position 2, tortoise / rabbit:	km/h	0 to 10 / 0 to 20
SKL 200: 40 km/h - version		
Gearbox position 1, tortoise / rabbit:	km/h	0 to 7 / 0 to 16
Gearbox position 2, tortoise / rabbit:	km/h	0 to 16 / 0 to 40

Cardan shaft rev. at **20 km/h - version**

				adjustment at nominal speed tortoise / rabbit
tyres				1./2. gear / 1./2. gear
standard:	20.5-25 12PR SGLD/L-2	Good Year:	min^{-1}	450 / 660 800 / 1,170
option:	20.5 R25 XHA TL	Michelin:	min^{-1}	450 / 660 800 / 1,170
	20.5-25 12PR E91TL	Dunlop:	min^{-1}	450 / 660 820 / 1,200
	555/70 R25 XHF	Michelin:	min^{-1}	450 / 660 840 / 1,230
	20.5 R25 EM RL-2	Good Year:	min^{-1}	450 / 660 800 / 1,170

Cardan shaft rev. at **40 km/h - version**

				adjustment at nominal speed tortoise / rabbit
tyres				1./2. gear / 1./2. gear
standard:	20.5-25 12PR SGLD/L-2	Good Year:	min^{-1}	450 / 1,035 1,015 / 2,330
option:	20.5 R25 XHA TL	Michelin:	min^{-1}	450 / 1,035 1,015 / 2,330
	20.5-25 12PR E91TL	Dunlop:	min^{-1}	450 / 1,035 1,040 / 2,380
	555/70 R25 XHF	Michelin:	min^{-1}	450 / 1,035 1,065 / 2,450
	20.5 R25 EM RL-2	Good Year:	min^{-1}	450 / 1,035 1,015 / 2,330

PRESSURE AND SETTING VALUES — travel

Suction pressure:	max. bar	- 0.25
Charge pressure (high idle):	bar	32 $^{\pm 1}$
High pressure (safety valves):	bar	480
Pressure cut-off:	bar	440 $^{\pm 10}$
Case pressure:	max. bar	2.5
Regulation start (DA-motor):	bar	220 (motor can be stalled up to 2,100 $_{-50}$ min^{-1})
Start-up speed:	min^{-1}	1,150 $^{\pm 50}$
Engine stalling (tortoise):	min^{-1}	2,000 $^{-100}$ at full speed and 220 bar HP
Brake inching beginning / end:	bar	5 / 13

STEERING

Steering unit:	type	Rexroth LAGU 320/160-12/LD 240-175
Servo selector valve:	type	Rexroth 7730
Steering pump:	make	Brueninghaus (see working hydraulics)
Steering pressure:	bar	205 $^{+10}/_{-5}$ (LS eff. 175 bar)
Supplementary steering (shift pressure)	bar	20 $^{\pm 2}$

WORKING HYDRAULICS

Working and steering pump:	make	Brueninghaus/Rexroth
	type	A10 VO 71 DFR 1
Displacement:	cm³/rev.	71
	ltr./min	156
Stand-by pressure (flow controller):	bar	32 $^{+2}$
Servo-controlled valve:	type	PRSV C01
Control valve:	type	Rexroth 3 M6-15

PRESSURE AND SETTING VALUES — working

LS pressure relief valve:	bar	250
Line relief pressures:		
- lifting frame lift:	bar	280 $^{+10}$
- lifting frame lower:	bar	anti-cavitation
- shovel dump in:	bar	280 $^{+10}$
- shovel dump out:	bar	280 $^{+10}$
- additional control circuit:	bar	230 $^{+10}$ / 230 $^{+10}$

WORKING CYCLES

Lifting frame lift:	s	6.3
Lifting frame lower:	s	4.3
Shovel dump in:	s	1.3
Shovel dump out:	s	1.4

AXLES

Front axle with self-locking diff., 20 km/h - version:	make/type	DANA 176 / 348
Rear axle with self-locking diff., 20 km/h - version:	make/type	DANA 360 / 176 / 70
Lock value:	max. 45%	
Front axle with self-locking diff., 40 km/h - version:	make/type	DANA 176 / 348
Rear axle with self-locking diff., 40 km/h - version:	make/type	DANA 360 / 176 / 69

BRAKE SYSTEM

Service brake (four-wheel-brake):		hydraulic 2-circuit brake, oil-immersed disks of both axles
Parking brake (hydraulic hand brake valve):		spring-loaded brake acting on the disks of both axles
Additional brake:		hydrostatic by closed circuit of the transmission
Brake pump (accessory drive):	make	Cassappa PLP 20.11.2
Displacement:	cm^3/rev.	11
	ltr./min.	24
Brake pressure (service brake):	max. bar	60 $^{+6}$
Accumulator charge valve:	make	Rexroth type LT 13
Cut-in / cut-off pressure:	bar	120 - 150
Sequence valve (pressure sequence valve):	bar	Δp 13 (e.g. 60 bar brake pressure means 60 bar at the inching valve and 47 bar at the brake)
Opening pressure (parking brake):	bar	15
Setting value, parking brake:	bar	25

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil recommendation table
Transmission oil:	MIL-L 2105 B or API-GL 5, SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. With lithium.
Brake medium:	hydraulic oil

MAINTENANCE PARTS

see instruction book

CAPACITIES

	ltr.	
Engine oil - change:	approx. 15.0	engine oil (+ 2 x 0.5 l filter)
Hydraulic oil (tank and system):	approx. 170.0	hydraulic oil
Hydraulic oil (change):	approx. 130.0	hydraulic oil
Fuel tank:	approx. 210.0	diesel
Front axle - central housing:	approx. 11.5	transmission oil
Front axle - wheel hub:	approx. 2.35	transmission oil, each
Rear axle - central housing:	approx. 10.5	transmission oil
Rear axle - reduction gearbox:	approx. 3.4	transmission oil
Rear axle - wheel hub:	approx. 2.35	transmission oil, each
Service brake:		connected to the hydraulic system
Cooling agent:	approx. 46.0	water with anti-corrosive and anti-freeze agent

DIESEL ENGINE

Manufacturer:		Deutz
Type:		F4M 2011
Performance according to (ECE-R24/ISO1585/ISO9249):	kW	37 at 2,300 min^{-1}
Construction:		4 cylinders in line
Cooling:		external oil cooling
Injection:		direct injection
Capacity:	cm^3	3,100
High idle:	min^{-1}	2,450 $^{+50}$
Low idle:	min^{-1}	850 $^{+50}$
Spec. fuel consumption under full load:	g/kWh	216
Tappet clearance - inlet cold:	mm	0.30
Tappet clearance - outlet cold:	mm	0.50
Torque of cylinder head studs (only in case of repair):	Nm	30 / 80 / 160 Tightening angle 90°
Further data:		see engine instruction book or chapter 3

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 80 / 720 (EN)
Generator:	V/A	14 / 95
Starter:	V/kW/PS	12 / 2.3 / 3.1
Cold start aid:		heater plug
Lighting:		acc. to German motor vehicle construction and use regulation (“StVZO”) and Euronorm. H4 halogen headlamp. Two working lights at the front.

TRANSMISSION

Travel pump:	type	A 4 VG 40 DA with pressure cut-off
Displacement:	max. cm^3/rev.	40
Travel motor 20/36 km/h version:	type	A 6 VM 55 DA 2
Displacement 20/36 km/h version:	max. cm^3/rev.	55

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 65:	**20 km/h - version:**				
	tortoise / rabbit	km/h	0 to 7.0	/	0 to 20
TL 65 S:	**36 km/h - version:**				
Gearbox position 1, tortoise / rabbit:		km/h	0 to 6.5	/	0 to 18
Gearbox position 2, tortoise / rabbit:		km/h	0 to 13	/	0 to 36

Cardan shaft rev. at **20 km/h - version**			adjustment at nominal speed tortoise / rabbit		
and standard tyres	365/70 R18:	min^{-1}	650 / 1,985		
	12,5-18:	min^{-1}	650 / 1,985		
	335/80 R18:	min^{-1}	650 / 1,940		

Cardan shaft rev. at **36 km/h - version**			adjustment at nominal speed tortoise 1./2. gear	/	rabbit 1./2. gear
and standard tyres	365/70 R18:	min^{-1}	630 / 1,290		1,750 / 3,565
	12,5-18:	min^{-1}	630 / 1,290		1,750 / 3,565
	335/80 R18:	min^{-1}	630 / 1,290		1,710 / 3.490

PRESSURE AND SETTING VALUES **travel**

Suction pressure:	max. bar	0.5 $^{\pm 0.1}$
Charge pressure (high idle):	bar	30 $^{\pm 1}$
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start, dynamic:	min^{-1}	2,200 $^{-50}$ at 240 bar HP (see setting instructions, chapter 5, measuring method 2)
Start-up speed:	min^{-1}	1,150
Engine stalling (rabbit) - dynamic:	min^{-1}	2,100 $^{-100}$ at 260 bar HP
Brake inching beginning / end:	bar	5 - 13
Pressure switch (hydrostatic brake):	bar	22

STEERING

Steering unit:	type	Danfoss OSPC 250 LS dyn.
Steering pump:	make	Cassappa
Displacement:	cm^3/rev:	17.8
Steering pressure (high idle):	bar	175
Priority valve:	type	Danfoss OLS 80 dyn.

WORKING HYDRAULICS

Working pump:	make	Cassappa
Displacement:	l/min.	41
Valve bank:	type	Parker P70
Servo-controlled valve:	type	Brown PRSV

PRESSURE AND SETTING VALUES **working**

Main pressure relief valve (high idle):	max. bar	250
Line relief pressures:		
- lifting frame lift:	bar	280
- lifting frame lower:	bar	anti-cavitation
- shovel dump in:	bar	280
- shovel dump out:	bar	130
- additional control circuit:	bar	230 / 230
- pilot pressure (charge pressure):	bar	30 $^{\pm 1}$

WORKING CYCLES

Lifting frame lift:	s	4.9
Lifting frame lower:	s	3.4
Shovel dump in:	s	---
Shovel dump out:	s	---

AXLES

Front axle with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 715 // 4472 004 064
Rear axle with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 715 // 4472 004 065
Front axle with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 715 // 4472 004 064
Rear axle with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 715 // 4472 004 067

BRAKE SYSTEM

Service brake:		hydraulically operated drum brake, front axle
Parking brake:		drum brake at the front axle
Master cylinder:	make	ATE (mineral oil)

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil recommendation table
Transmission oil:	MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS

see instruction book

CAPACITIES

	ltr.	
Engine oil with oil filter and oil cooler - change:	approx. 13.0	engine oil
Hydraulic oil (tank and system) - first filling:	approx. 49.0	hydraulic oil
Hydraulic oil tank (change):	approx. 40.0	hydraulic oil
Fuel tank:	approx. 75.0	diesel
Front axle - central housing:	approx. 3.5	transmission oil
Front axle - wheel hub:	approx. 0.3	transmission oil, each
Rear axle - central housing and reduction gearbox:	approx. 4.0	transmission oil
Rear axle - wheel hub:	approx. 0.3	transmission oil, each
Service brake:	approx. 0.25	ATF oil

DIESEL ENGINE

Manufacturer:		Deutz
Type:		F4M 2011
Performance according to (ECE-R24/ISO1585/ISO9249):	kW	44 at 2,400 min^{-1}
Construction:		4 cylinders in line
Cooling:		external oil cooling
Injection:		direct injection
Capacity:	cm^3	3,100
High idle:	min^{-1}	2,550 $^{+50}$
Low idle:	min^{-1}	850 $^{+50}$
Spec. fuel consumption under full load:	g/kWh	218
Tappet clearance - inlet cold:	mm	0.30
Tappet clearance - outlet cold:	mm	0.50
Torque of cylinder head studs	Nm	30 / 80 / 160
(only in case of repair):		Tightening angle 90°
Further data:		see engine instruction book or chapter 3

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 80 / 720 (EN)
Generator:	V/A	14 / 95
Starter:	V/kW/PS	12 / 2.3 / 3.1
Cold start aid:		heater plug
Lighting:		acc. to German motor vehicle construction and use regulation ("StVZO") and Euronorm. H4 halogen headlamp. Two working lights at the front.

TRANSMISSION

Travel pump:	type	A 4 VG 56 DA with pressure cut-off
Displacement:	max. cm^3/rev.	56
Travel motor 20/36 km/h version:	type	A 6 VM 80 DA 2
Displacement 20/36 km/h version:	max. cm^3/rev.	80

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 80:	**20 km/h - version:**				
	tortoise / rabbit	km/h	0 to 7.0	/	0 to 20
TL 80 S:	**36 km/h - version:**				
Gearbox position 1, tortoise / rabbit:		km/h	0 to 6.5	/	0 to 18
Gearbox position 2, tortoise / rabbit:		km/h	0 to 13	/	0 to 36

Cardan shaft rev. at **20 km/h - version**			adjustment at nominal speed tortoise / rabbit		
and standard tyres	405/70 R18:	min^{-1}	650 / 1,880		
	12,5-20:	min^{-1}	650 / 1,900		
	335/80 R20:	min^{-1}	650 / 1,850		

Cardan shaft rev. at **36 km/h - version**			adjustment at nominal speed tortoise	/	rabbit
			1./2. gear	/	1./2. gear
and standard tyres	405/70 R18:	min^{-1}	635 / 1,300		1,660 / 3,390
	12,5-20:	min^{-1}	635 / 1,300		1,675 / 3,420
	335/80 R20:	min^{-1}	635 / 1,300		1,625 / 3,320

PRESSURE AND SETTING VALUES **travel**

Suction pressure:	max. bar	0.5 $^{\pm 0.1}$
Charge pressure (high idle):	bar	30 $^{\pm 1}$
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start, dynamic:	min^{-1}	2,300 $^{-50}$ at 180 bar
		(see setting instructions, chapter 5, measuring method 2)
Start-up speed:	min^{-1}	1,150
Engine stalling (rabbit) - dynamic:	min^{-1}	2,200 $^{-100}$ at 220 bar HP
Brake inching beginning / end:	bar	5 - 13
Pressure switch (hydrostatic brake):	bar	22

STEERING

Steering unit:	type	Danfoss OSPC 250 LS dyn.
Steering pump:	make	Cassappa
Displacement:	cm^3/rev:	27
Steering pressure (high idle):	bar	175
Priority valve:	type	Danfoss OLS 80 dyn.

WORKING HYDRAULICS

Working pump:	make	Cassappa
Displacement:	l/min.	64
Valve bank:	type	Parker P 70
Servo-controlled valve:	type	Brown PRSV

PRESSURE AND SETTING VALUES **working**

Main pressure relief valve (high idle):	max. bar	250
Line relief pressures:		
- lifting frame lift:	bar	280
- lifting frame lower:	bar	anti-cavitation
- shovel dump in:	bar	280
- shovel dump out:	bar	130
- additional control circuit:	bar	230 / 230
- pilot pressure (charge pressure):	bar	30 $^{\pm 1}$

WORKING CYCLES

Lifting frame lift:	s	4.7
Lifting frame lower:	s	3.2
Shovel dump in:	s	---
Shovel dump out:	s	---

AXLES

Front axle with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 715 // 4472 004 061
Rear axle with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 715 // 4472 004 060
Front axle with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 715 // 4472 004 061
Rear axle with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 715 // 4472 004 066

BRAKE SYSTEM

Service brake:		hydraulically operated drum brake, front axle
Parking brake:		drum brake at the front axle
Master cylinder:	make	ATE (mineral oil)

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil recommendation table
Transmission oil:	MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS

see instruction book

CAPACITIES

	ltr.	
Engine oil with oil filter and oil cooler - change:	approx. 13.0	engine oil
Hydraulic oil (tank and system) - first filling:	approx. 55.0	hydraulic oil
Hydraulic oil tank (change):	approx. 46.0	hydraulic oil
Fuel tank:	approx. 75.0	diesel
Front axle - central housing:	approx. 4.0	transmission oil
Front axle - wheel hub:	approx. 0.3	transmission oil, each
Rear axle - central housing and reduction gearbox:	approx. 4.5	transmission oil
Rear axle - wheel hub:	approx. 0.3	transmission oil, each
Service brake:	approx. 0.25	ATF oil

DIESEL ENGINE

Manufacturer:		Deutz
Type:		F4M 2011
Performance according to (ECE-R24/ISO1585/ISO9249):	kW	44 at 2,400 min^{-1}
Construction:		4 cylinders in line
Cooling:		external oil cooling
Injection:		direct injection
Capacity:	cm^3	3,100
High idle:	min^{-1}	2,550 $^{+50}$
Low idle:	min^{-1}	850 $^{+50}$
Spec. fuel consumption under full load:	g/kWh	218
Tappet clearance - inlet cold:	mm	0.30
Tappet clearance - outlet cold:	mm	0.50
Torque of cylinder head studs	Nm	30 / 80 / 160
(only in case of repair):		Tightening angle 90°
Further data:		see engine instruction book or chapter 3

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 80 / 720 (EN)
Generator:	V/A	14 / 95
Starter:	V/kW/PS	12 / 2.3 / 3.1
Cold start aid:		heater plug
Lighting:		acc. to German motor vehicle construction and use regulation ("StVZO") and Euronorm. H4 halogen headlamp. Two working lights at the front.

TRANSMISSION

Travel pump:	type	A 4 VG 56 DA with pressure cut-off
Displacement:	max. cm^3/rev.	56
Travel motor 20/36 km/h version:	type/make	51D080 / Danfoss
Displacement 20/36 km/h version:	max. cm^3/rev.	80

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 80:	**20 km/h - version:**				
	tortoise / rabbit	km/h	0 to 7.0	/	0 to 20
TL 80 S:	**36 km/h - version:**				
Gearbox position 1, tortoise / rabbit:		km/h	0 to 6.5	/	0 to 18
Gearbox position 2, tortoise / rabbit:		km/h	0 to 13	/	0 to 36

Cardan shaft rev. at **20 km/h - version**			adjustment at nominal speed tortoise / rabbit		
and standard tyres	405/70 R18:	min^{-1}	650 / 1,880		
	12,5-20:	min^{-1}	650 / 1,900		
	335/80 R20:	min^{-1}	650 / 1,850		

Cardan shaft rev. at **36 km/h - version**			adjustment at nominal speed tortoise 1./2. gear	/	rabbit 1./2. gear
and standard tyres	405/70 R18:	min^{-1}	635 / 1,300		1,660 / 3,390
	12,5-20:	min^{-1}	635 / 1,300		1,675 / 3,420
	335/80 R20:	min^{-1}	635 / 1,300		1,625 / 3,320

PRESSURE AND SETTING VALUES travel

Suction pressure:	max. bar	0.5 $^{\pm 0.1}$
Charge pressure (high idle):	bar	30 $^{\pm 1}$
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start:	bar	230
		(see setting instructions, chapter 5, measuring method 2)
Start-up speed:	min^{-1}	1,150
Engine stalling (rabbit) - dynamic:	min^{-1}	2,200 $^{-100}$ at 220 bar HP
Brake inching beginning / end:	bar	5 - 13
Pressure switch (hydrostatic brake):	bar	22

STEERING

Steering unit:	type	Danfoss OSPC 250 LS dyn.
Steering pump:	make	Cassappa
Displacement:	cm^3/rev:	27
Steering pressure (high idle):	bar	175
Priority valve:	type	Danfoss OLS 80 dyn.

WORKING HYDRAULICS

Working pump:	make	Cassappa
Displacement:	l/min.	64
Valve bank:	type	Parker P 70
Servo-controlled valve:	type	Brown PRSV

PRESSURE AND SETTING VALUES working

Main pressure relief valve (high idle):	max. bar	250
Line relief pressures:		
- lifting frame lift:	bar	280
- lifting frame lower:	bar	anti-cavitation
- shovel dump in:	bar	280
- shovel dump out:	bar	130
- additional control circuit:	bar	230 / 230
- pilot pressure (charge pressure):	bar	30 $^{\pm 1}$

WORKING CYCLES

Lifting frame lift:	s	4.7
Lifting frame lower:	s	3.2
Shovel dump in:	s	---
Shovel dump out:	s	---

AXLES

Front axle with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 715 // 4472 004 061
Rear axle with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 715 // 4472 004 060
Front axle with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 715 // 4472 004 061
Rear axle with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 715 // 4472 004 066

BRAKE SYSTEM

Service brake:		hydraulically operated drum brake, front axle
Parking brake:		drum brake at the front axle
Master cylinder:	make	ATE (mineral oil)

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil recommendation table
Transmission oil:	MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS

see instruction book

CAPACITIES

	ltr.	
Engine oil with oil filter and oil cooler - change:	approx. 13.0	engine oil
Hydraulic oil (tank and system) - first filling:	approx. 55.0	hydraulic oil
Hydraulic oil tank (change):	approx. 46.0	hydraulic oil
Fuel tank:	approx. 75.0	diesel
Front axle - central housing:	approx. 4.0	transmission oil
Front axle - wheel hub:	approx. 0.3	transmission oil, each
Rear axle - central housing and reduction gearbox:	approx. 4.5	transmission oil
Rear axle - wheel hub:	approx. 0.3	transmission oil, each
Service brake:	approx. 0.25	ATF oil


TEREX®

DIESEL ENGINE

Manufacturer:		Deutz
Type:		F4M 2011
Performance according to (ECE-R24/ISO1585/ISO9249):	kW	44 at 2,400 min^{-1}
Construction:		4 cylinders in line
Cooling:		external oil cooling
Injection:		direct injection
Capacity:	cm^3	3,100
High idle:	min^{-1}	2,550 $^{+50}$
Low idle:	min^{-1}	850 $^{+50}$
Spec. fuel consumption under full load:	g/kWh	218
Tappet clearance - inlet cold:	mm	0.30
Tappet clearance - outlet cold:	mm	0.50
Torque of cylinder head studs	Nm	30 / 80 / 160
(only in case of repair):		Tightening angle 90°
Further data:		see engine instruction book

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 80 / 720 (EN)
Generator:	V/A	14 / 95
Starter:	V/kW/PS	12 / 2.3 / 3.1
Cold start aid:		heater plug
Lighting:		acc. to German motor vehicle construction and use regulation (“StVZO”) and Euronorm. H4 halogen headlamp. Two working lights at the front. Two working lights at the rear (option)

TRANSMISSION

Travel pump:	type	A 4 VG 56 DA with pressure cut-off
Displacement:	max. cm^3/rev.	56
Travel motor (20 km/h):	type/make	A 6 VM 80 DA 2
Displacement :	max. cm^3/rev.	80

TRAVEL RANGE 20 km/h :

Tortoise / rabbit		km/h	0 to 7.0 / 0 to 20
Cardan shaft rev.		adjustment at nominal speed	tortoise / rabbit
and standard tyres	12,5-20:	min^{-1}	650 / 1,865
	340/80 R20:	min^{-1}	650 / 1,830
	405/70 R18:	min^{-1}	650 / 1,850

PRESSURE AND SETTING VALUES travel

Suction pressure:	max. bar	0.5 $^{\pm 0.1}$
Charge pressure (high idle):	bar	30 $^{\pm 1}$
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start:	min^{-1}	2300^{-50} at 180 bar HP
		(see setting instructions, chapter 5, measuring method 2)
Start-up speed:	min^{-1}	1,150
Engine stalling (rabbit) - dynamic:	min^{-1}	2,200 $^{-100}$ at 220 bar HP
Brake inching beginning / end:	bar	5 - 13
Pressure switch (hydrostatic brake):	bar	22
		(see setting instructions,chapter 5,measuring method 2)

STEERING

Steering unit:	type	Rexroth LAGC100-15/LD240-1
Steering pump:	make	Cassappa
Displacement:	cm^3/rev:	27
Steering pressure (high idle):	bar	175
Priority valve:	type	Rexroth LPS80RM/LD7-643/0

WORKING HYDRAULICS

Working pump:	make	Cassappa
Displacement:	l/min.	64
Valve bank:	type	Walvoil SDM 100/3

PRESSURE AND SETTING VALUES working

Main pressure relief valve (high idle):	max. bar	250
Line relief pressures:		
- lifting frame lift:	bar	280
- lifting frame lower:	bar	anti-cavitation
- shovel dump in:	bar	280
- shovel dump out:	bar	130
- additional control circuit:	bar	230 / 230

WORKING CYCLES

Lifting frame lift:	s	6.2
Lifting frame lower:	s	4.4
Shovel dump in:	s	3.0
Shovel dump out:	s	3.8

AXLES

Front axle with self-locking differential - 20 km/h-version:	make/type	Dana 211/111
Rear axle with self-locking differential - 20 km/h-version:	make/type	Dana 311/211/174

BRAKE SYSTEM

Service brake:		hydraulically operated drum brake, front axle
Parking brake:		drum brake at the front axle
Master cylinder:	make	ATE (mineral oil)

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see TEREX hydraulic oil recommendation table
Transmission oil:	MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS

see instruction book

CAPACITIES

	ltr.	
Engine oil with oil filter and oil cooler - change:	approx. 14.0	engine oil
Hydraulic oil (tank and system) - first filling:	approx. 70.0	hydraulic oil
Hydraulic oil tank (change):	approx. 46.0	hydraulic oil
Fuel tank:	approx. 70.0	diesel
Front axle - central housing:	approx. 4.0	transmission oil
Front axle - wheel hub:	approx. 0.3	transmission oil, each
Rear axle - central housing and reduction gearbox:	approx. 4.5	transmission oil
Rear axle - wheel hub:	approx. 0.3	transmission oil, each
Service brake:	approx. 0.25	ATF oil


TEREX®

DIESEL ENGINE

Manufacturer:		Deutz
Type:		BF4M 2011 Turbo
Performance according to (ECE-R24/ISO1585/ISO9249):	kW	54 at 2,200 min^{-1}
Construction:		4 cylinders in line
Cooling:		external oil cooling
Injection:		direct injection, turbo charged
Capacity:	cm^3	3,100
High idle:	min^{-1}	2,350 $^{+50}$
Low idle:	min^{-1}	850 $^{+50}$
Spec. fuel consumption under full load:	g/kWh	205
Tappet clearance - inlet cold:	mm	0.30
Tappet clearance - outlet cold:	mm	0.50
Torque of cylinder head studs	Nm	30 / 80 / 160
(only in case of repair):		Tightening angle 90°
Further data:		see engine instruction book or chapter 3

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 80 / 720 (EN)
Generator:	V/A	14 / 95
Starter:	V/kW/PS	12 / 2.3 / 3.1
Cold start aid:		heater plug
Lighting:		acc. to German motor vehicle construction and use regulation (“StVZO”) and Euronorm. H4 halogen headlamp. Two working lights at the front.

TRANSMISSION

Travel pump:	type	A 4 VG 56 DA with pressure cut-off
Displacement:	max. cm^3/rev.	56
Travel motor 20/36 km/h version:	type	A 6 VM 80 DA 5 / 63 W
Displacement 20/36 km/h version:	max. cm^3/rev.	80

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 100:	**20 km/h - version:**			
	tortoise / rabbit	km/h	0 to 6.0	/ 0 to 20
TL 100 S:	**36 km/h - version:**			
Gearbox position 1, tortoise / rabbit:		km/h	0 to 6.0	/ 0 to 18
Gearbox position 2, tortoise / rabbit:		km/h	0 to 12	/ 0 to 36

Cardan shaft rev. at **20 km/h - version**			adjustment at nominal speed	
tyres			tortoise / rabbit	
standard:	405/70 R20:	min^{-1}	600 / 1,990	
option:	14,5-20:	min^{-1}	600 / 2,005	
	16/70-20:	min^{-1}	600 / 2,070	
	375/75 R20:	min^{-1}	600 / 2,040	

Cardan shaft rev. at **36 km/h - version**			adjustment at nominal speed		
			tortoise	/	rabbit
tyres			1./2. gear	/	1./2. gear
standard:	405/70 R20:	min^{-1}	580 / 1,190		1,750 / 3,570
option:	14,5-20:	min^{-1}	580 / 1,190		1,760 / 3,595
	16/70-20:	min^{-1}	580 / 1,190		1,800 / 3,700
	375/75 R20:	min-1	580 / 1,190		1,775 / 3,660

PRESSURE AND SETTING VALUES travel

Suction pressure:	max. bar	0.5 $^{\pm 0.1}$
Charge pressure (high idle):	bar	30 $^{\pm 1}$
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start, dynamic:	min^{-1}	2,100 $^{-50}$ at 250 bar
		(see setting instructions, chapter 5, measuring method 2)
Start-up speed:	min^{-1}	1,150
Engine stalling (rabbit) - dynamic:	min^{-1}	2,000 $^{-100}$ at 280 bar HP
Brake inching beginning / end:	bar	5 - 13
Pressure switch (hydrostatic brake):	bar	22

STEERING

Steering unit:	type	LAGU 400/130-11/LD240-175M01
Steering pump:	make	WSP 20.14-045
Displacement:	cm^3/rev:	33
Steering pressure (high idle):	bar	175
Priority valve:	type	LPS 80R11/LD7-643/01

WORKING HYDRAULICS

Working pump:	make	WSP 20.14-045
Displacement:	l/min.	72
Valve bank:	type	Parker P 70
Servo-controlled valve:	type	Brown PRSV C01 S053 FO

PRESSURE AND SETTING VALUES working

Main pressure relief valve (high idle):	max. bar	250
Line relief pressures:		
- lifting frame lift:	bar	280
- lifting frame lower:	bar	anti-cavitation
- shovel dump in:	bar	280
- shovel dump out:	bar	130
- additional control circuit:	bar	230 / 230
- pilot pressure (charge pressure):	bar	30 $^{\pm 1}$

WORKING CYCLES

Lifting frame lift:	s	5.1
Lifting frame lower:	s	3.2
Shovel dump in:	s	---
Shovel dump out:	s	---

AXLES

Front axle	with self-locking differential -	20 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 009
Rear axle	with self-locking differential -	20 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 010
Front axle	with self-locking differential -	36 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 009
Rear axle	with self-locking differential -	36 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 011

BRAKE SYSTEM

Service brake:		hydraulically operated drum brake, front axle
Parking brake:		drum brake at the front axle
Master cylinder:	make	ATE (mineral oil)

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil recommendation table
Transmission oil:	MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS

see instruction book

CAPACITIES

	ltr.	
Engine oil with oil filter and oil cooler - change:	approx. 13.0	engine oil
Hydraulic oil (tank and system) - first filling:	approx. 88.0	hydraulic oil
Hydraulic oil tank (change):	approx. 62.0	hydraulic oil
Fuel tank:	approx. 102.0	diesel
Front axle - central housing:	approx. 4.0	transmission oil
Front axle - wheel hub:	approx. 0.3	transmission oil, each
Rear axle - central housing and reduction gearbox:	approx. 4.5	transmission oil
Rear axle - wheel hub:	approx. 0.3	transmission oil, each
Service brake:	approx. 0.25	ATF oil

DIESEL ENGINE

Manufacturer:		Deutz
Type:		BF4M 2011 Turbo
Performance according to (ECE-R24/ISO1585/ISO9249):	kW	54 at 2,200 min^{-1}
Construction:		4 cylinders in line
Cooling:		external oil cooling
Injection:		direct injection, turbo charged
Capacity:	cm^3	3,100
High idle:	min^{-1}	2,350 $^{+50}$
Low idle:	min^{-1}	850 $^{+50}$
Spec. fuel consumption under full load:	g/kWh	205
Tappet clearance - inlet cold:	mm	0.30
Tappet clearance - outlet cold:	mm	0.50
Torque of cylinder head studs	Nm	30 / 80 / 160
(only in case of repair):		Tightening angle 90°
Further data:		see engine instruction book or chapter 3

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 80 / 720 (EN)
Generator:	V/A	14 / 95
Starter:	V/kW/PS	12 / 2.3 / 3.1
Cold start aid:		heater plug
Lighting:		acc. to German motor vehicle construction and use regulation (“StVZO”) and Euronorm. H4 halogen headlamp. Two working lights at the front.

TRANSMISSION

Travel pump:	type	A 4 VG 56 DA with pressure cut-off
Displacement:	max. cm^3/rev.	56
Travel motor 20/36 km/h version:	type/make	51D080 / Danfoss
Displacement 20/36 km/h version:	max. cm^3/rev.	80

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 100:	**20 km/h - version:**		
	tortoise / rabbit	km/h	0 to 6.0 / 0 to 20
TL 100 S:	**36 km/h - version:**		
Gearbox position 1, tortoise / rabbit:		km/h	0 to 6.0 / 0 to 18
Gearbox position 2, tortoise / rabbit:		km/h	0 to 12 / 0 to 36

Cardan shaft rev. at **20 km/h - version**			adjustment at nominal speed
tyres			tortoise / rabbit
standard:	405/70 R20:	min^{-1}	600 / 1,990
option:	14,5-20:	min^{-1}	600 / 2,005
	16/70-20:	min^{-1}	600 / 2,070
	375/75 R20:	min^{-1}	600 / 2,040

Cardan shaft rev. at **36 km/h - version**			adjustment at nominal speed		
			tortoise	/	rabbit
tyres			1./2. gear	/	1./2. gear
standard:	405/70 R20:	min^{-1}	580 / 1,190		1,750 / 3,570
option:	14,5-20:	min^{-1}	580 / 1,190		1,760 / 3,595
	16/70-20:	min^{-1}	580 / 1,190		1,800 / 3,700
	375/75 R20:	min-1	580 / 1,190		1,775 / 3,660

PRESSURE AND SETTING VALUES — travel

Suction pressure:	max. bar	0.5 $^{\pm 0.1}$
Charge pressure (high idle):	bar	30 $^{\pm 1}$
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start:	bar	290
Start-up speed:	min^{-1}	1,150
Engine stalling (rabbit) - dynamic:	min^{-1}	2,000 $^{-100}$ at 280 bar HP
Brake inching beginning / end:	bar	5 - 13
Pressure switch (hydrostatic brake):	bar	22

STEERING

Steering unit:	type	LAGU 400/130-11/LD240-175M01
Steering pump:	make	WSP 20.14-045
Displacement:	cm^3/rev:	33
Steering pressure (high idle):	bar	175
Priority valve:	type	LPS 80R11/LD7-643/01

WORKING HYDRAULICS

Working pump:	make	WSP 20.14-045
Displacement:	l/min.	72
Valve bank:	type	Parker P 70
Servo-controlled valve:	type	Brown PRSV C01 S053 FO

PRESSURE AND SETTING VALUES — working

Main pressure relief valve (high idle):	max. bar	250
Line relief pressures:		
- lifting frame lift:	bar	280
- lifting frame lower:	bar	anti-cavitation
- shovel dump in:	bar	280
- shovel dump out:	bar	130
- additional control circuit:	bar	230 / 230
- pilot pressure (charge pressure):	bar	30 $^{\pm 1}$

WORKING CYCLES

Lifting frame lift:	s	5.1
Lifting frame lower:	s	3.2
Shovel dump in:	s	---
Shovel dump out:	s	---

AXLES

Front axle	with self-locking differential -	20 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 009
Rear axle	with self-locking differential -	20 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 010
Front axle	with self-locking differential -	36 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 009
Rear axle	with self-locking differential -	36 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 011

BRAKE SYSTEM

Service brake:		hydraulically operated drum brake, front axle
Parking brake:		drum brake at the front axle
Master cylinder:	make	ATE (mineral oil)

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil recommendation table
Transmission oil:	MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS

see instruction book

CAPACITIES

	ltr.	
Engine oil with oil filter and oil cooler - change:	approx. 13.0	engine oil
Hydraulic oil (tank and system) - first filling:	approx. 88.0	hydraulic oil
Hydraulic oil tank (change):	approx. 62.0	hydraulic oil
Fuel tank:	approx. 102.0	diesel
Front axle - central housing:	approx. 4.0	transmission oil
Front axle - wheel hub:	approx. 0.3	transmission oil, each
Rear axle - central housing and reduction gearbox:	approx. 4.5	transmission oil
Rear axle - wheel hub:	approx. 0.3	transmission oil, each
Service brake:	approx. 0.25	ATF oil


TEREX®

DIESEL ENGINE

Manufacturer:		Perkins
Type:		1104 C - 44
Performance (ECE-R24/ISO1585/ISO9249):	kW	61.5 at 2,200 min^{-1}
Construction:		4 cylinders in line
Cooling:		water cooling
Injection:		direct injection
Capacity:	cm^3	4,400
High idle:	min^{-1}	2,350 $^{+50}$
Low idle:	min^{-1}	750 $^{+50}$
Spec. fuel consumption under full load:	g/kWh	211
Tappet clearance - inlet cold:	mm	0.20
Tappet clearance - outlet cold:	mm	0.45
Engine oil pressure:	bar	3.0 (high idle, service temperature)
Torque of cylinder head studs	Nm	100
(only in case of repair):		Tightening angle 225° (short) 270° (long) depending the length of the bolts.
Further data:		see engine instruction book or chapter 3

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 110 / 850 (EN)
Generator:	V/A	14 / 75
Starter:	V/kW/PS	12 / 3.0 / 4.1
Cold start aid:		4 Glow plugs
Lighting:		acc. to German motor vehicle construction and use regulation ("StVZO") and Euronorm. H4 halogen headlamp. Two working lights at the front.

TRANSMISSION

Travel pump:		type	A 4 VG 71 DA with pressure cut-off
Displacement:		cm^3/rev.	max. 71
Travel motor	20/36 km/h version:	type	A 6 VM 107 DA 5 / 63 W
Displacement	20/36 km/h version:	cm^3/rev.	max. 107

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 100:	**20 km/h - version:**				
	tortoise / rabbit	km/h	0 to 6.0	/	0 to 20
TL 100 S:	**36 km/h - version:**				
Gearbox position 1,	tortoise / rabbit:	km/h	0 to 6.0	/	0 to 19
Gearbox position 2,	tortoise / rabbit:	km/h	0 to 11	/	0 to 36

Cardan shaft rev. at	**20 km/h - version**		adjustment at nominal speed		
tyres			tortoise / rabbit		
standard:	405/70 R20 Mitas:	min^{-1}	560 / 1,800		
option:	14,5-20 Dunlop:	min^{-1}	560 / 1,815		
	16/70-20 Dunlop:	min^{-1}	560 / 1,870		
	375/75 R20 Michelin:	min^{-1}	560 / 1,850		

Cardan shaft rev. at	**36 km/h - version**		adjustment at nominal speed		
			tortoise	/	rabbit
tyres			1./2. gear	/	1./2. gear
standard:	405/70 R20 Mitas:	min^{-1}	500 / 1,050		1,490 / 3,300
option:	14,5-20 Dunlop:	min^{-1}	500 / 1,050		1,500 / 3,300
	16/70-20 Dunlop:	min^{-1}	500 / 1,050		1,550 / 3,300
	375/75 R20 Michelin:	min^{-1}	500 / 1,050		1,530 / 3,300

PRESSURE AND SETTING VALUES travel

Suction pressure:	max. bar	0.5 $^{\pm 0.1}$
Charge pressure (high idle):	bar	30 $^{\pm 1}$
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start, dynamic:	min^{-1}	2,100 $^{-50}$ at 220 bar
	(see setting instructions, chapter 5, measuring method 2)	
Start-up speed:	min^{-1}	1,150
Engine stalling (rabbit) - dynamic:	min^{-1}	2,000 $^{-100}$ at 240 bar HP
Brake inching beginning / end:	bar	5 - 13
Pressure switch (hydrostatic brake):	bar	22

STEERING

Steering unit:	type	LAGU 400/130-11/LD240-175M01
Steering pump:	make	Cassappa
Displacement:	cm^3/rev:	34.5
Steering pressure (high idle):	bar	175
Priority valve:	type	LPS 80R11/LD7-643/01

WORKING HYDRAULICS

Working pump:	make	KP 30.34DO-A8K9
Displacement:	l/min.	76
Valve bank:	type	Bucher HDM19WL/3
Servo-controlled valve:	type	Brown HPV1C01 F094 R0

PRESSURE AND SETTING VALUES working

Main pressure relief valve (high idle):	max. bar	250
Line relief pressures:		
- lifting frame lift:	bar	280
- lifting frame lower:	bar	anti-cavitation
- shovel dump in:	bar	280
- shovel dump out:	bar	130
- additional control circuit:	bar	230 / 230
- pilot pressure (charge pressure):	bar	30 $^{\pm 1}$

WORKING CYCLES

Lifting frame lift:	s	5.8
Lifting frame lower:	s	3.7
Shovel dump in:	s	1,3 in upper position
Shovel dump out:	s	1.5 in upper position

AXLES

Front axle	with self-locking differential -	20 km/h-version:	make/type	Dana - Hurth	112 / 213
Rear axle	with self-locking differential -	20 km/h-version:	make/type	Dana - Hurth	311 / 112 / 140
Front axle	with self-locking differential -	36 km/h-version:	make/type	Dana - Hurth	112 / 216
Rear axle	with self-locking differential -	36 km/h-version:	make/type	Dana - Hurth	357 / 112 / 248

BRAKE SYSTEM

Service brake	20km/h - Version:		hydraulically operated drum brake at the front axle
	36km/h - Version:		hydraulically operated drum brake at the front axle and oil-immersed disk brake at the rear axle
Parking brake:			drum brake at the front axle
Master cylinder:		make	ATE (mineral oil)

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see instruction book table
Transmission oil:	MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS

see instruction book

CAPACITIES

	ltr.	
Engine oil with oil filter - change:	approx. 9.5	engine oil
Hydraulic oil (tank and system) - first filling:	approx. 93.0	hydraulic oil
Hydraulic oil tank (change):	approx. 62.0	hydraulic oil
Fuel tank:	approx.110.0	diesel
Front axle - central housing:	approx. 7.8	transmission oil
Front axle - wheel hub:	approx. 0.85	transmission oil, each
Rear axle - central housing and reduction gearbox:	approx. 9.3	transmission oil
Rear axle - wheel hub:	approx. 0.85	transmission oil, each
Service brake:	approx. 0.25	ATF oil
Cooling agent:	approx. 17.5	water with anti-corrosive and anti-freeze agent

DIESEL ENGINE

Manufacturer:		Perkins
Type:		1104 C – 44 Turbo
Performance (ECE-R24/ISO1585/ISO9249):	kW	74.5 at 2,200 min^{-1}
Construction:		4 cylinders in line
Cooling:		water cooling
Injection:		direct injection
Capacity:	cm^3	4,400
Max. Torque:	Nm	412 at 1,400 min^{-1}
High idle:	min^{-1}	2,350 $^{+50}$
Low idle:	min^{-1}	750 $^{+50}$
Spec. fuel consumption under full load:	g/kWh	215
Tappet clearance - inlet cold:	mm	0.20
Tappet clearance - outlet cold:	mm	0.45
Engine oil pressure:	bar	3.0 (high idle, service temperature)
Torque of cylinder head studs	Nm	100
(only in case of repair):		Tightening angle 225° (short) 270° (long) depending the length of the bolts.
Further data:		see engine instruction book

ELECTRICAL SYSTEM

Voltage:	V	24
Battery:	V/Ah/A	2 x 12 / 74 / 680 (EN)
Generator:	V/A	24 / 75
Starter:	V/kW/PS	24 / 4.5 / 6.1
Cold start aid:		4 Glow plugs
Lighting:		acc. to German motor vehicle construction and use regulation (“StVZO”) and Euronorm. H4 halogen headlamp. Two working lights at the front and rear.

TRANSMISSION

Travel pump:		type	A 4 VG 90 DA 2 D8 / 32R
Displacement:		cm^3/rev.	max. 90
Travel motor	20/40 km/h version:	type	A 6 VM 160 DA 3 / 63 W
Displacement	20/40 km/h version:	cm^3/rev.	max. 160

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 160:	**20 km/h - version:**				
	tortoise / rabbit	km/h	0 to 6.0	/	0 to 20
TL 160 S:	**40 km/h - version:**				
Gearbox position 1,	tortoise / rabbit:	km/h	0 to 6.0	/	0 to 20
Gearbox position 2,	tortoise / rabbit:	km/h	0 to 12	/	0 to 40

Cardan shaft rev. at	**20 km/h - version**			adjustment at nominal speed
tyres				tortoise / rabbit
standard:	15,5 R25 GP-2B L-2:	min^{-1}		412 / 1,410
option:	17,5-25 TL12PR SGL:	min^{-1}		412 / 1,340
	16/70-24 SPT9 TL:	min^{-1}		412 / 1,575
	455/70 R24 SPT9 TL:	min^{-1}		412 / 1,445
	19,5 LR24 XM27 TL:	min^{-1}		412 / 1,395

Cardan shaft rev. at **40 km/h - version**			adjustment tortoise	/	rabbit
tyres			1./2. gear	/	1./2. gear
standard:	15,5 R25 GP-2B L-2:	min^{-1}	412 / 845		1,340 / 2,735
option:	17,5-25 TL12PR SGL:	min^{-1}	412 / 800		1,340 / 2,735
	16/70-24 SPT9 TL:	min^{-1}	412 / 945		1,340 / 3,060
	455/70 R24 SPT9 TL:	min^{-1}	412 / 865		1,340 / 2,810
	19,5 LR24 XM27 TL:	min^{-1}	412 / 835		1,340 / 2,710

PRESSURE AND SETTING VALUES **travel**

Suction pressure:	max. bar	0.5 $^{\pm 0.1}$
Charge pressure (high idle):	bar	30 $^{\pm 1}$
High pressure (SV):	bar	490
Pressure cut-off:	bar	460 $^{\pm 10}$
Case pressure at + 50° C:	max. bar	2.5
Regulation start, dynamic:	min^{-1}	2,100 $^{-50}$ at 220 bar
	(see setting instructions, chapter 5, measuring method 2)	
Start-up speed:	min^{-1}	1,150$^{\pm 50}$
Engine stalling (rabbit) - dynamic:	min^{-1}	2,000 $^{-100}$ at 230 bar HP

STEERING

Steering unit:	type	LAGZ 420/100-21/LD240-175M01
Steering pump:	make	Brueninghaus A10VO45DFR1
Displacement:	cm^3/rev:	45
Steering pressure (high idle):	bar	175

WORKING HYDRAULICS

Working pump:	make	Brueninghaus A10VO45DFR1
Displacement:	l/min.	99
Stand-by pressure (flow controller):	bar	28 $^{+2}$
Valve bank:	type	Rexroth 3M6-15
Servo-controlled valve:	type	Brown HPV1C01 F094 R0

PRESSURE AND SETTING VALUES **working**

Main pressure relief valve (high idle):	bar	310
Line relief pressures:		
- lifting frame lift:	bar	340
- lifting frame lower:	bar	anti-cavitation
- shovel dump in:	bar	340
- shovel dump out:	bar	340
- additional control circuit:	bar	230 / 230
- pilot pressure (charge pressure):	bar	30 $^{\pm 1}$

WORKING CYCLES

Lifting frame lift:	s	5.7
Lifting frame lower:	s	3.7
Shovel dump in:	s	2.0 in upper position
Shovel dump out:	s	1.4 in upper position

AXLES

Front axle	with self-locking differential -	20 km/h-version: make/type	Dana	176 / 379
Rear axle	with self-locking differential -	20 km/h-version: make/type	Dana	360 / 176 / 88
Front axle	with self-locking differential -	40 km/h-version: make/type	Dana	176 / 379
Rear axle	with self-locking differential -	40 km/h-version: make/type	Dana	360 / 176 / 88

BRAKE SYSTEM

Service brake (four-wheel-brake):		hydraulically operated 2 circuit brake oil-immersed disks at both axles
Parking brake (electr. switch):		spring-loaded brake acting on the disks of both axles
Additional brake:		hydrostatically by closed circuit of the transmission
Brake pump (accessory drive):	make	Cassappa PLP 20.11.2 DO-L9P1
Displacement:	cm^3/rev.	11
	ltr./min.	24
Brake pressure (service brake):	max. bar	30^{+5}
Accumulator charge valve:	make	Safim S6
Cut-in / cut-off pressure:	bar	120 - 150
Opening pressure (parking brake):	bar	15
Setting value, parking brake:	bar	30^{-5}
Fan r.p.m. - oil cooler temperatur related	min^{-1}	$2{,}100^{\pm 50}$

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see instruction book table
Transmission oil:	MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS

see instruction book

CAPACITIES

	ltr.	
Engine oil with oil filter and oilcooler - change:	approx. 9.5	engine oil
Hydraulic oil (tank and system) - first filling:	approx. 99.0	hydraulic oil
Hydraulic oil tank (change):	approx. 72.0	hydraulic oil
Fuel tank:	approx.140.0	diesel
Front axle - central housing:	approx. 13.5	transmission oil
Front axle - wheel hub:	approx. 1.7	transmission oil, each
Rear axle - central housing:	approx. 15.7	transmission oil
Rear axle - reduction gearbox:	approx. 3.4	transmission oil
Rear axle - wheel hub:	approx. 1.7	transmission oil, each
Service brake:	connected to the hydraulic system	
Cooling agent:	approx. 28.0	water with anti-corrosive and anti-freeze agent

DIESEL ENGINE

Manufacturer:		Cummins
Type:		QSB 6.7 turbo charged with intercooler
Performance (ECE-R24/ISO1585/ISO9249):	kW	119 at 2,200 min^{-1}
Construction:		6 cylinders in line
Cooling:		water cooling
Injection:		Common Rail Injection
Capacity:	cm^3	6,700
Max. Torque:	Nm	732 at 1,400 min^{-1}
High idle:	min^{-1}	2,350 $^{+50}$
Low idle:	min^{-1}	700 $^{+50}$
Spec. fuel consumption under full load:	g/kWh	219
Tappet clearance - inlet cold:	mm	0.25 (tightening torque M = 24 Nm)
Tappet clearance - outlet cold:	mm	0.50 (tightening torque M = 24 Nm)
Minimum engine oil pressure:	bar	0.7 (low idle, service temperature)
Minimum engine oil pressure:	bar	2.1 (high idle, service temperature)
Torque of cylinder head studs	Nm	90 (2 times!)
	°	90 (Tightening angle – for all bolts)
Charge pressure fuel system	bar	3.0 to 11.0
(Rail pressure)		(without electrical fuel pump at crank idle)
		5.0 to 13.0
		(with electrical fuel pump at crank idle)
Further data:		see engine instruction book

ELECTRICAL SYSTEM

Voltage:	V	24
Battery:	V/Ah/A	2 x 12 / 110 / 850 (EN)
Generator:	V/A	24 / 70
Starter:	V/kW	24 / 3.7 / 5.0
Cold start aid:		heater flange
Lighting:		acc. to German motor vehicle construction and use regulation (“StVZO”) and Euronorm. H4 halogen headlamp. Two working lights at the front and rear.

TRANSMISSION

Travel pump:	type	A4 VG 125 DA2 D2
Displacement:	cm^3/rev.	max. 125
Travel motor:	type	A6 VM 140 DX
Displacement:	cm^3/rev.	max. 140
Travel motor:	type	A6 VM 80 DA 3
Displacement:	cm^3/rev.	max. 80

TRAVEL RANGE

Two pre-selectable travel ranges, electro-hydraulically controlled:

TL 210:

Travel range 1:	km/h	0 to 6.0
Travel range 2:	km/h	0 to 40.0

Cardan shaft rev. at **40 km/h - version**			adjustment at nominal engine idle Travel range 1 / Travel range 2	
standard tire:				
20.5 R-25 EM 60 12PR	Mitas:	min^{-1}	425	2,830
optional tires:				
20.5 R-25 EM 16 PR SGLD L-2	Goodyear:	min^{-1}	425	2,830
20.5 R 25 RL 2	Goodyear:	min^{-1}	425	2,830
20.5 R 25 GP-2B	Goodyear:	min^{-1}	425	2,830
20.5 R 25 XTLA TL	Michelin:	min^{-1}	425	2,830
20.5 R 25 X HA TL	Michelin:	min^{-1}	425	2,830
20.5 R 25 XLDD2A	Michelin:	min^{-1}	425	2,830
20.5 R 25 X Mine D2	Michelin:	min^{-1}	425	2,830

PRESSURE AND SETTING VALUES	**travel**	
Suction pressure:	max. bar	0.5 $^{\pm 0.1}$
Charge pressure (high idle):	bar	30 $^{\pm 1}$
High pressure (SV):	bar	480
Pressure cut-off:	bar	440 $^{\pm 10}$
Case pressure at + 50° C:	max. bar	2.5
Regulation start, dynamic:	bar	A6VM80 @280bar high pressure + 30 bar pressure in displacement chamber of the travel motor A6VM140 @280bar high pressure + 30 bar pressure in displacement chamber of the travel motor
Start-up speed:	min^{-1}	1,150$^{\pm 50}$
Engine stalling (rabbit):	min^{-1}	2,050 $^{-100}$ at 260 bar dynamically

STEERING

Steering unit:	type	LAGC 630 – 15/LD240-175M01
Steering pump:	make	Casappa LVP 75D-06S7 LMF
Emergency steering pump :	type	DC1-MPG (switchpoint: stand-by < 5bar)
Displacement:	l/min:	160
Steering pressure (high idle):	bar	190 $^{\pm 10}$
Safety valves / orbitrol:	bar	240/240

WORKING HYDRAULICS

Working pump:	make	Casappa LVP 75D-06S7 LMF
Displacement:	l/min.	160
Stand-by pressure (flow controller):	bar	36 $^{+2}$
Safety valve at the working pump:	bar	340 $^{+10}$
Valve bank:	type	Rexroth 3M6-15
Servo-controlled valve:	type	Brown HPV1C01 F055 R 0 CB
Reversing fan speed (combined water-oil-intercooler)		
temperature depended controlled:	min^{-1}	1,650

PRESSURE AND SETTING VALUES	**working**	
Pressure cut off valve:	bar	270 (measured at the test port of the pump; Δp eff. 240bar + stand-by pressure)
Line relief pressures:		
- lifting frame lift:	bar	340
- lifting frame lower:	bar	anti-cavitation
- shovel dump in:	bar	340
- shovel dump out:	bar	340
- additional control circuit:	bar	230 / 230
- pilot pressure (charge pressure):	bar	36 $^{\pm 1}$

WORKING CYCLES

Lifting frame lift:	s	5.9
Lifting frame lower:	s	3.9
Shovel dump in:	s	1.7 in upper position
Shovel dump out:	s	1.2 in upper position

AXLES

Front axle with self-locking differential:	make/type	Dana	113 / 56
Rear axle with self-locking differential:	make/type	Dana	319 / 113 / 56

BRAKE SYSTEM

Service brake (four-wheel-brake):		hydraulically operated 2 circuit brake oil-immersed disks at both axles
Parking brake (electrically switched):		spring-loaded brake acting on the disks of the rear axle
Additional brake:		hydrostatically by closed circuit of the transmission
Brake pump (accessory drive):	make	Casappa PLP 20.19 SO-07S1-LBE/BC-N-L
Displacement:	cm^3/rev.	19
	l/min.	42
Brake pressure (service brake):	max. bar	45 $^{+5}$
Accumulator charge valve:	make	Safim S6
Cut-in / cut-off pressure:	bar	120 - 150
Opening pressure (parking brake):	bar	15
Setting value, parking brake:	bar	30 $^{-3}$

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see instruction book
Axle oil:	MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Gear oil (reduction gearbox):	MINERAL-OIL ATF
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	hydraulic oil

MAINTENANCE PARTS

see instruction book

CAPACITIES

	ltr.	
Engine oil with oil filter and oilcooler - change:	approx. 15	engine oil
Hydraulic oil (tank and system) - first filling:	approx. 135	hydraulic oil
Hydraulic oil tank (change):	approx. 95	hydraulic oil
Fuel tank:	approx. 240	diesel
Front axle - central housing:	approx. 16.0	transmission oil
Front axle - wheel hub:	approx. 2.6	transmission oil, each
Rear axle - central housing:	approx. 14.7	transmission oil
Rear axle - reduction gearbox:	approx. 4.25	ATF
Rear axle - wheel hub:	approx. 2.6	transmission oil, each
Service brake:	connected to the hydraulic system	
Cooling agent:	approx. 41.0	water with anti-corrosive and anti-freeze agent


TEREX®

DIESEL ENGINE

Manufacturer:		Perkins
Type:		1106 C – E60 TA Turbo with intercooler
Performance (ECE-R24/ISO1585/ISO9249):	kW	129 at 2,200 min^{-1}
Construction:		6 cylinders in line
Cooling:		water cooling
Injection:		direct injection
Capacity:	cm^3	6000
Max. Torque:	Nm	695 at 1,400 min^{-1}
High idle:	min^{-1}	2,350 $^{+50}$
Low idle:	min^{-1}	750 $^{+50}$
Spec. fuel consumption under full load:	g/kWh	219
Tappet clearance - inlet cold:	mm	0.20
Tappet clearance - outlet cold:	mm	0.45
Minimum engine oil pressure:	bar	1.9 (low idle, service temperature)
Minimum engine oil pressure:	bar	2.8 (high idle, service temperature)
Torque of cylinder head studs	Nm	110 (2 times!)
	°	150 (Tightening angle - short bolts)
	°	180 (Tightening angle - medium sized bolts)
	°	210 (Tightening angle - long bolts)
Further data:		see engine instruction book

ELECTRICAL SYSTEM

Voltage:	V	24
Battery:	V/Ah/A	2 x 12 / 110 / 850 (EN) 510 A (DIN)
Generator:	V/A	24 / 80
Starter:	V/kW	24 / 4.5
Cold start aid:		heater spiral and resistor
Lighting:		acc. to German motor vehicle construction and use regulation (“StVZO”) and Euronorm. H4 halogen headlamp. Two working lights at the front and rear.

TRANSMISSION

Travel pump:		type	A 4 VG 140 DA 2 D2
Displacement:		cm^3/rev.	max. 140
Travel motor	16/40 km/h version:	type	A 6 VM 160 DA 3
Displacement	16/40 km/h version:	cm^3/rev.	max. 160

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 260:	**16 km/h - version:**				
	tortoise / rabbit	km/h	0 to 6.0	/	0 to 16
TL 260 S:	**40 km/h - version:**				
Gearbox 1.gear	tortoise / rabbit:	km/h	0 to 6.0	/	0 to 16
Gearbox 2.gear	tortoise / rabbit:	km/h	0 to 14	/	0 to 40

Cardan shaft rev. at **16 km/h - version** adjustment at nominal speed tortoise / rabbit

and standard tyres

20.5 R-25 EM 16 PR SGLD L-2:	min^{-1}	445 / 1,120
optional tires:	20.5 R 25 RL 2:	min^{-1}	445 / 1,120
	20.5 R 25 GP –2B:	min^{-1}	445 / 1,120
	20.5 R 25 XTLA TL:	min^{-1}	445 / 1,120
	20.5 R 25 XHA TL:	min^{-1}	445 / 1,120
	20.5 R 25 XLDD2A:	min^{-1}	445 / 1,100
	20.5 R 25 X Mine D2:	min^{-1}	445 / 1,090

Cardan shaft rev. at **40 km/h - version**		adjustment tortoise / rabbit 1./2. gear / 1./2. gear
standard tire:20.5 R-25 EM 16 PR SGLD L-2:	min^{-1}	445 / 1.290 — 1.020 / 2.950
optional tires:		
20.5 R 25 RL 2:	min^{-1}	445 / 1.290 — 1.020 / 2.950
20.5 R 25 GP-2B :	min^{-1}	445 / 1.290 — 1.020 / 2.950
20.5 R 25 XTLA TL:	min^{-1}	445 / 1.290 — 1.020 / 2.950
20.5 R 25 X HA TL:	min^{-1}	445 / 1.290 — 1.020 / 2.950
20.5 R 25 XLDD2A:	min^{-1}	445 / 1.290 — 1.020 / 2.950
20.5 R 25 X Mine D2:	min^{-1}	445 / 1.290 — 1.020 / 2.950

PRESSURE AND SETTING VALUES **travel**

Suction pressure:	max. bar	$0.5^{\pm 0.1}$
Charge pressure (high idle):	bar	$30^{\pm 1}$
High pressure (SV):	bar	480
Pressure cut-off:	bar	$440^{\pm 10}$
Case pressure at + 50° C:	max. bar	2.5
Regulation start, dynamic:	min^{-1}	$2{,}100^{-50}$ at 260 bar dynamic (see setting instructions, chapter 5, measuring method 2)
Start-up speed:	min^{-1}	$1{,}150^{\pm 50}$
Engine stalling (rabbit):	min^{-1}	$2{,}000^{-100}$ at 280 bar dynamic

STEERING

Steering unit:	type	LAGC 630 – 15/LD240-175M01
Steering pump:	make	Casappa LVP 75D-06
Displacement:	l/min.	160
Steering pressure (high idle):	bar	175

WORKING HYDRAULICS

Working pump:	make	Brueninghaus A10VO45DFR1
Displacement:	l/min.	99
Stand-by pressure (flow controller):	bar	28^{+2}
Valve bank:	type	Rexroth 3M6-15
Servo-controlled valve:	type	Brown HPV1C01 F094 R0

PRESSURE AND SETTING VALUES **working**

Main pressure relief valve (high idle):	bar	340
Pressure cut off valve:	bar	310
Line relief pressures:		
- lifting frame lift:	bar	340
- lifting frame lower:	bar	anti-cavitation
- shovel dump in:	bar	340
- shovel dump out:	bar	340
- additional control circuit:	bar	230 / 230
- pilot pressure (charge pressure):	bar	$30^{\pm 1}$

WORKING CYCLES

Lifting frame lift:	s	5.9
Lifting frame lower:	s	3.9
Shovel dump in:	s	1.7 in upper position
Shovel dump out:	s	1.2 in upper position

AXLES

Front axle	with self-locking differential -	16 km/h-version: make/type	Dana	113 / 51
Rear axle	with self-locking differential -	16 km/h-version: make/type	Dana	360 / 113 / 95 (second gear not shiftable)
Front axle	with self-locking differential -	40 km/h-version: make/type	Dana	113 / 51
Rear axle	with self-locking differential -	40 km/h-version: make/type	Dana	360 / 113 / 95

BRAKE SYSTEM

Service brake (four-wheel-brake):		hydraulically operated 2 circuit brake oil-immersed disks at both axles
Parking brake (electr. switch):		spring-loaded brake acting on the disks of the rear axle
Additional brake:		hydrostatically by closed circuit of the transmission
Brake pump (accessory drive):	make	Cassappa PLP 20.11.2 DO-L9P1
Displacement:	cm^3/rev.	19
	ltr./min.	42
Brake pressure (service brake):	max. bar	45^{+5}
Accumulator charge valve:	make	Safim S6
Cut-in / cut-off pressure:	bar	120 - 150
Opening pressure (parking brake):	bar	15
Setting value, parking brake:	bar	30^{-3}

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see instruction book
Transmission oil:	MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	hydraulic oil

MAINTENANCE PARTS

see instruction book

CAPACITIES

	ltr.	
Engine oil with oil filter and oilcooler - change:	approx. 15	engine oil
Hydraulic oil (tank and system) - first filling:	approx. 135	hydraulic oil
Hydraulic oil tank (change):	approx. 95	hydraulic oil
Fuel tank:	approx. 240	diesel
Front axle - central housing:	approx. 16.0	transmission oil
Front axle - wheel hub:	approx. 2.6	transmission oil, each
Rear axle - central housing:	approx. 16.0	transmission oil
Rear axle - reduction gearbox:	approx. 3.4	transmission oil
Rear axle - wheel hub:	approx. 2.6	transmission oil, each
Service brake:	connected to the hydraulic system	
Cooling agent:	approx. 41.0	water with anti-corrosive and anti-freeze agent

DIESEL ENGINE

Manufacturer:		Cummins
Type:		QSB 6.7 turbo charged with intercooler
Performance (ECE-R24/ISO1585/ISO9249):	kW	128 at 2,200 min^{-1}
Construction:		6 cylinders in line
Cooling:		water cooling
Injection:		Common Rail Injection
Capacity:	cm^3	6,700
Max. Torque:	Nm	763 at 1,400 min^{-1}
High idle:	min^{-1}	2,350 $^{+50}$
Low idle:	min^{-1}	700 $^{+50}$
Spec. fuel consumption under full load:	g/kWh	219
Tappet clearance - inlet cold:	mm	0.25 (tightening torque M = 24 Nm)
Tappet clearance - outlet cold:	mm	0.50 (tightening torque M = 24 Nm)
Minimum engine oil pressure:	bar	0.7 (low idle, service temperature)
Minimum engine oil pressure:	bar	2.1 (high idle, service temperature)
Torque of cylinder head studs	Nm	90 (2 times!)
	°	90 (Tightening angle – for all bolts)
Charge pressure fuel system	bar	3.0 to 11.0
(Rail pressure)		(without electrical fuel pump at crank idle)
		5.0 to 13.0
		(with electrical fuel pump at crank idle)
Further data:		see engine instruction book

ELECTRICAL SYSTEM

Voltage:	V	24
Battery:	V/Ah/A	2 x 12 / 110 / 850 (EN)
Generator:	V/A	24 / 70
Starter:	V/kW	24 / 3.7 / 5.0
Cold start aid:		heater flange
Lighting:		acc. to German motor vehicle construction and use regulation (“StVZO”) and Euronorm. H4 halogen headlamp. Two working lights at the front and rear.

TRANSMISSION

Travel pump:	type	A4 VG 125 DA2 D2
Displacement:	cm^3/rev.	max. 125
Travel motor:	type	A6 VM 140 DX
Displacement:	cm^3/rev.	max. 140
Travel motor:	type	A6 VM 80 DA 3
Displacement:	cm^3/rev.	max. 80

TRAVEL RANGE

Two pre-selectable travel ranges, electro-hydraulically controlled:

TL 210:

Travel range 1:	km/h	0 to 6.0
Travel range 2:	km/h	0 to 40.0

Cardan shaft rev. at **40 km/h - version**			adjustment at nominal engine idle Travel range 1 / Travel range 2	
standard tire:				
20.5 R-25 EM 60 12PR	Mitas:	min^{-1}	425	2,830
optional tires:				
20.5 R-25 EM 16 PR SGLD L-2	Goodyear:	min^{-1}	425	2,830
20.5 R 25 RL 2	Goodyear:	min^{-1}	425	2,830
20.5 R 25 GP-2B	Goodyear:	min^{-1}	425	2,830
20.5 R 25 XTLA TL	Michelin:	min^{-1}	425	2,830
20.5 R 25 X HA TL	Michelin:	min^{-1}	425	2,830
20.5 R 25 XLDD2A	Michelin:	min^{-1}	425	2,830
20.5 R 25 X Mine D2	Michelin:	min^{-1}	425	2,830

PRESSURE AND SETTING VALUES	**travel**	
Suction pressure:	max. bar	0.5 $^{\pm 0.1}$
Charge pressure (high idle):	bar	30 $^{\pm 1}$
High pressure (SV):	bar	480
Pressure cut-off:	bar	440 $^{\pm 10}$
Case pressure at + 50° C:	max. bar	2.5
Regulation start, dynamic:	bar	A6VM80 @290bar high pressure + 30 bar pressure in displacement chamber of the travel motor A6VM140 @290bar high pressure + 30 bar pressure in displacement chamber of the travel motor
Start-up speed:	min^{-1}	1,150$^{\pm 50}$
Engine stalling (rabbit):	min^{-1}	2,050 $^{-100}$ at 280 bar dynamically

STEERING

Steering unit:	type	LAGC 630 – 15/LD240-175M01
Steering pump:	make	Casappa LVP 75D-06S7 LMF
Emergency steering pump :	type	DC1-MPG (switchpoint: stand-by < 5bar)
Displacement:	l/min:	160
Steering pressure (high idle):	bar	190 $^{\pm 10}$
Safety valves / orbitrol:	bar	240/240

WORKING HYDRAULICS

Working pump:	make	Casappa LVP 75D-06S7 LMF
Displacement:	l/min.	160
Stand-by pressure (flow controller):	bar	36 $^{+2}$
Safety valve at the working pump:	bar	340 $^{+10}$
Valve bank:	type	Rexroth 3M6-15
Servo-controlled valve:	type	Brown HPV1C01 F055 R 0 CB
Reversing fan speed (combined water-oil-intercooler)		
temperature depended controlled:	min^{-1}	1,650

PRESSURE AND SETTING VALUES	**working**	
Pressure cut off valve:	bar	310 (measured at the test port of the pump; Δp eff. 240bar + stand-by pressure)
Line relief pressures:		
- lifting frame lift:	bar	340
- lifting frame lower:	bar	anti-cavitation
- shovel dump in:	bar	340
- shovel dump out:	bar	340
- additional control circuit:	bar	230 / 230
- pilot pressure (charge pressure):	bar	36 $^{\pm 1}$

WORKING CYCLES

Lifting frame lift:	s	5.9
Lifting frame lower:	s	3.9
Shovel dump in:	s	1.7 in upper position
Shovel dump out:	s	1.2 in upper position

AXLES

Front axle with self-locking differential:	make/type	Dana	113 / 51
Rear axle with self-locking differential:	make/type	Dana	319 / 113 / 54

BRAKE SYSTEM

Service brake (four-wheel-brake):		hydraulically operated 2 circuit brake oil-immersed disks at both axles
Parking brake (electrically switched):		spring-loaded brake acting on the disks of the rear axle
Additional brake:		hydrostatically by closed circuit of the transmission
Brake pump (accessory drive):	make	Casappa PLP 20.19 SO-07S1-LBE/BC-N-L
Displacement:	cm^3/rev.	19
	l/min.	42
Brake pressure (service brake):	max. bar	45 $^{+5}$
Accumulator charge valve:	make	Safim S6
Cut-in / cut-off pressure:	bar	120 - 150
Opening pressure (parking brake):	bar	15
Setting value, parking brake:	bar	30 $^{-3}$

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see instruction book
Axle oil:	MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Gear oil (reduction gearbox):	MINERAL-OIL ATF
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	hydraulic oil

MAINTENANCE PARTS

see instruction book

CAPACITIES

	ltr.	
Engine oil with oil filter and oilcooler - change:	approx. 15	engine oil
Hydraulic oil (tank and system) - first filling:	approx. 135	hydraulic oil
Hydraulic oil tank (change):	approx. 95	hydraulic oil
Fuel tank:	approx. 240	diesel
Front axle - central housing:	approx. 16.0	transmission oil
Front axle - wheel hub:	approx. 2.6	transmission oil, each
Rear axle - central housing:	approx. 14.7	transmission oil
Rear axle - reduction gearbox:	approx. 4.25	ATF
Rear axle - wheel hub:	approx. 2.6	transmission oil, each
Service brake:	connected to the hydraulic system	
Cooling agent:	approx. 41.0	water with anti-corrosive and anti-freeze agent


TEREX®

DIESEL ENGINE

Manufacturer:		Cummins
Type:		QSM 11 Turbo with intercooler
Performance:	kW	216 at 2,100 min^{-1}
Construction:		6 cylinders in line
Cooling:		water cooling
Injection:		direct injection
Capacity:	cm^3	10,800
Max. Torque:	Nm	1,478 at 1,200 min^{-1}
High idle:	min^{-1}	2,230
Low idle:	min^{-1}	750
Spec. fuel consumption under full load:	g/kWh	226
Tappet clearance - inlet cold:	mm	0.35
Tappet clearance - outlet cold:	mm	0.7
Minimum engine oil pressure:	bar	0.7 (low idle, service temperature)
Minimum engine oil pressure:	bar	2-4 (high idle, service temperature)
Torque of cylinder head studs	Nm	68
	Nm	136
	°	180 (Tightening angle)
Further data:		see engine instruction book

ELECTRICAL SYSTEM

Voltage:	V	24
Battery:	V/Ah/A	2 x 12 / 110 / 850 (EN)
Generator:	V/A	24 / 100
Starter:	V/kW	24 / 4.5
Cold start aid:		heater flange
Lighting:		acc. to German motor vehicle construction and use regulation (“StVZO”) and Euronorm. H4 halogen headlamp. Two working lights at the front and rear.

TRANSMISSION

Travel gear:	type	ZF 4WG260 Power shift transmission with torque converter

TRAVEL RANGE

Four speed gearbox:

Gearbox 1.gear	km/h	7
Gearbox 2.gear	km/h	13
Gearbox 3.gear	km/h	27
Gearbox 4.gear	km/h	40

TYRES

standard tyres	26.5 -25
optional tires:	26.5 R-25 RL 2 26.5 R-25 EM60 26.5 R-25 XHA 26.5 R-25 RT5C 26.5 R-25 TB516

PRESSURE AND SETTING VALUES

STEERING

Steering unit:	type	EHPS 80/8-011008658
Steering valve:	type	OSPCX 80 CN 150 G 6001
Priority valve	type	OLS 320 152B 6001
Steering pump:	make	Danfoss JRR 075
Displacement:	l/min.	140
Stand-by pressure (flow controller):	bar	42
Steering pressure (high idle):	bar	250

WORKING HYDRAULICS

Working pump:	make	Danfoss ERR 100 BBS 3130
Displacement:	l/min.	210
Stand-by pressure (flow controller):	bar	30
Valve bank:	type	Rexroth 2M6-22
Servo-controlled valve:	type	4THF 6Z43

PRESSURE AND SETTING VALUES **working**

Main pressure controller (high idle):	bar	380
Pressure cut off valve:	bar	310
Line relief pressures:		
- lifting frame lift:	bar	380
- lifting frame lower:	bar	anti-cavitation
- shovel dump in:	bar	380
- shovel dump out:	bar	130
- additional control circuit:	bar	230 / 230

WORKING CYCLES

Lifting frame lift:	s	5.8
Lifting frame lower:	s	3.9
Shovel dump in:	s	1.7 in upper position
Shovel dump out:	s	1.7 in upper position

AXLES

Front axle	with self-locking differential	make/type	ZF	MT-L 3105 / LKV
Rear axle	with self-locking differential	make/type	ZF	MT-L 3095 / HKV

BRAKE SYSTEM

Service brake (four-wheel-brake):		hydraulically operated 2 circuit brake oil-immersed disks at both axles
Parking brake (electr. switch):		spring-loaded brake acting on the disk of the cardan shaft
Brake pump (accessory drive):	make	Cassappa PLP 20.19-04S5-LBM
Displacement:	ltr./min.	23
Brake pressure (service brake):	max. bar	75 $^{+5}$
Accumulator charge valve:	make	Safim
Cut-in / cut-off pressure:	bar	160 - 200
Opening pressure (parking brake):	bar	100
Setting value, parking brake:	bar	200

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see instruction book
Rear and front axle:	UTTO TE ML 5 Titan Powerfluid
Transmission oil:	SAE 15W40 API CF-4
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	hydraulic oil

MAINTENANCE PARTS — see instruction book

CAPACITIES (approx.)	**ltr./Gallon**	
Engine oil with oil filter - change:	30 / 8.5	engine oil
Hydraulic oil (system content including tank):	370 / 97.7	hydraulic oil
Fuel tank:	455 / 120.0	diesel
Front axle:	51 / 13.5	
Rear axle:	42 / 11.1	
Transmission oil:	32 / 8.7	
Service brake:	connected to the hydraulic system	
Cooling agent:	47 / 12.4	water with anti-corrosive and anti-freeze agent


TEREX®

DIESEL ENGINE

Manufacturer:		Cummins
Type:		QSM 11 Turbo with intercooler
Performance:	kW	231 at 2,100 min^{-1}
Construction:		6 cylinders in line
Cooling:		water cooling
Injection:		direct injection
Capacity:	cm^3	10,800
Max. Torque:	Nm	1,573 at 1,200 min^{-1}
High idle:	min^{-1}	2,230
Low idle:	min^{-1}	750
Spec. fuel consumption under full load:	g/kWh	226
Tappet clearance - inlet cold:	mm	0.35
Tappet clearance - outlet cold:	mm	0.7
Minimum engine oil pressure:	bar	0.7 (low idle, service temperature)
Minimum engine oil pressure:	bar	2-4 (high idle, service temperature)
Torque of cylinder head studs	Nm	68
	Nm	136
	°	180 (Tightening angle)
Further data:		see engine instruction book

ELECTRICAL SYSTEM

Voltage:	V	24
Battery:	V/Ah/A	2 x 12 / 110 / 850 (EN)
Generator:	V/A	24 / 100
Starter:	V/kW	24 / 4.5
Cold start aid:		heater flange
Lighting:		acc. to German motor vehicle construction and use regulation (“StVZO”) and Euronorm. H4 halogen headlamp. Two working lights at the front and rear.

TRANSMISSION

Travel gear:	type	ZF 4WG260 Power shift transmission with torque converter

TRAVEL RANGE

Four speed gearbox:

Gearbox 1.gear	km/h	7
Gearbox 2.gear	km/h	13
Gearbox 3.gear	km/h	27
Gearbox 4.gear	km/h	40

TYRES

standard tyres	26.5 -25
optional tires:	26.5 R-25 RL 2 26.5 R-25 EM60 26.5 R-25 XHA 26.5 R-25 RT5C 26.5 R-25 TB516

PRESSURE AND SETTING VALUES

STEERING

Steering unit:	type	EHPS 80/8-011008658
Steering valve:	type	OSPCX 80 CN 150 G 6001
Priority valve	type	OLS 320 152B 6001
Steering pump:	make	Danfoss JRR 075
Displacement:	l/min.	140
Stand-by pressure (flow controller):	bar	42
Steering pressure (high idle):	bar	250

WORKING HYDRAULICS

Working pump:	make	Danfoss ERR 100 BBS 3130
Displacement:	l/min.	210
Stand-by pressure (flow controller):	bar	30
Valve bank:	type	Rexroth 2M6-22
Servo-controlled valve:	type	4THF 6Z43

PRESSURE AND SETTING VALUES **working**

Main pressure controller (high idle):	bar	380
Pressure cut off valve:	bar	350
Line relief pressures:		
- lifting frame lift:	bar	380
- lifting frame lower:	bar	anti-cavitation
- shovel dump in:	bar	380
- shovel dump out:	bar	130
- additional control circuit:	bar	230 / 230

WORKING CYCLES

Lifting frame lift:	s	5.8
Lifting frame lower:	s	3.9
Shovel dump in:	s	1.7 in upper position
Shovel dump out:	s	1.7 in upper position

AXLES

Front axle	with self-locking differential	make/type	ZF	MT-L 3105 / LKV
Rear axle	with self-locking differential	make/type	ZF	MT-L 3095 / HKV

BRAKE SYSTEM

Service brake (four-wheel-brake):		hydraulically operated 2 circuit brake oil-immersed disks at both axles
Parking brake (electr. switch):		spring-loaded brake acting on the disk of the cardan shaft
Brake pump (accessory drive):	make	Cassappa PLP 20.19-04S5-LBM
Displacement:	ltr./min.	23
Brake pressure (service brake):	max. bar	75 $^{+5}$
Accumulator charge valve:	make	Safim
Cut-in / cut-off pressure:	bar	160 - 200
Opening pressure (parking brake):	bar	100
Setting value, parking brake:	bar	200

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see instruction book
Rear and front axle:	UTTO TE ML 5 Titan Powerfluid
Transmission oil:	SAE 15W40 API CF-4
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	hydraulic oil

MAINTENANCE PARTS — see instruction book

CAPACITIES (approx.)

	ltr. /Gallon	
Engine oil with oil filter - change:	30 / 8.5	engine oil
Hydraulic oil (system content including tank):	370 / 97.7	hydraulic oil
Fuel tank:	455 / 120.0	diesel
Front axle:	51 / 13.5	transmission oil
Rear axle:	42 / 11.1	transmission oil
Transmission oil:	32 / 8.7	
Service brake:	connected to the hydraulic system	
Cooling agent:	47 / 12.4	water with anti-corrosive and anti-freeze agent


TEREX®

DIESEL ENGINE

Manufacturer:		Deutz
Type:		F4M 2011
Performance according to (ECE-R24/ISO1585/ISO9249):	kW	44 at 2,400 min^{-1}
Construction:		4 cylinders in line
Cooling:		external oil cooling
Injection:		direct injection
Capacity:	cm^3	3,100
High idle:	min^{-1}	2,550 $^{+50}$
Low idle:	min^{-1}	850 $^{+50}$
Spec. fuel consumption under full load:	g/kWh	218
Tappet clearance - inlet cold:	mm	0.30
Tappet clearance - outlet cold:	mm	0.50
Torque of cylinder head studs	Nm	30 / 80 / 160
(only in case of repair):		Tightening angle 90°
Further data:		see engine instruction book or chapter 3

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 80 / 720 (EN)
Generator:	V/A	14 / 95
Starter:	V/kW/PS	12 / 2.3 / 3.1
Cold start aid:		heater plug
Lighting:		acc. to German motor vehicle construction and use regulation ("StVZO") and Euronorm. H4 halogen headlamp. Two working lights at the front.

TRANSMISSION

Travel pump:		type	A 4 VG 56 DA with pressure cut-off
Displacement:		max. cm^3/rev.	56
Travel motor	20/36 km/h version:	type	A 6 VM 80 DA 2
Displacement	20/36 km/h version:	max. cm^3/rev.	80

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 70:	**20 km/h - version:**				
	tortoise / rabbit	km/h	0 to 7.0	/	0 to 20
TL 70 S:	**36 km/h - version:**				
Gearbox position 1, tortoise / rabbit:		km/h	0 to 6.5	/	0 to 18
Gearbox position 2, tortoise / rabbit:		km/h	0 to 13	/	0 to 36

Cardan shaft rev. at **20 km/h - version**			adjustment at nominal speed		
tyres			tortoise / rabbit		
standard:	12,5-20:	min^{-1}	650 / 2,100		
option:	335/80 R20 SPT 9:	min^{-1}	650 / 2,050		
	335/80 R20 XM 27TL:	min^{-1}	650 / 2,080		

Cardan shaft rev. at **36 km/h - version**			adjustment at nominal speed		
			tortoise	/	rabbit
tyres			1./2. gear	/	1./2. gear
standard:	12,5-20:	min^{-1}	635 / 1,300		1.860 / 3,780
option:	335/80 R20 SPT 9:	min^{-1}	635 / 1,300		1.800 / 3,680
	335/80 R20 XM 27TL:	min^{-1}	635 / 1,300		1.840 / 3,750

PRESSURE AND SETTING VALUES **travel**

Suction pressure:	max. bar	0.5 $^{\pm 0.1}$
Charge pressure (high idle):	bar	30 $^{\pm 1}$
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start, dynamic:	min^{-1}	2,300 $^{-50}$ at 180 bar
		(see setting instructions, chapter 5, measuring method 2)
Start-up speed:	min^{-1}	1,150
Engine stalling (rabbit) - dynamic:	min^{-1}	2,200 $^{-100}$ at 220 bar HP
Brake inching beginning / end:	bar	5 - 13
Pressure switch (hydrostatic brake):	bar	22

STEERING

Steering unit:	type	Danfoss OSPC 250 LS dyn.
Steering pump:	make	Cassappa
Displacement:	l/min	37
Steering pressure (high idle):	bar	175
Priority valve:	type	Danfoss OLS 80 dyn.

WORKING HYDRAULICS

Working pump:	make	Cassappa
Displacement:	l/min	65
	(= slewing 28 l/min and steering 37 l/min summation)	
Valve bank:	type	Parker P 70 CF
Servo-controlled valve:	type	Brown PRSV

PRESSURE AND SETTING VALUES **working** (at high idle)

Main pressure relief valve I:		max. bar	250
Line relief pressures:			
- lifting frame lift:	(B2)	bar	280
- lifting frame lower:	(A2)	bar	anti-cavitation
- shovel dump in:	(B3)	bar	280
- shovel dump out:	(A3)	bar	130
- additional control circuit:	(A1+Y9 / B1+Y8)	bar	230 / 230
Main pressure relief valve II:		max. bar	250
Line relief pressures:			
- slewing left:	(A1+Y31)	bar	230
- slewing right:	(B1+Y32)	bar	230
- pilot pressure (charge pressure):		bar	30 $^{\pm 1}$

WORKING CYCLES

Lifting frame lift:	s	4.7
Lifting frame lower:	s	3.3
Shovel dump in:	s	---
Shovel dump out:	s	---
Slewing right / left:	s	3.2 to each side

AXLES

Front axle:	with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 009
Rear axle:	with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 010
Front axle:	with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 009
Rear axle :	with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 011

BRAKE SYSTEM

Service brake:		hydraulically operated drum brake, front axle
Parking brake:		drum brake at the front axle
Master cylinder:	make	ATE (mineral oil)

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil recommendation table
Transmission oil:	MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS

see instruction book

CAPACITIES

	ltr.	
Engine oil with oil filter and oil cooler - change:	approx. 13.0	engine oil
Hydraulic oil (tank and system) - first filling:	approx. 55.0	hydraulic oil
Hydraulic oil tank (change):	approx. 46.0	hydraulic oil
Fuel tank:	approx. 75.0	diesel
Front axle - central housing:	approx. 4.0	transmission oil
Front axle - wheel hub:	approx. 0.3	transmission oil, each
Rear axle - central housing and reduction gearbox:	approx. 4.5	transmission oil
Rear axle - wheel hub:	approx. 0.3	transmission oil, each
Service brake:	approx. 0.25	ATF oil

DIESEL ENGINE

Manufacturer:		Deutz
Type:		F4M 2011
Performance according to (ECE-R24/ISO1585/ISO9249):	kW	44 at 2,400 min^{-1}
Construction:		4 cylinders in line
Cooling:		external oil cooling
Injection:		direct injection
Capacity:	cm^3	3,100
High idle:	min^{-1}	2,550 $^{+50}$
Low idle:	min^{-1}	850 $^{+50}$
Spec. fuel consumption under full load:	g/kWh	218
Tappet clearance - inlet cold:	mm	0.30
Tappet clearance - outlet cold:	mm	0.50
Torque of cylinder head studs	Nm	30 / 80 / 160
(only in case of repair):		Tightening angle 90°
Further data:		see engine instruction book or chapter 3

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 80 / 720 (EN)
Generator:	V/A	14 / 95
Starter:	V/kW/PS	12 / 2.3 / 3.1
Cold start aid:		heater plug
Lighting:		acc. to German motor vehicle construction and use regulation (“StVZO”) and Euronorm. H4 halogen headlamp. Two working lights at the front.

TRANSMISSION

Travel pump:		type	A 4 VG 56 DA with pressure cut-off
Displacement:		max. cm^3/rev.	56
Travel motor	20/36 km/h version:	type	51D080 Danfoss
Displacement	20/36 km/h version:	max. cm^3/rev.	80

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 70:	**20 km/h - version:**				
	tortoise / rabbit	km/h	0 to 7.0	/	0 to 20
TL 70 S:	**36 km/h - version:**				
Gearbox position 1, tortoise / rabbit:		km/h	0 to 6.5	/	0 to 18
Gearbox position 2, tortoise / rabbit:		km/h	0 to 13	/	0 to 36

Cardan shaft rev. at **20 km/h - version**			adjustment at nominal speed		
tyres			tortoise / rabbit		
standard:	12,5-20:	min^{-1}	650 / 2,100		
option:	335/80 R20 SPT 9:	min^{-1}	650 / 2,050		
	335/80 R20 XM 27TL:	min^{-1}	650 / 2,080		

Cardan shaft rev. at **36 km/h - version**			adjustment at nominal speed		
			tortoise	/	rabbit
tyres			1./2. gear	/	1./2. gear
standard:	12,5-20:	min^{-1}	635 / 1,300		1.860 / 3,780
option:	335/80 R20 SPT 9:	min^{-1}	635 / 1,300		1.800 / 3,680
	335/80 R20 XM 27TL:	min^{-1}	635 / 1,300		1.840 / 3,750

PRESSURE AND SETTING VALUES **travel**

Suction pressure:	max. bar	0.5 $^{\pm 0.1}$
Charge pressure (high idle):	bar	30 $^{\pm 1}$
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start, dynamic:	min^{-1}	2,300 $^{-50}$ at 180 bar
		(see setting instructions, chapter 5, measuring method 2)
Start-up speed:	min^{-1}	1,150
Engine stalling (rabbit) - dynamic:	min^{-1}	2,200 $^{-100}$ at 220 bar HP
Brake inching beginning / end:	bar	5 - 13
Pressure switch (hydrostatic brake):	bar	22

STEERING

Steering unit:	type	Danfoss OSPC 250 LS dyn.
Steering pump:	make	Cassappa
Displacement:	l/min	37
Steering pressure (high idle):	bar	175
Priority valve:	type	Danfoss OLS 80 dyn.

WORKING HYDRAULICS

Working pump:	make	Cassappa
Displacement:	l/min	65
	(= slewing 28 l/min and steering 37 l/min summation)	
Valve bank:	type	Parker P 70 CF
Servo-controlled valve:	type	Brown PRSV

PRESSURE AND SETTING VALUES **working** (at high idle)

Main pressure relief valve I:		max. bar	250
Line relief pressures:			
- lifting frame lift:	(B2)	bar	280
- lifting frame lower:	(A2)	bar	anti-cavitation
- shovel dump in:	(B3)	bar	280
- shovel dump out:	(A3)	bar	130
- additional control circuit:	(A1+Y9 / B1+Y8)	bar	230 / 230
Main pressure relief valve II:		max. bar	250
Line relief pressures:			
- slewing left:	(A1+Y31)	bar	230
- slewing right:	(B1+Y32)	bar	230
- pilot pressure (charge pressure):		bar	30 $^{\pm 1}$

WORKING CYCLES

Lifting frame lift:	s	4.7
Lifting frame lower:	s	3.3
Shovel dump in:	s	---
Shovel dump out:	s	---
Slewing right / left:	s	3.2 to each side

AXLES

Front axle:	with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 009
Rear axle:	with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 010
Front axle:	with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 009
Rear axle :	with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 011

BRAKE SYSTEM

Service brake:		hydraulically operated drum brake, front axle
Parking brake:		drum brake at the front axle
Master cylinder:	make	ATE (mineral oil)

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil recommendation table
Transmission oil:	MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:	ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS

see instruction book

CAPACITIES

	ltr.	
Engine oil with oil filter and oil cooler - change:	approx. 13.0	engine oil
Hydraulic oil (tank and system) - first filling:	approx. 55.0	hydraulic oil
Hydraulic oil tank (change):	approx. 46.0	hydraulic oil
Fuel tank:	approx. 75.0	diesel
Front axle - central housing:	approx. 4.0	transmission oil
Front axle - wheel hub:	approx. 0.3	transmission oil, each
Rear axle - central housing and reduction gearbox:	approx. 4.5	transmission oil
Rear axle - wheel hub:	approx. 0.3	transmission oil, each
Service brake:	approx. 0.25	ATF oil

DIESEL ENGINE

Manufacturer:		KHD
Type:		F 4 M 2011
Performance according to DIN 70020:	kW	44 at 2,400 min^{-1}
Cooling:		engine oil / air; external oil cooling
Injection:		direct injection
Capacity:	cm^3	3,100
High idle:	min^{-1}	2,550 $^{\pm 50}$
Low idle:	min^{-1}	850 $^{\pm 50}$
Spec. fuel consumption under full load:	g/kWh	235
Tappet clearance - inlet cold:	mm	0.30
Tappet clearance - outlet cold:	mm	0.50
Engine oil pressure (at Service-Temp. 110°C)	bar	1,4 at 900 min^{-1} 2,2 at 1,800 min^{-1} 3,0 at 2,550 min^{-1}
Torque cylinder head studs:	Nm	30, 80, 160°
(only in case of repair):		Tightening angle 90°
Further data:		see engine instruction book

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 110 / 850
Generator:	V/A	14 / 95
Starter:	kW/PS	2.3 / 3.1
Starting aid:		heater plug
Lighting:		acc. to German motor vehicle construction and use regulation and Euronorm

TRANSMISSION

Travel pump:	type	A 4 VG 40 DA with pressure cut-off
Displacement:	cm^3/rev.	0 to 40
Travel motor:	type	A 6 VM 55 DA
Displacement:	max. cm^3/rev.	55
Servo-controlled valve, pedal:	type	Rexroth 2TH6 RP20

TRAVEL RANGE

TW 70	20 km/h version		
Symbol	tortoise / rabbit:	km/h	0 to 6 / 0 to 20
TW 70	30 km/h - Version:		
4 pre-selectable travel ranges, electro-hydraulically operated:			
Gearbox position 1,	tortoise / rabbit:	km/h	0 to 6 / 0 to 17
Gearbox position 2,	tortoise / rabbit:	km/h	0 to 11 / 0 to 30
Cardan shaft rev.	**20 km/h version**		adjustment at nominal speed tortoise / rabbit
with standard tyres:	365/70 R18:	min^{-1}	795 / 2,560
option:	8.25-20:	min^{-1}	735 / 2,370
	500/45-20:	min^{-1}	770 / 2,490
Cardan shaft rev.	**30 km/h version**		adjustment at nominal speed tortoise / rabbit 1st / 2nd gear / 1st / 2nd gear
with standard tyres:	365/70 R18:	min^{-1}	300 / 1,305 / 855 / 3,560
option:	8.25-20:	min^{-1}	300 / 1,305 / 855 / 3,560
	500/45-20:	min^{-1}	300 / 1,305 / 855 / 3,560

PRESSURE AND SETTING VALUES	**Travel**	
Suction pressure:	bar	- 0.25
Charge pressure (high idle):	bar	30^{+2}
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start (dynamic):	bar	$290^{\pm 10}$
Start-up speed:	min^{-1}	$1{,}100^{+50}$ (50 bar HP)
Engine stalling (tortoise, dynamic):	min^{-1}	$2{,}300^{+50}/_{-100}$ at 280^{+10} bar HP

STEERING

Steering unit:	type	Rexroth LAGC SD 160
Steering pump:	make	Kayaba P3
Displacement:	cm³/rev.	18 (≈ 43 l/min)
Steering pressure (high idle):	bar	120
Priority valve:	type	Rexroth LPS 80

WORKING HYDRAULICS

Working pump (variable displacement pump):	type	Kayaba PSVD2-26E
Displacement:	cm³/rev.	2 x 26 (≈ 2 x 62 l/min)
Gear pump: P3	type	Kayaba
Displacement:	cm³/rev.	18 (≈ 43 l/min)
Main relief valve: P1 + P2	bar	245
Main relief valve: P3	bar	205
Servo-controlled valve (joystick) right / left:	type	Rexroth 4TH5 E70
Servo-controlled valve, linear lever (stabilising):	type	Hydro – Control HC-RC11
Servo-controlled valve, pedal (intermediate boom / articulation)	type	Rexroth 2TH6 RP20
Valve bank:	type	Kayaba KVSE-72-9

PRESSURE AND SETTING VALUES	**Working**	
Valve bank - KVSE-72		
Main relief valve P1 + P2	bar	245
Line relief pressures:		
- Boom - articulated boom (raise / lower):	bar	280 / 280
- Dipperstick:	bar	280 / 280
- Bucket:	bar	280 / 280
- Intermediate boom - articulated boom / circular boom in / out:	bar	280 / 150
- Additional control circuit / breaker:	bar	280 / 280
Main relief valve P3	bar	205
Line relief pressures:		
- Slewing (valves at slew motor):	bar	205 / 205
- Articulation:	bar	---
- Stabilising:	bar	---
Pilot pressure (charge pressure) - high idle:	bar	30^{+2}

SLEW DRIVE

Slew gear with slew motor:	type	Kayaba MSG-27P-23E-2
Slew pressure (valves at the slew motor):	bar	205 (high idle)

CYCLE TIMES

Articulated boom -	raise / lower:	sec.	4.5 / 4.5
Intermediate boom -	raise / lower:	sec.	4.1 / 3.2
Dipperstick -	in / out:	sec.	3.5 / 2.9
Bucket -	in / out:	sec.	2.6 / 2.1

AXLES

Front axle:	**20 km/h version**	make/type	Clark-Hurth	211 / 52
Rear axle:	**20 km/h version**	make/type	Clark-Hurth	315 / 111 / 61
Front axle:	**30 km/h version**	make/type	Clark-Hurth	211 / 52
Rear axle:	**30 km/h version**	make/type	Clark-Hurth	357 / 111 / 237

BRAKES

Brake pump:	make	Kayaba
Displacement:	cm^3/rev.	18
Brake shut-off valve:	make	Wabco 477
Switching range:	bar	120 - 150
Foot brake valve:	make	Wabco 467
Brake pressure:	bar	45
Beginning/ end of inching:	bar	5 - 13
Parking brake:		spring-loaded brake in the front axle
Service brake:		oil-immersed multi-disk brake, front and rear axle

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil recommendation table
Transmission oil:	MIL-L 2105 B / API-GL 5, SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170°C. Lithium-saponified. NLGI grade 2 with EP additives

MAINTENANCE PARTS

see operating manual

CAPACITIES

		ltr.	
Engine oil (change):	approx.	13.0	engine oil
Hydraulic oil (tank and system):	approx.	180.0	hydraulic oil
Hydraulic oil (change):	approx.	110.0	hydraulic oil
Fuel tank:	approx.	150.0	diesel
Steering front axle - central housing:	approx.	4.0	transmission oil
Rear axle - central housing:	approx.	4.4	transmission oil
Reduction gear:	approx.	0.7	transmission oil
Wheel hubs front axle:	approx.	0.9	transmission oil, each
Wheel hubs rear axle:	approx.	0.9	transmission oil, each
Swing gear:	lubrication by circulation of the hydraulic oil		
Service brake:	connected to the hydraulic system		
Cooling agent:			engine oil

DIESEL ENGINE

Manufacturer:		KHD
Type:		BF 4 M 2012 - COM 2
Performance according to DIN 70020:	kW	60 at 2,000 min^{-1}
Cooling:		water
Injection:		direct injection
Capacity:	cm^3	4,040
High idle:	min^{-1}	$2{,}150^{+50}$
Low idle:	min^{-1}	800^{+50}
Spec. fuel consumption under full load:	g/kWh	208
Tappet clearance - inlet cold:	mm	$0.3^{+0.1}$
Tappet clearance - outlet cold:	mm	$0.5^{+0.1}$
Torque cylinder head studs:	Nm	30, 80, 90°
Further data:		see engine instruction book

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 110 / 850
Generator:	V/A	14 / 95
Starter:	kW/PS	3.1 / 4
Starting aid:		heater flange
Lighting:		acc. to German motor vehicle construction and use regulation and Euronorm

TRANSMISSION

Travel pump:	type	A 4 VG 56 DA with pressure cut-off
Displacement:	cm^3/rev.	0 to 56
Travel motor:	type	A 6 VM 107 DA
Displacement:	max. cm^3/rev.	107
Servo-controlled valve, pedal:	type	Rexroth 2TH6 RP20

TRAVEL RANGE

TW 85	20km/h version		
Symbol	tortoise/rabbit	km/h	0 to 6 / 0 to 20
TW 85	36km/h version		
4 pre-selectable travel ranges, electro-hydraulically operated:			
Gear position 1:	tortoise/rabbit	km/h	0 to 5 / 0 to 15
Gear position 2:	tortoise/rabbit	km/h	0 to 11 / 0 to 36
Cardan shaft rev. with	**20 km/h version**		adjustment at nominal speed tortoise / rabbit
with standard tyres:	8.25-20:	min^{-1}	395 / 1,480
	365/70 R18:	min^{-1}	395 / 1,475
	500/45-20:	min^{-1}	395 / 1,450
Cardan shaft rev. with	**25 km/h version**		adjustment at nominal speed tortoise / rabbit
with standard tyres:	8.25-20:	min^{-1}	395 / 1,850
	365/70 R18:	min^{-1}	395 / 1,840
	500/45-20:	min^{-1}	395 / 1,810

Cardan shaft rev. with	**36 km/h version**		adjustment at nominal speed tortoise / rabbit gear pos.1 / 2	gear pos. 1 / 2
with standard tyres:	8.25-20:	min^{-1}	350 / 850	1,105 / 2,660
	365/70 R18:	min^{-1}	350 / 850	1,100 / 2,650
	500/45-20:	min^{-1}	350 / 850	1,080 / 2,600

PRESSURE AND SETTING VALUES	**Travel**	
Suction pressure:	bar	- 0.25
Charge pressure (high idle):	bar	30^{+2}
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start (dynamic):	bar	$270^{\pm 10}$
Start-up speed:	min^{-1}	$1{,}100^{+50}$ (50 bar HP)
Engine stalling (tortoise, dynamic):	min^{-1}	$1{,}900^{\pm 50}$ at 320^{+10} bar HP

STEERING

Steering unit:	type	Rexroth LAGC 200-14/LD 200-140
Steering pump:	make	Casappa
Displacement:	cm^3/rev.	16,6
Steering pressure (high idle):	bar	140
Priority valve:	type	Rexroth LPS 40 R11

WORKING HYDRAULICS

Working pump (variable displacement pump):	type	A 10 VO 071 DFLR
Displacement:	cm^3/rev.	0 to 71
Triple gear pumps:	type	Casappa
Displacement:	cm^3/rev.	16.6+11.1
LS-pressure relief valve:	bar	280 (valve bank 1)
LS-regulator (stand-by pressure):	bar	22 at 2,150 min^{-1} (variable displacement pump)
Servo-controlled valve (joystick) right / left:	type	Rexroth 4TH 6 N
Servo-controlled valve, linear lever (stabilizing):	type	Hydro – Control
MONO boom:		
Servo-controlled valve, pedal (articulation):	type	Rexroth 2TH 6 RP 20
With articulated boom and circular boom:		
Servo-controlled valve, pedal (intermediate boom / articulation)	type	Rexroth 2TH 6 RP 20
Valve bank 1, articulated boom and circular boom / MONO boom:	type	Rexroth 5 SX 14 / 4 SX 14
Valve bank 2:	type	Rexroth 4 SM 12

PRESSURE AND SETTING VALUES		Working	
Valve bank 1 - SX 14			
LS valve:		bar	280
Main relief valve:		bar	310
Line relief pressures:			
- Boom - articulated boom	(raise / lower):	bar	300 / 300
- Boom - Mono boom	(raise / lower):	bar	300 / 180
- Boom - circular boom	(raise / lower):	bar	300 / 180
- Dipperstick:		bar	300 / 300
- Bucket:		bar	300 / 300
- Intermediate boom - articulated boom / circular boom in / out:		bar	300 / 150
- Additional control circuit / breaker:		bar	300 / 300
Valve bank 2 - SM 12			
Main pressure relief valve 2 (high idle):		bar	230
Line relief pressures:			
- Slewing (valves at slew motor):		bar	100/250 / 100/250
- Articulation:		bar	----
- Stabilizing:		bar	----
- Option: front dozer blade:		bar	130 $^{+10}$ (Bosch safety valve in the undercarriage)
Cut-off valve:		make	Bergin
Cut-off pressure (high idle):		bar	110
Pilot pressure (charge pressure) - high idle:		bar	30 $^{+2}$

SLEW DRIVE

Slew gear :	type	ZFP DR - 140
Slew motor:	type	A 2 FM 28
Slew pressure (valves at the slew motor):	bar	100 / 250

CYCLE TIMES

Mono boom -	raise / lower:	sec.	4.5 / 4.8
Articulated boom -	raise / lower:	sec.	4.5 / 4.5
Intermediate boom -	raise / lower:	sec.	4.0 / 3.0
Dipperstick -	in / out:	sec.	4.0 / 3.6
Bucket -	in / out:	sec.	2.6 / 2.0

AXLES

Front axle:	standard	make/type	Clark-Hurth 311/212/99
Rear axle:	standard	make/type	Clark-Hurth 162/53

Options:

Front axle:	4 wheel steering	make/type	Clark-Hurth 311/212/110
Rear axle:	4 wheel steering	make/type	Clark-Hurth 212/348
Front axle:	“S”-version	make/type	Clark-Hurth 357/212/199
Rear axle:	“S”-version	make/type	Clark-Hurth 162/53
Front axle:	“S”-version, 4 wheel steering	make/type	Clark-Hurth 357/212/199
Rear axle:	“S”-version, 4 wheel steering	make/type	Clark-Hurth 212/348

BRAKES

Brake pump:	make	Casappa
Displacement:	cm^3/rev.	11.1
Brake shut-off valve:	make	Wabco
Switching range:	bar	120 - 150
Foot brake valve:	make	Wabco
Brake pressure:	bar	40^{+10}
Beginning/ end of inching:	bar	5 - 13
Parking brake:		spring-loaded brake in the front axle
Service brake:		oil-immersed multi-disk brake, front and rear axle

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil recommendation table
Transmission oil:	MIL-L 2105 B / API-GL 5, SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170°C. Lithium-saponified. NLGI grade 2 with EP additives

MAINTENANCE PARTS

see operating manual

CAPACITIES

		ltr.	
Engine oil (first filling):	approx.	10.0	engine oil
Hydraulic oil (tank and system):	approx.	210.0	hydraulic oil
Hydraulic oil (change):	approx.	125.0	hydraulic oil
Fuel tank:	approx.	190.0	diesel
Steering front axle - central housing:	approx.	7.4	transmission oil
Rear axle - central housing:	approx.	7.0	transmission oil
Reduction gear:	approx.	1.5	transmission oil
Wheel hubs front axle:	approx.	0.5	transmission oil, each
Wheel hubs rear axle:	approx.	0.5	transmission oil, each
Swing gear:	lubrication by circulation of the hydraulic oil		
Service brake:	connected to the hydraulic system		
Cooling agent:	approx.	12.0	water with anti-corrosive and anti-freeze agent

DIESEL ENGINE

Manufacturer:		KHD
Type:		BF 4 M 2012 – COM 2
Performance acc. to DIN 70020:	kW	67 at 2,000 min^{-1}
Cooling:		water/ water antifreeze mixture
Injection:		direct injection
Capacity:	cm^3	4,040
High idle:	min^{-1}	2,150 $^{+50}$
Low idle:	min^{-1}	800 $^{+50}$
Spec. fuel consumption under full load:	g/kWh	227
Tappet clearance - inlet cold:	mm	0.3 $^{+0.1}$
Tappet clearance - exhaust cold:	mm	0.5 $^{+0.1}$
Torque cylinder head studs:	Nm	1st step: 40 2nd step: 70 Tightening angle: 180°
Further data:		see engine instruction book

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 135 / 950(EN)
Generator:	V/A	14 / 95
Starter:	kW/PS	3.1 / 4
Cold start aid:		heater flange
Lighting:		acc. to German motor vehicle construction and use regulation ("StVZO") and Euronorm

TRANSMISSION

Travel pump:		type	A 4 VG 90 DA 1 DT 8 with pressure cut-off
Displacement:		cm^3/rev.	0 to 90
Travel motor:	20/25km/h-version	type	A 6 VM 140 DA 1
	36 km/h-version	type	A 6 VM 107 DA 1
Displacement:	20/25km/h-version	cm^3/ min^{-1}	max. 140
	36 km/h-version	cm^3/ min^{-1}	max. 107
Pilot-operated valve, pedal:		type	Rexroth 2 TH 6 RP 20

TRAVEL RANGE

TW 110	20km/h version		
Symbol	tortoise/rabbit	km/h	0 to 6 / 0 to 20
TW 110	36km/h version		
4 pre-selectable travel ranges, electro-hydraulically operated:			
Gear position 1:	tortoise/rabbit	km/h	0 to 7 / 0 to 16
Gear position 2:	tortoise/rabbit	km/h	0 to 16 / 0 to 36
Cardan shaft rev. with	**20 km/h version**		adjustment at nominal speed tortoise / rabbit
with standard tyres:	9.00-20 14 PR:	min^{-1}	570 / 1,840
	600/40-22,5:	min^{-1}	570 / 1,795
	315/80 R22,5:	min^{-1}	570 / 1,780
Cardan shaft rev. with	**25 km/h version**		adjustment at nominal speed tortoise / rabbit
with standard tyres:	9.00-20 14 PR:	min^{-1}	570 / 2,150
	600/40-22,5:	min^{-1}	570 / 2,065
	315/80 R22,5:	min^{-1}	570 / 2,050

Cardan shaft rev. with	**36 km/h version**		adjustment at nominal speed tortoise / rabbit gear pos.1 / 2	gear pos. 1 / 2
with standard tyres:	9.00-20 14PR:	min^{-1}	510 / 1.180	1,440 / 3,300
	600/40-22,5:	min^{-1}	510 / 1.180	1,400 / 3,230
	315/80-R22,5:	min^{-1}	510 / 1.180	1,395 / 3,200

PRESSURE AND SETTING VALUES **travel**

Suction pressure:	bar	- 0.25
Charge pressure (high idle):	bar	30 $^{+2}$
High pressure (SV):	bar	480
Pressure cut-off:	bar	460 $^{-10}$
Case pressure at + 50° C:	max. bar	2.5
Regulation start (dynamic):	bar	220 $^{\pm10}$
Start-up speed:	min^{-1}	1,000 $^{+50}$ (50 bar HP)
Engine stalling (tortoise dynamic):	min^{-1}	1,900 $^{\pm50}$ at 230 $^{+10}$ bar HP

STEERING

Steering unit:	type	Rexroth LAGC 160-14/LD 200-140/M01
Steering pump:	make	Casappa
Displacement:	cm^3/rev.	16,6
Steering pressure (high idle):	bar	140 $^{\pm5}$
Priority valve:	type	Rexroth LPS 80 R11/LD7

WORKING HYDRAULICS

Working pump (variable displacement pump):	type	A 11 VO 95 DFSR
Displacement:	cm^3/rev.	0 to 93.5
Gear pumps (triple):	type	Casappa
Displacement:	cm^3/rev.	16.6 + 11.1 + 4.8
LS-pressure relief valve:	bar	330 (valve bank 1)
LS-regulator (stand-by pressure):	bar	22 $^{\pm1}$at 2,150 min^{-1} (variable displacement pump)
Engine stall RPM:	min^{-1}	1,900 $^{-100}$ (intermediate boom out, stabilizer up)
Servo-controlled valve (joystick), right / left:	type	Rexroth 4TH6 NE-70-10
Servo-controlled valve, linear lever (stabilising):	type	Hydro-Control HC-RCB-01-A01
Servo-controlled valve, pedal (intermediate boom/articulation):	type	Rexroth 2TH6 RP 20
Valve bank 1, articulated boom:	type	Rexroth 5 SX 14
Valve bank 2:	type	Rexroth 4 SM 12

PRESSURE AND SETTING VALUES **working**

Valve bank 1 (SX 14)

LS valve	bar	330
Main relief valve (high idle)	bar	380
Line relief pressures		
- Boom, articulated boom (up/down):	bar	370 / 370
- Stick:	bar	370 / 370
- Bucket:	bar	370 / 370
- Intermediate boom, articulated boom (in/out):	bar	370 / 200
- Additional control circuit / breaker:	bar	300 / 300

Valve bank 2 (SM 12)

Main pressure relief valve 2 (high idle)	bar	230
Line relief pressures		
- Swing (valves at swing motor):	bar	100/250 / 100/250
- Articulation:	bar	---/---
- Stabilizing:	bar	---/---
- **Option**: front dozer blade	bar	150 $^{+10}$ (Bosch safety valve in the undercarriage)

Shut-off valve	make	Knappheide
Shut-off valve (high idle):	bar	110 $^{\pm 5}$
Pilot pressure (charge pressure) – high idle:	bar	30 $^{+2}$

SWING DRIVE

Swing gear:	type	ZFP DR - 140
Swing motor:	type	A 2 FM 28
Swing pressure (valves at the swing motor):	bar	100 / 250

CYLE TIMES:

Articulated boom, boom	up / down:	s	3.4 / 3.0
Intermediate boom	up / down:	s	3.3 / 3.7
Stick	in / out:	s	3.6 / 3.1
Bucket	in / out:	s	2.8 / 1.7

AXLES

Front axle:	standard	make/type	Clark-Hurth 311/212/100
Rear axle:	standard	make/type	Clark-Hurth 162/54

Options:

Front axle:	4 wheel steering	make/type	Clark-Hurth 311/212/118
Rear axle:	4 wheel steering	make/type	Clark-Hurth 212/402
Front axle:	"S"-version	make/type	Clark-Hurth 357/212/217
Rear axle:	"S"-version	make/type	Clark-Hurth 162/54
Front axle:	"S"-version, 4 wheel steering	make/type	Clark-Hurth 357/212/217
Rear axle:	"S"-version, 4 wheel steering	make/type	Clark-Hurth 212/402

BRAKES

Brake pump:	make	Cassappa
Displacement:	cm³/rev.	4,8
Brake shut-off valve:	make	Wabco
Switching range:	bar	120 – 150 $^{\pm 10}$
Foot brake valve:	make	Wabco
Brake pressure:	bar	40 $^{+5}$
Beginning / end of brake inching:	bar	5 - 13
Beginning / end of brake inching (S-version):	bar	9 - 13
Parking brake:		spring-loaded brake in the front axle
Service brake:	bar	oil-immersed multi-disk brake, front and rear axle

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil specification in the operating manual
Transmission oil:	SAE 80W 90LS / API-GL 5, SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825, lithium-saponified multi-purpose grease, K2K-30

MAINTENANCE PARTS see operating manual

CAPACITIES	**ltr.**	
Engine oil (first filling):	approx. 10.0	engine oil
Hydraulic oil (tank and system):	approx. 230.0	hydraulic oil
Hydraulic oil (change):	approx. 155.0	hydraulic oil
Fuel tank:	approx. 240.0	diesel
Steering front axle - central housing:	approx. 7.2	transmission oil
Steering front axle – gearbox:	approx. 0.9	transmission oil
Steering front axle – wheel hub:	approx. 0.9	transmission oil, each
Rear axle - central housing:	approx. 8.0	transmission oil
Rear axle – wheel hubs:	approx. 2.1	transmission oil, each
Swing gear:	Hydraulic oil, lubrication by circulation of the oil	
Service brake:	connected to the hydraulic system	
Cooling agent:	approx. 12.0	water with anti-corrosive and anti-freeze agent

DIESEL ENGINE

Manufacturer:		Mitsubishi
Type:		S 4Q 2 - Y 163 KL
Output acc. to ISO 9249 (DIN 70020):	kW	37.9 at 2,400 min^{-1}
Construction:		4 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm^3	2,505
High idle:	min^{-1}	2,570 $^{+30}/_{-20}$
Low idle:	min^{-1}	850 $^{\pm 20}$
Spec. fuel consumption (full load):	g/kWh	252
Fuel bleeding:		automatic
Tappet clearance - inlet / outlet:	mm	0.25 (cold)
Injection timing:	°	20 (before upper dead centre)
Tightening torque of cylinder head studs (in case of repair):	Nm	M 12 x 1.75 : 118 5
Further data:		see engine operator's manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 50
Starter:	V/kW	12 / 2.0
Starting aid:		glow plugs, glow time controlled,
Lighting:		working headlamp H3, additional headlamp (optional)

TRANSMISSION

Travel motors with travel gear:	make / type	Kayaba MAG-33V-550 E
Travel speed:	km/h	0 to 3.0, 0 to 5.2

EXCAVATOR AND TRAVEL HYDRAULICS

Summation-controlled double variable displacement pump and 2 gear pumps:	make	Kayaba PSVD 2-26 E
Flow rate:	l/min.	62.4+62.4+43.2+8.4
Pilot pressure (high idle):	bar	30 (service temperature)
Control valve:	type	Kayaba KVSE 72-11
Joystick:	type	Rexroth 4TH 5
Pedal-operated valve (travel right/left, articulation, additional control circuit):	type	Rexroth 2TH 6
Pedal-operated valve (dozer blade)	type	Hydrocontrol HC-RCM-1S

SLEW DRIVE

Slew motor with gearbox:	make	Kayaba MSG-27P-23E-2
Slew pressure (valves at slew motor):	bar	205 (high idle) (service temperature)

PRESSURE AND SETTING VALUES

Main pressure relief valve	P1 (high idle):	max. bar	245
	P2	max. bar	245
	P3	max. bar	205

LINE RELIEF PRESSURES

P1 (main pressure relief valve: 245 bar)		
- Travel right:	bar	-- / --
- Stick:	bar	280 / 280
- Articulation:	bar	anti-cavitation
- Additional control circuit: (slew bucket, grab rotation, rock breaker)	bar	210 / 210
P2 (main pressure relief valve: 245 bar)		
- Travel left:	bar	-- / --
- Boom lift / lower:	bar	280 / 180
- Bucket:	bar	280 / 280
P3 (main pressure relief valve: 205 bar)		
- Slewing (valves at the slew motor):	bar	205 / 205
- Dozer blade:	bar	-- / --

CYCLE TIMES

Boom up / down - to the ground (without damping)	sec.	3.0 / 2.7
Dipperstick cylinder extend / retract:	sec.	3.0 / 3.2
Bucket cylinder extend / retract:	sec.	2.0 / 2.5

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see **Terex** hydraulic oil recommendation table
Transmission oil:	MIL-L-2105 B or API-GL5, SAE 85 W 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. With lithium.

MAINTENANCE PARTS

see operation manual

CAPACITIES

	ltr.	
Fuel:	approx. 95.0	diesel
Engine oil, engine and filter:	approx. 5.5 + 1.0	HD oil (change)
Hydraulic oil, tank and system:	approx. 108.0	hydraulic oil
Hydraulic oil tank:	approx. 75.0	hydraulic oil (change)
Travel gear:	approx. 0.9	transmission oil, each
Slew gear:	supply of hydraulic oil	
Cooling agent:	approx. 10.0	water with anti-corrosive and anti-freeze agent

The values stated are approximate.
The level indicator is always decisive.

DIESEL ENGINE

Manufacturer:		Deutz
Type:		BF 4 M 2011 Turbo - TIER II
Output acc. to DIN 70020:	kW	54 at 2,200 min^{-1}
Cooling:		external oil cooler
Injection:		direct injection, turbo charged
Capacity:	cm^3	3,100
Engine Torque	Nm	270 at 1,600 min^{-1}
High idle:	min^{-1}	2,350 $^{+50}$
Low idle:	min^{-1}	950 $^{+50}$
Spec. fuel consumption (full load):	g/kWh	224
Tappet clearance-inlet cold:	mm	0.3 $^{+0,1}$
Tappet clearance-outlet cold:	mm	0.5 $^{+0,1}$
Compression ratio:	bar	22 – 27
Injection nozzle (opening pressure)	bar	210 $^{+8}$
Engine oil pressure:	bar	1.4 at 900 min^{-1} 2.2 at 1,800 min^{-1} 3.0 at high idle
Torque of cylinder head studs:	Nm	30 / 80 / 160
(only in case of repair):		Tightening angle 90°
Further data:		see engine operator's manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 110 / 850 (EN)
Generator:	V/A	14 / 95
Starter:	kW	2.3
Starting aid:		2 glow plugs
Lighting:		acc. to German motor vehicle construction and use regulation and Euronorm.

TRANSMISSION

Travel gear:	make	Lohmann Stolterfoht GFT 9 T2
2-stage variable displacement motor (integrated in the travel gear):	type	A 10 VE 45 HZ

TRAVEL RANGE

Travel range I:	km/h	2.7
Travel range II:	km/h	5.2

WORKING HYDRAULICS

Working pump (variable displacement pump):	type	A 10 VO 71 DFSR
Displacement:	cm^3/rev.	0 to 71
Gear pump:	make	Bosch A510341201
Displacement:	cm^3/rev.	28
LS-regulator (stand-by pressure variable displacement pump):	bar	22 $^{\pm 1}$
Engine stalling (boom + dozer blade down in end position):	min^{-1}	2,000 $^{+200}$
Servo-controlled valve (cross servo control stick):	type	Rexroth 4TH5 E70
Servo-controlled valve, pedal (travel):	type	Rexroth 2TH6
Servo-controlled valve, pedal (add.control circuit):	type	Rexroth 2TH6
Valve bank 1: (Mono / circular boom)	type	6 SX 14 / 7 SX 14
Valve bank 2: (Standard / 2nd add. Circuit-Option)	type	3 SM 12 / 4 SM 12

PRESSURE AND SETTING VALUES	**WORKING**	
LS-pressure relief valve (6 SX 14):	bar	280 (valve bank 1)
Main pressure relief valve 1 (6 SX 14):	bar	310 (SV)
Main pressure relief valve 2 (3 SM 12) (high idle):	bar	230
Line relief pressures - valve bank 1 (SX 14):		
- MONO and circular boom:	bar	210 / 300
- Intermediate boom:	bar	180 / 300
- Dipperstick:	bar	300 / 300
- Bucket:	bar	300 / 300
- Breaker / additional control circuit:	bar	300 / 300
- Travel left / travel right:	bar	300 / 300 (valves in the travel motor)
Line relief pressures - valve bank 2 (SM 12):		
- Slewing (2 stage valves at the slew motor):	bar	100/250 **/** 100/250
- Dozer blade:	bar	----
- Articulation:	bar	----
Pilot pressure valve bank including the pressure reducing valve:	make	Hydac
Pilot pressure - high idle	bar	35^{+5}

SLEW DRIVE		
Slew gear:	type	ZFP - DR 140
Slew motor:	type	A 2 FM 28 / 61W
Slew pressure (2-stage valves at slew motor):	bar	100 / 250 (high idle)

LUBRICANTS	
Engine oil:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil recommendation table
Transmission oil:	MIL-L-2105 B / API-GL 5, SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.

MAINTENANCE PARTS	see operating manual

CAPACITIES		**ltr.**	
Engine oil (change):	approx.	10.0	engine oil
Hydraulic oil (tank and system):	approx.	140.0	hydraulic oil
Hydraulic oil (change):	approx.	110.0	hydraulic oil
Fuel tank:	approx.	130.0	diesel
Travel gear:	approx.	1.1	transmission oil, each
Slew gear:	Hydraulic oil, lubrication by circulation of the oil		

DIESEL ENGINE

Manufacturer:		Deutz
Type:		BF 4 M 2012 – TIER II
Output acc. to DIN 70020:	kW	69 at 2,100 min^{-1}
Cooling:		water
Injection:		direct injection, turbo charged
Capacity:	cm^3	4,040
High idle:	min^{-1}	2,250 $^{\pm 50}$
Low idle:	min^{-1}	800 $^{\pm 50}$
Spec. fuel consumption (full load):	g/kWh	231
Tappet clearance-inlet cold:	mm	0.3 $^{+0.1}$
Tappet clearance-outlet cold:	mm	0.5 $^{+0.1}$
Compression ratio:	bar	30 – 38
Injection nozzle (opening pressure)	bar	220
Engine oil pressure:	bar	0.8 at low idle, 120°C
Torque of cylinder head studs:	Nm	40, 70, Tightening angle 180°
Further data:		see engine operator's manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 135 / 1000(EN)
Generator:	V/A	14 / 95
Starter:	kW/PS	3.1 / 4
Starting aid:		air intake heater plate
Lighting:		acc. to German motor vehicle construction and use regulation and Euronorm.

TRANSMISSION

Travel gear:	make	Lohmann Stolterfoht GFT 17 T3
2-stage variable displacement motor (integrated in the travel gear):	type	A 10 VE 45 HZ
Parking and service brake:		oil immersed, spring loaded multi-disk brake in the travel gear

TRAVEL RANGE:

Travel range I:	km/h	2.5
Travel range II:	km/h	5.4

WORKING HYDRAULICS

Working pump (variable displacement pump):	type	A 11 VO 75 LR3S
Displacement:	cm^3/rev.	0 to 75
Gear pumps:	make	Casappa
Displacement:	cm^3/rev.	16,6+14,4
LS-regulator (stand-by pressure):	bar	22 $^{\pm 1}$ at 2,250 min^{-1}
LS-pressure relief valve (SX 14):	bar	350 (valve bank 1)
Engine stalling	min^{-1}	2,000 $^{\pm 50}$
Servo-controlled valve (cross servo control stick):	type	Rexroth 4TH5 E70
Servo-controlled valve, pedal (articulation):	type	Rexroth 2TH6 RG06-10
Servo-controlled valve, pedal (dozer blade):	type	Rexroth 2TH6
Servo-controlled valve, pedal (travel):	type	Rexroth 2TH6 RP20
Servo-controlled valve, pedal (add. control circuit):	type	Rexroth 2TH6 RP20

Control valve 1: (mono boom)	type	6 SX 14	(08 401 397)
Control valve 2:	type	3 SM 12	(08 401 195)
Control valve 1: (articulated boom)	type	7 SX 14	(08 402 325)
Control valve 2: (with option 2nd control circuit)	type	4 SM 12	(08 401 495)

PRESSURE AND SETTING VALUES	**WORKING**	
Main pressure relief valve 1 (6 SX 14):	bar	380 (safety valve)
Main pressure relief valve 2 (3 SM 12):	bar	230
Line relief pressures - valve bank 1 (6/7 SX 14):		
- Boom mono:	bar	330 / 330
articulated:	bar	370 / 370
- Intermediate boom:	bar	370 / 200
- Dipper stick:	bar	370 / 370
- Bucket:	bar	370 / 370
- Breaker / additional control circuit:	bar	300 / 300
- Travel left / travel right:	bar	350 / 350 (valves in the travel motor)
Line relief pressures - valve bank 2 (3 SM 12):		
- Slewing (valves at the slew motor):	bar	150/250 ///**/** 150/250
- Dozer blade:	bar	----
- Articulation:	bar	----
Shut-off valve:	make	Bergin
Shut-off pressure (high idle):	bar	110
Pressure reducing valve (pilot control):	make	Parker PRS-6 G
Pilot pressure - high idle	bar	35 $^{+2}$

SLEW DRIVE

Slew gear:	type	ZFP - DR 140
Slew motor:	type	A 2 FM 32/61W
Slew pressure (valves at slew motor):	bar	150 / 250 /// 150 / 250 (high idle)

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil recommendation table
Transmission oil:	MIL-L-2105 B / API-GL 5, SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.

MAINTENANCE PARTS see operating manual

CAPACITIES	**ltr.**		
Engine oil (change):	approx.	10.0	engine oil
Hydraulic oil (tank and system):	approx.	180.0	hydraulic oil
Hydraulic oil (change):	approx.	110.0	hydraulic oil
Fuel tank:	approx.	150.0	diesel
Travel gear:	approx.	1.8	transmission oil, each
Cooling agent:	approx.	12.0	water with anti-corrosive and anti-freeze agent

DIESEL ENGINE

Manufacturer:		Mitsubishi
Type:		S 4L - 262 KL
Output acc. to DIN 70020 and ECE-R24:	kW	19 at 2,000 min^{-1}
Construction:		4 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm^3	1,500
High idle:	min^{-1}	2,250 $^{+20}/_{-20}$
Low idle:	min^{-1}	1,000 $^{+50}/_{-25}$
Spec. fuel consumption (full load):	g/kWh	265
Fuel bleeding:		automatic
Tappet clearance - inlet / outlet:	mm	0.25 (cold)
Compression ratio:	bar	27 - 30
Injection timing:	°	17 (before upper dead centre)
Engine oil pressure:	bar	3.5 $^{\pm 0.5}$ (at high idle, service temperature)
Torque of cylinder head studs (in case of repair):	Nm	M 10 → 83 – 92
Injection pressure (valve opening pressure)	bar	140 $^{+5}$
Further data:		see engine operator's manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 50
Starter:	V/kW	12 / 2.0
Starting aid:		Glow plugs, glow time controlled,
Lighting:		working headlamps H3, additional headlamp (optional)

TRANSMISSION

Travel motors with travel gear:	make/type	SOM PGRF 402
Travel speed:	km/h	0 to 2.7; 0 to 4.6

EXCAVATOR AND TRAVEL HYDRAULICS

Hydraulic pump:	make	A 10 VO 45 DFR
Flow rate:	l/min	0 - 45
Pilot pressure (high idle):	bar	28 (service temperature)
Valve bank:	type	Rexroth 9 SX 12
Cross servo control stick:	type	Rexroth 4TH 6 N

SLEW DRIVE

Slew motor with gearbox:	make	Kayaba MSG-27P-10E-19
Slew pressure (valves at slew motor):	bar	210^{+5}(high idle; service temperature) (Δp at the slew motor 180 $^{+5}$bar)

PRESSURE AND SETTING VALUES

Main pressure relief valve (high idle):	max. bar	210 $^{+5}$	
Power regulator (G-regulator):	bar	20	(high idle, service temperature)
Stand-by regulator:	bar	21	(high idle, service temperature)
∆p (LS-Pressure)	bar	15,0	(high idle, service temperature)

LINE RELIEF PRESSURES

- slewing (valves at the slew motor):	bar	210^{+5} / 210^{+5}	(high idle, service temperature) (∆p at the slew motor 180bar)
- blade:	bar	---	
- travel left:	bar	--- / ---	(190 bar shock valves at the travel motor)
- travel right:	bar	--- / ---	(190 bar shock valves at the travel motor)
- bucket:	bar	175 / 175	
- boom lift / lower:	bar	230 / 160	
- articulation:	bar	anti-cavitation	
- dipperstick in/out:	bar	230 / 230	
- breaker / slew bucket / grab rotation:	bar	---	

CYCLE TIMES

Boom up / down - to the ground (without damping)	sec.	2.8 / 2.6
Dipperstick out / in:	sec.	2.5 / 3.3
Bucket out / in:	sec.	2.0 / 2.8

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual table
Transmission oil:	MIL-L-2105 B or API-GL5, SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. With lithium.

MAINTENANCE PARTS see operation manual

CAPACITIES	**ltr.**		
Fuel:	approx.	52.0	diesel
Engine oil, engine and filter:	approx.	7.7 + 0.5	HD-oil (change)
Hydraulic oil, tank and system:	approx.	85.0	hydraulic oil
Hydraulic oil tank:	approx.	72.0	hydraulic oil (change)
Travel gear:	approx.	0.6	transmission oil, each
Slew gear:	lubrication by circulation of the hydraulic oil		
Cooling agent:	approx.	5.3	water with anti-corrosive and anti-freeze agent

The values stated are approximate.
The level indicator is always decisive.

DIESEL ENGINE

Manufacturer:		Mitsubishi
Type:		S 4L 2 – Y 263 KL – Tier II
Output acc. to DIN 70020 and ECE-R24:	kW	23.8 at 2,100 min^{-1}
Construction:		4 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm^3	1,758
Torque	Nm	105 at 1,500 min^{-1}
High idle:	min^{-1}	2,300 $^{-50}$
Low idle:	min^{-1}	1,000 $^{+25}/_{-25}$
Spec. fuel consumption (full load):	g/kWh	258
Fuel bleeding:		automatic
Tappet clearance - inlet / outlet:	mm	0.25 (cold)
Compression ratio:	bar	27 - 30
Injection timing:	°	17 (before upper dead centre)
Engine oil pressure:	bar	3.5 $^{\pm 0.5}$ (high idle, service temperature)
Torque of cylinder head studs (in case of repair):	Nm	M 10 → 83 to 92
Injection pressure	bar	140 $^{+5}$
Further data:		see engine operator's manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 50
Starter:	V/kW	12 / 2.0
Starting aid:		Glow plugs, glow time controlled,
Lighting:		working headlamp H3, additional headlamp (optional)

TRANSMISSION

Travel motors with travel gear:	make/type	SOM PGR 402
Travel speed:	km/h	0 to 2.7 / 0 to 4.6

EXCAVATOR AND TRAVEL HYDRAULICS

Variable displacement pump:	make	Rexroth
	type	A 10 VO 45 DFLR
Flow rate:	cm^3/rev.	0 – 45 (0 – 94.5 l/min)
Pilot pressure (high idle):	bar	28 (service temperature)
Valve bank:	type	Rexroth 9 SX 12
Cross servo control stick:	type	Rexroth 4TH6

SLEW DRIVE

Slew motor with gearbox:	make	Kayaba MSG-27P-10E-19
Slew pressure (valves at slew motor):	bar	250 $^{+5}$ ($\Delta p=200^{+5}$ between M1 and M2; high idle; service temperature)

PRESSURE AND SETTING VALUES

Main pressure relief valve:	max. bar	250 $^{+5}$	(high idle, service temperature)
Power regulator (G-regulator):	bar	20	(high idle, service temperature)
Stand-by regulator:	bar	21	(high idle, service temperature)
∆p (LS-Pressure)	bar	15,0	(high idle, service temperature)

LINE RELIEF PRESSURES

- slewing (valves at the slew motor):	bar	250 / 250	(∆p between M1 and M2 high idle, service temperature)
- blade:	bar	---	
- travel left:	bar	---	(250 bar shock valves at the travel motor)
- travel left:	bar	---	(250 bar shock valves at the travel motor)
- bucket:	bar	210 / 210	
- boom lift / lower:	bar	280 / 160	
- articulation:	bar	anti-cavitation	
- dipper stick:	bar	280 / 280	
- breaker / slew bucket / grab rotation:	bar	210 / 210	

CYCLE TIMES

Boom up / down - to the ground (without damping)	sec.	2.8 / 2.7
Dipper stick cylinder extend / retract:	sec.	2.5 / 3.3
Bucket cylinder extend / retract:	sec.	2.4 / 2.8

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual
Transmission oil:	MIL-L-2105 B or API-GL5, SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. With lithium.

MAINTENANCE PARTS see operation manual

CAPACITIES

		ltr.	
Fuel:	approx.	52.0	diesel
Engine oil, engine and filter:	approx.	7.7	+ 0.5 HD oil (change)
Hydraulic oil, tank and system:	approx.	85.0	hydraulic oil
Hydraulic oil tank:	approx.	72.0	hydraulic oil (change)
Travel gear:	approx.	0.6	transmission oil, each
Slew gear:	lubrication by circulation of the hydraulic oil		
Cooling agent:	approx.	5.3	water with anti-corrosive and anti-freeze agent

The values stated are approximate.
The level indicator is always decisive.

DIESEL ENGINE

Manufacturer:		Mitsubishi
Type:		S 4Q 2 - 262 KL
Output acc. to ISO 9249 (DIN 70020):	kW	34.6 at 2,200 min^{-1}
Construction:		4 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm^3	2,505
High idle:	min^{-1}	2,350 $^{+20}$
Low idle:	min^{-1}	850 $^{+50}$
Spec. fuel consumption (full load):	g/kWh	252
Compression ration	bar	26 - 30
Fuel bleeding:		automatic
Tappet clearance - inlet / outlet:	mm	0.25 (cold)
Injection timing:	°	20 (before upper dead centre)
Engine oil pressure:	bar	3.5 $^{\pm 0.5}$ (at high idle, service temperature)
Tightening torque of cylinder head studs (in case of repair):	Nm	M 12 x 1.75 → 118 $^{\pm 5}$
Injection pressure (valve opening pressure)	bar	120 $^{+10}$
Further data:		see engine operator's manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 50
Starter:	V/kW	12 / 2.0
Starting aid:		glow plugs, glow time controlled,
Lighting:		working headlamp H3, additional headlamp (optional)

TRANSMISSION

Travel motors with travel gear:	make/type	Kayaba MAG-33V-550 E
Travel speed:	km/h	0 to 2.6; 0 to 5.0

EXCAVATOR AND TRAVEL HYDRAULICS

Summation-controlled double variable displacement pump and 2 gear pumps:	make	Kayaba PSVD 2 - 26 E
Flow rate:	l/min.	57 + 57 + 37 + 10
Pilot pressure (high idle):	bar	30 (service temperature)
Control valve:	type	Kayaba KVSE 70-10
Joystick:	type	Rexroth 4TH 5
Pedal-operated valve (travel right/left, dozer blade, articulation, additional control circuit):	type	Rexroth 2TH 6

SLEW DRIVE

Slew motor with gearbox:	make	Kayaba MSG-27 P-23
Slew pressure (valves at slew motor):	bar	205 (high idle) (service temperature)

PRESSURE AND SETTING VALUES

Main pressure relief valve	P1 (high idle):	max. bar	245
	P2	max. bar	245
	P3	max. bar	205

LINE RELIEF PRESSURES

P1 (main pressure relief valve: 245 bar)		
- Travel right (valves at the slew motor):	bar	270 / 270
- Stick:	bar	280 / 280
- Articulation:	bar	anti-cavitation
- Additional control circuit: (slew bucket, grab rotation, rock breaker)	bar	210 / 210
P2 (main pressure relief valve: 245 bar)		
- Travel left (valves at the slew motor):	bar	270 / 270
- Boom lift / lower:	bar	280 / 140
- Bucket:	bar	280 / 280
P3 (main pressure relief valve: 205 bar)		
- Slewing (valves at the slew motor):	bar	205 / 205
- Dozer blade:	bar	----

CYCLE TIMES

Boom up / down - to the ground (without damping)	sec.	3.1 / 2.6
Dipperstick extend / retract:	sec.	3.4 / 3.8
Bucket extend / retract:	sec.	1.5 / 2.7

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual
Transmission oil:	MIL-L-2105 B or API-GL5, SAE 85 W 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. With lithium.

MAINTENANCE PARTS

see operation manual

CAPACITIES

	ltr.	
Fuel:	approx. 60.0	diesel
Engine oil, engine and filter:	approx. 5.5 + 1.0	HD oil (change)
Hydraulic oil, tank and system:	approx. 102.0	hydraulic oil
Hydraulic oil tank:	approx. 72.0	hydraulic oil (change)
Travel gear:	approx. 0.9	transmission oil, each
Slew gear:	lubrication by circulation of the hydraulic oil	
Cooling agent:	approx. 10.0	water with anti-corrosive and anti-freeze agent

The values stated are approximate.
The level indicator is always decisive.

DIESEL ENGINE

Manufacturer:		Mitsubishi
Type:		L 3 E - W 262 KL
Performance acc. to DIN 70020 + ECE-R24:	kW	13.0 at 2,250 min^{-1}
Construction:		3 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm^3	952
High idle:	min^{-1}	2.450 $^{+35}/_{-10}$
Low idle:	min^{-1}	1.020 $^{+50}$
Spec. fuel consumption (full load):	g/kWh	247
Fuel bleeding:		automatic
Tappet clearance - inlet / exhaust:	mm	0.25 (cold)
Injection timing:	°	17 before upper dead centre
Torque of cylinder head studs:	Nm	M 10: 75 - 85 M 8: 20 – 30
Electric fuel pump:	bar	0,18
	l/min	0.37
Injection pressure (valve opening pressure):	bar	140
Further data:		see engine operating manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 40
Starter:	V/kW	12 / 1.7
Starting aid:		3 glow plugs, glow time controlled
Lighting:		working headlight H3

TRANSMISSION

Travel motors:	make/type	SOM MOR 15
Travel gears:	make/type	SOM PGR 132 N
Travel speed:	km/h	0 to 2.4

EXCAVATOR AND TRAVEL HYDRAULICS

Hydaulic pump:	make	Haldex WP 09 A2
Flow rate:	l/min	33,6 + 19,2
Cut off valve:		pump integrated
Cut off pressure (high idle):	bar	110 $_{-5}$ (service temperature)
Pilot pressure (high idle):	bar	28 (service temperature)
Pressure reducing valve with accu	make	Hydac
Valve bank:	type	Rexroth 9 SX 10
Cross servo control stick:	type	Rexroth 4TH 6
Flow at additional circuit	l/min	at 100 bar ➔ approx. 32 at 140 bar ➔ approx. 26

SLEW DRIVE

Slew motor with gearbox:	make	SOM SD50 + GWS200
Slew pressure (valves at slew motor):	bar	140 (high idle and service temperature, measured at pressure port P1)

PRESSURE AND SETTING VALUES

Main pressure relief valve (high idle):	max. bar	165

LINE RELIEF PRESSURES

- travel left (valves in the motor):	bar	----
- travel right (valves in the motor):	bar	----
- slewing (valves at the slew motor):	bar	140 (high idle and service temperature, measured at pressure port P1)
- dipperstick:	bar	210 / 210
- bucket:	bar	210 / 210
- boom lift / lower:	bar	210 / 160
- breaker / slew bucket / grab rotation:	bar	----
- articulation:	bar	anti cavitation
- dozer blade:	bar	----

CYCLE TIMES

Boom up / down to the ground:	s	3.0 / 2.9
Dipperstick extend / retract:	s	2.6 / 2.9
Bucket extend / retract:	s	2.1 / 2.4
Slew speed (max.)	min^{-1}	10

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual
Transmission oil:	MIL-L-2105 B or API-GL5, SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. With lithium.

MAINTENANCE PARTS

see operation manual

CAPACITIES

		ltr.	
Fuel:	approx.	30.0	diesel
Engine oil, engine and filter:	approx.	3.4 + 0.2	HD-oil (change)
Hydraulic oil, tank and system:	approx.	35.0	hydraulic oil
Hydraulic oil tank:	approx.	25.0	hydraulic oil (change)
Travel gear:	approx.	0.3	transmission oil, each
Slew gear:	approx.	0.07	transmission oil
Cooling agent:	approx.	4.2	water with anticorrosive and anti-freeze agent

The values stated are approximate.
The level indicator is always decisive.

DIESEL ENGINE

Manufacturer:		Mitsubishi
Type:		L 3 E - W 262 KL
Performance acc. to DIN 70020 + ECE-R24:	kW	13.0 at 2,250 min^{-1}
Construction:		3 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm^3	952
High idle:	min^{-1}	2.450 $^{+35}/_{-10}$
Low idle:	min^{-1}	1.020 $^{+50}$
Spec. fuel consumption (full load):	g/kWh	247
Fuel bleeding:		automatic
Tappet clearance - inlet / exhaust:	mm	0.25 (cold)
Injection timing:	°	17 before upper dead centre
Torque of cylinder head studs:	Nm	M 10: 75 - 85 M 8: 20 – 30
Electric fuel pump:	bar	0,18
	l/min	0.37
Injection pressure (valve opening pressure):	bar	140
Further data:		see engine operating manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 40
Starter:	V/kW	12 / 1.7
Starting aid:		3 glow plugs, glow time controlled
Lighting:		working headlight H3

TRANSMISSION

Travel motors:	make/type	SOM MOR 15
Travel gears:	make/type	SOM PGR 132 N
Travel speed:	km/h	0 to 2.4

EXCAVATOR AND TRAVEL HYDRAULICS

Hydaulic pump:	make	Haldex WP 09 A2
Flow rate:	l/min	33,6 + 19,2
Cut off valve:		pump integrated
Cut off pressure (high idle):	bar	110 $_{-5}$ (service temperature)
Pilot pressure (high idle):	bar	28 (service temperature)
Pressure reducing valve with accu	make	Hydac
Valve bank:	type	Rexroth 9 SX 10
Cross servo control stick:	type	Rexroth 4TH 6
Flow at additional circuit	l/min	at 100 bar ➔ approx. 32 at 140 bar ➔ approx. 26

SLEW DRIVE

Slew motor with gearbox:	make	Nachi PCR-01B-05A
Slew pressure (valves at slew motor):	bar	125 (high idle and service temperature, measured at pressure port P1)

PRESSURE AND SETTING VALUES

Main pressure relief valve (high idle):	max. bar	165

LINE RELIEF PRESSURES

- travel left (valves in the motor):	bar	----
- travel right (valves in the motor):	bar	----
- slewing (valves at the slew motor):	bar	140 (high idle and service temperature, measured at pressure port P1)
- dipperstick:	bar	210 / 210
- bucket:	bar	210 / 210
- boom lift / lower:	bar	210 / 160
- breaker / slew bucket / grab rotation:	bar	----
- articulation:	bar	anti cavitation
- dozer blade:	bar	----

CYCLE TIMES

Boom up / down to the ground:	s	3.0 / 2.9
Dipperstick extend / retract:	s	2.6 / 2.9
Bucket extend / retract:	s	2.1 / 2.4
Slew speed (max.)	min^{-1}	10

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual
Transmission oil:	MIL-L-2105 B or API-GL5, SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. With lithium.

MAINTENANCE PARTS

see operation manual

CAPACITIES

		ltr.	
Fuel:	approx.	30.0	diesel
Engine oil, engine and filter:	approx.	3.4 + 0.2	HD-oil (change)
Hydraulic oil, tank and system:	approx.	35.0	hydraulic oil
Hydraulic oil tank:	approx.	25.0	hydraulic oil (change)
Travel gear:	approx.	0.3	transmission oil, each
Slew gear:	approx.	0.07	transmission oil
Cooling agent:	approx.	4.2	water with anticorrosive and anti-freeze agent

The values stated are approximate.
The level indicator is always decisive.

DIESEL ENGINE

Manufacturer:		Mitsubishi
Type:		L 3 E - W 262 KL
Performance acc. to DIN 70020 + ECE-R24:	kW	13.0 at 2,250 min^{-1}
Construction:		3 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm^3	952
High idle:	min^{-1}	2.450 $^{+35}/_{-10}$
Low idle:	min^{-1}	1.020 $^{+50}$
Spec. fuel consumption (full load):	g/kWh	247
Fuel bleeding:		automatic
Tappet clearance - inlet / exhaust:	mm	0.25 (cold)
Injection timing:	°	17 before upper dead centre
Torque of cylinder head studs:	Nm	M 10: 75 - 85 M 8: 20 – 30
Electric fuel pump	bar	0,18
	l/min	0,37
Injection pressure (valve opening pressure):	bar	140
Further data:		see engine operating manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 40
Starter:	V/kW	12 / 1.7
Starting aid:		3 glow plugs, glow time controlled
Lighting:		working headlight H3

TRANSMISSION

Travel motors:	make/type	SOM MOR 15
Travel gears:	make/type	SOM PGR 132 N
Travel speed:	km/h	0 to 2.7

EXCAVATOR AND TRAVEL HYDRAULICS

Hydraulic pump:	make	Haldex WP 09 A2
Flow rate:	l/min	33,6 + 19,2
Cut off valve:		pump integrated
Cut off pressure (high idle):	bar	110 $_{-5}$ (service temperature)
Pilot pressure (high idle):	bar	28 (service temperature)
Pressure reducing valve with accu	make	Hydac
Valve bank:	type	Rexroth 9 SX 10
Cross servo control stick:	type	Rexroth 4TH 5
Flow at additional circuit	l/min	at 100 bar ➔ approx. 32 at 140 bar ➔ approx. 26

SLEW DRIVE

Slew motor with gearbox:	make	SOM SD50 + GWS200
Slew pressure (valves at slew motor):	bar	140 (high idle and service temperature, measured at pressure port P1)

PRESSURE AND SETTING VALUES

Main pressure relief valve (high idle):	max. bar	165

LINE RELIEF PRESSURES

- travel left (valves in the motor):	bar	----
- travel right (valves in the motor):	bar	----
- slewing (valves at the slew motor):	bar	140 (high idle and service temperature, measured at pressure port P1)
- dipperstick:	bar	210 / 210
- bucket:	bar	210 / 210
- boom lift / lower:	bar	210 / 160
- breaker / slew bucket / grab rotation:	bar	----
- articulation:	bar	anti cavitation
- dozer blade:	bar	----

CYCLE TIMES

Boom up / down to the ground:	s	3.0 / 2.9
Dipperstick extend / retract:	s	2.6 / 2.9
Bucket extend / retract:	s	2.1 / 2.4
Slew speed (max.)	min^{-1}	10

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual
Transmission oil:	MIL-L-2105 B or API-GL5, SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. With lithium.

MAINTENANCE PARTS

see operation manual

CAPACITIES

		ltr.	
Fuel:	approx.	30.0	diesel
Engine oil, engine and filter:	approx.	3.4 + 0.2	HD-oil (change)
Hydraulic oil, tank and system:	approx.	35.0	hydraulic oil
Hydraulic oil tank:	approx.	25.0	hydraulic oil (change)
Travel gear:	approx.	0.3	transmission oil, each
Slew gear:	approx.	0.07	transmission oil
Cooling agent:	approx.	4.2	water with anticorrosive and anti-freeze agent

The values stated are approximate.
The level indicator is always decisive.

DIESEL ENGINE

Manufacturer:		Mitsubishi
Type:		L 3 E - W 262 KL
Performance acc. to DIN 70020 + ECE-R24:	kW	13.0 at 2,250 min^{-1}
Construction:		3 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm^3	952
High idle:	min^{-1}	2.450 $^{+35}/_{-10}$
Low idle:	min^{-1}	1.020 $^{+50}$
Spec. fuel consumption (full load):	g/kWh	247
Fuel bleeding:		automatic
Tappet clearance - inlet / exhaust:	mm	0.25 (cold)
Injection timing:	°	17 before upper dead centre
Torque of cylinder head studs:	Nm	M 10: 75 - 85 M 8: 20 – 30
Electric fuel pump	bar	0,18
	l/min	0,37
Injection pressure (valve opening pressure):	bar	140
Further data:		see engine operating manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 40
Starter:	V/kW	12 / 1.7
Starting aid:		3 glow plugs, glow time controlled
Lighting:		working headlight H3

TRANSMISSION

Travel motors:	make/type	SOM MOR 15
Travel gears:	make/type	SOM PGR 132 N
Travel speed:	km/h	0 to 2.7

EXCAVATOR AND TRAVEL HYDRAULICS

Hydraulic pump:	make	Haldex WP 09 A2
Flow rate:	l/min	33,6 + 19,2
Cut off valve:		pump integrated
Cut off pressure (high idle):	bar	110 $_{-5}$ (service temperature)
Pilot pressure (high idle):	bar	28 (service temperature)
Pressure reducing valve with accu	make	Hydac
Valve bank:	type	Rexroth 9 SX 10
Cross servo control stick:	type	Rexroth 4TH 5
Flow at additional circuit	l/min	at 100 bar ➔ approx. 32 at 140 bar ➔ approx. 26

SLEW DRIVE

Slew motor with gearbox:	make	Nachi PCR-01B-05A
Slew pressure (valves at slew motor):	bar	125 (high idle and service temperature, measured at pressure port P1)

PRESSURE AND SETTING VALUES

Main pressure relief valve (high idle):	max. bar	165

LINE RELIEF PRESSURES

- travel left (valves in the motor):	bar	----
- travel right (valves in the motor):	bar	----
- slewing (valves at the slew motor):	bar	140 (high idle and service temperature, measured at pressure port P1)
- dipperstick:	bar	210 / 210
- bucket:	bar	210 / 210
- boom lift / lower:	bar	210 / 160
- breaker / slew bucket / grab rotation:	bar	----
- articulation:	bar	anti cavitation
- dozer blade:	bar	----

CYCLE TIMES

Boom up / down to the ground:	s	3.0 / 2.9
Dipperstick extend / retract:	s	2.6 / 2.9
Bucket extend / retract:	s	2.1 / 2.4
Slew speed (max.)	min^{-1}	10

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual
Transmission oil:	MIL-L-2105 B or API-GL5, SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. With lithium.

MAINTENANCE PARTS

see operation manual

CAPACITIES

		ltr.	
Fuel:	approx.	30.0	diesel
Engine oil, engine and filter:	approx.	3.4 + 0.2	HD-oil (change)
Hydraulic oil, tank and system:	approx.	35.0	hydraulic oil
Hydraulic oil tank:	approx.	25.0	hydraulic oil (change)
Travel gear:	approx.	0.3	transmission oil, each
Slew gear:	approx.	0.07	transmission oil
Cooling agent:	approx.	4.2	water with anticorrosive and anti-freeze agent

The values stated are approximate.
The level indicator is always decisive.

DIESEL ENGINE

Manufacturer:		Mitsubishi
Type:		L 3 E - W 262 KL
Performance acc. to DIN 70020 + ECE-R24:	kW	13.0 at 2,250 min^{-1}
Construction:		3 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm^3	952
High idle:	min^{-1}	2.450 $^{+35}/_{-10}$
Low idle:	min^{-1}	1.020 $^{+50}$
Spec. fuel consumption (full load):	g/kWh	247
Fuel bleeding:		automatic
Tappet clearance - inlet / exhaust:	mm	0.25 (cold)
Injection timing:	°	17 before upper dead centre
Torque of cylinder head studs:	Nm	M 10: 75 - 85 M 8: 20 – 30
Electric fuel pump	bar	0,18
	l/min	0,37
Injection pressure (valve opening pressure):	bar	140
Further data:		see engine operating manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 40
Starter:	V/kW	12 / 1.7
Starting aid:		3 glow plugs, glow time controlled
Lighting:		working headlight H3

TRANSMISSION

Travel motors:		make/type	SOM MOR 15
Travel gears:		make/type	SOM PGR 132 N
Travel speed:	tortoise	km/h	0 to 2.7
	rabbit	km/h	0 to 4.5

EXCAVATOR AND TRAVEL HYDRAULICS

Hydraulic pump:	make	Haldex WP 09 A2
Flow rate:	l/min	33,6 + 19,2
Cut off valve:		pump integrated
Cut off pressure (high idle):	bar	125 $_{-5}$ (service temperature)
Pilot pressure (high idle):	bar	28 (service temperature)
Pressure reducing valve with accu	make	Hydac
Valve bank:	type	Rexroth 9 SX 10
Cross servo control stick:	type	Rexroth 4TH 5
Flow at additional circuit	l/min	at 100 bar ➔ approx. 33 at 140 bar ➔ approx. 30

SLEW DRIVE

Slew motor with gearbox:	make	SOM RCG-35
Slew pressure (valves at slew motor):	bar	155 (high idle and service temperature, measured **at pressure port P1**)

PRESSURE AND SETTING VALUES

Main pressure relief valve (high idle):	max. bar	180

LINE RELIEF PRESSURES

- travel left (valves in the motor):	bar	180 / 180
- travel right (valves in the motor):	bar	180 / 180
- slewing (valves at the slew motor):	bar	155 (high idle and service temperature, measured **at pressure port P1**)
- dipperstick:	bar	210 / 210
- bucket:	bar	210 / 210
- boom lift / lower:	bar	230 / 160
- breaker / slew bucket / grab rotation:	bar	----
- articulation:	bar	anti cavitation
- dozer blade:	bar	----

CYCLE TIMES

Boom up / down to the ground:	s	3.0 / 2.9
Dipperstick extend / retract:	s	2.6 / 2.9
Bucket extend / retract:	s	2.1 / 2.4
Slew speed (max.)	min^{-1}	10

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual
Transmission oil:	MIL-L-2105 B or API-GL5, SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. With lithium.

MAINTENANCE PARTS

see operation manual

CAPACITIES

		ltr.	
Fuel:	approx.	30.0	diesel
Engine oil, engine and filter:	approx.	3.4 + 0.2	HD-oil (change)
Hydraulic oil, tank and system:	approx.	35.0	hydraulic oil
Hydraulic oil tank:	approx.	25.0	hydraulic oil (change)
Travel gear:	approx.	0.3	transmission oil, each
Slew gear:	approx.	0.1	transmission oil
Cooling agent:	approx.	4.2	water with anticorrosive and anti-freeze agent

The values stated are approximate.
The level indicator is always decisive.

DIESEL ENGINE

Manufacturer:		Mitsubishi
Type:		L 3 E - W 262 KL
Performance acc. to DIN 70020 + ECE-R24:	kW	13.0 at 2,250 min^{-1}
Construction:		3 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm^3	952
High idle:	min^{-1}	2.450 $^{+35}/_{-10}$
Low idle:	min^{-1}	1.020 $^{+50}$
Spec. fuel consumption (full load):	g/kWh	247
Fuel bleeding:		automatic
Tappet clearance - inlet / exhaust:	mm	0.25 (cold)
Injection timing:	°	17 before upper dead centre
Torque of cylinder head studs:	Nm	M 10: 75 - 85 M 8: 20 – 30
Electric fuel pump	bar	0,18
	l/min	0,37
Injection pressure (valve opening pressure):	bar	140
Further data:		see engine operating manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 40
Starter:	V/kW	12 / 1.7
Starting aid:		3 glow plugs, glow time controlled
Lighting:		working headlight H3

TRANSMISSION

Travel motors:		make/type	SOM MOR 15
Travel gears:		make/type	SOM PGR 132 N
Travel speed:	tortoise	km/h	0 to 2.7
	rabbit	km/h	0 to 4.5

EXCAVATOR AND TRAVEL HYDRAULICS

Hydraulic pump:	make	Haldex WP 09 A2
Flow rate:	l/min	33,6 + 19,2
Cut off valve:		pump integrated
Cut off pressure (high idle):	bar	125 $_{-5}$ (service temperature)
Pilot pressure (high idle):	bar	28 (service temperature)
Pressure reducing valve with accu	make	Hydac
Valve bank:	type	Rexroth 9 SX 10
Cross servo control stick:	type	Rexroth 4TH 5
Flow at additional circuit	l/min	at 100 bar ➔ approx. 33 at 140 bar ➔ approx. 30

SLEW DRIVE

Slew motor with gearbox:	make	Nachi PCR-01B-05A
Slew pressure (valves at slew motor):	bar	130 (high idle and service temperature, measured **at pressure port P1**)

PRESSURE AND SETTING VALUES

Main pressure relief valve (high idle):	max. bar	180

LINE RELIEF PRESSURES

- travel left (valves in the motor):	bar	180 / 180
- travel right (valves in the motor):	bar	180 / 180
- slewing (valves at the slew motor):	bar	155 (high idle and service temperature, measured **at pressure port P1**)
- dipperstick:	bar	210 / 210
- bucket:	bar	210 / 210
- boom lift / lower:	bar	230 / 160
- breaker / slew bucket / grab rotation:	bar	----
- articulation:	bar	anti cavitation
- dozer blade:	bar	----

CYCLE TIMES

Boom up / down to the ground:	s	3.0 / 2.9
Dipperstick extend / retract:	s	2.6 / 2.9
Bucket extend / retract:	s	2.1 / 2.4
Slew speed (max.)	min^{-1}	10

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual
Transmission oil:	MIL-L-2105 B or API-GL5, SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. With lithium.

MAINTENANCE PARTS

see operation manual

CAPACITIES

		ltr.	
Fuel:	approx.	30.0	diesel
Engine oil, engine and filter:	approx.	3.4 + 0.2	HD-oil (change)
Hydraulic oil, tank and system:	approx.	35.0	hydraulic oil
Hydraulic oil tank:	approx.	25.0	hydraulic oil (change)
Travel gear:	approx.	0.3	transmission oil, each
Slew gear:	approx.	0.1	transmission oil
Cooling agent:	approx.	4.2	water with anticorrosive and anti-freeze agent

The values stated are approximate.
The level indicator is always decisive.

DIESEL ENGINE

Manufacturer:		Mitsubishi
Type:		S 3L 2 – W 463 KL (Tier 4)
Output acc. to DIN 70020 and ECE-R24:	kW	17.4 at 2,200 min^{-1}
Construction:		3 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm^3	1,318
Torque	Nm	78,4 at 1,800 min^{-1}
High idle:	min^{-1}	2,400 $^{+30}/_{-25}$
Low idle:	min^{-1}	1,160 $^{\pm 25}$
Spec. fuel consumption (full load):	g/kWh	260
Fuel bleeding:		automatic
Tappet clearance - inlet / outlet:	mm	0.25 (cold)
Injection timing:	°	17° (before upper dead centre)
Engine oil pressure:	bar	3.5 $^{\pm 0,5}$ (high idle, service temperature)
Torque of cylinder head studs (in case of repair):	Nm	83 to 92 (M10)
Injection pressure	bar	140 $^{+10}$
Further data:		see engine operator's manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 50
Starter:	V/kW	12 / 1.7
Starting aid:		3 Glow plugs. Glow time: temperature independent preglowing: 6 sec continuous postglowing: 4,5 sec continuous
Lighting:		working headlamp H3, additional headlamp (optional)

TRANSMISSION

Travel motors with travel gear:	make/type	Nachi PHV-3B-35A
Travel speeds:	km/h	0 to 2.7 / 0 to 4.4

EXCAVATOR AND TRAVEL HYDRAULICS

Variable displacement pump:	make	Bosch Rexroth
	type	A 10 VNO 28
Flow rate:	cm^3/rev.	0 – 28 (max. 67 l/min)
Pilot pressure (high idle):	bar	28 (service temperature)
Valve bank:	type	9 SX 10
Cross servo control stick:	type	4 TH5
Travel pedal	type	4 TH5 NR
Control lever boom offset	type	Hydrocontrol HC-RCM
Control lever add.circuit	type	Hydrocontrol HC-RCM

SLEW DRIVE

Slew motor with gearbox:	make		Kayaba MSG-27P-10E-19
Slew pressure (valves at slew motor):	bar	180 $^{+5}$	(∆p between M1 and M2; high idle; service temperature)

PRESSURE AND SETTING VALUES

Pump safety relief valve:	bar	280	(high idle, service temperature)
Main relief valve - LS:	bar	250	(high idle, service temperature)
Stand-by (free flow circuit):	bar	24,2	(high idle, service temperature)
∆p (P minus LS pressure)	bar	17,0	(high idle, service temperature)

LINE RELIEF PRESSURES

- slewing (valves at the slew motor):	bar	180^{+5}	(∆p between M1 and M2, high idle, service temperature)
- dozer:	bar	---	
- travel left:	bar	---	
- travel left:	bar	---	
- bucket:	bar	270 / 270	
- boom lift / lower:	bar	270 / 160	
- boom offset:	bar	anti-cavitation	
- dipper stick:	bar	270 / 270	
- breaker / slew bucket / grab rotation:	bar	210 / 210	

CYCLE TIMES

Boom up / down - to the ground (without damping)	sec.	2.5 / 2.7
Dipper stick cylinder out / in:	sec.	2.2 / 2.5
Bucket cylinder open / close:	sec.	1.8 / 2.1
Slew speed	min^{-1}	10

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual
Transmission oil:	MIL-L-2105 B or API-GL5, SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. With lithium.

MAINTENANCE PARTS see operation manual

CAPACITIES	ltr.		
Fuel:	approx.	40	diesel
Engine oil, engine and filter:	approx	5,7	HD oil (change)
Hydraulic oil, tank and system:	approx.	40	hydraulic oil
Hydraulic oil tank:	approx.	34	hydraulic oil (change)
Travel gear:	approx.	0.6	transmission oil, each
Slew gear:		lubrication by circulation of the hydraulic oil	
Cooling agent:	approx.	4.8	water with anti-corrosive and anti-freeze agent

The values stated are approximate.
The level indicator is always decisive.

DIESEL ENGINE

Manufacturer:		Mitsubishi
Type:		S 4L 2 – Y 263 KL – TIER II
Output acc. to DIN 70020 and ECE-R24:	kW	23.8 at 2,100 min^{-1}
Construction:		4 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm^3	1,758
Torque	Nm	105 at 1,500 min^{-1}
High idle:	min^{-1}	2,300 $^{-50}$
Low idle:	min^{-1}	1,000 $^{+25}/_{-25}$
Spec. fuel consumption (full load):	g/kWh	258
Fuel bleeding:		automatic
Tappet clearance - inlet / outlet:	mm	0.25 (cold)
Compression ratio:	bar	27 - 30
Injection timing:	°	17 (before upper dead centre)
Engine oil pressure:	bar	3.5 $^{\pm 0.5}$ (high idle, service temperature)
Torque of cylinder head studs (in case of repair):	Nm	M 10 → 83 to 92
Injection pressure	bar	140 $^{+5}$
Further data:		see engine operator's manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 50
Starter:	V/kW	12 / 2.0
Starting aid:		Glow plugs, glow time controlled,
Lighting:		working headlamp H3, additional headlamp (optional)

TRANSMISSION

Travel motors with travel gear:		make/type	SOM PGR 402
Travel speed:	shift I	km/h	0 to 2.7
	shift II	km/h	0 to 4.6

EXCAVATOR AND TRAVEL HYDRAULICS

Variable displacement pump:	make	Rexroth
	type	A 10 VO 45 DFLR
Flow rate:	cm^3/min.	0 – 45 (0 - 94.5 l/min)
Pilot pressure (high idle):	bar	28 (service temperature)
Valve bank:	type	Rexroth 9 SX 12
Cross servo control stick:	type	Rexroth 4TH6

SLEW DRIVE

Slew motor with gearbox:	make	Kayaba MSG-27P-10E
Slew pressure (valves at slew motor):	bar	250^{+5} ($\Delta p = 200^{+5}$ between M1 and M2; high idle; service temperature)

PRESSURE AND SETTING VALUES

Main pressure relief valve:	max. bar	250^{+5}	(high idle, service temperature)
Power regulator (G-regulator):	bar	20.0	(high idle, service temperature)
Stand-by regulator:	bar	21.0	(high idle, service temperature)
Δp (LS-Pressure)	bar	15.0	(high idle, service temperature)

LINE RELIEF PRESSURES

- slewing (valves at the slew motor):	bar	215^{+5} / 215^{+5}	(Δp= 185^{+5} between M1 and M2 high idle, service temperature)
- blade:	bar	---	
- travel left:	bar	---	(250 bar shock valves at the travel motor)
- travel left:	bar	---	(250 bar shock valves at the travel motor)
- bucket:	bar	210 / 210	
- boom lift / lower:	bar	280 / 160	
- articulation:	bar	anti-cavitation	
- dipper stick:	bar	280 / 280	
- breaker / slew bucket / grab rotation:	bar	210 / 210	

CYCLE TIMES

Boom up / down - to the ground (without damping)	sec.	2.5 / 2.7
Dipper stick cylinder extend / retract:	sec.	2.5 / 2.4
Bucket cylinder extend / retract:	sec.	2.4 / 2.1

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual
Transmission oil:	MIL-L-2105 B or API-GL5, SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. With lithium.

MAINTENANCE PARTS

see operation manual

CAPACITIES

	ltr.	
Fuel:	approx. 65.0	diesel
Engine oil, engine and filter:	approx. 7.7	+ 0.5 HD oil (change)
Hydraulic oil, tank and system:	approx. 72.0	hydraulic oil
Hydraulic oil tank:	approx. 54.0	hydraulic oil (change)
Travel gear:	approx. 0.6	transmission oil, each
Slew gear:	lubrication by circulation of the hydraulic oil	
Cooling agent:	approx. 5.3	water with anti-corrosive and anti-freeze agent

The values stated are approximate.
The level indicator is always decisive.

DIESEL ENGINE

Manufacturer:		Yanmar
Type:		4TNV88 (Tier2)
Output acc. to DIN 70020 and ECE-R24:	kW	29 at 2,200 min^{-1}
Construction:		4 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm^3	2,190
Torque	Nm	133-144 at 1,500 min^{-1}
High idle:	min^{-1}	2,400 $^{\pm 25}$
Low idle:	min^{-1}	950 $^{+50}$
Spec. fuel consumption (full load):	g/kWh	222
Fuel bleeding:		automatic
Tappet clearance - inlet / outlet:	mm	0.15 – 0,25 (cold)
Compression ratio:	bar	34 - 36
Injection timing:	°	16 (before upper dead centre)
Engine oil pressure:	bar	2.8 – 4.3 (high idle, service temperature)
Engine oil pressure:	bar	0.6 (low idle, service temperature)
Torque of cylinder head studs		M10 x 1.25
(in case of repair):	Nm	40 – 45 Nm (Step 1)
	Nm	85 – 91 Nm (Step 2)
Injection pressure	bar	410
Injection pressure (opening pressure nozzle)	bar	196 $^{+10}$
Further data:		see engine operator's manual

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 40
Starter:	V/kW	12 / 2.3
Starting aid:		Glow flange, glow time controlled,
Lighting:		working headlamp H3, additional headlamp (optional)

TRANSMISSION

Travel motors with travel gear:		make/type	MAG-33V-550F (auto 2-speed)
Travel speed:	shift I	km/h	0 to 2.8
	shift II	km/h	0 to 5.0

EXCAVATOR AND TRAVEL HYDRAULICS

Variable displacement pump:	make	Rexroth
	type	A 10 VO 63 LR3DS
Flow rate:	cm^3/min.	0 – 63 (0 - 136 l/min)
Pilot pressure (high idle):	bar	28 (service temperature)
Valve bank:	type	Rexroth 9 SX 12
Cross servo control stick:	type	Rexroth 4TH5

SLEW DRIVE

Slew motor with gearbox:	make	Kayaba
Slew pressure (valves at slew motor):	bar	205 (Δp between M1 and M2; high idle; service temperature)

PRESSURE AND SETTING VALUES

Main pressure relief valve:	bar	280	(high idle, service temperature)
Pressure cut-off valve:	bar	250	(high idle, service temperature)
Stand-by:	bar	27.0	(high idle, service temperature)
∆p (LS-Pressure)	bar	19.0	(high idle, service temperature)

LINE RELIEF PRESSURES

- slewing (valves at the slew motor):	bar	205	(∆p between M1 and M2 high idle, service temperature)
- blade:	bar	---	
- travel left:	bar	---	(250 bar shock valves at the travel motor)
- travel left:	bar	---	(250 bar shock valves at the travel motor)
- bucket:	bar	280 / 280	
- boom lift / lower:	bar	280 / 160	
- articulation:	bar	anti-cavitation	
- dipper stick:	bar	280 / 280	
- breaker / slew bucket / grab rotation:	bar	210 / 210	

CYCLE TIMES

Boom up / down - to the ground (without damping)	sec.	2.3 / 2.1
Dipper stick cylinder extend / retract:	sec.	2.5 / 2.4
Bucket cylinder extend / retract:	sec.	1.5 / 1.7
Swing	rev.	10 per minute

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual
Transmission oil:	MIL-L-2105 B or API-GL5, SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over 170° C. With lithium.

MAINTENANCE PARTS

see operation manual

CAPACITIES

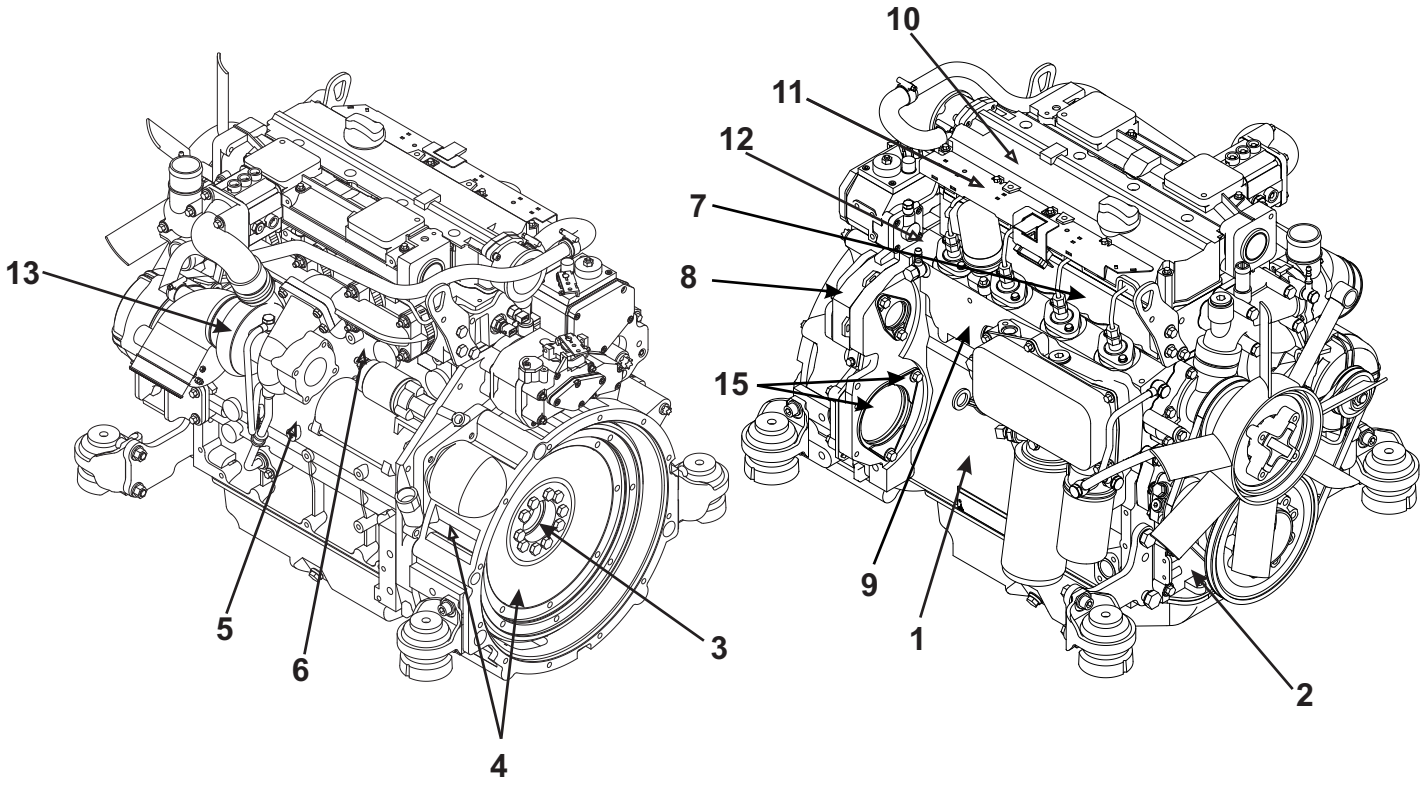
	ltr.	
Fuel:	approx. 65.0	diesel
Engine oil, engine and filter:	approx. 7.4	+ 0.5 HD oil (change)
Hydraulic oil, tank and system:	approx. 90.0	hydraulic oil
Hydraulic oil tank:	approx. 60.0	hydraulic oil (change)
Travel gear:	approx. 0.9	transmission oil, each
Slew gear:	lubrication by circulation of the hydraulic oil	
Cooling agent:	approx. 6.5	water with anti-corrosive and anti-freeze agent

The values stated are approximate.
The level indicator is always decisive.

SUBGROUP LIST

DIESEL ENGINES

TW 85 / TW 110 (HML 32 COM2)/ (HML 42) **TC 125** (HR 42)	**DEUTZ BF 4M 2012 E**	**3.150**
TL 65 / TL 70 (SKL 824) / (SKS 634) **TL 80 / TL100** (SKL 834) / (SKL 844) **TC 75 / TW 70** (HR 32) / (HML 23)	**DEUTZ F4M 2011**	**3.250**
TL 210 / TL 260	**CUMMINS QSB 6.7**	**3.290**
TL 120 / TL 160 (SKL 854) / (SKL 160)	**PERKINS 1104 C**	**3.300**
TL 420 / TL 450	**CUMMINS QSM 11**	**3.350**
SKL 200 / TL 260 (SKL 873) / (SKL 260)	**PERKINS 1106**	**3.450**
TC 15, 16, 20 (HR 1.5, 1.6, 1.7)	**Mitsubishi L3E**	**3.500**
TC 29 / TC 35 (HR 14) / (HR 16)	**Mitsubishi S4L**	**3.600**
TC 48 / TC 60 (HR 18) / (HR 20)	**Mitsubishi S4Q**	**3.800**
TC 50	**Yanmar TNV88**	**3.900**



Deutsch		Français	
Baugruppe	**Benennung**	**Groupe**	**Désignation**
1	Kurbelgehäuse	1	Bloc-moteur
2	Vorderer Deckel / Schmierölpumpe	2	Couvercle avant / pompe à huile de graissage
3	Kurbelwelle	3	Vilebrequin
4	Starterzahnkranz / Schwungrad	4	Couronne de démarreur / Volant
5	Pleuelstange	5	Bielle
6	Kolben	6	Piston
7	Zylinderkopf	7	Culasse
8	Räderkasten	8	Carter de distribution
9	Nockenwelle	9	Arbre à cames
10	Kipphebel	10	Support de culbuteur
11	Einspritzventil	11	Injecteur
12	Regelstange	12	Crémaillère
13	Luftpresser	13	Compresseur d'air
14	Massenausgleichswelle	14	Arbre à masses d'équilibrage
15	Hydraulikpumpenantrieb	15	Entraînement de pompe hydraulique
	Hydraulikpumpe mit Befestigungsflansch		Pompe hydraulique avec bride de fixation

English		Español	
Assembly Group	**Description**	**Grupo de construcción**	**Denominación**
1	Crankcase	1	Bloque motor
2	Front cover / Lube oil pump	2	Tapa delantera / Bomba de aceite lubricante
3	Crankshaft	3	Cigüeñal
4	Starter ring gear / flywheel	4	Corona del volante / Volante
5	Connecting rod	5	Biela
6	Piston	6	Pistón
7	Cylinder head	7	Culata
8	Timing case	8	Cárter de la distribución
9	Camshaft	9	Arbol de levas
10	Rocker arm bracket	10	Soporte de balancines
11	Injector	11	Inyector
12	Control rod	12	Cremallera
13	Air compressor	13	Compresor de aire
14	Mass balancing shaft	14	Eje equilibrador
15	Hydraulic pump drive	15	Accionamiento de bomba hidráulica
	Hydraulic pump with fastening flange		Bomba hidráulica con brida de fijación

Typ Model Type Tipo	**Deutz BF-4/6 M 2012**	**Motor Engine Moteur Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Technische Daten Specification Data Caractéristicos techniques Datos téchnicos**		Blatt Page Feuille Página	**3.150.01**

Ventilspieleinstellschema
Schematic for valve clearance adjustment
Schéma de réglage des soupapes
Esquema para el ajuste del juego de válvulas

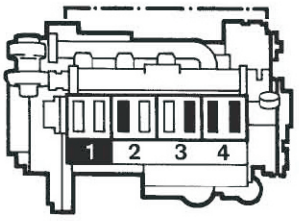
Kurbelwellenstellung **1**

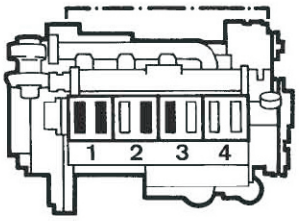
Motor bis zum Erreichen der Ventilüberschneidung am Zyl. Nr. 1 durchdrehen.

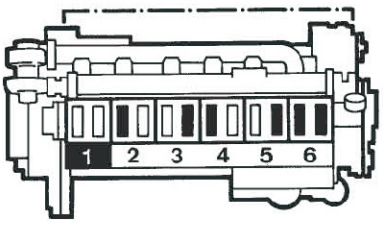
Kurbelwellenstellung **2**

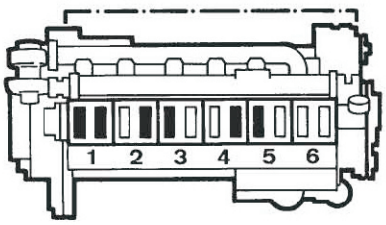
Motor um eine volle Umdrehung (360°) weiterdrehen.

nicht einstellbar — einstellbar









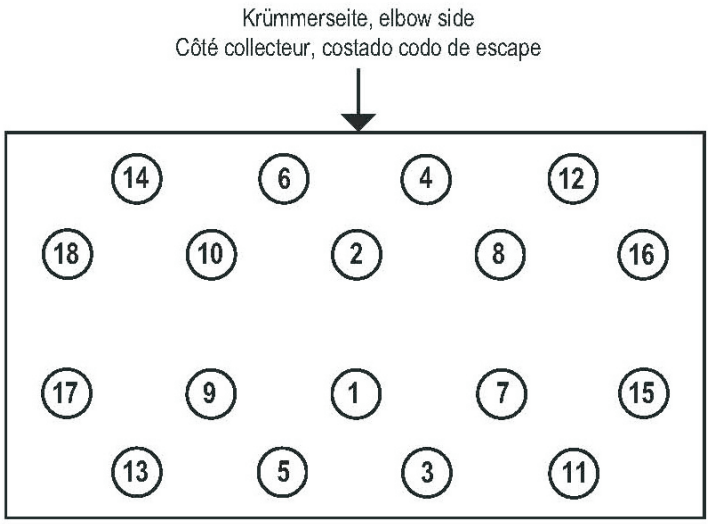
Typ Model Type Tipo	**Deutz** **BF-4/6 M 2012**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinstellschema** **Schematic for valve clearance adjustment** **Schéma de réglage des soupapes** **Esquema para el adjuste del juego de válvulas**		Blatt Page Feuille Página	**3.150.02**

English	Français	Español
Crankshaft position 1	**Position de vilebrequin** 1	**Posición del cigüeñal** 1
Turn engine until valves of cylinder No. 1 overlap.	Virer le moteur jusqu'à ce que les soupapes du cyl. n° 1 soient en balance.	Girar el cigüeñal hasta el cruce de las válvulas en el cilindro No. 1.
Not ready for adjustment.	non réglable	no ajustable
Crankshaft position 2:	**Position de vilebrequin** 2	**Posición del cigüeñal** 2
Turn engine further by one complete revolution (360°).	Virer encore le moteur d'un tour complet (360°).	Continuar girando el cigüeñal una vuelta entera (360°)
Ready for adjustment.	réglable	ajustable

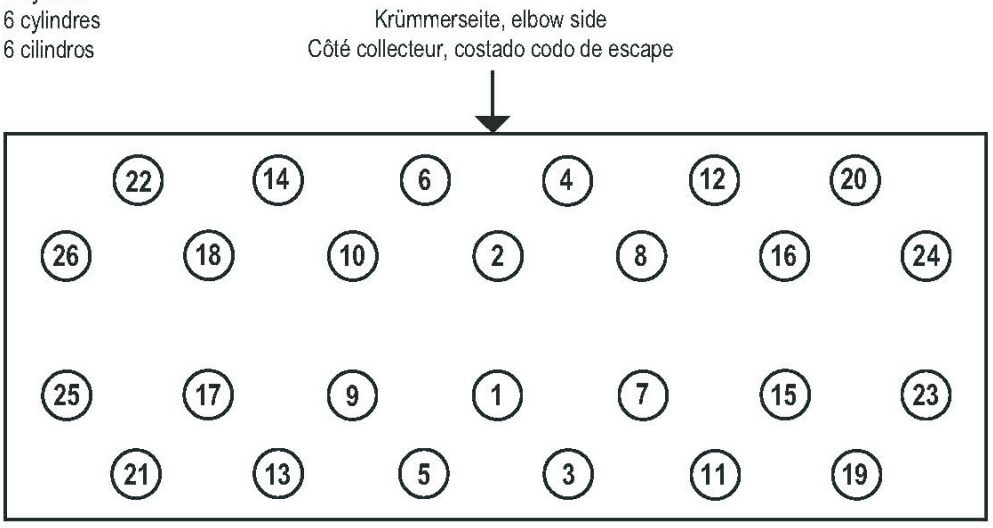
Typ Model Type Tipo	**Deutz** **BF-4/6 M 2012**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinstellschema** **Schematic for valve clearance adjustment** **Schéma de réglage des soupapes** **Esquema para el adjuste del juego de válvulas**		Blatt Page Feuille Página	**3.150.03**

Reihenfolge beim Anziehen der Zylinderkopfschrauben
Tightening order for cylinder head bolts
Ordre de serrage des boulons de culasse
Orden a seguir para el apriete de los tornillos de culata

4-Zylinder
4-cylinder
4 cylindres
4 cilindros



6-Zylinder
6-cylinder
6 cylindres
6 cilindros



Typ Model Type Tipo	**Deutz** **BF-4/6 M 2012**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Reihenfolge bei Anziehen der Zylinderkopfschraube** **Tightening order cylinder head bolt** **Ordre de serrage des boulons de culasse** **Orden a seguir para el apriete de los tornillos de culata**		Blatt Page Feuille Página	**3.150.04**

Technische Daten
Specification data
Caractéristiques techniques
Datos técnicos

Werkstatthandbuch BFM 2012

Deutsch	English	Français	Español
Motorgewicht nach DIN 70020 - A ca. kg	Engine weight acc. to DIN 70020 - A approx. kg	Poids du moteur selon DIN 70020 - A approx. kg	Peso del motor según DIN 70020-A aprox. kg
Gesamthubvolumen cm^3	Engine swept volume cm^3	Cylindrée totale cm^3	Cilindrada total cm^3
Bohrung mm	Bore mm	Alésage mm	Calibre mm
Hub mm	Stroke mm	Course mm	Carrera mm
Drehrichtung	Direction of rotation	Sens de rotation	Sentido de rotación
Nenndrehzahl max. 1/min	Rated speed rpm	Régime nominal maxi tr/mn	Régimen nominal máx. r/min
niedrigste Leerlaufdrehzahl 1/min	Minimum idling speed rpm	Ralenti extrême tr/mn	Régimen mín. en vacío r/min
Arbeitsweise	Working cycle	Principe de fonction-nement	Ciclo de trabajo

BF4M 2012	BF4M 2012 C		BF6M 2012 C
ohne Kühlsystem w/o cooling system sans système de refroidissement sin sistema de refrigeración	ohne Kühlsystem w/o cooling system sans système de refroidissement sin sistema de refrigeración		ohne Kühlsystem w/o cooling system sans système de refroidissement sin sistema de refrigeración
380	380		495
4 040			6 060
101			
126			
Auf Schwungrad gesehen links When facing flywheel counter-clockwise Vu sur le volant, à gauche Mirándose sobre el volante, a izquierdas			
2500			
800			
Viertakt - Diesel Four-stroke diesel Diesel à 4 temps Diesel de 4 tiempos			

Technische Daten
Specification data
Caractéristiques techniques
Datos técnicos

Werkstatthandbuch BFM 2012

Deutsch	English	Français	Español
Verbrennungs-verfahren	Combustion principle	Principe de combustion	Sistema de combustión
Verdichtungs-verhältnis	Compression ratio	Taux de compression	Relación de compresión
Kompressionsdruck bar	Compression pressure bar	Compression bars	Presión de compresión bar
Zündfolge	Firing order	Ordre d'allumage	Orden de encendido
Abmessungen des Motors mit Anschlußgehäuse (normal)	Dimensions of engine with standard adapter housing	Dimensions du moteur avec carter d'adaption standard	Dimensiones del motor con cárter de adaptación (normal)
größte Länge mm	Max. length mm	Longueur HT mm	Longitud máx. mm
größte Breite mm	Max. width mm	Largeur HT mm	Ancho máx. mm
größte Höhe mm	Max. height mm	Hauteur HT mm	Altura máx. mm

Werkstatthandbuch BFM 2012

BF4M 2012	BF4M 2012 C		BF6M 2012 C
Direkteinspritzung Direct injection Injection directe Inyección directa			
19			
30 - 38			
1 - 3 - 4 - 2		1 - 5 - 3 - 6 - 2 - 4	
910	921	1038	
643		628	
771	833	908	

Technische Daten
Specification data
Caractéristiques techniques
Datos técnicos

Werkstatthandbuch BFM 2012

Deutsch	English	Français	Español
Steuerzeiten ohne Stößel- und Ventilspiel	Valve timing without tappet and valve clearance	Calage de la distribution sans jeu de poussoirs et de soupapes	Cotas de reglaje sin juegos de válvulas y de empujadores
Einlass öffnet vor OT Grad	Inlet opens before TDC degrees	Admission ouvre avant PMH degrés	Admisión abre ante PMS grados
Einlass schließt nach UT Grad	Inlet closes after BDC degrees	Admission ferme après PMB degrés	Admisión cierra tras PMI grados
Auslass öffnet vor UT Grad	Exhaust opens before BDC degrees	Echappement ouvre avant PMB degrés	Escape abre ante PMI grados
Auslass schließt nach OT Grad	Exhaust closes after TDC degrees	Echappement ferme après PMH degrés	Escape cierra tras PMS grados
Absteuerventil bar	Pressurestat bar	Clapet régulateur final bars	Válvula reguladora final bar
Schmieröldruck in niedrigem Leerlauf Temperatur ca. 120 °C Öl SAE 15W/40 Minimum bar	Lube oil pressure at low idling Temperature approx. 120 °C oil SAE 15W/40 min. bar	Pression d'huile au ralenti mini température environ 120 °C huile SAE 15W/40 mini bar	Presión de aceite a marcha lenta en vacío, temperatura aprox. 120 °C aceite SAE 15W/40 mín. bar

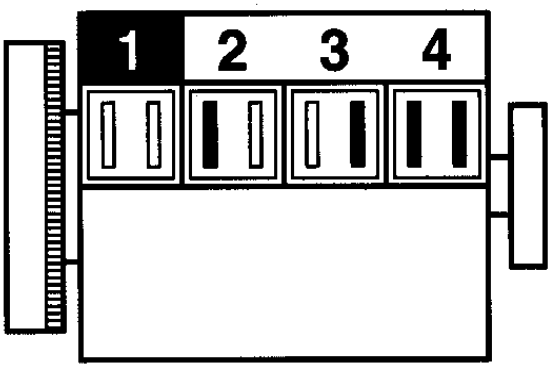
BF4M 2012	BF4M 2012 C		BF6M 2012 C
		46	
		56	
		96	
		50	
		4 ± 0,4	
		0,8	

Specification data	**3.250.01**
Schematic for valve clearance adjustment	**3.250.02**
Key to Symbols	**3.250.03**
Engine DEUTZ F-4M 2011 - overview	**3.250.04**
Valve clearance checking and adjusting	**3.250.05-3.250.06**
Compression pressure checking and adjusting	**3.250.07-3.250.08**
Injector checking and adjusting	**3.250.09-3.250.11**
Injector, repair of components	**3.250.12-3.250.14**

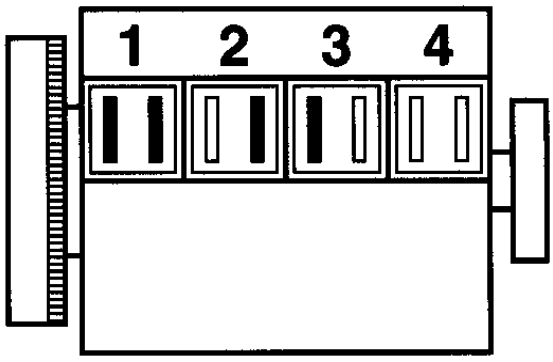
Deutsch	*English*	*Français*	*Español*
Technische Daten	**Specification data**	**Caractéristiques techniques**	**Datos técnicos**
F – 4M 2011 ohne Kühlsystem	**F – 4M 2011** Without cooling system	**F – 4M 2011** sans système de refroid	**F – 4M 2011** sin sistema de refrige
Motorgewicht ohne Starter, mit Generator ca. 248 kg	**Engine weight** without starter with generator approx. 248 kg	**Poids du moteur** sans démarreur avec génératrice approx. 248 kg	**Peso del motor** sin arrancador, con generador aprox. 248 kg
Gesamthubvolumen 3108 cm^3	**Engine swept volume** 3108 cm^3	**Cylindrée totale** 3108 cm^3	**Cilindradea total** 3108 cm^3
Bohrung 94mm	**Bore** 94mm	**Alésage** 94mm	**Calibre** 94mm
Hub 112mm	**Stroke** 112mm	**Course** 112mm	**Carrera** 112mm
Drehrichtung: Auf Schwungrad gesehen links	**Direction of rotation:** When facing flywheel counter-clockwise	**Sens de rotation:** Vu sur volant à gauche	**Sentido de giro:** Visto sobre el volante a izquierdas
Nenndrehzahl: max. 2800/min	**Rated speed:** max. 2800 rpm	**Régime nominal:** max.2800 tr/mn	**Régimen nominal:** máx. 2800 r/min
Niedrigste Leerlauf-drehzahl: 900/min	**Minimum idle speed:** 900 rpm	**Ralenti extrême:** 900 tr/mn	**Régimen min. en vacío:** 900 r/min
Arbeitsweise: Viertakt - Diesel	**Working cycle:** four-stroke diesel	**Principe de fonctionnement:** Diesel 4 temps	**Sistema de trabajo:** Diesel a 4 tiempos
Verbrennungsverfahren: Direkteinspritzung	**Combustion system:** Direct injection	**Principe de combustion:** Injection directe	**Sistema de compustión:** Inyección directa
Verdichtungsverhältnis: 19	**Compression ratio:** 19	**Taux de compression:** 19	**Relación de compresión:**19
Kompressionsdruck: 25-30 bar	**Compression pressure:** 25-30 bar	**Compression:** 25-30 bars	**Pressión de compresión:** 25-30 bar
Zündfolge: 1 – 3 – 4 - 2	**Firing order:** 1 – 3 – 4 - 2	**Ordre d'allumage:** 1 – 3 – 4 - 2	**Orden de encendido:** 1 – 3 – 4 - 2

Deutsch	*English*	*Français*	*Español*
Technische Daten	**Specification data**	**Caractéristiques techniques**	**Datos técnicos**
F – 4M 2011 ohne Kühlsystem	**F – 4M 2011** Without cooling system	**F – 4M 2011** sans système de refroid	**F – 4M 2011** sin sistema de refrige
Steuerzeiten ohne Stößel- und Ventilspiel	**Valve timing without valve clearance**	**Calage distribution sans jeux des poussoirs st soupapes**	**Cotas de reglaje sin juegos de válvula y de empujadores**
Einlaß öffnet 45 Grad vor OT	**Inlet opens** 45 degrees before TDC	**Admission ouvre** 45 degrés avant PMH	**Admisión abre** 45 drados a. PMS
Einlaß schließt 65 Grad nach UT	**Inlet closes** 65 degrees after BDC	**Admission ferme** 65 degrés après PMB	**Admisión cierra** 65 grados t. PMI
Auslaß öffnet 76 Grad vor UT	**Exhaust opens** 76 degrees before BDC	**Échappement ouvre** 76 degrés avant PMB	**Escape apre** 76 grados a. PMI
Auslaß schließt 44 Grad nach OT	**Exhaust closes** 44 degrees after TDC	**Échappement ferme** 44 degrés après PMH	**Escape cierra** 44 grados t. PMS
Mindestöldruck bei warmem Motor, Öltemperatur 110 °C Öl SAE 20/20 bei:	**Minimum oil pressure during warm motor, Oil temperature 110 °C Oil SAE 20/20 during:**	**Pression d'huile minimum sur moteur chaud, température d'huile 110 °C, huile SAE 20/20, à :**	**Presión min. de aceite a motor caliente, temperatura del aceite 110 °C, SAE 20/20, a:**
900/min (niederer Leerlauf) 1,4 bar	900 rpm (lower no-load) 1,4 bar	900 tr/mn (ralenti minimum)1,4 bars	900 r/min (régimen bajo en vacìo) 1,4 bar
1800/ min 2,2 bar	1800 rpm 2,2 bar	1800 tr/mn 2,2 bars	1800 r/min 2,2 bar
max. 2800/min 3,0 bar	max. 2800 rpm 3,0 bar	2800 tr/mn maxi 3,0 bars	máx. 2800 r/min 3,0 bar
Angaben für Motoren ohne Motoröl-Heizung	*Data related to motors without motor oil heating*	*Indications pour moteurs sans chauffage par huile moteur*	*Datos para motores sin calefacción por el aceite del motor*
Absteuerventil 7 bar	**Pressurestat** 7 bar	**Clapet de décharge** 7bar	**Válvula reguladora final** 7 bar

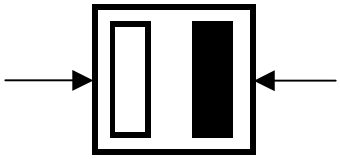
Deutsch	*English*	*Français*	*Español*
Ventilspieleinstell-schema	**Schematic for valve clearance adjustment**	**Schema de reglage des soupapes**	**Esquema para el ajuste de holgura de v81vulas**
Kurbelwellen-stellung **1** Motor bis zum Erreichen der Ventilüberschneidung am Zyl. Nr. 1 durchdrehen	**Crankshaft position** **1** Turn engine until valves of cylinder No.1 overlap	**Position de l'arbre à cames** **1** Virer le moteur jusqu'au chevau-chement des soupapes au cylindre 1	**Posición dei cigüeñal** **1** Gírese el motor, hasta que las válvulas del cilindro N° 1 coincidan en su posición momentánea



Kurbelwellen-stellung **2** Motor um eine volle Umdrehung (360°) weiterdrehen	**Crankshatt position** **2** Turn engine further by one complete revolution (360°).	**Position de l'arbre à cames** **2** Taurner le mateur d'un taur complet (360°)	**Posición dei cigüeñal** **2** Continuese girando el motor por una rotación completa (360°)



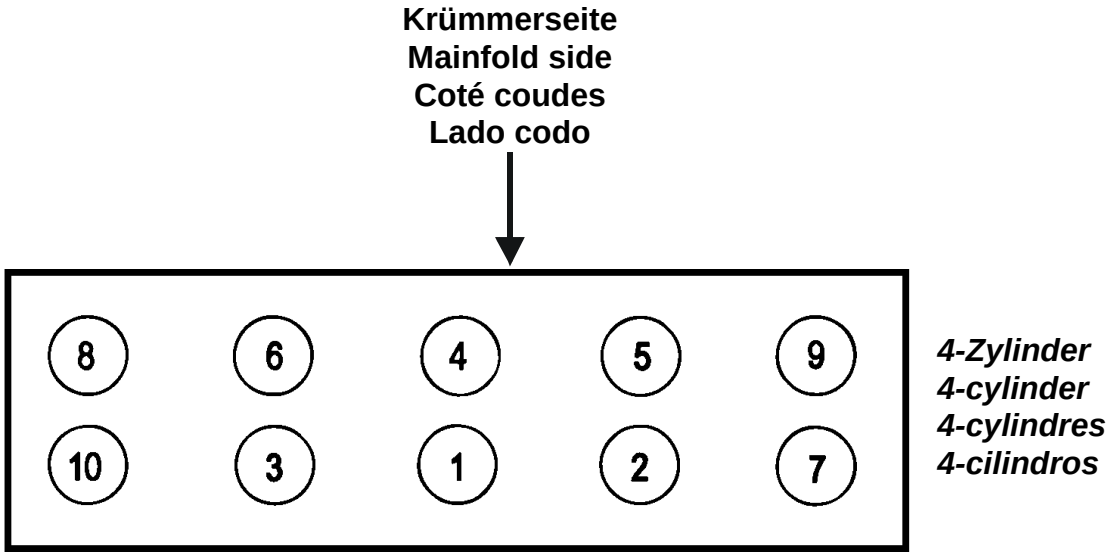
nicht einstellbar
not ready for adjustment
non réglable
no ajustable



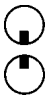
einstellbar
ready for adjustment
réglable
ajustable

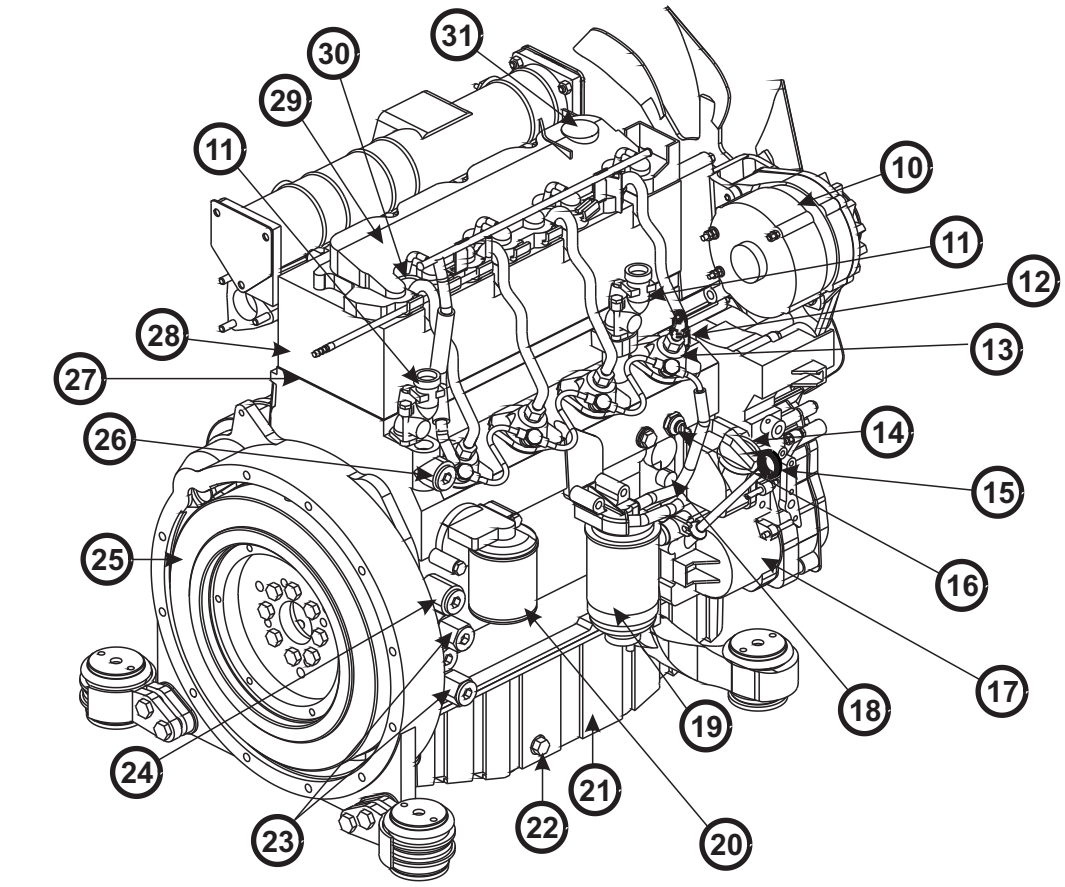
Typ Model Type Tipo	**DEUTZ** **F - 4M 2011**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Technische Daten** **Specification data** **Caractéristiques techniques** **Datos técnicos**		Blatt Page Feuille Página	**3.250.02**

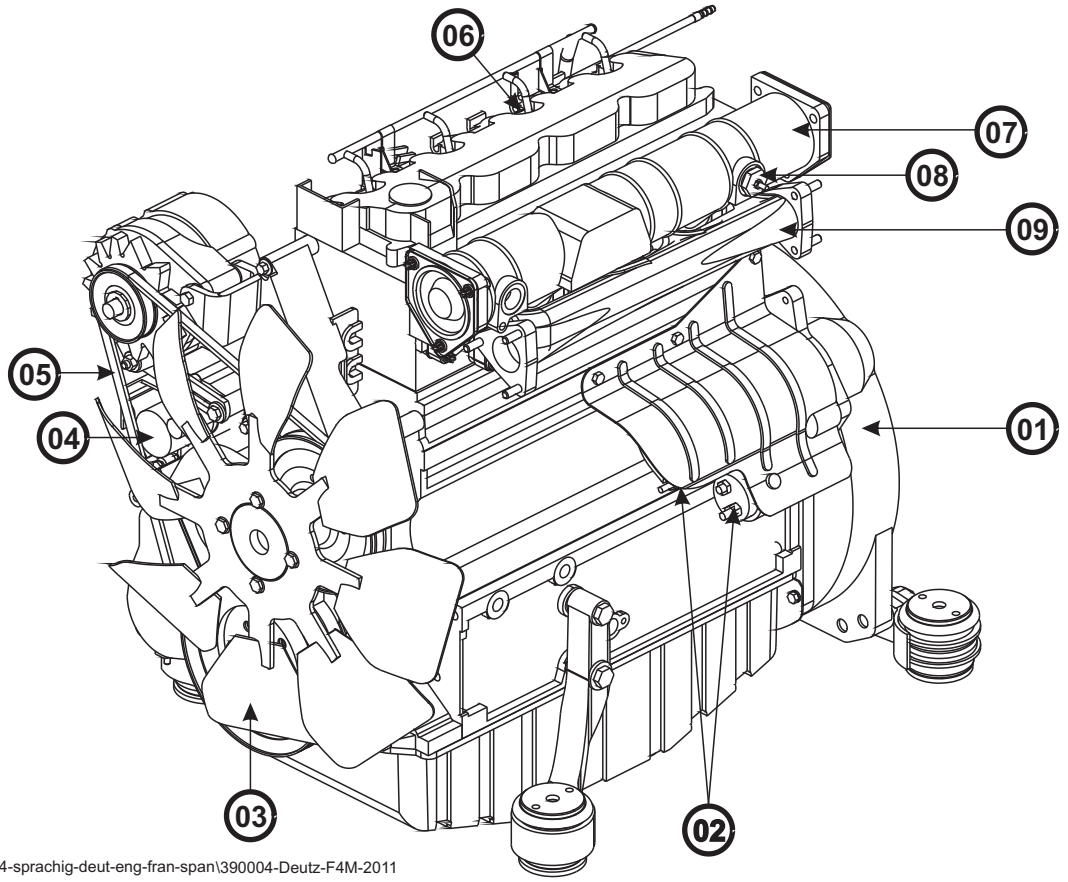
Reihenfolge beim Anziehen der Zylinderkopfschrauben
Tightening order for cylinder head bolts
Ordre à respecter lors du serrage d'approche et définitif des vis de cul.
Sucesión de los trabajos al apretar los tornillos de culata



	Deutsch	*English*	*Français*	*Español*
	Bildzeichen-erklärung	**Key to Symbols**	**Explication des symboles**	**Leyenda de símbolos**
	**Zerlegen** von Baugruppen	**Disassembly** of assembly groups	**Déassemblage** d'ensemble constructifs	**Desarmer** grupos de constucción
	**Zusammenbauen** zu einer Baugruppe	**Reassembly** to form assembly group	**Assemblage** d'un ensemble constructif	**Ensamblar** un grupo de construcción
	**Abbauen – Ausbauen** behindernder Teile	**Remove** obstructing parts	**Démontage – Dépose** de pièces entravant l'accès	**Desmontar** elementos estorbantes
	**Einbauen – Anbauen** Teile, die beim Ab-/Ausbauen hinderten	**Reinstall – Remount** parts which had obstructed disassembly	**Remontage – repose** de pièces qui entravaient la dépose	**Remontar** elementos que habían estorbado en el desmontaje
	**Achtung**, **wichtiger Hinweis**	**Attention! Important notice!**	**Attention, remarque importante**	**Atención: Indicación importante**
	**Prüfen – Einstellen** z.B. Drehmomente, Maße, Drücke usw.	**Check – Adjust** e. g. torque dimensions, pressures, etc.	**Contrôler – régler** p. ex. couples, cotes, pressions etc.	**Verificar – ajustar** p. ej. pares motor, medidas, presiones, etc.
	**Spezialwerkzeug**	**Special tool**	**Outillage spécial**	**Herramienta especial**
	**Einbaurichtung beachten**	**Note direction of installation**	**Respecter le sens de montage**	**Dirección de montaje**
	**Kontrollieren – Prüfen** Sichtprüfung	**Visual inspection**	**Contrôle – Vérifier** contrôle visuel	**Inspección visual**
	**Bedingt wiederverwendbar** Bei Bedarf auswechseln	**Possibly still serviceable** renew if necessary	**Réutilisation conditionnelle** Remplacer le cas échéant	**Reutilizable en determinadas condiciones** Sustitur, si es necesario
	**Beim Zusammenbauen immer erneuern**	**Renew at each reassembly**	**Toujours remplacer au remontage**	**Renovar en cada montaje**
	**Entsichern – Sichern** z. B. Splint, Sicherungsbleche usw.	**Unlock – Lock** e. g. split pin, locking plate, etc.	**Débloquer – Arrêter** p. ex. goupille, tôle d'arrêt etc.	**Quitar – colocar elementos de seguridad** p. ej. pasador de aletas, chapa de seguridad, etc.
	**Sichern – Kleben** z. B. Dichtmittel flüssig	**Lock – Adhere** e. g. with liquid sealant	**Freiner – Coller** p. ex. produit d'étanchéité liquide	**Frenar – pegar** p. ej. utilizando pasta sellante

	Deutsch	*English*	*Français*	*Español*
	Bildzeichen-erklärung	**Key to Symbols**	**Explication des symboles**	**Leyenda de símbolos**
	**Personenschäden verhüten** Hinweis auf Gefahrenstelle	**Guard against personal injury** Indication of hazard	**Prévention de dommages corporels** Signalisation de danger	**Prevención de daños personales** Aviso a puntos de peligro
	**Materialschaden verhüten** Teilbeschädigung	**Guard against material damage** Damage to parts	**Prévention de dommages matériels** Endommagement de pièces	**Prevención de daños materiales** Daños en partes o piezas
	**Unterbauen – Abstützen - Abfangen**	**Prop up - Support - Hold**	**Supporter – Étayer**	**colocar sobre caballeta – apoyar – sostener – retener**
	**Einölen**	**Oil**	**Huiler**	**Aceitar**
	**Einfetten**	**Grease**	**Graisser**	**Lubricar con grasa**
	**Markieren** Vor dem Zerlegen, beachten beim Zusammenbauen	**Mark** before disassembly, observe marks when reassembly	**Repérer** avant désassemble, respecteur au réassemblage	**Marcar** antes de desarmar, observar la marcas al remontar
	**Wuchten** Ausgleichen von Unwuchten	**Balance** Eliminate any imbalance	**Equilibrer** éliminer le balourds	**Equilibar** Eliminar desequilibrios
	**Einfüllen – Auffüllen – Nachfüllen** z. B. Öl, Kühlwasser usw.	**Filling – Topping up – Refilling** e. g. oil, cooling water, etc.	**Remplir – Faire l'appoint** p. ex. huile, eau de refroidissement	**Llenar – reponer - rellenar** p. ej. aceite, agua de refrigeración, etc.
	**Ablassen** z. B. Öl, Kühlwasser usw.	**Drain off** e. g. oil, cooling water, etc.	**Vidange** p. ex. huile, eau de refroidissement	**Evacuar** p. ej. aceite, agua de refrigeración, etc.
	**Lösen** z. B. Lockern einer Spanneinrichtung	**Loosen – Release** e. g. loosening a clamping device	**Desserrer** p. ex. desserrer un dispositif de tension	**Soltar** p. ej. aflojar un dispositivo de sujeción
	**Spannen** z. B. Anziehen einer Spanneinrichtung	**Tighten – Clamp** e. g. tightening a clamping device	**Serrer** p. ex. serrer un dispositif de tension	**Fijar** p. ej. apretar un dispositivo de sujeción
	**Entlüften**	**Vent**	**Purge d'air**	**Purgar de aire**
	**Spanabhebende Bearbeitung**	**machining process**	**Usinage par enlèvement de copeaux**	**Mecanizado con arranque de virutas**

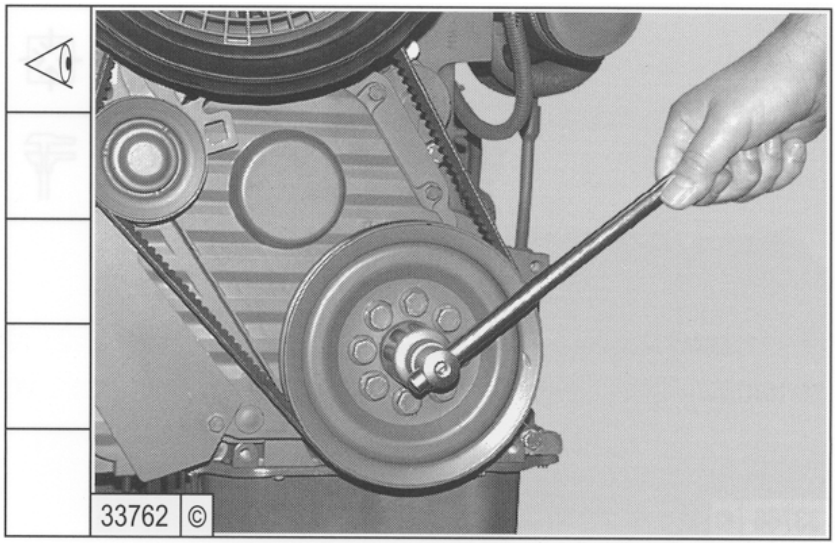


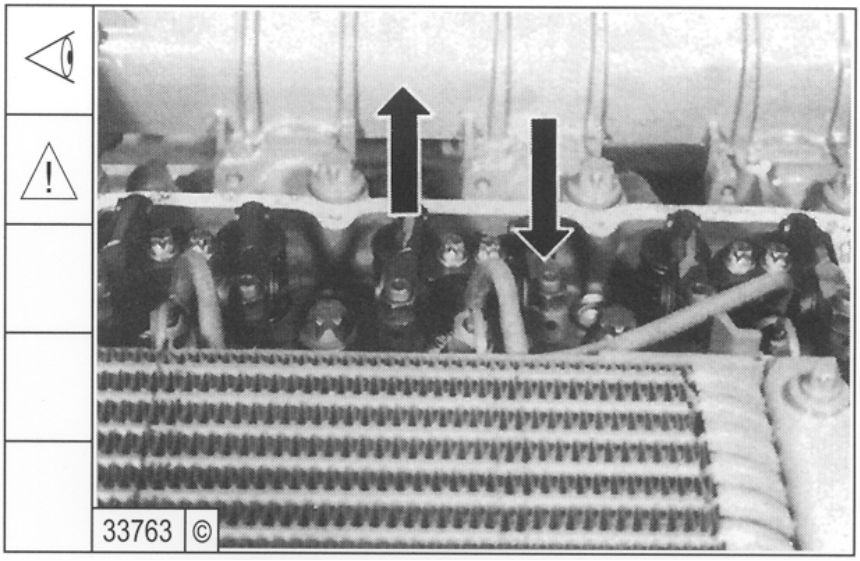


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Typ Model Type Tipo	**Deutz** **F - 4M 2011**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**06.2002**
Benennung Description Dénomination Denominación	**Technische Daten** **Specification data** **Caractéristiques techniques** **Datos técnicos**		Blatt Page Feuille Página	**3.250.04**

Pos. Item Rep. No.	*Deutsch*	*English*	*Français*	*Español*
01	Motor *DEUTZ F - 4M 2011*	Engine *DEUTZ F - 4M 2011*	Moteur *DEUTZ F - 4M 2011*	Motor *DEUTZ F - 4M 2011*
02	Starter	Starter	Démarreur	Arrancador
03	Lüfter	Fan	Ventilateur	Ventilador
04	Motorabstellung	Shutdown device	Arrêt du moteur	Parada del motor
05	Keilriemen	V-belt	Courroie trapézoïdale	Correa trapezoidal
06	Einspritzventile	Injectors	Injecteurs	Inyectóres
07	Luftansaugrohr	Air intake manifold	Collecteur d'admis. d'air	Colector de admisión
08	Glühwendelkerze	Glow plug	Bougie de réchauffage	Bujía de incandescente
09	Abgassammelrohr	Exhaust manifold	Collecteur d'échappement	Colector de escape
10	Generator	Alternator	Alternateur	Alternador
11	Ölkühleranschlüsse	Oil cooler connections	Raccords de refroidisseur d'huile	Racores para el refrigeradore de aceite
12	Öletmperaturgeber	Oil temperature regulator	Transmetteur de température d'huile	Transmisor de temperatura de aceite
13	Einspritzpumpen	Injection pumps	Pompes d'injection	Bombas de inyección
14	Verschlussdeckel für Öleinfüllung	Closure cover for oil filling	Bouchon de remplissage d'huile	Tapa en la boca de llendo de aceite
15	Ölmessstab	Oil dipstick	Jauge d'huile	Varilla medidora de nivel de aceite
16	Öldruckschalter	Oil pressure switch	Manocontact d'huile	Interruptor de presión de aceite
17	Schmierölpumpe	Lube oil pump	Pompe à huile	Bomba de aceite lubricante
18	Kraftstoffförderpumpe	Fuel feed pump	Pompe d'alimentation en combustible	Bomba de alimentación de combustible
19	Kraftstofffilter	Fuel filter	Filtre à combustible	Filtro de combustible
20	Ölfilter	Oil filter	Filtre à huile	Filtro de aceite
21	Ölwanne	Oil pan	Carter d'huile	Cárter de aceite
22	Ölablasschraube	Oil drain plug	Bouchon de vidange d'huile	Tornillo de salida de aceite provisto
23	Öldruckventil mit Heizungsanschluß	Oil pressure control valve with heater connection	Soupape de régulation de pression d'huile avec branchem. de chauffage	Válvula reguladora de presión de aceite con conexión para calefacción
24	Öldruckventil	Oil pressure control valve	Soupape de régulation de pression d'huile	Válvula reguladora de presión de aceite
25	Starterkranz, Schwungrad	Starter ring gear, flywheel	Couronne de démarrage, volant	Corona del volante, volante
26	Thermostat	Thermostat	Thermostat	Termostato
27	Zylinderkopfdichtung	Cylinder head gasket	Joint de culasse	Juanta de culata
28	Zylinderkopf	Cylinder head	Culasse	Culata
29	Zylinderkopfhaube	Cylinder head cover	Cache-culbuteurs	Tapa de culata
30	Einspritzventile	Injectors	Injecteurs	Inyectores
31	Entlüftungsventil	Vent valve	Soupape de purge d'air	Válvula de ventilacón





Typ Model Type Tipo	**DEUTZ** **F - 4M 2011**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**06.2002**
Benennung Description Dénomination Denominación	**Ventilspiel - prüfen und einstellen** **Valve clearance - checking and adjusting** **Jeu des soupapes - contrôle et réglage** **Juego de válvulas - verificación y ajustes**		Blatt Page Feuille Página	**3.250.05**

Deutsch

Ventilspiel prüfen und einstellen

Die Standard-Ventilspieleinstellung ist möglich:

Am kalten- oder am warmen Motor nach einer Abkühlzeit von mindestens **0,5 h.**
Öltemperatur ≤ **80 °C**

Hinweis:
Bei jedem Zylinderkopf-Dichtungswechsel ist das Ventilspiel um 0,1 mm zu erhöhen.
*Nach **1000 Bh** ist das Standard-Ventilspiel einzustellen.*

Zylinderkopfhaube ist abgebaut

1. Motor durchdrehen bis zum Erreichen der Ventilüberschneidung, Zyl. Nr. 1.

Ventilspieleinstellschema siehe Technische Daten

Hinweis:
Ventilüberschneidung bedeutet:
Auslassventil ist noch nicht geschlossen, Einlassventil beginnt zu öffnen. Dabei sind beide Stoßstangen nicht drehbar.

English

Valve clearance checking and adjusting

The standard valve clearance can be adjusted:

with engine cold or warm after cooling down for at least **0.5 h**.
Oil temperature ≤ 80°C.

Note:
The valve clearance is to be increased by 0.1 mm at every cylinder head gasket renewal.
*After **1000 Bh** , the standard valve clearance is to be adjusted.*

Cylinder head cover has been removed.

1. Turn engine until valves of cylinder No.1 overlap.

For valve clearance adjustment schematic see Specification Data.

Note:
Valves overlapping means:
Exhaust valve about to close.
Inlet valve about to open.
Neither pushrod can be turned in this position.

Français

Jeu des soupapes contrôle et réglage

Un réglage standard du jeu des soupapes peut se faire:

sur moteur froid ou chaud après une durée de refroidissement d'au moins **0,5 h**.
Température d'huile **≤ 80 °C.**

Nota:
Après chaque remplacement de joint de culasse, le jeu des soupapes est a augmenter de 0, 1 mm.
Après 1000 h de marche, régler le jeu de soupape standard.

La cache-culbuteurs est déposé

1. Virer le moteur jusqu'à ce que les soupapes du cylindre n° 1 soient en bascule.

Schéma de réglage du jeu des soupapes, voir Caractéristiques techniques.

***Nota**:*
Soupapes en bascule signifie: soupape d'échappement pas encore fermée, soupape d'admission commence à s'ouvrir. Les deux tiges de culbuteur ne se laissent pas tourner alors.

Español

Juego de válvulas verificación y ajustes

El juego estándar de válvulas se puede ajustar:

A motor frio o a motor caliente tras un período de enfriamiento de, por lo menos,
media hora **(0,5 h)**.
Temperatura dei aceite:
≤ 80 °C

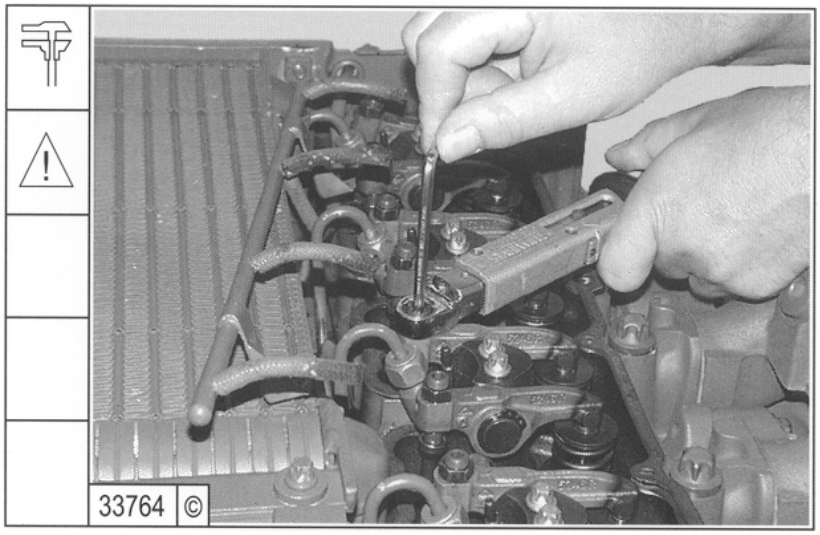
Nota:
Cada vez que se cambia la junta de culata, es necesario aumentar el juego de válvulas en 0,1 mm.
Tras **1000 horas** de funcionamiento hay que ajustar el juego estándar de válvulas.

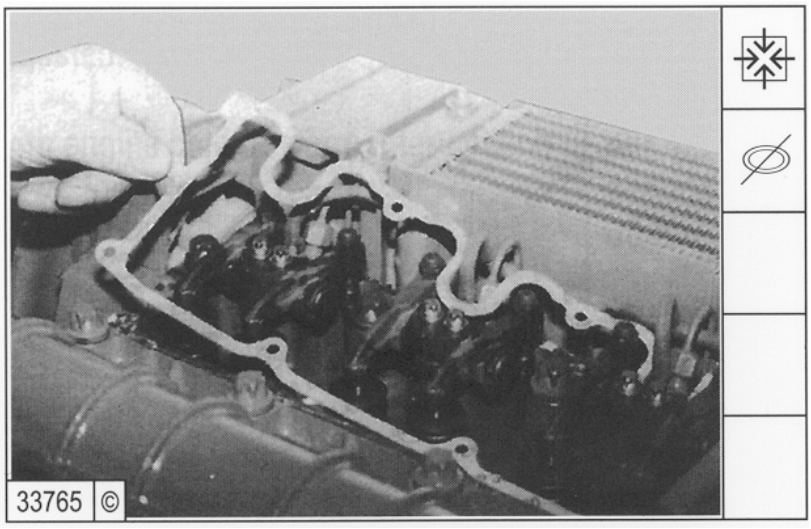
La tapa de culata está desmontada.

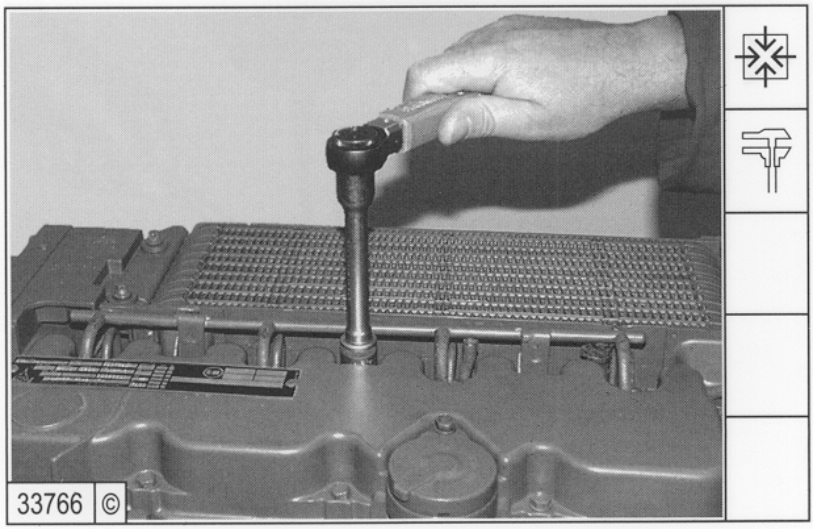
1. Girar el cigüeñal hasta que se crucen las válvulas en el cilindro No.1.

Para el esquema de ajuste del juego de válvulas, ver Datos técnicos.

Nota:
Por cruce de válvulas se entiende: La válvula de escape aún no está cerrada y la de admisión empieza a abrirse, sin que se puedan girar las dos varillas de empuje en esta posición.

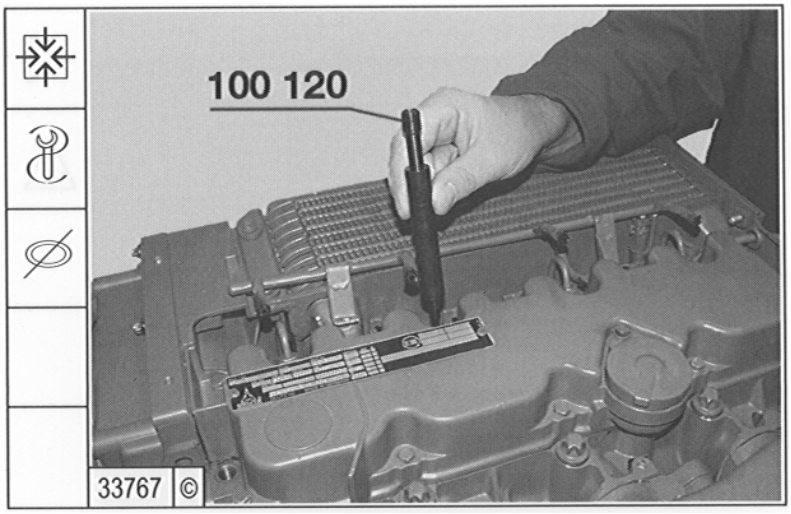


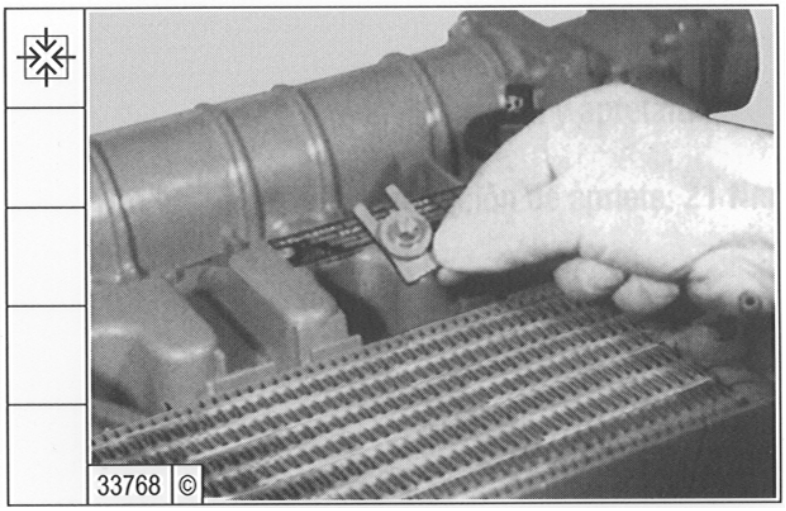


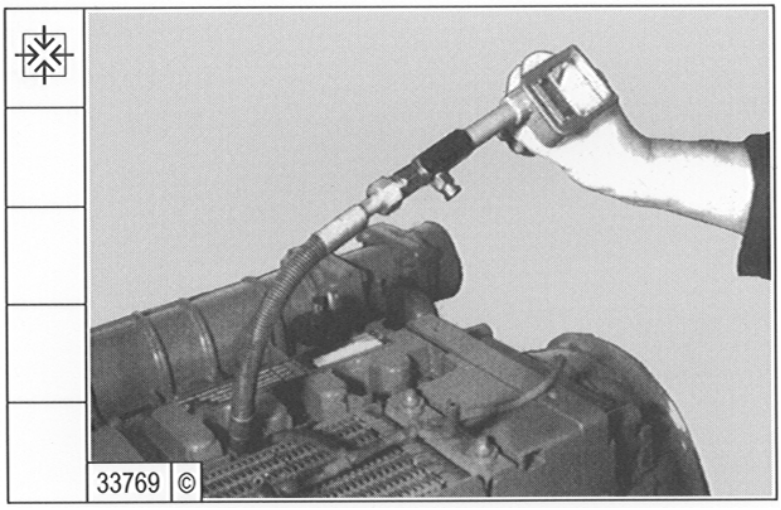


Typ Model Type Tipo	**DEUTZ** **F - 4M 2011**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**06.2002**
Benennung Description Dénomination Denominación	**Ventilspiel - prüfen und einstellen** **Valve clearance - checking and adjusting** **Jeu des soupapes - contrôle et réglage** **Juego de válvulas - verificación y ajustes**		Blatt Page Feuille Página	**3.250.06**

Deutsch	*English*	*Français*	*Español*
Ventilspiel prüfen und einstellen	**Valve clearance checking and adjusting**	**Jeu des soupapes contrôle et réglage**	**Juego de válvulas verificación y ajustes**
2. Ventilspieleinstellung am entsprechenden Zylinder mit Fühlerlehrenblatt einstellen	2. Adjust valve clearance on respective cylinder with feeler gauge.	2. Régler le jeu des soupapes du cylindre correspondant avec une jauge d'épaisseur.	2. Ajustar el juego de válvula en el cilindro correspondiente mediante la galga de espesores.
☞ ***Hinweis:*** *Ventilspiel Einlass:* ***0,3 mm*** *Ventilspiel Außlaß:* ***0,5 mm***	☞ ***Note:*** *Inlet valve clearance:* ***0.3 mm*** *Exhaust valve clearance:* ***0.5 mm***	☞ ***Nota:*** *Jeu de soupape Admission* ***0,3 mm*** *Jeu de soupape Échappement* ***0,5 mm***	☞ ***Nota:*** *Juego de válvula admisión:* ***0,3 mm*** *Juego de válvula escape:* ***0,5 mm***
3. Kontermutter festdrehen.	3. Tighten locknut.	3. Serrer le contre-écrou.	3. Apretar la contratuerca.
Anziehvorschrift: **20 ± 2 Nm**	Tightening specification: **20 ± 2 Nm**	Prescription de serrage: **20 ± 2 Nm**	Prescripción de apriete: 20 **±** 2 Nm
Einstellung nochmals mit Fühlerlehrenblatt überprüfen.	Recheck the adjustment with feeler gauge.	Vérifier encore une fois le réglage avec la jauge d'épaisseur.	Verificar otra vez el ajuste efectuado, mediante la galga de espesores.
4. Dichtung aufsetzen.	4. Put gasket in place.	4. Mettre en place le joint.	4. Colocar la junta.
5. **Neue** Gummischläuche an Überströmleitung und Einspritzventile bis Anschlag aufschieben. Zylinderkopfhaube und Überströmleitung montieren. Schrauben festdrehen.	5. Insert **New** rubber tubes at the cross-over pipe and injection valves until the end stop. Mount the cylinder head cover and the cross-over pipe. Tighten bolts.	5. Emmancher des flexibles en caoutchouc **neufs** sur la rampe de décharge et les injecteurs jusqu'en butée. Monter le cache-culbuteurs et la rampe de décharge. Serrer les vis.	5. Colocar mangueras de goma **nuevas** sobre la tuberìa de rebose y los inyectores hasta el tope. Montar la tapa de culata y la tubería de rebose. Apretar los tornillos.
Anziehvorschrift: **8,5 Nm**	Tightening specification: **8.5 Nm**	Prescription de serrage: **8,5 Nm**	Prescripcion de apriete: **8,5 Nm**

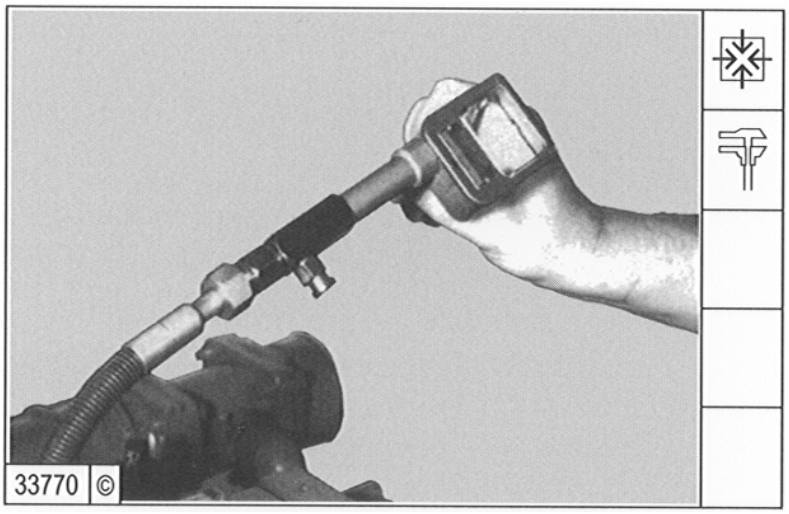


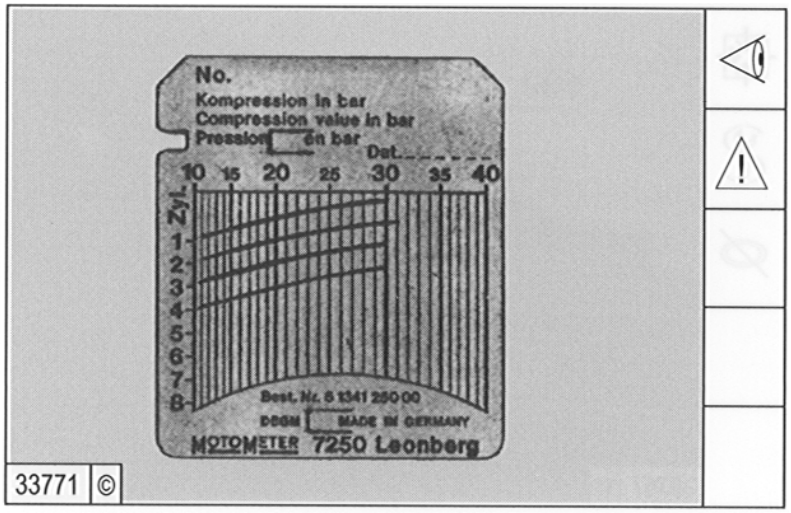




Typ Model Type Tipo	**DEUTZ** **F - 4M 2011**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**06.2002**
Benennung Description Dénomination Denominación	**Kompressionsdruck - prüfen und einstellen** **Compression pressure - checking and adjusting** **Pression de compression - controle et réglage** **Presión de comprsión - verificación y ajustes**		Blatt Page Feuille Página	**3.250.07**

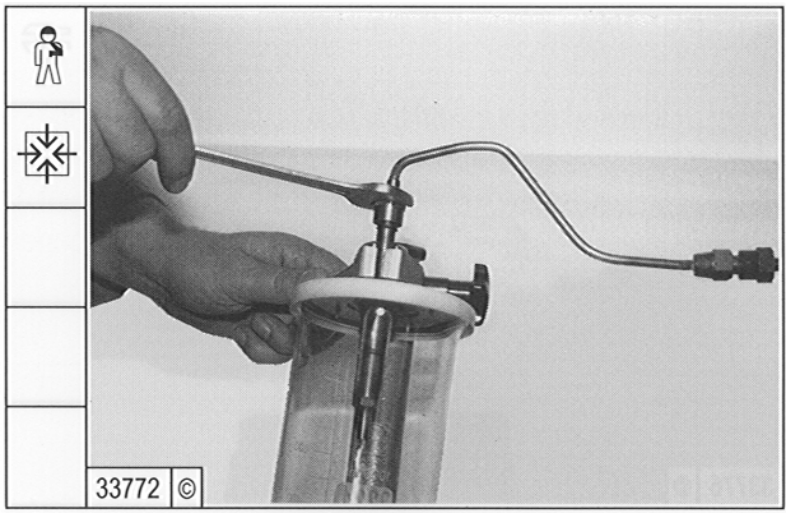
Deutsch	*English*	*Français*	*Español*
Kompressionsdruck prüfen und einstellen	**Compression pressure checking and adjusting**	**Pression de compression contrôle et réglage**	**Presión de compresión verificación y ajustes**
Handelsübliche Werkzeuge: Kompressionsdruckprüfer Klauenschlüssel Torx-Werkzeugsatz	**Commercial tools required:** Compression tester Glaw key Torx tool kit	**Outillage standard:** Compressiomètre Clé à griffes Jeu d'outils Torx	**Herramientas comerciales:** Compresímetro Llave de garra Juego de herramientas Torx
Spezialwerkzeuge: Anschlussstück 100120	**Special tools required:** Connector 100120	**Outillage spécial:** Élément raccord 100120	**Herramientas especiales:** Pieza de ernpalme 100120
Einspritzventile sind ausgebaut, Ventilspiel ist kontrolliert.	**Injectors have been removed, valve clearance has been checked.**	**Les injecteurs sont déposés, le jeu des soupapes est contrôlé.**	**Los inyectores están desmontados, el juego de válvulas está verificado.**
1. Anschlussstück mit Spezialdichtung einsetzen.	1. Insert connector with new special seal.	1. Insérer l'élément raccord avec le joint spécial.	1. Introducir la pieza de empalme con una junta especial.
2. Spannpratze aufsetzen. Schraube festdrehen.	2. Fit clamping pad. Tighten bolt.	2. Mettre en place la patte de serrage. Serrer la vis..	2. Colocar la garra de sujeción. Apretar el tornillo.
3. Falls notwendig Adapter für Anschlussstück aufschrauben.	3. If necessary, screw on adapter for connector.	3. Si nécessaire, visser une pièce d'adaptation pour l'élément raccord	3. De ser necesario, enroscar el adaptador para la pieza de empalme.

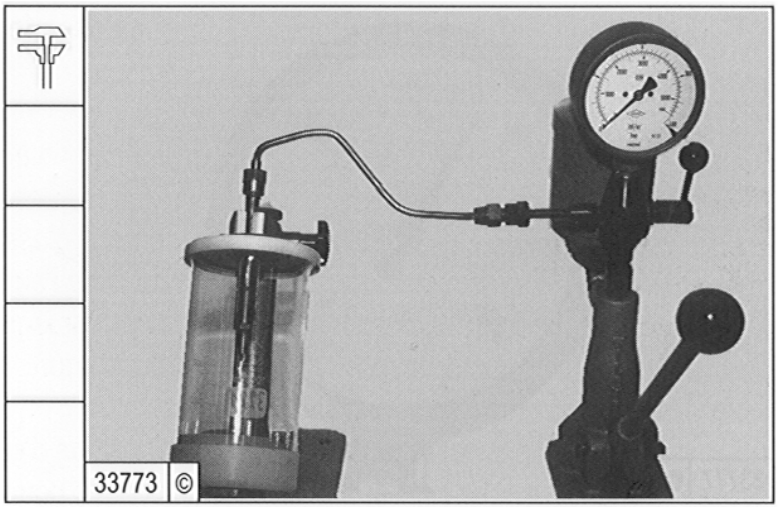




Typ Model Type Tipo	**DEUTZ** **F - 4M 2011**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**06.2002**
Benennung Description Dénomination Denominación	**Kompressionsdruck - prüfen und einstellen** **Compression pressure - checking and adjusting** **Pression de compression - controle et réglage** **Presión de comprsión - verificación y ajustes**		Blatt Page Feuille Página	**3.250.08**

Deutsch	*English*	*Français*	*Español*
Kompressionsdruck prüfen und einstellen	**Compression pressure checking and adjusting**	**Pression de compression contrôle et réglage**	**Presión de compresión verificación y ajustes**
4. Kompressions-druckprüfer anschließen. Motor mit Starter durchdrehen. Kompressionsdruck: **25 - 30 bar**	4. Connect compression tester. Turn engine with starter. Compression pressure: **25 - 30 bar**	4. Brancher le compressiomètre. Virer le moteur à l'aide du démarreur. Pression de compression: **25 à 30 bars**	4. Conectar el compresímetro. Girar el motor mediante el arrancador. Presión de compresión: **25 - 30 bar**
Der gemessene Kompressionsdruck ist abhängig von der Anlassdrehzahl während des Messvorganges und der Höhenlage des Motoraufstellortes. Grenzwerte sind daher nicht genau festlegbar. Empfohlen wird die Kom-pressionsdruckmessung nur als Vergleichsmes-sung aller Zylinder eines Motors untereinander anzusehen. Sind mehr als **15%** Abweichung ermittelt worden, sollte durch die Demontage der betrof-fenen Zylindereinheit die Ursache ermittelt werden.	The measured compression pressure is dependent on the starting speed during the measuring process and also on the altitude of the engine site. Therefore it is difficult to specify precise limit values. It is recommended to use the compression pressure measure-ment only for comparison of compression pressures of all cylinders in one engine. If a difference in pressure in excess of **15%** is determined, the cylinder unit concerned should be dismantled to establish the cause.	La pression de compression mesurée dépend de la vitesse de démarrage durant le relevé et de l'altitude du site d'installation du moteur. Des valeurs limites précises ne peuvent donc pas être fixées. Le relevé de la pression de compression doit uniquement être considéré comme relevé comparatif pour lensemble des cylindres d'un moteur. Si l'ecart relevé est supérieur à **15%**, il faut en déterminer la cause par démontage des unités de cylindre en question	La presión de compresión medida depende de la velocidad de arranque al hacer la medición y de la altitud dellugar de instalación del motor. Por eso, no se pueden fijar valores límite exactos. Se recomienda considerar la medición de la compresión tan sólo como una medición de comparación entre todos los cilindros de un motor. Si las diferencias son superiores al **15%,** es conveniente. buscar la causa desmontando la unidad de cilindro afectada.
Hinweis: *Einspritzventile mit neuer Spezialdichtung einsetzen und festdrehen.* *Anziehvorschrift:* ***21 Nm*** *Einspritzleitungen anbauen und festdrehen.* *Anziehvorschrift:* ***25 ± 2,5 Nm*** ***Neue** Gummischläuche an Überströmleitung und Einspritzventile bis An-schlag aufschieben. Überströmleitung anbauen.* *Anziehvorschrift:* ***8,5 Nm***	***Note:*** *Fit injector with new special seal and tighten* *Tightening specification:* ***21 Nm*** *Attach the injection pipes and fix them firmly.* *Tightening specification:* ***25 ± 2.5 Nm*** *Insert **New** rubber tubes at the cross-over pipe and injection valves until the end stop.* *Attach the cross-over pipe.* *Tightening specification:* ***8,5 Nm***	***Nota:*** *Remonter les injecteurs avec un joint spécial neuf et les serrer.* *Prescription de serrage:* ***21 Nm*** *Remonter les tuyauteries d'injection et les serrer.* *Prescription de serrage:* **25 ± 2,5 Nm** *Emmancher des flexibles en caoutchouc **neufs** sur la rampe de décharge et les injecteurs jusqu'en butée. Monter la rampe de décharge.* *Prescription de serrage:* ***8,5 Nm***	***Nota:*** *Introducir los inyectores con una junta especial nueva y apretar.* *Prescripción de apriete:* ***21 Nm*** *Montar las tuberias de inyección y apretar.* *Prescripción de apriete:* ***25 ± 2,5 Nm*** *Colocar mangueras de goma **nuevas** sobre la tubería de rebose y los inyectores hasta el tope. Montar la tubería de rebose.* *Prescripción de apriete:* ***8,5 Nm**:*





Typ Model Type Tipo	**DEUTZ** **F - 4M 2011**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einspritzventil – prüfen und einstellen** **Injector – checking and adjusting** **Injecteur – contrôle et réglage** **Inyector – verificatión y ajustes**		Blatt Page Feuille Página	**3.250.09**

Deutsch

Einspritzventil prüfen und einstellen

Handelsübliche Werkzeuge:
Düsenprüfgerät
Lange Stecknuss SW 15

Spezialwerkzeug:
Halter für Einspritzventil 110 110

Hinweis:
Bei Arbeiten an der Einspritzausrüstung auf größte Sauberkeit achten. Zur Prüfung der Einspritzventile nur reines Prüföl nach ISO 4113 oder sauberen Dieselkraftstoff verwenden

Achtung!
Hände weg vom Düsenstrahl. Der Kraftstoff dringt tief in das Fleisch ein und kann zur Blutvergiftung führen.

1. Einspritzventil an das Düsenprüfgerät anbauen.

2. Prüfung des Öffnungsdruckes

Hebel des Düsenprüfgerätes bei zugeschaltetem Manometer langsam niederdrücken.
Der Druck bei dem der Zeiger stehe bleibt oder plötzlich abfällt, ist der Öffnungsdruck.

Öffnungsdruck für die Neueinstellung:
210 + 8 bar

English

Injector checking and adjusting

Commercial tools required:
Nozzle tester
Long socket a/flats 15

Special tool required:
Retainer for injector 110110

Note:
Utmost cleanliness must be ensured when working on the injection equipment. For testing the injector use only pure test oil to ISO 4113 or clean diesel fuel.

Caution
Beware of injection nozzle fuel jet. The! fuel penetrates deeply into the skin tissue and may cause blood poisoning.

1. Connect injector to nozzle tester.

2. Checking opening pressure

With pressure gauge switched on, slowly press down lever of nozzle tester. The pressure at which the gauge pointer stops or suddenly drops, is the opening pressure.

Opening pressure for initial setting:
210 + 8 bar

Français

Injecteur contrôle et réglage

Outillage standard:
Pompe d'essai des injecteurs
Douille longue de 15

Outillage spécial:
Dispositif de blocage d'injecteur 110110

Nota:
Lors de travaux sur le système d'injection, veiller a la plus grande propreté. Pour le contr61e des injecteurs, n'utiliser que du fuel d'essai pur selon IS0 4113 ou du gasoil propre.

Attention!
Tenir les mains hors du jet des injecteurs. Le combustible peut pénétrer profondément dans la chair et provoquer un empoisonnement du sang.

1. Monter l'injecteur sur la pompe d'essai des injecteurs.

2. Contr61e de la pression d'ouverture

Le manomètre étant branche, abaisser lentement le levier de la pompe d'essai. La pression a laquelle l'aiguille s'immobilise ou chute brusquement est la pression d'ouverture.

Pression d'ouverture pour un nouveau réglage:
210 + 8 bars

Español

Inyector verificación y ajustes

Herramientas comerciales:
Comprobador para inyectores
Llave de vaso largo de 15

Herramientas especiales:
Retenedor para inyector 110110

Nota:
Para cualquier trabajo a realizar en el equipo de inyección se observara la maxima limpieza. Para la comprobación de los inyectores se utilizará solamente aceite de prueba puro según IS0 4113 ó combustible diesel limpio.

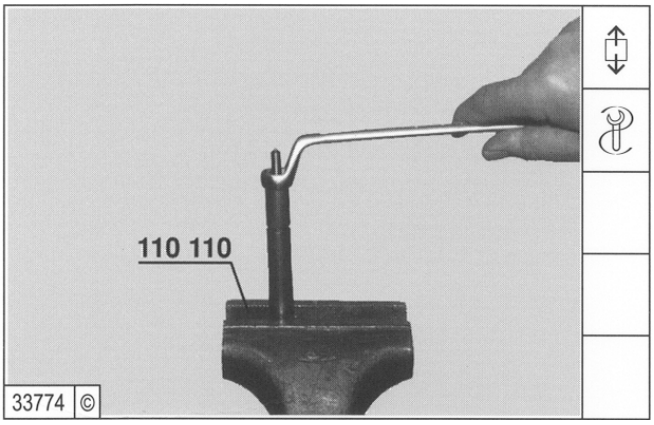
Atención:
No acercar nunca las manos al chorro del inyector, pues el combustible penetra profundamente en los tejidos y puede causar una intoxicación de la sangre.

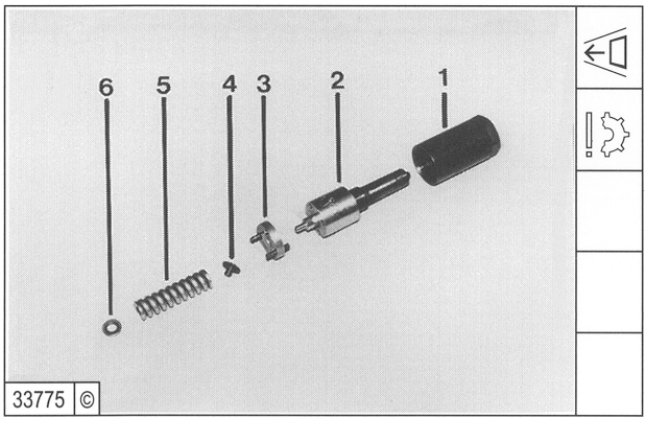
1. Montar el inyector en el comprobador.

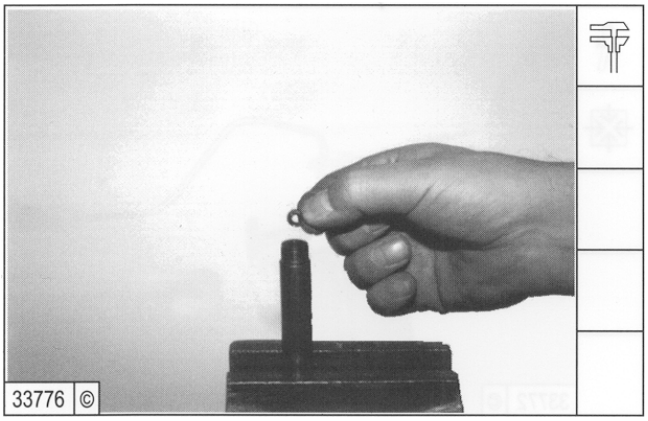
2. Comprobación de la presión de apertura

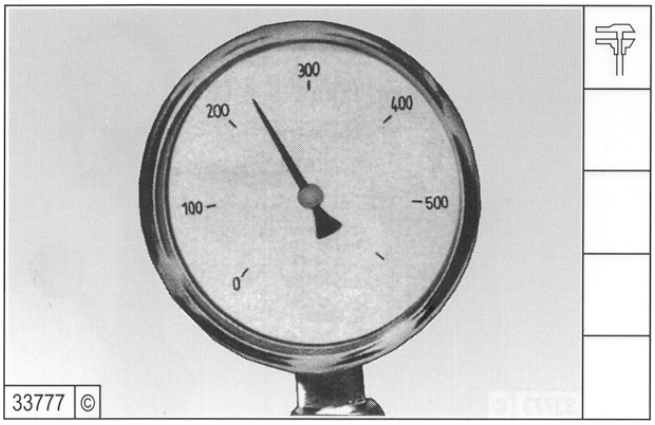
Con el manómetro conectado, tirar de la palanca del comprobador lentamente hacia abajo. La presión a la que la aguja se detenga o caiga bruscamente es la presión de apertura.

Presión de apertura para el nuevo ajuste:
210 + 8 bar



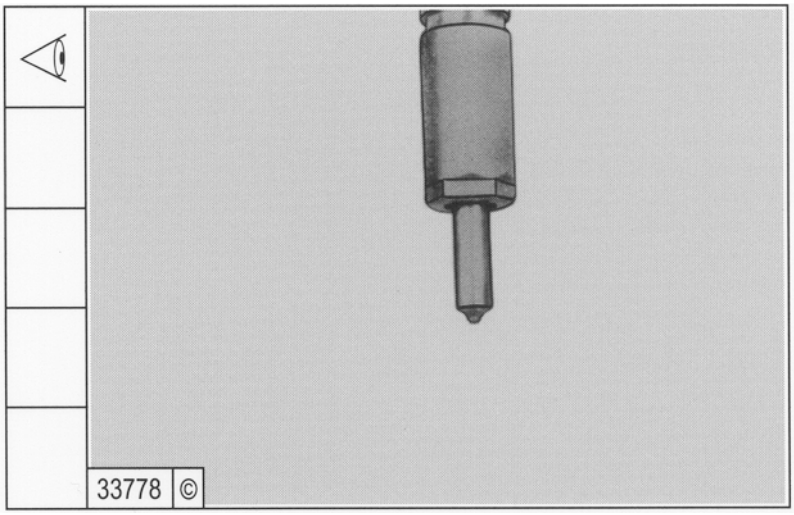


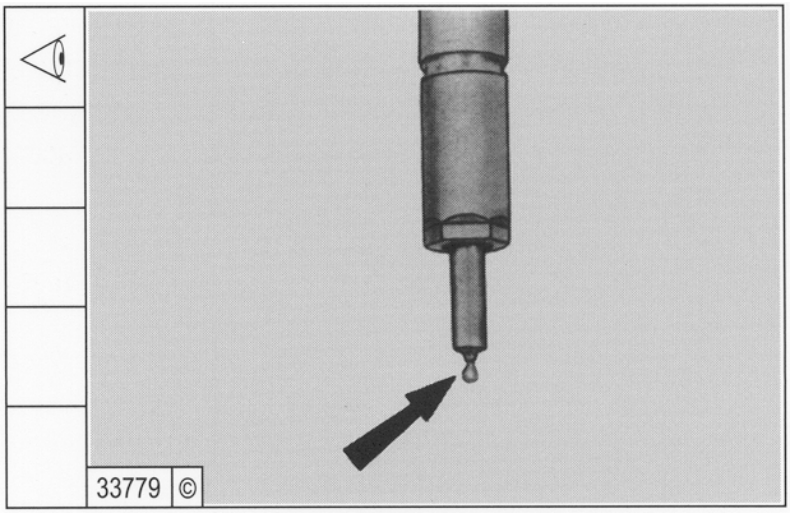


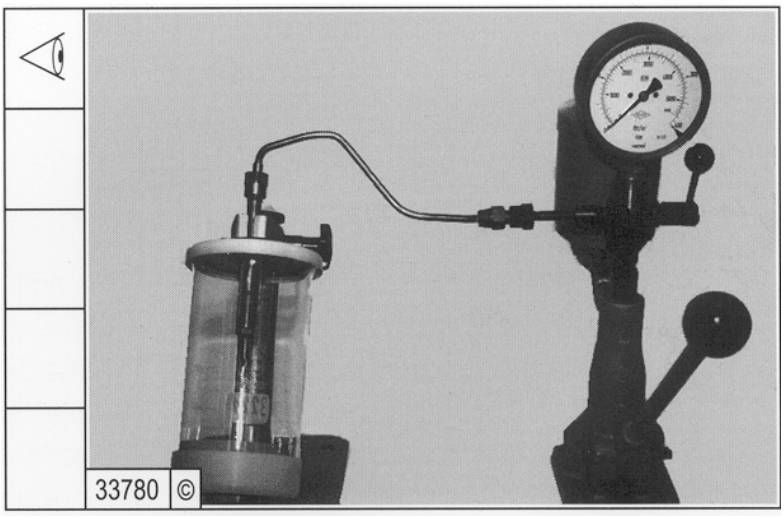


Typ Model Type Tipo	**DEUTZ** **F - 4M 2011**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einspritzventil – prüfen und einstellen** **Injector – checking and adjusting** **Injecteur – contrôle et réglage** **Inyector – verificatión y ajustes**		Blatt Page Feuille Página	**3.250.10**

Deutsch	*English*	*Français*	*Español*
Einspritzventil prüfen und einstellen	**Injector checking and adjusting**	**Injecteur contrôle et réglage**	**Inyector verificación y ajustes**
3. Einstellen des Öffnungsdruckes am Einspritzventil	**3. Adjusting the opening pressure on the injector**	**3. Réglage de la pression d'ouverture sur l'injecteur**	**3. Ajuste de la presión de apertura en el inyector**
Überwurfmutter abschrauben, alle Teile ausbauen.	Unscrew cap nut and remove all parts	Dévisser l'écrou- raccord, démonter toutes les pièces.	Desenroscar la tuerca de unión y desmontar todas las piezas
Folge der Einzeldemontage	**Sequence of parts disassembly**	**Ordre de démontage des pièces**	**Secuencia del despiece**
1. Überwurfmutter 2. Einspritzdüse 3. Zwischenstück 4. Druckbolzen 5. Druckfeder 6. Ausgleichscheibe	1. Cap nut 2. Injection nozzle 3. Adapter 4. Thrust pin 5. Compression spring 6. Shims	1) Écrou - raccord 2) Injecteur 3) Pièce intermédiaire 4) Poussoir 5) Ressort 6) Rondelles de réglage	1. Tuerca de unión 2. Inyector o tobera 3. Pieza intermedia 4. Perno de presión 5. Resorte de presión 6. Arandelas de reglaje
4. Durch Auswahl der erforderlichen Scheibe Druck einstellen. Stärkere Scheibe ergibt höheren Öffnungs-druck. Einspritzventil zusammenbauen. Überwurfmutter festdrehen.	4. Adjust pressure by selecting appropriate shim. A thicker shim increases the opening pressure. Reassemble injector. Tighten cap nut.	4. Régler la pression en choisissant la rondelle adéquate. Une rondelle plus épaisse donne une pression d'ouverture plus élevée. Remonter l'injecteur. Serrer l'écrou - raccord.	4. Ajustar la presión eligiendo la arandela adecuada. Una arandela más gruesa aumenta la presión de apertura. Ensamblar el inyector. Apretar la tuerca de unión.
Anziehvorschrift: **45 ± 5 Nm**	Tightening specification: **45 ± 5 Nm**	Prescription de serrage: **45 ± 5 Nm**	Prescripción de apriete: **45 ± 5 Nm**
Einspritzventil auf dem Düsenprüfgerät erneut prüfen.	Recheck injector on nozzle tester.	Contr61er a nouveau l'injecteur sur la pompe d'essai	Comprobar el inyector de nuevo sobre el comprobador.
5. Prüfung auf Dichtheit	**5. Checking for tightness**	**5. Contrôle d'étanchéité**	**5. Comprobación de estanqueidad**
Düse und Düsenhalter abtrocknen mit Luft trockenblasen. Handhebel des Prüfgerätes langsam niederdrücken, bis **ca. 20 bar** unterhalb des vorher abgelesenen Öffnungsdruckes erreicht werden.	Dry nozzle and nozzle holder -blow out with compressed air. Press down handlever of nozzle tester slowly until a pressure of about **20 bar** below the previous opening pressure reading is attained.	Sécher l'injecteur et le porte-injecteur au jet d'air. Abaisser lentement le levier de la pompe d'essai jusqu'a env. **20 bars** au-dessous de la pression d'ouverture relevée précédemment.	Secar el inyector (tobera) y portainyector, soplándolos con aire comprimido. Tirar de la palanca del comprobador lentamente hacia abajo hasta que se alcance una presión en aprox. **20 bar** inferior a la de apertura leída anteriormente.





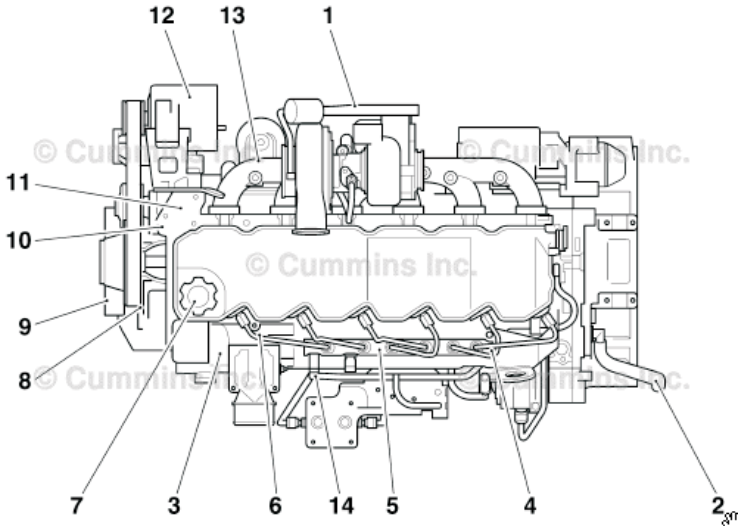


Typ Model Type Tipo	**DEUTZ** **F - 4M 2011**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einspritzventil – prüfen und einstellen** **Injector – checking and adjusting** **Injecteur – contrôle et réglage** **Inyector – verificatión y ajustes**		Blatt Page Feuille Página	**3.250.11**

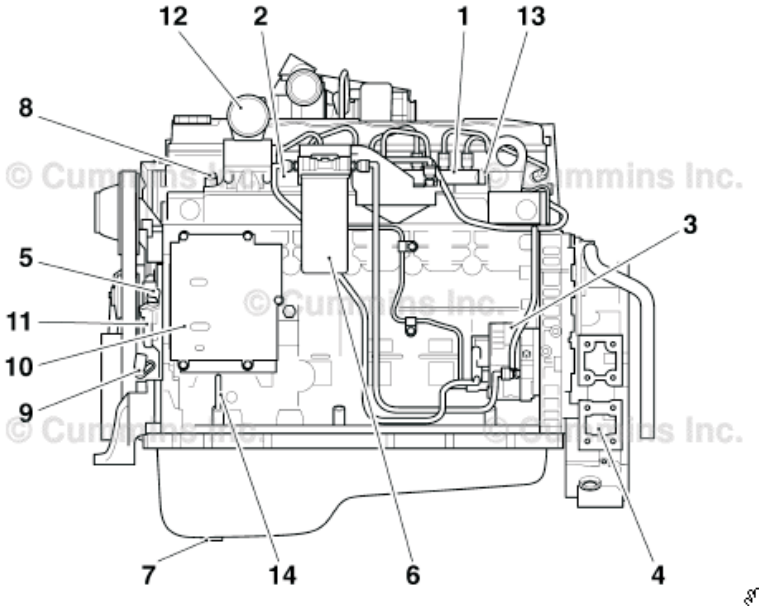
Deutsch	*English*	*Français*	*Español*
Einspritzventil prüfen und einstellen	**Injector checking and adjusting**	**Injecteur contrôle et réglage**	**Inyector verificación y ajustes**
6. Düse ist dicht, wenn innerhalb **10 Sekunden** kein Tropfen abfällt.	6. Nozzle is tight if there is no dripping within a period of **10 seconds**.	6. L'injecteur est étanche si aucune goutte ne s'écoule pendant **10 secondes**.	6. El inyector es estanco si, pasados **10 segundos**, no sale ni una gota.
7. Fällt ein Tropfen ab, ist das Einspritzventil zu zerlegen und die Undichtigkeit durch Reinigen zu beseitigen. Ist das nicht erfolgreich, muss die Einspritzdüse erneuert werden.	7. In case of a drip, the injector must be dismantled and cleaned to remedy the leak. If this does not cure the leak, the injector must be replaced.	7. Si l'injecteur goutte, il doit être démonte et la fuite éliminée par nettoyage. En cas d'échec, remplacer l'injecteur.	7. Si sale una gota, es necesario despiezar y limpiar el inyector para eliminar la falta de estanqueidad. Si esto no surte el efecto deseado, hay que sustituir el inyector por otro nuevo.
Nacharbeit ist nicht zulässig.	Reworking is not permissible.	Ne jamais rectifier l'injecteur.	No está permitido rectificar el inyector.
8. Schnarr- und Strahlprüfung	**8. Buzzing and spray pattern test**	**8. Contrôle du crissement et du jet**	**8. Comprobación del ronquido y la pulverización**
Manometer des Prüfgerätes abschalten.	Switch off pressure gauge of tester.	Débrancher le manomètre de la pompe d'essai.	Desconectar el manómetro del comprobador.
Die Schnarrprüfung ermöglicht eine hörbare Prüfung der Leichtgängigkeit der Düsennadel im Düsenkörper. Neue Einspritzventile haben gegenüber gebrauchten ein geändertes Schnarrverhalten. Durch Verschleiß im Nadelsitzbereich verschlechtert es sich. Schnarrt eine Einspritzdüse trotz Reinigung nicht, muss sie durch eine neue ersetzt werden.	The buzzing test permits an audible check of the ease of movement of the nozzle needle in the nozzle body. New injectors emit a different buzzing sound as compared to used injectors. It deteriorates due to wear in the needle seat area. If an injection nozzle does not buzz despite cleaning, it must be renewed.	Le contrôle du crissement est un contrôle acoustique du mouvement de l'aiguille dans le corps de l'injecteur. Les injecteurs neufs présentent un comportement de crissement différent par rapport aux injecteurs usages. Par suite de l'usure du logement d'aiguille, il se détériore. Si malgré nettoyage, un injecteur ne crisse plus, il doit être remplace par un injecteur neuf.	La comprobación del ronquido permite verificar audiblemente el fácil movimiento de la aguja dentro del cuerpo del inyector. Un inyector nuevo tiene un ronquido distinto del de un inyector usado. El ronquido disminuye con el desgaste en la zona de asiento de la aguja. Si un inyector deja de emitir el ronquido característico pese a su limpieza anterior, hay que sustituirlo por otro nuevo.
Ein gebrauchtes Einspritzventil muss bei schneller Hebeltätigkeit hörbar schnarren und dabei gut zerstäubt abspritzen. Das Strahlbild kann dabei gegenüber dem eines neuen Einspritzventils deutlich unterschiedlich sein.	A used injector should buzz clearly during rapid actuation of the handlever, while exhibiting a well atomized spray pattern. The spray pattern may differ noticeably from that of a new injector.	Un injecteur usage doit présenter un crissement audible lorsque le levier est actionne rapidement et bien pulvériser alors. La forme du jet peut alors être nettement différente de celle d'un injecteur neuf.	A rápido accionamiento de la palanca, un inyector usado debe roncar de forma audible y dar un chorro bien pulverizado, pudiendo variar la pulverización claramente de la de un inyector nuevo.

Cummins QSB 6.7

1. Turbocharger wastegate
2. Crankcase breather
3. Barometic pressure/temperature sensor
4. Fuel rail pressure sensor
5. Fuel rail
6. High-pressure fuel lines
7. Oil fill cap
8. Tone wheel
9. Vibration damper
10. Coolant temperature sensor
11. Coolant outlet
12. Alternator
13. Exhaust manifold
14. Rail pressure relief valve

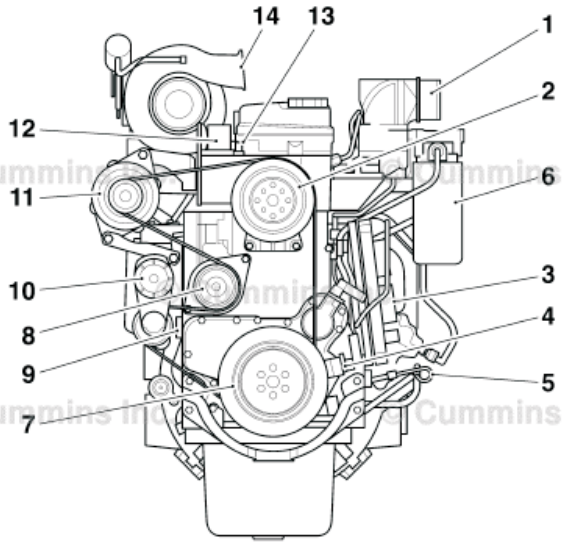


1. Fuel rail
2. Intake pressure and temperature sensor
3. Bosch fuel pump
4. Flywheel housing
5. Oil pressure switch
6. Fuel filter
7. Oil pan drain plug
8. Barometic pressure sensor
9. Engine speed sensor (crankshaft)
10. Electronic control module
11. Engine position sensor (camshaft)
12. Air intake inlet
13. Rail pressure sensor
14. Dipstick

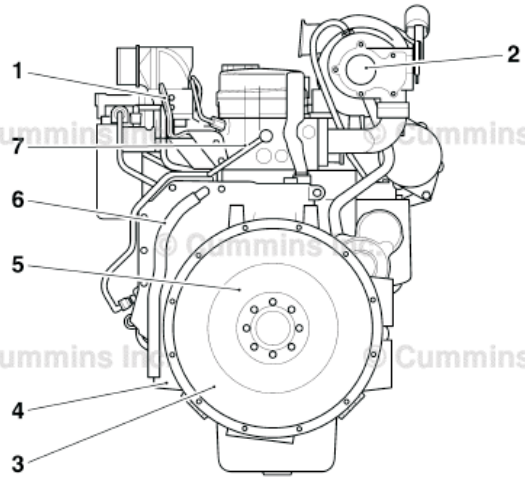


Typ Model Type Tipo	**Cummins QSB 6.7**	**Motor Engine Moteur Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Motoransichten Engine views**		Blatt Page Feuille Página	**3.300.01**

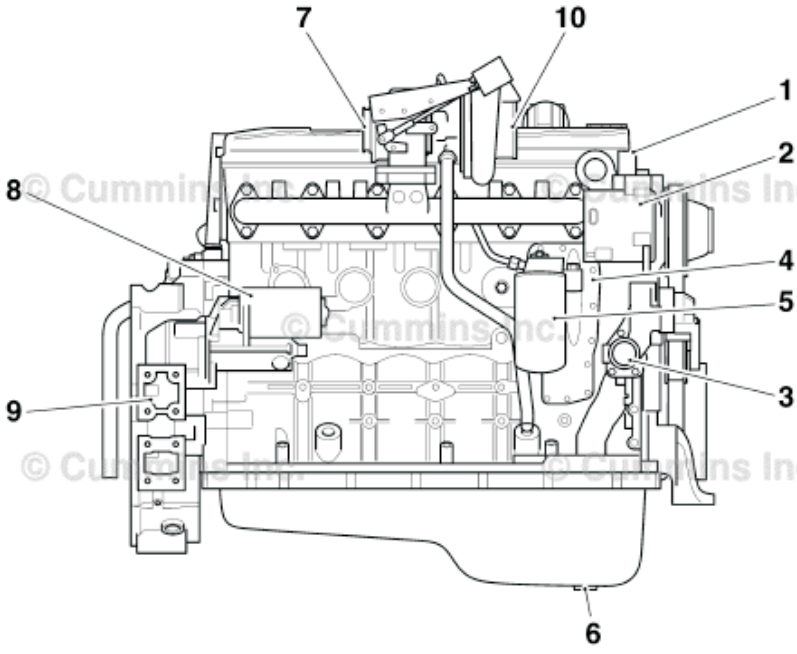
1. Air inlet
2. Fan drive
3. Electronic control module
4. Engine speed sensor (crankshaft)
5. Dipstick
6. Fuel filter
7. Vibration damper
8. Water pump
9. Starter
10. Belt tensioner
11. Alternator
12. Coolant outlet
13. Coolant temperature sensor
14. Turbocharger air outlet



1. Rear engine lifting bracket
2. Turbocharger exhaust outlet
3. Clutch mounting holes
4. Flywheel housing
5. Flywheel/flexplate
6. Crankcase breather tube
7. Injector drain line



1. Coolant outlet
2. Alternator
3. Coolant inlet
4. Lubricating oil cooler
5. Oil filter
6. Oil pan drain plug
7. Turbocharger exhaust outlet
8. Starter
9. Flywheel housing
10. Turbocharger compressor inlet



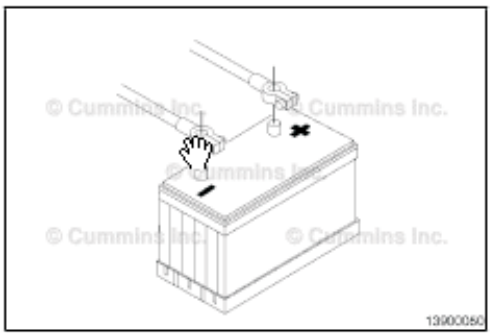
Typ Model Type Tipo	**Cummins QSB 6.7**	**Motor Engine Moteur Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Motoransichten Engine views**		Blatt Page Feuille Página	**3.300.02**

Preparatory Steps

⚠WARNING⚠

Batteries can emit explosive gases. To reduce the possibility of personal injury, always ventilate the compartment before servicing the batteries. To reduce the possibility of arcing, remove the negative (-) battery cable first and attach the negative (-) battery cable last.

Disconnect the batteries.



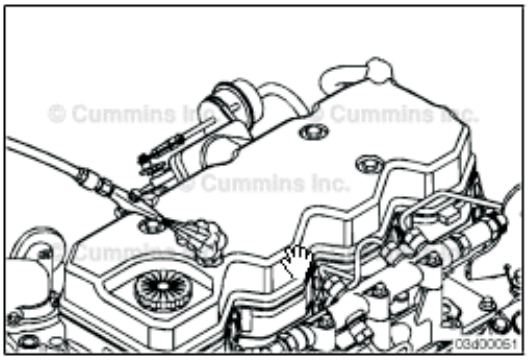
Rocker Lever Cover

Remove

⚠WARNING⚠

Wear appropriate eye and face protection when using compressed air. Flying debris and dirt can cause personal injury.

Prior to removing any components, clean around the mounting fasteners and sealing joints with compressed air to remove any loose debris.



Remove

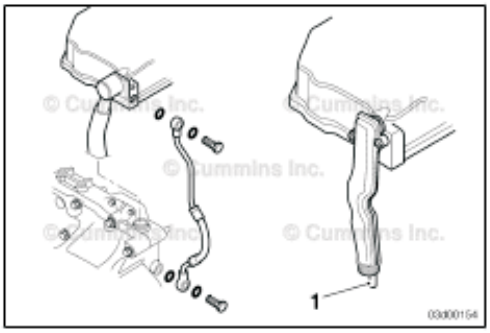
Rear Gear Train

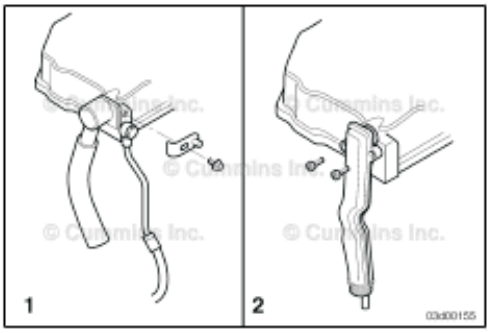
If equipped, remove the breather oil drain line which is located at the rear of the engine on the exhaust side of the engine.

Remove the breather oil drain line connections:

1. Remove the oil drain line banjo bolt and sealing washers from the rear of the rocker lever cover
2. Remove the oil drain line banjo bolt and sealing washers from the rear gear housing
3. Remove the breather oil drain line.

NOTE: Not all engines with an internal mounted crankcase breather are equipped with an external breather oil drain line. On some engines the breather oil drain line is internal to the breather connection tube (1).



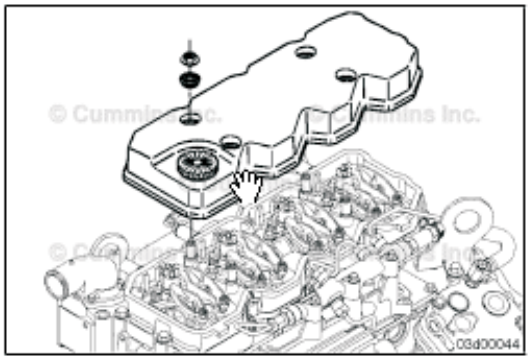


Disconnect the breather tube connection at the back of the rocker lever cover.

In general, two type of breather tube connections are used at the rocker lever cover:

1. A clamping plate and capscrew hold the breather tube connection to the rocker lever cover. Remove the capscrew and clampling plate to disconnect the breather tube connection from the rocker lever cover.
2. 1 or 2 Capscrew(s) directly mount the breather tube connection to the rocker lever cover. Remove the capscrew(s) to disconnect the breather tube connection from the rocker lever cover.

NOTE: Some breather tube connections use internal torx capscrews to secure the breather tube connection to the rocker lever cover.



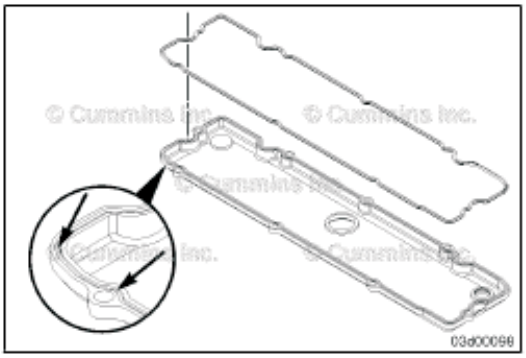
Stud Mounted Rocker Lever Cover.

NOTE: Do **not** remove the rocker lever gasket on engines in which the rocker lever cover gasket is fit into a groove at the base of the rocker lever cover. The gasket is reusable. Once the gasket is removed from the rocker lever cover it **must** be replaced.

Remove the mounting nuts and isolators from the rocker lever cover.

NOTE: If equipped, it may be necessary to gently pry the breather tube connection from the back of the rocker lever cover while removing.

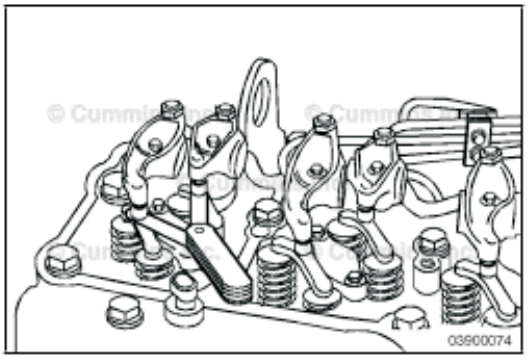
Remove the rocker lever cover.



NOTE: If the gasket has been removed from the rocker lever cover, a new gasket **must** be used.

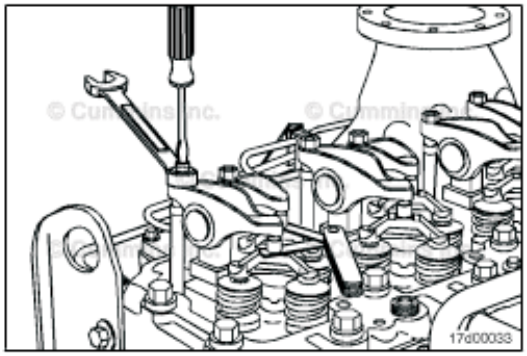
If replacing the rocker lever gasket, the following installation procedure must be used when installing the press-in gasket.

1. Press the molded gasket into the corners of the rocker lever cover
2. Press the remaining gasket into the rocker lever cover.



Lash Check Limits			
	mm		in
Intake	0.152	MIN	0.006
	0.381	MAX	0.015
Exhaust	0.381	MIN	0.015
	0.762	MAX	0.030

NOTE: Checking the overhead setting is usually performed as part of a troubleshooting procedure, and resetting is **not** required during checks as long as the lash measurements are within the above ranges.



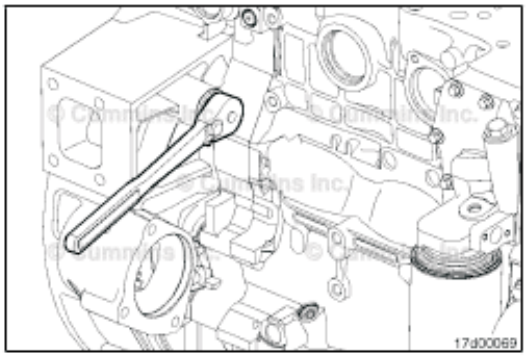
NOTE: The clearance is correct when some resistance is "felt" when the feeler gauge is slipped between the crosshead and the rocker lever socket.

Measure lash by inserting a feeler gauge between the crosshead and the rocker lever socket. If the lash measurement is out of specification, loosen the locknut, and adjust the lash to nominal specifications.

Lash Specifications		
	mm	in
Intake	0.254	0.010
Exhaust	0.508	0.020

Tighten the locknut and remeasure.

Torque Value: 24 N•m [212 in-lb]



Using barring tool, Part Number 3824591, rotate the crankshaft 360 degrees.

Following the same steps and specifications as previously stated, measure lash for the following rocker levers:

(E = exhaust, I = Intake)

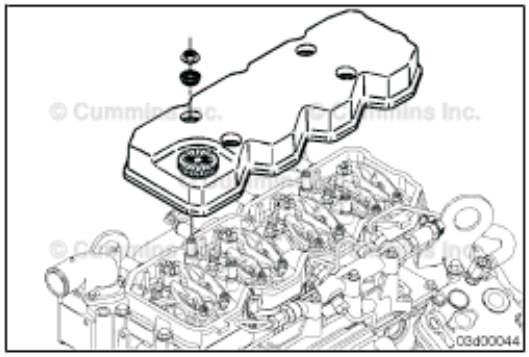
Four-cylinder 2E, 3I, 4E, and 4I:

Six-cylinder 2E, 3I, 4E, 5I, 6I, and 6E.

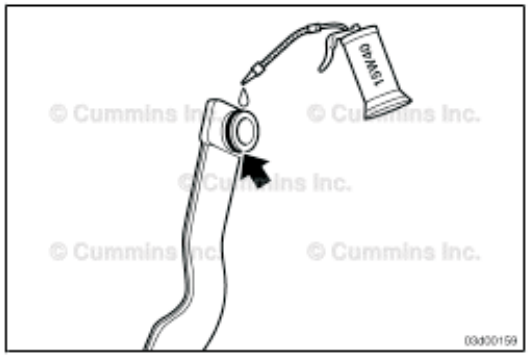
Reset if out of specification.

Install

Install the rocker lever cover. Refer to Procedure 003-011.



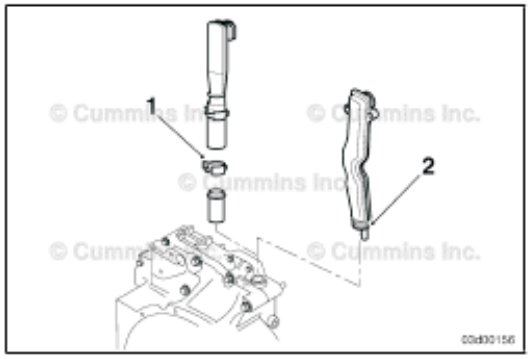
Prior to installing the breather connection tube, apply clean engine oil to the o'ring(s) located on the breather tube connection.

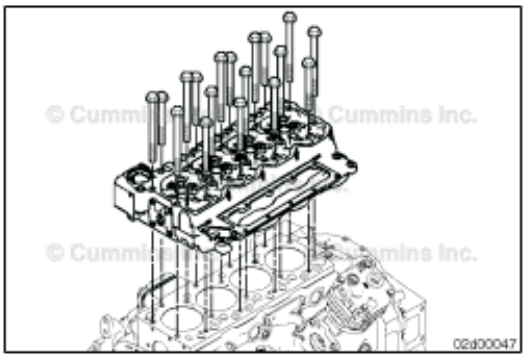


Install the breather tube connection into the rear gear housing.

In general, two type of breather tube connections are used at the rear gear housing:

1. An o'ring sealed connection. Install the breather tube connection by inserting the breather tube connection into the rear gear housing until fully seated
2. A clamped hose. Install the breather tube connection hose onto the inlet at the rear gear housing and install/tighten the clamp.





Cylinder Head (002-004)

Remove

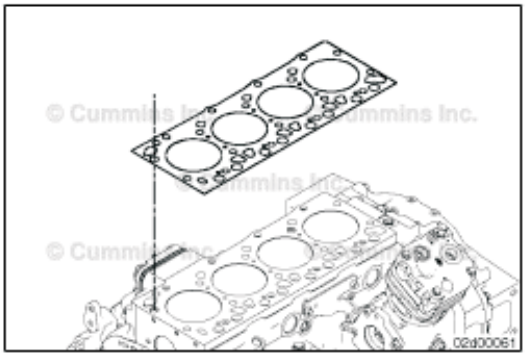
⚠WARNING⚠

This component weighs 23 kg [50 lb] or more. To reduce the possibility of personal injury, use a hoist or get assistance to lift this component.

△CAUTION△

If removing the cylinder head with the injectors installed, be careful not to damage the tips of the injector. Do not set the cylinder head down on the combustion face with the injectors installed. Damage to the injector tips will result.

Remove the cylinder head capscrews and cylinder head.



Remove the cylinder head gasket from the cylinder block.

NOTE: Do **not** discard the head gasket. For some engines, that require head gasket grading, the head gasket will help to determine which replacement head gasket to use. Refer to Procedure 002-021.

Install

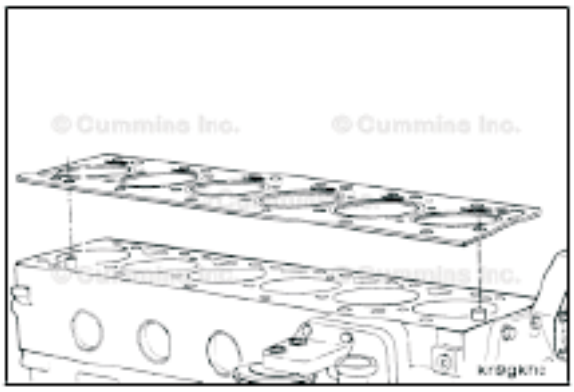
⚠CAUTION⚠

Make sure the gasket is correctly aligned with the holes in the cylinder block. Damage to the cylinder block can occur if the gasket is not aligned correctly.

NOTE: If a piston, crankshaft, connecting rod, or block replacement has been performed, the cylinder head gasket may require that it be graded. Refer to Procedure 002-021.

NOTE: Marine applications do not use cylinder head gasket grades. Refer to Procedure 002-021.

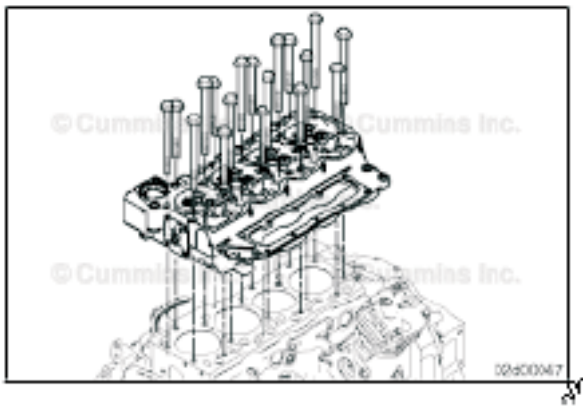
Install the cylinder head gasket. Refer to Procedure 002-021.



⚠WARNING⚠

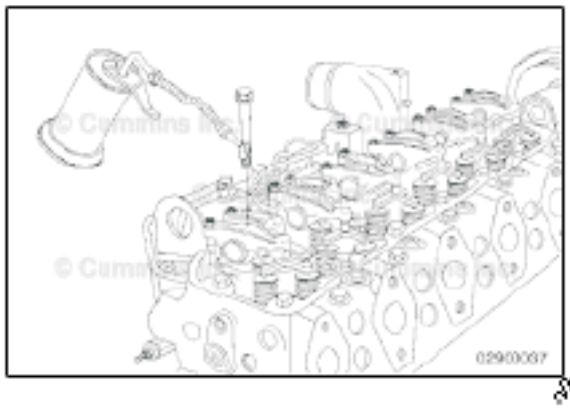
This component weighs 23 kg [50 lb] or more. To reduce the possibility of personal injury, use a hoist or get assistance to lift this component.

Carefully put the cylinder head on the cylinder block, and seat it onto the dowels.



Lubricate the threads and under the heads on the cylinder head mounting capscrews with clean engine oil.

Install the capscrews and tighten finger-tight.

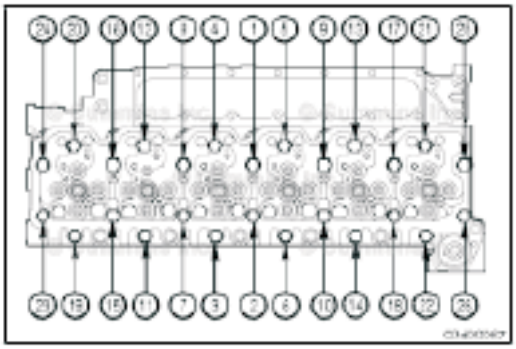


5.9 L and 6.7 L Engines with Equal Length Cylinder Head Capscrews

Use the illustrated sequence to tighten the cylinder head capscrews.

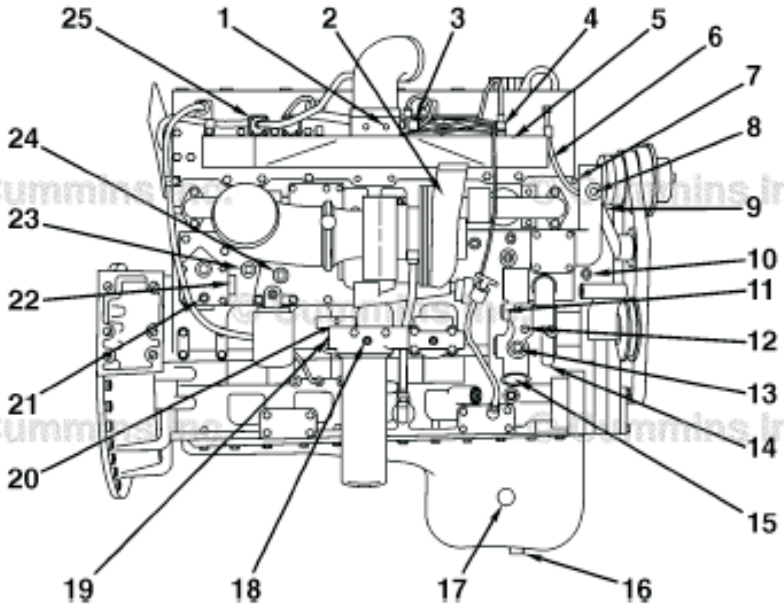
Tighten the cylinder head capscrews.

5.9L and 6.7L Engines with Equal Length Cylinder Head Capscrews — Cylinder Head Torque Values			
Step	Capscrews	N•m	ft-lb
1	All capscrews	90	66
2	All capscrews	90	66
3	All capscrews	Rotate 90-degrees clockwise	



Typ Model Type Tipo	**Cummins QSB 6.7**	**Motor Engine Moteur Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Zylinderkopf Cylinder head**		Blatt Page Feuille Página	**3.300.08**

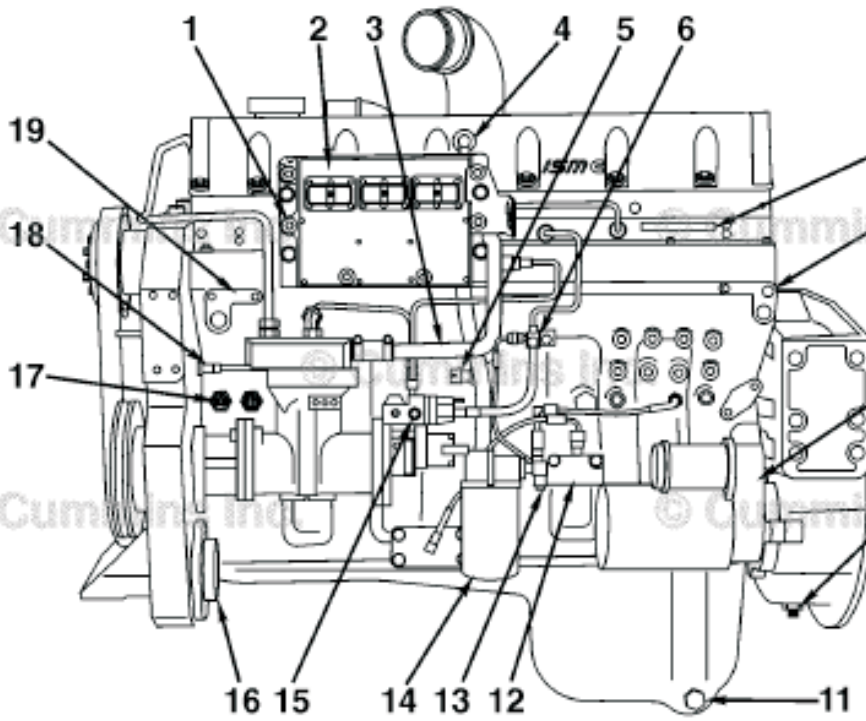
Cummins QSM 11



Automotive - Exhaust Side

1. Ether hookup
2. Before charge air cooler
3. Boost temperature sensor
4. Intake manifold pressure sensor
5. After charge air cooler (intake manifold)
6. Shutter stat
7. Engine coolant vent
8. Shutter stat port
9. Fan sensor
10. Coolant temperature sensor
11. Heater return
12. Coolant inlet pressure
13. Makeup line from radiator
14. Water pump pressure
15. Coolant inlet
16. Oil drain
17. Oil pan sump heater
18. Filter outlet pressure
19. Engine brake oil supply
20. Filter inlet pressure port
21. Block coolant pressure port
22. Coolant heater port
23. Heater supply port
24. Coolant temperature pickup port
25. Wastegate controller.

Typ Model Type Tipo	**TL420 - 450**	**Motor** **Engine** **Moteur** **Motor**	**Cummins QSM 11**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Motoransichten** **Engine views**			Blatt Page Feuille Página	**3.350.01**

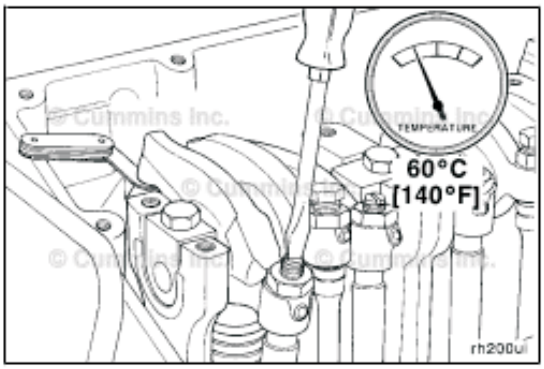


Automotive - Fuel Pump Side

1. ECM cooling plate
2. ECM
3. Compressor air inlet
4. Blowby measurement
5. Ambient air pressure sensor
6. Fuel return to tank
7. Engine data tag
8. Engine serial number
9. Starter
10. Flywheel ring gear sensor
11. Side oil drain
12. Centinel™ (optional)
13. Fuel inlet to pump
14. Fuel filter
15. Rail pressure
16. Power steering pump mounting location
17. Oil pressure and temperature sensor
18. Engine position sensor
19. Freon compressor mounting location.

Typ Model Type Tipo	**TL420 - 450**	**Motor** **Engine** **Moteur** **Motor**	**Cummins** **QSM 11**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Motoransichten** **Engine views**			Blatt Page Feuille Página	**3.350.02**

Valve and injector adjustment
Method 1

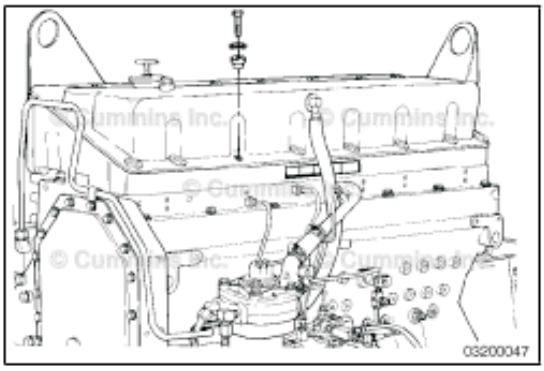


Overhead Set

Measure

General Information

All overhead lash measurements **must** be made when the engine is cold. Stabilized coolant temperature **must** be at 60°C [140°F] or below.



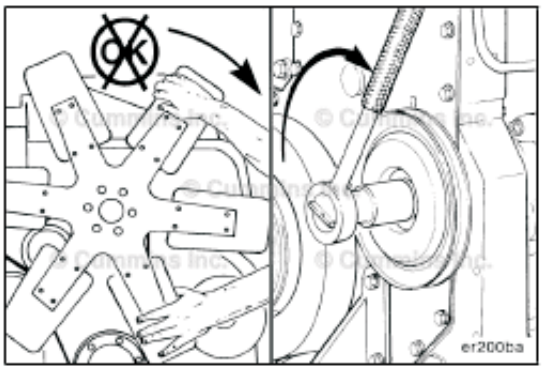
Remove the rocker lever cover.

⚠WARNING⚠

Do not pull or pry on the fan blades to rotate the crankshaft. Doing so can damage the fan blades. Damaged fans blades can cause premature fan failures, which can result in serious personal injury or property damage.

The valve set marks are located on the accessory drive pulley. The marks align with a pointer on the gear housing.

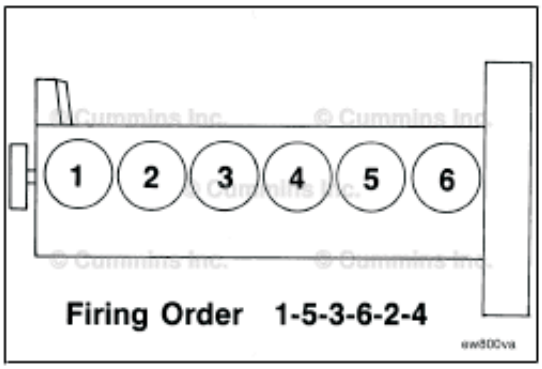
Use the accessory driveshaft to rotate the crankshaft.



The crankshaft rotation is **clockwise** when viewed from the front of the engine.

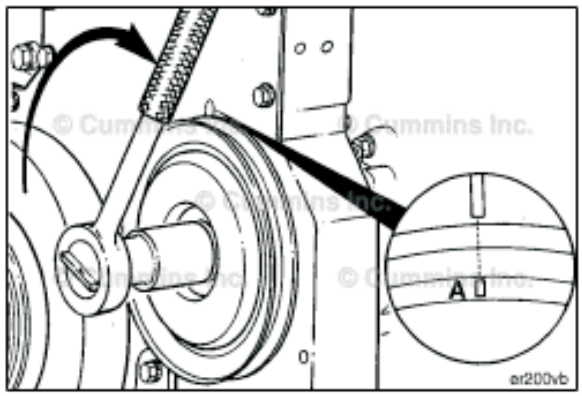
The cylinders are numbered from the front end of the engine.

The firing order is 1-5-3-6-2-4.



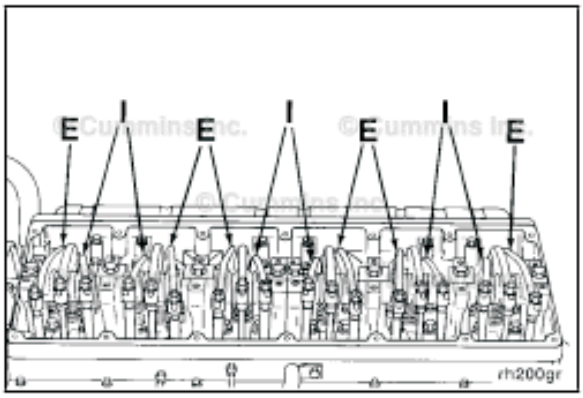
Typ Model Type Tipo	**TL420 - 450**	**Motor Engine Moteur Motor**	**Cummins QSM 11**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Zylinderkopf Cylinder head**			Blatt Page Feuille Página	**3.350.03**

Rotate the accessory drive **clockwise** until the A valve set mark on the accessory drive pulley is aligned with the pointer on the gear cover.



Each cylinder has three rocker levers:

- The long rocker lever (E) is the exhaust lever.
- The center rocker lever is the injector lever
- The short rocker lever (I) is the intake lever.



Valve and Injector Lash

Injector and Valve Measurement Sequence			
Bar engine in direction of rotation	**Pulley position**	**Set Cylinder**	
		Injector	Valve
Start	A	1	1
Advance to	B	5	5
Advance to	C	3	3
Advance to	A	6	6
Advance to	B	2	2
Advance to	C	4	4

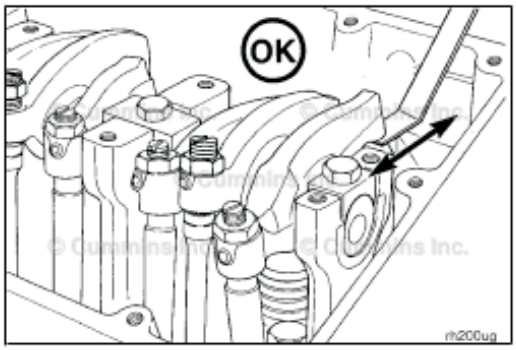
The firing order is 1-5-3-2-4-6.

When the A mark is aligned with the pointer the intake and exhaust valves for cylinder number 1 **must** be closed. The injector plunger for cylinder number 1 **must** be at the bottom of its stroke. If these conditions are **not** correct, cylinder number 6 **must** be ready to check. Check the injector and valves on the cylinder making sure both the intake and exhaust valve rocker levers can be rattled by hand or the push tubes can be freely rotated.

Valve Lash

Use a set of feeler gauges, measure the amount of clearance (lash) between the crosshead and the rocker lever nose. Measure and record the intake and exhaust valve lash. If the valve lash is **not** within specifications listed below, the valve **must** be adjusted. See the adjust step in this procedure.

ISM, M11 Series Valve Lash Recheck Limits			
Intake	**0.10 mm**	**minimum**	**0.004 in**
Intake	0.41 mm	maximum	0.016 in
Exhaust	0.46 mm	minimum	0.018 in
Exhaust	0.76 mm	maximum	0.030 in

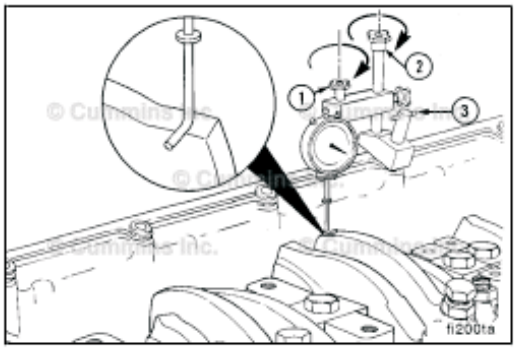


Injector Lash

Install the dial indicator and the support from injector travel measurement kit so the extension for the dial indicator is on top of the injector rocker lever, directly over the socket on the cylinder being checked.

Securely tighten the thumbscrew (1) and hold down the capscrews (2 and 3).

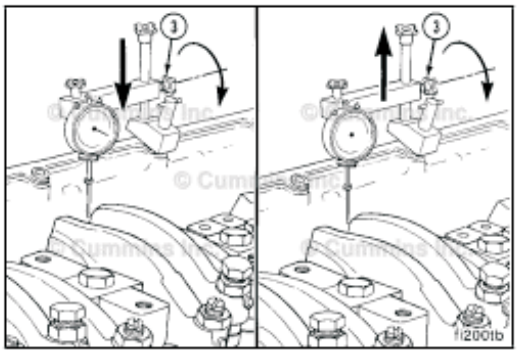
All adjusting screws **must** be tight to get an accurate measurement.



The tip of the dial indicator extension **must** rest on the rocker lever directly above the socket. If it does **not**, incorrect readings can result.

Loosen the thumb screw (3) , and lower the indicator against the injector rocker lever until the stem is fully compressed.

Raise the indicator approximately 12.7 mm [0.5 in] and tighten the thumb screw (3) to hold the indicator in position.

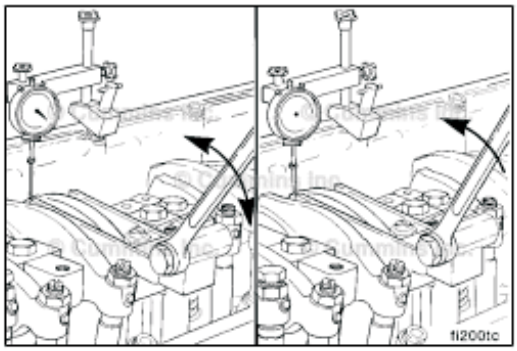


⚠WARNING⚠

The injector plunger is under spring-tension. Do not allow the tool to slip. Serious personal injury can result.

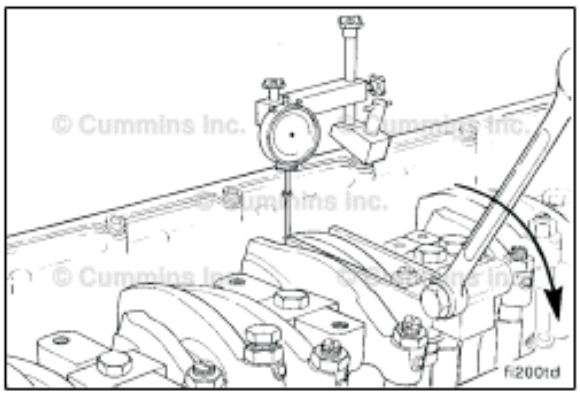
Actuate the injector plunger three or four times to make sure the fuel has been removed from the injector assembly. Allow the lever to return slowly to prevent damage to the dial indicator.

Actuate the lever again; set the dial indicator at zero while holding the injector plunger to the bottom of its travel.

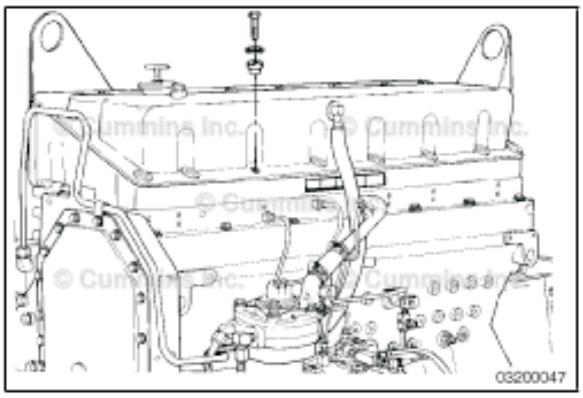


Slowly release the actuator, and check the dial indicator travel. Record the measured value. If the injector setting is **not** within the specification listed below, the injector **must** be adjusted. See the adjust step listed in this procedure.

ISM, M11 Series Injector Lash Recheck Limits		
0.51 mm	**minimum**	**0.020 in**
2.04 mm	maximum	0.080 in



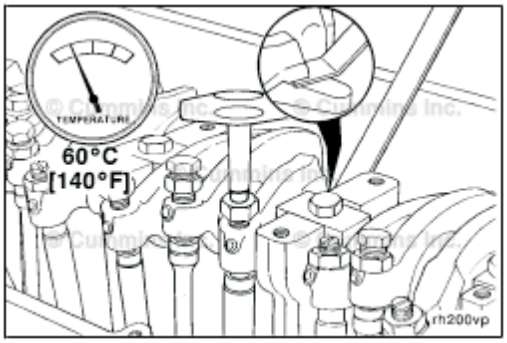
Install the rocker lever cover.



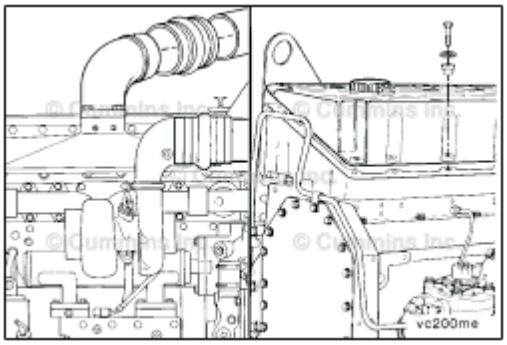
Valve and injector adjustment
Method 2

Valve, Injector, and Engine Brake Adjustment Specifications		
	mm	in
Intake Valve	0.36	0.014
Exhaust Valve	0.69	0.027
Engine Brake	0.38	0.015

All valve and injector adjustments **must** be made when the engine is cold (any stabilized coolant temperature at 60° C [140°F] or below).



Remove the rocker lever cover and gasket. Refer to Procedure 003-011.

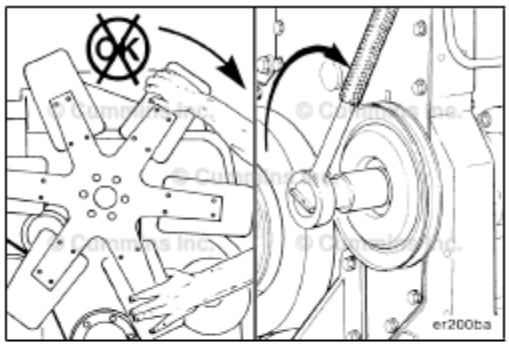


⚠WARNING⚠

Do not straighten a bent fan blade or continue to use a damaged fan. A bent or damaged fan blade can fail during operation and cause personal injury or property damage.

The valve set marks are located on the accessory drive pulley. The marks align with a pointer on the gear cover.

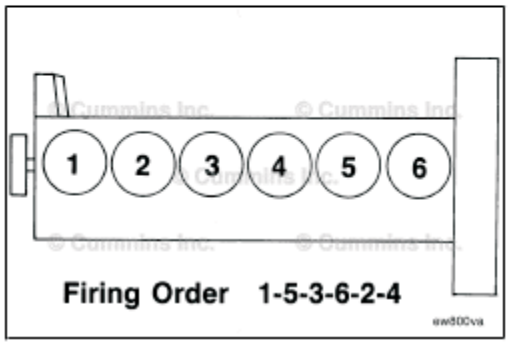
Use the accessory driveshaft to rotate the crankshaft.



The crankshaft rotation is **clockwise** when viewed from the front of the engine.

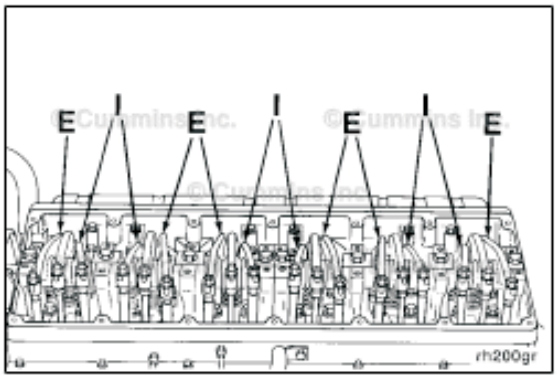
The cylinders are numbered from the front gear housing end of the engine.

The engine firing order is 1-5-3-6-2-4.



Each cylinder has three rocker levers:

- The long rocker lever (E) is the exhaust lever.
- The center rocker lever is the injector lever.
- The short rocker lever (I) is the intake lever.



The valves and injectors on the same cylinders are adjusted at the same index mark on the accessory drive pulley.

One pair of valves and one injector are adjusted at each pulley index mark before rotating the accessory drive to the next index mark.

Two crankshaft revolutions are required to adjust all the valves and injectors.

NOTE: See the example before attempting to begin the adjusting procedure.

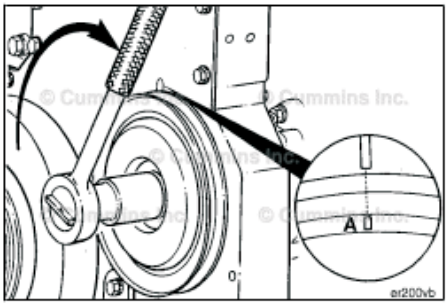
NOTE: Set the injector on the same cylinder before setting valves.

Adjust all of the injectors, valves, and brakes (if equipped) to the following injector and valve adjustment sequence chart.

Injector and Valve Measurement Sequence			
Bar Engine in Direction of Rotation	Pulley Position	Set Cylinder	
		Injector	Valve
Start	A	1	1
Advance to	B	5	5
Advance to	C	3	3
Advance to	A	6	6
Advance to	B	2	2
Advance to	C	4	4
Firing Order: 1-5-3-6-2-4			

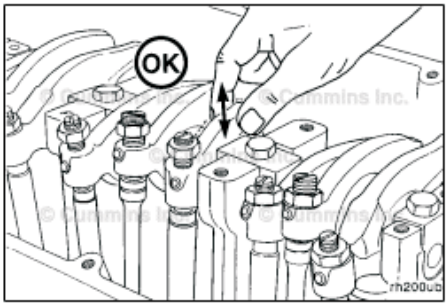
The adjustment can begin on any valve set mark. In the following example, the adjustment will begin on the "A" valve set mark with cylinder number 1 valves closed and ready for adjustment.

Rotate the accessory drive **clockwise** until the "A" valve set mark on the accessory drive pulley is aligned with the pointer on the gear cover.



When the "A" mark is aligned with the pointer, the intake and exhaust valves for cylinder Number 1 **must** be closed. If these conditions are **not** correct, cylinder Number 6 injector and valves **must** be ready to set. Set the injector and valves on the cylinder so that both the intake and exhaust valve rocker lever arms are loose and can be moved from side-to-side.

Both valves are closed when both rocker levers are loose and can be moved from side-to-side.



Injectors

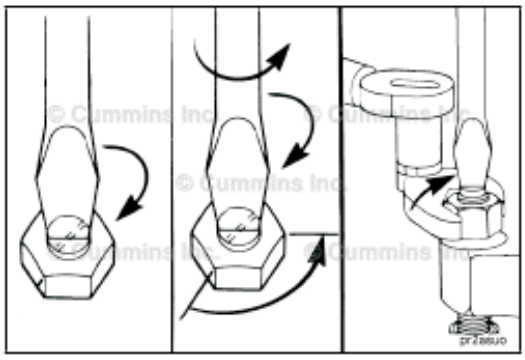
Loosen the injector adjusting screw locknut. Using a screwdriver (box end wrench if equipped with engine brakes) and the adjusting screw, bottom the injector plunger three or four times to remove the fuel.

Turn the adjusting screw in until you can feel it just bottom the plunger.

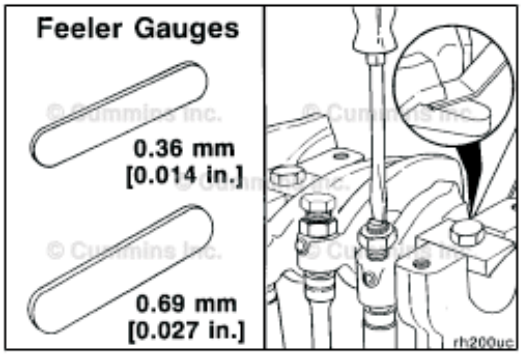
NOTE: Do **not** use excessive force when bottoming the plunger.

Back out the adjusting screw two flats, 120 degrees. Hold the adjusting screw, and tighten the locknut.

Torque Value: 61 N•m [45 ft-lb]

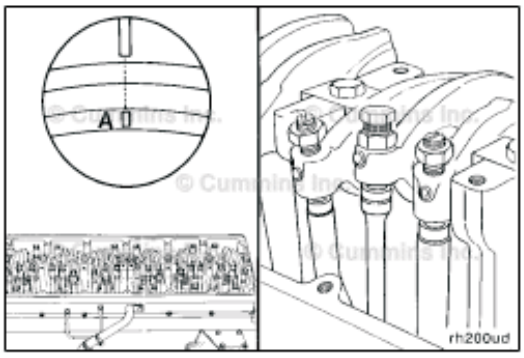


After setting the injector, set the valves on the same cylinder.



Valves

With the "A" valve set mark aligned with the pointer on the gear cover and both valves closed on the cylinder to be adjusted, loosen the adjusting screw locknuts on the intake and exhaust valves.

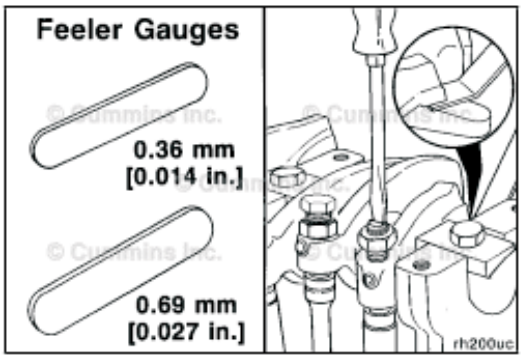


Select a feeler gauge for the correct valve lash specification.

Valve Lash Specification

	mm	in
Intake	0.36	0.014
Exhaust	0.69	0.027

Insert the feeler gauge between the top of the crosshead and the rocker lever pad.

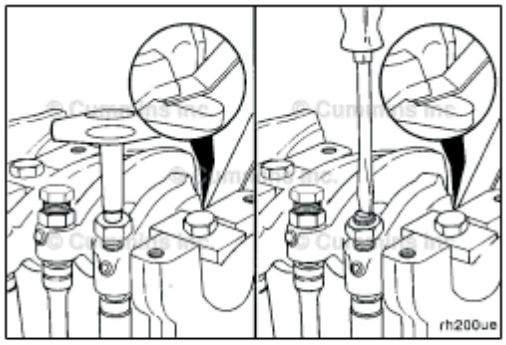


Two different methods for establishing valve lash clearance are described below. Either method can be used; however, the torque wrench method has proven to be the most consistent. It eliminates the need to feel the drag on the feeler gauge.

- Torque Wrench Method: Use the inch-pound torque wrench, Part Number 3376592, normally used to set preload on top-stop injectors and tighten the adjusting screw.

Torque Value: 0.7 N•m [6 in-lb]

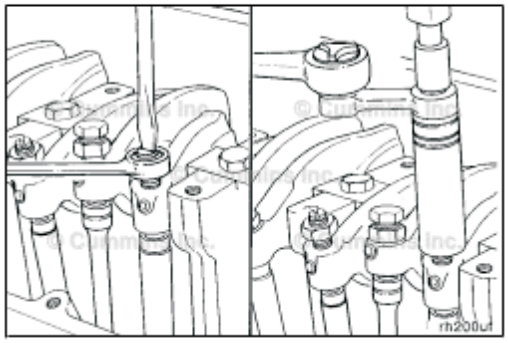
- Touch Method: Tighten the adjusting screw until a slight drag is felt on the feeler gauge.



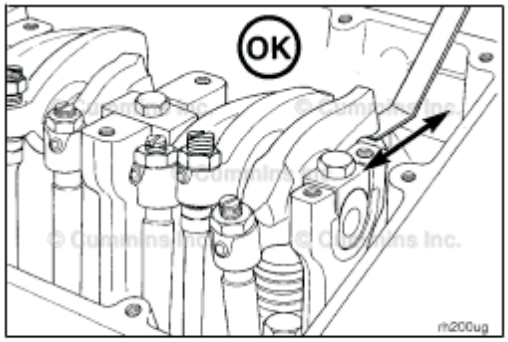
Hold the adjusting screw in this position. The adjusting screw **must not** turn when the locknut is tightened.

Torque Value:

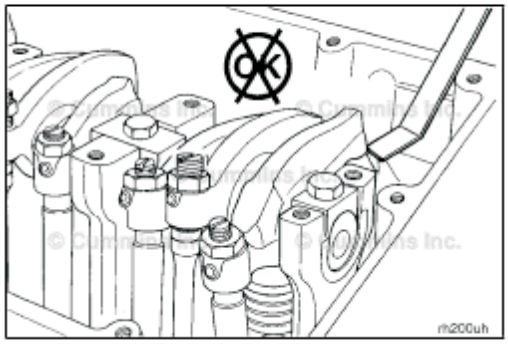
Without torque wrench adapter	61 N•m	[45 ft-lb]
With torque wrench adapter, Part Number 3163196	47 N•m	[35 ft-lb]



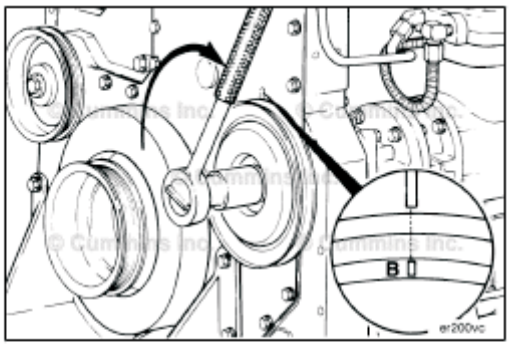
After tightening the locknut to the correct torque value, check to make sure the feeler gauge will slide backward and forward between the crosshead and the rocker lever with **only** a slight drag.



If using the touch method, attempt to insert a feeler gauge that is 0.03 mm [0.001 in] thicker between the crosshead and the rocker lever pad. The valve lash is **not** correct when a thicker feeler gauge will fit.

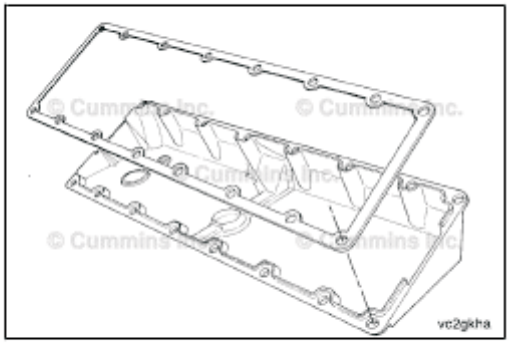


After adjusting the injector, valves, and engine brakes (if equipped) on the appropriate cylinder, rotate the accessory drive pulley, and align the next valve set mark with the pointer on the gear cover.



If the valve cover gasket was **not** damaged, it can be used again. If the gasket was damaged, it **must** be discarded and a new one installed.

Install the gasket on the cover.

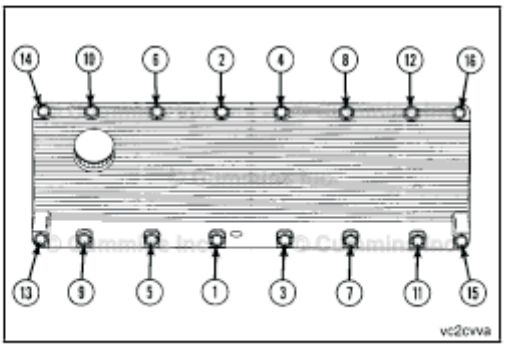


Install the cover on the rocker lever housing.

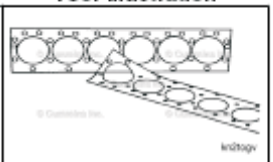
Install the 16 isolators, spacers, and capscrews in the cover.

Tighten the capscrews in the sequence shown.

Torque Value: 15 N•m [130 in-lb]



The following special tools are recommended to perform procedures in this section. The use of these tools is shown in the appropriate procedure. These tools can be purchased from your local Cummins Authorized Repair Location.

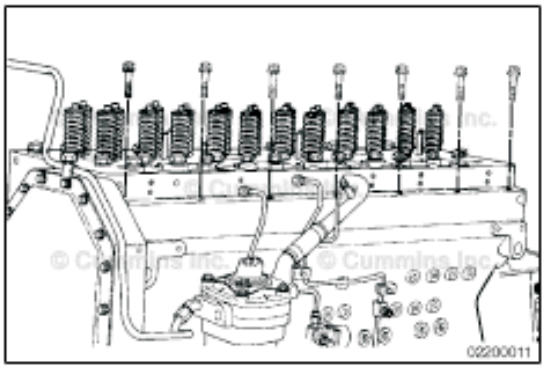
Tool No.	Tool Description	Tool Illustration
3376082	**Cylinder Head Water Test Fixture** Used to pressure-test the cylinder head injector sleeves for leakage.	
3822479	**Cylinder Head Lifting Bracket** Used for lifting the cylinder head on and off the engine.	
3823546	**Cylinder Head Capscrew Length Gauge** Used to measure the length of the cylinder head mounting capscrews.	

Remove

⚠WARNING⚠

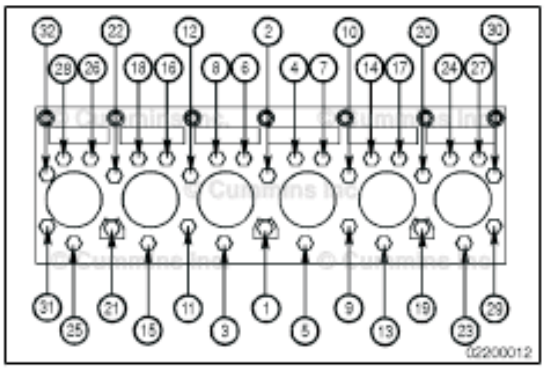
This component weighs 23 kg [50 lb] or more. To reduce the possibility of personal injury, use a hoist or get assistance to lift this component.

Remove the seven 12-point cylinder head capscrews on the fuel pump side of the engine.



Remove the remaining 32 cylinder head capscrews in the sequence shown.

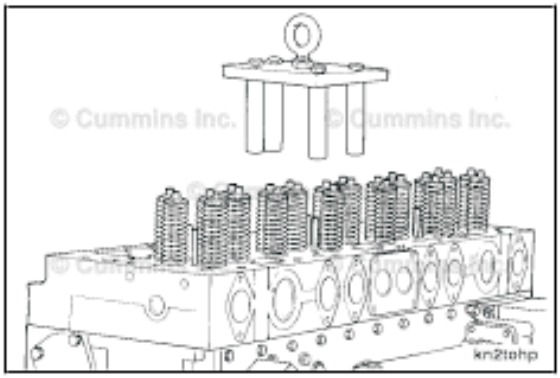
Three capscrews are located inside the intake ports.



Install cylinder head lifting bracket, Part Number 3822479, with two rocker lever support mounting capscrews and two of the long rocker housing mounting capscrews.

Tighten the capscrews.

Torque Value: 47 N•m [35 ft-lb]



⚠WARNING⚠

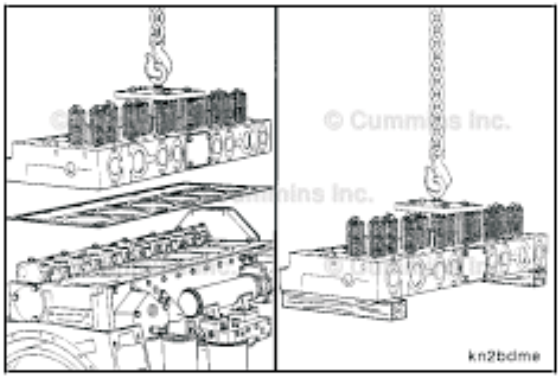
This component weighs 23 kg [50 lb] or more. To reduce the possibility of personal injury, use a hoist or get assistance to lift this component.

△CAUTION△

Place the cylinder head on wood blocks to prevent damage to the combustion face.

Use a hoist or hydraulic arm, and remove the cylinder head.

Remove the cylinder head gasket.



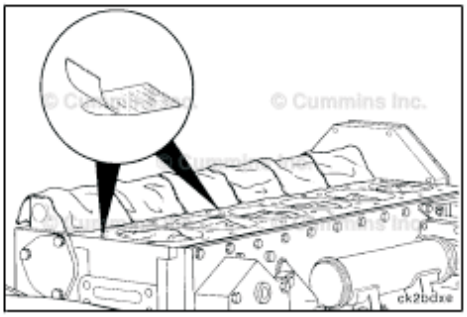
Clean

⚠CAUTION⚠

If the oil passages are not plugged or covered before cleaning, a crankshaft failure can occur.

Place clean, lint-free rags over the cam followers and above the pistons to prevent dirt from falling into the engine.

Plug or cover the coolant and oil passages in the cylinder block deck.



⚠WARNING⚠

When using solvents, acids, or alkaline materials for cleaning, follow the manufacturer's recommendations for use. Wear goggles and protective clothing to reduce the possibility of personal injury.

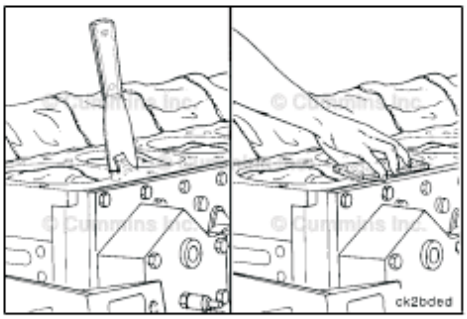
⚠WARNING⚠

Wear appropriate eye and face protection when using compressed air. Flying debris and dirt can cause personal injury.

Use a gasket scraper to clean the cylinder block deck surface.

Use Scotch-Brite™ 7448 abrasive pad, Part Number 3823259, or equivalent, and solvent to remove any residual gasket material from the cylinder block deck surface.

Make sure the cylinder head capscrew holes are clean and free of debris, oil, and coolant.



⚠WARNING⚠

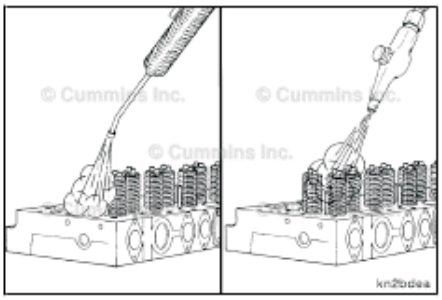
When using a steam cleaner, wear safety glasses or a face shield as well as protective clothing. Hot steam can cause serious personal injury.

⚠WARNING⚠

Wear appropriate eye and face protection when using compressed air. Flying debris and dirt can cause personal injury.

Steam clean the cylinder head and dry with compressed air.

Use compressed air to blow out all capscrew holes.

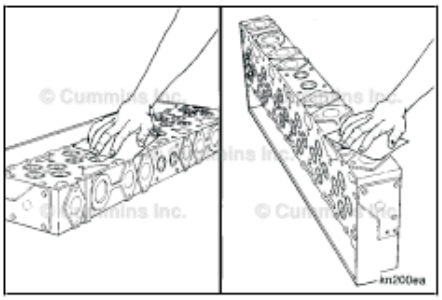


⚠WARNING⚠

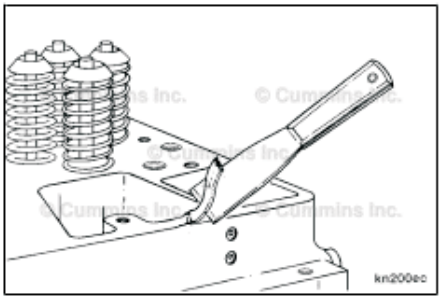
When using solvents, acids, or alkaline materials for cleaning, follow the manufacturer's recommendation for use. Wear goggles and protective clothing to reduce the possibility of personal injury.

Use Scotch-Brite™ 7448 abrasive pad, Part Number 3823258, or equivalent, and solvent to clean the cylinder head combustion face.

Clean the exhaust manifold gasket surface.



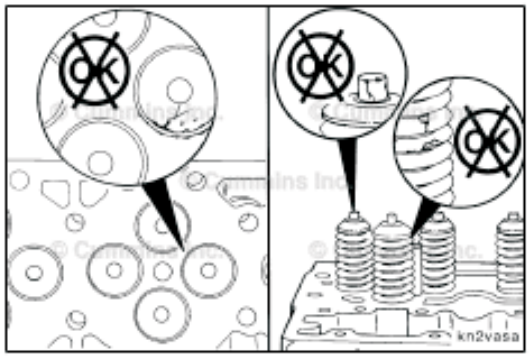
Clean the rocker housing gasket surface.



Inspect the valves and valve springs for cracks, bent or broken valve stems, broken valve spring collets, or other damage.

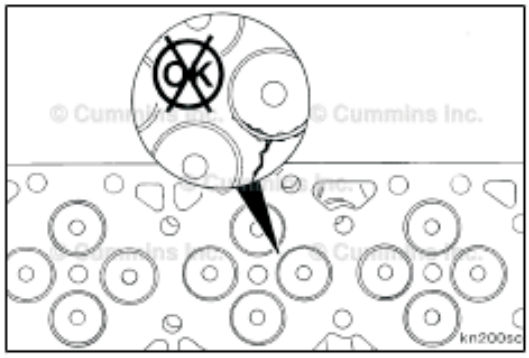
Inspect the valves for indications of leaking or burning.

If cracked or damaged parts or indication of leaking or burning is found, the cylinder head **must** be rebuilt. Refer to the M11 Series Shop Manual, Bulletin 3666075.



Inspect the cylinder head and valves for cracks or damage.

If a crack in the cylinder head is suspected, pressure-test the cylinder head. See Pressure Test in this procedure.



Measure the flatness of the cylinder head combustion face surface as follows:

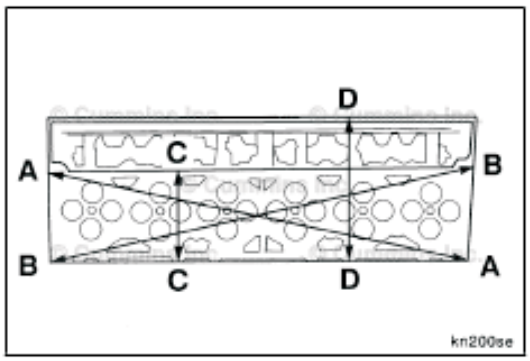
- AA and BB (corner to corner)
- CC (across combustion face)
- DD (across entire head surface).

Dimensions CC and DD **must** be checked from front to rear of cylinder head.

Cylinder Head Flatness

	mm		in
AA and BB	0.200	MAX	0.008
CC	0.076	MAX	0.003
DD	0.127	MAX	0.005

If the cylinder head is pitted, has grooves or wear greater than the maximum specified, the cylinder head surface **must** be machined or cut. Refer to the L10 Alternative Repair Shop Manual, Bulletin 3810310.



⚠WARNING⚠

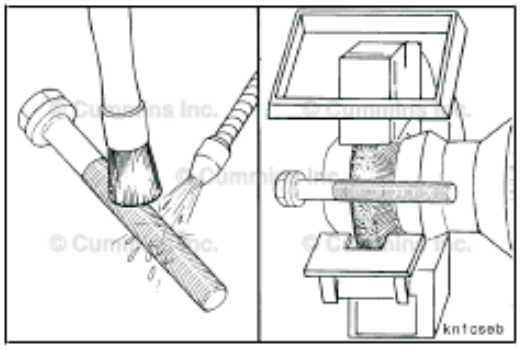
When using solvents, acids, or alkaline materials for cleaning, follow the manufacturer's recommendation for use. Wear goggles and protective clothing to reduce the possibility of personal injury.

⚠CAUTION⚠

Do not use caustic or acid solutions to clean the cylinder head capscrews to avoid damage to cylinder head capscrews.

Clean the cylinder head capscrews with a petroleum-based solvent.

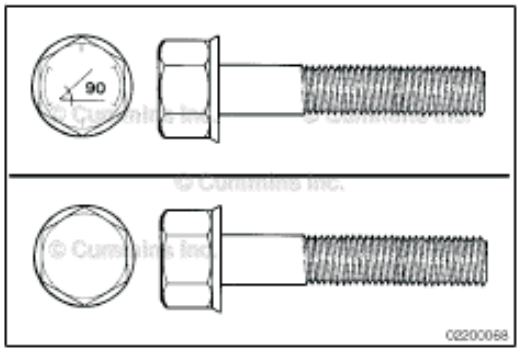
Clean the capscrews thoroughly with a wire brush, with a wire wheel (soft), or use a nonabrasive bead blast to remove deposits from the shank and threads.



Using flange head capscrews with the torque plus angle method of installation places the capscrews beyond the yield point and permanently stretches the capscrews. These capscrews can be reused throughout the life of the engine unless the capscrew exceeds the specified free length. The free length **must** be checked to avoid bottoming in the block during installation.

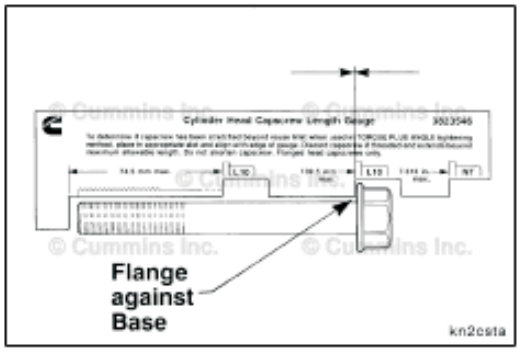
Cylinder head capscrew length gauge, Part Number 3823546, has been designed to check capscrew free length.

NOTE: The new capscrews are coated with grey coating and do **not** have the 90 degree markings on the capscrew.

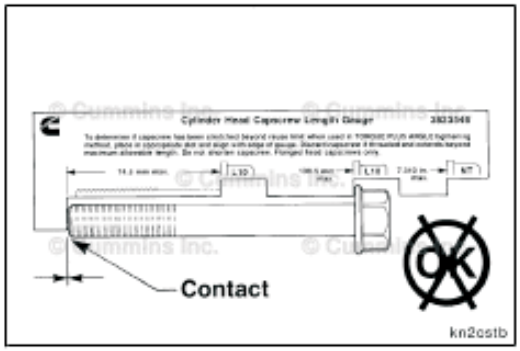


To check the capscrew free length, place the head of the capscrew in the appropriate slot, long or short, with the flange against the base of the slot.

Use the slot marked for L10 cylinder head capscrews when checking M11 cylinder head capscrews.

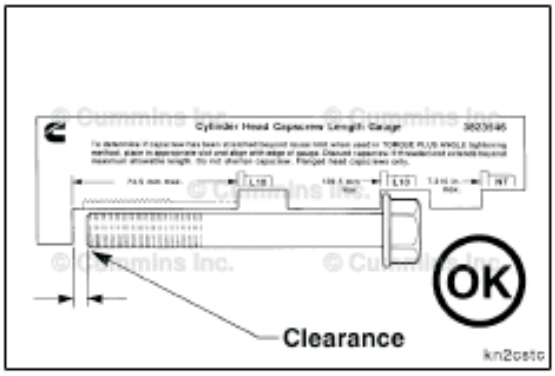


If the end of the capscrew touches the foot of the gauge, the capscrew is too long and **must** be discarded.



Typ Model Type Tipo	**TL420 - 450**	**Motor** **Engine** **Moteur** **Motor**	**Cummins** **QSM 11**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Zylinderkopf** **Cylinder head**			Blatt Page Feuille Página	**3.350.16**

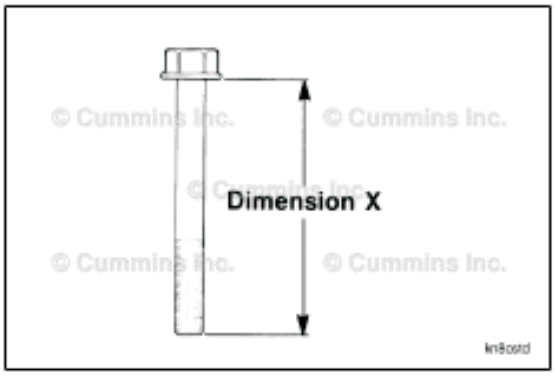
If there is clearance between the end of the capscrew and the bottom base of the tool, the capscrew can be reused.



The capscrew can also be checked using a set of calipers. The maximum allowable free length is measured from the bottom of the flange to the end of the capscrew (dimension X).

Cylinder Head Capscrew Free Length

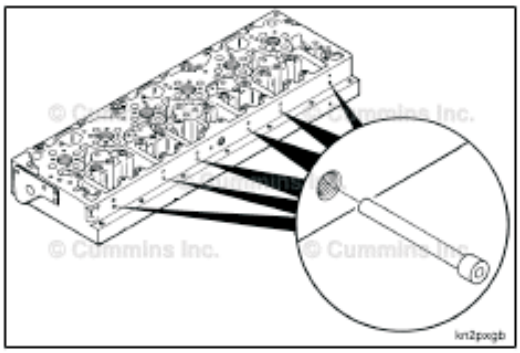
	mm		in
3045849 Short Intake Port Capscrews	74.5	MAX	2.933
3045850 Long Hex Head Capscrews	139.5	MAX	5.492
4923187 Long Hex Head Capscrews	139.5	MAX	5.492



Install

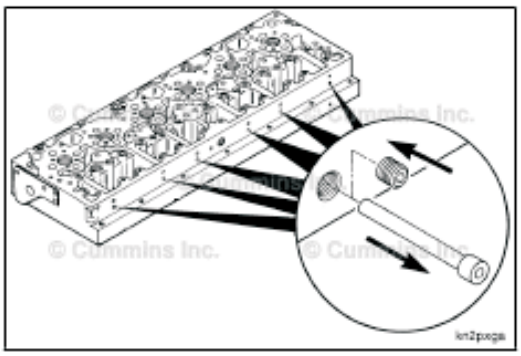
A plastic insert is installed in all fuel inlet passages on new and ReCon® cylinder heads.

The fuel inlet passages are the lower row of drillings.



Depending on the fuel plumbing option, one fuel inlet passage insert **must** be removed to allow fuel to flow to the injectors. If the insert is **not** removed, the engine will **not** start.

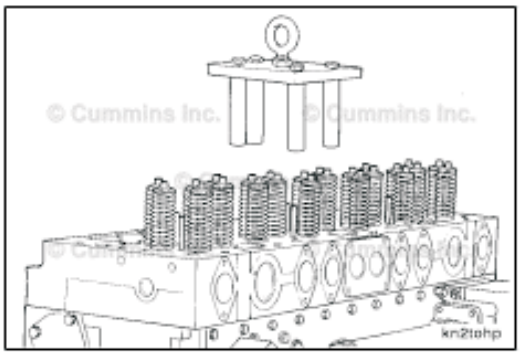
Remove the pipe plug and use a sharp object to pull the insert from the hole.



Install the cylinder head lifting bracket, Part Number 3822476, with two rocker lever support mounting capscrews and two long rocker housing mounting capscrews.

Tighten the capscrews.

Torque Value: 47 N•m [35 ft-lb]



⚠WARNING⚠

This component weighs 23 kg [50 lb] or more. To reduce the possibility of personal injury, use a hoist or get assistance to lift this component.

△CAUTION△

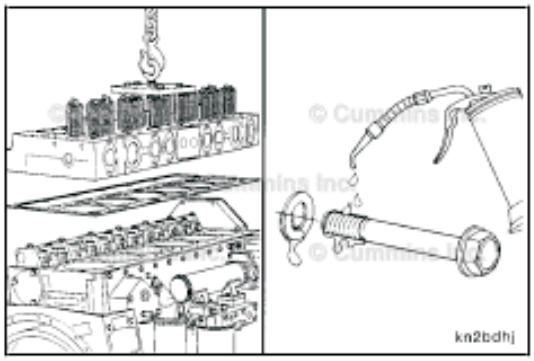
Do not drop the cylinder head on the cylinder head gasket. The gasket material can be damaged.

Install the cylinder head gasket.

Use a hoist or hydraulic arm and install the cylinder head.

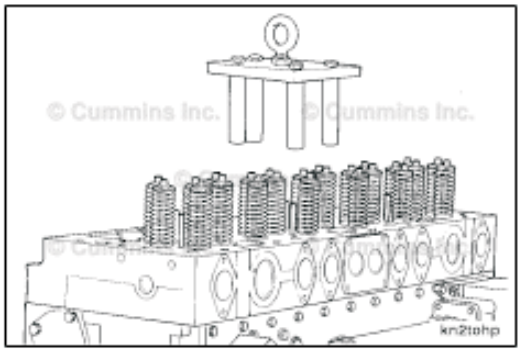
Use clean 15W-40 oil to lightly coat the cylinder head capscrew threads and bottom of the flange.

Allow the excess oil to drain from the capscrew threads.

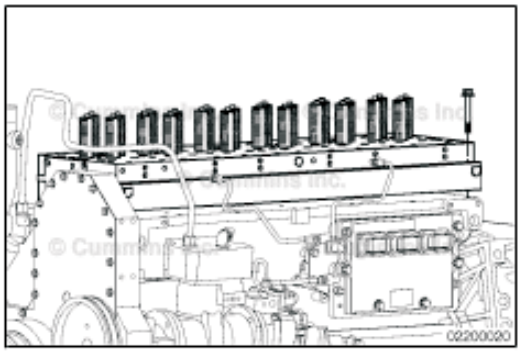


Typ Model Type Tipo	**TL420 - 450**	**Motor** **Engine** **Moteur** **Motor**	**Cummins QSM 11**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Zylinderkopf** **Cylinder head**			Blatt Page Feuille Página	**3.350.18**

Remove cylinder head lifting bracket, Part Number 3822479.

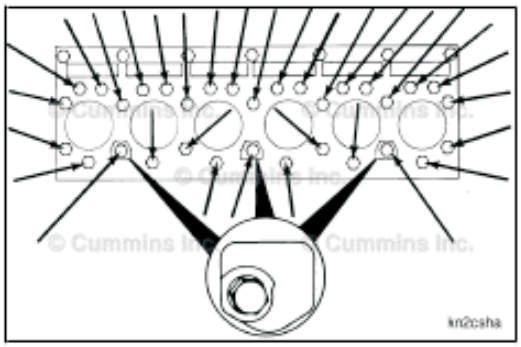


Install the seven hex flange head capscrews with new sealing washers on the fuel pump side of the engine.



Install the remaining 32 cylinder head capscrews in the sequence shown.

Be sure to install the three short capscrews inside the intake ports.

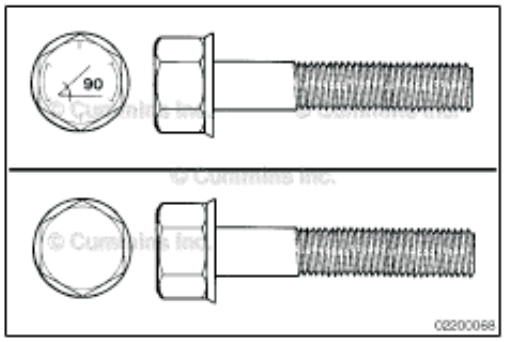


All of the 32 capscrews, old and new, **must** be rotated 180 degrees after they have been tightened according to torque step 2. Make a mark on the cylinder head as a reference. Rotate the capscrew more than two flats and but less than three flats.

After tightening according to torque step 2, mark the cylinder head as a reference.

When using torque plus angle, the tolerance on the 180-degree angle of rotation is between two and three flats. If the capscrew is unintentionally rotated beyond three flats, do **not** loosen the capscrew. The clamp load is still acceptable. However, rotating the capscrew beyond three flats reduces the number of potential reuses.

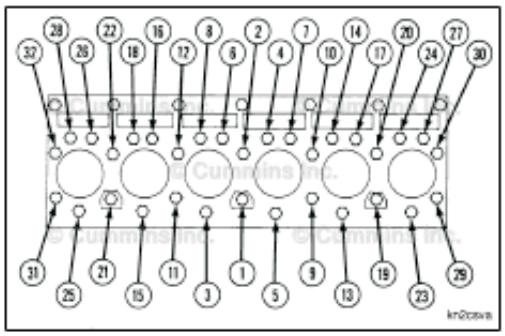
NOTE: This torque procedure is applicable to both old and new capscrews.



Tighten all the capscrews in the sequence shown to the specified values:

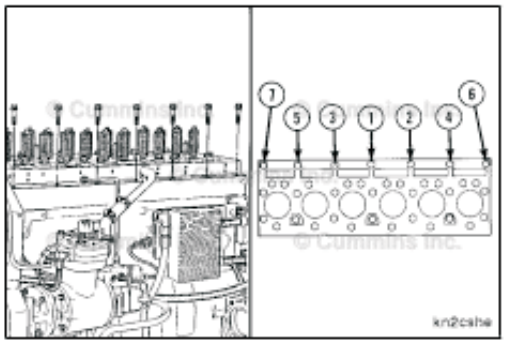
Torque Value: Step1 68 N•m [50 ft-lb]
Step2 136 N•m [100 ft-lb]
Step3 Rotate 180 degrees

NOTE: Rotate at least two flats, but **not** more than three flats.



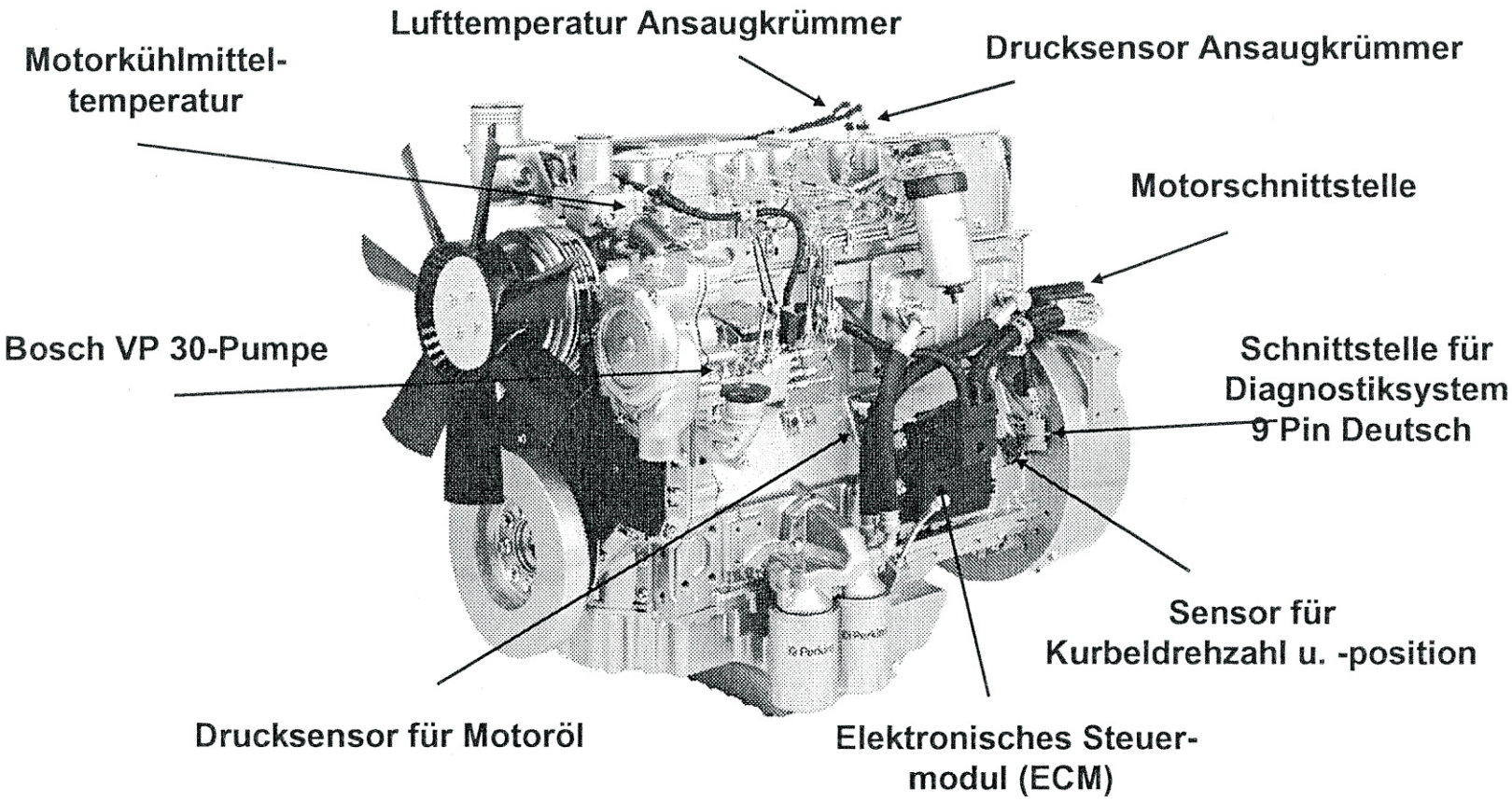
Tighten the seven capscrews in the fuel pump side of the cylinder head in the sequence shown.

Torque Value: 68 N•m [50 ft-lb]



Typ Model Type Tipo	Perkins 1100er Serie	Motor Engine Moteur Motor	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Technische Daten Specification data		Blatt Page Feuille Página	3.450.01

Perkins-Serie 1100



Motorauslegung

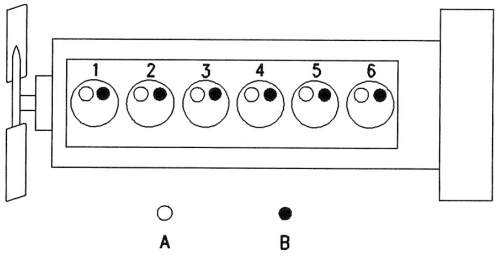


Abbildung 1 g00939480

Lage der Zylinder und Ventile

(A) Einlassventil
(B) Auslassventil

Bohrung ..... 100 mm (3,937 inch)

Hub ..... 127 mm (5,00 inch)

Hubraum ..... 6 l (366 in^3)

Zylinderanordnung ..... Reihe

Verbrennungsart ..... Direkteinspritzung

Verdichtungsverhältnis 17,25:1

Anzahl der Zylinder 6

Ventile pro Zylinder 2

Ventilspiel

Einlassventil ..... 0,20 mm (0,008 inch)
Auslassventil ..... 0,45 mm (0,018 inch)

Zündfolge 1, 5, 3, 6, 2, 4

Von der Vorderseite des Motors aus gesehen dreht sich die Kurbelwelle in folgender Richtung: ..... im Uhrzeigersinn

Von der Vorderseite des Motors aus gesehen dreht sich die Nockenwelle in folgender Richtung: ..... im Uhrzeigersinn

Ventilspiel einstellen

Tabelle 4

	Einlassventile	Auslassventile
Ventilspiel	0,20 mm (0,008 inch)	0,45 mm (0,018 inch)
o. T. Verdichtungstakt	1-2-4	1-3-5
o. T. Auspufftakt(1)	3-5-6	2-4-6
Zündfolge	1-5-3-6-2-4(2)	

(1) 360° vom o. T. Verdichtungstakt
(2) Zylinder Nr. 1 befindet sich vorne am Motor.

Die Vorderseite des Motors befindet sich gegenüber dem Schwungradende des Motors. Die linke und rechte Motorseite wird von der Schwungradseite aus festgelegt. Zylinder Nr. 1 befindet sich vorne am Motor.

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Kraftstoffeinspritzungs-leitungen

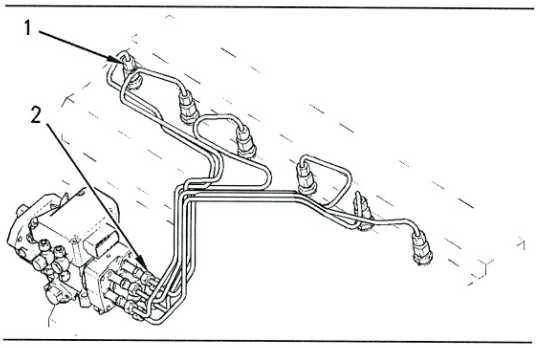


Abbildung 2 g00885325

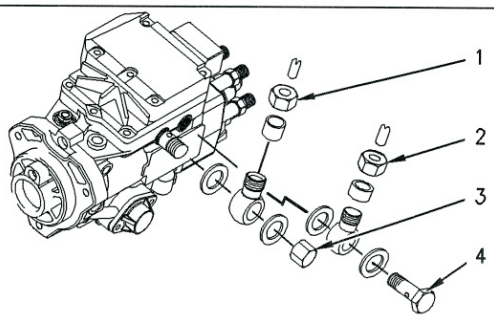
Typisches Beispiel

(1) Überwurfmutter mit folgendem Anziehdrehmoment festziehen: ..... 27,5 Nm (20 lb ft)

(2) Überwurfmutter mit folgendem Anziehdrehmoment festziehen: ..... 27,5 Nm (20 lb ft)

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Kraftstoffeinspritzpumpe



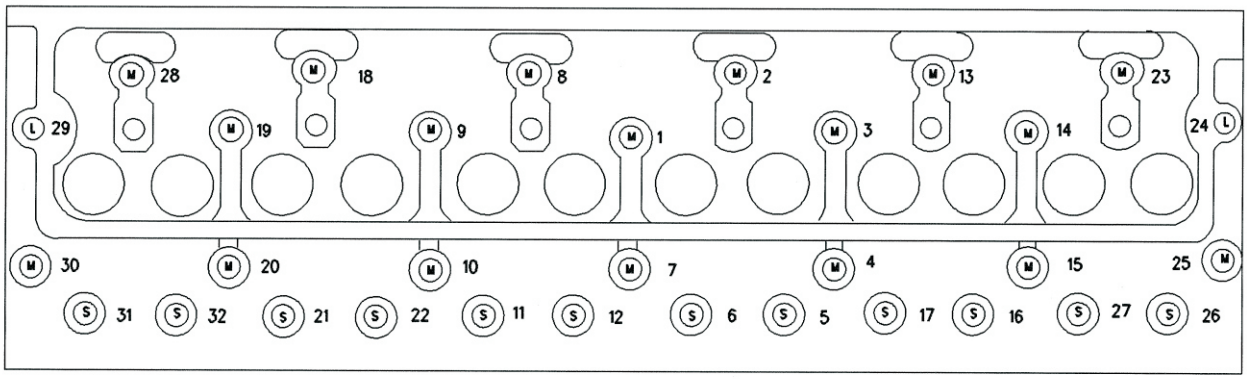
(1) Kompressionsmutter mit folgendem Anziehdrehmoment festziehen: .. 9 Nm (80 lb in)

(2) Kompressionsmutter mit folgendem Anziehdrehmoment festziehen: .. 9 Nm (80 lb in)

(3) Hutmutter mit folgendem Anziehdrehmoment festziehen: ..... 22 Nm (16 lb ft)

(4) Hohlschraube mit folgendem Anziehdrehmoment festziehen: ..... 25 Nm (19 lb ft)

Zylinderkopf



Reihenfolge für das Anziehen der Schrauben beim Zylinderkopf

Schrauben für den Zylinderkopf nach folgendem Verfahren festziehen:

1. Sauberes Motoröl auf das Gewinde der Schrauben auftragen. Die Schrauben werden in der numerischen Reihenfolge festgezogen, wie in Abbildung 17 dargestellt.

Schrauben mit folgendem Anziehdrehmoment festziehen: ..... 110 Nm (80 lb ft)

2. Schritt 1 wiederholen, damit sichergestellt ist, dass alle Schrauben mit dem vorgeschriebenen Anziehdrehmoment festgezogen sind.

3. Schrauben in der in Abbildung 17 dargestellten numerischen Reihenfolge mit dem spezifizierten zusätzlichen Anziehdrehmoment festziehen.

a. Kurze Schrauben (S) um zusätzlich 150 Grad (2,5 Sechskantseiten) festziehen.

b. Mittelgroße Schrauben (M) um zusätzlich 180 Grad (3,0 Sechskantseiten) festziehen.

c. Lange Schrauben (L) um zusätzlich 210 Grad (3,5 Sechskantseiten) festziehen.

Kraftstoffeinspritzpumpe

Bosch Fuel Injecion Pump

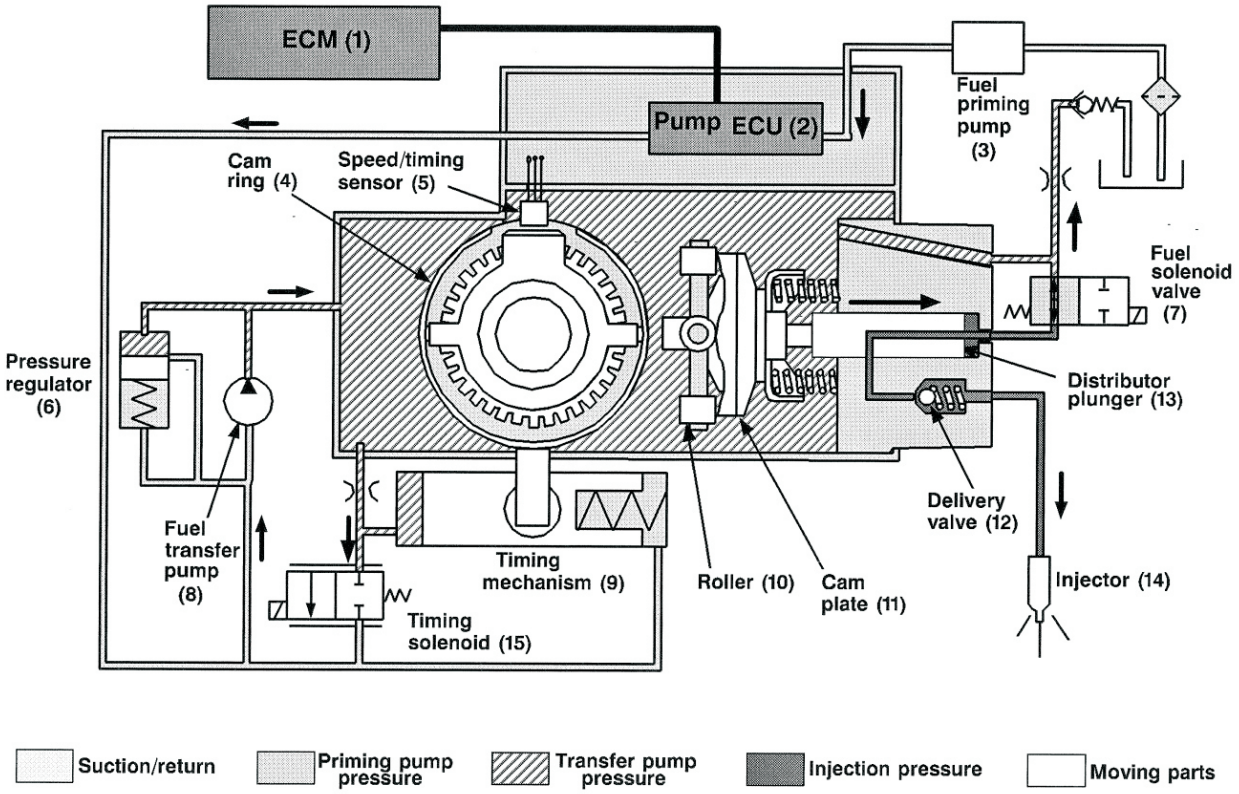


Abbildung 25 g00953215

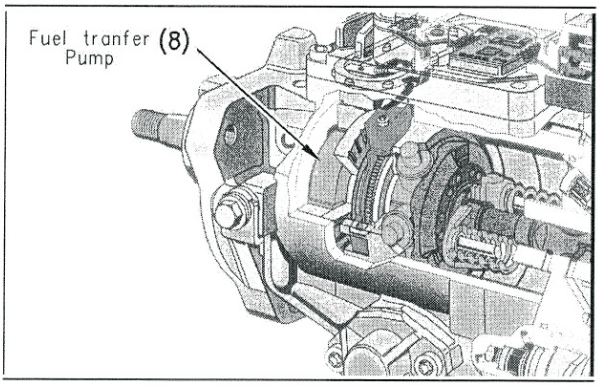
Schema der Bosch-Kraftstoffeinspritzpumpe

(1) ECM (Elektronische Steuereinheit)
(2) Elektronisches Steuergerät (ECU) der Einspritzpumpe
(3) Kraftstoff-Entlüftungspumpe
(4) Nockenring
(5) Drehzahl-/OT-Sensor
(6) Druckregler
(7) Kraftstoff-Magnetventil
(8) Kraftstoffförderpumpe
(9) Ventilsteuerungsmechanismus
(10) Rollenring
(11) Nockenplatte
(12) Lieferventil
(13) Verteilerstößel
(14) Einspritzdüse
(15) Ventilsteuerungs-Magnetventil

Die Kraftstoffeinspritzpumpe leistet Folgendes:

- Förderung
- Erzeugung von Hochdruck
- Verteilung und Einspritzung
- Ventilsteuerung
- Abstellen
- Regelung

Förderung



Typ Model Type Tipo	**Perkins 1100er Serie**	**Motor Engine Moteur Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einspritzpumpe Injection Pump**		Blatt Page Feuille Página	**3.450.04**

- Nach dem Ersetzen des Kraftstofffilters.

Folgendes Verfahren durchführen, um das Kraftstoffsystem zu entlüften:

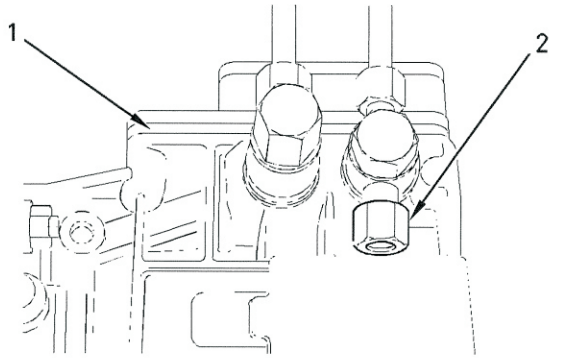


Abbildung 37 g00911348

1. Mutter (2) an Kraftstoffeinspritzpumpe (2) lösen.

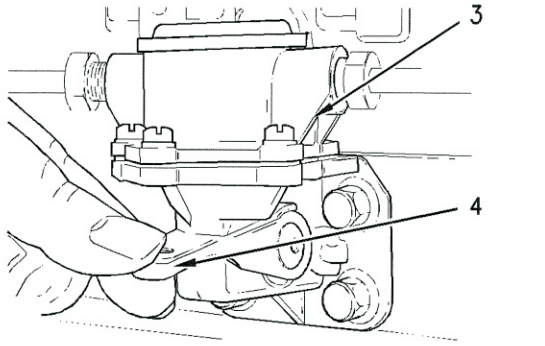


Abbildung 38 g00911349

Anmerkung: Wenn sich die Antriebsnocke für die Kraftstoff-Entlüftungspumpe in der maximalen Hubstellung befindet, funktioniert der Entlüftungshebel nicht. Die Kurbelwelle von Hand um eine Umdrehung drehen.

2. Mit Entlüftungshebel (4) der Entlüftungspumpe (3) pumpen, bis der Kraftstoff frei von Luftblasen aus Mutter (2) herausfließt.

3. Mutter (2) mit 23 Nm (17 lb ft) festziehen.

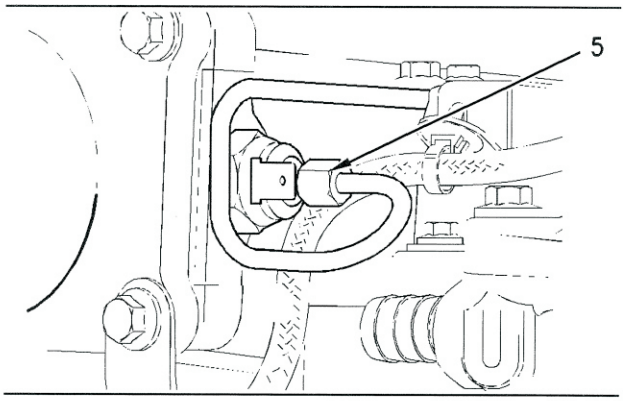


Abbildung 39 g00911351

4. Wenn die Kraftstoffleitung für die Ansaugluft-Vorwärmanlage entleert worden ist, Mutter (5) lösen. Den Anschluss an der Konusmutter beobachten. Mit dem Entlüftungshebel der Kraftstoff-Entlüftungspumpe pumpen, bis sich keine Luftblasen mehr im Kraftstoff befinden.

5. Mutter (5) mit 6 Nm (53 lb in) festziehen.

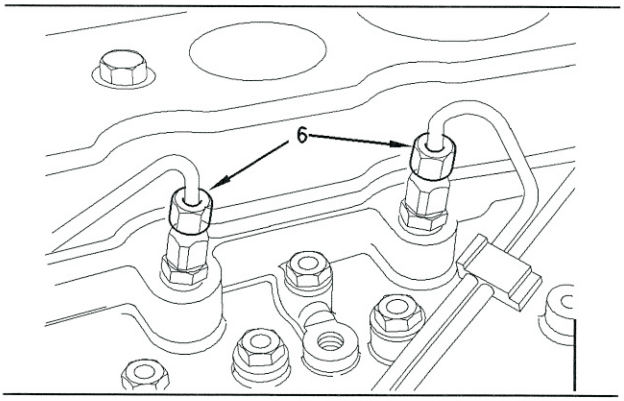


Abbildung 40 g00998751
Hochdruckrohre

Anmerkung: Die Kraftstoffeinspritzpumpe, die Batterie und der Startermotor können beschädigt werden, wenn der Startermotor zu häufig zum Entlüften des Kraftstoffsystems eingesetzt wird.

6. Die Konusmuttern (6) der Hochdruck-Kraftstoffleitungen an allen Kraftstoffeinspritzdüsen lösen.

HINWEIS
Den Motor nicht länger als 30 Sekunden durchdrehen. Den Startermotor zwei Minuten lang abkühlen lassen, bevor der Motor erneut durchgedreht wird.

Indicator lamps

Lamp states before engine is cranked - bulb check

When the ignition is turned on, the ECM will illuminate each bulb for 2 seconds then extinguish them, unless the cold start illumination is required.

On 	On 	For 2 seconds or until the engine is cranked
Then off  unless cold start	Off 	

Lamp states before engine is cranked - cold start indication

Solid warning lamp at start then will go out when ready to crank

Solid 	Off 	Whilst 'start aid' is operating
Then off 	Off 	When engine is cranked or start aid operation completed

Lamp states whilst engine cranking

When the engine is cranked the EMS will only illuminate the engine indicator lamps if necessary - e.g. lack of lubrication oil pressure after start delay exceeded, the engine stop lamp will be illuminated.

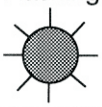
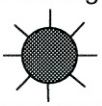
Off 	Off 	No problems
Off 	On 	Lubrication oil pressure low (after delay exceeded)

Lamp states after engine cranking - if engine failed to start

Off 	Off 	No detected faults
On 	Off 	Electrical fault warning
Off 	Flashing 	Stop engine - stop engine fault detected that prevented the engine start

Other lamp states

Lamp states that may be exhibited when the engine is running or has shut down automatically

Off 	Off 	No detected faults
Off 	On 	Oil pressure low
Flashing 	Off 	Coolant temp is high or intake air temp is high, engine may be de - rating
Off 	Flashing 	Stop engine fault detected or exceeding de-rate conditions
On 	Off 	Electrical fault warning
On 	On 	Oil pressure is low and electrical fault warning
On 	Flashing 	Stop engine fault detected or exceeding de-rate conditions and electrical fault warning
Flashing 	On 	The oil pressure is low and the coolant temp is high or intake air temperature is high etc. engine may be de - rating

A4E1 electronic control system

Key system components

The 1100 Series electronic engine management system consists of the Engine Control Module ECM, an electronically controlled fuel pump and a collection of engine, machine and operator sensors.

The ECM (A1) controls the engine operating parameters based upon the software within the ECM and the inputs from the various sensors. The software contains many parameters that control the engine operation including all the rating maps and the customer selectable configuration parameters.

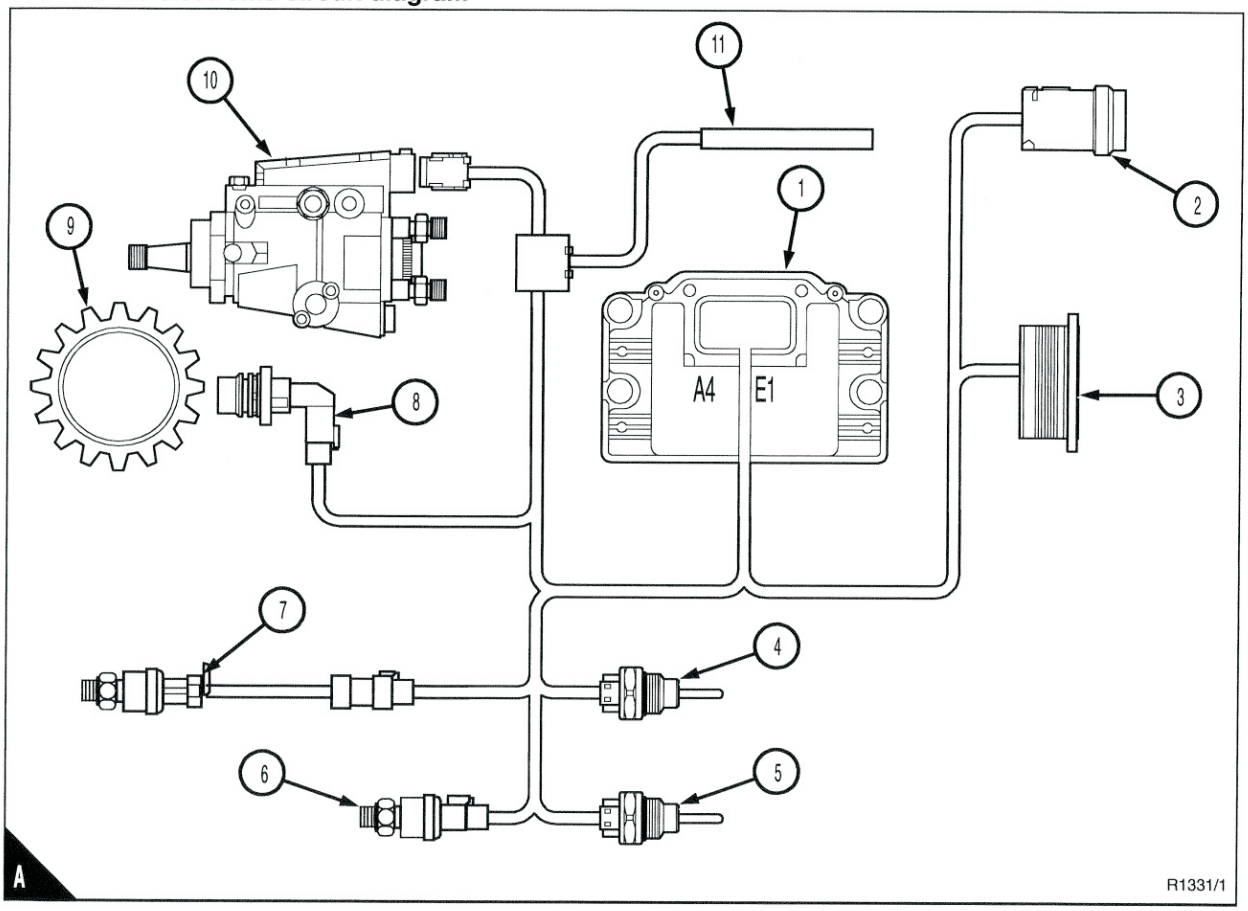
A diagnostic connector (A2) is fitted to all 1100 Series electronic engines; It is used to ensure that all Perkins engines can be serviced and repaired by either the diagnostic code reader or by the Perkins TIPSS diagnostic suite.

Machine interface connector (A3) is the means by which the engine is connected to the machine. This connector is used to provide all control, power, and data feeds to the engine, except starter motor power / start aids, fuel lift pump and ground. It is an industry standard 70-pin Deutsch connector.

Intake manifold temperature sensor (A4) measures the air temperature in the intake manifold and sends a proportional signal to the engine ECM. Information from this sensor is used to determine the air mass flow into the engine, therefore allowing the correct air / fuel ratio to be maintained. It also provides information to smoke limiting strategies, especially at lower air temperatures where the amount of fuel injected must be carefully controlled to minimise smoke.

Coolant temperature sensor (A5) detects the coolant temperature in the thermostat housing during engine start and running, and sends a proportional signal to the engine ECM. This input is used for engine protection, cold fuelling compensation and to drive gauges and warning

1100 Series electronic circuit diagram



Typ Model Type Tipo	**Perkins** **1100er Serie**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Elektronische Steuerung** **Electronic control schematic**		Blatt Page Feuille Página	**3.450.08**

Oil pressure sensor (A6) detects pressure of the engine lubricating oil during engine start and running, and sends a proportional signal to the engine ECM. This input is primarily used for engine protection; to drive gauges and warning lamps and instigate warning or shutdown.

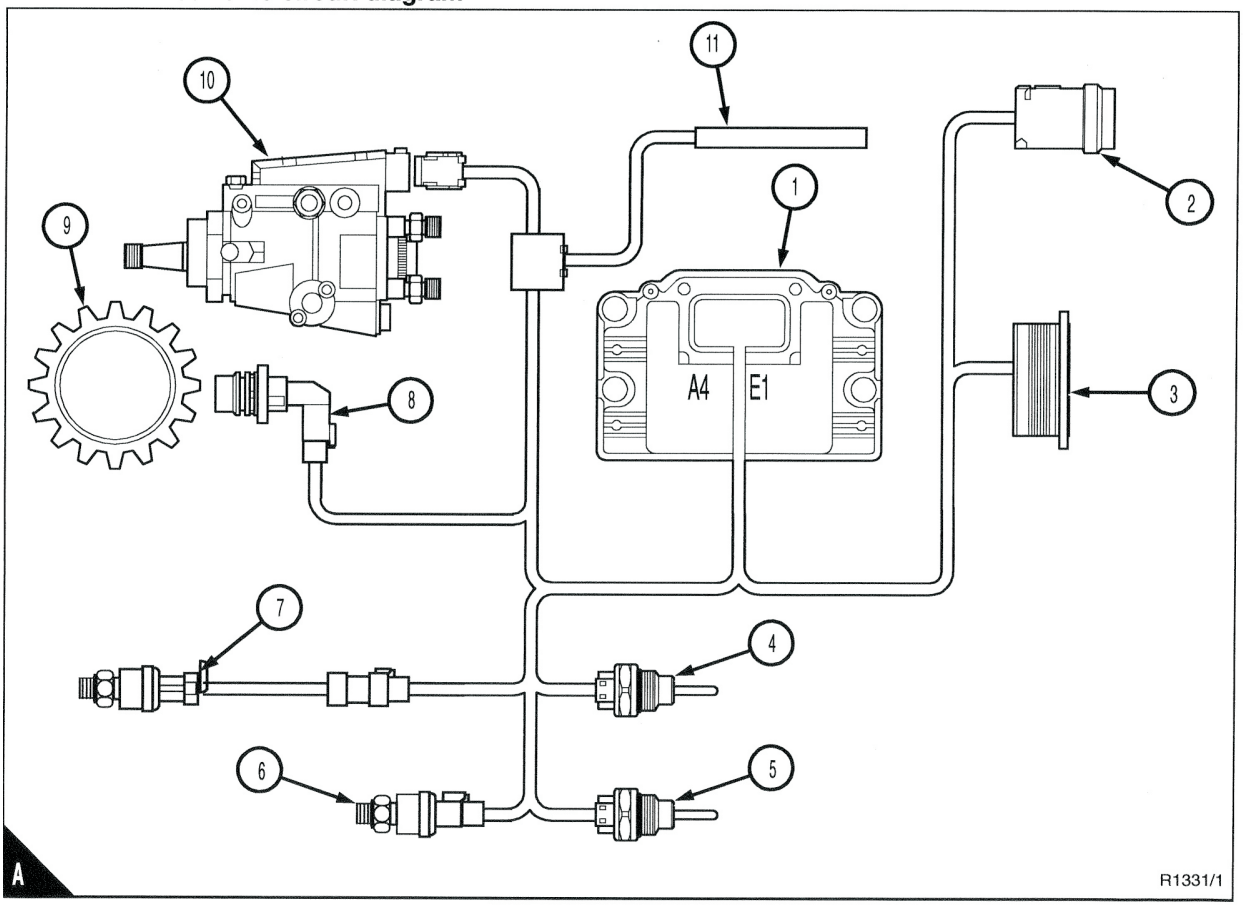
Intake manifold pressure sensor (A7) detects the air pressure in the intake manifold during engine running and sends a proportional signal to the engine ECM. Before the engine is started, this sensor measures the pressure in the intake manifold and uses this as a measure of the atmospheric pressure this removes the need for a separate sensor to provide altitude compensation. Information from this sensor is used to determine the air mass flow into the engine, therefore allowing the correct air / fuel ratio to be maintained.

Speed sensor (A8) generates pulses from the toothed timing ring on the crank see "1100 Series electronic circuit diagram" on page 4. This enables the ECM to calculate engine speed. The toothed ring (A9) has 35 teeth set at 10° intervals, with one missing tooth that allows the crank position to be determined.

Fuel pump (A10) with integrated controller (PSG) controls fuel injection quantity and timing to meet ECM demands. The ECM controls the amount and timing of fuel injected by the pump message via a CAN transmitted to the fuel pump PSG. The fuel pump controller determines the pumps rotational timing. The controller determines the quantity of fuel injected as a function of pump speed, fuel temperature and the duration for which the spill valve is closed. This is pre - calibrated in the pump, so that using the requested fuel injection quantity from the engine ECM, the pump PSG looks up in the calibration table what the relative timing of the closing and opening of the spill valve should be. The start of this period is based on the timing request from the ECM and is commenced by closing the fuel pump spill valve (stopping the fuel from spilling to the low pressure side) and forcing the fuel to flow to the injectors. End of injection occurs when the spill valve opens again.

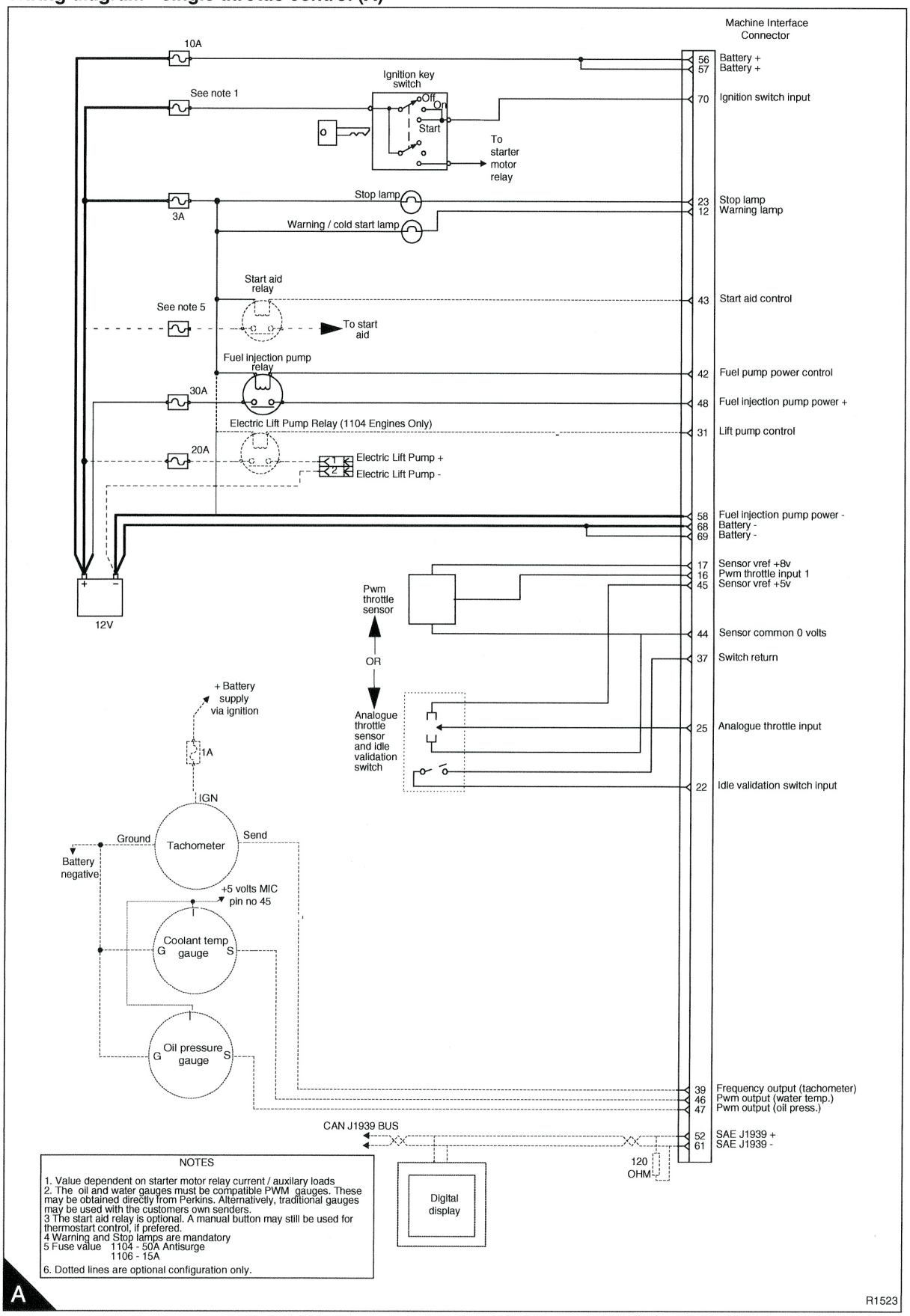
Voltage load dump protection module (A11) Provides protection against voltage spikes for the fuel injection pump.

1100 Series electronic circuit diagram

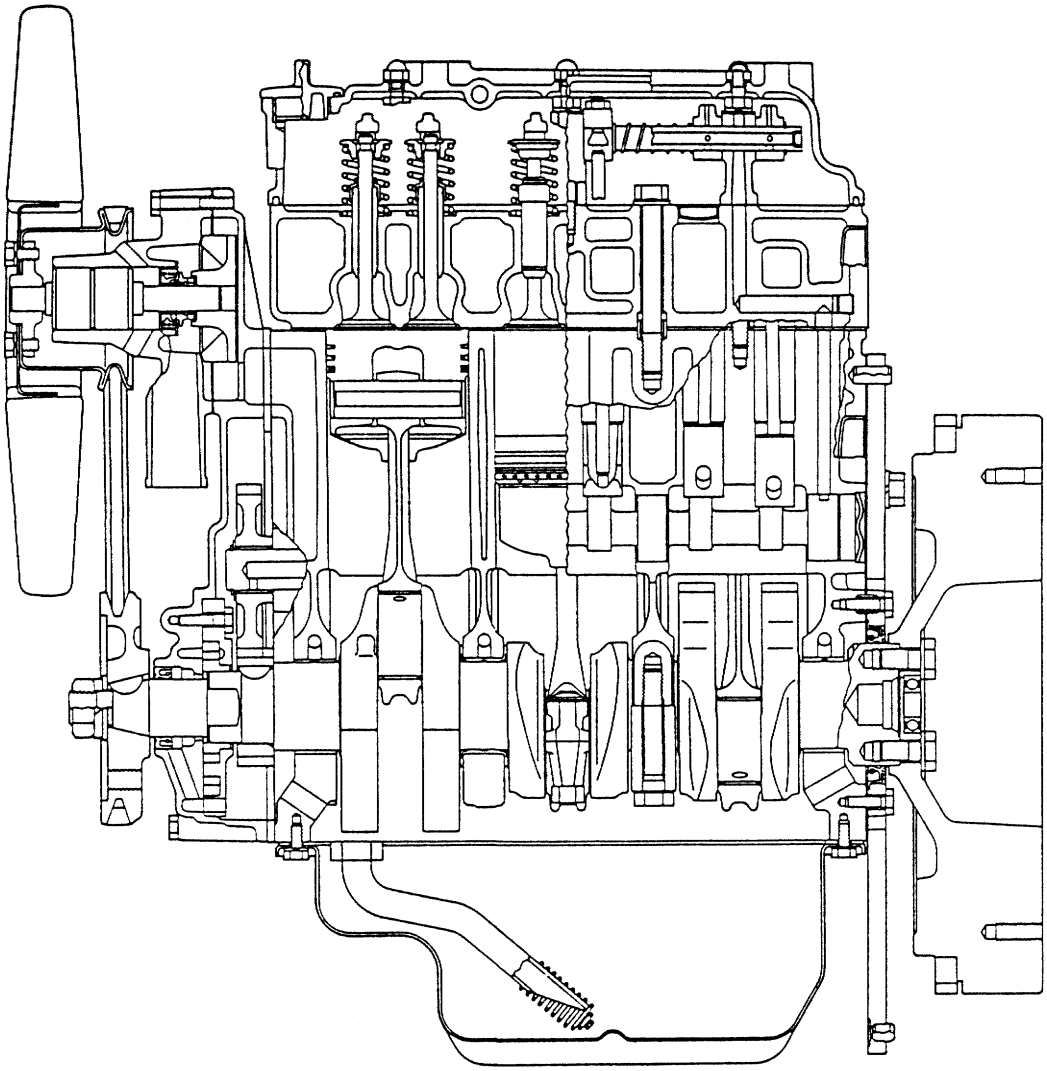


Typ Model Type Tipo	**Perkins** **1100er Serie**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Elektronische Steuerung** **Electronic control schematic**		Blatt Page Feuille Página	**3.450.09**

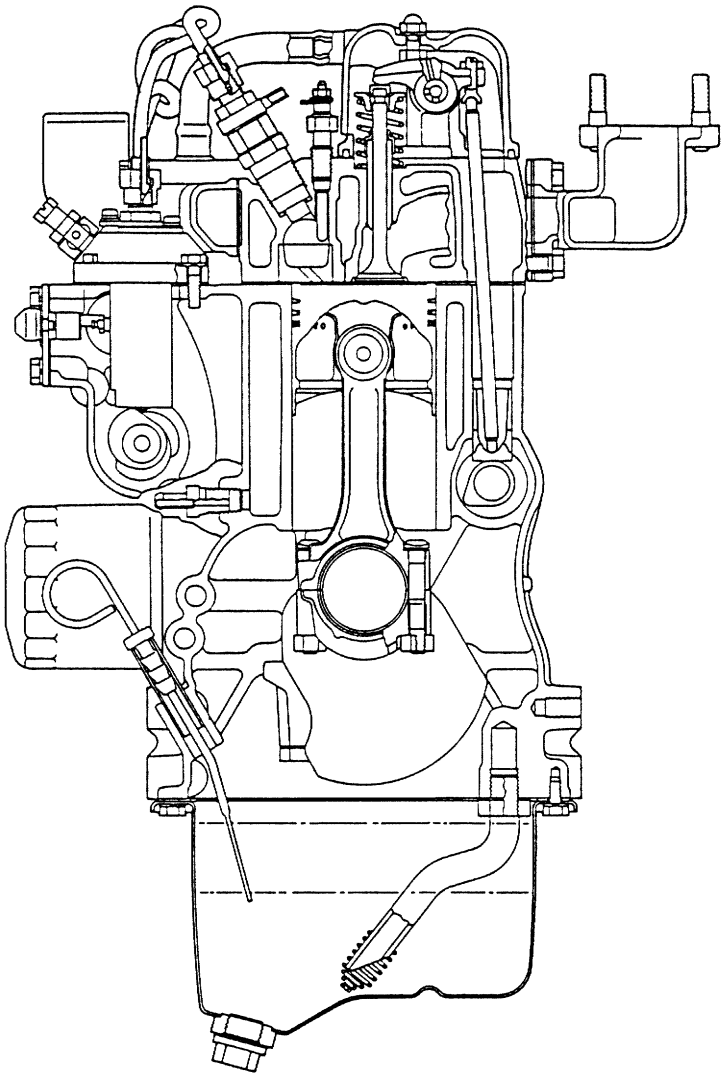
Wiring diagram - single throttle control (A)



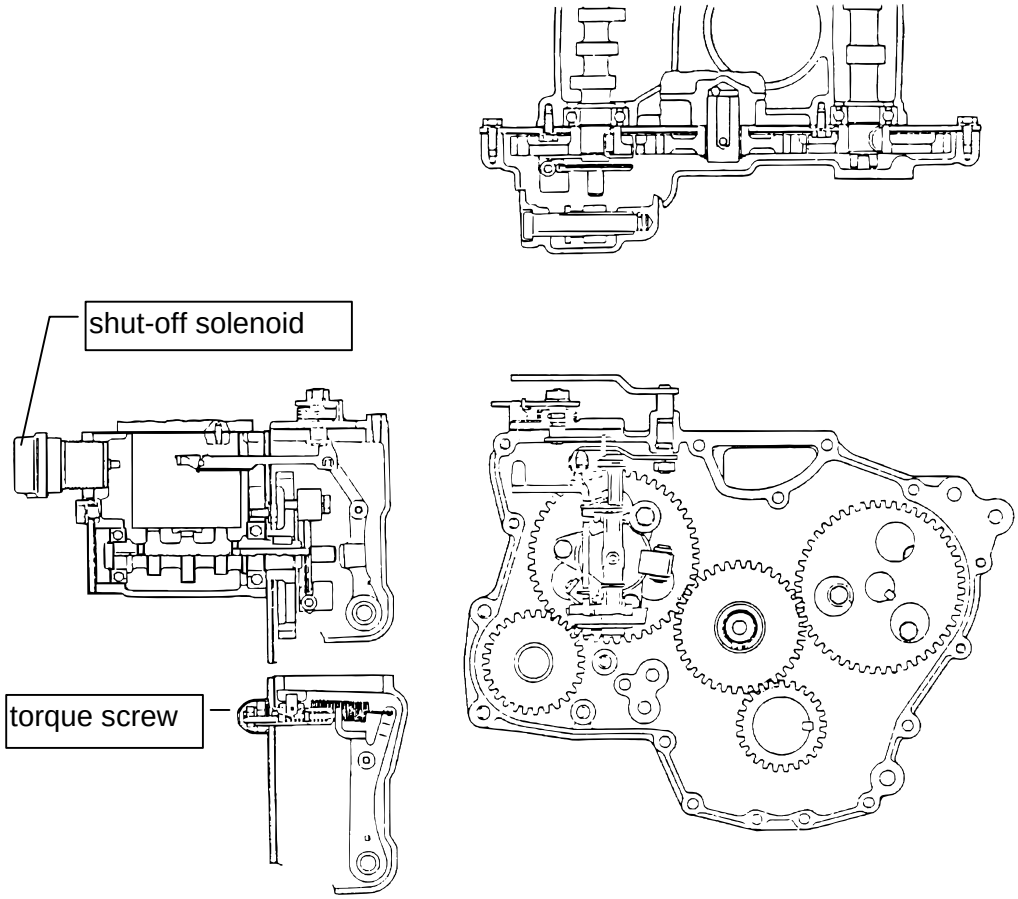
Typ Model Type Tipo	**Perkins 1100er Serie**	**Motor Engine Moteur Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Stromlaufplan Wiring schematic**		Blatt Page Feuille Página	**3.450.10**



longitudinal section



cross section

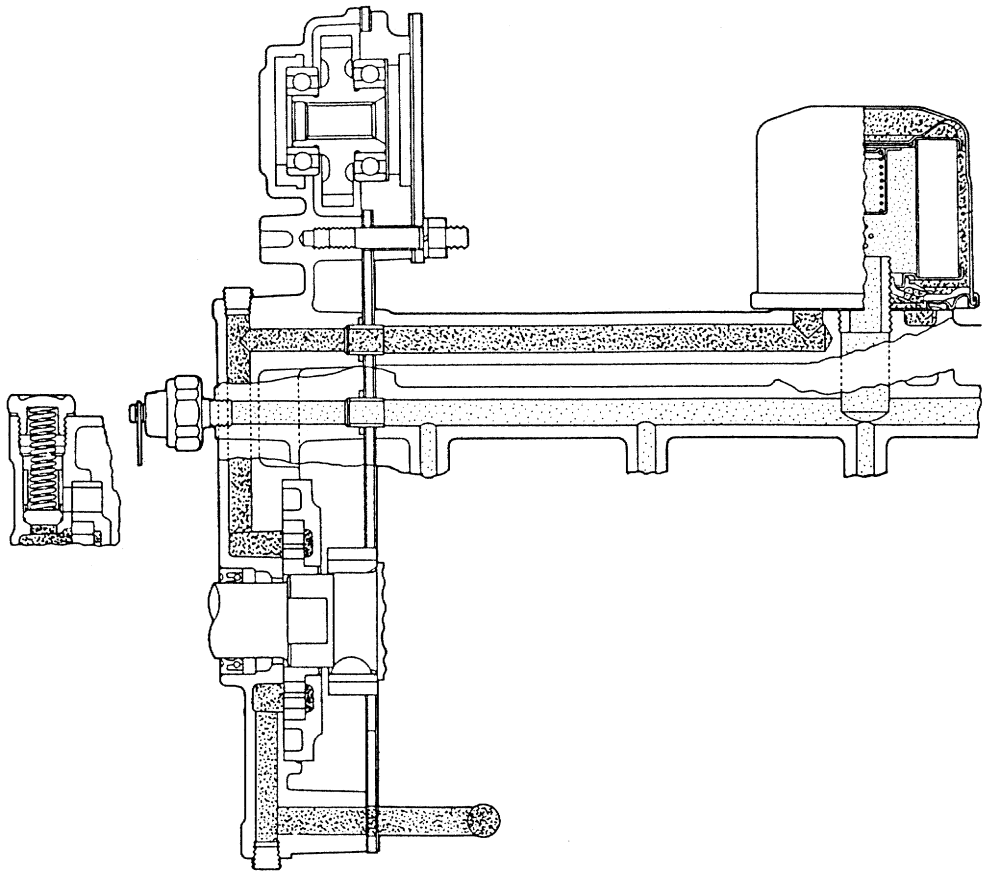


Basic adjustment of the torque screw (power setting of the engine)

Slacken counternut, turn out torque screw by 2 turns
Connect engine rpm gauge, start the engine, fully accelerate, 2,600 min^{-1}
Turn in screw until the engine decreases by 50 min^{-1}
Stop accelerating, engine must stop
Turn out torque screw by 2.8 turns again, so the correct engine power is set.

Cable colours, shut-off solenoid

Connector, wire harness:		Connector, solenoid:
brown	ground	blue
red	50 a	pink
blue/black	15/54	white



Oil circuit

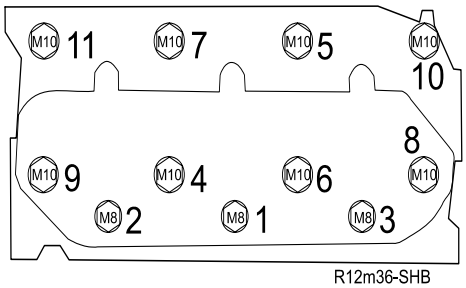
Technical Data

Valve clearance	cold	0.25	mm	inlet & exhaust
Injection nozzle pressure		140	bar	(+ 10 / - 0)
Compression pressure	new:	28	bar	lower limit 22
Injection timing		15°	v.OT*	up to 2000 min^{-1}
Injection timing		17°	v.OT*	more than 2000 till 3600 min^{-1}
Injection timing		19°	v.OT*	3600 min^{-1}

*v.OT = before top dead centre

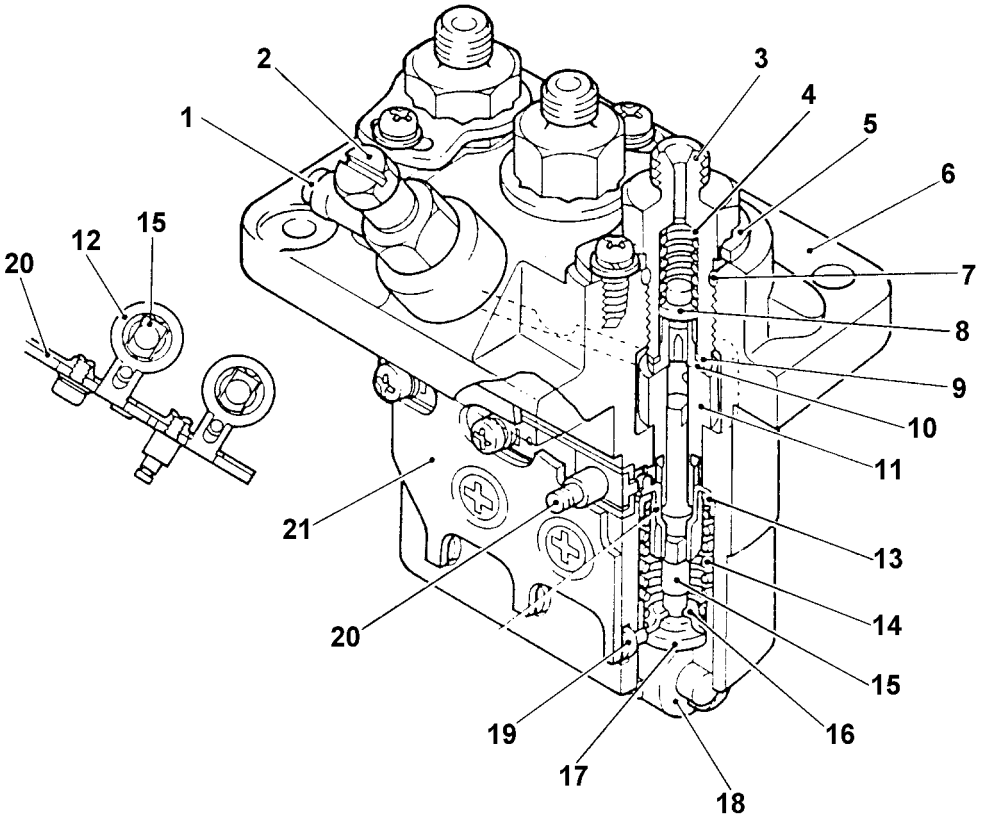
Tightening torques

Crankshaft pulley	M 16	100 to 120 Nm
Main bearing cap	M 10	50 to 55 Nm
Connecting rod cap	M 8	32 to 35 Nm
Flywheel bolts	M 10	85 to 95 Nm
Nozzle holder	M 20	50 to 60 Nm
Glow plug	M 10	15 to 20 Nm
General bolts	M 6	7 Nm
General bolts	M 8	17 Nm
General bolts	M 10	35 Nm
General bolts	M 12	64 Nm

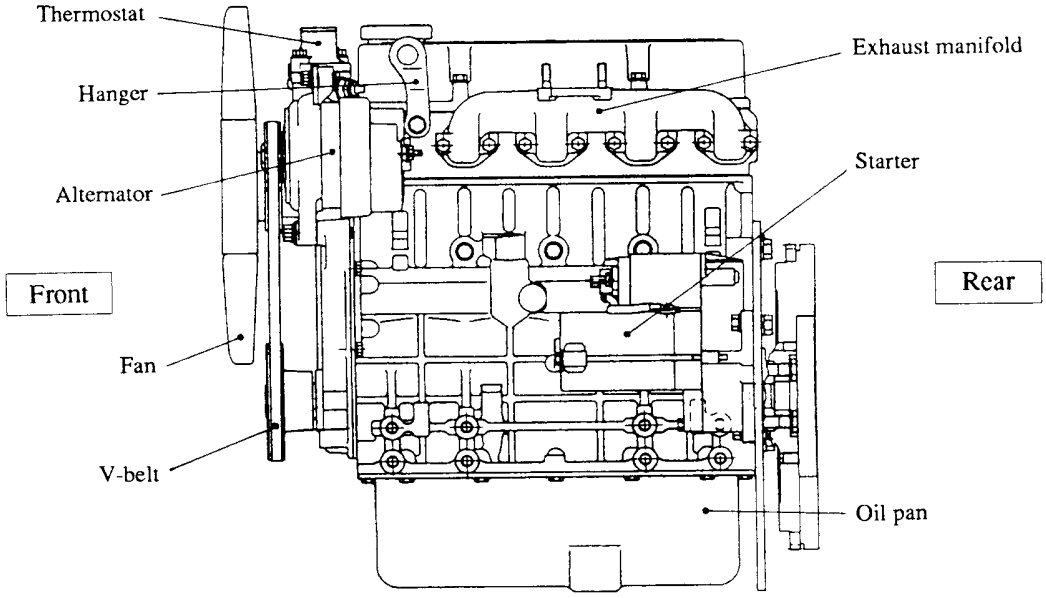


cylinder head - tightening order

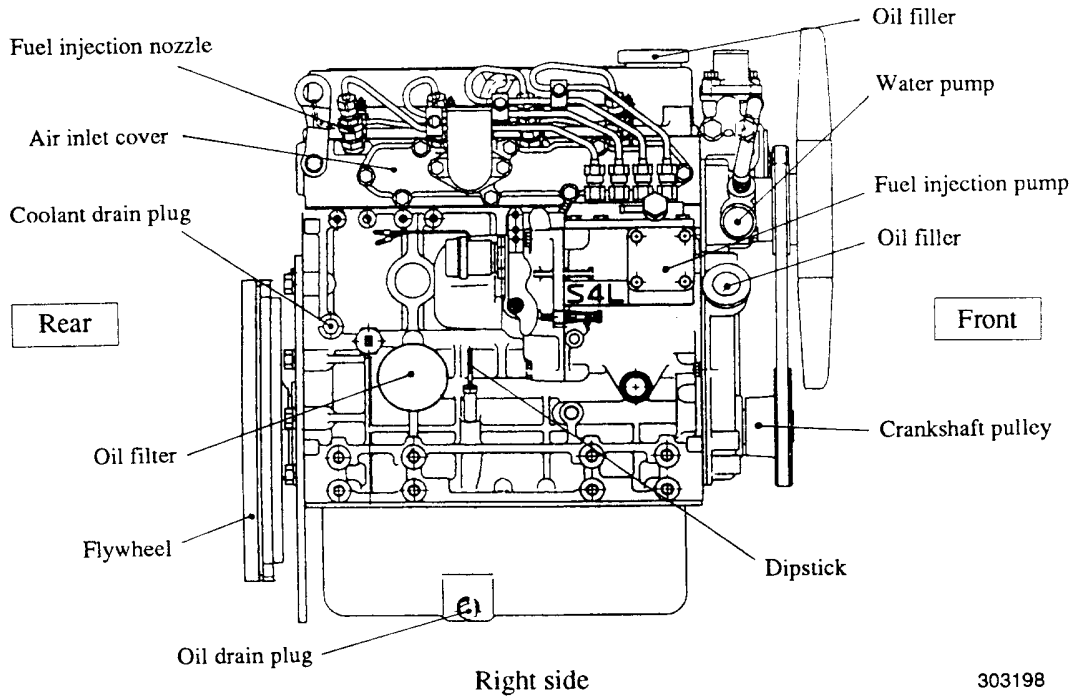
Cylinder head bolts	M 10	75 to 85 Nm
Cylinder head bolts	M 8	20 to 30 Nm



1	union collar	12	sleeve
2	air vent screw	13	upper seat
3	delivery valve holder	14	plunger spring
4	valve spring	15	plunger
5	holder stopper	16	lower seat
6	housing	17	adjusting shim
7	O - ring	18	tappet roller
8	delivery valve	19	pin
9	gasket	20	control rack
10	seat valve	21	stop wire bracket
11	plunger barrel		



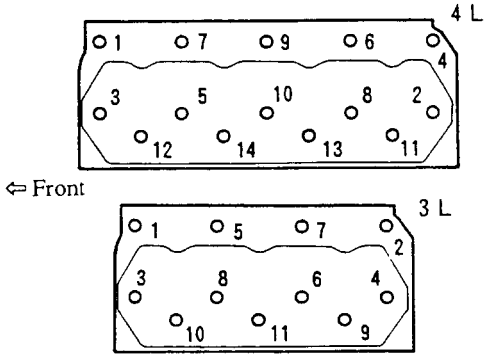
Left side



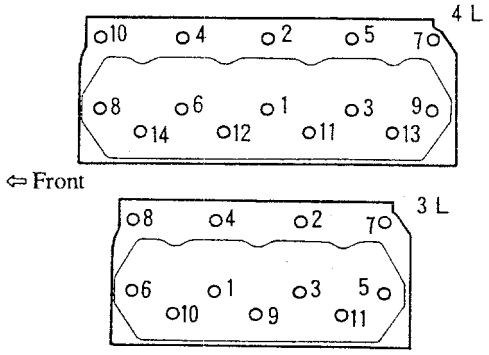
Right side

CYLINDER HEAD

Loosening of the bolts - sequence -



Tightening of the bolts - sequence -



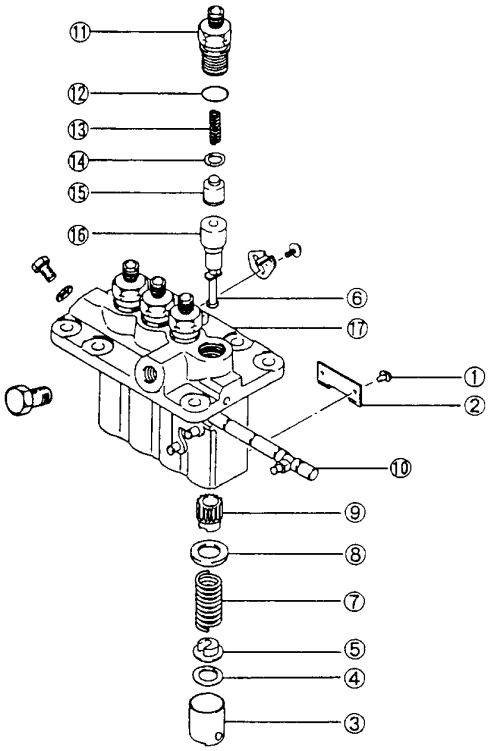
Tightening torque, cylinder head bolts: 88 ± 5 Nm

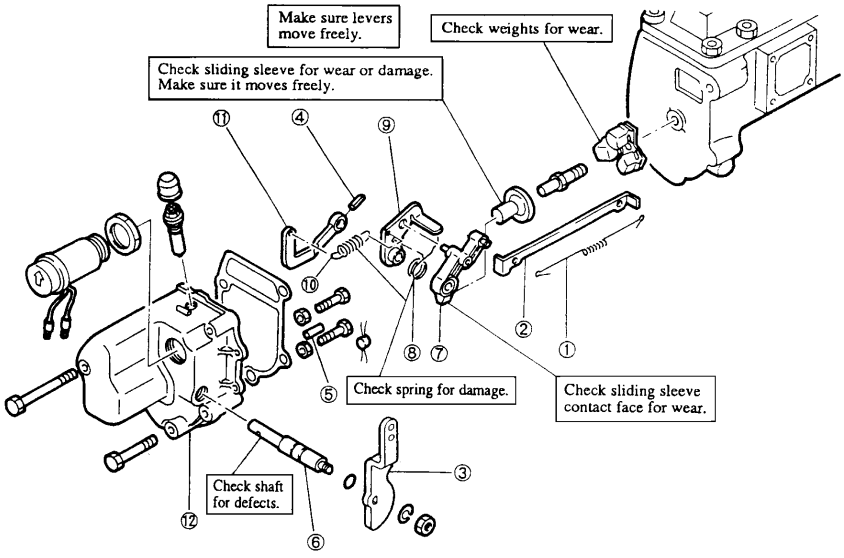
Technical Data

Valve clearance, cold	0.25	mm	inlet & exhaust
Injection pressure	140	bar	+ 5 bar
Compression pressure new	30	bar	lower limit: 27 bar
Injection timing	17°	before top dead centre	
Oil pressure, service temperature	3.5	bar	± 0.5 bar

Tightening torques: Bolts/nuts in general

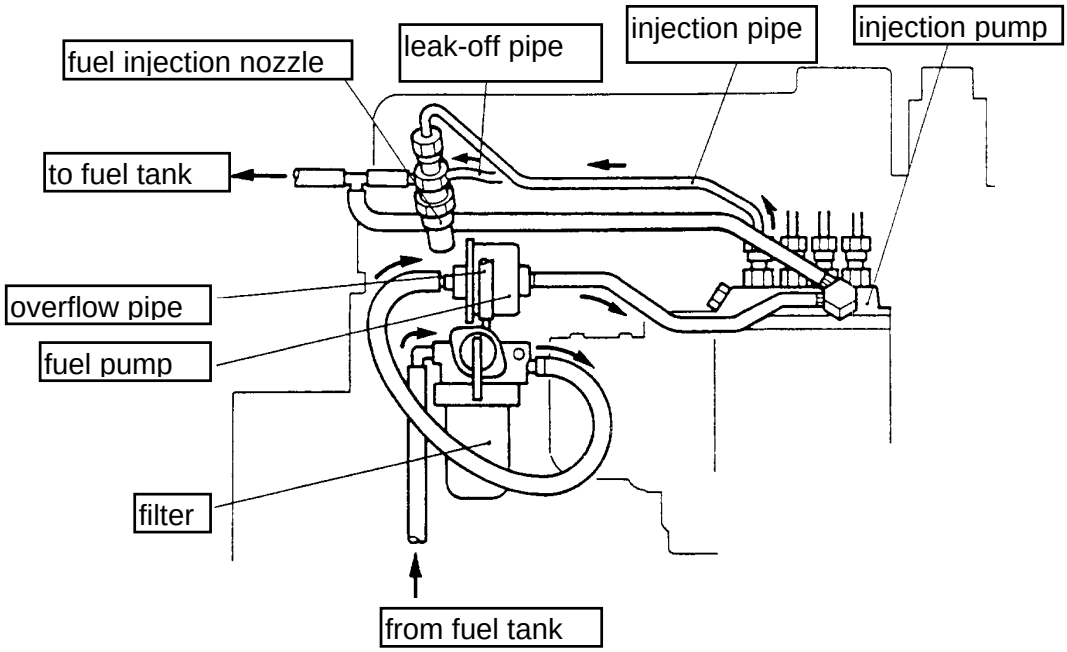
Thread	Quality class 4	Quality class 7
M 6	4 Nm	9 Nm
M 8	11 Nm	18 Nm
M 10	21 Nm	35 Nm
M 12	35 Nm	64 Nm
M14	60 Nm	93 Nm



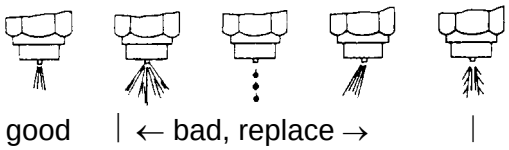


TEREX	Typ/Model/Type **Mitsubishi S4L**	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Diesel engine**	Blatt/Page/Feuille **3.600.02**

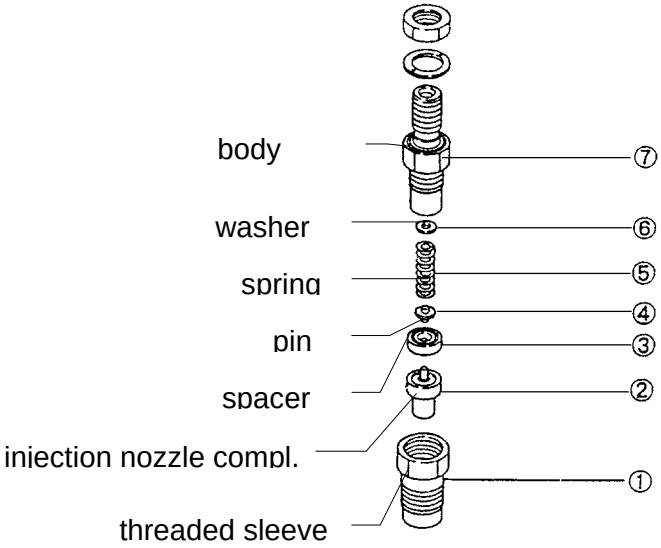
Fuel system



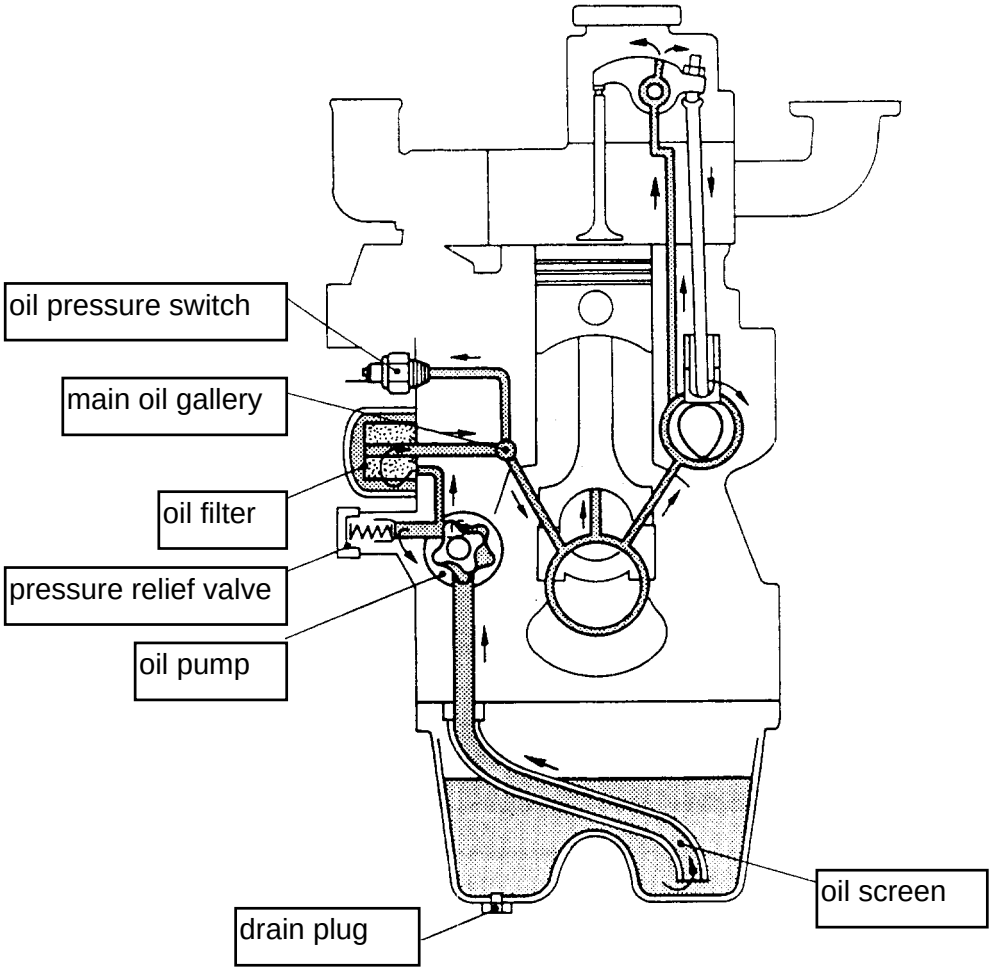
Injection nozzles - injection figures



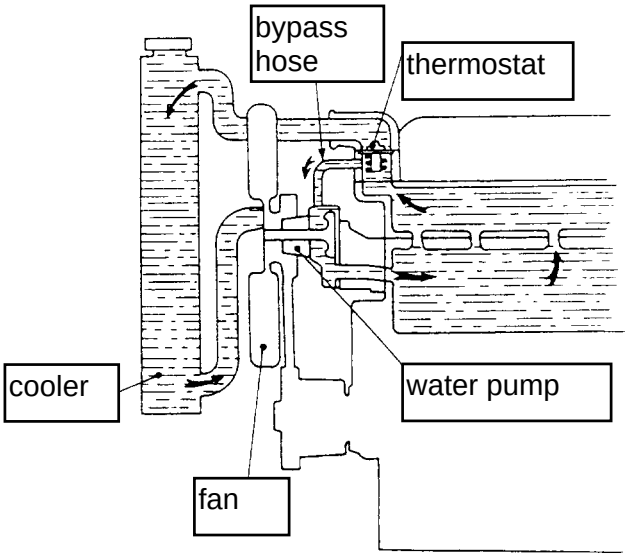
Injection nozzle

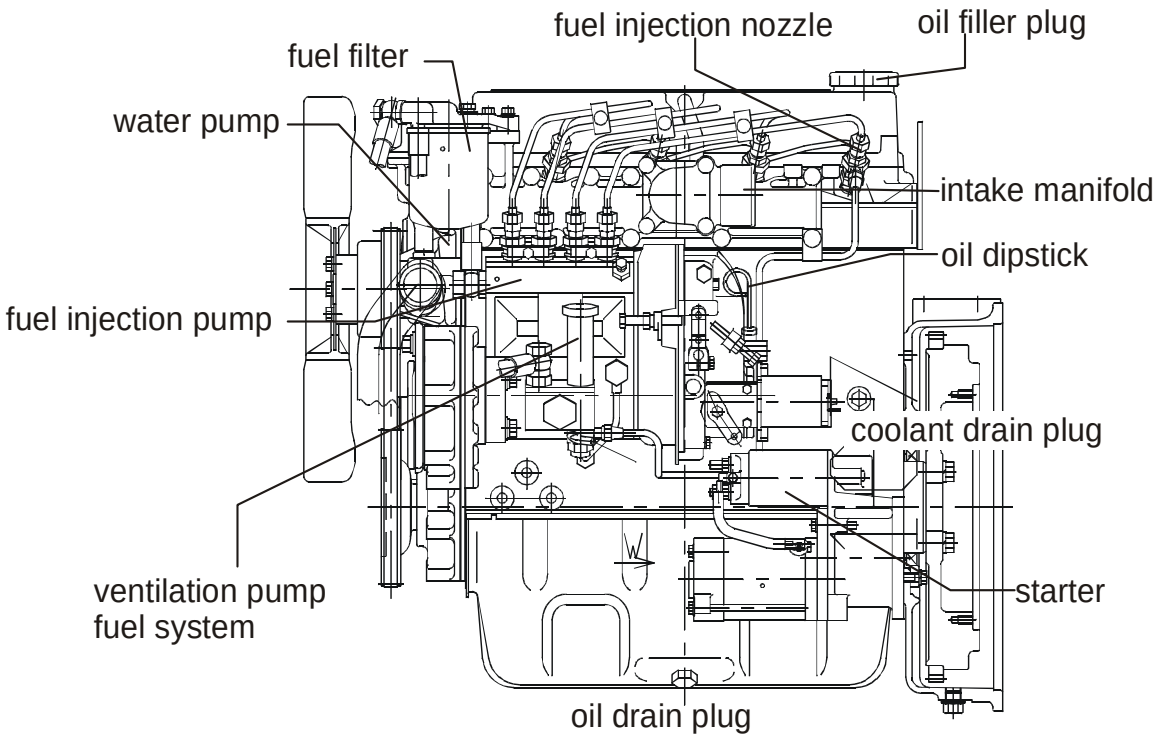


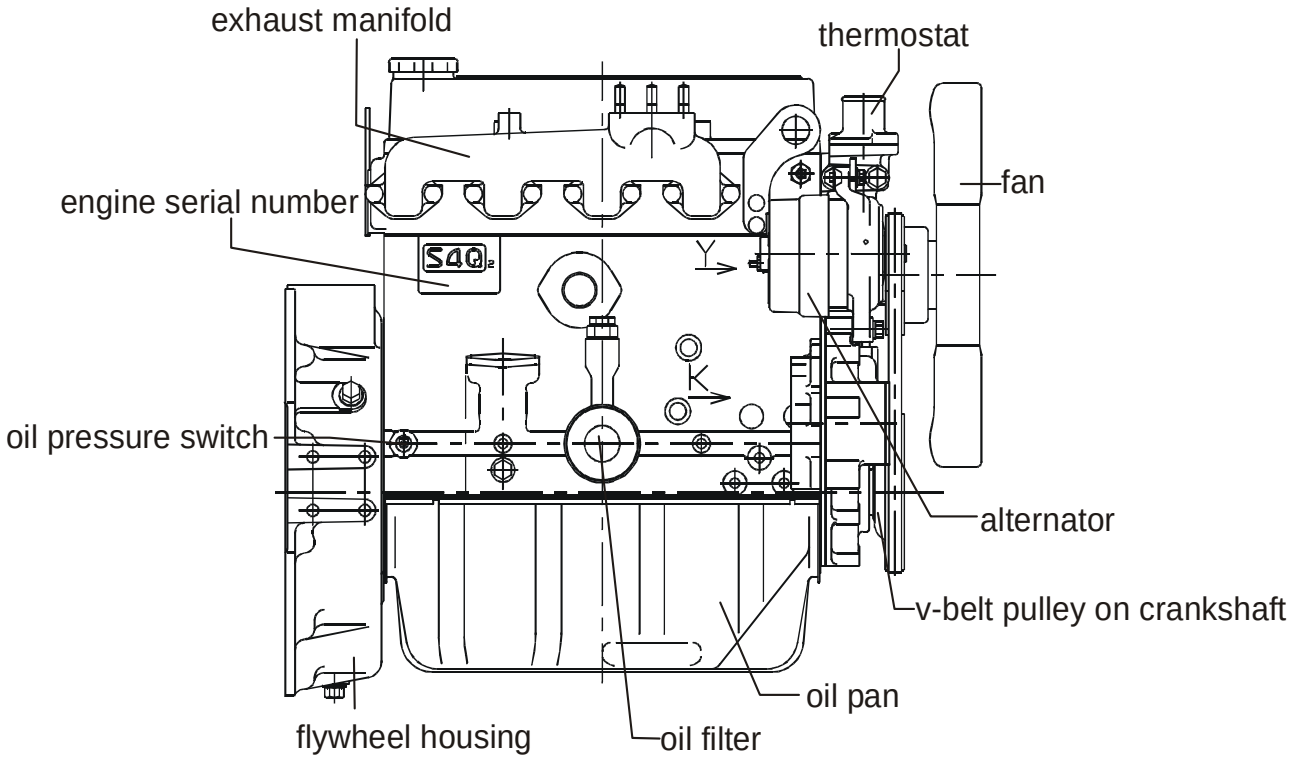
Oil circuit



Water circuit



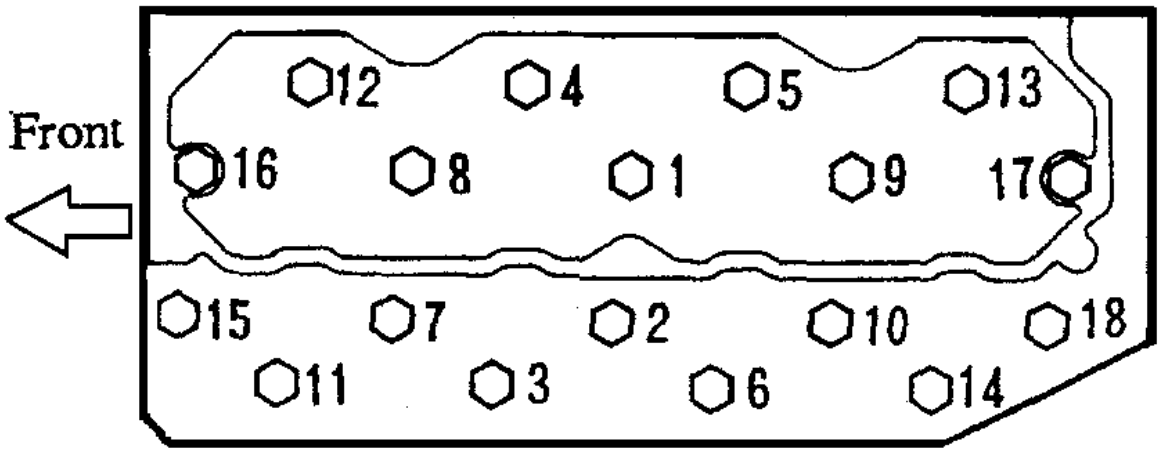




TEREX	Typ/Model/Type **Mitsubishi S 4 Q**	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Diesel engine**	Blatt/Page/Feuille **3.800.01**

CYLINDER HEAD

Tightening order of bolts



Tightening torque of cylinder head studs: 118 ± 5 Nm

Technical Data

Tappet clearance	cold	0.25	mm	inlet & exhaust
Injection pressure		120	bar	+ 10 bar
Compression pressure	new	30	bar	Lower limit: 26 bar
Injection timing		22°	before top dead centre	
Oil pressure, service temperature		2 - 4	bar (under load)	± 0,5 bar

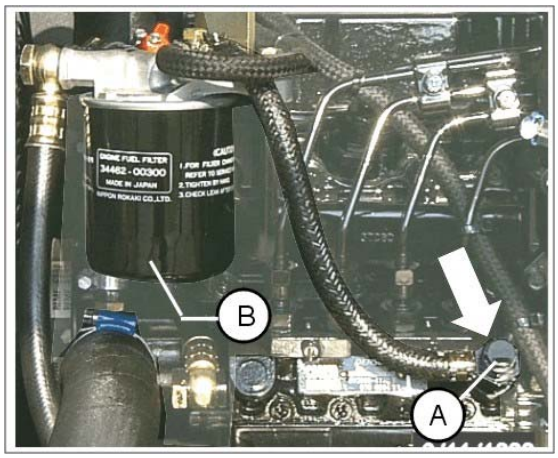
Tightening torques: bolts / nuts, general

Thread	Quality class 4	Quality class 7
M 6	4 Nm	9 Nm
M 8	11 Nm	18 Nm
M 10	21 Nm	35 Nm
M 12	35 Nm	64 Nm
M 14	60 Nm	93 Nm

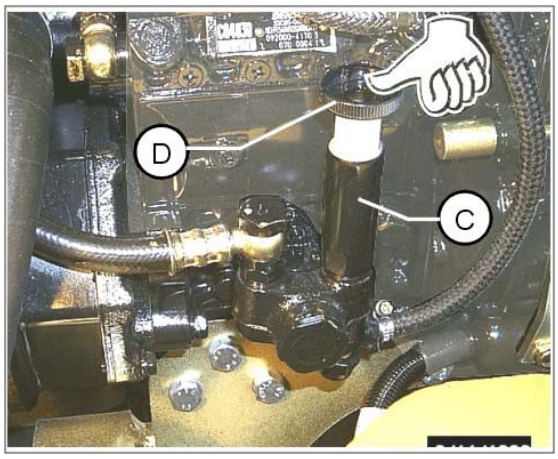
Fuel feed

Fuel filter

- Slacken the ventilation plug **(A)** of the fuel filter **(B)** by means of an open end wrench.
- Put a clean cloth around the ventilation plug **(A)** to collect the escaping fuel, then operate the feed pump **(C)** as shown in the illustration.
- The ventilation plug **(A)** is to be closed when the fuel escapes from the ventilation without bubbles.



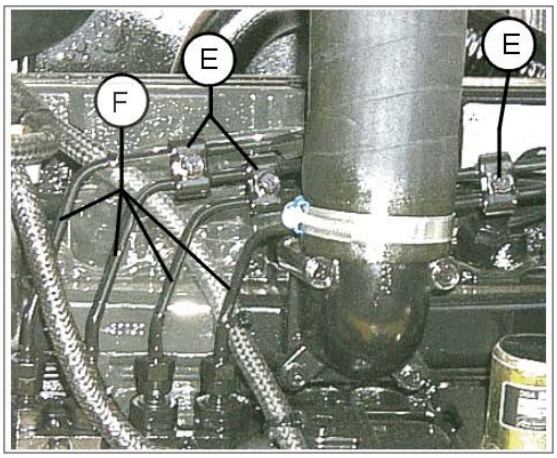
If the fuel pump valve is dirty and the fuel cannot be fed through the fuel filter, the ventilation plug as well as the feed line of the fuel filter are to be dismounted and cleaned with compressed air.



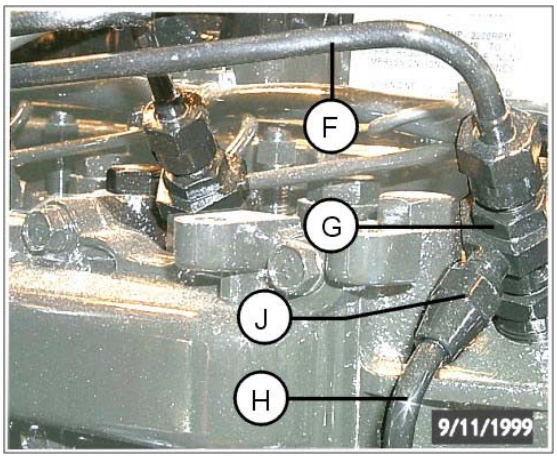
- To unlock the fuel pump cover **(D)**, turn it to the left.
- Operate the fuel feed pump **(C)** approximately 20 times, then turn the cover **(D)** to the right and lock.

Remove fuel lines

- Remove pipe clamp **(E)** from the injection lines **(F)**. Unscrew lines **(F)** at the injection pump and at the injection nozzles **(G)**.



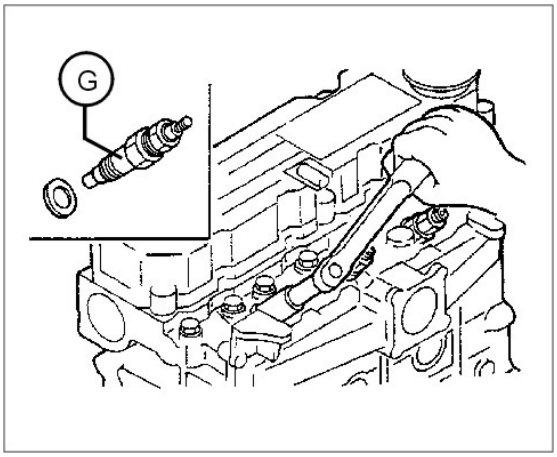
- Unscrew the drain oil lines **(H)** at the injection nozzles **(G)** by slackening the nuts **(J)**.



Mount protective caps to protect the fuel system against dirt or foreign particles at the pump and injection nozzles !

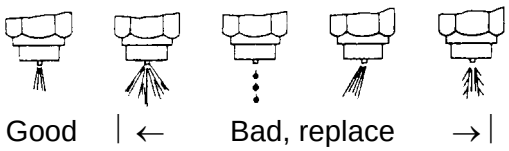
Removal of the injection nozzles

- Screw out the injection nozzles **(G)** of the engine by means of a socket wrench.

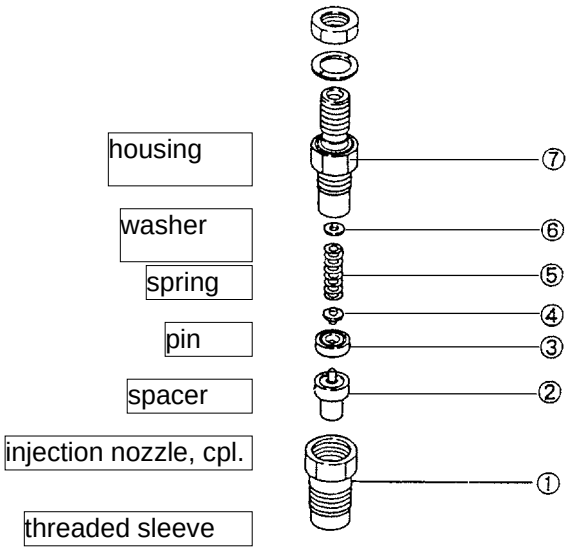


Remove the injection nozzle seals with a wire or a screwdriver and dispose of according to regulations.

Injection nozzles - injection figures

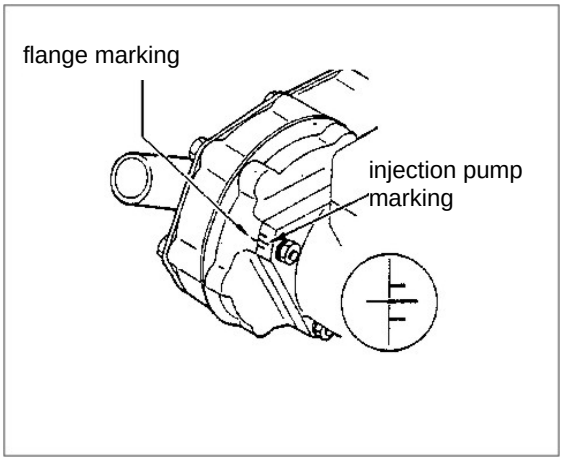


Injection nozzle



Removal of the injection pump

- Check the alignment of the marking on the injection pump with the marking on the flange.

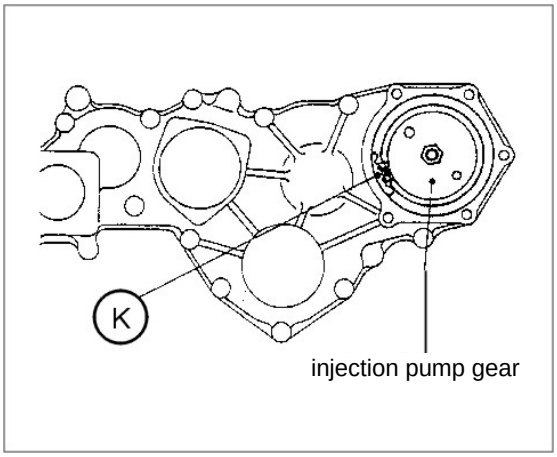


- Remove the front cover of the injection pump gear.

- Make markings **(K)** at the idler gear and injection pump gear.
- Slacken the bolts of the intermediate flange and remove the injection pump including the intermediate flange and gear.

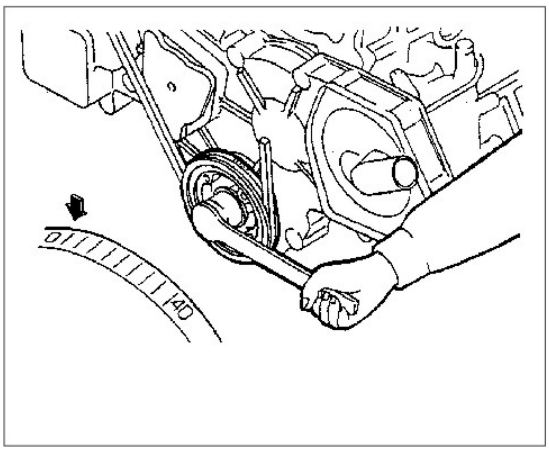
Make sure that the engine does not turn after the removal of the injection pump.

To remove the gear of the injection pump, slacken the nut of the gear prior to the removal of the pump.

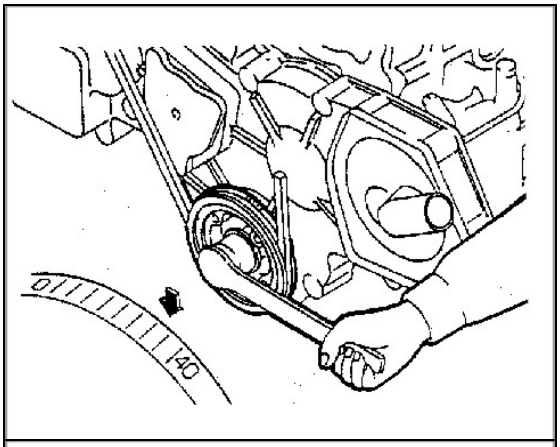


Check the injection timing

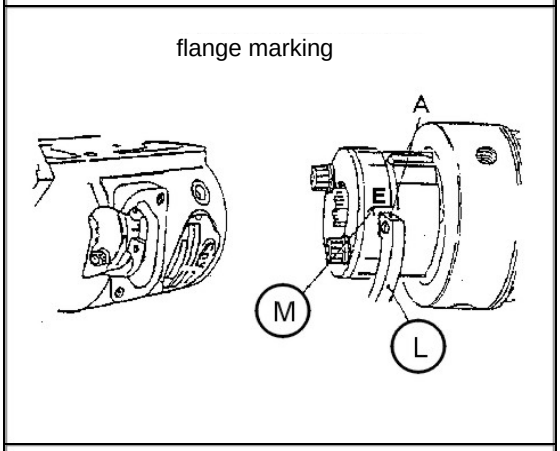
- Adjust the piston no. 1 to top dead centre.



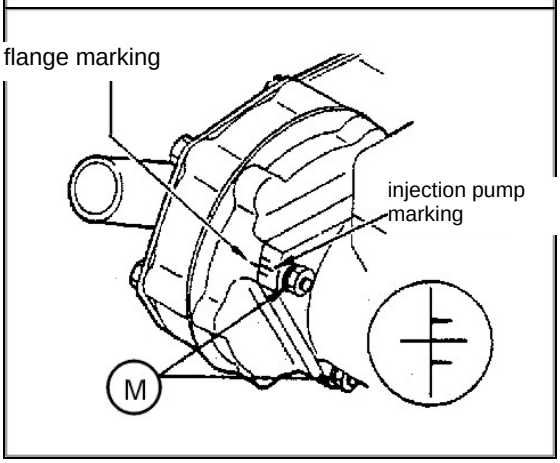
- Turn the crankshaft approximately 30° counter-clockwise, facing the engine front side (fan side). Then slowly turn clockwise up to 20° before top dead centre until the marking on the crankshaft V-belt pulley is in line with the one of the control housing.
- Remove the maintenance cover from the fuel injection pump.



- Make sure that the flat side „A“ of the circlip aligns with marking „E“ on the setting plate. If this is alright, the injection timing is adjusted correctly.

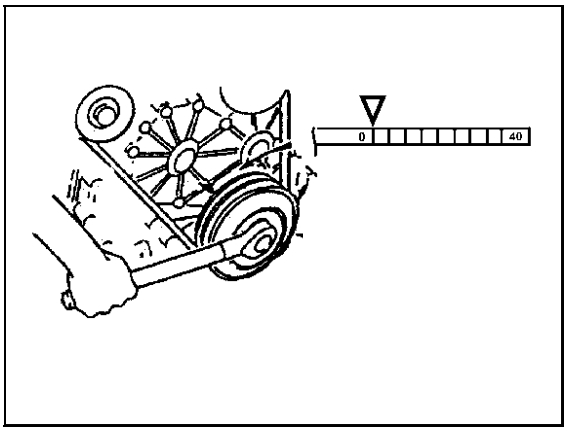


- If the flat side „A“ is not in alignment with line „E“, the nuts holding the injection pump are to be slackened and the pump is to be turned in such a manner that the markings align.
- Hold the injection pump in that position and tighten the nuts.



Engine control

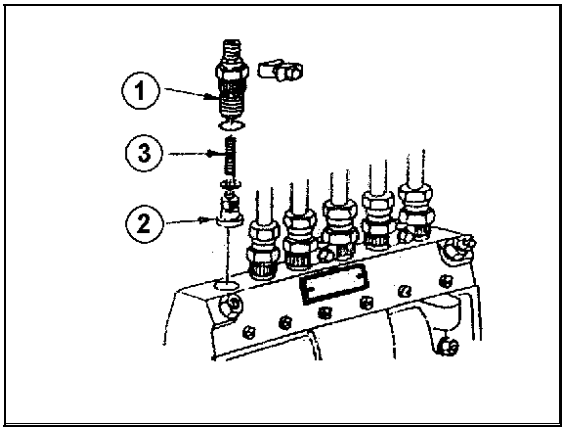
The setting data of the injection system depends on the performance, speed (rpm) and specification of the engine. For the correct data, please refer to the documentation of the engine manufacturer.



1) Adjustment of the first piston to top dead centre in compression stroke

a) Turn the crankshaft clockwise (with a view of the engine front side) until the „O“ at the crankshaft V-belt pulley is in line with the marking.

b) Press the inlet and outlet rocker at the first cylinder downward.
Tappets must be free.



2) Check of the injection timing

a) Remove the retainer ring of the valve holder for the first cylinder at the injection pump.

b) Dismount the valve holder (1) for the first cylinder. Remove the piston of the pressure valve (2) and the spring (3).

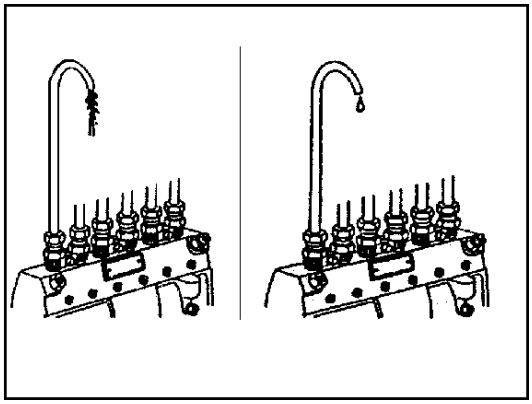
c) Re-mount the valve holder (1).

d) Mount the overflow pipe on the valve holder (1) for the first cylinder.

e) Turn the crankshaft until the piston of the first cylinder is 60° before top dead centre.

f) Turn the crankshaft in engine turning direction by operating the hand feed pump until the fuel flow from the overflow pipe stops.

g) Check injection timing (marking on the crankshaft V-belt pulley of the crankshaft).



3) Adjustment of the injection timing

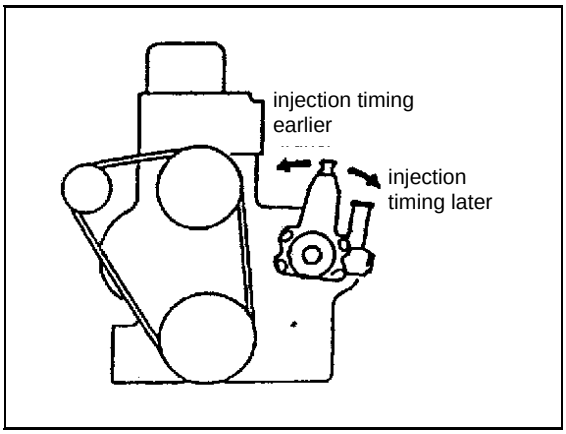
a) If the injection timing must be changed, turn the injection pump as shown in the illustration opposite.

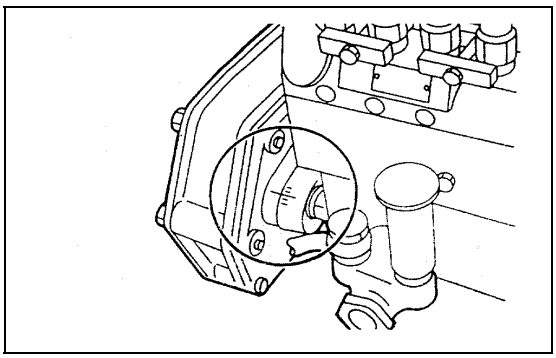
b) Only the setscrew for max. engine speed is sealed.

c) If this setting is checked and adjusted, please ensure that there is somebody near the engine to be able to operate the engine cut-off mechanically in case of engine overspeeding.

d) A marking unit at the injection pump flange changes the injection timing by 6° to the crankshaft angle.

For inspections and settings warm the engine up thoroughly until the coolant and engine oil temperatures are higher than 70°C (158° F).





Off-load min. speed (idle running speed) and max. speed setting

a) The off-load min. speed (idle running speed) as well as the max. speed of each engine are set on the test bench in the factory. The setscrew for max. speed is sealed. These settings are to be performed by an authorised workshop only.

b) After removing the leaden seals and adjusting the regulator, all visisble stops are to be sealed as though they would have been sealed by the factory.

c) It is decisive for the settlement of warranty claims whether the stop screw leaden seals are alright or not.

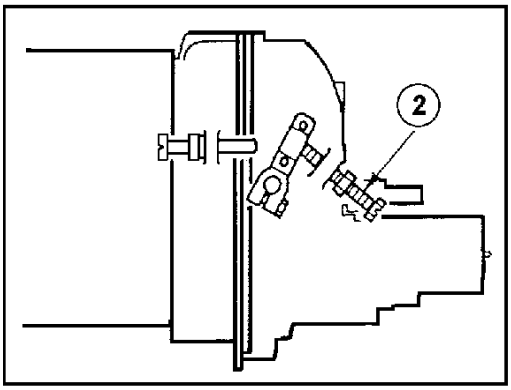
d) ***When this setting is checked and adjusted, please make sure that there is somebody near the engine in order to be able to stop engine mechanically in case of engine overspeeding.***

1) Engine start-up

a) Set speed adjusting lever to high idle running speed. Actuate starter.
b) The engine fires from a crankshaft speed of 150 min^{-1}. When the engine is running, the speed is to be held between 800 and 1,000 min^{-1}.
c) When the engine is running with constant speed, the speed adjusting lever is to be brought into idle running position.

2) Set off-load low idle running speed

a) Hold the speed adjusting lever in off-load min. speed position and set low idle running speed by means of the setscrew (2)

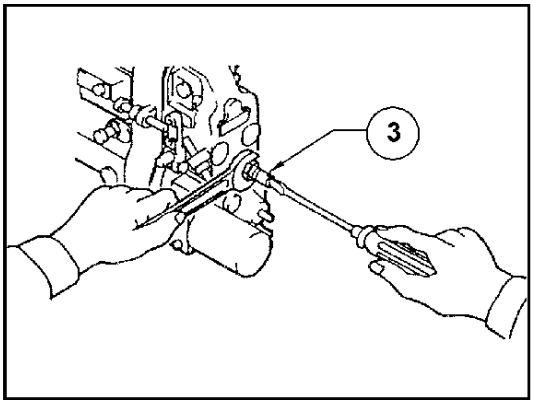


In case of a critical speed (speed resulting in bad engine vibrations due to torsional oscillations), a higher or lower speed range is to be chosen.

b) Engine speed increase:
Turn the setscrew of the low idle running speed clockwise.

To be performed by trained and qualified personnel only:

c) In case of speed variations (fluctuations of the engine), turn the setscrew (3) of the idle running speed spring clockwise to increase the spring preload.



An excessive spring preload results in engine overspeeding with the load decreasing. Make sure that this is prevented.

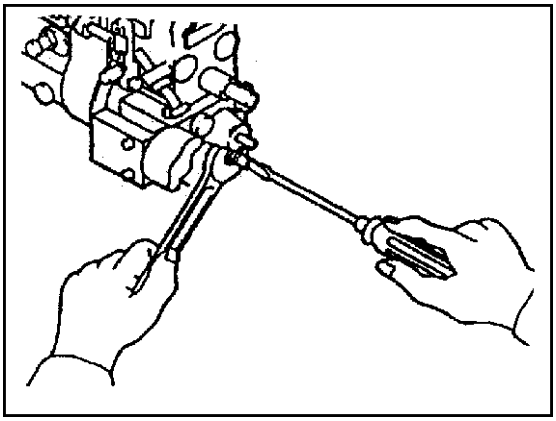
3) Set max. output (capacity)

To be performed by trained and qualified personnel only:

a) Bring speed adjusting lever into full load position and load engine with its indicated output.

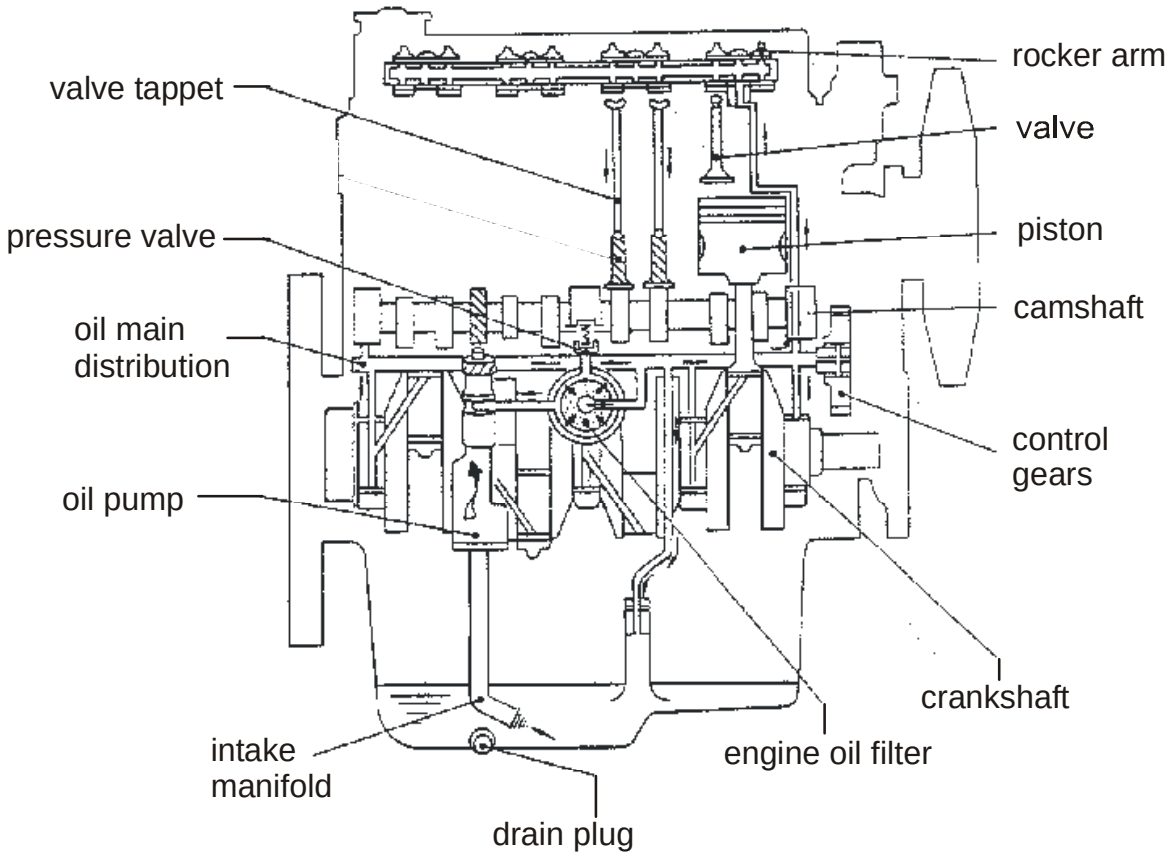
b) While the engine is running with constant speed, adjust the full load stop screw in such a manner that the engine achieves its indicated output.

c) If the full load stop screw is turned counter-clockwise, the capacity is reduced, and the engine speed is lowered.
If the full load stop screw is turned clockwise, the capacity is increased, and the exhaust gas values deteriorate.

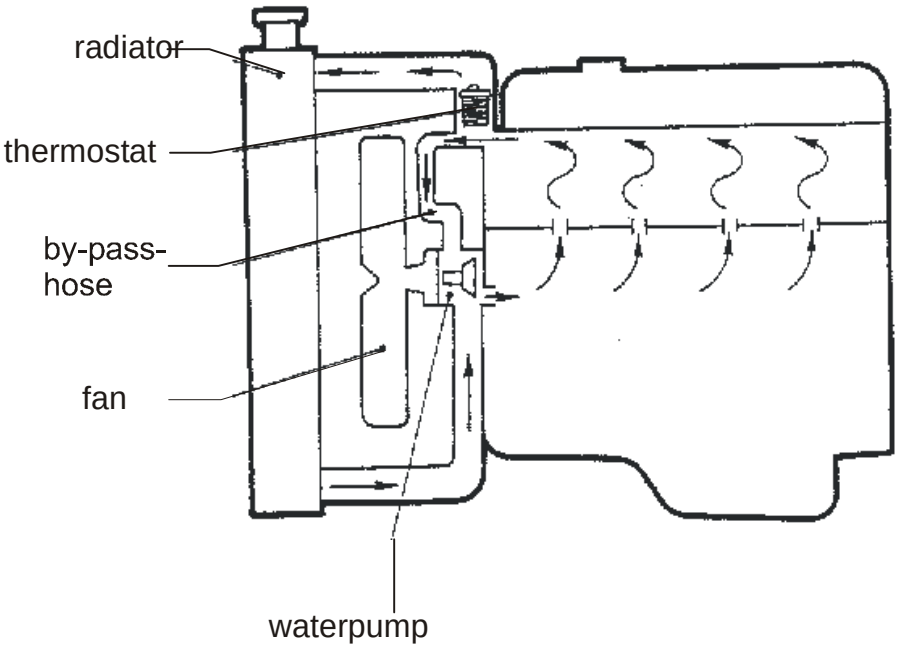


This setting can only be performed on the test bench as it is sealed by the factory.

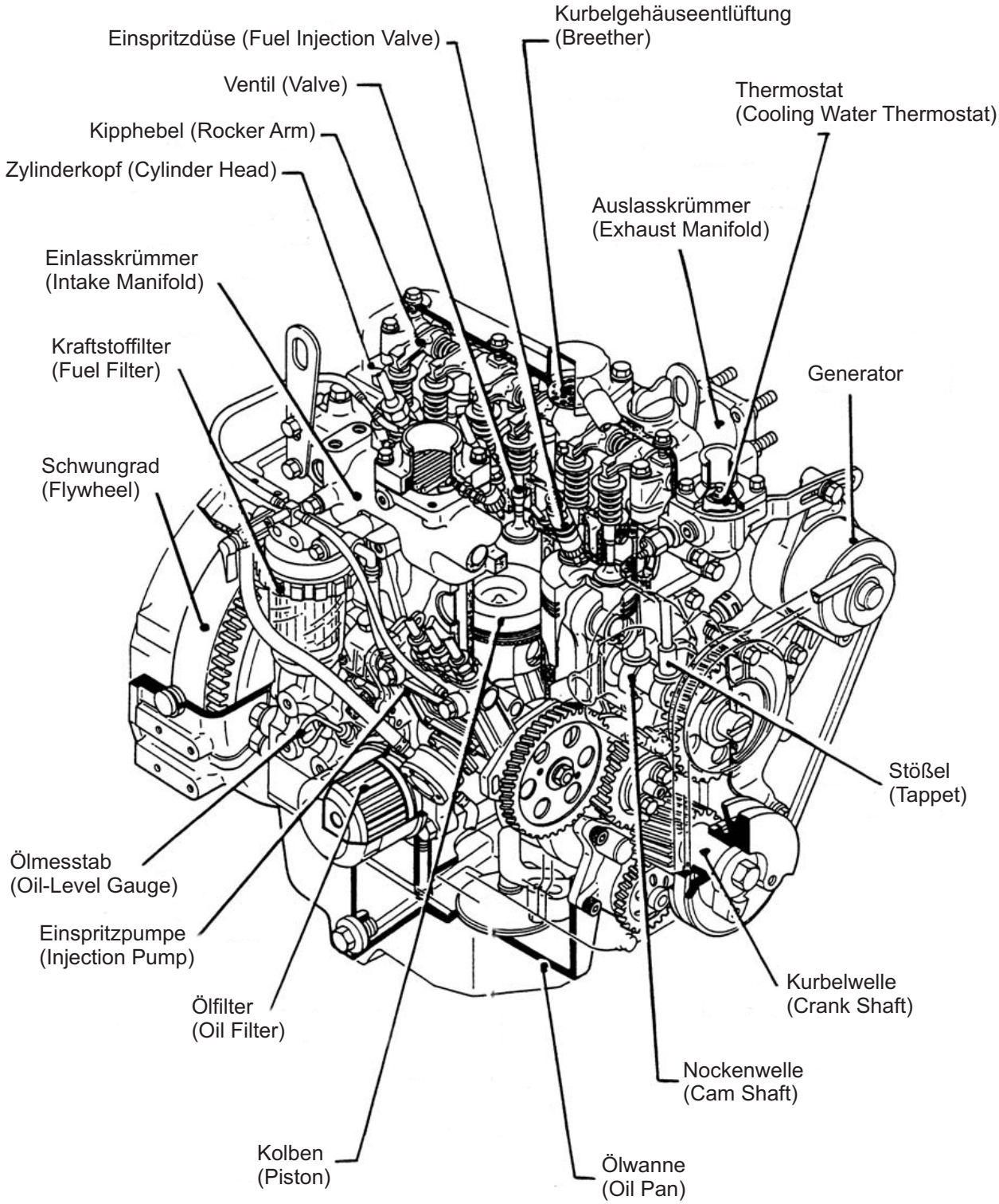
Oil circuit



Water circuit



Yanmar 4TNV88



Typ Model Type Tipo	**Yanmar** **4 TNV 88**	**Motor** **Engine** **Moteur** **Motor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Technische Daten** **Specification data**		Blatt Page Feuille Página	**3.900.01**

Ventilspiel einstellen:

Valve clearance adjustment:

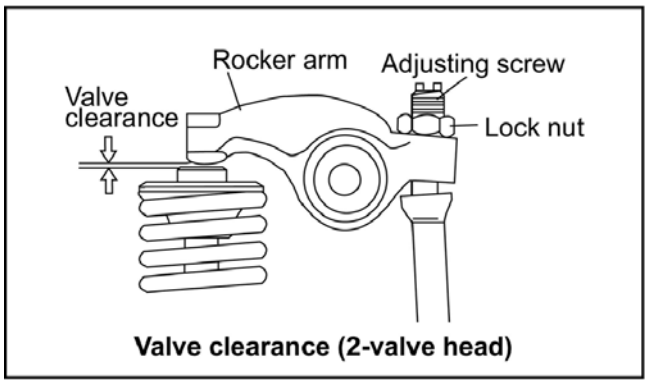
Einstellungen bei kaltem Motor.
Adjustments to do when engine is cold.

Zündreihenfolge: 1-3-4-2
Firing order:

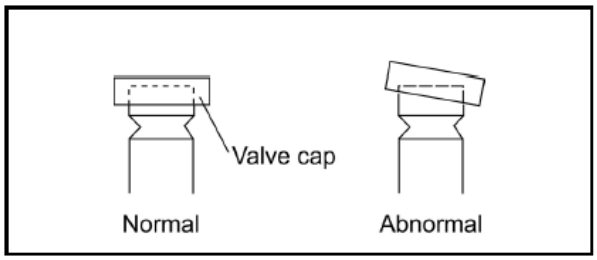
Ventilspiel bei OT bzw. Überschneidung des 1. Zylinders (Schwungradseite) an folgenden Ventilen Einstellbar.
Valve clearence to be adjust at TDC respectively overlap of cylinder 1 (flywheelside) at following valves.

Zylinder Nummer : Cylinder No. :	**1**		**2**		**3**		**4**	
Ventil Valve	**EIN** IN	**AUS** OUT	**EIN** IN	**AUS** OUT	**EIN** IN	**AUS** OUT	**EIN** IN	**AUS** OUT
Zylinder 1 OT No.1 TDC	**X**	**X**	**X**			**X**		
Zylinder 1 überschneidung No. 1 overlap				**X**	**X**		**X**	**X**

Ventilspiel : 0,15 - 0,25 mm
Valve clearence : 0,15 – 0,25 mm

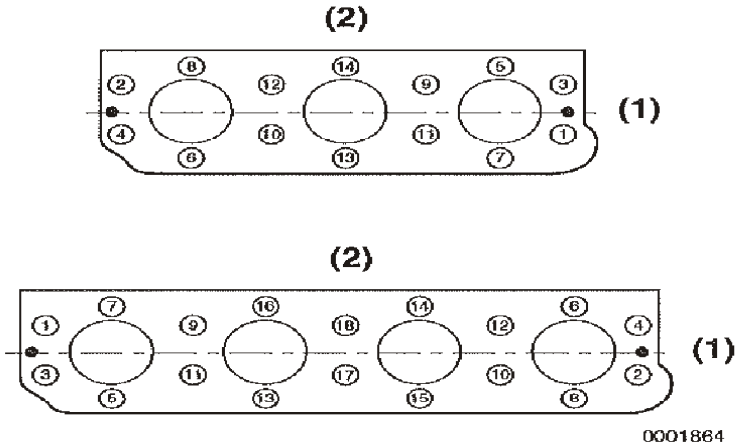


Valve clearance (2-valve head)



Removal of Cylinder Head

1. Loosen the cylinder head bolts following the sequence shown in **(Figure 6-8)**.



1 – Cooling Fan End
2 – Camshaft Side

Figure 6-8

2. Remove the cylinder head bolts **(Figure 6-9, (1))**.
3. Lift the cylinder head away from the cylinder block. Discard the cylinder head gasket **(Figure 6-9, (2))**. Position the cylinder head on the work bench to prevent damage to the combustion surface.

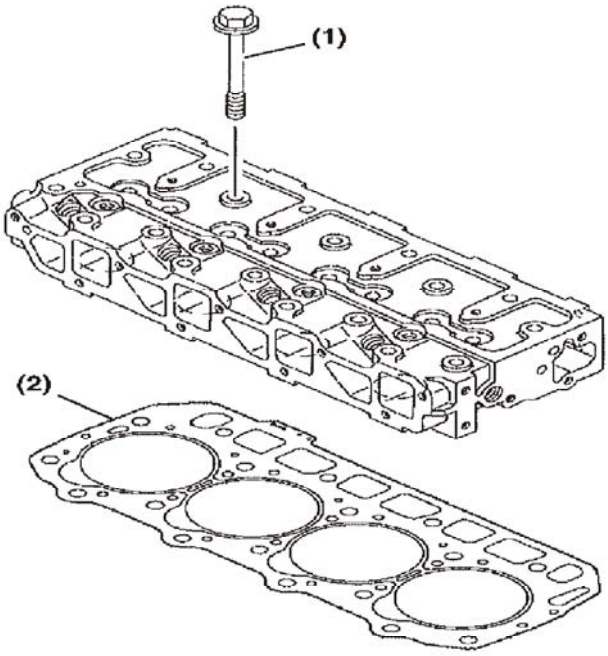


Figure 6-9

Reassembly of Cylinder Head

1. Carefully clean both the combustion surface of the cylinder head and the top surface of the cylinder block. Then place a new cylinder head gasket **(Figure 6-31, (2))** on the cylinder block.
2. Position the cylinder head on the cylinder head gasket.

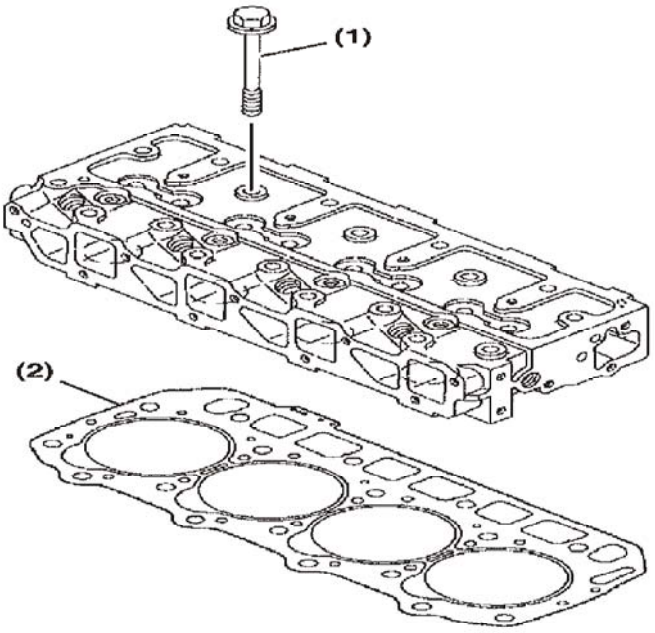
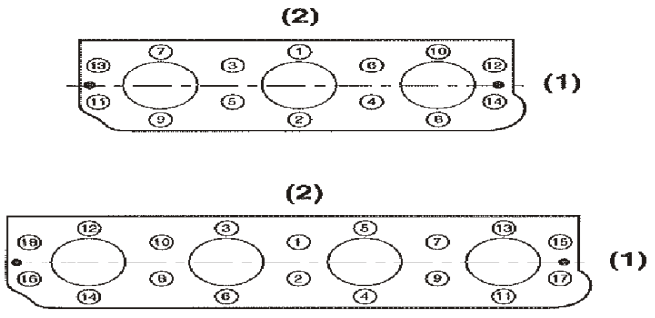


Figure 6-31

3. Lightly oil the threads of the cylinder head bolts **(Figure 6-31, (1))**. Tighten the bolts to the specified torque in two steps as shown in the chart below. Tighten in the sequence shown in **(Figure 6-32)**. *See Special Torque Chart on page 6-23 for specification.*

First Step	1/2 of final torque
Second Step	Final torque

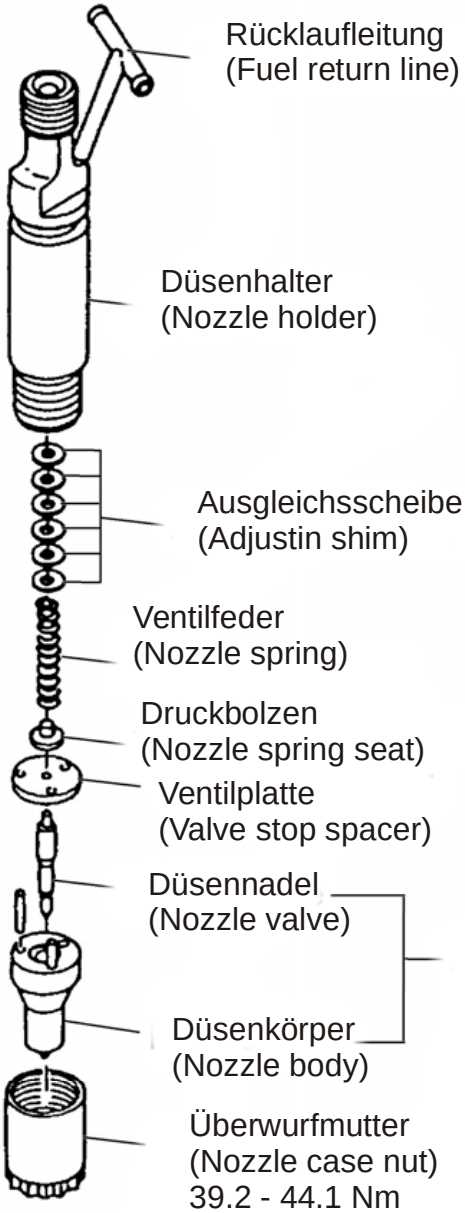
4. Insert the push rods in their respective positions.



1 – Fan End
2 – Camshaft Side

Figure 6-32

Einspritzdüse
(Fuel injector)



Einspritzdruck: 210+10 bar
(Injection pressure)

FUEL INJECTION PUMP

Removal of Fuel Injection Pump

1. Loosen the cooling fan V-belt.
2. Remove the engine coolant fan guard (if equipped), engine coolant fan **(Figure 7-6, (2))**, spacer **(Figure 7-6, (3))** if equipped, V-pulley **(Figure 7-6, (4))** and cooling fan V-belt **(Figure 7-6, (1))**.

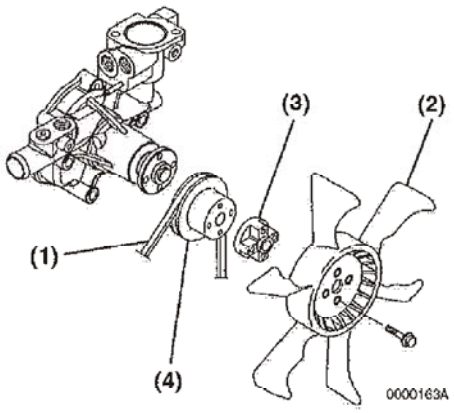


Figure 7-6

3. Close any fuel valves in the fuel supply line.
4. Place a drain pan under the fuel injection pump to catch any spillage.
5. Remove the high-pressure fuel injection lines as an assembly **(Figure 7-7, (1))**.

Note: To prevent "rounding" the fuel line nuts always use a "line" or "flare nut" wrench. When loosening the fuel line nuts, always hold the fuel injection pump delivery valves with a "back up" wrench to prevent loosening of the delivery valves.

6. First loosen the fuel line nuts at the fuel injectors and then at the fuel injection pump.

CAUTION

Remove or install the high-pressure fuel injection lines as an assembly whenever possible. Disassembling the high-pressure fuel injection lines from the retainers or bending any of the fuel lines will make it difficult to reinstall the fuel lines.

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7. Finish loosening all the fuel line nuts and remove the high-pressure fuel lines as an assembly being careful not to bend any of the fuel lines. Be sure to protect the fuel system from contamination by covering all open connections.
8. Disconnect the coolant lines from the cold start device **(Figure 7-7, (3))** on the fuel injection pump. Plug the open ends of the lines to minimize leakage and prevent contamination.
9. Disconnect the fuel return lines from the fuel return fitting **(Figure 7-7, (2))**. Plug the open ends of the lines to minimize leakage and prevent contamination.

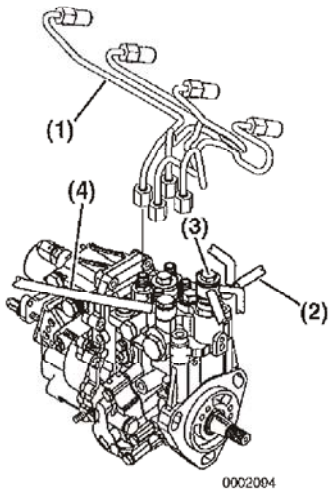


Figure 7-7

10. Remove the fuel supply line **(Figure 7-7, (4))**. Plug the open end of the line to minimize leakage and prevent contamination.
11. Remove the throttle cable from the fuel injection pump.
12. Separate the stop solenoid wiring connector **(Figure 7-8, (2))**.
13. Remove the rear fuel injection pump bracket(s) **(Figure 7-8, (1))** from the fuel injection pump.

Note: Configuration of the fuel injection pump rear brackets may vary depending upon engine model.

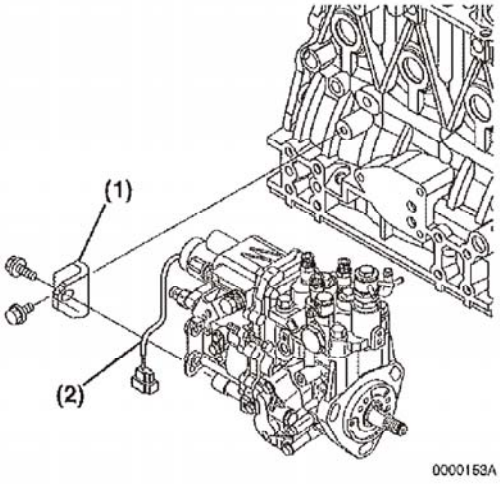


Figure 7-8

14. Disconnect the lube oil line **(Figure 7-9, (1))** and the clamp **(Figure 7-9, (2))** from the pump.

IMPORTANT

Take care to not damage or bend the oil line. In some applications, it may be preferable to remove the complete oil line assembly from the engine before proceeding.

Note: On models 3TNV82-4TNV88, the fuel injection pump drive gear cover is retained to the gear case cover by 4 bolts. On models 4TNV94-4TNV106, the cover is larger and retained by 7 bolts.

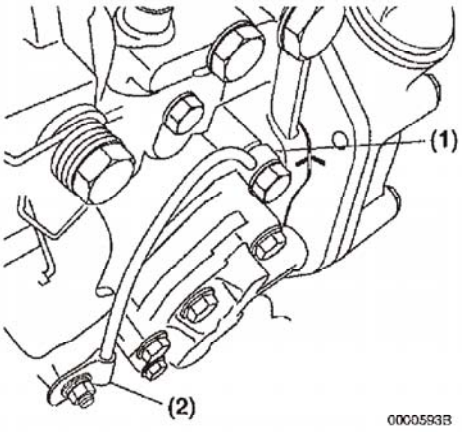


Figure 7-9

15. Remove the fuel injection pump drive gear cover **(Figure 7-10, (1))** from the gear case cover **(Figure 7-10, (2))**.

Note: The fuel injection pump drive gear cover is secured with an adhesive sealant. Use a gasket scraper to separate the fuel injection pump cover from the gear case cover.

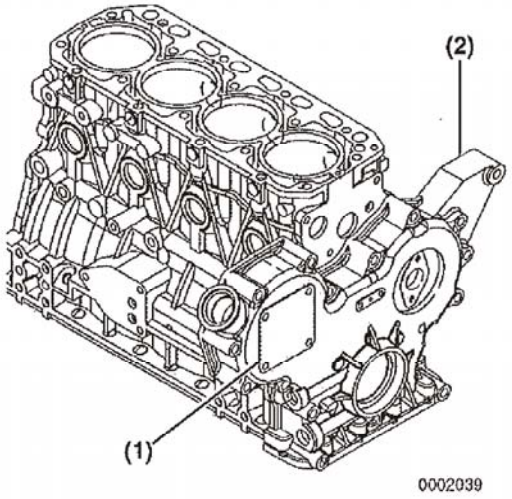


Figure 7-10

Note: TNV82-88 shown.

16. To position the fuel injection pump for easier removal and installation, install a dial indicator *(see Checking and Adjusting Fuel Injection Timing on page 7-26)* into the injection pump plunger opening. Using a wrench on the crankshaft pulley bolt, rotate the crankshaft until the dial indicator shows that injection pump plunger is at the bottom of it's stroke.
17. To aid in reassembly, make reference marks on the fuel injection pump drive gear, and on either the gear case cover or idler gear.

CAUTION

After marking the position of the pump drive gear, do not rotate the engine crankshaft. Rotating the crankshaft will cause the fuel injection pump to become misaligned.

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- On TNV82-88 model engines, the idler gear is not visible. Make a reference mark on the fuel injection pump drive gear **(Figure 7-11, (1))** and a matching mark on the bore of the gear case opening **(Figure 7-11, (2))**.

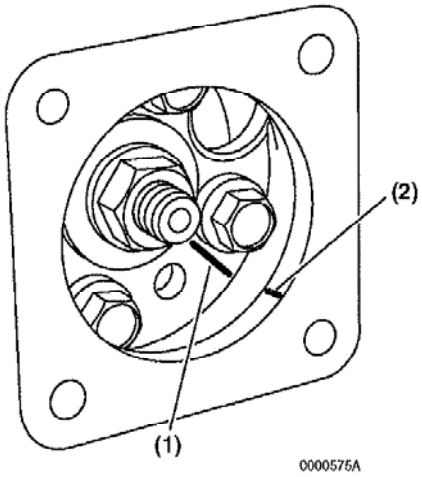


Figure 7-11

- On TNV94 - 106 model engines, the idler gear is visible. Make a reference mark **(Figure 7-12, (1))** across both the fuel injection pump drive gear and the idler gear.

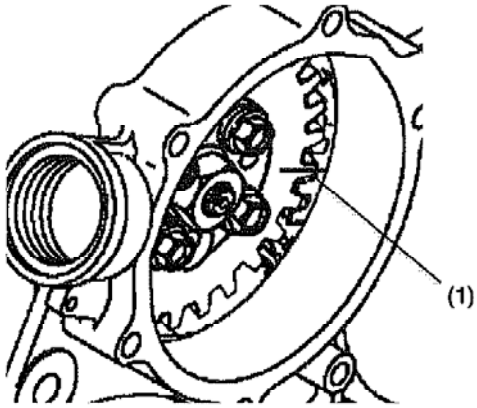


Figure 7-12

CAUTION

Do not loosen or remove the four bolts retaining the fuel injection pump drive gear to the fuel injection pump hub. Do not disassemble the fuel injection pump drive gear from the hub. Correct fuel injection timing will be very difficult or impossible to achieve.

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18. Do not loosen or remove the four bolts **(Figure 7-13, (3))** retaining the pump drive gear to the hub. Only remove the single drive gear nut **(Figure 7-13, (1))** and washer **(Figure 7-13, (2))**, leaving the hub attached to the gear.

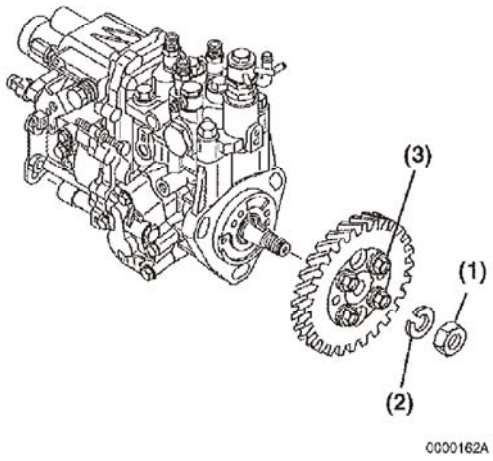


Figure 7-13

19. Hold the gear train using a large socket wrench on the crankshaft pulley nut. Loosen the fuel injection pump drive gear retaining nut **(Figure 7-13, (1))** and turn it out to the end of the fuel injection pump shaft.
20. Remove the pump drive gear and hub as an assembly using an appropriate two-bolt gear puller **(Figure 7-14).**

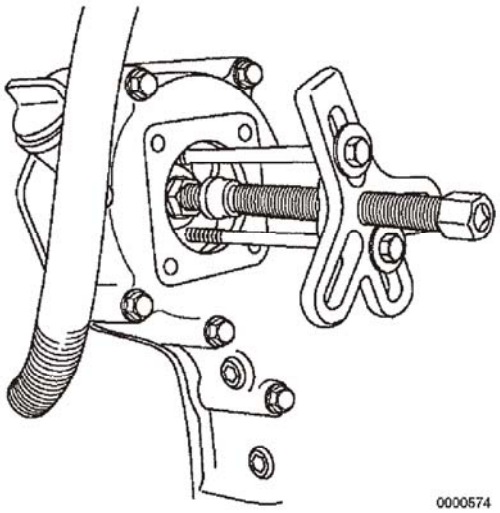


Figure 7-14

Note: On TNV82 - 88 models the injection pump drive gear will remain "captured" in the gear case. On TNV94 - 106 models, the injection pump drive gear can be removed through the gear case cover opening.

21. Once the fuel injection pump drive gear and hub assembly has "popped" loose from the tapered fuel injection pump drive shaft, carefully remove the drive gear nut **(Figure 7-15, (1))** and lock washer **(Figure 7-15, (2))**.

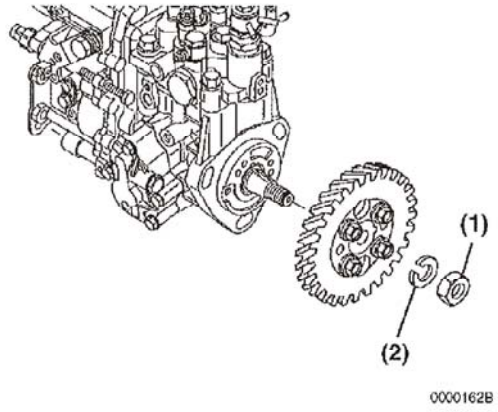


Figure 7-15

22. Locate the mark stamped into the upper outside mounting boss of the fuel injection pump. Highlight this mark and make a corresponding mark on the gear case or front plate **(Figure 7-16, (1)).**

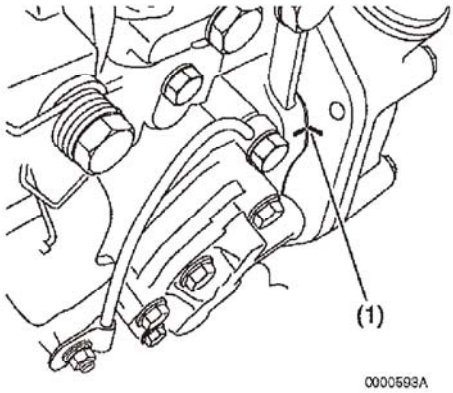


Figure 7-16

Note: Some model engines may require the intake manifold and fuel injection pump insulator **(Figure 7-17, (2))** be removed to access the inner fuel injection pump **(Figure 7-17, (1))** retaining nuts.

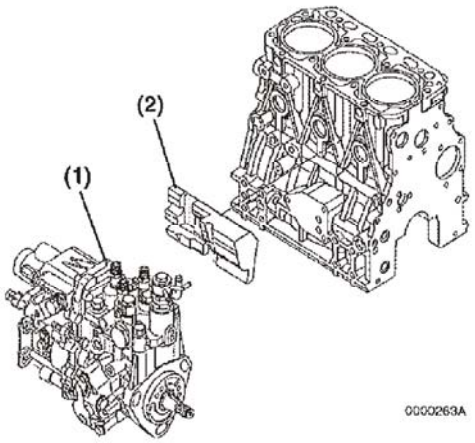


Figure 7-17

23. If required, remove the intake manifold and fuel pump insulator to access the fuel injection pump mounting nuts.

Note: The MP2 fuel injection pumps (TNV82 - 88 model engines) are fastened to the gear case with three (3) studs and nuts. The MP4 fuel injection pumps (TNV94 - 106 model engines) are fastened to the gear case with four (4) studs and nuts.

24. Remove the fuel injection pump **(Figure 7-17, (1))**. For purposes of future injection timing purposes, record the fuel injection pump timing index number located on the boss on the engine side (back) of the of the fuel injection pump **(Figure 7-18, (1))**.

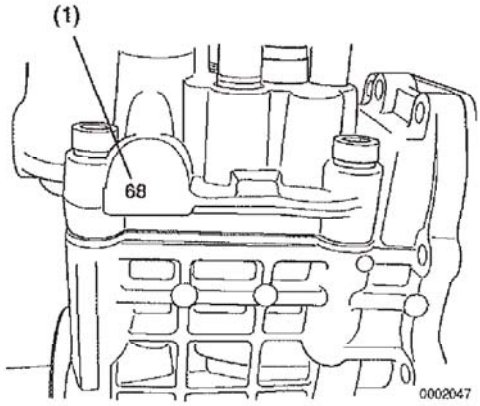


Figure 7-18

CAUTION

Do not rotate the crankshaft with the injection pump removed.

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25. If the fuel injection pump requires servicing, it must be sent to an authorized Yanmar FIE repair facility for repair and calibration, or replaced with a new fuel injection pump.

CAUTION

- **NEVER remove or attempt to remove the tamper-proof devices from the full-load fuel adjusting screw or the high-speed throttle limit screw on the fuel injection pump and governor assembly. These adjustments have been made at the factory to meet all applicable emissions regulations and then sealed.**
- **NEVER attempt to make any adjustments to these sealed adjustment screws. If adjustments are required, they can be made only by a qualified fuel injection shop that will ensure the injection pump continues to meet all applicable emissions regulations and then replace the tamper-proof seals.**
- **Tampering with or removing these devices may void the "Yanmar Limited Warranty."**

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Installation of Fuel Injection Pump

IMPORTANT

If installing a new or recalibrated fuel injection pump, locate and record the timing index number located on the pump housing boss on the engine side of the new or recalibrated fuel injection pump ***(Figure 7-19, (1))****. This number will be used to calculate and adjust the final fuel injection timing.*

Note: If either or both of the fuel injection pumps do not have a timing index number, note the injection pump ID (example: XK42) on the injection pump ID label.

To locate the timing index number for the engine being serviced use the Timing Index Chart under "FIE Specs" on the Yanmar Distributor Website (http://distributor.yanmar.co.jp).

If additional assistance is needed in locating the engine timing index number *See To Locate an Authorized Yanmar Industrial Engine Dealer or Distributor: on page 2-4* and follow the instructions to locate an authorized Yanmar industrial engine dealer or distributor for assistance.

Note: Treat the timing index number as if it has a decimal point (68 = 6.8).

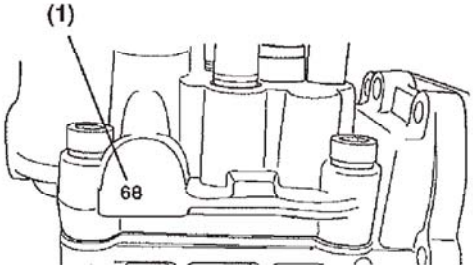
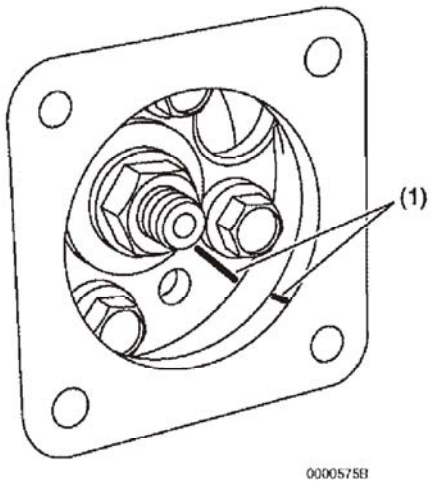


Figure 7-19

1. Align the pump drive gear with the idler gear using the reference marks made earlier.
   TNV82 - 88 model engines **(Figure 7-20, (1))**.
   TNV94 - 106 model engines **(Figure 7-21, (1))**.



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Figure 7-20

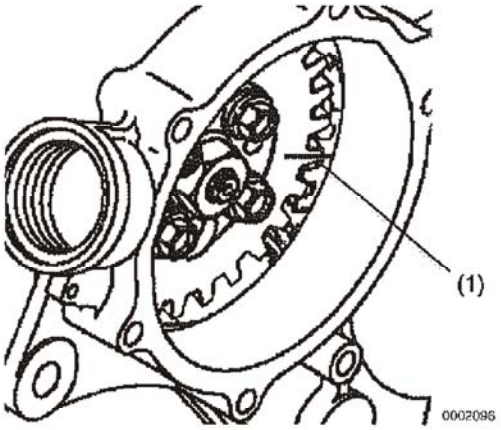
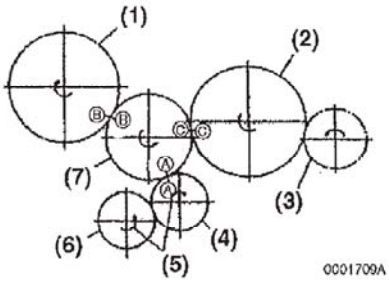


Figure 7-21

2. If installing the fuel injection pump on an engine with the front gear case cover removed, the fuel injection pump drive gear can be aligned with the idler gear by aligning the stamped marks **(A, B, C)** on the fuel injection pump drive gear, idler gear, and crankshaft drive gear. Ensure all three timing marks **(Figure 7-22, (A, B, C)) are aligned.**



1 – Fuel Injection Pump Drive Gear
2 – Camshaft Drive Gear
3 – Auxiliary Drive Gear (Optional)
4 – Crankshaft Drive Gear
5 – Direction of Rotation
6 – Oil Pump Drive Gear (4TNV94L - 4TNV106)
7 – Idler Gear

Figure 7-22

3. Install a new O-ring on the pump mounting flange. Apply grease to the O-ring to hold it in place during installation of the injection pump.

Note: Ensure the tapered surface of the fuel injection pump shaft is clean and dry.

4. Align the key on the fuel injection pump shaft with the keyway in the fuel injection pump drive gear hub. Reinstall the fuel injection pump into the fuel injection pump drive gear and gear housing. Reinstall the pump retaining nuts finger tight.
5. Reinstall the fuel injection pump drive gear lock washer **(Figure 7-23, (2))** and nut **(Figure 7-23, (1))**. Do not lubricate the threads of the nut or shaft. Hold the crankshaft pulley bolt with a socket wrench and tighten the drive gear nut to the specified torque. *See Special Torque Chart on page 7-8.*

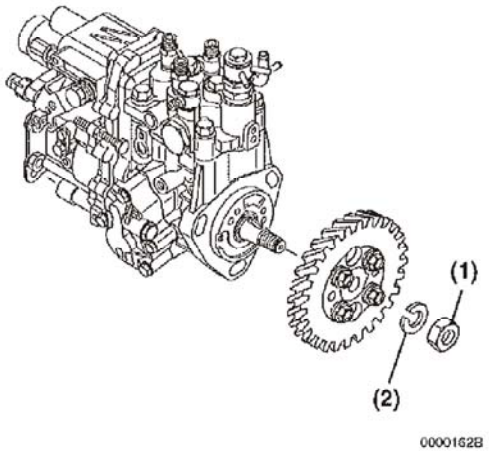


Figure 7-23

If reinstalling the original fuel injection pump:

- Align the reference marks **(Figure 7-24, (1))** previously made on both the fuel injection pump mounting flange and gear case or front plate.

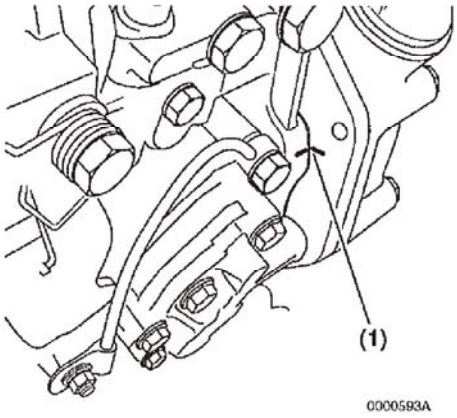


Figure 7-24

- Tighten the fuel injection pump retaining nuts to specification. *See Special Torque Chart on page 7-8.*

If installing a new fuel injection pump:

- Reinstall the timing grid sticker, provided with the new fuel injection pump, onto the back of the gear case / front plate **(Figure 7-25).** Align the "standard mark" **(Figure 7-25, (1))** with the reference mark **(Figure 7-25, (2))** made on the gear case during disassembly.

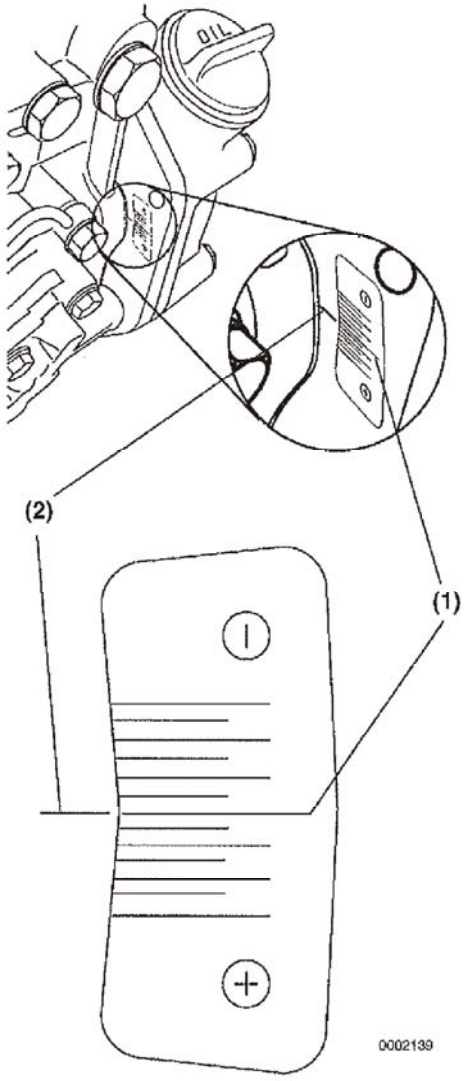


Figure 7-25

- Calculate the difference between the timing index numbers **(Figure 7-26, (1))** of the fuel injection pump that you removed and the replacement fuel injection pump. *See Calculation Example below.*

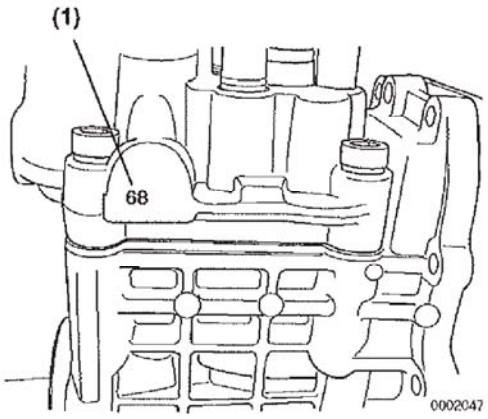


Figure 7-26

Adjusting the fuel injection timing to compensate for the difference in pump timing index numbers:

Calculation Example

Timing Index Number	
Original injection pump=	6.8
Replacement injection pump=	7.3
Difference=	+0.5

- If the difference between the timing index numbers is a positive number, the fuel injection pump mounting position must be advanced **(Figure 7-27, (2))** (rotated away from the engine) as compared to the "standard mark" **(Figure 7-27, (1))** by the calculated positive amount, adjust the fuel injection pump to the calculated value.
- If the difference between the timing index numbers is a negative number, the replacement injection pump must be retarded **(Figure 7-27, (3))** (rotated toward the engine) by the calculated negative amount.
- Each mark on the timing sticker represents 0.5° timing change.

The above calculated difference indicates that the replacement fuel injection pump is to be installed at +0.5° (advanced) from the "Standard Mark" **(Figure 7-27, (1))** on the timing sticker.

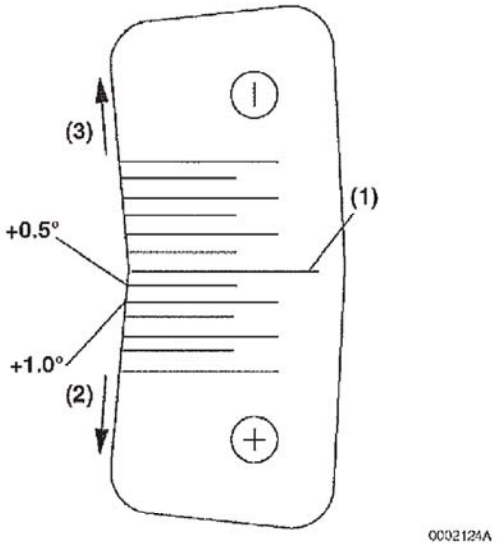


Figure 7-27

In this case, rotate the top of the fuel injection pump away from the cylinder block until the mark on the outside upper mounting boss **(Figure 7-28, (1))** of the fuel injection pump aligns with the +0.5° mark on the timing sticker.

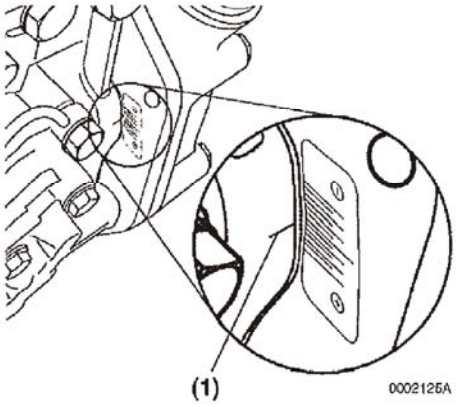


Figure 7-28

Tighten the fuel injection pump mounting nuts to specification. *See Special Torque Chart on page 7-8.*

6. Reinstall the rear bracket(s) **(Figure 7-29, (1))** to the fuel injection pump. Tighten the rear support bolts.

Note: Configuration of the fuel injection pump rear brackets may vary depending on the model.

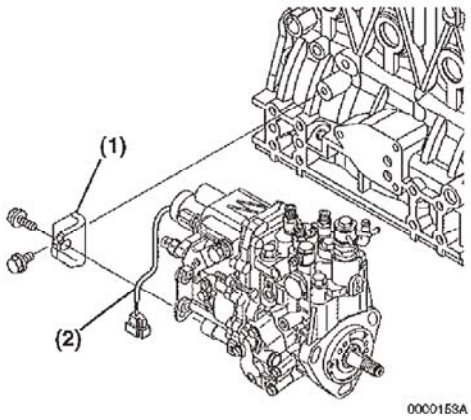


Figure 7-29

7. Reconnect the throttle linkage and the stop solenoid connector **(Figure 7-30, (2))**.
8. Reconnect the lube oil line **(Figure 7-30, (1))** and clamp **(Figure 7-30, (2))**.

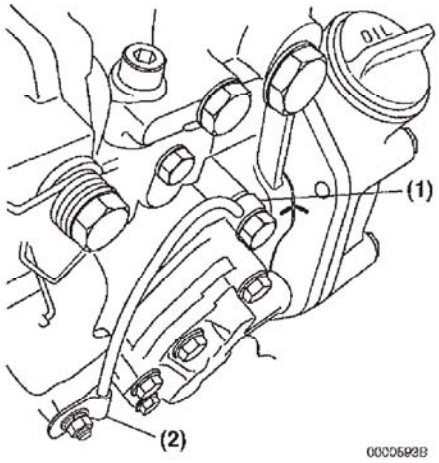


Figure 7-30

9. Apply ThreeBond Liquid Gasket No. 1212, Yanmar Part No. 977770-01212, or equivalent sealant to the sealing surface of the pump cover. Install the pump cover and tighten the cover bolts.
10. Reconnect the fuel return lines, fuel supply line and coolant lines to the fuel injection pump.
11. Reinstall the fuel injection high-pressure lines. Tighten the nuts to specification. *See Special Torque Chart on page 7-8.*

IMPORTANT

When reinstalling a new or repaired fuel injection pump, it is important to add engine oil to the fuel injection pump to provide lubrication for initial start-up. Add 5-7 oz (150-200 cc) of clean engine oil to the fuel injection pump at the fill plug located in the upper outside section of the governor housing.

12. If equipped, verify the fuel injection pump insulator **(Figure 7-31, (2))** is not damaged. Reinstall the insulator and intake manifold if previously removed.

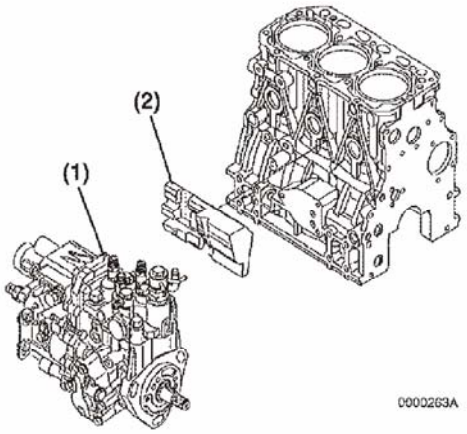


Figure 7-31

13. Reinstall the coolant pump V-pulley **(Figure 7-32, (4))**, spacer **(Figure 7-32, (3))** (if equipped) and engine coolant fan **(Figure 7-32, (2))**.

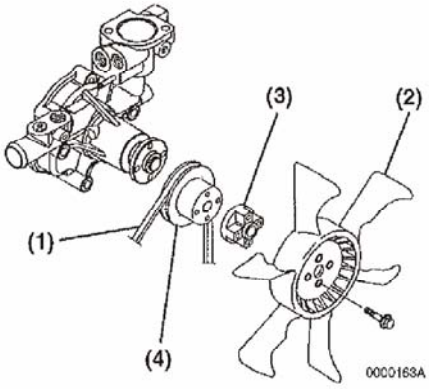


Figure 7-32

14. Reinstall the cooling fan V-belt **(Figure 7-32, (1))**. Adjust it as described in *Check and Adjust Cooling Fan V-Belt on page 5-21.*
15. Reinstall the cooling fan guard (if equipped).
16. Prime the fuel system. *See Priming the Fuel System on page 4-12.*
17. Operate the engine and check for fuel and coolant leaks.

CHECKING AND ADJUSTING FUEL INJECTION TIMING

Determining the Fuel Injection Timing Specification

1. Locate and record the fuel injection pump timing index number **(Figure 7-34, (1))** stamped into the boss on the engine side of the fuel injection pump housing **(Figure 7-33, (1))**. Treat this number as though there is a decimal point between the two digits. i.e. 68 = 6.8

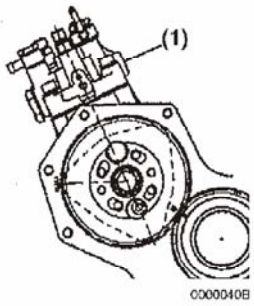


Figure 7-33

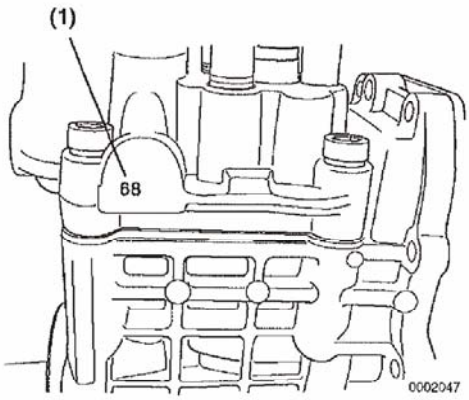


Figure 7-34

2. Using the FIR number for the engine being serviced use the Fuel Injection Reference (FIR) Chart under "FIE Specs" on the Yanmar Distributor Website (http://distributor.yanmar.co.jp).

   The FIR number is determined by the complete engine model number. The engine model number is located on the engine nameplate **(Figure 7-35)**.

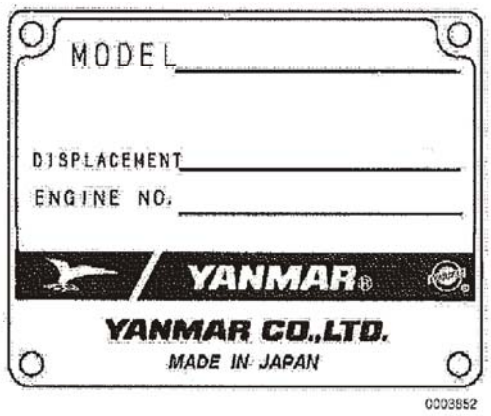


Figure 7-35

EXAMPLE: The following example is for an engine model 3TNV82A-DSA.

- Find the engine model number in the FIR chart. Locate and record the FIR number (The FIR number for this engine is 4).
- Insert the numbers you have recorded into the following equation:

(Fuel Injection Pump Timing Index Number X 2) + FIR Number = FIT° (Fuel injection Timing in Degrees)

(6.8 X 2) = 13.6 + 4 = 17.6° Fuel injection Timing

- Record the calculated fuel injection timing specification.

Checking Fuel Injection Timing

Note: Some fuel may drain from the fuel injection pump during this process. Make provisions to contain any such spillage.

1. Turn off the fuel valve in the fuel supply hose and the fuel return hose.
2. Clamp shut the fuel injection pump fuel return hose leading to fuel filter **(Figure 7-36, (1))**.

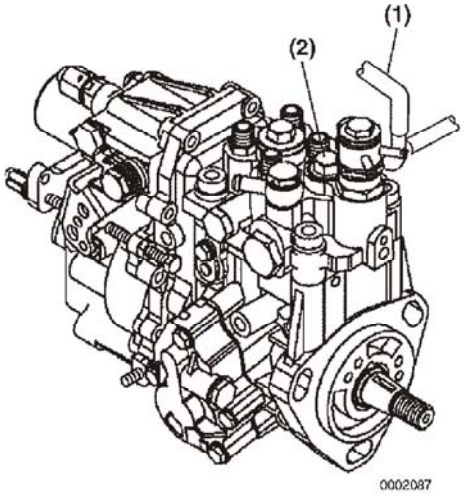


Figure 7-36

IMPORTANT

Clean the top of the fuel injection pump to prevent any contamination when the fuel injection pump plunger plug is removed.

3. Remove the forward fuel injection pump plunger plug **(Figure 7-36, (2))** on the top of the fuel injection pump.
4. Install a dial indicator adapter and clamp into the pump plunger opening.

Note: Use the Yanmar part no. 158090-51831 M14 adapter for the MP2 fuel injection pumps (TNV82 - 88 model engines) or Yanmar part no. 158090-51841 for the M16 adapter used on the MP4 fuel injection pumps (TNV94 - 106 model engines) and Yanmar part no. 23000-013000 plunger adapter clamp **(Figure 7-37,** (1)).

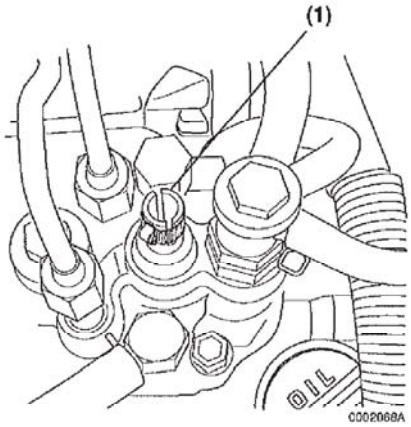


Figure 7-37

5. Install a dial indicator **(Figure 7-38, (1))**, Mitutoyo No. 2050SB or equivalent, with a 30 mm extension, Yanmar part no. 158090-51870 or Mitutoyo No. 303613, into the adapter. Secure with the Yanmar part no. 23000-013000 plunger adapter clamp **(Figure 7-37,** (1)) at approximately the mid-point of its travel.

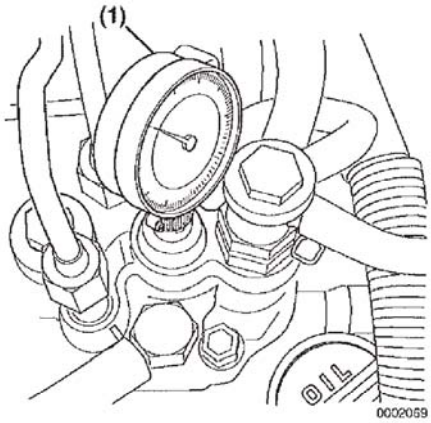


Figure 7-38

Note: The following references to the direction-of-rotation are facing the coolant pump end of the engine and are adjusted by turning the crankshaft pulley.

6. Using a wrench on the crankshaft pulley bolt, rotate the crankshaft in a clockwise direction while looking through the flywheel inspection port **(Figure 7-39, (1))**. Rotate the crankshaft until the injection timing marks on the flywheel are visible.

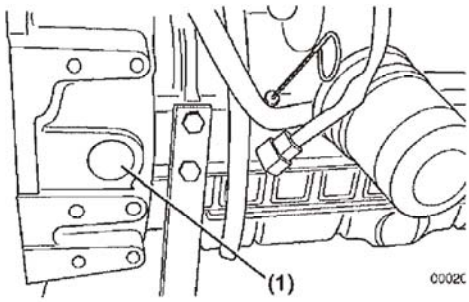
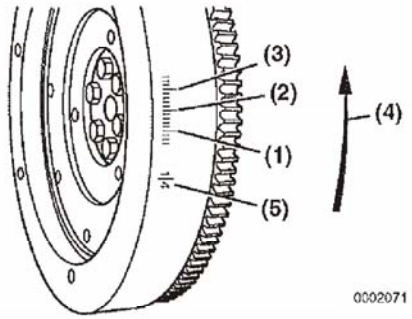


Figure 7-39

7. Typical flywheel markings are as shown in **(Figure 7-40, (1))**.

Note: A typical flywheel will have multiple timing grids depending on the number of cylinders. Any grid can be used to check the fuel injection timing.

The flywheel shown in **Figure 7-40** is for a Yanmar "Standard Specification" DI engine. Flywheels used on some "OEM Specific" DI engines may be marked differently. You should contact that specific OEM for information on the identification of the timing marks.



1 – 10° BTDC (Before Top Dead Center)
2 – 15° BTDC
3 – 20° BTDC
4 – Direction of Rotation
5 – TDC (Top Dead Center)

Figure 7-40

Note: The TDC (Top Dead Center) mark can be identified by the cylinder numbers stamped near the TDC mark on the flywheel.

If you are uncertain as to the timing degree designation of the timing marks on the flywheel timing grid, you can determine the timing degree designation by measuring the timing grid.

- First measure the distance between two of the "longer" marks on the timing grid. (They are 5° apart.) Then measure the distance from the TDC mark to the first "longer" mark on the timing grid. Divide that measurement by the distance between the two "longer" marks. The resulting answer will tell you how many degrees there are between the TDC mark and the first "longer" mark.
- EXAMPLE: If the distance between the two "longer" marks is approximately 2.0 cm and the distance from the TDC mark is approximately 4.0 cm, the answer is approximately 2. This indicates there is 10° (2 x 5°) between the TDC mark and the first "longer" mark on the timing grid. That means the first "longer" mark on the timing grid indicates 10° BTDC, the second "longer" mark indicates 15° BTDC and the third timing mark indicates 20° BTDC. If the answer is 3, that indicates there is 15° (3 x 15°) between the TDC mark and the first "longer" mark and that the first "longer" mark indicates 15° BTDC with the second and third "longer" marks indicating 20° BTDC and 25° BTDC respectively.

8. Highlight the timing reference mark **(Figure 7-41, (2))** on the flywheel housing or engine back plate **(Figure 7-42, (2))**. Highlight the TDC (Top Dead Center) mark **(Figure 7-41, (1))** on the flywheel.
9. Highlight the target timing mark **(Figure 7-42, (1))** on the flywheel as calculated in *Determining the Fuel Injection Timing Specification on page 7-26.*

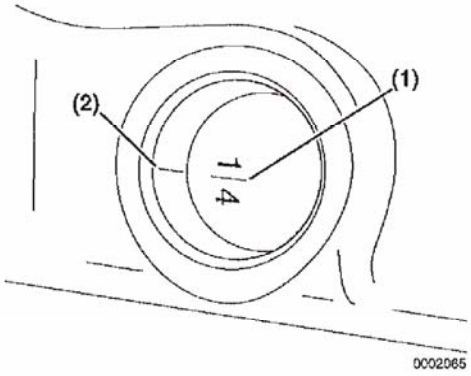


Figure 7-41

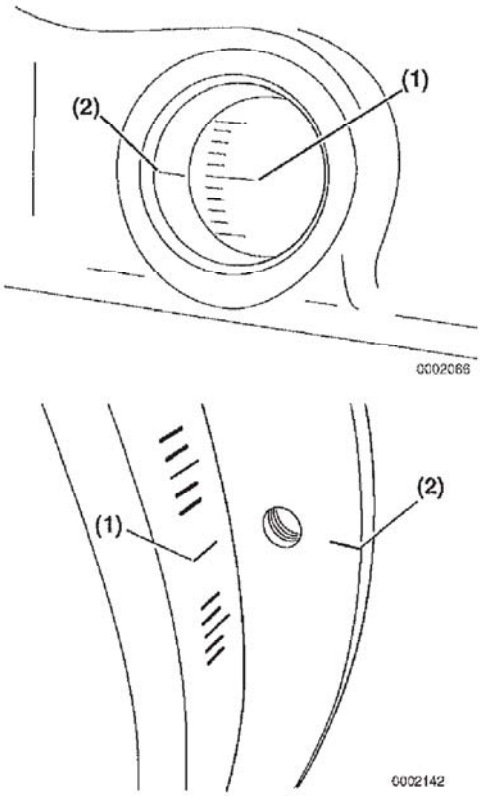


Figure 7-42

10. Rotate the crankshaft counter-clockwise until the dial indicator shows that the injection pump plunger is at the bottom of its stroke. Rock the crankshaft back and forth slightly to confirm a point where the dial indicator shows no movement. Zero the dial indicator.
11. Slowly rotate the crankshaft clockwise until the dial indicator shows a pump plunger lift of 2.5 mm (0.098 in.).
12. Check the position of the flywheel target timing mark (previously determined) **(Figure 7-42, (1))** in relation to the timing reference mark **(Figure 7-42, (2))** on the flywheel housing or engine back plate. If the two marks are aligned, the fuel injection timing is correct. If the marks do not align, the fuel injection timing must be adjusted. *See Adjusting Fuel Injection Timing on page 7-30.*
13. If the injection timing is correct, remove the dial indicator and adapter. Replace the pump plunger plug and its copper gasket and tighten to specifications. Replace the flywheel inspection port cover. Open the fuel supply valve and remove the clamp from the fuel supply hose and the fuel return hose.
14. Prime the fuel system. Operate the engine and check for leaks.

Adjusting Fuel Injection Timing

If the timing marks did not align when performing the *Checking Fuel Injection Timing on page 7-27*, the following steps must be performed to properly time the engine.

1. Leave the dial indicator installed in the fuel injection pump. Do not disturb the reading on the dial indicator.
2. Rotate the flywheel until the target timing mark **(Figure 7-43, (1))** and the timing reference mark **(Figure 7-43, (2))** on the flywheel housing or back plate are aligned.

IMPORTANT

Do not rotate the crankshaft during the remainder of this procedure.

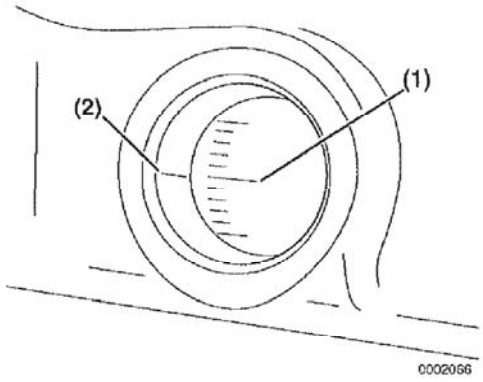


Figure 7-43

3. Note the reading on the dial indicator **(Figure 7-44, (1))**. If the reading is less than 2.5 mm (0.098 in.), the fuel injection timing is "retarded." If the dial indicator reading is greater than 2.5 mm (0.098 in.), the fuel injection timing is "advanced."

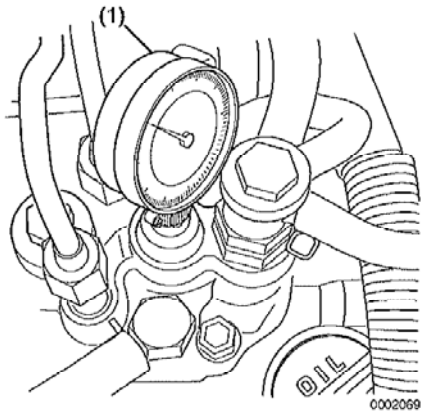


Figure 7-44

Note: Some model engines require the intake manifold and fuel injection pump insulator be removed to access the inner fuel injection pump retaining nuts.

4. Loosen the nuts fastening the fuel injection pump to the gear case or front plate. Loosen the rear bracket(s) on the fuel injection pump.

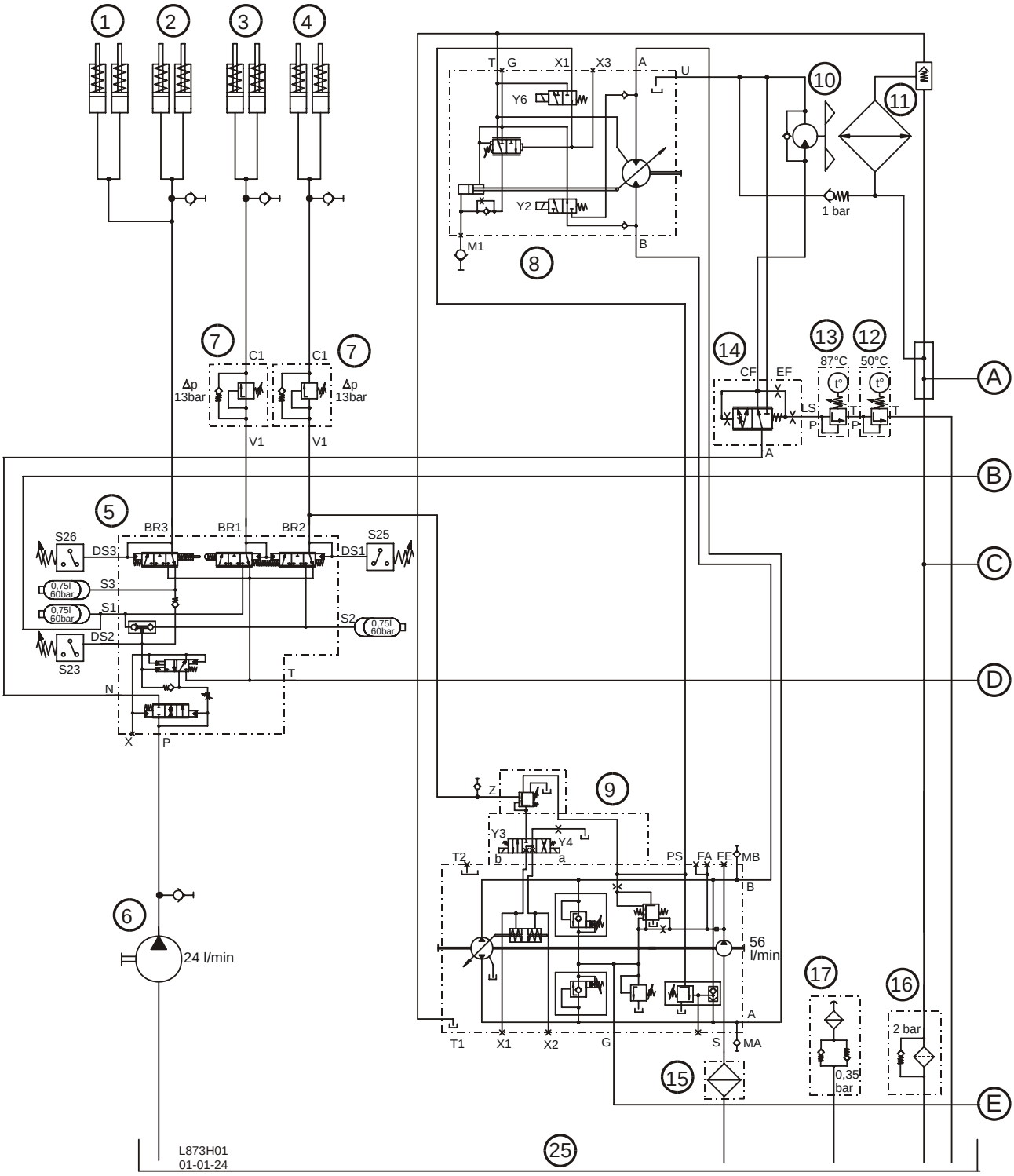
Note: Loosening the high-pressure injection line nuts on the fuel injection pump may make rotating the pump easier.

5. Rotate the fuel injection pump until the dial indicator reads 2.5 mm (0.098 in.).
6. To "advance" the injection timing, rotate the top of the fuel injection pump away from the engine.
7. To "retard" the injection timing, rotate the top of the fuel injection pump toward the engine.
8. When the dial indicator reads 2.5 mm (0.098 in.) of pump plunger lift and the target timing mark on the flywheel aligns with the reference mark on the flywheel housing or engine back plate, the injection timing is correct.
9. Tighten the fuel injection pump mounting nuts and rear bracket(s).
10. Remove the dial indicator and adapter. Replace the plug in the pump plunger opening and tighten it to specification. If removed, install the intake manifold and pump insulator. Tighten the high-pressure injection line nuts to specification. Open the fuel supply valve, remove the clamp from the fuel return line and prime the fuel system. Operate the engine and check it for leaks.

SUBGROUP LIST

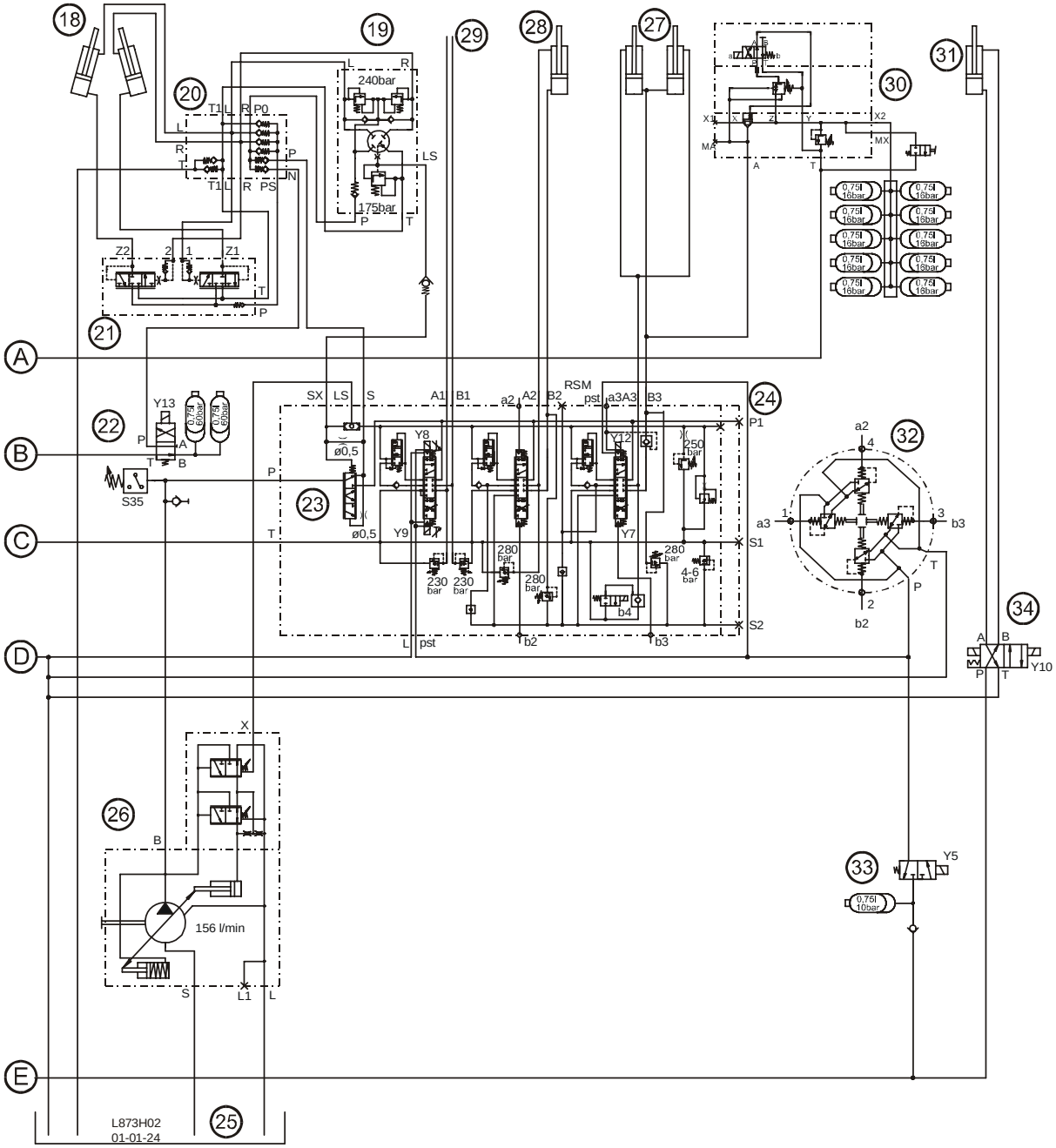
Hydraulic system
Diagrams - schemes

SKL 200 (SKL 873)	**4.13**
TL 65 (SKL 824)	**4.22**
TL 80 (SKL 834)	**4.24**
TL 80 AS	**4.25**
TL 100 (SKL 844)	**4.26**
TL 120 (SKL 854)	**4.27**
TL 160 (SKL 160)	**4.28**
TL 210	**4.29**
TL 260 (SKL 260)	**4.30**
TL 420	**4.33**
TL 450	**4.35**
TL 70 (SKS 634)	**4.37**
TW 70 (HML 23)	**4.49.50**
TW 85 (HML 32)	**4.51**
TW 110 (HML 42)	**4.53**
TC 60 (HR 20)	**4.60**
TC 75 (HR 32)	**4.65**
TC 125 (HR 42)	**4.67**
TC 29 (HR 14)	**4.76**
TC 35 (HR 16)	**4.78**
TC 48 (HR 18)	**4.80**
TC 15 (HR 1.5)	**4.90**
TC 16 (HR 1.6)	**4.91**
TC 20 (HR 2.0)	**4.92**
TC 25	**4.93**
TC 37 (HR 3.7)	**4.97**
TC 50	**4.99**



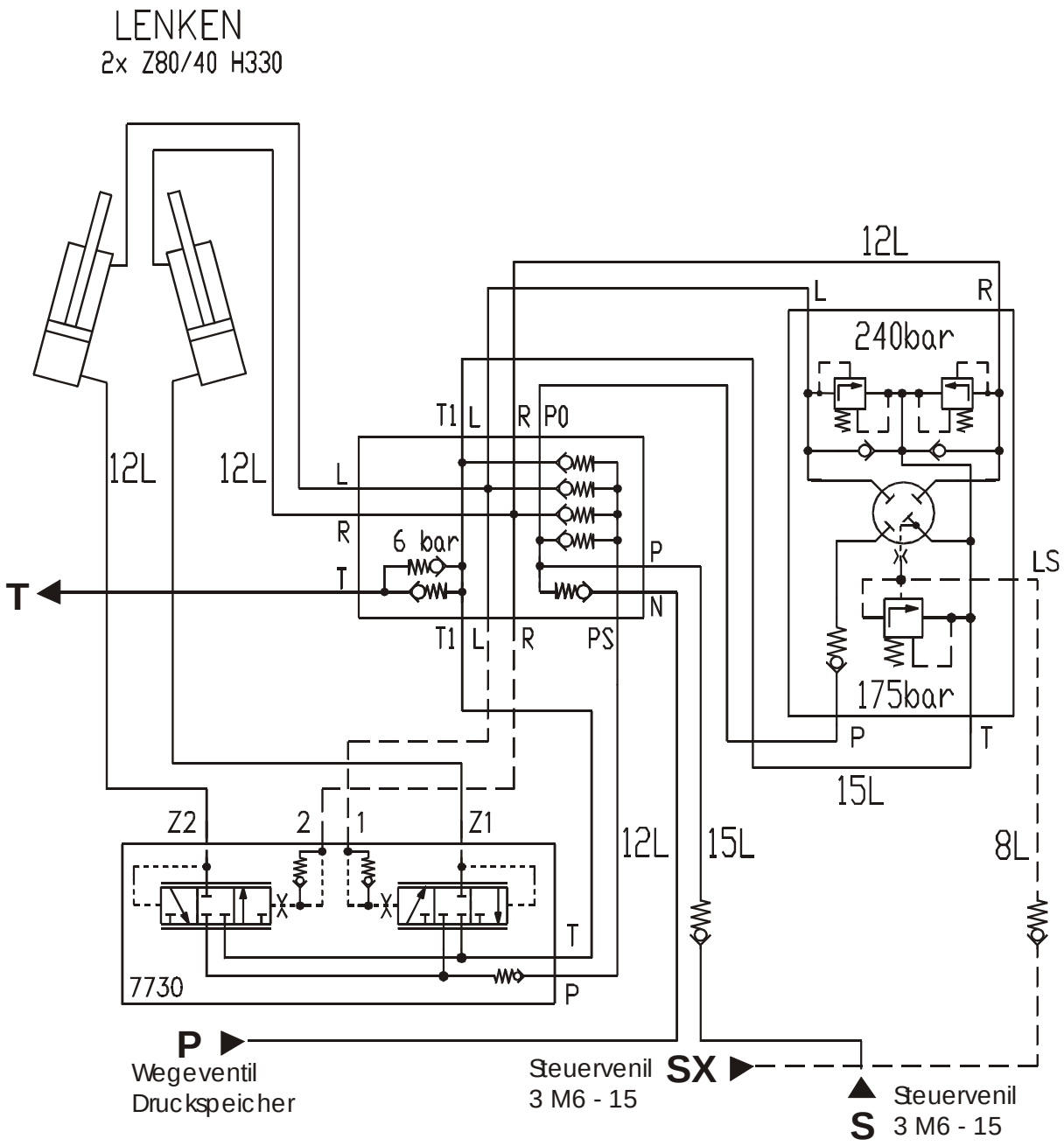
TEREX	Typ/Model/Type **SKL 200** (SKL 873)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Hydraulic diagram, complete, part 1**	Blatt/Page/Feuille **4.13.01**

1	Parking brake, rear axle	18	Steering cylinder
2	Parking brake, front axle	19	Steering orbitrol
3	Service brake, rear axle	20	Logic block
4	Service brake, front axle	21	Servo control valve
5	Brake control system	22	Emergency steering
6	Gear pump on accessory drive - brake, radiator drive	23	Priority valve (integrated in control valve)
7	Valve	24	Control valve
8	Travel motor	25	Hydraulic oil tank
9	Travel pump	26	Axial piston variable-capacity pump
10	Fan motor	27	Hydraulic cylinder - lifting frame
11	Hydraulic oil radiator	28	Hydraulic cylinder - bucket tilt
12	Hydraulic oil tank temperature sensor	29	Additional control circuit
13	Water radiator temperature sensor	30	Ride control system (option)
14	Fan motor selector valve	31	2-gear transmission
15	Hydraulic oil, suction filter	32	Joystick
16	Hydraulic oil, return filter	33	Working hydraulics cut-off valve
17	Ventilation filter	34	Selector valve



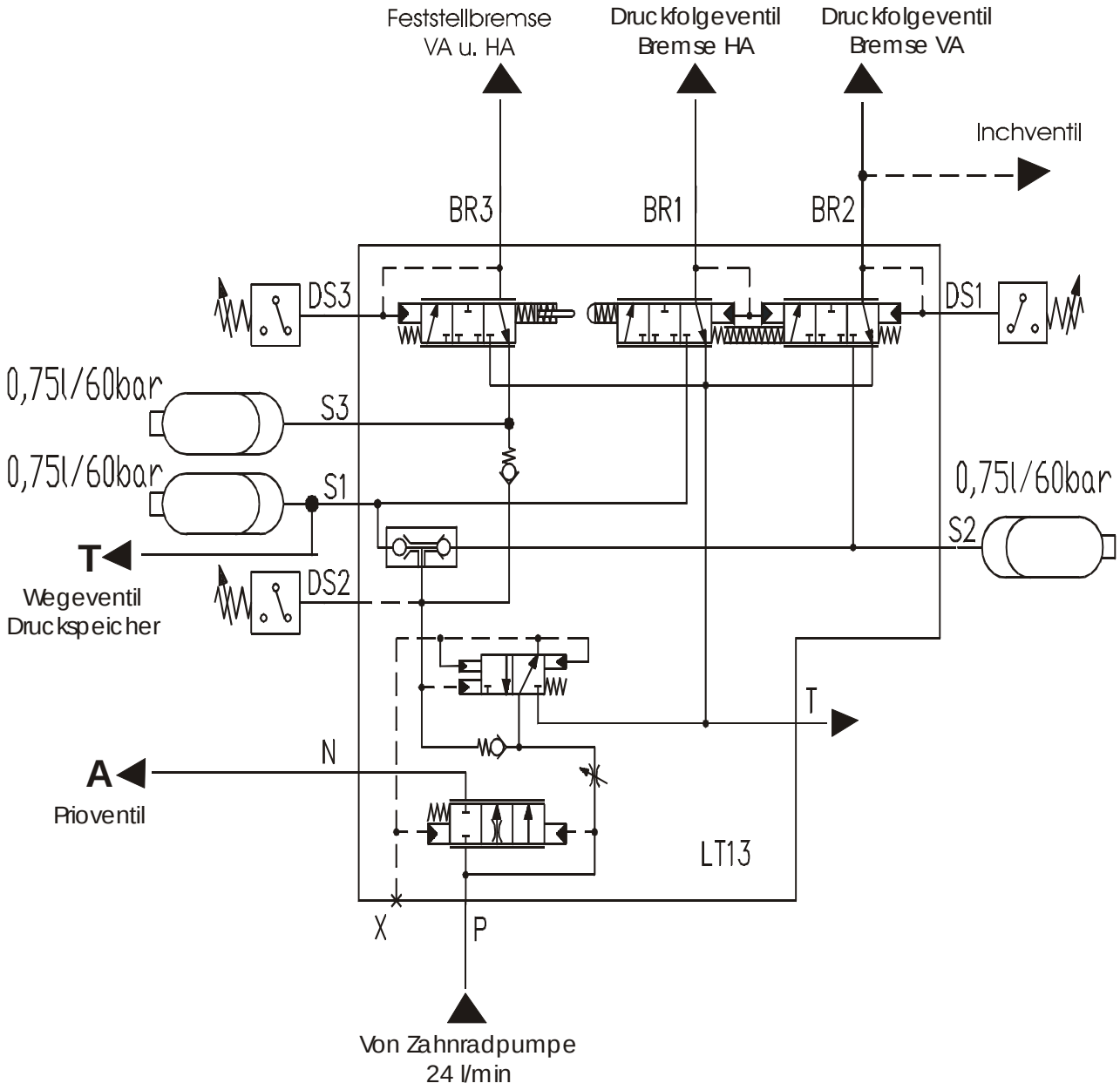
TEREX	Typ/Model/Type **SKL 200** (SKL 873)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Hydraulic diagram, complete, part 2**	Blatt/Page/Feuille **4.13.02**

1	Parking brake, rear axle	18	Steering cylinder
2	Parking brake, front axle	19	Steering orbitrol
3	Service brake, rear axle	20	Logic block
4	Service brake, front axle	21	Servo control valve
5	Brake control system	22	Emergency steering
6	Gear pump on accessory drive, radiator drive	23	Priority valve (integrated in control valve)
7	Valve	24	Control valve
8	Travel motor	25	Hydraulic oil tank
9	Travel pump	26	Axial piston variable-capacity pump
10	Fan motor	27	Hydraulic cylinder - lifting frame
11	Hydraulic oil radiator	28	Hydraulic cylinder - bucket tilt
12	Hydraulic oil tank temperature sensor	29	Additional control circuit
13	Water radiator temperature sensor	30	Ride control system (option)
14	Fan motor selector valve	31	2-gear transmission
15	Hydraulic oil, suction filter	32	Joystick
16	Hydraulic oil, return filter	33	Working hydraulics cut-off valve
17	Ventilation filter	34	Selector valve



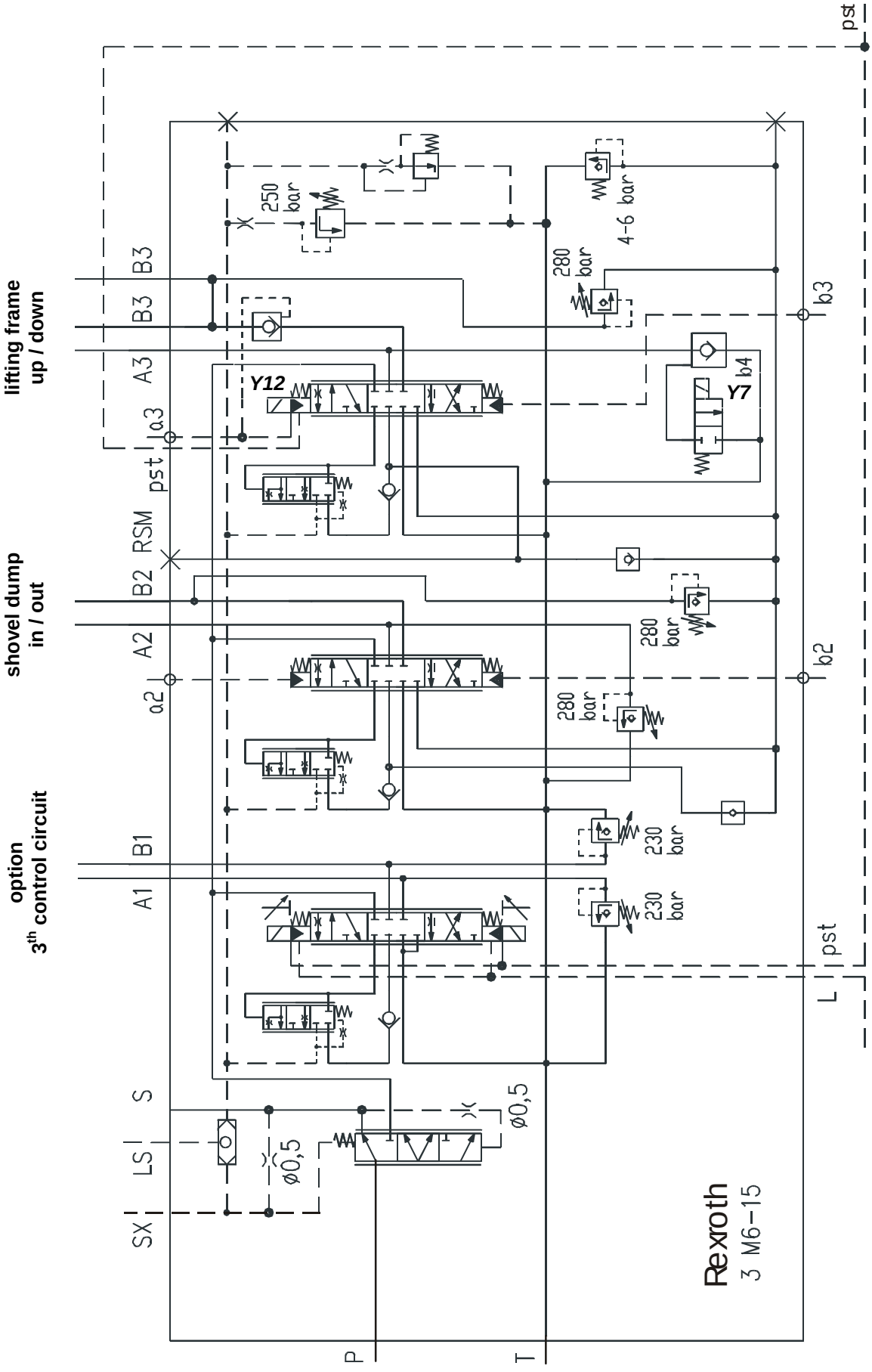
Lenken = steering
Steuerventil = control valve
Wegeventil = solenoid valve
Druckspeicher = pressure accumulator

TEREX	Typ/Model/Type **SKL 200** (SKL 873)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Hydraulic diagram, steering**	Blatt/Page/Feuille **4.13.03**

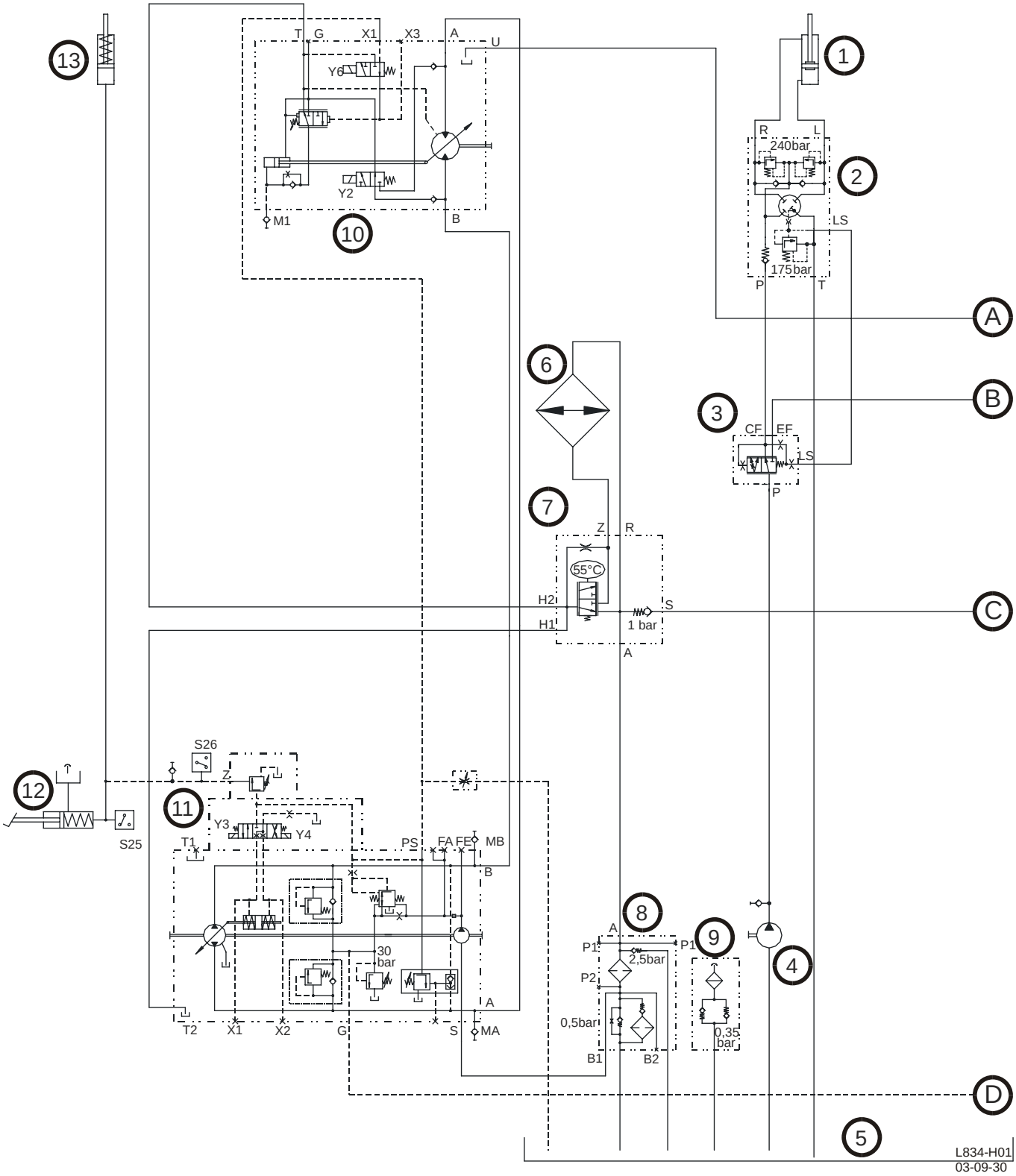


Wegeventil = solenoid valve
Druckspeicher = pressure accumulator
Prioventil = priority valve
von Zahnradpumpe = from gear pump
Inchventil = inching valve
Druckfolgeventil = pressure sequence valve
Bremse VA = brake front axle
Bremse HA = brake rear axle
Feststellbremse VA und HA = parking brake front axle and rear axle

TEREX	Typ/Model/Type **SKL 200** (SKL 873)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Hydraulic diagram, brake**	Blatt/Page/Feuille **4.13.04**

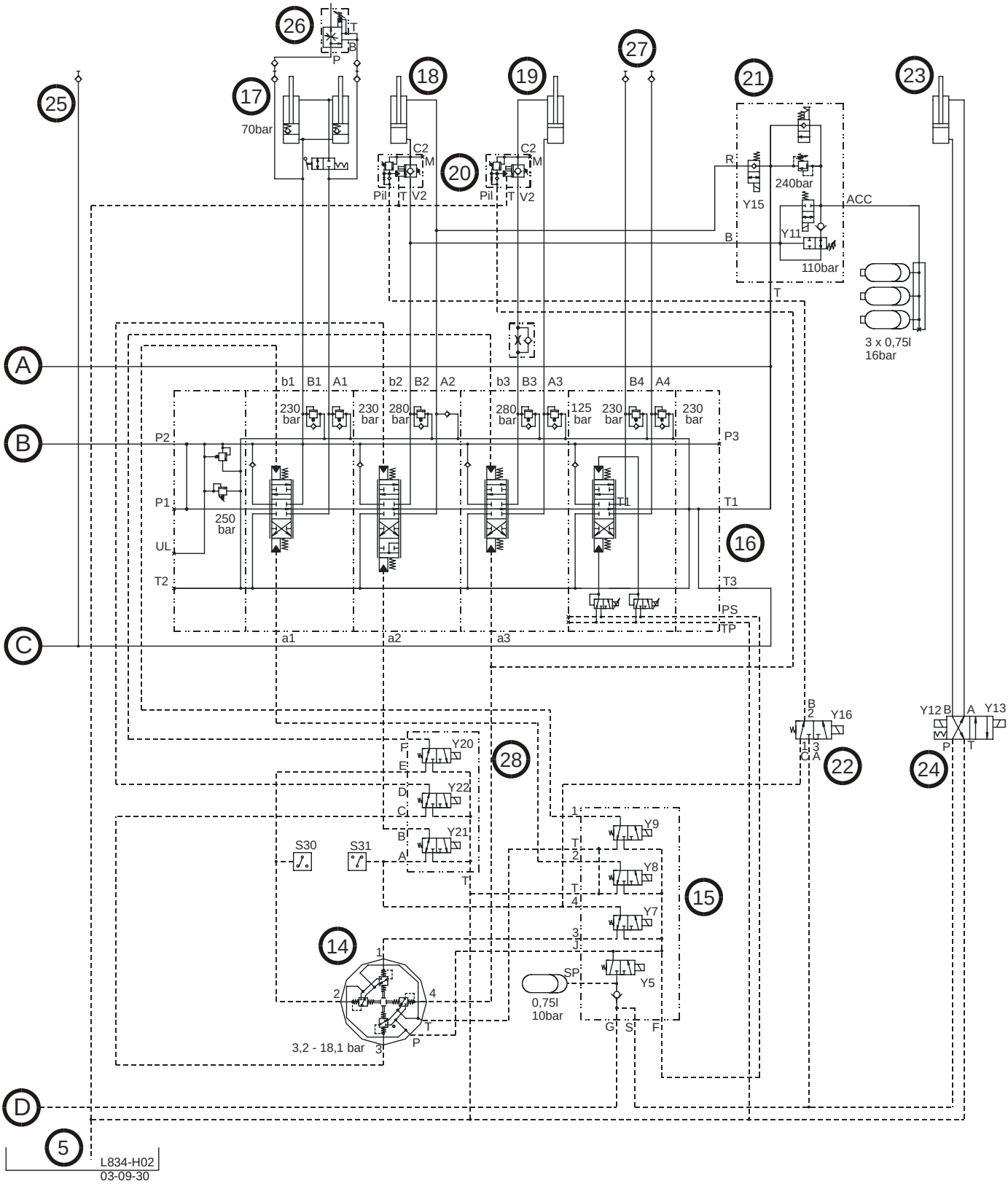


TEREX	Typ/Model/Type **SKL 200** (SKL 873)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Hydraulic diagram, control valve**	Blatt/Page/Feuille **4.13.05**



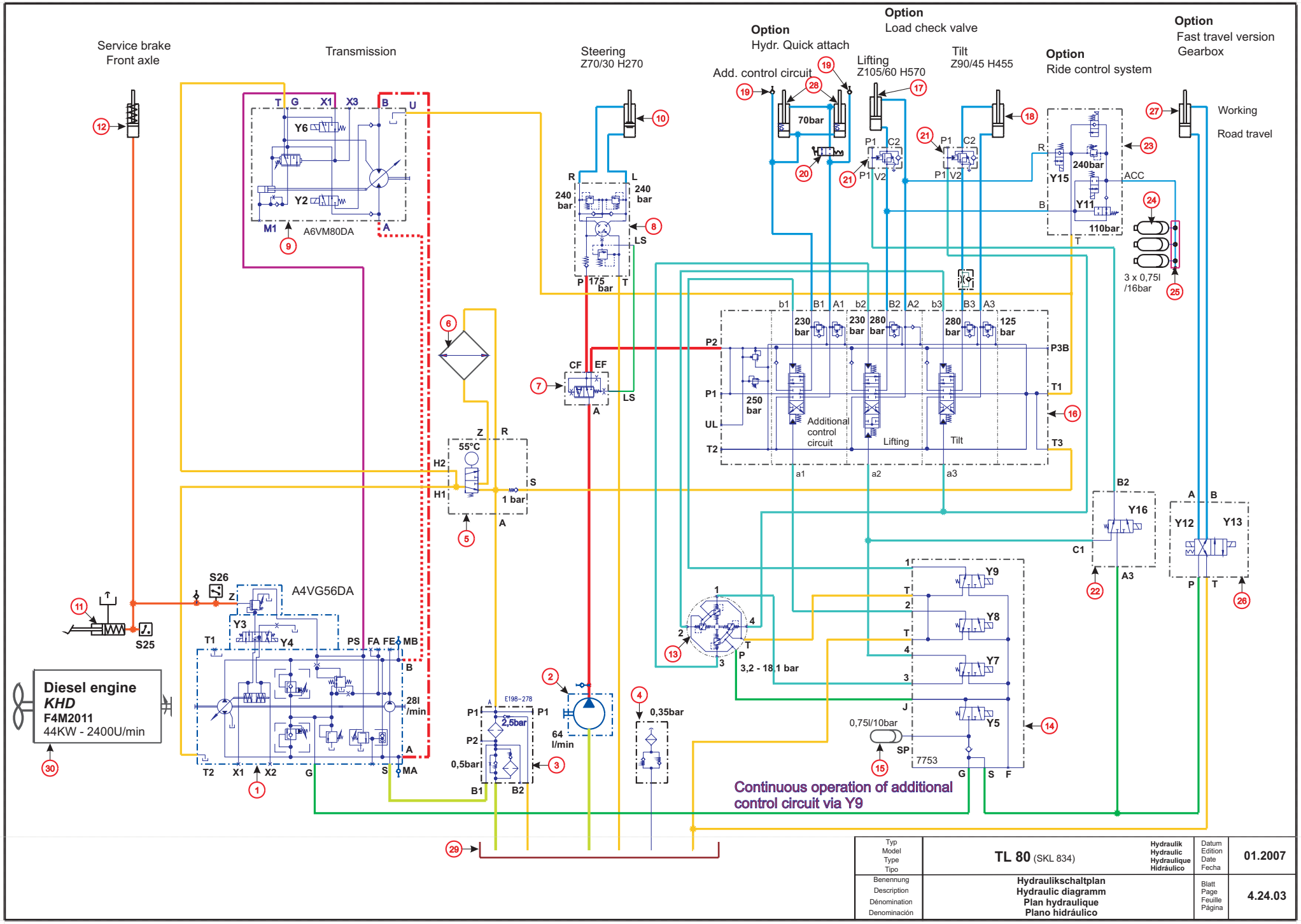
TEREX	Typ/Model/Type **TL 65** (SKL824 / SKL824 S)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Hydraulic diagram**	Blatt/Page/Feuille **4.22.01**

1	Steering cylinder
2	Steering unit
3	Priority valve
4	Steering / loading pump
5	Hydraulic oil tank
6	Hydraulic oil radiator
7	Hydraulic oil temperature control
8	Hydraulic oil combined filter
9	Breather
10	Travel motor
11	Travel pump
12	Main brake cylinder
13	Brake, front axle



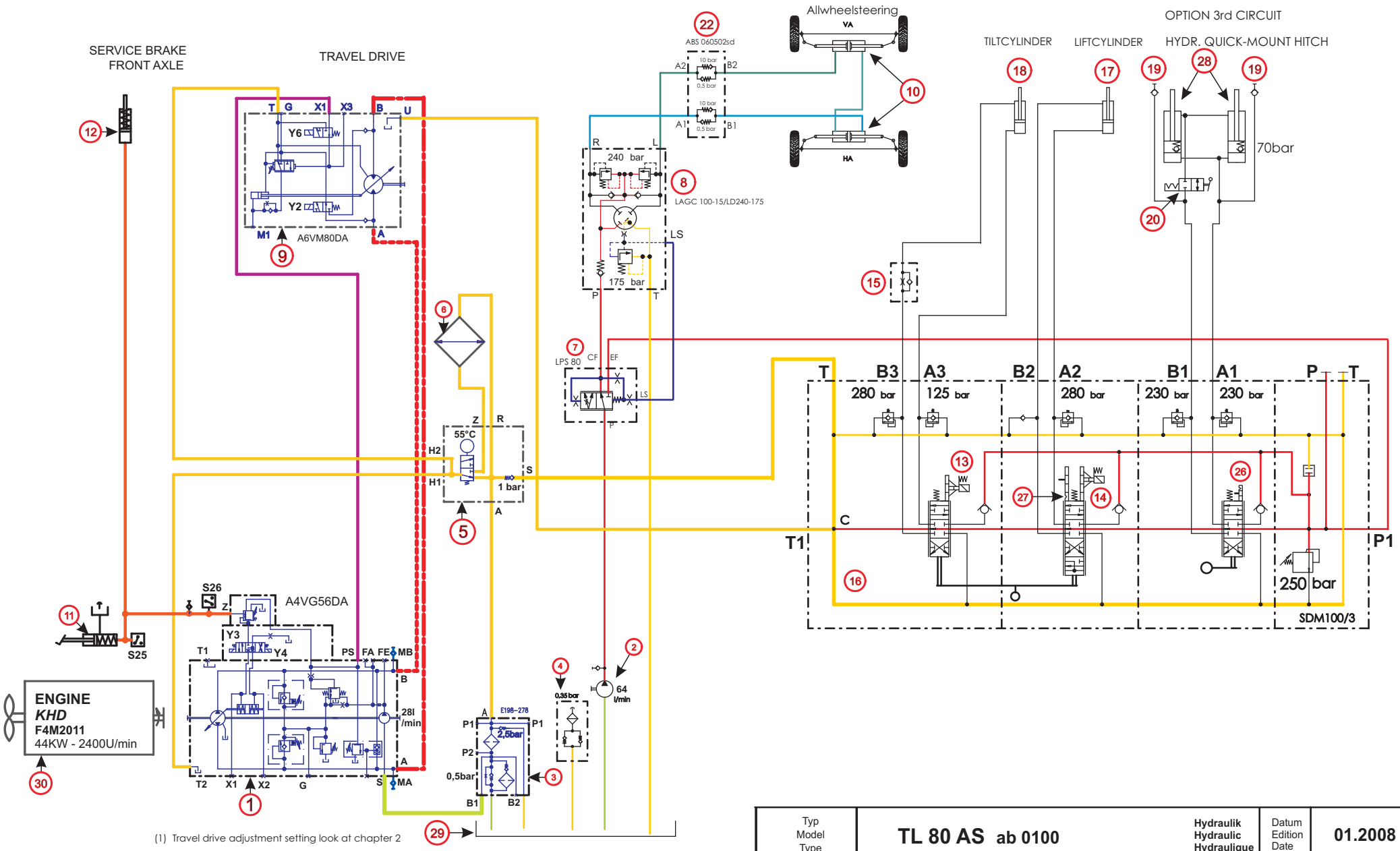
TEREX	Typ/Model/Type **TL 65** (SKL824 / SKL824 S)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Hydraulic diagram**	Blatt/Page/Feuille **4.22.02**

5	Hydraulic oil tank
14	Loader control lever
15	Pilot control unit
16	Control valve
17	Additional control circuit connection; hydraulic quick-attach system
18	Hydraulic cylinder – lift frame
19	Hydraulic cylinder – bucket tilt
20	Load retailing valves
21	Vibration damping
22	Release valve (only if Pos. 20 and 21 exist)
23	Transmission (high speed version)
24	Valve


Service brake
Front axle
Transmission
Steering
Z70/30 H270
Option
Hydr. Quick attach
Add. control circuit
Option
Load check valve
Lifting
Z105/60 H570
Tilt
Z90/45 H455
Option
Ride control system
Option
Fast travel version
Gearbox
Working
Road travel
A6VM80DA
A4VG56DA
Diesel engine
KHD
F4M2011
44KW - 2400U/min
Additional control circuit
Lifting
Tilt
Continuous operation of additional control circuit via Y9
TL 80 (SKL 834)
Hydraulikschaltplan
Hydraulic diagramm
Plan hydraulique
Plano hidráulico
01.2007
4.24.03

Pos. Item Rep. No.	Deutsch	English	Français
1	Verstellpumpe	Variable displacement pump	Pompe à débit variable
2	Zahnradpumpe	Gear pump	Pumpe à engrenage
3	Rücklauffilter, Saugfilter	Return filter, suction filter	Filtre de retour, filtre d'aspiration
4	Belüftungsfilter	Vent filter	Filtre d'aération
5	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
6	Ölkühler	Oil cooler	Refroidisseur d'huile
7	Prioritätsventil	Priority valve	Valve prioritaire
8	Lenkaggregat	Steering unit	Ensemble direction
9	Verstellmotor - Fahren	Variable displacement motor - travel	Moteur à cylindrée variable - translation
10	Hydraulikzylinder - Lenken	Hydraulic cylinder - steering	Vérin hydraulique - direction
11	Hauptbremszylinder	Master cylinder (brake)	Maître - cylindre (frein)
12	Betriebsbremse (Vorderachse)	Service brake (front axle)	Frein de service (essieu AV)
13	Vorsteuergerät	Joy stick	Distributeur à commande assistèe
14	Vorsteuereinheit	Pilot - operated unit	Système pilotage
15	Hydrospeicher	Hydraulic accumulator	Accumulateur hydraulique
16	Blocksteuergerät	Valve bank	Bloc distributeur
17	Hydraulikzylinder - Hubrahmen	Hydraulic cylinder - lifting frame	Vérin hydraulique - bras de levage
18	Hydraulikzylinder - Schaufel kippen	Hydraulic cylinder - dump shovel	Vérin hydraulique - basculement godet
19	Zusatzsteuerkreis	Additional control circuit	Circuit supplémentaire
20	Umschalthahn	Ball cock	Robinet - inverseur
21	Lasthalteventil	Load check valve	Clapet de sécurité
22	3/2 Wegeventil	3/2 Solenoid valve	electrovanne 3/2
23	Lastschwingungsdämpfventil	Ride control valve	bloc anti-tangage
24	Hydrospeicher (3x)	Hydraulic accumulator (3x)	Accumulateur hydraulique (3x)
25	Speicherblock	Accumulator bloc	Bloc d'accumulateurs
26	3/2 Wegeventil (schnell / langsam)	3/2 Solenoid valve (low / high speed)	Electrovanne 3/2 (petite / grande vitesse)
27	Hydraulikzylinder - Schaltgetriebe	Hydraulic cylinder - gearbox	Vérin hydraulique - boîte de vitesses
28	Schnellwechselaufhängung	Quick mount hitch suspension	Suspension attache rapide
29	Hydrauliköltank	Hydraulic oil tank	Réservoir hydraulique
30	Dieselmotor	Diesel engine	Moteur diesel

Typ Model Type Tipo	**TL 80** (SKL 834)	**HYDRAULIKSCHALTPLAN** **HYDRAULIC DIAGRAMM** **PLAN HYDRAULIQUE** **PLANO HIDRAULICO**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Legende** **Legend** **Légende** **Leyenda**		Blatt Page Feuille Página	**4.24.04**

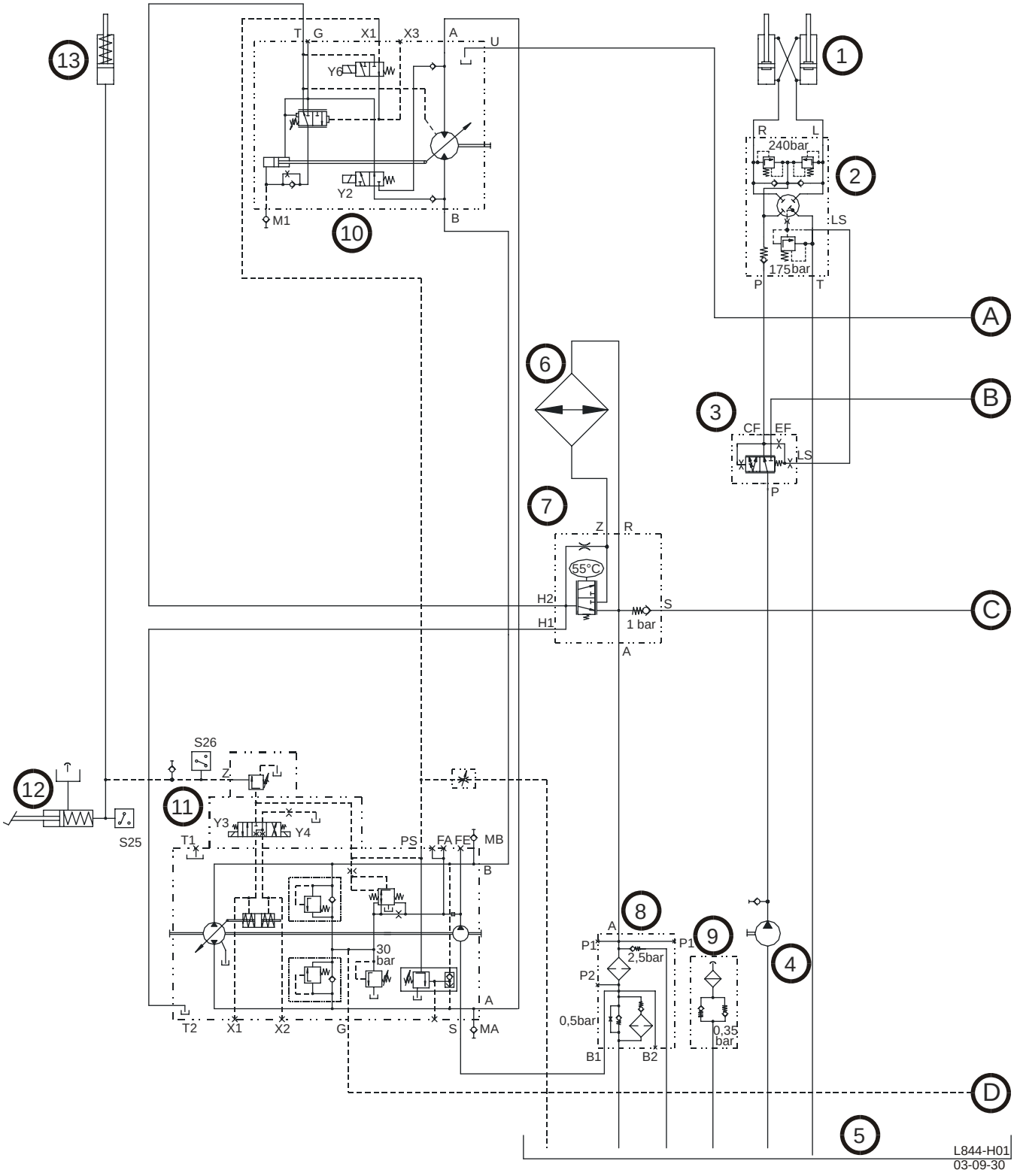


(1) Travel drive adjustment setting look at chapter 2

Typ Model Type	**TL 80 AS ab 0100**	**Hydraulik Hydraulic Hydraulique**	Datum Edition Date **01.2008**
Benennung Description Dénomination	**Hydraulikschaltplan Hydraulic diagramm Plan hydraulique**		Blatt Page Feuille **4.25.01**

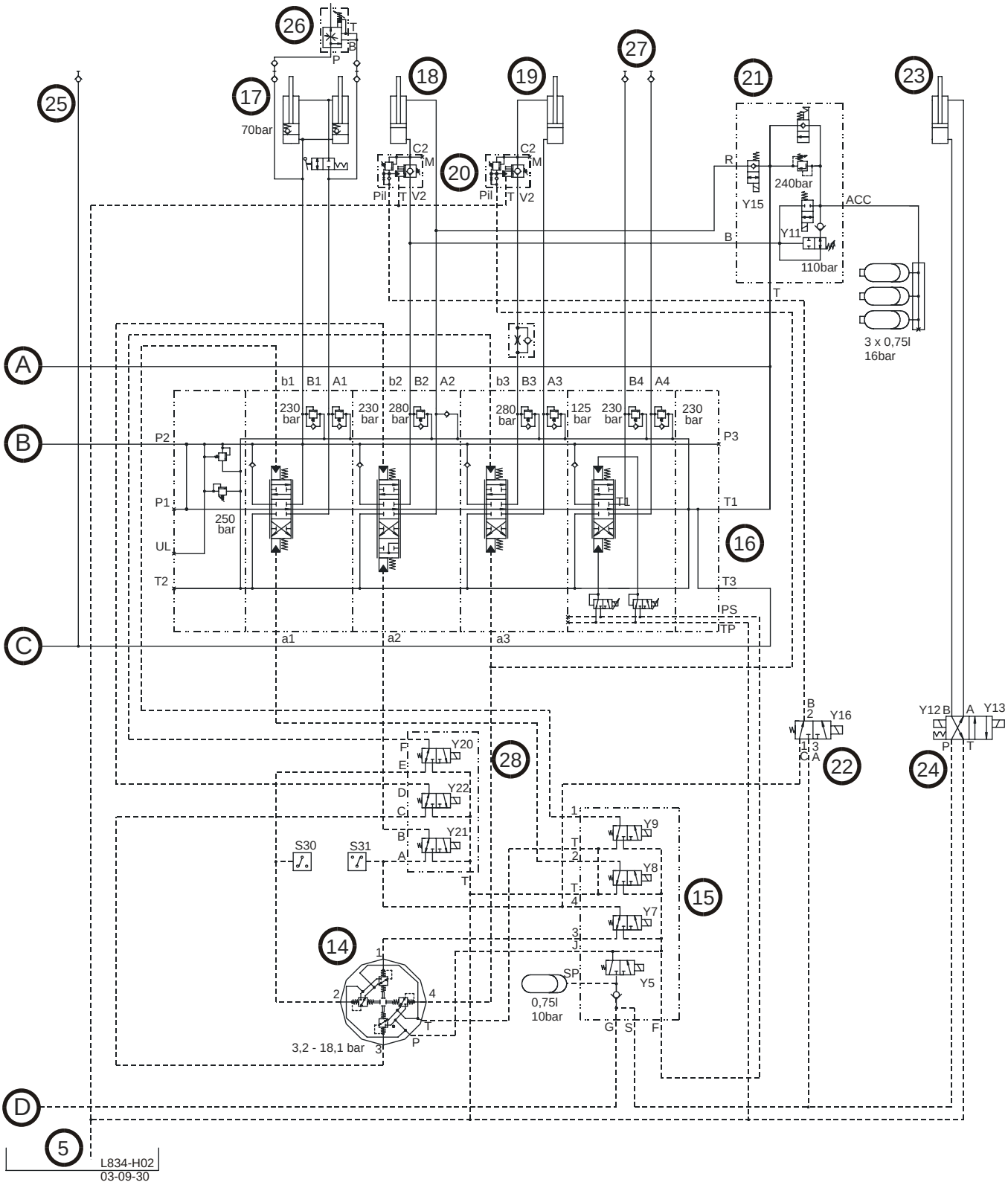
Pos. Item Rep.	Deutsch	English	Français
1	Verstellpumpe - Fahren	Variable displacement pump	Pompe à débit variable
2	Zahnradpumpe	Gear pump	Pompe à engrenage
3	Rücklauffilter, Saugfilter	Return filter, suction filter	Filtre de retour, filtre d'aspiration
4	Belüftungsfilter	Vent filter	Filtre d'aération
5	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
6	Ölkühler	Oil cooler	Refroidisseur d'huile
7	Prioritätsventil	Priority valve	Valve prioritaire
8	Lenkaggregat	Steering unit	Ensemble direction
9	Verstellmotor - Fahren	Variable displacement motor - travel	Moteur à cylindrée variable - translation
10	Lenkzylinder mit integriertem Parallelausgleich	Steering cyl. with integrated parallel compensation	Vérin de direction avec compensation en parallel
11	Hauptbremszylinder	Master cylinder (brake)	Maître - cylindre (frein)
12	Betriebsbremse (Vorderachse)	Service brake (front axle)	Frein de service (essieu AV)
13	**Y9** Magnet Schieberarretierung	**Y9** Spool solenoid lock devise	**Y9** Electrovanne blocage tiroir
14	**Y10** Magnet Schieberarretierung	**Y10** Spool solenoid lock devise	**Y10** Electrovanne blocage tiroir
15	Auskippdrossel	Dump throttle	Etrangleur de basculement
16	Blocksteuergerät	Valve bank	Bloc distributeur
17	Hydraulikzylinder - Hubrahmen	Hydraulic cylinder - lifting frame	Vérin hydraulique - bras de levage
18	Hydraulikzylinder - Schaufel kippen	Hydraulic cylinder - dump shovel	Vérin hydraulique - basculement godet
19	Zusatzsteuerkreis	Additional control circuit	Circuit supplémentaire
20	Umschalthahn	Ball cock	Robinet - inverseur
21			
22			
23			
24			
25			
26			
27			
28	Schnellwechselzylinder	Quick mount hitch cylinders	Vérins attache rapide
29	Hydrauliköltank	Hydraulic oil tank	Réservoir hydraulique
30	Dieselmotor	Diesel engine	Moteur diesel

Typ Model Type	**TL 80 AS**	**HYDRAULIKSCHALTPLAN HYDRAULIC DIAGRAMM PLAN HYDRAULIQUE**	Datum Edition Date	**01.2008**
Benennung Description Dénomination		**Legende Legend Légende**	Blatt Page Feuille	**4.25.02**



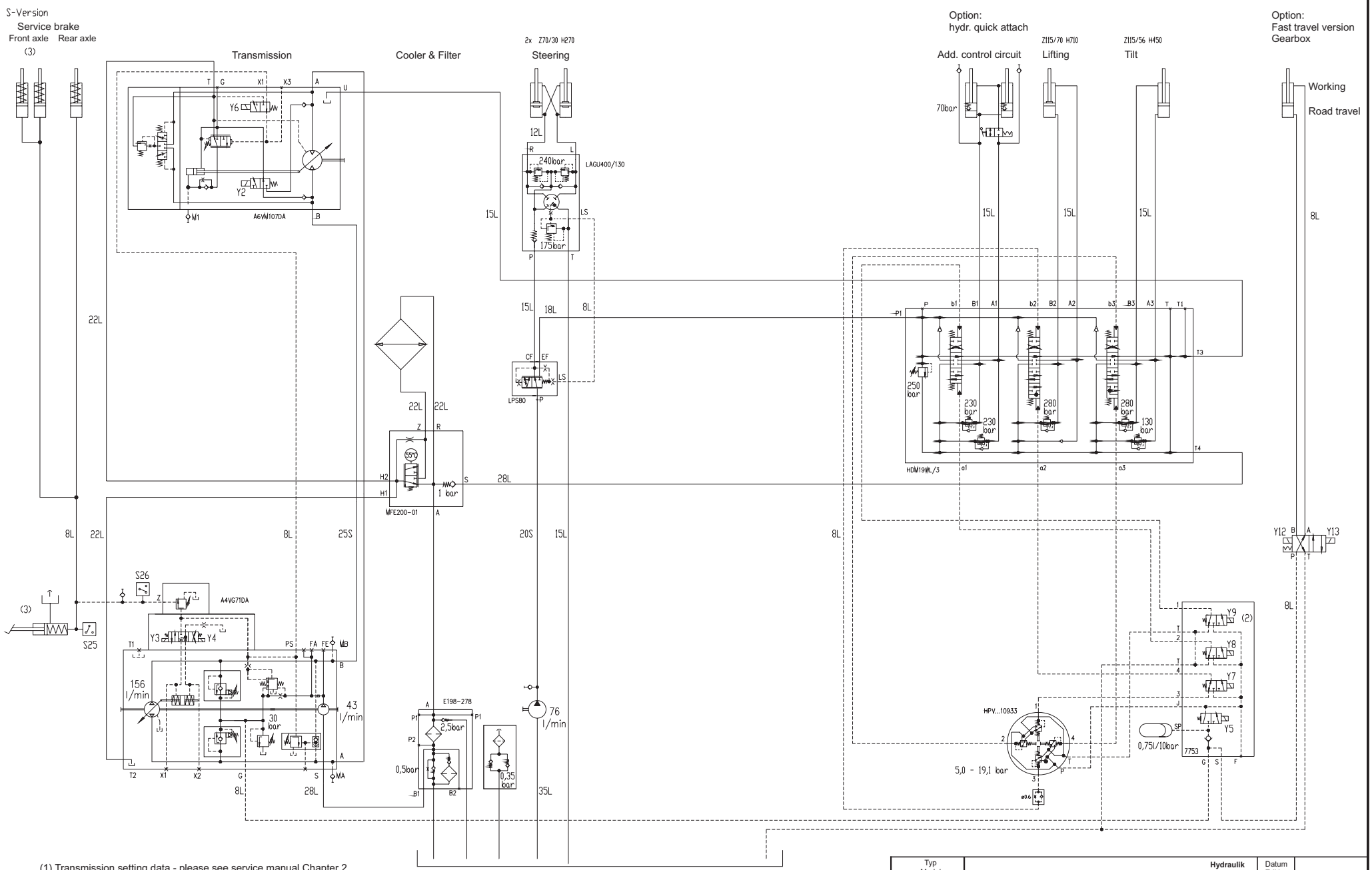
TEREX	Typ/Model/Type **TL 100** from : TL01000100 (SKL 844 / SKL 844 S)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Hydraulic Diagramm**	Blatt/Page/Feuille **4.26.01**

1	Steering cylinder
2	Steering unit
3	Priority valve
4	Steering / loading pump
5	Hydraulic oil tank
6	Hydraulic oil radiator
7	Hydraulic oil temperature control
8	Hydraulic oil combined filter
9	Breather
10	Travel motor
11	Travel pump
12	Main brake cylinder
13	Brake, front axle



TEREX	Typ/Model/Type **TL 100** ab Fz.-Id.-Nr.: TL01000100 (SKL 844 / SKL 844 S)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Hydraulic diagram**	Blatt/Page/Feuille **4.26.02**

5	Hydraulic oil tank
14	Steering unit
15	Pilot control unit
16	Control valve
17	Additional control circuit connection, hydraulic quick-attach system
18	Hydraulic cylinder – lift frame
19	Hydraulic cylinder – bucket tilt
20	Load retaining valves
21	Vibration damping
22	Release valve (only if pos. 20 und 21 exist)
23	Transmission (S-version)
24	Valve (S-sersion)
25	Pressureless return
26	Flow divider
27	Additional control circuit
28	Control unit

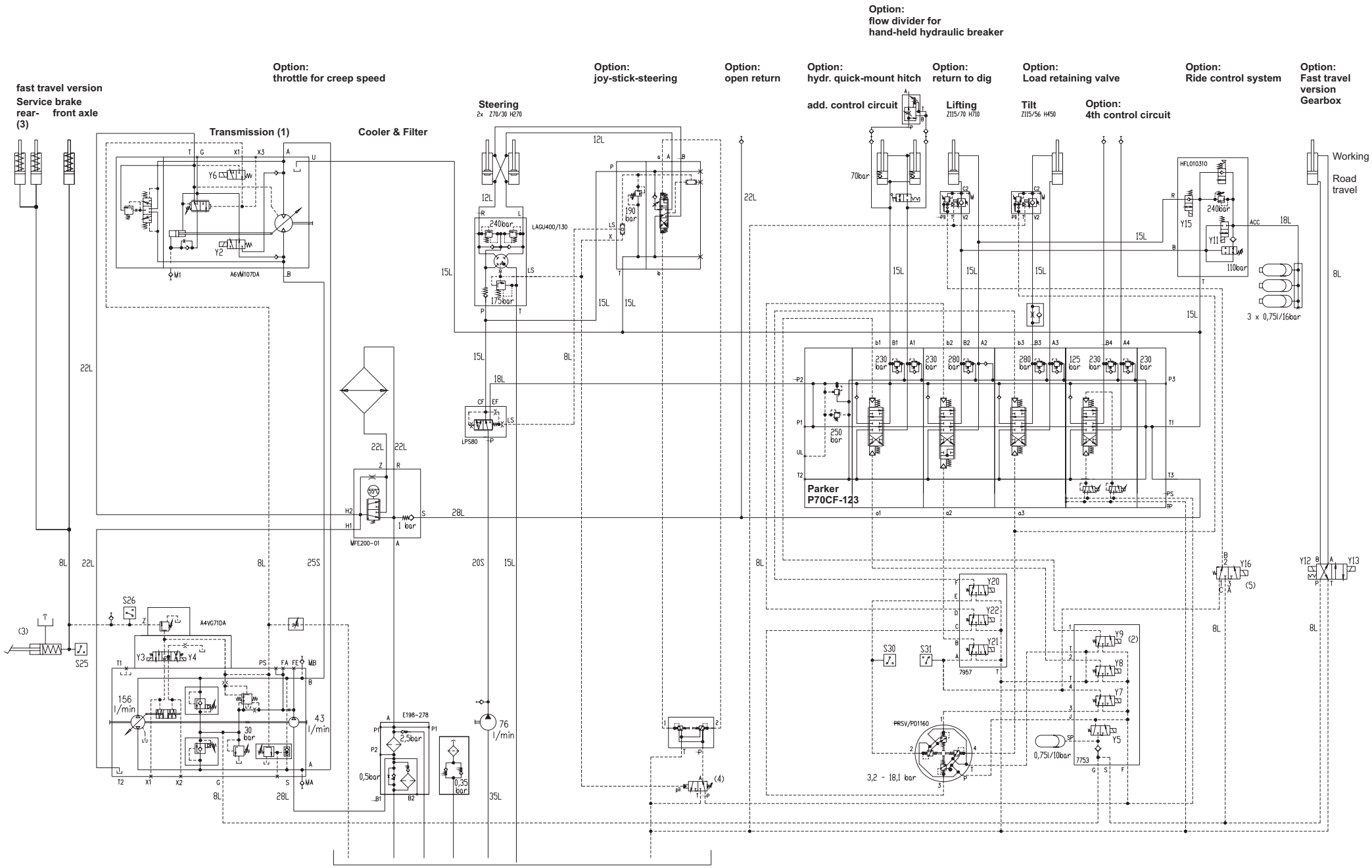


(1) Transmission setting data - please see service manual Chapter 2.

(2) Add. control circuit - continuous operation via Y9.

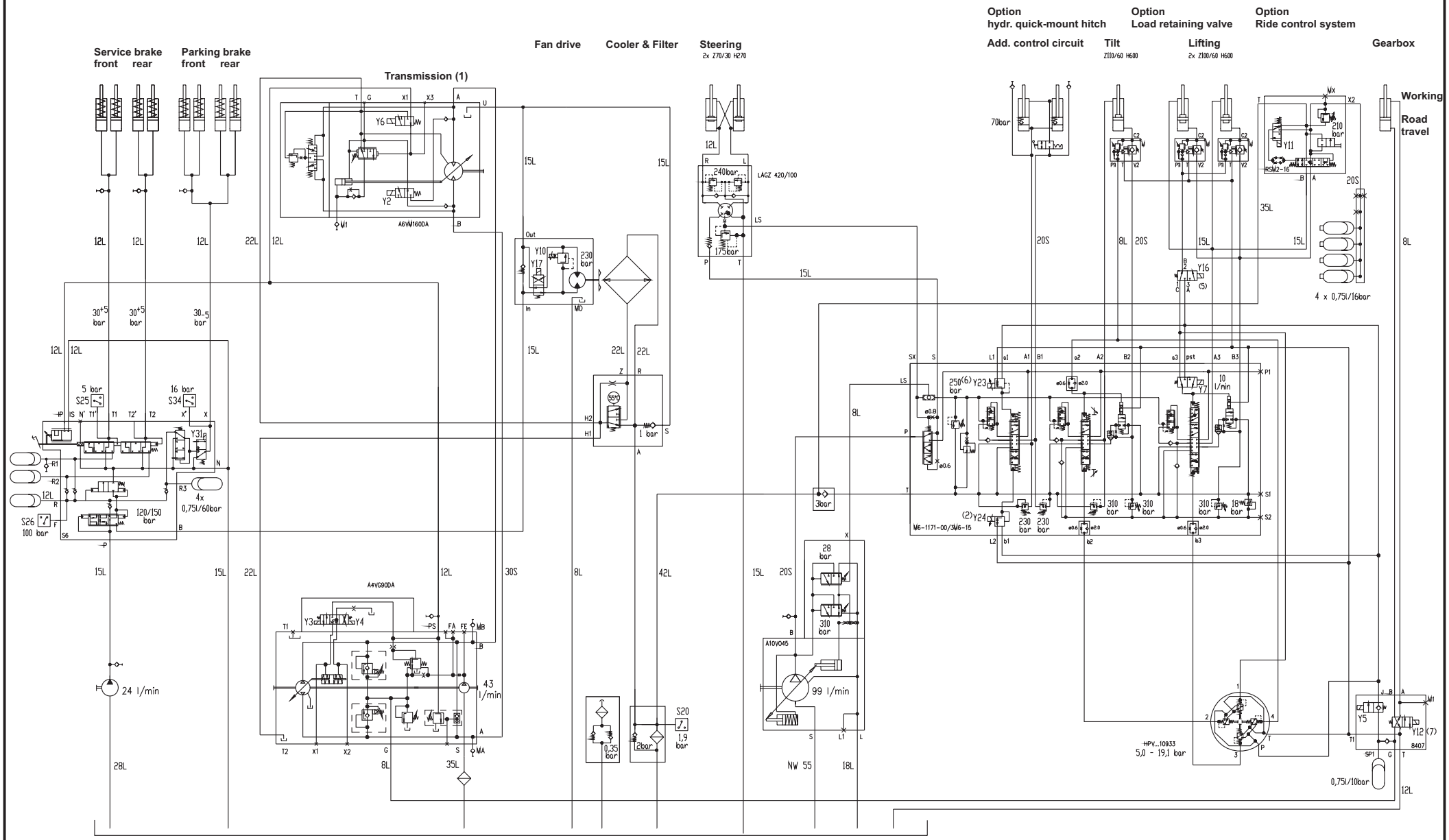
(3) Oil immersed disk brake in the rear axle at the SKL 854 fast travel version.

Typ Model Type Tipo	**TL 120** (SKL 854)	**Hydraulik** **Hydraulic** **Hydraulique** **Hidráulico**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan** **Hydraulic diagramm** **Plan hydraulique** **Plano hidráulico**		Blatt Page Feuille Página	**4.27.01**



(1) Transmission setting data please see service manual chapter 2.
(2) Add. control circuit - continuous operation via Y9.
(3) Oil immersed disk brake in the rear axle at the SKI854 fast travel version.
(4) Adjust this valve as follows: While operation the Joy stick steering and the steering wheel at the same time, the wheel should have the higher priority!
(5) Only necessarry when both, load retaining valves as well as the Ride control system is fitted at the machine.

Typ Model Type Tipo	**TL 120** (SKL 854)	**Hydraulik** **Hydraulic** **Hydraulique** **Hidráulico**	Datum Edition Date Fecha: **01.2007**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan** **Hydraulic diagramm** **Plan hydraulique** **Plano hidráulico**	**Options !** The Parker P70 control valve is only used with the option 4th control circuit !	Blatt Page Feuille Página: **4.27.02**



(1) Transmission setting data please see service manual chapter 2

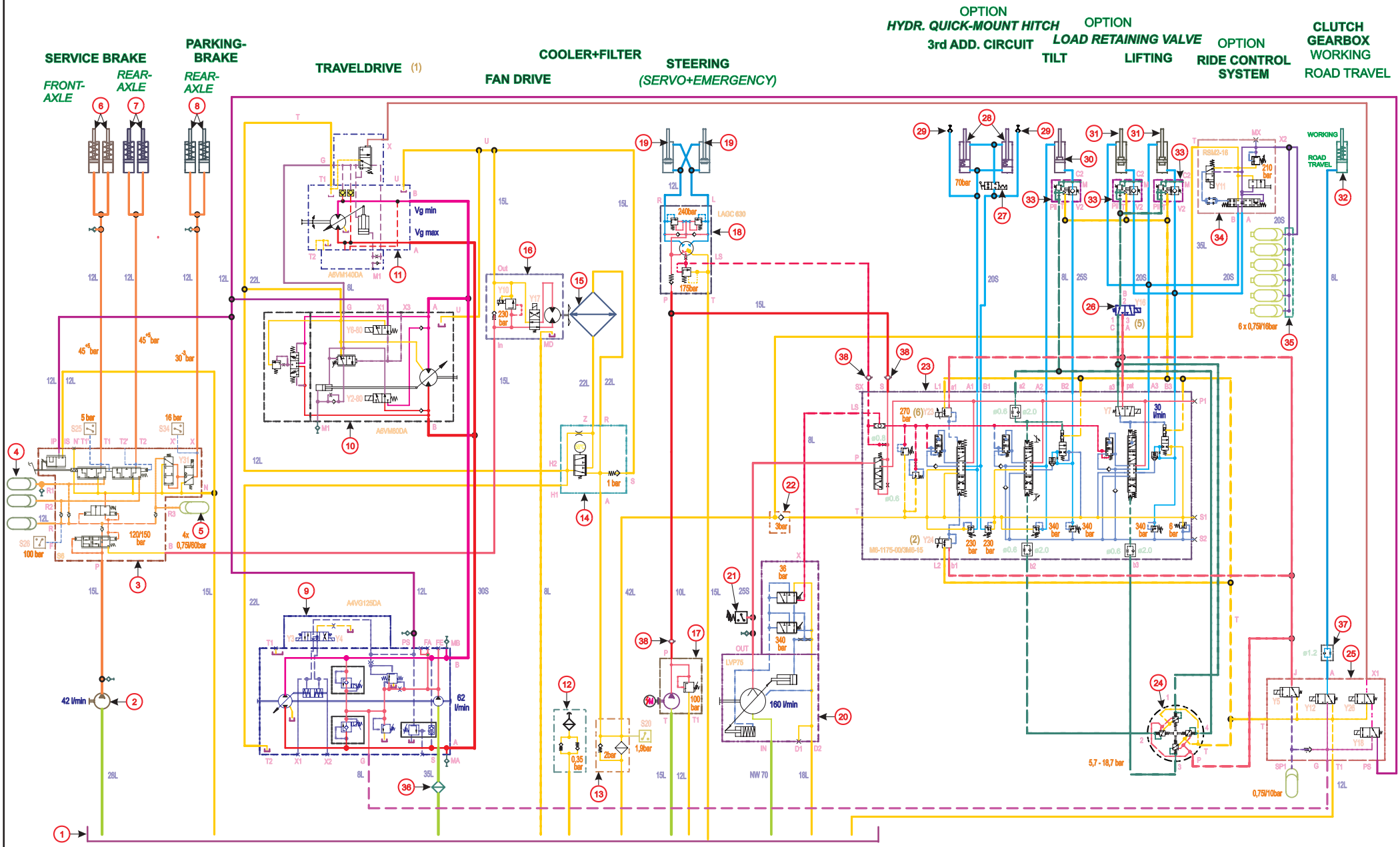
(2) Add. control circuit - continuous operation via Y9

(5) Only necessarry when both, load retaining valves as well as the Ride control system is fitted at the machine.

(6) Adjust LS-pressure cut off to 280bar at the working pump A10VO.

(7) With 20 km/h-Version is the switch of the solenoid Y12 not assigned!

Typ Model Type Tipo	**TL 160**	Hydraulik Hydraulic Hydraulique Hidráulico	ab Fz.-Id.-Nr. from s/n à partir n du s desde el numero	**TL01600100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan Hydraulic diagramm Plan hydraulique Plano hidráulico**				Blatt Page Feuille Página	**4.28.01**



(1) Fahrantrieb-Einstellwerte siehe Kapitel 2
(1) travel drive adjustment setting look at chapter 2
(1) Entraînement- valeurs de réglage voir chapitre 2

(5) nur erforderlich, wenn Lasthalteventile und Lastschwingungssystem gleichzeitig eingebaut sind.
(5) only necessary when load control valves and ride control unit are installed together.
(5) seulement nécessaire si des clapets anti- chute et anti- tangage sont montes en même temps.

(6) LS-Druckabschneidung so einstellen, daß an der Meßstelle OUT an der Verstellpumpe (20) 270 bar wirken
(6) Adjust LS pressure- cut off in that manner to obtain 270 bar at pressure port OUT at the pump (20)
(6) Regler la coupure de pression LS de tel facon afin d´obtenir 270 bar à la prise de pression OUT de la pompe (20)

Typ Model Type	TL210	ab Fz.-Id.-Nr. from s/n à partir du n/s	TL02100100	Datum Edition Date	09.2007
Benennung Description Dénomination	Hydraulikschaltplan Hydraulic diagramm Plan hydraulique	Blatt Page Feuille	1/3	Blatt Page Feuille	4.29.01


TEREX®

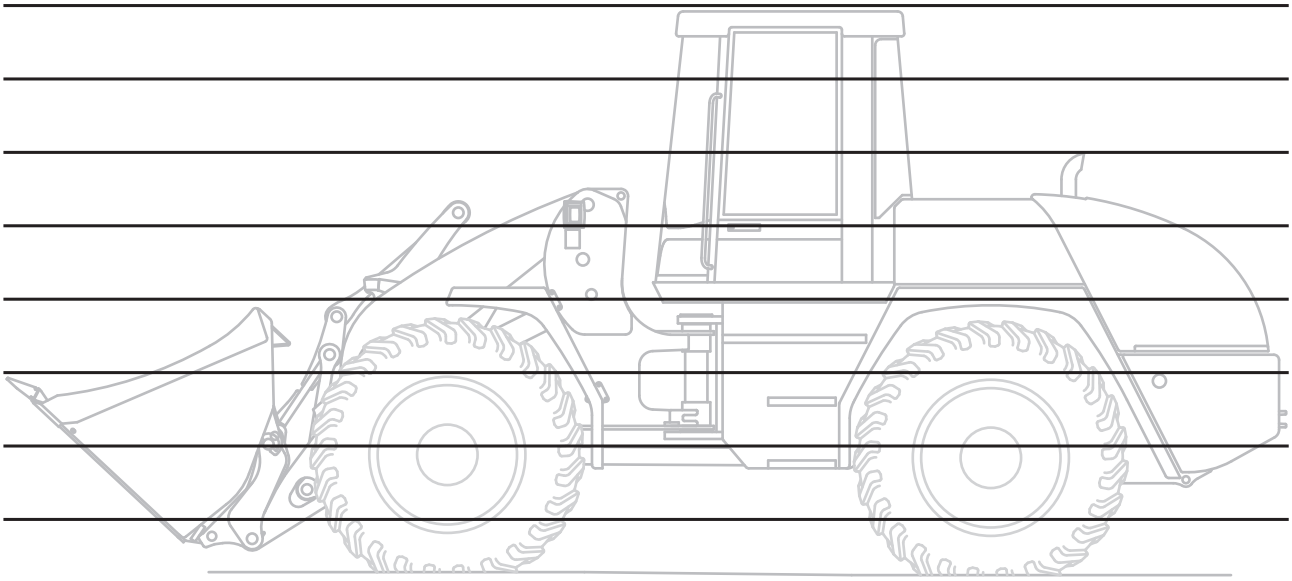
Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
1	Hydrauliköltank	Hydraulic oil tank	Réservoir hydraulique
2	Zahnradpumpe *(Bremse + Lüfter)*	Gear pump *(brake + fan)*	Pompe à engrenage *(frein+vent.)*
3	Fremdkraftbremsventil Wegeventil **Y31** Feststellbremse	Brake system Solenoid **Y31** parking brake	Système frein Electrovanne **Y31** frein de stationnement
4	Hydrospeicher (2x)*Betriebsbremse (1x) Schaltspeicher R*	Service brake accumulator (2x) (1x) charging accumulator R	Accus frein de service (2x) (1x) Remplissage accus R
5	Hydrospeicher (1x)Feststellbremse R3	Accumulator (1x) parking brake R3	Accu (1x) frein de stationnement R3
6	Betriebsbremse *(Vorderachse)*	Service brake*(front axle)*	Frein de service*(essieu AV)*
7	Betriebsbremse *(Hinterachse)*	Service brake*(rear axle)*	Frein de service*(essieu AR)*
8	Feststellbremse *(Hinterachse)*	Parking brake *(rear axle)*	Frein de stationnement *(essieu AR)*
9	Verstellpumpe *[A4VG125DA] (Fahren)* Wegeventil **Y3** fahren rückwärts Wegeventil **Y4** fahren vorwärts	Variable displacement pump *[A4VG125DA] (travel)* Solenoid **Y3** travel backward Solenoid **Y4** travel forward	Pompe à débit *variable [A4VG125DA] (translation)* Electrovanne **Y4** translation AR Electrovanne **Y4** translation VR
10	Verstellmotor *[A6VM80DA] (Fahren)* Wegeventil **Y2** Fahrtrichtungserkennung Wegeventil **Y6** fahren schnell / langsam	Variable displacement motor *[A6VM80DA] (travel)* Solenoid **Y2** travel direction guide Solenoid **Y6** travel low / high speed	Moteur à cylindrée variable *[A6VM80DA] (translation)* Electrovanne **Y2** translation reconnaissance de sens de marche Electrovanne **Y6** translation petite / grande vitesse
11	Verstellmotor *[A6VM140DA] (Fahren)*	Variable displacement motor *[A6VM140DA] (travel)*	Moteur à cylindrée variable *[A6VM140DA] (translation)*
12	Belüftungsfilter	Vent filter	Filtre d'aération
13	Rücklauffilter	Return filter	Filtre de retour
14	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
15	Ölkühler	Oil cooler	Refroidisseur d'huile
16	Umkehrlüftermotor *(Kühler) mit Steuerventil* Wegeventil **Y10** Lüftergeschwindigkeit Wegeventil **Y17** Lüfterdrehrichtung	Reversible fan motor (cooler) *with control unit* Solenoid **Y10** fan speed Solenoid **Y17** fan turn	Ventilateur réversible *(refroidisseur) avec distributeur* Electrovanne **Y10** vitesse de ventilateur Electrovanne **Y17** direction de ventilateur
17	Notlenkaggregat	Emergency steering unit	Groupe direction de secours
18	Lenkeinheit	Steering unit	Ensemble direction
19	Hydraulikzylinder *(Lenken)*	Hydraulic cylinder *(steering)*	Vérin hydraulique *(direction*)
20	Verstellpumpe *(Arbeiten)*	Variable displacement pump *(working)*	Pompe à débit *variable (travail)*
21	Druckschalter *(Notlenkung)*	Pressure switch *(emergency steering)*	Interrupteur de pressure *(direction de secours)*
22	Rücklaufsammler *(Arbeiten)*	Return line collector	Collecteur de retour
23	Blocksteuergerät Wegeventil **Y7** Schwimmstellung Wegeventil **Y23** Zusatzsteuerkreis Wegeventil **Y24** Zusatzsteuerkreis	Valve bank Solenoid **Y7** float position Solenoid **Y23** additional control circuit Solenoid **Y24** additional control circuit	Bloc distributeur Electrovanne **Y7** position flottante Electrovanne **Y23** circuit supplémentaire Electrovanne **Y24** circuit supplémentaire
24	Koordinatenhebel	Joy stick	Distributeur à commande assistée
25	Vorsteuereinheit mit Speicher Wegeventil **Y5** *Vorsteuerung ein/aus* Wegeventil **Y12** *Getriebeschaltung* Wegeventil **Y18** *Verstellmotor(11) elektronisch aus- / einkuppeln* Wegeventil **Y26** fahren schnell / langsam mit „Y6" geschaltet	Pilot Control Unit with accumulator Solenoid **Y5** pilot pressure on/off Solenoid **Y12** gear shifting Solenoid **Y18** variable displacement motor (11) clutch in / out electronically Solenoid **Y26** travel low / high speed connected with "Y6"	Bloc pilotage et accu Electrovanne **Y5** pilotage marche/arrêt Elektrov.**Y12** changement de vitesses Electrovanne **Y18** Moteur à cylindrée variable (11) embrayage débrayer / embrayer électronique Electrovanne **Y26** translation petite / grande vitesse ensemble avec « Y6 »
26	3/2 Wegeventil ***Option*** **Y16** Entriegelung Lasthalteventile	3/2 Solenoid valve ***option*** **Y16** unlock load check valves	électrovanne 3/2 ***option*** **Y16** déverrouillage clapets anti-chute
27	Umschalthahn ***Option*** *(Schnellwechsler)*	Ball cock ***option*** *(quick mount hitch)*	Robinet inverseur ***option*** *(attache rapide)*
28	Hydraulikzylinder ***Option*** *(Schnellwechsler)*	Hydraulic cylinders ***option*** *(quick mount hitch)*	Vérins hydrauliques ***option*** *(attache rapide)*
29	Zusatzsteuerkreis	Additional control circuit	Circuit supplémentaire
30	Hydraulikzylinder *(Schaufel kippen)*	Hydraulic cylinder (dump shovel)	Vérin hydraulique (*basculement godet)*
31	Hydraulikzylinder *(Hubrahmen)*	Hydraulic cylinders *(lifting frame)*	Vérins hydrauliques *(bras de vitesses*)

Typ Model Type	**TL 210**	***ab Fz. Id. Nr. from s/n à partir du n/s***	**TL02100100**		Datum Edition Date	**09.2007**
Benennung Description Dénomination	***HYDRAULIKSCHALTPLAN HYDRAULIKDIAGRAM PLAN HYDRAULIQUE***	**LEGENDE LEGEND LEGENDE**	Blatt Page Feuille	**2/3**	Blatt Page Feuille	**4.29.02**

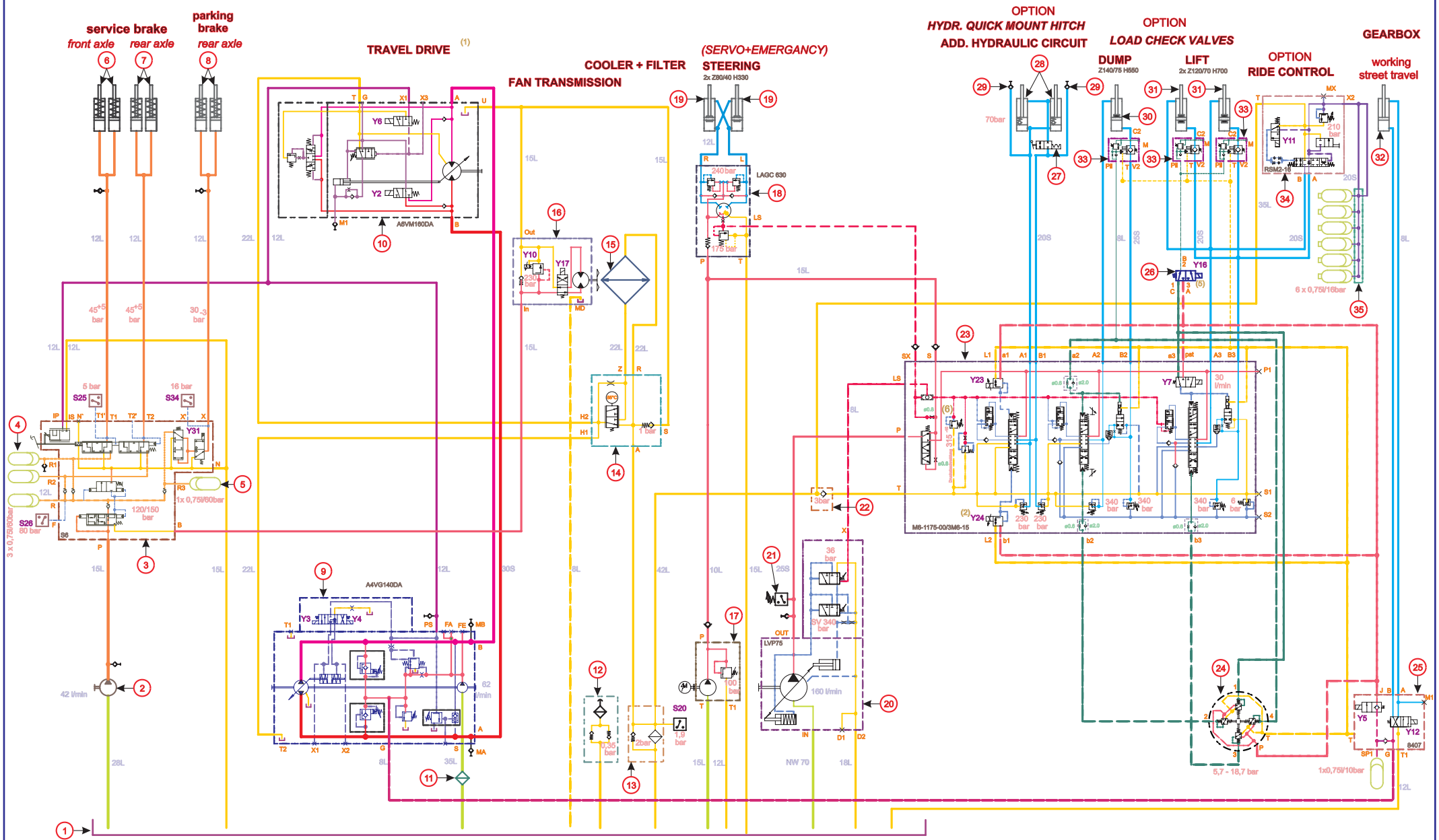
Pos. Item Rep. No.	***DEUTSCH***	***ENGLISH***	***FRANÇAIS***

32	Hydraulikzylinder *(Schaltgetriebe)*	Hydraulic cylinder *(gearbox)*	Vérin hydraulique *(boîte de vitesses)*
33	Lasthalteventile ***Option***	Load check valves ***option***	Clapets anti-chute ***option***
34	Blocksteuergerät ***Option*** *(Lastschwingungsdämpfung)*	Valve bank ***option*** *(ride control)*	Bloc distributeur ***option*** *(anti-tangage)*
35	Speicherblock ***Option*** *(Lastschwingungsdämpfung)*	Accumulator bloc ***option*** *(ride control)*	Bloc d'accumulateurs ***option*** *(anti-tangage)*
36	Saugfilter	Suction filter	Filtre d'aspiration
37	Drosselrückschlagventil	One way valve with throttle	Clapet retenu avec dispositif étrangleur
38	Rückschlagventil	Check valve	Clapet anti retour

TL260



Typ Model Type Tipo	**TL 260** (SKL 260)	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Notizen** **Notes** **Notices** **Notas**	Blatt Page Feuille Página	**4.30.00**



(1) Fahrantrieb-Einstellwerte siehe Kapitel 2
(1) travel drive adjustment setting look at chapter 2
(1) Entraînement- valeurs de réglage voir chapitre 2

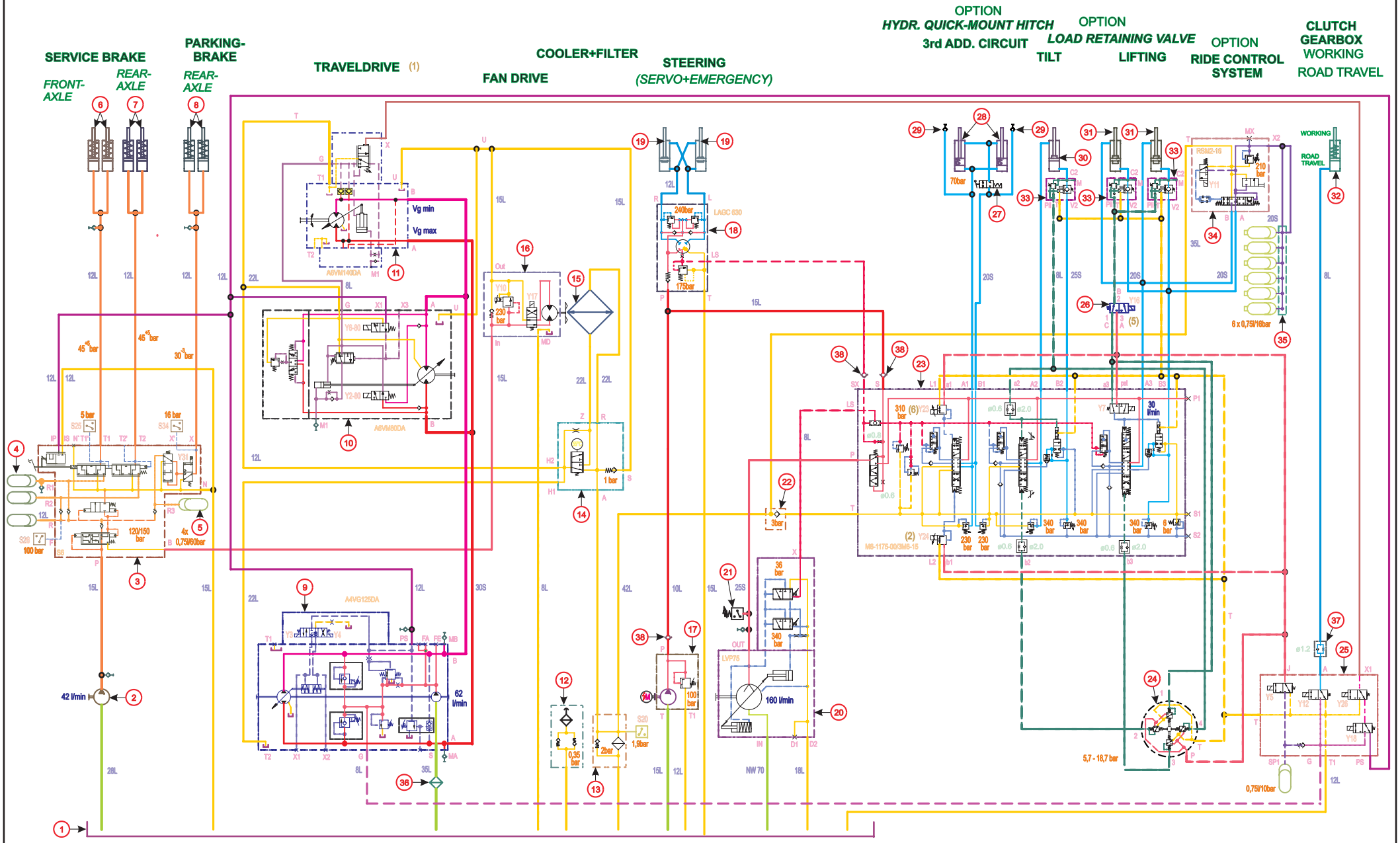
(5) nur erforderlich, wenn Lasthalteventile und Lastschwingungssystem gleichzeitig eingebaut sind
(5) only necessary when load control valves and ride control unit are installed together
(5) seulement nécessaire si des clapets anti- chute et anti- tangage sont montes en même temps.

(6) LS-Druckabschneidung so einstellen, daß an der Meßstelle OUT an der Verstellpumpe (20) 315 $^{-10}$ bar wirken
(6) Adjust LS pressure- cut off in that manner to obtain 315 $^{-10}$ bar at pressure port OUT at the pump (20)
(6) Regler la coupure de pression LS de tel facon afin d´obtenir 315 $^{-10}$ bar à la prise de pression OUT de la pompe (20)

Typ Model Type	**TL 260** (SKL 260)	ab Fz.-Id.-Nr. from s/n à partir du n/s	*TL02600100 - TL02600134*	Datum Edition Date	01.2008
Benennung Description Dénomination	**Hydraulikschaltplan** **Hydraulic diagramm** **Plan hydraulique**	Blatt Page Feuille	*1/1*	Blatt Page Feuille	4.30.01

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
1	Hydrauliköltank	Hydraulic oil tank	Réservoir hydraulique
2	Zahnradpumpe *(Bremse+Lüfter)*	Gear pump *(brake+fan)*	Pompe à engrenage *(frein+vent.)*
3	Fremdkraftbremsventil	Brake system	Système frein
4	Hydrospeicher (2x)*Betriebsbremse (1x) Schaltspeicher R*	Service brake accu (2x) (1x) charging accu R	Accus frein de service (2x) (1x) Remplissage accus R
5	Hydrospeicher (1x) *Feststellbremse R3*	Accu (1x) parking brake R3	Accu (1x) frein de stationnement R3
6	Betriebsbremse *(Vorderachse)*	Service brake*(front axle)*	Frein de service*(essieu AV)*
7	Betriebsbremse *(Hinterachse)*	Service brake*(rear axle)*	Frein de service*(essieu AR)*
8	Feststellbremse *(Hinterachse)*	Parking brake *(rear axle)*	Frein de stationnement *(essieu AR)*
9	Verstellpumpe *(Fahren)*	Variable displacement pump *(travel)*	Pompe à débit *variable (translation)*
10	Verstellmotor *(Fahren)*	Variable displacement motor *(travel)*	Moteur à cylindrée variable *(translation)*
11	Saugfilter	Suction filter	Filtre d'aspiration
12	Belüftungsfilter	Vent filter	Filtre d'aération
13	Rücklauffilter	Return filter	Filtre de retour
14	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
15	Ölkühler	Oil cooler	Refroidisseur d'huile
16	Umkehrlüftermotor *(Kühler) mit Steuerventil*	Reversible fan motor (cooler) with control unit	Ventilat. reversible *(refroidisseur)* *Avec distributeur*
17	Notlenkaggregat	Emergency steering unit	Groupe direction de secours
18	Lenkeinheit	Steering unit	Ensemble direction
19	Hydraulikzylinder *(Lenken)*	Hydraulic cylinder *(steering)*	Vérin hydraulique *(direction*)
20	Verstellpumpe *(Arbeiten)*	Variable displacement pump *(working)*	Pompe à débit *variable (travail)*
21	Druckschalter *(Notlenkung)*	Pressure switch *(emergency steering)*	Interrupteur de pressure *(direction de secours)*
22	Rücklaufsammler *(Arbeiten)*	Return line collector	Collecteur de retour
23	Blocksteuergerät	Valve bank	Bloc distributeur
24	Koordinatenhebel	Joy stick	Distributeur à commande assistée
25	Vorsteuereinheit mit Speicher Wegeventil **Y5** *Vorsteuerung ein/aus* Wegeventil **Y12** *Getriebeschaltung*	Pilot Control Unit with accumulator Solenoid **Y5** pilot pressure on/off Solenoid **Y12** gear shifting	Bloc pilotage et accu Elektrov. **Y5** pilotage marche/arrêt Elektrov.**Y12** changement de vitesses
26	3/2 Wegeventil ***Option*** *(Entriegelung Lasthalteventile)*	3/2 Solenoid valve ***option*** *(unlock load check valves)*	électrovanne 3/2 ***option*** *déverrouillage clapets anti-chute*
27	Umschalthahn ***Option*** *(Schnellwechsler)*	Ball cock ***option*** *(quick mount hitch)*	Robinet inverseur ***option*** *(attache rapide)*
28	Hydraulikzylinder *(Schnellwechsler)*	Hydraulic cylinders *(quick mount hitch)*	Vérins hydraulique *(attache rapide)*
29	Zusatzsteuerkreis ***Option*** *(Schnellwechsler)*	Additional control circuit ***option*** *(quick mount hitch)*	Circuit supplémentaire ***option*** *(attache rapide)*
30	Hydraulikzylinder *(Schaufel kippen)*	Hydraulic cylinder (dump shovel)	Vérin hydraulique (*basculement godet)*
31	Hydraulikzylinder *(Hubrahmen)*	Hydraulic cylinders *(lifting frame)*	Vérins hydraulique *(bras de vitesses*)
32	Hydraulikzylinder *(Schaltgetriebe)*	Hydraulic cylinder *(gearbox)*	Vérin hydraulique *(boîte de vitesses)*
33	Lasthalteventile ***Option***	Load check valves ***option***	Clapets anti-chute ***option***
34	Blocksteuergerät ***Option*** *(Lastschwingungsdämpfung)*	Valve bank ***option*** *(ride control)*	Bloc distributeur ***option*** *(anti-tangage)*
35	Speicherblock ***Option*** *(Lastschwingungsdämpfung)*	Accumulator bloc ***option*** *(ride control)*	Bloc d'accumulateurs ***option*** *(anti-tangage)*

Typ Model Type Tipo	**TL 260** (SKL 260)	***ab Fz. Id. Nr.*** ***from s/n*** ***à partir du n/s*** ***desde el no.*** **TL02600100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	***HYDRAULIKSCHALTPLAN*** ***HYDRAULIKDIAGRAM*** ***PLAN HYDRAULIQUE*** ***PLANO HYDRAULICO***	**LEGENDE** **LEGEND** **LEGENDE** **LAYENDA**	Blatt Page Feuille Página	**4.30.02**



(1) Fahrantrieb-Einstellwerte siehe Kapitel 2
(1) travel drive adjustment setting look at chapter 2
(1) Entraînement- valeurs de réglage voir chapitre 2

(6) LS-Druckabschneidung so einstellen, daß an der Meßstelle OUT an der Verstellpumpe (20) 270 bar wirken
(6) Adjust LS pressure- cut off in that manner to obtain 270 bar at pressure port OUT at the pump (20)
(6) Regler la coupure de pression LS de tel facon afin d´obtenir 270 bar à la prise de pression OUT de la pompe (20)

(5) nur erforderlich, wenn Lasthalteventile und Lastschwingungssystem gleichzeitig eingebaut sind.
(5) only necessary when load control valves and ride control unit are installed together.
(5) seulement nécessaire si des clapets anti- chute et anti- tangage sont montes en même temps.

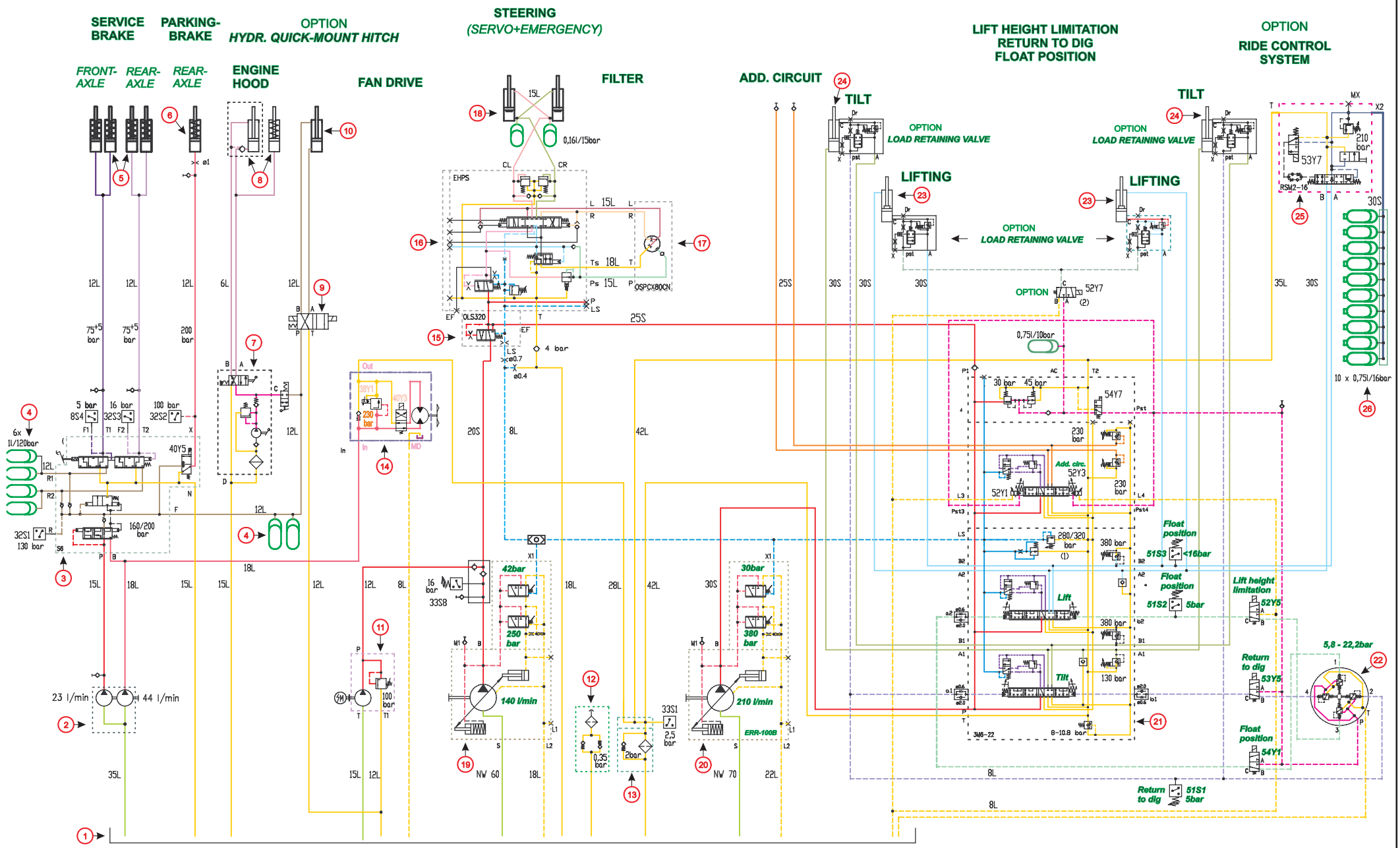
Typ Model Type	TL260	ab Fz.-Id.-Nr. from s/n à partir du n/s	TL02600135	Datum Edition Date	09.2007
Benennung Description Dénomination	Hydraulikschaltplan Hydraulic diagramm Plan hydraulique	Blatt Page Feuille	1/3	Blatt Page Feuille	4.30.03

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
1	Hydrauliköltank	Hydraulic oil tank	Réservoir hydraulique
2	Zahnradpumpe *(Bremse + Lüfter)*	Gear pump *(brake + fan)*	Pompe à engrenage *(frein+vent.)*
3	Fremdkraftbremsventil Wegeventil **Y31** Feststellbremse	Brake system Solenoid **Y31** parking brake	Système frein Electrovanne **Y31** frein de stationnement
4	Hydrospeicher (2x)*Betriebsbremse (1x) Schaltspeicher R*	Service brake accumulator (2x) (1x) charging accumulator R	Accus frein de service (2x) (1x) Remplissage accus R
5	Hydrospeicher (1x)Feststellbremse R3	Accumulator (1x) parking brake R3	Accu (1x) frein de stationnement R3
6	Betriebsbremse *(Vorderachse)*	Service brake*(front axle)*	Frein de service*(essieu AV)*
7	Betriebsbremse *(Hinterachse)*	Service brake*(rear axle)*	Frein de service*(essieu AR)*
8	Feststellbremse *(Hinterachse)*	Parking brake *(rear axle)*	Frein de stationnement *(essieu AR)*
9	Verstellpumpe *[A4VG125DA] (Fahren)* Wegeventil **Y3** fahren rückwärts Wegeventil **Y4** fahren vorwärts	Variable displacement pump *[A4VG125DA] (travel)* Solenoid **Y3** travel backward Solenoid **Y4** travel forward	Pompe à débit *variable [A4VG125DA] (translation)* Electrovanne **Y4** translation AR Electrovanne **Y4** translation VR
10	Verstellmotor *[A6VM80DA] (Fahren)* Wegeventil **Y2** Fahrtrichtungserkennung Wegeventil **Y6** fahren schnell / langsam	Variable displacement motor *[A6VM80DA] (travel)* Solenoid **Y2** travel direction guide Solenoid **Y6** travel low / high speed	Moteur à cylindrée variable *[A6VM80DA] (translation)* Electrovanne **Y2** translation reconnaissance de sens de marche Electrovanne **Y6** translation petite / grande vitesse
11	Verstellmotor *[A6VM140DA] (Fahren)*	Variable displacement motor *[A6VM140DA] (travel)*	Moteur à cylindrée variable *[A6VM140DA] (translation)*
12	Belüftungsfilter	Vent filter	Filtre d'aération
13	Rücklauffilter	Return filter	Filtre de retour
14	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
15	Ölkühler	Oil cooler	Refroidisseur d'huile
16	Umkehrlüftermotor *(Kühler) mit Steuerventil* Wegeventil **Y10** Lüftergeschwindigkeit Wegeventil **Y17** Lüfterdrehrichtung	Reversible fan motor (cooler) *with control unit* Solenoid **Y10** fan speed Solenoid **Y17** fan turn	Ventilateur réversible *(refroidisseur) avec distributeur* Electrovanne **Y10** vitesse de ventilateur Electrovanne **Y17** direction de ventilateur
17	Notlenkaggregat	Emergency steering unit	Groupe direction de secours
18	Lenkeinheit	Steering unit	Ensemble direction
19	Hydraulikzylinder *(Lenken)*	Hydraulic cylinder *(steering)*	Vérin hydraulique *(direction*)
20	Verstellpumpe *(Arbeiten)*	Variable displacement pump *(working)*	Pompe à débit *variable (travail)*
21	Druckschalter *(Notlenkung)*	Pressure switch *(emergency steering)*	Interrupteur de pressure *(direction de secours)*
22	Rücklaufsammler *(Arbeiten)*	Return line collector	Collecteur de retour
23	Blocksteuergerät Wegeventil **Y7** Schwimmstellung Wegeventil **Y23** Zusatzsteuerkreis Wegeventil **Y24** Zusatzsteuerkreis	Valve bank Solenoid **Y7** float position Solenoid **Y23** additional control circuit Solenoid **Y24** additional control circuit	Bloc distributeur Electrovanne **Y7** position flottante Electrovanne **Y23** circuit supplémentaire Electrovanne **Y24** circuit supplémentaire
24	Koordinatenhebel	Joy stick	Distributeur à commande assistée
25	Vorsteuereinheit mit Speicher Wegeventil **Y5** *Vorsteuerung ein/aus* Wegeventil **Y12** *Getriebeschaltung* Wegeventil **Y18** *Verstellmotor(11) elektronisch aus- / einkuppeln* Wegeventil **Y26** fahren schnell / langsam mit „Y6" geschaltet	Pilot Control Unit with accumulator Solenoid **Y5** pilot pressure on/off Solenoid **Y12** gear shifting Solenoid **Y18** variable displacement motor (11) clutch in / out electronically Solenoid **Y26** travel low / high speed connected with "Y6"	Bloc pilotage et accu Electrovanne **Y5** pilotage marche/arrêt Elektrov.**Y12** changement de vitesses Electrovanne **Y18** Moteur à cylindrée variable (11) embrayage débrayer / embrayer électronique Electrovanne **Y26** translation petite / grande vitesse ensemble avec « Y6 »
26	3/2 Wegeventil ***Option*** **Y16** Entriegelung Lasthalteventile	3/2 Solenoid valve ***option*** **Y16** unlock load check valves	électrovanne 3/2 ***option*** **Y16** déverrouillage clapets anti-chute
27	Umschalthahn ***Option*** *(Schnellwechsler)*	Ball cock ***option*** *(quick mount hitch)*	Robinet inverseur ***option*** *(attache rapide)*
28	Hydraulikzylinder ***Option*** *(Schnellwechsler)*	Hydraulic cylinders ***option*** *(quick mount hitch)*	Vérins hydrauliques ***option*** *(attache rapide)*
29	Zusatzsteuerkreis	Additional control circuit	Circuit supplémentaire
30	Hydraulikzylinder *(Schaufel kippen)*	Hydraulic cylinder (dump shovel)	Vérin hydraulique (*basculement godet)*
31	Hydraulikzylinder *(Hubrahmen)*	Hydraulic cylinders *(lifting frame)*	Vérins hydrauliques *(bras de vitesses*)

Typ Model Type	**TL 260**	***ab Fz. Id. Nr. from s/n à partir du n/s***	**TL02600135**		Datum Edition Date	**09.2007**
Benennung Description Dénomination	***HYDRAULIKSCHALTPLAN HYDRAULIKDIAGRAM PLAN HYDRAULIQUE***	**LEGENDE LEGEND LEGENDE**	Blatt Page Feuille	**2/3**	Blatt Page Feuille	**4.30.04**

Pos. Item Rep. No.	***DEUTSCH***	***ENGLISH***	***FRANÇAIS***
32	Hydraulikzylinder *(Schaltgetriebe)*	Hydraulic cylinder *(gearbox)*	Vérin hydraulique *(boîte de vitesses)*
33	Lasthalteventile ***Option***	Load check valves ***option***	Clapets anti-chute ***option***
34	Blocksteuergerät ***Option*** *(Lastschwingungsdämpfung)*	Valve bank ***option*** *(ride control)*	Bloc distributeur ***option*** *(anti-tangage)*
35	Speicherblock ***Option*** *(Lastschwingungsdämpfung)*	Accumulator bloc ***option*** *(ride control)*	Bloc d'accumulateurs ***option*** *(anti-tangage)*
36	Saugfilter	Suction filter	Filtre d'aspiration
37	Drosselrückschlagventil	One way valve with throttle	Clapet retenu avec dispositif étrangleur
38	Rückschlagventil	Check valve	Clapet anti retour


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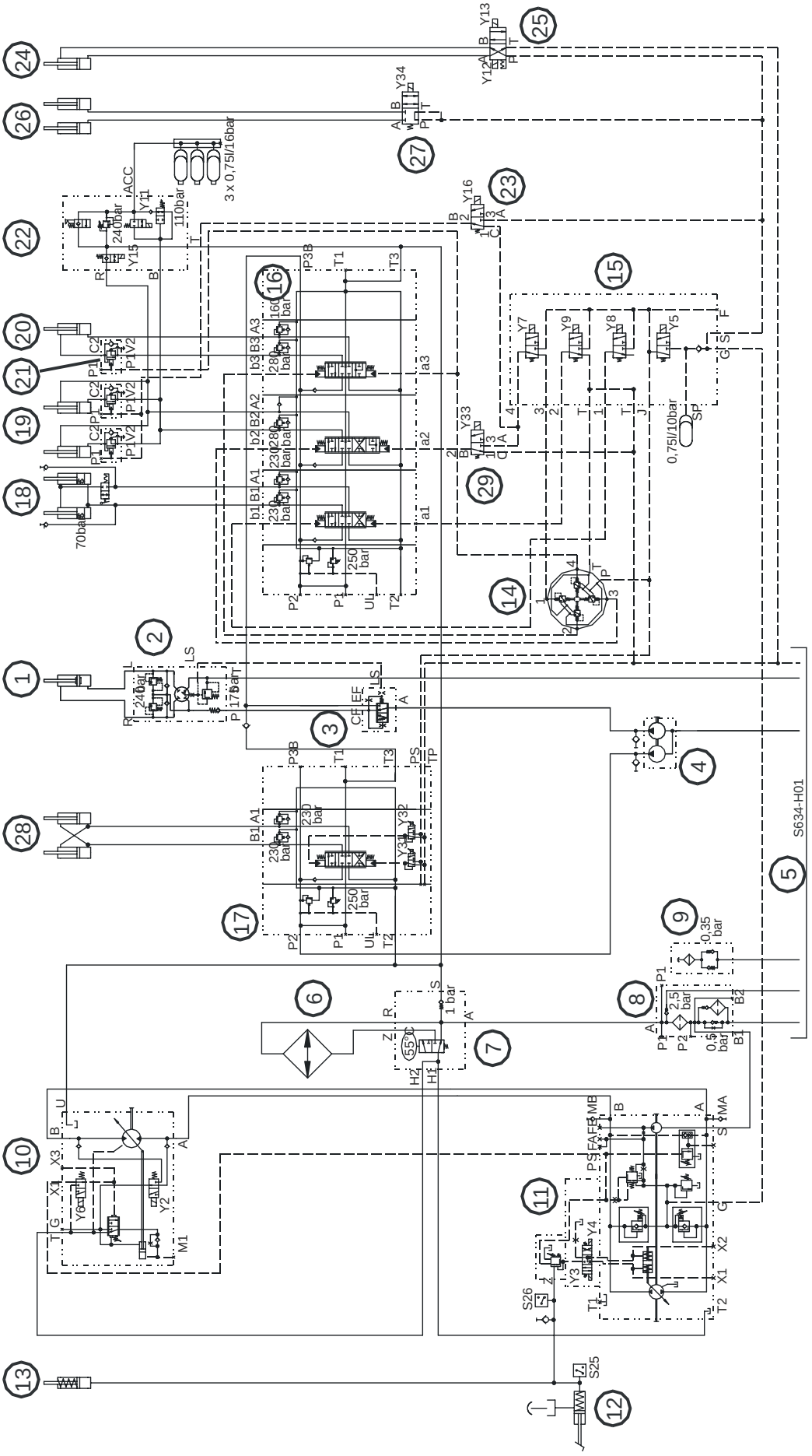
(1) LS-Druckabschneidung so einstellen, daß an der Meßstelle MI an der Pumpe ERR 310 bar beim TL420 bzw 350 bar beim TL450 wirken

(2) nur erforderlich, wenn Lastholteventile und Lastschwingungssystem gleichzeitig eingebaut sind

Typ Model Type	**TL 420 - 450**	ab Fz.-Id.-Nr. from s/n à partir du n/s	*TL04200100* *TL04500100*	Datum Edition Date	01.2008
Benennung Description Dénomination	Hydraulikschaltplan Hydraulic diagramm Plan hydraulique	Blatt Page Feuille	1/2	Blatt Page Feuille	4.35.01

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
1	Hydrauliköltank	Hydraulic oil tank	Réservoir hydraulique
2	Zahnradpumpen *(Bremse + Lüfter)*	Gear pumps *(brake + fan)*	Pompe à engrenage *(frein+vent.)*
3	Fremdkraftbremsventil Wegeventil **Y31** Feststellbremse	Brake system Solenoid **Y31** parking brake	Système frein Electrovanne **Y31** frein de stationnement
4	Hydrospeicher (6x)*Betriebsbremse*	Service brake accumulator (6x)	Accus frein de service (6x)
5	Betriebsbremse *(Vorderachse)* Betriebsbremse *(Hinterachse)*	Service brake*(front axle)* Service brake*(rear axle)*	Frein de service*(essieu AV)* Frein de service*(essieu AR)*
6	Feststellbremse *(Hinterachse)*	Parking brake *(rear axle)*	Frein de stationnement *(essieu AR)*
7	Handpumpe (Motorhaube)	Handpump (engine hood)	
8	Hub- und Verriegelungszylinder (Motorhaube)	Lift- and lockzylinder (engine hood)	
9	**Wegeventil (Schnellwechsler)**	Soleniod valve (quick mount hitch)	
10	Verriegelungszylinder (Schnellwechsler)	Lock zylinder (quick mount hitch)	
11	Notlenkaggregat	Emergency steering unit	Groupe direction de secours
12	Belüftungsfilter	Vent filter	Filtre d'aération
13	Rücklauffilter	Return filter	Filtre de retour
14	Umkehrlüftermotor *(Kühler) mit Steuerventil* Wegeventil **38Y1** Lüftergeschwindigkeit Wegeventil **40Y3** Lüfterdrehrichtung	Reversible fan motor (cooler) *with control unit* Solenoid **38Y1** fan speed Solenoid **40Y3** fan turn	Ventilateur réversible *(refroidisseur) avec distributeur* Electrovanne **38Y1** vitesse de ventilateur Electrovanne **40Y3** direction de ventilateur
15	Prioritätsventil	*Priority valve*	
16	Lenkventil (Amplifier)	Steering valve (amplifier)	
17	Lenkeinheit	Steering unit	Ensemble direction
18	Hydraulikzylinder *(Lenken)*	Hydraulic cylinder *(steering)*	Vérin hydraulique *(direction*)
19	Verstellpumpe *(Lenken)*	Variable displacement pump *(steering)*	Pompe à débit *variable*
20	Verstellpumpe *(Lenken)*	Variable displacement pump *(steering)*	Pompe à débit *variable*
21	Blocksteuergerät Wegeventil **53Y1** Zusatzsteuerkreis Wegeventil **53Y2** Zusatzsteuerkreis	Valve bank Solenoid **Y23** additional control circuit Solenoid **Y24** additional control circuit	Bloc distributeur Electrovanne **53Y1** circuit supplémentaire Electrovanne **53Y2** circuit supplémentaire
22	Koordinatenhebel	Joy stick	Distributeur à commande assistée
23	Hydraulikzylinder *(Hubrahmen) (mit Lasthalteventilen, Option)*	Hydraulic cylinders *(lifting frame) (with load retaining valves, option)*	Vérins hydrauliques *(bras de vitesses*)
24	Hydraulikzylinder *(Schaufel kippen) (mit Lasthalteventilen, Option)*	Hydraulic cylinder (dump shovel) (with load retaining valves, option)	Vérin hydraulique (*basculement godet)*
25	Blocksteuergerät ***Option*** *(Lastschwingungsdämpfung)*	Valve bank ***option*** *(ride control)*	Bloc distributeur ***option*** *(anti-tangage)*
26	Speicherblock ***Option*** *(Lastschwingungsdämpfung)*	Accumulator bloc ***option*** *(ride control)*	Bloc d'accumulateurs ***option*** *(anti-tangage)*

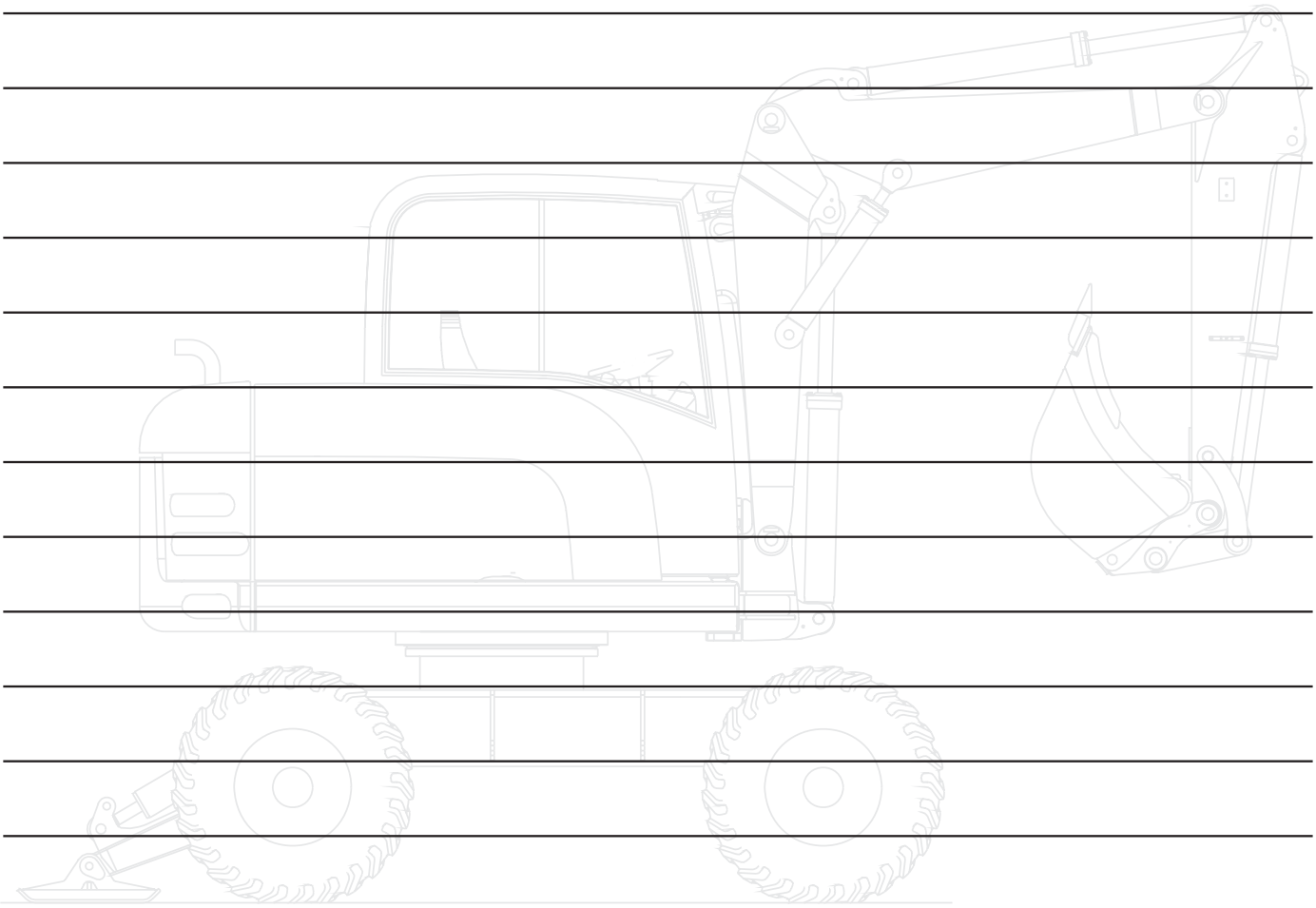
Typ Model Type	TL 420 - 450	*ab Fz. Id. Nr. from s/n à partir du n/s*	TL04200100 TL04500100	Datum Edition Date	01.2008
Benennung Description Dénomination	***HYDRAULIKSCHALTPLAN*** ***HYDRAULIKDIAGRAM*** ***PLAN HYDRAULIQUE***	**LEGENDE** **LEGEND** **LEGENDE**	Blatt Page Feuille **2/2**	Blatt Page Feuille	**4.35.02**



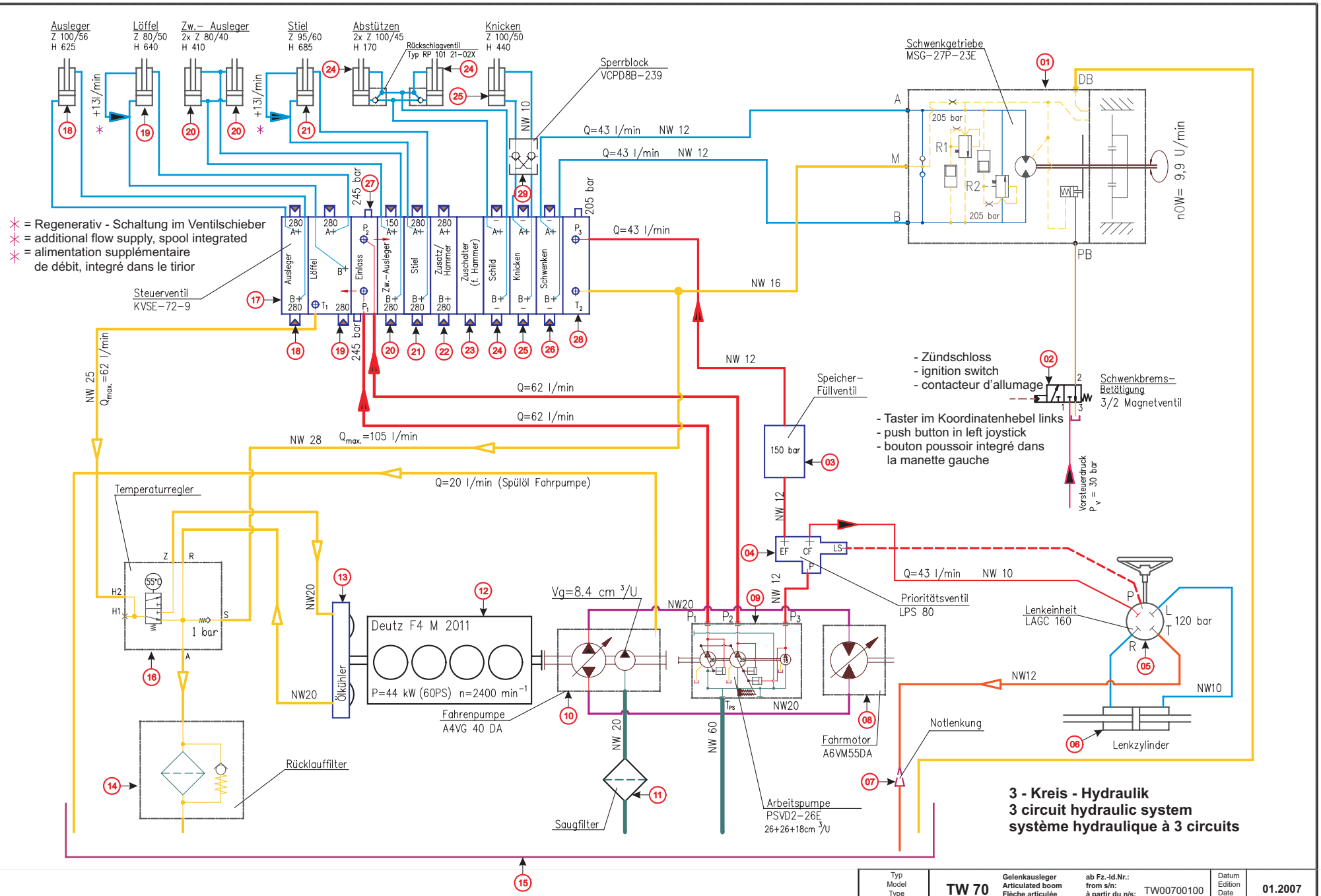
TEREX | SCHAEFF	Typ/Model/Type **TL 70** (SKS 634 / SKS 634 S)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Hydraulic diagram**	Blatt/Page/Feuille **4.37.01**

1	Steering cylinders
2	Steering unit
3	Priority valve
4	Steering / charge pump
5	Hydraulic oil tank
6	Hydraulic oil cooler
7	Hydraulic oil temperature control
8	Hydraulic oil combined filter
9	Breather
10	Travel motor
11	Travel pump
12	Main brake cylinder
13	Brake, front axle
14	Loader control lever
15	Pilot control unit
16	Control valve 1
17	Control valve 2 (slewing)
18	Additional control circuit connection; hydraulic quick-attach system
19	Hydraulic cylinder — lift frame
20	Hydraulic cylinder — bucket tilt
21	Option — Load retaining valves
22	Option — Vibration damping
23	Release valve (only if pos. 21 & 22 installed)
24	Transmission (high-speed version)
25	Valve
26	Hydraulic cylinder — oscillating axle
27	Valve
28	Hydraulic cylinder — slewing
29	Valve — Safety mechanism for lowering lift frame

HML 23



Typ Model Type Tipo	**TW 70** (HML 23)	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Notizen** **Notes** **Notices** **Notas**	Blatt Page Feuille Página	**4.49.50**

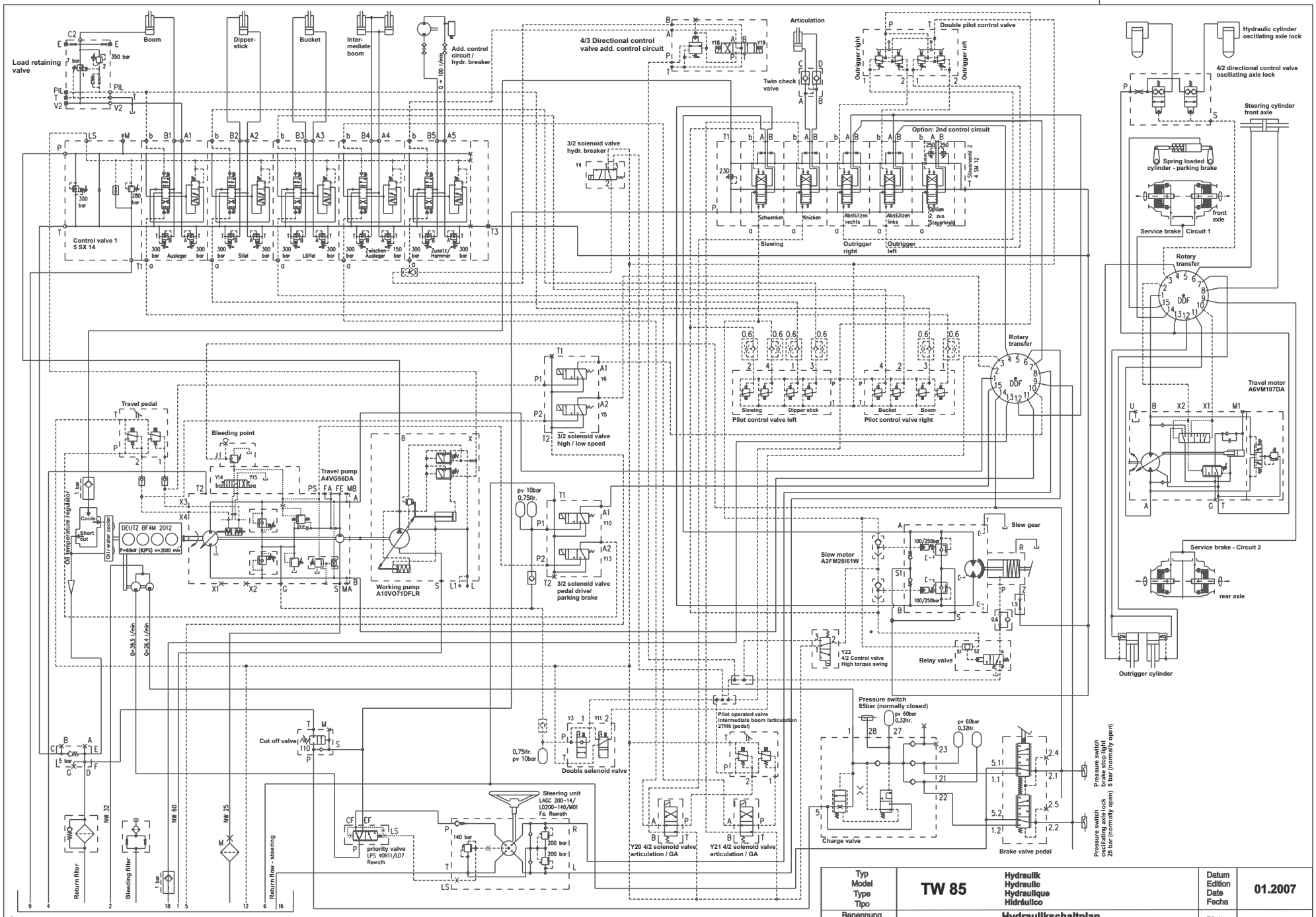

Ausleger
Z 100/56
H 625
Löffel
Z 80/50
H 640
Zw.– Ausleger
2x Z 80/40
H 410
Stiel
Z 95/60
H 685
Abstützen
2x Z 100/45
H 170
Rückschlagventil
Typ RP 101 21–02X
Knicken
Z 100/50
H 440
Sperrblock
VCPD8B–239
Schwenkgetriebe
MSG–27P–23E
+13l/min
NW 10
Q=43 l/min NW 12
Q=43 l/min NW 12
245 bar
205 bar
Q=43 l/min
NW 16
✳ = Regenerativ - Schaltung im Ventilschieber
✳ = additional flow supply, spool integrated
✳ = alimentation supplémentaire de débit, integré dans le tirior
Steuerventil
KVSE–72–9
Ausleger
Löffel
Einlass
Zw.–Ausleger
Stiel
Zusatz/ Hammer
Zuschalter (f. Hammer)
Schild
Knicken
Schwenken
A
M
B
DB
PB
205 bar
R1
R2
nOW= 9,9 U/min
NW 25
Qmax. =62 l/min
Q=62 l/min
Q=62 l/min
NW 28
Qmax. =105 l/min
NW 12
Speicher–Füllventil
150 bar
- Zündschloss
- ignition switch
- contacteur d'allumage
Schwenkbrems–Betätigung
3/2 Magnetventil
- Taster im Koordinatenhebel links
- push button in left joystick
- bouton poussoir integré dans la manette gauche
Vorsteuerdruck
Pv = 30 bar
Q=20 l/min (Spülöl Fahrpumpe)
Temperaturregler
55°C
1 bar
NW20
Ölkühler
Deutz F4 M 2011
P=44 kW (60PS) n=2400 min-1
Vg=8.4 cm 3/U
Fahrenpumpe
A4VG 40 DA
Prioritätsventil
LPS 80
Q=43 l/min NW 10
Lenkeinheit
LAGC 160
120 bar
NW12
NW10
Lenkzylinder
Notlenkung
Fahrmotor
A6VM55DA
NW 20
NW 60
Saugfilter
Rücklauffilter
Arbeitspumpe
PSVD2–26E
26+26+18cm 3/U
3 - Kreis - Hydraulik
3 circuit hydraulic system
système hydraulique à 3 circuits
TW 70
Gelenkausleger
Articulated boom
Flèche articulée
Pluma intermediara
ab Fz.-Id.Nr.:
from s/n:
à partir du n/s:
desde el no.:
TW00700100
01.2007
Hydraulikschema
Hydraulic diagram
Plan hydraulique
Plano hidráulico
4.49.51

Pos. Item Rep. No.	Deutsch	English	Français
01	Drehwerkgetriebe + Hydromotor - *Drehantrieb*	Swing gear + hydraulic motor - *swing drive*	Reducteur d'orientation + moteur hydraulique - *entraînement d'orientation*
02	Wegeventil *Schwenkbremse - öffnen*	solenoid valve *swing brake - opening*	Electrovanne *frein de orientation - ouvert*
03	Speicherfüllventil - *Bremsanlage*	Accumulator charge valve - *brake system*	Valve de remplissage accu - système *de frein*
04	Prioritätsventil	Priority valve	Valve de priorité
05	Lenkeinheit	Steering unit	Unité de direction
06	Hydraulikzylinder-– Lenken *Vorderachse*	Hydraulic cylinder - steering *front axle*	Vérin hydraulique - direction *essieu AR*
07	Notlenkung	Emergency steering	Direction de secours
08	Verstellmotor - Fahren	Variable displacement motor - travel	Moteur à cylindrée variable - translation
09	Verstellpumpe – Arbeiten	Variable displacement pump - working	Pompe à débit variable - équipement
10	Verstellpumpe – Fahren	Variable displacement pump - travel	Pompe à débit variable - translation
11	Saugfilter	Suction filter	Filtre d'aspiration
12	Dieselmotor	Diesel engine	Moteur diesel
13	Ölkühler	Oil cooler	Refroidisseur d'huile
14	Rücklauffilter	Return filter	Filtre de retour
15	Öltank	Oilt tank	Reservoir hydraulique
16	Hydrauliköltemperaturregler	Hydraulic oil temperature regulator	Régulateur de température d'huile hydraulique
17	Blocksteuergerät	Valve bank	Distributeur
18	Hydraulikzylinder – Ausleger	Hydraulic cylinder – boom	Vérin hydraulique – flèche
19	Hydraulikzylinder – Löffel	Hydraulic cylinder – bucket	Vérin hydraulique – godet
20	Hydraulikzylinder - Zwischenausleger	Hydraulic cylinder - intermediate boom	Vérin hydraulique – flèche intermédiaire
21	Hydraulikzylinder – Löffelstiel	Hydraulic cylinder – stick	Vérin hydraulique – balancier
22	Zusatzsteuerkreis / Hydraulikhammer	Additional control circuit / hydraulic hammer	Circuit supplémentaire / marteau hydraulique
23	Zuschaltbarer Steuerkreis für Hydraulikhammer	Hydraulic hammer overflow	Circuit supplémentaire pour marteau - grand debit
24	Hydraulikzylinder - Abstützen	Hydraulic cylinder – outrigger	Vérin hydraulique - stabilisateur
25	Hydraulikzylinder -	Hydraulic cylinder -	Vérin hydraulique -
	Knicken	articulation	deport de flèche

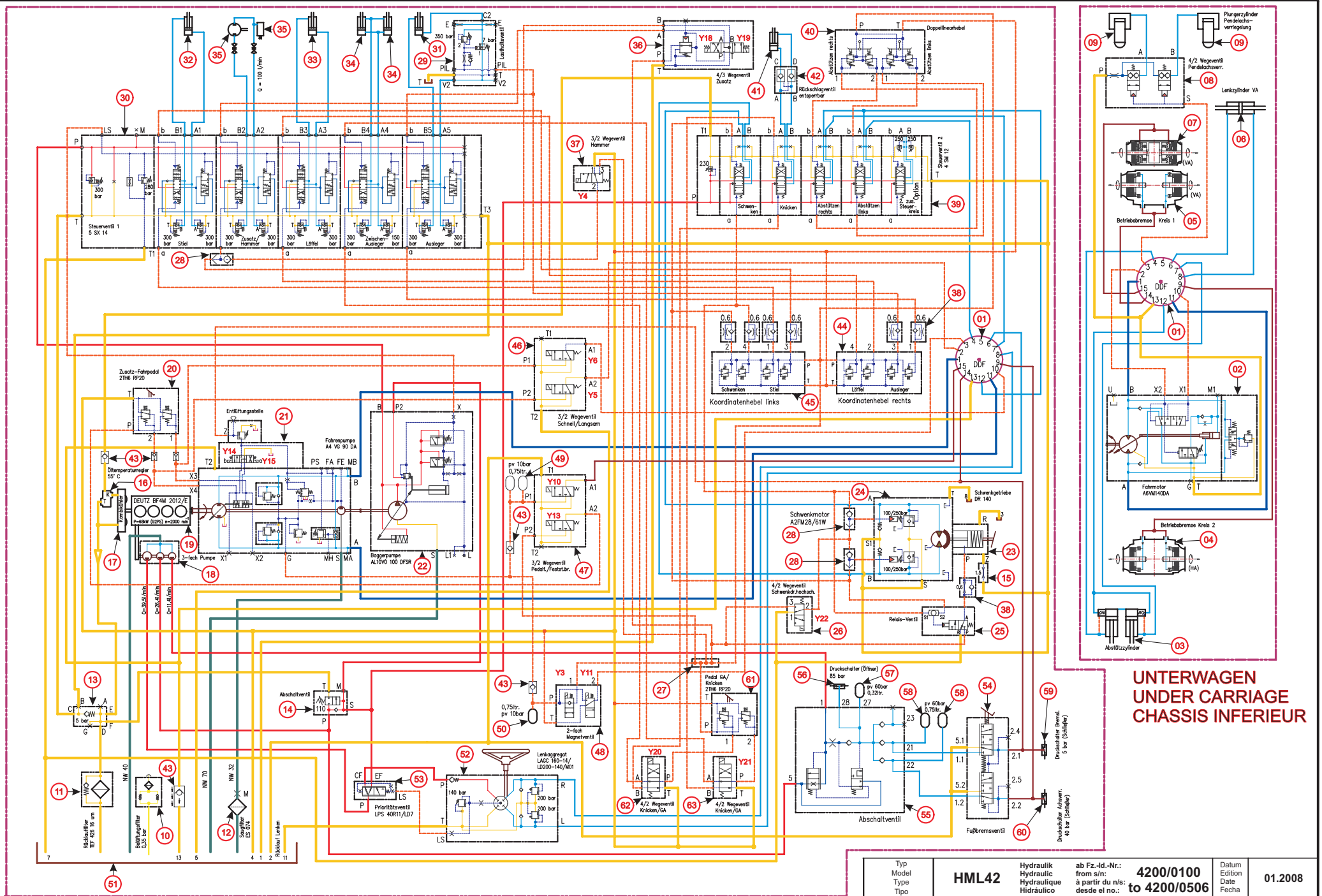
Typ Model Type Tipo	**TW 70** (HML 23)	**HYDRAULIKSCHALTPLAN HYDRAULIC DIAGRAMM PLAN HYDRAULIQUE PLANO HIDRAULICO**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Legende Legend Légende Leyenda**		Blatt Page Feuille Página	**4.49.52**

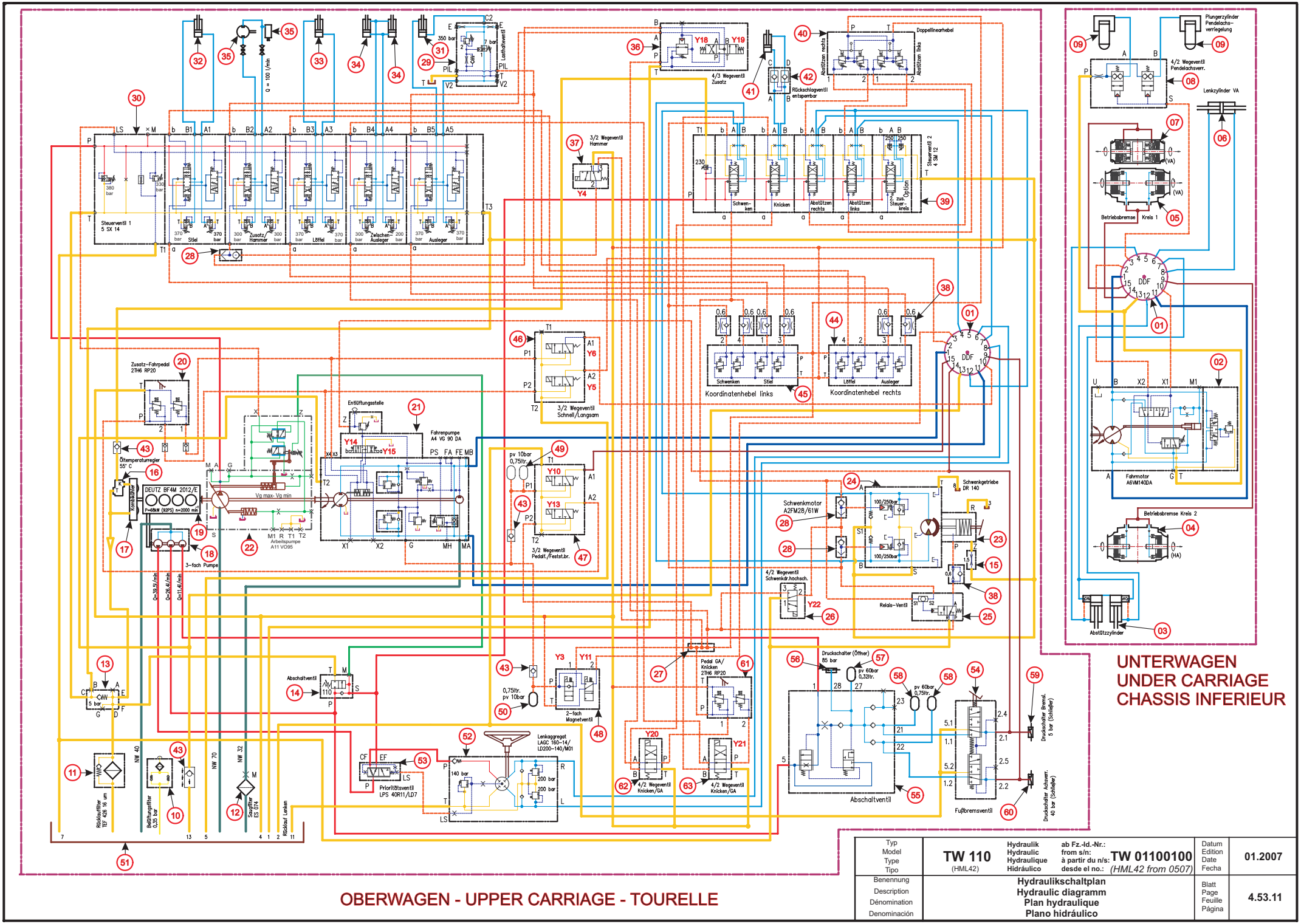
Pos. Item Rep. No.	Deutsch	English	Français
26	Steuerkreis - Schwenken	Swing - circuit	Circuit - orientation
27	Eingangselement **P3**	Inlet element **P3**	Elément d'entrée **P3**
28	Eingangselement **P1 + P2**	Inlet element **P1 + P2**	Elément d'entrée **P1 + P2**
29	Drosselrückschlagventil *entsperrbar*	Pilot controlled throttle check valve	Clapet anti-tetour avec ètrangleur piloté

Typ Model Type Tipo	**TW 70** (HML 23)	**HYDRAULIKSCHALTPLAN** **HYDRAULIC DIAGRAMM** **PLAN HYDRAULIQUE** **PLANO HIDRAULICO**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Legende** **Legend** **Légende** **Leyenda**		Blatt Page Feuille Página	**4.49.53**



Typ Model Type Tipo	**TW 85**	**Hydraulik** **Hydraulic** **Hydraulique** **Hidráulico**	Datum Edition Date Fecha **01.2007**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan** **Hydraulic diagramm** **Plan hydraulique** **Plano hidráulico**		Blatt Page Feuille Página **4.51.51**


UNTERWAGEN
UNDER CARRIAGE
CHASSIS INFERIEUR
OBERWAGEN - UPPER CARRIAGE - TOURELLE
Steuerventil 1 5 SX 14
Steuerventil 2 4 SM 12
Fahrpumpe A4 VG 90 DA
Baggerpumpe AL10V0 100 DFSR
DEUTZ BF4M 2012/E
Schwenkmotor A2FM28/61W
Schwenkgetriebe DR 140
Fahrmotor A6VM140DA
Lenkaggregat LAGC 160-14/ LD200-140/M01
Koordinatenhebel links
Koordinatenhebel rechts
Abstützzylinder
Fußbremsventil
Abschaltventil
Prioritätsventil LPS 40R11/LD7
Rückschlagventil entsperrbar
Doppellinearhebel
Plungerzylinder Pendelachs-verriegelung
Lenkzylinder VA
Betriebsbremse Kreis 1
Betriebsbremse Kreis 2
Rücklauffilter TEF 426 16 um
Belüftungsfilter 0,35 bar
Saugfilter ES 07/4
Rücklauf Lenken
Typ / Model / Type / Tipo: HML42
Hydraulik / Hydraulic / Hydraulique / Hidráulico
ab Fz.-Id.-Nr.: / from s/n: / à partir du n/s: / desde el no.: 4200/0100 to 4200/0506
Datum / Edition / Date / Fecha: 01.2008
Benennung / Description / Dénomination / Denominación: Hydraulikschaltplan Hydraulic diagramm Plan hydraulique Plano hidráulico
Blatt / Page / Feuille / Página: 4.53.10


UNTERWAGEN
UNDER CARRIAGE
CHASSIS INFERIEUR
OBERWAGEN - UPPER CARRIAGE - TOURELLE
Steuerventil 1
5 SX 14
Steuerventil 2
4 SW 12
Fahrpumpe
A4 VG 90 DA
Arbeitspumpe
A11 VO95
DEUTZ BF4M 2012/E
Schwenkmotor
A2FM28/61W
Schwenkgetriebe
DR 140
Fahrmotor
A6VM140DA
Lenkzylinder VA
Betriebsbremse Kreis 1
Betriebsbremse Kreis 2
Abstützzylinder
Koordinatenhebel links
Koordinatenhebel rechts
Abschaltventil
Fußbremsventil
Lenkaggregat
LAGC 160-14/
LD200-140/M01
Prioritätsventil
LPS 40R11/LD7
Rückschlagventil entsperrbar
3/2 Wegeventil Hammer
3/2 Wegeventil Schnell/Langsam
3/2 Wegeventil Pedalf./Feststbr.
4/3 Wegeventil Zusatz
4/2 Wegeventil Knicken/GA
4/2 Wegeventil Schwenkbr.hochsch.
2-fach Magnetventil
Relais-Ventil
Pedal GA/
Knicken
2THG RP20
Zusatz-Fahrpedal
2TH6 RP20
Druckschalter (Öffner)
85 bar
Druckschalter Bremsl.
5 bar (Schließer)
Druckschalter Achsverr.
40 bar (Schließer)
Rückschlagventil
Doppellinearhebel
Abstützen rechts
Abstützen links
Plungerzylinder
Pendelachs-
verriegelung
4/2 Wegeventil
Pendelachsverr.
Rücklauffilter
TEF 426 16 um
Belüftungsfilter
0,35 bar
Saugfilter
ES 074
Rücklauf Lenken
Typ
Model
Type
Tipo
TW 110
(HML42)
Hydraulik
Hydraulic
Hydraulique
Hidráulico
ab Fz.-Id.-Nr.:
from s/n:
à partir du n/s:
desde el no.:
TW 01100100
(HML42 from 0507)
Datum
Edition
Date
Fecha
01.2007
Benennung
Description
Dénomination
Denominación
Hydraulikschaltplan
Hydraulic diagramm
Plan hydraulique
Plano hidráulico
Blatt
Page
Feuille
Página
4.53.11

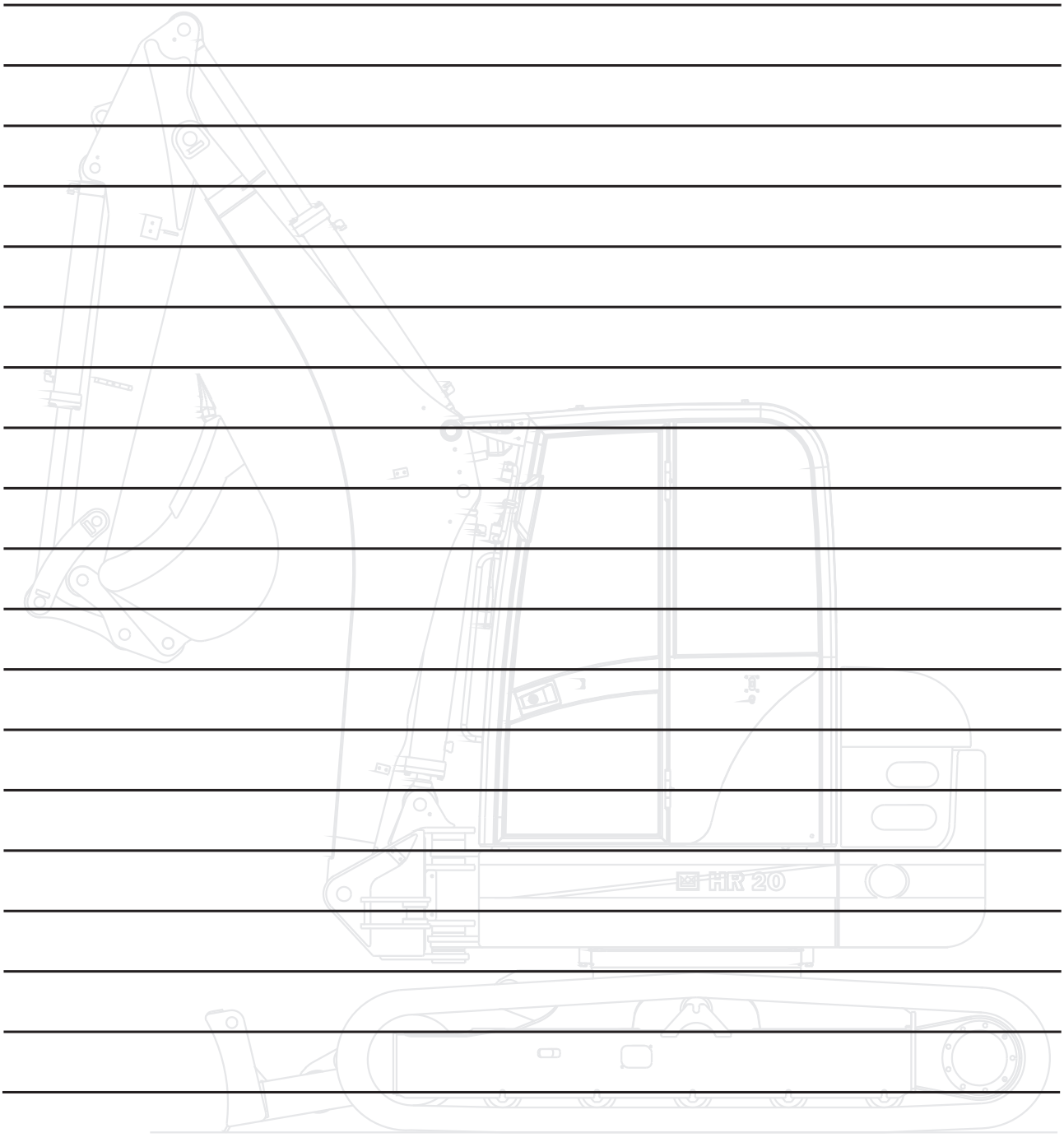
Pos. Item Rep. No.	Deutsch	English	Français
01	Drehdurchführung	Rotary transfer	Joint tournant
02	Verstellmotor - *Fahren*	Variable displacement motor - *travel*	Moteur à cylindrée variable - translation
03	Hydraulikzylinder – Abstützen	Hydraulic cylinder – outrigger	Vérin hydraulique - stabilisateur
04	Betriebsbremse - Kreis 2 *Hinterachse*	Service brake - circuit 2 *rear axle*	Frein de service - circuit 2 *essieu AR*
05	Betriebsbremse - Kreis 1 *Vorderachse*	Service brake - circuit 1 *front axle*	Frein de service - circuit 1 *essieu AV*
06	Hydraulikzylinder-- Lenken *Vorderachse*	Hydraulic cylinder - steering *front axle*	Vérin hydraulique - direction *essieu AV*
07	Federspeicherzylinder - Feststellbremse	Spring loaded cylinder - parking brake	Cylindre à ressort accumulé - frein de stationnement
08	Wegeventil *Pendelachsverriegelung*	Control valve *oscillating axle lock*	Distributeur *verrouillage de l'essieu oscillant*
09	Hydraulikzylinder - Pendelachsverriegelung	Hydraulic cylinder – oscillating axle lock	Vérin hydraulique - verrouillage de l'essieu oscillant
10	Belüftungsfilter	Vent valve	Filtre d'aération
11	Rücklauffilter	Return filter	Filtre de retour
12	Saugfilter	Suction filter	Filtre d'aspiration
13	Rücklaufsammler **5bar**	Return line collector **5bar**	Collecteur de retour **5bar**
14	Abschaltventil	Shut-off valve	Valve de coupure
15	Drossel	Throttle	Etrangleur
16	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
17	Ölkühler	Oil cooler	Refroidisseur d'huile
18	Dreifachzahnradpumpe	Triple gear pump	Triple pompe à engrenages
19	Dieselmotor	Diesel engine	Moteur diesel
20	Vorsteuergerät – Fußpedal *Fahren*	Pilot-operated valve – pedal *travel*	Distributeur à commande assistée - pédale *translation*
21	Verstellpumpe – *Fahren*	Variable displacement pump - *travel*	Pompe à débit variable - translation
22	Verstellpumpe – *Arbeiten*	Variable displacement pump - *working*	Pompe à débit variable - *équipement*
23	Drehwerkgetriebe *Drehantrieb*	Swing gear *swing drive*	Reducteur d'orientation *entraînement d'orientation*
24	Hydromotor *Drehantrieb*	Hydraulic motor *swing drive*	Moteur hydraulique *entraînement d'orientation*
25	Relaisventil *Schwenkbremse*	Relay valve *swing brake*	Clapet-relais *frein d'orientation*
26	Wegeventil **Y22** *Schwenkdruckhochschaltung*	Solenoid valve **Y22** *high torque swing*	electro-vanne **Y22** *élevation pression d'orientation*
27	Sammler	Collector	Collecteur
28	Wechselventil	Shuttle valve	Selecteur

Typ Model Type Tipo	**TW 110**	**ab Fz.-Id.nr..** **from s/n:** **à partir du n/s: TW 01100100** **desde el no.:**	**HYDRAULIKSCHALTPLAN** **HYDRAULIC DIAGRAMM** **PLAN HYDRAULIQUE** **PLANO HIDRAULICO**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Legende** **Legend** **Légende** **Leyenda**			Blatt Page Feuille Página	**4.53.12**

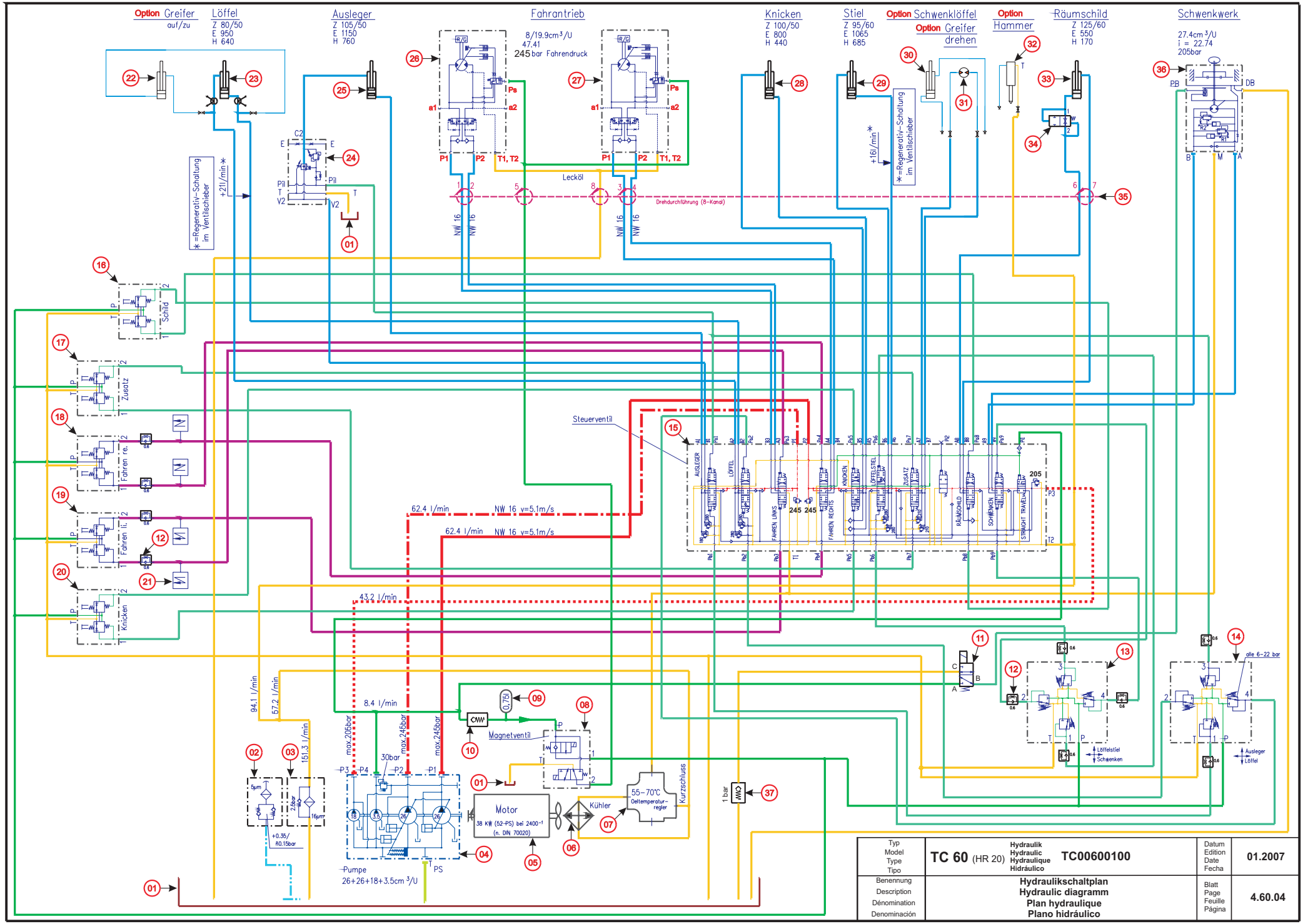
Pos. Item Rep. No.	Deutsch	English	Français
29	Lasthalteventil	Load holding valve	Clapet maintieu de charge
30	Blocksteuergerät 5SX14	Valve bank 5SX14	Distributeur 5SX14
31	Hydraulikzylinder – *Ausleger*	Hydraulic cylinder – *boom*	Vérin hydraulique – *flèche*
32	Hydraulikzylinder – *Löffelstiel*	Hydraulic cylinder – *stick*	Vérin hydraulique – *balancier*
33	Hydraulikzylinder – *Löffel*	Hydraulic cylinder – *bucket*	Vérin hydraulique – *godet*
34	Hydraulikzylinder - **Zwischenausleger**	Hydraulic cylinder - **intermediate boom**	Vérin hydraulique – *flèche intermédiaire*
35	Zusatzsteuerkreis / Hydraulikhammer	Additional control circuit / hydraulic hammer	Circuit supplémentaire / marteau hydraulique
36	Wegeventil / Druckminder-ventil **Y18 / Y19** *Zusatzsteuerkreis*	Solenoid valve / pressure reducing valve **Y18 / Y19** *additional control circuit*	Electrovanne / diminueur de pression **Y18 / Y19** *circuit supplémentaire*
37	Wegeventil **Y4** *Hydraulikhammer*	Control valve **Y4** *hydraulic hammer*	Distributeur **Y4** *marteau hydraulique*
38	Drosselrückschlagventil	Throttle check-valve	Clapet anti-retour avec étrangleur
39	Blocksteuergerät 4SM12	Valve bank 4SM12	Distributeur 4SM12
40	Vorsteuergerät - *Abstützen*	Pilot-operated valve - *outrigger*	Distributeur à commande assistée - *stabilisateur*
41	Hydraulikzylinder - *Knicken*	Hydraulic cylinder - *articulation*	Vérin hydraulique - *deport de flèche*
42	Doppelrückschlagventil *entsperrbar*	Pilot controlled double check valve	Double clapet anti-retour piloté
43	Rückschlagventil	Non-return valve	Clapet anti-retour
44	Vorsteuergerät *Löffel, Ausleger*	Pilot-operated valve *bucket, boom*	Distributeur à commande assistée *godet, flèche*
45	Vorsteuergerät *Schwenken, Löffelstiel*	Pilot-operated valve *swing, stick*	Distributeur à commande assistée *orientation, balancier*
46	Wegeventil **Y5 / Y6** *Schnell / Langsam*	Control valve **Y5 / Y6** *low / high speed*	Electovanne **Y5 / Y6** *petite / grande vitesse*
47	Wegeventil **Y10 / Y13** *Feststellbremse / Pedalfahren*	Control valve **Y10 / Y13** *parking brake / pedal drive*	Distributeur **Y10 / Y13** *frein de stationnement / translation par pédale*
48	Zweifach-Magnetventil *-Vorsteuerung ein/aus* **Y3** *-Achsverriegelung* **Y11**	Double solenoid valve *-pilot pressure on/off* **Y3** *-oscillating axle lock* **Y11**	Double electrovanne *-pression pilotage marche/arrêt* **Y3** *-verrouillage pont oscillant* **Y11**
49	Hydrospeicher	Hydraulic accumulator	Accumulateur hydraulique
50	Hydrospeicher	Hydraulic accumulator	Accumulateur hydraulique
51	Öltank	Oilt tank	Reservoir hydraulique

Typ Model Type Tipo	**TW 110**	**ab Fz.-Id.nr.. from s/n: à partir du n/s: TW 01100100**	**HYDRAULIKSCHALTPLAN HYDRAULIC DIAGRAMM PLAN HYDRAULIQUE PLANO HIDRAULICO**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Legende Legend Légende Leyenda**			Blatt Page Feuille Página	**4.53.13**

Pos. Item Rep. No.	Deutsch	English	Français
52	Lenkeinheit	Steering unit	Unité de direction
53	Prioritätsventil	Priority valve	Valve de priorité
54	Bremsventil *Fußpedal*	Brake valve *pedal*	Clapet de frein *pedale*
55	Druckabschaltventil	Shut-off valve	Valve de coupure
56	Druckschalter **85 bar** *Bremsspeicher*	Pressure switch **85 bar** *brake accumulator*	Interrupteur de pression **85 bar** *accu frein*
57	Hydrospeicher	Hydraulic accumulator	Accu hydraulique
58	Hydrospeicher	Hydraulic accumulator	Accu hydraulique
59	Druckschalter **5 bar** *Bremslicht*	Pressure switch **5 bar** *brake stop light*	Interrupteur de pression **5 bar** *feu de stop*
60	Druckschalter **40 bar** *Achsverriegelung / automotives Fahren*	Pressure switch **40 bar** *axle lock / automotive drive*	Interrupteur de pression **40 bar** *verrouillage pont oscillant / translation automotive*
61	Vorsteuergerät *Knicken* / **GA**	Pilot-operated valve *articulation* / ***intermediate boom***	Distributeur à commande assistée *articulation* / ***bras intermediaire***
62	Wegeventil **Y20** *Knicken* / ***GA***	Solenoid valve **Y20** *articulation* / ***intermediate boom***	Electrovanne **Y20** *deport flèche* / ***bras intermediaire***
63	Wegeventil **Y21** *Knicken* / ***GA***	Solenoid valve **Y21** *articulation* / ***intermediate boom***	Electrovanne **Y21** *deport flèche* / ***bras intermediaire***

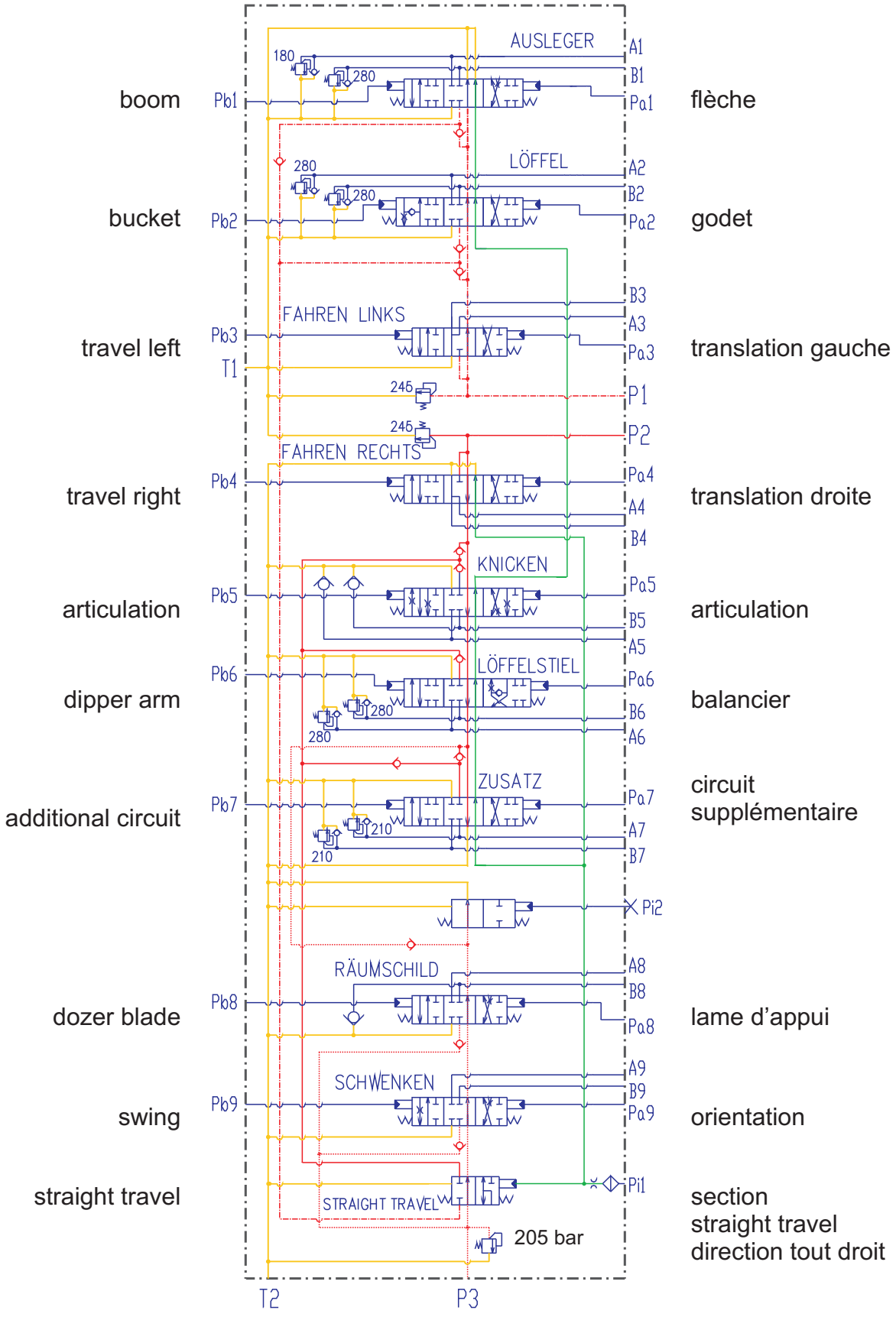


Typ Model Type Tipo	**TC 60** (HR 20)	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Notizen** **Notes** **Notices** **Notas**	Blatt Page Feuille Página	**4.60.00**

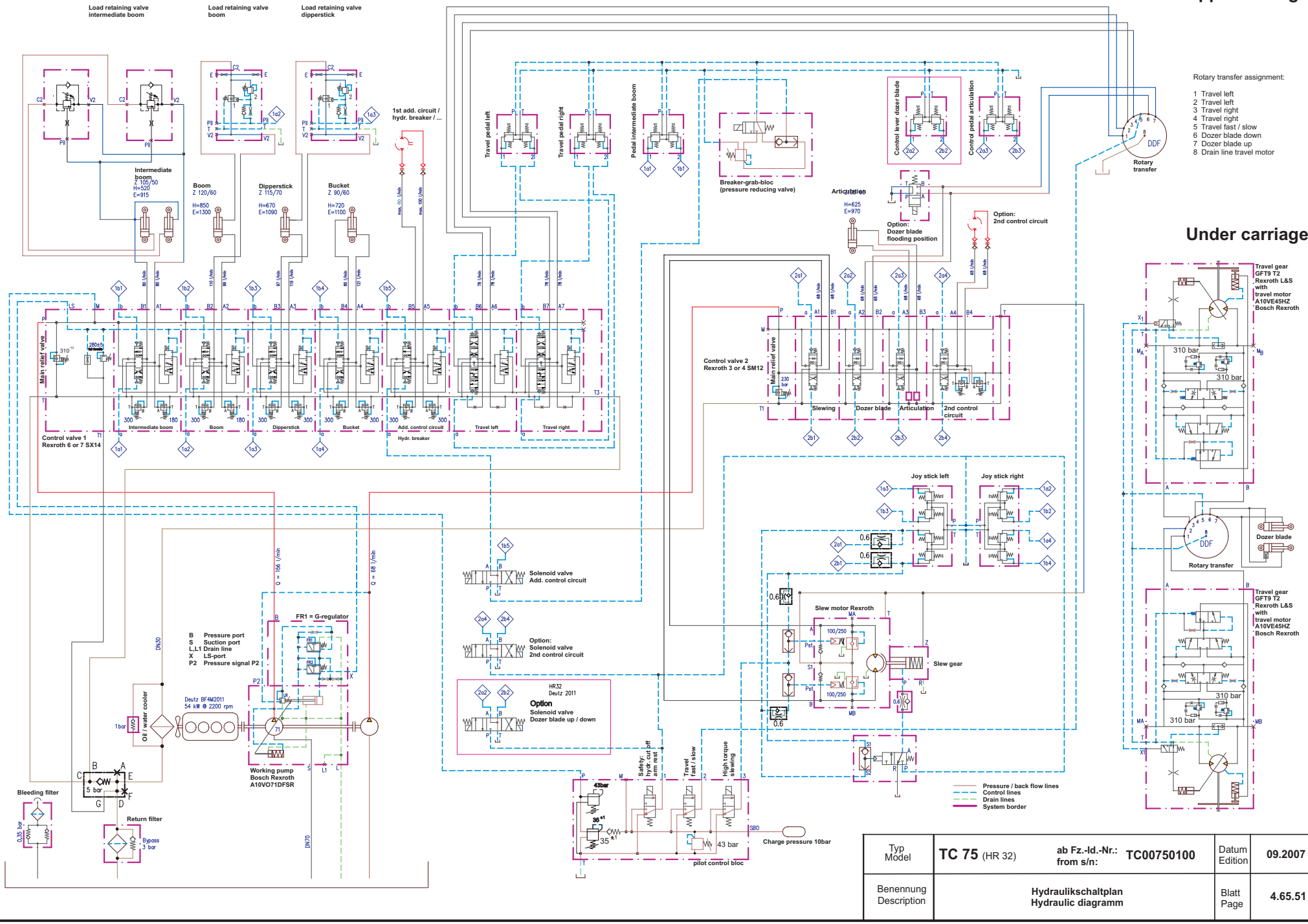


Typ / Model / Type / Tipo	**TC 60** (HR 20) Hydraulik / Hydraulic / Hydraulique / Hidráulico **TC00600100**	Datum / Edition / Date / Fecha	01.2007
Benennung / Description / Dénomination / Denominación	**Hydraulikschaltplan / Hydraulic diagramm / Plan hydraulique / Plano hidráulico**	Blatt / Page / Feuille / Página	4.60.04

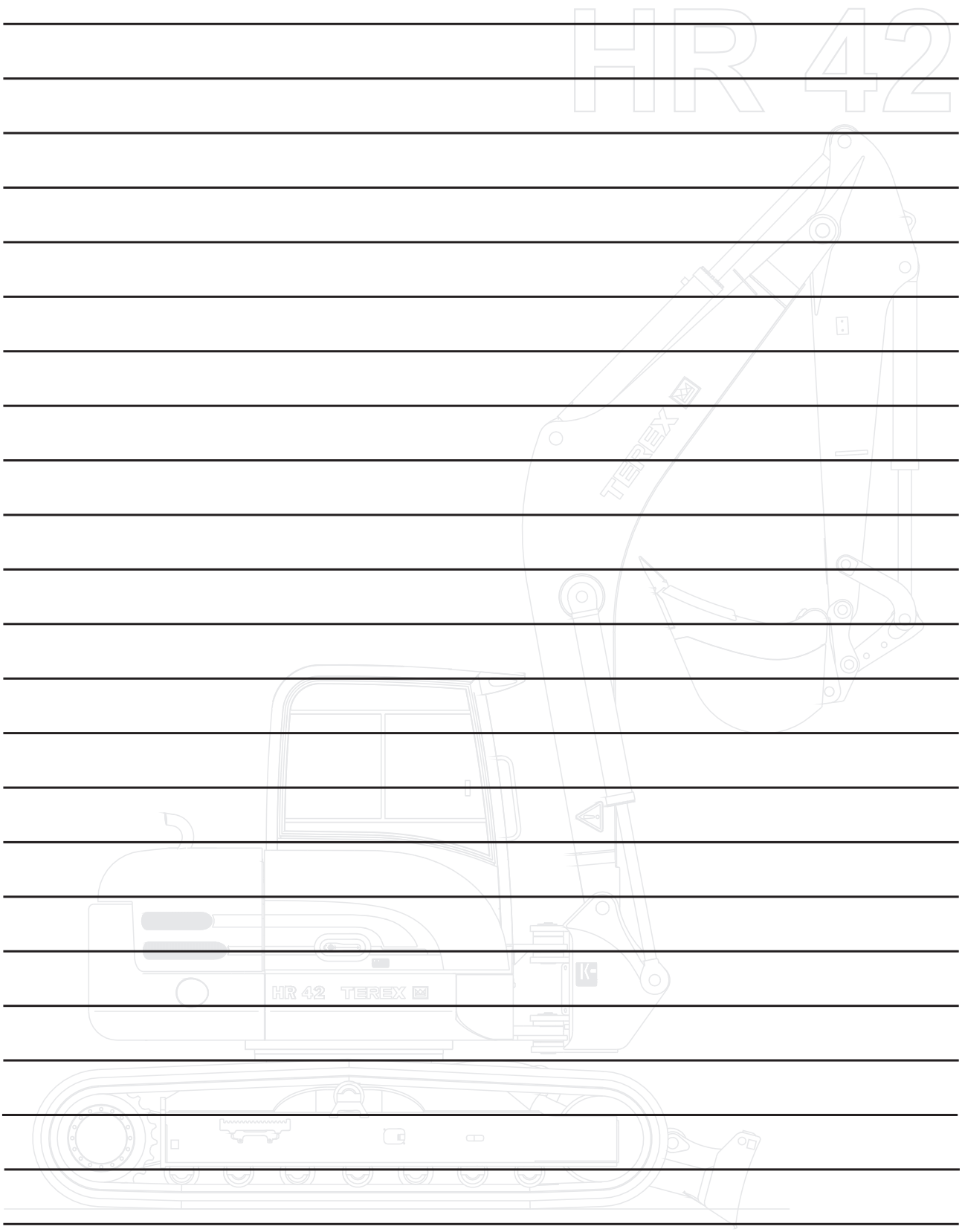
Pos. Item Rep. No.	Deutsch	English	Français
01	Hydrauliköltank	Hydraulic oil tank	Réservoir hydraulique
02	Belüftungsfilter	Vent filter	Filtre d'aération
03	Rücklauffilter	Return filter	Filtre de retour
04	Verstellpumpe	Variable displacement pump	Pompe à débit variable
05	Dieselmotor	Diesel engine	Moteur diesel
06	Ölkühler	Oil cooler	Refroidisseur d'huile
07	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
08	Magnetventil (2-fach) 1= Vorsteuerung ein / aus 2= Fahren schnell / langsam	Solenoid valve (double-type) 1= Pilot control on / off 2= Travel high speed / low speed	Electrovanne (double) 1= Pilotage marche / arrêt 2= Translation grande vitesse / petite
09	Hydrospeicher **Pp**	Hydraulic accumulator **Pp**	Accumulateur hydraulique **Pp**
10	Rückschlagventil	Check valve	Clapet anti-retour
11	Magnetventil - Schwenkbremse	Solenoid valve - swing brake	Electrovanne - frein d'orientation
12	Drosselrückschlagventil	Throttle check valve	Clapet anti-retour d'étranglement
13	Vorsteuergerät (links)	Pilot operated valve (left)	Distributeur à commande assistée (gauche)
14	Vorsteuergerät (rechts)	Pilot-operated valve (right)	Distributeur à commande assistée (droite)
15	Blocksteuergerät	Valve bank	Bloc distributeur
16	Vorsteuergerät (Räumschild)	Pilot-operated valve (dozer blade)	Distibuteur à commande assistée (lame)
17	Vorsteuergerät (Zusatzsteuerkreis)	Pilot-operated valve (additional control circuit)	Distributeur à commande assistée (circuit supplémentaire)
18	Vorsteuergerät (Fahren rechts)	Pilot-operated valve (travel right)	Distributeur à commande assistée (translation à droite)
19	Vorsteuergerät (Fahren links)	Pilot-operated valve (travel left)	Distributeur à commande assistée (translation à gauche)
20	Vorsteuergerät (Knicken)	Pilot-operated valve (articulation)	Distributeur à commande assistée (articulation)
21	Druckschalter	Pressure switch	Interrupteur de pression
22	Hydraulikzylinder - Greifer ***Option***	Hydraulic cylinder - grab ***Option***	Vérin hydr. - benne preneuse ***Option***
23	Hydraulikzylinder - Löffel	Hydraulic cylinder - bucket	Vérin hydraulique - godet
24	Lasthalteventil	Load check valve	Clapet de sécurite
25	Hydraulikzylinder - Ausleger	Hydraulic cylinder - boom	Vérin hydraulique - flèche
26	Fahrantrieb (links)	Travel drive (left)	Entraînement (gauche)
27	Fahrantrieb (rechts)	Travel drive (right)	Entraînement (droite)
28	Hydraulikzylinder - Knicken	Hydraulic cylinder - articulation	Vérin hydraulique - articulation
29	Hydraulikzylinder - Löffelstiel	Hydraulic cylinder - dipper arm	Vérin hydraulique - balancier
30	Hydr.-Zylinder - Schwenklöffel	Hydr. cyl. - swing bucket	Vérin hydr. - godet orientable
31	Drehantrieb - Greifer ***Option***	Swing drive - grab ***Option***	Entraînement d'orientation - benne preneuse ***Option***
32	Hydraulikhammer ***Option***	Hydraulic hammer ***Option***	Marteau hydraulique ***Option***
33	Hydr.-Zylinder - Räumschild	Hydr. cylinder - dozer blade	Vérin hydr. - lame d'appui
34	Rohrbruchsicherung	Hose rupture valve	Clapet d'arrêt automatique
35	Drehdurchführung	Rotary transfer	Joint tournant
36	Schwenkantrieb	Swing drive	Entraînement d'orientation



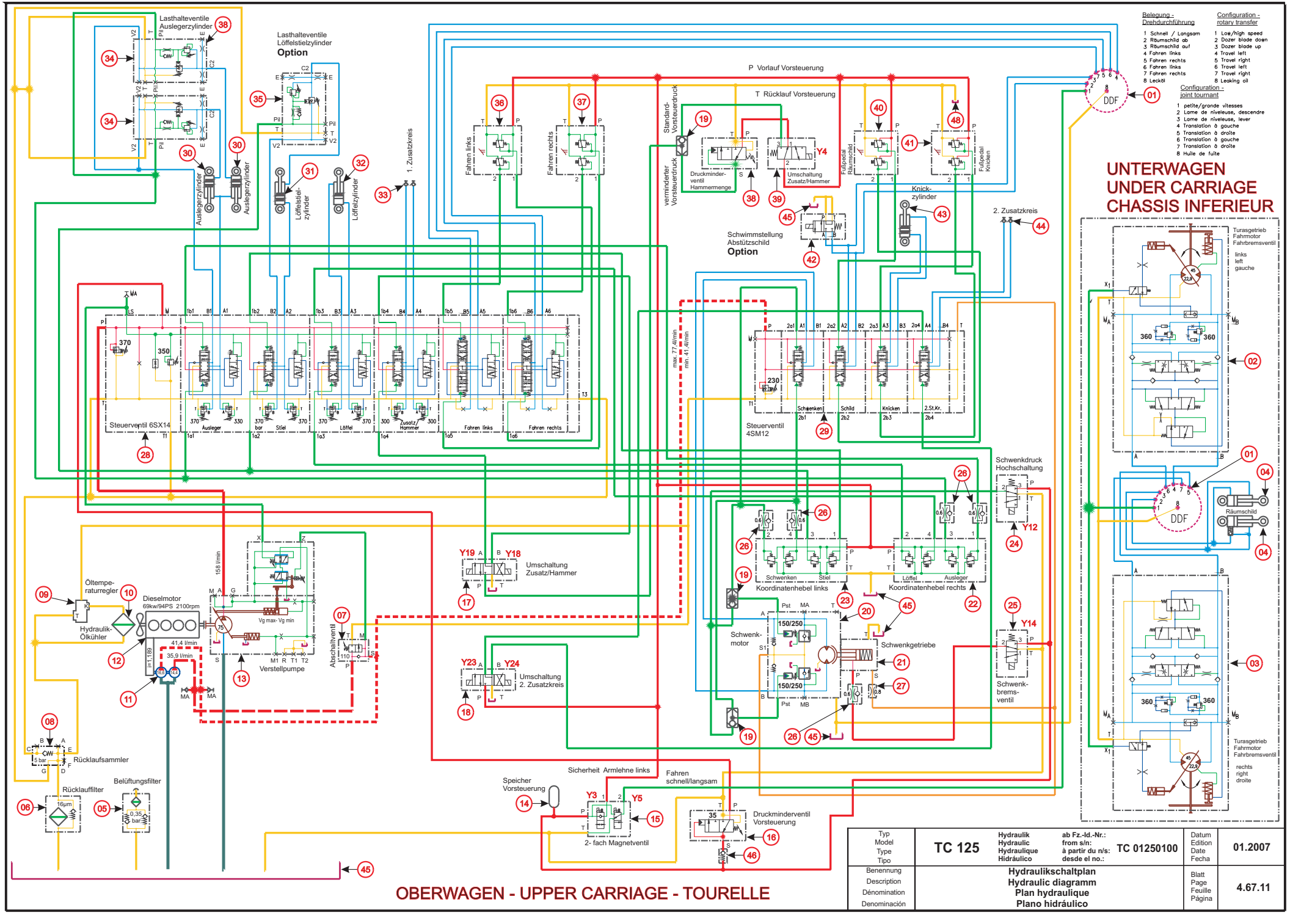
Typ Model Type Tipo	**TC 60** (HR 20)	**HYDRAULIKSCHALTPLAN** **HYDRAULIC DIAGRAMM** **PLAN HYDRAULIQUE** **PLANO HIDRAULICO**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Blocksteuergerät** **Valve bank** **Bloc distributeur** **Válvula de control**		Blatt Page Feuille Página	**4.60.06**



Typ Model	**TC 75** (HR 32)	ab Fz.-Id.-Nr.: from s/n:	**TC00750100**	Datum Edition	**09.2007**
Benennung Description	**Hydraulikschaltplan Hydraulic diagramm**			Blatt Page	**4.65.51**



Typ Model Type Tipo	**TC 125** (HR 42)	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Notizen** **Notes** **Notices** **Notas**	Blatt Page Feuille Página	**4.67.10**

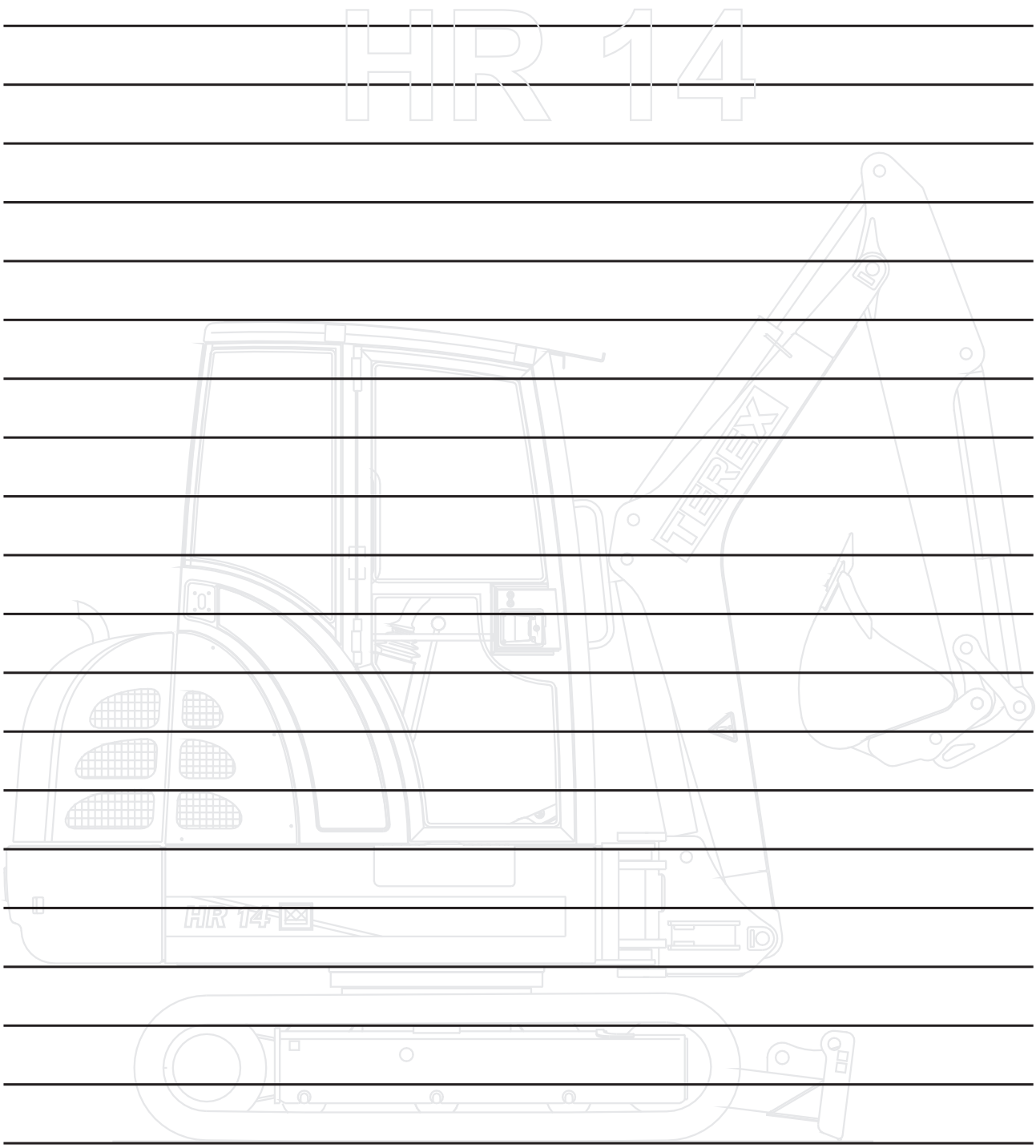

Lasthalteventile Auslegerzylinder
Lasthalteventile Löffelstielzylinder
Option
1. Zusatzkreis
P Vorlauf Vorsteuerung
T Rücklauf Vorsteuerung
Fahren links
Fahren rechts
Standard-Vorsteuerdruck
verminderter Vorsteuerdruck
Druckminder-ventil Hammermenge
Umschaltung Zusatz/Hammer
Fußpedal Räumschild
Fußpedal Knicken
Knick-zylinder
2. Zusatzkreis
Schwimmstellung Abstützschild
Option
Auslegerzylinder
Löffelstiel-zylinder
Löffelzylinder
Steuerventil 6SX14
Steuerventil 4SM12
Schwenken
Schild
Knicken
2.St.Kr.
Ausleger
Stiel
Löffel
Zusatz/ Hammer
Fahren links
Fahren rechts
max. 77,4l/min
min. 41,4l/min
Schwenkdruck Hochschaltung
Koordinatenhebel links
Koordinatenhebel rechts
Schwenk-motor
Schwenkgetriebe
Schwenk-brems-ventil
Umschaltung Zusatz/Hammer
Umschaltung 2. Zusatzkreis
Öltempe-raturregler
Dieselmotor
69kw/94PS 2100rpm
Hydraulik-Ölkühler
Verstellpumpe
Vg max- Vg min
158 l/min
41,4 l/min
35,9 l/min
Abschaltventil
Rücklaufsammler
Rücklauffilter
16µm
Belüftungsfilter
0,35 bar
Speicher Vorsteuerung
Sicherheit Armlehne links
Fahren schnell/langsam
2- fach Magnetventil
Druckminderventil Vorsteuerung
DDF
Räumschild
Turasgetrieb Fahrmotor Fahrbremsventil
links
left
gauche
rechts
right
droite
Belegung - Drehdurchführung
1 Schnell / Langsam
2 Räumschild ab
3 Räumschild auf
4 Fahren links
5 Fahren rechts
6 Fahren links
7 Fahren rechts
8 Lecköl
Configuration - rotary transfer
1 Low/high speed
2 Dozer blade down
3 Dozer blade up
4 Travel left
5 Travel right
6 Travel left
7 Travel right
8 Leaking oil
Configuration - joint tournant
1 petite/grande vitesses
2 Lame de niveleuse, descendre
3 Lame de niveleuse, lever
4 Translation à gauche
5 Translation à droite
6 Translation à gauche
7 Translation à droite
8 Huile de fuite
UNTERWAGEN
UNDER CARRIAGE
CHASSIS INFERIEUR
OBERWAGEN - UPPER CARRIAGE - TOURELLE
Typ
Model
Type
Tipo
TC 125
Hydraulik
Hydraulic
Hydraulique
Hidráulico
ab Fz.-Id.-Nr.:
from s/n:
à partir du n/s:
desde el no.:
TC 01250100
Datum
Edition
Date
Fecha
01.2007
Benennung
Description
Dénomination
Denominación
Hydraulikschaltplan
Hydraulic diagramm
Plan hydraulique
Plano hidráulico
Blatt
Page
Feuille
Página
4.67.11

Pos. Item Rep. No.	Deutsch	English	Français
01	Drehdurchführung	Rotary transfer	Joint tournant
02	Fahrantrieb - links *mit Getriebe, Fahrmotor und Bremsventil*	Travel drive - *left* *with gear, travel motor and brake valve*	Entraînement - gauche *avec transmission,moteur translation et soupape de frein*
03	Fahrantrieb - rechts *mit Getriebe, Fahrmotor und Bremsventil*	Travel drive - *right* *with gear, travel motor and brake valve*	Entraînement - droite *avec transmission,moteur translation et soupape de frein*
04	Hydraulikzylinder - Abstützschild	Hydraulic cylinder - support blade	Vérin hydraulique - lame d'appui
05	Belüftungsfilter	Vent valve	Filtre d'aération
06	Rücklauffilter	Return filter	Filtre de retour
07	Abschaltventil	Shut-off valve	Valve de coupure
08	Rücklaufsammler **5bar**	Return line collector **5bar**	Collecteur de retour **5bar**
09	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
10	Ölkühler	Oil cooler	Refroidisseur d'huile
11	Doppelzahnradpumpe	Double gear pump	Pompe tandem à engrenage
12	Dieselmotor	Diesel engine	Moteur diesel
13	Verstellpumpe – *Arbeiten, Fahren*	Variable displacement pump - *working, travel*	Pompe à débit variable - *équipemen, translation*
14	Hydrospeicher	Hydraulic accumulator	Accumulateur hydraulique
15	Magnetventil (2-fach) *1= Vorsteuerung ein / aus* **Y3** *2= Fahren schnell / langsam* **Y5**	Solenoid valve (double-type) *1= Pilot control on / off* **Y3** *2= Travel high speed / low speed* **Y5**	Electrovanne (double) *1= Pilotage marche / arrêt* **Y3** *2= Translation grande vitesse / petite* **Y5**
16	Druckminderventil *Vorsteuerung*	Pressure reducing valve p*ilot control*	Diminueur de pression *pilotage*
17	Wegeventil **Y18 / Y19** *Zusatzsteuerkreis / Hydraulikhammer*	Control valve **Y18 / Y19** a*dditional control circuit / hydraulic hammer*	Distributeur **Y18 / Y19** circuit supplémentaire / marteau hydraulique
18	Wegeventil **Y23 / Y24** *2.Zusatzsteuerkreis*	Control valve **Y23 / Y24** 2 nd a*dditional control circuit*	Distributeur **Y23 / Y24** *2 ^{me} circuit supplémentaire*
19	Wechselventil	Shuttle valve	Selecteur
20	Hydromotor *Drehantrieb*	Hydraulic motor *swing drive*	Moteur hydraulique *entraînement d'orientation*
21	Drehwerkgetriebe *Drehantrieb*	Swing gear *swing drive*	Reducteur d'orientation *entraînement d'orientation*
22	Vorsteuergerät *Löffel, Ausleger*	Pilot-operated valve *bucket, boom*	Distributeur à commande assistée *godet, flèche*
23	Vorsteuergerät *Schwenken, Löffelstiel*	Pilot-operated valve *swing, stick*	Distributeur à commande assistée *orientation, balancier*
24	Wegeventil **Y12** *Schwenkdruckhochschaltung*	Solenoid valve **Y12** *high torque swing*	electro-vanne **Y12** *élevation pression d'orientation*

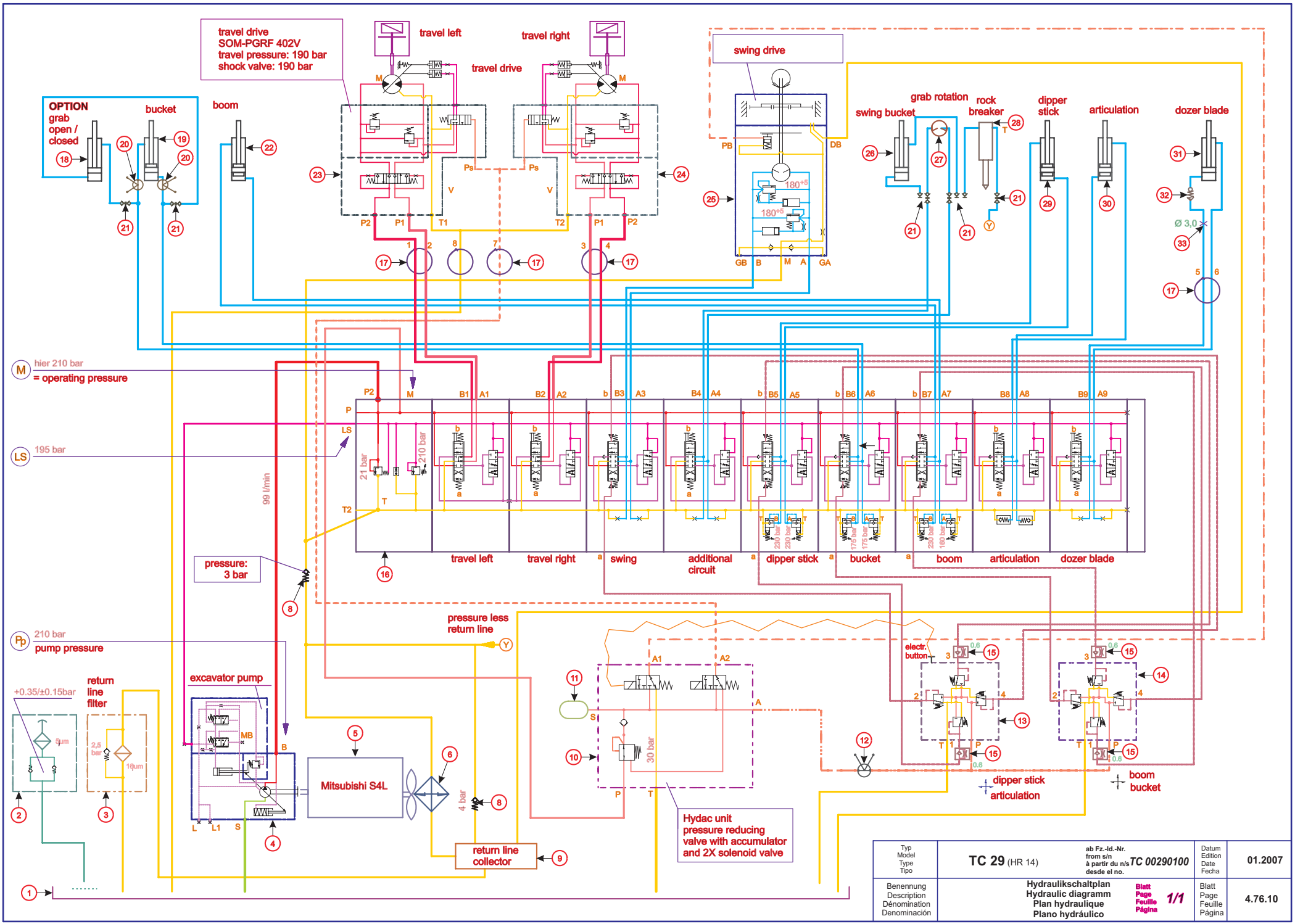
Typ Model Type Tipo	**TC 125**	**ab Fz.-Id.nr..** **from s/n:** **à partir du n/s: TC 01250100** **desde el no.:**	**HYDRAULIKSCHALTPLAN** **HYDRAULIC DIAGRAMM** **PLAN HYDRAULIQUE** **PLANO HIDRAULICO**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Legende** **Legend** **Légende** **Leyenda**			Blatt Page Feuille Página	**4.67.12**

Pos. Item Rep. No.	Deutsch	English	Français
25	Wegeventil **Y14** *Schwenkdruckhochschaltung*	Solenoid valve **Y14** *swing brake*	electro-vanne **Y14** *frein d'orientation*
26	Drosselrückschlagventil	Throttle check-valve	Clapet anti-retour avec étrangleur
27	Drossel	Throttle	Étrangleur
28	Blocksteuergerät 6SX14	Valve bank 6SX14	Distributeur 6SX14
29	Blocksteuergerät 4SM12	Valve bank 4SM12	Distributeur 4SM12
30	Hydraulikzylinder – *Ausleger*	Hydraulic cylinder – *boom*	Vérin hydraulique – *flèche*
31	Hydraulikzylinder – *Löffelstiel*	Hydraulic cylinder – *stick*	Vérin hydraulique – *balancier*
32	Hydraulikzylinder – *Löffel*	Hydraulic cylinder – *bucket*	Vérin hydraulique – *godet*
33	Zusatzsteuerkreis / Hydraulikhammer	Additional control circuit / hydraulic hammer	Circuit supplémentaire / marteau hydraulique
34	Lasthalteventil	Load holding valve	Clapet maintieu de charge
35	Lasthalteventil **Option**	Load holding valve **Option**	Clapet maintieu de charge **Option**
36	Vorsteuergerät – Fußpedal *Fahren links*	Pilot-operated valve – pedal *travel left*	Distributeur à commande assistée - pédale *translation gauche*
37	Vorsteuergerät – Fußpedal *Fahren rechts*	Pilot-operated valve – pedal *travel right*	Distributeur à commande assistée - pédale *translation droite*
38	Druckminderventil - *Zusatzsteuerkreis /* *Hydraulikhammer*	Pressure reducing valve - *additional control circuit /* *hydraulic hammer*	Diminueur de pression - *circuit supplémentaire /* *marteau hydraulique*
39	Wegeventil **Y4** *Zusatzsteuerkreis /* *Hydraulikhammer*	Solenoid valve **Y4** *additional control circuit /* *hydraulic hammer*	Electro-vanne **Y4** *circuit supplémentaire /* *marteau hydraulique*
40	Vorsteuergerät - Fußpedal *Abstützschild*	Pilot-operated valve - pedal *support blade*	Distributeur à commande assistée - pédale *lame d'appui*
41	Vorsteuergerät - Fußpedal *Knicken*	Pilot-operated valve - pedal *articulation*	Distributeur à commande assistée - pédale *deport de flèche*
42	Wegeventil **Y11** Schwimmstellung *Abstützschild* **Option**	Control valve **Y11** flost position *support blade* **Option**	Distributeur **Y11** position du floteur - *lame d'appui* **Option**
43	Hydraulikzylinder - *Knicken*	Hydraulic cylinder - *articulation*	Vérin hydraulique - *deport de flèche*
44	*2.Zusatzsteuerkreis*	2 nd additional control circuit	*2 me* circuit supplémentaire
45	*Öltank*	Oil tank	Reservoir hydraulique
46	Rückschlagventil	Check-valve	Clapet anti-retour

Typ Model Type Tipo	**TC 125**	**ab Fz.-Id.nr..** **from s/n:** **à partir du n/s: TC 01250100** **desde el no.:**	**HYDRAULIKSCHALTPLAN** **HYDRAULIC DIAGRAMM** **PLAN HYDRAULIQUE** **PLANO HIDRAULICO**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Legende** **Legend** **Légende** **Leyenda**			Blatt Page Feuille Página	**4.67.13**

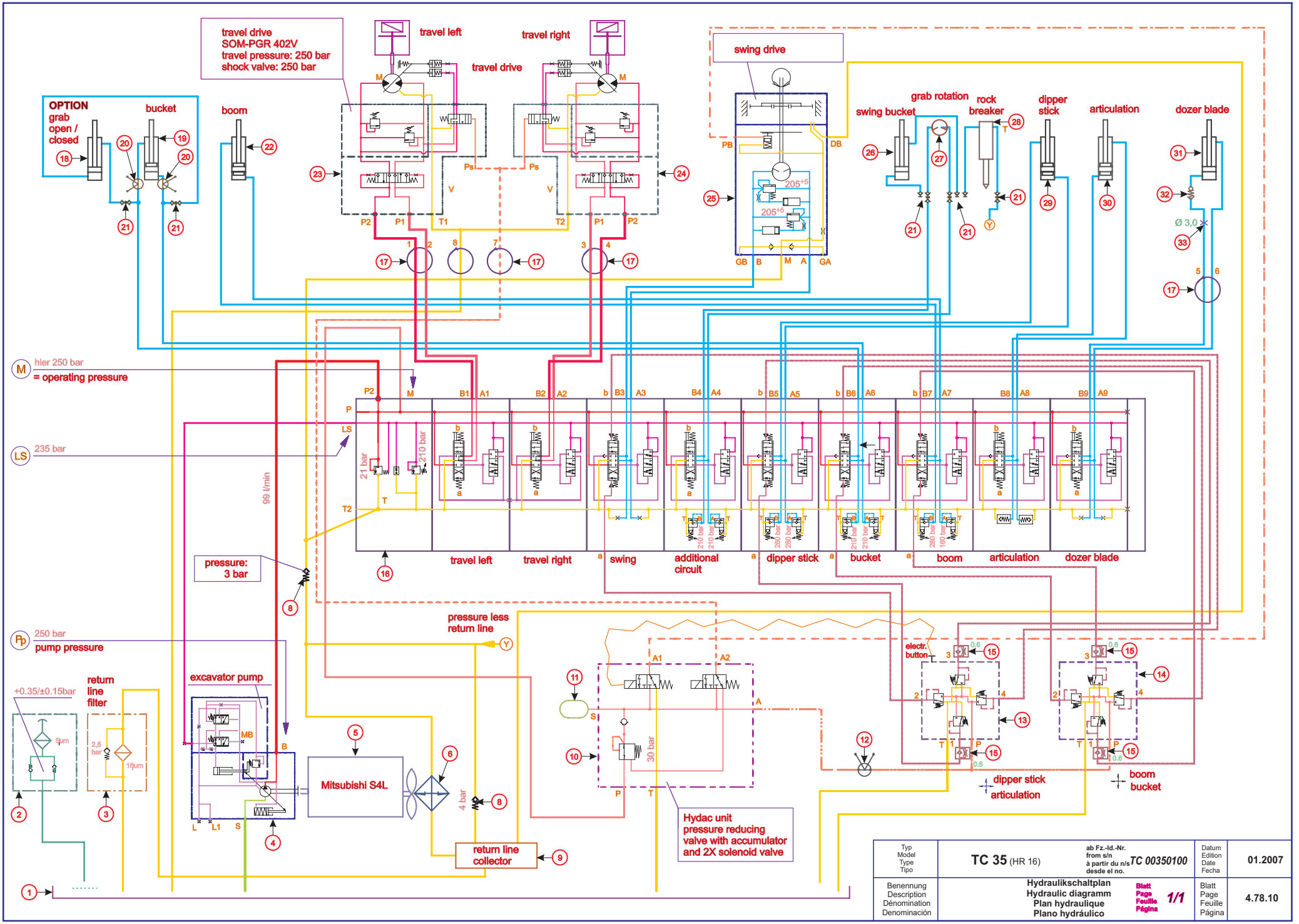


Typ Model Type Tipo	**TC 29** (HR 14)	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Notizen** **Notes** **Notices** **Notas**	Blatt Page Feuille Página	**4.76.04**



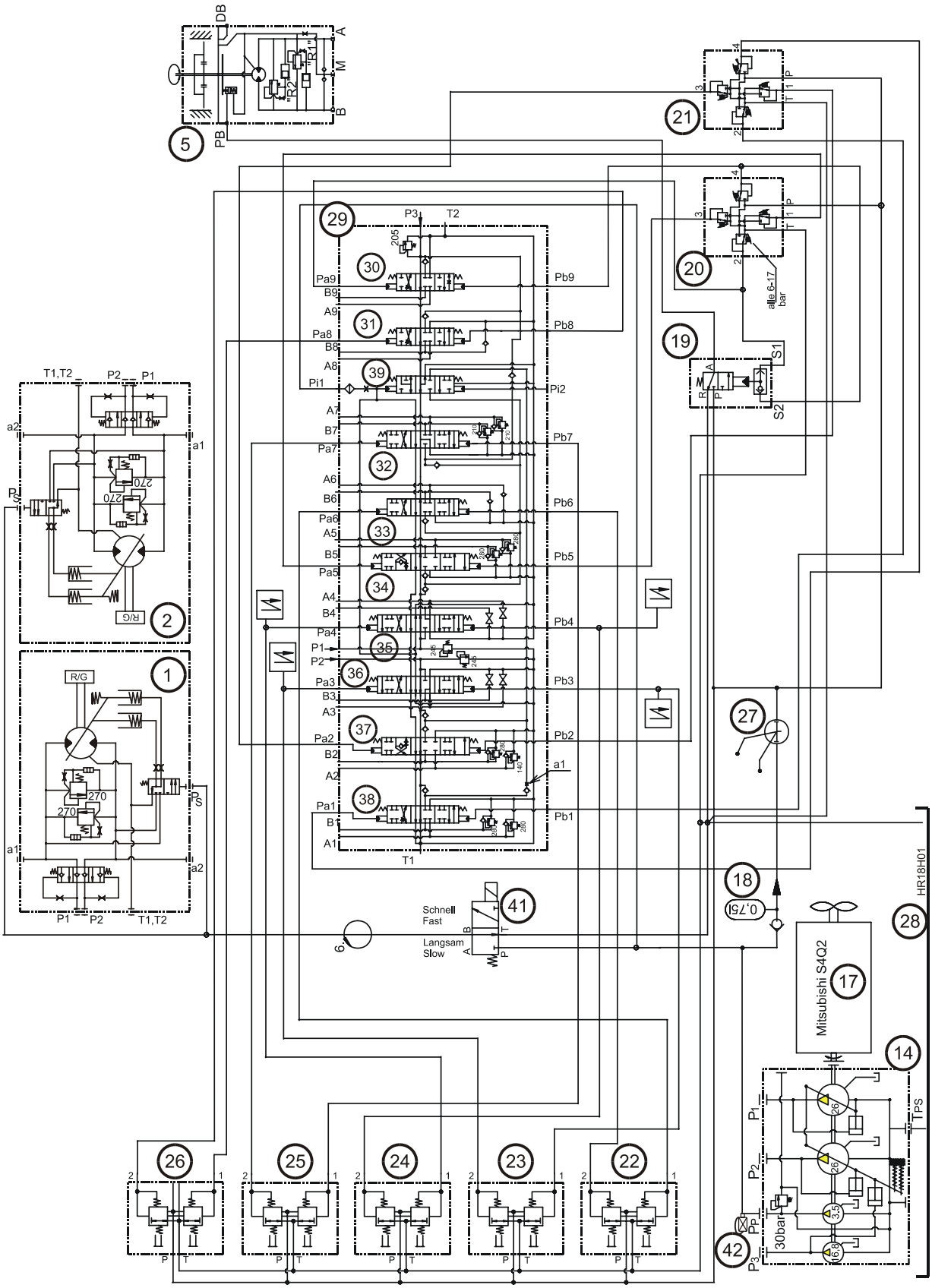
Typ Model Type Tipo	**TC 29** (HR 14)	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no. *TC 00290100*	Datum Edition Date Fecha **01.2007**
Benennung Description Dénomination Denominación	Hydraulikschaltplan Hydraulic diagramm Plan hydraulique Plano hydráulico	Blatt Page Feuille Página *1/1*	Blatt Page Feuille Página **4.76.10**

Pos. Item Rep. No.	***DEUTSCH***	***ENGLISH***	***FRANÇAIS***
1	Hydrauliköltank	Hydraulic oil tank	Réservoir hydraulique
2	Belüftungsfilter	Vent filter	Filtre d'aération
3	Rücklauffilter	Return filter	Filtre de retour
4	Verstellpumpe	Variable displacement pump	Pompe à débit variable
5	Dieselmotor	Diesel engine	Moteur diesel
6	Ölkühler	Oil cooler	Refroidisseur d'huile
7	Rücklaufsammler	Return line collector	Collecteur de retour
8	Ventil*, Rücklaufvorspannung*	Valve, *return pre-load*	Clapet, *pressurisation de retour*
9	Rücklaufsammler	Return line collector	Collecteur de retour
10	Druckminderventil mit Hydrospeicher *(schnell/langsam)* und 2x 3/2 Wegeventile	Pressure reducing valve with hydraulic accumulator *(high/low speed)* and 2x solenoid valve	Soupape réductrice de pression avec accumulateur hydraulique *(grande vitesse/petite)* et 2x électrovanne
11	Hydrospeicher	Hydraulic. accumulator	Accumulateur hydraulique
12	Kugelhahn, Ausstiegsschranke *(sperren Arbeitshydraulik)*	Ball valve, cut-off lever *(stop working hydraulic)*	Robinet, levier de sécurité *(coupure pilotage)*
13	Vorsteuergerät (links)	Pilot operated valve (left)	Distributeur à commande assistée (gauche)
14	Vorsteuergerät (rechts)	Pilot-operated valve (right)	Distributeur à commande assistée (droite)
15	Drosselrückschlagventil	Throttle check valve	Clapet anti-retour d'étranglement
16	Blocksteuergerät	Valve bank	Bloc distributeur
17	Drehdurchführung	Rotary transfer	Joint tournant
18	Hydraulikzylinder - Greifer **Option**	Hydraulic cylinder – grab **Option**	Vérin hydraulique - benne preneuse **Option**
19	Hydraulikzylinder - Löffel	Hydraulic cylinder - bucket	Vérin hydraulique - godet
20	Kugelhahn *(sperren)*	Ball valve *(stop)*	Robinet *(coupure)*
21	Hydraulikkupplung	Hydraulic coupling	Coupleur hydraulique
22	Hydraulikzylinder - Ausleger	Hydraulic cylinder - boom	Vérin hydraulique - flèche
23	Fahrantrieb (links)	Travel drive (left)	Translation (gauche)
24	Fahrantrieb (rechts)	Travel drive (right)	Translation (droite)
25	Schwenkantrieb	Swing drive	Entraînement d'orientation
26	Hydraulikzylinder - Schwenklöffel **Option**	Hydraulic cylinder - swing bucket **Option**	Vérin hydraulique - godet orientable **Option**
27	Drehantrieb - Greifer **Option**	Swing drive - grab **Option**	Entraînement d'orientation - benne preneuse **Option**
28	Hydraulikhammer **Option**	Hydraulic rock breaker **Option**	Marteau hydraulique **Option**
29	Hydraulikzylinder - Löffelstiel	Hydraulic cylinder - dipper arm	Vérin hydraulique - balancier
30	Hydraulikzylinder - Knicken	Hydraulic cylinder - articulation	Vérin hydraulique - déport latérale
31	Hydraulikzylinder - Räumschild	Hydraulic cylinder - dozer blade	Vérin hydraulique - lame d'appui
32	Rohrbruchsicherung	Hose rupture valve	Clapet d'arrêt automatique
33	Blende	Orifice	Orifice



Typ Model Type Tipo	**TC 35** (HR 16)	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no. *TC 00350100*	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	**Hydraulikschaltplan** **Hydraulic diagramm** **Plan hydraulique** **Plano hydráulico**	Blatt Page Feuille Página **1/1**	Blatt Page Feuille Página	4.78.10

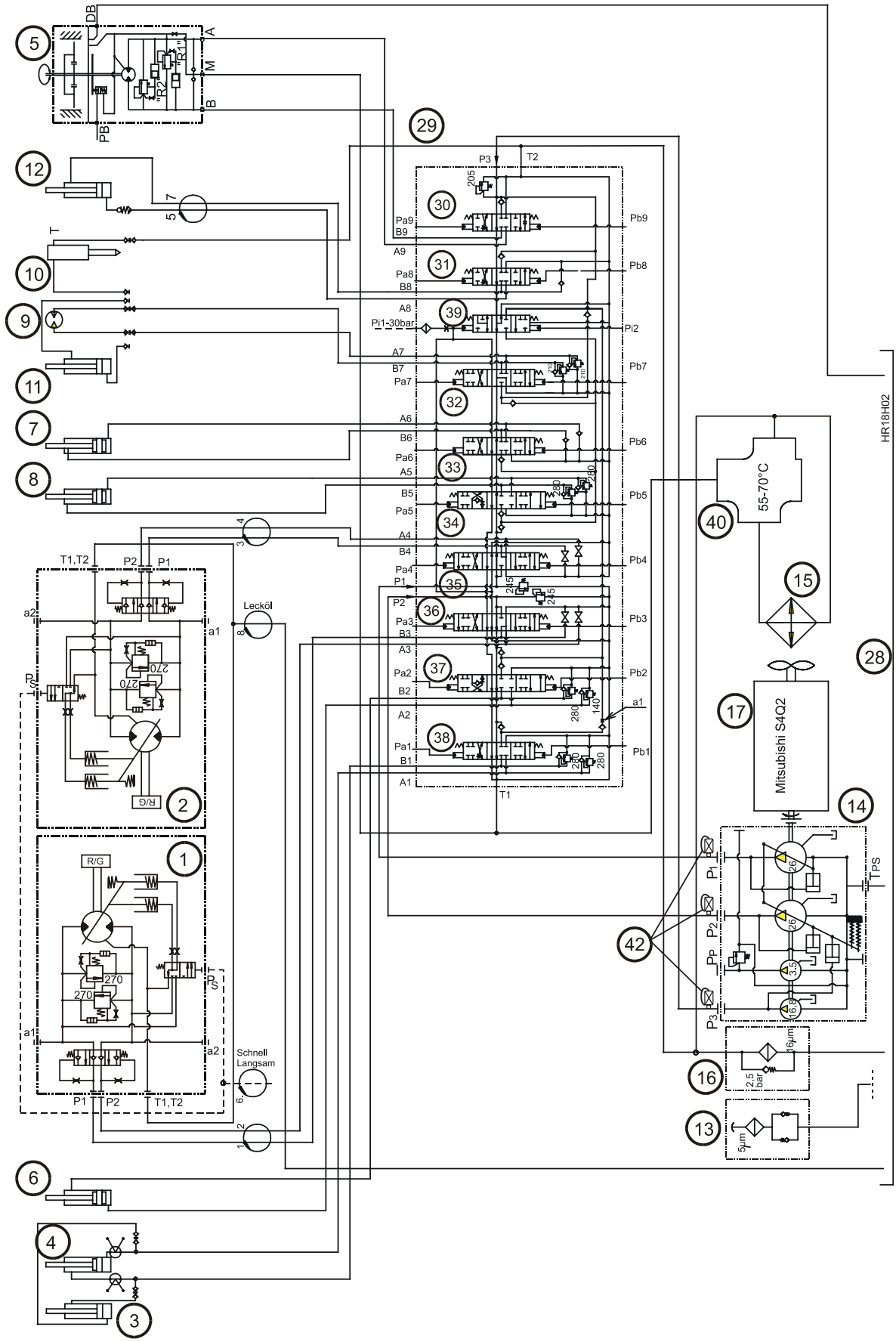
Pos. Item Rep. No.	***DEUTSCH***	***ENGLISH***	***FRANÇAIS***
1	Hydrauliköltank	Hydraulic oil tank	Réservoir hydraulique
2	Belüftungsfilter	Vent filter	Filtre d'aération
3	Rücklauffilter	Return filter	Filtre de retour
4	Verstellpumpe	Variable displacement pump	Pompe à débit variable
5	Dieselmotor	Diesel engine	Moteur diesel
6	Ölkühler	Oil cooler	Refroidisseur d'huile
7	Rücklaufsammler	Return line collector	Collecteur de retour
8	Ventil*, Rücklaufvorspannung*	Valve, *return pre-load*	Clapet, *pressurisation de retour*
9	Rücklaufsammler	Return line collector	Collecteur de retour
10	Druckminderventil mit Hydrospeicher *(schnell/langsam)* und 2x 3/2 Wegeventile	Pressure reducing valve with hydraulic accumulator *(high/low speed)* and 2x solenoid valve	Soupape réductrice de pression avec accumulateur hydraulique *(grande vitesse/petite)* et 2x électrovanne
11	Hydrospeicher	Hydraulic. accumulator	Accumulateur hydraulique
12	Kugelhahn, Ausstiegsschranke *(sperren Arbeitshydraulik)*	Ball valve, cut-off lever *(stop working hydraulic)*	Robinet, levier de sécurité *(coupure pilotage)*
13	Vorsteuergerät (links)	Pilot operated valve (left)	Distributeur à commande assistée (gauche)
14	Vorsteuergerät (rechts)	Pilot-operated valve (right)	Distributeur à commande assistée (droite)
15	Drosselrückschlagventil	Throttle check valve	Clapet anti-retour d'étranglement
16	Blocksteuergerät	Valve bank	Bloc distributeur
17	Drehdurchführung	Rotary transfer	Joint tournant
18	Hydraulikzylinder - Greifer **Option**	Hydraulic cylinder – grab **Option**	Vérin hydraulique - benne preneuse **Option**
19	Hydraulikzylinder - Löffel	Hydraulic cylinder - bucket	Vérin hydraulique - godet
20	Kugelhahn *(sperren)*	Ball valve *(stop)*	Robinet *(coupure)*
21	Hydraulikkupplung	Hydraulic coupling	Coupleur hydraulique
22	Hydraulikzylinder - Ausleger	Hydraulic cylinder - boom	Vérin hydraulique - flèche
23	Fahrantrieb (links)	Travel drive (left)	Translation (gauche)
24	Fahrantrieb (rechts)	Travel drive (right)	Translation (droite)
25	Schwenkantrieb	Swing drive	Entraînement d'orientation
26	Hydraulikzylinder - Schwenklöffel **Option**	Hydraulic cylinder - swing bucket **Option**	Vérin hydraulique - godet orientable **Option**
27	Drehantrieb - Greifer **Option**	Swing drive - grab **Option**	Entraînement d'orientation - benne preneuse **Option**
28	Hydraulikhammer **Option**	Hydraulic rock breaker **Option**	Marteau hydraulique **Option**
29	Hydraulikzylinder - Löffelstiel	Hydraulic cylinder - dipper arm	Vérin hydraulique - balancier
30	Hydraulikzylinder - Knicken	Hydraulic cylinder - articulation	Vérin hydraulique - déport latérale
31	Hydraulikzylinder - Räumschild	Hydraulic cylinder - dozer blade	Vérin hydraulique - lame d'appui
32	Rohrbruchsicherung	Hose rupture valve	Clapet d'arrêt automatique
33	Blende	Orifice	Orifice



TEREX | SCHAEFF	Typ/Model/Type **TC 48** (HR 18)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Hydraulic diagram, pilot control**	Blatt/Page/Feuille **4.80.01**

Legend to hydraulic diagram

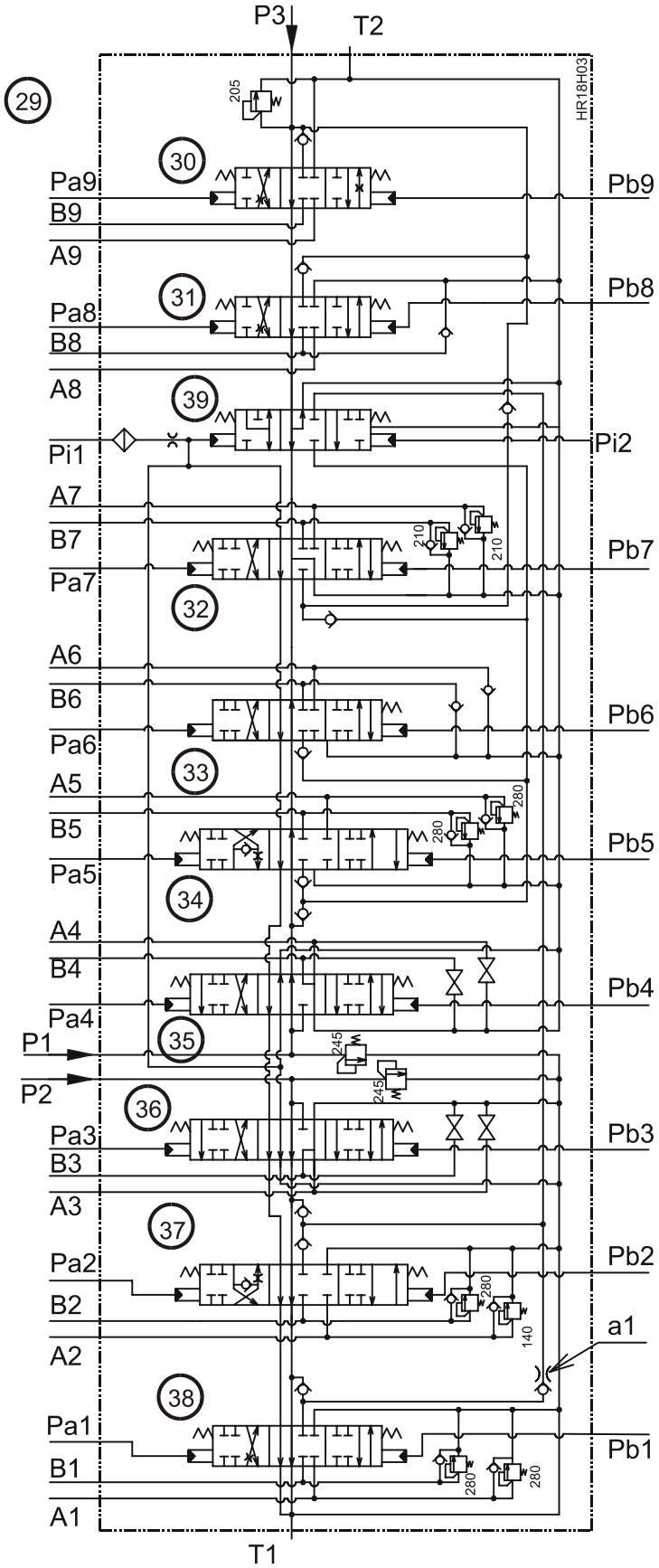
1	Travel motor, left
2	Travel motor, right
5	Slew drive
14	Hydraulic pump
17	Diesel engine
18	Pilot pressure accumulator
19	Relay valve for slew brake
20	Pilot-operated valve - slewing, dipperstick
21	Pilot-operated valve - boom, bucket
22	Pilot-operated valve - articulation
23	Pilot-operated valve - travel, left
24	Pilot-operated valve - travel, right
25	Pilot-operated valve - additional control circuit
26	Pilot-operated valve - dozer blade
27	Working hydraulics cut-off/ exit barrier
28	Hydraulic oil tank
29	Valve bank
30	Valve segment, slewing
31	Valve segment, dozer blade
32	Valve segment, additional control circuit
33	Valve segment, articulation
34	Valve segment, dipperstick
35	Valve segment, travel, right
36	Valve segment, travel, left
37	Valve segment, boom
38	Valve segment, bucket
39	Valve segment, travelling straight on
41	Selector valve, fast/ slow
42	Gauge port



TEREX | SCHAEFF	Typ/Model/Type **TC 48** (HR 18)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Hydraulic diagram, working/travelling**	Blatt/Page/Feuille **4.80.02**

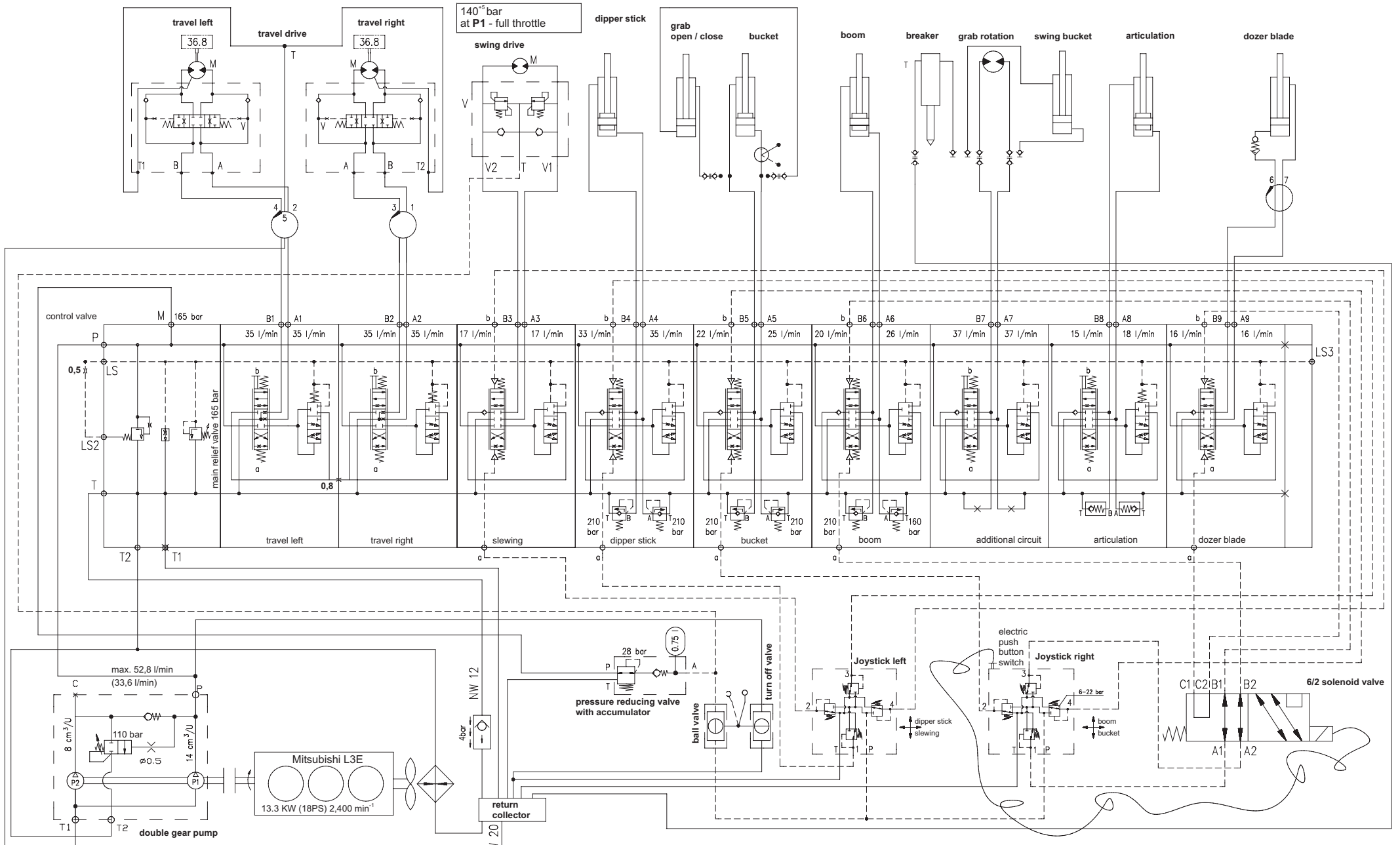
Legend to hydraulic diagram

1	Travel motor, left
2	Travel motor, right
3	Grab cylinder
4	Bucket cylinder
5	Slew drive
6	Boom cylinder
7	Articulated cylinder
8	Dipperstick cylinder
9	Grab slew motor
10	Breaker
11	Slew bucket
12	Dozer blade cylinder
13	Ventilation filter
14	Hydraulic pump
15	Hydraulic oil cooler
16	Return line filter
17	Diesel engine
28	Hydraulic oil tank
29	Valve bank
30	Valve segment, slewing
31	Valve segment, dozer blade
32	Valve segment, additional control circuit
33	Valve segment, articulation
34	Valve segment, dipperstick
35	Valve segment, travel, right
36	Valve segment, travel, left
37	Valve segment, boom
38	Valve segment, bucket
39	Valve segment, travelling straight on
40	Thermostat valve
42	Gauge port

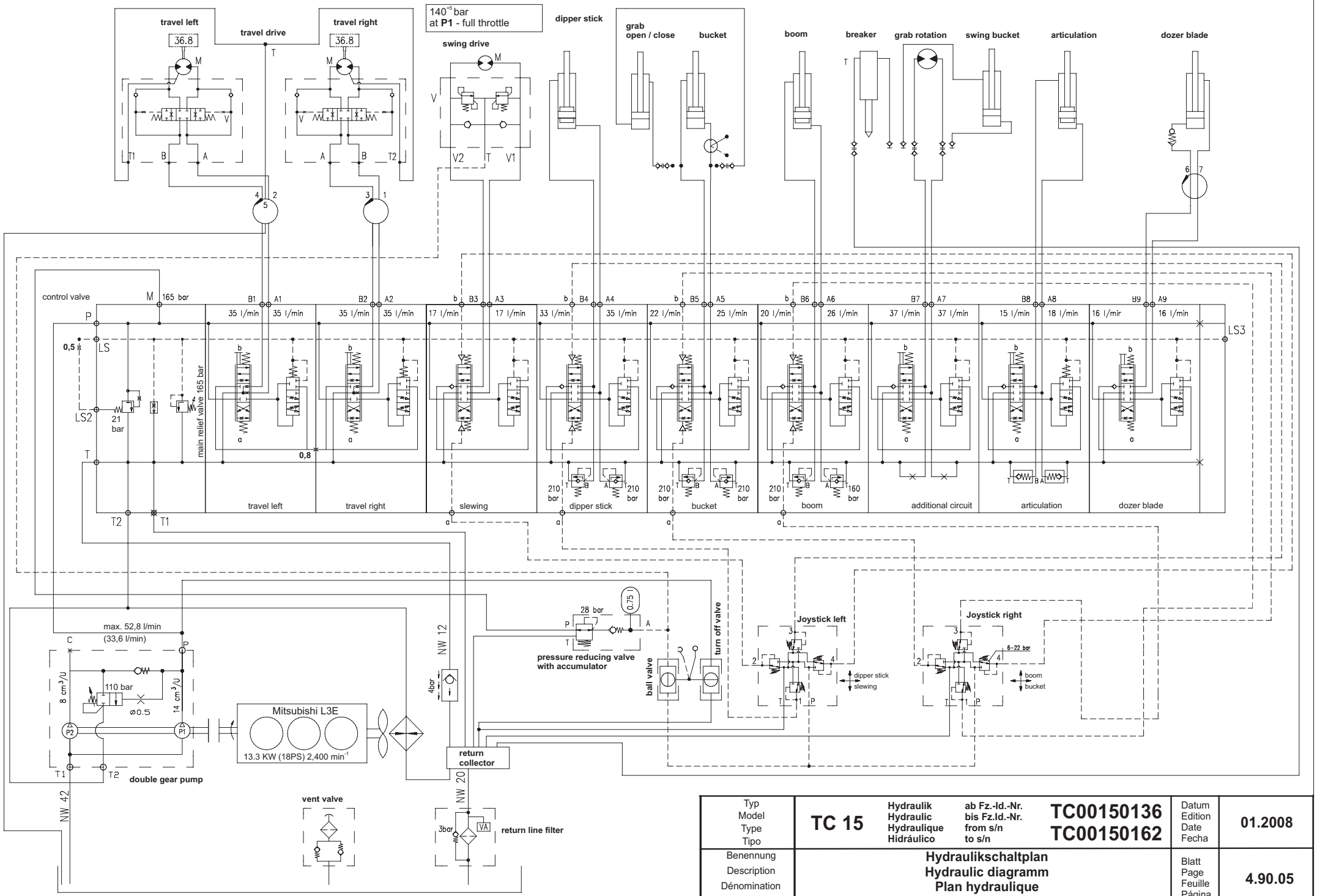


TEREX | SCHAEFF	Typ/Model/Type **TC 48** (HR 18)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Hydraulic diagram, valve bank**	Blatt/Page/Feuille **4.80.03**

29	Valve bank
30	Valve segment, slewing
31	Valve segment, dozer blade
32	Valve segment, additional control circuit
33	Valve segment, articulation
34	Valve segment, dipperstick
35	Valve segment, travel, right
36	Valve segment, travel, left
37	Valve segment, boom
38	Valve segment, bucket
39	Valve segment, travelling straight on

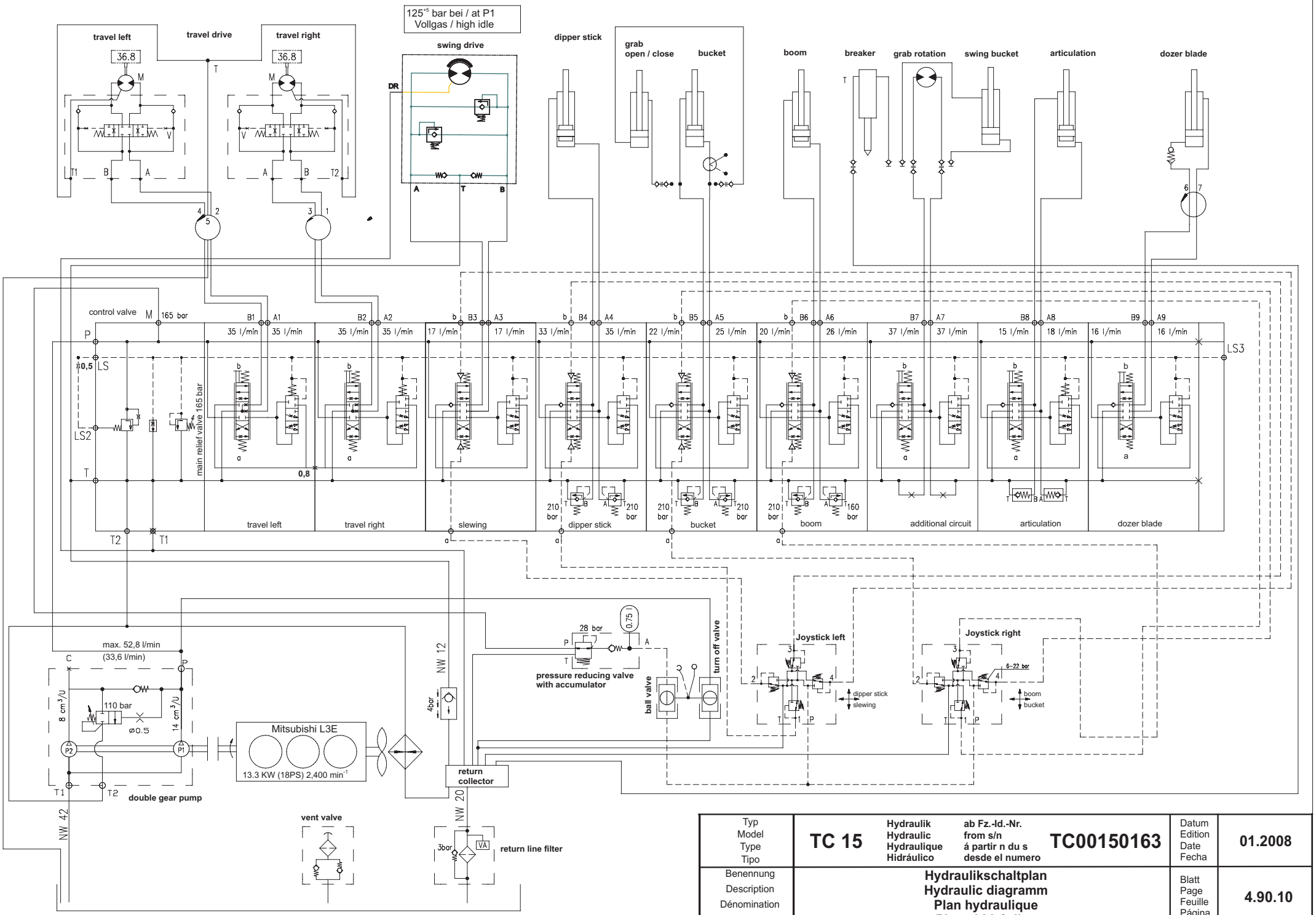


Typ Model Type Tipo	**TC 15**	**Hydraulik** **Hydraulic** **Hydraulique** **Hidráulico**	**bis Fz.-Id.-Nr.** **to s/n**	**TC00150135**	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan** **Hydraulic diagramm** **Plan hydraulique** **Plano hidráulico**				Blatt Page Feuille Página	**4.90.02**



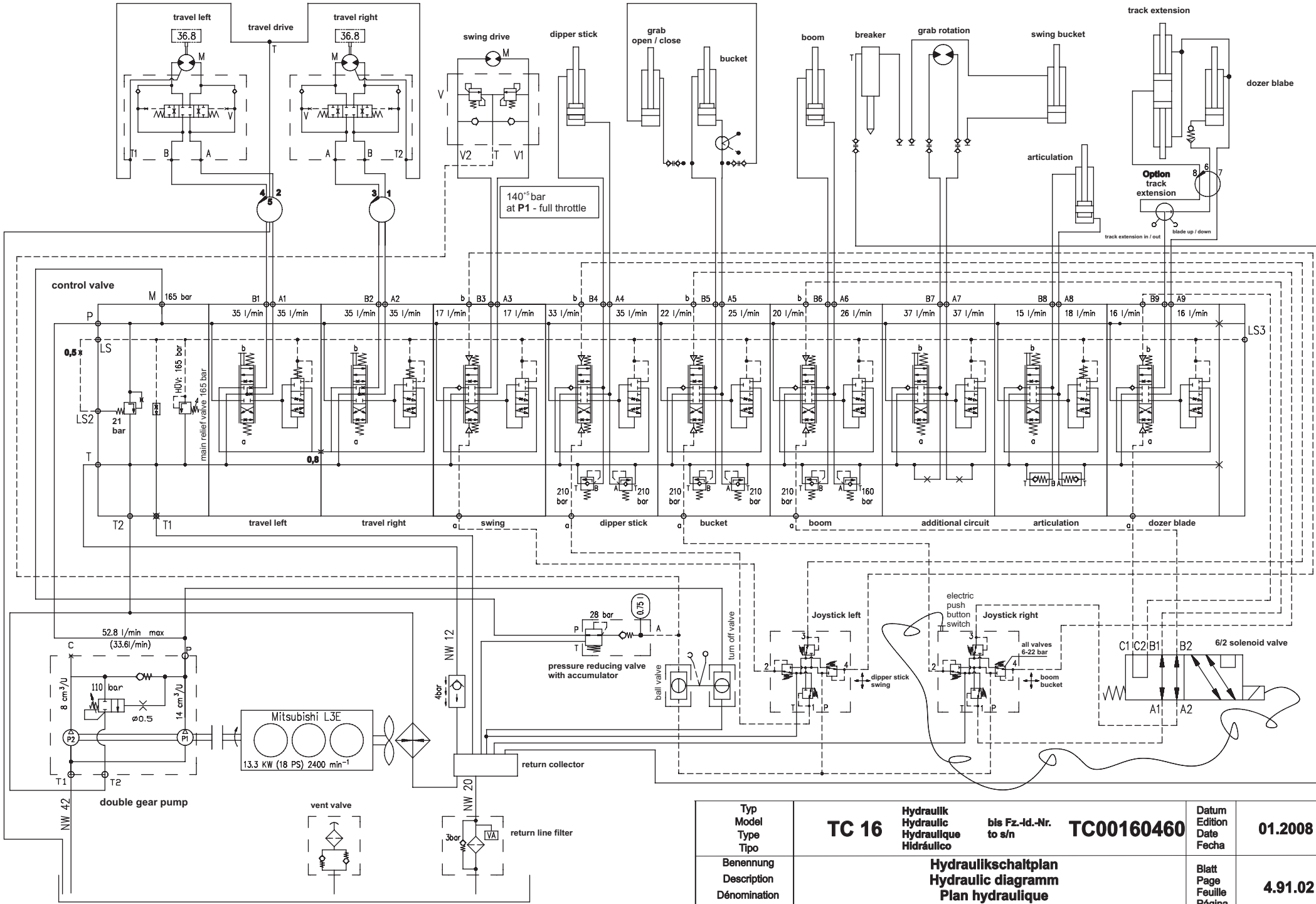
Typ Model Type Tipo	**TC 15**	**Hydraulik** **Hydraulic** **Hydraulique** **Hidráulico**	**ab Fz.-Id.-Nr.** **bis Fz.Id.-Nr.** **from s/n** **to s/n**	**TC00150136** **TC00150162**	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan** **Hydraulic diagramm** **Plan hydraulique** **Plano hidráulico**				Blatt Page Feuille Página	**4.90.05**


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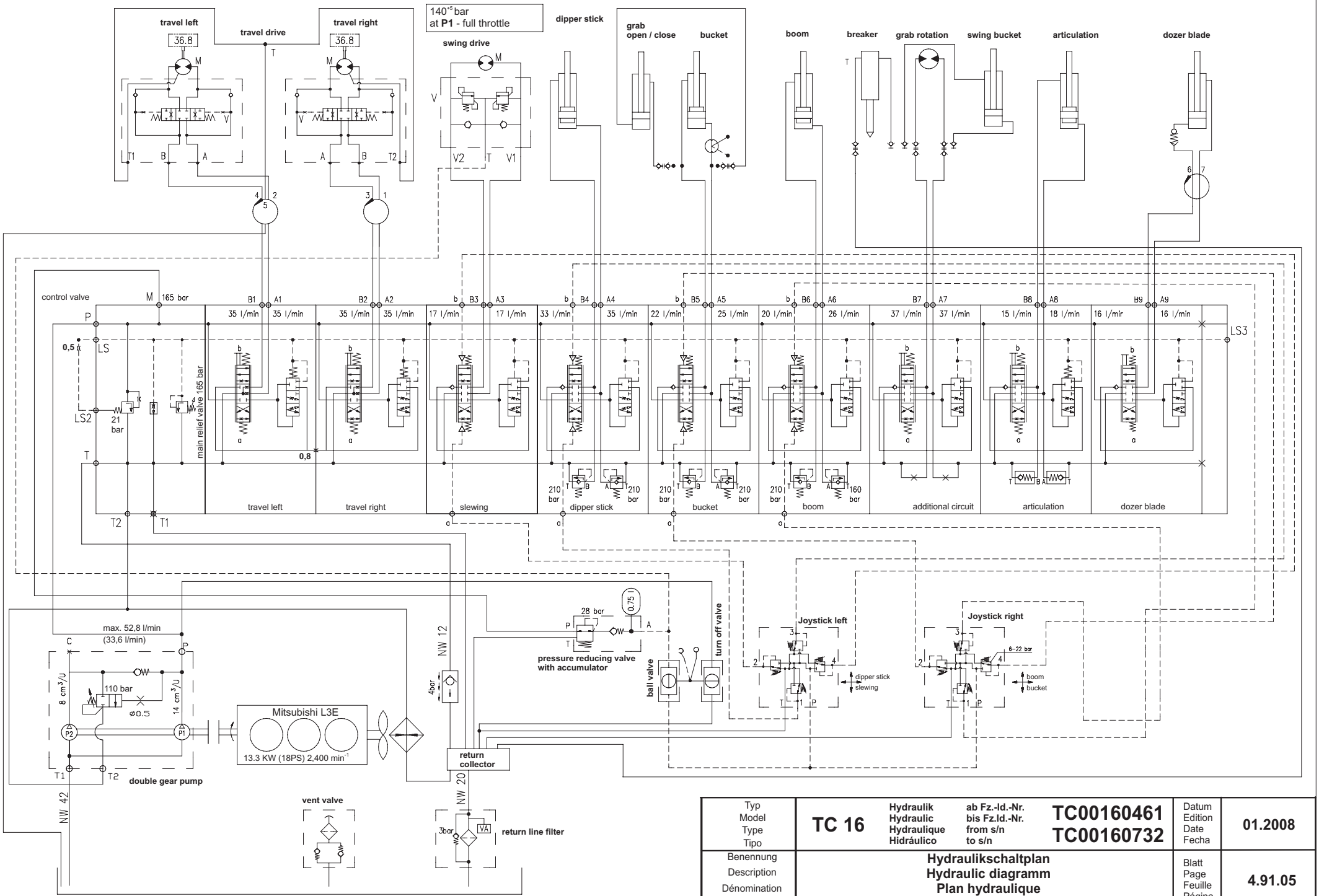


Typ Model Type Tipo	**TC 15**	**Hydraulik** **Hydraulic** **Hydraulique** **Hidráulico**	**ab Fz.-Id.-Nr.** **from s/n** **á partir n du s** **desde el numero** **TC00150163**	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan** **Hydraulic diagramm** **Plan hydraulique** **Plano hidráulico**			Blatt Page Feuille Página	**4.90.10**


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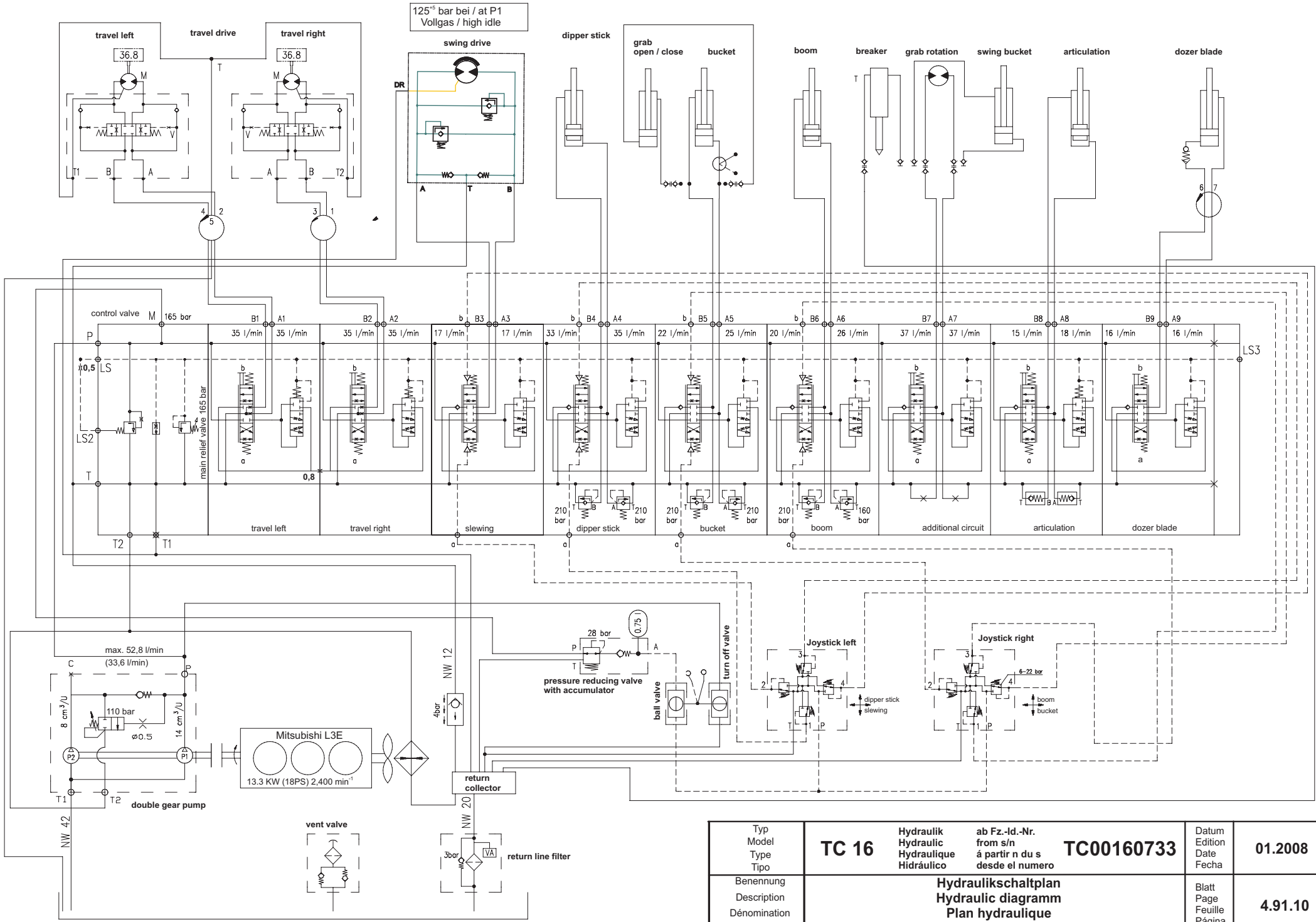


Typ Model Type Tipo	**TC 16**	**Hydraulik** **Hydraulic** **Hydraulique** **Hidráulico**	**bis Fz.-Id.-Nr.** **to s/n**	**TC00160460**	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan** **Hydraulic diagramm** **Plan hydraulique** **Plano hidráulico**				Blatt Page Feuille Página	**4.91.02**



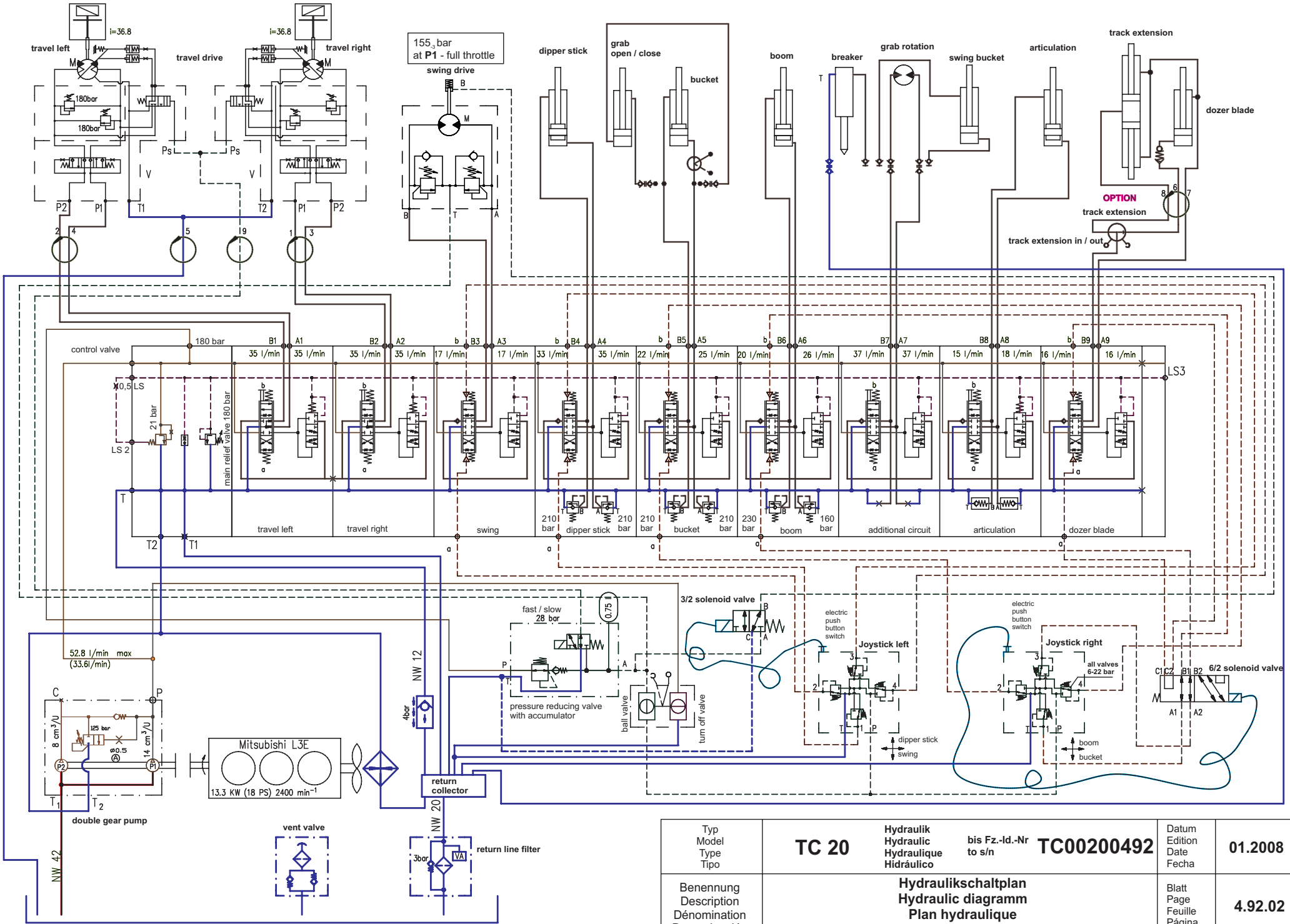
Typ Model Type Tipo	**TC 16**	**Hydraulik** **Hydraulic** **Hydraulique** **Hidráulico**	**ab Fz.-Id.-Nr.** **bis Fz.Id.-Nr.** **from s/n** **to s/n**	**TC00160461** **TC00160732**	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan** **Hydraulic diagramm** **Plan hydraulique** **Plano hidráulico**				Blatt Page Feuille Página	**4.91.05**


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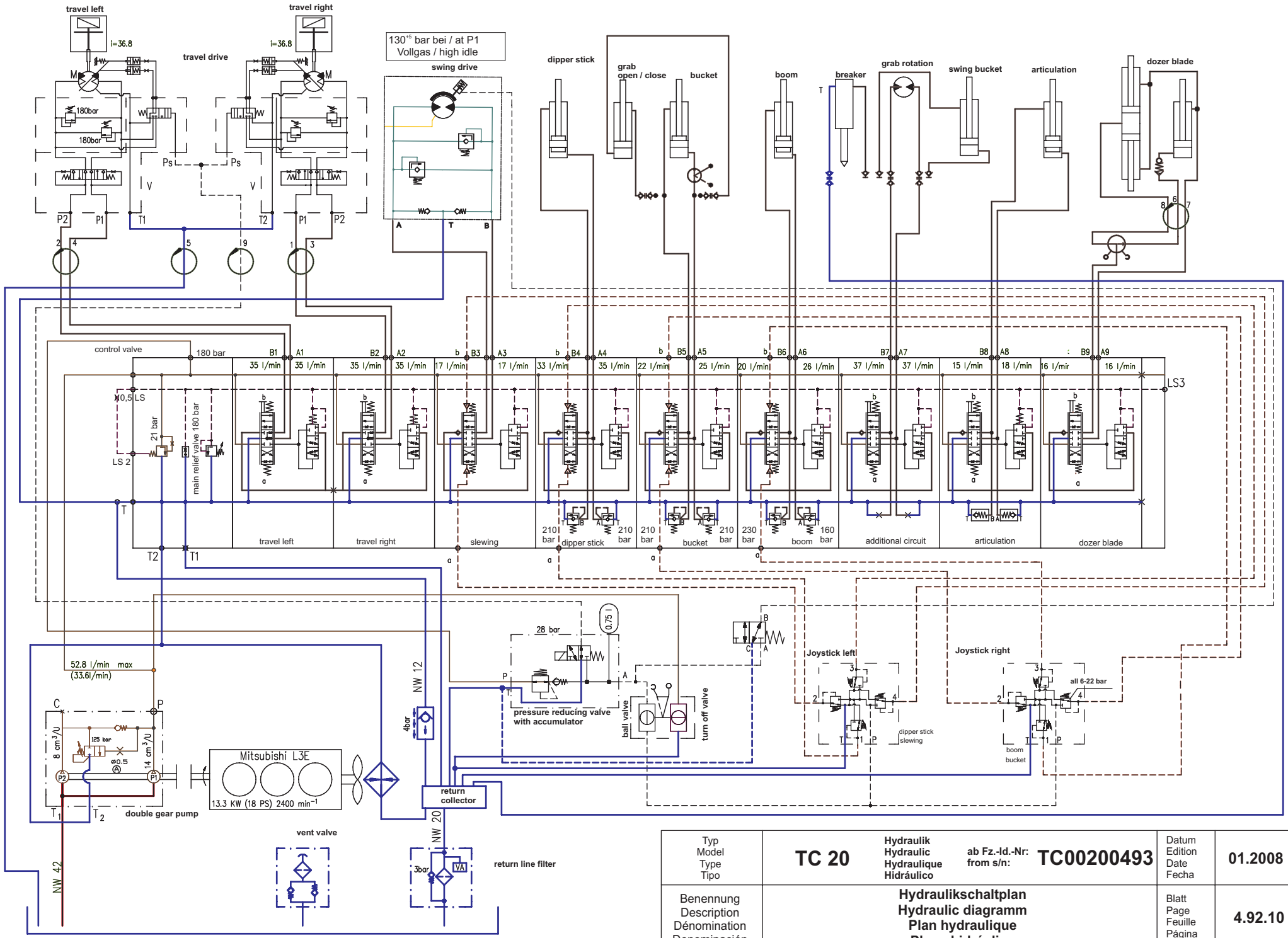


Typ Model Type Tipo	**TC 16**	**Hydraulik** **Hydraulic** **Hydraulique** **Hidráulico**	**ab Fz.-Id.-Nr.** **from s/n** **á partir n du s** **desde el numero**	**TC00160733**	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan** **Hydraulic diagramm** **Plan hydraulique** **Plano hidráulico**				Blatt Page Feuille Página	**4.91.10**


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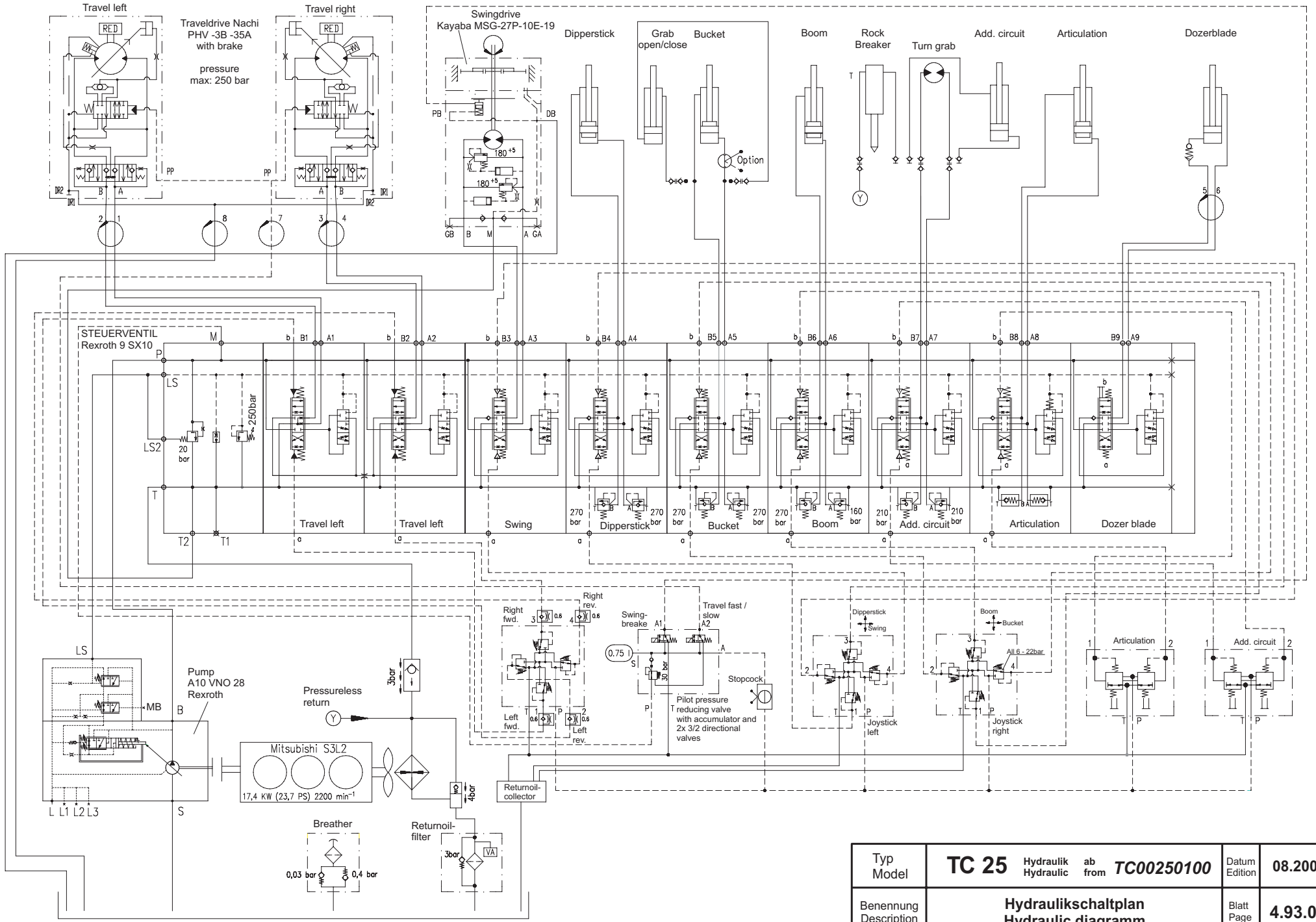


Typ Model Type Tipo	**TC 20**	**Hydraulik** **Hydraulic** **Hydraulique** **Hidráulico** bis Fz.-Id.-Nr to s/n **TC00200492**	Datum Edition Date Fecha **01.2008**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan** **Hydraulic diagramm** **Plan hydraulique** **Plano hidráulico**		Blatt Page Feuille Página **4.92.02**



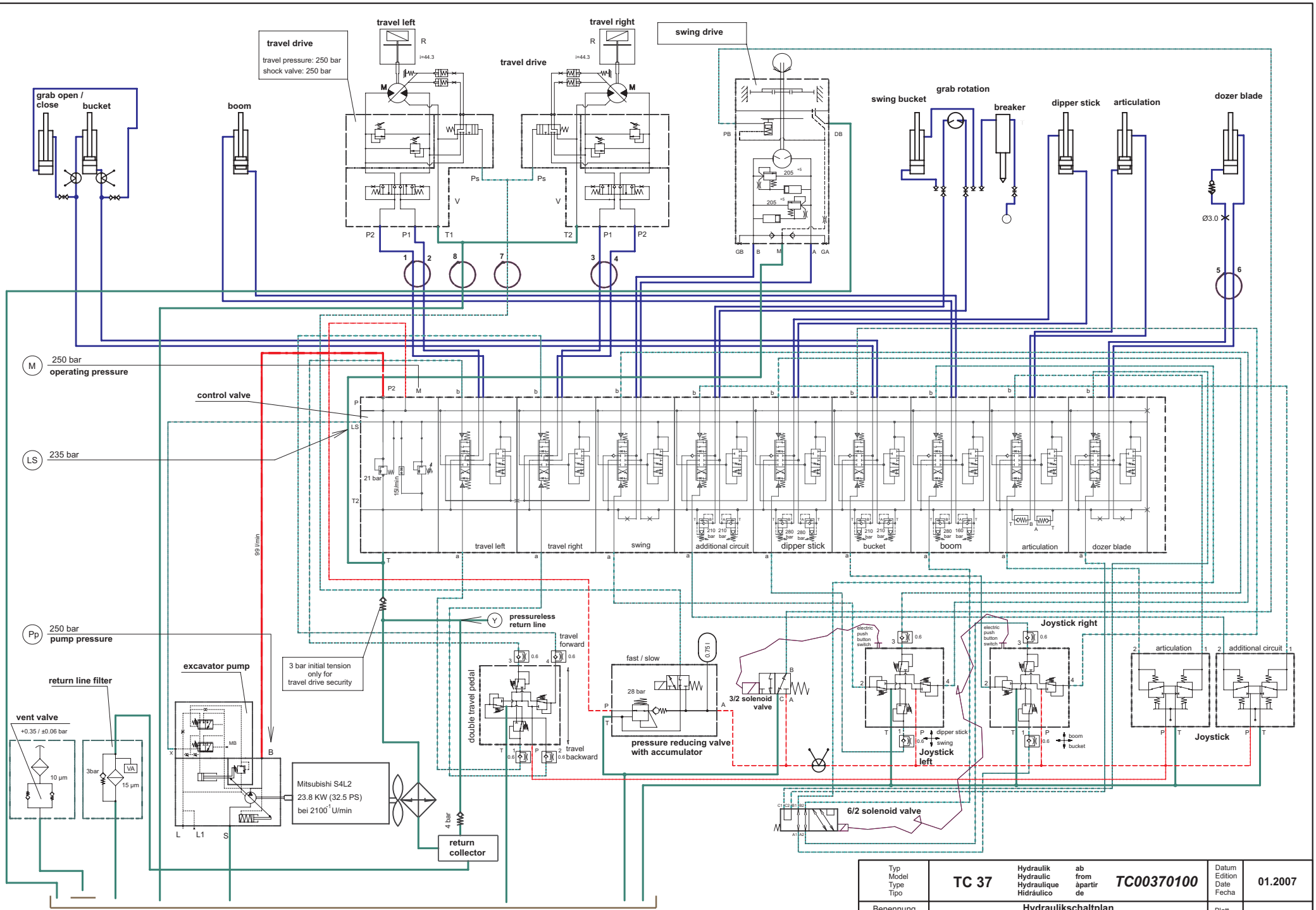
Typ Model Type Tipo	**TC 20**	**Hydraulik** **Hydraulic** **Hydraulique** **Hidráulico**	ab Fz.-Id.-Nr: from s/n:	**TC00200493**	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan** **Hydraulic diagramm** **Plan hydraulique** **Plano hidráulico**				Blatt Page Feuille Página	**4.92.10**


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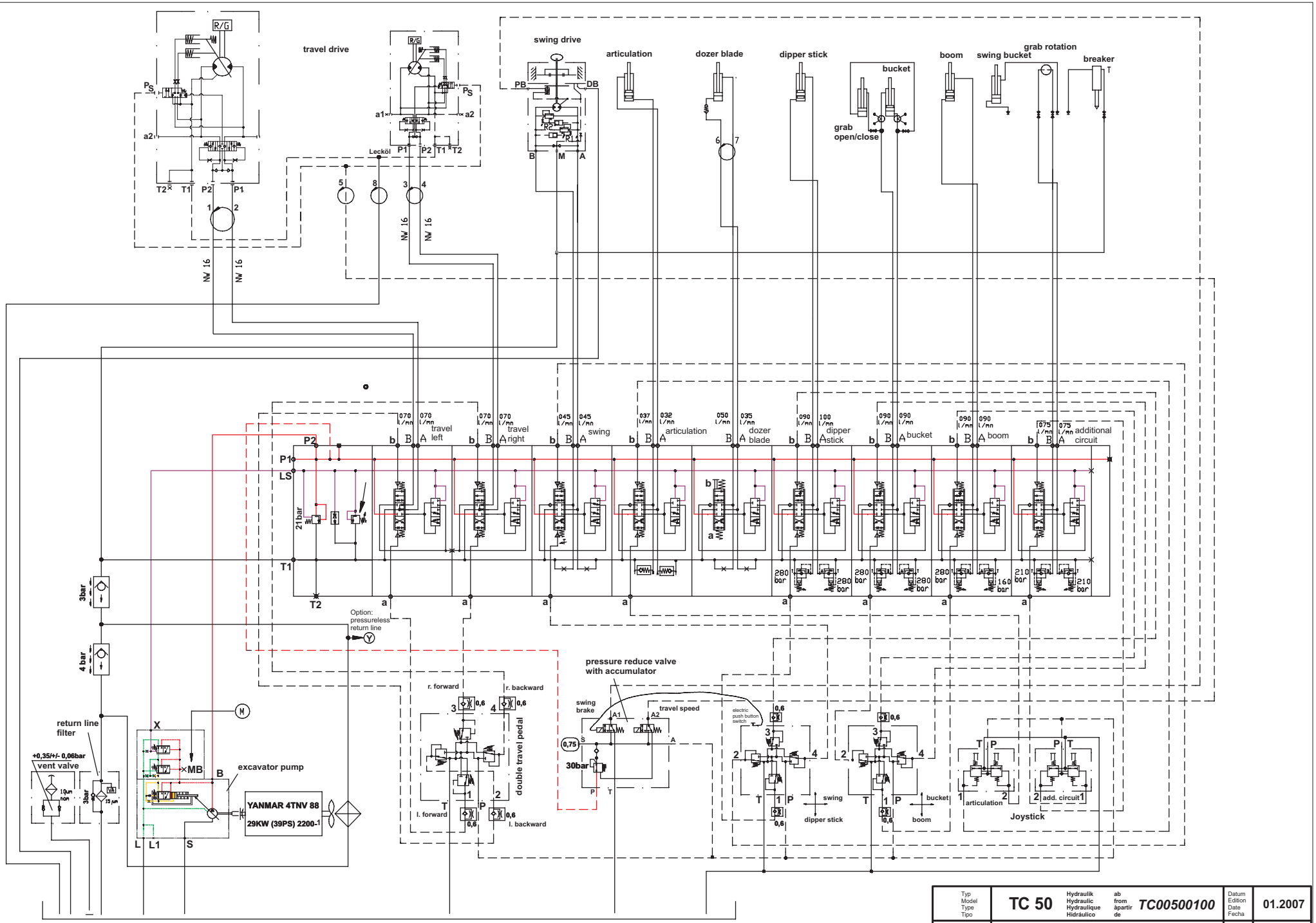


Typ Model	**TC 25**	**Hydraulik** **Hydraulic**	**ab** **from**	***TC00250100***	Datum Edition	**08.2007**
Benennung Description	**Hydraulikschaltplan** **Hydraulic diagramm**				Blatt Page	**4.93.01**


TEREX®



Typ Model Type Tipo	**TC 37**	**Hydraulik ab** **Hydraulic from** **Hydraulique à partir de** **Hidráulico**	***TC00370100***	Datum Edition Date Fecha	**01.2007**
Benennung Description dénomination Denominación	**Hydraulikschaltplan** **Hydraulic diagramm** **Plan hydraulique** **Plano hidráulico**			Blatt Page Feuille Página	**4.97.01**



Typ Model Type Tipo	**TC 50**	Hydraulik Hydraulic Hydraulique Hidráulico	ab from à partir de	*TC00500100*	Datum Edition Date Fecha	01.2007
Benennung Description dénomination Denominación	**Hydraulikschaltplan Hydraulic diagramm Plan hydraulique Plano hidráulico**				Blatt Page Feuille Página	4.99.01

SUBGROUP LIST

Setting instructions

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TC 29 (HR 14)	**Working pump**	**5.76**
TC 35 (HR 16)	**Working pump**	**5.78**
TC 48 (HR 18)	**Working pump**	**5.80**
TC 25	**Working pump**	**5.93**
TC 50	**Working pump**	**5.99**
TW	**Travelhydraulic**	**5.100**
TL (SKL/SKS)	**Hydromatik pump**	**5.200**
SKL 200 (SKL873)	**Travel and workinghydraulic**	**5.213**
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TL 160/210/260	**Rexroth 3M6 Control valve**	
TW 85/110, TC 75/125 (HML/HR 32/42)	**Rexroth SX14 Control Valve** **Rexroth SM12 Control Valve**	**5.251** **5.253**
TC 15 - 25	**Rexroth SX10 Control Valve**	**5.274**
TC 29/35/37 (HR 14/16/3.7)	**Rexroth SX12 Control Valve**	**5.276**
TL 65 - 120	**Travelhydraulic**	**5.300**
TL 420/450	**Danfoss pumps, Rexroth 2M6** **Control valve, Brakevalve**	**5.350**
TW 85 (HML 32)	**Working hydraulics**	**5.510**
TW/TC (HML/HR)	**Basic adjustment of variable** **displacement pump A10 VO**	**5.520**
TC 75 (HR 32)	**Working hydraulics**	**5.650**
TC 125 (HR 42)	**Working hydraulics**	**5.670**

The following checking and setting instructions contain information necessary to perform correct tests and settings. As with all maintenance and repair jobs, the regulations for accident prevention are binding.

For additional explanations or possible questions, please contact our Customer Service Department - Technical Service - by phone or fax.

First and foremost tests and settings of hydraulic units and components of particular importance are described. The order of the tests and settings should be observed, especially in case of trouble-shooting and new settings.

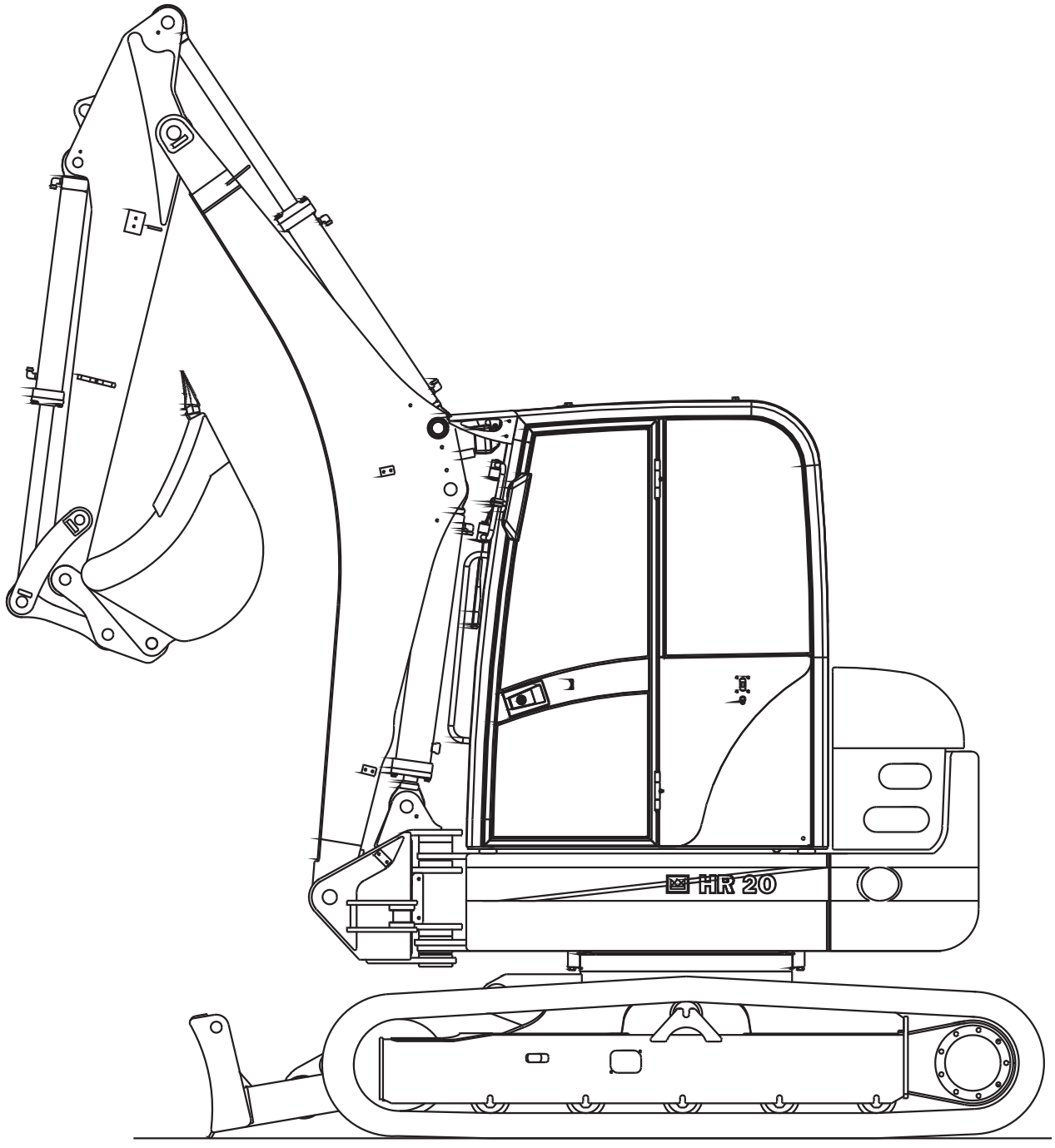
Attention: All tests and settings **have to be performed** at an oil temperature of 50 - 60° C.

Furthermore, the indicated engine speeds have to be observed carefully in order to guarantee the requested flow rates. Pay special attention when checking and setting high pressure valves, main pressure relief valves and line relief valves.

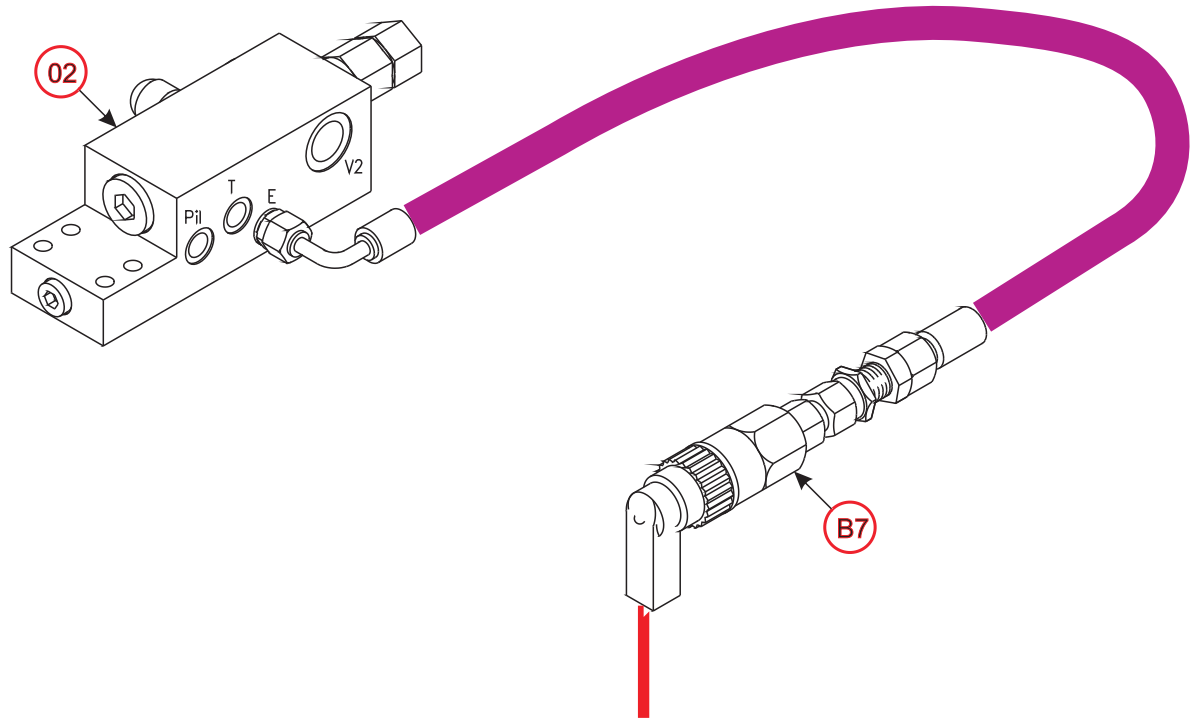
If any settings of aggregates or components have to be changed in order to perform other tests, the initial setting has to be reset after finishing these jobs. Only perform settings of line relief valves if they are adjusted lower than the pressure cut-off and / or the main pressure relief valve.

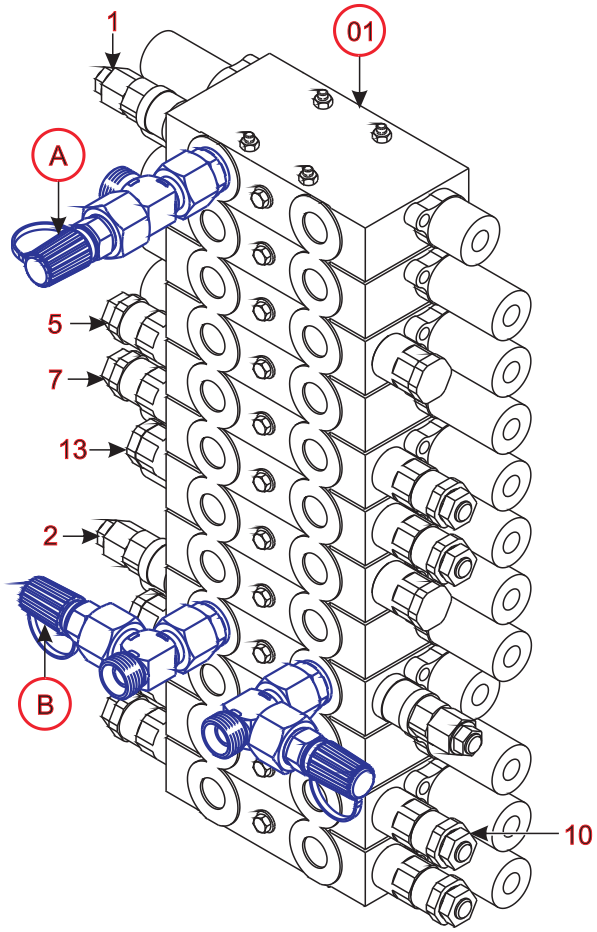
The test and setting instructions do not claim to be complete. The data given is not subject to the alteration service. Furthermore, we reserve the right to make improvements in the course of technical development without changing the test and setting instructions.

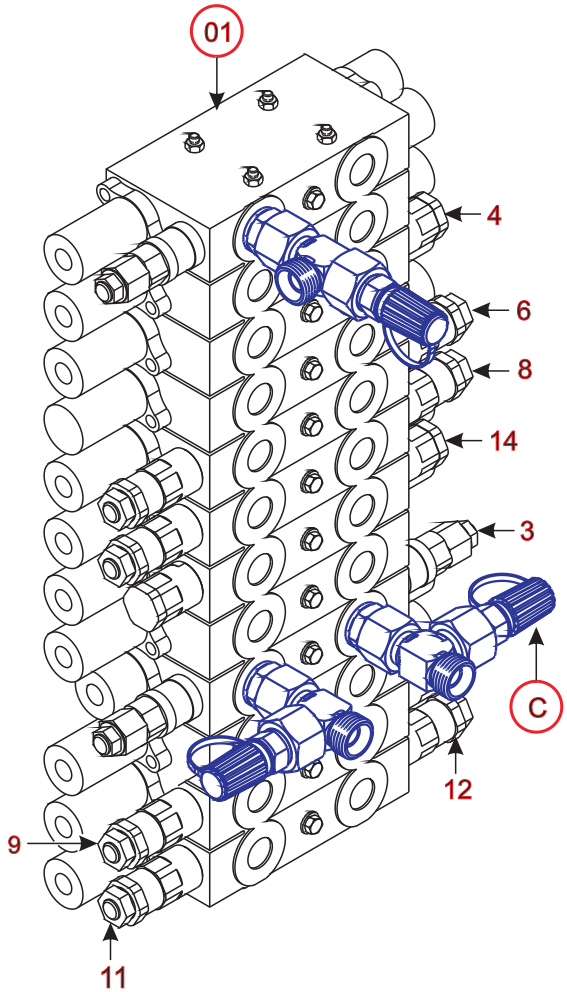
TC 60



Typ Model Type Tipo	**TC 60**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Instrucción de ajuste**	Blatt Page Feuille Página	**5.60.00**

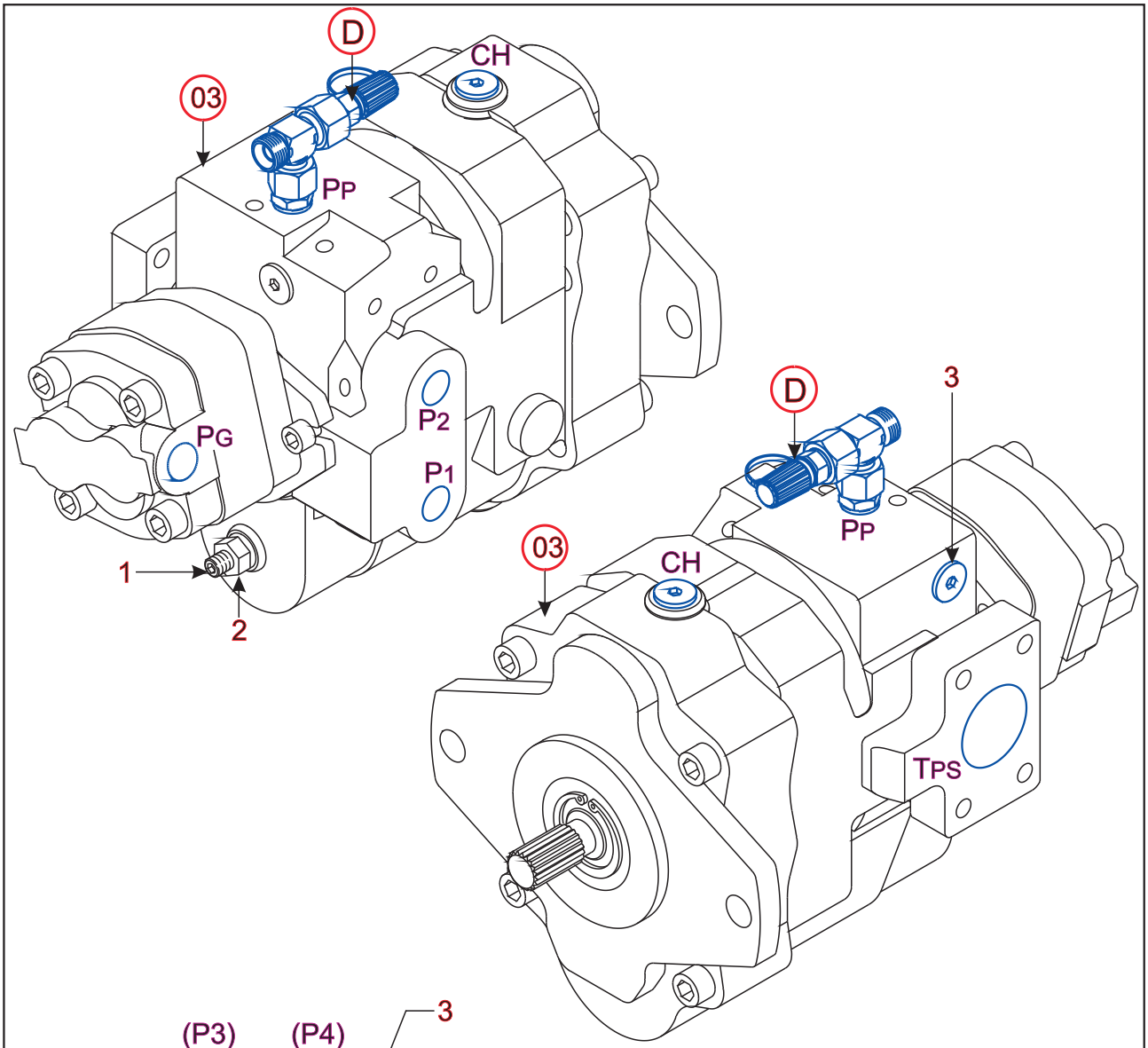


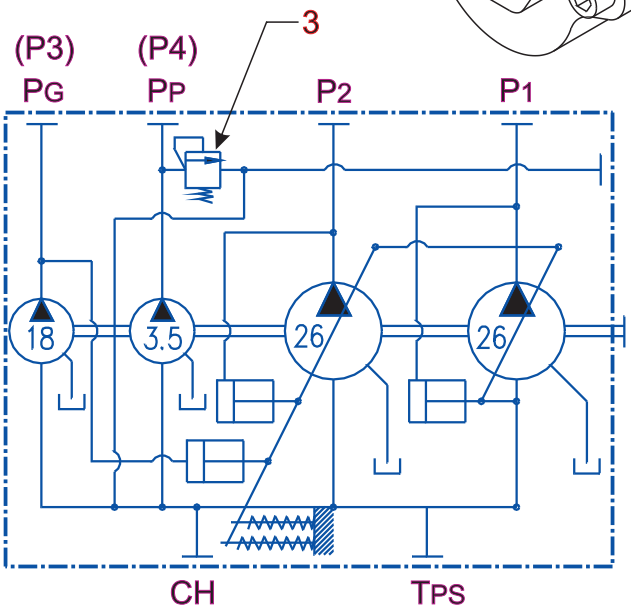




Typ Model Type Tipo	**TC 60** (HR 20)	**Blocksteuergerät - Lasthalteventil** **Valve bank - load check valve** **Bloc distributeur - clapet de sécurite** **Bloque de válvulas - válvula de seguridad**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Instrucción de regulación**		Blatt Page Feuille Página	**5.60.01**

Pos. Item Rep. No.	Deutsch	English	Français
01	**Blocksteuergerät** *KVSE-72-11*	**valve bank** *KVSE-72-11*	**bloc distributeur** *KVSE-72-11*
02	**Lasthalteventil**	**load check valve**	**clapet de sécurite**
B7	**Lastwarnsensor**	**load warning sensor**	**capteur avertiseur de charge**
A	**Messstelle für** **Arbeitspumpe P3** und *Einstellungen am Blocksteuergerät* 01	**test port for** **working pump P3** and *settings at valve bank* 01	**prise de pression pour** **pompe équipement P3** et *réglages côté distributeur* 01
1	**Hauptüberdruckventil (HÜV)**	**main relief**	**limiteur de pression**
	für	*for*	*pour*
○	Schwenken	swing	orientation
○	Räumschild *mit Nachsaugventil* **(4)**	dozer blade *with anticavitation valve* **(4)**	lame d'appui *avec clapet anti-cavitation* **(4)**
B	**Messstelle für** **Arbeitspumpe P1** und *Einstellungen am Blocksteuergerät* 01	**test port for** **working pump P1** and *settings at valve bank* 01	**prise de pression pour** **pompe équipement P1** et *réglages côté distributeur* 01
2	**Hauptüberdruckventil (HÜV)**	**main relief**	**limiteur de pression**
	für	*for*	*pour*
○	Fahren rechts	travel right	translation droite
○	Knicken *mit Nachsaugventilen* **(13+14)**	articulation *with anticavitation valves* **(13+14)**	articulation *avec clapets anti-cavitations* **(13+14)**
○	Löffelstiel *mit Sekundärventilen* **(7+8)**	dipper *with line relief valves* **(7+8)**	balancier *avec clapets secondaires* **(7+8)**
○	Zusatzsteuerkreis *mit Sekundärventilen* **(5+6)**	additional hydraulic circuit *with line relief valves* **(5+6)**	circuit supplémentaire *avec clapets secondaires* **(5+6)**
C	**Messstelle für** **Arbeitspumpe P2** und *Einstellungen am Blocksteuergerät* 01	**test port for** **working pump P2** and *settings at valve bank* 01	**prise de pression pour** **pompe équipement P2** et *réglages côté distributeur* 01
3	**Hauptüberdruckventil (HÜV)**	**main relief**	**limiteur de pression**
○	Fahren links	travel left	translation gauche
○	Löffel *mit Sekundärventilen* **(9+10)**	bucket *with line relief valves* **(9+10)**	godet *avec clapets secondaires* **(9+10)**
○	Ausleger *mit Sekundärventilen* **(11+12)**	boom *with line relief valves* **(11+12)**	flèche *avec clapets secondaires* **(11+12)**





Motor
Engine
Moteur
Motor

Typ Model Type Tipo	**TC 60** (HR 20) **Arbeitspumpe** **Working pump** **Pompe équipement** **Bomba de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Instrucción de regulación**	Blatt Page Feuille Página	**5.60.03**

Pos. Item Rep. No.	Deutsch	English	Français
03	**Arbeitspumpe** PSVD2-26E *26+26+18+3,5 cm³/U*	**working pump** PSVD2-26E *26+26+18+3,5 cm³/rev.*	**pompe équipement** PSVD2-26E *26+26+18+3,5 cm³/tour*
D	**Messstelle für** **Arbeitspumpe PP (P4)** und *Einstellungen am Vorsteuerdruck* **(3)**	**test port for** **working pump PP (P4)** and *settings at pilot pressure* **(3)**	**prise de pression pour** **pompe équipement PP (P4)** et *réglages côté pression pilotage* **(3)**
3	**Vorsteuerventil**	**pilot valve**	**clapet pilot**
P1	Arbeitspumpe *(Axialverstellkolbenpumpe)*	working pump *(plunger pump)*	pompe équipement *(pompe à débit variable)*
P2	Arbeitspumpe *(Axilaverstellkolbenpumpe)*	working pump *(plunger pump)*	pompe équipement *(pompe à débit variable)*
PG	Arbeitspumpe *(Zahnradpumpe **P3**)*	working pump *(gear pump **P3**)*	pompe équipement *(pompe à engrenages **P3**)*
PP	Vorsteuerpumpe	pilot pump	pompe pression pilotage
CH	Enlüftungsstopfen *(verschlossen)*	breather plug *(closed)*	bouchon d'aération *(bouche)*
TPS	Sauganschluss	suction port	pot d'aspiration

Deutsch

Die werkseitige Leistungseinstellung kann bei Bedarf wie folgt nach **Druck, Fördermenge** und **Drückungsdrehzahl** überprüft werden:

- Litermengenmessgerät am Pumpenausgang P2 installieren.
- 600 bar Manometer an Messstelle P2 anschließen.
- Maschine auf ca. 60 C Hydrauliköltemperatur warm fahren.
- Drehzahlmeßgerät anschließen, obere Leerlaufdrehzahl am Dieselmotor prüfen und ggf. einstellen.

TC 60: 2570 +30 / -20 min $^{-1}$

- Die Motordrückungsdrehzahl gemäß nachstehender Tabelle mit dem Steuerkreis "Löffelstiel aus" bei Vollgas in der Zylinderendlage überprüfen.

TC 60	bar	l/min	Motor-Drückungsdrehzahl
			bei HÜV - Druck 245 bar: 2450 +30 / -20 min $^{-1}$
	245	**41 - 42**	

Bei zu starken Abweichungen der Litermenge bzw. der Drückungsdrehzahl Einstellschraube **(1)** nachjustieren.

Hierzu: Kontermutter (2) lösen und Einstellschraube (1) verstellen.

- Eindrehen nach rechts : Regelbeginn später (höhere Litermenge))
- Ausdrehen nach links : Regelbeginn früher (Litermenge niedriger)

Typ Model Type Tipo	**TC 60** (HR 20) **Arbeitspumpe Working pump Pompe équipement Bomba de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung Setting instructions Instructions de réglage Instrucción de regulación**	Blatt Page Feuille Página	**5.60.04**

English

If necessary, the factory power setting can be checked for **pressure, flow rate** and **engine stall rpm:**

- Install flow meter (litre) at the pump outlet **P2**
- Connect 600 bar gauge to gauge port **P2**
- Operate the machine until it reaches a hydraulic oil temperature of approx. 60 C
- Connect tachometer, check and adjust if necessarry the max. idle running speed at the diesel engine.

TC 60: 2570 +30 / -20 min^{-1}

- Check the engine stall rpm at full speed with the control circuit “dipper stick out” in the end position according to the following values:

TC 60	bar	l/min	Engine stall rpm
			at main pressure relief valve
	245	**41 - 42**	pressure of 245 bar:
			2,450 +30 / -20 min^{-1}

In case the flow and / or the engine stall rpm differ too much, re-adjust the setscrew **(1)**.

- **To do this:** Slacken the counternut **(2)** and adjust the setscrew **(1)**

  - Turning to the right: Regulation start later (higher flow)
  - Turning to the left: Regulation start earlier (less flow)

Français

Si besoin est, les **pressions**, les **débits** et la **chute de régime** ajustés par l’usine peuvent être vérifiés:

- Installer un indicateur de débit sur la sortie de pompe **P2**.
- Monter un manomètre de 600 bar sur la prise de pression **P2**.
- Actionner le matériel jusqu’à ce qu’une température d’huile hydraulique d’env. 60 C soit atteinte.
- Brancher un indicateur de nombre de tours, ajuster la marche à vide maxi. au moteur diesel et vérifier.

TC 60: 2570 +30 / -20 min^{-1}

- Vérifier la chute de régime, moteur à plein régime, d’après le tableau ci - dessous avec le circuit „balancier sorti“, fin de course.

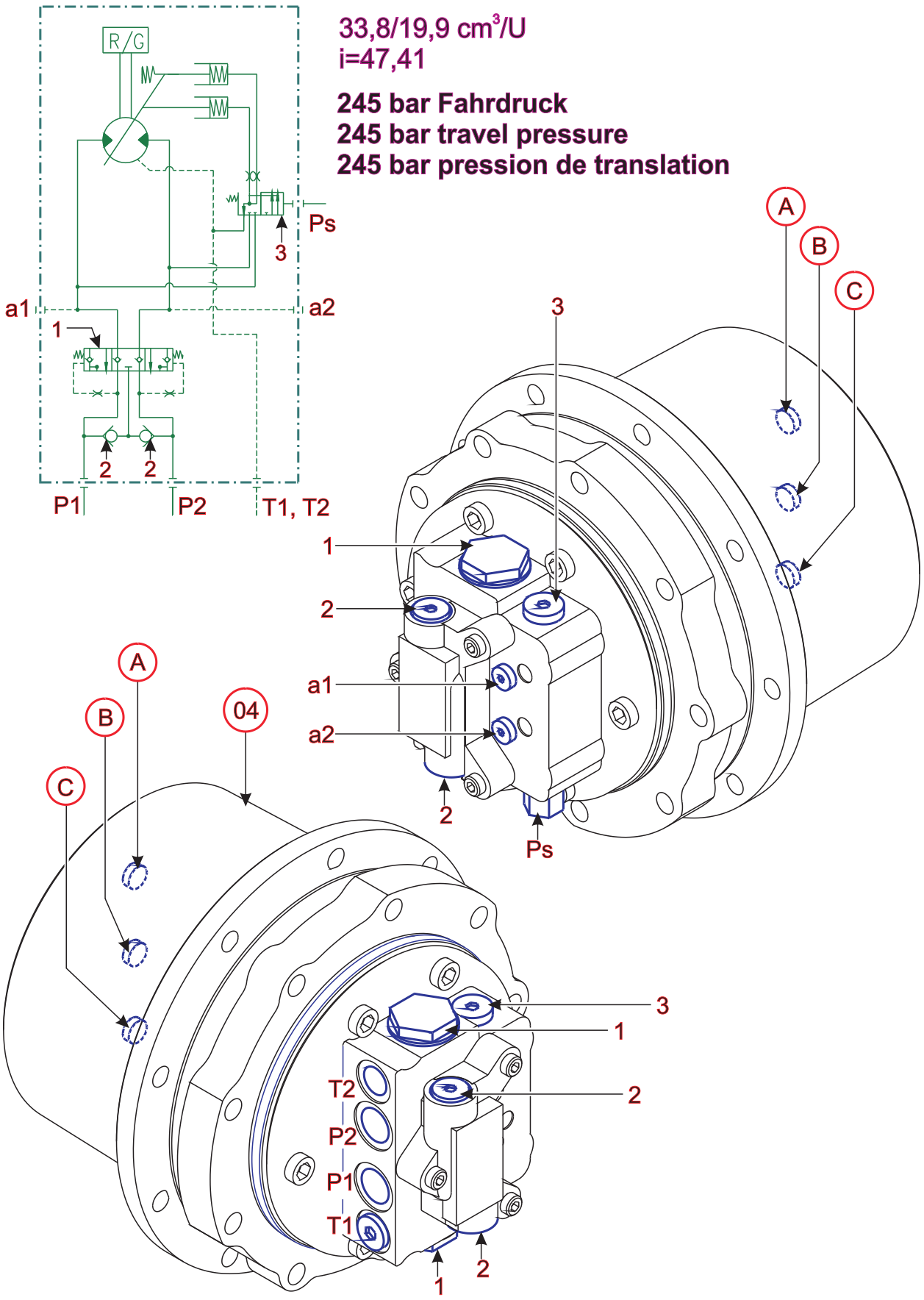
TC 60	bar	l/min	Chute de régime moteur
			à une pression du limiteur de
	245	**41 - 42**	pression principal de 245 bar:
			2.450 +30 / -20 min^{-1}

Rajuster la vis de réglage **(1)** en cas des différences excessives du débit et / ou de la chute de régime.

- **Pour faire cela:** Desserrer le contre-écrou **(2)** et ajuster la vis de réglage **(1).**

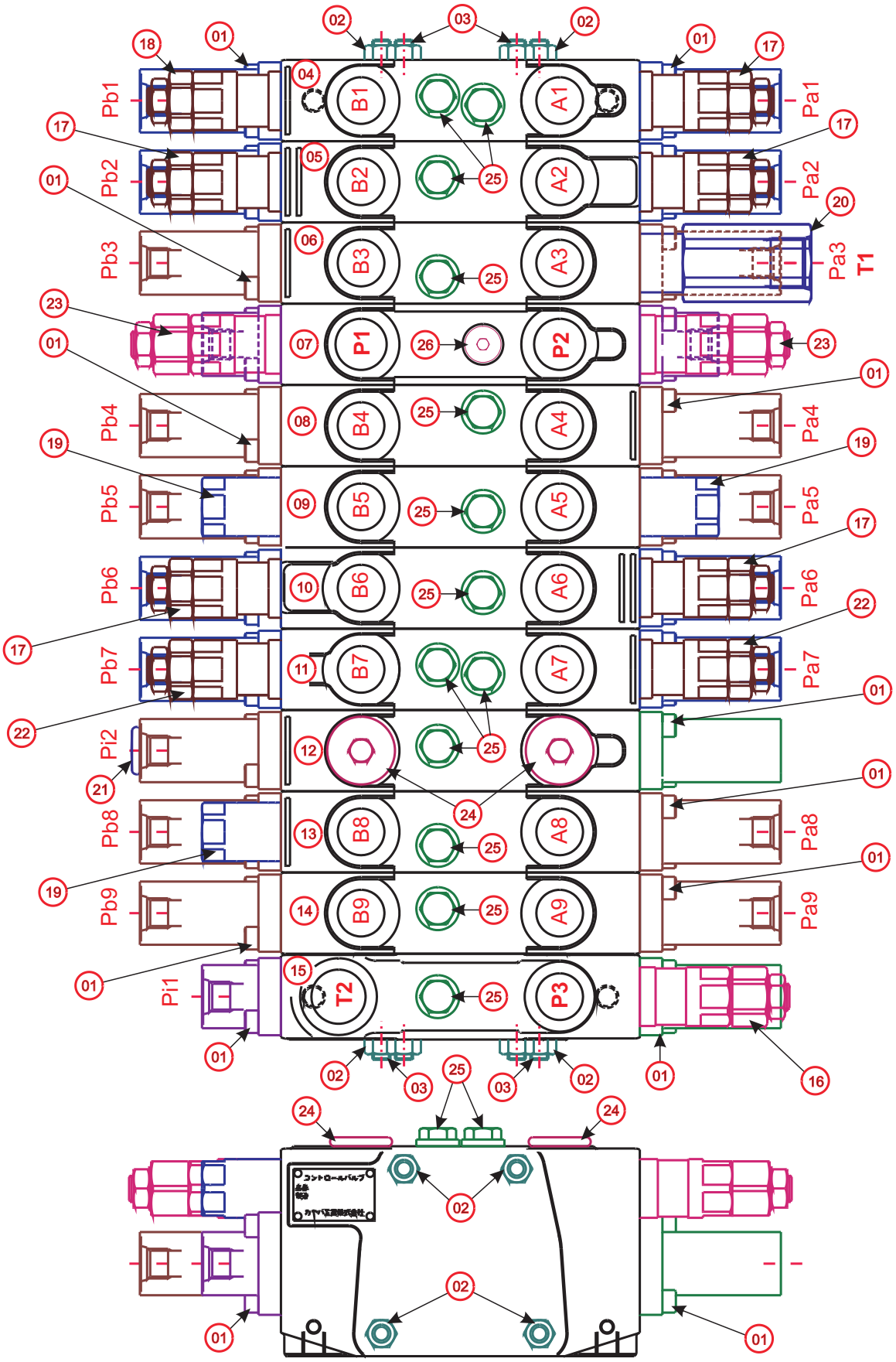
  - Resserer vers la droite: début de régulation plus tard (plus de débit)
  - Desserrer vers la gauche: début de régulation plus tôt (moins de débit)

Typ Model Type Tipo	**TC 60** (HR 20) **Arbeitspumpe** **Working pump** **Pompe équipement** **Bomba de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Instrucción de regulación**	Blatt Page Feuille Página	**5.60.05**



Typ Model Type Tipo	**TC 60** (HR 20)	**Fahrantrieb** **travel drive** **entraînement** **transmisión**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Instrucción de regulación**		Blatt Page Feuille Página	**5.60.06**

Pos. Item Rep. No.	Deutsch	English	Français
04	**Fahrantrieb**	**travel drive**	**entraînement**
P1	Druckanschluß *(Fahren)*	pressure connection *(travel)*	connexion de pression *(translation)*
P2	Druckanschluß *(Fahren)*	pressure connection *(travel)*	connexion de pression *(translation)*
T1	Verschlußschraube *(Lecköl)*	plug *(drain oil)*	bouchon *(huile de fuite)*
T2	Leckölanschluß	drain oil connection	connexion d'huile de fuite
Ps	Schaltdruckanschluß *(schnell / langsam)*	shift pressure connection *(low / high speed)*	connexion de commande de pression *(petite / grande vitesse)*
a1	Verschlußschraube *(Meßanschluß - Fahrdruck* **P2***)*	plug *(testport for travel pressure* **P2***)*	bouchon *(prise de pression pour pression de translation* **P2***)*
a2	Verschlußschraube *(Meßanschluß - Fahrdruck* **P1***)*	plug *(testport for travel pressure* **P1***)*	bouchon *(prise de pression pour pression de translation* **P1***)*
1	Verschlußschraube für Fahrbremsschieber	plug for counter balance spool	bouchon pour tiroir de frein de translation
2	Nachsaugventil (*Fahren* **P1, P2**)	anticavitation valve (*travel* **P1, P2**)	clapet anti-cavitation (*translation* **P1, P2**)
3	Verschlußschraube für Steuerkolben (schnell / langsam)	plug for spool *(low / high speed)*	bouchon pour tiroir *(petite / grande vitesse)*
C	Öleinfüllschraube	oil filling plug	bouchon de remplissage d'huile
B	Ölstandsschraube	oil-level check plug	bouchon de contrôle du niveau d'huile
C	Ölablaßschraube	oil-drain plug	bouchon de vidange d'huile



Typ Model Type Tipo	**TC 60**	**Blocksteuergerät** **Valve bank** **Distributeur** **Válvula de mando**	**KAYABA KVSE-72-11**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Anziehdrehmomente** **Tightening torques** **Couples de serrage** **Pares de apriete**			Blatt Page Feuille Página	**5.60.08**

Pos. Item Rep. No.	Deutsch	English	Français
01	Schrauben für Ventilkappen **8,8-10,8 Nm**	Bolts for pilot caps **8.8-10.8 Nm**	Vis de fixation pour capouchons **8,8-10,8 Nm**
02	Muttern für Zuganker **26,5-29,4 Nm**	Nuts for tie rods **26.5-29.4 Nm**	Ecrous pour tirants d'ancrages **26,5-29,4 Nm**
03	Zuganker	Tie rods	Tirants d'ancrages
04	Ventilelement (Ausleger)	Valve element (boom)	Élément distribution (flèche)
05	Ventilelement (Löffel)	Valve element (bucket)	Élément distribution (godet)
06	Ventilelement (Fahren links)	Valve element (travle left)	Élément distrib. (translation gauche)
07	Ventilelement (Druckeingang)	Valve element (pressure inlet)	Élément distrib. (entrée pression)
08	Ventilelement (Fahren rechts)	Valve element (travel right)	Élément distrib. (translation droite)
09	Ventilelement (Knicken)	Valve element (articulation)	Élément distribution (articulation)
10	Ventilelement (Löffelstiel)	Valve element (dipper arm)	Élément distribution (balancier)
11	Ventilelement (Zusatzkreis)	Valve element (add. circuit)	Élément distribution (circuit suppl.)
12	Ventilelement (Hydr.-Hammer)	Valve element (hydr. hammer)	Élément distribution (marteau hydr.)
13	Ventilelement (Räumschild)	Valve element (dozer blade)	Élément distribution (lame d'appui)
14	Ventilelement (Schwenken)	Valve element (swing)	Élément distribution (orientation)
15	Ventilelement (Straight travel)	Ventilelement (straight travel)	Élément distribution (straight travel)
16	Hauptüberdruckventil ***205 bar*** **69-78 Nm**	Main relief valve ***205 bar*** **69-78 Nm**	Limiteur de press. principale ***205 bar*** **69-78 Nm**
17	Sekundärventil ***280 bar***	Line relief valve ***280 bar***	Clapet secondaire ***280 bar***
	69-78 Nm	**69-78 Nm**	**69-78 Nm**
18	Sekundärventil ***180 bar*** **69-78 Nm**	Line relief valve ***180 bar*** **69-78 Nm**	Clapet secondaire ***180 bar*** **69-78 Nm**
19	Nachsaugventil **69-78 Nm**	Anticavitation valve **69-78 Nm**	Clapet anti-cavitation **69-78 Nm**
20	Verschlußschraube **60 Nm**	Plug **60 Nm**	Bouchon **60 Nm**
21	Verschlußschraube **28 Nm**	Plug **28 Nm**	Bouchon **28 Nm**
22	Sekundärventil ***210 bar*** **69-78 Nm**	Line relief valve ***210 bar*** **69-78 Nm**	Clapet secondaire ***210 bar*** **69-78 Nm**
23	Hauptüberdruckventil ***245 bar*** **69-78 Nm**	Main relief valve ***245 bar*** **69-78 Nm**	Limiteur de press. principale ***245 bar*** **69-78 Nm**
24	Verschlußschr. **67,7-73,5 Nm**	Plug **67.7-73.5 Nm**	Bouchon **67,7-73,5 Nm**
25	Verschlußschraube für Rückschlagventile **31,4±1 Nm**	Plug for check valves **31.4±1 Nm**	Bouchon pour clapets de retenue **31,4±1 Nm**
26	Verschlußschr. **31,4±1 Nm**	Plug **31.4±1 Nm**	Bouchon **31,4±1 Nm**

Typ Model Type Tipo	**TC 60**	**Blocksteuergerät** **Valve bank** **Distributeur** **Válvula de mando**	**KAYABA KVSE-72-11**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Anziehdrehmomente** **Tightening torques** **Couples de serrage** **Pares de apriete**			Blatt Page Feuille Página	**5.60.09**

Rohrbruchsicherung
Hose rupture valve

Eingeschraubt im Stützschildzylinder, bodenseitig.
Installed in dozer hydraulic cylinder, bottom side

HR 11 / 12 / 13 TC 15- (HR 1.5) / TC 16- (HR 1.6) / TC 20- (HR 2.0)

- A - ROHRBRUCHSICHERUNG **# 5 368 632 258** R1/4“
hose rupture valve

TC 29- (HR 14) / TC 35- (HR 16) / TC 37- (HR 3.7)

- B - ROHRBRUCHSICHERUNG **# 5 368 632 262** R3/8“
hose rupture valve

HR 22 / TC 75- (HR 32) / TC 125- (HR 42)

- C- ROHRBRUCHSICHERUNG # **5 368 632 256** R1/2“
hose rupture valve

TC 48- (HR 18) / TC 50

- C- ROHRBRUCHSICHERUNG # **5 368 632 272** R1/2“
hose rupture valve

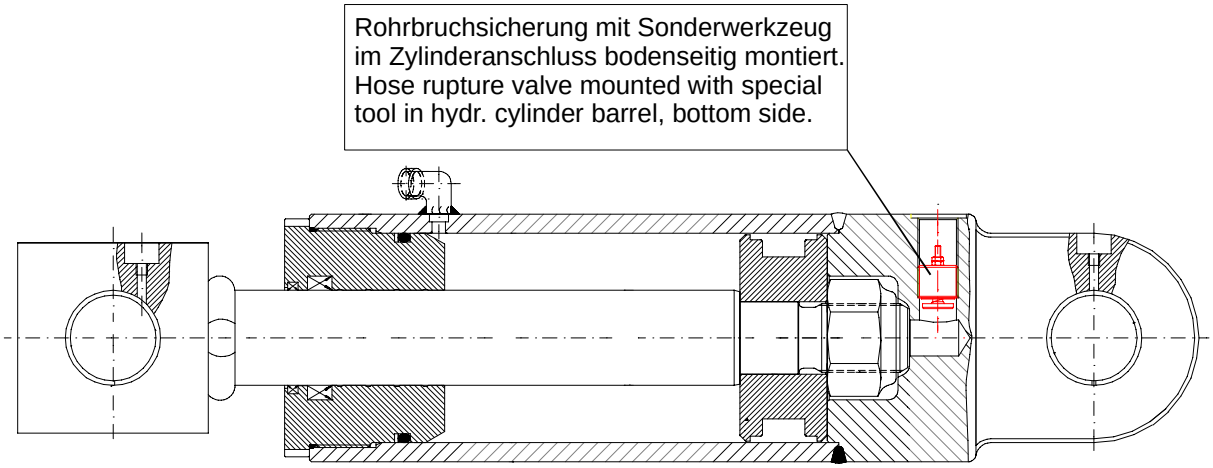
TC 60- (HR 20)

- C- ROHRBRUCHSICHERUNG # **5 368 632 277** R1/2“
hose rupture valve

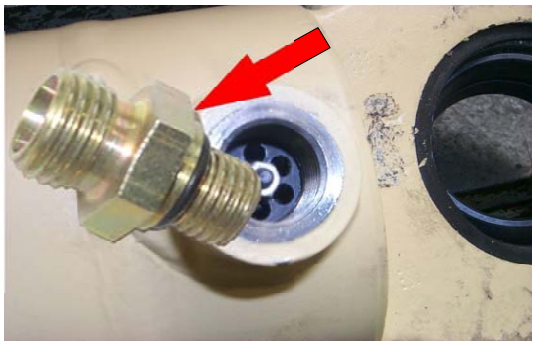
	Rohrbruchsicherungsgewinde Hose rupture valve thread	**Bestell Nr. für Einschraubwerkzeug Tool part #**	
A	1/4“	5 368 655 672	
B	3/8 “	5 368 655 673	
C	1/2 “	5 368 655 674	

Montageanleitung / Mounting instruction

BEISPIEL / EXAMPLE

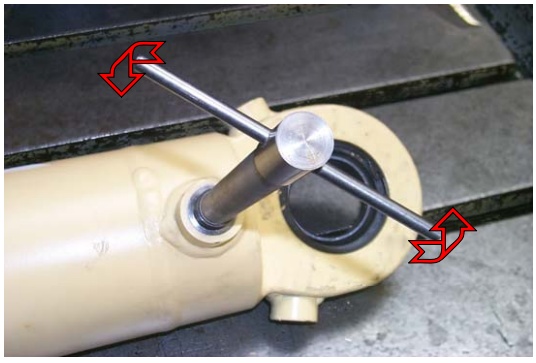


Demontage / Removal



Einschraubstutzen herausschrauben

remove fitting



Rohrbruchsicherung mit Sonderwerkzeug (siehe Tabelle) herausschrauben

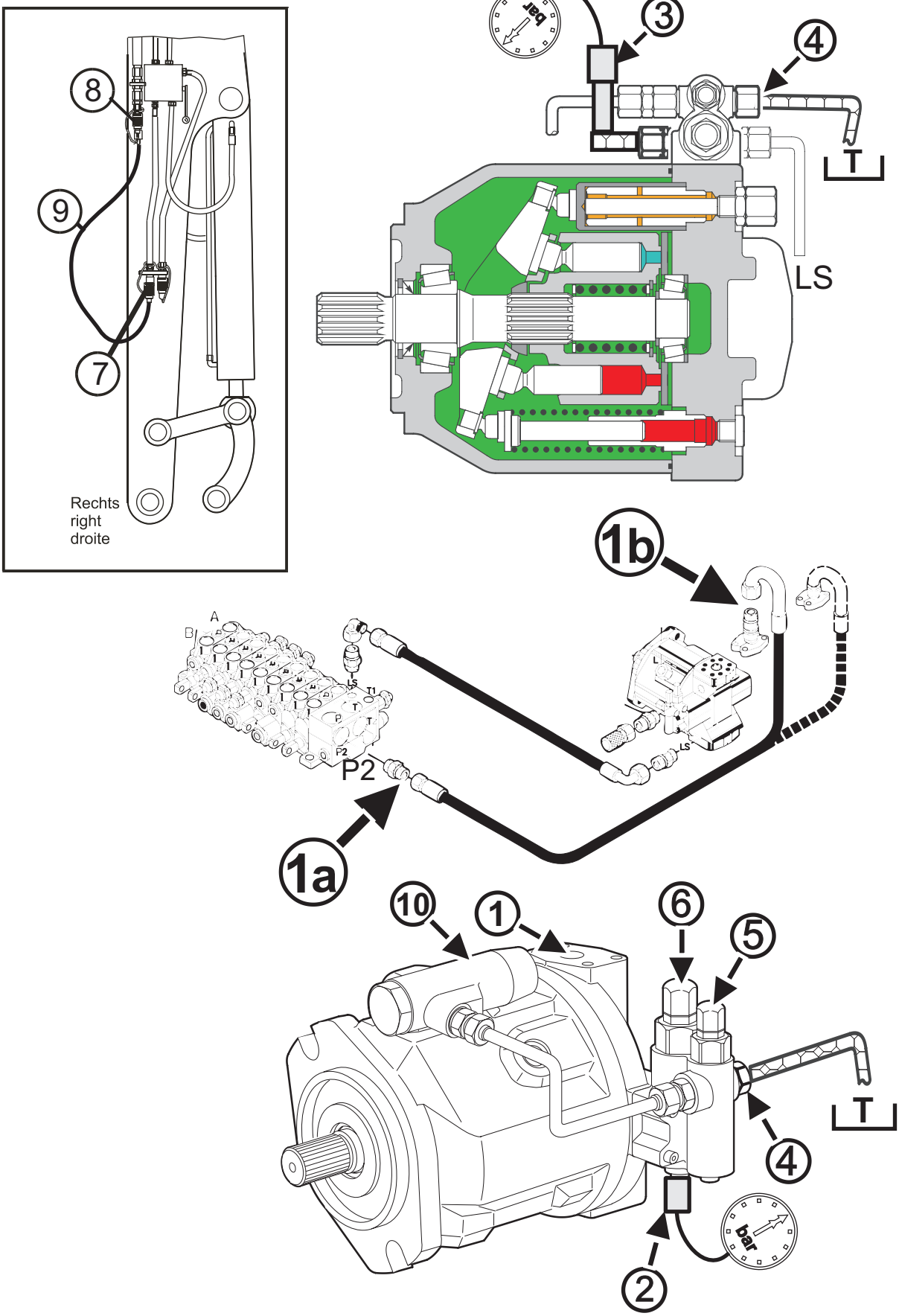
remove hose rupture valve with special tool (see index list)

Montage / Installation



Die Rohrbruchsicherung mit Sonderwerkzeug einschrauben.

To install the hose rupture valve, use the special tool.



TEREX	Typ/Model/Type **TC 29** (HR 14)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Setting instruction working pump A10VO45 DFLR**	Blatt/Page/Feuille **5.76.04**

Mounting instructions

1 Hose situation of pump P towards valve bank port P2

1b Remove hose at pump flange P (thread :S25)
Mount additional hose (part # 4.470.079.502) at pump flange
and put a flow meter between flange and hose.

Needed parts for situation:

2 x	elbow fitting	part # 1.924.060.256
2 x	hose	part # 4.470.079.502
1 x	fitting	part # 1.915.060.873

2 Gauge port for max. pump pressure (P) is factory mounted

3 Mount pressure gauge at LS-controller (stand by) opposite of LS-hose

Needed parts:

1 x	gauge port		part # 5.066.234.230
1 x	straight fitting	GES 10-PL 7/16-20 UNF	part # 1.939.060.103
1 x	elbow fitting		part # 1.925.060.149

4 Hose for tank discharge of the horse power valve (5).
Mount hose at horse power valve (5) at pump,remove vent valve and
connect the other end of the hose to the vent valve port.

Needed parts:

1 x	straight fitting GES 10-L 7/16-20 UNF	part # 1.939.060.103
1 x	hose NW8 x 1600 mm	part # 4.508.160.301

5 Horse power valve (Δp valve)

6 LS – regulator (stand-by)

7 Connect additional circuit (7) right hand side of dipperstick with pressureless returnline (8) by means of a hose (9)

Following parts are needed:

1 x	quick coupler plug male	part no. 5.000.253.100
1 x	quick coupler plug female	part no. 5.000.276.100
2 x	fitting	part no. 1.915.060.564
1 x	hose	part no. 4.262.110.363

10 Horsepower regulator (regulation start,regulation end)

Adjustment procedure

- Machine must have service temperature (approx 50 – 60 ° C)
- Mount gauges
- Check engine rpms, low and high idle and adjust if necessary

Adjustment of the regulators:

- Without tank discharge (4). Set LS-Controller(6) to a differencial pressure (Δp) between P and LS to approx.25 – 28 bar while additional circuit is activated (dynamic)

- Mount tank discharge (4) Set horse power valve (5) to 20 bar (no Δp) while additional circuit is activated

- Without tank discharge (4) Set LS-Controller (6) now to a differencial pressure (Δp) between P and LS to 15,3 bar while additional circuit is activated (dynamic)

Checking of adjustment:

- Lift the machine, give full throttle and run the tracks in high speed (rabbit)
  Flow: 90 liters
  Pressure: 90 bar

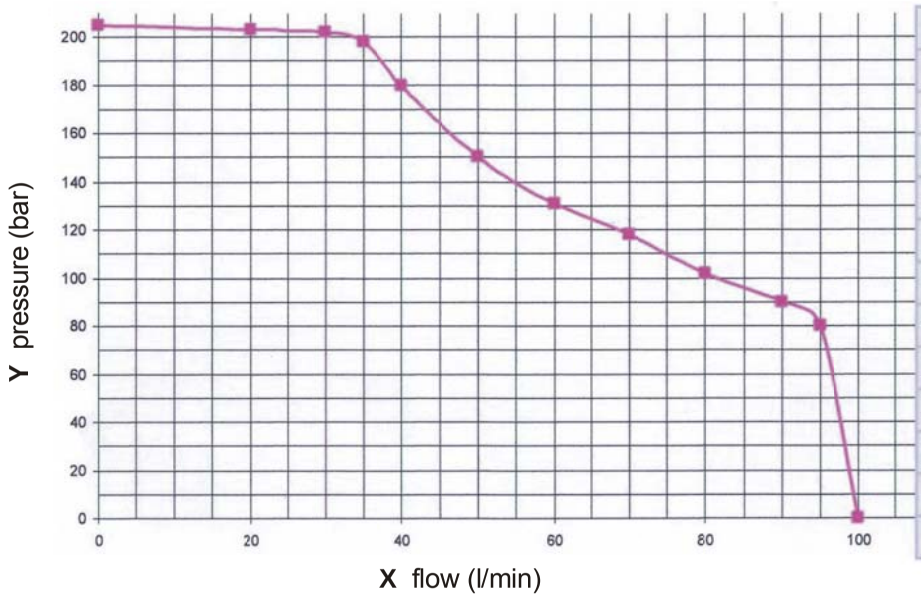
  In case of too much divergences ,adjustment of regulation start and end is possible at horse power control valve (6) according characteristic curve and chart.

A10V(S)O pressure, flow, power control

Mobile Hydraulics

TEREX SCHAEFF

power line for A10 VO 45 DFLR (t.o. 2429462 / serial-no.769491) mounted in HR14 from the Terex Schaeff company



X (flow)	Y (pressure)
0	205
20	203
30	202
35	198
40	180
50	150
60	131
70	118
80	102
90	90
95	80
100	0

TEREX | SCHAEFF

Typ/Model/Type
TC 29 from s/n.: TC00290100 (HR 14)

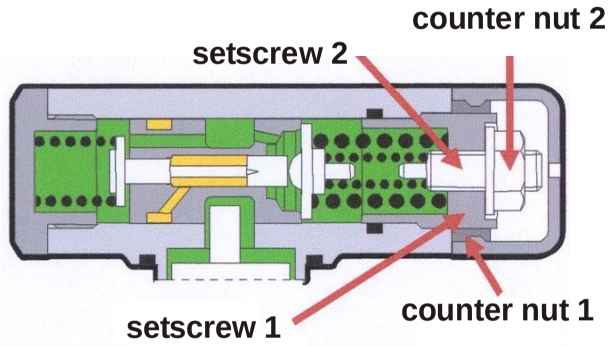
Benennung / Description / Dénomination
Setting instruction working pump A10 VO45 DFLR

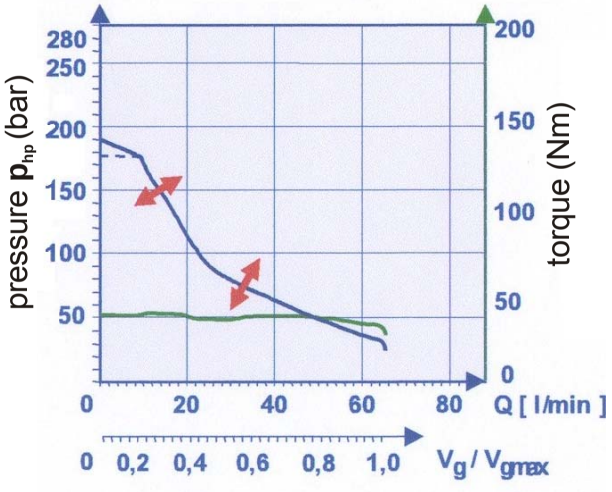
Datum/Edition/Date
01.2007

Blatt/Page/Feuille
5.76.06

A10V(S)O pressure, flow, power control

Adjust power control





Adjust the regulation start with the setscrew "1"

1. Loosen the counter nut "1"

2. Adjust the regulation start by turning the setscrew "1":
   Turning to the right - increase power
   Turning to the left - decrease power

3. Secure the setscrew "1" with the counter nut "1"

Adjust the regulation end with the setscrew "2":

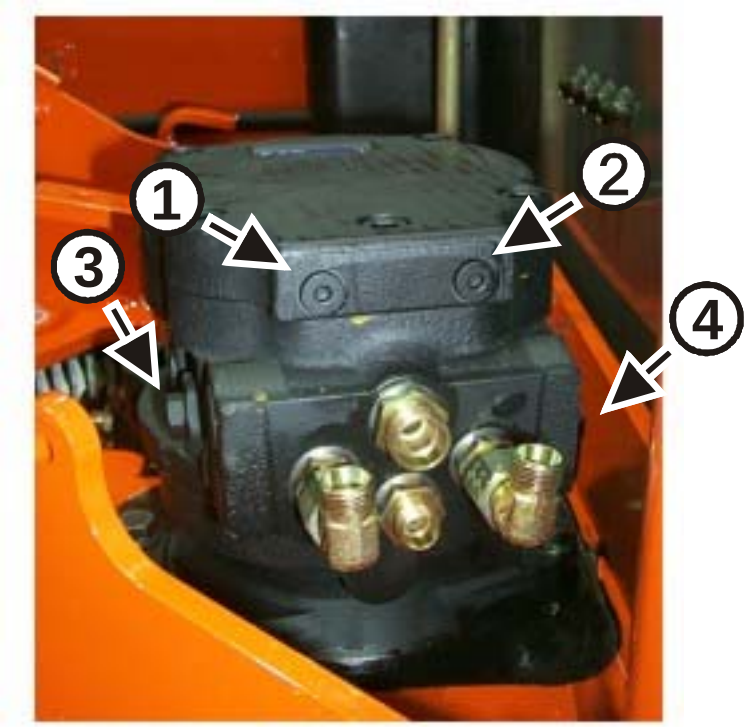
4. Loosen the counter nut (13mm hexagon)

5. Adjust the regulation end by turning the setscrew "2" (4mm allen screw).
   Turning to the right - increase power
   Turning to the left - decrease power

6. Secure the setscrew "2" with the counter nut "2"

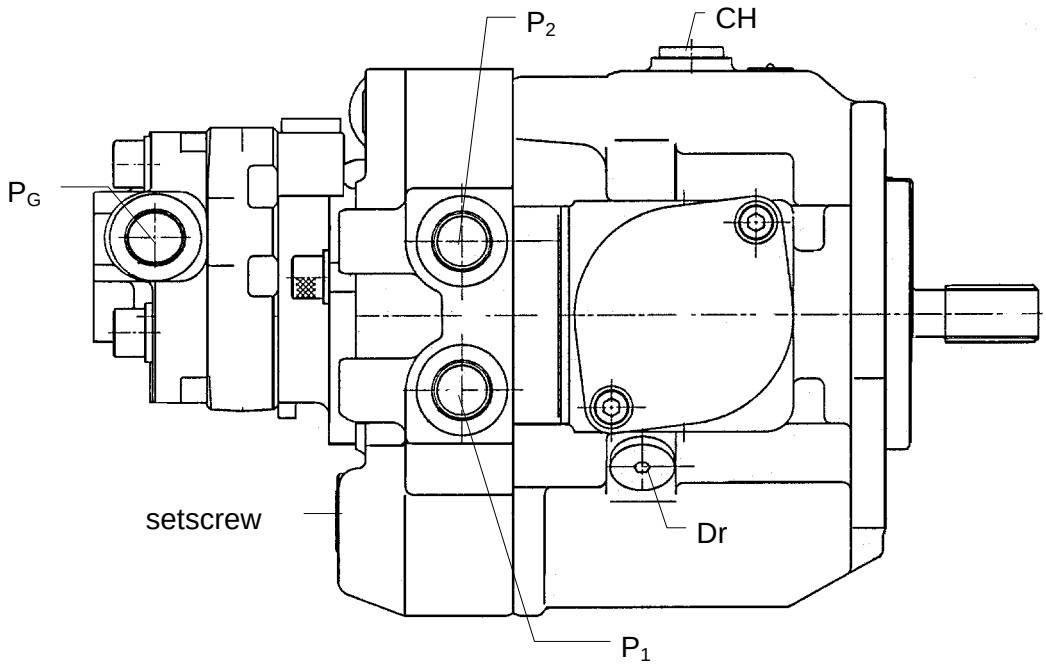
Requirement *for adjustment:*

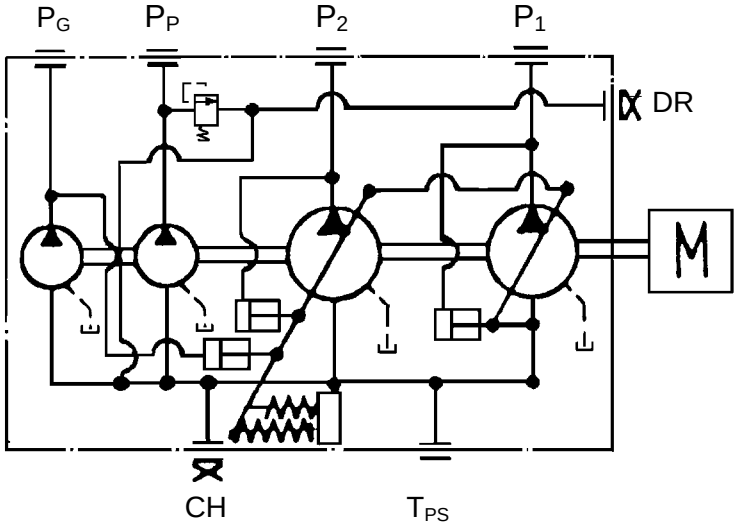
Measuring of revolutions per minute and pressure
Flow rate measuring (flow meter)



Adjustment procedure swing drive

- Machine must have service temperature (approx. 50-60°C)
- Remove floor plate in the cabin
- Release pilot pressure from accumulator, plug (1) and (2) are pressurized
- Remove plug (1) and (2) from valve bloc
- Mount gauge ports R1/8" into (1) and (2)
- Mount pressure gauge (digital version recommended) to (1) and (2)
- Swing left and right under full throttle against a fix obstacle and set the pressures at valve (3) and (4) each to a **Δp** between (1) and (2) of 180 bar
  (Example: (1) = 210 bar (2) = 30 bar = Δp 180 bar)





P_1	working pump	(piston pump)
P_2	working pump	(piston pump)
P_P	pilot pump	
P_G	working pump	(gear pump P3)
DR	closed	
CH	closed	(breather plug)
T_{PS}	suction port	

Setting instructions working pump TC 48

If necessary, the factory power setting can be checked for **pressure, flow rate** and **engine stall rpm**:

- Install flow meter (litre) at the pump outlet P2
- Connect 600 bar gauge to gauge port P2
- Operate the machine until it reaches a hydraulic oil temperature of approx. 50° C
- Connect tachometer, adjust and check max. idle running speed at the diesel engine.

TC 48: 2,350 +20 min^{-1}

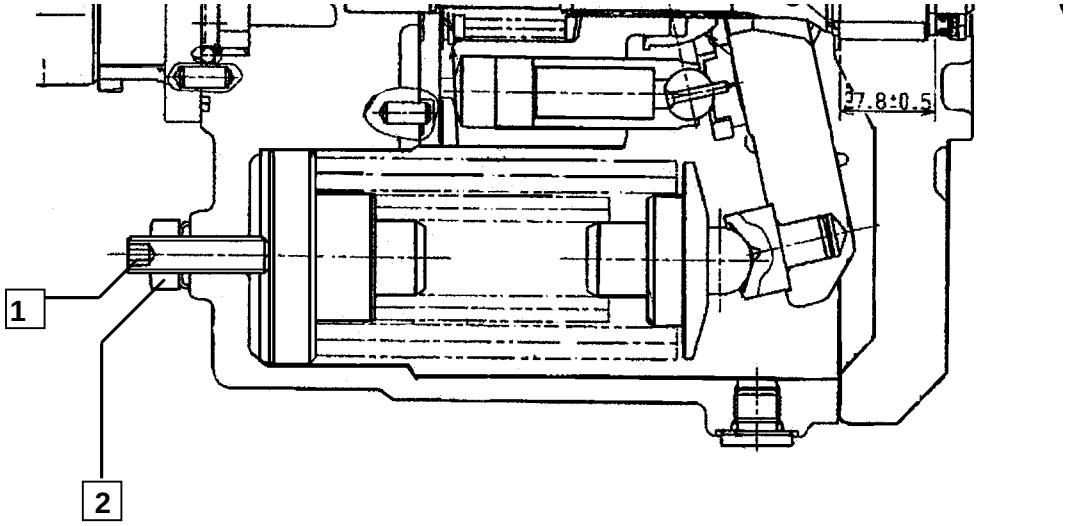
- Check the regulation start as well as the engine stall rpm at full speed with the control circuit "boom" according to the following table:

TC 48	**bar**	**l/min** ±1	**Engine stall rpm**
	220	55	at main pressure relief valve
Regulation start at	230	52	pressure of 245 bar:
	240	48	2,270 + 20 min^{-1}

In case the regulation start and / or the engine stall rpm differ too much, re-adjust the setscrew **(1)**.

- **To do this:** Slacken the counternut (2) and adjust the setscrew (1)

  - Turning to the right: Regulation start later (more power)
  - Turning to the left: Regulation start earlier (less power)



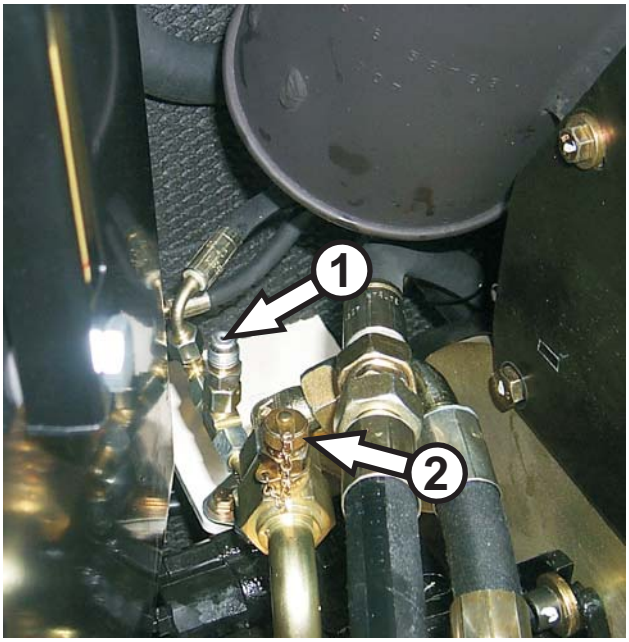
When doing any testing or adjustment jobs, please respect the general safety regulations!
See page 1.200.01-05

Operate the machine until it reaches a hydraulic oil temperature of approx. 50°C - 60°C.
Check high and low idle, adjust if necessary.
(see technical data cap. 2.93.01)

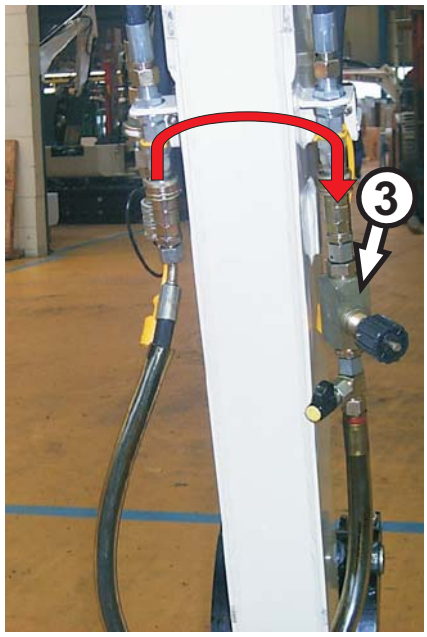
Install flow meter at the P-port of the pump



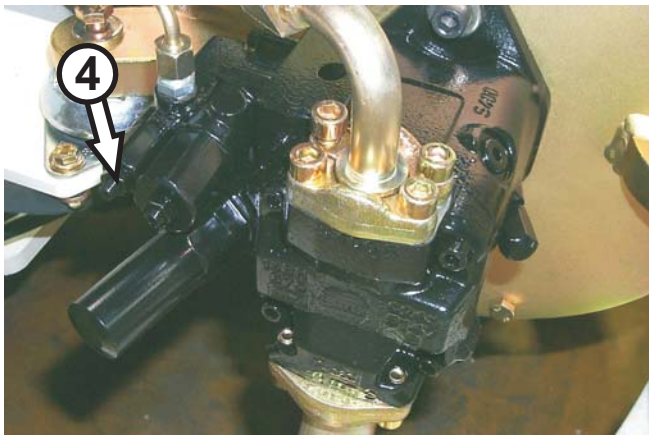
Install test port at the pump between flow compensator valve and LS-hose. (1)
Test port “P” is factory installed. (2)



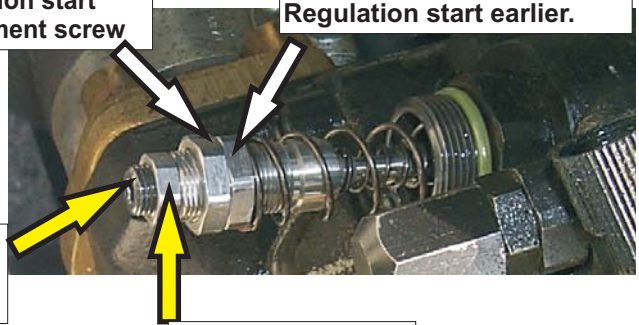
Mount a hose with an adjustable throttle valve (3) between the two quick couplers (add. circuit).



Set at the flow compensator valve (4) on the pump a **(△ p)** of **15 bar** between **P** and **LS.**
Operate the “additional circuit” at full throttle. Throttle (3) is totally opened.



Power-curve:
Adjustment of regulation start - end of regulation



Attention!
During loosening of counterlock nuts,back stop adjustment screws.

For values see the following table

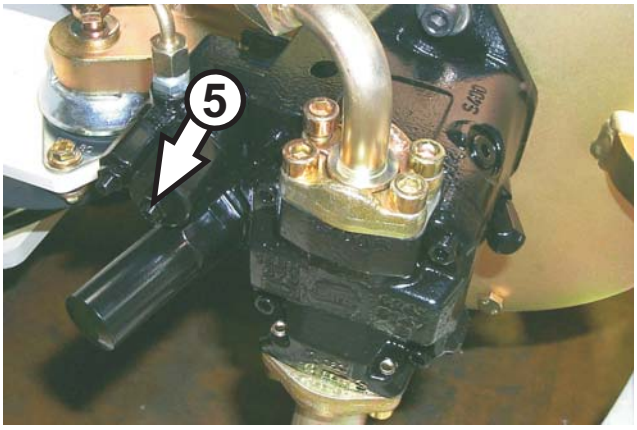
To adjust the power curve operate the additional circuit and the travelling function (lift up machine).
Engine full throttle.
When doing any adjustments respect engine stall speed (min. 2200 rpm).

1. **Operate additional circuit + one track in low gear**
   Set throttle valve (3) to 110 bar P = 110 bar Q = 54 l/min

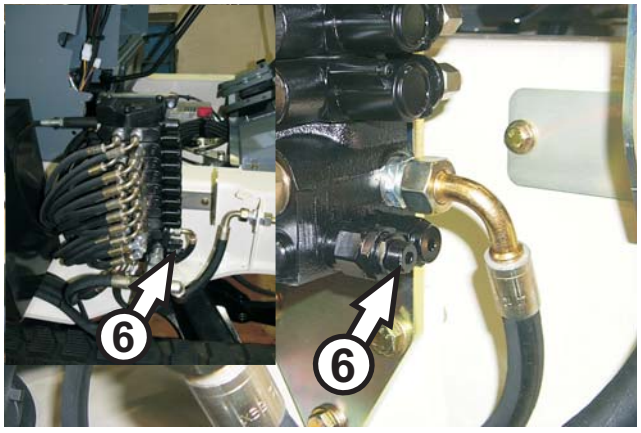
2. **Only operate additional circuit, set throttle valve (3) to 150 bar**
   P = 150 bar Q = 40 l/min

3. **Only operate additional circuit, set throttle valve (3) to 230 bar**
   P = 230 bar Q = 26 l/min

Adjustment of the pressure compensator:
The pressure compensator (5) is preset to 280 bar at approx. 1000 rpm.
Test port (2) at the pump.

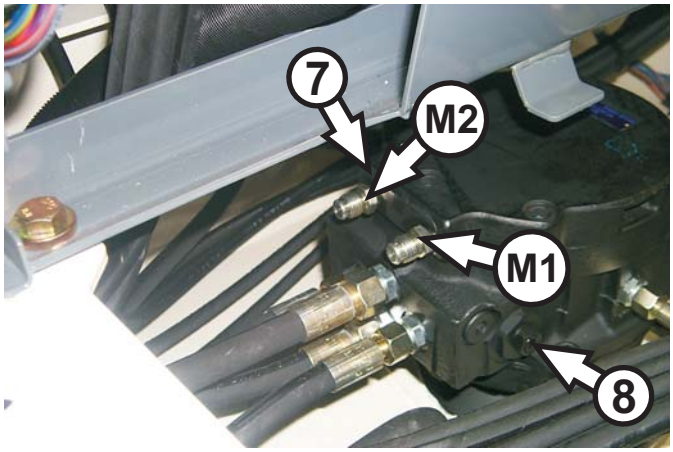


For that turn the adjustment screw (6) of the LS-secondary valve 1 turn in, operate the function "dozer up" and hold in end stroke position. Adjust pressure compensator (5) if necessary. After that reset the LS-secondary (6) to 250 bar again.



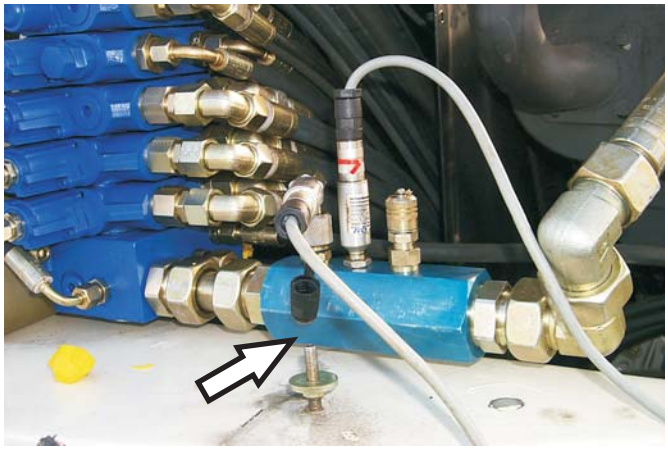
Typ Model Type	**TC 25**	**ab Fz.-Id.nr.. from s/n: à partir du n/s:**	**TC00250100**	Datum Edition Date	**01.2008**
Benennung Description Dénomination	**Einstellanweisung Setting instructions Instructions de réglage**		**Arbeitshydraulik Working hydraulik Hydraulique équipement**	Blatt Page Feuille	**5.93.02**

Mount test ports at the swing drive at
M1 and M2 (thread: R1/8”)
Install gauge (digital gauge recommended)
at port M1 and M2.
Swing left and right against a fixed obstacle
at full throttle. Adjust the swing pressure at the
valves ⑦ and ⑧ to a ∆p of
185 bar between M1 and M2.
Example:
M1: 200bar M2: 15bar ∆p: 185bar

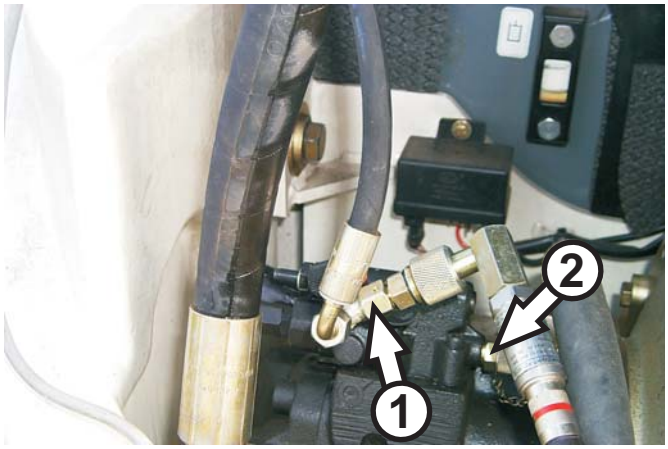


Operate the machine until it reaches a hydraulic oil temperature of approx. 50°C - 60°C. Check high and low idle, adjust if necessary.
(see technical data cap. 2.99.01)

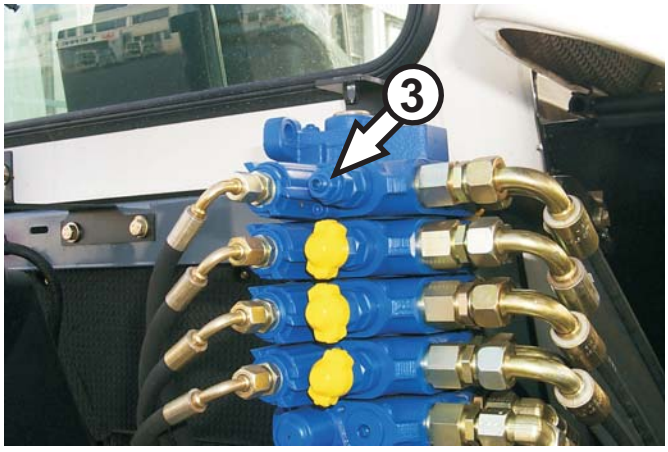
Install flow meter at the P-port of the main valve.



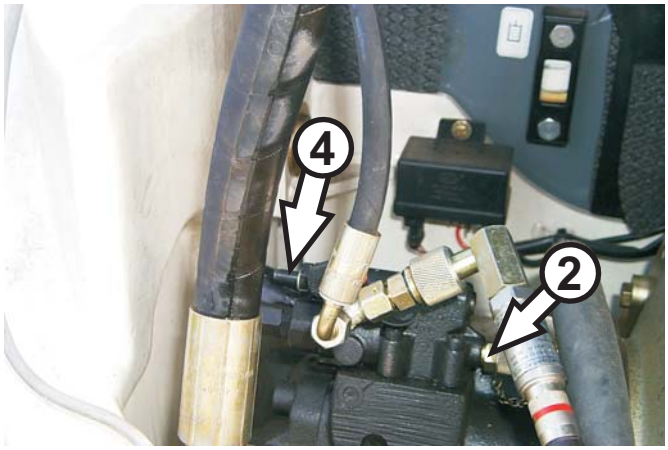
Install test port at the pump between flow compensator valve and LS-hose. ①
Test port “P” is factory installed. ②



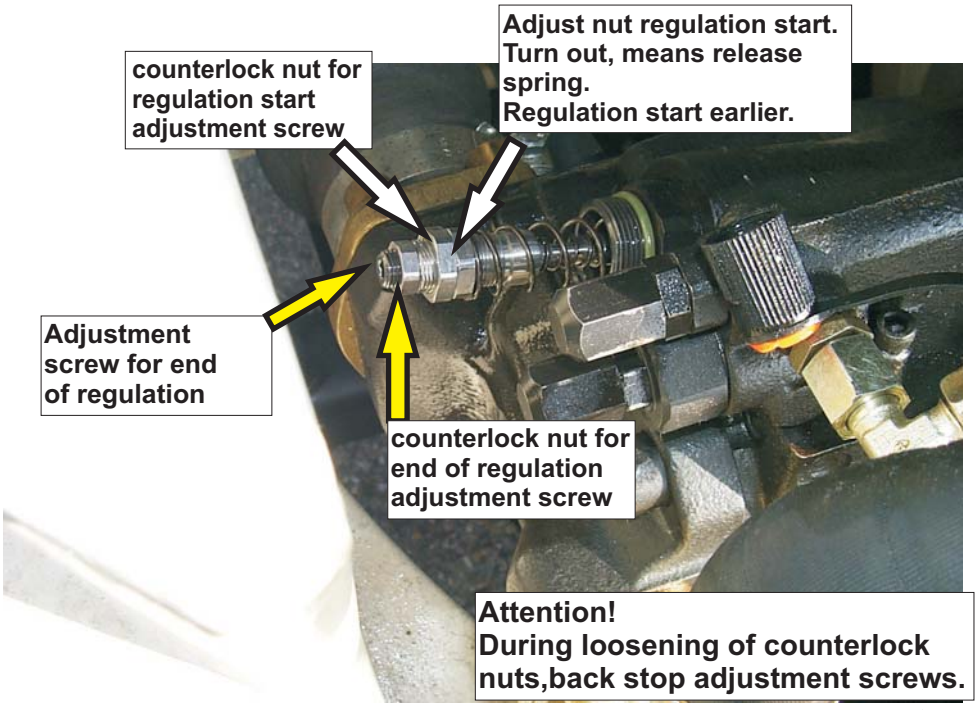
Adjustment flow compensator valve:
turn the adjustment screw of the
secondary valve (3) (B-Side) “additional circuit”
1/2 turn out (= approx. 120bar)



Set at the flow compensator valve (4)
on the pump a **(△p)** of **17 bar**
between **P** and **LS.**
Operate the B-Side of the “additional circuit”
at full throttle.



Power-curve:
Adjustment of regulation start - end of regulation



For values see the following table

To adjust the power curve operate the "B-Side" of the additional circuit and the travelling function (lift up machine).
Engine full throttle.
When doing any adjustments respect engine stall speed (min. 2200 rpm).

1. **Set secondary valve B-Side to 80 bar + operate both tracks in low gear**
   operation of 3 functions: P = 80 bar Q = 130 l/min

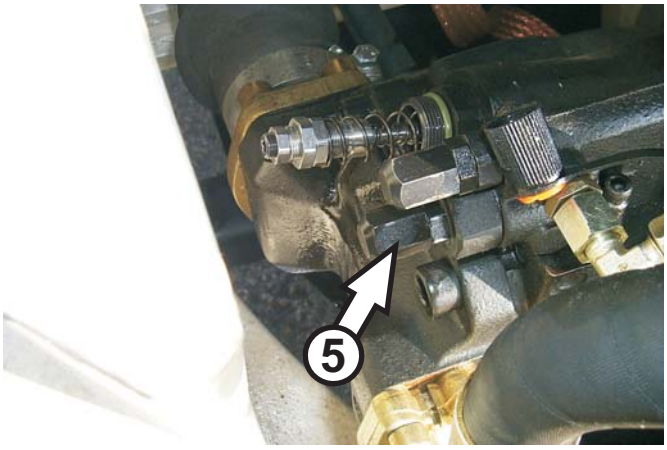
2. **Set secondary valve B-Side to 125 bar + operate both tracks in low gear**
   operation of 3 functions: P = 125 bar Q = 100 l/min

3. **Set secondary valve B-Side to 140 bar + operate both tracks in low gear**
   operation of 3 functions: P = 140 bar Q = 90 l/min

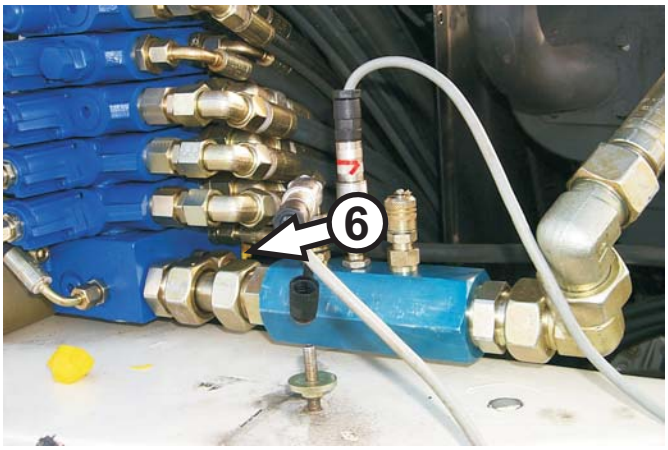
4. **Set secondary valve B-Side to 205 bar + operate one track in low gear**
   operation of 2 functions: P = 200 bar Q = 63 l/min

5. **Set secondary valve B-Side to 230 bar**
   operation of these function: P = 230 bar Q = 57 l/min

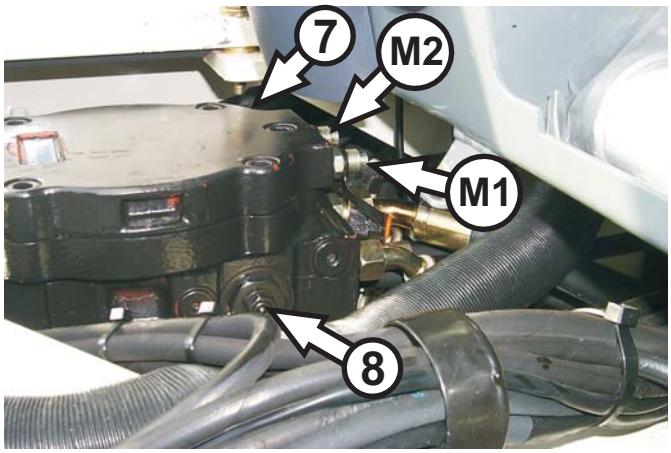
Adjustment of the pressure compensator:
The pressure compensator (5) is preset to 280 bar at approx. 1000 rpm.
Test port (2) at the pressure compensator.



For that turn the adjustment screw (6) of the LS-secondary valve 1 turn in, operate the function "dozer up" and hold in end stroke position. Adjust pressure compensator (5) if necessary. After that reset the LS-secondary (6) to 250 bar again.



Mount test ports at the swing drive at
M1 and M2 (thread: R1/8”)
Install gauge (digital gauge recommended)
at port M1 and M2.
Swing left and right against a fixed obstacle
at full throttle. Adjust the swing pressure at the
valves ⑦ and ⑧ to a Δp of
205 bar between M1 and M2.
Example:
M1 = 220bar M2 = 15bar = Δ p 205bar



The diesel engine rpms have to be measured and - if necessary - adjusted prior to the check and / or adjustment of the transmission and working hydraulics.

1. <u>Check and adjustment of the charge pressure (= pilot pressure of the working hydraulics)</u>

- open the engine hood
- connect 60 bar - gauge to pressure port (M_A) or (M_B) of the travel pump
- attention, do not select any travel direction !
- set engine to high idle running speed
- read the value on the gauge. Desired value: see Technical Data
- if the desired value is not reached, screw the setscrew at the charge pressure relief valve of the travel pump (3) in or out resp.

  Screwing in: pressure increase
  Screwing out: pressure decrease

  Travel pumps without setscrew have to be adjusted via shims.

2. <u>Check and replacement of the travel high pressure valves</u>
(The travel high pressure valves are safety valves with towing function)

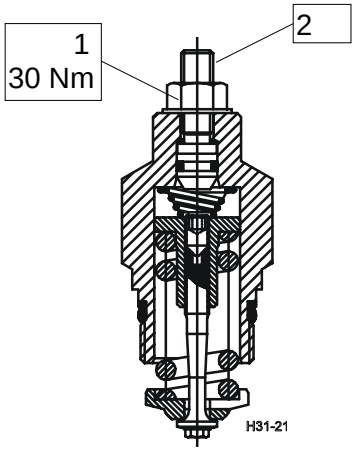
<u>Note</u>: It is only checked whether the travel high pressure valves are approx. 30 bar above the pressure cut-off

- connect 600 bar - gauge to gauge port (M_A) resp. (M_B) of the travel pump. Increase pressure cut-off (7) by approx. 30 - 40 bar
- set travel range selector switch to „rabbit“
- set travel direction lever to „forward“ or „reverse“ resp.
- drive the vehicle against a solid object
- fully accelerate
- read the value on the gauge. Desired value: approx. 460 bar

– both travel directions have to be checked

– if the reading is below the desired value, adjust the travel high pressure valves (4)

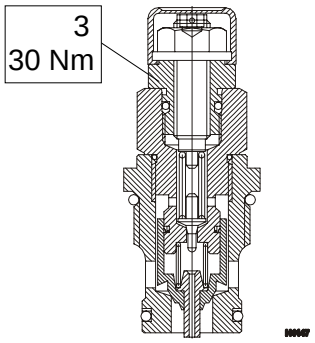
– re-adjust the pressure cut-off after this test, see point 3.



Towing function - HML 22 / HML 31:

– Slacken nut (1) at both high pressure relief valves and tighten screw (2) until it is flush with the nut (1). Tighten nut.

– Slacken nut (1) after towing and turn back screw (2) until stop. Re-tighten nut (1).



Towing function - HML 41:

– Slacken spring cartridge (3) at both high pressure relief valves by approx. 2 turns

– Retighten spring cartridge (3) after towing

3. <u>Check and adjustment of the pressure cut-off (travel pump)</u>

– connect 600 bar - gauge to gauge port (M_A) resp. (M_B) of the travel pump

– set travel range selector switch to „rabbit“

– start the engine

– set travel direction lever to „forward“ or „reverse“ resp.

– drive the vehicle against a solid object

– fully accelerate

– read the value on the gauge. Desired value: see Technical Data

– if the desired value is not reached, turn the setscrew (7) at the travel pump in or out resp.

Screwing in: pressure increase
Screwing out: pressure decrease

4. <u>Check and adjustment of the start-up speed</u>

- park machine on even ground
- connect engine rpm tachometer
- set travel range selector switch to „rabbit“
- start the engine
- set travel direction lever to „forward“
- slowly actuate accelerator pedal
- read the engine rpm when the machine is starting. Desired value: see Technical Data
- if the desired value is not reached, turn the setscrew at the regulator cartridge (1) in or out resp.

  Screwing in: machine starts later
  Screwing out: machine starts earlier

5. <u>Check and adjustment of the engine stall rpm</u>
provided that the start-up speed is adjusted correctly

- remove brake inching hose (8) at travel pump and plug it. The connection at the pump can remain open.
- connect 600 bar - gauge to gauge port (M_A) or (M_B) resp. of the travel pump
- connect engine rpm tachometer
- start the engine
- jack up and secure the machine to allow free running of the wheels
- set travel range selector switch to „tortoise“ (travel motor must not regulate)
- set travel direction lever to „forward“ or „reverse“ resp.
- fully accelerate
- slowly actuate the foot brake pedal until the pressure value according to the Technical Data is reached. Read the engine rpm when the indicated pressure value is reached at the gauge port (M_A) or (M_B) . Desired value: see Technical Data
- If the desired value within the tolerance range is not reached, slight corrections can be made via the regulator cartridge and the start-up speed. In case the deviation is too high, the orifice in the regulator cartridge has to be replaced.

6. Check and adjustment of the regulation start at the travel motor

- remove brake inching hose (8) at the travel pump and plug it. The connection at the pump can remain open
- connect 600 bar - gauge to gauge port (M_A) or (M_B) of the travel pump
- connect 600 bar - gauge to gauge port (9) of the travel motor
- start the engine
- jack up and secure the machine in order to allow free running of the wheels
- set travel range selector switch to „rabbit“
- fully accelerate
- slowly operate the service brake. Both gauges increase. When the gauge (M_A - M_B) at the pump has reached the indicated regulation start value (see Technical Data), the gauge at the travel motor (9) has to decrease.
- if the desired value is not reached, screw the setscrew (10) at the travel motor in or out resp.

  Screwing in: Regulation start later
  Screwing out: Regulation start earlier

  Note: For the maximum use of the motor performance, the regulation start can vary from machine to machine. A deviation of ±10 bar is possible.

7. Check and adjustment of the inching

- connect 600 bar - gauge to gauge port (M_A) or (M_B) resp. of the travel pump
- jack up and secure the machine to allow free running of the wheels
- set travel range selector switch to „rabbit“
- set travel direction lever to „forward“ resp. „reverse“
- fully accelerate
- slowly actuate the foot brake pedal
- watch the gauge: At approx. 200 bar travel high pressure, the pump has to inch, i.e. value of the gauge decreases, the wheels come to a standstill
- If the pump inches earlier or later, turn the setscrew (11) at the travel pump in or out resp.

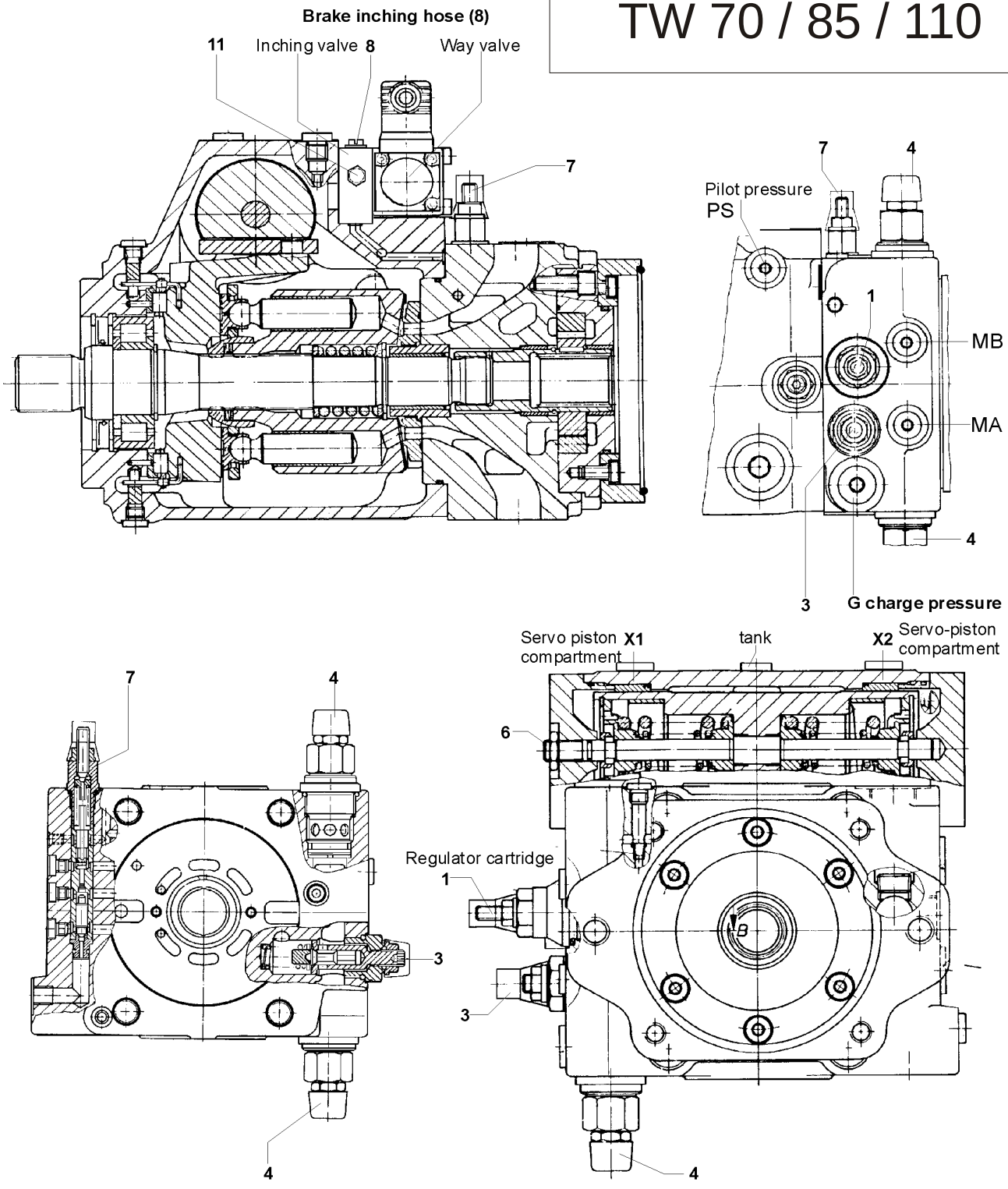
  Turning in: inching later
  Turning out: inching earlier

8. Check and adjustment of the travel pump neutral position

- connect gauge to the high pressure gauge port (M_A) or (M_B) of the travel pump
- set the engine to increased idle running speed
- watch the gauge. Both values have to be identical.
- if the values are different, the neutral position can be corrected via the setscrew (6) at the travel pump

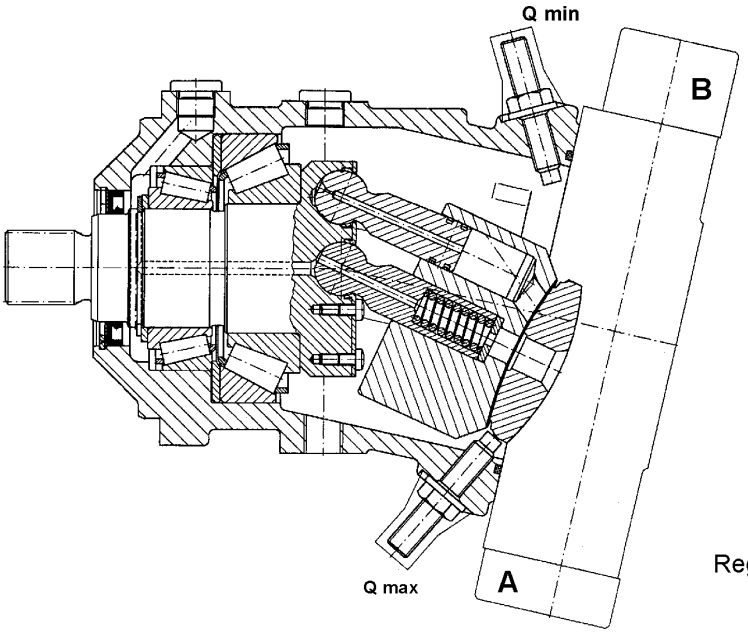
Travel pump A4VG...DA

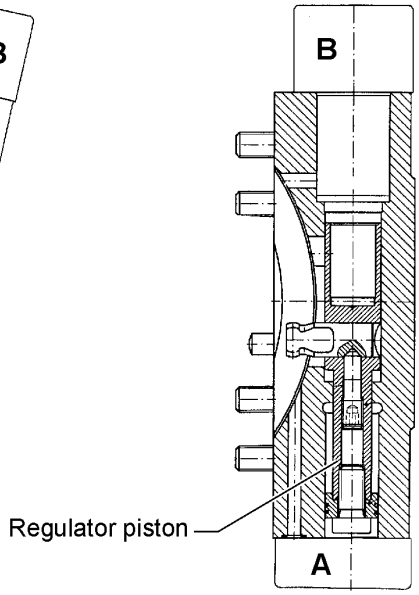
TW 70 / 85 / 110

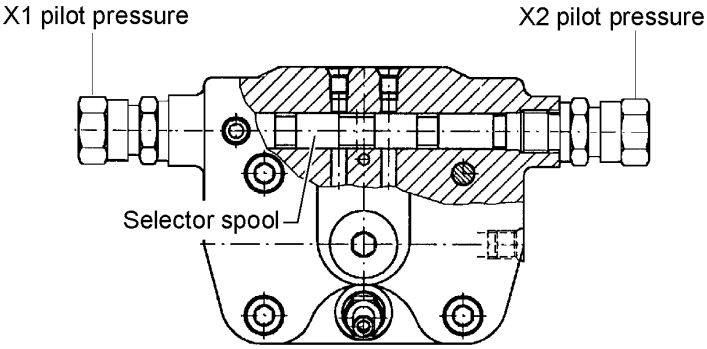


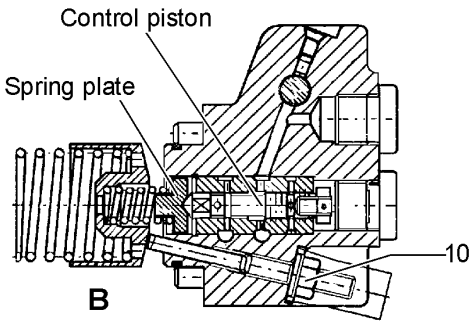
MA = high pressure gauge port
MB = high pressure gauge port
1 = setscrew, beginning of start-up
3 = charge pressure relief valve
4 = travel high pressure valves
6 = neutral position setscrew
7 = pressure cut-off
8 = brake inching hose
11 = inching setscrew

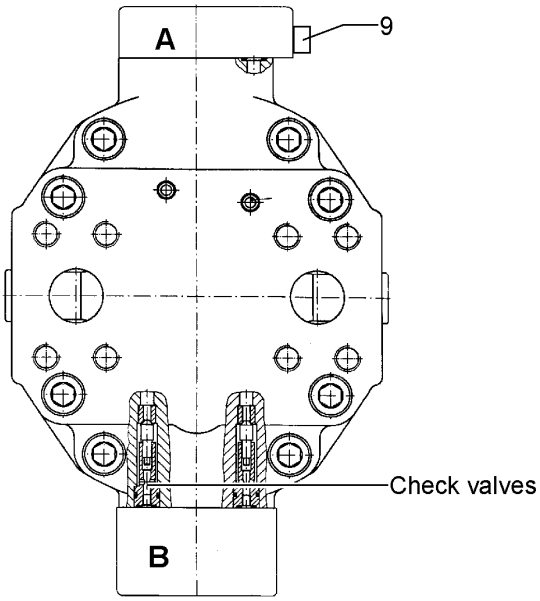
Travel motor A6VM....DA



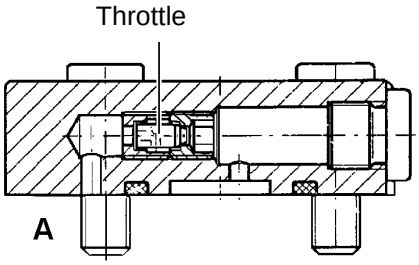








9 = gauge port regulation start
10 = setscrew regulation start




TEREX®

Anziehdrehmomente Hydromatikpumpen /-motore
Tightening torques Hydromatikpumps /-motors

Anziehdrehmomente für Schaftschrauben (Metrisches ISO-Regelgewinde)

Die nebenstehenden Werte für Anziehdrehmomente gelten nur für Schaftschrauben mit metrischem ISO-Regelgewinde und Kopfauflagemaßen nach DIN 912, DIN 931 und DIN 933. Außerdem gelten diese Werte nur für leicht oder nicht geölte, unbehandelte Oberflächen, sowie nur bei Verwendung von Drehmoment- und Kraftbegrenzungsschlüsseln.

Gewinde größe	Festigkeitsklassen 8.8	10.9	12.9
	Anziehdrehmoment(Nm)		
M 3	1,1	1,6	1,9
M 4	2,9	4,1	4,9
M 5	6	8,5	10
M 6	10	14	17
M 8	25	36	41
M10	49	69	83
M12	86	120	145
M14	135	190	230
M16	210	295	355
M18	290	405	485
M 20	410	580	690
M 22	550	780	930
M 24	710	1000	1200
M 27	1050	1500	1800
M 30	1450	2000	2400

Tightening torques for shaft bolts (Metric ISO Standard Thread)

The values for tightening torques shown in the table are valid only for shaft bolts with metric ISO- standard threads and head support surface dimensions in accordance with DIN 912, DIN 931 and DIN 933. These values are also valid only for light or unoiled, untreated surface as well as for use only with torque-indicating wrenches and force limiting tools.

Thread size	Strength Classes 8.8	10.9	12.9
	Tightening Torque (lb.ft)		
M 3	0,8	1,2	1,4
M 4	2,1	3,0	3,6
M 5	4,4	6,3	7,4
M 6	7,4	10,3	12,5
M 8	18,4	25,8	30,2
M10	36,1	50,9	61,2
M12	63,4	88,4	106,9
M14	99,5	140,0	169,5
M16	154,8	217,4	261,6
M18	213,7	298,5	357,4
M 20	302,2	427,5	508,5
M 22	405,4	574,9	685,4
M 24	523,5	737,0	884,4
M 27	773,9	1105,5	1326,6
M 30	1068,7	1474,0	1768,8

Anziehdrehmomente für Verschlußschrauben VSTI (Metrisches Feingewinde)

Gewindegröße	Bezeichnung		Anziehdrehmoment(Nm)
M 8 x 1	VSTI 8 x 1	-ED/SA	= 5
M 10 x 1	VSTI 10 x1	-ED	= 10
M 12 x 1,5	VSTI 12 x 1,5	-ED	= 20
M 14 x 1,5	VSTI 14 x 1,5	-ED	= 30
M 16 x 1,5	VSTI 16 x 1,5	-ED/SA	= 30
M 18 x 1,5	VSTI 18 x 1,5	-ED/SA	= 40
M 20 x 1,5	VSTI 20 x 1,5	-ED/SA	= 50
M 22 x 1,5	VSTI 22 x 1,5	-ED	= 60
M 26 x 1,5	VSTI 16 x 1,5	-ED/SA	= 70
M 27 x 2	VSTI 27 x 2	-ED	= 90
M 30 x 1 ,5	VSTI 30 x 1,5	-ED/SA	= 100
M 33 x 2	VSTI 33 x 2	-ED/SA	= 120
M 42 x 2	VSTI 42 x 2	-ED/SA	= 200
M 48 x 2	VSTI 48 x 2	-ED	= 300

Tightening torques for locking screws VSTI (Metric ISO fine thread)

Thread size	Designation		Tightening torques (lb.ft)
M 8 x 1	VSTI 8 x 1	-ED/SA	= 4
M 10 x 1	VSTI 10 x1	-ED	= 7
M 12 x 1,5	VSTI 12 x 1,5	-ED	= 15
M 14 x 1,5	VSTI 14 x 1,5	-ED	= 22
M 16 x 1,5	VSTI 16 x 1,5	-ED/SA	= 22
M 18 x 1,5	VSTI 18 x 1,5	-ED/SA	= 29
M 20 x 1,5	VSTI 20 x 1,5	-ED/SA	= 37
M 22 x 1,5	VSTI 22 x 1,5	-ED	= 44
M 26 x 1,5	VSTI 16 x 1,5	-ED/SA	= 51
M 27 x 2	VSTI 27 x 2	-ED	= 66
M 30 x 1 ,5	VSTI 30 x 1,5	-ED/SA	= 74
M 33 x 2	VSTI 33 x 2	-ED/SA	= 88
M 42 x 2	VSTI 42 x 2	-ED/SA	= 147
M 48 x 2	VSTI 48 x 2	-ED	= 220

Anziehdrehmomente für Seal-Lock Bundmuttern (Metrisches ISO-Regelgewinde)

Die nebenstehenden Werte für Anziehdrehmomente gelten nur für Seal-Lock Bundmuttern der Festigkeitsklasse 8.8 mit metrischem ISO-Regelgewinde.

Gewinde größe	Festigkeitsklassen 8.8	10.9	12.9
	Anziehdrehmoment (Nm)		
M 6	10		
M 8	22		
M 10	40		
M 12	69		
M 14	110		
M 16	170		

Tightening torques for seal-lock nuts (Metric ISO-Standard Thread)

The values for tightening torques shown in the table are valid only for seal-lock nuts of the strength class 8.8 and with metric ISO-standard thread.

Thread size	Strength classes 8.8	10.9	12.9
	Tightening torque (lb.ft)		
M 6	7,4		
M 8	16,2		
M 10	29,5		
M 12	50,9		
M 14	81,1		
M 16	125,3		

Anziehdrehmomente für Linsenschrauben mit Kreuzschlitz DIN 7985 (Metrisches ISO-Regelgewinde)

Die nebenstehenden Werte für Anziehdrehmomente gelten nur für Linsenschrauben mit Kreuzschlitz DIN 7985 der Festigkeitsklasse 8.8 mit metrischem ISO-Regelgewinde

Gewinde größe	Festigkeitsklassen 8.8	10.9	12.9
	Anziehdrehmoment(Nm)		
M 3	1,1		
M 4	2,9		
M 5	6		
M 6	10		
M 8	25		
M10	49		

Tightening torques for cross-slotted lens head screws DIN 7985 (Metric ISO- Standard Thread)

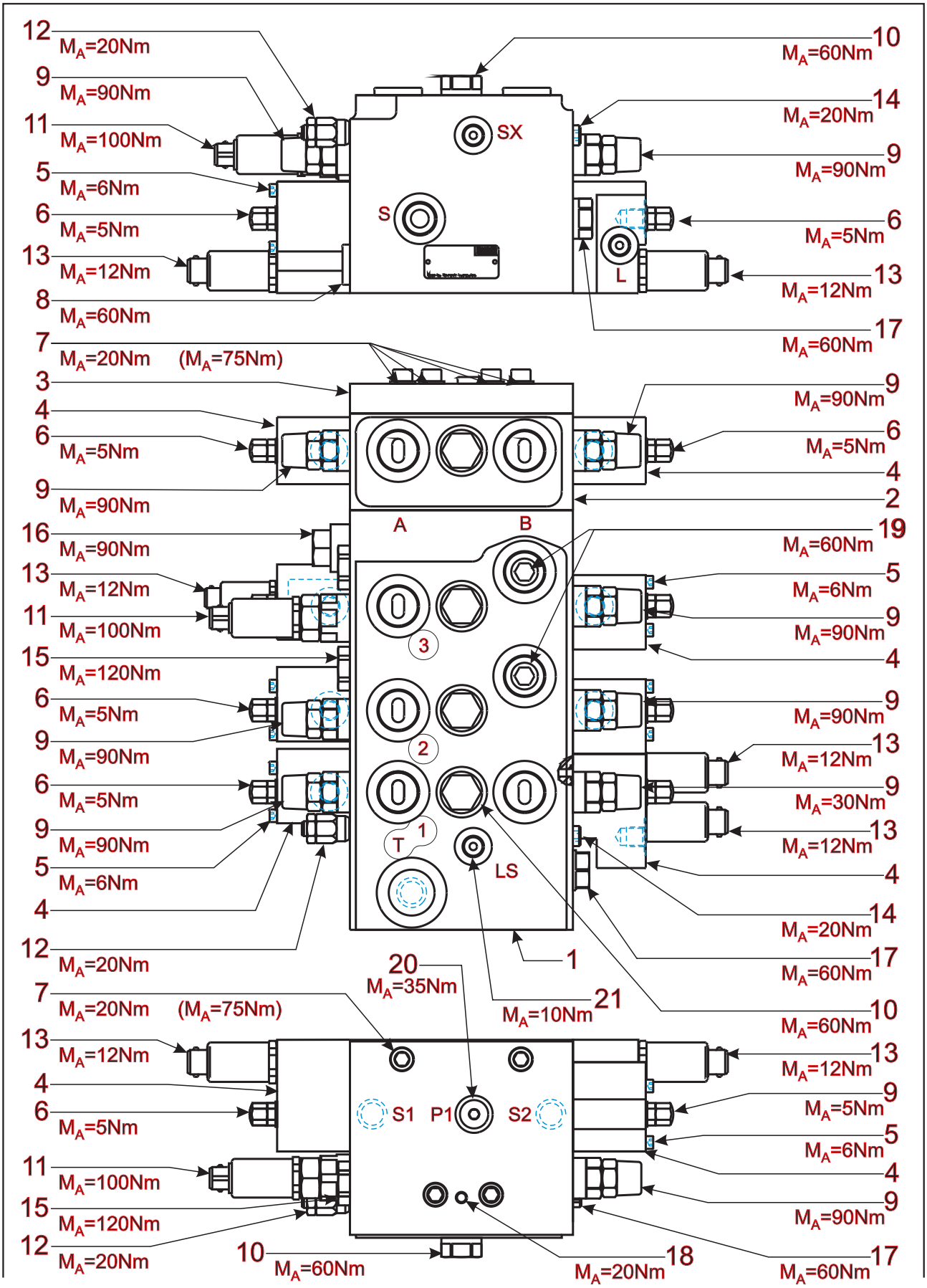
The values for tightening torques shown in the table are valid only for cross-slotted lens head screws DIN 7985 of the strength class 8.8 and with metric ISO-standard thread.

Thread size	Strength classes 8.8	10.9	12.9
	Tightening torques (lb.ft)		
M 3	0,8		
M 4	2,1		
M 5	4,4		
M 6	7,4		
M 8	18,4		
M10	36,1		

Typ / Model / Type / Tipo	**General**	Datum / Edition / Date / Fecha	**01.2007**
Benennung / Description / Dénomination / Denominación	**Tightening torques Hydromatik**	Blatt / Page / Feuille / Página	**5.200.02**

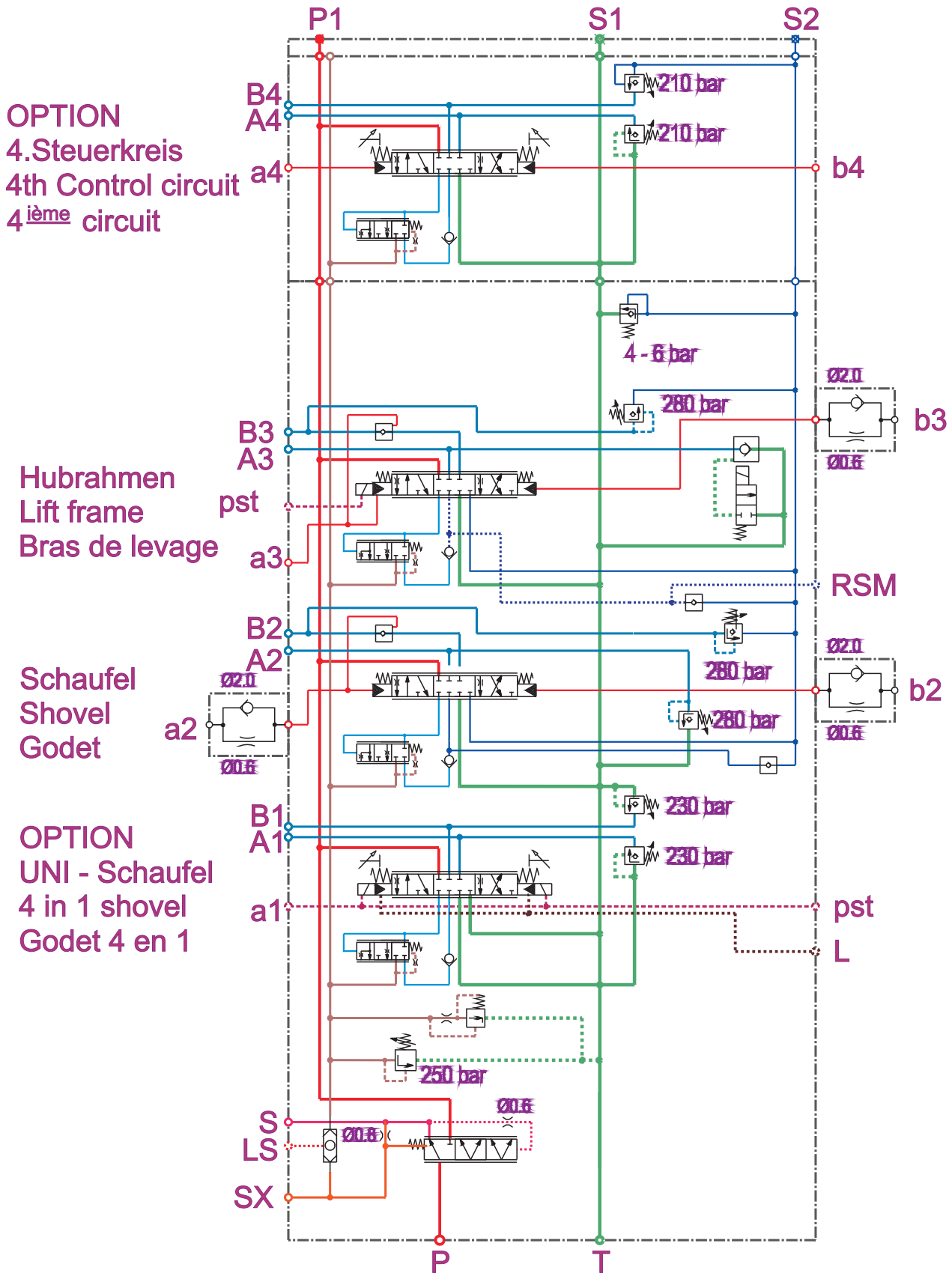
M6 - 15

Typ Model Type Tipo	**M6 - 15**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Notizen Notes Notices Notas**	Blatt Page Feuille Página	**5.213.00**



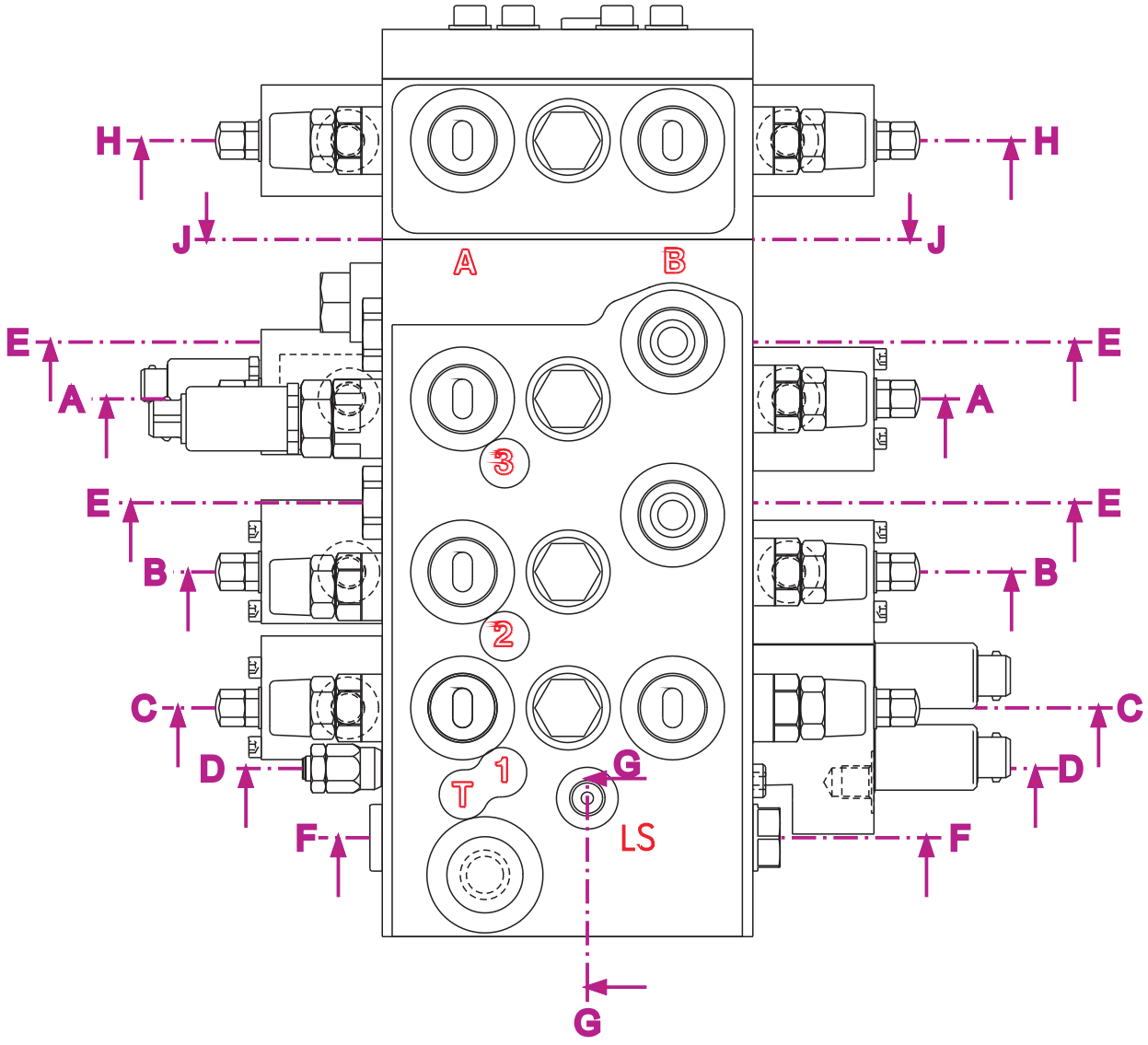
Typ Model Type Tipo	**SKL 200** (SKL 873)	**Steuerventil** **Valve bank** **Distributeur** **Válvula**	**M6-15**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**			Blatt Page Feuille Página	**5.213.01**

Pos. Item Rep. No.	Deutsch	English	Français
	BLOCKSTEUERGERAET	**VALVE BANK**	**DISTRIBUTEUR**
	4 M6-15	**4 M6-15**	**4 M6-15**
1	Steuerblock	Control block	Distributeur
2	Wegeventilelement	Directional valve element	Elément de distribution
3	Endelement	Final element	Elément finale
4	Deckel für hydraulische Betätigung mit Vorsteueranschluss	Cover for hydraulic operation with pilot operated connection	Capuchon pour commande hydraulique avec connexion à commande assistée
5	Schraube für Deckel	Screw for cover	Vis pour couvercle
6	Schieberwegbegrenzung	Spool stroke limitation	Limitation de course du tiroir
7	Zuganker	Tie rods	Tirants
8	Rückschlagventil	Check valve	Clapet anti-retour
9	Sekundärventil	Secondary pressure relief valve	Clapet secondaire
10	Verschlussschraube für Druckwaage	Plug for pressure compensator	Bouchon pour balance de pression
11	Schwimmstellungsventil	Floating position valve	Clapet position flottante
12	LS - Druckbegrenzungsventil	Load sensing pressure valve	Limiteur de pression LS
13	Druckminderventil	Pressure reducing valve	Soupape réductrice de pression
14	LS - Volumenstromregelventil	LS - flow regulator valve	Régulateur de débit LS
15	Sitzventil	Poppet valve	Soupappe
16	Vorspannventil	Initial tension valve	Soupape tension initiale
17	Verschlussschraube für Prioritätsschieber	Plug for priority spool	Bouchon pour tirior prioritaire
18	Verschlussschraube	Plug	Bouchon
19	Rückschlagventil (entsperrbar)	Check valve (unlock able)	Clapet anti-retour (antibloquage)
20	Verschlussschraube	Plug	Bouchon
21	Wechselventil	Shuttle valve	Soupape selecteur



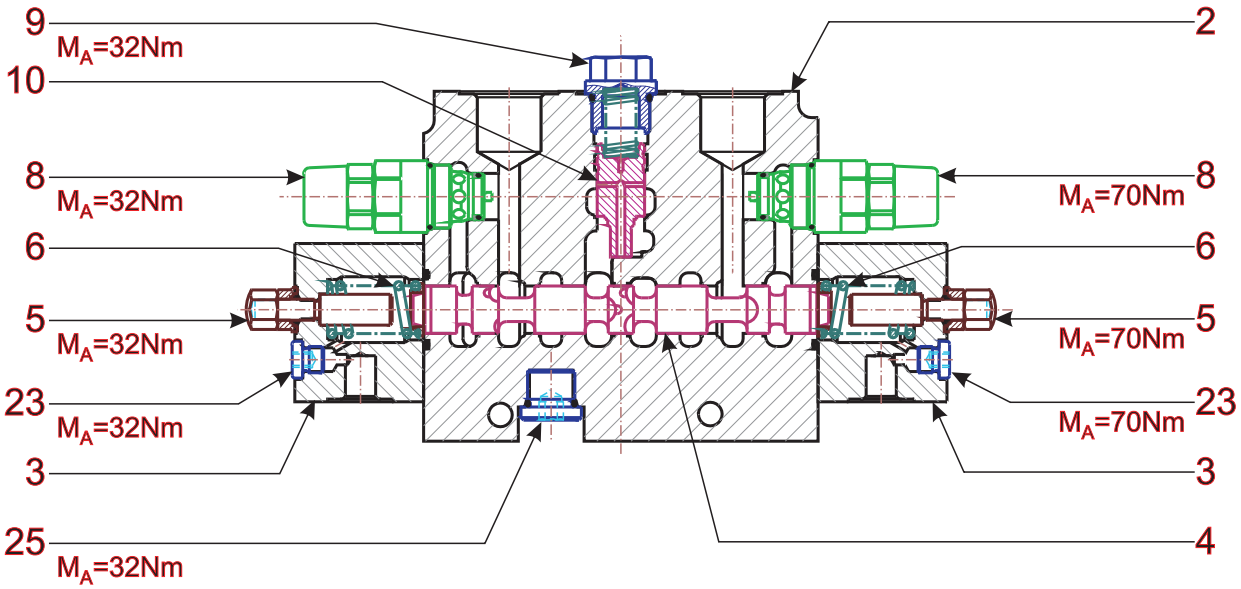
Typ Model Type Tipo	**SKL 200** (SKL 873)	**Steuerventil** **Valve bank** **Distributeur** **Válvula**	**M6-15**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**			Blatt Page Feuille Página	**5.213.03**

SCHNITTEBENEN **SURFACES OF CUT** **PLAN DE COUPES**

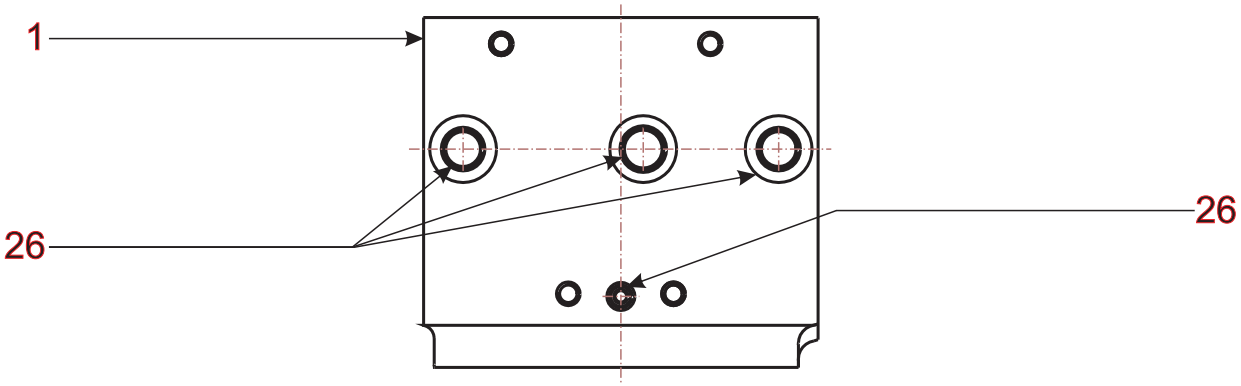


Typ Model Type Tipo	**SKL 200** (SKL 873)	**Steuerventil** **Valve bank** **Distributeur** **Válvula**	**M6-15**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**			Blatt Page Feuille Página	**5.213.04**

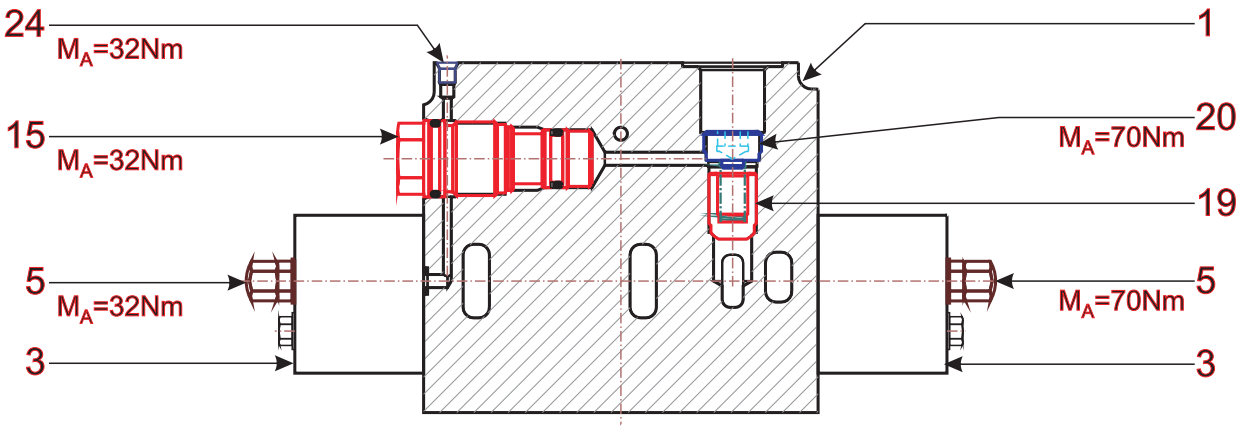
Option
H - H



J - J



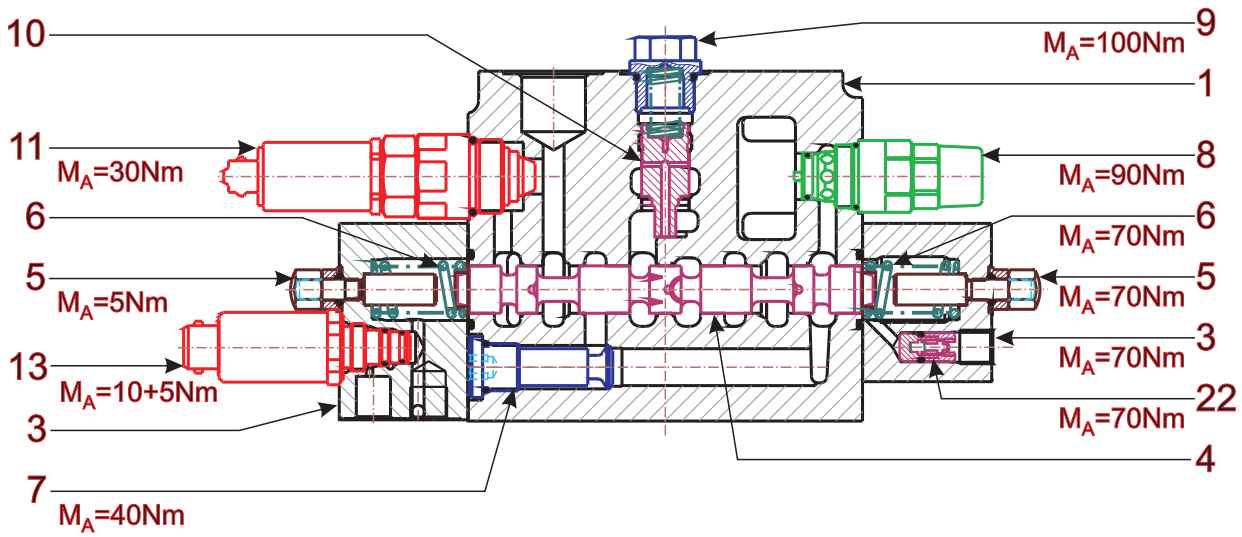
E - E (2x)



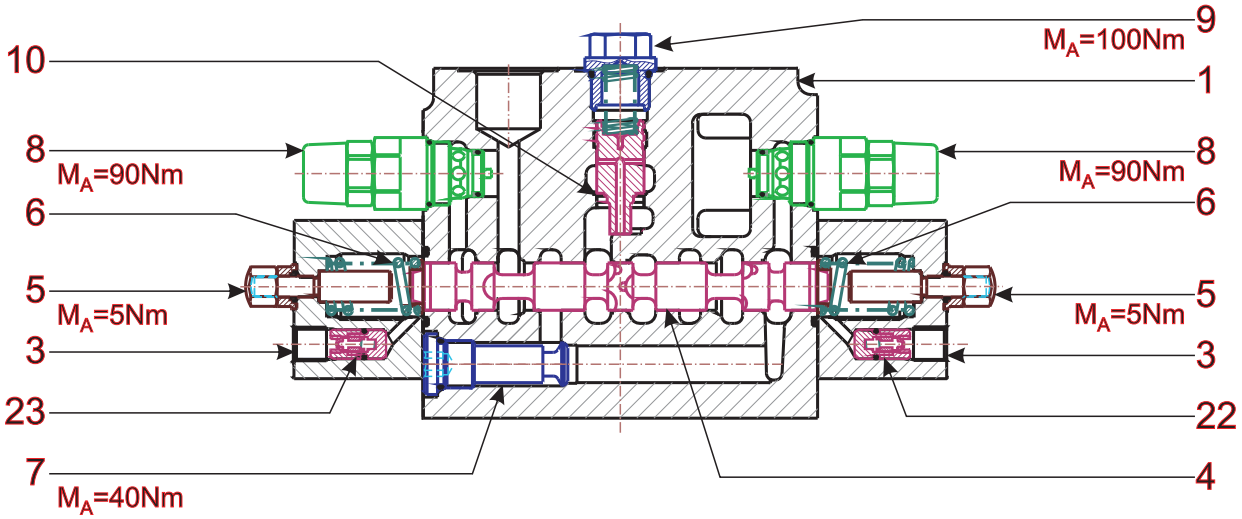
Typ Model Type Tipo	**SKL 200** (SKL 873)	**Steuerventil** **Valve bank** **Distributeur** **Válvula**	**M6-15**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**			Blatt Page Feuille Página	**5.213.05**

Pos. Item Rep. No.	Deutsch	English	Français
	BLOCKSTEUERGERAET	**VALVE BANK**	**DISTRIBUTEUR**
	4 M6-15	**4 M6-15**	**4 M6-15**
1	Steuerblock	Control block	Bloc distributeur
2	Wegeventilelement	Directional valve element	Elément de distribution
3	Deckel für hydraulische Betätigung mit Vorsteueranschluss	Cover for hydraulic operation with pilot operated connection	Capuchon pour commande hydraulique avec connexion à commande assistée
4	Steuerschieber	Main spool	Tiroir principale
5	Schieberwegbegrenzung	Spool stroke limitation	Limitation de course du tiroir
6	Rückstellfeder	Return spring	Ressort rappel
7	Rückschlagventil	Check valve	Clapet anti-retour
8	Sekundärventil	Secondary pressure relif valve	Clapet secondaire
9	Verschlussschraube	Plug	Bouchon
10	Druckwaage	Pressure compensator	Balance de pression
11	Schwimmstellungsventil	Floating position valve	Clapet position flottante
12	LS - Druckbegrenzungsventil	Load sensing pressure valve	Limiteur de pression LS
13	Druckminderventil	Pressure reducing valve	Soupape réductrice de pression
14	LS - Volumenstromregelventil	LS - flow regulator valve	Régulateur de débit LS
15	Sitzventil	Poppet valve	Soupappe
16	Verschlussschraube	Plug	Bouchon
17	Prioritätsschieber	Priority spool	Tirior prioritaire
18	Verschlussschraube	Plug	Bouchon
19	Rückschlagventil (entsperrbar)	Check valve (unlock able)	Clapet anti retour (antibloquage)
20	Duese	Nozzle	Injecteur
21	Wechselventil	Shuttle valve	Soupape selecteur
22	Drosselrückschlagventil	Throttle check-valve	Clapet anti-retour avec étrangleur
23	Verschlussschraube	Plug	Bouchon
24	Verschlussschraube	Plug	Bouchon
25	Verschlussschraube	Plug	Bouchon
26	O-Ring	O-ring	Joint torique

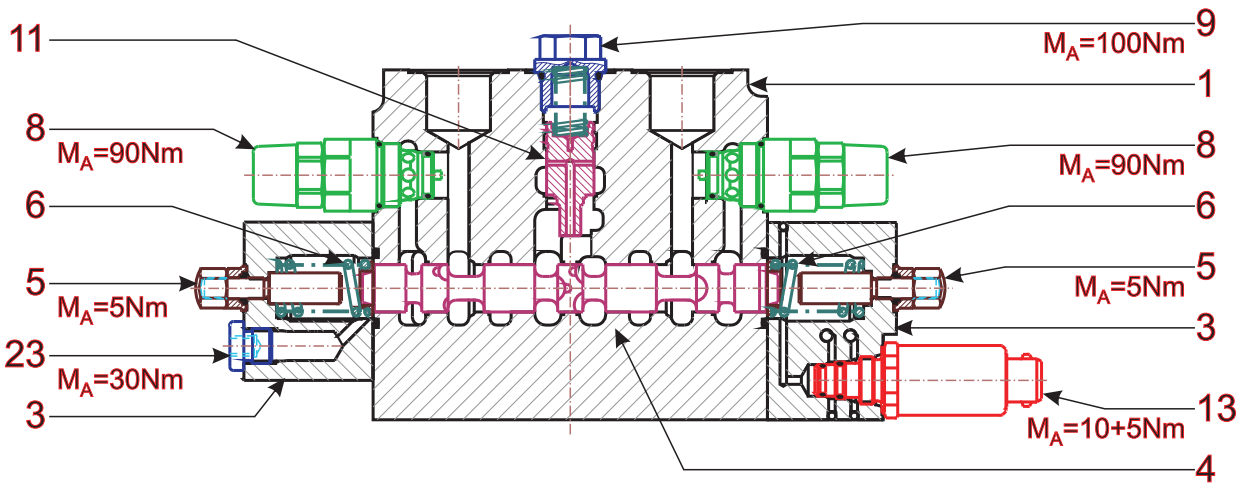
A - A



B - B



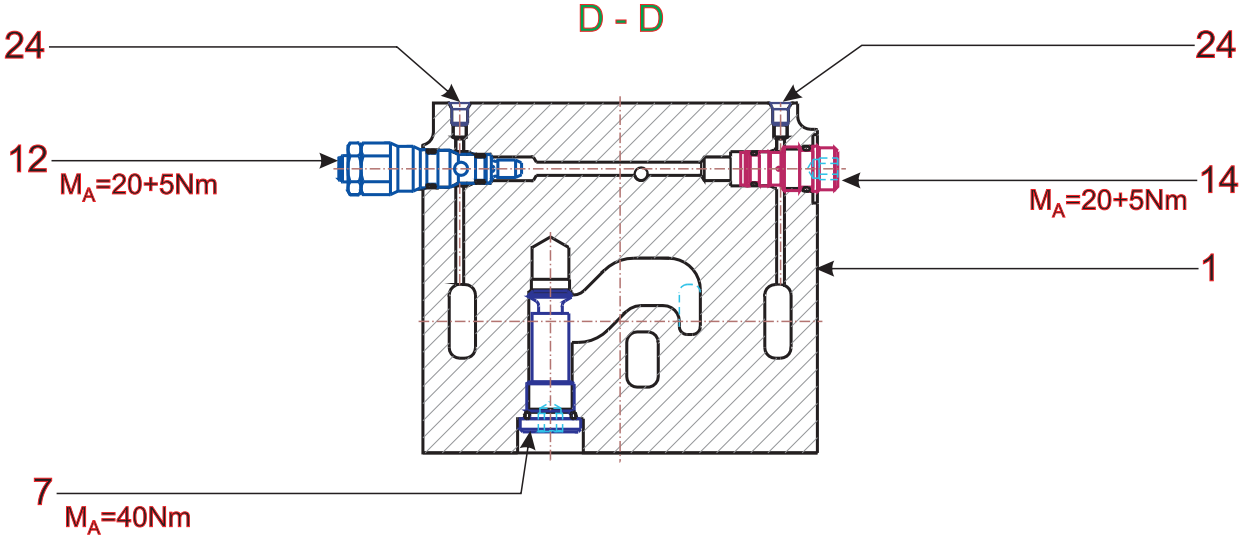
C - C



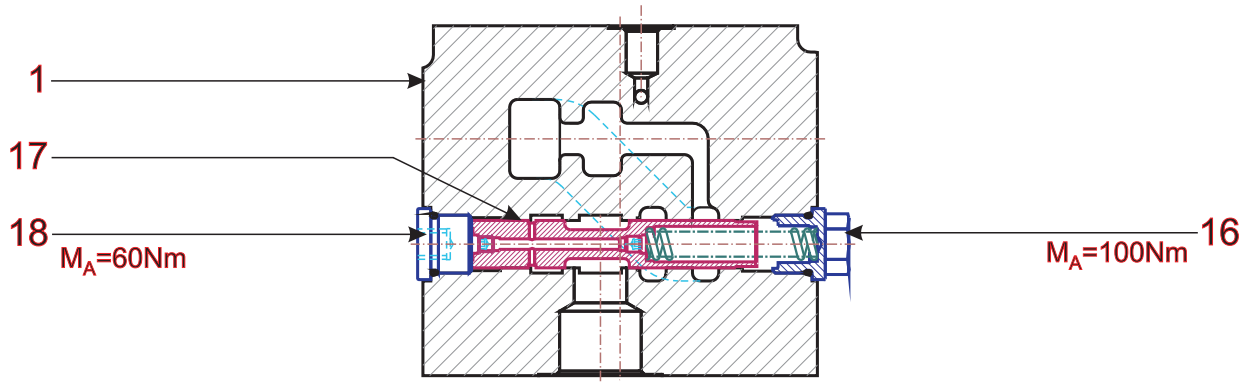
Typ Model Type Tipo	**SKL 200** (SKL 873)	**Steuerventil** **Valve bank** **Distributeur** **Válvula**	**M6-15**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**			Blatt Page Feuille Página	**5.213.07**

Pos. Item Rep. No.	Deutsch	English	Français
	BLOCKSTEUERGERAET	**VALVE BANK**	**DISTRIBUTEUR**
	4 M6-15	**4 M6-15**	**4 M6-15**
1	Steuerblock	Control block	Bloc distributeur
2	Wegeventilelement	Directional valve element	Elément de distribution
3	Deckel für hydraulische Betätigung mit Vorsteueranschluss	Cover for hydraulic operation with pilot operated connection	Capuchon pour commande hydraulique avec connexion à commande assisrée
4	Steuerschieber	Main spool	Tiroir principale
5	Schieberwegbegrenzung	Spool stroke limitation	Limitation de course du tiroir
6	Rückstellfeder	Return spring	Ressort rappel
7	Rückschlagventil	Check valve	Clapet anti-retour
8	Sekundärventil	Secondary pressure relif valve	Clapet secondaire
9	Verschlussschraube	Plug	Bouchon
10	Druckwaage	Pressure compensator	Balance de pression
11	Schwimmstellungsventil	Floating position valve	Clapet position flottante
12	LS - Druckbegrenzungsventil	Load sensing pressure valve	Limiteur de pression LS
13	Druckminderventil	Pressure reducing valve	Soupape réductrice de pression
14	LS - Volumenstromregelventil	LS - flow regulator valve	Régulateur de débit LS
15	Sitzventil	Poppet valve	Soupappe
16	Verschlussschraube	Plug	Bouchon
17	Prioritätsschieber	Priority spool	Tirior prioritaire
18	Verschlussschraube	Plug	Bouchon
19	Rückschlagventil (entsperrbar)	Check valve (unlock able)	Clapet anti retour (antibloquage)
20	Duese	Nozzle	Injecteur
21	Wechselventil	Shuttle valve	Soupape selecteur
22	Drosselrückschlagventil	Throttle check-valve	Clapet anti-retour avec étrangleur
23	Verschlussschraube	Plug	Bouchon
24	Verschlussschraube	Plug	Bouchon
25	Verschlussschraube	Plug	Bouchon
26	O-Ring	O-ring	Joint torique

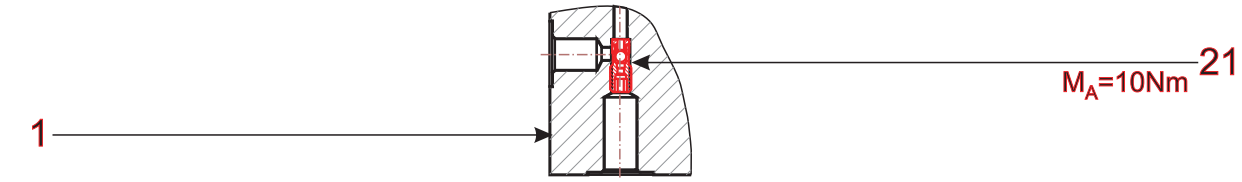
D - D



F - F



G - G



Typ Model Type Tipo	**SKL 200** (SKL 873)	**Steuerventil** **Valve bank** **Distributeur** **Válvula**	**M6-15**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**			Blatt Page Feuille Página	**5.213.09**

Pos. Item Rep. No.	Deutsch	English	Français
	BLOCKSTEUERGERAET	**VALVE BANK**	**DISTRIBUTEUR**
	4 M6-15	**4 M6-15**	**4 M6-15**
1	Steuerblock	Control block	Bloc distributeur
2	Wegeventilelement	Directional valve element	Elément de distribution
3	Deckel für hydraulische Betätigung mit Vorsteueranschluss	Cover for hydraulic operation with pilot operated connection	Capuchon pour commande hydraulique avec connexion à commande assistée
4	Steuerschieber	Main spool	Tiroir principale
5	Schieberwegbegrenzung	Spool stroke limitation	Limitation de course du tiroir
6	Rückstellfeder	Return spring	Ressort rappel
7	Rückschlagventil	Check valve	Clapet anti-retour
8	Sekundärventil	Secondary pressure relif valve	Clapet secondaire
9	Verschlussschraube	Plug	Bouchon
10	Druckwaage	Pressure compensator	Balance de pression
11	Schwimmstellungsventil	Floating position valve	Clapet position flottante
12	LS - Druckbegrenzungsventil	Load sensing pressure valve	Limiteur de pression LS
13	Druckminderventil	Pressure reducing valve	Soupape réductrice de pression
14	LS - Volumenstromregelventil	LS - flow regulator valve	Régulateur de débit LS
15	Sitzventil	Poppet valve	Soupappe
16	Verschlussschraube	Plug	Bouchon
17	Prioritätsschieber	Priority spool	Tirior prioritaire
18	Verschlussschraube	Plug	Bouchon
19	Rückschlagventil (entsperrbar)	Check valve (unlock able)	Clapet anti retour (antibloquage)
20	Duese	Nozzle	Injecteur
21	Wechselventil	Shuttle valve	Soupape selecteur
22	Drosselrückschlagventil	Throttle check-valve	Clapet anti-retour avec étrangleur
23	Verschlussschraube	Plug	Bouchon
24	Verschlussschraube	Plug	Bouchon
25	Verschlussschraube	Plug	Bouchon
26	O-Ring	O-ring	Joint torique

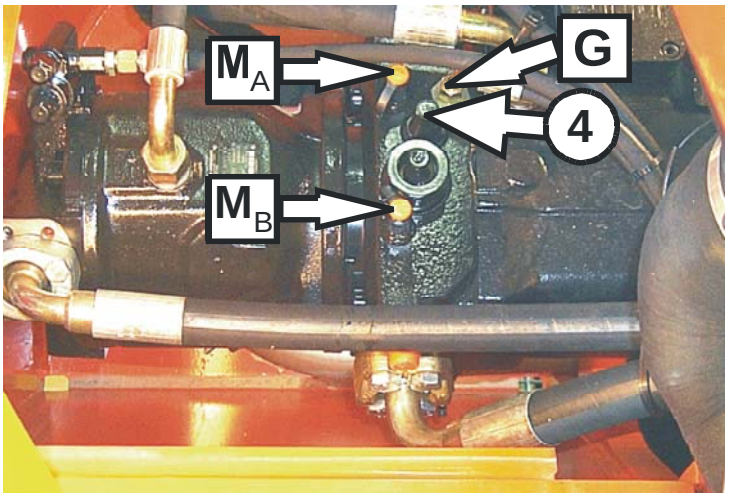
All checks and adjustments have to be carried out when the machine has reached service temperature

TRAVEL PUMP: Charge pressure ∗

Check : at high idle,
Put a 60 bar gauge at $\mathbf{M_A}$ or $\mathbf{M_B}$

Adjustment: at valve **4** (charge pressure) ∗

G = another test possibility for charge pressure and pilot pressure for working hydraulics.Mount test port here.



TRAVEL PUMP: Neutral position

Test**:** in low idle,put a 60 bar gauge at $\mathbf{M_A}$ and $\mathbf{M_B}$,
both pressures must be identical

Adjustment: set screw **5**

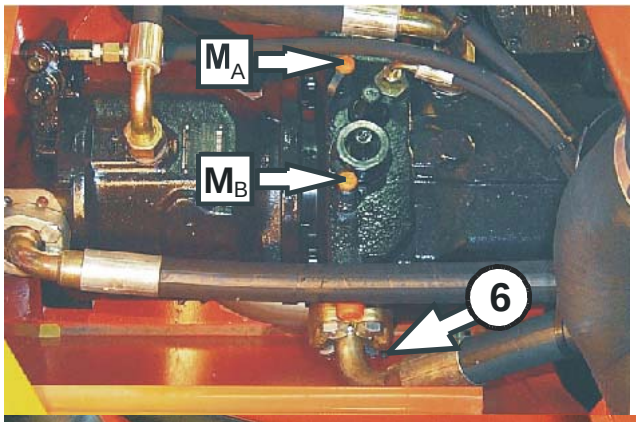
∗ Adjustment values: see chapter 2 technical data resp. chapter. 8 test certificate

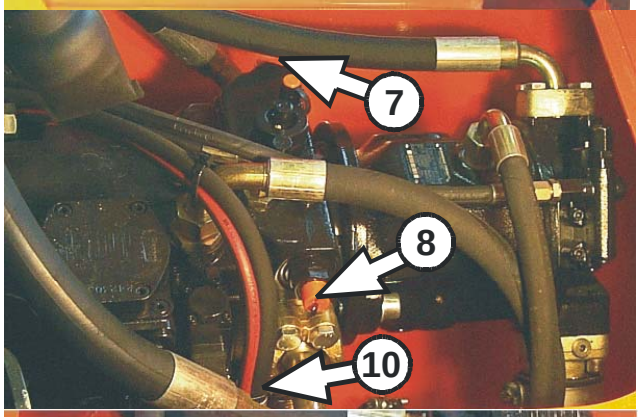
TRAVEL PUMP: High pressure ∗
(Savety valves forward/ reverse)

Test: Turn pressure cut-off set screw **6** until mechanical stop (clockwise).
Put a 600 bar gauge at $\mathbf{M_A}$ resp.at $\mathbf{M_B}$.
Drive machine against a solid object,
the wheels must be locked.
Give full throttle. Read the pressures. ∗
Adjustment: safety valve **7** resp. **8** ∗

Following adjust the pressure cut-off valve **6**:
Put a 600 bar gauge at $\mathbf{M_A}$ resp.at $\mathbf{M_B}$.
Drive machine against a solid object,
the wheels must be locked.
Give full throttle. Read the pressures ∗

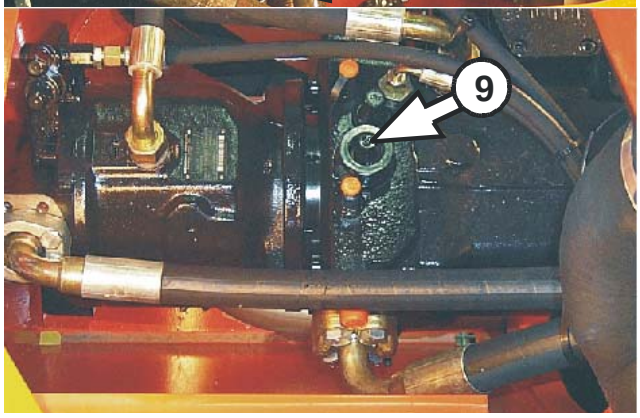
Adjustment: cut-off valve **6** ∗





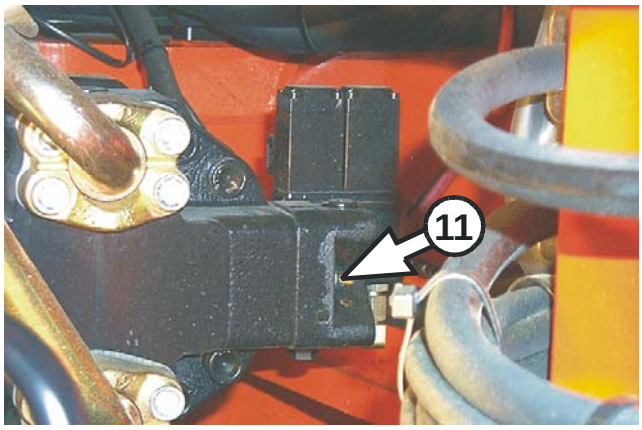
TRAVEL PUMP: Start-up speed ∗

Test: place maschine on even ground ,
put an appropriate speedometer to the diesel engine.
Slowly press the accelerator pedal,
then read the engine rpms when the machine starts moving.
Adjustment: set screw at valve **9**
(turning in = clockwise: starting later)



TRAVEL PUMP: Engine stallspeed ∗

*Test***:** put an appropriate speedometer to the diesel engine.
Put a 600 bar gauge at $\mathbf{M_A}$ (travel forward).
Remove the brake inching hose **10** and plug.
Turn the regulation start set screw **11** one turn clockwise . The travel motor is not allowed to regulate.
Engage “rabbit“ and give full throttle
Attention,respect the traffic !
Press the brake pedal until the pressure value is reached ∗ , read the rpms ∗



Adjustment: Set screw at valve **9**
Respect start-up speed!
Turn the regulation start set screw **11** into initial position (anti-clockwise), mount brake inching hose again.

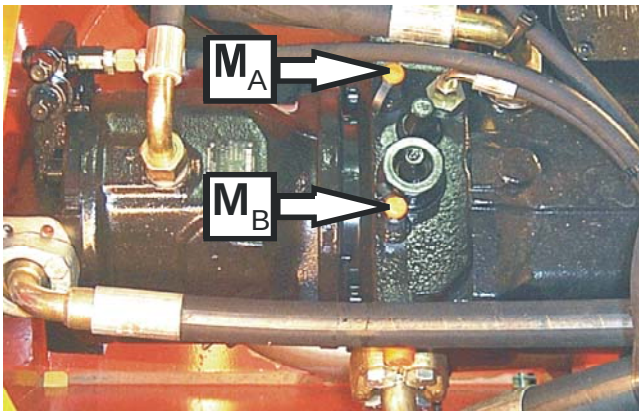
∗ Adjustment values:see chapter 2 technical data resp. chapter 8 test certificate

TRAVEL MOTOR: Regulation start

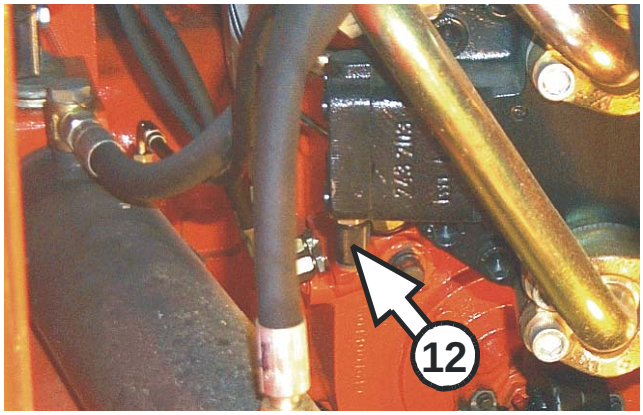
Test :put a 600 bar gauge at high pressure test port forward **M_A**.at the travel pump.
Put another 600 bar gauge at test port regulation start **12** of the travel motor.
Remove the brake inching hose **10** (see page 5.213.12) and plug. Place both gauges into the driver's cab, they have to be supervised during travel. Engage „rabbit" and give full throttle.

Attention, respect the traffic!

Apply the brake inching pedal slowly, the high pressure at both gauges will increase.
When the desired value ∗ at the gauge at the test port **M_A** is reached, the regulation start pressure has to decrease.



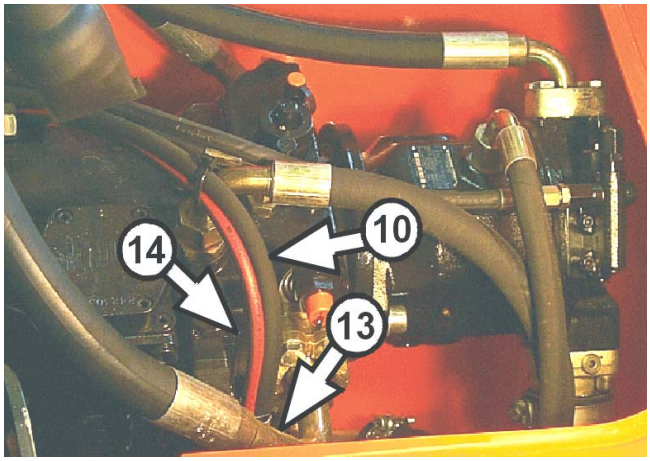
Adjustment: regulation start set screw **11** (see 5.213.12) at travel motor
Mount brake inching hose (see 5.213.12) again.



TRAVEL PUMP: Brake inching valve

Test: Mount a 60 bar gauge at the brake inching valve test port **13.**
At a brake pressure of approx. 5 bar the speed of the machine must decrease.
Reaching a brake pressure of approx.13 bar, the machine has to come to a complete standstill.

Adjustment: Set screw at brake inching valve **14**



∗ Adjustment values: see chapter 2 technical data resp. chapter 8 test certificate

All checks and adjustments have to be carried out when the machine has reached service temperature

STEERING:
Test: Put a 600 bar gauge at test port **15** .
Start the engine, increased idle.
Turn the steering to mechanical stop
Read the pressure

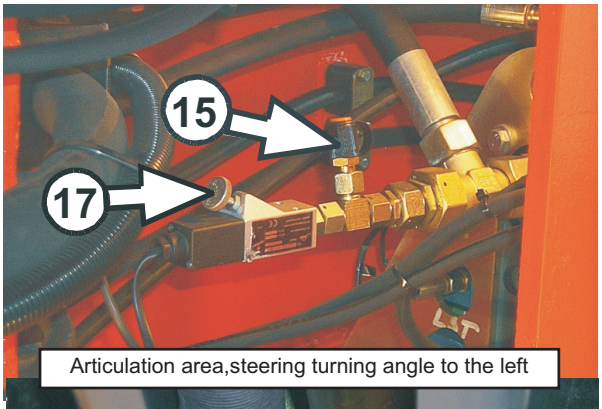
Adjustment: Remove plug **16** to acces to the main relief valve underneath .

WORKING HYDRAULICS: LS-valve
Test: Put a 600 bar gauge at test port **15** .
Start the engine, increased idle.
Tilt the bucket in, resp. raise loader arm completely up to mechanical stop.
Read the pressure
Adjustment: LS-valve **20** at control valve

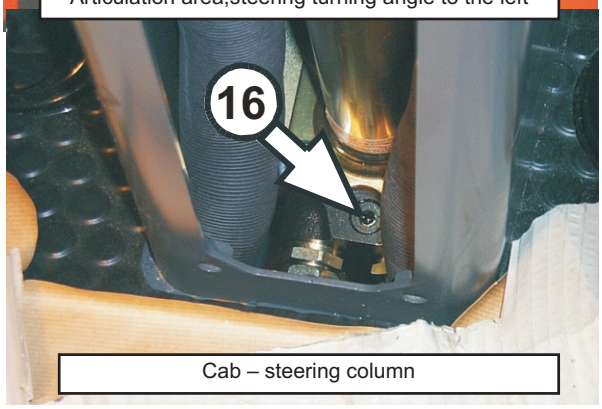
WORKING HYDRAULICS: Secundary relief valves
Test:Turn LS-valve set screw **20** ½ turn clockwise.
Operate all functions to its mechanical stops.
Read the pressures
Adjustment: Secundary relief valves **21** at control valve.Reset LS-valve **20** .

WORKING HYDRAULICS: Variable displacement pump
Check stand-by pressure :
Put a 60 bar gauge at test port **15** .
Give full throttle, **do not operate any function,** read the pressures
Adjustment: Regulator valve **18** at variable displacement pump.

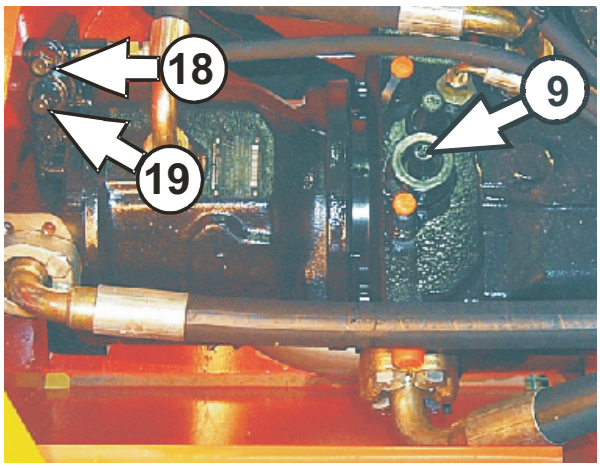
Check safety valve:
Put a 600 bar gauge at test port **15** .
Turn LS-valve set screw **20** ½ turn clockwise. Lower lifting frame until mechanical stop. Read the pressure
Adjustment:. Regulator valve **19** at variable displacement pump.
Reset LS-valve **20.**

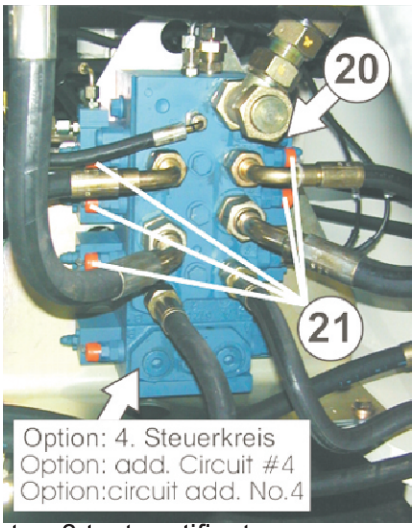


Articulation area,steering turning angle to the left



Cab – steering column





Adjustment values: see chapter 2 technical data resp. chapter. 8 test certificate

	Typ/Model/Type	Datum/Edition/Date
	SKL 200 (SKL 873)	**01.2007**
	Benennung/Description/Dénomination	Blatt/Page/Feuille
	Setting instruction **Steering and working hydraulic**	**5.213.14**

All checks and adjustments have to be carried out when the machine has reached service temperature

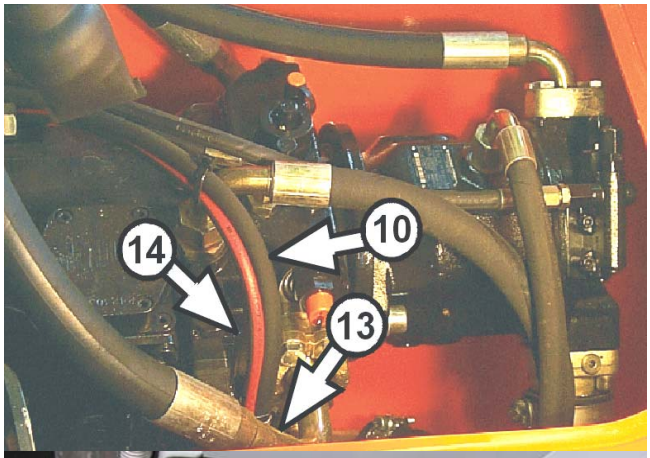
BRAKE HYDRAULIC:
Test : Put a 200 bar gauge at test port **13** (Travel pump – Inching valve).
Start the engine, increased idle.
Press the brake pedal down until mechanical stop is reached.
Read the pressure ∗

Adjustment : brake pedal rod **1** under cab floor.

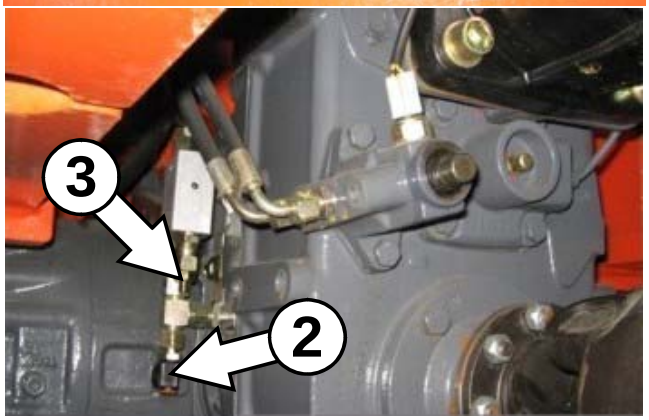
BRAKE HYDRAULIC:
Pressure sequence valves
Test : Put a 60 bar gauge at test port **2** at the pressure sequence valve of front and rear axle.
Start the engine, increased idle.
Press the brake pedal down until mechanical stop is reached.
Read the pressure ∗

Adjustment: Set screw **3** at pressure sequence valve at front - and rear axle.

Adjust pressure sequence valves at front and rear axles.

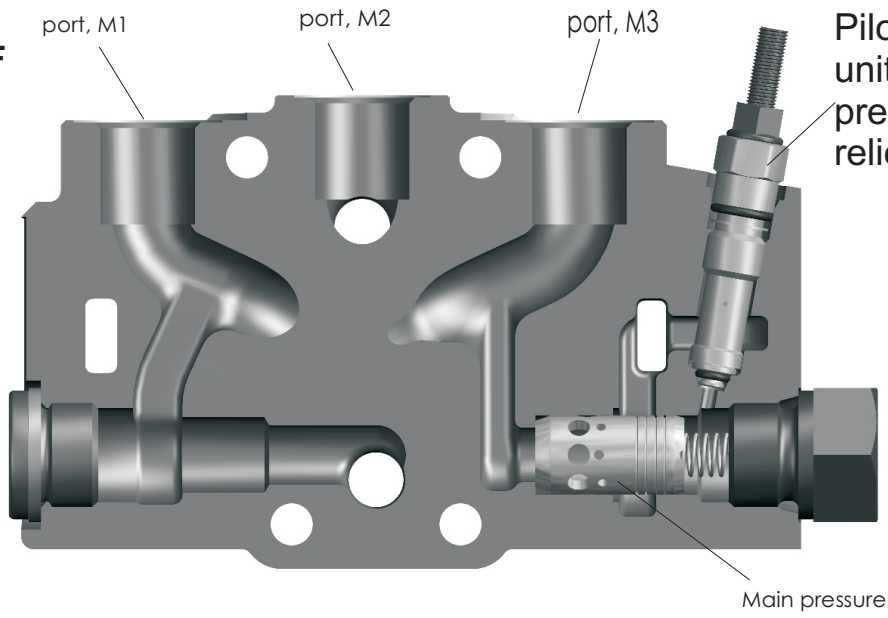




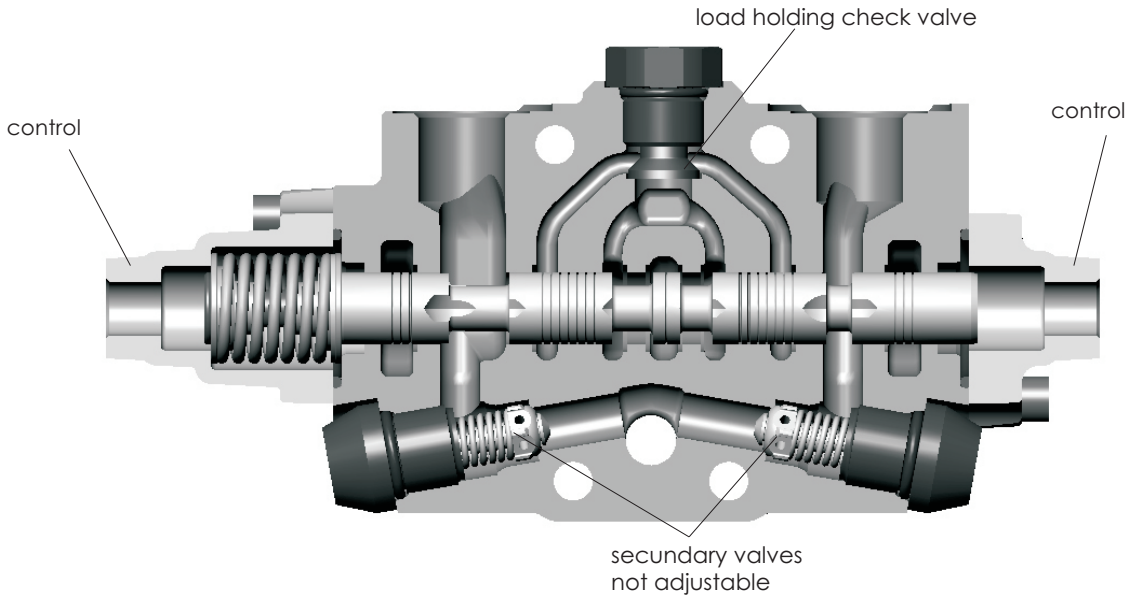


∗ Adjustment values see chapter 2 technical data or chapter 8 test certificate

Contol valve Parker P 70 CF inletsection

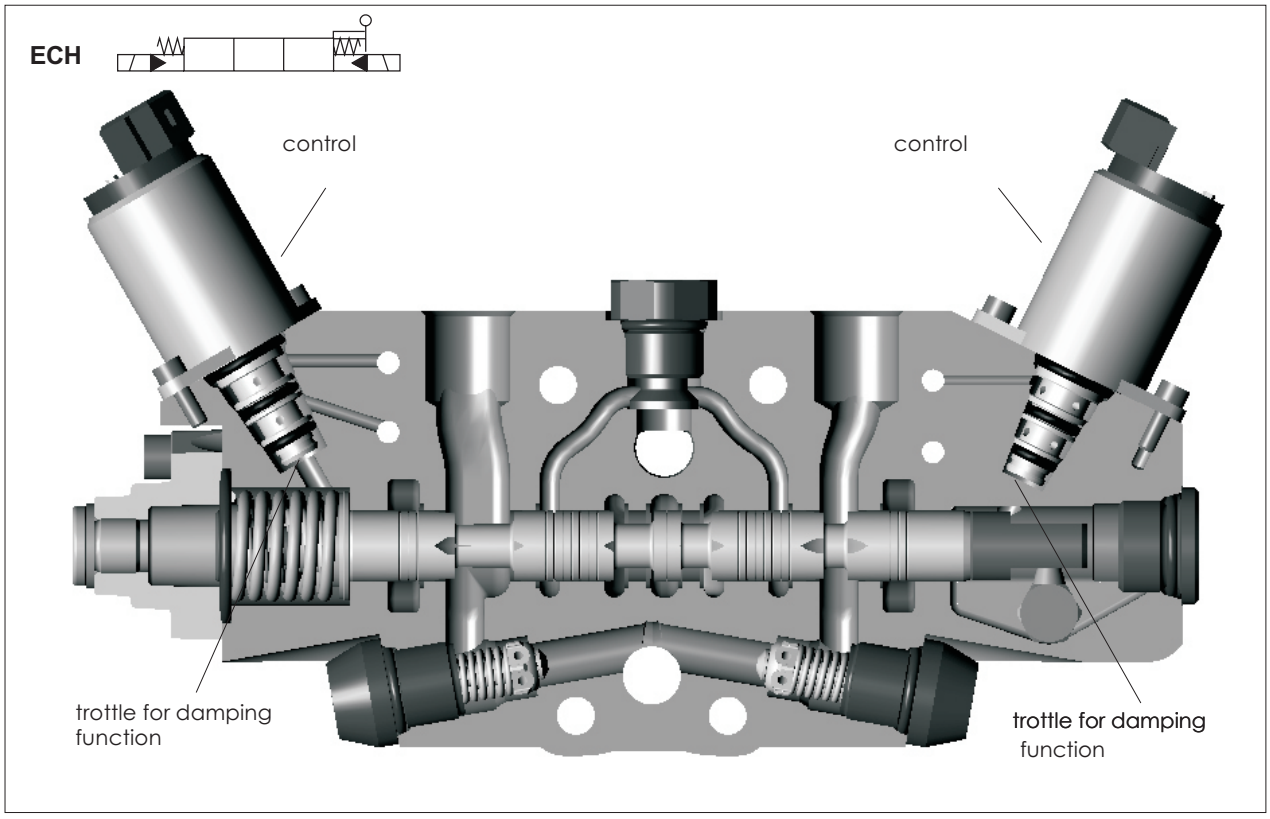


PC

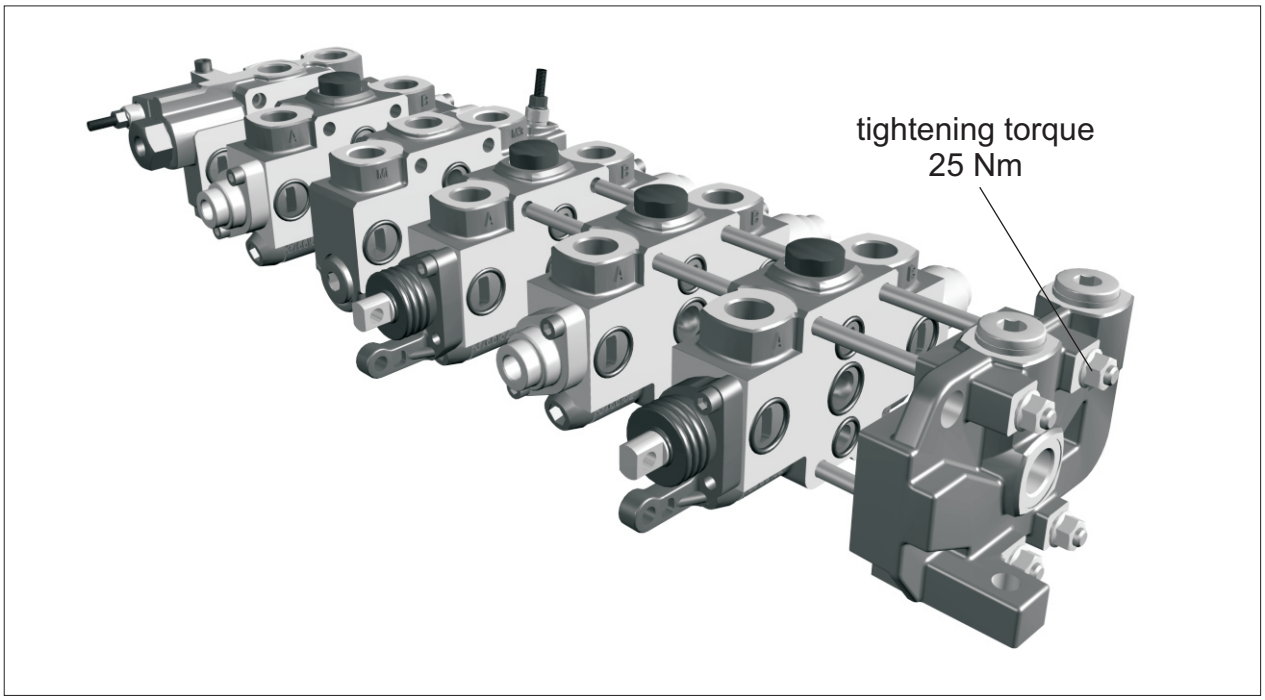


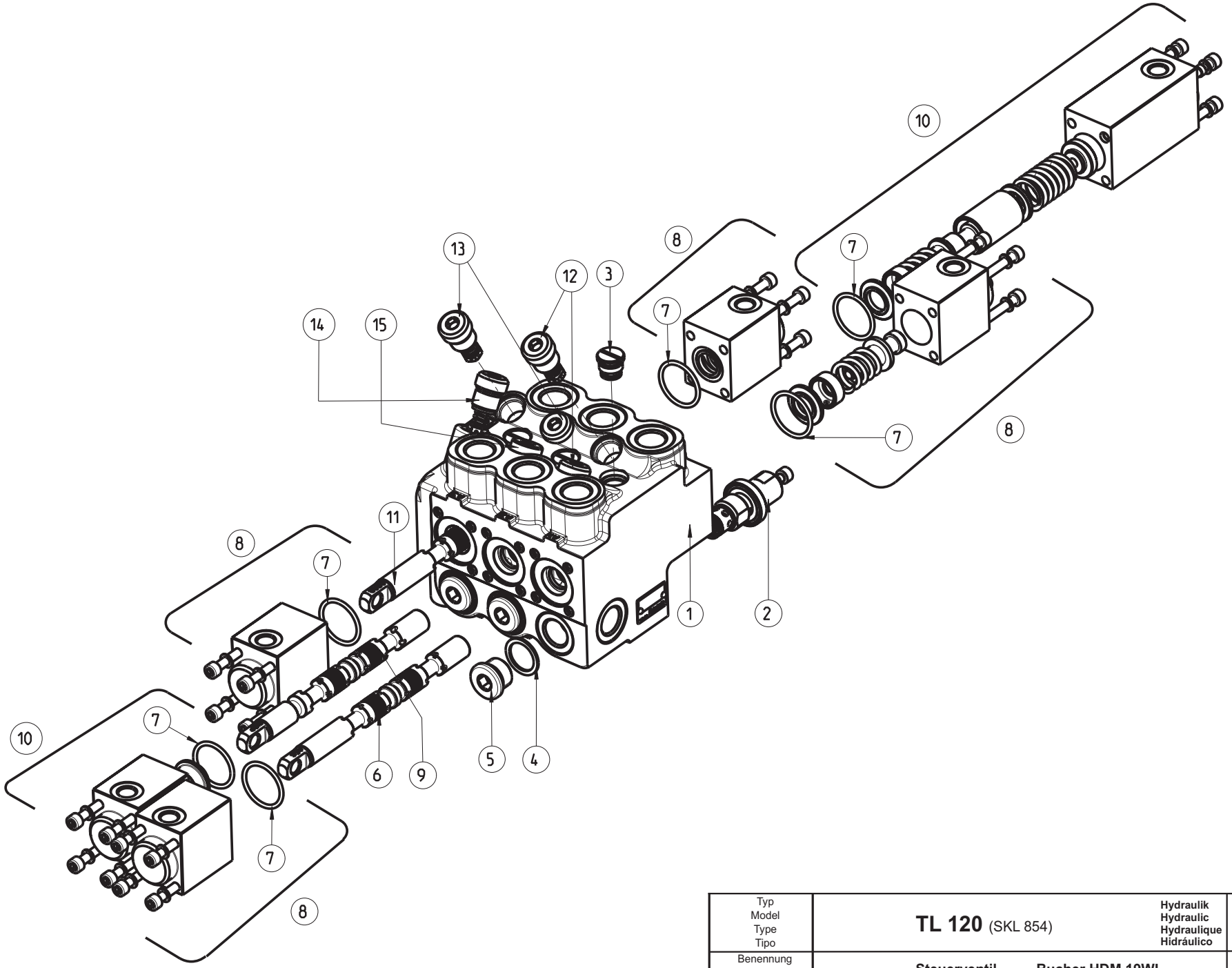
propotional remote controlled spool operation with closed spool end

Typ Model Type Tipo	**TL 65 - 80 - 100 - 120**	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Steuerventil Parker P 70 CF** **Valve bank Parker P 70 CF** **Distributeur Parker P 70 CF**		Blatt Page Feuille Página	**5.224.01**



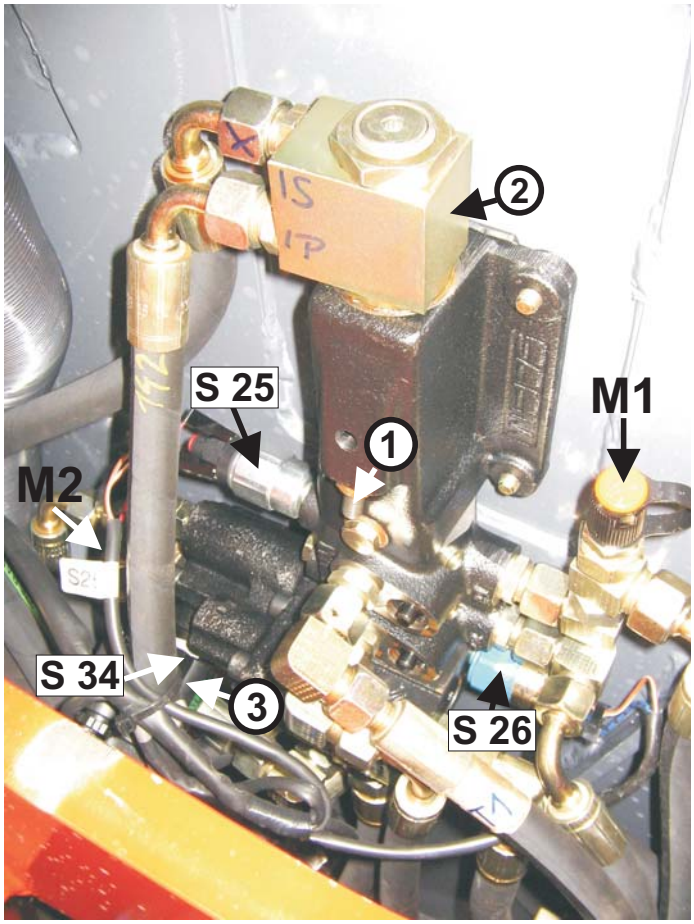
propotional remote spool control, closed spool end with possibility for manual operation

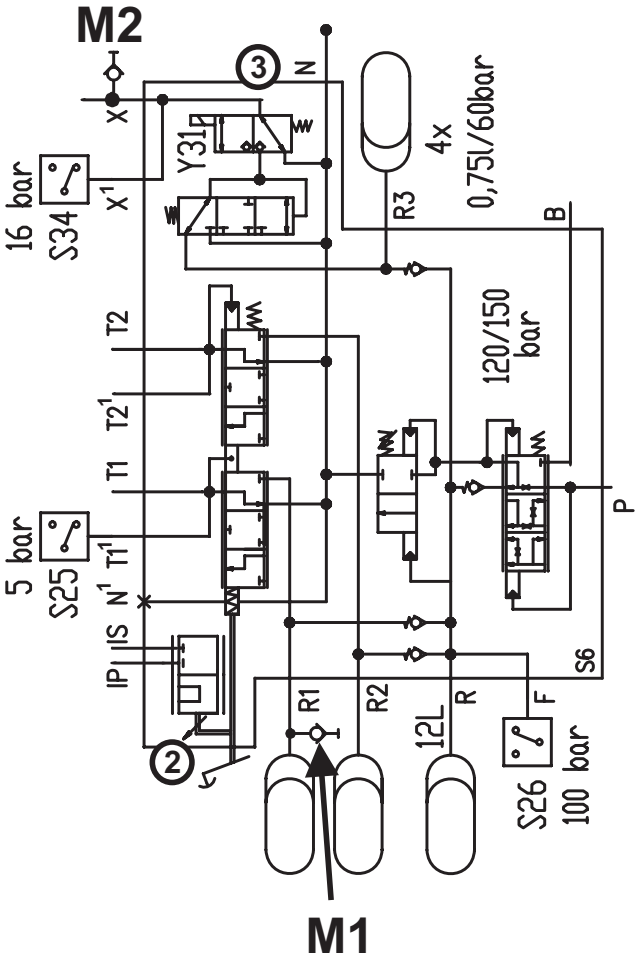


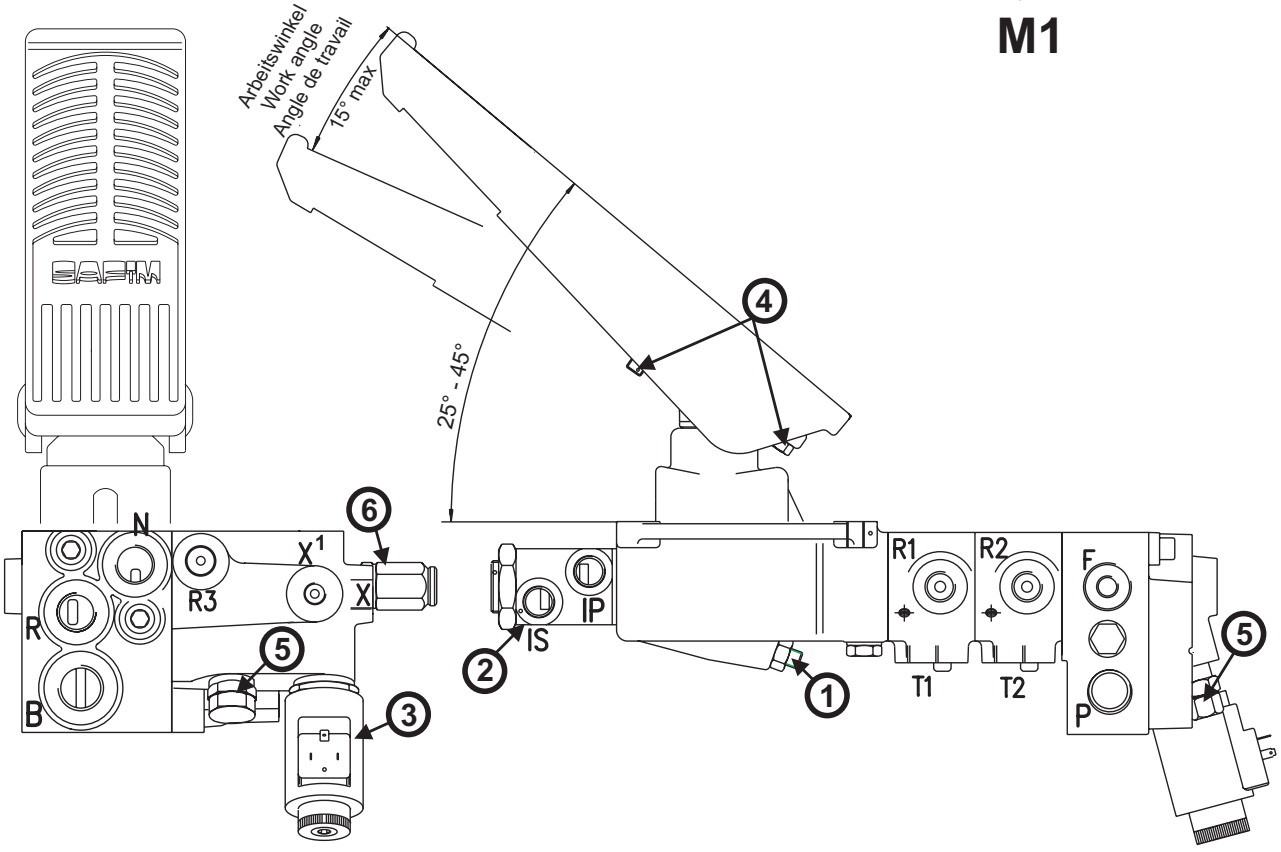


Typ Model Type Tipo	**TL 120** (SKL 854) **Hydraulik** **Hydraulic** **Hydraulique** **Hidráulico**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Steuerventil** **Bucher HDM 19WL** **Control valve** **Distributeur**	Blatt Page Feuille Página	**5.227.01**

Ref.	Benennung	Description	Note	Q.ty
1	Steuerventil kpl.	Control valve HDM19WL/3 K302 ½”	COMPLEWTE WITH CHECK VALVE	1
2	Hauptüberdruckventil	Main relief valve VMP02 T.100-270 MAX VALVE		1
3	Lasthalte-Rückschlagventil	Check valve HDS10		3
4	Dichtscheibe	Washer (sealed) 21.3X27.5X1.50		3
5	Stopfen	Plug TCEI 1/2” G DIN908ST ZG		3
6	Steuerschieber (Zusatz)	Type Spool HDM19WL A5S		1
7	O - Ring	O-ring 3118 029.82X2.62 NBR90		6
8	Vorsteuerkappe kpl.	Pilot control cap (complete) HDM19WL POSIT. 50 HP		2
9	Steuerschieber (Hubrahmen)	Type Spool HDM19WL W5P		1
10	Vorsteuerkappe kpl. (Schwimmst.)	Pilot control cap (floating position) HDM19WL POSIT. 52 HP		1
11	Steuerschieber (Schaufel)	Type Spool HDM19WL R5RB		1
12	Sekundärventil (230 bar Zusatz)	Secondary (safety) valve 230 bar HDM19WL T.230		2
13	Sekundärventil (280 bar heben, einkippen)	Secondary valve 280 bar Lifting, shovel in HDM19WL T.280		2
14	Sekundärventil (130 bar auskippen)	Secondary valve 130 bar Dump out HDM19WL T.130		1
15	Nachsaugventil (Hubrahmen senken)	Anticavitation valve C/A-C/B HDM19WL		1



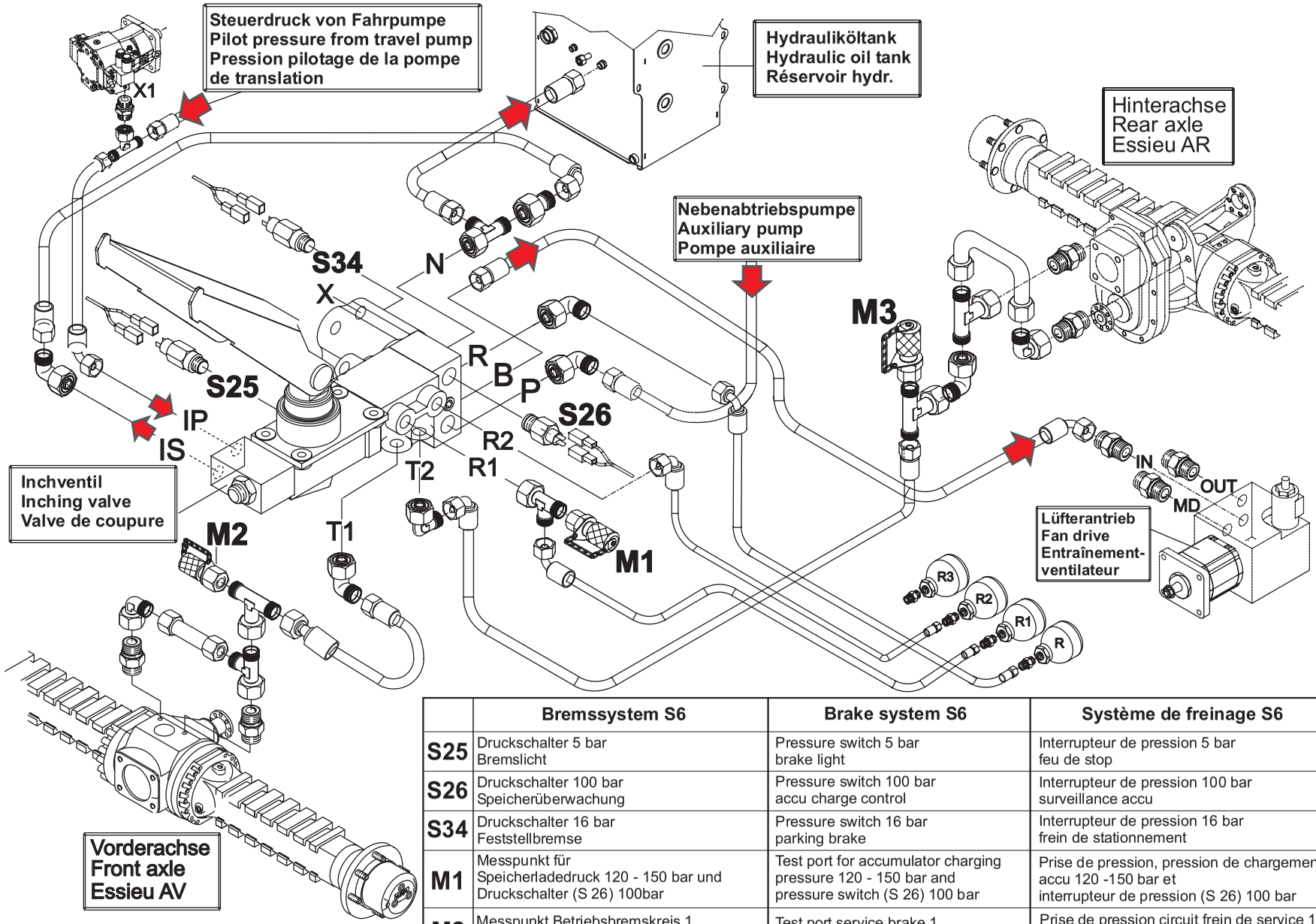




Typ Model Type	**TL 160 - 260**	**Bremssystem S6** **Brake system S6** **Système de freinage S6**	Datum Edition Date	**01.2008**
Benennung Description Dénomination	**Einstellanweisung** **Setting instructions** **Instructions de réglage**		Blatt Page Feuille	**5.228.05**

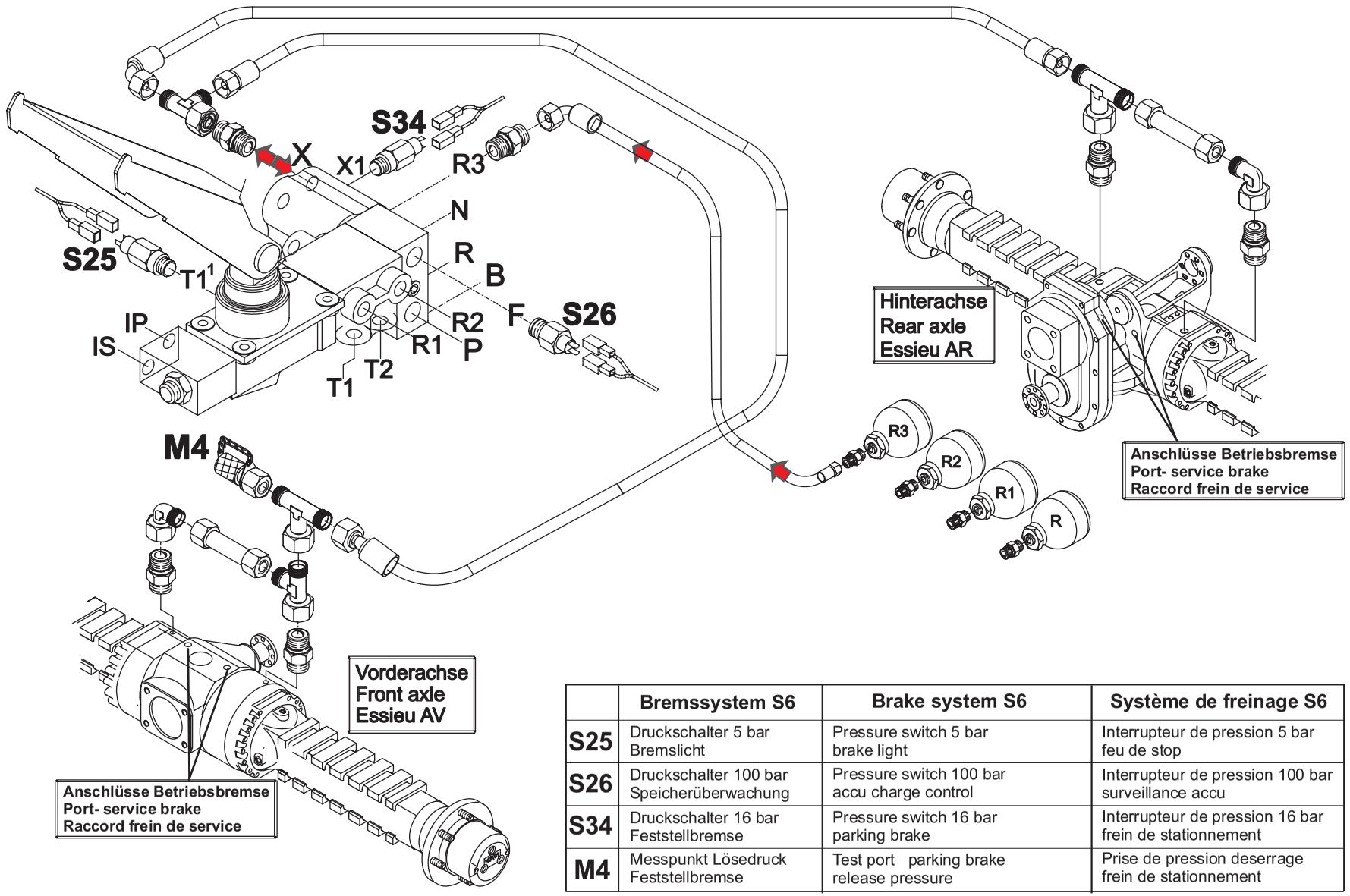
Pos. Item Rep. No.	Deutsch	English	
	Bremssystem S6	**Brake system S6**	
1	Einstellschraube Bremsdruck	Set screw - brake pressure	
2	Inchventil	Inching valve	
3	Magnetventil Y 31 Feststellbremse	Solenoid valve Y 31 parking brake	
4	Pedallageneinstellung	Pedal position adjustment	
5	Einstellschraube Lösedruck Federspeicherbremse	Set screw - release pressure negative brake	
6	Einstellschraube Speicher-füllventil	Set screw - accumulator charge valve	
S25	Druckschalter 5 bar Bremslicht	Pressure switch - 5 bar brake light	
S26	Druckschalter 100 bar Speicherüberwachung	Pressure switch - 100 bar charge pressure control	
S34	Druckschalter 16 bar Feststellbremse	Pressure switch - 16 bar parking brake	
M1	Messpunkt Speicherlade-druck	Test port - accumulator charge pressure	
M2	Messpunkt Lösedruck Fest-stellbremse	Test port - release pressure parking brake	
R	Druckspeicher für Lade-druck 120 - 150 bar	Accumulators - charge pressure 120 - 150 bar	
R1	Druckspeicher für Brems-kreis 1 Vorderachse	Accumulator for brake circuit 1 - front axle	
R2	Druckspeicher für Brems-kreis 2 Hinterachse	Accumulator for brake circuit 2 - rear axle	
R3	Druckspeicher für Feststellbremse	Accumulator for parking brake	

Typ Model Type	TL 160
Benennung Description Dénomination	Bremssystem S6 Brake system S6 Système de freinage S6
Einstellanweisung Setting instructions Instructions de réglage	Betriebsbremse Service brake Frein de service
Datum Edition Date	01.2008
Blatt Page Feuille	5.228.11

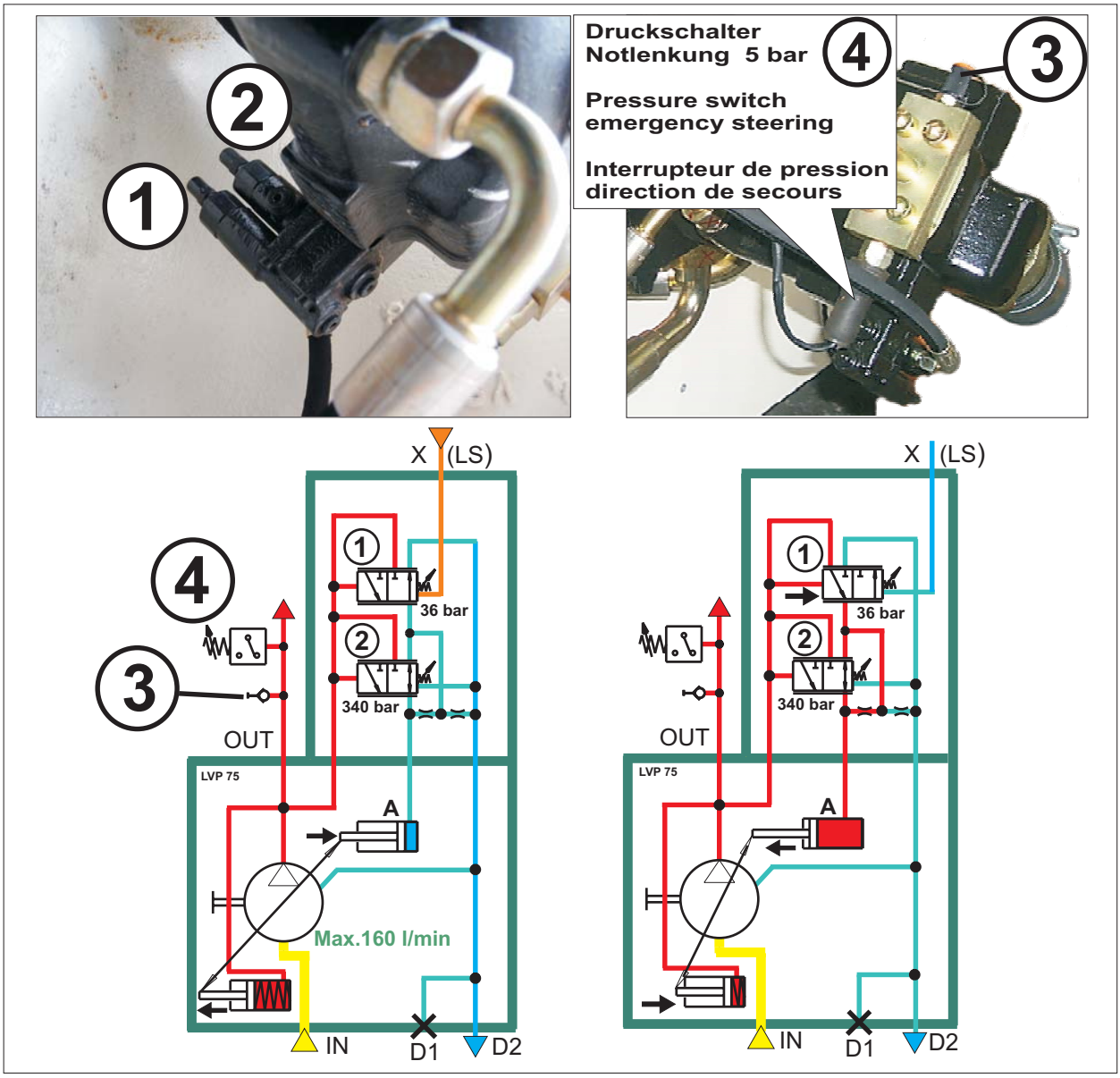


	Bremssystem S6	Brake system S6	Système de freinage S6
S25	Druckschalter 5 bar Bremslicht	Pressure switch 5 bar brake light	Interrupteur de pression 5 bar feu de stop
S26	Druckschalter 100 bar Speicherüberwachung	Pressure switch 100 bar accu charge control	Interrupteur de pression 100 bar surveillance accu
S34	Druckschalter 16 bar Feststellbremse	Pressure switch 16 bar parking brake	Interrupteur de pression 16 bar frein de stationnement
M1	Messpunkt für Speicherladedruck 120 - 150 bar und Druckschalter (S 26) 100bar	Test port for accumulator charging pressure 120 - 150 bar and pressure switch (S 26) 100 bar	Prise de pression, pression de chargement accu 120 -150 bar et interrupteur de pression (S 26) 100 bar
M2	Messpunkt Betriebsbremskreis 1 Vorderachse 30 +5 bar	Test port service brake 1 front axle 30 +5 bar	Prise de pression circuit frein de service 1 essieu AV 30 +5 bar
M3	Messpunkt Betriebsbremskreis 2 Hinterachse 30 +5 bar	Test port service brake 2 rear axle 30 +5 bar	Prise de pression circuit frein de service 2 essieu AR 30 +5 bar

Typ Model Type	TL 160
Benennung Description Dénomination	Bremssystem S6 Brake system S6 Système de freinage S6
Einstellanweisung Setting instructions Instructions de réglage	Feststellbremse Parking brake Frein de stationnement
Blatt Page Feuille	5.228.12
Datum Edition Date	01.2008



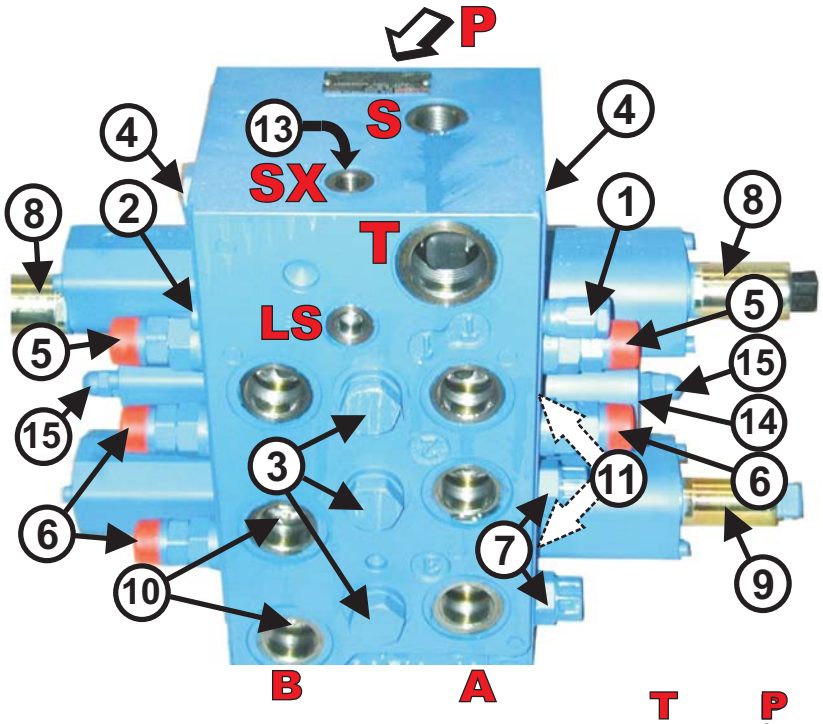
	Bremssystem S6	Brake system S6	Système de freinage S6
S25	Druckschalter 5 bar Bremslicht	Pressure switch 5 bar brake light	Interrupteur de pression 5 bar feu de stop
S26	Druckschalter 100 bar Speicherüberwachung	Pressure switch 100 bar accu charge control	Interrupteur de pression 100 bar surveillance accu
S34	Druckschalter 16 bar Feststellbremse	Pressure switch 16 bar parking brake	Interrupteur de pression 16 bar frein de stationnement
M4	Messpunkt Lösedruck Feststellbremse	Test port parking brake release pressure	Prise de pression deserrage frein de stationnement

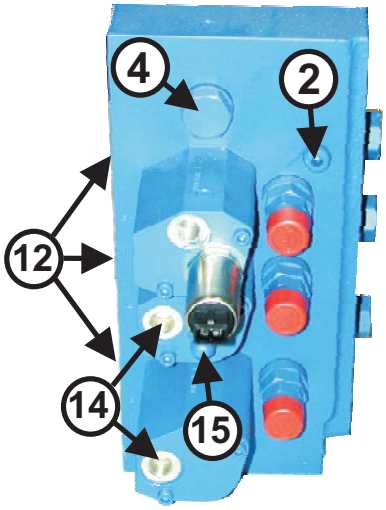


Steering and Working pump Casappa LVP 75:
Diagramm right**:** Diesel engine to be started, no function operated jet.
At stopped engine the displacement pump is at max. flow.
As soon as the engine is started, the power regulator **(1)** is pushed to the right hand side.
Then the actuation piston **(A)** is linked at the piston side to pressure port **(P)**. The pump will be displaced to minimum flow, until the adjusted Stand-by pressure of 36 bar is reached at the power regulator **(1)**. This pressure will be hold.
Diagramm left**:** Steering or Working function operated. The power regulator **(1)** is pushed to the left hand side because of the pressure signal coming via the X port (LS) to the spring feather side of the power regulator **(1)**. Then, the piston side of the actuation piston is switched via port **(D2)** to tank, the displacement pump moves to maximum flow.

SETTING INSTRUCTION PUMP:
Bring machine to service temperature (50 - 60°C hydraulik oil - temp.)
Connect 60 bar pressure gauge to the **P** outlet **(3)** of the pump. Start up diesel engine, set engine to high idle. **DO NOT OPERATE ANY FUNCTION !!!** Check the pressure at the gauge, it should be at 36 bar! If not, please readjust the power regulator **(1)** at the pump.
The second regulator **(2)** is the safety valve of the pump, set to 340 bar. Under normal conditions this safety valve is not in use. The working pressure is usually limited by the load sensing cut off valve at the control valve 3M6. To check safety valve regulator **(2)**, connect 600 bar pressure gauge to the **P** outlet **(3)** of the pump, then you'll have to set the LS cut off valve at the control valve to a higher pressure setting. Then actuate lifting frame down into its end stroke, check the pressure at the gauge **(3).**

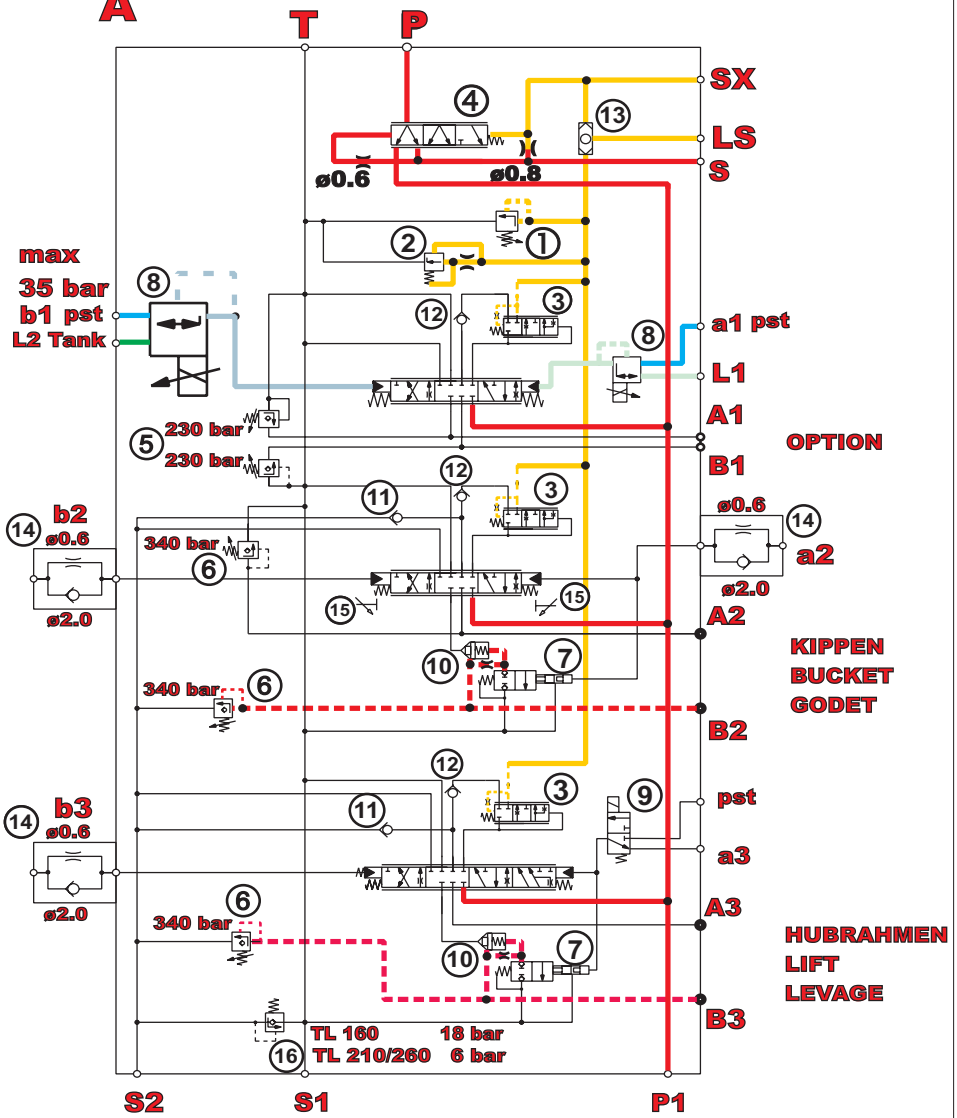
Typ Model Type Tipo	**TL 210-260**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Funktions- und Einstellanweisung Verstellpumpe Casappa LVP 75**	Blatt Page Feuille Página	**5.230.01**





① **LS-Druckabschneider**
LS-Pressure cut off

TL 160	310 bar
TL 210	270 bar
TL 260	310 bar



Alle Funktionen
All functions
Toutes fonctions

TL 160 Q = 100 L/min
TL 210 Q = 160 L/min
TL 260 Q = 160 L/min

Typ Model Type Tipo	**TL 160 - 210 - 260**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Steuerventil 3M6-15** **Valve bank 3M6-15** **Distributeur 3M6-15**	Blatt Page Feuille Página	**5.230.02**

Pos. Item Rep. No.	Deutsch	English	Français
	STEUERVENTIL	**VALVE BANK**	**DISTRIBUTEUR**
	3 M6-15	**3 M6-15**	**3 M6-15**
1	LS - Druckbegrenzungsventil 310 bar	Load sensing pressure valve 310 bar	Limiteur de pression LS 310 bar
2	LS - Volumenstromregelventil nicht einstellbar	LS - flow regulator valve not adjustable	Régulateur de débit LS non réglable
3	Sektionsdruckwaage	Pressure compensator	Balance de pression
4	Prioritätsschieber	Priority spool	Tiroir prioritaire
5	Sekundärventil 230 bar	Secondary pressure relief valve 230 bar	Clapet secondaire 230 bar
6	Sekundärventil 340 bar	Secondary pressure relief valve 340 bar	Clapet secondaire 340 bar
7	Sitzventil	Poppet valve	Valve à clapet
8	Druckminderventil proportional	Proportional pressure reducing valve	Réducteur de pression proportionnel
9	Schwimmstellungsventil	Floating position valve	Clapet position flottante
10	Rückschlagventil (entsperrbar)	Check valve (unlockable)	Clapet anti-retour (piloté)
11	Rückschlagventil, unter Vorsteuerkappe	Check valve, under pilot pressure cap	Clapet anti-retour, sous capuchon pression pilotage
12	Rückschlagventil	Check valve	Clapet anti-retour
13	Wechselventil	Shuttle valve	Soupape selecteur
14	Drosselrückschlagventil	Throttle check valve	Clapet anti-retour avec é etranglement
15	Schieberwegbegrenzung	Spool stroke limitation	Limitation de course du tiroir
16	Vorspannventil	Initial tension valve	Soupape précontrainte

Sekundärventile: Prüfen und Einstellen.

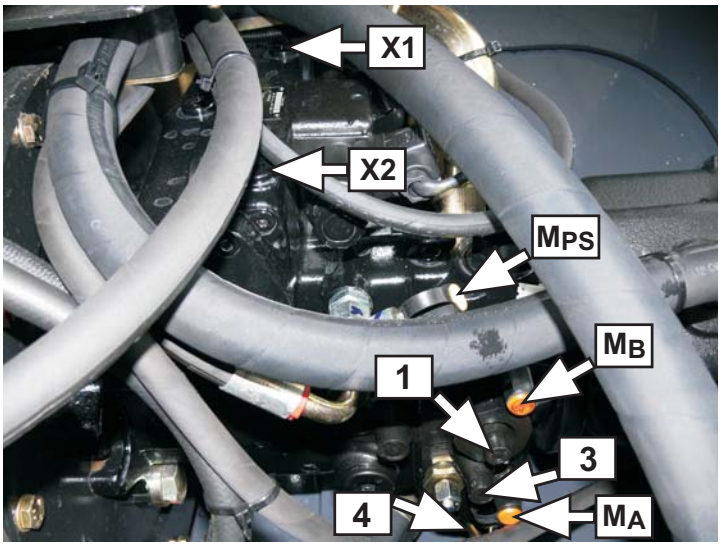
- 600 bar Manometer an Messpunkt 3 der Pumpe (siehe Blatt 5.230.01) anschliessen.
- Sicherheitsregler 2 der Pumpe, (siehe Blatt 5.230.01), über 340 bar einstellen.
- LS Druckbegrenzungsventil 1 am Steuerventil (siehe Blatt 5.230.02) über 340 bar einstellen.
- Alle Funktionen, ausser Hubrahmen senken, (ist ohne Sekundärventil), mit niedriger Motordrehzahl in Zylinderendlage fahren.
- Druck ablesen, gegebenenfalls nachstellen.
- Sicherheitsregler 2 und LS Druckbegrenzungsventil 1 wieder auf die angegebenen Werte zurückstellen.

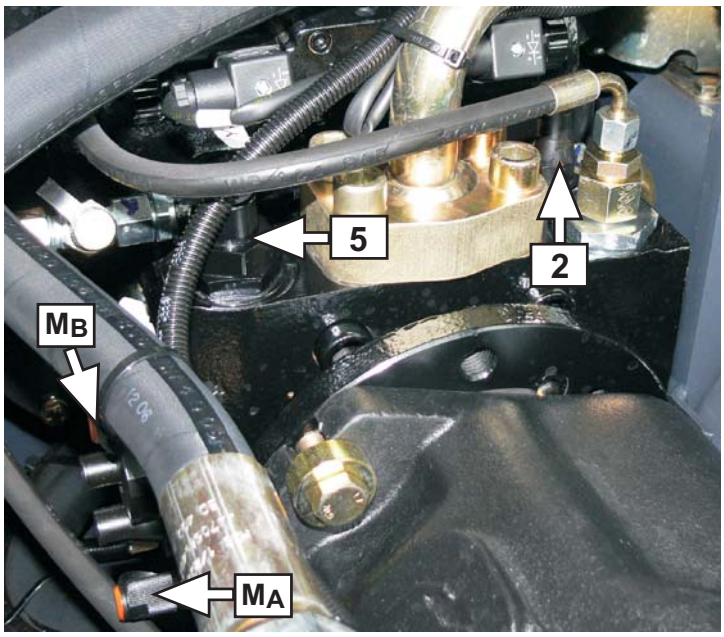
Secondary pressure relief valve: Checks and adjustment.

- Connect a 600 bar gauge at test-port 3 at displacement pump (see page 5.230.01).
- Adjust safety controller 2 higher than 340 bar at displacement pump (see page 5.230.01).
- Adjust LS-pressure valve 1 higher than 340 bar at Control valve (see page 5.230.02)
- Actuate all functions, exept lowering loader frame (without secondary relief valve) with low engine rpms into hydr. cylinder end stroke position.
- Read the pressures, readjust if necessary.
- Readjust safety controller 2 and LS-pressure valve 1 to indicated values.

Clapets secondaires: Contrôle et réglage.

- Brancher un manomètre au prise de pression 3 ou pompe (voir page 5.230.01).
- Regler la pression du clapet de securité 2 ou pompe, (voir page 5.230.01) à une valeur supérieur à 340 bar.
- Regler la pression du limiteur de pression LS 1 ou distributeur,(voir page 5.230.02) à une valeur supérieur à 340 bar.
- Actionner toutes les fonctions de verins, sauf bras de levage abaisser, (sans clapet secondaire) á un régime moteur assez bas à fin de course. Relever les pressions et les reajuster si necessaire.
- Reajuster le clapet de securité 2 et le limiteur de pression LS 1 aux valeurs indiquées.



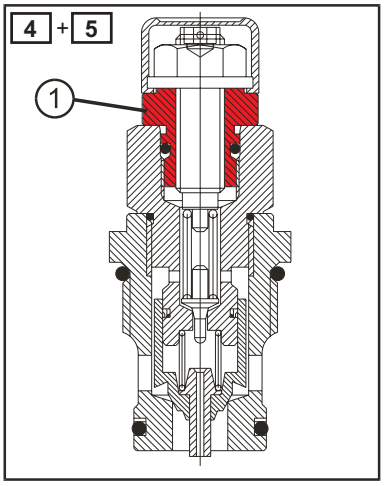


Um die Maschine Abschleppen zu könnnen, muss der Ölkreislauf “Fahren” geöffnet werden!
Dazu an beiden Hochdruckventilen 4 + 5 der Fahrpumpe den Bypass (1) ca. 2 Umdrehungen herausdrehen.
Nur im Schritt-Tempo aus Gefahrenbereich schleppen!

Betriebsanweisung beachten

In order to tow the machine, the hydraulic circuit “travel” has to be opened.
To do this, the by pass (1) of both travel high pressure valves 4 + 5 has to be opened by 2 turns anti clock wise.
Only tow the machine in really slow speed out of the danger zone!

Refer to operator’s manual



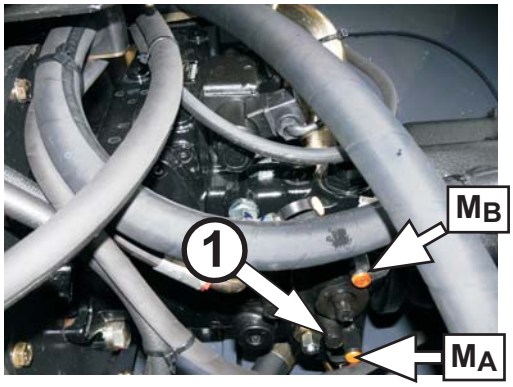
	Deutsch	English
M_A	Messpunkt für Speisedruck und Hochdruck-Druckabschneidung (Fahren vorwärts)	Test port charge pressure and high pressure cut-off valve (travel forward)
M_B	Messpunkt für Speisedruck und Hochdruck-Druckabschneidung (Fahren rückwärts)	Test port charge pressure and high pressure cut-off valve (travel backward)
M_{PS}	Messpunkt für Steuerdruck. Nach dem Regel-ventil, vor dem Ansteuergerät	Test port pilot pressure, between start-up speed valve and forward / backward valve
X1	Messpunkt (M12x1,5) für Steuerdruck im Stellzylinder (Fahren vorwärts)	Test port (M12x1,5), pilot pressure in servo chamber travel (forward)
X2	Messpunkt (M12x1,5) für Steuerdruck im Stellzylinder (Fahren rückwärts)	Test port (M12x1,5), pilot pressure in servo chamber travel (backward)
1	Regelventil für Einstellung der Anfahrdrehzahl und Drückungsdrehzahl (Dieselmotor)	Control valve start-up speed and engine stall speed
2	Druckabschneidung Hochdruck Fahren, einstellbar über Stellschraube	Pressure cut-off valve high pressure, adjustable by adjusting bolt
3	Speisedruckventil, einstellbar über Stellschraube	Charge pressure valve, adjustable by adjusting bolt
4	Hochdruck- Sicherheitsventil Fahren vorwärts mit Abschleppfunktion	High pressure safety relief valve, travel forward with towing function
5	Hochdruck- Sicherheitsventil Fahren rückwärts mit Abschleppfunktion	High pressure safety relief valve, travel backward with towing function

Typ Model Type	**TL 210 / 260**	**ab Fz.-Id.-Nr. from s/n à partir du n/s**	**TL02100100 TL02600135**	Datum Edition Date	**01.2008**
Benennung Description Dénomination	**Messpunkte Fahrpumpe u. Abschleppfunktion Test ports travel pump and towing function**			Blatt Page Feuille	**5.230.04**

The general valid accident prevention regulations have to be observed during all tests and settings!
(See Chapter 1.200.01-05)

All adjustments have to be carried out at service temperature.

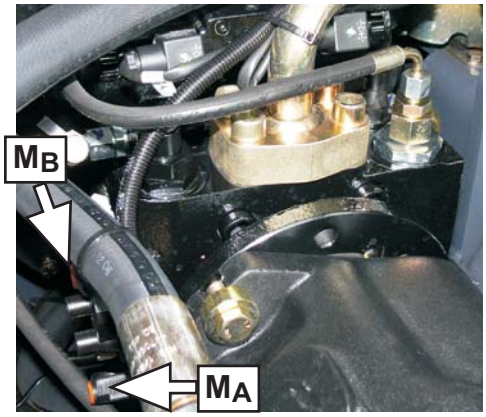
A.) Setting instruction travel drive, charge pressure



- Connect gauge to testport MA forward or MB backward (60 bar)
- Start engine, **do not operate any travel direction,** give full throttle
- Read charge pressure* at gauge
- Adjustable at valve **(1)**

* See chap. 2 (technical data) for setting values

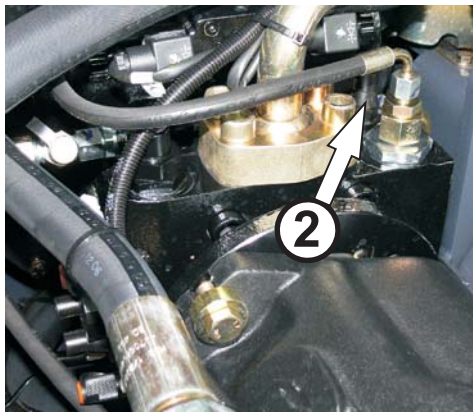
B.) Setting instruction travel drive, safety relief valves, pressure cut-off valve



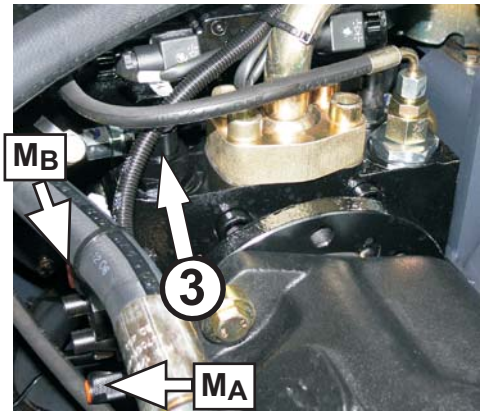
- Connect gauge to testport MA and MB (600 bar)

Typ Model Type Tipo	**TL 210 / 260**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.** **TL02100100** **TL02600135**	Datum Edition Date Fecha **01.2008**
Benennung Description Dénomination Denominación	**Einstellanweisung Fahrantrieb** **Setting instructions travel drive**		Blatt Page Feuille Página **5.230.05**

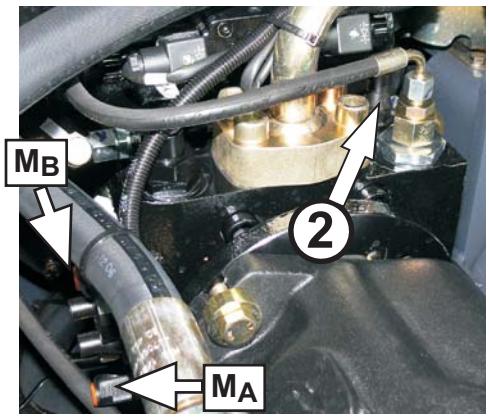
- Turn pressure cut-off valve **(2)** two turns in
- Start engine, drive machine against a fix obstacle, the tires must not rotate
- Increase enginerev. slowly
- Read pressure values* (relief valve) at MA (forward) respectively MB (backward)



- If necessary set pressure at relief valve **(3)** (forward) or at the opposite relief valve (backward) (turn in, pressure increase)



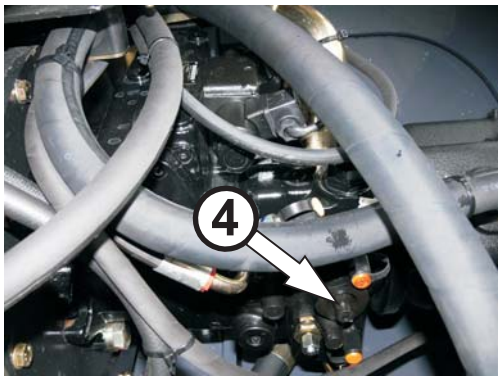
- Reset pressure cut-off valve **(2)** to desired value*
- Start engine, drive machine against a fix obstacle, the tires must not rotate
- Increase enginerev. slowly
- Read pressure value* (cut-off valve) at MA (forward) or MB (backward)



***** See chap. 2 (technical data) for setting values

Start up and engine stall speed depends of the valve (4)!
One setting correlates with the other.
Attention should be paid to:
The machine have to standstill with inserted travel direction at low idle (risk of accident).
The engine stall speed (engine could be overheated).

C.) Setting instruction travel drive, start up speed



- Place machine on even ground, connect speedometer to engine
- Slowly press the accelerator pedal, read the engine revs.* when the machine starts to move
- Adjustment: set valve **(4)** (turn in, starting later)

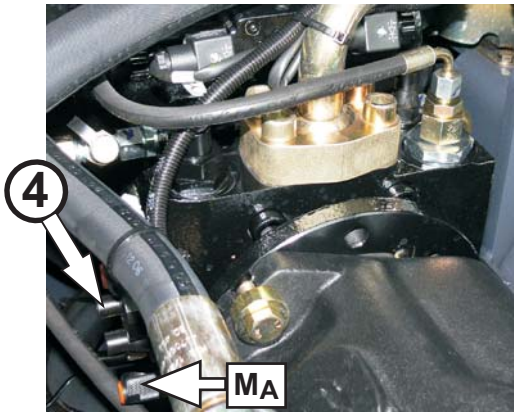
Stall speed changes !

D.) Setting instruction travel drive, engine stallspeed



- Remove the brake inching hose at port IP **(5)** at the brakevalve, plug hose and screwed fitting
- Engage “rabbit”
- Connect gauge to test port MA (600 bar)
- Connect speedometer to engine
- Drive machine with full throttle

Attention, respect the traffic !



- Brake machine down until high pressure* is reached, then read engine stall speed*
- Adjustment: set valve **(4)** (turn in, engine stall speed increases)

Start up speed changes !

- Mount brake inching hose **(5)** again to port IP

* See chap. 2 (technical data) for setting values

Typ Model Type Tipo	**TL 210 / 260**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.** **TL02100100** **TL02600135**	Datum Edition Date Fecha **01.2008**
Benennung Description Dénomination Denominación	**Einstellanweisung Fahrantrieb** **Setting instructions travel drive**		Blatt Page Feuille Página **5.230.06**

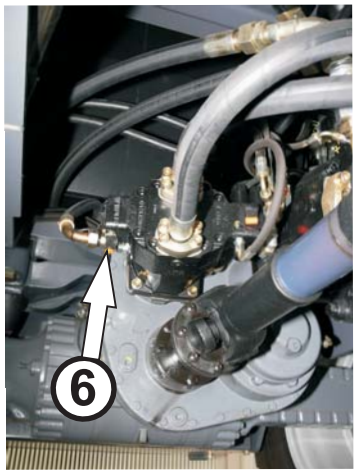
E.) Setting instruction travel drive, start of regulation

- Remove brake inching hose at IP port **(5)** at the brakevalve, plug hose and screwed fitting



- Connect a gauge (60 bar) to the testports **(6)** and **(7)** (servocylinder) of the travel motors

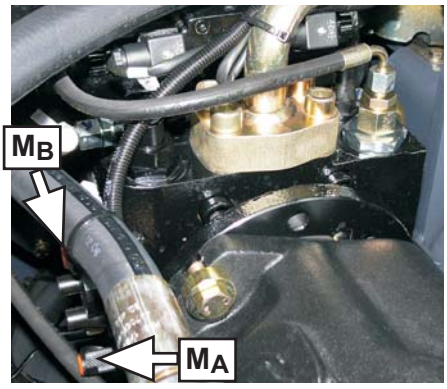
Attention: The gauges could be overloadet during the setting.
Digital gauge recommended!



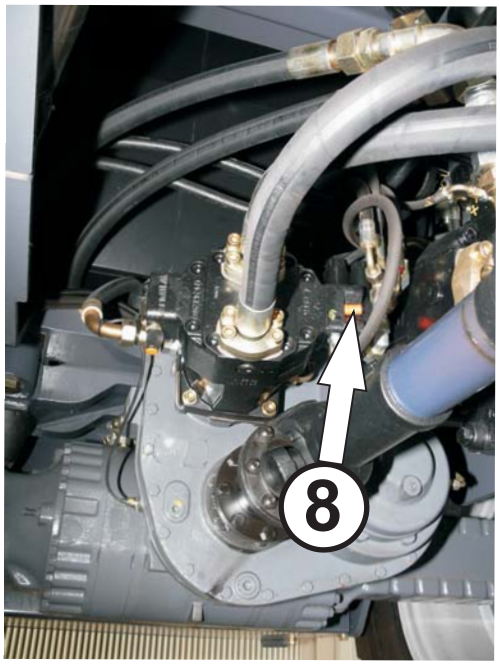


- Connect a gauge (600 bar) to the testports MA forward or MB backward of the travelpump

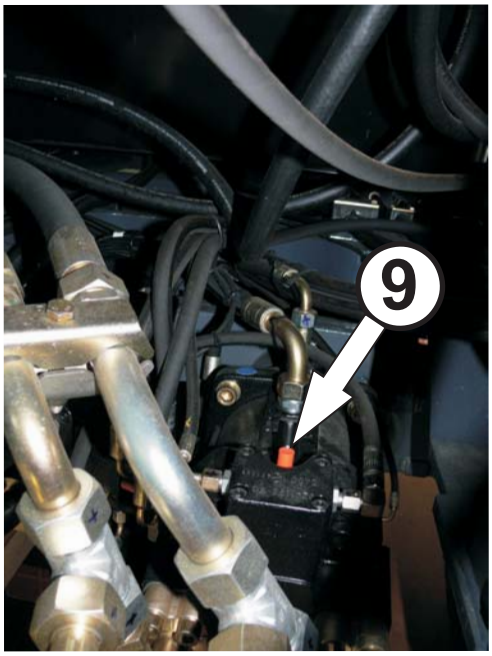
Attention, respect the traffic !



- Start engine, engage “rabbit”, press the brake pedal
- Switch traveldirection, push slowly the accelerator, the high pressure reaches 300 bar
- Release slowly the brake pedal, the pressure in the servo cylinder increases **(6)+(7)**
- Check the gauges (high pressure and servocylinder pressure)
- The start of regulation is when the servocylinder pressures at **(6)+(7)** are 30 bar, the highpressure at MA or MB have to be 280 bar at TL 210 respectively 290 bar at TL 260.



- The start of regulation could be adjusted if it´s not possible to achieve the values. Set the screws **(8)** and **(9)** of the respective motor (turn in, start of regulation later, high pressure increases)



Typ Model Type Tipo	**TL 210 / 260**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.**	**TL02100100** **TL02600135**	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Einstellanweisung Fahrantrieb** **Setting instructions travel drive**			Blatt Page Feuille Página	**5.230.07**


TEREX®

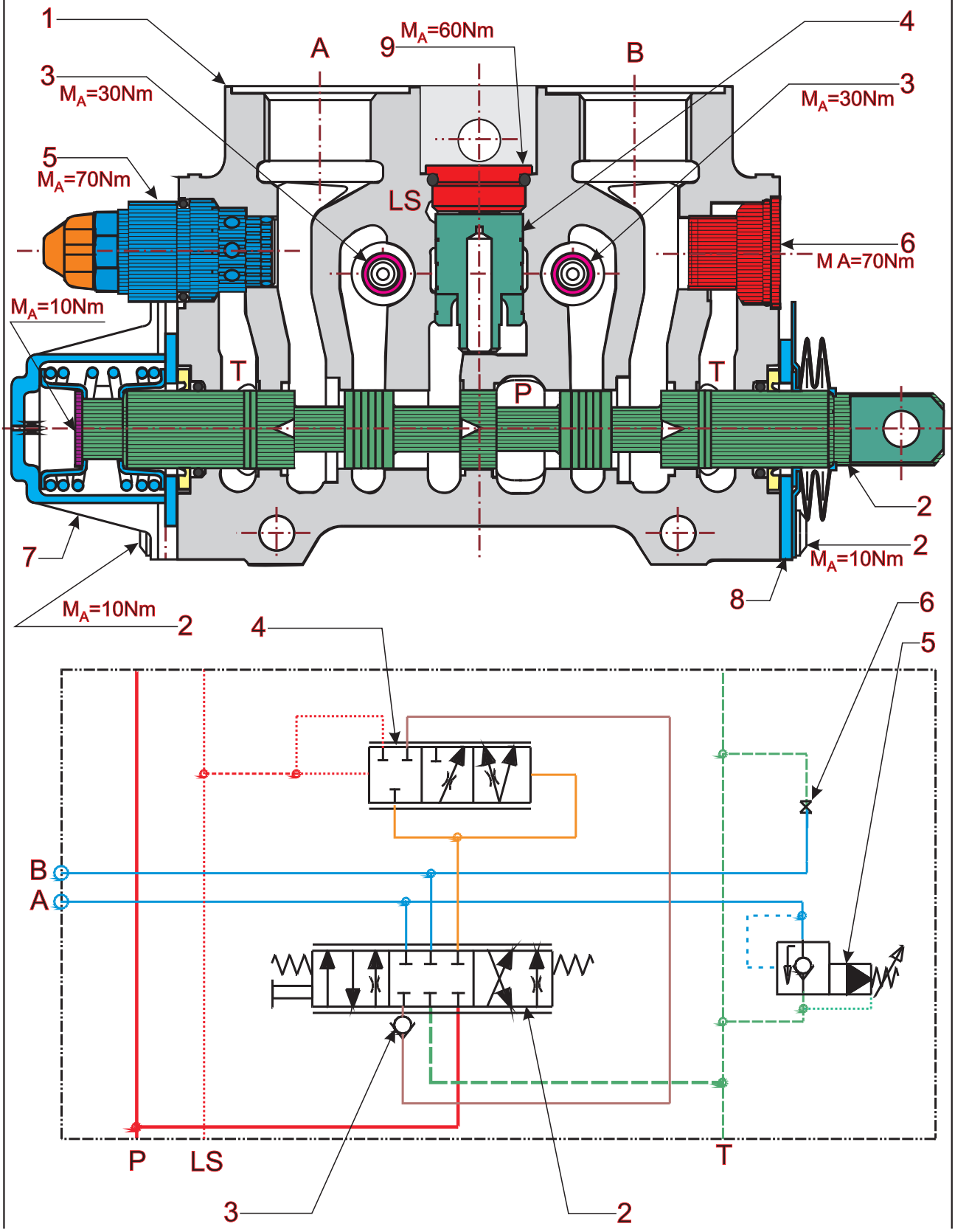
SX 14

Typ Model Type Tipo	**SX 14**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Notizen Notes Notices Notas**	Blatt Page Feuille Página	**5.251.00**

Wegeventilelement

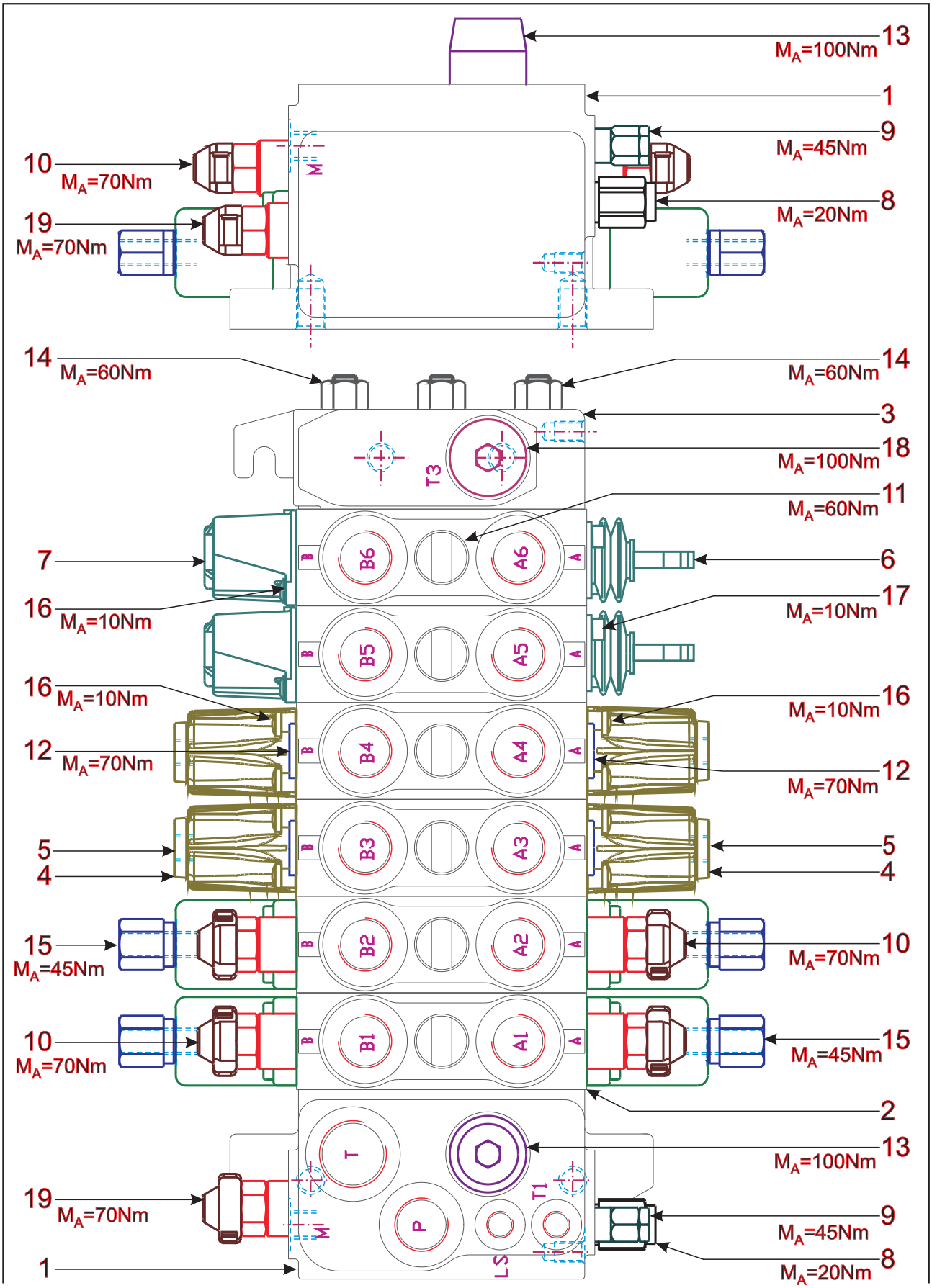
Directional valve element

Elément de distribution



Typ Model Type Tipo	**SX 14**	**Steuerventil** **Valve bank** **Distributeur** **Válvula**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**		Blatt Page Feuille Página	**5.251.01**

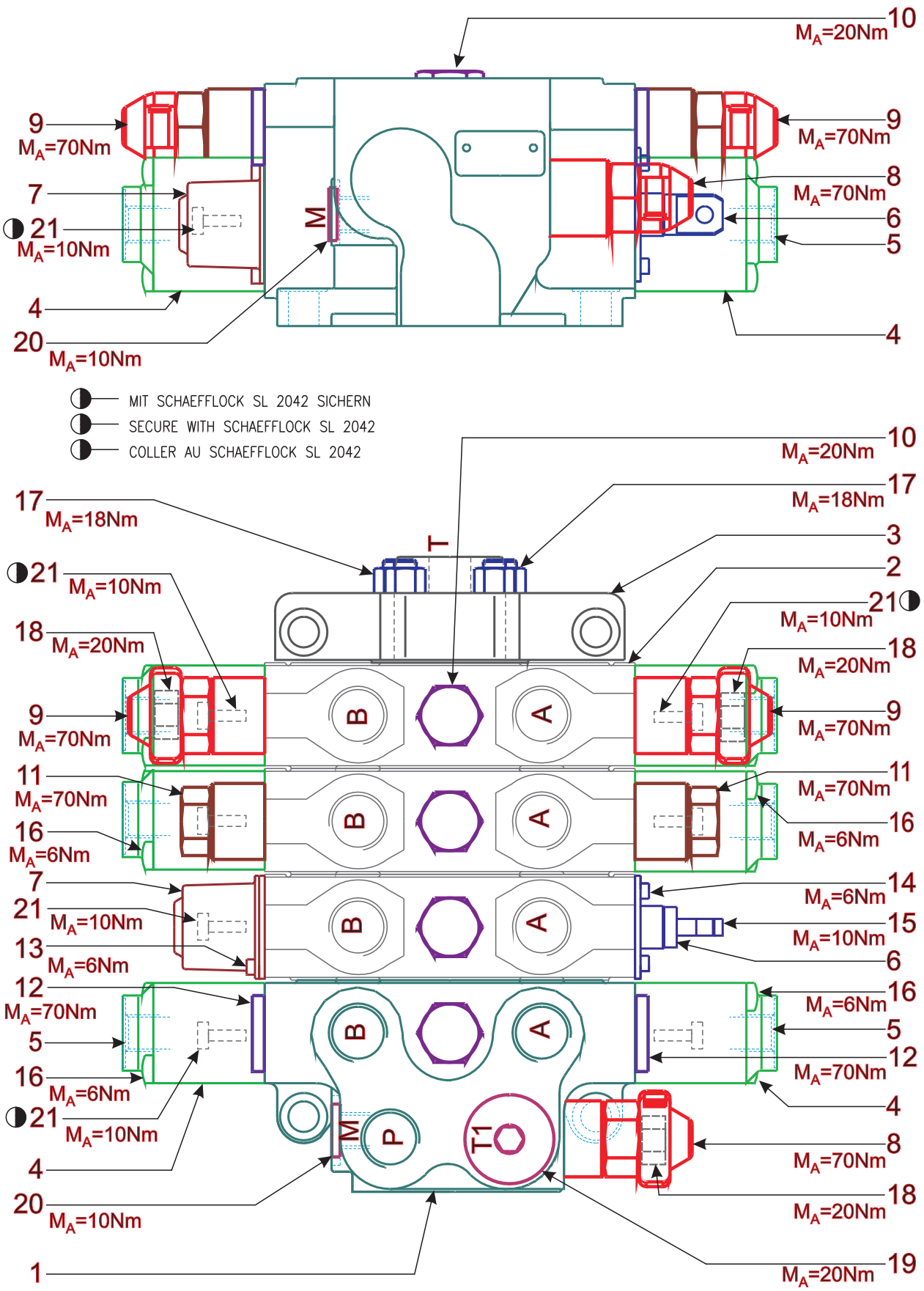
Pos. Item Rep. No.	Deutsch	English	Français
	Wegeventilelement	**Directional valve element**	**Elément de distribution**
1	Gehäuse	Housing	Corps
2	Steuerschieber mit Federrückstellung	Spool with spring return	Tiroir principal avec rappel ressort
3	Rückschlagventil	Check valve	Clapet anti-retour
4	Druckwaage	Pressure compensator	Balance de pression
5	Sekundärventil	Secondary relief valve	Clapet secondaire
6	Verschlußschraube	Plug	Bouchon
7	Deckel für Federrückstellung	Cover for spring spool return	Couvercle pour ressort tiroir
8	Platte	Plate	Plaque
9	Verschlussschraube für Druckwaage	Plug for pressure compensator	Bouchon pour balance de pression
10	Einschraubstück	Adapter	Raccord fileté
11	Schraube für Deckel	Screw for cover	Vis pour couvercle
12	Schraube für Platte	Screw for plate	Vis pour plaque



Typ Model Type Tipo	**SX 14**	**Steuerventil** **Valve bank** **Distributeur** **Válvula**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**		Blatt Page Feuille Página	**5.251.03**

Pos. Item Rep. No.	Deutsch	English	Français
	BLOCKSTEUERGERAET	**VALVE BANK**	**DISTRIBUTEUR**
	6 SX 14	**6 SX 14**	**6 SX 14**
1	Eingangselement	Inlet element	Elément d'entrée
2	Wegeventilelement	Directional valve element	Elément de distribution
3	Endelement	Final element	Elément finale
4	Deckel für hydraulische Betätigung	Cover for hydraulic operation	Capuchon pour commande hydraulique
5	Vorsteuranschluss (hydraulisch)	Pilot operated connection (hydraulic)	Connexion à commande assistée (hydraulique)
6	Mechanische Betätigung	Mechanical operation	Commande mécanique
7	Deckel für Federrückstellung	Cover for spring spool return	Couvercle pour ressort tiroir
8	LS - Volumenstromregelventil	LS - flow regulator valve	Régulateur de débit LS
9	LS - Druckbegrenzungsventil	Load sensing pressure valve	Limiteur de pression LS
10	Sekundärventil, *einstellbar*	Line relief valve, *adjustable*	Clapet secondaire, *réglable*
11	Verschlussschraube für Sektionsdruckwaage	Pressure compensator plug	Bouchon pour balance de pression
12	Verschlussschraube	Plug	Bouchon
13	Spülventil	Drain valve	Valve de purge
14	Zuganker	Tie rods	Tirants
15	Schieberwegbegrenzung	Spool stroke limitation	Limitation de course du tiroir
16	Schraube für Deckel	Screw for cover	Vis pour couvercle
17	Schraube für Platte	Screw for plate	Vis pour plaque
18	Verschlussschraube	Plug	Bouchon
19	Hauptüberdruckventil	Main relief valve	Limiteur pression principal

SM 12



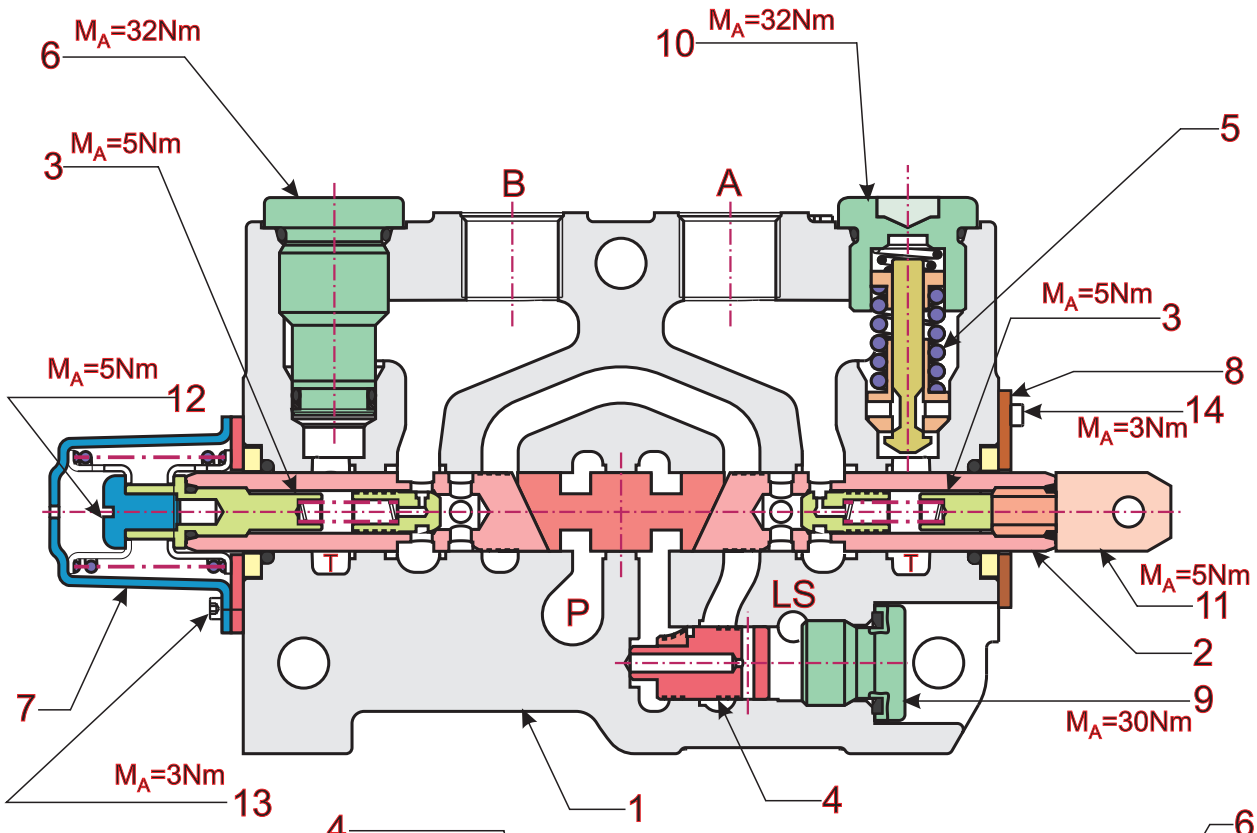
Typ Model Type Tipo	**SM 12**	**Steuerventil** **Valve bank** **Distributeur** **Válvula**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**		Blatt Page Feuille Página	**5.253.01**

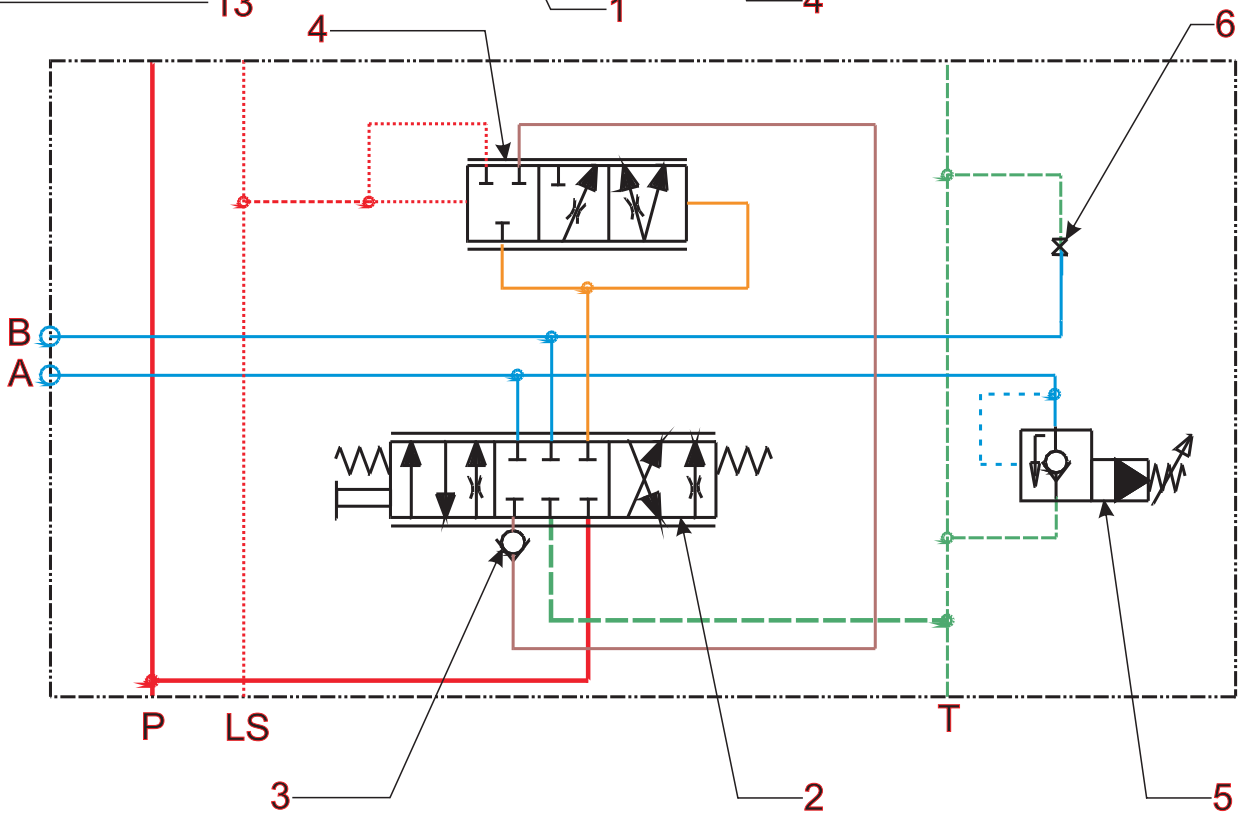
Pos. Item Rep. No.	Deutsch	English	Français
	BLOCKSTEUERGERAET	**VALVE BANK**	**DISTRIBUTEUR**
	4 SM 12	**4 SM 12**	**4 SM 12**
1	Eingangselement	Inlet element	Elément d'entrée
2	Wegeventilelement	Directional valve element	Elément de distribution
3	Endelement	Final element	Elément finale
4	Vorsteuerkappe	Cover for hydraulic operation	Capuchon pour commande hydraulique
5	Vorsteueranschluss (hydraulisch)	Pilot operated connection (hydraulic)	Connexion à commande assistée (hydraulique)
6	Mechanische Betätigung	Mechanical operation	Commande mécanique
7	Deckel für Federrückstellung	Cover for spring spool return	Couvercle pour ressort tiroir
8	Hauptüberdruckventil, einstellbar	Main relief valve, adjustable	Limiteur pression principal, réglable
9	Sekundärventil, *einstellbar*	Line relief valve, *adjustable*	Clapet secondaire, *réglable*
10	Verschlussschraube für Rückschlagventil	Plug for load retaining valve	Bouchon pour clapet anti retourr
11	Nachsaugventil	Anticavitation check valve	Clapet de gavage
12	Stopfen "Q"	Plug "Q"	Obturateur "Q"
13	Schraube für Deckel	Screw for cover	Vis pour couvercle
14	Schraube für Platte	Screw for plate	Vis pour plaque
15	Schieberzunge	Spool tongue	Embout à tenon
16	Schraube für Vorsteuerkappe	Screw for cover	Vis pour couvercle
17	Zuganker	Tie rods	Tirants
18	Kontermutter *Hauptüberdruckventil, Sekundärventil*	Counter nut *main relief valve, secondary relief valve*	Contre écrou *limiteur principal clapet secondaire*
19	Verschlussschraube	Plug	Bouchon
20	Verschlussschraube für Messanschluß "M"	Plug for test port "M"	Bouchon pour prise de pression "M"
21	Einschraubstück für Förderzentrierung Steuerschieber	Fitting for spool spring centering	Raccord fileté pour centrage du ressort de tirior

SX 10

Typ Model Type Tipo	**SX 10**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Notizen Notes Notices Notas**	Blatt Page Feuille Página	**5.274.00**

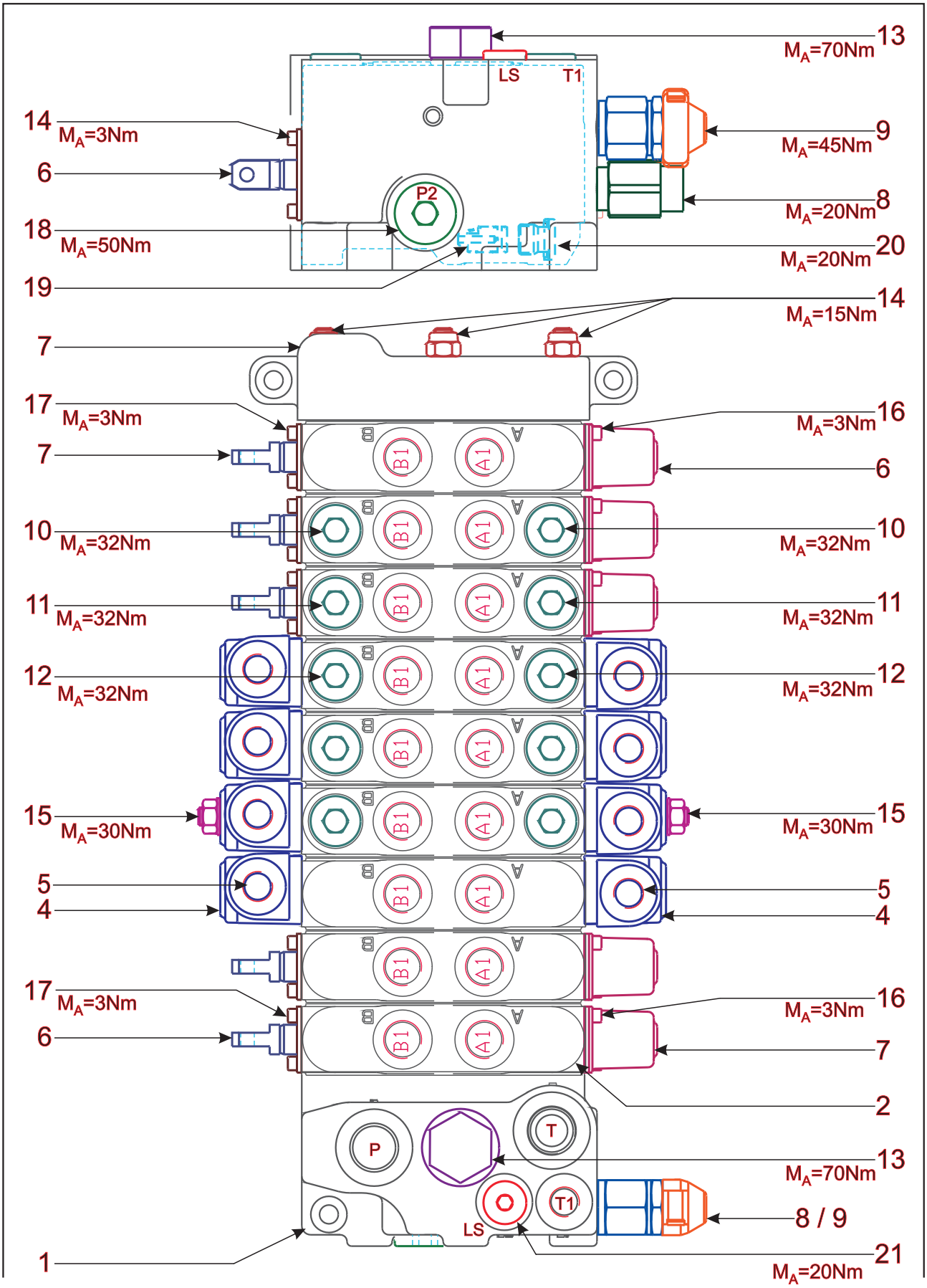
Wegeventilelement | Directional valve element | Elément de distribution





Typ Model Type Tipo	**SX 10**	**Steuerventil** **Valve bank** **Distributeur** **Válvula**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**		Blatt Page Feuille Página	**5.274.01**

Pos. Item Rep. No.	Deutsch	English	Français
	Wegeventilelement	**Directional valve element**	**Elément de distribution**
1	Gehäuse	Housing	Corps
2	Steuerschieber mit Federrückstellung	Spool with spring return	Tiroir principal avec rappel ressort
3	Rückschlagventil	Check valve	Clapet anti-retour
4	Druckwaage	Pressure compensator	Balance de pression
5	Sekundärventil	Secondary relief valve	Clapet secondaire
6	Verschlußschraube	Plug	Bouchon
7	Deckel für Kolbenrückstellung	Cover for spool return	Couvercle pour rappel tiroir
8	Platte	Plate	Plaque
9	Verschlussschraube für Druckwaage	Plug for pressure compensator	Bouchon pour balance de pression
10	Verschlussschraube für Sekundärventil	Plug for secondary relief valve	Bouchon pour clapet secondaire
11	Steuerschieberzunge	Spool tongue	Embbout à tenon de tirior principal
12	Zylinderschraube mit Schlitz	Slotted haed screw	Vis à tête fendue cylindrique
13	Schraube für Deckel	Screw for cover	Vis pour couvercle
14	Schraube für Platte	Screw for plate	Vis pour plaque



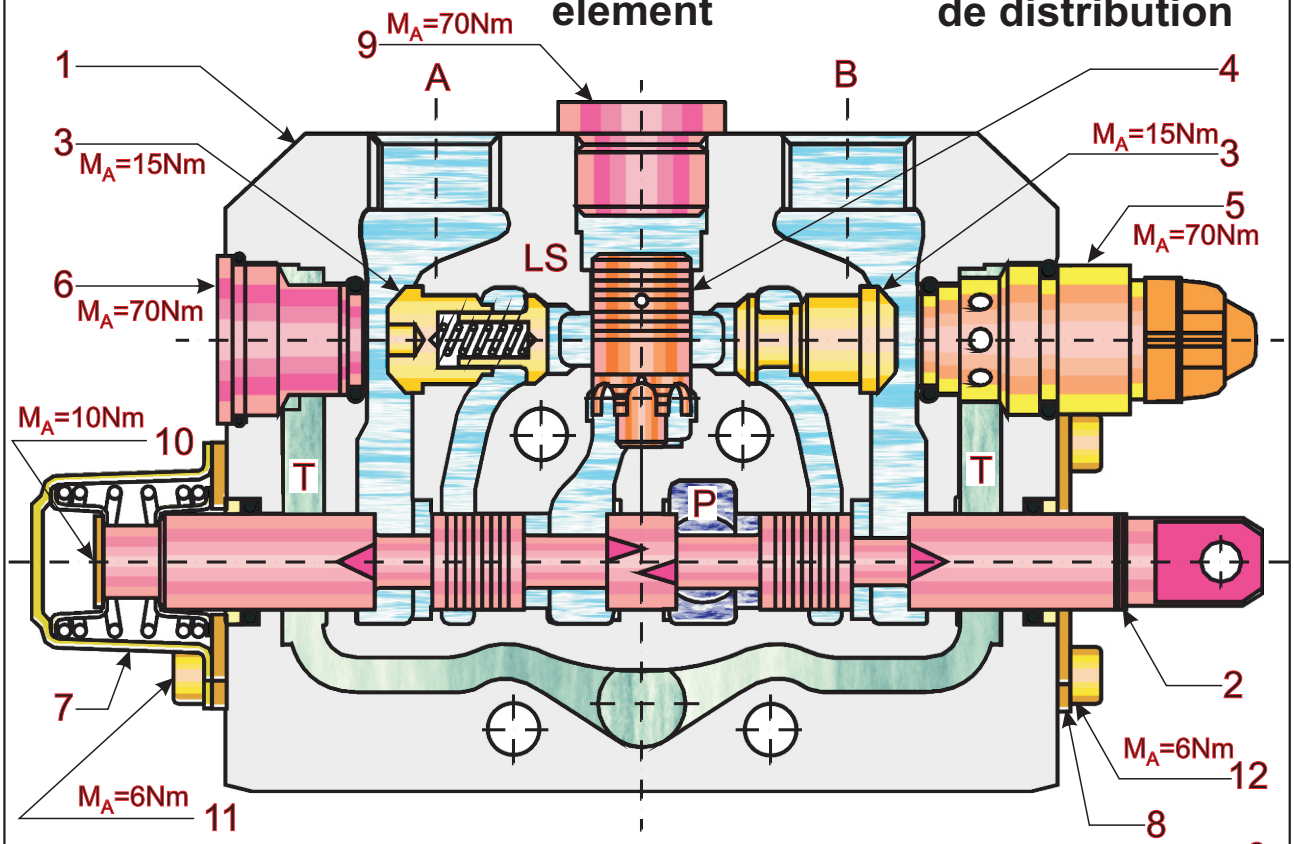
Typ Model Type Tipo	**SX 10**	**Steuerventil** **Valve bank** **Distributeur** **Válvula**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**		Blatt Page Feuille Página	**5.274.03**

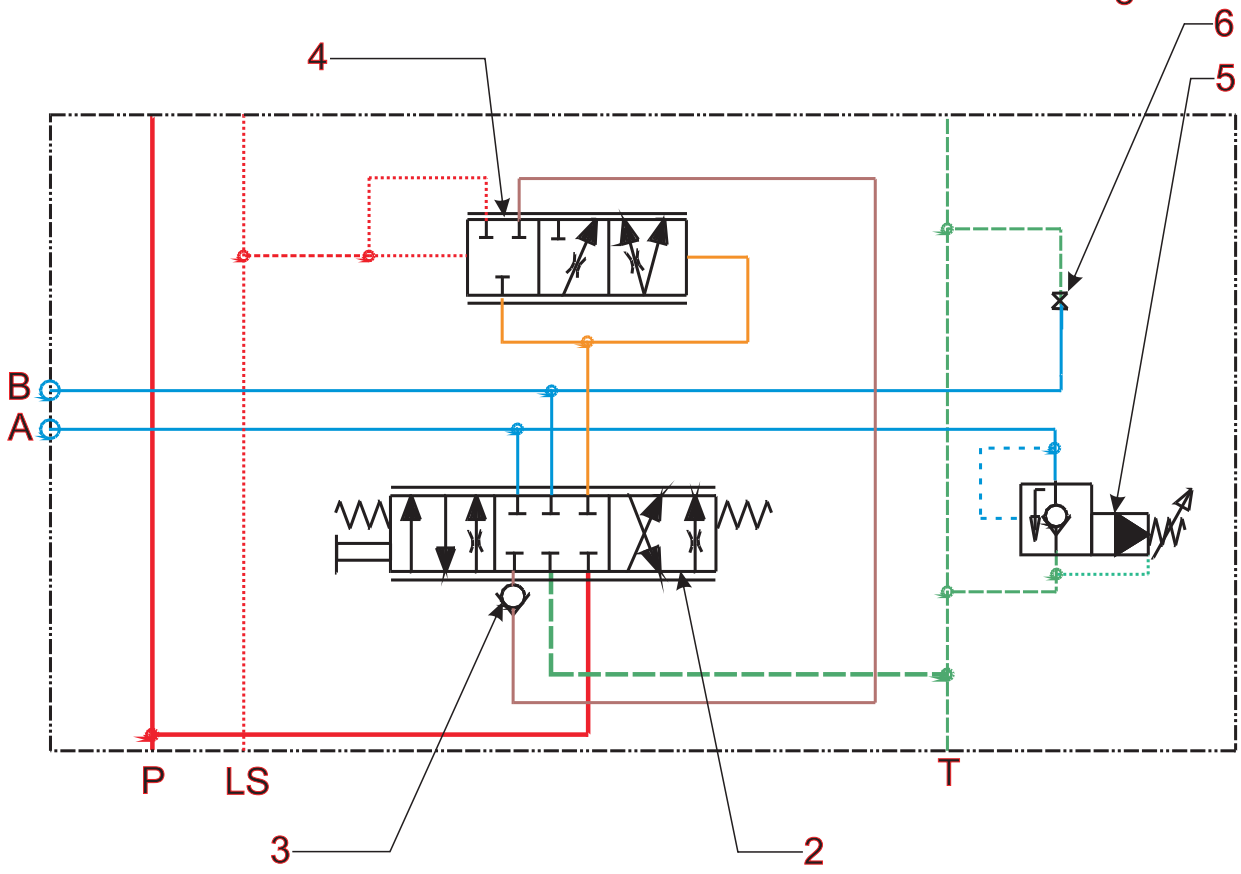
Pos. Item Rep. No.	Deutsch	English	Français
	BLOCKSTEUERGERAET	**VALVE BANK**	**DISTRIBUTEUR**
	9 SX 10	**9 SX 10**	**9 SX 10**
1	Eingangselement	Inlet element	Elément d'entrée
2	Wegeventilelement	Directional valve element	Elément de distribution
3	Endelement	Final element	Elément finale
4	Deckel für hydraulische Betätigung	Cover for hydraulic operation	Capuchon pour commande hydraulique
5	Vorsteuranschluss (hydraulisch)	Pilot operated connection (hydraulic)	Connexion à commande assistée (hydraulique)
6	Mechanische Betätigung	Mechanical operation	Commande mécanique
7	Deckel für Federrückstellung	Cover for spring spool return	Couvercle pour ressort tiroir
8	LS - Volumenstromregelventil	LS - flow regulator valve	Régulateur de débit LS
9	LS - Druckbegrenzungsventil	Load sensing pressure valve	Limiteur de pression LS
10	Verschlussschraube für Sekundärventil	Plug from secondary relief valve	Bouchon pour clapet secondaire
11	Verschlussschraube für Nachsaugventil	Plug for anti-cavitation check valve	Bouchon pour clapet realimentation
12	Verschlussschraube	Plug	Bouchon
13	Spülventil	Drain valve	Valve de purge
14	Zuganker	Tie rods	Tirants
15	Schieberwegbegrenzung	Spool stroke limitation	Limitation de course du tiroir
16	Schraube für Deckel	Screw for cover	Vis pour couvercle
17	Schraube für Platte	Screw for plate	Vis pour plaque
18	Verschlussschraube	Plug	Bouchon
19	Druckwaage	Pressure compensator	Balance de pression
20	Verschlussschraube für Druckwaage	Plug for pressure compensator	Bouchon pour balance de pression
21	Verschlussschraube	Plug	Bouchon

SX 12

Typ Model Type Tipo	**SX 12**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Notizen Notes Notices Notas**	Blatt Page Feuille Página	**5.276.00**

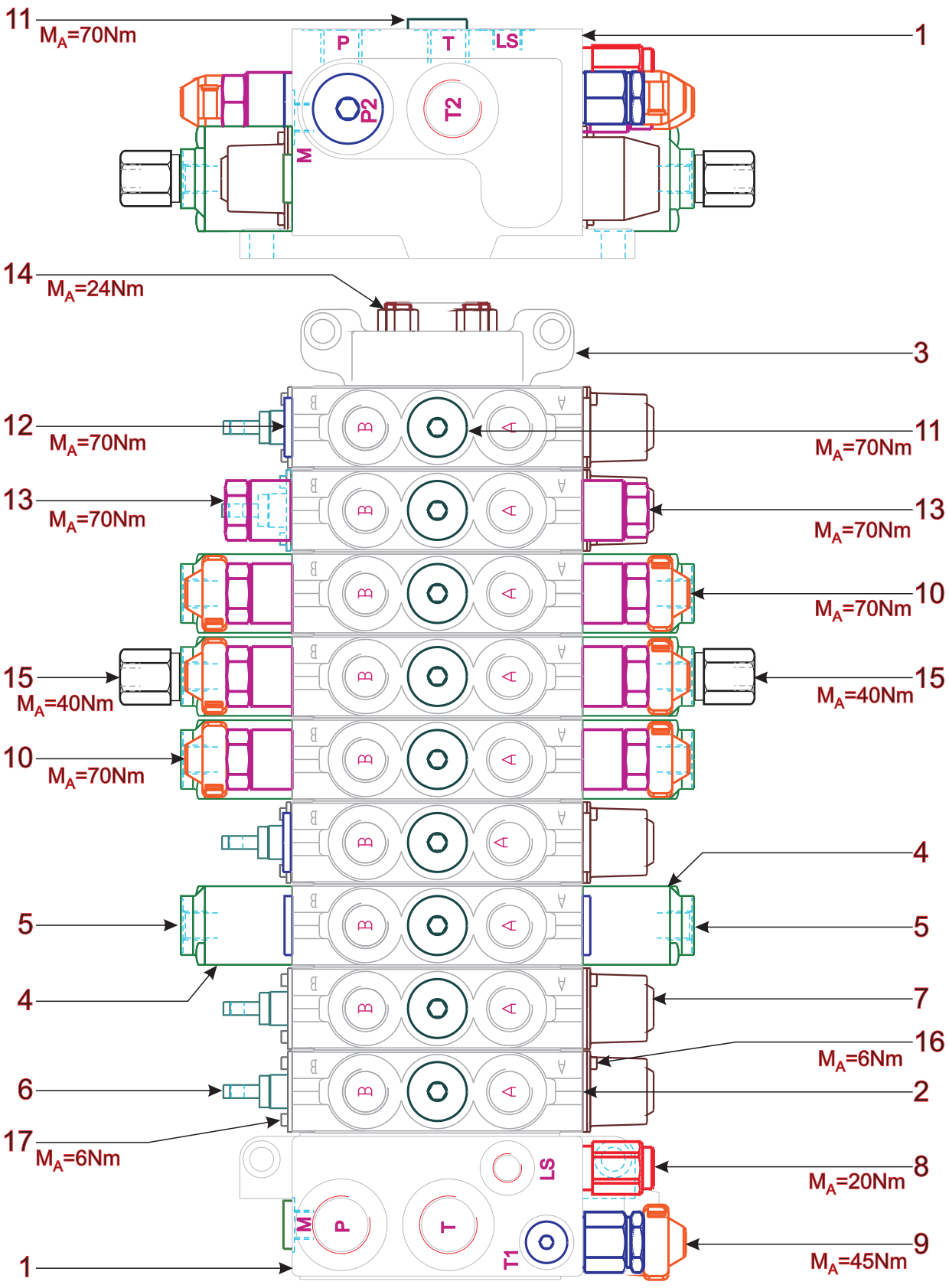
Wegeventilelement | Directional valve element | Elément de distribution





Typ Model Type Tipo	**SX 12**	**Steuerventil** **Valve bank** **Distributeur** **Válvula**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**		Blatt Page Feuille Página	**5.276.01**

Pos. Item Rep. No.	Deutsch	English	Français
	Wegeventilelement	**Directional valve element**	**Elément de distribution**
1	Gehäuse	Housing	Corps
2	Steuerschieber	Spool	Tiroir principal
3	Rückschlagventil	Check valve	Clapet anti-retour
4	Druckwaage	Pressure compensator	Balance de pression
5	Sekundärventil	Secondary relief valve	Clapet secondaire
6	Verschlußschraube	Plug	Bouchon
7	Deckel für Federrückstellung	Cover for spring spool return	Couvercle pour ressort tiroir
8	Platte	Plate	Plaque
9	Verschlussschraube für Druckwaage	Plug for pressure compensator	Bouchon pur balance de pression
10	Einschraubstück	Adapter	Raccord fileté
11	Schraube für Deckel	Screw for cover	Vis pour couvercle
12	Schraube für Platte	Screw for plate	Vis pour plaque



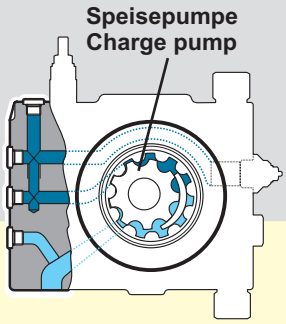
Typ Model Type Tipo	**SX 12**	**Steuerventil** **Valve bank** **Distributeur** **Válvula**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**		Blatt Page Feuille Página	**5.276.03**

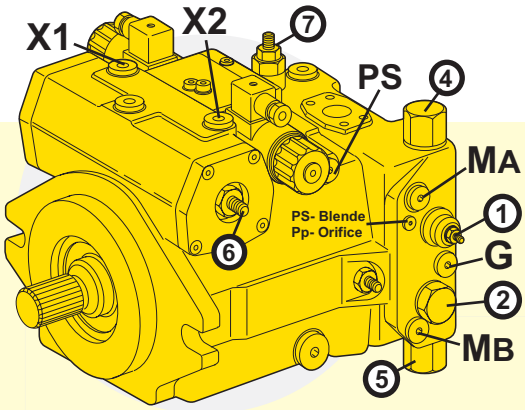
Pos. Item Rep. No.	Deutsch	English	Français
	BLOCKSTEUERGERAET	**VALVE BANK**	**DISTRIBUTEUR**
	9 SX 12	**9 SX 12**	**9 SX 12**
1	Eingangselement	Inlet element	Elément d'entree
2	Wegeventilelement	Direction valve element	Elément de distribution
3	Endelement	Final element	Elément finale
4	Deckel für hydraulische Betätigung	Cover for hydraulic operation	Capuchon pour commande hydraulique
5	Vorsteuranschluss (hydraulisch)	Pilot operated connection (hydraulic)	Connexion à commande assistée (hydraulique)
6	Mechanische Betätigung	Mechanical operation	Commande mécanique
7	Deckel für Federrückstellung	Cover for spring spool return	Couvercle pour ressort tiroir
8	LS - Volumenstromregelventil	LS - flow regulator valve	Régulateur de débit LS
9	LS - Druckbegrenzungsventil	Load sensing pressure valve	Limiteur de pression LS
10	Sekundärventil, *einstellbar*	Line relief valve, *adjustable*	Clapet secondaire, *réglable*
11	Verschlussschraube für Sektionsdruckwaage	Pressure compensator plug	Bouchon pour balance de pression
12	Verschlussschraube für Rückschlagventil	Plug for load retaining valve	Bouchon pour clapet anti retourr
13	Nachsaugventil	Anticavitation valve	Clapet realimentation
14	Zuganker	Tie rods	Tirants
15	Schieberwegbegrenzung	Spool stroke limitation	Limitation de course du tiroir
16	Schraube für Deckel	Screw for cover	Vis pour couvercle
17	Schraube für Platte	Screw for plate	Vis pour plaque

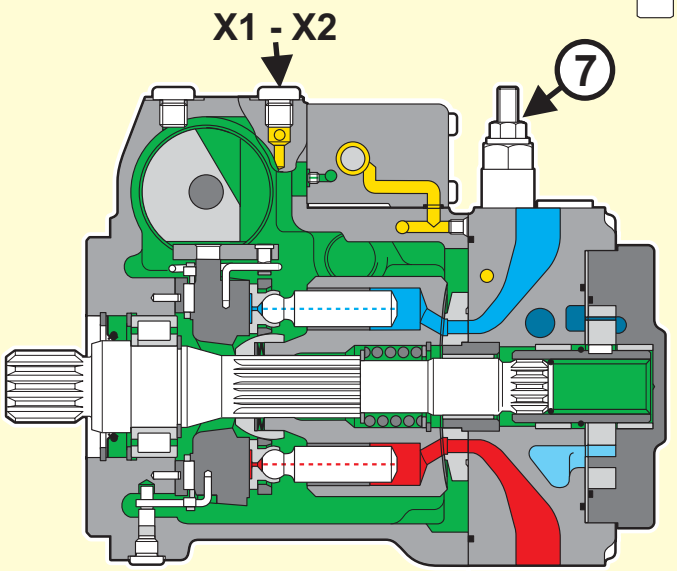
A4VG ... DAD

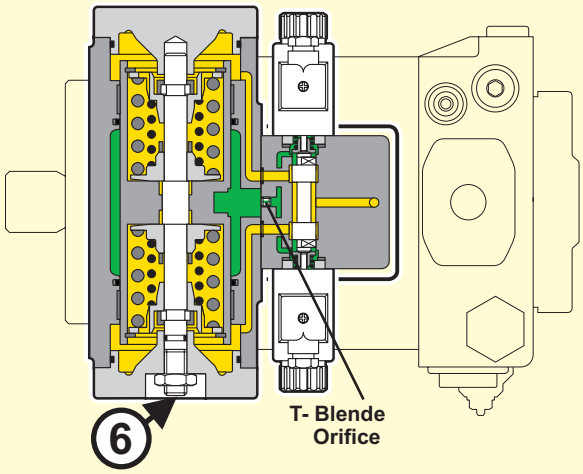
Baureihe / Series 32

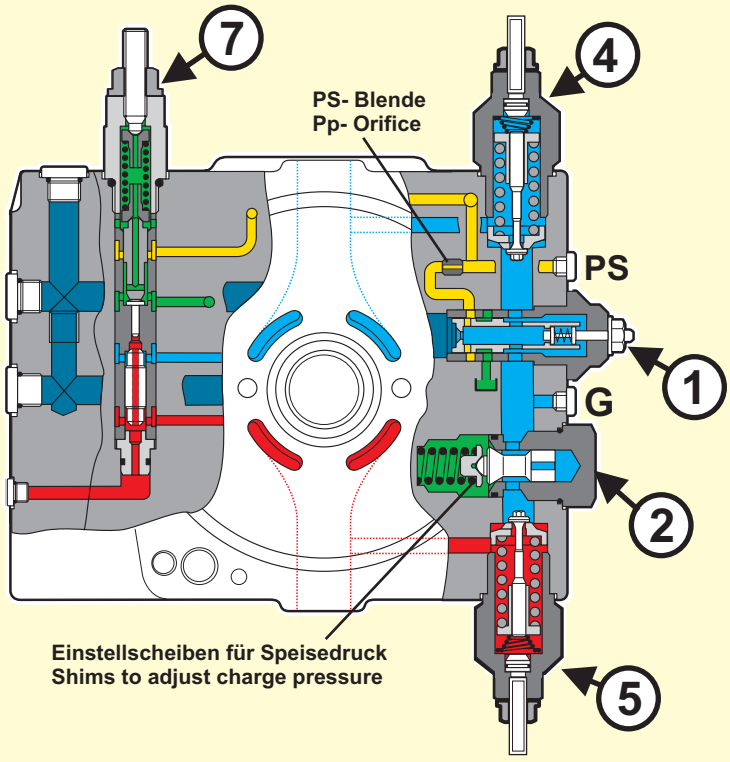
Verstellpumpe NG 40/56
Variable pump Size 40/56



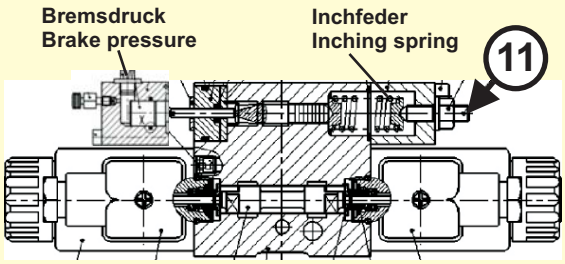


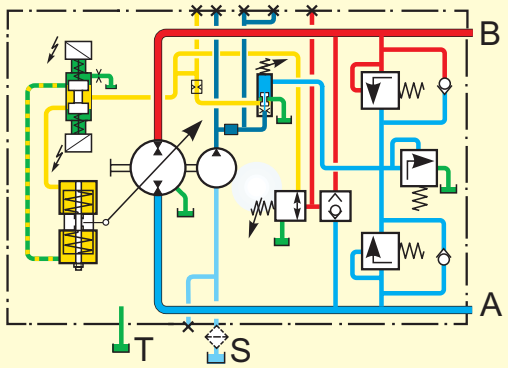






Ansteuergerät und Inchventil
Control device and inching





Hochdruck High pressure	
Niederdruck Return line press.	
Saugdruck Suction pressure	
Leckölddruck Case drain press.	
Steuerdruck Pilot pressure	
Stelldruck Control press.	

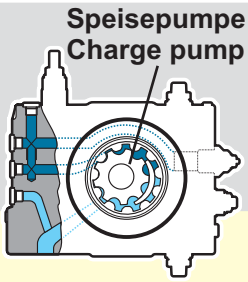
TEREX	Typ/Model/Type **SKL - TL 65 / 70 / 80 / 80AS / 100**	Datum/Edition/Date **01.2008**
	Benennung/Description/Dénomination **Fahrhydraulik** **Travel drive**	Blatt/Page/Feuille **5.300.01**

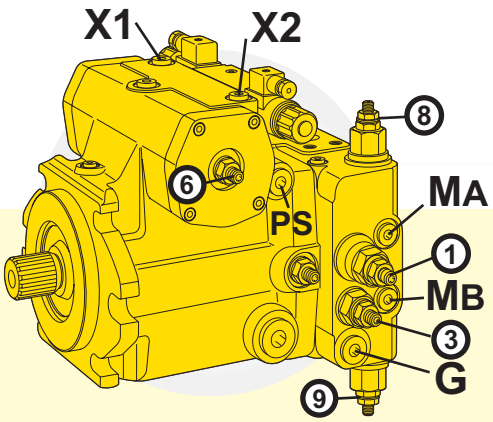
	Fahrpumpe A4VG56DA	Travel pump A4VG56DA	Pompe de translation A4VG56DA
1	DA Regelventil	Control valve	Soupape de régulation
2	Speisedruckventil	Charge pressure relief valve	Clapet pression de gavage
3			
4	Hochdruck-Sicherheitsventil	HP - safety relief valve	Clapet de securité HP
5	Hochdruck-Sicherheitsventil	HP - safety relief valve	Clapet de securité HP
6	Einstellschraube für mechanische Nulllage	Adjusting bolt for mechanic neutral positioning	Vis de réglage positionement au neutre
7	Druckabschneidung	Pressure cut - off	Cupure de pression
8			
9			
10			
11	Einstellschraube für Inchbeginn u.- ende	Adjusting bolt for inching start and -end	Vis de réglage debut et fin coupure
MA	Messpunkt Hochdruck und Speisedruck	Test port HP and charge pressure	Prise de pression HP et gavage
MB	Messpunkt Hochdruck und Speisedruck	Test port HP and charge pressure	Prise de pression HP et gavage
X1	Messpunkt Stelldruck	Test port control pressure	Prise de pression pression de commande
X2	Messpunkt Stelldruck	Test port control pressure	Prise de pression pression de commande
PS	Messpunkt Steuerdruck nach der PS -Blende	Test port control pressure after Pp orifice	Après orifice PS
G	Anschluss Speisedruck-Vorsteuerdruck	Charge pressure and pilot pressure port	Raccord pression de gavage et de pilotage

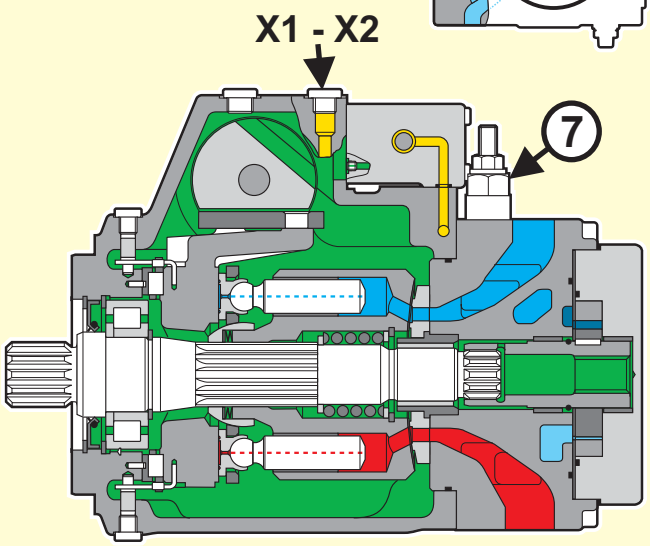
A4VG ... DAD

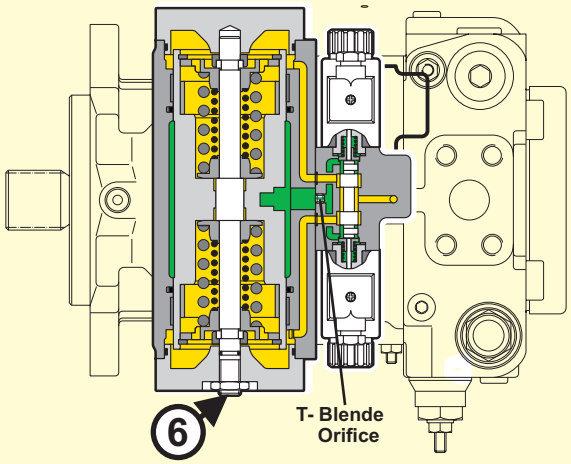
Baureihe / Series 32

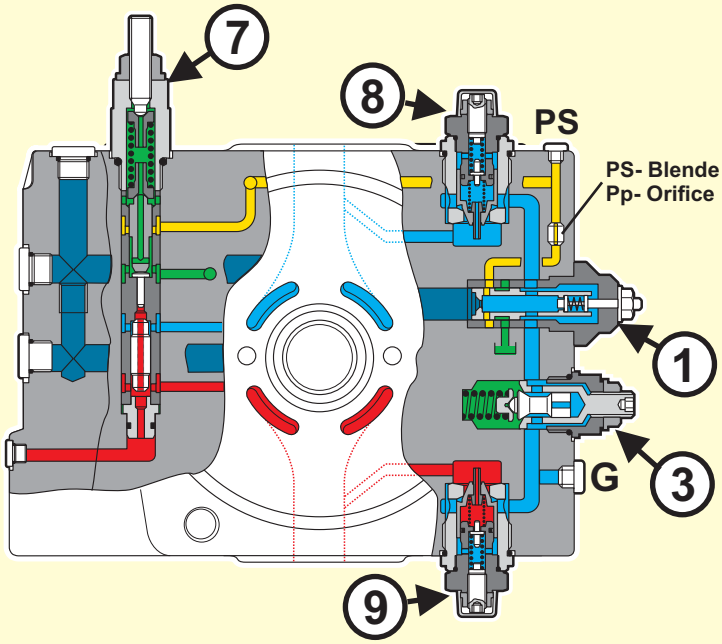
Verstellpumpe NG 71...180
Variable pump Size 71...180

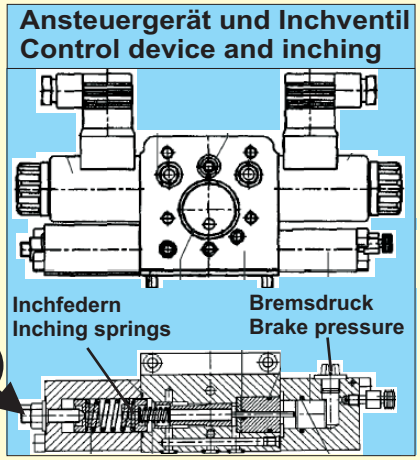


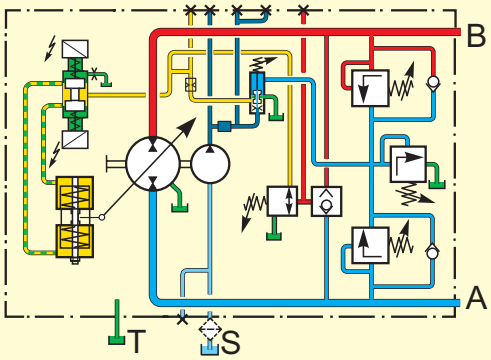












Hochdruck
High pressure

Niederdruck
Return line press.

Saugdruck
Suction pressure

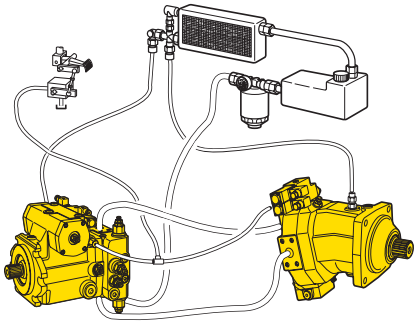
Leckölдruck
Case drain press.

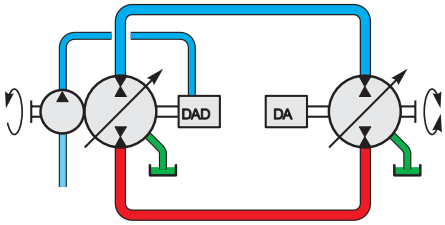
Steuerdruck
Pilot pressure

Stelldruck
Control press.

TEREX	Typ/Model/Type **TL 120**	Datum/Edition/Date **01.2008**
	Benennung/Description/Dénomination **Einstellanweisung Fahrhydraulik**	Blatt/Page/Feuille **5.300.02**

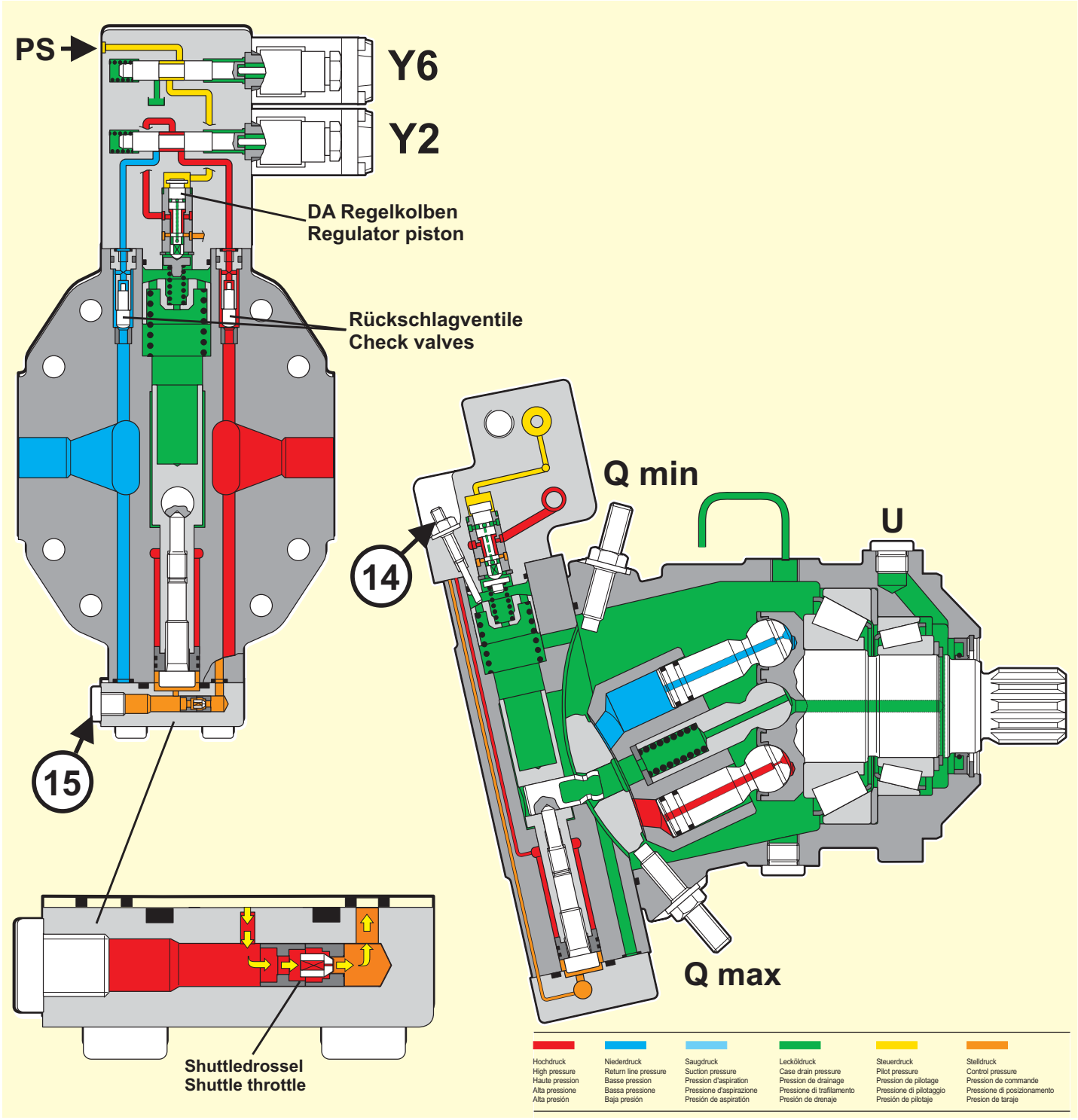
	Fahrpumpe A4VG71DA	Travel pump A4VG71DA	Pompe de translation A4VG71DA
1	DA Regelventil	Control valve	Soupape de régulation
2			
3	Speisedruckventil	Charge pressure relief valve	Clapet pression de gavage
4			
5			
6	Einstellschraube für mechanische Nulllage	Adjusting bolt for mechanic neutral positioning	Vis de réglage positionement au neutre
7	Druckabschneidung	Pressure cut - off	Cupure de pression
8	Hochdruck-Sicherheitsventil	HP - safety relief valve	Clapet de securité HP
9	Hochdruck-Sicherheitsventil	HP - safety relief valve	Clapet de securité HP
10			
11	Einstellschraube für Inchbeginn u.- ende	Adjusting bolt for inching start and -end	Vis de réglage debut et fin coupure
MA	Messpunkt Hochdruck und Speisedruck	Test port HP and charge pressure	Prise de pression HP et gavage
MB	Messpunkt Hochdruck und Speisedruck	Test port HP and charge pressure	Prise de pression HP et gavage
X1	Messpunkt Stelldruck	Test port control pressure	Prise de pression pression de commande
X2	Messpunkt Stelldruck	Test port control pressure	Prise de pression pression de commande
PS	Messpunkt Steuerdruck nach der PS -Blende	Test port control pressure after Pp orifice	Après orifice PS
G	Anschluss Speisedruck-Vosteuerdruck	Charge pressure and pilot pressure port	Raccord pression de gavage et de pilotage



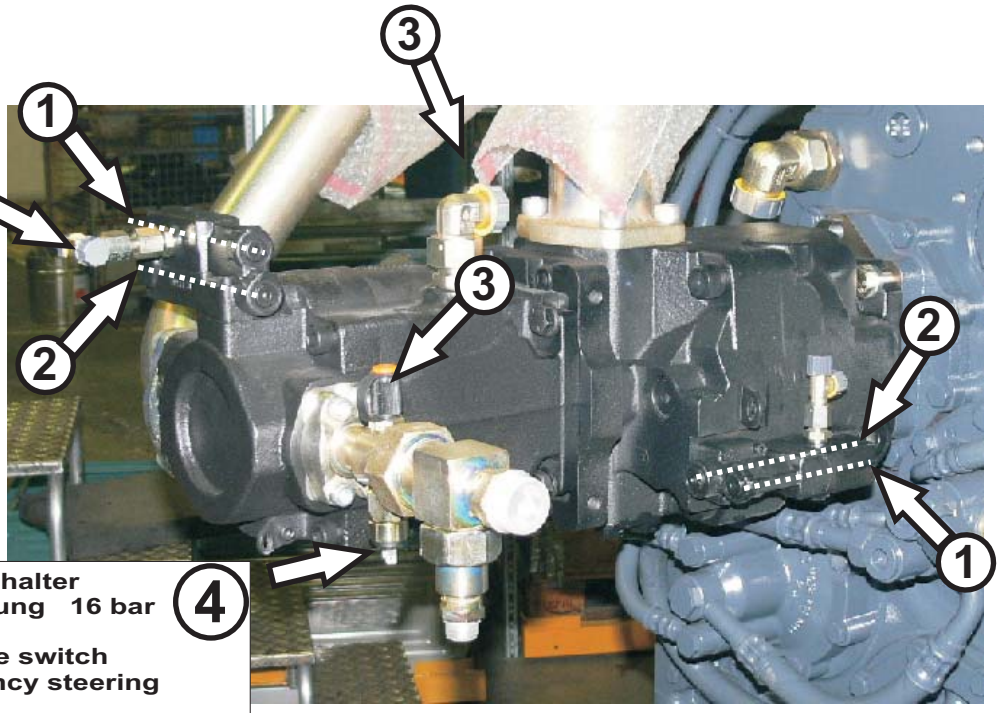


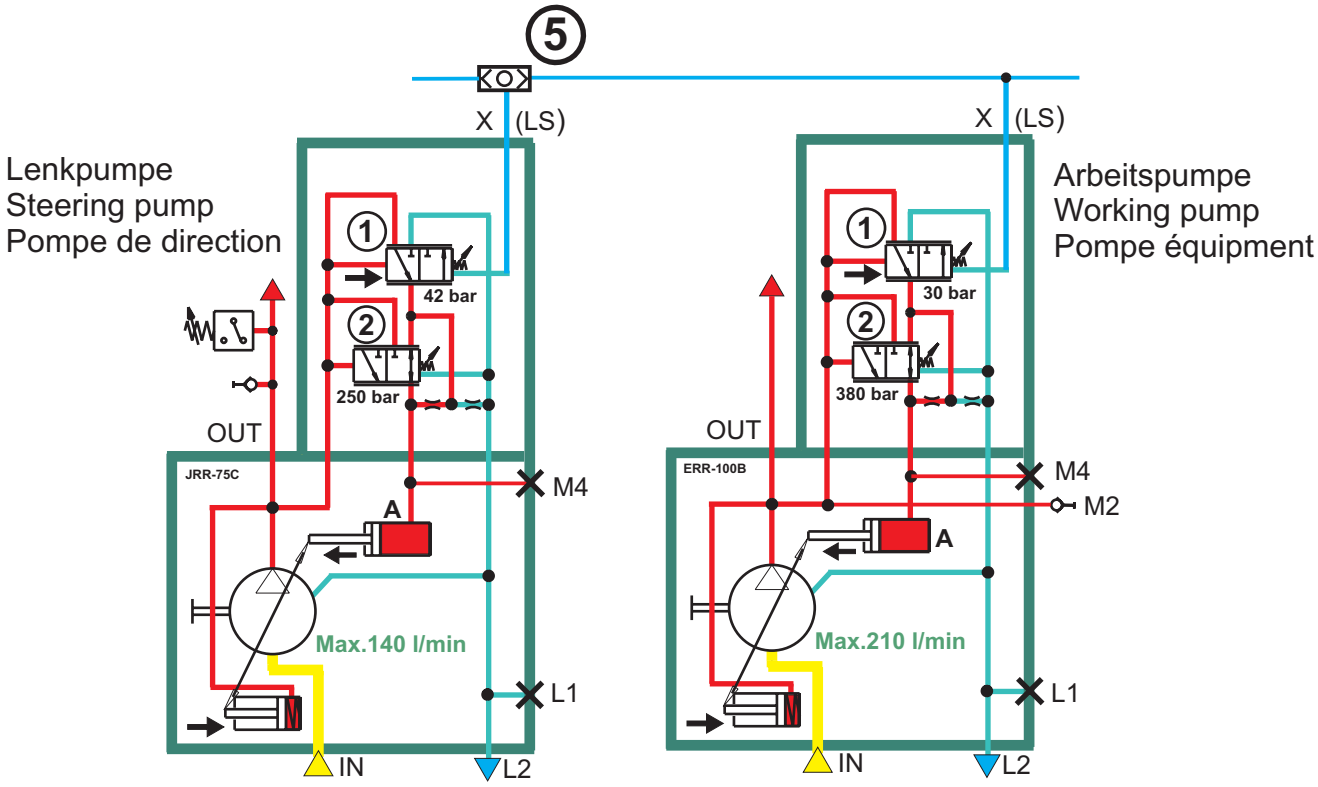
A6VM ... DA3 /63

Mobilgetriebe
Mobile transmissions



TEREX	Typ/Model/Type **SKL - TL 65 / 70 / 80 / 80AS / 100 / 120**	Datum/Edition/Date **01.2008**
	Benennung/Description/Dénomination **Fahrhydraulik** **Travel drive**	Blatt/Page/Feuille **5.300.03**





Steering- and working equipment pumps Danfoss:
Diagram above: Diesel engine to be started, no function operated jet.
At stopped engine are the displacement pumps at maximum flow.
As soon as the engine is started, will the power regulators **(1)** pushed to the right hand side.
Then the actuation piston **(A)** is linked at the bottom side to **P**. The pumps
will destroke until the adjusted pressure of 42 bar respectively 30 bar is reached at the power regulator **(1)**. This pressure will be hold as stand-by pressure.

Typ Model Type Tipo	**TL 420 - 450**	**ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.**	***TL04200100 TL04500100***	Datum Edition Date Fecha	**10.2007**
Benennung Description Dénomination Denominación	**Funktions- und Einstellanweisung Danfoss Functioning- and settingdescription Danfoss**			Blatt Page Feuille Página	**5.350.01**

When doing any tests or/and adjustments please respect the general safety and accident prevention regulations! See page 1.200.01-05

1. <u>Check and adjustment of the charge pressure</u>

– connect 60 bar - gauge to high pressure port (M_A) or (M_B) of the travel pump

– attention, do not select any travel direction !

– read the value at the gauge. Desired value: see technical data

If the desired value is not reached:

TL 65 / 70 / 80 / 100:
Unscrew plug of the charge pressure valve (2) and correct the pressure by adding or removing shims.

Shims:	**10 X 16 X 0,3**	**1.309.412.107 = approx. 0,9 bars**
	10 X 16 X 0,5	**1.309.412.217 = approx. 1,5 bars**
	10 X 16 X 1,0	**1.309.412.117 = approx. 3,0 bars**

TL 120:
Adjustment of the charge pressure by adjustment bolt (3)

2. <u>Check and adjustment of the travel pump neutral position</u>

– connect gauge to the high pressure port (M_A) and (M_B) of the travel pump

– set the engine to increased idle running speed

– watch the gauge. Both values have to be identical (charge pressure)

If the values are different, the neutral position can be corrected via the setscrew **(6)** at the travel pump

3. <u>Check and adjustment of the start-up speed</u>

– park machine on even ground

– connect engine rpm tachometer

– set travel range selector switch to „tortoise“

– set travel direction lever to „forward“ or „reverse“

– slowly actuate accelerator pedal

read the engine rpm when the machine starts moving. Desired value: see technical data

If the desired value is not reached, turn the setscrew (1) at the regulator cartridge in or out .

Screwing in: machine starts later
Screwing out: machine starts earlier

4. Check and adjustment of the engine stall rpm

This check has to be carried on the road or in the field (A slope would be favourable). Beware of the road traffic ! If possible, carry out this check with 2 people.

– load the bucket,if the incline is not sufficient.

– connect 600 bar gauge to high pressure port (M_A) forward of the travel pump

– connect engine rpm tachometer

– screw in the regulation start setscrew by 1 turn, travel motor must not regulate

– remove brake inching hose from the travel pump and plug

– set travel range selector switch to „rabbit“

– set travel direction lever to „forward“

– start up, fully accelerate

– operate the service brake when driving in order to obtain high pressure value, (see technical data). Read the engine rpm (see technical data) when this value is achieved.

the adjustment can be corrected by turning the setscrew (1), regulator cartridge at the travel pump, in or out resp. (Attention: Start-up speed must be within the tolerance range)

Turning in: Machine starts later
Turning out: Machine starts earlier

Afterwards reconnect the brake hose and deaerate the brake at the inching block. Adjust the regulation start as per the instructions, item 7.

5. Check and adjustment of the pressure cut-off

- connect 600 bar - gauge to gauge port (M_A) or (M_B) resp. of the travel pump

- set travel range selector switch to position „rabbit“

- set travel direction lever lever to „forward“ or „reverse“ resp.

- drive the vehicle against a solid object

- fully accelerate

- read the value on the gauge. Desired value: see technical data

if the desired value is not reached, turn the setscrew (7) for the pressure cut-off in or out resp.

Screwing in: pressure increase
Screwing out: pressure decrease

6. Check and replacement of the travel high pressure valves

☞ Note: It is only checked whether the travel high pressure valves are approx. 30 bar above the pressure cut-off

– connect 600 bar - gauge to gauge port (M_A) or (M_B) resp. of the travel pump

– increase pressure cut-off by approx. 30 - 40 bar

– set travel direction lever to „forward“ or „reverse“ resp.

– drive the vehicle against a solid object (wheels must lock up)

– fully accelerate

– read the value on the gauge. Desired value: 30 bar above the pressure cut-off

☞ ***if the desired value is not reached, remove the high pressure valve (4) or (5) resp. at the travel pump of the TL 65 / TL 70 / TL 80 / TL 100, adjust, re-install and check pressure, re-adjust if necessary.***
On the TL 120 adjust the high pressure valves - without removing them - via the setscrew.

– ***reset pressure cut-off to the desired value (see technical data)***

7. Check and adjustment of the regulation start

⚠ **The regulation start of the travel motor is also influencing the engine stall. Diesel engine can be overheated during long uphill travel when regulation start is set too high!**

☞ ***TL80 until s/n 0750 / TL100 until s/n 0452***

Method 1: Test at slope

The high pressure is simulated by uphill travel. The regulation start will be achieved automatically at a corresponding gradient (dynamic measuring).

– connect 600 bar - gauge to gauge port (9) (regulation start) at the travel motor

– connect 600 bar - gauge to gauge port (M_A) = (high pressure forward) of the travel pump

– set travel range selector switch to „rabbit“

– set travel direction lever to „forward“

– start up, fully accelerate. ⚠ **<u>Attention</u>: Beware of the road traffic**
– (if possible, carry out this check with 2 people)

– both gauges increase slowly. The gauge at the regulation start gauge port has to decrease after having reached the desired value (see technical data)

– if the gradient is not steep enough (high pressure too low), use the service brake, to do this, first remove the brake inching hose from the travel pump and plug.

☞ ***the adjustment can be corrected by turning in or out resp. the setscrew (10) at the travel motor***

Turning in: Regulation start later
Turning out: Regulation start earlier

☞ ***Afterwards re-connect the brake hose and <u>bleed</u> the <u>brake</u> at the inching block.***

Method 2: Test on even ground

– interchange the pressure hoses charge pressure **(G)** and pilot pressure **(Pst)** at the travel pump, thus there is charge pressure at the travel motor regulation

– connect 600 bar - gauge to the travel pump **M**A = high pressure forward

– connect 60 bar - gauge to the travel pump **M**B = high pressure reverse (charge pressure in this case)

– connect 600 bar gauge to the travel motor, regulation start gauge port

– drive the machine forward against a solid object

– select fast travel range (rabbit)

- slowly accelerate

– ***watch all three gauges - if the gauge of the travel motor decreases, read the values on the other gauges and compare them with the following table (adjust the regulation start in case of excessive deviations)***

TL 65	**Charge pressure**	**Regulation start**
	30 bar	345 bar
	31 bar	355 bar
	32 bar	365 bar
	33 bar	370 bar

TL 70 / TL 80

TL80AS	**Charge pressure**	**Regulation start**
	28 bar	215 bar
	30 bar	240 bar
	32 bar	270 bar
	34 bar	300 bar

TL100	**Charge pressure**	**Regulation start**
	30 bar	300 bar
	31 bar	310 bar
	32 bar	320 bar
	33 bar	325 bar

TL 120	**Charge pressure**	**Regulation start**
	26 bar	220 bar
	28 bar	250 bar
	30 bar	280 bar
	32 bar	300 bar

☞ ***Tolerance range, regulation start: ± 10 bar***

8. Check and adjustment of the regulation start against mechanical stop

☞ *TL80 from s/n 0751 / TL100 from s/n 0453*

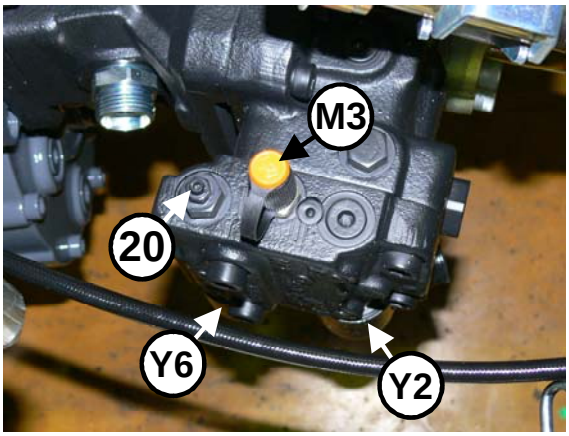
Sauer Danfoss travel motors type 51D080

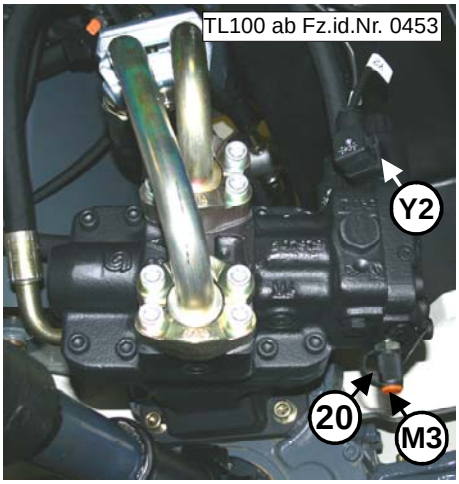
- connect 600 bar - gauge to the existing gauge port **M**A (high pressure forward) of the travel pump
- connect a 600 bar gauge at the travel motor regulation start gauge port drive machine forward against mechanical stop
- select fast speed (rabbit)
- slowly accelerate
- the gauges at the pump and at the travel motor increase slowly. When the regulation start value is reached (see technical data) the gauge at the regulation start port (**M3**) must drop

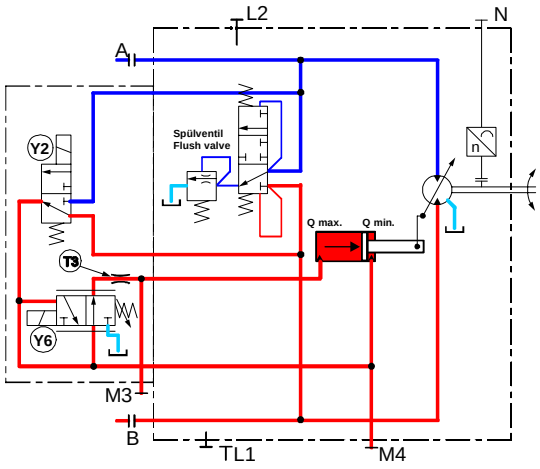
☞ ***The adjustment can be corrected by turning in or out resp. the setscrew (20) at the travel motor***

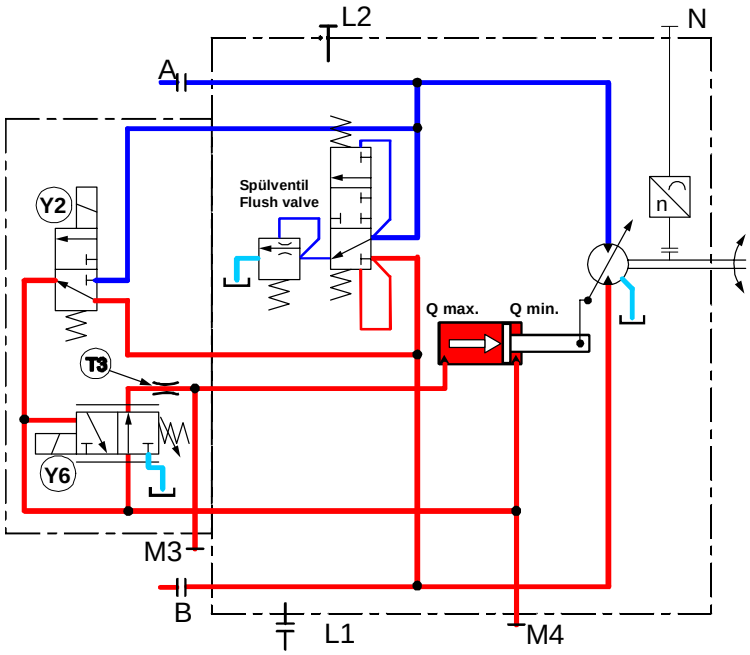
☞ ***Turning in: Regulation start later***
Turning out: Regulation start earlier





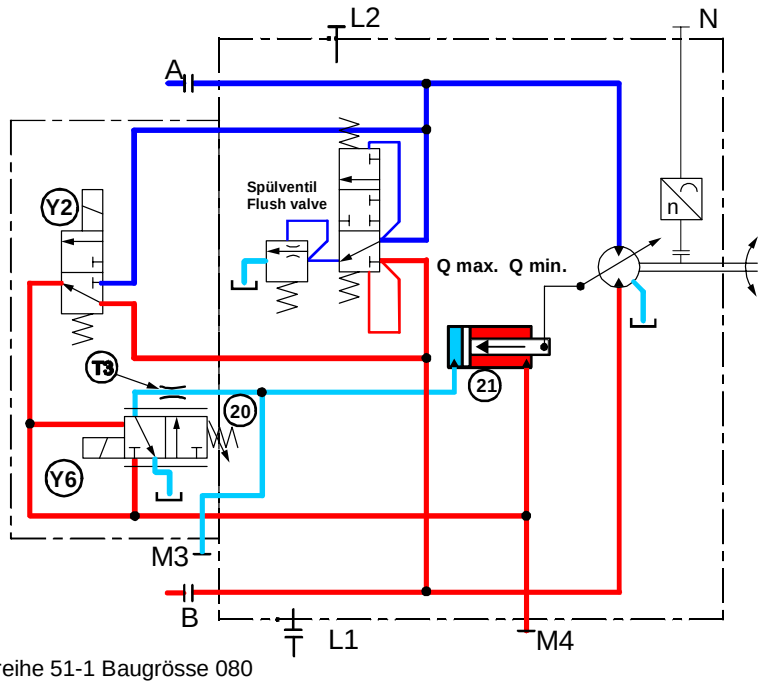






Sauer Danfoss Schrägachsen-Verstellmotor Baureihe 51-1 Baugrösse 080
Schaltbildsituation:
Fahrtrichtung vorwärts geschaltet, Magnetventil Y2 stromlos.
Fahrstufe schnell geschaltet, Magnetventil Y6 stromlos.
Beispiel: Die Maschine fährt auf ebener Strasse, der Hochdruck "B" Seite liegt unter dem Regelbeginnwert.
Der Kolben vom Magnetventil Y6 wird von der Feder (20) in linker Position gehalten. Beide Stellzylinderkammern sind mit Hochdruck beaufschlagt. Die Verstellzylinderbodenseite (21) hat gegenüber der Stangenseite die höhere Kraft.
Der Fahrmotor verstellt Richtung Q min (Schnellgang) und wird dort gehalten.

A	Hochdruckanschluss Fahren rückwärts	High pressure port travel reverse
B	Hochdruckanschluss Fahren vorwärts	High pressure port travel forward
M3	Messanschluss Fahrmotor Regelbeginn	Test port travel motor regulation start
M4	Messanschluss Fahrmotor Fahrtrichtungserkennung	Test port travel direction recognition
Y2	Magnetventil Fahrmotor Fahrtrichtungserkennung	Solenoid valve travel motor travel direction recognition
Y6	Magnetventil Fahrmotor Fahrgeschwindigkeit	Solenoid valve travel motor travel speed
20	Einstellbare Feder Fahrmotor Regelbeginn	Adustable spring travel motor regulation start
21	Verstellzylinder	Servo piston
T3	Verzögerungsblende Fahrmotorverstellung	Orifice travel motor regulation
N	Drehzahlaufnehmer (Option)	RPM sensor (option)
L1	Leckölanschluss	Case drain
L2	Leckölanschluss	Case drain



Sauer Danfoss Schrägachsen-Verstellmotor Baureihe 51-1 Baugrösse 080
Schaltbildsituation:
Fahrtrichtung vorwärts geschaltet, Magnetventil Y2 stromlos.
Fahrstufe schnell geschaltet, Magnetventil Y6 stromlos.
Beispiel: Maschine fährt bergauf, der Hochdruck an "B" Seite steigt.
Ab Regelbeginn wird der Kolben vom Magnetventil Y6 vom dort wirkenden Hochdruck gegen die Feder (20) verschoben, die Verstellkolben (21) Bodenseite wird zu Tank verbunden. Der permanent auf der Stellkolben (21) Ringseite wirkende Hochdruck verstellt den Motor Richtung Q max.
Beispiel: Fahrstufe langsam geschaltet, Magnetventil Y6 bestromt.
Die Regelung wird übersteuert, der Kolben vom Magnetventil Y6 wird vom erregten Magnet gegen die Feder (20) geschaltet.
Der Verstellkolben(21) hält den Motor in Q max.

9.Check and adjustment of the inching

- open the engine bonnet
- connect 600 bar - gauge to the existing gauge port **M**A (high pressure forward) of the travel pump
- connect 60 bar - gauge to gauge port „brake pressure at the inching valve“
- drive the machine forward against a solid object so that the wheels lock up
- fully accelerate
- slowly actuate the foot brake pedal
- watch both gauges: At approx. 5 bar brake pressure the inching must begin, i.e. the 600 bar - gauge decreases. At approx. 13 bar brake pressure the inching must be finished, i.e. the 600 bar - gauge decreases to the charge pressure value

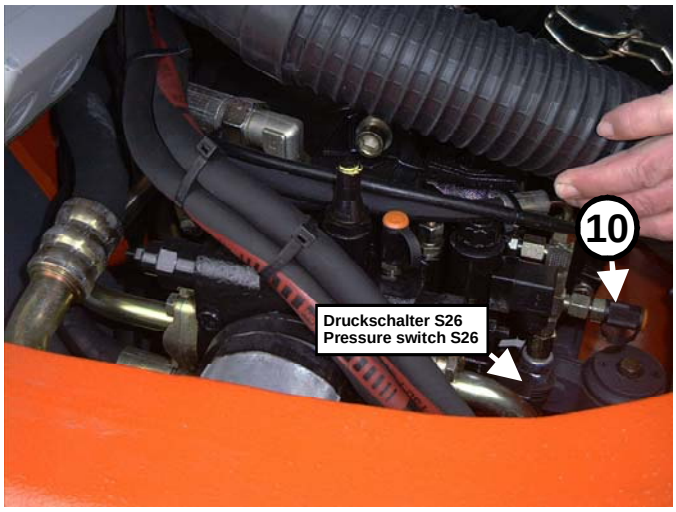
☞ ***The inching range can be changed or corrected resp. via the setscrew (11) at the inching valve***

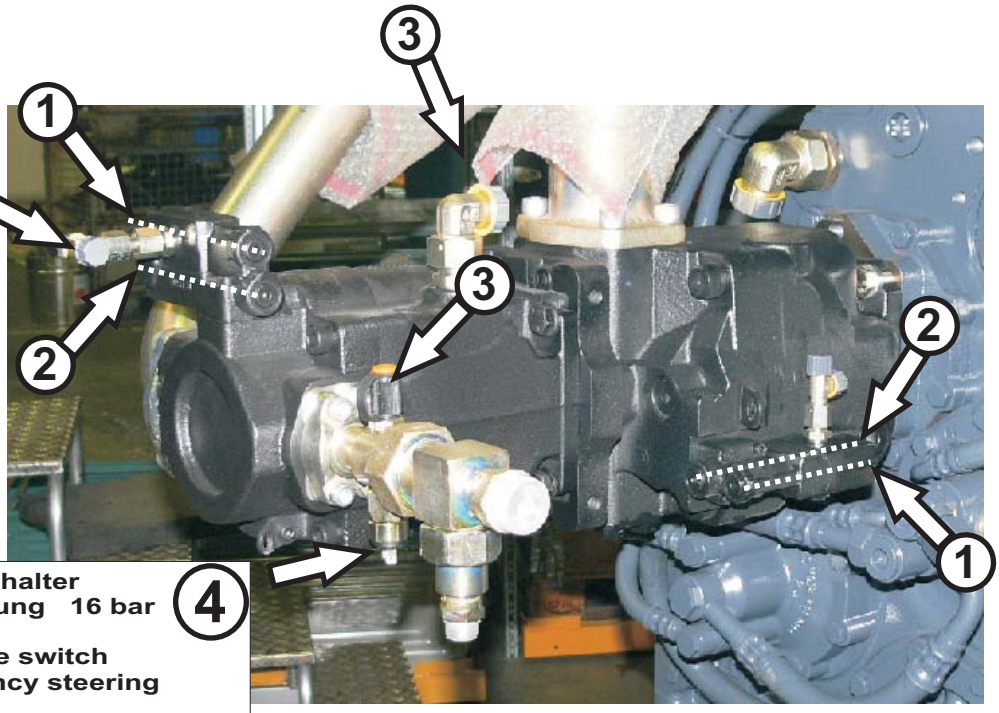
Turning in: inching later
Turning out: inching earlier

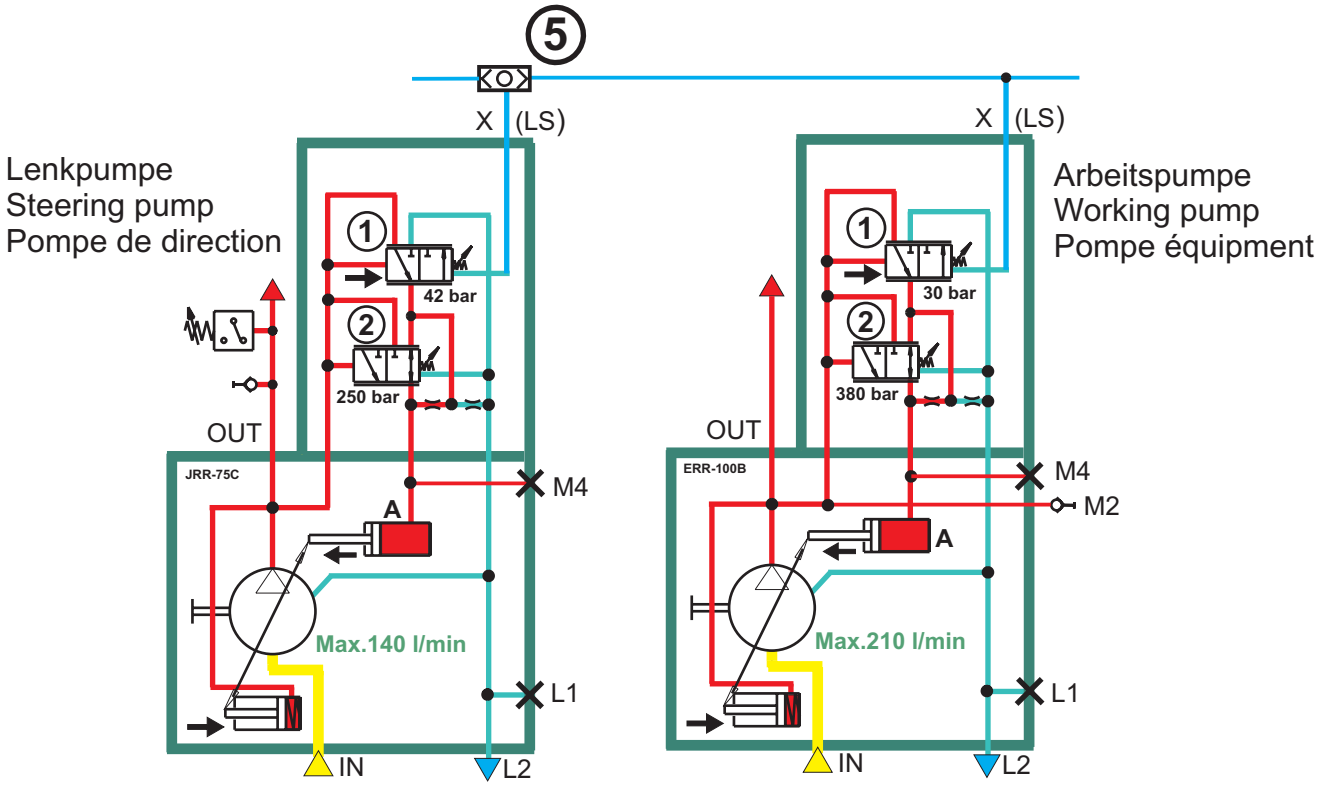
10. Check of pressure switch (hydrostatic brake S26)

- open the engine bonnet
- connect 60 bar - gauge to gauge port „brake pressure at the inching valve“(10)
- connect a test lamp to the currentless cable of the brake pressure switch (S26)
- the test lamp has to light up at the brake pressure value (see technical data)

☞ ***if the pressure value does not correspond to the desired value, adjust the pressure switch(S26) or replace it***

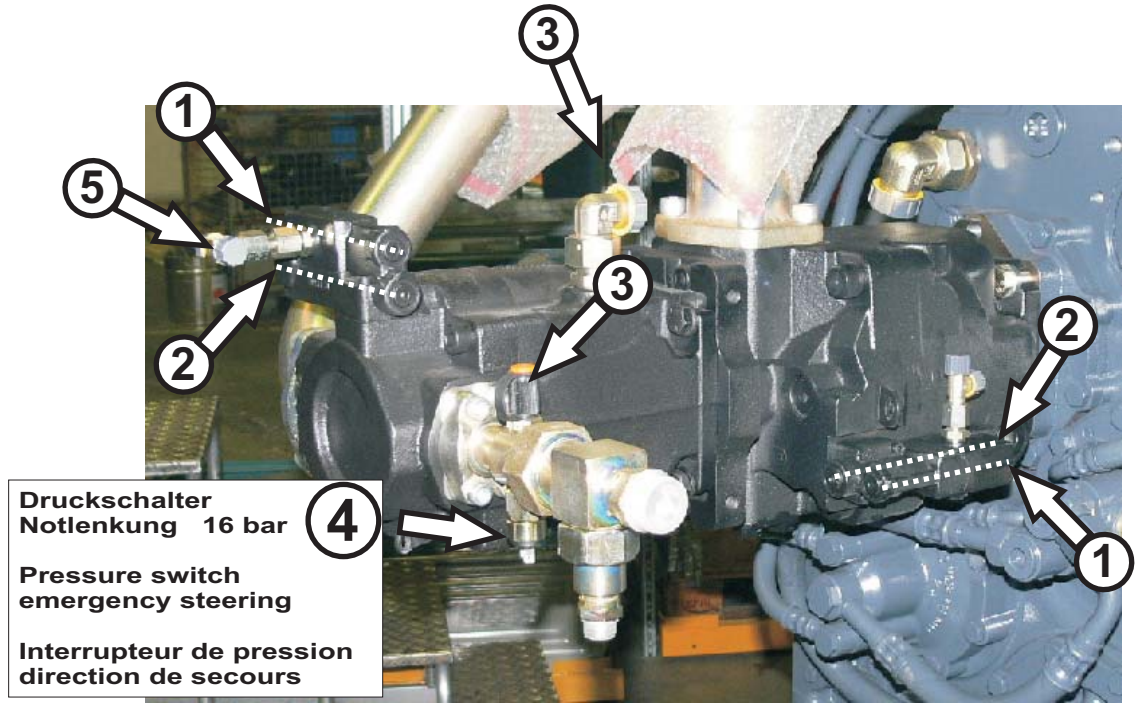






Steering- and working equipment pumps Danfoss:
Diagram above: Diesel engine to be started, no function operated jet.
At stopped engine are the displacement pumps at maximum flow.
As soon as the engine is started, will the power regulators **(1)** pushed to the right hand side.
Then the actuation piston **(A)** is linked at the bottom side to **P**. The pumps
will destroke until the adjusted pressure of 42 bar respectively 30 bar is reached at the power regulator **(1)**. This pressure will be hold as stand-by pressure.

Typ Model Type Tipo	**TL 420 - 450**	**ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.**	***TL04200100 TL04500100***	Datum Edition Date Fecha	**10.2007**
Benennung Description Dénomination Denominación	**Funktions- und Einstellanweisung Danfoss Functioning- and settingdescription Danfoss**			Blatt Page Feuille Página	**5.350.01**



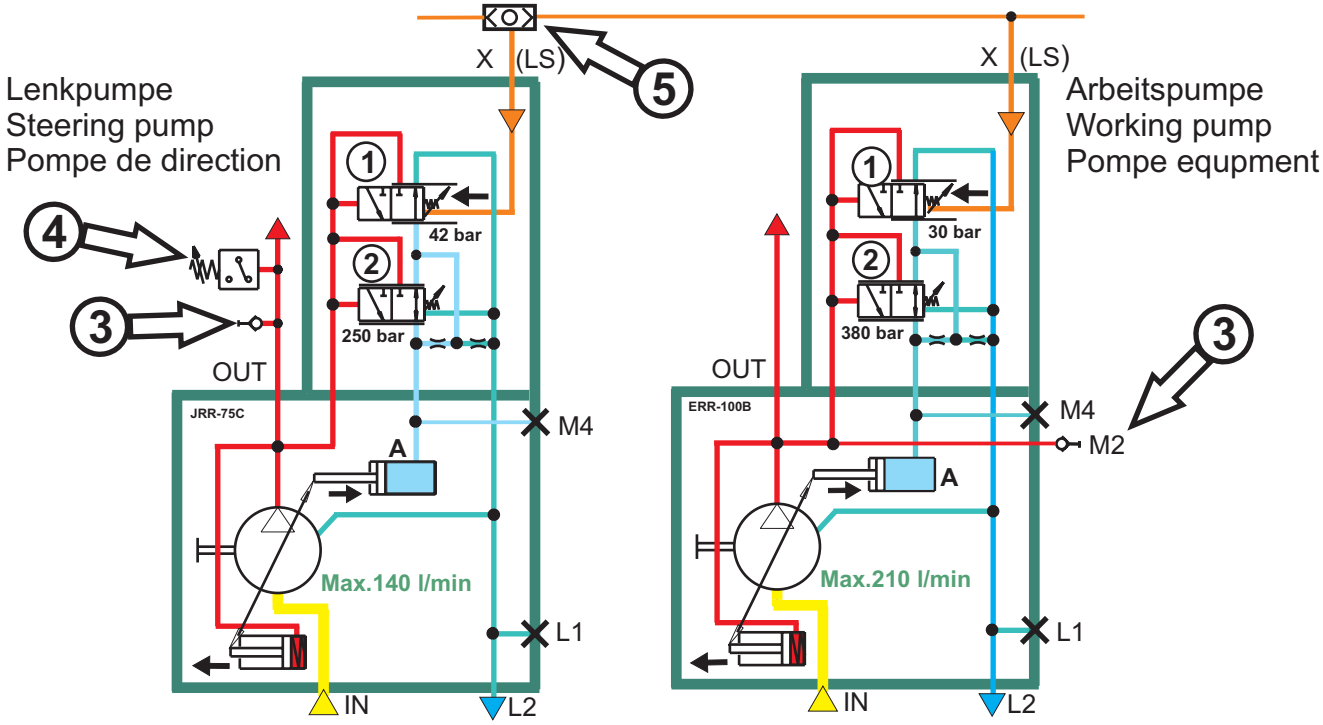
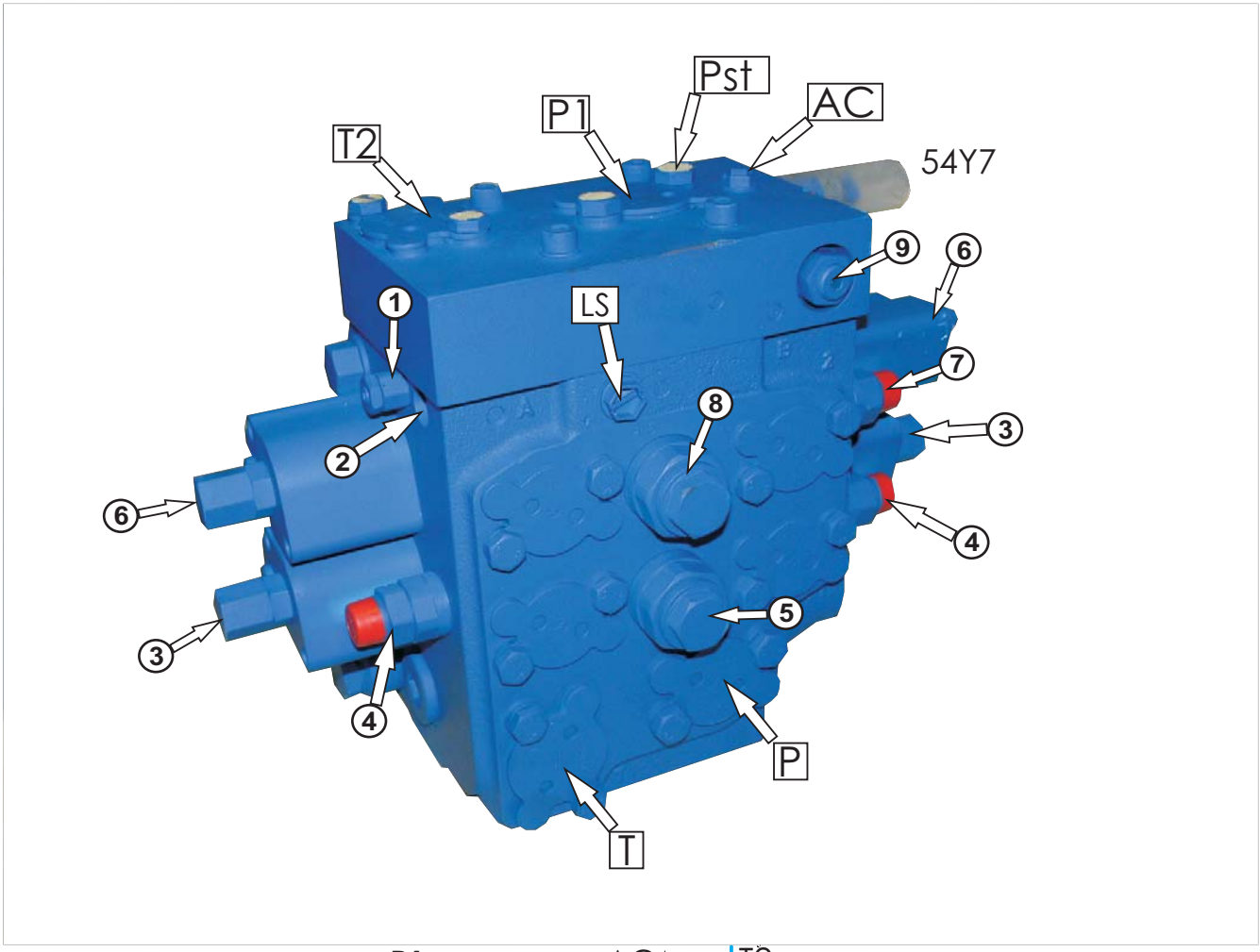
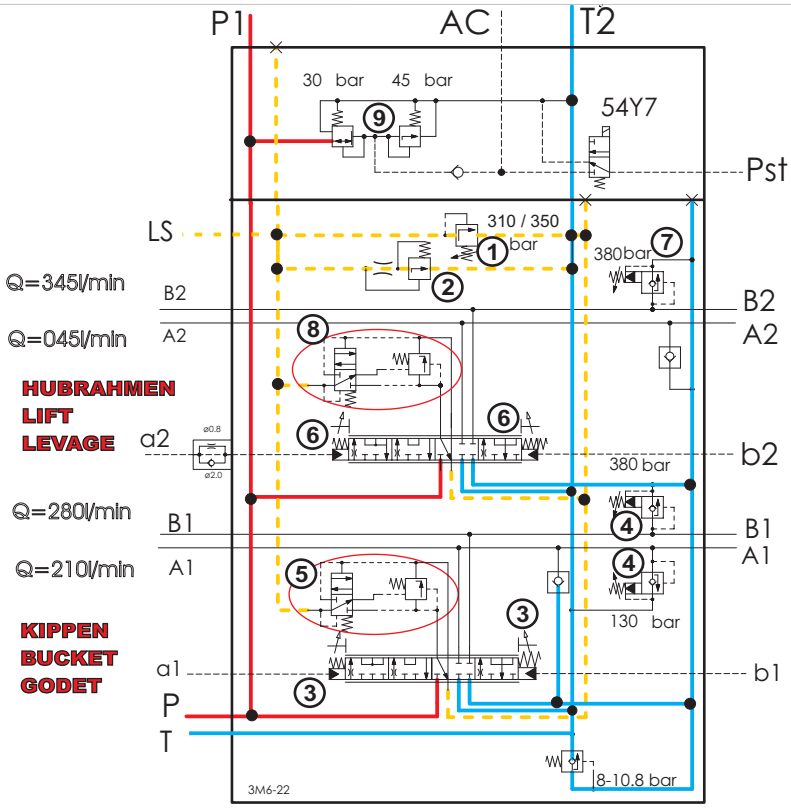


Diagramm above: Steering- or working functions operated. The power regulators **(1)** will pushed to the left hand side because the pressure signal which is coming via the X ports **(LS)** to the spring feather sides of the power regulators **(1)**. Then, the piston **(A)** bottom side is switched via port **(L2)** to the tank. The displacement pumps are moving up to max. flow.

Setting instruction pump:

Bring machine to service temperature (50 - 60°C hydraulic oil temperature).
Connect a 60 bar gauge to testport **(3)** at the corresponding pump.
Start up diesel engine, set engine to high idle. **Do not operate any function!** Check the pressure at the gauge, it should be at 30 bar resp. 42 bar! (The stand-by pressure of the steering pump must be under 30 bar to set the stand-by pressure at the working pump.)
If not, readjust the power regulator **(1)** of the corresponding pump.
Under normal conditions the savety regulator **(2)** of the working pump which is preset to 380 bar, is not in use. The working pressure is limited by the LS-pressure cut-off valve in the valve bank (3M6).
To check the regulator **(2)**, the LS-valve have to be set to a higher setting at the control valve and the loader arm have to be lowered into end stroke position. The safety regulator (250 bar) of the steering pump works at a outlet pressure of 250 bar at the pump.





Typ Model Type Tipo	**TL 420** **TL 450**	**Elektrisches System** **Electrical system** **Circuit électrique** **Sistema elèctrico**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.**	***TL04200100*** ***TL04500100***	Datum Edition Date Fecha	**10.2007**
Benennung Description Dénomination Denominación	**Steuerventil 2/3 M6-15** **Valve bank 2/3 M6-15** **Distributeur 2/3 M6-15**				Blatt Page Feuille Página	**5.350.02**

Pos. Item Rep. No.	Deutsch	English	Français
	STEUERVENTIL	**VALVE BANK**	**DISTRIBUTEUR**
	3 M6-22	**3 M6-22**	**3 M6-22**
1	LS - Druckbegrenzungsventil 310 bar / 350 bar	Load sensing pressure valve 310 bar / 350 bar	Limiteur de pression LS 310 bar / 350 bar
2	LS - Volumenstromregelventil nicht einstellbar	LS - flow regulator valve not adjustable	Régulateur de débit LS non réglable
3	Schieberwegbegrenzung	Spool stroke limitation	Limitation de course du tiroir
4	Sekundärventil 380 bar / 130 bar	Secondary pressure relief valve 380 bar / 130 bar	Clapet secondaire 380 bar / 130 bar
5	Sektionsdruckwaage	Pressure compensator	Balance de pression
6	Schieberwegbegrenzung	Spool stroke limitation	Limitation de course du tiroir
7	Sekundärventil 380 bar	Secondary pressure relief valve 380 bar	Clapet secondaire 380 bar
8	Sektionsdruckwaage	Pressure compensator	Balance de pression
9	Druckminderventil 30 bar	Pressure reducing valve 30 bar	Réducteur de pression 30 bar

Sekundärventile: Prüfen und Einstellen.

- 600 bar Manometer an Messpunkt 3 der Arbeitspumpe anschliessen .
- Sicherheitsregler 2 der Arbeitspumpe über 380 bar einstellen.
- LS Druckbegrenzungsventil 1 am Steuerventil über 380 bar einstellen.
- Alle Funktionen, ausser Hubrahmen senken, (ist ohne Sekundärventil), mit niedriger Motordrehzahl in Zylinderendlage fahren.
- Druck ablesen, gegebenenfalls nachstellen.
- Sicherheitsregler 2 und LS Druckbegrenzungsventil 1 wieder auf die angegebenen Werte (siehe Seite 2.33-2.35) zurückstellen.

Secondary pressure relief valve: Checks and adjustment.

- Connect a 600 bar gauge at testport 3 at the workingpump.
- Adjust safety controller 2 higher than 380 bar at working pump.
- Adjust LS-pressure valve 1 higher than 380 bar at Control valve.
- Actuate all functions, exept lowering loader frame (without secondary relief valve) with low engine rpms into hydr. cylinder end stroke position.
- Read the pressures, readjust if necessary.
- Readjust safety controller 2 and LS-pressure valve 1 to indicated values (see page 2.33-2.35).

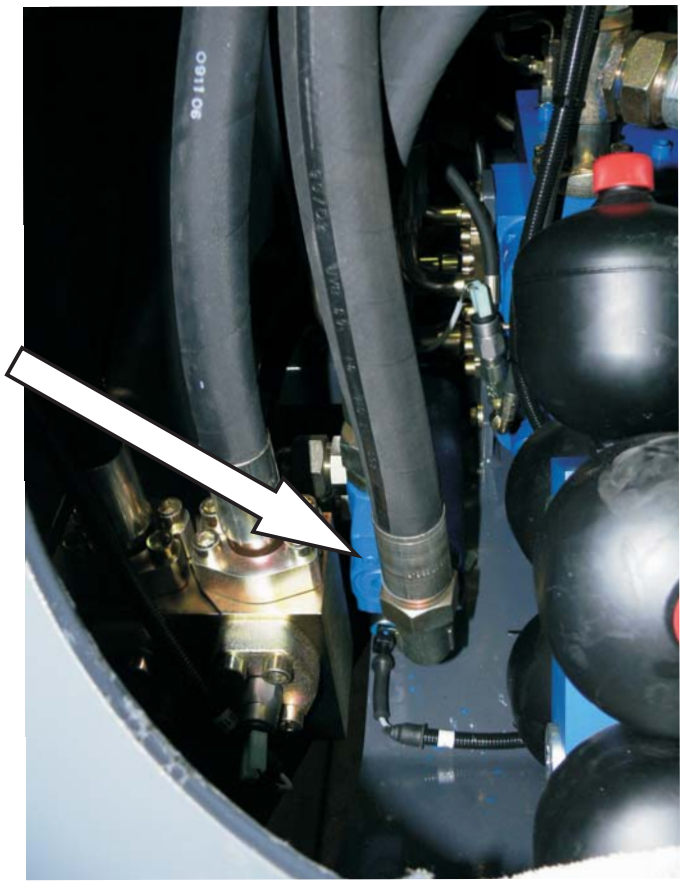
Clapets secondaires: Contrôle et réglage.

- Brancher un manomètre au prise de pression 3 de la pompe d´ equipement
- Regler la pression du clapet de securité 2 de la pompe d´equipement, à une valeur supérieur à 380 bar.
- Regler la pression du limiteur de pression LS 1 au distributeur, à une valeur supérieur à 380 bar.
- Actionner toutes les fonctions de verins, sauf bras de levage abaisser, (sans clapet secondaire) á un régime moteur assez bas à fin de course. Relever les pressions et les reajuster si necessaire.
- Reajuster le clapet de securité 2 et le limiteur de pression LS 1 aux valeurs indiquées (voir page 2.33-2.35).

Speicherdruck-Entlastungsschraube

Vor Arbeiten an der Lastschwingungsdämpfung Sicherstellen dass die Druckspeicher drucklos sind.
Hierzu die Verschlussschraube herausdrehen und die Ventilspindel SW 3 zwei Umdrehungen gegen den Uhrzeigersinn aufdrehen.

Hinweis:
Anzugsmoment: Ventilspindel **3,5 Nm**
Anzugsmoment: Verschlussschraube **7 Nm**

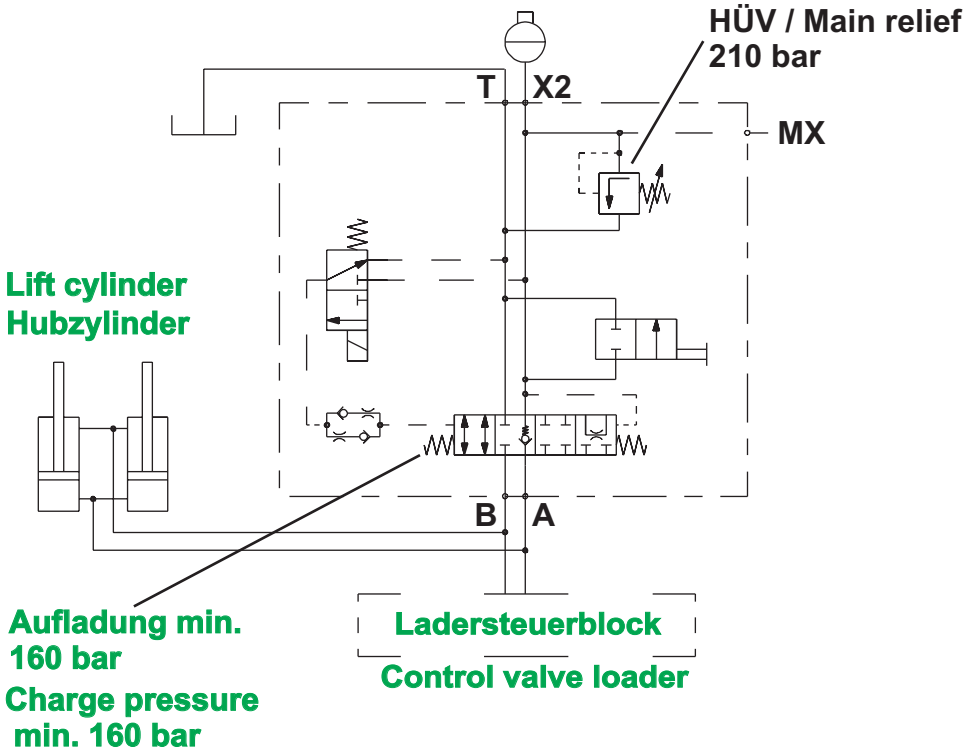


Pressure accumulator - discharge screw

Before carriing out repair jobs at the ride control system, ensure the pressure accumulators to be totally discharged.

To do this, dismount plug and screw out the valve coil (wrench size 3mm) approx. two revolutions (counter clockwise).

REMARK:
Tightening torque: valve coil = **3,5 Nm**
Tightening torque: plug = **7 Nm**



Typ Model Type Tipo	**TL 420** **TL 450**	**Elektrisches System** **Electrical system** **Circuit électrique** **Sistema elèctrico**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.**	***TL04200100*** ***TL04500100***	Datum Edition Date Fecha	**10.2007**
Benennung Description Dénomination Denominación	**Steuerventil 2/3 M6-15** **Valve bank 2/3 M6-15** **Distributeur 2/3 M6-15**				Blatt Page Feuille Página	**5.350.03**

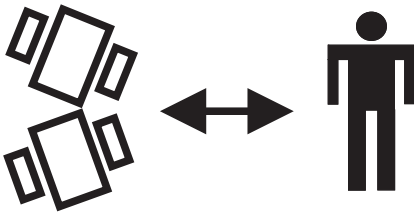

TEREX®

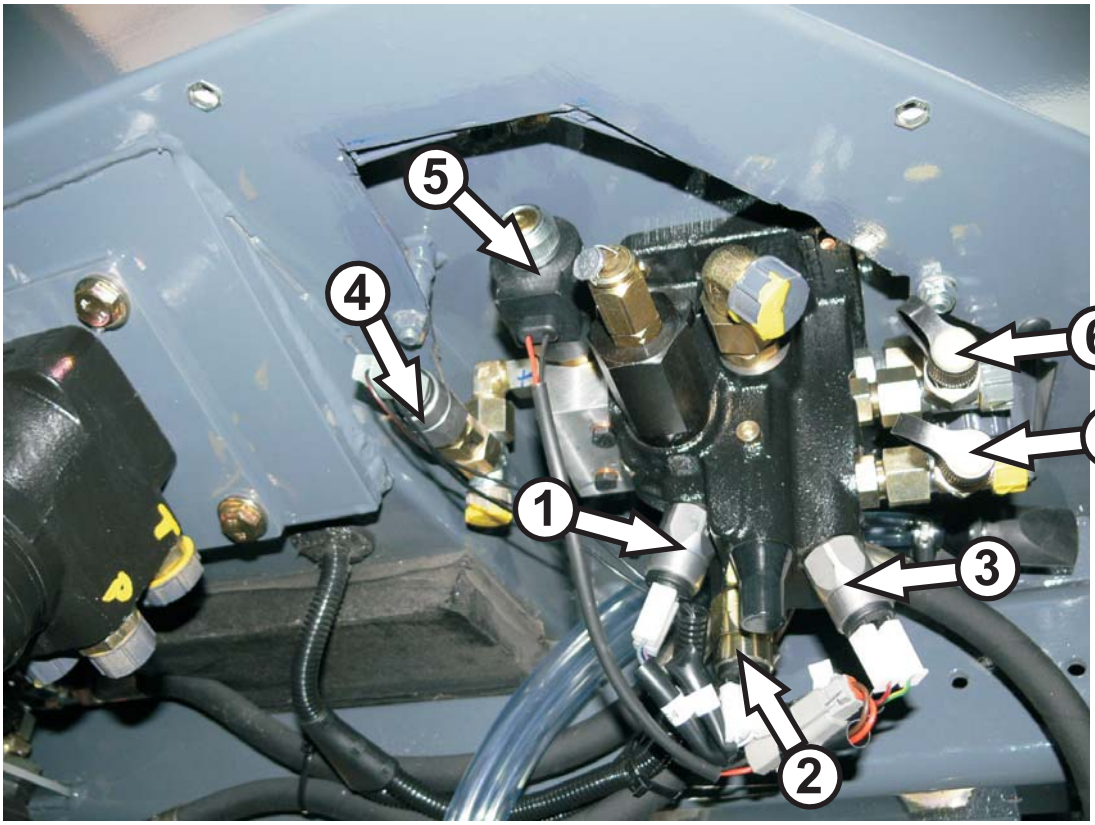
Brake valve

Location



Attention !



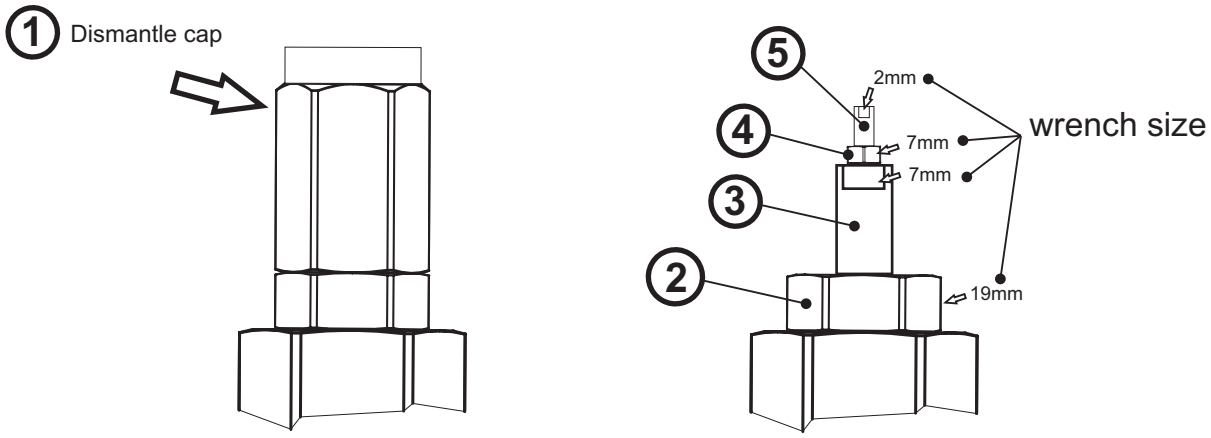


① **Brake light switch (5 bar)**
② **Brake pressure accumulator (130 bar)**
③ **Transmission deactivating switch (16 bar)**
④ **Parking brake switch (100 bar)**
⑤ **Solenoid valve parking brake**
⑥ **Test port front axle**
⑦ **Test port rear axle**

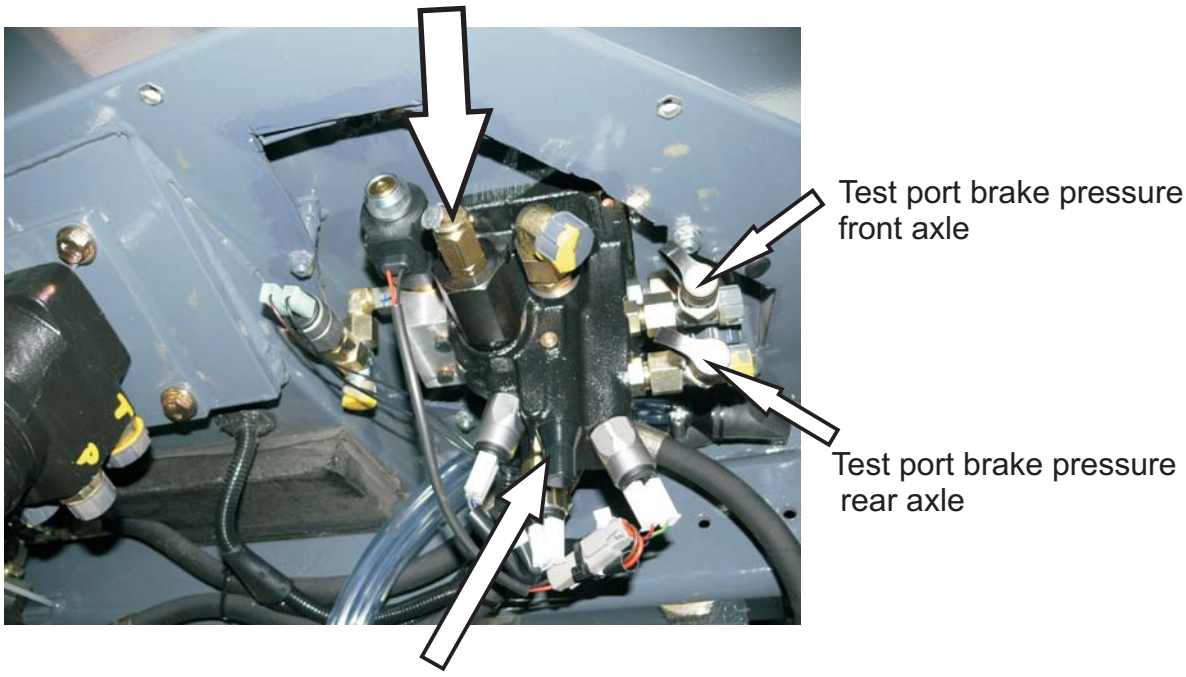
Typ Model Type Tipo	**TL 420** **TL 450**	**Elektrisches System** **Electrical system** **Circuit électrique** **Sistema elèctrico**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.**	***TL04200100*** ***TL04500100***	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Bremsventil** **Brake valve**				Blatt Page Feuille Página	**5.35.04**

Setting instructions - brake valve

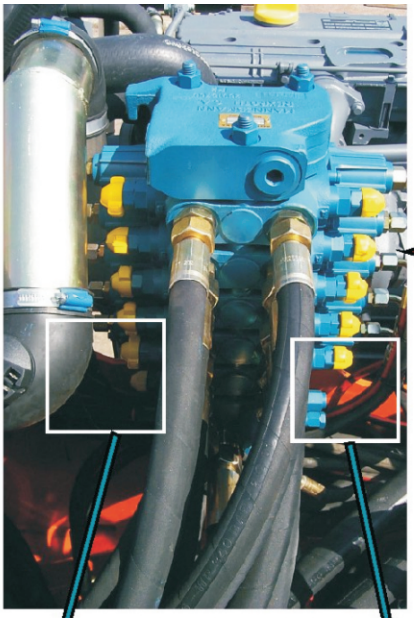
(Adjusting of the brake pressure accumulator fill valve)



1. Install test port at the brake pressure accumulators
2. Dismantle cap (1)
3. Start engine, loosen parkingbrake
   (prevent inadvertent rolling of the machine)
4. Open nut (2) and turn bolt (3) out to increase the cut-in pressure (160bar)
5. Open nut (4) and turn bolt (5) out to increase the cut-off pressure (200bar)
6. Check the adjustment of the fill valve in the following way:
   Push brake a several times, the pressure must decrease to 160 bar.
   Stop pushing the brake, the pressure must increase to 200 bar.

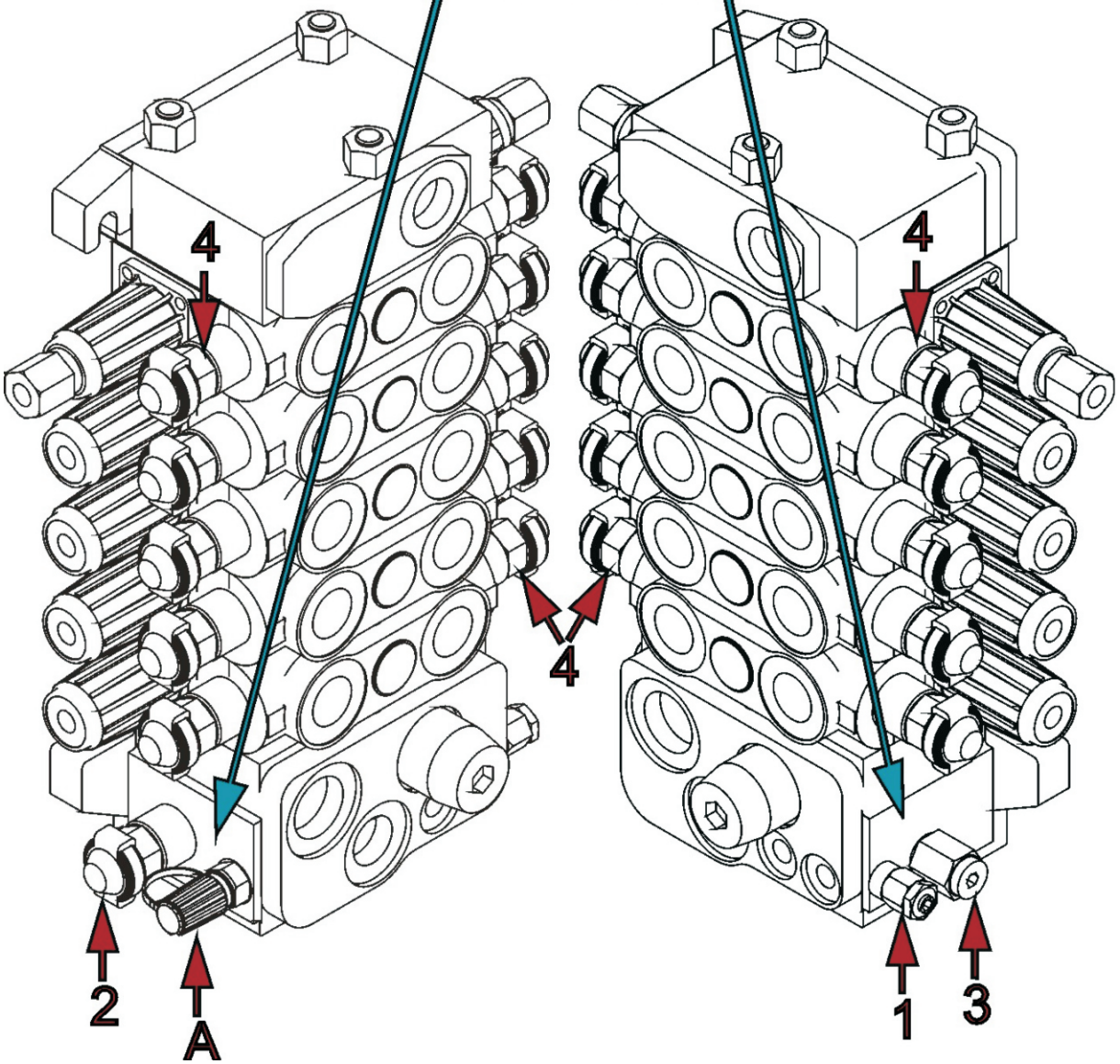


Brake pressure adjustment bolt (70+5 bar)



SX 14 Steuerventil 1
SX 14 valve bank 1
SX 14 distributeur 1

12

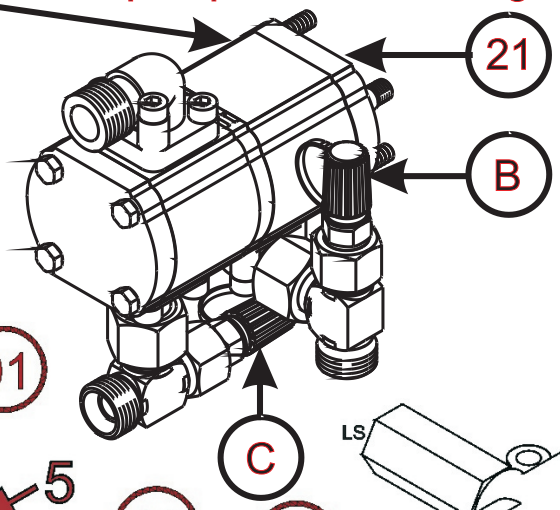


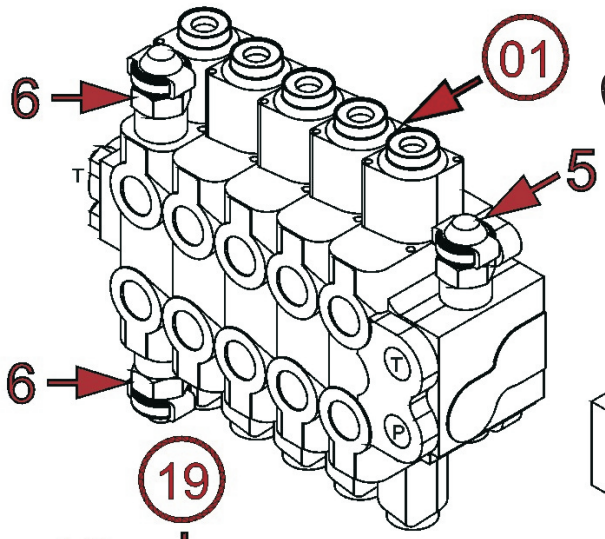
Typ Model Type Tipo	**TW 85** (HML 32)	**ab Fz.-Id.nr..** **from s/n:** **à partir du n/s: TW00850100** **desde el no.:**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Blatt Page Feuille Página	**5.510.11**

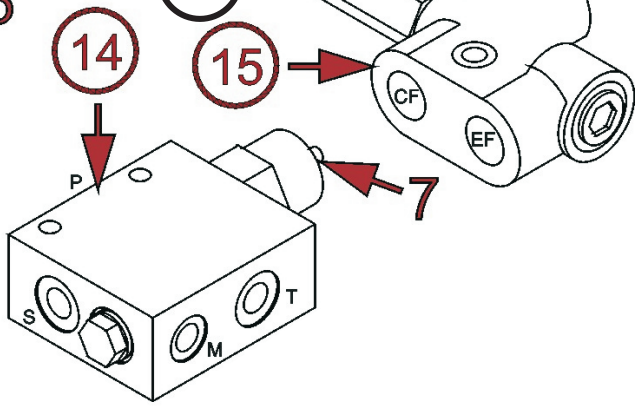
Pos. Item Rep. No.	Deutsch	English	Français
⑫	**SX14 Steuerventil 1**	**SX14 valve bank 1**	**12 SX14 distributeur 1**
A	**Messstelle für** *Einstellungen am Steuerventil:* LS Druck (**1**) SV Druck (**2**) Sekundärdrücke (**4**) und **Messstelle für** *Einstellungen an der Arbeitspumpe:* Stand–by Druck p Druck	**test port for** *settings at valve bank:* LS pressure (**1**) safety valve pressure (**2**) line relief pressures (**4**) and **test port for** *settings at working pump:* stand-by pressure p pressure	**prise de pression pour** *réglages côté distributeur:* pression LS (**1**) pression valve de sécurité (**2**) pressions secondaires (**4**) et **prise de pression pour** *réglages côté pompe équipement:* pression d'attente pression p
1	LS – Druckbegrenzungsventil *(einstellbar)*	load sensing pressure relief valve *(adjustable)*	limiteur de pression LS (réglable)
2	Sicherheitsventil *(einstellbar)*	safety valve *(adjustable)*	valve de sécurité *(réglable)*
3	LS - Stromregelventil *(nicht einstellbar)*	LS – flow regulator valve *(not adjustable)*	régulateur de débit LS *(non réglable)*
4	Sekundärventil(e) *(einstellbar)*	line relief valve(s) *(adjustable)*	clapet(s) secondaire(s) *réglable(s)*

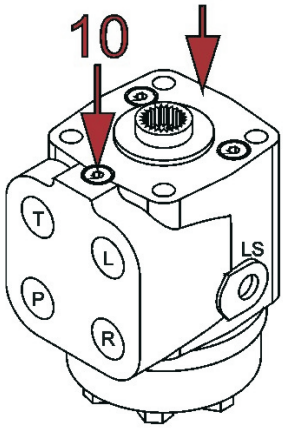


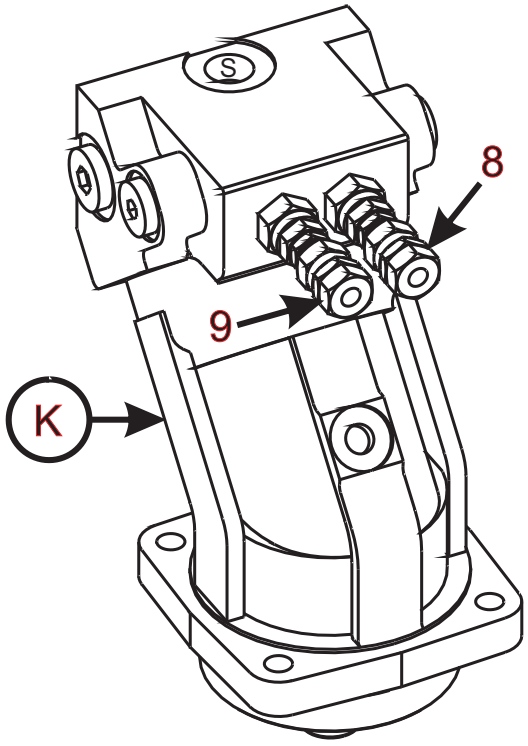
Doppelzahnradpumpe
double gear pump
pompe tandem à engrenages

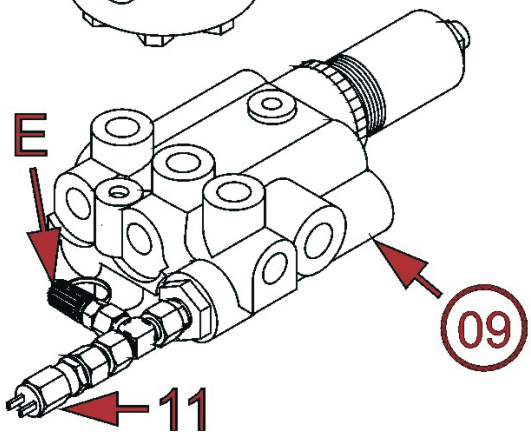






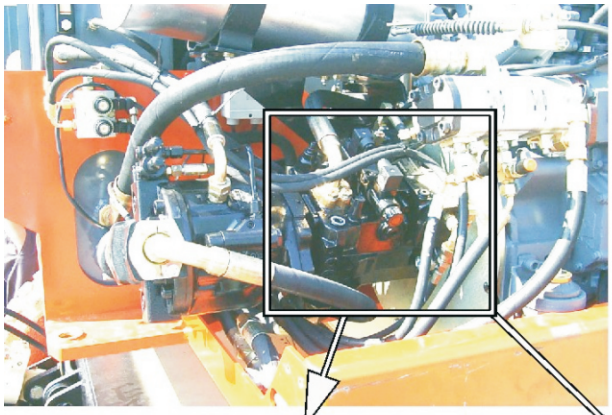




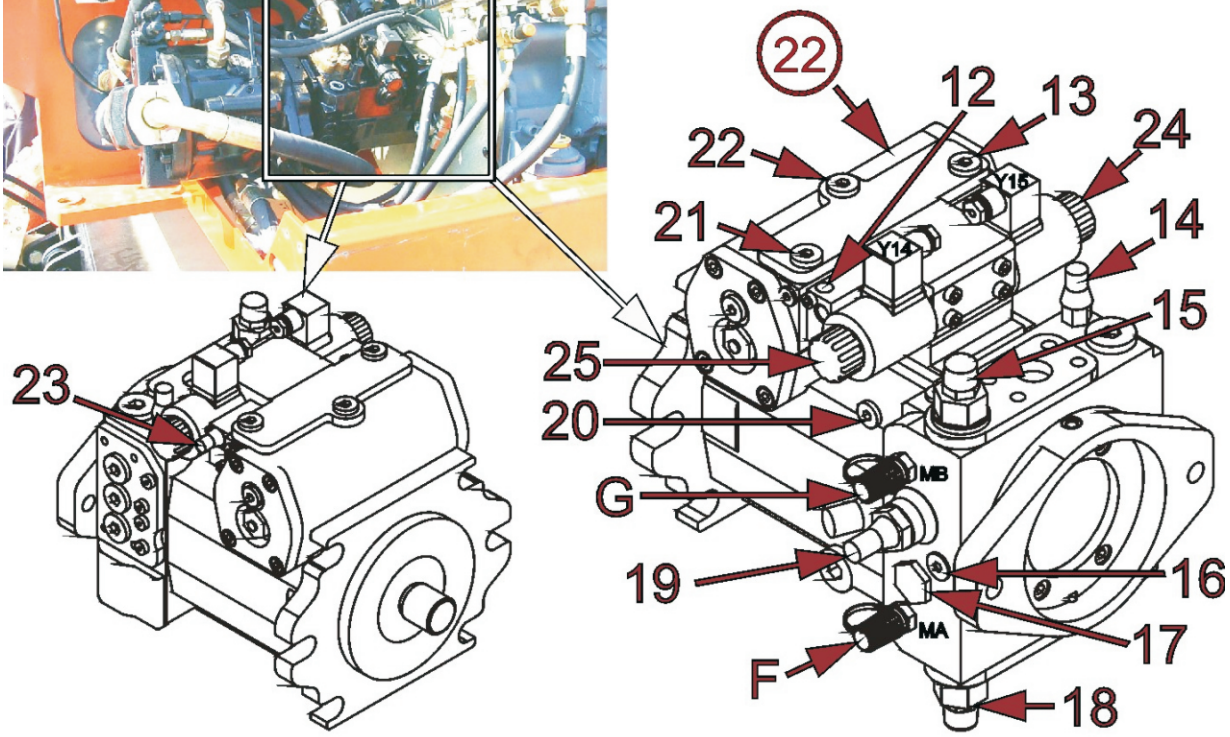


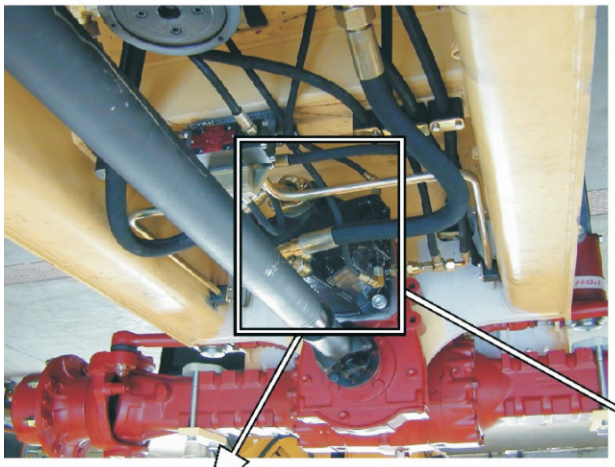
Typ Model Type Tipo	**TW 85** (HML 32)	**ab Fz.-Id.nr..** **from s/n:** **à partir du n/s: TW00850100** **desde el no.:**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Blatt Page Feuille Página	**5.510.13**

Pos. Item Rep. No.	Deutsch	English	Français
(21)	**Doppelzahnradpumpe**	**Double gear pump**	**Double pompe à engrenages**
B	***Messstelle für*** *Einstellungen am Steuerventil 2, Schwenkmotor, Lenkaggregat und (Nebenkreis)*	***test port for*** *settings at valve bank 2, swing motor, steering unit and (secondary functions)*	***prise de pression pour*** *réglages côté distributeur 2, moteur d'orientation, ensemble direction et (circuit secondaire)*
(01)	**Steuerventil 2 (SM12)**	**valve bank 2 (SM12)**	**distributeur 2 (SM12)**
	Hauptüberdruckventil (**5**) für	main pressure relief valve (5) for	limiteur de pression principal (**5**) pour
	Schwenken Knicken Abstützen rechts Abstützen links Zweiter Zusatzsteuerkreis mit Sekundärventile (**6**) **Option** – *(Sortiergreifer, Schlegelmäher, Betonzange)*	swing articulation outrigger right outrigger left secondary add. control circuit with line relief valves (**6**) **option** – *(sorting grab, brush cutter, concrete crusher)*	orientation articulation stabilisateur droit stabilisateur gauche deuxième circuit supplémentaire avec clapets secondaires (**6**) **option** – *(grappin de triage, faucheuse à fléaux, broyeur de béton)*
(20)	**Schwenkmotor** Ventile am Schwenkmotor (**8** und **9**)	**swing motor** line relief valves at swing motor (**8** and **9**)	**moteur d'orientation** clapets secondaires côté moteur d'orientation (**8** et **9**)
(15)	**Prioritätsventil**	**priority valve**	**valve prioritaire**
(19)	**Lenkaggregat** Druckbegrenzungsventil (**10**)	**steering unit** pressure relief valve (**10**)	**ensemble direction** limiteur de pression (**10**)
C	***Messstelle für*** *Einstellungen am Abschaltventil*	***test port for*** *settings at cut-off valve*	***prise de pression pour*** *réglages côté valve de coupure*
(14)	**Abschaltventil** Druckbegrenzungsventil (7)	**cut off valve** pressure relief valve (7)	**valve de coupure** limiteur de pression (7)
E	***Messstelle für***	***test port for***	***prise de pression pour***
(09)	**Speicherfüllventi**l (Bremse) Druckschalter – *S44* (**11**)	**accumulator charge valve** (brake) pressure switch – *S44* (**11**)	**valve de remplissage accu** (frein) interrupteur à pression – *S44* (**11**)

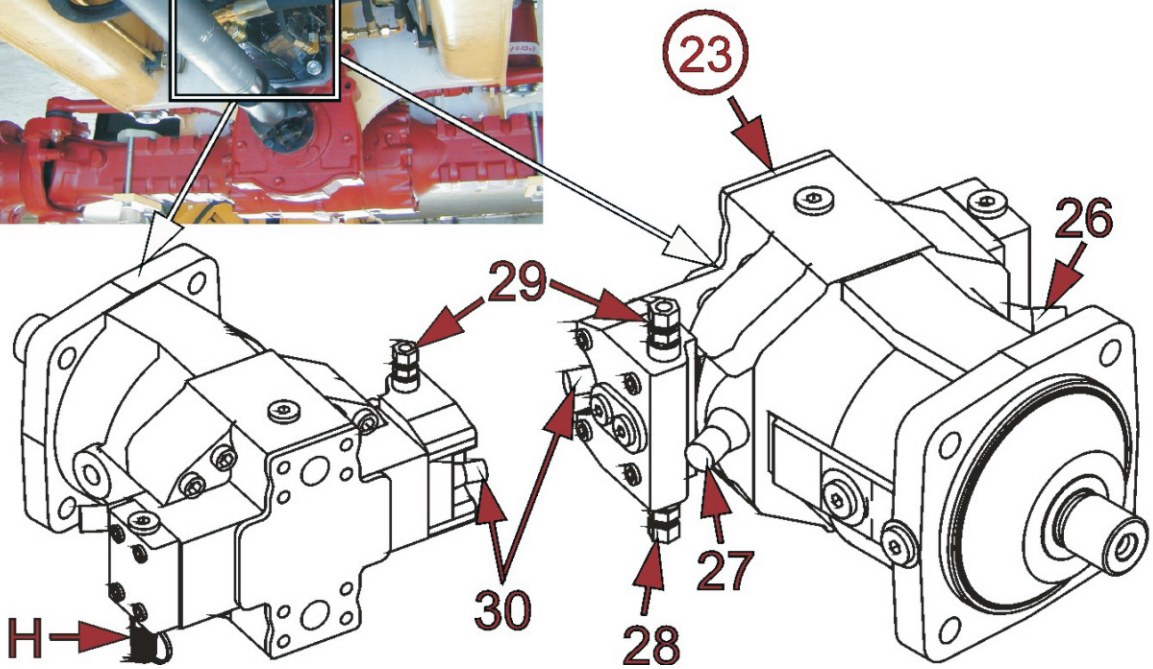


Verstellpumpe - Fahren
variable displacement pump - travel
pompe à débit variable - translation





Verstellmotor - Fahren
variable displacement motor - travel
moteur à cylindrée variable - translation



Typ Model Type Tipo	**TW 85** (HML 32)	**ab Fz.-Id.nr..** **from s/n:** **à partir du n/s: TW00850100** **desde el no.:**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung** **Setting instructions** **Instructions de réglage** **Guía de ajuste**	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Blatt Page Feuille Página	**5.510.15**

Pos. Item Rep. No.	Deutsch	English	Français
(22)	**Verstellpumpe - Fahren**	**variable displacement pump – travel**	**pompe à débit variable – translation**
(23)	**Verstellmotor - Fahren**	**variable displacement motor – travel**	**moteur à débit variable – translation**
F	***Messstelle für*** *Einstellungen an Verstellpumpe - Fahren und Verstellmotor – Fahren* ***(MA vorwärts)***	***test port for*** *settings at variable displacement pump – travel and variable displacement motor – travel* ***(MA travel forward)***	***prise de pression pour*** *réglages côté pompe à débit variable - translation et moteur à cylindrée variable – translation* ***(MA marche AV)***
G	***Messstelle für*** *Einstellungen an Verstellpumpe - Fahren und Verstellmotor – Fahren* ***(MB Fahren rückwärts)***	***test port for*** *settings at variable displacement pump – travel and variable displacement motor – travel* ***(MB travel reverse)***	***prise de pression pour*** *réglages côté pompe à débit variable - translation et moteur à cylindrée variable – translation* ***(MB marche AR)***
	Anschluß - *Bremsinchung* **(12)**	connection - *brake inching* **(12)**	connexion - *inching frein* **(12)**
	Anschluß ***„X1“*** *Stelldruck* **(13)**	connection ***„X1“*** *control pressure* **(13)**	connexion ***„X1“*** *pression de commande* **(13)**
	Ventil *Druckabschneidung* **(14)**	Valve *pressure cut-off* **(14)**	valve *coupure de pression* **(14)**
	Sicherheitsventil - *Fahren rückwärts* **(15)**	safety valve - *travel reverse* **(15)**	valve de sécurité - *marche AR* **(15)**
	Speisedruck ***„G“*** **(16)** – F*eststellbremse, Vorsteuerdruck, Pendelachsverrieglung*	charge pressure ***„G“*** **(16)** - *parking brake, pilot pressure, oscillating axle lock*	pression de gavage ***„G“*** **(16)** - *frein de stationnement, pression de pilotage, verrouillage essieu oscillant*
	Speisedruckventil **(17)**	charge pressure valve **(17)**	valve de pression de gavage **(17)**
	Sicherheitsventil - *Fahren vorwärts* **(18)**	safety valve - *travel forward* **(18)**	valve de sécurité - *marche AV* **(18)**
	Einstellschraube - *Regelventil* **(19)** *(Drückung – Anfahren)*	setting screw – *regulator* **(19)** *(stall and start up speed)*	vis de réglage – *régulateur* **(19)** *(chute de régime – régime de démarrage)*
	Anschluß ***„Ps“*** - *Stelldruck* **(20)** *(Pedalfahren)*	Connection ***„Ps“*** - *control pressure* **(20)** *(pedal drive)*	connexion ***„Ps“*** - *pression de commande* **(20)** *(translation par pédale)*
	Anschluß ***„X2“*** - *Stelldruck* **(21)**	connection ***„X2“*** - *control pressure* **(21)**	connexion ***„X2“*** - *pression de commande* **(21)**
	Entlüftung **(22)**	vent **(22)**	purge **(22)**
	Einstellschraube **(23) –** *Bremsinchung*	setting screw **(23)** - *brake inching*	vis de réglage **(23)** - *inching frein*
	Elektromagnetventil ***„y15“*** - *Fahren rückwärts* **(24)**	solenoid valve ***„y15“ –*** *travel reverse* **(24)**	électrovanne ***„y15“*** – marche *AR* **(24)**
	Elektromagnetventil ***„y14“*** *Fahren vorwärts* **(25)**	solenoid valve ***„y14“ –*** *travel forward* **(25)**	électrovanne ***„y14“*** – *marche AV* **(25)**

Pos. Item Rep. No.	Deutsch	English	Français
H	***Messstelle für*** *Einstellungen am Verstellmotor - Fahren (Regelbeginn)* Einstellschraube **(26)** - *Qmax* Einstellschraube **(27)** - *Qmin* Steuerdruckanschluß ***„X2“*** **(28)** Steuerdruckanschluß ***„X1“*** **(29)** Einstellschraube - *Regelbeginn* **(30)**	***test port for*** *settings at variable displacement motor – travel (regulation start)* setting screw **(26)** - *Qmax* setting screw **(27)** - *Qmin* pilot pressure ***„X2“*** **(28)** pilot pressure ***„X1“*** **(29)** setting screw - *regulation start* **(30)**	***prise de pression pour*** *réglages côté moteur à débit variable – translation (début de régulation)* vis de réglage **(26)** - *Qmax* vis de réglage **(27)** - *Qmin* pression de pilotage ***„X2“*** **(28)** pression de pilotage ***„X1“*** **(29)** vis de réglage – *début de régulation* **(30)**

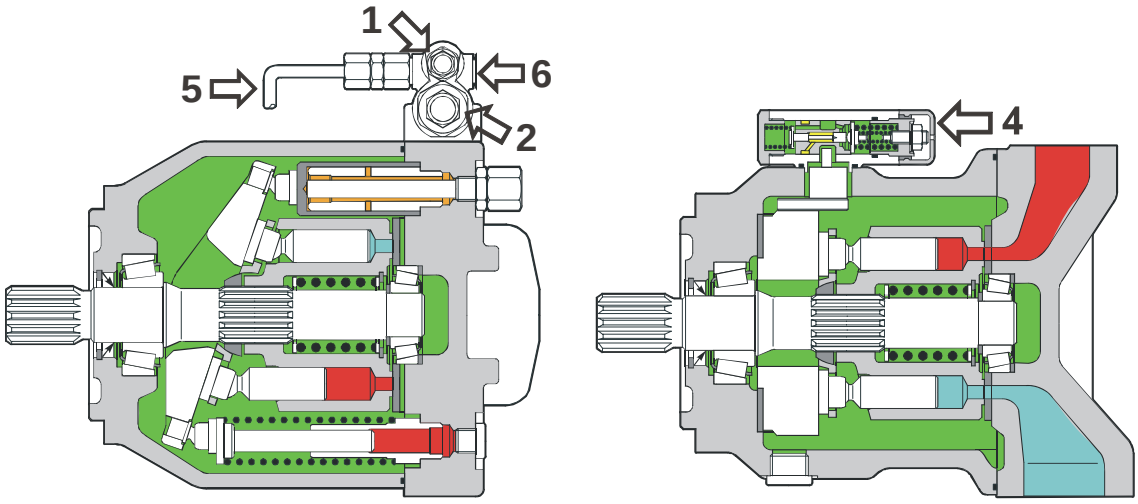
*A.) Adjustment of the Δp - valve (power regulator) **(1)** at the Brueninghaus variable displacement pump*

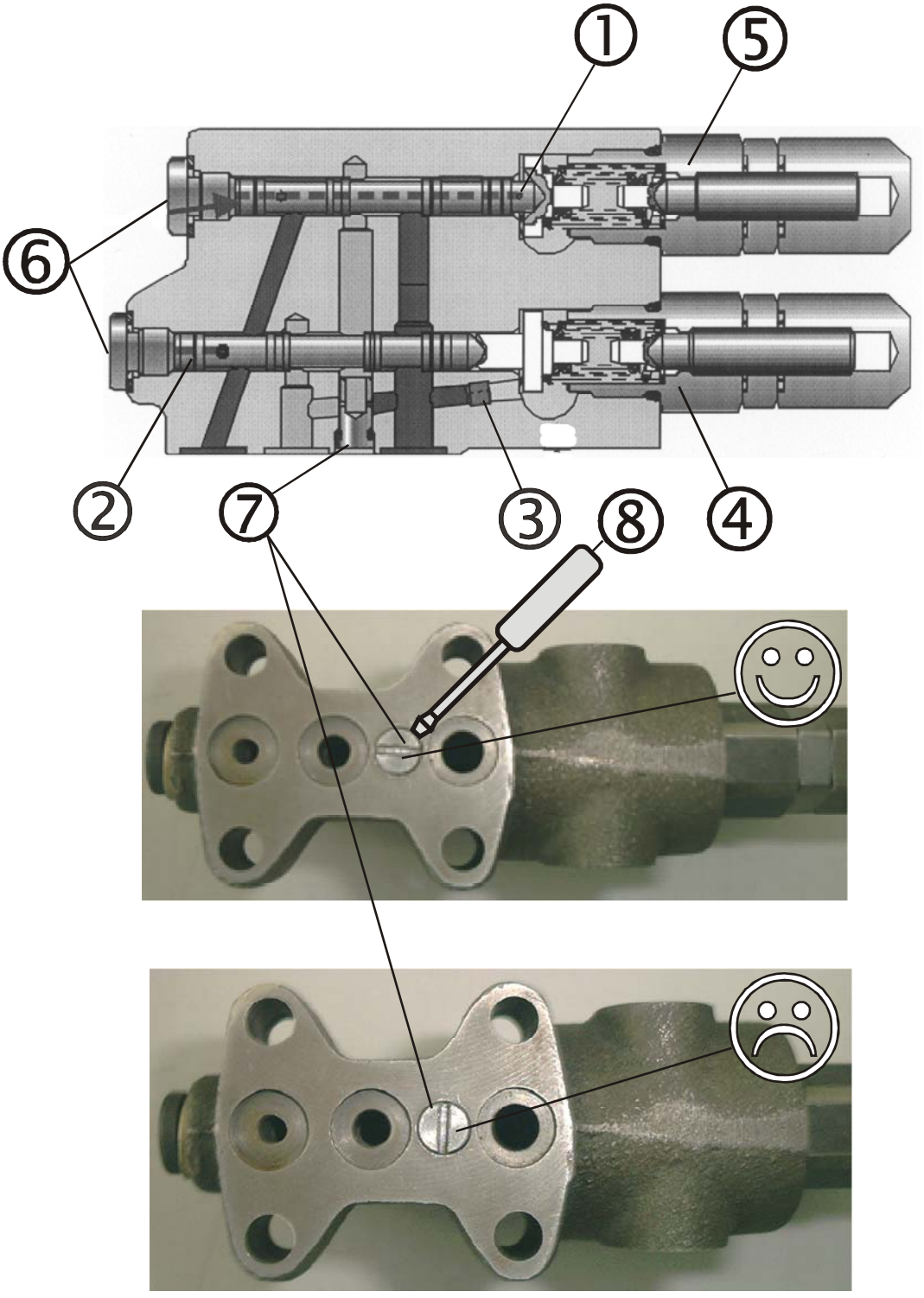
- Connect 60 bar - gauge to pump high pressure port of valve bank 1 (working hydraulics)
- Turn in the setting screw at the load-sensing regulator **(2)** by one turn
- Dismount plug **(6)** opposite the pressure signal line **(5)** at the power regulator **(1).** Mount a screwed fitting GES 10-PL 7/16-20 UNF (part no. 1 939 060 103) and a hose nominal width 8 mm (length: approx. 1.6m ⇒ part no. 4 508 160 301), put the latter into the hydraulic tank (ventilation filter hole). Prepare a receptacle for approx. 5 l drain oil for this check.
- Start the engine, high idle.
- Set a pressure of approx. 20 bar at the setting screw of the power regulator **(1)**
- Stop the engine, dismount the screwed fitting and hose. Slacken the setting screw at the load sensing regulator **(2)** by 1 turn. Check the stand-by pressure and re-adjust if necessary

*B.) Adjustment of the load-sensing regulator **(2)***

- Connect 60 bar - gauge to the gauge port of valve bank 1
- Start the engine, high idle.
- Set the stand-by pressure at the setting screw of the load-sensing regulator **(2)** (see Technical Data)

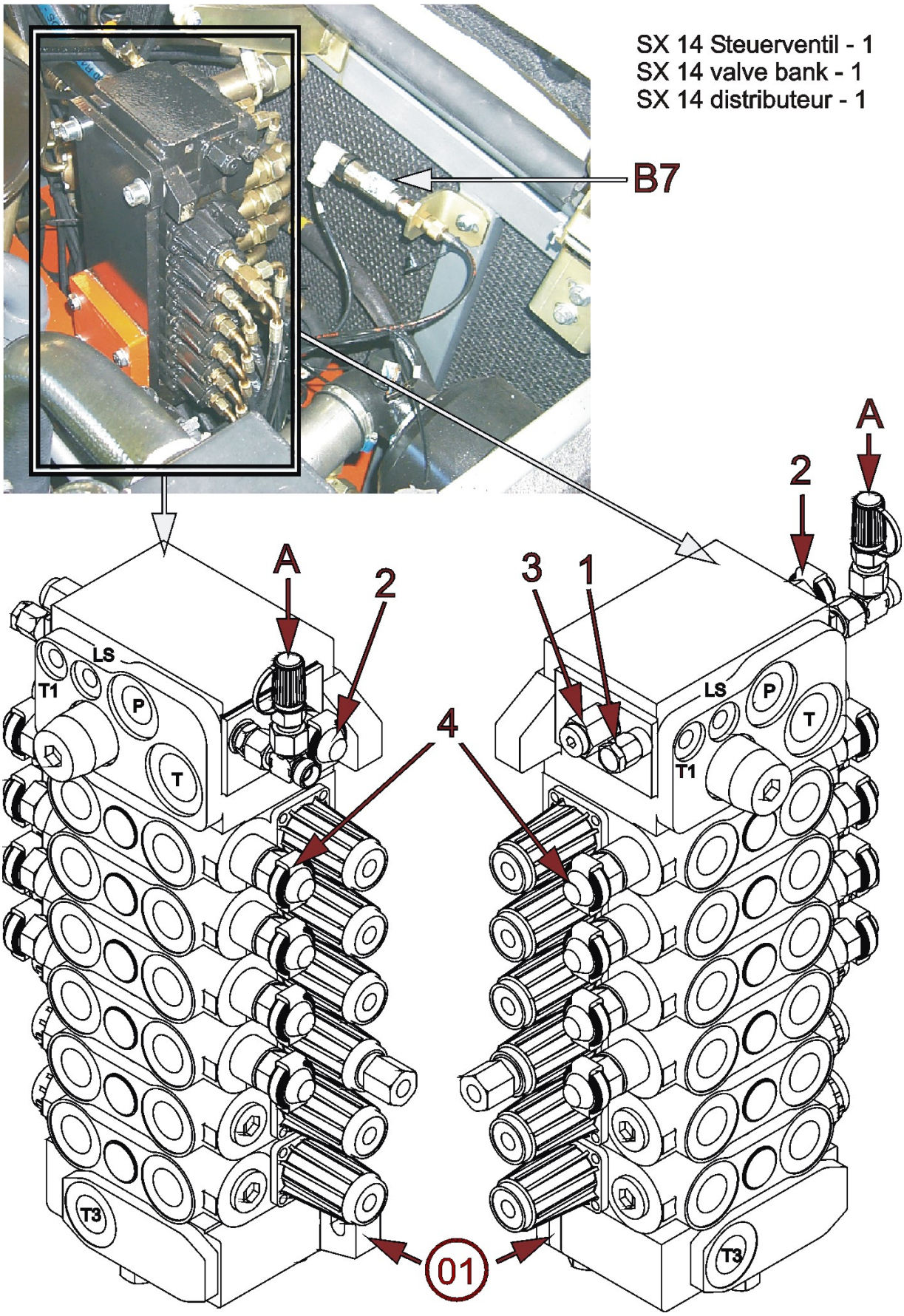
*D.) The horse power control valve **(4)** is adjusted on the test bench*





TEREX | SCHAEFF	Typ/Model/Type **Pumpe A 10 VO DFLR / DFSR**	Datum/Edition/Date **01.2006**
	Benennung/Description/Dénomination **Fehlersuche / Trouble shooting Recherche des pannes**	Blatt/Page/Feuille **5.520.03**

Trouble	Reason	Correction
Hydr.pressure at valve bank 1 too low only approx. 100 - 150 bar	Bore **1** in upper piston (△p regulator) clogged	Remove valve cartridge **5** without touching the setting. Care about springs and spring plate. Remove plug **6** and push piston out.Clean bore. Take care of the correct position of the parts when reassembling.
Not any hydr. pressure at valve bank 1, only stand-by pressure. Pumpe does not stroke	Piston **2** is pushed towards the springs and is jamed due to foreign particles or heat	Remove valve cartridge **4** without touching the setting. Care about springs and spring plate. Remove plug **6** and push piston out. Remove particles. A certain amount of oil should flow to flush eventually further particles. When piston sticks due to heat, the complete regulator unit has to be replaced and setted. See page 5.520.01 and 02. Check for correct position of orifice **7**. Can be positioned and if needed removed by means of a screw driver **8**.
Not any hydr.pressure at valve bank 1, only stand-by pressure. Pumpe does not stroke.	Plug **3** is loose	Plug **3** lays in spring chamber of the stand-by regulator. Remove valve cartridge **4**. Mount plug **3** by means of a 2 mm allen key again. Mount valve cartridge **4**.
Working movements are lazy, slow	Stand-by regulator **4** resp. △ p regulator **5** is set too low.	Adjust regulator **4** resp. **5**. See page 5.520.01 and 02.
Working movements too quick.	Stand-by regulator **4** resp. △ p regulator **5** is set too high.	Adjust regulator **4** resp. **5**. See page 5.520.01 and 02.



TEREX | SCHAEFF	Typ/Model/Type **TC 75** (HR 32)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Setting instructions (working hydraulics)**	Blatt/Page/Feuille **5.650.01**

(01) SX 14 Steuerventil - 1

A ***Messstelle für***

Einstellungen am Steuerventil - 1

- LS – Druck **(1)**
- SV – Druck **(2)**
- Sekundärdrücke **(4)**
  und

Messstelle für

Einstellungen an der Arbeitspumpe

- Stand-by Druck
- Δp Druck

B7 Lastwarnsensor

1 LS – Druckbegrenzungsventil *(einstellbar)*

2 Sicherheitsventil *(einstellbar)*

3 LS – Stromregelventil *(**nicht** einstellbar)*

4 Sekundärventil(e) *(einstellbar)*

(01) Siehe Blatt **6.65.01**

(01) SX 14 valve bank - 1

A ***test port for***

settings at valve bank - 1

- LS – pressure **(1)**
- safety valve pressure **(2)**
- line relief pressures **(4)**
  and

test port for

settings at working pump

- stand-by pressure
- Δp pressure

B7 load warning sensor

1 load sensing pressure relief valve *(adjustable)*

2 safety valve *(adjustable)*

3 LS – flow regulator valve *(**not** adjustable)*

4 line relief valve(s) *(adjustable)*

(01) see page **6.65.01**

(01) SX 14 distributeur - 1

A ***prise de pression pour***

réglages côté distributeur - 1

- pression LS **(1)**
- pression valve de sécurité **(2)**
- pressions secondaires **(4)**
  et

prise de pression pour

réglages côté pompe équipement

- pression d'attente
- pression Δp

B7 capteur avertisseur de charge

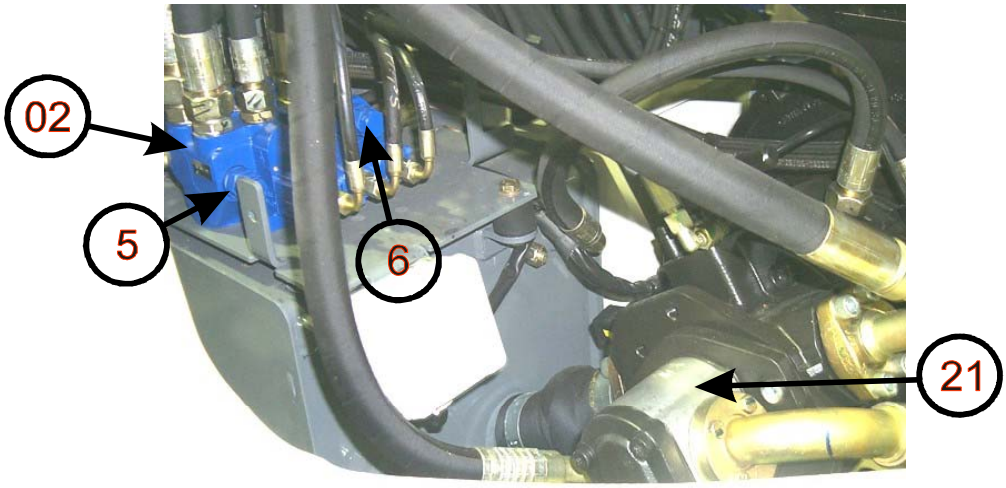
1 limiteur de pression LS *(réglable)*

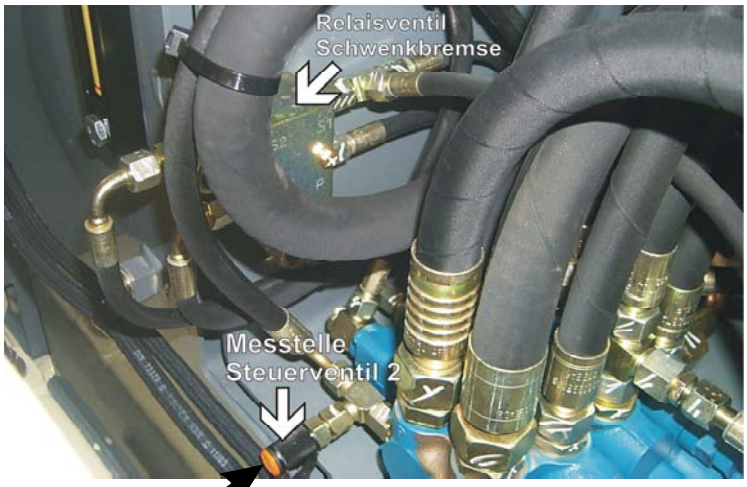
2 valve de sécurité *(réglable)*

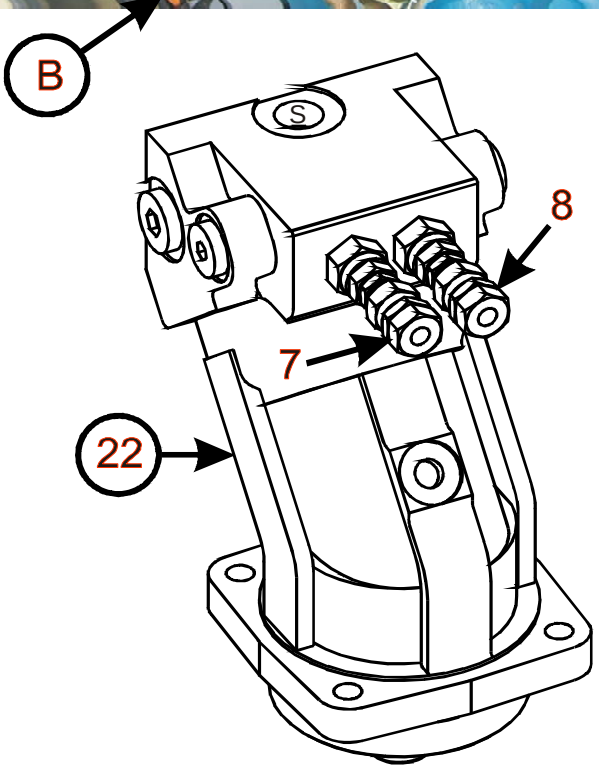
3 régulateur de débit LS *(**non** réglable)*

4 clapet(s) secondaire(s) *(réglable(s)*

(01) voir page **6.65.01**







TEREX	Typ/Model/Type **TC 75** (HR 32)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Setting instructions (working hydraulic)**	Blatt/Page/Feuille **5.650.02**

(21) **Zahnradpumpe**

B *Messstelle für*

Einstellungen am Steuerventil 2, Nebenkreis und Schwenkmotor

(02) **Steuerventil 2 (SM12)**

Hauptüberdruckventil (**5**) für

- Schwenken *(ohne Sekundärventile)*
- Räumschild *(ohne Sekundärventile)*
- Knicken *(mit Nachsaugventilen* (**6**)*)*

(22) **Schwenkmotor**

- Ventile am Schwenkmotor (**7** und **8**)

(21) **gear pump**

B *test port for*

settings at valve bank 2, secondary functions and swing motor

(02) **valve bank 2 (SM12)**

main pressure relief valve (**5**) for

- swing *(without line relief valves)*
- dozer blade *(without line relief valves)*
- articulation *(with anti-cavitation valves* (**6**)*)*

(22) **swing motor**

- line relief valves at swing motor (**7** and **8**)

(21) **pompe à engrenages**

B *prise de pression pour*

réglages côté distributeur 2, circuit hydraulique secondaire et moteur d'orientation

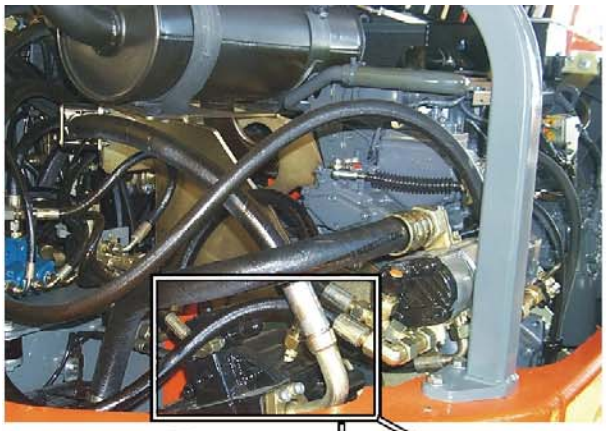
(02) **Distributeur 2 (SM12)**

limiteur de pression principal (**5**) pour

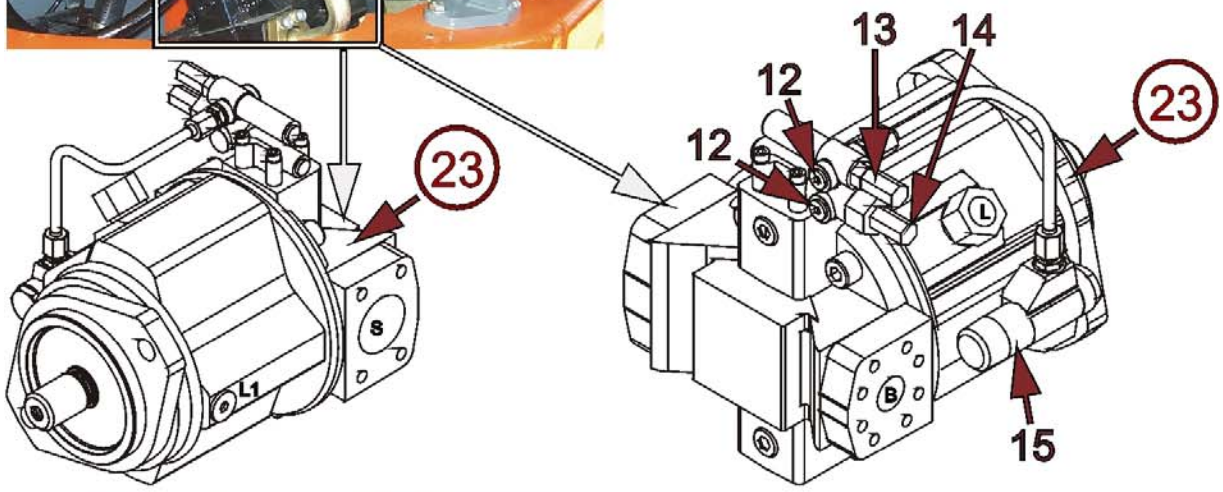
- orientation *(sans clapets secondaires)*
- lame de remblayage *(sans clapets secondaires)*
- articulation *(avec clapets anti-cavitation* (**6**)*)*

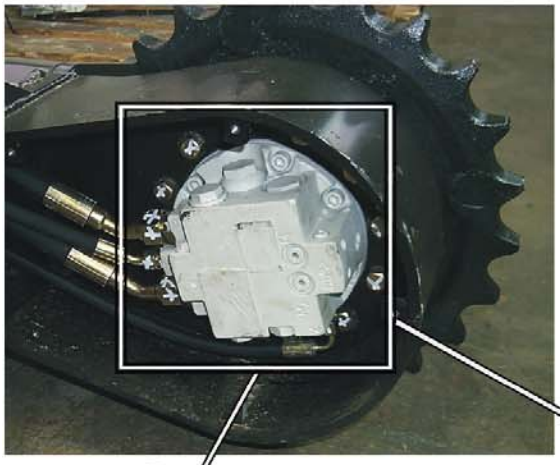
(22) **moteur d'orientation**

- clapets secondaires côté moteur d'orientation (**7** et **8**)

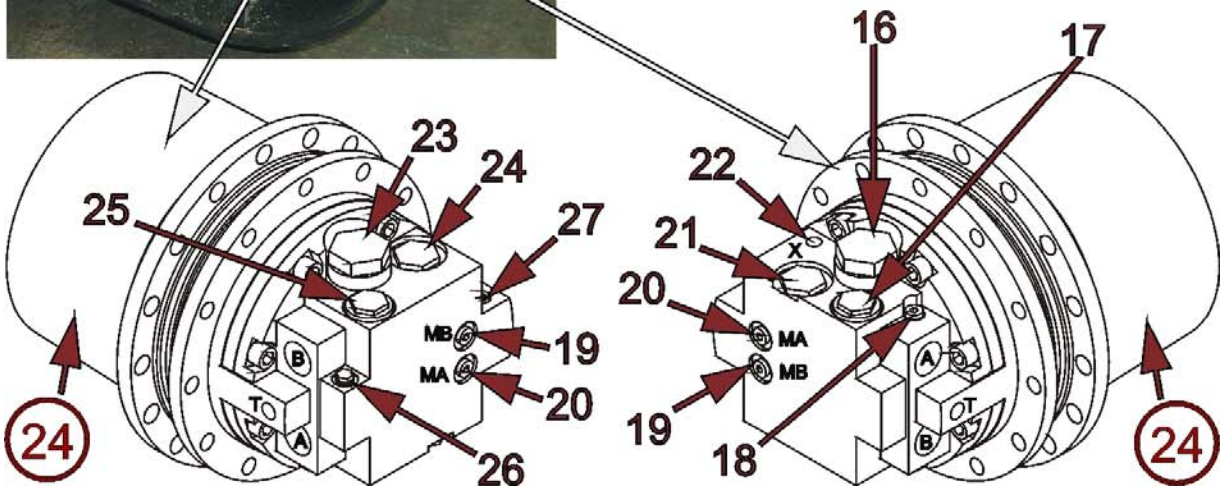


Verstellpumpe - Arbeiten
variable displacement pump - working
pompe à débit variable - équipement





Fahrantrieb
travel drive
entraînement



TEREX | SCHAEFF	Typ/Model/Type **TC 75** (HR 32)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Setting instructions (displacement pump, travel gear)**	Blatt/Page/Feuille **5.650.03**

(23) Verstellpumpe - Arbeiten

- Verschlusschraube **(12)**
- Δp-Druckventil **(13)**
  (Leistungsregler)
- Load-Sensing-Regler **(14)**
  (Stand-by Druck einstellen)
- Leistungsventil **(15)**
  (am Prüfstand einstellen)

(23) variable displacement pump - working

- plug **(12)**
- Δ p-pressure valve **(13)**
  (power regulator)
- load sensing regulator **(14)**
  (setting stand-by pressure)
- power valve **(15)**
  (setting at test bench)

(23) pompe à débit variable - équipement

- bouchon **(12)**
- valve de pression-Δp **(13)**
  (régulateur de puissance)
- régulateur LS (load sensing) **(14)**
  (réglage de la pression d'attente)
- valve de puissance **(15)**
  (réglage sur le banc d'essai)

(24) Fahrantrieb

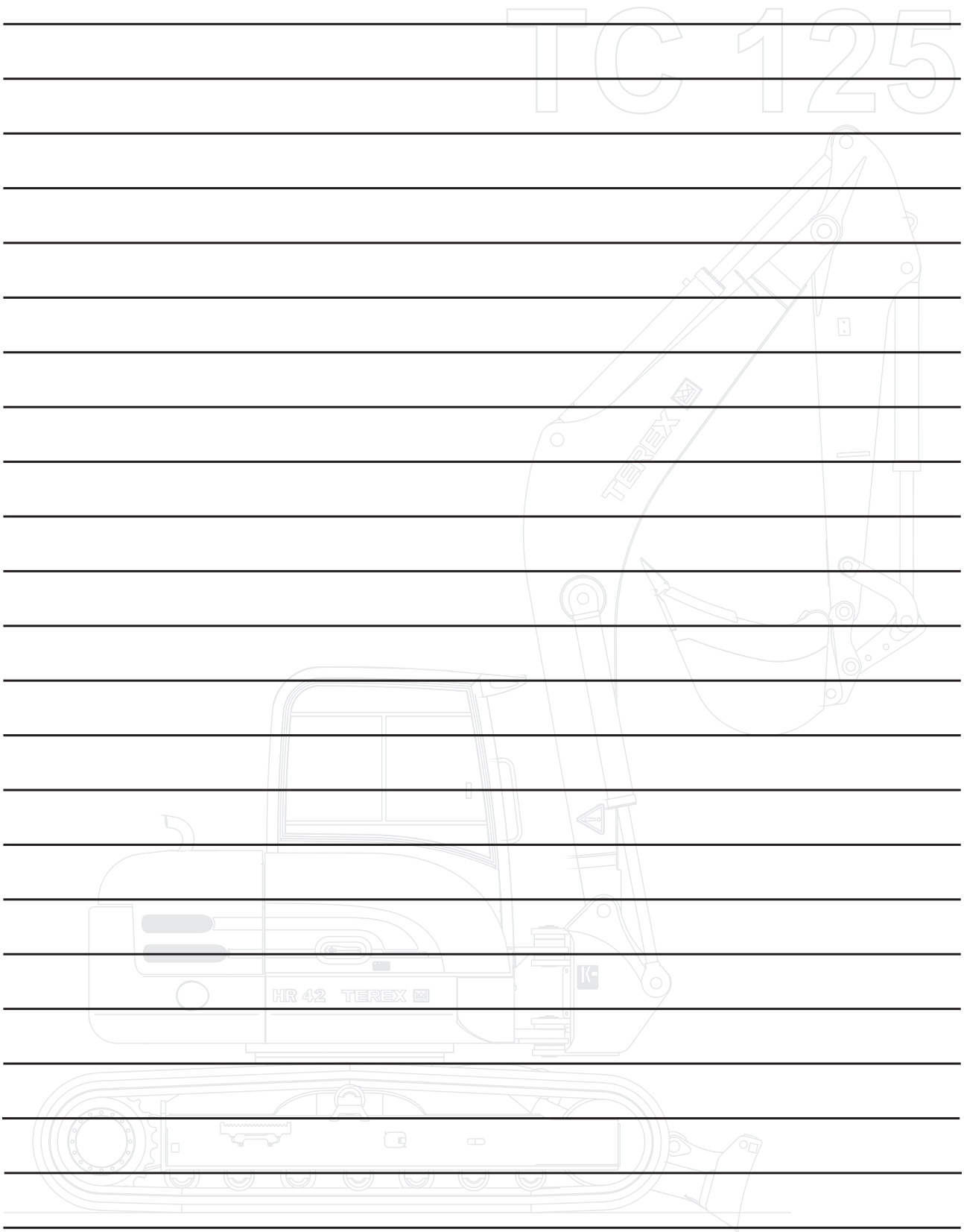
- Verschlusschraube **(16)**
  (Bremskolben)
- Rückschlagventil **(17)**
- Druckausgleichsventil **(18)**
- Verschlusschraube **(19)**
  *(Messanschluss **„MB„**)*
- Verschlusschraube **(20)**
  *(Messanschluss **„MA„**)*
- Sekundärventil mit Dämpfungskolben **(21)**
  (280 bar)
- Anschluss **„X" (22)**
  (Schaltdruck)
  schnell / langsam
- Verschlusschraube **(23)**
  (Bremskolben)
- Sekundärventil mit Dämpfungskolben **(24)**
  (280 bar)
- Rückschlagventil **(25)**
- Druckregelventil **(26)**
- Wechselventil **(27)**

(24) travel drive

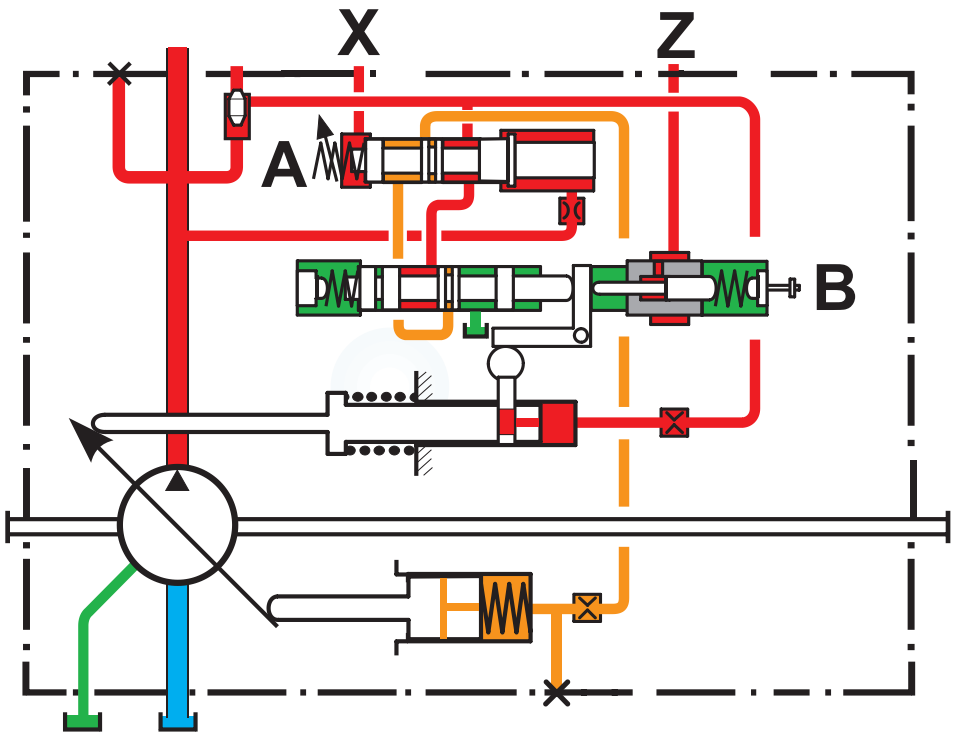
- plug **(16)**
  (counter balance valve)
- check valve **(17)**
- pressure balance valve **(18)**
- plug **(19)**
  *(test port **„MB„**)*
- plug **(20)**
  *test port **„MA„**)*
- line relief valve with cushion piston **(21)**
  (280 bar)
- connection **„X" (22)**
  (control pressure)
  fast / slow
- plug **(23)**
  (counter balance valve)
- line relief valve with cushion piston **(24)**
  (280 bar)
- check valve **(25)**
- pressure control valve **(26)**
- shuttle valve **(27)**

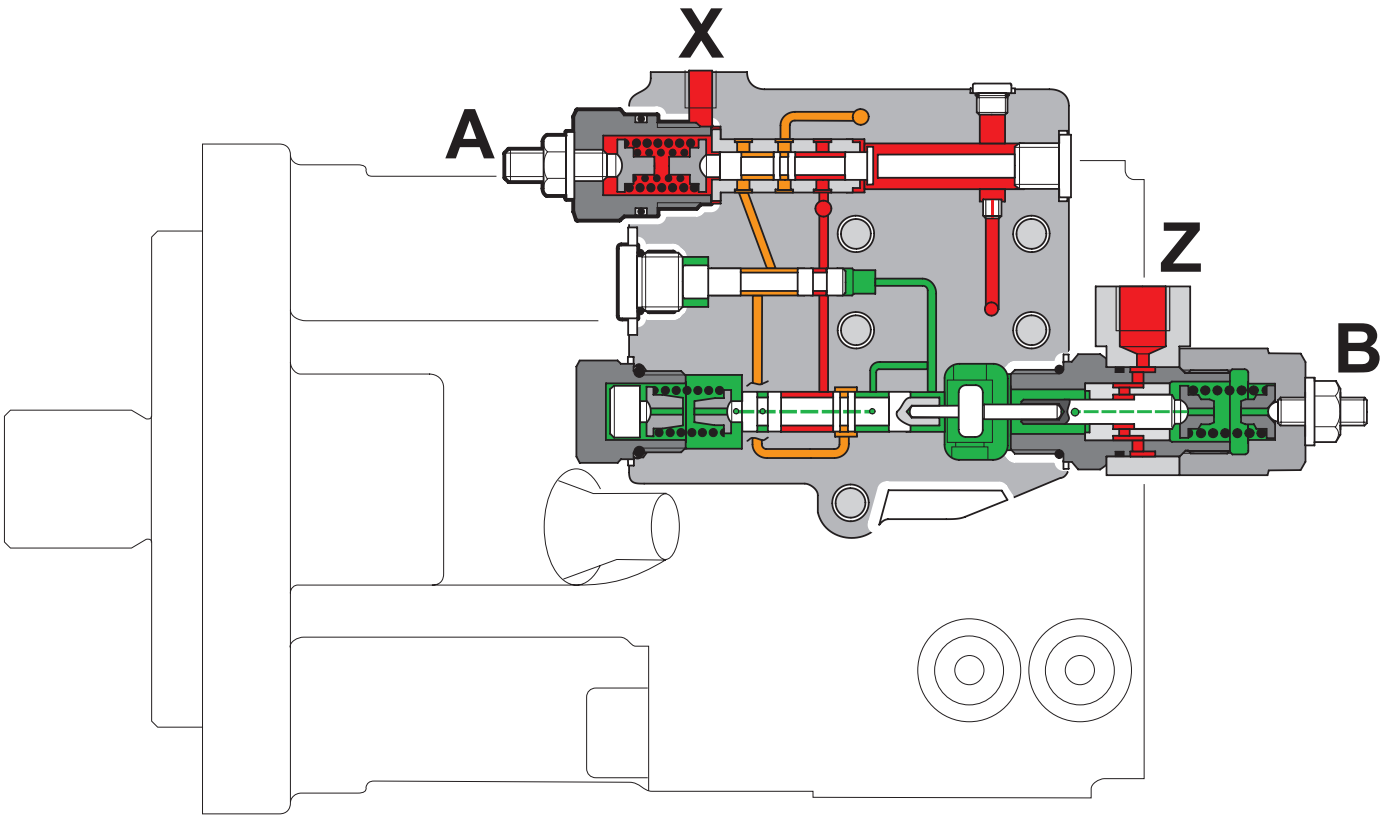
(24) entraînement

- bouchon **(16)**
  (tiroir de freinage de translation)
- clapet anti-retour **(17)**
- soupape compensatrice de pression **(18)**
- bouchon **(19)**
  *(prise de pression **„MB„**)*
- bouchon **(20)**
  *(prise de pression **„MA„**)*
- clapet secondaire avec piston d'amortissement **(21)**
  (280 bar)
- connexion **„X" (22)**
  (pression de commande)
  petite / grande
- bouchon **(23)**
  (tiroir de freinage de translation)
- valve secondaire avec piston d'amortissement **(24)**
  (280 bar)
- clapet anti-retour **(25)**
- régulateur de pression **(26)**
- sélecteur **(27)**



Typ Model Type Tipo	**TC 125** (HR 42)	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Notizen** **Notes** **Notices** **Notas**	Blatt Page Feuille Página	**5.670.00**



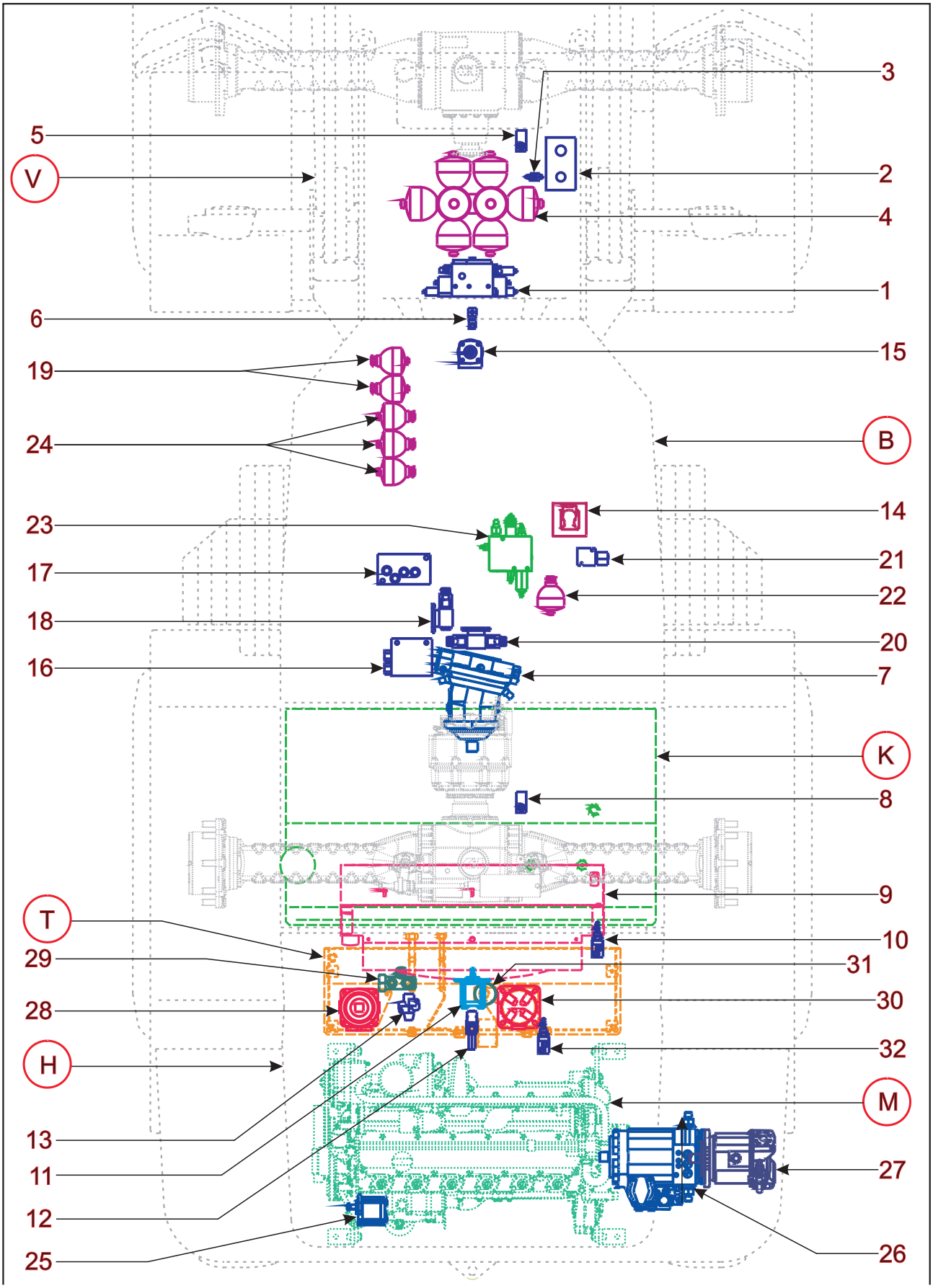


Typ Model Type Tipo	**TC 125** (HR 42) **ab Fz.-Id.-Nr.: from s/n: á partir du n/s: TC01250100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Einstellanweisung A11VO 75 LR3S Setting instructions Instructions de réglage**	Blatt Page Feuille Página	**5.670.01**

Pos. Item Rep. No.	Deutsch	English	Français
A	Einstellschraube **Stand by - Druck** (Messpunkt am Steuerventil 1). Bei Vollgas	Adjusting screw **stand by-pressure** (test port at control-valve 1) full throttle	Vis de réglage **pression d'attente (stand by)** (prise de pression au distributeur 1) plein gaz
B	Einstellschraube **Drückungs-drehzahl-Motor.** (Zusatz + Schild auf Block, bzw. Zwischenausleger aus + Schild auf Block).	Adjusting screw **engine stall** (add. cicuit and dozer blade at end stroke, resp. intermediate boom out and dozer blade at end stroke).	Vis de réglage **chute de regime** (circuit supplementaire et lame de niveleuse resp. flèche interédiaire et lame de niveleuse au fin de course).
X	Anschluss für LS-Leitung von Steuerventil 1	Port for LS - Line from control valve 1	Raccord conduite - LS du distributeur 1
Z	Anschluss für Summen-leistungsregelung von den Zahnradpumpen, Nebenantrieb	port for summation horse power control from gear pumps at auxilary drive	Raccord régulation de sommation de puissance des pompes à engrenages de l'entraînement latérale
	Einstellwerte siehe Technische Daten Kap.2	**Setting values see technical datas, chapter 2**	**Valeurs de réglage voir caractéristiques techniques chapitre 2**
Einstellanweisung Stand by - Druck: **Voraussetzung:** Maschine betriebswarm ! 60 bar Manometer am Messpunkt des Steuerventils 1 anschließen. Motor starten, Vollgas geben, keine Funktion ansteuern. Manometer ablesen. Wird der Sollwert nicht erreicht, an Stellschraube (**A**) Druck einstellen. **Einstellanweisung Drückungsdrehzahl Dieselmotor:** **Voraussetzung:** Maschine betriebswarm ! Motordrehzahlen und Hydraulikdrücke entsprechen den Vorgaben. Drehzahlmessgerät anschließen. Schild und Zusatzkreis auf Block ansteuern. **Wichtig:** Zusatzkreis Sekundärventile müssen richtig eingestellt sein: 300 bar Drückungsdrehzahl ablesen. Wird der Sollwert nicht erreicht, an Stellschraube (**B**) Drehzahl einstellen.	**Adjustment procedure stand - by - pressure:** **Pre-condition:** Machine must have service temperature! Put a 60 bar gauge to the test-port of valve bank 1, start the engine, give full throttle, don´t operate any function, read the gauge. If the desired value will not be reached, adjust the pressure by means of adjusting screw **(A)**. **Adjustment procedure:** **Pre-condition:** Machine must have service temperature! Engine RPM`s and hydraulic pressure correspond for the specification. Mount tachometer and operate dozer and add. circuit, hold in end stroke position. **Important:** Secondary relief valves must have correct setting: 300 bar Read engine stall RPM´s: If the desired value will not be reached, adjust the RPM´s at setscrew **(B)**.	**Instructions de réglage pression d´attente (stand-by).** **Condition:** Machine à température de service! Monteur un mano au prise de pression du distributeur 1. Demarrer le moteur, accelerer à fond, ne pas actionner les commandes. Relever la valeur du mano. Si on atteint pas la valeur prescrit régler la pression par la vis de reglage **(A)**. **Instructions de réglage chute de regime moteur.** **Condition:** Machine à température de service! Le regime moteur ainsi les pressions hydrauliques correspondent aux valeurs prescrits. Brancher un compte-tours. Actionner lame et circuit supplémentaire au fin de course. **Important:** Reglage correcte des clapets secondaires du circuit supplémentaire: 300 bars Relever le chute de regime. Si on atteint pas la valeur prescrit regler le regime avec la vis de réglage **(B)**.

SUBGROUP LIST
Functioning description

SKL 200 (SKL 873)	Location of hydraulic components	**6.13**
TL 65 (SKL 824)	Location of hydraulic components	**6.22**
TL 80 (SKL 834)	Location of hydraulic components	**6.24**
TL 80 AS	Walveoil control valve	**6.25**
TL 100 (SKL 844)	Location of hydraulic components	**6.26**
TL 120 (SKL 854)	Location of hydraulic components	**6.27**
TL 160 (SKL 160)	Rexroth 3M6 valve and ride control	**6.28**
TL 260 (SKL 260)	Rexroth 3M6 valve and ride control	**6.30**
TL 210 - 260	Description travel drive	**6.31**
TL 420 - 450	Location of hydraulic components	**6.35**
TL 70 (SKS 634)	Location of hydraulic components	**6.37**
TW 85 (HML 32)	Location of hydraulic components	**6.51**
TW 110 (HML 42)	Location of hydraulic components	**6.53**
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TC 75 (HR 32)	Location of hydraulic components	**6.65**
TC 125 (HR 42)	Location of hydraulic components	**6.67**
TC 29 (HR 14)	Location of hydraulic components	**6.76**
TC 35 (HR 16)	Location of hydraulic components	**6.78**
TC 48 (HR 18)	Kayaba control valve	**6.80**
TC 15 (HR 1.5)	Location of hydraulic components	**6.90**
TC 16 (HR 1.6)	Location of hydraulic components	**6.91**
TC 20 (HR 2.0)	Location of hydraulic components	**6.92**
TC 37 (HR 3.7)	Location of hydraulic components	**6.97**
TC 50	Location of hydraulic components	**6.99**
Excavator gen.	Description, pilot-operated valve 4TH6 /4TH5	**6.100**
Excavator gen.	Description, pilot-operated valve PCL 401	**6.105**
Excavator gen.	Relay valve swing	**6.110**
TC / TW (HR/HML)	SX 14 valve bank	**6.210**
TW (HML)**…S-Version**	Gear shift function	**6.490**
TL(SKL)**...S-Version**	Ride control system, lifting frame	**6.500**
TL(SKL)**, general**	Suction filter function	**6.520**
TC(HR)**, general**	Travel motor, brake spool	**6.740**
TC75/125 TW85/110 (HR/HML 32/42)	Pilot operated 2-stage valves slewing	**6.850**
Excavator, gen.	Maintenance switch hydraulic oil return filter	**6.890**
TC 15 – 50 (HR 1.5 – 5.0)	Display unit - mini excavators	**6.950**



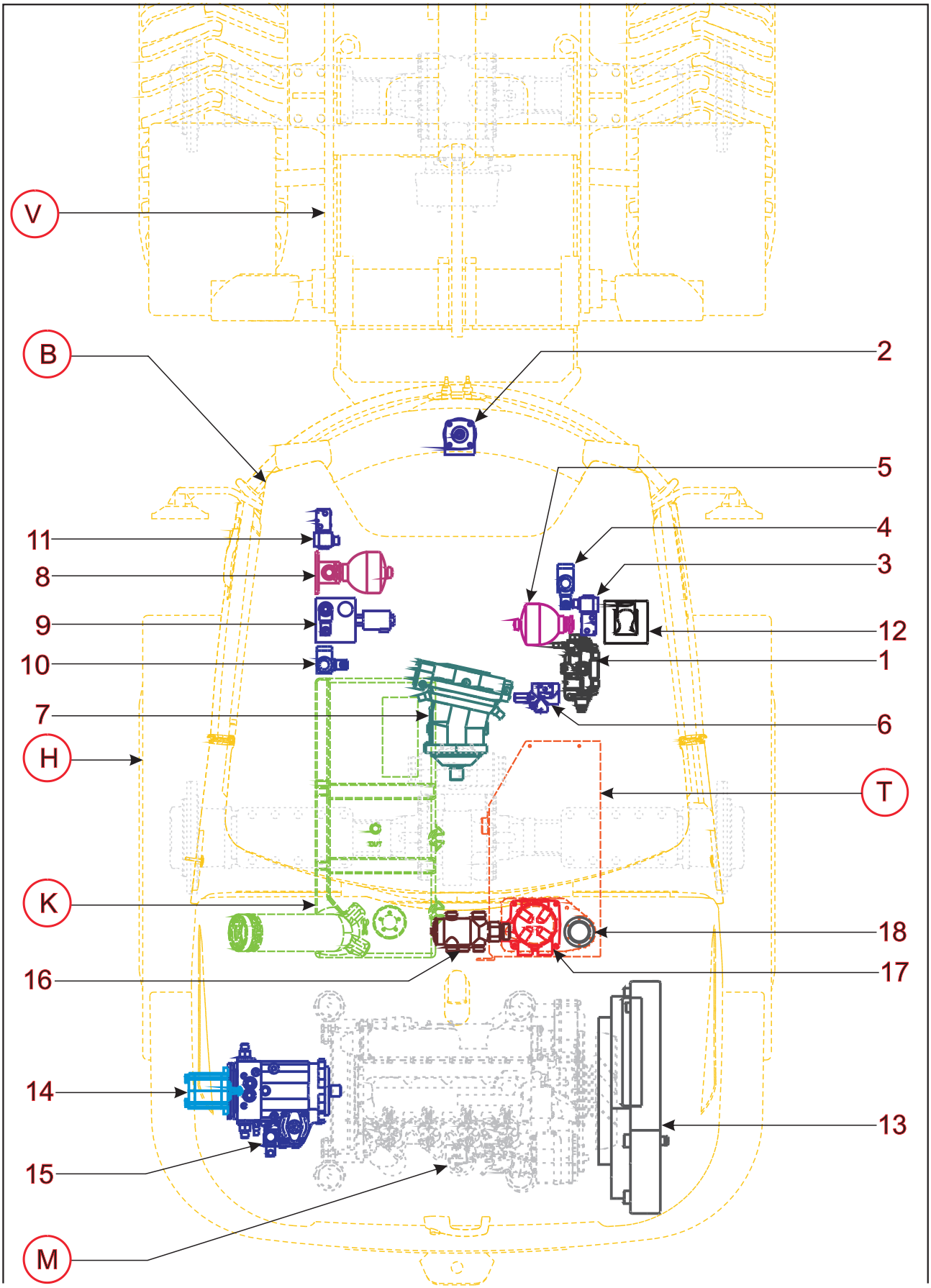
Typ Model Type Tipo	**SKL 200** (SKL 873)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.13.11**

Pos. Item Rep. No.	Deutsch	English	Français
V	**VORDERWAGEN**	**FRONT CHASSIS**	**CHÂSSIS AV**
1	Blocksteuergerät ***Y8, Y9***	Valve bank ***Y8, Y9***	Bloc distributeur ***Y8, Y9***
2	Stabilisierungsmodul ***Y11*** **OPTION** (Lastschwingungsdämpfung)	Stabilizing module ***Y11*** **OPTION** (ride control)	Module de stabilisation ***Y11*** **OPTION** (anti-tangage)
3	Kugelhahn **OPTION** **(Druckspeicherentlastung)**	Ball valve **OPTION** (acc. emergency release)	Robinet **OPTION** (detente de secours accumulateur)
4	Steuerplatte mit Hydrospeicher **OPTION** (Lastschwingungsdämpfung)	control plate with hydraulic accumulator **OPTION** (ride control)	Plaque de commande avec accumulateur hydr. **OPTION** **(anti-tangage)**
5	Druckfolgeventil (Betriebsbremse)	Preseure sepuence valve (service brake)	Clapet de sequence (frein de sevice)
6	Druckschalter ***Y13***	Pressure switch ***Y13***	Interrupteur de pression ***Y13***
H	**HINTERWAGEN**	**REAR CHASSIS**	**SCHÂSSIS AR**
7	Verstellmotor ***Y2, Y6*** (Fahren)	Variable displacement motor ***Y2, Y6*** (travel)	Moteur á cylindrée variable ***Y2, Y6*** (translation)
8	Druckfolgeventil (Betriebsbremse)	Pressure sequence valve (service brake)	Clapet de sequnce (frein de sevice)
9	Kombinierter Öl- Wasserkühler	Combi radiator cooler for oil and water	Refroidiseur combiné huile et eau
10	Thermostatventil 87°C (Kombikühler *Kühlwasser*)	Thermostatic valve 87°C (combi cooler *water*)	Régulateur de temperature *d'eau* (refroidisseur combiné)
11	Hydraulikmotor (Lüfter)	Hydraulic motor (fan)	Moteur hydraulique (ventilateur)
12	Prioritätsventil	Priority valve	Valve prioritaire
13	Öltemperaturregler	Oil temperature regulator	Régulateur de temp. d'huile
B	**BODENRAHMEN**	**FLOOR FRAME**	**CADRE DE PLANCHE**
14	Vorsteuergerät - *Joy-stick*	Pilot operated valve - *joy-stick*	Distributeur à commande assistée - *manipulateur*
15	Lenkeinheit	Steering unit	Unite de direction
16	Servo-Schaltventil	Servo valve	Valve à commande
17	Steuerblock	Valve bank	Block distributeur
18	4/2 Wegeventil ***Y5*** (Notlenkung)	4/2 Solenoid valve ***Y5*** (emergency steering)	Electrovanne 4/2 ***Y5*** (direction reserve)
19	Hydrospeicher (Notlenkung)	Hydraulic accumulatur (emergency steering)	Accumulateur hydraulique (Direction reserve)
20	4/2 Wegeventil ***Y10 , Y10*** (schnell / langsam)	4/2 Solenoid valve ***Y10, Y10*** (low / high speed)	Electrovanne 4/2 ***Y10, Y10*** (petite / grande vitesse)
21	3/2 Wegeventil (Abschaltung Arbeitshydraulik)	3/2 Solenoid valve (shut off working hydraulic)	Electrovanne 3/2 (coupure hydraulique de travail)

Typ Model Type Tipo	**SKL 200** (SKL 873)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.13.12**

Pos. Item Rep. No.	Deutsch	English	Français
22	Hydrospeicher (Abschaltung Arbeitshydraulik)	Hydraulic accumulator (shut off working hydraulik)	Accumulateur hydraulique (coupure hydraulique de travail)
23	Fremdkraftbremsventil	Brake valve	Soupape de frein
24	Hydrospeicher (Bremse)	Hydraulic accumulator (brake)	Accumulateur hydr. (frein)
M	**DIESELMOTOR**	**DIESEL ENGINE**	**MOTEUR DIESEL**
25	Zahnradpumpe	Gear pump	Pompe à engrenages
26	Verstellpumpe - Fahren ***Y3, Y4***	Variable displacement pump - travel ***Y3, Y4***	Pompe à débit variable - translation ***Y3, Y4***
27	Verstellpumpe - Arbeiten	Variable displacement pump - working	Pompe à débit variable - équipement
T	**HYDRAULIKÖLTANK**	**HYDRAULIC OIL TANK**	**RÉSERVOIR HYDRAULIQUE**
28	Rücklauffilter	Return filter	Filtre de retour
29	Rücklaufsammler	Return line collector	Collecteur de retour
30	Saugfilter	Suction filter	Filtre d'aspiration
31	Belüftungsfilter	Vent valve	Filtre d'aération
32	Thermostatventil 50°C (Hydrauliköltank)	Thermostatic valve 50°C (hydraulic oil tank)	Régulateur de temp. d'huile 50°C (réservoir hydraulique)
K	**KRAFTSTOFFTANK**	**FUEL TANK**	**RESERVOIR DE CARBURANT**

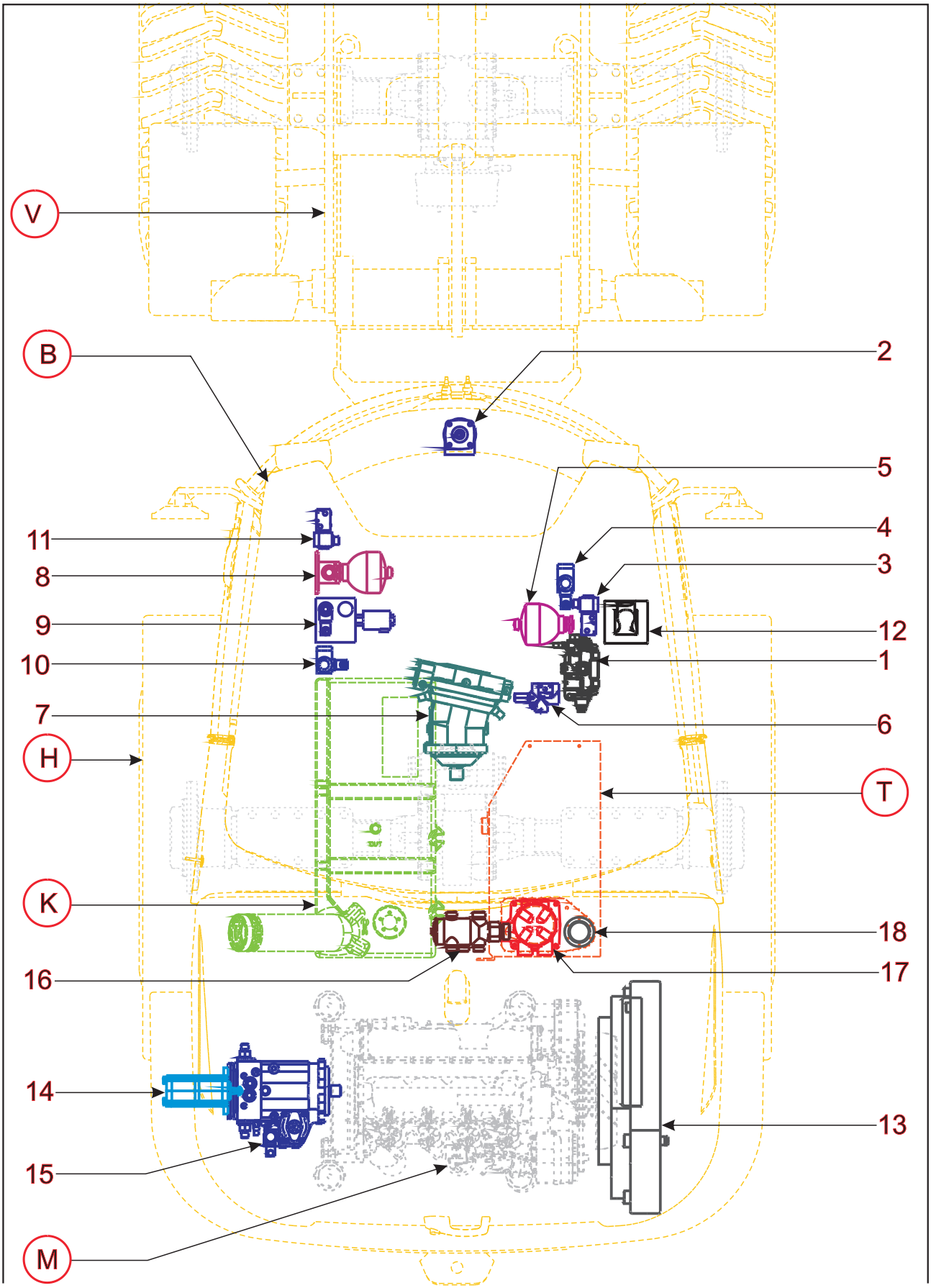
Typ Model Type Tipo	**SKL 200** (SKL 873)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.13.13**



Typ Model Type Tipo	**TL 65** (SKL 824)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.22.11**

Pos. Item Rep. No.	Deutsch	English	Français
V	**VORDERWAGEN**	**FRONT CHASSIS**	**CHÂSSIS AV**
H	**HINTERWAGEN**	**REAR CHASSIS**	**CHÂSSIS AR**
1	Blocksteuergerät	Valve bank	Bloc distributeur
2	Lenkeinheit	Steering unit	Unite de direction
3	Vorsteuereinheit ***Y5,Y7,Y8,Y9***	Pilot-operated unit ***Y5,Y7,Y8,Y9***	Système pilotage ***Y5, Y7, Y8, Y9***
4	4/2 Wegeventil ***Y12, Y13*** (schnell / langsam)	4/2 Solenoid valve ***Y12,Y13*** (low / high speed)	Electrovanne 4/2 ***Y12,Y13*** (petite / grande vitesse)
5	Hydrospeicher (Arbeitshydraulik abschalten)	Hydraulic accumulator (Stop working hydraulic)	Accumulateur hydraulique (Neutralisation hydr. de travail)
6	Prioritätsventil (Lenken)	Priority valve (steering)	Valve prioritaire (direction)
7	Verstellmotor ***Y2,Y6*** (Fahren)	Variable displacement motor ***Y2,Y6*** (travel)	Moteur á cylindrée variable ***Y2,Y6*** (translation)
8	Speicherblock mit Hydrospeicher **OPTION** (Lastschwingungsdämpfung)	Accumulator bloc with hydr. accumulator **OPTION** (ride control)	Bloc d'accumulateurs avec accumulateur hydr. **OPTION** (anti-tangage)
9	Stabilisieungsmodul **OPTION** ***Y11,Y15***(Lastschwingungsd.)	Pilot bloc **OPTION** ***Y11, Y15*** **(**ride control)	Bloc de pilotage **OPTION** **Y11, Y15** (anti-tangage)
10	3/2 Wegeventil **OPTION** ***Y16*** (Lasthalteventil + Lastschwingungsdämpfung)	3/2 Solenoid valve **OPTION** ***Y16*** (load holding valve + ride control)	Electrovanne 3/2 **OPTION** ***Y16*** (clapet anti-chute + anti-tangage)
11	Steuerventil **OPTION** ***Y20,Y21, Y22*** (Schaufelrückstellung)	Valve bank **OPTION** ***Y20,Y21,Y22*** (return to dig))	Distributeur **OPTION** ***Y20,Y21,Y22*** (remise à niveau automatique)
B	**BODENRAHMEN**	**FLOOR FRAME**	**CADRE DE PLANCHER**
12	Vorsteuergerät - *Joy-stick*	Pilot operated valve - *joy-stick*	Distributeur à commande assistée - *manipulateur*
M	**DIESELMOTOR**	**DIESEL ENGINE**	**MOTEUR DIESEL**
13	Kombinierter Öl- Wasserkühler	Combi radiator cooler for oil and water	Refroidisseur combiné huile et eau
14	Zahnradpumpe (Lenken / Laden)	Gear pump (steering / working)	Pompe à engrenages (direction / travail)
15	Verstellpumpe (Fahren) ***Y3,Y4***	Variable displacement pump (travel) ***Y3,Y4***	Pompe à débit variable (translation) ***Y3,Y4***
T	**HYDRAULIKÖLTANK**	**HYDRAULIC OIL TANK**	**RÉSERVOIR HYDRAULIQUE**
16	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
17	Rücklauffilter	Return filter	Filtre de retour
18	Belüftungsfilter	Vent valve	Filtre d'aération
K	**KRAFTSTOFFTANK**	**FUEL TANK**	**RESERVOIR DE CARBURANT**

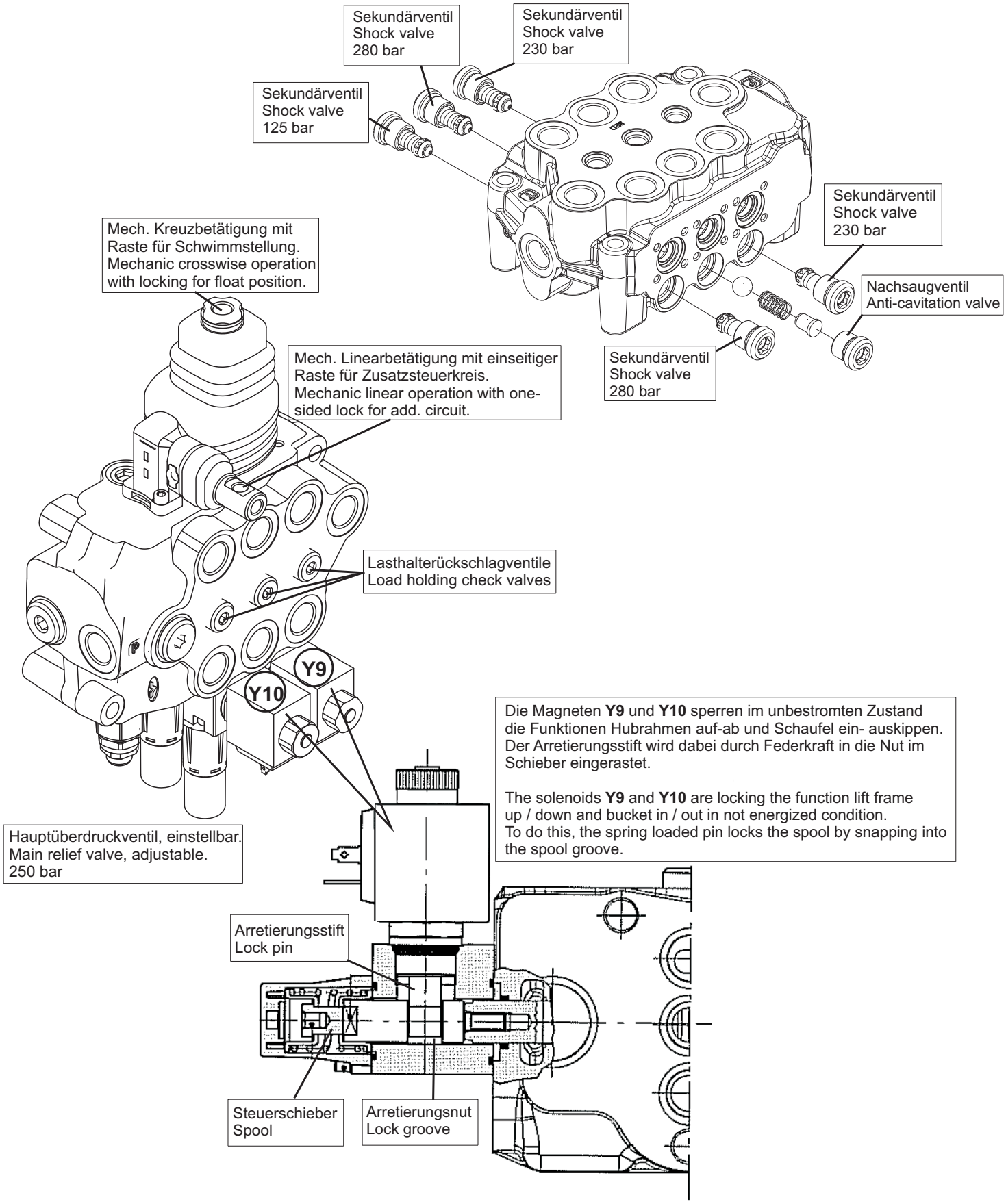
Typ Model Type Tipo	**TL 65** (SKL 824) **Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**	Blatt Page Feuille Página	**6.22.12**



Typ Model Type Tipo	**TL 80** (SKL 834)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.24.11**

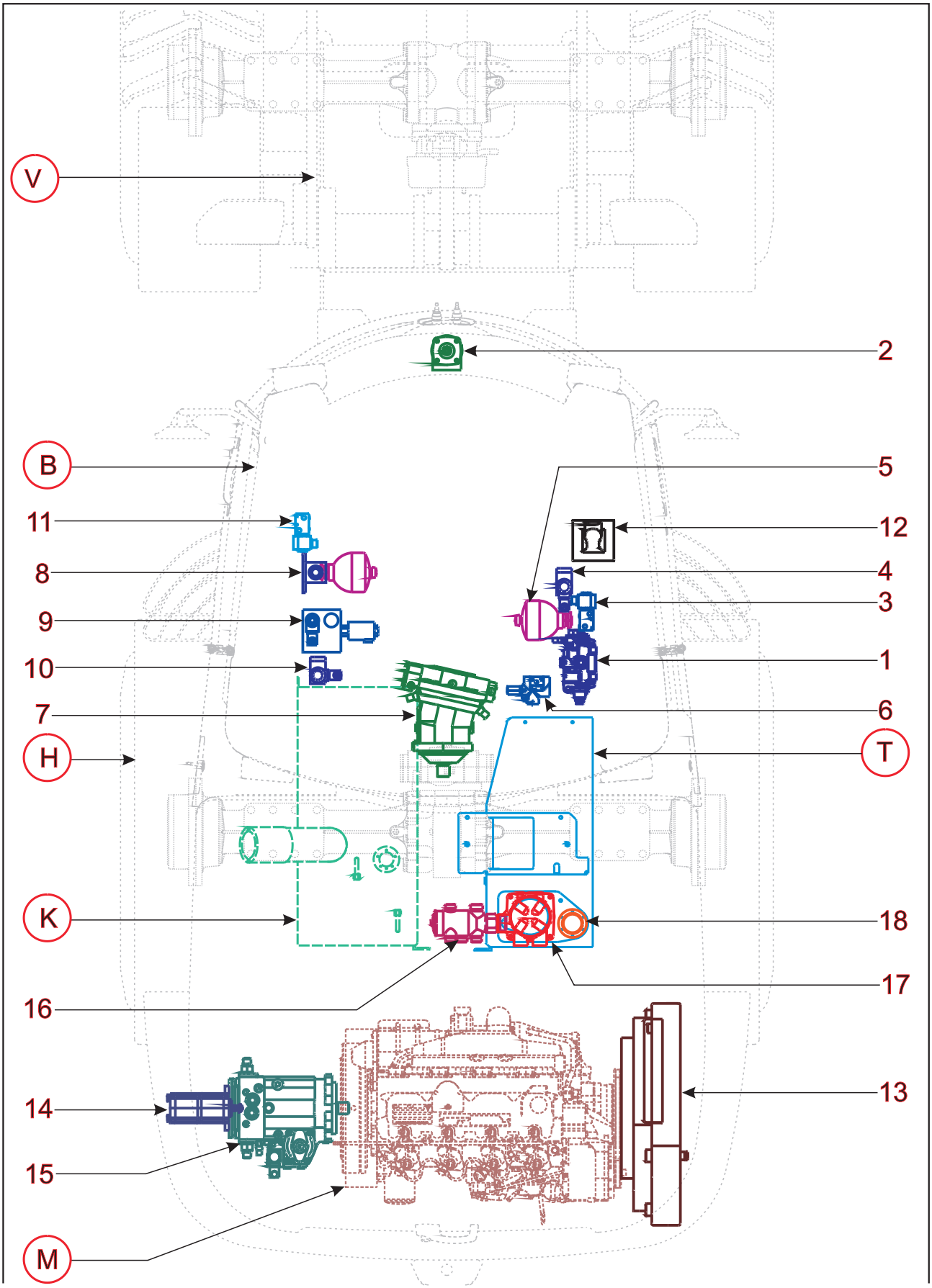
Pos. Item Rep. No.	Deutsch	English	Français
V	**VORDERWAGEN**	**FRONT CHASSIS**	**CHÂSSIS AV**
H	**HINTERWAGEN**	**REAR CHASSIS**	**CHÂSSIS AR**
1	Blocksteuergerät	Valve bank	Bloc distributeur
2	Lenkeinheit	Steering unit	Unite de direction
3	Vorsteuereinheit ***Y5,Y7,Y8,Y9***	Pilot-operated unit ***Y5,Y7,Y8,Y9***	Système pilotage ***Y5, Y7, Y8, Y9***
4	4/2 Wegeventil ***Y12, Y13*** (schnell / langsam)	4/2 Solenoid valve ***Y12,Y13*** (low / high speed)	Electrovanne 4/2 ***Y12,Y13*** (petite / grande vitesse)
5	Hydrospeicher (Arbeitshydraulik abschalten)	Hydraulic accumulator (Stop working hydraulic)	Accumulateur hydraulique (Neutralisation hydr. de travail)
6	Prioritätsventil (Lenken)	Priority valve (steering)	Valve prioritaire (direction)
7	Verstellmotor ***Y2,Y6*** (Fahren)	Variable displacement motor ***Y2,Y6*** (travel)	Moteur á cylindrée variable ***Y2,Y6*** (translation)
8	Speicherblock mit Hydrospeicher **OPTION** (Lastschwingungsdämpfung)	Accumulator bloc with hydr. accumulator **OPTION** (ride control)	Bloc d'accumulateurs avec accumulateur hydr. **OPTION** (anti-tangage)
9	Stabilisieungsmodul **OPTION** ***Y11,Y15***(Lastschwingungsd.)	Pilot bloc **OPTION** ***Y11, Y15*** **(**ride control)	Bloc de pilotage **OPTION** **Y11, Y15** (anti-tangage)
10	3/2 Wegeventil **OPTION** ***Y16*** (Lasthalteventil + Lastschwingungsdämpfung)	3/2 Solenoid valve **OPTION** ***Y16*** (load holding valve + ride control)	Electrovanne 3/2 **OPTION** ***Y16*** (clapet anti-chute + anti-tangage)
11	Steuerventil **OPTION** ***Y20,Y21, Y22*** (Schaufelrückstellung)	Valve bank **OPTION** ***Y20,Y21,Y22*** (return to dig))	Distributeur **OPTION** ***Y20,Y21,Y22*** (remise à niveau automatique)
B	**BODENRAHMEN**	**FLOOR FRAME**	**CADRE DE PLANCHER**
12	Vorsteuergerät - *Joy-stick*	Pilot operated valve - *joy-stick*	Distributeur à commande assistée - *manipulateur*
M	**DIESELMOTOR**	**DIESEL ENGINE**	**MOTEUR DIESEL**
13	Kombinierter Öl- Wasserkühler	Combi radiator cooler for oil and water	Refroidisseur combiné huile et eau
14	Zahnradpumpe (Lenken / Laden)	Gear pump (steering / working)	Pompe à engrenages (direction / travail)
15	Verstellpumpe (Fahren) ***Y3,Y4***	Variable displacement pump (travel) ***Y3,Y4***	Pompe à débit variable (translation) ***Y3,Y4***
T	**HYDRAULIKÖLTANK**	**HYDRAULIC OIL TANK**	**RÉSERVOIR HYDRAULIQUE**
16	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
17	Rücklauffilter	Return filter	Filtre de retour
18	Belüftungsfilter	Vent valve	Filtre d'aération
K	**KRAFTSTOFFTANK**	**FUEL TANK**	**RESERVOIR DE CARBURANT**

Typ Model Type Tipo	**TL 80** (SKL 834)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.24.12**



Typ Model Type	**TL 80 AS**	**Hydraulik** **ab Fz.-Id.-Nr.** **Hydraulic** **from s/n** **Hydraulique** **à partir n du s** **0100**	Datum Edition Date	**01.2008**
Benennung Description Dénomination	**Steuerventil Walvoil SDM 100/3** **Control valve Walvoil SDM 100/3** **Distributeur Walvoil SDM 100/3**		Blatt Page Feuille	**6.25.01**

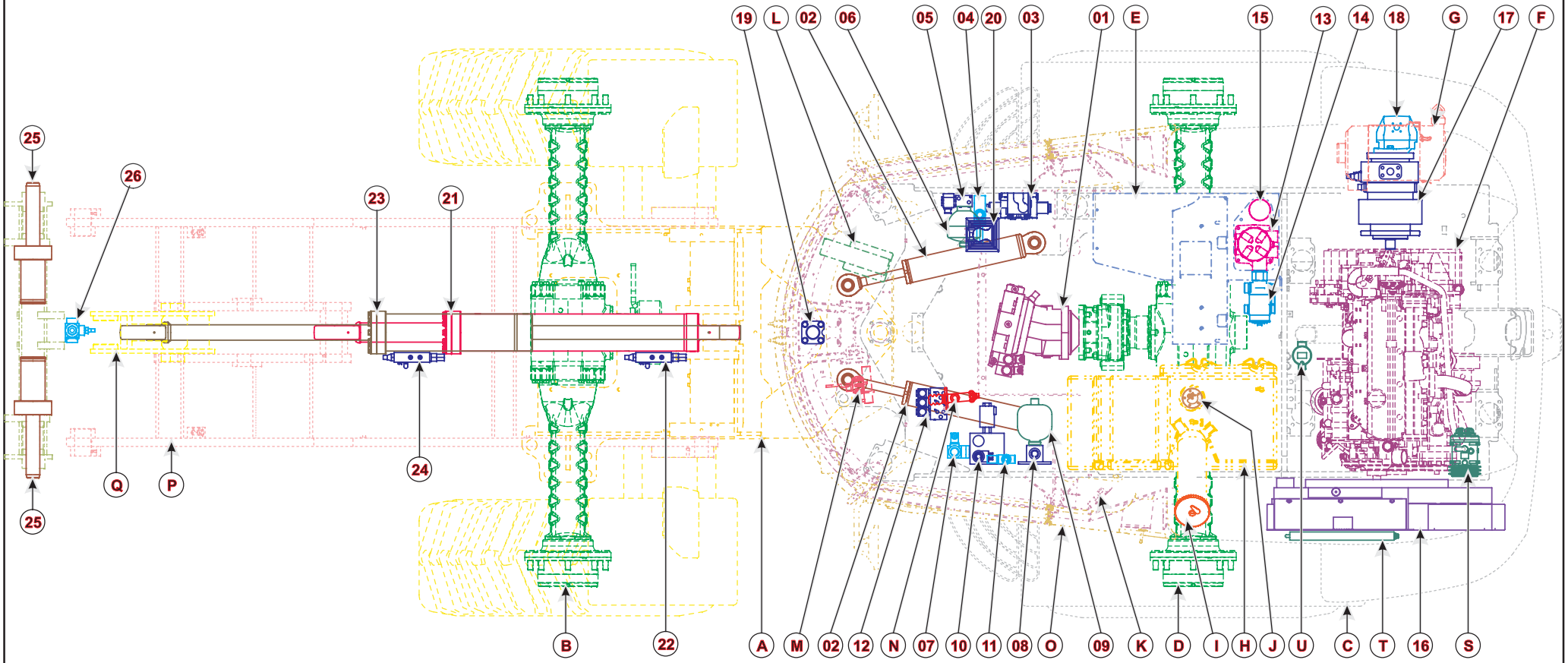

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Typ Model Type Tipo	**TL 100** (SKL 844)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.26.11**

Pos. Item Rep. No.	Deutsch	English	Français
V	**VORDERWAGEN**	**FRONT CHASSIS**	**CHÂSSIS AV**
H	**HINTERWAGEN**	**REAR CHASSIS**	**CHÂSSIS AR**
1	Blocksteuergerät	Valve bank	Bloc distributeur
2	Lenkeinheit	Steering unit	Unite de direction
3	Vorsteuereinheit ***Y5,Y7,Y8,Y9***	Pilot-operated unit ***Y5,Y7,Y8,Y9***	Système pilotage ***Y5, Y7, Y8, Y9***
4	4/2 Wegeventil ***Y12, Y13*** (schnell / langsam)	4/2 Solenoid valve ***Y12,Y13*** (low / high speed)	Electrovanne 4/2 ***Y12,Y13*** (petite / grande vitesse)
5	Hydrospeicher (Arbeitshydraulik abschalten)	Hydraulic accumulator (Stop working hydraulic)	Accumulateur hydraulique (Neutralisation hydr. de travail)
6	Prioritätsventil (Lenken)	Priority valve (steering)	Valve prioritaire (direction)
7	Verstellmotor ***Y2,Y6*** (Fahren)	Variable displacement motor ***Y2,Y6*** (travel)	Moteur á cylindrée variable ***Y2,Y6*** (translation)
8	Speicherblock mit Hydrospeicher **OPTION** (Lastschwingungsdämpfung)	Accumulator bloc with hydr. accumulator **OPTION** (ride control)	Bloc d'accumulateurs avec accumulateur hydr. **OPTION** (anti-tangage)
9	Stabilisieungsmodul **OPTION** ***Y11,Y15***(Lastschwingungsd.)	Pilot bloc **OPTION** ***Y11, Y15*** **(**ride control)	Bloc de pilotage **OPTION** **Y11, Y15** (anti-tangage)
10	3/2 Wegeventil **OPTION** ***Y16*** (Lasthalteventil + Lastschwingungsdämpfung)	3/2 Solenoid valve **OPTION** ***Y16*** (load holding valve + ride control)	Electrovanne 3/2 **OPTION** ***Y16*** (clapet anti-chute + anti-tangage)
11	Steuerventil **OPTION** ***Y20,Y21, Y22*** (Schaufelrückstellung)	Valve bank **OPTION** ***Y20,Y21,Y22*** (return to dig))	Distributeur **OPTION** ***Y20,Y21,Y22*** (remise à niveau automatique)
B	**BODENRAHMEN**	**FLOOR FRAME**	**CADRE DE PLANCHER**
12	Vorsteuergerät - *Joy-stick*	Pilot operated valve - *joy-stick*	Distributeur à commande assistée - *manipulateur*
M	**DIESELMOTOR**	**DIESEL ENGINE**	**MOTEUR DIESEL**
13	Kombinierter Öl- Wasserkühler	Combi radiator cooler for oil and water	Refroidisseur combiné huile et eau
14	Zahnradpumpe (Lenken / Laden)	Gear pump (steering / working)	Pompe à engrenages (direction / travail)
15	Verstellpumpe (Fahren) ***Y3,Y4***	Variable displacement pump (travel) ***Y3,Y4***	Pompe à débit variable (translation) ***Y3,Y4***
T	**HYDRAULIKÖLTANK**	**HYDRAULIC OIL TANK**	**RÉSERVOIR HYDRAULIQUE**
16	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
17	Rücklauffilter	Return filter	Filtre de retour
18	Belüftungsfilter	Vent valve	Filtre d'aération
K	**KRAFTSTOFFTANK**	**FUEL TANK**	**RESERVOIR DE CARBURANT**

Typ Model Type Tipo	**TL 100** (SKL 844) **Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**	Blatt Page Feuille Página	**6.26.12**

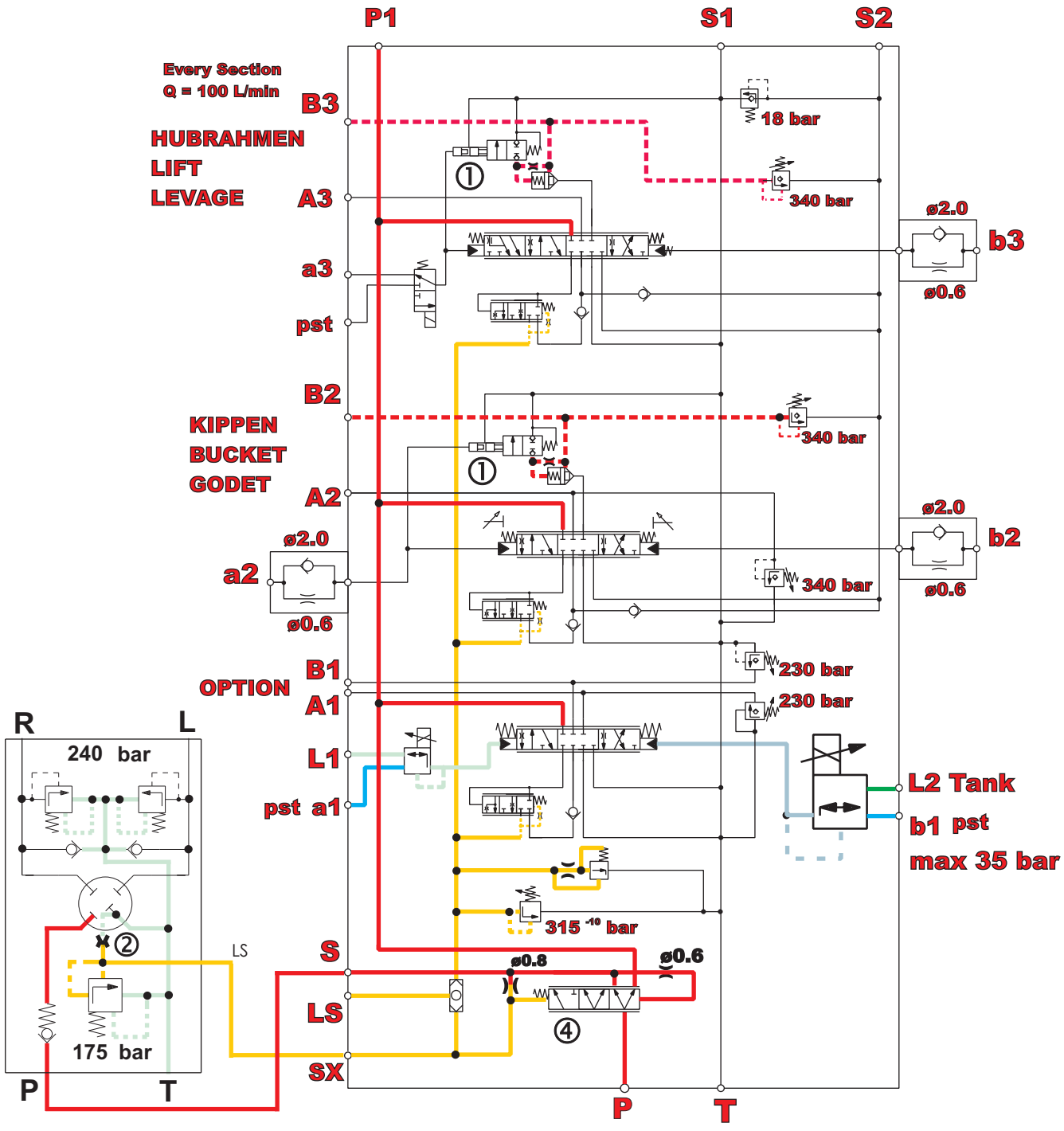


Typ Model Type Tipo	**TL 120** **Arbeitshydraulik** **Working hydraulic** **Hydraulique équipement** **Hidráulico de trabajo** **ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Composants hydrauliques position de montage** **Posiciones de las válvulas hidráulicas**	Blatt Page Feuille Página	**6.27.01**

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
A	***Vorderwagen***	***Front chassis***	***Châssis AV***
B	***Vorderachse***	***Front axle***	***Essieu AV***
C	***Hinterwagen***	***Rear chassis***	***Châssis AR***
D	***Hinterachse***	***Rear axle***	***Essieu AR***
01	Verstellmotor ***Y2, Y6*** *(Fahren)*	Variable displacement motor ***Y2, Y6*** *(travel)*	Moteur à cylindré variable ***Y2, Y6*** *(translation)*
02	Hydraulikzylinder *(Lenken)*	Hydraulic cylinder *(steering)*	Vérin hydraulique *(direction)*
03	Blocksteuergerät – **HDM19WL/3**	Valve bank – **HDM19WL/3**	Bloc distributeur – **HDM19WL/3**
04	Prioritätsventil	Priority valve	Valve de priorité
05	Vorsteuereinheit ***Y5, Y7, Y8, Y9***	Pilot operated unit ***Y5, Y7, Y8, Y9***	Système pilotage ***Y5, Y7, Y8, Y9***
06	Hydrospeicher – *Vorsteuereinheit* (Arbeitshydraulik abschalten)	Hydraulic accumulator – *Pilot operated unit* (Stop working hydraulic)	Accumulateur hydraulique - *Système pilotage* (Neutralisation hydraulique de travail)
07	**OPTION** 4/2 Wegeventil ***Y12, Y13*** Schaltgetriebe (schnell / langsam)	**OPTION** 4/2 Solenoid valve ***Y12, Y13*** *gearbox* (high / low)	**OPTION** Electrovanne 4/2 ***Y12, Y13*** (petite / grande)
08	**OPTION** Speicherblock (Lastschwingungsdämpfung)	**OPTION** Accumulator bloc (ride control)	**OPTION** Bloc d'accumulateurs (anti-tangage)
09	**OPTION** 3x Hydrospeicher (Lastschwingungsdämpfung)	**OPTION** 3x Hydraulic accumulator (ride control)	**OPTION** 3x Accumulateur hydraulique (anti-tangage)
10	**OPTION** Steuerblock ***Y11, Y15*** *(Lastschwingungsdämpfung)*	**OPTION** Pilot bloc ***Y11, Y15*** *(ride control)*	**OPTION** Bloc de pilotage ***Y11, Y15*** *(anti-tangage)*
11	**OPTION** 3/2 Wegeventil ***Y16*** (Lasthalteventil + Lastschwingungsdämpfung)	**OPTION** 3/2 Solenoid valve ***Y16*** (load holding valve + ride control)	**OPTION** Electrovanne 3/2 ***Y16*** (clapet anti-chute + anti-tangage)
12	**OPTION** Steuerventil ***Y20, Y21***, ***Y22*** (Schaufelrückstellung)	**OPTION** Valve bank ***Y20, Y21, Y22*** (return to dig)	**OPTION** Distributeur ***Y20,Y21,Y22*** (remise à niveau automatique)
E	Hydrauliköltank	Hydraulic oil tank	Réservoir hydraulique
13	Rücklauffilter *(Hydrauliköl)*	Return filter *(hydraulic oil)*	Filtre de retour *(huile hydraulique)*
14	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
15	Belüftungsfilter	Vent filter	Filtre d'aération
F	Dieselmotor	Diesel engine	Moteur diesel
16	Kombinierter Öl- Wasserkühler	Combined radiator cooler for oil and water	Refroidisseur combiné huile et eau
17	Verstellpumpe (Fahren) ***Y3, Y4***	Variable displacement pump (travel) ***Y3, Y4***	Pompe à débit variable (translation) ***Y3, Y4***
18	Zahnradpumpe (Lenken / Laden)	Gear pump (steering / working)	Pompe à engrenages (direction / travail)
G	Luftfilter	Air filter	Filtre à air
H	Kraftstofftank	Fuel tank	Réservoir de carburant
I	Kraftstofftank-Deckel	Fuel tank cover	Couvercle réservoir de carburant
J	Tauchrohrgeber	Fuel gauge transmitter	Jauge réservoir de carburant
K	Bodenrahmen	Floor frame	Cadre plancher
19	Lenkeinheit	Steering unit	Ensemble direction
20	Vorsteuergerät - Joystick	Pilot operated valve - joy-stick	Distributeur à commande assistée - manipulateur
L	Gaspedal	Throttle pedal	Accélérateur
M	Bremspedal	Brake pedal	Pédale de frein
N	Hauptbremszylinder	Master cylinder	Maître - cylindre de frein
O	Fahrerkabine	Driver cab	Cabine
P	Hubrahmen	Lift frame	Bras de levage

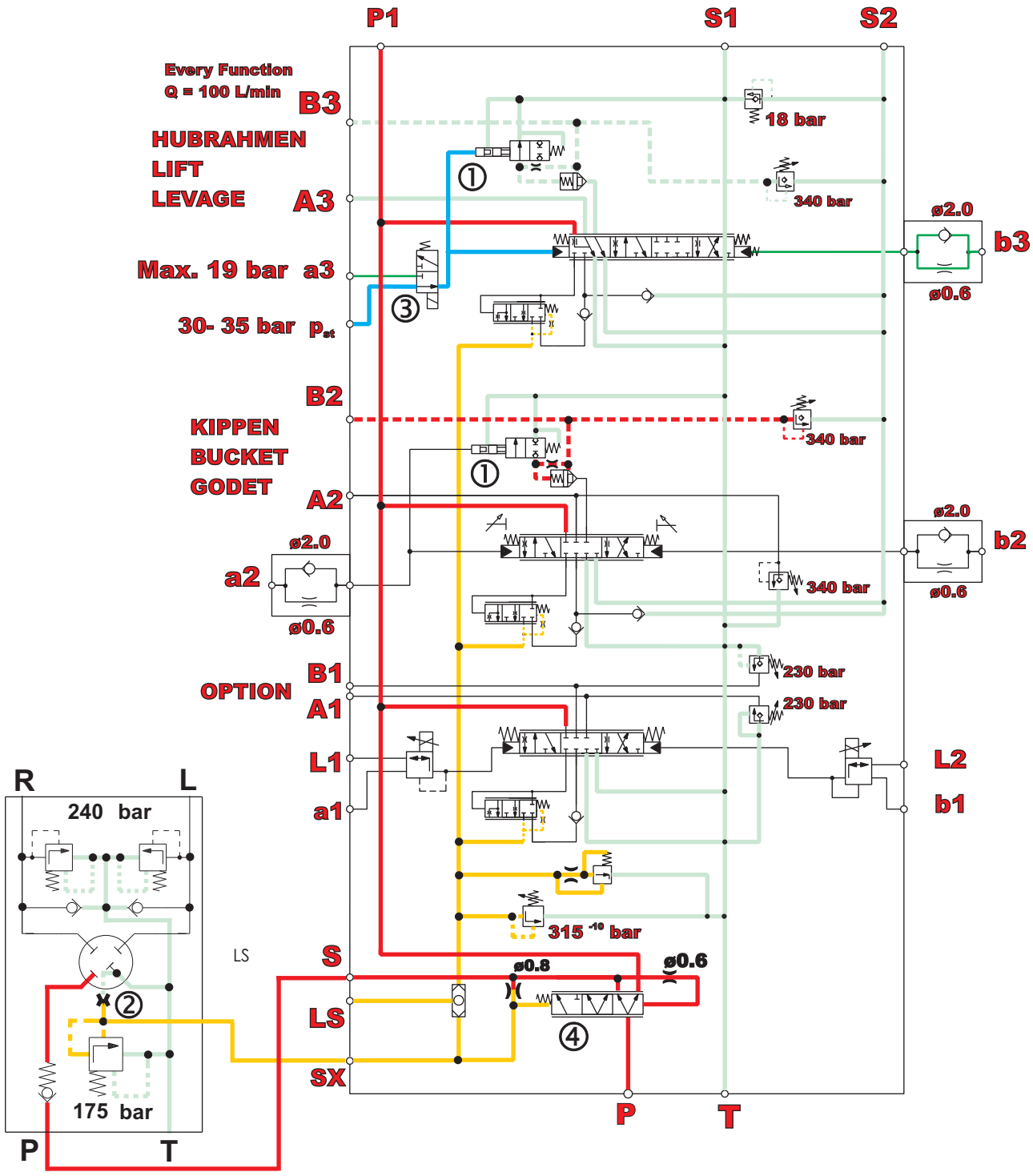
Typ Model Type Tipo	**TL120** (SKL854)	***ab Fz. Id. Nr. from s/n à partir du n/s desde el no.***	**TL01200100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht Location of hydraulic components Composants hydrauliques position de montage Posiciones de las válvulas hidràulicas**		**LEGENDE LEGEND LEGENDE LAYENDA**	Blatt Page Feuille Página	**6.27.02**

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
21	Hydraulikzylinder *(Hubrahmen)*	Hydraulic cylinder *(lifting frame)*	Vérin hydraulique *(bras de levage)*
22	**OPTION** Lasthalteventil *(Hubrahmen)*	**OPTION** Load check valve *(lifting frame)*	**OPTION** Clapet anti-chute *(bras de levage)*
23	Hydraulikzylinder *(Schaufel kippen)*	Hydraulic cylinder (dump shovel)	Vérin hydraulique (*basculement godet)*
24	**OPTION** Lasthalteventil *(Schaufel kippen)*	**OPTION** Load check valve (dump shovel)	**OPTION** Clapet anti-chute *(basculement godet)*
Q	Kipphebel	Tilting lever	Levier
R	Schnellwechsler	Quick mount hitch	Attache rapide
25	Hydraulikzylinder *(Schnellwechsler)*	Hydraulic cylinder *(quick mount hitch)*	Vérin hydraulique *(attache rapide)*
26	**OPTION** Stromregelventil *(Schnellwechsler)*	**OPTION** Flow regulator valve *(quick mount hitch)*	**OPTION** Régulateur de débit *(attache rapide)*
S	Kompressor - Klimaanlage	Compressor – air conditioner	Compresseur – climatisation
T	Kondensator - Klimaanlage	Condenser - air conditioner	Condensateur – climatisation
U	Trockner - Klimaanlage	Drier – air conditioner	Sécheur – climatisation



Represented Situation:
Engine started, steering and working hydraulics not actuated, lifting frame raised, bucket tilt.
The priority spool **(4)** is pushed against the spring to the left. Stand-by pressure (28 bar) is present to the spools and the steering orbit **(via port S)**. The variable displacement pump supplies a minimal flow only. The LS-channnel is released via the orifice **(2)** in the steering orbit to tank.
The function lifting frame **(lower B3)** and bucket **(B2)** are hydraulically supported at the low-leak-valves **(1)**. These valves prevent a creeping effect to the lowering and tilt of the bucket.
Additional circuit:
The flow adjustment of the additional circuit is proportional adjustable as standard (0 to 99 l/min).
The actuation is switched black/white, impluse or permanent mode.

Typ / Model / Type / Tipo	TL 160 (SKL 160)	Hydraulik / Hydraulic / Hydraulique / Hidráulico — ab Fz.-Id.-Nr. / from s/n / à partir n du s / desde el numero: TL01600100	Datum / Edition / Date / Fecha	01.2007
Benennung / Description / Dénomination / Denominación	Hydraulikschaltplan Steuerventil 3M6/15 Hydraulic diagramm Control valve 3M6/15 Plan hydraulique Distributeur 3M6/15 Plano hidráulico		Blatt / Page / Feuille / Página	6.28.05



Situation II: floating position

Engine started, steering and working hydraulics not actuated, floating position activated.
The priority spool **(4)** is pushed against the spring to the left. Stand-by pressure (28 bar) is present to the spools and the steering orbit **(via port S)**. The variable displacement pump supplies a minimal flow only. The LS-channnel is released via the orifice **(2)** in the steering orbit to tank. Pilot pressure, (p_{st}= approx. 30-35 bar, charge pressure of the travel pump) is switched via the 3/2 solenoid valve **(3)** to the low-leak-valve **(1)** and to the spool (**a3**), this will bring it to the to the floating position. Via the opened low-leak-valve **(1)** and the spool, the lifting cylinder piston side (**B3**) is linked to tank.
The lifting cylinder rod side "lower" (**A3**) has got a link to tank via the spool. The shovel rests with its weight on the ground and is able to move without cavitation freely up and down.

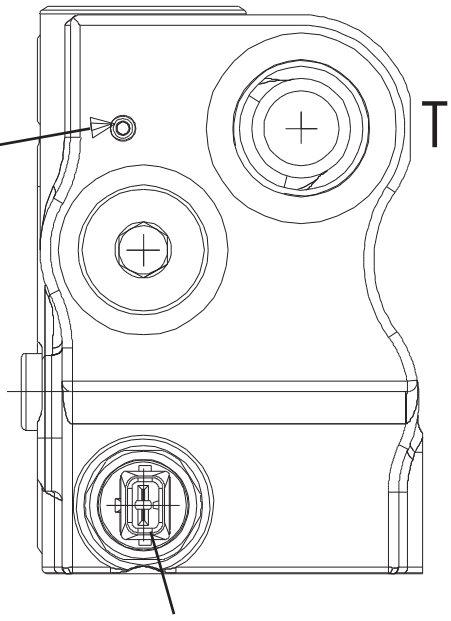
Typ Model Type Tipo	**TL 160** (SKL 160)	Hydraulik Hydraulic Hydraulique Hidráulico	ab Fz.-Id.-Nr. from s/n à partir n du s desde el numero	**TL01600100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan Steuerventil 3M6/15** **Hydraulic diagramm Control valve 3M6/15** **Plan hydraulique Distributeur 3M6/15** **Plano hidráulico**				Blatt Page Feuille Página	**6.28.06**

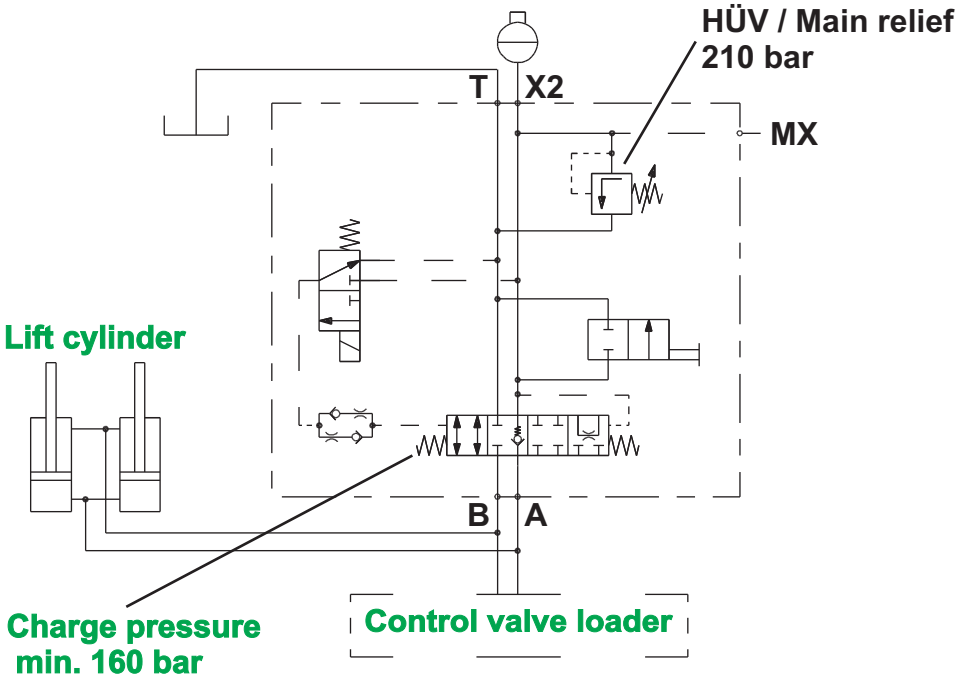
Pressure accumulator - discharge screw

Before carriing out repair jobs at the ride control system, ensure the pressure accumulators to be totally discharged.

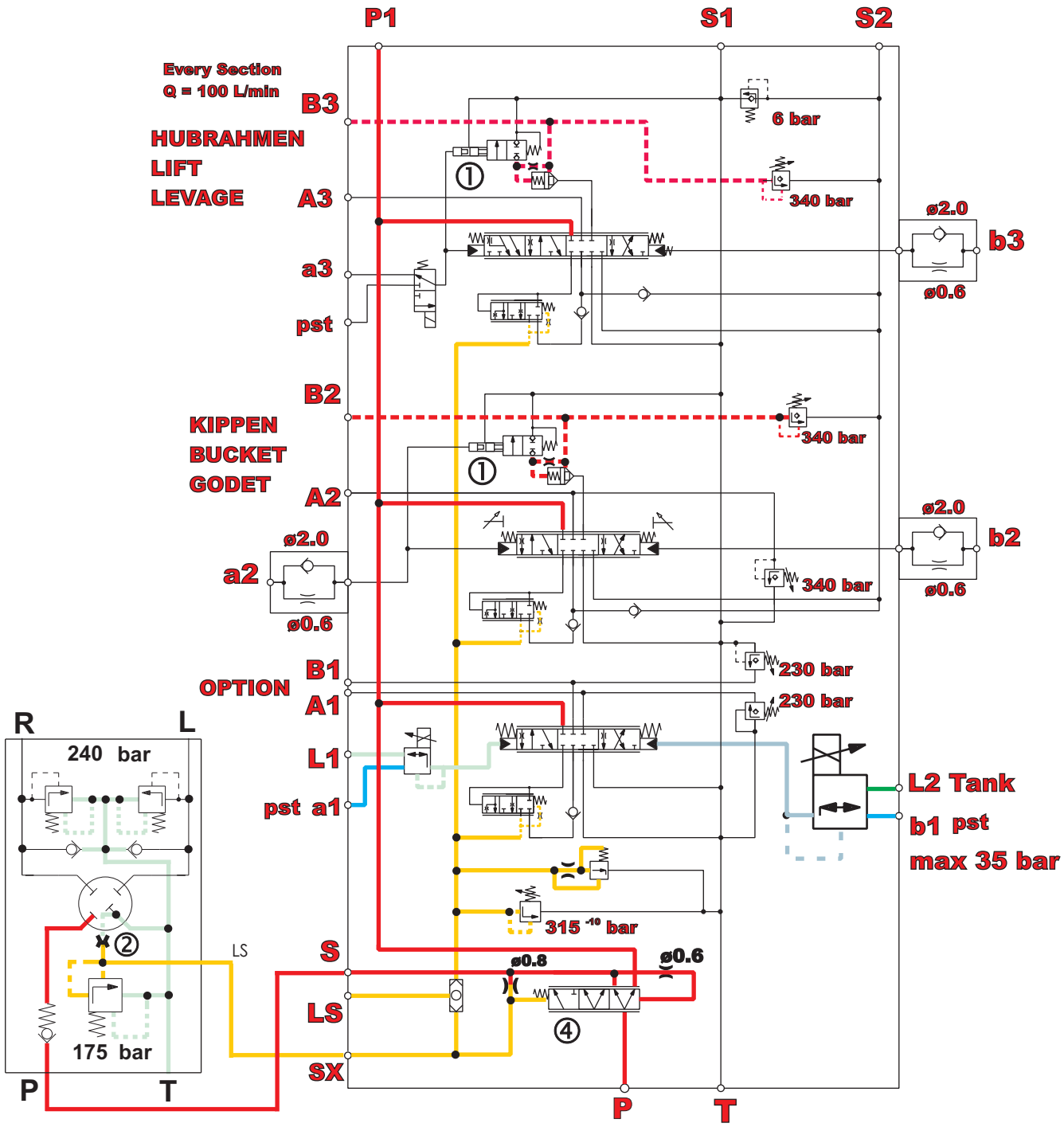
To do this, dismount plug and screw out the valve coil (wrench size 3mm) approx. two revolutions (counter clockwise).

REMARK:
Tightening torque: valve coil = **3,5 Nm**
Tightening torque: plug = **7 Nm**



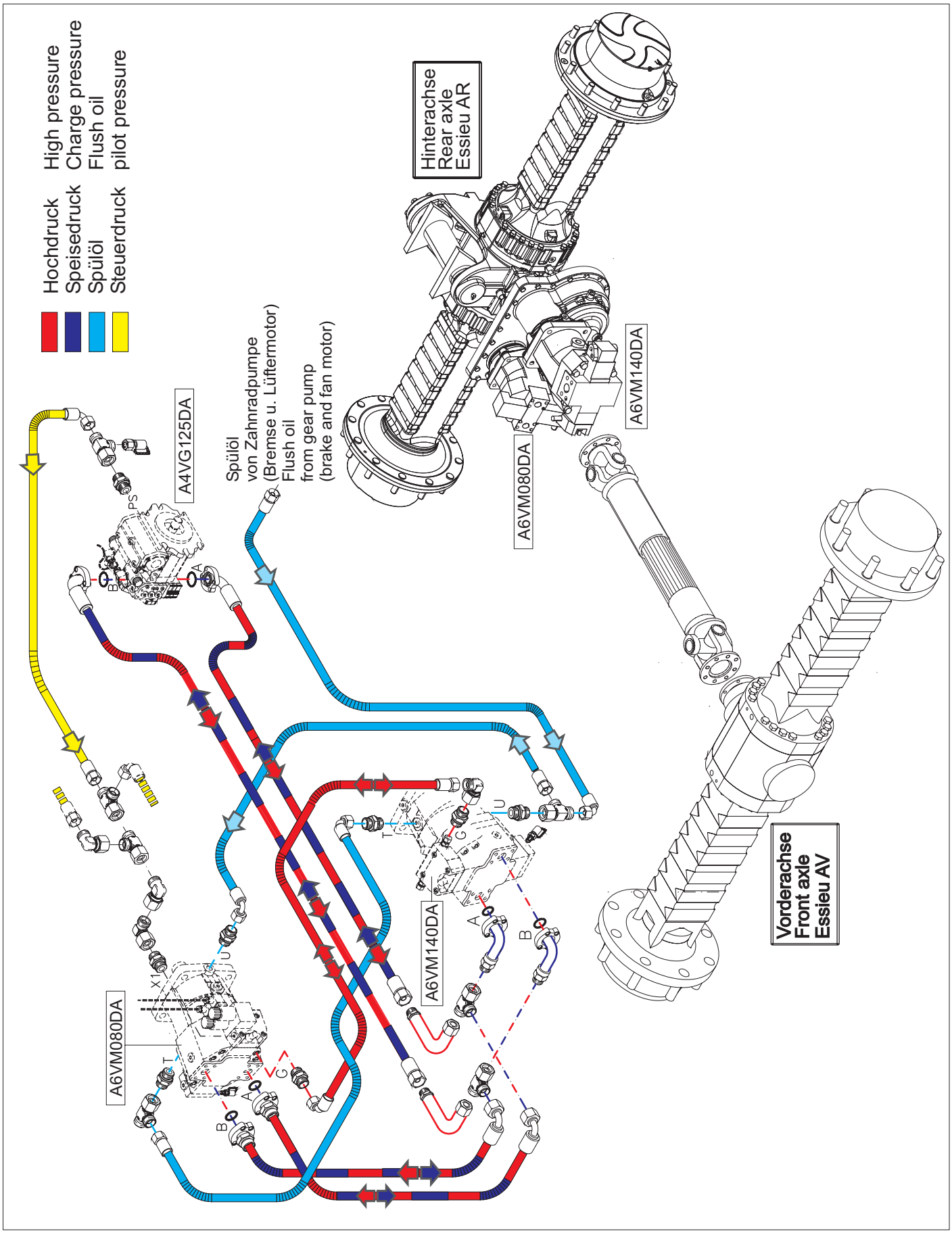


Typ Model Type Tipo	**TL 160** (SKL 160) Hydraulik / Hydraulic / Hydraulique / Hidráulico — ab Fz.-Id.-Nr. / from s/n / à partir n du s / desde el numero **TL01600100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan Lastschwingungsdaempfung** **Hydraulic diagramm Ride control system** **Plan hydraulique Amortissement d' oscillations** **Plano hidráulico**	Blatt Page Feuille Página	**6.28.07**



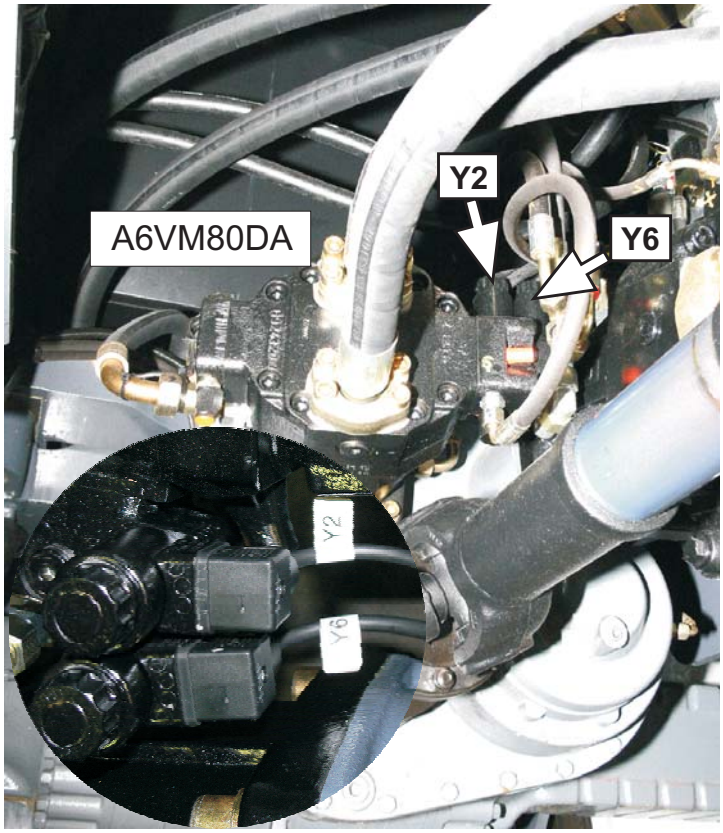
Represented Situation:
Engine started, steering and working hydraulics not actuated, lifting frame raised, bucket tilt.
The priority spool **(4)** is pushed against the spring to the left. Stand-by pressure (28 bar) is present to the spools and the steering orbit **(via port S)**. The variable displacement pump supplies a minimal flow only. The LS-channnel is released via the orifice **(2)** in the steering orbit to tank.
The function lifting frame **(lower B3)** and bucket **(B2)** are hydraulically supported at the low-leak-valves **(1)**. These valves prevent a creeping effect to the lowering and tilt of the bucket.
Additional circuit:
The flow adjustment of the additional circuit is proportional adjustable as standard (0 to 99 l/min).
The actuation is switched black/white, impluse or permanent mode.

Typ Model Type Tipo	**TL 260** (SKL 260) Hydraulik / Hydraulic / Hydraulique / Hidráulico — ab Fz.-Id.-Nr. / from s/n / à partir n du s / desde el numero **TL02600100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan Steuerventil 3M6/15** **Hydraulic diagramm Control valve 3M6/15** **Plan hydraulique Distributeur 3M6/15** **Plano hidráulico**	Blatt Page Feuille Página	**6.30.05**



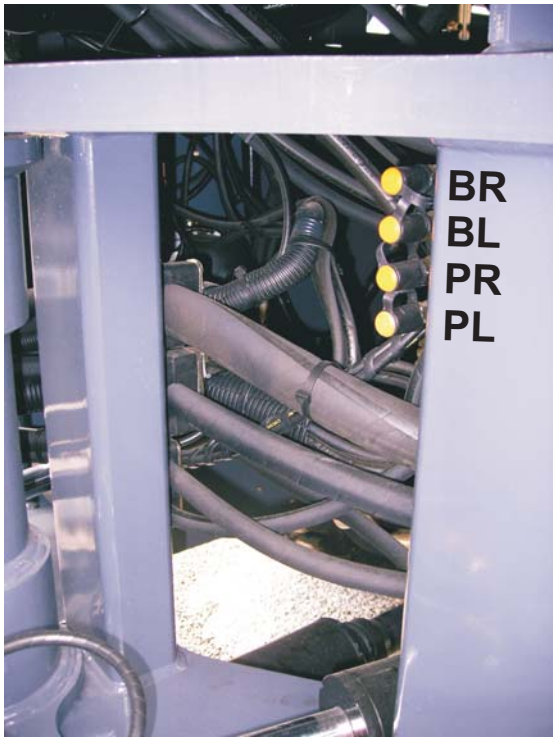
Typ Model Type	**TL 210 / 260**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s**	**TL02100100** **TL02600135**	Datum Edition Date	**01.2008**
Benennung Description Dénomination	**Funktionsbeschreibung Fahrantrieb** **Description function travel drive**			Blatt Page Feuille	**6.31.01**


TEREX®



Y2 solenoid valve:
on the inside of the travel motor
Function: Travel sens recognition
backward energized

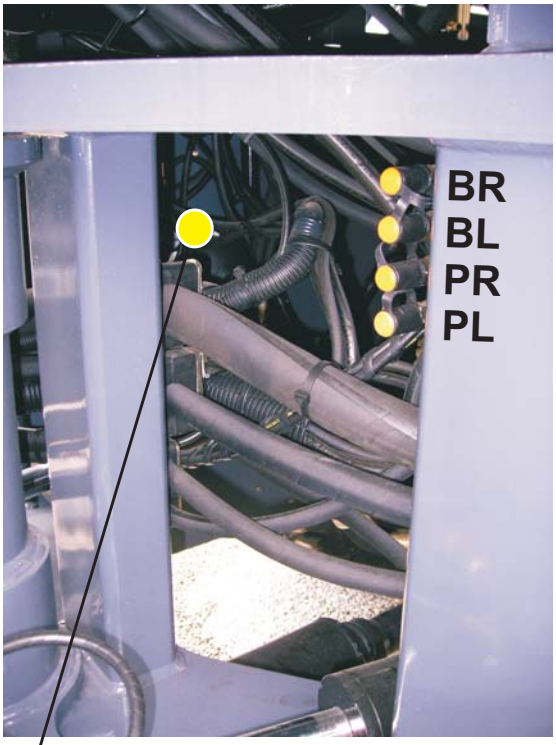
Y6 solenoid valve:
on the outside of the travel motor
Function: Travel fast - slow
slow energized



Test ports:
BR- Service brake rear axle right
BL- Service brake rear axle left
PR- Parking brake rear axle right
PL- Parking brake rear axle left

This ports are used to bleed the brake at the rear axle

Typ Model Type	**TL 210 / 260**	**ab Fz.-Id.-Nr. from s/n à partir du n/s**	**TL02100100 TL02600135**	Datum Edition Date	**01.2008**
Benennung Description Dénomination	**Funktionsbeschreibung Fahrantrieb Description function travel drive**			Blatt Page Feuille	**6.31.02**

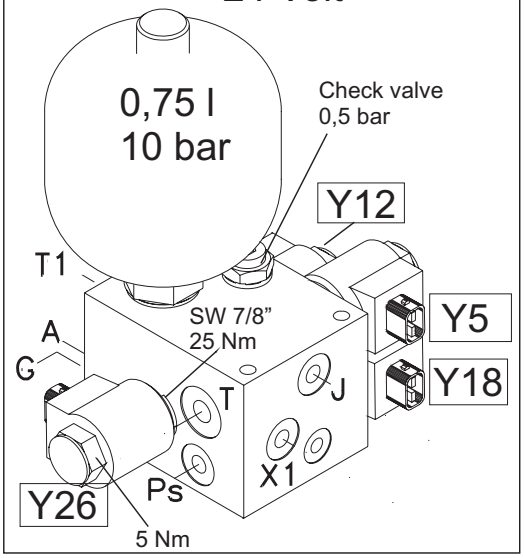


Y26 Solenoid valve: Is located at pilot pressure control unit and switchs together with the solenoid valve ***Y6*** at the little travelmotor.
Function: Switch big travelmotor A6VM140DA between “fast-slow”
e.g. when switching to “turtoise” ***Y6*** and ***Y26*** are energized, both travelmotors swing back and stay fixed at Qmax. (max. angle)

Solenoid valve Y12 : Located at pilot pressure control unit, electronically controlled
Function: Controlls the clutch in the gearbox for the big travelmotor A6VM140DA
clutch disengages at 15 km/h
clutch engages at 10 km/h

Solenoid valve Y18 : At pilot pressure control unit, electronic controlled
Function: Swings big travelmotor A6VM140DA to zero capacity and back to Qmax. (max. angle)

Pilot pressure control unit
24 Volt



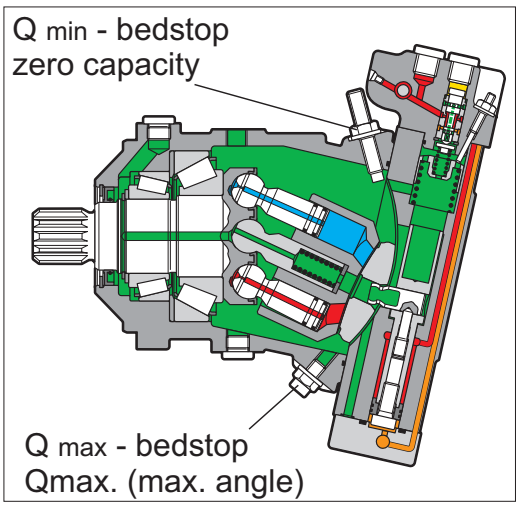
Operation sequence: Travel fast “Rabbit” (accelerate)

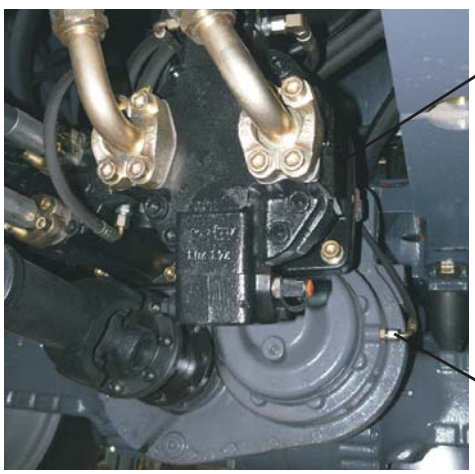
- ***Y18*** swings the big travelmotor A6VM140 back to zero capacity
- ***Y12*** disengages the clutch of the big travel motor at 15 km/h
- Machine drives only with the little travel motor A6VM 80 DA until max. speed

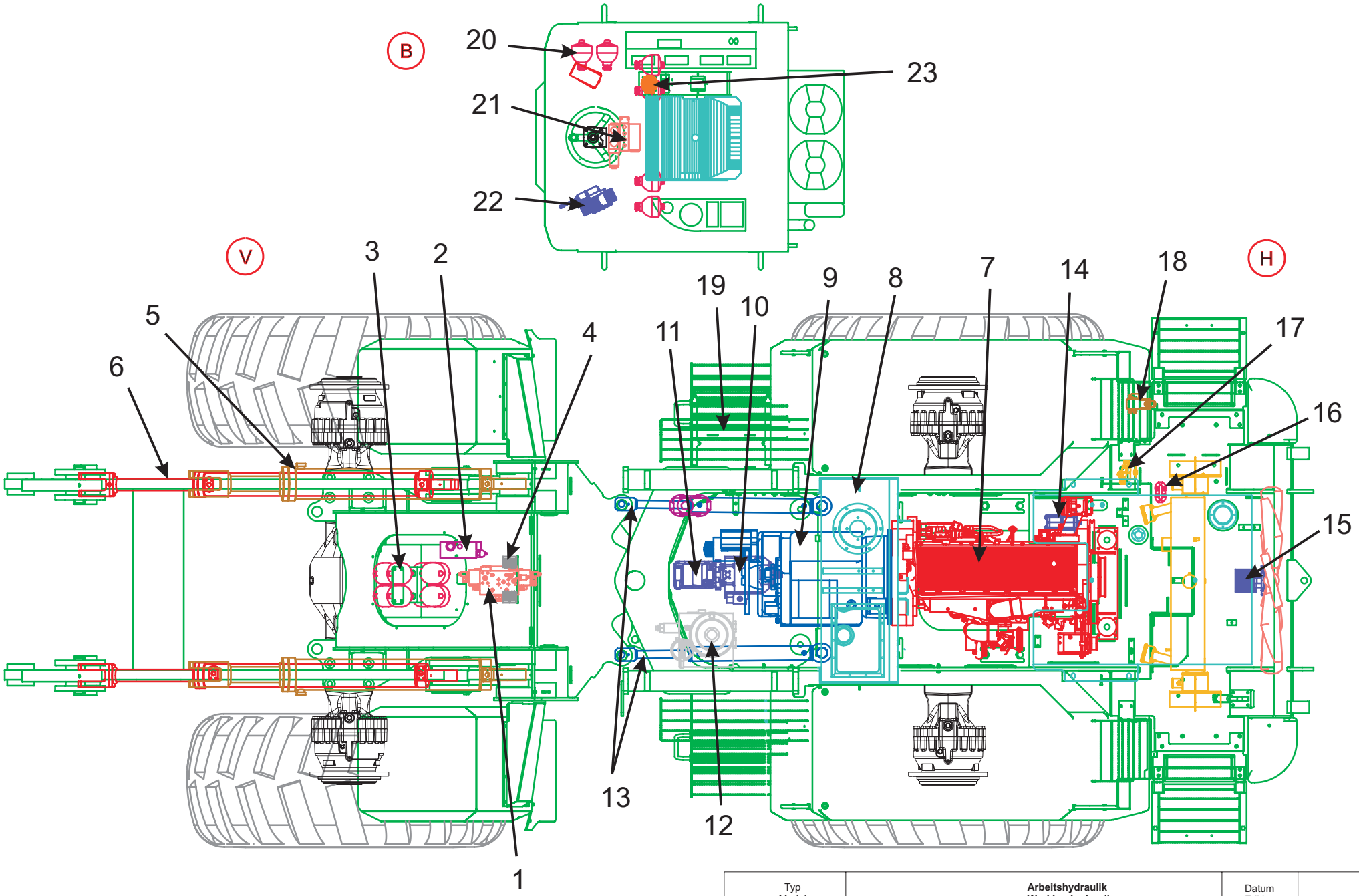
Operation sequence: Fast travel “Rabbit” (decrease speed)

- ***Y12*** engages the clutch at the big travelmotor at 10 km/h
- ***Y18*** swings big travelmotor from neutral to Qmax. (max. angle) Regulation of the motors are possible now

- ***Y5 Working hydraulic on - off***

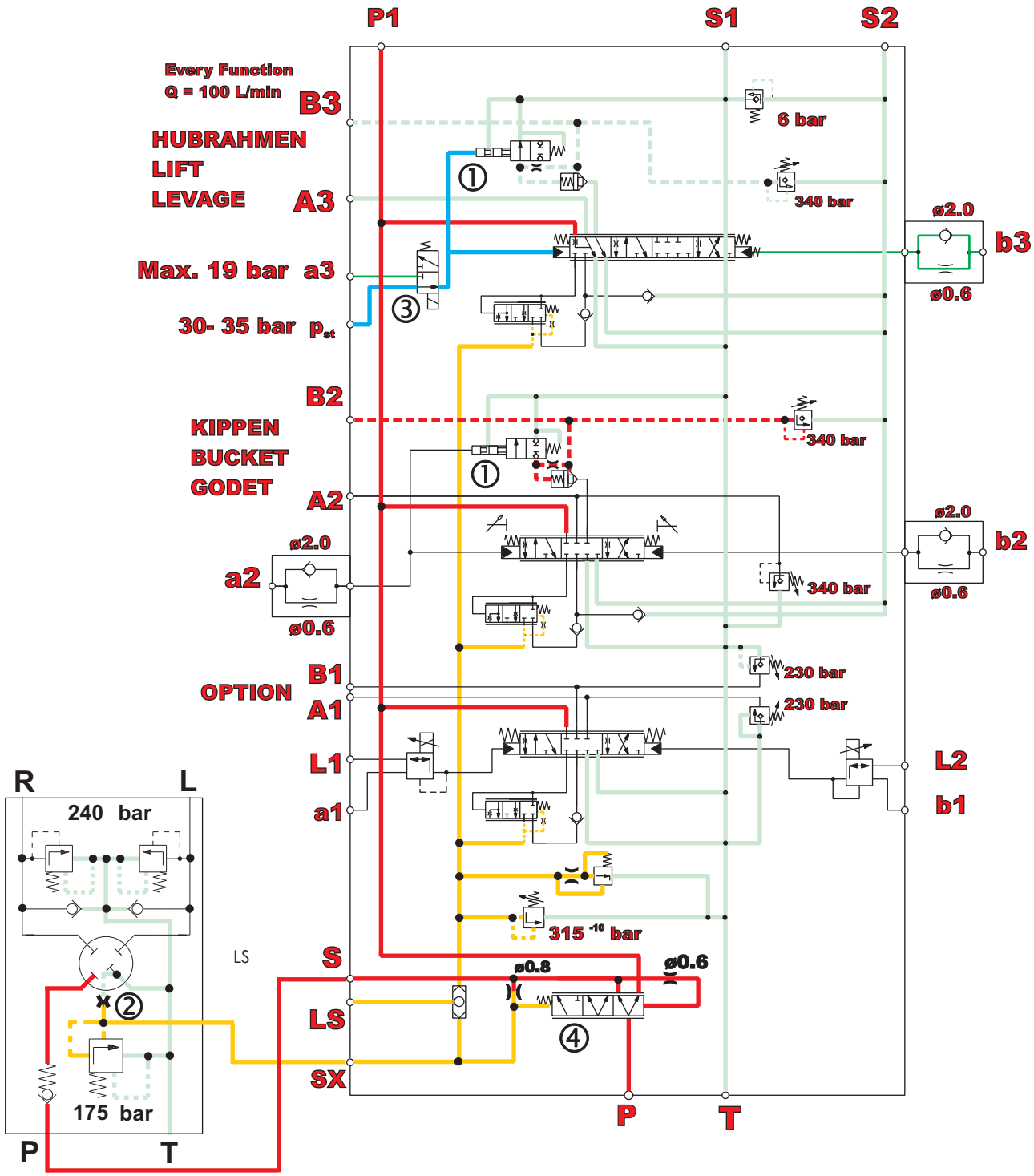






Typ Model Type Tipo	**TL 420 - TL 450**	**Arbeitshydraulik** **Working hydraulic** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha — **01.2008**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Composants hydrauliques position de montage** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página — **6.35.01**

Pos. Item Rep. No.	Deutsch	English	Français
V	**VORDERWAGEN**	**FRONT CHASSIS**	**CHASSIS AV**
1	Blocksteuergerät	Valve bank	Distributeur
2	Stabilisierungsmodul (Lastschwingungsdämpfung)	Stabilizing module (ride control)	Module de stabilisation (anti-tangage)
3	Steuerplatte mit Hydrospeicher (Lastschwingungsdämpfung)	control plate with hydraulic accumulator (ride control)	Plaque de commande avec accumulateur hydr. (anti-tangage)
4	Magnetventile Hubhöhenbegrenzung und Schaufelrückführung	Solenoid valves Lifting height stop return to dig	electro-vannes limimtation d'hauteur remise à niveau automatique
5	Hubzylinder (Hubrahmen)	Lift cylinder	vérin de levage (bras de levage)
6	Kippzylinder	Tilt cylinder	verin de cavage
H	**HINTERWAGEN**	**REAR CHASSIS**	**CHASSIS AR**
7	Dieselmotor (Cummins)	Engine (Cummins)	moteur (Cummins)
8	Hydrauliköltank	Hydraulic oil tank	reservoir hydraulique
9	ZF-Wendegetriebe	ZF-Reverse gear unit	boîte reversible ZF
10	Hydraulikpumpe (Arbeiten)	Workingpump	pompe hydr. (équipment)
11	Hydraulikpumpe (Lenken)	Steeringpump	pompe hydr. (direction)
12	Notlenkpumpe	Emergency steering pump	pompe de secours
13	Lenkzylinder	Steering cylinder	vérin de direction
14	Lüfterantriebsp./ Bremspumpe	Fan drive pump / Brakepump	pompe ventilateur / pompe frein
15	Hydraulikmotor (Lüfter)	Hydraulic motor (fan)	Moteur hydraulique (ventilateur)
16	Kraftstoffilter	Fuel filter	filtre gazoil
17	Steuerblock (Lüfter)	Valve bank (fan)	distributeur (ventilateur)
18	Haubenöffnungsvorrichtung	Engine hood device	dispositif ouverture capot
19	Sicherungskasten	Fuse box	boîte à fusibles
B	**BODENRAHMEN**	**FLOOR FRAME**	**PLANCHER**
20	Hydrospeicher (Lenkung)	Hydraulic accumulatur (steering)	Accumulateur hydraulique (Direction)
21	Steuerblock (Lenkung)	Valve bank (steering)	distributeur (direction)
22	Bremsventil	Brake valve	soupape frein
23	Vorsteuergerät - *Joy-stick*	Pilot operated valve - *joy-stick*	Distributeur à commande assistée - *manipulateur*



Situation II: floating position

Engine started, steering and working hydraulics not actuated, floating position activated.
The priority spool **(4)** is pushed against the spring to the left. Stand-by pressure (28 bar) is present to the spools and the steering orbit **(via port S)**. The variable displacement pump supplies a minimal flow only. The LS-channnel is released via the orifice **(2)** in the steering orbit to tank. Pilot pressure, (p_{st}= approx. 30-35 bar, charge pressure of the travel pump) is switched via the 3/2 solenoid valve **(3)** to the low-leak-valve **(1)** and to the spool (**a3**), this will bring it to the to the floating position. Via the opened low-leak-valve **(1)** and the spool, the lifting cylinder piston side (**B3**) is linked to tank.
The lifting cylinder rod side "lower" (**A3**) has got a link to tank via the spool. The shovel rests with its weight on the ground and is able to move without cavitation freely up and down.

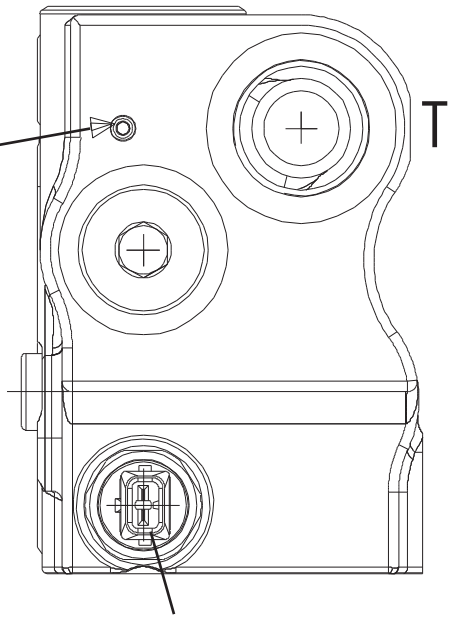
Typ / Model / Type / Tipo	**TL 260** (SKL 260) Hydraulik / Hydraulic / Hydraulique / Hidráulico **TI02600100** ab Fz.-Id.-Nr. / from s/n / à partir n du s / desde el numero	Datum / Edition / Date / Fecha	**01.2007**
Benennung / Description / Dénomination / Denominación	**Hydraulikschaltplan Steuerventil 3M6/15** **Hydraulic diagramm Control valve 3M6/15** **Plan hydraulique Distributeur 3M6/15** **Plano hidráulico**	Blatt / Page / Feuille / Página	**6.30.06**

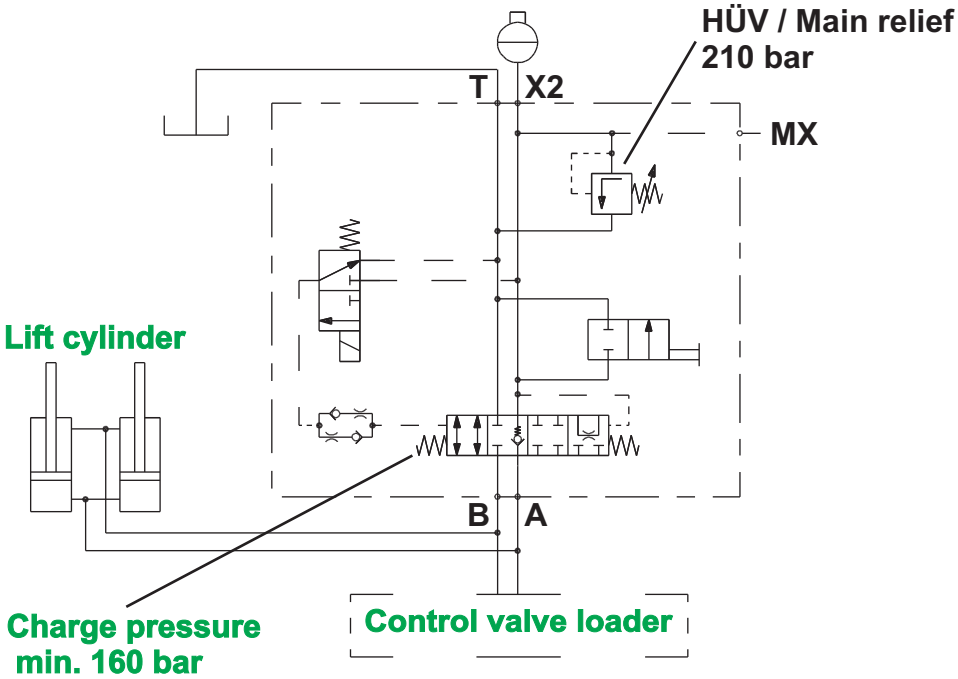
Pressure accumulator - discharge screw

Before carriing out repair jobs at the ride control system, ensure the pressure accumulators to be totally discharged.

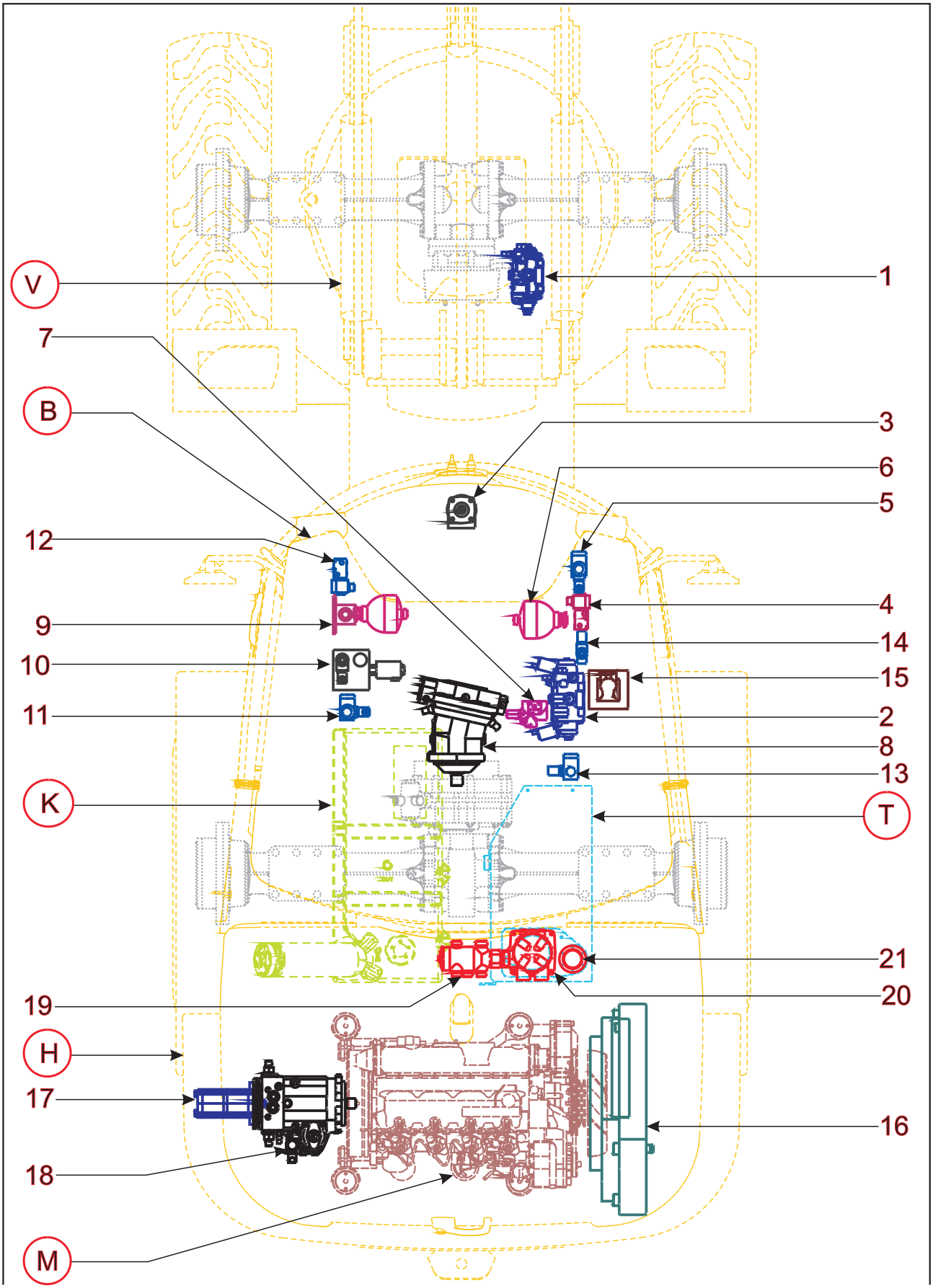
To do this, dismount plug and screw out the valve coil (wrench size 3mm) approx. two revolutions (counter clockwise).

REMARK:
Tightening torque: valve coil = **3,5 Nm**
Tightening torque: plug = **7 Nm**





Typ Model Type Tipo	**TL 260** (SKL 260) Hydraulik / Hydraulic / Hydraulique / Hidráulico — ab Fz.-Id.-Nr. / from s/n / à partir n du s / desde el numero **TL02600100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Hydraulikschaltplan Lastschwingungsdaempfung** **Hydraulic diagramm Ride control system** **Plan hydraulique Amortissement d' oscillations** **Plano hidráulico**	Blatt Page Feuille Página	**6.30.07**



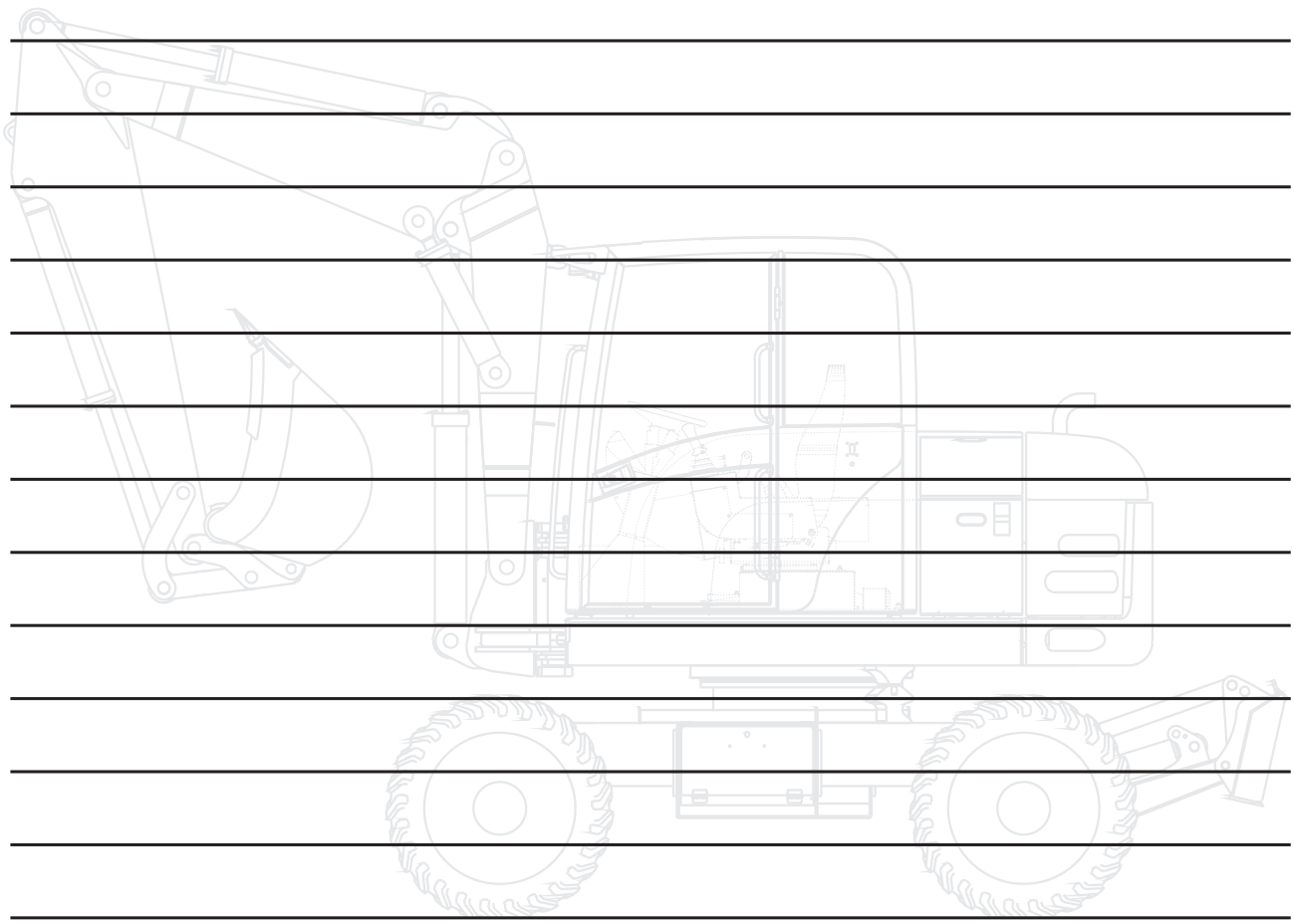
Typ Model Type Tipo	**TL 70** (SKS 634)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.37.11**

Pos. Item Rep. No.	Deutsch	English	Français
V	**VORDERWAGEN**	**FRONT CHASSIS**	**CHÂSSIS AV**
1	Blocksteuergerät	Valve bank	Bloc distributeur
H	**HINTERWAGEN**	**REAR CHASSIS**	**CHÂSSIS AR**
2	Blocksteuergerät (Schwenken) ***Y31, Y32***	Valve bank (swing) ***Y31, Y32***	Bloc distributeur (orientation) ***Y31, Y32***
3	Lenkeinheit	Steering unit	Unite de direction
4	Vorsteuereinheit ***Y5,Y7,Y8,Y9***	Pilot-operated unit ***Y5,Y7,Y8,Y9***	Système pilotage ***Y5, Y7, Y8, Y9***
5	4/2 Wegeventil ***Y12, Y13*** (schnell / langsam)	4/2 Solenoid valve ***Y12,Y13*** (low / high speed)	Electrovanne 4/2 ***Y12,Y13*** (petite / grande vitesse)
6	Hydrospeicher (Arbeitshydraulik abschalten)	Hydraulic accumulator (Stop working hydraulic)	Accumulateur hydraulique (Neutralisation hydr. de travail)
7	Prioritätsventil (Lenken)	Priority valve (steering)	Valve prioritaire (direction)
8	Verstellmotor ***Y2,Y6*** (Fahren)	Variable displacement motor ***Y2,Y6*** (travel)	Moteur á cylindrée variable ***Y2,Y6*** (translation)
9	Speicherblock mit Hydrospeicher **OPTION** (Lastschwingungsdämpfung)	Accumulator bloc with hydr. accumulator **OPTION** (ride control)	Bloc d'accumulateurs avec accumulateur hydr. **OPTION** (anti-tangage)
10	Stabilisieungsmodul **OPTION** ***Y11,Y15***(Lastschwingungsd.)	Pilot bloc **OPTION** ***Y11, Y15*** **(**ride control)	Bloc de pilotage **OPTION** **Y11, Y15** (anti-tangage)
11	3/2 Wegeventil **OPTION** ***Y16*** (Lasthalteventil + Lastschwingungsdämpfung)	3/2 Solenoid valve **OPTION** ***Y16*** (load holding valve + ride control)	Electrovanne 3/2 **OPTION** ***Y16*** (clapet anti-chute + anti-tangage)
12	Steuerventil **OPTION** ***Y20,Y21, Y22*** (Schaufelrückstellung)	Valve bank **OPTION** ***Y20,Y21,Y22*** (return to dig))	Distributeur **OPTION** ***Y20,Y21,Y22*** (remise à niveau automatique)
13	4/2 Wegeventil ***Y34*** (Pendelachsverriegelung)	4/2 Solenoid valve ***Y34*** (oscillating axle locking)	Electrovanne 4/2 ***Y34*** (blocage d'essieu oscillant)
14	3/2 Wegeventil ***Y33*** (Sicherheit Hubrahmen senken)	3/2 Solenoid valve ***Y33*** ***(s***afety mechanism for lowering lift frame)	Electrovanne 3/2 ***Y33*** (securité bras de levage abaisser)
B	**BODENRAHMEN**	**FLOOR FRAME**	**CADRE DE PLANCHER**
15	Vorsteuergerät - *Joy-stick*	Pilot operated valve - *joy-stick*	Distributeur à commande assistée - *manipulateur*
M	**DIESELMOTOR**	**DIESEL ENGINE**	**MOTEUR DIESEL**
16	Kombinierter Öl- Wasserkühler	Combi radiator cooler for oil and water	Refroidisseur combiné huile et eau
17	Zahnradpumpe - *2-fach* (Lenken / Schwenken)	Gear pump - *double type* (steering / swing)	Pompe à engrenages - *double* (direction / orientationl)
18	Verstellpumpe (Fahren) ***Y3,Y4***	Variable displacement pump (travel) ***Y3,Y4***	Pompe à débit variable (translation) ***Y3,Y4***

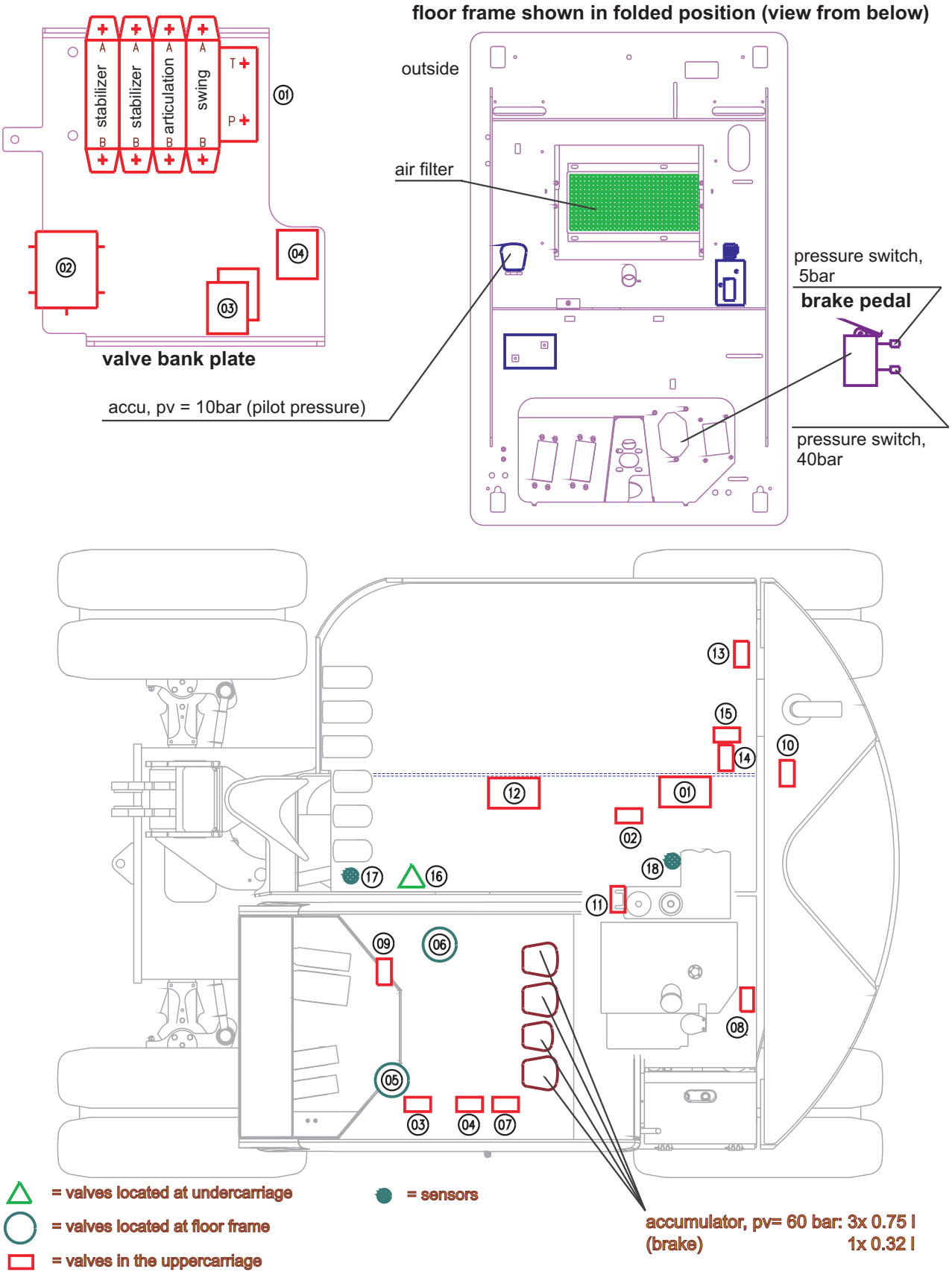
Typ Model Type Tipo	**TL 70** (SKS 634)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.37.12**

Pos. Item Rep. No.	Deutsch	English	Français
T	**HYDRAULIKÖLTANK**	**HYDRAULIC OIL TANK**	**RÉSERVOIR HYDRAULIQUE**
19	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
20	Rücklauffilter	Return filter	Filtre de retour
21	Belüftungsfilter	Vent valve	Filtre d'aération
K	**KRAFTSTOFFTANK**	**FUEL TANK**	**RESERVOIR DE CARBURANT**

Typ Model Type Tipo	**TL 70** (SKS 634)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.37.13**



Typ Model Type Tipo	**TW 85** (HML 32)	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Notizen** **Notes** **Notices** **Notas**	Blatt Page Feuille Página	**6.51.00**

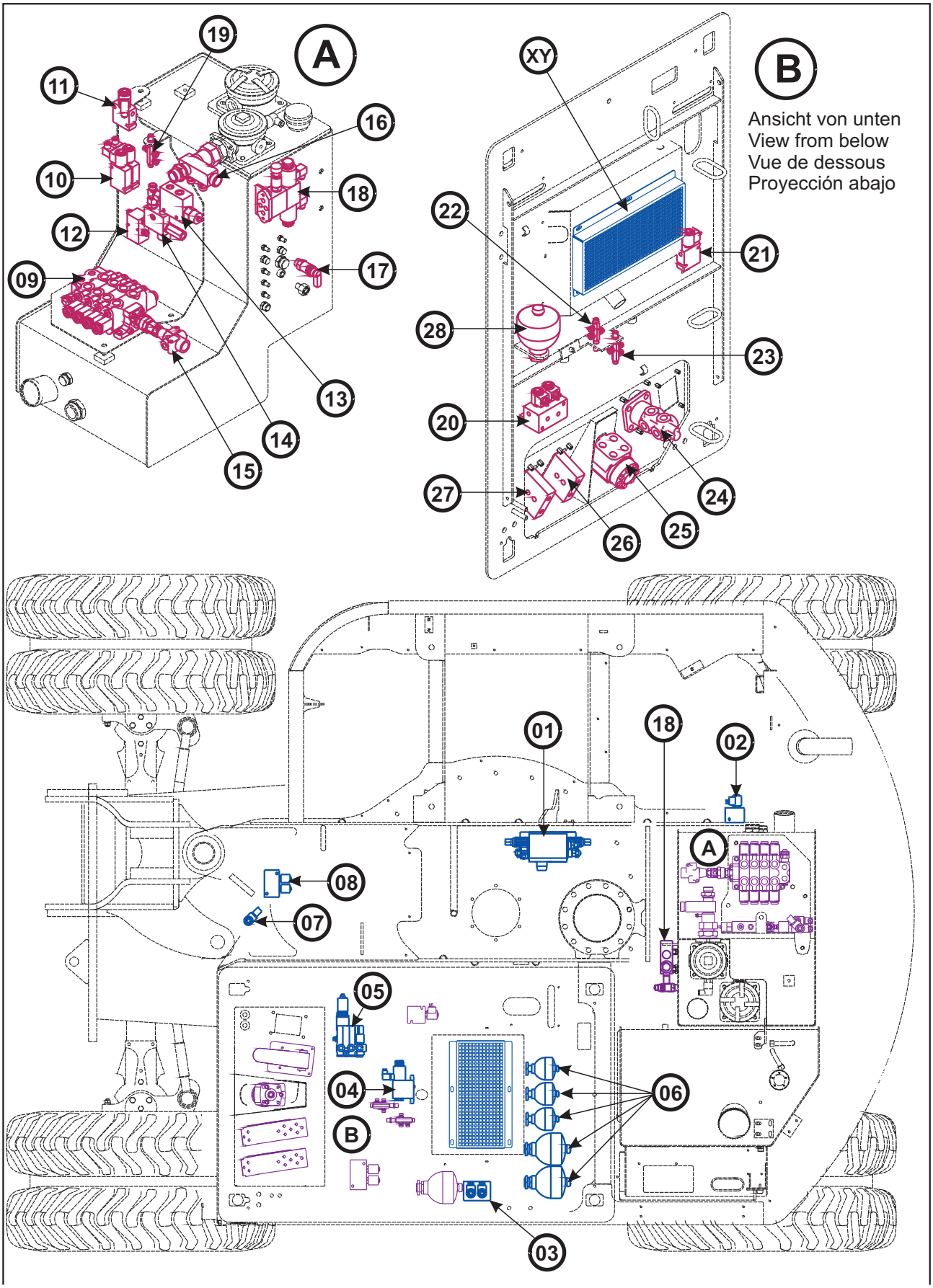


Typ Model Type Tipo	**TW 85** (HML 32)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Composants hydrauliques position de montage** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.51.01**

Pos. Item Rep. No.	Deutsch	English	Français
1	Steuerventil **4SM12** (an Mittelwand OW)	**valve bank 4SM12** (at partition wall uppercarriage)	**distributeur 4 SM 12** (sur cloison tourelle)
2	**Relaisventil** Schwenken (auf Ventilplatte)	**relay valve swing** (on valve bank plate)	**valve relais orientation** (sur plaque distributeur)
3	2x Ventil **GA/Knicken** ***Y20/Y21*** (auf Ventilplatte)	2 x solenoid **valve intermediate boom / articulation** ***Y20/Y21*** (on valve bank plate)	2 x électrovannes **flèche articulée / articulation** ***Y20/Y21*** (sur plaque distributeur)
4	Ventil Schwenken **Druckhochschaltung** ***Y22*** (auf Ventilplatte)	solenoid **valve high torque swing** ***Y22*** (on valve bank plate)	électrovanne **élevation pression orientation** ***Y22*** (sur plaque distributeur)
5	2-fach Magnetventil **abschalten Vorsteuerung** / **Achsverriegelung**. ***Y3/Y11***	double solenoid **valve pilot pressure cut-off / axle lock** ***Y3/Y11***	double électrovanne **coupure pression pilotage / verrouillage pont** ***Y3/Y11***
6	Ventil **Hammer** ***Y4*** (Bodenrahmen)	solenoid **valve breaker** ***Y4*** (floor frame)	électrovanne **marteau** ***Y6*** (cadre plancher)
7	3/2-Magnetventil **Pedalfahren/Feststellbremse** ***Y13/Y10*** (Oberwagen)	3/2 solenoid **valve pedal drive / parking brake** ***Y13/Y10*** (uppercarriage)	électrovanne 3/2 **translation par pédale/frein de stationnement** ***Y13/Y10*** (tourelle)
8	4/2-Magnetventil **Spülen / Schwenken** ***Y16*** (Oberwagen)	4/2 solenoid **valve flush / swing** ***Y16*** (uppercarriage)	électrovanne 4/2 **purge/orientation Y16** (tourelle)
9	**Speicherfüllventil** (Bremse) (Oberwgen) + Druckschalter 85 bar	**accumulator charge valve** (brake) (uppercarriage) + pressure switch 85 bar	**valve de remplissage accu** (frein) (tourelle) + interrupteur de pression 85 bar
10	2-fach Magnetventil **schnell/langsam** ***Y5/Y6*** (Trennwand Motorraum)	double solenoid valve **fast / slow** ***Y5/Y6*** (partition wall, engine compartment)	double électrovanne **petite / grande** ***Y5/Y6*** (cloison compartiment moteur)
11	4/3-Magnetventil **Zusatz** ***Y18/Y19*** (oben am Öltank)	4/3 solenoid valve **additional circuit** ***Y8/Y19*** (top of hydraulic oil tank)	électrovanne 4/3 **circuit supplémentaire** ***Y18/Y19*** (sur réservoir hydraulique)
12	Steuerventil **5SX14** (Ventilraum)	**valve bank 5 SX 14** (valve compartment)	**distributeur 5 SX 14** (compartiment distributeur)
13	**Öltemperaturregler** (unter Baggerpumpe)	**oil temperature regulator** (underneath the hydraulic pump)	**thermostat d'huile hydr.** (au-dessous de la pompe équipement)
14	**Abschaltventil** (Trennwand Motorraum)	**pressure cut-off valve** (partition wall, engine compartment)	**valve de coupure** (cloison compartiment moteur)
15	**Prioritätsventil** (Trennwand Motorraum)	**priority valve** (partition wall engine compartment)	**valve de priorité** (cloison compartiment moteur)
16	Ventil **Achsverriegelung** (Unterwagen)	**axle lock valve** (undercarriage)	**valve verrouillage pont** (châssis)

Typ Model Type Tipo	**TW 85** (HML 32) **Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Composants hydrauliques position de montage** **Posiciones de las válvulas hidráulicas**	Blatt Page Feuille Página	**6.51.02**

Pos. Item Rep. No.	Deutsch	English	Français
17	Lastwarnsensor	load indicator sensor	capteur indication de charge
18	Hydraulikölstandssensor	hydraulic oil level sensor	capteur niveau d'huile hydraulique



Typ Model Type Tipo	**TW 110** (HML 42)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.53.11**

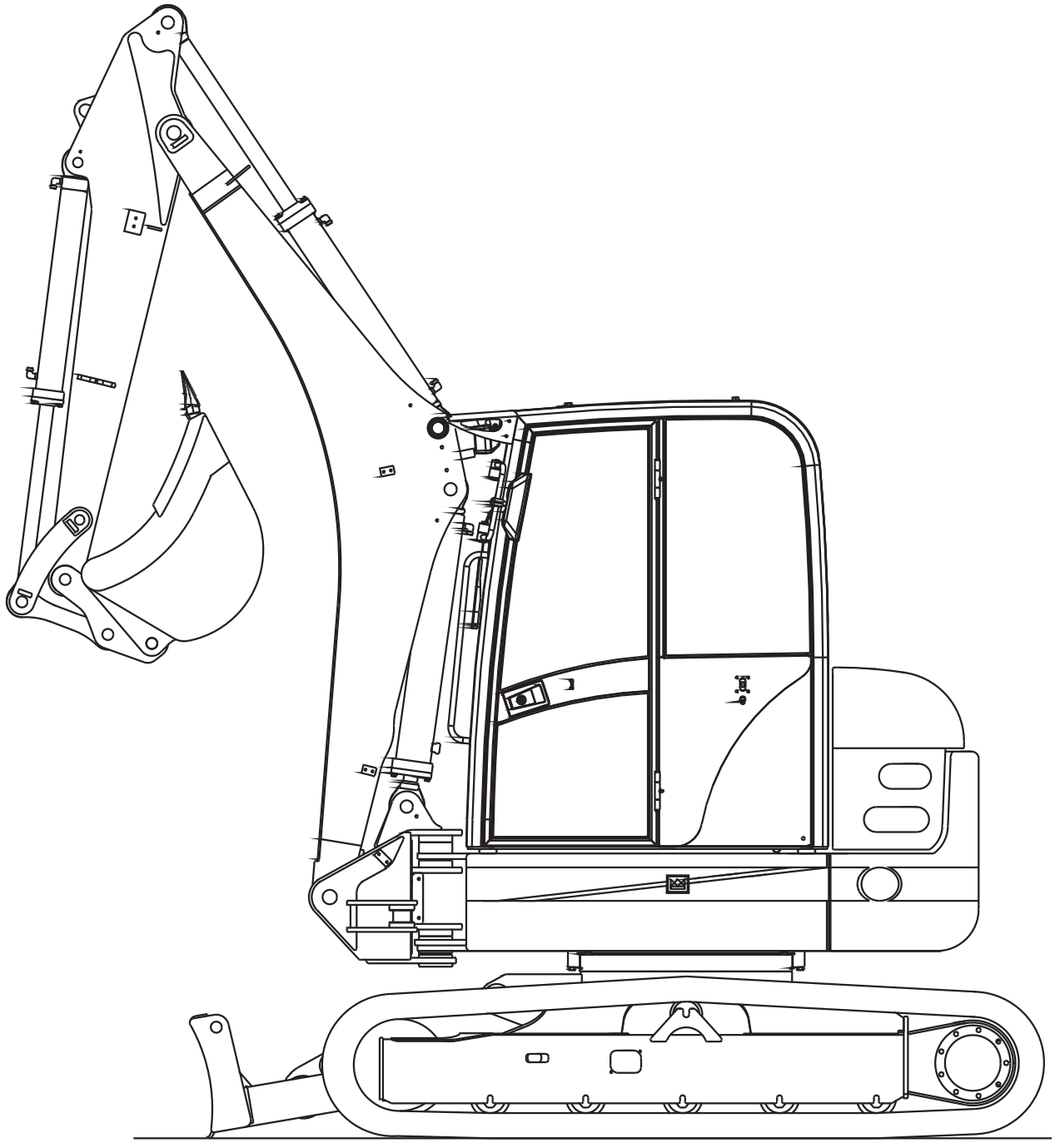
Pos. Item Rep. No.	Deutsch	English	Français
	OBERWAGEN	**UPPERCARRIAGE**	**TOURELLE**
01	***Steuerventil* 5SX14** (an Mittelwand Oberwagen)	***valve bank* 5SX14** (at partition wall uppercarriage)	***distributeur* 5SX14** (sur cloison tourelle)
02	***2-fach Magnetventil*** schnell/langsam **Y5/Y6** (Trennwand Motorraum)	***double solenoid valve*** **fast / slow Y5/Y6** (partition wall, engine compartment)	***double électrovanne*** **petite/grande Y5/Y6** (cloison compartiment moteur)
03	***3/2-Magnetventil*** Pedalfahren/Feststellbr. **Y13/Y10** (Oberwagen)	***3/2 solenoid valve* pedal drive / parking brake Y13/Y10** (uppercarriage)	***électrovanne 3/2* translation par pédale / frein de stationnement Y13/Y10** (tourelle)
04	***4/2-Magnetventil*** Spülen/Schwenken **Y16** (Oberwagen)	***4/2 solenoid valve*** flush / swing **Y16** (uppercarriage)	***électrovanne 4/2*** **purge/orientation Y16** (tourelle)
05	***Speicherfüllventil*** + ***Druckschalter*** 85 bar Bremse (Oberwagen)	***accumulator charge valve*** + ***pressure switch*** 85 bar brake (uppercarriage)	***valve de remplissage accu*** + ***interrupteur de pression*** 85 bar frein (tourelle)
06	***2x Druckspeicher*** 10 bar Feststellbremse, ***3x Druckspeicher*** 60 bar Speicherfüllventil (Oberwagen)	***2x accumulator*** 10 bar parking brake, ***3x accumulator*** 60bar accumulator charge valve (uppercarriage)	***2x accumulateur*** 10 bar frein de stationnement ***3x accumulateur*** 60 bar valve de remplissage (tourelle)
07	***Lastwarnsensor*** Ausleger (Oberwagen vorne oben)	***load indicator sensor*** boom (uppercarriage front up)	***capteur indication de charge*** flèche (tourelle)
	Unterwagen	**Undercarriage**	**Châssis**
08	***Ventil*** Achsverriegelung (Unterwagen)	***axle lock valve*** (undercarriage)	***valve*** verrouillage pont (châssis inférieure)
K	Ventilplatte, Öltank	Valve bank plate, oil tank	Plaque distributeur, réservoir hydraulique
09	***Steuerventil* 4SM12** (auf Ventilplatte)	***valve bank* 4SM12** (on valve bank plate)	***distributeur* 4SM12** (sur plaque distributeur)
10	2x ***4/2-Magnetventil*** GA/Knicken **Y20/Y21** (auf Ventilplatte)	***2x 4/2-solenoid valve*** **intermediate boom / articulation Y20/Y21** (on valve bank plate)	2x ***électrovannes 4/2*** **flèche articulée / articulation Y20/Y21** (sur plaque distributeur)
11	***3/2 Magnetventil*** Schwenken Druckhochschaltung **Y22** (auf Ventilplatte)	***3/2-solenoid valve*** **high torque swing Y22** (on valve bank plate)	***électrovanne 3/2*** élevation pression orientation **Y22** (sur plaque distributeur)
12	***Relaisventil*** Schwenken (auf Ventilplatte)	***relay valve* swing** (on valve bank plate)	***valve relais* orientation** (sur plaque distributeur)
13	***Abschaltventil*** (auf Ventilplatte)	***pressure cut-off valve*** (on valve bank plate)	***valve de coupure*** (sur plaque distributeur)

Typ Model Type Tipo	**TW 110** (HML 42)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.53.12**

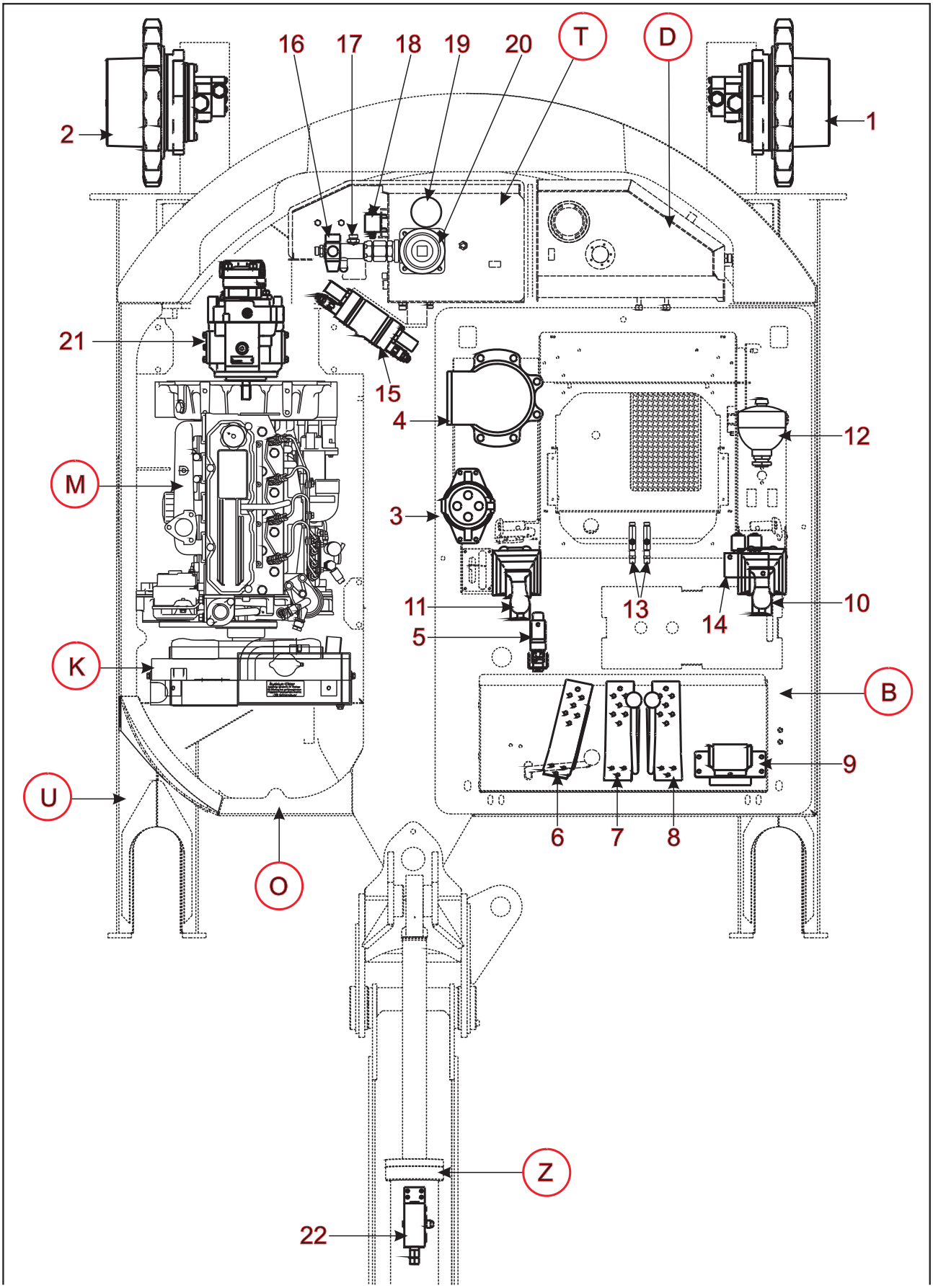
Pos. Item Rep. No.	Deutsch	English	Français
14	***Prioritätsventil*** (auf Ventilplatte)	***priority valve*** (on valve bank plate)	***valve de priorité*** (sur plaque distributeur)
15	***Öltemperaturregler*** (auf Ventilplatte)	***oil temperature regulator*** (on valve bank plate)	***thermostat d'huile hydraulique*** (sur plaque distributeur)
16	***Rücklaufsammler*** (oben am Öltank)	***Return line collector*** (on top at hydraulic oil tank)	***collecteur de retour*** (sur réservoir hydraulique)
17	***Sensor*** Hydraulikölstand (am Öltank)	***sensor*** hydraulic oil level (at hydraulic oil tank)	***capteur niveau*** **d'huile hydraulique** (sur réservoir hydraulique)
18	***4/3-Magnetventil*** *mit* ***Druckminderventil*** Zusatz **Y18/Y19** (oben am Öltank)	***4/3 solenoid valve*** *with* ***pressure reducing valve*** **additional circuit Y18/Y19** (top of hydraulic oil tank)	***électrovanne 4/3*** *avec* ***soupape réductrice de pression*** **circuit supplémentaire Y18/Y19** (sur réservoir hydraulique)
19	***Sammler*** Ölank (auf Ventilplatte)	***collector oil tank*** (on valve bank plate)	***collecteur*** réservoir hydraulique (sur plaque distributeur)
B	Bodenrahmen	Floor frame	Cadre plancher
20	***2-fach Magnetventil*** Abschaltung - Vorsteuerung / Achsverriegelung **Y3/Y11** (Bodenrahmen)	***double solenoid valve*** **pilot pressure cut-off / axle lock Y3/Y11** (floor frame)	double électrovanne **coupure pression pilotage/ verrouillage pont Y3/Y11** (cadre plancher)
21	***3/2-Magnetventil*** Hammer **Y4** (Bodenrahmen)	solenoid **valve breaker Y4** (floor frame)	***électrovanne 3/2*** **marteau Y4** (cadre plancher)
22	***Sammler*** Pumpe (Bodenrahmen)	***collector pump*** (floor frame)	***collecteur pompe*** (cadre plancher)
23	***Sammler*** Tank (Bodenrahmen)	***collector oil tank*** (floor frame)	***collecteur*** réservoir hydraulique (cadre plancher)
24	***Bremsventil*** Fußpedal (Bodenrahmen)	***counter balance valve*** pedal (floor frame)	***clapet de frein*** pédale (cadre plancher)
25	***Lenkeinheit*** (Bodenrahmen)	***steering unit*** (floor frame)	***ensemble direction*** (cadre plancher)
26	***Vorsteuergerät Pedal-Wippe*** Gelenkausleger Knicken (Bodenrahmen)	***pilot-operated pedal valve*** articulated boom - articulation (floor frame)	***distributeur à commande assistée pédale*** **flèche** articulée / deport de flèche (cadre plancher)
27	***Vorsteuergerät Pedal-Wippe*** Fahren (Bodenrahmen)	***pilot-operated pedal valve*** travel (floor frame)	***distributeur à commande assistée pédale*** translation (cadre plancher)
28	***Druckspeicher*** Vorsteuerung 10 bar (Bodenrahmen)	***pressure accumulator*** pilot control 10 bar (floor frame)	***collecteur*** commande assistée 10bar (cadre plancher)
XY	***Luftfilterelement*** Heizlüfter (Bodenrahmen)	***air filter element*** ventilator (floor frame)	***Cartouche filtre à air*** ventilateur (cadre plancher)

Typ Model Type Tipo	**TW 110** (HML 42)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.53.13**

TC 60



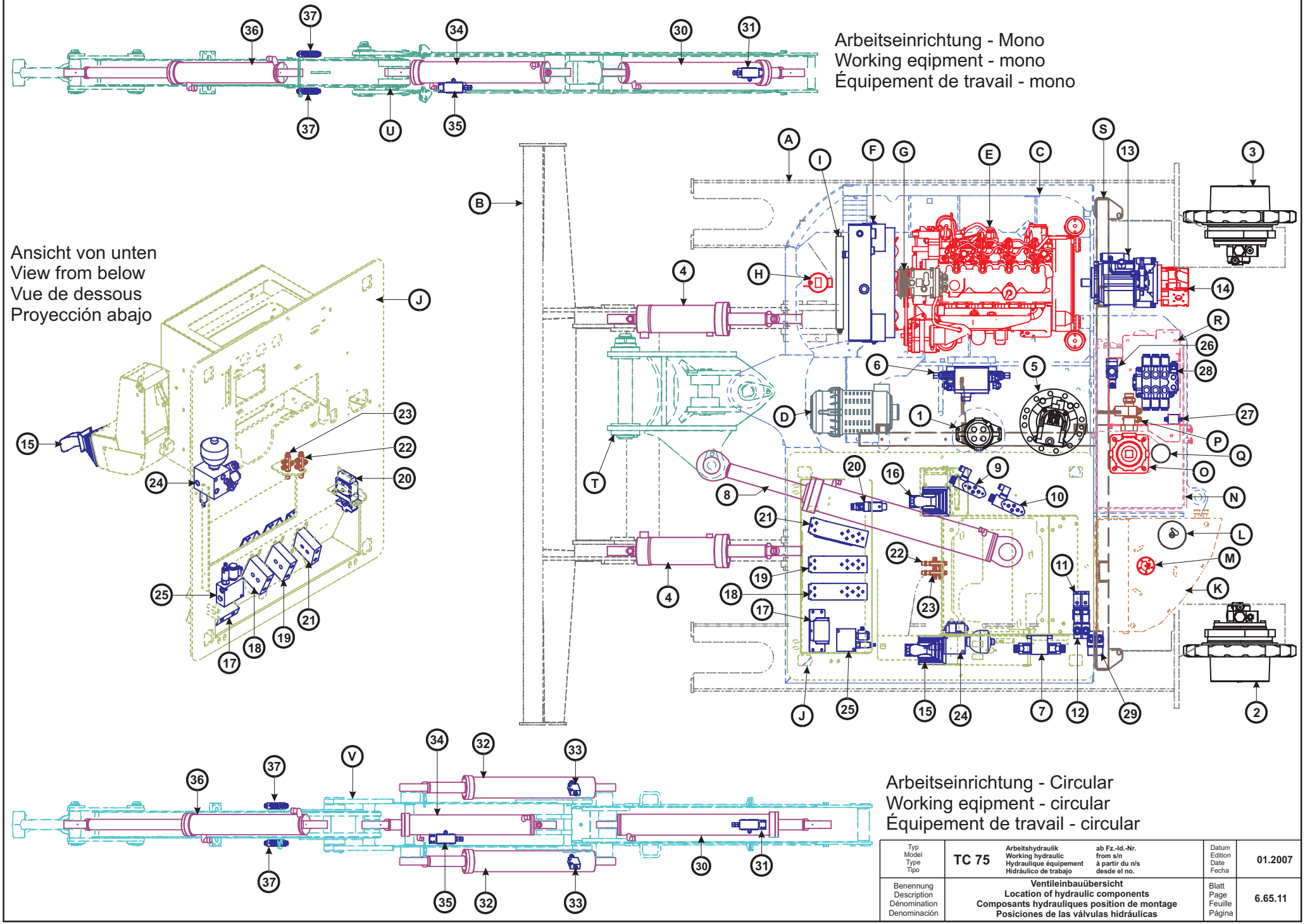
Typ Model Type Tipo	**TC 60** (HR 20)	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Composants hydrauliques position de montage** **Posiciones de las válvulas hidráulicas**	Blatt Page Feuille Página	**6.60.00**



Typ Model Type Tipo	**TC 60** (HR 20)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Composants hydrauliques position de montage** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.60.01**

Pos. Item Rep. No.	Deutsch	English	Français
U	**UNTERWAGEN**	**UNTERCARRIAGE**	**CHÂSSIS**
1	Fahrantrieb (links)	Travel drive (left)	Entraînement (gauche)
2	Fahrantrieb (rechts)	Travel drive (right)	Entraînement (droite)
3	Drehdurchführung	Rotary transfer	Joint tournant
O	**OBERWAGEN**	**UPPERCARRIAGE**	**TOURELLE**
4	Schwenkantrieb	Swing drive	Entraînement d'orientation
B	**BODENRAHMEN**	**FLOOR FRAME**	**CADRE PLANCHER**
5	Vorsteuergerät (Räumschild)	Pilot-operated valve (dozer blade)	Distibuteur à commande assistée (lame)
6	Vorsteuergerät - *Fußpedal* (Zusatzsteuerkreis)	Pilot-operated valve - *pedal* (additional control circuit)	Distributeur à commande assistée - pédale(circuit supplémentaire)
7	Vorsteuergerät - *Fußpedal* (Fahren rechts)	Pilot-operated valve - *pedal* (travel right)	Distributeur à commande assistée - pédale (translation à droite)
8	Vorsteuergerät - *Fußpedal* (Fahren links)	Pilot-operated valve - *pedal* (travel left)	Distributeur à commande assistée - pédale (translation à gauche)
9	Vorsteuergerät - *Fußpedal* (Knicken)	Pilot-operated valve - *pedal* (articulation)	Distributeur à commande assistée - pédal (articulation)
10	Vorsteuergerät - *Joy-stick* (links)	Pilot operated valve - *joy-stick* (left)	Distributeur à commande assistée - *manipulateur* (gauche)
11	Vorsteuergerät - *Joy-stick* (rechts)	Pilot-operated valve - *joy-stick* (right)	Distributeur à commande assistée - *manipulateur* (droite)
12	Hydrospeicher **Pp**	Hydraulic accumulator **Pp**	Accumulateur hydraulique **Pp**
13	Sammler / Druckverteiler **Pp**	Collector / pressure distributor **Pp**	Collecteur / distributeur de pression **Pp**
14	Magnetventil (2-fach) 1= Vorsteuerung ein / aus 2= Fahren schnell / langsam	Solenoid valve (double-type) 1= Pilot control on / off 2= Travel high speed / low speed	Electrovanne (double) 1= Pilotage marche / arrêt 2= Translation grande vitesse / petite
T	**HYDRAULIKOELTANK**	**HYDRAULIC OIL TANK**	**RÉSERVOIR HYDRAULIQUE**
15	Blocksteuergerät	Valve bank	Bloc distributeur
16	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
17	Rücklaufsammler	Return line collector	Collecteur de retour
18	3/2 W-ventil - Schwenkbremse	3/2 valve - swing brake	3/2 vanne - frein d'orientation
19	Belüftungsfilter	Vent filter	Filtre d'aération
20	Rücklauffilter	Return filter	Filtre de retour
M	**DIESELMOTOR**	**DIESEL ENGINE**	**MOTEUR DIESEL**
21	Verstellpumpe	Variable displacement pump	Pompe à débit variable
Z	**HYDR.-ZYL. AUSLEGER**	**HYDR.-CYL. BOOM**	**VÉRIN HYDR. FLÈCHE**
22	Lasthalteventil	Load check valve	Clapet de sécurite
D	**KRAFTSTOFFTANK**	**FUEL TANK**	**RESERVOIR DE CARBURANT**
K	**OELKUEHLER**	**OIL COOLER**	**REFROIDISSEUR D'HUILE**

Typ Model Type Tipo	**TC 60** (HR 20)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Composants hydrauliques position de montage** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.60.02**

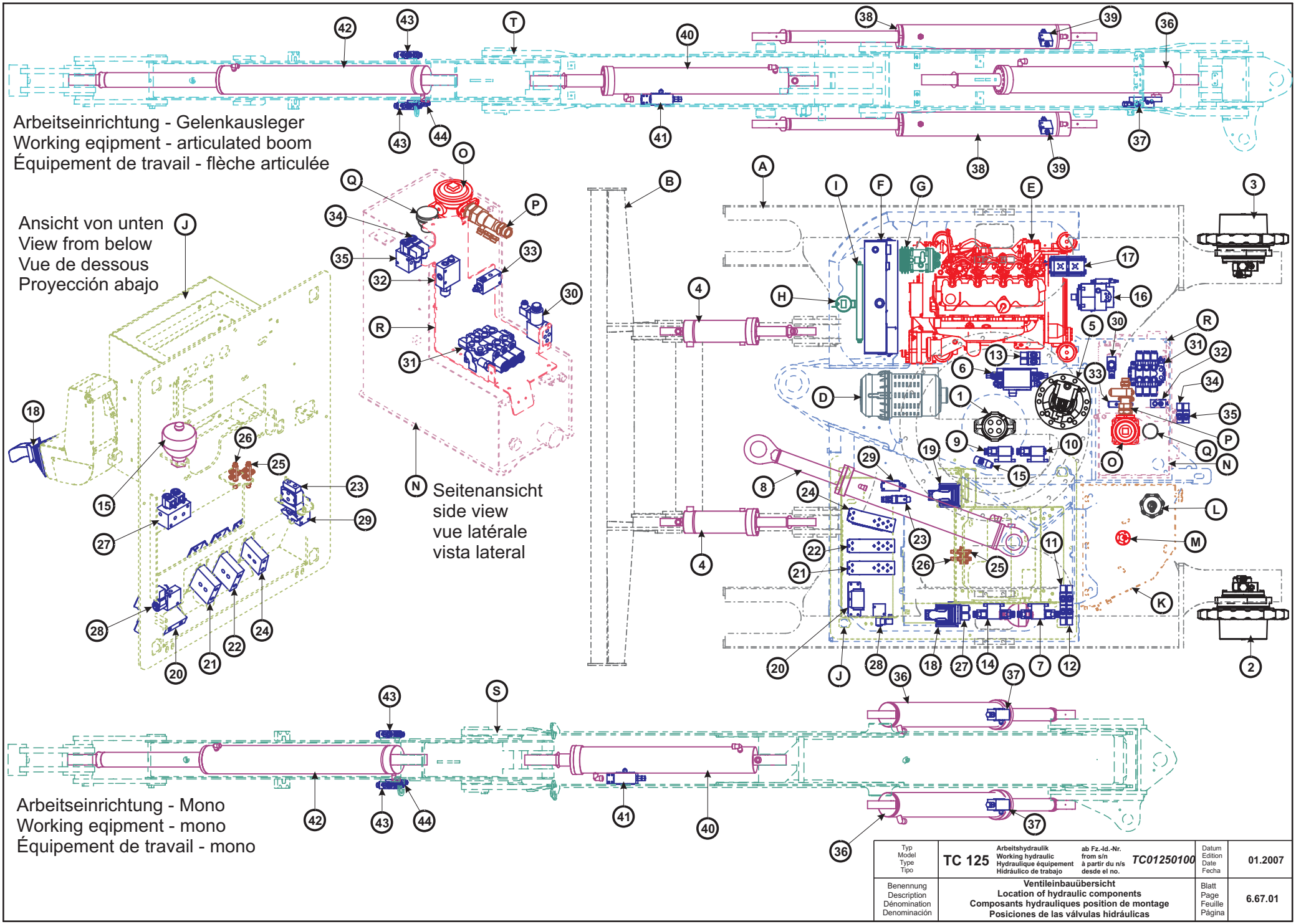


Typ / Model / Type / Tipo	TC 75 Arbeitshydraulik / Working hydraulic / Hydraulique équipement / Hidráulico de trabajo — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no.	Datum / Edition / Date / Fecha	01.2007
Benennung / Description / Dénomination / Denominación	Ventileinbauübersicht Location of hydraulic components Composants hydrauliques position de montage Posiciones de las válvulas hidráulicas	Blatt / Page / Feuille / Página	6.65.11

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
A	Unterwagen	Under carriage	Châssis inférieur
1	Drehdurchführung	Rotary transfer	Joint tournant
2	Fahrantrieb (links)	Travel drive (left)	Translation (gauche)
3	Fahrantrieb (rechts)	Travel drive (right)	Translation (droite)
B	Räumschild	Dozer blade	Lame
4	Hydraulikzylinder - Räumschild	Hydraulic cylinder - dozer blade	Vérin hydraulique - lame d'appui
C	Oberwagen	Upper carriage	Tourelle
5	Schwenkantrieb	Swing drive	Entraînement d'orientation
6	Blocksteuergerät – **SX14**	Valve bank – **SX14**	Bloc distributeur – **SX14**
7	4/2 Wegeventil ***Y18/Y19*** *(Zusatzsteuerkreis 1)*	Solenoid valve ***Y18/Y19*** *(additional control circuit 1)*	Electrovanne ***Y18/Y19*** *(circuit supplémentaire 1)*
8	Hydraulikzylinder - Knicken	Hydraulic cylinder - articulation	Vérin hydraulique - déport latérale
9	OPTION 3/2 Wegeventil ***Y23*** *(Zusatzsteuerkreis 2)*	OPTION Solenoid valve ***Y23*** *(Additional control circuit 2)*	OPTION Electrovanne ***Y23*** *(Circuit supplémentaire2)*
10	OPTION 4/2 Wegeventil ***Y24*** *(Zusatzsteuerkreis 2)*	OPTION Solenoid valve ***Y24*** *(additional control circuit 2)*	OPTION Electrovanne ***Y24*** *(circuit supplémentaire2)*
11	OPTION 2x Wegeventil ***Y25/Y26*** *(Umschaltung ISO/SAE)*	OPTION 2x Solenoid valve ***Y25/Y26*** *(change over ISO/SAE)*	OPTION 2x Electrovanne ***Y25/Y26*** *(ISO/SAE inversion)*
12	OPTION 2x Wegeventil ***Y29/Y30*** *(Schwenkbegrenzung links / rechts)*	OPTION 2x Solenoid valve ***Y29/Y30*** *(swing limitation left / right)*	OPTION 2x Electrovanne ***Y29/Y30*** *(limitation d'orientation gauche / droite)*
D	Luftfilter	Air filter	Filtre à air
E	Dieselmotor	Diesel engine	Moteur diesel
13	Verstellpumpe	Variable displacement pump	Pompe à débit variable
14	Zahnradpumpe	Gear type pump	Pompe à engrenages
F	Motorölkühler	Engine oil cooler	Refroidisseur d'huile moteur
G	Kompressor - Klimaanlage	Compressor – air conditioner	Compresseur – climatisation
H	Trockner - Klimaanlage	Drier – air conditioner	Sécheur – climatisation
I	Kondensator - Klimaanlage	Condenser - air conditioner	Condensateur – climatisation
J	Bodenrahmen	Floor frame	Cadre plancher
15	Vorsteuergerät – links *(Koordinatenhebel – links)*	Pilot operated valve – left *(joy stick – left)*	Distributeur à commande assistée – gauche *(manipulateur – gauche)*
16	Vorsteuergerät – rechts *(Koordinatenhebel – rechts)*	Pilot-operated valve – right *(joy stick – right)*	Distributeur à commande assistée – droite *(manipulateur – droite)*
17	Vorsteuergerät – Knicken *(Fußpedal))*	Pilot operated valve – articulation *(pedal)*	Distributeur à commande assistée – déport latérale *(pédale)*
18	Vorsteuergerät – Fahren links *(Fußpedal links)*	Pilot operated valve – travel left *(pedal left)*	Distributeur à commande assistée – translation gauche *(pédale gauche)*
19	Vorsteuergerät – Fahren rechts *(Fußpedal rechts)*	Pilot operated valve – travel right *(pedal right)*	Distributeur à commande assistée – translation droite *(pédale droite)*
20	Vorsteuergerät – Räumschild *(Handhebel))*	Pilot operated valve – dozer blade *(hand lever)*	Distributeur à commande assistée – lame *(levier à main)*
21	Vorsteuergerät – Zwischenausleger *(Fußpedal))*	Pilot operated valve – intermediate boom *(pedal)*	Distributeur à commande assistée – flèche intermédiaire *(pédale)*

Typ Model Type Tipo	**TC 75** (HR32)	***ab Fz. Id. Nr. from s/n à partir du n/s desde el no.*** **TC00750100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht Location of hydraulic components Composants hydrauliques position de montage Posiciones de las válvulas hidràulicas**	**LEGENDE LEGEND LEGENDE LAYENDA**	Blatt Page Feuille Página	**6.65.12**

22	Rücklaufsammler *(Vorsteuerung)*	Return line collector *(pilot operating)*	Collecteur de retour *(commande assistée)*
23	Sammler - Vorsteuerdruck	Collector – pressure pilot pressure	Collecteur – circuit de pression commande assistée
24	Vorsteuerblock mit Hydrospeicher ***Y3**=Arbeitshydraulik* ***Y5**=Fahren schnell/langsam* ***Y12**=Schwenkhochdruckschaltung*	Pilot operated valve with hydraulic accumulator ***Y3**=working hydraulic* ***Y5**=travel low- / high speed* ***Y12**=swing pressure boost*	Bloc électrovannes avec accumulateur hydraulique **Y3**=*hydraulique de travail* ***Y5**=translation* *petite- / grande vitesses* ***Y12**=augmentation de pression* *orientation*
25	Vorsteuerblock ***Y4**=Druckminderung –* *Vorsteuerung* *(Zusatzsteuerkreis 1)*	Pilot operated valve ***Y4**=pressure reducing* *pilot operating* *(additional hydraulic circuit 1)*	Vanne de pilotage **Y4**= diminuer de pression (*circuit hydraulique* *supplémentaire 1)*
K	Kraftstofftank	Fuel tank	Réservoir de carburant
L	Kraftstofftank-Deckel	Fuel tank cover	Couvercle réservoir de carburant
M	Tauchrohrgeber	Fuel gauge transmitter	Jauge réservoir de carburant
N	Hydrauliköltank	Hydraulic oil tank	Réservoir hydraulique
O	Rücklauffilter *(Hydrauliköl)*	Return filter *(hydraulic oil)*	Filtre de retour *(huile hydraulique)*
P	Rücklaufsammler	Return line collector	Collecteur de retour
Q	Belüftungsfilter	Vent filter	Filtre d'aération
R	Ventilplatte	Valve plate	Support distributeur
26	OPTION 4/2 Wegeventil ***Y11*** *(Schwimmstellung Räumschild)*	OPTION Solenoid valve ***Y11*** *(float position dozer blade)*	OPTION Electrovanne ***Y11*** *(position flottante lame)*
27	Relaisventil *(Schwenken)*	Relay valve *(swing)*	Soupape relais *(orientation)*
28	Blocksteuergerät – **SM12**	Valve bank – **SM12**	Bloc distributeur – **SM12**
S	Haubenrahmen	Hoods frame	Cadre de capots
29	OPTION Wegeventile ***Y27/Y28*** *(Auslegerhöhenbegrenzung)*	OPTION Solenoid valves ***Y27/28*** *(boom height limitation*	OPTION Electrovannes ***27/Y28*** *(limitation de levage flèche)*
T	Schwenksäule	King post	Pivot
U	Arbeitseinrichtung - Monoausleger	Working equipment - mono boom	Equipement de travail - flèche mono
V	Arbeitseinrichtung - Circularausleger	Working equipment circular - boom	Equipement de travail- flèche circular
30	Hydraulikzylinder - Ausleger	Hydraulic cylinder - boom	Vérin hydraulique - flèche
31	Lasthalteventil *(Ausleger)*	Load holding valve (boom)	Clapet anti-chute *(flèche)*
32	Hydraulikzylinder – Zwischenausleger	Hydraulic cylinder – intermediate boom	Vérin hydraulique – flèche intermédiaire
33	OPTION Lasthalteventile *(Zwischenausleger)*	OPTION Load holding valves *(intermediate boom)*	OPTION Clapets anti-chute *(flèche intermédiaire)*
34	Hydraulikzylinder - Löffelstiel	Hydraulic cylinder - dipper arm	Vérin hydraulique - balancier
35	OPTION Lasthalteventil *(Löffelstiel)*	OPTION Load holding valve *(dipper arm)*	OPTION Clapet anti-chute *(balancier)*
36	Hydraulikzylinder - Löffel	Hydraulic cylinder - bucket	Vérin hydraulique - godet
37	Verteilerblock	Distributor bloc	Bloc de distribution



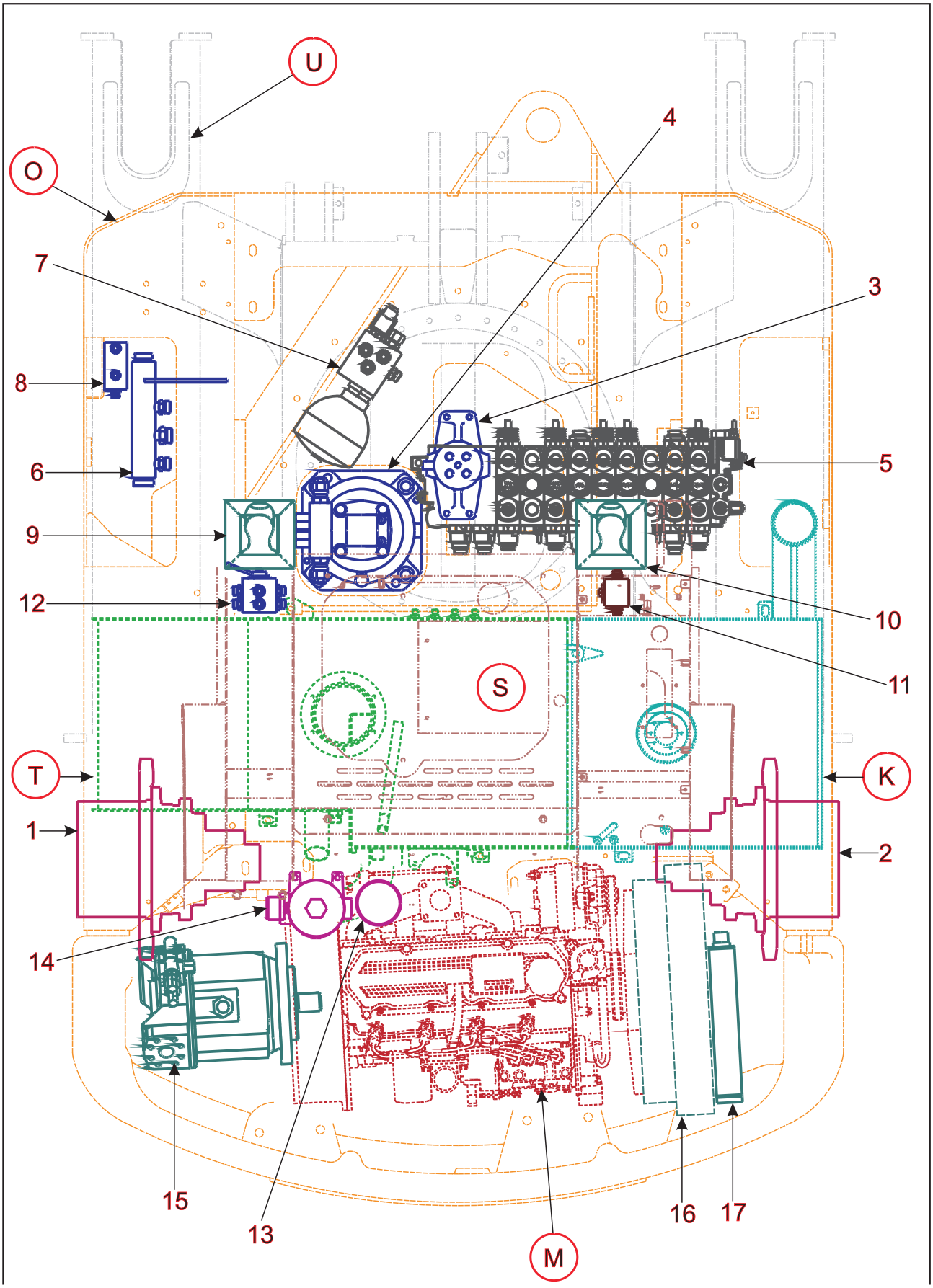
Typ Model Type Tipo	TC 125	Arbeitshydraulik Working hydraulic Hydraulique équipement Hidráulico de trabajo	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TC01250100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Ventileinbauübersicht Location of hydraulic components Composants hydrauliques position de montage Posiciones de las válvulas hidráulicas				Blatt Page Feuille Página	6.67.01

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
A	Unterwagen	Under carriage	Châssis inférieur
1	Drehdurchführung	Rotary transfer	Joint tournant
2	Fahrantrieb (links)	Travel drive (left)	Translation (gauche)
3	Fahrantrieb (rechts)	Travel drive (right)	Translation (droite)
B	Räumschild	Dozer blade	Lame
4	Hydraulikzylinder - Räumschild	Hydraulic cylinder - dozer blade	Vérin hydraulique - lame d'appui
C	Oberwagen	Upper carriage	Tourelle
5	Schwenkantrieb	Swing drive	Entraînement d'orientation
6	Blocksteuergerät – **SX14**	Valve bank – **SX14**	Bloc distributeur – **SX14**
7	4/2 Wegeventil ***Y18/Y19*** *(Zusatzsteuerkreis 1)*	Solenoid valve ***Y18/Y19*** *(additional control circuit 1)*	Electrovanne ***Y18/Y19*** *(circuit supplémentaire 1)*
8	Hydraulikzylinder - Knicken	Hydraulic cylinder - articulation	Vérin hydraulique - déport latérale
9	OPTION 3/2 Wegeventil ***Y23*** *Schnellwechsler (Zusatzsteuerkreis 2)*	OPTION Solenoid valve ***Y23*** Quick mount hitch *(Additional control circuit 2)*	OPTION Electrovanne ***Y23*** Attache rapide *(Circuit supplémentaire2)*
10	OPTION 4/2 Wegeventil ***Y24*** *Schnellwechsler (Zusatzsteuerkreis 2)*	OPTION Solenoid valve ***Y24*** Quick mount hitch *(additional control circuit 2)*	OPTION Electrovanne ***Y24*** Attache rapide *(circuit supplémentaire2)*
11	OPTION 2x Wegeventil ***Y25/Y26*** *(Umschaltung ISO/SAE)*	OPTION 2x solenoid valve ***Y25/Y26*** *(change over ISO/SAE)*	OPTION 2x électrovanne ***Y25/Y26*** *(ISO/SAE inversion)*
12	OPTION 2x Wegeventil ***Y29/Y30*** *(Umschaltung – Fußpedal Zwischenausleger / Steuerkreis 2)*	OPTION 2x solenoid valve ***Y29/Y30*** *(change over - pedal intermediate boom / hydraulic circuit 2)*	OPTION 2x électrovanne ***Y29/Y30*** *(inversion – pédale flèche intermédiaire 7 circuit hydraulique 2)*
13	OPTION 2x Wegeventil ***Y27/Y28*** *(Höhenbegrenzung Ausleger - Gelenkausleger)*	OPTION 2x solenoid valve ***Y27/28*** *(height limitation boom - intermediate boom)*	OPTION 2x électrovanne ***27/Y28*** *(limitation de levage flèche - flèche intermédiaire)*
14	OPTION 4/3 Wegeventil ***Y23/Y24*** *(Vorsteuerung Zusatzsteuerkreis 2)*	OPTION Solenoid valve ***Y23/Y24*** *(pilot operating additional control circuit 2)*	OPTION Electrovanne ***Y23/Y2*** *(commande assistée circuit supplémentaire2)*
15	Öltemperaturregler	Oil temperature regulator	Régulateur de température d'huile
D	Luftfilter	Air filter	Filtre à air
E	Dieselmotor	Diesel engine	Moteur diesel
16	Verstellpumpe	Variable displacement pump	Pompe à débit variable
17	Zahnradpumpe	Gear type pump	Pompe à engrenages
F	Motorölkühler	Engine oil cooler	Refroidisseur d'huile moteur
G	Kompressor - Klimaanlage	Compressor – air conditioner	Compresseur – climatisation
H	Trockner - Klimaanlage	Drier – air conditioner	Sécheur – climatisation
I	Kondensator - Klimaanlage	Condenser - air conditioner	Condensateur – climatisation
J	Bodenrahmen	Floor frame	Cadre plancher
18	Vorsteuergerät – links *(Koordinatenhebel – links)*	Pilot operated valve – left *(joy stick – left)*	Distributeur à commande assistée – gauche *(manipulateur – gauche)*
19	Vorsteuergerät – rechts *(Koordinatenhebel – rechts)*	Pilot-operated valve – right *(joy stick – right)*	Distributeur à commande assistée – droite *(manipulateur – droite)*

Typ Model Type Tipo	**TC 125** (HR42)	***ab Fz. Id. Nr. from s/n à partir du n/s desde el no.***	**TC01250100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht Location of hydraulic components Composants hydrauliques position de montage Posiciones de las válvulas hidràulicas**		**LEGENDE LEGEND LEGENDE LAYENDA**	Blatt Page Feuille Página	**6.67.02**

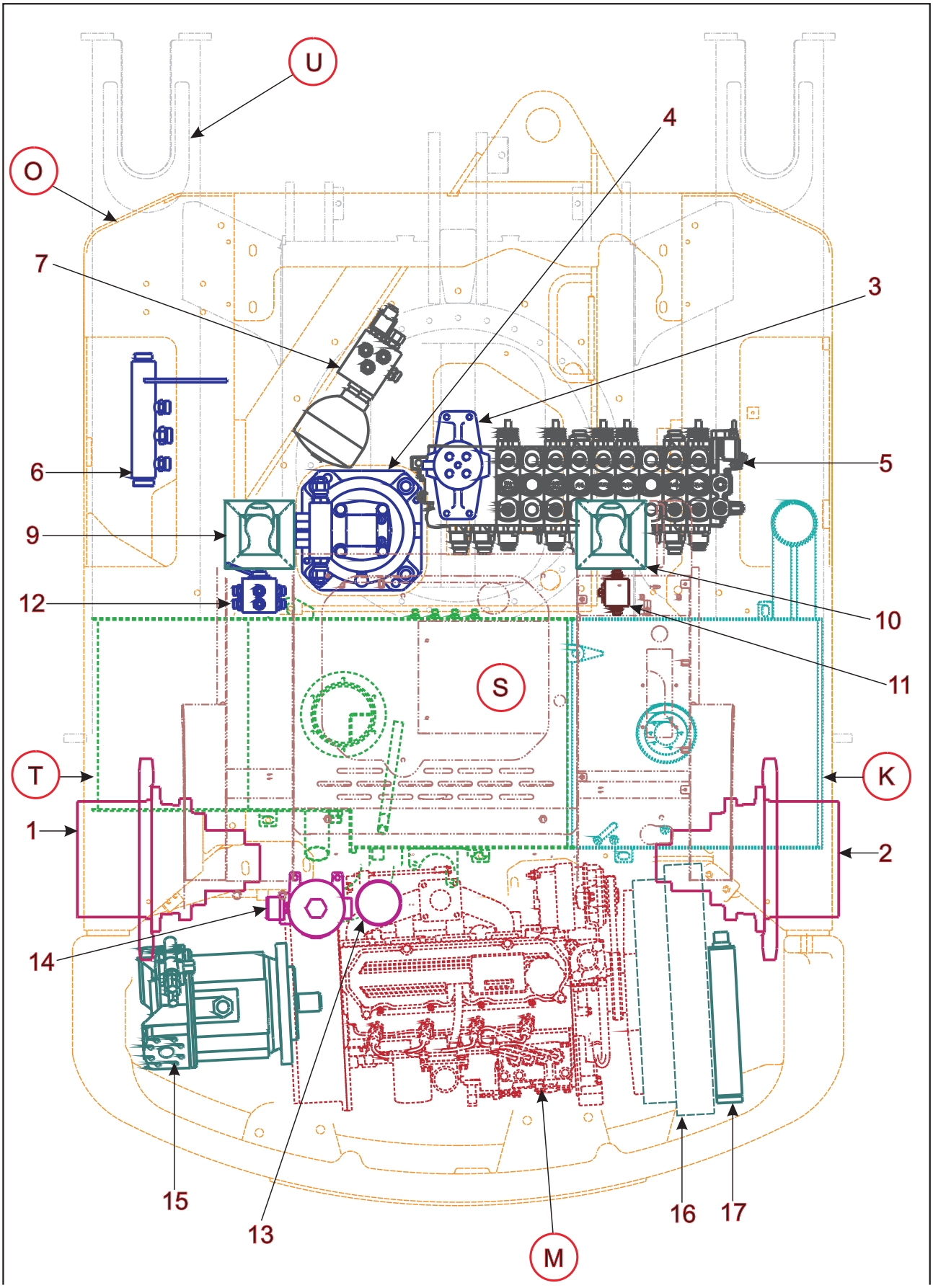
Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
20	Vorsteuergerät – Knicken *(Fußpedal))*	Pilot operated valve – articulation *(pedal)*	Distributeur à commande assistée – déport latérale *(pédale)*
21	Vorsteuergerät – Fahren links *(Fußpedal links)*	Pilot operated valve – travel left *(pedal left)*	Distributeur à commande assistée – translation gauche *(pédale gauche)*
22	Vorsteuergerät – Fahren rechts *(Fußpedal rechts)*	Pilot operated valve – travel right *(pedal right)*	Distributeur à commande assistée – translation droite *(pédale droite)*
23	Vorsteuergerät – Räumschild *(Handhebel))*	Pilot operated valve – dozer blade *(hand lever)*	Distributeur à commande assistée – lame *(levier à main)*
24	Vorsteuergerät – Zwischenausleger *(Fußpedal))*	Pilot operated valve – intermediate boom *(pedal)*	Distributeur à commande assistée – flèche intermédiaire *(pédale)*
25	Rücklaufsammler *(Vorsteuerung)*	Return line collector *(pilot operating)*	Collecteur de retour *(commande assistée)*
26	Sammler - Vorsteuerdruck	Collector – pressure pilot pressure	Collecteur – circuit de pression commande assistée
27	Magnetventil (2fach) ***Y3****=Vorsteuerung ein / aus* ***Y5****=Fahren schnell/langsam*	Solenoid valve (double type) ***Y3****=pilot control on / off* ***Y5****=travel low- / high speed*	Electrovannes (double) **Y3**= *pilotage marche / arrêt* ***Y5****=translation petite- / grande vitesses*
28	Wegeventil ***Y4*** *(Zusatzsteuerkreis 1 / Hydraulikhammer)*	Solenoid valve***Y4*** *(additional hydraulic circuit 1 / rock breaker)*	Electrovanne **Y4** (*circuit hydraulique supplémentaire 1 / marteau hydraulique)*
29	Druckminderventil *(Zusatzsteuerkreis 1 / Hydraulikhammer)*	Pressure reducing valve *(additional hydraulic circuit 1 / rock breaker)*	Diminuer de pression (*circuit hydraulique supplémentaire 1 / marteau hydraulique)*
K	Kraftstofftank	Fuel tank	Réservoir de carburant
L	Kraftstofftank-Deckel	Fuel tank cover	Couvercle réservoir de carburant
M	Tauchrohrgeber	Fuel gauge transmitter	Jauge réservoir de carburant
N	Hydrauliköltank	Hydraulic oil tank	Réservoir hydraulique
O	Rücklauffilter *(Hydrauliköl)*	Return filter *(hydraulic oil)*	Filtre de retour *(huile hydraulique)*
P	Rücklaufsammler	Return line collector	Collecteur de retour
Q	Belüftungsfilter	Vent filter	Filtre d'aération
R	Ventilplatte	Valve plate	Support distributeur
30	OPTION 4/2 Wegeventil ***Y11*** *(Schwimmstellung Räumschild)*	OPTION Solenoid valve ***Y11*** *(float position dozer blade)*	OPTION Electrovanne ***Y11*** *(position flottante lame)*
31	Blocksteuergerät – **SM12**	Valve bank – **SM12**	Bloc distributeur – **SM12**
32	Druckabschaltventil	Pressure shut-off valve	Valve de coupure pression
33	Druckminderventil *(Vorsteuerung)*	Pressure reducing valve *(pilot control)*	Diminuer de pression *(pilotage)*
34	3/2 Wegeventil ***Y12*** *(Schwenkhochdruckschaltung)*	Solenoid valve ***Y12*** *(high torque swing)*	Electrovanne ***Y12*** *(élévation pression d'orientation)*
35	3/2 Wegeventil ***Y14*** *(Schwenkbremse)*	Solenoid valve ***Y14*** *(swing brake)*	Electrovanne ***Y14*** *(frein d'orientation)*
S	Arbeitseinrichtung - Monoausleger	Working equipment - mono boom	Equipement de travail - flèche mono
T	Arbeitseinrichtung - Circulararausleger	Working equipment circular - boom	Equipement de travail- flèche circular
36	Hydraulikzylinder - Ausleger	Hydraulic cylinder - boom	Vérin hydraulique - flèche
37	Lasthalteventil *(Ausleger)*	Load holding valve (boom)	Clapet anti-chute *(flèche)*

Pos. Item Rep. No.	***DEUTSCH***	***ENGLISH***	***FRANÇAIS***
38	Hydraulikzylinder – Zwischenausleger	Hydraulic cylinder – intermediate boom	Vérin hydraulique – flèche intermédiaire
39	OPTION Lasthalteventile *(Zwischenausleger)*	OPTION Load holding valves *(intermediate boom)*	OPTION Clapets anti-chute *(flèche intermédiaire)*
40	Hydraulikzylinder - Löffelstiel	Hydraulic cylinder - dipper arm	Vérin hydraulique - balancier
41	OPTION Lasthalteventil *(Löffelstiel)*	OPTION Load holding valve *(dipper arm)*	OPTION Clapet anti-chute *(balancier)*
42	Hydraulikzylinder - Löffel	Hydraulic cylinder - bucket	Vérin hydraulique - godet
43	Verteilerblock	Distributor bloc	Bloc de distribution
44	Magnetventil ***Y26*** *Schnellwechsler (alte Ausführung)*	Solenoid valve **Y26** Quick mount hitch *(old version)*	Electrovanne **Y26** Attache rapide (version ancienne)



Typ Model Type Tipo	**TC 29** (HR 14)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.76.11**

Pos. Item Rep. No.	Deutsch	English	Français
U	**UNTERWAGEN**	**UNTERCARRIAGE**	**CHÂSSIS**
1	Fahrantrieb (links)	Travel drive (left)	Entraînement (gauche)
2	Fahrantrieb (rechts)	Travel drive (right)	Entraînement (droite)
3	Drehdurchführung	Rotary transfer	Joint tournant
O	**OBERWAGEN**	**UPPERCARRIAGE**	**TOURELLE**
4	Schwenkantrieb	Swing drive	Entraînement d'orientation
5	Blocksteuergerät	Valve bank	Bloc distributeur
6	Rücklaufsammler	Return line collector	Collecteur de retour
7	Druckminderventil mit Hydrospeicher **Pp**	Pressure reducing valve with hydraulic accumulator **Pp**	Soupape réduc. de pression avec accumulateur hydraulique **Pp**
8	Relaisventil - Schwenkbremse	Relay valve - swing brake	Clapet-relais - frein d'orientation
S	**SITZGESTELL**	**SEAT CONSOLE**	**CONSOLE DE SIÈGE**
9	Vorsteuergerät - *Joy-stick* (links)	Pilot operated valve - *joy-stick* (left)	Distributeur à commande assistée - *manipulateur* (gauche)
10	Vorsteuergerät - *Joy-stick* (rechts)	Pilot-operated valve - *joy-stick* (right)	Distributeur à commande assistée - *manipulateur* (droite)
11	Kugelhahn, Ausstiegsschranke (Sperren Arbeitshydraulik)	Ball valve, cut-off lever (stop working hydraulic)	Robinet, levier de sortie (neutralisation hydr. de travail)
12	Kugelhahn, (Umschalten - ISO / SAE) **OPTION**	Ball valve, (switch over - ISO / SAE) **OPTION**	Robinet, (inversion - ISO / SAE) **OPTION**
13	Belüftungsfilter	Vent valve	Filtre d'aération
14	Rücklauffilter	Return filter	Filtre de retour
M	**DIESELMOTOR**	**DIESEL ENGINE**	**MOTEUR DIESEL**
15	Verstellpumpe	Variable displacement pump	Pompe à débit variable
16	Motorölkühler	Engine oil cooler	Refroidisseur d'huile moteur
17	Hydraulikölkühler	Hydraulic oil cooler	Refroidisseur d'huile hydraulique
T	**HYDRAULIKÖLTANK**	**HYDRAULIC OIL TANK**	**RÉSERVOIR HYDRAULIQUE**
K	**KRAFTSTOFFTANK**	**FUEL TANK**	**RÉSERVOIR DE CARBURANT**



Typ Model Type Tipo	**TC 35** (HR 16)	**Arbeitshydraulik** **Working hydraulik** **Hydraulique équipement** **Hidráulico de trabajo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Position de montage des composants hydrauliques** **Posiciones de las válvulas hidráulicas**		Blatt Page Feuille Página	**6.78.11**

Pos. Item Rep. No.	Deutsch	English	Français
U	**UNTERWAGEN**	**UNTERCARRIAGE**	**CHÂSSIS**
1	Fahrantrieb (links)	Travel drive (left)	Entraînement (gauche)
2	Fahrantrieb (rechts)	Travel drive (right)	Entraînement (droite)
3	Drehdurchführung	Rotary transfer	Joint tournant
O	**OBERWAGEN**	**UPPERCARRIAGE**	**TOURELLE**
4	Schwenkantrieb	Swing drive	Entraînement d'orientation
5	Blocksteuergerät	Valve bank	Bloc distributeur
6	Rücklaufsammler	Return line collector	Collecteur de retour
7	Druckminderventil mit Hydrospeicher **Pp**	Pressure reducing valve with hydraulic accumulator **Pp**	Soupape réduc. de pression avec accumulateur hydraulique **Pp**
S	**SITZGESTELL**	**SEAT CONSOLE**	**CONSOLE DE SIÈGE**
9	Vorsteuergerät - *Joy-stick* (links)	Pilot operated valve - *joy-stick* (left)	Distributeur à commande assistée - *manipulateur* (gauche)
10	Vorsteuergerät - *Joy-stick* (rechts)	Pilot-operated valve - *joy-stick* (right)	Distributeur à commande assistée - *manipulateur* (droite)
11	Kugelhahn, Ausstiegsschranke (Sperren Arbeitshydraulik)	Ball valve, cut-off lever (stop working hydraulic)	Robinet, levier de sortie (neutralisation hydr. de travail)
12	Kugelhahn, (Umschalten - ISO / SAE) **OPTION**	Ball valve, (switch over - ISO / SAE) **OPTION**	Robinet, (inversion - ISO / SAE) **OPTION**
13	Belüftungsfilter	Vent valve	Filtre d'aération
14	Rücklauffilter	Return filter	Filtre de retour
M	**DIESELMOTOR**	**DIESEL ENGINE**	**MOTEUR DIESEL**
15	Verstellpumpe	Variable displacement pump	Pompe à débit variable
16	Motorölkühler	Engine oil cooler	Refroidisseur d'huile moteur
17	Hydraulikölkühler	Hydraulic oil cooler	Refroidisseur d'huile hydraulique
T	**HYDRAULIKÖLTANK**	**HYDRAULIC OIL TANK**	**RÉSERVOIR HYDRAULIQUE**
K	**KRAFTSTOFFTANK**	**FUEL TANK**	**RÉSERVOIR DE CARBURANT**

Valve bank, consisting of:

- 10 sections
- Sandwich design
- 3 pump inlets P1, P2, P3
- 3 main pressure relief valves with setscrew
- Line relief valves with setscrews
- 2 tank ports

Pressure supply P1:

- Main pressure relief valve: 245 bar
- 35 Travel right: without line relief valves
- 34 Dipperstick: 280/280 bar
  Anti-cavitation “dipperstick in“: spool-integrated
- Articulation: anti-cavitation on both sides

Pressure supply P2:

- Main pressure relief valve: 245 bar
- 36 Travel left: without line relief valves
- 37 Boom: down 140 bar / up 280 bar
  Anti-cavitation “boom down“: spool-integrated
- 38 Bucket: 280/280 bar

Pressure supply P3:

- Main pressure relief valve: 205 bar
- 30 Slewing: Line relief valves in the slew motor
- 31 Blade: without line relief valves
- 39 “Straight travel“
- 32 Additional control circuit: 210/210 bar

Function “Straight Travel“

Neutral position of all control spools:

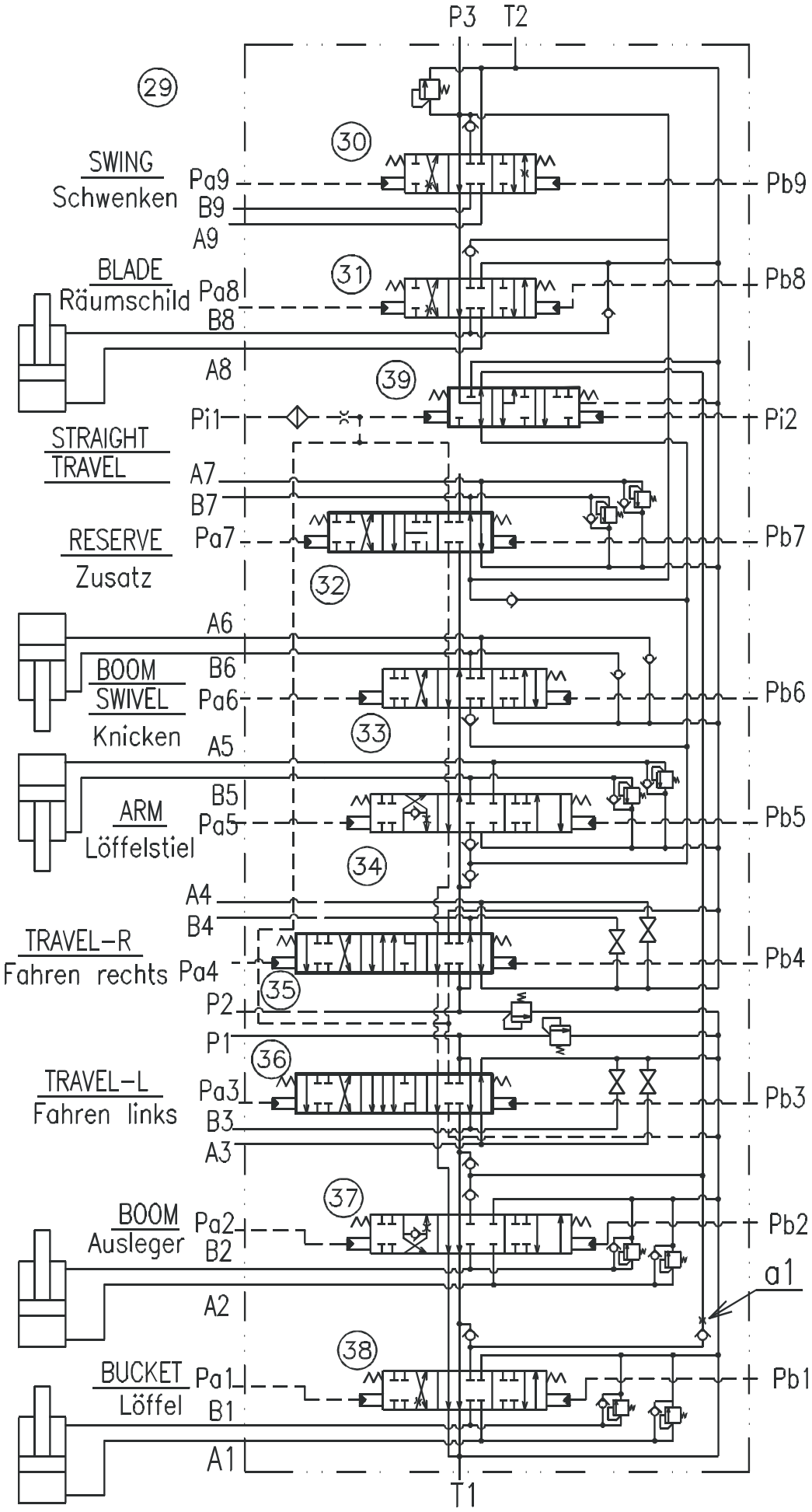
Both pilot pressure channels are switched to the tank at the spool “straight travel“ behind the orifice 0.4 mm.
The 3 pumps feed all working and setting functions described before.

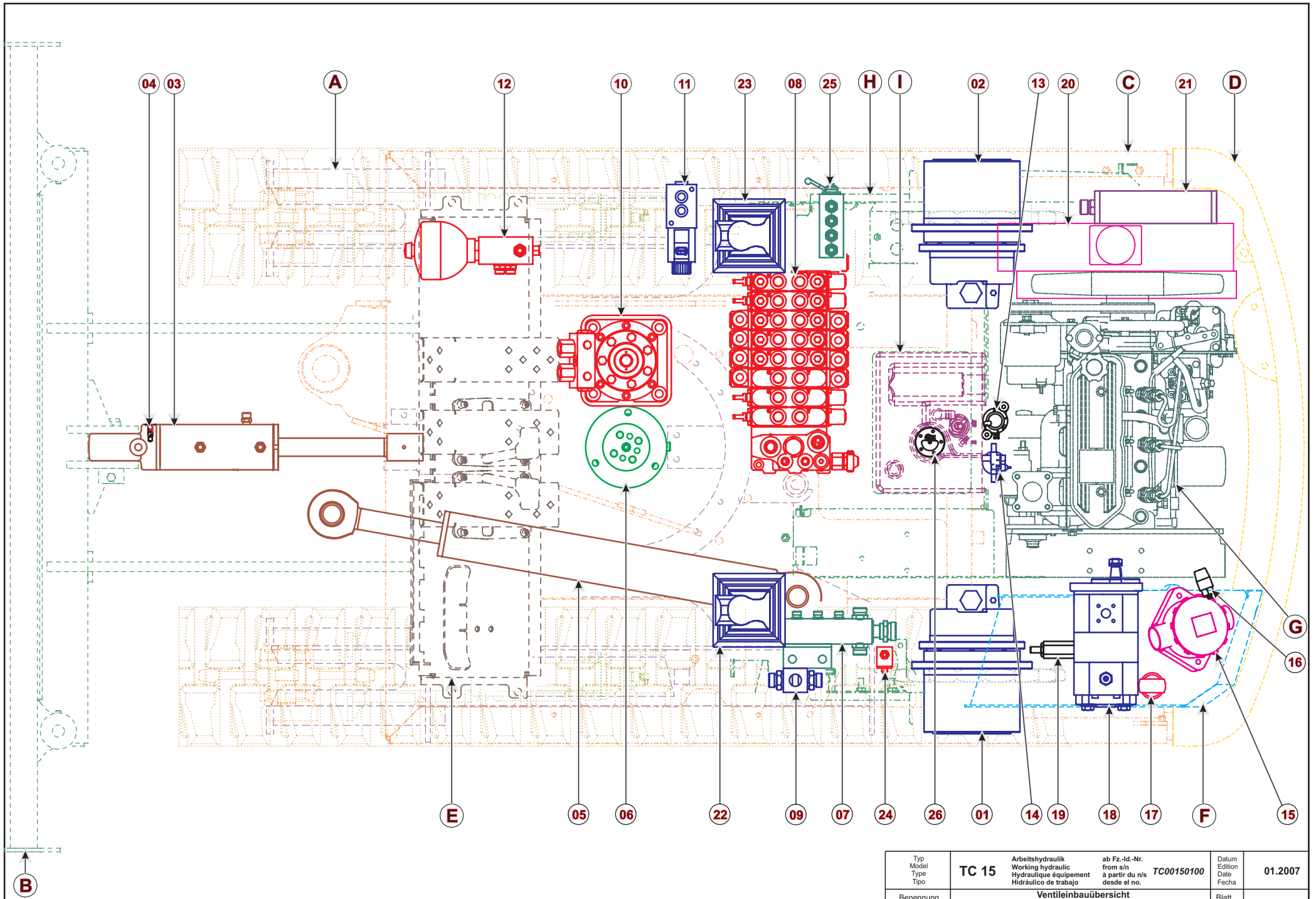
Both travel spools are operated:

If both travel spools are operated, one pilot pressure channel at the travel spools behind the orifice 0.4 mm will be switched to stop. If any other function is operated during travelling (e.g. additional control circuit), the second pilot pressure channel will also be switched to stop. By this pilot pressure accumulation, the spool “straight travel“ moves and opens the feed line from pump P3 to the remaining consumers.
The straight travel will not be influenced by the operation of another function (straight travel).

Function orifice a1 (Ø 3.1):

If the functions travel, boom, bucket are operated at the same time, the boom always has priority.

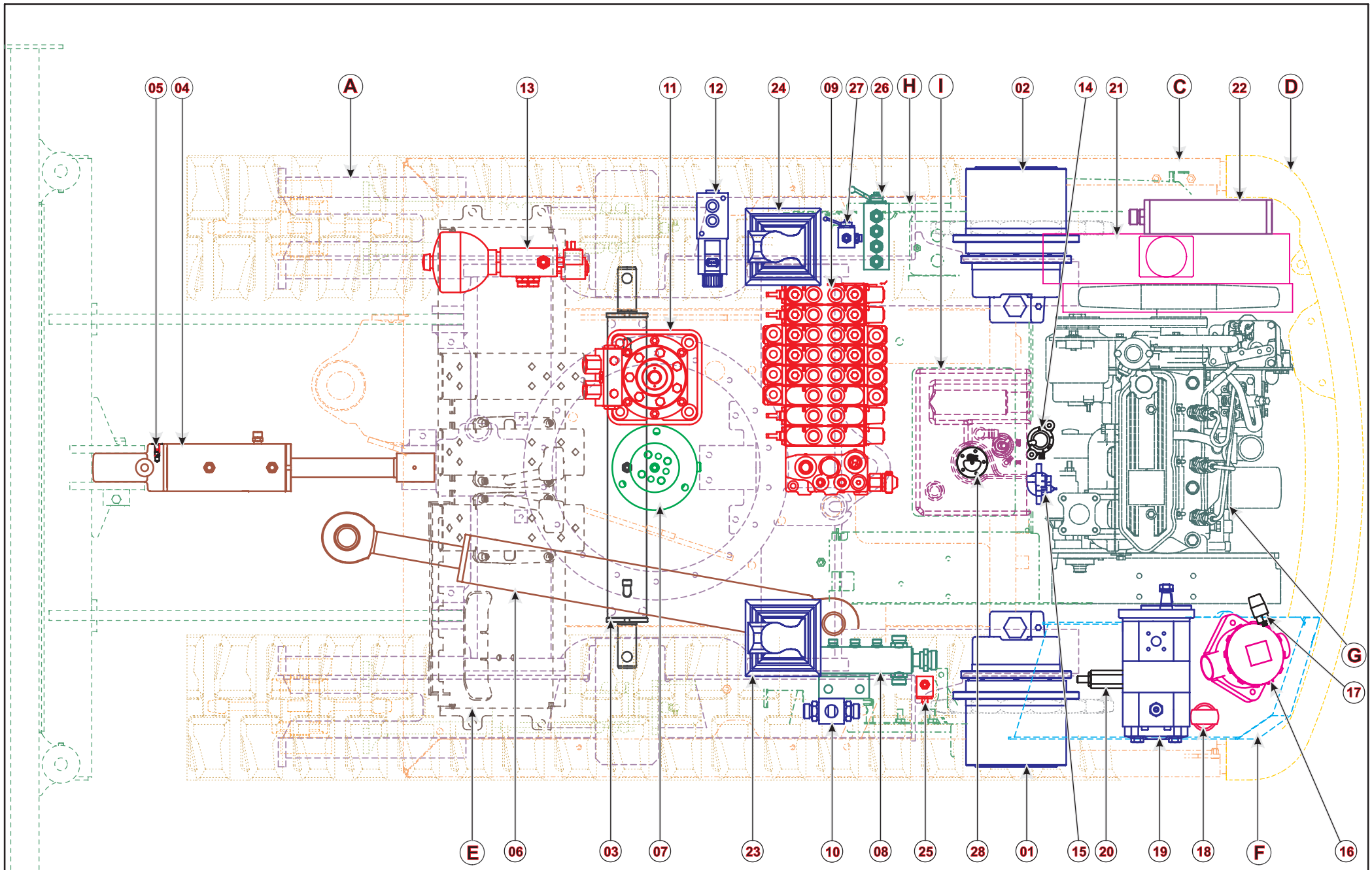

P3
T2
29
30
SWING
Schwenken
Pa9
B9
A9
Pb9
31
BLADE
Räumschild
Pa8
B8
A8
Pb8
39
Pi1
Pi2
STRAIGHT
TRAVEL
A7
B7
RESERVE
Zusatz
Pa7
Pb7
32
A6
BOOM
SWIVEL
Knicken
B6
Pa6
Pb6
33
A5
ARM
Löffelstiel
B5
Pa5
Pb5
34
A4
B4
TRAVEL-R
Fahren rechts
Pa4
Pb4
35
P2
P1
36
TRAVEL-L
Fahren links
Pa3
B3
A3
Pb3
37
BOOM
Ausleger
Pa2
B2
Pb2
a1
A2
38
BUCKET
Löffel
Pa1
B1
Pb1
A1
T1



Typ Model Type Tipo	TC 15	Arbeitshydraulik Working hydraulic Hydraulique équipement Hidráulico de trabajo	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	*TC00150100*	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Ventileinbauübersicht Location of hydraulic components Composants hydrauliques position de montage Posiciones de las válvulas hidráulicas				Blatt Page Feuille Página	6.90.01

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
A	***Unterwagen***	***Under carriage***	***Châssis inférieur***
01	Fahrantrieb (links)	Travel drive (left)	Translation (gauche)
02	Fahrantrieb (rechts)	Travel drive (right)	Translation (droite)
03	Hydraulikzylinder - Räumschild	Hydraulic cylinder - dozer blade	Vérin hydraulique - lame
04	Leitungsbruchsicherung	Hose rupture valve	Clapet de sécurité
B	***Räumschild***	***Dozer blade***	***Lame***
C	***Oberwagen***	***Upper carriage***	***Tourelle***
05	Hydraulikzylinder - Knicken	Hydraulic cylinder - articulation	Vérin hydraulique - déport latéral
06	Drehdurchführung	Rotary transfer	Joint tournant
07	Rücklaufsammler	Return line collector	Collecteur de retour
08	Blocksteuergerät – **SX10**	Valve bank – **SX10**	Distributeur – **SX10**
09	Absperrschieber *(Durchlaufschaltung Baggerhydraulik)*	Turn off spool *(flow circulation excavator hydraulics)*	Tiroir de coupure *(passage circulation hydraulique de la pelle)*
10	Schwenkantrieb	Swing drive	Entraînement d'orientation
11	6/2 Wegeventil ***Y3*** *(Räumschild / Ausleger)*	Solenoid valve ***Y3*** *(dozer blade / boom)*	Electrovanne ***Y3*** *(lame / flèche)*
12	Druckminderventil mit Hydrospeicher **Pp**	Pressure reducing valve with hydraulic accumulator **Pp**	Soupape réduction de pression avec accumulateur hydr. **Pp**
13	Krafftstoffpumpe	Fuel pump	Pompe à carburant
14	Kraftstoffvorfilter	Fuel filter	Filtre à carburant
D	***Heckgewicht***	***Counterweight***	***Contre-poids***
E	***Pedalkonsole***	***Pedal console***	***Console pédale***
F	***Hydrauliköltank***	***Hydraulic oil tank***	***Réservoir hydraulique***
15	Rücklauffilter *(Hydrauliköl)*	Return filter *(hydraulic oil)*	Filtre de retour *(huile hydraulique)*
16	Druckschalter *(Hydraulikölfilter Verschmutzungsanzeige)*	Pressure switch *(hydraulic oil filter clogging)*	Interrupteur pression *(entretien filtre à huile hydraulique)*
17	Belüftungsfilter	Vent filter	Filtre d'aération
G	***Dieselmotor***	***Diesel engine***	***Moteur diesel***
18	Doppelzahnradpumpe	Double gear pump	Pompe tandem à engrenages
19	Druckabschaltpatrone *(110bar)*	Pressure relief cartridge *(110bar)*	Cartouche de coupure*(110bar)*
20	Motorölkühler	Engine oil cooler	Refroidisseur d'huile moteur
21	Hydraulikölkühler	Hydraulic oil cooler	Refroidisseur d'huile hydraulique
H	***Sitzkonsole***	***Seat console***	***Console de siège***
22	Vorsteuergerät – links *(Koordinatenhebel – links)*	Pilot operated valve – left *(joy stick – left)*	Distributeur à commande assistée – gauche *(manipulateur – gauche)*
23	Vorsteuergerät – rechts *(Koordinatenhebel – rechts)*	Pilot-operated valve – right *(joy stick – right)*	Distributeur à commande assistée – droite *(manipulateur – droite)*
24	Kugelhahn, *Aufstiegsschranke (sperren Arbeitshydraulik)*	Ball valve, *cut off lever (stop working hydraulic)*	Robinet, *levier de sortie (neutralisation hydraulique d'équipement)*
25	OPTION Drehschieber *(Umschaltung ISO/SAE)*	OPTION Selector valve *(change over ISO/SAE)*	OPTION Sélecteur d'équipement *(ISO/SAE inversion)*
I	***Kraftstofftank***	***Fuel tank***	***Réservoir à carburant***
26	Tauchrohrgeber	Fuel gauge transmitter	Jauge réservoir à carburant

Typ Model Type Tipo	**TC15**(HR1.5)	***ab Fz. Id. Nr. from s/n à partir du n/s desde el no.*** **TC00150100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht Location of hydraulic components Composants hydrauliques position de montage Posiciones de las válvulas hidràulicas**	**LEGENDE LEGEND LEGENDE LAYENDA**	Blatt Page Feuille Página	**6.90.02**

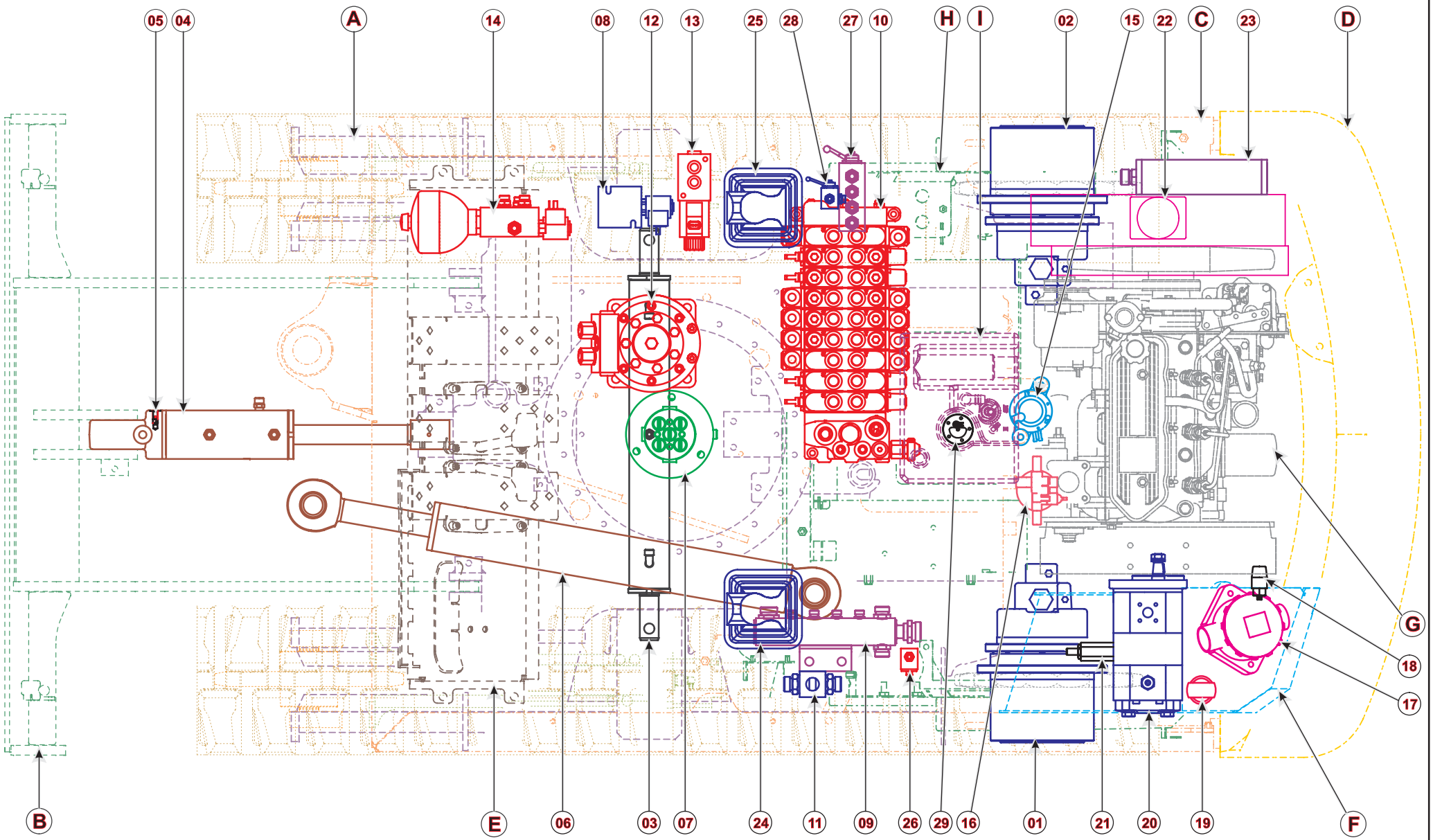


Typ Model Type Tipo	**TC 16**	**Arbeitshydraulik** **Working hydraulic** **Hydraulique équipement** **Hidráulico de trabajo**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.**	*TC00160100*	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht** **Location of hydraulic components** **Composants hydrauliques position de montage** **Posiciones de las válvulas hidráulicas**				Blatt Page Feuille Página	**6.91.01**

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
A	***Unterwagen***	***Under carriage***	***Châssis inférieur***
01	Fahrantrieb (links)	Travel drive (left)	Translation (gauche)
02	Fahrantrieb (rechts)	Travel drive (right)	Translation (droite)
03	Hydraulikzylinder - Spurweitenverstellung	Hydraulic cylinder – track adjustment	Vérin hydraulique – réglage voie variable
04	Hydraulikzylinder - Räumschild	Hydraulic cylinder - dozer blade	Vérin hydraulique - lame
05	Leitungsbruchsicherung	Hose rupture valve	Clapet de sécurité
B	***Räumschild***	***Dozer blade***	***Lame***
C	***Oberwagen***	***Upper carriage***	***Tourelle***
06	Hydraulikzylinder - Knicken	Hydraulic cylinder - articulation	Vérin hydraulique - déport latéral
07	Drehdurchführung	Rotary transfer	Joint tournant
08	Rücklaufsammler	Return line collector	Collecteur de retour
09	Blocksteuergerät – **SX10**	Valve bank – **SX10**	Distributeur – **SX10**
10	Absperrschieber *(Durchlaufschaltung Baggerhydraulik)*	Turn off spool *(flow circulation excavator hydraulics)*	Tiroir de coupure *(passage circulation hydraulique de la pelle)*
11	Schwenkantrieb	Swing drive	Entraînement d'orientation
12	6/2 Wegeventil ***Y3*** *(Räumschild / Ausleger)*	Solenoid valve ***Y3*** *(dozer blade / boom)*	Electrovanne ***Y3*** *(lame / flèche)*
13	Druckminderventil ***Y2*** mit Hydrospeicher **Pp**	Pressure reducing valve ***Y2*** with hydraulic accumulator **Pp**	Soupape réduction de pression ***Y2*** avec accumulateur hydraulique **Pp**
14	Krafftstoffpumpe	Fuel pump	Pompe à carburant
15	Kraftstoffvorfilter	Fuel filter	Filtre à carburant
D	***Heckgewicht***	***Counterweight***	***Contre-poids***
E	***Pedalkonsole***	***Pedal console***	***Console pédale***
F	***Hydrauliköltank***	***Hydraulic oil tank***	***Réservoir hydraulique***
16	Rücklauffilter *(Hydrauliköl)*	Return filter *(hydraulic oil)*	Filtre de retour *(huile hydraulique)*
17	Druckschalter *(Hydraulikölfilter Verschmutzungsanzeige)*	Pressure switch *(hydraulic oil filter clogging)*	Interrupteur pression *(entretien filtre à huile hydraulique)*
18	Belüftungsfilter	Vent filter	Filtre d'aération
G	***Dieselmotor***	***Diesel engine***	***Moteur diesel***
19	Doppelzahnradpumpe	Double gear pump	Pompe tandem à engrenages
20	Druckabschaltpatrone *(110bar)*	Pressure relief cartridge *(110bar)*	Cartouche de coupure*(110bar)*
21	Motorölkühler	Engine oil cooler	Refroidisseur d'huile moteur
22	Hydraulikölkühler	Hydraulic oil cooler	Refroidisseur d'huile hydraulique
H	***Sitzkonsole***	***Seat console***	***Console de siège***
23	Vorsteuergerät – links *(Koordinatenhebel – links)*	Pilot operated valve – left *(joy stick – left)*	Distributeur à commande assistée – gauche *(manipulateur – gauche)*
24	Vorsteuergerät – rechts *(Koordinatenhebel – rechts)*	Pilot-operated valve – right *(joy stick – right)*	Distributeur à commande assistée – droite *(manipulateur – droite)*
25	Kugelhahn, *Aufstiegsschranke (sperren Arbeitshydraulik)*	Ball valve, *cut off lever (stop working hydraulic)*	Robinet, *levier de sortie (neutralisation hydraulique* d'équipement)
26	OPTION Drehschieber *(Umschaltung ISO/SAE)*	OPTION Selector valve *(change over ISO/SAE)*	OPTION Sélecteur *(ISO/SAE inversion)*

Typ Model Type Tipo	**TC16** (HR1.6)	***ab Fz. Id. Nr. from s/n à partir du n/s desde el no.*** **TC00160100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht Location of hydraulic components Composants hydrauliques position de montage Posiciones de las válvulas hidràulicas**	**LEGENDE LEGEND LEGENDE LAYENDA**	Blatt Page Feuille Página	**6.91.02**

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
27	OPTION Kugelhahn - umschalten *(Räumschild /* *Spurweitenverstellung)*	OPTION Ball valve - shift *(dozer blade /* *tread adjustment)*	OPTION *Sélecteur* *(lame / réglage écartement)*
I	***Kraftstofftank***	***Fuel tank***	***Réservoir à carburant***
28	Tauchrohrgeber	Fuel gauge transmitter	Jauge réservoir à carburant

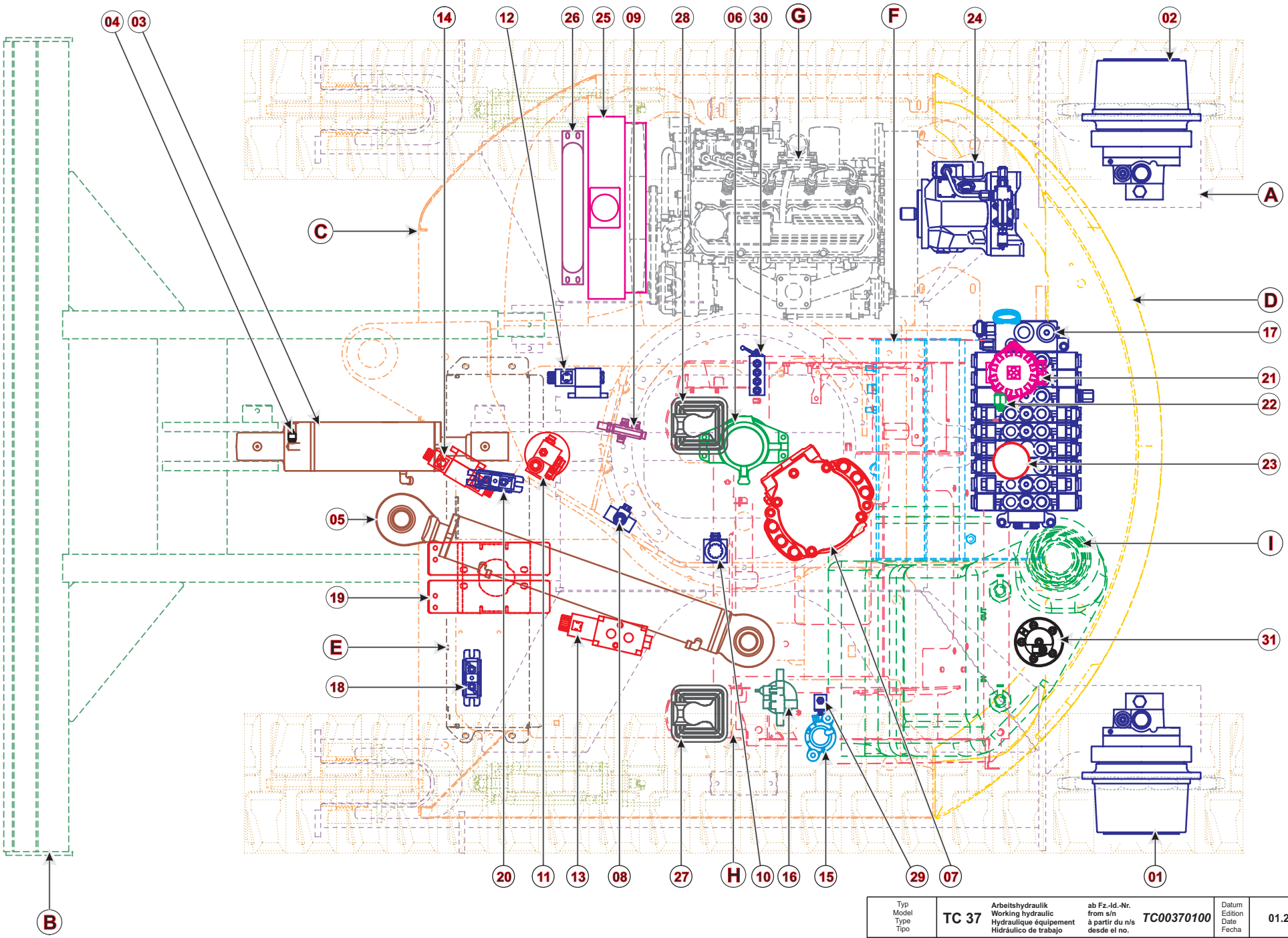


Typ Model Type Tipo	TC 20	Arbeitshydraulik Working hydraulic Hydraulique équipement Hidráulico de trabajo	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	*TC00200100*	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	**Ventileinbauübersicht Location of hydraulic components Composants hydrauliques position de montage Posiciones de las válvulas hidráulicas**				Blatt Page Feuille Página	6.92.01

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
A	***Unterwagen***	***Under carriage***	***Châssis inférieur***
01	Fahrantrieb (links)	Travel drive (left)	Translation (gauche)
02	Fahrantrieb (rechts)	Travel drive (right)	Translation (droite)
03	Hydraulikzylinder - Spurweitenverstellung	Hydraulic cylinder – track adjustment	Vérin hydraulique – réglage voie variable
04	Hydraulikzylinder - Räumschild	Hydraulic cylinder - dozer blade	Vérin hydraulique - lame
05	Leitungsbruchsicherung	Hose rupture valve	Clapet de sécurité
B	***Räumschild***	***Dozer blade***	***Lame***
C	***Oberwagen***	***Upper carriage***	***Tourelle***
06	Hydraulikzylinder - Knicken	Hydraulic cylinder - articulation	Vérin hydraulique - déport latéral
07	Drehdurchführung	Rotary transfer	Joint tournant
08	3/2 Wegeventil ***Y5*** *(Schwenkbremse)*	Solenoid valve ***Y5*** *(swing brake)*	Electrovanne ***Y5*** *(frein d'orientation)*
09	Rücklaufsammler	Return line collector	Collecteur de retour
10	Blocksteuergerät – **SX10**	Valve bank – **SX10**	Distributeur – **SX10**
11	Absperrschieber *(Durchlaufschaltung Baggerhydraulik)*	Turn off spool *(flow circulation excavator hydraulics)*	Tiroir de coupure *(passage circulation hydraulique de la pelle)*
12	Schwenkantrieb	Swing drive	Entraînement d'orientation
13	6/2 Wegeventil ***Y3*** *(Räumschild / Ausleger)*	Solenoid valve ***Y3*** *(dozer blade / boom)*	Electrovanne ***Y3*** *(lame / flèche)*
14	Druckminderventil ***Y2*** mit Hydrospeicher **Pp**	Pressure reducing valve ***Y2*** with hydraulic accumulator **Pp**	Soupape réduction de pression ***Y2*** avec accumulateur hydraulique **Pp**
15	Krafftstoffpumpe	Fuel pump	Pompe à carburant
16	Kraftstoffvorfilter	Fuel filter	Filtre à carburant
D	***Heckgewicht***	***Counterweight***	***Contre-poids***
E	***Pedalkonsole***	***Pedal console***	***Console pédale***
F	***Hydrauliköltank***	***Hydraulic oil tank***	***Réservoir hydraulique***
17	Rücklauffilter *(Hydrauliköl)*	Return filter *(hydraulic oil)*	Filtre de retour *(huile hydraulique)*
18	Druckschalter *(Hydraulikölfilter Verschmutzungsanzeige)*	Pressure switch *(hydraulic oil filter clogging)*	Interrupteur pression *(entretien filtre à huile hydraulique)*
19	Belüftungsfilter	Vent filter	Filtre d'aération
G	***Dieselmotor***	***Diesel engine***	***Moteur diesel***
20	Doppelzahnradpumpe	Double gear pump	Pompe tandem à engrenages
21	Druckabschaltpatrone *(125bar)*	Pressure relief cartridge *(125bar)*	Cartouche de coupure*(125bar)*
22	Motorölkühler	Engine oil cooler	Refroidisseur d'huile moteur
23	Hydraulikölkühler	Hydraulic oil cooler	Refroidisseur d'huile hydraulique
H	***Sitzkonsole***	***Seat console***	***Console de siège***
24	Vorsteuergerät – links *(Koordinatenhebel – links)*	Pilot operated valve – left *(joy stick – left)*	Distributeur à commande assistée – gauche *(manipulateur – gauche)*
25	Vorsteuergerät – rechts *(Koordinatenhebel – rechts)*	Pilot-operated valve – right *(joy stick – right)*	Distributeur à commande assistée – droite *(manipulateur – droite)*
26	Kugelhahn, *Aufstiegsschranke (Sperren Arbeitshydraulik)*	Ball valve, *cut off lever (stop working hydraulic)*	Robinet, *levier de sortie (neutralisation hydraulique* d'équipement)

Typ Model Type Tipo	**TC20** (HR2.0)	***ab Fz. Id. Nr. from s/n à partir du n/s desde el no.*** **TC00200100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht Location of hydraulic components Composants hydrauliques position de montage Posiciones de las válvulas hidràulicas**	**LEGENDE LEGEND LEGENDE LAYENDA**	Blatt Page Feuille Página	**6.92.02**

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
27	OPTION Drehschieber *(Umschaltung ISO/SAE)*	OPTION Revolving spool *(change over ISO/SAE)*	OPTION *Sélecteur* *(ISO/SAE inversion)*
28	OPTION Kugelhahn - umschalten *(Räumschild /* *Spurweitenverstellung)*	OPTION Ball valve - shift *(dozer blade /* *track adjustment)*	OPTION *Sélecteur* *(lame / réglage écartement)*
I	***Kraftstofftank***	***Fuel tank***	***Réservoir à carburant***
29	Tauchrohrgeber	Fuel gauge transmitter	Jauge réservoir à carburant



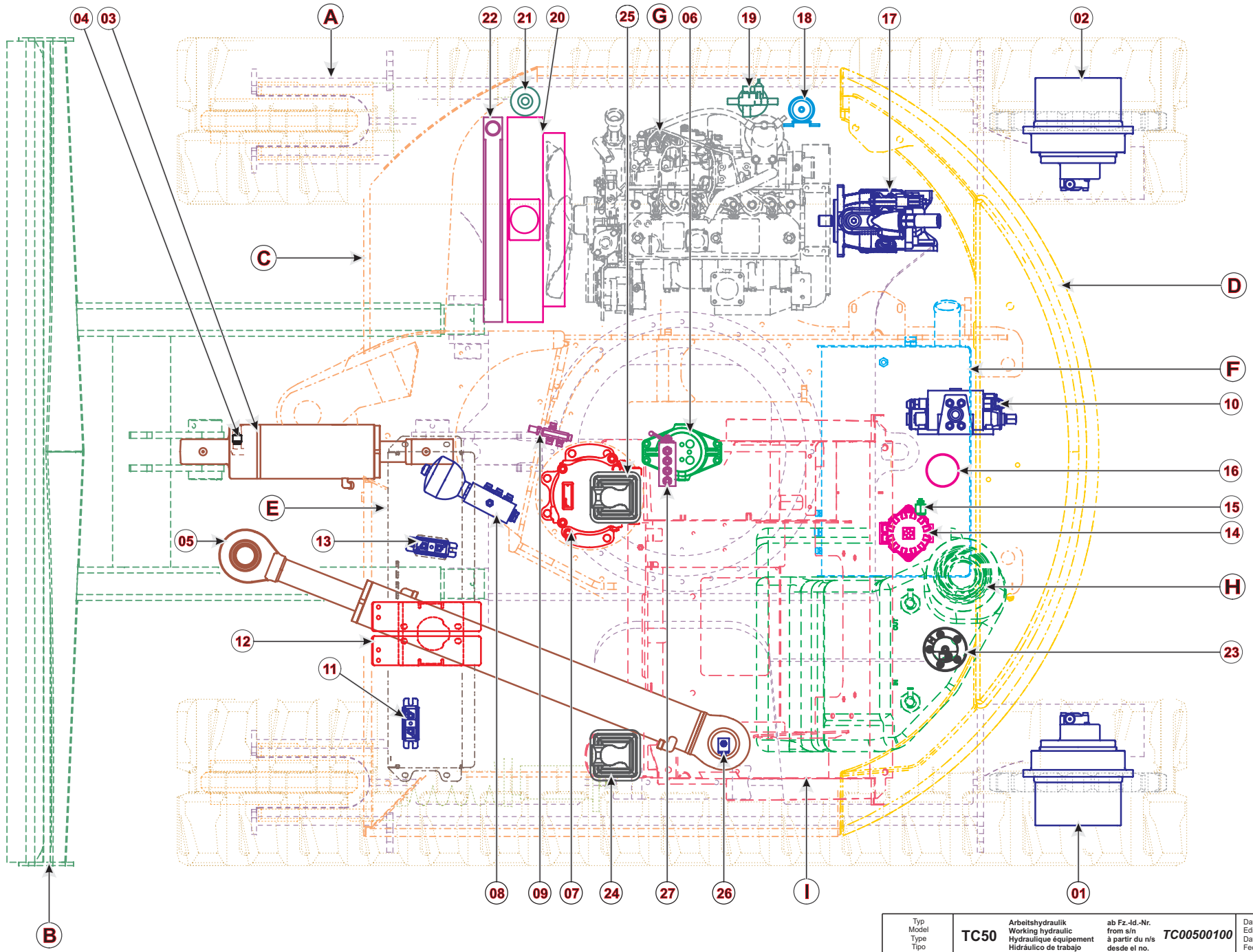
Typ Model Type Tipo	TC 37	Arbeitshydraulik Working hydraulic Hydraulique équipement Hidráulico de trabajo	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	*TC00370100*	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	**Ventileinbauübersicht Location of hydraulic components Composants hydrauliques position de montage Posiciones de las válvulas hidráulicas**				Blatt Page Feuille Página	6.97.01

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
A	***Unterwagen***	***Under carriage***	***Châssis inférieur***
01	Fahrantrieb (links)	Travel drive (left)	Translation (gauche)
02	Fahrantrieb (rechts)	Travel drive (right)	Translation (droite)
03	Hydraulikzylinder - Räumschild	Hydraulic cylinder - dozer blade	Vérin hydraulique - lame
04	Leitungsbruchsicherung	Hose rupture valve	Clapet de sécurité
B	***Räumschild***	***Dozer blade***	***Lame***
C	***Oberwagen***	***Upper carriage***	***Tourelle***
05	Hydraulikzylinder - Knicken	Hydraulic cylinder - articulation	Vérin hydraulique - déport latéral
06	Drehdurchführung	Rotary transfer	Joint tournant
07	Schwenkantrieb	Swing drive	Entraînement d'orientation
08	3/2 Wegeventil ***Y5*** *(Schwenkbremse)*	Solenoid valve ***Y5*** *(swing brake)*	Electrovanne ***Y5*** *(frein d'orientation)*
09	Rücklaufsammler	Return line collector	Collecteur de retour
10	6/2 Wegeventil ***Y3*** *(Räumschild / Ausleger)*	Solenoid valve ***Y3*** *(dozer blade / boom)*	Electrovanne ***Y3*** *(lame / flèche)*
11	Druckminderventil ***Y2*** mit Hydrospeicher **Pp** *(Fahren schnell / langsam)*	Pressure reducing valve ***Y2*** with hydraulic accumulator **Pp** *(travel low- /high speed)*	Soupape réduction de pression ***Y2*** avec accumulateur hydraulique **Pp** (translation petite-/grande vitesses)
12	OPTION 4/2 Wegeventil ***Y33*** *(Schnellwechsler hydraulisch)*	OPTION Solenoid valve ***Y33*** *(hydraulic quick mount hitch)*	OPTION Electrovanne ***Y33*** *(attache rapide hydraulique)*
13	OPTION 6/2 Wegeventil ***Y4*** *(Knicken / 2. Zusatzsteuerkreis)*	OPTION Solenoid valve ***Y4*** *(articulation / 2nd additional circuit)*	OPTION Electrovanne ***Y4*** *(articulation / 2nd circuit supplémentaire)*
14	OPTION 4/2 Wegeventil ***Y6/Y7*** *(Zusatzsteuerkreis - umschalten auf Koordinatenhebel-Steuerung)*	OPTION Solenoid valve ***Y6/Y7*** *(additional circuit - change over to joy stick pilot operating)*	OPTION Electrovanne ***Y6/Y7*** *(circuit supplémentaire - inversion sur* commande *manipulateur)*
15	Krafftstoffpumpe	Fuel pump	Pompe de carburant
16	Kraftstoff-Vorfilter	Fuel filter	Filtre de carburant
17	Blocksteuergerät – **SX12**	Valve bank – **SX12**	Bloc distributeur – **SX12**
D	***Heckgewicht***	***Counterweight***	***Poids AR***
E	***Pedalkonsole***	***Pedal console***	***Console pédale***
18	Vorsteuergerät *(Fußpedal – knicken)*	Pilot operated valve *(pedal – articulation)*	Distributeur à commande assistée *(pédale - articulation)*
19	Vorsteuergerät *(Doppelfußpedal –fahren)*	Pilot operated valve *(double pedal – drive)*	Distributeur à commande assistée *(pédale double - translation)*
20	Vorsteuergerät *(Fußpedal – Zusatzsteuerkreis)*	Pilot operated valve *(pedal – additional circuit)*	Distributeur à commande assistée *(pédale - circuit supplémentaire)*
F	***Hydrauliköltank***	***Hydraulic oil tank***	***Réservoir hydraulique***
21	Rücklauffilter *(Hydrauliköl)*	Return filter *(hydraulic oil)*	Filtre de retour *(huile hydraulique)*
22	Druckschalter *(Hydraulikölfilter Verschmutzungsanzeige)*	Pressure switch *(hydraulic oil filter clogging)*	Interrupteur pression *(entretien filtre à huile hydraulique)*
23	Belüftungsfilter	Vent filter	Filtre d'aération

Typ Model Type Tipo	**TC 37**	***ab Fz. Id. Nr. from s/n à partir du n/s desde el no.*** **TC00370100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht Location of hydraulic components Composants hydrauliques position de montage Posiciones de las válvulas hidràulicas**	**LEGENDE LEGEND LEGENDE LAYENDA**	Blatt Page Feuille Página	**6.97.02**

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS

G	***Dieselmotor***	***Diesel engine***	***Moteur diesel***
24	Verstellpumpe	Variable displacement pump	Pompe à débit variable
25	Motorölkühler	Engine oil cooler	Refroidisseur d'huile moteur
26	Hydraulikölkühler	Hydraulic oil cooler	Refroidisseur d'huile hydraulique
H	***Sitzkonsole***	***Seat console***	***Console de siège***
27	Vorsteuergerät – links *(Koordinatenhebel – links)*	Pilot operated valve – left *(joy stick – left)*	Distributeur à commande assistée – gauche *(manipulateur – gauche)*
28	Vorsteuergerät – rechts *(Koordinatenhebel – rechts)*	Pilot-operated valve – right *(joy stick – right)*	Distributeur à commande assistée – droite *(manipulateur – droite)*
29	Kugelhahn, *Aufstiegsschranke (Sperren Arbeitshydraulik)*	Ball valve, *cut off lever (stop working hydraulic)*	Robinet, *levier de sortie (neutralisation hydraulique* d'équipement)
30	OPTION Drehschieber *(Umschaltung ISO/SAE)*	OPTION Revolving spool *(change over ISO/SAE)*	OPTION *Sélecteur (ISO/SAE inversion)*
I	***Kraftstofftank***	***Fuel tank***	***Réservoir à carburant***
31	Tauchrohrgeber	Fuel gauge transmitter	Jauge réservoir à carburant



Typ Model Type Tipo	TC50	Arbeitshydraulik Working hydraulic Hydraulique équipement Hidráulico de trabajo	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	*TC00500100*	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Ventileinbauübersicht Location of hydraulic components Composants hydrauliques position de montage Posiciones de las válvulas hidráulicas				Blatt Page Feuille Página	6.99.01

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
A	***Unterwagen***	***Under carriage***	***Châssis inférieur***
01	Fahrantrieb (links)	Travel drive (left)	Translation (gauche)
02	Fahrantrieb (rechts)	Travel drive (right)	Translation (droite)
03	Hydraulikzylinder - Räumschild	Hydraulic cylinder - dozer blade	Vérin hydraulique - lame
04	Leitungsbruchsicherung	Hose rupture valve	Clapet de sécurité
B	***Räumschild***	***Dozer blade***	***Lame***
C	***Oberwagen***	***Upper carriage***	***Tourelle***
05	Hydraulikzylinder - Knicken	Hydraulic cylinder - articulation	Vérin hydraulique - déport latéral
06	Drehdurchführung	Rotary transfer	Joint tournant
07	Schwenkantrieb	Swing drive	Entraînement d'orientation
08	Druckminderventil mit Hydrospeicher **Pp** *(**Y2** Fahren schnell / langsam) (**Y5** Schwenkbremse)*	Pressure reducing valve with hydraulic accumulator **Pp** *(**Y2** travel low- /high speed) (**Y5** swing brake)*	Soupape réduction de pression avec accumulateur hydraulique **Pp** *(**Y2** translation petite-/grande vitesses) (**Y5** frein d'orientation)*
09	Rücklaufsammler	Return line collector	Collecteur de retour
D	***Heckgewicht***	***Counterweight***	***Poids AR***
10	Blocksteuergerät – **SX12**	Valve bank – **SX12**	Bloc distributeur – **SX12**
E	***Pedalkonsole***	***Pedal console***	***Console pédale***
11	Vorsteuergerät *(Fußpedal – knicken)*	Pilot operated valve *(pedal – articulation)*	Distributeur à commande assistée *(pédale* - déport latéral*)*
12	Vorsteuergerät *(Doppelfußpedal –fahren)*	Pilot operated valve *(double pedal – drive)*	Distributeur à commande assistée *(pédale double - translation)*
13	Vorsteuergerät *(Fußpedal – Zusatzsteuerkreis)*	Pilot operated valve *(pedal – additional circuit)*	Distributeur à commande assistée *(pédale - circuit supplémentaire)*
F	***Hydrauliköltank***	***Hydraulic oil tank***	***Réservoir hydraulique***
14	Rücklauffilter *(Hydrauliköl)*	Return filter *(hydraulic oil)*	Filtre de retour *(huile hydraulique)*
15	Druckschalter *(Hydraulikölfilter Verschmutzungsanzeige)*	Pressure switch *(hydraulic oil filter clogging)*	Interrupteur pression *(entretien filtre à huile hydraulique)*
16	Belüftungsfilter	Vent filter	Filtre d'aération
G	***Dieselmotor***	***Diesel engine***	***Moteur diesel***
17	Verstellpumpe	Variable displacement pump	Pompe à débit variable
18	Krafftstoffpumpe	Fuel pump	Pompe de carburant
19	Kraftstoff-Vorfilter	Fuel filter	Filtre de carburant
20	Motorölkühler	Engine oil cooler	Refroidisseur d'huile moteur
21	Ausgleichsbehälter *(Motorölkühler)*	Expansion tank *(*Engine oil cooler*)*	Réservoir compensation *(*Refroidisseur d'huile moteur*)*
22	Hydraulikölkühler	Hydraulic oil cooler	Refroidisseur d'huile hydraulique
H	***Kraftstofftank***	***Fuel tank***	***Réservoir de carburant***
23	Tauchrohrgeber	Fuel gauge transmitter	Jauge réservoir de carburant
I	***Sitzkonsole***	***Seat console***	***Console de siège***
24	Vorsteuergerät – links *(Koordinatenhebel – links)*	Pilot operated valve – left *(joy stick – left)*	Distributeur à commande assistée – gauche *(manipulateur – gauche)*
25	Vorsteuergerät – rechts *(Koordinatenhebel – rechts)*	Pilot-operated valve – right *(joy stick – right)*	Distributeur à commande assistée – droite *(manipulateur – droite)*

Typ Model Type Tipo	**TC50**	***ab Fz. Id. Nr. from s/n à partir du n/s desde el no.*** **TC00500100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Ventileinbauübersicht Location of hydraulic components Composants hydrauliques position de montage Posiciones de las válvulas hidràulicas**	**LEGENDE LEGEND LEGENDE LAYENDA**	Blatt Page Feuille Página	**6.99.02**

Pos. Item Rep. No.	DEUTSCH	ENGLISH	FRANÇAIS
26	Kugelhahn, *Aufstiegsschranke (Sperren Arbeitshydraulik)*	Ball valve, *cut off lever (stop working hydraulic)*	Robinet, *levier de sortie (neutralisation hydraulique* d'équipement)
27	OPTION Drehschieber *(Umschaltung ISO/SAE)*	OPTION Revolving spool *(change over ISO/SAE)*	OPTION *Sélecteur (ISO/SAE inversion)*

Functional description

Hydraulic pilot-operated valves of the type 4 TH 6 work on the basis of directional control pressure reducing valves.

These valves mainly consist of the control stick (5), 4 pressure reducing valves and the housing (10).

Each pressure reducing valve consists of a control spool (6), a regulator spring (7), a return spring (8) and a tappet (9).

When the joystick is not operated, it is held in neutral position by the return spring (8). The

ports (1, 2 , 3, 4) are connected with the tank port (T) by the bore (11).

When the the control stick (5) is operated, the tappet (9) exerts pressure on the return spring (8) and the regulator spring (7).

The regulator spring (7) moves the control spool (6) downwards at first, then closes the connection between the corresponding port and the tank port T.

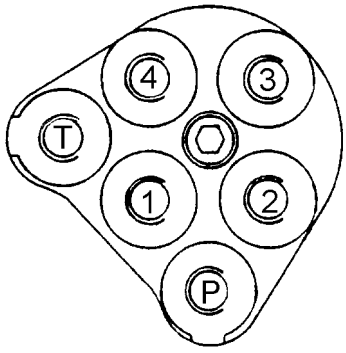
At the same time the corresponding port is connected to the port P via the bore (11).

The regulation procedure starts as soon as the regulator spool (6) finds its balance between the force of the regulator spring (7) and the force resulting from the hydraulic pressure in the corresponding port (1, 2, 3 or 4).

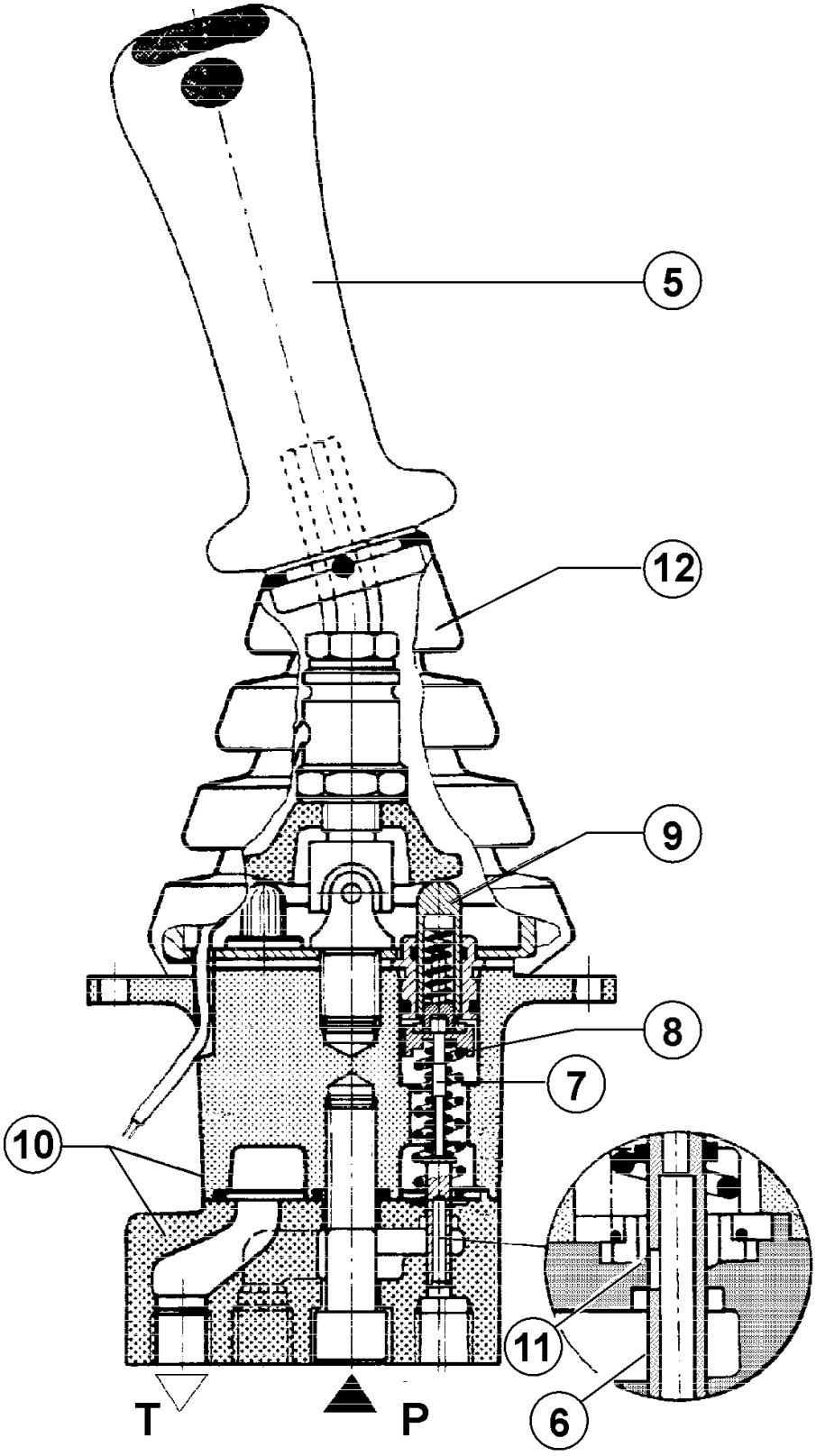
Due to the combined effect of the control spool (6) and the regulator spring (7), the pressure in the corresponding ports is proportional to the stroke of the tappet (9) and consequently to the position of the joystick (5).

This pressure regulation, dependent upon the position of the joystick and the characteristics of the regulator spring allows a proportional hydraulic control of all kinds of control valve banks and control valves for hydraulic pumps and motors.

A rubber collar (12) protects the mechanical parts of the housing against contamination. So these pilot-operated valves are also suitable for unfavourable operating conditions.



Pilot-operated valve type 4 TH 6



Functional description

Hydraulic pilot-operated valves of the type 4 TH 5 work on the basis of directional control pressure reducing valves.

These valves mainly consist of the control stick (5), 4 pressure reducing valves and the housing (10).

Each pressure reducing valve consists of a control spool (6), a regulator spring (7), a return spring (8) and a tappet (9).

When the joystick is not operated, it is held in neutral position by the return spring (8). The

ports (1, 2 , 3, 4) are connected with the tank port (T) by the bore (11).

When the control stick (5) is operated, the tappet (9) exerts pressure on the return spring (8) and the regulator spring (7).

The regulator spring (7) moves the control spool (6) downwards at first, then closes the connection between the corresponding port and the tank port T.

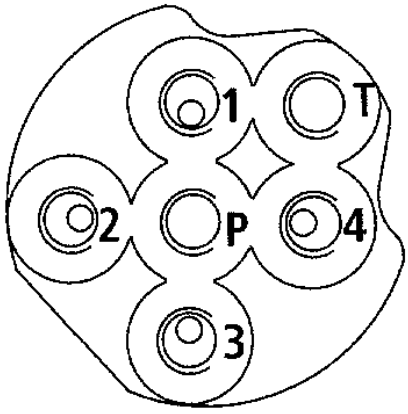
At the same time the corresponding port is connected to the port P via the bore (11).

The regulation procedure starts as soon as the regulator spool (6) finds its balance between the force of the regulator spring (7) and the force resulting from the hydraulic pressure in the corresponding port (1, 2, 3 or 4).

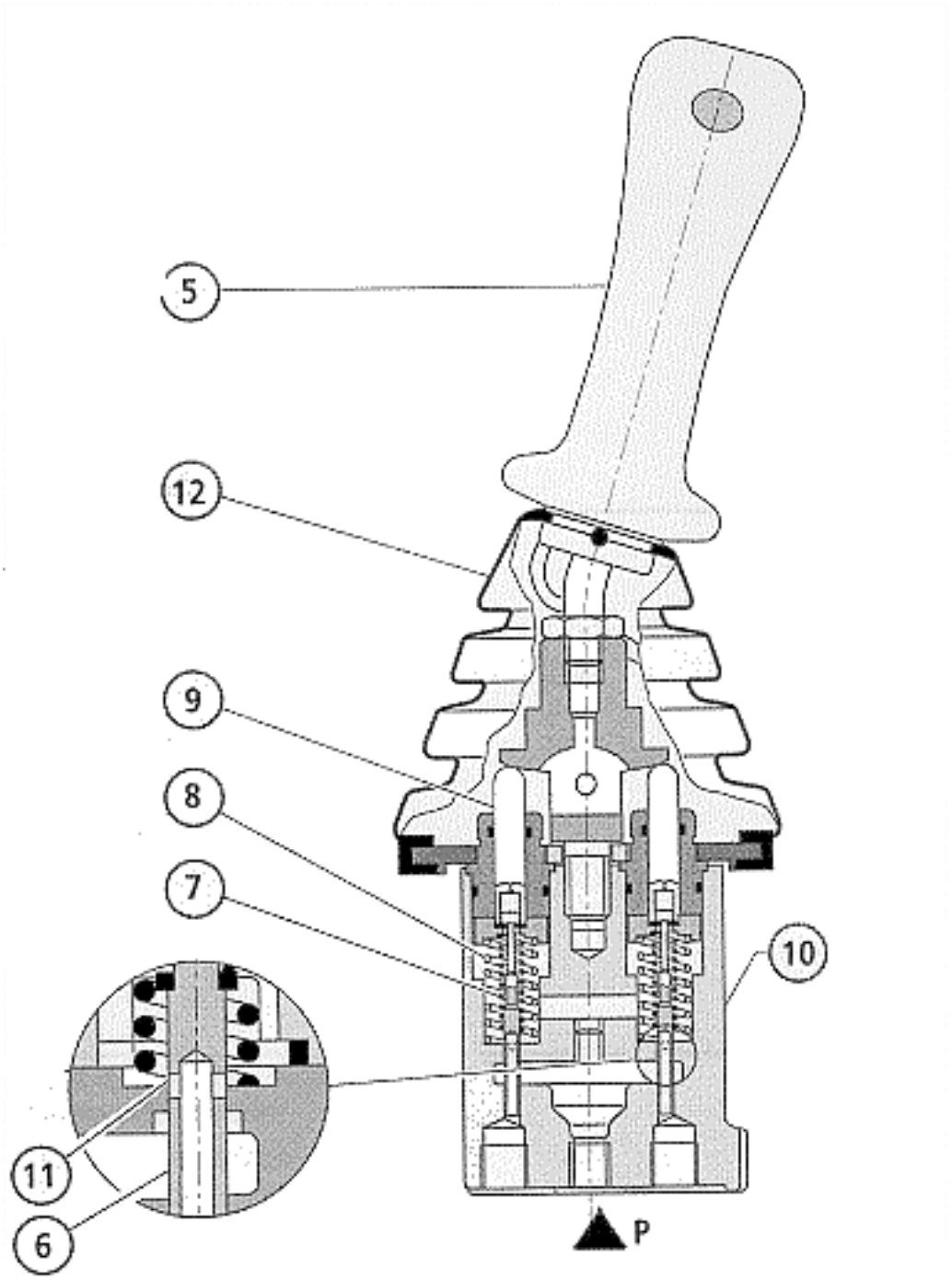
Due to the combined effect of the control spool (6) and the regulator spring (7), the pressure in the corresponding ports is proportional to the stroke of the tappet (9) and consequently to the position of the joystick (5).

This pressure regulation, dependent upon the position of the joystick and the characteristics of the regulator spring allows a proportional hydraulic control of all kinds of control valve banks and control valves for hydraulic pumps and motors.

A rubber collar (12) protects the mechanical parts of the housing against contamination. So these pilot-operated valves are also suitable for unfavourable operating conditions.



Pilot-operated valve type 4 TH 5



Functional description

Hydraulic pilot-operated valves of the type PCL 401 work on the basis of directional control pressure reducing valves.

These valves mainly consist of the control stick (5), 4 pressure reducing valves and the housing (10).

Each pressure reducing valve consists of a control spool (6), a regulator spring (7), a return spring (8) and a tappet (9).

When the joystick is not operated, it is held in neutral position by the return spring (8).

The ports (1, 2 , 3, 4) are connected with the tank port (T) by the bore (11).

When the control stick (5) is operated, the tappet (9) exerts pressure on the return spring (8) and the regulator spring (7).

The regulator spring (7) moves the control spool (6) downwards at first, then closes the connection between the corresponding port and the tank port T.

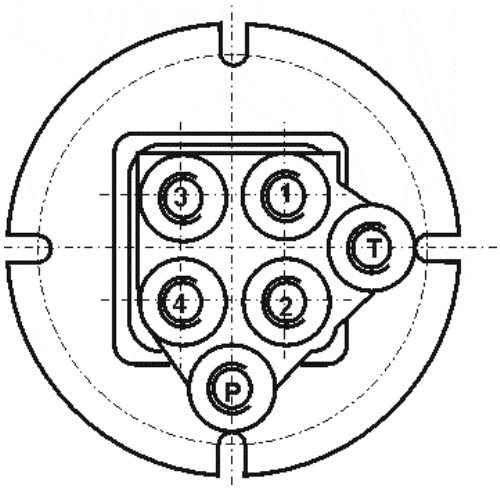
At the same time the corresponding port is connected to the port P via the bore (11).

The regulation procedure starts as soon as the regulator spool (6) finds its balance between the force of the regulator spring (7) and the force resulting from the hydraulic pressure in the corresponding port (1, 2, 3 or 4).

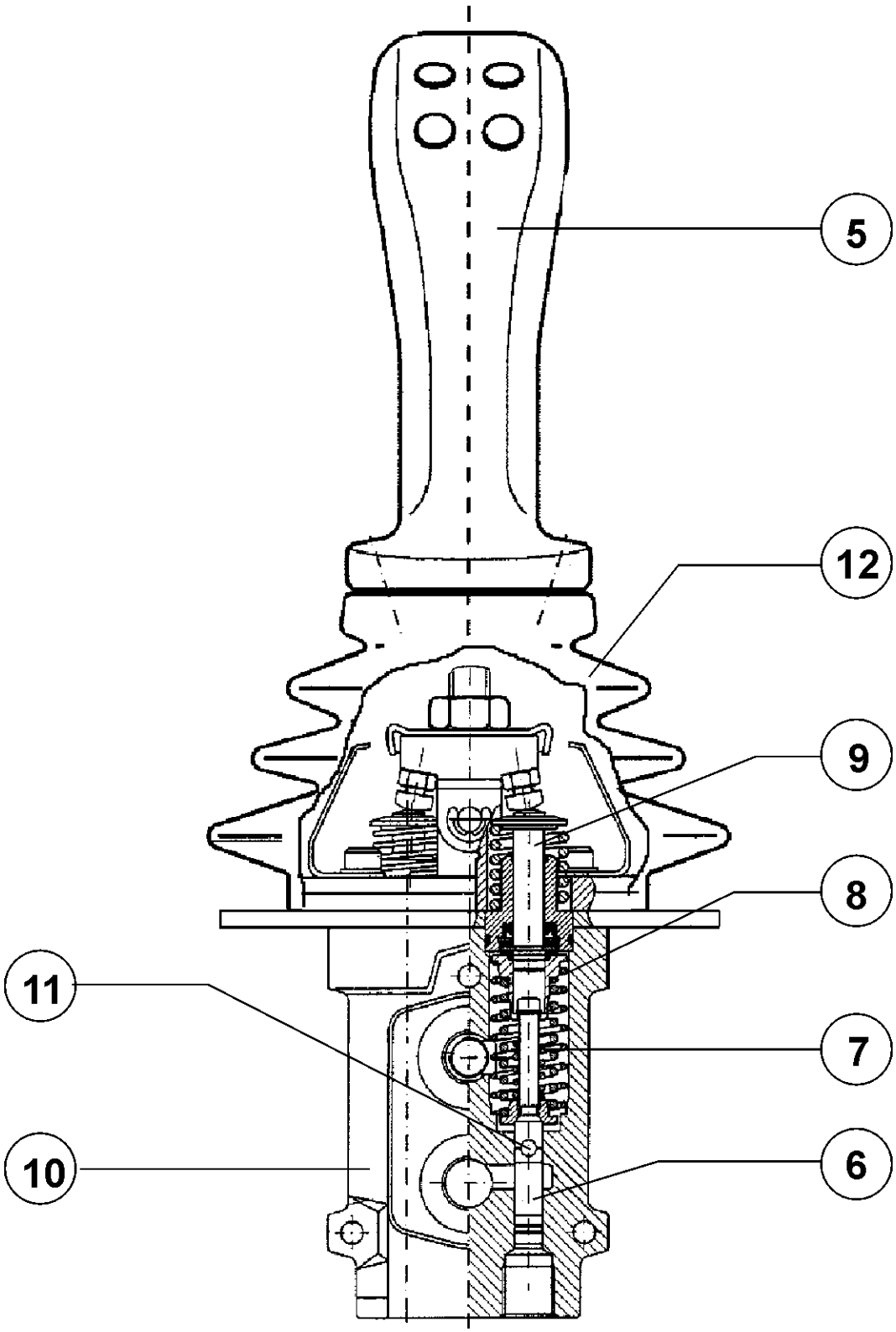
Due to the combined effect of the control spool (6) and the regulator spring (7), the pressure in the corresponding ports is proportional to the stroke of the tappet (9) and consequently to the position of the joystick (5).

This pressure regulation, dependent upon the position of the joystick and the characteristics of the regulator spring allows a proportional hydraulic control of all kinds of control valve banks and control valves for hydraulic pumps and motors.

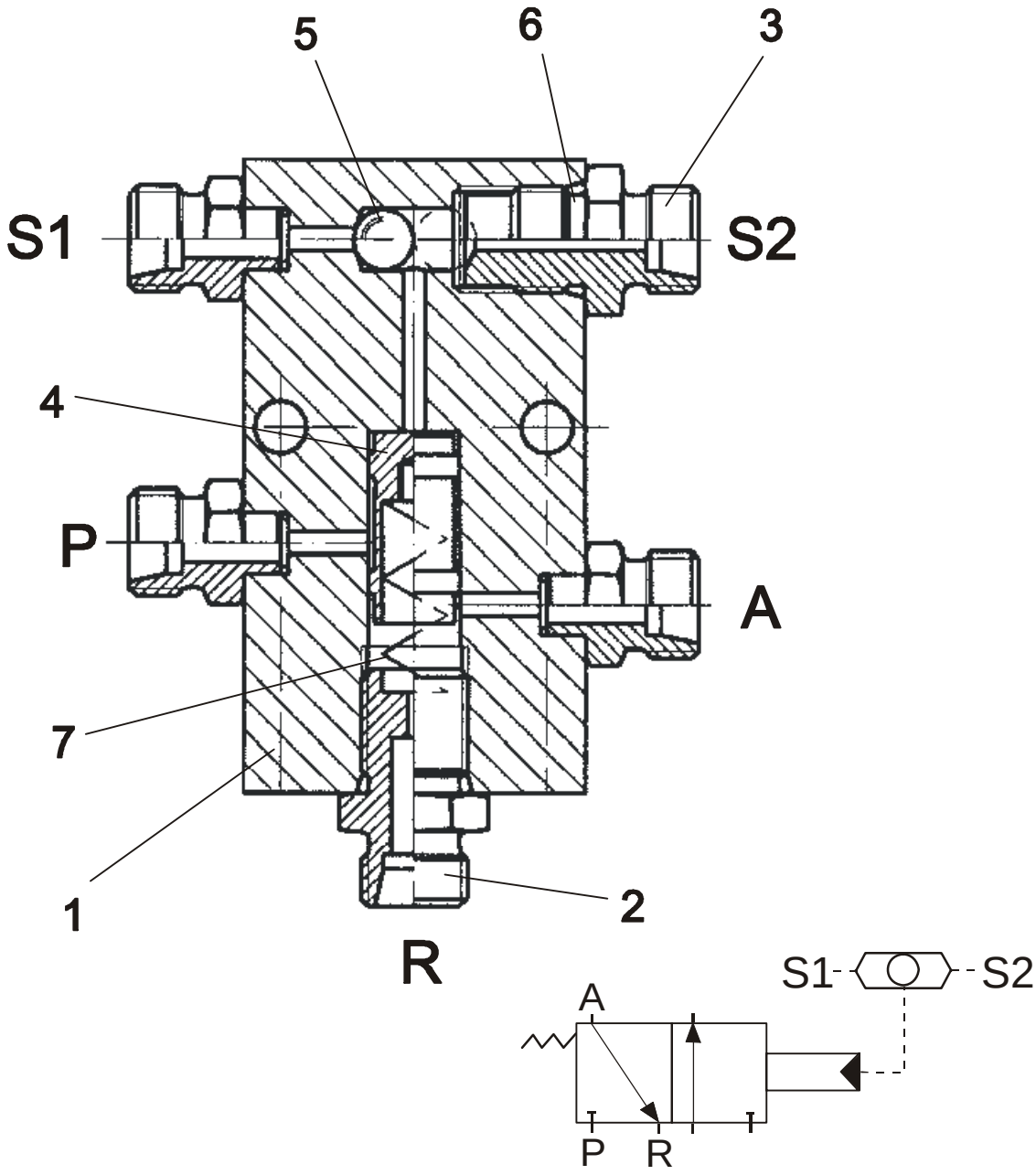
A rubber collar (12) protects the mechanical parts of the housing against contamination. So these pilot-operated valves are also suitable for unfavourable operating conditions.



Pilot-operated valve type PCL 401



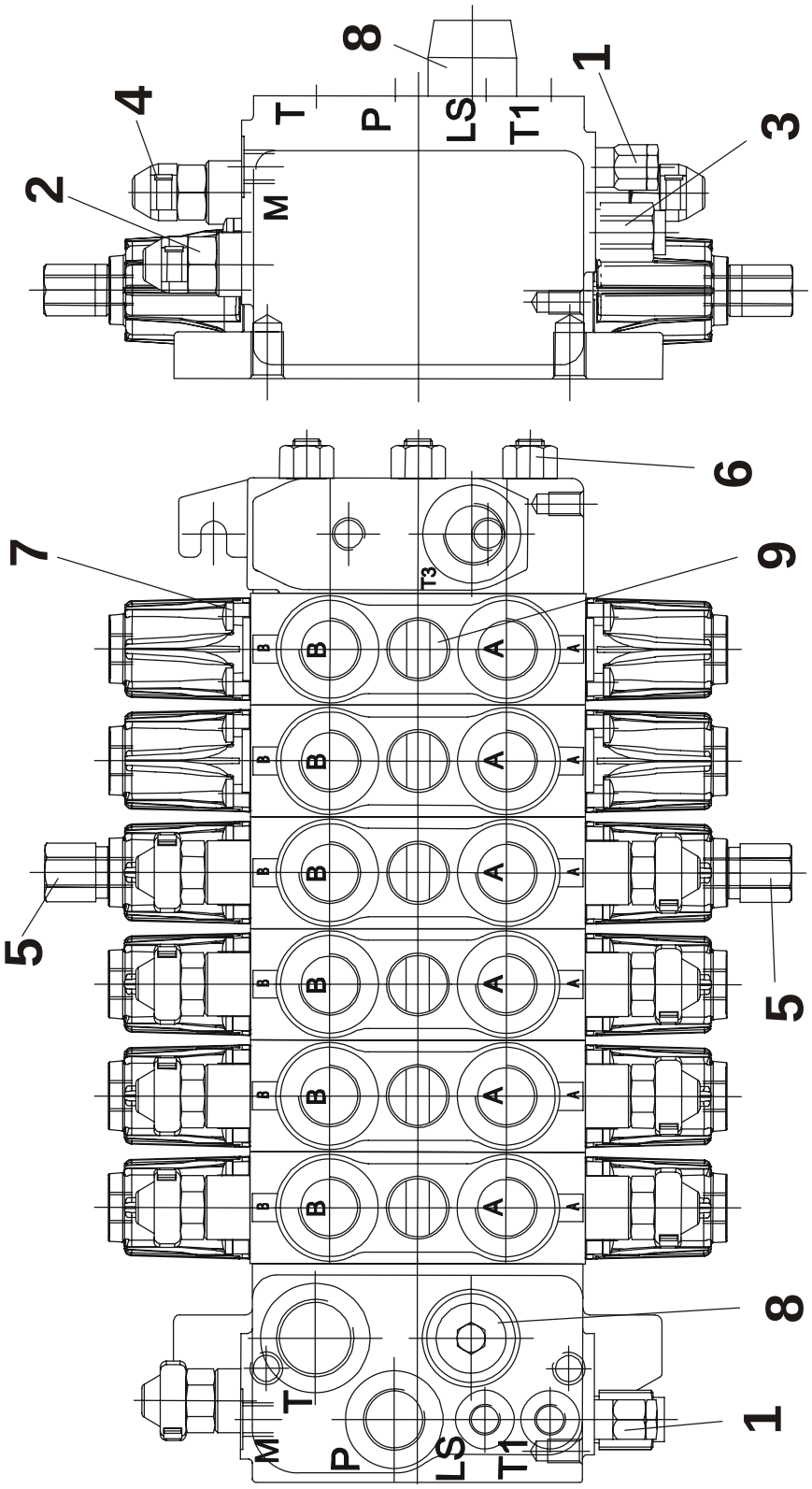
Relay valve - slewing



1 relay valve
2 screwed socket
3 screwed socket
4 valve tappet
5 ball 8mm
6 O-ring
7 pressure spring

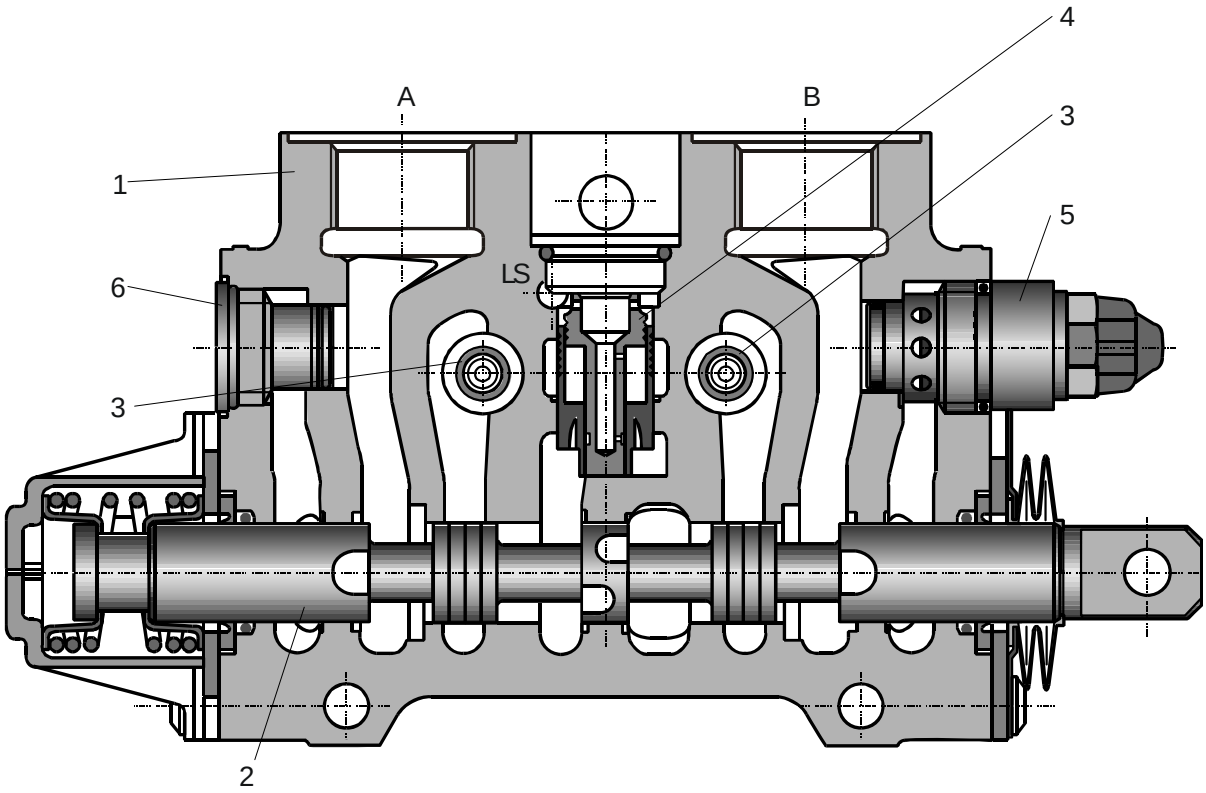
S1, **P** and **A** are soldered connections

TEREX	Typ/Model/Type **Excavator, general**	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Relay valve - swing**	Blatt/Page/Feuille **6.110.01**



TEREX	Typ/Model/Type **Valve bank SX 14**	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Tightening torques**	Blatt/Page/Feuille **6.210.01**

1 LS-Ventil M_A=45Nm	**1** LS-valve torque=45Nm	**1** limiteur LS couple de serrage=45Nm
2 Sicherheitsventil M_A=70Nm	**2** safety valve torque=70Nm	**2** limiteur de securité couple de serrage=70Nm
3 LS-Stromregelventil M_A=20Nm	**3** LS-flow regulator valve torque=20Nm	**3** régulateur de débit LS couple de serrage=20Nm
4 Sekundärventile M_A=70Nm	**4** line relief valves torque=70Nm	**4** clapets secondaires couple de serrage=70Nm
5 Schieberweg-begrenzung M_A=40Nm	**5** spool stroke limitation torque=40Nm	**5** limitation de course du tiroir couple de serrage=40Nm
6 Zuganker M12 M_A=60Nm	**6** tie rods M12 torque=60Nm	**6** tirants M12 couple de serrage=60Nm
7 Schrauben für Vorsteuerkappe M_A=10Nm	**7** screws for hydraulic control housing torque=10Nm	**7** vis de fixation du boîtier de la commande hydraulique. couple de serrage=10Nm
8 Druckwaage Eingangssektion M_A=100Nm	**8** pressure compensator inlet section torque=100Nm	**8** balance de pression entrée couple de serrage=100Nm
9 Druckwaagenstopfen M_A=60Nm	**9** pressure compensator plug torque=60Nm	**9** balance de pression bouchon couple de serrage=60Nm

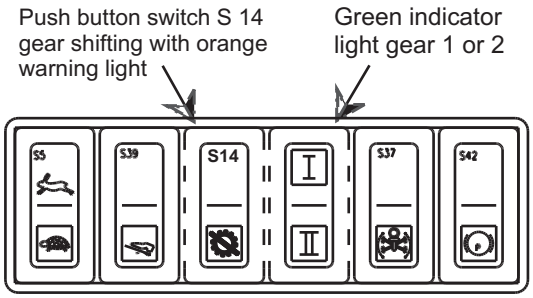


1 Gehäuse	**1** housing	**1** boîtier
2 Steuerschieber	**2** spool	**2** tiroir
3 Rückschlagventile M_A = 30Nm	**3** check valves torque = 30Nm	**3** clapets maintien de charge Couple de serrage = 30Nm
4 Druckwaage	**4** pressure compensator	**4** balance de pression
5 Sekundärventil	**5** line relief valve	**5** clapet secondaire
6 Verschlussstopfen	**6** plug	**6** bouchon

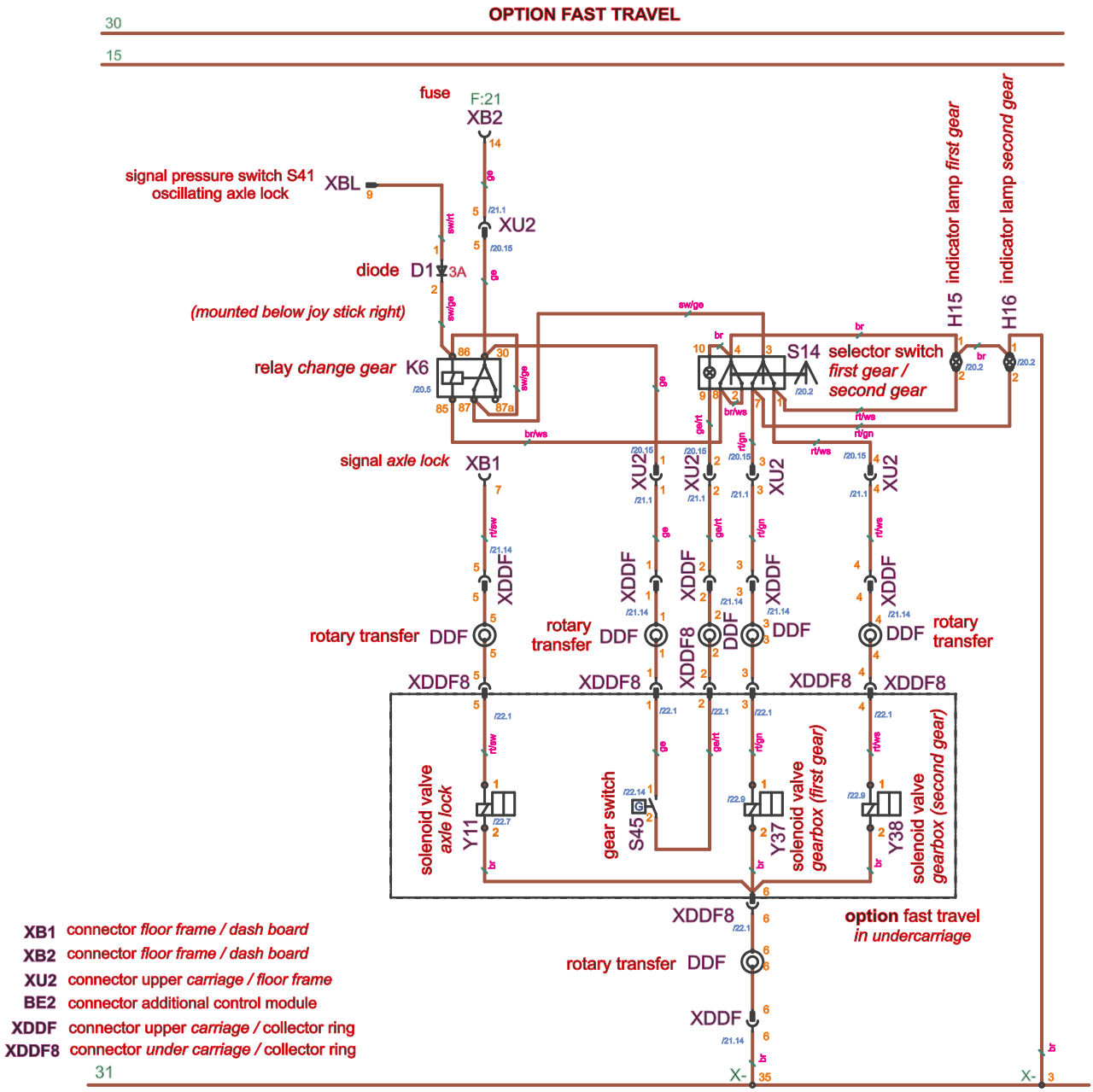
TEREX	Typ/Model/Type **Valve bank SX14**	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Sectional view (principle)**	Blatt/Page/Feuille **6.210.02**

Function: Gear shifting “fast speed” version.

Use the brake until the machine come to a standstill.
Keep the brake pressed. The relay K6 is actuated by the pressure switch S 41 (25 bar) oscillating axle lock.
The desired gear range can now be selected by rocker switch S 14.
After having selected the gear, it has to be visually checked if the selection procedure has happened perfectly.
The green indicator lamps gear 1 or gear 2 are in “on” position when the selected gear is switched.
The orange indicator lamp in the rocker switch S 14 lights up - activated by the pressure switch S 45 at the gear shift cylinder - when the gears are not engaged. The switching procedure has to be done once more.



Switches behind the right joy stick



Typ Model Type	**TW** (HML)	**ab Fz.-Id.-Nr. from s/n à partir du n/s**	Datum Edition Date	**01.2007**
Benennung Description Dénomination	**Getriebeschaltung Funktion u. Stromlaufplan Gear shift function - wiring Changement de vitesses fonction et circuit électrique**		Blatt Page Feuille	**6.490.50**

This system cushions the swinging movements of the loader which occur during driving. This system works with empty and full loader bucket.

This results in the following advantages:

- high transport speed
- stable manoeuvrability
- shorter braking distance
- higher comfort for the driver
- high handling rate

The ride control system can be switched on or off by a rocker switch located in the dashboard. A sensor in the rear axle measures the speed.

The signal is transmitted to the speedometer and the threshold switch. Independently of the travel speed "rabbit" or "tortoise", from the speed of 6 km/h the threshold switch switches on the ride control system via a solenoid valve located in the stabilizing module.

Peak pressures, which can be created when working with the loading equipment, cannot reach the accumulator system when the speed is below 6 km/h, thus the accumulators are not strained unnecessarily. In addition, the lifting frame would be unstable.

Switching position:

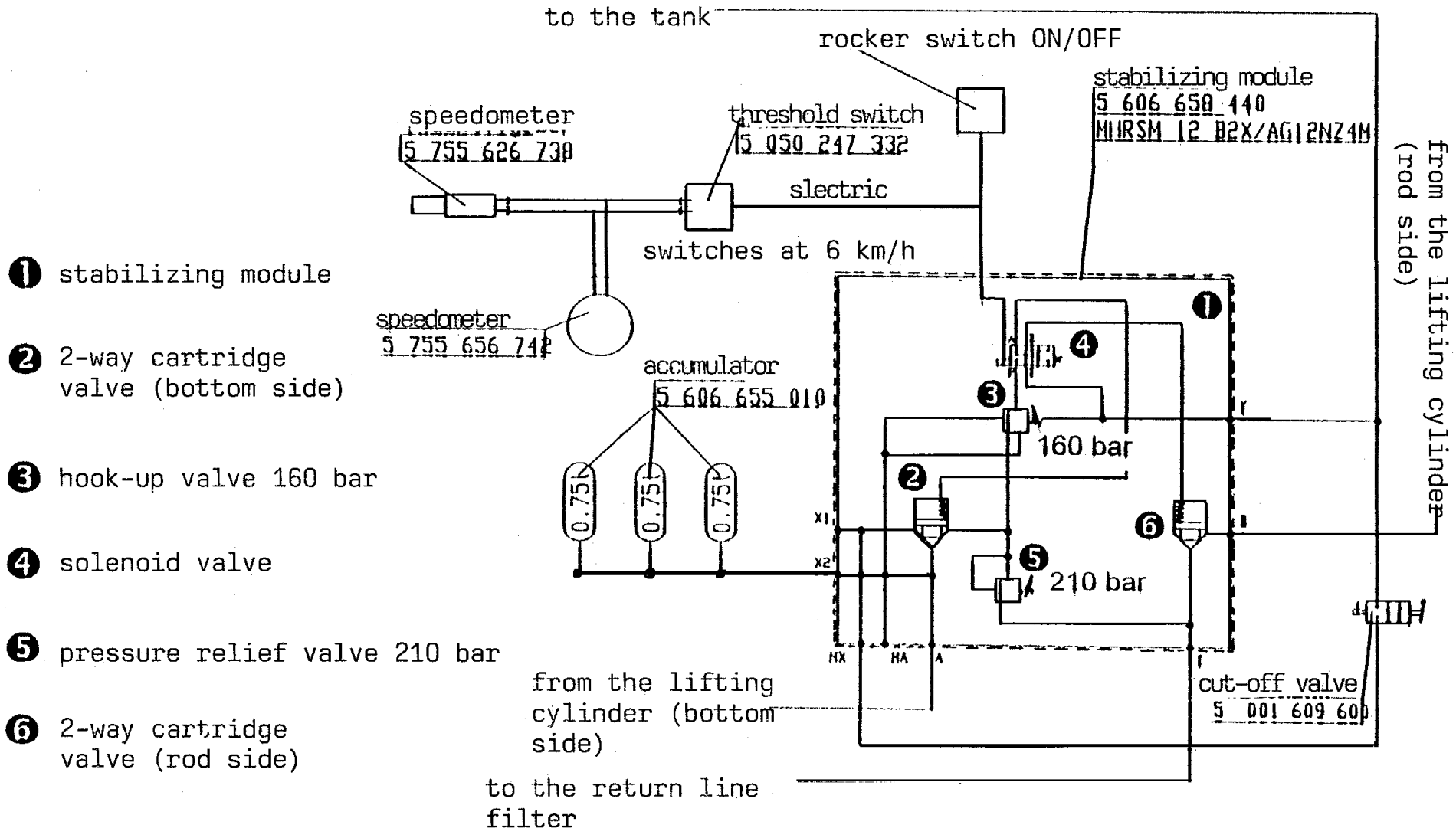
The ride control system is switched on.

When the travel speed of 6 km/h is reached, the threshold switch transmits an electric signal to the solenoid valve (4). The oil, which was „locked in“ on the spring-loaded side of the 2-way cartridge valve (2) and (6) before, now has return connection to the tank.

By the relief of the valve (2), there is a connection between lifting cylinder (bottom side) and accumulators. At the lifting cylinder (rod side) the oil flows to the return line filter via the 2-way cartridge valve (6). So the lifting cylinder can oscillate cavitation-free.

Attention:

There is a ball valve installed between accumulator and 2-way cartridge valve (2) in order to depressurize the accumulators when repairs have to be performed at the system.


to the tank
rocker switch ON/OFF
stabilizing module
5 606 650 140
MHRSM 12 B2X/AG12NZ4M
speedometer
5 755 626 730
threshold switch
5 050 247 332
slectric
switches at 6 km/h
from the lifting cylinder (rod side)
speedometer
5 755 656 742
accumulator
5 606 655 010
0.75l
0.75l
0.75l
160 bar
210 bar
X1
X2
MX
MA
A
T
cut-off valve
5 001 609 600
from the lifting cylinder (bottom side)
to the return line filter
❶ stabilizing module
❷ 2-way cartridge valve (bottom side)
❸ hook-up valve 160 bar
❹ solenoid valve
❺ pressure relief valve 210 bar
❻ 2-way cartridge valve (rod side)

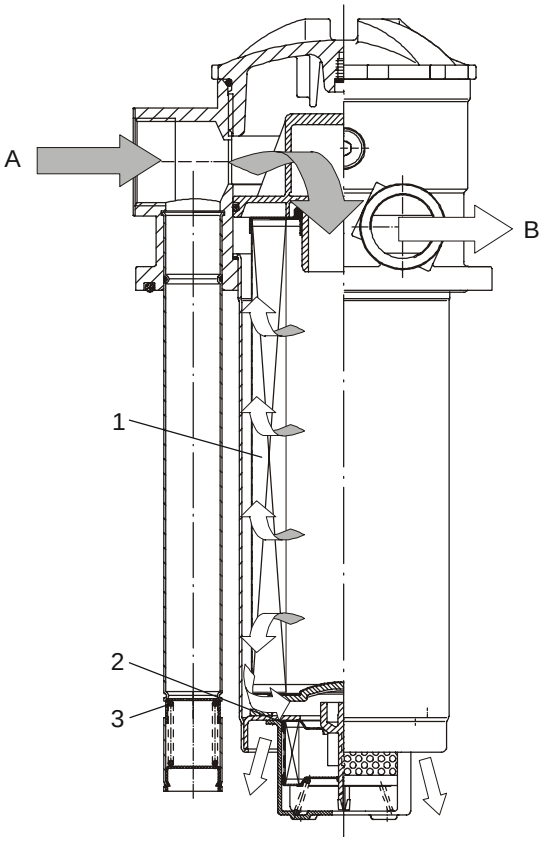
Suction filter function:
A 100% filtration of the suction flow guarantees that the boost pump is not contaminated.

Return filter function:
By means of the full flow filtration in the system return, any contamination remaining in the system after the assembly or repair or getting into the system from outside, is completely filtered.

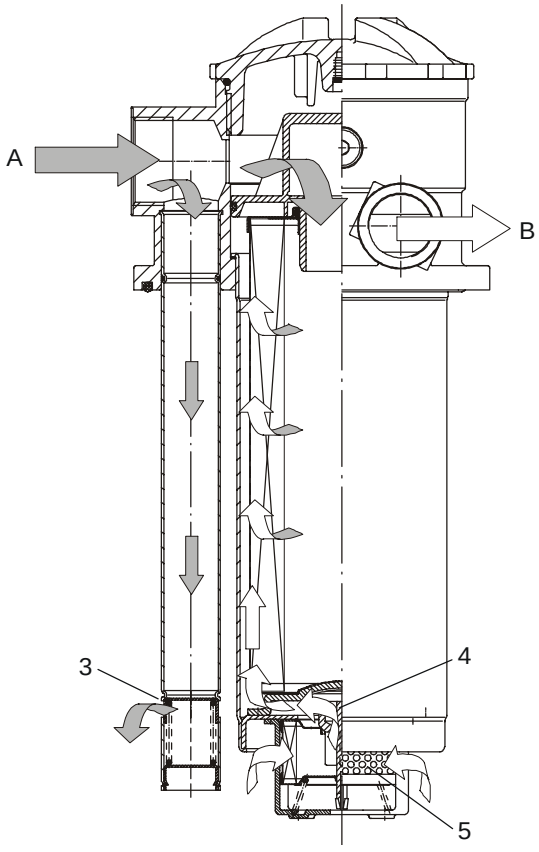
Functioning:
The hydraulic oil coming from the system return (A) passes the filter element (1). The volume the boost pump of the hydrostatic transmission (B) needs is supplied by a pressure valve (2) pressurised up to 0.5 bar. The surplus oil between the return flow and suction flow is fed into the tank in filtered condition.
The pressurisation of 0.5 bar in the suction line reduces the cavitation risk in the boost pump thus allowing excellent cold start characteristics.
An integrated pressure relief valve (3) prevents an inadmissibly high back pressure in the return line. There is no direct connection between the system return (A) and the suction port of the boost pump (B) (no bypass) as this valve leads directly to the tank.
The anti-cavitation valve (4) with the sieve (5) of the filter fineness of 125µm guarantees the supplies of the boost pump in case of a brief oil shortage (drain / cold start).

There is no oil shortage with normal operation.

normal operation



anti-cavitation operation



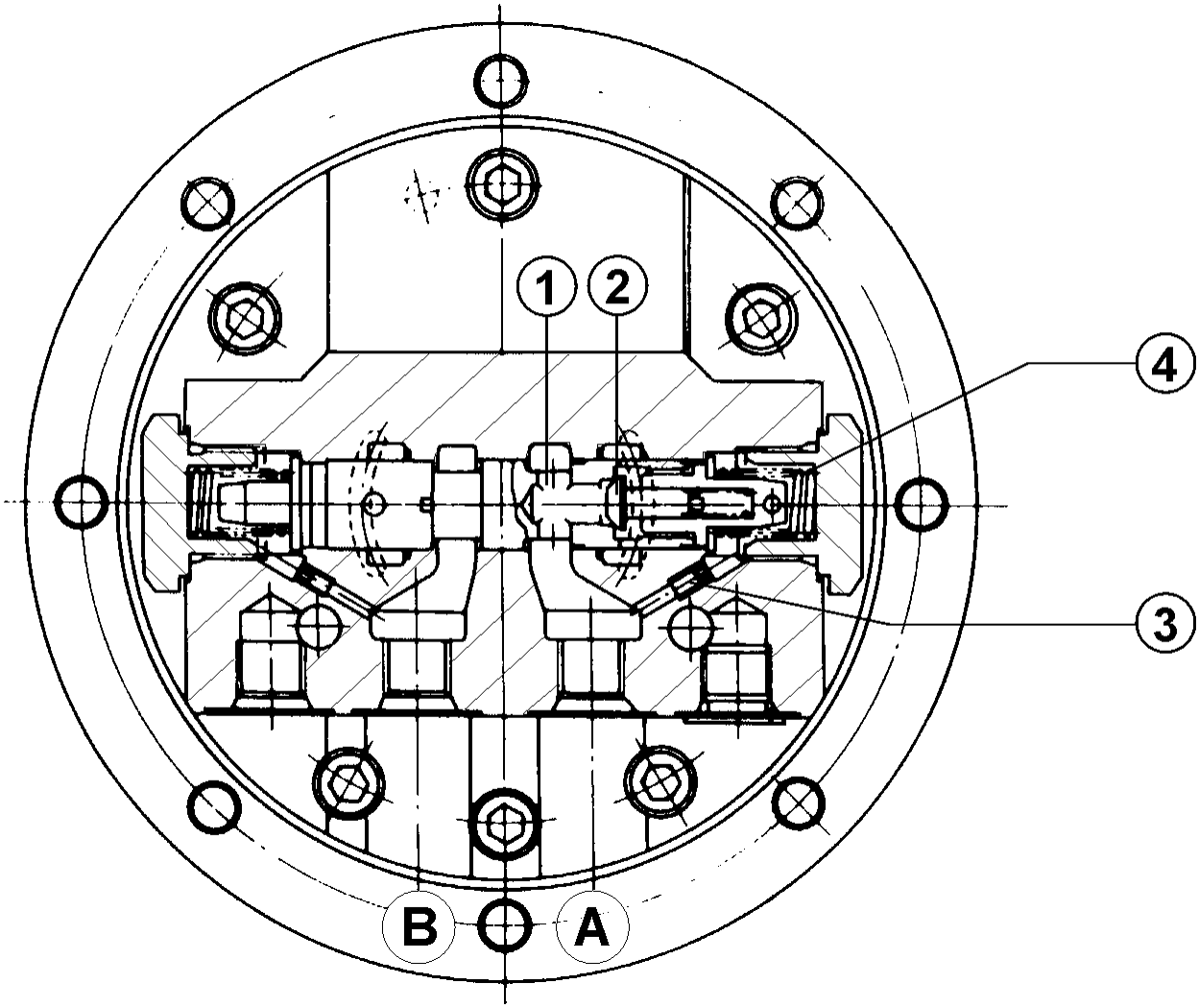
TEREX | SCHAEFF	Typ/Model/Type **TL**(SKL)**, general**	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Suction - return filter**	Blatt/Page/Feuille **6.520.01**

Start-up:
Pressurization of **A**:

The hydraulic oil flows through the cross hole (**1**) in the groove of the spool to the check valve (**2**) and via the control slots through the valve plate to the travel motor pistons.
The return line is still blocked. The pressure is fed into the spring compartment (**4**) via the orifice (**3**), the spool moves to the left and releases the return line **B**.
The travel motor turns, the machine travels.

Brakes (downhill):

The pressure side relieves during downhill travel as the travel motor, driven by the machine's own weight, turns into a pump.
By this pressure drop in the spring compartment (**4**) the spool moves towards neutral position.
The return line **B** is blocked until pressure is again built up on the feed side **A**.
The spool levels out in this position and keeps the travel speed constant.
Analogous in reverse travel.



Slew motor - pressure limitation

Valve type: **Pilot-operated pressure relief valve with pressure hook-up**

This valve effects a smoother braking of the slew procedure

- **Description of function**
- **Setting instructions**

HS41 / HS41M / HS41MM :

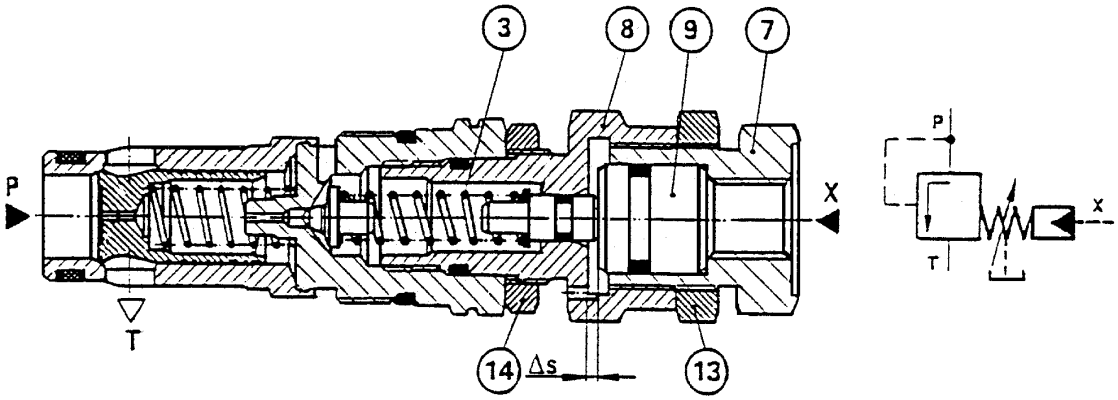
The spring (3) is pre-loaded by an external pressurization of the piston (9) with pilot pressure (P_{st} max. 30 bar) via the port x.

The value of the spring pre-load is determined by the piston stroke Δs.

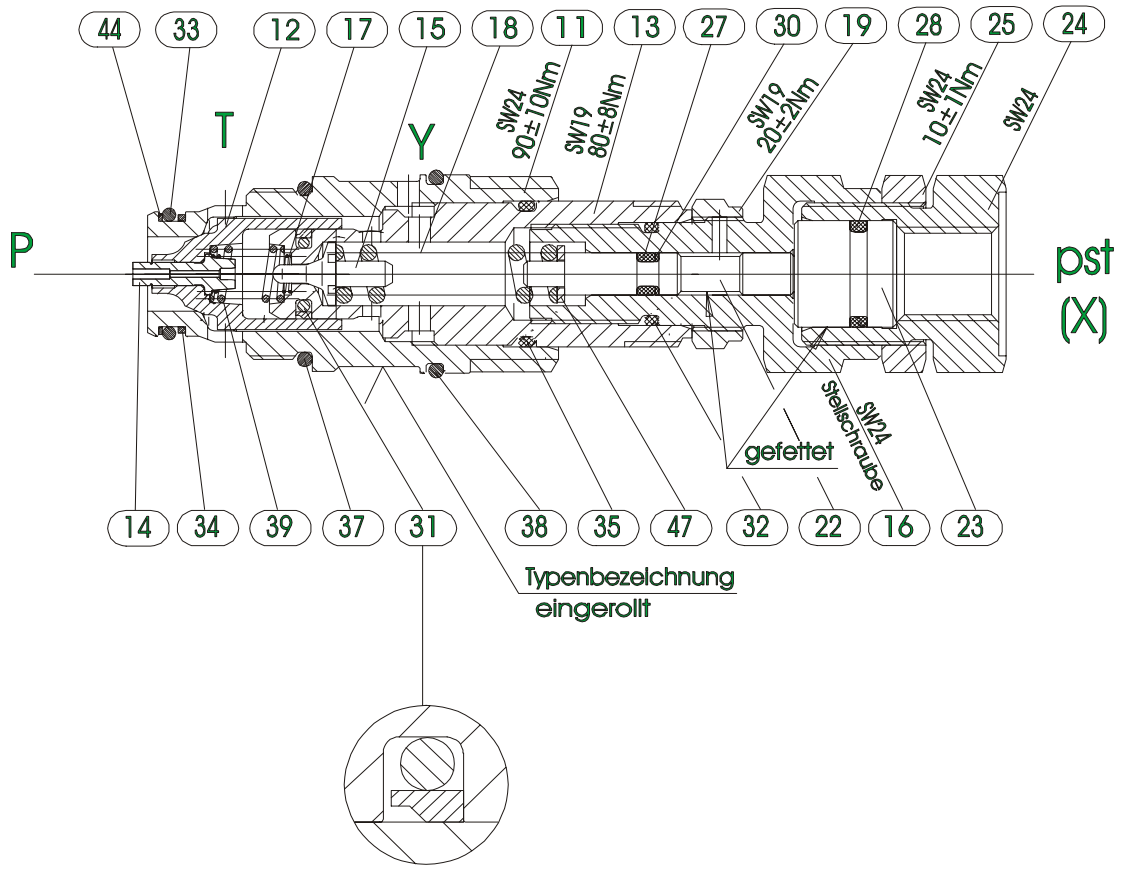
The hook-up pressure increase Δp is adjusted to (**280 bar – HS 41**) and (**250 bar – TC75/TW85** (HR / HML32)). The adjustment has to be effected by the setting screw (7) and the counter nut (13). 1 turn corresponds to 150 bar.

Adjustment of the main pressure and hook-up pressure:

- Connect gauge to pump test port (I) of the double pump at the accessory drive
- Adjust main pressure relief valve at valve bank (II) to more than 280 bar - see diagram
- Disconnect pilot control line from the main pressure relief valve and plug
- Adjust max. engine rpm
- Loosen counter nut (13) and turn pressure setting screw (7) clockwise until stop. Tighten counter nut (13).
- Loosen counter nut (14) and set pressure setting screw (8) to (**280 bar – HS 41**) and (**250 bar – TC 75/TW85** (HR / HML32) (pressure stage 2) by simultaneously operating the slew function. Tighten counter nut (14). Re-check pressure.
- Screwing in: Pressure increase
  Screwing out: Pressure decrease
- Operate slew function again until stop and set main pressure to (**190 bar - HS 41**) and (**100 bar – TC75/TW85** (HR / HML32)) by turning the setting screw (7) counter-clockwise. To do this, loosen counter nut (13) first, retighten afterwards. Re-check pressure setting.
- Re-connect the pilot control line



TEREX | SCHAEFF	Typ/Model/Type **TW / TC** (HML / HR) **HS**	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Pilot-operated pressure relief valve**	Blatt/Page/Feuille **6.850.07**



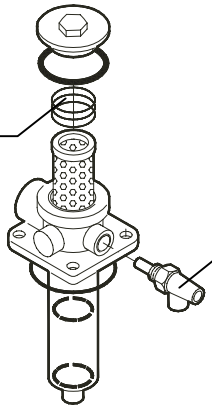
TC 75/125, TW 85/110 (HR 32/42 HML 32/42)**:**

The spring (47) is pre-loaded by an external pressurization of the piston (23) with pilot pressure (P_{st} max. 30 bar) via the port x.
The value of the spring pre-load is determined by the piston stroke (23).
The hook-up pressure increase Δp is adjusted to **100 or 150 bar**. The adjustment has to be effected by the setting screw (24) and the counter nut (25). 1 turn corresponds to 150 bar.

Adjustment of the main pressure and hook-up pressure:

- Connect gauge to pump test port (I) of the double pump at the accessory drive
- Adjust main pressure relief valve at valve bank (II) to more than 250 bar
- Disconnect pilot control line from the main pressure relief valve and plug them
- Adjust max. engine rpm
- Loosen counter nut (25) and turn pressure setting screw (24) clockwise until stop. Tighten counter nut (25).
- Loosen counter nut (19) and set pressure setting screw (16) to **250 bar** (pressure stage 2) by simultaneously operating the slew function. Tighten counter nut (19). Re-check pressure.
- Screwing in: Pressure increase
  Screwing out: Pressure decrease
- Operate slew function again until stop and set main pressure to (**100 bar - TC75 / TW85,110** (HR 32/ HML32,42)) and (**150 bar – TC125** (HR42)) by turning the setting screw (24) counter-clockwise. To do this, loosen counter nut (25) first, retighten afterwards. Re-check pressure setting.
- Re-connect the pilot control line

filter unit, part no.:
5.003.659.255



filter by-pass
opens at
2.5 bar

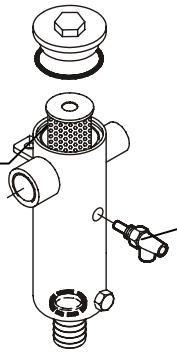
installed in :
HR 11 **HR 12**
HR 13

maintenance switch
part no. 5.380.660.831.
Pressure setting:
1.9 $^{-0.2}$ bar

filter unit part no.:
5.380.660.842

installed in :
TC 29/35 (HR 14/16)

filter unit part no.:
5.380.660.841

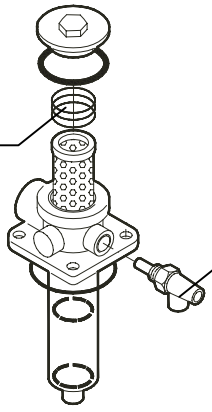


installed in :
TC 48 (HR 18)

filter by-pass
opens at
2.5 bar

maintenance switch
part no. 5.380.660.831.
Pressure setting:
1.9 $^{-0.2}$ bar

filter unit part no.:
5.380.660.829



installed in: **HS 41** **SMB 2041**
HR 22 **HR 31** **TC 75** (HR 32)
HR 41 **HML 22** **HML 31**
TW 85 (HML32) **HML 41** **TW110** (HML 42)

filter by-pass
opens at
2.5 bar

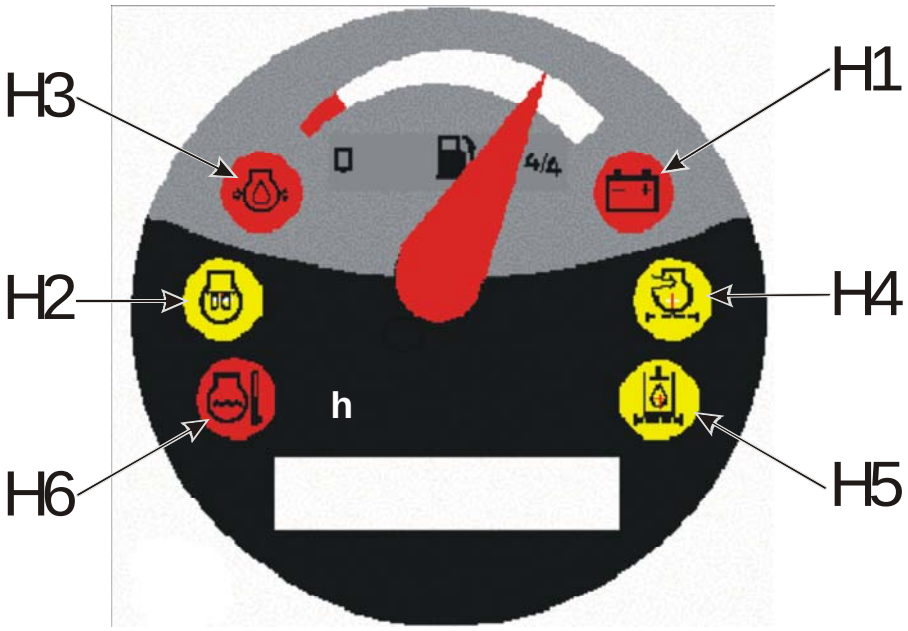
maintenance switch
part no. 5.380.660.831.
Pressure setting:
1.9 $^{-0.2}$ bar

Note: The filter clogging warning lamp can light up briefly
as long as the hydraulic oil is cold

Indicator Unit

TC15, TC16, TC20, TC29, TC35, TC37, TC48, TC50

(HR 1.5, 1.6, 2.0,14, 16, 3.7, 18)



1. Mechanic

- Instrument with 80mm port diameter
- Fuel gauge, hour meter, 6 indicator lights,

2. Indicator lights

• H1	Charge control	red	switched to negative		
• H2	pre-heating control	yellow	switched to positive		
• H3	Engine oil pressure	red	switched to negative	buzzer	
• H4	Air filter clog control	yellow	switched to negative	buzzer	
• H5	Hydraulic filter control	yellow	switched to negative	buzzer	delayed
• H6	Coolant temperaturered	switched to negative	buzzer		

3. Check- control

- Indicator lights up for a period of 2 seconds
- Hour meter - all indicator light segments in line are active
- All 6 indicator lights are active
- Buzzer is active

4. Pictograms



air filter control



hydraulic oil filter clog control



coolant temperature



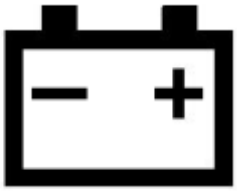
engine oil pressure



fuel gauge



pre-heating control



charge control

5. Buzzer

- Soldered at strip conductor and riveted
- Volume 92 dB/m intermittent
- Diode wiring on the circuit board
- Input signals to activate the buzzer are the input signals from “H3”, “H4”,”H5” und “H6”
- Activation of buzzer when engine is turned on (charge control off), 1 second time-delay, time delay at active input “H5” there is a time delay of 5 minutes; then 3 minutes intermittent buzzer; follow that there is a 5 minute interval.
- Buzzer connected at power supply “+Ub” for more volume.

6. Fuel gauge

- Type with “SMH” step motor
- Luminous indicator - glass clear red, white designed
- Code capable of 6 different fuel gauges
- Code entered by using a 4 DIP- Switch
- Indicator needle operates smoothly
- Dial face and needle lit via 6 LED’s (yellow or red) when power supply “off”, the needle is in the left-most position

Fuel gauge indicator:		***fuel sender parts.no.***
TC 15, 16, 20, 29,35	empty : 60,5 Ohm full : 2,0 Ohm	....**5.755.628.629**….
TC 48	empty : 62,0 Ohm full : 2,5 Ohm	....**5.755.628.630**....
TC 37, 50	empty : 77,7 Ohm full : 1,1 Ohm	....**5.755.628.631**....

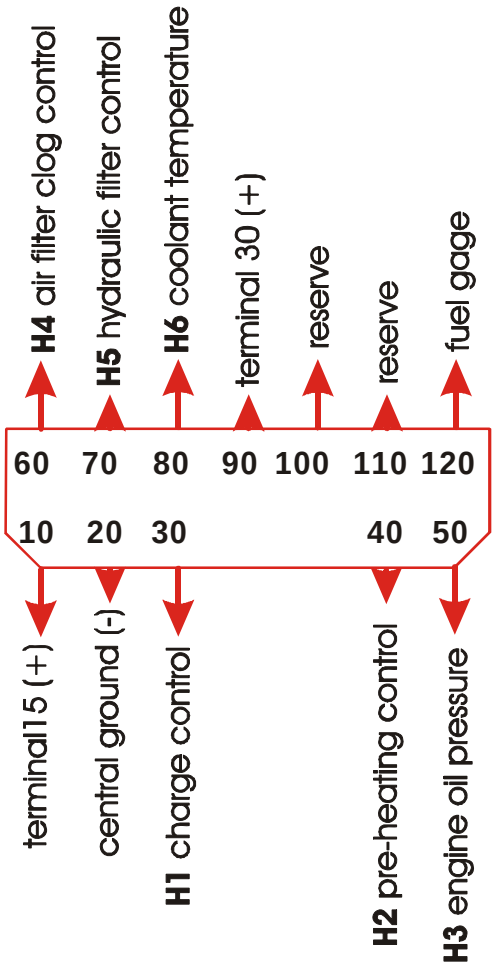
0	0	0	0	
0	0	1	0	
0	1	0	0	
1	**2**	**3**	**4**	**DIP-switch**

7. Hour meter

- Display in LED – 7 segments per digit design
- Green light digit display
- Display with 6 digits
- 5 segments per digit after decimal point
- One line display for total operating hours
- Hours are counted on the meter when certain conditions are satisfied (terminal 15) “on” and charge control “off”.
- Accuracy tolerance of +/- 0.1% completes area.

8. Main connector

- 12 terminal connector
- Resting on the PC-board, soldered
- Including securing latch and reverse battery protection



terminal layout of the plug on the back of the dial

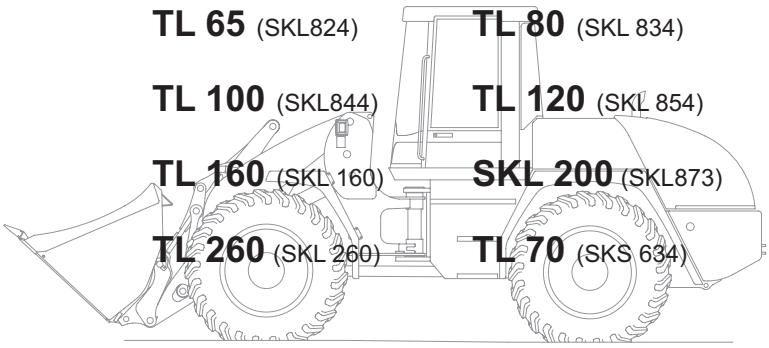
9. Electric specification

- Power supply (Ub): 8V to 16V
- Reserve battery protection for the power supply connections

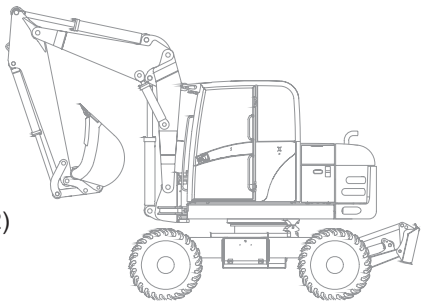
TEREX

SERVICE-MANUAL

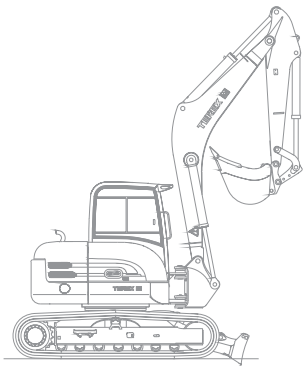
TL 65 (SKL824)
TL 80 (SKL 834)
TL 100 (SKL844)
TL 120 (SKL 854)
TL 160 (SKL 160)
SKL 200 (SKL873)
TL 260 (SKL 260)
TL 70 (SKS 634)



TW 70 (HML 23)
TW 85 (HML 32)
TW 110 (HML 42)



TC 60 (HR 20)
TC 75 (HR 32)
TC 125 (HR 42)



TC 29 (HR14)
TC 35 (HR 16)
TC 48 (HR 18)

TC 15 (HR 1.5)
TC 16 (HR 1.6)
TC 20 (HR 2.0)
TC 37 (HR 3.7)
TC 50

List of Contents

1 General
2 Technical Data
3 Diesel Engine
4 Hydraulic System
5 Setting Instructions
6 Functioning Description
7 Electrical System
8 Maintenance
9 Operation
10 Options
11 Repair Instructions
12 Service-Bulletins

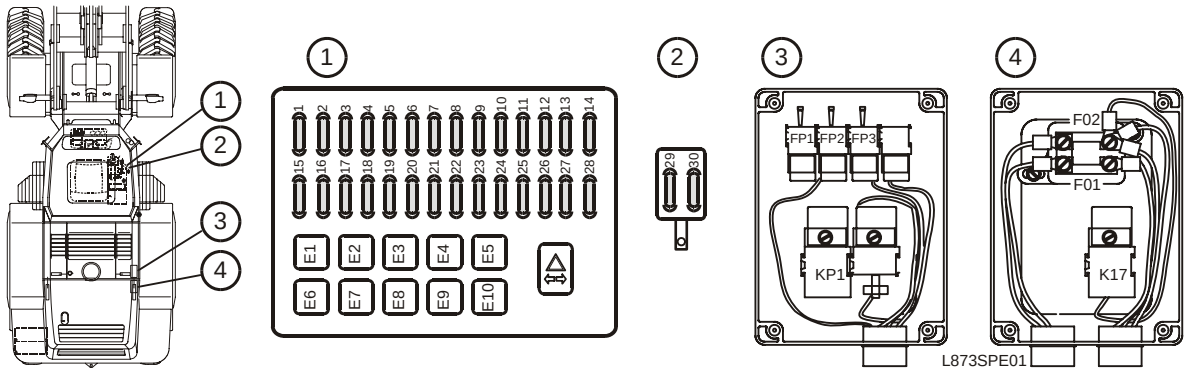
01.2007
folder 2 of 2

SUBGROUP LIST

Electrical system
Fuse assignment diagrams / wiring diagrams

SKL 200 (SKL 873)	**7.13**
TL 65 (SKL 824)	**7.22**
TL 80 (SKL 834)	**7.24**
TL 80 AS	**7.25**
TL 100 (SKL 844)	**7.26**
TL 120 (SKL 854)	**7.27**
TL 160 (SKL 160)	**7.28**
TL 210	**7.29**
TL 260 (SKL 260)	**7.30**
TL 420	**7.33**
TL 450	**7.35**
TL 70 (SKS 634)	**7.37**
TW 70 (HML 23)	**7.49.50**
TW 85 (HML 32)	**7.51**
TW 110 (HML 42)	**7.53**
TC 60 (HR 20)	**7.60**
TC 75 (HR 32)	**7.65**
TC 125 (HR 42)	**7.67**
TC 29 (HR 14)	**7.76**
TC 35 (HR 16)	**7.78**
TC 48 (HR 18)	**7.80**
TC 15 (HR 1.5)	**7.90**
TC 16 (HR 1.6)	**7.91**
TC 20 (HR 2.0)	**7.92**
TC 25	**7.93**
TC 37 (HR 3.7)	**7.97**
TC 50	**7.99**
Electrical system, general	**7.100**

Fuse box - Assignment diagram



1 = Fuse and relay box	2 = Fuse box (behind Pos. 1)
3 = Engine control box	4 = Starter box

Location	Relay	Function
E 1	K 1	Starting safeguard
E 2	K 2	Hand brake; travel
E 3	K 3	Travel — reverse
E 4	K 4	Travel — forward
E 5	K 5	Brake light
E 6	K 6	Idle running
E 7	K 7	Flasher transmitter
E 8		unassigned
E 9	K 9	Working floodlight, front
E 10	K 10	Working floodlight, rear
		unassigned
	K 17	Start-up
	K 18	Glow-time control (engine compartment dividing wall - near generator)
	KP1	Injection pump

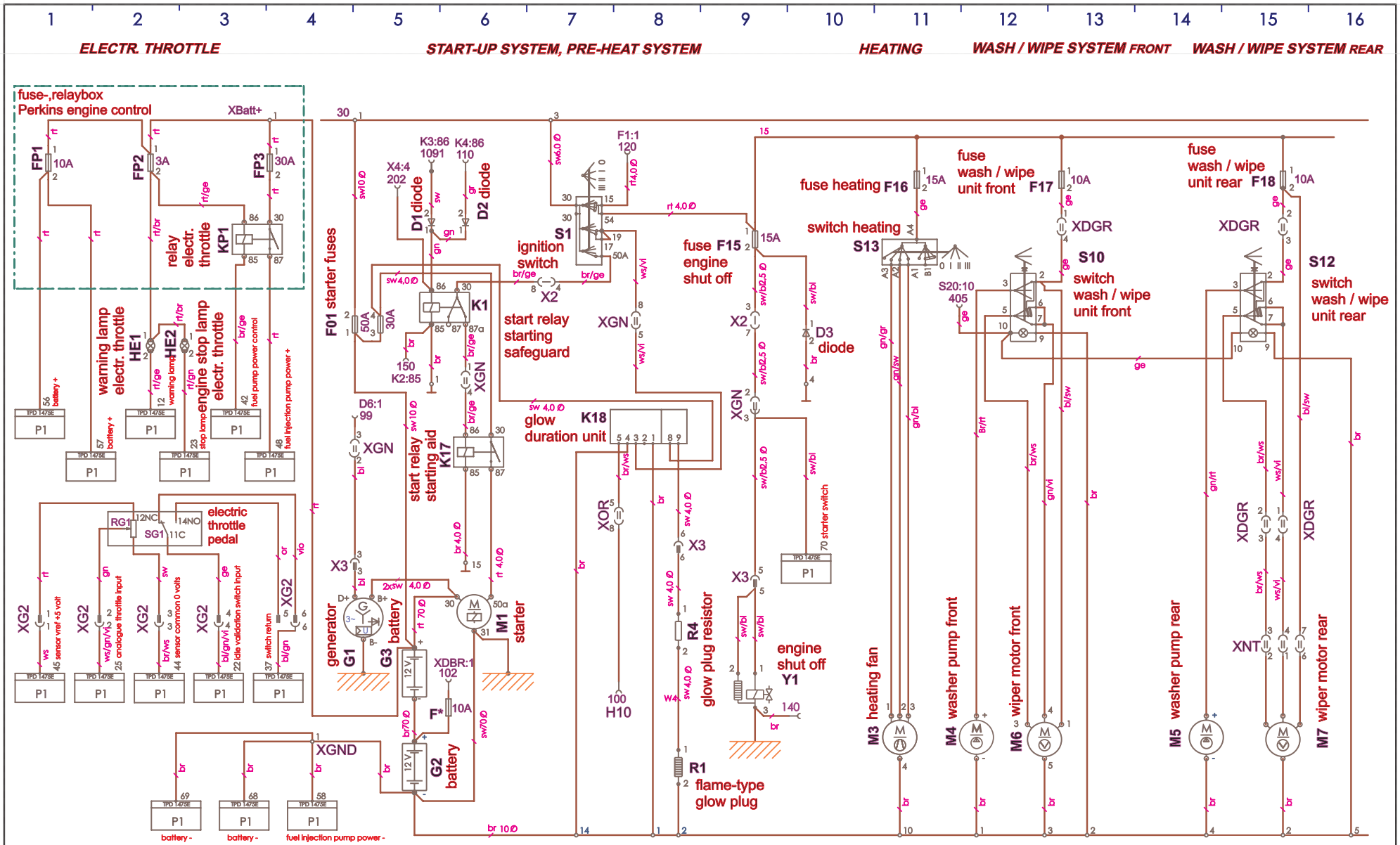
Fuse colors					
3A	purple	5A	brown	10A	red
15A	blue	20A	yellow	30A	light green

Fuse and diode assignment

Position	Ampere	assigned with	Position	Ampere	assigned with
F 1	10	Direction indicator Immobilizer	F 15	15	Engine shut-off
F 2	10	Travel - FAST/ SLOW	F 16	10	Heater fan
F 3	10	Working hydraulics Float position, additional control circuit	F 17	10	Wash-wipe system, front
F 4	10	Instrument panel lamp D+	F 18	10	Wash-wipe system, rear
F 5	10	Signal horn	F 19		Option
F 6	10	Brake light	D 7 (F 20)	Diode 3A	Blocking diode
F 7		Option	D 8 (F 21)	Diode 3A	Blocking diode
F 8	10	Working floodlight, front	D 9 (F 22)	Diode 3A	Blocking diode
F 9	10	Working floodlight, rear	F 23	10	Side marker lamp, left
F 10	10	Hazard warning switch Immobilizer	F 24	10	Side marker lamp, right
F 11	10	Rotating beacon Interior light	D 6 (F 25)	Diode 3A	Blocking diode D+
F 12	10	Socket	D 1 (F 26)	Diode 3A	Starting safeguard
F 13	10	Low beam	D 2 (F 27)	Diode 3A	Starting safeguard
F 14	10	High beam	D 3 (F 28)	Diode 3A	Engine shut-off blocking diode
D 10 (F 29)	Diode 3A	Float position	D 11 (F 30)	Diode 3A	Float position
FP 1	10	Power supply Diesel engine	FP 2	3	Power supply Engine control
FP 3	30	Power supply Injection pump			
F 01	50	Glow plug and starter switch	F 02	30	Starter
F *	10	Radio (cable fuse - near battery)			

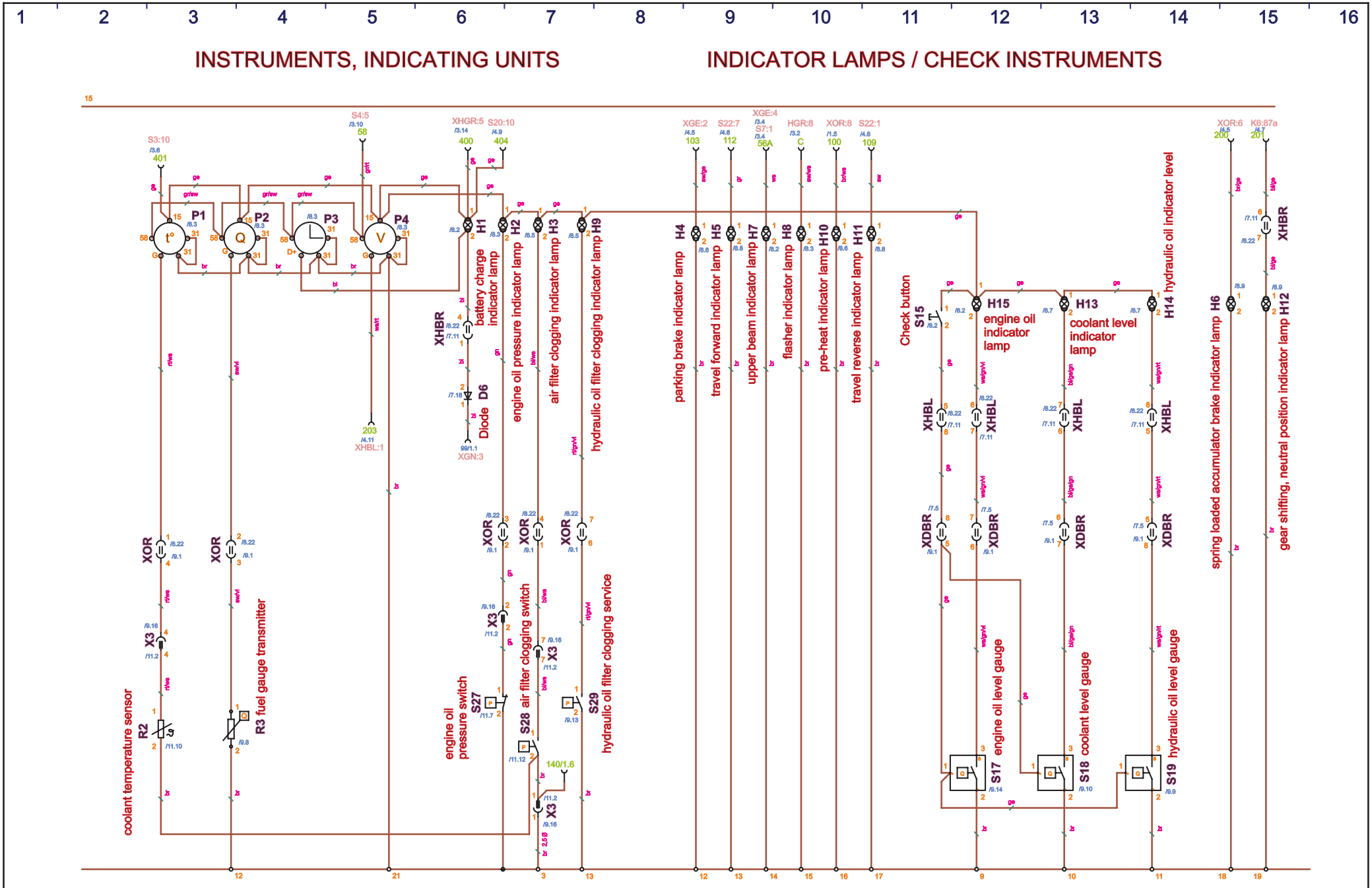
Cable and Plug colors

bg	beige	dgr	dark gray	hbr	light brown	rt	red
bl	blue	ge	yellow	hgr	light gray	sw	black
br	brown	gn	green	hr	light red	vi	violet
dbl	dark blue	gr	gray	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		



FP1	fuse 10A	power supply Perkins engine	F*	fuse 10A	X2	connector
FP2	fuse 3A	ignition switch input	P1	machine interface connector	X3	connector engine
FP3	fuse 30A	power supply fuel injection pump	XGND	central ground point	XOR	connector machine
RG1	throttle demand sensor		XG2	connector electr. throttle	XDGR	connector relay panel
SG1	idle validation switch		XGN	connector relay panel	XNT	connector

Typ / Model / Type / Tipo	SKL 200	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no.	Datum / Edition / Date / Fecha	01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / Circuit èlectrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 1/5	Blatt / Page / Feuille / Página	7.13.15

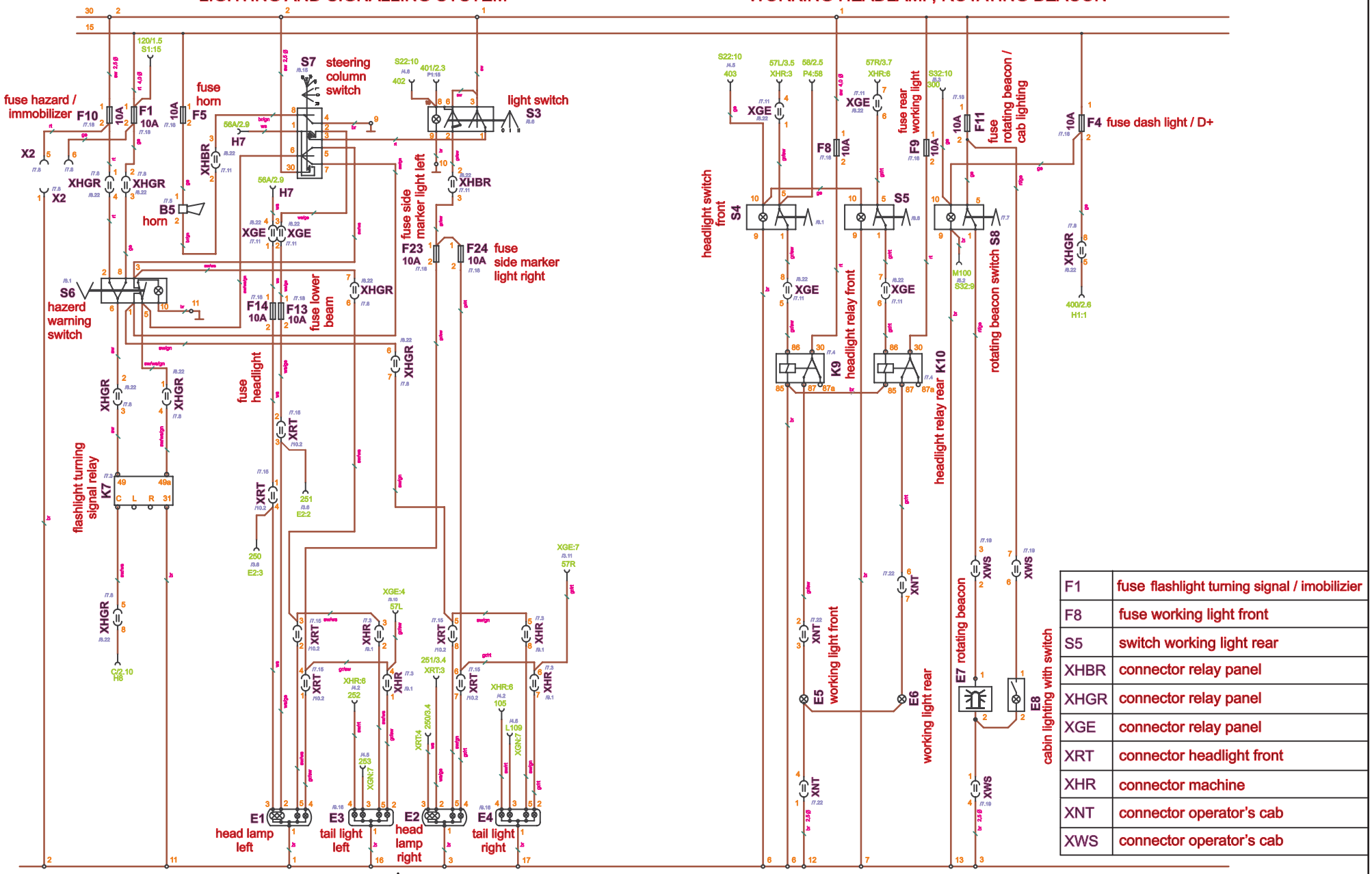


P1	temperatur indicator (coolant)	P4	speedometer	XOR	connector machine
P2	fuel gauge	X3	connector engine	XDBR	connector relay panel
P3	operating hour meter	XHBR	connector relay panel	XHBL	connector relay panel

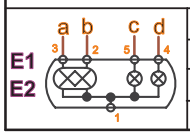
Typ / Model / Type / Tipo	SKL 200	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no.	Datum / Edition / Date / Fecha: 01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / Circuit èlectrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página: 2/5	Blatt / Page / Feuille / Página: 7.13.16

LIGHTING AND SIGNALLING SYSTEM

WORKING HEADLAMP, ROTATING BEACON

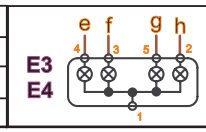


F1	fuse flashlight turning signal / imobilizier
F8	fuse working light front
S5	switch working light rear
XHBR	connector relay panel
XHGR	connector relay panel
XGE	connector relay panel
XRT	connector headlight front
XHR	connector machine
XNT	connector operator's cab
XWS	connector operator's cab



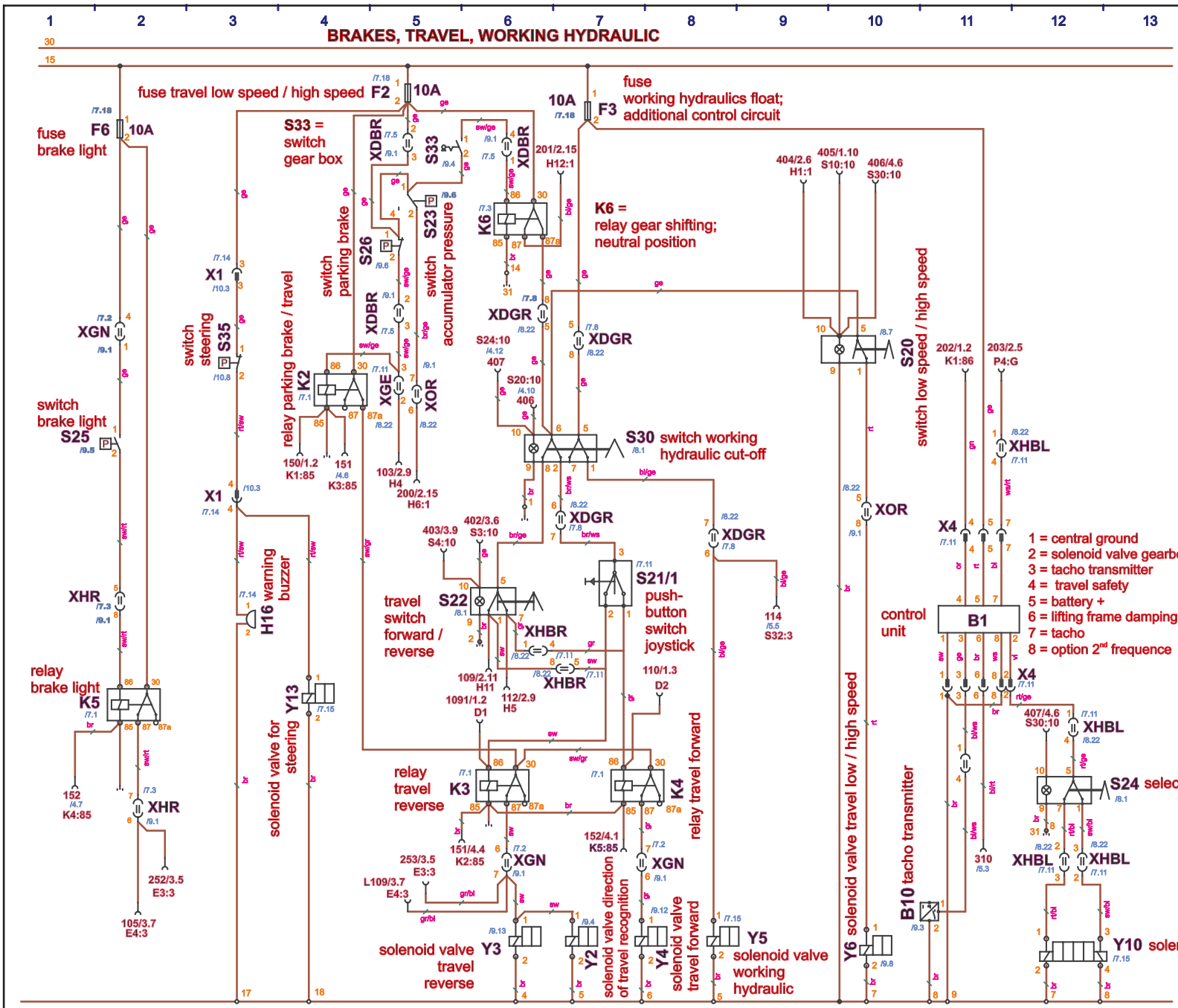
a	upper beam
b	lower beam
c	turning indicator
d	side marker light

e	brake light
f	reversing headlight
g	turning indicator
h	side marker light



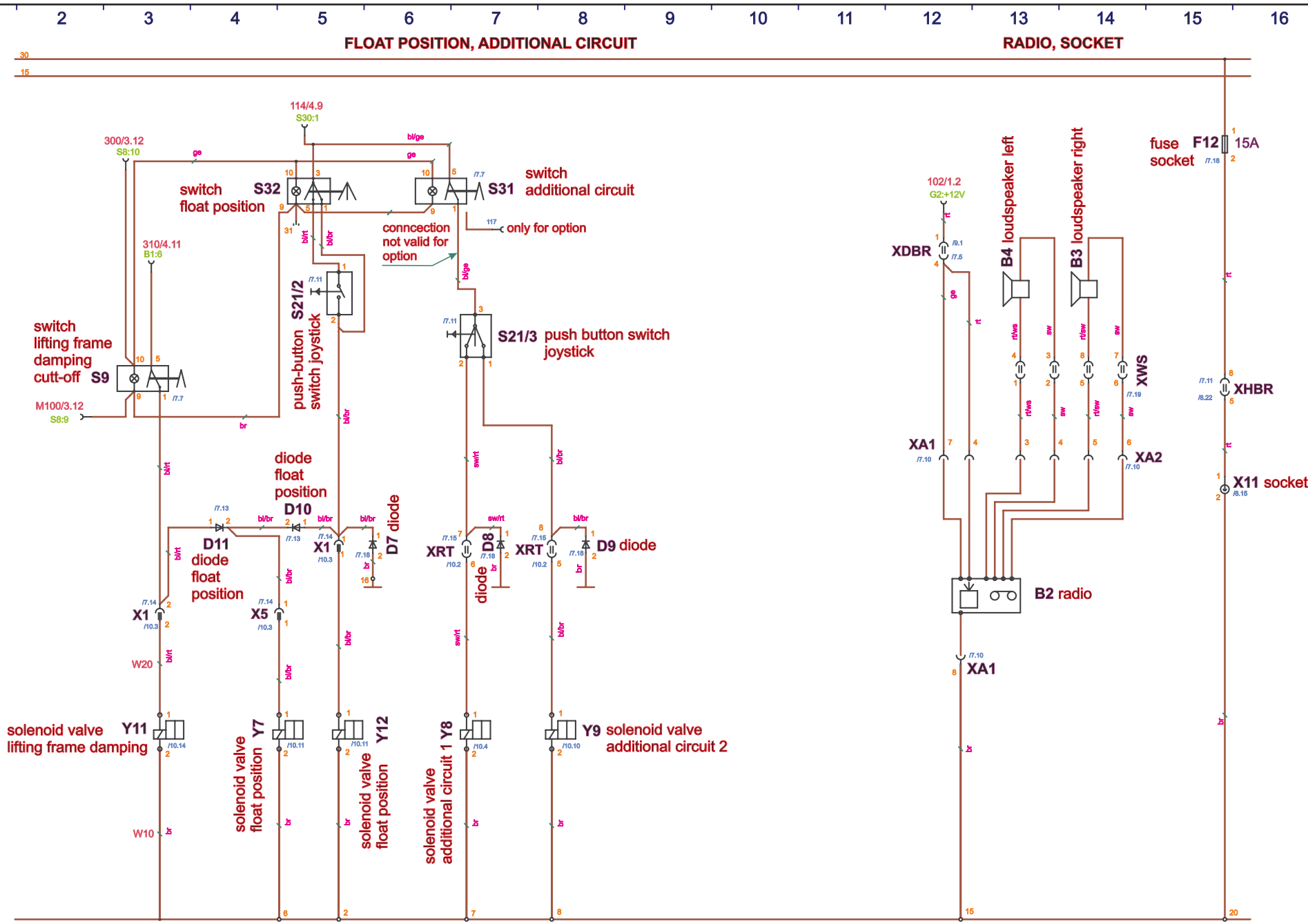
Typ / Model / Type / Tipo	SKL 200	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no.	Datum / Edition / Date / Fecha: 07.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / Circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página: 3/5	Blatt / Page / Feuille / Página: 7.13.17

BRAKES, TRAVEL, WORKING HYDRAULIC



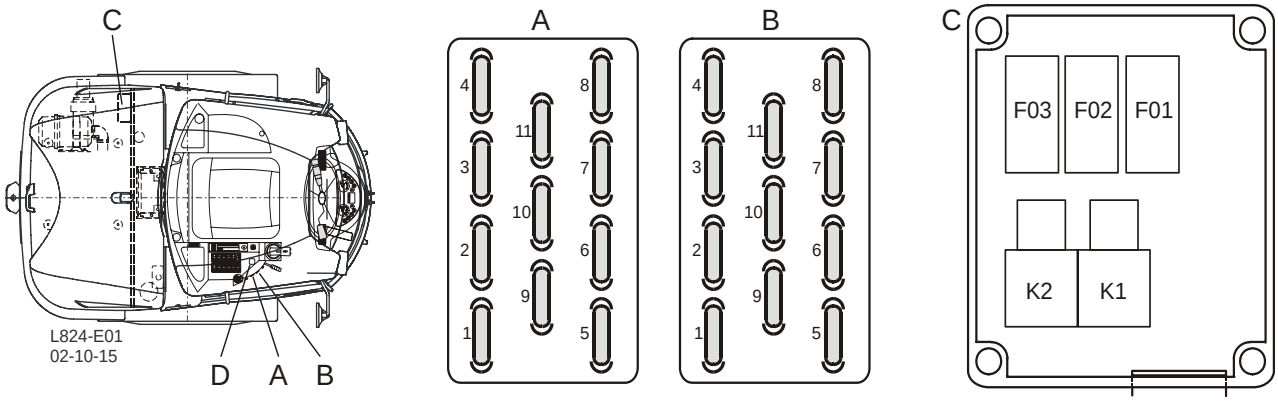
XGN	connector machine
XHR	connector machine
X1	connector lighting front
XDBR	connector relay panel
XGE	connector relay panel
XDGR	conector dash board
XHBR	connector relay panel
XOR	connector machine
X4	connector control unit
XHBL	connector relay panel

Typ / Model / Type / Tipo	SKL 200	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no.	Datum / Edition / Date / Fecha: 01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / Circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página: 4/5	Blatt / Page / Feuille / Página: 7.13.18



X1	connector lighting front	XA1	connector radio	XDBR	connector machine	Typ / Model / Type / Tipo	SKL 200	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no.	Datum / Edition / Date / Fecha	01.2007
X5	connector relay panel	XA2	connector radio	XWS	connector operator's cab	Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / Circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página	5/5	Blatt / Page / Feuille / Página	7.13.19
XRT	connector relay panel	XHBR	connector dash board								

Fuse box — Assignment diagram



D = K3 (turn-signal flasher relay) below instrument panel

A			B		
Position	**Ampere**	**assigned to**	**Position**	**Ampere**	**assigned to**
F 1	15	Heater fan	F 1	15	Working floodlight, front
F 2	15	Wash/wipe, front	F 2	15	Working floodlight, rear
F 3	15	Wash/wipe, rear	F 3	10	Turn signal
F 4	10	Rotating beacon; interior light	F 4	10	Hazard warning switch
F 5	15	Travel, forward/reverse	F 5	15	Socket; radio
F 6	10	Reserve	F 6	15	Reserve
F 7	10	Reserve	F 7	10	Horn
F 8	10	E-module inputs	F 8	10	High beam
F 9	10	Instruments	F 9	10	Low beam
F 10	10	Radio	F 10	10	Side marker light, left
F 11	15	Reserve	F 11	10	Side marker light, right

C / D					
F 01	50	Series fuse	K 1		Start relay
F 02	80	Starting system	K 2		Pre-heat relay
F 03	30	Control module power supply	K 3		Turn-signal flasher relay

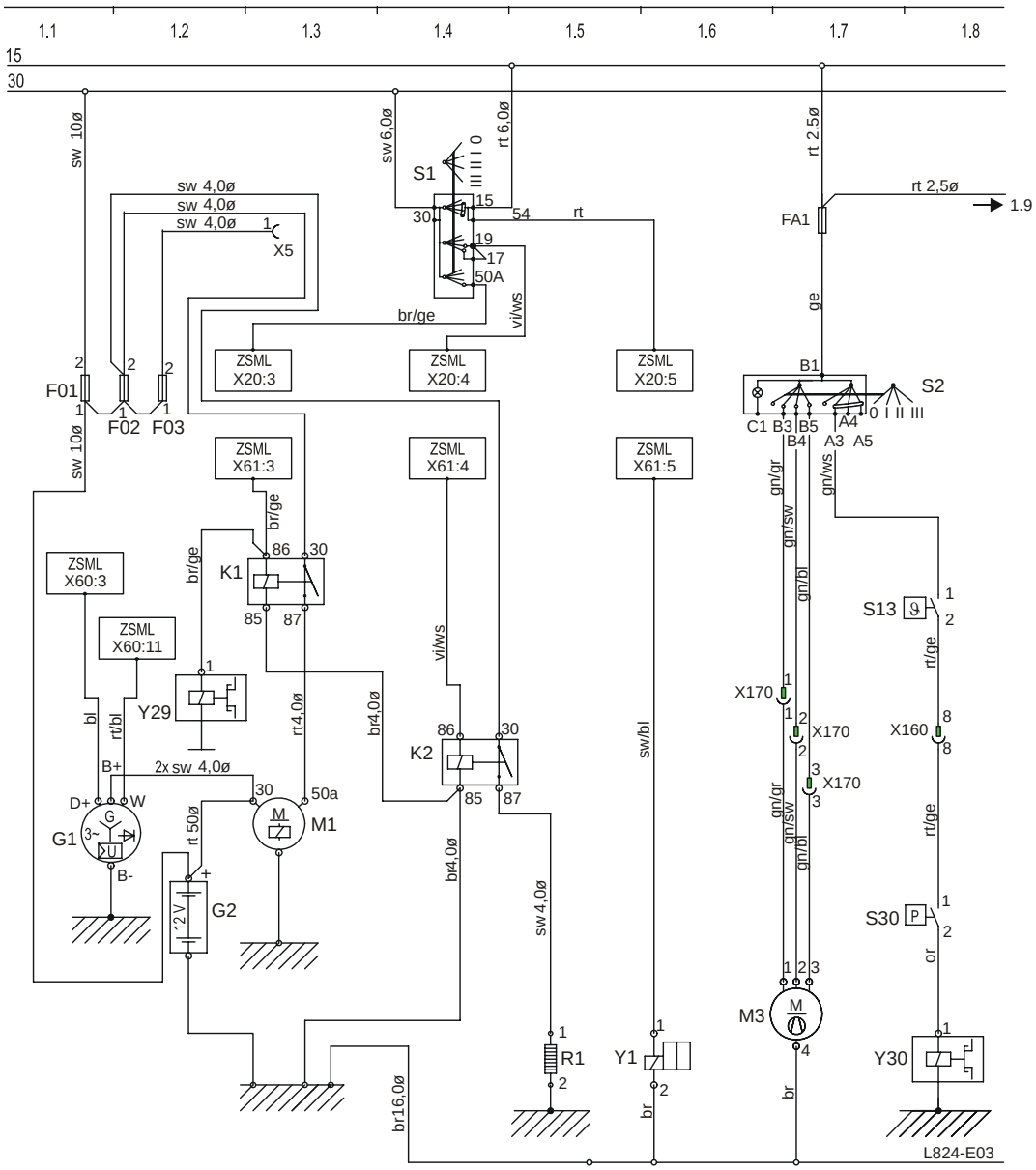
Colors of fuses

10 A	red	15 A	blue	30 A	Rose	50 A	red	80 A	white

Cable and plug colors

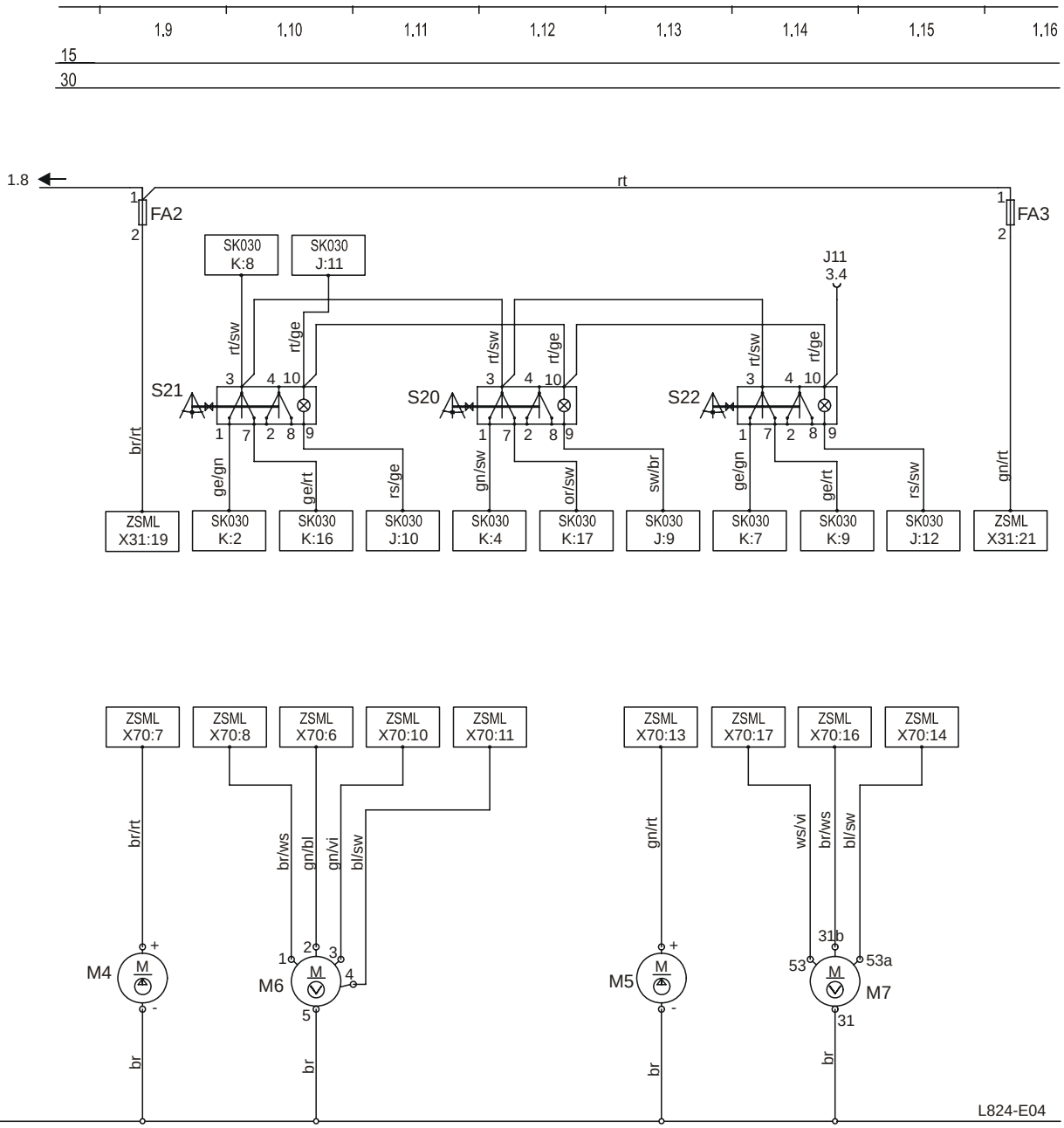
bg	beige	Dgr	dark gray	hbr	light brown	rt	red
bl	blue	Ge	yellow	hgr	light gray	sw	black
br	brown	Gn	green	hr	light red	vi	violet
dbl	dark blue	Gr	grey	nt	nature	ws	white
dbr	dark brown	Hbl	light blue	or	orange		

Start-up	Pre-heat	Shut-off	Heating	Air conditioning



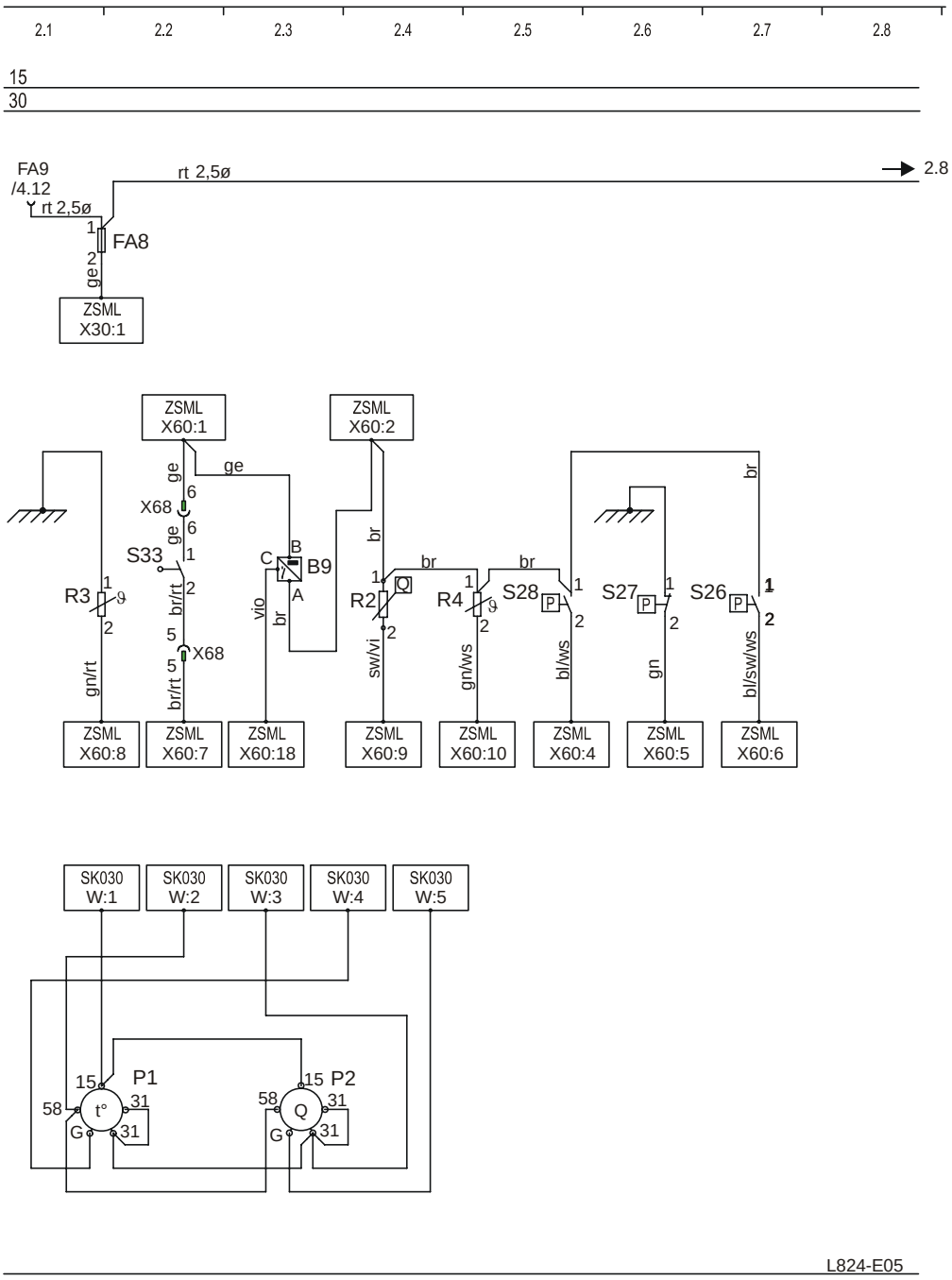
Path	Designation	Device	Path	Designation	Device
	ZSML	Central control module	1.4	K2	Start relay (starting safeguard)
1.1	F01	Flat-type fuse	1.5	R1	Glow plugs
1.1	G1	Generator	1.5	Y1	Engine shutdown
1.1	F02	Flat-type fuse	1.7	FA1	Fuse
1.2	F03	Flat-type fuse	1.7	S2	Heater switch
1.2	Y29	Cold start enhancement	1.7	M3	Heating
1.2	G2	Battery 12 V	1.8	S13	Air conditioning temperat. switch
1.3	K1	Start relay (starting aid)	1.8	S30	Air conditioning pressure switch
1.3	M1	Starter	1.8	Y30	Air conditioning relay
1.4	S1	Pre-heat/ starter switch			

Wash/wipe system, front	Wash/wipe system, rear



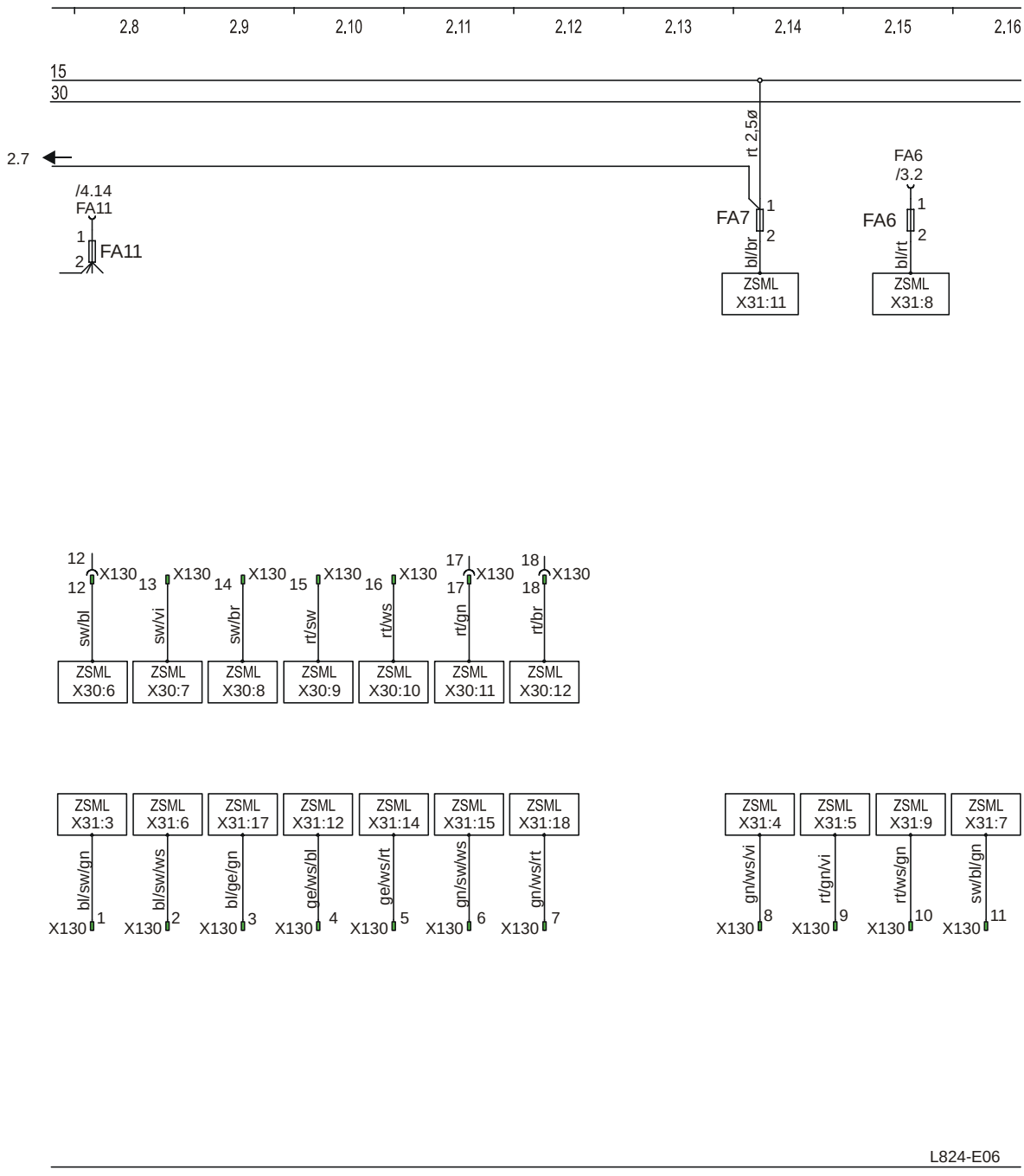
Path	Designation	Device	Path	Designation	Device
	ZSML	Central control module	1.11	S20	Washer switch front/rear
	SK030	Instrument panel	1.13	M5	Washer pump rear
1.9	FA2	Fuse	1.14	S22	Wiper switch rear
1.9	M4	Washer pump front	1.14	M7	Wiper rear
1.10	S21	Wiper switch front	1.16	FA3	Fuse
1.10	M6	Wiper front			

Monitoring



Path	Designation	Device	Path	Designation	Device
2.1	FA8	Fuse	2.4	R2	Tank sensor
2.1	R3	Engine temperature sensor	2.5	R4	Hydraulic oil temperature sensor
2.2	P1	Engine temperature indicator	2.5	S28	Air filter maintenance switch
2.2	S33	Transmission position	2.6	S27	Oil pressure switch
2.3	B9	Speed	2.7	S26	Hydrostatic brake switch
2.3	P2	Fuel tank indicator			

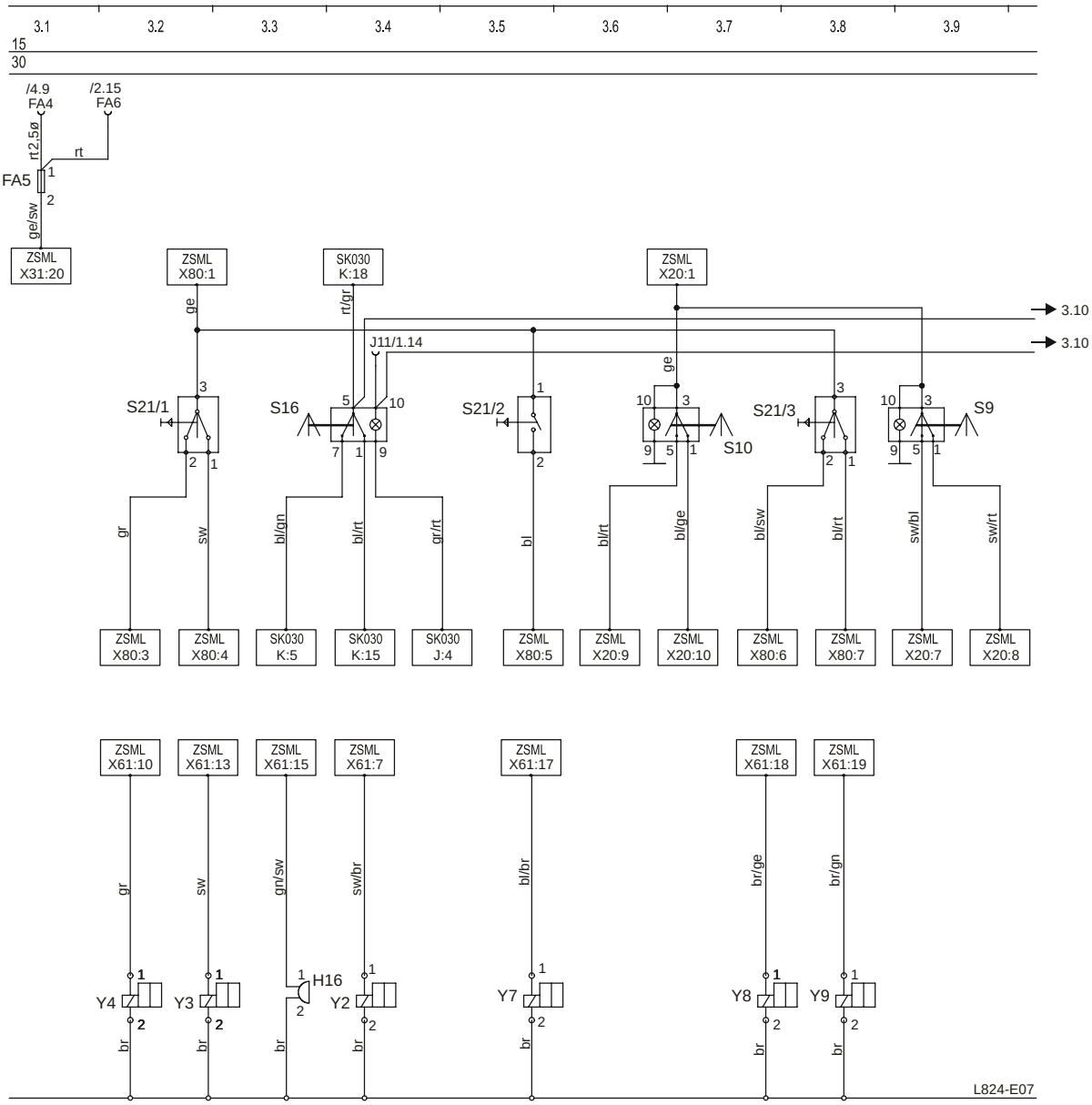
Monitoring



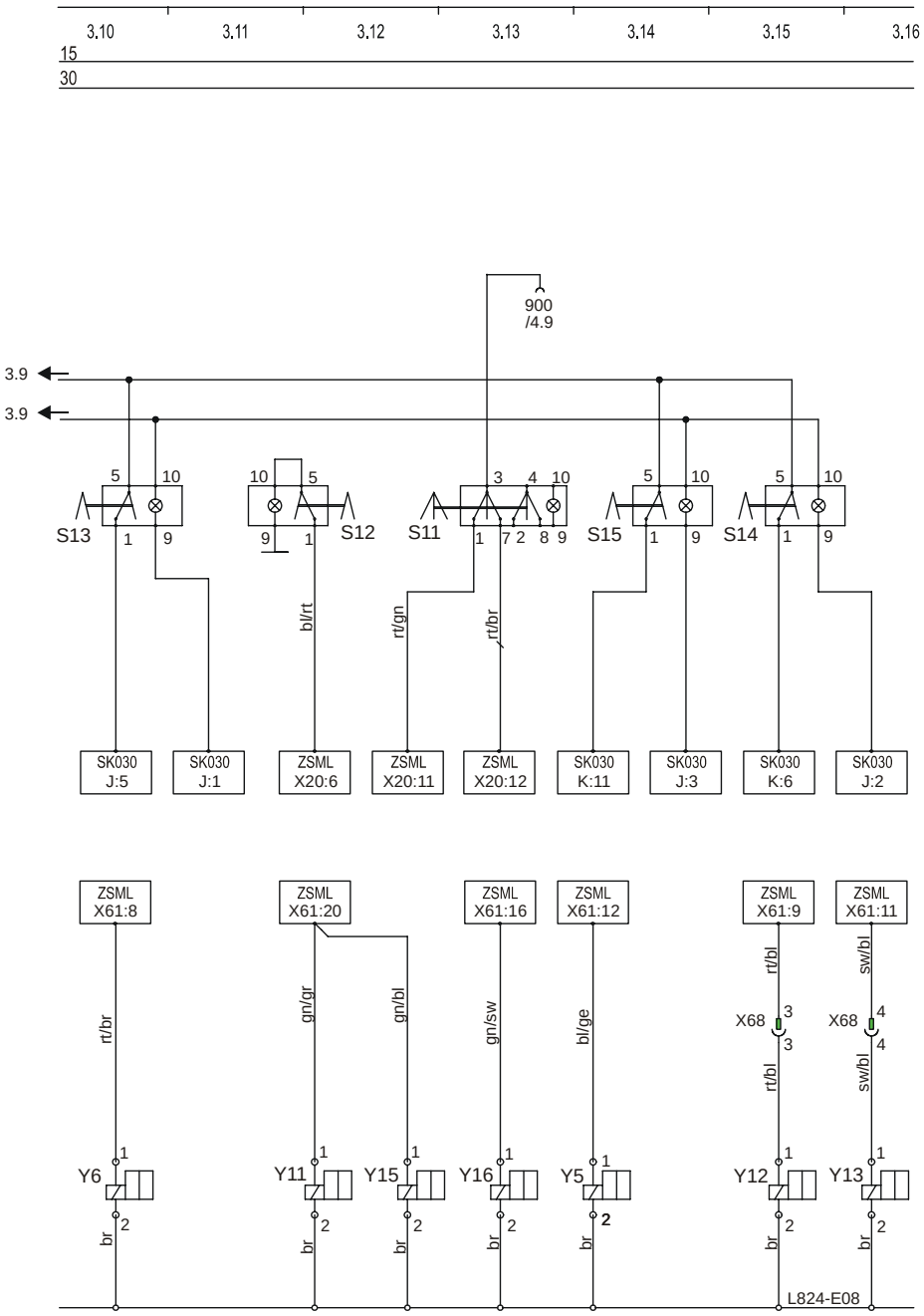
L824-E06

Path	Designation	Device	Path	Designation	Device
2.8	FA11	Reserve fuse	2.15	FA6	Reserve fuse
2.14	FA7	Reserve fuse			

"Travel" fuse	Travel	Float position	Additional control circuit

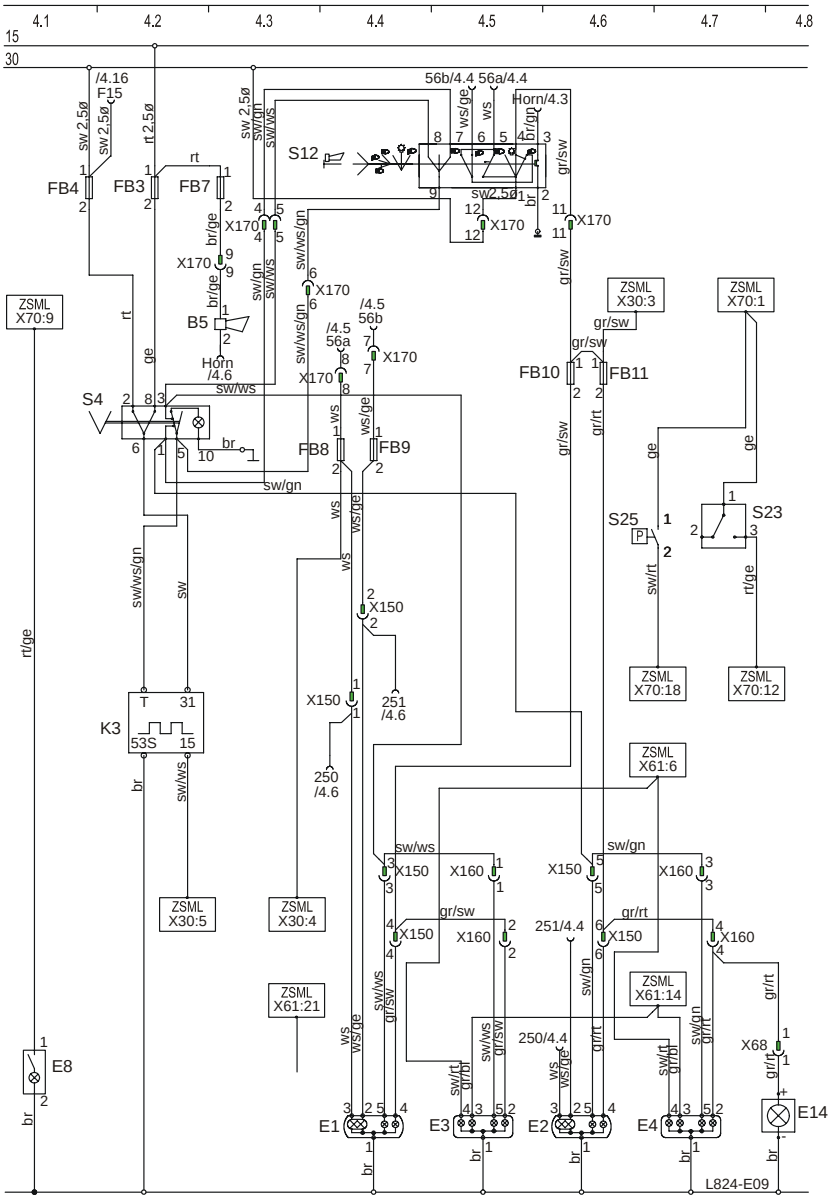


Path	Designation	Device	Path	Designation	Device
3.1	FA5	Fuse	3.5	S21/2	Float position switch
3.2	Y4	Travel, forward	3.5	Y7	Float position
3.2	S21/1	Switch for travel, forward/reverse	3.7	S10	Float position switch
3.3	Y3	Travel, reverse	3.8	Y8	Additional control circuit 1
3.3	H16	Travel motion alarm	3.8	S21/3	Additional control circuit switch
3.4	S16	Switch for travel, forward/reverse	3.8	Y9	Additional control circuit 2
3.4	Y2	Travel direction recognition	3.9	S9	Additional control circuit



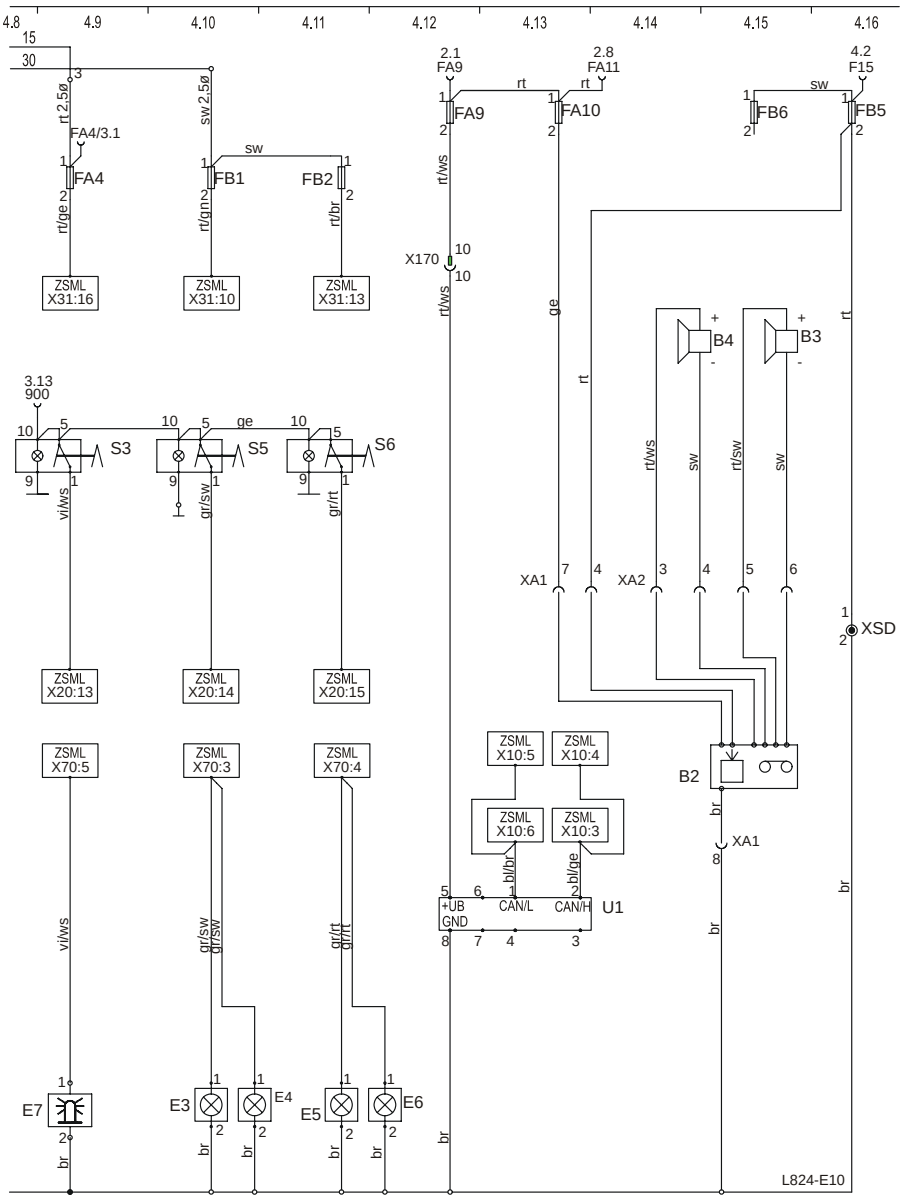
Path	Designation	Device	Path	Designation	Device
3.10	S13	Travel, SLOW	3.13	S11	4th control circuit
3.10	Y6	Travel, SLOW	3.14	Y5	Working hydraulics
3.12	S12	Ride control system switch	3.14	S15	Working hydraulics
3.12	Y11	Ride control system 1	3.15	S14	Transmission
3.12	Y15	Ride control system 2	3.15	Y12	Transmission 1
3.13	Y16	Ride control system 3	3.16	Y13	Transmission 2

Lighting and signaling



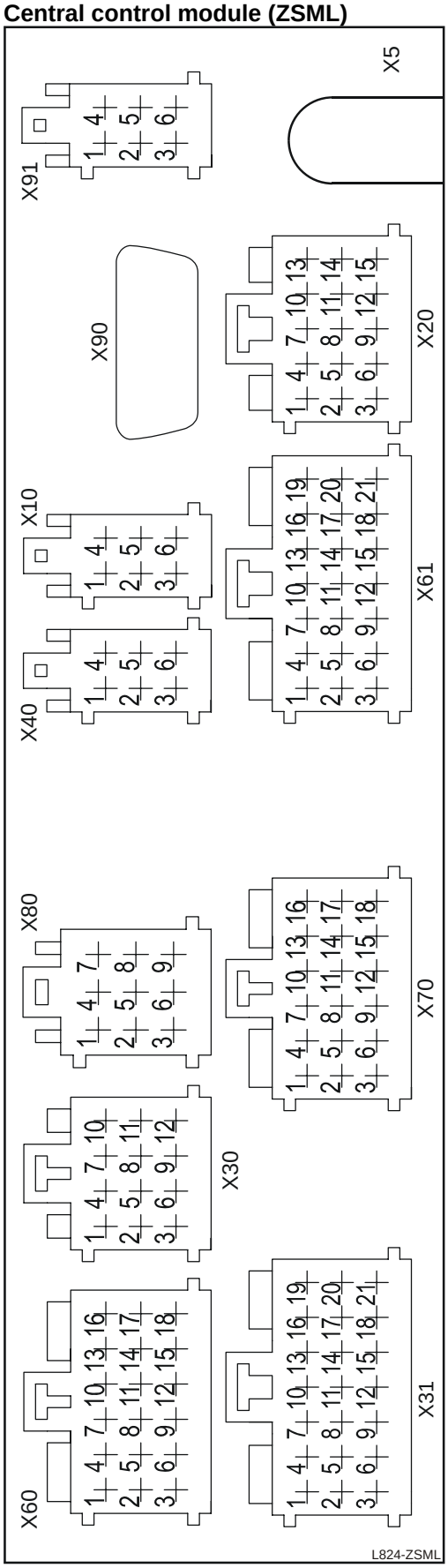
Path	Designation	Device	Path	Designation	Device
4.1	E8	Interior light	4.4	E1	Lighting front left
4.1	FB4	Fuse	4.5	S12	Light switch
4.2	FB3	Fuse	4.5	E3	Lighting rear left
4.2	S4	Direction indicator switch, hazard warning switch	4.6	FB10	Fuse
4.2	K3	Flasher transmitter	4.6	FB11	Fuse
4.3	FB7	Fuse	4.6	E2	Lighting front right
4.3	B5	Horn	4.6	S25	Brake light switch
4.4	FB8	Fuse	4.7	E4	Lighting rear right
4.4	FB9	Fuse	4.7	S23	Hand brake switch
			4.8	E14	License-plate illumination

Rotating beacon	Working floodlights	Instrument panel	Radio	Socket

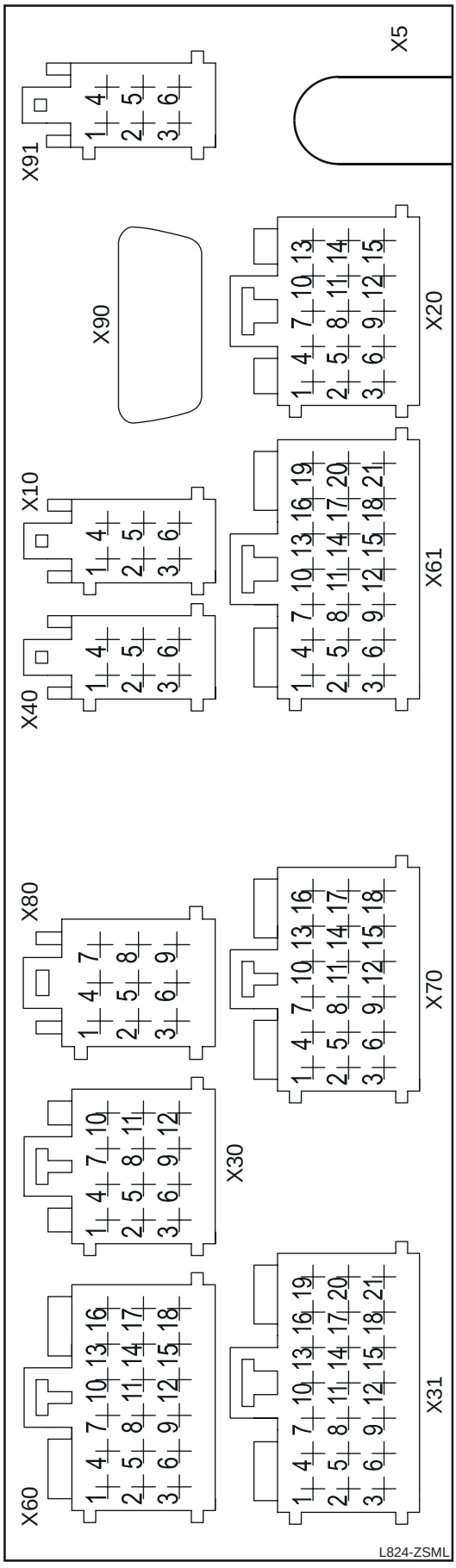


Path	Designation	Device	Path	Designation	Device
4.9	FA4	Fuse	4.12	E6	Working floodlight rear
4.9	S3	Rotating beacon switch	4.12	FA9	Fuse
4.9	E7	Rotating beacon	4.13	U1	Instrument panel
4.10	FB1	Fuse	4.13	FA10	Fuse
4.10	S5	Working floodlight front	4.15	B4	Loudspeaker
4.10	E3	Working floodlight front	4.15	B2	Radio
4.11	E4	Working floodlight front	4.15	FB6	Fuse
4.11	FB2	Fuse	4.15	B3	Loudspeaker
4.11	S6	Working floodlight rear	4.16	FB5	Fuse
4.11	E5	Working floodlight rear	4.16	XSD	Socket

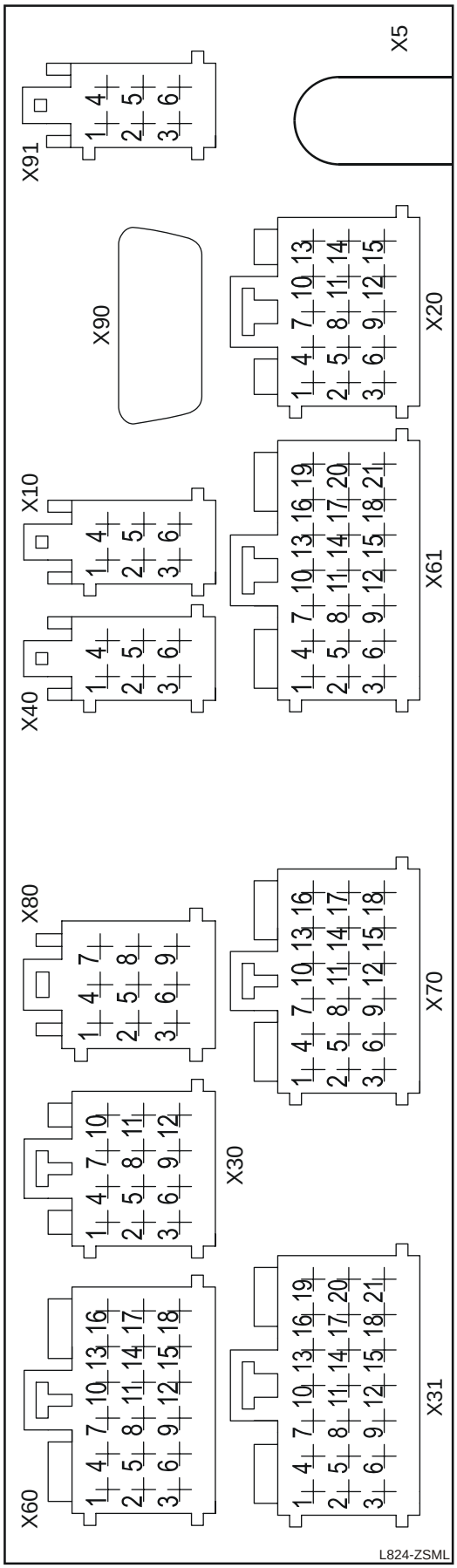
Central control module (ZSML)



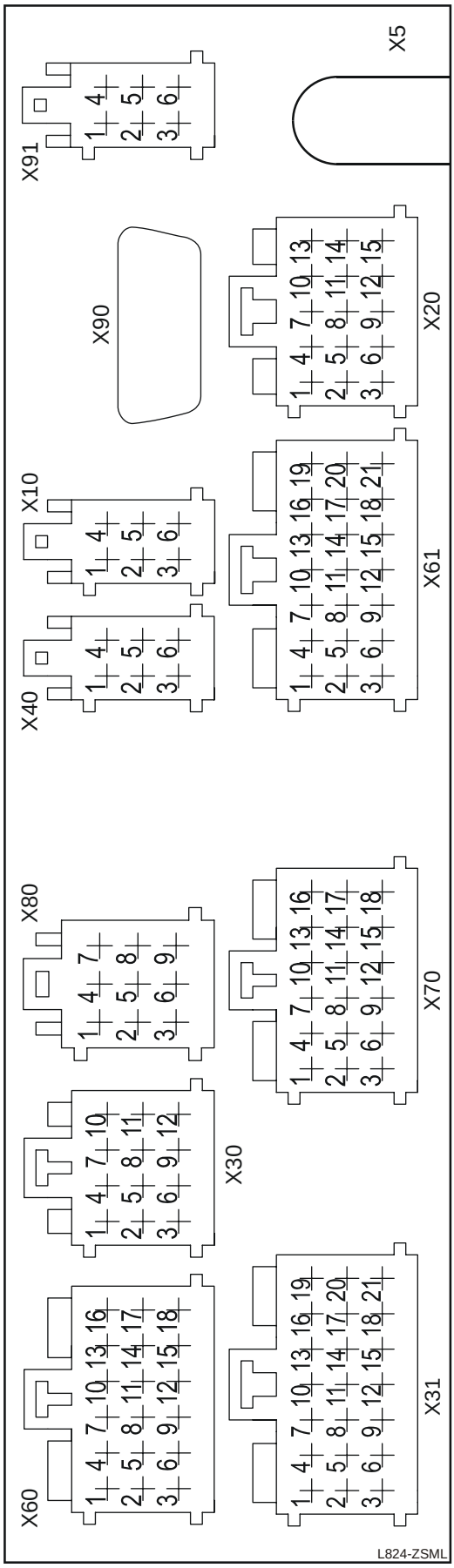
X60	***Signal inputs "engine monitoring"***
1	Power supply Terminal 15 output
2	Central mass Terminal 31
3	Charge control generator D+
4	Air filter maintenance switch signal
5	Oil pressure switch signal
6	Hydrostatic brake pressure switch signal
7	Transmission switch signal
8	Engine temperature sensor signal
9	Tank sensor signal
10	Hydraulic oil temperature sensor signal
11	Speed signal generator "W" signal
12	--
13	--
13	--
15	--
16	--
17	--
18	Speedometer signal sensor
X30	***Signal inputs "Lighting"***
1	Power supply Terminal 15 output
2	--
3	Parking light Terminal 15 input
4	High beam signal
5	Direction indicator control signal
6	Reserve -
7	Reserve +
8	Reserve +
9	Reference voltage
10	Reserve - Analog
11	Reserve - Analog
12	Reserve - Analog
X80	***Coordinate lever***
1	Power supply Terminal 15 output
2	Central mass Terminal 31
3	Travel forward signal
4	Travel reverse signal
5	Float position signal
6	Additional control circuit signal
7	Additional control circuit signal
8	Reserve - Analog
9	Reserve - Analog



X40	***CAN-BUS (Option)***
1	Power supply Terminal 15 output
2	Central mass Terminal 31
3	CAN/HI
4	R1
5	R2
6	CAN/LO
X10	***Control panel***
1	--
2	Central mass Terminal 31
3	CAN/HI
4	--
5	--
6	CAN/LO
X90	***Programming connection***
X91	***Immobilizer (Option)***
1	Power supply Terminal 15 output
2	Central mass Terminal 31
3	***TXD***
4	RXD
5	CTS
6	RTS

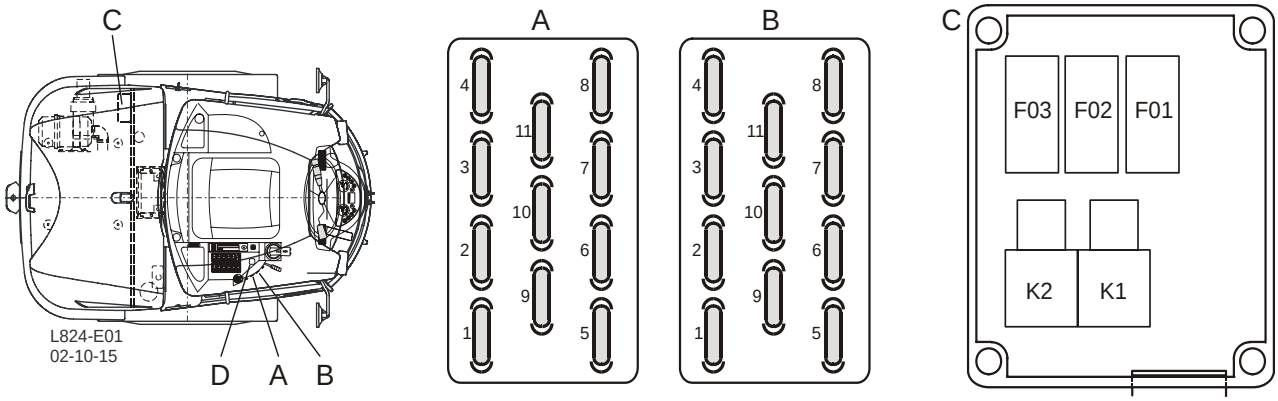


X31	***Module power supply, working floodlights, rotating beacon, wiper***
1	--
2	-
3	Reserve digital output
4	Relay K11:87a N.C. contact output
5	Relay K11:87 N.O. contact output
6	Reserve digital output
7	Relay K12:87 N.O. contact output
8	Relay K12 power supply Terminal 15 input
9	Relay K12:87a N.C. contact Output
10	Power supply Terminal 15 input working floodlight front
11	Relay K11 power supply Terminal 15 input
12	Reserve PWM output
13	Power supply Terminal 15 input working floodlight rear
14	Reserve PWM output
15	Reserve PWM output
16	Power supply Terminal 30 input rotating beacon
17	Reserve Digital output
18	Reserve PWM output
19	Power supply Terminal 15 input wash/ wipe rear
20	Power supply Terminal 15 input travel
21	Power supply Terminal 15 input wash/ wipe rear
X70	***Working floodlights , Wipers***
1	Brake light switch Terminal 15 output
2	--
3	Working floodlight front output
4	Working floodlight rear output
5	Rotating beacon output
6	Wiper Terminal 53b 2nd setting output
7	Washer pump front output
8	Wiper Terminal 31b output
9	Interior lamp Terminal 30 output
10	Wiper Terminal 53 output
11	Wiper Terminal 53a output
12	Hand brake switch signal input
13	Washer pump rear output
14	Rear wiper Terminal 53a output
15	--
16	Rear wiper Terminal 31b output
17	Rear wiper Terminal output
18	Brake light switch signal input



X61	***Rear carriage***
1	--
2	--
3	Starting Terminal 50a output
4	Pre-heat output
5	Engine shutdown output
6	Brake light output
7	Travel, direction recognition output
8	Travel, FAST-SLOW output
9	Transmission 1 output
10	Travel motion alarm output
11	Transmission 2 output
12	Working hydraulics output
13	Fog lamp Output
14	Ride control system 3 output
15	Back-up lamp output
16	Travel reverse output
17	Float position output
18	Additional control circuit output
19	Additional control circuit output
20	Ride control system 1,2 output
21	Travel forward output
X20	***Panel, right***
1	Power supply Terminal 15 output
2	--
3	Starting Terminal 50a signal
4	Pre-heat signal
5	Engine shutdown signal
6	Ride control system signal
7	Additional control circuit signal
8	Additional control circuit signal
9	Float position 1 signal
10	Float position 2 signal
11	4th control circuit signal
12	4th control circuit signal
13	Rotating beacon signal
14	Working floodlight front signal
15	Working floodlight rear Signal
X5	***Power supply***

Fuse box — Assignment diagram



D = K3 (turn-signal flasher relay) below instrument panel

A			B		
Position	**Ampere**	**assigned to**	**Position**	**Ampere**	**assigned to**
F 1	15	Heater fan	F 1	15	Working floodlight, front
F 2	15	Wash/wipe, front	F 2	15	Working floodlight, rear
F 3	15	Wash/wipe, rear	F 3	10	Turn signal
F 4	10	Rotating beacon; interior light	F 4	10	Hazard warning switch
F 5	15	Travel, forward/reverse	F 5	15	Socket; radio
F 6	10	Reserve	F 6	15	Reserve
F 7	10	Reserve	F 7	10	Horn
F 8	10	E-module inputs	F 8	10	High beam
F 9	10	Instruments	F 9	10	Low beam
F 10	10	Radio	F 10	10	Side marker light, left
F 11	15	Reserve	F 11	10	Side marker light, right

C / D					
F 01	50	Series fuse	K 1		Start relay
F 02	80	Starting system	K 2		Pre-heat relay
F 03	30	Control module power supply	K 3		Turn-signal flasher relay

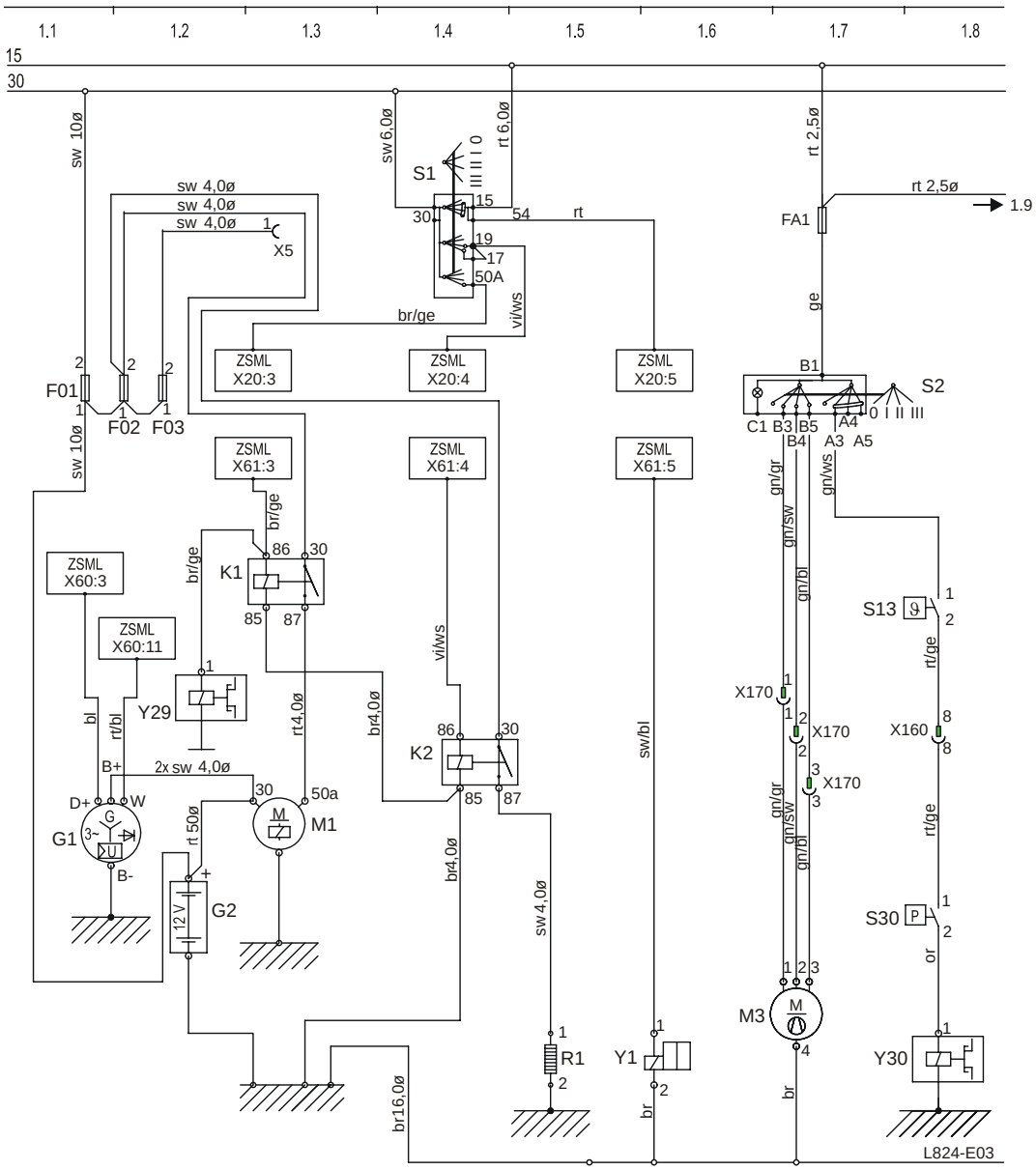
Colors of fuses

10 A	red	15 A	blue	30 A	Rose	50 A	red	80 A	white

Cable and plug colors

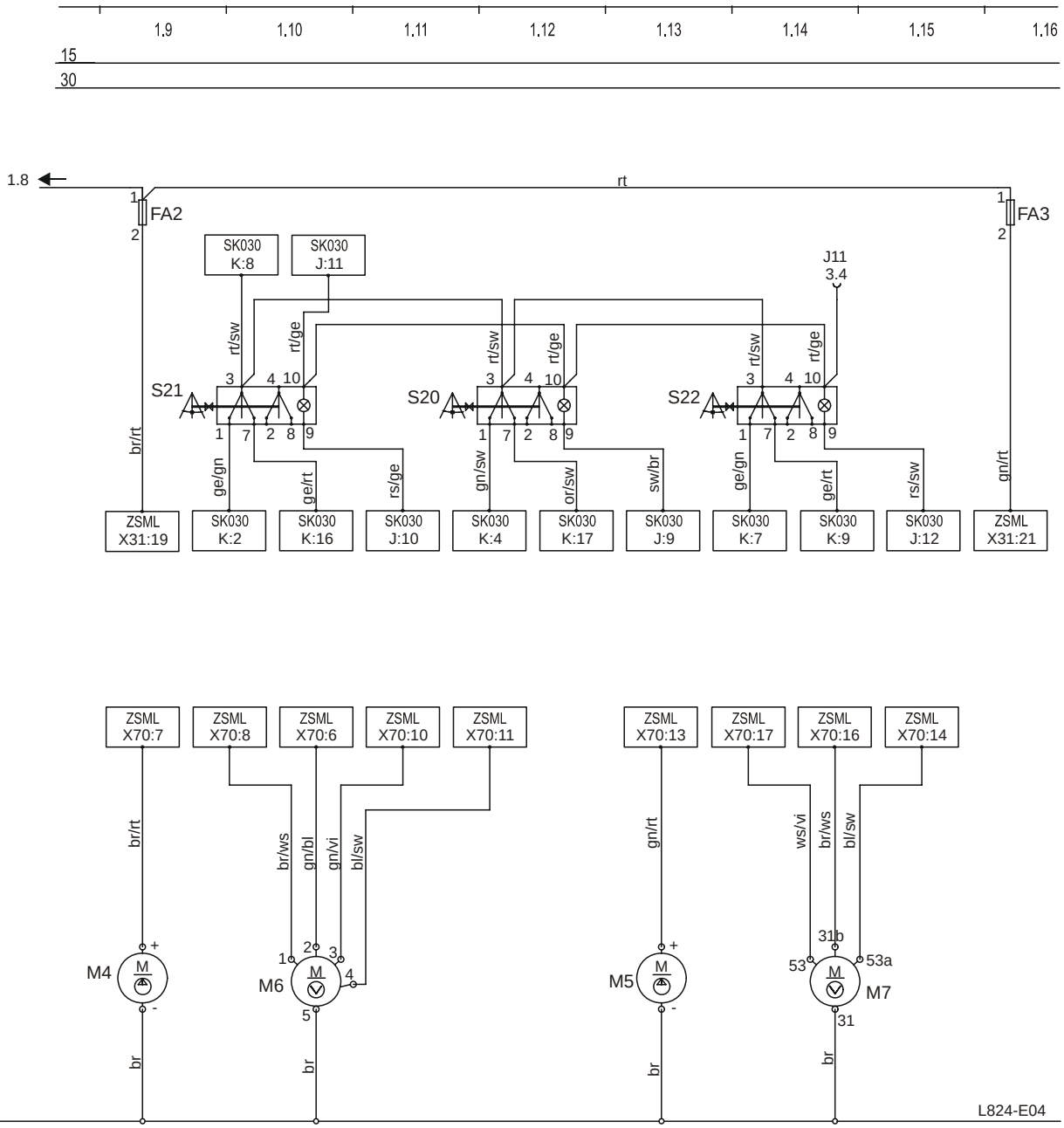
bg	beige	Dgr	dark gray	hbr	light brown	rt	red
bl	blue	Ge	yellow	hgr	light gray	sw	black
br	brown	Gn	green	hr	light red	vi	violet
dbl	dark blue	Gr	grey	nt	nature	ws	white
dbr	dark brown	Hbl	light blue	or	orange		

Start-up	Pre-heat	Shut-off	Heating	Air conditioning



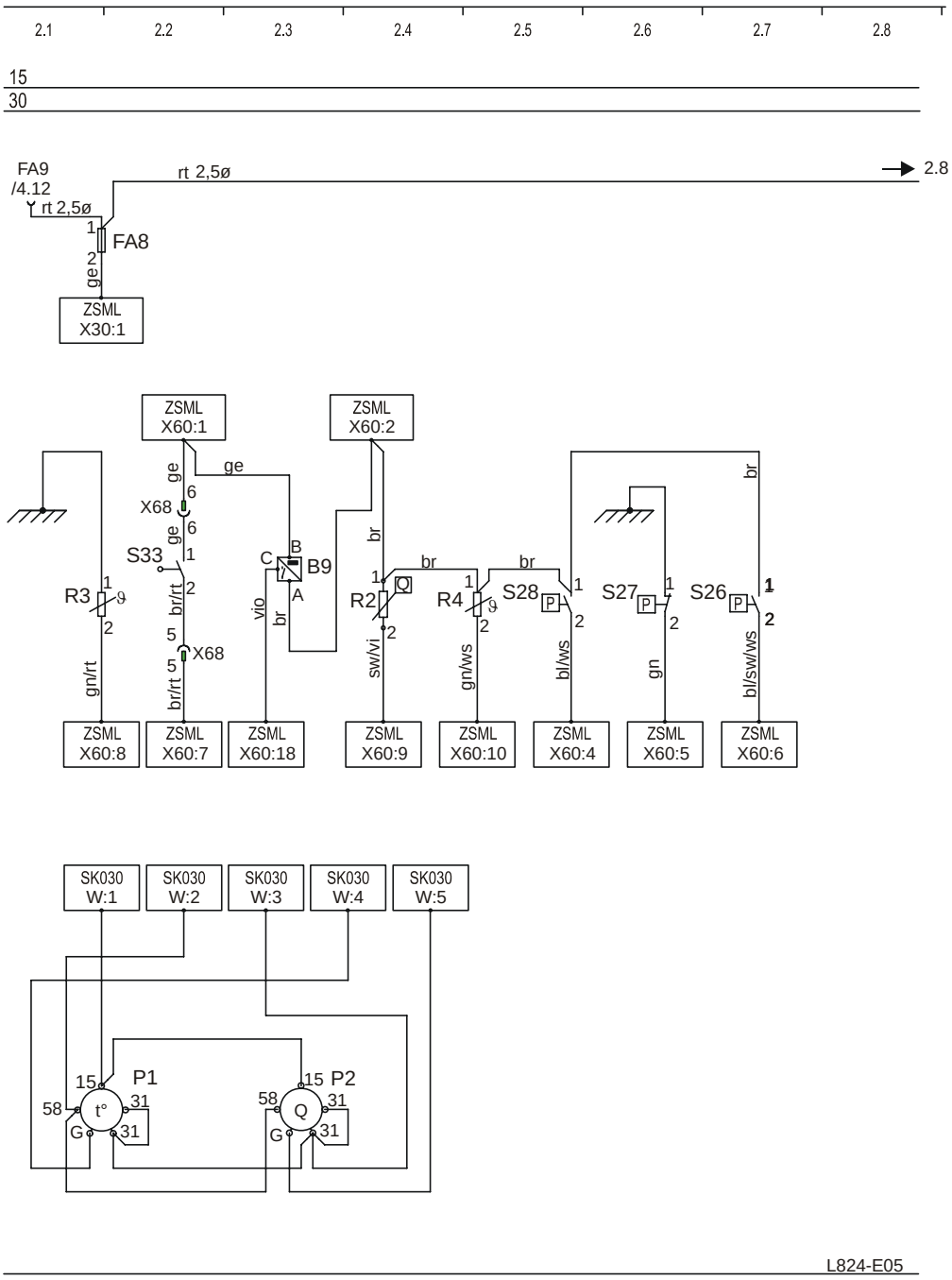
Path	Designation	Device	Path	Designation	Device
	ZSML	Central control module	1.4	K2	Start relay (starting safeguard)
1.1	F01	Flat-type fuse	1.5	R1	Glow plugs
1.1	G1	Generator	1.5	Y1	Engine shutdown
1.1	F02	Flat-type fuse	1.7	FA1	Fuse
1.2	F03	Flat-type fuse	1.7	S2	Heater switch
1.2	Y29	Cold start enhancement	1.7	M3	Heating
1.2	G2	Battery 12 V	1.8	S13	Air conditioning temperat. switch
1.3	K1	Start relay (starting aid)	1.8	S30	Air conditioning pressure switch
1.3	M1	Starter	1.8	Y30	Air conditioning relay
1.4	S1	Pre-heat/ starter switch			

Wash/wipe system, front	Wash/wipe system, rear



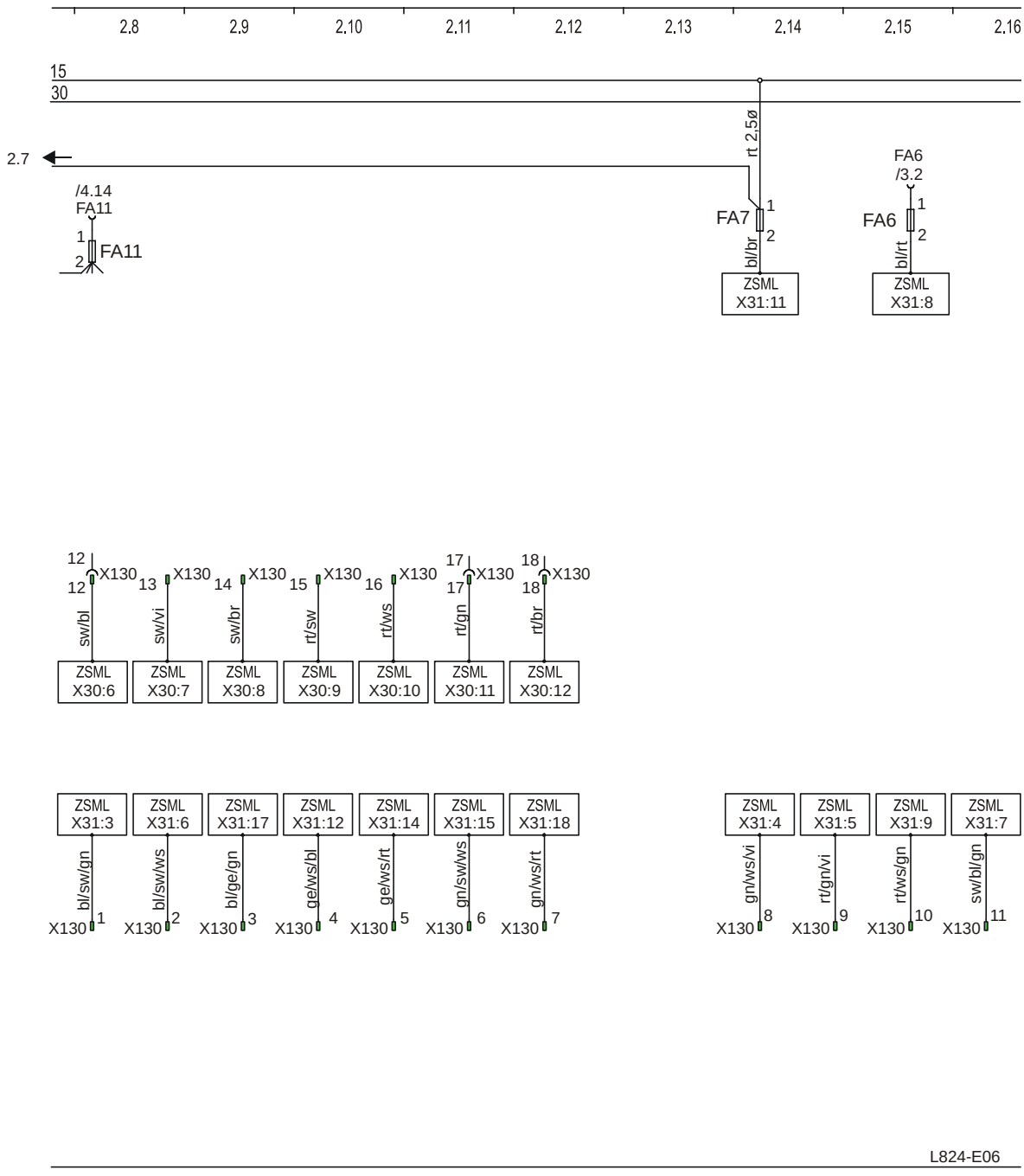
Path	Designation	Device	Path	Designation	Device
	ZSML	Central control module	1.11	S20	Washer switch front/rear
	SK030	Instrument panel	1.13	M5	Washer pump rear
1.9	FA2	Fuse	1.14	S22	Wiper switch rear
1.9	M4	Washer pump front	1.14	M7	Wiper rear
1.10	S21	Wiper switch front	1.16	FA3	Fuse
1.10	M6	Wiper front			

Monitoring



Path	Designation	Device	Path	Designation	Device
2.1	FA8	Fuse	2.4	R2	Tank sensor
2.1	R3	Engine temperature sensor	2.5	R4	Hydraulic oil temperature sensor
2.2	P1	Engine temperature indicator	2.5	S28	Air filter maintenance switch
2.2	S33	Transmission position	2.6	S27	Oil pressure switch
2.3	B9	Speed	2.7	S26	Hydrostatic brake switch
2.3	P2	Fuel tank indicator			

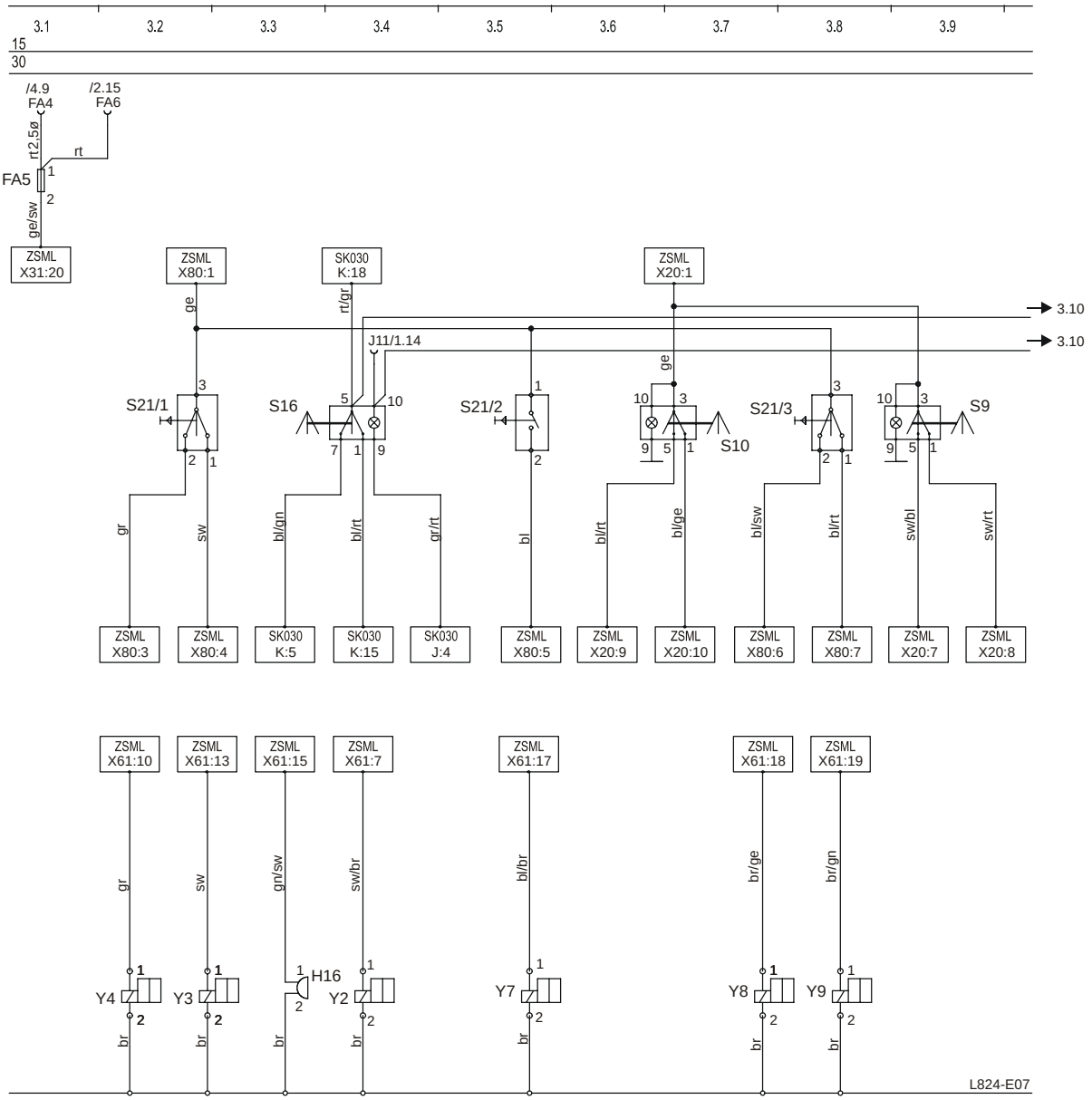
Monitoring



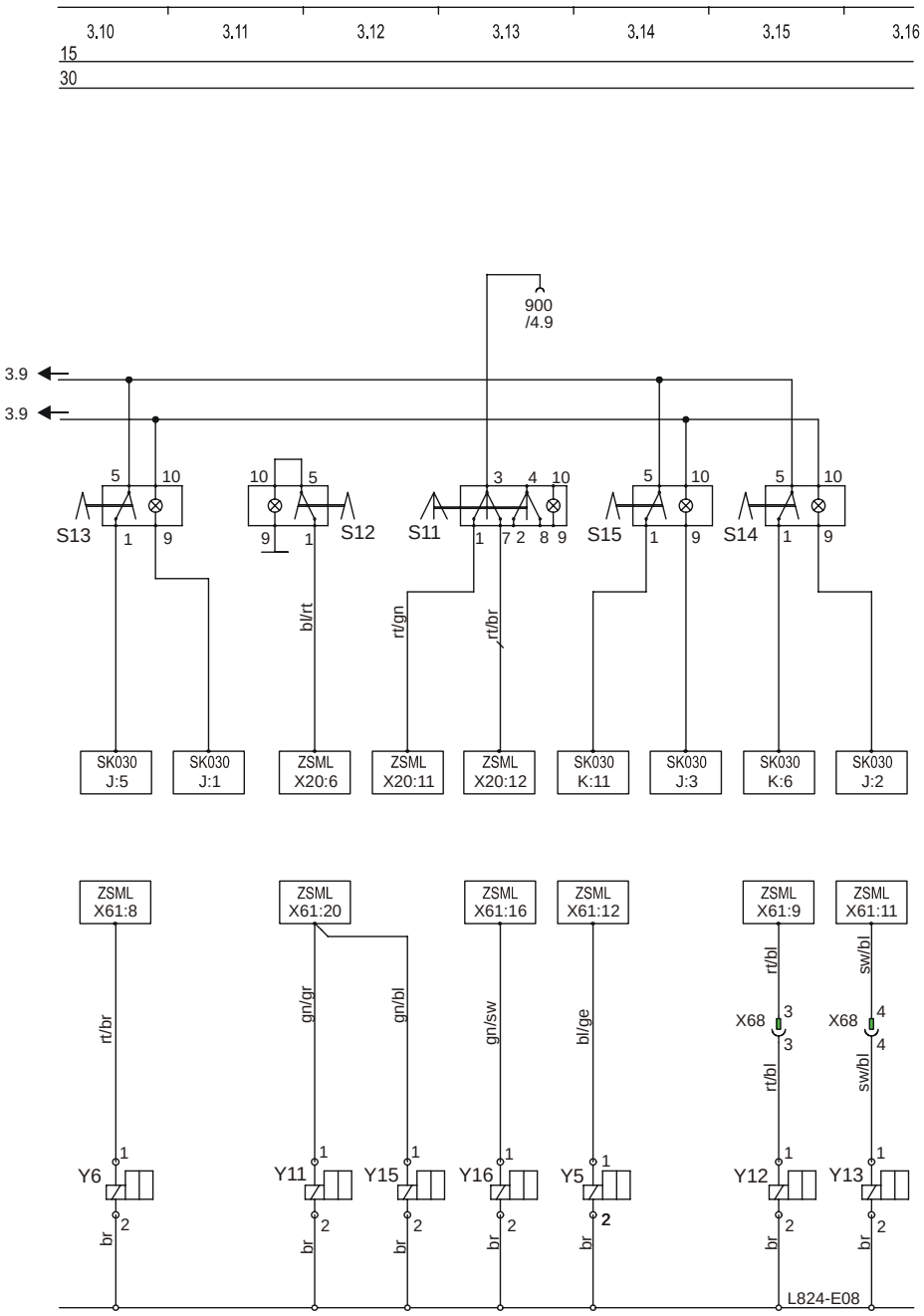
L824-E06

Path	Designation	Device	Path	Designation	Device
2.8	FA11	Reserve fuse	2.15	FA6	Reserve fuse
2.14	FA7	Reserve fuse			

"Travel" fuse	Travel	Float position	Additional control circuit

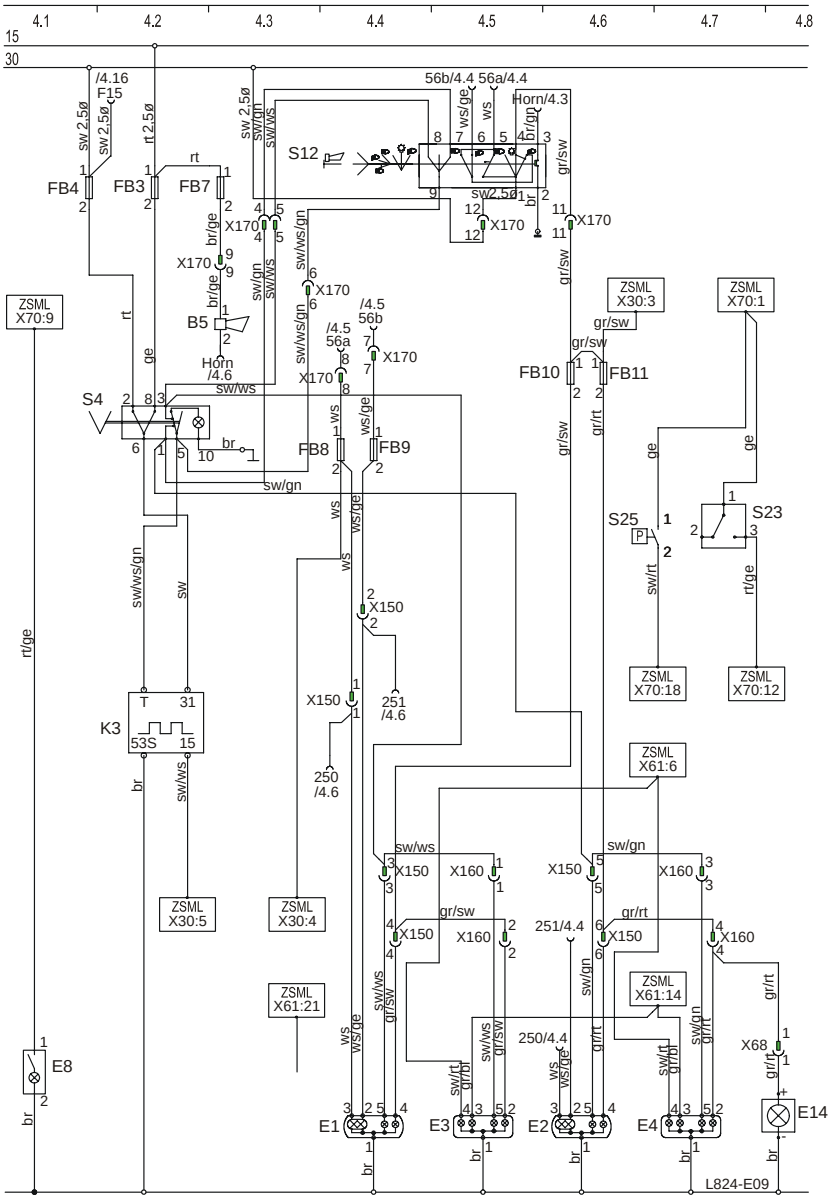


Path	Designation	Device	Path	Designation	Device
3.1	FA5	Fuse	3.5	S21/2	Float position switch
3.2	Y4	Travel, forward	3.5	Y7	Float position
3.2	S21/1	Switch for travel, forward/reverse	3.7	S10	Float position switch
3.3	Y3	Travel, reverse	3.8	Y8	Additional control circuit 1
3.3	H16	Travel motion alarm	3.8	S21/3	Additional control circuit switch
3.4	S16	Switch for travel, forward/reverse	3.8	Y9	Additional control circuit 2
3.4	Y2	Travel direction recognition	3.9	S9	Additional control circuit



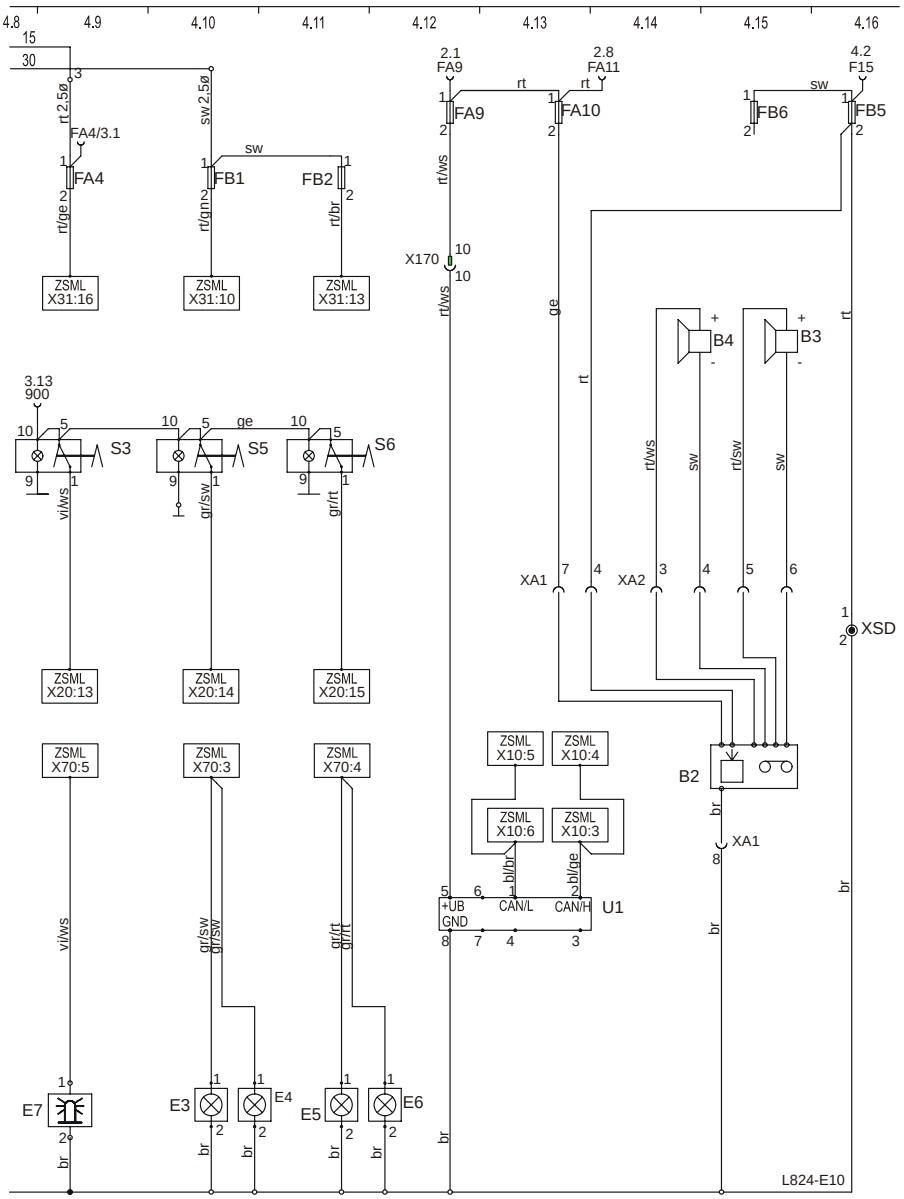
Path	Designation	Device	Path	Designation	Device
3.10	S13	Travel, SLOW	3.13	S11	4th control circuit
3.10	Y6	Travel, SLOW	3.14	Y5	Working hydraulics
3.12	S12	Ride control system switch	3.14	S15	Working hydraulics
3.12	Y11	Ride control system 1	3.15	S14	Transmission
3.12	Y15	Ride control system 2	3.15	Y12	Transmission 1
3.13	Y16	Ride control system 3	3.16	Y13	Transmission 2

Lighting and signaling



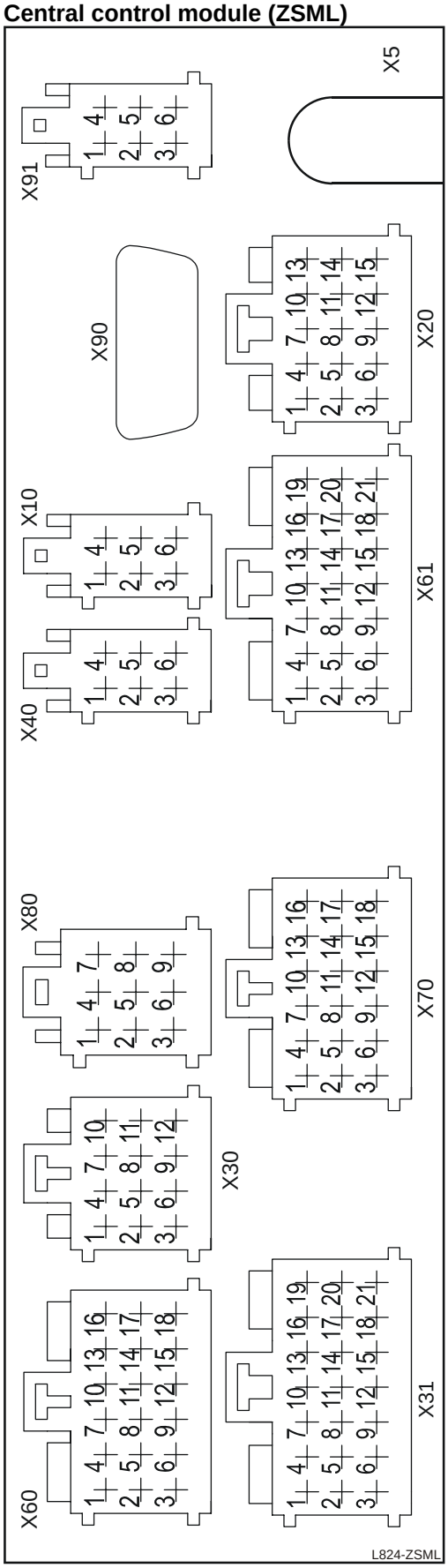
Path	Designation	Device	Path	Designation	Device
4.1	E8	Interior light	4.4	E1	Lighting front left
4.1	FB4	Fuse	4.5	S12	Light switch
4.2	FB3	Fuse	4.5	E3	Lighting rear left
4.2	S4	Direction indicator switch, hazard warning switch	4.6	FB10	Fuse
4.2	K3	Flasher transmitter	4.6	FB11	Fuse
4.3	FB7	Fuse	4.6	E2	Lighting front right
4.3	B5	Horn	4.6	S25	Brake light switch
4.4	FB8	Fuse	4.7	E4	Lighting rear right
4.4	FB9	Fuse	4.7	S23	Hand brake switch
			4.8	E14	License-plate illumination

Rotating beacon	Working floodlights	Instrument panel	Radio	Socket

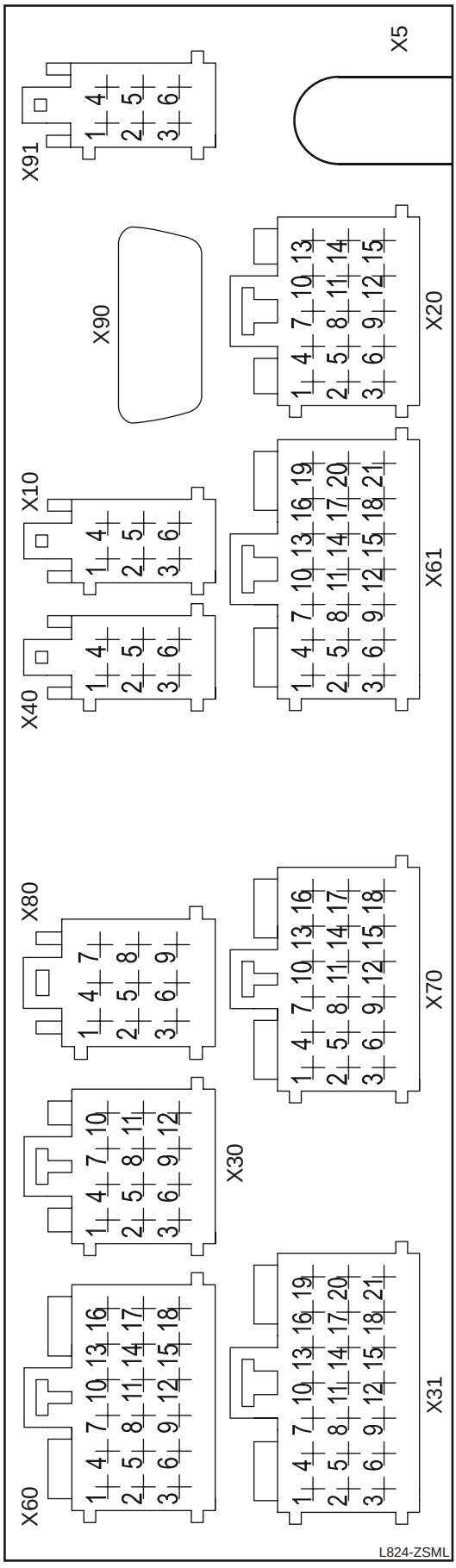


Path	Designation	Device	Path	Designation	Device
4.9	FA4	Fuse	4.12	E6	Working floodlight rear
4.9	S3	Rotating beacon switch	4.12	FA9	Fuse
4.9	E7	Rotating beacon	4.13	U1	Instrument panel
4.10	FB1	Fuse	4.13	FA10	Fuse
4.10	S5	Working floodlight front	4.15	B4	Loudspeaker
4.10	E3	Working floodlight front	4.15	B2	Radio
4.11	E4	Working floodlight front	4.15	FB6	Fuse
4.11	FB2	Fuse	4.15	B3	Loudspeaker
4.11	S6	Working floodlight rear	4.16	FB5	Fuse
4.11	E5	Working floodlight rear	4.16	XSD	Socket

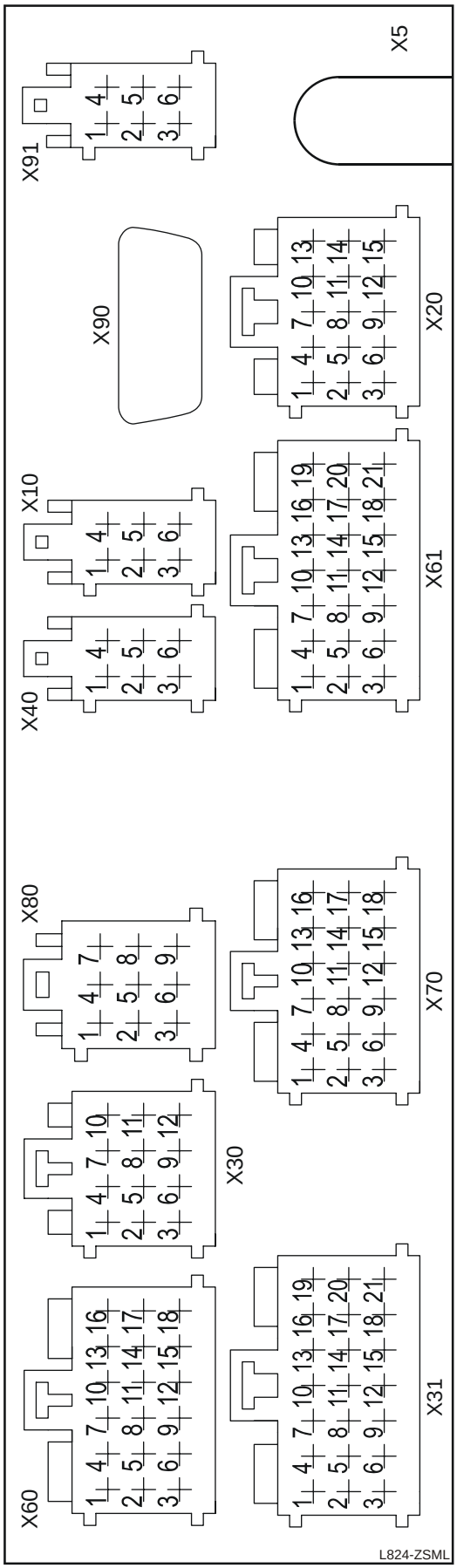
Central control module (ZSML)



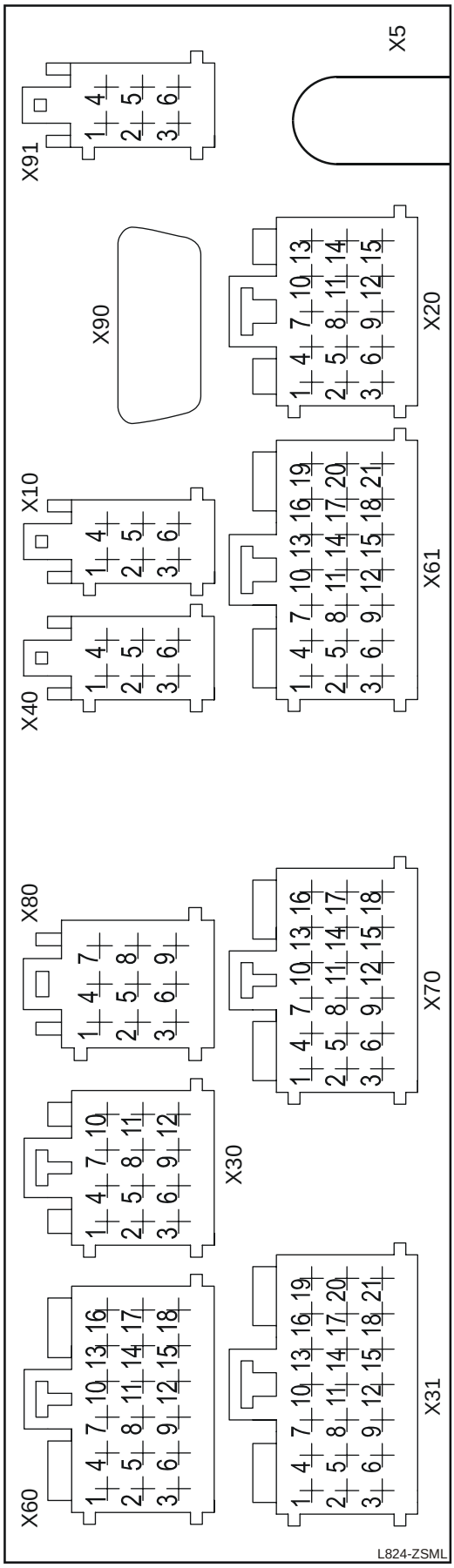
X60	***Signal inputs "engine monitoring"***
1	Power supply Terminal 15 output
2	Central mass Terminal 31
3	Charge control generator D+
4	Air filter maintenance switch signal
5	Oil pressure switch signal
6	Hydrostatic brake pressure switch signal
7	Transmission switch signal
8	Engine temperature sensor signal
9	Tank sensor signal
10	Hydraulic oil temperature sensor signal
11	Speed signal generator "W" signal
12	--
13	--
13	--
15	--
16	--
17	--
18	Speedometer signal sensor
X30	***Signal inputs "Lighting"***
1	Power supply Terminal 15 output
2	--
3	Parking light Terminal 15 input
4	High beam signal
5	Direction indicator control signal
6	Reserve -
7	Reserve +
8	Reserve +
9	Reference voltage
10	Reserve - Analog
11	Reserve - Analog
12	Reserve - Analog
X80	***Coordinate lever***
1	Power supply Terminal 15 output
2	Central mass Terminal 31
3	Travel forward signal
4	Travel reverse signal
5	Float position signal
6	Additional control circuit signal
7	Additional control circuit signal
8	Reserve - Analog
9	Reserve - Analog



X40	***CAN-BUS (Option)***
1	Power supply Terminal 15 output
2	Central mass Terminal 31
3	CAN/HI
4	R1
5	R2
6	CAN/LO
X10	***Control panel***
1	--
2	Central mass Terminal 31
3	CAN/HI
4	--
5	--
6	CAN/LO
X90	***Programming connection***
X91	***Immobilizer (Option)***
1	Power supply Terminal 15 output
2	Central mass Terminal 31
3	***TXD***
4	RXD
5	CTS
6	RTS

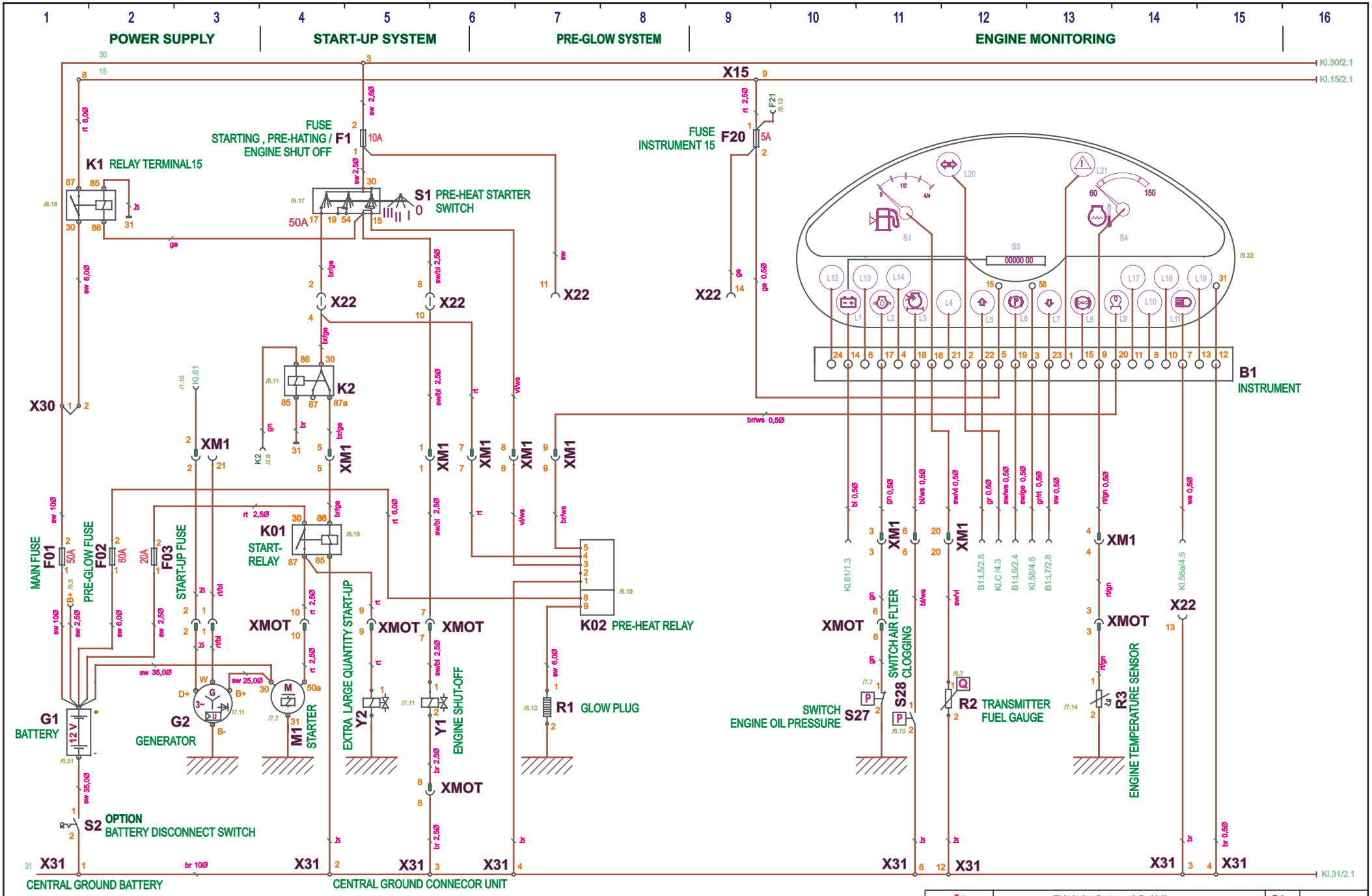


X31	***Module power supply, working floodlights, rotating beacon, wiper***
1	--
2	-
3	Reserve digital output
4	Relay K11:87a N.C. contact output
5	Relay K11:87 N.O. contact output
6	Reserve digital output
7	Relay K12:87 N.O. contact output
8	Relay K12 power supply Terminal 15 input
9	Relay K12:87a N.C. contact Output
10	Power supply Terminal 15 input working floodlight front
11	Relay K11 power supply Terminal 15 input
12	Reserve PWM output
13	Power supply Terminal 15 input working floodlight rear
14	Reserve PWM output
15	Reserve PWM output
16	Power supply Terminal 30 input rotating beacon
17	Reserve Digital output
18	Reserve PWM output
19	Power supply Terminal 15 input wash/ wipe rear
20	Power supply Terminal 15 input travel
21	Power supply Terminal 15 input wash/ wipe rear
X70	***Working floodlights , Wipers***
1	Brake light switch Terminal 15 output
2	--
3	Working floodlight front output
4	Working floodlight rear output
5	Rotating beacon output
6	Wiper Terminal 53b 2nd setting output
7	Washer pump front output
8	Wiper Terminal 31b output
9	Interior lamp Terminal 30 output
10	Wiper Terminal 53 output
11	Wiper Terminal 53a output
12	Hand brake switch signal input
13	Washer pump rear output
14	Rear wiper Terminal 53a output
15	--
16	Rear wiper Terminal 31b output
17	Rear wiper Terminal output
18	Brake light switch signal input



X61	***Rear carriage***
1	--
2	--
3	Starting Terminal 50a output
4	Pre-heat output
5	Engine shutdown output
6	Brake light output
7	Travel, direction recognition output
8	Travel, FAST-SLOW output
9	Transmission 1 output
10	Travel motion alarm output
11	Transmission 2 output
12	Working hydraulics output
13	Fog lamp Output
14	Ride control system 3 output
15	Back-up lamp output
16	Travel reverse output
17	Float position output
18	Additional control circuit output
19	Additional control circuit output
20	Ride control system 1,2 output
21	Travel forward output
X20	***Panel, right***
1	Power supply Terminal 15 output
2	--
3	Starting Terminal 50a signal
4	Pre-heat signal
5	Engine shutdown signal
6	Ride control system signal
7	Additional control circuit signal
8	Additional control circuit signal
9	Float position 1 signal
10	Float position 2 signal
11	4th control circuit signal
12	4th control circuit signal
13	Rotating beacon signal
14	Working floodlight front signal
15	Working floodlight rear Signal
X5	***Power supply***

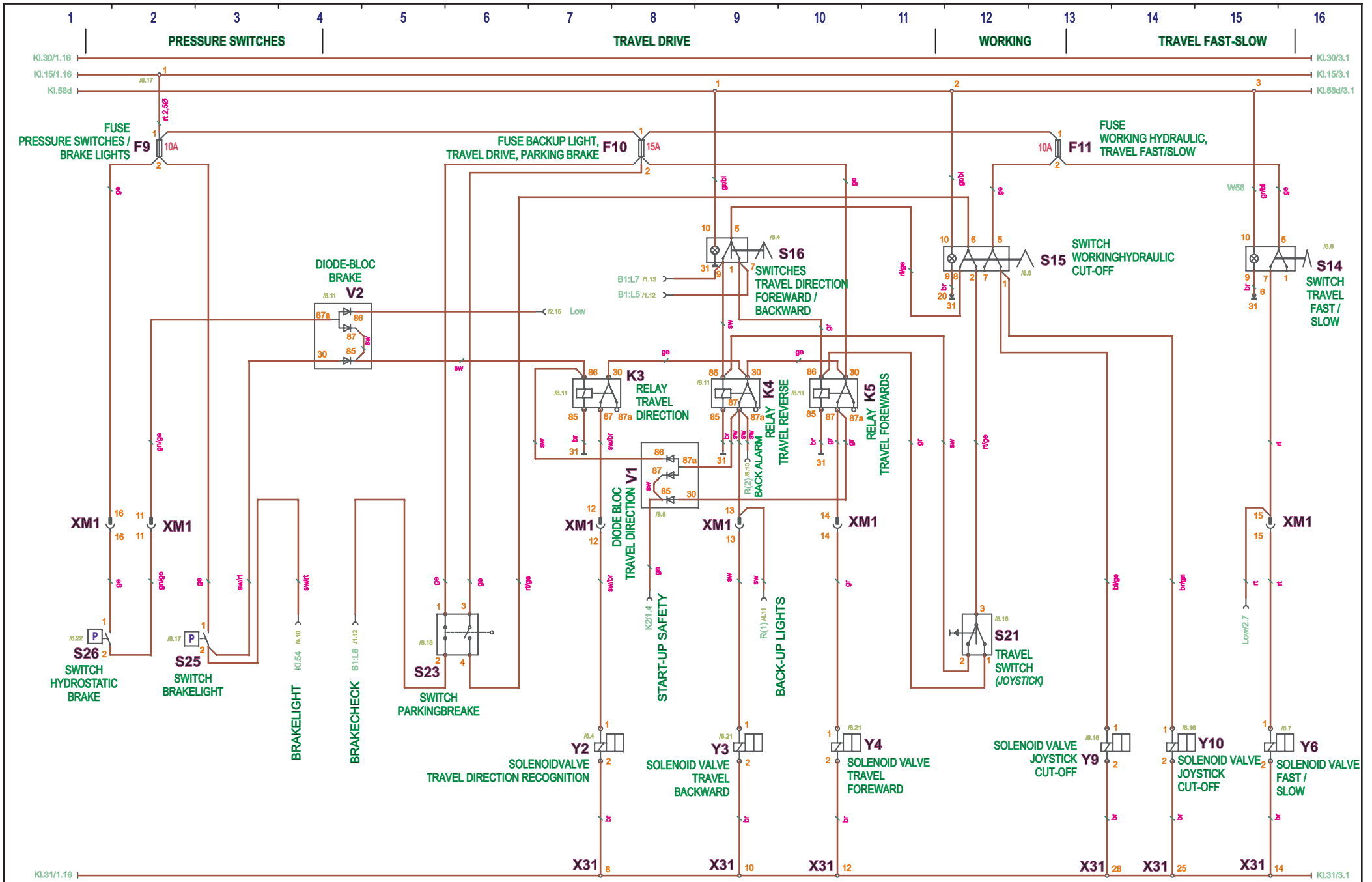

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X31	CENRAL GROUND
X15	POWER SUPPLY
X30	POWER SUPPLY

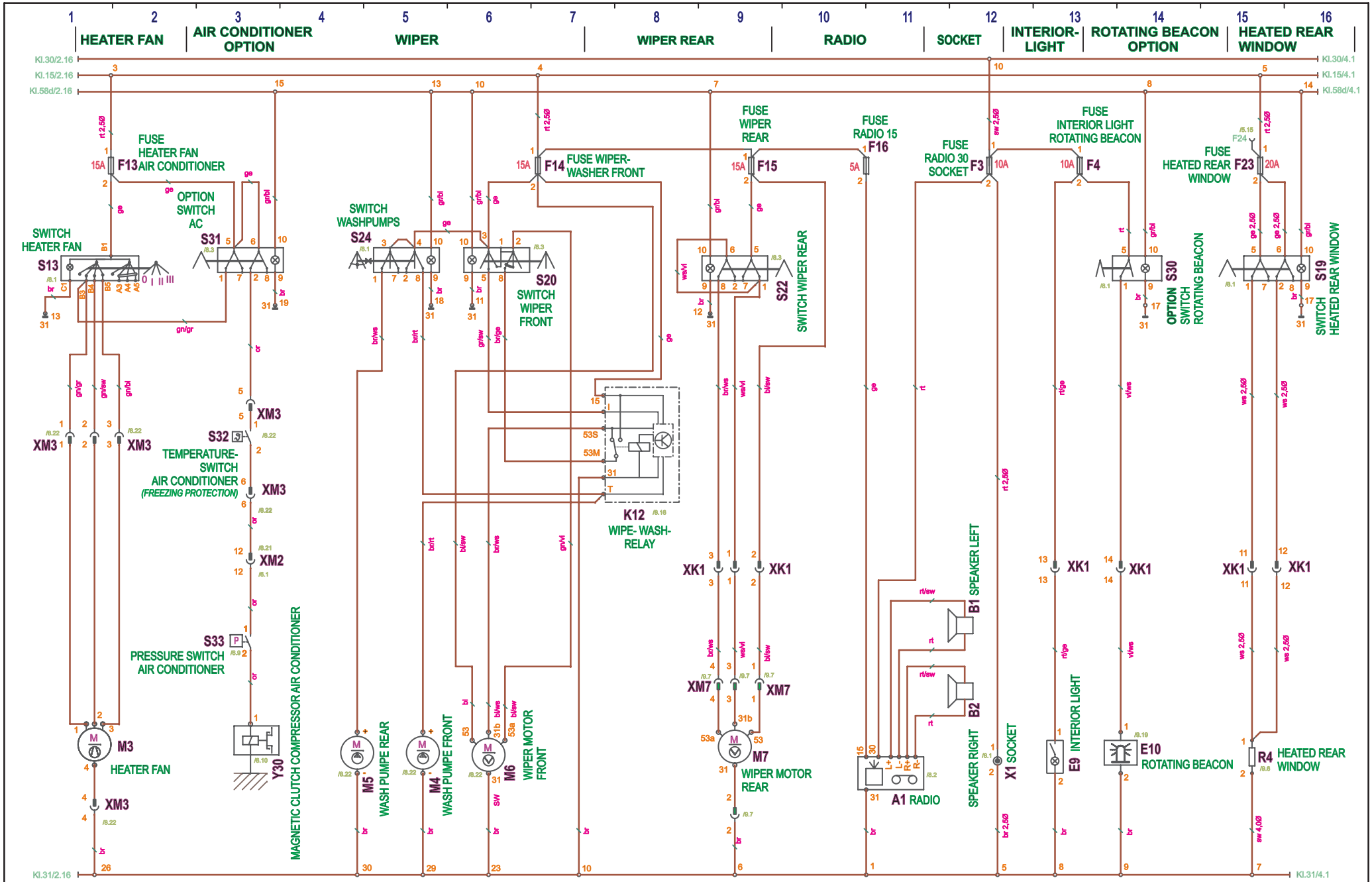
X22	CONNECTOR MACHINE-DASH BOARD
XM1	CONNECTOR DASH BOARD-MACHINE FRAME
XMOT	CONNECTOR MACHINE FRAME-ENGINE

Typ / Model / Type / Tipo	TL80AS	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TL80AS0101	Datum / Edition / Date / Fecha: 01.2008
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página: 1/6	Blatt / Page / Feuille / Página: 7.25.01



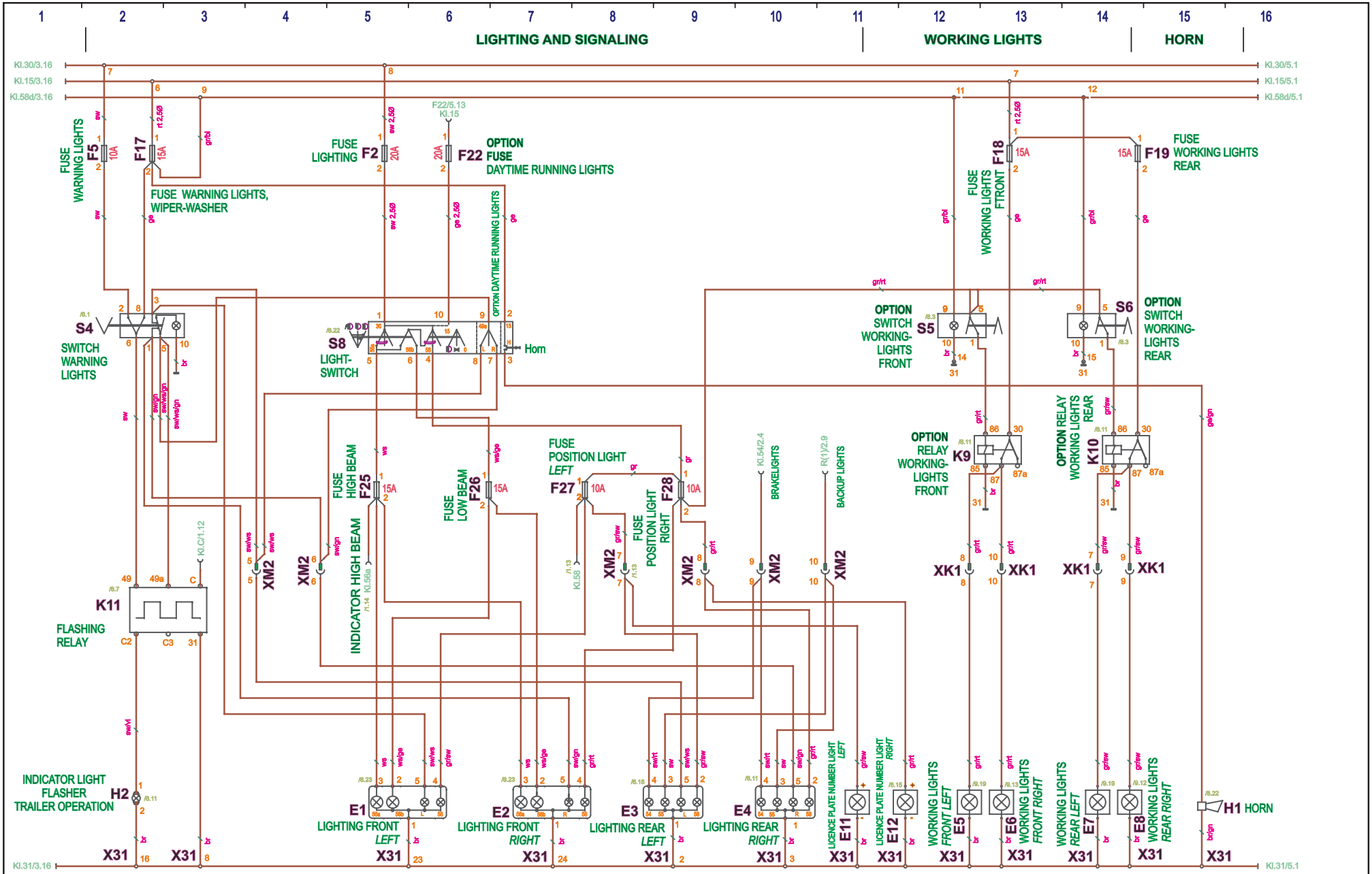
Typ Model Type Tipo	TL80AS	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL80AS0101	Datum Edition Date Fecha 01.2008
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página 2/6		Blatt Page Feuille Página 7.25.02

X31	Ground	XM1	Connector dash board - machine frame



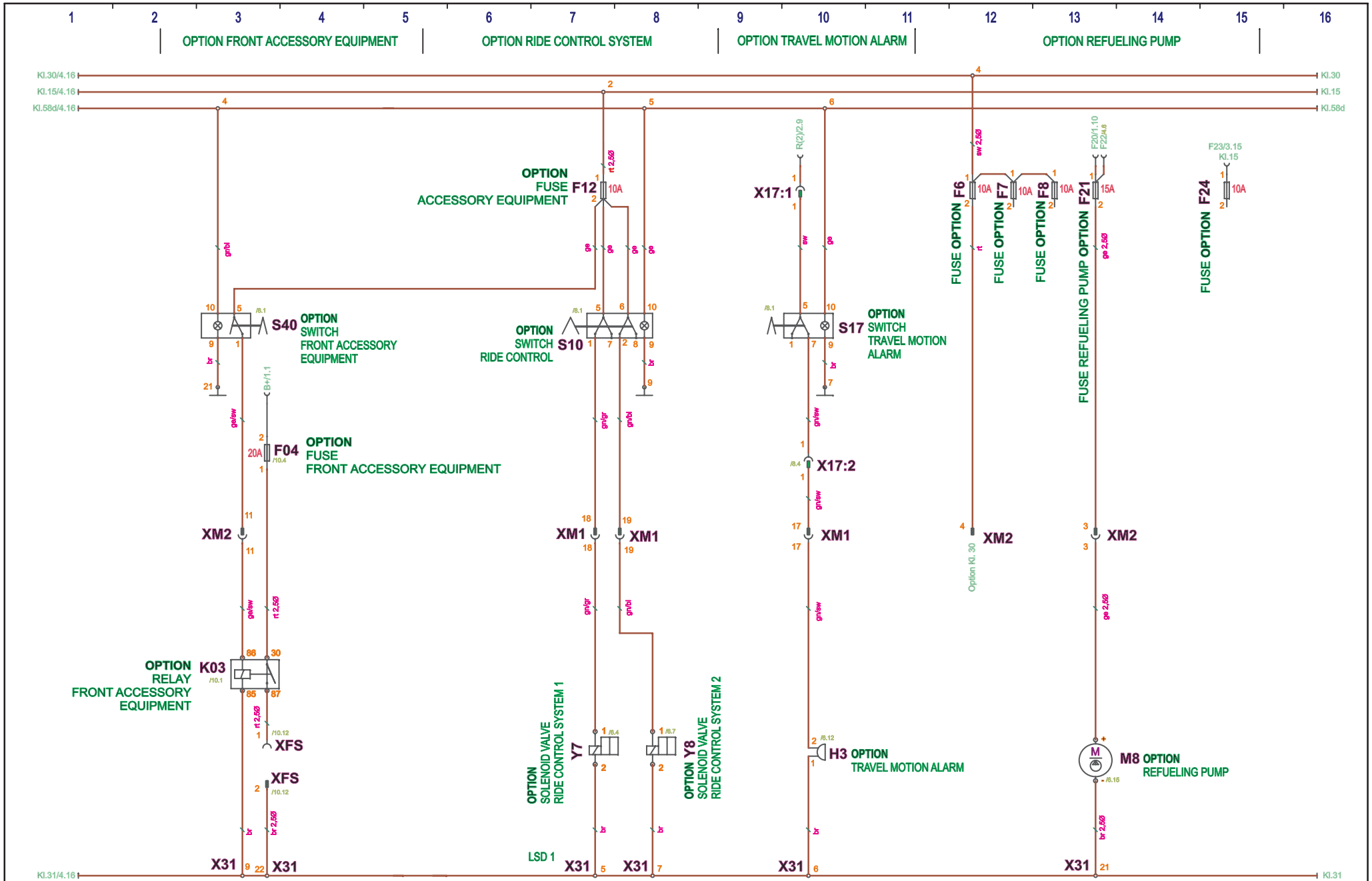
XM2	CONNECTOR DASH BOARD / MACHINE FRAME
XM3	CONNECTOR DASH BORD / HEATER FAN
XM7	CONNECTOR OPERATORS CAB / WIPER MOTOR
XK1	CONNECTOR DASH BOARD / OPERATORS CAB

Typ Model Type Tipo	TL80AS	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-kl.-Nr. from s/n à partir du n/s desde el no. TL80AS0101	Datum Edition Date Fecha	01.2008
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página 3/6	Blatt Page Feuille Página	7.25.03



X31	CENTRAL GROUND
XK1	CONNECTOR DASH BOARD / OPERATORS CAB
XM2	CONNECTOR DASH BOARD / MACHINE FRAME

Typ Model Type Tipo	TL80AS	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL80AS0101	Datum Edition Date Fecha 01.2008
Benennung Description Dénomination Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos		Blatt Page Feuille Página 4/6		Blatt Page Feuille Página 7.25.04

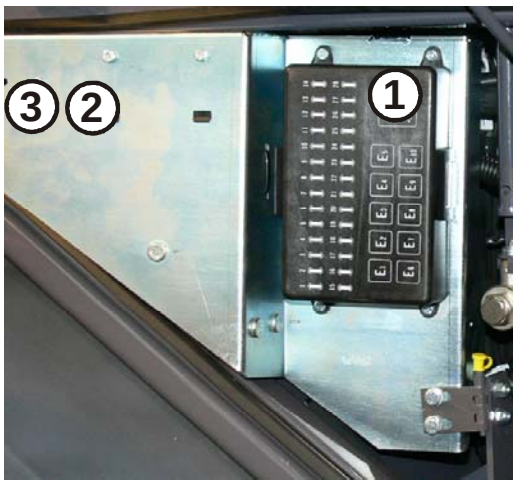


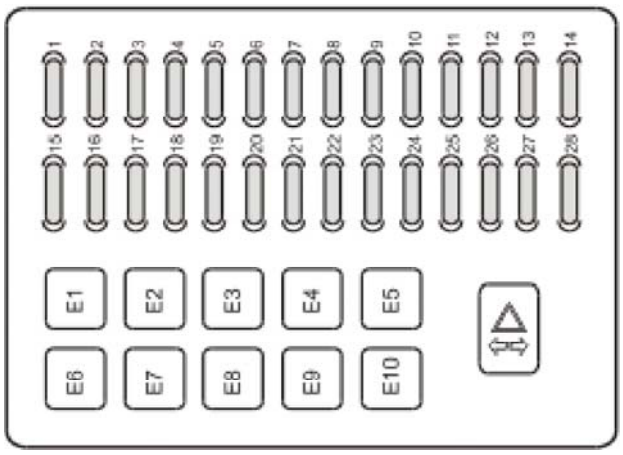
XM1	CONNECTOR DASH BOARD / MACHINE FRAME
XM2	CONNECTOR DASHBOARD / MACHINE FRAME
X31	CENTRAL GROUND

XFS	FRONT ACCESSORY EQUIPMENT SOCKET
X17:1	CONNECTOR DASHBOARD / TRAVEL MOTION ALARM
X17:2	CONNECTOR DASHBOARD / TRAVEL MOTION ALARM

Typ Model Type Tipo	TL80AS	Elektrisches System Electrical system Circuit électrique Sistema eléctrico ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no. TL80AS0101	Datum Edition Date Fecha 01.2008
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos	Blatt Page Feuille Página 5/6	Blatt Page Feuille Página 7.25.05


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① fuse and relay box ..... at operators compartment, cover right

② K12 washer/wiper relay ..... underneath cover

③ K1 relay terminal 15 ..... underneath cover

Location	Relay	Function
E 1	K 2	Starting safety
E 2	K 3	Travel direction
E 3	K 4	Travel - reverse
E 4	K 5	Travel - forward
E 5	K 9	Working lights front (Option)
E 6	K 10	Working lights rear (Option)
E 7	V 2	Diodes bloc
E 8	V 1	Diodes bloc
E 9	-----	not assigned
E 10	-----	not assigned
⇕▷	K 11	Flasher transmitter
	K01*	Starter relay
	K02*	Glow time control unit

* These relays are located behind the cab at the battery compartment.

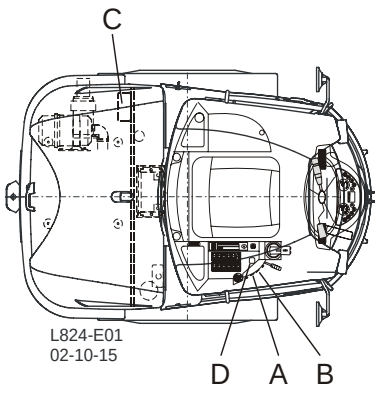
Position	Ampere	Assigned to	Position	Ampere	Assigned to
F 1	10	Pre-heat switch, engine shut off	F 15	15	Wiper rear
F 2	20	Lighting system	F 16	5	Radio, terminal 15 (Option)
F 3	10	Socket, Radio	F 17	15	Direction indicator, Wiper / washer, horn
F 4	10	Rotating beacon, Cab light	F 18	15	Working lights front
F 5	10	Hazard warning light	F 19	15	Working lights rear
F 6	10	Terminal 30 (Option)	F 20	5	Instrument
F 7	5	Engine shut-off	F 21	15	Refueling pump, (Option)
F 8	10	Exhaust-gas return system (Option)	F 22	20	Daytime running light (Option)
F 9	10	Pressure switches brake lights, hydrostatic brake	F 23	20	Rear window defroster
F 10	15	Travel drive, parking brake, backup light	F 24	10	Terminal 15 (Option)
F 11	10	Working hydraulic, travel fast	F 25	15	Upper beam
F 12	10	Additional control circuit	F 26	15	Lower beam
F 13	15	Heater fan, air condition	F 27	10	Left side marker light
F 14	15	Washer / wiper front	F 28	10	Right side marker light
F 01*	50	Main fuse	F 02*	60	Pre-heat fuse
F 03*	20	Starter fuse			

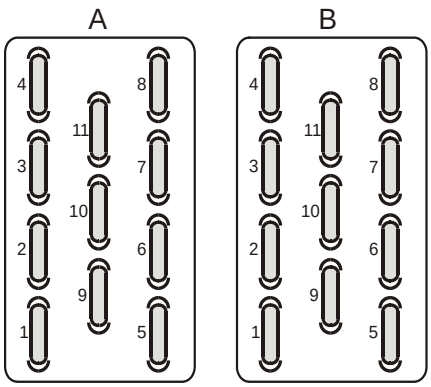
* These fuses are located behind the cab at the battery compartment.

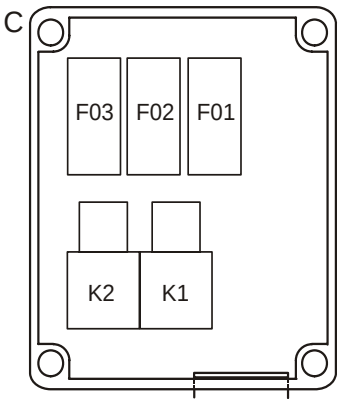
Cable colours

bg	beige	dgr	dark grey	hbr	light brown	rt	red
bl	blue	ge	yellow	hgr	light grey	sw	black
br	brown	gn	green	hr	light red	vi	violet
dbl	dark blue	gr	grey	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		

Fuse box — Assignment diagram







D = K3 (turn-signal flasher relay) below instrument panel

A			B		
Position	**Ampere**	**assigned to**	**Position**	**Ampere**	**assigned to**
F 1	15	Heater fan	F 1	15	Working floodlight, front
F 2	15	Wash/wipe, front	F 2	15	Working floodlight, rear
F 3	15	Wash/wipe, rear	F 3	10	Turn signal
F 4	10	Rotating beacon; interior light	F 4	10	Hazard warning switch
F 5	15	Travel, forward/reverse	F 5	15	Socket; radio
F 6	10	Reserve	F 6	15	Reserve
F 7	10	Reserve	F 7	10	Horn
F 8	10	E-module inputs	F 8	10	High beam
F 9	10	Instruments	F 9	10	Low beam
F 10	10	Radio	F 10	10	Side marker light, left
F 11	15	Reserve	F 11	10	Side marker light, right

C / D					
F 01	50	Series fuse	K 1		Start relay
F 02	80	Starting system	K 2		Pre-heat relay
F 03	30	Control module power supply	K 3		Turn-signal flasher relay

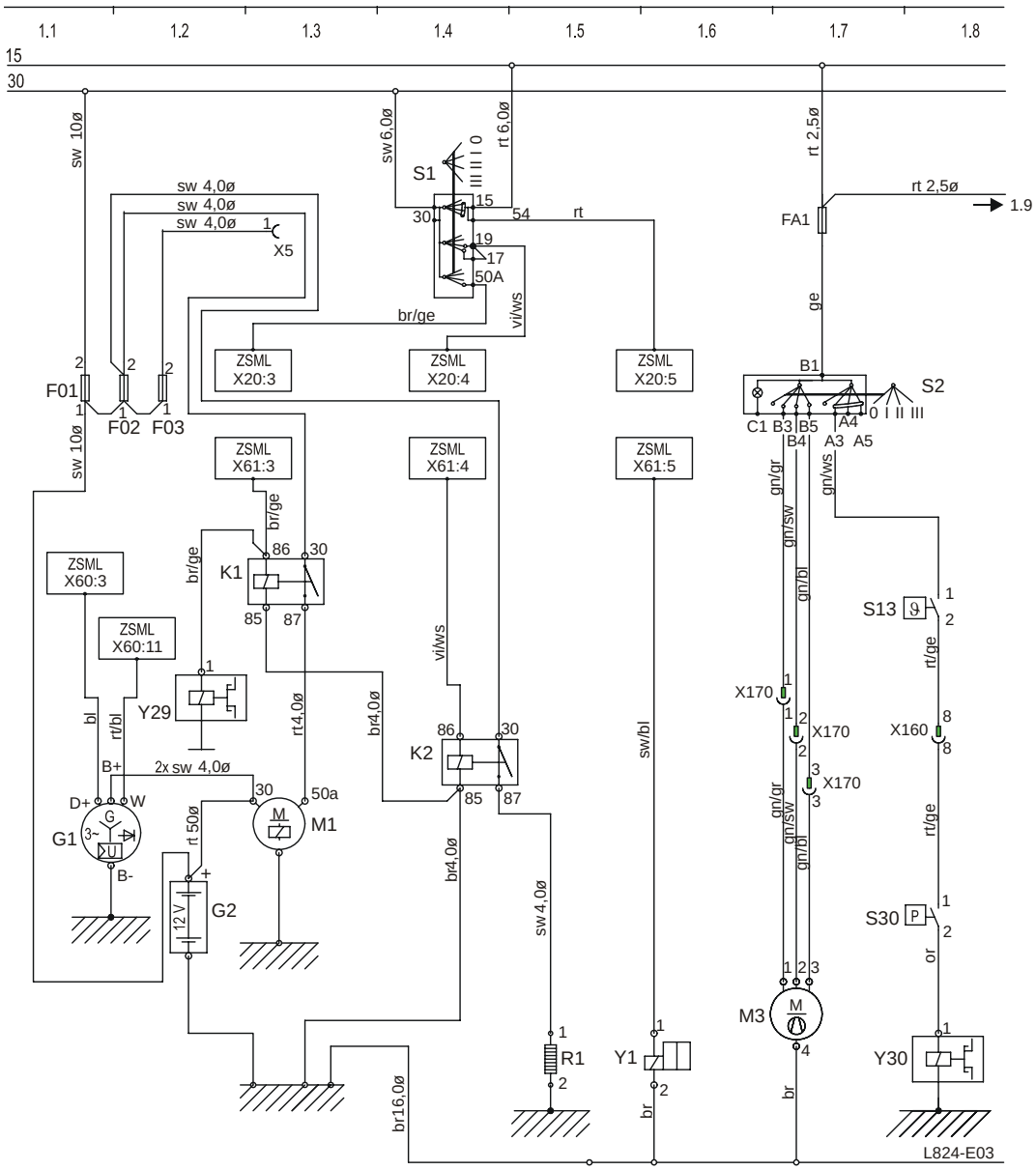
Colors of fuses

10 A	red	15 A	blue	30 A	Rose	50 A	red	80 A	white

Cable and plug colors

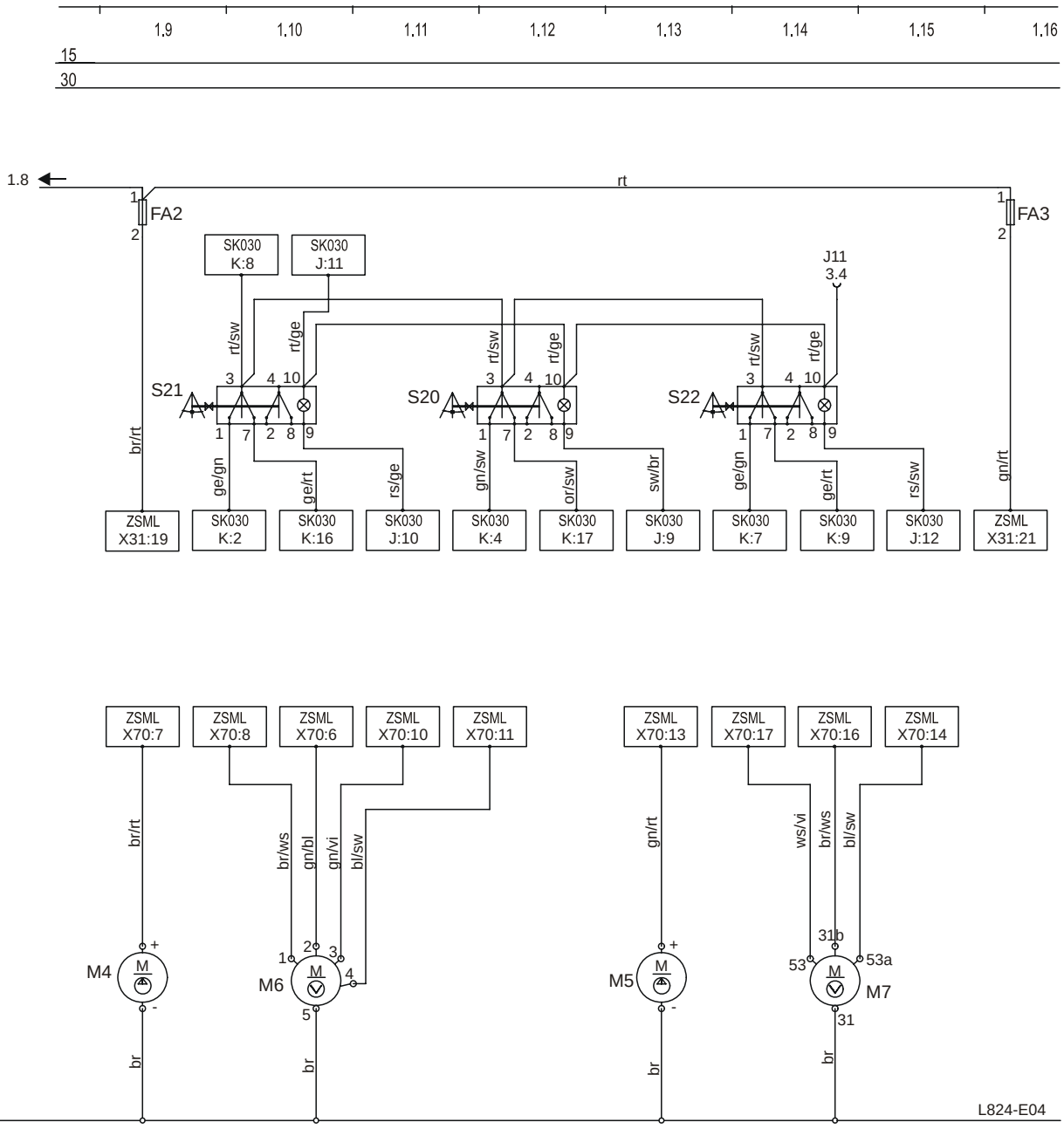
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bl	blue	ge	yellow	hgr	light gray	sw	black
br	brown	gn	green	hr	light red	vi	violet
dbl	dark blue	gr	grey	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		

Start-up	Pre-heat	Shut-off	Heating	Air conditioning



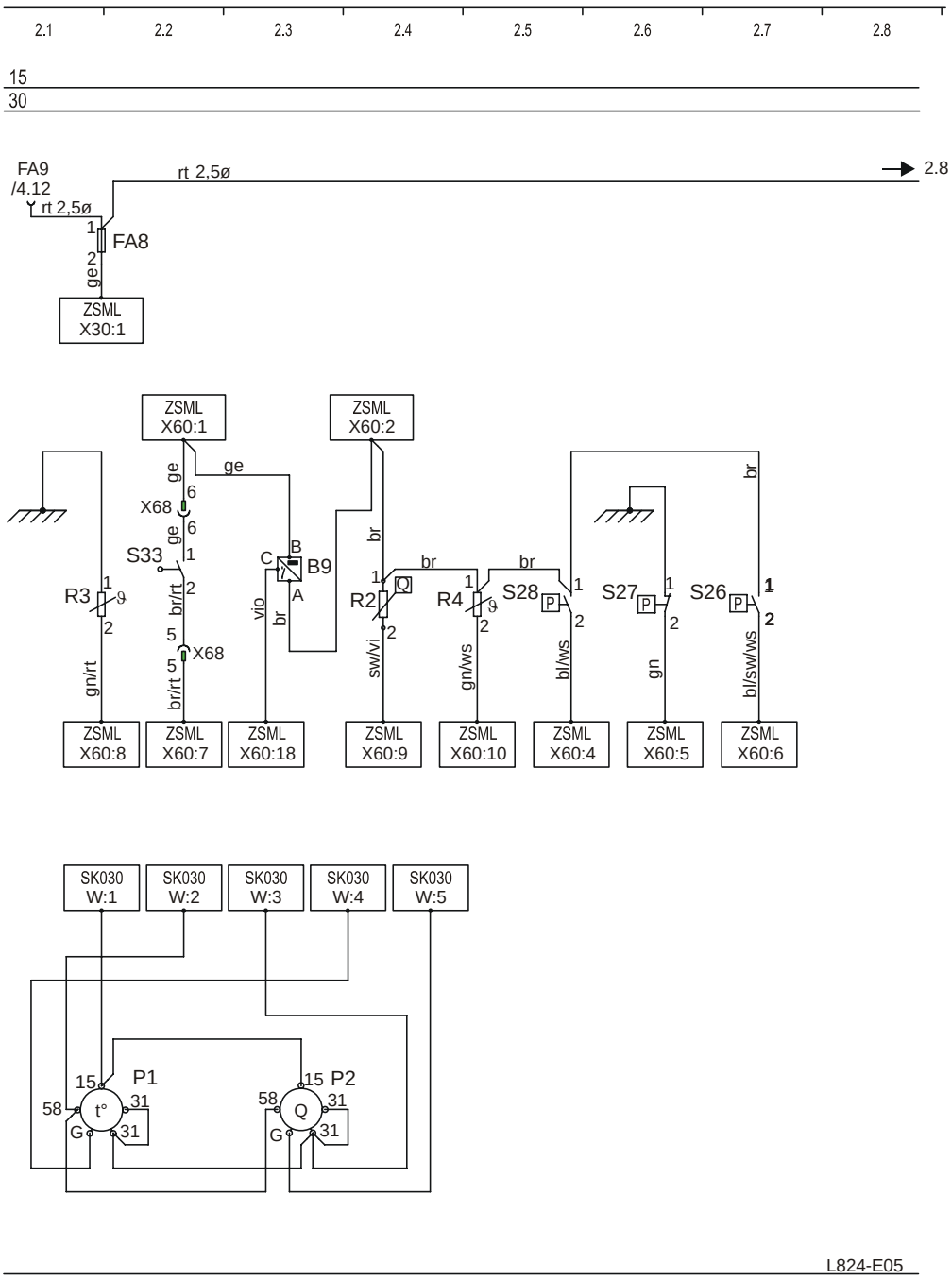
Path	Designation	Device	Path	Designation	Device
	ZSML	Central control module	1.4	K2	Start relay (starting safeguard)
1.1	F01	Flat-type fuse	1.5	R1	Glow plugs
1.1	G1	Generator	1.5	Y1	Engine shutdown
1.1	F02	Flat-type fuse	1.7	FA1	Fuse
1.2	F03	Flat-type fuse	1.7	S2	Heater switch
1.2	Y29	Cold start enhancement	1.7	M3	Heating
1.2	G2	Battery 12 V	1.8	S13	Air conditioning temperat. switch
1.3	K1	Start relay (starting aid)	1.8	S30	Air conditioning pressure switch
1.3	M1	Starter	1.8	Y30	Air conditioning relay
1.4	S1	Pre-heat/ starter switch			

Wash/wipe system, front	Wash/wipe system, rear



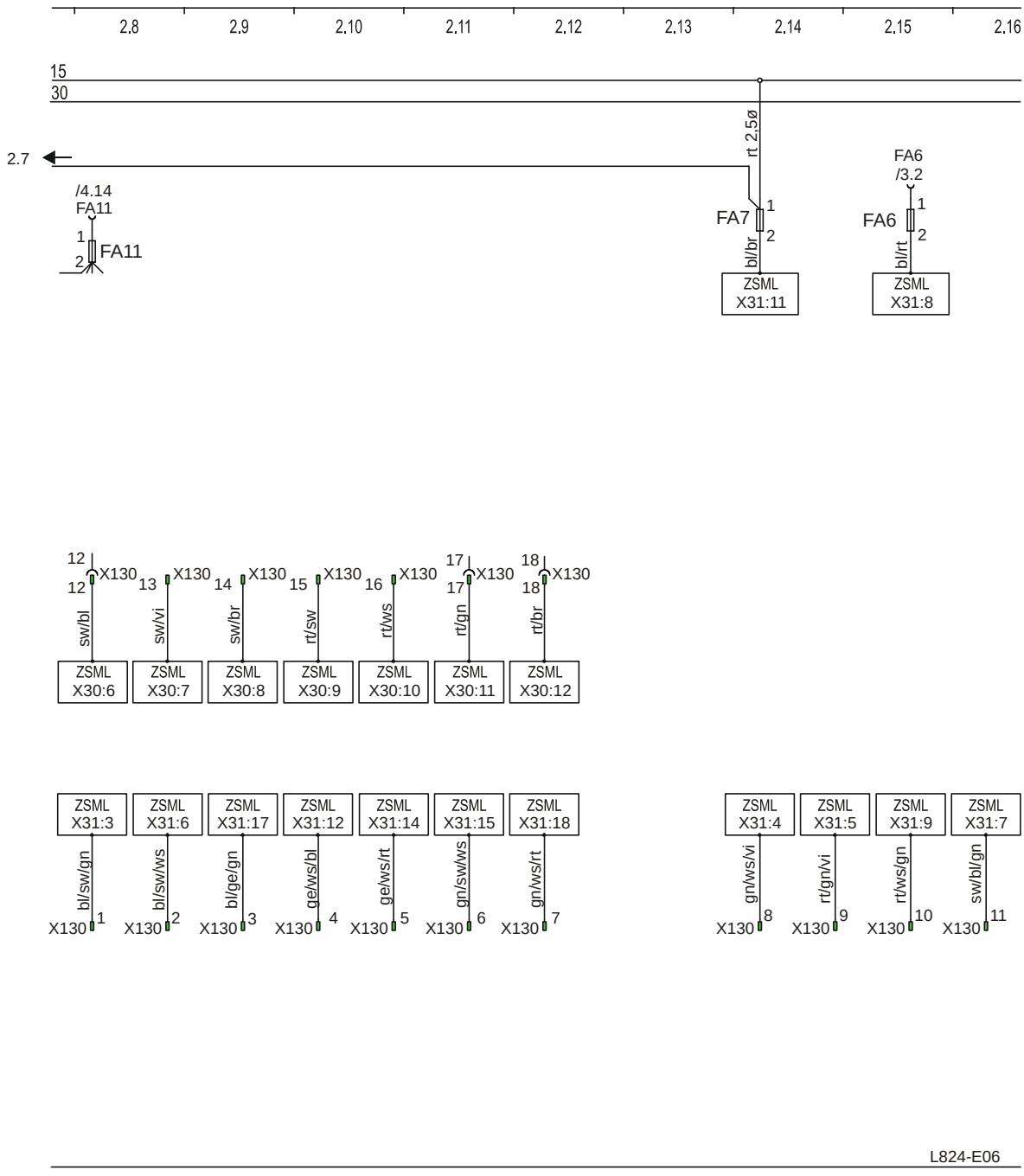
Path	Designation	Device	Path	Designation	Device
	ZSML	Central control module	1.11	S20	Washer switch front/rear
	SK030	Instrument panel	1.13	M5	Washer pump rear
1.9	FA2	Fuse	1.14	S22	Wiper switch rear
1.9	M4	Washer pump front	1.14	M7	Wiper rear
1.10	S21	Wiper switch front	1.16	FA3	Fuse
1.10	M6	Wiper front			

Monitoring



Path	Designation	Device	Path	Designation	Device
2.1	FA8	Fuse	2.4	R2	Tank sensor
2.1	R3	Engine temperature sensor	2.5	R4	Hydraulic oil temperature sensor
2.2	P1	Engine temperature indicator	2.5	S28	Air filter maintenance switch
2.2	S33	Transmission position	2.6	S27	Oil pressure switch
2.3	B9	Speed	2.7	S26	Hydrostatic brake switch
2.3	P2	Fuel tank indicator			

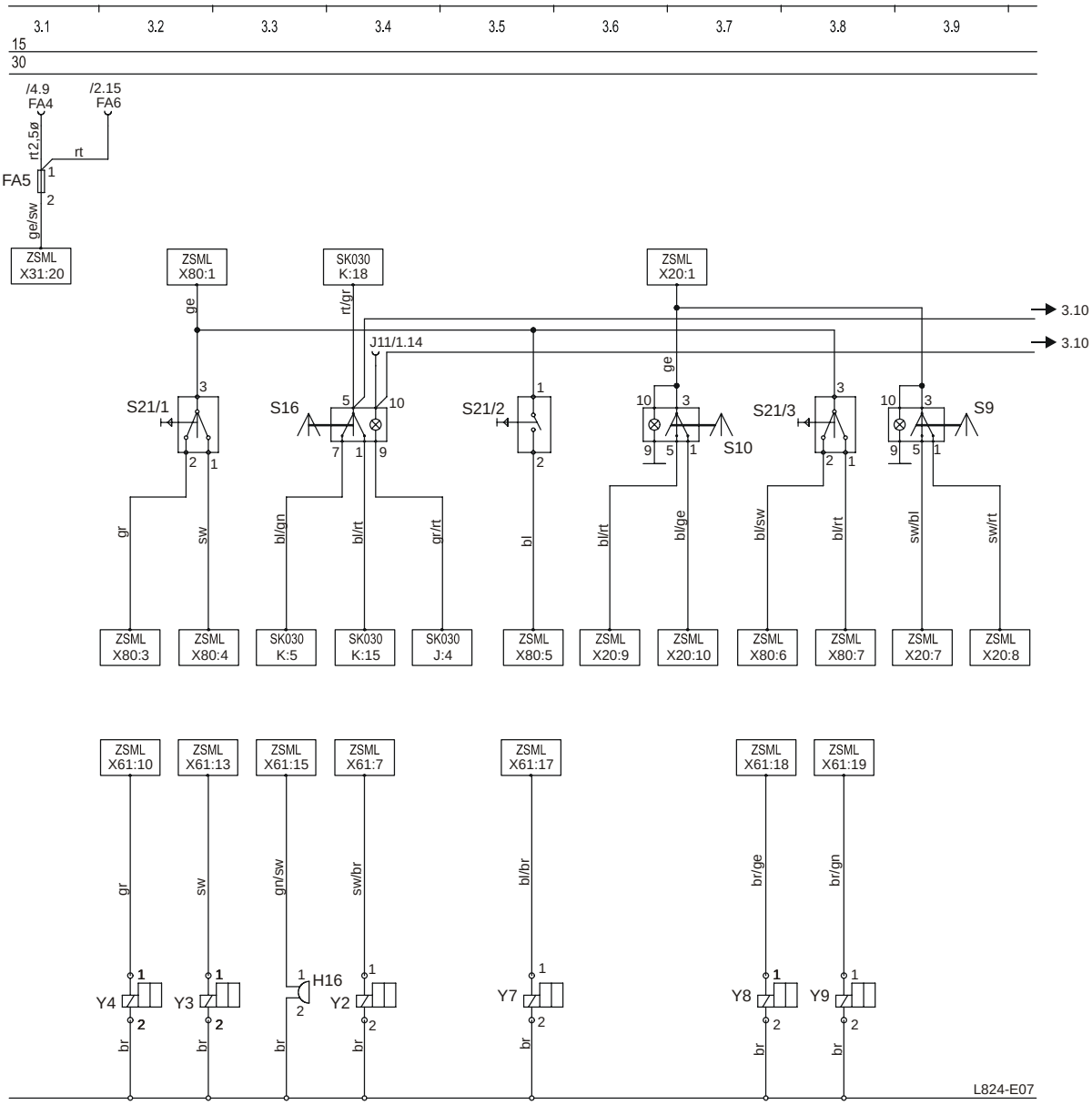
Monitoring



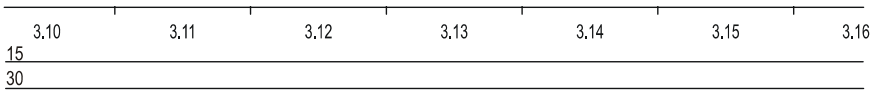
L824-E06

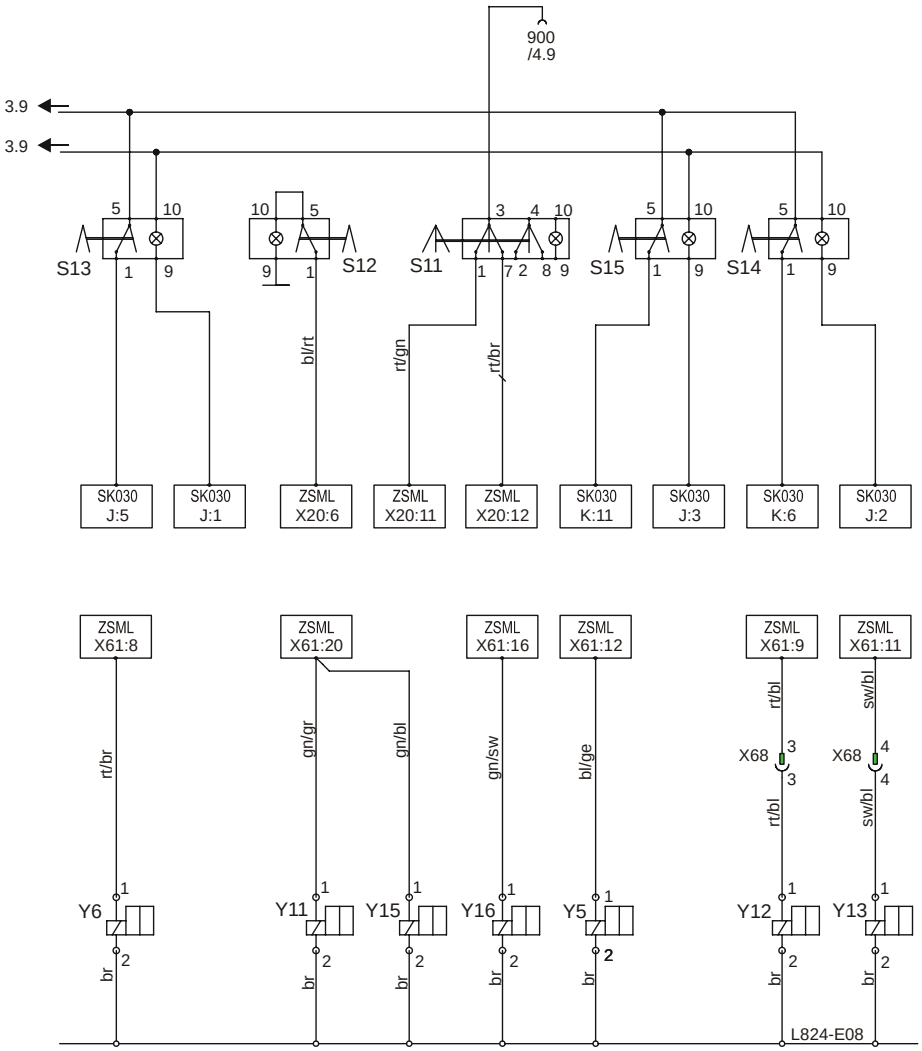
Path	Designation	Device	Path	Designation	Device
2.8	FA11	Reserve fuse	2.15	FA6	Reserve fuse
2.14	FA7	Reserve fuse			

"Travel" fuse	Travel	Float position	Additional control circuit



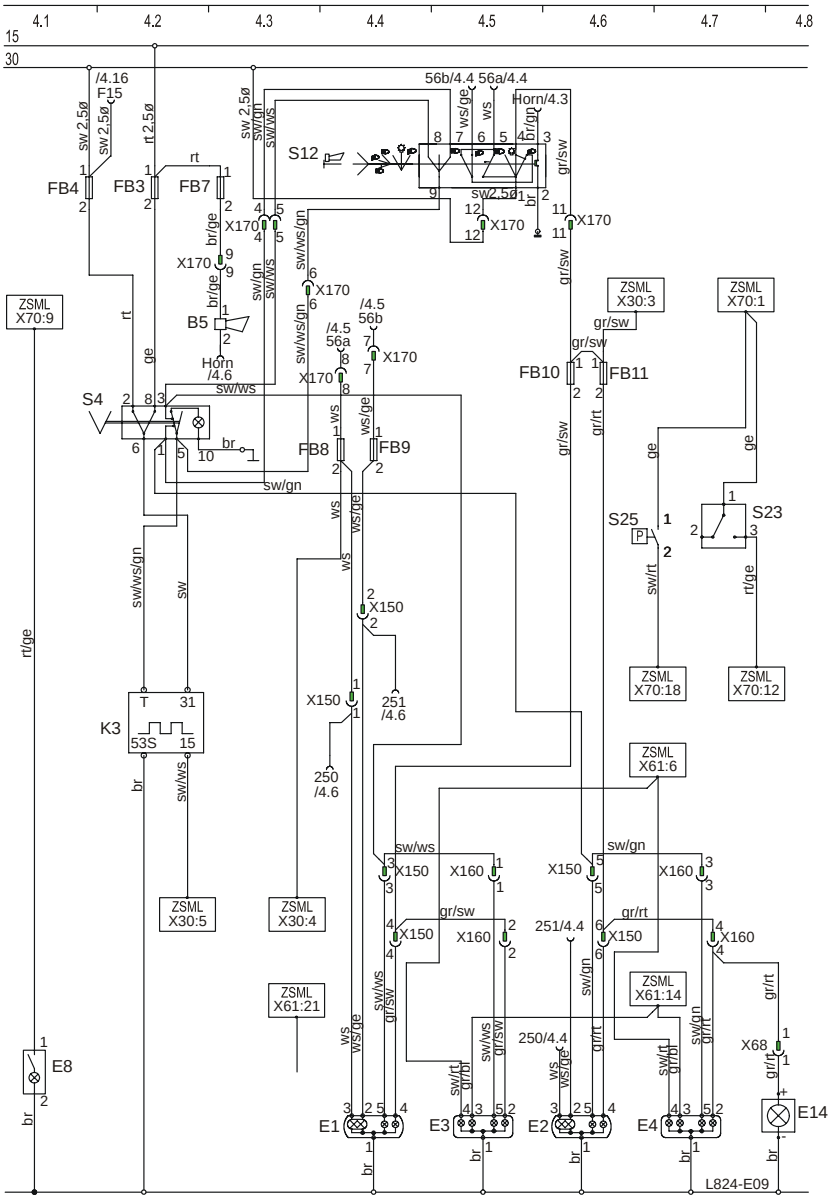
Path	Designation	Device	Path	Designation	Device
3.1	FA5	Fuse	3.5	S21/2	Float position switch
3.2	Y4	Travel, forward	3.5	Y7	Float position
3.2	S21/1	Switch for travel, forward/reverse	3.7	S10	Float position switch
3.3	Y3	Travel, reverse	3.8	Y8	Additional control circuit 1
3.3	H16	Travel motion alarm	3.8	S21/3	Additional control circuit switch
3.4	S16	Switch for travel, forward/reverse	3.8	Y9	Additional control circuit 2
3.4	Y2	Travel direction recognition	3.9	S9	Additional control circuit





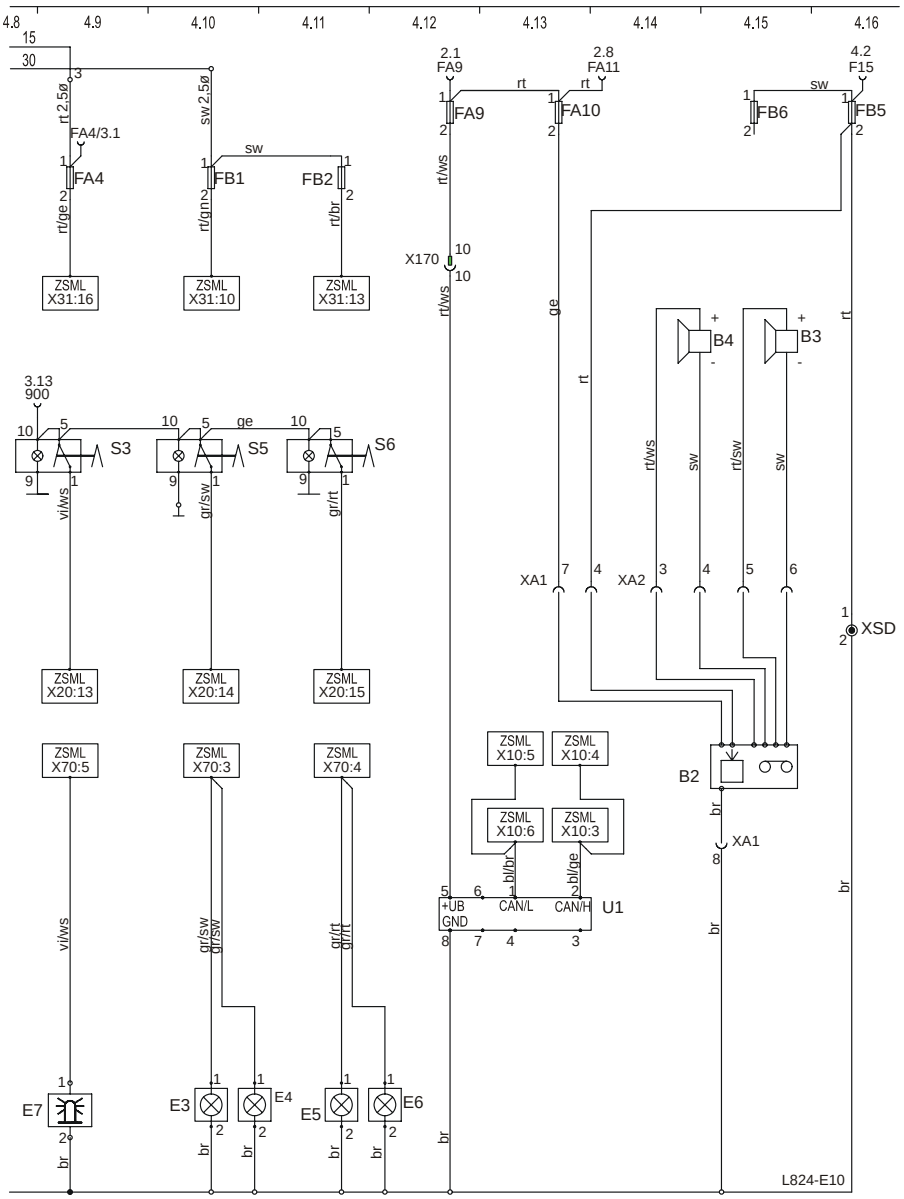
Path	Designation	Device	Path	Designation	Device
3.10	S13	Travel, SLOW	3.13	S11	4th control circuit
3.10	Y6	Travel, SLOW	3.14	Y5	Working hydraulics
3.12	S12	Ride control system switch	3.14	S15	Working hydraulics
3.12	Y11	Ride control system 1	3.15	S14	Transmission
3.12	Y15	Ride control system 2	3.15	Y12	Transmission 1
3.13	Y16	Ride control system 3	3.16	Y13	Transmission 2

Lighting and signaling



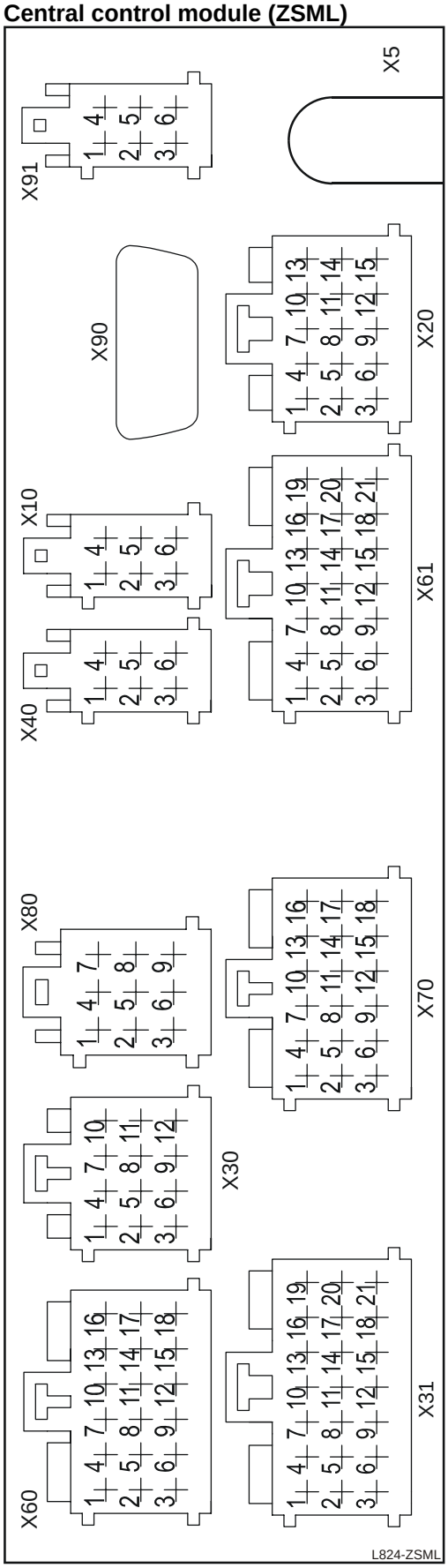
Path	Designation	Device	Path	Designation	Device
4.1	E8	Interior light	4.4	E1	Lighting front left
4.1	FB4	Fuse	4.5	S12	Light switch
4.2	FB3	Fuse	4.5	E3	Lighting rear left
4.2	S4	Direction indicator switch, hazard warning switch	4.6	FB10	Fuse
4.2	K3	Flasher transmitter	4.6	FB11	Fuse
4.3	FB7	Fuse	4.6	E2	Lighting front right
4.3	B5	Horn	4.6	S25	Brake light switch
4.4	FB8	Fuse	4.7	E4	Lighting rear right
4.4	FB9	Fuse	4.7	S23	Hand brake switch
			4.8	E14	License-plate illumination

Rotating beacon	Working floodlights	Instrument panel	Radio	Socket

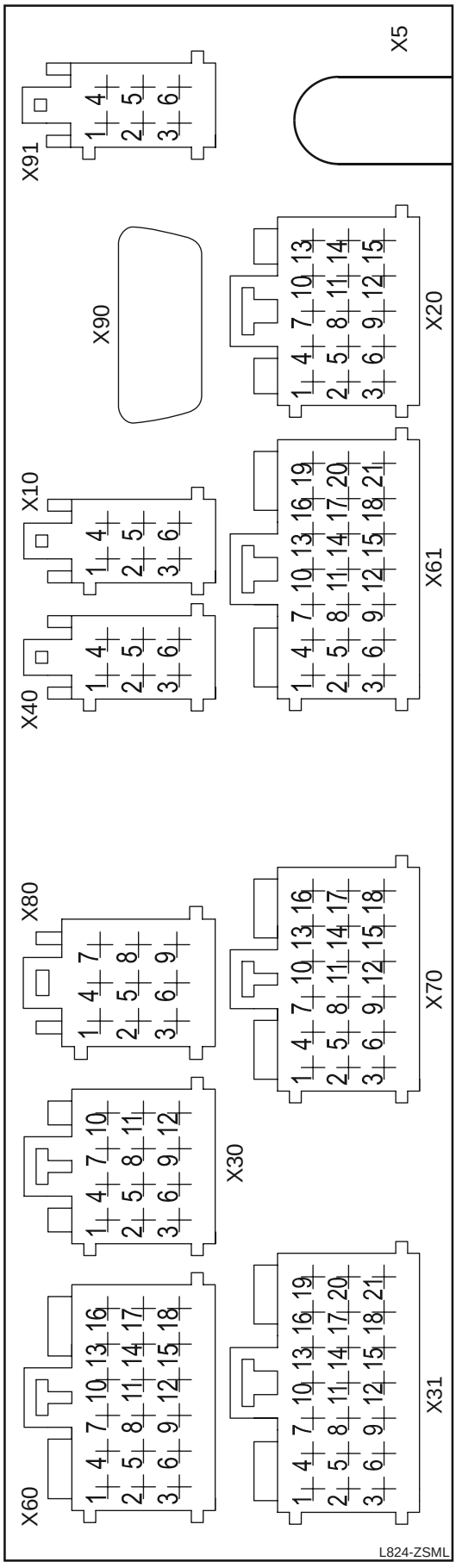


Path	Designation	Device	Path	Designation	Device
4.9	FA4	Fuse	4.12	E6	Working floodlight rear
4.9	S3	Rotating beacon switch	4.12	FA9	Fuse
4.9	E7	Rotating beacon	4.13	U1	Instrument panel
4.10	FB1	Fuse	4.13	FA10	Fuse
4.10	S5	Working floodlight front	4.15	B4	Loudspeaker
4.10	E3	Working floodlight front	4.15	B2	Radio
4.11	E4	Working floodlight front	4.15	FB6	Fuse
4.11	FB2	Fuse	4.15	B3	Loudspeaker
4.11	S6	Working floodlight rear	4.16	FB5	Fuse
4.11	E5	Working floodlight rear	4.16	XSD	Socket

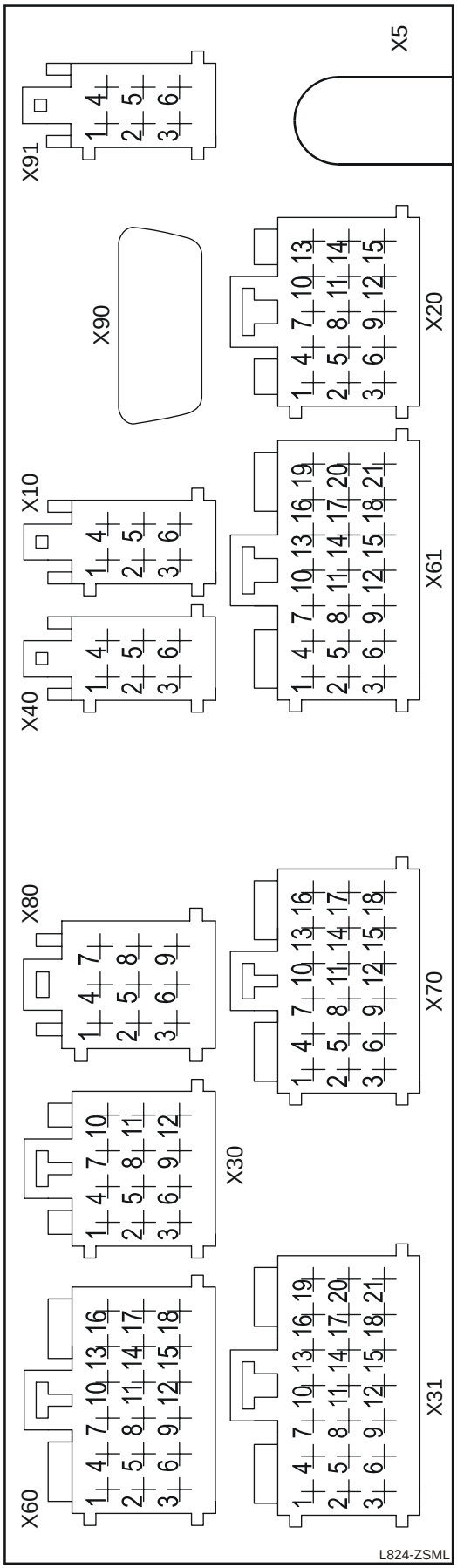
Central control module (ZSML)



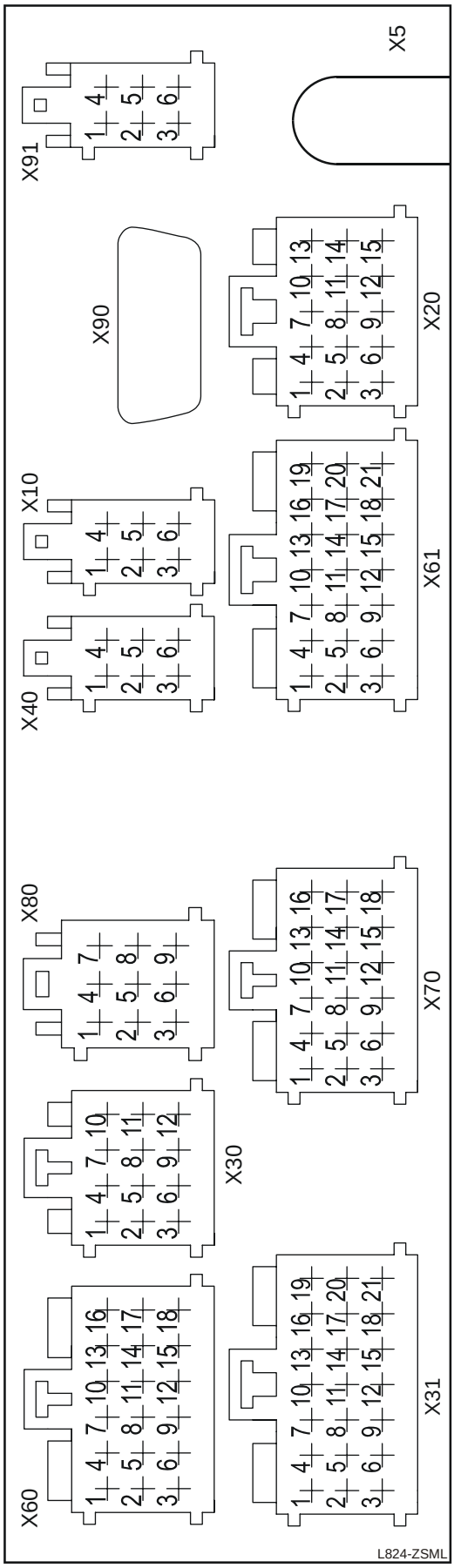
X60	***Signal inputs "engine monitoring"***
1	Power supply Terminal 15 output
2	Central mass Terminal 31
3	Charge control generator D+
4	Air filter maintenance switch signal
5	Oil pressure switch signal
6	Hydrostatic brake pressure switch signal
7	Transmission switch signal
8	Engine temperature sensor signal
9	Tank sensor signal
10	Hydraulic oil temperature sensor signal
11	Speed signal generator "W" signal
12	--
13	--
13	--
15	--
16	--
17	--
18	Speedometer signal sensor
X30	***Signal inputs "Lighting"***
1	Power supply Terminal 15 output
2	--
3	Parking light Terminal 15 input
4	High beam signal
5	Direction indicator control signal
6	Reserve -
7	Reserve +
8	Reserve +
9	Reference voltage
10	Reserve - Analog
11	Reserve - Analog
12	Reserve - Analog
X80	***Coordinate lever***
1	Power supply Terminal 15 output
2	Central mass Terminal 31
3	Travel forward signal
4	Travel reverse signal
5	Float position signal
6	Additional control circuit signal
7	Additional control circuit signal
8	Reserve - Analog
9	Reserve - Analog



X40	***CAN-BUS (Option)***
1	Power supply Terminal 15 output
2	Central mass Terminal 31
3	CAN/HI
4	R1
5	R2
6	CAN/LO
X10	***Control panel***
1	--
2	Central mass Terminal 31
3	CAN/HI
4	--
5	--
6	CAN/LO
X90	***Programming connection***
X91	***Immobilizer (Option)***
1	Power supply Terminal 15 output
2	Central mass Terminal 31
3	***TXD***
4	RXD
5	CTS
6	RTS

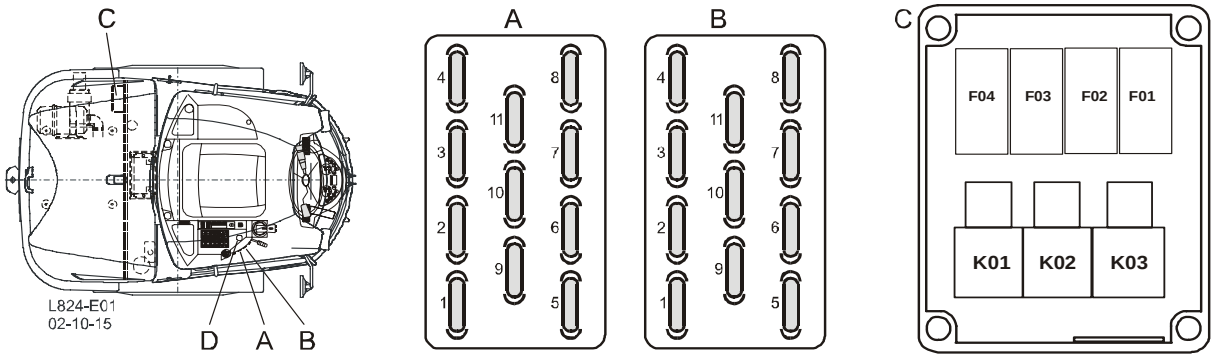


X31	***Module power supply, working floodlights, rotating beacon, wiper***
1	--
2	-
3	Reserve digital output
4	Relay K11:87a N.C. contact output
5	Relay K11:87 N.O. contact output
6	Reserve digital output
7	Relay K12:87 N.O. contact output
8	Relay K12 power supply Terminal 15 input
9	Relay K12:87a N.C. contact Output
10	Power supply Terminal 15 input working floodlight front
11	Relay K11 power supply Terminal 15 input
12	Reserve PWM output
13	Power supply Terminal 15 input working floodlight rear
14	Reserve PWM output
15	Reserve PWM output
16	Power supply Terminal 30 input rotating beacon
17	Reserve Digital output
18	Reserve PWM output
19	Power supply Terminal 15 input wash/ wipe rear
20	Power supply Terminal 15 input travel
21	Power supply Terminal 15 input wash/ wipe rear
X70	***Working floodlights , Wipers***
1	Brake light switch Terminal 15 output
2	--
3	Working floodlight front output
4	Working floodlight rear output
5	Rotating beacon output
6	Wiper Terminal 53b 2nd setting output
7	Washer pump front output
8	Wiper Terminal 31b output
9	Interior lamp Terminal 30 output
10	Wiper Terminal 53 output
11	Wiper Terminal 53a output
12	Hand brake switch signal input
13	Washer pump rear output
14	Rear wiper Terminal 53a output
15	--
16	Rear wiper Terminal 31b output
17	Rear wiper Terminal output
18	Brake light switch signal input



X61	***Rear carriage***
1	--
2	--
3	Starting Terminal 50a output
4	Pre-heat output
5	Engine shutdown output
6	Brake light output
7	Travel, direction recognition output
8	Travel, FAST-SLOW output
9	Transmission 1 output
10	Travel motion alarm output
11	Transmission 2 output
12	Working hydraulics output
13	Fog lamp Output
14	Ride control system 3 output
15	Back-up lamp output
16	Travel reverse output
17	Float position output
18	Additional control circuit output
19	Additional control circuit output
20	Ride control system 1,2 output
21	Travel forward output
X20	***Panel, right***
1	Power supply Terminal 15 output
2	--
3	Starting Terminal 50a signal
4	Pre-heat signal
5	Engine shutdown signal
6	Ride control system signal
7	Additional control circuit signal
8	Additional control circuit signal
9	Float position 1 signal
10	Float position 2 signal
11	4th control circuit signal
12	4th control circuit signal
13	Rotating beacon signal
14	Working floodlight front signal
15	Working floodlight rear Signal
X5	***Power supply***

Fuse box — Assignment diagram



D = K3 (turn-signal flasher relay) below instrument panel

A			B		
Position	**Ampere**	**assigned to**	**Position**	**Ampere**	**assigned to**
F 1	15	Heater fan	F 1	15	Working floodlight, front
F 2	15	Wash/wipe, front	F 2	15	Working floodlight, rear
F 3	15	Wash/wipe, rear	F 3	10	Turn signal
F 4	10	Rotating beacon; interior light	F 4	10	Hazard warning switch
F 5	10	Travel, forward/reverse	F 5	15	Socket; radio Option Socket
F 6	10	Reserve	F 6	15	Reserve
F 7	10	Option Socket	F 7	10	Horn
F 8	10	E-module inputs	F 8	10	High beam
F 9	10	Instruments	F 9	10	Low beam
F 10	10	Radio	F 10	10	Side marker light, left
F 11	10	Option, automatic bucket positioner, refueling pump	F 11	10	Side marker light, right

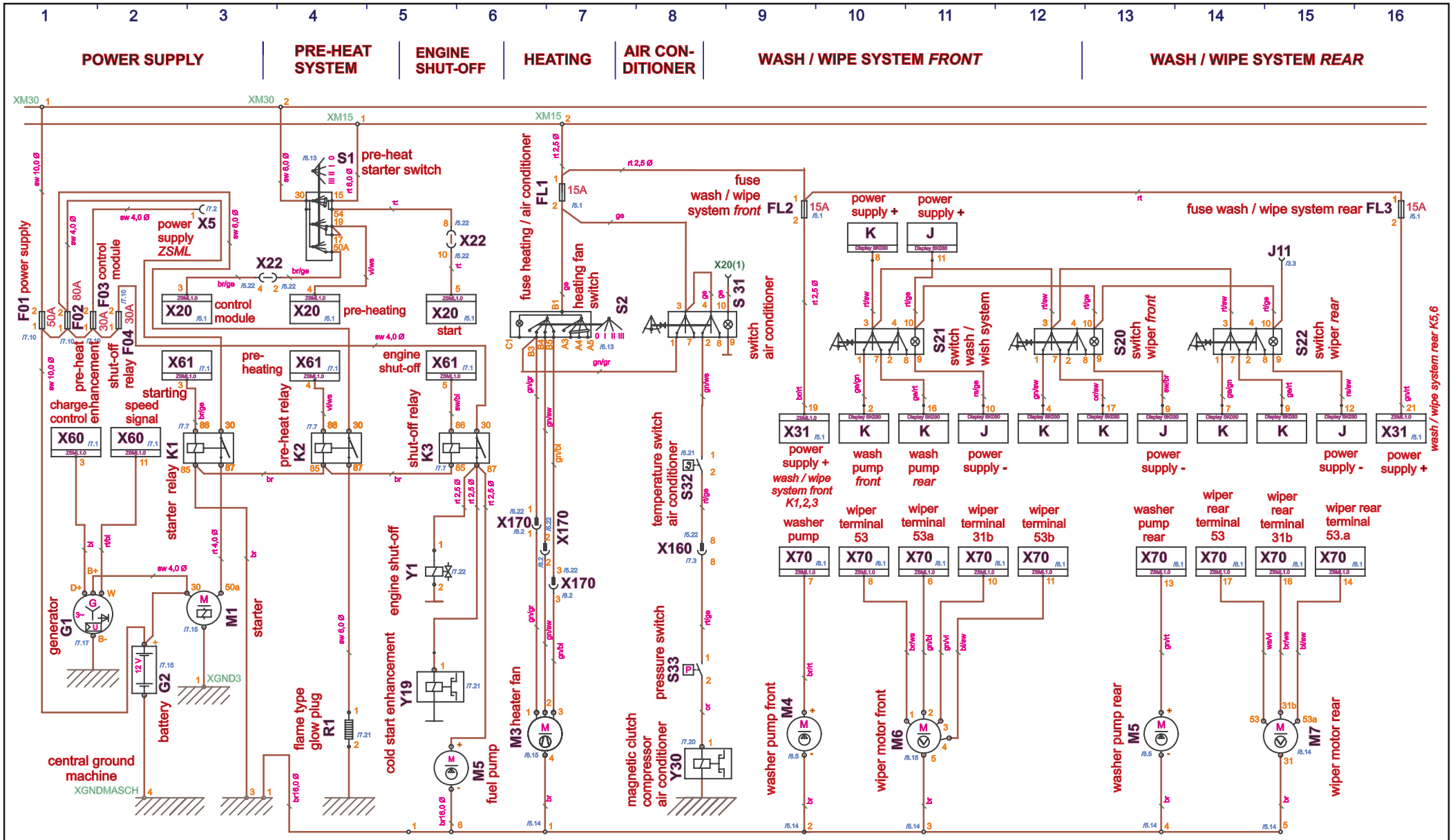
C / D					
F 01	50	Series fuse	K 01		Start relay
F 02	80	Starting system	K 02		Pre-heat relay
F 03	30	Control module power supply	K 03		Engine shut off solenoid, Fuel pump, cold start valve
F 04	30	Engine shut off solenoid, Fuel pump, cold start valve	K 3		Turn-signal flasher relay

Colors of fuses

10 A	red	15 A	blue	30 A	Rose	50 A	red	80 A	white

Cable and plug colors

bg	beige	dgr	dark gray	hbr	light brown	rt	red
bl	blue	ge	yellow	hgr	light gray	sw	black
br	brown	gn	green	hr	light red	vi	violet
dbl	dark blue	gr	grey	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		

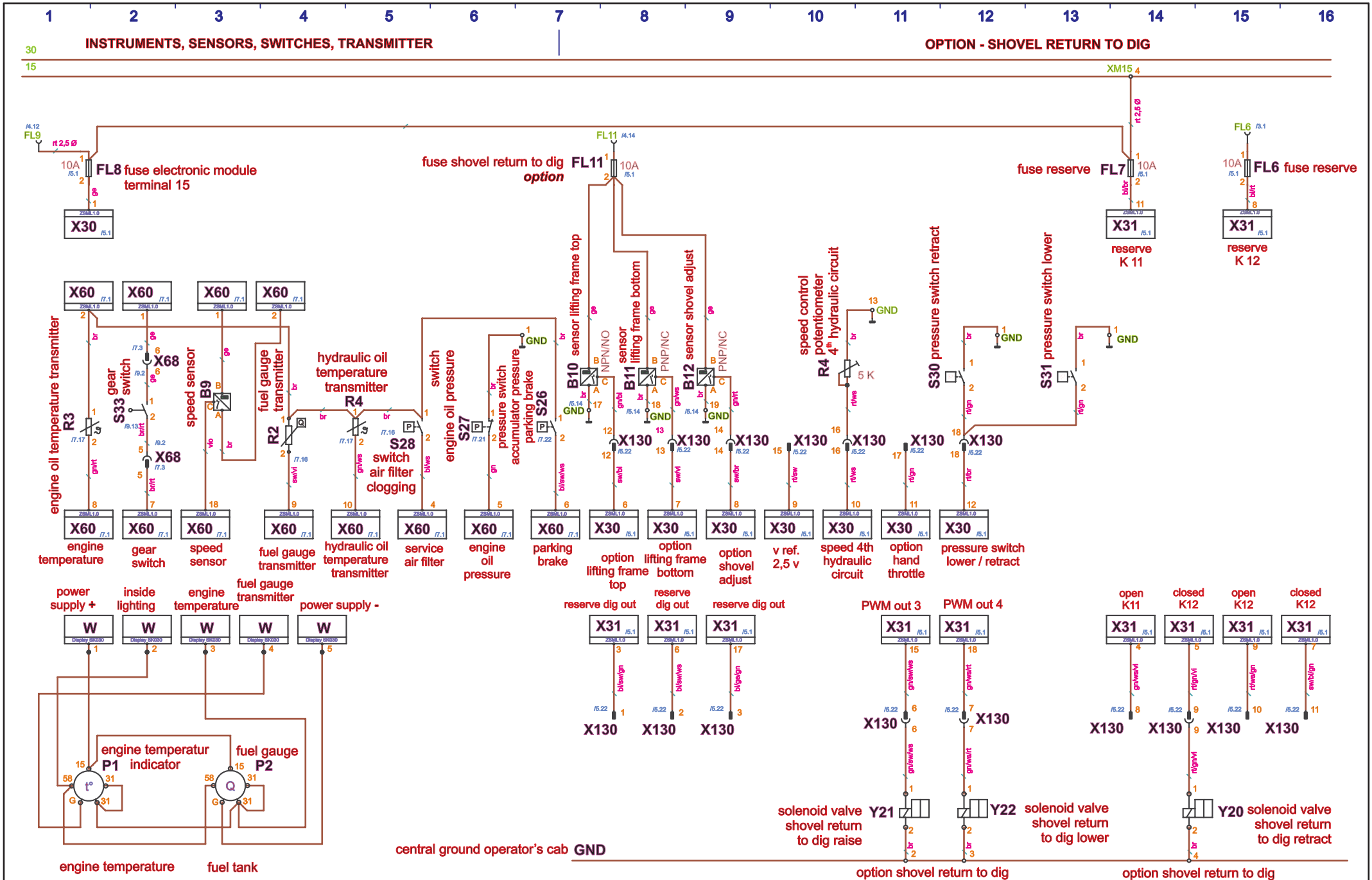


X5	connector central control module
X20	connector central control module
X31	connector central control module

X60	connector central control module
X61	connector central control module
X70	connector central control module
X160	connector switch console

X170	connector operator's cab / floor frame
K	connector display
J	connector display
F01-F04	input fuses (starter box)

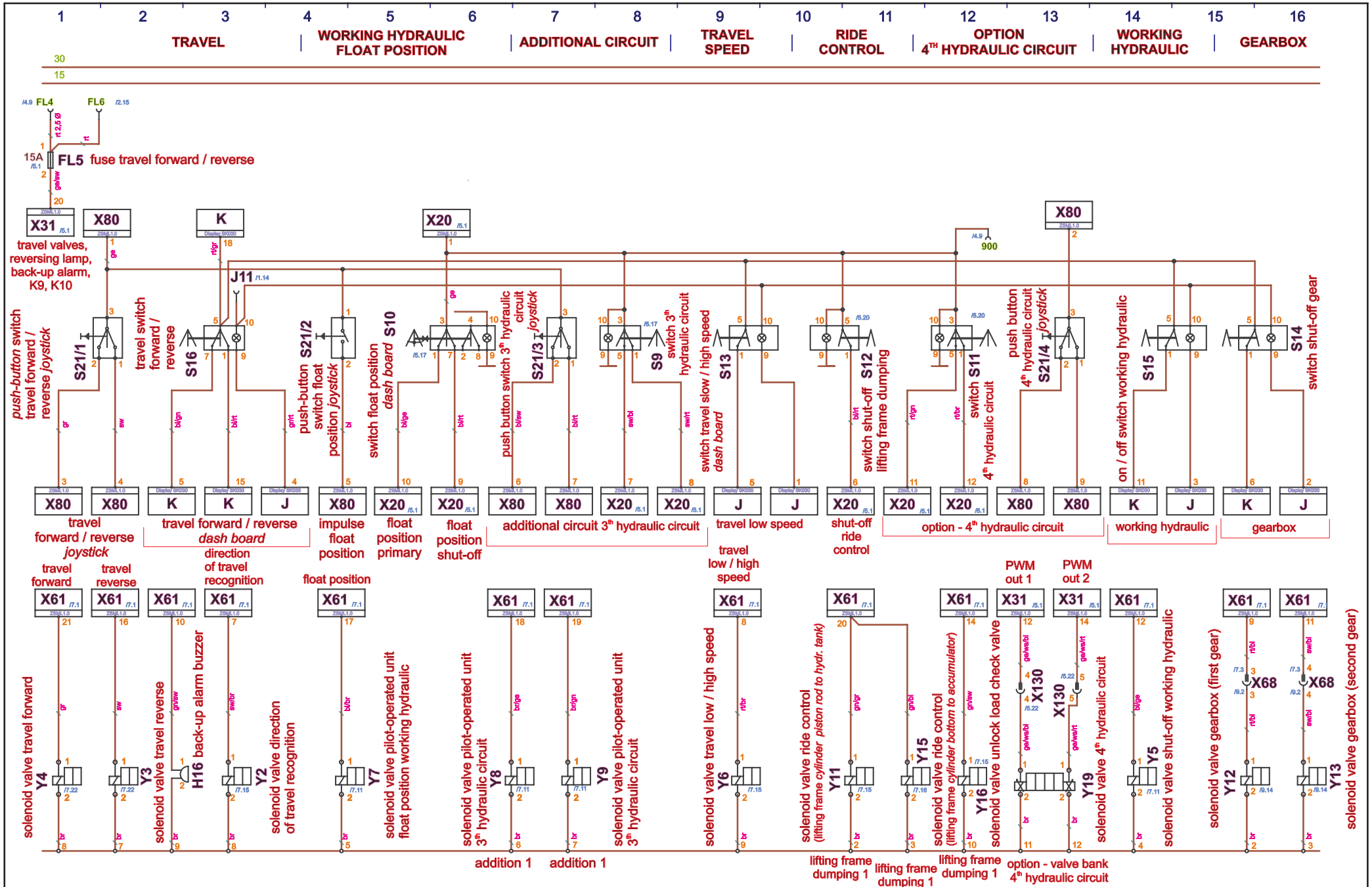
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Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / Circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 1/4	Blatt / Page / Feuille / Página 7.27.01.1



X30	connector central control module
X31	connector central control module
X60	connector central control module
X61	connector central control module

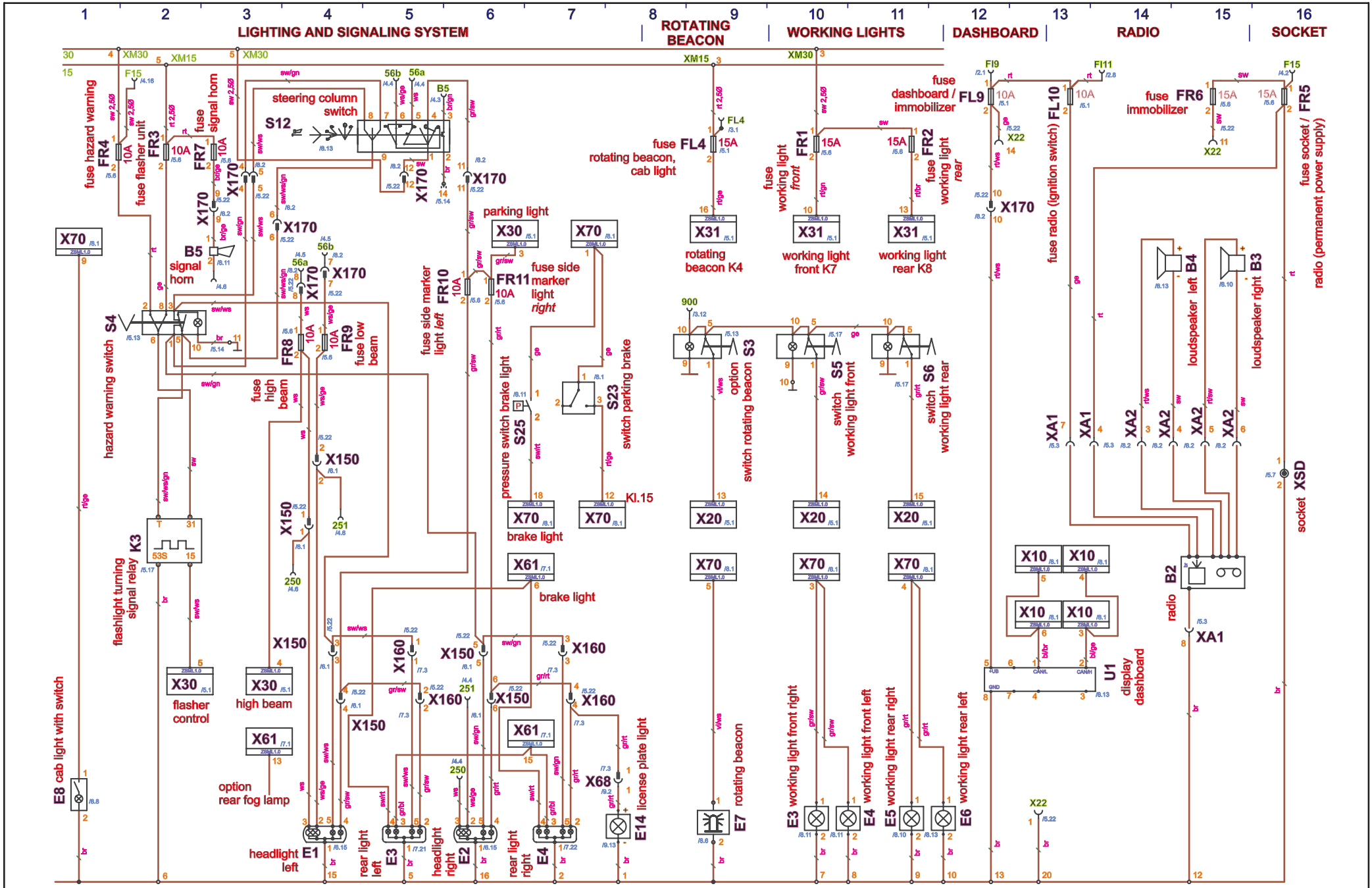
X130	connector switch console / rear chassis
W	connector display

Typ Model Type Tipo	TL 120	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TL01200100	Datum Edition Date Fecha 01.2007
Benennung Description Dénomination Denominación	Stromlaufplan / Wiring diagramm / Circuit èlectrique / Esquemas de los circuitos	Blatt Page Feuille Página 2/4	Blatt Page Feuille Página 7.27.02



X20	connector central control module	X80	connector central control module	K	connector display
X31	connector central control module	X61	connector central control module	J	connector display
X61	connector central control module	X130	connector switch console / shovel return to dig		
		X68	connector fast travel version / rear chassis		

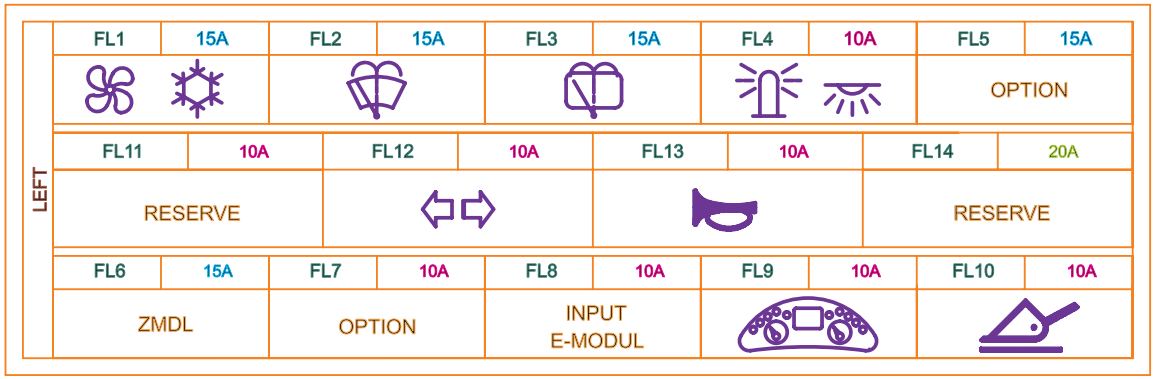
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Benennung Description Dénomination Denominación	Stromlaufplan / Wiring diagramm / Circuit électrique / Esquemas de los circuitos	Blatt Page Feuille Página 3/4	Blatt Page Feuille Página 7.27.03

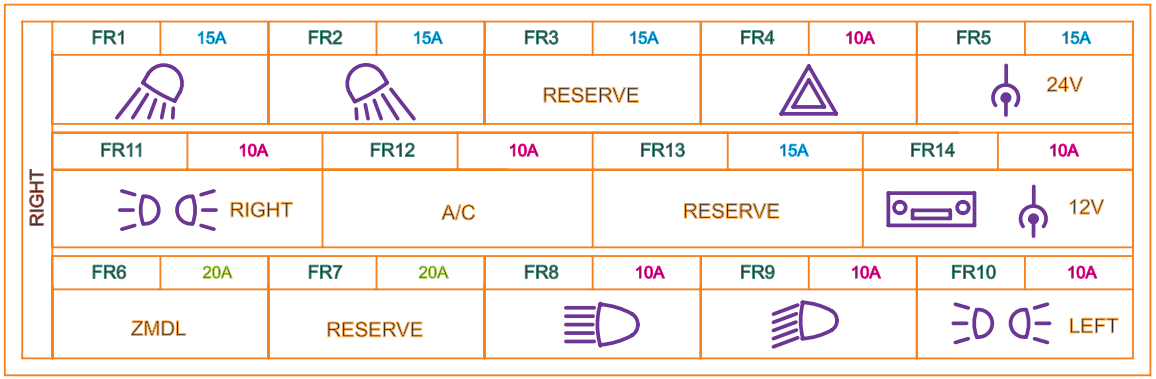


X10	connector central control module	X61	connector central control module	X160	connector operator's cab / floor frame
X20	connector central control module	X68	connector fast travel version	X170	connector operator's cab / switch console
X30	connector central control module	X70	connector central control module	XA1	connector radio connection
X31	connector central control module	X150	connector switch console / front chassis	XA2	connector loudspeaker connection

Typ Model Type Tipo	TL 120	Elektrisches System Electrical system Circuit électrique Sistema elèctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	*TL01200100*	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm Circuit èlectrique Esquemas de los circuitos	Blatt Page Feuille Página	4/4		Blatt Page Feuille Página	7.27.04

FL1	15A	HEATER/AIR CONDITIONER
FL2	15A	WASH/WIPE FRONT
FL3	15A	WASH/WIPE REAR
FL4	10A	ROTATING BEACON/INTERIOR LIGHT
FL5	15A	POWER SUPPLY K9/K10
FL6	15A	ADDITIONAL CONTROL MODULE (TERMINAL 15)
FL7	10A	POWER SUPPLY K11/K12
FL8	10A	CENTRAL CONTROL MODUL ENTRIES
FL9	10A	DASHBOARD
FL10	10A	RESERVE (TERMINAL 15)
FL11	10A	RESERVE (TERMINAL 15)
FL12	10A	FLASHER (TERMINAL 15)
FL13	10A	HORN (TERMINAL 15)
FL14	20A	RESERVE (TERMINAL 15)



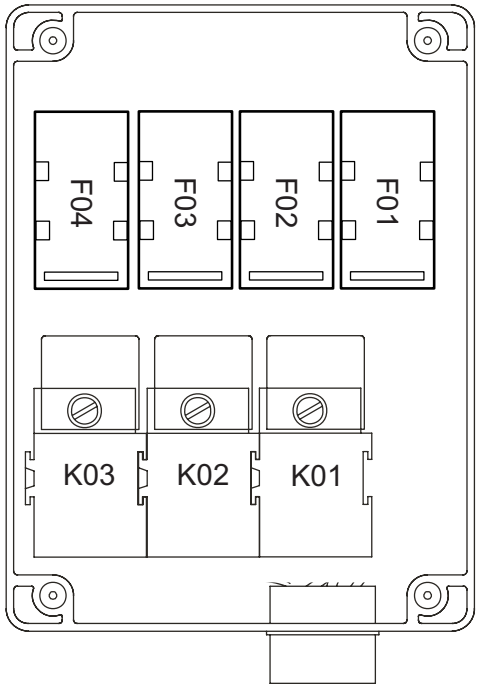


FR1	15A	WORKING FLOODLIGHT FRONT (TERMINAL 30)
FR2	15A	WORKING FLOODLIGHT REAR (TERMINAL 30)
FR3	15A	RESERVE (TERMINAL 30)
FR4	10A	HAZARD WARNING SWITCH (TERMINAL30)
FR5	15A	SOCKET 24VOLT (TERMINAL 30)
FR6	20A	ADDITIONAL CONTROL MODULE (TERMINAL 30)
FR7	20A	RESERVE (TERMINAL 30)
FR8	10A	HIGH BEAM
FR9	10A	LOW BEAM
FR10	10A	SIDE MARKER LAMP LEFT
FR11	10A	SIDE MARKER LAMP RIGHT (TERMINAL 30)
FR12	10A	AIR CONDITIONER (TERMINAL 30)
FR13	15A	RESERVE (TERMINAL 30)
FR14	10A	RADIO 12VOLT (TERMINAL 30)

Typ / Model / Type / Tipo	TL160 — Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TL01600100	Datum / Edition / Date / Fecha	01.2007
Benennung / Description / Dénomination / Denominación	Sicherungs- und Belegungsplanfplan / Assignment diagramm / Schéma de réparation / Esquemas de la caja	Blatt / Page / Feuille / Página	7.28.00

Ansicht - offene Box

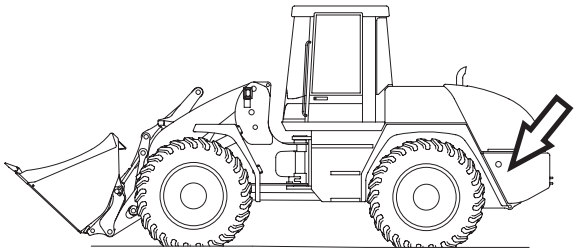
View - open Box



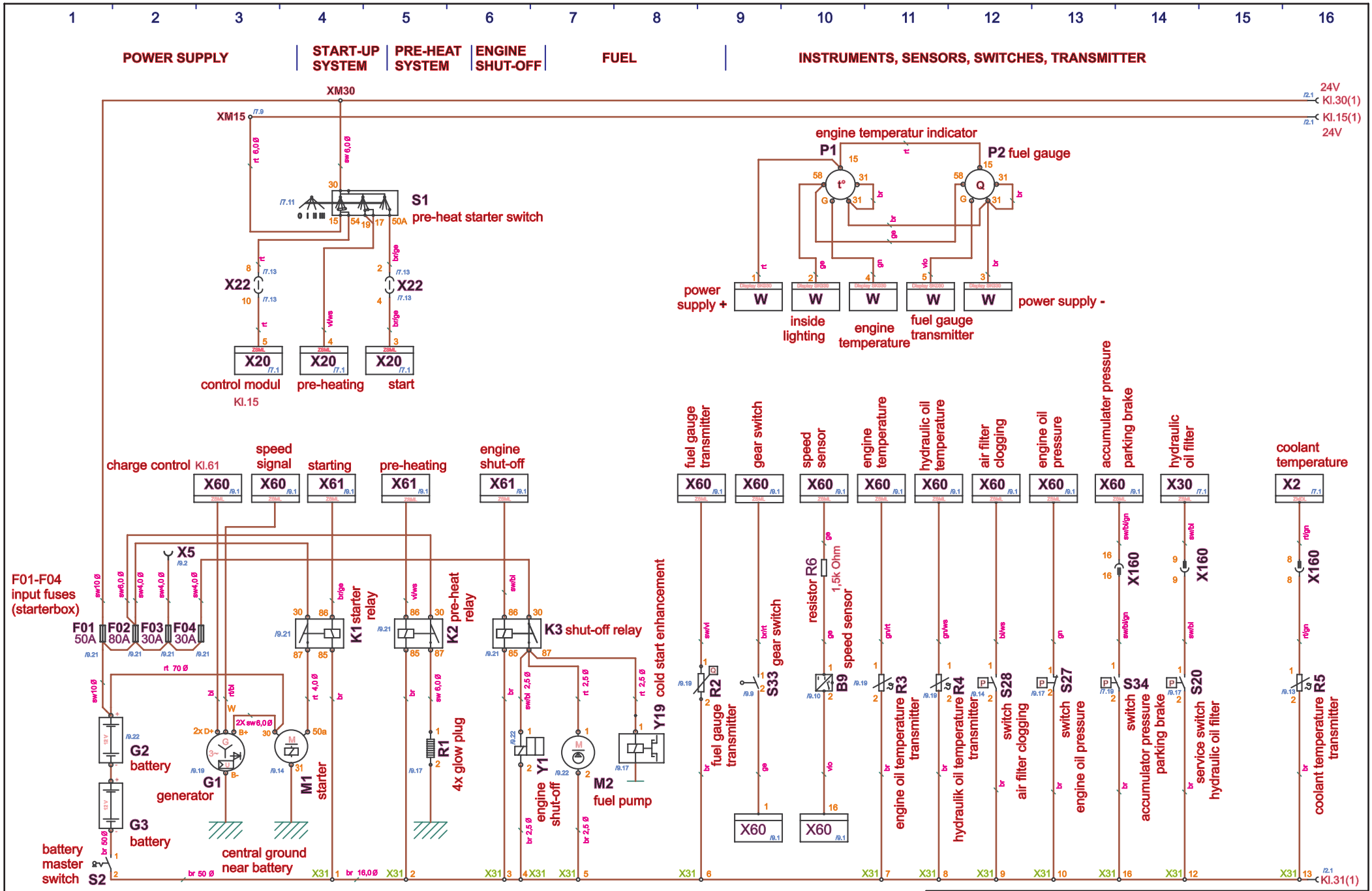
F01	50A	Haupsicherung (Klemme 30)/ Main fuse (terminal 30)
F02	80A	Startrelais / start-up relay, Vorglühen / pre-glow
F03	30A	ZSML / Control modul
F04	30A	Abstellmagnet / Shut-off solenoid, Kraftstoffpumpe / fuel pump

K1	Startrelais / start-up relay
K2	Vorglührelais / pre-glow relay
K3	Relais Motorabsteller / Relay shut-off solenoid, Kraftstoffpumpe / Fuel pump

Location

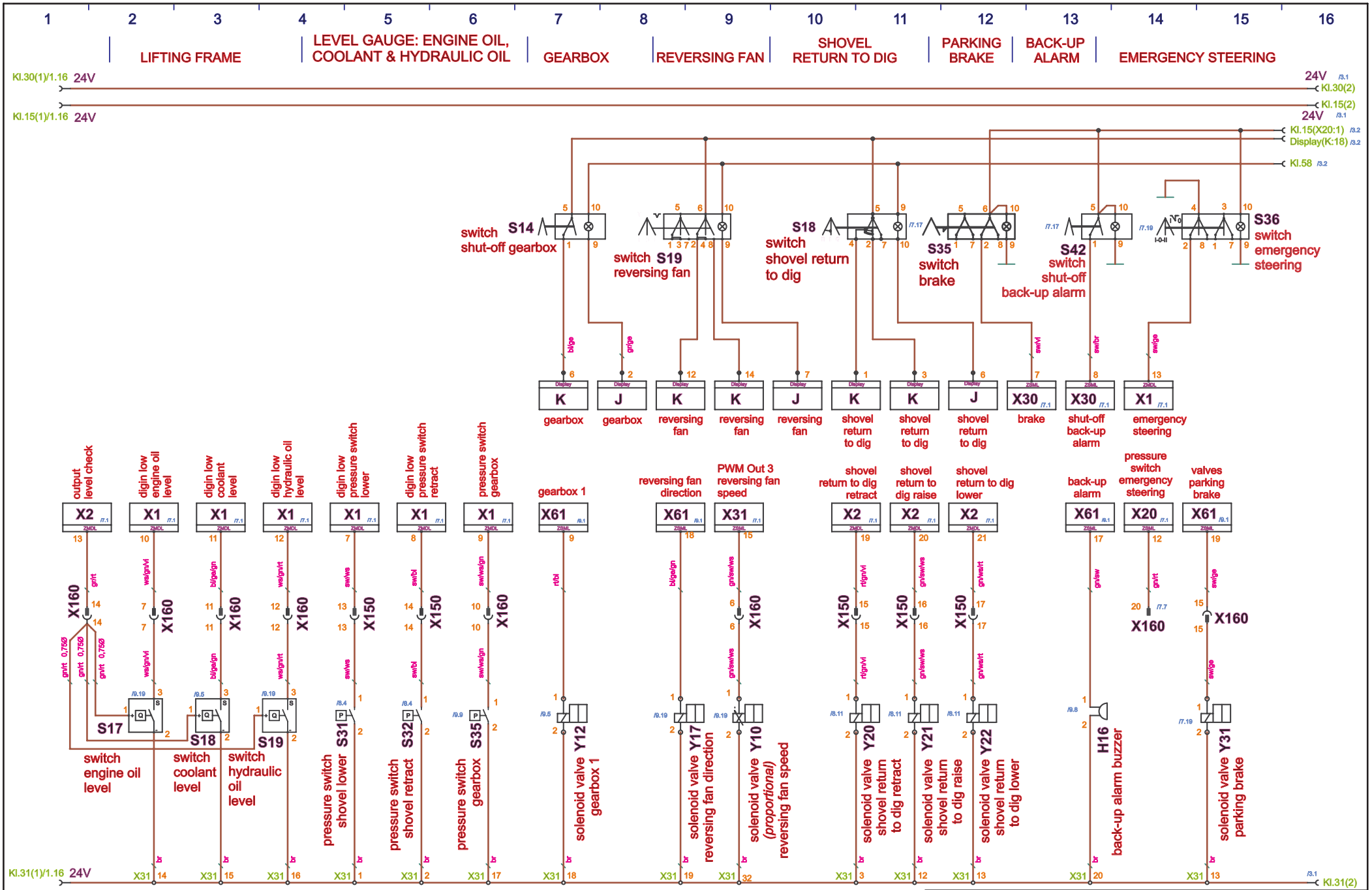


Typ / Model / Type / Tipo	**TL 160** Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. *TL 01600100*	Datum / Edition / Date / Fecha	**01.2007**
Benennung / Description / Dénomination / Denominación	**Sicherungs- und Belegungsplanfplan / Assignment diagramm / Schéma de réparation / Esquemas de la caja**	Blatt / Page / Feuille / Página	**7.28.01**



X2	connector additional control module			X61	connector central control module
X5	connector central control module	X30	connector central control module	X160	connector switch console
X20	connector central control module	X60	connector central control module	W	connector display

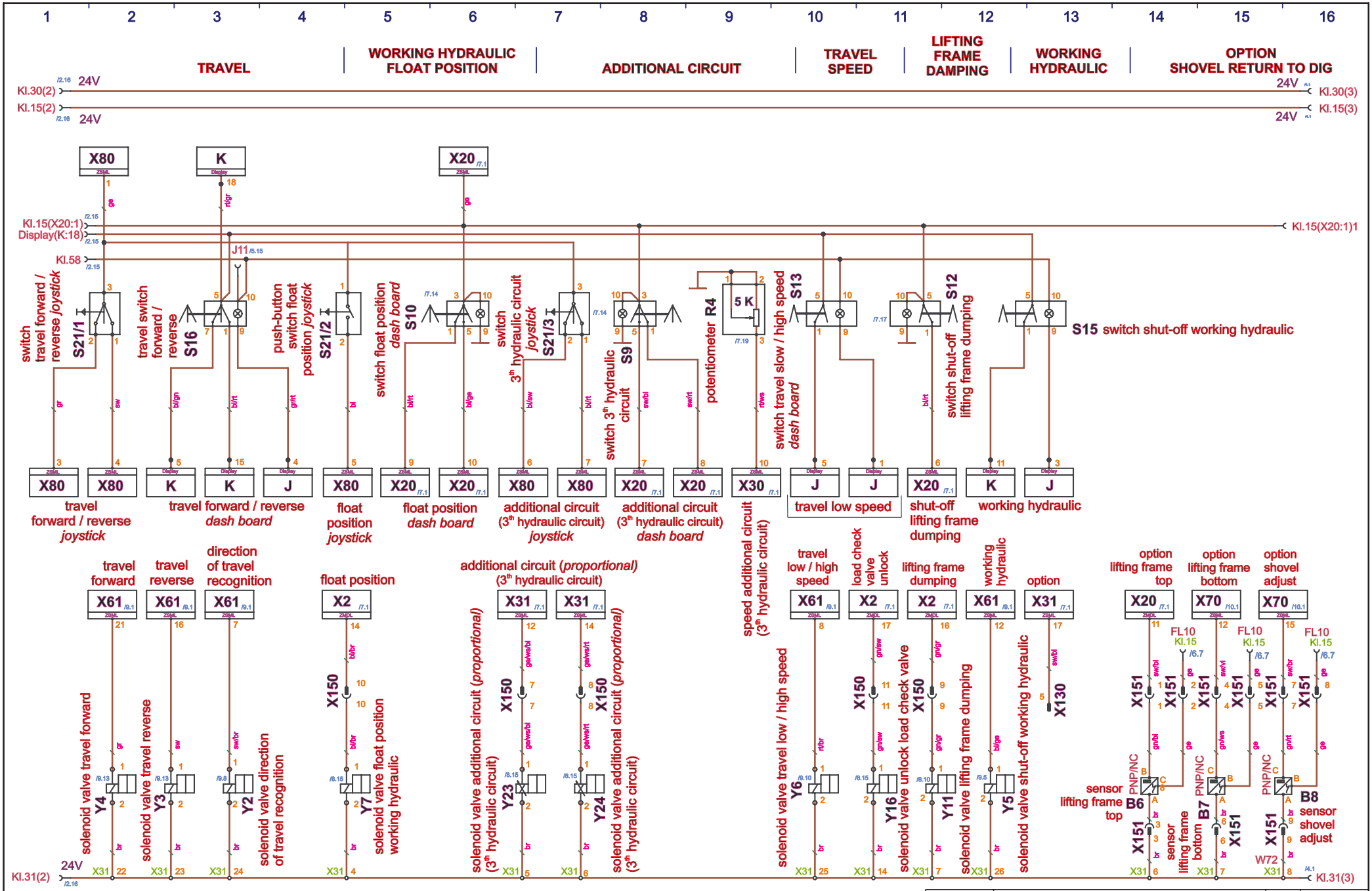
Typ / Model / Type / Tipo	TL 160	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TL01600100	Datum / Edition / Date / Fecha: 01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / Circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 1/6	Blatt / Page / Feuille / Página: 7.28.02



X1	connector additional control module	X30	connector switch console	X150	connector switch console
X2	connector additional control module	X31	connector switch console	X160	connector switch console
X20	connector central control module	X61	connector switch console	J & K	connector display

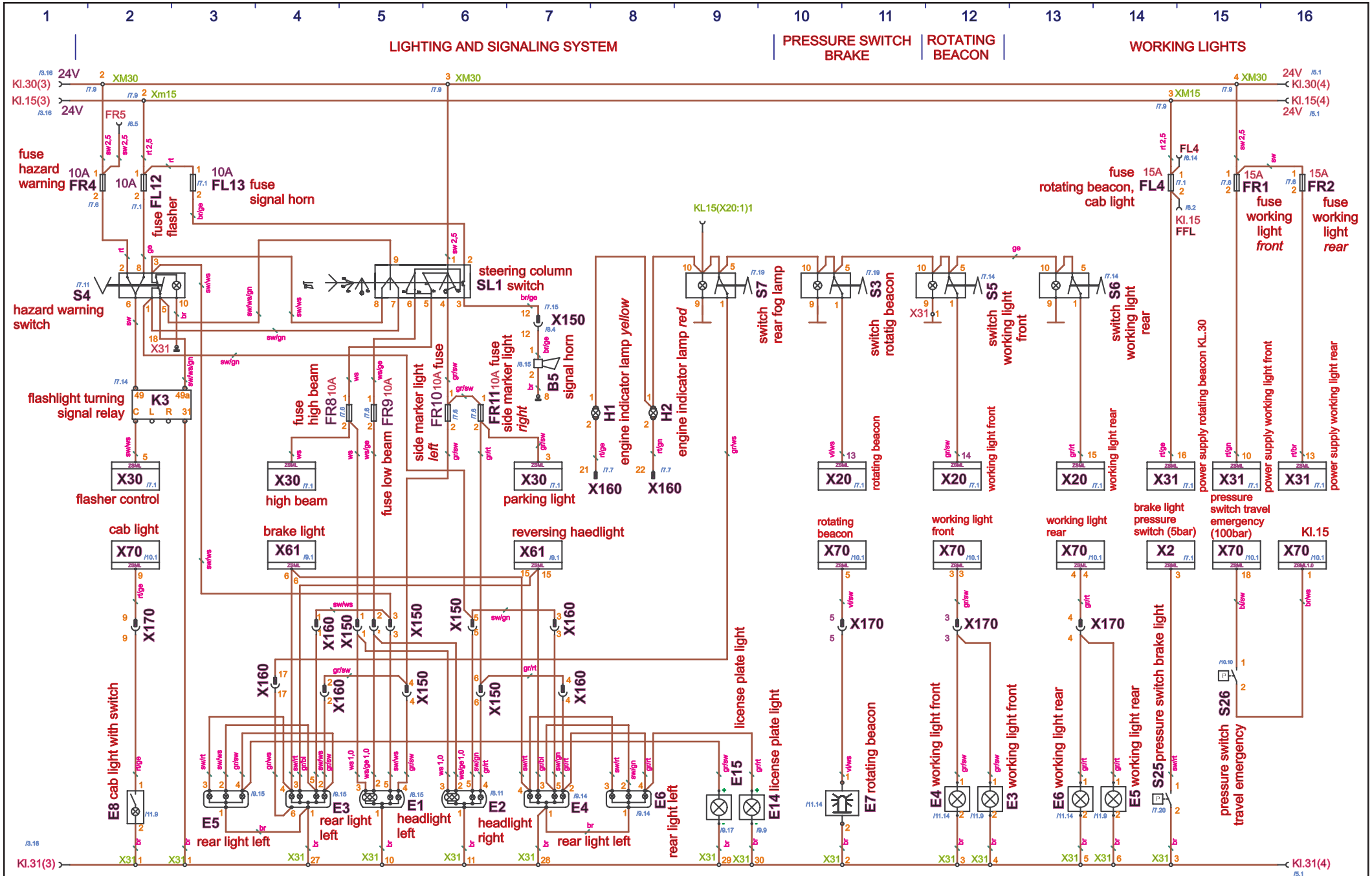
Typ Model Type Tipo	TL 160	Elektrisches System Electrical system Circuit électrique Sistema elèctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no. TL01600100
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos	Blatt Page Feuille Página	2/6

Datum Edition Date Fecha	01.2007
Blatt Page Feuille Página	7.28.03



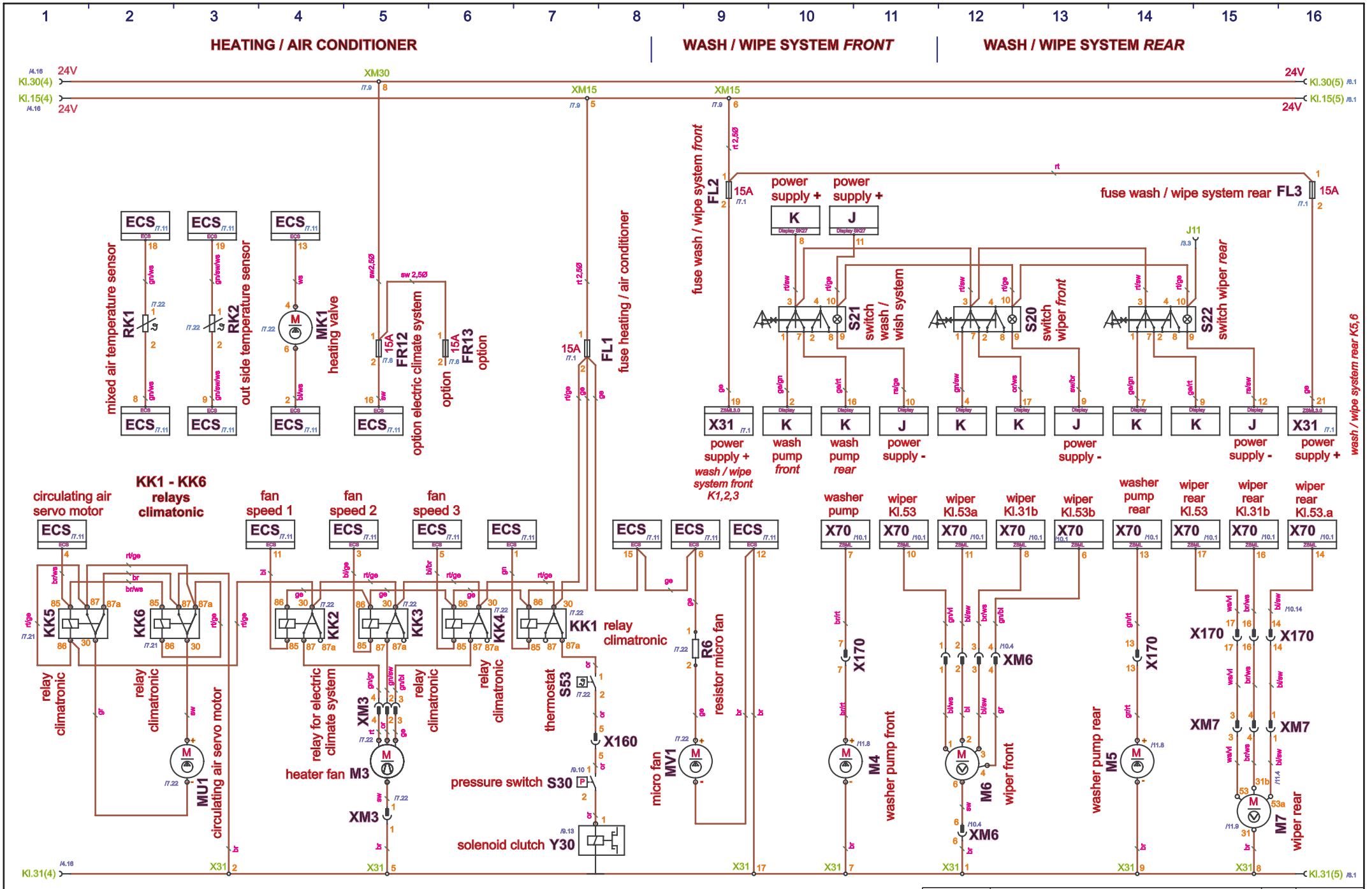
X2	connector additional control modul	X61	connector central control modul	X150	connector switch console
X20	connector central control modul	X70	connector central control modul	X151	connector shovel return to dig *operator's cab*
X30	connector central control modul	X80	connector central control modul	J	connector display
X31	connector central control modul	X130	connector switch console	K	connector display

Typ / Model / Type / Tipo	TL 160	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TL01600100	Datum / Edition / Date / Fecha	01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / Circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 3/6		Blatt / Page / Feuille / Página	7.28.04



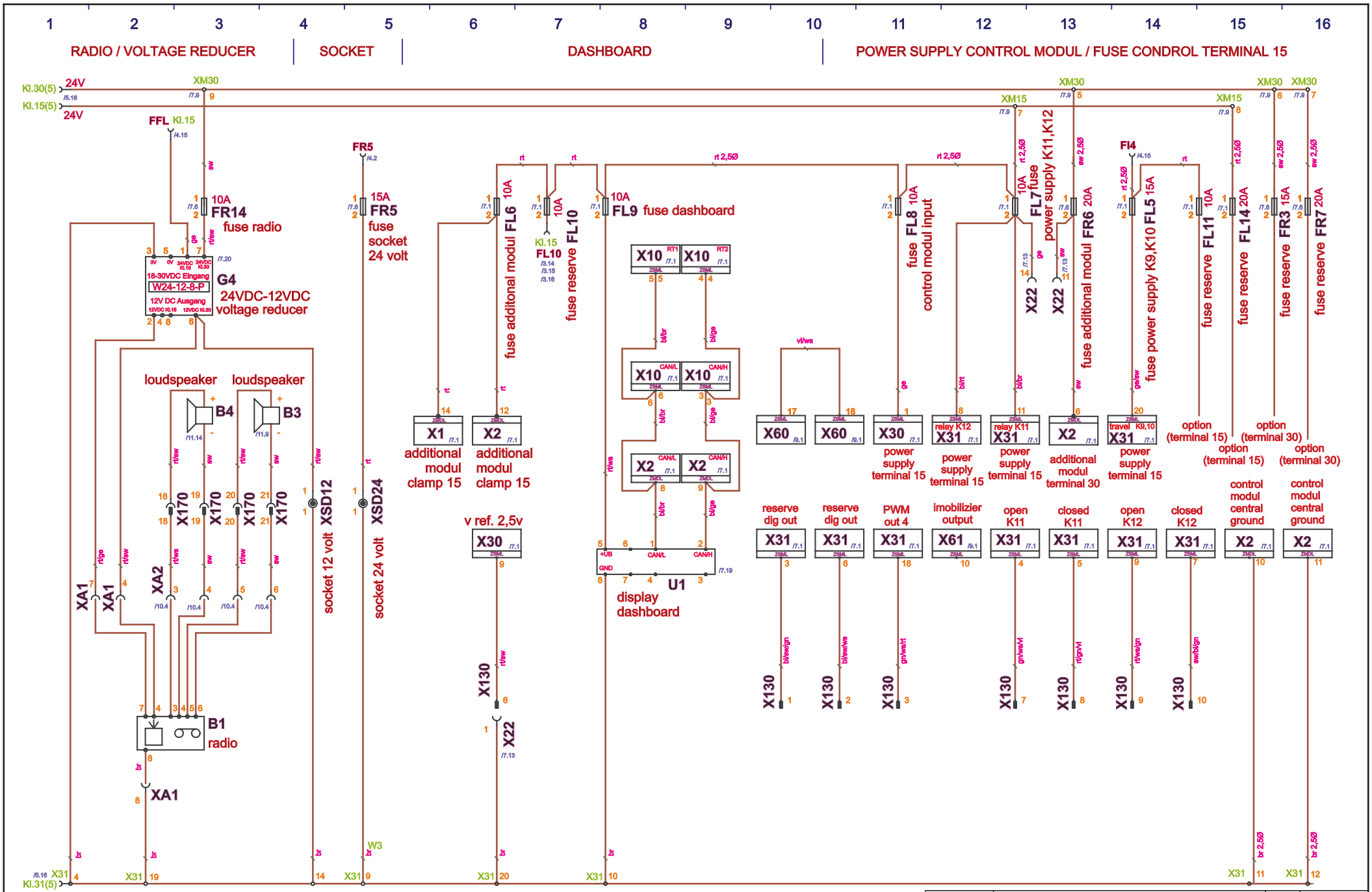
X2	connector additional control modul	X61	connector central control modul	X170	connector operator's cab
X20	connector central control modul	X70	connector central control modul		
X30	connector central control modul	X150	connector front chassis		
X31	connector central control modul	X160	connector rear chassis		

Typ / Model / Type / Tipo	TL160	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TL01600100	Datum / Edition / Date / Fecha: 01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / Circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 4/6	Blatt / Page / Feuille / Página: 7.28.05



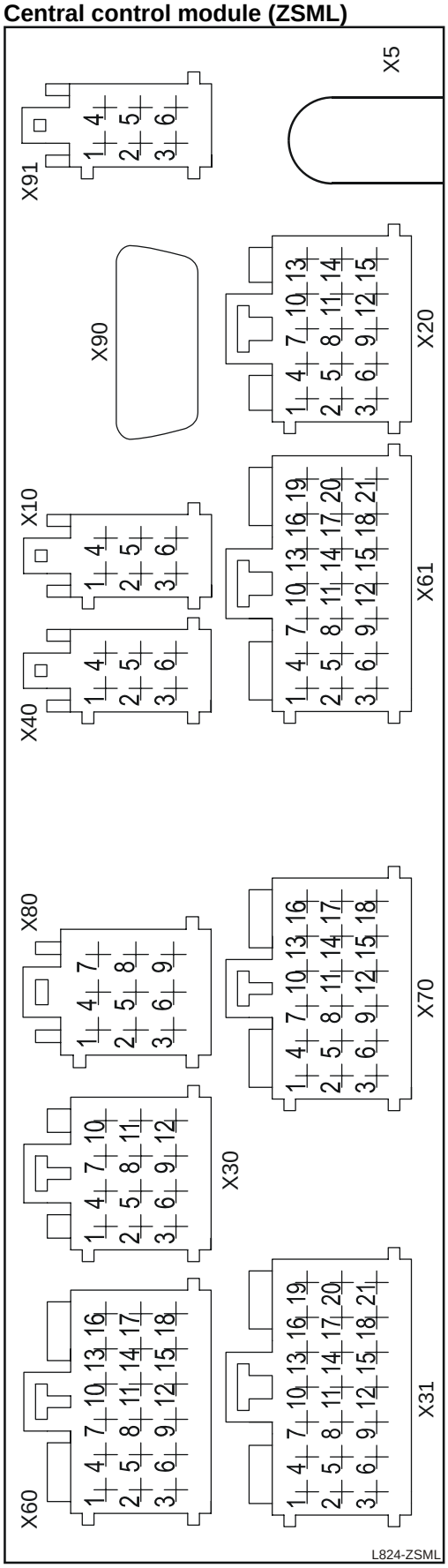
X31	connector central control modul	XM3	connector fan	K	connector display
X70	connector central control modul	XM6	connector wiper motor front	XM6	connector wiper motor rear
X160	connector rear chassis	ECS	connector climatronic		
X170	connector operator's cab	J	connector display		

Typ / Model / Type / Tipo	TL 160	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TL01600100	Datum / Edition / Date / Fecha	01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / Circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 5/6		Blatt / Page / Feuille / Página	7.28.06

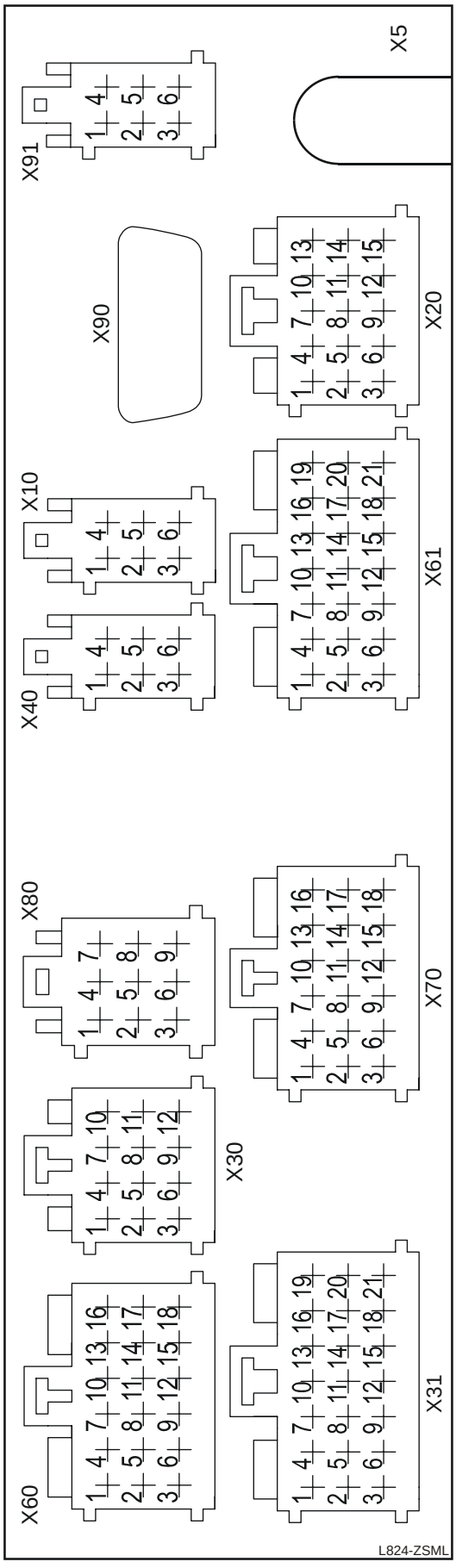


X1	connector additional control modul	X30	connector central control modul	X130	connector switch console	Typ / Model / Type / Tipo	TL 160
X2	connector additional control modul	X31	connector central control modul	X170	connector operator's cab / floor frame	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no. TL01600100
X10	connector central control modul	X60	connector central control modul	XA1	connector radio connection	Datum / Edition / Date / Fecha	01.2007
		X61	connector central control modul	XA2	connector radio / floor frame	Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / Circuit électrique / Esquemas de los circuitos
						Blatt / Page / Feuille / Página	6/6
						Blatt / Page / Feuille / Página	7.28.07

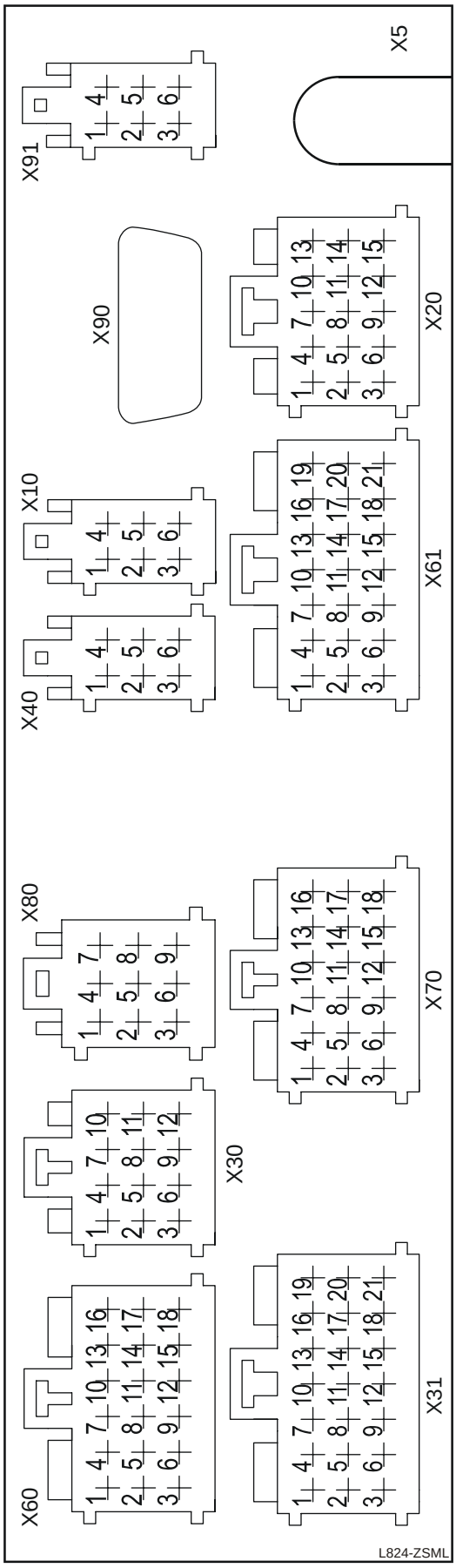
Central control module (ZSML)



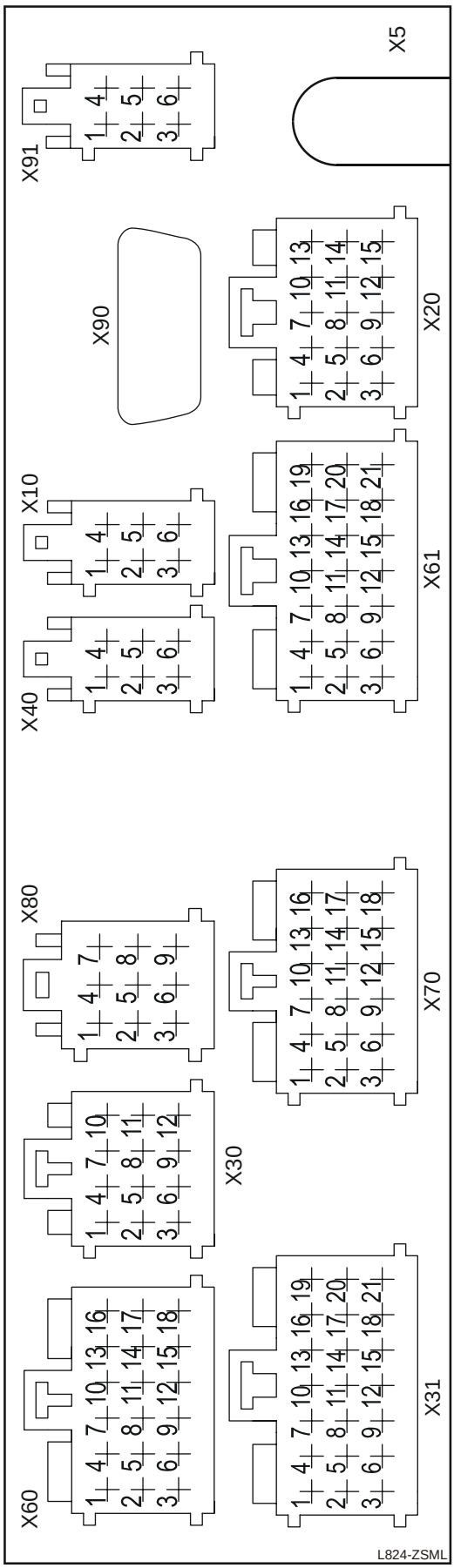
X60	***Signal inputs "engine monitoring"***
1	Transmission switch signal
2	--
3	Charge signal generator D+
4	Air filter maintenance switch signal
5	Oil pressure switch signal
6	Accumulator pressure parking brake
7	Transmission switch signal
8	Engine temperature sensor signal
9	Fuel gauge sensor signal
10	Hydraulic oil temperature sensor signal
11	Idle signal generator "W" signal
12	--
13	--
14	--
15	Speedometer signal sensor
16	Speedometer sensor output
17	link to terminal 18
18	link to terminal 17
X30	***Signal inputs "Lighting"***
1	Power supply Terminal 15 output
2	Central ground Terminal 31
3	Parking light Terminal 15 input
4	High beam signal
5	Direction indicator control signal
6	Hydraulic oil filter clogging (signal)
7	Parking brake (signal)
8	shut off back-up alarm
9	Reference voltage 2.5V
10	Analog input speed 3rd control circuit
11	Spare - Analog
12	Spare - Analog
X80	***Coordinate lever***
1	Power supply Terminal 15 output
2	Central ground Terminal 31
3	Travel forward signal
4	Travel reverse signal
5	Float position signal
6	Additional control circuit signal
7	Additional control circuit signal
8	Spare - Analog
9	Spare - Analog



X40	***CAN-BUS (Option)***
1	Power supply Terminal 15 output
2	Central ground Terminal 31
3	CAN/HI
4	R1
5	R2
6	CAN/LO
X10	***Control panel***
1	--
2	Central ground Terminal 31
3	CAN/HI
4	--
5	--
6	CAN/LO
X90	***Programming connection***
X91	***Immobilizer (Option)***
1	Power supply Terminal 15 output
2	Central ground Terminal 31
3	***TXD***
4	RXD
5	CTS
6	RTS

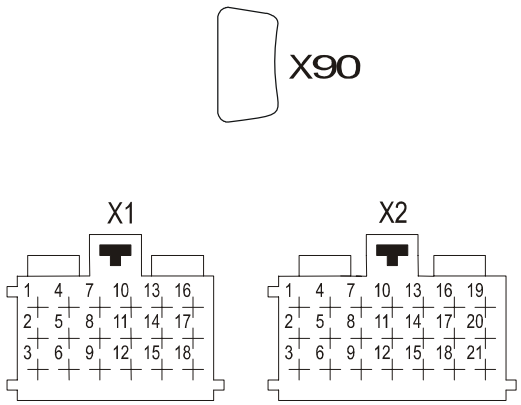


X31	***Module power supply, working floodlights, rotating beacon, wiper***
1	--
2	-
3	Spare digital output
4	Relay K11:87a N.C. contact output
5	Relay K11:87 N.O. contact output
6	Spare digital output
7	Relay K12:87 N.O. contact output
8	Relay K12 power supply Terminal 15 input
9	Relay K12:87a N.C. contact Output
10	Power supply Terminal 30 input working floodlight front
11	Relay K11 power supply Terminal 15 input
12	3rd control circuit (PWM output)
13	Power supply Terminal 30 input working floodlight rear
14	3rd control circuit (PWM output)
15	Reversing fan speed PWM output
16	Power supply Terminal 15 input rotating beacon
17	Spare Digital output
18	Spare PWM output
19	Power supply Terminal 15 input wash/ wipe rear
20	Power supply Terminal 15 input travel
21	Power supply Terminal 15 input wash/ wipe rear
X70	***Working floodlights , Wipers***
1	Power supply brake pressure switch
2	--
3	Working floodlight front output
4	Working floodlight rear output
5	Rotating beacon output
6	Wiper Terminal 53b 2nd setting output
7	Washer pump front output
8	Wiper Terminal 31b output
9	Interior lamp Terminal 30 output
10	Wiper Terminal 53 output
11	Wiper Terminal 53a output
12	RTD lifting frame lower position (signal)
13	Washer pump rear output
14	Rear wiper Terminal 53a output
15	RTD shovel position (signal)
16	Rear wiper Terminal 31b output
17	Rear wiper Terminal output
18	Brake light switch 100bar signal input

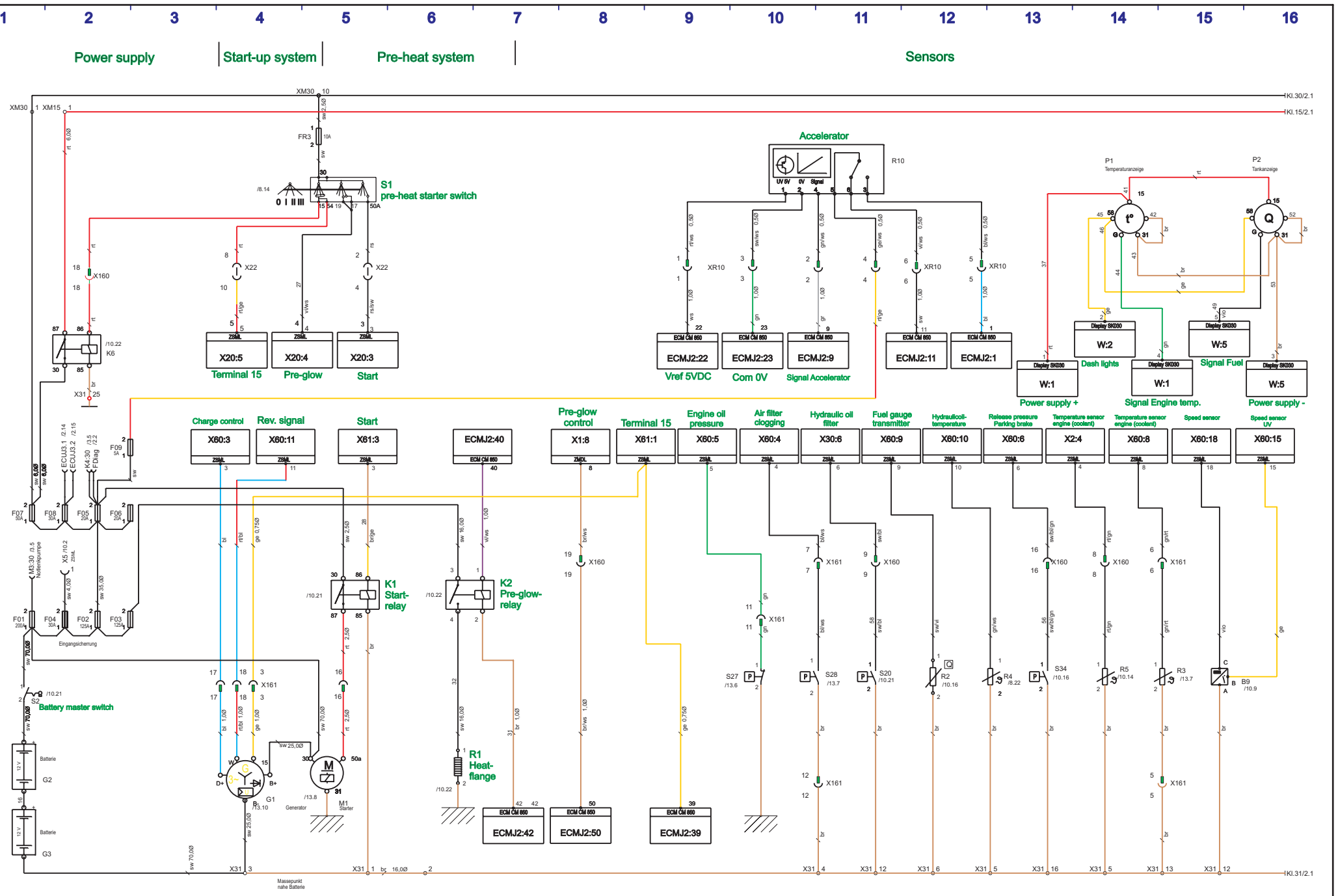


X61	***Rear carriage***
1	--
2	--
3	Starting Terminal 50a output
4	Pre-heating output
5	Engine shutdown output
6	Brake light output
7	Travel, direction recognition output
8	Travel, FAST-SLOW output
9	Transmission 1 output
10	Option Immobilizer
11	--
12	Working hydraulics output
13	--
14	--
15	Back-up lamp output
16	Travel reverse output
17	Back-up alarm output
18	Reversing fan output
19	Solenoid valve parking brake output
20	--
21	Travel forward output
X20	***Panel, right***
1	Power supply Terminal 15 output
2	--
3	Start-up Terminal 50a signal
4	Pre-heat signal
5	Power supply control unit Terminal 15
6	Ride control system signal
7	Additional control circuit signal
8	Additional control circuit signal
9	Float position 1 signal
10	Float position 2 signal
11	RTD lifting frame high position (signal)
12	Pressure switch emergency steering
13	Rotating beacon signal
14	Working floodlight front signal
15	Working floodlight rear Signal
X5	***Power supply***

Additional Control Unit ZMDL



X1	***plug***
1	
2	
3	
4	
5	
6	
7	digin low pressure switch lower
8	digin low pressure switch retract
9	pressure switch gear shift (signal)
10	digin low engine oil level
11	digin low coolant level
12	digin low hydraulic oil level
13	emergency steering (signal)
14	power supply control unit terminal 15
15	--
16	--
17	--
18	--
X2	***plug***
1	--
2	--
3	brake light pressure switch 5 bar
4	coolant temperature
5	--
6	power supply control unit terminal 30
7	--
8	CAN-Bus-link ZSML X10 CAN/L
9	CAN-Bus-link ZSML X10 CAN/L
10	central ground
11	central ground
12	power supply control unit terminal 15
13	level check output
14	float position output
15	--
16	solenoid valve ride control
17	solenoid valve unlock load check valve
18	--
19	RTD retract output
20	RTD lifting frame high position (cut off output)
21	RTD lower output
X90	***plug***



Typ Model Type Tipo	**TL 210**	**Elektrisches System** **Electrical system** **Circuit électrique** **Sistema eléctrico**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.**	**TL02100100**	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Stromlaufplan** **Wiring diagramm** **Circuit èlectrique** **Esquemas de los circuitos**		Blatt Page Feuille Página	**1/9**	Blatt Page Feuille Página	**7.29.01**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Engine sensors and actuating elements

Power supply ECM

Kl.30/1.16 — Kl.30/3.1

Kl.15/1.16 — Kl.15/3.1

SAE 1939 Diagnosticplug

A B C F D G E H J

br sw gn gr

A XD A B XD B C XD C

X31 1

FDiag/1.2 Kl.30

ECMJ1:8 — CAN High

ECMJ1:6 — CAN Low

?? — CAN Shield

Injector Cylinder 1 — ECMJ1:45 — YZY1 — ECMJ1:53 — Actor GND

Injector Cylinder 2 — ECMJ1:54 — YZY2 — ECMJ1:51 — Actor GND

Injector Cylinder 3 — ECMJ1:55 — YZY3 — ECMJ1:52 — Actor GND

Injector Cylinder 4 — ECMJ1:56 — YZY4 — ECMJ1:58 — Actor GND

Injector Cylinder 5 — ECMJ1:46 — YZY5 — ECMJ1:60 — Actor GND

Injector Cylinder 6 — ECMJ1:57 — YZY6 — ECMJ1:59 — Actor GND

ECUJ3.1/1.1 Kl.30 — W28 sw 2,5/3 — ECMJ3:3

ECUJ3.2/1.1 Kl.30 — W29 sw 2,5/4 — ECMJ3:4

Crank shaft speed sensor — ECMJ1:27 — BM1 — ECMJ1:16 — Sensor UV 5V

ECMJ1:48 — Sensor GND

Crank shaft position sensor — ECMJ1:26 — BM2 — ECMJ1:37 — Sensor UV 5V

ECMJ1:47 — Sensor GND

Rail pressure sensor — ECMJ1:25 — BM3

Water in fuel sensor — ECMJ1:14 — SM1 — XWIF

Charge air pressure — ECMJ1:44 — BM4

Charge air temperature — ECMJ1:23

Oil pressure engine — ECMJ1:13 — BM5 — ECMJ1:33 — Sensor UV 5V

ECMJ1:38 — Sensor GND

Ambient air pressure sensor — ECMJ1:3 — BM6

Coolant temperature Engine — ECMJ1:15 — RM1

Fuelpump — ECMJ1:1 — MM1 — ECMJ1:11 — Aktor GND

Oilpressure-switch — ECMJ1:17 — SM2

Fuel pump-shut-off — ECMJ1:2 — YM1 — ECMJ1:32 — Aktor GND

ECMJ3:1 — W30 br 2,5/3 — X31 2

ECMJ3:2 — W31 br 2,5/4 — X31 3

Kl.31/1.16 — Kl.31/3.1

Typ / Model / Type / Tipo	TL 210	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TL02100100	Datum / Edition / Date / Fecha	01.2008
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / Circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 2/9		Blatt / Page / Feuille / Página	7.29.02

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

emergency steering | Option shovel return to dig | fast / slow | reversable fan | Versa Steer | Backalarm | parking brake

Kl.30/2.16 — Kl.30/4.1

Kl.15/2.16 — Kl.15/4.1

Kl.15(X20:1) /4.2
Display(K:18) /4.2
Kl.58 /4.2

S36 /8.15 — emergency steering

FL10/7.11 Kl.15 — X151 — B8 /9.11 — X171 — X70:15 — return to dig signal

FL10/7.11 Kl.15 — X151 — B6 /9.11 — X151 — X20:11 — lift height limitation signal

S18 — K 12 — return to dig

K 14 — return to dig S18

J 8 — return to dig

W11 — S14 — J 2 — travel speed 1-2

K 6 — travel speed 1-2 turtle and rabbit

S19 — K 1 — reverse fan manual

K 3 — reverse fan off

J 7 — reverseble fan

S33 /8.13 — X1:7 — Versa Steer

S42 /8.11 — X30:8 — shut off Back Alarm

S35 /8.13 — X30:7 — switch parking brake

power supply level check — X2:13 — S18

coolant level — X1:11 — S18

hydraulik oil level — X1:12 — S19

pressure switch emergency steering — X20:12 — S37 /10.10 — X60:1

emergency steering — X61:20 — K4 — W51 — W91 — M3 /10.9

shovel return to dig release joystick — X2:19 — K4 — W36

lift height limitation release joystick — X2:20 — K5 — X81 — W37

reverse fan direction — X31:18 — Y17 /10.15

reverseable fan speed (PWM) — X31:15 — Y10 /10.15

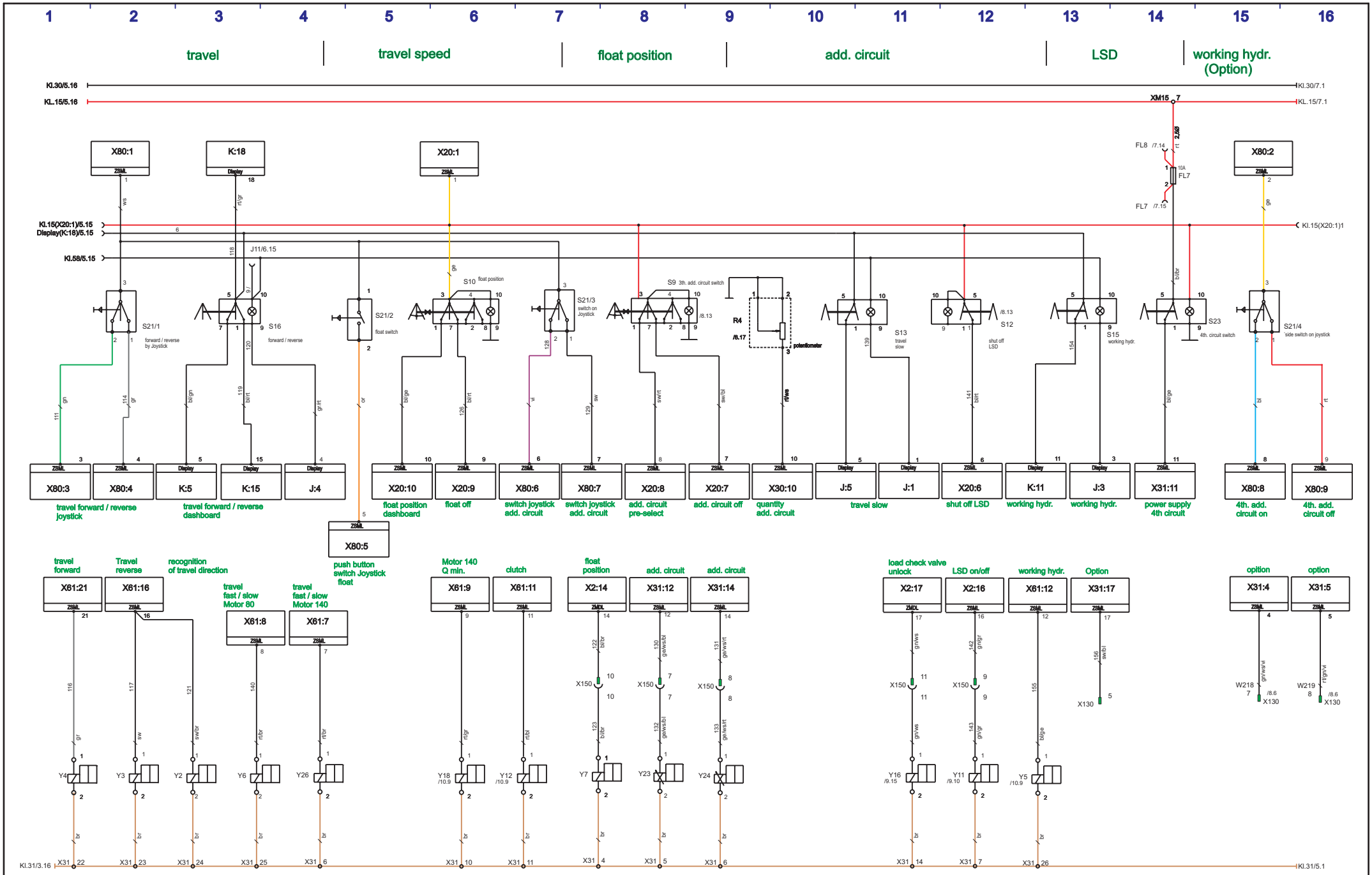
Versa Steer — X61:10 — Y33 /10.9

Back Alarm — X61:17 — H16 /10.14

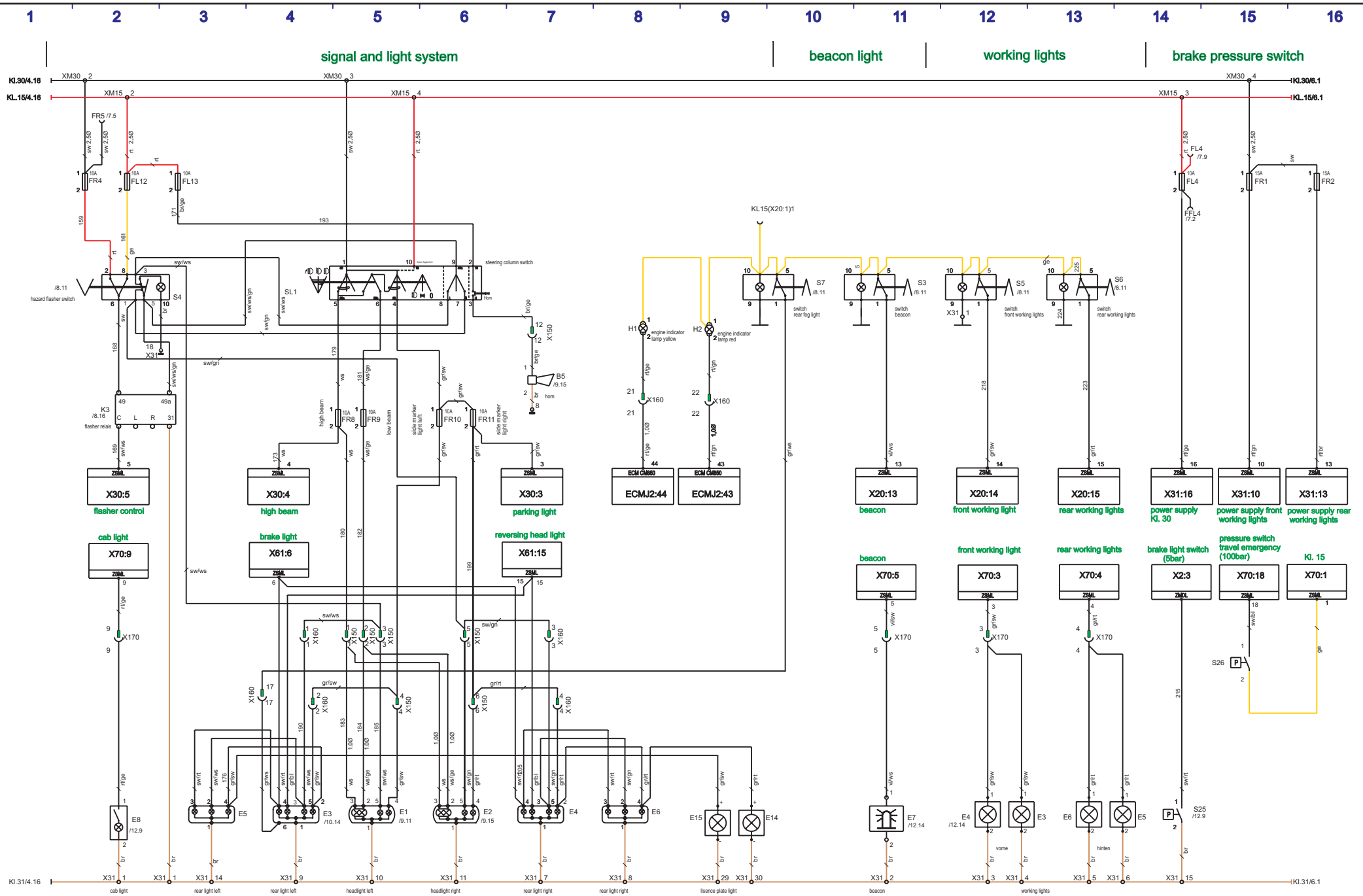
parking brake valve — X61:19 — Y31 /8.22

Kl.31/2.16 — Kl.31/4.1

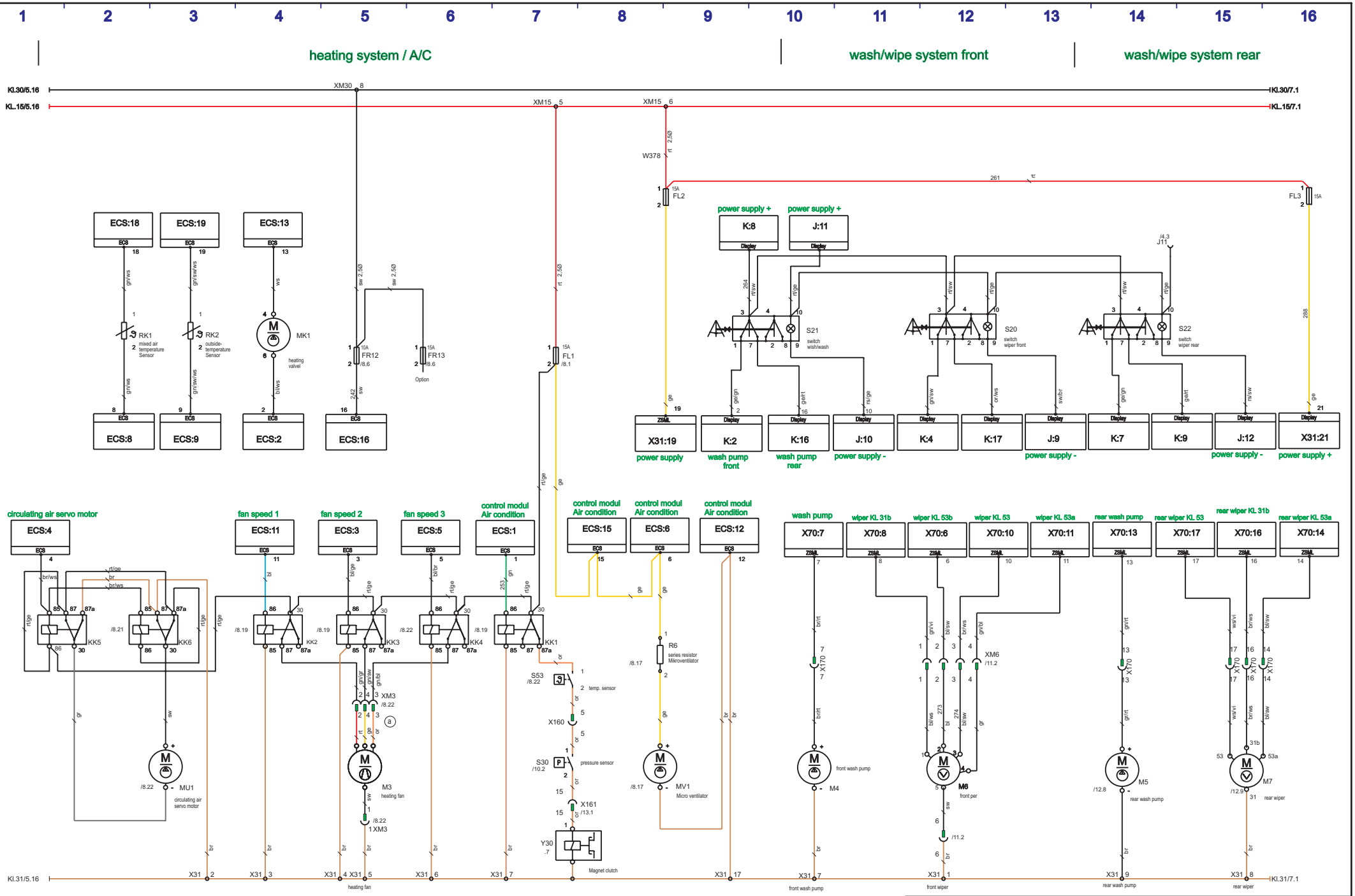
Typ / Model / Type / Tipo	TL 210	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TL02100100	Datum / Edition / Date / Fecha	01.2008
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / Circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 3/9		Blatt / Page / Feuille / Página	7.29.03



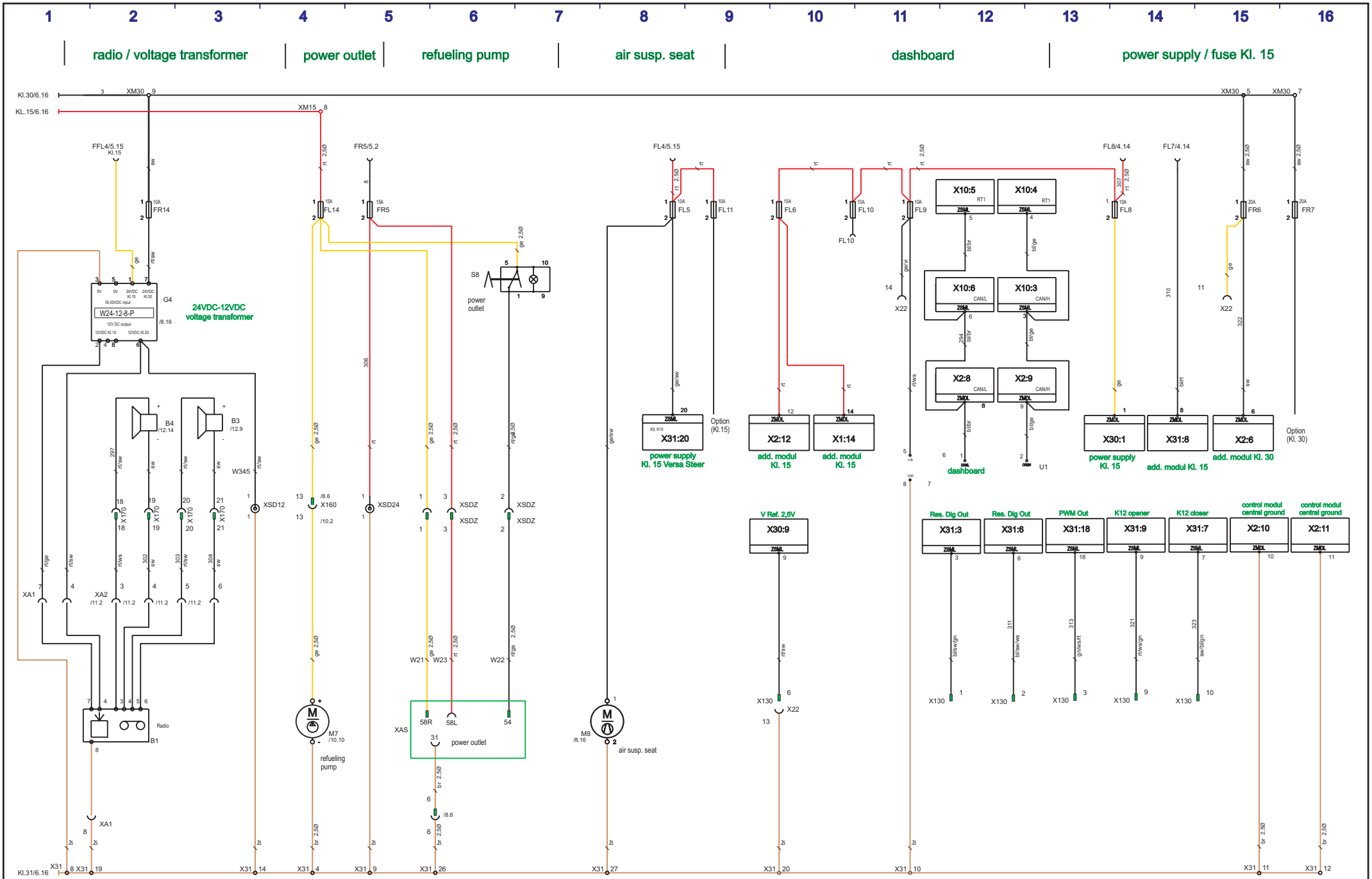
Typ Model Type Tipo	**TL 210**	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL02100100	Datum Edition Date Fecha	01.2008
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm Circuit èlectrique Esquemas de los circuitos		Blatt Page Feuille Página	4/9	Blatt Page Feuille Página	7.29.04



Typ Model Type Tipo	**TL 210**	**Elektrisches System** **Electrical system** **Circuit électrique** **Sistema elèctrico**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.**	**TL02100100**	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Stromlaufplan** **Wiring diagramm** **Circuit èlectrique** **Esquemas de los circuitos**		**Blatt** **Page** **Feuille** **Página**	**5/7**	Blatt Page Feuille Página	**7.29.05**



Typ Model Type Tipo	TL 210	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no. TL02100100	Datum Edition Date Fecha	01.2008
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página 6/7	Blatt Page Feuille Página	7.29.06



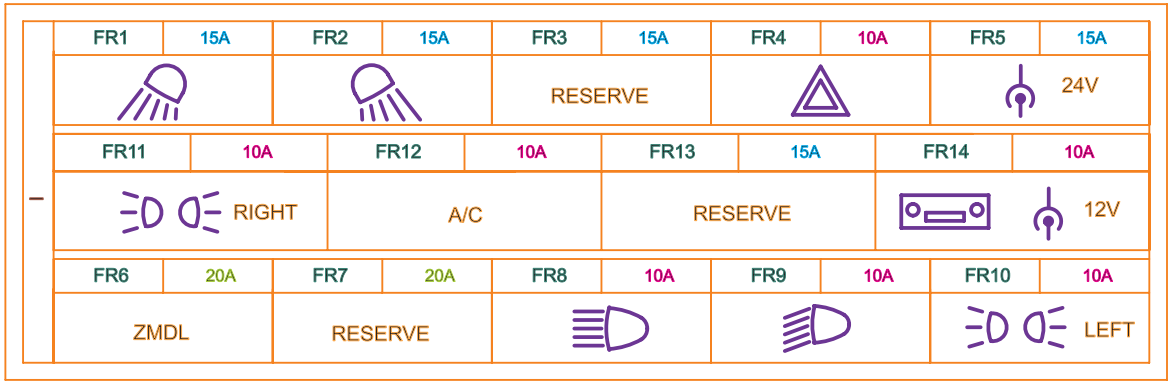
Typ Model Type Tipo	**TL 210**	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL02100100	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos**		Blatt Page Feuille Página	**7/7**	Blatt Page Feuille Página	**7.29.07**


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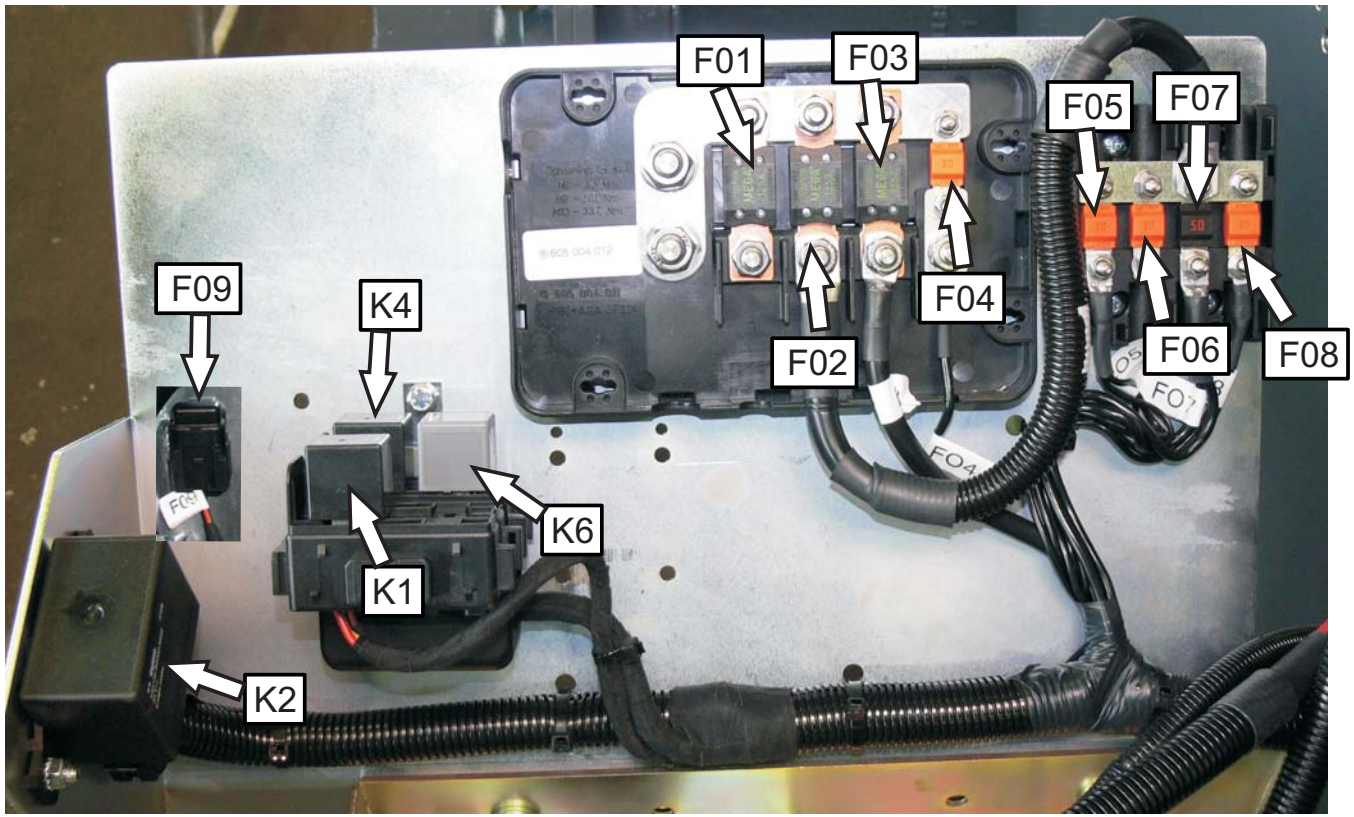
FL1	15A	HEATER/AIR CONDITIONER
FL2	15A	WASH/WIPE FRONT
FL3	15A	WASH/WIPE REAR
FL4	10A	ROTATING BEACON/INTERIOR LIGHT
FL5	15A	POWER SUPPLY K9/K10
FL6	15A	ADDITIONAL CONTROL MODULE (TERMINAL 15)
FL7	10A	POWER SUPPLY K11/K12
FL8	10A	CENTRAL CONTROL MODUL ENTRIES
FL9	10A	DASHBOARD
FL10	10A	SHOVEL RETURN TO DIG
FL11	10A	RESERVE (TERMINAL 15)
FL12	10A	FLASHER (TERMINAL 15)
FL13	10A	HORN (TERMINAL 15)
FL14	20A	RESERVE (TERMINAL 15)



FR1	15A	WORKING FLOODLIGHT FRONT (TERMINAL 30)
FR2	15A	WORKING FLOODLIGHT REAR (TERMINAL 30)
FR3	15A	RESERVE (TERMINAL 30)
FR4	10A	HAZARD WARNING SWITCH (TERMINAL30)
FR5	15A	SOCKET 24VOLT (TERMINAL 30)
FR6	20A	ADDITIONAL CONTROL MODULE (TERMINAL 30)
FR7	20A	RESERVE (TERMINAL 30)
FR8	10A	HIGH BEAM
FR9	10A	LOW BEAM
FR10	10A	SIDE MARKER LAMP LEFT
FR11	10A	SIDE MARKER LAMP RIGHT (TERMINAL 30)
FR12	10A	AIR CONDITIONER (TERMINAL 30)
FR13	15A	RESERVE (TERMINAL 30)
FR14	10A	RADIO 12VOLT (TERMINAL 30)



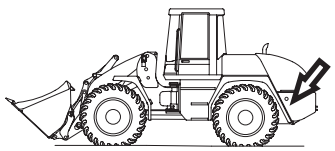
Typ Model Type Tipo	TL 210	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL02100100	Datum Edition Date Fecha	01.2008
Benennung Description Dénomination Denominación	Sicherungs- und Belegungsplanfplan Assignment diagramm Schéma de réparation Esquemas de la caja				Blatt Page Feuille Página	7.29.08



F01 200A Notlenkpumpe / emergency steering pump
F02 125A F05, F06, F07, F08
F03 125A Vorglühen / pre-glow
F04 30A ZSML / Machine control unit
F05 30A Klemme 30, Fahrpedal / Terminal 30, accelerator pedal
F06 30A Option
F07 50A Klemme 30, 15 / Terminal 30, 15
F08 30A Motorsteuergerät / ECU
F09 5A Fahrpedal / accelerator pedal

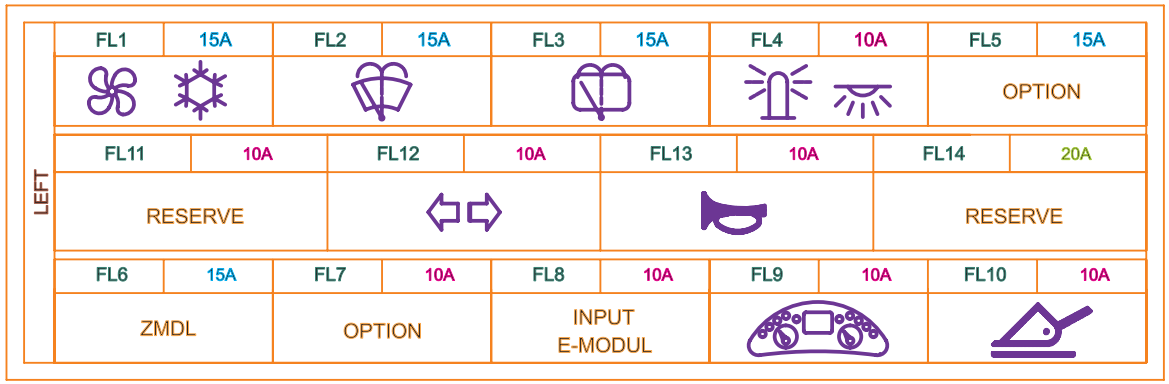
K1 Startrelais / start-up relay
K2 Vorglührelais / pre-glow relay
K4 Notlenkpumpe / emergency steering pump
K6 Klemme 15 / terminal 15

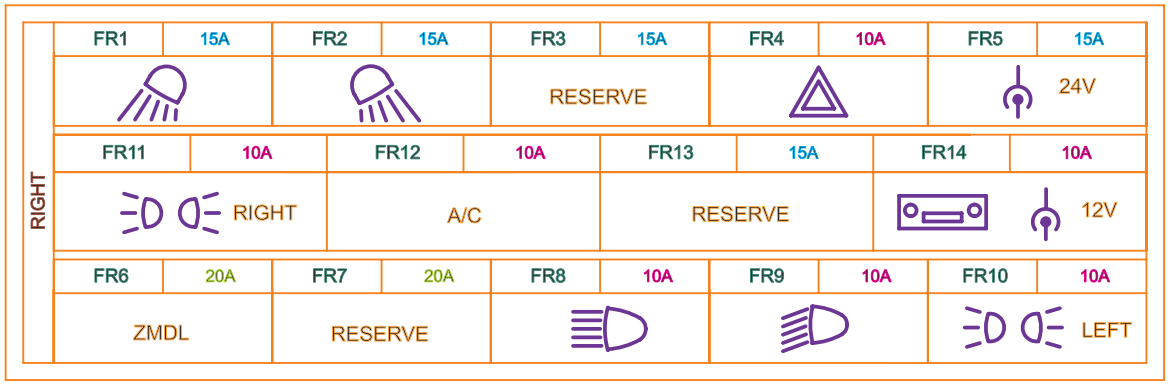
Location



Typ Model Type Tipo	TL 210	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL02100100	Datum Edition Date Fecha	01.2008
Benennung Description Dénomination Denominación	Sicherungs- und Belegungsplan Assignment diagramm Schéma de réparation Esquemas de la caja				Blatt Page Feuille Página	7.29.09

FL1	15A	HEATER/AIR CONDITIONER
FL2	15A	WASH/WIPE FRONT
FL3	15A	WASH/WIPE REAR
FL4	10A	ROTATING BEACON/INTERIOR LIGHT
FL5	15A	POWER SUPPLY K9/K10
FL6	15A	ADDITIONAL CONTROL MODULE (TERMINAL 15)
FL7	10A	POWER SUPPLY K11/K12
FL8	10A	CENTRAL CONTROL MODUL ENTRIES
FL9	10A	DASHBOARD
FL10	10A	SHOVEL RETURN TO DIG
FL11	10A	RESERVE (TERMINAL 15)
FL12	10A	FLASHER (TERMINAL 15)
FL13	10A	HORN (TERMINAL 15)
FL14	20A	RESERVE (TERMINAL 15)

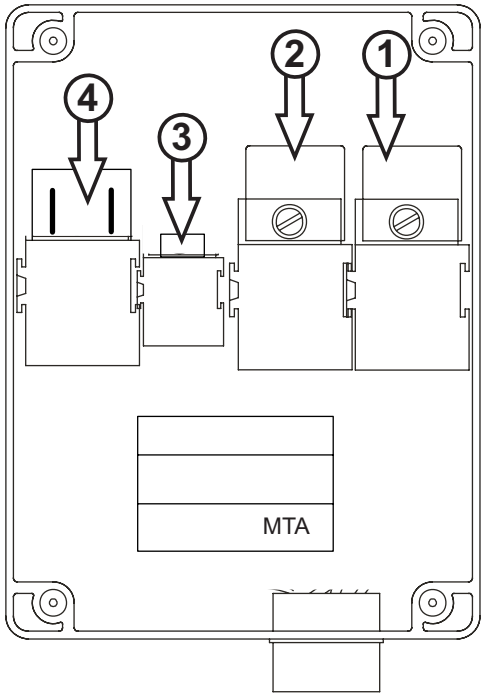




FR1	15A	WORKING FLOODLIGHT FRONT (TERMINAL 30)
FR2	15A	WORKING FLOODLIGHT REAR (TERMINAL 30)
FR3	15A	RESERVE (TERMINAL 30)
FR4	10A	HAZARD WARNING SWITCH (TERMINAL30)
FR5	15A	SOCKET 24VOLT (TERMINAL 30)
FR6	20A	ADDITIONAL CONTROL MODULE (TERMINAL 30)
FR7	20A	RESERVE (TERMINAL 30)
FR8	10A	HIGH BEAM
FR9	10A	LOW BEAM
FR10	10A	SIDE MARKER LAMP LEFT
FR11	10A	SIDE MARKER LAMP RIGHT (TERMINAL 30)
FR12	10A	AIR CONDITIONER (TERMINAL 30)
FR13	15A	RESERVE (TERMINAL 30)
FR14	10A	RADIO 12VOLT (TERMINAL 30)

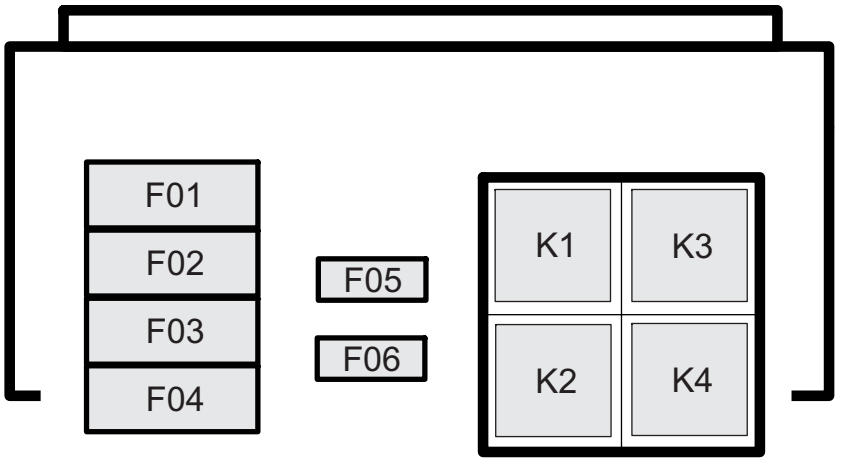
Typ Model Type Tipo	TL 260	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n bis Fz.-Id.-Nr. to s/n	TL02600100 TL02600134	Datum Edition Date Fecha	01.2008
Benennung Description Dénomination Denominación	Sicherungs- und Belegungsplanplan Assignment diagramm Schéma de réparation Esquemas de la caja				Blatt Page Feuille Página	7.30.00

Ansicht - offene Box
View - open Box



① **Relais K3, K4**
② **Relais K1, K2**
③ **Sicherung/ Fuse F05, F06**
④ **Sicherung/ Fuse F01, F02, F03, F04**

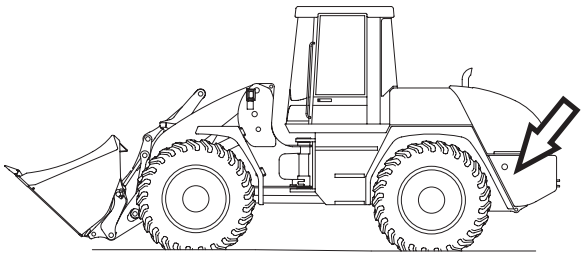
Draufsicht
Topview



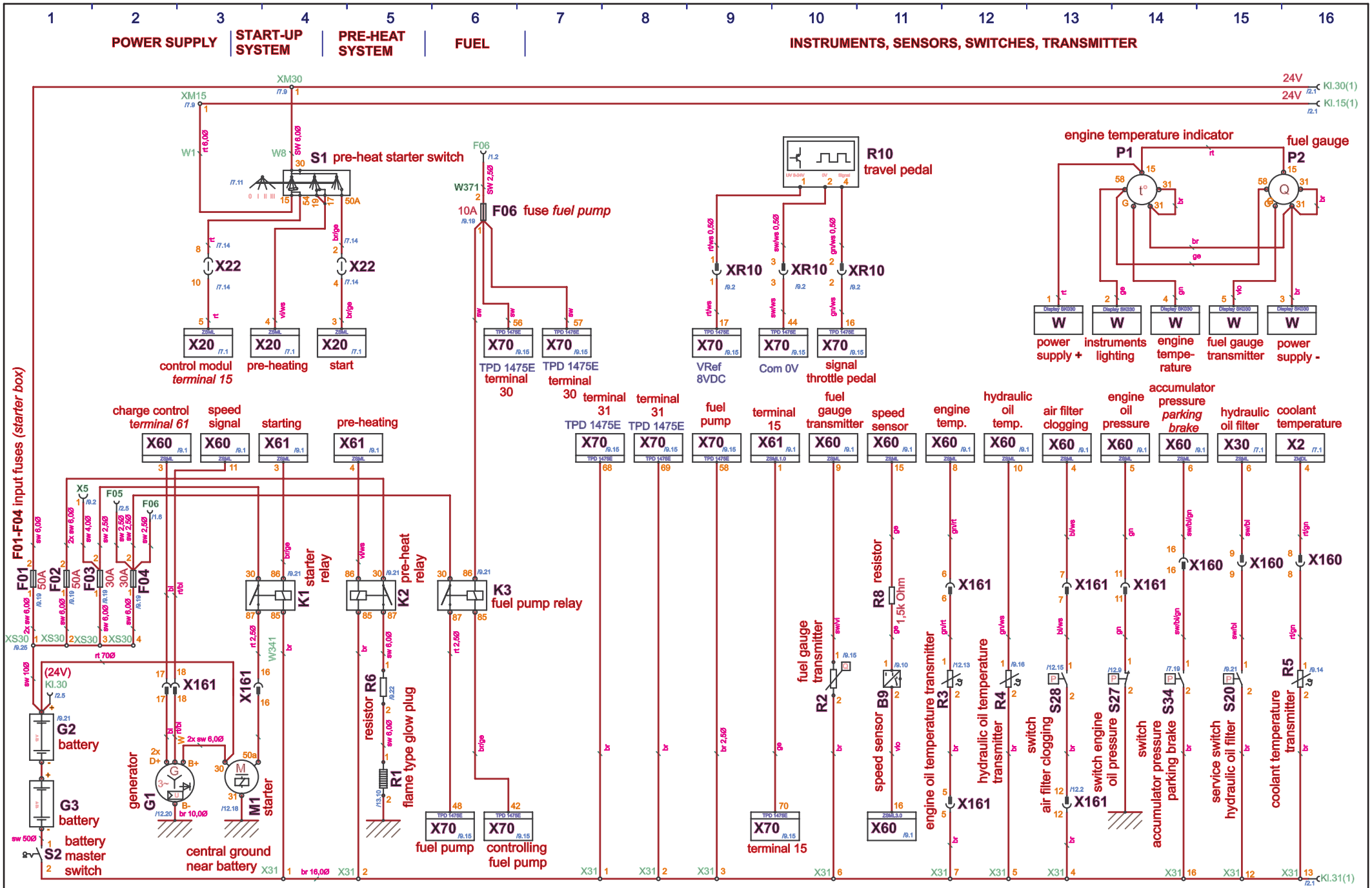
F01	50A	Haupsicherung (Klemme 30)/ Main fuse (terminal 30)
F02	80A	Vorglühen / pre-glow
F03	30A	Startrelais / start-up relay, ZSML / Control modul
F04	30A	Einspritzpumpe / Injection pump
F05	10A	Notlenkpumpe / pump emergency steering
F06	10A	Kraftstoffpumpe / fuel pump

K1	Startrelais / start-up relay
K2	Vorglührelais / pre-glow relay
K3	Einspritzpumpe / Injection pump
K4	Notlenkpumpe / pump emergency steering

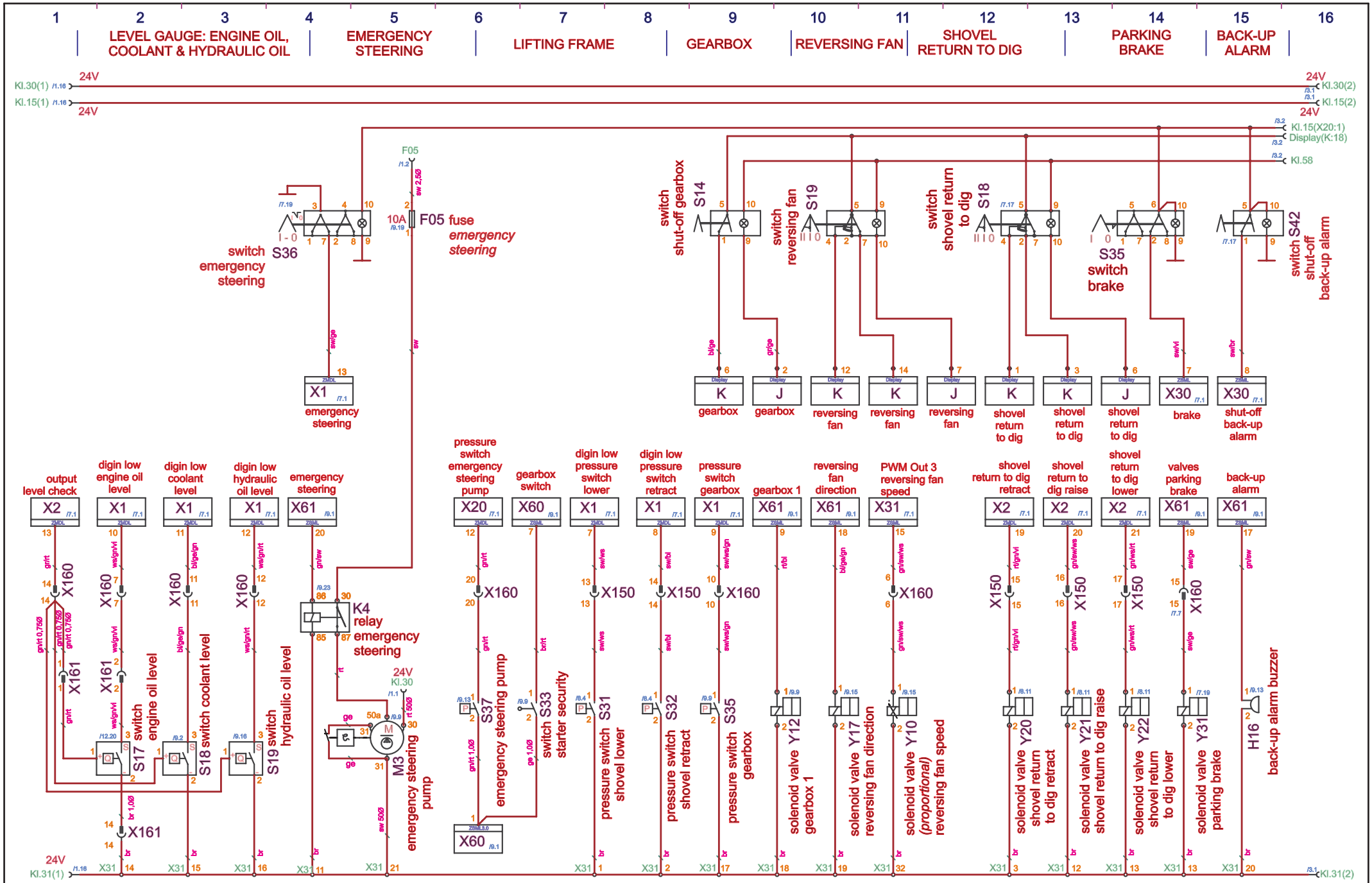
Location



Typ / Model / Type / Tipo	**TL 260**	**Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico**	**ab Fz.-Id.-Nr. / from s/n / bis Fz.-Id.-Nr. / to s/n**	**TL02600100 TL02600134**	Datum / Edition / Date / Fecha: **01.2008**
Benennung / Description / Dénomination / Denominación	**Sicherungs- und Belegungsplanfplan / Assignment diagramm / Schéma de réparation / Esquemas de la caja**				Blatt / Page / Feuille / Página: **7.30.01**

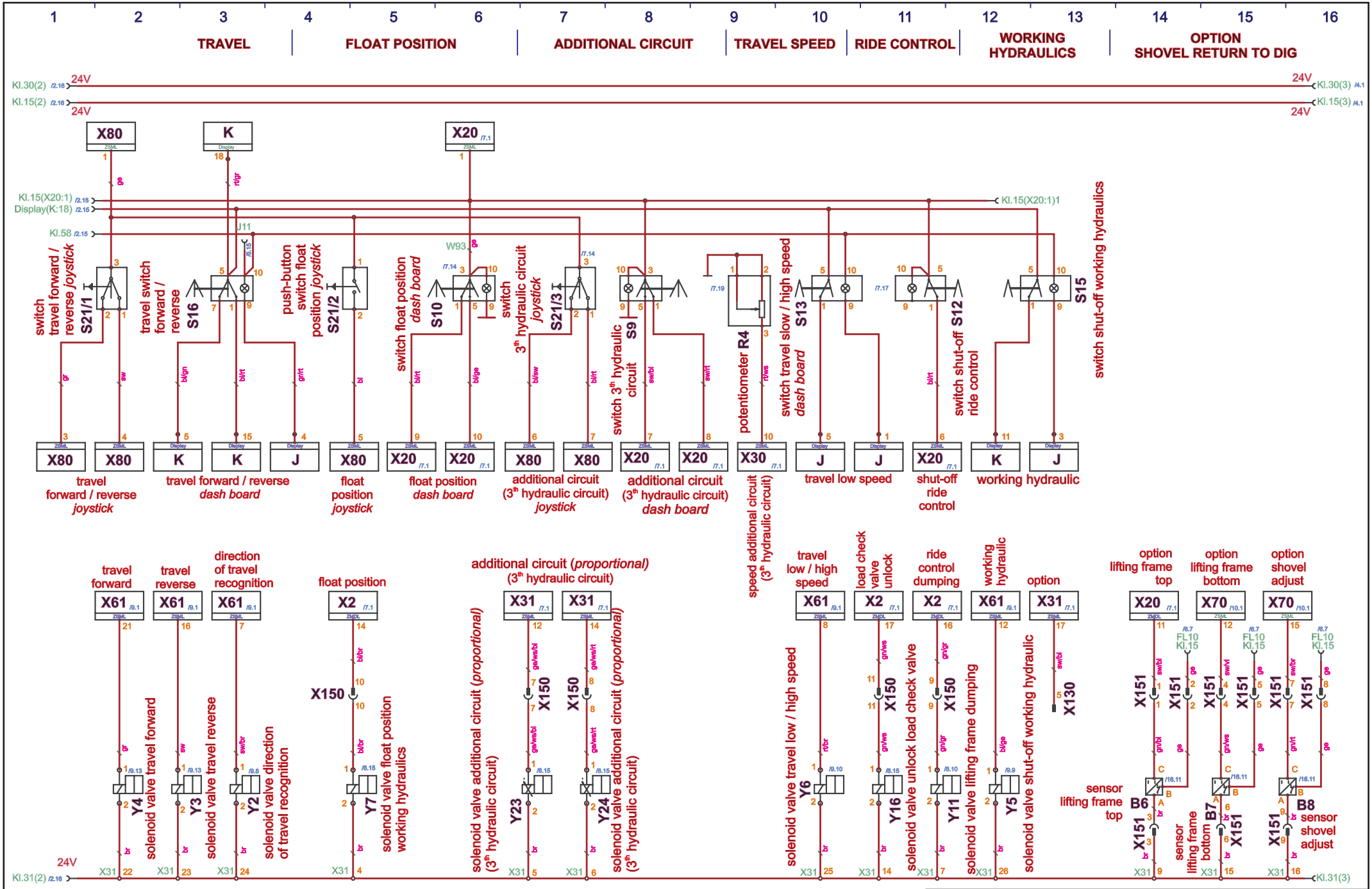


X2	connector *additional control modul*	X61	connector *central control modul*	XR10	connector *travel pedal / rear chassis*	Typ Model Type Tipo	TL 260	Elektrisches System Electrical system Circuit électrique Sistema elèctrico	ab Fz.-Id.-Nr. from s/n bis Fz.-Id.-Nr. to s/n	TL02600100 TL02600134	Datum Edition Date Fecha	01.2008
X20	connector *central control modul*	X70	connector *central control modul*	W	connector *display*							
X30	connector *central control modul*	X160	connector *switch console / rear chassis*			Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página	1/6	Blatt Page Feuille Página	7.30.02
X60	connector *central control modul*	X161	connector *switch console / rear chassis*									



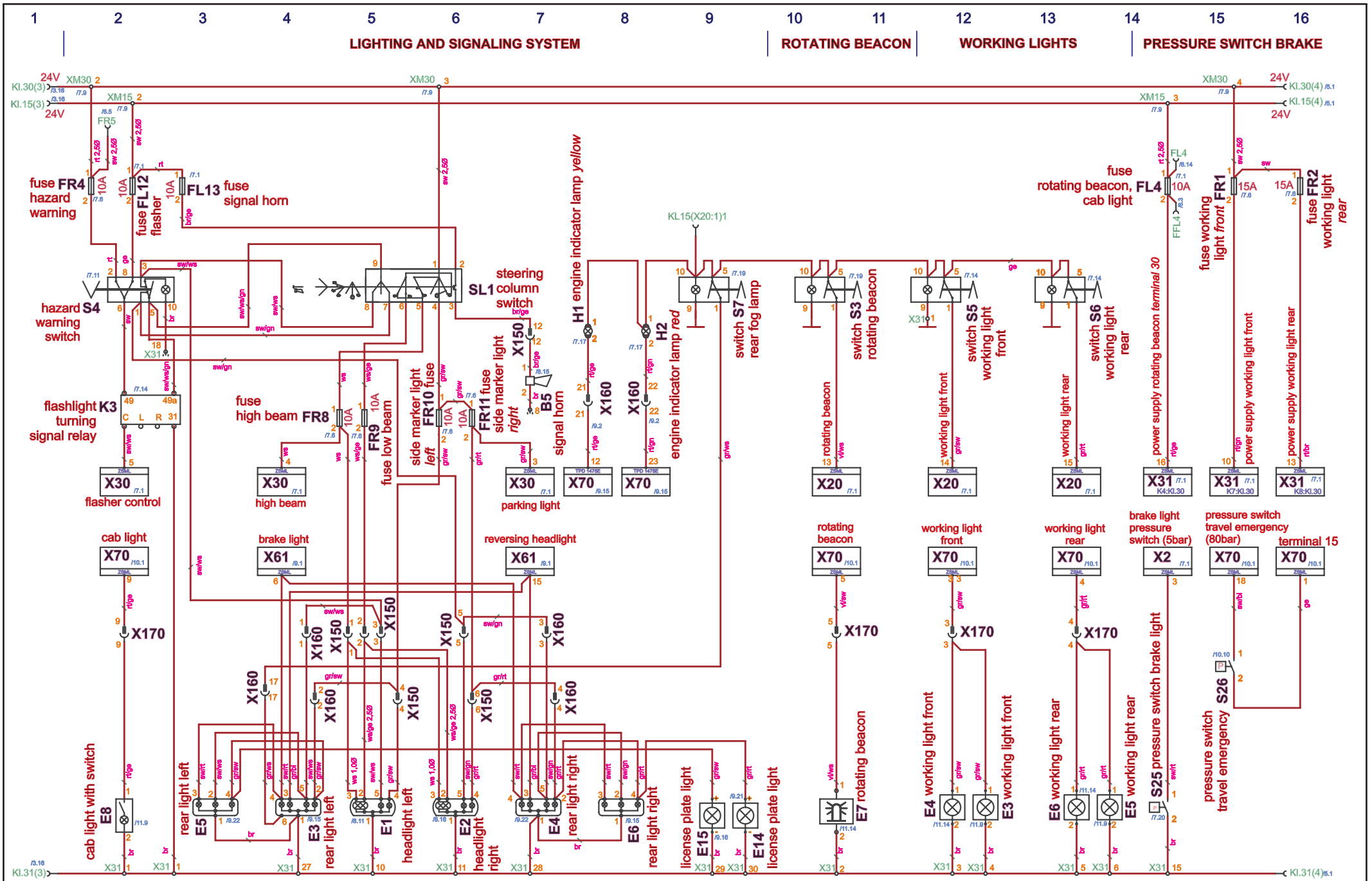
X1	connector additional control module	X30	connector switch console	X150	connector switch console / front chassis
X2	connector additional control module	X31	connector switch console	X160	connector switch console / rear chassis
X20	connector central control module	X61	connector switch console	J & K	connector display

Typ Model Type Tipo	TL 260	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n bis Fz.-Id.-Nr. to s/n	TL02600100 TL02600134	Datum Edition Date Fecha	01.2008
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos	Blatt Page Feuille Página	2/6		Blatt Page Feuille Página	7.30.03

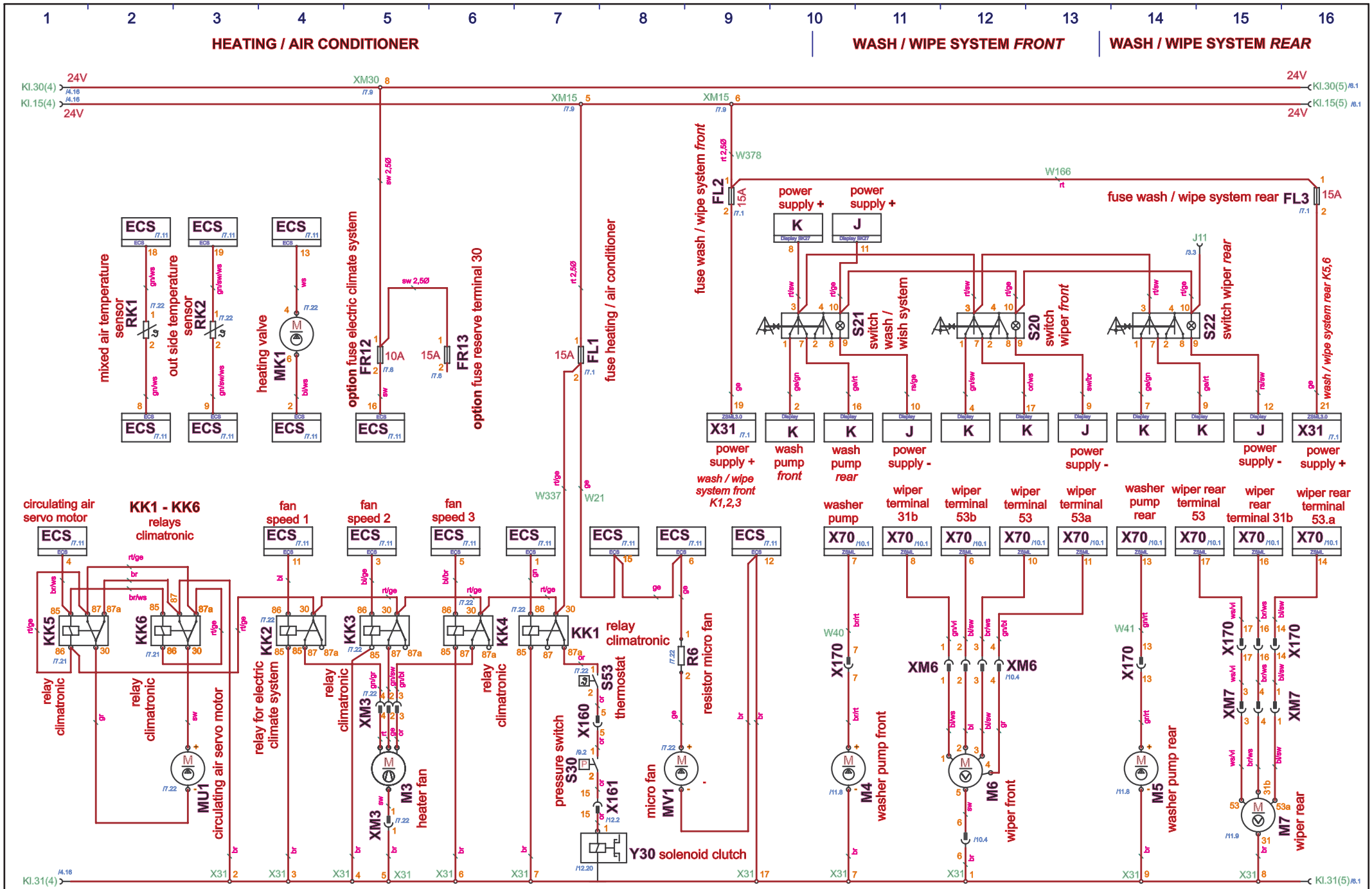


X2	connector additional control modul	X61	connector central control modul	X150	connector switch console / rear chassis
X20	connector central control modul	X70	connector central control modul	X151	connector shovel return to dig *operator's cab / lifting frame*
X30	connector central control modul	X80	connector central control modul	K&J	connector display
X31	connector central control modul	X130	connector switch console		

Typ Model Type Tipo	TL 260	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. from s/n bis Fz.-Id.-Nr. to s/n	TL02600100 TL02600134	Datum Edition Date Fecha	01.2008
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos	Blatt Page Feuille Página	3/6		Blatt Page Feuille Página	7.30.04

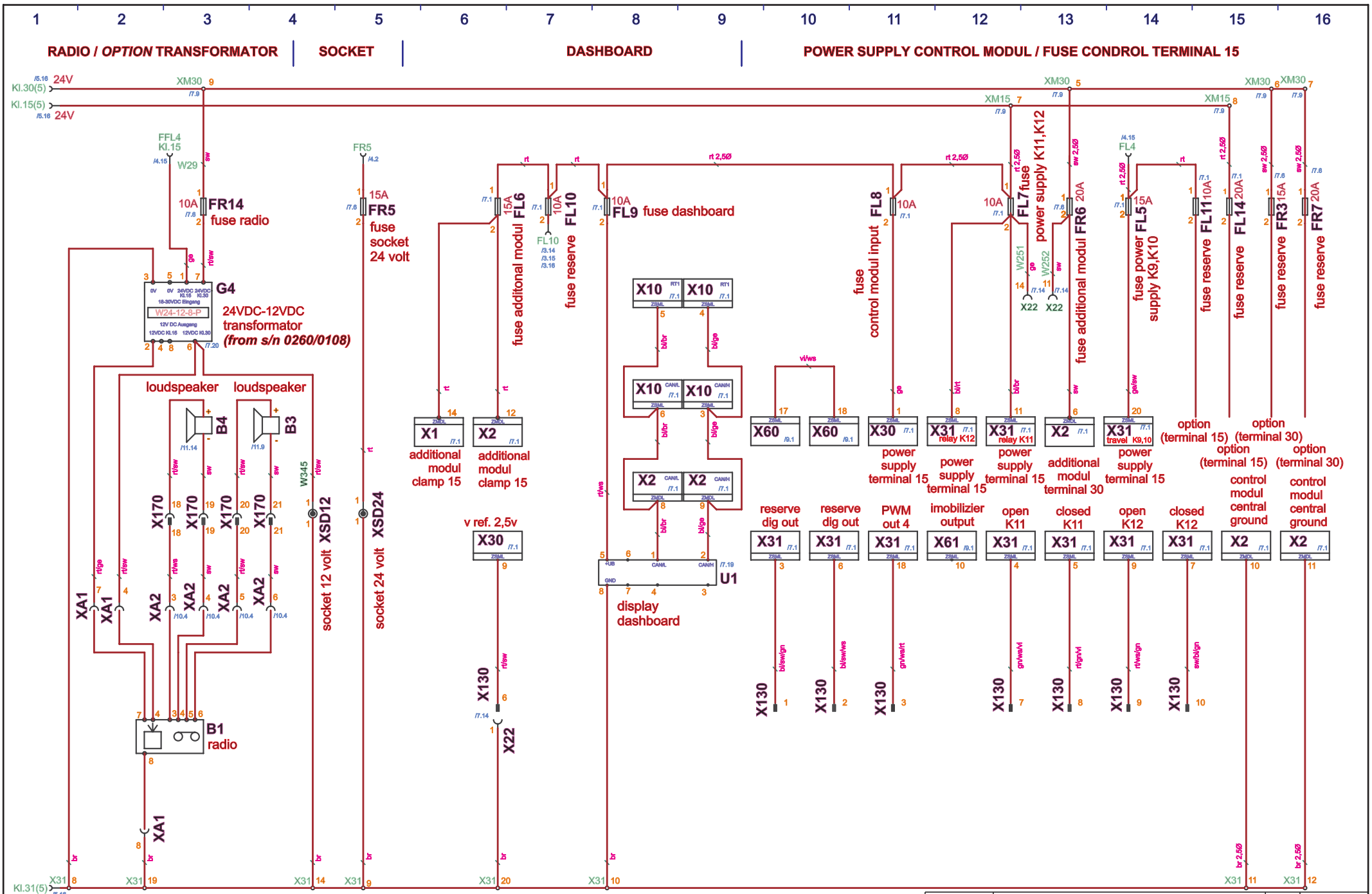


X2	connector additional control modul	X61	connector central control modul	X170	connector operator's cab / floor frame	Typ Model Type Tipo	TL 260	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n bis Fz.-Id.-Nr. to s/n TL02600100 TL02600134	Datum Edition Date Fecha	01.2008
X20	connector central control modul	X70	connector central control modul			Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos	Blatt Page Feuille Página	4/6	Blatt Page Feuille Página	7.30.05
X30	connector central control modul	X150	connector front chassis / switch console								
X31	connector central control modul	X160	connector rear chassis / switch console								



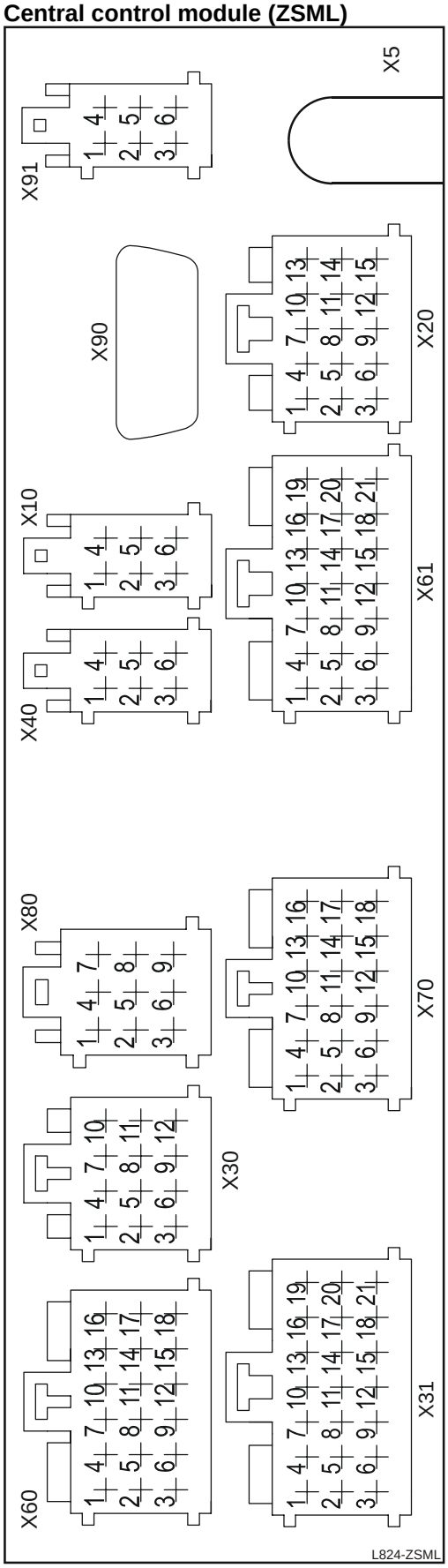
X31	connector central control modul	XM3	connector fan	K	connector display
X70	connector central control modul	XM6	connector wiper motor front	XM7	connector wiper motor rear
X160	connector rear chassis	ECS	connector climatronic		
X170	connector operator's cab	J	connector display		

Typ Model Type Tipo	TL 260	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico	ab Fz.-Id.-Nr. from s/n bis Fz.-Id.-Nr. to s/n	TL02600100 TL02600134	Datum Edition Date Fecha	01.2008
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos	Blatt Page Feuille Página	5/6		Blatt Page Feuille Página	7.30.06

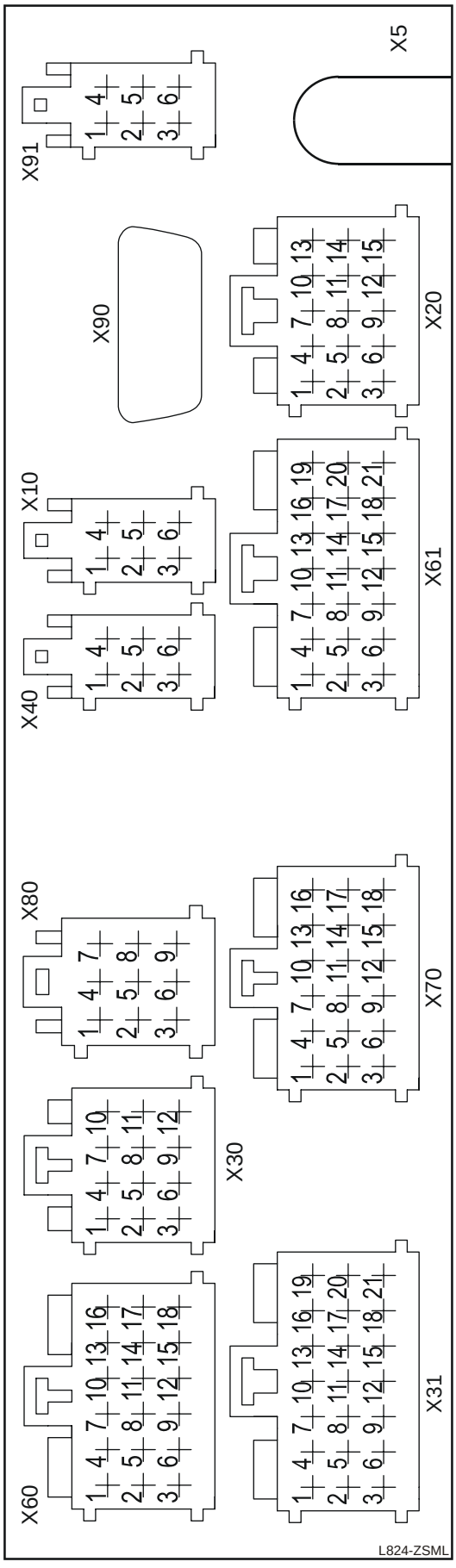


X1	connector additional control modul	X30	connector central control modul	X130	connector switch console	Typ / Model / Type / Tipo	TL 260
X2	connector additional control modul	X31	connector central control modul	X170	connector operator's cab / floor frame	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico	ab Fz.-Id.-Nr. / from s/n / bis Fz.-Id.-Nr. / to s/n: TL02600100 – TL02600134
X10	connector central control modul	X60	connector central control modul	XA1	connector radio connection	Datum / Edition / Date / Fecha	01.2008
		X61	connector central control modul	XA2	connector radio / floor frame	Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos
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						Blatt / Page / Feuille / Página	7.30.07

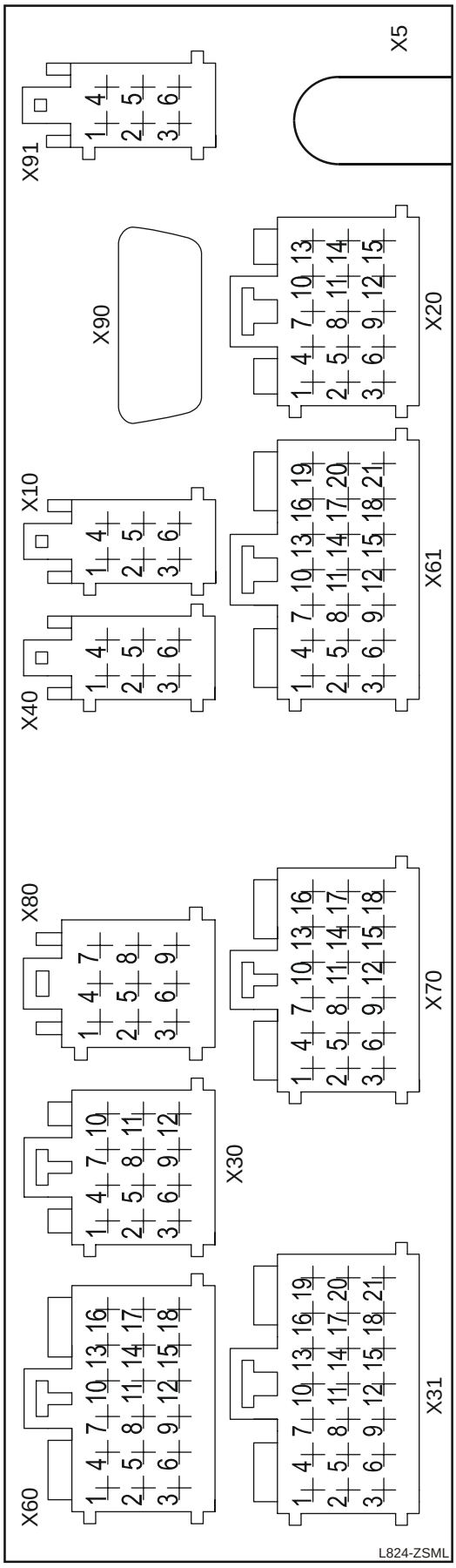
Central control module (ZSML)



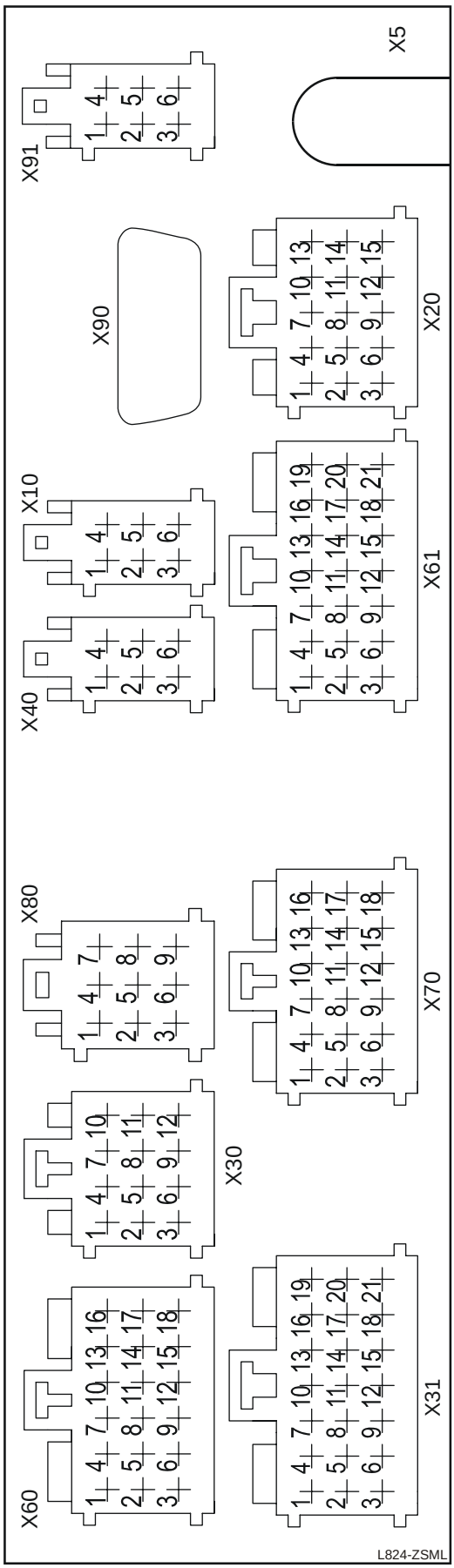
X60	***Signal inputs "engine monitoring"***
1	Transmission switch signal
2	--
3	Charge signal generator D+
4	Air filter maintenance switch signal
5	Oil pressure switch signal
6	Accumulator pressure parking brake
7	Transmission switch signal
8	Engine temperature sensor signal
9	Fuel gauge sensor signal
10	Hydraulic oil temperature sensor signal
11	Idle signal generator "W" signal
12	--
13	--
14	--
15	Speedometer signal sensor
16	Speedometer sensor output
17	link to terminal 18
18	link to terminal 17
X30	***Signal inputs "Lighting"***
1	Power supply Terminal 15 output
2	Central ground Terminal 31
3	Parking light Terminal 15 input
4	High beam signal
5	Direction indicator control signal
6	Hydraulic oil filter clogging (signal)
7	Parking brake (signal)
8	shut off back-up alarm
9	Reference voltage 2.5V
10	Analog input speed 3rd control circuit
11	Spare - Analog
12	Spare - Analog
X80	***Coordinate lever***
1	Power supply Terminal 15 output
2	Central ground Terminal 31
3	Travel forward signal
4	Travel reverse signal
5	Float position signal
6	Additional control circuit signal
7	Additional control circuit signal
8	Spare - Analog
9	Spare - Analog



X40	***CAN-BUS (Option)***
1	Power supply Terminal 15 output
2	Central ground Terminal 31
3	CAN/HI
4	R1
5	R2
6	CAN/LO
X10	***Control panel***
1	--
2	Central ground Terminal 31
3	CAN/HI
4	--
5	--
6	CAN/LO
X90	***Programming connection***
X91	***Immobilizer (Option)***
1	Power supply Terminal 15 output
2	Central ground Terminal 31
3	***TXD***
4	RXD
5	CTS
6	RTS

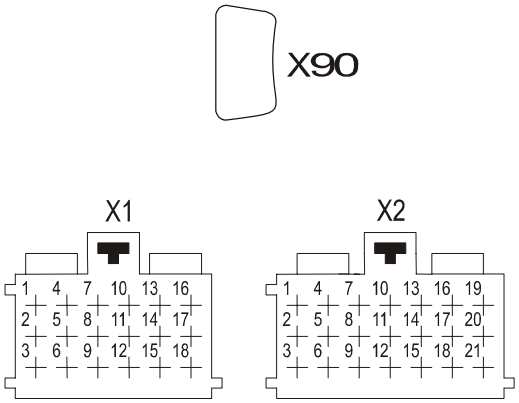


X31	***Module power supply, working floodlights, rotating beacon, wiper***
1	--
2	-
3	Spare digital output
4	Relay K11:87a N.C. contact output
5	Relay K11:87 N.O. contact output
6	Spare digital output
7	Relay K12:87 N.O. contact output
8	Relay K12 power supply Terminal 15 input
9	Relay K12:87a N.C. contact Output
10	Power supply Terminal 30 input working floodlight front
11	Relay K11 power supply Terminal 15 input
12	3rd control circuit (PWM output)
13	Power supply Terminal 30 input working floodlight rear
14	3rd control circuit (PWM output)
15	Reversing fan speed PWM output
16	Power supply Terminal 15 input rotating beacon
17	Spare Digital output
18	Spare PWM output
19	Power supply Terminal 15 input wash/ wipe rear
20	Power supply Terminal 15 input travel
21	Power supply Terminal 15 input wash/ wipe rear
X70	***Working floodlights , Wipers***
1	Power supply brake pressure switch
2	--
3	Working floodlight front output
4	Working floodlight rear output
5	Rotating beacon output
6	Wiper Terminal 53b 2nd setting output
7	Washer pump front output
8	Wiper Terminal 31b output
9	Interior lamp Terminal 30 output
10	Wiper Terminal 53 output
11	Wiper Terminal 53a output
12	RTD lifting frame lower position (signal)
13	Washer pump rear output
14	Rear wiper Terminal 53a output
15	RTD shovel position (signal)
16	Rear wiper Terminal 31b output
17	Rear wiper Terminal output
18	Brake light switch 100bar signal input



X61	***Rear carriage***
1	--
2	--
3	Starting Terminal 50a output
4	Pre-heating output
5	Engine shutdown output
6	Brake light output
7	Travel, direction recognition output
8	Travel, FAST-SLOW output
9	Transmission 1 output
10	Option Immobilizer
11	--
12	Working hydraulics output
13	--
14	--
15	Back-up lamp output
16	Travel reverse output
17	Back-up alarm output
18	Reversing fan output
19	Solenoid valve parking brake output
20	--
21	Travel forward output
X20	***Panel, right***
1	Power supply Terminal 15 output
2	--
3	Start-up Terminal 50a signal
4	Pre-heat signal
5	Power supply control unit Terminal 15
6	Ride control system signal
7	Additional control circuit signal
8	Additional control circuit signal
9	Float position 1 signal
10	Float position 2 signal
11	RTD lifting frame high position (signal)
12	Pressure switch emergency steering
13	Rotating beacon signal
14	Working floodlight front signal
15	Working floodlight rear Signal
X5	***Power supply***

Additional Control Unit ZMDL

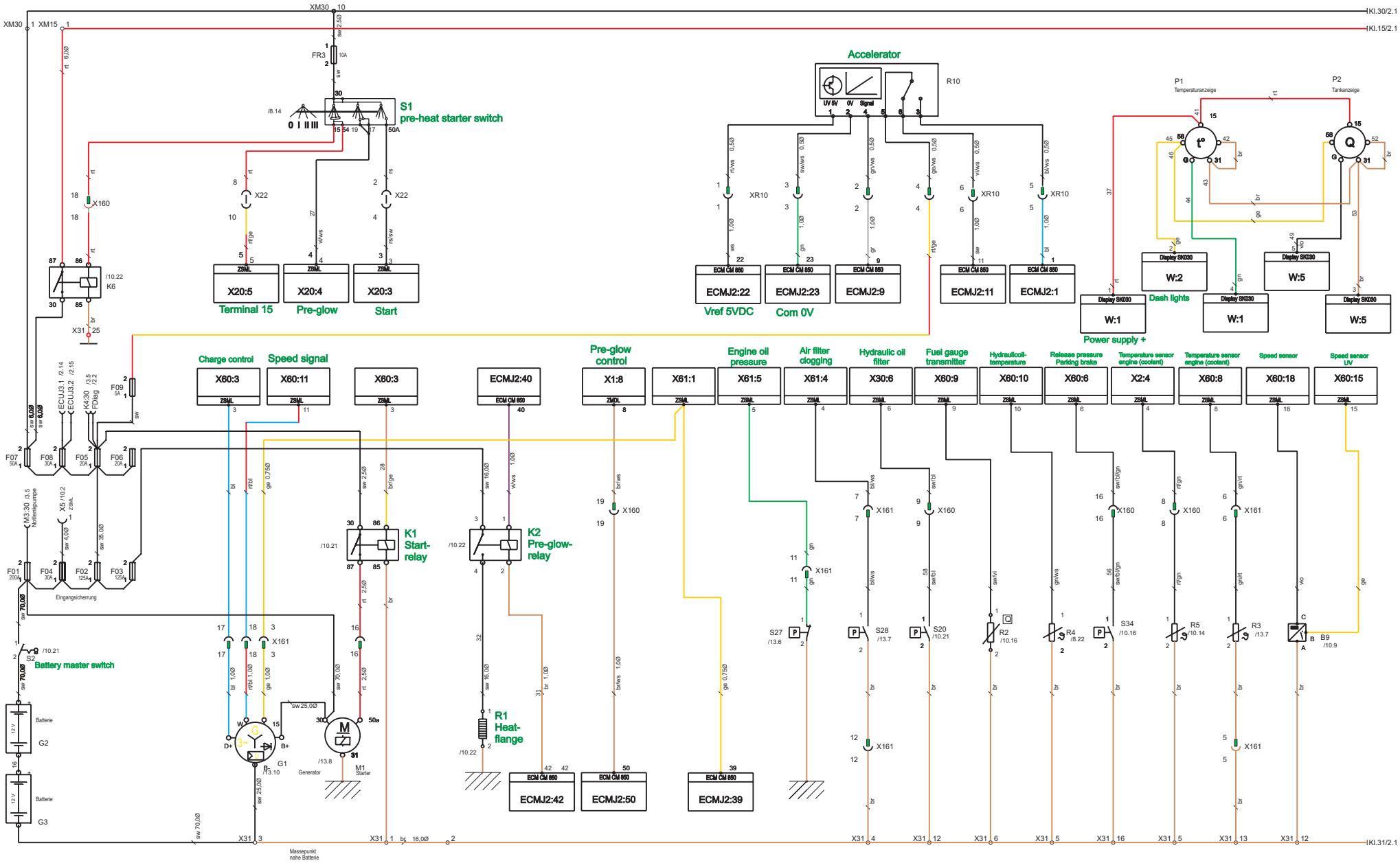


X1	***plug***
1	
2	
3	
4	
5	
6	
7	digin low pressure switch lower
8	digin low pressure switch retract
9	pressure switch gear shift (signal)
10	digin low engine oil level
11	digin low coolant level
12	digin low hydraulic oil level
13	emergency steering (signal)
14	power supply control unit terminal 15
15	--
16	--
17	--
18	--
X2	***plug***
1	--
2	--
3	brake light pressure switch 5 bar
4	coolant temperature
5	--
6	power supply control unit terminal 30
7	--
8	CAN-Bus-link ZSML X10 CAN/L
9	CAN-Bus-link ZSML X10 CAN/L
10	central ground
11	central ground
12	power supply control unit terminal 15
13	level check output
14	float position output
15	--
16	solenoid valve ride control
17	solenoid valve unlock load check valve
18	--
19	RTD retract output
20	RTD lifting frame high position (cut off output)
21	RTD lower output
X90	***plug***


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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Power supply | Start-up system | Pre-heat system | Sensors



Typ Model Type Tipo	**TL 260**	Elektrisches System Electrical system Circuit électrique Sistema elèctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL02600135	Datum Edition Date Fecha	01.2008
Benennung Description Dénomination Denominación	**Stromlaufplan Wiring diagramm Circuit èlectrique Esquemas de los circuitos**		Blatt Page Feuille Página	1/9	Blatt Page Feuille Página	7.30.21

Engine sensors and actuating elements

Power supply ECM

Kl.30/1.16 — Kl.30/3.1

Kl.15/1.16 — Kl.15/3.1

SAE 1939 Diagnosticplug

A B C F D G E H J

X31 1

FDiag/1.2 Kl.30

ECMJ1:8 CAN High

ECMJ1:6 CAN Low

?? CAN Shield

Injector Cylinder 1 — ECMJ1:45 — YZY1 — ECMJ1:53 — Actor GND

Injector Cylinder 2 — ECMJ1:54 — YZY2 — ECMJ1:51 — Actor GND

Injector Cylinder 3 — ECMJ1:55 — YZY3 — ECMJ1:52 — Actor GND

Injector Cylinder 4 — ECMJ1:56 — YZY4 — ECMJ1:58 — Actor GND

Injector Cylinder 5 — ECMJ1:46 — YZY5 — ECMJ1:60 — Actor GND

Injector Cylinder 6 — ECMJ1:57 — YZY6 — ECMJ1:59 — Actor GND

ECUJ3.1/1.1 Kl.30 — W28 sw 2,50 — ECMJ3:3

ECUJ3.2/1.1 Kl.30 — W29 sw 2,50 — ECMJ3:4

Crank shaft speed sensor — ECMJ1:27 — BM1 — ECMJ1:16 — Sensor UV 5V

ECMJ1:48 — Sensor GND

Crank shaft position sensor — ECMJ1:26 — BM2 — ECMJ1:37 — Sensor UV 5V

ECMJ1:47 — Sensor GND

Rail pressure sensor — ECMJ1:25 — BM3

Water in fuel sensor — ECMJ1:14 — SM1 — XWIF

Charge air pressure — ECMJ1:44 — BM4

Charge air temperature — ECMJ1:23

Oil pressure engine — ECMJ1:13 — BM5 — ECMJ1:33 — Sensor UV 5V

ECMJ1:38 — Sensor GND

Ambient air pressure sensor — ECMJ1:3 — BM6

Coolant temperature Engine — ECMJ1:15 — RM1

Fuelpump — ECMJ1:1 — MM1 — ECMJ1:11 — Aktor GND

Oilpressure-switch — ECMJ1:17 — SM2

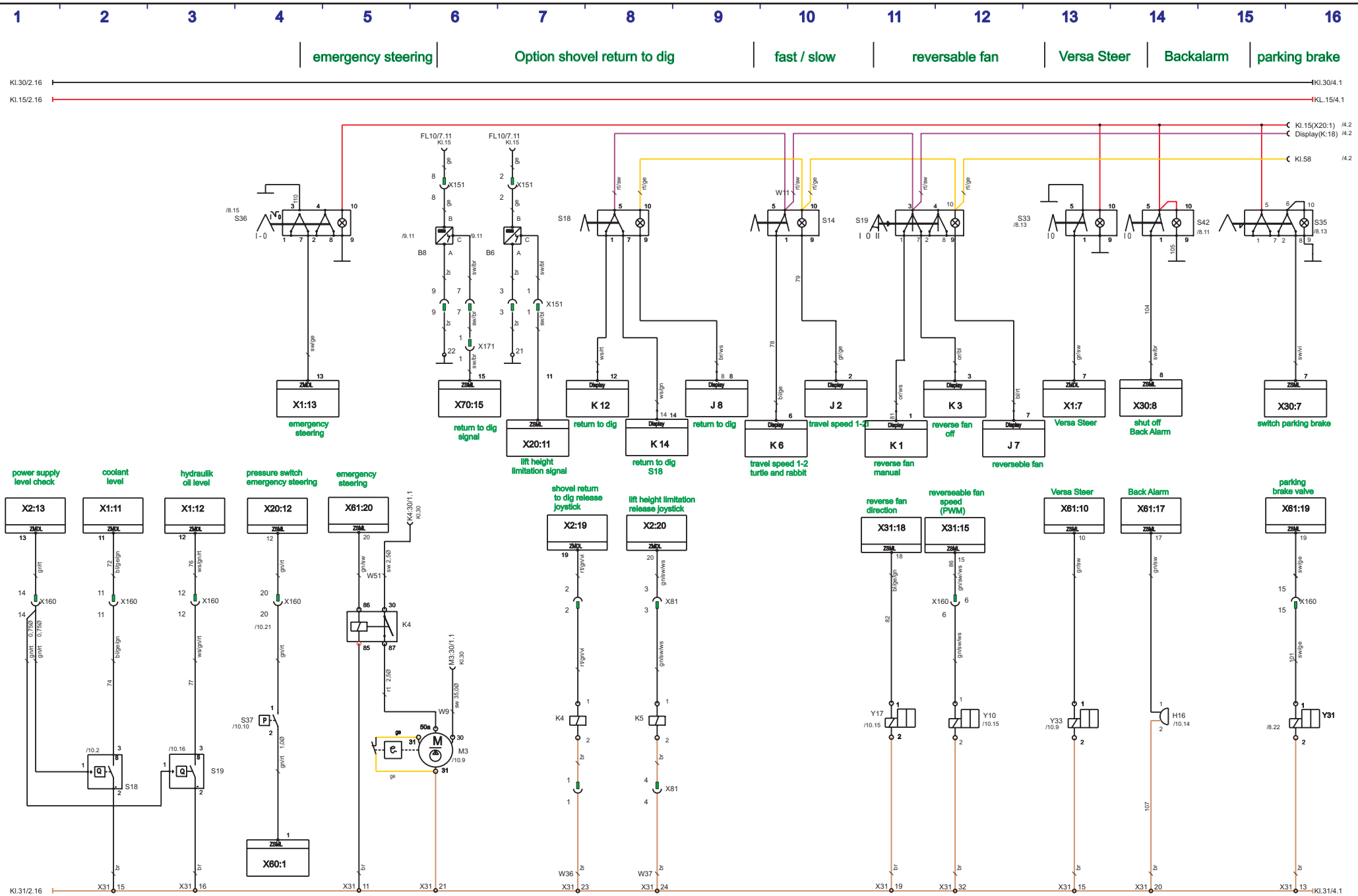
Fuel pump-shut-off — ECMJ1:2 — YM1 — ECMJ1:32 — Aktor GND

ECMJ3:1 — W30 br 2,50 — X31 2

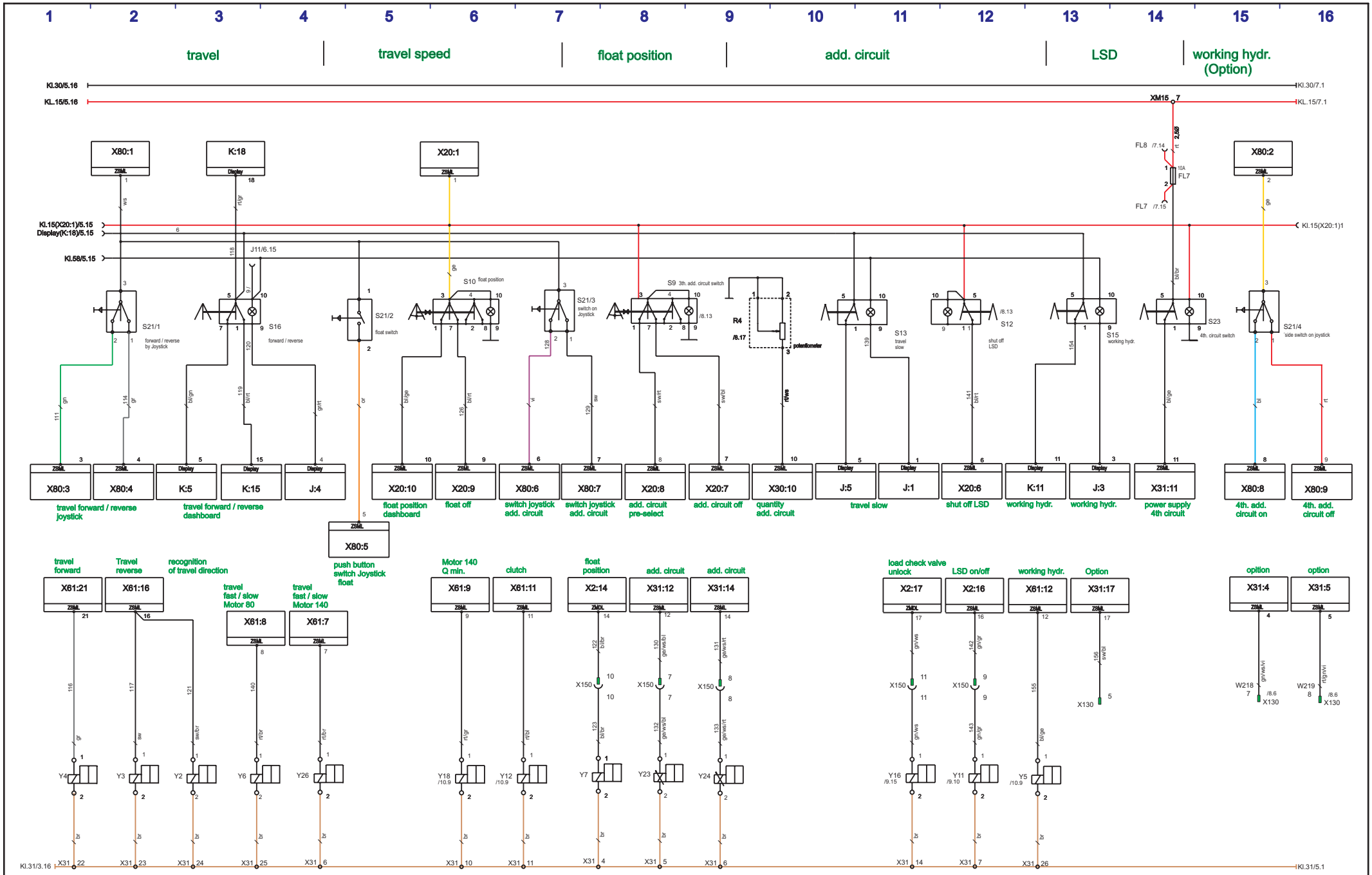
ECMJ3:2 — W31 br 2,50 — X31 3

Kl.31/1.16 — Kl.31/3.1

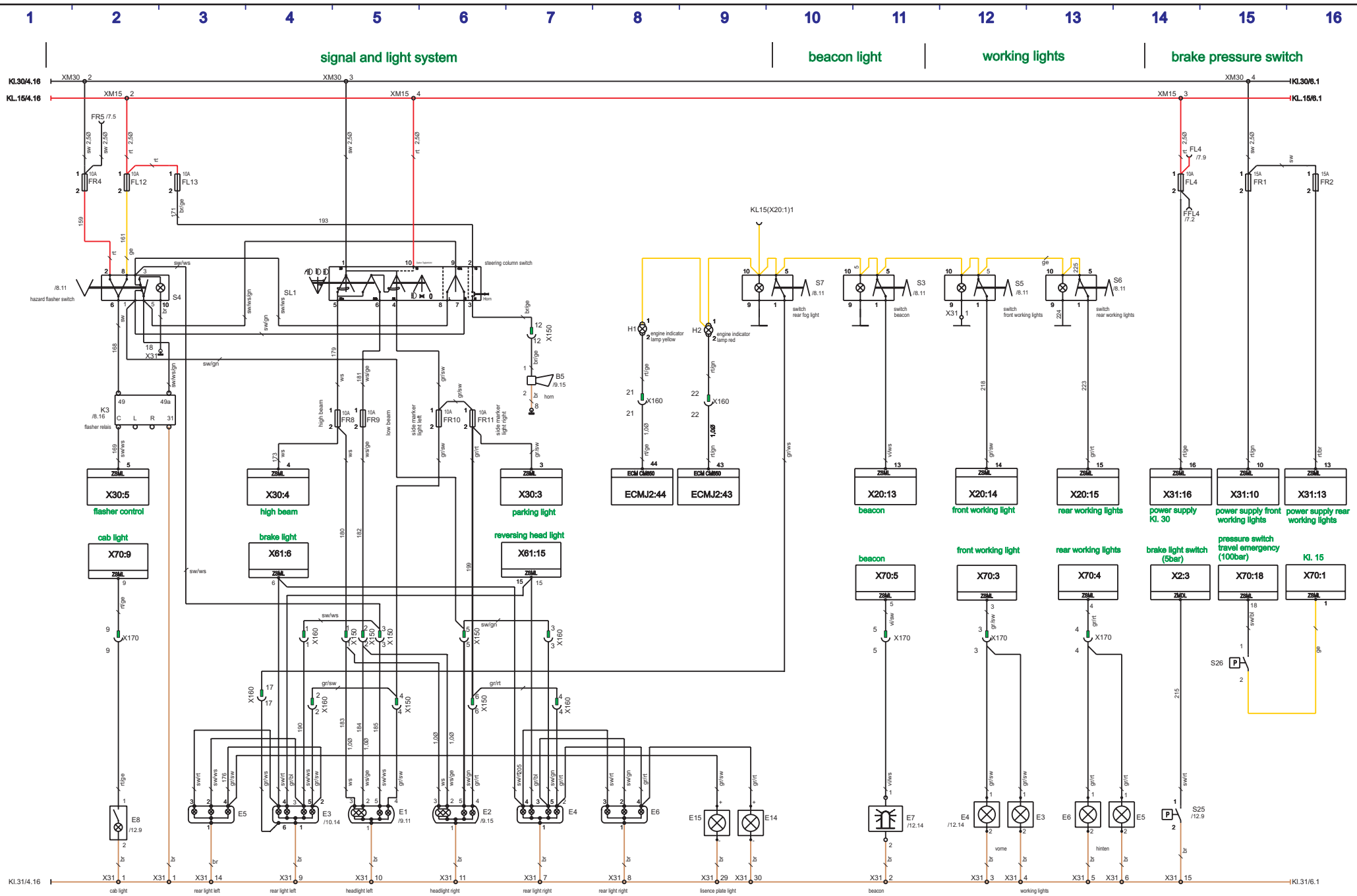
Typ / Model / Type / Tipo	TL 260	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no.	TL02600135	Datum / Edition / Date / Fecha	01.2008
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / Circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página	2/9	Blatt / Page / Feuille / Página	7.30.22



Typ Model Type Tipo	**TL 260**	**Elektrisches System** **Electrical system** **Circuit électrique** **Sistema elèctrico**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.** **TL02600135**	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Stromlaufplan** **Wiring diagramm** **Circuit èlectrique** **Esquemas de los circuitos**		**Blatt** **Page** **Feuille** **Página** **3/9**	Blatt Page Feuille Página	**7.30.23**

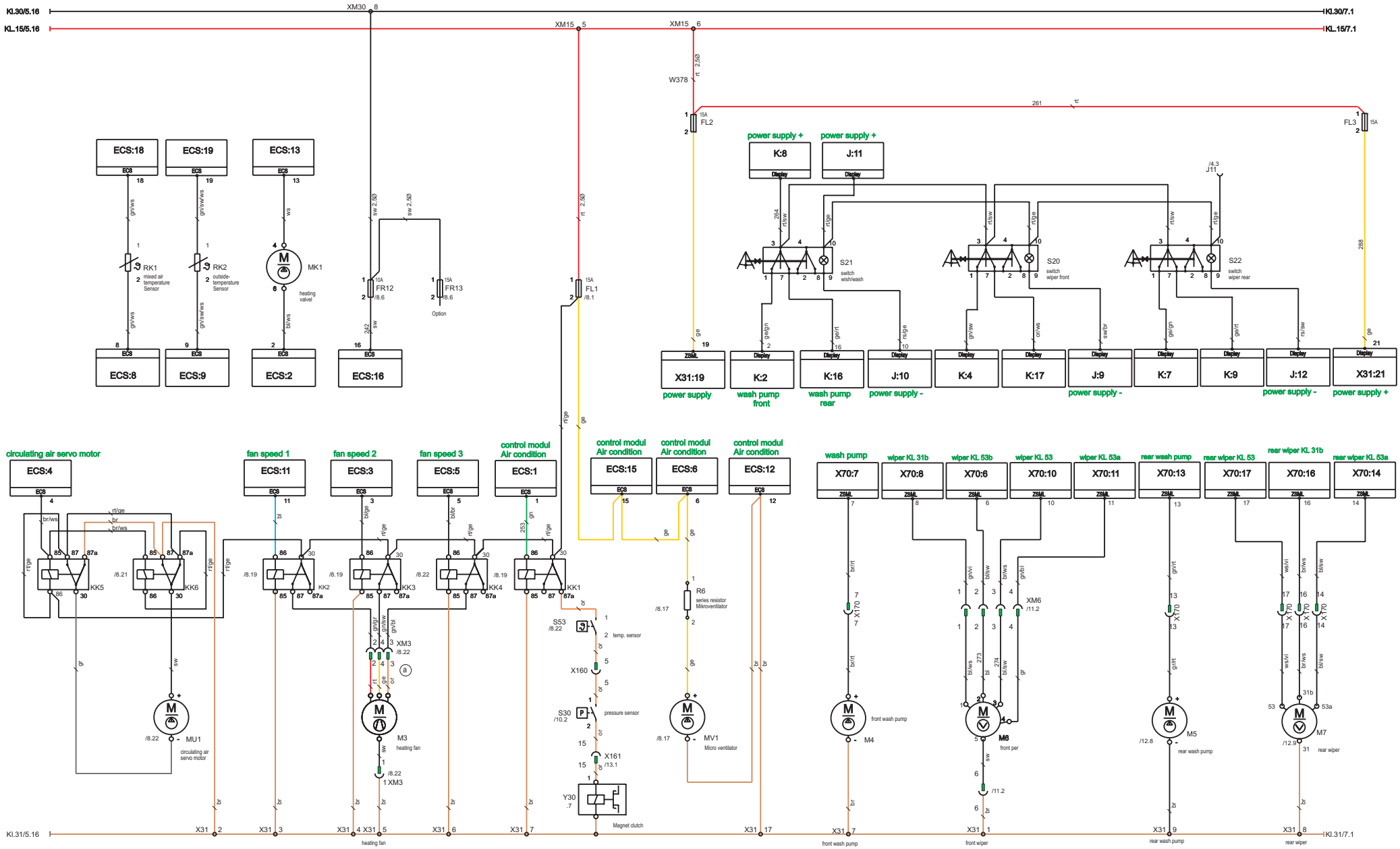


Typ Model Type Tipo	**TL 260**	**Elektrisches System** **Electrical system** **Circuit électrique** **Sistema elèctrico**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.**	**TL02600135**	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Stromlaufplan** **Wiring diagramm** **Circuit èlectrique** **Esquemas de los circuitos**		**Blatt** **Page** **Feuille** **Página**	***4/9***	Blatt Page Feuille Página	**7.30.24**

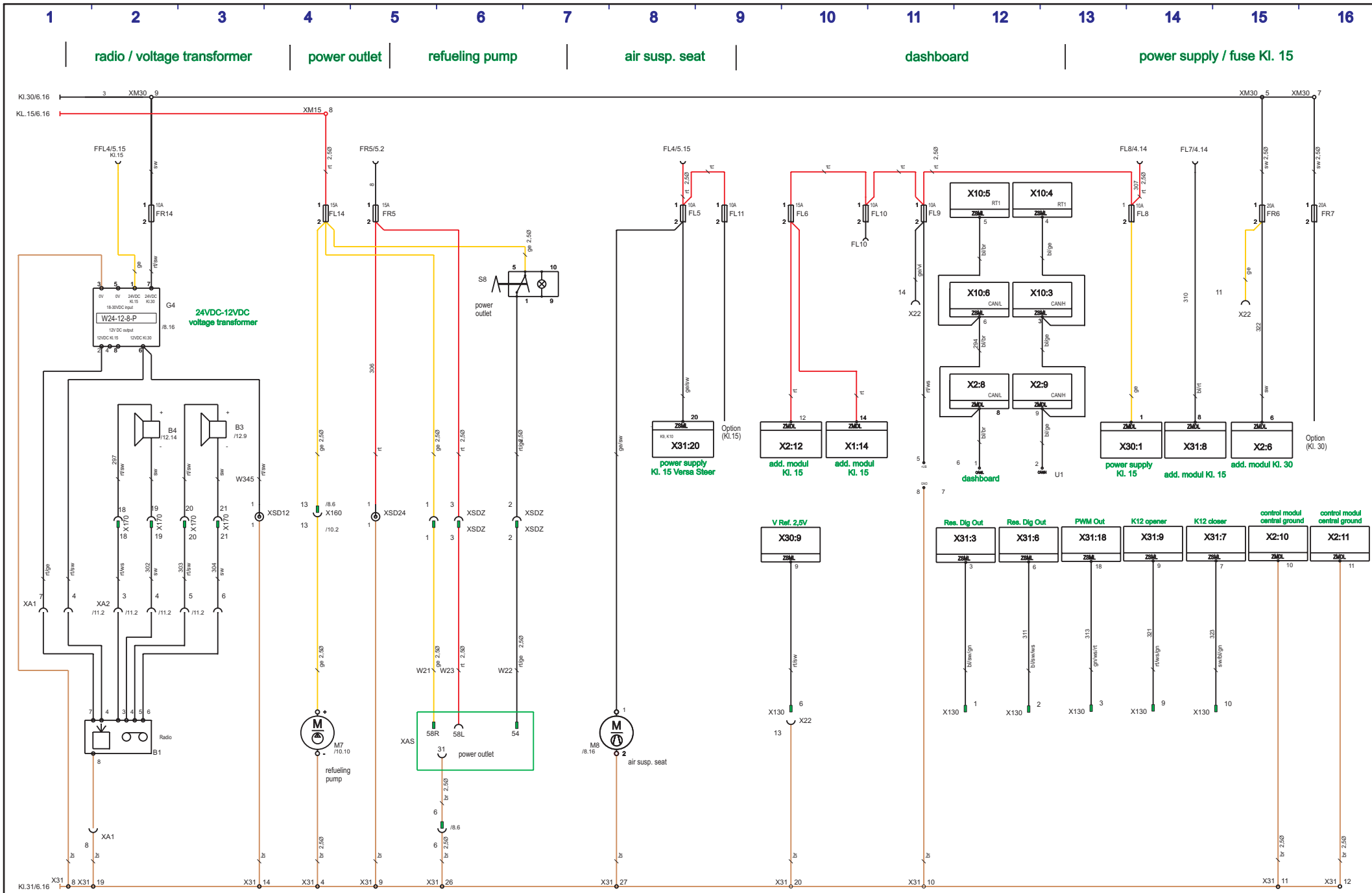

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
signal and light system
beacon light
working lights
brake pressure switch
Kl.30/4.16
KL.15/4.16
Kl.30/6.1
KL.15/6.1
Kl.31/4.16
Kl.31/6.1
KL15(X20:1)1
steering column switch
hazard flasher switch
flasher relais
engine indicator lamp yellow
engine indicator lamp red
switch rear fog light
switch beacon
switch front working lights
switch rear working lights
horn
high beam
low beam
side marker light left
side marker light right
ECMJ2:44
ECMJ2:43
X30:5
flasher control
X30:4
high beam
X30:3
parking light
X20:13
beacon
X20:14
front working light
X20:15
rear working lights
X31:16
power supply Kl. 30
X31:10
power supply front working lights
X31:13
power supply rear working lights
cab light
X70:9
brake light
X61:6
reversing head light
X61:15
beacon
X70:5
front working light
X70:3
rear working lights
X70:4
brake light switch (5bar)
X2:3
pressure switch travel emergency (100bar)
X70:18
Kl. 15
X70:1
cab light
rear light left
rear light left
headlight left
headlight right
rear light right
rear light right
lisence plate light
beacon
working lights
Typ
Model
Type
Tipo
TL 260
Elektrisches System
Electrical system
Circuit électrique
Sistema eléctrico
ab Fz.-Id.-Nr.
from s/n
à partir du n/s
desde el no.
TL02600135
Datum
Edition
Date
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01.2008
Benennung
Description
Dénomination
Denominación
Stromlaufplan
Wiring diagramm
Circuit électrique
Esquemas de los circuitos
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Página
7.30.25

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

heating system / A/C | wash/wipe system front | wash/wipe system rear



Typ Model Type Tipo	**TL 260**	**Elektrisches System** **Electrical system** **Circuit électrique** **Sistema elèctrico**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.**	**TL02600135**	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Stromlaufplan** **Wiring diagramm** **Circuit èlectrique** **Esquemas de los circuitos**		**Blatt** **Page** **Feuille** **Página**	***6/7***	Blatt Page Feuille Página	**7.30.26**



Typ Model Type Tipo	**TL 260**	**Elektrisches System** **Electrical system** **Circuit électrique** **Sistema eléctrico**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.**	**TL02600135**	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Stromlaufplan** **Wiring diagramm** **Circuit électrique** **Esquemas de los circuitos**		**Blatt** **Page** **Feuille** **Página**	**7/7**	Blatt Page Feuille Página	**7.30.27**


TEREX®

FL1	15A	HEATER/AIR CONDITIONER
FL2	15A	WASH/WIPE FRONT
FL3	15A	WASH/WIPE REAR
FL4	10A	ROTATING BEACON/INTERIOR LIGHT
FL5	15A	POWER SUPPLY K9/K10
FL6	15A	ADDITIONAL CONTROL MODULE (TERMINAL 15)
FL7	10A	POWER SUPPLY K11/K12
FL8	10A	CENTRAL CONTROL MODUL ENTRIES
FL9	10A	DASHBOARD
FL10	10A	SHOVEL RETURN TO DIG
FL11	10A	RESERVE (TERMINAL 15)
FL12	10A	FLASHER (TERMINAL 15)
FL13	10A	HORN (TERMINAL 15)
FL14	20A	RESERVE (TERMINAL 15)

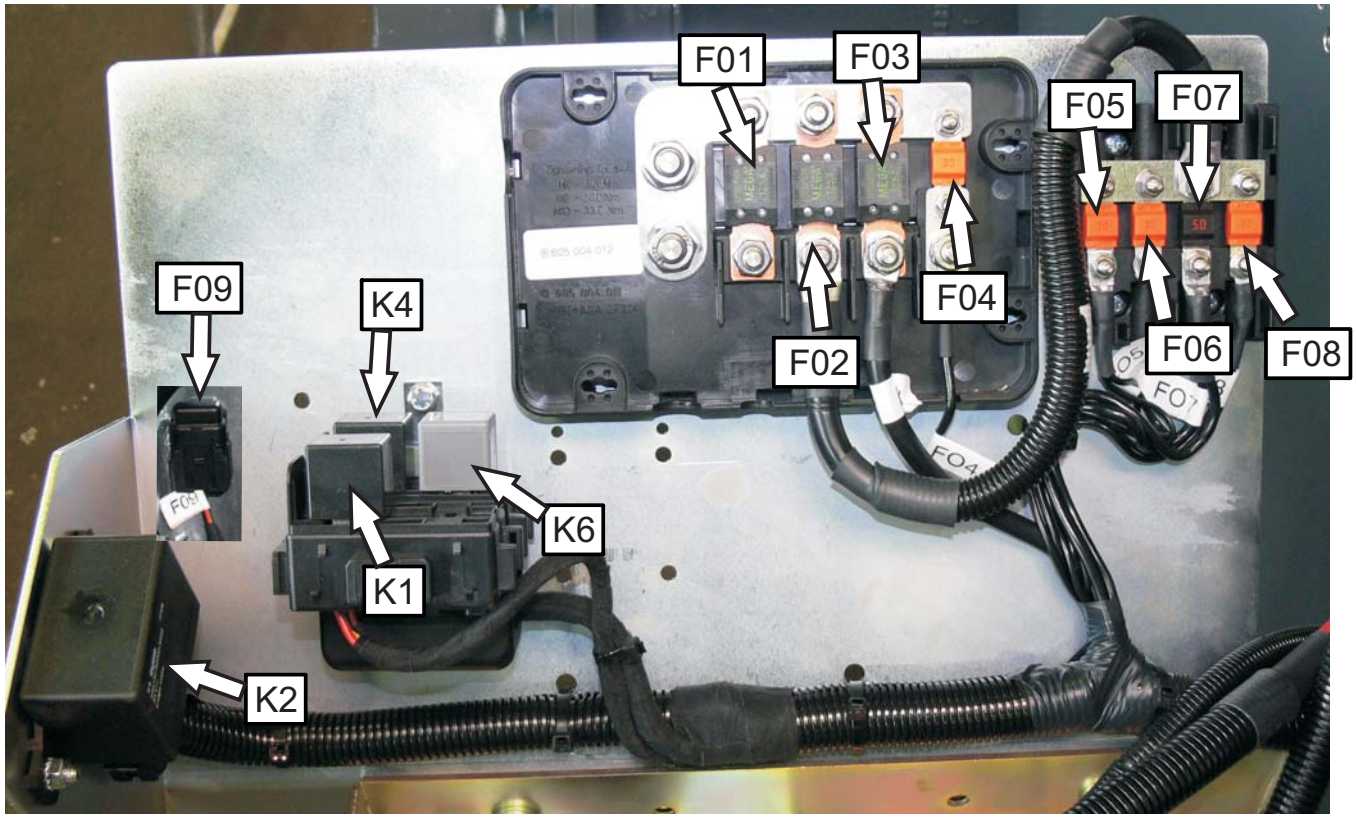


L	FL1 15A		FL2 15A		FL3 15A		FL4 10A		FL5 15A
									OPTION
	FL11 10A		FL12 10A		FL13 10A		FL14 20A		
	RESERVE						RESERVE		
	FL6 15A		FL7 10A		FL8 10A		FL9 10A		FL10 10A
	ZMDL		OPTION		INPUT E-MODUL				

–	FR1 15A		FR2 15A		FR3 15A		FR4 10A		FR5 15A
					RESERVE				24V
	FR11 10A		FR12 10A		FR13 15A		FR14 10A		
	RIGHT		A/C		RESERVE				12V
	FR6 20A		FR7 20A		FR8 10A		FR9 10A		FR10 10A
	ZMDL		RESERVE						LEFT

FR1	15A	WORKING FLOODLIGHT FRONT (TERMINAL 30)
FR2	15A	WORKING FLOODLIGHT REAR (TERMINAL 30)
FR3	15A	RESERVE (TERMINAL 30)
FR4	10A	HAZARD WARNING SWITCH (TERMINAL30)
FR5	15A	SOCKET 24VOLT (TERMINAL 30)
FR6	20A	ADDITIONAL CONTROL MODULE (TERMINAL 30)
FR7	20A	RESERVE (TERMINAL 30)
FR8	10A	HIGH BEAM
FR9	10A	LOW BEAM
FR10	10A	SIDE MARKER LAMP LEFT
FR11	10A	SIDE MARKER LAMP RIGHT (TERMINAL 30)
FR12	10A	AIR CONDITIONER (TERMINAL 30)
FR13	15A	RESERVE (TERMINAL 30)
FR14	10A	RADIO 12VOLT (TERMINAL 30)

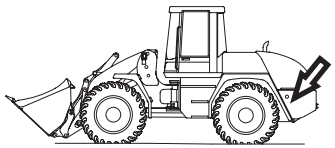
Typ / Model / Type / Tipo	TL 260	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TL02600135	Datum / Edition / Date / Fecha: 01.2008
Benennung / Description / Dénomination / Denominación	Sicherungs- und Belegungsplanfplan Assignment diagramm Schéma de réparation Esquemas de la caja		Blatt / Page / Feuille / Página: 7.30.28



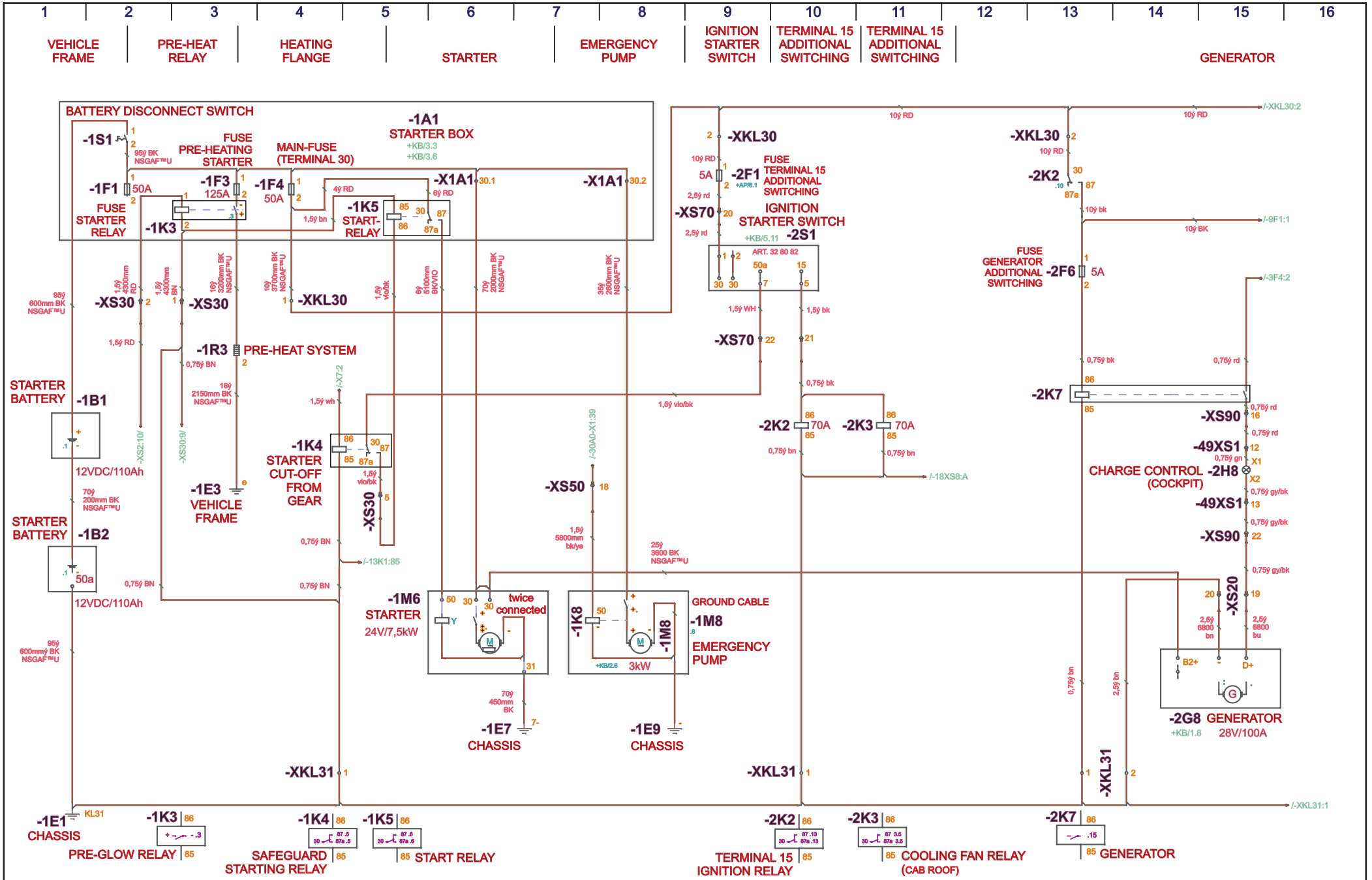
F01 200A Notlenkpumpe / emergency steering pump
F02 125A F05, F06, F07, F08
F03 125A Vorglühen / pre-glow
F04 30A ZSML / Machine control unit
F05 30A Klemme 30, Fahrpedal / Terminal 30, accelerator pedal
F06 30A Option
F07 50A Klemme 30, 15 / Terminal 30, 15
F08 30A Motorsteuergerät / ECU
F09 5A Fahrpedal / accelerator pedal

K1 Startrelais / start-up relay
K2 Vorglührelais / pre-glow relay
K4 Notlenkpumpe / emergency steering pump
K6 Klemme 15 / terminal 15

Location



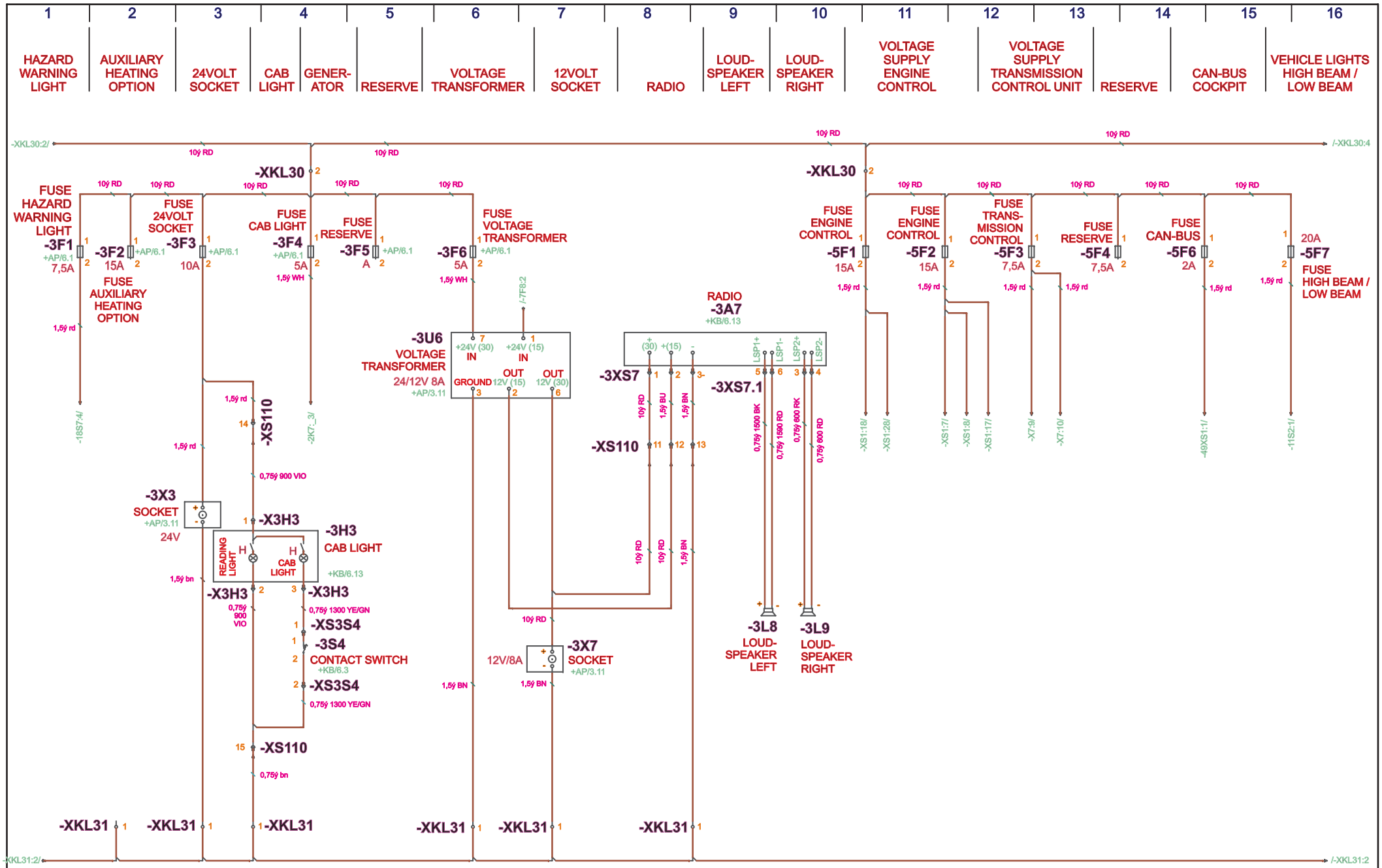
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Benennung Description Dénomination Denominación	Sicherungs- und Belegungsplan Assignment diagramm Schéma de réparation Esquemas de la caja				Blatt Page Feuille Página	7.30.29



-XKL30	Tension voltage distributer central electric-3
-XKL31	Central ground central electric-3
-49XS1	Connector console / charge control
-X1A1	Terminal plate starter box

-XS30	Connector rear chassis / central electric-1
-XS50	Connector front chassis / central electric-1
-XS70	Connector console / central electric-1
-XS90	Connector console / central electric-2

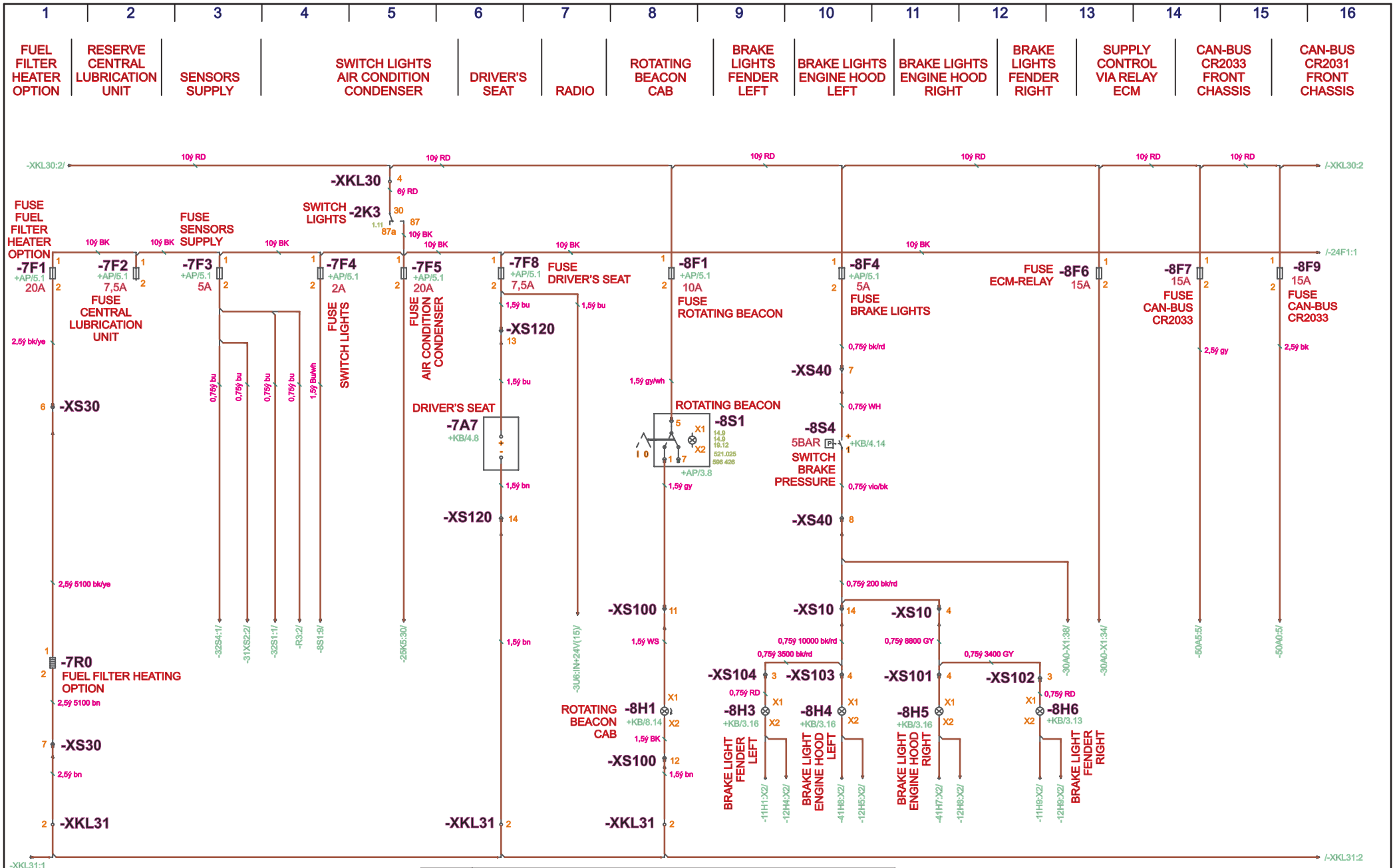
Typ Model Type Tipo	TL420 TL450	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from a/n à partir du n/e desde el no.	TL04200100 TL04500100	Datum Edition Date Fecha	07.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página	1/18	Blatt Page Feuille Página	7.35.01



-XKL30	Voltage distributer central electric-3
-XKL31	Central ground central electric-3
-XS3S4	Connector door contact switch
-X3H3	Connector cab light

-XS110	Connector cab front / central electric-2
-3X7	Connector front radio / central electric-3
-3X7.1	Connector radio / loud speaker

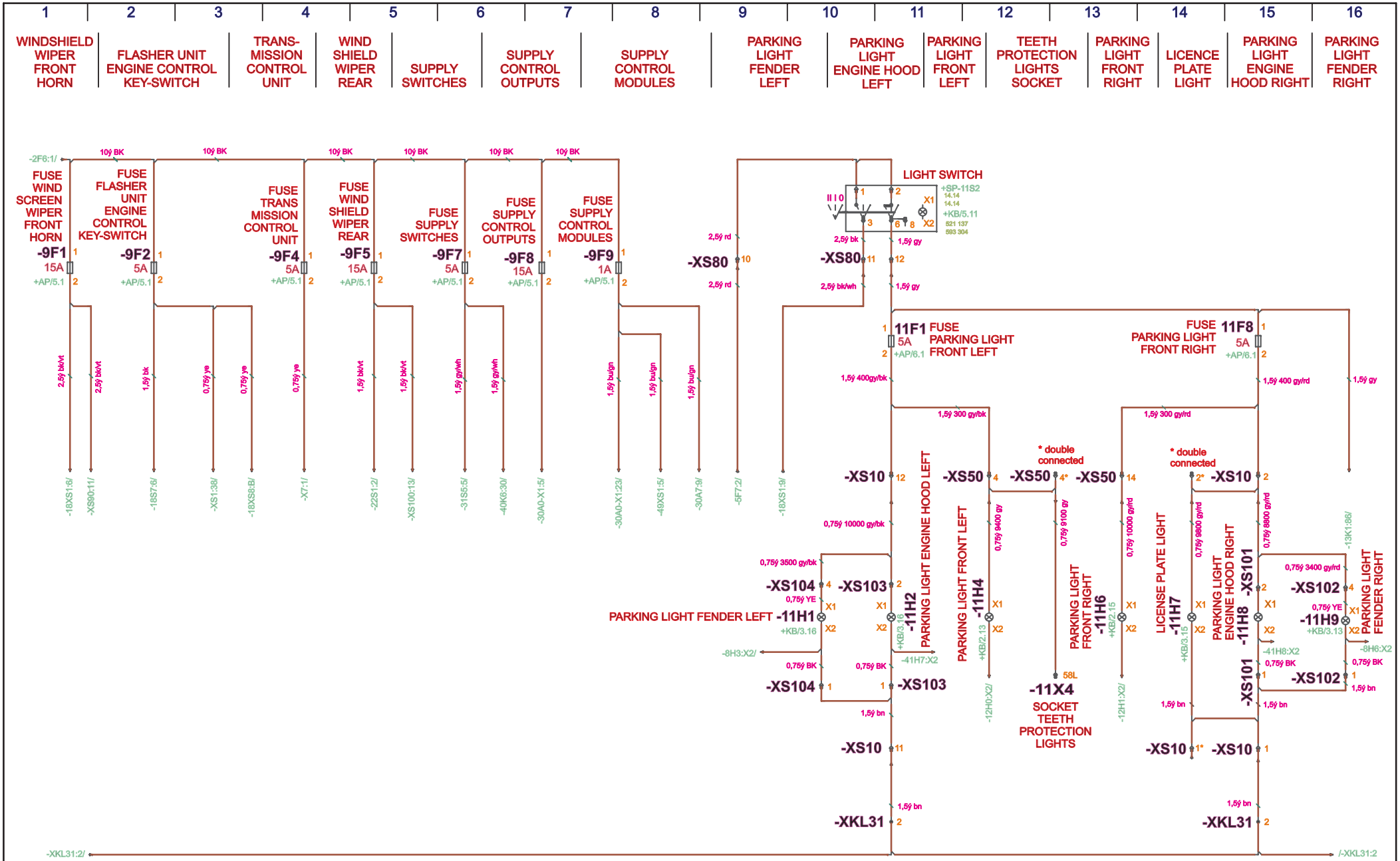
Typ Model Type Tipo	TL420 TL450	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL04200100 TL04500100	Datum Edition Date Fecha	07.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página	2/18	Blatt Page Feuille Página	7.35.02



-XKL30	Voltage distributer central electric-3
-XKL31	Central ground central electric-3
-XS10	Connector rear chassis / central electric-1
-XS30	Connector rear chassis / central electric-1
-XS40	Connector floor frame / central electric-1

-XS100	Connector operator's cab rear / central electric-2
-XS101	Connector rear chassis / brake light engine hood right
-XS102	Connector rear chassis / brake light fender right
-XS103	Connector rear chassis / brake light engine hood left
-XS104	Connector rear chassis / brake light fender left
-XS120	Connector floor frame / central electric-2

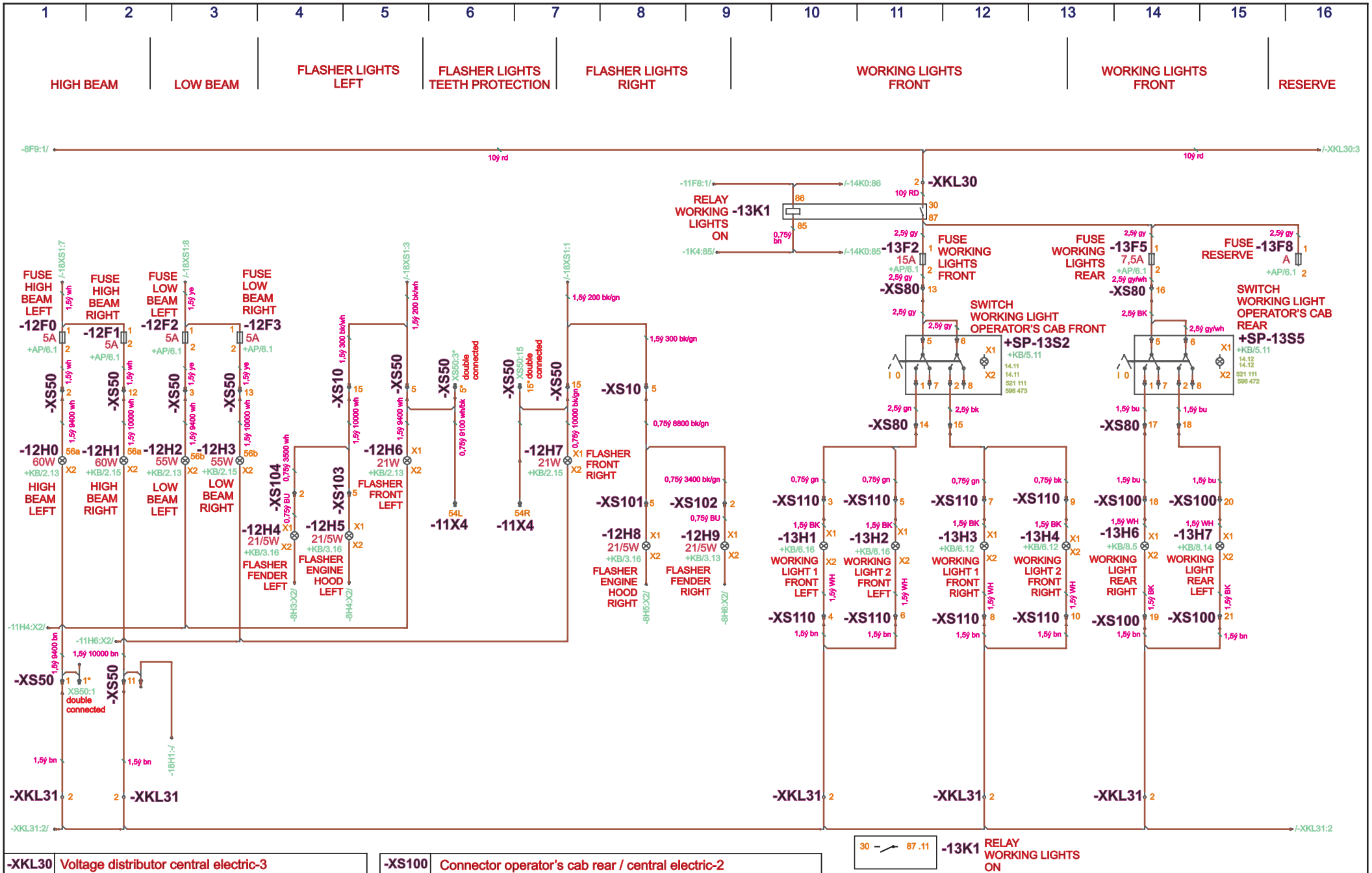
Typ / Model / Type / Tipo	TL420 TL450	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no.	TL04200100 TL04500100	Datum / Edition / Date / Fecha	07.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos		Blatt / Page / Feuille / Página	3/18	Blatt / Page / Feuille / Página	7.35.03



-XKL31	Central ground central electric-3
-XS10	Connector rear chassis / central electric-1
-XS50	Connector front chassis / central electric-1
-XS80	Connector console / central electric-1

-XS101	Connector rear chassis / brake light engine hood right
-XS102	Connector rear chassis / brake light fender right
-XS103	Connector rear chassis / brake light engine hood left
-XS104	Connector rear chassis / brake light fender left

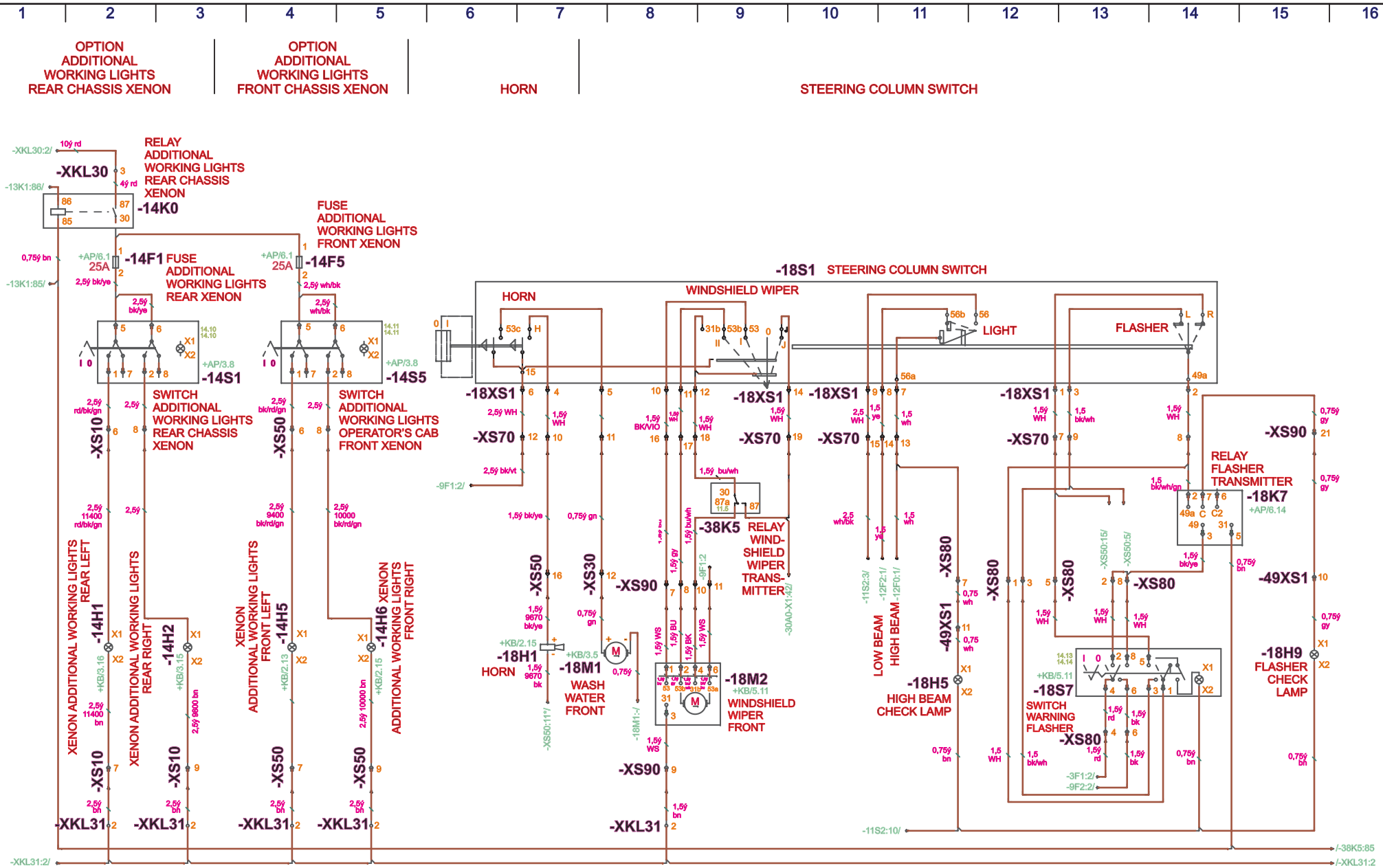
Typ Model Type Tipo	TL420 TL450	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL04200100 TL04500100	Datum Edition Date Fecha 07.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página 4/18		Blatt Page Feuille Página 7.35.04



-XKL30	Voltage distributor central electric-3
-XKL31	Central ground central electric-3
-11X4	Connector front chassis / teeth protection
-XS10	Connector rear chassis / central electric-1
-XS50	Connector front chassis / central electric-1
-XS80	Connector console / central electric-1

-XS100	Connector operator's cab rear / central electric-2
-XS101	Connector rear chassis / flasher engine hood right
-XS102	Connector rear chassis / flasher fender right
-XS103	Connector rear chassis / flasher engine hood left
-XS104	Connector rear chassis / flasher fender left
-XS110	Connector operator's cab front / central electric-2

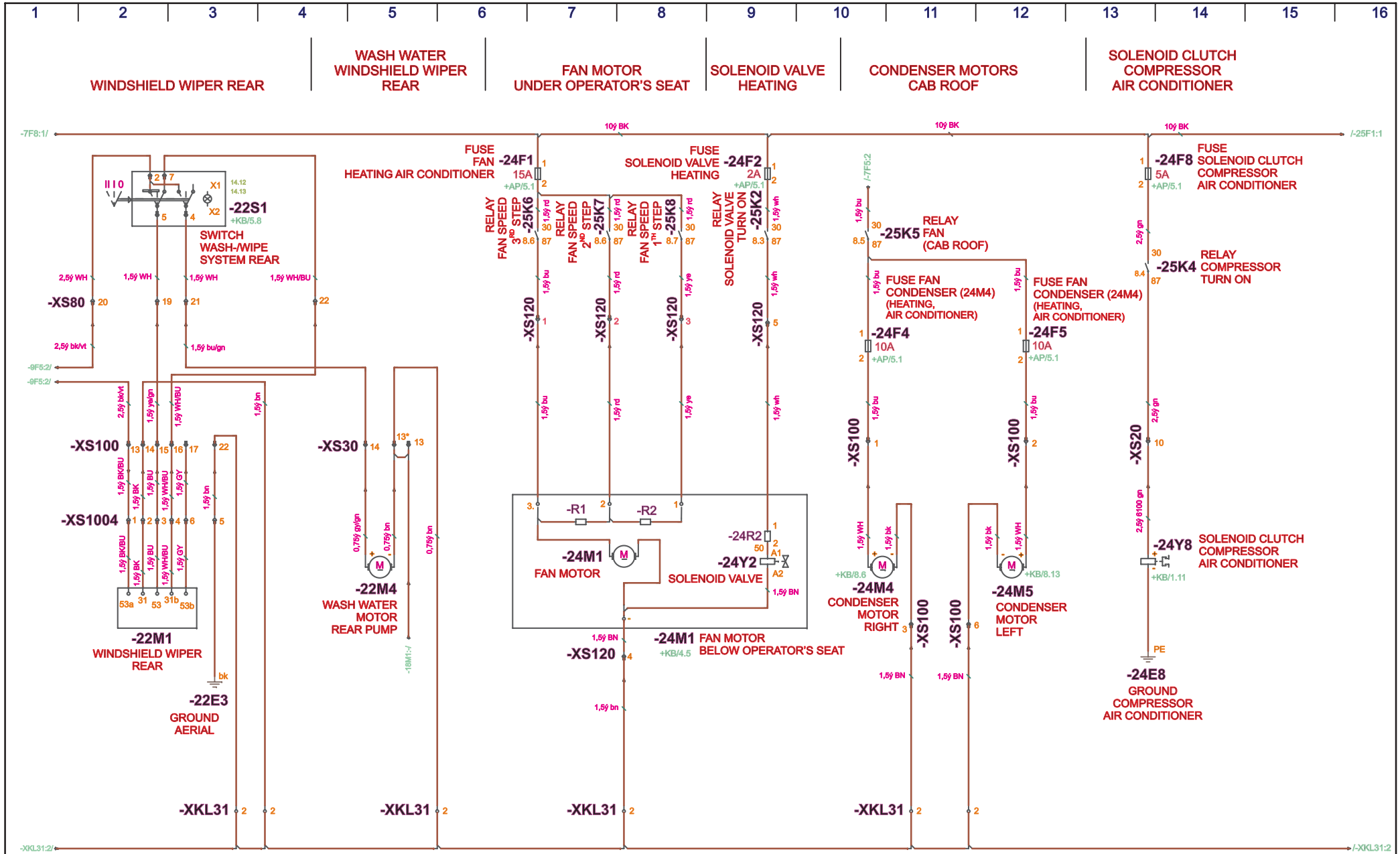
Typ Model Type Tipo	TL420 TL450	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL04200100 TL04500100	Datum Edition Date Fecha	07.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página	5/18	Blatt Page Feuille Página	7.35.05



-XKL30	Voltage distributer central electric-3
-XKL31	Central ground central electric-3
-18XS1	Connector console / steering column switch
-49XS1	Connector console / charge control
-XS10	Connector rear chassis / central electric-1

-XS30	Connector rear chassis / central electric-1
-XS50	Connector front chassis / central electric-1
-XS70	Connector console / central electric-1
-XS80	Connector console / central electric-1
-XS90	Connector console / central electric-2

Typ / Model / Type / Tipo	TL420 / TL450	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no.	TL04200100 / TL04500100	Datum / Edition / Date / Fecha	07.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos		Blatt / Page / Feuille / Página	6/18	Blatt / Page / Feuille / Página	7.35.06

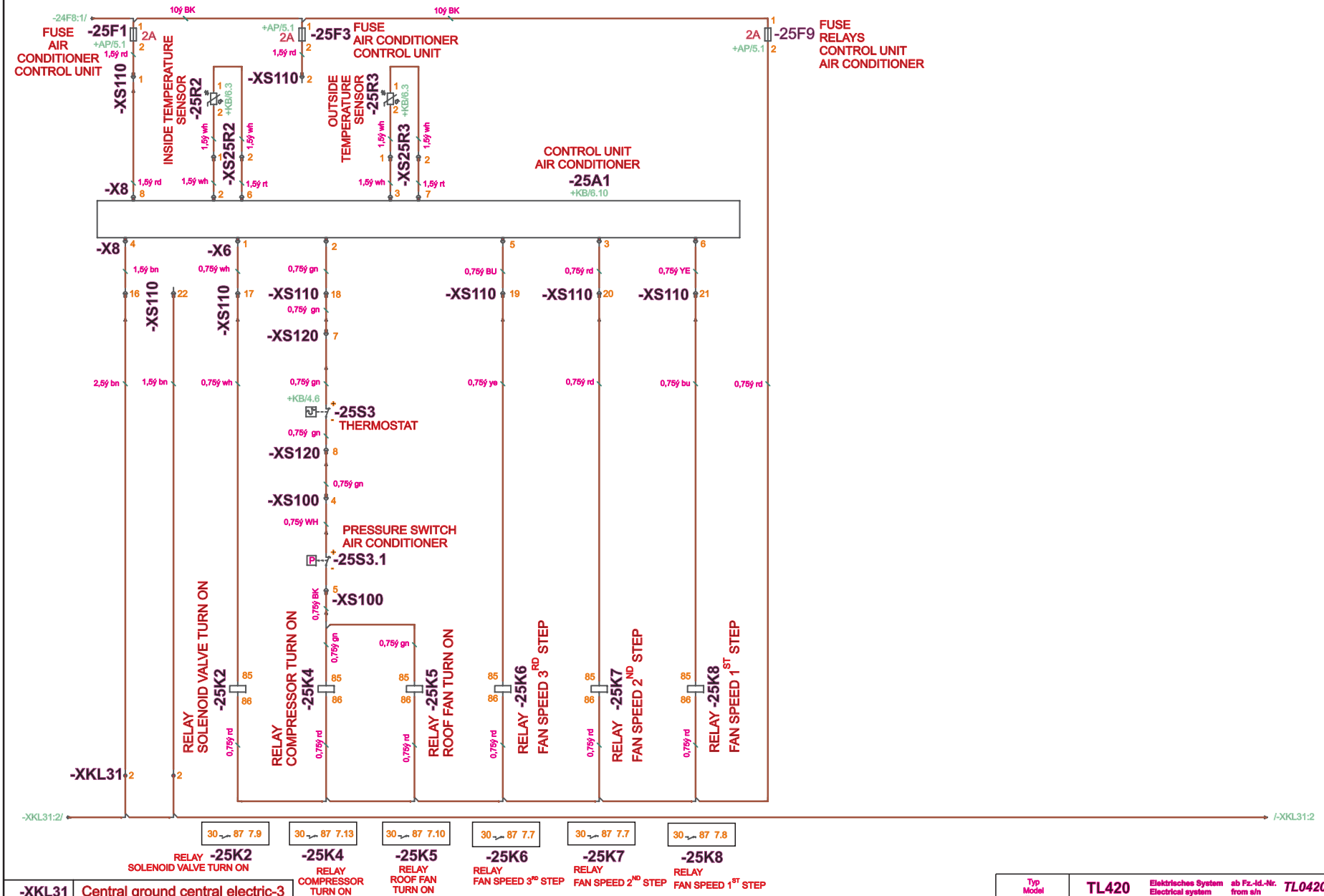


-XKL30	Voltage distributor central electric-3
-XKL31	Central ground central electric-3
-XS20	Connector engine / central electric-1
-XS30	Connector rear chassis / central electric-1

-XS80	Connector console / central electric-1
-XS100	Connector operator's cab rear / central electric-2
-XS120	Connector floor frame / central electric-2
-XS1004	Connector operator's cab rear / windshield wiper rear

Typ Model Type Tipo	TL420 TL450	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL04200100 TL04500100	Datum Edition Date Fecha	07.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página	7/18	Blatt Page Feuille Página	7.35.07

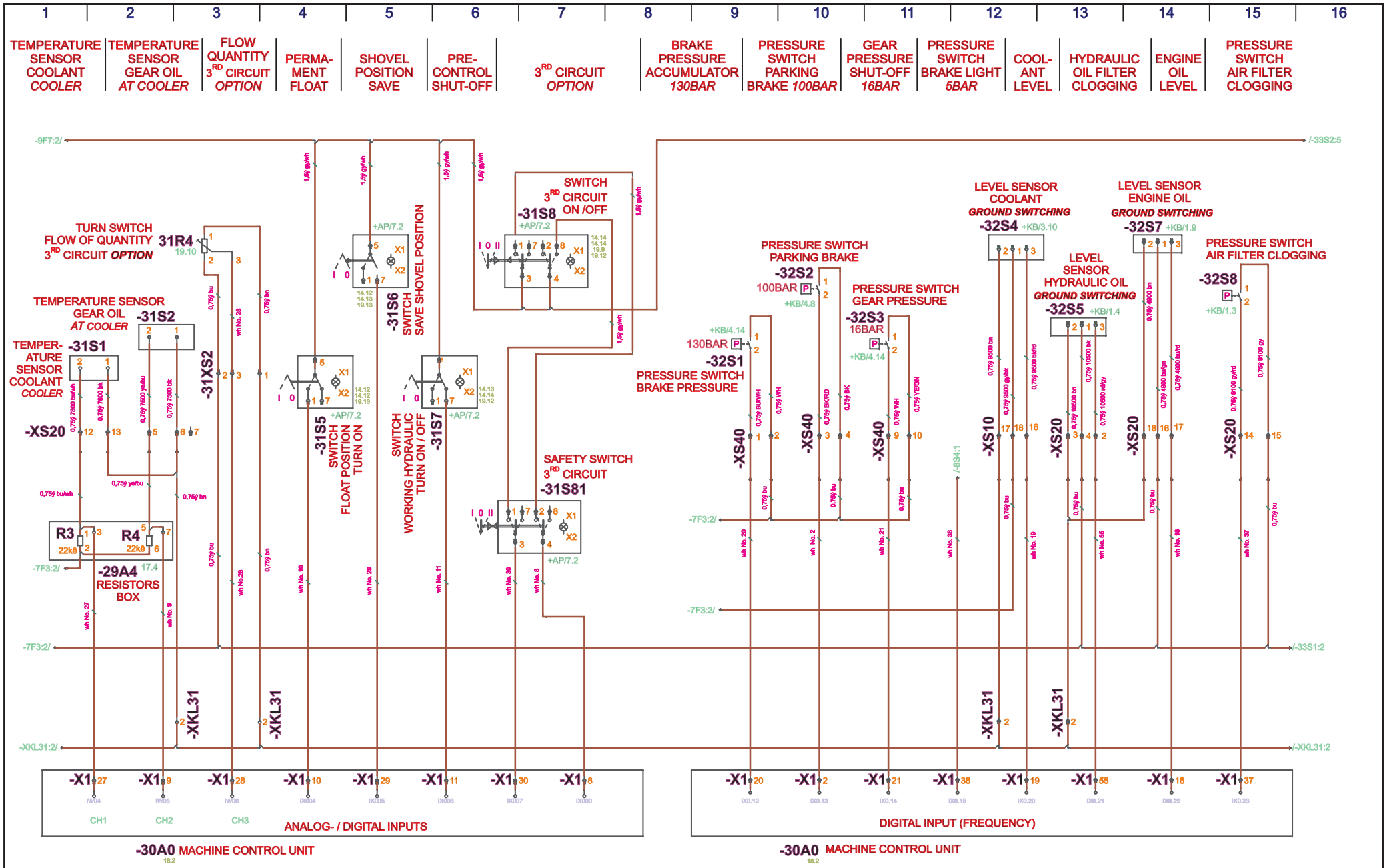
AIR CONDITIONER



-XKL31	Central ground central electric-3
-XS25R2	Connector operator's cab front / inside temperature sensor
-XS25R2	Connector operator's cab front / outside temperature sensor
-XS8	Connector operator's cab front / control unit air conditioner

-XS100	Connector operator's cab rear / central electric-2
-XS110	Connector operator's cab front / central electric-2
-XS120	Connector floor frame / central electric-2

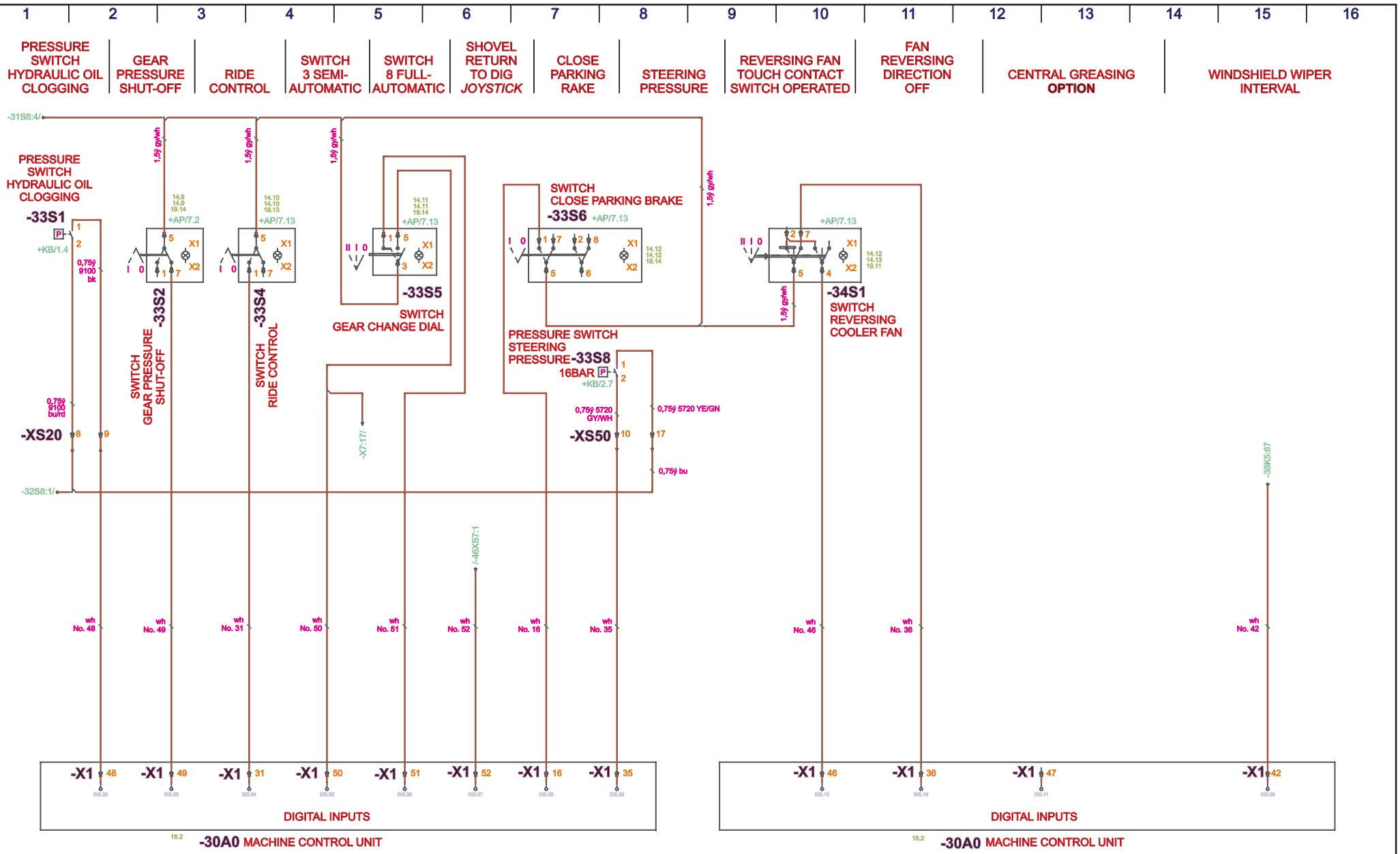
Typ / Model / Type / Tipo	TL420 TL450	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no.	TL04200100 TL04500100	Datum / Edition / Date / Fecha	07.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos		Blatt / Page / Feuille / Página	8/18	Blatt / Page / Feuille / Página	7.35.08



-XKL31	Central ground central electric -3
-X1	Connection machine control unit / central electric-7
-31XS2	Connection turn switch console / central electric-3

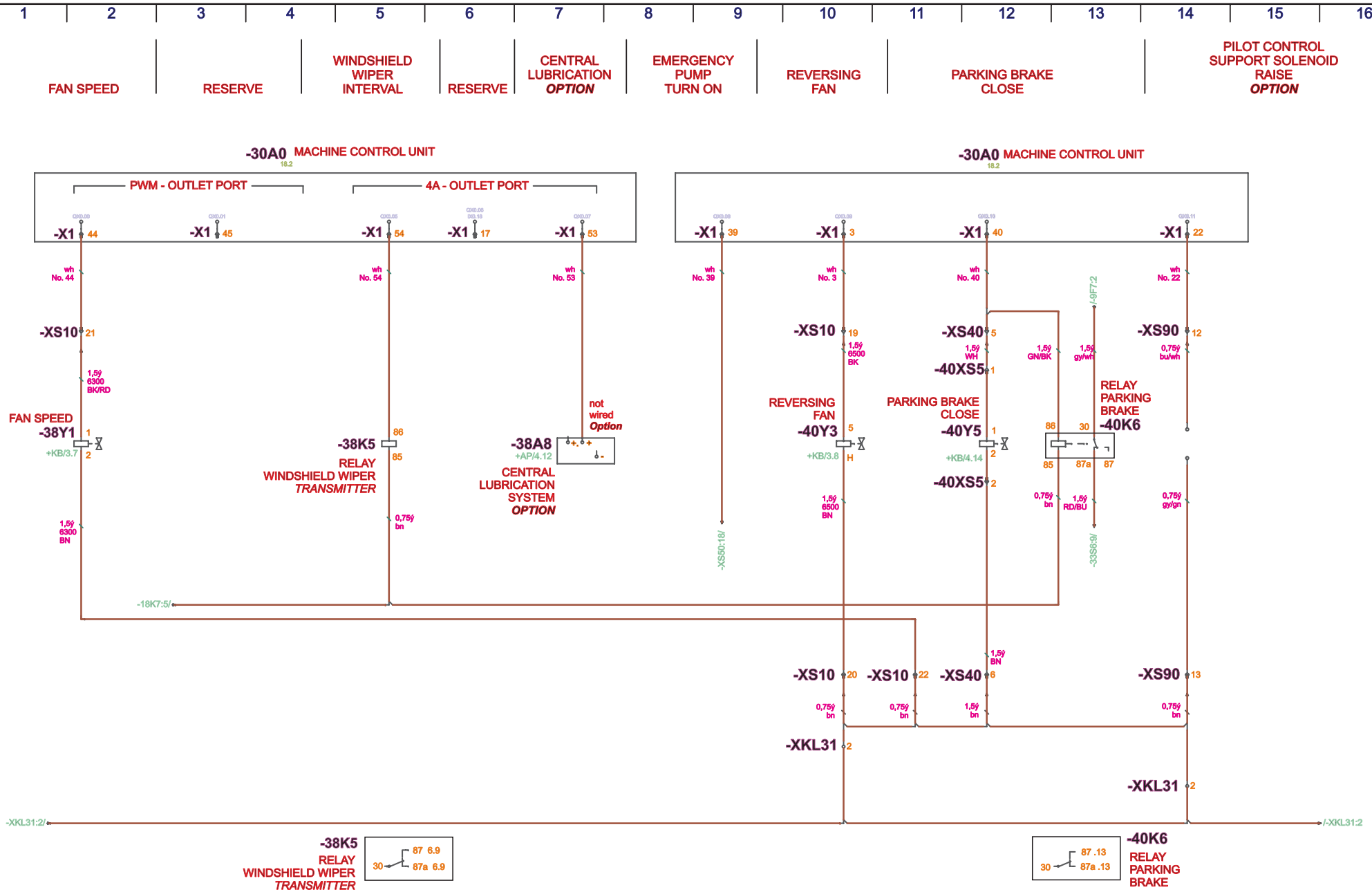
-XS10	Connection rear chassis / central electric-1
-XS20	Connection engine / central electric-1
-XS40	Connection floor frame / central electric-1

Typ Model Type Tipo	TL420 TL450	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL04200100 TL04500100	Datum Edition Date Fecha	07.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página	9/18	Blatt Page Feuille Página	7.35.09



-X1	Connection machine control unit / central electric-7
-XS20	Connection engine / central electric-1
-XS50	Connection front chassis / central electric-1

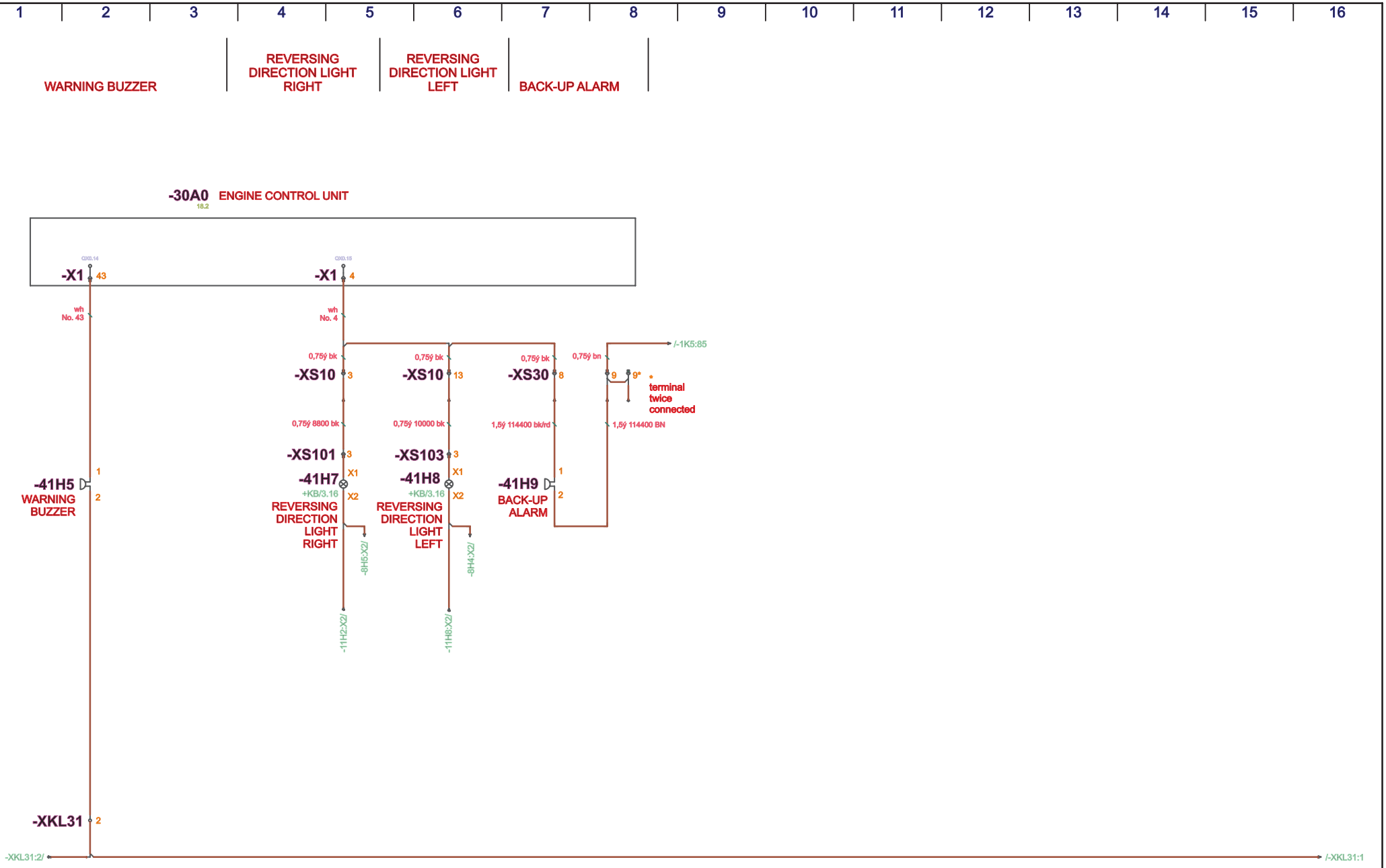
Typ Model Type Tipo	TL420 TL450	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL04200100 TL04500100	Datum Edition Date Fecha	07.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página	10/18	Blatt Page Feuille Página	7.35.10



-XKL31	Central ground central electric-3
-40XS5	Connection floor frame / parking brake open
-X1	Connection engine control unit / central electric-7

-XS10	Connection rear chassis / central electric-1
-XS40	Connection floor frame / central electric-1
-XS90	Connection console / central electric-2

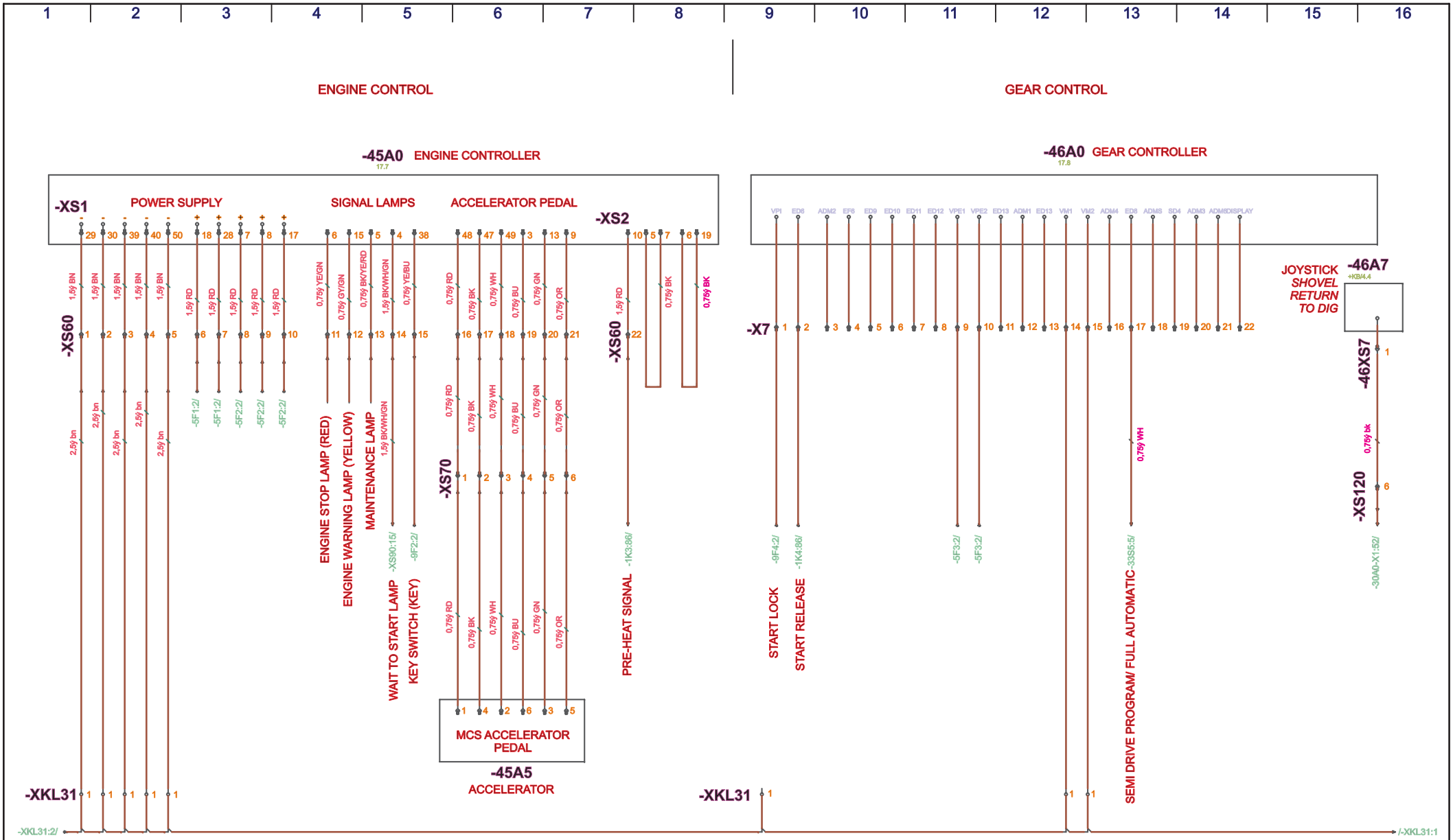
Typ Model Type Tipo	TL420 TL450	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL04200100 TL04500100	Datum Edition Date Fecha	07.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página	11/18	Blatt Page Feuille Página	7.35.11



-XKL31	Central ground central electric-3
-XS10	Connection rear chassis / central electric-1
-XS30	Connection rear chassis / central electric-1

-XS101	Connection rear chassis / reversing direction light right
-XS103	Connection rear chassis / reversing direction light left

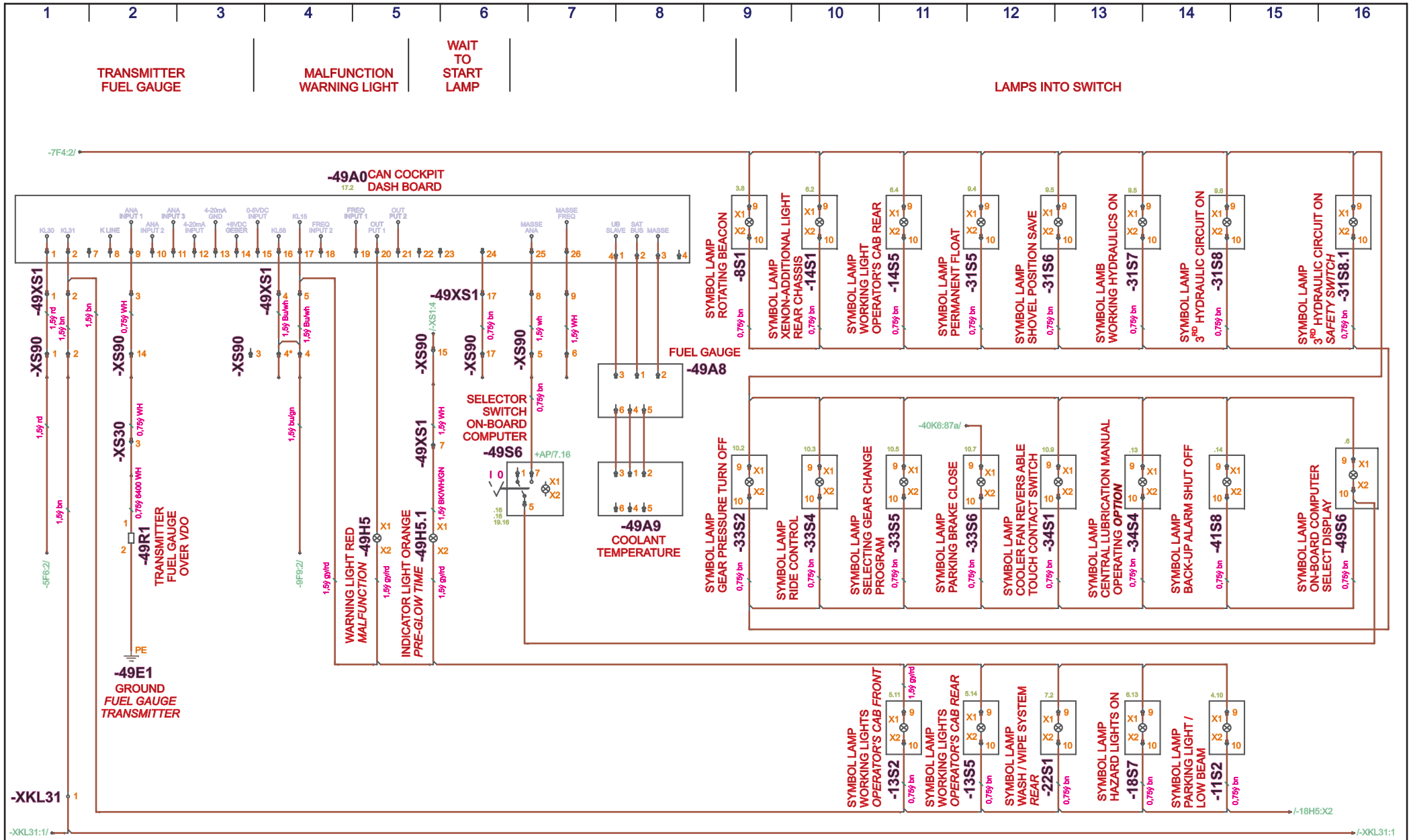
Typ Model Type Tipo	TL420 TL450	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL04200100 TL04500100	Datum Edition Date Fecha	07.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página	12/18	Blatt Page Feuille Página	7.35.12



-XKL31	Central ground central electric-3
-46X7	Connection floor frame / joystick
-XS1	Connection engine / engine controller
-XS2	Connection engine / engine controller

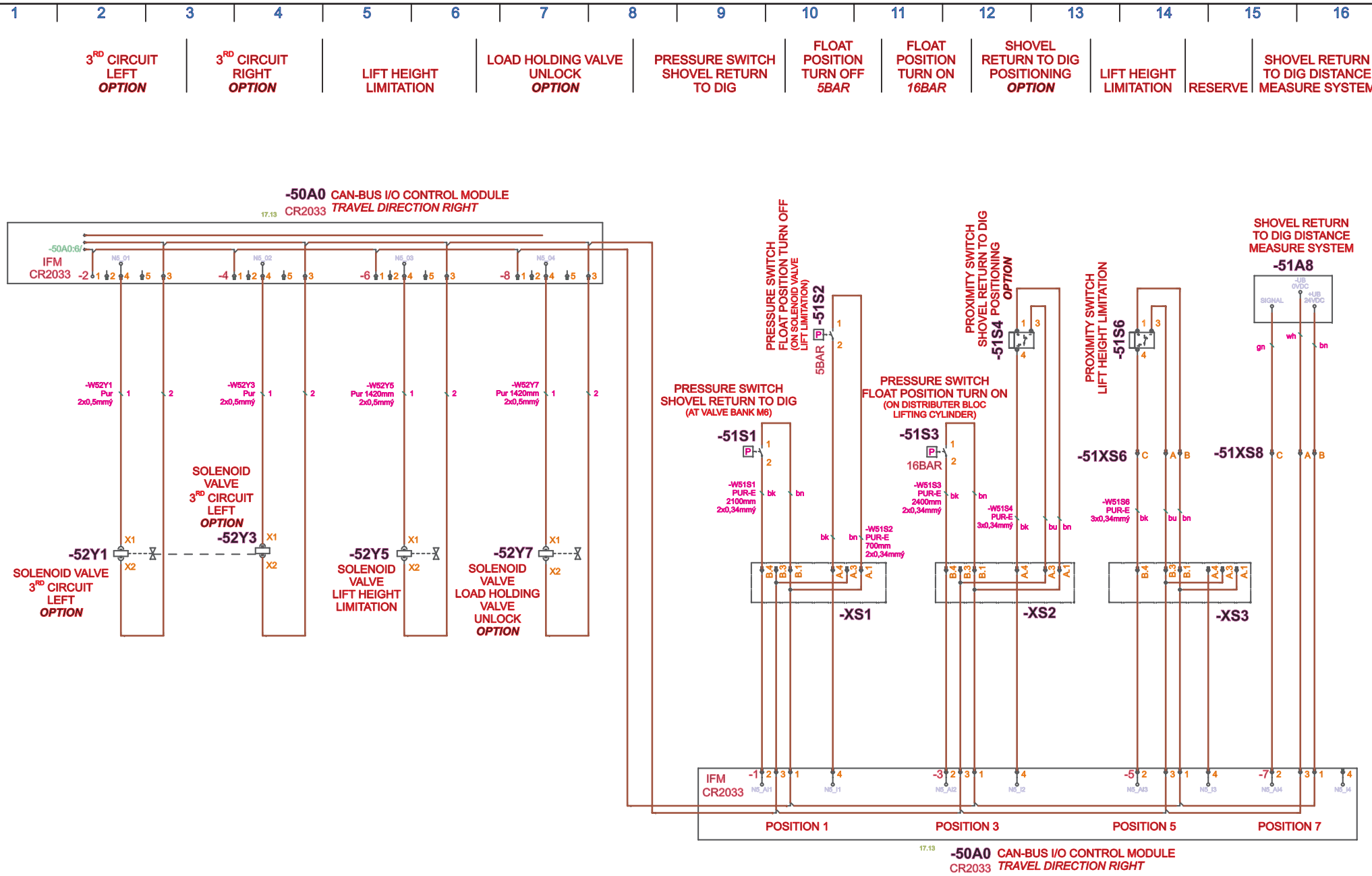
-XS60	Connection engine / central electric-1
-XS70	Connection console / central electric-1
-XS120	Connection floor frame / central electric-2
-X7	Connection gear controller / central electric-4

Typ Model Type Tipo	TL420 TL450	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL04200100 TL04500100	Datum Edition Date Fecha: 07.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página	13/18	Blatt Page Feuille Página: 7.35.13



-XKL31	Central ground central electric-3
-49XS1	Connection console / charge control
-XS30	Connection rear chassis / central electric-1
-XS90	Connection console / central electric-2

Typ Model Type Tipo	TL420 TL450	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL04200100 TL04500100	Datum Edition Date Fecha 07.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página 14/18		Blatt Page Feuille Página 7.35.14



-XS1	Connection pressure switch shovel return to dig, float position turn off / CAN-BUS I/O control module
-XS2	Connection pressure switch float position turn on, proximity switch return to dig / CAN-BUS I/O control module
-XS3	Connection cable to lift height limitation / CAN-BUS I/O control module
-51XS6	Connection proximity switch proximity switch return to dig / cable to CAN-BUS I/O control module
-51XS8	Connection dumping cylinder right / cable to CAN-BUS I/O control module

Typ / Model / Type / Tipo	TL420 TL450	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no.	TL04200100 TL04500100	Datum / Edition / Date / Fecha	07.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos		Blatt / Page / Feuille / Página	15/18	Blatt / Page / Feuille / Página	7.35.15

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

SHOVEL RETURN TO DIG VALVE RAISE *OPTION*

SHOVEL RETURN TO DIG VALVE LOWER *OPTION*

SHOVEL RETURN TO DIG VALVE RETRACT *OPTION*

GEAR SHUT-OFF

FLOAT POSITION

WORKING HYDRAULIC *OPTION*

RESERVE

PILOT CONTROL SHUT-OFF

-50A5 CAN-BUS ON/OFF CONTROL UNIT *TRAVEL DIRECTION LEFT*

17.10 CR2031

-50A5:6/

IFM CR2031 -1 -2 -3 -4

N7_01 N7_02 N7_03 N7_04

-50A5 CAN-BUS ON/OFF CONTROL UNIT *TRAVEL DIRECTION LEFT*

17.10 CR2031

IFM CR2031 -5 -6 -7 -8

N7_05 N7_06 N7_07 N7_08

-W53Y1 Pur 1320mm 2x0,5mmý

-W53Y3 Pur 1320mm 2x0,5mmý

-W53Y5 Pur 1320mm 2x0,5mmý

-W53Y7 Pur 2320mm 2x0,5mmý

-W54Y1 Pur 2x0,5mmý

-W54Y3 Pur 2x0,5mmý

-W54Y7 Pur 1420mm 2x0,5mmý

SOLENOID VALVE SHOVEL RETURN TO DIG VALVE RAISE *OPTION* **-53Y1**

SOLENOID VALVE SHOVEL RETURN TO DIG VALVE LOWER *OPTION* **-53Y3**

SOLENOID VALVE SHOVEL RETURN TO DIG VALVE RETRACT *OPTION* **-53Y5**

SOLENOID VALVE GEAR SHUT-OFF AT *STABILIZATION MODULE* **-53Y7**

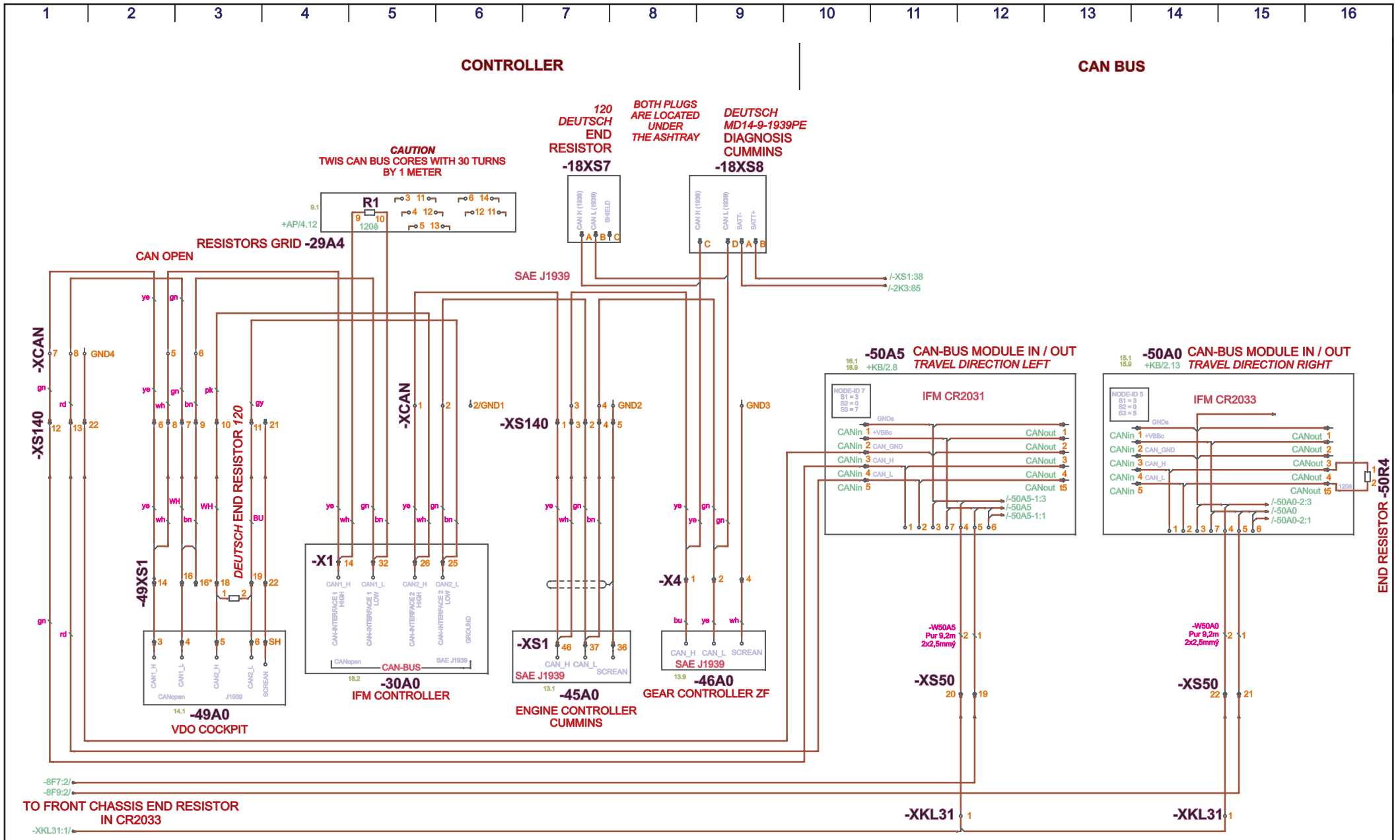
SOLENOID VALVE FLOAT POSITION **-54Y1**

SOLENOID VALVE WORKING HYDRAULIC *OPTION* **-54Y3**

SOLENOID VALVE PILOT CONTROL SHUT-OFF **-54Y7**

X1 X2

Typ / Model / Type / Tipo	TL420 TL450	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no.	TL04200100 TL04500100	Datum / Edition / Date / Fecha	07.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos		Blatt / Page / Feuille / Página	16/18	Blatt / Page / Feuille / Página	7.35.16

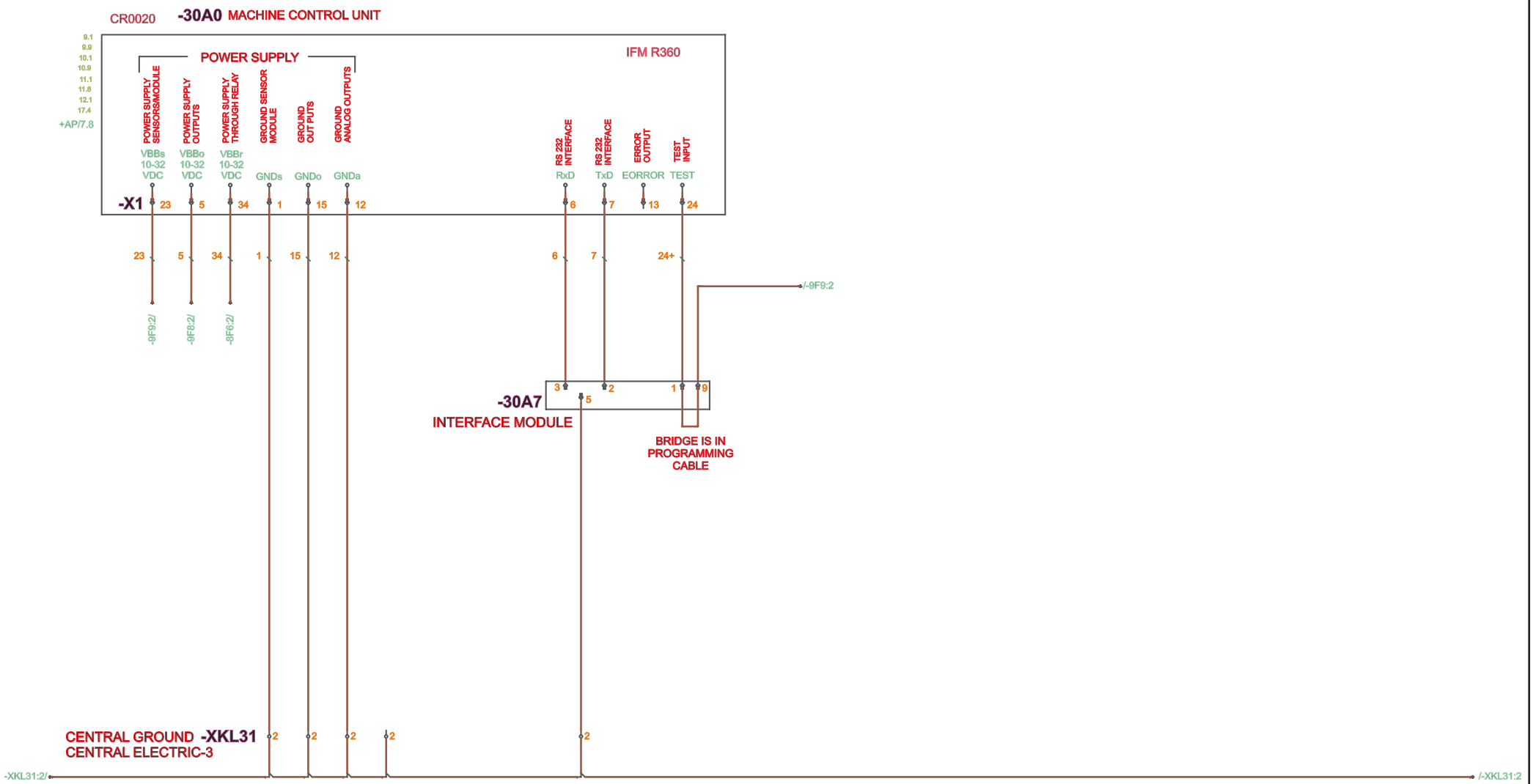


-XKL31	Central ground central electric-3
-49XS1	Connection console / charge control
-X1	Connection IFM control /central electric-7
-X4	Connection gear control /central electric-4

-XS1	Connection engine / engine control Cummins
-XS140	Connection front chassis / central electric-2
-XS50	Connection front chassis / CAN-bus module in/out
-XCAN	Wedge strip / mounting plate central electric

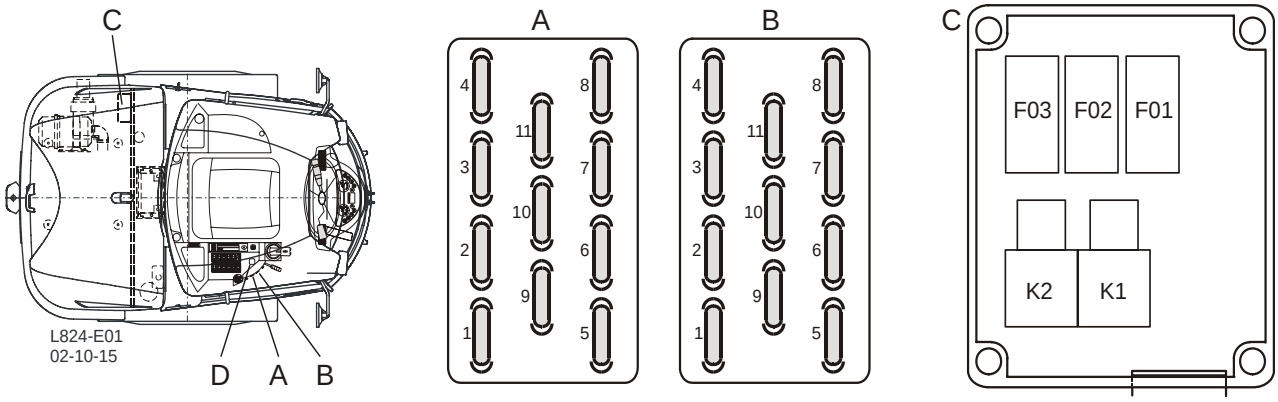
Typ Model Type Tipo	TL420 TL450	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL04200100 TL04500100	Datum Edition Date Fecha	07.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página	17/18	Blatt Page Feuille Página	7.35.17

PROGRAMMING MODULE



Typ Model Type Tipo	TL420 TL450	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL04200100 TL04500100	Datum Edition Date Fecha	07.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página	1/18	Blatt Page Feuille Página	7.35.18

Fuse box — Assignment diagram



D = K3 (turn-signal flasher relay) below switch board

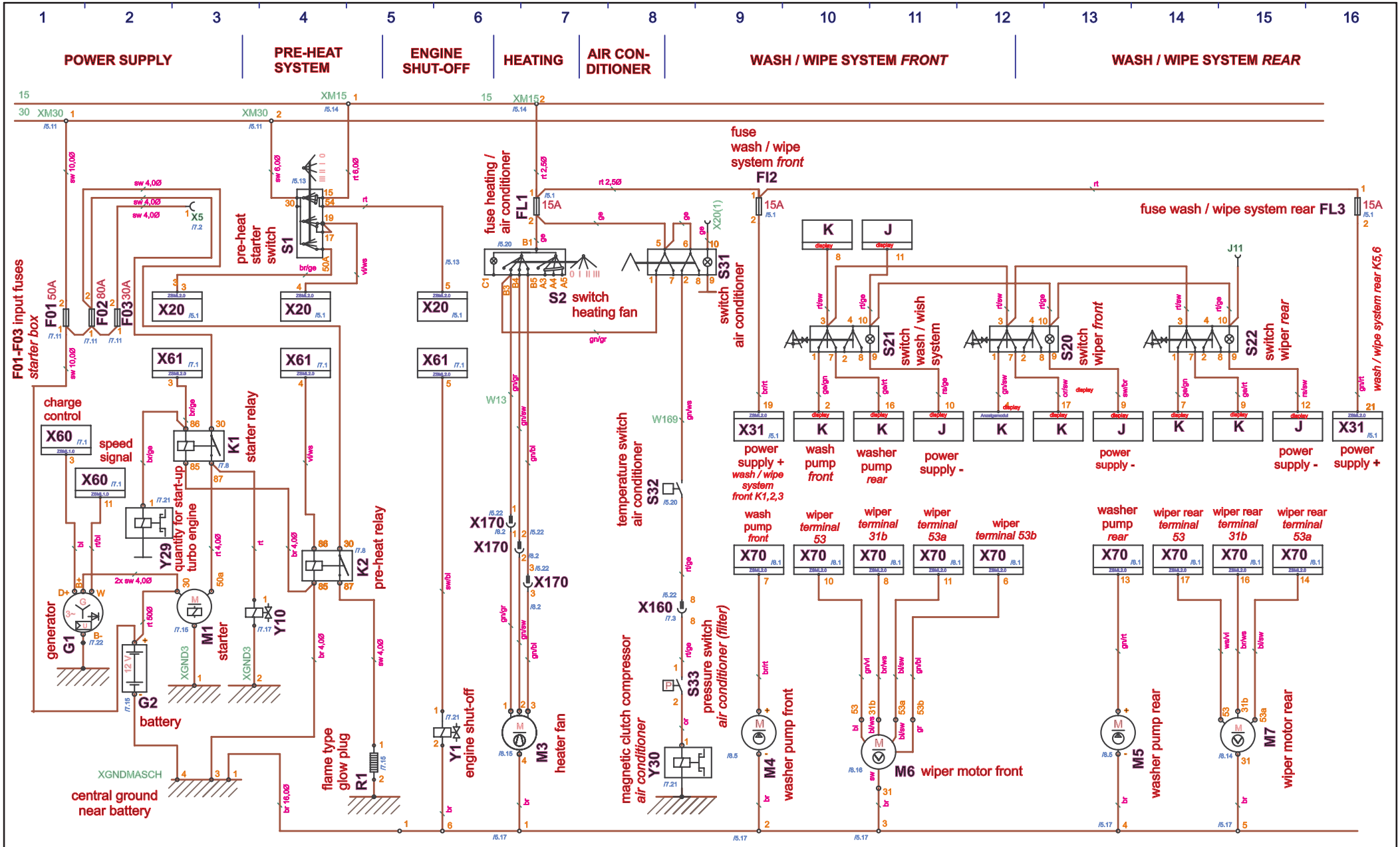
A			B		
Position	**Ampere**	**assigned to**	**Position**	**Ampere**	**assigned to**
F 1	15	Heater fan	F 1	15	Working floodlight, front
F 2	15	Wash/wipe, front	F 2	15	Working floodlight, rear
F 3	15	Wash/wipe, rear	F 3	10	Turn indicator
F 4	10	Rotating beacon; interior light	F 4	10	Hazard warning switch
F 5	15	Travel, forward/reverse	F 5	15	Socket; radio
F 6	10	Reserve	F 6	15	Reserve
F 7	10	swing axle lock	F 7	10	Horn
F 8	10	E-module inputs	F 8	10	High beam
F 9	10	Instruments	F 9	15	Low beam
F 10	10	Radio	F 10	10	Side marker light, left
F 11	10	Proximity switches	F 11	10	Side marker light, right
C / D					
F 01	50	Series fuse	K 1		Start relay
F 02	80	Starting system	K 2		Pre-heat relay
F 03	30	Control module power supply	K 3		Turn-indicator flasher relay

Colors of fuses

10 A	red	15 A	blue	30 A	Rose	50 A	red	80 A	white

Cable and plug colors

bg	beige	dgr	dark gray	hbr	light brown	rt	red
bl	blue	ge	yellow	hgr	light gray	sw	black
br	brown	gn	green	hr	light red	vi	violet
dbl	dark blue	gr	grey	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		



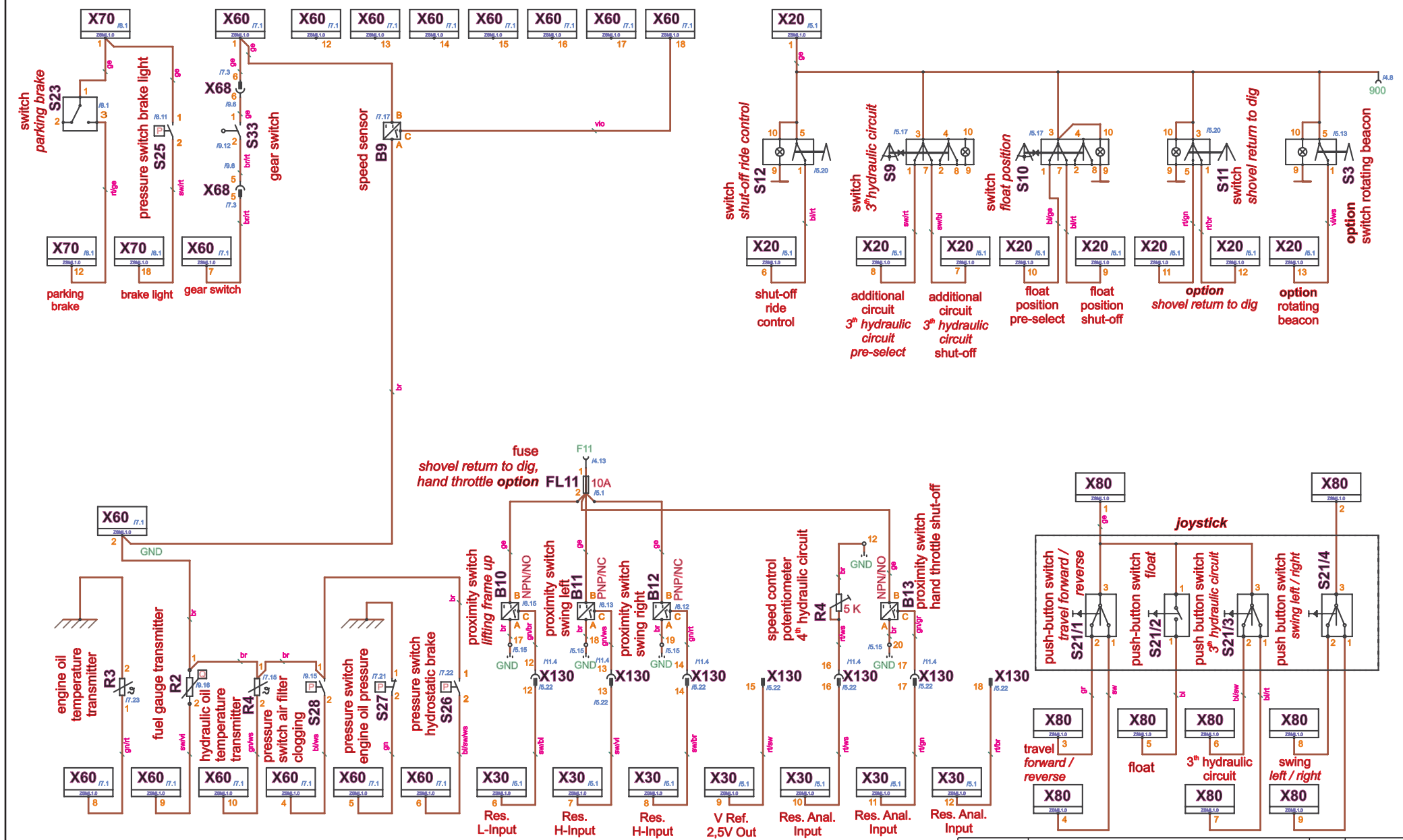
X20	connector central control module
X31	connector central control module
X60	connector central control module
X61	connector central control module

X70	connector central control module
X160	connector switch console
X170	connector operator's cab / floor frame
K	connector display

J	connector display
XMOT	connector rear chassis / engine
F01-F03	input fuses (starter box)

Typ Model Type Tipo	TL 70	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TL 00700100	Datum Edition Date Fecha: 01.2007
Benennung Description Dénomination Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt Page Feuille Página 1/4	Blatt Page Feuille Página: 7.37.01

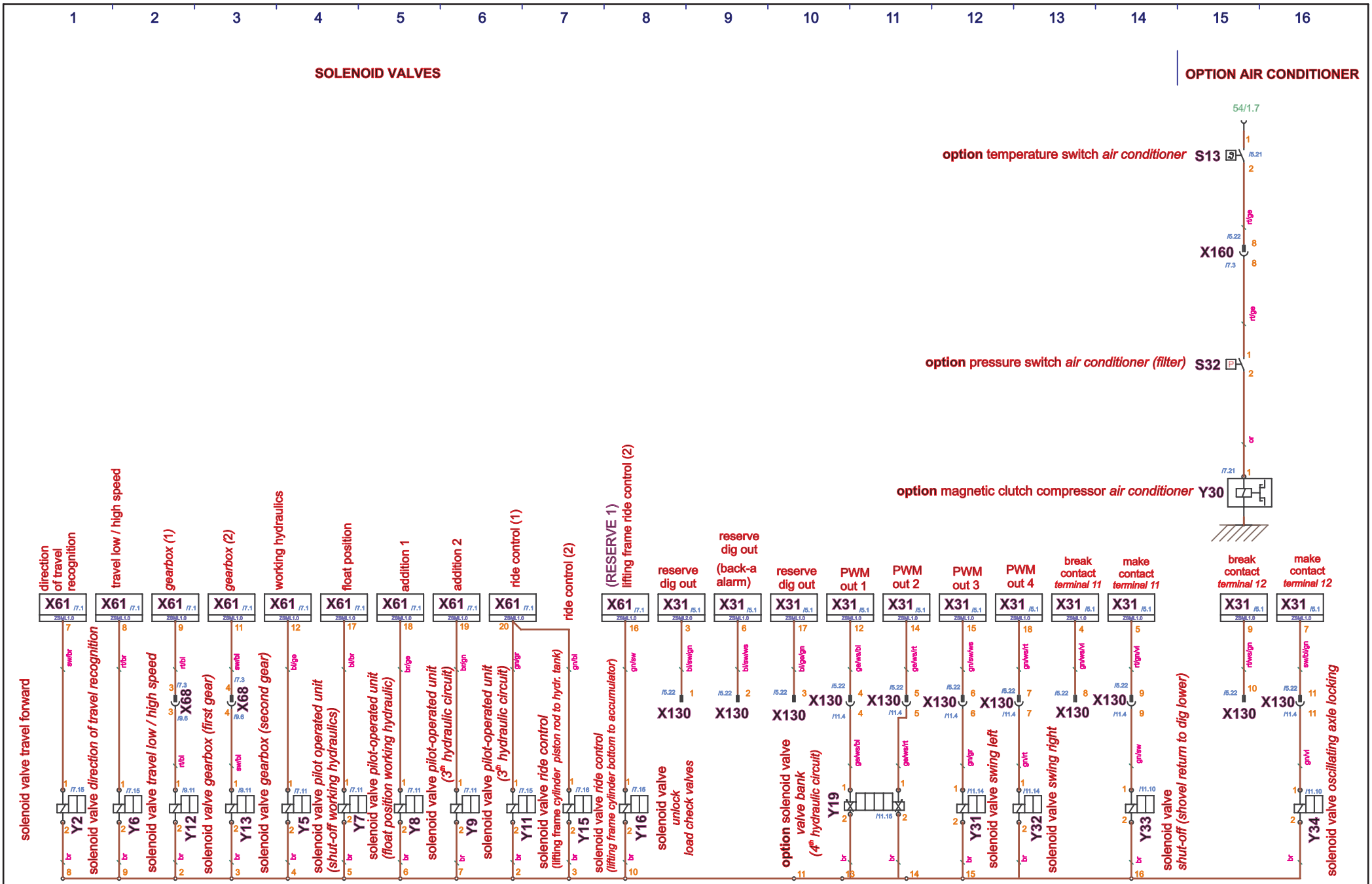
INSTRUMENTS, SENSORS, SWITCHES, TRANSMITTER



X20	connector central control module
X30	connector central control module
X60	connector central control module
X68	connector switch console / rear chassis

X130	connector switch console / front chassis

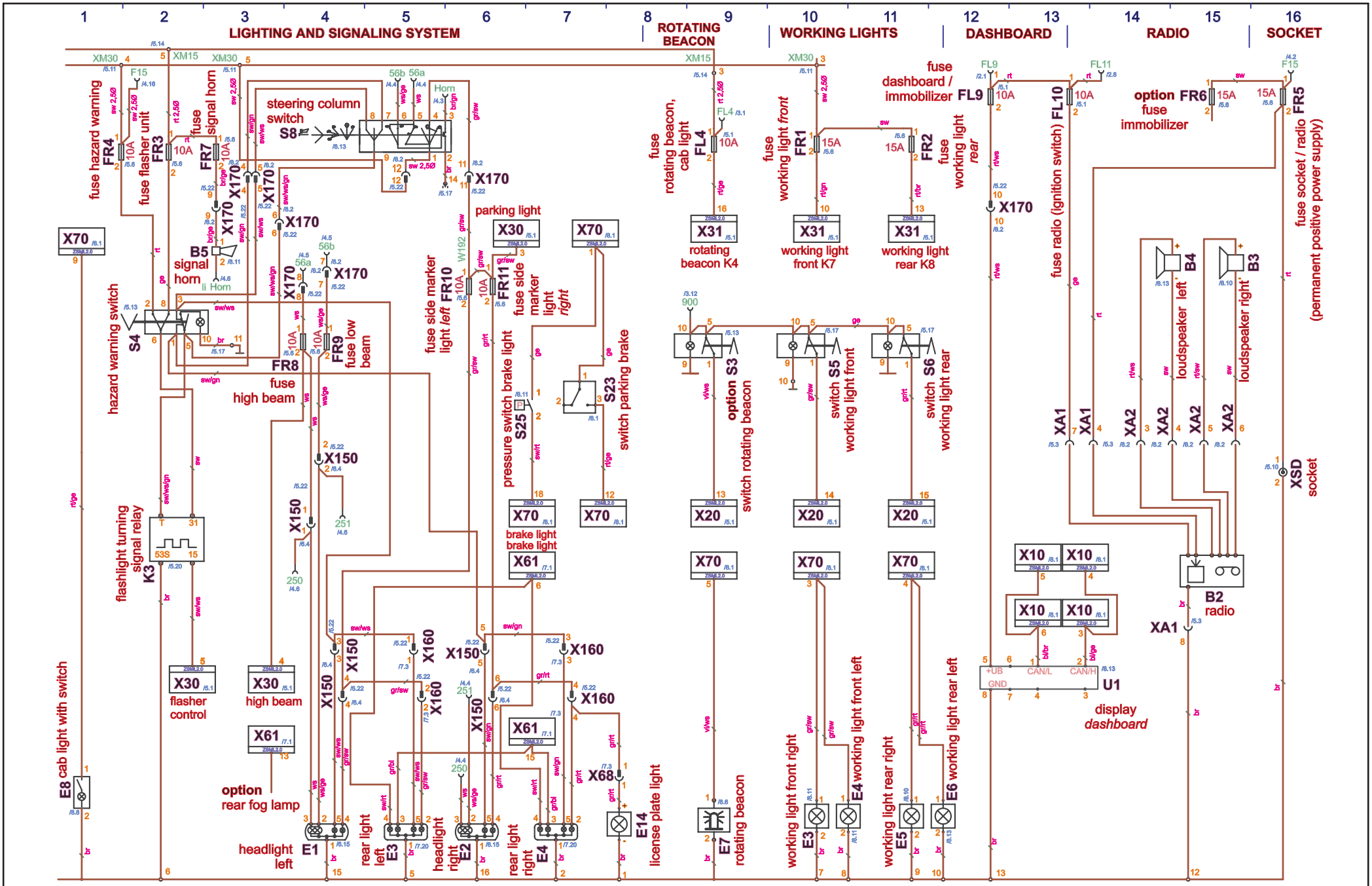
Typ Model Type Tipo	TL 70	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TL 00700100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página	2/4	Blatt Page Feuille Página	7.37.02



X31	connector central control module
X61	connector central control module

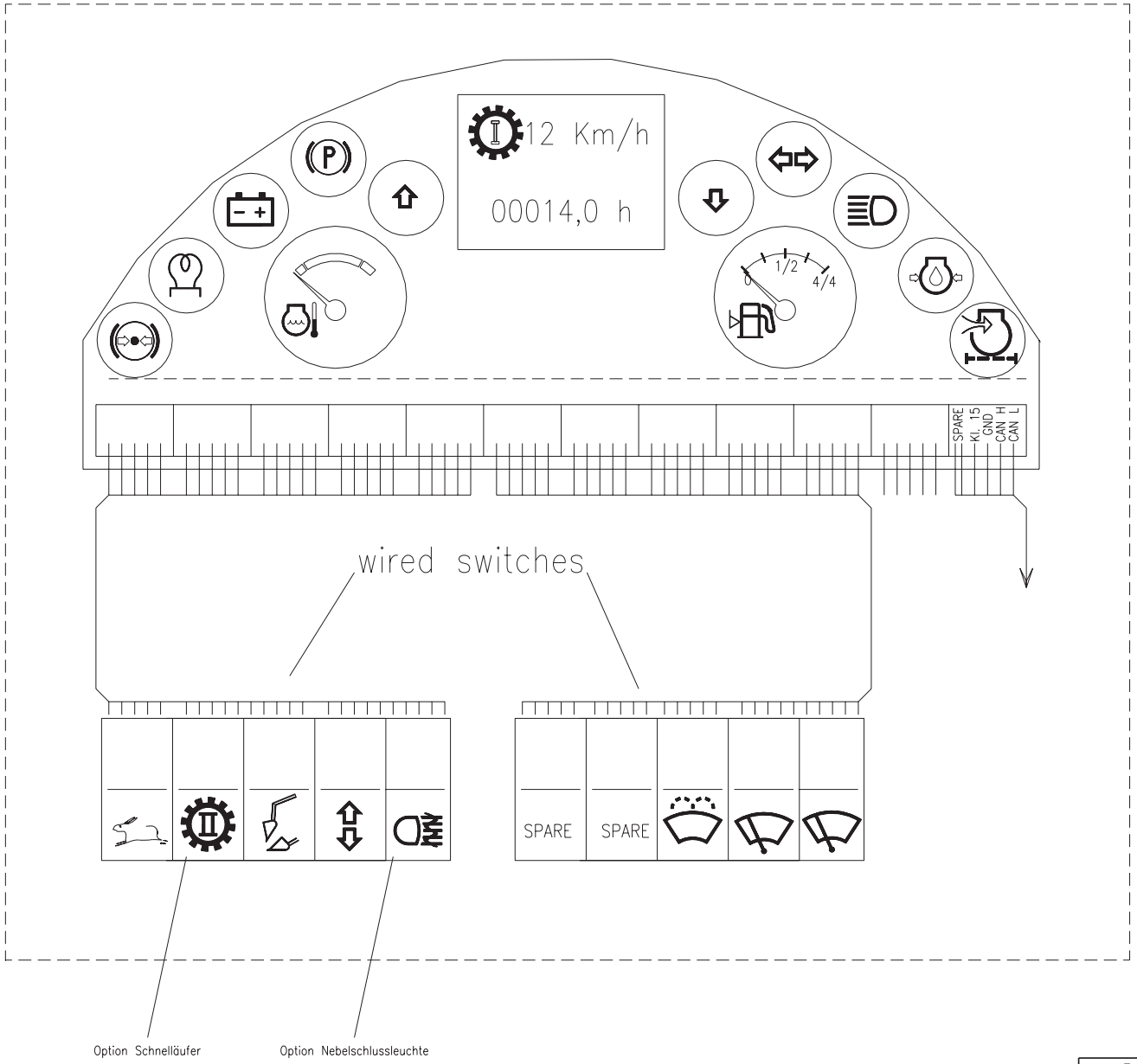
X68	connector 2-stage gearbox / rear chassis
X130	connector switch console / front chassis
X160	connector switch console / rear chassis

Typ Model Type Tipo	TL 70	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no. TL 00700100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página 3/4	Blatt Page Feuille Página	7.37.03



X10	connector central control module	X61	connector central control module	X160	connector switch console / rear chassis
X20	connector central control module	X68	connector fast travel version	X170	connector operator's cab / switch console
X30	connector central control module	X70	connector central control module	XA1	connector radio connection
X31	connector central control module	X150	connector switch console / front chassis	XA2	connector loudspeaker connection

Typ Model Type Tipo	TL 70	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no. TL 00700100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos	Blatt Page Feuille Página	4/4	Blatt Page Feuille Página	7.37.04



SCHAEFF

00014,0 h

12 Km/h

00014,0 h

21 Km/h

00014,0 h

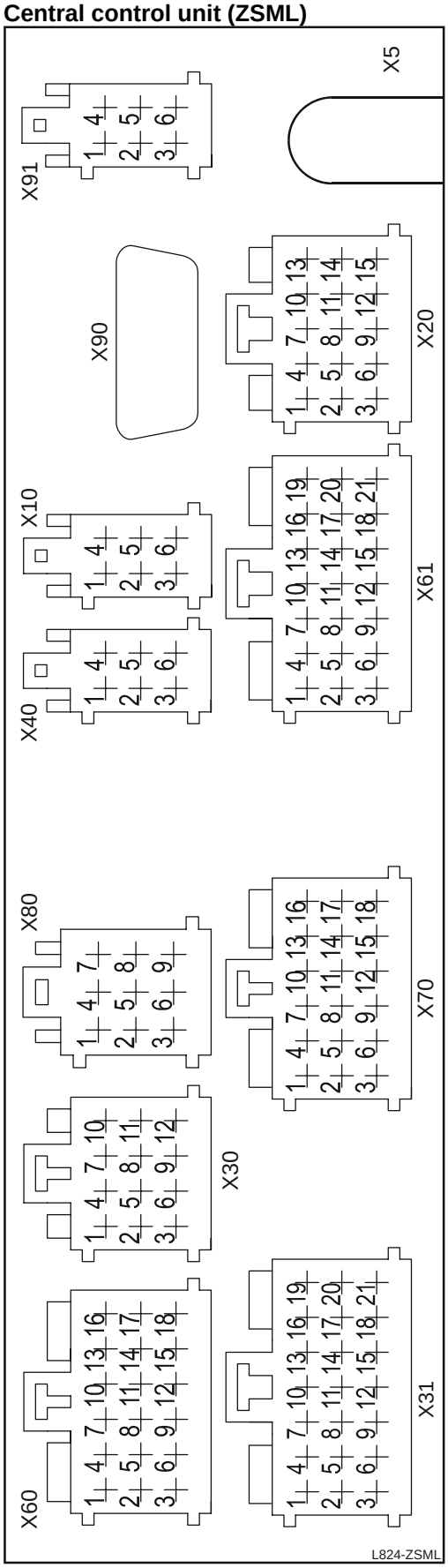
00 Km/h

00014,0 h

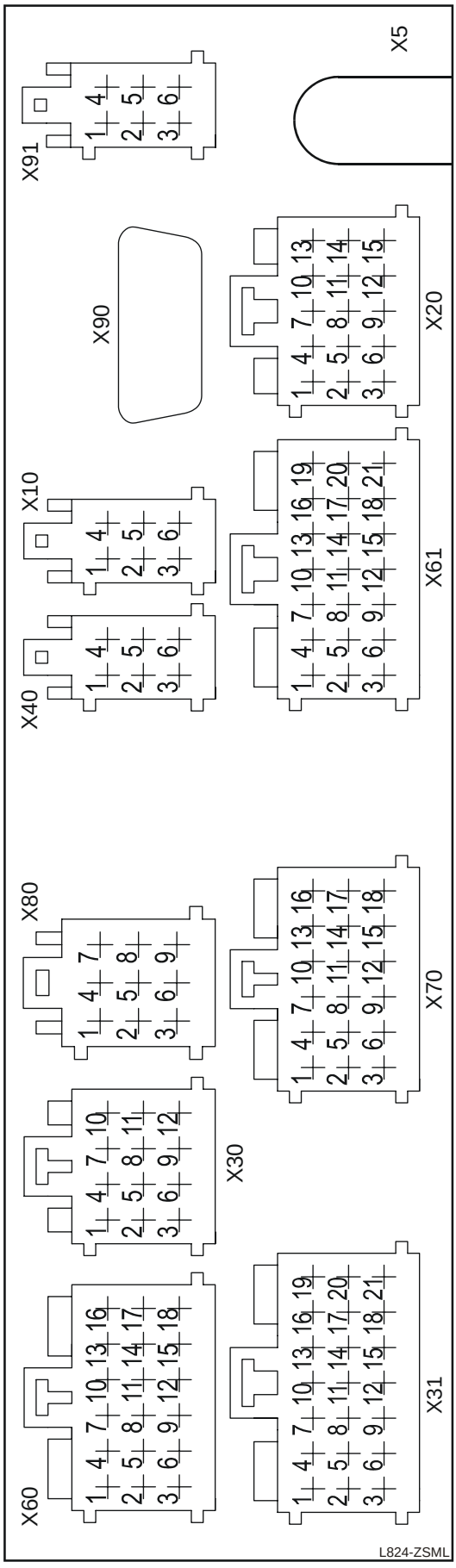
12 Km/h

Typ Model Type Tipo	**TL 70**	**Elektrisches System** **Electrical system** **Circuit électrique** **Sistema elèctrico**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.**	***TL 00700100***	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Stromlaufplan** **Wiring diagramm** **Circuit électrique** **Esquemas de los circuitos**				Blatt Page Feuille Página	**7.37.05**

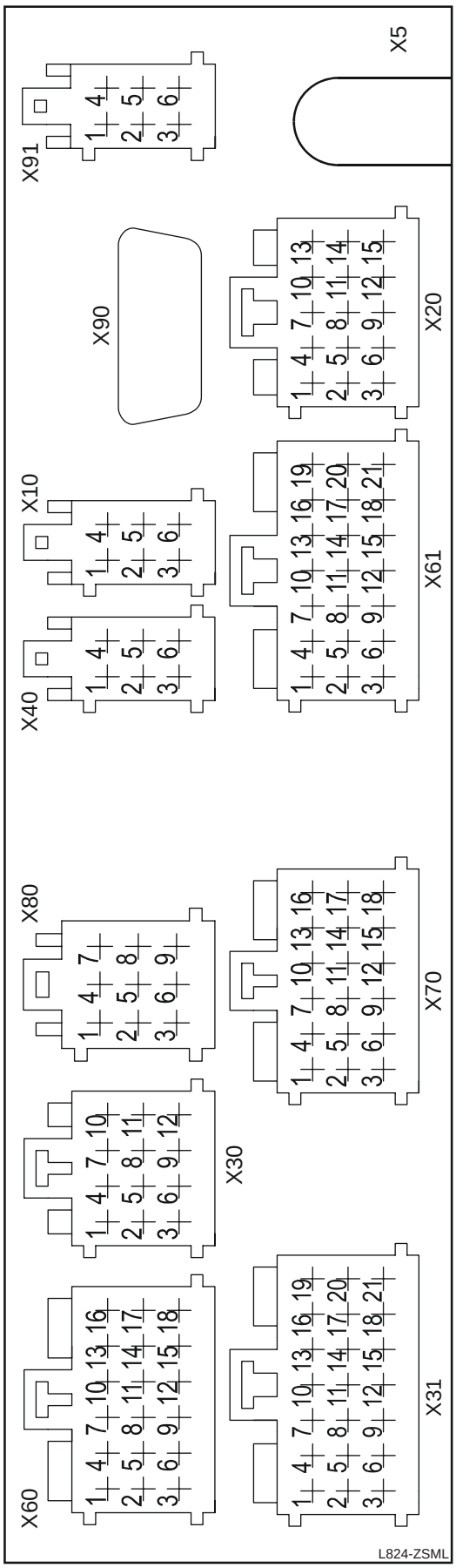
Central control unit (ZSML)



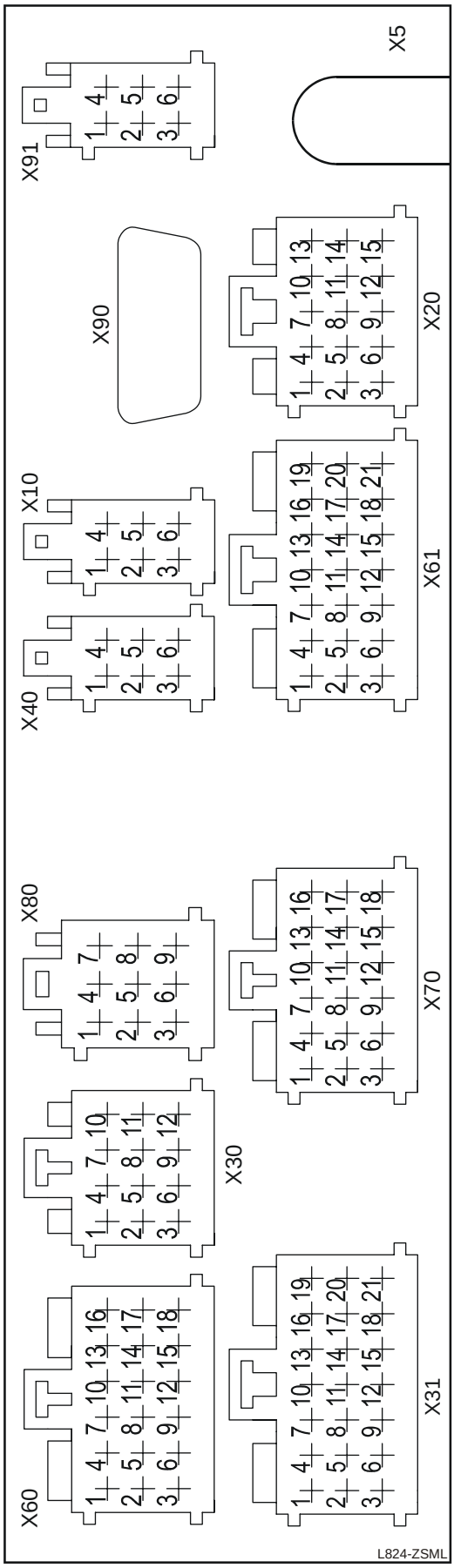
X60	***Signal inputs "engine monitoring"***
1	Power supply Terminal 15 output
2	Central ground Terminal 31
3	Charge control generator D+
4	Air filter maintenance switch signal
5	Oil pressure switch signal
6	Hydrostatic brake pressure switch signal
7	Transmission switch signal
8	Engine temperature sensor signal
9	Tank sensor signal
10	Hydraulic oil temperature sensor signal
11	Speed signal generator "W" signal
12	--
13	--
13	--
15	--
16	--
17	--
18	Speedometer signal sensor
X30	***Signal inputs "Lighting"***
1	Power supply Terminal 15 output
2	--
3	Parking light Terminal 15 input
4	High beam signal
5	Direction indicator control signal
6	Lifting frame high
7	Slew left
8	Slew right
9	Reference voltage 2.5V
10	Spare - Analog
11	Option
12	Spare - Analog
X80	***Coordinate lever***
1	Power supply Terminal 15 output
2	Central ground Terminal 31
3	Travel forward signal
4	Travel reverse signal
5	Float position signal
6	Additional control circuit signal
7	Additional control circuit signal
8	Slew left signal
9	Slew right signal



X40	***CAN-BUS (Option)***
1	Power supply Terminal 15 output
2	Central ground Terminal 31
3	CAN/HI
4	R1
5	R2
6	CAN/LO
X10	***Control panel***
1	--
2	Central ground Terminal 31
3	CAN/HI
4	--
5	--
6	CAN/LO
X90	***Programming connection***
X91	***Immobilizer (Option)***
1	Power supply Terminal 15 output
2	Central ground Terminal 31
3	***TXD***
4	RXD
5	CTS
6	RTS



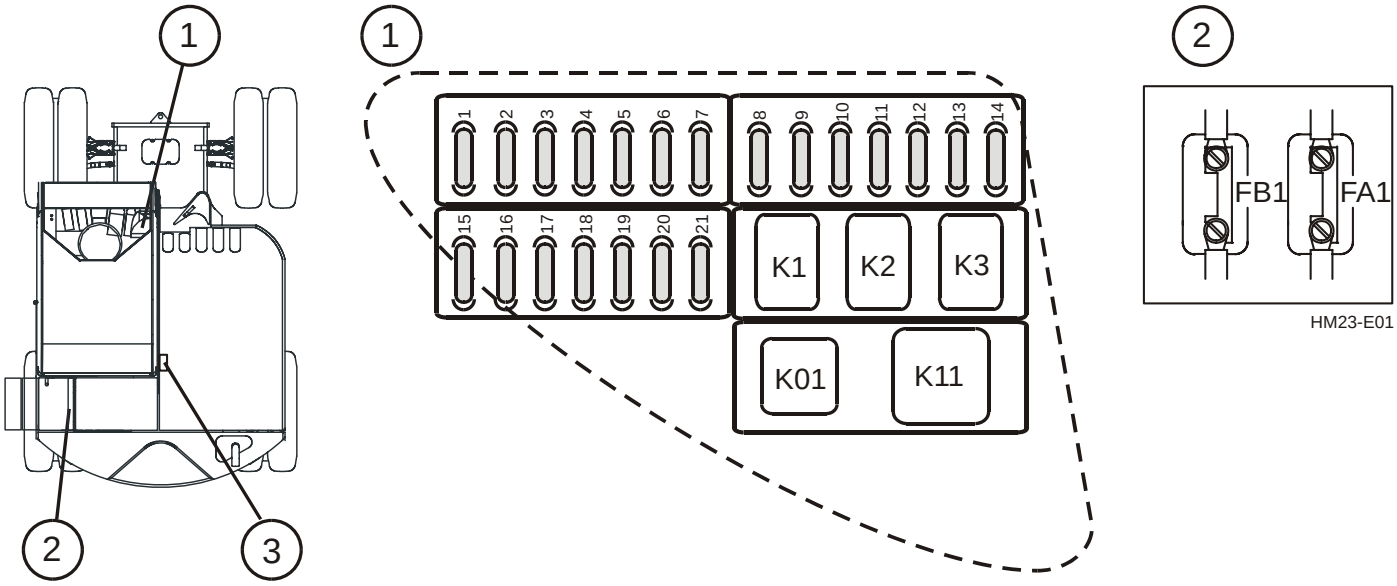
X31	***Control unit power supply, working floodlights, rotating beacon, wiper***
1	--
2	-
3	Spare digital output
4	Relay K11:87a N.C. contact output
5	Cut off lifting frame lower
6	Spare digital output
7	Swing axle lock
8	Relay K12 power supply Terminal 15 input
9	Relay K12:87a N.C. contact Output
10	Power supply Terminal 15 input working floodlight front
11	Relay K11 power supply Terminal 15 input
12	Option 4th control circuit proportional regulated output signal 1
13	Power supply Terminal 15 input working floodlight rear
14	Option 4th control circuit proportional regulated output signal 2
15	Slew left (PWM) output
16	Power supply Terminal 30 input rotating beacon
17	Spare Digital output
18	Slew right (PWM) output
19	Power supply Terminal 15 input wash/ wipe rear
20	Power supply Terminal 15 input travel
21	Power supply Terminal 15 input wash/ wipe rear
X70	***Working floodlights , Wipers***
1	Brake light switch Terminal 15 output
2	--
3	Working floodlight front output
4	Working floodlight rear output
5	Rotating beacon output
6	Wiper Terminal 53b 2nd setting output
7	Washer pump front output
8	Front wiper Terminal 31b output
9	Interior lamp Terminal 30 output
10	Front wiper Terminal 53 output
11	Front wiper Terminal 53a output
12	Parking brake switch signal input
13	Rear washer pump output
14	Rear wiper Terminal 53a output
15	--
16	Rear wiper Terminal 31b output
17	Rear wiper Terminal output
18	Brake light switch signal input



X61	***X61*** new from 634/0118	***Rear carriage***
1	1	--
2	2	--
3	3	Starting Terminal 50a output
4	4	Pre-heat output
5	5	Engine shutdown output
6	6	Brake light output
7	7	Travel, direction recognition output
8	8	Travel, FAST-SLOW output
9	9	Transmission 1 output
10	21	Travel forward output
11	11	Transmission 2 output
12	12	Working hydraulics output
13	16	Travel reverse output
14	15	Back-up lamp output
15	10	Travel motion alarm output
16	14	Ride control system 3 output
17	17	Float position output
18	18	Additional control circuit output
19	19	Additional control circuit output
20	20	Ride control system 1,2 output
21	13	Fog lamp Output
X20		***Panel, right***
1		Power supply Terminal 15 output
2		--
3		Starting Terminal 50a signal
4		Pre-heat signal
5		Engine shutdown signal
6		Ride control system signal
7		Additional control circuit signal
8		Additional control circuit signal
9		Float position 1 signal
10		Float position 2 signal
11		Option return to dig signal 1
12		Option return to dig signal 2
13		Rotating beacon signal
14		Working floodlight front signal
15		Working floodlight rear Signal
X5		***Power supply***

Electrical system

Fuse and relay box - Assignment diagram



1 = Instrument panel 2 = Service ladder 3 = Starter box in engine compartment

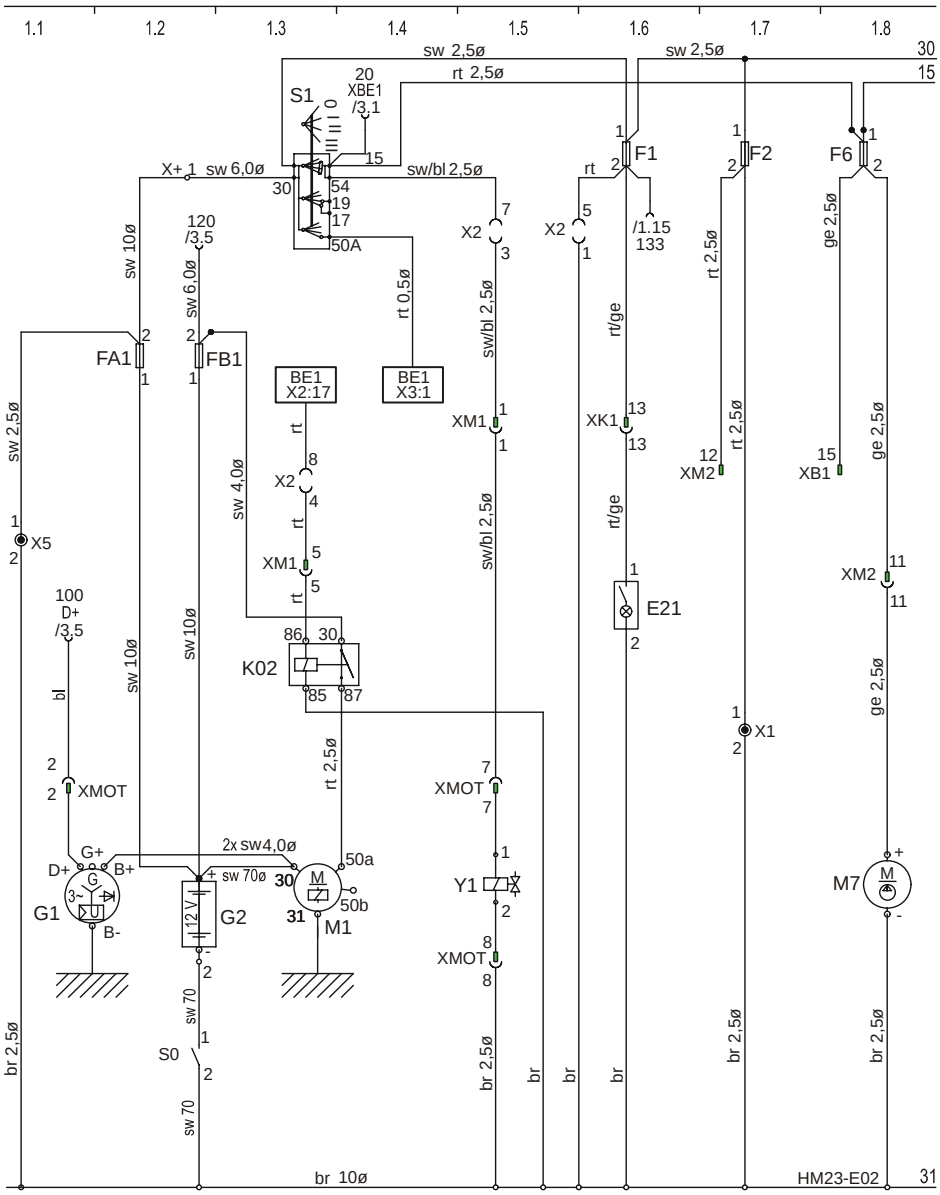
Fuses		
Location	**Ampere**	**assigned with**
F1	10	Interior light, radio, immobilizer
F2	20	Socket, additional heating (option)
F3	10	Hazard lamp, headlamp flasher, rotating beacon
F4	15	Working floodlight, front
F5	15	Working floodlight, rear
F6	15	Refueling pump, electrical seat heating (option)
F7	10	Horn, switch lighting, immobilizer
F8	15	Heater fan
F9	10	Wiper and washer system, radio
F10	5	Hydr. oil level, overload warning, rock breaker, additional control circuit
F11	5	Travel, parking brake, brake light switch
F12	5	Working hydraulics
F13	10	Brake light
F14	10	Hazard lamp
F15	15	High beam

Fuses		
Location	**Ampere**	**assigned with**
F16	15	Low beam
F17	10	Side marker lamp, left
F18	10	Side marker lamp, right
F19	10	Additional module
F20	10	All-wheel steering (option)
F21	10	(Option)
FA1	40	Main fuse
FB1	50	Pre-heating

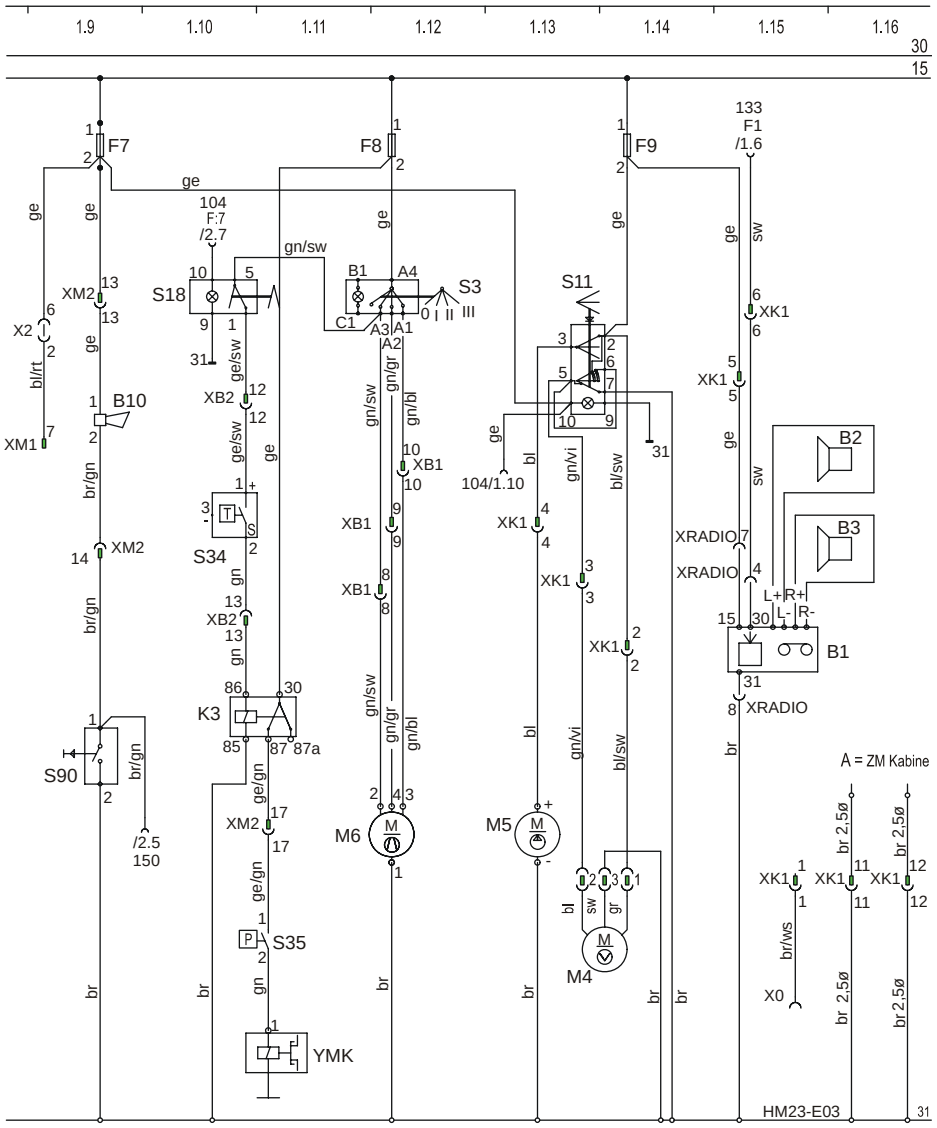
Colors of fuses			
5A	brown	10A	red
15A	blue	20A	yellow

Relays	
Position	**Function**
K 01	Pre-heating relay
K 02	Start-up relay (in starter box)
K 1	Working floodlight, front
K 2	Working floodlight, rear
K 3	not assigned (air conditioning — option)
K11	Directional indicator

Power supply	Start-up system	Shut-off	Interior light, socket	Refueling pump

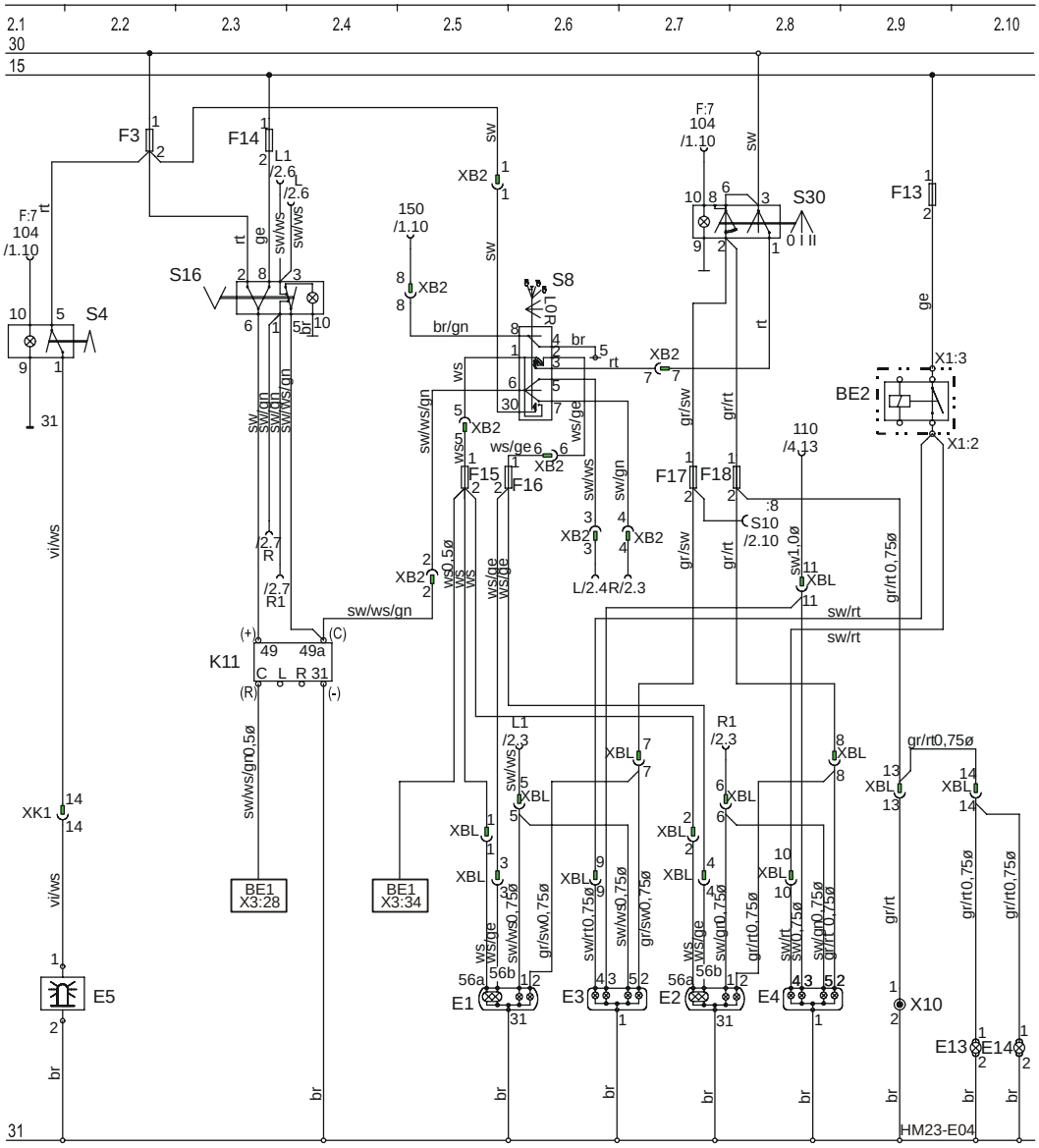


Path	Code	Device	Path	Code	Device
		Power supply			***Shut-off***
1.1	X5	Service ladder socket	1.5	Y1	Shut-off valve
1.2	G1	Generator			
1.2	FA 1	Fuse			***Interior light, socket***
1.2	FB 1	Fuse	1.6	F1	Fuse
1.2	G2	Battery	1.6	E21	Interior light
1.2	SO	Battery disconnect switch	1.7	F2	Fuse
		Start-up system	1.7	X1	Instrument panel socket
1.3	S1	Glow plug and starter switch			
1.3	M1	Starter			***Refueling pump***
1.3	K02	Start-up relay	1.8	F6	Fuse
			1.8	M7	Refueling pump



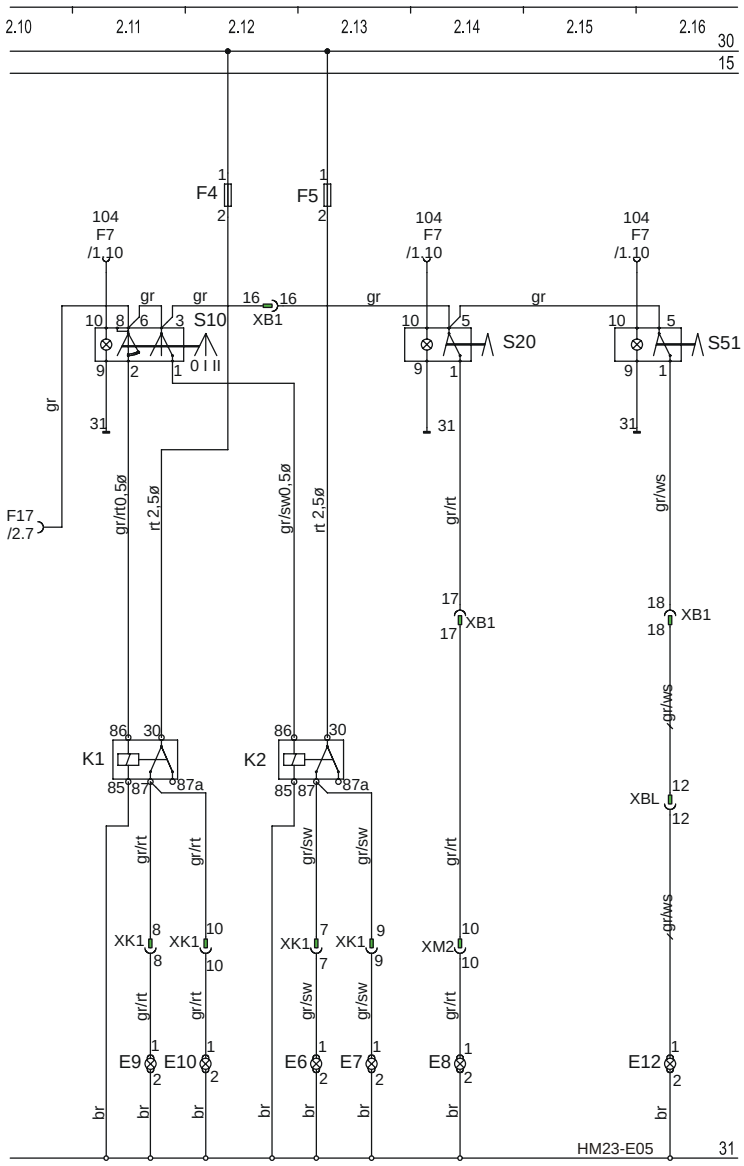
Path	Code	Device	Path	Code	Device
		Horn			***Wiper and washer system***
1.9	F7	Fuse	1.13	M5	Washer pump
1.9	B10	Horn	1.13	S11	Wipe/wash switch
1.9	S90	Coordinate lever horn button	1.13	F9	Fuse
		Heater fan, air conditioning	1.13	M4	Wiper motor
1.10	S18	Air conditioning switch			***Radio***
1.10	S34	Air conditioning temperature switch	1.15	B1	Radio
1.10	K3	Relay	1.16	B2	Loudspeaker
1.10	S35	Air conditioning pressure switch	1.16	B3	Loudspeaker
1.10	YMK	Compress. magnetic coupling			
1.11	F8	Fuse	1.16	A	Central mass, cab
1.12	S3	Heater fan switch			

Rotating beacon	Lighting system



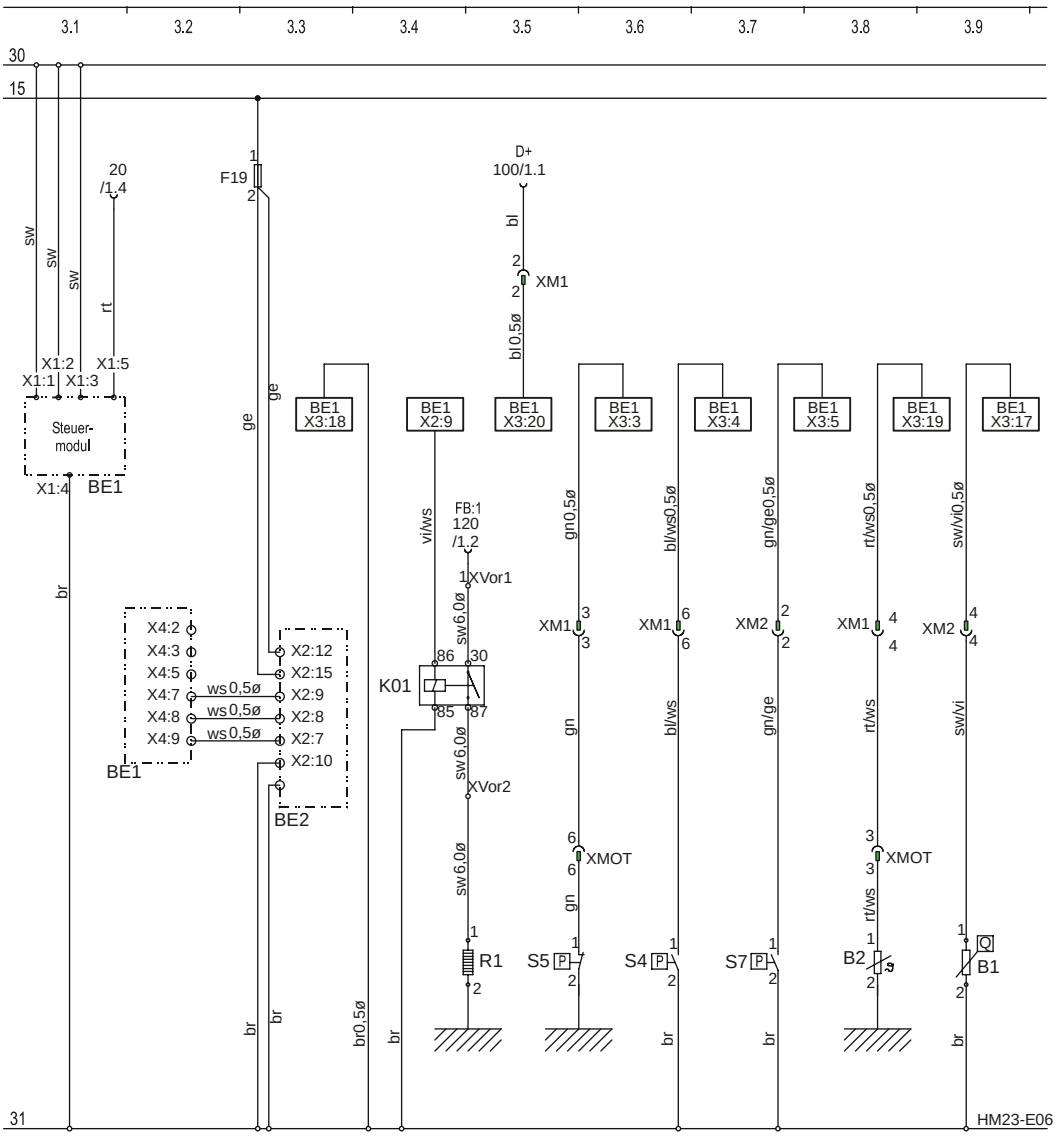
Path	Code	Device	Path	Code	Device
		Rotating beacon	2.5	E1	Headlamp, left
2.1	S4	Rotating beacon switch	2.6	E3	Tail lamp, left
2.2	E5	Rotating beacon	2.7	E2	Headlamp, right
2.2	F3	Fuse	2.7	F17	Fuse
		Lighting system	2.8	S30	Light switch
2.3	F14	Fuse	2.8	F18	Fuse
2.3	S16	Hazard warning switch	2.8	E4	Tail lamp, right
2.3	K11	Directional indicator	2.9	F13	Fuse
2.5	F15	Fuse	2.9	BE2	Additional module
2.5	F16	Fuse	2.9	X10	Side marker lamp socket
2.6	S8	Steering column switch	2.10	E13	License-plate illumination
			2.10	E14	License-plate illumination

Working floodlights	Rear fog lamp

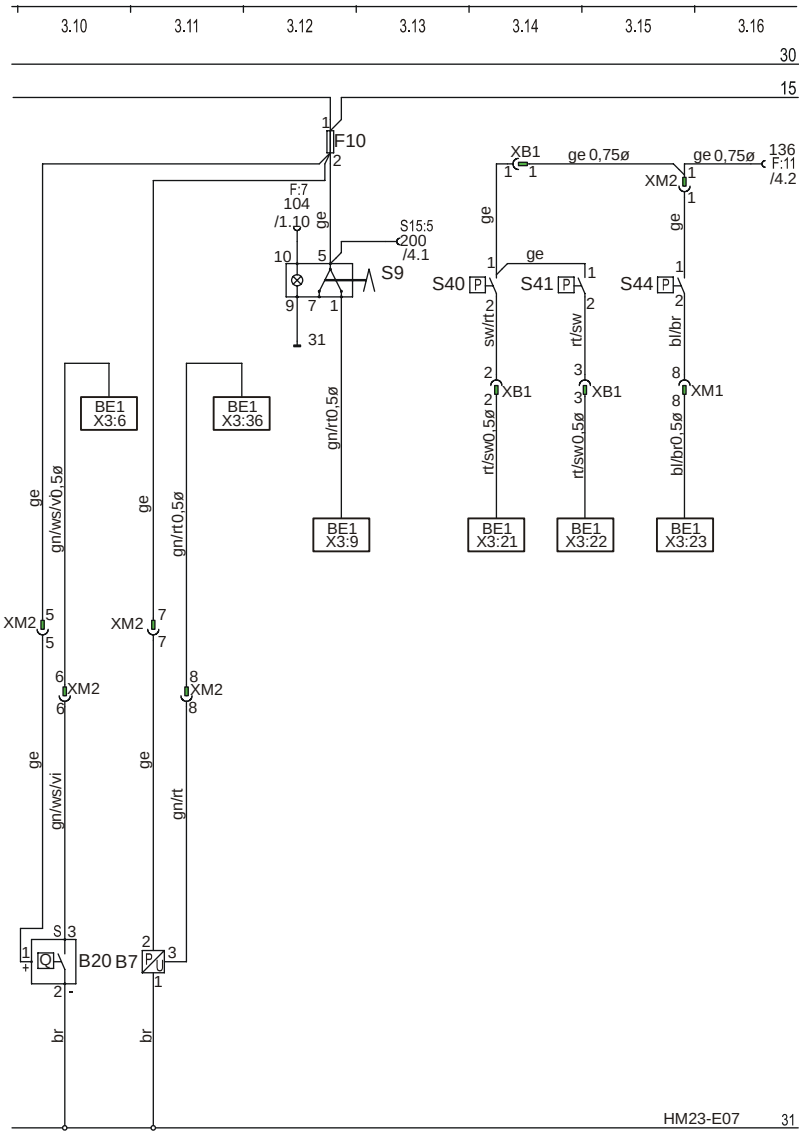


Path	Code	Device	Path	Code	Device
		Working floodlights	2.13	E7	Working floodlight, rear
2.10	S10	Switch for working floodlights, front & rear	2.14	S20	Switch for boom-mounted working floodlight
2.11	K1	Relay for front floodlight	2.14	E8	Boom-mounted working floodlight
2.11	E9	Working floodlight, front			***Rear fog lamp***
2.12	E10	Working floodlight, front	2.16	S51	Rear fog lamp switch
2.12	F4	Fuse	2.16	E12	Rear fog lamp
2.13	F5	Fuse			
2.13	K2	Relay for rear floodlight			
2.13	E6	Working floodlight, rear			

Control module	Pre-heat system	Instruments, warning devices

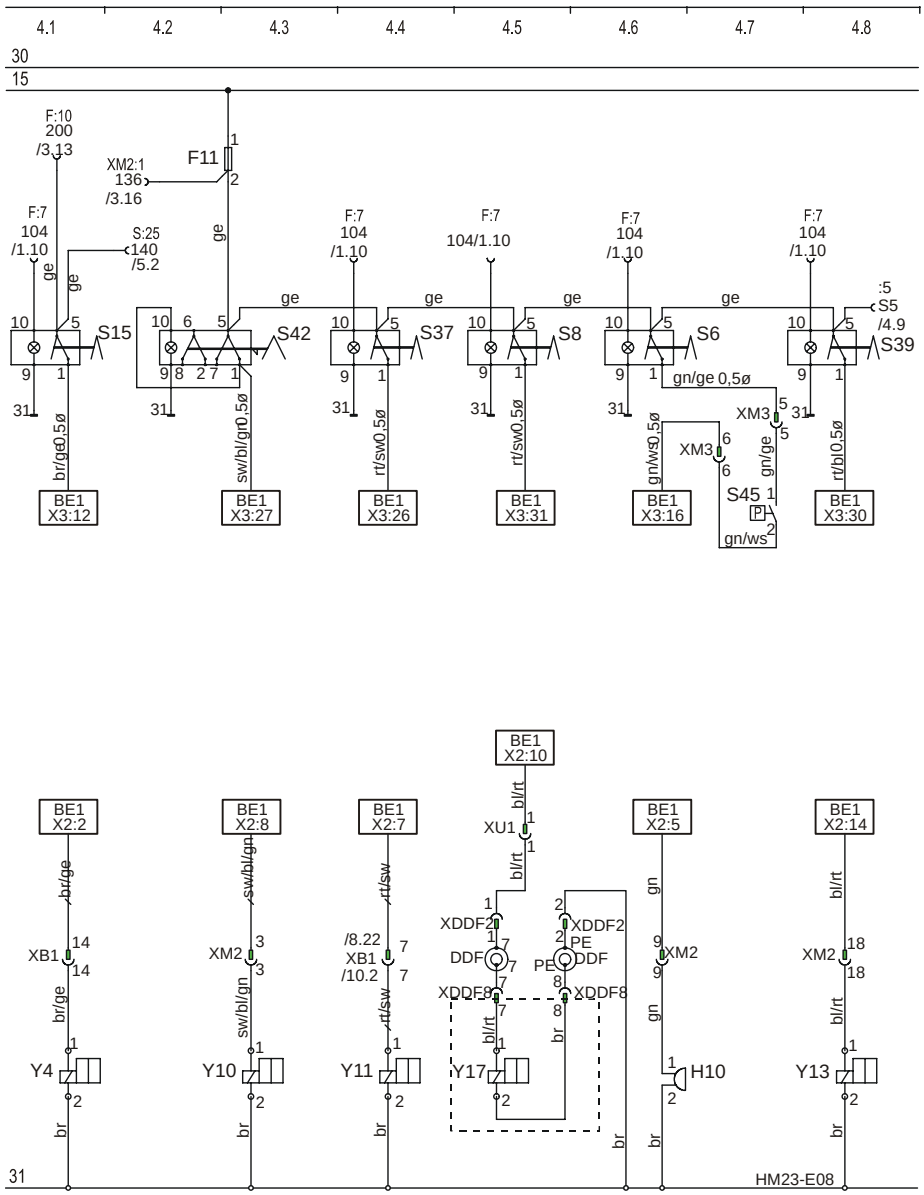


Path	Code	Device	Path	Code	Device
		Control module			**Instruments, warning devices**
3.1	BE1	Control module	3.5	S5	Oil pressure switch
3.3	F19	Fuse	3.6	S4	Air filter maintenance
3.3	BE2	Additional module	3.7	S7	Hydraulic oil filter maintenance
		Pre-heating	3.8	B2	Coolant temperature
3.4	K01	Pre-heat relay	3.9	B1	Fuel-level sensor
3.4	R1	Glow plugs			



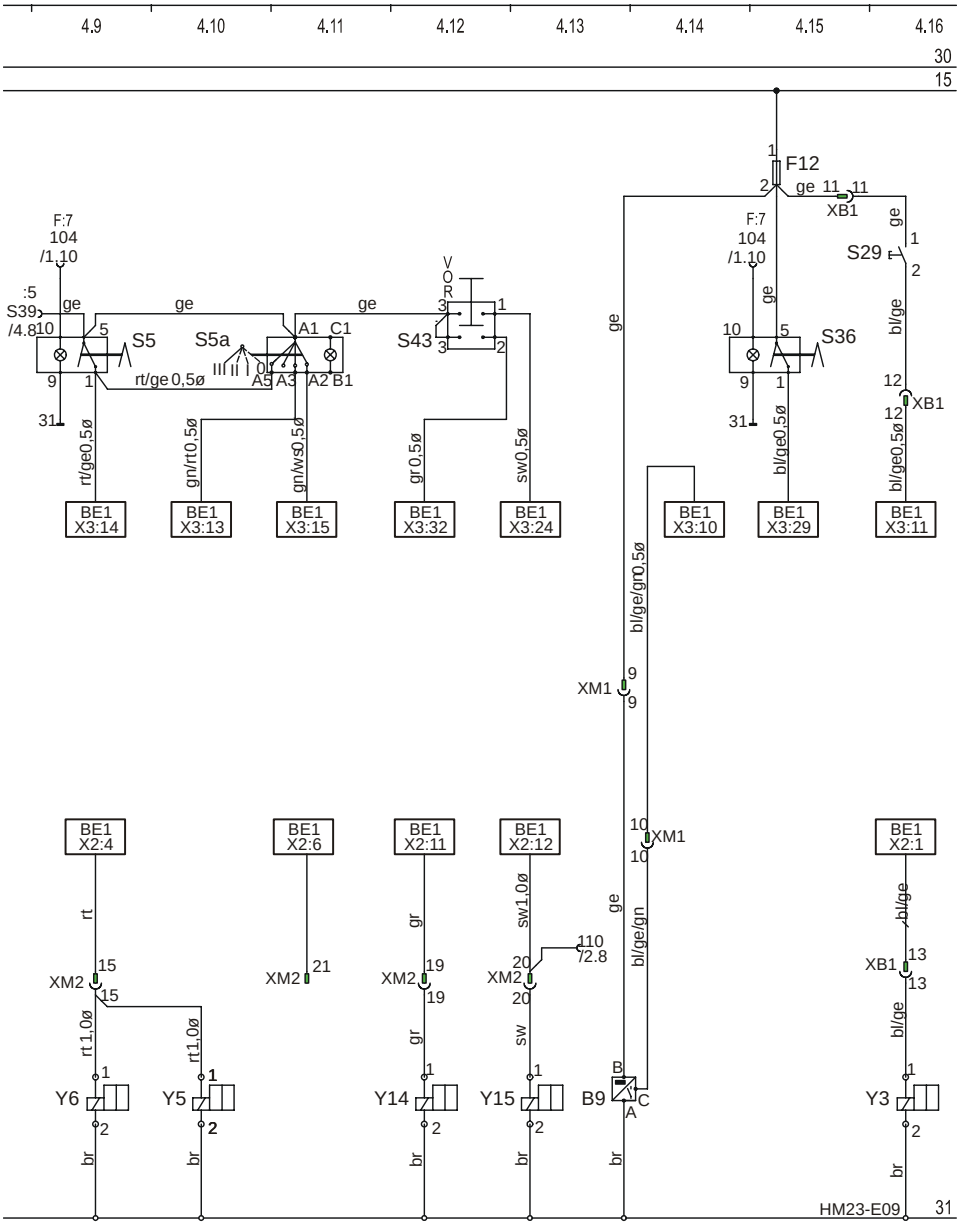
Path	Code	Device	Path	Code	Device
		Instruments, warning devices			***Hydraulic functions***
3.10	B20	Hydraulic oil level	3.14	S40	Brake light pressure switch
		Overload warning device	3.15	S41	Axle lock pressure switch
3.11	B7	Overload warning signal sensor	3.15	S44	Accumulator pressure
3.12	F10	Fuse			
3.12	S9	Overload warning switch			

Hydraulic functions	Travel drive



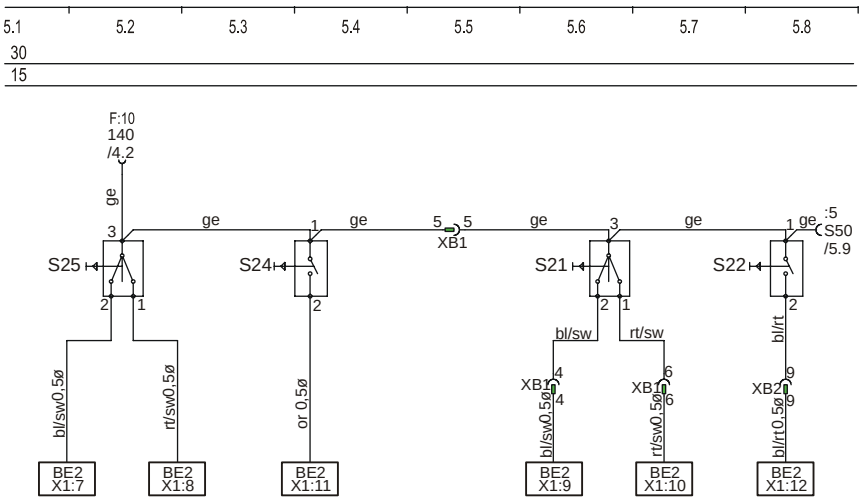
Path	Code	Device	Path	Code	Device
		Hydraulic functions	4.5	DDF	Swivel joint
4.1	S15	Rock breaker switch	4.5	Y17	Front dozer blade valve
4.1	Y4	Rock breaker valve	4.6	S6	Travel motion alarm switch
4.2	F11	Fuse	4.6	H10	Travel motion alarm horn
4.2	S42	Parking brake switch	4.7	S45	Travel motion alarm pressure switch
4.3	Y10	Parking brake valve	4.8	S39	Accelerator pedal switch
4.4	S37	Axle lock switch	4.8	Y13	Accelerator pedal valve
4.4	Y11	Axle lock valve			
4.5	S8	Front dozer blade switch			

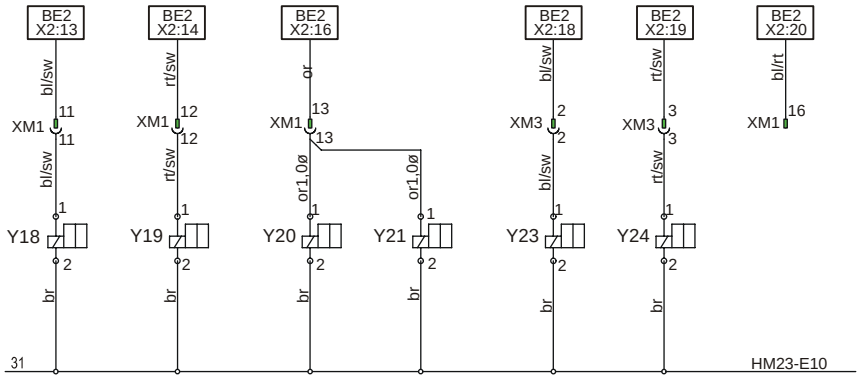
Travel drive	Working hydraulics cut-off



Path	Code	Device	Path	Code	Device
		Travel drive			***Working hydraulics cut-off***
4.9	S5	Switch FAST-SLOW	4.14	B9	Service ladder proximity switch
4.9	Y6	"FAST" valve	4.15	F12	Fuse
4.11	S5a	All-wheel steering switch	4.15	S36	Working hydraulics cut-off
4.10	Y5	"FAST" valve	4.16	S29	Armrest switch
4.12	Y14	Valve for travel, forward	4.16	Y3	Working hydraulics valve
4.12	S43	"Forward/Reverse" switch			
4.13	Y15	Valve for travel, reverse			

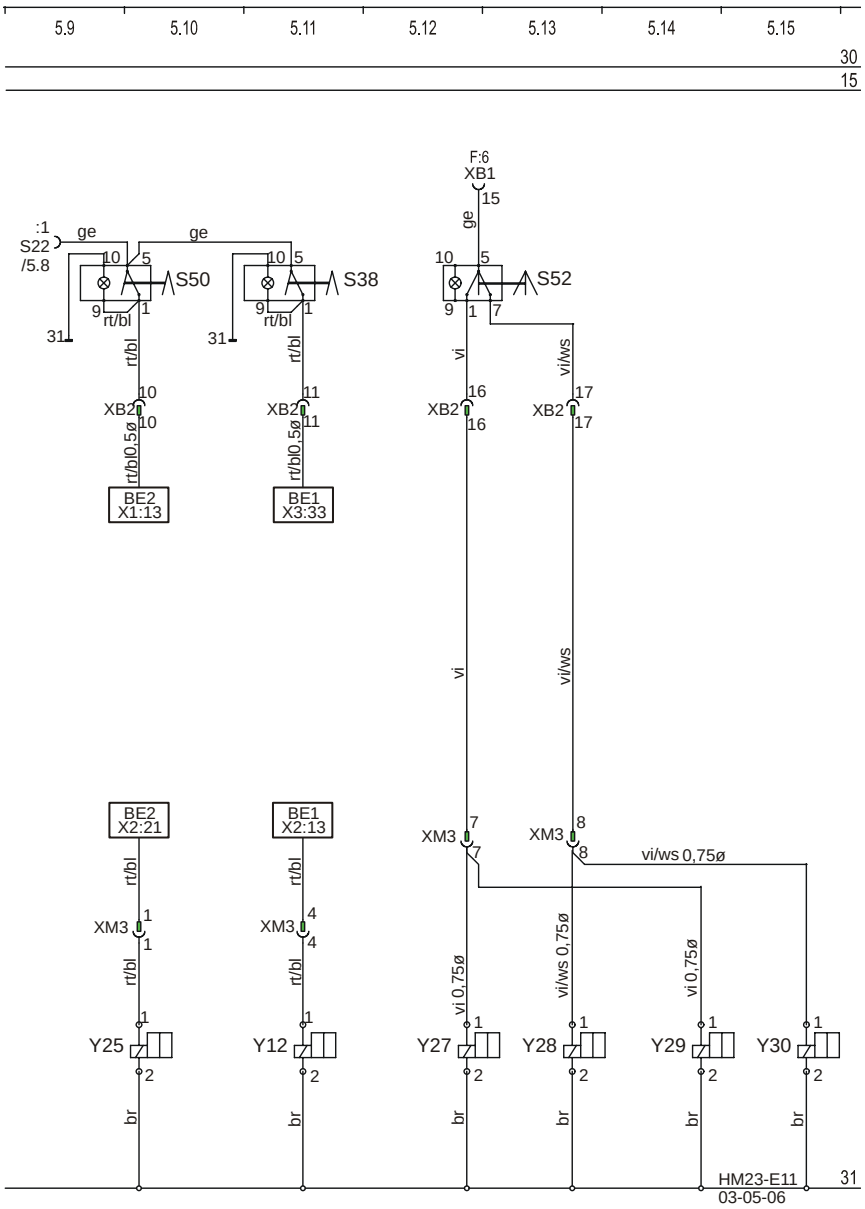
Coordinate lever, right	Coordinate lever, left





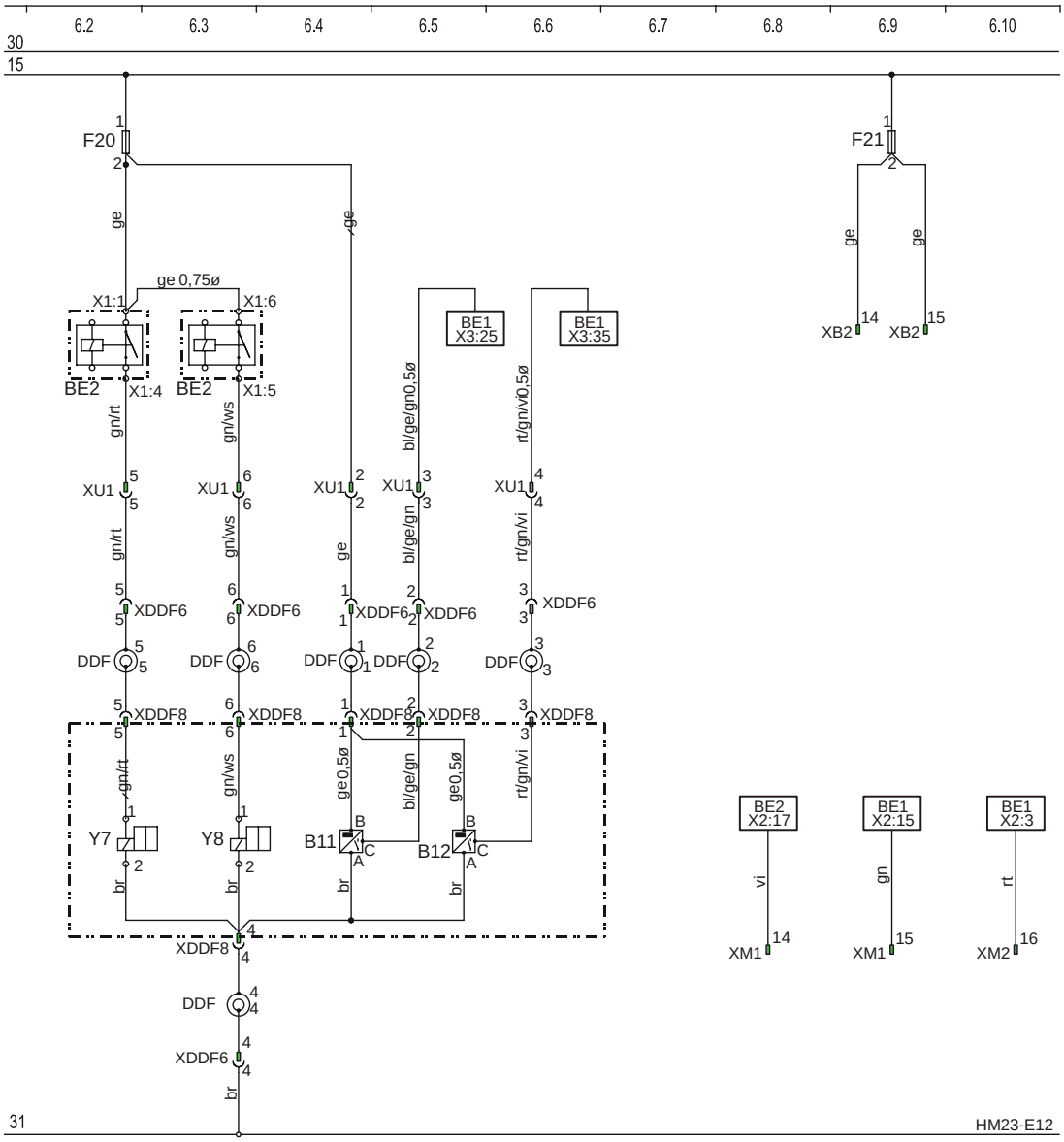
Path	Code	Device	Path	Code	Device
		Coordinate lever, right			***Coordinate lever, left***
5.2	S25	Push-button for additional control circuit 1	5.6	S21	Push-button for additional control circuit 2
5.1	Y18	Valve for additional control circuit 1	5.6	Y23	Valve for additional control circuit 2
5.2	Y19	Valve for additional control circuit 1	5.7	Y24	Valve for additional control circuit 2
5.4	S24	Articulation changeover switch	5.8	S22	Push-button swing brake
5.4	Y20	Valve for articulation	5.8	Y22	Valve swing brake
5.5	Y21	Valve for articulation			

Armrest, left	Individual pads for machine support



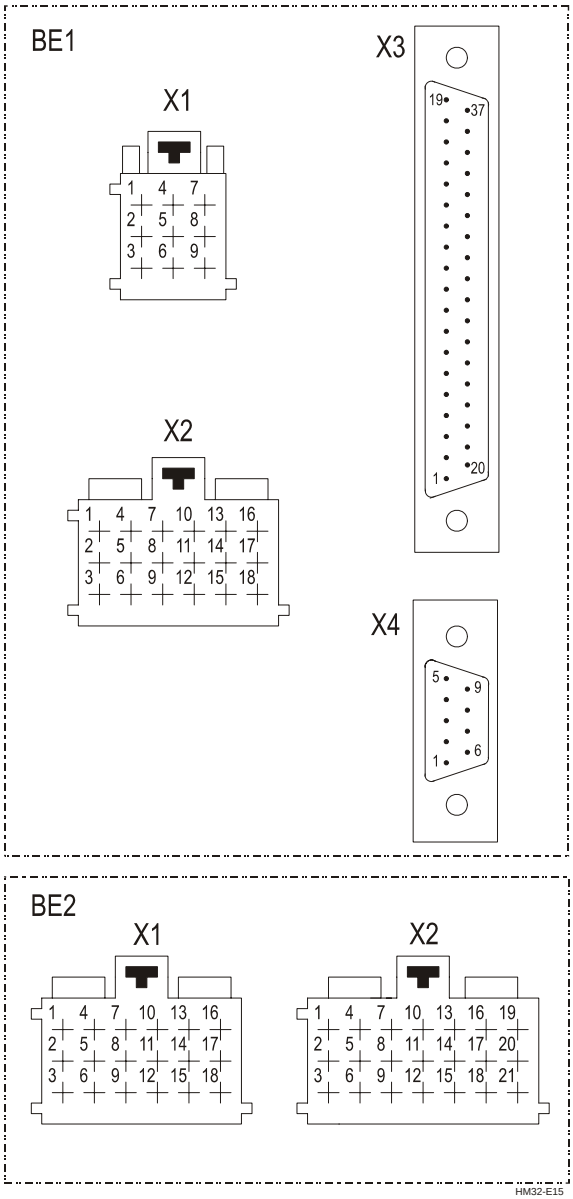
Path	Code	Device	Path	Code	Device
		Armrest, left			***Individual pads for machine support***
5.9	S50	Bucket changeover switch	5.12	S52	Switch for support
5.10	Y25	Bucket changeover valve	5.12	Y27	Support, left
5.11	S38	Steering changeover switch	5.13	Y28	Support, left
5.11	Y12	Steering changeover valve	5.15	Y29	Support, right
			5.15	Y30	Support, right

All-wheel steering of undercarriage	Option



Path	Code	Device	Path	Code	Device
		All-wheel steering of undercarriage	6.4	B11	Front axle proximity switch
6.2	F20	Fuse	6.5	B12	Rear axle proximity switch
6.2	BE2	Additional module			**Option**
6.2	DDF	Swivel joint	6.9	F21	Fuse
6.2	Y7	Valve "round"/"crab" (steering)			
6.3	Y8	Valve "round"/"crab" (steering)			

Control module BE1



X1	***Power supply***
1	Power supply Terminal 30
2	Power supply Terminal 30
3	Power supply Terminal 30
4	Central mass
5	Power supply Terminal 15
6	--
7	--
8	--
9	--
X2	***Signal outputs***
1	Working hydraulics
2	Rock breaker
3	--
4	FAST
5	Travel motion alarm
6	--
7	Axle lock
8	Parking brake
9	Pre-heating
10	Front dozer blade
11	Travel, forward
12	Travel, reverse
13	Steering changeover
14	Accelerator pedal
15	--
16	--
17	Start-up solenoid switch Terminal 50A
18	--
X3	***Signal inputs***
1	Start-up ignition lock Terminal 50A
2	--
3	Oil pressure switch
4	Air filter clogging
5	Hydraulic oil filter clogging
6	Hydraulic oil float switch
7	--
8	--
9	Overload warning switch
10	Service ladder proximity switch
11	Armrest switch

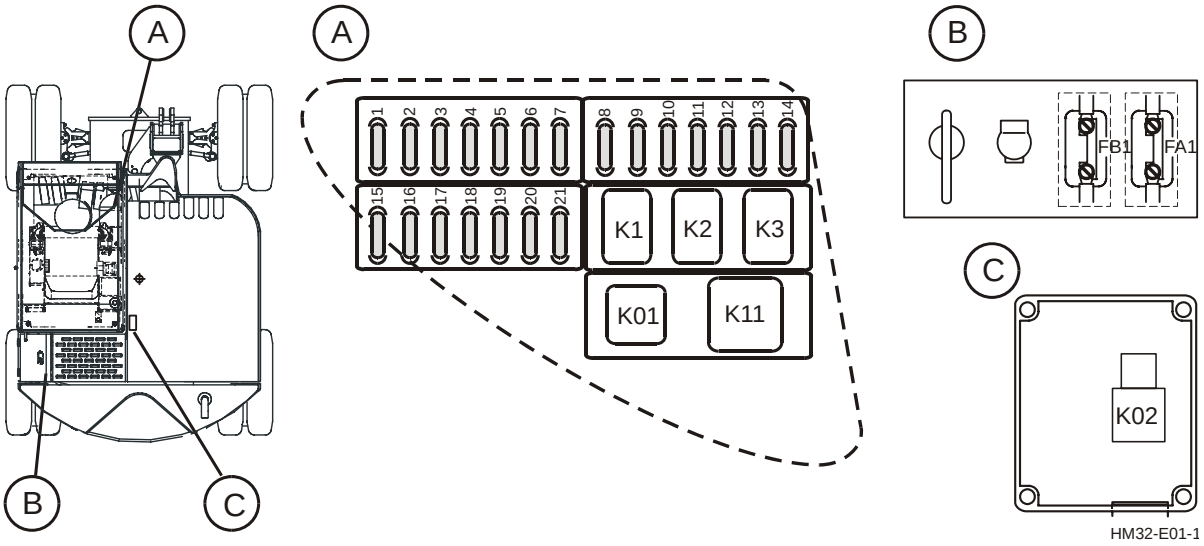
Additional module BE2

12	Rock breaker switch
13	All-wheel steering "crab"
14	FAST–SLOW switch
15	All-wheel steering, "round"
16	Travel motion alarm switch
17	Fuel-level sensor
18	Central mass
19	Coolant temperature
20	Charge control
21	Brake light signal
22	Axle lock signal
23	Accumulator pressure signal
24	Switch for travel, reverse
25	Front axle steering angle signal
26	Axle lock switch
27	Parking brake switch
28	Direction indicator lamp signal
29	Working hydraulics switch
30	Accelerator pedal switch
31	Front dozer blade switch
32	Switch for travel, forward
33	Steering changeover switch
34	High beam signal
35	Rear axle steering angle signal
36	Overload warning signal
37	--
X4	***Interface***
1	--
2	--
3	--
4	--
5	--
6	--
7	Connection additional module X2:9
8	Connection additional module X2:8
9	Connection additional module X2:7

X1	***Plug***
1	--
2	--
3	Power supply Terminal 15
4	--
5	--
6	--
7	Additional control circuit 1 push-button
8	Additional control circuit 1 push-button
9	Additional control circuit 2 push-button
10	Additional control circuit 2 push-button
11	Articulation changeover push-button
12	Swing brake push-button
13	Bucket changeover switch (option)
14	--
15	--
16	--
17	--
18	--
X2	***Plug***
1	--
2	--
3	--
4	--
5	--
6	--
7	Connection control module X4:9
8	Connection control module X4:8
9	Connection control module X4:7
10	Central mass
11	Central mass
12	Power supply Terminal 15
13	Valve additional control circuit 1
14	Valve additional control circuit 1
15	Power supply Terminal 15
16	Valve for articulation
17	--
18	Valve for additional control circuit 2
19	Valve for additional control circuit 2
20	Valve swing brake
21	Bucket changeover (option)

Electrical system

Fuse and relay box - Assignment diagram



1 = Instrument panel 2 = Service ladder 3 = Starter box

Fuses		
Position	**Ampere**	**assigned to**
F 1	10	Interior lamp, radio, immobilizer
F 2	20	Socket, additional heating (option)
F 3	10	Hazard flasher, headlamp flasher, rotating beacon
F 4	15	Working floodlight, front
F 5	15	Working floodlight, rear
F 6	15	Fuel-filling pump, electrical seat heating (option)
F 7	10	Horn, switch lighting, immobilizer
F 8	15	Heater fan
F 9	10	Wish-wash system, radio
F 10	5	Hydraulic oil level, overload warning, rock breaker, additional control circuit
F11	5	Travel, parking brake, brake light switch
F12	5	Working hydraulics
F13	10	Brake light
F14	10	Hazard flasher
F 15	15	High beam
F 16	15	Low beam

Fuses		
Position	**Ampere**	**assigned to**
F17	10	Side marker lamp, left
F18	10	Side marker lamp, right
F19	10	Additional module
F20	10	All-wheel steering
F21	10	--
FA1	40	Main fuse
FB1	40	Pre-heating

Colors of fuses			
5A	brown	10A	red
15A	blue	20A	yellow

Relays	
Position	**Function**
K 01	Pre-heating relay
K 02	Start-up relay
K 1	Working floodlight, front
K 2	Working floodlight, rear
K 3	not assigned (air conditioning — option)
K11	Turn-signal flasher

All voltages are measured between ground and the corresponding test point !!
Unless otherwise advised, the ignition has to be switched on !!

Charge indicator

generator D+	wire harness machine engine plug XMNT:2	wire harness machine disconnect XM1:2	input plug control module X3:20	warning lamp
blue	blue	blue	blue	
12V	12V	12V	12V	OFF

only with running engine

Oil pressure indicator

oil pressure switch S5	wire harness machine engine plug XMNT:6	wire harness machine disconnect XM1:3	input plug control module X3:3	warning lamp
green	green	green	green	
0V	0V	0V	0V	ON

Air filter indicator

maintenance switch air filter S4	wire harness machine disconnect XM1:6	input plug control module X3:4	warning lamp
blue / white	blue / white	blue / white	
0V	0V	0V	ON

Hydraulic oil filter indicator

maintenance switch hydraulic oil filter S7	wire harness machine disconnect XM2:2	input plug control module X3:5	warning lamp
green / yellow	green / yellow	green / yellow	
0V	0V	0V	ON

Hydraulic oil level

oil level transmitter B20	wire harness machine disconnect XM2:6	input plug control module X3:6	warning lamp
green / white / violet	green / white / violet	green / white / violet	
0V	0V	0V	ON

Accumulator charge pressure indicator

pressure switch S44	wire harness machine disconnect XM1:8	input plug control module X3:23	warning lamp
blue / brown	blue / brown	blue / brown	
12V	12V	12V	ON

Flasher indicator

flasher relay K11:C	input plug control module X3:28	warning lamp
black / white / green	black / white / green	
12V	12V	ON

All voltages are measured between ground and the corresponding test point !!
Unless otherwise advised, the ignition has to be switched on !!

High beam indicator

steering column switch S8:1	wire harness floor frame disconnect XB2:5	fuse F15:2	input plug control module X3:34	warning lamp
white	white	white	white	
12V	12V	12V	12V	ON

Starting safety

switch forward S43:2	input plug control module X3:32	switch reverse S43:1	input plug control module X3:24	pre-heat/ starter switch S1:50a	control module X3:1
grey	grey	black	black	red	red
0V	0V	0V	0V	12V	12V

only when key is in start position

output plug control module X2:17	wire harness machine disconnect XM1:5	starter box: relay K02:86	starter box: fuse F02:2	starter box: relay K02:30	starter box: relay K02:87	wire harness machine engine plug XMGE:1
red	red	red	red	red	red	red
12V	12V	12V	12V	12V	12V	12V

Fast/ slow

switch S5:1	input plug control module X3:14	output plug control module X2:4	wire harness machine disconnect XM2:15	valve Y6:1	output plug control module X2:3	wire harness machine disconnect XM2:16	valve Y5:1
red / yellow	red / yellow	red	red	red	red	red	red
12V	12V	12V	12V	12V	12V	12V	12V

Sensitive travel

switch S39:1	input plug control module X3:30	wire harness floor frame: armrest switch S29:2	wire harness floor frame disconnect XB1:12	input plug control module X3:11
red / blue	red / blue	blue / yellow	blue / yellow	blue / yellow
12V	12V	12V	12V	12V

output plug control module X2:14	wire harness machine disconnect XM2:18	valve Y13:1
blue / red	blue / red	blue / red
12V	12V	12V

Travel forward

switch forward S43:2	input plug control module X3:32	switch reverse S43:1	input plug control module X3:24	switch parking brake S42:1	input plug control module X3:27	wire harness machine pressure switch axle lock S41:2	wire harness floor frame disconnect XB1:3	input plug control module X3:22
grey	grey	black	black	black / blue / green	black / blue / green	red / black	red / black	red / black
12V	12V	0V	0V	0V	0V	0V	0V	0V

switch sensitive travel S39:1	input plug control module X3:30	wire harness floor frame: armrest switch S29:2	wire harness floor frame disconnect XB1:12	input plug control module X3:11	wire harness machine: proximity switch stairs B9:C	wire harness machine disconnect XM1:10	input plug control module X3:10
red / blue	red / blue	blue / yellow	blue / yellow	blue / yellow	blue / yellow / green	blue / yellow / green	blue / yellow / green
0V	0V	12V	12V	12V	12V	12V	12V

output plug control module X2:11	wire harness machine disconnect XM2:19	valve Y14:1	warning lamp
grey	grey	grey	
12V	12V	12V	ON

All voltages are measured between ground and the corresponding test point !!
Unless otherwise advised, the ignition has to be switched on !!

Travel reverse

switch forward S43:2	input plug control module X3:32	switch reverse S43:1	input plug control module X3:24	switch parking brake S42:1	input plug control module X3:27	wire harness machine pressure switch axle lock S41:2	wire harness floor frame disconnect XB1:3	input plug control module X3:22
grey	grey	black	black	black / blue / green	black / blue / green	red / black	red / black	red / black
0V	0V	12V	12V	0V	0V	0V	0V	0V

switch sensitive travel S39:1	input plug control module X3:30	wire harness floor frame: armrest switch S29:2	wire harness floor frame disconnect XB1:12	input plug control module X3:11	wire harness machine: proximity switch stairs B9:C	wire harness machine disconnect XM1:10	input plug control module X3:10
red / blue	red / blue	blue / yellow	blue / yellow	blue / yellow	blue / yellow / green	blue / yellow / green	blue / yellow / green
0V	0V	12V	12V	12V	12V	12V	12V

output plug control module X2:12	wire harness machine disconnect XM2:20	valve Y15:1	warning lamp
black	black	black	
12V	12V	12V	ON

Flushing

wire harness machine pressure switch axle lock S41:2	wire harness floor frame disconnect XB1:3	input plug control module X3:22
red / black	red / black	red / black
12V	12V	12V

output plug control module X2:6	wire harness machine disconnect XM2:21	valve Y16:1
black / white	black / white	black / white
12V	12V	12V

Parking brake

switch S42:1	input plug control module X3:27	output plug control module X2:8	wire harness machine disconnect XM2:3	valve Y10:1	warning lamp
black / blue / green	black / blue / green	black / blue / green	black / blue / green	black / blue / green	
12V	12V	0V	0V	0V	ON

Stop light

wire harness floor frame pressure switch stop light S40:2	wire harness floor frame disconnect XB1:2	input plug control module X3:21
black / red	black / red	black / red
12V	12V	12V

when pressure switch excavator brake is actuated
switches off stop light automatically after approx. 1 minute

add. module plug X1:2	wire harness floor frame disconnect XBL:9	plug left-hand rear light pin 4	wire harness floor frame disconnect XBL:10	plug right-hand rear light pin 4
black / red	black / red	black / red	black / red	black / red
12V	12V	12V	12V	12V

All voltages are measured between ground and the corresponding test point !!
Unless otherwise advised, the ignition has to be switched on !!

Steering inversion

switch steering inversion S38:1	input plug control module X3:33
red / blue	red / blue
12V	12V

output plug control module X2:13	additional wire harness XU1:1	valve Y12:1
red / blue	red / blue	red / blue
12V	12V	12V

Oscillating axle lock

wire harness floor frame pressure switch excavator brake S41:2	wire harness floor frame disconnect XB1:3	input plug control module X3:22
red / black	red / black	red / black
12V	12V	12V

output plug control module X2:7	wire harness floor frame disconnect XB1:7	valve Y11:1
red / black	red / black	red / black
0V	0V	0V

switch oscillating axle lock S37:1	input plug control module X3:26
red / black	red / black
12V	12V

output plug control module X2:7	wire harness floor frame disconnect XB1:7	valve Y11:1
red / black	red / black	red / black
0V	0V	0V

Working hydraulics

switch working hydraulics S36:1	input plug control module X3:29	wire harness floor frame: armrest switch S29:2	wire harness floor frame disconnect XB1:12	input plug control module X3:11	wire harness machine: proximity switch stairs B9:C	wire harness machine disconnect XM1:10	input plug control module X3:10
blue / yellow	blue / yellow	blue / yellow	blue / yellow	blue / yellow	blue / yellow / green	blue / yellow / green	blue / yellow / green
12V	12V	12V	12V	12V	12V	12V	12V

output plug control module X2:1	wire harness floor frame disconnect XB1:13	valve Y3:1
blue / yellow	blue / yellow	blue / yellow
12V	12V	12V

Front dozer blade

switch front dozer blade S8:1	input plug control module X3:31
red / black	red / black
12V	12V

output plug control module X2:10	wire harness machine disconnect XM2:22	valve Y17:1
blue / red	blue / red	blue / red
12V	12V	12V

All voltages are measured between ground and the corresponding test point !!
Unless otherwise advised, the ignition has to be switched on !!

Breaker

switch breaker operation S15:1	input plug control module X3:12	pushbutton right-hand joystick S25:2	input plug additional module X1:7
brown / yellow	brown / yellow	blue / black	blue / black
12V	12V	12V	12V

output plug additional module X2:2	wire harness floor frame disconnect XB1:14	valve Y4:1
brown / yellow	brown / yellow	brown / yellow
12V	12V	12V

switch breaker operation S15:1	input plug control module X3:12	pushbutton right-hand joystick S25:1	input plug additional module X1:8
brown / yellow	brown / yellow	red / black	red / black
12V	12V	12V	12V

output plug additional module X2:2	wire harness floor frame disconnect XB1:14	valve Y4:1
brown / yellow	brown / yellow	brown / yellow
12V	12V	12V

Swing brake

pushbutton left-hand joystick S22:2	wire harness floor frame disconnect XB2:9	input plug additional module X1:12	output plug additional module X2:20	wire harness machine disconnect XM1:16	valve Y22:1
blue / red	blue / red	blue / red	blue / red	blue / red	blue / red
12V	12V	12V	12V	12V	12V

Articulation

pushbutton right-hand joystick S24:2	input plug add. module X1:11	output plug add. module X2:16	wire harness machine disconnect XM1:13	valve Y20:1	output plug add. module X2:17	wire harness machine disconnect XM1:14	valve Y21:1	
orange	orange	orange	orange	orange	violet	violet	violet	
12V	12V	12V	12V	12V	12V	12V	12V	

Additional control circuit I

switch breaker operation S15:1	input plug control module X3:12	pushbutton right-hand joystick S25:2	input plug add. module X1:7
brown / yellow	brown / yellow	blue / black	blue / black
0V	0V	12V	12V

output plug add. module X2:13	wire harness machine disconnect XM1:11	valve Y18:1
blue / black	blue / black	blue / black
12V	12V	12V

switch breaker operation S15:1	input plug control module X3:12	pushbutton right-hand joystick S25:1	input plug add. module X1:8
brown / yellow	brown / yellow	red / black	red / black
0V	0V	12V	12V

output plug add. module X2:14	wire harness machine disconnect XM1:12	valve Y19:1
red / black	red / black	red / black
12V	12V	12V

Additional control circuit II

pushbutton left-hand joystick S21:2	wire harness floor frame disconnect XB1:4	input plug add. module X1:9
blue / black	blue / black	blue / black
12V	12V	12V

output plug add. module X2:18	wire harness machine disconnect XM3:2	valve Y23:1
blue / black	blue / black	blue / black
12V	12V	12V

pushbutton left-hand joystick S21:1	wire harness floor frame disconnect XB1:6	input plug add. module X1:10
red / black	red / black	red / black
12V	12V	12V

output plug add. module X2:19	wire harness machine disconnect XM3:3	valve Y24:1
red / black	red / black	red / black
12V	12V	12V

Service Conditions Warning Buzzer

During Operation:

Warning signal active at the presence of:

- Cooling agent max.
- Fuel level at min.
- Load warning signal given

Engine Off:

Warning signal active at the absence of:

- Hydraulic oil level

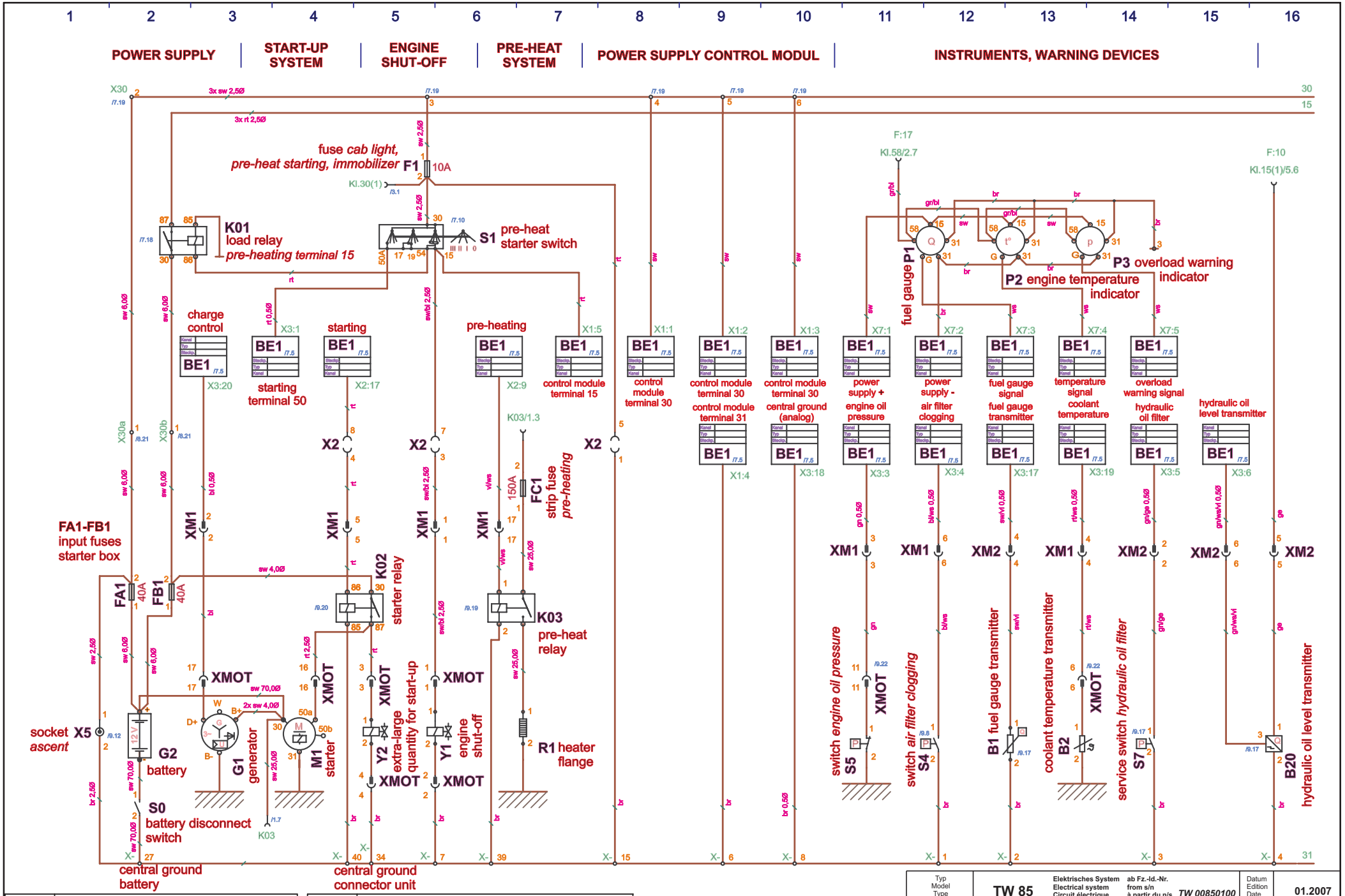
Engine at Idle:

Warning signal active at the absence of:

- Engine oil pressure
- Battery charge

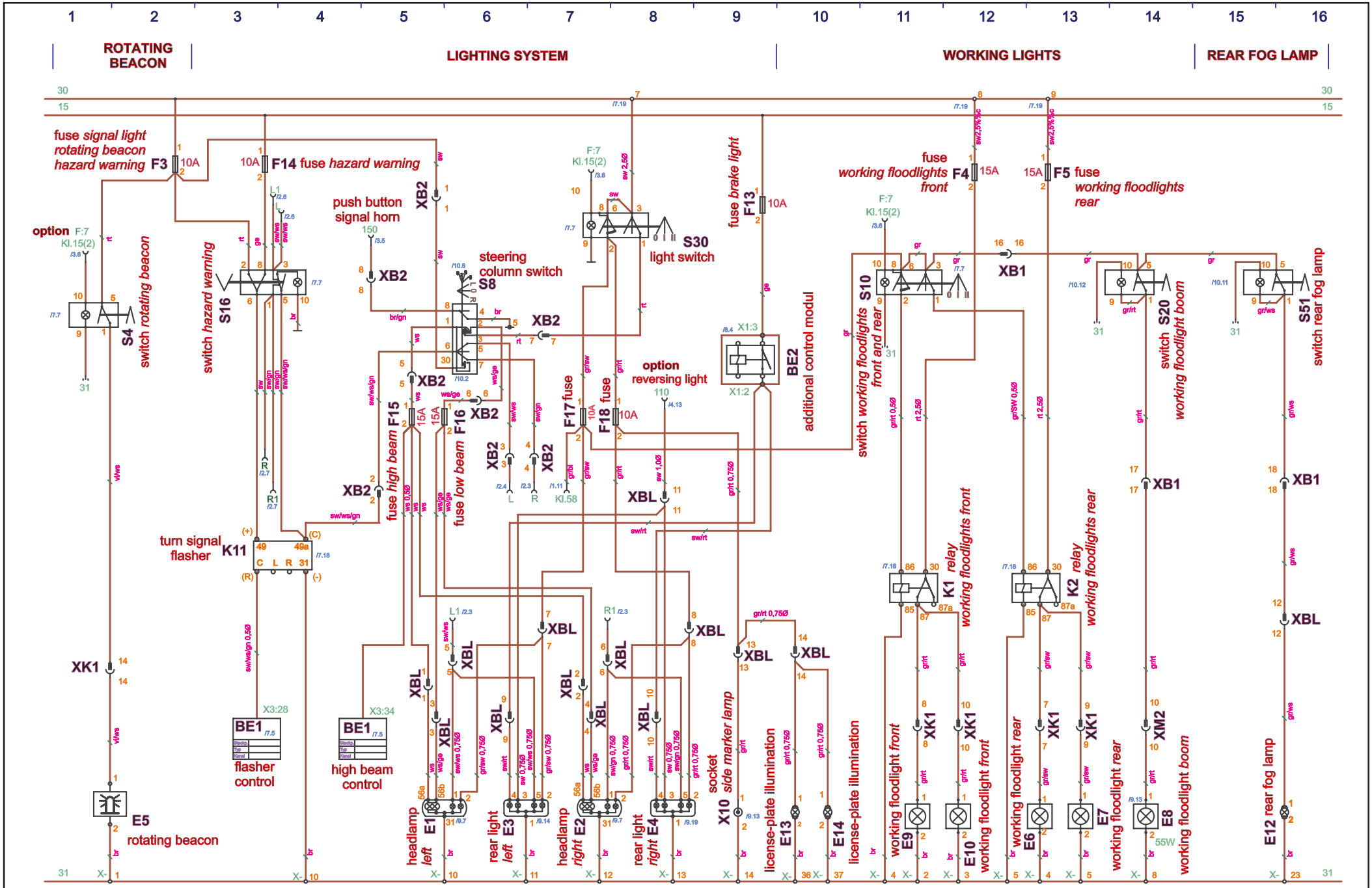
Warning signal active at the presence of:

- Air filter clogging indication
  Hydraulic oil return filter clogging indication



BE1	connector central control module	XM2	connector machine - dash board
XMOT	connector engine - machine		
XM1	connector machine - dash board		

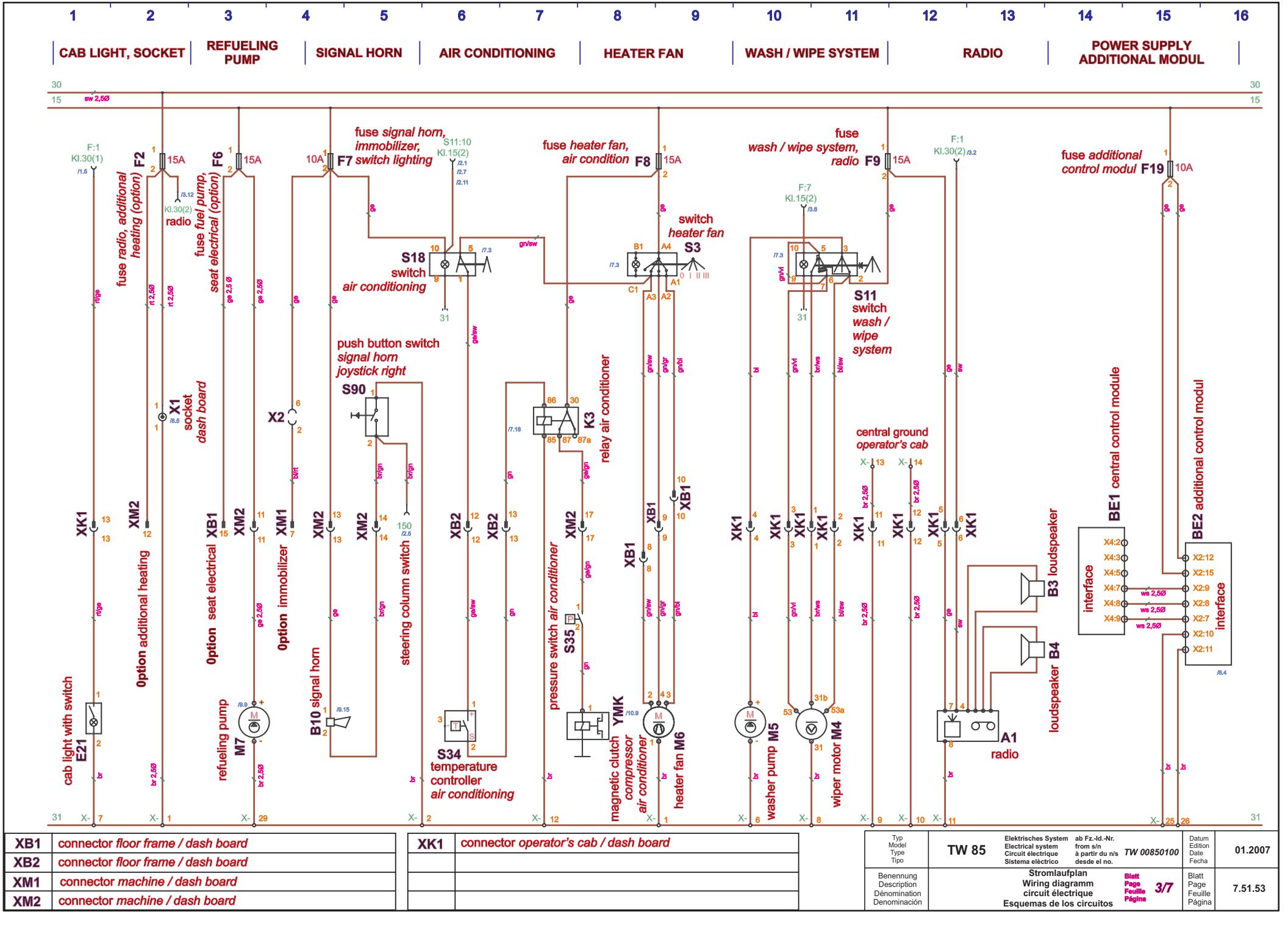
Typ Model Type Tipo	TW 85	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TW 00850100	Datum Edition Date Fecha 01.2007
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F17	fuse *side marker light left, instruments lighting*
F18	fuse *side marker right*
XB1	connector *floor frame / dash board*
XB2	connector *floor frame / dash board*

XBL	connector *machine / dash board*
XK1	connector *operator's cab / dash board*
XM2	connector *machine / dash board*
BE1	connector *central control module*

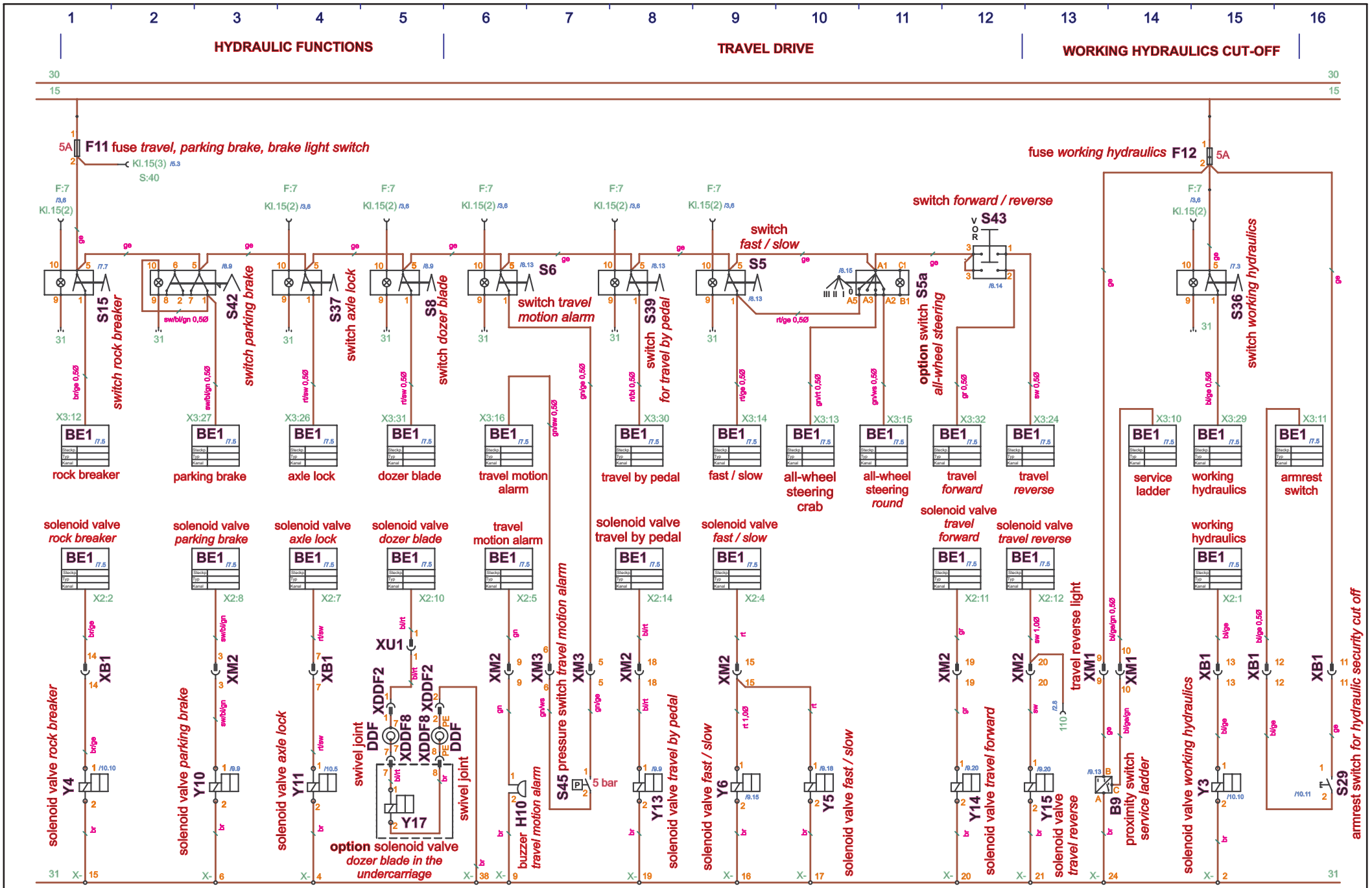
Typ / Model / Type / Tipo	TW 85	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TW 00850100	Datum / Edition / Date / Fecha 01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 2/7	Blatt / Page / Feuille / Página 7.51.52



XB1	connector *floor frame / dash board*
XB2	connector *floor frame / dash board*
XM1	connector *machine / dash board*
XM2	connector *machine / dash board*

XK1	connector *operator's cab / dash board*

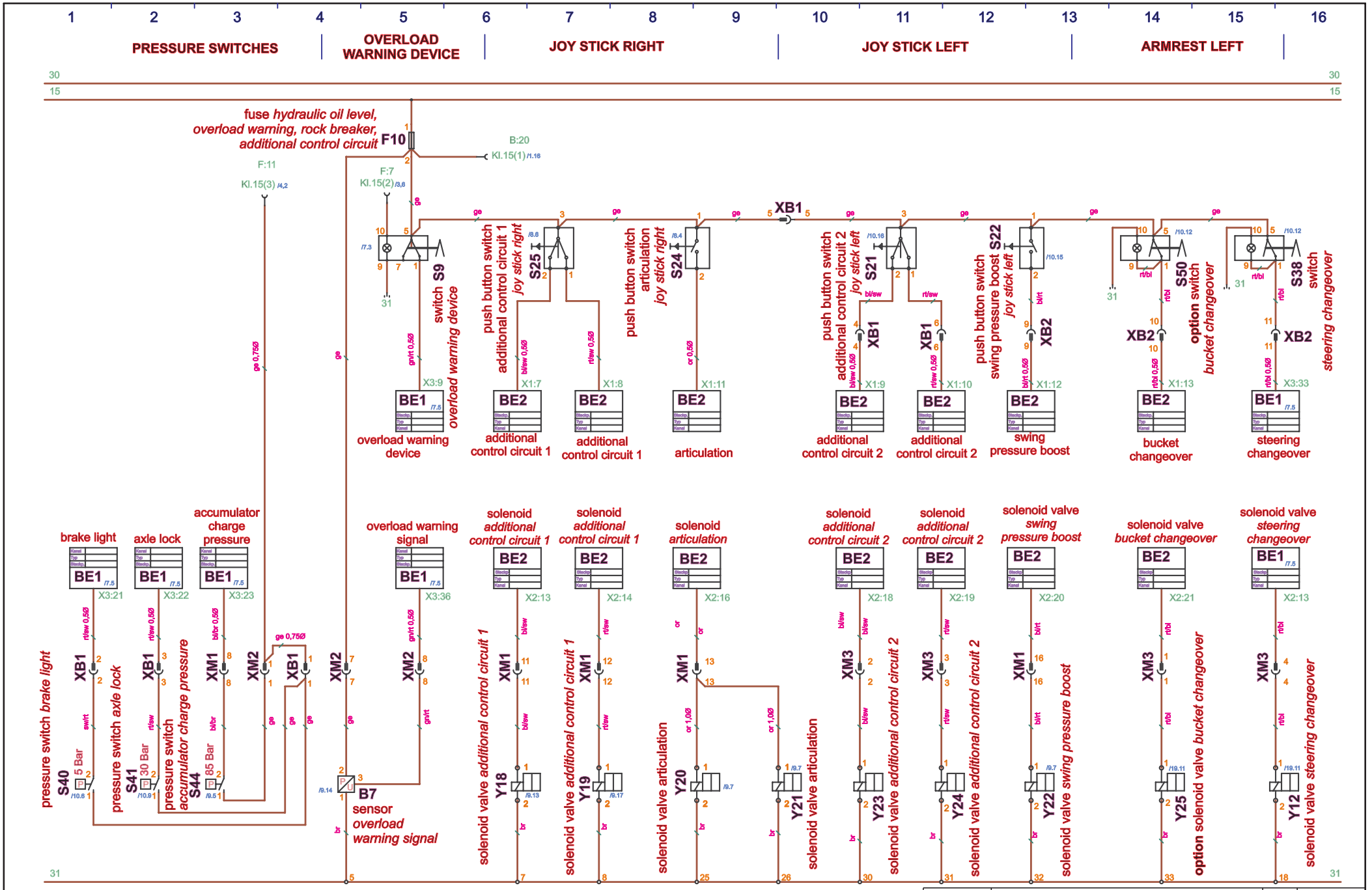
Typ Model Type Tipo	TW 85	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TW 00850100	Datum Edition Date Fecha 01.2007
Benennung Description Dénomination Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt Page Feuille Página 3/7	Blatt Page Feuille Página 7.51.53



XB1	connector *floor frame / dash board*
XM1	connector *machine / dash board*
XM2	connector *machine / dash board*
XM3	connector *machine / dash board*

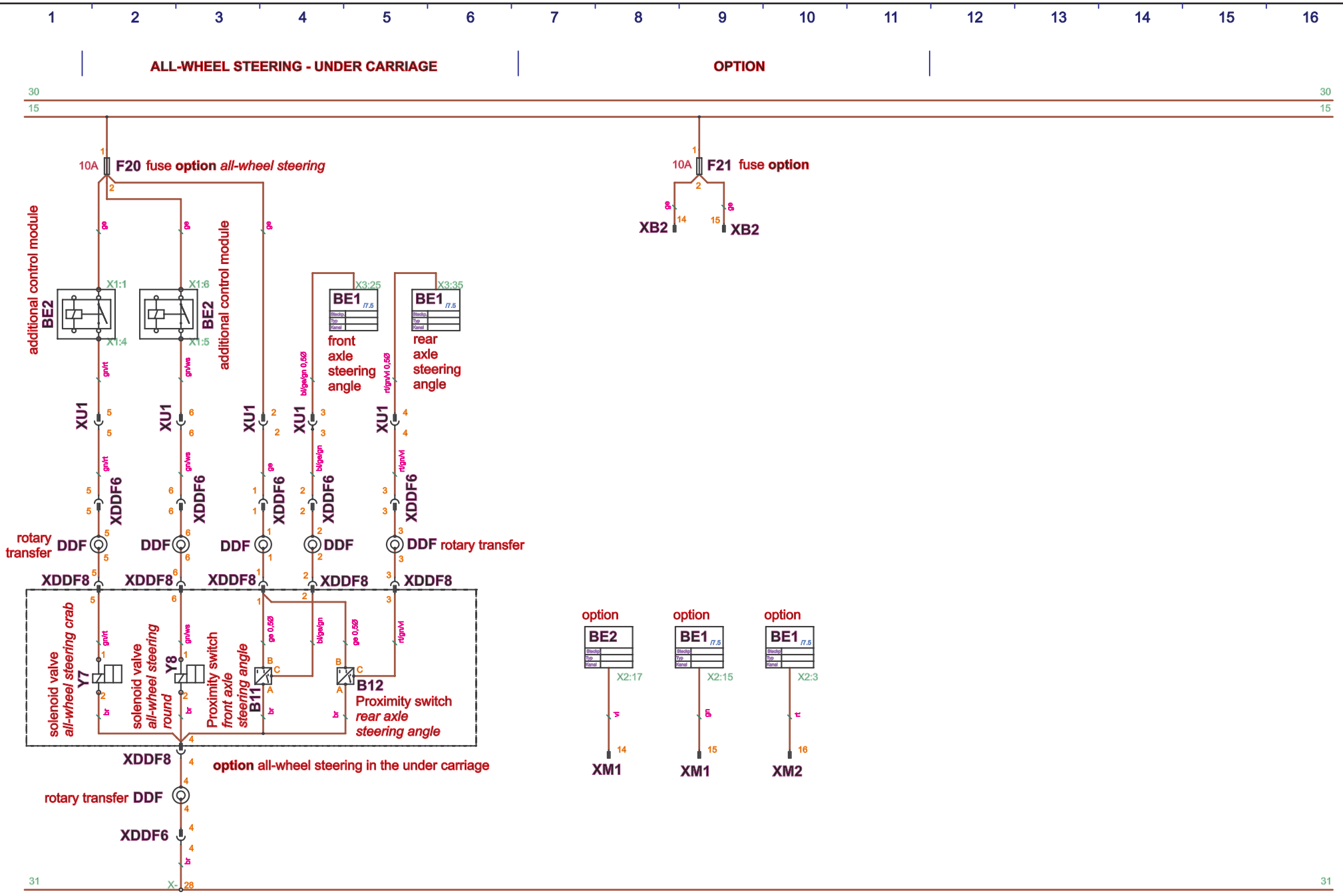
XU1	connector under carriage / *dash board*
XDDF2	connector *machine* / collector ring
XDDF8	connector *machine* / collector ring
BE1	connector central control module

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XM1	connector *machine / dash board*
XM2	connector *machine / dash board*
XM3	connector *machine / dash board*
XB1	connector *floor frame / dash board*
XB2	connector *floor frame / dash board*
BE1	connector central control module
BE2	connector additional control module

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Benennung Description Dénomination Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt Page Feuille Página 5/7	Blatt Page Feuille Página: 7.51.55

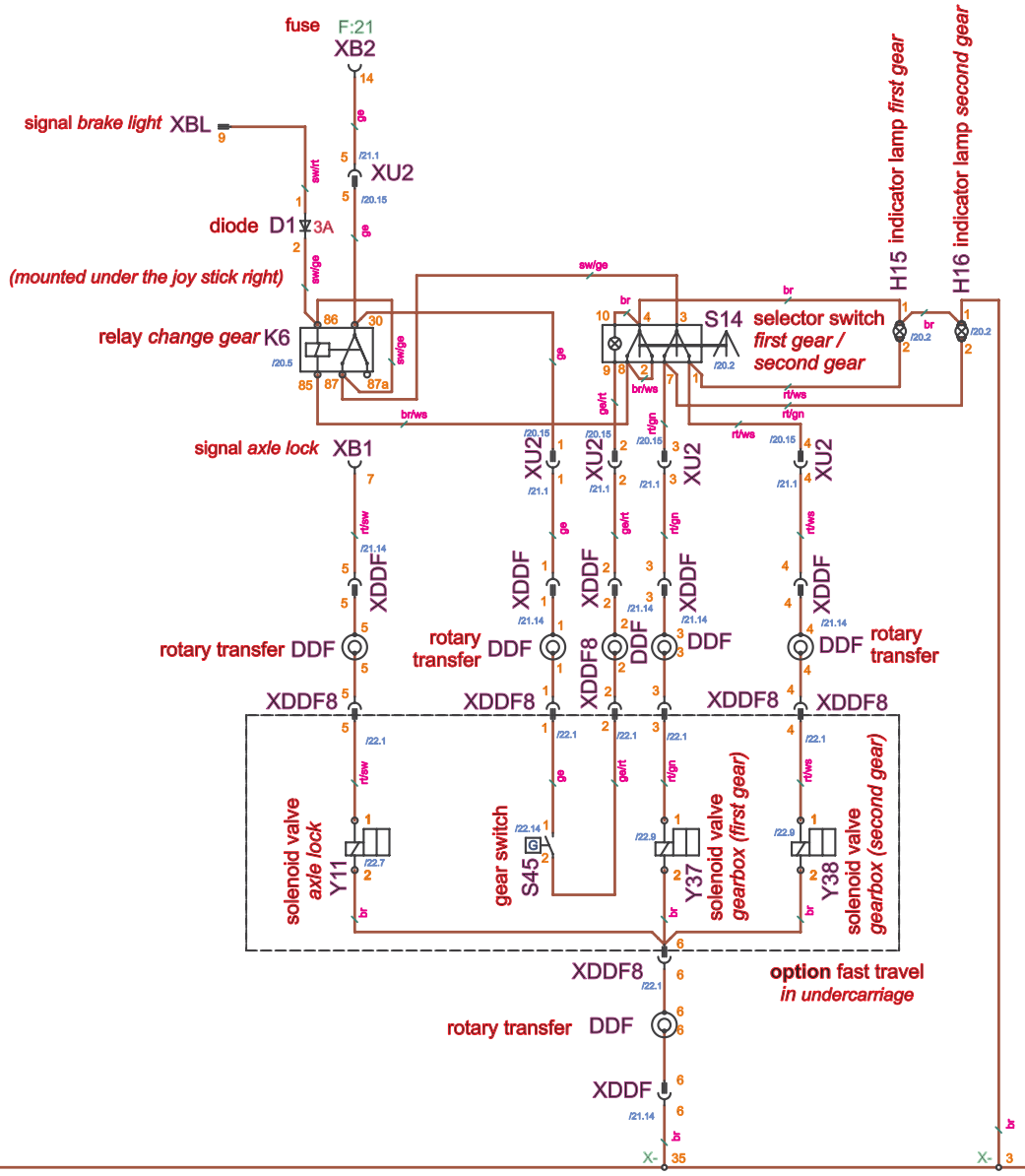


XM1	connector *machine / dash board*
XM2	connector *machine / dash board*
XB2	connector *floor frame / dash board*
BE1	connector central control module

BE2	connector additional control module
XU1	connector machine / *dash board*
XDDF6	connector upper carriage / collector ring
XDDF8	connector *under carriage* / collector ring

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OPTION FAST TRAVEL

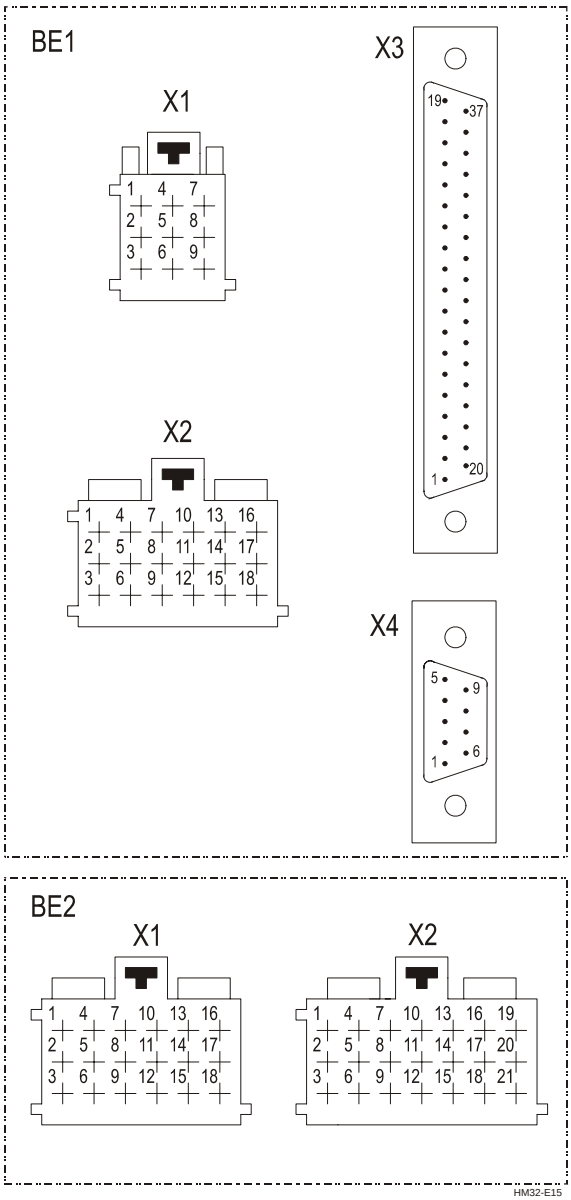


XB1	connector *floor frame / dash board*
XB2	connector *floor frame / dash board*
XU2	connector upper *carriage / floor frame*
BE2	connector additional control module

XDDF	connector upper *carriage* / collector ring
XDDF8	connector *under carriage* / collector ring

Typ Model Type Tipo	TW 85	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. *TW 00850100*	Datum Edition Date Fecha: 01.2007
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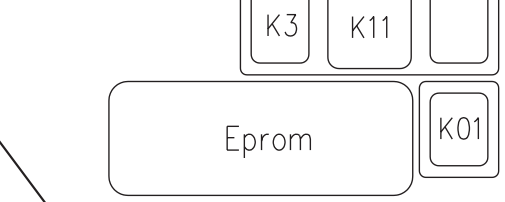
Control module BE1



X1	***Power supply***
1	Power supply Terminal 30
2	Power supply Terminal 30
3	Power supply Terminal 30
4	Central mass
5	Power supply Terminal 15
6	--
7	--
8	--
9	--
X2	***Signal outputs***
1	Working hydrauliks
2	Rock breaker
3	--
4	Fast
5	Travel motion alarm
6	Flush
7	Axle lock
8	Parking brake
9	Pre-heating
10	Front dozer blade
11	Travel, forward
12	Travel, backward
13	Steering changeover
14	Accelerator pedal
15	--
16	--
17	Start up solenoid switch Terminal 50A
18	--
X3	***Signal inputs***
1	Start up ignition lock Terminal 50A
2	--
3	Öl pressure switch
4	Air filter clogging
5	Hydraulic oil filter clogging
6	Hydraulic oil float switch
7	--
8	--
9	Overload warning switch
10	Service ladder proximity switch
11	Armrest switch

12	Rock breaker switch
13	All-wheel steering "crab"
14	FAST–SLOW switch
15	All-wheel steering, "round"
16	Travel motion alarm switch
17	Fuel-level sensor
18	Central mass
19	Coolant temperature
20	Charge control
21	Brake light signal
22	Axle lock signal
23	Accumulator pressure signal
24	Switch for travel, reverse
25	Front axle steering angle signal
26	Axle lock switch
27	Parking brake switch
28	Direction indicator lamp signal
29	Working hydraulics switch
30	Accelerator pedal switch
31	Front dozer blade switch
32	Switch for travel, forward
33	Steering changeover switch
34	High beam signal
35	Rear axle steering angle signal
36	Overload warning signal
37	--
X4	***Interface***
1	--
2	--
3	--
4	--
5	--
6	--
7	Connection additional module X2:9
8	Connection additional module X2:8
9	Connection additional module X2:7

X1	***Plug***
1	Power supply Terminal 15
2	Brakelights
3	Power supply Terminal 15
4	Valve all wheel steering (crab)
5	Valve all wheel steering (round)
6	Power supply Terminal 15
7	Additional control circuit 1 push-button
8	Additional control circuit 1 push-button
9	Additional control circuit 2 push-button
10	Additional control circuit 2 push-button
11	Articulation changeover push-button
12	Swing brake push-button
13	Bucket changeover switch (option)
14	--
15	--
16	--
17	--
18	--
X2	***Plug***
1	--
2	--
3	--
4	--
5	--
6	--
7	Connection control module X4:9
8	Connection control module X4:8
9	Connection control module X4:7
10	Central mass
11	Central mass
12	Power supply Terminal 15
13	Valve additional control circuit 1
14	Valve additional control circuit 1
15	Power supply Terminal 15
16	Valve for articulation
17	--
18	Valve for additional control circuit 2
19	Valve for additional control circuit 2
20	Valve swing brake
21	Bucket changeover (option)



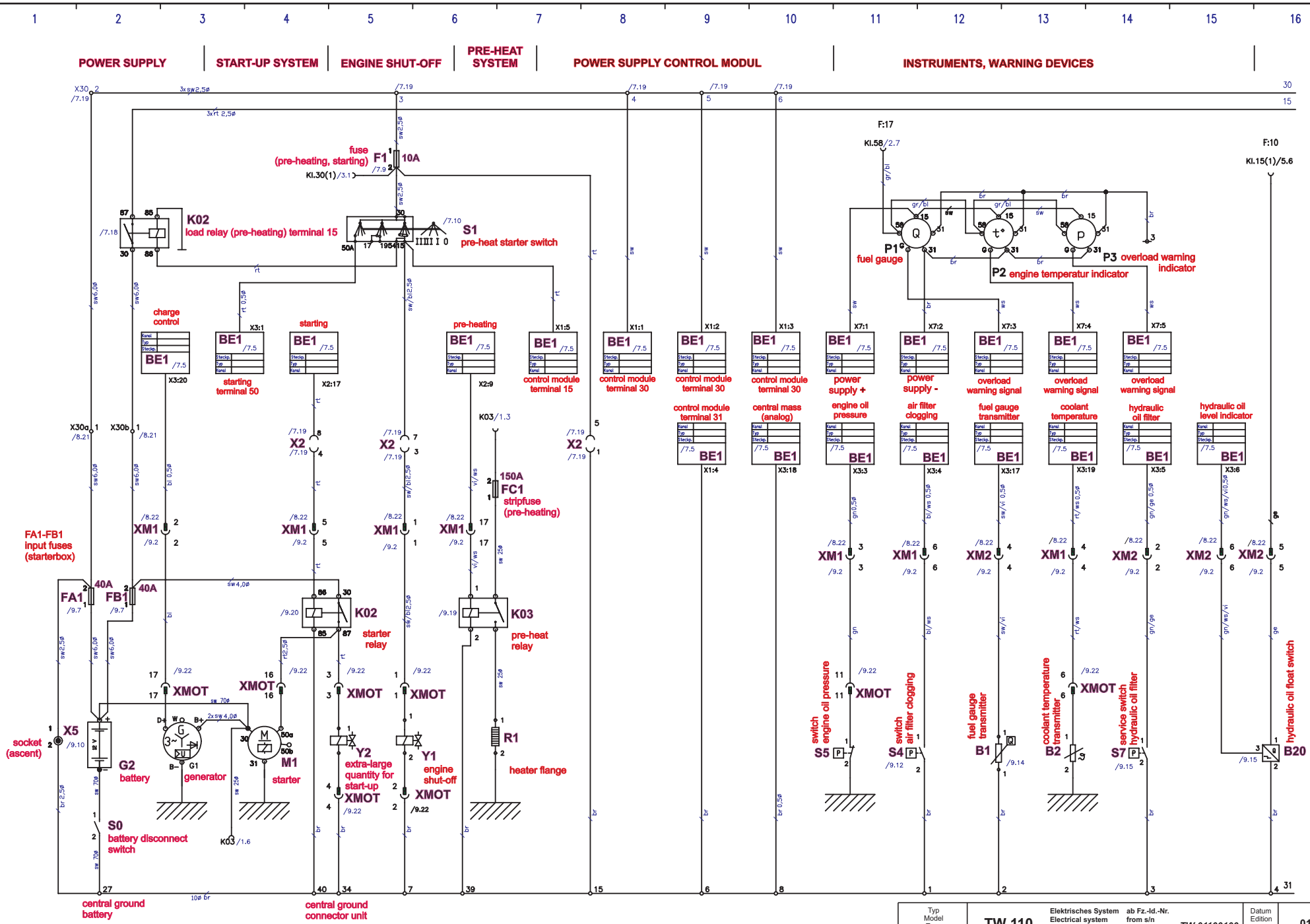
Sicherungen (Fuses)

Pos. (item)	Amp. (Amp.)	belegt mit (assigned to)
F1	10	Glühstart Innenleuchte, Wegfahrsperre (glow plug and starter switch, interior light, immobilizer)
F2	15	Steckdose, Radio Zusatzheizung (Option) (socket, radio, additional heating–option)
F3	10	Warnblinker, Lichthupe, Rundumleuchte (hazard flasher, headlamp flasher, rotating beacon)
F4	15	Arbeitsscheinwerf. vo. (working floodlight, front)
F5	15	Arbeitsscheinwerf. hi. (working floodlight, rear)
F6	15	Betankungspumpe, elektr. Sitz (Option) (fuel–filling pump, electrical seat heating–option)
F7	10	Horn, Wegfahrsperre, Schalterbeleuchtung (horn, immobilizer, switch lighting)
F8	15	Heizgebläse (heater fan)
F9	15	Wisch–Waschanlage, Radio (wish–wash system, radio)
F10	5	Hydr. Ölniveau, Lastwarn Hammer, Zusatz (hydraulic oil level, overload warning, rock breaker, additional control circuit)
F11	5	Fahren, Feststellbremse Bremslichtschalter (travel, parking brake, brake light switch)
F12	5	Arbeitshydraulik (working hydraulics)
F13	10	Bremslicht (brake light)
F14	10	Warnblinker (hazard flasher)
F15	15	Fernlicht (high beam)
F16	15	Abblendlicht (low beam)
F17	10	Begrenzungslicht li., Instrumenten–beleuchtung (side marker lamp, left, instruments lighting)
F18	10	Begrenzungslicht re. (side marker lamp, right)
F19	10	Zusatzmodul (additional module)
F20	10	Allradlenkung (all–wheel steering)
F21	10	frei (not assigned)

Relais (relays)

Pos. (item.)	Funktion (function)
K01	Relais Kl 15 (relay term. 15)
K1	Arbeitsscheinwerfer vo. (working floodlight, front)
K2	Arbeitsscheinwerfer hi. (working floodlight, rear)
K3	frei (Klimaanlage–Option) (not assigned – air conditioning–option)
K11	Blinkgeber (directional indicator)

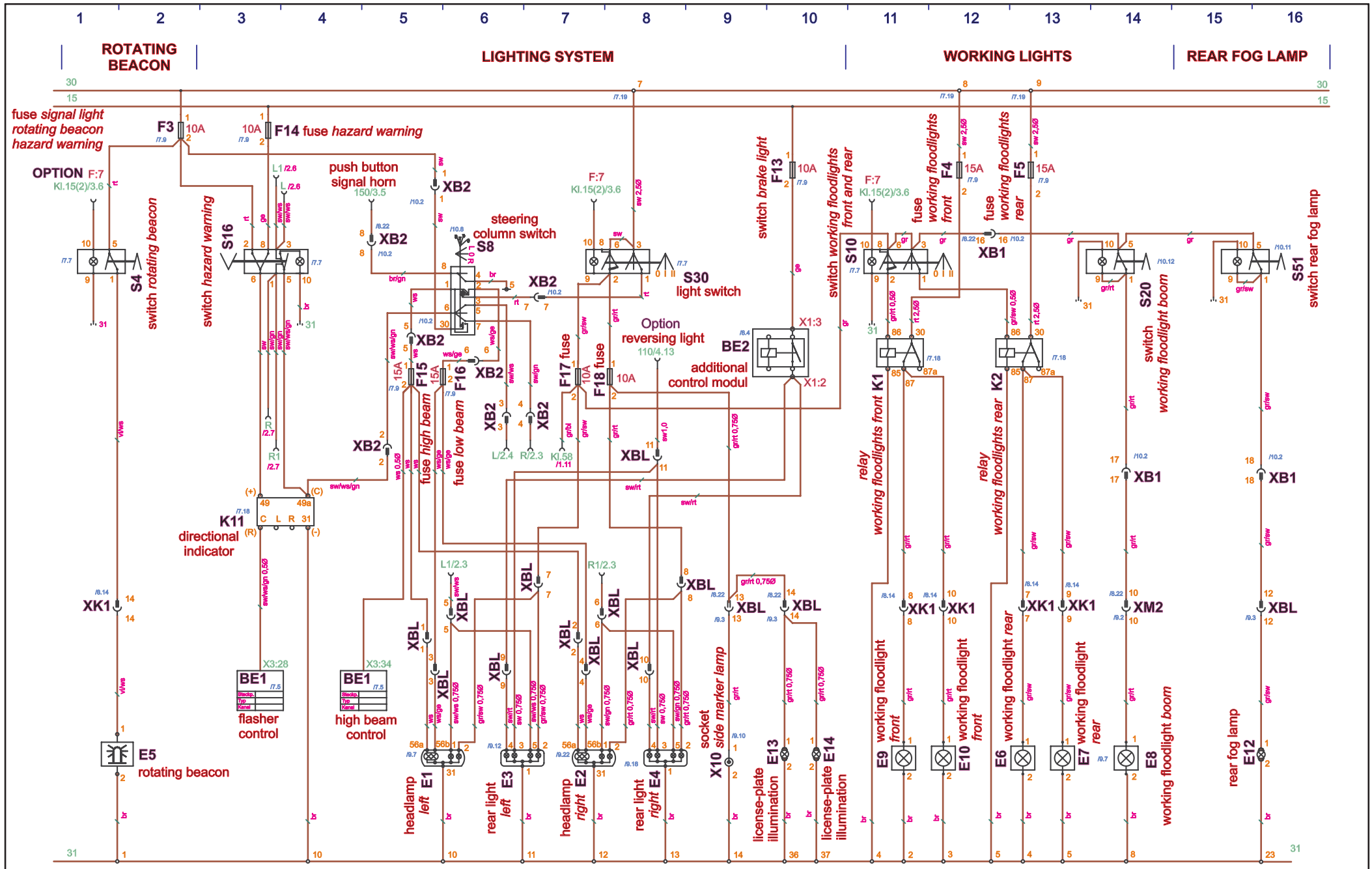
Typ / Model / Type / Tipo	**TW 110**	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. **TW 01100100**	Datum / Edition / Date / Fecha	**01.2007**
Benennung / Description / Dénomination / Denominación	**Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos**			Blatt / Page / Feuille / Página	**7.53.50**



BE1	connector central control module
XMOT	connector engine - machine
XM1	connector machine - dash board

XM2	connector machine - dash board

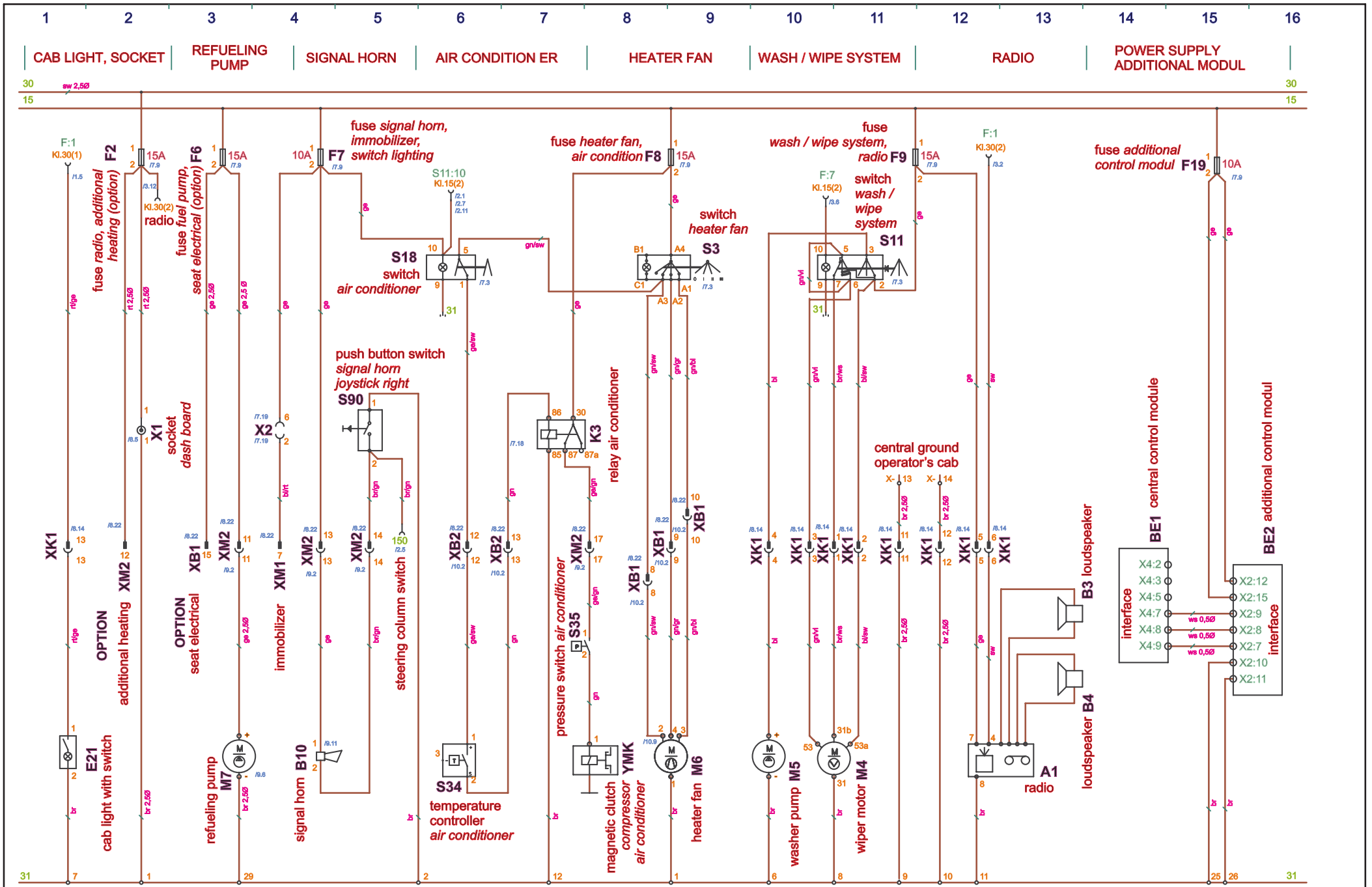
Typ Model Type Tipo	TW 110	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TW 01100100	Datum Edition Date Fecha 01.2007
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F17	fuse *side marker light left, instruments lighting*
F18	fuse *side marker right*
XB1	connector *floor frame / dash board*
XB2	connector *floor frame / dash board*

XBL	connector *machine / dash board*
XK1	connector *operator's cab / dash board*
XM2	connector *machine / dash board*
BE1	connector *central control module*

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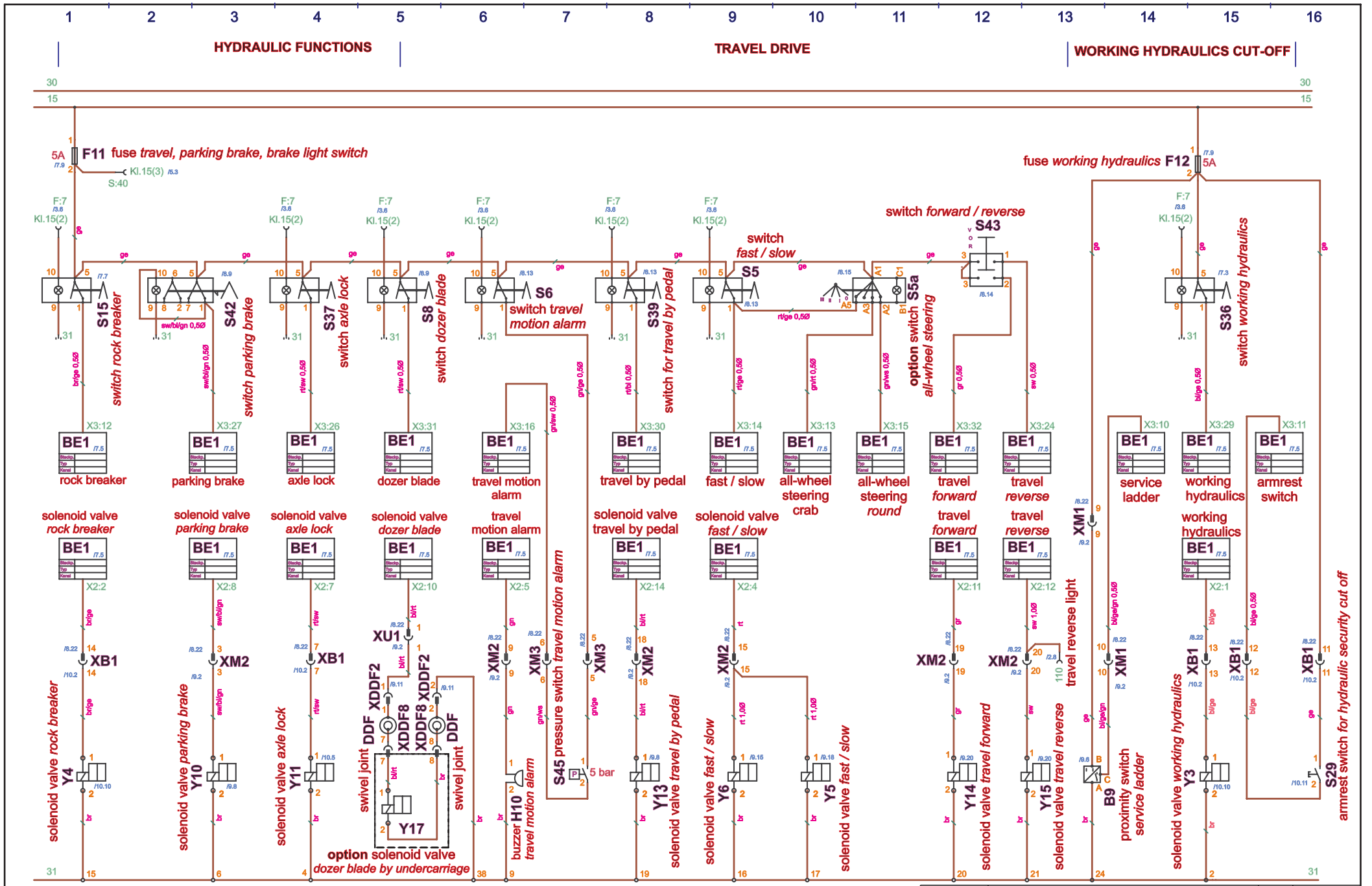


XB1	connector *floor frame / dash board*
XB2	connector *floor frame / dash board*
XM1	connector *machine / dash board*
XM2	connector *machine / dash board*

XK1	connector *operator's cab / dash board*

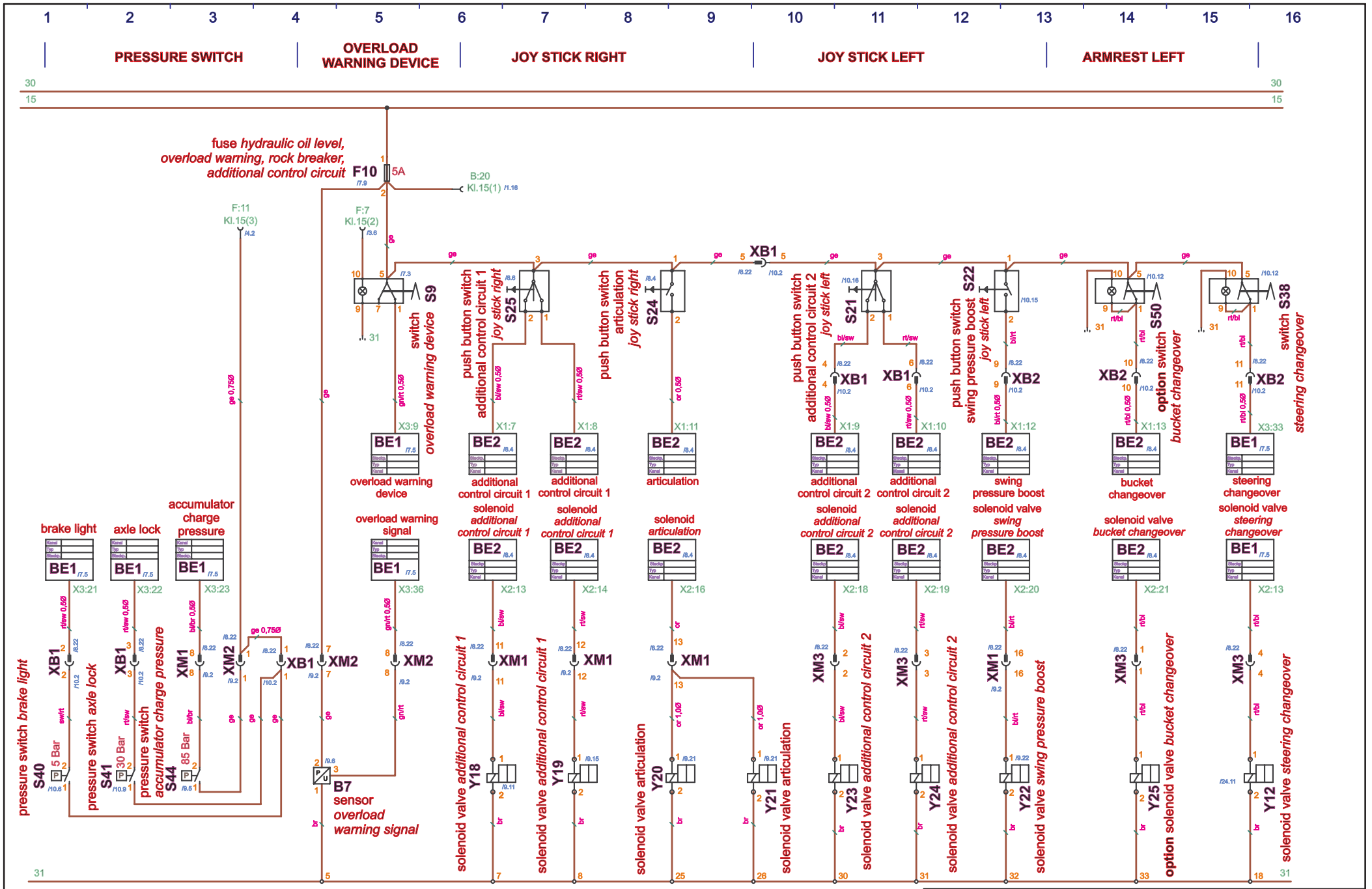
Typ Model Type Tipo	TW 110	Elektrisches System Electrical system Circuit électrique Sistema elèctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no. TW 01100100
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		

Datum Edition Date Fecha	01.2007
Blatt Page Feuille Página	7.53.53



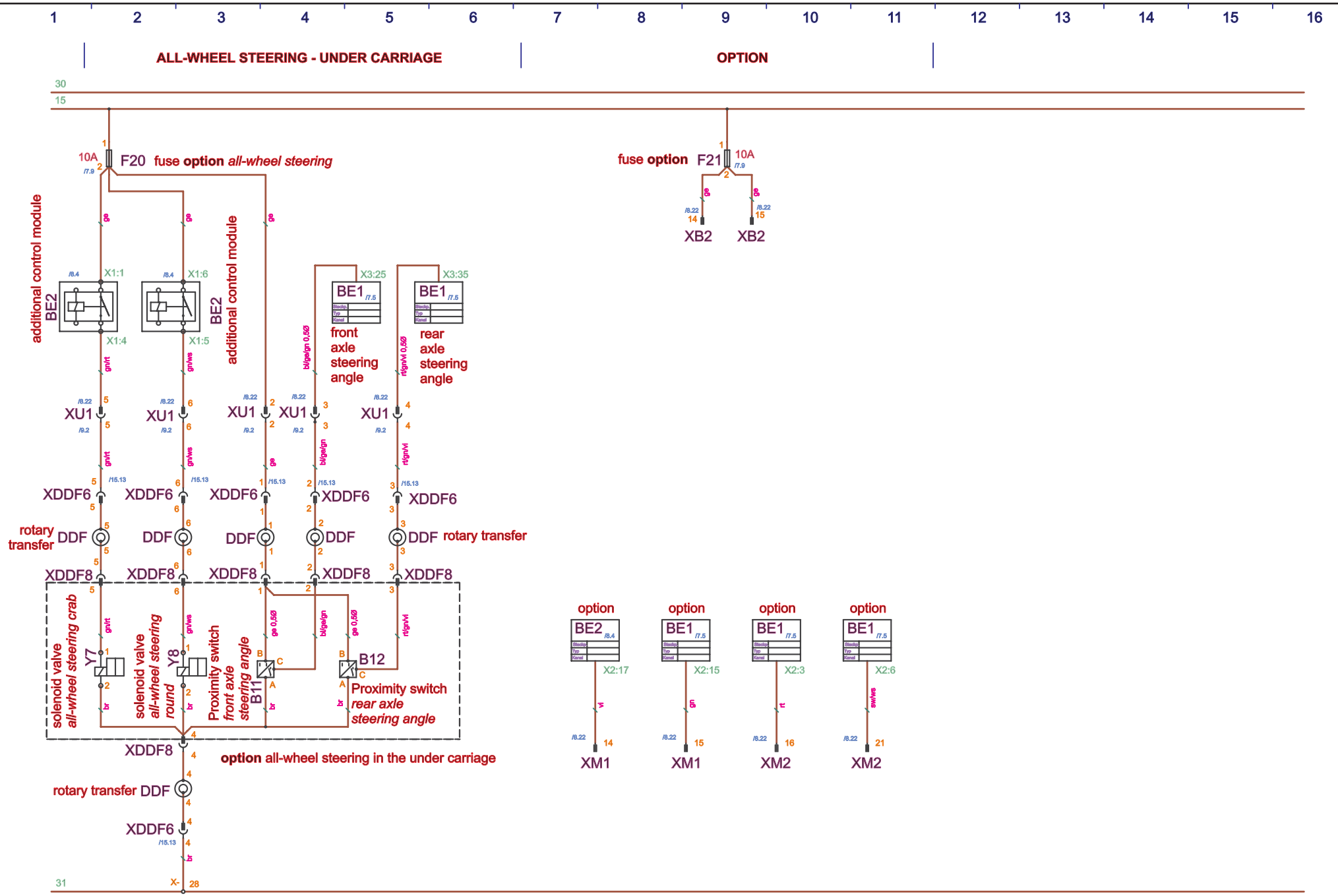
XB1	connector *floor frame / dash board*
XM1	connector *machine / dash board*
XM2	connector *machine / dash board*
XM3	connector *machine / dash board*
XU1	connector under carriage / *dash board*
XDDF2	connector *machine* / collector ring
XDDF8	connector *machine* / collector ring
BE1	connector central control module

Typ / Model / Type / Tipo	TW 110	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TW 01100100	Datum / Edition / Date / Fecha 01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 4/6	Blatt / Page / Feuille / Página 7.53.54



XM1	connector *machine / dash board*
XM2	connector *machine / dash board*
XM3	connector *machine / dash board*
XB1	connector *floor frame / dash board*
XB2	connector *floor frame / dash board*
BE1	connector central control module
BE2	connector additional control module

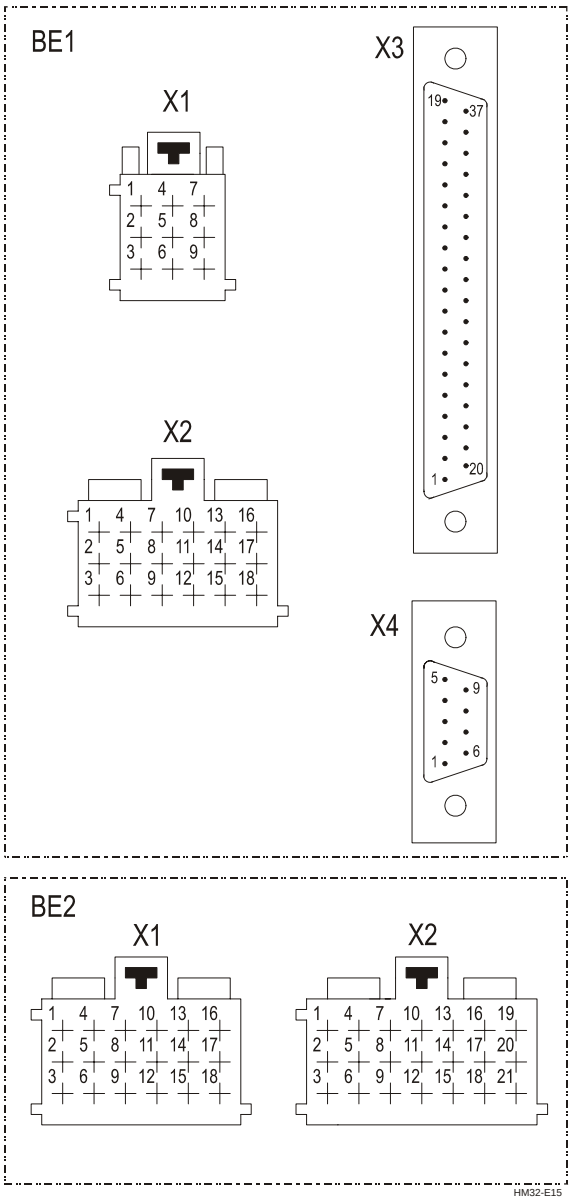
Typ / Model / Type / Tipo	TW 110	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TW01100100	Datum / Edition / Date / Fecha	01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 5/6		Blatt / Page / Feuille / Página	7.53.55



XM1	connector *machine / dash board*
XM2	connector *machine / dash board*
XB2	connector *floor frame / dash board*
BE1	connector *central control module*
BE2	connector *additional control module*
XU1	connector *under carriage / dash board*
XDDF6	connector *under carriage /* collector ring
XDDF8	connector *machine /* collector ring

Typ Model Type Tipo	TW 110	Elektrisches System Electrical system Circuit électrique Sistema elèctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	*TW 01100100*	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación		Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos	Blatt Page Feuille Página	*6/6*	Blatt Page Feuille Página	7.53.56

Control module BE1



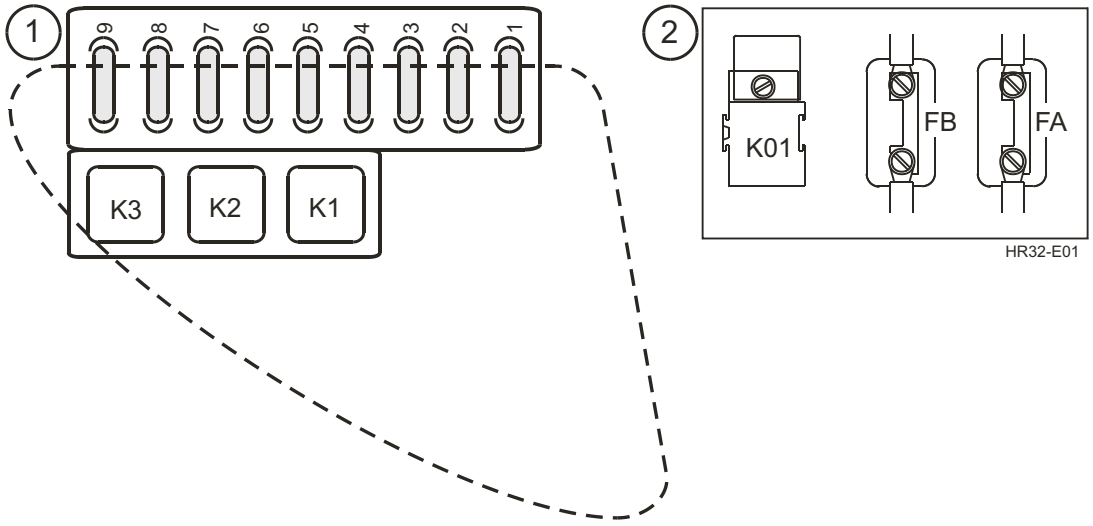
X1	***Power supply***
1	Power supply Terminal 30
2	Power supply Terminal 30
3	Power supply Terminal 30
4	Central mass
5	Power supply Terminal 15
6	--
7	--
8	--
9	--
X2	***Signal outputs***
1	Working hydrauliks
2	Rock breaker
3	Fast-Slow
4	Fast-Slow
5	Travel motion alarm
6	Flush
7	Axle lock
8	Parking brake
9	Pre-heating
10	Front dozer blade
11	Travel, forward
12	Travel, backward
13	Steering changeover
14	Accelerator pedal
15	Option
16	--
17	Start up solenoid switch Terminal 50A
18	--
X3	***Signal inputs***
1	Start up ignition lock Terminal 50A
2	--
3	Öl pressure switch
4	Air filter clogging
5	Hydraulic oil filter clogging
6	Hydraulic oil float switch
7	--
8	--
9	Overload warning switch
10	Service ladder proximity switch
11	Armrest switch

12	Rock breaker switch
13	--
14	FAST–SLOW switch
15	--
16	Travel motion alarm switch
17	Fuel-level sensor
18	Central mass
19	Coolant temperature
20	Charge control
21	Brake light signal
22	Axle lock signal
23	Accumulator pressure signal
24	Switch for travel, reverse
25	Front axle steering angle signal
26	Axle lock switch
27	Parking brake switch
28	Direction indicator lamp signal
29	Working hydraulics switch
30	Accelerator pedal switch
31	Front dozer blade switch
32	Switch for travel, forward
33	Steering changeover switch
34	High beam signal
35	Rear axle steering angle signal
36	Overload warning signal
37	--
X4	***Interface***
1	--
2	--
3	--
4	--
5	--
6	--
7	Connection additional module X2:9
8	Connection additional module X2:8
9	Connection additional module X2:7

X1	***Plug***
1	--
2	Brakelights
3	Power supply Terminal 15
4	--
5	--
6	--
7	Additional control circuit 1 push-button
8	Additional control circuit 1 push-button
9	Additional control circuit 2 push-button
10	Additional control circuit 2 push-button
11	Articulation changeover push-button
12	Swing brake push-button
13	Bucket changeover switch (option)
14	--
15	--
16	--
17	--
18	--
X2	***Plug***
1	--
2	--
3	--
4	--
5	--
6	--
7	Connection control module X4:9
8	Connection control module X4:8
9	Connection control module X4:7
10	Central mass
11	Central mass
12	Power supply Terminal 15
13	Valve additional control circuit 1
14	Valve additional control circuit 1
15	Power supply Terminal 15
16	Valve for articulation
17	Valve for articulation
18	Valve for additional control circuit 2
19	Valve for additional control circuit 2
20	Valve swing brake
21	Bucket changeover (option)

Electrical system

Fuse and relay box - Assignment diagram



1 = Instrument panel 2 = next to battery

Fuses			Relay	
Item	**Ampere**	**Assigned to**	**Position**	***Function***
F 1	15	Interior light, radio, immobilizer, rotating beacon	K 01	Pre-heat relay
F 2	20	Socket, refueling pump, additional heating (option)		
F 3	15	Working floodlight, front	K 1	Working floodlight, front
F 4	15	Working floodlight, rear	K 2	Working floodlight, rear
F 5	10	Horn, switch light, immobilizer	K 3	not assigned
F 6	15	Heater fan		
F 7	10	Wish/wash system		
F 8	5	Control module signal input		
F 9	-	Additional heating (option) Seat with electrical heating (option) Working floodlight(s) (option)		
FA	30	Main fuse		
FB	60	Pre-heating		

Fuse colors

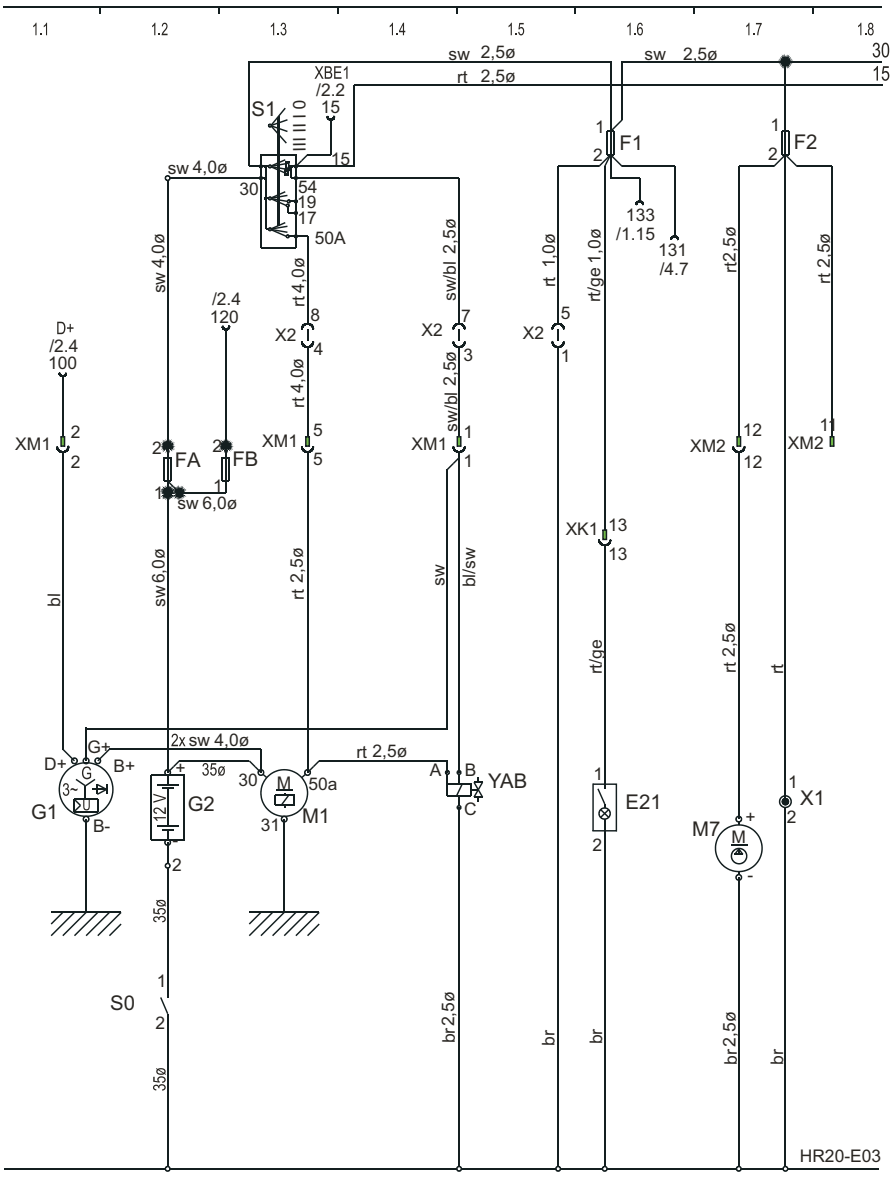
5 A	yellow-brown	10 A	red	15 A	blue	20A	yellow

Cable and plug colors

bg	beige	dgr	dark gray	hbr	light brown	rt	red
bl	blue	ge	yellow	hgr	light gray	sw	black
br	brown	gn	green	hr	light red	vi	violet
dbl	dark blue	gr	gray	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		

Typ Model Type Tipo	**TC 60**	**Elektrisches System** **Electrical System** **Circuit électrique** **Sistema eléctricor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación		**Belegungsplan** **Asignment diagram** **Schéma de répartition** **Esquema de la caja**	Blatt Page Feuille Página	**7.60.01**

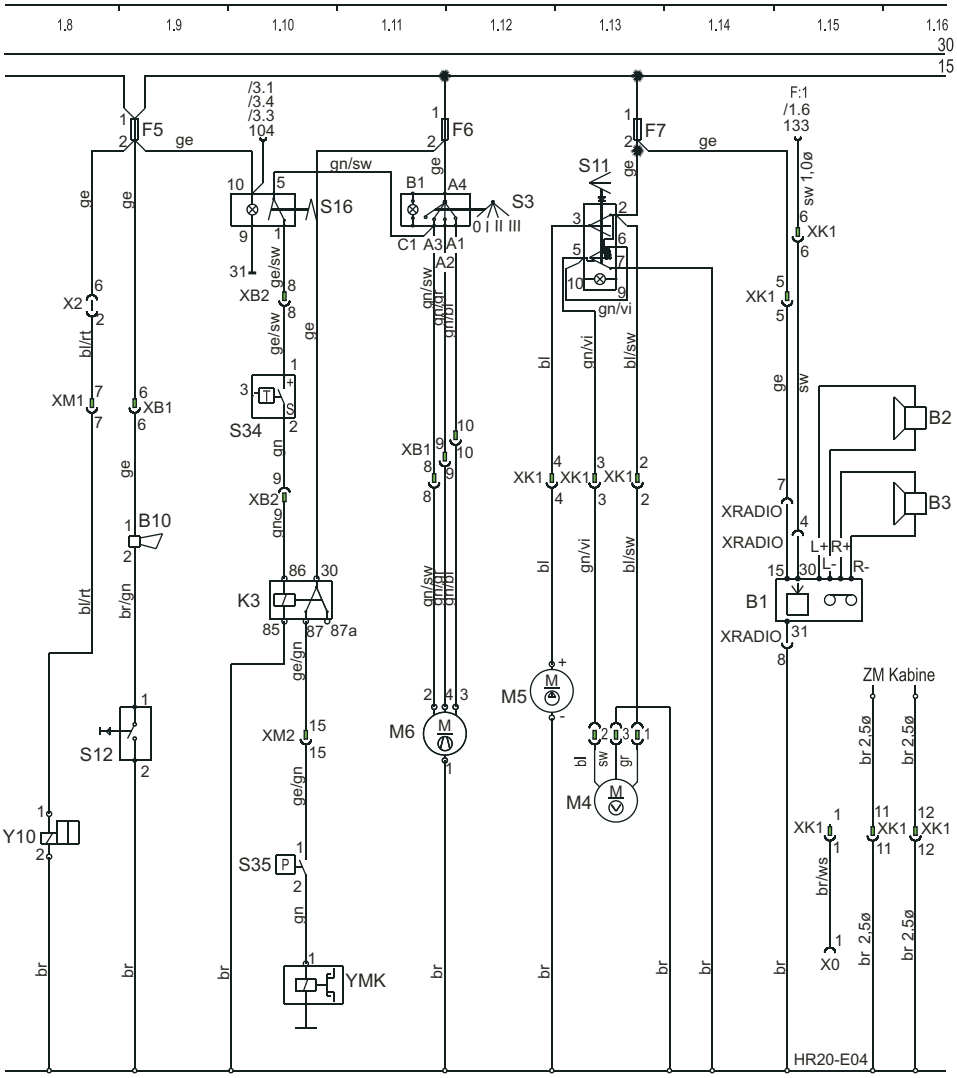
Power supply	Start-up system	Shut-off	Interior light	Socket, refueling pump



Path	Desig-nation	Device	Path	Desig-nation	Device
		Power supply			***Shut-off***
1.1	G1	Generator	1.4	Y1	Shut-off
1.2	FA	Fuse			***Interior light***
1.2	FB	Fuse	1.6	F1	Fuse
1.2	G2	Battery	1.6	E21	Interior light
1.2	SO	Battery disconnect switch			***Socket, refueling pump***
		Start-up system	1.7	F2	Fuse
1.3	S1	Pre-heat/ starter switch	1.7	M7	Refueling pump
1.3	M1	Starter	1.8	X1	Socket

Typ Model Type Tipo	**TC 60**	**Elektrisches System** **Electrical System** **Circuit électrique** **Sistema eléctricor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación		**Stromlaufplan** **Wiring diagram** **Circuit électrique** **Esquemas de los circuitos**	Blatt Page Feuille Página	**7.60.02**

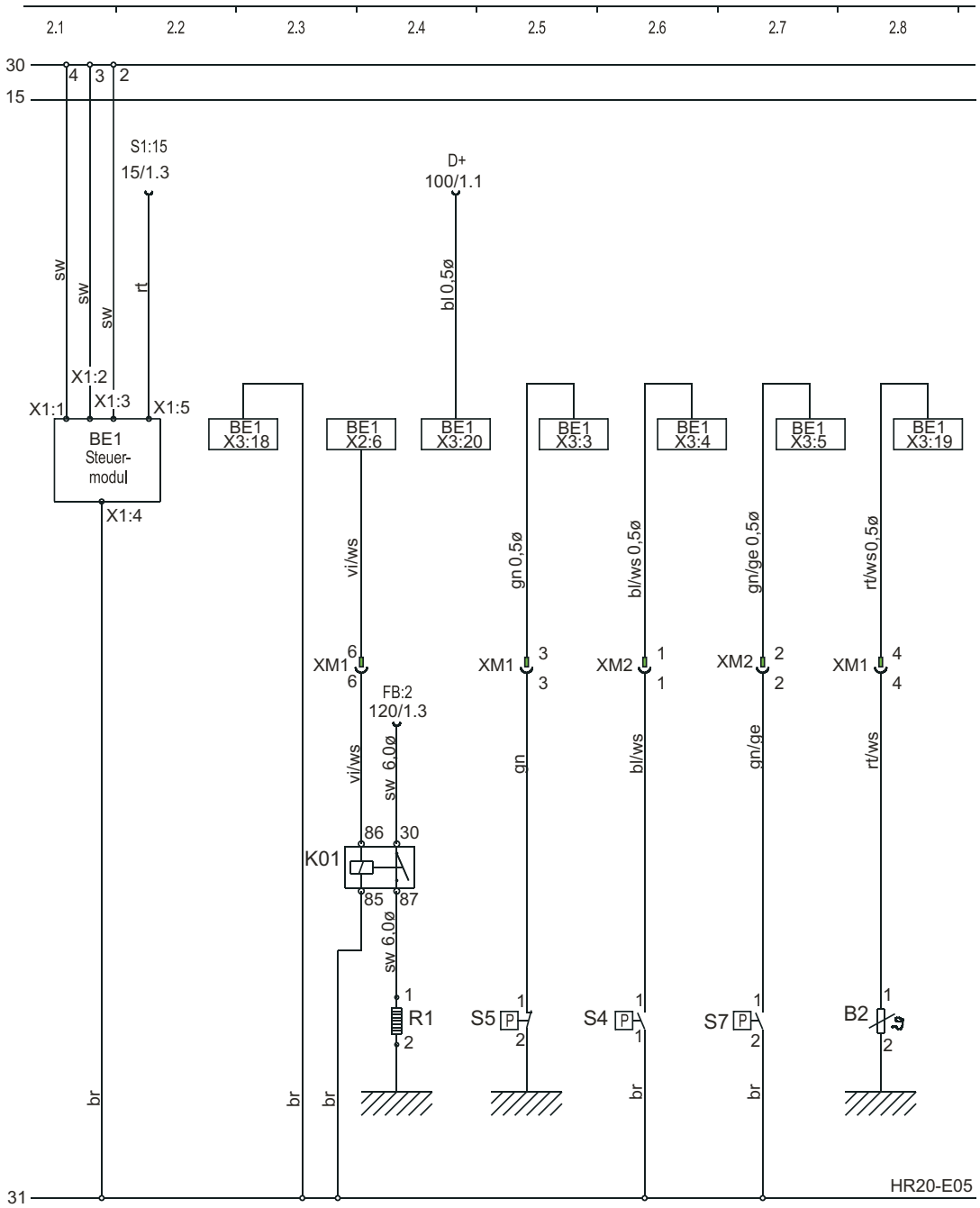
Horn	Heater fan / air conditioner	Wash/ wipe system	Radio



Path	Designation	Device	Path	Designation	Device
		Horn	1.11	M6	Heater fan
1.8	F5	Fuse	1.11	S3	Heater fan switch
1.8	B10	Horn			***Wash/ wipe system***
1.8	S12	Horn button	1.12	M5	Washer pump
1.8	Y10	Solenoid valve, immobilizer	1.13	S11	Wash/ wipe switch
		Heater fan/ air conditioning	1.13	F7	Fuse
1.9	S16	Air conditioning switch	1.13	M4	Wiper motor
1.10	K3	Relay			***Radio***
1.10	S34	Air condition. pressure switch	1.15	B1	Radio
1.10	YMK	Compressor magnetic coupling	1.16	B2	Loudspeaker
1.10	S35	Air conditioning temperature switch	1.16	B3	Loudspeaker
1.11	F6	Fuse	1.16	ZM	Central mass, cab

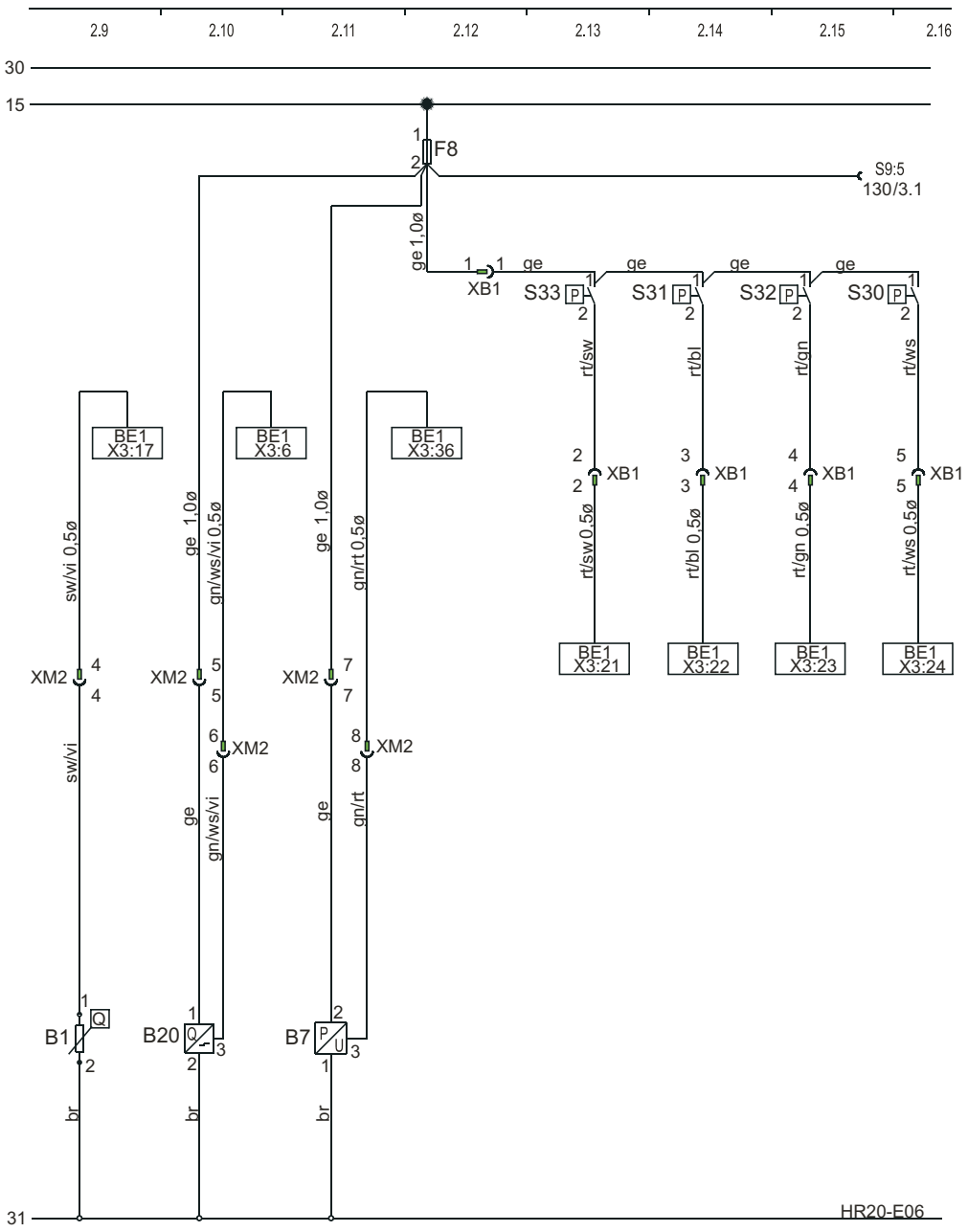
Typ Model Type Tipo	**TC 60**	**Elektrisches System** **Electrical System** **Circuit électrique** **Sistema eléctricor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación		**Stromlaufplan** **Wiring diagram** **Circuit électrique** **Esquemas de los circuitos**	Blatt Page Feuille Página	**7.60.03**

Check module	Pre-heating	Instruments, monitors



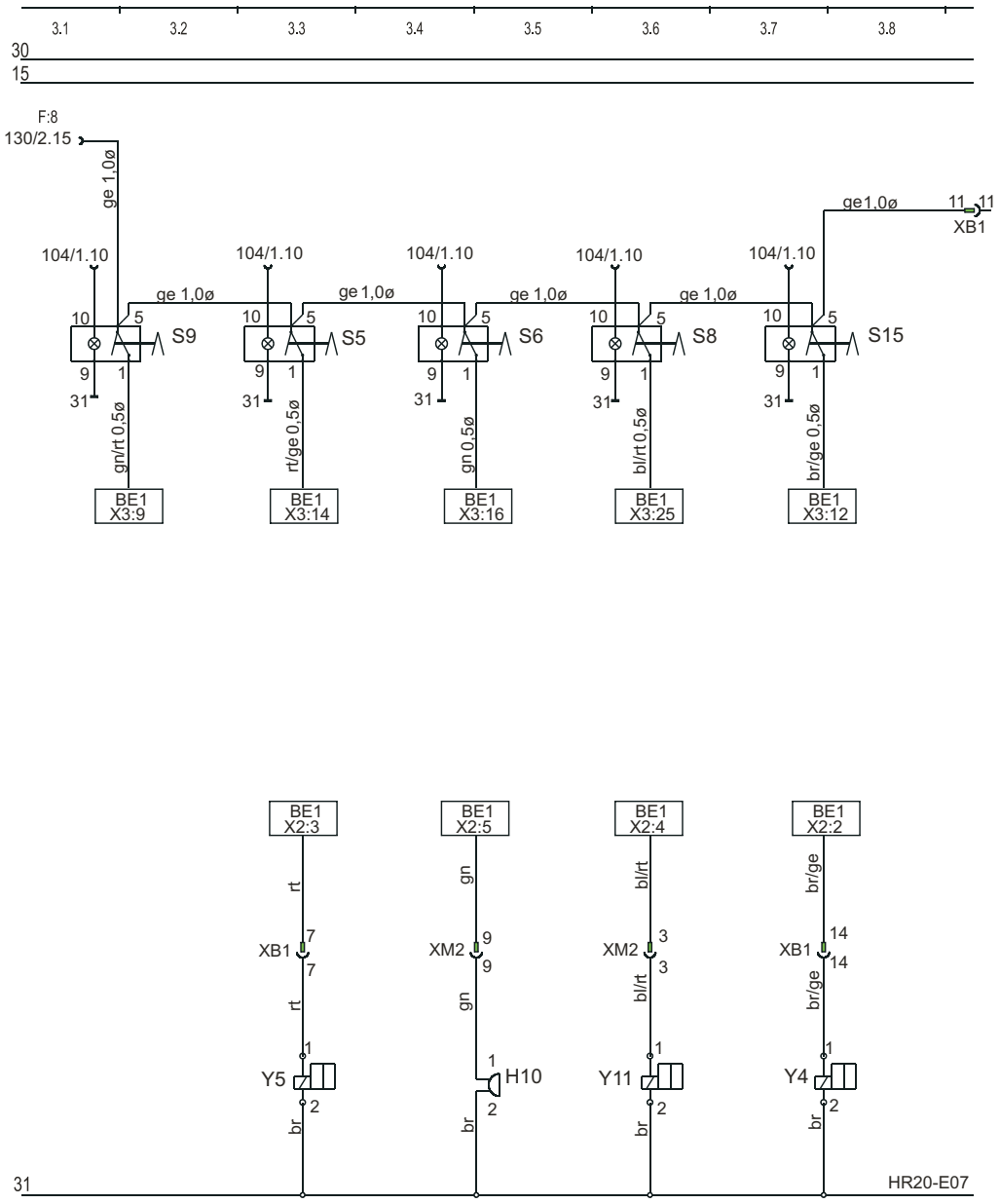
Path	Desig-nation	Device	Path	Desig-nation	Device
		Check module			***Instruments, monitors***
2.1	BE1	Control module	2.4	S5	Oil pressure switch
		Pre-heating	2.5	S4	Maintenance, air filter
2.3	K01	Pre-heat relay	2.6	S7	Hydraulic oil filter
2.3	R1	Glow plugs	2.7	B2	Coolant temperature

Typ Model Type Tipo	**TC 60**	**Elektrisches System** **Electrical System** **Circuit électrique** **Sistema eléctricor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación		**Stromlaufplan** **Wiring diagram** **Circuit électrique** **Esquemas de los circuitos**	Blatt Page Feuille Página	**7.60.04**



Path	Designation	Device	Path	Designation	Device
		Load warning sensor			***Pressure switch, "Travel"***
2.8	B1	Tank sensor	2.13	S33	Pressure switch forward/left
2.9	B20	Hydr. oil level	2.14	S31	Pressure switch reverse/left
2.11	B7	Load warning signal	2.15	S32	Pressure switch forward/right
2.12	F8	Fuse	2.16	S30	Pressure switch reverse/right

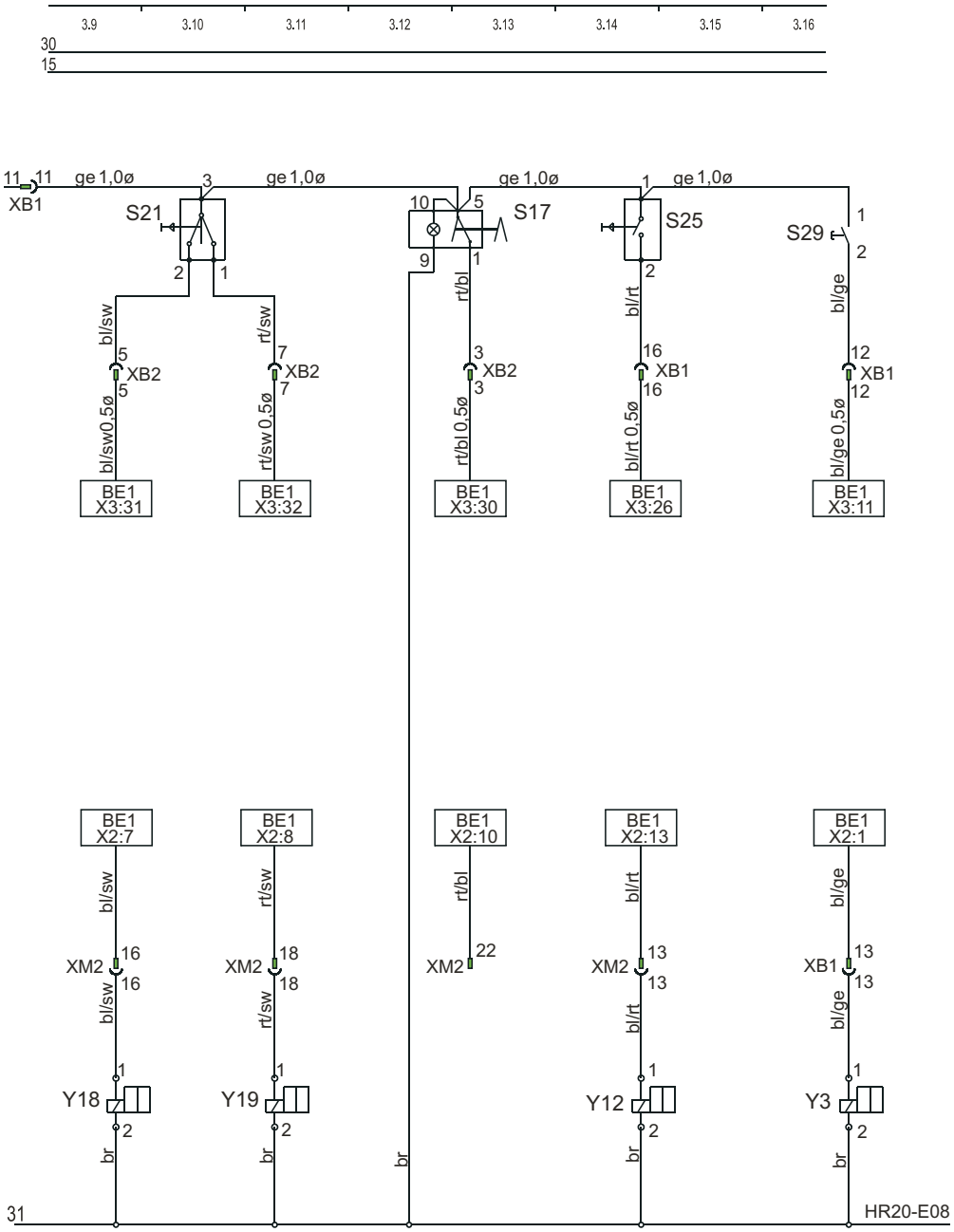
Load warning device	Travel	Float position, rock breaker



Path	Desig-nation	Device	Path	Desig-nation	Device
		Load warning device			**Float position, breaker**
3.2	S9	Shut-off - load warning device	3.6	S8	Float position
		Travel	3.6	Y11	Float position valve
3.3	S5	FAST-SLOW	3.7	S15	Rock breaker
3.3	Y5	Valve, fast	3.7	Y4	Rock breaker valve
3.4	S6	Travel motion alarm			
3.4	H10	Travel motion alarm			

Typ Model Type Tipo	**TC 60**	**Elektrisches System** **Electrical System** **Circuit électrique** **Sistema eléctricor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación		**Stromlaufplan** **Wiring diagram** **Circuit électrique** **Esquemas de los circuitos**	Blatt Page Feuille Página	**7.60.06**

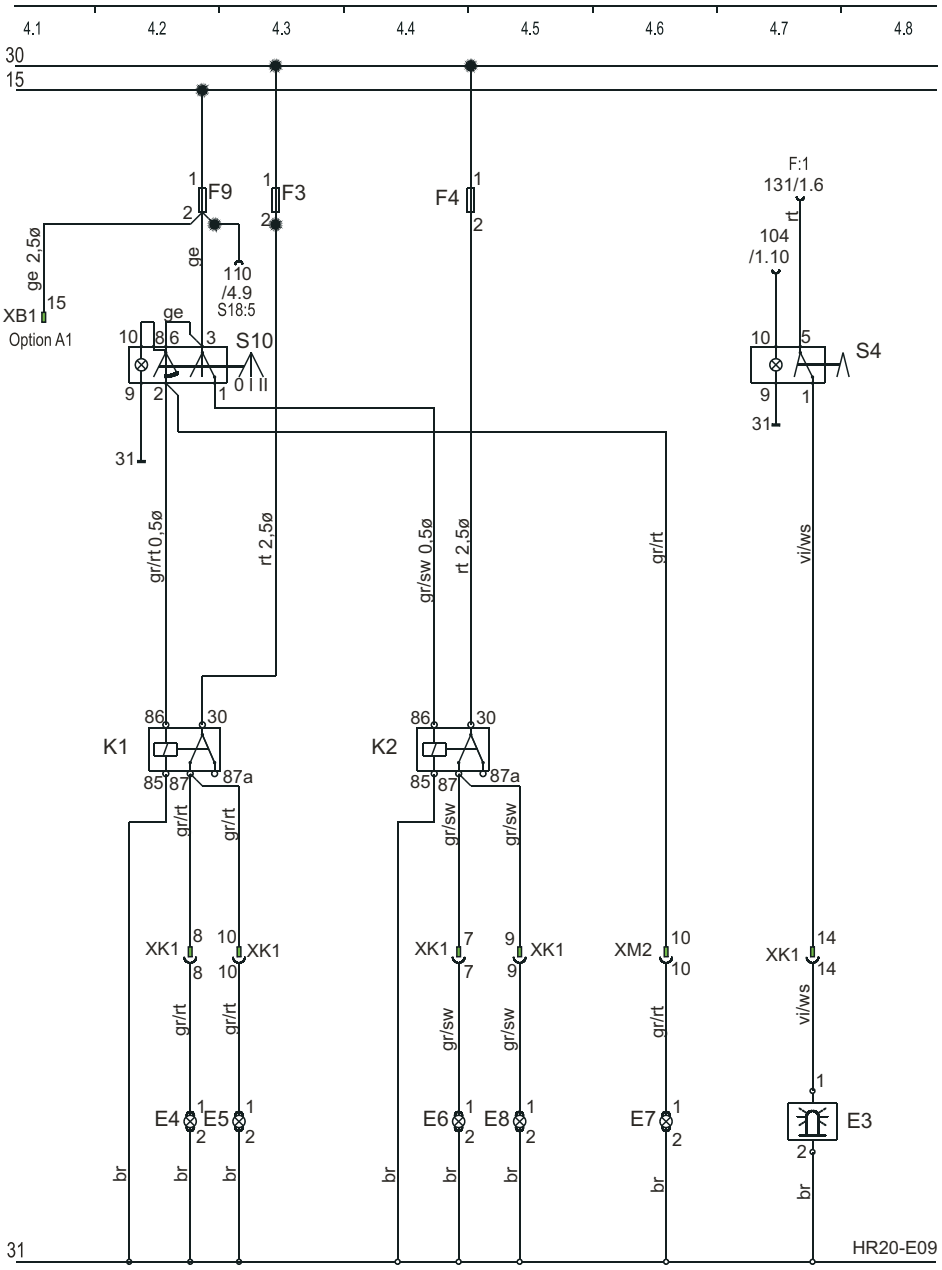
Joystick, right	Option	Swing brake	Working hydraulics



Path	Desig-nation	Device	Path	Desig-nation	Device
		Joystick, right			***Swing brake***
3.10	S21	Push-button — additional control circuit	3.14	S25	Swing brake
3.10	Y18	Valve — additional control circuit	3.14	Y12	Valve — swing brake
3.10	Y19	Valve — additional control circuit			***Working hydraulics***
		Option	3.15	S29	Armrest switch
3.12	S17	Option	3.15	Y3	Working hydraulics

Typ Model Type Tipo	**TC 60**	**Elektrisches System** **Electrical System** **Circuit électrique** **Sistema eléctricor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Stromlaufplan** **Wiring diagram** **Circuit électrique** **Esquemas de los circuitos**		Blatt Page Feuille Página	**7.60.07**

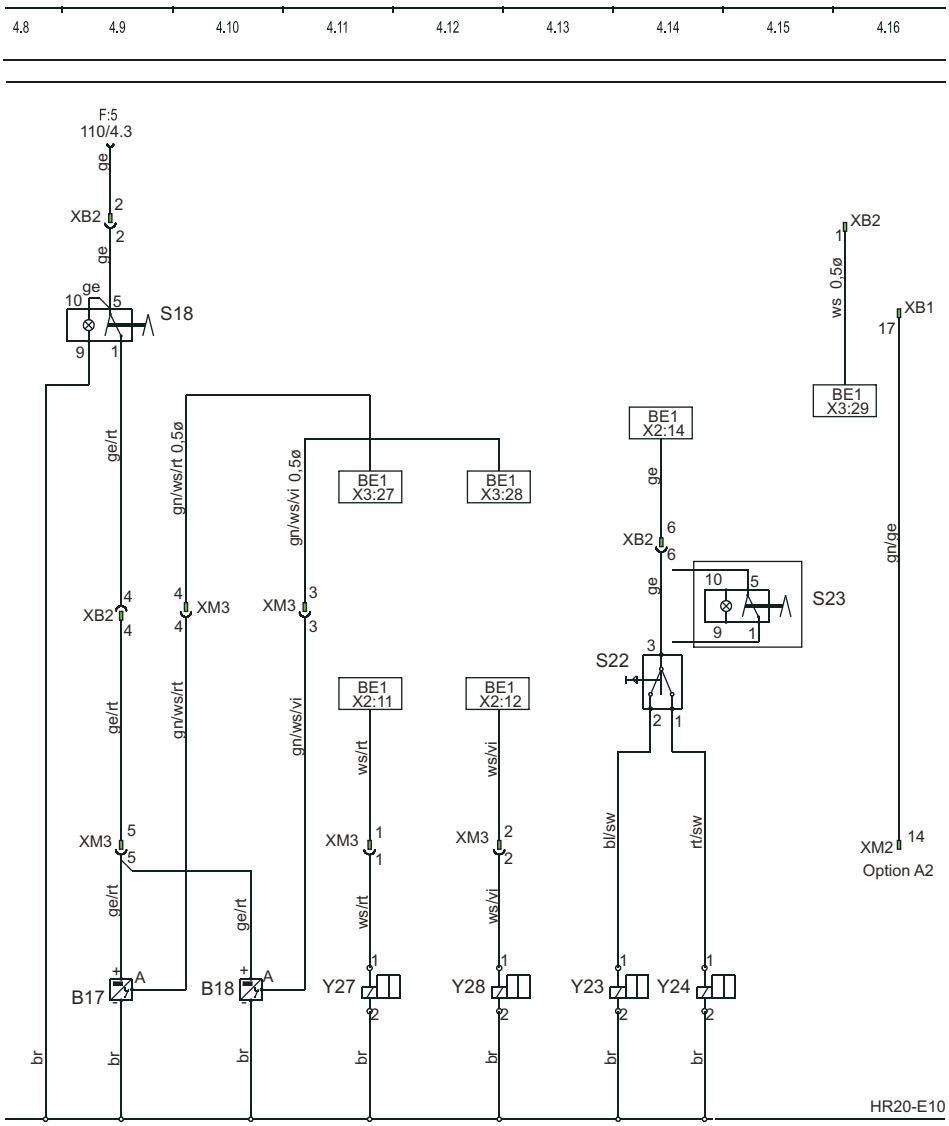
Working floodlights	Rotating beacon



Path	Desig-nation	Device	Path	Desig-nation	Device
		Working floodlights	4.4	F4	Fuse
4.1	A1	Air-cushioned seat (option)	4.4	K2	Relay
4.2	F9	Fuse	4.4	E6	Working floodlight rear
4.2	S10	Working floodlights	4.5	E8	Working floodlight rear
4.2	K1	Relay	4.6	E7	Boom-mounted work. floodlight
4.2	E4	Working floodlight front	4.7	S4	Rotating beacon switch
4.3	F3	Fuse	4.7	E3	Rotating beacon
4.3	E5	Working floodlight front			

Typ Model Type Tipo	**TC 60**	**Elektrisches System** **Electrical System** **Circuit électrique** **Sistema eléctricor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Stromlaufplan** **Wiring diagram** **Circuit électrique** **Esquemas de los circuitos**		Blatt Page Feuille Página	**7.60.08**

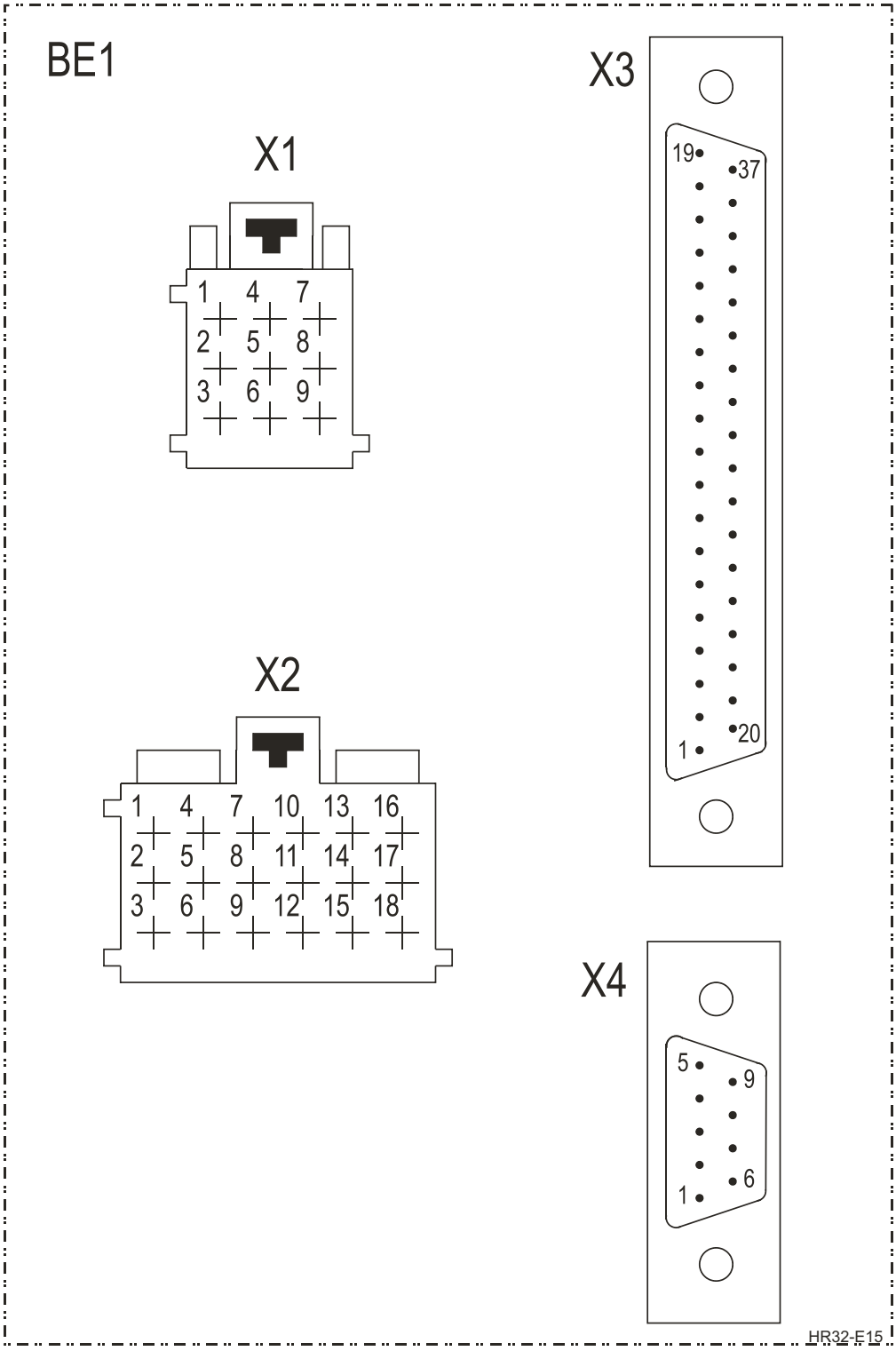
"Circular" boom — restriction of reach	Joystick, left	Option



Path	Designation	Device	Path	Designation	Device
		Restriction of reach for "Circular" boom			***Joystick, left***
4.9	B17	Boom proximity switch	4.14	S22	Push-button — additional control circuit II
4.9	S18	Switch — restriction of reach	4.14	Y23	Solenoid valve — additional control circuit II
4.10	B18	Intermediate boom proximity switch	4.14	Y24	Solenoid valve — additional control circuit II
4.12	Y27	Boom solenoid valve	4.15	S23	Cut-off switch — additional control circuit II - option
4.13	Y28	Intermed. boom solenoid valve			***Option***
			4.16	--	Cable link ISO/SAE
			4.16	X3:29	Reserve

Typ Model Type Tipo	**TC 60**	**Elektrisches System** **Electrical System** **Circuit électrique** **Sistema eléctricor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Stromlaufplan** **Wiring diagram** **Circuit électrique** **Esquemas de los circuitos**		Blatt Page Feuille Página	**7.60.09**

Check module



Typ Model Type Tipo	**TC 60**	**Elektrisches System** **Electrical System** **Circuit électrique** **Sistema eléctricor**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación		**Kontrollmodul** **Control module** **Module de surveilance** **Módulo de control**	Blatt Page Feuille Página	**7.60.10**

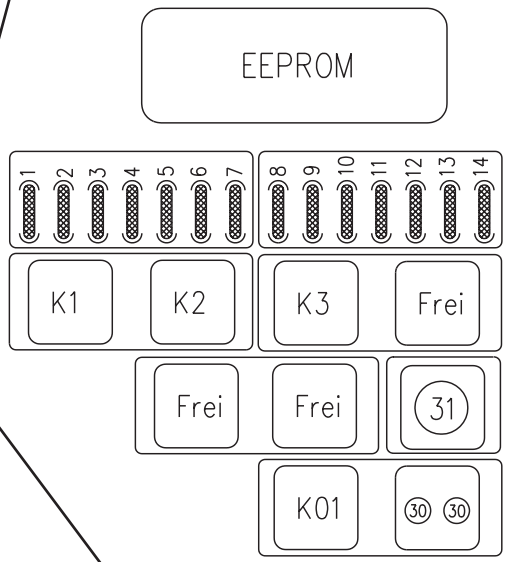
X1	***Power supply***
1	Power supply Ter minal 30
2	Power supply Terminal 30
3	Power supply Terminal 30
4	Central mass
5	Power supply Terminal 15
6	--
7	--
8	--
9	--
X2	***Signal outputs***
1	Working hydraulics
2	Rock breaker
3	FAST-SLOW
4	Float position
5	Travel motion alarm
6	Pre-heat
7	Valve — additional control circuit
8	Valve — additional control circuit
9	--
10	Option
11	Boom cut-off
12	Intermediate boom cut-off
13	High torque swing drive
14	Valve — additional control circuit 2
15	--
16	--
17	--
18	--
X3	***Signal inputs***
1	--
2	--
3	Oil pressure switch
4	Air filter clogging
5	Hydraulic oil filter clogging
6	Hydraulic oil level switch
7	--
8	--
9	Overload warning switch
10	--
11	Armrest switch
12	Rock breaker switch
13	--
14	FAST-SLOW switch
15	--
16	Travel motion alarm switch
17	Tank sensor
18	Central mass
19	Coolant temperature
20	Charge control
21	Pressure switch "Travel" forward left
22	Pressure switch "Travel" reverse left
23	Pressure switch "Travel" forward right
24	Pressure switch "Travel" reverse right
25	Float position switch
26	High torque swing drive
27	Boom proximity switch
28	Intermediate boom proximity switch
29	Option
30	Option
31	Additional control circuit — push-button
32	Additional control circuit — push-button
33	--
34	--
35	--
36	Overload warning signal
37	--
X4	***Interface***
1	--
2	--
3	--
4	--
5	--
6	--
7	--
8	--
9	--

Sicherungen (Fuses)

Name	Amp.	belegt mit (assigned to)
F1	10	Glühstartschalter Innenleuchte Wegfahrsperre (ignition start switch interior light immobilizer)
F2	15	Steckdose, Radio Kl.30 Option Zusatzheizung (socket, radio, option additional heating)
F3	10	Rundumleuchte (rotating beacon)
F4	15	Arbeitsscheinwerf. vorne (working floodlight, front)
F5	15	Arbeitsscheinwerf. hi. (working floodlight, rear)
F6	15	Betankungspumpe, Option elektr. Sitz (refuelling pump, option electrical seat)
F7	10	Horn, Schalterbeleucht.,Wegfahrsperre (horn, panel light, immobilizer)
F8	15	Heizgebläse Klimaanlage (heater fan A/C system
F9	15	Wisch–Waschanlage Radio Kl.15 (wish/wash system radio cl.15)
F10	5	Hydr.–Ölniveau, Lastwarn Hydraulikfunktionen (hydraulic oil level, overload warning hydraulic functions)
F11	5	Druckschalter Fahren (pressure switch travelling)
F12	5	Arbeitshydraulik (hydraulic main system)
F13	5	Koordinatenhebel li. / re. (joy–stick left / right)
F14	10	Option: Reichweitenbegrenz. (option: range limitation)

Relais (relays)

	Funktion (function)
K1	Arbeitsscheinwerfer vo. (working floodlight, front)
K2	Arbeitsscheinwerfer hi. (working floodlight, rear)
K3	nicht belegt (not assigned)



Typ Model Type Tipo	**TC 75**	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no. *TC 00750100*	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Sicherungs- und Belegungsplanfplan Assignment diagramm Schéma de réparation Esquemas de la caja**			Blatt Page Feuille Página	**7.65.50**


TEREX®

Charge indicator

generator D+	wire harness machine engine plug XMNT:2	wire harness machine disconnect XM1:2	input plug control module X3:20	warning lamp	only with running engine
blue	blue	blue	blue		
12V	12V	12V	12V	OFF	

Oil pressure indicator

oil pressure switch S5	wire harness machine engine plug XMNT:6	wire harness machine disconnect XM1:3	input plug control module X3:3	warning lamp
green	green	green	green	
0V	0V	0V	0V	ON

Air filter indicator

maintenance switch air filter S4	wire harness machine disconnect XM2:1	input plug control module X3:4	warning lamp
blue / white	blue / white	blue / white	
0V	0V	0V	ON

Hydraulic oil filter indicator

maintenance switch hydraulic oil filter S7	wire harness machine disconnect XM2:2	input plug control module X3:5	warning lamp
green / yellow	green / yellow	green / yellow	
0V	0V	0V	ON

Hydraulic oil level

oil level transmitter B20	wire harness machine disconnect XM2:6	input plug control module X3:6	warning lamp
green / white / violet	green / white / violet	green / white / violet	
0V	0V	0V	ON

Working hydraulics

wire harness floor frame: armrest switch S29:2	wire harness floor frame disconnect XB1:12	input plug control module X3:11
blue / yellow	blue / yellow	blue / yellow
12V	12V	12V

All voltages are measured between ground and the corresponding test point!!
Unless otherwise indicated, the ignition has to be switched on !!

output plug control module X2:1	wire harness floor frame disconnect XB1:13	valve Y3:1
blue / yellow	blue / yellow	blue / yellow
12V	12V	12V

Breaker

switch breaker operation S15:1	input plug control module X3:12
brown / yellow	brown / yellow
12V	12V

output plug add. module X2:2	wire harness floor frame disconnect XB1:14	valveY4:1
brown / yellow	brown / yellow	brown / yellow
12V	12V	12V

Fast travel

switch S5:1	input plug control module X3:14	pressure switch front left S33:2	wire harness floor frame disconnect XB1:2	input plug control module X3:21	pressure switch front right S32:2	wire harness floor frame disconnect XB1:4	input plug control module X3:23
red / yellow	red / yellow	red / black	red / black	red / black	red / green	red / green	red / green
12V	12V	12V	12V	12V	12V	12V	12V

output plug control module X2:3	wire harness floor frame disconnect XB1:7	valveY5:1
red	red	red
12V	12V	12V

switch S5:1	input plug control module X3:14	pressure switch rear left S31:2	wire harness floor frame disconnect XB1:2	input plug control module X3:22	pressure switch rear right S30:2	wire harness floor frame disconnect XB1:4	input plug control module X3:24
red / yellow	red / yellow	red / blue	red / blue	red / blue	red / white	red / white	red / white
12V	12V	12V	12V	12V	12V	12V	12V

output plug control module X2:3	wire harness floor frame disconnect XB1:7	valveY5:1
red	red	red
12V	12V	12V

Float position

switch float position S8:1	input plug control module X3:25
blue / red	blue / red
12V	12V

output plug control module X2:4	wire harness machine disconnect XM2:3	valveY11:1
blue / red	blue / red	blue / red
12V	12V	12V

Swing brake

pushbutton left-hand joystick S25:2	wire harness floor frame disconnect XB1:16	input plug control module X3:26
blue / red	blue / red	blue / red
12V	12V	12V

output plug control module X2:13	wire harness machine disconnect XM2:13	valveY12:1
blue / red	blue / red	blue / red
12V	12V	12V

Additional control circuit I

pushbutton right-hand joystick S21:2	wire harness floor frame disconnect XB2:5	input plug control module X3:31	switch breaker operation S15:1	input plug control module X3:12	pushbutton right-hand joystick S21:1	wire harness floor frame disconnect XB2:7	input plug control module X3:32
blue / black	blue / black	blue / black	brown / yellow	brown / yellow	red / black	red / black	red / black
12V	12V	12V	0V	0V	12V	12V	12V

output plug control module X2:7	wire harness machine disconnect XM2:16	valveY18:1	output plug control module X2:8	wire harness machine disconnect XM2:18	valveY19:1
blue / black	blue / black	blue / black	red / black	red / black	red / black
12V	12V	12V	12V	12V	12V

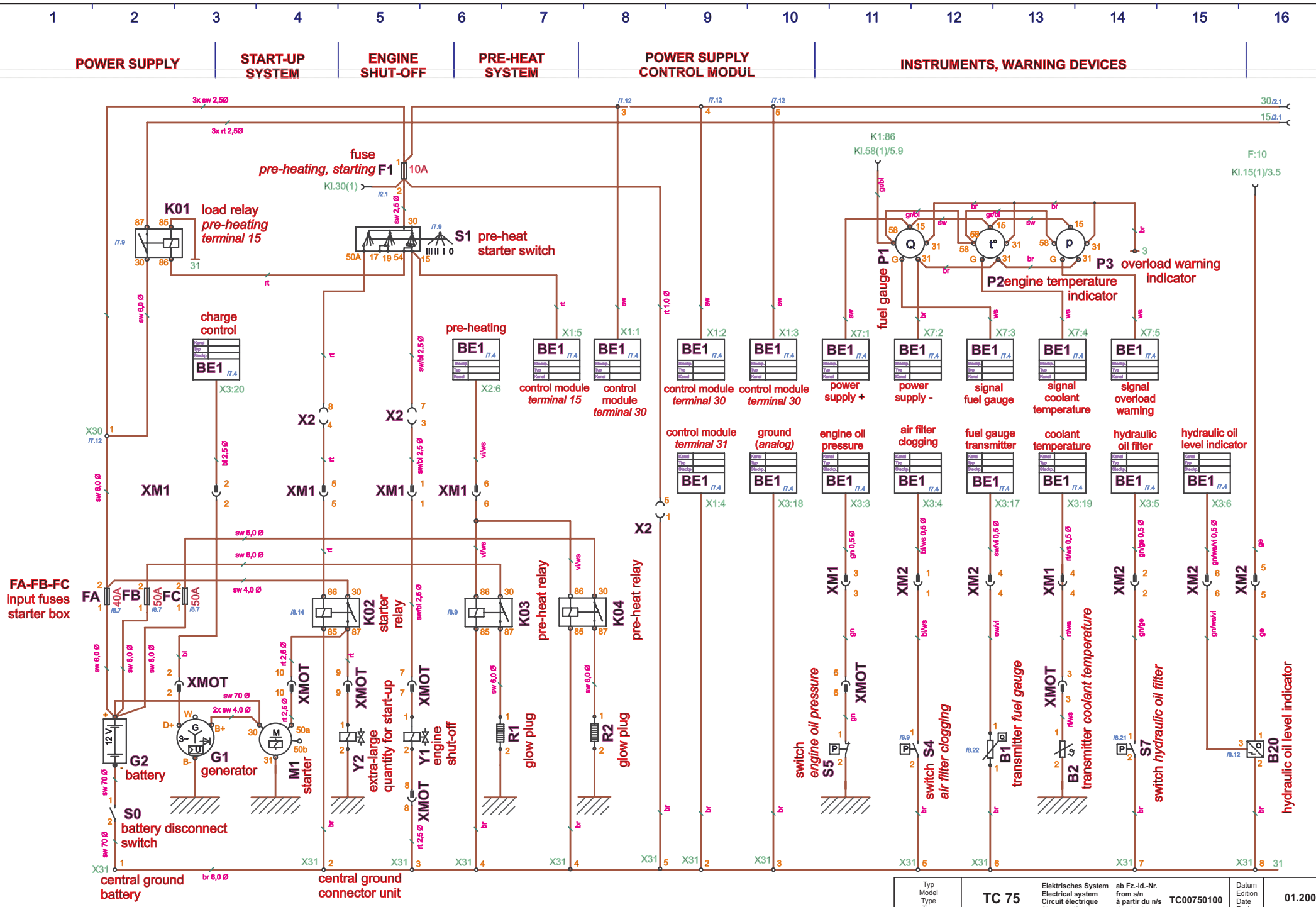
Additional control circuit II

output plug control module X2:14	wire harness floor frame disconnect XB2:6	pushbutton left-hand joystick S22:3	pushbutton left-hand joystick S22:2	output plug control module X2:14	wire harness floor frame disconnect XB2:6	pushbutton left-hand joystick S22:3	pushbutton left-hand joystick S22:1
yellow	yellow	yellow	blue / black	yellow	yellow	yellow	red / black
12V	12V	12V	12V	12V	12V	12V	12V

valveY23:1		valveY24:1
blue / black		red / black
12V		12V

All voltages are measured between ground and the corresponding test point!!
Unless otherwise indicated, the ignition has to be switched on !!

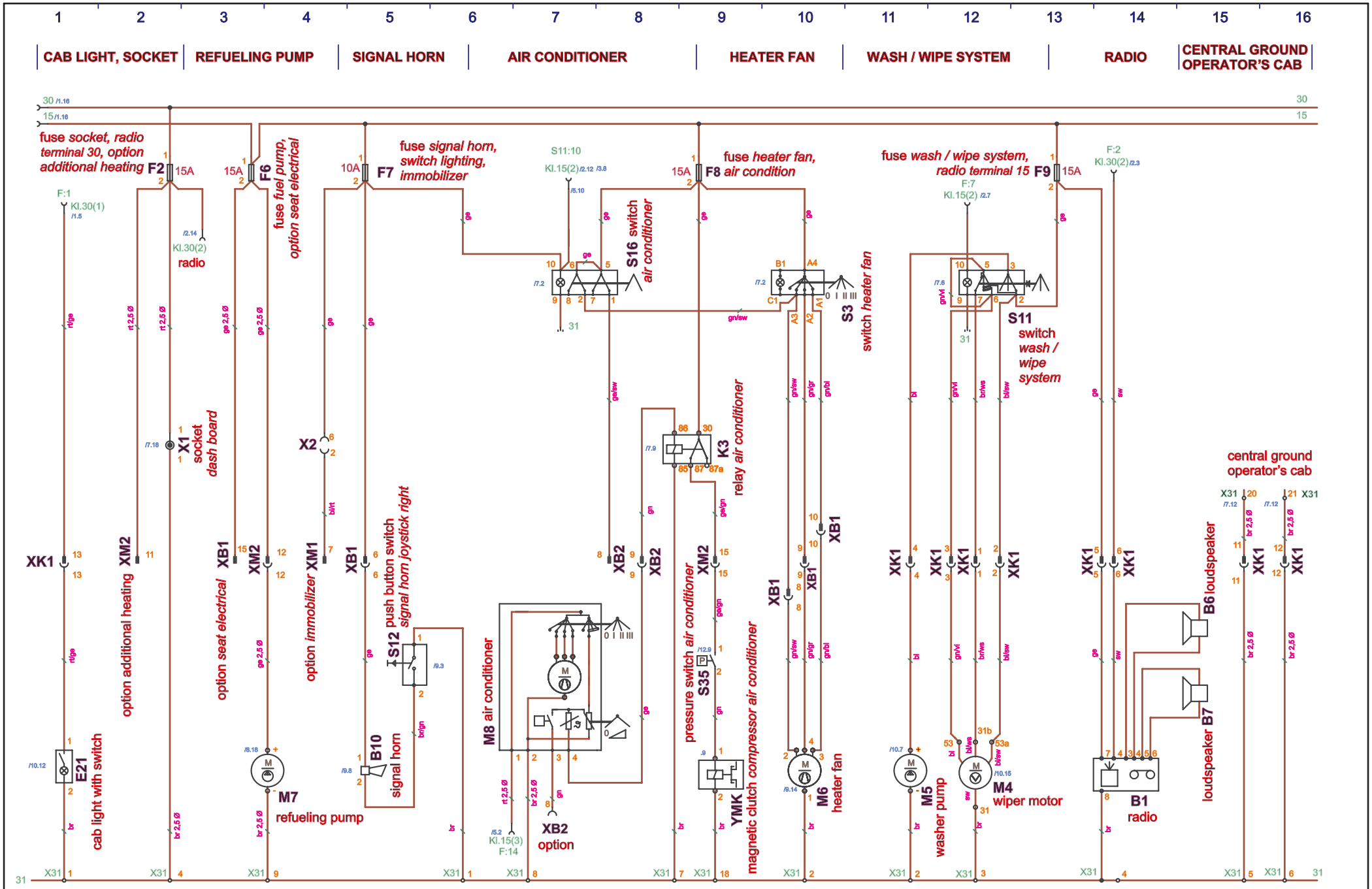

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BE1	connector central control module
XMOT	connector engine - machine

XM1	connector machine - dash board
XM2	connector machine - dash board

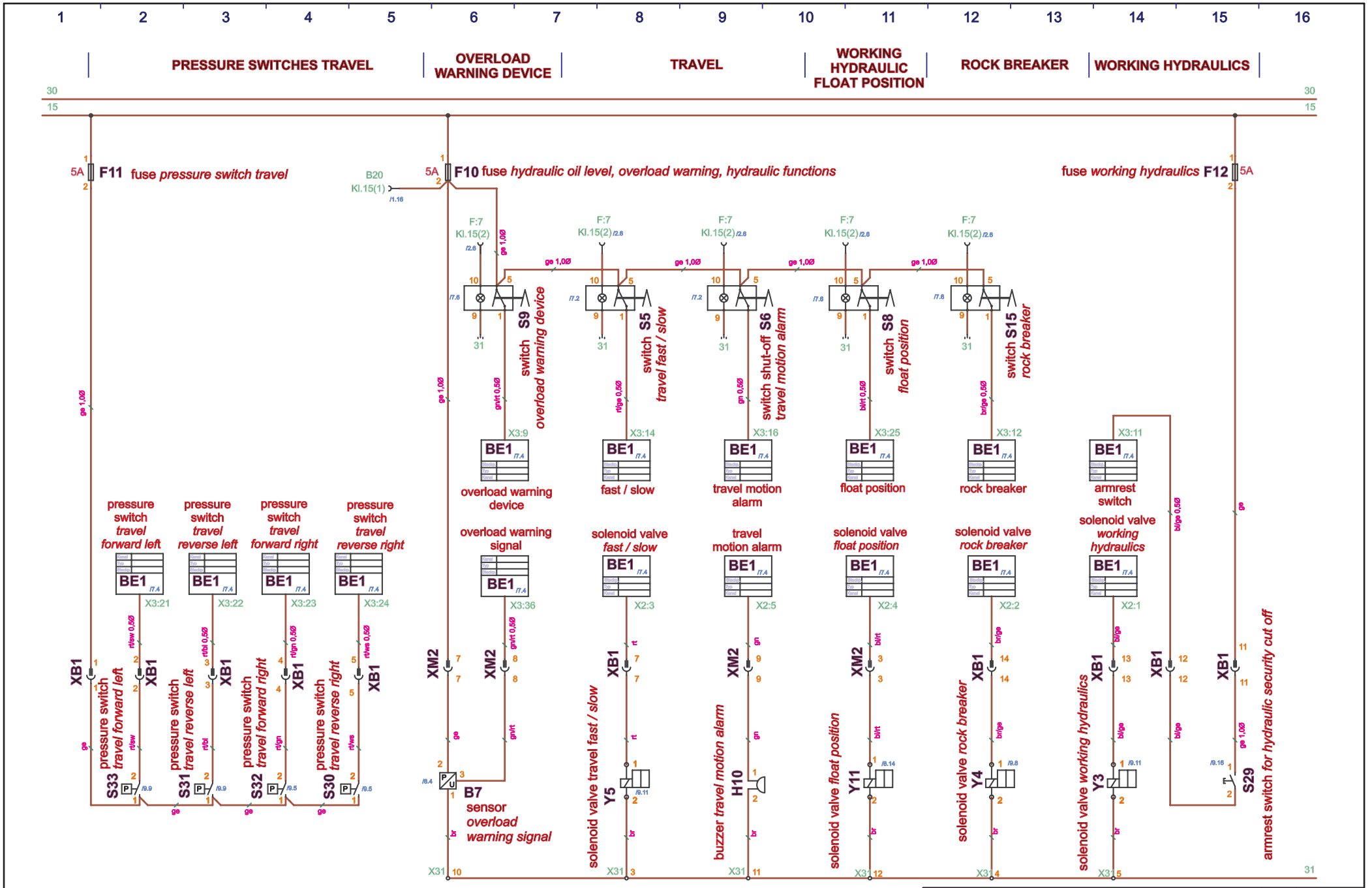
Typ Model Type Tipo	TC 75	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TC00750100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos	Blatt Page Feuille Página	1/5		Blatt Page Feuille Página	7.65.51



XB1	connector *floor frame / dash board*
XB2	connector *floor frame / dash board*
XM1	connector *machine / dash board*
XM2	connector *machine / dash board*

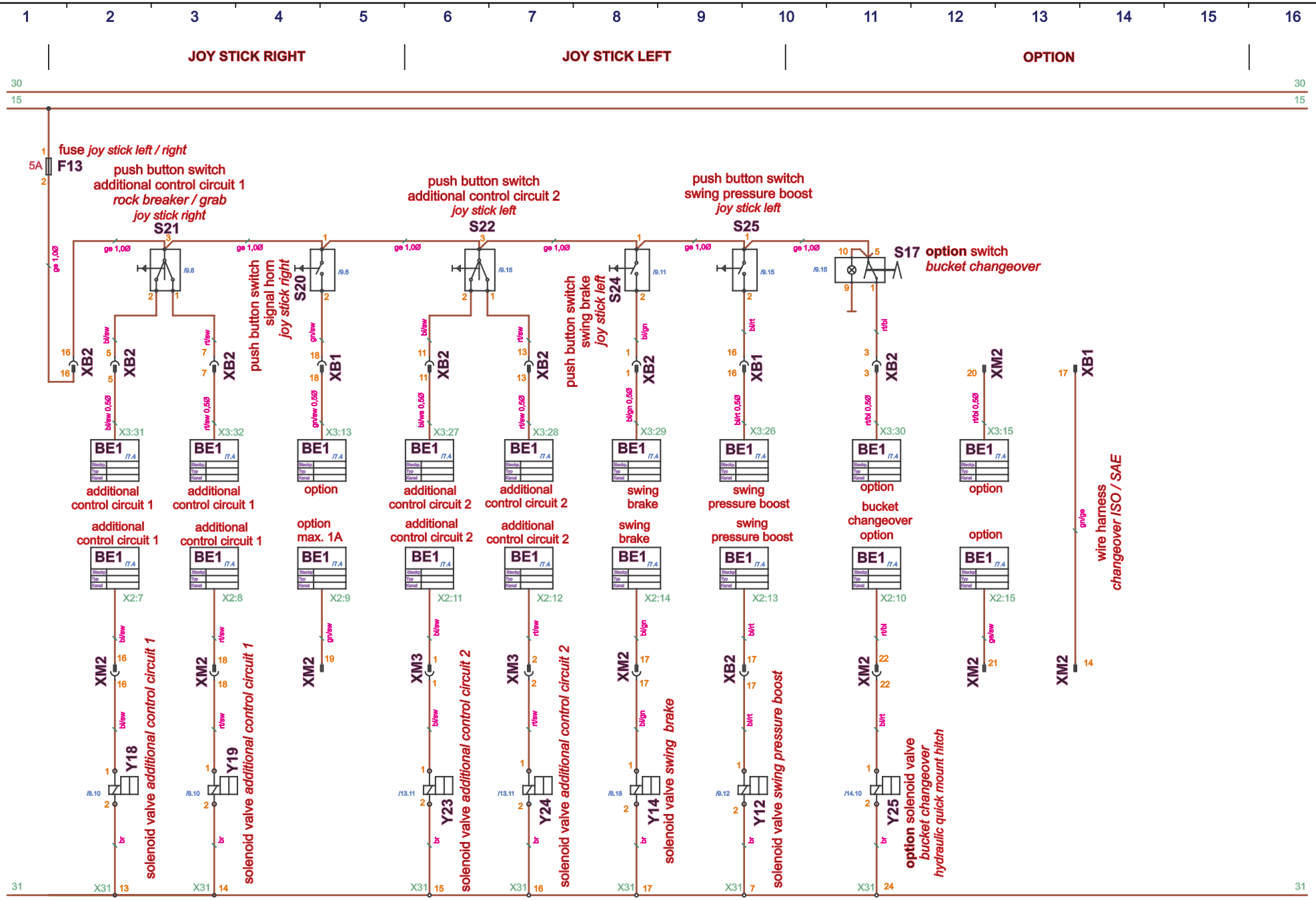
XK1	connector *operator's cab / dash board*

Typ / Model / Type / Tipo	TC 75	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC00750100	Datum / Edition / Date / Fecha 01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 2/5	Blatt / Page / Feuille / Página 7.65.52



XB1	connector *floor frame / dash board*
XM1	connector *machine / dash board*
BE1	connector central control module

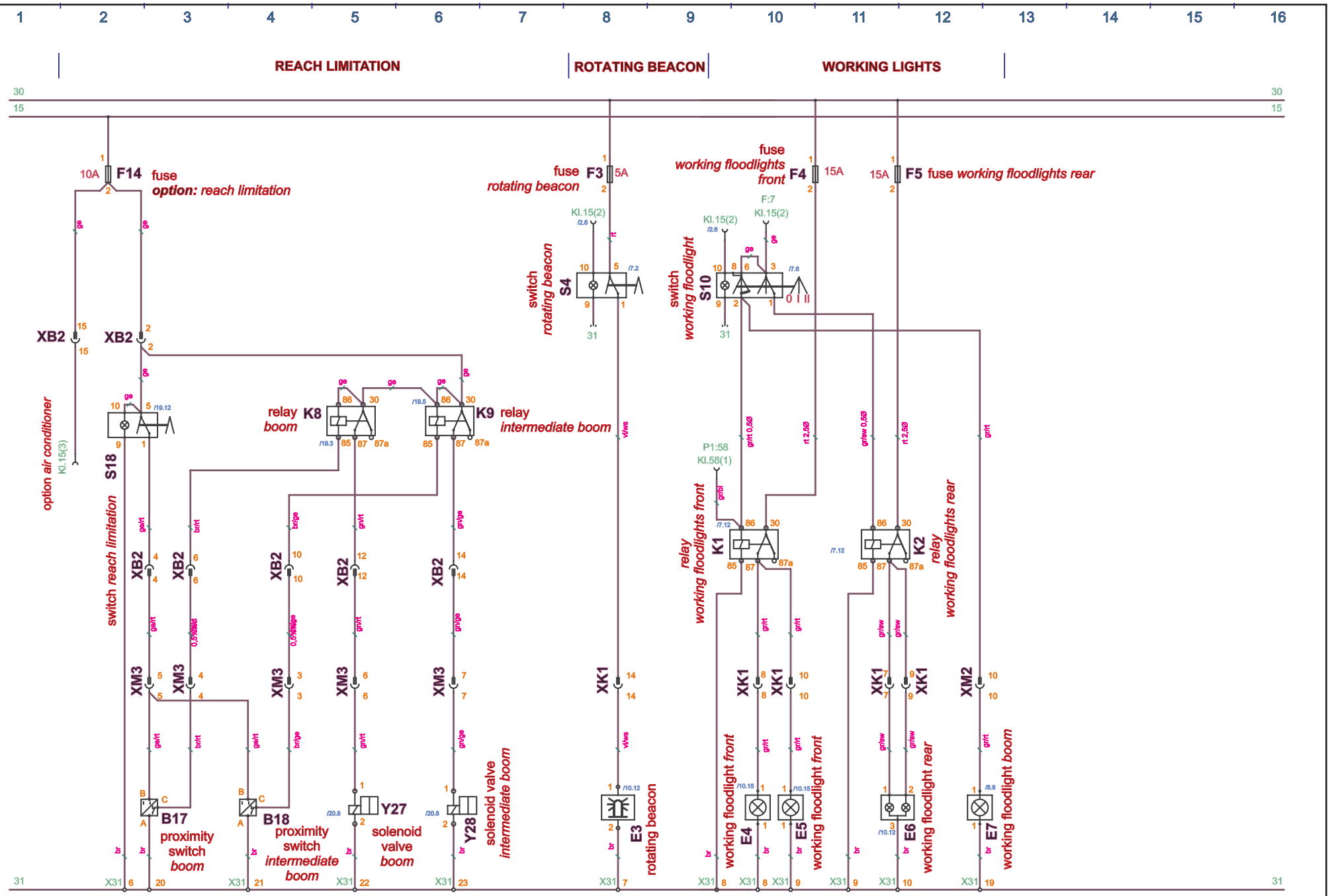
Typ Model Type Tipo	TC 75	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC 00750100	Datum Edition Date Fecha 01.2007
Benennung Description Dénomination Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt Page Feuille Página 3/5	Blatt Page Feuille Página 7.65.53



XM2	connector *machine / dash board*
XM3	connector *machine / dash board*
XB1	connector *floor frame / dash board*
XB2	connector *floor frame / dash board*

BE1	connector *central control module*

Typ Model Type Tipo	TC 75	Elektrisches System Electrical system Circuit électrique Sistema elèctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TC 00750100	Datum Edition Date Fecha 01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos	Blatt Page Feuille Página 4/5			Blatt Page Feuille Página 7.65.54



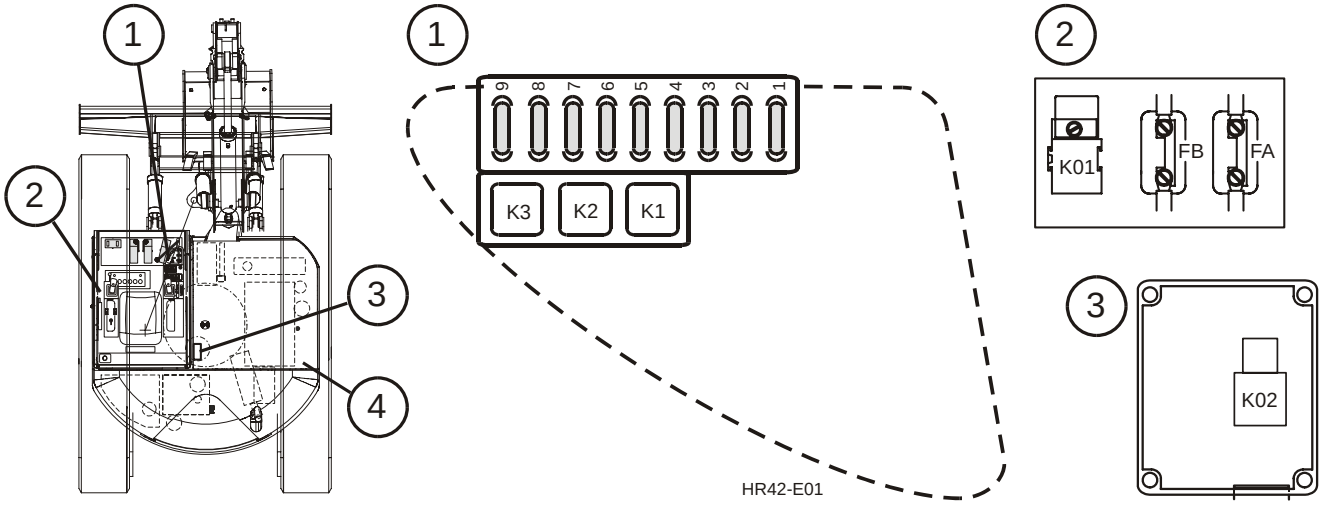
XB2	connector *floor frame / dash board*
XM2	connector *machine / dash board*
XM3	connector *machine / dash board*
XK1	connector *operator's cab / dash board*

Typ / Model / Type / Tipo	TC 75	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC 00750100	Datum / Edition / Date / Fecha	01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 5/5		Blatt / Page / Feuille / Página	7.65.55


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Electrical system

Fuse and relay box — Assignment plan



A = Instrument panel B = Battery compartment C = Starter box in engine compartment D = Power relay K03

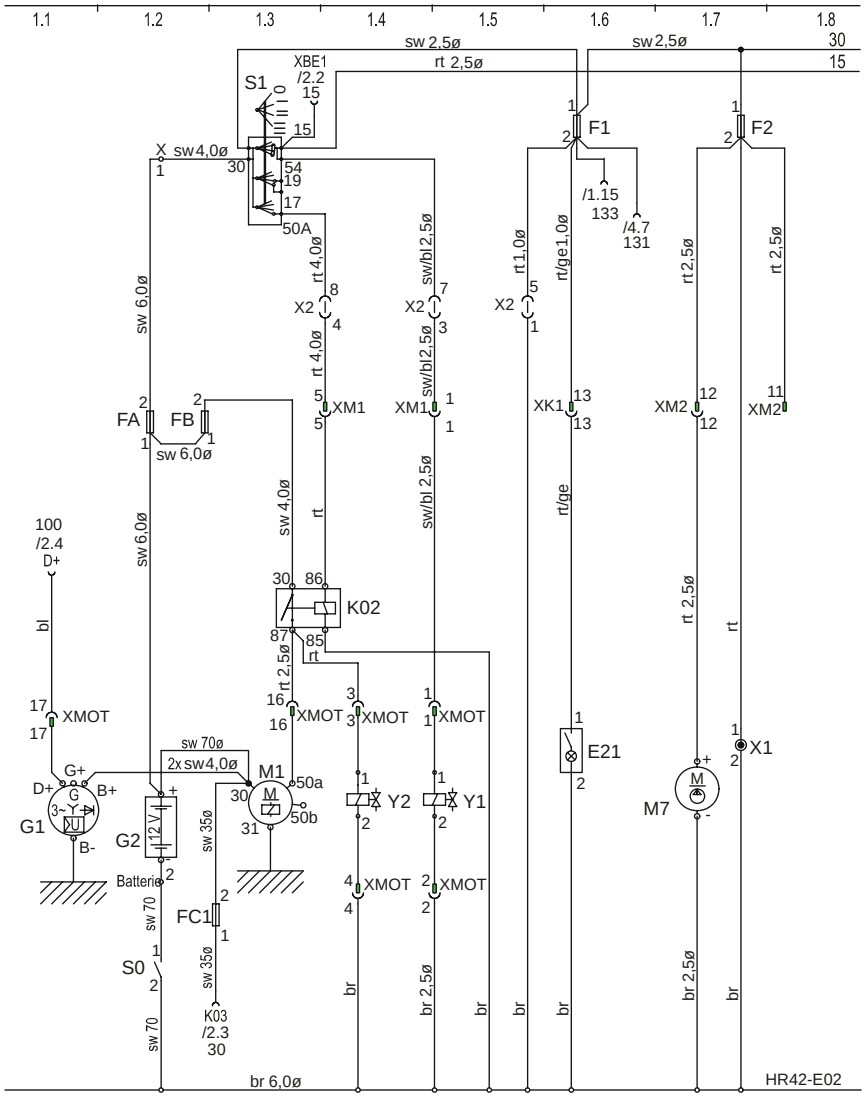
Fuses		
Item	**Ampere**	**Assigned to**
F 1	15	Interior light, radio, immobilizer, rotating beacon
F 2	20	Socket, refueling pump, optional additional heating
F 3	15	Working floodlight, front
F 4	15	Working floodlight, rear
F 5	10	Horn, switch illumination, immobilizer
F 6	15	Heater fan
F 7	15	Wish/wash system
F 8	5	Control module signal input
F 9	15	Additional heating (option) Seat with electrical heating (option) Working floodlight(s) (option)

Fuse colors			
5A	brown	10A	red
15A	blue	20A	yellow

Fuses		
Item	**Ampere**	**Assigned to**
FA	40	Main fuse
FB	40	Start-up, pre-heating
FC	150	Heater flange (K03)

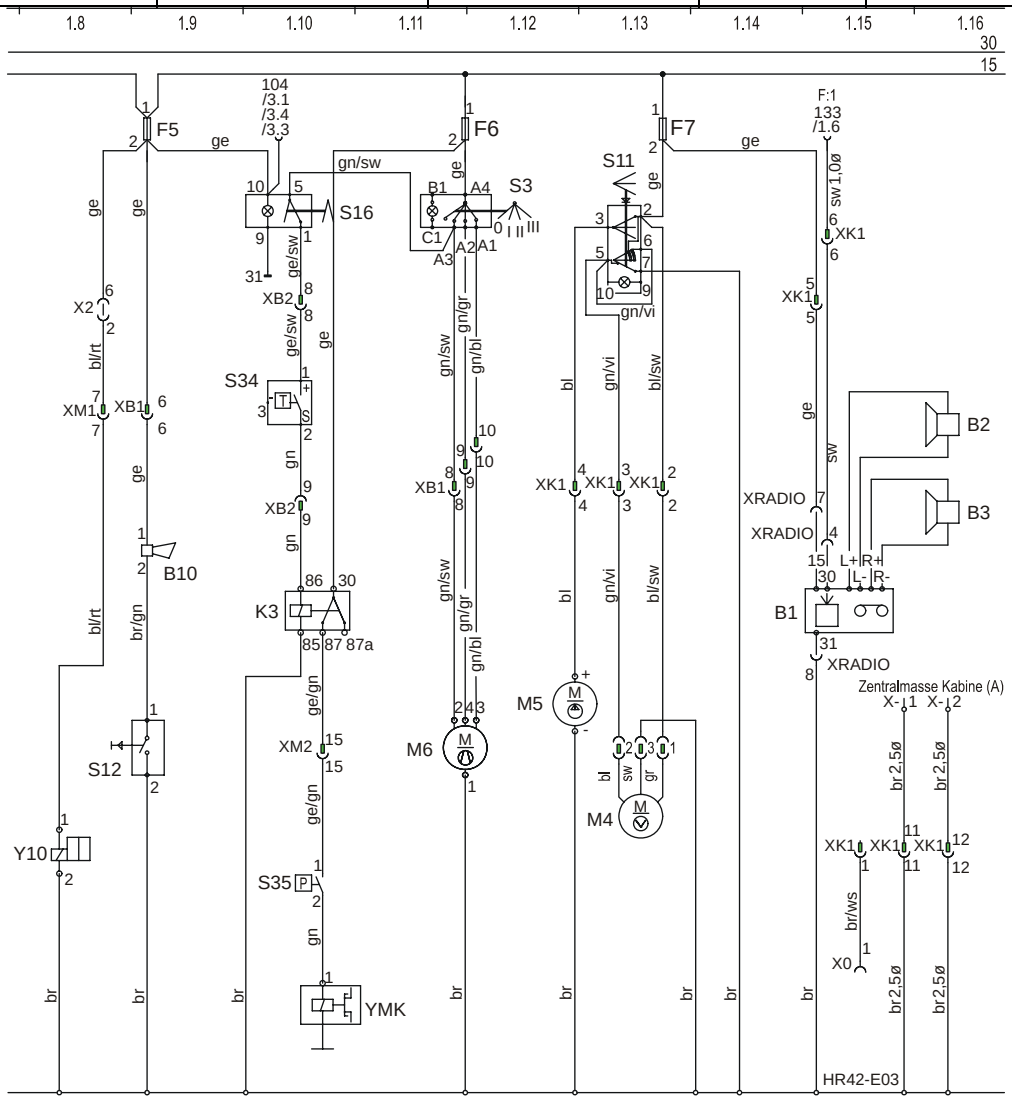
Relays	
Position	**Function**
K 02	Starting relay
K 03	Heater flange power relay
K 1	Working floodlight, front
K 2	Working floodlight, rear
K 3	not assigned (optional air conditioning)

Power supply	Start-up system	Shut-off	Interior light	Refueling pump, socket



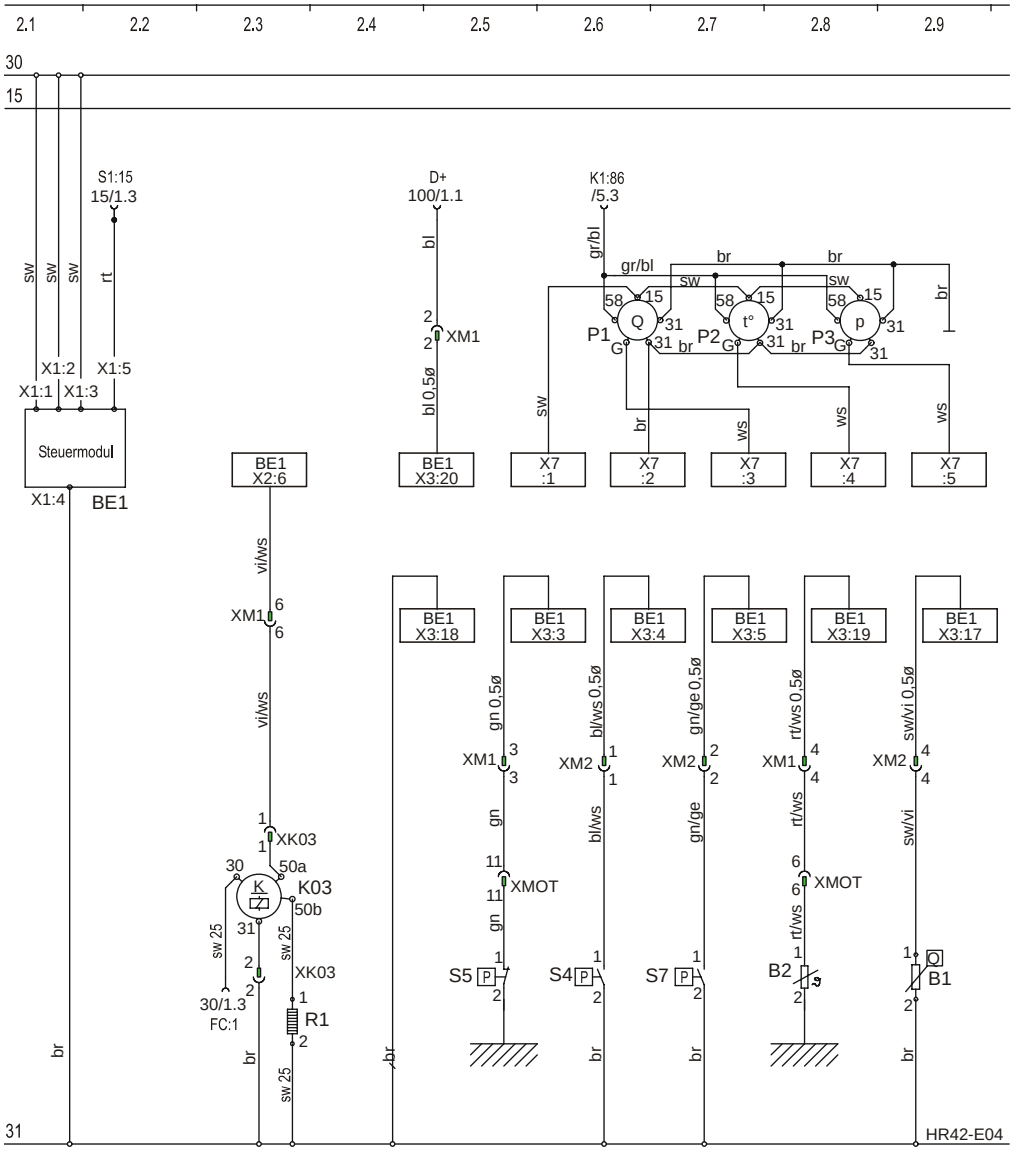
Path	Desig-nation	Device	Path	Desig-nation	Device
		Power supply			***Shut-off***
1.1	G1	Generator	1.5	Y1	Shut-off
1.2	FA	Fuse			***Interior light***
1.2	FB	Fuse	1.6	F1	Fuse
1.2	G2	Battery	1.6	E21	Interior light
1.2	S0	Battery disconnecting switch			***Refueling pump, socket***
		Start-up system	1.7	F2	Fuse
1.3	FC	Fuse	1.7	M7	Refueling pump
1.3	S1	Glow plug and starter switch	1.7	X1	Socket
1.3	M1	Starter			
1.3	K02	Start-up relay			
1.4	Y2	Excess fuel for starting			

Horn	Air conditioning	Heater fan	Wash/ wipe system	Radio



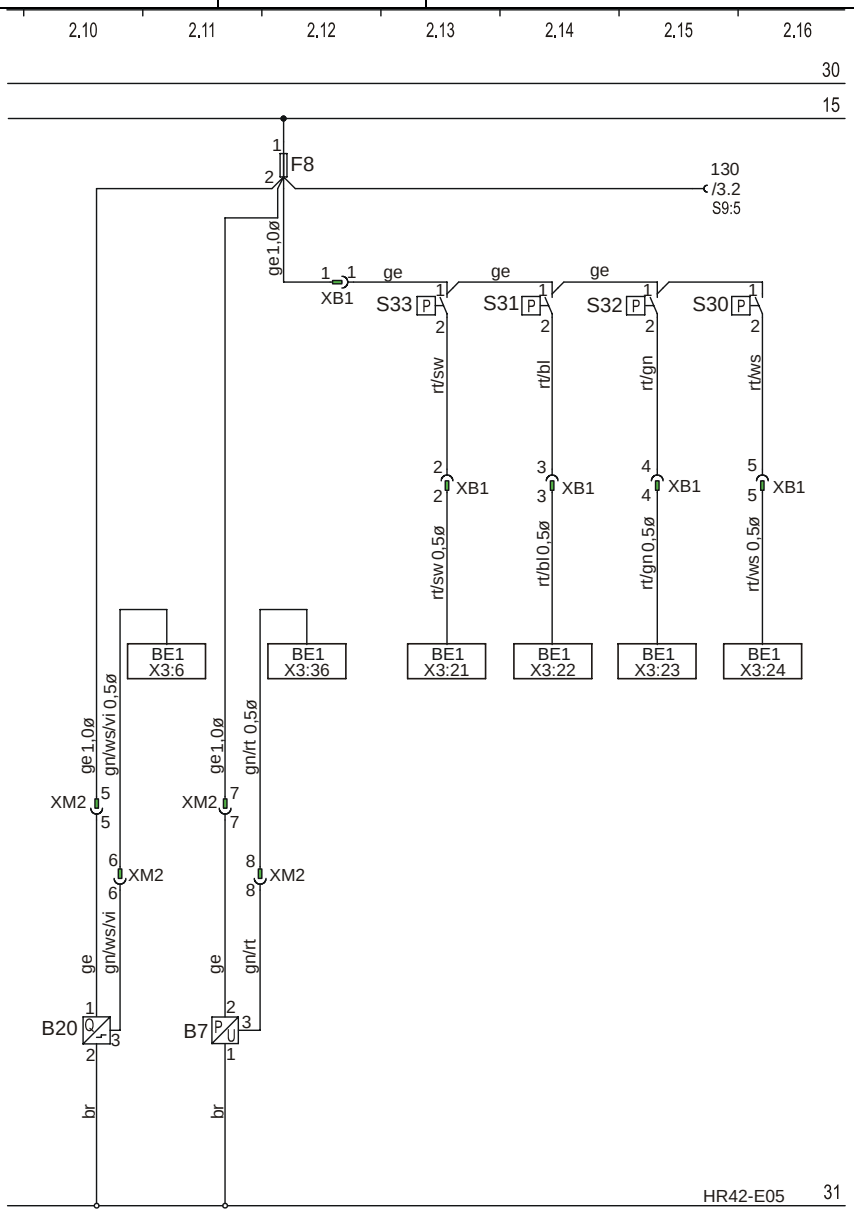
Path	Desig-nation	Device	Path	Desig-nation	Device
		Horn			***Heater fan***
1.8	Y10	Solenoid valve, immobilizer	1.11	F6	Fuse
1.9	F5	Fuse	1.11	S3	Heater fan switch
1.9	B10	Horn	1.11	M6	Heater fan
1.9	S12	Horn button			***Wash/ wipe system***
		Air conditioning	1.13	S11	Wash/ wipe switch
1.10	S16	Air conditioning switch	1.13	M5	Washer pump
3	K3	Relay	1.13	F7	Fuse
3	S34	Air condition. temperature switch	1.13	M4	Wiper motor
1.10	S35	Air condition. pressure switch			***Radio***
1.10	YMK	Compressor magnet.coupling	1.15	B1	Radio
			1.16	B2	Loudspeaker
			1.16	B3	Loudspeaker

Check module	Pre-heating	Instruments, warning equipment



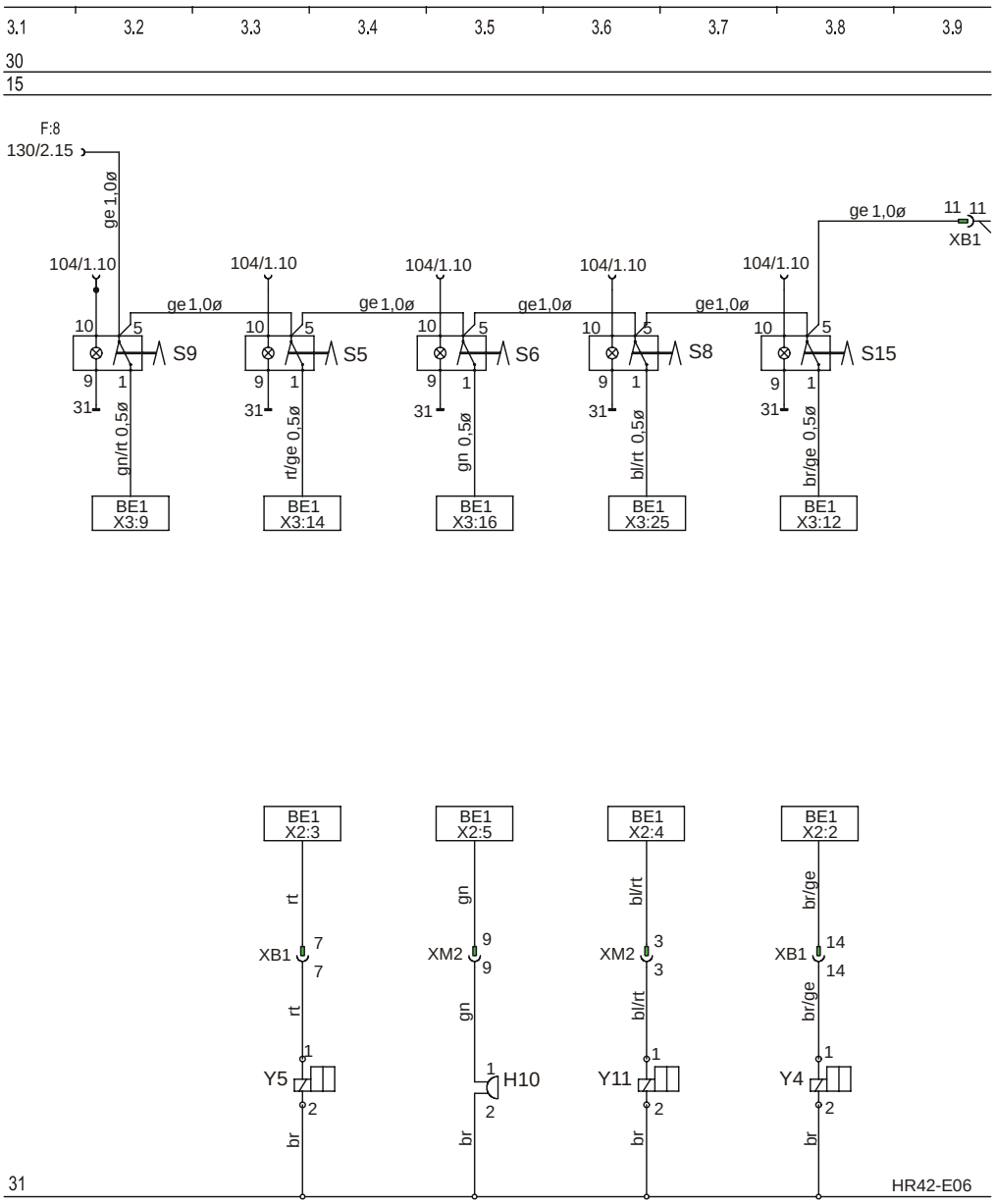
Path	Desig-nation	Device	Path	Desig-nation	Device
		Check module			***Instruments, warning equipment***
2.1	BE1	Control module	2.5	S5	Oil pressure switch
		Pre-heating	2.6	S4	Air filter servicing
2.3	K03	Power relay	2.6	P1	Fuel-level indicator
2.3	R1	Heater flange	2.7	S7	Hydraulic oil filter
			2.7	P2	Coolant temperature indicator
			2.8	B2	Coolant temperature
			2.8	P3	Overload warning device
			2.9	B1	Fuel-level sensor

Hydraulic oil level	Load warning sensor	"Travel" pressure switch



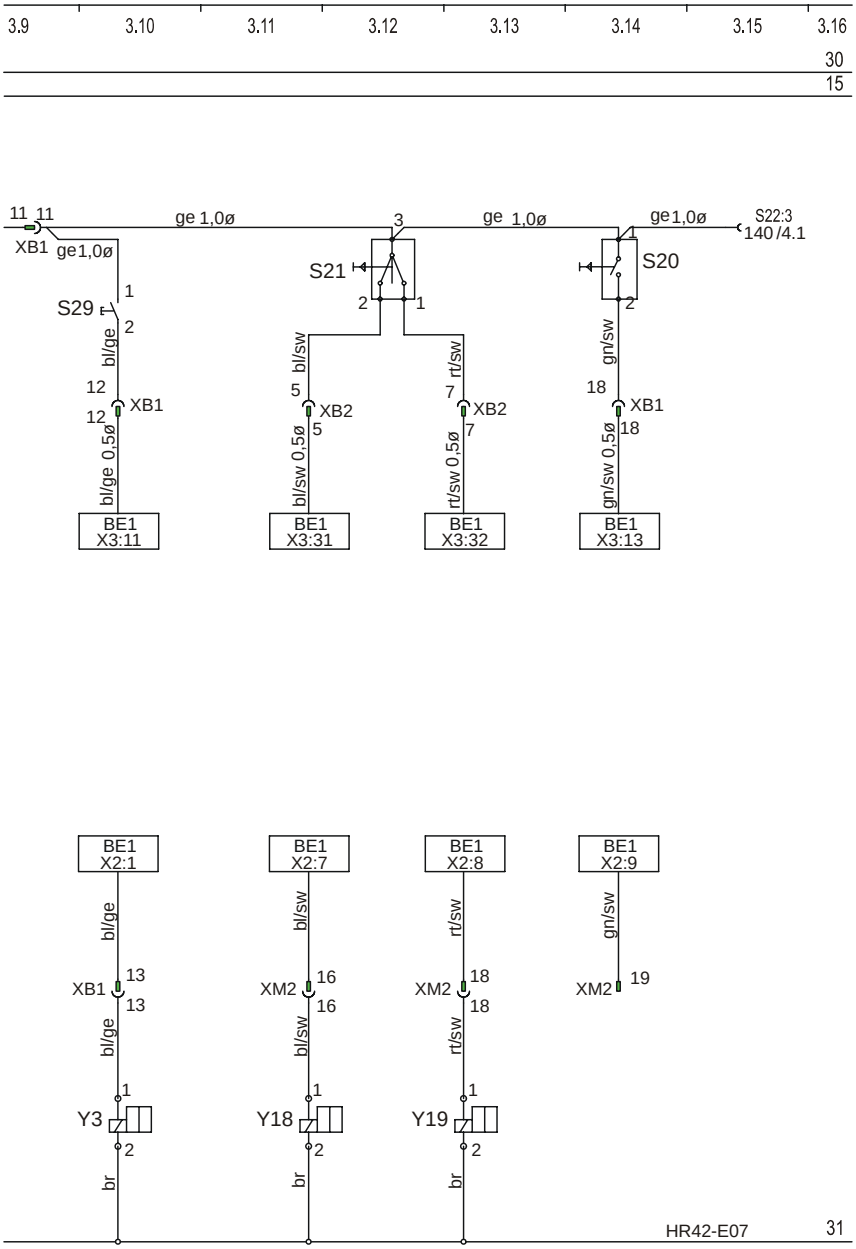
Path	Desig-nation	Device	Path	Desig-nation	Device
		Hydraulic oil level			***"Travel" pressure switch***
2.10	B20	Hydraulic oil level	2.13	S33	Pressure switch forward/left
		Load warning sensor	2.14	S31	Pressure switch reverse/left
2.11	B7	Load warning signal	2.15	S32	Pressure switch forward/right
2.12	F8	Fuse	2.16	S30	Pressure switch reverse/right

Load warning device	Travel	Float position	Rock breaker



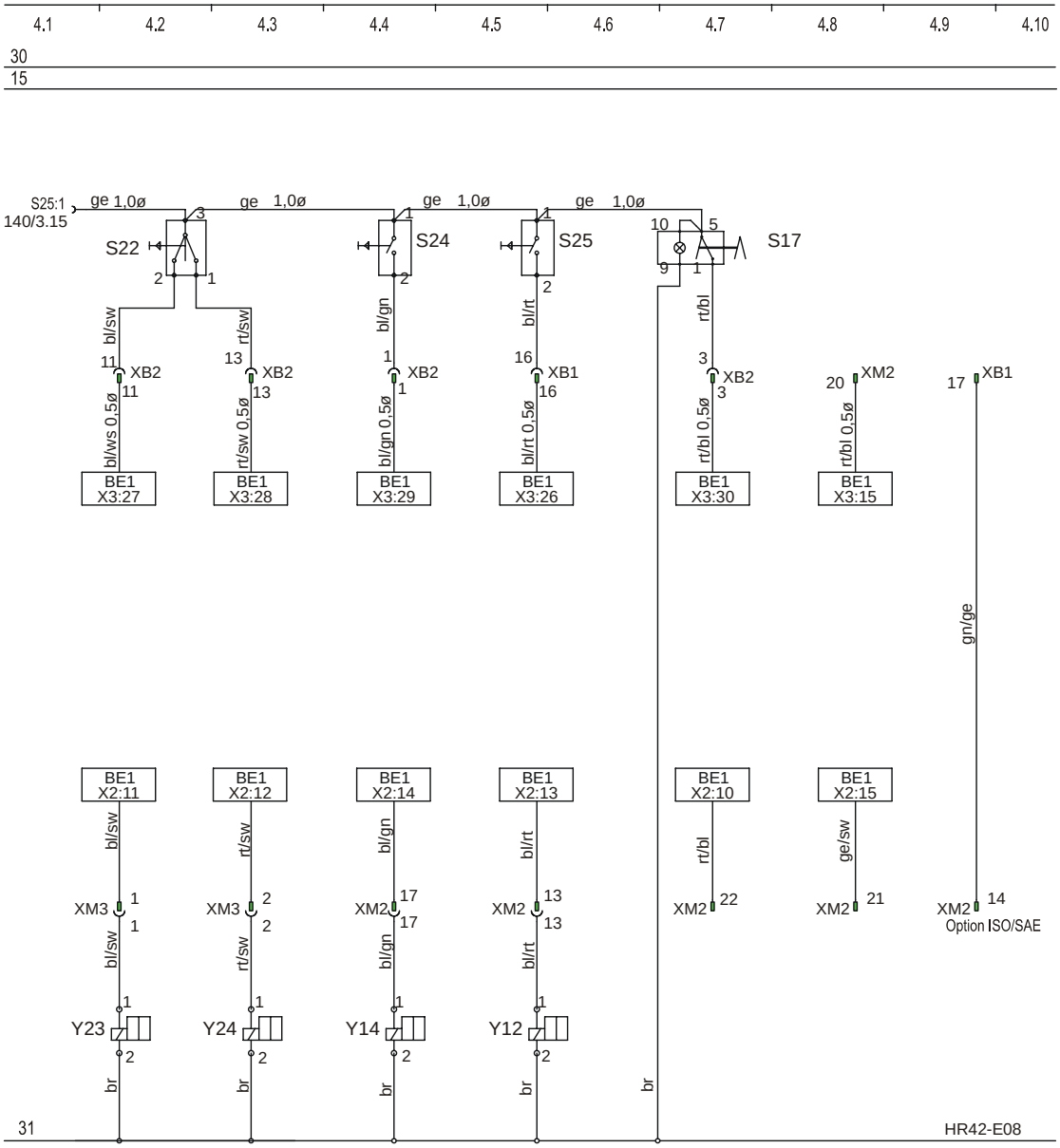
Path	Desig-nation	Device	Path	Desig-nation	Device
		Load warning device			***Float position***
3.2	S9	Shut-off - load warning device	3.6	S8	Float position
		Travel	3.6	Y11	Float position valve
3.3	S5	FAST-SLOW			***Rock breaker***
3.4	Y5	Valve, fast	3.8	S15	Rock breaker
3.5	S6	Travel motion alarm	3.8	Y4	Rock breaker valve
3.5	H10	Travel motion alarm			

Working hydraulics	Joystick, right



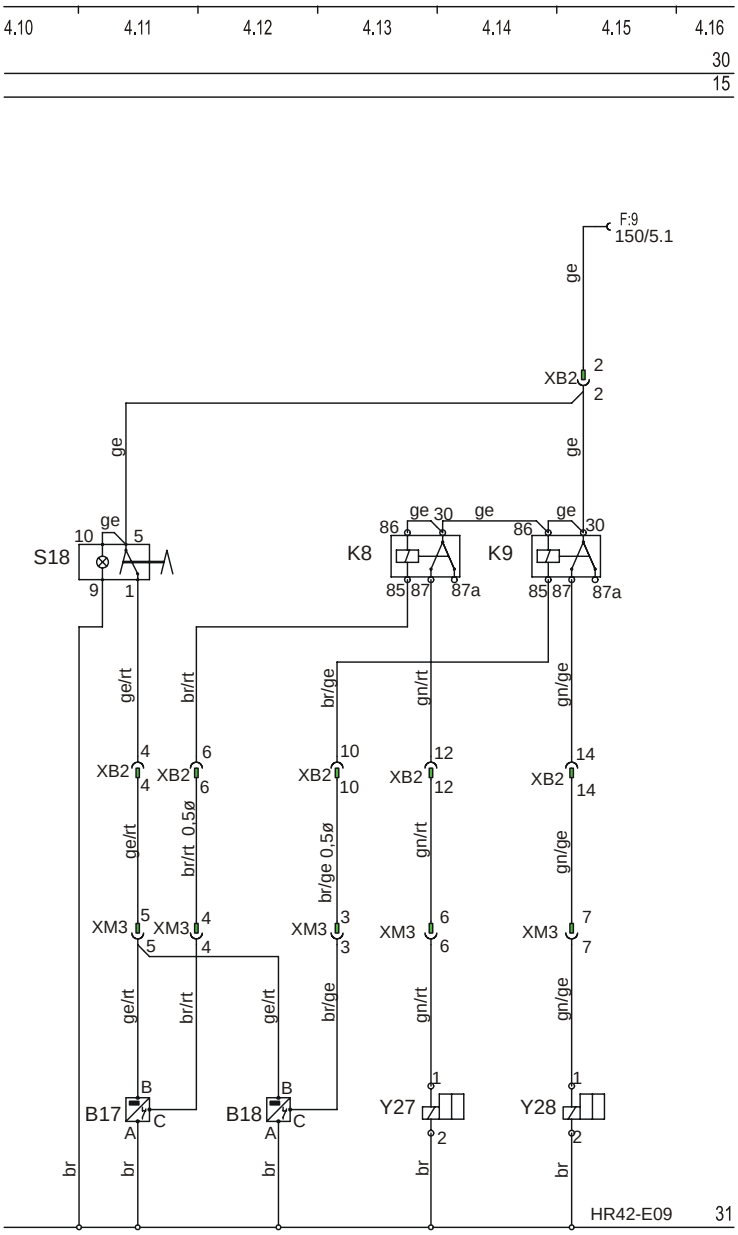
Path	Desig-nation	Device	Path	Desig-nation	Device
		Working hydraulics			***Joystick, right***
3.10	S29	Armrest switch	3.11	Y18	Valve, additional control circuit 1
3.10	Y3	Working hydraulics	3.12	S21	Push-button, additional control circuit 1
			3.13	Y19	Valve, additional control circuit 1
			3.14	S20	Option

Joystick, left	Option



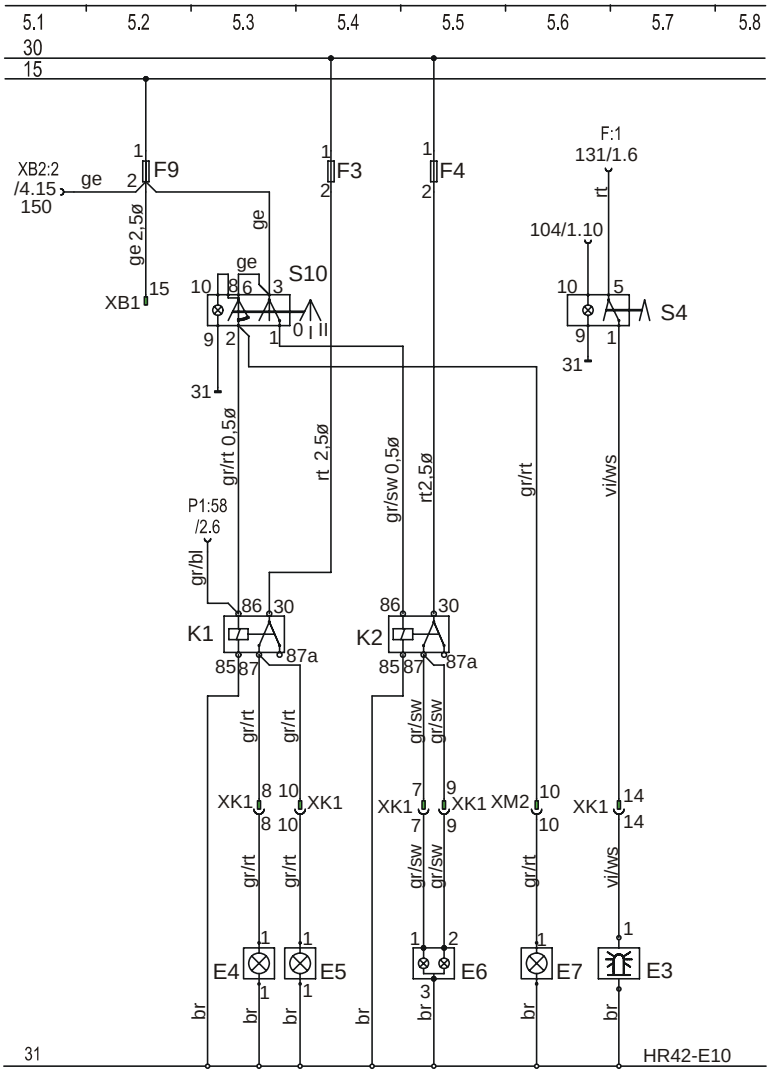
Path	Desig-nation	Device	Path	Desig-nation	Device
		Joystick, left			***Option***
4.2	Y23	Valve, additional control circuit 2	4.7	S17	Switch for option
4.2	S22	Push-button, additional control circuit 2	4.9	--	Cable link ISO/SAE
4.3	Y24	Valve, additional control circuit 2			
4.4	S24	Push-button – swing brake			
4.4	Y14	Valve – swing brake			
4.6	S25	Push-button - high torque swing drive			
4.6	Y12	Valve - high torque swing drive			

Restriction of reach



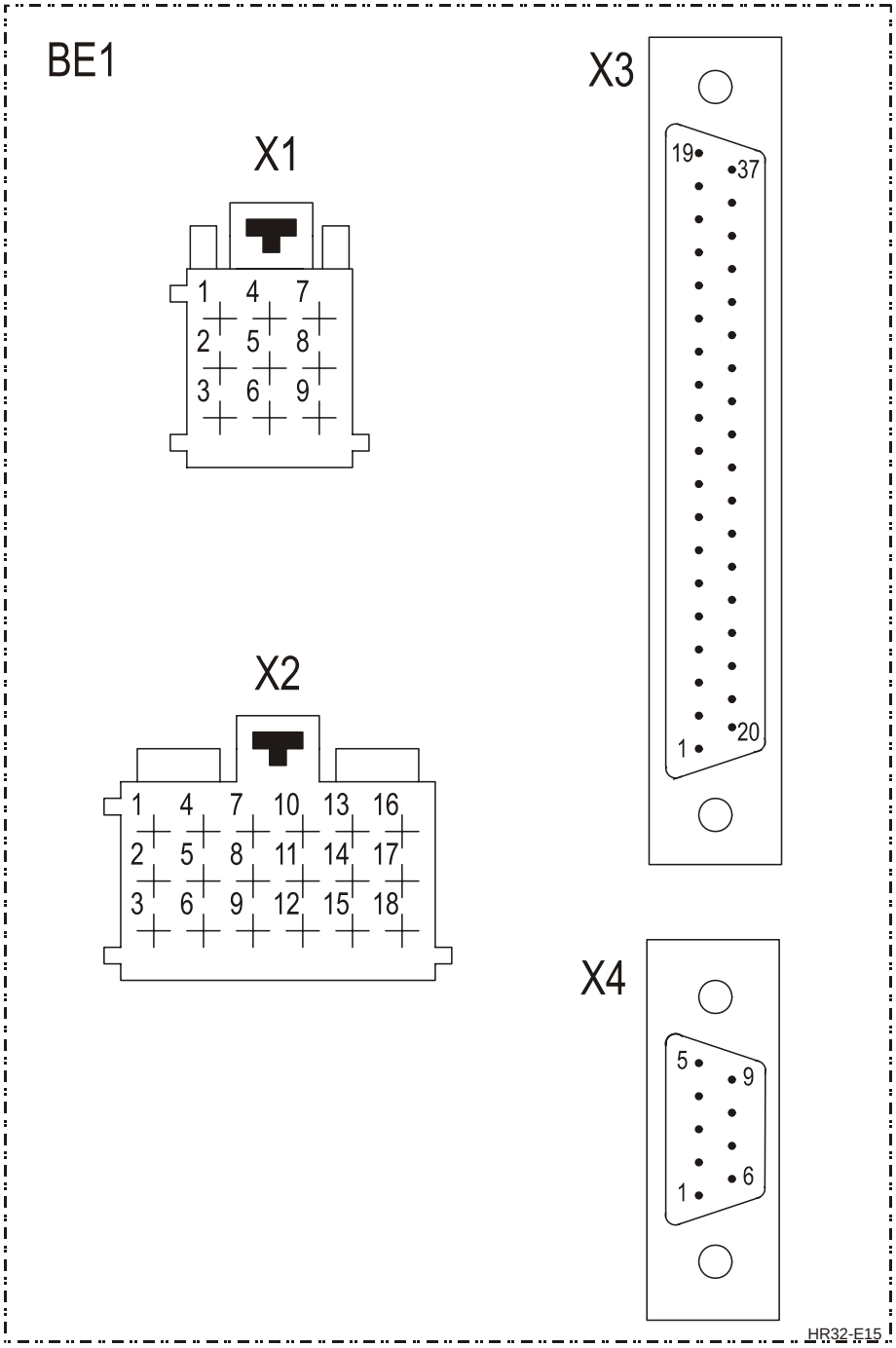
Path	Desig-nation	Device	Path	Desig-nation	Device
		Restriction of reach			
4.11	S18	Switch - restriction of reach			
4.11	B17	Boom proximity switch			
4.12	B18	Intermediate boom proximity switch			
4.14	K8	Boom relay			
4.14	Y27	Boom solenoid valve			
4.19	K9	Intermediate boom relay			
4.15	Y28	Intermediate boom solenoid valve			

Working floodlights	Rotating beacon



Path	Desig-nation	Device	Path	Desig-nation	Device
		Working floodlights	5.5	F4	Fuse
5.2	F9	Fuse	5.5	K2	Relay
5.3	S10	Working floodlight	5.5	E6	Working floodlight rear
5.3	K1	Relay	5.6	E7	Boom-mounted working floodlight
5.3	E4	Working floodlight front			***Rotating beacon***
5.4	E5	Working floodlight front	5.7	S4	Switch for rotating beacon
5.4	F3	Fuse	5.7	E3	Rotating beacon

Check module



TEREX | SCHAEFF	Typ/Model/Type **TC 125** (HR 42)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Control module assignment diagram**	Blatt/Page/Feuille **7.67.06**

Check module BE1

X1	***Power supply***
1	Power supply Terminal 30
2	Power supply Terminal 30
3	Power supply Terminal 30
4	Central mass
5	Power supply Terminal 15
6	--
7	--
8	--
9	--
X2	***Signal outputs***
1	Working hydraulics
2	Rock breaker
3	FAST - SLOW
4	Float position
5	Travel motion alarm
6	Pre-heating
7	Additional control circuit — valve
8	Additional control circuit — valve
9	Option
10	Option
11	Additional control circuit 2 — valve
12	Additional control circuit 2 — valve
13	High torque swing drive
14	Swing brake valve
15	--
16	--
17	--
18	--
X3	***Signal inputs***
1	--
2	--
3	Oil pressure switch
4	Air filter clogging
5	Hydraulic oil filter clogging
6	Hydraulic oil level switch
7	--
8	--
9	Overload warning switch
10	--
11	Armrest switch
12	Rock breaker switch
13	Option
14	FAST – SLOW switch
15	--
16	Travel motion alarm switch
17	Fuel-level sensor
18	Central mass
19	Coolant temperature
20	Battery charge indicator
21	Pressure switch "travel", forward, left
22	Pressure switch, "travel", reverse, left
23	Pressure switch, "travel", forward, right
24	Pressure switch, "travel", reverse, right
25	Float position switch
26	High torque swing drive
27	Additional control circuit 2 – push-button
28	Additional control circuit 2 – push-button
29	Swing brake switch
30	Switch for option
31	Additional control circuit – push-button
32	Additional control circuit – push-button
33	--
34	--
35	--
36	Overload warning signal
37	--
X4	***Interface***
1	--
2	--
3	--
4	--
5	--
6	--
7	--
8	--
9	--

Fuse box-assignment diagram

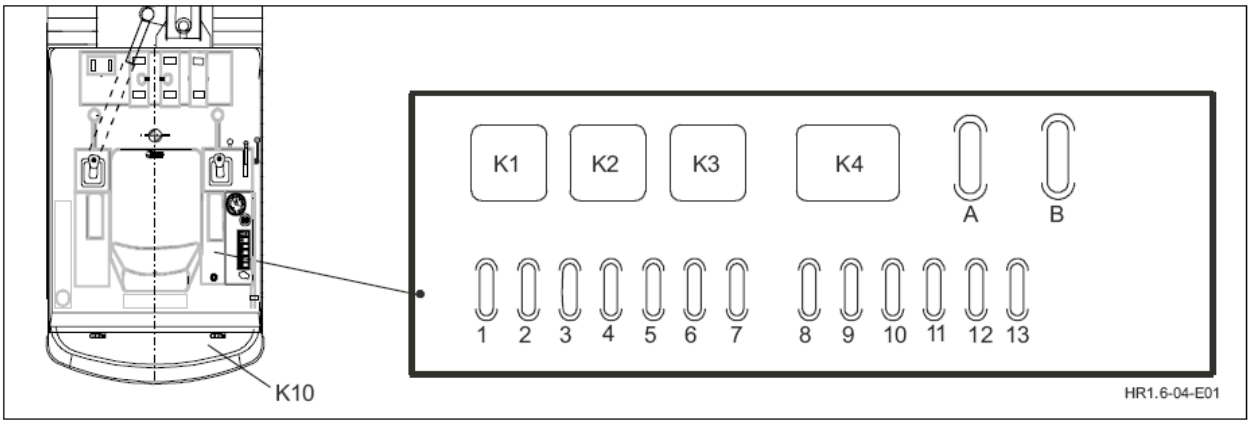


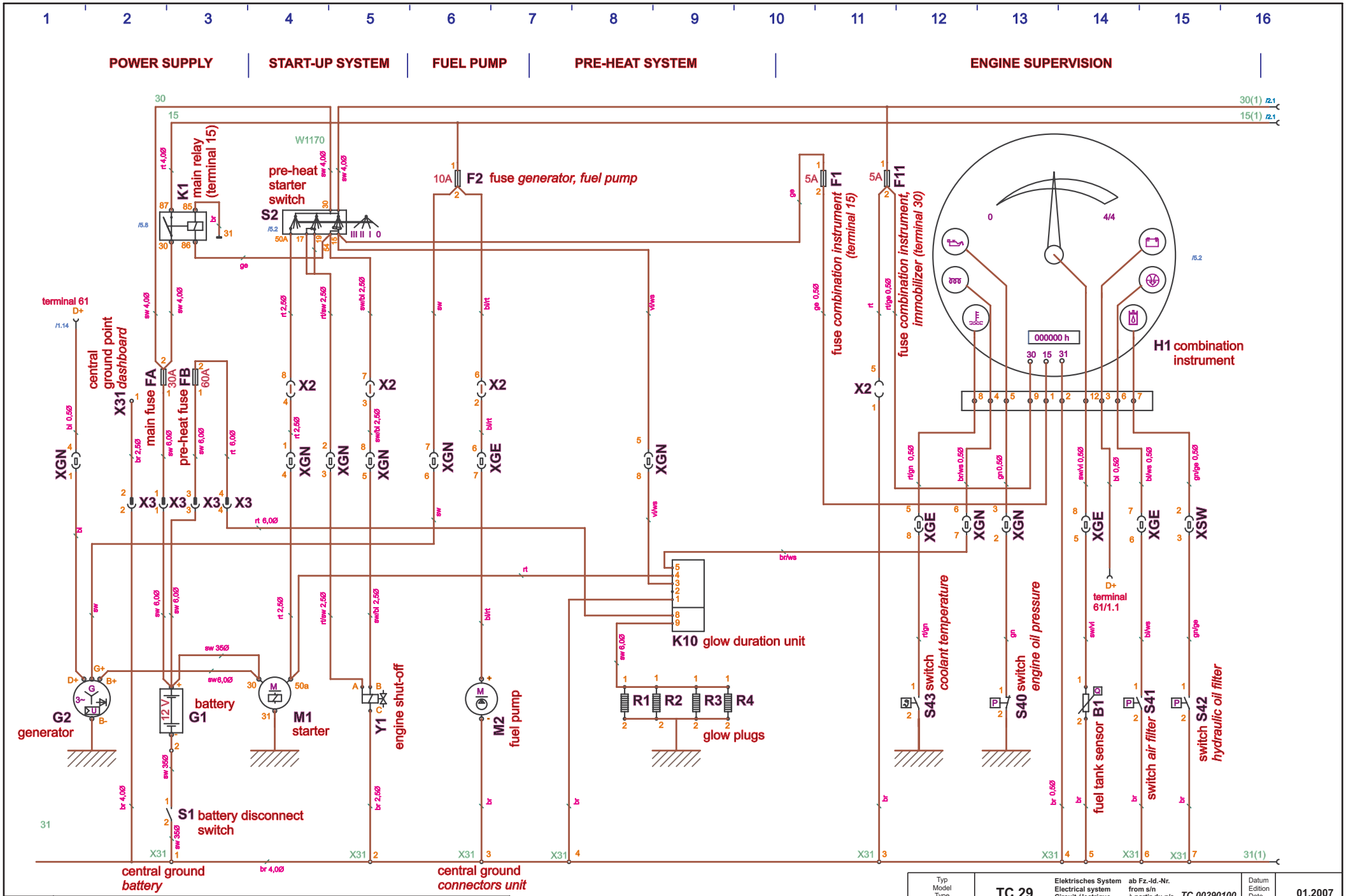
Bild 71 Sicherungs- und Relaiskasten – Belegungsplan

Position	Ampere	Assignment
FA	30A	Main input fuse
FB	60A	Fuse for pre-heater system
F1	5A	Instrument (terminal 15)
F2	10A	Generator, Fuel pump
F3	15A	Working floodlight, front
F4	15A	Working floodlight, rear/boom (option)
F5	10A	Travel fast/slow, travel motion alarm
F6	10A	Swing brake, dozer
F7	15A	Heater fan
F8	15A	Windshield wiper, windshield washer
F9	10A	Radio (option), horn
F10	10A	Driver seat, 2. add. circuit (option)
F11	5A	Instrument, immobilizer (terminal 30)
F12	10A	Interior light, rotating beacon, radio (option)
F13	15A	Socket
F14	15A	Option refulling pump

K1	Main relais (terminal 15)	K2	Swing brake
K10	Glow-time controller		

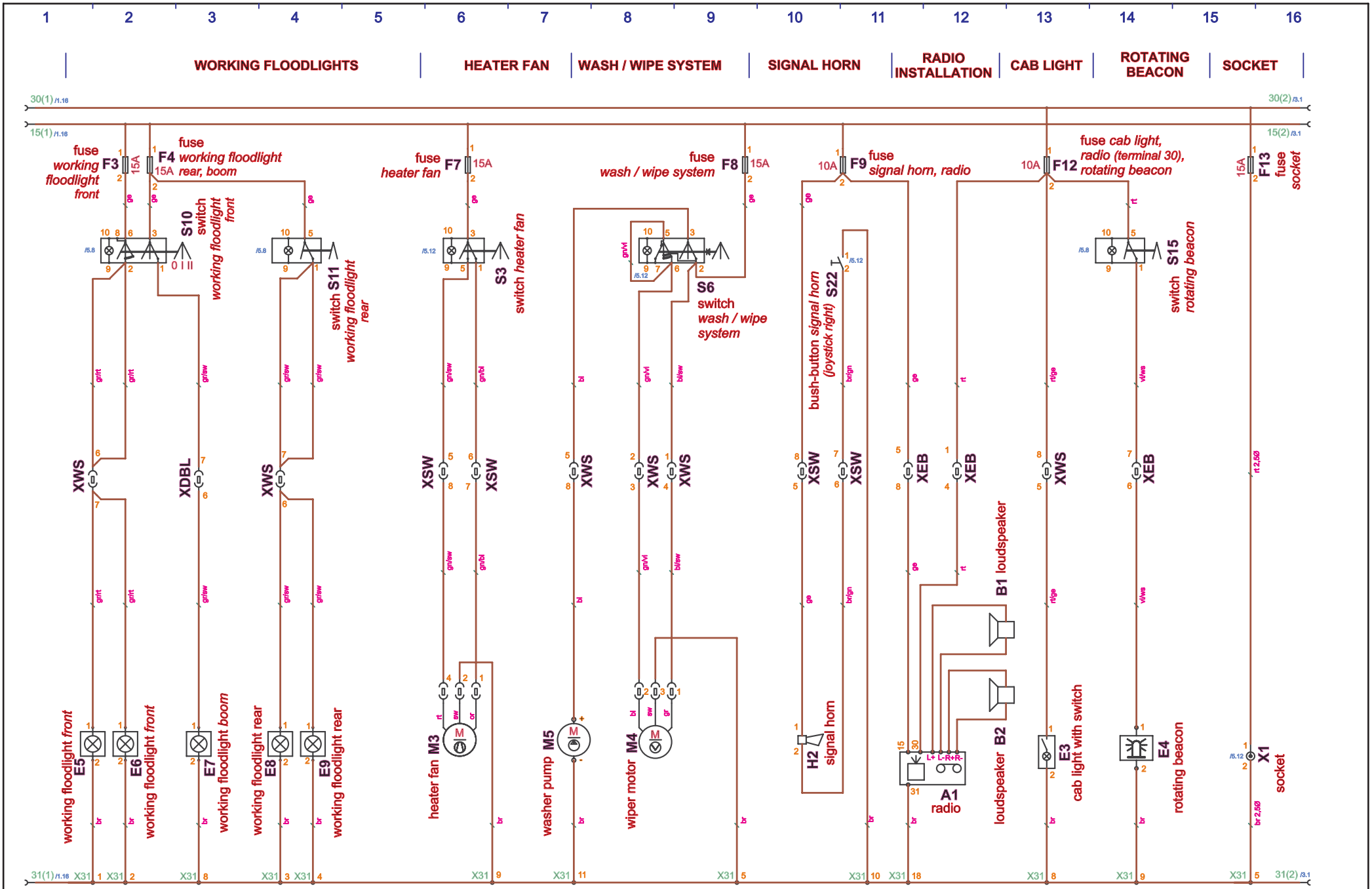
Cable and plug colours

bg	beige	dgr	dark grey	hbr	light brown	rt	red
bl	blue	ge	yellow	hgr	light grey	sw	black
br	brown	gn	green	hr	light red	vie	violet
dbl	dark blue	gr	grey	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		



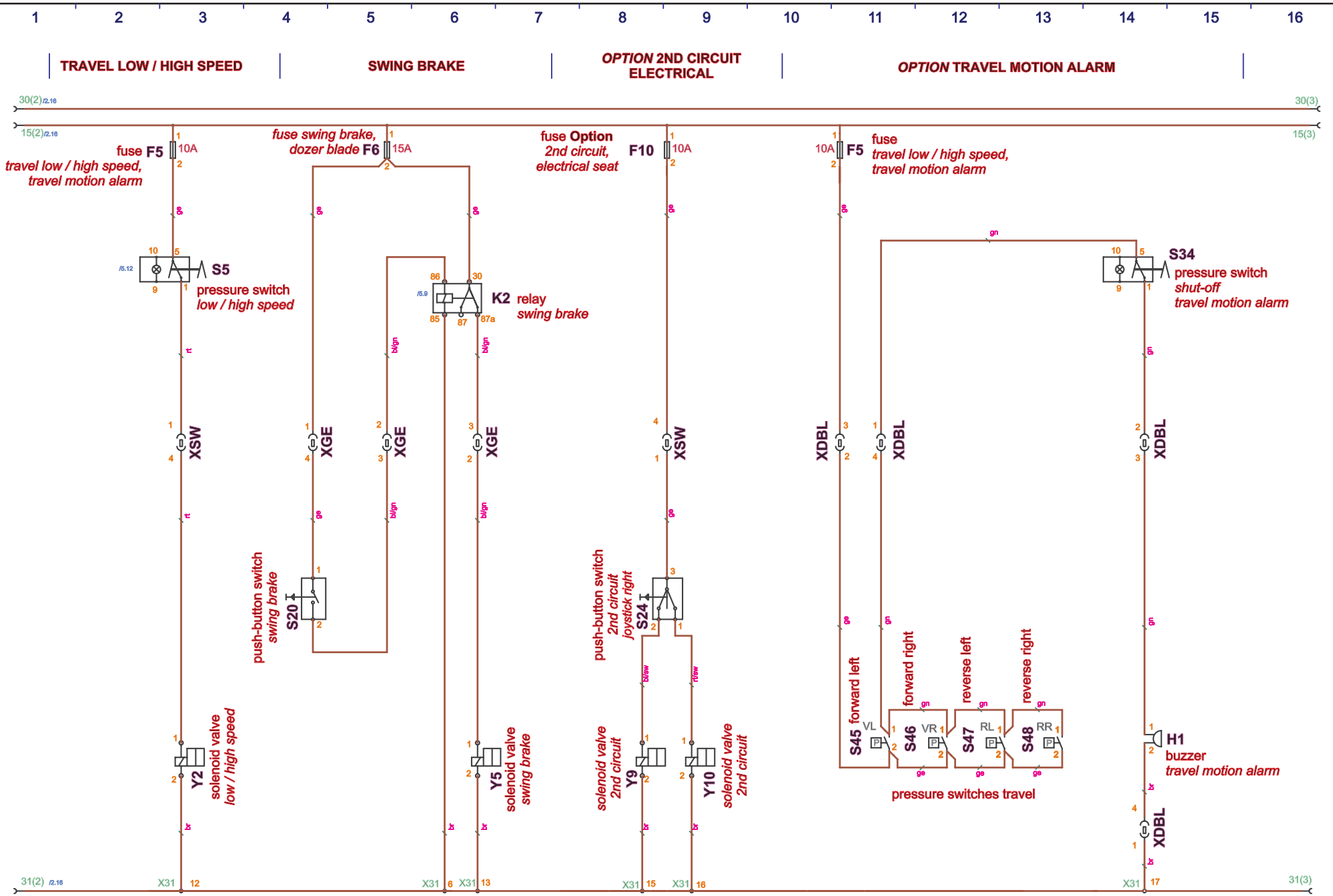
XSW	Connector (plug black) *dashboard - machine*
XGE	Connector (plug yellow) *dashboard - machine*
XGN	Connector (plug green) *dashboard - machine*

Typ / Model / Type / Tipo	TC 29	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC 00290100	Datum / Edition / Date / Fecha 01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 1/3	Blatt / Page / Feuille / Página 7.76.11



XWS	connector (plug white) *dashboard - operator's cab*
XSW	connector (plug black) *dashboard - machine*
XEB	connector (plug ivory-coloured) *dashboard - operator's cab*
XDBL	connector (plug dark blue) *dashboard - working light (boom)*

Typ / Model / Type / Tipo	TC 29	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC 00290100	Datum / Edition / Date / Fecha 01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 2/3	Blatt / Page / Feuille / Página 7.76.12



XSW	Connector (plug black) *dashboard - machine*
XGE	Connector (plug yellow) *dashboard - machine*
XDBL	Connector (plug dark blue) *dashboard - travel motion alarm*

Typ / Model / Type / Tipo	TC 29	Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC 00290100	Datum / Edition / Date / Fecha	01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 3/3	Blatt / Page / Feuille / Página	7.76.13

Fuse box-assignment diagram

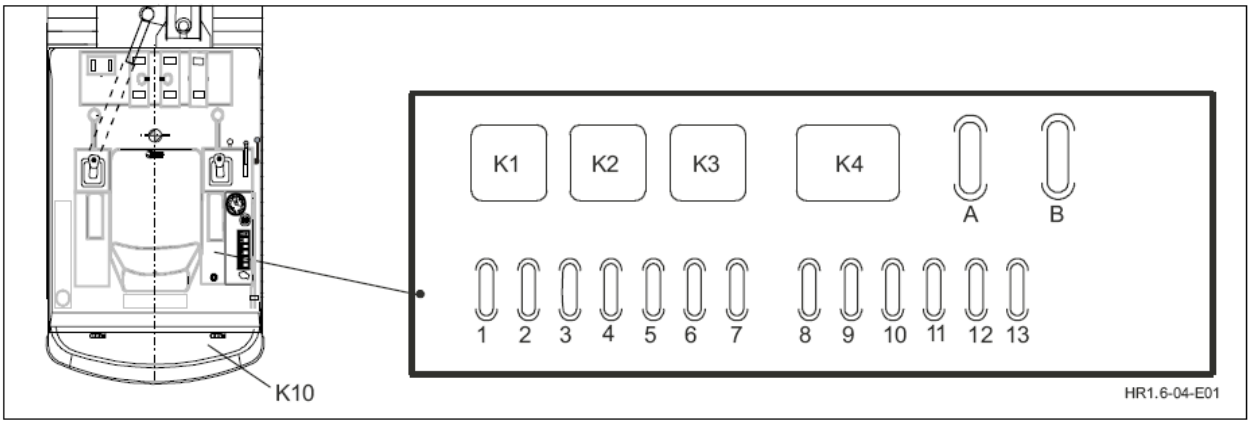


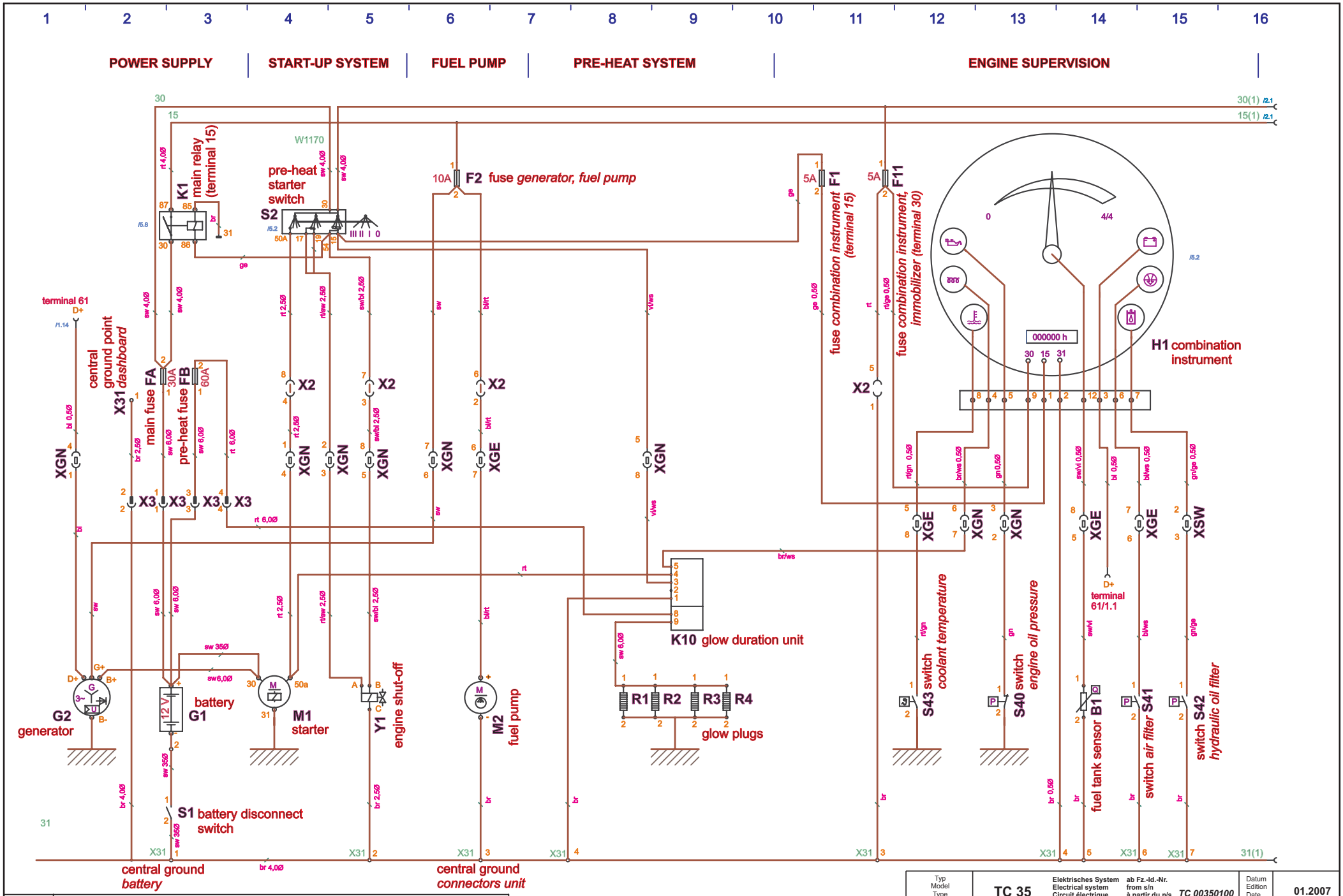
Bild 71 Sicherungs- und Relaiskasten – Belegungsplan

Position	Ampere	Assignment
FA	30A	Main input fuse
FB	60A	Fuse for pre-heater system
F1	5A	Instrument (terminal 15)
F2	10A	Generator, Fuel pump
F3	15A	Working floodlight, front
F4	15A	Working floodlight, rear/boom (option)
F5	10A	Travel fast/slow, travel motion alarm
F6	10A	Swing brake, dozer
F7	15A	Heater fan
F8	15A	Windshield wiper, windshield washer
F9	10A	Radio (option), horn
F10	10A	Driver seat, 2. add. circuit (option)
F11	5A	Instrument, immobilizer (terminal 30)
F12	10A	Interior light, rotating beacon, radio (option)
F13	15A	Socket
F14	15A	Option refulling pump

K1	Main relais (terminal 15)	K2	Swing brake
K10	Glow-time controller		

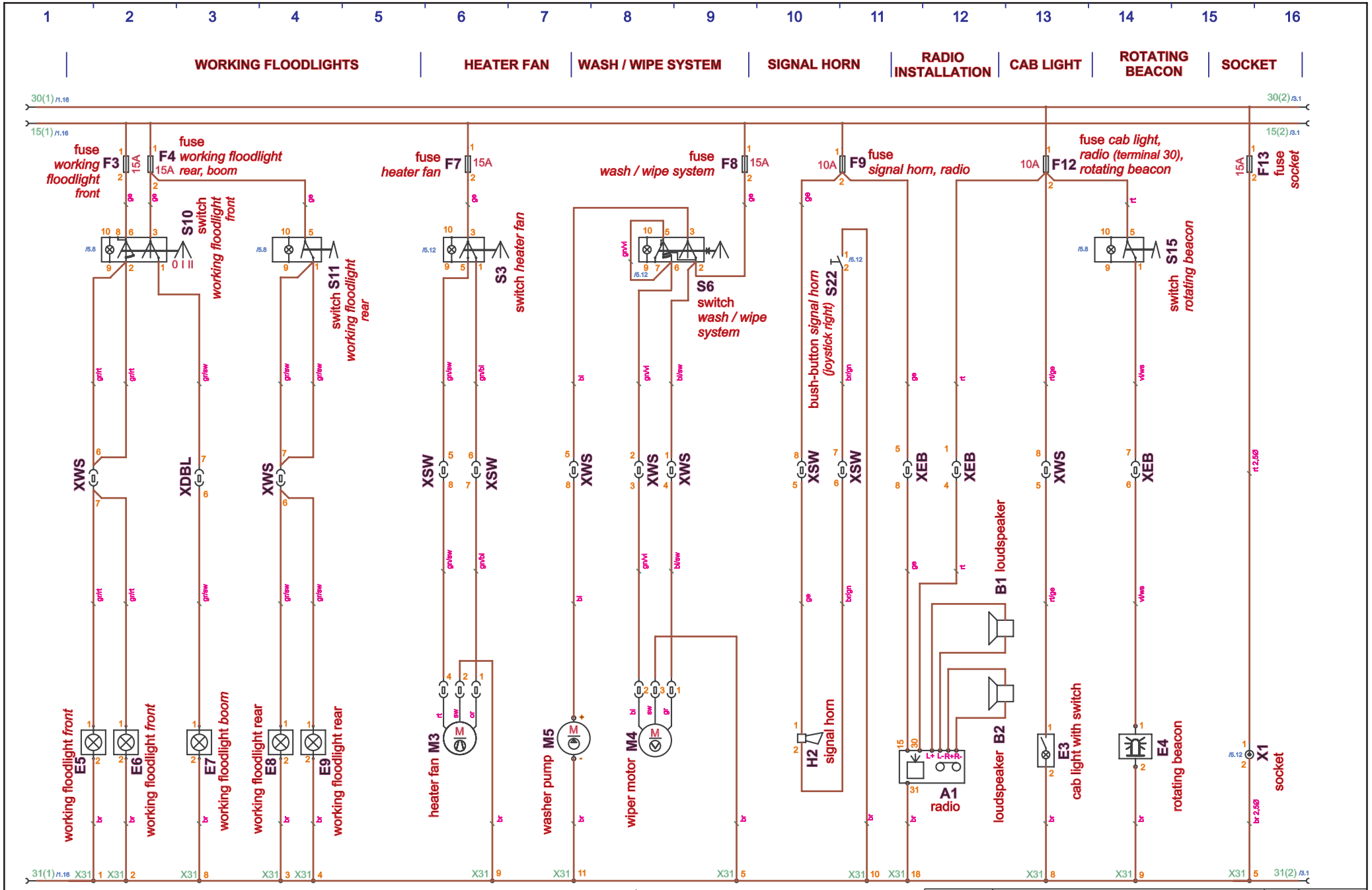
Cable and plug colours

bg	beige	dgr	dark grey	hbr	light brown	rt	red
bl	blue	ge	yellow	hgr	light grey	sw	black
br	brown	gn	green	hr	light red	vie	violet
dbl	dark blue	gr	grey	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		



XSW	Connector (plug black) *dashboard - machine*
XGE	Connector (plug yellow) *dashboard - machine*
XGN	Connector (plug green) *dashboard - machine*

Typ Model Type Tipo	TC 35	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC 00350100	Datum Edition Date Fecha 01.2007
Benennung Description Dénomination Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt Page Feuille Página 1/3	Blatt Page Feuille Página 7.78.11

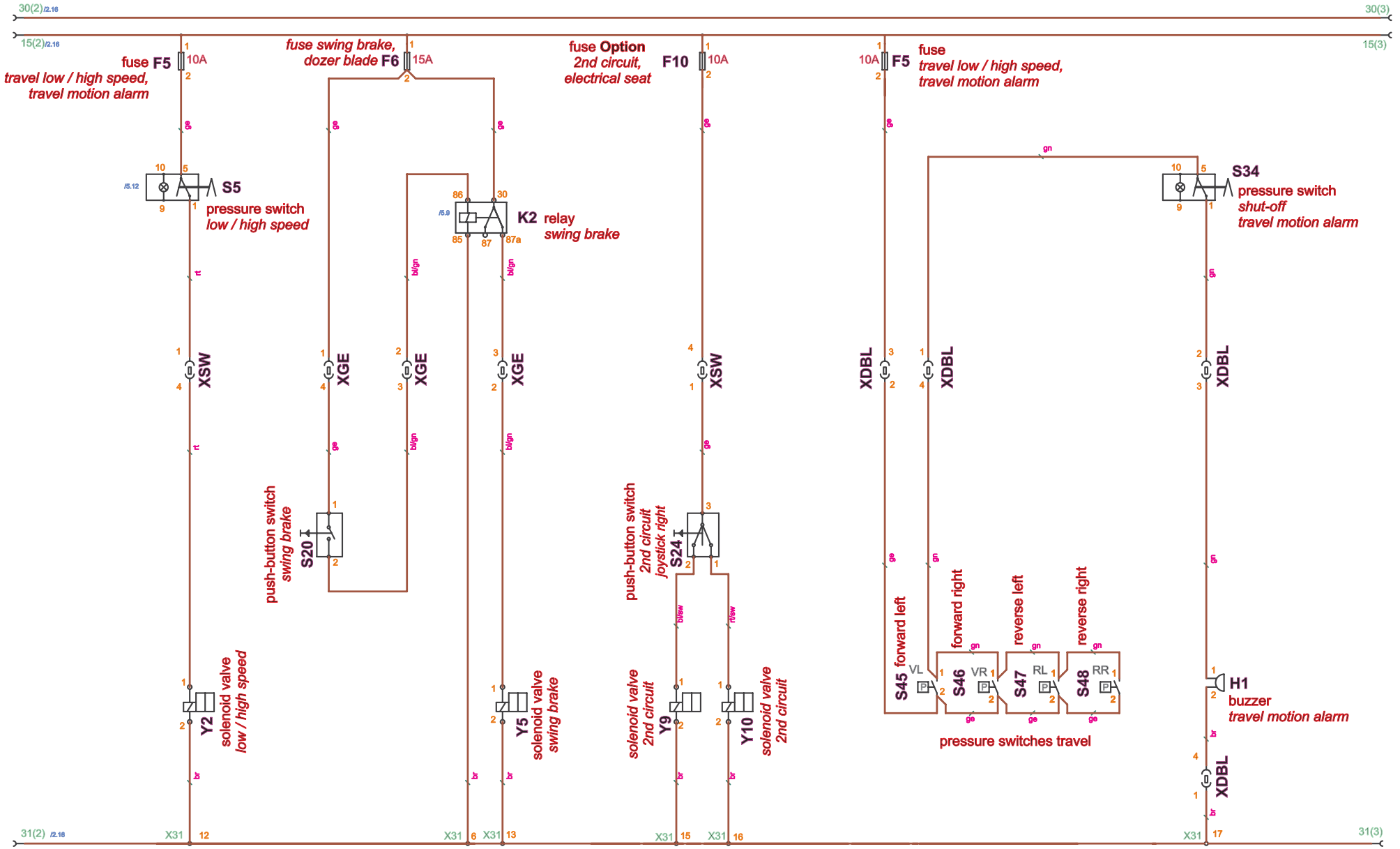


XWS	connector (plug white) *dashboard - operator's cab*
XSW	connector (plug black) *dashboard - machine*
XEB	connector (plug ivory-coloured) *dashboard - operator's cab*
XDBL	connector (plug dark blue) *dashboard - working light (boom)*

Typ / Model / Type / Tipo	TC 35	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC 00350100	Datum / Edition / Date / Fecha 01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 2/3	Blatt / Page / Feuille / Página 7.78.12

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

TRAVEL LOW / HIGH SPEED | **SWING BRAKE** | ***OPTION* 2ND CIRCUIT ELECTRICAL** | ***OPTION* TRAVEL MOTION ALARM**



XSW	Connector (plug black) *dashboard - machine*
XGE	Connector (plug yellow) *dashboard - machine*
XDBL	Connector (plug dark blue) *dashboard - travel motion alarm*

Typ / Model / Type / Tipo	TC 35	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC 00350100	Datum / Edition / Date / Fecha: 01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 3/3	Blatt / Page / Feuille / Página: 7.78.13

Fuse box-assignment diagram

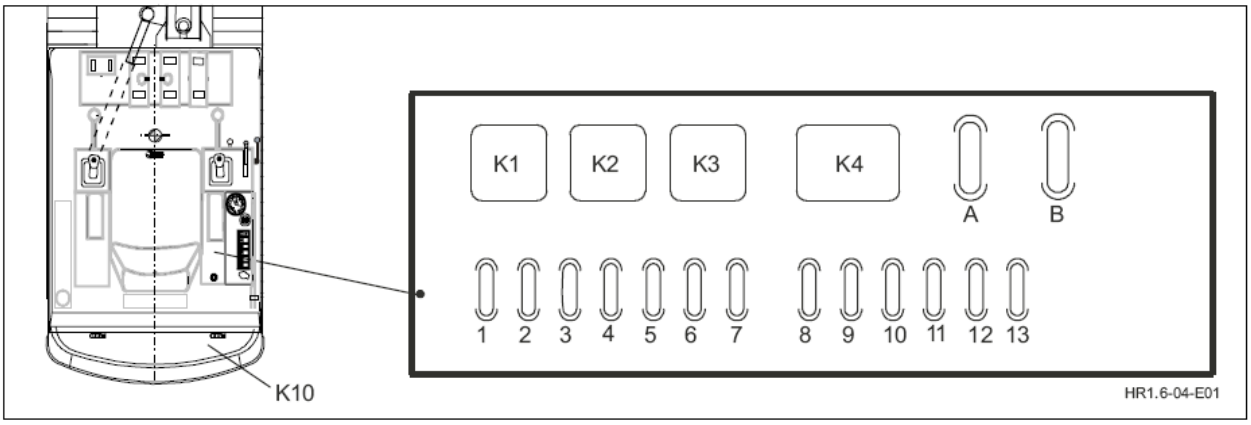


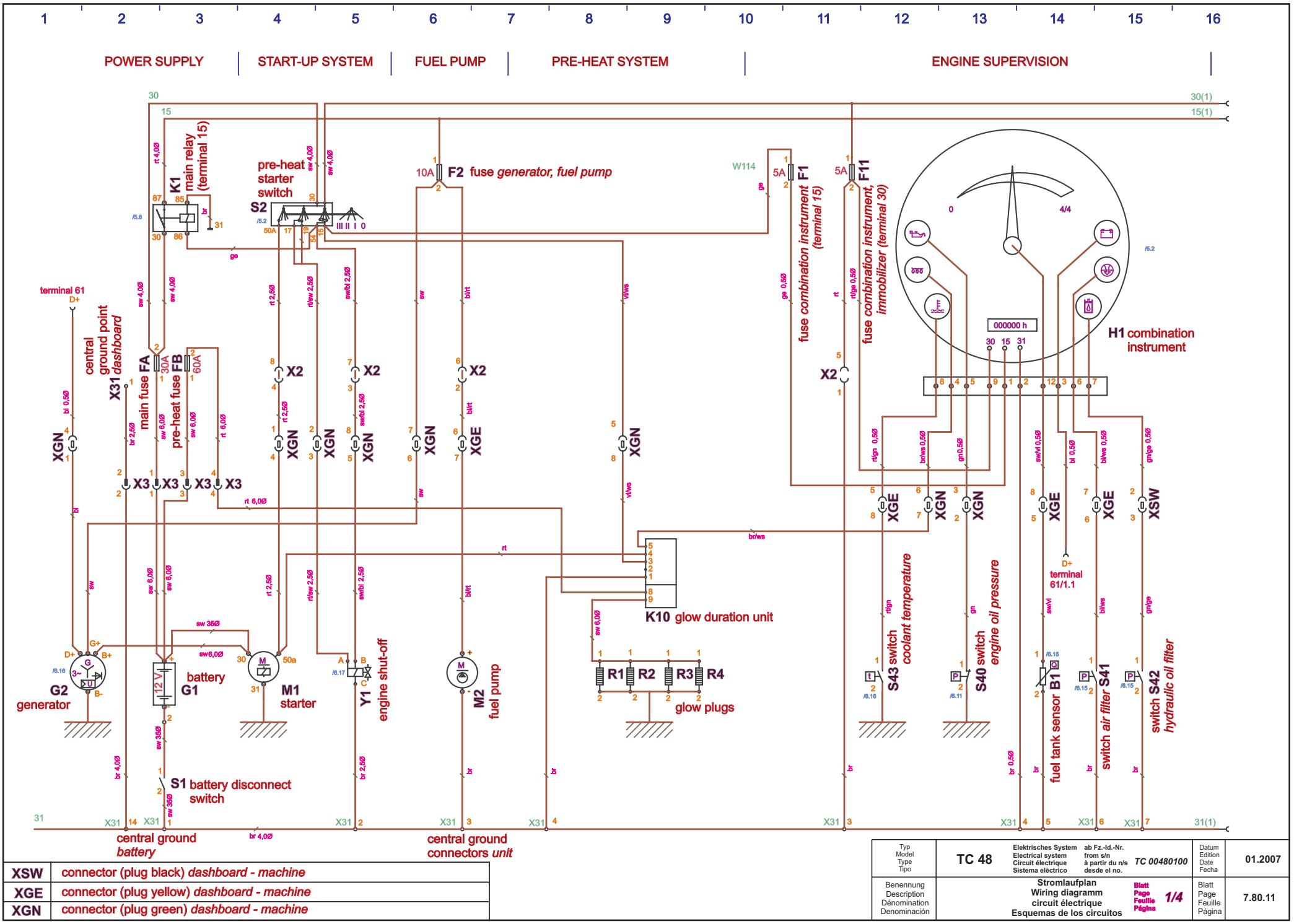
Bild 71 Sicherungs- und Relaiskasten – Belegungsplan

Position	Ampere	Assignment
FA	30A	Main input fuse
FB	60A	Fuse for pre-heater system
F1	5A	Instrument (terminal 15)
F2	10A	Generator, Fuel pump
F3	15A	Working floodlight, front
F4	15A	Working floodlight, rear/boom (option)
F5	10A	Travel fast/slow, travel motion alarm
F6	10A	Swing brake, dozer
F7	15A	Heater fan
F8	15A	Windshield wiper, windshield washer
F9	10A	Radio (option), horn
F10	10A	Driver seat, 2. add. circuit (option)
F11	5A	Instrument, immobilizer (terminal 30)
F12	10A	Interior light, rotating beacon, radio (option)
F13	15A	Socket
F14	15A	Option refulling pump

K1	Main relais (terminal 15)	K2	Swing brake
K10	Glow-time controller		

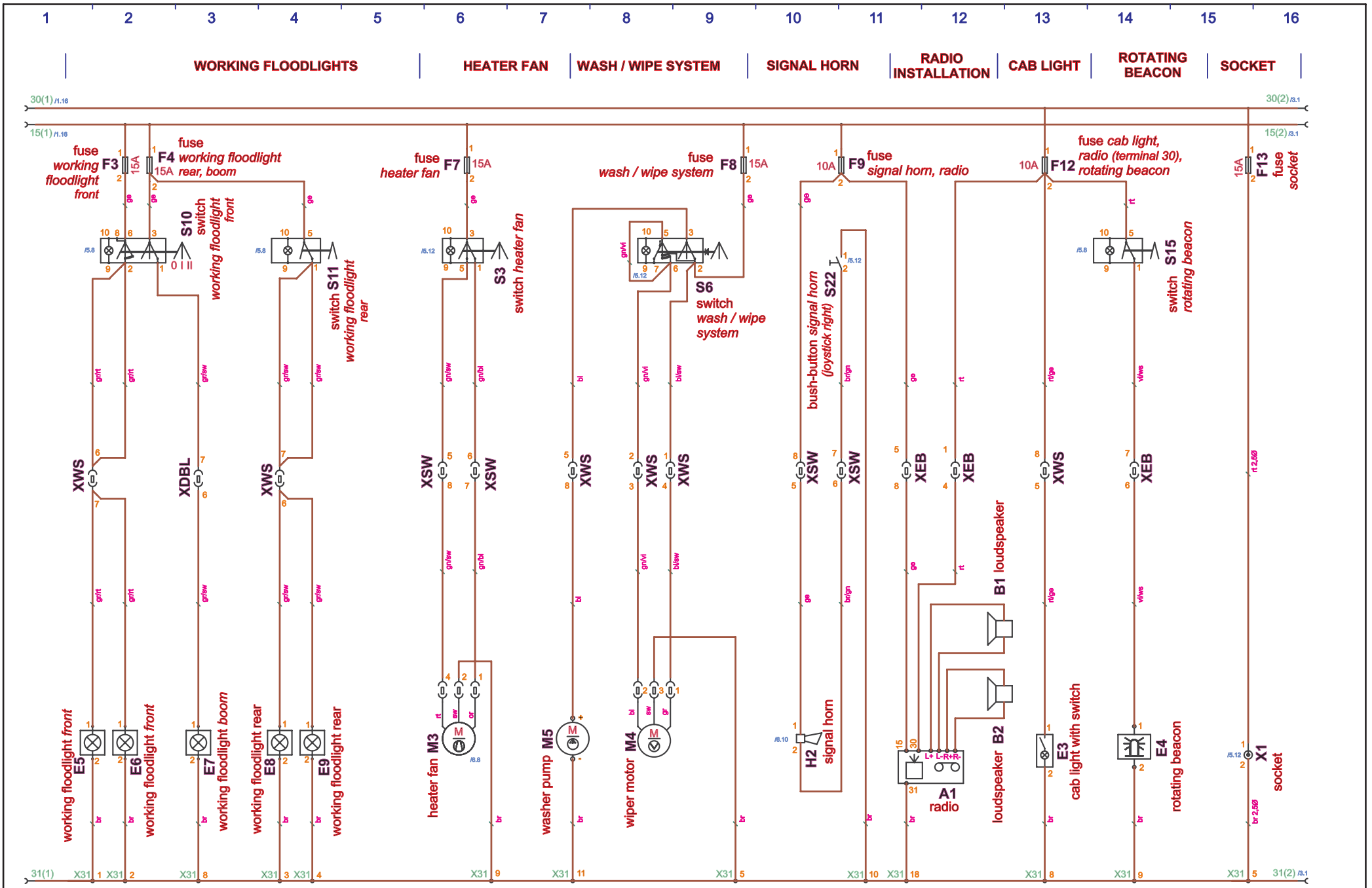
Cable and plug colours

bg	beige	dgr	dark grey	hbr	light brown	rt	red
bl	blue	ge	yellow	hgr	light grey	sw	black
br	brown	gn	green	hr	light red	vie	violet
dbl	dark blue	gr	grey	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		



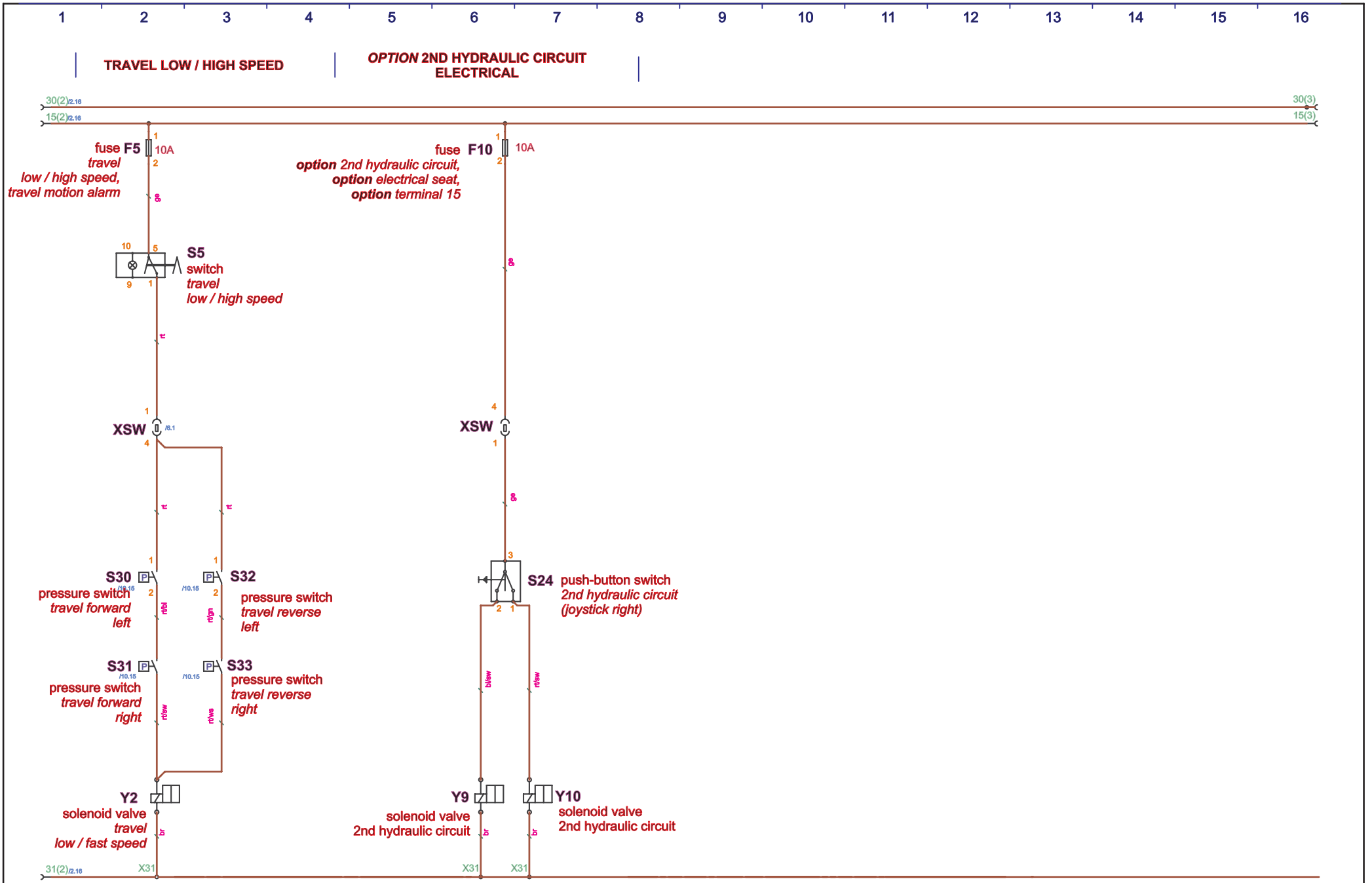
XSW	connector (plug black) *dashboard - machine*
XGE	connector (plug yellow) *dashboard - machine*
XGN	connector (plug green) *dashboard - machine*

Typ / Model / Type / Tipo	TC 48	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC 00480100	Datum / Edition / Date / Fecha	01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 1/4	Blatt / Page / Feuille / Página	7.80.11



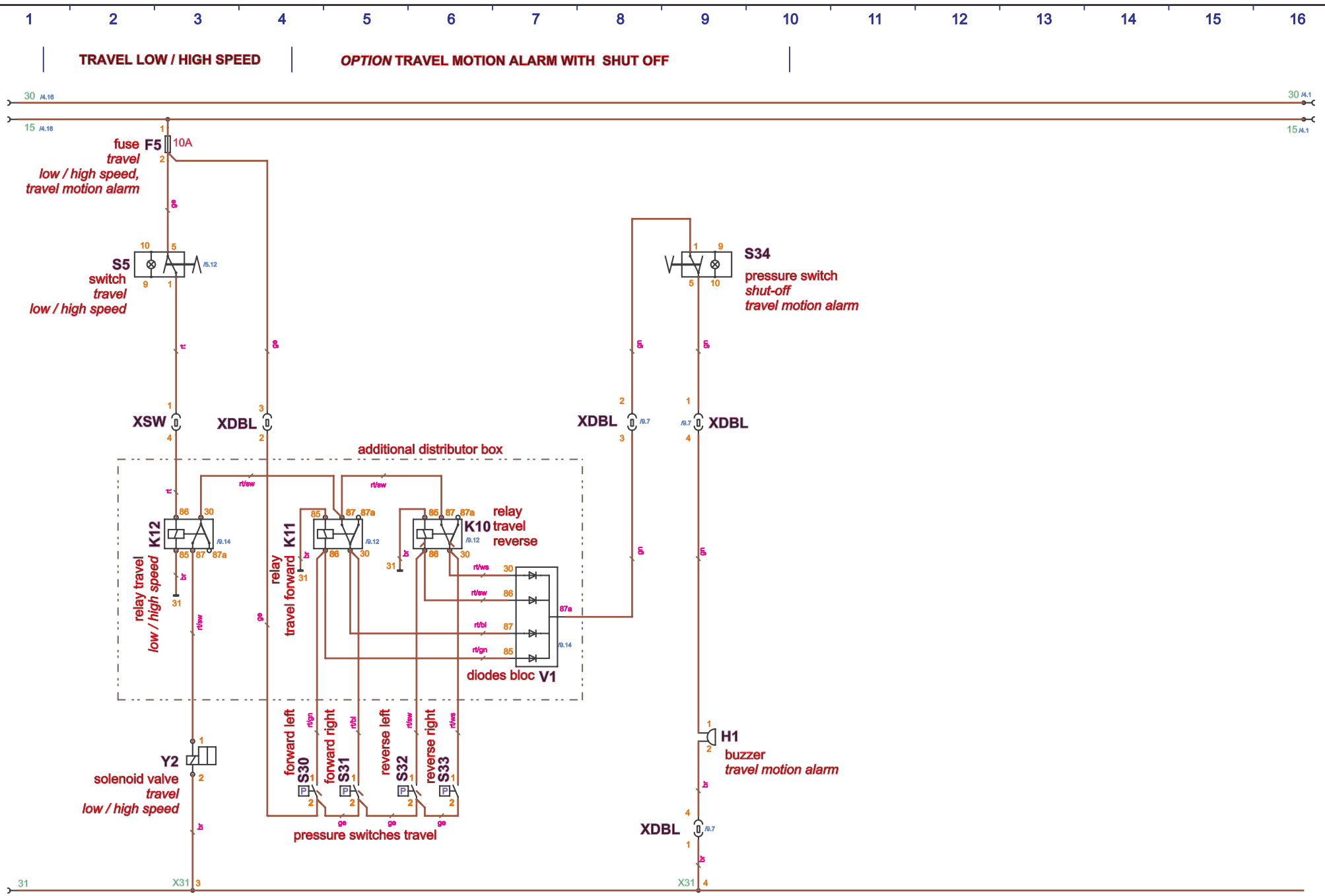
XWS	connector (plug white) *dashboard - operator's cab*
XSW	connector (plug black) *dashboard - machine*
XEB	connector (plug ivory-coloured) *dashboard - operator's cab*
XDBL	connector (plug dark blue) *dashboard - working light (boom)*

Typ / Model / Type / Tipo	TC 48	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC 00480100	Datum / Edition / Date / Fecha 01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 2/4	Blatt / Page / Feuille / Página 7.80.12



XSW	connector (plug black) *dashboard - machine*

Typ / Model / Type / Tipo	TC 48	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no.	*TC 00480100*	Datum / Edition / Date / Fecha	01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página	3/4		Blatt / Page / Feuille / Página	7.80.13



XSW	Connector (plug black) *dashboard - machine*
XDBL	Connector (plug dark blue) *dashboard - travel motion alarm*

Typ Model Type Tipo	TC 48	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TC 00480100	Datum Edition Date Fecha 01.2007
Benennung Description Dénomination Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos		Blatt Page Feuille Página 4/4		Blatt Page Feuille Página 7.80.14

Fuse box-assignment diagram

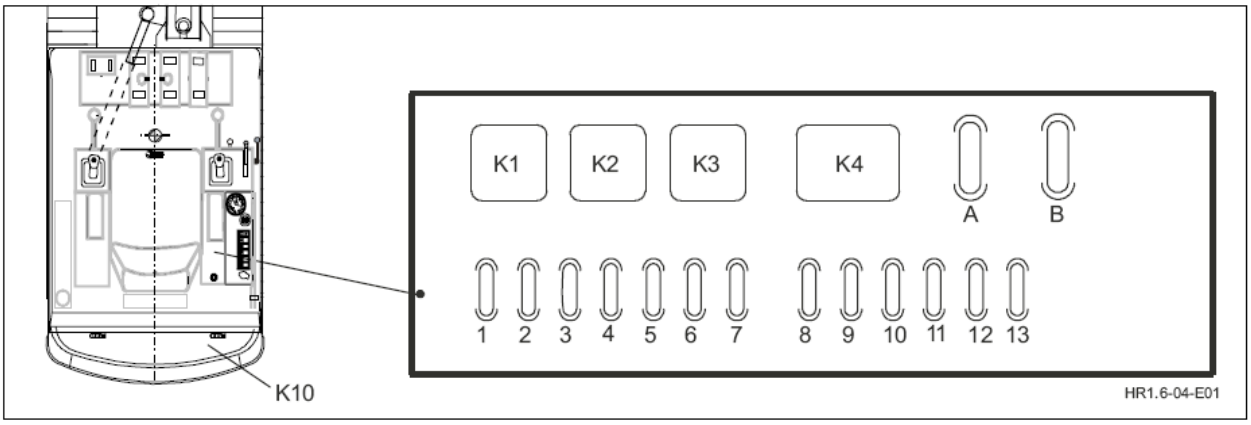


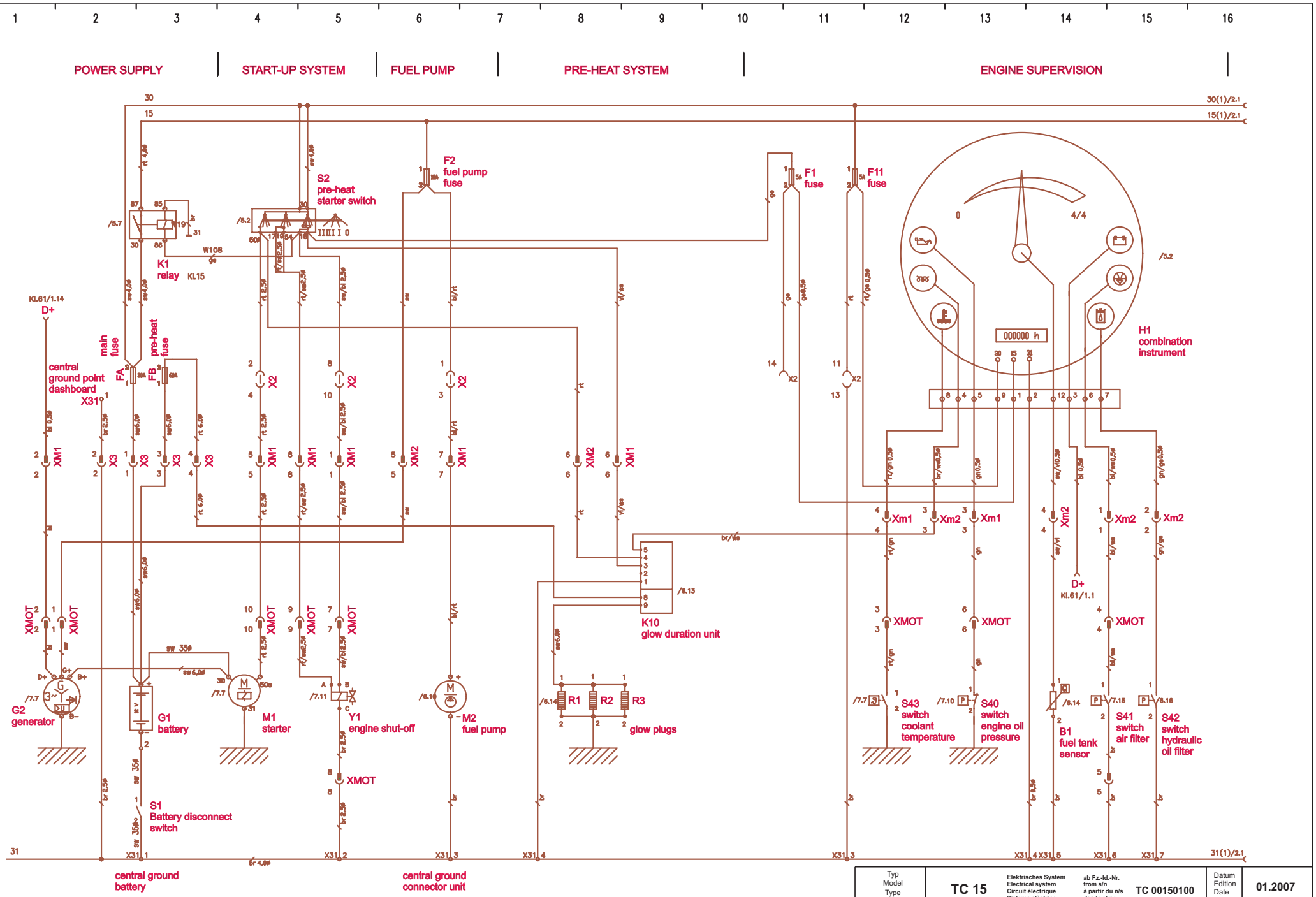
Bild 71 Sicherungs- und Relaiskasten – Belegungsplan

Position	Ampere	Assignment
FA	30A	Main input fuse
FB	60A	Fuse for pre-heater system
F1	5A	Instrument (terminal 15)
F2	10A	Generator, Fuel pump
F3	15A	Working floodlight, front
F4	15A	Working floodlight, rear/boom (option)
F5	10A	Travel fast/slow, travel motion alarm
F6	10A	Swing brake, dozer
F7	15A	Heater fan
F8	15A	Windshield wiper, windshield washer
F9	10A	Radio (option), horn
F10	10A	Driver seat, 2. add. circuit (option)
F11	5A	Instrument, immobilizer (terminal 30)
F12	10A	Interior light, rotating beacon, radio (option)
F13	15A	Socket
F14	15A	Option refulling pump

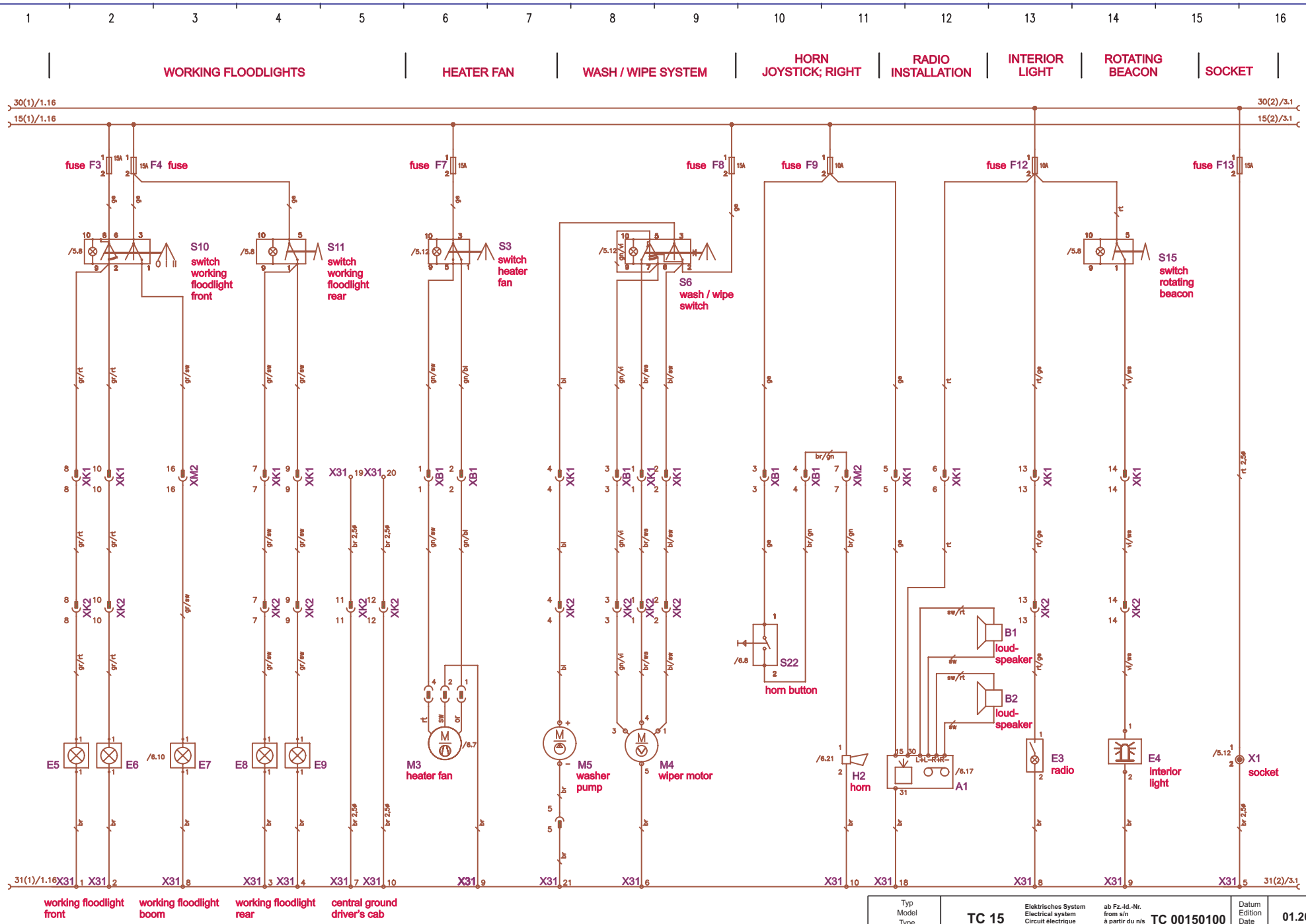
K1	Main relais (terminal 15)	K2	Swing brake
K3	Dozer (option)	K4	2. add. circuit (option)
K10	Glow-time controller		

Cable and plug colours

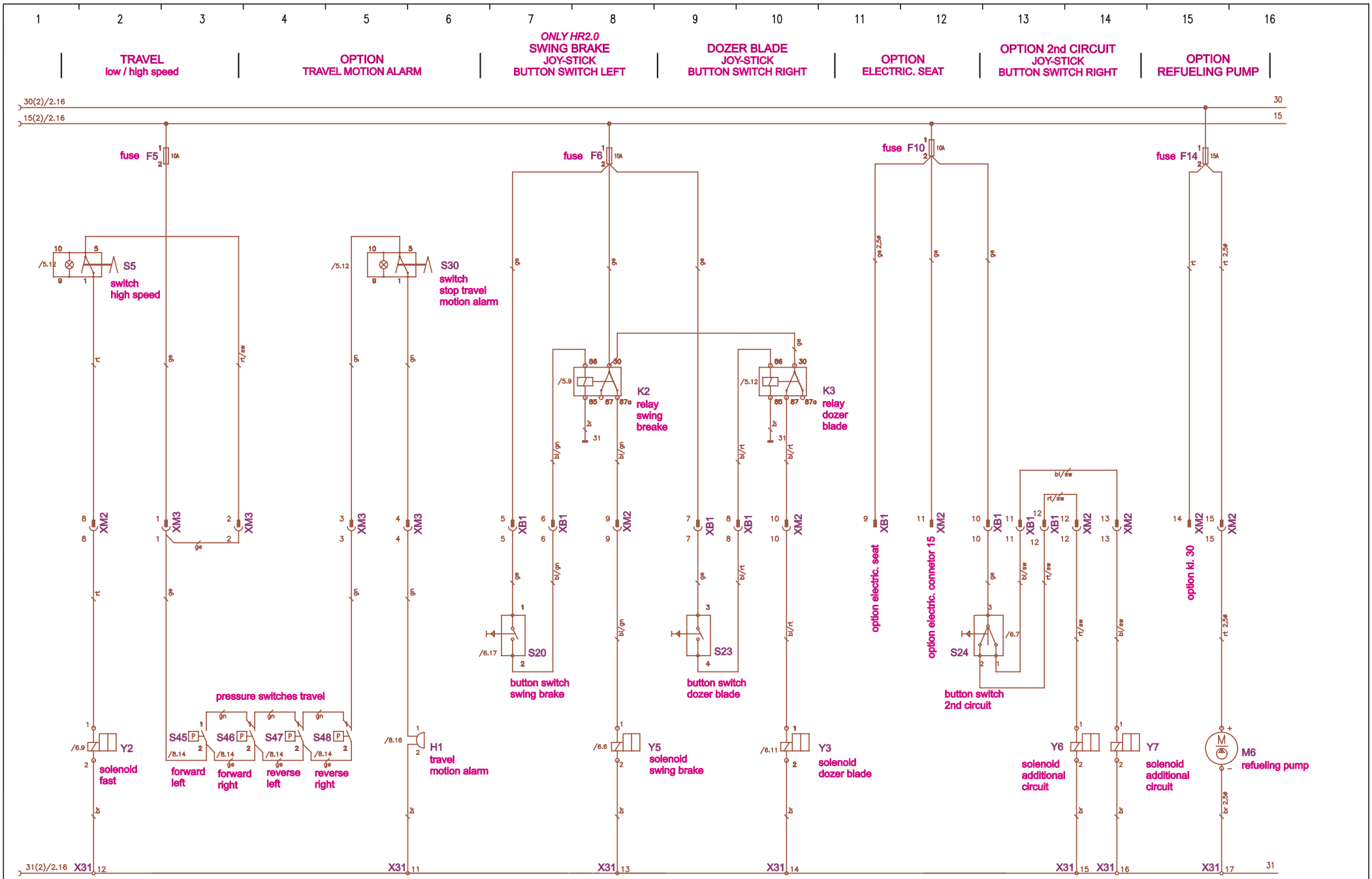
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bl	blue	ge	yellow	hgr	light grey	sw	black
br	brown	gn	green	hr	light red	vie	violet
dbl	dark blue	gr	grey	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		



Typ Model Type Tipo	TC 15	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TC 00150100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos				Blatt Page Feuille Página	7.90.11



Typ Model Type Tipo	TC 15	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TC 00150100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos				Blatt Page Feuille Página	7.90.12



Typ Model Type Tipo	TC 15 — Elektrisches System / Electrical system / Circuit électrique / Sistema elèctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC 00150100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	**Stromlaufplan** **Wiring diagramm** **Circuit électrique** **Esquemas de los circuitos**	Blatt Page Feuille Página	7.90.13

Fuse box-assignment diagram

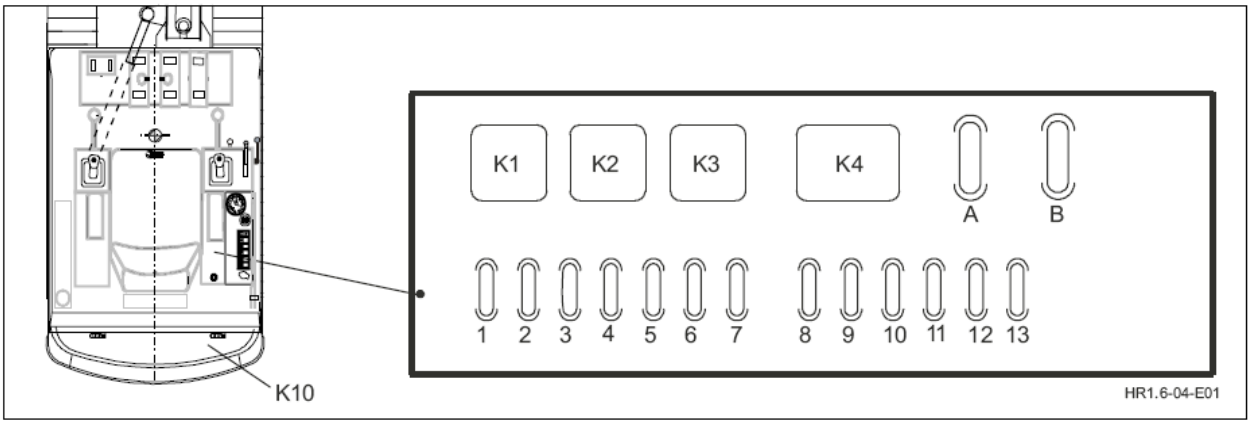


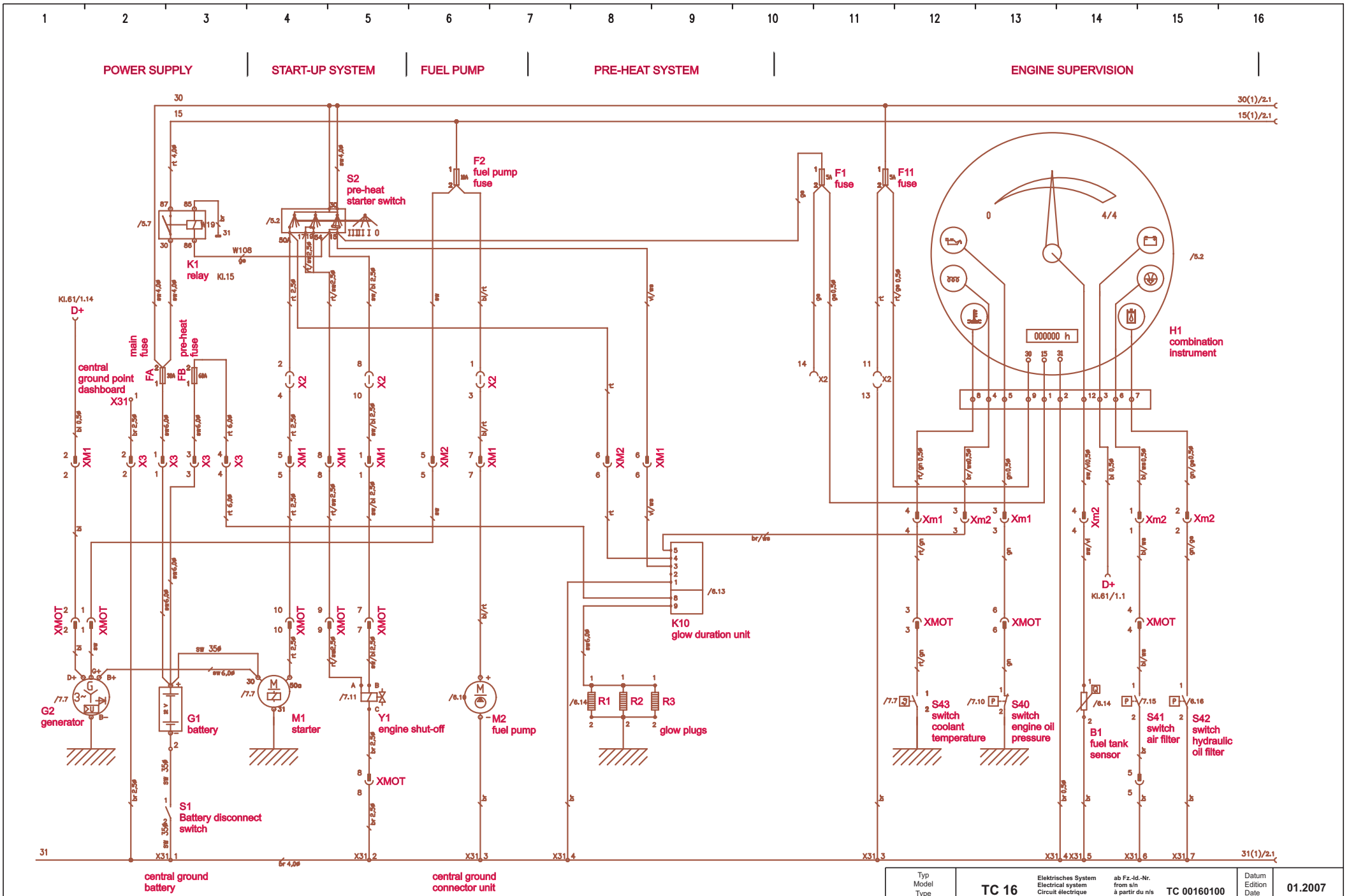
Bild 71 Sicherungs- und Relaiskasten – Belegungsplan

Position	Ampere	Assignment
FA	30A	Main input fuse
FB	60A	Fuse for pre-heater system
F1	5A	Instrument (terminal 15)
F2	10A	Generator, Fuel pump
F3	15A	Working floodlight, front
F4	15A	Working floodlight, rear/boom (option)
F5	10A	Travel fast/slow, travel motion alarm
F6	10A	Swing brake, dozer
F7	15A	Heater fan
F8	15A	Windshield wiper, windshield washer
F9	10A	Radio (option), horn
F10	10A	Driver seat, 2. add. circuit (option)
F11	5A	Instrument, immobilizer (terminal 30)
F12	10A	Interior light, rotating beacon, radio (option)
F13	15A	Socket
F14	15A	Option refulling pump

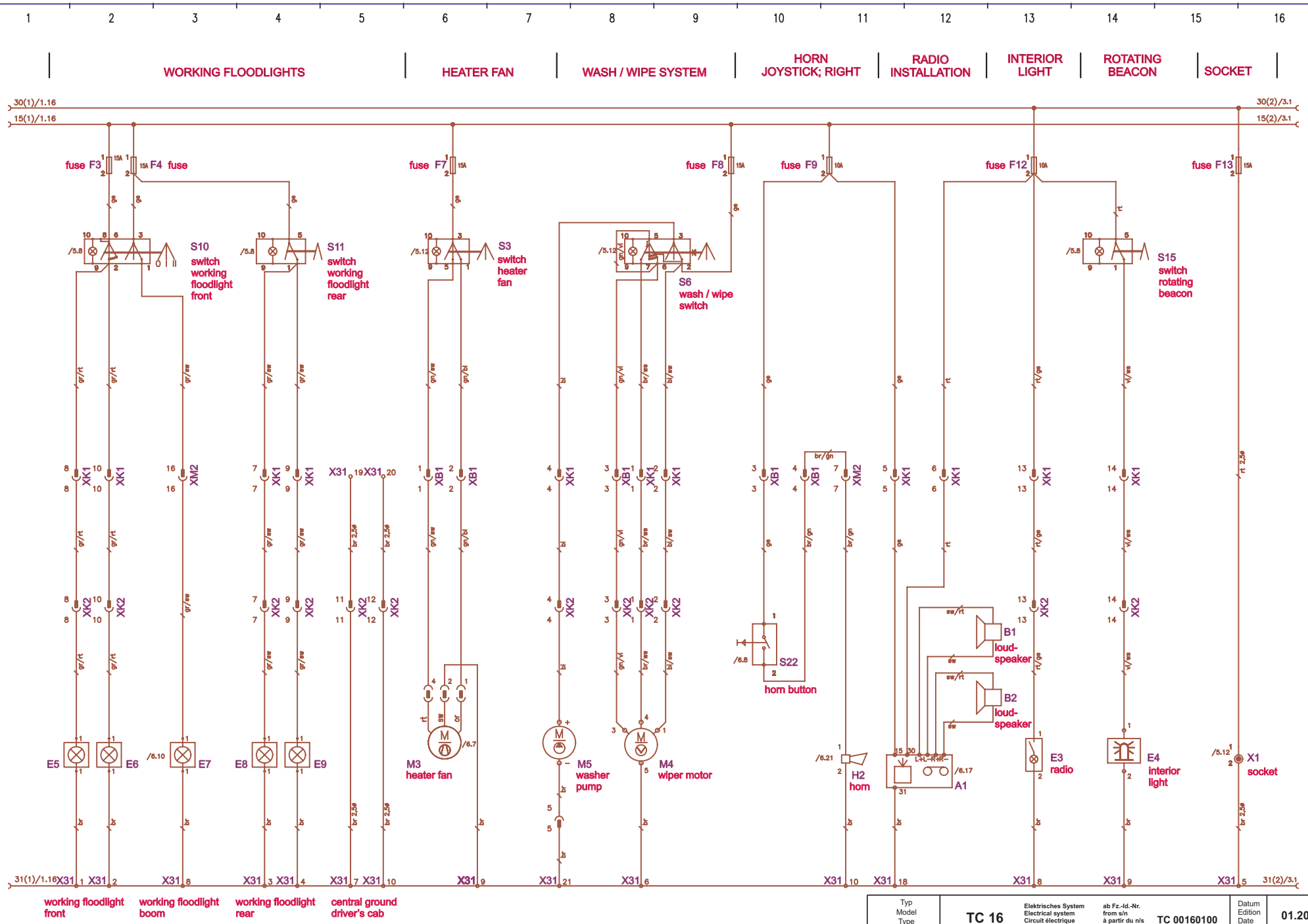
K1	Main relais (terminal 15)	K2	Swing brake
K3	Dozer (option)	K4	2. add. circuit (option)
K10	Glow-time controller		

Cable and plug colours

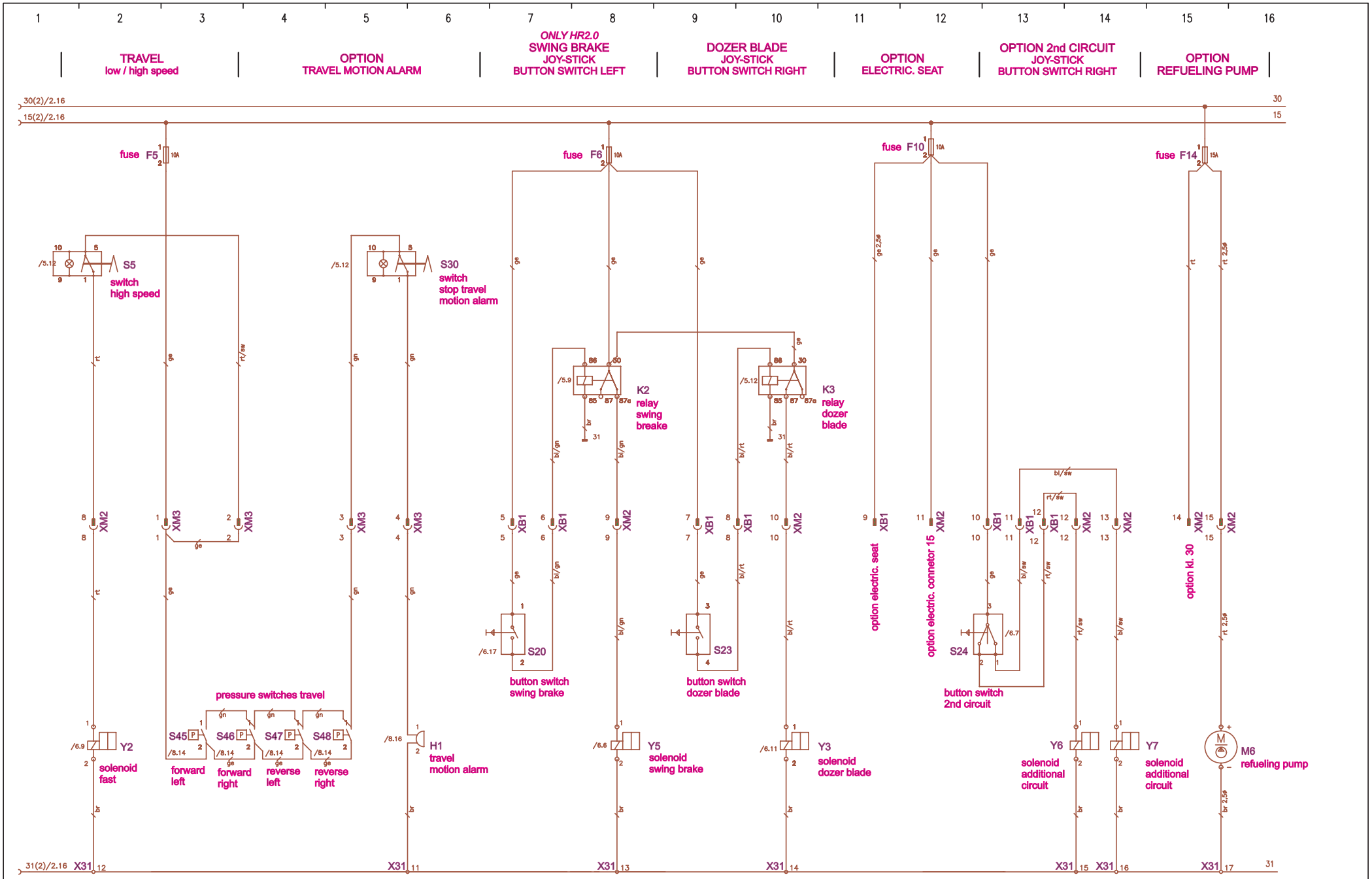
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dbl	dark blue	gr	grey	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		



Typ Model Type Tipo	TC 16	Elektrisches System Electrical system Circuit électrique Sistema elèctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TC 00160100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos				Blatt Page Feuille Página	7.91.11



Typ Model Type Tipo	TC 16	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TC 00160100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos				Blatt Page Feuille Página	7.91.12



Typ Model Type Tipo	TC 16	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no. TC 00160100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos			Blatt Page Feuille Página	7.91.13

Fuse box-assignment diagram

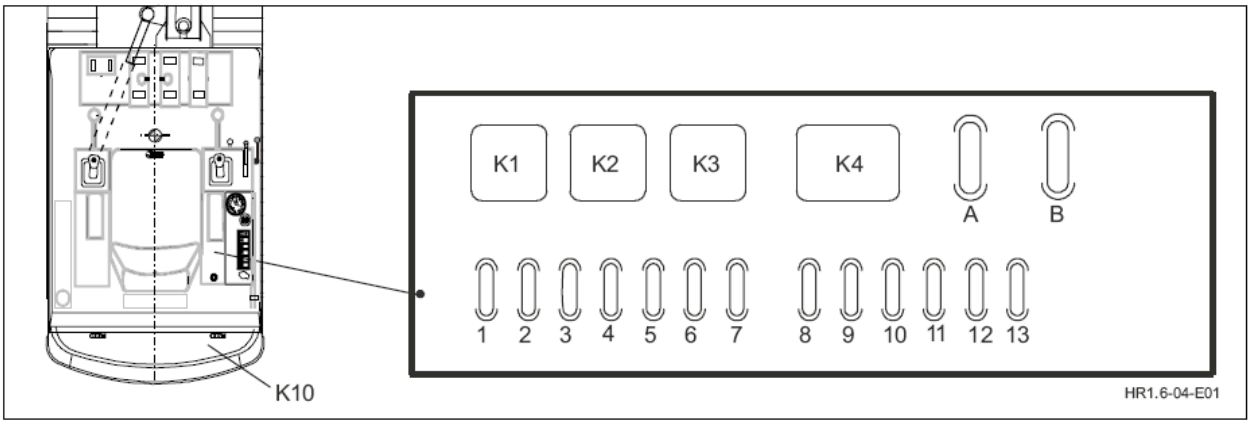


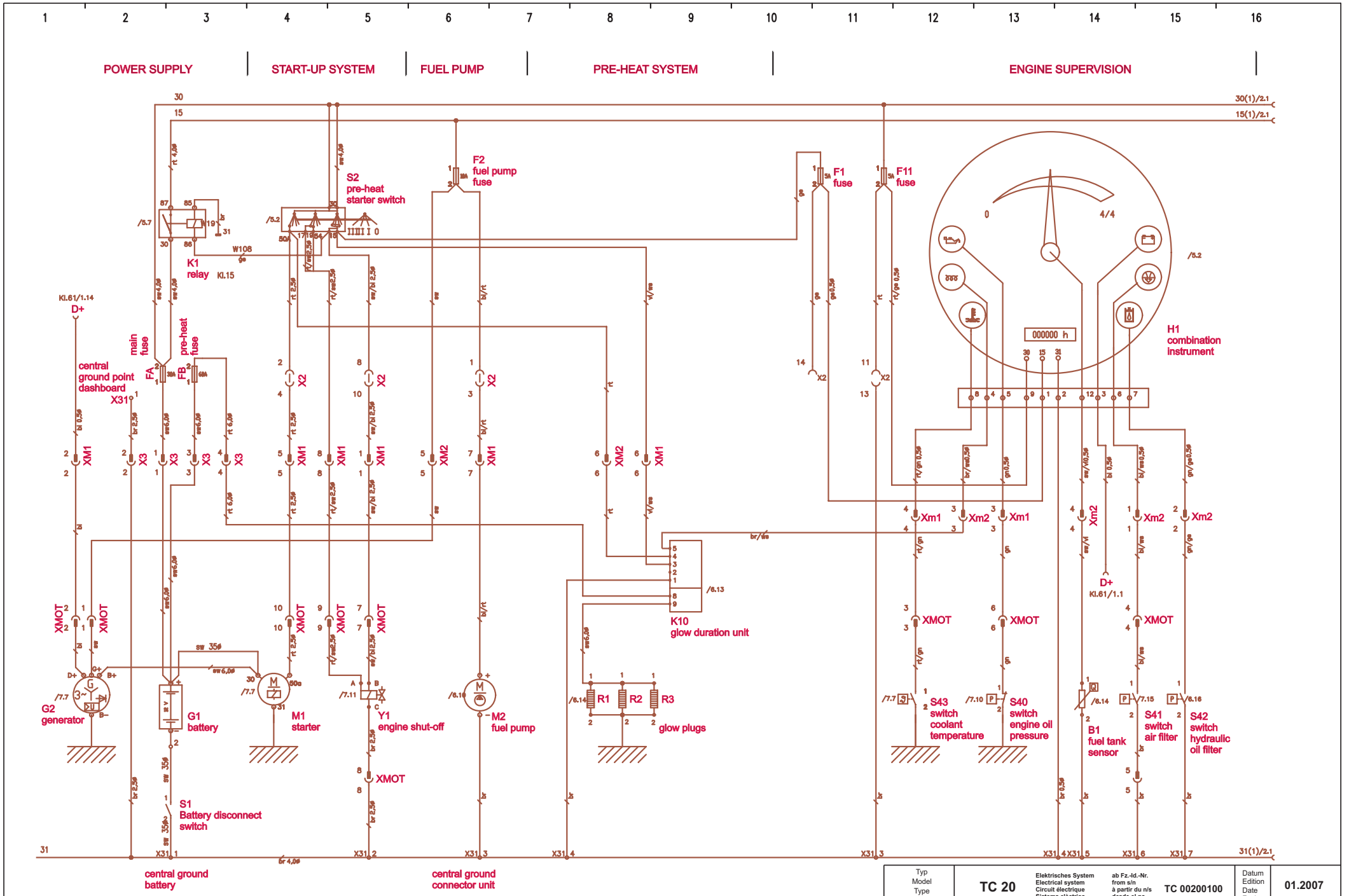
Bild 71 Sicherungs- und Relaiskasten – Belegungsplan

Position	Ampere	Assignment
FA	30A	Main input fuse
FB	60A	Fuse for pre-heater system
F1	5A	Instrument (terminal 15)
F2	10A	Generator, Fuel pump
F3	15A	Working floodlight, front
F4	15A	Working floodlight, rear/boom (option)
F5	10A	Travel fast/slow, travel motion alarm
F6	10A	Swing brake, dozer
F7	15A	Heater fan
F8	15A	Windshield wiper, windshield washer
F9	10A	Radio (option), horn
F10	10A	Driver seat, 2. add. circuit (option)
F11	5A	Instrument, immobilizer (terminal 30)
F12	10A	Interior light, rotating beacon, radio (option)
F13	15A	Socket
F14	15A	Option refulling pump

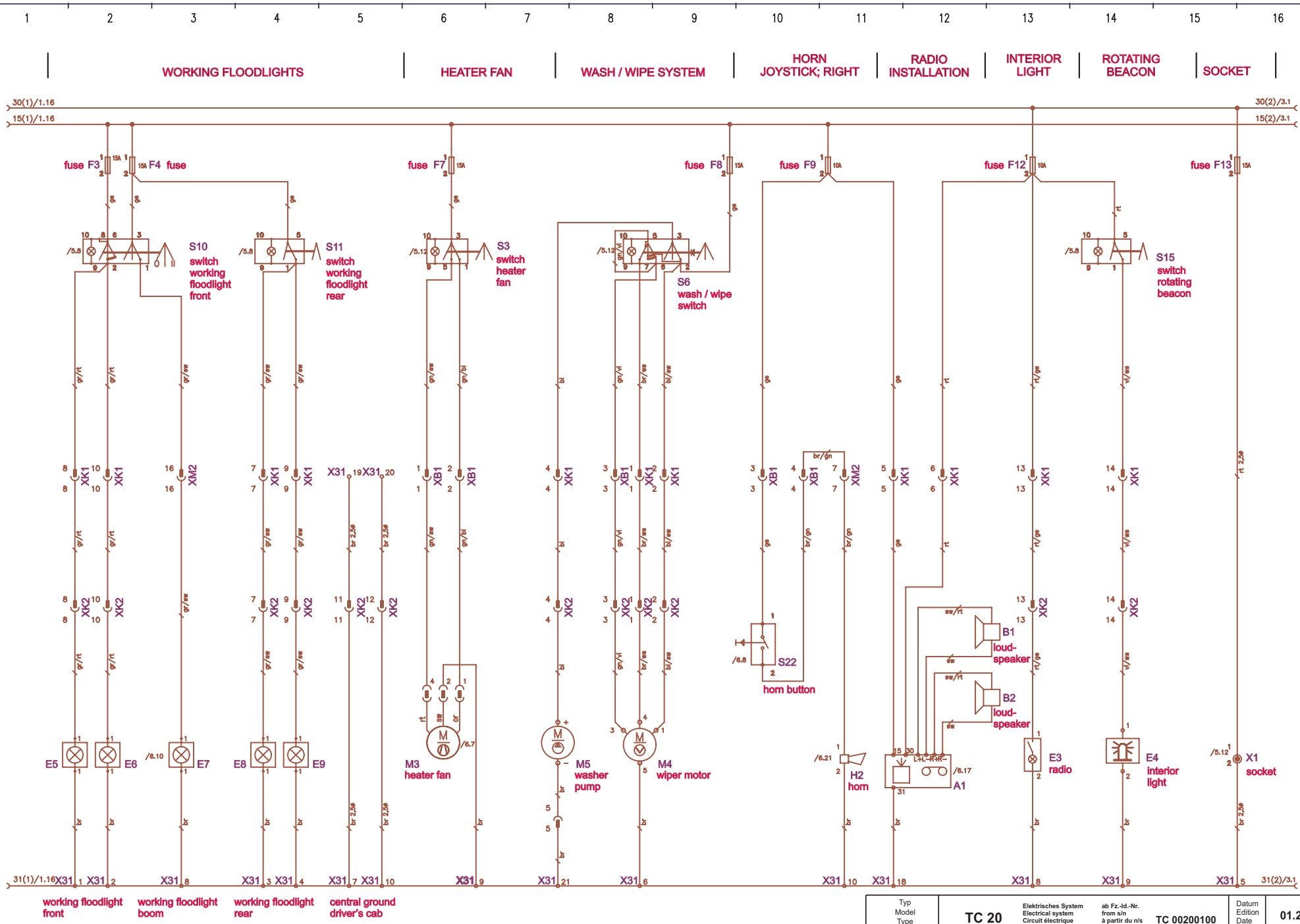
K1	Main relais (terminal 15)	K2	Swing brake
K3	Dozer (option)	K4	2. add. circuit (option)
K10	Glow-time controller		

Cable and plug colours

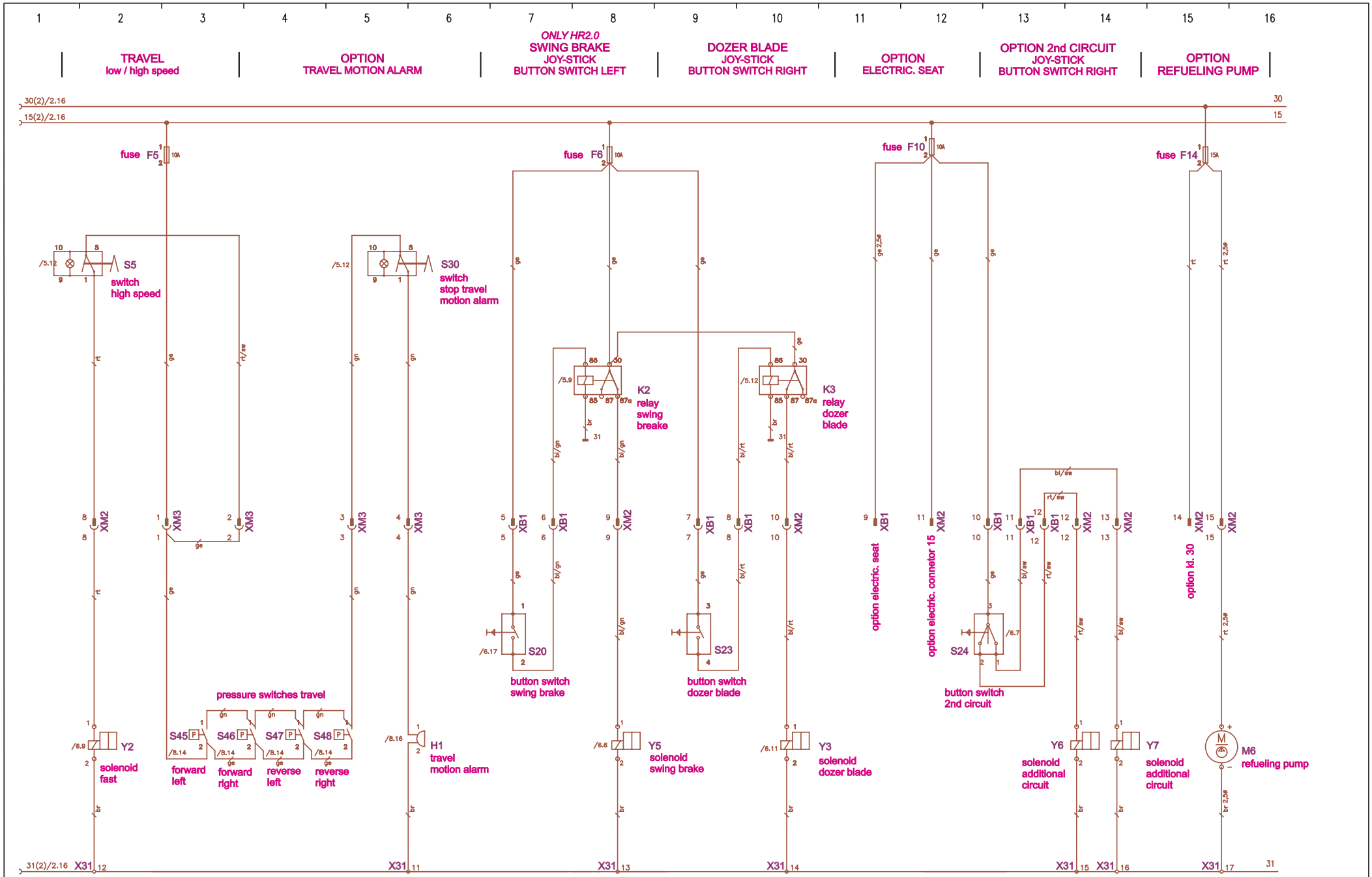
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bl	blue	ge	yellow	hgr	light grey	sw	black
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dbl	dark blue	gr	grey	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		



Typ Model Type Tipo	TC 20	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TC 00200100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos				Blatt Page Feuille Página	7.92.11

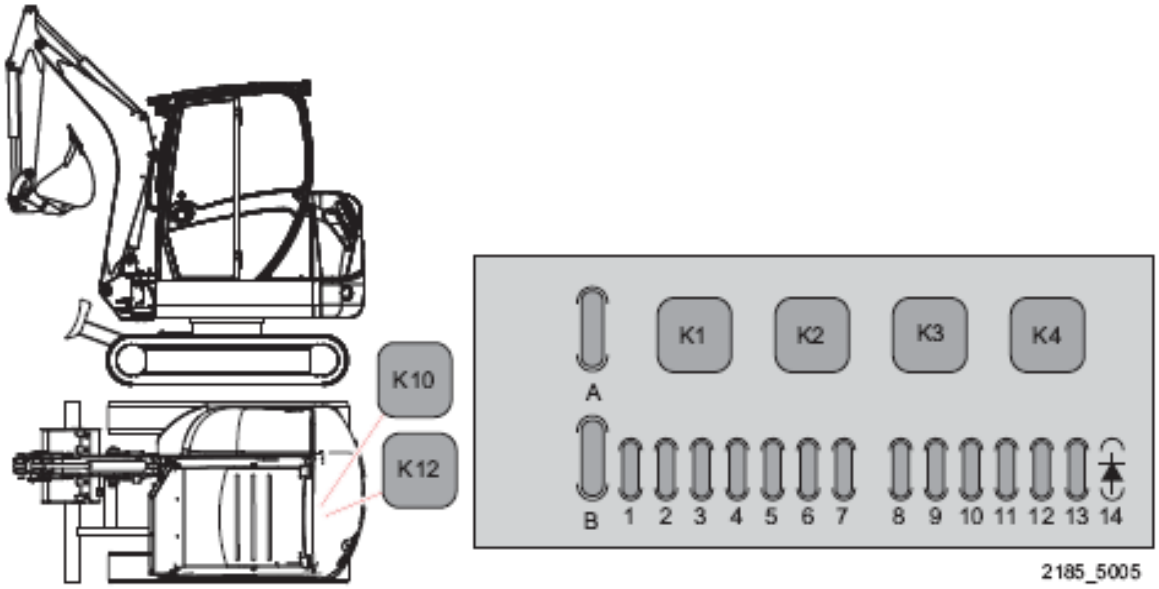


Typ Model Type Tipo	TC 20	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no. TC 00200100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos			Blatt Page Feuille Página	7.92.12



Typ Model Type Tipo	**TC 20**	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	**TC 00200100**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos**				Blatt Page Feuille Página	**7.92.13**

Fuse box-assignment diagram

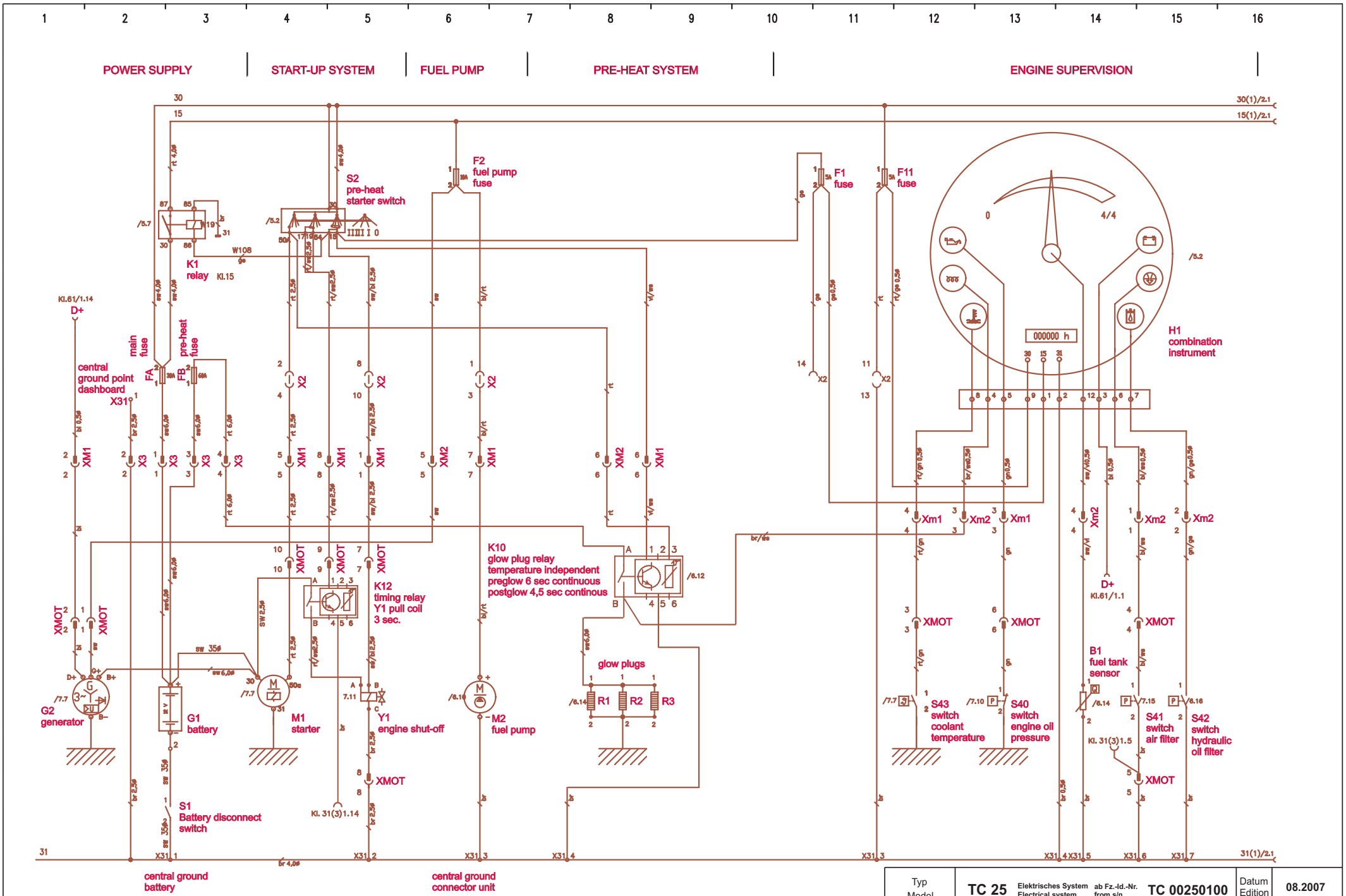


Position	Ampere	Assignment
FA	30A	Main input fuse
FB	60A	Fuse for pre-heater system
F1	5A	Instrument (terminal 15)
F2	10A	Fuelpump, generator
F3	15A	Working floodlight, front
F4	15A	Working floodlight, rear/boom (option)
F5	10A	Travel fast/slow
F6	10A	Swing brake
F7	15A	Heater fan
F8	15A	Wisher, Wiper
F9	10A	Horn, Radio (Option)
F10	10A	2nd add. Circuit (option)
F11	5A	Instrument (terminal 30)
F12	10A	Interior light, rotating beacon (option)
F13	15A	Socket
F14	15A	Refuelingpump (option)

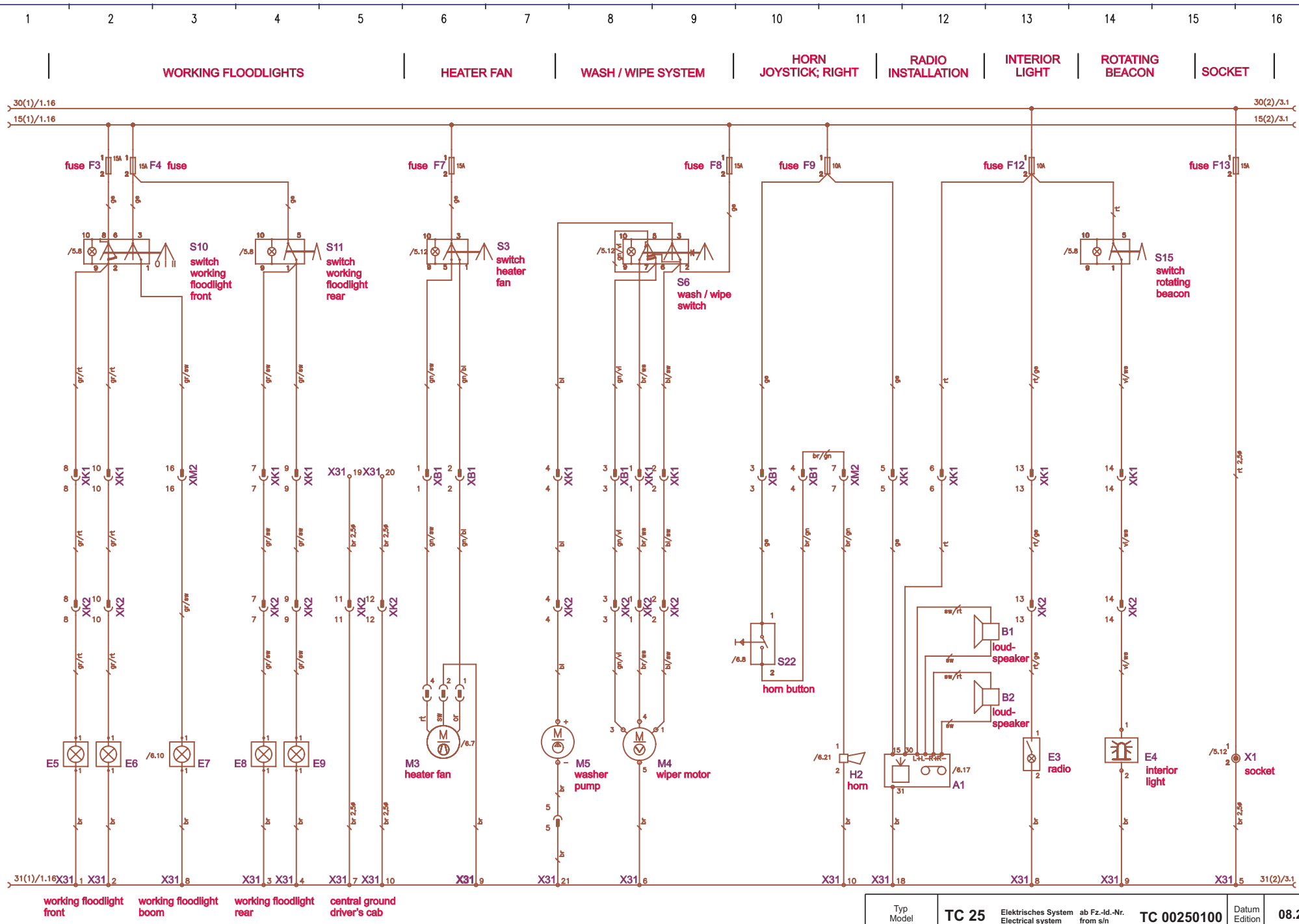
K1	Terminal 15	K2	Swing brake
K3	Dozer blade (option)		

Cable and plug colours

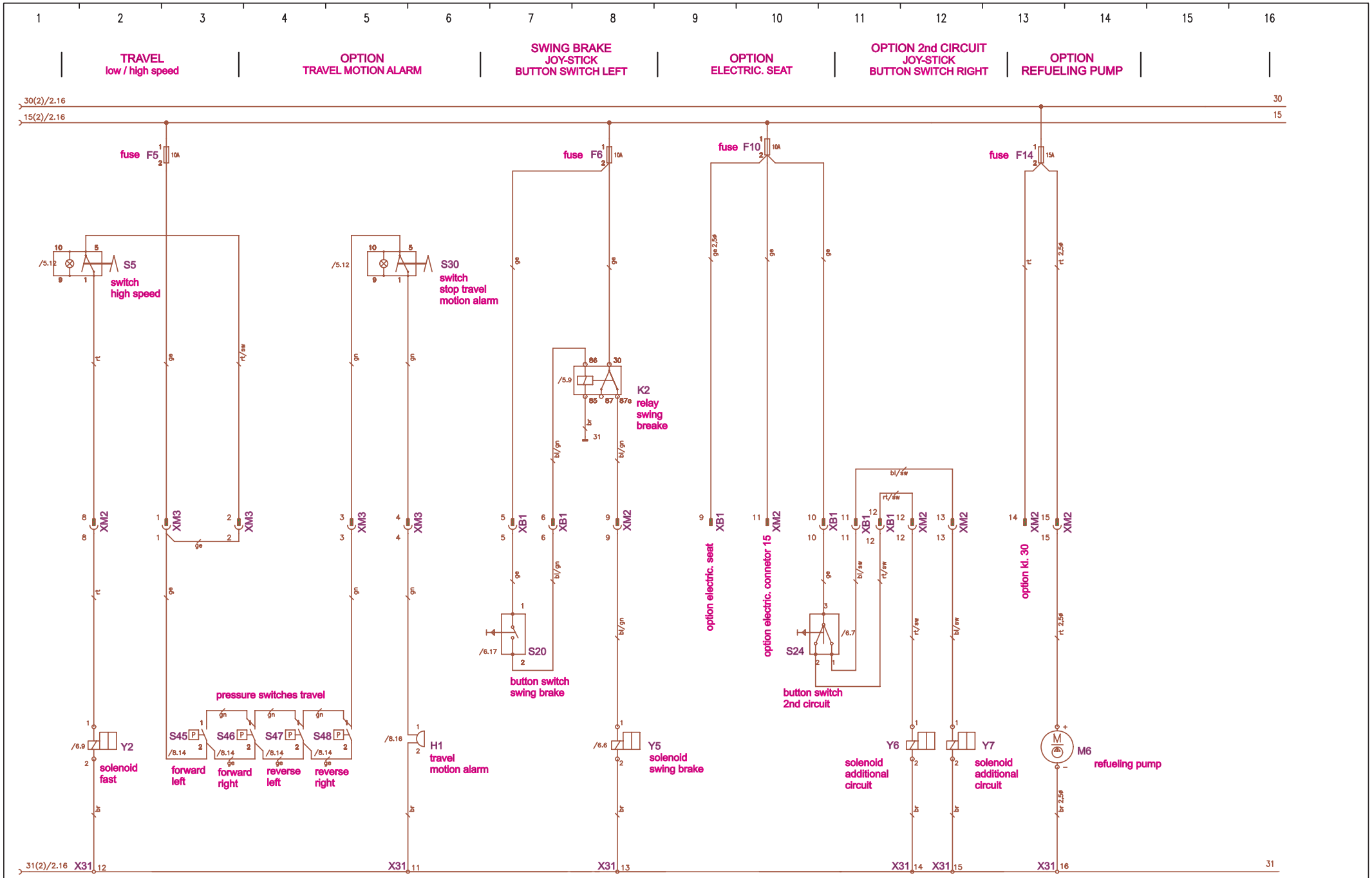
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bl	blue	ge	yellow	hgr	light grey	sw	black
br	brown	gn	green	hr	light red	vie	violet
dbl	dark blue	gr	grey	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		



Typ Model	TC 25	Elektrisches System Electrical system	ab Fz.-Id.-Nr. from s/n	TC 00250100	Datum Edition	08.2007
Benennung Description	Stromlaufplan Wiring diagramm			(1)	Blatt Page	7.93.02



Typ Model	TC 25	Elektrisches System Electrical system	ab Fz.-Id.-Nr. from s/n	TC 00250100	Datum Edition 08.2007
Benennung Description	Stromlaufplan Wiring diagramm	(2)			Blatt Page 7.93.03



Typ Model	TC 25	Elektrisches System Electrical system	ab Fz.-Id.-Nr. from s/n	TC 00250100	Datum Edition	08.2007
Benennung Description	Stromlaufplan Wiring diagramm	(3)			Blatt Page	7.93.04

Fuse box-assignment diagram

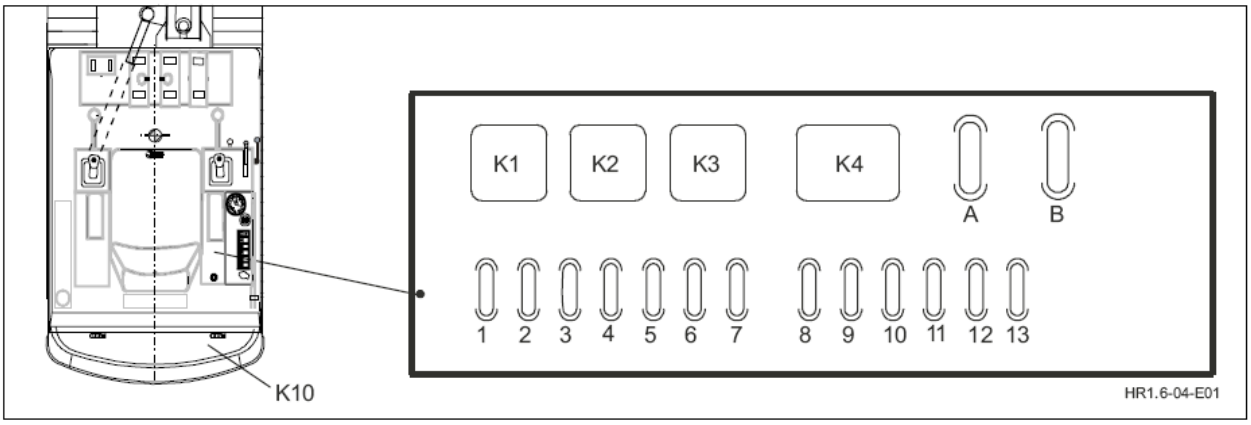


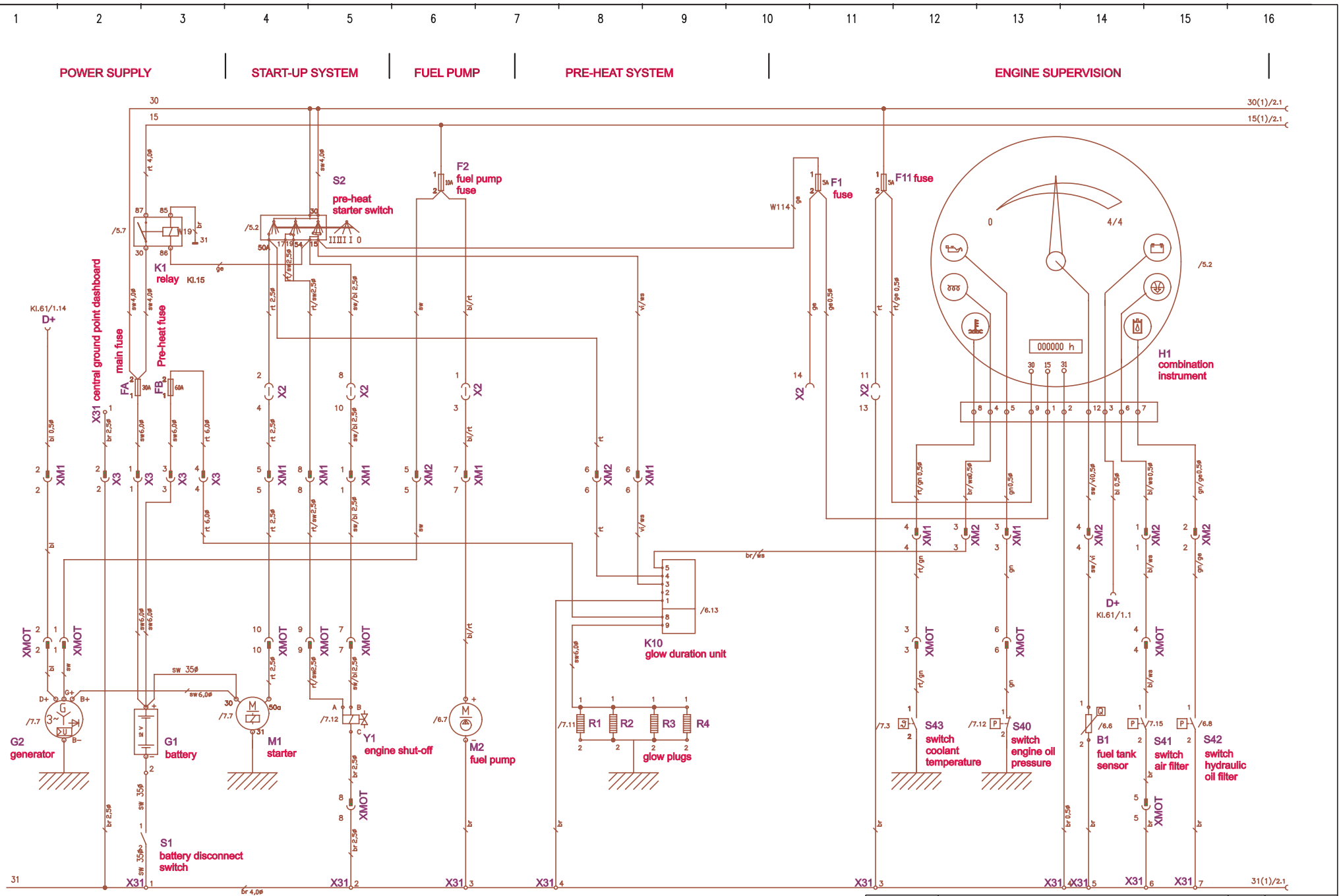
Bild 71 Sicherungs- und Relaiskasten – Belegungsplan

Position	Ampere	Assignment
FA	30A	Main input fuse
FB	60A	Fuse for pre-heater system
F1	5A	Instrument (terminal 15)
F2	10A	Generator, Fuel pump
F3	15A	Working floodlight, front
F4	15A	Working floodlight, rear/boom (option)
F5	10A	Travel fast/slow, travel motion alarm
F6	10A	Swing brake, dozer
F7	15A	Heater fan
F8	15A	Windshield wiper, windshield washer
F9	10A	Radio (option), horn
F10	10A	Driver seat, 2. add. circuit (option)
F11	5A	Instrument, immobilizer (terminal 30)
F12	10A	Interior light, rotating beacon, radio (option)
F13	15A	Socket
F14	15A	Option refulling pump

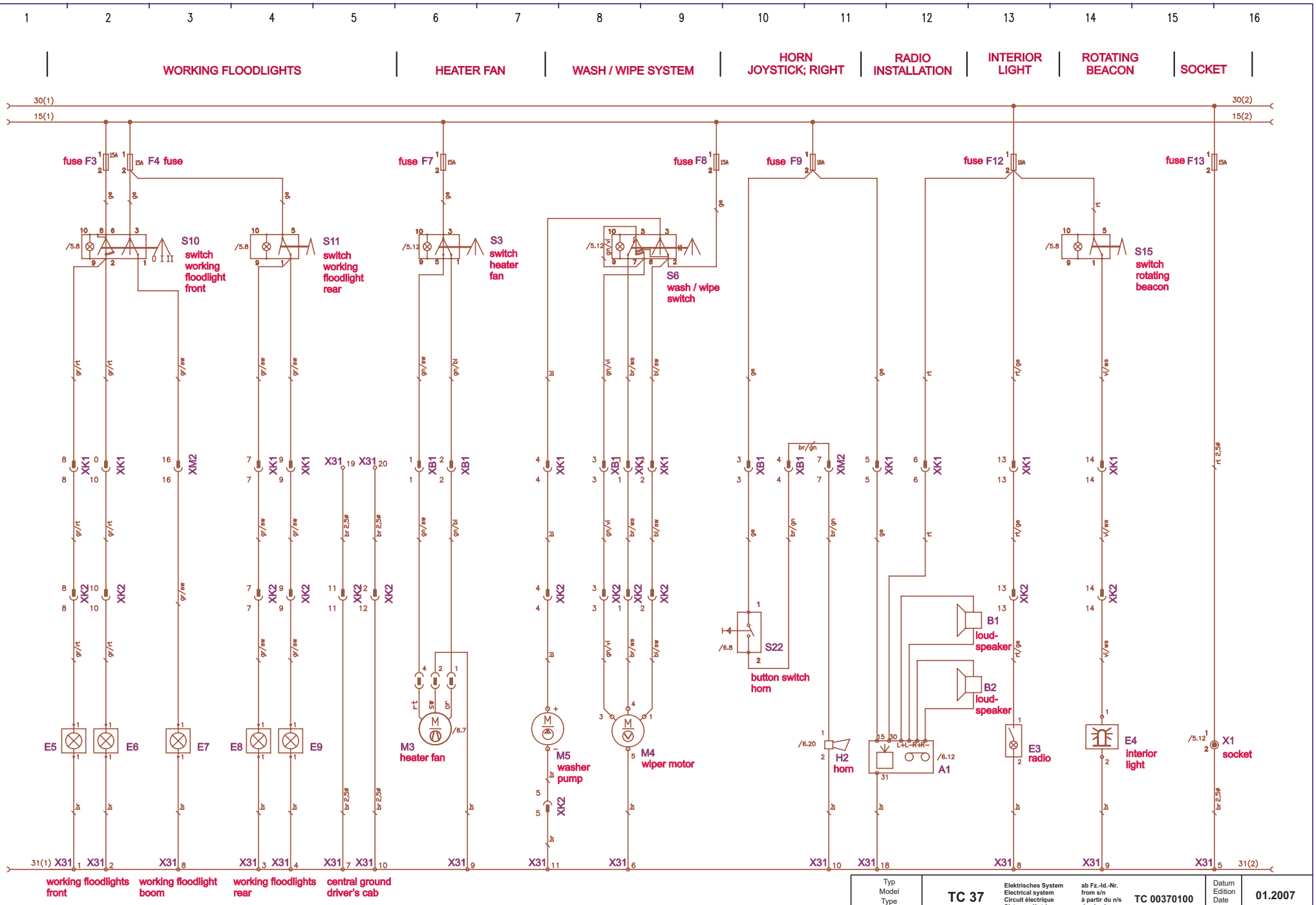
K1	Main relais (terminal 15)	K2	Swing brake
K3	Dozer (option)	K4	2. add. circuit (option)
K10	Glow-time controller		

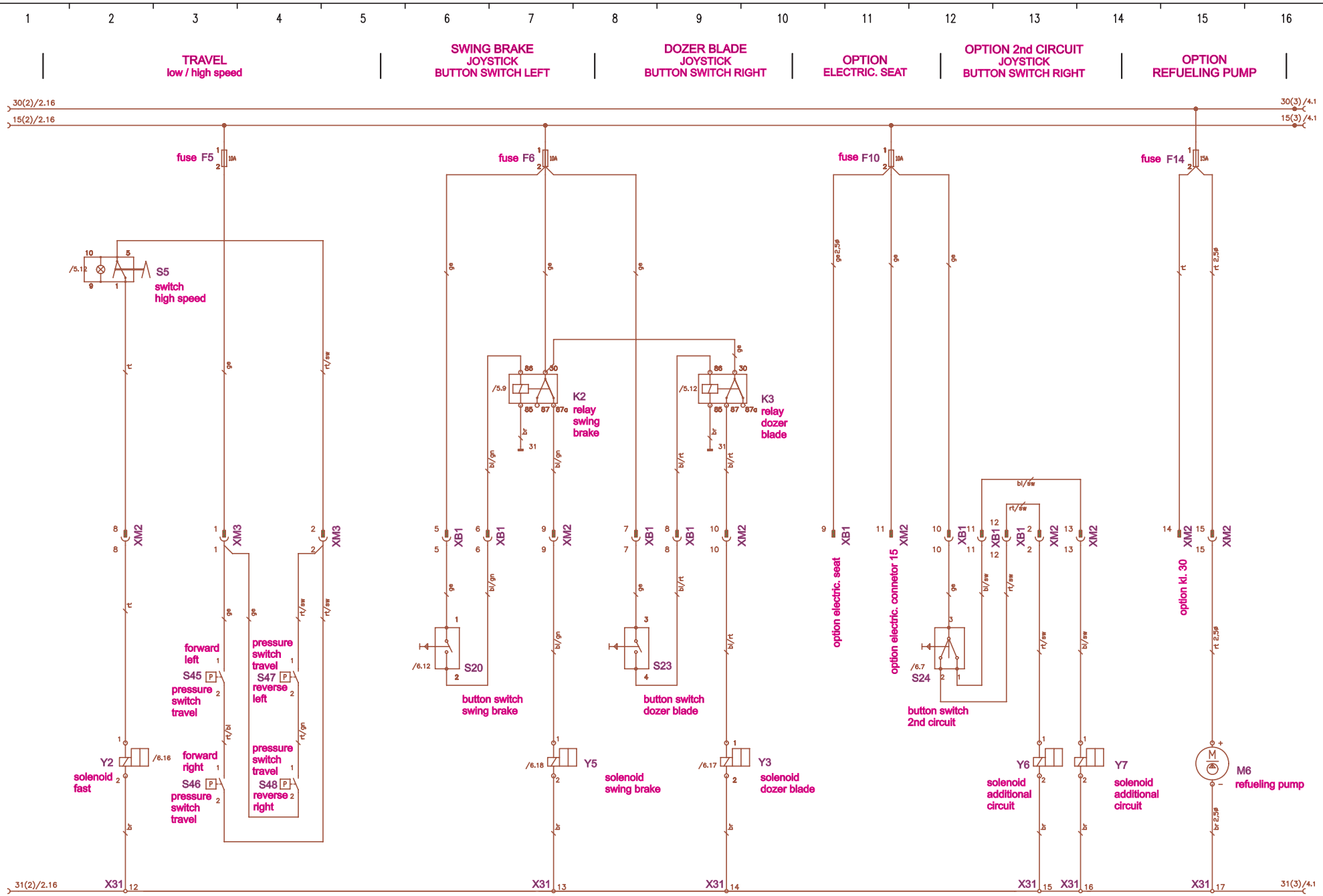
Cable and plug colours

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bl	blue	ge	yellow	hgr	light grey	sw	black
br	brown	gn	green	hr	light red	vie	violet
dbl	dark blue	gr	grey	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		

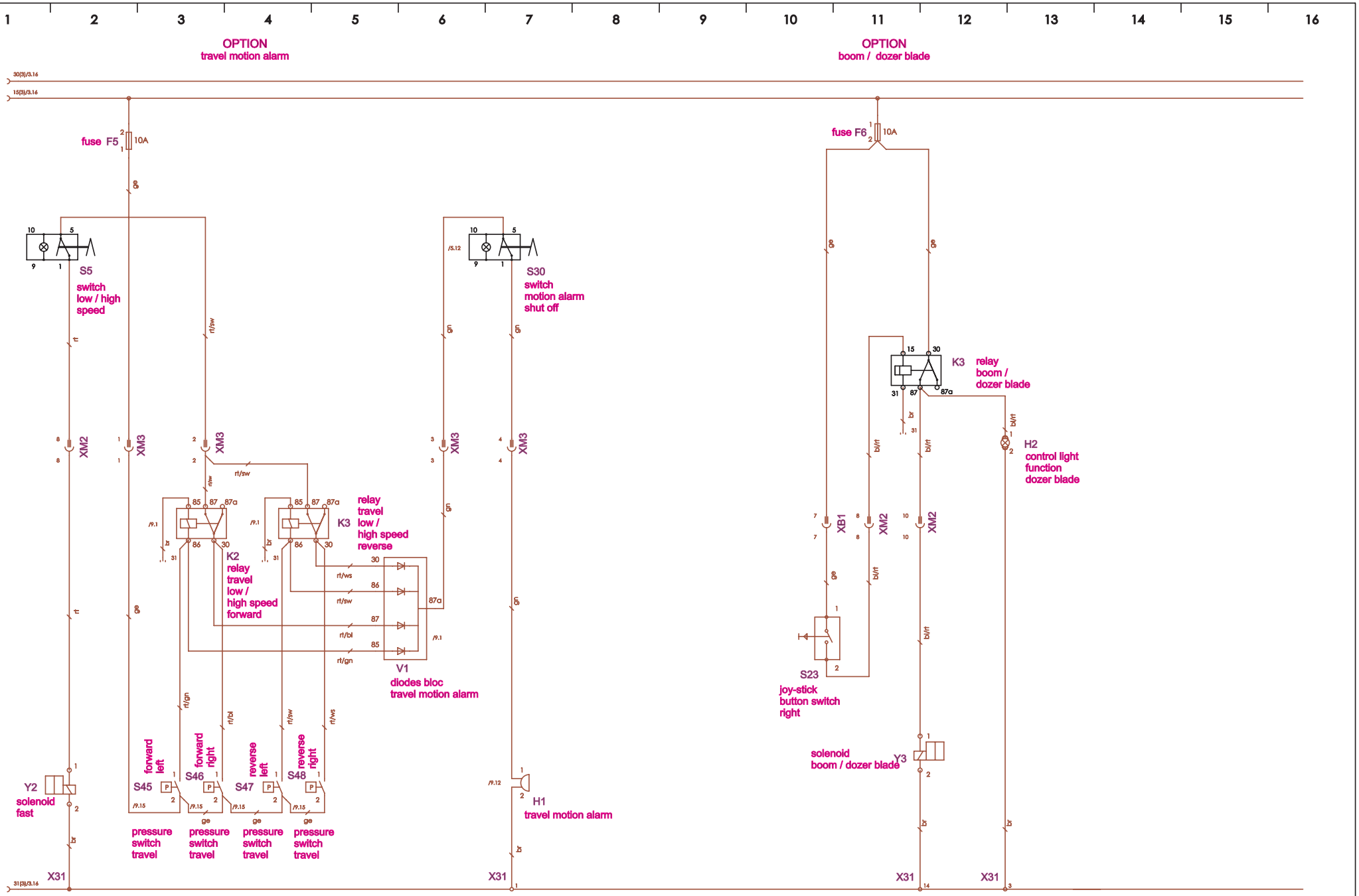


Typ / Model / Type / Tipo	TC 37	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico	ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC 00370100	Datum / Edition / Date / Fecha	01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos			Blatt / Page / Feuille / Página	7.97.11


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
WORKING FLOODLIGHTS
HEATER FAN
WASH / WIPE SYSTEM
HORN JOYSTICK; RIGHT
RADIO INSTALLATION
INTERIOR LIGHT
ROTATING BEACON
SOCKET
30(1)
15(1)
30(2)
15(2)
fuse F3 15A
F4 fuse 15A
fuse F7 15A
fuse F8 15A
fuse F9 10A
fuse F12 10A
fuse F13 15A
S10 switch working floodlight front
S11 switch working floodlight rear
S3 switch heater fan
S6 wash / wipe switch
S15 switch rotating beacon
S22 button switch horn
B1 loud-speaker
B2 loud-speaker
E3 radio
E4 interior light
X1 socket
H2 horn
A1
M3 heater fan
M4 wiper motor
M5 washer pump
E5 E6 E7 E8 E9
XK1 XK2 XB1 XM2
X31
working floodlights front
working floodlight boom
working floodlights rear
central ground driver's cab
Typ Model Type Tipo
TC 37
Elektrisches System Electrical system Circuit électrique Sistema elèctrico
ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.
TC 00370100
Datum Edition Date Fecha
01.2007
Benennung Description Dénomination Denominación
Stromlaufplan
Wiring diagramm
Circuit électrique
Esquemas de los circuitos
Blatt Page Feuille Página
7.97.12



Typ Model Type Tipo	TC 37	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TC 00370100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos				Blatt Page Feuille Página	7.97.13



Typ Model Type Tipo	TC 37	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TC 00370100	Datum Edition Date Fecha	01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm Circuit électrique Esquemas de los circuitos				Blatt Page Feuille Página	7.97.14

Fuse box-assignment diagram

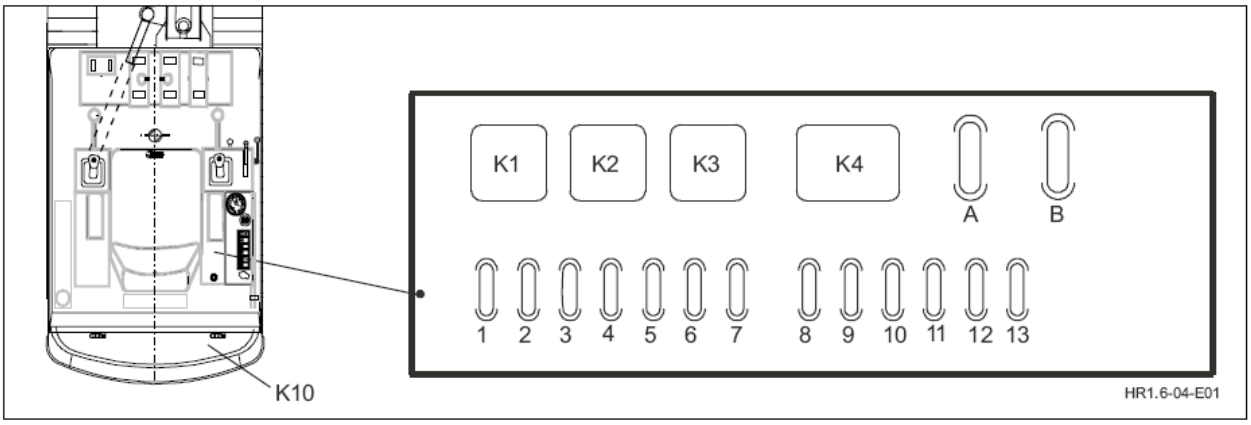


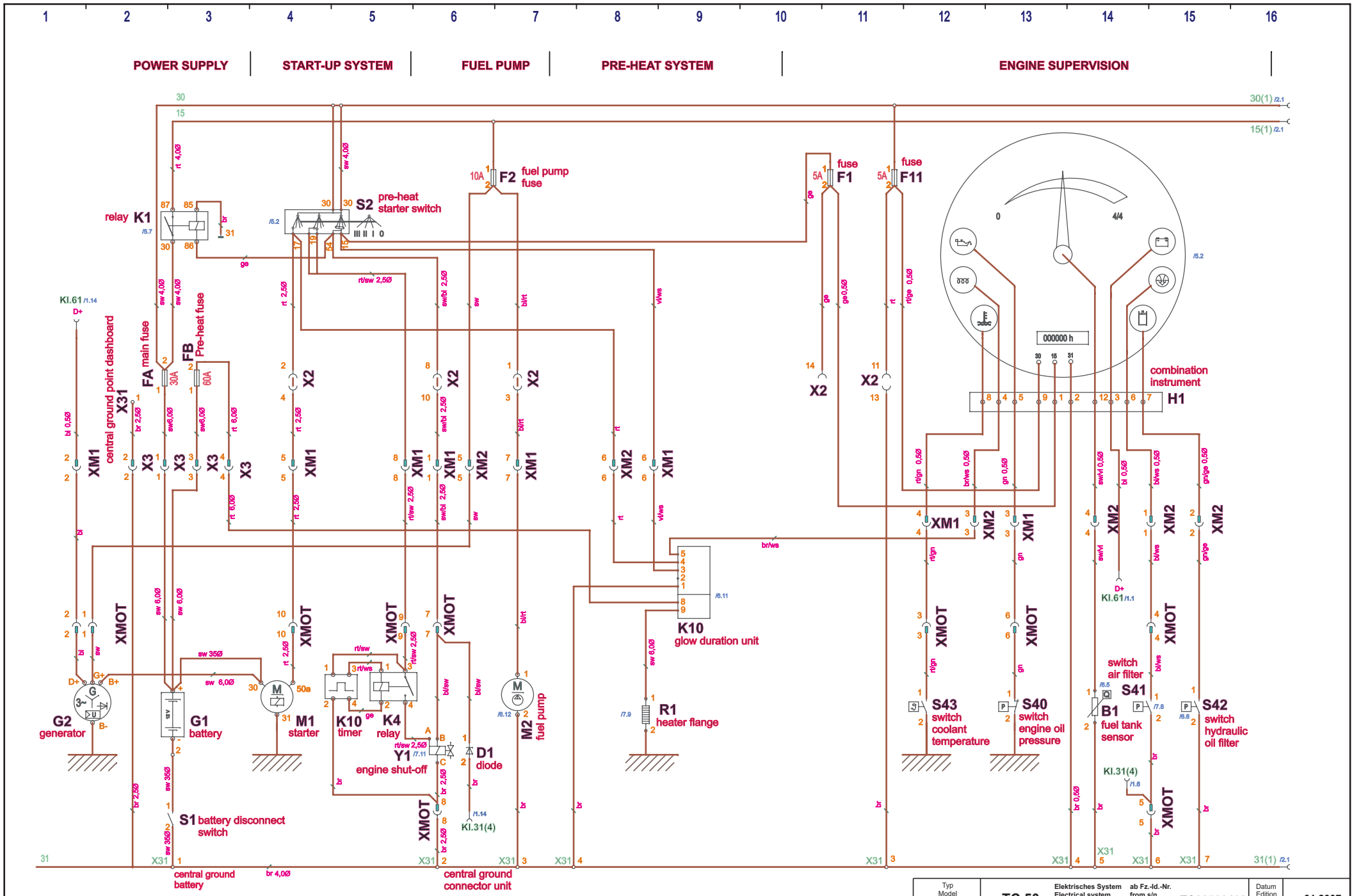
Bild 71 Sicherungs- und Relaiskasten – Belegungsplan

Position	Ampere	Assignment
FA	30A	Main input fuse
FB	60A	Fuse for pre-heater system
F1	5A	Instrument (terminal 15)
F2	10A	Generator, Fuel pump
F3	15A	Working floodlight, front
F4	15A	Working floodlight, rear/boom (option)
F5	10A	Travel fast/slow, travel motion alarm
F6	10A	Swing brake, dozer
F7	15A	Heater fan
F8	15A	Windshield wiper, windshield washer
F9	10A	Radio (option), horn
F10	10A	Driver seat, 2. add. circuit (option)
F11	5A	Instrument, immobilizer (terminal 30)
F12	10A	Interior light, rotating beacon, radio (option)
F13	15A	Socket
F14	15A	Option refulling pump

K1	Main relais (terminal 15)	K2	Swing brake
K3	Dozer (option)	K4	2. add. circuit (option)
K10	Glow-time controller		

Cable and plug colours

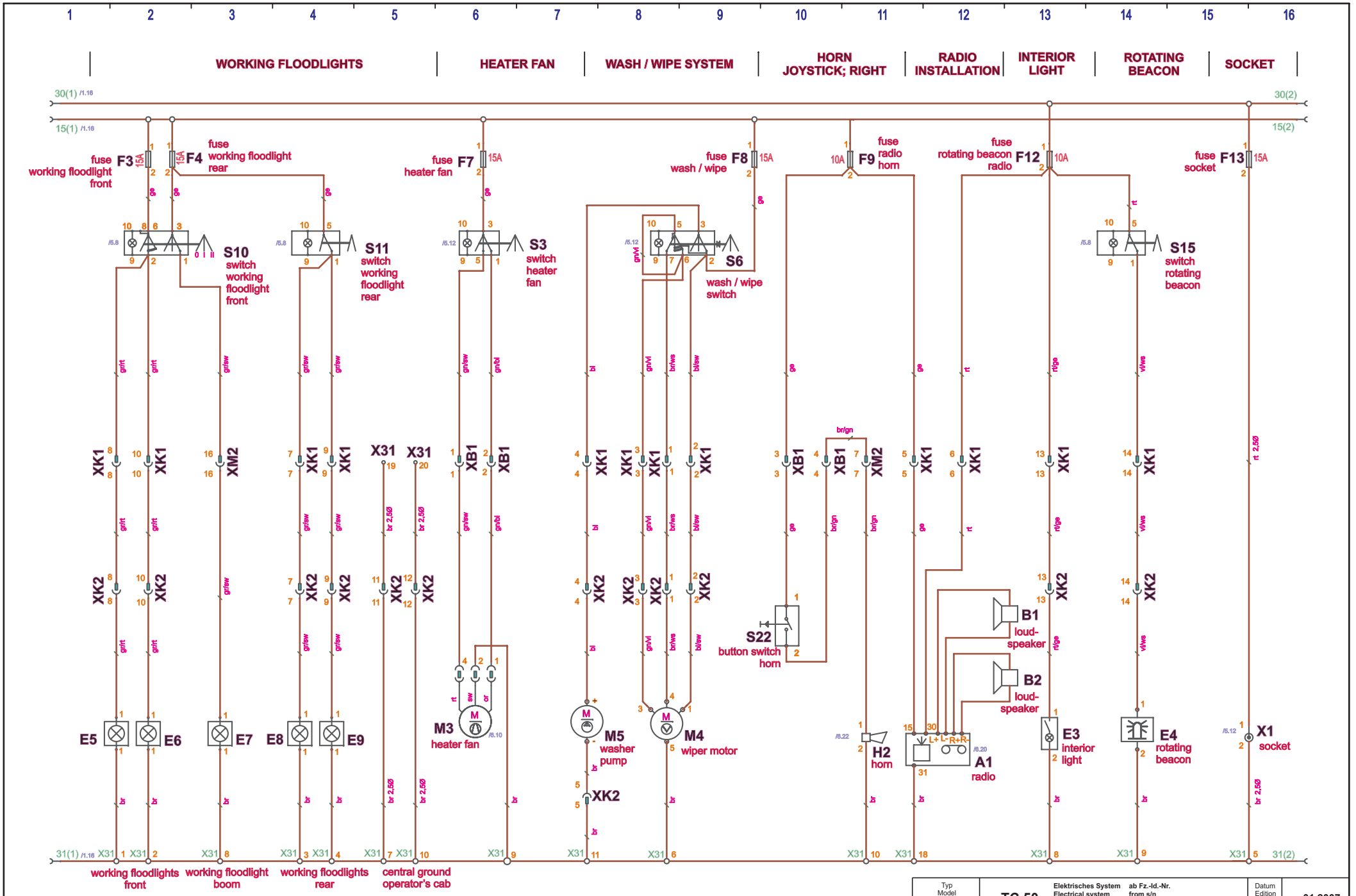
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bl	blue	ge	yellow	hgr	light grey	sw	black
br	brown	gn	green	hr	light red	vie	violet
dbl	dark blue	gr	grey	nt	nature	ws	white
dbr	dark brown	hbl	light blue	or	orange		



XMOT	connector machine / engine
XM1	connector machine / dash board
XM2	connector machine / dash board

X2	connector dash board / immobilizer
X3	connector machine / dash board

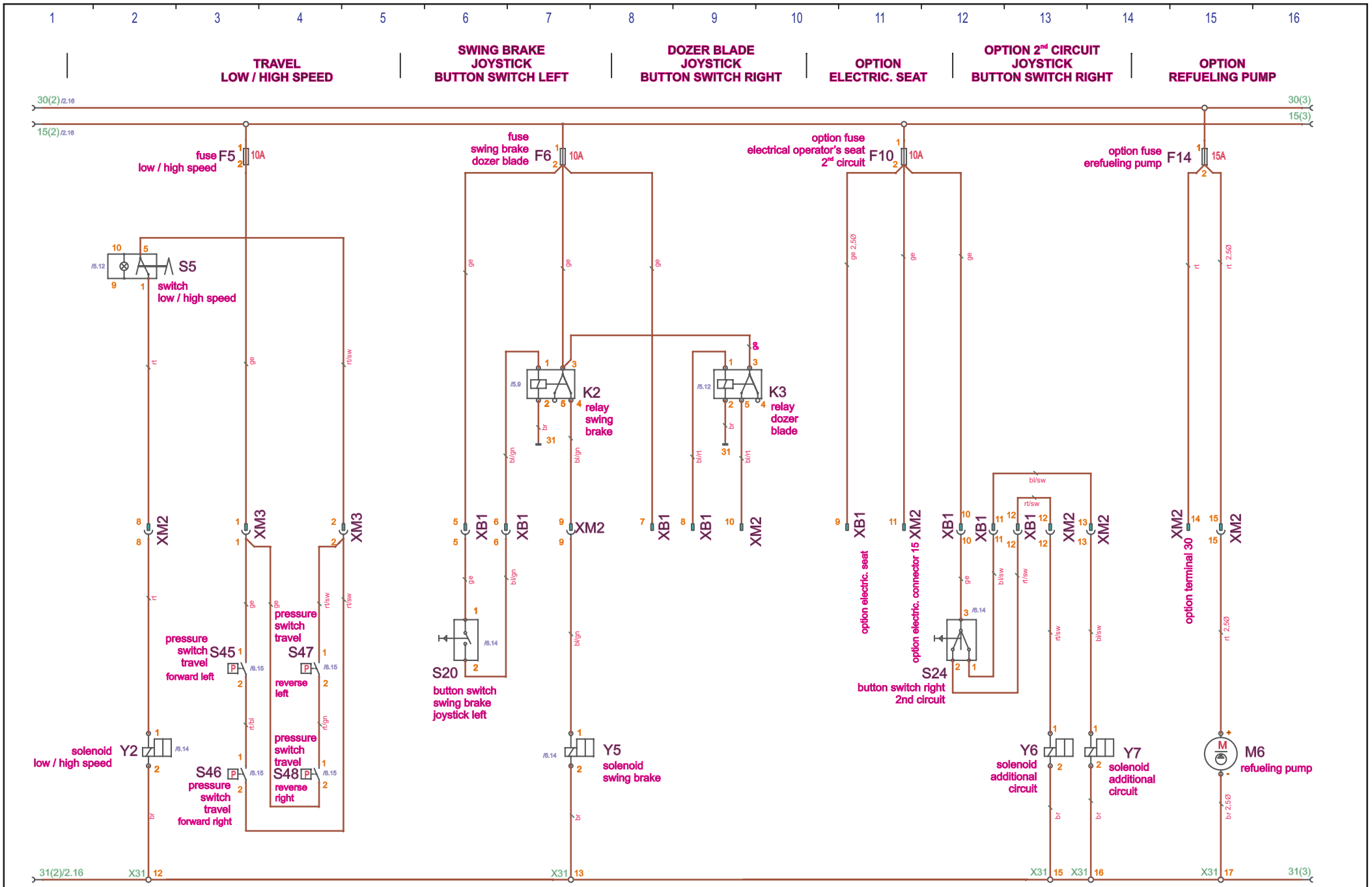
Typ Model Type Tipo	TC 50	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC00500100	Datum Edition Date Fecha: 01.2007
Benennung Description Dénomination Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt Page Feuille Página 1/4	Blatt Page Feuille Página: 7.99.01



XB1	connector machine / dash board
XK1	connector machine / dash board
XK2	connector machine / operator's cab

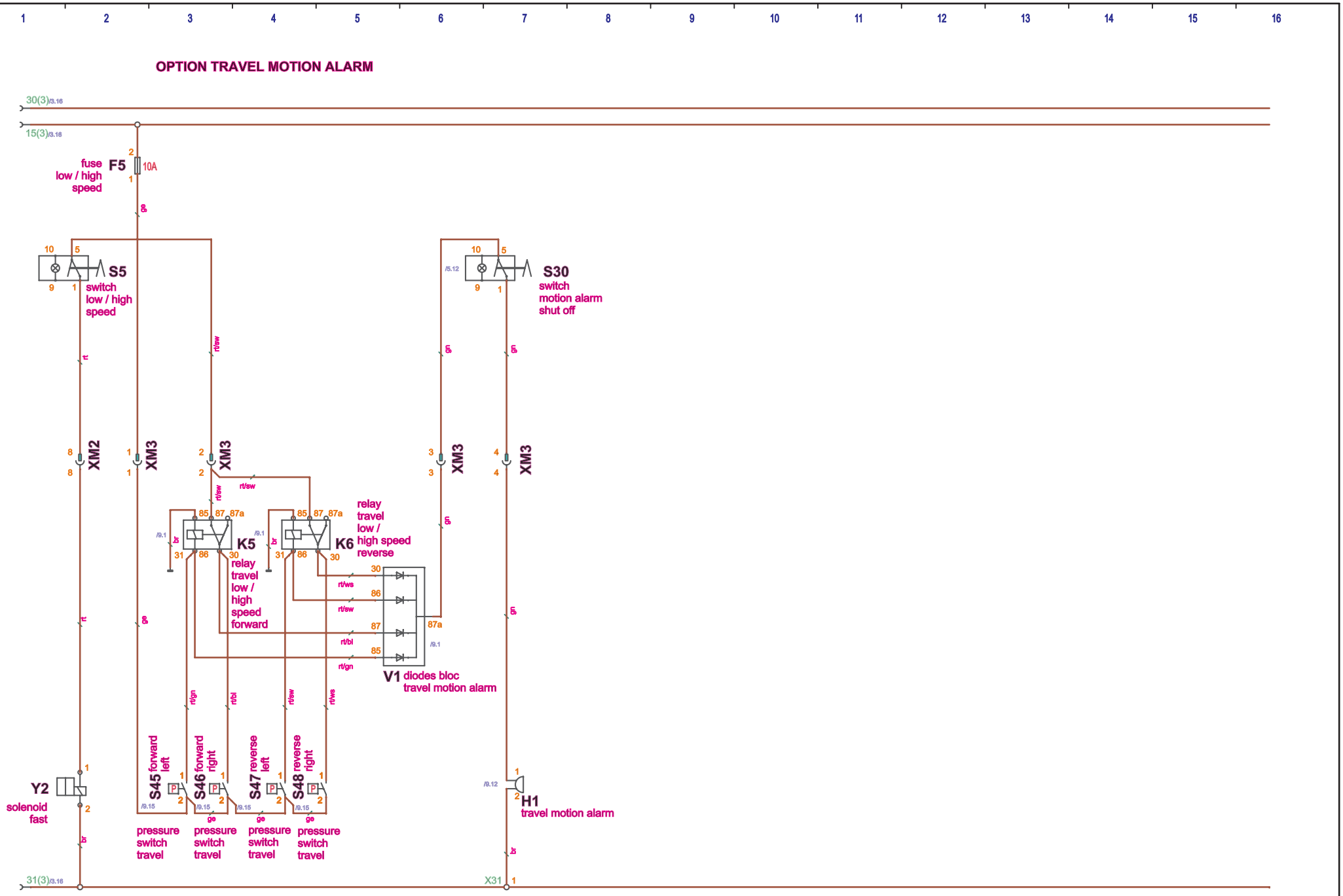
XM2	connector machine / dash board

Typ / Model / Type / Tipo	TC 50	Elektrisches System / Electrical system / Circuit électrique / Sistema eléctrico — ab Fz.-Id.-Nr. / from s/n / à partir du n/s / desde el no. TC00500100	Datum / Edition / Date / Fecha 01.2007
Benennung / Description / Dénomination / Denominación	Stromlaufplan / Wiring diagramm / circuit électrique / Esquemas de los circuitos	Blatt / Page / Feuille / Página 2/4	Blatt / Page / Feuille / Página 7.99.02



XB1	connector machine / dash board
XM2	connector machine / dash board
XM3	connector machine / dash board

Typ Model Type Tipo	TC 50	Elektrisches System Electrical system Circuit électrique Sistema eléctrico ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no. TC 00500100	Datum Edition Date Fecha 01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos	Blatt Page Feuille Página 3/4	Blatt Page Feuille Página 7.99.03



XM2	connector machine / dash board
XM3	connector machine / dash board

Typ Model Type Tipo	TC 50	Elektrisches System Electrical system Circuit électrique Sistema eléctrico	ab Fz.-Id.-Nr. from s/n à partir du n/s desde el no.	TC 00500100	Datum Edition Date Fecha 01.2007
Benennung Description Dénomination Denominación	Stromlaufplan Wiring diagramm circuit électrique Esquemas de los circuitos		Blatt Page Feuille Página 4/4		Blatt Page Feuille Página 7.99.04

Cable colours	Terminal	Significance	Nominal cross sections (mm²) 0.75	1.5	2.5	4.0	6.0
black	30/49	Battery, positive, reverse, flasher	x	x	x	x	x
red	15	Glow starter, positive		x	x	x	
brown	31	Ground, negative	x	x	x	x	
blue	D+/61	Generator, working hour meter	x	x	x		
white	56a	High beam	x	x	x		
yellow	15	Switched positive output	x	x	x		
green		Oil pressure - engine	x	x	x		
grey		Switch forward - rectifier	x	x	x		
beige		Board check system		x			
black / red	54	Brake lights, stop light switch		x			
black / blue		Additional valve		x			
black / white	L	Flasher left, flasher check, terminal C		x			
black / green	R	Flasher right		x			
black / yellow		Parking brake - charge indicator light		x			
black / white / green	49a	Flasher switch		x			
black / grey	C2	Flasher indicator light		x			
black / violet	G	Fuel level gauge		x			
black / brown		Warning buzzer		x			
red / black		Axle lock		x			
red / white		Temperature indicator		x			
red / yellow		Hand brake switch - cabin lamp		x			
red / blue		Steering inversion		x			
red / green		4-wheel steering - crab		x			
red / brown		4-wheel steering - round		x			
brown / red		Hydr.oil cooler / transmitter / engine		x			
brown / white	17/31b	Warning lamp pre-glow / wiper motor		x			
brown / yellow		V-belt check, valve-breaker		x			
brown / green		Horn		x			
blue / red		Hydraulic pressure		x			
blue / brown		Diesel fuel heat., charge press. (fuel)		x			
blue / white		Air filter check		x			
blue / yellow		Armrest switch - pilot control		x			
blue / black		Electr. engine shut-off, wiper motor		x			
white / yellow	56b	Low beam		x			
white / grey	3	Light switch		x			
yellow / black		Heater fan switch - motor		x			
yellow / green		Hydr. filter clogging indicator		x			
green / red		Engine oil temperature light (Deutz)		x			
green / white		Hydraulic oil temperature		x			
green / violet		Windscreen wiper		x			
green / grey		Heater fan		x			
green / blue		Heater fan		x			
green / black		Heater fan		x			
grey / black		Side marker lamp left		x			
grey / red		Side marker lamp right, panel lamps / working floodlights		x			
violet / white		Rotating beacon		x			
green / white / red		Cooling water level		x			
green / black / white		Engine oil level		x			
green / white / violet		Hydraulic oil level		x			
orange		Slew limitation		x			
blue / green		Wiper switch		x			
blue / yellow / green (1,5)		Steering lock angle rear		x			
red / green / violet		Steering lock angle front		x			

In case of a bad battery charge, the functioning of the battery has to be checked prior to the generator replacement !

- Check tightness of eye connections at the generator **B+** = battery+ and **D+** = dynamo+, retighten if need be

- Check ground connection of **generator** to **engine** and **engine** to **chassis**

Simple test method:

- With volt meter with diesel engine turned off:
  from battery positive pole to generator housing

  The volt meter must indicate the voltage of the battery.

- With volt meter with running diesel engine:
  from ground cable to generator housing

  The volt meter must indicate nearly nothing.

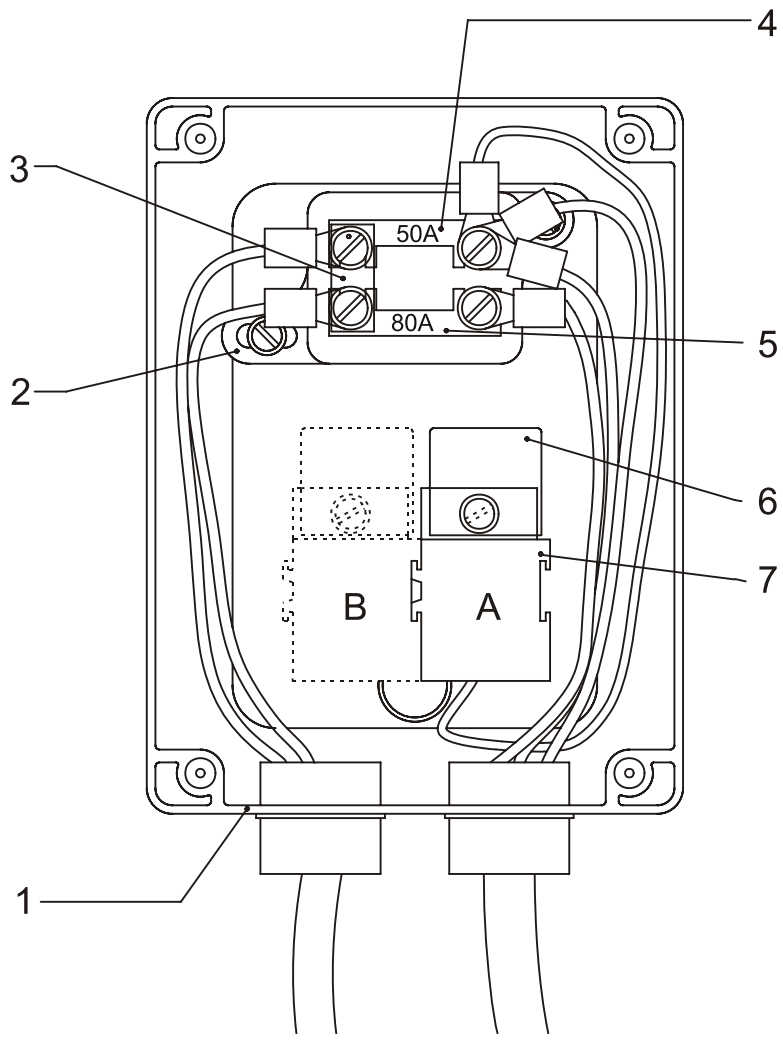
⇒ **In case of voltage drop, clean ground connection surfaces, ensure good contact.**

- Checking of the charge performance of the generator

- connect volt meter to the battery
- start the diesel engine
- voltage after approximately 5 minutes: **13.5 - 14.5 Volt**

⇒ **If one or several consumers (e.g. headlamps, windscreen wipers etc.) are switched on, the voltage must not drop below 13 V.**

Note: Also check the diodes in the fuse box.

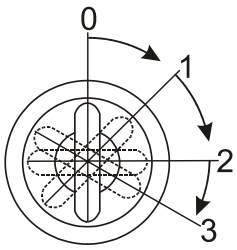


1	Cable distributor box	part no. 5 208 640 150
2	Blade-type fuse carrier	part no. 5 756 656 510
3	Bridge for blade-type fuse	part no. 6 179 007 110
4	Strip fuse 50 A	part no. 5 050 165 815
5	Strip fuse 80 A	part no. 5 050 165 880
	Strip fuse 60 A	part no. 5 050 165 860
	Strip fuse 30 A	part no. 5 050 165 810
6	Relay 12V 70A	part no. 5 050 247 810
7	Relay base	part no. 5 050 247 815

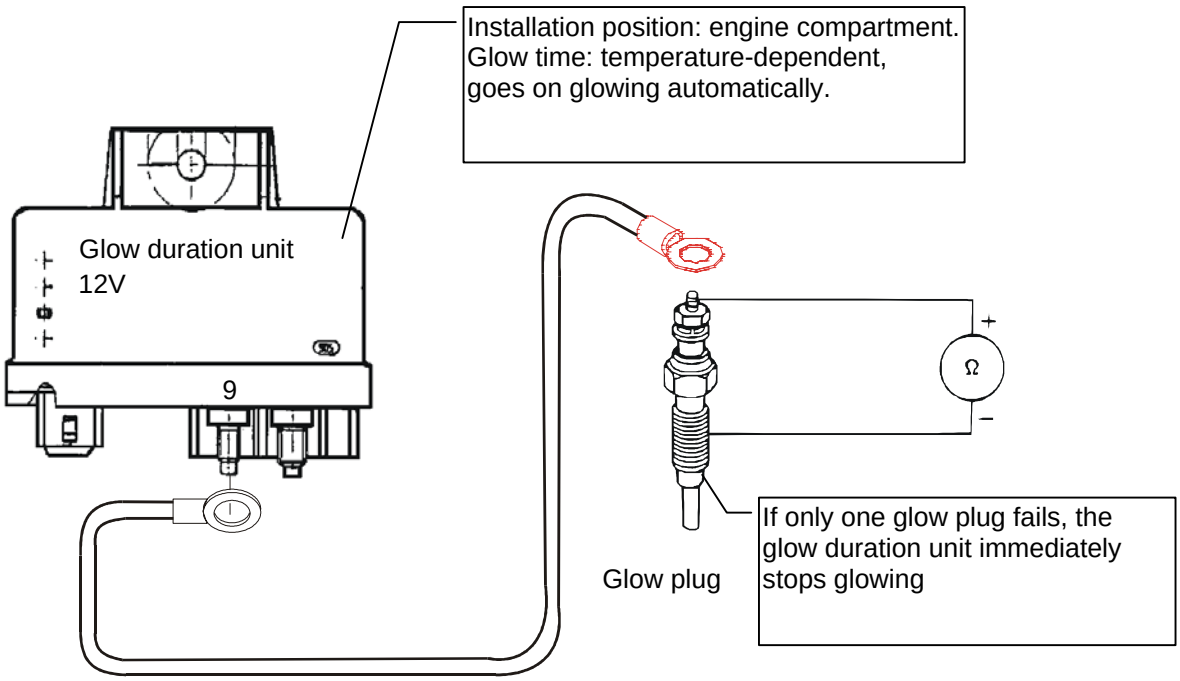
A Starting relay for TW (HML) / TC (HR) (except for mini-excavators)
(Please note: The glow duration unit for automatic pre-glow of the TW (HML) / TC (HR), including mini-excavators, is located in the engine compartment)

Type A: **Automatic pre-glow via ignition lock with glow duration unit and glow plugs**

Installed in: **HML 22 / 31 / 41** **HR 22 / 31 / 41** **HS 41** **TC 29 / 35 / 48, HR 12** **SKL 823 / 833** **SKS 633**



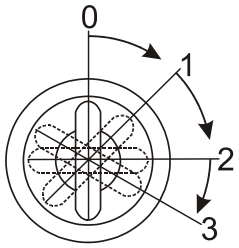
<u>Ignition lock positions, engine start-up:</u>
Ignition key is turned to position **1**
Warning lamps „charge control“, „engine oil pressure“ and „pre-glow“ light up (pre-glow starts simultaneously).
Turn the ignition key to position **3** after the pre-glow monitoring has extinguished, the engine starts up (position **2** is skipped).



Trouble shooting: In case of problems with the pre-glow system, the glow plugs have to be checked prior to the replacement of the glow duration unit.
If the glow plugs do not have an electrical passage at the test and / or present a high ohmic resistance, the glow plugs have to be replaced.

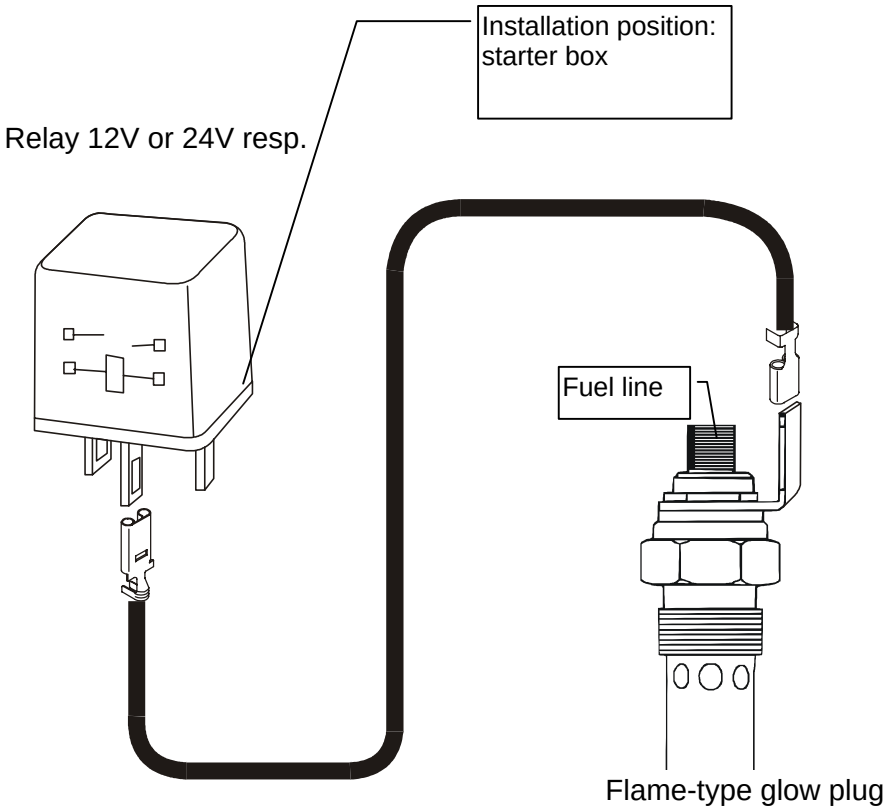
Type B: **Manual pre-glow via ignition lock with relay and flame-type glow plug, without glow duration unit**

Installed in:
SKL 843 (up to serial no. 843/0244)
SKL 853 (up to serial no. 853/0199)
SKL 871 / 873 / 877 (relay 24V and resistance for flame-type glow plug)
SKS 661
SMB 2041



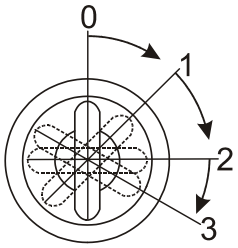
Ignition lock positions, engine start-up:
Turn ignition key to position **2**,
warning lamp „pre-glow“ lights up, (pre-glow starts simultaneously), keep the ignition key in that position for approx. 15 sec. Then turn to position **3**, engine starts up.

Attention, no time relay, warning lamp does not extinguish automatically !
Too long pre-glowing may result in damage at the flame-type glow plug !

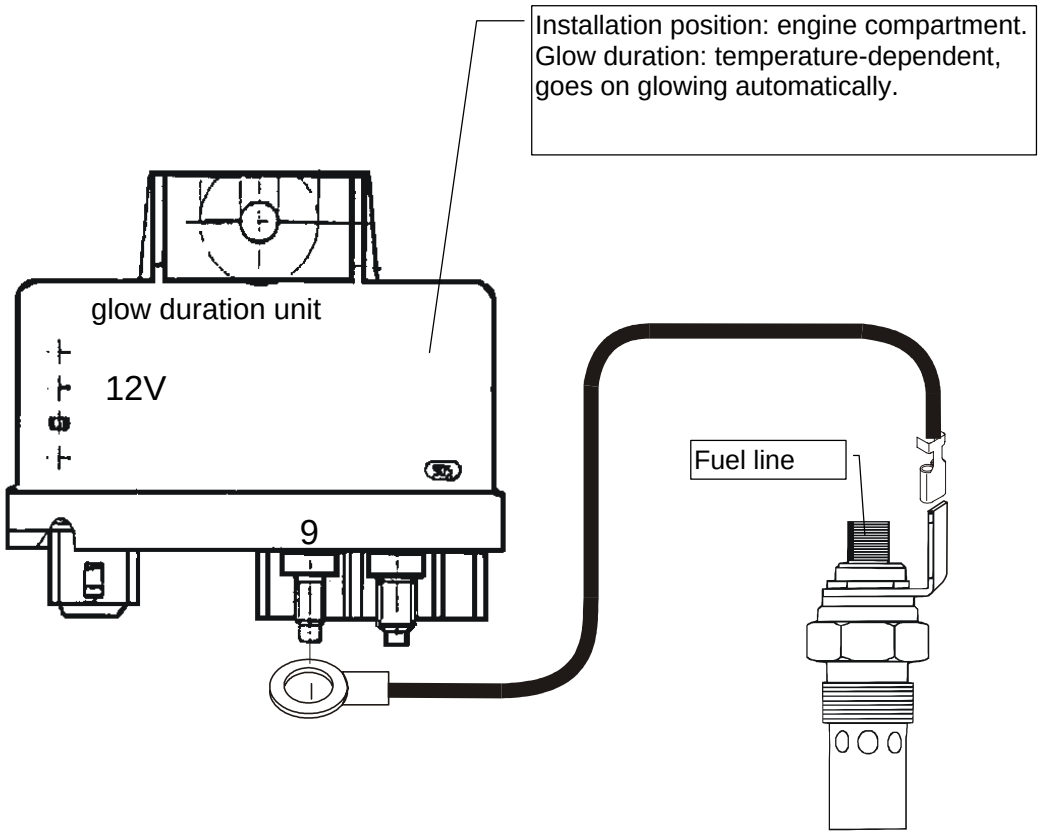


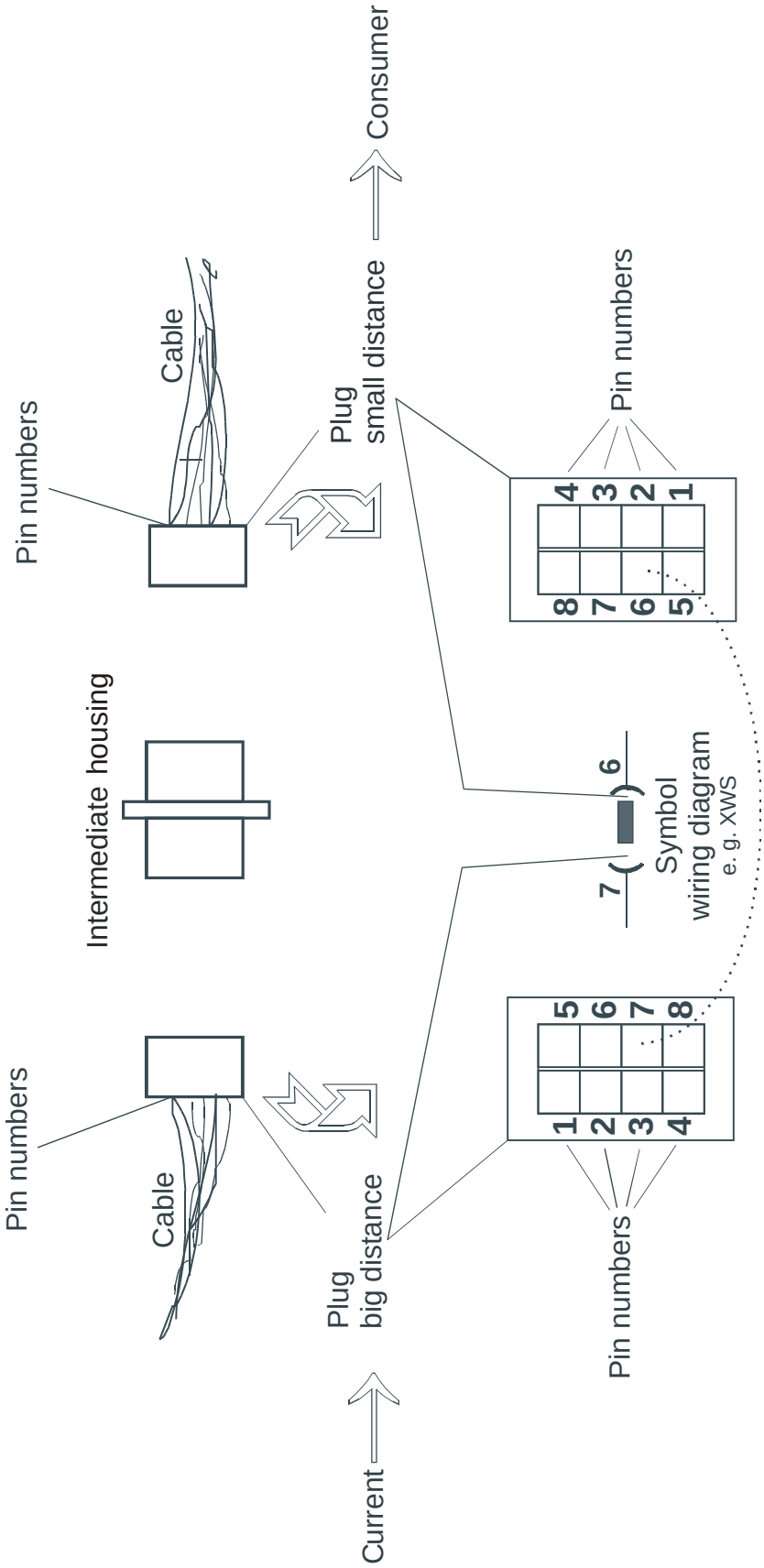
Type C: **Manual pre-glow via ignition lock with glow duration unit and flame-type glow plug**

Installed in: **SKL 843** (from serial no. 843/0245)
SKL 853 (from serial no. 853/0200)
SKL 863



Ignition lock positions, engine start-up:
Turn ignition key to position **2,**
warning lamp „pre-glow“ lights up, (pre-glow starts simultaneously).
Turn the ignition key to position **3** after the pre-glow monitoring has extinguished, engine starts up



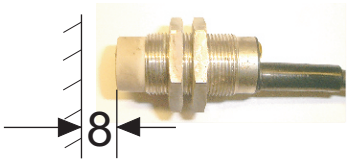


TEREX	Typ/Model/Type **Electrical system - general**	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Plug connections**	Blatt/Page/Feuille **7.100.06**

Gewinde nicht bündig
Nennschaltabstand max. = 8 mm

Thread not even
nominal switching distance max. = 8 mm

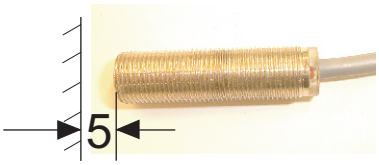
Filetage pas à fleur
distance de commutation nominale max. = 8 mm



Gewinde bündig
Nennschaltabstand max. = 5 mm

Thread even
nominal switching distance max. = 5 mm

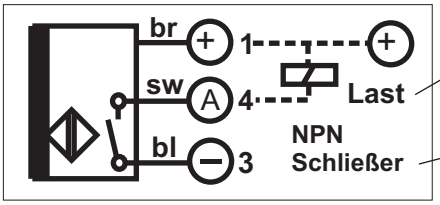
Filetage à fleur
distance de commutation nom. max. = 5 mm



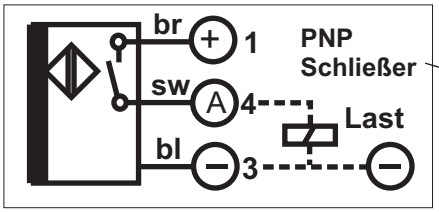
Anschlusskabel: 3 x 0,5 mm²
Connecting cable
Câble de raccordement

br - braun/ brown/ brun = Plus/ positive/ positif
bl - blau/ blue/ bleu = Masse/ ground/ masse
sw - schwarz/ black/ noir = Signal/ signal/ signal

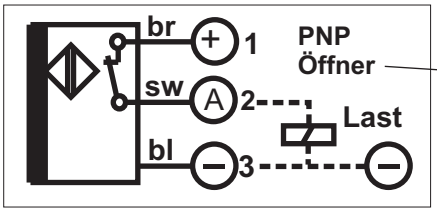
5 350 639 017



5 350 639 018



5 350 639 019



Typ Model Type Tipo	**Elektrisches System** **Electrical system** **Circuit électrique** **Sistema elèctrico**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Näherungsschalter** **Proximity switch** **Interrupteur de proximité**	Blatt Page Feuille Página	**7.100.07**

SUBGROUP LIST

Maintenance
Inspection plans and test certificates

SKL 200 (SKL 873)	**8.13**
TL 65 (SKL 824)	**8.22**
TL 80 (SKL 834)	**8.24**
TL 80AS	**8.25**
TL 100 (SKL 844)	**8.26**
TL 120 (SKL 854)	**8.27**
TL 160 (SKL 160)	**8.28**
TL 210	**8.29**
TL 260 (SKL 260)	**8.30**
TL 70 (SKS 634)	**8.37**
TW 70 (HML 23)	**8.49.50**
TW 85 (HML 32)	**8.51**
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TC 75 (HR 32)	**8.65**
TC 125 (HR 42)	**8.67**
TC 29 (HR 14)	**8.76**
TC 35 (HR 16)	**8.78**
TC 48 (HR 18)	**8.80**
TC 15 (HR 1.5)	**8.90**
TC 16 (HR 1.6)	**8.91**
TC 20 (HR 2.0)	**8.92**
TC 25	**8.93**
TC 37 (HR 3.7)	**8.97**
TC 50	**8.99**

To be carried out by trained specialist dealer personnel

O = *Checking, Maintenance* **X = *Replace***		**Operating hours**				2x min.	1x min.	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000	yearly	yearly	
1	Check whether machine-specific Instruction Book is in the machine	**O**	**O**					
2	Change engine oil		**X**				**X**	
3	Change engine oil filters		**X**				**X**	
4	Drain water from fuel tank	**O**	**O**			**O**		
5	Change fuel filter		**X**				**X**	
6	Clean fuel pump and screen filter		**O**					
7	Check air intake	**O**	**O**					
8	Change air filter - main cartridge	**to service indicator**					**X**	
9	Change air filter - safety cartridge	**as required** [1)]						
10	Clean cooling fins of combined hydraulic oil-water cooler and charge-air cooler  *In case of high exposure to dust, shorten the cleaning intervals.*	**O**	**O**			**O**		
11	Check level of antifreeze in coolant						**O**	
12	Change coolant	**as required** [1)]						
13	Check V-belt tension	**O**	**O**					
14	Air-conditioning (option) — Check V-belt tension and fastening of compressor	**O**	**O**					
15	Check engine mounting and pump attachments	**O**	**O**					
16	Check engine speed adjustment, top-end and low idle speed	**O**	**O**					
17	Check valve lash of engine and adjust if necessary			**O**				
18	Check condition and tightness of crankcase breather and renew element [3)]		**X**					
19	Clean housing of turbine and impeller of turbocharger [4)]				**O**			
20	Check acid level and battery connections	**O**	**O**					
21	Check condition of tires, tire pressure and tightness of wheel nuts	**O**	**O**					
22	Check secure fastening of axles and propeller shaft	**O**	**O**					
23	Check bearing bushings and bolts of work equipment and replace if necessary	**O**	**O**					
24	Check bushings and bolts of the articulation and the articulated steering and replace if necessary.	**O**	**O**					
25	Check that door catches function perfectly, and replace if necessary	**O**	**O**					

O = *Checking, Maintenance* **X = *Replace***		**Operating hours**				2x min. yearly	1x min. yearly	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000			
26	Clean or replace dust filter for cab ventilation	**O**		**X**			**X**	
27	Check electrical indicating and warning elements, and lighting system	**O**	**O**					
28	Check smooth running of operator controls and adjust if necessary	**O**	**O**					
29	Check tightness of all pipes, hoses, control valve, hydraulic pumps, cylinders, etc. ☞ *When tightening hose and line connections, the screw-in couplings must be locked to prevent rotation.*	**O**	**O**					
30	Check or change hydraulic oil	**O**	**O**	**X** [2)]			**X**	
31	Replace insert of hydraulic oil suction filter	**X**	**X**			**X**		
32	Replace insert of hydraulic oil return filter	**X**	**to service indicator**				**X**	
33	Replace breather			**X**			**X**	
34	Check function of brakes and brake disc play	**O**	**O**				**O**	
35	Bleed brake	**O**	**O**					
36	Rear axle differential: oil check and/or oil change	**X**	**O**	**X**			**X**	
37	Front axle differential: oil check and/or oil change	**X**	**O**	**X**			**X**	
38	Manual transmission: oil check or oil change	**X**	**O**	**X**			**X**	
39	Wheel hubs of front and rear axles: oil check or oil change	**X**	**O**	**X**			**X**	
40	Grease machine according to overview of lubricating points	**O**	**O**					
41	Check function, condition and completeness of safety equipment	**O**	**O**					
42	Hydraulic function check with pressure function test	**O**	**O**					
43	Test run and test work	**O**	**O**					
44	Initial inspection cards and return to manufacturer	**O**	**O** [5)]					

1) at least every 2 years

2) Extension of oil change intervals according to oil sample analysis and lab report.
For further information see Chapter 7.3 (operators manual)

3) Completely replace the crankcase breather every 8,000 operating hours and every time the engine is overhauled

4) Only to be performed by qualified personnel

5) within warranty

	Desired value		Actual value		Adjusted		Remark
Engine, transmission, brake, steering, loading							
Engine, high idle min^{-1}	2350^{+70}						
Engine, low idle min^{-1}	750^{+50}						
Charge pressure, pilot pressure bar	32^{+1}						high idle
Start-up speed min^{-1}	1150 ±50						
Engine stalling min^{-1}	2000^{-100}						full throttle, 220 bar HP, rabbit, dyn.
Pressure cut-off travel bar	440 ±10						
High pressure safety valve bar	480						
Regulation start travel motor bar	220						dynamic at 2100^{-100} min^{-1}
Cardan shaft rev. min^{-1}	see techn. data chapter 2						
Beginning / end of inching bar	5 - 13						
LS pressure relief valve bar	250						Full throttle, set at control valve
Line relief pressures	**out**	**in**	**out**	**in**	**out**	**in**	
hydraulic cylinders							
Lifting frame bar	280	---					
Tilting bar	280	280					
Add. control circuit bar	230	230					
Steering bar	205	205					Full throttle

Inspection plan

To be carried out by trained specialist dealer personnel.

O = *Checking, Maintenance* **X = *Replace***		**Operating hours**				2x min.	1x min.	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000	yearly	yearly	
1	Check whether machine-specific instruction book is in the machine	**O**	**O**					
2	Change engine oil			**X** [2)]			**X**	
3	Change engine oil filter			**X**			**X**	
4	Drain water from fuel tank	**O**	**O**			**O**		
5	Change fuel filter			**X**			**X**	
6	Clean fuel pump and screen filter			**O**				
7	Check air intake	**O**	**O**					
8	Change air filter - main cartridge	**to service indicator**					**X**	
9	Change air filter - safety cartridge	**as required** [1)]						
10	Clean cooling fins of hydraulic oil radiator. *In case of high exposure to dust, shorten the cleaning intervals.*	**O**	**O**			**O**		
11	Clean cooling fins of engine oil radiator *In case of high exposure to dust, shorten the cleaning intervals.*	**O**	**O**			**O**		
12	Check V-belt tension	**O**		**O**				
13	Check engine mounts and pump attachments	**O**	**O**					
14	Check engine speed adjustment, top-end and low idle speed	**O**	**O**					
15	Check valve lash of engine and adjust if necessary			**O**				
16	Check injection valves				**O**			
17	Check fuel leak oil pipe and replace if necessary			**O**	**X**[1)]			
18	Replace toothed belt [3)]							
19	Check crankcase breather in valve cover				**O**			
20	Check acid level and battery connections	**O**	**O**					
21	Check condition of tires, tire pressure and tightness of wheel nuts	**O**	**O**					
22	Check secure fastening of axles and propeller shaft	**O**	**O**					
23	Check bearing bushings and bolts of work equipment and replace if necessary	**O**	**O**					
24	Check bushings and bolts of the articulation and the articulated steering and replace if necessary.	**O**	**O**					

O = *Checking, Maintenance* **X = *Replace***		**Operating hours**				2x min.	1x min.	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000	yearly	yearly	
25	Check that door catches function perfectly, and replace if necessary	**O**	**O**					
26	Clean or replace the dust filter for cab ventilation	**O**		**X**			**X**	
27	Check electrical indicating and warning elements, and lighting system	**O**	**O**					
28	Check smooth running of operator controls and adjust if necessary	**O**	**O**					
29	Check tightness of all pipes, hoses, control valve, hydraulic pumps, cylinders, etc. *When tightening hose and pipe connections, screw-in couplings must be locked to prevent rotation.*	**O**	**O**					
30	Check or change hydraulic oil	**O**	**O**	**X** 2)			**X**	
31	Replace insert of hydraulic oil return suction filter	**X**	**X**			**X**		
32	Replace breather			**X**			**X**	
33	Check function of brakes and replace brake oil	**O**	**O**		**X**		**X**	
34	Bleed brake	**O**	**O**					
35	Rear axle differential with transmission / option: transmission: oil check or oil change	**X**	**O**	**X** 2)			**X**	
36	Front axle differential - oil check or oil change	**X**	**O**	**X** 2)			**X**	
37	Wheel hubs of front and rear axles: oil check or oil change	**X**	**O**	**X** 2)			**X**	
38	Grease machine according to overview of lubricating points	**O**	**O**					
39	Check function, condition and completeness of safety equipment	**O**	**O**					
40	Hydraulic function check with pressure function test	**O**	**O**					
41	Test run and test work	**O**	**O**					
42	Initial inspection cards and return to MANUFACTURER	**O**	**O** 4)					

1) at least every 2 years

2) Extension of oil change intervals according to oil sample analysis and lab report.

3) Every 5 years or 5,000 operating hours respectively

4) within warranty

		Desired value		Actual value		Adjusted		Remark
Engine, transmission, brake, steering, loading								
Engine, high idle running speed	min^{-1}	$2{,}450^{+50}$						
Engine, low idle running speed	min^{-1}	850^{+50}						
Charge pressure, pilot pressure	bar	30^{+5}						high idle running speed
Start-up speed	min^{-1}	1,150						
Engine stalling	min^{-1}	2,100						full throttle, 260 bar HP, rabbit, dyn.
Pressure cut-off	bar	450						
High pressure (SV)	bar	480						
Regulation start DA-motor	bar	240						dynamic at 2200 min^{-1}
Cardan shaft rev.	min^{-1}	see Techn. Data Chapter 2						
Beginning / end of inching	bar	5 - 13						
Pressure switch, hydrostatic brake	bar	22						
Main pressure relief valve	bar	250						full throttle, 50° - 60° C
Line relief pressures		**out**	**in**	**out**	**in**	**out**	**in**	
hydraulic cylinders								
Lifting frame	bar	280	---					
Tilting	bar	130	280					
Add. control circuit	bar	230	230					
Steering	bar	175	175					

Inspection plan

To be carried out by trained specialist dealer personnel.

O = *Checking, Maintenance* **X = *Replace***		**Operating hours**				2x min.	1x min.	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000	yearly	yearly	
1	Check whether machine-specific instruction book is in the machine	**O**	**O**					
2	Change engine oil			**X** [2)]			**X**	
3	Change engine oil filter			**X**			**X**	
4	Drain water from fuel tank	**O**	**O**			**O**		
5	Change fuel filter			**X**			**X**	
6	Clean fuel pump and screen filter			**O**				
7	Check air intake	**O**	**O**					
8	Change air filter - main cartridge	**to service indicator**					**X**	
9	Change air filter - safety cartridge	**as required** [1)]						
10	Clean cooling fins of hydraulic oil radiator. *In case of high exposure to dust, shorten the cleaning intervals.*	**O**	**O**			**O**		
11	Clean cooling fins of engine oil radiator *In case of high exposure to dust, shorten the cleaning intervals.*	**O**	**O**			**O**		
12	Check V-belt tension	**O**		**O**				
13	Check engine mounts and pump attachments	**O**	**O**					
14	Check engine speed adjustment, top-end and low idle speed	**O**	**O**					
15	Check valve lash of engine and adjust if necessary			**O**				
16	Check injection valves				**O**			
17	Check fuel leak oil pipe and replace if necessary			**O**	**X**[1)]			
18	Replace toothed belt [3)]							
19	Check crankcase breather in valve cover				**O**			
20	Check acid level and battery connections	**O**	**O**					
21	Check condition of tires, tire pressure and tightness of wheel nuts	**O**	**O**					
22	Check secure fastening of axles and propeller shaft	**O**	**O**					
23	Check bearing bushings and bolts of work equipment and replace if necessary	**O**	**O**					
24	Check bushings and bolts of the articulation and the articulated steering and replace if necessary.	**O**	**O**					

O = *Checking, Maintenance* **X = *Replace***		**Operating hours**				2x min.	1x min.	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000	yearly	yearly	
25	Check that door catches function perfectly, and replace if necessary	**O**	**O**					
26	Clean or replace the dust filter for cab ventilation	**O**		**X**			**X**	
27	Check electrical indicating and warning elements, and lighting system	**O**	**O**					
28	Check smooth running of operator controls and adjust if necessary	**O**	**O**					
29	Check tightness of all pipes, hoses, control valve, hydraulic pumps, cylinders, etc. *When tightening hose and pipe connections, screw-in couplings must be locked to prevent rotation.*	**O**	**O**					
30	Check or change hydraulic oil	**O**	**O**	**X** 2)			**X**	
31	Replace insert of hydraulic oil return suction filter	**X**	**X**			**X**		
32	Replace breather			**X**			**X**	
33	Check function of brakes and replace brake oil	**O**	**O**		**X**		**X**	
34	Bleed brake	**O**	**O**					
35	Rear axle differential with transmission / option: transmission: oil check or oil change	**X**	**O**	**X** 2)			**X**	
36	Front axle differential - oil check or oil change	**X**	**O**	**X** 2)			**X**	
37	Wheel hubs of front and rear axles: oil check or oil change	**X**	**O**	**X** 2)			**X**	
38	Grease machine according to overview of lubricating points	**O**	**O**					
39	Check function, condition and completeness of safety equipment	**O**	**O**					
40	Hydraulic function check with pressure function test	**O**	**O**					
41	Test run and test work	**O**	**O**					
42	Initial inspection cards and return to MANUFACTURER	**O**	**O** 4)					

1) at least every 2 years

2) Extension of oil change intervals according to oil sample analysis and lab report.

3) Every 5 years or 5,000 operating hours respectively

4) within warranty

		Desired value		Actual value		Adjusted		Remark
Engine, transmission, brake, steering, loading								
Engine, high idle running speed	min^{-1}	$2{,}550^{+50}$						
Engine, low idle running speed	min^{-1}	850^{+50}						
Charge pressure, pilot pressure	bar	30^{+5}						high idle running speed
Start-up speed	min^{-1}	1,150						
Engine stalling	min^{-1}	2,200						full throttle, 220 bar HP, rabbit, dyn.
Pressure cut-off	bar	450						
High pressure (SV)	bar	480						
Regulation start DA-motor	bar	180						dynamic at 2,300 min^{-1}
Cardan shaft rev.	min^{-1}	see Techn. Data Chapter 2						
Beginning / end of inching	bar	5 - 13						
Pressure switch, hydrostatic brake	bar	22						
Main pressure relief valve	bar	250						full throttle, 50° - 60° C
Line relief pressures		**out**	**in**	**out**	**in**	**out**	**in**	
hydraulic cylinders								
Lifting frame	bar	280	---					
Tilting	bar	130	280					
Add. control circuit	bar	230	230					
Steering	bar	175	175					

Inspection plan

Work to be carried out by trained specialist dealer personnel:

Item	Inspection	Operating hours					
	o = Check, x = Replace	af-ter 100	ev-ery 500	ev-ery 1000	ev-ery 2000	min 2 x year	min. 1 x year
1	Check machine for presence of machine-specific operating instructions	o	o				
2	Change the engine oil			x			x
3	Change the engine oil filter			x			x
4	Drain water from the fuel tank	o	o			o	
5	Replace the fuel filter			x			x
6	Clean fuel pump, sieving filter			o			x
7	Check the air intake	o	o				
8	Replace main air filter cartridge	according to the service indicator					x
9	Replace the air filter safety cartridge	as required [1)]					
10	Clean cooling fins of the hydraulic and engine oil cooler. The cleaning intervals should be shortened if there is high exposure to dust.	o	o			o	
11	Check and re-adjust the V-belt tension			o			
12	Check engine mount and pump attachment	o	o				
13	Check engine speed setting, upper and lower idle speeds	o	o				
14	Check acid level and battery connections	o	o				
15	Check condition of tires, tire pressure and fastening of wheel nuts	o	o				
16	Check fastening of axles and propeller shaft	o	o				
17	Check bearing bushings and pins/bolts of work equipment and adjust to "no play"	o	o				

Item	Inspection	Operating hours					
	o = Check, x = Replace	af-ter 100	ev-ery 500	ev-ery 1000	ev-ery 2000	min 2 x year	min. 1 x year
18	Check that door catches function perfectly, and replace if necessary	o	o				
19	Clean or replace the dust filter for cab ventilation.	o		x			x
20	Check electrical indicating and warning elements as well as lighting equipment.	o	o				
21	Check smooth running of operator controls and adjust if necessary	o	o				
22	Check all pipes, hoses, control valves, hydraulic pumps, cylinders, etc. for leaks. **Note: The screw-in couplings must be locked when tightening hose and line connections to prevent rotation.**	o	o				
23	Check or change the hydraulic oil	o	o	x[2)]			x
24	Replace insert of hydraulic oil return suction filter	x	x			x	
25	Replace the breathing filter			x			x
26	Check function of brakes, replace brake fluid.	o	o		x		x
27	Bleed brake	o	o				
28	Differential – rear axle including manual transmission: oil check and/or oil change	x	o	x			x
29	Differential – front axle oil: check or oil change resp.	x	o	x			x
30	Wheel hubs of front and rear axles: oil check or oil change	x	o	x			x
31	Lubricate the machine according to overview of lubricating points	o	o				
32	Check function, condition and completeness of safety equipment	o	o				
33	Hydraulic function check with pressure function test	o	o				
34	Perform test run and test work	o	o				
33	Sign inspection card and return to manufacturer	o	o [3)]				

Item	Inspection	Operating hours						See
	o = Check, x = Replace	af-ter 100	ev-ery 500	ev-ery 1000	ev-ery 2000	min 2 x year	min. 1 x year	

[1] at least every 2 years
[2] Extension of oil change intervals according to Terexoil sample analysis and laboratory report. See chapter 6.3.1 "Regular oil analysis", page 47.
[3] within warranty

Tab. 6-13 Inspection plan machine


TEREX®

Inspection plan

To be carried out by trained specialist dealer personnel

	O = *Checking, Maintenance* X = *Replace* Perform work with machine at operating temperature	Operating hours after 100	every 500	every 1000	every 2000	2x min. jearly	1x min. jearly
1	Check whether machine-specific instruction book is in the machine	O	O				
2	Change engine oil		X [2)]				X
3	Change engine oil filter		X				X
4	Drain water from fuel tank	O	O			O	
5	Change fuel filter			X			X
6	Clean fuel pump and screen filter			O			
7	Check air intake	O	O				
8	Change air filter - main cartridge	to service indicator					X
9	Change air filter - safety cartridge	as required [1)]					
10	Clean cooling fins of hydraulic oil cooler (combined cooler). *In case of high exposure to dust, shorten the cleaning intervals.*	O	O			O	
11	Clean cooling fins of engine oil cooling system (comb. cooler). *In case of high exposure to dust, shorten the cleaning intervals.*	O	O			O	
12	Check V-belt tension	O		O			
13	Check engine mounts and pump attachments	O	O				
14	Check engine speed adjustment, top-end and low idle speed	O	O				
15	Check valve lash of engine and adjust if necessary			O			
16	Check injection valves				O		
17	Check fuel leak oil pipe and replace if necessary			O	X [1)]		
18	Replace toothed belt [3)]						
19	Check crankcase breather in valve cover				O		
20	Check acid level and battery connections	O	O				
21	Check condition of tires, tire pressure and tightness of wheel nuts	O	O				
22	Check secure fastening of axles and propeller shaft	O	O				
23	Check bearing bushings and bolts of work equipment and replace if necessary	O	O				
24	Check bushings and bolts of the articulation and the articulated steering and replace if necessary.	O	O				
25	Check that door catches function perfectly, and replace if necessary	O	O				
26	Clean or replace the dust filter for cab ventilation	O		X			X
27	Check electrical indicating and warning elements, and lighting system	O	O				
28	Check smooth running of operator controls and adjust if necessary	O	O				

Inspection plan

To be carried out by trained specialist dealer personnel

		Operating hours					
O = *Checking, Maintenance* X = *Replace* Perform work with machine at operating temperature		after 100	every 500	every 1000	every 2000	2x min. jearly	1x min. jearly
29	Check tightness of all pipes, hoses, control valve, hydraulic pumps, cylinders, etc. When tightening hose and pipe connections, screw-in couplings must be locked to prevent rotation.	**O**	**O**				
30	Check or change hydraulic oil	**O**	**O**	**X** [2)]			**X**
31	Replace insert of hydraulic oil return suction filter	**X**	**X**			**X**	
32	Replace breather			**X**			**X**
33	Check function of brakes and replace brake oil	**O**	**O**		**X**		**X**
34	Bleed brake	**O**	**O**				
35	Rear axle differential with transmission / option: transmission: oil check or oil change	**X**	**O**	**X** [2)]			**X**
36	Front axle differential - oil check or oil change	**X**	**O**	**X** [2)]			**X**
37	Wheel hubs of front and rear axles: oil check or oil change	**X**	**O**	**X** [2)]			**X**
38	Grease machine according to overview of lubricating points	**O**	**O**				
39	Check function, condition and completeness of safety equipment	**O**	**O**				
40	Hydraulic function check with pressure function test	**O**	**O**				
41	Test run and test work	**O**	**O**				
42	Initial inspection cards and return to manufacture	**O**	**O** [4)]				

1) at least every 2 years

2) Extension of oil change intervals according to oil sample analysis and lab report.

3) Every 5 years or 5,000 operating hours respectively

4) within warranty

TL 100 from serial no. TL01000100

	Desired value	Actual value	Adjusted	Remark
Engine, transmission, brake, steering, loading				
Engine, high idle running speed min^{-1}	2,350 $^{+50}$			
Engine, low idle running speed min^{-1}	850 $^{+50}$			
Charge pressure, pilot pressure bar	30 $^{\pm 1}$			high idle running speed
Start-up speed min^{-1}	1,150			
Engine stalling min^{-1}	2,000 $^{-100}$			full throttle, 280 bar HP, rabbit, dyn.
Pressure cut-off bar	450			
High pressure (SV) bar	480			
Regulation start DA-motor bar	250			dynamic at 2,100 min^{-1}
Cardan shaft rev. min^{-1}	see Techn. Data Chapter 2			
Beginning / end of inching bar	5 - 13			
Pressure switch, hydrostatic brake bar	22			
Main pressure relief valve bar	250			full throttle, 50° - 60° C

Line relief pressures	**out**	**in**	**out**	**in**	**out**	**in**	
hydraulic cylinders							
Lifting frame bar	280	---					
Tilting bar	130	280					
Add. control circuit bar	230	230					
Steering bar	175	175					

Inspection plan

Work to be carried out by trained specialist dealer personnel.

O = Checking, maintenance X = Replace Perform work with machine at operating temperature		Operating hours				min. 2 x annually	min. 1 x annually
		after 100	every 500	every 1000	every 2000		
1	Check whether machine-specific instruction book is in the machine.	O	O				
2	Change engine oil.		X				X
3	Change engine oil filter.		X				X
4	Drain water from fuel tank.	O	O			O	
5	Change fuel filter.		X				X
6	Check the air intake.	O	O				
7	Replace the air filter main cartridge.	according to the service indicator					X
8	Replace the air filter safety cartridge.	as required [1]					
9	Clean cooling fins on the hydraulic oil cooler. ***Machine damage*** *due to strong accumulation of dust.* • *Shorten the cleaning intervals.*	O	O			O	
10	Clean cooling fins of water cooler (combined cooler). ***Machine damage*** *due to strong accumulation of dust.* • *Shorten the cleaning intervals.*	O	O			O	
11	Check antifreeze level in coolant.						O
12	Change coolant.	as required [1]					
13	Check V-belt tension.	O	O				
14	Check engine mounts and pump attachments.	O	O				
15	Check engine speed adjustment, upper and lower idling speeds.	O	O				
16	Check valve lash of engine and adjust if necessary.			O			O
17	Check injection valves.			O			
18	Check crankcase breather in valve cover.				O		
19	Check acid level and battery connections.	O	O				
20	Check condition of tires, tire pressure and tightness of wheel nuts.	O	O				
21	Check fastening of axles and propeller shaft.	O	O				
22	Check bearing bushings and bolts of work equipment and replace if necessary.	O	O				
23	Check bushings and bolts of the articulation and the articulated steering and replace if necessary.	O	O				

O = Checking, maintenance X = Replace Perform work with machine at operating temperature		Operating hours after 100	every 500	every 1000	every 2000	min. 2 x annually	min. 1 x annually
24	Check that door catches function perfectly, and replace if necessary.	O O					
25	Clean or replace the dust filter for cab ventilation.	O		X			X
26	Check electrical indicating and warning elements and lighting equipment.	O O					
27	Check smooth running of operator controls and adjust if necessary.	O O					
28	Check for leaks in all pipes, hoses, control valves, hydraulic pumps, cylinders, etc. ***Attention*** *The screw-in couplings must be locked when tightening hose and line connections to prevent rotation.*	O O					
29	Check or change hydraulic oil.	O	O	X [2]			X
30	Replace insert of hydraulic oil return suction filter.	X	X			X	
31	Replace breather.			X			X
32	Check function of brakes, replace brake oil.	O	O		X		X
33	Bleed brake.	O	O				
34	Differential – rear axle with transmission / Option: manual transmission: oil check or oil change resp.	X X	O	X			
35	Differential – front axle oil: check or oil change resp.	X	O	X			X
36	Wheel hubs of front and rear axles: oil check or oil change.	X	O	X			X
37	Grease machine according to overview of lubricating points.	O	O				
38	Check function, condition and completeness of safety devices.	O	O				
39	Hydraulic function check with pressure function test.	O	O				
40	Test run and test work.	O	O				
41	Initial inspection card and return to manufacturer.	O	O [3]				

[1] *At least once every two years.*

[2] *Extension of oil change intervals after an oil analysis and laboratory report*

[3] *Within the warranty period.*

TL 120 from serial no. TL01200100

	Desired value	Actual value	Adjusted	Remark
Engine, transmission, brake, steering, loading				
Engine, high idle running speed min^{-1}	2,350 $^{+50}$			
Engine, low idle running speed min^{-1}	750 $^{+50}$			
Charge pressure, pilot pressure bar	30 $^{\pm 1}$			high idle running speed
Start-up speed min^{-1}	1,150			
Engine stalling min^{-1}	2,000 $^{-100}$			full throttle, 240 bar HP, rabbit, dyn.
Pressure cut-off bar	450			
High pressure (SV) bar	480			
Regulation start DA-motor bar	220			dynamic at 2,100^{-50} min^{-1}
Cardan shaft rev. min^{-1}	see Techn. Data Chapter 2			
Beginning / end of inching bar	5 - 13			
Pressure switch, hydrostatic brake bar	22			
Main pressure relief valve bar	250			full throttle, 50° - 60° C

Line relief pressures	**out**	**in**	**out**	**in**	**out**	**in**	
hydraulic cylinders							
Lifting frame bar	280	---					
Tilt bar	130	280					
Add. control circuit bar	230	230					
Steering bar	175	175					

Inspection plan

Work to be carried out by trained dealer service personnel.

	O = Checking, maintenance **X = Replace** **Perform work with machine at operating temperature**	**operating hours** **after 100**	**ev-ery 500**	**ev-ery 1000**	**ev-ery 2000**	**min. 2 x an-nual-ly**	**min. 1 x an-nual-ly**	
1	Check whether machine-specific Operating Manual is in the machine.	**O**	**O**					
2	Change engine oil.		**X**				**X**	
3	Change engine oil filter.		**X**				**X**	
4	Drain water from fuel tank.	**O**	**O**			**O**		
5	Change fuel filter.		**X**				**X**	
6	Check air intake.	**O**	**O**					
7	Replace air filter main cartridge.	**according to service indicator**					**X**	
8	Replace air filter safety cartridge.	**as required** [1]						
9	Check level of antifreeze in coolant.						**O**	
10	Change coolant.	**as required** [1]						
11	Check V-belt tension.	**O**	**O**					
12	Check engine mounting and pump attachments.	**O**	**O**					
13	Check engine speed adjustment, upper and lower idling speeds.	**O**	**O**					
14	Check valve lash on engine and adjust if necessary.			**O**			**O**	
15	Check injection valves.			**O**				
16	Check crankcase breather in valve cover.				**O**			
17	Check acid level and battery connections.	**O**	**O**					
18	Check condition of tires, tire pressure and tightness of wheel nuts.	**O**	**O**					
19	Check fastening of axles and propeller shaft.	**O**	**O**					
20	Check bearing bushings and bolts of work equipment and replace if necessary.	**O**	**O**					
21	Check bushings and bolts of the articulation and the articulated steering and replace if necessary.	**O**	**O**					
22	Check that door catches function perfectly, and replace if necessary.	**O**	**O**					
23	Clean or replace the dust filter for cabin ventilation.	**O**		**X**			**X**	
24	Check electrical indicating and warning elements and lighting equipment.	**O**	**O**					
25	Check smooth running of operator controls and adjust if necessary.	**O**	**O**					
26	Check for leaks in all pipes, hoses, control valves, hydraulic pumps, cylinders, etc. ***Attention*** *The screw-in couplings must be locked when tightening hose and line connections to prevent rotation.*	**O**	**O**					
27	Check or change hydraulic oil.	**O**	**O**	**X** [2]			**X**	
28	Replace insert of hydraulic oil return suction filter.	**X**	**X**			**X**		
29	Replace breather.			**X**			**X**	
30	Check function of brakes and brake disc play.	**O**	**O**		**X**		**X**	
31	Bleed brake	**O**	**O**					

[1] *At least every two years.*

[2] *Extension of oil change intervals according to oil sample analysis and laboratory report*

[3] *Within warranty.*

O = Checking, maintenance X = Replace Perform work with machine at operating temperature		operating hours				min. 2 x annually	min. 1 x annually	
		after 100	every 500	every 1000	every 2000			
32	Differential – rear axle including transmission: oil check and/or oil change	X	O	X			X	
33	Differential – front axle: oil check and/or oil change.	X	O	X			X	
34	Wheel hubs of front and rear axles: oil check or oil change	X	O	X			X	
35	Grease machine according to overview of lubricating points.	O	O					
36	Check function, condition and completeness of safety devices.	O	O					
37	Hydraulic function check with pressure function test.	O	O					
38	Test run and test work.	O	O					
39	Initial inspection card and return to manufacturer.	O	O[3]					

[1] *At least every two years.*

[2] *Extension of oil change intervals according to oil sample analysis and laboratory report*

[3] *Within warranty.*

TL 160 **from serial no. TL01600100**

		Desired value		Actual value		Adjusted		Remark
Engine, transmission, brake, steering, loading								
Engine, high idle running speed	min^{-1}	2,350 $^{+50}$						
Engine, low idle running speed	min^{-1}	750 $^{+50}$						
Charge pressure, pilot pressure	bar	30 $^{\pm 1}$						high idle running speed
Start-up speed	min^{-1}	1,150						
Engine stalling	min^{-1}	2,000 $^{-100}$						full throttle, 230 bar HP, rabbit, dyn.
Pressure cut-off	bar	460$^{+/-10}$						
High pressure (SV)	bar	490						
Regulation start DA-motor	bar	220						dynamic at 2,100^{-50} min^{-1}
Cardan shaft rev.	min^{-1}	see Techn. Data Chapter 2						
Beginning / end of inching	bar	5 - 13						
Pressure switch, hydrostatic brake	bar	80						
Stand by pressure	bar	28 $^{+2}$						full throttle
Main pressure relief valve	bar	310						full throttle, 50° - 60° C
Line relief pressures		**out**	**in**	**out**	**in**	**out**	**in**	
hydraulic cylinders								
Lifting frame	bar	340	---					
Tilt	bar	340	340					
Add. control circuit	bar	230	230					
Steering	bar	175	175					

Inspection plan

Work to be carried out by trained specialist dealer personnel:

Item	Inspection	Operating hours					
	o = Check, x = Replace	af-ter 100	ev-ery 500	ev-ery 1000	ev-ery 2000	min 2 x year	min. 1 x year
1	Check machine for presence of machine-specific operating instructions	o	o				
2	Change the engine oil		x				x
3	Change the engine oil filter		x				x
4	Drain water from the fuel tank	o	o			o	
5	Replace the fuel filter		x				x
6	Check the air intake	o	o				
7	Replace main air filter cartridge	according to the service indicator					x
8	Replace the air filter safety cartridge	as required [1)]					
9	Check antifreeze level in coolant						o
10	Change coolant				x		
11	Check V-belt tension	o	o				
12	Check engine mount and pump attachment	o	o				
13	Check engine speed setting, upper and lower idle speeds	o	o				
14	Check valve lash on the engine and adjust if necessary			o			o
15	Check injection valves	every 5000 oh (I= 0.25, O = 0.50)					
16	Check the crankcase ventilation system				o		
17	Check acid level and battery connections	o	o				
18	Check condition of tires, tire pressure and fastening of wheel nuts	o	o				
19	Check fastening of axles and propeller shaft	o	o				
20	Check bearing bushings and pins/bolts of work equipment and adjust to "no play"	o	o				

Item	Inspection	Operating hours					
	o = Check, x = Replace	af-ter 100	ev-ery 500	ev-ery 1000	ev-ery 2000	min 2 x year	min. 1 x year
21	Check bushings and bolts of the articulation and the articulated steering and replace if necessary	o	o				
22	Check that door catches function perfectly, and replace if necessary	o	o				
23	Clean or replace the dust filter for cab ventilation.	o		x			x
24	Check electrical indicating and warning elements and lighting equipment	o	o				
25	Check smooth running of operator controls and adjust if necessary	o	o				
26	Check all pipes, hoses, control valves, hydraulic pumps, cylinders, etc. for leaks **Note: The screw-in couplings must be locked when tightening hose and line connections to prevent rotation.**	o	o				
27	Check or change the hydraulic oil.	o	o	x[2)]			x
28	Replace insert of hydraulic oil return suction filter	x	x			x	
29	Replace breather.			x			x
30	Check function of brakes and brake disc play	o	o		x		x
31	Bleed brake	o	o				
32	Differential – rear axle including manual transmission: oil check and/or oil change	x	o	x			x
33	Differential – front axle oil: check or oil change resp.	x	o	x			x
34	Wheel hubs of front and rear axles: oil check or oil change	x	o	x			x
35	Lubricate the machine according to overview of lubricating points	o	o				
36	Check function, condition and completeness of safety devices	o	o				
37	Hydraulic function check with pressure function test	o	o				

Item	Inspection	Operating hours					
	o = Check, x = Replace	af-ter 100	ev-ery 500	ev-ery 1000	ev-ery 2000	min 2 x year	min. 1 x year
38	Test run and test work.	o	o				
39	Initial inspection card and return to manufacturer.	o	o [3)]				

[1)] at least every 2 years
[2)] Extension of oil change intervals according to Terexoil sample analysis and laboratory report. See chapter 6.3.1 "Regular oil analysis", page 49.
[3)] within warranty


TEREX®

Inspection plan

Work to be carried out by trained dealer service personnel.

	O = Checking, maintenance **X = Replace** **Perform work with machine at operating temperature**	**operating hours** **after 100**	**ev-ery 500**	**ev-ery 1000**	**ev-ery 2000**	**min. 2 x an-nual-ly**	**min. 1 x an-nual-ly**	
1	Check whether machine-specific Operating Manual is in the machine.	**O**	**O**					
2	Change engine oil.		**X**				**X**	
3	Change engine oil filter.		**X**				**X**	
4	Drain water from fuel tank.	**O**	**O**			**O**		
5	Change fuel filter.		**X**				**X**	
6	Check air intake.	**O**	**O**					
7	Replace air filter main cartridge.	**according to service indicator**					**X**	
8	Replace air filter safety cartridge.	**as required** [1]						
9	Check level of antifreeze in coolant.						**O**	
10	Change coolant.	**as required** [1]						
11	Check V-belt tension.	**O**	**O**					
12	Check engine mounting and pump attachments.	**O**	**O**					
13	Check engine speed adjustment, upper and lower idling speeds.	**O**	**O**					
14	Check valve lash on engine and adjust if necessary.			**O**			**O**	
15	Check injection valves.			**O**				
16	Check crankcase breather in valve cover.				**O**			
17	Check acid level and battery connections.	**O**	**O**					
18	Check condition of tires, tire pressure and tightness of wheel nuts.	**O**	**O**					
19	Check fastening of axles and propeller shaft.	**O**	**O**					
20	Check bearing bushings and bolts of work equipment and replace if necessary.	**O**	**O**					
21	Check bushings and bolts of the articulation and the articulated steering and replace if necessary.	**O**	**O**					
22	Check that door catches function perfectly, and replace if necessary.	**O**	**O**					
23	Clean or replace the dust filter for cabin ventilation.	**O**		**X**			**X**	
24	Check electrical indicating and warning elements and lighting equipment.	**O**	**O**					
25	Check smooth running of operator controls and adjust if necessary.	**O**	**O**					
26	Check for leaks in all pipes, hoses, control valves, hydraulic pumps, cylinders, etc. ***Attention*** *The screw-in couplings must be locked when tightening hose and line connections to prevent rotation.*	**O**	**O**					
27	Check or change hydraulic oil.	**O**	**O**	**X** [2]			**X**	
28	Replace insert of hydraulic oil return suction filter.	**X**	**X**			**X**		
29	Replace breather.			**X**			**X**	
30	Check function of brakes and brake disc play.	**O**	**O**		**X**		**X**	
31	Bleed brake	**O**	**O**					

[1] *At least every two years.*

[2] *Extension of oil change intervals according to oil sample analysis and laboratory report*

[3] *Within warranty.*

O = Checking, maintenance X = Replace Perform work with machine at operating temperature		operating hours				min. 2 x annually	min. 1 x annually	
		after 100	every 500	every 1000	every 2000			
32	Differential – rear axle including transmission: oil check and/or oil change	X	O	X			X	
33	Differential – front axle: oil check and/or oil change.	X	O	X			X	
34	Wheel hubs of front and rear axles: oil check or oil change	X	O	X			X	
35	Grease machine according to overview of lubricating points.	O	O					
36	Check function, condition and completeness of safety devices.	O	O					
37	Hydraulic function check with pressure function test.	O	O					
38	Test run and test work.	O	O					
39	Initial inspection card and return to manufacturer.	O	O[3]					

[1] *At least every two years.*

[2] *Extension of oil change intervals according to oil sample analysis and laboratory report*

[3] *Within warranty.*

TL 260 **from serial no. TL02600100**

	Desired value	Actual value	Adjusted	Remark
Engine, transmission, brake, steering, loading				
Engine, high idle running speed min^{-1}	2,350 $^{+50}$			
Engine, low idle running speed min^{-1}	750 $^{+50}$			
Charge pressure, pilot pressure bar	30 $^{\pm 1}$			high idle running speed
Start-up speed min^{-1}	1,150$^{+/-50}$			
Engine stalling min^{-1}	2,000 $^{-100}$			full throttle, 280 bar HP, rabbit, dyn.
Pressure cut-off bar	440$^{+/-10}$			
High pressure (SV) bar	480			
Regulation start DA-motor bar	260			dynamic at 2,100^{-50} min^{-1}
Cardan shaft rev. min^{-1}	see Techn. Data Chapter 2			
Beginning / end of inching bar	5 - 13			
Pressure switch, hydrostatic brake bar	80			
Stand by pressure bar	36 $^{+2}$			full throttle
Main pressure relief valve bar	315^{-10}			full throttle, 50° - 60° C

Line relief pressures	**out**	**in**	**out**	**in**	**out**	**in**	
hydraulic cylinders							
Lifting frame bar	340	---					
Tilt bar	340	340					
Add. control circuit bar	230	230					
Steering bar	175	175					

Inspection plan

Work to be carried out by trained specialist dealer personnel:

Item	Inspection	Operating hours					
	o = Check, x = Replace	af-ter 100	ev-ery 500	ev-ery 1000	ev-ery 2000	min 2 x year	min. 1 x year
1	Check machine for presence of machine-specific operating instructions	o	o				
2	Change the engine oil		x				x
3	Change the engine oil filter		x				x
4	Drain water from the fuel tank	o	o			o	
5	Replace the fuel filter		x				x
6	Check the air intake	o	o				
7	Replace main air filter cartridge	according to the service indicator					x
8	Replace the air filter safety cartridge	as required [1)]					
9	Check antifreeze level in coolant						o
10	Change coolant				x		
11	Check V-belt tension	o	o				
12	Check engine mount and pump attachment	o	o				
13	Check engine speed setting, upper and lower idle speeds	o	o				
14	Check valve lash on the engine and adjust if necessary			o			o
15	Check injection valves	every 5000 oh (I= 0.25, O = 0.50)					
16	Check the crankcase ventilation system				o		
17	Check acid level and battery connections	o	o				
18	Check condition of tires, tire pressure and fastening of wheel nuts	o	o				
19	Check fastening of axles and propeller shaft	o	o				
20	Check bearing bushings and pins/bolts of work equipment and adjust to "no play"	o	o				

Item	Inspection	Operating hours					
	o = Check, x = Replace	af-ter 100	ev-ery 500	ev-ery 1000	ev-ery 2000	min 2 x year	min. 1 x year
21	Check bushings and bolts of the articulation and the articulated steering and replace if necessary	o	o				
22	Check that door catches function perfectly, and replace if necessary	o	o				
23	Clean or replace the dust filter for cab ventilation.	o		x			x
24	Check electrical indicating and warning elements and lighting equipment	o	o				
25	Check smooth running of operator controls and adjust if necessary	o	o				
26	Check all pipes, hoses, control valves, hydraulic pumps, cylinders, etc. for leaks **Note: The screw-in couplings must be locked when tightening hose and line connections to prevent rotation.**	o	o				
27	Check or change the hydraulic oil.	o	o	x[2)]			x
28	Replace insert of hydraulic oil return suction filter	x	x			x	
29	Replace breather.			x			x
30	Check function of brakes and brake disc play	o	o		x		x
31	Bleed brake	o	o				
32	Differential – rear axle including manual transmission: oil check and/or oil change	x	o	x			x
33	Differential – front axle oil: check or oil change resp.	x	o	x			x
34	Wheel hubs of front and rear axles: oil check or oil change	x	o	x			x
35	Lubricate the machine according to overview of lubricating points	o	o				
36	Check function, condition and completeness of safety devices	o	o				
37	Hydraulic function check with pressure function test	o	o				

Item	Inspection	Operating hours					
	o = Check, x = Replace	af-ter 100	ev-ery 500	ev-ery 1000	ev-ery 2000	min 2 x year	min. 1 x year
38	Test run and test work.	o	o				
39	Initial inspection card and return to manufacturer.	o	o [3)]				

[1)] at least every 2 years
[2)] Extension of oil change intervals according to Terexoil sample analysis and laboratory report. See chapter 6.3.1 "Regular oil analysis", page 49.
[3)] within warranty


TEREX®

Inspection plan

To be carried out by trained specialist dealer personnel

O = *Checking, Maintenance* **X = *Replace***		**Operating hours**				2x min.	1x min.	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000	yearly	yearly	
1	Check whether machine-specific instruction book is in the machine	**O**	**O**					
2	Change engine oil			**X**			**X**	
3	Change engine oil filter			**X**			**X**	
4	Drain water from fuel tank	**O**	**O**			**O**		
5	Change fuel filter			**X**			**X**	
6	Clean fuel pump and screen filter			**O**				
7	Check air intake	**O**	**O**					
8	Change air filter - main cartridge	**to service indicator**					**X**	
9	Change air filter - safety cartridge	**as required** [1)]						
10	Clean cooling fins of hydraulic oil cooler *In case of high exposure to dust, shorten the cleaning intervals.*	**O**	**O**			**O**		
11	Clean cooling fins of engine oil cooling system *In case of high exposure to dust, shorten the cleaning intervals.*	**O**	**O**			**O**		
12	Check V-belt tension	**O**		**O**				
13	Check engine mounts and pump attachments	**O**	**O**					
14	Check engine speed adjustment, top-end and low idle speed	**O**	**O**					
15	Check valve lash of engine and adjust if necessary			**O**				
16	Check injection valves				**O**			
17	Check fuel leak oil pipe and replace if necessary			**O**	**X**[1)]			
18	Replace toothed belt [3)]							
19	Check crankcase breather in valve cover				**O**			
20	Check acid level and battery connections	**O**	**O**					
21	Check condition of tires, tire pressure and tightness of wheel nuts	**O**	**O**					
22	Check secure fastening of axles and propeller shaft	**O**	**O**					
23	Check that ring gear attachment screws are securely fastened	**O**	**O**					

1) at least every 2 years

3) Every 5 years or 5,000 operating hours respectively

O = *Checking, Maintenance* **X = *Replace***		**Operating hours**				2x min.	1x min.	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000	yearly	yearly	
24	Check function of axle lock and vent cylinders	**O**	**O**					
25	Check bearing bushings and bolts of work equipment and replace if necessary	**O**	**O**					
26	Check bushings and bolts of the articulation and the articulated steering and replace if necessary.	**O**	**O**					
27	Check that door catches function perfectly, and replace if necessary	**O**	**O**					
28	Clean or replace the dust filter for cab ventilation	**O**		**X**			**X**	
29	Check electrical indicating and warning elements, and lighting system	**O**	**O**					
30	Check smooth running of operator controls and adjust if necessary	**O**	**O**					
31	Check tightness of all pipes, hoses, control valve, hydraulic pumps, cylinders, etc. *When tightening hose and pipe connections, screw-in couplings must be locked to prevent rotation.*	**O**	**O**					
32	Check or change hydraulic oil	**O**	**O**	**X** 2)			**X**	
33	Replace insert of hydraulic oil return suction filter	**X**	**X**			**X**		
34	Replace breather			**X**			**X**	
35	Check function of brakes and replace brake oil	**O**	**O**		**X**		**X**	
36	Bleed brake	**O**	**O**					
37	Rear axle differential with transmission / option: transmission: oil check or oil change	**X**	**O**	**X** 2)			**X**	
38	Front axle differential - oil check or oil change	**X**	**O**	**X** 2)			**X**	
39	Wheel hubs of front and rear axles: oil check or oil change	**X**	**O**	**X** 2)			**X**	
40	Grease machine according to overview of lubricating points	**O**	**O**					
41	Check function, condition and completeness of safety equipment	**O**	**O**					
42	Hydraulic function check with pressure function test	**O**	**O**					
43	Test run and test work	**O**	**O**					
44	Initial inspection cards and return to Manufacturer	**O**	**O** 4)					

1) at least every 2 years

2) Extension of oil change intervals according to oil sample analysis and lab report.

3) Every 5 years or 5,000 operating hours respectively

4) within warranty

TL 70 from serial no. TL00700100

		Desired value		Actual value		Adjusted		Remarks
Engine, transmission, brake, steering, loading								
Engine, high idle running speed	min^{-1}	2,550 $^{+50}$						
Engine, low idle running speed	min^{-1}	850 $^{+50}$						
Charge pressure, pilot pressure	bar	30 $^{+5}$						high idle running speed
Start-up speed	min^{-1}	1,150 $^{\pm 50}$						
Engine stalling	min^{-1}	2,200 $^{-100}$						full throttle, 220 bar HP, rabbit, dyn.
Pressure cut-off	bar	450						
High pressure (SV)	bar	480						
Regulation start DA-motor	bar	180						dynamic at 2,300 min^{-1}
Cardan shaft rev.	min^{-1}	see Techn. Data Chapter 2						
Beginning / end of inching	bar	5 - 13						
Pressure switch, hydrostatic brake	bar	22						
Main pressure relief valve	bar	250						full throttle, 50° - 60° C
Line relief pressures		**out**	**in**	**out**	**in**	**out**	**in**	
hydraulic cylinders								
Lifting frame	bar	280	---					
Tilting	bar	130	280					
Add. control circuit	bar	230	230					
Slewing	bar	230	230					
Steering	bar	175	175					full throttle

Inspection plan

To be carried out by trained dealer personnel

O = *Checking, maintenance* **X = *Replacement***		**Operating hours**				min 2x	min 1x	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000	yearly	yearly	
1	Check whether machine-specific instruction book is in the machine	**O**	**O**					
2	Change engine oil			**X**			**X**	
3	Change engine oil filter			**X**			**X**	
4	Drain fuel tank	**O**	**O**			**O**		
5	Replace fuel filter			**X**			**X**	
6	Clean fuel pump and screen filter			**O**				
7	Check air intake	**O**	**O**					
8	Change air filter main cartridge	**to service indicator**					**X**	
9	Change air filter safety cartridge	**as required** [1]						
10	Clean cooling fins of engine oil cooler *The cleaning intervals should be shor tened if there is high exposure to dust.*	**O**	**O**			**O**		
11	Clean cooling fins of hydraulic oil cooler *The cleaning intervals should be shortened if there is high exposure to dust.*	**O**	**O**			**O**		
12	Check V-belt tension	**O**		**O**				
13	Check engine suspension and pump attachments	**O**	**O**					
14	Check engine speed adjustment, top-end and low idle speed	**O**	**O**					
15	Check valve lash of engine and adjust if necessary			**O**				
16	Check injection valves				**O**			
17	Check or replace fuel-leakage pipe			**O**	**X**[1]			
18	Replace toothed belt [3]							
19	Check crankcase breather in valve cover				**O**			
20	Check acid level and battery connections	**O**	**O**					
21	Replace cab ventilation dust filter		**X**				**X**	
22	Check condition of tires, tire pressure and tightness of wheel nuts	**O**	**O**					
23	Check secure fastening of axles and propeller shaft	**O**	**O**					
24	Check bearing bushings and bolts of work equipment and replace if necessary	**O**	**O**					
25	Check that door catches are in perfect condition and replace if necessary	**O**	**O**					
26	Check electrical indicating and warning elements, and lighting system	**O**	**O**					

O = *Checking, maintenance* **X = *Replacement***		**Operating hours**				min 2x	min 1x	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000	yearly	yearly	
27	Check smooth running of operator controls and adjust if necessary	**O**	**O**					
28	Check function of hydraulic axle lock and vent plunger cylinders	**O**	**O**					
29	Check function of steering	**O**	**O**					
30	Check function and condition of outriggers and dozer blade	**O**	**O**					
31	Check line rupture valves of outriggers and dozer blade	**O**	**O**					
32	Check tightness of all pipes, hoses, control valve, hydraulic pumps, cylinders, etc. ☞ *When tightening hose and line connections, the screw-in couplings must be locked to prevent rotation.*	**O**	**O**					
33	Check or change hydraulic oil	**O**	**O**	**X** [2)]				
34	Replace insert of hydraulic oil return filter	**X**	**in compliance with service indicator**				**X**	
35	Replace insert of hydraulic oil suction filter	**X**	**X**			**X**		
36	Replace breather			**X**			**X**	
37	Check function of brakes and play of brake discs	**O**	**O**					
38	Differential of rear axle - oil check or oil change	**X**	**O**	**X**			**X**	
39	Differential of front axle - oil check or oil change	**X**	**O**	**X**			**X**	
40	Transfer gear - oil check or oil change	**X**	**O**	**X**			**X**	
41	Wheel hubs of front and rear axles - oil check or oil change	**X**	**O**	**X**			**X**	
42	Check that ring gear attachment screws are securely fastened	**O**	**O**					
43	Check that swing-drive attachment (hydraulic motor and transmission) is securely fastened	**O**	**O**					
44	Grease machine in compliance with overview of lubricating points	**O**	**O**					
45	Check function, condition and completeness of safety equipment	**O**	**O**					
46	Hydr. function check with pressure function test	**O**	**O**					
47	Test run and test work	**O**	**O**					
48	Initial inspection cards and return to manufacturer	**O**	**O** [4)]					

1. at least every 2 years

2. Extension of oil change intervals in compliance with oil sample analysis and lab report.

3. every 5 years or 5,000 operating hours respectively

4. within warranty

TW 70 s/n: TW00700100

		Desired values		Actual values		Adjusted		Remarks
Engine, transmission, steering, working								
Engine, high idle running speed	min^{-1}	2,520 $^{+50}$						
Engine, low idle running speed	min^{-1}	800 $^{+50}$						
Charge pressure	bar	30 $^{+2}$						high idle
Start-up speed	min^{-1}	1,100 $^{\pm 50}$						at 50 bar HP
Engine stalling min-1 tortoise, dynamic		2,300 $^{+50}/_{-100}$						at 210^{+10} bar HP
High pressure valves	bar	480						
High pressure	bar	450						pressure cut-off
Regulation start	bar	290 $^{\pm 10}$						dynamic
Cardan shaft rev.	min^{-1}	see Technical Data Chapter 2						
Beginning / end of inching	bar	5 - 13						
Brake accumulator pressure	bar	120 - 150						
Brake pressure	bar	60 $^{+10}$						
Steering left / right	bar	120						
Pilot pressure	bar	30 $^{+2}$						charge pressure, high idle
Main pressure relief valve P1 + P2	bar	245 $^{+5}$						full throttle
Main pressure relief valve P3	bar	205 $^{+5}$						full throttle
Slewing right / left	bar	205						valves at the slew motor
Line relief pressures		**out**	**in**	**out**	**in**	**out**	**in**	
hydraulic cylinders								
Articulated boom	bar	280	280					
Dipperstick	bar	280	280					
Bucket	bar	280	280					
Intermediate boom	bar	150	280					
Add. control circuit	bar	280	280					
Articulation	bar	---	---					
Stabilizing	bar	---	---					

Inspection plan

To be carried out by trained dealer personnel

O = *Checking, maintenance* X = *Replacement*		Operating hours				min 2x yearly	min 1x yearly	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000			
1	Check whether machine-specific instruction book is in the machine	**O**	**O**					
2	Change engine oil		**X**				**X**	
3	Change engine oil filter		**X**				**X**	
4	Drain fuel tank	**O**	**O**			**O**		
5	Replace fuel filter		**X**				**X**	
6	Replace fuel pre-filter		**X**				**X**	
7	Check air intake	**O**	**O**					
8	Change air filter main cartridge	**to service indicator**					**X**	
9	Change air filter safety cartridge	**as required** [1)]						
10	Clean cooling fins of combined hydraulic oil/ water radiator. *In case of high exposure to dust, shorten the cleaning intervals.*	**O**	**O**			**O**		
11	Check antifreeze level in coolant						**O**	
12	Change coolant	**as required** [1)]						
13	Check V-belt tension	**O**	**O**					
14	Check engine mounts and pump attachments	**O**	**O**					
15	Check engine speed adjustment, top-end and low idle speed	**O**	**O**					
16	Check valve lash of engine and adjust if necessary			**O**				
17	Check acid level and battery connections	**O**	**O**					
18	Replace cab ventilation dust filter		**X**				**X**	
19	Check condition of tires, tire pressure and tightness of wheel nuts	**O**	**O**					
20	Check secure fastening of axles and propeller shaft	**O**	**O**					
21	Check bearing bushings and bolts of work equipment and replace if necessary	**O**	**O**					
22	Check that door catches are in perfect condition and replace if necessary	**O**	**O**					
23	Check electrical indicating and warning elements, and lighting system	**O**	**O**					
24	Check smooth running of operator controls and adjust if necessary	**O**	**O**					
25	Check function of hydraulic axle lock and vent plunger cylinders	**O**	**O**					

O = *Checking, maintenance* **X = *Replacement***		**Operating hours**				min 2x	min 1x	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000	yearly	yearly	
26	Check function of steering	**O**	**O**					
27	Check condition and function of support equipment	**O**	**O**					
28	Check hose-rupture safety valves of support equipment	**O**	**O**					
29	Check tightness of all pipes, hoses, control valve, hydraulic pumps, cylinders, etc. ☞ *When tightening hose and pipe connections, screw-in couplings must be locked to prevent rotation*	**O**	**O**					
30	Check or change hydraulic oil	**O**	**O**	**X** [2)]				
31	Replace insert of hydraulic oil return filter	**X**	**according to service indicator**				**X**	
32	Replace insert of hydraulic oil suction filter	**X**	**X**			**X**		
33	Replace ventilation filter			**X**			**X**	
34	Check function of brakes and play of brake discs	**O**	**O**					
35	Differential of rear axle - oil check or oil change	**X**		**X**			**X**	
36	Differential of front axle - oil check or oil change	**X**		**X**			**X**	
37	Transfer gear - oil check or oil change	**X**		**X**			**X**	
38	Wheel hubs of front and rear axles - oil check or oil change	**X**		**X**			**X**	
39	Swing gear - oil check	**O**	**O**					
40	Check that ring gear attachment screws are securely fastened	**O**	**O**					
41	Check that swing-drive attachment (hydraulic motor and transmission) is securely fastened	**O**	**O**					
42	Grease machine according to overview of lubricating points	**O**	**O**					
43	Check function, condition and completeness of safety equipment	**O**	**O**					
44	Hydraulic function check with pressure function test	**O**	**O**					
45	Test run and test work	**O**	**O**					
46	Initial inspection cards and return to MANUFACTURER	**O**	**O** [3)]					

1. at least every 2 years

2. extension of oil change interval according to oil sample analysis and lab report.

3. within warranty

TW 85, serial no. TW00850100

		Desired value		Actual value		Adjusted		Remarks
Engine, transmission, steering, working								
Engine, high idle running speed	min^{-1}	2150 $^{+50}$						
Engine, low idle running speed	min^{-1}	800 $^{+50}$						
Charge pressure	bar	30 $^{+2}$						high idle running speed
Start-up speed	min^{-1}	1100 $^{\pm 50}$						
Engine stalling tortoise, dynamic	min^{-1}	1900 $^{\pm 50}$						at 320 bar HP
Pressure cut-off	bar	460 $^{-10}$						
High pressure (SV)	bar	480						
Regulation start	bar	270 $^{\pm 10}$						dynamic
Cardan shaft rev.	min^{-1}	see Techn. Data Chapter 2						
Beginning / end of inching	bar	5 - 13						
Brake accumulator pressure	bar	120 - 150						
Brake pressure	bar	40 $^{+10}$						
Steering left / right	bar	140 $^{\pm 5}$						
Pilot pressure / charge pressure	bar	30 $^{+2}$						high idle
Stand-by pressure	bar	22						high idle
Pressure cut-off (SX 14)	bar	280						full throttle
Main pressure relief valve 1 (SX 14)	bar	310 $^{-10}$						(SV = safety valve)
Main pressure relief valve 2 (SM12)	bar	230						
Cut-off valve	bar	110 $^{\pm 5}$						
Swing	bar	100/250						2 stage valves
Line relief pressures		**out**	**in**	**out**	**in**	**out**	**in**	
hydraulic cylinders								
Articulated boom	bar	300	300					
Mono/ circular boom	bar	180	300					
Dipperstick	bar	300	300					
Bucket	bar	300	300					
Intermediate boom	bar	150	300					
Telescopic stick	bar	---	---					
Add. control circuit	bar	300	300					
Boom off-set	bar	---	---					
Stabilizing	bar	---	---					
Add.dozer blade option	bar	130						Push dozer down

Inspection plan

To be carried out by trained dealer service staff

O = *Checking, maintenance* X = *Replacement*		Operating hours				min 2x	min 1x	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000	yearly	yearly	
1	Check whether machine-specific instruction book is in the machine	**O**	**O**					
2	Change engine oil		**X**				**X**	
3	Change engine oil filter		**X**				**X**	
4	Drain fuel tank	**O**	**O**			**O**		
5	Replace fuel filter			**X**			**X**	
6	Replace fuel pre-filter			**X**			**X**	
7	Check air intake	**O**	**O**					
8	Change air filter main cartridge	**to service indicator**					**X**	
9	Change air filter safety cartridge	**as required** [1)]						
10	Clean cooling fins of combined hydraulic oil-water cooler *In case of high exposure to dust, shorten the cleaning intervals.*	**O**	**O**			**O**		
11	Check antifreeze level in coolant						**O**	
12	Change coolant	**as required** [1)]						
13	Check V-belt tension	**O**	**O**					
14	Check engine mounts and pump attachments	**O**	**O**					
15	Check engine speed adjustment, top-end and low idle speed	**O**	**O**					
16	Check valve lash of engine and adjust if necessary			**O**				
17	Check acid level and battery connections	**O**	**O**					
18	Replace cab ventilation dust filter		**X**				**X**	
19	Check condition of tires, tire pressure and tightness of wheel nuts	**O**	**O**					
20	Check secure fastening of axles and propeller shaft	**O**	**O**					
21	Check bearing bushings and bolts of work equipment and replace if necessary	**O**	**O**					
22	Check that door catches are in perfect condition and replace if necessary	**O**	**O**					
23	Check electrical indicating and warning elements, and lighting system	**O**	**O**					
24	Check smooth running of operator controls and adjust if necessary	**O**	**O**					
25	Check function of hydraulic axle lock and vent plunger cylinders	**O**	**O**					
26	Check function of steering	**O**	**O**					

O = *Checking, maintenance* **X = *Replacement***		**Operating hours**				min 2x	min 1x	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000	yearly	yearly	
27	Check condition and function of support equipment	**O**	**O**					
28	Check line rupture valves of support equipment	**O**	**O**					
29	Check tightness of all pipes, hoses, control valve, hydraulic pumps, cylinders, etc. *When tightening hose and line connections, the screw-in couplings must be locked to prevent rotation.*	**O**	**O**					
30	Check or change hydraulic oil	**O**	**O**	**X** [2)]				
31	Replace insert of hydraulic oil return filter	**X**	**in compliance with service indicator**				**X**	
32	Replace insert of hydraulic oil suction filter	**X**	**X**			**X**		
33	Replace breather			**X**			**X**	
34	Check function of brakes and play of brake discs	**O**	**O**					
35	Differential of rear axle - oil check or oil change	**X**		**X**			**X**	
36	Differential of front axle - oil check or oil change	**X**		**X**			**X**	
37	Front axle transmission - oil check or oil change	**X**		**X**			**X**	
38	Wheel hubs of front and rear axles - oil check or oil change	**X**		**X**			**X**	
39	Check that ring gear attachment screws are securely fastened	**O**	**O**					
40	Check that swing-drive attachment (hydraulic motor and transmission) is securely fastened	**O**	**O**					
41	Grease machine in compliance with overview of lubricating points	**O**	**O**					
42	Check function, condition and completeness of safety equipment	**O**	**O**					
43	Hydraulic function check with pressure function test	**O**	**O**					
44	Test run and test work	**O**	**O**					
45	Initial inspection cards and return to manufacturer	**O**	**O** [3)]					

1) at least every 2 years

2) Extension of oil change intervals in compliance with oil sample analysis and lab report.

3) within warranty

TW 110 from s/n: TW01100100

		Desired value		Actual value		Adjusted		Remarks
Engine, transmission, steering, working								
Engine, high idle running speed	min^{-1}	2,150 $^{+50}$						
Engine, low idle running speed	min^{-1}	800 $^{+50}$						
Charge pressure	bar	30 $^{+2}$						high idle running speed
Start-up speed	min^{-1}	1,000 $^{\pm50}$						at 50 bar HP
Engine stalling tortoise, dynamic	min^{-1}	1,900 $^{\pm50}$						at 230 $^{+10}$ bar HP, tortoise
Pressure cut-off	bar	460 $^{-10}$						
High pressure (SV)	bar	480						
Regulation start	bar	220 $^{\pm10}$						dynamic
Cardan shaft rev.	min^{-1}	see Techn. Data Chapter 2						
end of inching	bar	20						
Brake accumulator pressure	bar	120 - 150						
Brake pressure	bar	40 $^{\pm10}$						
Steering left / right	bar	140 $^{\pm5}$						
Pilot pressure / charge pressure	bar	30 $^{+2}$						high idle
Stand-by pressure	bar	22 $^{\pm1}$						2,150 min^{-1}
Pressure cut-off (SX 14)	bar	330						high idle
Main pressure relief valve 1 (SX 14)	bar	380						(SV = safety valve)
Main pressure relief valve 2 (SM12)	bar	230						high idle
Cut-off valve	bar	110 $^{\pm5}$						high idle
Swing	bar	100/250						2 stage valves
Line relief pressures		**out**	**in**	**out**	**in**	**out**	**in**	
hydraulic cylinders								
Articulated boom	bar	370	370					
Dipperstick	bar	370	370					
Bucket	bar	370	370					
Intermediate boom	bar	200	370					
Add. control circuit	bar	300	300					
Articulation	bar	---	---					
Stabilising	bar	---	---					
Option Front dozer blade	bar	140						Push dozer down

Inspection plan

To be carried out by trained dealer personnel.

O = *Checking, maintenance* **X = *Replacement***		**Operating hours**				min. 2x yearly	min. 1x yearly
Perform work with machine at operating temperature		after 100	every 500		every 1,000		
1	Check whether machine-specific instruction book is in the machine	**O**	**O**				
2	Change engine oil	**X**	**X**			**X**	
3	Change engine oil filter	**X**	**X**			**X**	
4	Drain fuel tank	**O**	**O**			**O**	
5	Change fuel filter	**X**	**X**				**X**
6	Clean fuel pre-filter	**O**	**O**				
7	Check air intake	**O**	**O**				
8	Change air filter - main cartridge	**in compliance with service indicator**					**X**
9	Change air filter - safety cartridge	**as required** [1]					
10	Clean cooling fins of combined hydraulic oil-water cooler *The cleaning intervals should be shortened if there is high exposure to dust*	**O**	**O**			**O**	
11	Check antifreeze level in coolant						**O**
12	Change coolant	**as required** [1]					
13	Check V-belt tension	**O**	**O**				
14	Check engine mounts and pump attachments	**O**	**O**				
15	Check engine speed adjustment, top-end and low-idle idle speed	**O**	**O**				
16	Check valve lash of engine and adjust if necessary	**O**			**O**		**O**
17	Check injection nozzles [2]				**O**		
18	Check injection pump [2]				**O**		
19	Check acid level and battery connections	**O**	**O**				
20	Check condition of rubber crawler chains	**O**	**O**				
21	Check condition and fastening of grouser plates on the undercarriage steel crawlers	**O**	**O**				
22	Check secure fastening of sprocket, crawler gear units and hydraulic motor	**O**	**O**				
23	Check smooth running of bottom and top rollers	**O**	**O**				
24	Check bearing bushings and bolts of work equipment and re-adjust "free of clearance"	**O**	**O**				

O = *Checking, maintenance* **X = *Replacement***		**Operating hours**				min. 2x yearly	min. 1x yearly
Perform work with machine at operating temperature		after 100	every 500		every 1,000		
25	Check dust filter for cab ventilation				**X**		**X**
26	Check that door catches function perfectly, and replace if necessary	**O**	**O**				
27	Check electrical indicating and warning elements, and lighting system	**O**	**O**				
28	Check smooth running of operator controls	**O**	**O**				
29	Visual inspection of all steel components and other components for material cracks, deformation, wear, other damage	**O**	**O**				
30	Check condition and function of dozer blade	**O**	**O**				
31	Check tightness of all pipes, hoses, control valve, hydraulic pumps, cylinders, etc. When tightening hose and line connections, the screw-in couplings must be locked to prevent rotation.	**O**	**O**				
32	Check or change hydraulic oil	**O**	**O**		**X** [3]		**X**
33	Replace hydraulic oil return filter insert	**X**	**X**				
34	Replace breather for hydraulic oil tank				**X**		**X**
35	Crawler gear units: Check or replace oil	**X**	**O**		**X**		**X**
36	Check that ring gear attachment screws are securely fastened	**O**	**O**				
37	Check that swing gear unit is securely fastened (hydraulic motor and transmission)	**O**	**O**				
38	Grease machine in compliance with overview of lubricating points	**O**	**O**				
39	Check function, condition and completeness of safety equipment	**O**	**O**				
40	Hydraulic function check with pressure function test	**O**	**O**				
41	Test run and test work	**O**	**O**				
42	Initial inspection card and return to manufacturer	**O**	**O** [4]				

1. at least every 2 years
2. by trained personnel
3. Extension of oil change interval in compliance with oil sample analysis and lab report.

TC 60 from serial no. TC00600100

		Desired value		Actual value		Adjusted		Remarks
Engine, travel hydraulics, working hydraulics								
Engine, high idle running speed	min^{-1}	2,350 $^{+20}/_{-30}$						
Engine, low idle running speed	min^{-1}	850 $^{\pm 20}$						
Pilot pressure	bar	30 $^{+1}$						high idle
Main pressure relief valve (P1)	bar	245						high idle running speed
Main pressure relief valve (P2)	bar	245						high idle running speed
Main pressure relief valve (P3)	bar	205						high idle running speed
Slewing right / left Valves at slew motor	bar bar	205 205						
Travel left/right, main pressure relief valve Valves at travel motor	bar bar	245 ---	245 ---					
Line relief pressures,		**out**	**in**	**out**	**in**	**out**	**in**	
hydraulic cylinders								
Boom	bar	180	280					
Dipperstick	bar	280	280					
Bucket	bar	280	280					
Articulation	bar	*	*					* = anti-cavitation
Dozer blade	bar	----	----					
Breaker, slew bucket, grab rotation	bar	210	210					

Inspection plan

To be carried out by trained specialist dealer personnel.

O = *Checking, maintenance* **X = *Replacement***		**Operating hours**				min. 2x yearly	min. 1x yearly
Perform work with machine at operating temperature		after 100	every 500	every 1000	every 2000		
1	Check whether machine-specific instruction book is in the machine	**O**	**O**				
2	Change engine oil		**X**				**X**
3	Change engine oil filter		**X**				**X**
4	Drain fuel tank and fuel filter	**O**	**O**			**O**	
5	Change fuel filter		**X**				**X**
6	Change fuel pre-filter		**X**				**X**
7	Check air intake	**O**	**O**				
8	Change air filter - main cartridge	**according to service indicator**					**X**
9	Change air filter - safety cartridge	**as required** [1)]					
10	Clean cooling fins of combined hydraulic oil-engine oil cooler *The cleaning intervals should be shortened if there is high exposure to dust.*	**O**	**O**			**O**	
11	--						
12	--						
13	Check V-belt tension	**O**	**O**				
14	Check engine mounts and pump attachments	**O**	**O**				
15	Check engine speed adjustment, top-end and low idle speed	**O**	**O**				
16	Check valve lash of engine and adjust if necessary			**O**			
17	Check acid level and battery connections	**O**	**O**				
18	Check dust filter for cab ventilation		**X**				**X**
19	Check condition and secure fastening of steel crawler chain track shoes	**O**	**O**				
20	Check secure fastening of sprocket, crawler gear units and hydraulic motor	**O**	**O**				
21	Check smooth running of bottom and top rollers	**O**	**O**				
22	Check function of parking brake	**O**	**O**				
23	Check bearing bushings and bolts of work equipment and replace if necessary	**O**	**O**				
24	Check that door catches function perfectly, and replace if necessary	**O**	**O**				

O = *Checking, maintenance* **X = *Replacement***		**Operating hours**				min. 2x yearly	min. 1x yearly
Perform work with machine at operating temperature		after 100	every 500	every 1000	every 2000		
25	Check electrical indicating and warning elements, and lighting system	**O**	**O**				
26	Check smooth running of operator controls and adjust if necessary	**O**	**O**				
27	Check condition and function of dozer blade	**O**	**O**				
28	Check tightness of all pipes, hoses, control valve, hydraulic pumps, cylinders, etc. ☞ *When tightening hose and line connections, the screw-in couplings must be locked to prevent rotation.*	**O**	**O**				
29	Check or change hydraulic oil	**O**	**O**	**X** [2)]			
30	Replace hydraulic oil return filter insert	**X**	**according to service indicator**				
31	Replace breather			**X**			**X**
32	Crawler gear units: Check or replace oil	**X**	**O**	**X**			**X**
33	--						
34	Check that ring gear attachment screws are securely fastened	**O**	**O**				
35	Check that swing gear attachment (hydraulic motor and transmission) is securely fastened	**O**	**O**				
36	Grease machine according to overview of lubricating points	**O**	**O**				
37	Check function, condition and completeness of safety equipment	**O**	**O**				
38	Hydraulic function check with pressure function test	**O**	**O**				
39	Test run and test work	**O**	**O**				
40	Initial inspection card and return to manufacturer	**O**	**O** [3)]				

1. at least every 2 years
2. Extension of oil change interval according to oil sample analysis and lab report. For further information
3. within warranty

TC 75 from serial no. TC00750100

		Desired value		Actual value		Adjusted		Remarks
Engine, transmission, steering, working								
Engine, high idle running speed	min^{-1}	2.350 $^{+150}$						
Engine, low idle running speed	min^{-1}	850 $^{+100}$						
Pilot pressure / charge pressure	bar	35 $^{\pm 1}$						
Main pressure relief valve 1 (SX 14)	bar	280 $^{\pm 5}$						high idle valve bank 1
Stand-by pressure	bar	22 $^{+1}$						high idle
Main pressure relief valve 1 (SX 14)	bar	310 $^{-10}$						high idle valve bank 1
Main pressure relief valve 2 (SM12)	bar	230 $^{\pm 5}$						high idle valve bank 2
Swing right / left	bar	100 / 250						2-stage valves
Line relief pressures,		**out**	**In**	**out**	**in**	**out**	**in**	
hydraulic cylinders								
Boom (mono / circular boom)	bar	180	300					
Intermediate boom /circular)	bar	180	300					
Dipper stick	bar	300	300					
Bucket	bar	300	300					
Add. control circuit	bar	300	300					
Travel right	bar	$300^{\pm 10}$	$300^{\pm 10}$					Valves in travel motor
Travel left	bar	$300^{\pm 10}$	$300^{\pm 10}$					Valves in travel motor
Articulation	bar	----	----					
Dozer blade	bar	----	----					

Inspection plan

To be carried out by trained specialist dealer personnel.

O = *Checking, maintenance* **X = *Replacement***		**Operating hours**				min. 2x yearly	min. 1x yearly	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000			
1	Check whether machine-specific instruction book is in the machine	**O**	**O**					
2	Change engine oil		**X**				**X**	
3	Change engine oil filter		**X**				**X**	
4	Drain fuel tank	**O**	**O**			**O**		
5	Change fuel filter			**X**			**X**	
6	Change fuel pre-filter			**X**				
7	Check air intake	**O**	**O**					
8	Change air filter - main cartridge	**according to service indicator**					**X**	
9	Change air filter - safety cartridge	**as required** [1)]						
10	Clean cooling fins of the combined hydraulic oil-water cooler *The cleaning intervals should be shortened if there is high exposure to dust.*	**O**	**O**			**O**		
11	Check antifreeze level in coolant						**O**	
12	Change coolant	**as required** [1)]						
13	Check V-belt tension	**O**	**O**					
14	Check engine mounts and pump attachments	**O**	**O**					
15	Check engine speed adjustment, top-end and low idle speed	**O**	**O**					
16	Check valve lash of engine and adjust if necessary			**O**				
17	Check acid level and battery connections	**O**	**O**					
18	Check dust filter for cab ventilation		**X**				**X**	
19	Check condition and secure fastening of steel crawler chain track shoes	**O**	**O**					
20	Check secure fastening of sprocket, crawler gear units and hydraulic motor	**O**	**O**					
21	Check smooth running of bottom and top rollers	**O**	**O**					
22	Check function of parking brake	**O**	**O**					
23	Check bearing bushings and bolts of work equipment and replace if necessary	**O**	**O**					
24	Check that door catches function perfectly, and replace if necessary	**O**	**O**					

O = *Checking, maintenance* **X = *Replacement***		**Operating hours**				min. 2x yearly	min. 1x yearly	
Perform work with machine at operating temperature		after 100	every 500	every 1,000	every 2,000			
25	Check electrical indicating and warning elements, and lighting system	**O**	**O**					
26	Check smooth running of operator controls and adjust if necessary	**O**	**O**					
27	Check condition and function of dozer blade	**O**	**O**					
28	Check tightness of all pipes, hoses, control valve, hydraulic pumps, cylinders, etc. When tightening hose and line connections, the screw-in couplings must be locked to prevent rotation.	**O**	**O**					
29	Check or change hydraulic oil	**O**	**O**	**X** [2)]				
30	Replace hydraulic oil return filter insert	**X**	**according to service indicator**					
31	Replace breather			**X**			**X**	
32	Crawler gear units: Check or replace oil	**X**	**O**	**X**			**X**	
33	Check that ring gear attachment screws are securely fastened	**O**	**O**					
34	Check that swing gear attachment (hydraulic motor and transmission) is securely fastened	**O**	**O**					
35	Grease machine according to overview of lubricating points	**O**	**O**					
36	Check function, condition and completeness of safety equipment	**O**	**O**					
37	Hydraulic function check with pressure function test	**O**	**O**					
38	Test run and test work	**O**	**O**					
39	Initial inspection card and return to manufacturer	**O**	**O** [3)]					

1. at least every 2 years

2. Extension of oil change intervals according to oil sample analysis and lab report.

3. within warranty

TC 125, serial no. TC01250100

		Desired value		Actual value		Adjusted		Remarks
Engine, travel hydraulics, working hydraulics								
Engine, high idle running speed	min^{-1}	2,250 $^{\pm 50}$						
Engine, low idle running speed	min^{-1}	800 $^{\pm 50}$						
Pilot pressure	bar	35 $^{+2}$						
LS pressure relief valve (SX 14)	bar	340 $^{+10}$						high idle valve bank 1
Stand-by pressure	bar	22 $^{\pm 1}$						high idle
Main pressure relief valve 1 (SX 14)	bar	370 $^{-10}$						high idle valve bank 1
Main pressure relief valve 2 (5 SM 12)	bar	230 $^{\pm 5}$						high idle valve bank 2
Shut-off valve	bar	110 $^{\pm 5}$						
Swing right / left	bar	150-250 $^{\pm 10}$ / 150-250 $^{\pm 10}$						2-stage valves
Circulation pressure Gear pump P1	bar	18						high idle
Circulation pressure Gear pump P2	bar	19						high idle
Line relief pressures,		**out**	**In**	**out**	**in**	**out**	**in**	
hydraulic cylinders								
Boom (mono boom)	bar	370	330					
Boom (articulated boom)	bar	370	370					
Intermediate boom		330	330					
Dipper stick	bar	370	370					
Bucket	bar	370	370					
Add. control circuit	bar	300	300					
Articulation	bar	----	----					
Dozer blade	bar	----	----					
		forward	backward					
Travel right	bar	360 $^{\pm 5}$	360 $^{\pm 5}$					Valves in travel motor
Travel left	bar	360 $^{\pm 5}$	360 $^{\pm 5}$					Valves in travel motor

Inspection plan

To be carried out by trained dealer personnel.

O = *Checking, maintenance* **X = *Replacement***		**Operating hours**				min. 2x	min. 1x
Perform work with machine at operating temperature		after 100	every 500		every 1,000	yearly	yearly
1	Check whether machine-specific instruction book is in the machine	**O**	**O**				
2	Change engine oil	**X**	**X**			**X**	
3	Change engine oil filter	**X**	**X**			**X**	
4	Drain water from fuel tank	**O**	**O**			**O**	
5	Change fuel filter	**X**	**X**				**X**
6	Check air intake	**O**	**O**				
7	Change air filter - main cartridge	**in compliance with service indicator**					**X**
8	Change air filter - safety cartridge	**as required** [1)]					
9	Clean cooling fins of hydraulic oil cooler The cleaning intervals should be shortened if there is high exposure to dust	**O**	**O**			**O**	
10	Clean cooling fins of water cooler The cleaning intervals should be shortened if there is high exposure to dust	**O**	**O**			**O**	
11	Check antifreeze level in coolant						**O**
12	Change coolant	**as required** [1)]					
13	Check V-belt tension	**O**	**O**				
14	Check engine mounts and pump attachments	**O**	**O**				
15	Check engine speed adjustment, top-end and low-idle idle speed	**O**	**O**				
16	Check valve lash of engine and adjust if necessary	**O**			**O**		**O**
17	Check injection nozzles				**O**		
18	Check injection pump				**O**		
19	Check acid level and battery connections	**O**	**O**				
20	Check condition of crawler chains	**O**	**O**				
21	Check secure fastening of sprocket, crawler gear units and hydraulic motor	**O**	**O**				
22	Check smooth running of bottom and top rollers	**O**	**O**				
23	Check bearing bushings and bolts of work equipment and re-adjust "free of clearance"	**O**	**O**				

O = *Checking, maintenance* X = *Replacement*		Operating hours				min. 2x	min. 1x
Perform work with machine at operating temperature		after 100	every 500		every 1,000	yearly	yearly
24	Check electrical indicating and warning elements, and lighting system	**O**	**O**				
25	Check smooth running of operator controls and adjust if necessary	**O**	**O**				
26	Check tightness of all pipes, hoses, control valve, hydraulic pumps, cylinders, etc. When tightening hose and pipe connections, screw-in couplings must be locked to prevent rotation.	**O**	**O**				
27	Check or change hydraulic oil	**O**	**O**		**X** [2)]		**X**
28	Replace hydraulic oil return filter insert	**X**	**X**				**X**
29	Replace breather				**X**		**X**
30	Crawler gear units: Check or replace oil	**X**	**O**		**X**		**X**
31	Check that swing gear unit is securely fastened	**O**	**O**				**O**
32	Check that ring gear attachment screws are securely fastened	**O**	**O**				**O**
33	Grease machine in compliance with overview of lubricating points	**O**	**O**				
34	Check function, condition and completeness of safety equipment	**O**	**O**				
35	Function of brake valves	**O**	**O**				
36	Hydraulic function check with pressure function test	**O**	**O**				
37	Test run and test work	**O**	**O**				
38	Initial inspection card and return to manufacturer	**O**	**O** [3)]				

1. at least every 2 years
2. Extension of oil change interval in compliance with oil sample analysis and lab report.
   For further information see Chapter 7.3
3. within warranty

TC 29 from s/n.: TC00290100

		Desired value	Actual value	Adjusted	Remarks
Engine, travel hydraulics, working hydraulics					
Engine, high idle running speed	min^{-1}	2,250 $^{+35}/_{-10}$			
Engine, low idle running speed	min^{-1}	1,000 $^{\pm 25}$			
Pilot pressure	bar	21			
Main pressure relief valve (9 SX12)	bar	210 $^{+5}$			high idle
Slewing right / left	bar	210 $^{+5}$			Valves at the slew motor

Line relief pressures

hydraulic cylinders		**out**	**in**	**out**	**in**	**out**	**in**	
Boom	bar	160	230					
Dipper stick	bar	230	230					
Bucket	bar	175	175					
Travel right	bar	190	190					Shock valves at the
Travel left	bar	190	190					travel motor
Articulation	bar	----	----					
Dozer blade	bar	----	----					

Inspection plan

Work to be carried out by trained specialist dealer personnel.

O = Checking, maintenance X = Replace Work with machine its at operating temperature		Operating hours				min. 2 x annually	min. 1 x annually	
		after 100	every 500		every 1000			
1	Checking whether the operating manual for the machine is kept in the machine.	O	O					
2	Changing the engine oil.	X	X			X		
3	Changing the engine oil filter.	X	X			X		
4	Draining water from the fuel tank.	O	O			O		
5	Changing the fuel filter.	X	X				X	
6	Checking the air intake.	O	O					
7	Replacing the air filter - main cartridge.	**according to the service indicator**					X	
8	Replacing the air filter - safety cartridge.	**as required** [1]						
9	Cleaning cooling fins on the hydraulic oil cooler. ***Machine damage*** *due to strong accumulation of dust.* • *Shorten the cleaning intervals.*	O	O			O		
10	Cleaning cooling fins on the radiator. ***Machine damage*** *due to strong accumulation of dust.* • *Shorten the cleaning intervals.*	O	O			O		
11	Check the level of antifreeze in the coolant.						O	
12	Changing the coolant.	**as required** [1]						
13	Checking the V-belt tension.	O	O					
14	Checking the engine mount and pump attachments.	O	O					
15	Checking engine speed adjustment, upper and lower idling speeds.	O	O					
16	Check valve play on the engine and adjusting if necessary.	O			O		O	
17	Checking injection nozzles.				O			
18	Checking the injection pump.				O			
19	Checking acid level and battery connections.	O	O					
20	Checking the condition of crawler chains.	O	O					
21	Checking secure fastening of the chain drive, crawler gear units and hydraulic motor.	O	O					
22	Checking smooth running of bottom and top rollers.	O	O					
23	Checking bearing bushings and bolts on operating equipment and adjusting to make "play-free".	O	O					
24	Checking electrical indicating and warning elements and the lighting equipment.	O	O					
25	Checking operating elements for smooth movement and adjusting as required.	O	O					

[1] *At least once every two years.*

[2] *Extension of the oil change intervals after an oil analysis and laboratory report*

[3] *Within the warranty period.*

O = Checking, maintenance X = Replace Work with machine its at operating temperature		Operating hours				min. 2 x annu-ally	min. 1 x annu-ally	
		after 100	every 500		every 1000			
26	Checking for leaks in all pipes, hoses, control valves, hydraulic pumps, cylinders, etc. ***Note*** *The screw-in couplings must be locked when tightening hose and line connections to prevent rotation.*	**O**	**O**					
27	Checking or changing the hydraulic oil.	**O**	**O**		**X** [2]		**X**	
28	Replacing the hydraulic oil return filter insert.	**X**	**X**				**X**	
29	Replacing the breather.				**X**		**X**	
30	Checking or replacing oil for crawler gear units.	**X**	**O**		**X**		**X**	
31	Checking that the swivelling gear unit is securely fastened.	**O**	**O**				**O**	
32	Checking that the ring gear attachment screws are securely fastened.	**O**	**O**				**O**	
33	Greasing the machine in accordance with the overview of lubricating points.	**O**	**O**					
34	Checking the function, condition and completeness of safety devices.	**O**	**O**					
35	Checking the function of service brake valves.	**O**	**O**					
36	An hydraulic function check with pressure function test.	**O**	**O**					
37	Test run and test operation.	**O**	**O**					
38	Signing the inspection card and returning it to the manufacturer.	**O**	**O** [3]					

[1] *At least once every two years.*

[2] *Extension of the oil change intervals after an oil analysis and laboratory report*

[3] *Within the warranty period.*

TC 35 from serial no. TC00350100

		Desired value		Actual value		Adjusted		Remarks
Engine, transmission, steering, working								
Engine, high idle running speed [1]	min^{-}	2,300 $^{-50}$						
Engine, low idle running speed [1]	min^{-}	1,000 $^{\pm 25}$						
G-regulator	bar	20.0						high idle
Stand-by pressure	bar	21.0						high idle
Δp (LS-pressure)	bar	15.0						high idle
Pilot pressure / charge pressure	bar	28 $^{\pm 1}$						high idle
Main pressure relief valve (SX12)	bar	250 $^{+5}$						high idle
Swing right / left Δp between M1-M2	bar	185						Valves at the swing motor
Line relief pressures,		**out**	**In**	**out**	**in**	**out**	**in**	
hydraulic cylinders								
Boom	bar	160	280					
Dipper stick	bar	280	280					
Bucket	bar	210	210					
Articulation	bar	---	---					anti-cavitation
Dozer blade	bar	---	---					
Rock breaker, swing bucket, grab rotation	bar	210	210					
Travel right	bar	250	250					Shock valves at the travel motor
Travel left	bar	250	250					Shock valves at the travel motor

Inspection plan

To be carried out by trained dealer personnel.

O = *Checking, maintenance* **X = *Replacement***		**Operating hours**				min. 2x	min. 1x	
Perform work with machine at operating temperature		after 100	every 500		every 1,000	yearly	yearly	
1	Check whether machine-specific instruction book is in the machine	**O**	**O**					
2	Change engine oil	**X**	**X**			**X**		
3	Change engine oil filter	**X**	**X**			**X**		
4	Drain water from fuel tank	**O**	**O**			**O**		
5	Change fuel filter	**X**	**X**				**X**	
6	Check air intake	**O**	**O**					
7	Change air filter - main cartridge	**in compliance with service indicator**					**X**	
8	Change air filter - safety cartridge	**as required** [1)]						
9	Clean cooling fins of combined hydraulic oil / water radiator The cleaning intervals should be shortened if there is high exposure to dust	**O**	**O**			**O**		
10	--							
11	Check antifreeze level in coolant						**O**	
12	Change coolant	**as required** [1)]						
13	Check V-belt tension	**O**	**O**					
14	Check engine mounts and pump attachments	**O**	**O**					
15	Check engine speed adjustment, top-end and low-idle idle speed	**O**	**O**					
16	Check valve lash of engine and adjust if necessary	**O**			**O**		**O**	
17	Check injection nozzles				**O**			
18	Check injection pump				**O**			
19	Check acid level and battery connections	**O**	**O**					
20	Check condition of crawler chains	**O**	**O**					
21	Check secure fastening of sprocket, crawler gear units and hydraulic motor	**O**	**O**					
22	Check smooth running of bottom and top rollers	**O**	**O**					
23	Check bearing bushings and bolts of work equipment and re-adjust "free of clearance"	**O**	**O**					

O = *Checking, maintenance* X = *Replacement*		Operating hours				min. 2x	min. 1x	
Perform work with machine at operating temperature		after 100	every 500		every 1,000	yearly	yearly	
24	Check electrical indicating and warning elements, and lighting system	**O**	**O**					
25	Check smooth running of operator controls and adjust if necessary	**O**	**O**					
26	Check tightness of all pipes, hoses, control valve, hydraulic pumps, cylinders, etc. When tightening hose and pipe connections, screw-in couplings must be locked to prevent rotation.	**O**	**O**					
27	Check or change hydraulic oil	**O**	**O**		**X** [2)]		**X**	
28	Replace hydraulic oil return filter insert	**X**	**X**				**X**	
29	Replace breather				**X**		**X**	
30	Crawler gear units: Check or replace oil	**X**	**O**		**X**		**X**	
31	Check that swing gear unit is securely fastened	**O**	**O**				**O**	
32	Check that ring gear attachment screws are securely fastened	**O**	**O**				**O**	
33	Grease machine in compliance with overview of lubricating points	**O**	**O**					
34	Check function, condition and completeness of safety equipment	**O**	**O**					
35	Function of brake valves	**O**	**O**					
36	Hydraulic function check with pressure function test	**O**	**O**					
37	Test run and test work	**O**	**O**					
38	Initial inspection card and return to manufacturer	**O**	**O** [3)]					

1. at least every 2 years
2. Extension of oil change interval in compliance with oil sample analysis and lab report.
   For further information see Chapter 7.3
3. within warranty

Test certificate TC48 Mitsubishi engine, serial no. TC00480100

		Desired value		Actual value		Adjusted		Remarks
Engine, travel hydraulics, working hydraulics								
Engine, high idle running speed	min^{-1}	2350						
Engine, low idle running speed	min^{-1}	850						
Pilot pressure	bar	30						high idle
Main pressure relief valve (P1)	bar	245						high idle running speed
Main pressure relief valve (P2)	bar	245						high idle running speed
Main pressure relief valve (P3)	bar	205						high idle running speed
Slewing right / left	bar	205						
Valves at slew motor	bar	205						
Travel left/right, main pressure relief valve	bar	245	245					
Valves at travel motor	bar	270	270					
Line relief pressures,		**out**	**in**	**out**	**in**	**out**	**in**	
hydraulic cylinders								
Boom	bar	140	280					
Dipperstick	bar	280	280					
Bucket	bar	280	280					
Articulation	bar	*	*					* = anti-cavitation
Dozer blade	bar	----	----					
Breaker, slew bucket, grab rotation	bar	210	210					

Inspection plan

Work to be carried out by trained dealer service personnel.

O = Checking, maintenance X = Replace Perform work with machine at operating temperature		operating hours				min. 2 x annually	min. 1 x annually	
		after 100	every 500		every 1000			
1	Check whether machine-specific Operating Manual is in the machine.	O	O					
2	Change engine oil.	X	X			X		
3	Change the engine oil filter.	X	X			X		
4	Drain water from the fuel tank.	O	O			O		
5	Change fuel filter.	X	X				X	
6	Check air intake.	O	O					
7	Replace air filter main cartridge.	according to the service indicator					X	
8	Replace the air filter safety cartridge.	as required [1]						
9	Clean cooling fins of the hydraulic oil cooler. ***Machine damage*** *due to strong accumulation of dust.* • *Shorten the cleaning intervals.*	O	O			O		
10	Clean cooling fins of water cooler. ***Machine damage*** *due to strong accumulation of dust.* • *Shorten the cleaning intervals.*	O	O			O		
11	Check level of antifreeze in the coolant.						O	
12	Change the coolant.	as required [1]						
13	Check V-belt tension.	O	O					
14	Check engine mount and pump attachments.	O	O					
15	Check engine speed adjustment, upper and lower idling speeds.	O	O					
16	Check valve lash on the engine and adjust if necessary.	O			O		O	
17	Check injection nozzles.				O			
18	Check injection pump.				O			
19	Check acid level and battery connections.	O	O					
20	Check condition of crawler chains.	O	O					
21	Check secure fastening of crawler-chain sprocket, crawler gear units and hydraulic motor.	O	O					
22	Check smooth running of bottom and top rollers.	O	O					
23	Check bearing bushings and pins/bolts of work equipment and adjust until they are without play.	O	O					
24	Check electrical indicating and warning elements and lighting equipment.	O	O					
25	Check smooth running of operator controls and adjust if necessary.	O	O					

[1] *At least every two years.*

[2] *Extension of oil change intervals according to oil sample analysis and laboratory report*

[3] *Within warranty.*

O = Checking, maintenance X = Replace Perform work with machine at operating temperature		operating hours				min. 2 x annually	min. 1 x annually	
		after 100	every 500		every 1000			
26	Check for leaks in all pipes, hoses, control valves, hydraulic pumps, cylinders, etc. ***Attention*** *The screw-in couplings must be locked when tightening hose and line connections to prevent rotation.*	O	O					
27	Check or change the hydraulic oil.	O	O		X [2]		X	
28	Replace the hydraulic oil return filter insert.	X	X				X	
29	Replace breather.				X		X	
30	Check or replace oil of crawler gear units.	X	O		X		X	
31	Check secure fastening of swing bearing attachment.	O	O				O	
32	Check that the ring gear attachment screws are securely fastened.	O	O				O	
33	Grease machine according to overview of lubricating points.	O	O					
34	Check function, condition and completeness of safety devices.	O	O					
35	Check function of brake valves.	O	O					
36	Hydraulic function check with pressure function test.	O	O					
37	Test run and test work.	O	O					
38	Initial inspection card and return to manufacturer.	O	O [3]					

[1] *At least every two years.*

[2] *Extension of oil change intervals according to oil sample analysis and laboratory report*

[3] *Within warranty.*

TC15 from serial no. TC00150100

	Desired value		Actual value		Adjusted		Remarks
Engine, transmission, steering, working							
Engine, high idle running speed min^{-1}	2,450 $^{+35}/_{-10}$						
Engine, low idle running speed min^{-1}	1,020 $^{+50}$						
Δp (between P und LS) bar	15						high idle
Pilot pressure bar	28 $^{\pm 1}$						high idle
Main pressure relief valve (SX10) bar	165 $^{+5}$						high idle
Swing right / left At test point P1 bar	140 $^{+5}$						Valves at the swing motor
Line relief pressures, hydraulic cylinders	**out**	**In**	**out**	**in**	**out**	**in**	
Boom bar	160	210					
Dipper stick bar	210	210					
Bucket bar	210	210					
Articulation bar	---	---					anti-cavitations
Dozer blade bar	---	---					
Rock breaker, swing bucket, grab rotation bar	---	---					
Travel right bar	---	---					Shock valves at the travel motor
Travel left bar	---	---					Shock valves at the travel motor

Inspection plan

Work to be carried out by trained dealer service personnel.

O = Checking, maintenance X = Replace Perform work with machine at operating temperature		operating hours				min. 2 x annually	min. 1 x annually	
		after 100	every 500		every 1000			
1	Check whether machine-specific Operating Manual is in the machine.	O	O					
2	Change engine oil.	X	X			X		
3	Change the engine oil filter.	X	X			X		
4	Drain water from the fuel tank.	O	O			O		
5	Change fuel filter.	X	X				X	
6	Check air intake.	O	O					
7	Replace air filter main cartridge.	according to the service indicator					X	
8	Replace the air filter safety cartridge.	as required [1]						
9	Clean cooling fins of the hydraulic oil cooler. ***Machine damage*** *due to strong accumulation of dust.* • *Shorten the cleaning intervals.*	O	O			O		
10	Clean cooling fins of the water cooler. ***Machine damage*** *due to strong accumulation of dust.* • *Shorten the cleaning intervals.*	O	O			O		
11	Check level of antifreeze in the coolant.						O	
12	Change the coolant.	as required [1]						
13	Check V-belt tension.	O	O					
14	Check engine mount and pump attachments.	O	O					
15	Check engine speed adjustment, upper and lower idling speeds.	O	O					
16	Check valve lash on the engine and adjust if necessary.	O			O		O	
17	Check injection nozzles.				O			
18	Check injection pump.				O			
19	Check acid level and battery connections.	O	O					
20	Check condition of crawler chains.	O	O					
21	Check secure fastening of crawler-chain sprocket, crawler gear units and hydraulic motor.	O	O					
22	Check smooth running of bottom and top rollers.	O	O					
23	Check bearing bushings and pins/bolts of work equipment and adjust until they are without play.	O	O					
24	Check electrical indicating and warning elements and lighting equipment.	O	O					
25	Check smooth running of operator controls and adjust if necessary.	O	O					

[1] *At least every two years.*

[2] *Extension of oil change intervals according to oil sample analysis and laboratory report*

[3] *Within warranty.*

O = Checking, maintenance X = Replace Perform work with machine at operating temperature		operating hours				min. 2 x annually	min. 1 x annually	
		after 100	every 500		every 1000			
26	Check for leaks in all pipes, hoses, control valves, hydraulic pumps, cylinders, etc. ***Attention*** *The screw-in couplings must be locked when tightening hose and line connections to prevent rotation.*	O	O					
27	Check or change the hydraulic oil.	O	O		X [2]		X	
28	Replace the hydraulic oil return filter insert.	X	X				X	
29	Replace breather.				X		X	
30	Check or replace oil of crawler gear units.	X	O		X		X	
31	Check secure fastening of swing bearing attachment.	O	O				O	
32	Check that the ring gear attachment screws are securely fastened.	O	O				O	
33	Grease machine according to overview of lubricating points.	O	O					
34	Check function, condition and completeness of safety devices.	O	O					
35	Check function of brake valves.	O	O					
36	Hydraulic function check with pressure function test.	O	O					
37	Test run and test work.	O	O					
38	Initial inspection card and return to manufacturer.	O	O [3]					

[1] *At least every two years.*

[2] *Extension of oil change intervals according to oil sample analysis and laboratory report*

[3] *Within warranty.*

TC16 from serial no. TC00160100

	Desired value		Actual value		Adjusted		Remarks
Engine, transmission, steering, working							
Engine, high idle running speed min^{-1}	2,450 $^{+35}/_{-10}$						
Engine, low idle running speed min^{-1}	1,020 $^{+50}$						
Δp (between P und LS) bar	15						high idle
Pilot pressure bar	28 $^{\pm 1}$						high idle
Main pressure relief valve (SX10) bar	165 $^{+5}$						high idle
Shut-off valve bar	110 $^{+5}$						
Swing right / left at test point P1 bar	140 $^{+5}$						Valves at the swing motor
Line relief pressures, hydraulic cylinders	**out**	**In**	**out**	**in**	**out**	**in**	
Boom bar	160	210					
Dipper stick bar	210	210					
Bucket bar	210	210					
Articulation bar	---	---					anti-cavitations
Dozer blade bar	---	---					
Rock breaker, swing bucket, grab rotation bar	---	---					
Travel right bar	---	---					Shock valves at the travel motor
Travel left bar	---	---					Shock valves at the travel motor

Inspection plan

Work to be carried out by trained dealer service personnel.

O = Checking, maintenance X = Replace Perform work with machine at operating temperature		operating hours				min. 2 x annually	min. 1 x annually	
		after 100	every 500		every 1000			
1	Check whether machine-specific Operating Manual is in the machine.	O	O					
2	Change engine oil.	X	X			X		
3	Change the engine oil filter.	X	X			X		
4	Drain water from the fuel tank.	O	O			O		
5	Change fuel filter.	X	X				X	
6	Check air intake.	O	O					
7	Replace air filter main cartridge.	according to the service indicator					X	
8	Replace the air filter safety cartridge.	as required [1]						
9	Clean cooling fins of the hydraulic oil cooler. ***Machine damage*** *due to strong accumulation of dust.* • *Shorten the cleaning intervals.*	O	O			O		
10	Clean cooling fins of the water cooler. ***Machine damage*** *due to strong accumulation of dust.* • *Shorten the cleaning intervals.*	O	O			O		
11	Check level of antifreeze in the coolant.						O	
12	Change the coolant.	as required [1]						
13	Check V-belt tension.	O	O					
14	Check engine mount and pump attachments.	O	O					
15	Check engine speed adjustment, upper and lower idling speeds.	O	O					
16	Check valve lash on the engine and adjust if necessary.	O			O		O	
17	Check injection nozzles.				O			
18	Check injection pump.				O			
19	Check acid level and battery connections.	O	O					
20	Check condition of crawler chains.	O	O					
21	Check secure fastening of crawler-chain sprocket, crawler gear units and hydraulic motor.	O	O					
22	Check smooth running of bottom and top rollers.	O	O					
23	Check bearing bushings and pins/bolts of work equipment and adjust until they are without play.	O	O					
24	Check electrical indicating and warning elements and lighting equipment.	O	O					
25	Check smooth running of operator controls and adjust if necessary.	O	O					

[1] *At least every two years.*

[2] *Extension of oil change intervals according to oil sample analysis and laboratory report*

[3] *Within warranty.*

O = Checking, maintenance X = Replace Perform work with machine at operating temperature		operating hours				min. 2 x annually	min. 1 x annually	
		after 100	every 500		every 1000			
26	Check for leaks in all pipes, hoses, control valves, hydraulic pumps, cylinders, etc. ***Attention*** *The screw-in couplings must be locked when tightening hose and line connections to prevent rotation.*	O	O					
27	Check or change the hydraulic oil.	O	O		X [2]		X	
28	Replace the hydraulic oil return filter insert.	X	X				X	
29	Replace breather.				X		X	
30	Check or replace oil of crawler gear units.	X	O		X		X	
31	Check secure fastening of swing bearing attachment.	O	O				O	
32	Check that the ring gear attachment screws are securely fastened.	O	O				O	
33	Grease machine according to overview of lubricating points.	O	O					
34	Check function, condition and completeness of safety devices.	O	O					
35	Check function of brake valves.	O	O					
36	Hydraulic function check with pressure function test.	O	O					
37	Test run and test work.	O	O					
38	Initial inspection card and return to manufacturer.	O	O [3]					

[1] *At least every two years.*

[2] *Extension of oil change intervals according to oil sample analysis and laboratory report*

[3] *Within warranty.*

TC20 from serial no. TC00200100

	Desired value		Actual value		Adjusted		Remarks
Engine, transmission, steering, working							
Engine, high idle running speed min^{-1}	2,450 $^{+35}/_{-10}$						
Engine, low idle running speed min^{-1}	1,020 $^{+50}$						
Δp (between P und LS) bar	15						high idle
Pilot pressure bar	28 $^{\pm 1}$						high idle
Main pressure relief valve (SX10) bar	180 $^{+5}$						high idle
Shut-off valve bar	125 $^{-5}$						
Swing right / left at test point P1 bar	155 $^{-5}$						Valves at the swing motor
Line relief pressures,	**out**	**In**	**out**	**in**	**out**	**in**	
hydraulic cylinders							
Boom bar	160	230					
Dipper stick bar	210	210					
Bucket bar	210	210					
Articulation bar	---	---					anti-cavitations
Dozer blade bar	---	---					
Rock breaker, swing bucket, grab rotation bar	---	---					
Travel right bar	---	---					Shock valves at the travel motor
Travel left bar	---	---					Shock valves at the travel motor

Inspection plan

Work to be carried out by trained specialist dealer personnel:

Item	Inspection	Operating hours					
	o = Check, x = Replace	af-ter 100	ev-ery 500	ev-ery 1000	ev-ery 1500	ev-ery 2000	min. 1 x year
1	Check machine for presence of machine-specific operating instructions	o	o				
2	Change the engine oil	x	x				
3	Change the engine oil filter	x	x				
4	Drain water from the fuel tank	o	o				
6	Replace the fuel filter		x				
7	Check the air intake	o	o				
8	Replace main air filter cartridge	according to the service indicator					x
9	Replace the air filter safety cartridge	as required [1)]					
10	Clean cooling fins on hydraulic oil cooler **In case of strong accumulation of dust, shorten the cleaning intervals.**	o	o				
11	Clean cooling fins of water cooler. **In case of strong accumulation of dust, shorten the cleaning intervals.**	o	o				
12	Check antifreeze level in coolant						o
13	Change coolant			x			x
14	Check and re-adjust the V-belt tension	o	o				
15	Check engine mount and pump attachment	o	o				
16	Check engine speed setting, upper and lower idle speeds.	o	o				
17	Adjust inlet/outlet valve play			o			
18	Check injection nozzles and clean.				o		
19	Check injection pump			o			
20	Check acid level and battery connections	o	o				
21	Check condition of crawler tracks	o	o				

Item	Inspection	Operating hours					
	o = Check, x = Replace	af-ter 100	ev-ery 500	ev-ery 1000	ev-ery 1500	ev-ery 2000	min. 1 x year
22	Check secure fastening of crawler track tumbler, crawler gear unit and hydraulic motor.	o	o				
23	Check smooth running and tightness of bottom and top rollers	o	o				
24	Check bearing bushings and pins/bolts of work equipment and adjust to "no play".	o	o				
25	Check electrical indicating and warning elements as well as lighting equipment.	o	o				
26	Check smooth movement of operating controls and adjust as necessary.	o	o				
27	Check all pipes, hoses, control valves, hydraulic pumps, cylinders, etc. for leaks. **The screw-in couplings must be locked when tightening hose or line connections to prevent rotation.**	o	o				
28	Replace hoses for fuel and cooling water system					o	
29	Check or change the hydraulic oil	o	o		x[2)]		x
30	Replace the hydraulic oil return filter insert.	x	according to the service indicator				x
31	Replace the breathing filter				x		x
32	Check or replace oil in crawler gear unit	x	o		x		x
33	Check secure fastening of swing bearing attachment	o	o				o
34	Check that ring gear attachment screws are securely fastened	o		o			o
35	Lubricate the machine according to overview of lubricating points.	o	o				
36	Check function, condition and completeness of safety equipment	o	o				
37	Check function of brake valves	o	o				
38	Hydraulic function check with function pressure test	o	o				
39	Perform test run and test work	o	o				

Item	Inspection	Operating hours						See
	o = Check, x = Replace	af-ter 100	ev-ery 500	ev-ery 1000	ev-ery 1500	ev-ery 2000	min. 1 x year	
40	Sign inspection card and return to manufacturer	o	o [3]					

[1] at least every 2 years
[2] Extension of oil change intervals according to Terexoil sample analysis and laboratory report. See chapter 6.3.1 "Regular oil analysis", page 45.
[3] within warranty


TEREX®

Inspection plan

O = Checking, maintenance X = Replace Perform work with machine at operating temperature		Operating hours				min. 2 x annually	min. 1 x annually
		after 100	every 500		every 1000		
1	Check whether Operating Manual for the machine is kept in the machine.	O	O				
2	Change engine oil.	X	X			X	
3	Change engine oil filter.	X	X			X	
4	Drain water from the fuel tank.	O	O			O	
5	Change fuel filter.	X	X				X
6	Check air intake.	O	O				
7	Replace air filter main cartridge.	according to the service indicator					X
8	Replace the air filter safety cartridge.	as required [1]					
9	Clean cooling fins of the hydraulic oil cooler. ***Machine damage*** *due to strong accumulation of dust.* • *Shorten the cleaning intervals.*	O	O			O	
10	Clean cooling fins of the water cooler. ***Machine damage*** *due to strong accumulation of dust.* • *Shorten the cleaning intervals.*	O	O			O	
11	Check level of antifreeze in the coolant.						O
12	Change the coolant.	as required [1]					
13	Check V-belt tension.	O	O				
14	Check engine mount and pump attachments.	O	O				
15	Check engine speed adjustment, upper and lower idling speeds.	O	O				
16	Check valve lash on the engine and adjust if necessary.	O			O		O
17	Check injection nozzles.				O		
18	Check injection pump.				O		
19	Check acid level and battery connections.	O	O				
20	Check condition of crawler chains.	O	O				
21	Check secure fastening of crawler-chain sprocket, crawler gear units and hydraulic motor.	O	O				
22	Check smooth running of bottom and top rollers.	O	O				

O = Checking, maintenance X = Replace Perform work with machine at operating temperature		Operating hours after 100	every 500		every 1000	min. 2 x annually	min. 1 x annually
23	Check bearing bushings and pins/bolts of work equipment and adjust until they are without play.	**O**	**O**				
24	Check electrical indicating and warning elements and lighting equipment.	**O**	**O**				
25	Check smooth running of operator controls and adjust if necessary.	**O**	**O**				
26	Check for leaks in all pipes, hoses, control valves, hydraulic pumps, cylinders, etc. ***Attention*** *The screw-in couplings must be locked when tightening hose and line connections to prevent rotation.*	**O**	**O**				
27	Check or change the hydraulic oil.	**O**	**O**		**X** [2]		**X**
28	Replace the hydraulic oil return filter insert.	**X**	**X**				**X**
29	Replace breather.				**X**		**X**
30	Check or replace oil of crawler gear units.	**X**	**O**		**X**		**X**
31	Check secure fastening of swing bearing attachment.	**O**	**O**				**O**
32	Check that the ring gear attachment screws are securely fastened.	**O**	**O**				**O**
33	Grease machine according to overview of lubricating points.	**O**	**O**				
34	Check function, condition and completeness of safety devices.	**O**	**O**				
35	Check function of brake valves.	**O**	**O**				
36	Hydraulic function check with pressure function test.	**O**	**O**				
37	Test run and test work.	**O**	**O**				
38	Initial inspection card and return to manufacturer.	**O**	**O** [3]				

[1] *At least every two years.*

[2] *Extension of the oil change intervals after an oil analysis and laboratory report*

[3] *Within warranty.*

TC 37 from serial no. TC00370100

	Desired value		Actual value		Adjusted		Remarks
Engine, transmission, steering, working							
Engine, high idle running speed min^{-1}	2,300 $^{-50}$						
Engine, low idle running speed min^{-1}	1,000 $^{\pm 25}$						
G-regulator bar	20.0						high idle
Stand-by pressure bar	21.0						high idle
Δp (LS-pressure) bar	15.0						high idle
Pilot pressure / charge pressure bar	28 $^{\pm 1}$						high idle
Main pressure relief valve (SX12) bar	250 $^{+5}$						high idle
Swing right / left Δp between M1-M2 bar	185						Valves at the swing motor
Line relief pressures, hydraulic cylinders	**out**	**In**	**out**	**in**	**out**	**in**	
Boom bar	160	280					
Dipper stick bar	280	280					
Bucket bar	210	210					
Articulation bar	---	---					anti-cavitations
Dozer blade bar	---	---					
Rock breaker, swing bucket, grab rotation bar	210	210					
Travel right bar	250	250					Shock valves at the travel motor
Travel left bar	250	250					Shock valves at the travel motor

Inspection plan

Perform all inspection work at operating temperature of the machine.

Work to be carried out by trained specialist dealer personnel:

Item	Inspection	Operating hours						
	o = Check, x = Replace, y = Contact authorized Yanmar-dealer	after 100	every 500	every 1000	every 1500	every 2000	min. 1 x year	
1	Check machine for presence of machine-specific operating instructions	o	o					
2	Change the engine oil	x	x					
3	Change the engine oil filter	x	x					
4	Drain water from the fuel tank	o	o					
5	Drain and clean fuel pre-cleaner	o	o					
6	Replace the fuel filter		x					
7	Check the air intake	o	o					
8	Replace main air filter cartridge	according to service indicator					x	
9	Replace the air filter safety cartridge.	as required [1)]						
10	Clean cooling fins on hydraulic oil cooler **In case of visible dust, shorten the cleaning intervals.**	o	o					
11	Clean cooling fins on water cooler **In case of visible dust, shorten the cleaning intervals.**	o	o					
12	Check antifreeze level in coolant						o	
13	Change coolant			x			x	
14	Check and adjust V-belt tension	o	o					
15	Check engine mount and pump attachment	o	o					
16	Check engine speed setting, upper and lower idle speeds.	o	o					
17	Adjust intlet- and outlet valve			o				
18	Lap intlet- and outlet valve					y		
19	Check and clean injection nozzles				o			
20	Check injection pump			o				
21	Check crankcase venting system				o			

Item	Inspection	Operating hours						See
	o = Check, x = Replace, y = Contact authorized Yanmar-dealer	after 100	every 500	every 1000	every 1500	every 2000	min. 1 x year	
22	Check acid level and battery connections	o	o					
23	Check condition of crawler tracks	o	o					
24	Check secure fastening of crawler track tumbler, crawler gear unit and hydraulic motor.	o	o					
25	Check smooth running of bottom and top rollers	o	o					
26	Check bearing bushings and pins/ bolts of work equipment and adjust to "no play".	o	o					
27	Check electrical indicating and warning elements as well as lighting equipment.	o	o					
28	Check smooth movement of operating controls and adjust as necessary.	o	o					
29	Check all pipes, hoses, control valves, hydraulic pumps, cylinders, etc. for leaks. **The screw-in couplings must be locked when tightening hose or line connections to prevent rotation.**	o	o					
30	Replace hoses of fuel- and cooling system					o		
31	Check or change the hydraulic oil	o	o		x[2)]		x	
32	Replace the hydraulic oil return filter insert.	x	according to service indicator				x	
33	Replace the breathing filter				x		x	
34	Check or replace oil in crawler gear unit	x	o		x		x	
35	Check secure fastening of swing bearing attachment	o	o				o	
36	Check that ring gear attachment screws are securely fastened[1]	o		o			o	
37	Lubricate the machine according to overview of lubricating points.	o	o					
38	Check function, condition and completeness of safety equipment	o	o					

Item	Inspection	Operating hours						
	o = Check, x = Replace, y = Contact authorized Yanmar-dealer	after 100	every 500	every 1000	every 1500	every 2000	min. 1 x year	
39	Check function of brake valves	o	o					
40	Hydraulic function check with function pressure test	o	o					
41	Perform test run and test work	o	o					
42	Sign inspection card and return to manufacturer	o	o [3)]					

[1)]at least every 2 years
[2)]Extension of oil change intervals according to Terexoil sample analysis and laboratory report.

[3)]Within warranty.

TC50 from serial no. TC00500100

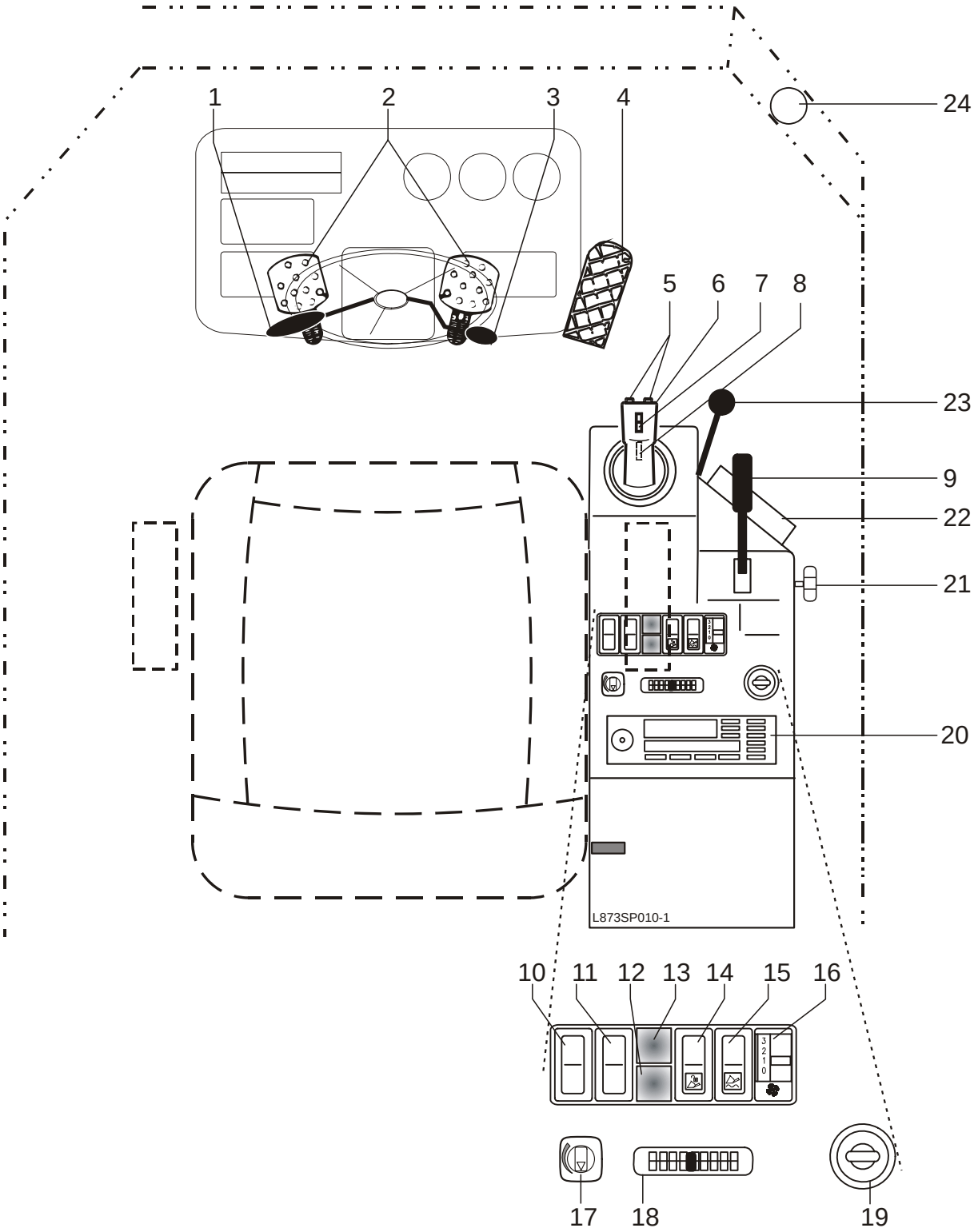
	Desired value		Actual value		Adjusted		Remarks
Engine, transmission, steering, working							
Engine, high idle running speed min^{-1}	2,400 $^{\pm 25}$						
Engine, low idle running speed min^{-1}	950 $^{+50}$						
Stand-by pressure bar	27.0						high idle
Δp (LS-pressure) bar	19.0						high idle
Pilot pressure / charge pressure bar	28 $^{\pm 1}$						high idle
Main pressure relief valve (SX12) bar	250 $^{+5}$						high idle
Swing right / left Δp between M1-M2 bar	205 $^{+5}$						Valves at the swing motor
Line relief pressures, hydraulic cylinders	**out**	**In**	**out**	**in**	**out**	**in**	
Boom bar	160	280					
Dipper stick bar	280	280					
Bucket bar	280	280					
Articulation bar	---	---					anti-cavitations
Dozer blade bar	---	---					
Rock breaker, swing bucket, grab rotation bar	210	210					
Travel right bar	--	--					Shock valves at the travel motor
Travel left bar	--	--					Shock valves at the travel motor

SUBGROUP LIST

Operation

SKL 200 (SKL873)	**9.13**
TL 65 (SKL 824)	**9.22**
TL 80 (SKL 834)	**9.24**
TL 80AS	**9.25**
TL 100 (SKL 844)	**9.26**
TL 120 (SKL 854)	**9.27**
TL 160 (SKL 160)	**9.28**
TL 210	**9.29**
TL 260 (SKL 260)	**9.30**
TL 420	**9.33**
TL 450	**9.35**
TL 70 (SKS 634)	**9.37**
TW 70 (HML 23)	**9.49.50**
TW 85 (HML 32)	**9.51**
TW 110 (HML 42)	**9.53**
TC 60 (HR 20)	**9.60**
TC 75 (HR 32)	**9.65**
TC 125 (HR 42)	**9.67**
TC 29 (HR 14)	**9.76**
TC 35 (HR 16)	**9.78**
TC 48 (HR 18)	**9.80**
TC 15 (HR 1.5)	**9.90**
TC 16 (HR 1.6)	**9.91**
TC 20 (HR 2.0)	**9.92**
TC 25	**9.93**
TC 37 (HR 3.7)	**9.97**
TC 50	**9.99**

Operator controls and display elements



1 Direction indicator — horn — low/high beam (steering column mounted switch)

2 Dual brake inching pedal

3 Tilt adjustment of steering wheel

4 Accelerator pedal

5 Actuation of additional control circuit

6 Joystick (control lever) — loader installation

7 Direction-of-travel pre-selection (without function if working hydraulics are switched off)

8 Impulse mode — float position

9 Parking brake

10 not assigned *

11 not assigned *

12 Red — Engine monitoring indicator lamp

13 Yellow — Engine monitoring indicator lamp

14 OFF switch for actuation of additional control circuit (Pos. 8)

15 Pre-selection switch for float position - OFF/Impulse-/Continuous operation

16 Fan switch

17 Option — Air conditioning

18 Heater control

19 Glow plug and starter switch

20 Option — Radio

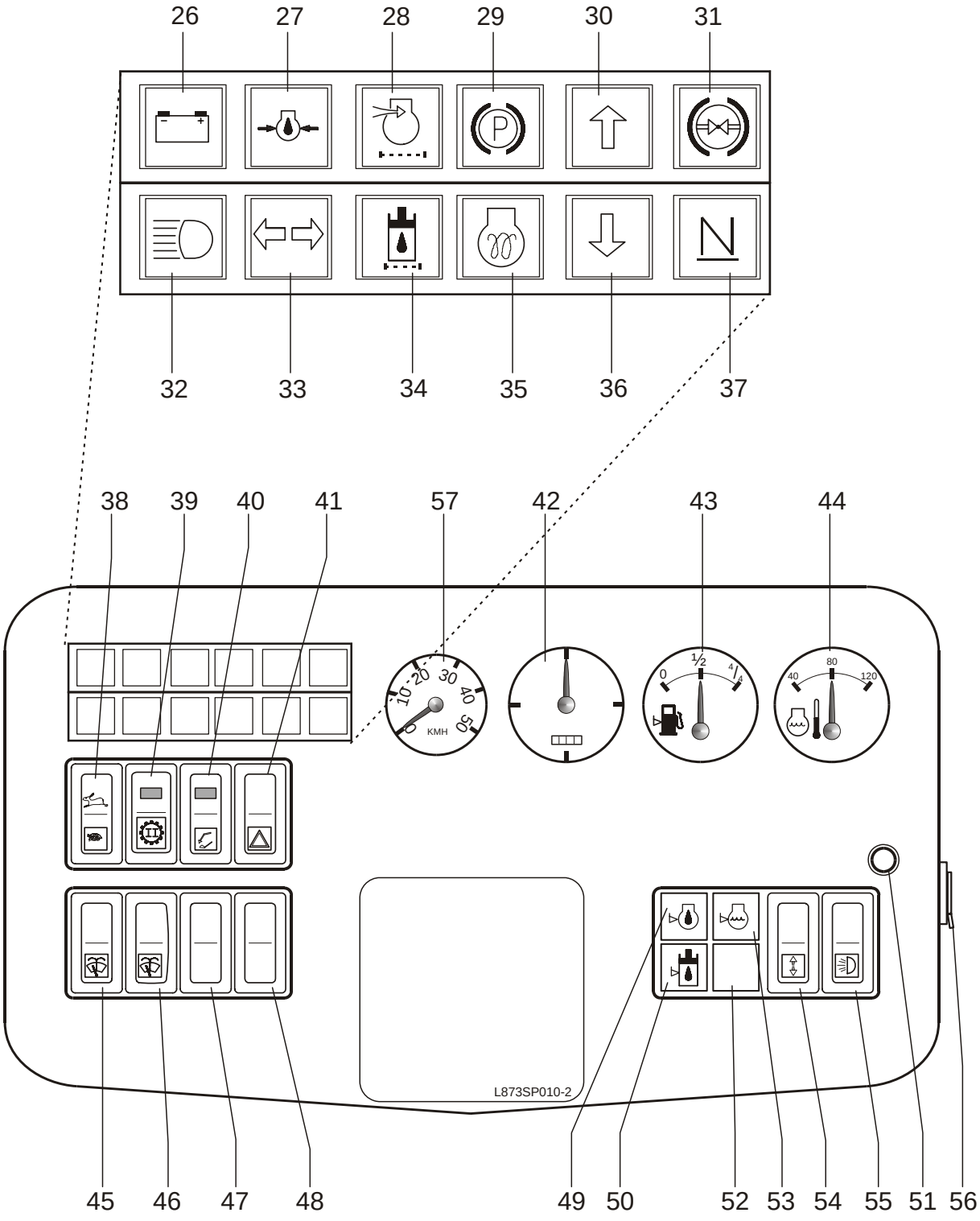
21 Fan: fresh air/ re-circulating air

22 Fuse and relay holder

23 Option — 4th control circuit

24 Washer fluid storage tank

* for functions such as bucket return, load vibration-damping, etc.


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26 Red — Battery charge indicator
27 Red — Engine oil pressure indicator lamp
28 Red — Air filter clogging indicator
29 Red — Parking brake indicator lamp
30 Green — Travel, forward
31 Red — Brake accumulator pressure indicator lamp
32 Blue — High beam
33 Green — Direction indicator
34 Red — Hydraulic oil return filter clogging indicator
35 Yellow — Pre-heat indicator
36 Green — Travel in reverse
37 Red — Manual transmission indicator lamp



*If the **manual transmission indicator lamp** lights up, it is in an intermediate position. **The machine is not ready for operation!** This can be remedied by brief steering movements to be performed until the transmission engages.*

38 Travel speed switch FAST/SLOW
39 Change-over switch with stop - mechanical driving position



Only press the button when machine is at standstill!

40 Multi-function switch with lock for work equipment cut-off and change-over of direction-of-travel pre-selection switches from Pos. 07 to Pos. 46



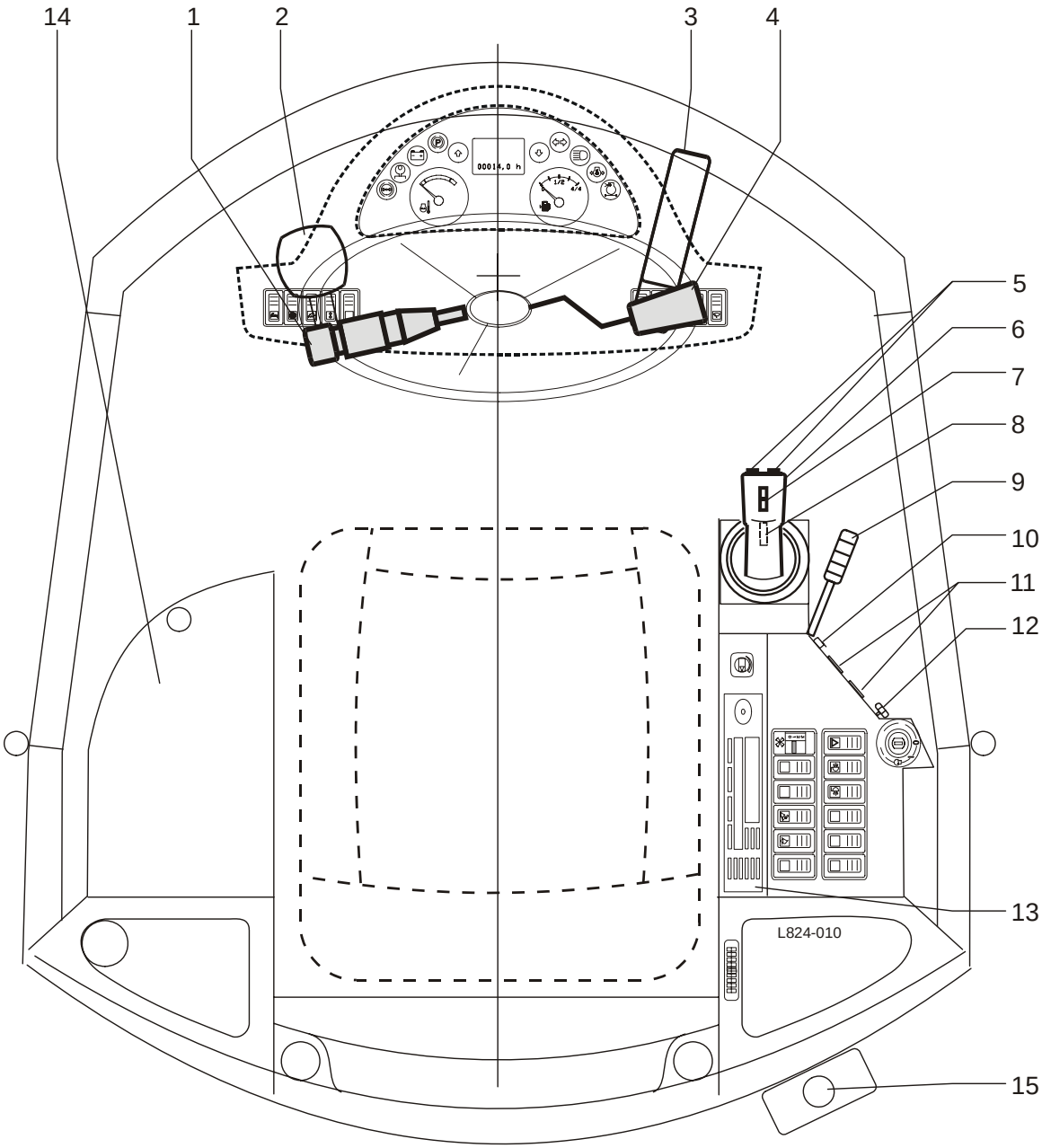
Only press the button when machine is at standstill!

41 Hazard warning switch
42 Operating hour meter
43 Fuel gauge
44 Coolant temperature indicator
45 Switch for windshield wiper, front, Wash-wipe function
46 Switch for windshield wiper, rear, Wash-wipe function
47 not assigned *
48 not assigned *
49 Red — Filling level indicator for engine oil
50 Red — Filling level indicator for hydraulic oil
51 Check button
52 not assigned
53 Red — Coolant level indicator
54 Direction-of-travel pre-selection — Function only activated when working hydraulics are switched off
55 Light switch
56 Socket
57 Speedometer (only high-speed version)

* e.g. for accessories such as rotating beacon, additional floodlight(s), etc.

Operator controls and display elements

The following list includes non-standard equipment !



1 Direction indicator — horn — low/high beam (steering column mounted switch)

2 Brake inching pedal

3 Accelerator pedal

4 Tilt adjustment of steering wheel (option: height adjustment)

5 Actuation of additional control circuit

6 Control lever — loader installation

7 Direction-of-travel pre-selection (without function if working hydraulics are disabled)

8 Impulse mode — float position

9 Parking brake

10 Socket

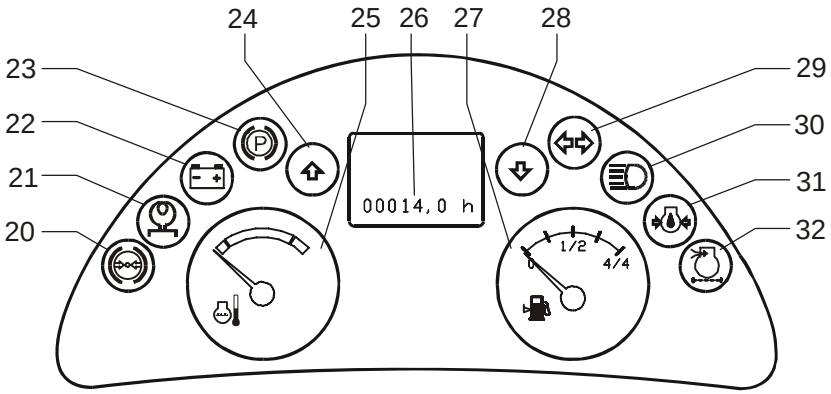
11 Fuse carrier

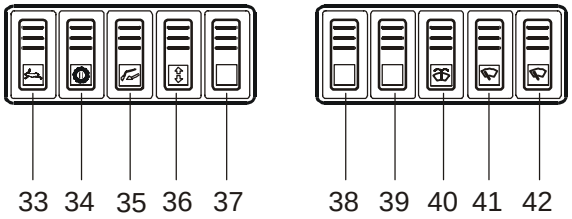
12 Fan: fresh air/ re-circulating air

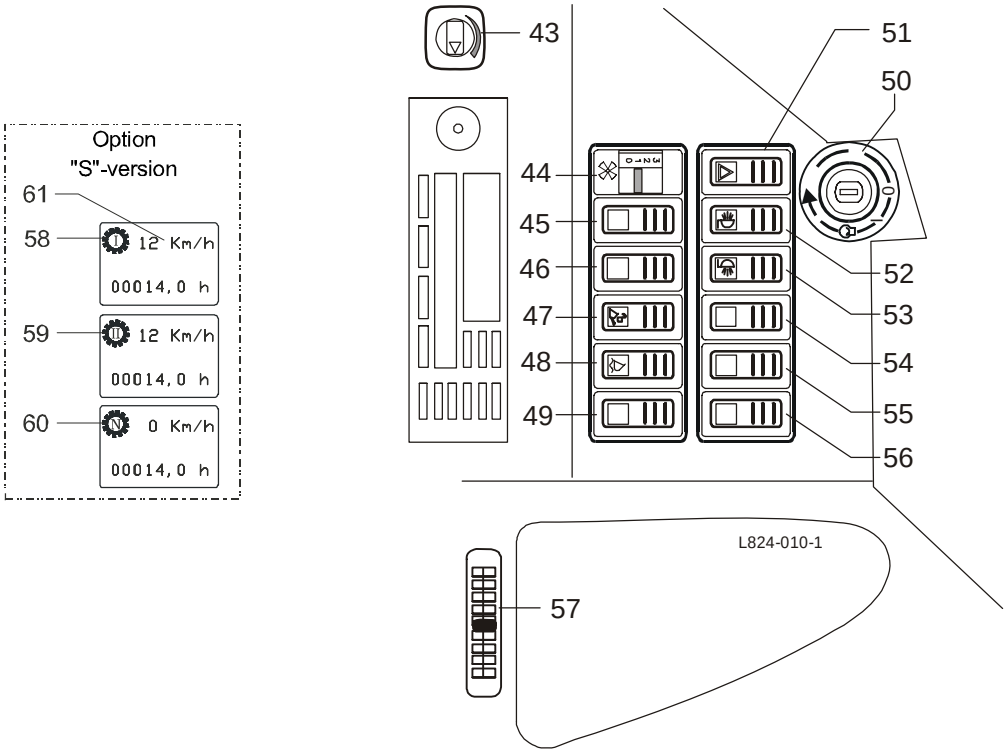
13 Radio

14 Control rod for mechanical quick-attach system

15 Washer tank


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Option
"S"-version
61
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12 Km/h
00014,0 h
59
12 Km/h
00014,0 h
60
0 Km/h
00014,0 h
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L824-010-1

20 not assigned *
21 YELLOW — pre-heating monitor
22 RED — battery charge indicator
23 RED — parking brake
24 GREEN — travel direction, forward
25 Coolant temperature
26 Operating hour meter
27 Fuel gauge
28 GREEN — travel direction, reverse
29 GREEN — direction indicator
30 BLUE — high beam
31 RED — engine oil pressure
32 YELLOW — air filter indicator
33 Travel speed — fast/slow
34 Change-over switch for high gear



Only press when machine is at standstill!

35 Multi-function switch with lock for work equipment cut-off and change-over of the direction-of-travel pre-selection switches from pos. 07 to pos. 36



Only press when machine is at standstill!

36 Pre-selection of travel direction — Function only active if working hydraulics are disabled
37 not assigned *
38 not assigned *
39 not assigned *
40 Windshield wash function front/rear
41 Windshield wiper, front
42 Windshield wiper, rear
43 Switch for air conditioning and temperature control
44 Fan switch – heater
45 not assigned *
46 not assigned *
47 Pre-selection switch for actuation of additional control circuit (Pos. 5)
48 Pre-selection switch for float position — OFF/Impulse/Continuous mode
49 not assigned *
50 Pre-heat/starter switch
51 Hazard warning switch
52 Working floodlight, front
53 Working floodlight, rear
54 not assigned *
55 not assigned *
56 not assigned *
57 Heater control
58 Monitor — transmission indicator range I
59 Monitor — transmission indicator range II
60 Monitor — transmission indicator range — disabled

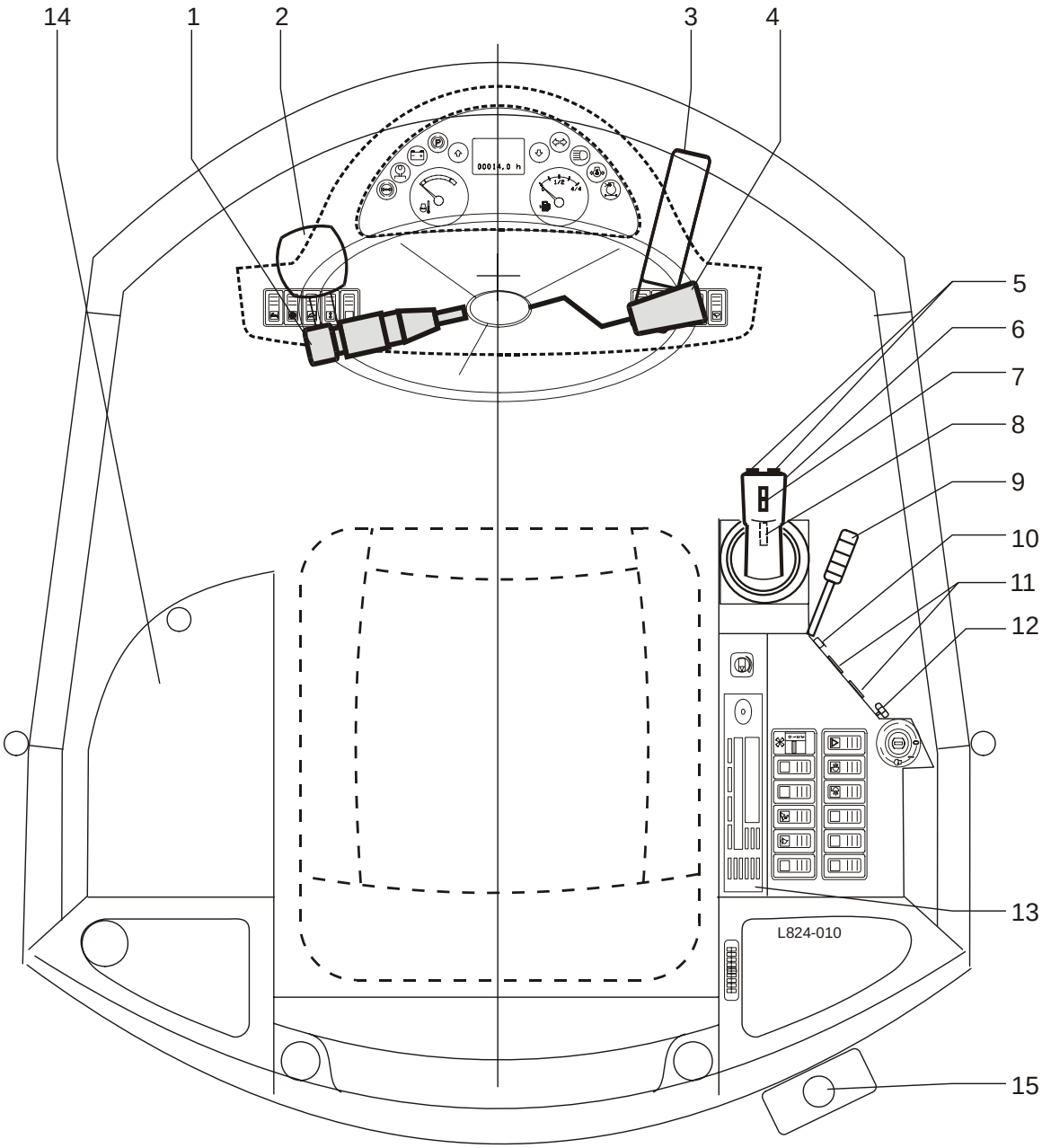


If this symbol comes up, the transmission is in an intermediate position. ***The machine is not ready to start!*** *This can be remedied by performing brief steering movements until the transmission engages.*

61 Speed indicator

Operator controls and display elements

The following list includes non-standard equipment !



1 Direction indicator — horn — low/high beam (steering column mounted switch)

2 Brake inching pedal

3 Accelerator pedal

4 Tilt adjustment of steering wheel (option: height adjustment)

5 Actuation of additional control circuit

6 Control lever — loader installation

7 Direction-of-travel pre-selection (without function if working hydraulics are disabled)

8 Impulse mode — float position

9 Parking brake

10 Socket

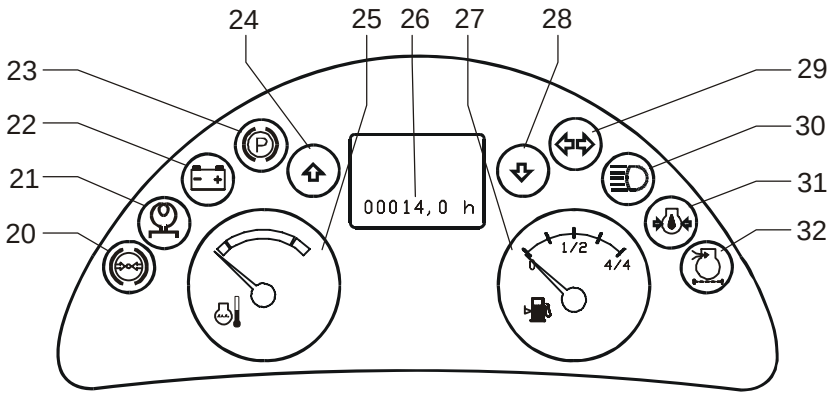
11 Fuse carrier

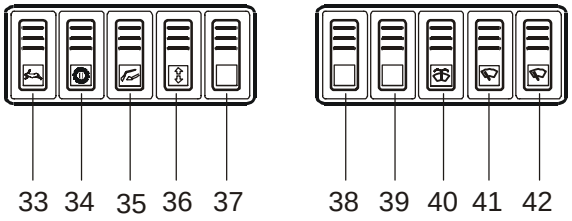
12 Fan: fresh air/ re-circulating air

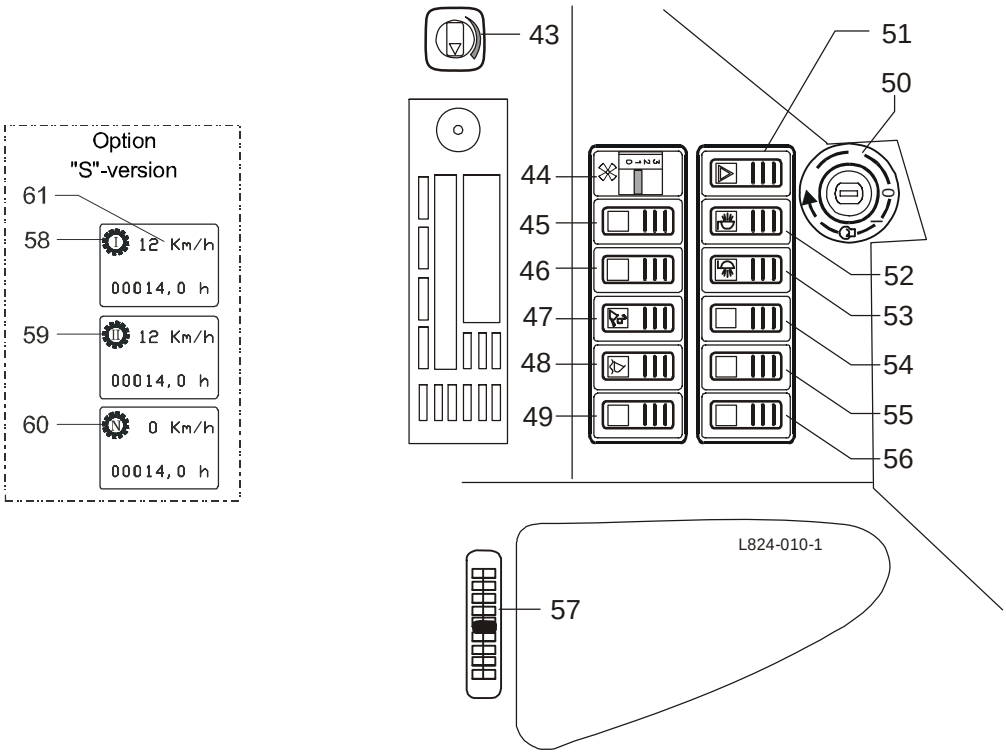
13 Radio

14 Control rod for mechanical quick-attach system

15 Washer tank


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1/2
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Option
"S"-version
61
58
12 Km/h
00014,0 h
59
12 Km/h
00014,0 h
60
0 Km/h
00014,0 h
43
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L824-010-1

20 not assigned *
21 YELLOW — pre-heating monitor
22 RED — battery charge indicator
23 RED — parking brake
24 GREEN — travel direction, forward
25 Coolant temperature
26 Operating hour meter
27 Fuel gauge
28 GREEN — travel direction, reverse
29 GREEN — direction indicator
30 BLUE — high beam
31 RED — engine oil pressure
32 YELLOW — air filter indicator
33 Travel speed — fast/slow
34 Change-over switch for high gear



Only press when machine is at standstill!

35 Multi-function switch with lock for work equipment cut-off and change-over of the direction-of-travel pre-selection switches from pos. 07 to pos. 36



Only press when machine is at standstill!

36 Pre-selection of travel direction — Function only active if working hydraulics are disabled
37 not assigned *
38 not assigned *
39 not assigned *
40 Windshield wash function front/rear
41 Windshield wiper, front
42 Windshield wiper, rear
43 Switch for air conditioning and temperature control
44 Fan switch – heater
45 not assigned *
46 not assigned *
47 Pre-selection switch for actuation of additional control circuit (Pos. 5)
48 Pre-selection switch for float position — OFF/Impulse/Continuous mode
49 not assigned *
50 Pre-heat/starter switch
51 Hazard warning switch
52 Working floodlight, front
53 Working floodlight, rear
54 not assigned *
55 not assigned *
56 not assigned *
57 Heater control
58 Monitor — transmission indicator range I
59 Monitor — transmission indicator range II
60 Monitor — transmission indicator range — disabled



If this symbol comes up, the transmission is in an intermediate position. ***The machine is not ready to start!*** *This can be remedied by performing brief steering movements until the transmission engages.*

61 Speed indicator

Note
The following list includes non-standard equipment!

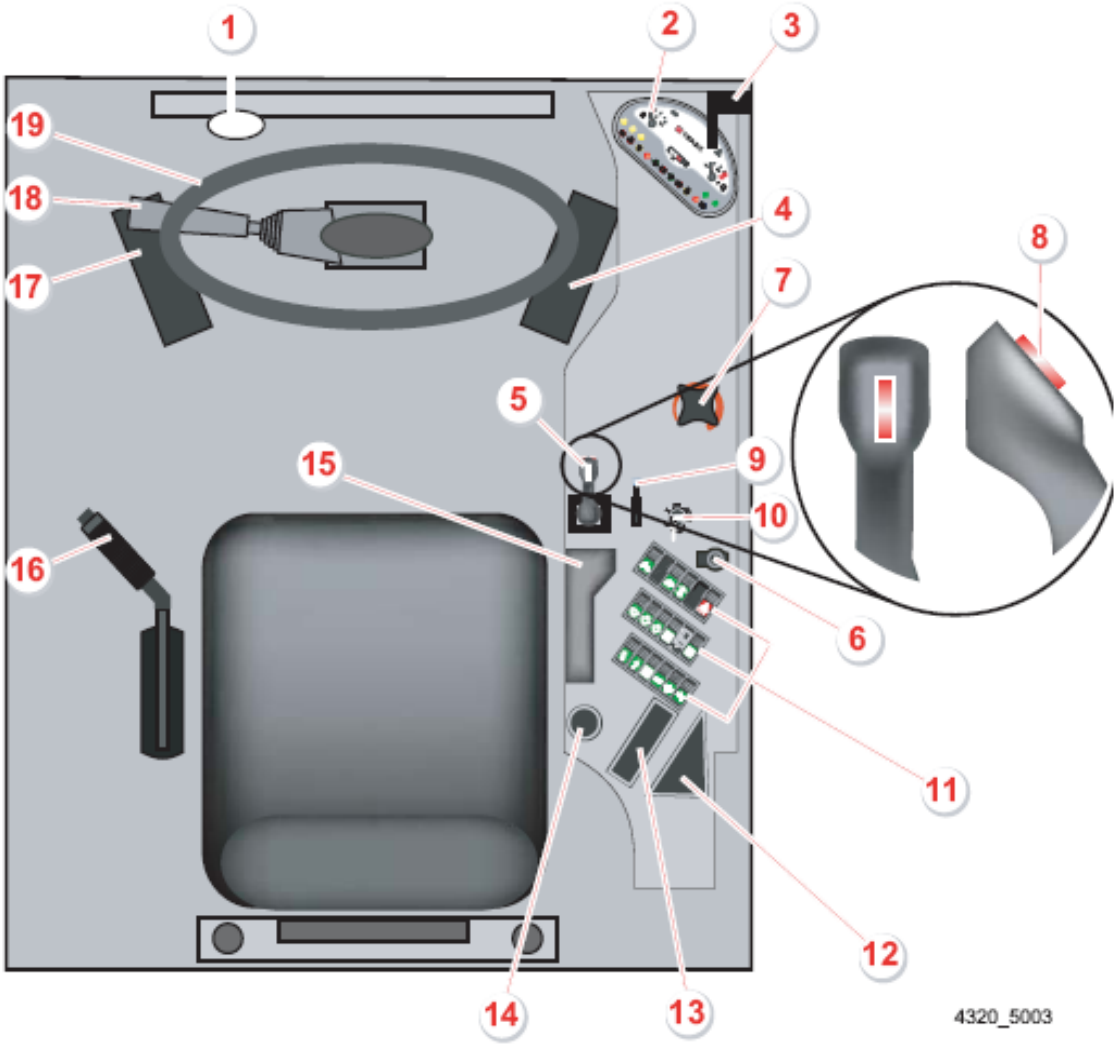
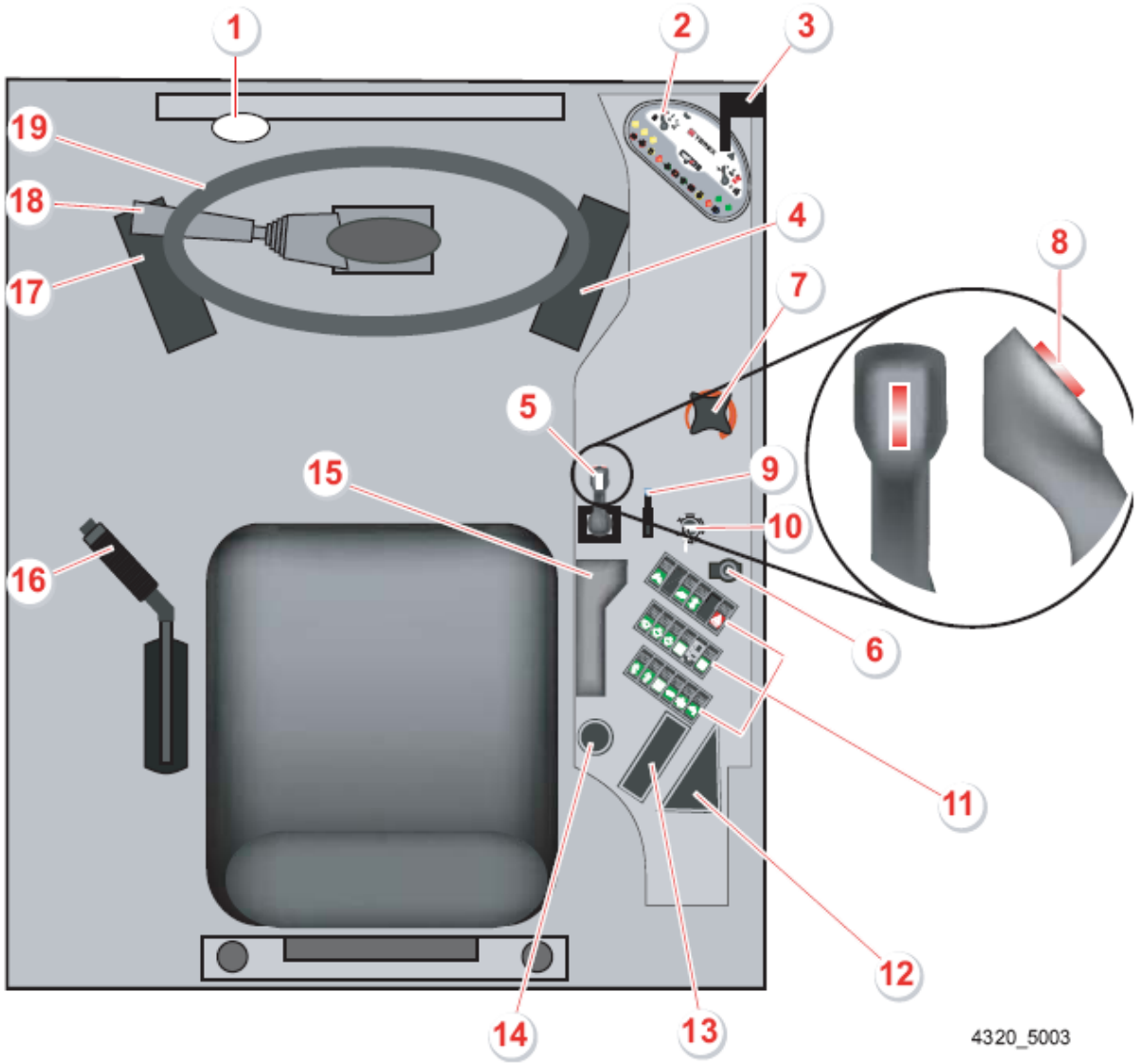


Fig. 5-3 Operating controls

1 Tank for windshield washer
2 Instrument cluster
3 Window lock
4 Accelerator pedal
5 Control lever - loading equipment
6 Power socket
7 Heat regulator
8 Preselection of travel direction (function only active if working hydraulics are activated)
9 Operation of additional control circuit
10 Pre-heat starting switch



11 Lateral control console
12 Storage rack
13 Radio compartment
14 Drink holder
15 Armrest
16 Parking brake
17 Brake-inching pedal
18 Lighting, direction indicator, horn and low-high beam (steering-column switch)
19 Steering wheel

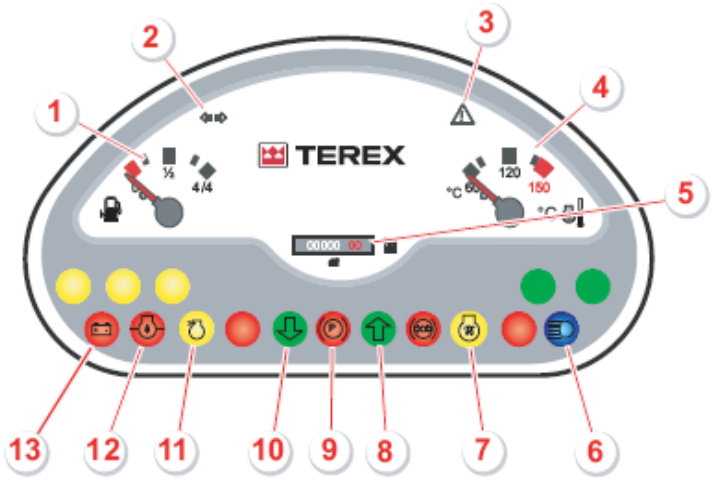


Fig. 5-4 Front control console

1 Fuel gauge
2 Direction indicator
3 Error indicator
4 Engine oil temperature display
5 Operating hour meter
6 High beam
7 Preheating
8 Preselection of travel direction (function only active if working hydraulics are disabled)
9 Parking brake
10 Preselection of travel direction reverse (function only active if working hydraulics are disabled)
11 Air filter indicator
12 Engine oil pressure
13 Charge control lamp

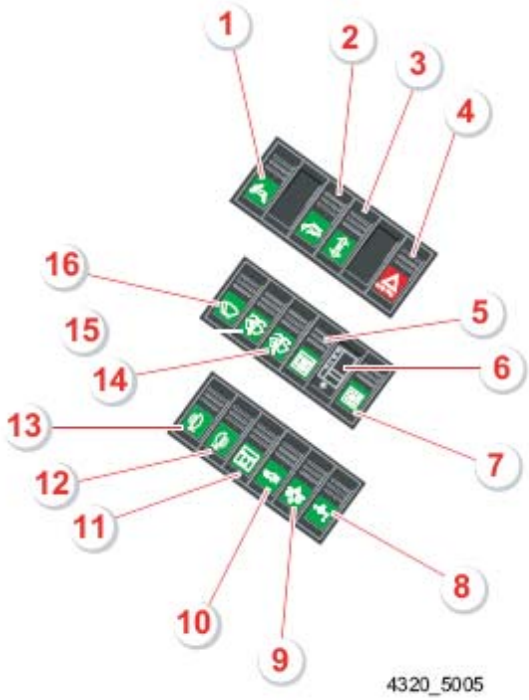
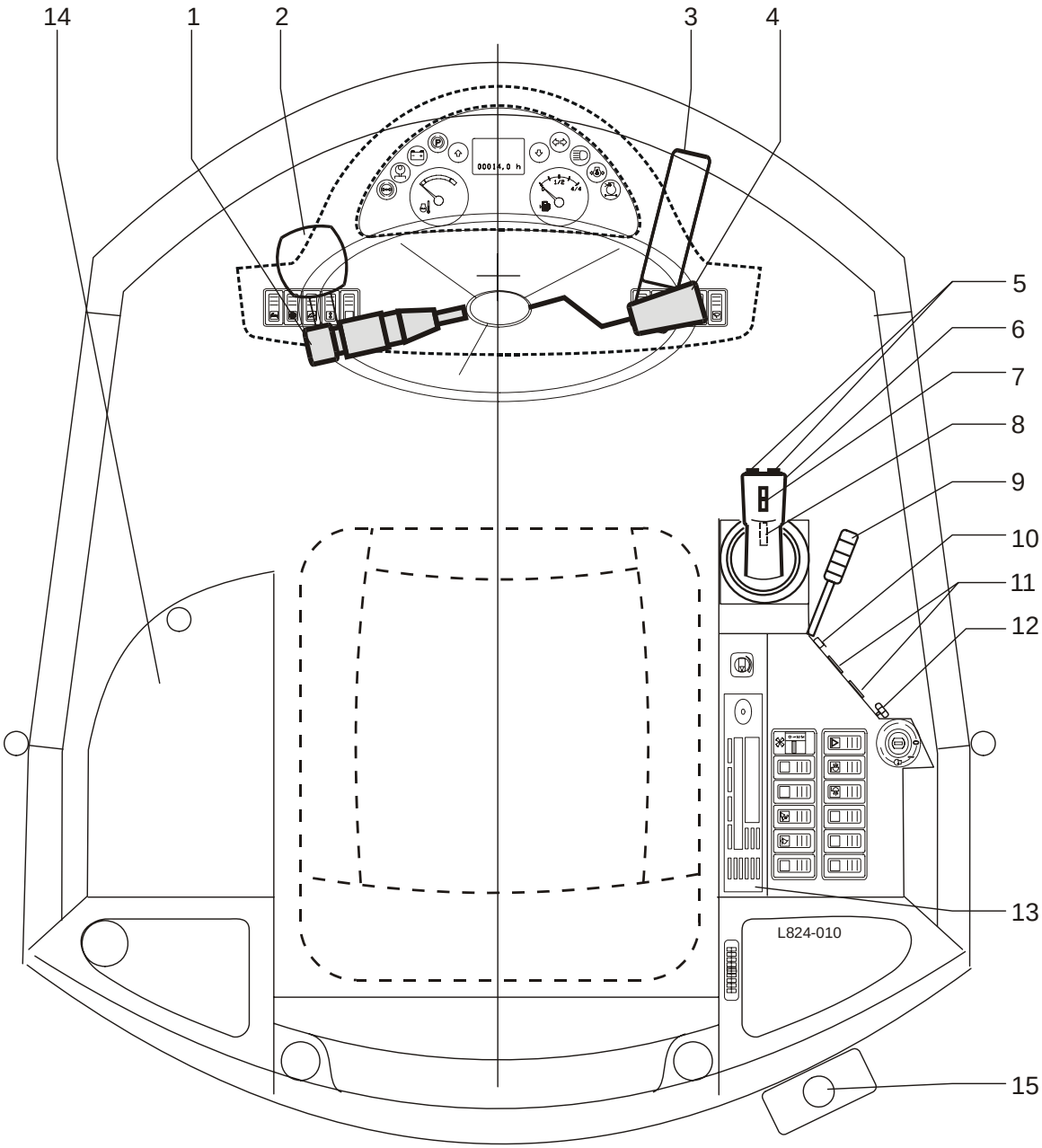


Fig. 5-5 Lateral control console

1 High gear/working gear
2 Multi-function switch working, lock charging valve
3 Travel direction preselection (FWD/REV)
4 Hazard warning switch
5 Heating of rear windshield
6 Heater fan
7 Air-conditioning (option)
8 Front attachments (option)
9 Ride control system (option)
10 Back-up alarm (option)
11 Rotating beacon (optional)
12 Working floodlight, rear (optional)
13 Working floodlight, front (optional)
14 Windshield wiper, rear
15 Wash pump front/rear windshield
16 Windshield wiper, front

Operator controls and display elements

The following list includes non-standard equipment !



1 Direction indicator — horn — low/high beam (steering column mounted switch)

2 Brake inching pedal

3 Accelerator pedal

4 Tilt adjustment of steering wheel (option: height adjustment)

5 Actuation of additional control circuit

6 Control lever — loader installation

7 Direction-of-travel pre-selection (without function if working hydraulics are disabled)

8 Impulse mode — float position

9 Parking brake

10 Socket

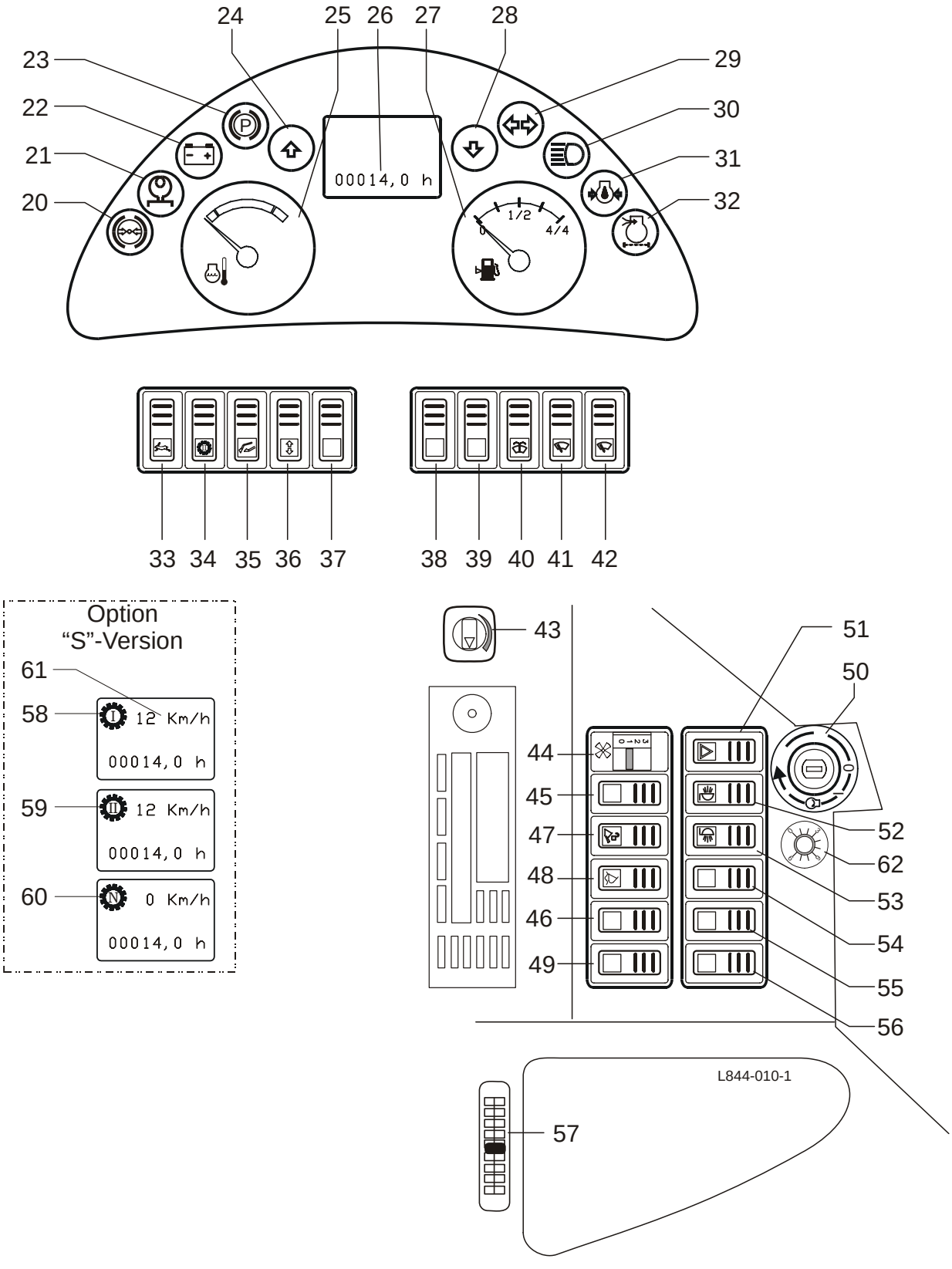
11 Fuse carrier

12 Fan: fresh air/ re-circulating air

13 Radio

14 Control rod for mechanical quick-attach system

15 Washer tank



Instrument panel

20 not assigned *

21 YELLOW — pre-heating monitor

22 RED — battery charge indicator

23 RED — parking brake

24 GREEN — travel direction, forward

25 Coolant temperature

26 Operating hour meter

27 Fuel gauge

28 GREEN — travel direction, reverse

29 GREEN — direction indicator

30 BLUE — high beam

31 RED — engine oil pressure

32 YELLOW — air filter indicator

33 Travel speed — fast/slow

34 Change-over switch for high gear



Only press when machine is at standstill!

35 Multi-function switch with lock for work equipment cut-off and change-over of the direction-of-travel pre-selection switches from pos. 07 to pos. 36



Only press when machine is at standstill!

36 Pre-selection of travel direction — Function only active if working hydraulics are disabled

37 not assigned *

38 not assigned *

39 not assigned *

40 Windshield wash function front/rear

41 Windshield wiper, front

42 Windshield wiper, rear

43 Switch for air conditioning and temperature control

44 Fan switch – heater

45 not assigned *

46 not assigned *

47 Pre-selection switch for actuation of additional control circuit (Pos. 5)

48 Pre-selection switch for float position — OFF/Impulse/Continuous mode

49 not assigned *

50 Pre-heat/starter switch

51 Hazard warning switch

52 Working floodlight, front

53 Working floodlight, rear

54 not assigned *

55 not assigned *

56 Option — 4th control circuit

57 Heater control

58 Monitor — transmission indicator range I

59 Monitor — transmission indicator range II

60 Monitor — transmission indicator range — disabled



If this symbol comes up, the transmission is in an intermediate position. ***The machine is not ready to start!*** *This can be remedied by performing brief steering movements until the transmission engages.*

61 Speed indicator

62 Option — Flow setting for 4th control circuit, e.g. sweeper rotating speed

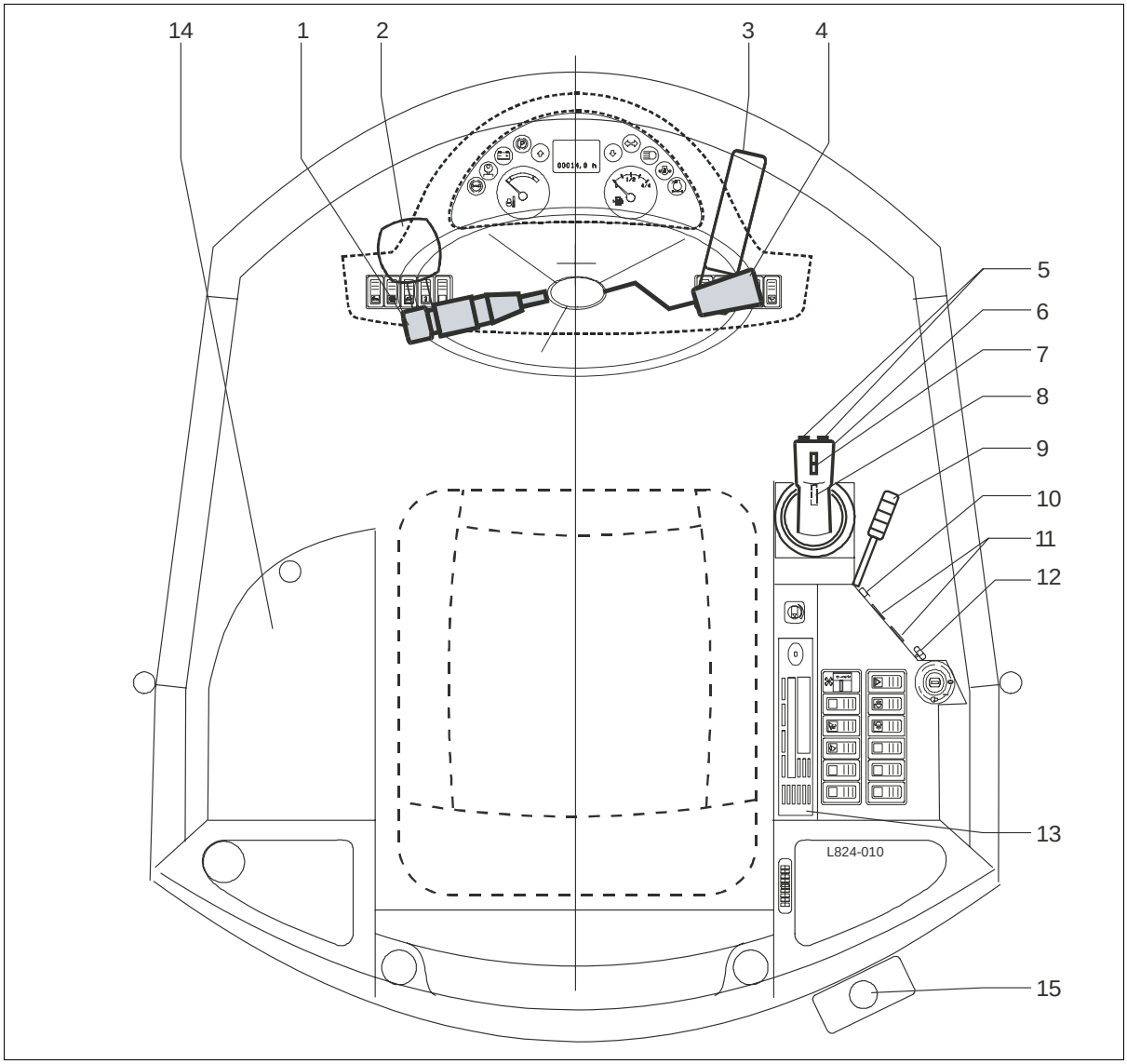
* for non-standard equipment

Operator controls and display elements

The following list includes non-standard equipment !

Attention

The following list includes non-standard equipment!



1 *Direction indicator, horn, low/-high beam (steering-column switch)*

2 *Brake-inching pedal*

3 *Accelerator pedal*

4 *Tilt adjustment of steering wheel (option: height adjustment)*

5 *Operation - additional control circuit*

6 *Control lever - loader installation*

7 *Travel direction preselection (without function if working hydraulics are disabled)*

8 *Impulse mode - float position*

9 *Parking brake*

10 *Power socket*

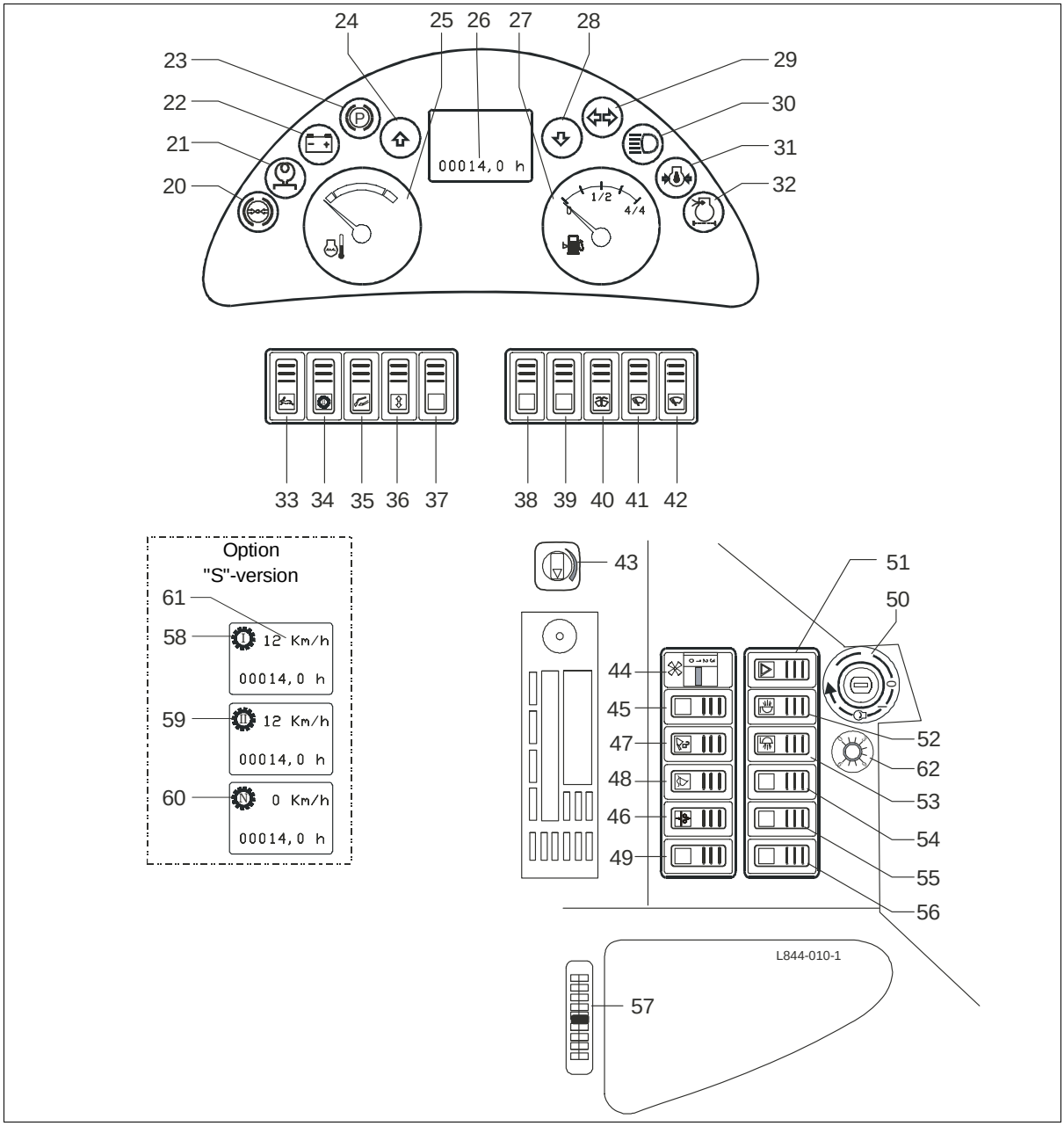
11 *Fuse carrier*

12 *Fresh air - recirculating air*

13 *Radio*

14 *Control rod for mechanical quick-attach device*

15 *Washer fluid tank*



Instrument panel

20 *Not assigned*

21 *ORANGE - pre-heating monitor*

22 *RED - battery charge indicator*

23 *RED - parking brake*

24 *GREEN - travel direction, forward*

25 *Coolant temperature*

26 *Operating hour meter*

27 *Fuel-level indicator*

28 *GREEN - travel direction, reverse*

29 *GREEN - direction indicator*

30 *BLUE - high beam*

31 *RED - engine oil pressure*

32 *RED - air filter indicator*

33 *Travel speed - FAST - SLOW*

34 *High-gear changeover switch*

Attention

Only press if machine is at standstill!

35 *Multi-function switch with lock for work equipment cut-off and change-over of the direction-of-travel preselection switches from Pos. 7 auf Pos. 36*

Machine damage

due to incorrect operation.

Only press if machine is at standstill!

36 *Preselection of travel direction - Function only active if working hydraulics are disabled*

37 *Not assigned**

38 *Not assigned**

39 *Not assigned**

40 *Windshield washer function front/rear*

41 *Windshield wiper, front*

42 *Windshield wiper, rear*

43 *Switch for air-conditioning and temperature control*

44 *Fan switch - heating*

45 *Not assigned**

46 *Option - Preselection switch - Ride Control System*

47 *Preselection switch - operation of additional control circuit (Pos. 5)*

48 *Preselection switch - float position - OFF/Impulse/Continuous operation*

49 *Not assigned**

50 *Glow plug and starter switch*

51 *Hazard warning switch*

52 *Working floodlight, front*

53 *Working floodlight, rear*

54 *Not assigned**

55 *Not assigned**

56 *Option - 4th control circuit*

57 *Heater control*

58 *Monitor - indicator "manual transmission range I"*

59 *Monitor - indicator "manual transmission range II"*

60 *Monitor - indicator "manual transmission not ready for operation"*

Attention

If this symbol comes up, the manual transmission is in an intermediate position. The machine is not ready for operation! This can be remedied by performing brief steering movements until the manual transmission engages.

61 *Speed indicator*

62 *Option - flow setting for 4th control circuit, e.g. rotating speed of sweeper*

* for non-standard equipment

Operator controls and display elements

The following list includes non-standard equipment !

Attention

The following list includes non-standard equipment!

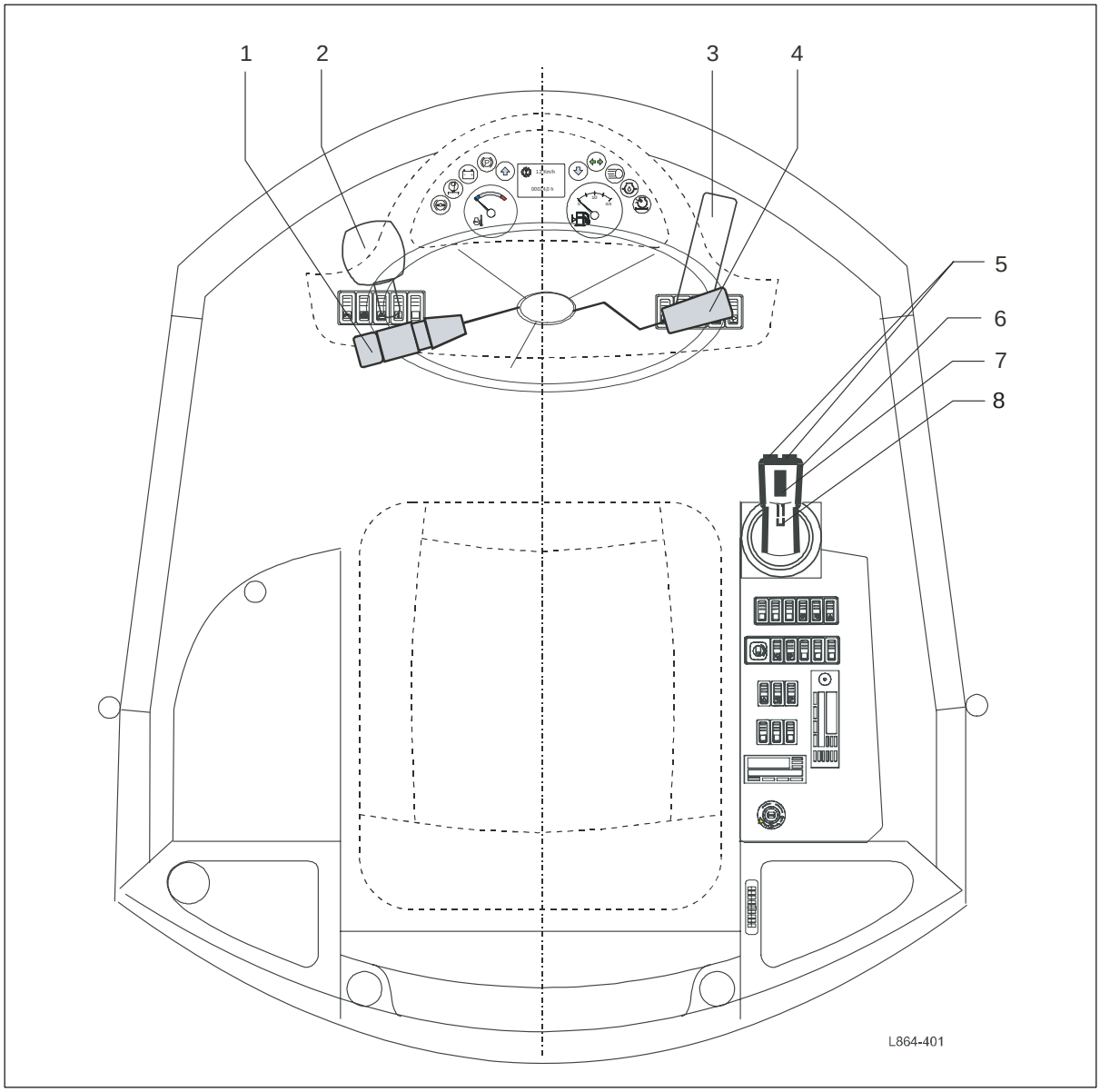


Fig. 8 Operator controls

1 *Direction indicator, horn, low-high beam (steering-column switch)*

2 *Brake-inching pedal*

3 *Accelerator pedal*

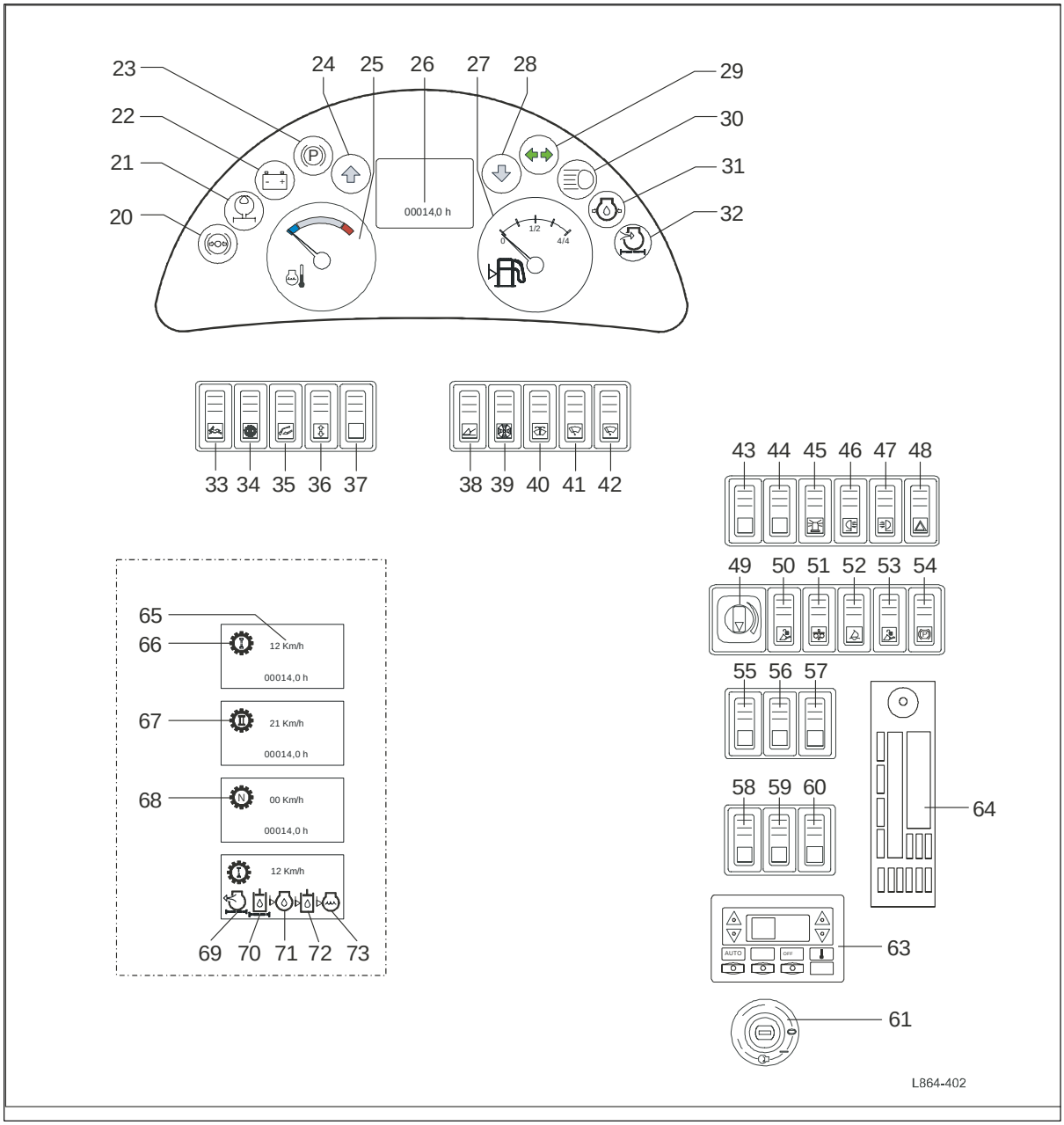
4 *Tilt adjustment of steering wheel (option: height adjustment)*

5 *Operation – additional control circuit (left OFF, right ON)*

6 *Control lever - loader installation*

7 *Travel direction preselection (without function if working hydraulics are disabled)*

8 *Impulse mode - float position*


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43 44 45 46 47 48
49 50 51 52 53 54
55 56 57
58 59 60
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66
12 Km/h
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67
21 Km/h
00014,0 h
68
00 Km/h
00014,0 h
12 Km/h
69 70 71 72 73
AUTO
OFF
L864-402

20 *Brake accumulator pressure*

21 *ORANGE - pre-heating monitor*

22 *RED - battery charge indicator*

23 *RED - parking brake*

24 *GREEN - travel direction, forward*

25 *Coolant temperature*

26 *Operating hour meter*

27 *Fuel-level indicator*

28 *GREEN - travel direction, reverse*

29 *GREEN - direction indicator*

30 *BLUE - high beam*

31 *RED - engine oil pressure*

32 *RED - air filter indicator*

33 *Travel speed - FAST - SLOW*

34 *High-gear changeover switch*

Attention

Transmission only shifts at a speed of below 0.5 km/h!

35 *Multi-function switch with lock for work equipment cut-off and change-over of the direction-of-travel preselection switches from Pos. 7 to Pos. 36*

Machine damage

due to incorrect operation.

Only press if machine is at standstill!

36 *Preselection of travel direction - Function only active if working hydraulics are disabled*

37 *Not assigned**

38 *Option – bucket return positioner*

39 *Engine cooler reversing fan changeover switch*

40 *Windshield washer function front/rear*

41 *Windshield wiper, front*

42 *Windshield wiper, rear*

43 *Option – rear fog lamp*

44 *Option – back-up warning lamp*

45 *Option – rotating beacon*

46 *Working floodlight, rear*

47 *Working floodlight, front*

48 *Hazard warning switch*

49 *Flow rate adjustment for 3rd control circuit*

50 *Option – preselection switch for 4th control circuit OFF/Impulse/Continuous operation*

51 *Option – ride control system*

52 *Preselection switch - float position - OFF/Impulse/Continuous operation*

53 *Preselection switch for 3rd control circuit OFF/Impulse/Continuous operation*

54 *Parking brake preselection switch ON/OFF, ON = locked*

55 *Not assigned**

56 *Not assigned**

57 *Not assigned**

58 *Option – mirror heating*

59 *Option – pressurized cabin*

60 *Option – central lubrication*

61 *Glow plug and starter switch*

62 *Not assigned**

63 *Control unit heating / Klimatronic*

64 *Option - radio*

65 *Speed indicator*

66 *Monitor - indicator "manual transmission range I"*

67 *Monitor - indicator "manual transmission, range II" (optional for high-speed version)*

68 *Monitor - indicator "manual transmission not ready for operation"*

Attention

If this symbol comes up, the manual transmission is in an intermediate position. The machine is not ready for driving! This can be remedied by performing brief steering movements until the manual transmission engages.

69 *Option – soot filter clogging indicator*

70 *Hydraulic oil filter clogging indicator*

71 *Engine oil level*

72 *Hydraulic oil level*

73 *Coolant Level*

* for non-standard equipment

Note
The following lists include non-standard equipment!

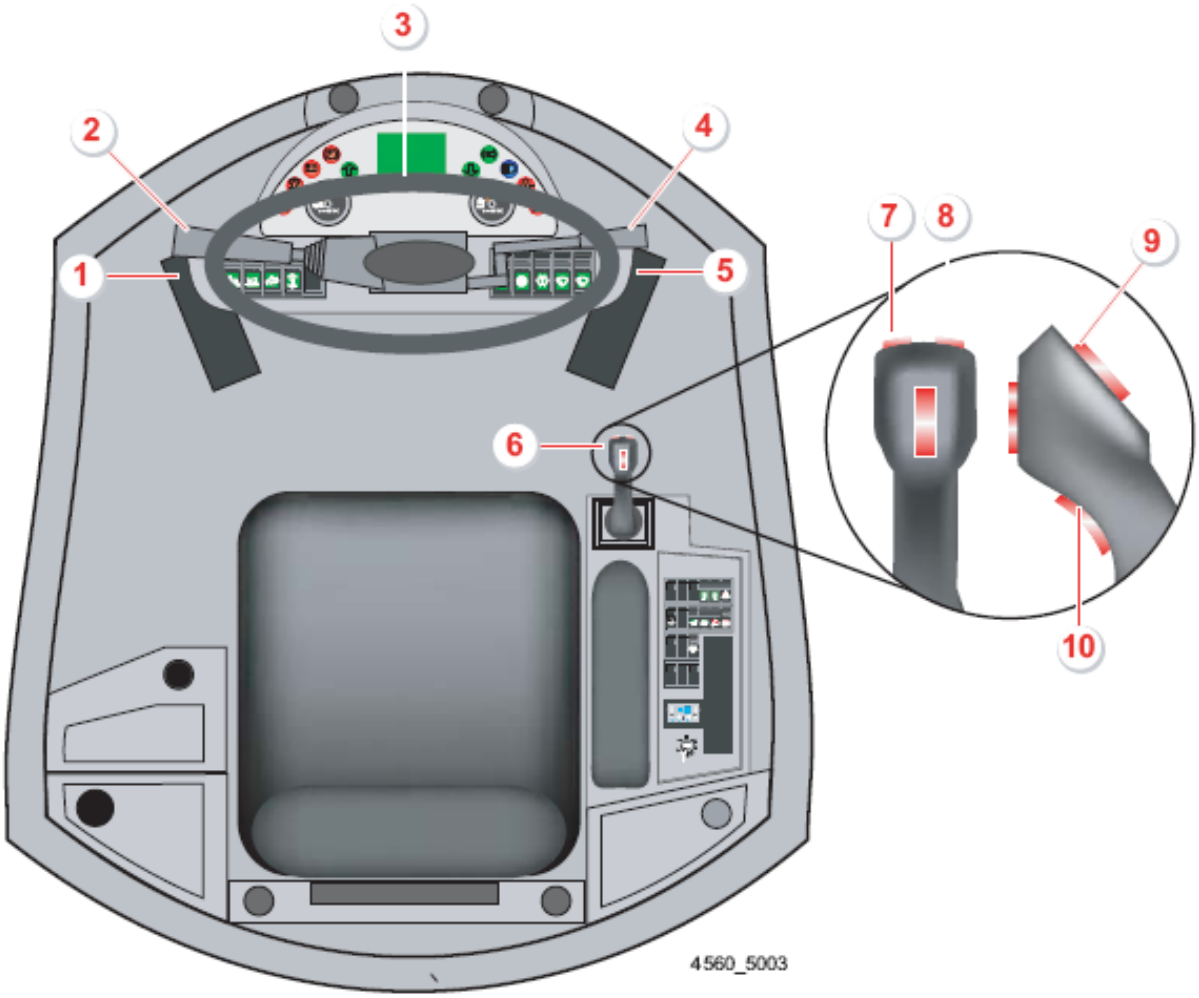


Fig. 5-3 Operating controls

1 Brake-inching pedal
2 Lighting, direction indicator, horn and low-high beam (steering-column switch)
3 Steering wheel
4 Tilt and height adjustment of steering wheel
5 Accelerator pedal
6 Control lever - loading equipment
7 Operation - additional control circuit OFF
8 Operation - additional control circuit ON
9 Preselection of travel direction (function only active if working hydraulics are activated)
10 Impulse mode - float position

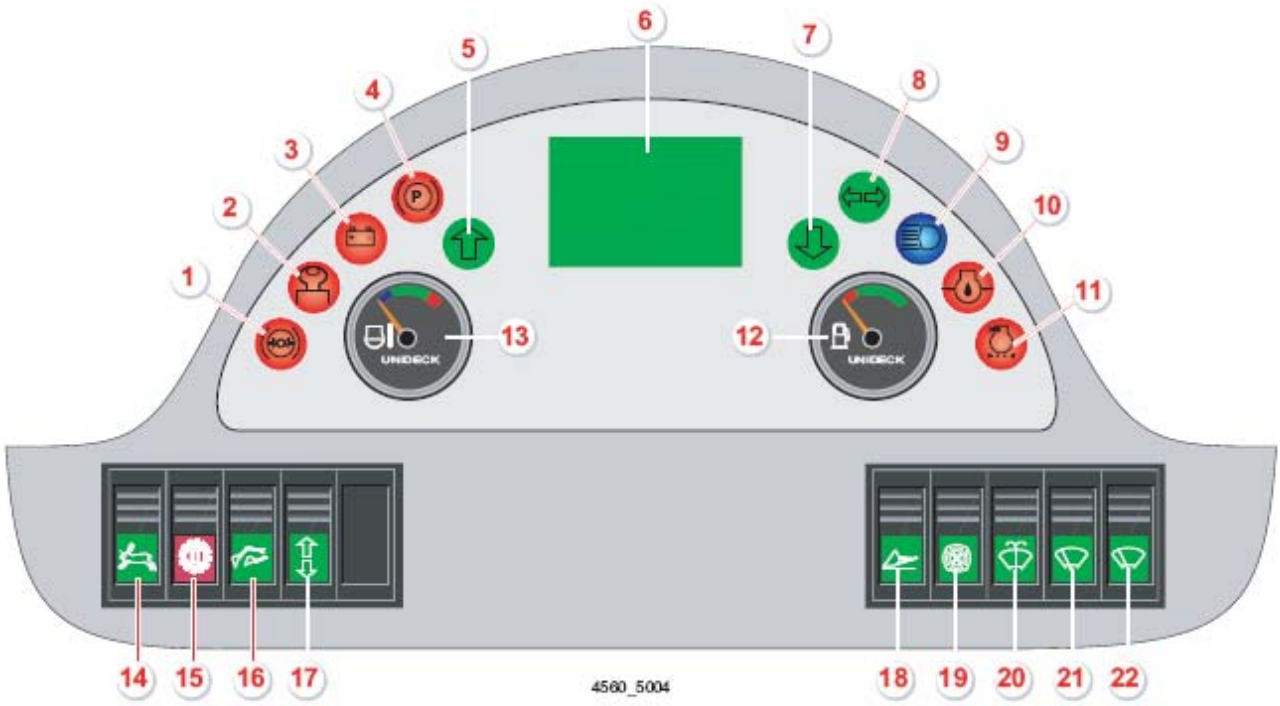


Fig. 5-4 Front control console

1 Brake accumulator pressure
2 Pre-heating monitor
3 Charge control lamp
4 Parking brake
5 Travel direction, forward
6 Display with operating hour meter
7 Travel direction, reverse
8 Direction indicator
9 High beam
10 Engine oil pressure
11 Air filter indicator
12 Fuel-level indicator
13 Coolant temperature
14 Travel speed switch - FAST/SLOW
15 High-gear changeover switch
16 Multi-function switch (lock for working hydraulics cut-off and activation of the direction-of-travel preselection switches (9) page 37 and (17) page 38)
17 Preselection of travel direction (function only active if working hydraulics are disabled)
18 Bucket return positioner (option)
19 Engine cooler reversing fan changeover switch – automatic / temperature-controlled / manual
20 Windshield washing function - front/ rear
21 Windshield wiper, front
22 Windshield wiper, rear

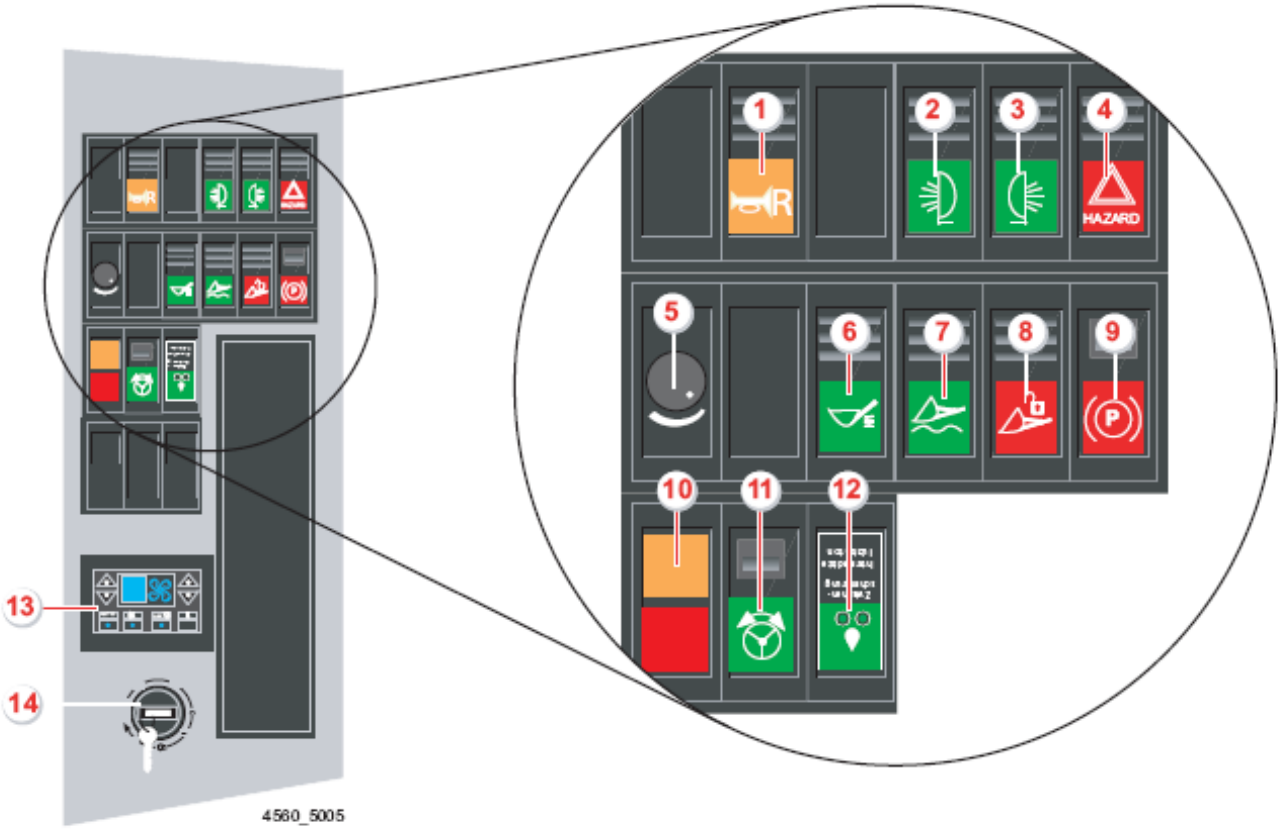


Fig. 5-5 Lateral control console

1 Reverse signal off
2 Working floodlight, front
3 Working floodlight, rear
4 Hazard warning switch
5 Flow rate adjustment for additional control circuit
6 Ride control system (option)
7 Float position preselection switch OFF/Impulse/Continuous operation
8 Preselection switch of additional control circuit - OFF/Impulse/Continuous operation
9 Parking brake preselection switch ON/OFF, ON = locked
10 Motor control lights
11 Emergency steering Automatic/ON
12 Intermediate lubrication (manual operation of central lubrication)
13 Control unit heating / Klimatronic
14 Glow plug and starter switch

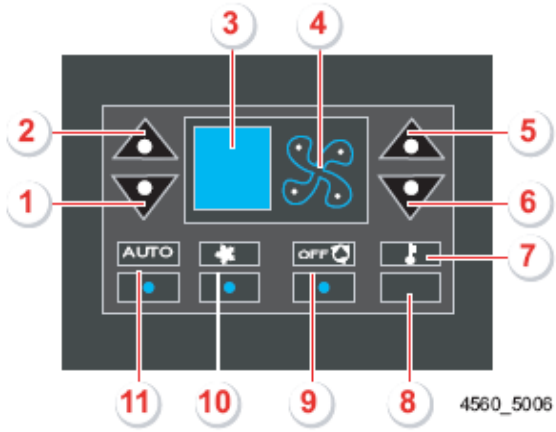


Fig. 5-6 Control unit heating / Klimatronic

1 Lowering temperature by 1°C
2 Raising temperature by 1°C
3 Temperature, error code display
4 Fan level display (LED)
5 Increasing fan speed by 1 level
6 Lowering fan speed by 1 level
7 Button for temperature display
8 Interior space temperature sensor
9 Circulating air button and display
10 Cooling button and display
11 Automatic diagnosis button and display

Operator controls and display elements

Attention

The following list includes non-standard equipment!

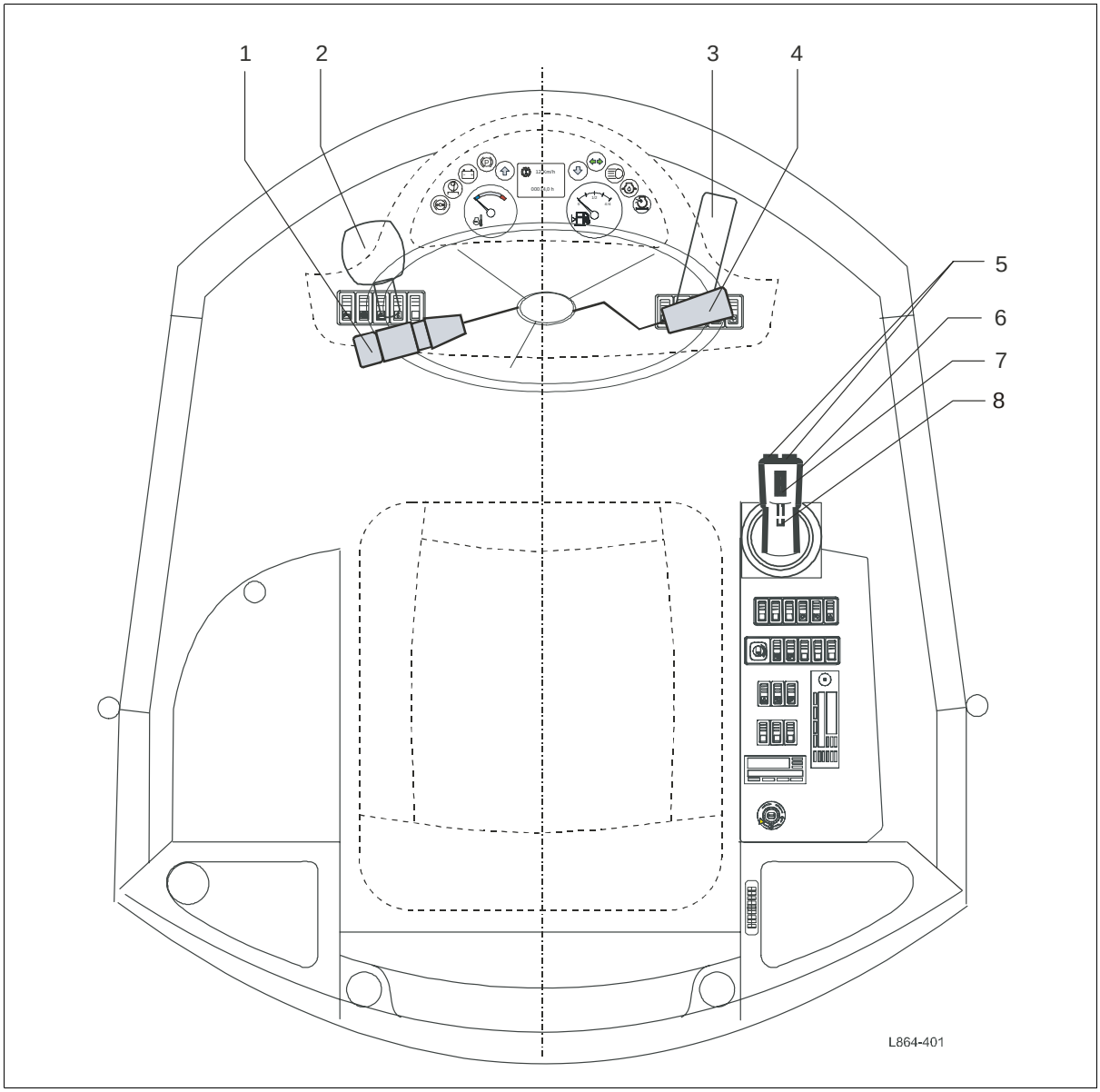


Fig. 8 Operator controls

1 *Direction indicator, horn, low-high beam (steering-column switch)*

2 *Brake-inching pedal*

3 *Accelerator pedal*

4 *Tilt and height adjustment of steering wheel*

5 *Operation – additional control circuit (left OFF, right ON)*

6 *Control lever - loader installation*

7 *Travel direction preselection (without function if working hydraulics are disabled)*

8 *Impulse mode - float position*

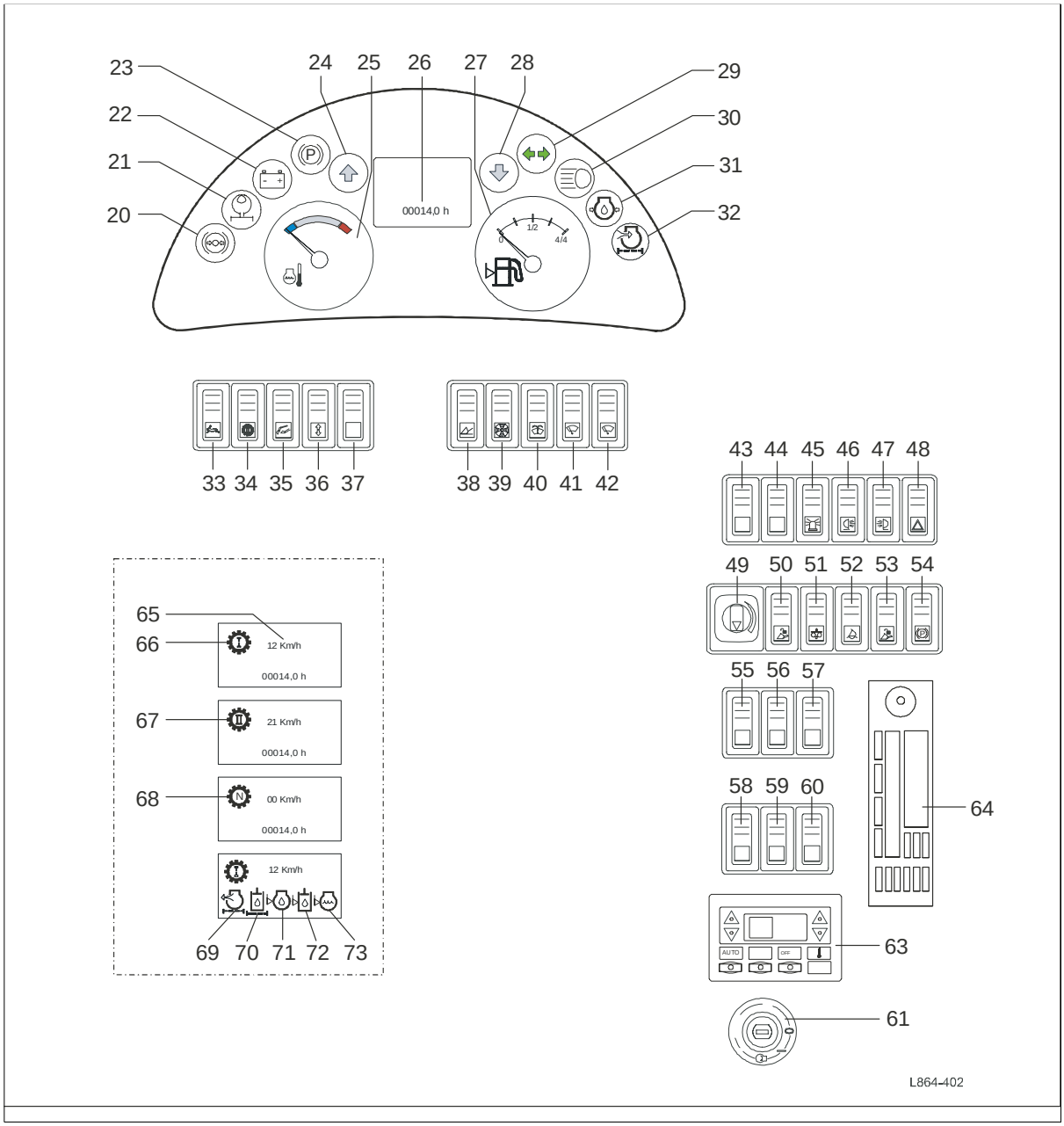


Fig. 9 Instrument panel

20 *Brake accumulator pressure*

21 *ORANGE - pre-heating monitor*

22 *RED - battery charge indicator*

23 *RED - parking brake*

24 *GREEN - travel direction, forward*

25 *Coolant temperature*

26 *Operating hour meter*

27 *Fuel-level indicator*

28 *GREEN - travel direction, reverse*

29 *GREEN - direction indicator*

30 *BLUE - high beam*

31 *RED - engine oil pressure*

32 *RED - air filter indicator*

33 *Travel speed - FAST - SLOW*

34 *High-gear changeover switch*

Attention

Transmission only shifts at a speed of below 0.5 km/h!

35 *Multi-function switch with lock for work equipment cut-off and change-over of the direction-of-travel preselection switches from Pos. 7 to Pos. 36*

Machine damage

due to incorrect operation.

Only press if machine is at standstill!

36 *Preselection of travel direction - Function only active if working hydraulics are disabled*

37 *Not assigned**

38 *Option – bucket return positioner*

39 *Engine cooler reversing fan changeover switch – automatic / off / manual*

40 *Windshield washer function front/rear*

41 *Windshield wiper, front*

42 *Windshield wiper, rear*

43 *Option – rear fog lamp*

44 *Option – back-up warning lamp*

45 *Option – rotating beacon*

46 *Working floodlight rear, switch on the parking light* (8/1).

47 *Working floodlight front, switch on the parking light* (8/1).

48 *Hazard warning switch*

49 *Flow rate adjustment for 3rd control circuit*

50 *Option – preselection switch for 4th control circuit OFF/Impulse/Continuous operation*

51 *Option – ride control system*

52 *Preselection switch - float position - OFF/Impulse/Continuous operation*

53 *Preselection switch for 3rd control circuit OFF/Impulse/Continuous operation*

54 *Parking brake preselection switch ON/OFF, ON = locked*

55 *Not assigned**

56 *Emergency steering Automatic/ON*

57 *Perkins error indicator red/yellow*

58 *Option – mirror heating*

59 *Option – pressurized cabin*

60 *Option – central lubrication*

61 *Glow plug and starter switch*

62 *Not assigned**

63 *Control unit heating / Klimatronic*

64 *Option - radio*

65 *Speed indicator*

66 *Monitor - indicator "manual transmission range I"*

67 *Monitor - indicator "manual transmission, range II" (optional for high-speed version)*

68 *Monitor - indicator "manual transmission not ready for operation"*

Attention

If this symbol comes up, the manual transmission is in an intermediate position. The machine is not ready for driving! This can be remedied by performing brief steering movements until the manual transmission engages.

69 *Option – soot filter clogging indicator*

70 *Hydraulic oil filter clogging indicator*

71 *Engine oil level*

72 *Hydraulic oil level*

73 *Coolant level*

* for non-standard equipment

Note
The following lists include non-standard equipment!

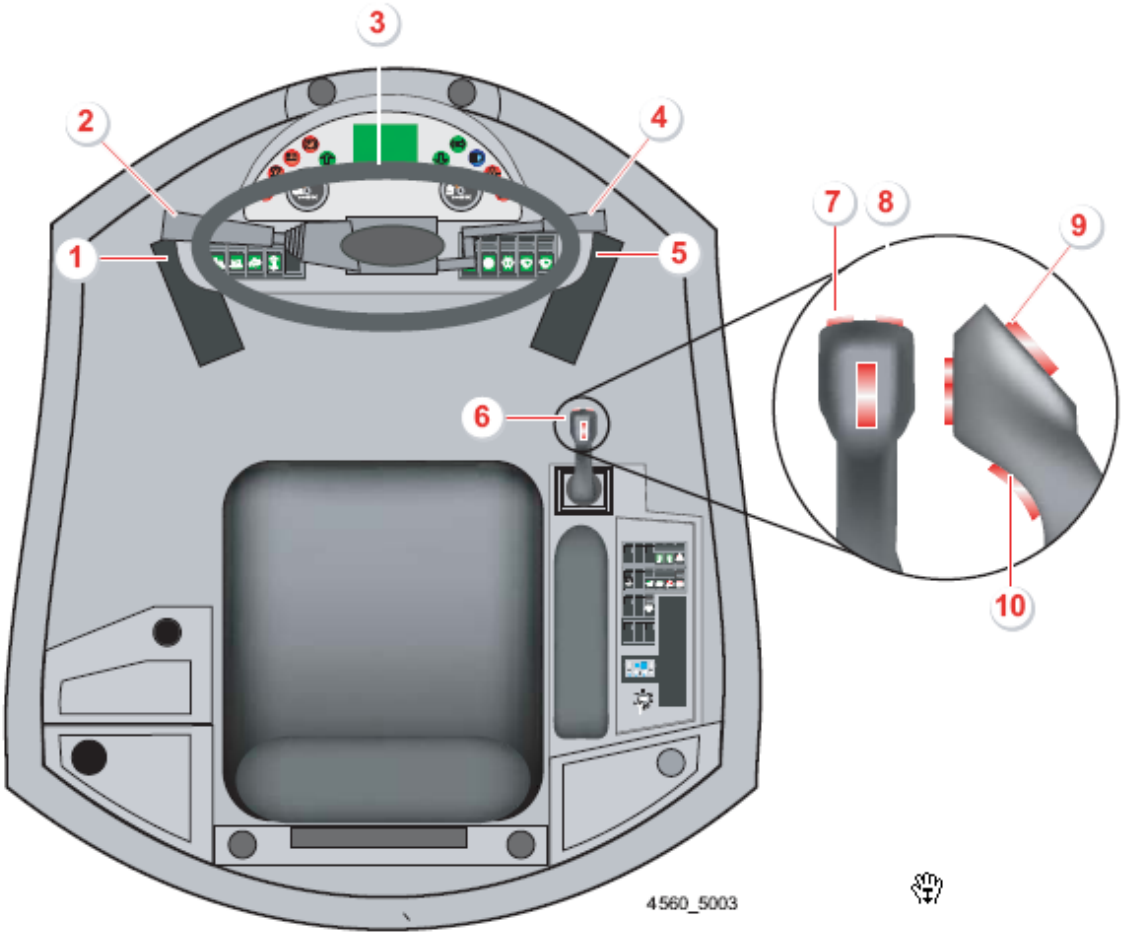


Fig. 5-3 Operating controls

1 Brake-inching pedal
2 Lighting, direction indicator, horn and low-high beam (steering-column switch)
3 Steering wheel
4 Tilt and height adjustment of steering wheel
5 Accelerator pedal
6 Control lever - loading equipment
7 Operation - additional control circuit OFF
8 Operation - additional control circuit ON
9 Preselection of travel direction (function only active if working hydraulics are activated)
10 Impulse mode - float position



Fig. 5-4 Front control console

1 Brake accumulator pressure
2 Pre-heating monitor
3 Charge control lamp
4 Parking brake
5 Travel direction, forward
6 Display with operating hour meter
7 Travel direction, reverse
8 Direction indicator
9 High beam
10 Engine oil pressure
11 Air filter indicator
12 Fuel-level indicator
13 Coolant temperature
14 Travel speed switch - FAST/SLOW
15 High-gear changeover switch
16 Multi-function switch (lock for working hydraulics cut-off and activation of the direction-of-travel preselection switches (9) page 37 and (17) page 38)
17 Preselection of travel direction (function only active if working hydraulics are disabled)
18 Bucket return positioner (option)
19 Engine cooler reversing fan changeover switch – automatic / temperature-controlled / manual
20 Windshield washing function - front/ rear
21 Windshield wiper, front
22 Windshield wiper, rear

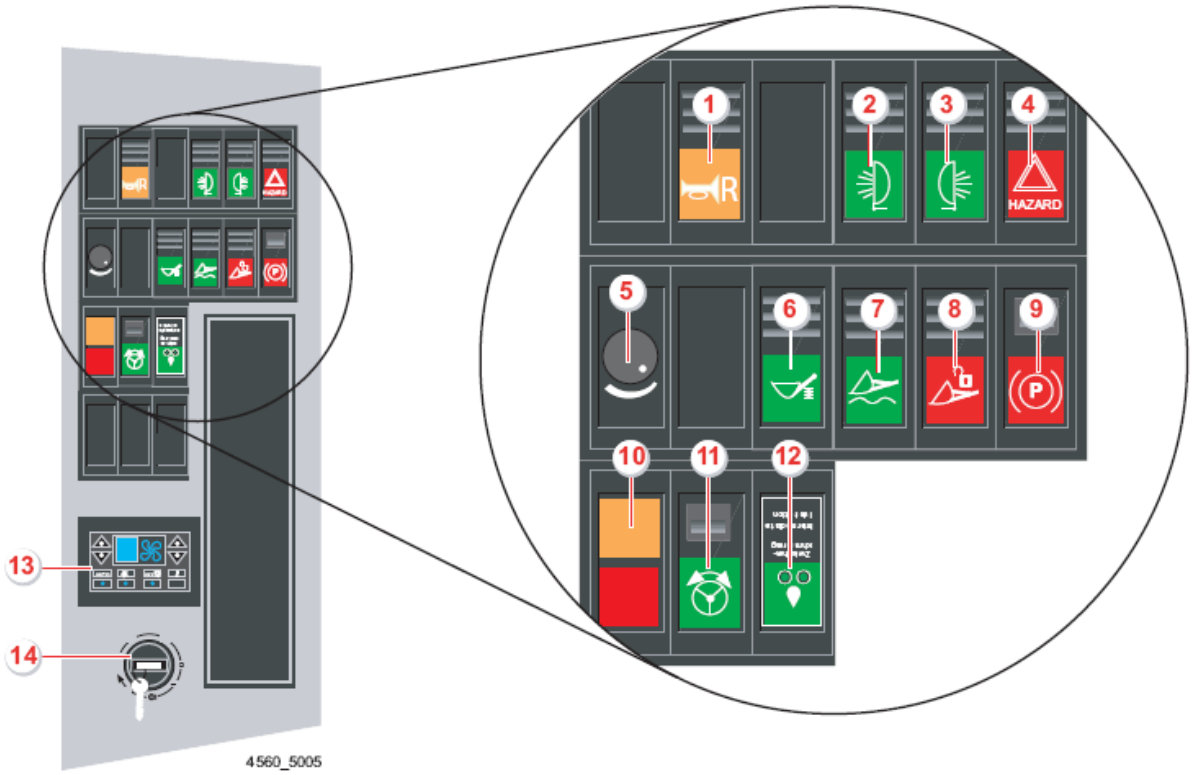


Fig. 5-5 Lateral control console

1 Reverse signal off
2 Working floodlight, front
3 Working floodlight, rear
4 Hazard warning switch
5 Flow rate adjustment for additional control circuit
6 Ride control system (option)
7 Float position preselection switch OFF/Impulse/Continuous operation
8 Preselection switch of additional control circuit - OFF/Impulse/Continuous operation
9 Parking brake preselection switch ON/OFF, ON = locked
10 Motor control lights
11 Emergency steering Automatic/ON
12 Intermediate lubrication (manual operation of central lubrication)
13 Control unit heating / Klimatronic
14 Glow plug and starter switch

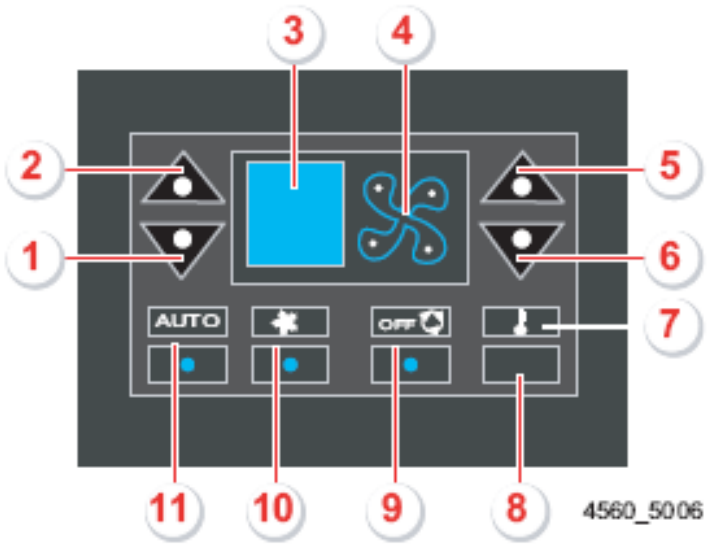
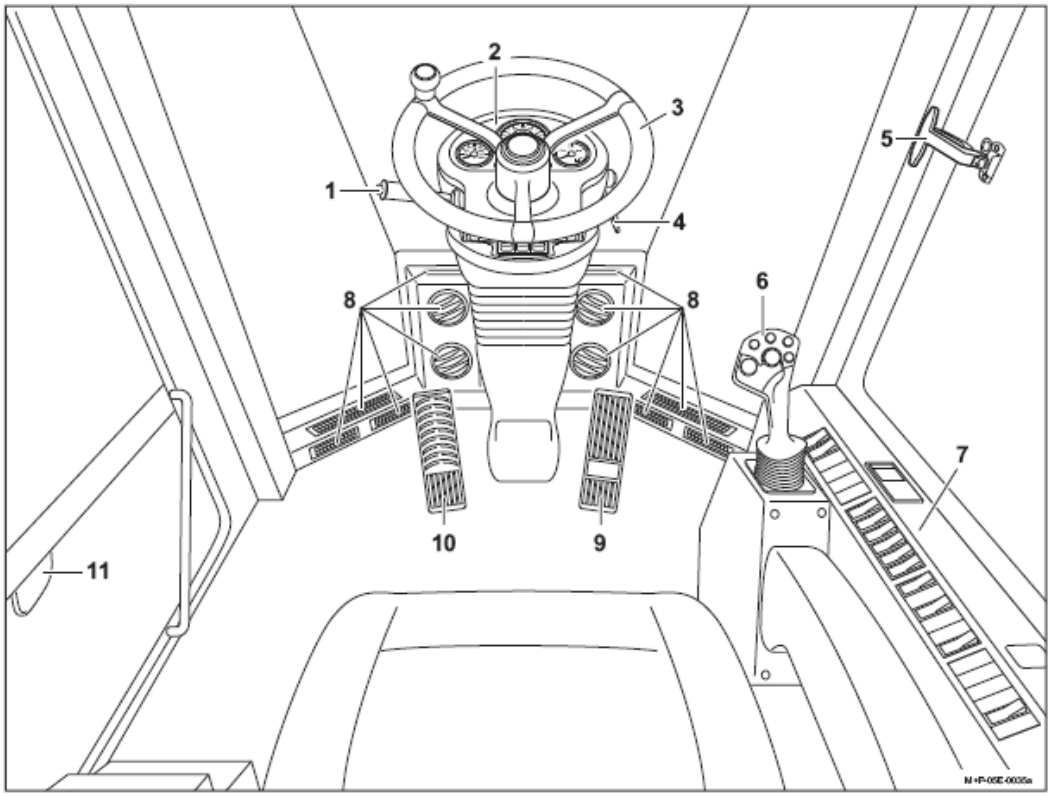


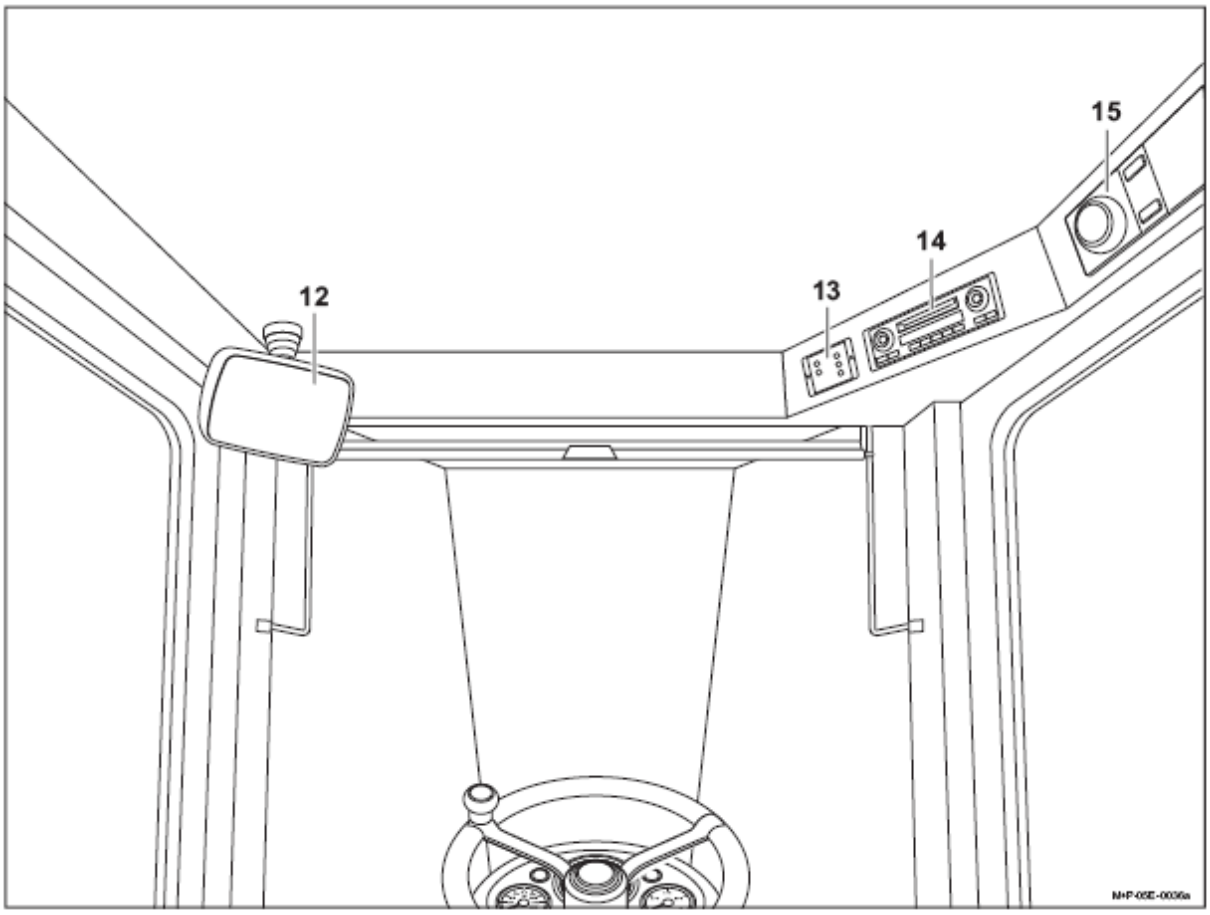
Fig. 5-6 Control unit heating / Klimatronic

1 Lowering temperature by 1°C
2 Raising temperature by 1°C
3 Temperature, error code display
4 Fan level display (LED)
5 Increasing fan speed by 1 level
6 Lowering fan speed by 1 level
7 Button for temperature display
8 Interior space temperature sensor
9 Circulating air button and display
10 Cooling button and display
11 Automatic diagnosis button and display



1 Combi-switch 25
2 Instrument panel 22
3 Steering wheel
4 Steering wheel adjustment 47
5 Side window
- Opening/closing 43
- Emergency exit 43

6 Lifting and tilting cylinders' control column with ERGO-II drive switch 26
7 Console 23
8 Air vents 51
9 Accelerator pedal
10 Brake pedal
11 Door handle 43



12 Interior mirror 46

13 Heater and air conditioner..... 50

14 Radio

15 Cab light..... 49

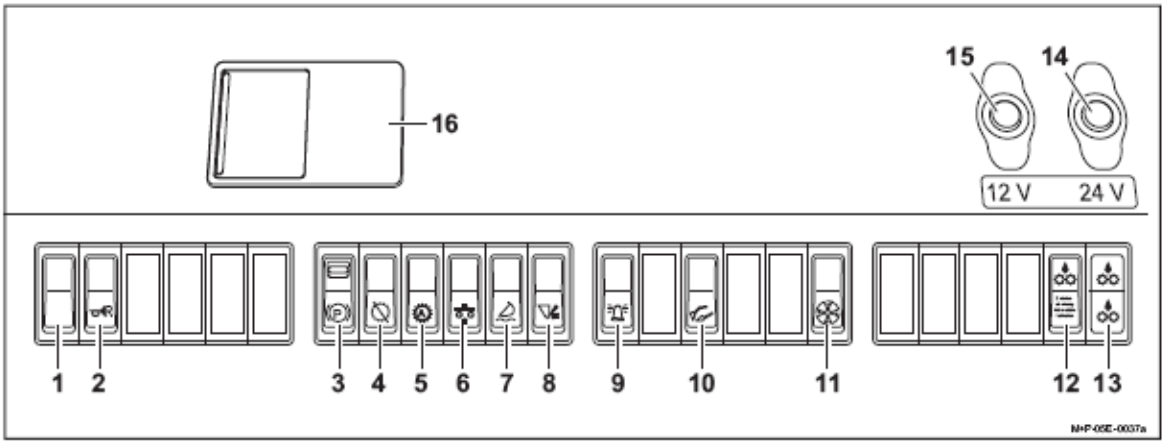
Note
The radio can always be switched on, even if the ignition is switched off. The switched on radio will drain the battery if the engine is stopped, therefore the radio should not be used for a long time when the engine is switched off. Please refer to the radio's separate operating manual with regard to operating the radio.



1 Tachometer
2 Coolant temperature display 25
3 Fuel gauge 25
4 Blinker indicator light 47
5 Malfunction warning light 24
6 Not used
7 Battery charge warning light 24
8 High beam indicator light 48
9 Not used
10 Rear windshield wiper 50
11 Rear working spotlight 48
12 Warning blinker 48
13 Front working spotlight 48
14 Parking light/low beam 47

Note

The switches are only dimly lit when the machine is switched on. The indicator light inside the switch is only fully lit when the switch is activated.



1 On-board computer selector switch 24
Fault messages..... 108

2 Warning tone★ when reversing 56

3 Parking brake..... 54

4 Transmission pressure switching..... 56

5 Selecting the gear change program..... 55

6 Ride control system RCS 61

7 Switching on float position 60

8 Saving the bucket settings..... 59

9 Warning beacon★ 48

10 Switching the working hydraulics on/off
When working 59
When parking..... 56
When driving on public roads..... 58

11 Cooler fan, rotational direction reversal 64

12 Central lubrication system★, starting additional lubricating processes..... 73

13 Indicator lights of central lubrication system★, refer to separate operating manual

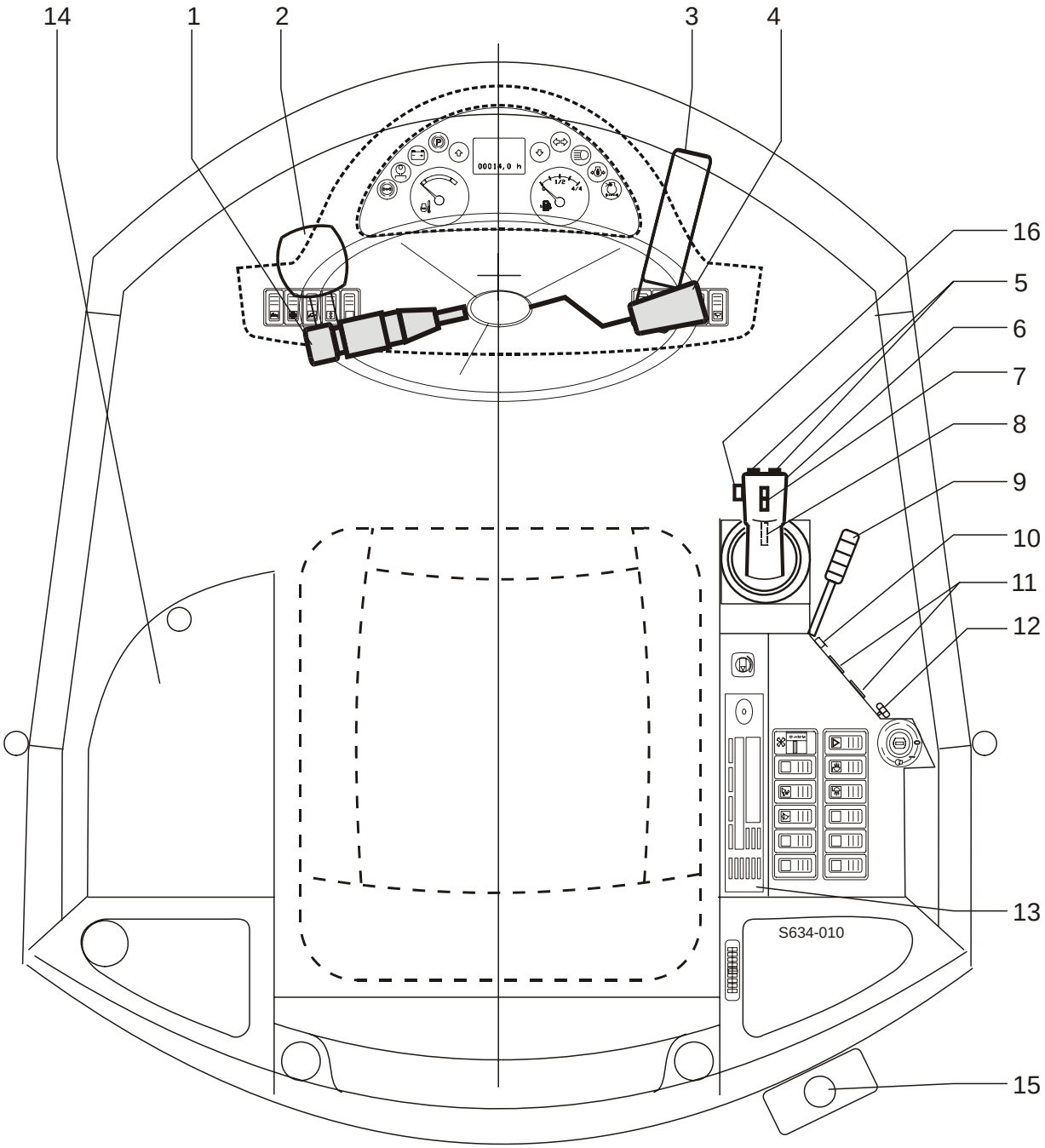
14 24 V socket (can be loaded up to 240 W)

15 12 V socket (can be loaded up to 96 W)

16 Ashtray..... 52

Operator controls and display elements

The following list includes non-standard equipment !



Operator controls

1 Direction indicator — horn — low/high beam (steering column mounted switch)

2 Brake inching pedal

3 Accelerator pedal

4 Tilt adjustment of steering wheel (option: height adjustment)

5 Actuation of additional control circuit

6 Control lever — loader installation

7 Direction-of-travel pre-selection (without function if working hydraulics are disabled)

8 Impulse mode — float position

9 Parking brake

10 Socket

11 Fuse carrier

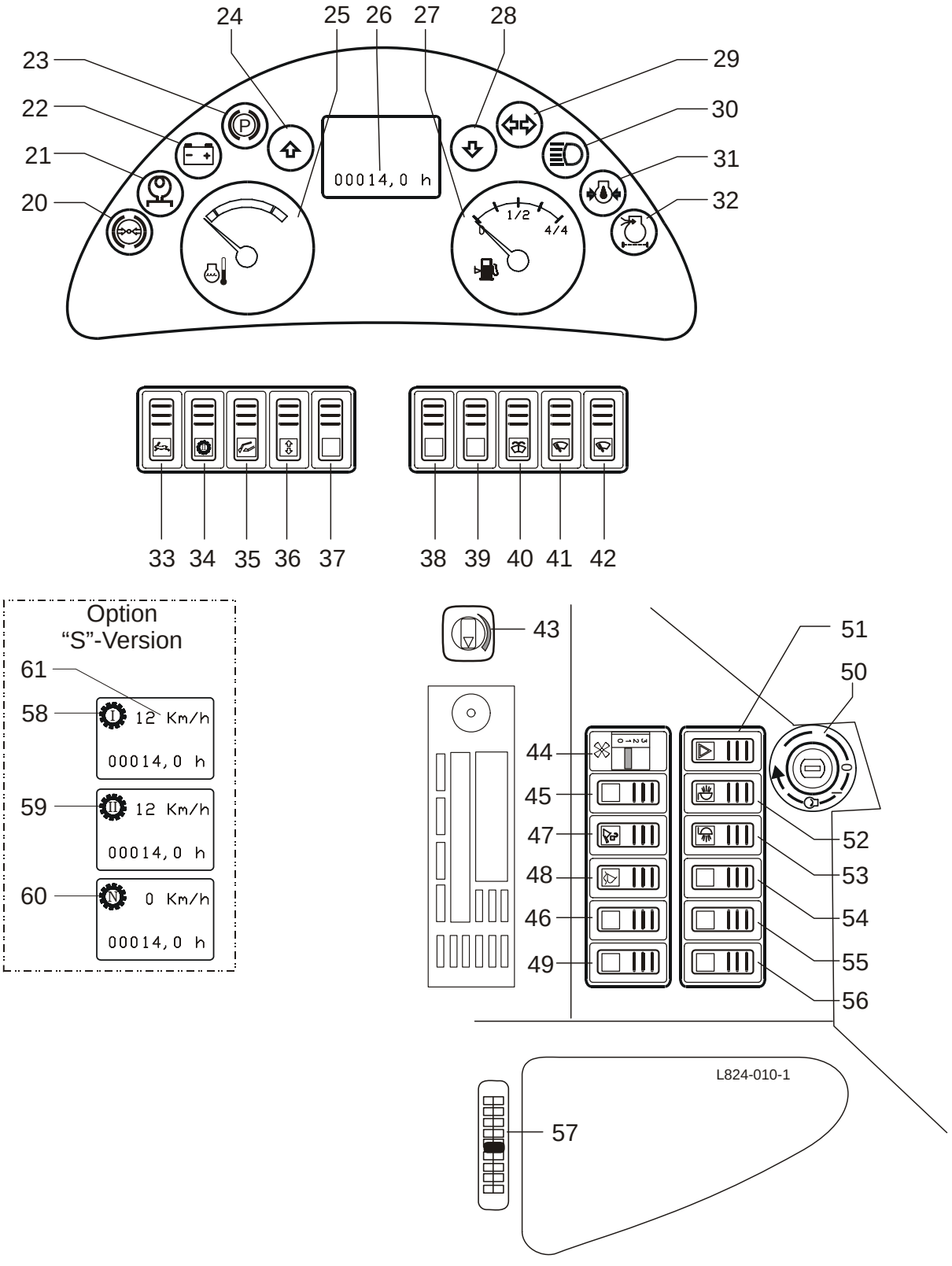
12 Fan: fresh air/ re-circulating air

13 Radio

14 Control rod for mechanical quick-attach system

15 Washer tank

16 Loader installation slewing function



Instrument panel

20 not assigned

21 YELLOW — pre-heating monitor

22 RED — battery charge indicator

23 RED — parking brake

24 GREEN — travel direction, forward

25 Coolant temperature

26 Operating hour meter

27 Fuel gauge

28 GREEN — travel direction, reverse

29 GREEN — direction indicator

30 BLUE — high beam

31 RED — engine oil pressure

32 YELLOW — air filter indicator

33 Travel speed — fast/slow

34 "S"-version only — Change-over switch for high gear



Only press when machine is at standstill!

35 Multi-function switch with lock for work equipment cut-off and change-over of the direction-of-travel pre-selection switches from pos. 07 to pos. 36



Only press when machine is at standstill!

36 Pre-selection of travel direction — Function only active if working hydraulics are disabled

37 not assigned *

38 not assigned *

39 not assigned *

40 Windshield wash function front/rear

41 Windshield wiper, front

42 Windshield wiper, rear

43 Option — Switch for air conditioning and temperature control

44 Fan switch – heater

45 not assigned *

46 not assigned *

47 Pre-selection switch for actuation of additional control circuit (Pos. 5)

48 Pre-selection switch for float position — OFF/Impulse/Continuous mode

49 not assigned *

50 Pre-heat/starter switch

51 Hazard warning switch

52 Working floodlight, front

53 Working floodlight, rear

54 not assigned *

55 not assigned *

56 not assigned *

57 Heater control

58 Monitor — transmission indicator range I

59 Monitor — transmission indicator range II

60 Monitor — transmission indicator range — disabled



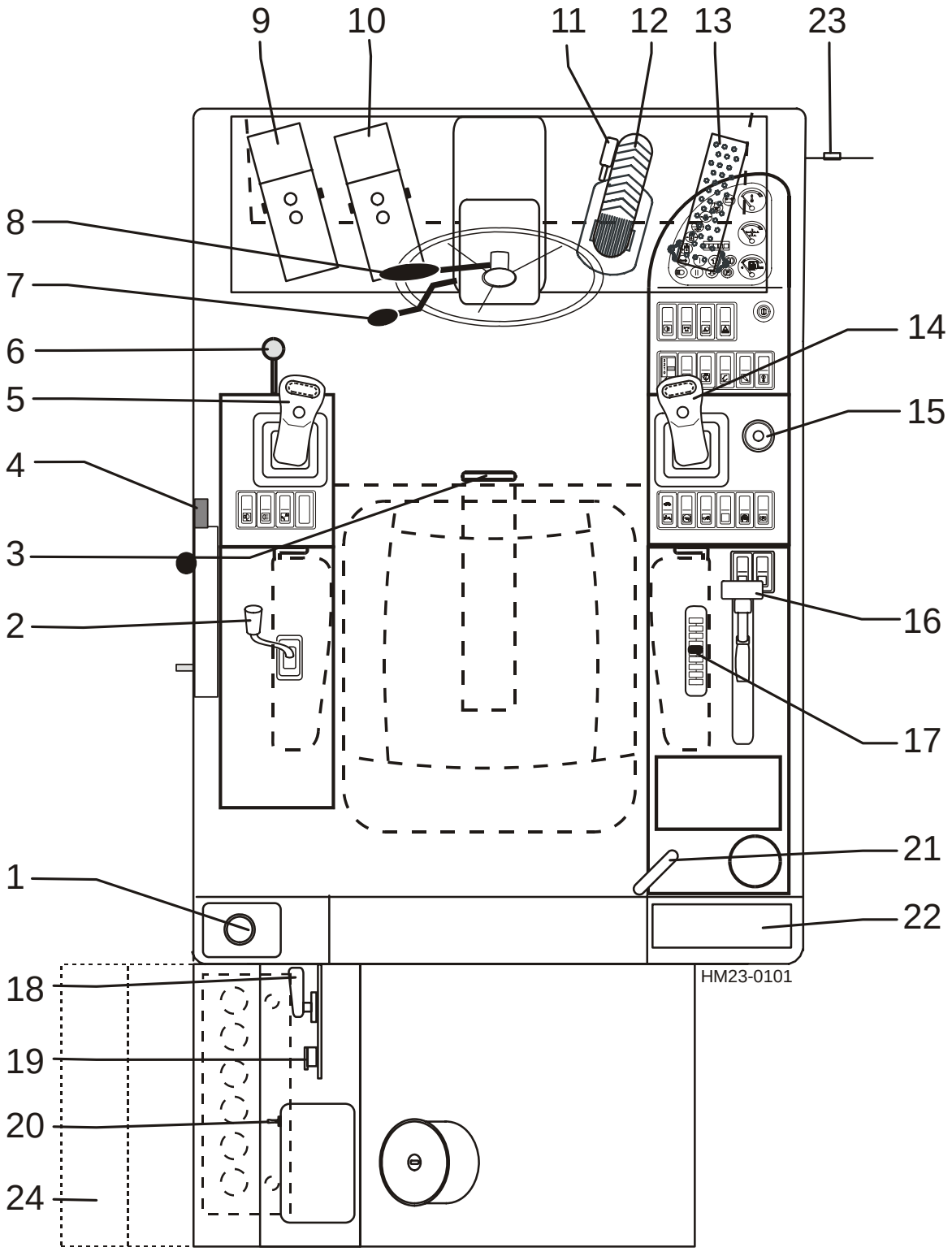
If this symbol comes up, the transmission is in an intermediate position. ***The machine is not ready to start!*** *This can be remedied by performing brief steering movements until the transmission engages.*

61 Speed indicator

* for non-standard equipment

Operator controls

This picture contains non-standard equipment!



1 Windshield washer fluid tank

2 Control lever — stabilizer/ support blade front / rear

3 Changeover fresh air — re-circulating air

4 Door release

5 Control lever — excavator installation

6 Working hydraulics cut-off (raise panel)

7 Steering column — tilt and height adjustment

8 Direction-indicator switch

9 Sensitive travel

10 Operation — intermediate boom / articulation

11 Excavator brake release

12 Service brake / excavator brake

13 Accelerator pedal

14 Control lever — excavator installation

15 Travel direction pre-selector — forward / neutral / reverse

16 Engine speed control (manual throttle)

17 Heater temperature control

18 Battery main switch

19 Socket

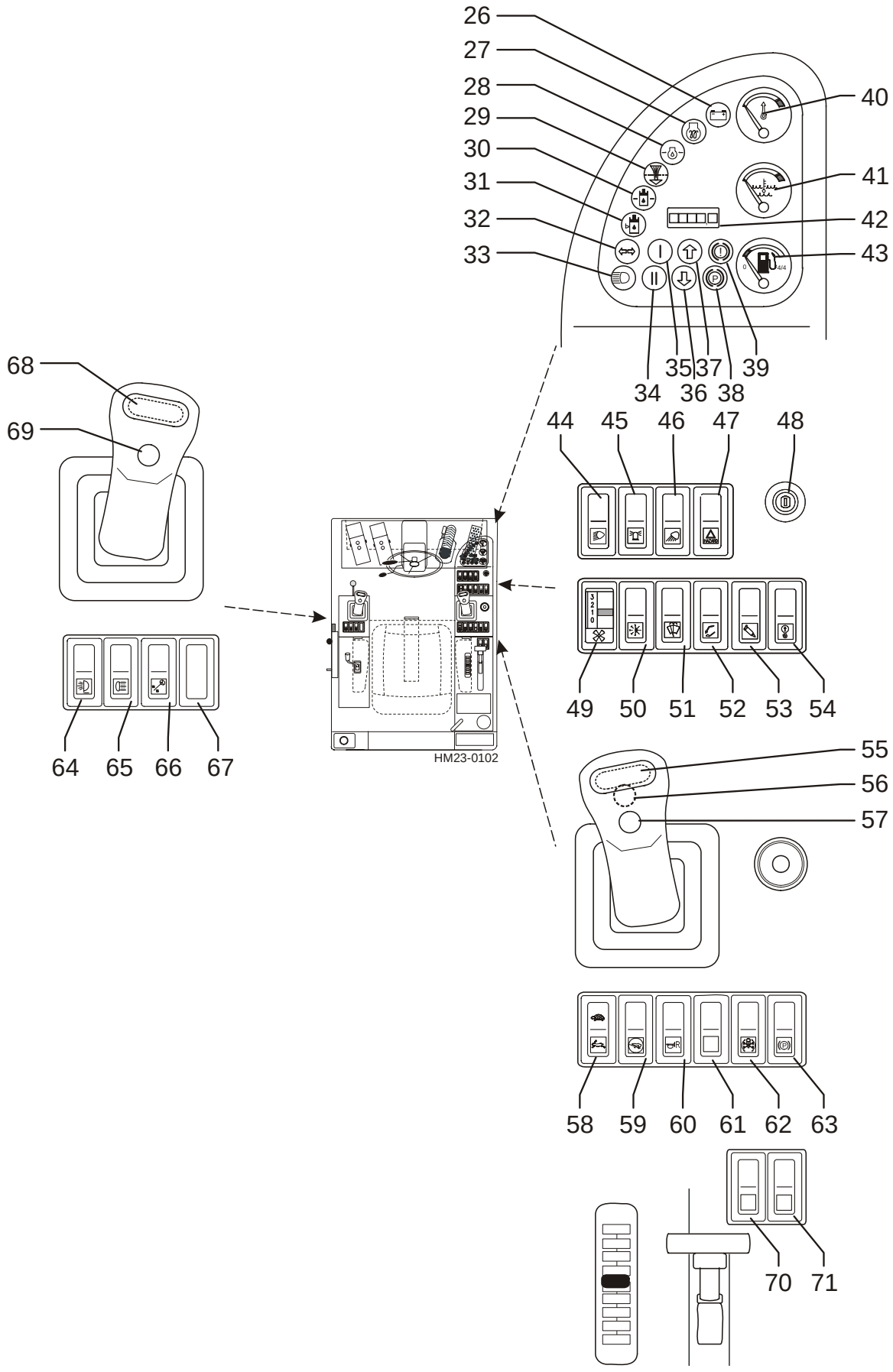
20 Refueling pump (option)

21 Superstructure locking bolt

22 Radio

23 Socket

24 Service ladder (cover)


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26 RED — battery charge indicator lamp

27 YELLOW — pre-heating monitor

28 RED — engine oil pressure

29 YELLOW — air filter indicator

30 RED — hydraulic oil return filter clogging indicator

31 RED — hydraulic oil level

32 GREEN — direction indicator

33 BLUE — high beam

34 GREEN — not assigned

35 GREEN — not assigned

36 GREEN — travel direction, reverse

37 GREEN — travel direction, forward

38 RED — parking brake

39 RED — brake accumulator pressure indicator

40 Overload warning device

41 Coolant temperature

42 Operating hour meter

43 Fuel gauge

44 Light switch

45 Rotating beacon

46 Working floodlights

47 Hazard warning switch

48 Glow plug and starter switch

49 Heater fan switch

50 Air conditioning

51 Windshield wiper - wash/wipe system

52 Working hydraulics cut-off

53 Rock breaker / additional control circuit

54 Overload warning device ON/OFF

55 Rocker switch — Operation of additional control circuit I; e.g. grab rotation, rock breaker

56 Horn button

57 Button — intermediate boom / articulation change-over

58 FAST — SLOW

59 Sensitive travel

60 Travel motion alarm cut-off

61 not assigned

62 Oscillating axle lock

63 Parking brake

64 Boom-mounted working floodlight

65 Rear fog lamp

66 Steering change-over

67 not assigned

68 Rock breaker — Operation of additional control circuit II

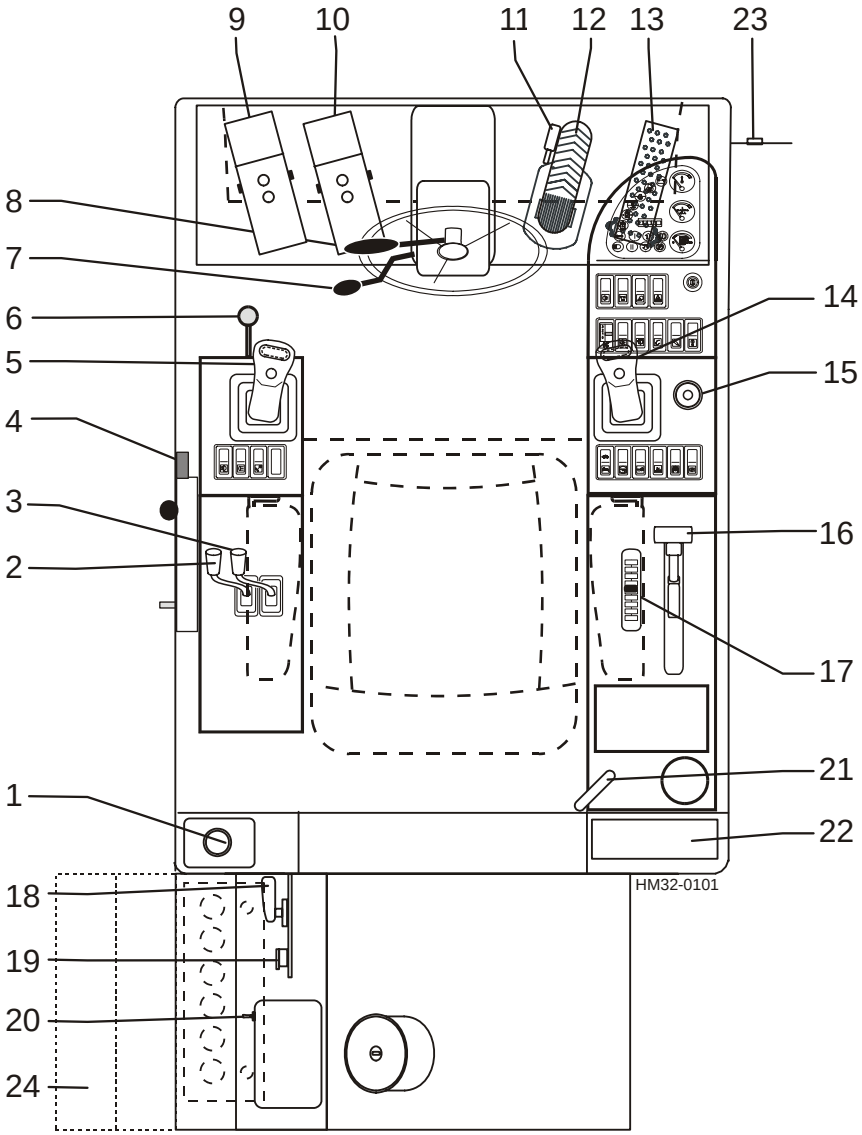
69 Push-button — Slewing holding brake

70 Change-over switch — front dozer blade / stabilizers

71 Change-over switch right-hand / left-hand stabilizer

Operator controls

This picture contains non-standard equipment!



Description of instrument panel

1 Windshield washer tank

2 Stabilizer, left

3 Stabilizer, right

4 Door release

5 Control lever — excavator installation

6 Working hydraulics cut-off (raise panel)

7 Steering column — tilt and height adjustment

8 Turning indicator

9 Sensitive travel

10 Monobloc: operation of articulation

"TPA"/"CI": operation of intermediate boom / articulation

11 Excavator brake release

12 Service brake / excavator brake

13 Accelerator pedal

14 Control lever — excavator installation

15 Travel direction pre-selector — forward / neutral / reverse

16 Engine speed control (manual throttle)

17 Heater temperature control

18 Battery main switch

19 Socket

20 Refueling pump (option)

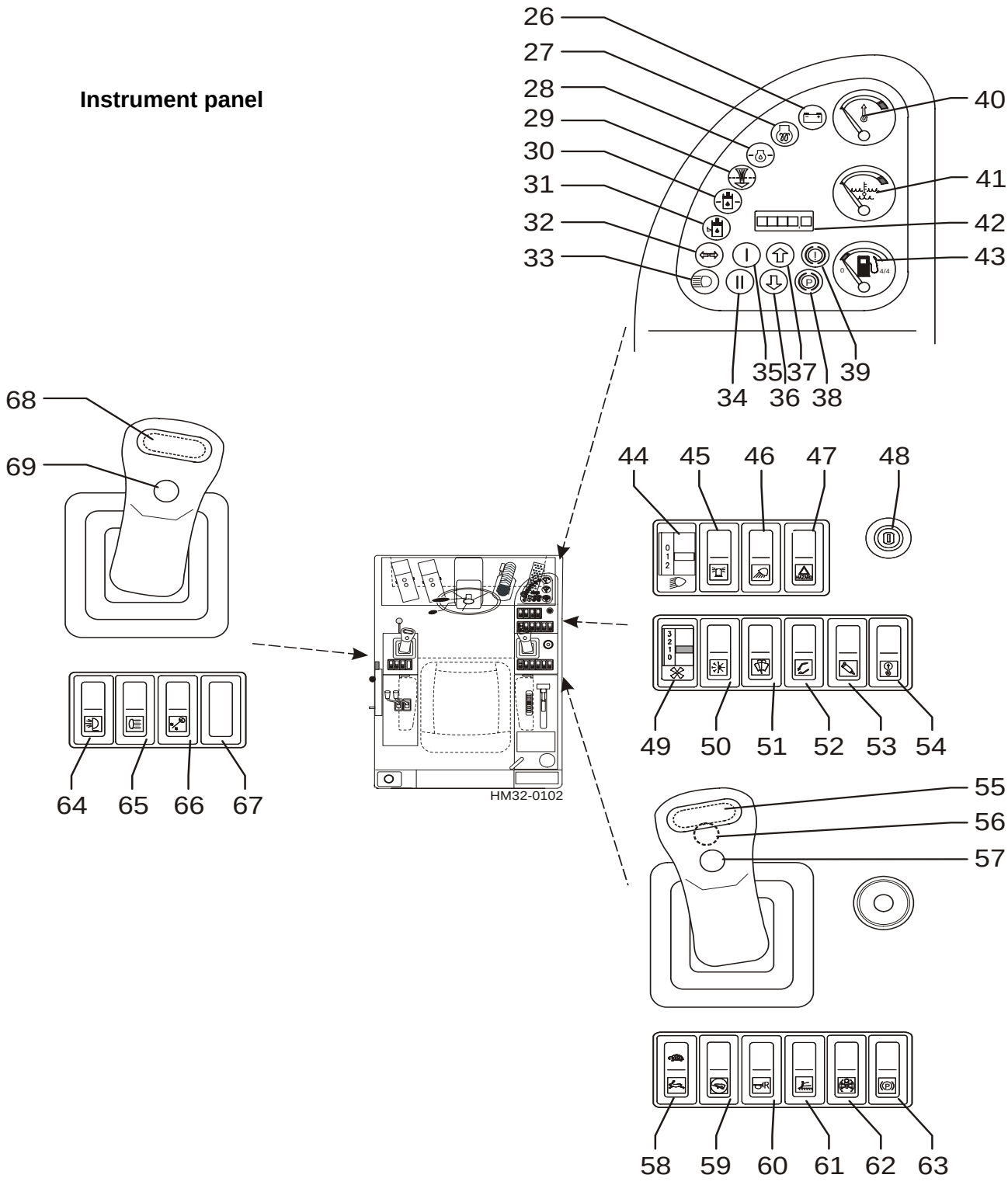
21 Uppercarriage slewing lock

22 Radio

23 Socket

24 Service ladder (cover)

Instrument panel

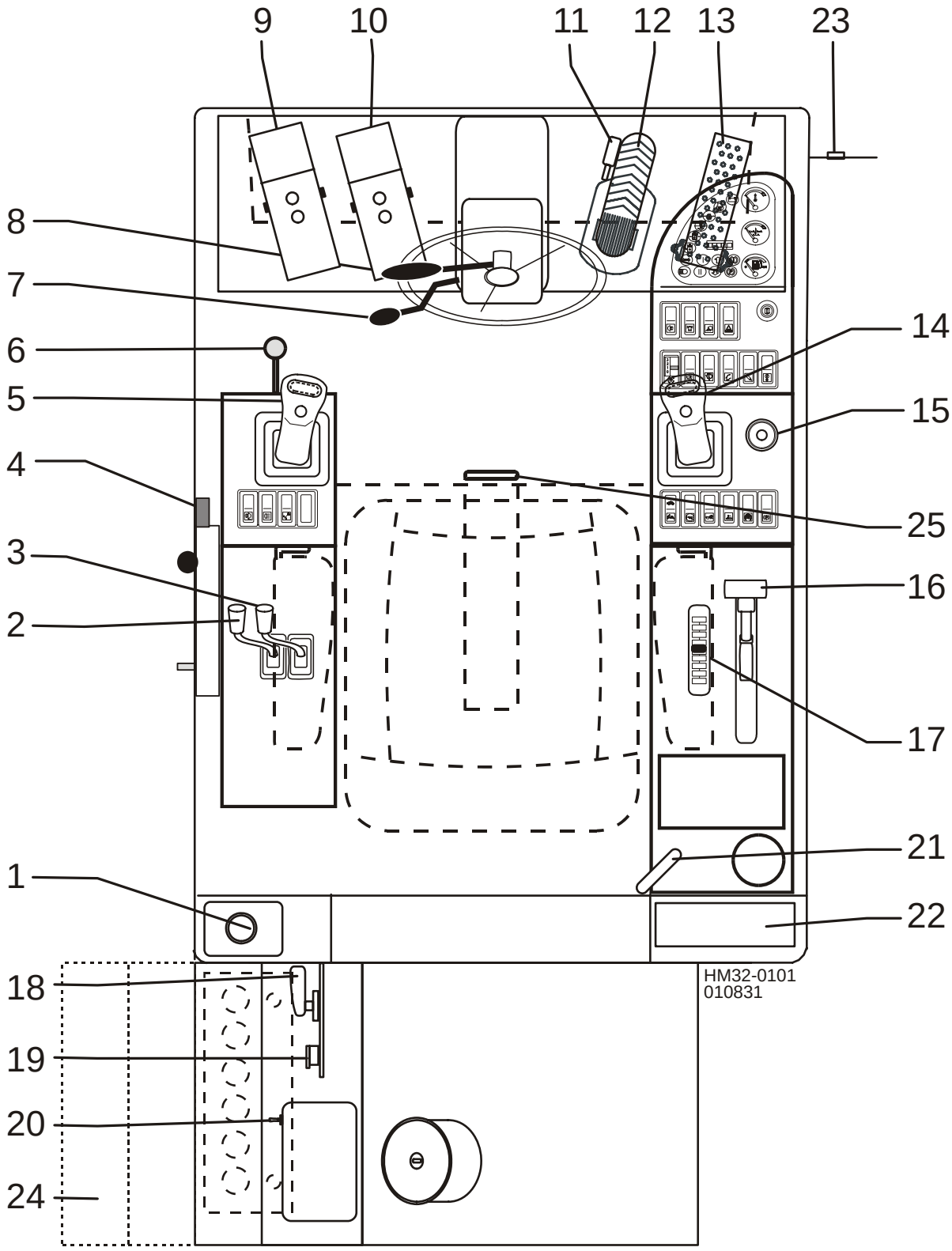


Description of instrument panel

26	RED — battery charge indicator lamp
27	YELLOW — pre-heating monitor
28	RED — engine oil pressure
29	YELLOW — air filter indicator
30	RED — hydraulic oil return filter clogging indicator
31	RED — hydraulic oil level
32	GREEN — turn signals
33	BLUE — high beam
34	GREEN — not assigned
35	GREEN — not assigned
36	GREEN — travel direction, reverse
37	GREEN — travel direction, forward
38	RED — parking brake
39	RED — brake accumulator pressure indicator
40	Overload warning device
41	Coolant temperature
42	Operating hour meter
43	Fuel gauge
44	Light switch
45	Rotating beacon
46	Working floodlight
47	Hazard warning switch
48	Pre-heat/ starter switch
49	Heater fan switch
50	Air conditioning
51	Windshield wiper - wash/wipe system
52	Working hydraulics cut-off
53	Rock breaker / additional control circuit
54	Overload warning device ON/OFF
55	Operation of additional control circuit I
56	Horn
57	Button — change-over intermediate boom / articulation
58	Fast — slow
59	Sensitive travel
60	Travel motion alarm cut-off
61	Front dozer blade
62	Oscillating axle lock
63	Parking brake
64	Boom-mounted working floodlight
65	Fog light
66	Steering change-over
67	not assigned
68	Operation of additional control circuit II
69	Hydrostatic additional swing brake

Operator controls

This picture contains non-standard equipment!



Description of cab

1 Windshield washer tank

2 Stabilizer, left

3 Stabilizer, right

4 Door release

5 Control lever — excavator installation

6 Working hydraulics cut-off (raise panel)

7 Steering column — tilt and height adjustment

8 Turning indicator

9 Sensitive travel

10 Monobloc: operation of articulation

"TPA"/"CI": operation of intermediate boom / articulation

11 Excavator brake release

12 Service brake / excavator brake

13 Accelerator pedal

14 Control lever — excavator installation

15 Travel direction pre-selector — forward / neutral / reverse

16 Engine speed control (manual throttle)

17 Heater temperature control

18 Battery main switch

19 Socket

20 Refueling pump (option)

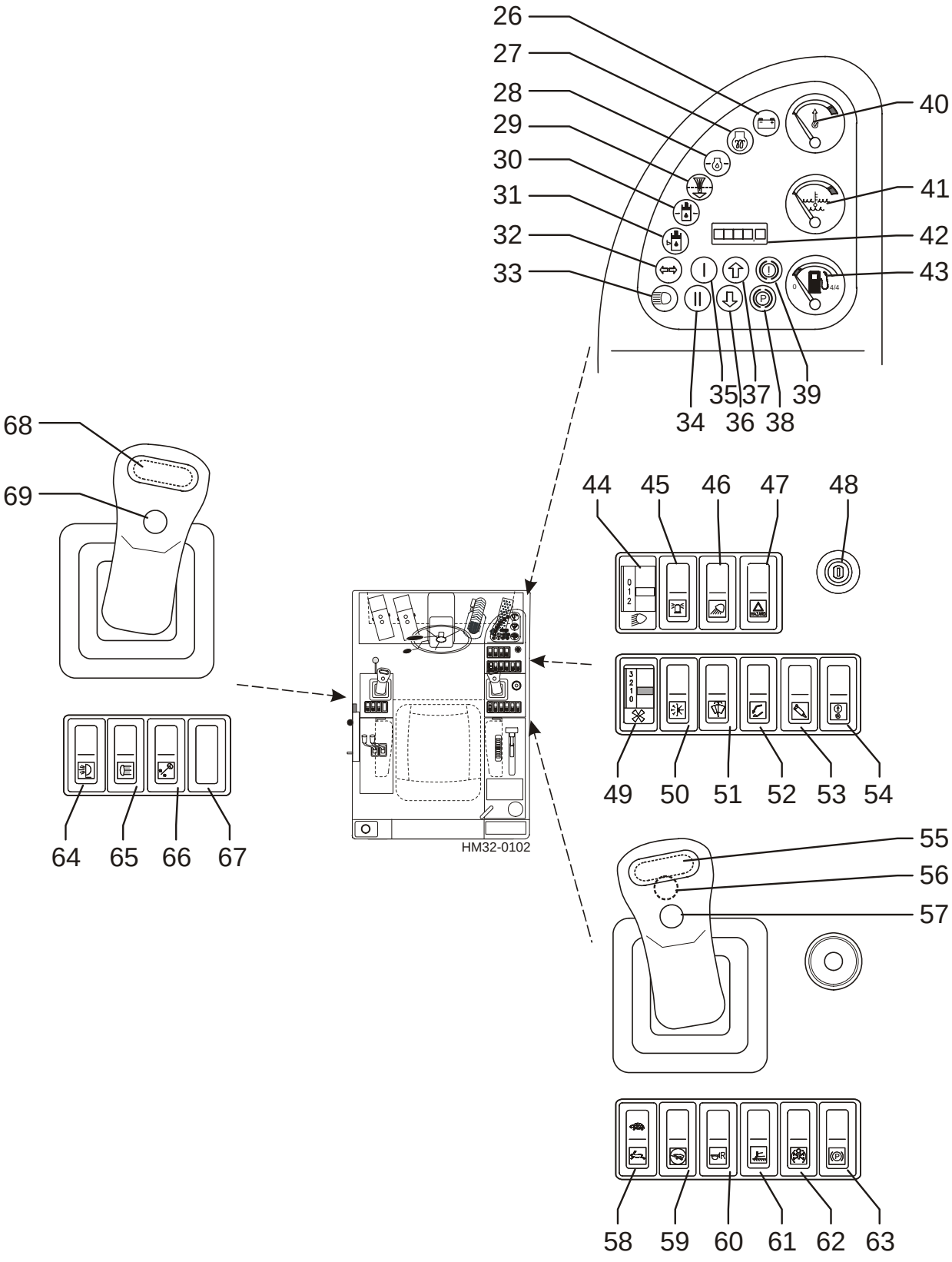
21 Superstructure slewing lock

22 Radio

23 Socket

24 Service ladder (cover)

25 Choice fresh air — recirculating air


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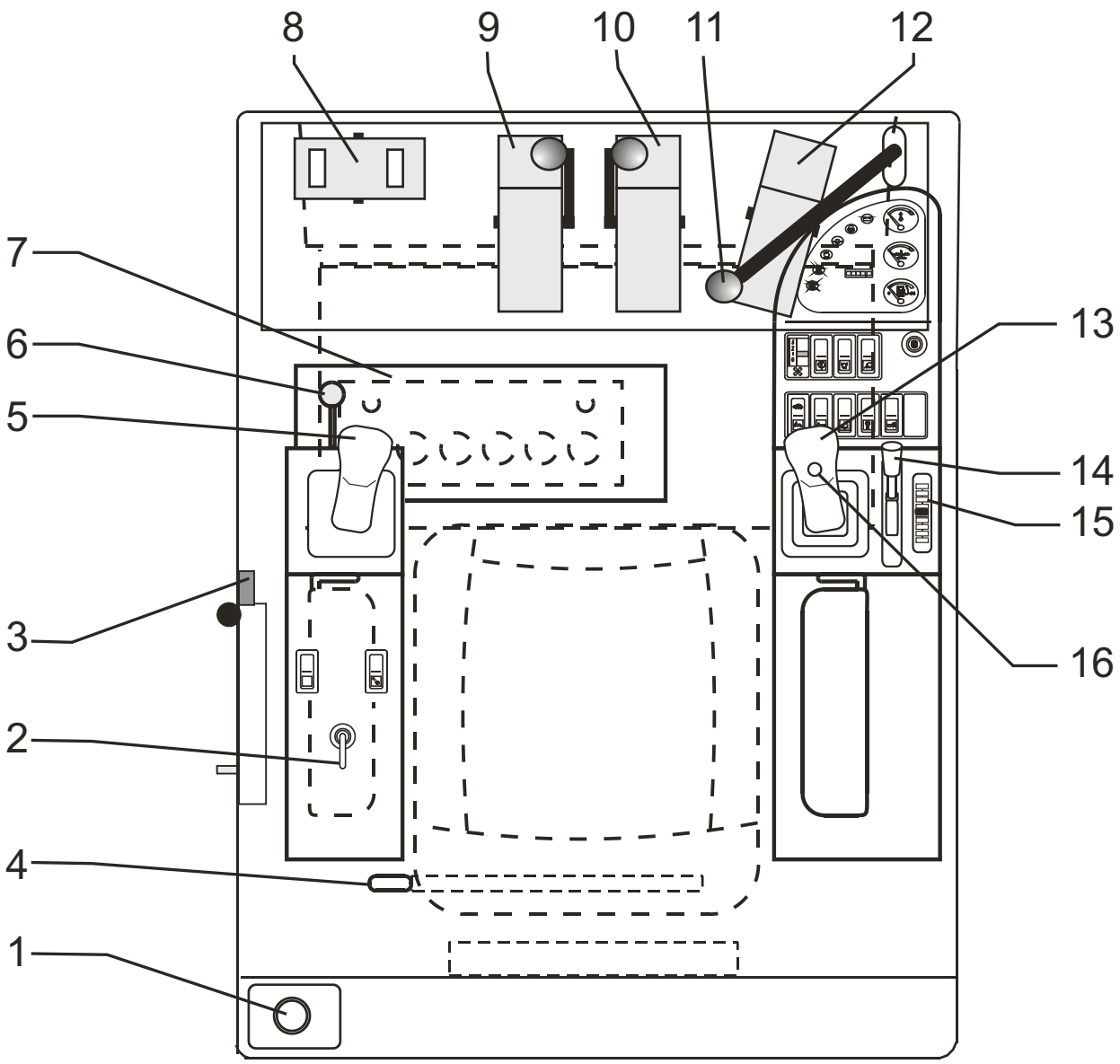
Description of instrument panel

26 RED — battery charge indicator lamp
27 YELLOW — pre-heating monitor
28 RED — engine oil pressure
29 YELLOW — air filter indicator
30 RED — hydraulic oil return filter clogging indicator
31 RED — hydraulic oil level
32 GREEN — turn signals
33 BLUE — high beam
34 GREEN — not assigned
35 GREEN — not assigned
36 GREEN — travel direction, reverse
37 GREEN — travel direction, forward
38 RED — parking brake
39 RED — brake accumulator pressure indicator
40 Overload warning device
41 Coolant temperature
42 Operating hour meter
43 Fuel gauge
44 Light switch
45 Rotating beacon
46 Working floodlights
47 Hazard warning switch
48 Pre-heat/ starter switch
49 Heater fan switch
50 Air conditioning
51 Windshield wiper - wash/wipe system
52 Working hydraulics cut-off
53 Rock breaker / additional control circuit
54 Overload warning device ON/OFF
55 Operation of additional control circuit I;
e.g. grab rotation, rock breaker
56 Horn
57 Button — change-over intermediate boom / articulation
58 Fast — slow
59 Sensitive travel
60 Travel motion alarm cut-off
61 Front dozer blade
62 Oscillating axle lock
63 Parking brake
64 Boom-mounted working floodlight
65 Rear fog lamp
66 Steering change-over
67 not assigned
68 Operation of additional control circuit II
69 Hydrostatic additional swing brake

Die nachfolgende Aufstellung beinhaltet Sonderausstattungen.

This picture contains non-standard equipment!

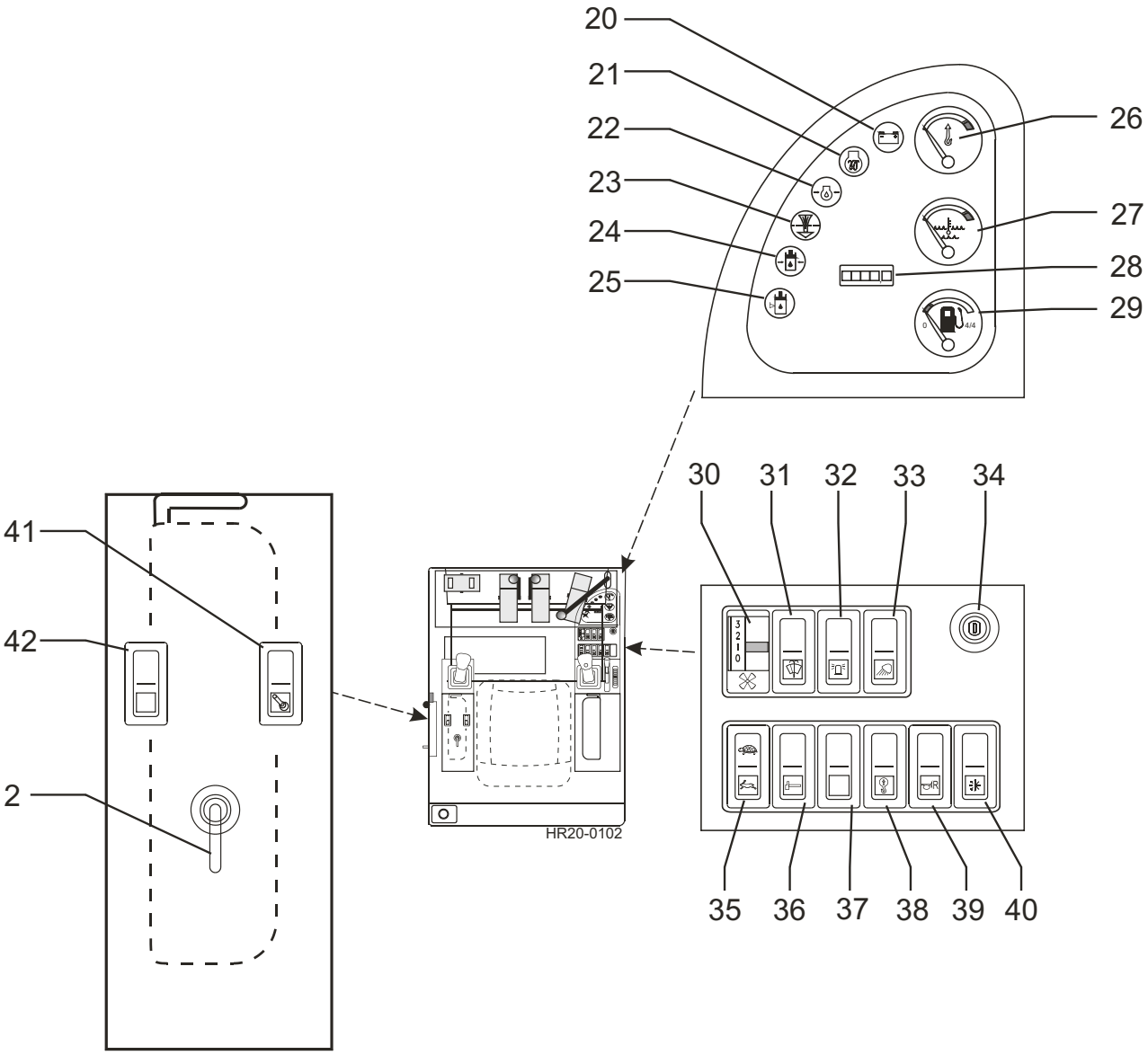
Ce schéma comporte des exécutions hors-série!



Typ Model Type Tipo	**TC 60**	**Bedienung** **Operation** **Maniement** **Manejo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Bedienelemente** **Operator controls** **Indicateurs et éléments de commande** **Elementos de manejar**		Blatt Page Feuille Página	**9.60.01**

Pos. Item Rep. No.	Deutsch	English	Français
	Bedienelemente	**Operator controls**	Indicateurs et éléments de commande
1	Behälter Scheibenwaschwasser	Window washer tank	Réservoir d'eau de lavage pour la lave-glace
2	Batterie - Hauptschalter	Battery main switch	Interrupteur principale - battrie
3	Türentriegelung	Door release	Déverrouillage de portière
4	Umschalter Frischluft/Umluft	Selector switch fresh air / circulating air	Inverseur air frais / air pulsé
5	Betätigungshebel - Baggereinrichtung	Joy stick for digging equipment	Manette de commande équipement pelle
6	Abschalter für Arbeitshydraulik (Anheben der Konsole)	Cut-off for working hydraulics (raise control panel)	Interrupteur équipement hydraulique (soulever l'accoudoir)
7	Wartungsdeckel Batterie	Battery service cover	Couvercle d'entretien batterie
8	Betätigung - Knicken	Actuation of articulation	Commande - articulation
9	Fahrwerk links	Crawler unit, left	Chenille gauche
10	Fahrwerk rechts	Crawler unit, right	Chenille droite
11	Betätigungshebel - Räumschild	Actuating lever for dozer blade	Manette de commande - lame de remblayage
12	Zusatzsteuerkreis - Greifer / Hammer	Additional control circuit - grab / rock breaker	Circuit supplémentaire - benne preneuse / marteau
13	Betätigungshebel - Baggereinrichtung	Joy stick for digging equipment	Manette de commande - équipement pelle
14	Motordrehzahlverstellung (Handgas)	Engine speed (manual throttle)	Manette d'accélérateur
15	Temperaturregelung Heizung	Temperature control, heating	Régulateur de température du chauffage
16	Signalhorn	Horn	Klaxon

Armaturenkonsole

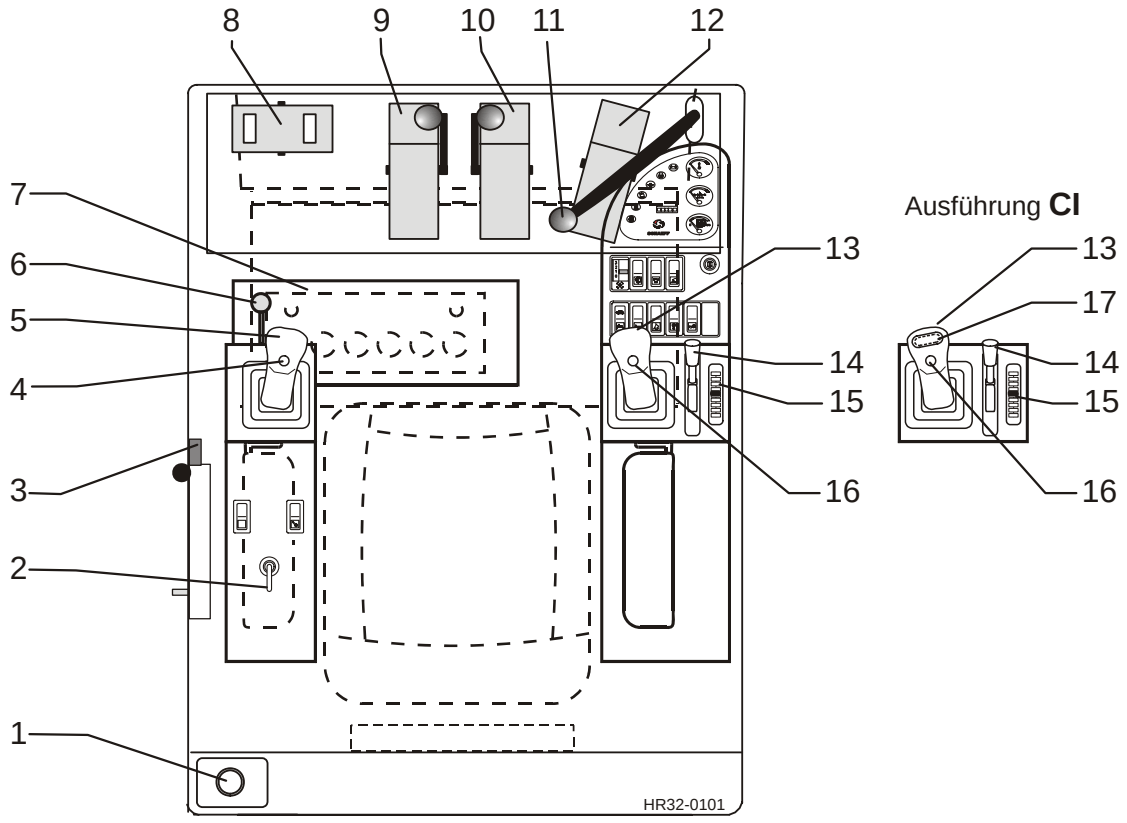


Typ Model Type Tipo	**TC 60**	**Bedienung** **Operation** **Maniement** **Manejo**	Datum Edition Date Fecha	**01.2007**
Benennung Description Dénomination Denominación	**Armaturenkonsole** **Instrument panel** **Console de commande** **Consola de mando**		Blatt Page Feuille Página	**9.60.03**

Pos. Item Rep. No.	Deutsch	English	Français
	Beschreibung - Armaturenkonsole	**Description - Instrument panel**	**Descriptif - console de commande**
2	Batteriehauptschalter	Battery main switch	Interrupteur principale de batterie
20	Ladekontrolllampe	Battery charge indicator	Témoin de charge
21	Vorglühüberwachung	Pre -heating monitor	Témoin de préchauffage
22	Motoröldruck	Engine oil pressure	Pression d'huile moteur
23	Luftfilterkontrolle	Air filter indicator	Contrôle d'entretien du filtre à air
24	Hydraulikölfilter - Verschmutzungsanzeige	Hydraulic oil filter - clogging indicator	Témoin colmatage du filtre d'huile hydraulique
25	nicht belegt	not assigned	non utilisé
26	Lastwarneinrichtungsanzeige	Overload warning device	Avertisseur de charge
27	Kühlmitteltemperatur	Coolant temperature	Température réfrigérant
28	Betriebsstundenzähler	Operating hour meter	Compteur d'heures de service
29	Kraftstoffvorratsanzeige	Fuel indicator	Témoin de carburant
30	Gebläseschalter - Heizung	Heater fan switch	Commutateur ventilation - chauffage
31	Scheibenwischer - Wisch-/Waschanlage	Windshield wash/ wipe system	Essuie - glace / lave - glace
32	Rundum - Warnleuchte	Rotating beacon	Gyrophare
33	Arbeitsscheinwerfer	Working floodlight	Phare de travail
34	Glühstartschalter	Pre-heat / starter switch	Interrupteur de préchauffage et démarrage
35	Schnell - Langsam	high speed / low speed	Grande vitesse / petite
36	Umschalter - Greifer / Hammer	Switch - grab / rock breaker	Commutateur - benne preneuse / marteau
37	nicht belegt	not assigned	non utilisé
38	Abschalter - Lastwarneinrichtung (akustisch)	Switch - overload warning device	Interrupteur - avertisseur de charge
39	Abschalter - Fahralarm	Switch - travel motion alarm	Interrupteur - avertisseur de translation
40	Option - Klimaanlage	Option - Air conditioning	Option - climatisation
41	Option - Umschaltung ISO-Steuerung - SAE-Steuerung	Option - Changeover from ISO control to SAE control	Option - commutation commande ISO / commande John Deere
42	nicht belegt	not assigned	non utilisé

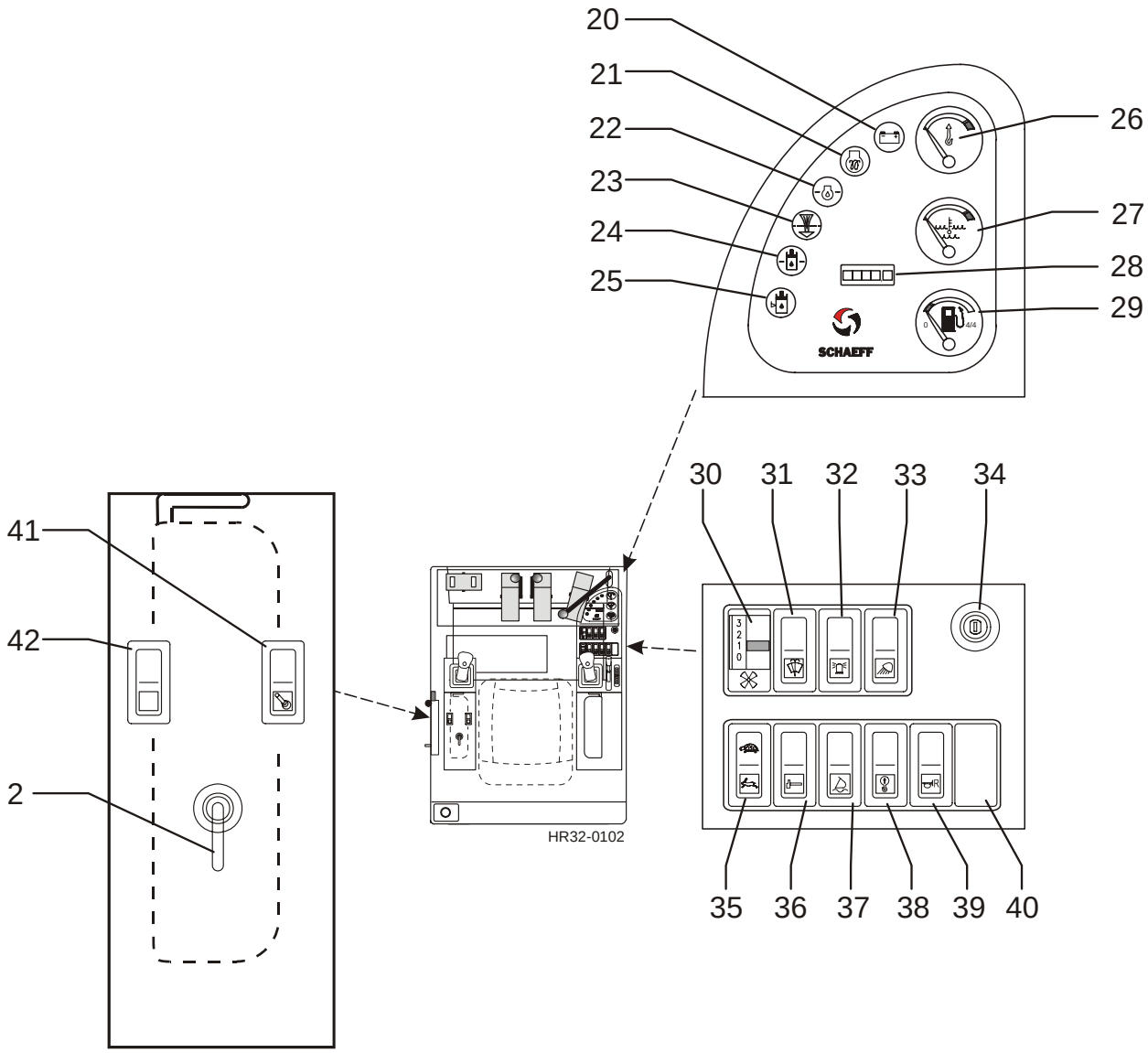
Operator controls

This picture contains non-standard equipment!



1 Window washer tank
2 Battery main switch
3 Door release
4 Hydrostatic additional swing brake
5 Actuating lever for excavator installation
6 Cut-off for working hydraulics (raise control panel)
7 Battery service cover
8 Actuation of articulation
9 Crawler unit, left
10 Crawler unit, right
11 Actuating lever for dozer blade
12 Additional control circuit — grab/ rock breaker
with "Circular" boom fitted: intermediate boom
13 Actuating lever for excavator installation
14 Engine speed (manual throttle)
15 Temperature control, heating
16 Horn
17 **with "Circular" boom fitted**: Additional control circuit — grab/ rock breaker

Instrument panel



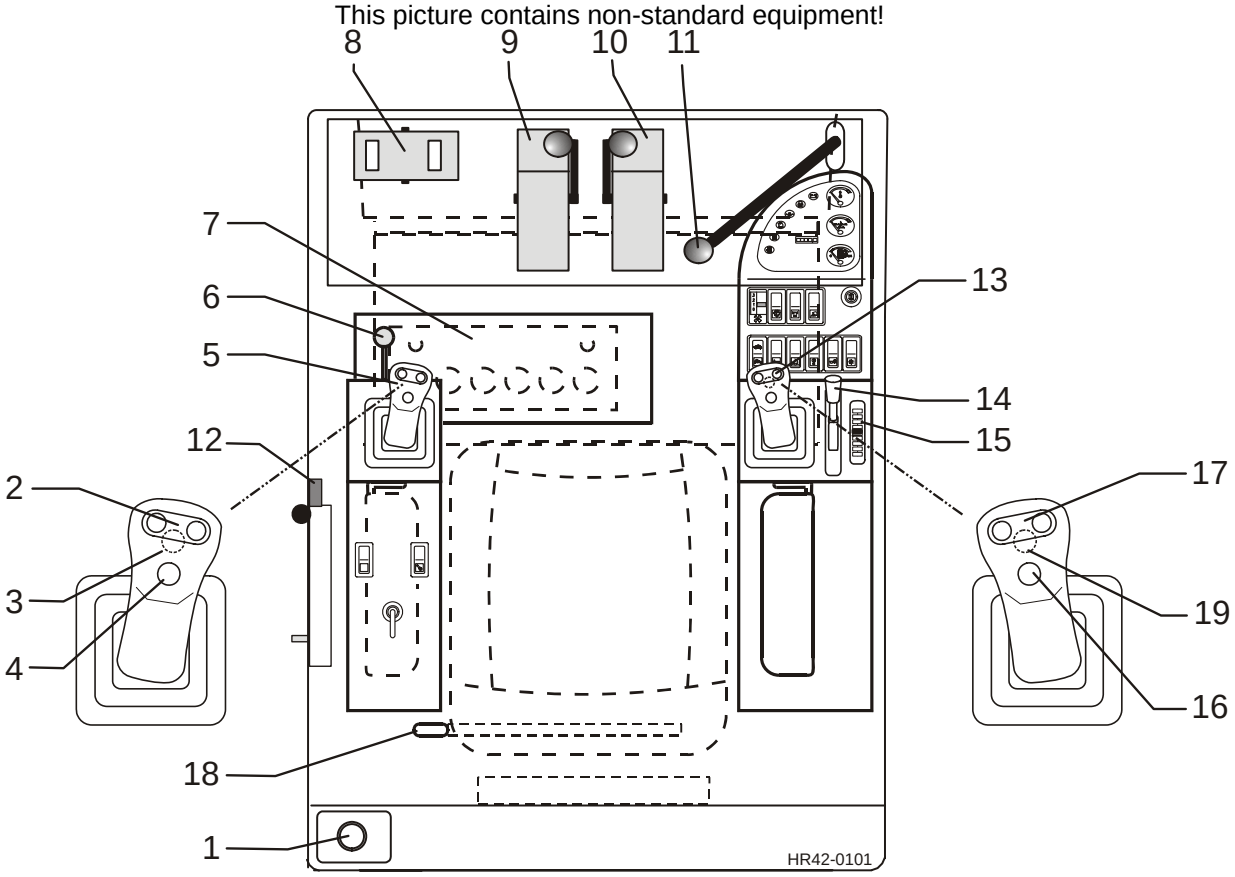
Instrument panel

Description — Instrument panel

2	Battery main switch
20	Battery charge indicator
21	Pre-heating monitor
22	Engine oil pressure
23	Air filter indicator
24	Hydraulic oil filter - clogging indicator
25	Hydraulic oil level
26	Overload warning device
27	Coolant temperature
28	Operating hour meter
29	Fuel gauge
30	Heater fan switch
31	Windshield wash/ wipe system
32	Rotating beacon
33	Working floodlight
34	Pre-heat/ starter switch
35	Fast - slow
36	Rock breaker
37	Dozer blade float position
38	Overload warning device cut-off
39	Travel motion alarm OFF switch
40	not assigned
41	Changeover from ISO control to John Deere control (option)
42	not assigned

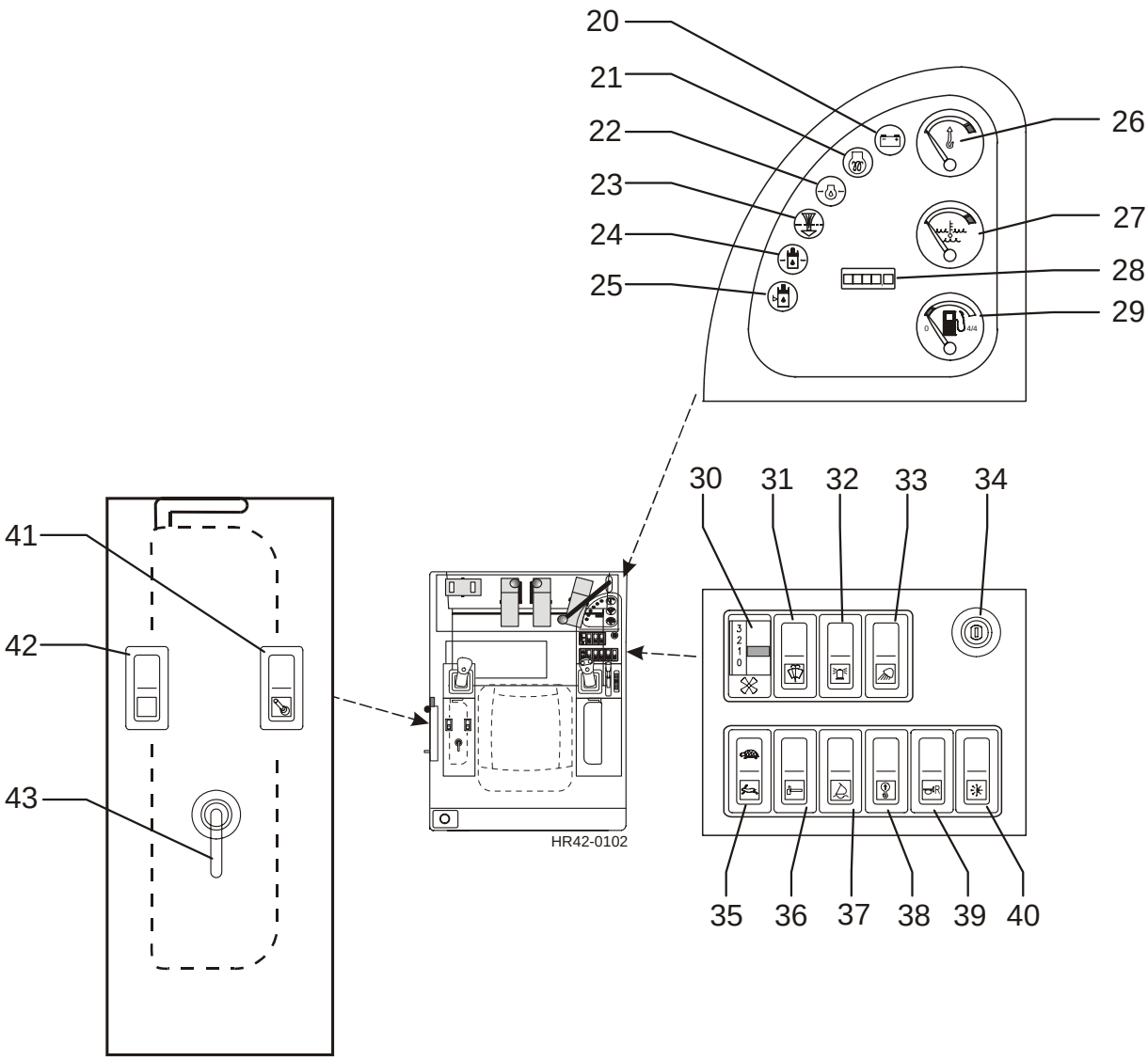
Operator controls

This picture contains non-standard equipment!



1	Window washer tank
2	Rocker switch - Additional control circuit — special function
3	Push-button – Holding brake for uppercarriage slewing motion
4	Push-button – Swing brake
5	Actuating lever for excavator installation
6	Cut-off for working hydraulics (raise control panel)
7	Battery service cover
8	Actuation of articulation
9	Crawler unit, left
10	Crawler unit, right
11	Actuating lever — dozer blade
12	Door release
13	Actuating lever — excavator installation
14	Engine speed adjustment (manual throttle)
15	Temperature control, heating
16	Push-button – Horn
17	Rocker switch - Additional control circuit — grab/ rock breaker
18	Choice fresh air / circulating air
19	Push-button – not assigned

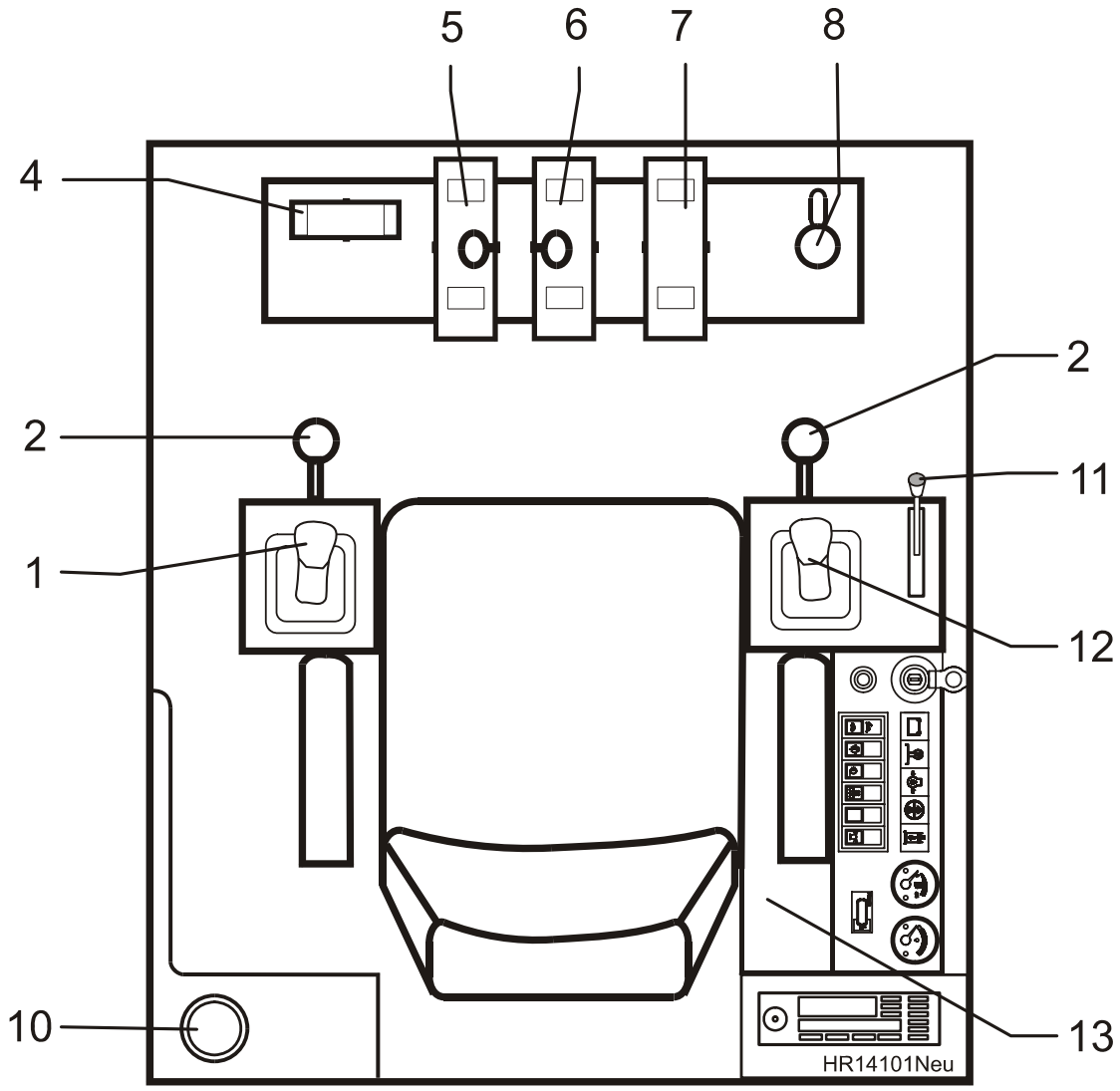
Instrument panel



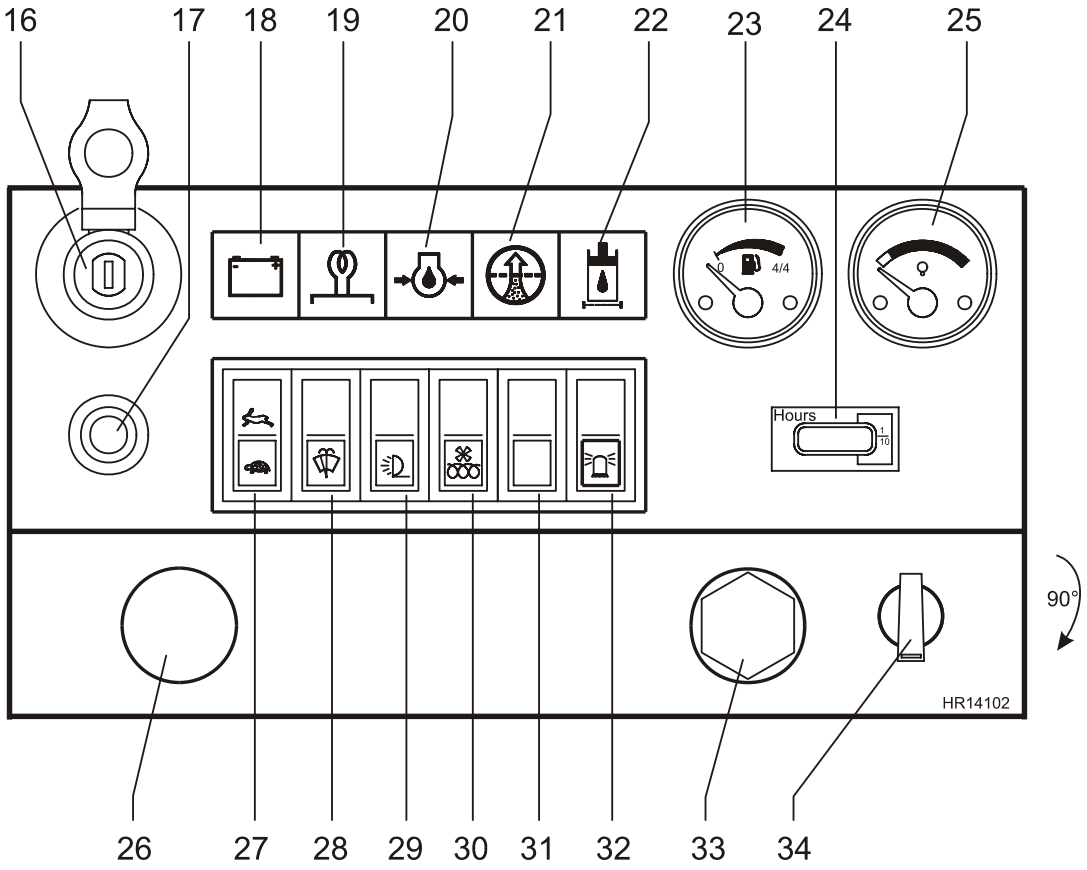
Instrument panel

Description — Instrument panel

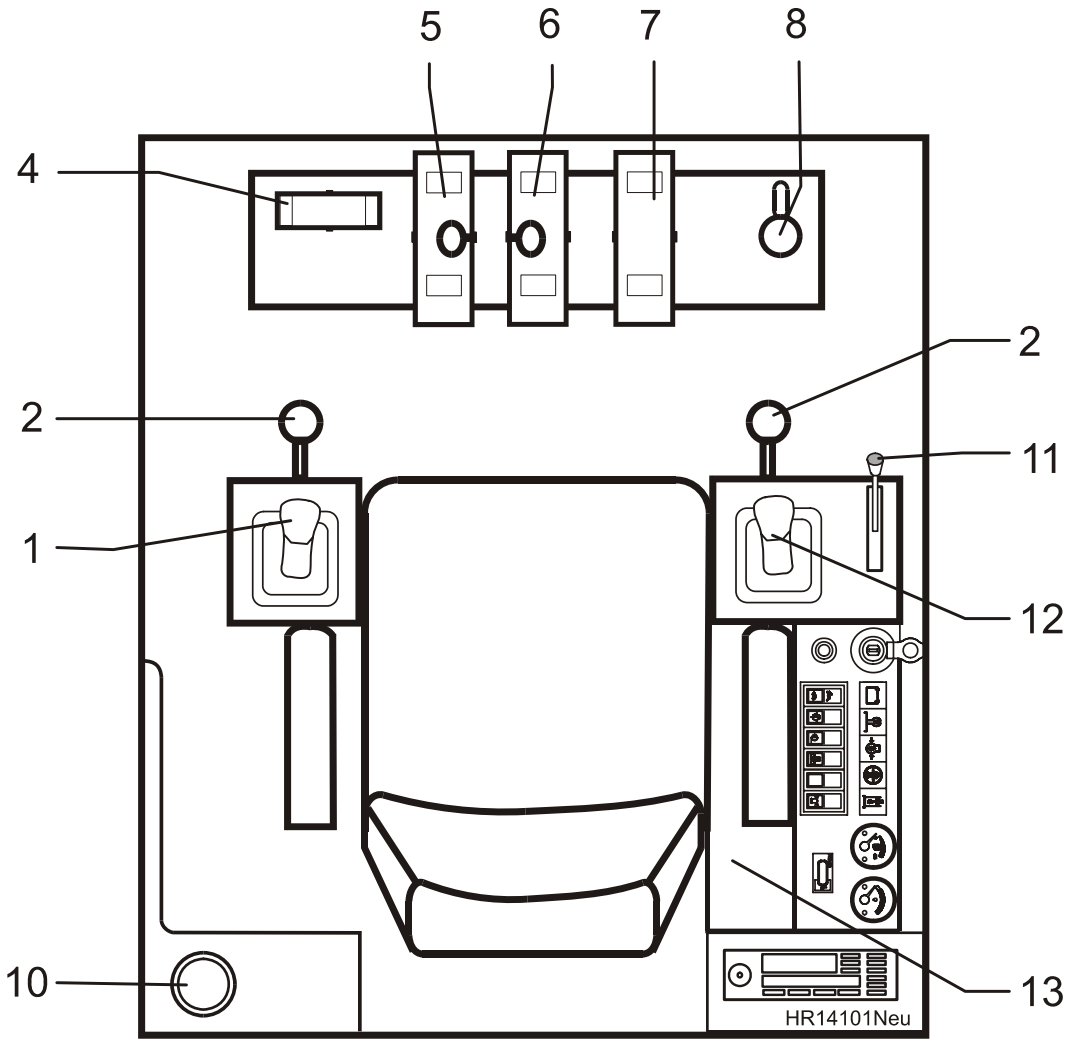
20 Battery charge indicator
21 Pre-heating monitor
22 Engine oil pressure
23 Air filter indicator
24 Hydraulic oil filter clogging indicator
25 Hydraulic oil level
26 Overload warning device
27 Coolant temperature
28 Operating hour meter
29 Fuel gauge
30 Heater fan switch
31 Windshield wash/ wipe system
32 Rotating beacon
33 Working floodlight
34 Glow-plug and starter switch
35 FAST - SLOW
36 Rock breaker
37 Dozer blade float position
38 Overload warning device OFF switch
39 Travel motion alarm OFF switch
40 Option — Air conditioning
41 Option — Changeover ISO-SAE control
42 not assigned
43 Battery disconnect switch



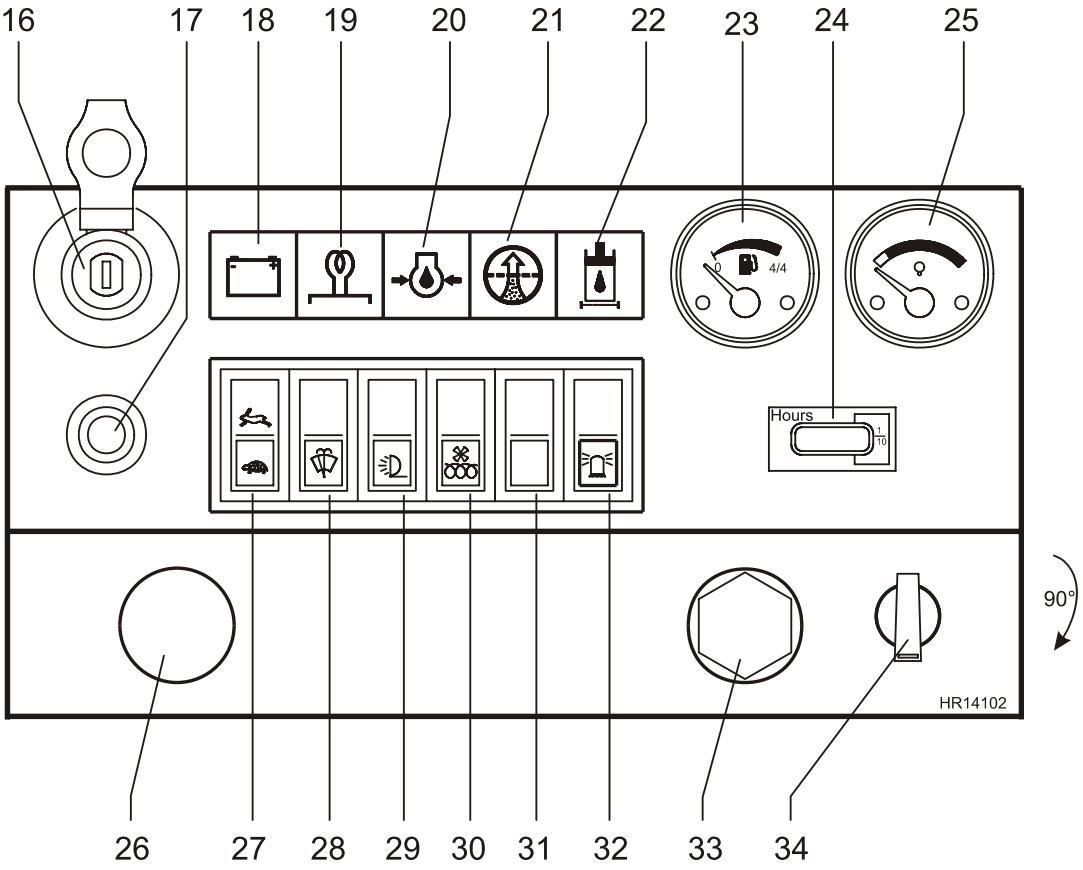
1	Actuation of excavator equipment
2	Cut-off - working hydraulics/ exit barrier
3	---
4	Actuation of articulation
5	Crawler-type undercarriage, left
6	Crawler-type undercarriage, right
7	Additional control circuit - grab rotation, rock breaker, etc.
8	Actuation of dozer blade
9	---
10	Windscreen washer tank
11	Manual throttle
12	Actuation of excavator equipment
13	Fuel and relay box



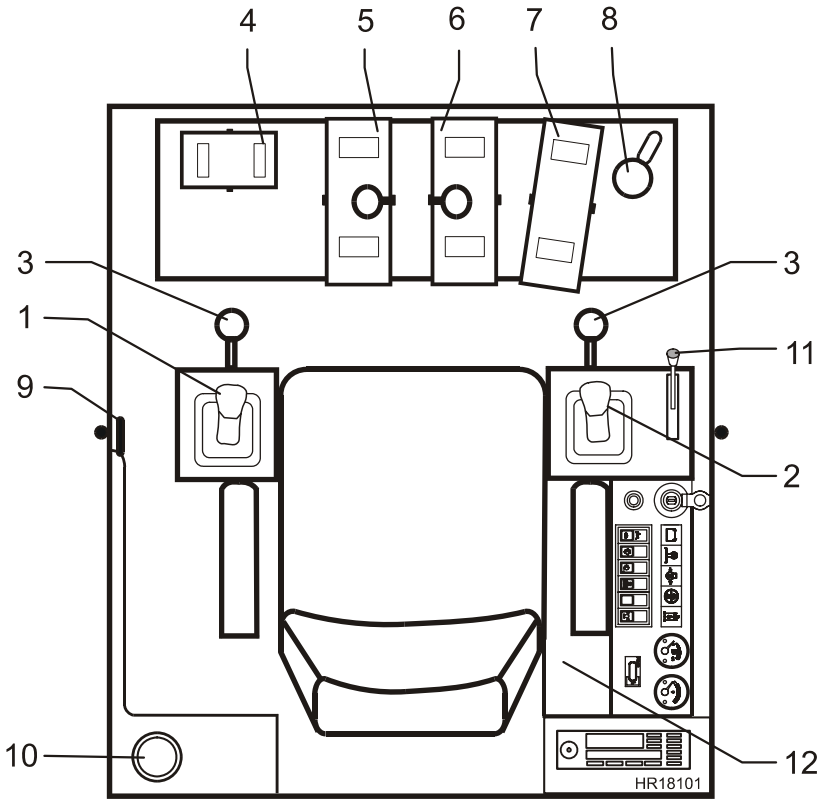
16	Pre-heat/ starter switch (ignition lock)
17	Horn button
18	Red - battery charge indicator
19	Orange - pre-heating monitor
20	Red - engine oil pressure indicator
21	Red - air filter clogging indicator
22	Hydraulic oil filter clogging indicator
23	Fuel level gauge
24	Operating hour meter
25	Coolant temperature
26	Immobilizer (option)
27	Fast/ slow
28	Windscreen wash/ wipe system
29	Working floodlights
30	Heater / fan
31	Blank
32	Rotating warning beacon (option)
33	Warning buzzer
34	Socket



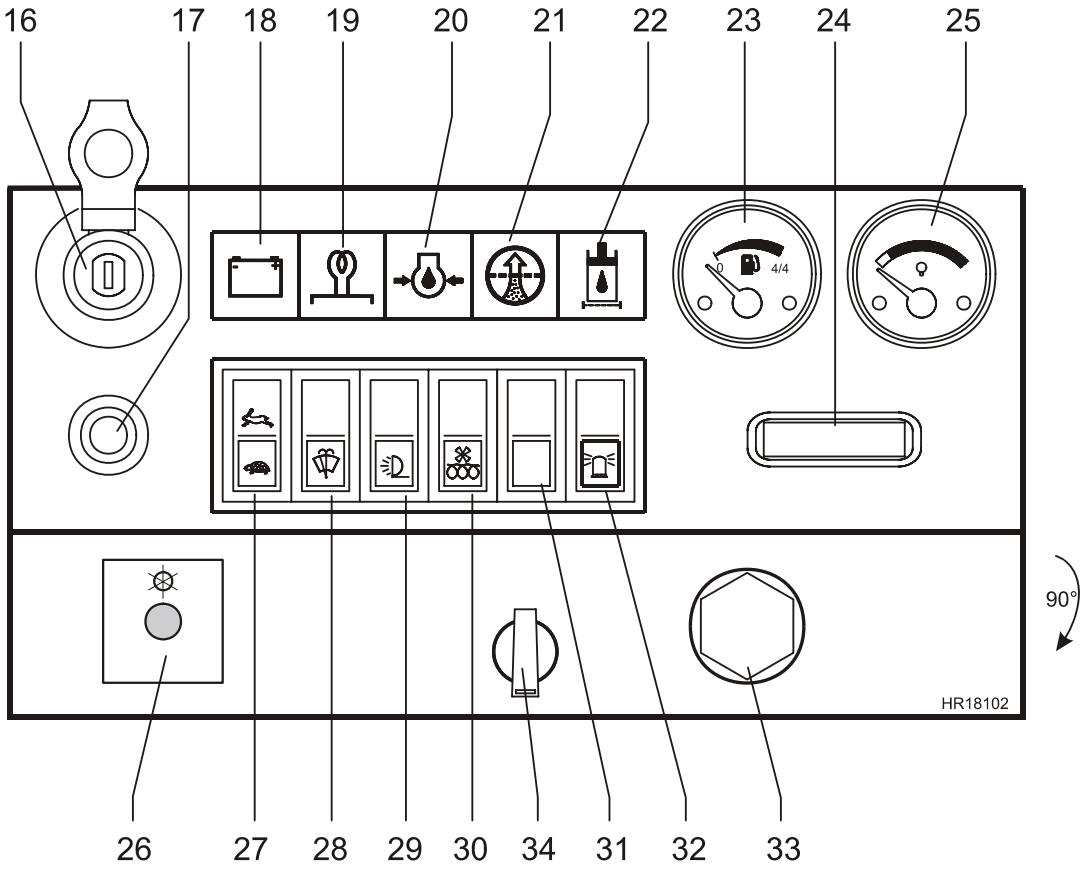
1	Actuation of excavator equipment
2	Cut-off - working hydraulics/ exit barrier
3	---
4	Actuation articulation
5	Crawler-type undercarriage, left
6	Crawler-type undercarriage, right
7	Additional control circuit - grab rotation, rock breaker, etc.
8	Actuation of dozer blade
9	---
10	Washer tank for windscreen
11	Manual throttle
12	Actuation of excavator equipment
13	Fuel and relay box



16	Pre-heat/ starter switch (ignition lock)
17	Horn button
18	Red - battery charge indicator
19	Orange - pre-heating monitor
20	Red - engine oil pressure indicator
21	Red - air filter clogging indicator
22	Hydraulic oil filter clogging indicator
23	Fuel gauge
24	Operating hour meter
25	Coolant temperature
26	Immobilizer (option)
27	Fast/ slow
28	Windscreen wash/ wipe system
29	Work floodlights
30	Heater / ventilation
31	Blank
32	Rotating warning beacon (option)
33	Warning buzzer
34	Socket



1	Actuation of excavator equipment
2	Actuation of excavator equipment
3	Working hydraulics cut-off lever (exit barrier)
4	Actuation of articulation
5	Crawler unit, left
6	Crawler unit, right
7	Additional control circuit - grab rotation, rock breaker, etc.
8	Actuation of dozer blade
9	Door release
10	Washer tank for windscreen wiper
11	Manual throttle
12	Fuse and relay box



16	Pre-heat/ starter switch (ignition lock)
17	Horn button
18	Red - battery charge indicator
19	Orange - pre-heating monitor
20	Red - engine oil pressure indicator
21	Yellow - air filter clogging indicator
22	Hydraulic oil filter clogging indicator
23	Fuel gauge
24	Operating hour meter
25	Coolant temperature
26	Immobilizer (option)
27	Fast/ slow
28	Windscreen wash/ wipe system
29	Working floodlight(s)
30	Heater / ventilation
31	Blank
32	Rotating warning beacon (option)
33	Warning buzzer
34	Socket

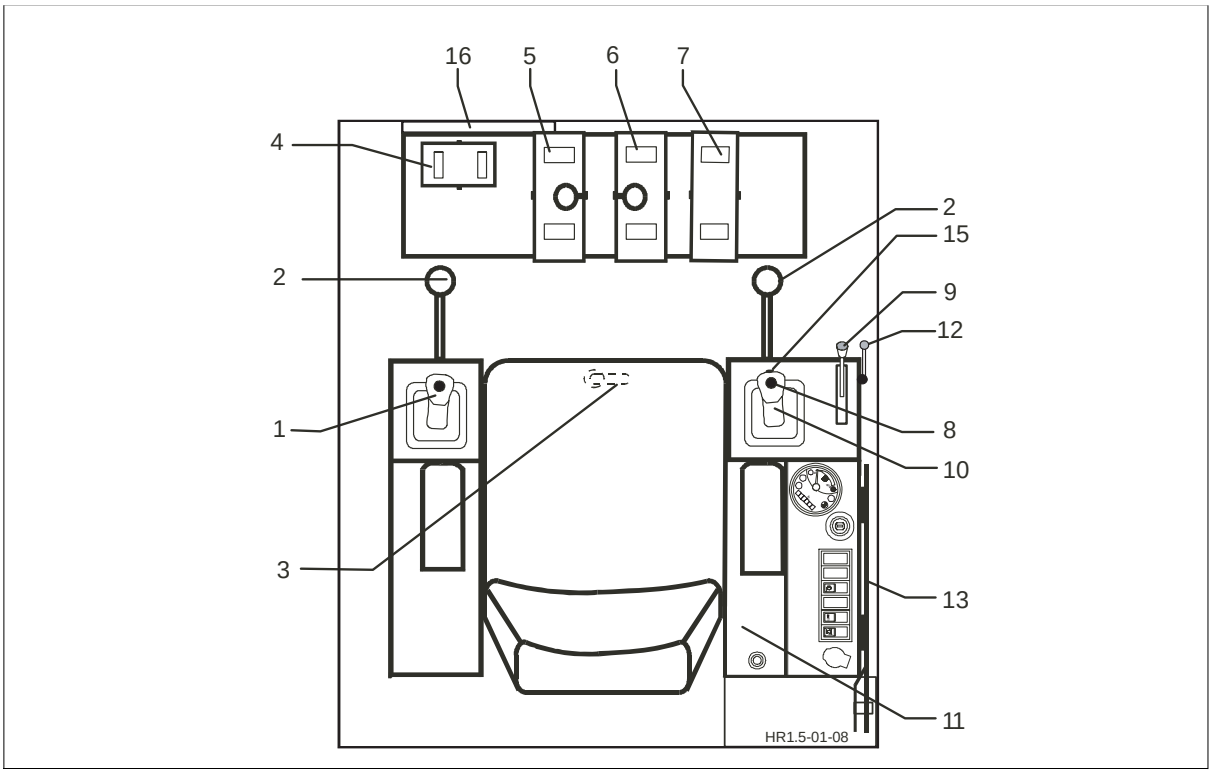


Fig. 8 Operator controls

1 Operation – excavator installation
2 OFF switch – excavator hydraulics / exit barrier
3 Uppercarriage locking pin
4 Operation – articulation
5 Crawler unit, left
6 Crawler unit, right
7 Additional control circuit – rock breaker, etc. (option)
8 Operation – dozer blade up / down (in connection with joystick Pos. 10)
9 Manual throttle
10 Operation – excavator installation
11 Fuse and relay box
12 Change-over "ISO" to "SAE" control (option)
13 Vandalism guard
14 -
15 Horn
16 Storage space for control rod of quick-attach system

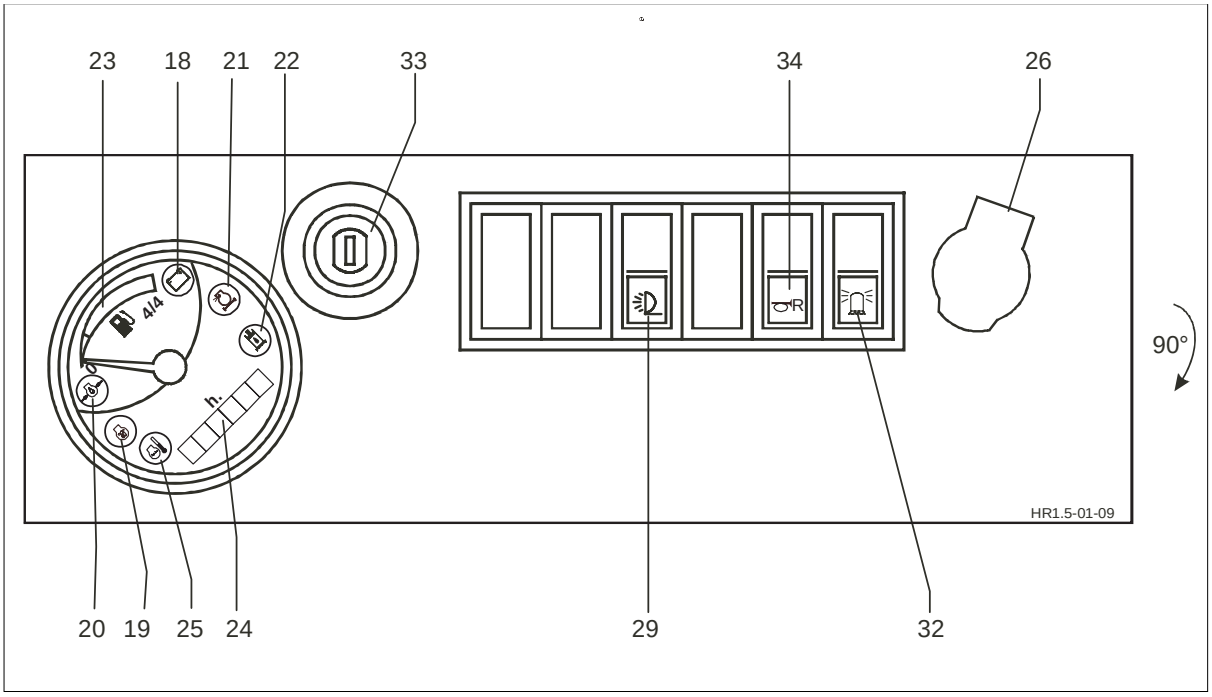


Fig. 9 Operator controls

18 Battery charge indicator (red)

19 Preheating monitor (yellow)

20 Engine oil pressure indicator (red)

21 Air filter clogging indicator (yellow)

22 Hydraulic oil filter clogging indicator (yellow)

23 Fuel gauge

24 Operating-hour meter

25 Coolant temperature (red)

26 Power socket

27 -

28 -

29 Working floodlight(s)

30 -

31 -

32 Rotating beacon (option)

33 Glow plug and starter switch (ignition lock)

34 Travel motion alarm ON/OFF (option)

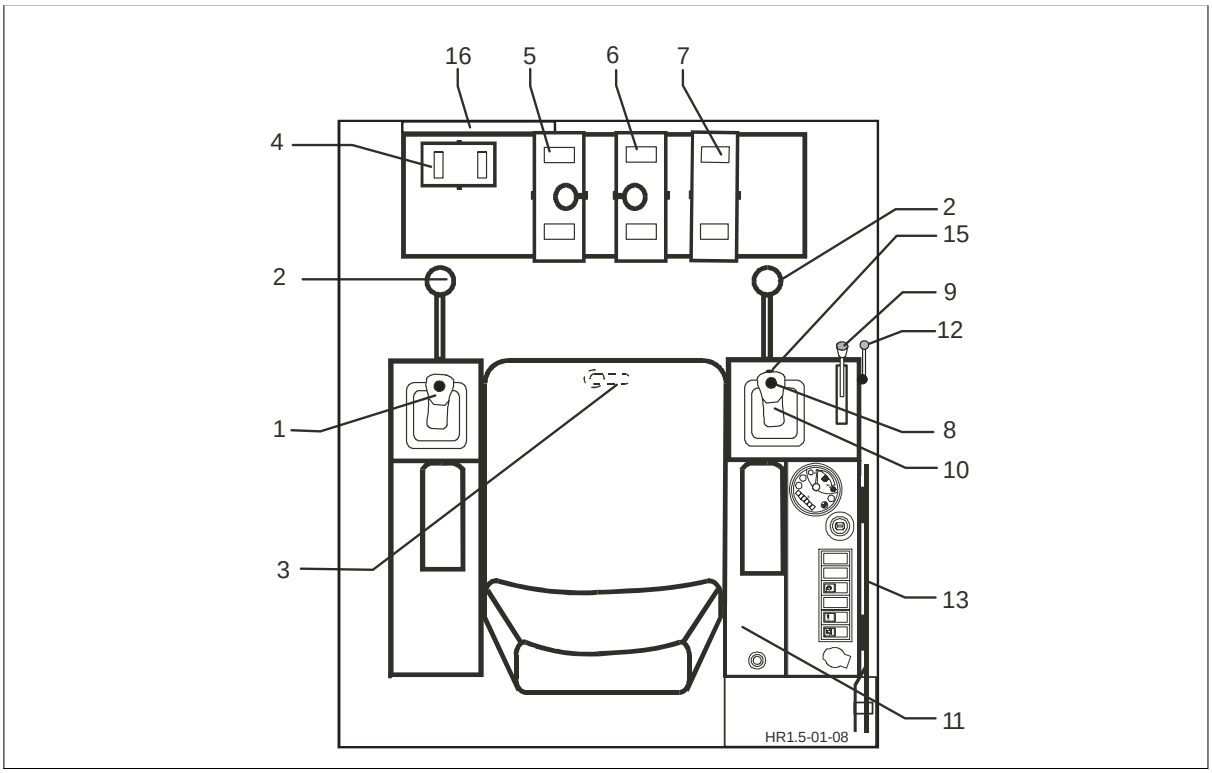


Fig. 8 Operator controls

1 Operation – excavator installation
2 OFF switch – excavator hydraulics / exit barrier
3 Uppercarriage locking pin
4 Operation – articulation
5 Crawler unit, left
6 Crawler unit, right
7 Additional control circuit – rock breaker, etc. (option)
8 Operation – dozer blade up / down (in connection with joystick Pos. 10)
9 Manual throttle
10 Operation – excavator installation
11 Fuse and relay box
12 Change-over "ISO" to "SAE" control (option)
13 Vandalism guard
14 -
15 Horn
16 Storage space for control rod of quick-attach system

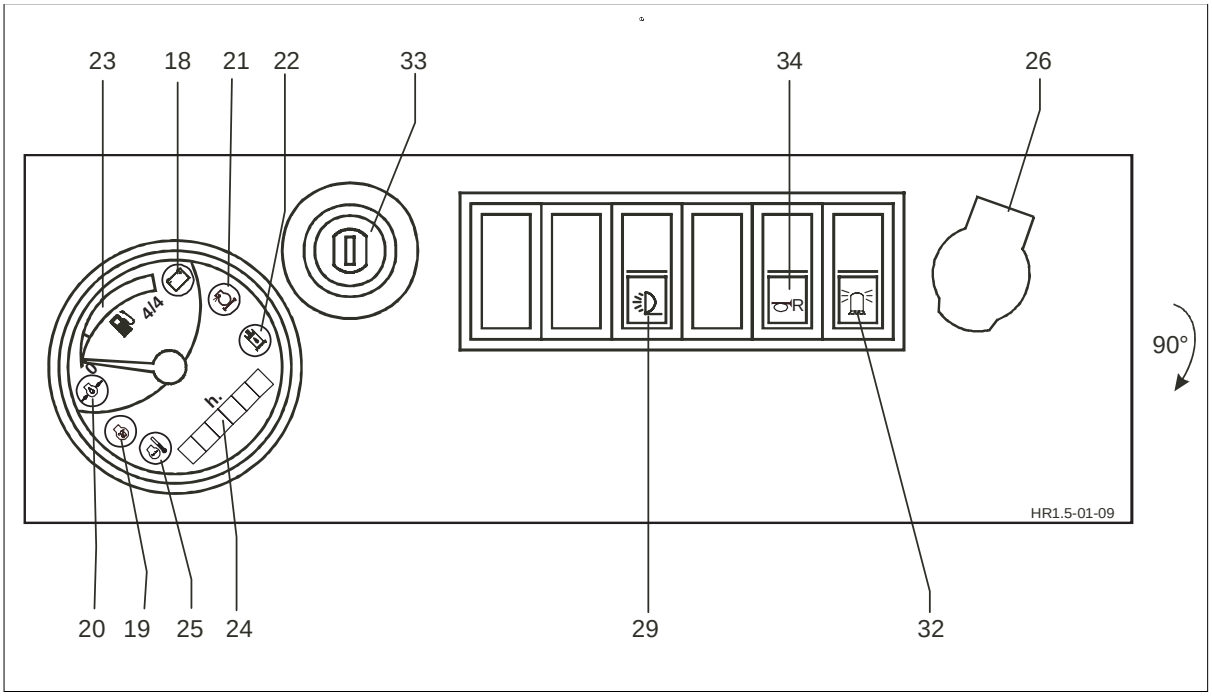


Fig. 9 Operator controls

18 Battery charge indicator (red)

19 Preheating monitor (yellow)

20 Engine oil pressure indicator (red)

21 Air filter clogging indicator (yellow)

22 Hydraulic oil filter clogging indicator (yellow)

23 Fuel gauge

24 Operating-hour meter

25 Coolant temperature (red)

26 Power socket

27 -

28 -

29 Working floodlight(s)

30 -

31 -

32 Rotating beacon (option)

33 Glow plug and starter switch (ignition lock)

34 Travel motion alarm ON/OFF (option)

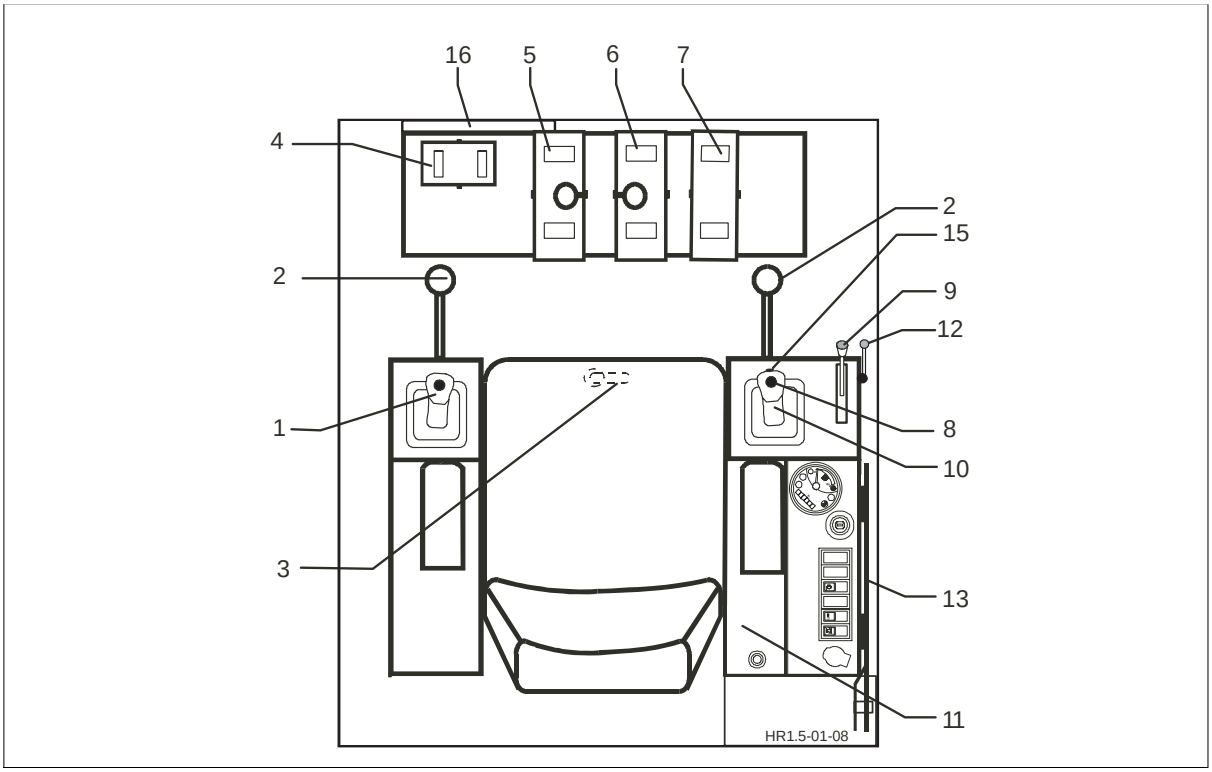


Fig. 8 Operator controls

1 Operation – excavator installation
2 OFF switch – excavator hydraulics / exit barrier
3 Uppercarriage locking pin
4 Operation – articulation
5 Crawler unit, left
6 Crawler unit, right
7 Additional control circuit – rock breaker, etc. (option)
8 Operation – dozer blade up / down (in connection with joystick Pos. 10)
9 Manual throttle
10 Operation – excavator installation
11 Fuse and relay box
12 Change-over "ISO" to "SAE" control (option)
13 Vandalism guard
14 -
15 Horn
16 Storage space for control rod of quick-attach system

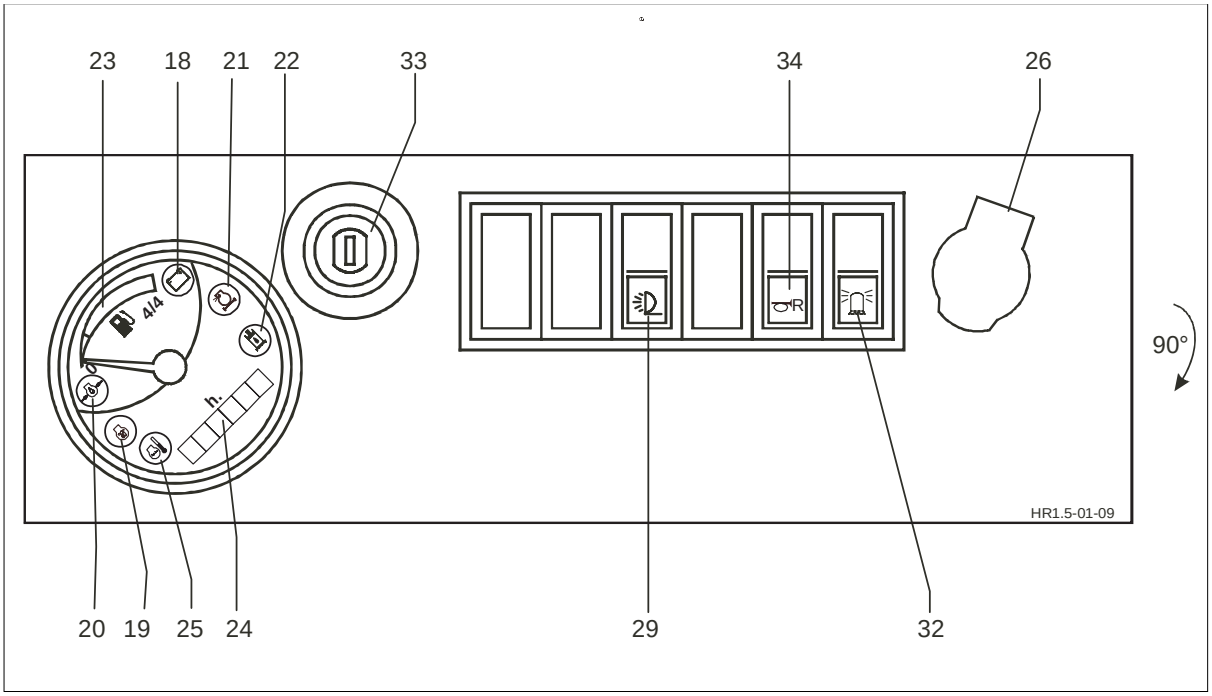


Fig. 9 Operator controls

18 Battery charge indicator (red)

19 Preheating monitor (yellow)

20 Engine oil pressure indicator (red)

21 Air filter clogging indicator (yellow)

22 Hydraulic oil filter clogging indicator (yellow)

23 Fuel gauge

24 Operating-hour meter

25 Coolant temperature (red)

26 Power socket

27 -

28 -

29 Working floodlight(s)

30 -

31 -

32 Rotating beacon (option)

33 Glow plug and starter switch (ignition lock)

34 Travel motion alarm ON/OFF (option)

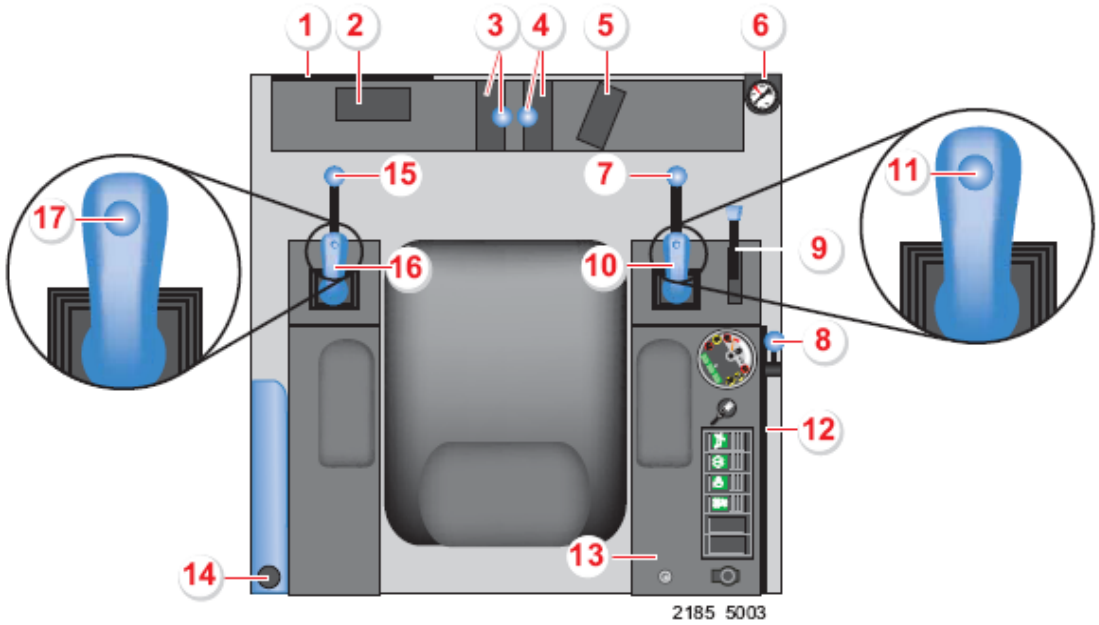


Fig. 5-3 Operating controls

1 Storage space for quick-attach system control rod
2 Work equipment articulation left/right
3 Left-hand crawler track forward/reverse
4 Right-hand crawler track forward/reverse
5 Additional control circuit for rock breaker, etc.
6 Overload display (option)
7 OFF switch for excavator hydraulics / exit barrier
8 Dozer blade up/down
9 Manual throttle
10 Operation of excavator equipment
11 Horn
12 Vandalism guard (canopy only) (option)
13 Fuse and relay box
14 Windshield washer fluid tank
15 OFF switch for excavator hydraulics / exit barrier
16 Operation of excavator equipment
17 Uppercarriage holding brake

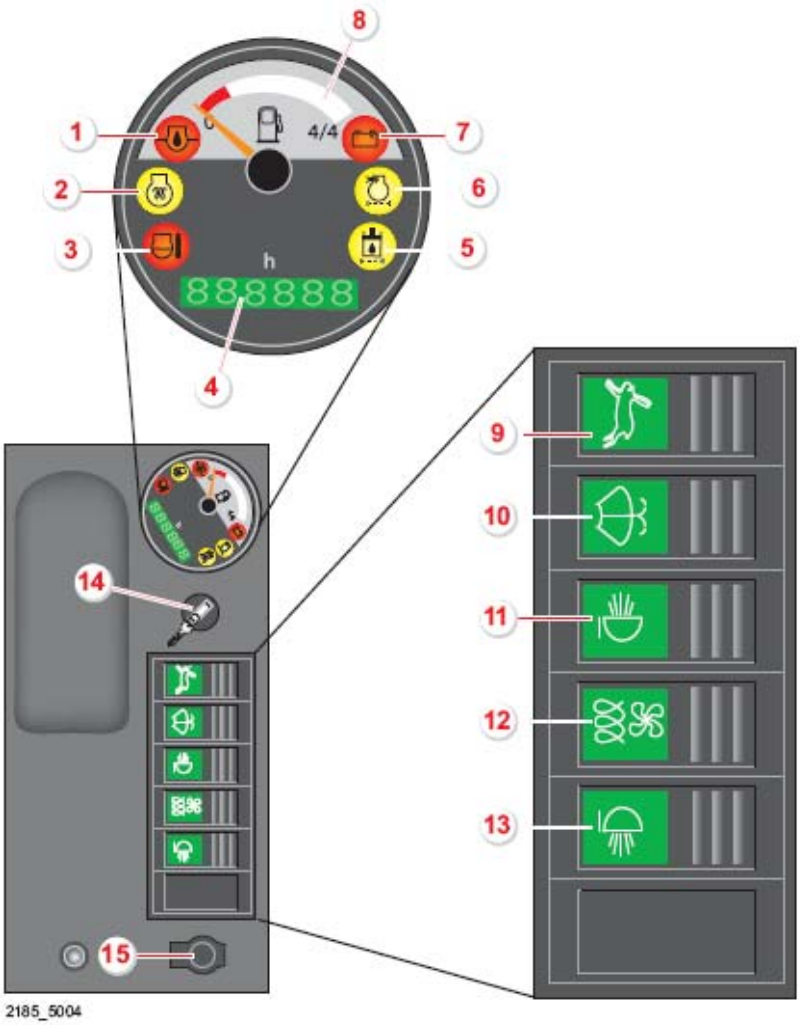


Fig. 5-4 Control console

1 Engine oil pressure
2 Preheating
3 Coolant temperature
4 Operating-hour meter
5 Hydraulic oil filter clogging
6 Air filter clogging
7 Charge control
8 Fuel level
9 Travel, FAST/SLOW
10 Windshield wiper and washer system
11 Working floodlight, front
12 Heating/fan
13 Working floodlight, rear (optional)
14 Pre-heat/ starter switch
15 Power socket

Display elements and operator controls

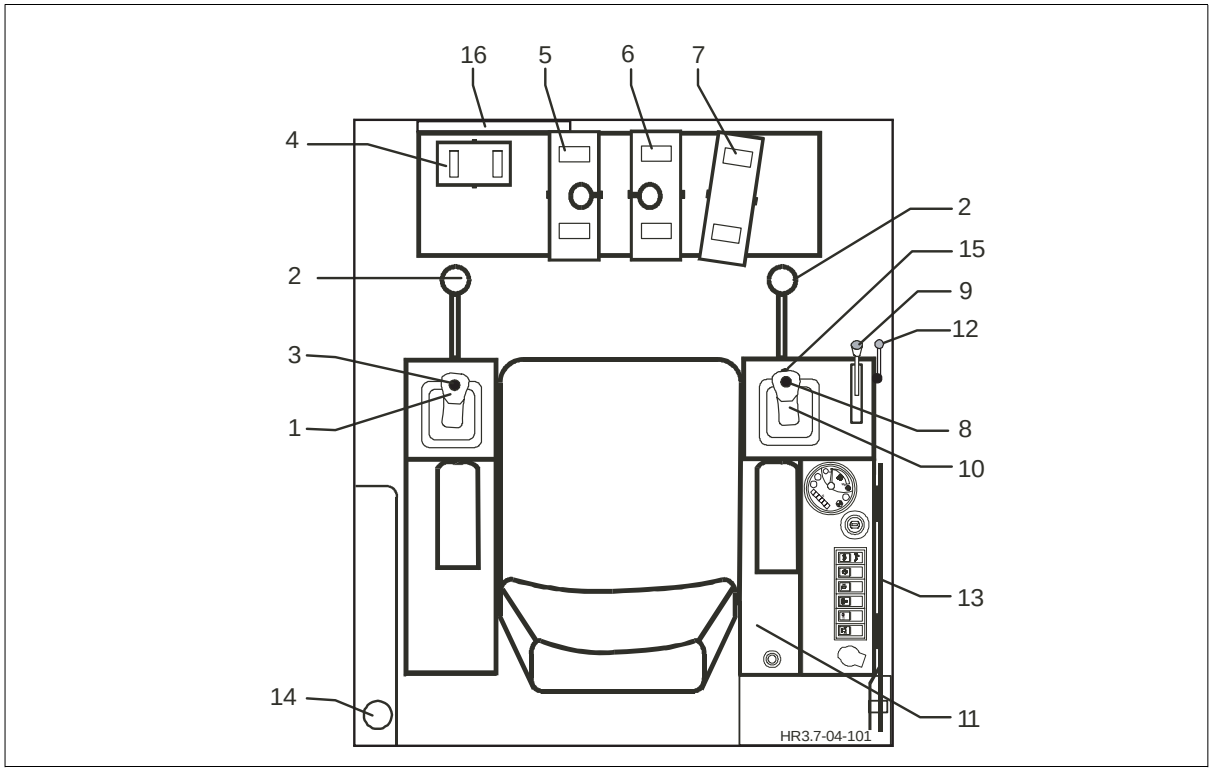


Fig. 8 Operator controls

1 *Operation - excavator installation*
2 *OFF switch - excavator hydraulics / exit barrier*
3 *Brake - swing motion of uppercarriage*
4 *Operation – articulation*
5 *Crawler unit, left*
6 *Crawler unit, right*
7 *Additional control circuit - rock breaker, etc.*
8 *Operation – dozer blade (up/down in connection with joystick Pos. 10)*
9 *Manual throttle*
10 *Operation - excavator installation*
11 *Fuse and relay box*
12 *Change-over "ISO" to "SAE" control (option)*
13 *Vandalism guard (canopy only) (option)*
14 *Windshield washer fluid tank*
15 *Horn*
16 *Storage space for control rod of quick-attach system*

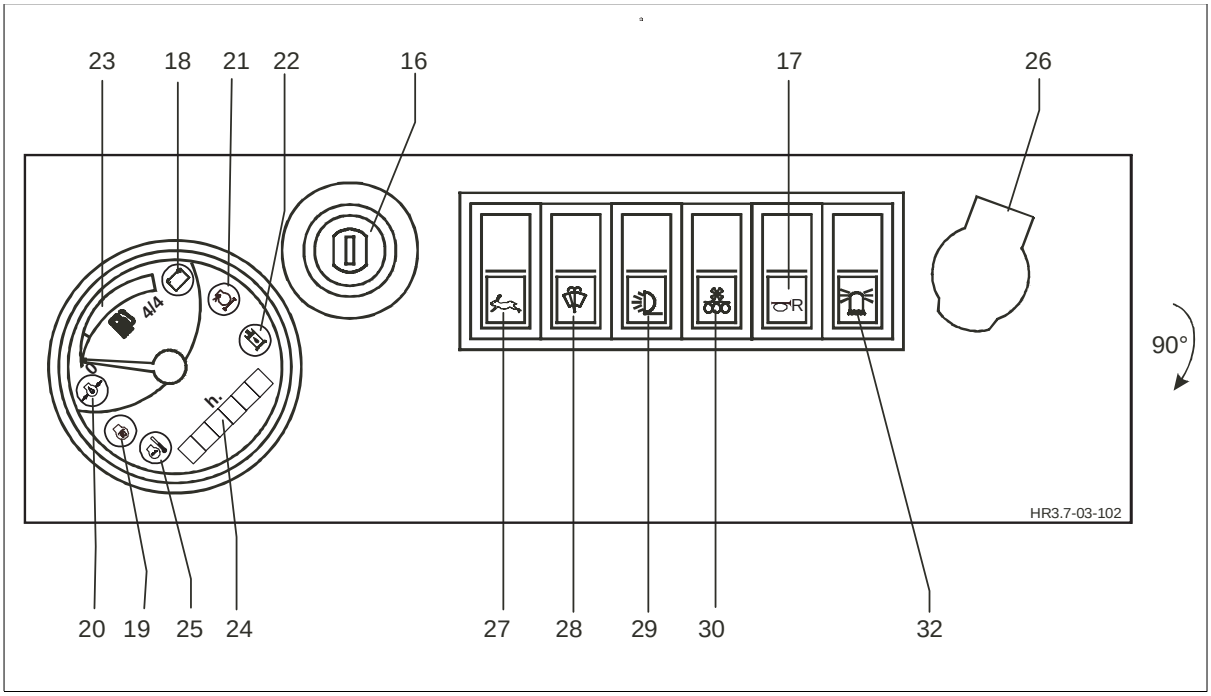


Fig. 9 Operator controls

16 Glow plug and starter switch (ignition lock)

17 Travel motion alarm ON/OFF

18 Battery charge indicator (red)

19 Preheating monitor (yellow)

20 Engine oil pressure indicator (red)

21 Air filter clogging indicator (yellow)

22 Hydraulic oil filter clogging indicator (yellow)

23 Fuel gauge

24 Operating-hour meter

25 Coolant temperature (red)

26 Power socket

27 Travel, FAST/SLOW

28 Windshield wiper and washer system

29 Working floodlight

30 Heating/ventilation

31 -

32 Rotating beacon (option)

33 -

Display elements and operating controls in operator's stand

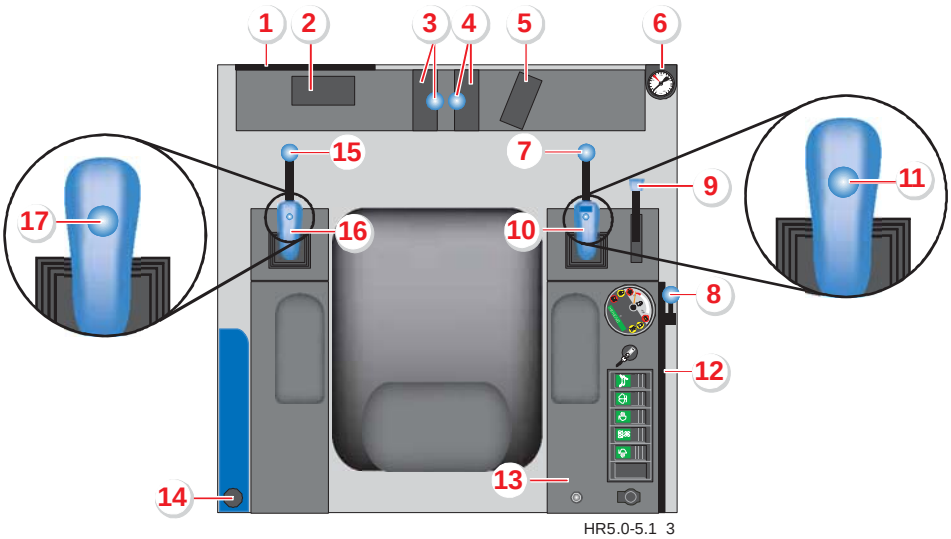
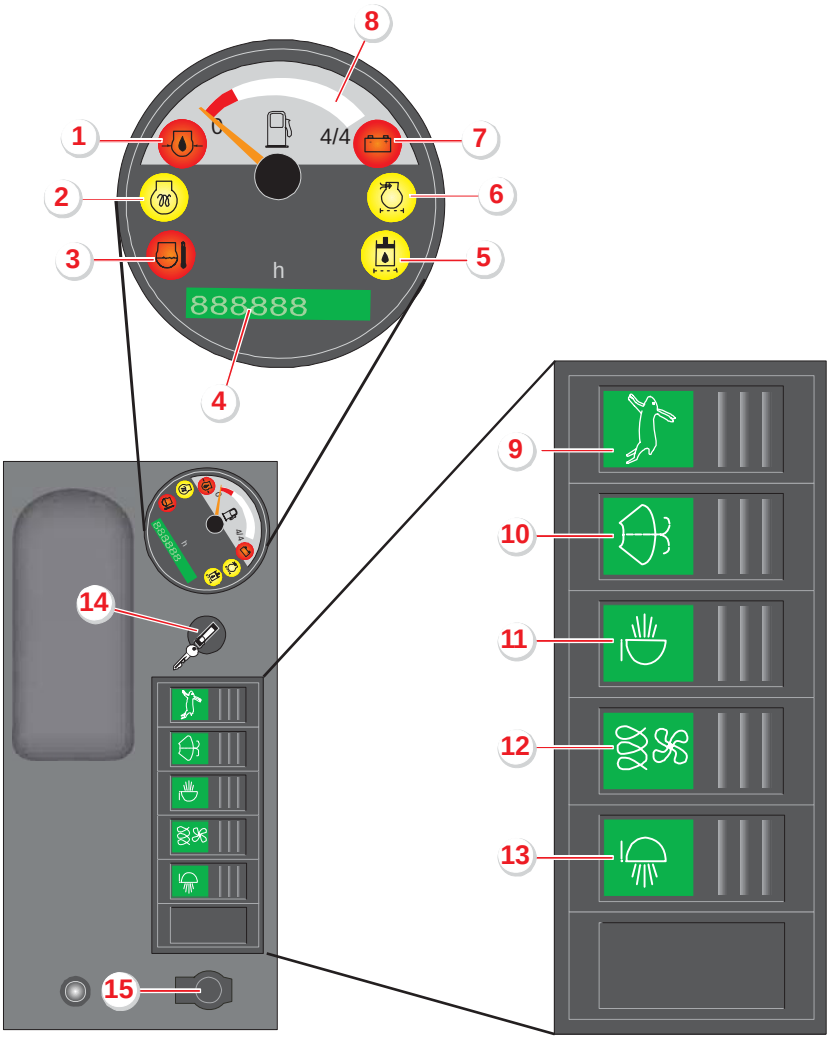


Abb. 5-3 Operating Controls

1 Storage space for quick-attach system control rod
2 Work equipment articulation left/right
3 Left-hand crawler track forward/reverse
4 Right-hand crawler track forward/reverse
5 Additional control circuit for rock breaker, etc.
6 Overload display (option)
7 OFF switch for excavator hydraulics / exit barrier
8 Dozer blade up/down
9 Manual throttle
10 Operation of excavator equipment
11 Horn
12 Vandalism guard (canopy only) (option)
13 Fuse and relay box
14 Windshield washer fluid tank
15 OFF switch for excavator hydraulics / exit barrier
16 Operation of excavator equipment
17 Uppercarriage holding brake

- Radio
- Immobilizer
- Air-conditioning
- 2nd Additional control circuit

Control console



HR5.0_5.1_4

Abb. 5-4 Control console

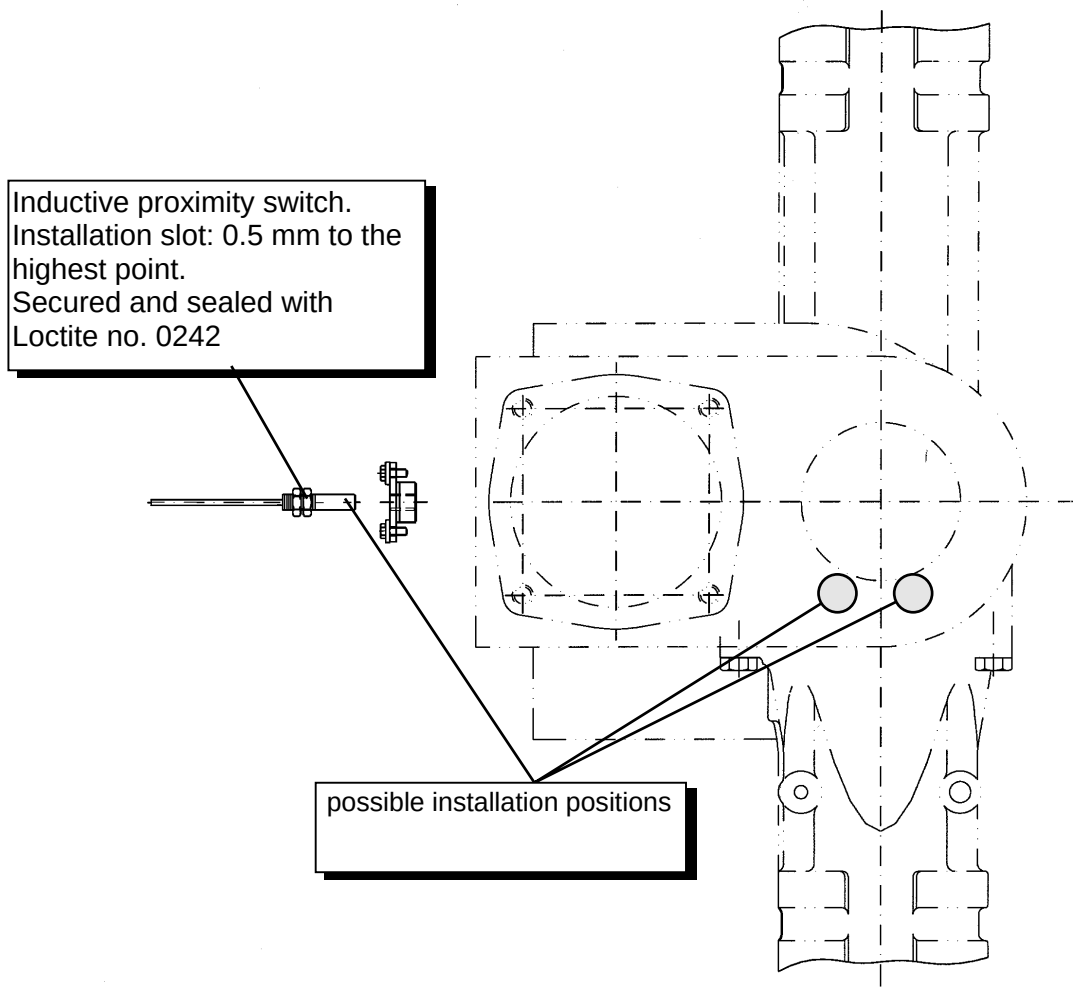
1 Engine oil pressure
2 Preheating
3 Coolant temperature
4 Operating-hour meter
5 Hydraulic oil filter clogging
6 Air filter clogging
7 Charge control
8 Fuel level
9 Travel, FAST/SLOW
10 Windshield wiper and washer system
11 Working floodlight, front
12 Heating/fan
13 Working floodlight, rear (optional)
14 Pre-heat/ starter switch
15 Power socket

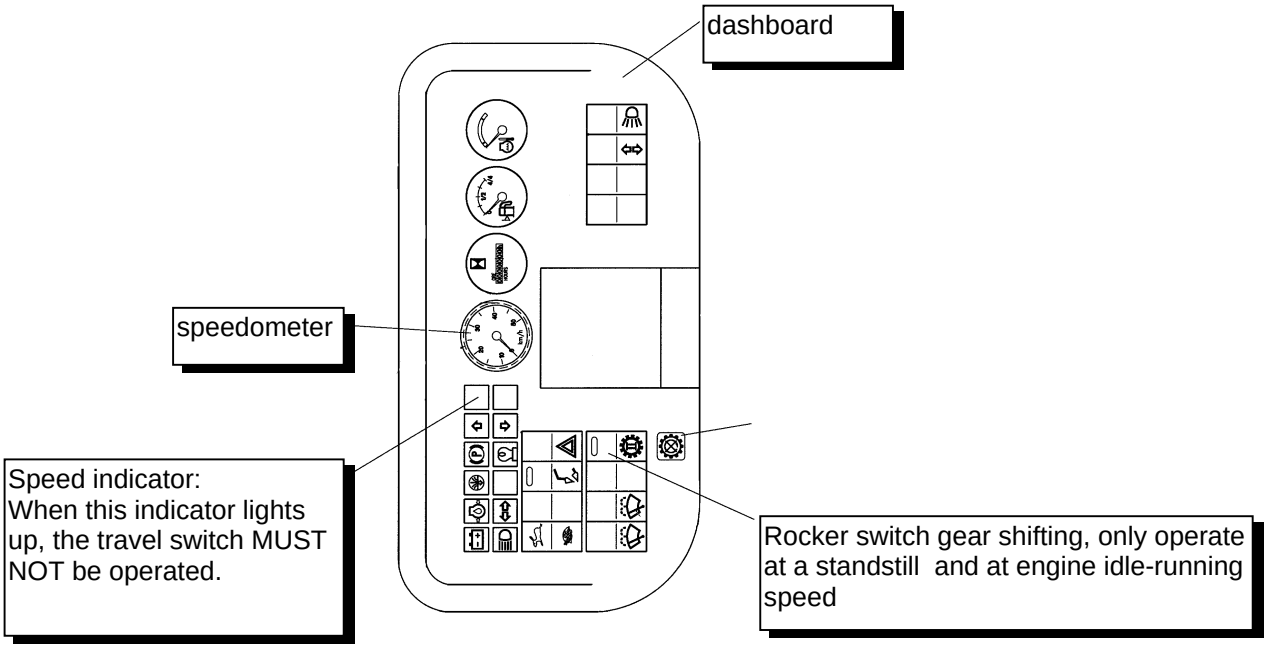
- Air-conditioning (option)

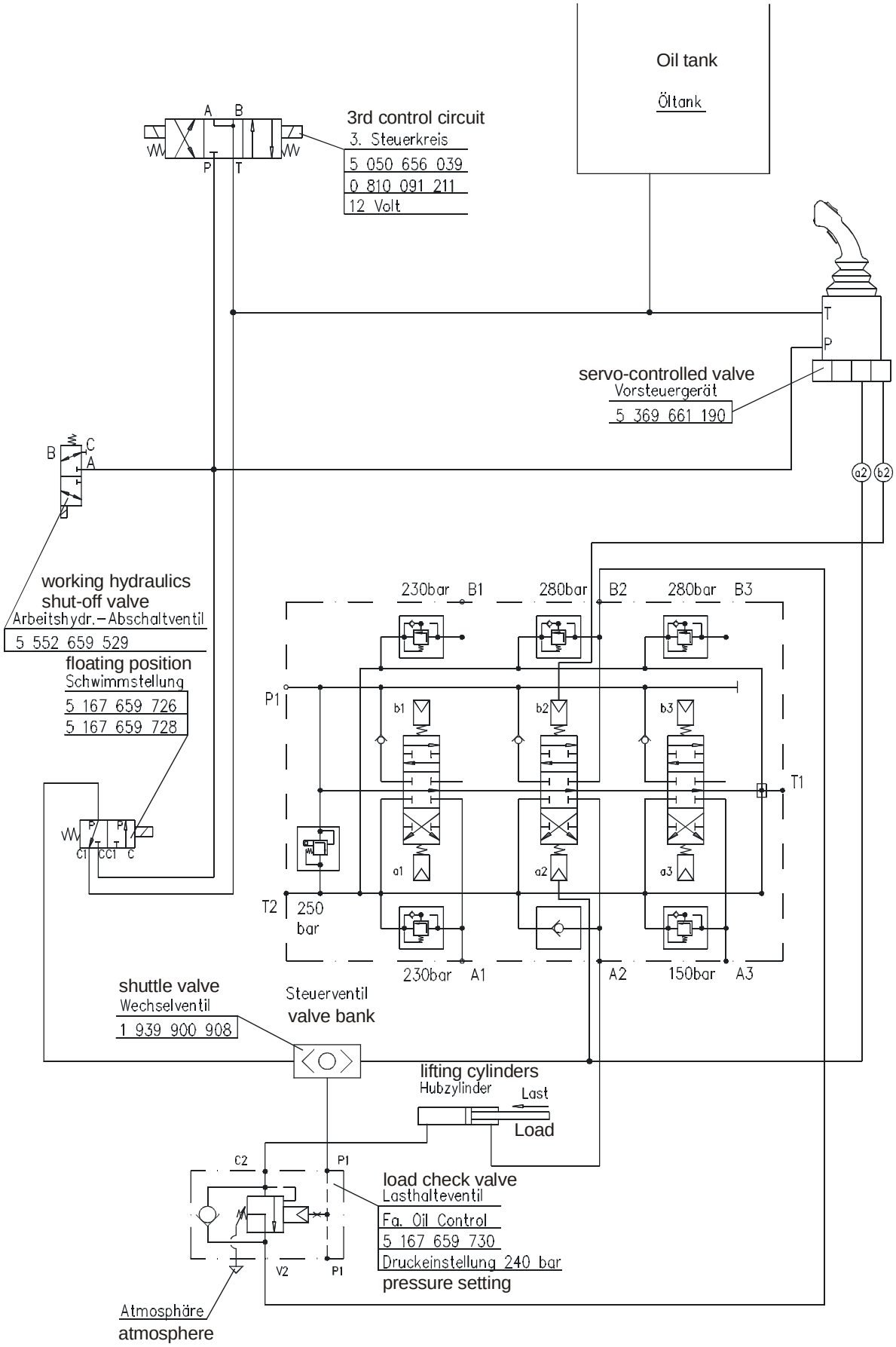
SUBGROUP LIST

Options

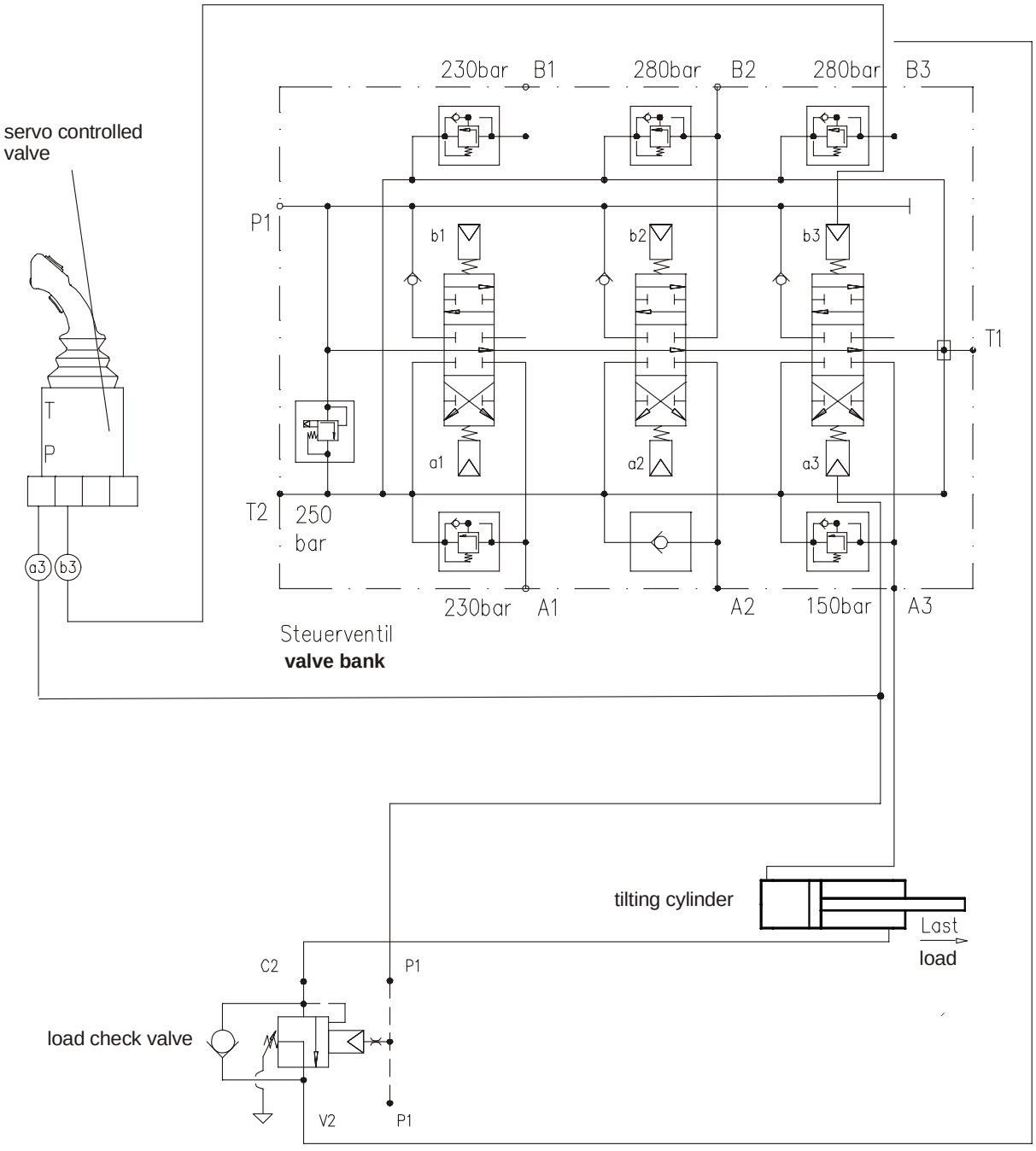
TL (SKL / SKS) **Fast travel version**	**10.020**
TL (SKL / SKS) **Load check valves**	**10.040**
Add. Circuit flow rates	**10.100**
Air Condition filling quantities	**10.400**


Inductive proximity switch.
Installation slot: 0.5 mm to the highest point.
Secured and sealed with Loctite no. 0242
possible installation positions


dashboard
speedometer
Speed indicator:
When this indicator lights up, the travel switch MUST NOT be operated.
Rocker switch gear shifting, only operate at a standstill and at engine idle-running speed



TEREX | SCHAEFF	Typ/Model/Type **TL** (SKL / SKS)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Load check valve, lifting cylinder**	Blatt/Page/Feuille **10.040.01**



TEREX | SCHAEFF	Typ/Model/Type **TL** (SKL / SKS)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Load check valve, tilting cylinder**	Blatt/Page/Feuille **10.040.02**

Hydr. Flow at add. Circuit mini excavator

(at additional circuit)

TC 15	**from S/N TC00150100** 31,0 l/min at 100 bar 29,0 l/min at 130 bar			
TC 16	**from S/N TC00160100** 31,0 l/min at 100 bar 29,0 l/min at 130 bar			
TC 20	**from S/N TC00200100** 31,0 l/min at 100 bar 29,0 l/min at 140 bar			
TC 29	**from S/N TC00290100** 37,5 l/min at 100 bar 36,0 l/min at 140 bar 33,0 l/min at 180 bar			
TC 35	**from S/N TC00350100** 48,5 l/min at 100 bar 47,5 l/min at 140 bar 42,0 l/min at 200 bar		**TC 37**	**fron S/N TC00370100** 48,5 l/min at 100 bar 47,5 l/min at 140 bar 42,0 l/min at 200 bar
TC 48	**from S/N TC00480100** 55,5 l/min at 100 bar 54,0 l/min at 140 bar 40,0 l/min at 200 bar			
TC 60	**from S/N TC00600100** 61,0 l/min at 100 bar 59,5 l/min at 140 bar 40,0 l/min at 200 bar			

(there can be variations, for example: high idle of the engine
or wear of the pump)

Maschinentyp	Füllmenge	Füllmedium	Prüf-Füllanschluß-type	Schaltdruck Magnetkupplung ein	Schaltdruck Magnetkupplung aus	
Machine Type	**Filling Quantities**	**Cooling agent**	**Test Port Type**	**Pressure Solenoid Coupling on**	**Pressure Solenoid Coupling off**	
TL65 (SKL824)	800g	R134a	R134a genormt	2bar	25 bar	
	1.764 lb	**R134a**	**R134a standard**	**29 PSI**	363 PSI	
TL70s (SKS634)	800g	R134a	R134a genormt	2bar	25 bar	
	1.764 lb	**R134a**	**R134a standard**	**29 PSI**	363 PSI	
TL80 (SKL834)	800g	R134a	R134a genormt	2bar	25 bar	
	1.764 lb	**R134a**	**R134a standard**	**29 PSI**	363 PSI	
TL100 (SKL844)	800g	R134a	R134a genormt	2bar	25 bar	
	1.764 lb	R134a	R134a standard	29 PSI	363 PSI	
TL120 (SKL854)	800g	R134a	R134a genormt	2bar	25 bar	
	1.764 lb	R134a	R134a standard	29 PSI	363 PSI	
TL160 (SKL160)	900g	R134a	R134a genormt	2bar	25 bar	
	1.985 lb	R134a	R134a standard	29 PSI	363 PSI	
SKL873-200	1100g	R134a	R134a genormt	2bar	25 bar	
	2.426 lb	R134a	R134a standard	29 PSI	363 PSI	
TL210	900g	R134a	R134a genormt	2bar	25 bar	
	1.985 lb	R134a	R134a standard	29 PSI	363 PSI	
TL260 (SKL260)	900g	R134a	R134a genormt	2bar	25 bar	
	1.985 lb	R134a	R134a standard	29 PSI	363 PSI	
TL420	1200g	R134a	R134a genormt	2bar	25 bar	
	2.646 lb	R134a	R134a standard	29 PSI	363 PSI	
TL450	1200g	R134a	R134a genormt	2bar	25 bar	
	2.646 lb	R134a	R134a standard	29 PSI	363 PSI	
TW70 (HML23)	1200g	R134a	R134a genormt	2 bar	27 bar	
	2.646 lb	R134a	R134a standard	29 PSI	392 PSI	
TW85 (HML32)	1200g	R134a	R134a genormt	2 bar	27 bar	
	2.646 lb	R134a	R134a standard	29 PSI	392 PSI	
TW110 (HML42)	1200g	R134a	R134a genormt	2 bar	27 bar	
	2.646 lb	R134a	R134a standard	29 PSI	392 PSI	
TC60 (HR20)	1100g	R134a	R134a genormt	2 bar	27 bar	
	2.426 lb	R134a	R134a standard	29 PSI	392 PSI	
TC75 (HR32)	1200g	R134a	R134a genormt	2 bar	27 bar	
	2.646 lb	R134a	R134a standard	29 PSI	392 PSI	
TC125 (HR42)	1200g	R134a	R134a genormt	2 bar	27 bar	
	2.646 lb	R134a	R134a standard	29 PSI	392 PSI	
TC48 (HR18)	1250g	R134a	R134a genormt			
	2.756 lb	R134a	R134a standard			
TC50	1250g	R134a	R134a genormt			
	2.756 lb	R134a	R134a standard			


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SUBGROUP LIST

Repair instructions

TC / TL (HR / SKL)	**Overview Assembly Tool**	**11.001.01**
TL 420/450	**Tilt cabin / Engine hood**	**11.35.01**
TW 70/85/110 (HML)	**Tilt cabin**	**11.51.01**
TC 60/75/125 (HR)	**Tilt cabin**	**11.65.01-02**
TC 29 (HR 14)	**Sealing of cylinders**	**11.76.01-04**
TC 35 (HR 16)	**Sealing of cylinders**	**11.78.01-04**
TC 48 (HR 18)	**Sealing of cylinders**	**11.80.01-03**
TC 48 (HR 18)	**Pump removal**	**11.80.20**
TC 48 (HR 18)	**Pump disassembly**	**11.80.21-26**
TC 48 (HR 18)	**Pump assembly**	**11.80.30-37**
TC 48 (HR 18)	**Travel gear removal**	**11.80.50**
TC 15-50 (HR)	**Pilot-operated valve TH6**	**11.230.01**
TC 15-50 (HR)	**Glue kit, cabin window panes**	**11.300.01**

Overview of assembly tools for pistons with piston rings TC 15 / TC 16 / TC 20 / TC 29 / TC 35 / TC 48 (HR)

Cylinder function	Cylinder number	Piston ϕ / Rod ϕ	Machine Type	Assembly Tool Number
Boom / Dipperstick	6 5005 400 00 6 5005 405 00 6 5005 410 00	70/35	TC 15/16/20	6 9500 300 02
Dipperstick	6 5004 265 00	63/35	TC 15/16	6 9500 300 01
Bucket	6 5004 811 00	63/40	TC 15/16/20	6 9500 300 01
Dozer blade	6 5004 065 00	63/30	TC 15/16/20	none

Cylinder function	Cylinder number	Piston ϕ / Rod ϕ	Machine Type	Assembly Tool Number
Boom	6 5006 375 00	80/40	TC 29	6 9500 300 03
Dipperstick	6 5005 695 00	70/40	TC 29	6 9500 300 02
Bucket	6 5005 835 00	70/35	TC 29	6 9500 300 02
Articulation	6 5006 430 00	80/40	TC 29/TC 35	6 9500 300 03
Dozer blade	6 5007 297 00	90/40	TC 29/TC 35	none

Cylinder function	Cylinder number	Piston ϕ / Rod ϕ	Machine Type	Assembly Tool Number
Boom	6 5007 545 00	90/45	TC 35	6 9500 300 04
Dipperstick	6 5005 845 00	70/45	TC 35	6 9500 300 02
Bucket	6 5005 855 00	70/35	TC 35	6 9500 300 02

Cylinder function	Cylinder number	Piston ϕ / Rod ϕ	Machine Type	Assembly Tool Number
Boom	6 5009 200 00	100/50	TC 48	6 9500 300 05
Dipperstick	6 5007 870 00	90/55	TC 48	6 9500 300 04
Bucket	6 5005 860 00	70/45	TC 48	6 9500 300 02
Articulation	6 5007 870 00	90/55	TC 48	6 9500 300 04
Dozer blade new	6 5011 470 00	110/50	TC 48	none
Dozer blade old	6 5009 100 00	100/45	TC 48	none

Cabin tilt procedure

Instruction for tilting the cabin:

1) Before starting, completely read the mounting instructions

2) Set the working equipment to the ground, turn off engine and relieve the hydraulics (Fasten or remove all objects which could fall to the side when the cabin is tilted).

3) Fasten the screw jack at the cabin and on the frame of the rear chassis.

4) Check the bolts on the right hand side of the cabin.

5) Remove the bolts on the left hand side of the cabin.

6) Tilt the cabine till the rubber hoses of the heating can be removed.

7) Remove the rubber hoses of the heating. (Caution, hot water can cause personal serious injury !)

8) Tilt cabin till screw jack is on end stop.

9) Secure the cabin in tilted position. **Do not work underneath the cabin as long as the cabin is not secured !**

10) The cabin is lowered in reverse order.



Spindelwinde 5 424 316 926
Screw jack 5 424 316 926
Vérin à vis 5 424 316 926



Typ Model Type Tipo	**TL 420** **TL 450**	**Elektrisches System** **Electrical system** **Circuit électrique** **Sistema elèctrico**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.**	***TL04200100*** ***TL04500100***	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Kabine kippen** **Tilt cabin**				Blatt Page Feuille Página	**11.35.01**


TEREX®

Engine Hood

opening procedure

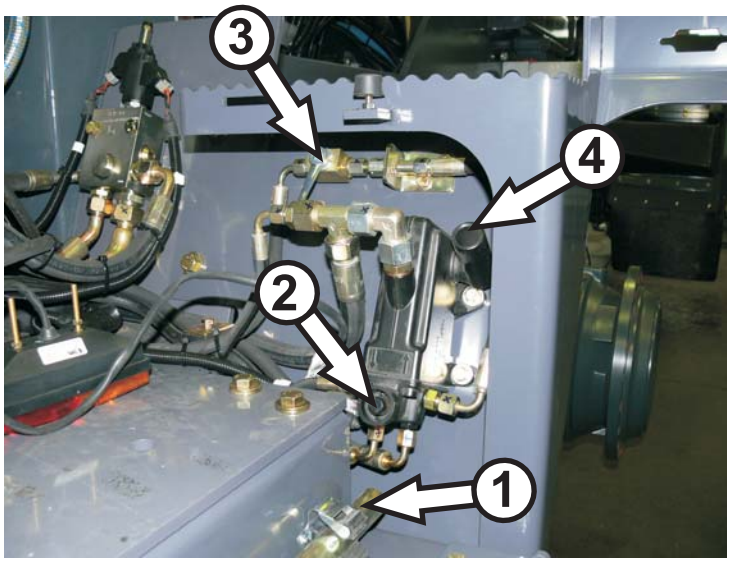
Location of engine hood device

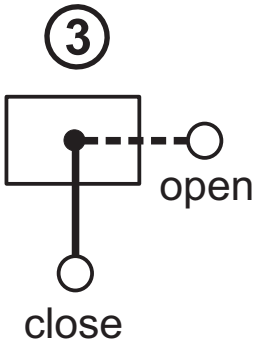


How to open the engine hood

- Open the cover of engine hood device with ignition key
- Take the bar ① out of the machine and place it to the ball cock ②
- Turn the ball cock ② bar to the right until stop
- Open the ball cock ③
- The hood opens automatically (brake accumulators must be fully pressurized)
- Shut the ball cock ③ when the hood is open

- If the hood is not totaly open place the bar ① into the jack ④ and do pump movements until the hood is opened completely
- Close the ball cock ③





Typ Model Type Tipo	**TL 420** **TL 450**	**Elektrisches System** **Electrical system** **Circuit électrique** **Sistema elèctrico**	**ab Fz.-Id.-Nr.** **from s/n** **à partir du n/s** **desde el no.**	***TL04200100*** ***TL04500100***	Datum Edition Date Fecha	**01.2008**
Benennung Description Dénomination Denominación	**Motorhaube** **Engine hood device**				Blatt Page Feuille Página	**11.35.02**

Engine Hood

closeing procedure

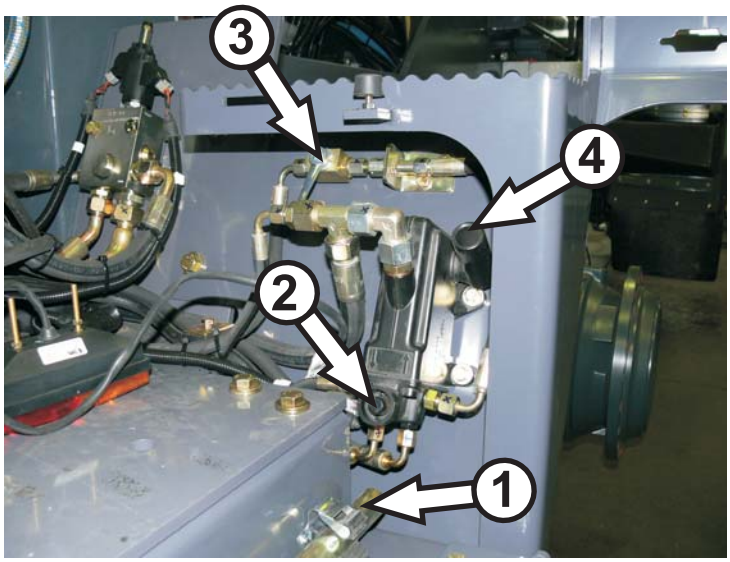
Location of engine hood device

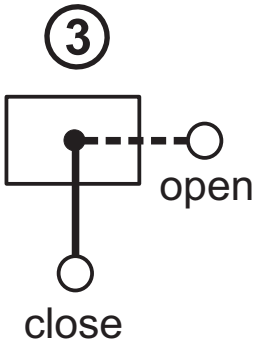


How to close the engine hood

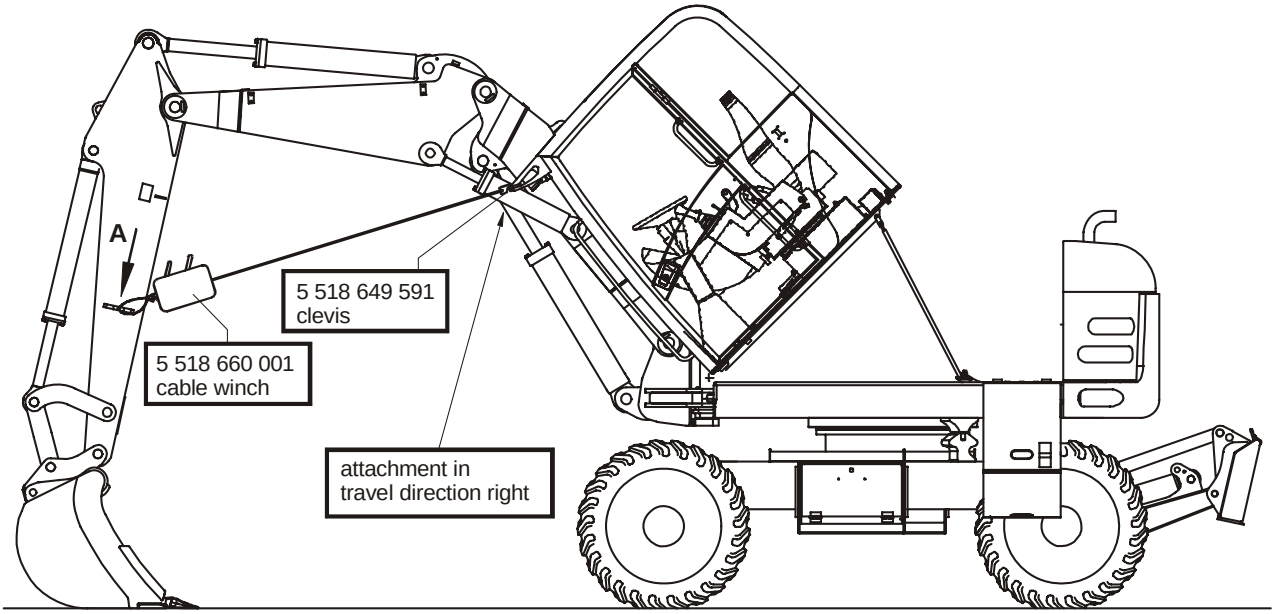
- Take the bar ① and place it to the ball cock ②
- Turn the ball cock ② bar to the left until stop
- Open the ball cock ③
- The hood closes automatically
  (brake accumulators must be fully pressurized)
- Shut the ball cock ③ when the hood is closed

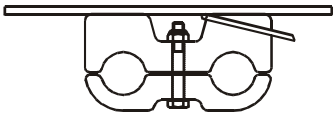
- If the hood is not totaly closed place the bar ①
  into the jack ④ and do pump movements until the
  hood is closed completely
- Close the ball cock ③
- Close the cover of engine hood device
  and lock it with the ignition key



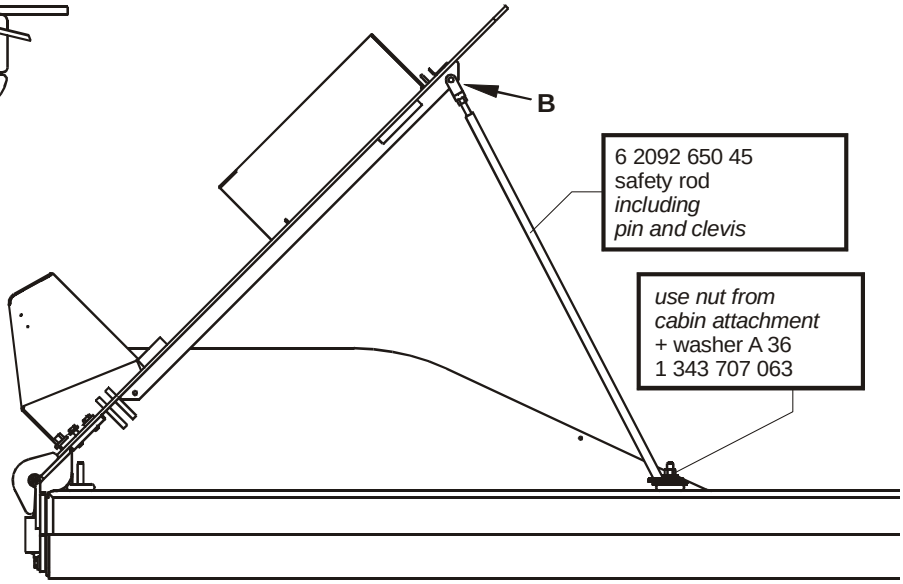


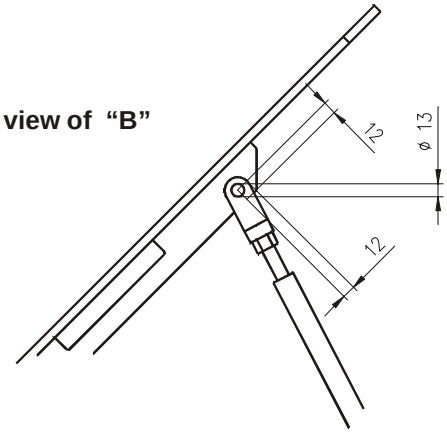
Tilt cabine
Kit-No. 6.209.265.000





view of "A"

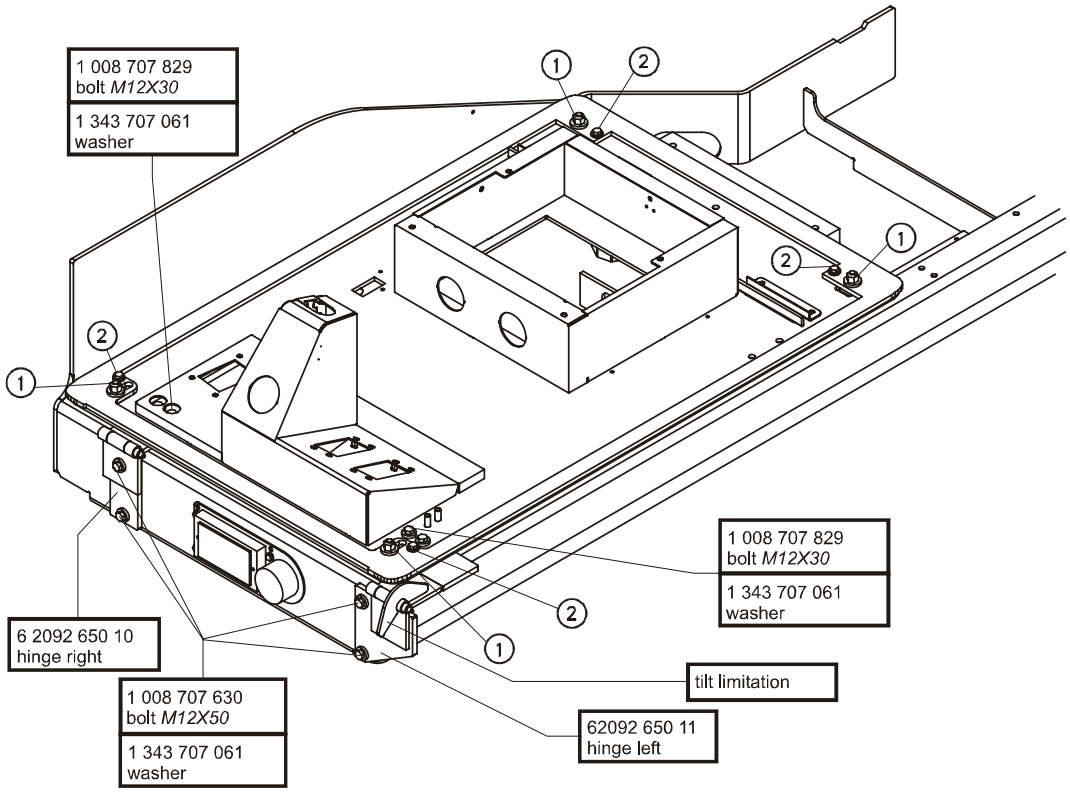




view of "B"

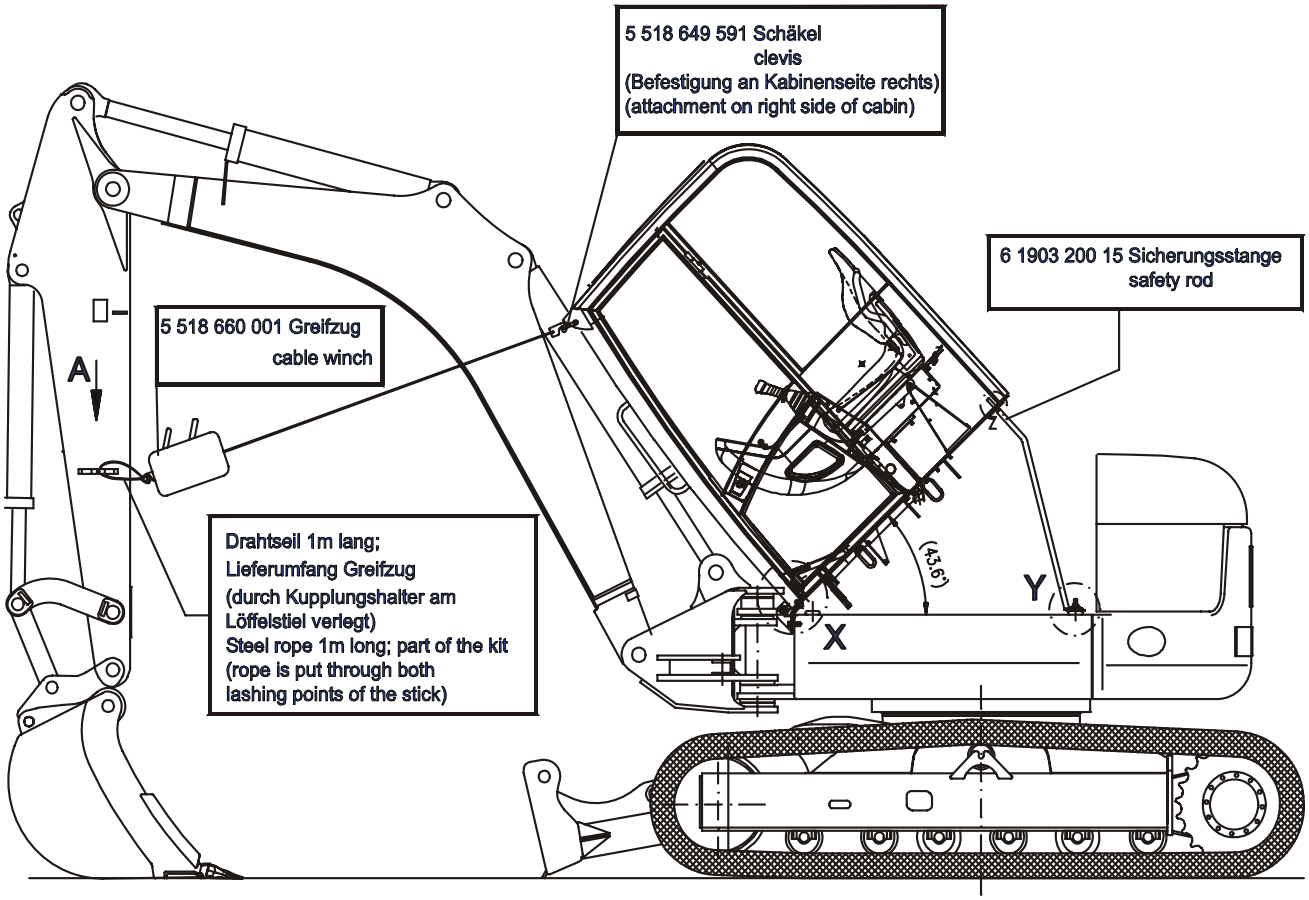
rework
drilled hole ∅ 13mm

TEREX | SCHAEFF	Typ/Model/Type **TW 70 - 85 - 110** (HML)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Tilt cabin**	Blatt/Page/Feuille **11.51.01**

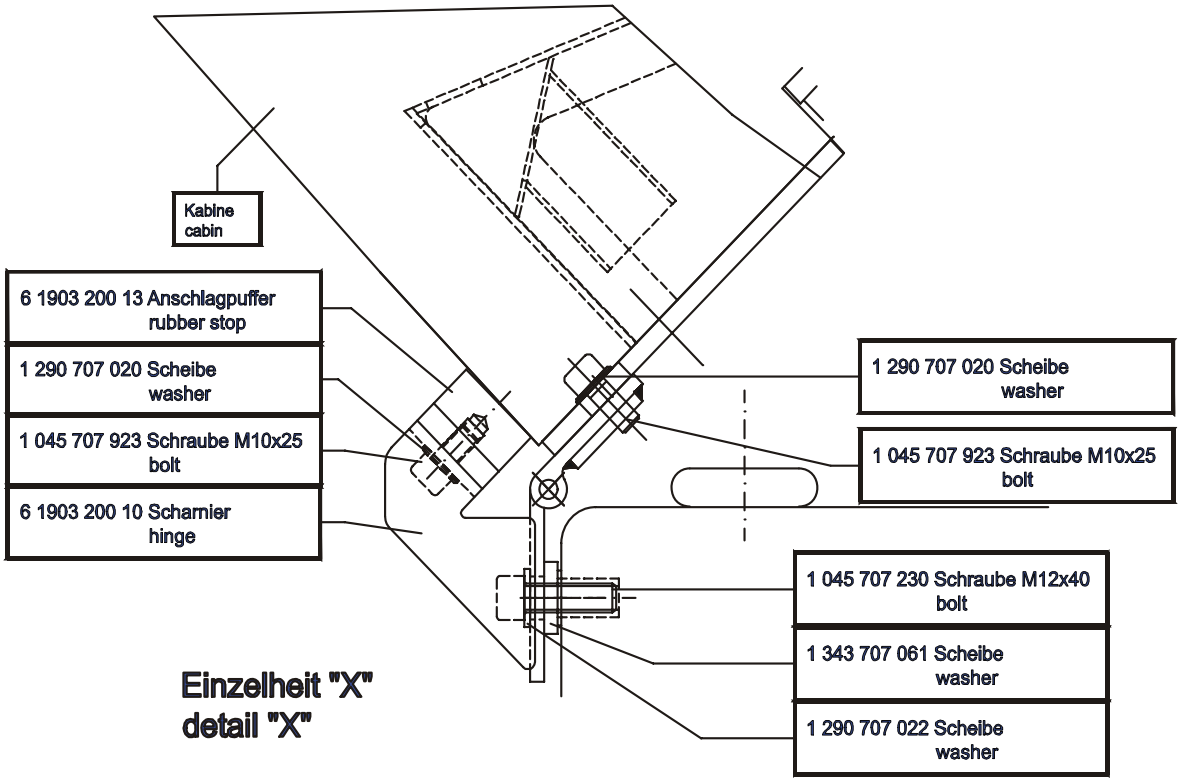


Instructions for tilting the cabin: *(it will take you approx. 30 min to execute points 1 - 14)*

1) Before starting, completely read the mounting instructions.
2) Set the working equipment parallel to the cabin. Lower the boom, turn off the engine and relieve the hydraulics. (Fasten or remove from the cabin all objects which could fall to the front when the cabin is tilted).
3) Fasten the hinges 6 2092 650 10 + 11 at the upper carriage and floor frame.
Attention ! 50mm bolts for fastening on the upper carriage ! The hinge 6 2092 650 11 must have the tilt limitation **otherwise the cabin must not be tilted !** (see sketch)
4) Check whether the bolts item 2 are available **and** tightened.
5) Remove all 4 nuts and washers ***item 1***
Attention! Do not remove ***item 2*** as they connect the cabin with the floor frame !!
6) Fasten the clevis on the right-hand support (in travel direction) of the canopy and attach the cable winch (see sketch)
7) Fasten the other rope (1 m long) on the coupling support of the stick. The steel rope loops point to the machine (see sketch).
8) Shut the cabin door and open the rear flap.
9) Carefully lift the cabin by approx. 20 cm by means of the cable winch.
10) Check whether the fastening hole for the safety bar is available at the floor frame otherwise rework (see sketch) **Attention**! Secure cabin during rework !
11) If the fastening hole for the safety bar is available, the cabin has to be tilted until the tilt limitation touches the hinge 6 2092 650 11.
12) Mount the safety bar (see sketch). **Attention! *DANGER!* Do not work underneath the cabin as long as the safety rod is not mounted**
13) Secure the safety rod both at the top and at the bottom with a nut and washer and/or pin (see sketch).
14) Release the cable winch but do not remove it.
15) Do not put lateral load on the safety rod while working underneath the cabin.
16) The cabin is lowered in reverse order. The locks which prevent turning on the cabin bearings must possibly be realigned.

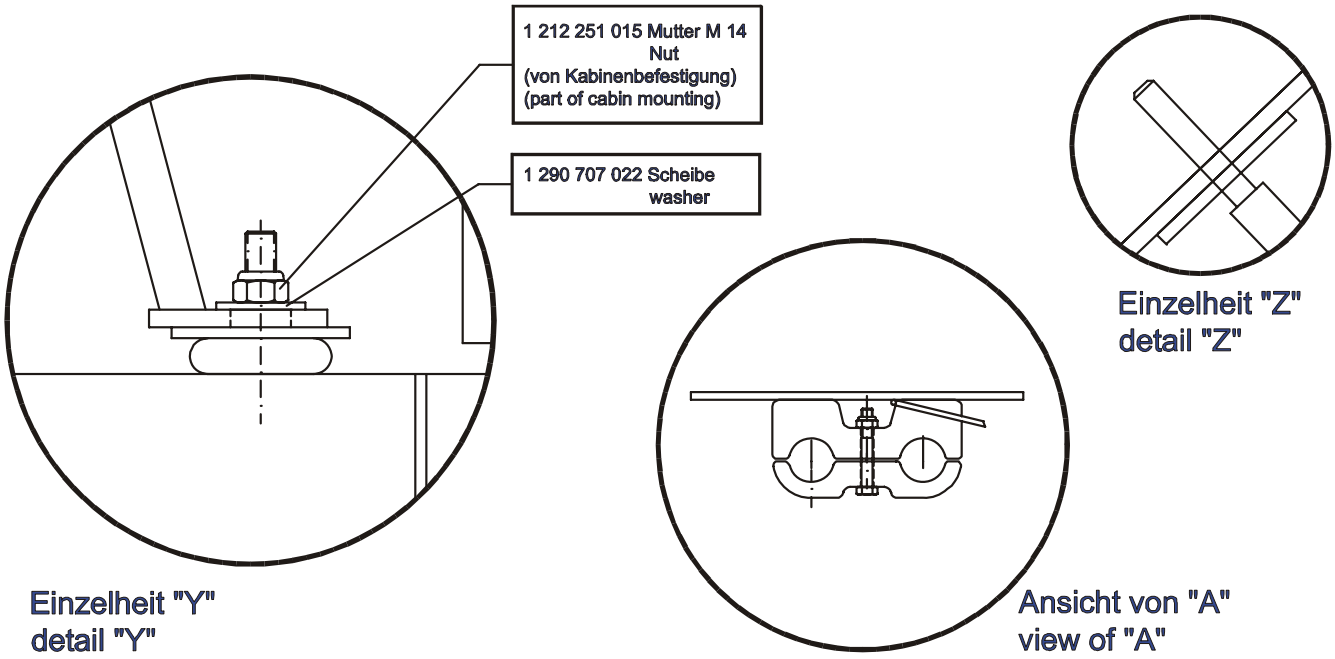


Arbeitseinrichtung parallel zu Raupenfahrwerk (nicht geknickt)
Working equipment parallel to the tracks (not articulated)

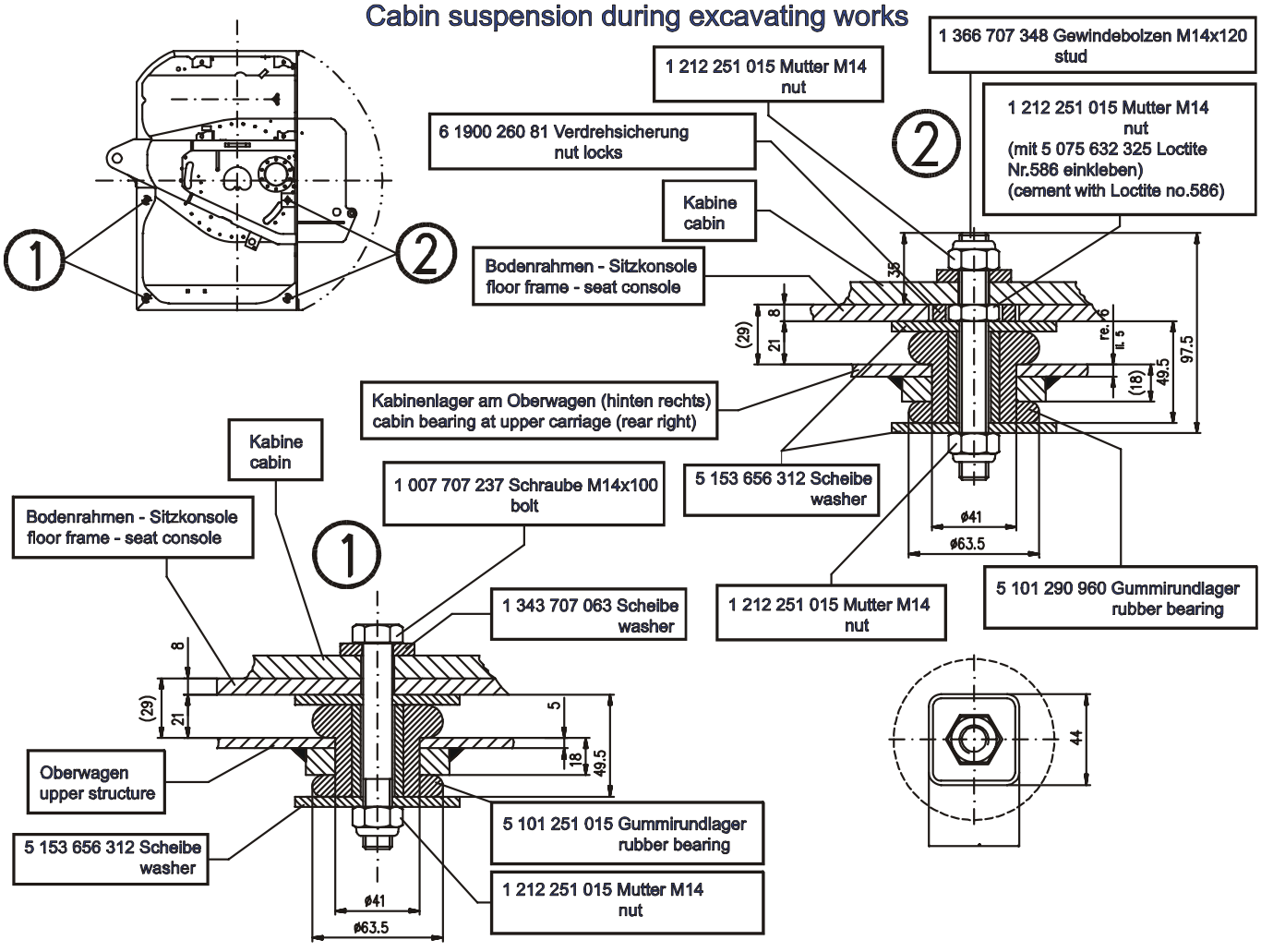


Einzelheit "X"
detail "X"

TEREX | SCHAEFF	Typ/Model/Type **TC 60, 75, 125** (HR)	Datum/Edition/Date **01.2007**
	Benennung/Description/Dénomination **Kabine kippen / Tilt cabin**	Blatt/Page/Feuille **11.65.01**



Kabinenlagerung bei Baggerbetrieb
Cabin suspension during excavating works

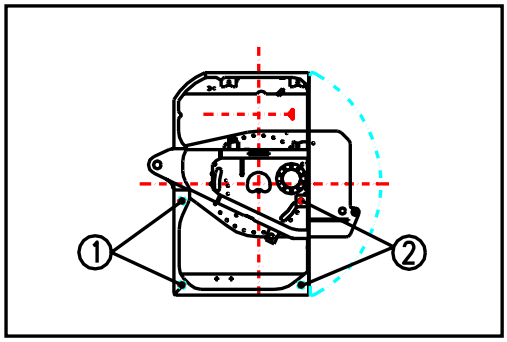


Instructions for tilting the cabin

Please use the parts kit no.
6 190 320 000

Due to danger of accident, please respect these mounting instructions !!!

►►► please read them carefully !



1.) Mount 2x hinge 6 1903 200 10 to the upper carriage and the floor frame.

Bolt 2x rubber stop 6 1903 200 13 on the hinges.

2.) Remove the cover at the bottom of the upper carriage.

3.) Remove the stowage box and right armrest

4.) Remove 2x cabin fastening bolt M14 (item 2)

Remove 2x hexagon bolt M14x100 and nut M14 (item 1)

5.) Put 1m steel rope through the lashing points situated on both sides of the dipperstick. The steel rope loops point to the machine.

6.) Fasten a clevis on the right-hand support of the canopy

7.) Attach the cable winch (attach the hook at the cable winch housing to the steel rope loops on the dipperstick and attach the hook at the steel rope of the cable winch to the clevis)

8.) Lift the cabin by means of the cable winch until the rubber stops reach the cabin. Now the safety rod 6 1903 200 15 can be mounted. (Installation at the external cabin bearing)

!! Danger !!

Do not work underneath the tilted cabin as long as the safety rod has not been mounted.

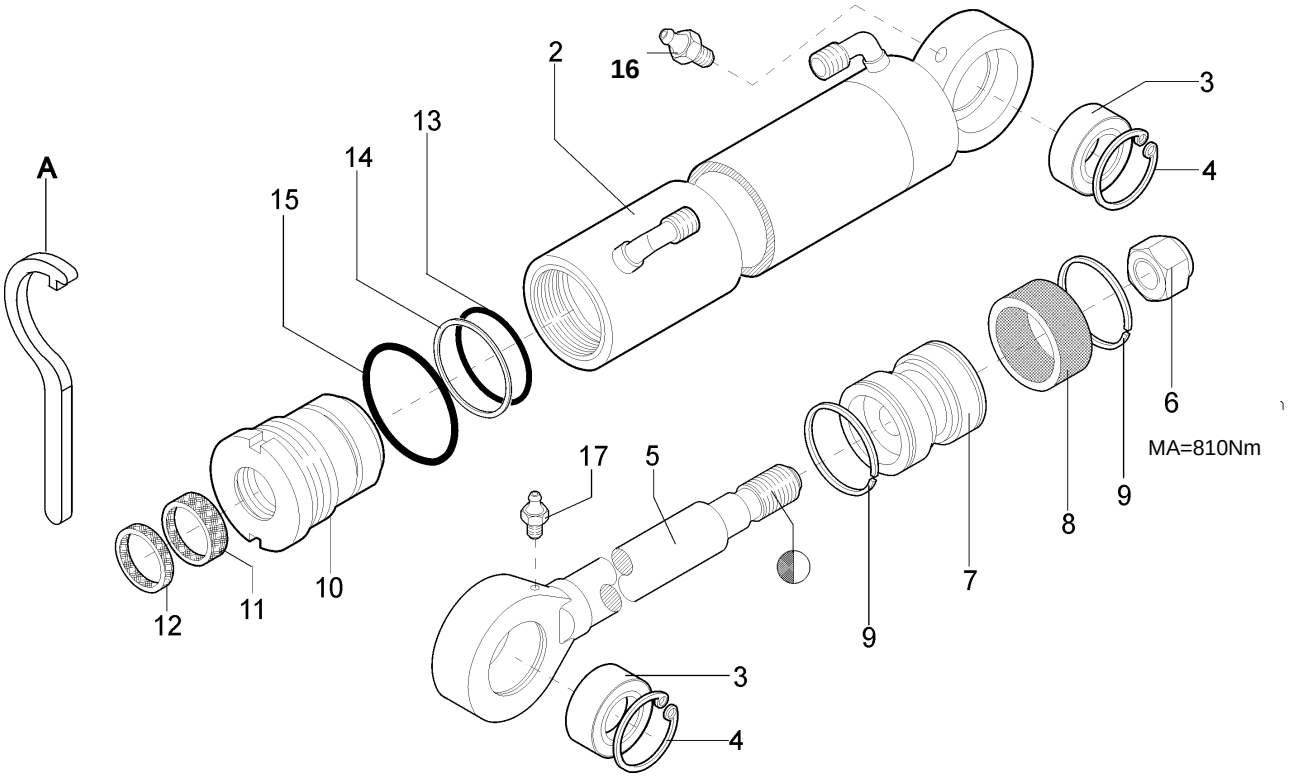
Do not put lateral load on the safety rod while working under the cabin.

9.) Release the cable winch **but do not remove it**.

The cabin is lowered in reverse order.

The locks 6 1900 260 81 which prevent turning on the cabin bearings must possibly be realigned !

TC 29
Boom cylinder



(both cylinder sides with end stroke dampening)

- dismount the hydraulic cylinder
- plug the hoses
- clamp the dismounted hydraulic cylinder in a suitable vice in horizontal position
- put an oil collecting receptacle underneath
- unscrew the bushing item 10 by means of a hook wrench item A
- pull the piston rod assembly with piston and bushing out of the cylinder barrel
- clamp the piston rod eye in a suitable vice in horizontal position
- stabilize the piston rod at the piston by means of a square timber
- slacken the nut item 6 (nut is secured with Loctite, warm up to 200° C if necessary)
- extract the piston item 7 with seal item 8
- remove the bushing item 10 from the piston rod

- check the segment type S item 9

- check the piston rod for damage, replace if necessary

- check both bearings, item 3, for wear and tear, replace if necessary

- remove the old seals

Attention:
- do not damage the seal surfaces at the bushing and piston when removing the old seals

- replace all seals and rub with oil

Carry out the assembly in reverse order

- clean the piston rod thread (free from grease)

- screw the new nut (free from grease) item 6 onto the piston rod, secure with Loctite 270.
  Tightening torque of nut: 810 Nm

- check the inside of the cylinder barrel for scratches, damage, bulges, etc.

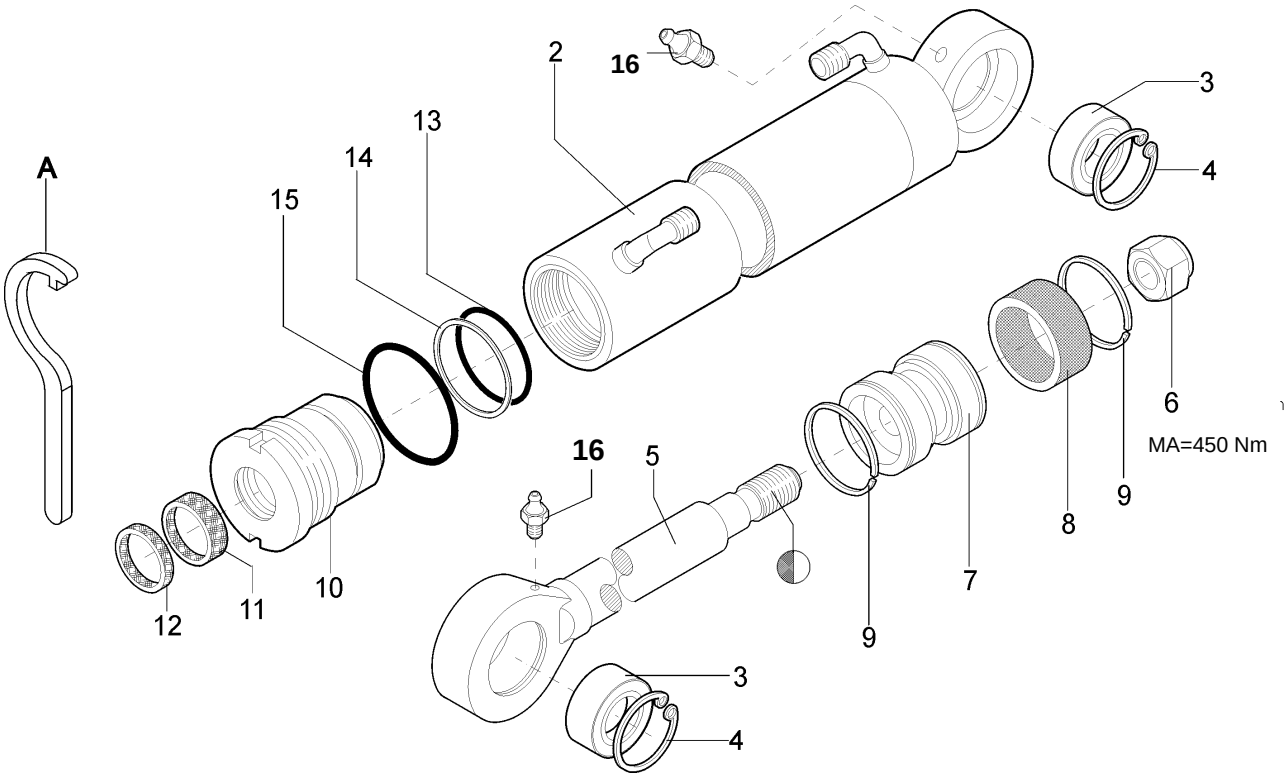
- insert the piston rod into the cylinder barrel

- grease the thread of the bushing

- screw the bushing in the cylinder barrel
  Tightening torque: see chapter 1

- mount the cylinder, connect it and move it carefully and slowly to end stroke (on both sides)

TC 29
Dipperstick cylinder



(both cylinder sides with end stroke dampening)

- dismount the hydraulic cylinder
- plug the hoses
- clamp the dismounted hydraulic cylinder in a suitable vice in horizontal position
- put an oil collecting receptacle underneath
- unscrew the bushing item 10 by means of a hook wrench item A
- pull the piston rod assembly with piston and bushing out of the cylinder barrel
- clamp the piston rod eye in a suitable vice in horizontal position
- stabilize the piston rod at the piston by means of a square timber
- slacken the nut item 6 (nut is secured with Loctite, warm up to 200° C if necessary)
- extract the piston item 7 with seal item 8
- remove the bushing item 10 from the piston rod

- check the segment type S, item 9

- check the piston rod for damage, replace if necessary

- check both bearings, item 3, for wear and tear, replace if necessary

- remove the old seals

Attention:
- do not damage the seal surfaces at the bushing and piston when removing the old seals

- replace all seals and rub with oil

Carry out the assembly in reverse order

- clean the piston rod thread (free from grease)

- screw the new nut (free from grease) item 6 onto the piston rod, secure with Loctite 270.
  Tightening torque of nut: 450 Nm

- check the inside of the cylinder barrel for scratches, damage, bulges, etc.

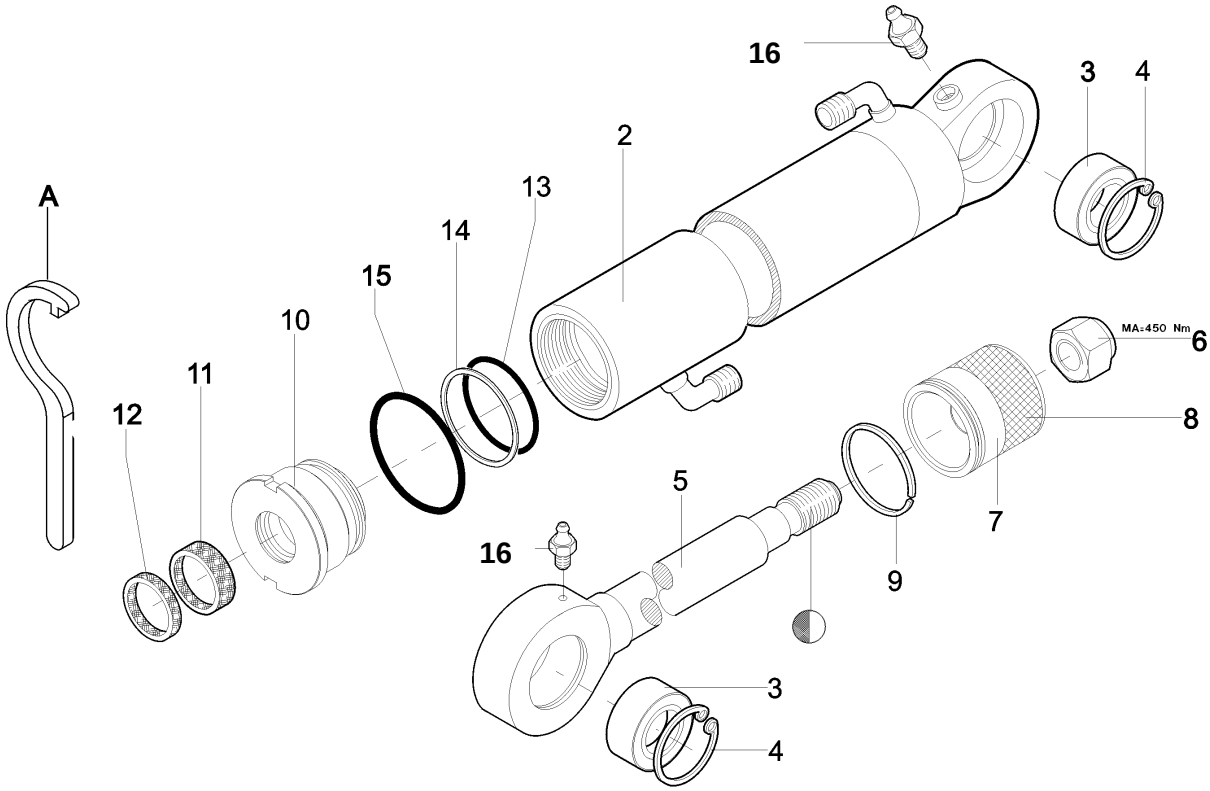
- insert the piston rod into the cylinder barrel

- grease the thread of the bushing

- screw the bushing in the cylinder barrel
  Tightening torque: see chapter 1

- mount the cylinder, connect it and move it carefully and slowly to end stroke (on both sides)

TC 29
Bucket cylinder



(one cylinder side with end stroke dampening)

- dismount the hydraulic cylinder
- plug the hoses
- clamp the dismounted hydraulic cylinder in a suitable vice in horizontal position
- put an oil collecting receptacle underneath
- unscrew the bushing item 10 by means of a hook wrench item A
- pull the piston rod assembly with piston and bushing out of the cylinder barrel
- clamp the piston rod eye in a suitable vice in horizontal position
- stabilize the piston rod at the piston by means of a square timber
- slacken the nut item 6 (nut is secured with Loctite, warm up to 200° C if necessary)
- extract the piston item 7 with seal item 8
- remove the bushing item 10 from the piston rod

- check the piston rod for damage, replace if necessary

- check both bearings, item 3, for wear and tear, replace if necessary

- remove the old seals

Attention:
- do not damage the seal surfaces at the bushing and piston when removing the old seals

- replace all seals and rub with oil

Carry out the assembly in reverse order

- clean the piston rod thread (free from grease)

- screw the new nut (free from grease) item 6 onto the piston rod, secure with Loctite 270.
  Tightening torque of nut: 450 Nm

- check the inside of the cylinder barrel for scratches, damage, bulges, etc.

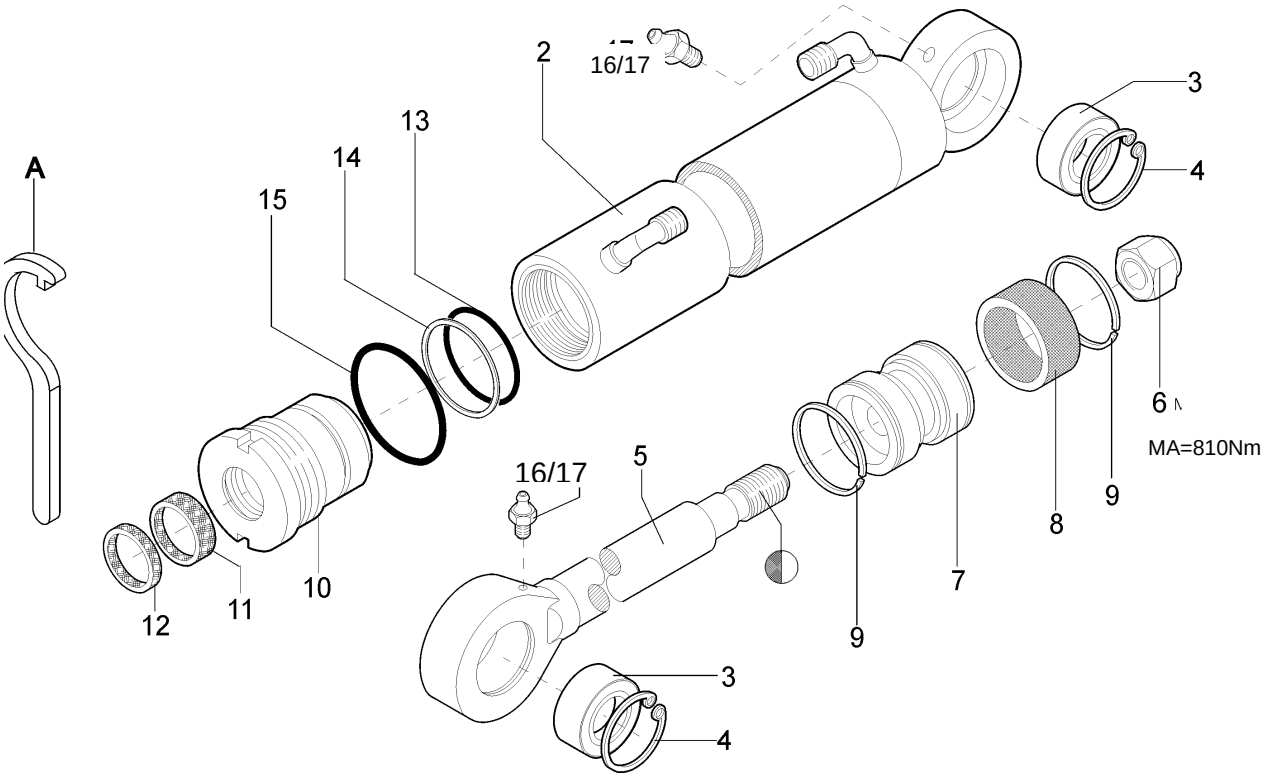
- insert the piston rod into the cylinder barrel

- grease the thread of the bushing

- screw the bushing in the cylinder barrel
  Tightening torque: see chapter 1

- mount the cylinder, connect it and move it carefully and slowly to end stroke (on both sides)

TC 29
Articulated cylinder



(both cylinder sides with end stroke dampening)

- dismount the hydraulic cylinder
- plug the hoses
- clamp the dismounted hydraulic cylinder in a suitable vice in horizontal position
- put an oil collecting receptacle underneath
- unscrew the bushing item 10 by means of a hook wrench item A
- pull the piston rod assembly with piston and bushing out of the cylinder barrel
- clamp the piston rod eye in a suitable vice in horizontal position
- stabilize the piston rod at the piston by means of a square timber
- slacken the nut item 6 (nut is secured with Loctite, warm up to 200° C if necessary)
- extract the piston item 7 with seal item 8
- remove the bushing item 10 from the piston rod

- check the segment type S, item 9

- check the piston rod for damage, replace if necessary

- check both bearings, item 3, for wear and tear, replace if necessary

- remove the old seals

Attention:
- do not damage the seal surfaces of the bushing and piston when removing the old seals

- replace all seals and rub with oil

Carry out the assembly in reverse order

- clean the piston rod thread (free from grease)

- screw the new nut (free from grease) item 6 onto the piston rod, secure with Loctite 270.
  Tightening torque of nut: 810 Nm

- check the inside of the cylinder barrel for scratches, damage, bulges, etc.

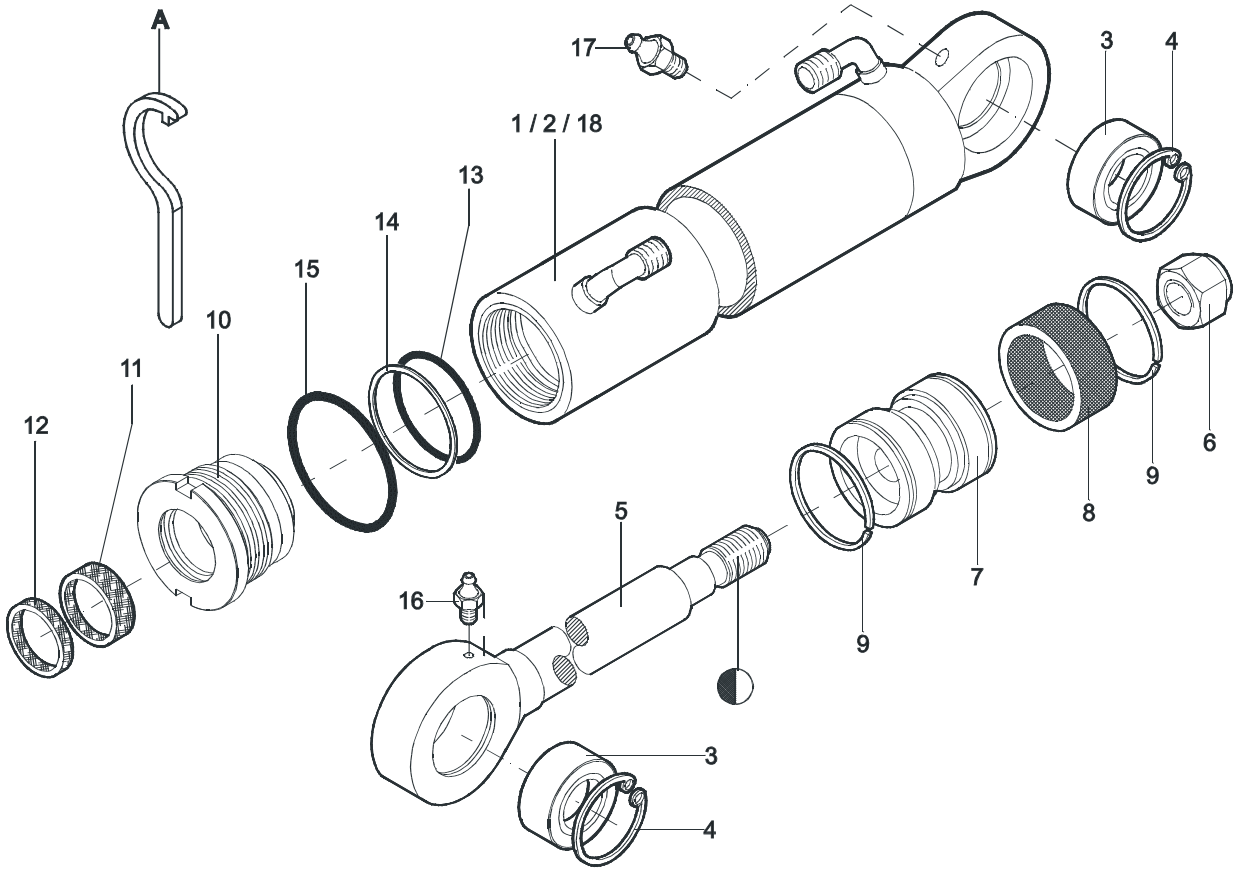
- insert the piston rod into the cylinder barrel

- grease the thread of the bushing

- screw the bushing in the cylinder barrel
  Tightening torque: see chapter 1

- mount the cylinder, connect it and move it carefully and slowly to end stroke (on both sides)

TC 35
Dipperstick cylinder



(both cylinder sides with end stroke dampening)

- dismount the hydraulic cylinder
- plug the hoses
- clamp the dismounted hydraulic cylinder in a suitable vice in horizontal position
- put an oil collecting receptacle underneath
- unscrew the bushing item 10 by means of a hook wrench item A
- pull the piston rod assembly with piston and bushing out of the cylinder barrel
- clamp the piston rod eye in a suitable vice in horizontal position
- stabilize the piston rod at the piston by means of a square timber
- slacken the nut item 6 (nut is secured with Loctite, warm up to 200° C if necessary)
- extract the piston item 7 with seal item 8
- remove the bushing item 10 from the piston rod

- check the segment type S, item 9

- check the piston rod for damage, replace if necessary

- check both bearings, item 3, for wear and tear, replace if necessary

- remove the old seals

Attention:
- do not damage the seal surfaces of the bushing and piston when removing the old seals

- replace all seals and rub with oil

Carry out the assembly in reverse order

- clean the piston rod thread (free from grease)

- screw the new nut (free from grease) item 6 onto the piston rod, secure with Loctite 270.
  Tightening torque of nut: 450 Nm

- check the inside of the cylinder barrel for scratches, damage, bulges, etc.

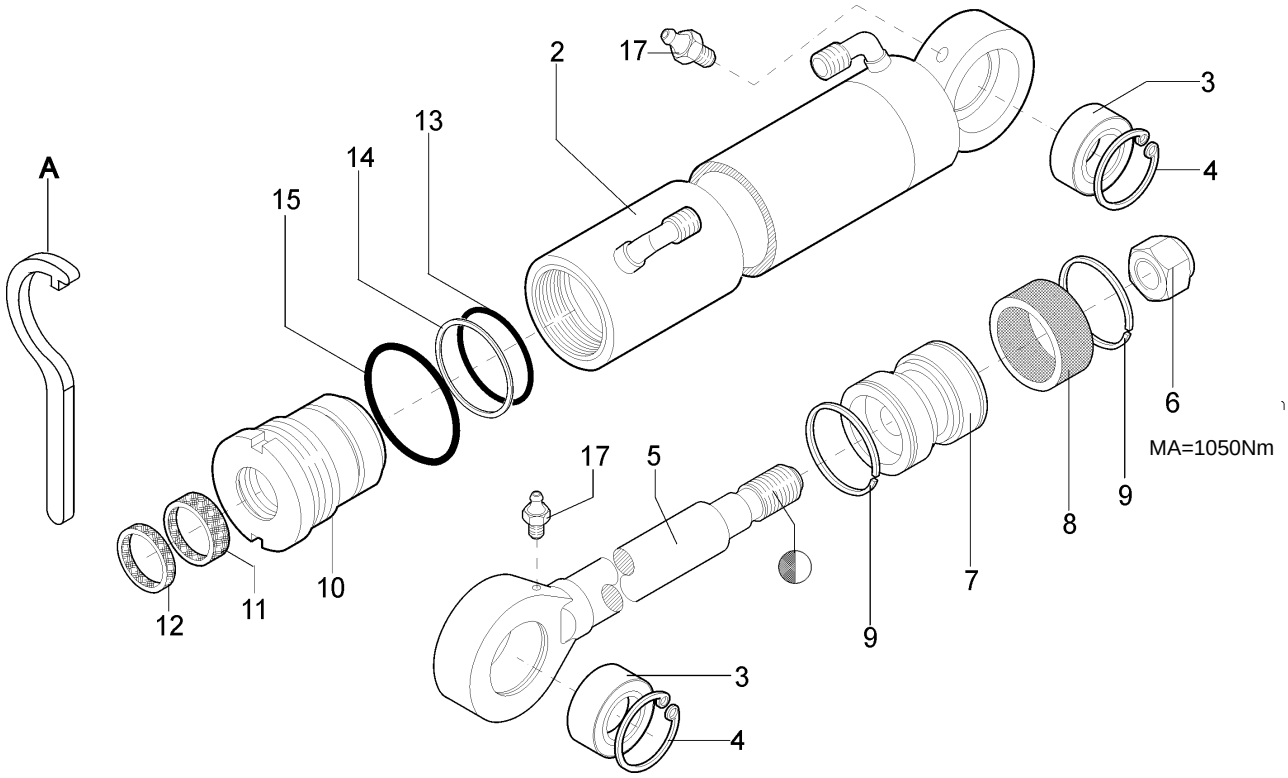
- insert the piston rod into the cylinder barrel

- grease the thread of the bushing

- screw the bushing in the cylinder barrel
  Tightening torque: see chapter 1

- mount the cylinder, connect it and move it carefully and slowly to end stroke (on both sides)

TC 35
Boom cylinder



(both cylinder sides with end stroke dampening)

- dismount the hydraulic cylinder
- plug the hoses
- clamp the dismounted hydraulic cylinder in a suitable vice in horizontal position
- put an oil collecting receptacle underneath
- unscrew the bushing item 10 by means of a hook wrench item A
- pull the piston rod assembly with piston and bushing out of the cylinder barrel
- clamp the piston rod eye in a suitable vice in horizontal position
- stabilize the piston rod at the piston by means of a square timber
- slacken the nut item 6 (nut is secured with Loctite, warm up to 200° C if necessary)
- extract the piston item 7 with seal item 8
- remove the bushing item 10 from the piston rod

- check the segment type S item 9

- check the piston rod for damage, replace if necessary

- check both bearings, item 3, for wear and tear, replace if necessary

- remove the old seals

Attention:
- do not damage the seal surfaces of the bushing and piston when removing the old seals

- replace all seals and rub with oil

Carry out the assembly in reverse order

- clean the piston rod thread (free from grease)

- screw the new nut (free from grease) item 6 onto the piston rod, secure with Loctite 270.
  Tightening torque of nut: 1050 Nm

- check the inside of the cylinder barrel for scratches, damage, bulges, etc.

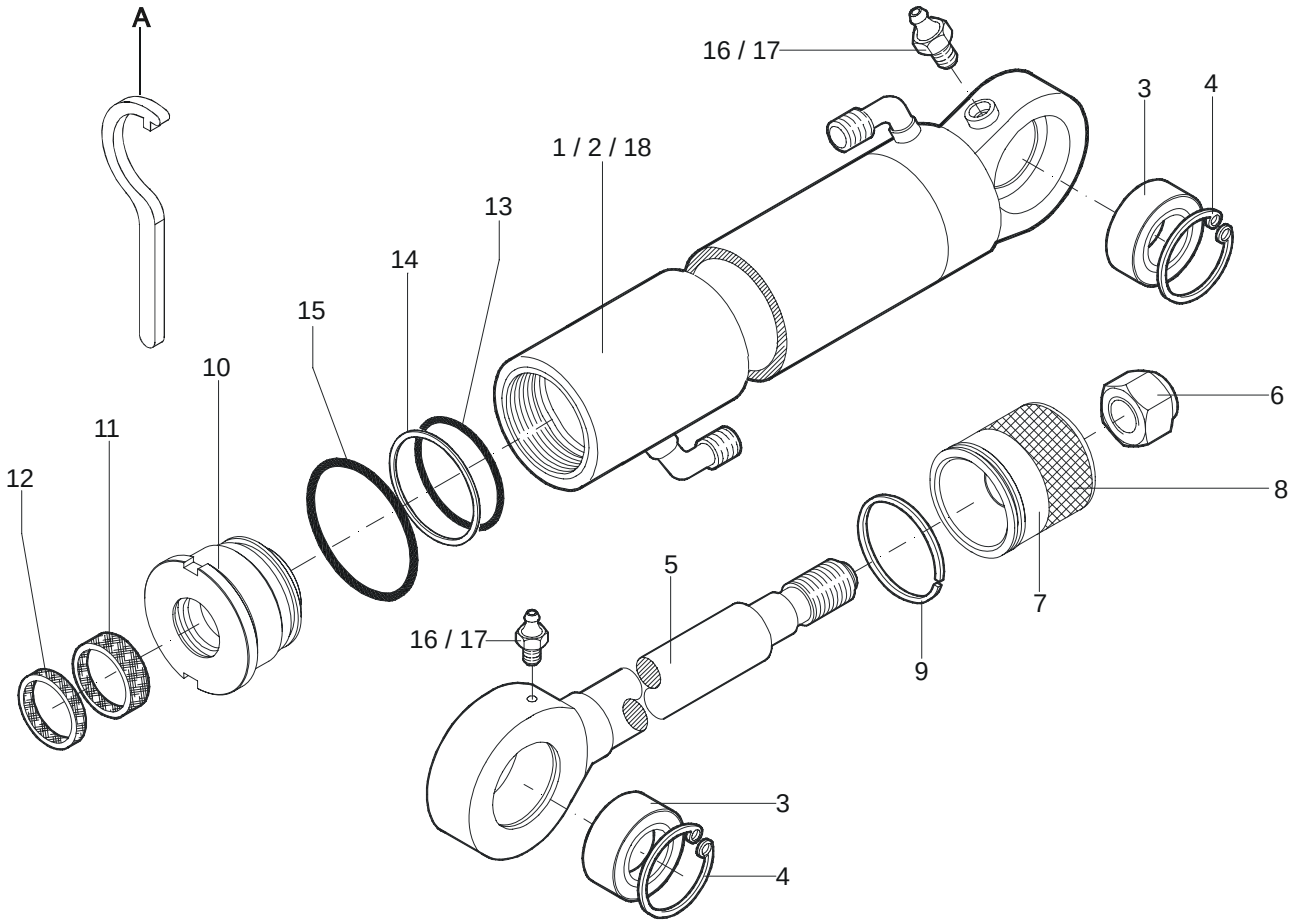
- insert the piston rod into the cylinder barrel

- grease the thread of the bushing

- screw the bushing in the cylinder barrel
  Tightening torque: see chapter 1

- mount the cylinder, connect it and move it carefully and slowly to end stroke (on both sides)

TC 35
Bucket cylinder



(one cylinder side with end stroke dampening)

- dismount the hydraulic cylinder
- plug the hoses
- clamp the dismounted hydraulic cylinder in a suitable vice in horizontal position
- put an oil collecting receptacle underneath
- unscrew the bushing item 10 by means of a hook wrench item A
- pull the piston rod assembly with piston and bushing out of the cylinder barrel
- clamp the piston rod eye in a suitable vice in horizontal position
- stabilize the piston rod at the piston by means of a square timber
- slacken the nut item 6 (nut is secured with Loctite, warm up to 200° C if necessary)
- extract the piston item 7 with seal item 8
- remove the bushing item 10 from the piston rod

- check the piston rod for damage, replace if necessary

- check both bearings, item 3, for wear and tear, replace if necessary

- remove the old seals

Attention:
- do not damage the seal surfaces of the bushing and piston when removing the old seals

- replace all seals and rub with oil

Carry out the assembly in reverse order

- clean the piston rod thread (free from grease)

- screw the new nut (free from grease) item 6 onto the piston rod, secure with Loctite 270.
  Tightening torque of nut: 450 Nm

- check the inside of the cylinder barrel for scratches, damage, bulges, etc.

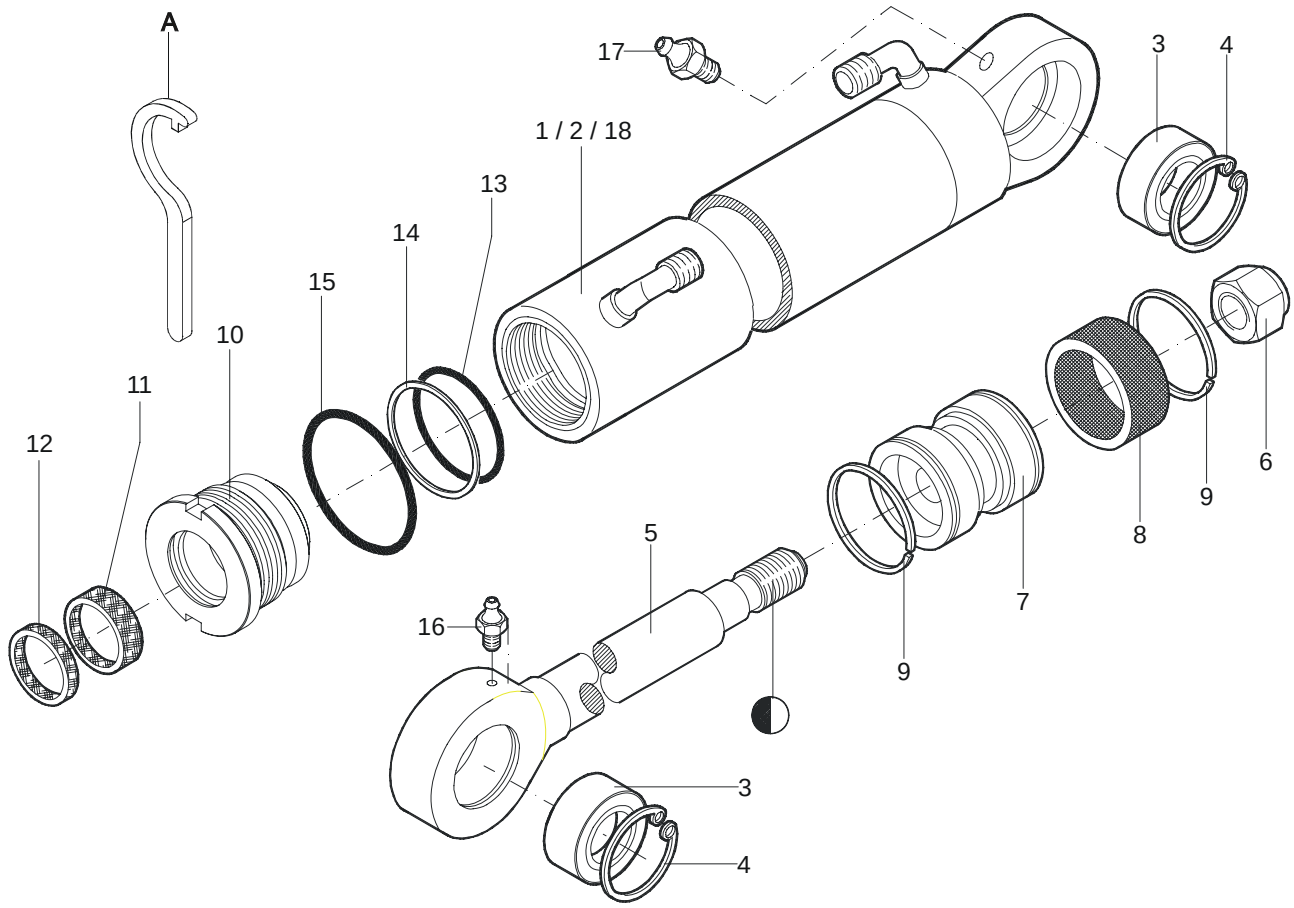
- insert the piston rod into the cylinder barrel

- grease the thread of the bushing

- screw the bushing in the cylinder barrel
  Tightening torque: see chapter 1

- mount the cylinder, connect it and move it carefully and slowly to end stroke (on both sides)

TC 35
Articulated cylinder



(both cylinder sides with end stroke dampening)

- dismount the hydraulic cylinder
- plug the hoses
- clamp the dismounted hydraulic cylinder in a suitable vice in horizontal position
- put an oil collecting receptacle underneath
- unscrew the bushing item 10 by means of a hook wrench item A
- pull the piston rod assembly with piston and bushing out of the cylinder barrel
- clamp the piston rod eye in a suitable vice in horizontal position
- stabilize the piston rod at the piston by means of a square timber
- slacken the nut item 6 (nut is secured with Loctite, warm up to 200° C if necessary)
- extract the piston item 7 with seal item 8
- remove the bushing item 10 from the piston rod

- check the segment type S, item 9

- check the piston rod for damage, replace if necessary

- check both bearings, item 3, for wear and tear, replace if necessary

- remove the old seals

Attention:
- do not damage the seal surfaces of the bushing and piston when removing the old seals

- replace all seals and rub with oil

Carry out the assembly in reverse order

- clean the piston rod thread (free from grease)

- screw the new nut (free from grease) item 6 onto the piston rod, secure with Loctite 270.
  Tightening torque of nut: 810 Nm

- check the inside of the cylinder barrel for scratches, damage, bulges, etc.

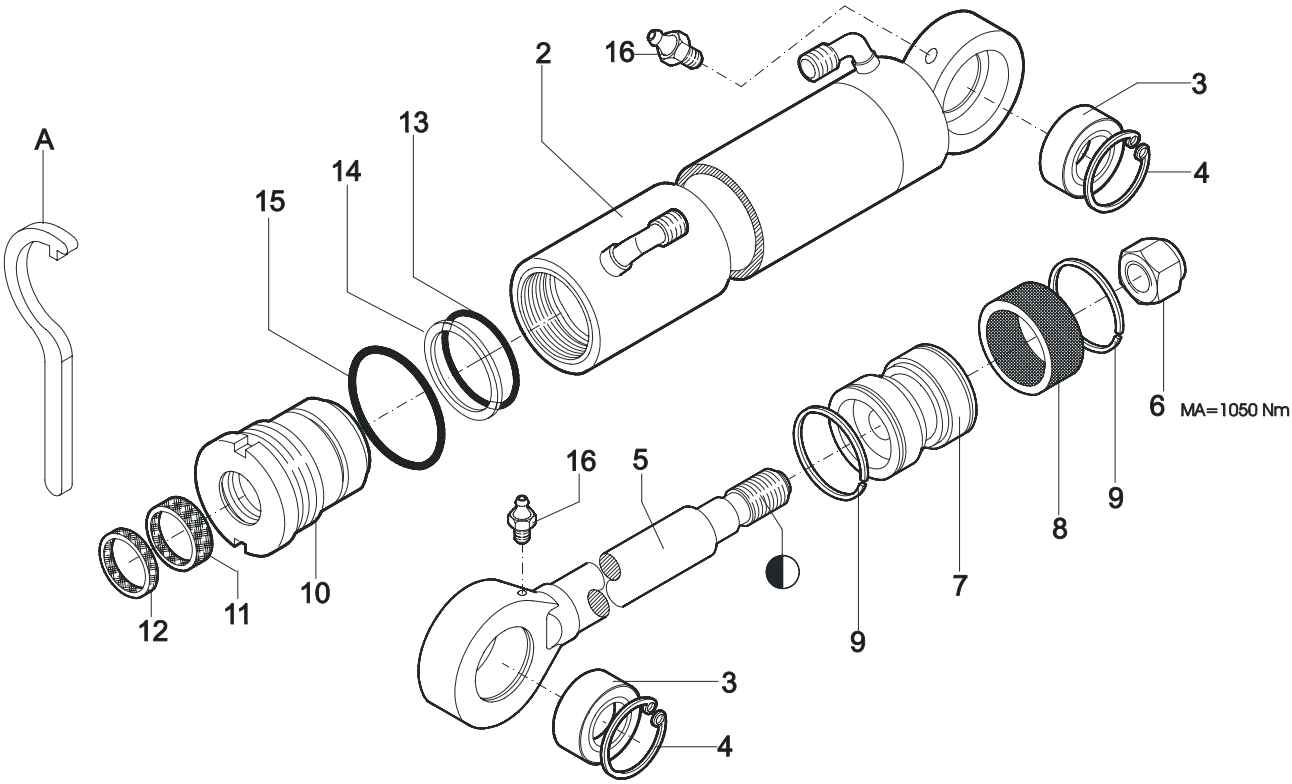
- insert the piston rod into the cylinder barrel

- grease the thread of the bushing

- screw the bushing in the cylinder barrel
  Tightening torque: see chapter 1

- mount the cylinder, connect it and move it carefully and slowly to end stroke (on both sides)

TC 48
Dipperstick cylinder/Articulated cylinder



(both cylinder sides with end stroke dampening)

- dismount the hydraulic cylinder
- plug the hoses
- clamp the dismounted hydraulic cylinder in a suitable vice in horizontal position
- put an oil collecting receptacle underneath
- unscrew the bushing item 10 by means of a hook wrench item A
- pull the piston rod assembly with piston and bushing out of the cylinder barrel
- clamp the piston rod eye in a suitable vice in horizontal position
- stabilize the piston rod at the piston by means of a square timber
- slacken the nut item 6 (nut is secured with Loctite, warm up to 200° C if necessary)
- extract the piston item 7 with seal item 8
- remove the bushing item 10 from the piston rod

- check the segment type S, item 9

- check the piston rod for damage, replace if necessary

- check both bearings, item 3, for wear and tear, replace if necessary

- remove the old seals

Attention:
- do not damage the seal surfaces of the bushing and piston when removing the old seals

- replace all seals and rub with oil

Carry out the assembly in reverse order

- clean the piston rod thread (free from grease)

- screw the new nut (free from grease) item 6 onto the piston rod, secure with Loctite 270.
  Tightening torque of nut: 1050 Nm

- check the inside of the cylinder barrel for scratches, damage, bulges, etc.

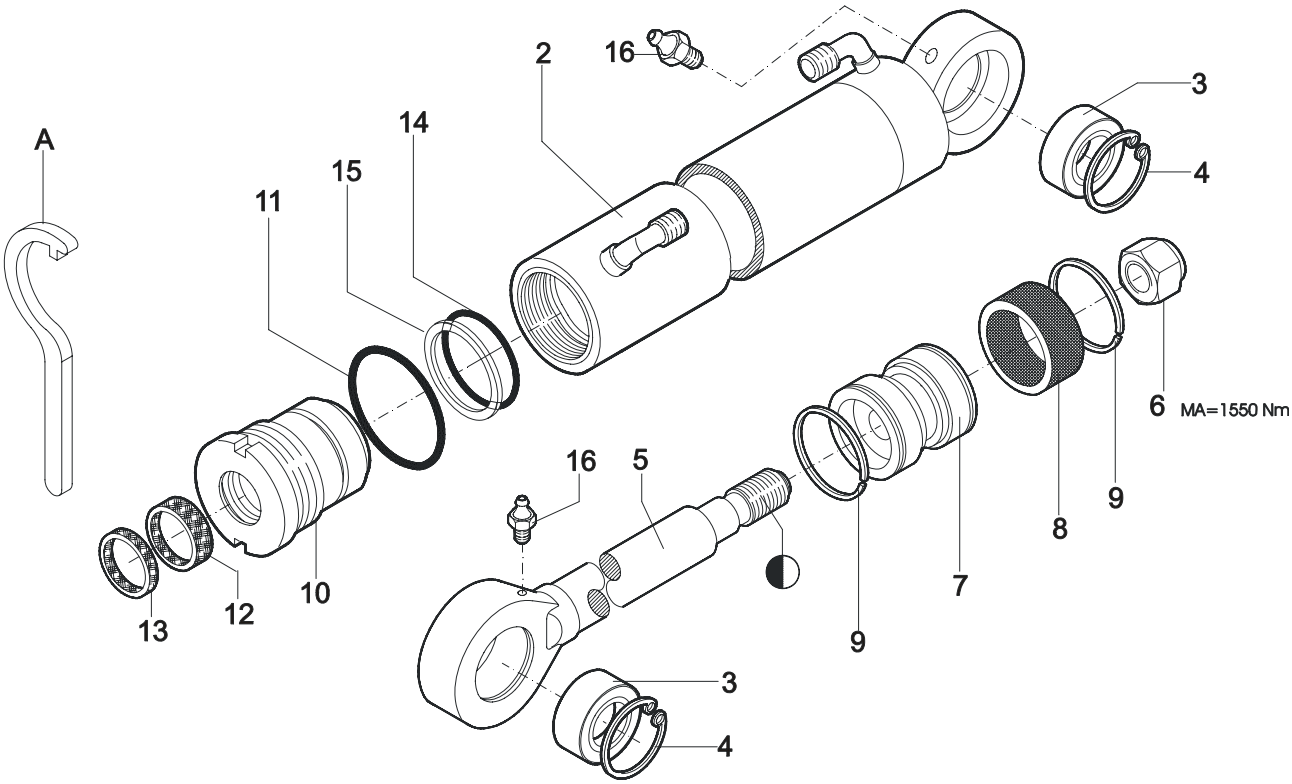
- insert the piston rod into the cylinder barrel

- grease the thread of the bushing

- screw the bushing in the cylinder barrel
  Tightening torque: see chapter 1

- mount the cylinder, connect it and move it carefully and slowly to end stroke (on both sides)

TC 48
Boom cylinder



(both cylinder sides with end stroke dampening)

- dismount the hydraulic cylinder
- plug the hoses
- clamp the dismounted hydraulic cylinder in a suitable vice in horizontal position
- put an oil collecting receptacle underneath
- unscrew the bushing item 10 by means of a hook wrench item A
- pull the piston rod assembly with piston and bushing out of the cylinder barrel
- clamp the piston rod eye in a suitable vice in horizontal position
- stabilize the piston rod at the piston by means of a square timber
- slacken the nut item 6 (nut is secured with Loctite, warm up to 200° C if necessary)
- extract the piston item 7 with seal item 8
- remove the bushing item 10 from the piston rod

- check the segment type S item 9

- check the piston rod for damage, replace if necessary

- check both bearings, item 3, for wear and tear, replace if necessary

- remove the old seals

Attention:
- do not damage the seal surfaces of the bushing and piston when removing the old seals

- replace all seals and rub with oil

Carry out the assembly in reverse order

- clean the piston rod thread (free from grease)

- screw the new nut (free from grease) item 6 onto the piston rod, secure with Loctite 270.
  Tightening torque of nut: 1550 Nm

- check the inside of the cylinder barrel for scratches, damage, bulges, etc.

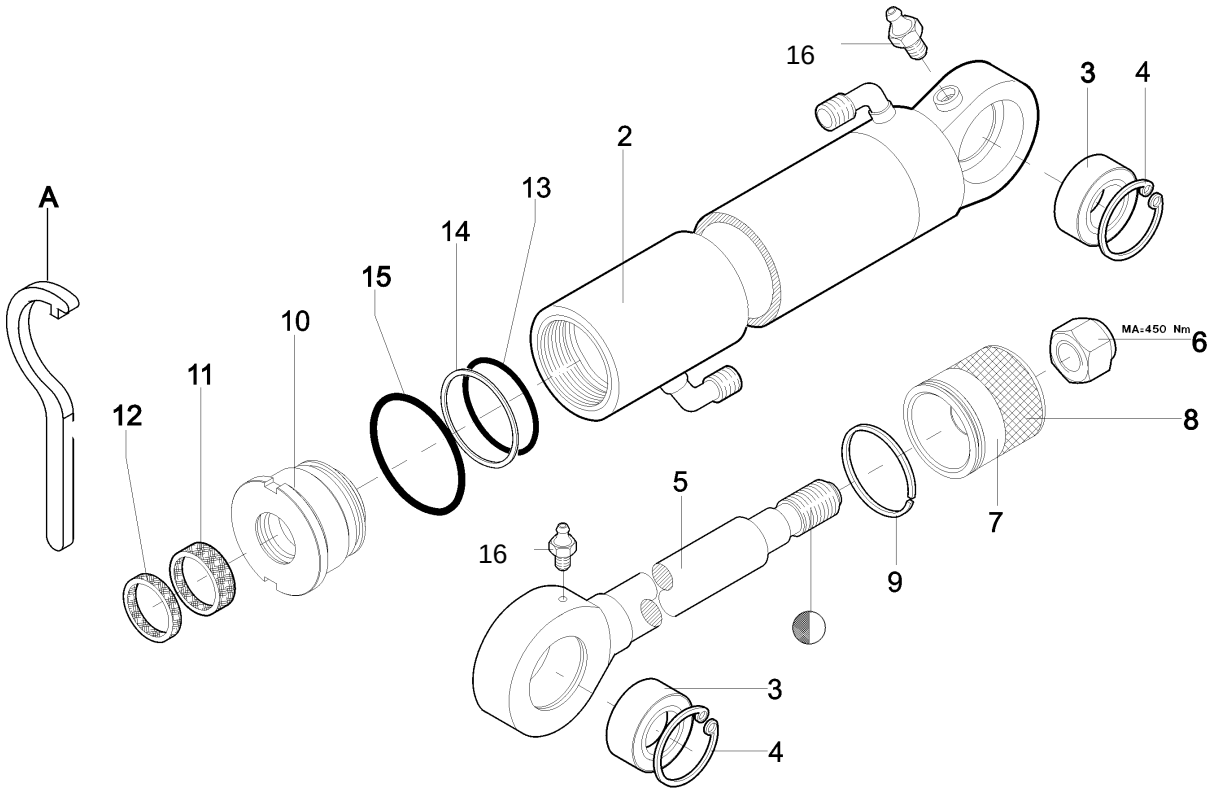
- insert the piston rod into the cylinder barrel

- grease the thread of the bushing

- screw the bushing in the cylinder barrel
  Tightening torque: see chapter 1

- mount the cylinder, connect it and move it carefully and slowly to end stroke (on both sides)

TC 48
Bucket cylinder



(one cylinder side with end stroke dampening)

- dismount the hydraulic cylinder
- plug the hoses
- clamp the dismounted hydraulic cylinder in a suitable vice in horizontal position
- put an oil collecting receptacle underneath
- unscrew the bushing item 10 by means of a hook wrench item A
- pull the piston rod assembly with piston and bushing out of the cylinder barrel
- clamp the piston rod eye in a suitable vice in horizontal position
- stabilize the piston rod at the piston by means of a square timber
- slacken the nut item 6 (nut is secured with Loctite, warm up to 200° C if necessary)
- extract the piston item 7 with seal item 8
- remove the bushing item 10 from the piston rod

- check the piston rod for damage, replace if necessary

- check both bearings, item 3, for wear and tear, replace if necessary

- remove the old seals

Attention:
- do not damage the seal surfaces of the bushing and piston when removing the old seals

- replace all seals and rub with oil

Carry out the assembly in reverse order

- clean the piston rod thread (free from grease)

- screw the new nut (free from grease) item 6 onto the piston rod with Loctite 270.
  Tightening torque of nut: 450 Nm

- check the inside of the cylinder barrel for scratches, damage, bulges, etc.

- insert the piston rod into the cylinder barrel

- grease the thread of the bushing

- screw the bushing in the cylinder barrel
  Tightening torque: see chapter 1

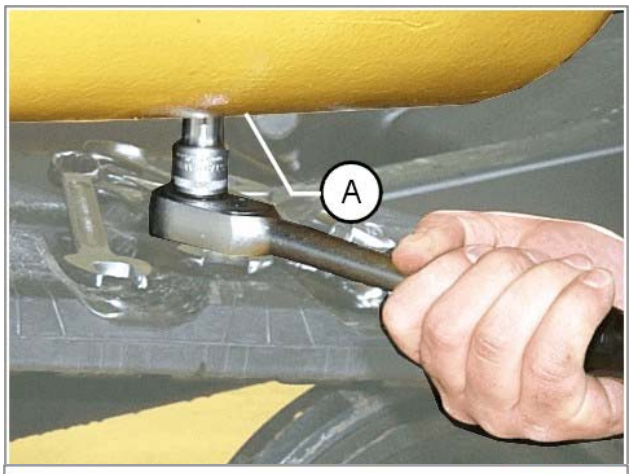
- mount the cylinder, connect it and move it carefully and slowly to end stroke (on both sides)

Remove the variable displacement pump

Park the machine in a safe place:

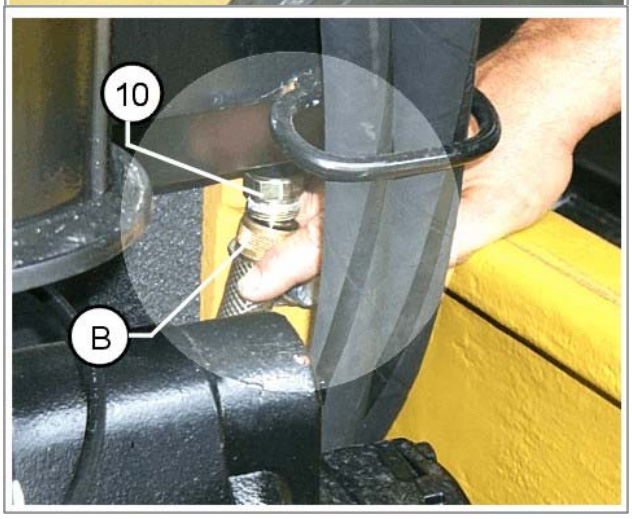
- Observe the safety and accident prevention regulations of the operating manual
- Leaking agents such as fuels, hydraulic oil, engine oil or coolant are harmful to the environment
- Prepare receptacles which are big enough to collect the corresponding quantities
- Collect fluids drained off to reuse them or dispose of them according to the regulations
- Plug the ports, lines and hoses

- Unscrew the cover **(A)** below the engine.

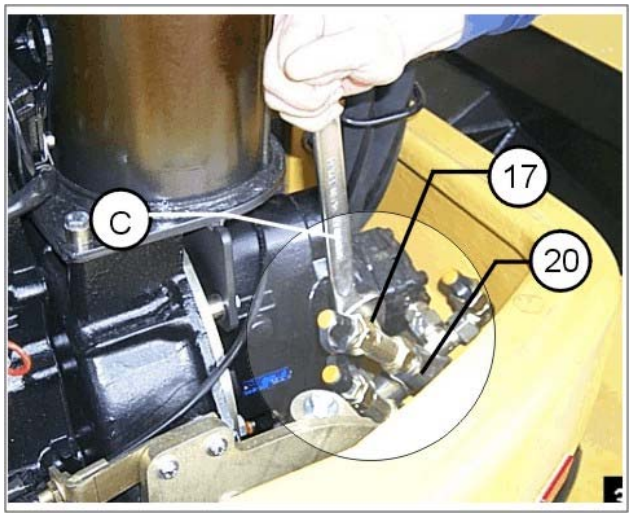


Drain hydraulic oil:

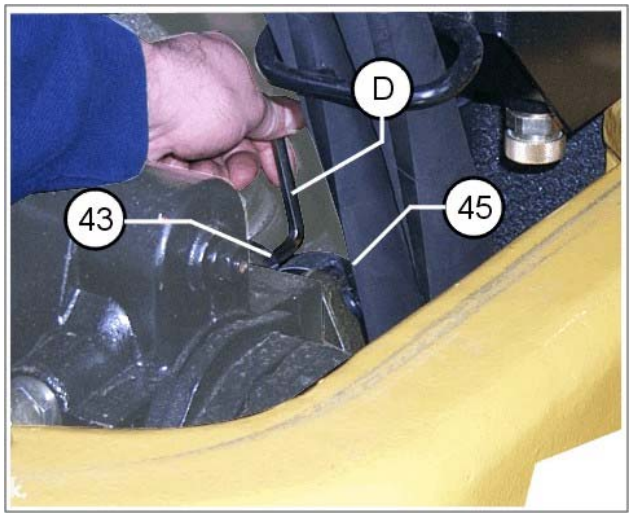
- Connect the drain hose **(B)** at the drain valve **(10)** mounted at the oil tank
- Collect the oil in the receptacle.



- Unscrew the fittings **(17)** and the pressure hoses **(20)** together from the pump (fork wrench **(C)** SW 32)
- Collect the oil
- Plug the hoses and pump with blind plugs



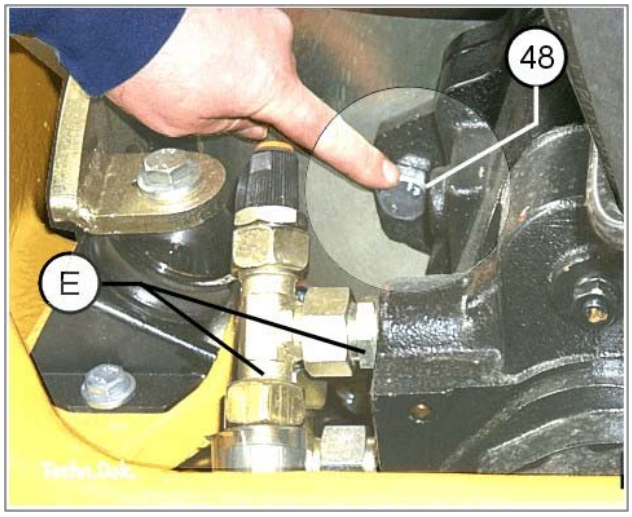
- Unscrew the bolts **(43)** at the suction flange with a hexagon socket screw key **(D)** SW10
- Remove the suction hose **(45)**
- Collect the oil
- Plug the hoses and pump with blind plugs



- Slacken the pump fastening bolts (48) (SW24).

Be careful when removing the pump !

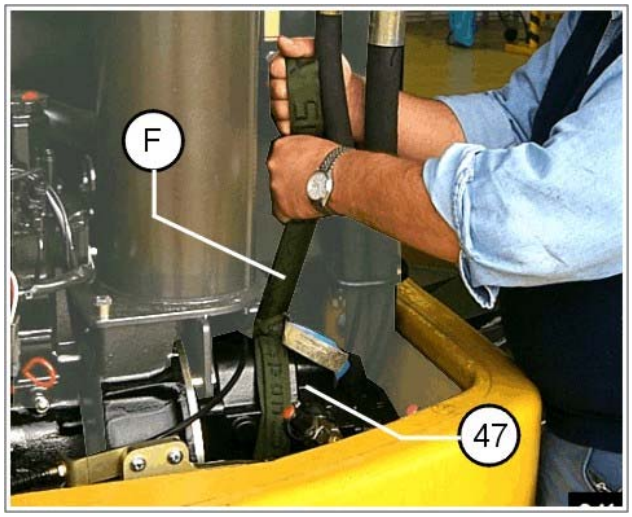
- Secure the pump fastening bolts (48) with Loctite 242, tightening torque MA = 220 Nm.



- Pull the pump out of the flange by means of a shoulder strap **(F)** and lift it out obliquely
- When replacing the pump, reuse the screwed fitting **(E)** of the old pump
- For the repair of the pump, please refer to pages 11.80.21 to 11.80.25
- Assembly analogous.

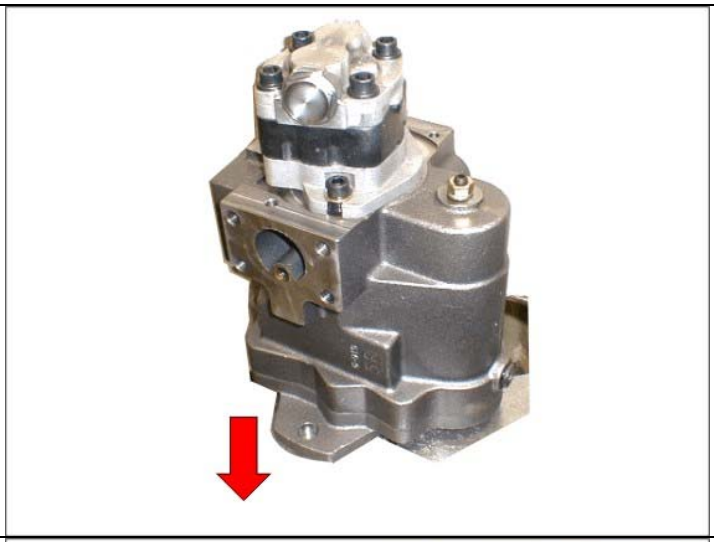
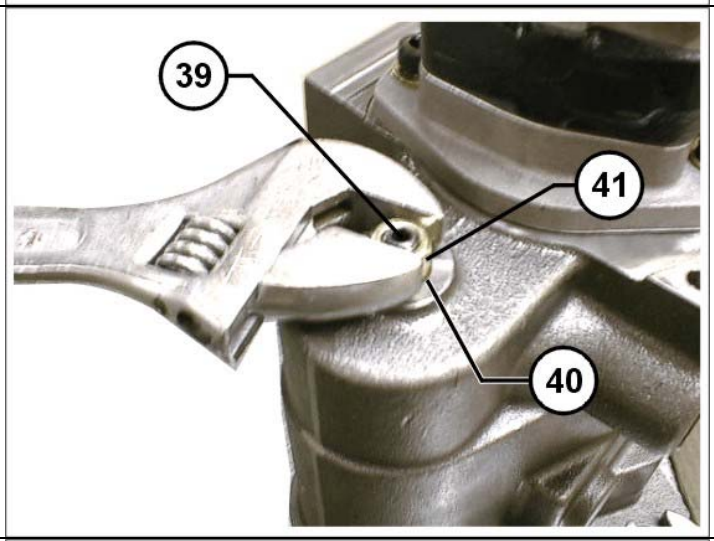
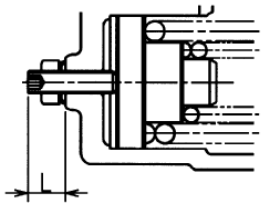
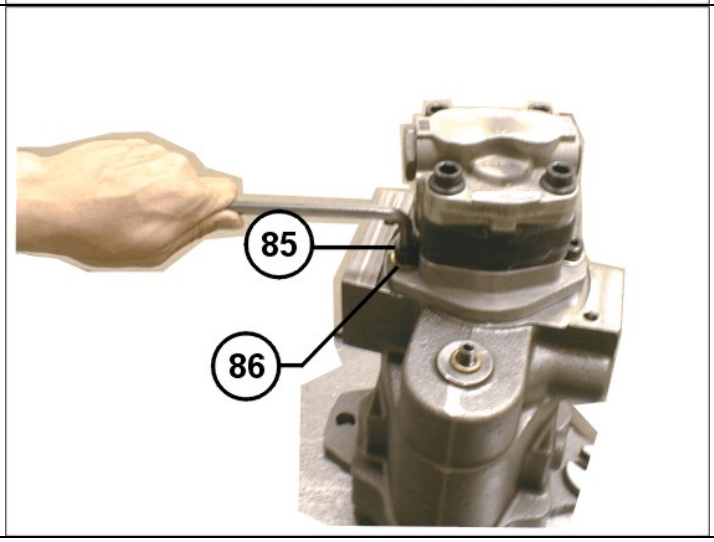
Attention !

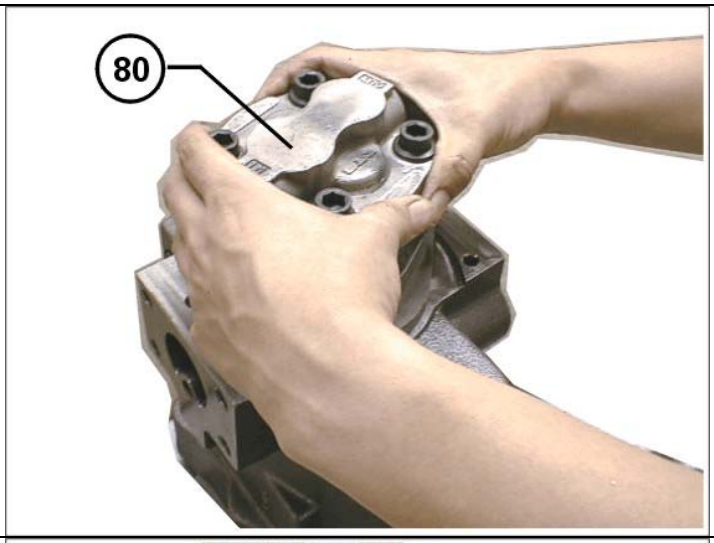
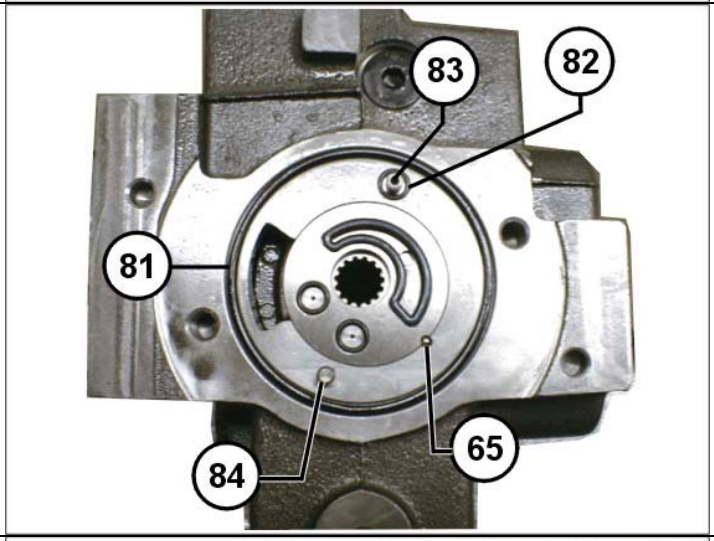
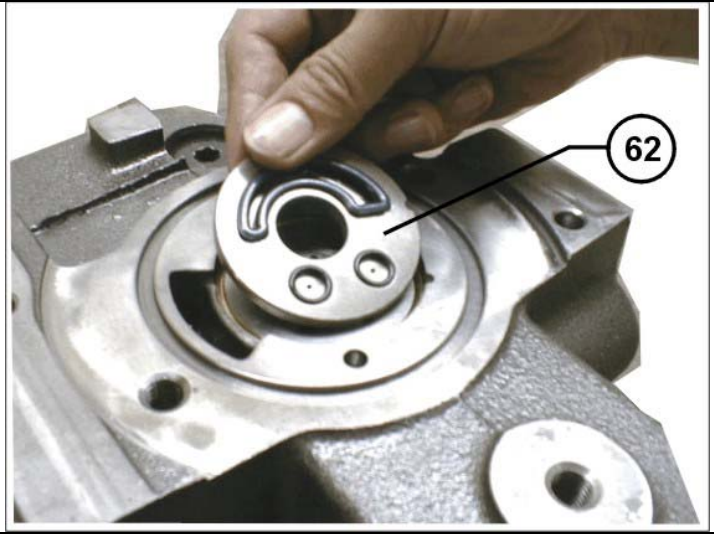
It is imperative to clean the tank, flush the hydraulic system and replace the filter element after a pump damage.

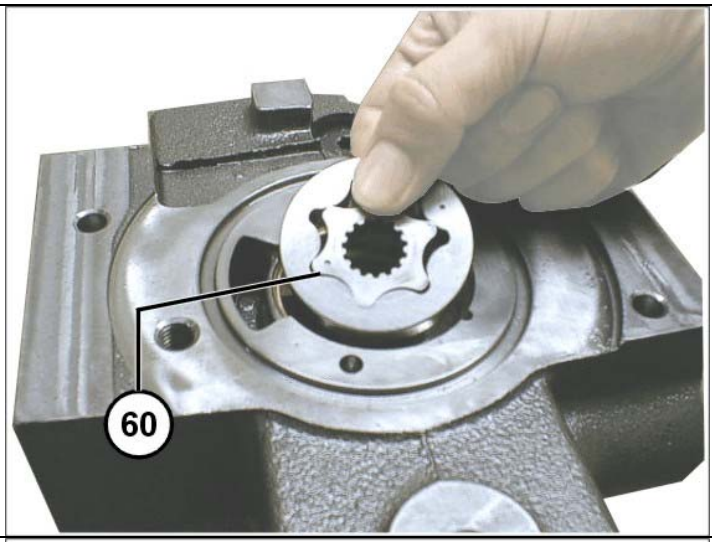
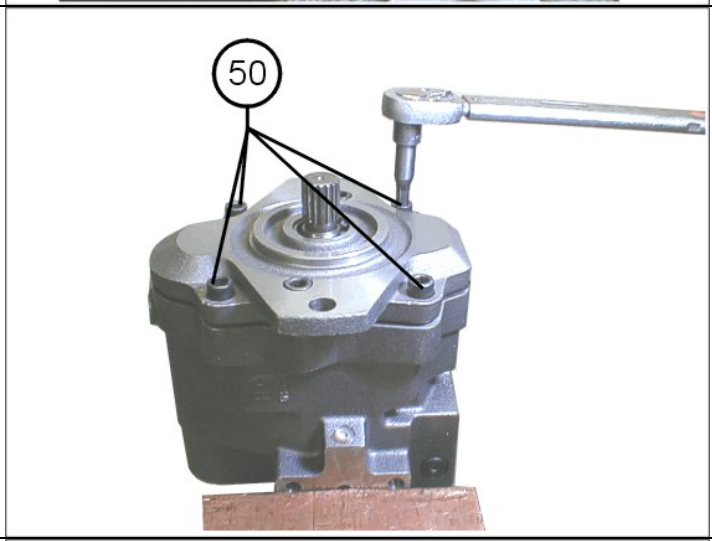
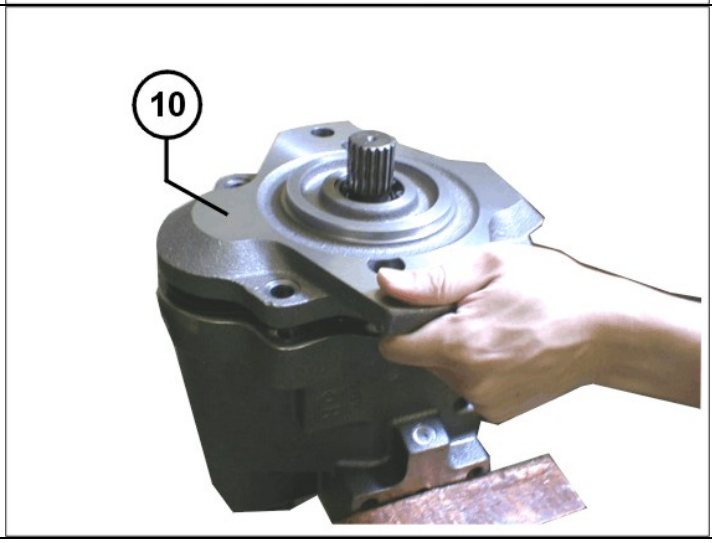


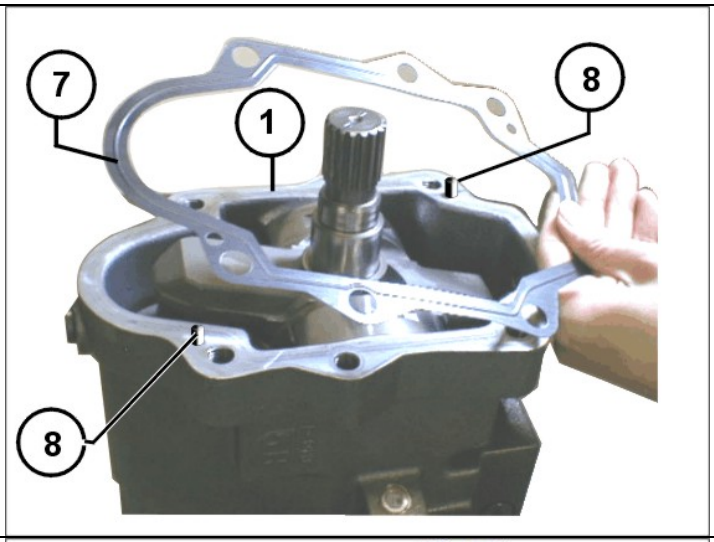
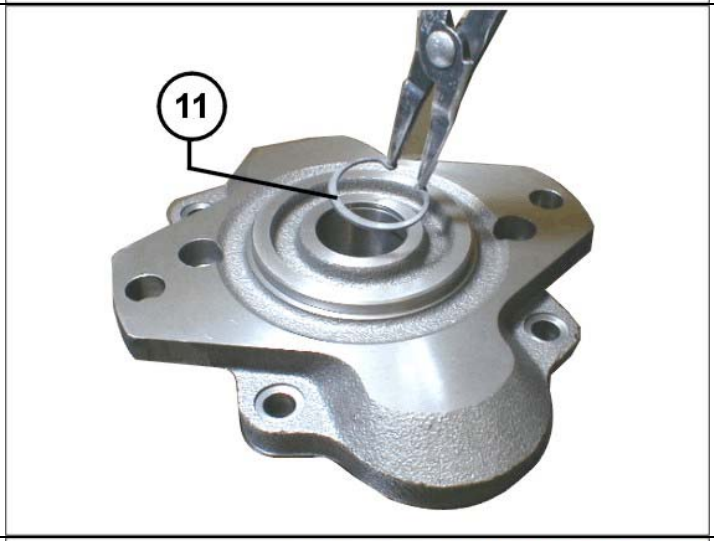
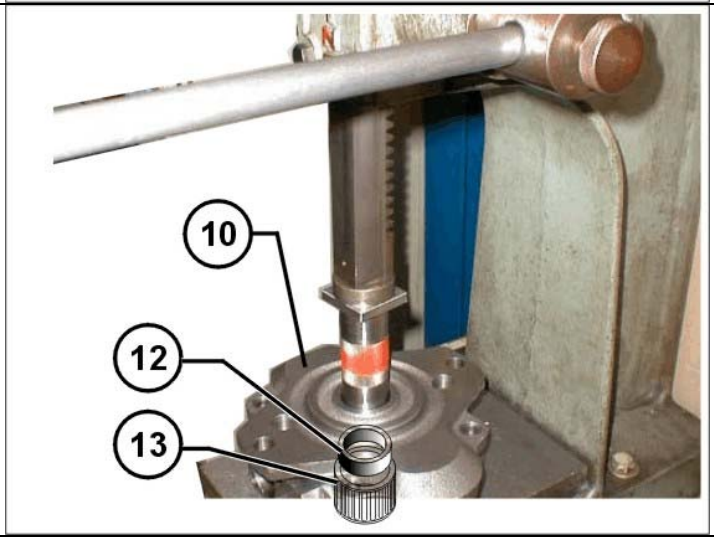
	PROCEDURE	NOTE
	Clean the pump compartment carefully. Dismount the pressure and suction hoses. Drain the oil of the pump and tank. Plug all ports. Remove the pump. Clean the pump carefully before disassembly.	After draining the oil, the plugs should be closed tight in order to prevent oil leakage and oil contamination

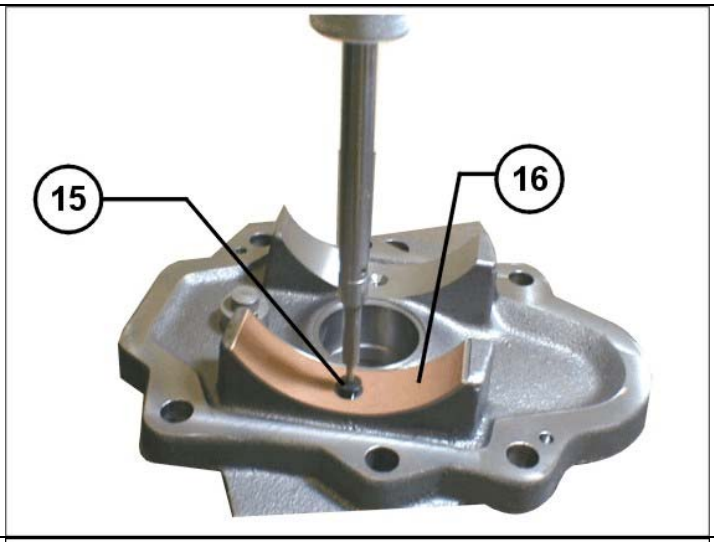
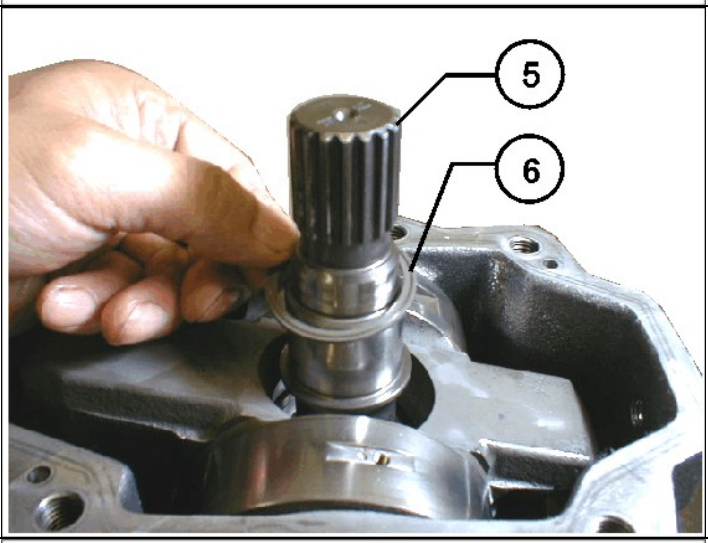
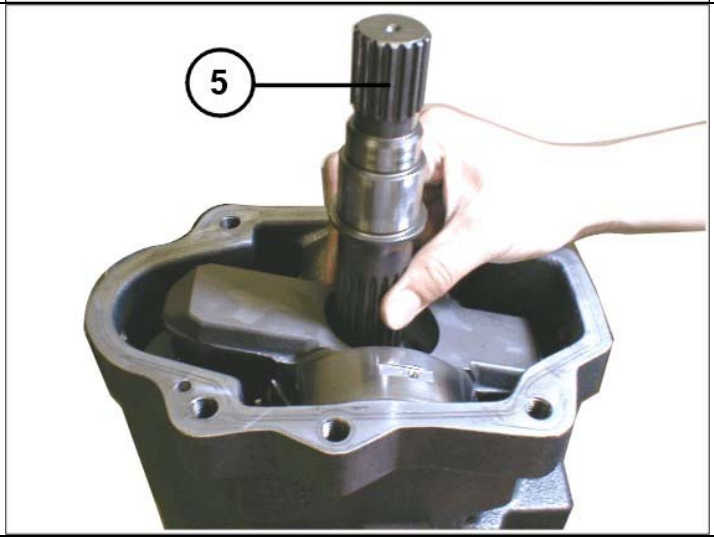
Pump disassembly

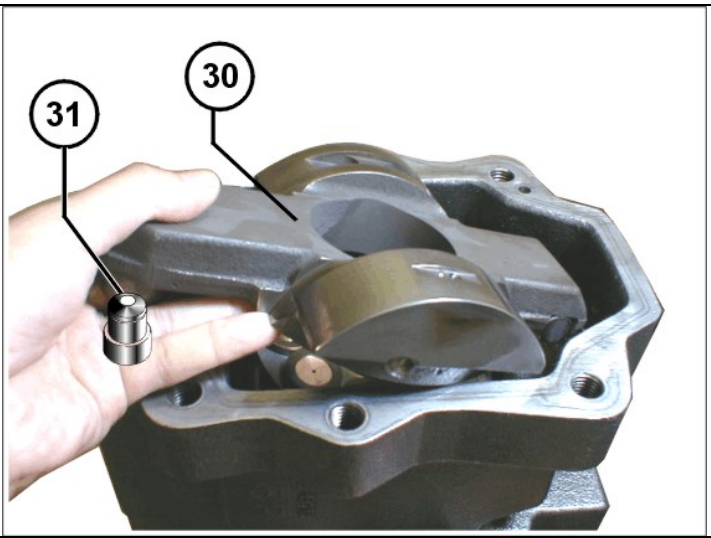
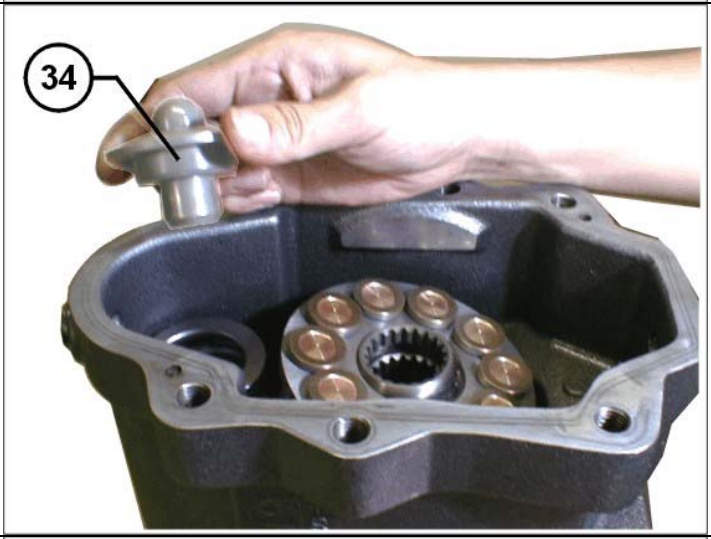
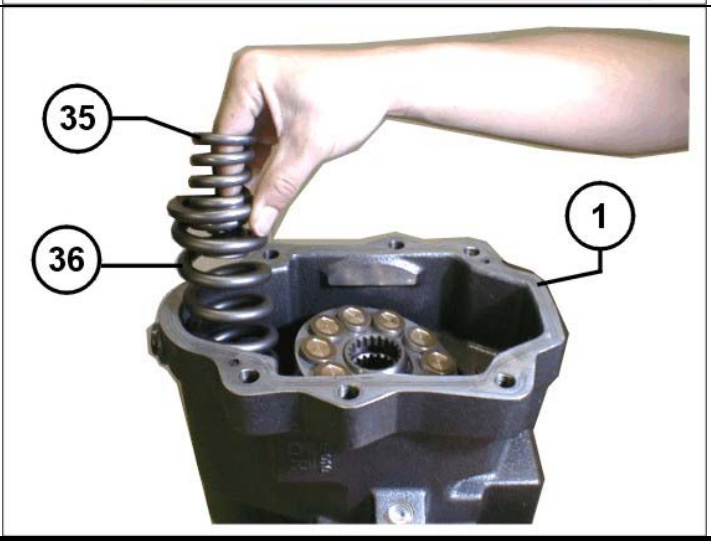
	PICTURE	PROCEDURE
		Clamp the pump with the shaft pointing downward.
		Dismount the setscrew **(39)**, nut **(41)** and seal washer **(40)**. ***BE CAREFUL*** Measure the height **„L“** before removing the setscrew. 
		Dismount the bolts **(85)** and washers **(86)**.

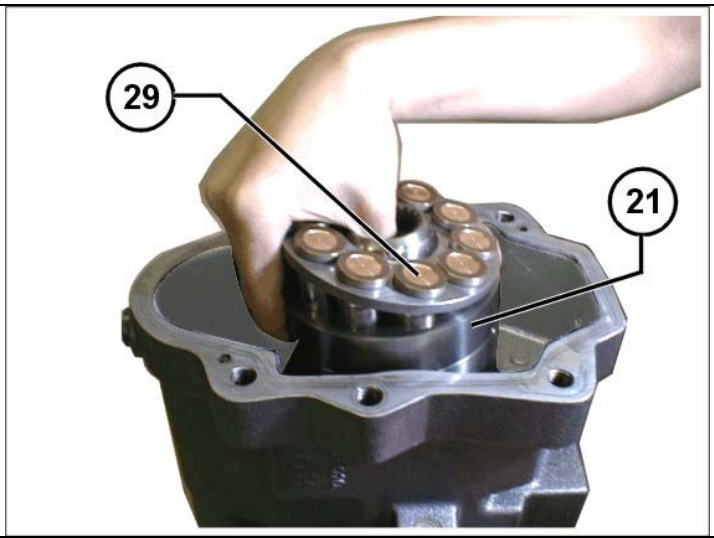
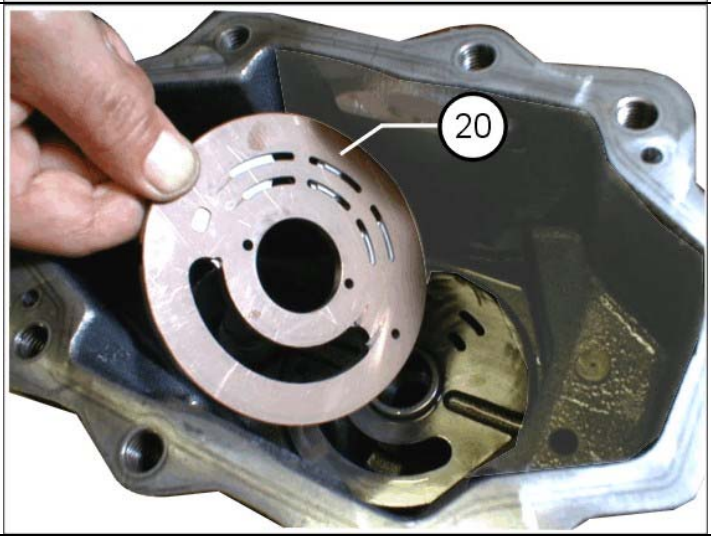
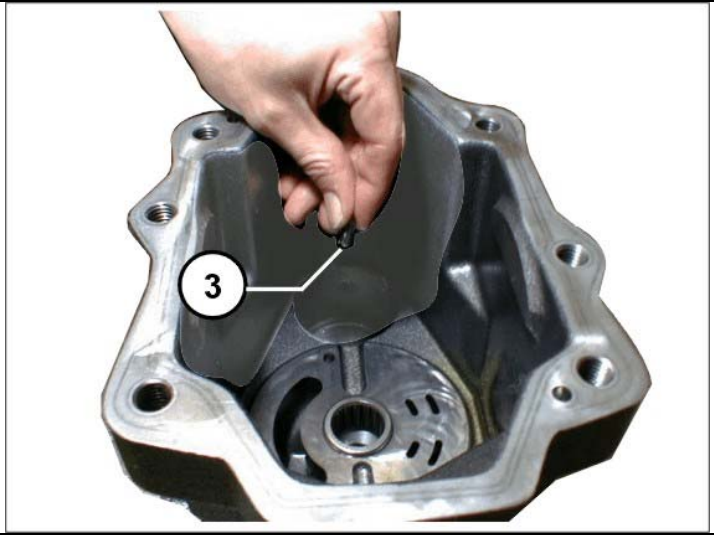
	PICTURE	PROCEDURE
		Pull out the gear pump **(80)**.
		Remove the steel ball **(65)**, O-rings **(81),(82)** and pins **(83)** and **(84)**
		Remove the control plate **(62)**.

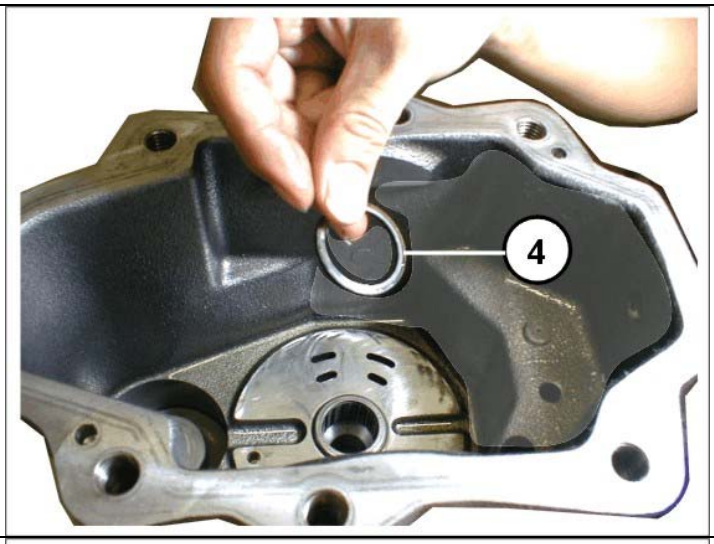
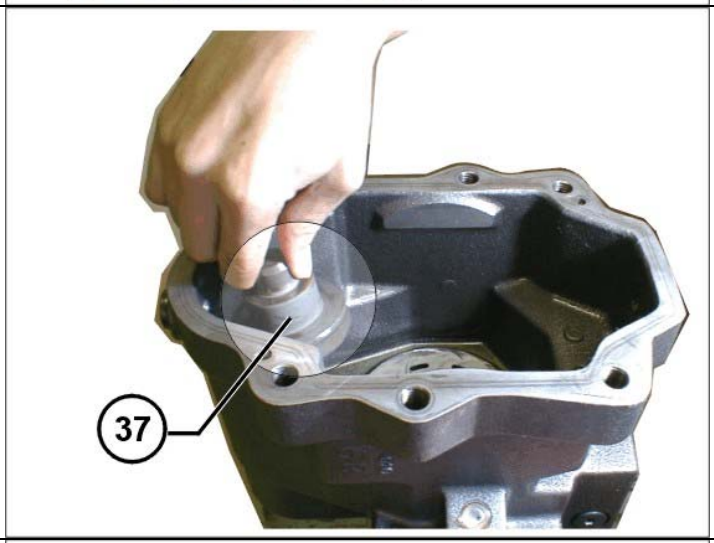
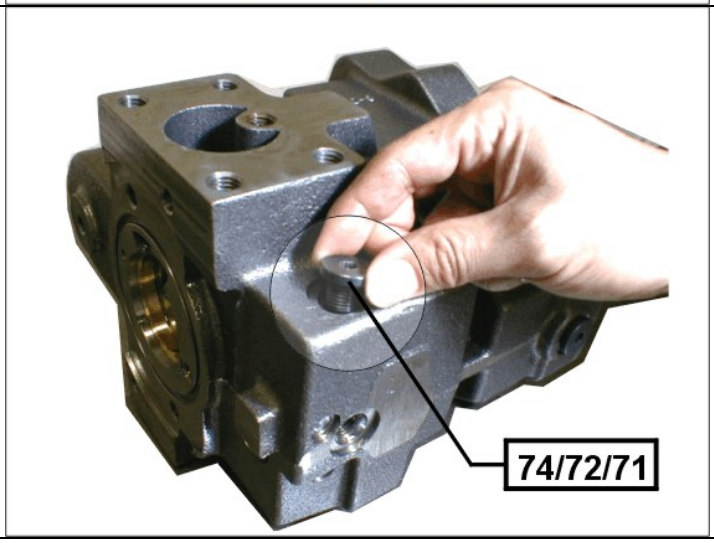
	PICTURE	PROCEDURE
		Remove the rotor assembly **(60)**.
		Fasten the pump with the pump shaft pointing upward. Unscrew the 6 bolts **(50)**. ***BE CAREFUL*** The flange plate is under pressure (spring pressure).
		Remove the flange **(10)**. ***BE CAREFUL*** Do not catch your fingers and hands between the flange and housing.

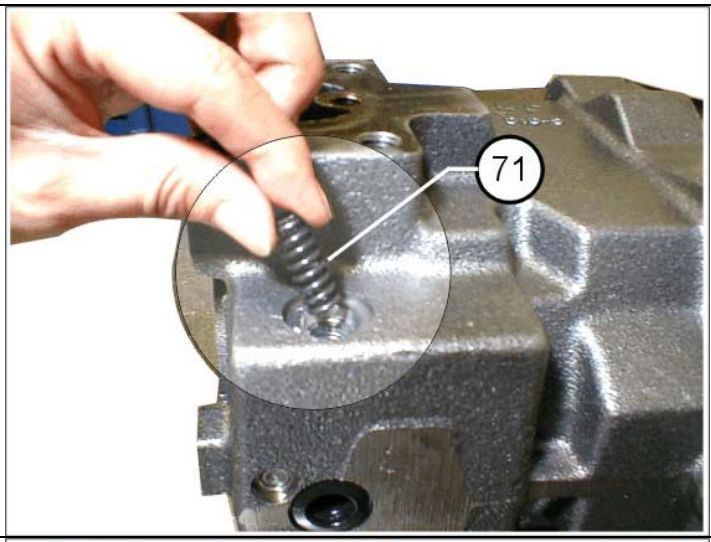
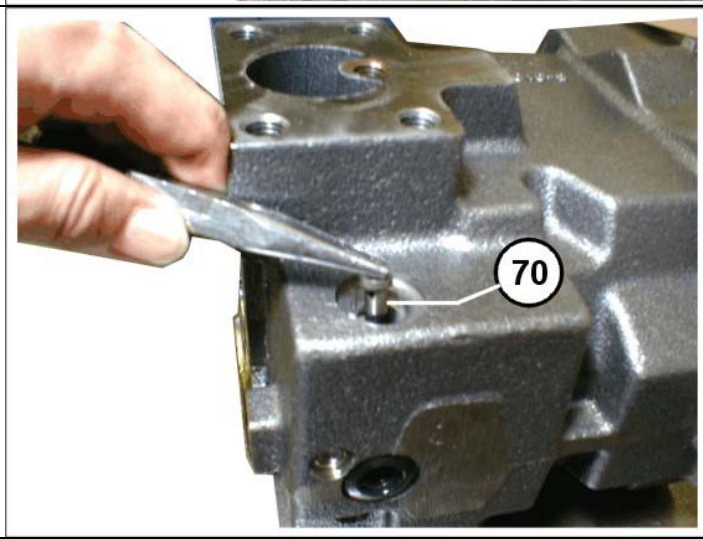
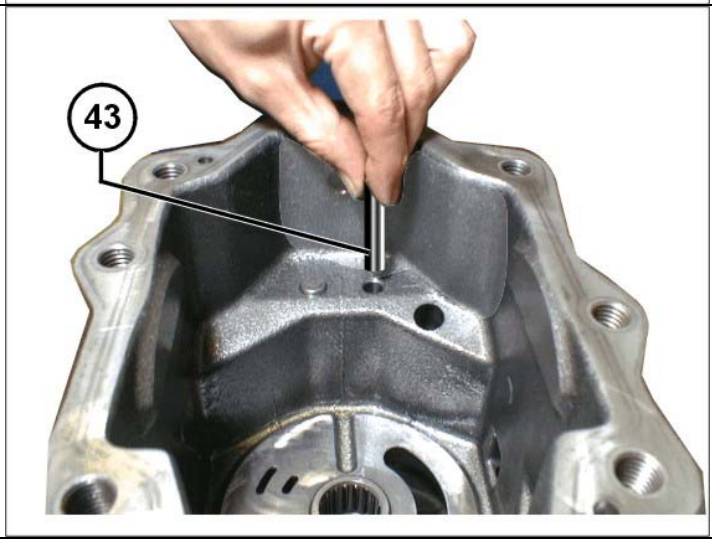
	PICTURE	PROCEDURE
		Remove the gasket **(7)** and pins **(8)** from the housing **(1)** ***BE CAREFUL*** The gasket can cause injuries on your fingers or hands.
		Take out the snap ring **(11)** ***BE CAREFUL*** The snap ring can jump out.
		Press the seal ring **(12)** as well as the needle bearing **(13)** out of the flange **(10)** by means of a hand press

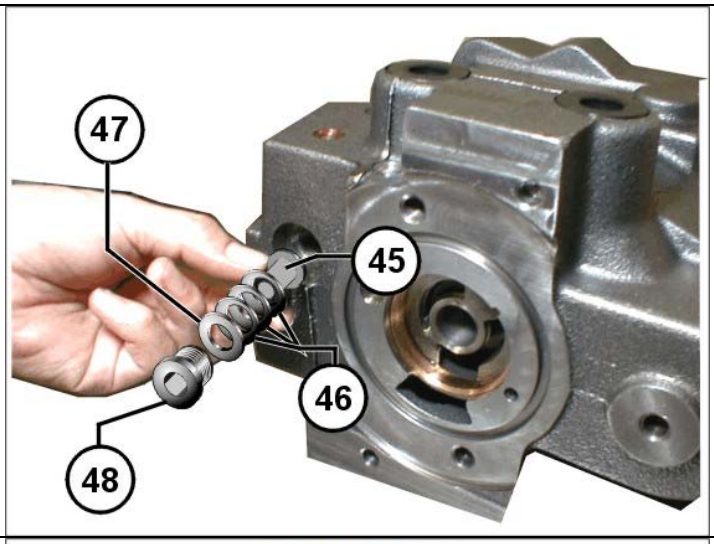
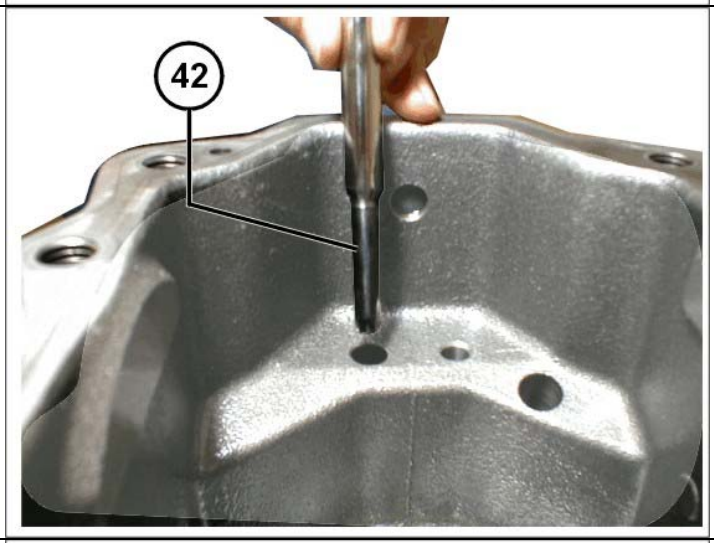
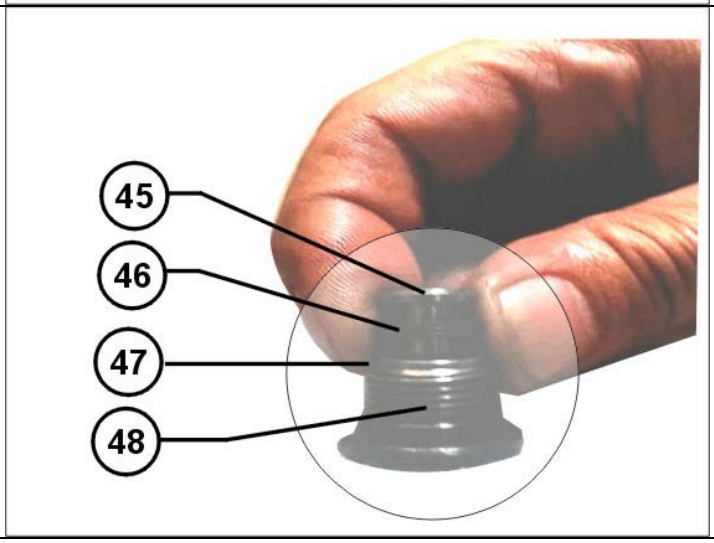
	PICTURE	PROCEDURE
		Unscrew the bolts **(15)** and remove the bearing shells **(16)**.
		Remove the thrust washer **(6)** from the shaft **(5)**.
		Extract the shaft **(5)**.

	PICTURE	PROCEDURE
		Remove the swashplate **(30)** and holder **(31)**. ***BE CAREFUL*** Handle with care to make sure that the holder **(31)** does not drop.
		Pull out the spring seat **(34)**.
		Remove the inner **(35)** and outer spring **(36)** from the housing **(1)**.

	PICTURE	PROCEDURE
		Carefully take out the cylinder block assembly **(21) / (29)**.
		Remove the valve plate **(20)**.
		Remove the pin **(3)**.

	PICTURE	PROCEDURE
		Take out the thrust washer **(4)**.
		Pull out the lower spring seat **(37)**.
		Remove the plug **(74)** from the relief valve. Pay attention to the shims at the rear of the plug. ***BE CAREFUL*** Spring **(71)** can jump out.

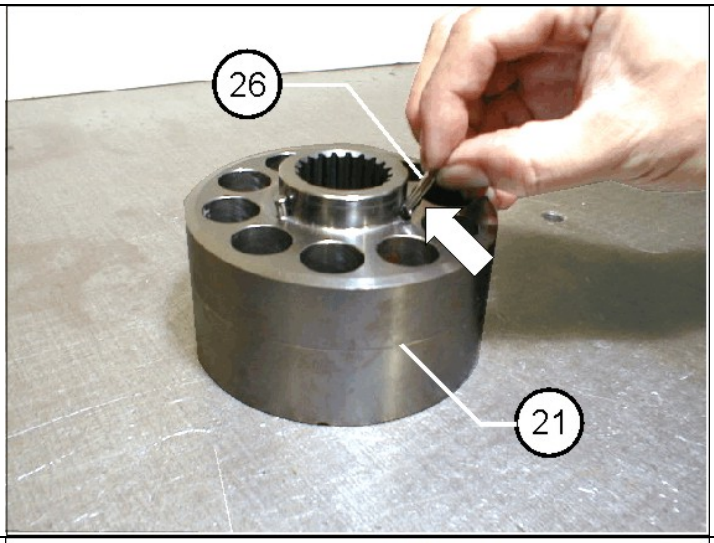
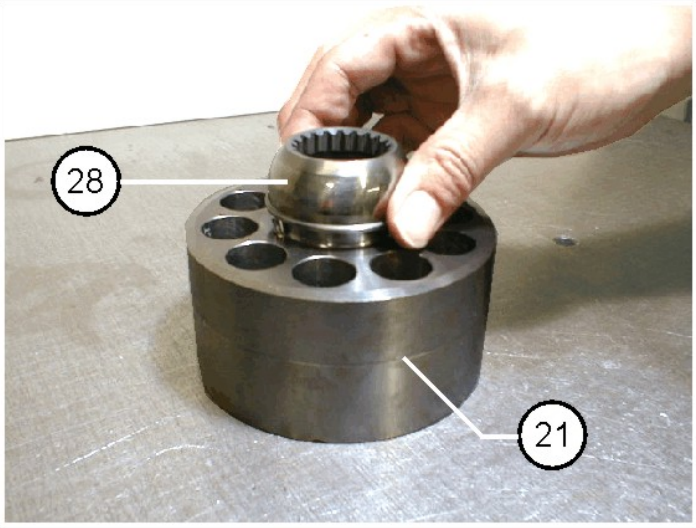
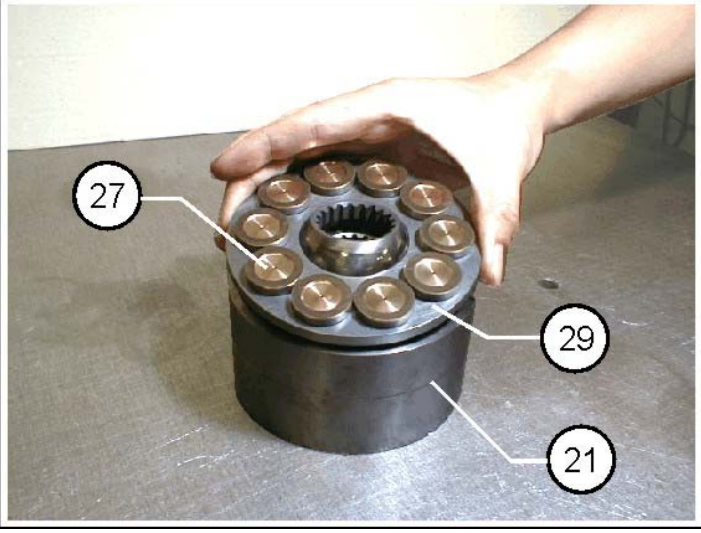
	PICTURE	PROCEDURE
		Take out the spring **(71)**.
		Take out the valve cone **(70)**.
		Remove the control pin **(43)**.

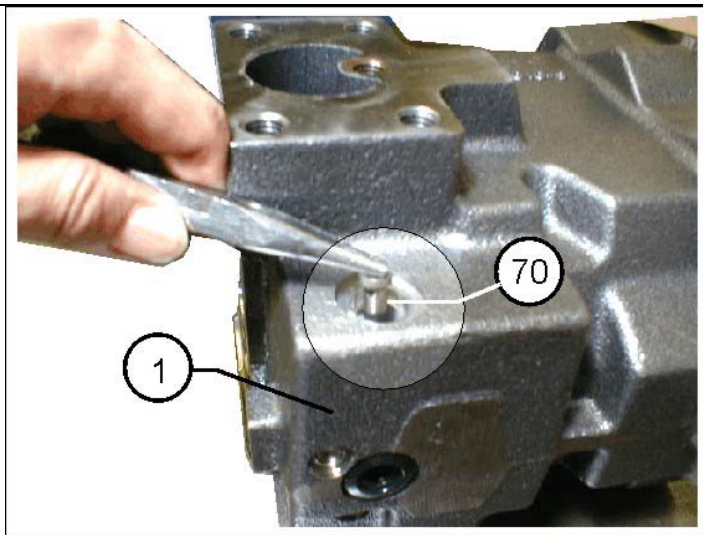
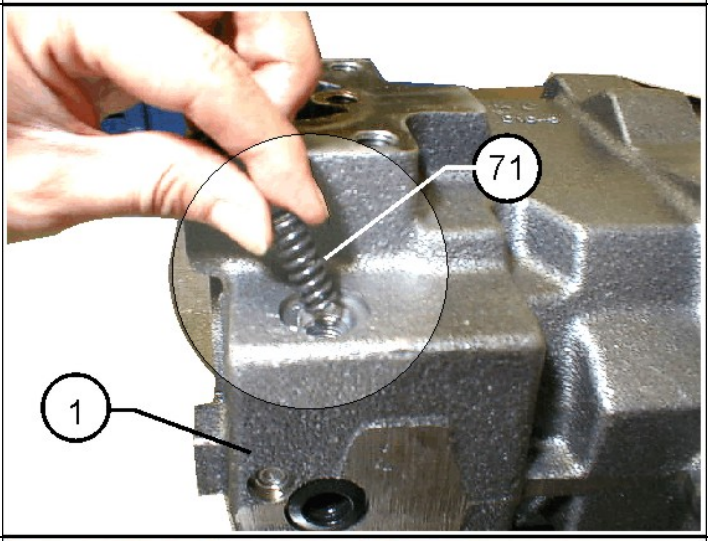
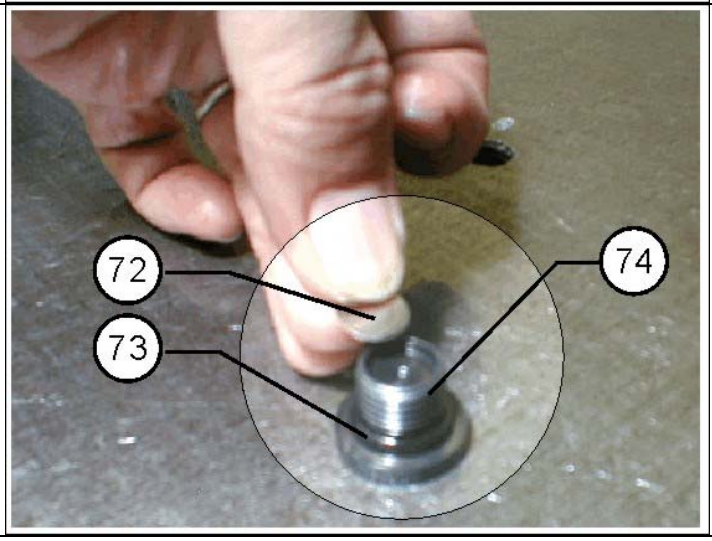
	PICTURE	PROCEDURE
		Unscrew the plug **(48)**, pay attention to the stopper **(45)**, the disk springs **(46)** and the washers **(47)**.
		Remove the control pin **(42)**.
		Remove the stopper **(45)**, the disk springs **(46)** and the washers **(47)** from the plug **(48)**.

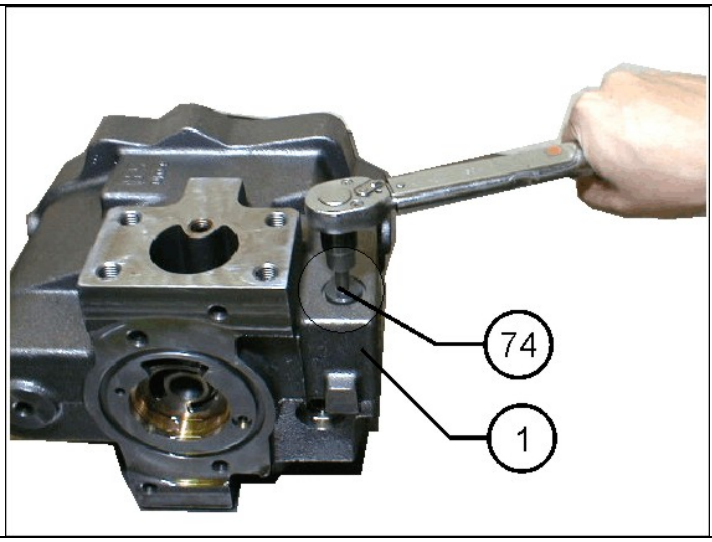
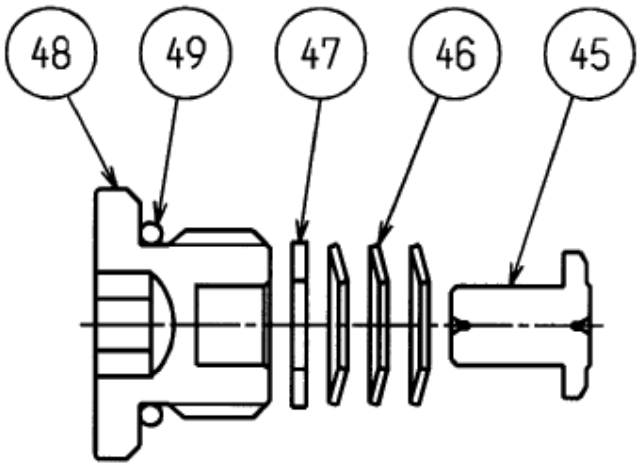
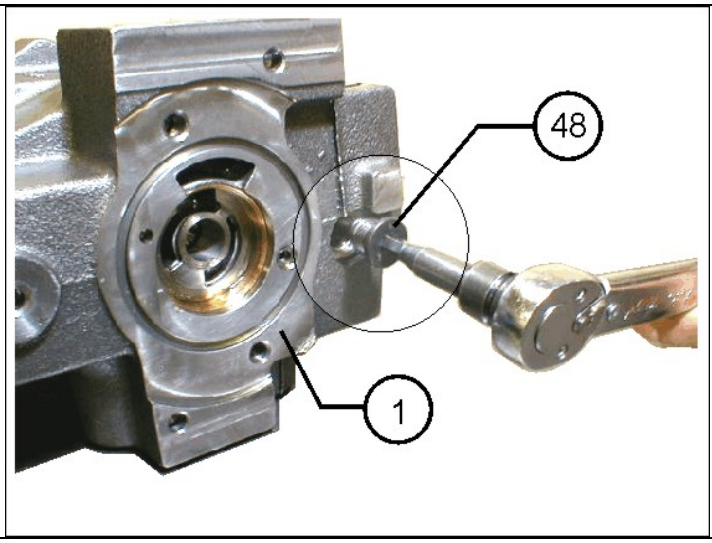
Assembly

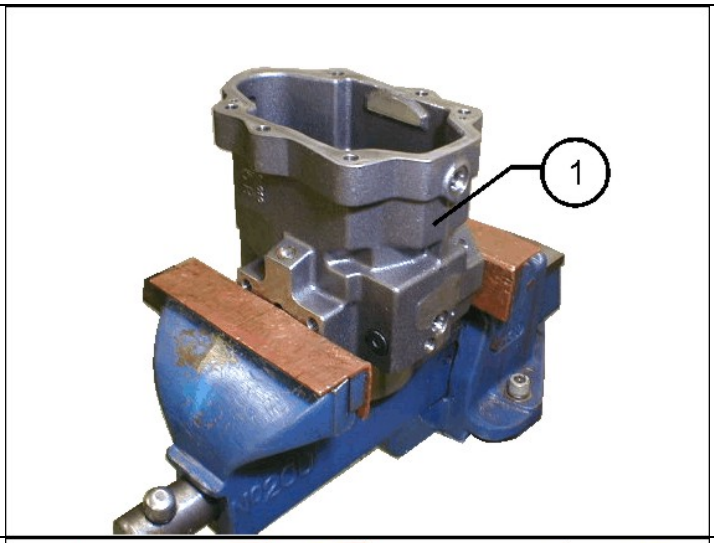
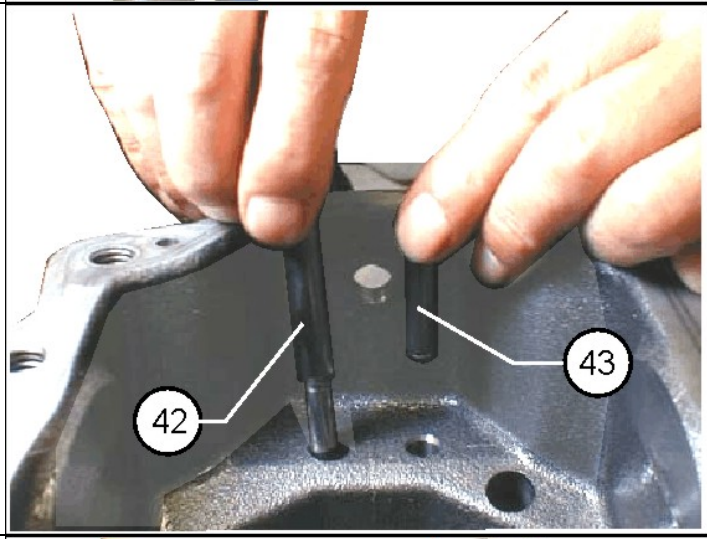
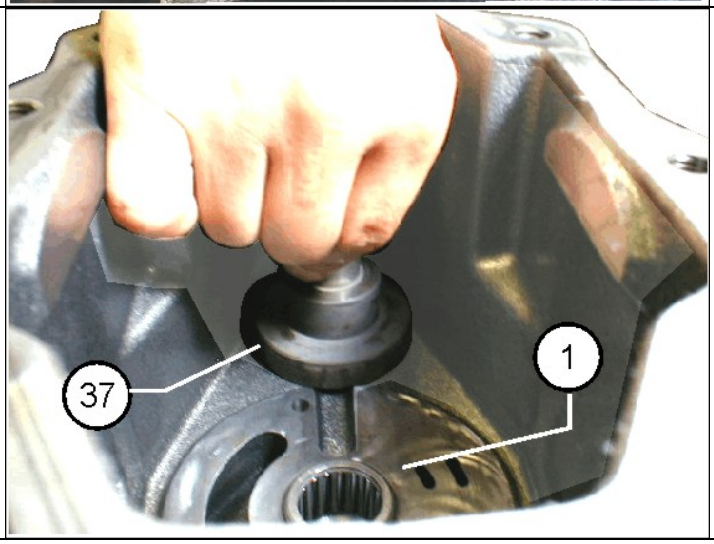
Precautionary measures prior to the assembly

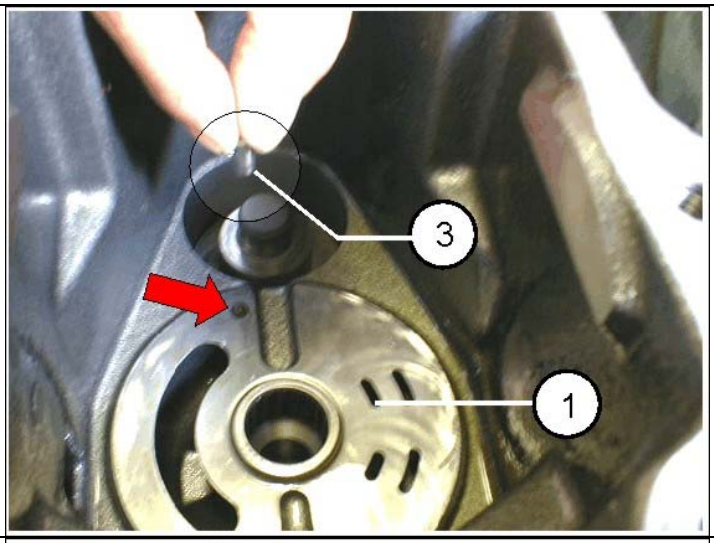
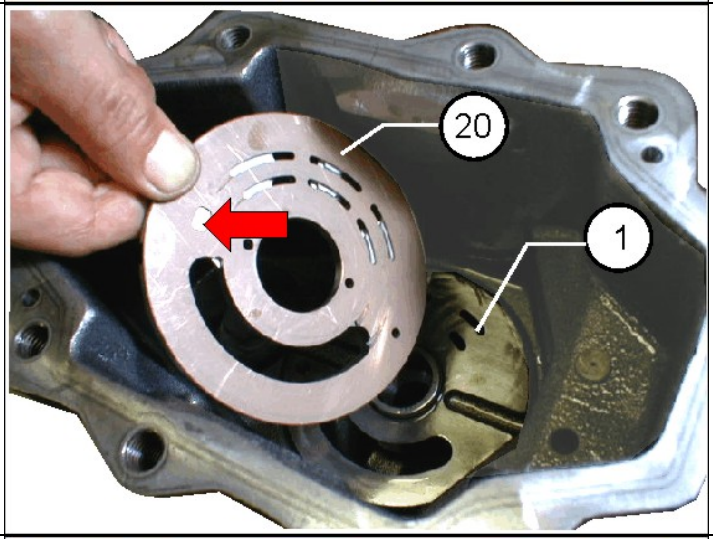
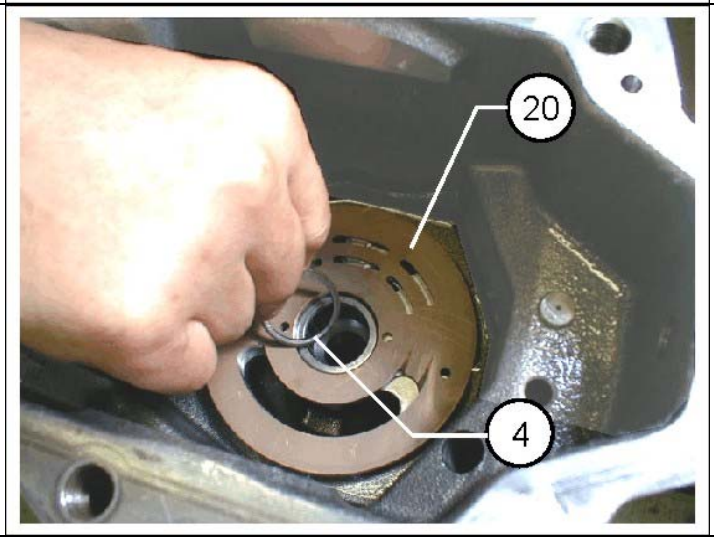
	PROCEDURE	NOTE
	Clean all parts The parts must not be damaged. Replace the seals and O-rings by new ones. Tighten the bolts, etc. with the correct torque.	Lubricate all oil seals and O-rings (especially the oil seal lip area).

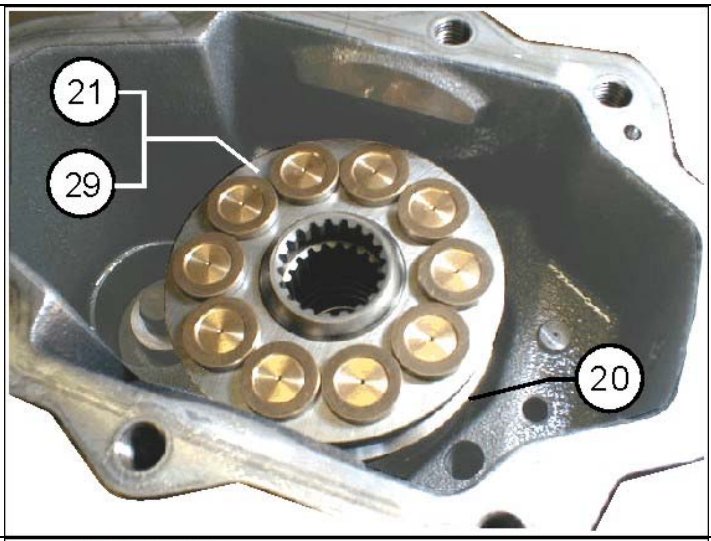
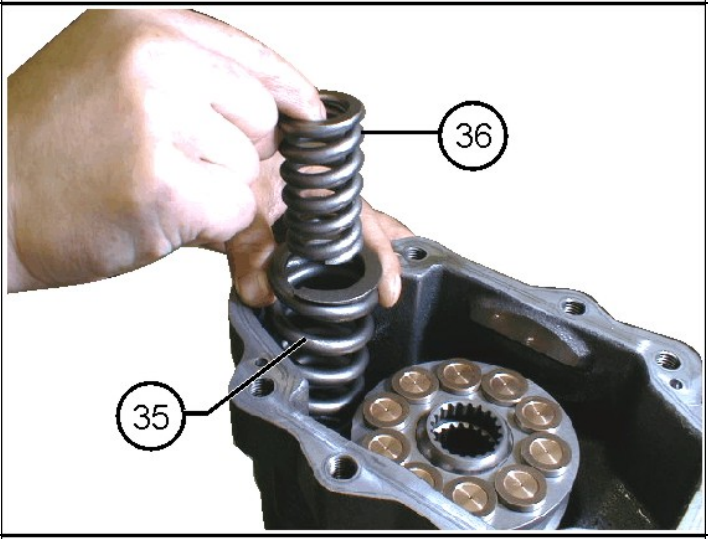
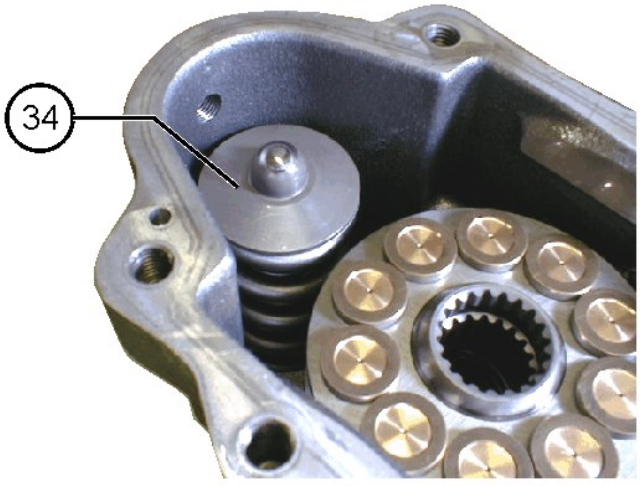
	PICTURE	PROCEDURE
		Apply grease on the three pins **(26)** and put them into the cylinder block **(21)**.
		Put the retainer holder **(28)** on the cylinder block **(21)**.
		***CAUTION*** *Do not use a hammer !* Put the piston **(27)** into the retainer holder **(29)** and install this assembly in the cylinder block **(21)**.

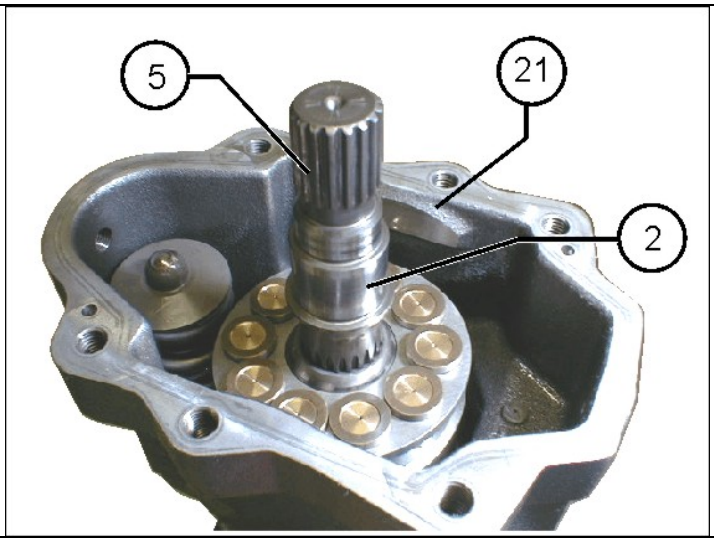
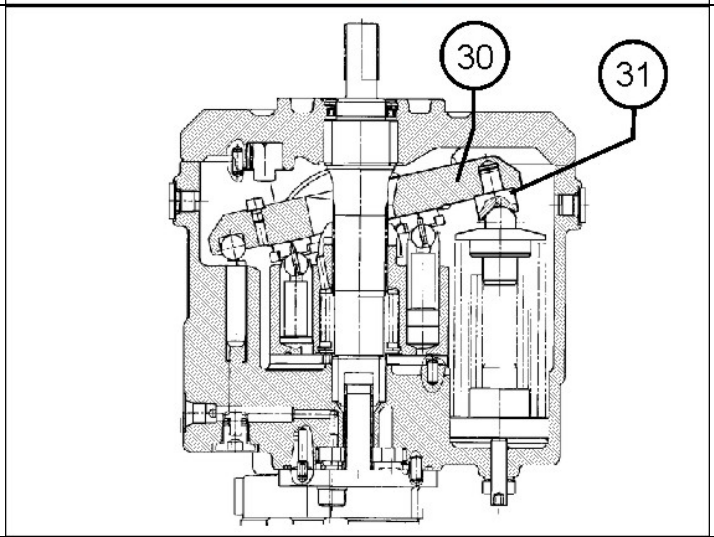
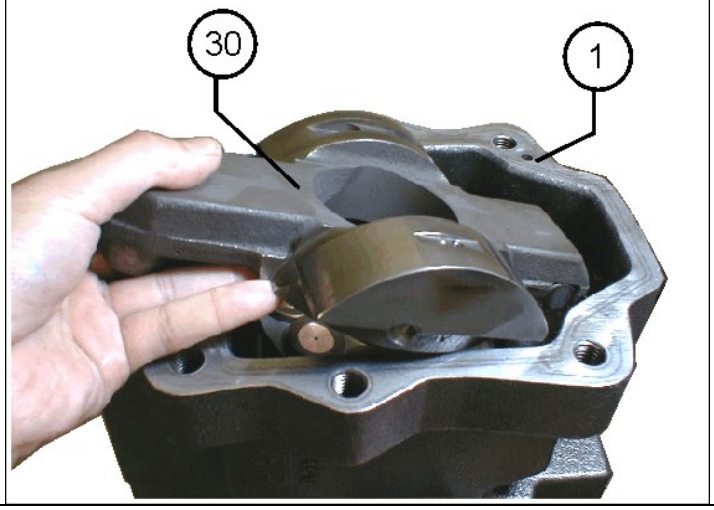
	PICTURE	PROCEDURE
		Mount the valve cone **(70)** in the housing **(1)**.
		Insert the spring **(71)** into the housing **(1)**.
		Mount the O-ring **(73)** on the plug **(74)**. Put the shim **(72)** with grease into the plug **(74)**.

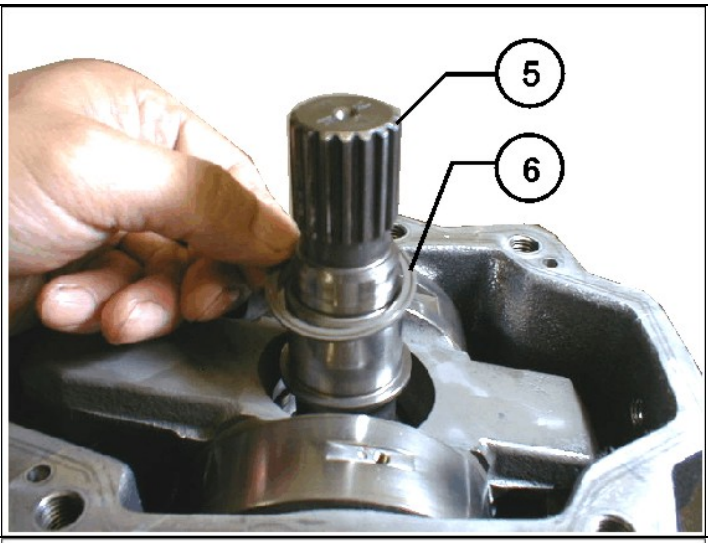
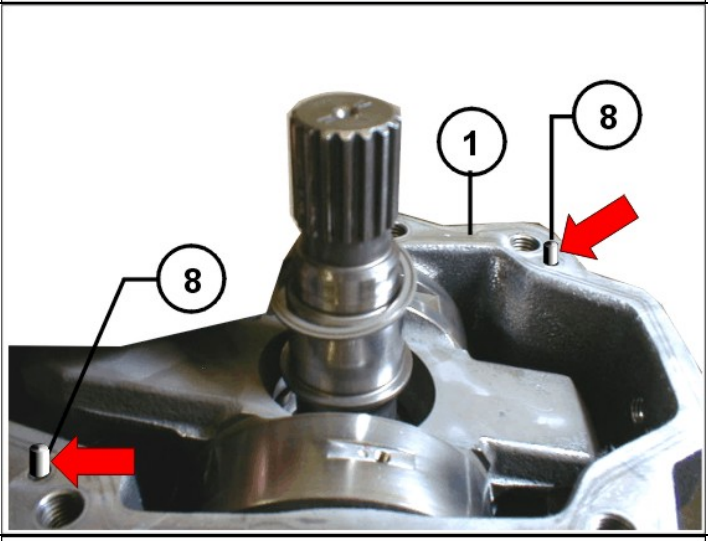
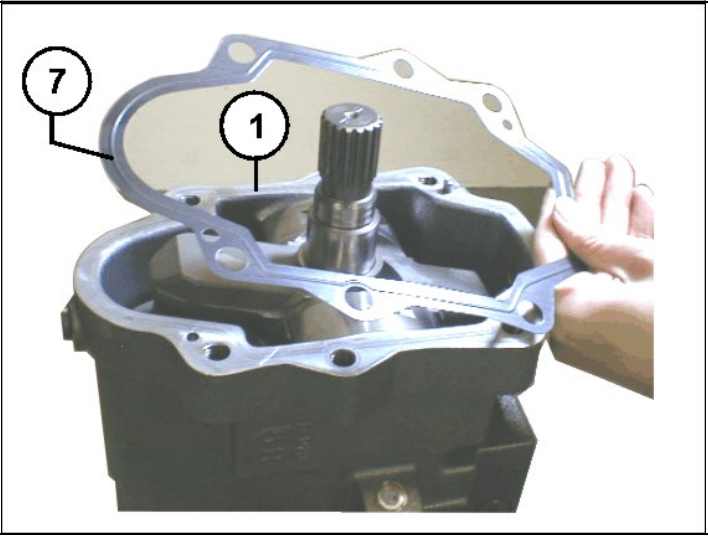
	PICTURE	PROCEDURE
		Screw the plug **(74)** into the housing **(1)**. Tightening torque: 29.4 Nm
		Mount the O-ring **(49)**, the washer **(47)**, the disk springs **(46)** and the stopper **(45)** in the plug **(48)**. ***CAUTION*** Consider the installation direction of the disk springs.
		Screw the plug **(48)** into the housing **(1)**. Tightening torque: 57.0 Nm

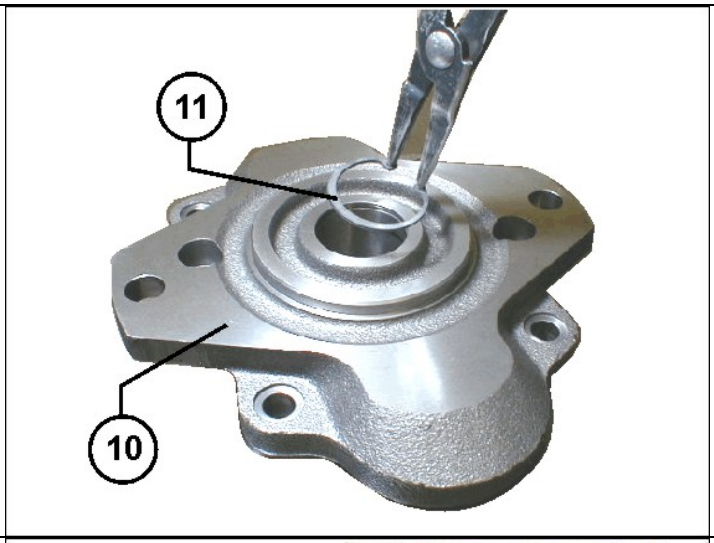
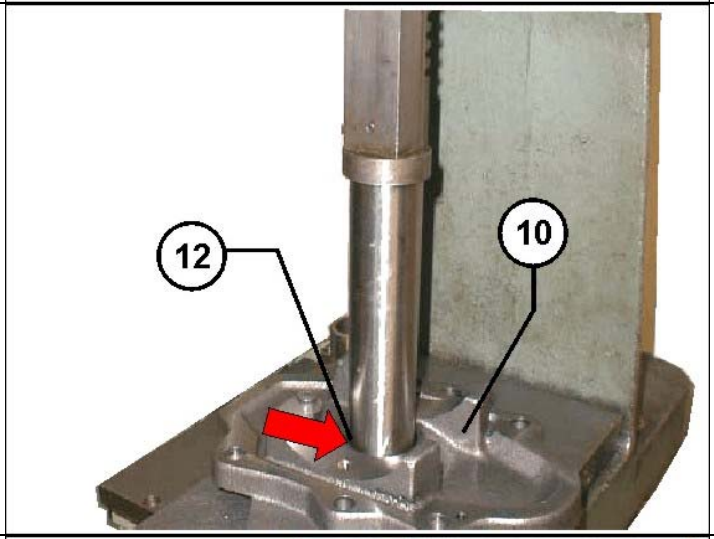
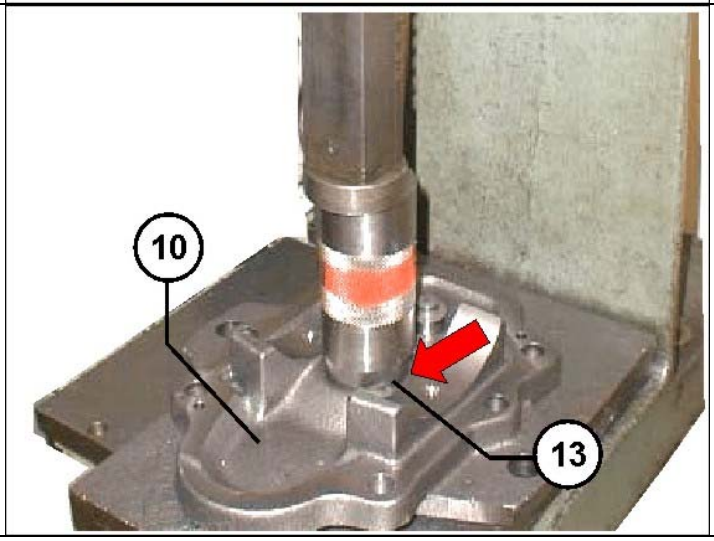
	PICTURE	PROCEDURE
		Clamp the housing **(1)** in a vice with protection pads. ***CAUTION*** Be careful that the suction port is not damaged by the vice.
		Put the control pins **(42)** and **(43)** into the housing.
		Mount the spring seat **(37)** in the housing **(1)**.

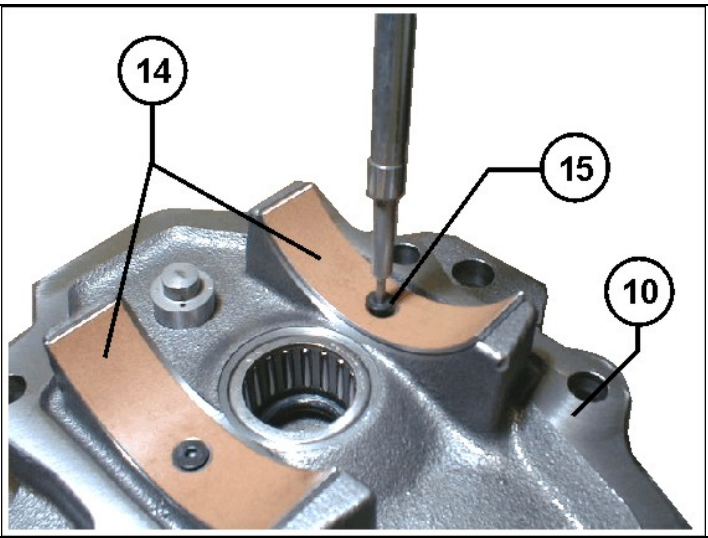
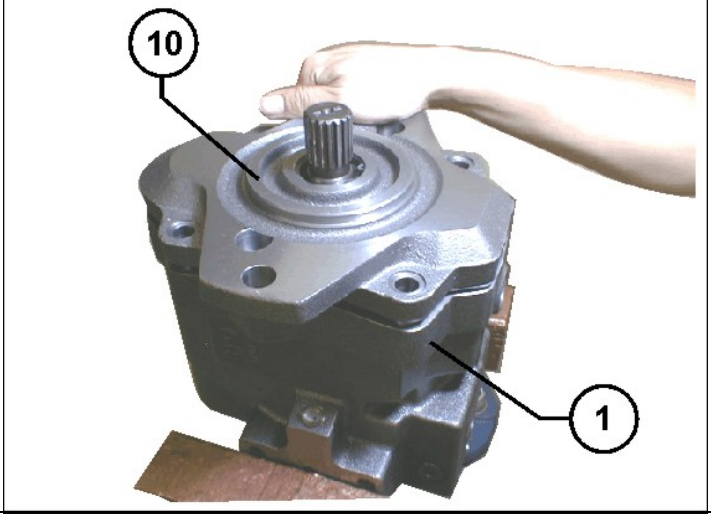
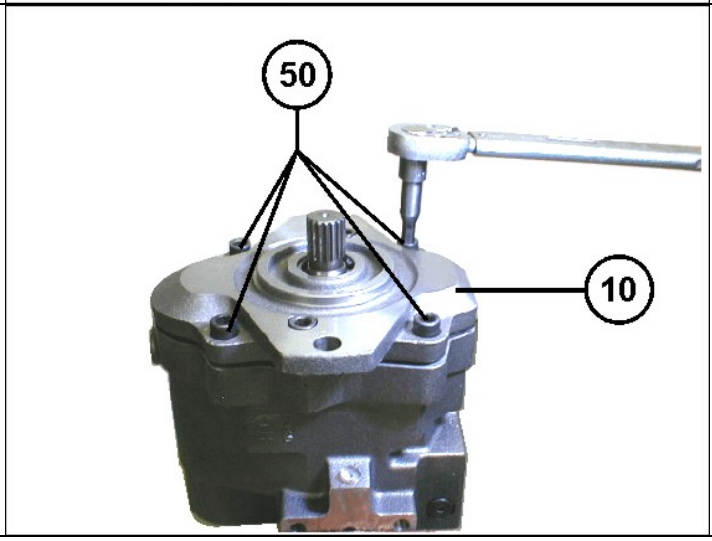
	PICTURE	PROCEDURE
		Put the pin **(3)** into the housing **(1)**, see arrow.
		Put the valve plate **(20)** into the housing **(1)**. The copper alloy must point upward. The pin **(3)** must engage (see arrow).
		Put the thrust washer **(4)** into the valve plate **(20)**.

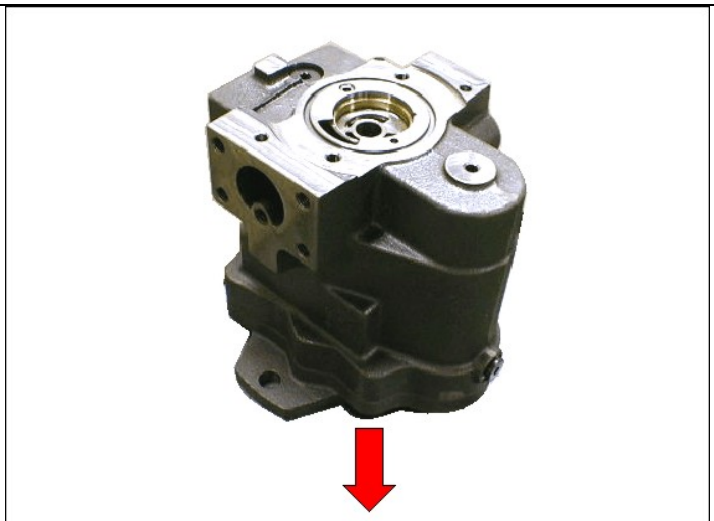
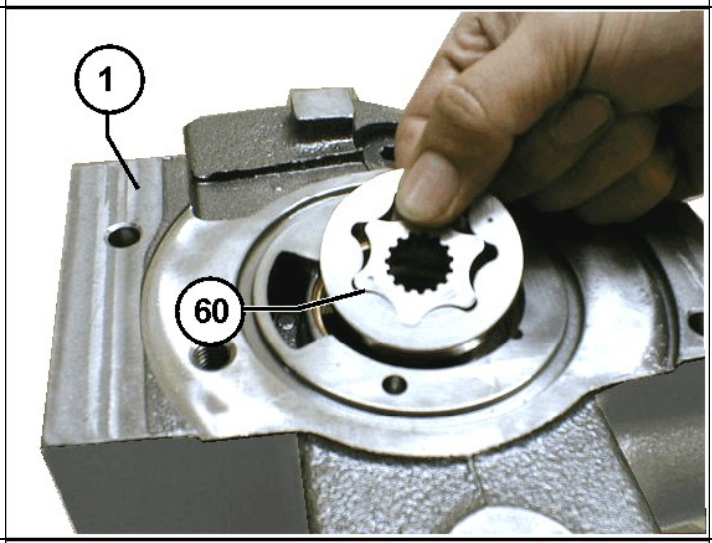
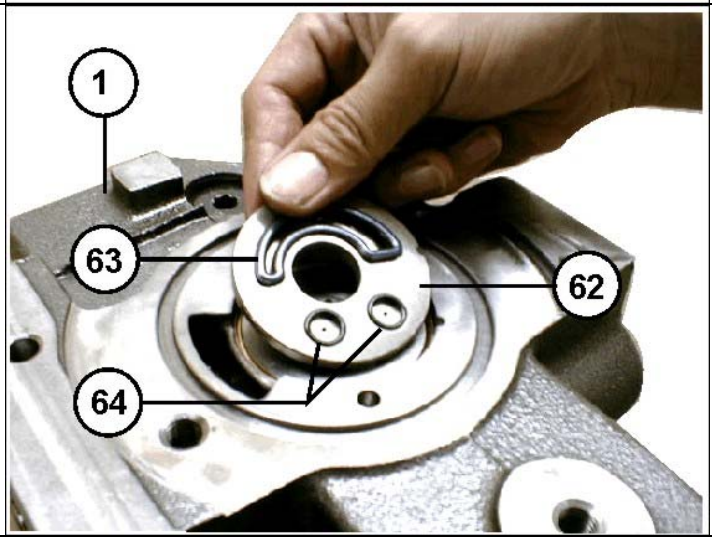
	PICTURE	PROCEDURE
		Put the cylinder block assembly **(21)** and **(29)** on the valve plate **(20)** rubbed with oil. ***CAUTION*** Be careful that the valve plate and rotor assembly are not damaged.
		Mount both springs **(35)** and **(36)**. ***CAUTION*** Be careful that the valve plate and rotor assembly are not damaged.
		Insert the spring seat **(34)**.

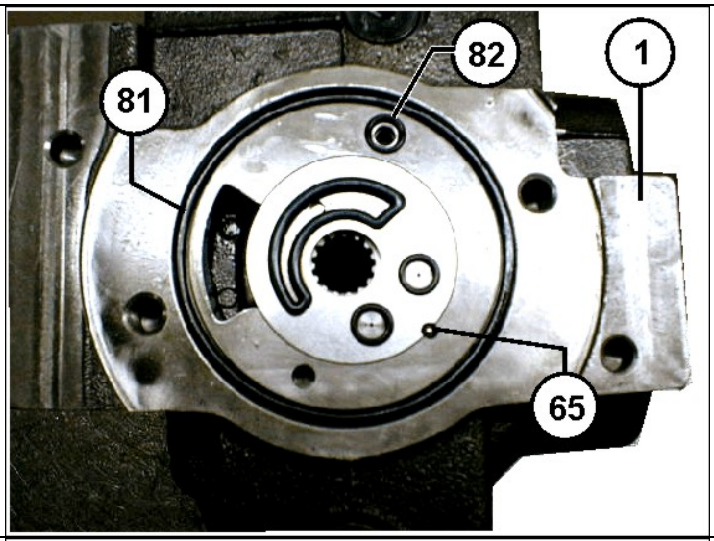
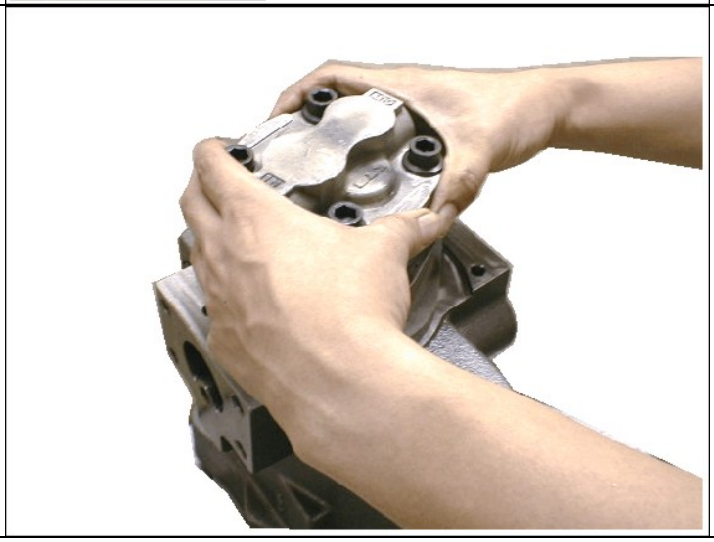
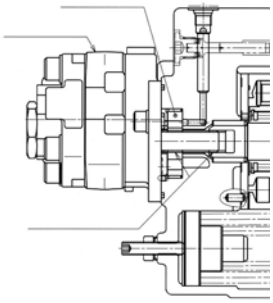
	PICTURE	PROCEDURE
		Mount the shaft **(5)** in such a manner that the grooves in the cylinder block **(21)** and the needle bearing **(2)** match. ***CAUTION*** Be careful that the swashplate, valve group and rotor assembly are not damaged.
		Apply grease on the holder **(31)** and mount it in the swashplate **(30)**.
		Put the swashplate **(30)** into the housing **(1)**. ***CAUTION*** Be careful that the swashplate and rotor assembly are not damaged. Handle with care that the holder does not drop **(31)**.

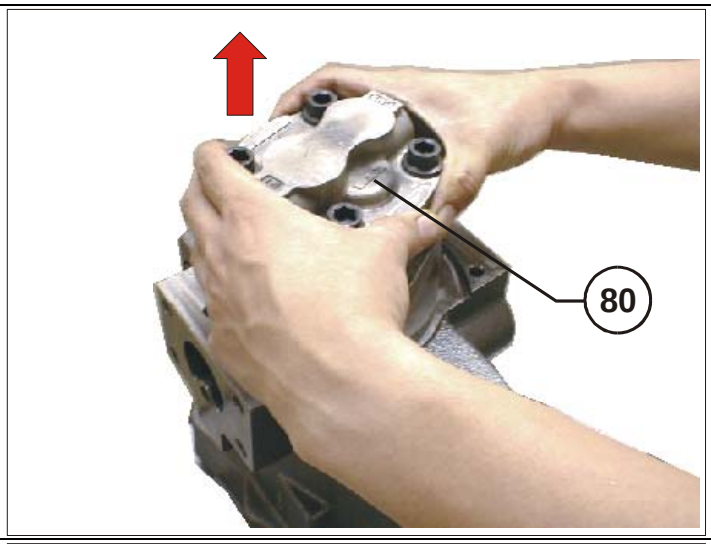
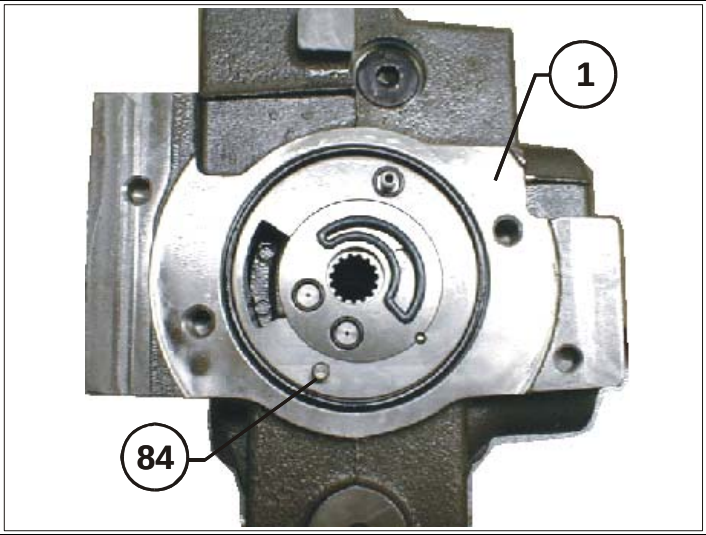
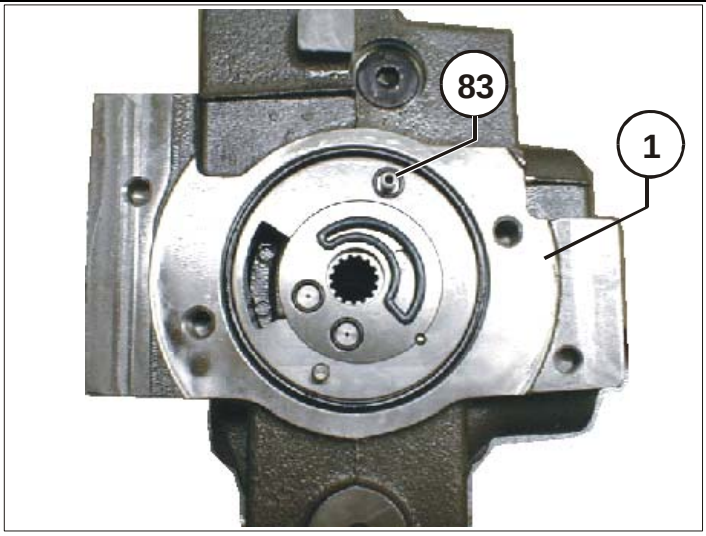
	PICTURE	PROCEDURE
		Put the thrust washer **(6)** on the shaft **(5)**.
		Insert the pins **(8)** into the housing **(1)**.
		Put the gasket on **(7)** on the housing **(1)**. ***CAUTION*** The gasket can cause injuries on your fingers or hands.

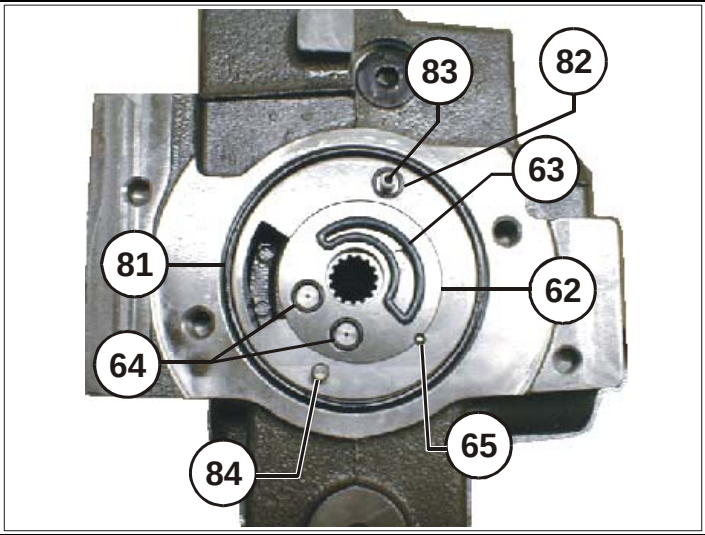
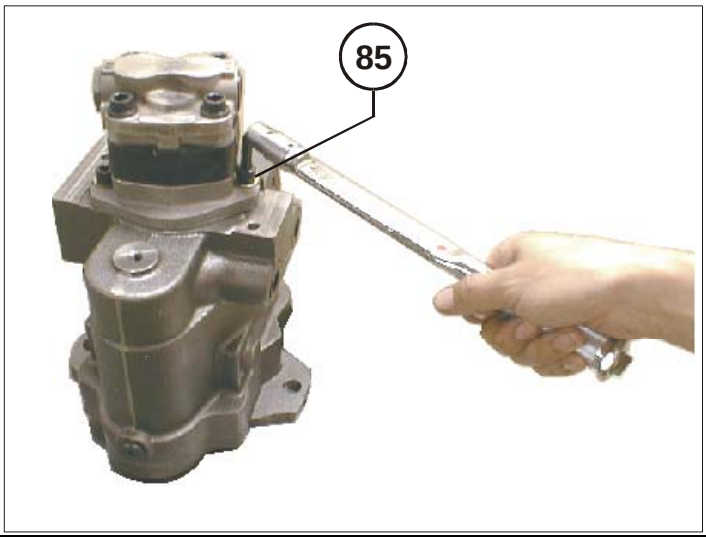
	PICTURE	PROCEDURE
		Mount the snap ring **(11)** in the flange **(10)**. ***CAUTION*** The snap ring can jump out.
		Press the shaft seal ring **(12)** into the flange **(10)** from the inside by using an appropriate tool.
		Press the needle bearing **(13)** carefully into the flange **(10)**. ***CAUTION*** The type description at the bearing should point to the front. The pressing height measure can be found in the following.

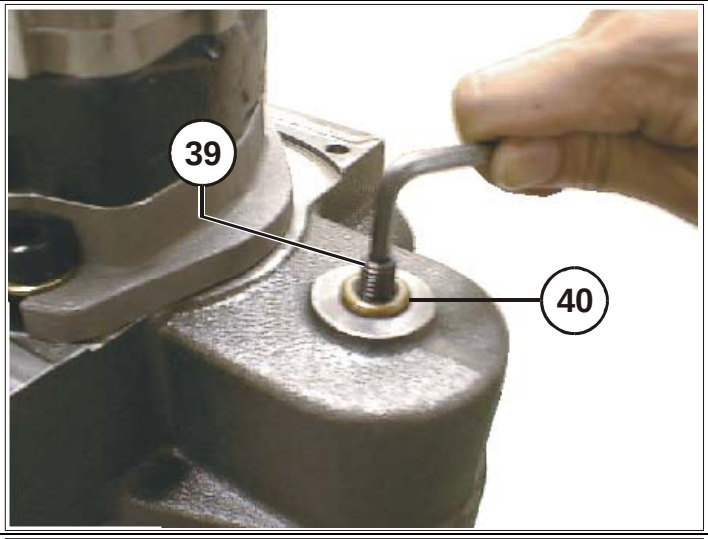
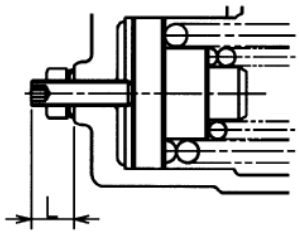
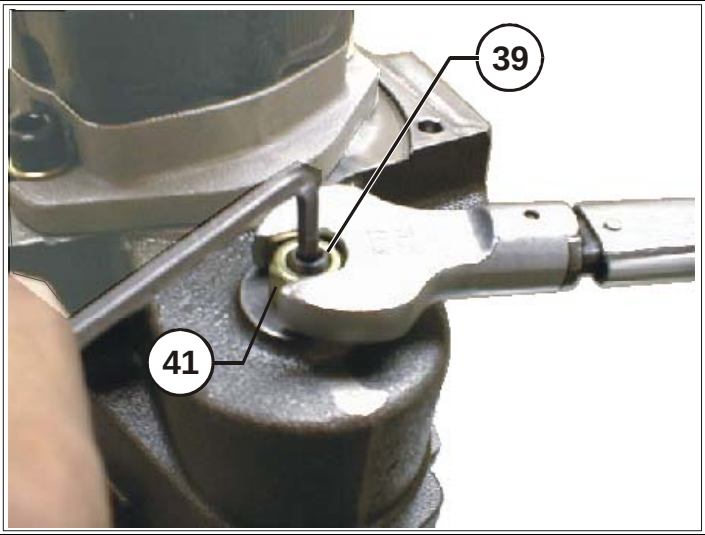
	PICTURE	PROCEDURE
		Fix the flange **(10)**. Fasten the bearing shells **(14)** with the two bolts **(15)**. Tightening torque: 5.9 Nm
		Mount the flange **(10)** on the housing **(1)**. The shaft **(5)**, needle bearing **(13)** and pin **(8)** must match. ***CAUTION*** Do not catch your fingers or hands between the flange and housing.
		Fasten the flange **(10)** with six bolts **(50)**. Tightening torque: 106.9 Nm ***CAUTION*** (Tighten crosswise)

	PICTURE	PROCEDURE
		Clamp the pump with the shaft pointing downward.
		Put the rotor assembly **(60)** into the housing **(1)**.
		Mount the O-rings **(63)** and **(64)** in the plate **(62)**, put the plate **(62)** into the housing **(1)**.

	PICTURE	PROCEDURE
		Put the steel ball **(65)** and the O-rings **(81)** and **(82)** on the housing **(1)**. ***CAUTION*** The steel ball can fall out.
		Fix the gear pump temporarily and adapt it to the internal spline of the rotor assembly and the shaft of the piston pump. 
	 	Rotate the gear pump housing until the threaded hole and flange hole are in alignment.

	PICTURE	PROCEDURE
		Pull out the gear pump **(80)** carefully. ***CAUTION*** Pay attention that the plate and steel ball do not get loose when pulling out the gear pump.
		Insert the pin **(84)** into the housing **(1)**. ***NOTE*** The pin **(84)** is hardened.
		Insert the pin **(83)** into the housing **(1)**. ***NOTE*** The pin **(83)** is hollow. ***CAUTION*** The pins must not be mixed up.

	PICTURE	PROCEDURE
		Check the surface for cleanliness. Make sure that the following parts are installed: a) O-rings **(63/64) (81/82)** b) Plate **(62)** c) Steel ball **(65)** d) Pins **(83/84)**
		Position the gear pump on the housing. ***ATTENTION*** Do not use a hammer !
		Fasten the gear pump with two bolts **(85)**. Tightening torque: 44.1 Nm

	PICTURE	PROCEDURE
		Mount the setscrew **(39)**, tighten it to same height as before the disassembly **(L)**. 
		Mount the sealing washer **(40)** and tighten the nut **(41)**. Tightening torque: 15.7 Nm ***CAUTION*** Hold the setscrew **(39)** with a wrench while tightening the nut **(41)**.

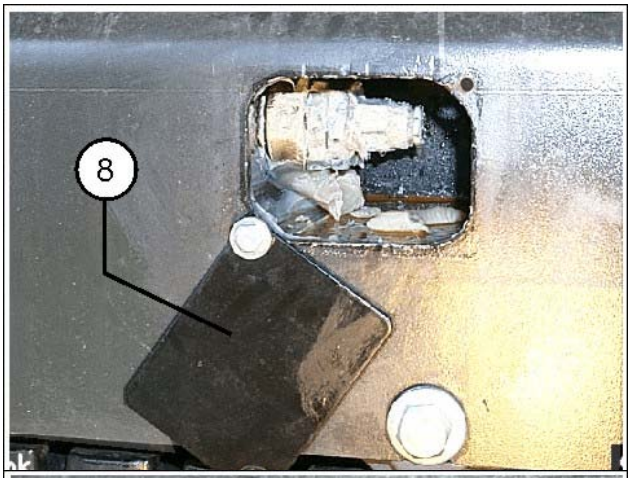
Remove the travel gear

Park the machine in a safe place:

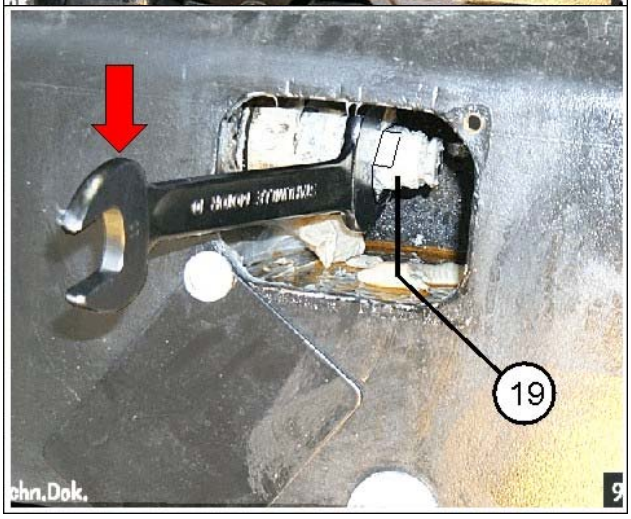
- Observe the safety and accident prevention regulations of the operating manual.
- Leaking agents such as fuel, hydraulic oil, engine oil or coolants are harmful to the environment.
- Prepare receptacles which are big enough to collect the corresponding quantities
- Collect fluids drained off to reuse them or dispose of them according to the regulations
- Plug the ports, lines and hoses.

Release the crawler track

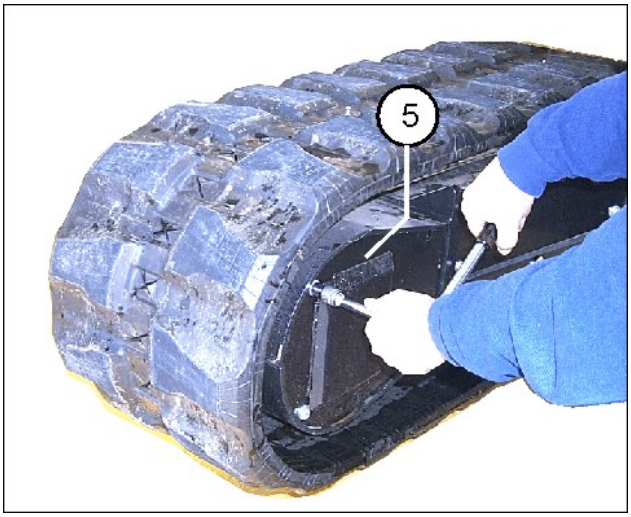
- Unscrew the cover **(8)** of the undercarriage (SW 13).



- Loosen and unscrew the track tensioning valve **(19)** until grease escapes at the thread of the track tensioning valve.
- The track is released when there is no longer grease escaping at the track tensioning valve **(19)**
- Remove the grease from the undercarriage and dispose of it according to the regulations.

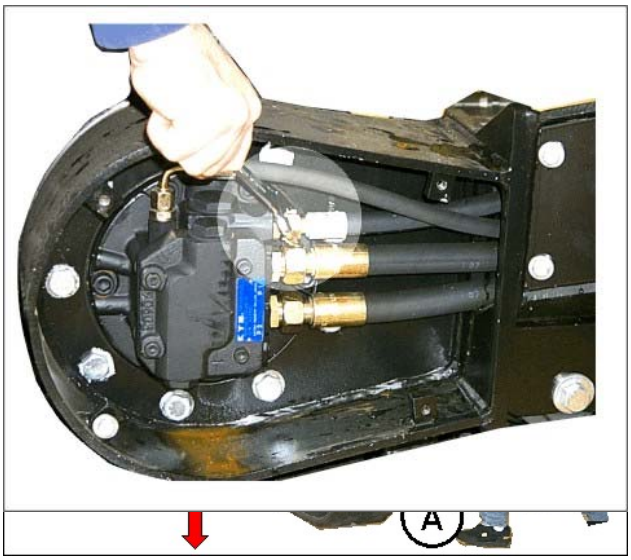


- Unscrew the cover **(5)** above the travel motor (SW 13).



Dismount

- Slew the uppercarriage at right angles to the excavator direction.
- Lift the corresponding crawler carriage by means of the boom (jack up and secure the undercarriage).
- Dismount the released track from inside by means of a mounting bar **(A)** with the help of another person. Let the track fall off extremely ***carefully*** and ***slowly***.



Attention !

– Danger of accident !

- Pull the rubber track **(10)** aside.

Dismount the hoses

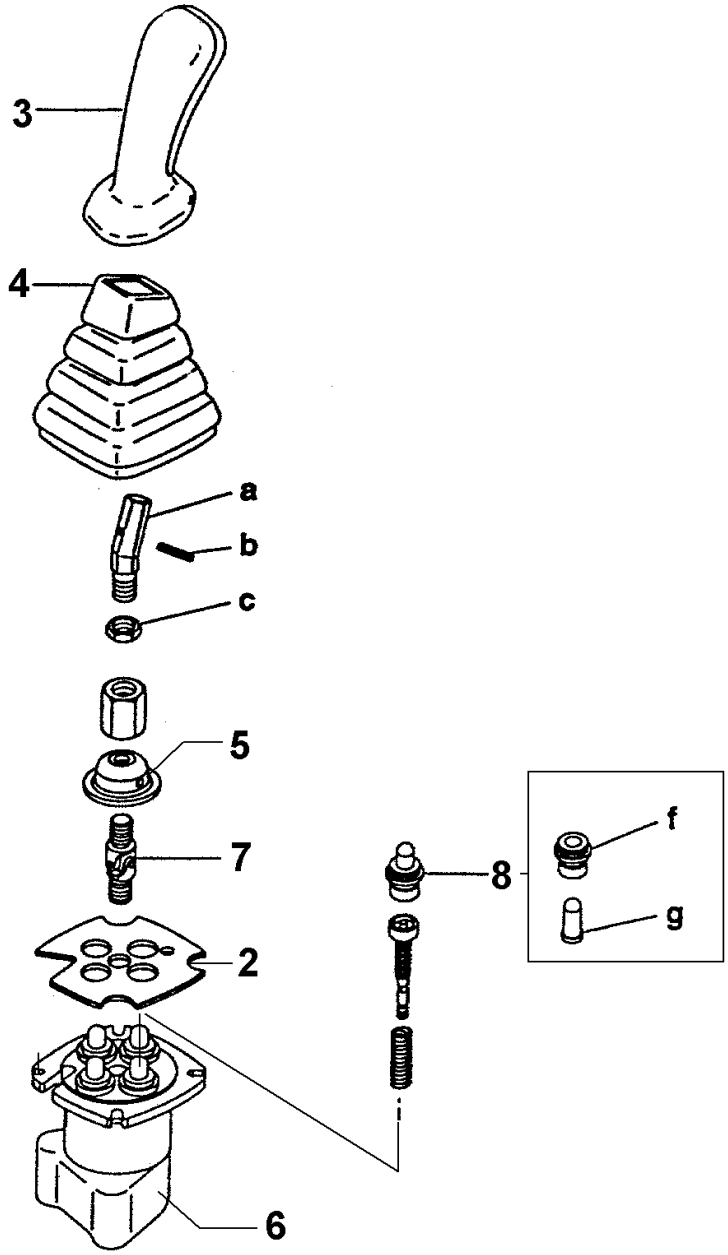
- Turn the engine off
- Unscrew the ventilation filter **(9)** of the hydraulic tank (the tank is thus de-pressurized)
- Release the hydraulic system by operating the control elements several times.
- (Connect a vacuum pump at the ventilation filter thread to prevent that the hydraulic oil from the tank continues to flow out of the unplugged hoses).
- Mark the hoses before removing them.
- Unscrew the hoses.
- Plug the open hoses as well the motor ports with clean blind plugs.



Dismount travel gear assembly with motor

- Remove the fastening bolts.
- Assembly of a new or replacement gear with motor analogous.

- Should foreign particles (dirt, abrasion, etc.) be found in the hydraulic system, clean it or flush it. Replace the filter and top up new oil.

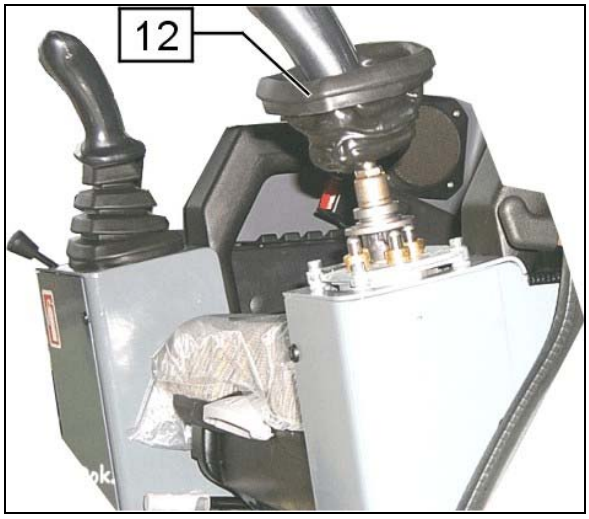


Sealing of the joystick (oil leakage below the bellow)

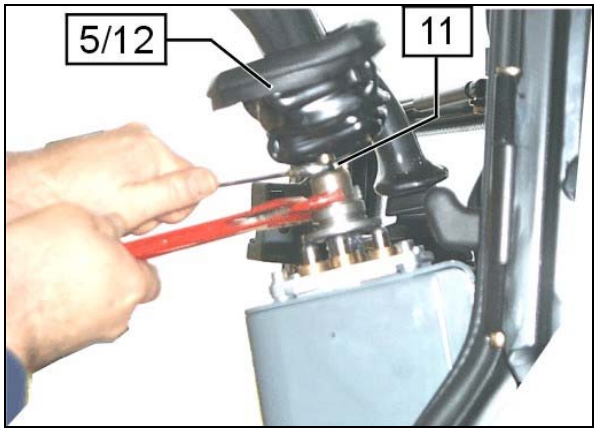
- Let escape the excess pressure of the hydraulic oil tank (open the ventilation filter)
- Connect a vacuum pump instead of the ventilation filter, create vacuum
- Turn up the bellow **4** at the pilot-operated valve
- Unscrew the handle **3** together with the cardan joint **7** and the remaining parts
- Pull the leaking tappet set **8** out of the housing
- Check the seat surface in the housing **6** for scratches, damage, etc
- Press in the new tappet set **8**
- Remaining assembly analogous (lever must nearly be free from play, if need be, readjust pressure disk **5**.

Sealing of the joystick (oil leakage below the bellow)

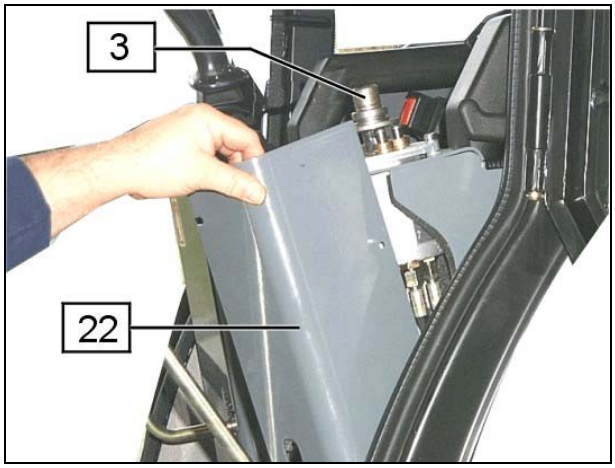
- Let escape the excess pressure of the hydraulic oil tank (open the ventilation filter)
- Connect a vacuum pump instead of the ventilation filter, create a vacuum
- For the work to be carried out now, e.g. replacement of hydraulic lines, all ports have to be plugged. Do not interrupt the vacuum pump operation



- Turn up the bellow **(12)** at the pilot-operated valve

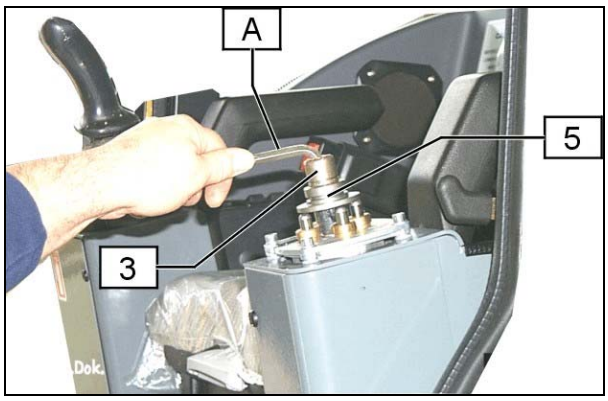


- Slacken the nut **(11)** with fork wrench 19 mm
- Unscrew the handle **(5)** together with the bellow **(12)**



- Before slackening the cardan joint **(3)**, unscrew the cover **(22)** from the seat console

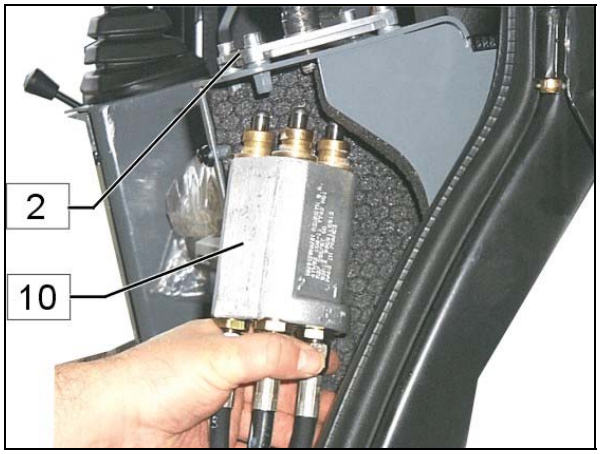
- Unscrew the cardan joint **(3)** by means of a hexagon socket screw key **(A)** 8 mm



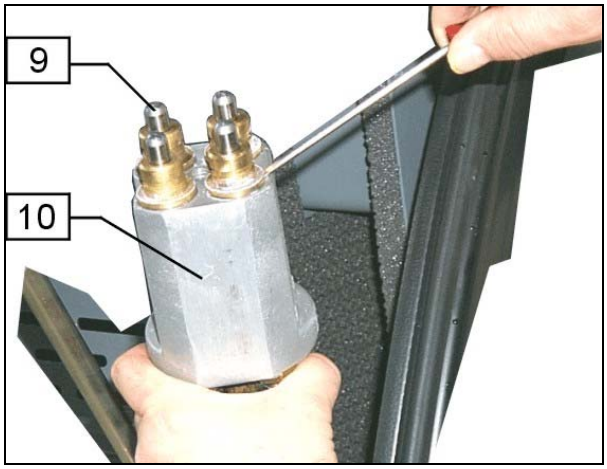
Attention !

- Hold the housing as, otherwise, it will drop

- Pull the housing **(10)** out of the retaining plate **(2)**

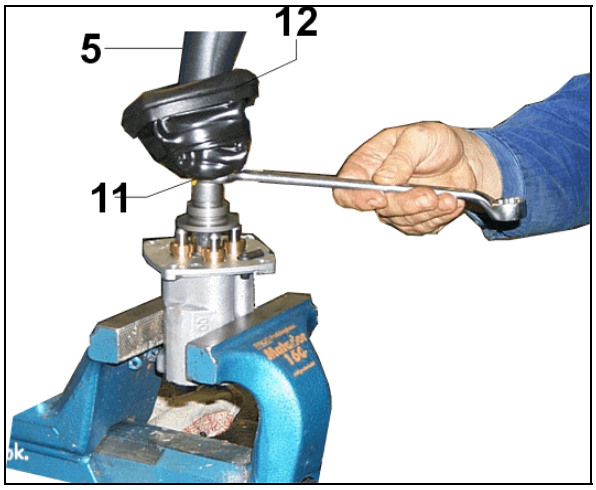


- Pull the leaking tappet set **(9)** out of the housing
- Check the seat surface in the housing **(10)** for scratches, damage, etc.
- Press in the new tappet set **(9)**
- Remaining assembly analogous (lever must nearly be free from play), if need be, readjust pressure disk **(5)**
- Pay attention to the colour marking when tightening the nut **(11)** !

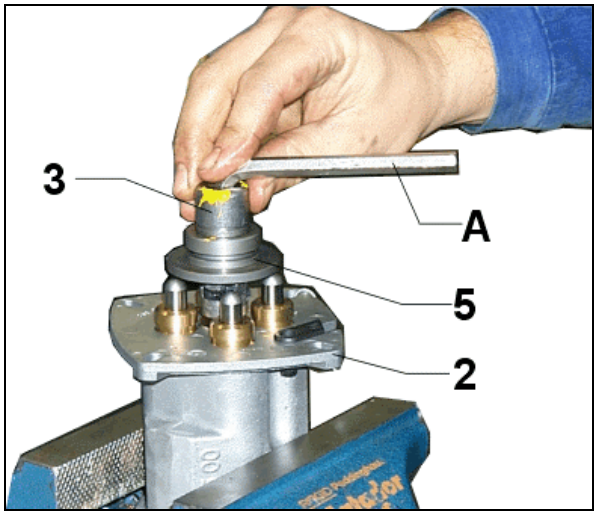


Sealing of the joystick (oil leakage below the bellow)

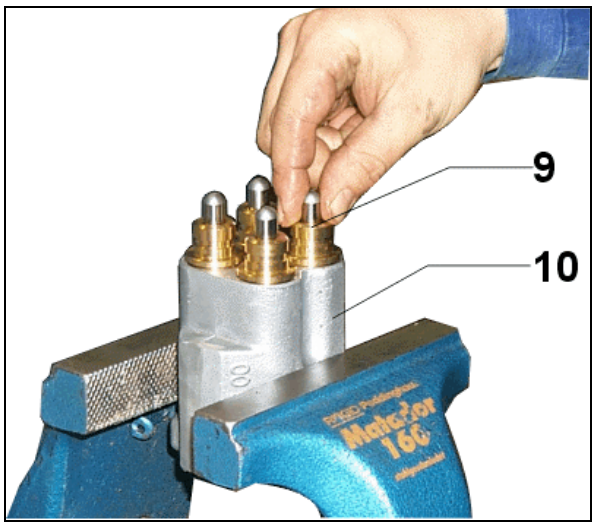
- Let escape the excess pressure of the hydraulic oil tank (open the ventilation filter).
- Connect a vacuum pump instead of the ventilation filter, create a vacuum.
- Turn up the bellow **(12)** at the pilot-operated valve.
- Slacken the nut **(11)** with a 19 mm fork wrench.
- Unscrew the handle **(5)** together with the bellow **(12)**.



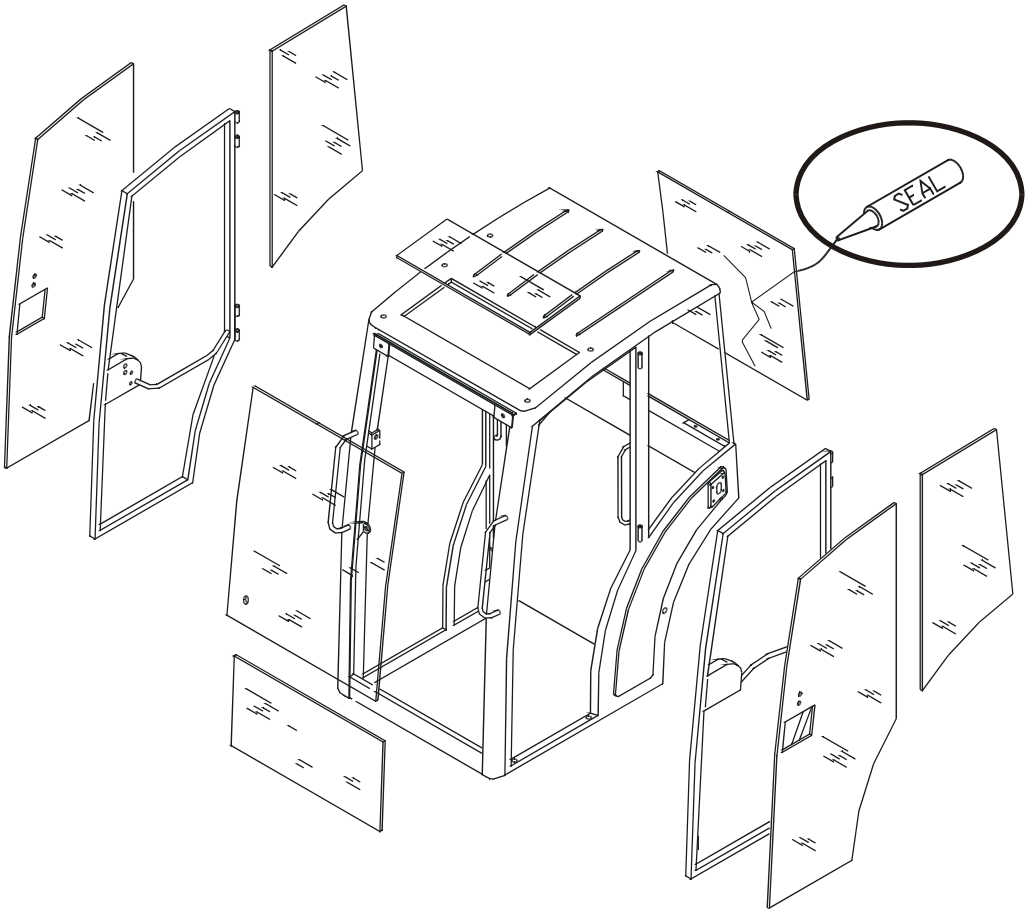
- Unscrew the cardan shaft **(3)** by means of an 8 mm hexagon socket screw key **(A)**.
- Remove the shims and the holding plate **(2)**.



- Pull the leaking tappet set **(9)** out of the housing.
- Check the seat surface in the housing **(10)** for scratches, damage, etc.
- Press in the new tappet set **(9)**.
- Remaining assembly analogous (lever must be nearly free from play, if need be, readjust pressure disk **(5)**).
- Pay attention to the colour marking when tightening the nut **(11) !**



Driver's cab with cemented window panes



If need be, the **repair kit part no. MCS008042A** is available.
It also contains the repair instructions.

“BETASEAL“ window pane glue kit part no. MCS008042A

1. Remove the broken glass pane by means of the cutting wire enclosed.

2. Trim the remaining PUR material back to a thickness of 1 - 2 mm by using a well-sharpened knife.

3. Clean / activate the cut surfaces with “BETAWIPE 4001“ (blue cap) and let dry for 2 - 3 minutes.

4. Apply “BETAWIPE VP 04604“ (yellow cap) on the glue surfaces of the glass pane by means of a (clean) cloth and rub dry.

5. Shake “BETAPRIME 5100“ (green cap) well before use for approx. 1 minute. Then rapidly apply “BETAPRIME 5100“ on the glue surface of the pane by means of the applicator and let dry for 15 minutes.

6. Tear off the rear steel cap of the glue cartridge and remove the enclosed “Silicagel“ bag.

7. Evenly apply the glue “BETASEAL“ or “BETAMATE“ on the glue surfaces of the cabin by means of the enclosed nozzle.

8. Position the pane immediately with an appropriate glass transport handle and press into place with an appropriate webbing.

Drying times and safety regulations:
Please respect the instructions of the glue manufacturer.

SUBGROUP LIST

Service - Bulletins