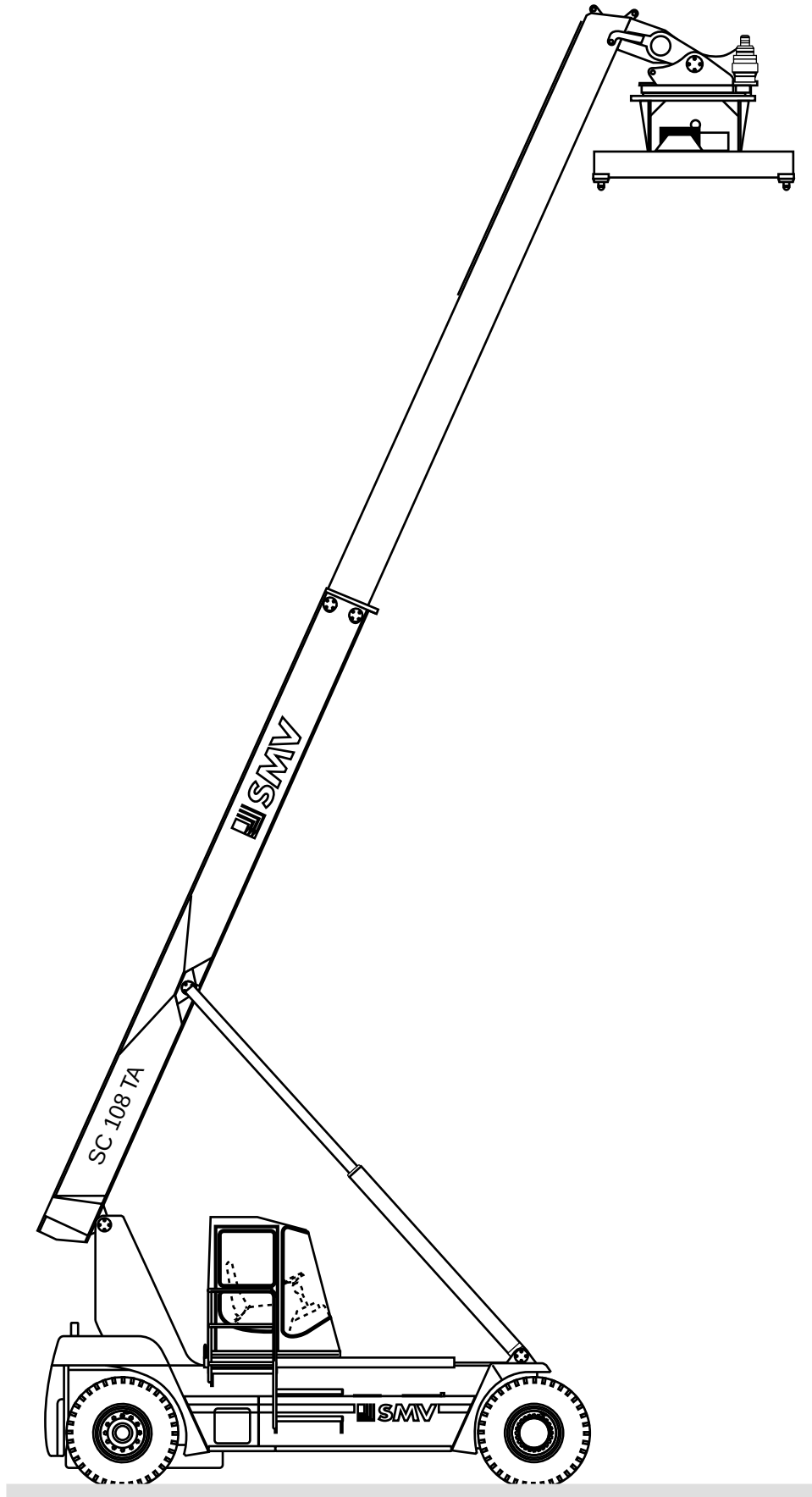


MODEL RANGE REACH STACKER SC 108 TA





This user manual provides you with the information you need to know about starting, driving, servicing and maintaining your SMV lift-machine.

Using and attending to the truck properly will preserve its qualities for a long and profitable working life, and will make full use of its applications.

The expressions "front", "back", "right" and "left" indicate the position in which the relevant component is installed in the truck as seen from the driving compartment.

Follow all instructions in the manual on using the machine and carry out maintenance and inspection as described in the maintenance table on a regular basis and at the correct time, using the specified lubricant.

Maintenance must be carried out only by qualified staff.

Above all, we would like to emphasise the importance of following both the general traffic regulations and the guidelines in force for the use of lift-machines and the prevention of accidents at work.

The regulations in force for normal and regular use of commercial lift-machines must be strictly adhered to by management, commercial operators and service staff.

The user, not SMV, is responsible for any dangers that may arise when the machine is being used for applications not approved by the manufacturer.

SMV lift-machines are designed for the transport and lifting of loads indicated on the load-bearing capacity plate.

No alterations and, above all, no additions or conversions may be made to the machine without the permission of the manufacturer.

The user instructions for additional parts issued by the manufacturer apply to those additional parts.

Technical remarks

SMV is constantly developing both the design and manufacture of its products. Illustrations and technical details concerning the design, parts and performance of the lift-machine are subject to alteration as a result of this technological development.

SMV therefore assumes no responsibility on the basis of those specifications, illustrations and descriptions found in the user manual.

If you have any questions concerning SMV lift-machine and ordering spares, contact your nearest authorised dealer. Take care to supply the correct address for delivery.

If any repairs are needed, use only SMV original spares. This is necessary in order for your SMV machine to retain its original technical standard.

When ordering spares, it is important to indicate the item number found in the spares list as well as the following information:

Model:
Serial number/year of manufacture:
Delivery date:

When ordering spares for the following units, you must indicate their individual manufacturing numbers:

Engine no.:
Boom no.:
The lift height of the boom:
Transmission no.:
Drive shaft no.:

When the lift-machine is delivered, the details on the type plate should be written in this user manual.

Delivery inspection

Every SMV lift-machine is carefully inspected before it leaves the factory to ensure that it is fully in order and is fully equipped in accordance with the order. Authorised SMV dealers are then required to reinspect the machine before it is delivered to the customer.

In order to avoid later complaints and problems, the customer should also check that the machine is in full working order and is fully equipped when it is delivered, with a receipt of the acceptance/handover of the machine from the dealer.

Always perform Lubrication, Checking, Maintenance and Daily Maintenance according to the Maintenance tables in this book as well as the Delivery Report before operating the Fork-lift truck for the first time.

The following technical manuals accompany every lift-machine:

- 1 Spares catalogue for the lift-machine
- 1 User manual for the lift-machine
- 1 Machine card

When contacting your authorised dealer, always indicate:

- 1. Machine designation
- 2. Machine serial number
- 3. Year of manufacture.



Safety regulations

- * Follow national safety regulations.
- * The truck must only be driven by those trained to do so and who have the permission of the management.
- * Remember: The national law on driving licences and driving regulations always apply!
- * Before starting up: Ensure that no person(s) or other obstacles are in the way of the truck or its equipment.
- * The truck must not be used if it has faulty brakes, steering, lifting or other important functions.
- * Passengers are not allowed.
- * Lifting a person or persons is forbidden unless the truck is equipped with an approved lift cage for this purpose.
- * Never exceed the lifting capacity of the truck - see type plate and load diagram.
- * The load should always be transported in a lowered position.
- * Always report damage and wear and tear affecting the safety/function and life of the truck.
- * The hydraulics of the truck is equipped with a high-pressure hydraulic accumulator. Take great care when working with the hydraulic system. Only service staff with knowledge of the hydraulics may intervene here.

BEFORE OPERATION

Persons responsible, particularly machine drivers and service staff, must be instructed on the regulations for normal and safe use of commercial lift-machine which accompany this manual. Follow the guidelines and safety regulations applicable to:

- use of commercial machine
- roads and work places
- drivers (rights, obligations and regulations for implementation)
- any extra equipment
- different types of vehicle
- service (maintenance and inspection)
- annual inspection for the prevention of accidents.

The driver /(owner) or other persons in positions of responsibility must ensure that the above guidelines and safety regulations are adhered to. When a trained driver is about to operate the truck, instruct him on:

- special functions of the SMV machine extra equipment
- special operating applications.

Driving, manoeuvring and steering should be practised until the driver is fully acquainted with all these operations.

Only after that stage can training in stacking manoeuvres begin. The stability of the machine in the working area can only be guaranteed if the correct procedures are followed. Should the machine start to roll due to unapproved manoeuvres or incorrect driving, the full instructions supplied must be followed.

Prevention of accidents

In some countries, lift-machines must be inspected once a year by trained staff in accordance with the prevention of accidents regulations. Authorised SMV dealers can supply information on these.

We reserve the right to modify our design and material specifications without prior notice.

ENVIRONMENTAL ASPECTS

1. Driving the lift truck
Exhaust emissions, noise, leakage (oil, fuel, fluids) are influenced negatively by incorrect driving and handling of the lift truck.
2. Remainings from servicing
Oil, fuel, filters and filter deposit, cleaning fluid/shave to be disposed of or recovered according to local legislation.
3. Remainings from repairs
Metal, batteries, electronics, rubber (tyres, hoses, seals), solutions, and chemicals have to be disposed of or recovered according to local legislation.

NORMS

This lift truck is built regarding the following norms according to

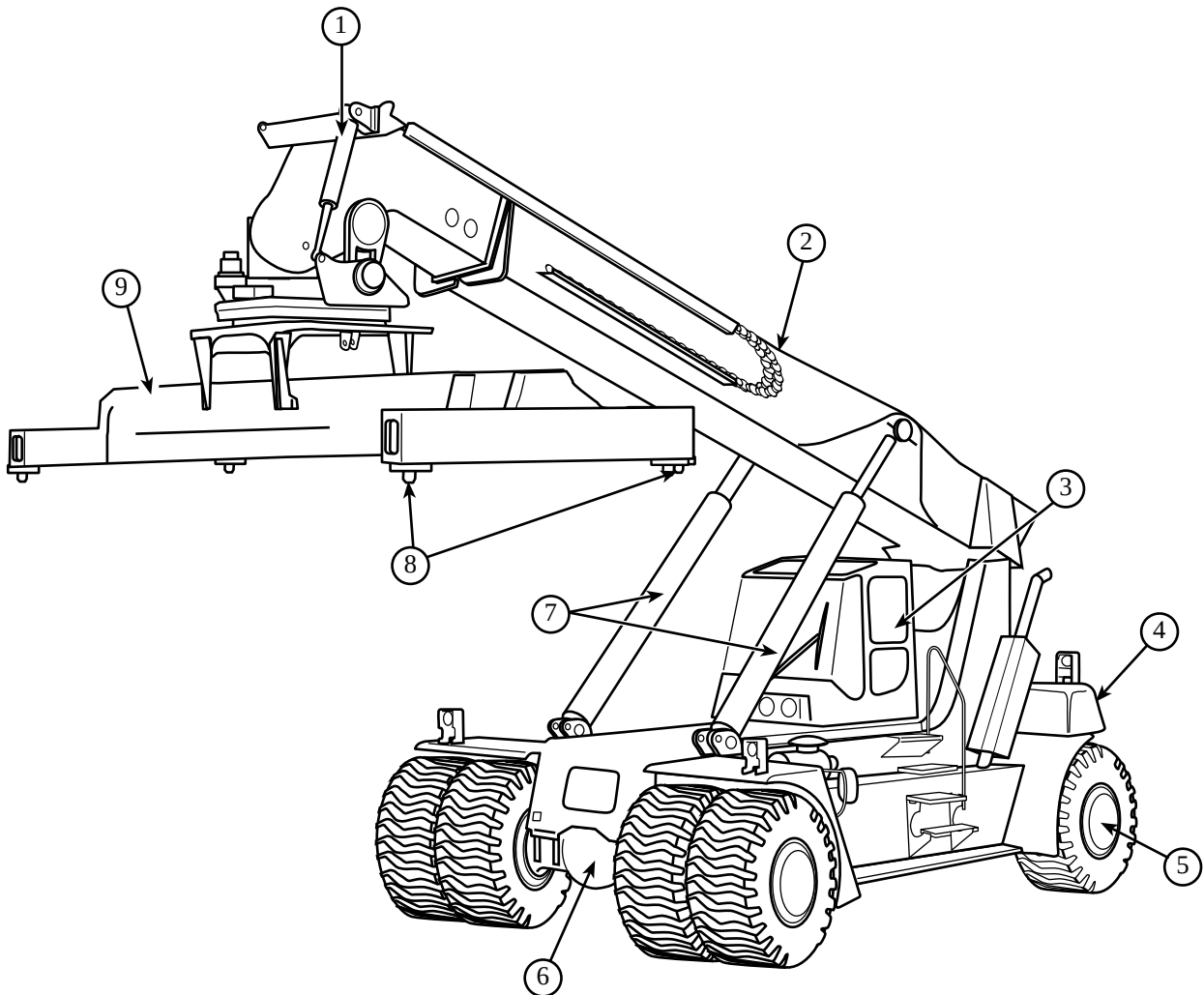
Noise 2000/14/EC PrEN 12053
ISO 3744:1998
DIN 45635
Vibrations 2000/44/EC PrEN
13059:1997
Emission 97/23/EC



OUTLINE PICTURE OF THE LIFT TRUCK

DESCRIPTION

- | | | |
|----------------------------|------------------|----------------------|
| 1. Damping cylinders 2 pcs | 4. Counterweight | 7. Lifting cylinders |
| 2. Lift boom | 5. Steer axle | 8. Twistlocks |
| 3. Driver's cab | 6. Drive axle | 9. Attachment |



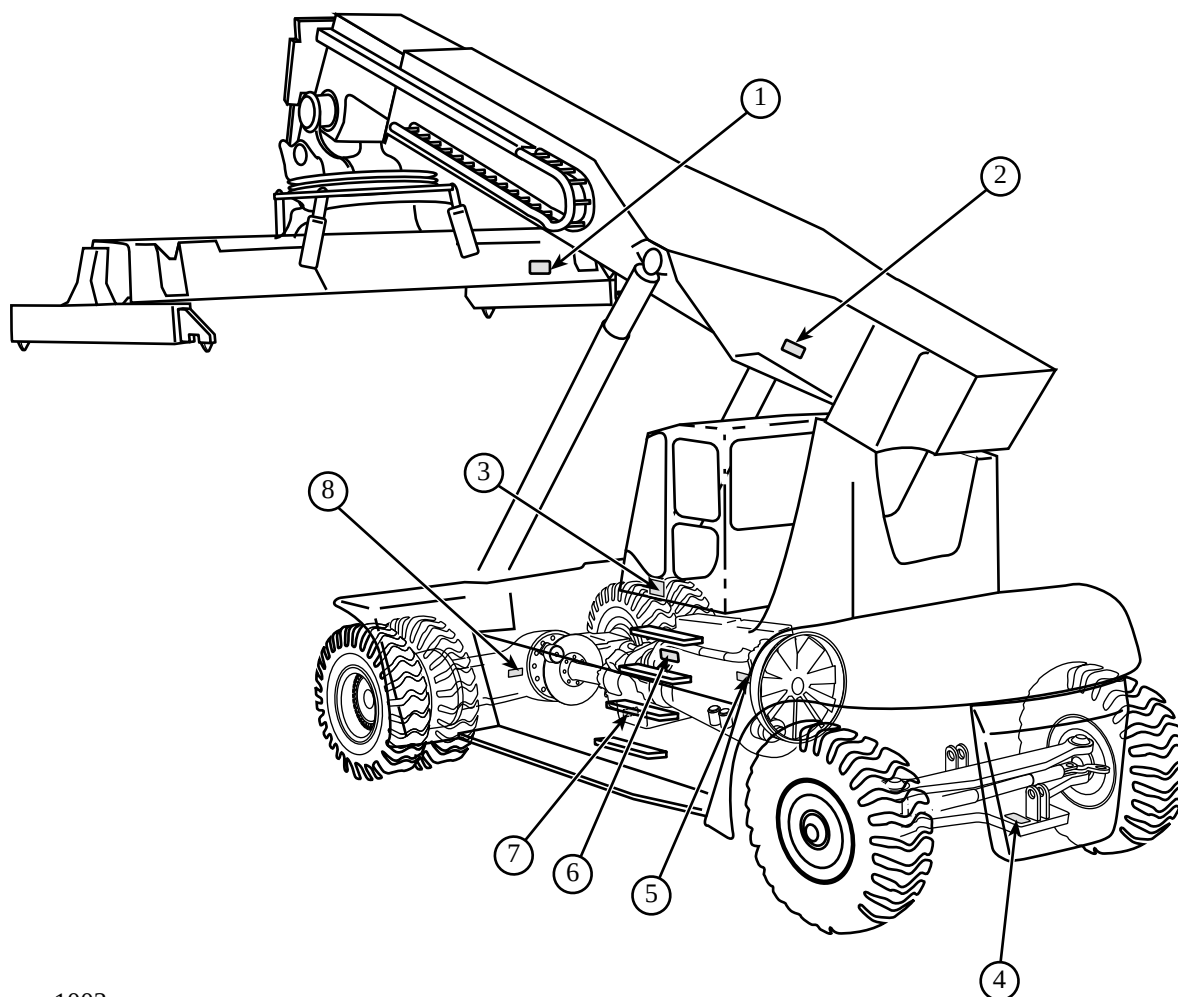
1002



ID PLATES AND SERIAL NUMBERS

DESCRIPTION

- | | | |
|----------------|------------------------|------------------------|
| 1. Attachment | 3. Load capacity plate | 6. Chassis number |
| 2. Boom number | 4. Steer axle number | 7. Transmission number |
| | 5. Engine number | 8. Drive axle number |



1003



TECHNICAL DESCRIPTION

Specification SC 108 TA means:

- SC = Silver Stacker handler
- 10 = 10 tons lift capacity in first row
- 8 = 8 tons lift capacity in second row
- TA = Toplift attachment

The engine is a water-cooled, turbo-charged 6-cylinder diesel engine. The engine drives a four speed transmission using a torque converter. The gear selection is electrical with three or four gears for driving front/back. The torque converter is equipped with an oil cooler which lies underneath the radiator. The gearbox has a dis-engaging valve controlled by the brake pedal in the cab. This valve disengages the gearbox so that the operator can control the brakes whilst maintaining a high engine speed during stacking manoeuvres.

The front axle is driven by the gearbox via an universally jointed drive shaft. The axle is of the heavy duty double reduction type. The primary reduction is through the hypoid crown wheel and pinion gear set, the differential gears are carried within the centre of the crown wheel. The secondary reduction is achieved by a planetary gear set within the wheel hub. The wheel hubs are carried on taper roller bearings, thus relieving the half shaft of any loading other than driving torque.

The steer axle is mounted in "spherelastic" bushes which allow sufficient wheel movements for stability on uneven ground. The parallel tierods are between the steering cylinder and the wheel axles.

The brakes are operated by an oil-cooled wet disc-braking system. The foot brakes are controlled by the foot brake valve which activates the drive axle. The parking brake is controlled electrically and activates a hydraulic cylinder on the drive shaft.

The hydraulic pumps are mounted directly on the gearbox. The system is divided into four circuits - two for manoeuvring, one for servo functions and one for steering. The relief valves in the hydraulic circuits are installed to prevent the system from overloading.

The steering is fully servo-assisted. If the engine should stall, it is still possible to steer the truck without servo assistance, although it is heavy going.

Two control valves, mounted on the chassis, are controlled from the cab by a servo-assisted joystick control levers

to the right of the driver. The joystick regulates the functions for lifting, lowering, boom in/out and the spreader.

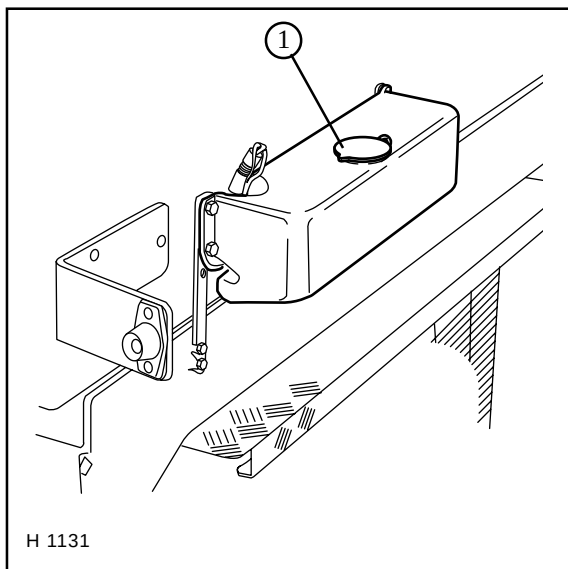
The driver's cab fulfils international safety standards, and is rubbermounted to protect the driver from vibrations. Entrance to the cab is on the left side via the steps on the machine. When the driver's seat is rotated through 90°, it is also possible to exit the cab from the right side.

All hydraulic controls for the lifting functions are grouped on the console to the right of the driver's seat. The parking brake and the switch for selecting additional electrical equipment instruments, gauges and warning lights together with the switches for the direction indicators and windscreen wipers are located on the front mounted instrument panel. Gear control lever on the steer shaft.

The electrical system is 24 V and has two serial-connected 140 Ah heavy duty batteries.

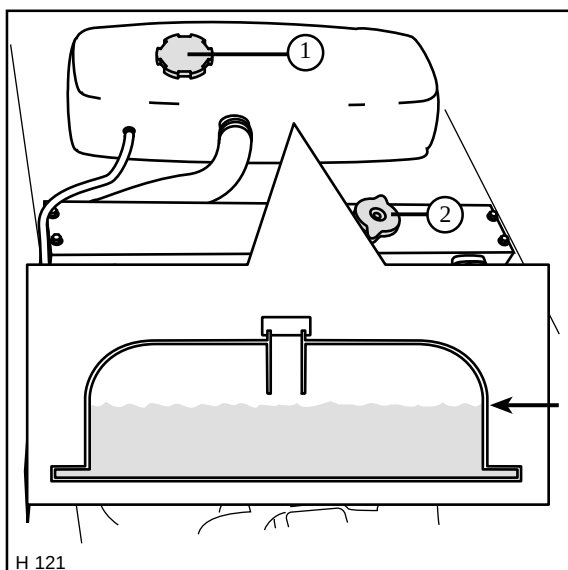


YOUR SMV LIFT- TRUCK	2	DISASSEMBLING THE BOOM/SPREADER	
SAFETY REGULATIONS	3	Disassambling the spreader,	
ENVIRONMENT ASPECTS	3	disassambling the boom	43-45
NORMS	3	TIGHTENING BOLTED JOINTS	
OUTLINE PICTURE OF THE LIFT TRUCK	4	Tightening torque, torque table, tightening wheel	
ID-PLATES AND SERIAL NUMBERS	5	nuts, universal drive shaft	46
TECHNICAL DESCRIPTION	6	Differential nuts, engine mounting, gearbox	47
CONTENTS	7	Drive axle suspension, hydraulic pumps,	
DAILY MAINTENANCE AND SERVICE BEFORE OPERATION		cab fastening	48
Checking the washer fluid level, checking the		Counterweights, steer axle	49
coolant of the radiator and the engine oil level	8	GENERAL LUBRICATION REGULATIONS	50-51
Checking the oil in the gearbox, the air filter		LUBRICATION SPREADER	52
indicator and the hydraulic oil level	9	Lubrication of the spreader	53-54
Topping up the hydraulic oil,		LUBRICATION	
checking the fuel level, filling with fuel	10	Front and rear section of the boom, lubricating	
Checking the tyres, main circuit	11	the steer axle	56
CAB CONTROLS AND INDICATORS		Boom suspension, the drive shaft, door hinges	57
Description	12-13	CHANGING OIL AND FILTERS	
BEFORE DRIVING		Changing and topping up the engine oil,	
Adjusting the driver's seat	14	Changing the turbo filter	58
Adjustment lever of the steering wheel	15	Cleaning the engine oil filter	59
Starting the engine	15	Changing gearbox oil and oil filters,	
Stopping the engine	15	changing the breathing filter	60-61
IQAN PANEL	16-24	Checking and changing the oil in the drive axle	61
OPERATING		Changing return filter hydraulic oil, changing	
Driving the machine forwards	25	hydraulic oil and the breathing filters	62
Stopping the machine, driving backwards	26	Changing fuel filter, bleeding the fuel system	63
STEERING AND BRAKING		Cleaning/changing air filters, safety cartridge	64
Steering, the disengaging switch, parking brake	27	CHECKING AND OTHER MAINTENANCE	
Emergency stop	28	Checking the intake system and battery	65
CABIN	28-29	Windscreen wiper, checking the cooling system	66
Sliding cabin	28	Changing the coolant,	
Ventilation and cab filter	29	checking the exhaust system for leaks	67
LIFTING LOADS		Valve clearance, checking the fuel injector,	
Capacity plates	30	checking the fuel system for leaks, ...	68
Load diagram	31	Checking the fuel tank, checking the V-belts	69
OPERATING THE BOOM AND SPREADER		Boom wear pads, main pads, side guide pads,	
Manoeuvring the boom and spreader, the lamps		checking the boom and weld constructions	70-71
of the spreader	32	Checking/adjusting steer axle bearing, wheel	
LIFTING AND DRIVING WITH CONTAINERS		bearing, spindle bearing	71
Lifting and driving with load, releasing load	33-36	PARKING BRAKE	74
Safety override and emergency lowering	36	Adjustment of the parking brake, ...	74
SERVICE/MAINTENANCE		emergency release of the parking brake	74
General information	37	MAINTENANCE TABLE	
TRANSPORT/TOWING		Table of inspection hours	75-76
Lifting the machine, towing	38	MAINTENANCE DATA	77
CLEANING		FUEL AND OIL RECOMMENDATIONS	
Cleaning the machine, cleaning the radiator	39	The quality and viscosity of the engine oil	78
CHANGING WHEELS	40-42	The quality and viscosity of the gearbox oil	79
Pressure release	40	FUEL AND HYDRAULIC OILS	
		Diesel fuel, hydraulic oil, gearbox oil, universal	
		grease, coolant, drive shaft oil, grease for	
		battery connections	80
		ELECTRICAL SYSTEM	81-108
		NOTES	109-110



Daily maintenance and service before operation
Points to check:

- Water level of the radiator
- Washer level
- The level of the engine oil
- The air filter indicator (the engine's air filter)
- The gear box oil level
- Hydraulic oil level
- The fuel level
- Tyre pressure and condition
- Brake operation.
- Steering operation.

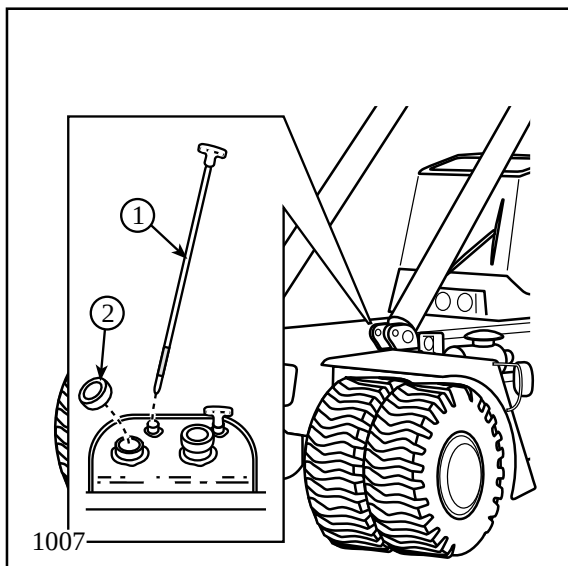


Check the coolant of the radiator

- Open the cap of the expansion tank (1).
First a quarter of a turn to ensure that the system is under no pressure.
- The level should be up to the lower edge of the filling tube (3).

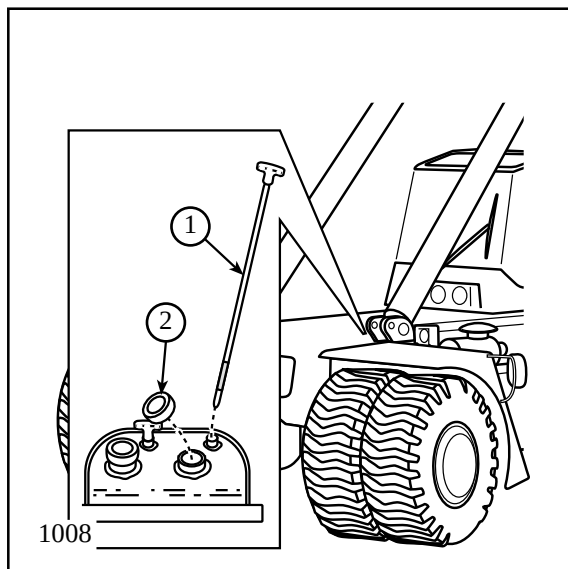
NOTE

- Do not refill through or open the cap of the radiator (2).



Checking the engine oil level

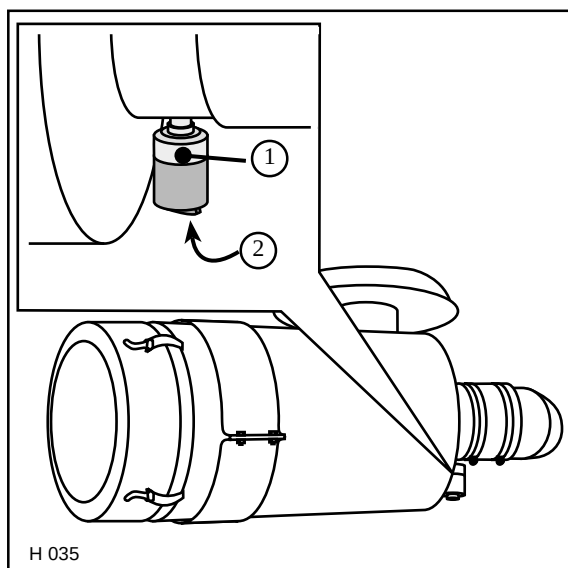
- Lift the engine casing.
 - The dip stick (1) is on the right hand side of the engine.
 - Remove the dip stick (1) completely and dry it off with a clean cloth.
 - Dip the stick back in fully and remove again.
 - The oil level should be between the minimum and maximum level indicators.
 - If necessary, remove the fuel cap (2) and top up the oil.
 - Fill with oil to the maximum level indicator on the dip stick.
- See maintenance data for volume.



Checking the oil level in the gearbox

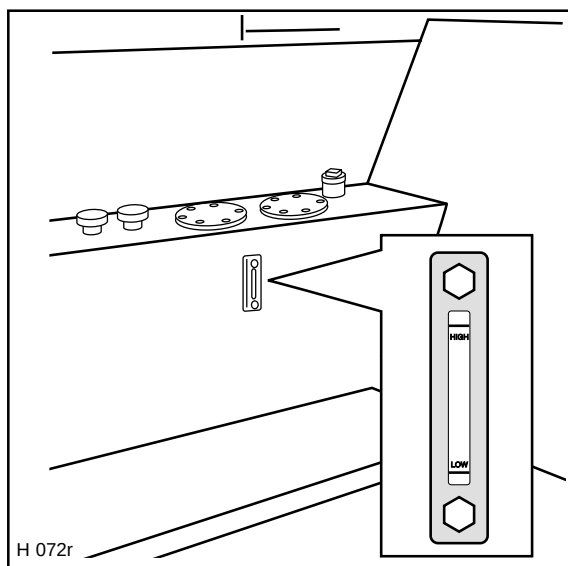
- Start the engine and run until the oil has reached operating temperature.
- Remove the dip stick (1) and dry it off with a clean cloth.
- Dip the stick back in fully and remove again.
- The oil level should be between the minimum and maximum level indicators.
- If necessary, remove the fuel cap (2) and top up the oil.
- Fill with oil to the maximum level indicator on the dip stick.
- Turn off the engine.

See maintenance data for volume.



Air filter indicator

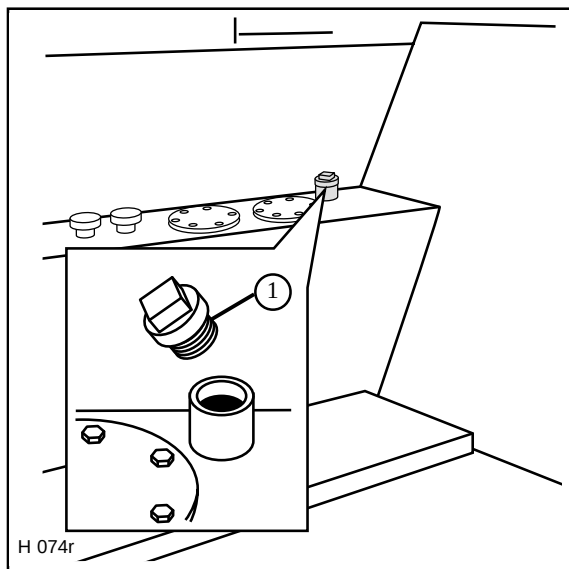
- Check the indicator (1).
- If the indicator shows RED, reset the indicator by pressing the knob (2) under the unit.
- Start the engine. If the indicator still shows red, stop the engine and clean or replace the air filter.



Hydraulic system

Checking the hydraulic oil level

- Check that the oil level is between the MIN and MAX marks on the indicator at the side of the hydraulic oil tank (the boom should be lowered & fully retracted).



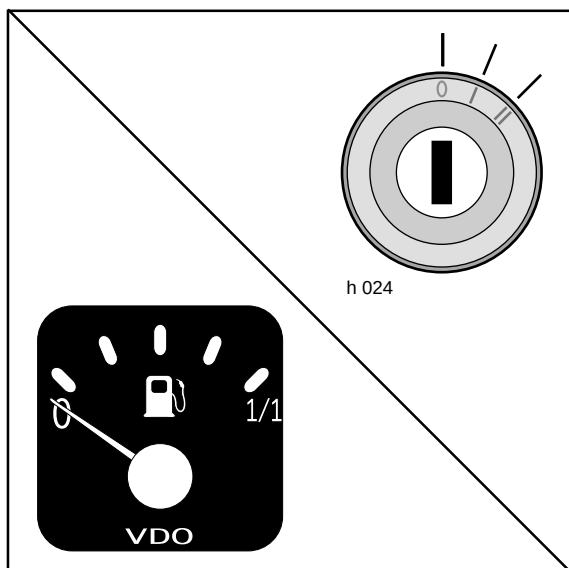
Topping up the hydraulic oil



WARNING

Do not open the oil cap whilst the engine is running

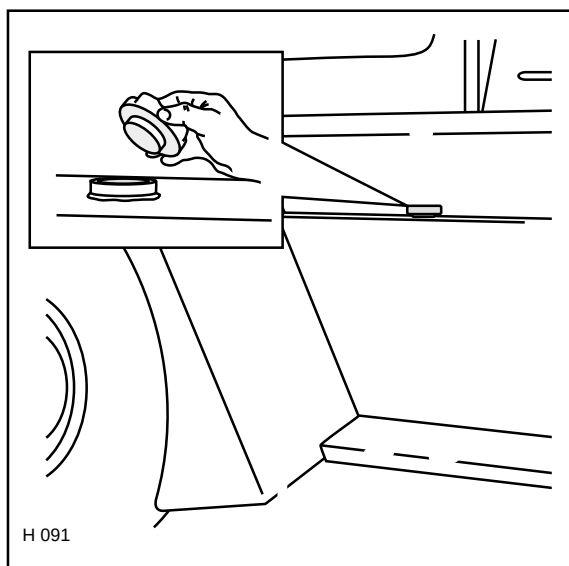
- Unscrew the oil cap (1).
- Fill with hydraulic oil up to the upper mark on the indicator.
- Screw the cap back on.



Checking the fuel level

Checking the fuel level Checking the fuel level Checking the fuel level

- Turn the ignition key to position 1.
- Wait until the fuel indicator on the dashboard (2) has stabilised.
- If necessary, fill.
- Turn off the ignition key.
- Fill up according to ill. "H091s".

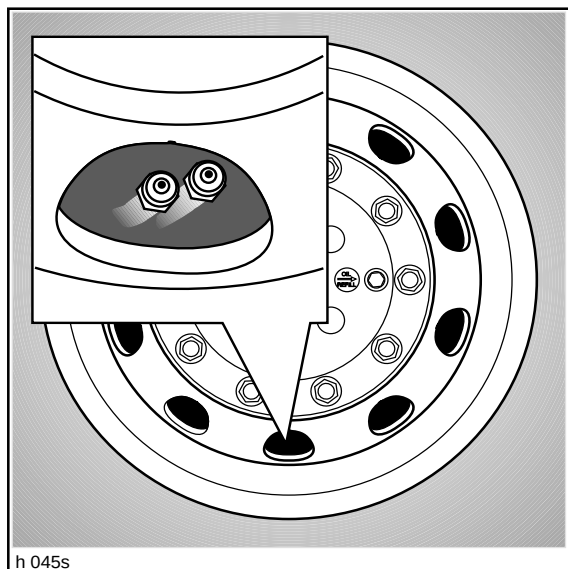


Filling with fuel

- Open the tank cap located on the left-hand side of the machine and fill with the recommended fuel. See page 84.
 - Screw on the cap.
- See maintenance data for volume

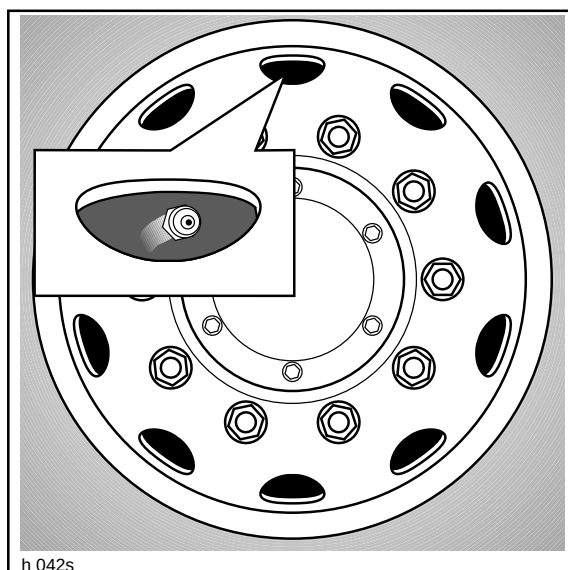
NOTE

To avoid air being sucked into the fuel injection system, the fuel tank should never be run completely empty.



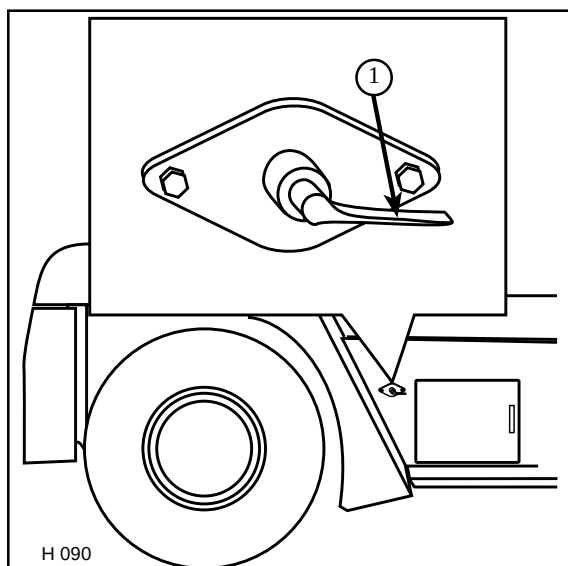
Checking the condition and pressure of the tyres

- Check that the tyres have not been damaged or become too worn.
- Remove any foreign objects from the tread.
- Check that the tyres have the correct pressure of 9 bar. (Michelin 10 bar)
- Pump the tyres according to the relevant regulations.



WARNING

When changing tyres, use only tyres which are approved by the manufacturer.



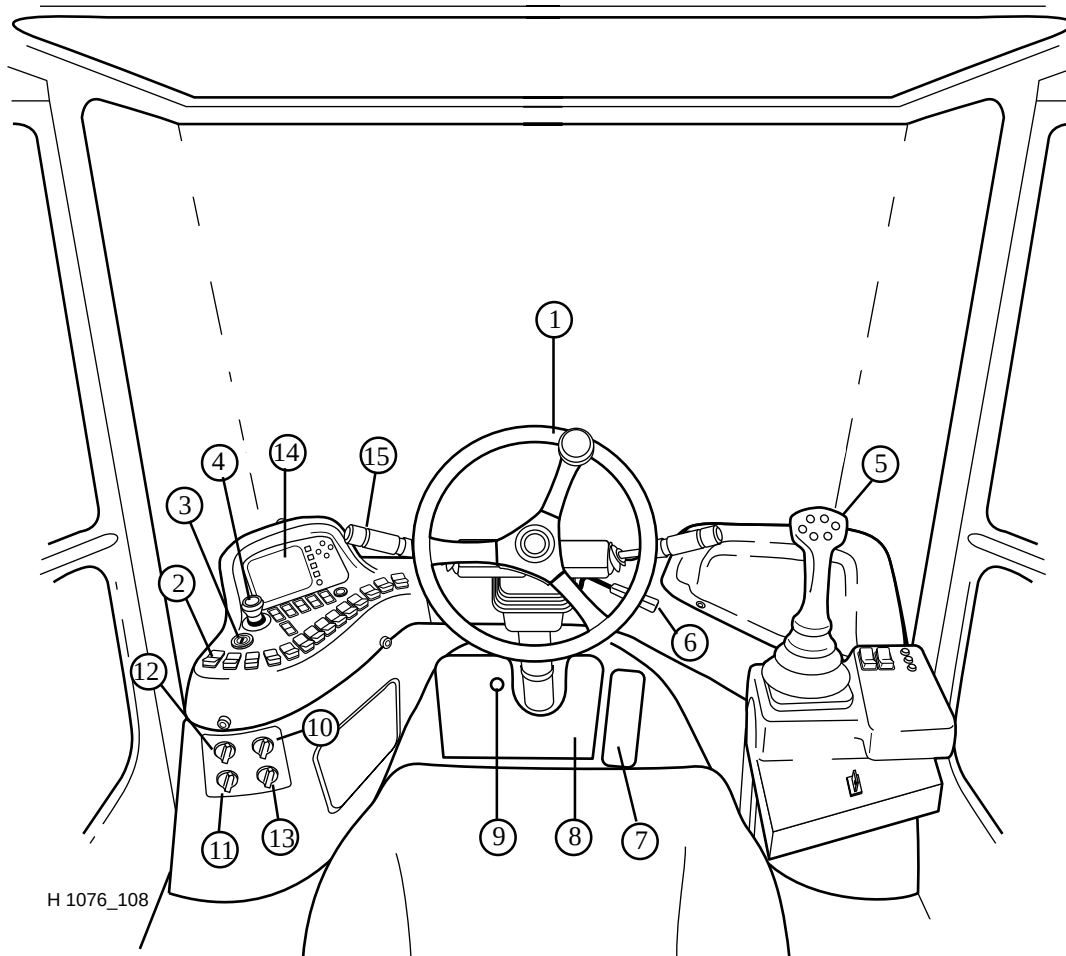
Main circuit switch

- The circuit switch is located on the right-hand side of the machine.
- Turn the cut-out switch clockwise to turn it on.
- Turn the switch anti-clockwise to turn it off and remove the key.



WARNING

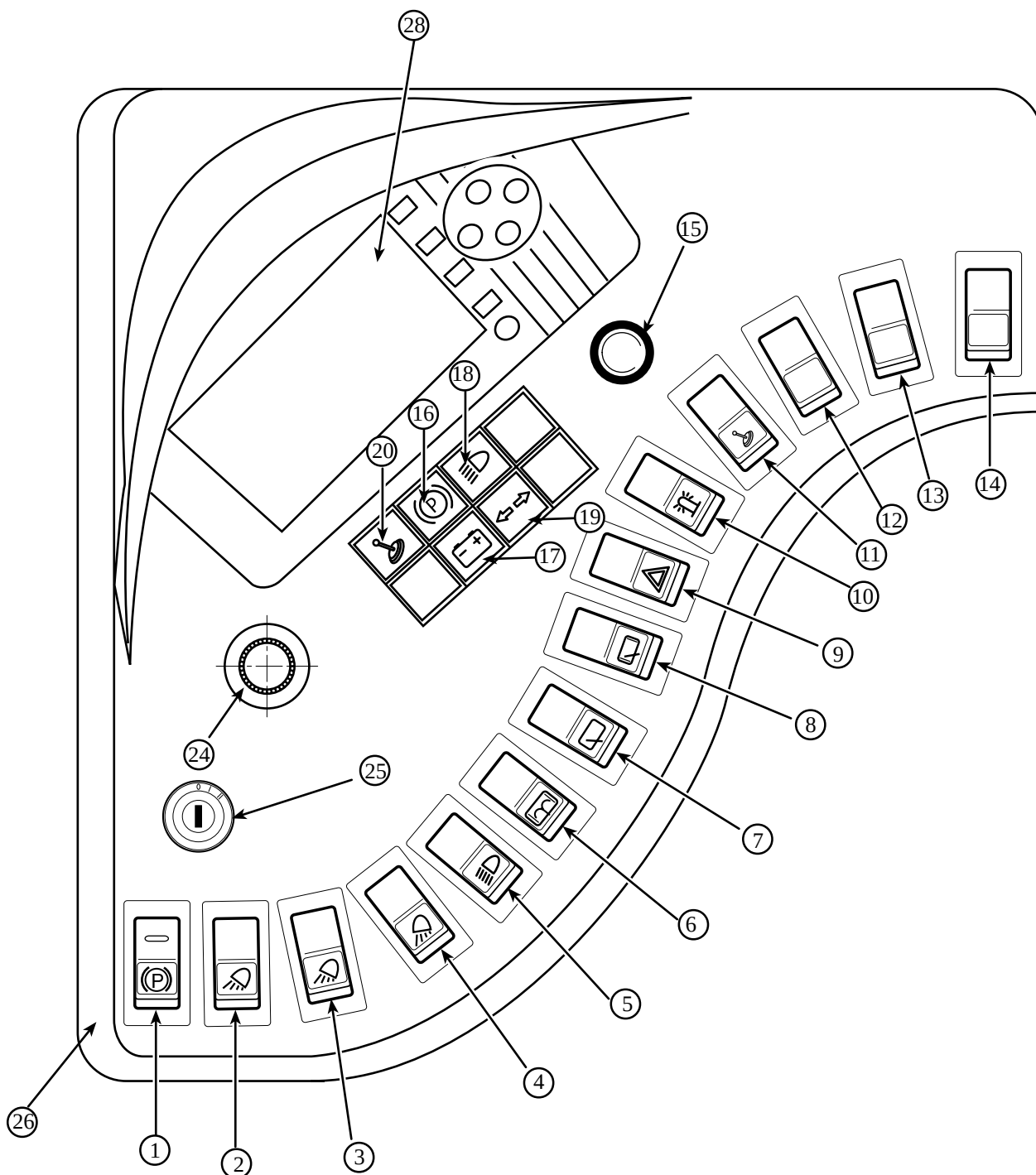
The main disconnect do not cut the power to the alternator. Always disconnect the ground (minus) cable at the battery when working near or on the alternator.



H 1076_108

DESCRIPTION

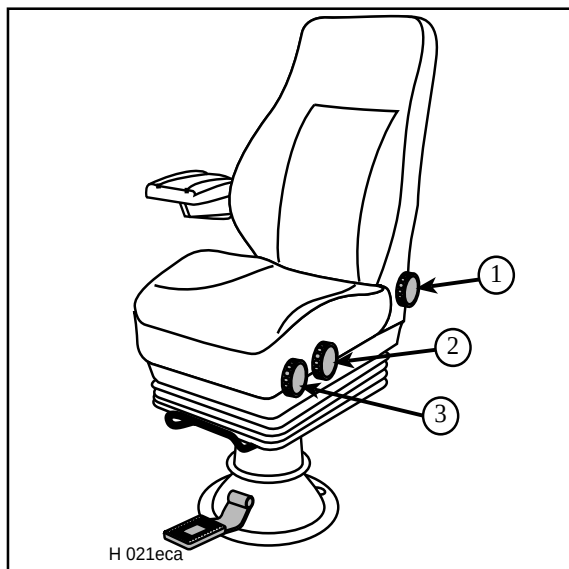
- | | | |
|-----------------------------------|--------------------|---------------------------------|
| 1. Steering wheel | 7. Accelerator | 13. Recirculation |
| 2. Instrument panel with switches | 8. Brake pedal | 14. Display for EMC |
| 3. Ignition switch | 9. Declutch switch | 15. Direction and gear selector |
| 4. Emergency stop | 10. Fan | |
| 5. Joystick | 11. Air condition | |
| 6. Adjustment steering wheel | 12. Heater | |



H1089_108

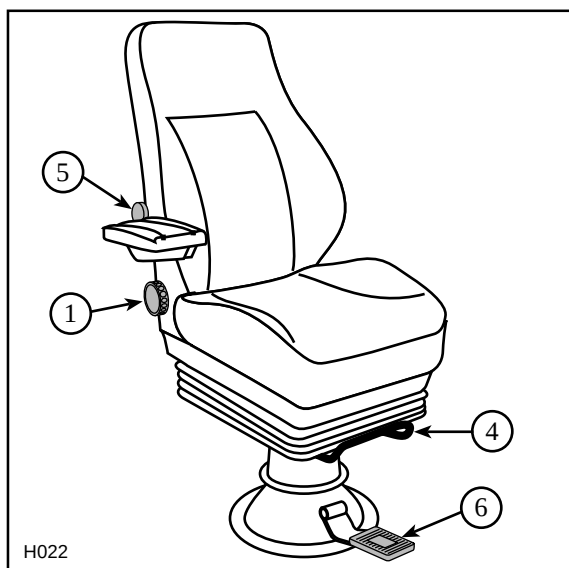
DESCRIPTION

- | | | |
|------------------------------|------------------------------------|----------------------------------|
| 1. Parking brake | 9. Hazard | 17. Alternator |
| 2. Working lights boom | 10. Rotating beacon (optional) | 18. High beam |
| 3. Working lights attachment | 11. Joystick steering (optional) | 19. Directionals |
| 4. Working lights optional | 12. Central lubrication (optional) | 20. Joystick steering (optional) |
| 5. Road lights | 13. Central lubrication (optional) | 24. Emergency switch |
| 6. Screen washer | 14. Emergency lowering | 25. Ignition switch |
| 7. Rear windscreen wiper | 15. Warning light EMC | 26. Buzzer EMC (internally) |
| 8. Roof wiper | 16. Parking brake | 28. Display EMC |

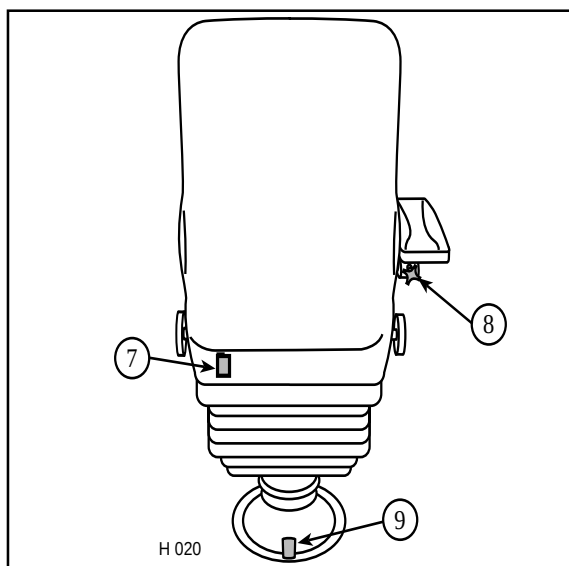


Adjusting the driver's seat

- To elevate the seat, turn the hand wheel (3) clockwise. Weight adjustment is automatic.
- Adjust tilting of the seat cushion, by the hand wheel (2).
- Adjust tilting of the backrest with hand wheel (1).



- Lift the clamp (4), to adjust the seat forward/backwards
- Adjust the lumbar support with hand wheel (5)
- Rotate the seat by pressing pedal (6) Option

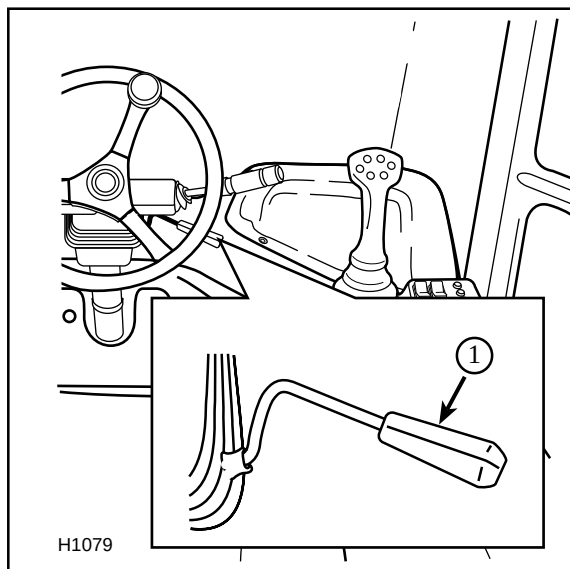


- Adjust the height stroke limiter with handle (7)
Lever to the right - full stroke
Lever one step to left - stroke limited partially
Lever to the left - stroke fully limited
- Adjust the armrest with the hand wheel (8)
- To remove seat press pedal (9) Option



WARNING

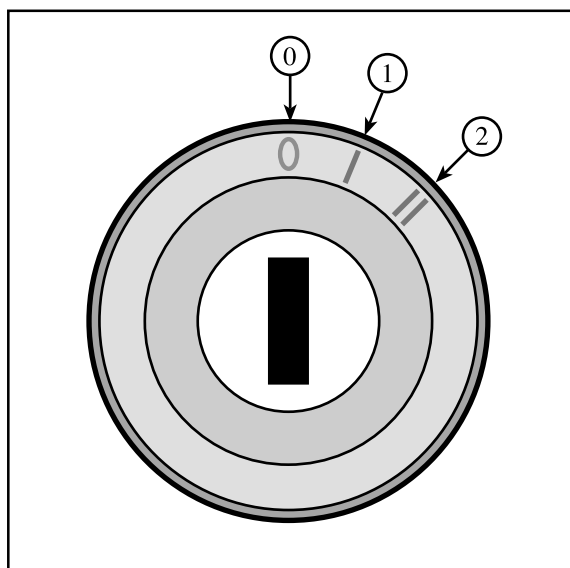
Never drive the truck unless the seat is locked in position.



Adjustment lever of steering wheel

When positioning the steering wheel:

- Pull lever (1) upwards adjust the tilt.
- Push lever (1) downward to adjust the height.



Starting the engine



WARNING

Exhaust fumes are harmful. Never run the engine in unventilated places.

Before starting up the engine, the driving direction control on the left-hand side of the instrument panel must be in neutral.

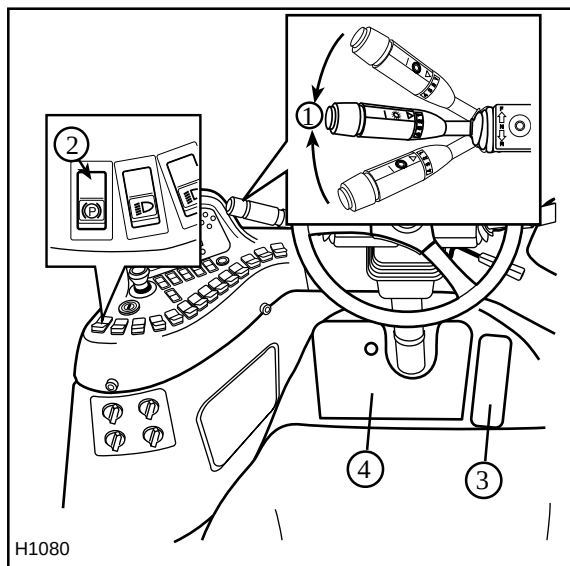
On starting up:

- Position yourself in the driver's seat
- Insert the ignition key into the ignition switch, position (0)
- Turn the key into position (1). The electrical system is now turned on

Starting the engine

Turn the key to position (II). Release the key as soon as the engine has started up.

- If the engine does not start within 20 seconds, wait at least 1 minute and try again.



Stopping the engine

- Release the accelerator (3).
- Apply the brakes in a controlled manner (4).
- Engage the parking brake (2).
- Put the driving direction control (1) into neutral.
- Allow the engine to idle for a few minutes if it has constantly been run with loads.
- Turn the ignition key to position (0).
- Remove the key from the ignition switch when leaving the machine.
- Turn the electricity off as well at the main circuit switch if the machine is being left unsupervised.

Description of the drive monitor type IQAN

The drive monitor's purpose is to efficiently control the reach stacker's hydraulic system and drive line by utilising both analog and digital information from various sensors.

For example, prevent lowering, hoisting and extension in an overload situation. Prevent gear change from forward (F) to reverse (R) as long as the machine is not stationary. Prevent the parking brake from being activated at too high speed. Increase engine RPM when hoisting. Prevent full flow from the hydraulic pump at low engine RPM. Limit engine RPM in case of high engine or transmission temperature.

The following options are also offered - regenerative fast hoist, automatic transmission, and joystick steering with proportionally limited steering movement at higher speeds.

The monitor informs and warns the driver via a display, if any value happens to be abnormal eg. overload, abnormal pressure, or temperature.

The monitor can also be used for fault finding.

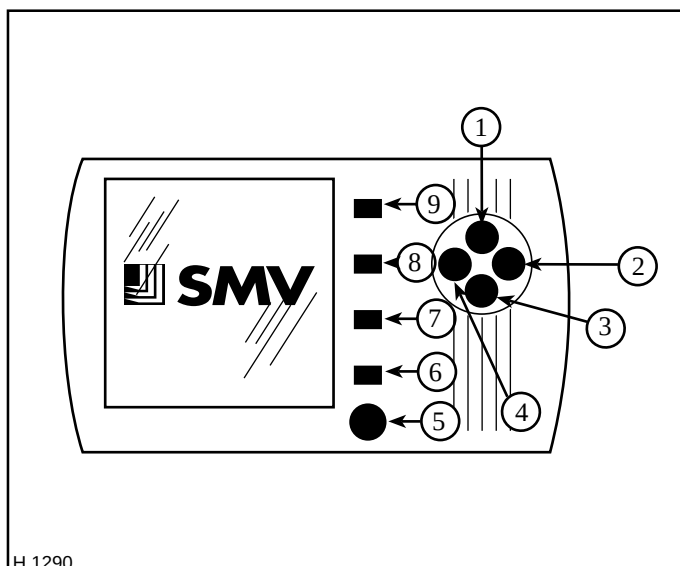
The monitor computes the following information;

- Position of the regulator motor on the fuel injection pump
- Position of the accelerator pedal
- Position of the joystick for boom hoist, lower, extend and retract
- Pressure in hoist cylinders
- Length and angle of the boom
- The engine, transmission and brake accumulator's pressure
- Temperature of the engine and transmission
- Fuel level
- Position of gearshift lever and declutch gear function
- Parking brake switch
- Position of twist locks, open or locked
- RPM of engine and drive train
- Steering wheel's angle and orbitrol pressure. Obs. joystick steering option

The monitor controls the following functions;

- Fuel pump regulator motor (engine RPM)
- The hydraulic valve for hoist and boom lower, extend and boom retract
- The transmission's valves for F&R, 1st, 2nd and 3rd gears
- Opening and closing of the hose burst valves on the hoist cylinders
- Parking brake valve
- Fast hoist valves on the lift and extension cylinders, optional
- Steering system when joystick type steering fitted, optional
- Automatic transmission, optional

The following information can be obtained by utilising the display's various keys



Description of the keys

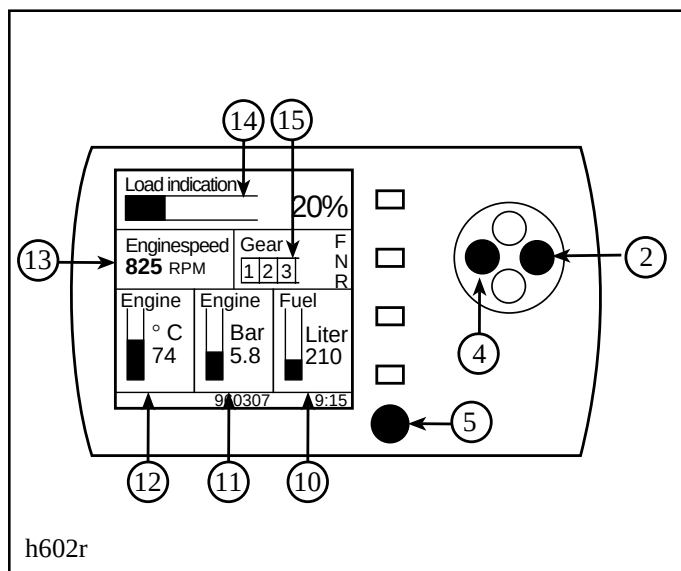
Step keys (1) up, (2) forward, (3) down, and (4) back, pages through the menus.

Menu/enter key (5), change menus/endorse fault information.

Alternative keys (6,7,8 and 9)

After starting turning on the ignition switch, this picture will be shown for approx. 1 second and will then be followed by the logo which will be visible for approx 2 to 3 seconds.

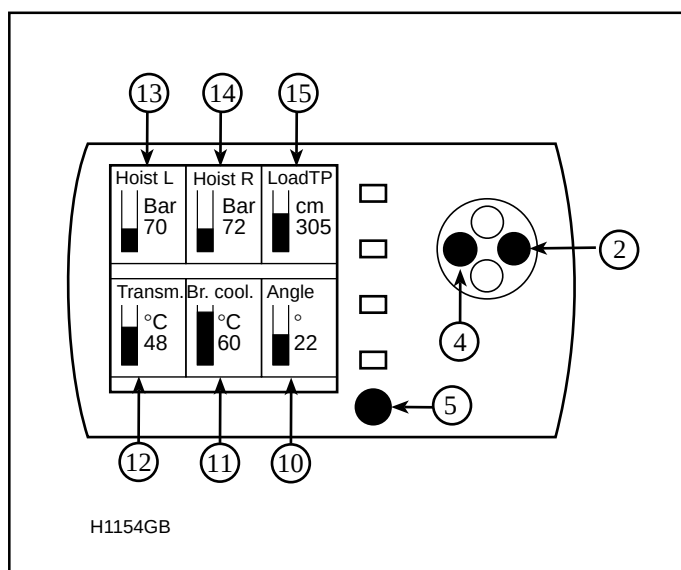
H 1290



First page picture menu

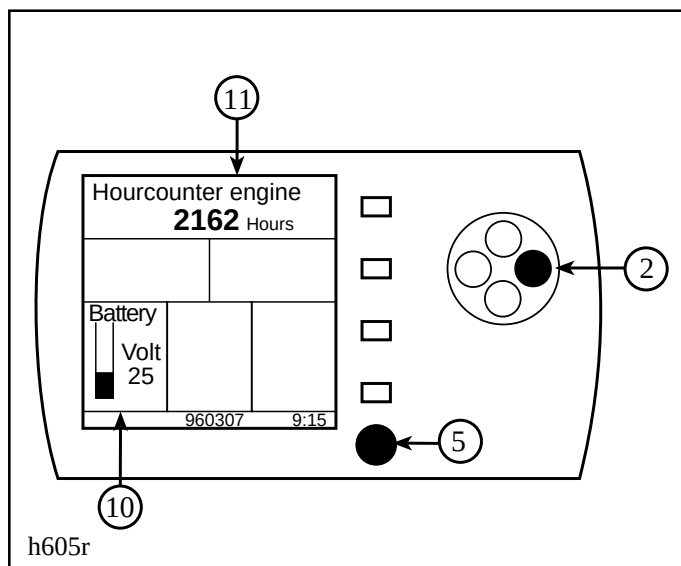
The picture menu contains three pages where various digital and analog values are shown.

- (2) forward.
- (4) backwards.
- (5) can be used to change between the picture and text menus.
- (14) indication of load as a % of max load.
- (15) chosen gear, forward, reverse, neutral, 1,2 and 3
- (10) fuel level in liters.
- (11) engine's oil pressure in Bar.
- (12) engine's temperature in degrees centigrade.
- (13) engine RPM.
- (2) continue to page two of picture menu.
- (5) return to text menu.



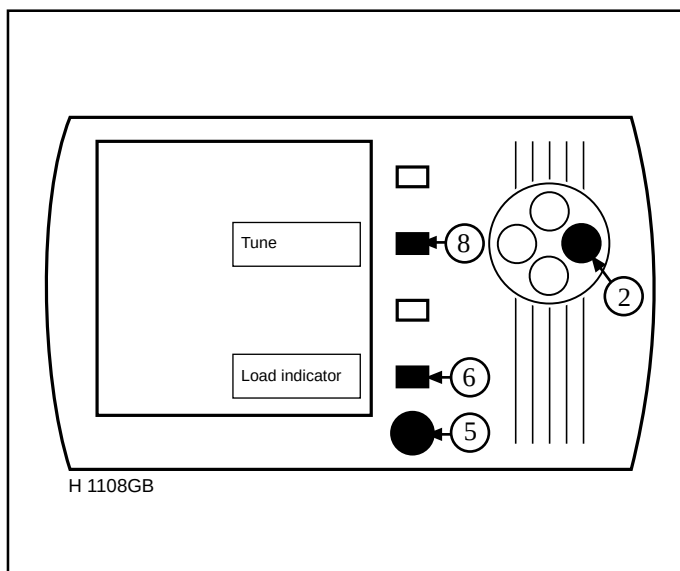
Second page picture menu

- (13) pressure in left hand hoist cylinder in Bar.
- (14) pressure in right hand hoist cylinder in Bar.
- (15) The load's center of gravity distance calculated from the front edge of the drive wheels.
- (10) boom angle in degrees (0 = horizontal).
- (12) temperature of transmission oil.
- (11) Brake temperature in degrees C.
- (4) return to first page of picture menu.
- (2) continue to third page of picture menu.
- (5) return to text menu.



Third page picture menu

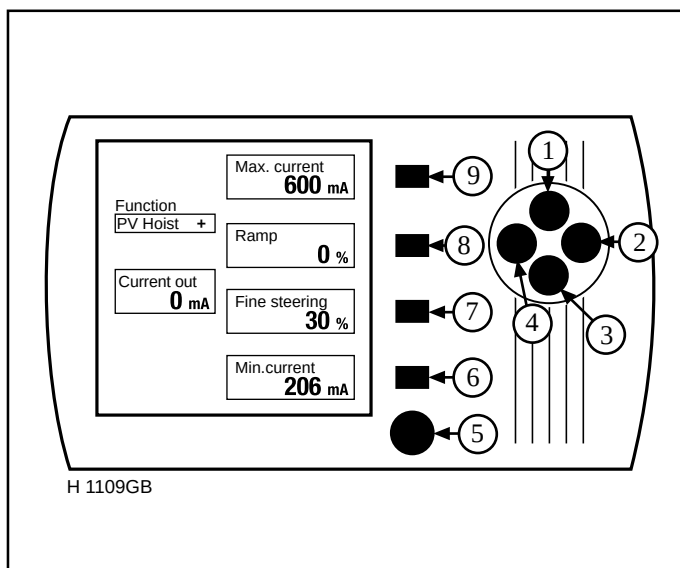
- (11) Hour meter reading.
- (10) Battery voltage.
- (2) to first page of picture menu.
- (5) to text page.



Text menu, first page

The text menu is obtained by pressing key (5) and includes two pages with sub menus.

- (8) tune menu.
- (6) load indicator.
- (2) text menu second page.
- (5) return to picture menu.



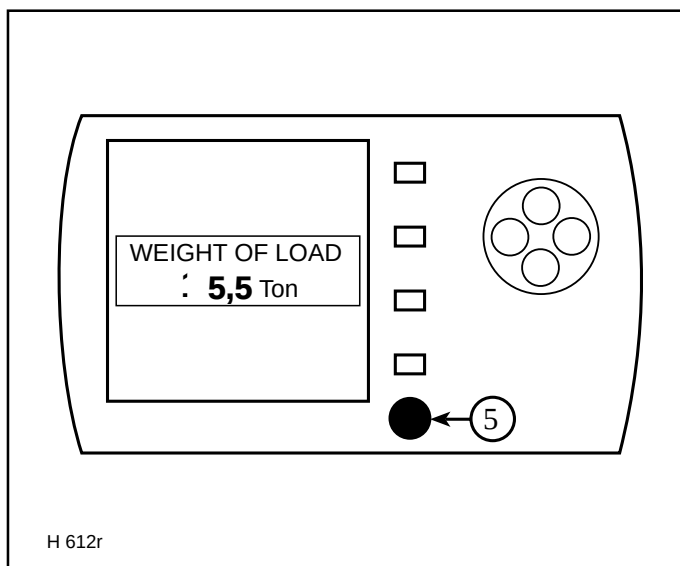
Tune menu

This sub menu gives access to tune certain functions, for example; Lift- and extension functions, start and maximum current. Joystick steering and start and maximum current. It's also possible to adjust ramp on these functions. Choose function by operating joystick. Chooosed function will be shown at the upper left corner. Press keys (6), (7), (8) or (9) depending what to be tuned. Headline will be lit up.

Press key (1) or (3) to increase or decrease the value. (Larger steps could be obtained by using keys (2) or (4).

The adjusted value is entered by key (5).

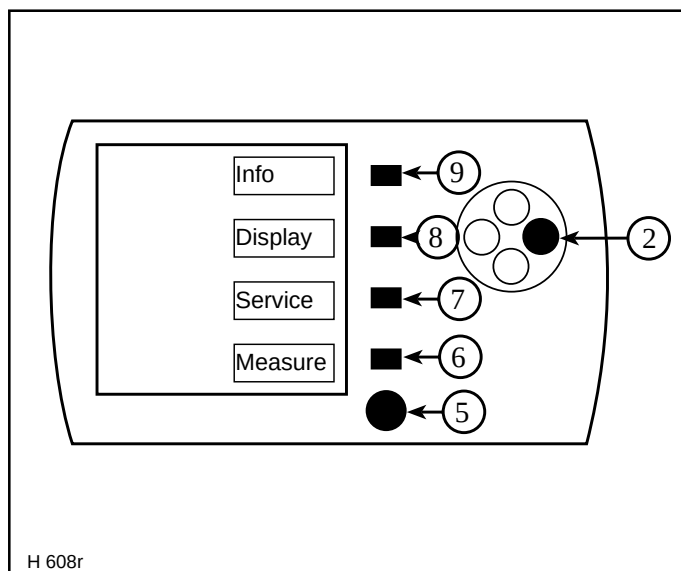
Key (5) will also return to picture menu.



Submenu load scale (option)

The value shown is the weight of the load in metric tons.

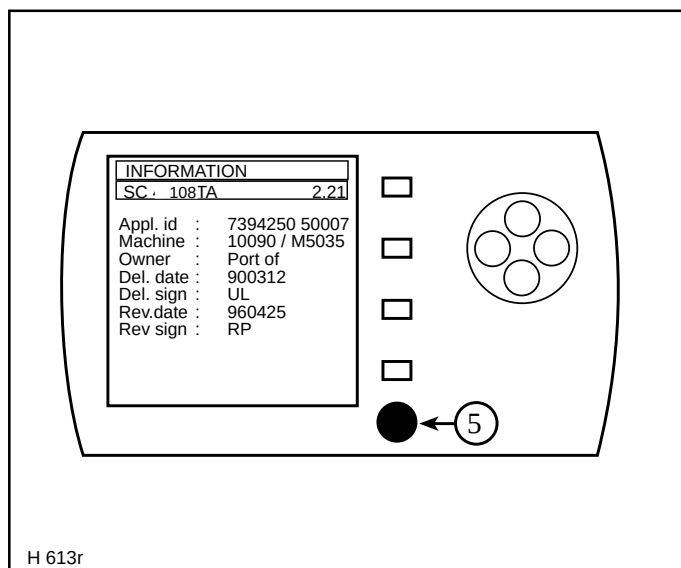
- (5) return to picture menu.



Text menu, second page

The second page is reached by pressing key (2) on the first text menu page and contains the following sub menus:

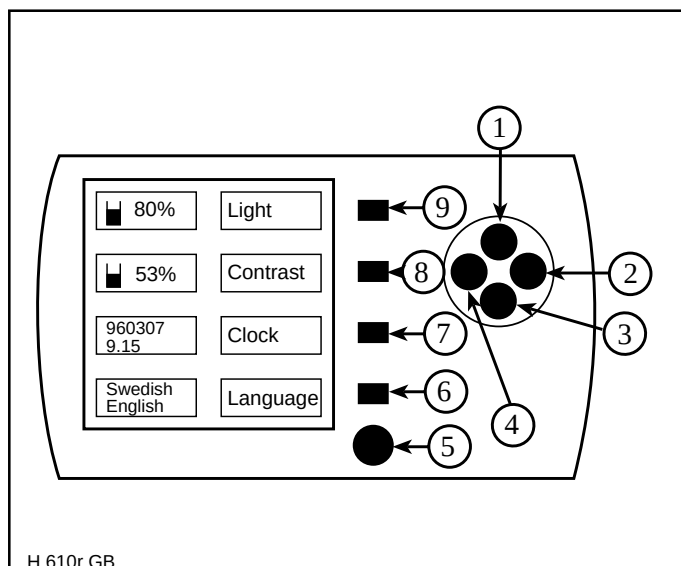
- (9) information
- (8) display
- (7) service
- (6) trouble shooting
- (5) return to picture menu



Submenu information

This menu contains important machine data

- (5) return to picture menu.



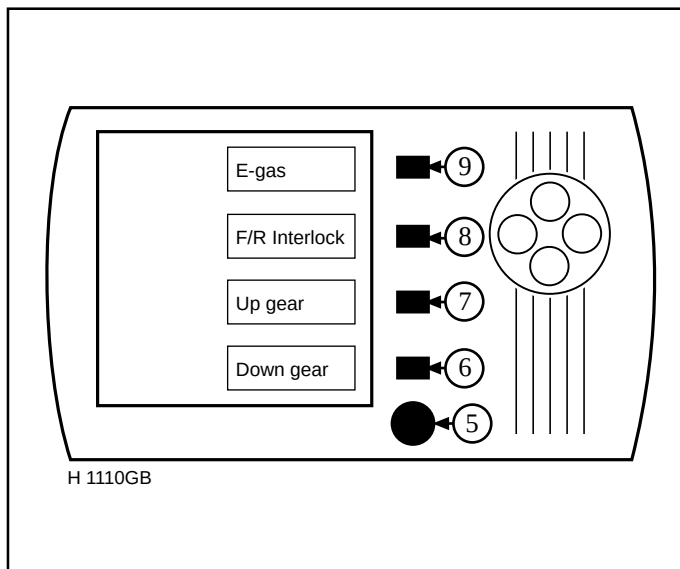
Submenu display

This menu gives the possibility of adjusting brilliance, contrast, time and language.

- (6) language
- (7) time
- (8) contrast
- (9) brilliance

The present settings are shown and it is possible to adjust them by using keys (2, 3, 4 and 5).

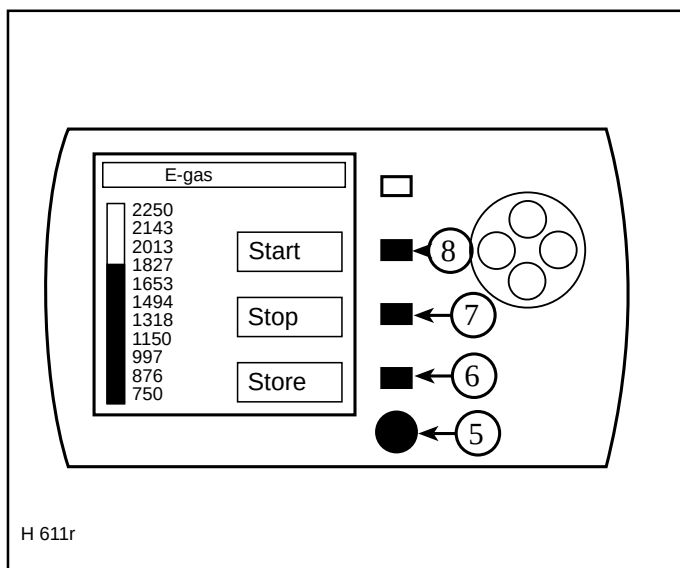
- (5) return to picture menu.



Submenu Service

This menu gives further sub menus.

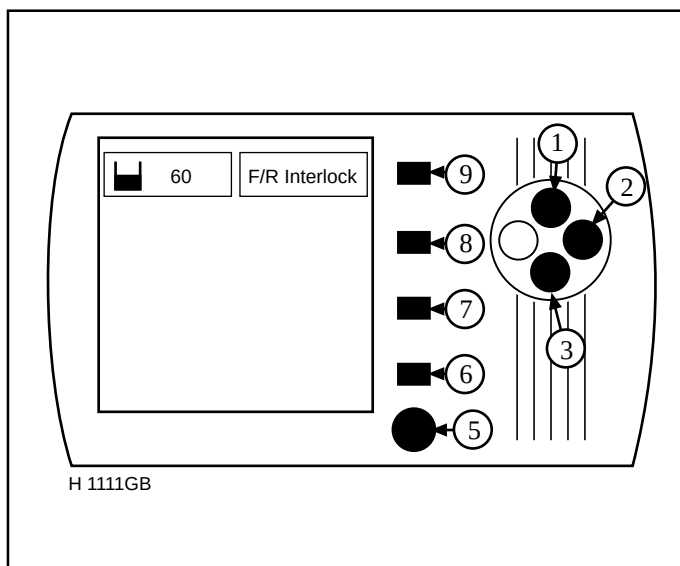
- (9) E-gas is an automatic setup for electric foot throttle. (Only Scania DSI 9).
- (8) adjustment of forward/reverse interlock.
- (7) adjustment of upgear.
- (6) adjustment of downgear.
- (6) and (7) automatic gearshift option.
- (5) return to picture menu.



Submenu E-gas

E-GAS is an automatic adjustment of the accelerator system's adjustment motor in relation to engine RPM.

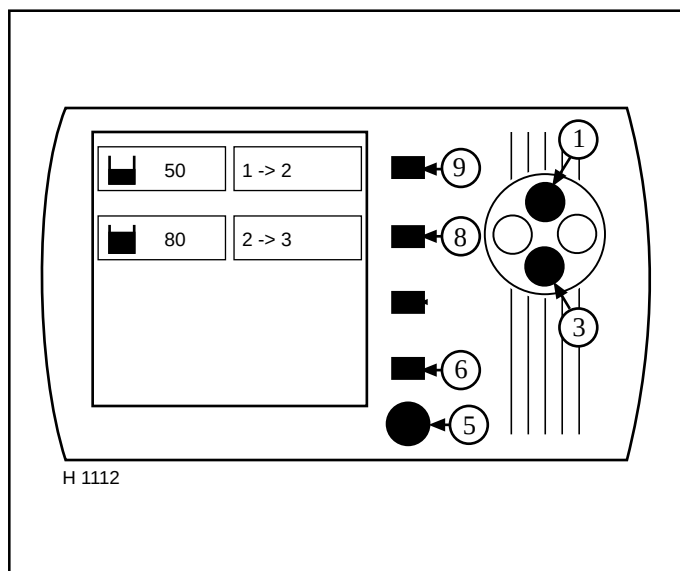
- (8) start the adjustment program. The program is automatically run. The adjustment takes a few minutes and the engine must be running.
- (7) switch off adjustment if program has not succeeded.
- (6) stores the new adjustment.
- (5) return to picture menu.



Sub menu F/R interlock

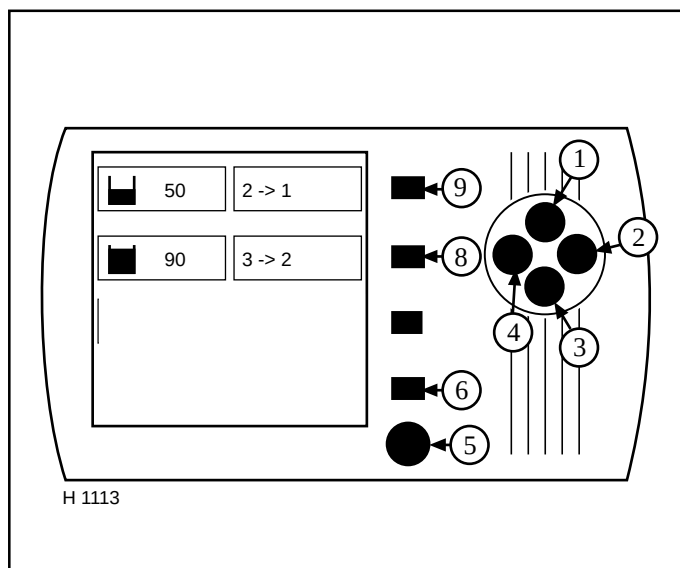
Key (9) activates F/R interlock level. By pressing key (1) increases and key (3) decreases the value and by that the speed that allow change of direction. This is adjustable only within limits from 0 km/h - 3 km/h.

- (5) return to sub menu Service.



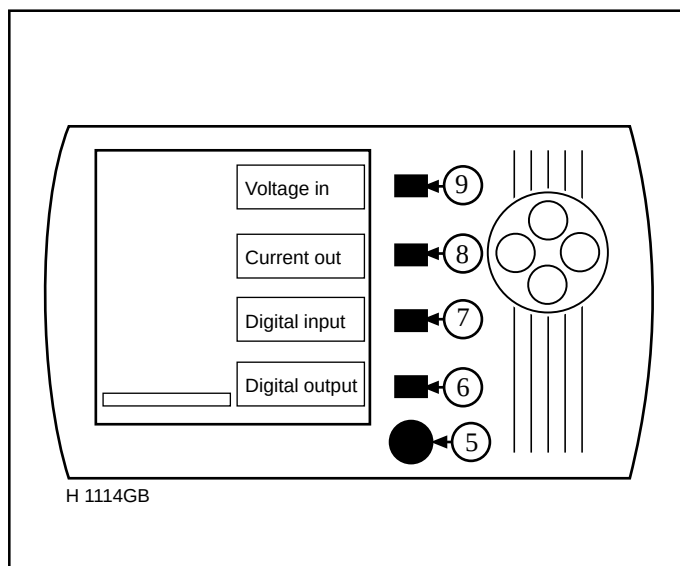
Sub menu up gear.

- Press key (9) to activate the function for shifting from 1st to 2nd.
Box will light up.
- Adjust by keys (1) and (3) to in/decrease the level shift between 1st and 2nd.
- Press key (8) to activate the function for shifting from 2nd to 3rd.
- Adjust by key (1) and (3) to in/decrease the value. Speeds can be set only within limits that acceptable for the drive train.



Sub menu down gear.

- Press key (9) to activate the function for shifting from 2nd to 1st.
- Box will light up.
- Adjust by keys (1) and (3) to in/decrease the level shift between 2nd and 1st.
- Press key (8) to activate the function for shifting from 3rd to 2nd.
- Adjust by key (1) and (3) to in/decrease the value. Speeds can be set only within limits that acceptable for the drive train.



Sub menu Measure

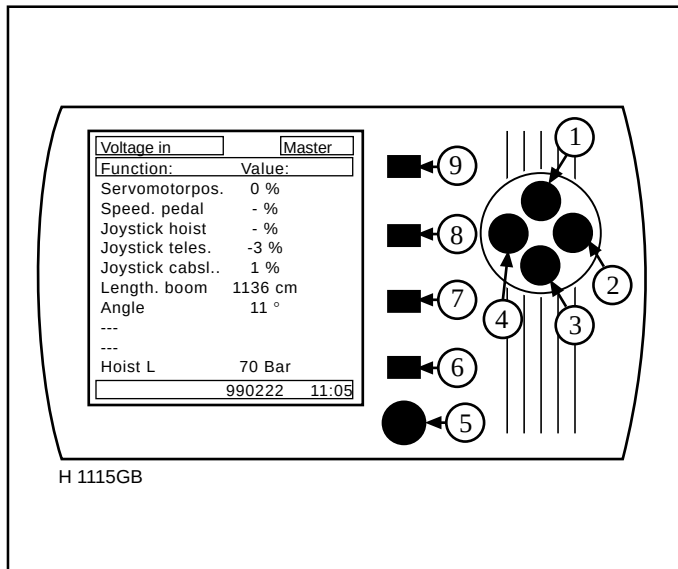
This menu is obtained from the text menu's second page gives six different submenus.

Page one

- (6) Digital output
- (7) Digital input
- (8) Current out.
- (9) Voltage in,

Go to page two (not shown) by pressing key (4) or (2)

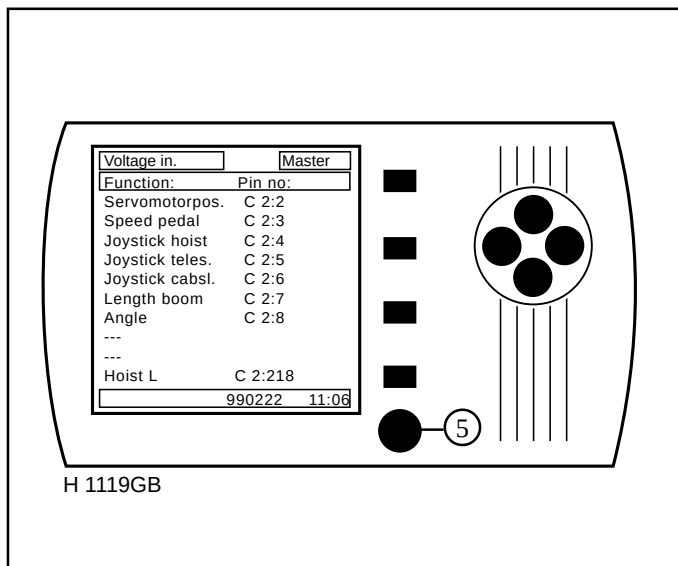
- (9) frequency 6 two pages.
- (8) internal



Sub menu voltage in

In this menu all voltage-input gates could be checked. By activating a function, for example the joystick, the value for the joystick will change accordingly.

- Press key (3) or (1) to change from “value” to “pin no” See below
- Press key (2) or (4) to scroll to a second page of voltage input.
- Key (5) return to picture menu.

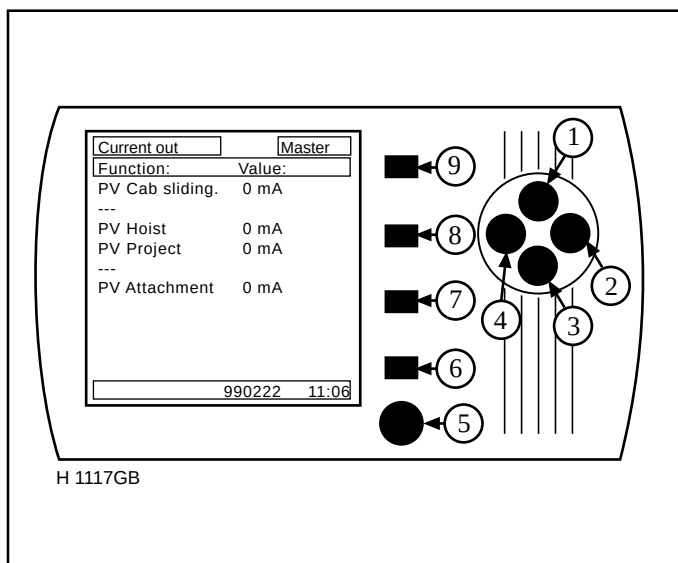


Sub menu voltage in, pin numbers.

Same as above except that the pin number for the input gate is shown instead of value.

These pin numbers correspond with the electric diagrams

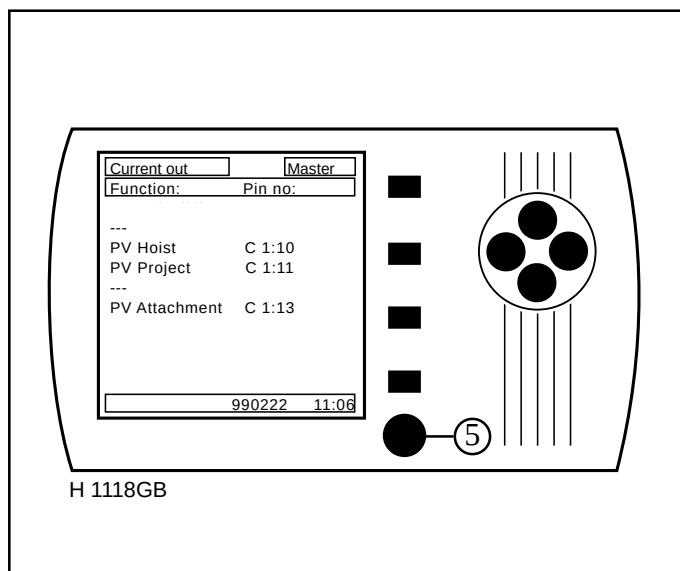
- Key (5) return to picture



Sub menu Current out put.

Out put current for proportional valves “PV” could here be checked.

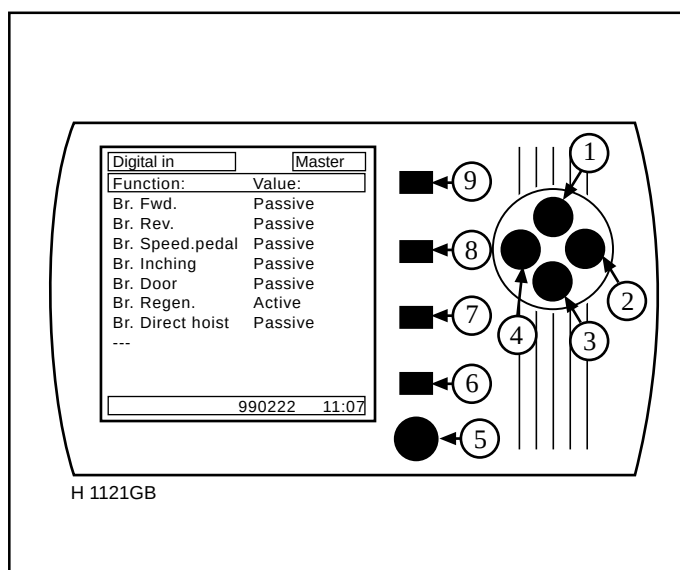
- Press key (3) or (1) to change from “value” to “pin no”
- Key (2) or (4) scroll to a second page



Sub menu Current out put, pin numbers.

Pin numbers corresponding to electric diagram are shown.

- (5) Return to picture menu.

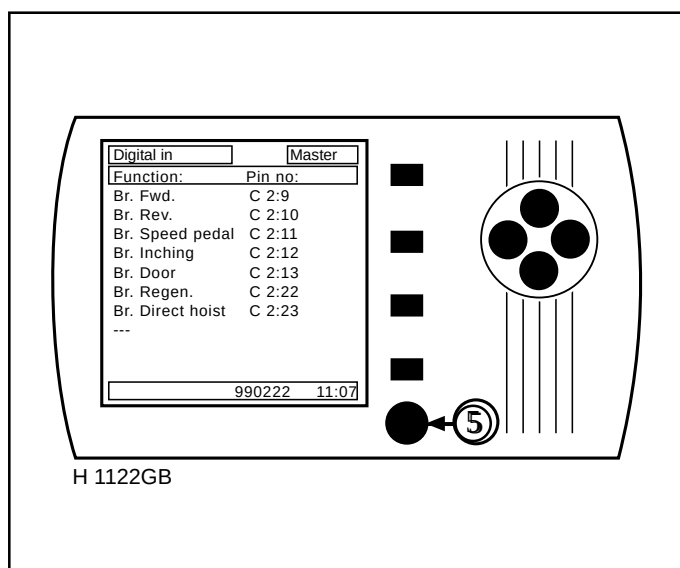


Sub menu Digital inputs.

Value of the digital inputs could be checked.

On = active, off = passive .

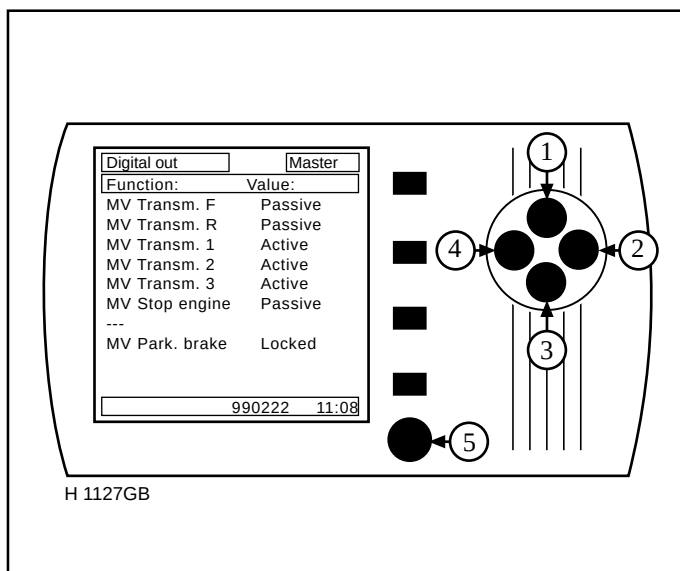
- Press key (1) or (3) to obtain pin numbers instead of value.
- Press key (2) or (4) to obtain a second page.
- Press key (5) to return to picture menu.



Sub menu Digital inputs / Pin numbers.

Pin numbers are shown that correspond to electric diagrams.

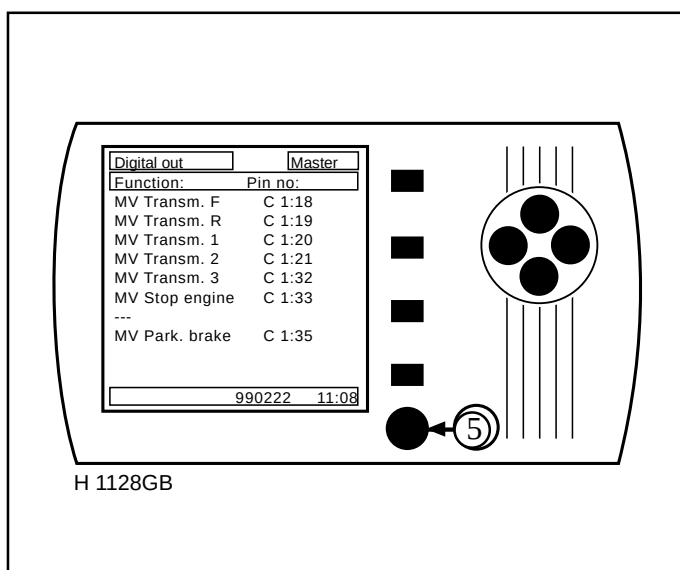
- Press key (5) to return to picture menu.



Sub menu Digital outputs.

The value of the out put signals could here be checked. On = active , off = passive .

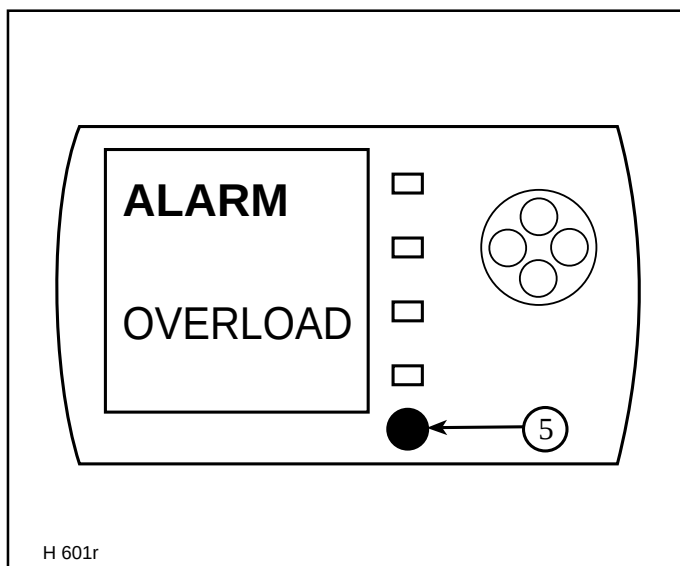
- Press key (1) or (3) to obtain pin numbers instead of value.
- Press key (2) or (4) to obtain a second page.
- Press key (5) to return to picture menu.



Sub menu Digital Outputs / Pin numbers.

Pin numbers are shown that correspond to electric diagrams.

- Press key (5) to return to picture menu.

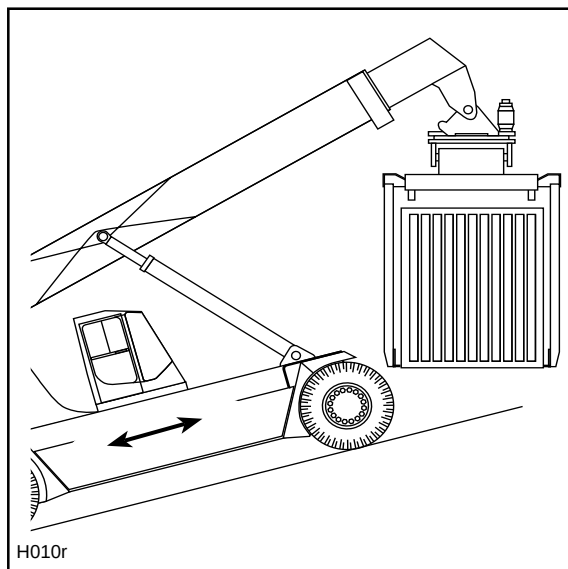


Alarm

If anything is abnormal an audible warning will be activated (buzzer) and the display will indicate.

- (5) endorse warning.

This does not mean that the safety functions are overridden eg. hoist and lower.



Operating



WARNING

- The machine is not intended for off-road driving.
- The machine is not equipped with wheel suspension and should therefore only be driven on level ground intended for the total weight and surface pressure of the machine.

- **Driving on slopes steeper than 15% is not permitted** as a rule because of the minimum regulations for braking and the stabilising capabilities of the machine. If the machine has to be driven along steeper slopes, you should contact your SMV dealer. The hill-climbing capacity of the machine indicated in the data sheet is based on the pulling power of the machine, and applies only to driving over obstacles and minor replaces in ground level.

Always adjust your method of driving to the condition of the road (undulations, etc.), to hazards within the working area and the load.

- Start the engine.
- Hold the steering wheel steady. Always use the whole of your hand to hold the wheel knob.



WARNING

Before you start to move the machine, check that the road ahead is free and that you have a clear view.

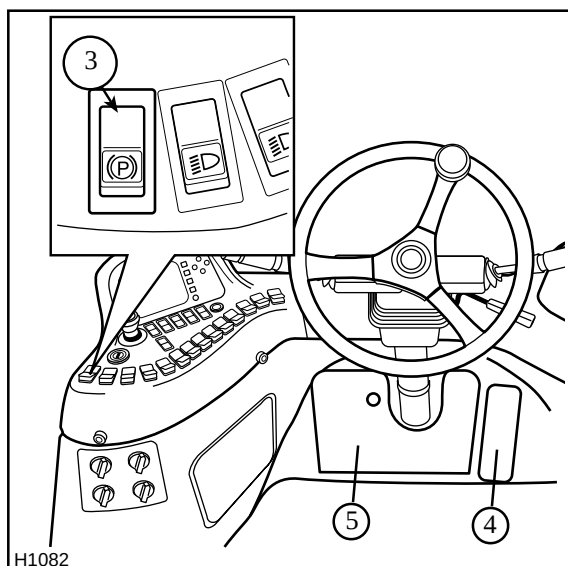
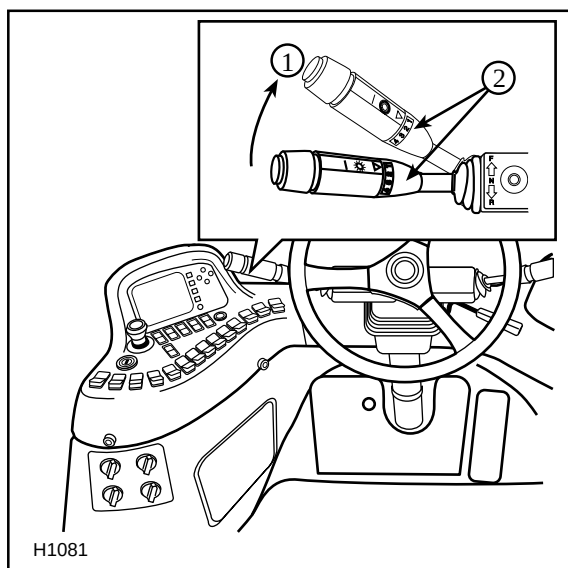
Driving forwards

- Put into first gear using the gear stick (2).

NOTE

Always start in first gear to avoid damage and prevent the gearbox from overheating.

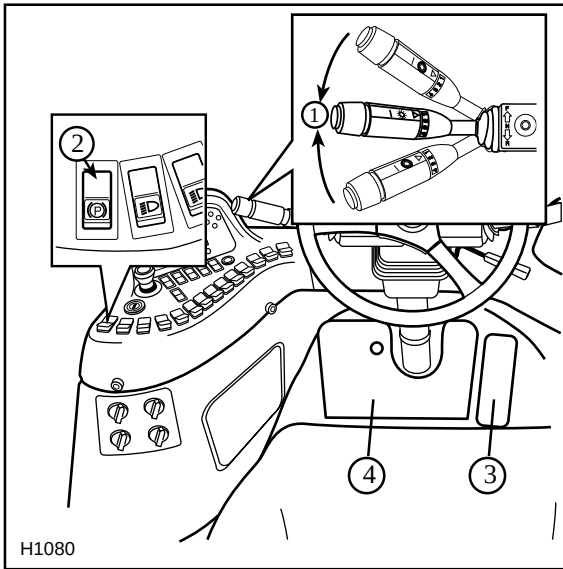
- Push the driving direction control (1) forward.



- Release the parking brake (3).
- Depress the accelerator (4) slowly so that the machine starts off gently.

NOTE

When starting up a hill, hold the machine still using the brake pedal (5) until you have sufficient pulling power.



Stopping the machine

- Take your foot off the accelerator (3).
- Press the brake pedal (4) and stop the machine in a gentle, controlled manner.



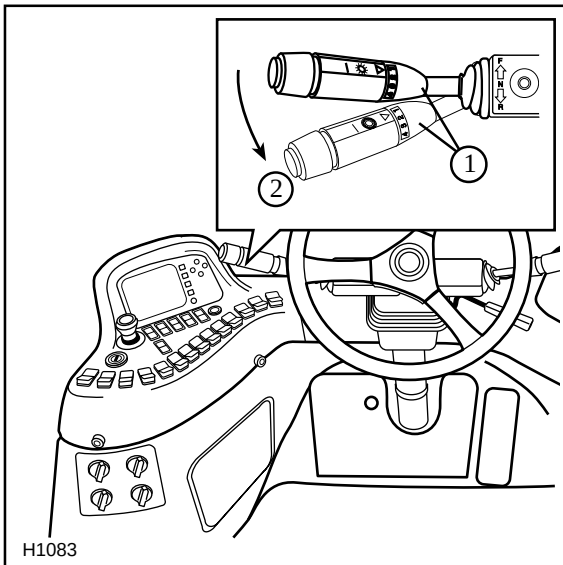
WARNING

Brakes are powerful and should be used gently. Especially when driving with loads, and when boom is araised.

NOTE

Do not use the gearbox as a brake.

- When the machine has stopped completely, engage the parking brake (2) before releasing the brake pedal.
- Put the driving direction control (1) into neutral.



Driving backwards

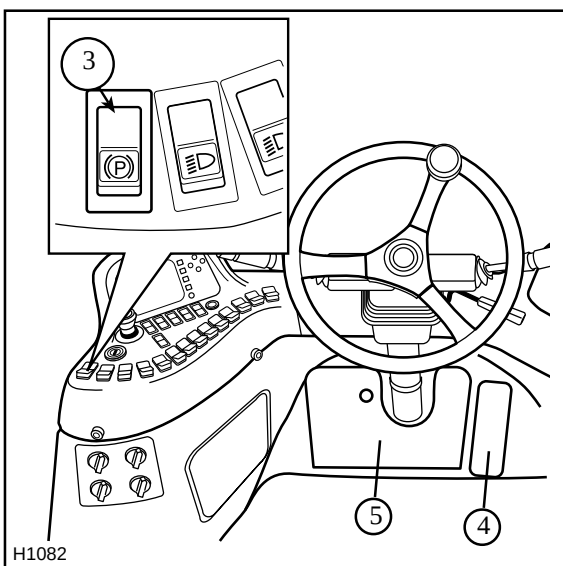
Changing the direction of driving



WARNING

The machine must be completely stopped before changing the direction of driving.

- Put into first gear using the gear stick (1).
- Pull the driving direction control backwards (2).
- Release the parking brake.

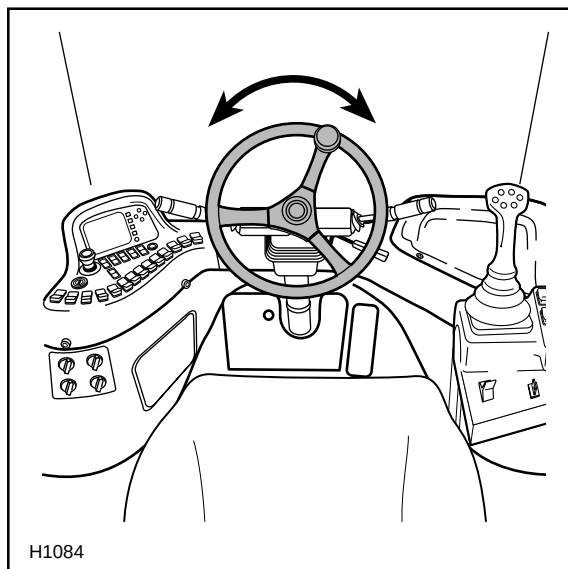


- Release the parking brake.
- Depress the accelerator (4) slowly so that the machine starts gently.

NOTE

When starting uphill, hold the machine still using the brake pedal (5) for until you have obtained sufficient pulling power.

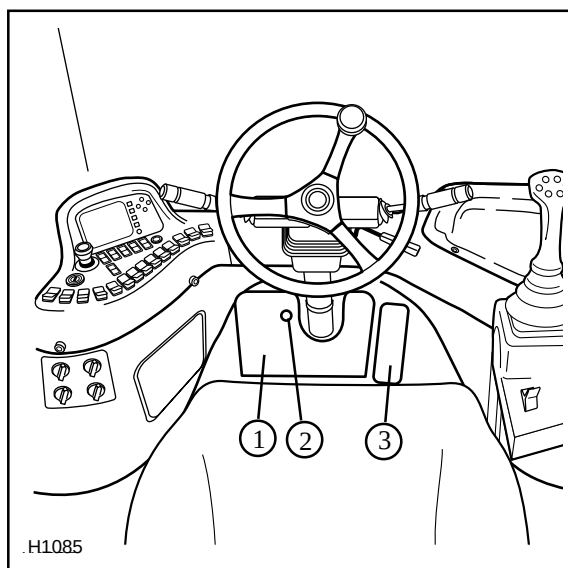
Always start in the lowest gear.



Steering

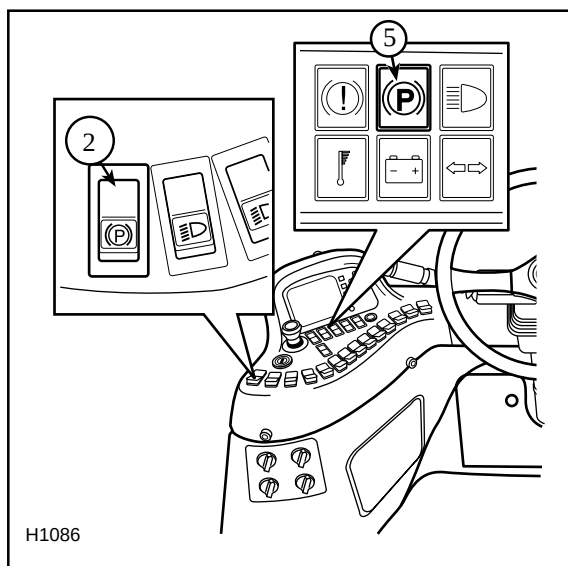
Very little effort is needed to turn the steering wheel thanks to the servo-assisted steering system.

To minimise unnecessary wear and tear to the tyres, the steering wheel should, if possible, be turned only when the machine is moving.



The disengaging switch

- Release the accelerator (3).
- Activate the clutch using the disengaging switch (2).
- If the disengager is pressed at the same time as the brake (1) pedal, the brakes are applied.
- When braking using only the brake pedal (1), the disengaging function is activated only after the brakes have been applied.

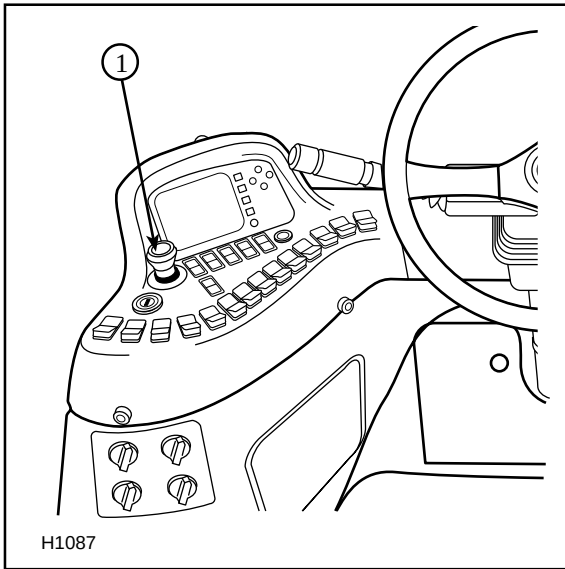


The parking brake switch

- The parking brake (2) is to the left of the steering wheel.
- The parking brake **should not be** used to bring the truck to a halt unless in an emergency.
- When the parking brake is used, the warning light comes on (5).
- If the driver is leaving the seat with parking brake not activated, a audio signal is sounding.



EMERGENCY STOP, EXIT AND SLIDING CAB



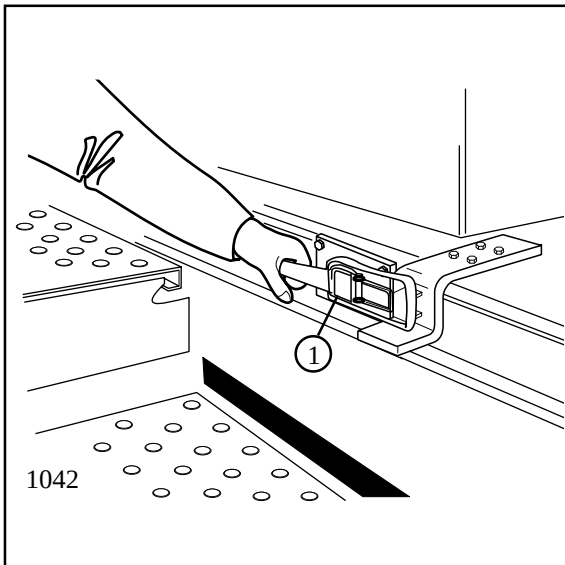
Emergency stop

- When using the emergency stop (press button (1) down wards), all functions are cut out, the parking brake is activated and the engine stops.



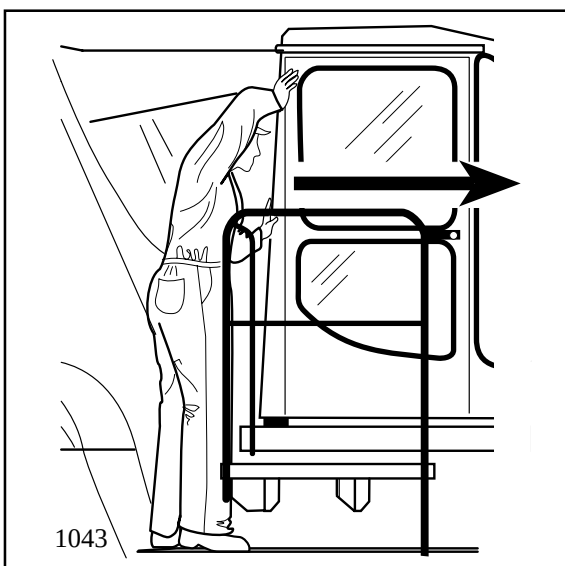
WARNING

There is a risk of tipping over if the emergency stop is used when the machine is moving.



Manually sliding cab

- Lift up the handles (1) at the side of the cabin.

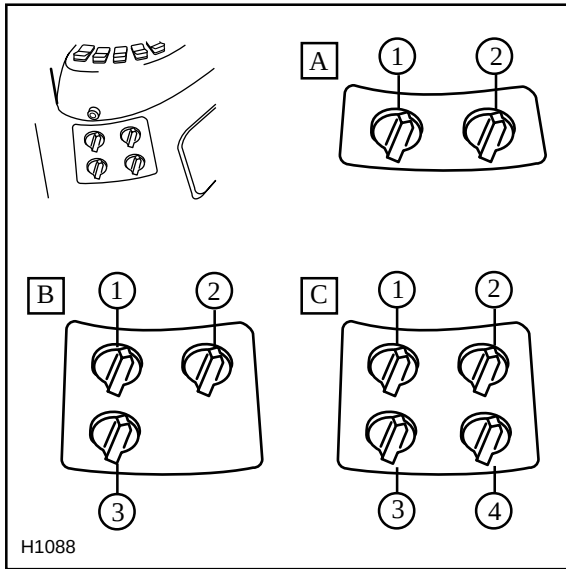


- Push the cabin forward by hand.

NOTE

The manually slided cabin should **always** be locked in its rear position while operating the machine.

SMV SLIDING CABIN, VENTILATION AND CAB FILTER



Ventilation

A = Standard.

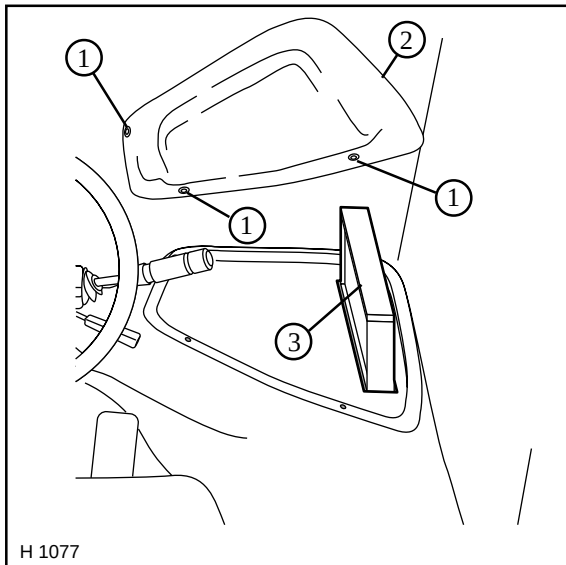
- (1) heating
- (2) fan.

B = ACC

- (1) temperature
- (2) fan
- (3) recirculation

C = AC

- (1) heating
- (2) fan
- (3) recirculation
- (4) cooling



Cab filter

A filter for cab air intake is located on the right hand dashboard.

- loosen screws (1)
- disassemble cover (2)
- pull up the filter cassette (3) gentle to avoid dust in the climate unit and cabin.

Replace the filter insert, Part No. 2050000143.



Silverdalens Mek. Verkstad AB
P.O.BOX 103 • S-285 23 MARKARYD • SWEDEN

TYPE TYPE TYPE	SL 10-600 A	
MANUFACTURING NO. HERSTELL. NR.	M5434	
NUMERO DE FABRICATION MANUFACTURING YEAR HERSTELL. JAHR ANNEE DE FABRICATION	2000	
MAX LIFTING HEIGHT MAX HUBHÖHE ELEVATION MAXIMUM	4000	
LOWEST MAST HEIGHT MIN HUBGERÜSH HÖHE MÂT ENTIEREMENT ABAISSE	3450	
SERVICE WEIGHT EIGENWICHT POIDS DE SERVICE	14 400	
CAPACITY KAPAZITÄT CAPACITE	10 000 KG	
	4000 MM	600 MM
	7800 KG	900 MM
	5800 KG	1200 MM
	4800 KG	1500 MM

H1318

Before lifting loads

Capacity plates

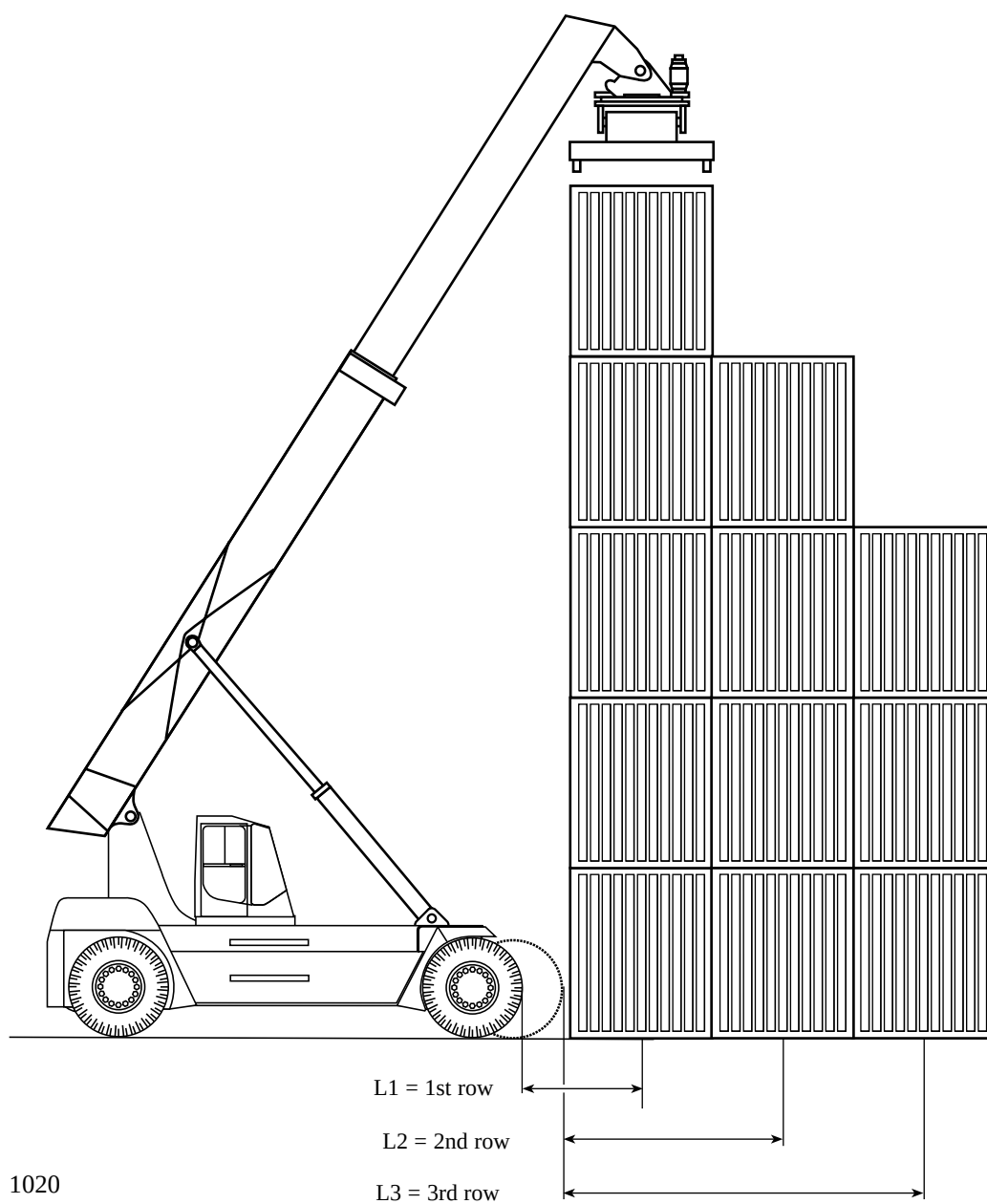
Before lifting a load, read the lifting capacity plate on the left side of the cabin.

If an accessory has been fitted, read the capacity plate for this.

The values indicated on the capacity plate are valid for compact and regular loads, and if they are exceeded, there is a risk to the stability of the machine and the tensile strength of the boom/lifting attachment.

Maximum capacity depends on the height of the lift and the distance to the centre of the load.

Model	L 1	L 2	L 3
	2400 mm 1st row	3850 mm 2nd row	6350 mm 3rd row
SC 108 TA	10 Ton	10 Ton 8 Ton	5 Ton



Manoeuvring the boom and spreader

Manoeuvring the joystick



WARNING

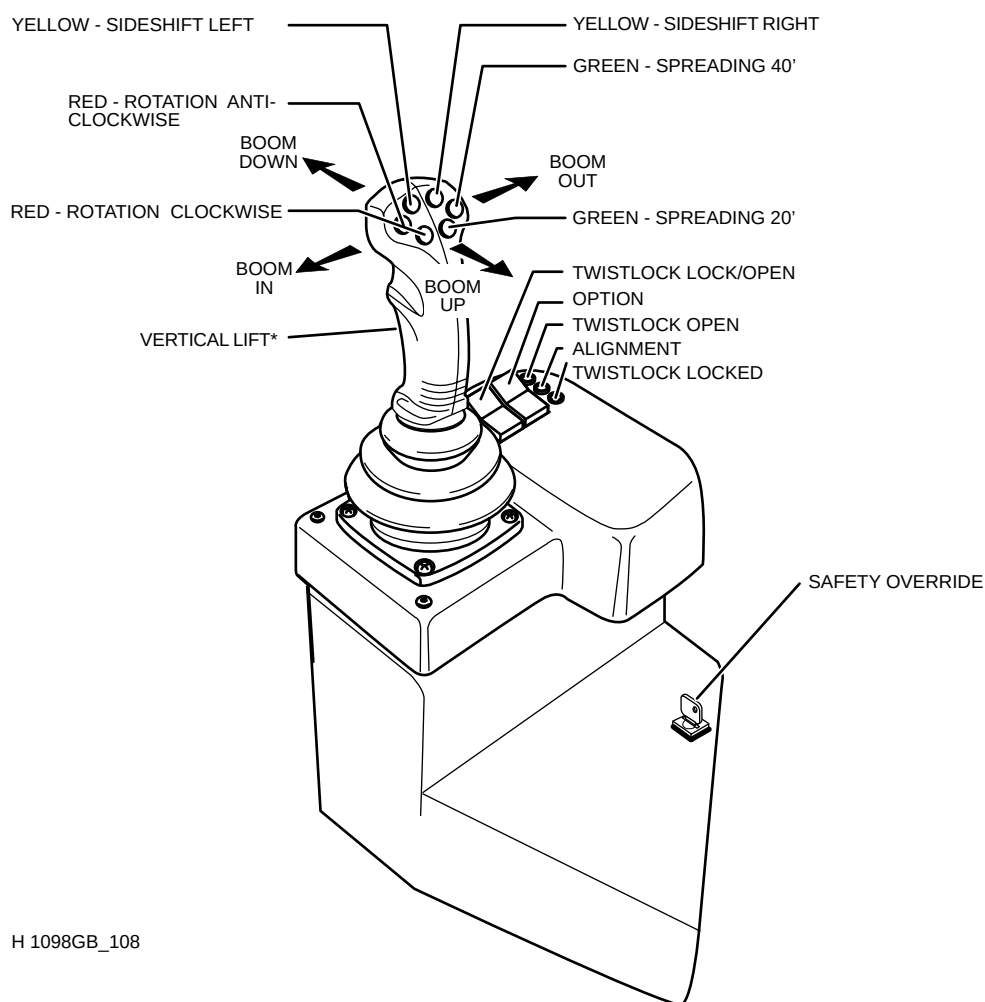
Use the boom and its attachments only for approved applications. The driver must be trained to handle the machinery and its equipment.

Always manoeuvre the control gently and slowly.

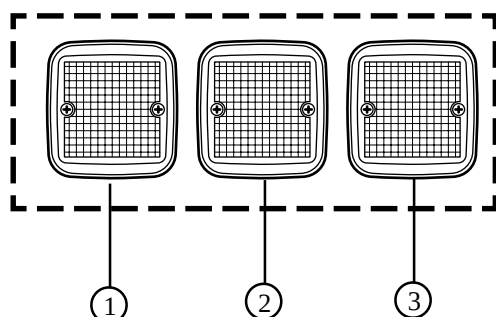
The speed of the hydraulic function depends on position of the control.

The control automatically slips into its initial position when released.

All hydraulic controls sit on the console to the right of the driver's seat.



H 1098GB_108



H 1153

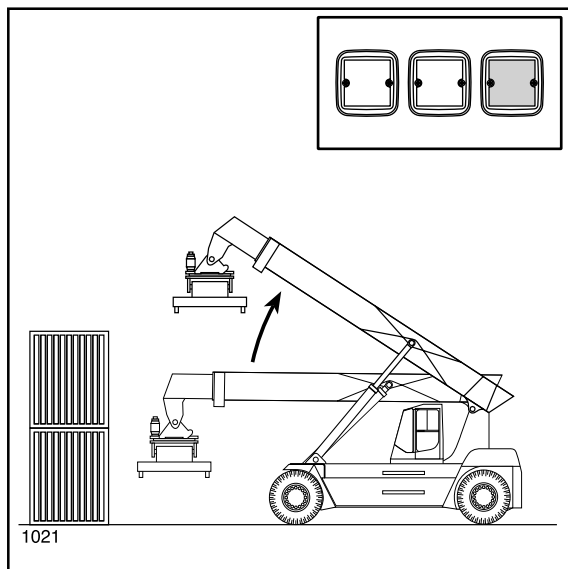
Spreader lights

The picture shows the indicator light panel for the spreader.

Group 1.

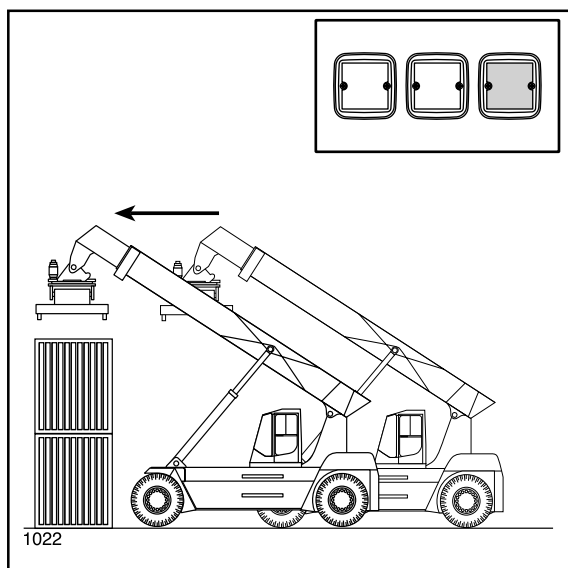
The group of lamps is used for indicating the functions of the spreader.

There are three lamps, one for LOCKED (1), one for SEATED (2) and one for NOT LOCKED (3).

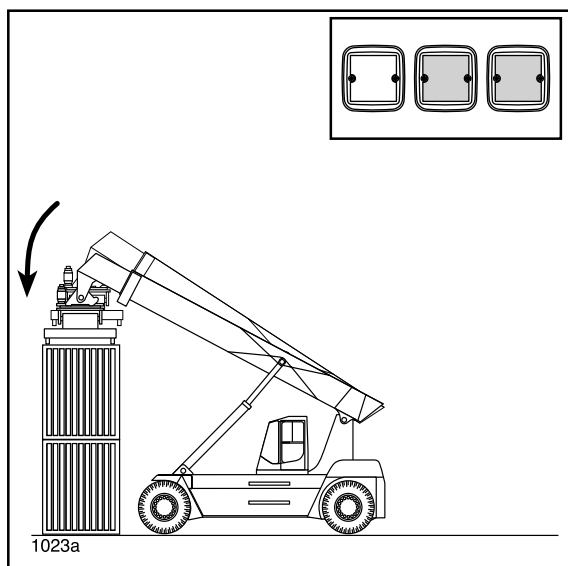


Before lifting loads

- Drive forward towards the pile.
- Endeavour to move the centre of the machine towards the centre of the container.
- Lift the spreader until it is above the container.
- The right-hand lamp (red) indicates open twist lock.



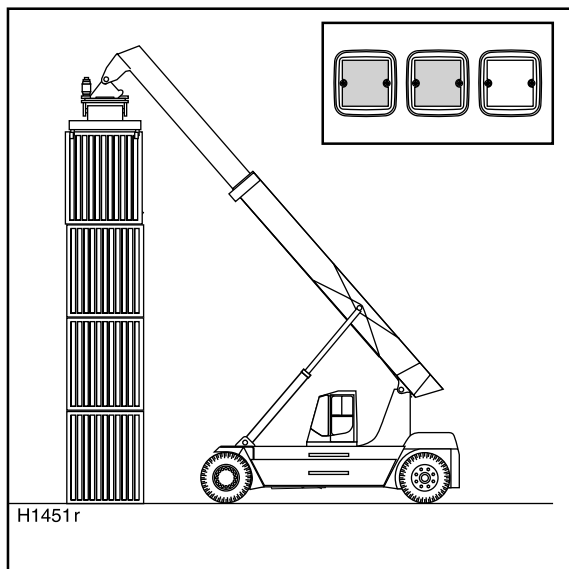
- Drive the machine forward as close to the pile as possible.
- Engage the parking brake if desired, or keep the machine still using the brake pedal.
- Manoeuvre the spreader into position over the container using sideshifting, turning and boom in/out.
- The right-hand light (red) indicates open twist lock.



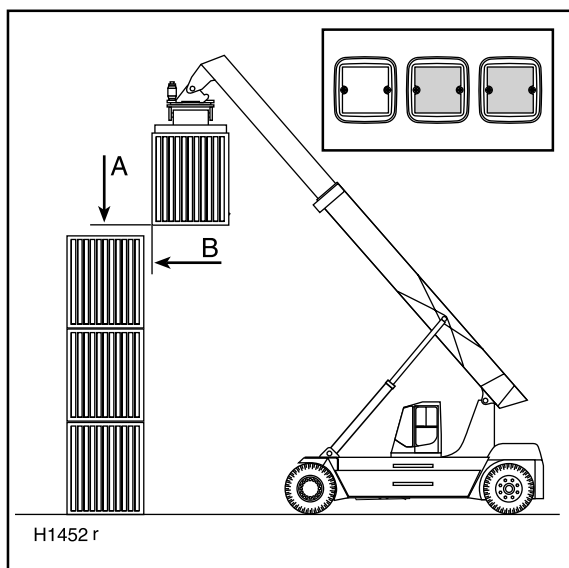
- Lower the spreader on the container.
- The middle light (yellow) is lit when all four corners are correct aligned.
- Use the switch to lock the twist lock (if it is not locked automatically).



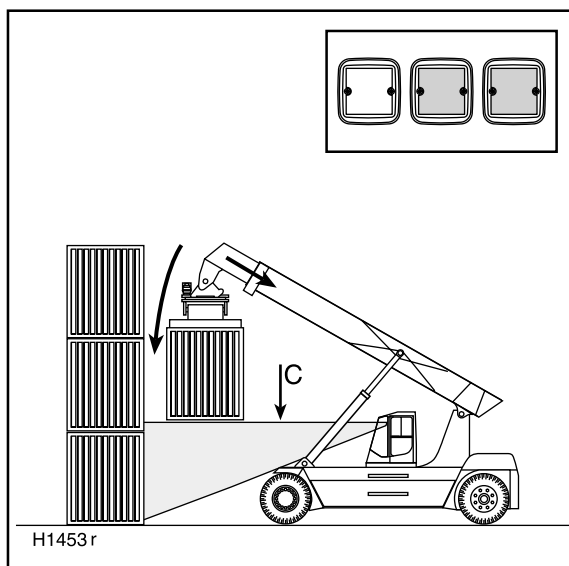
LIFTING AND DRIVING WITH CONTAINERS



- Right-hand light (red) goes out when the locking moment starts.
- The lifting function is locked whilst either the right-hand (red) or the left-hand (green) is off.
- Left-hand light (green) lights up when the locking moment has been completed.
- Ready to lift a load.



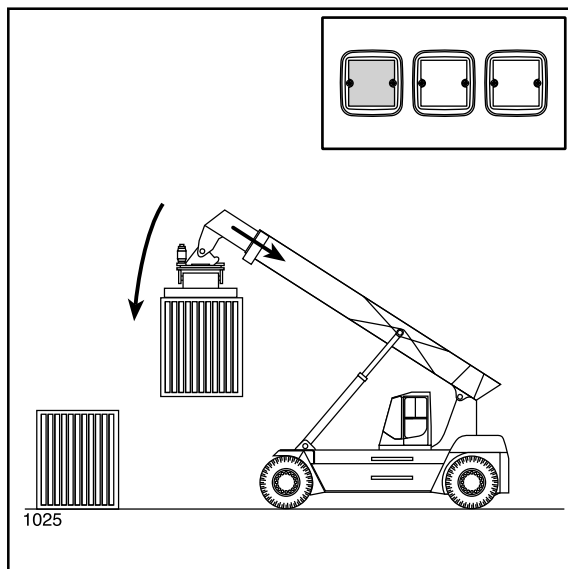
- As soon as the load is lifted the middle light (yellow) goes out and the twistlock function is interrupted.
- Lift up only as much as needed to ensure clearance from the container below. ("A"= approx. 20 to 40 cm.)
- Reverse the machine carefully to a position where the lifted container is clear of the front face of the container below. "B" not more than 20 to 40 cm. Then stop the machine and remain stationary.
- Retract the boom as much as possible, which lowers the container down, the EMC will warn and interrupt the retraction of the boom when it is too far back, at this position lower the boom. Be aware of the stack in front as lowering will make the container go forward.
- Continue, altering retraction and lowering until a safe transport position is obtained.



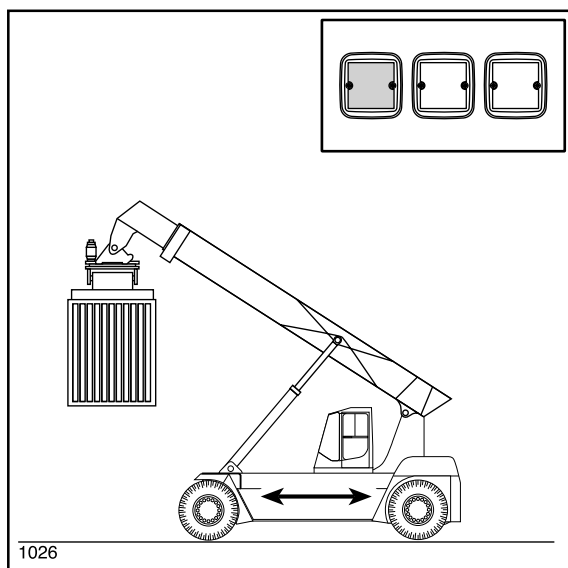
- Retract the boom all the way back.
- Lower the load as much as possible without obstructing the visibility, I.E. not below "C".
- Centralize the load by side shifting until the spreader hangs level, horizontally.



LIFTING AND DRIVING WITH CONTAINERS

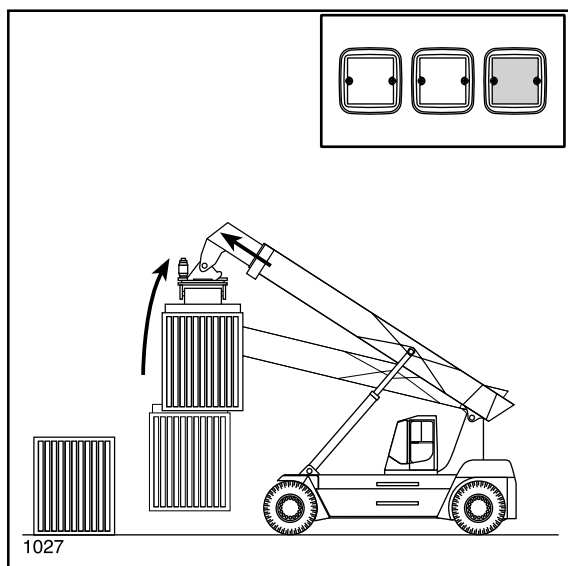


- The correct transport position is with the load as low and as close to the vehicle as possible without obstructing visibility.
- The centre of gravity of the load must be centred horizontally.



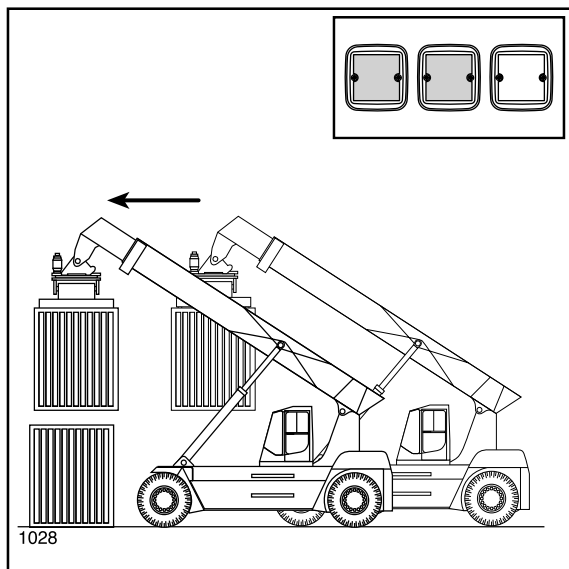
Before releasing the container

- Drive forward towards the pile.
- Endeavour to centre the load above the pile.
- Lift the load above the pile.



- Drive as close to the pile as possible.
- Engage the parking brake if desired or keep the machine still using the brake pedal.
- Manoeuvre the load into position above the pile using sideshifting, turning and boom in/out.

SMV TRANSPORTING AND RELEASING A CONTAINER

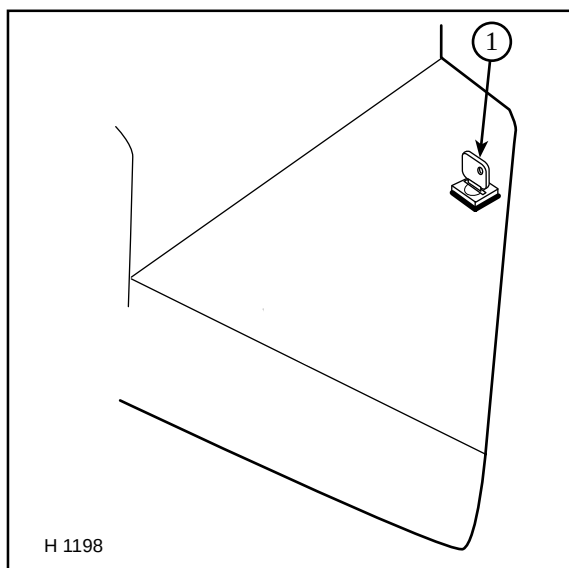


- Lower the load.
- The middle light (yellow) comes on when the correct position is reached.
- The twist lock can now be opened.
- The left-hand light (green) goes out when the unlocking moment starts.
- The right-hand light (red) only lights up when the twist lock is fully open.
- The machine can now begin a new work function.



WARNING

Never lift during the locking moment



Safety override

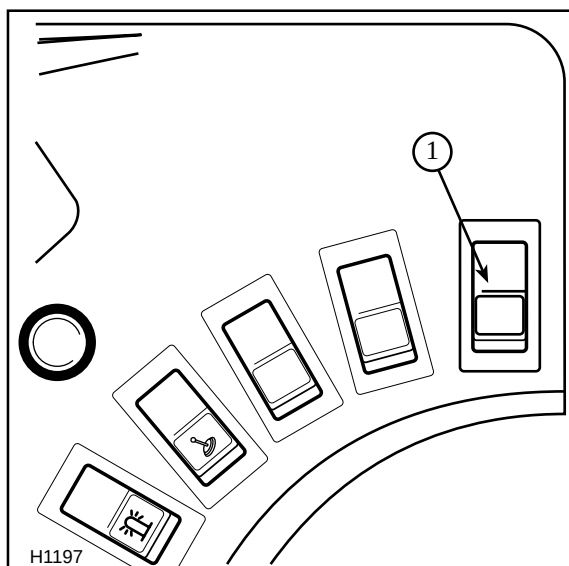
The safety override key (1) is used to simulate alignment. I.E. yellow light lits up.

This can be used to open or close twist locks if alignment has not been achived normally. (Defect corner castings or safety system). Key should only be used by service personel.



WARNING

Override cause a risk for container to be released uncontrollable.



Emergency lowering

Should a fault arise, the load may be lowered using the emergency lowering function (1).

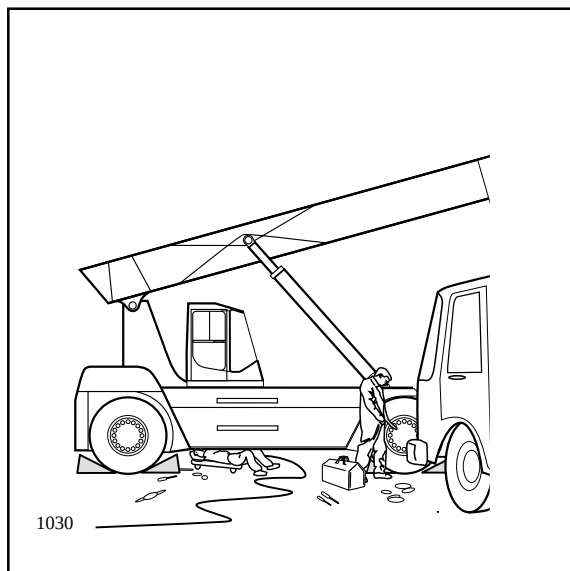
This should only be done with the greatest of care.

This lowering is slow and should only be used to unload the twist locks.



WARNING

The emergency lowering is overriding the overload system witch can cause a risk for tilting over.



General information

Preventive maintenance and maintenance must be carried out regularly and in accordance with the regulations supplied in the inspection table so that the truck will work as well as possible.

Maintenance must only be carried out by trained staff or an authorised SMV dealer in accordance with a service agreement. If you wish to service the machine yourself, we recommend that you carry out the first three customer service checks in the presence of SMV's authorised staff who can check that you are following the maintenance instructions.

Before any service work, check that;

- the machine is parked on firm, level ground.
- the machine is blocked so that it cannot roll.
- the engine is turned off and the ignition key removed.
- the boom and attachment have been secured if they are in the raised position.
- the machine is firmly chocked if work is to be carried out underneath when the machine is lifted up.

After every service, carry out a test drive and an operational test on the truck.

NOTE

If the machine is used in extremely warm, cold or dusty environments or in other unfavourable conditions, the service should be carried out more frequent compared to the inspection table.

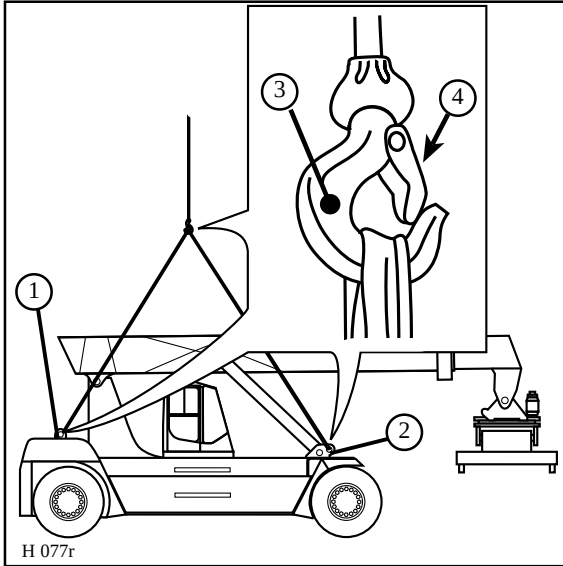
Clean the area around each component before lubricating, changing filters or repairing the hydraulic system. Use only clean containers when topping up lubricants.

Running in/servicing after the first 100 - 150 hours of operation

The machine may be driven at full speed right from the start. However, prolonged maximum loading of the hydraulic system and gearbox should be avoided during the first 50 hours of operation.

After the first 100 - 150 hours, carry out first service.

[See page 80-81.](#)



Lifting the machine

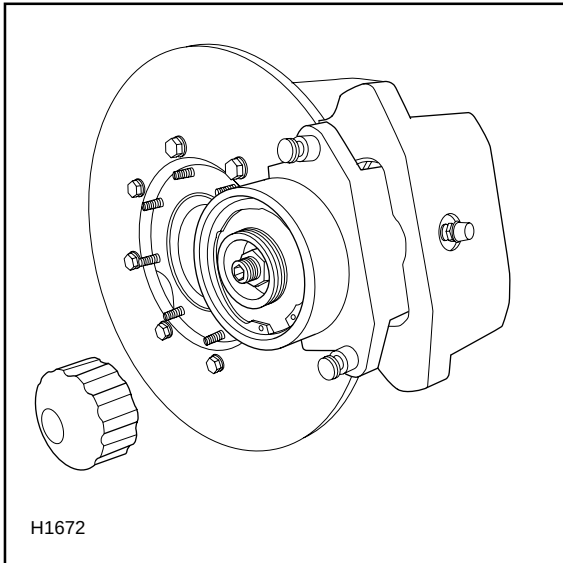
NOTE

Use only lifting equipment and cranes which have sufficient lifting capacity. See the manufacturer's type plate for the weight of the machine. Attach lift chains to the four points shown:

- Attach two lift hooks to the rear lifting eyes (1), located above on the counterweight.
- Attach two lift hooks to the front lifting eyes (2).
- Attach the lift chains to the lift hook of the crane (3).

NOTE

After attaching the lift chains to the lift hook, the safety lock (4) must be closed. When the machine is lifted, the lift chains must not rub against any part of the machine.



Towing

NOTE

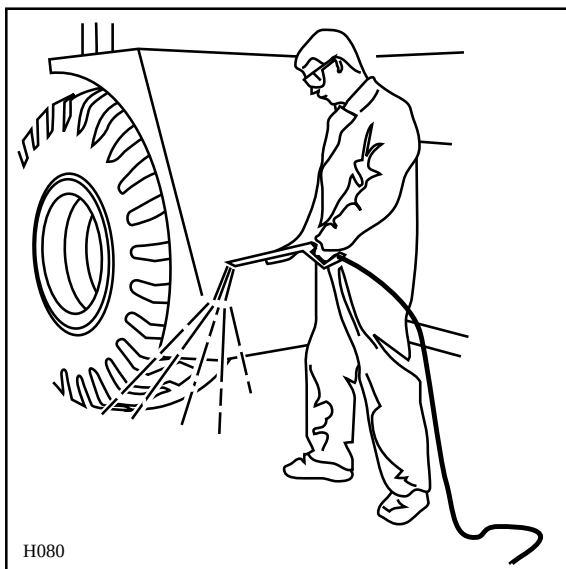
As the machine is equipped with a hydraulic braking system, servo-assisted steering and a hydraulic gearbox, the engine must be idling when towed.

If this is not possible, the hydraulic parking brake (1) must be released. See page 75.



WARNING

The machine will now have no brakes and must only be towed by a vehicle which has sufficient braking capacity to stop both vehicles.



Cleaning the machine

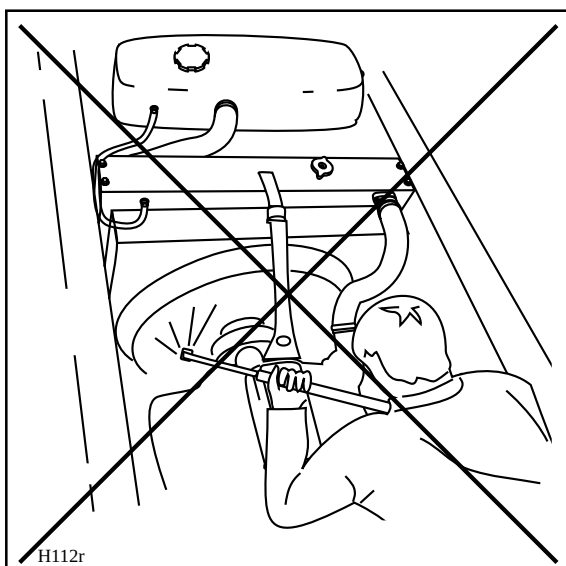
The length of time between cleaning sessions depends on the type of work carried out by the machine. If it is used in extremely aggressive environments where it is exposed to elements like salt water, fertilisers, chemicals, cement, etc., it should be thoroughly cleaned when the work is finished.



WARNING

Hot steam or aggressive degreasing agents should be used with great care. Protective clothing and eye protection must be worn.

- Protect all electrical components and the air intake filter from steam, water, etc., during cleaning.
- Clean particularly the areas around the oil top-up and lubrication places before servicing.
- If a degreasing agent is used in cleaning, allow sufficient time for it to penetrate and then rinse with a powerful jet of water.
- After cleaning the engine, it should be run warm so that it dries and to check that no water that has penetrated has caused any faults.
- All materials used in cleaning should be disposed of in an environmentally-friendly manner.
- Always lubricate the machine after steam cleaning. See page 50-57.

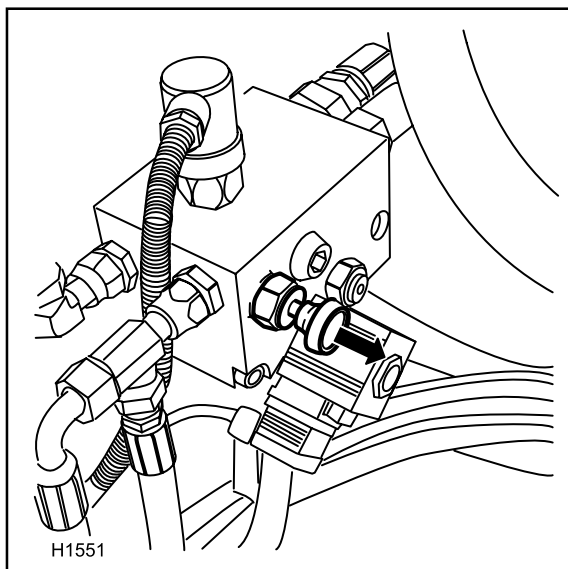


Cleaning the radiator

NOTE

The cooler must only be cleaned when the engine has been turned off and cooled down.

- The most suitable way of cleaning the cooler is with dry compressed air.
- Blow against the direction of the fan.
- The cooler must not be cleaned with high-pressure water.
- In extreme cases, solvents or a jet of steam can also be used with great care.
- Allow the solvent time to penetrate. Rinse off with water.
- Run the engine warm so that surplus water evaporates and does not cause rusting.



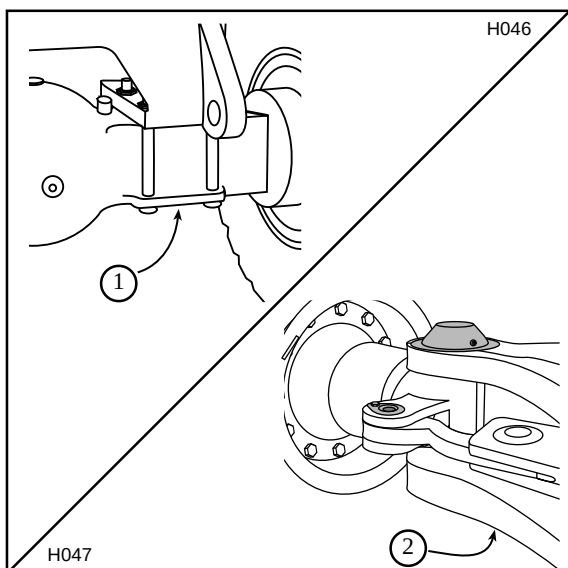
PRESSURE RELEASE



WARNING

Always release the brake pressure before maintaining or servicing the hydraulics of the truck.

Never loosen any hydraulic hoses without ensuring that the brake pressure is released.



Positioning of the jack



WARNING

Observe the following regulations before lifting the machine.

- Use only a jack that has sufficient lifting capacity. See technical data sheet for axle pressure.
- To lift the machine drive axle, position the jack underneath the drive axle (1) and block the steer shaft wheels.
- To lift the steer shaft of the machine, position the jack underneath the main plate of the steer shaft (2) and block the drive axle wheels.
- When working underneath the machine, support the underside of the chassis with suitable material. Do NOT simply rely on the jack.

Changing a wheel

Changing a wheel is a two-man operation.

- An ancillary truck fitted with an attachment for the wheel (1) facilitates the work.
- Position the machine on even ground.
- Lift the side of the machine and support the underside of the chassis in accordance with recommendations.

Specifications for drive axle and steer axle tyres

SC 108 TA	Front/rear	14.00 x 24	24 ply	9 bar
				(Michelin 10 bar)

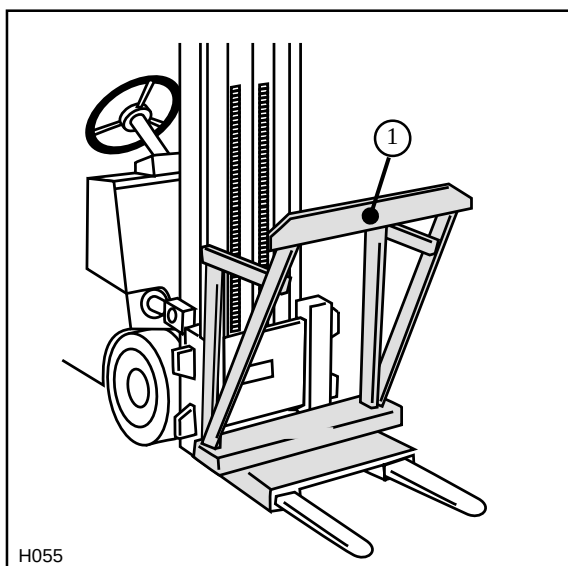
Specifications for rims

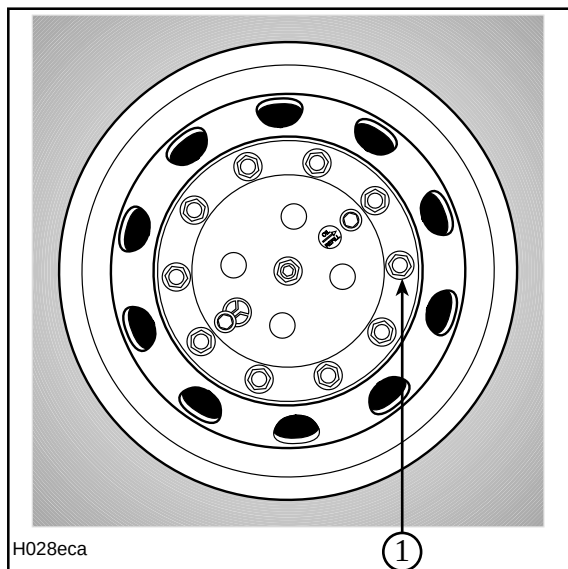
Use only rims that are approved by the machine manufacturer.

Other type of tyres

The machine is designed to use pneumatic tyres.

Solid/cushion tyres are used only in consultation with the machine manufacturer.





Dismantling the drive wheel

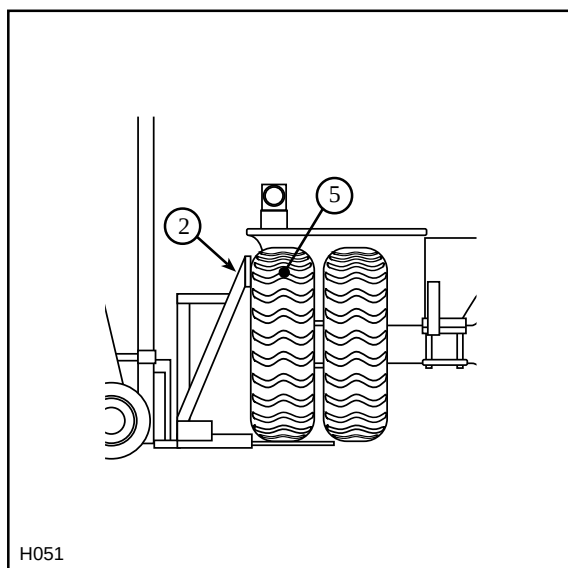
Outer drive wheels



WARNING

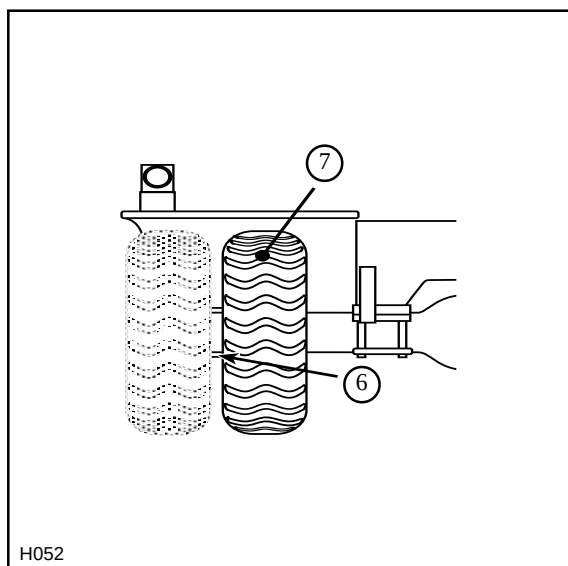
Release the air from both tyres.

- Remove all but two of the nuts (1).
- Use the ancillary truck to support the weight of the outer wheel on its forks.
- Remove the two remaining nuts (1).
- Remove the conical joint.
- Lean the outer wheel against the ancillary truck's wheel support and secure it.
- Reverse the ancillary truck carefully and unload the outer wheel (5).



Inner drive wheel

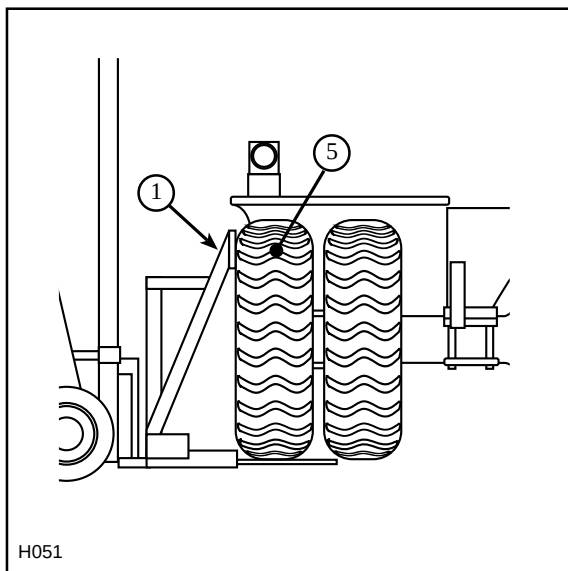
- Remove the outer drive wheel.
- Remove the spacer (6).
- Use the forks of the ancillary truck to support the weight of the inner wheel (7).
- Lean the inner wheel (7) against the wheel support (2) and secure it.
- Carefully reverse the ancillary truck and unload the inner wheel (7).



Mounting the drive wheels

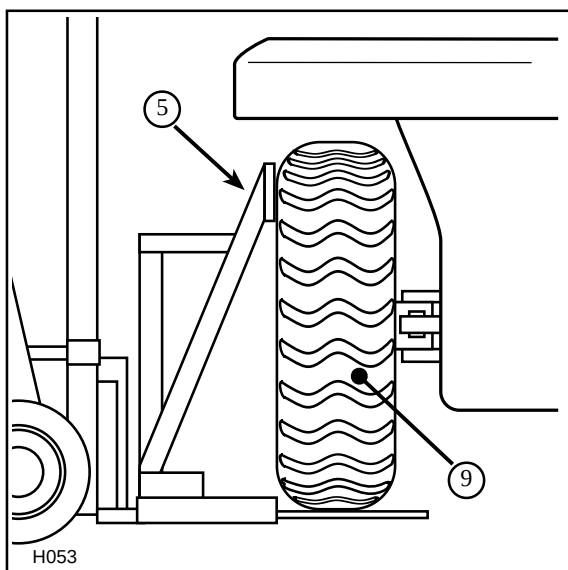
The inner drive wheel

- Load the inner wheel (7) onto the ancillary truck and fasten it to the support.
- Clean the application surfaces.
- Carefully drive the ancillary truck to the required position, and place the inner wheel (7) over the drive axle and the hub.
- Remove the fastening device from the wheel support (2) and the inner wheel (7) and straighten the wheel (7).
- Lower the forks of the ancillary truck until the inner wheel (7) is resting on the hub.
- Carefully reverse the ancillary truck.
- Mount the spacer (6).



Outer drive wheel

- Load the outer wheel (5) onto the ancillary truck and secure it to the wheel support. Carefully drive the ancillary truck into position and place the outer wheel (5) over the hub.
- Remove the fastening device from the wheel support (1) and the outer wheel (5) and straighten the wheel (5).
- Secure the conical joint and hold it in place with two clips (3) and nuts (2) placed diagonally to each other.
- Carefully reverse the ancillary truck.
- Fasten the remaining clips (3) and nuts (2) and tighten the wheel nuts crosswise using a 400 Nm torque.
- Pump the tyres to 9 bar. (Michelin 10 bar)



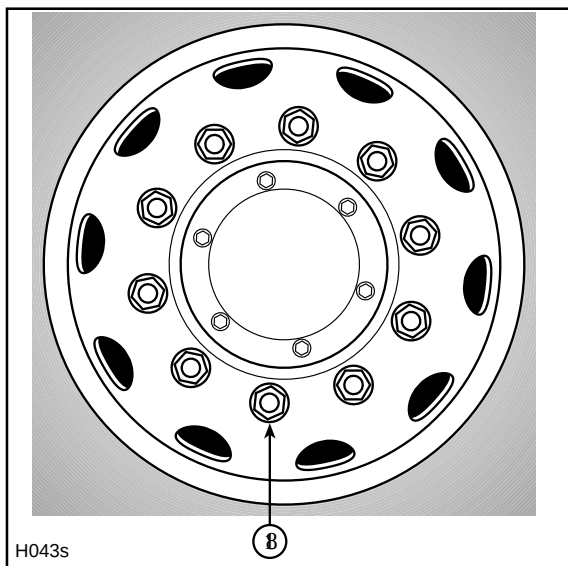
Disassembling the steer wheel



WARNING

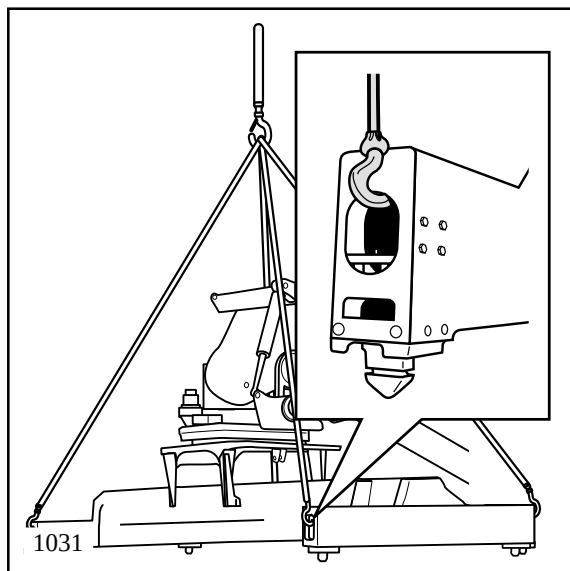
Release the air from the tyres

- Remove all but two of the wheel nuts and clips (8).
- Use the ancillary truck forks to support the weight of the steer wheel (9).
- Remove the remaining nuts and clips (8).
- Lean the steer wheel (9) against the wheel support (1) and fasten it.
- Carefully reverse the ancillary truck and unload the steer wheel (9).



Assembling the steer wheel

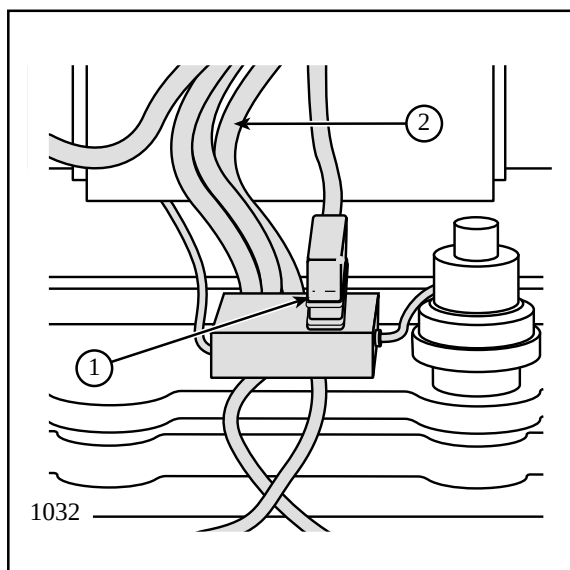
- Load the steer wheel (9) onto the ancillary truck and fasten it onto the support.
- Clean alignment surfaces of the hub.
- Carefully drive the ancillary truck into position and place the steering wheel (9) against the hub.
- Use the forks of the ancillary truck to support the weight of the steer wheel.
- Fix and tighten two of the nuts (8) diagonal to each other.
- Remove the fork support.
- Assemble and tighten up the remaining nuts (8) using a 400 Nm torque.
- Carefully reverse the ancillary truck.
- Pump the tyres up to 9 bar. (Michelin 10 bar)



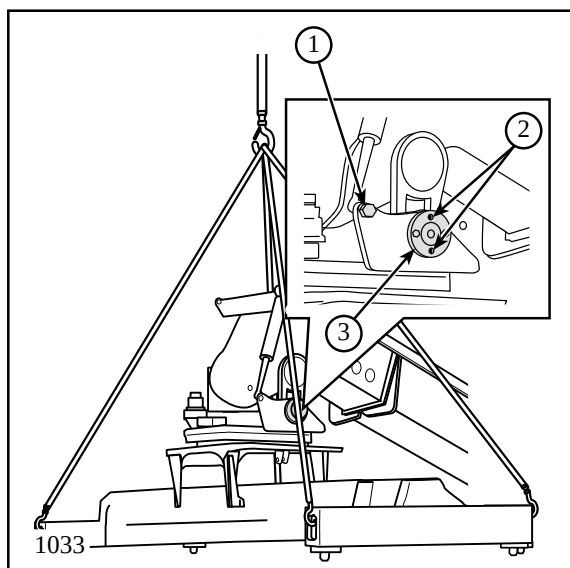
Before disassembling

Ensure that there is no pressure in the hoses.

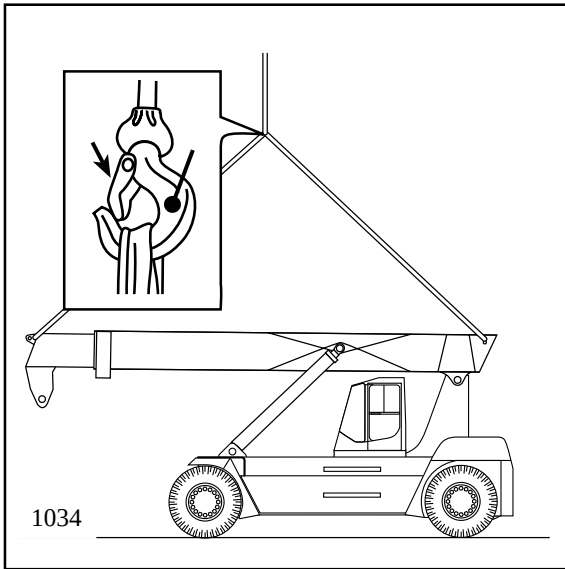
- Retract the spreader into the 20' foot position.
- Centre the spreader.
- Turn the spreader until it is 90° to the boom.
- Arrange for suitable lifting equipment.
- The weight of the model unit is 5 tonnes.



- Disconnect (1) the electric multi contact
- Disconnect the 6 hydraulic hoses (2).
- Plug the hydraulic hoses.

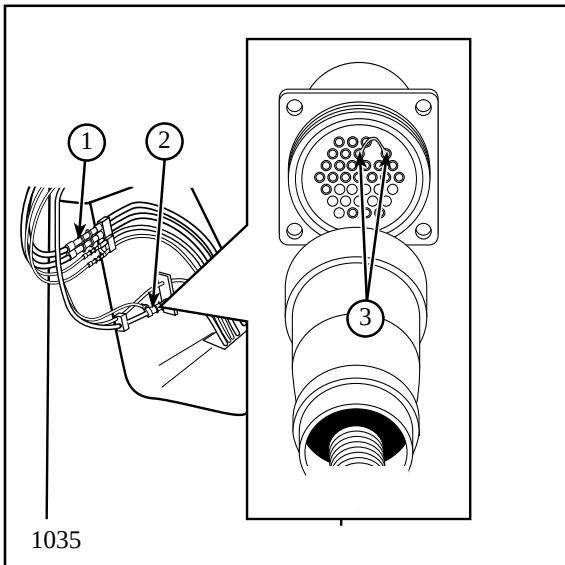


- Remove the damping cylinders' clips and tap out the shafts (1).
- Attach the cylinders so that they do not damage the pistons.
- Lift the spreader as shown in the picture until the shafts (2) are unloaded.
- Pull out the axles (2) using the extender bolts (3).
- Lift the spreader away.

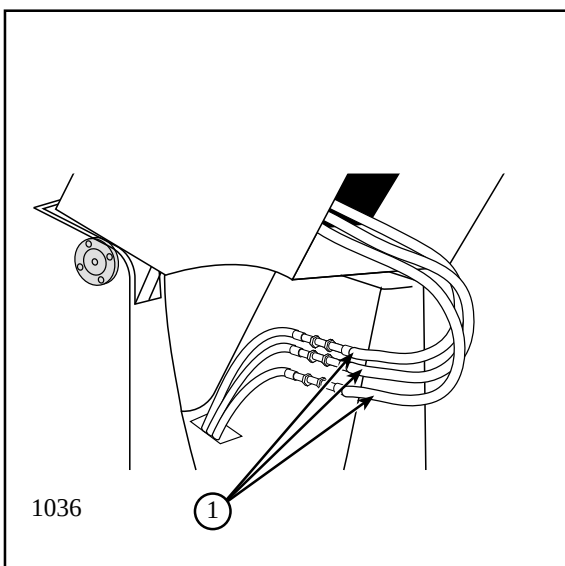


Disassembling the boom

- Lower the boom fully.
- Retract the boom fully.
- Arrange suitable lifting equipment as shown in the picture.
- The weight of the boom is around 10 tonnes.



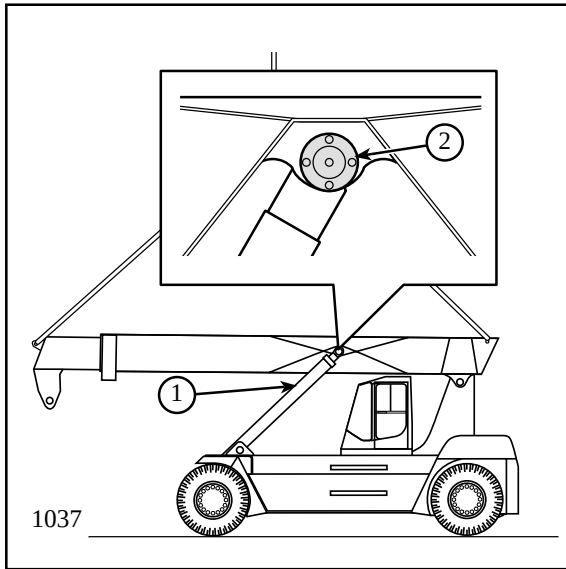
- Disassemble the unit's hydraulic hoses (1) and plug the hoses.
- Disassemble the unit's electric cables (2). Note that if the machine is to be used after this, cables 7 and 9 (3) must be spanned in the multi contact.



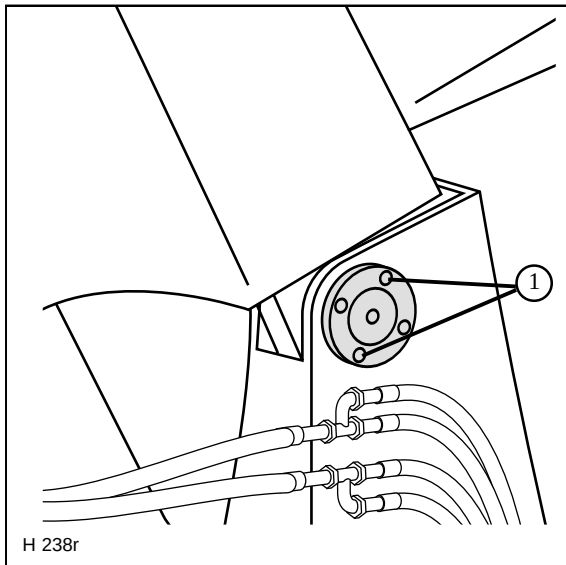
- Disconnect and plug the hydraulic hoses of the extension cylinder (1).



DISASSEMBLING THE BOOM



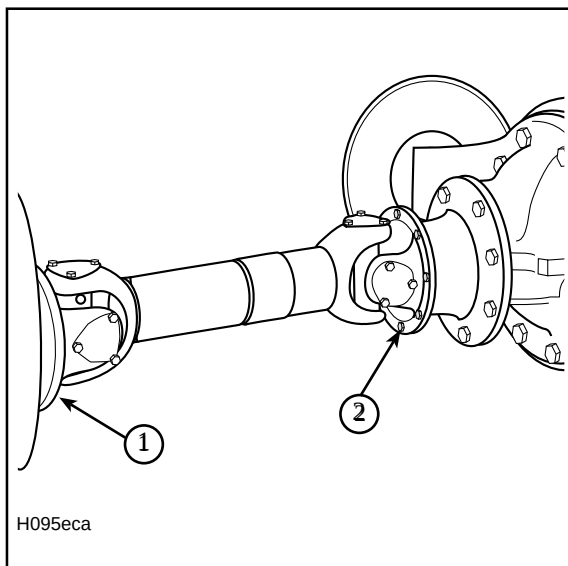
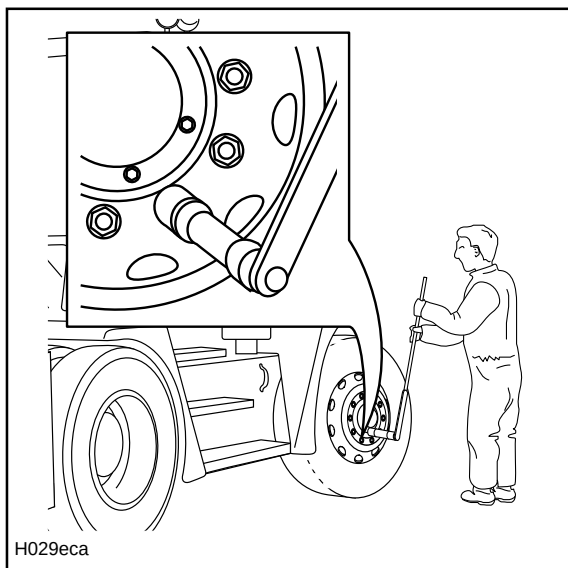
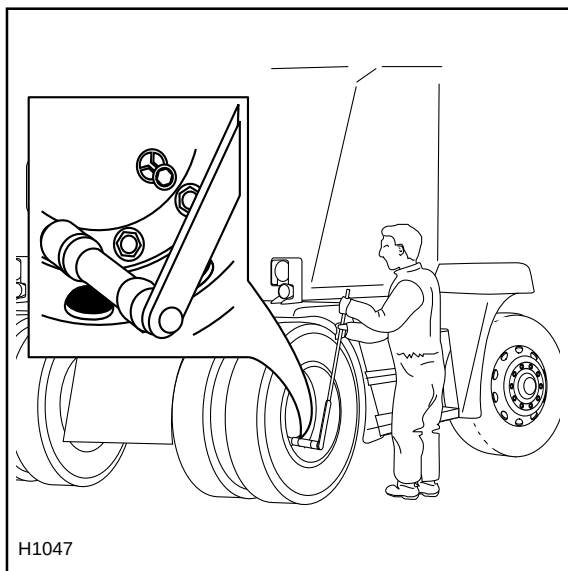
- Release the lift cylinders by lifting the boom.
- Also lift each cylinder and support them. This function can be suitably carried out using smaller trucks and lifting straps (1).



- Release the rear boom fastening.
- Pull out the shaft using extender bolts (1).
- Release the boom and position it on a suitable base.



TIGHTENING BOLTED JOINTS



Tightening torque

Information on friction ratio is needed in order to select the exact tightening torque. The tables below specify the torque for "lightly greased" bolts.

It is particularly important to check all bolts after the first 50 hours of operation.

The following pages describe how bolted joints should be tightened using a torque key.

Milimetre screws			
Tensile strength class			
Thread M	8.8 kpm	10.9 kpm	12.9 kpm
6	1.11	1.56	1.87
8	2.66	3.75	4.50
10	5.25	7.38	8.86
12	9.12	12.8	15.4
14	14.5	20.4	24.4
16	22.2	31.3	37.5
18	31.0	43.6	52.3
20	43.4	61.0	73.2
22	58.4	82.2	98.6
24	75.0	105	127
27	108	152	183
30	148	208	250
33	199	280	336
36	257	362	434

Inch screws			
Tensile strength class			
Thread UNC	8.8 kpm	10.9 kpm	12.9 kpm
1/4"	1.24	1.76	2.07
5/16"	2.51	3.55	4.20
3/8"	4.42	6.10	7.38
7/16"	7.06	9.97	11.8
1/2"	10.7	15.1	17.8
9/16"	15.3	21.6	25.5
5/8"	21.1	29.8	35.3
3/4"	37.1	52.4	61.9
7/8"	59.4	83.9	99.1
1"	88.9	126	148
1 1/8"	126	178	210
1 1/4"	176	249	294
1 1/2"	232	328	387

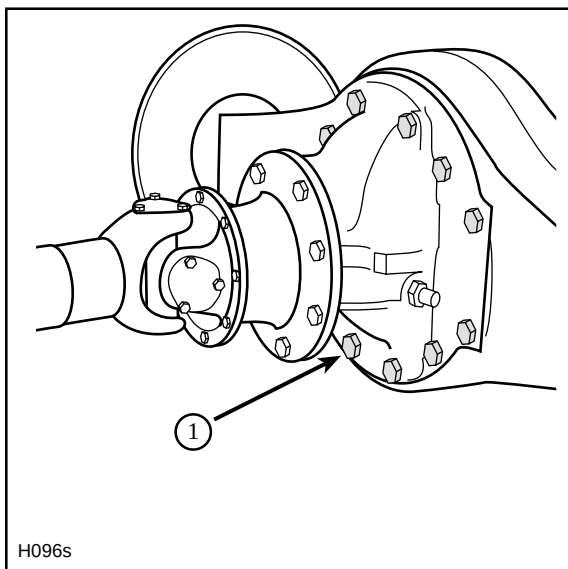
Tightening the wheel nuts

NOTE

The wheel nuts must be tightened daily before use until they are fully settled, i.e. when it is not possible to tighten them any further. The wheel nuts are tightened crosswise with a torque of 40 kpm.

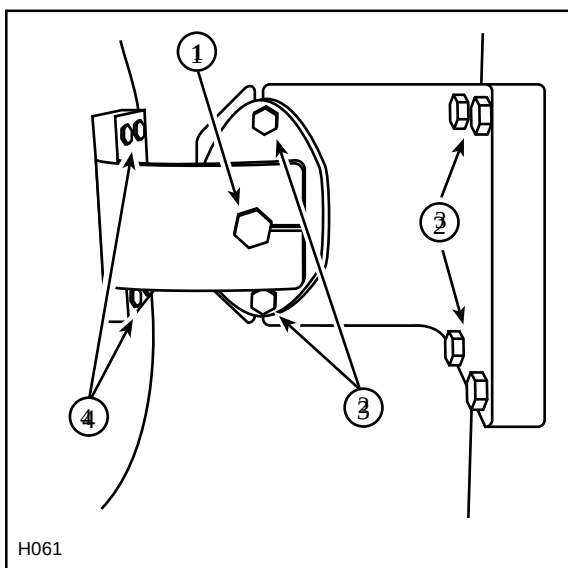
Drive shaft

To the gearbox (1) 3/8 UNF 12.9 8.5 kpm
To the drive axle (2) 3/8 UNF 12.9 8.5 kpm



Differential nuts

- (1) 5/8" UNC 8.8 22 kpm

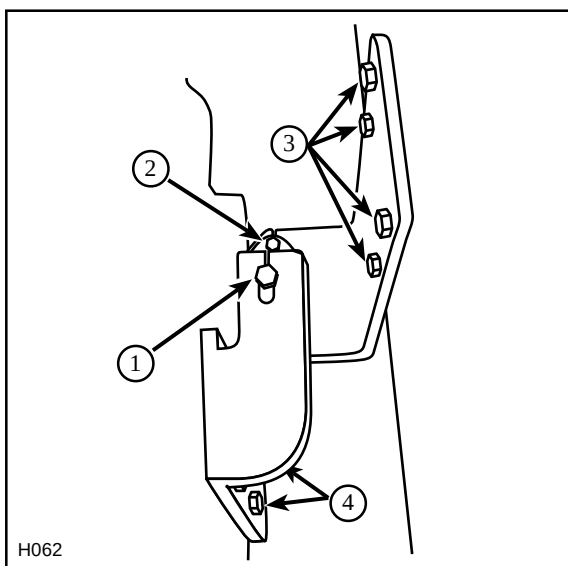


The engine mounting

Check the condition of the rubber suspensions.
If any wear and tear is discovered, replace the damaged parts.

The engine mountings are accessible from the engine compartment, one on each side of the rear part of the engine.

- (1) M20 8.8 43 kpm
- (2) M16 8.8 22 kpm
- (3) M16 8.8 22 kpm
- (4) M12 8.8 12.5 kpm



The gearbox

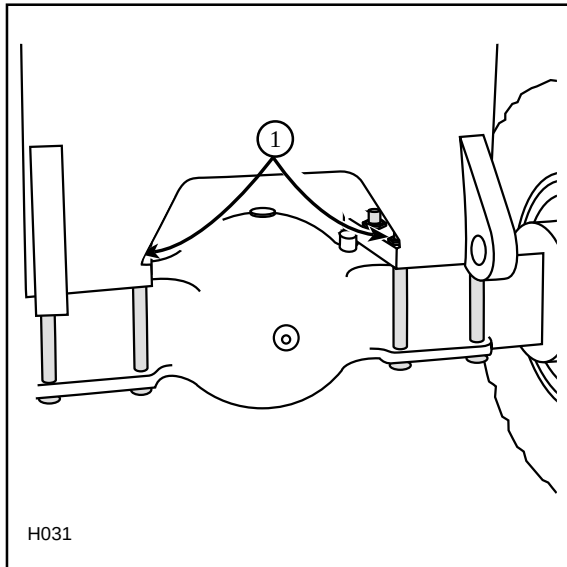
Check the condition of the mountings and the rubber suspension. Replace the worn parts if you discover any wear and tear.

The mountings are accessible from the engine compartment, one on each side of the gearbox.

- (1) M20 8.8 43 kpm
- (2) M16 8.8 22 kpm
- (3) M16 8.8 22 kpm
- (4) 3/4" UNC 8.8 37 kpm

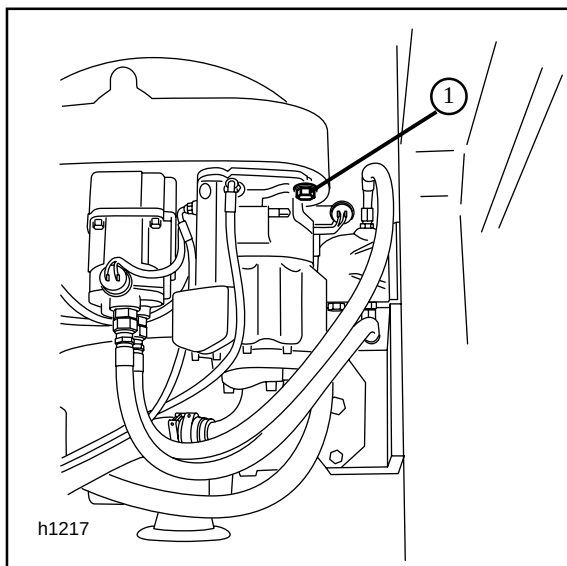


TIGHTENING BOLTED JOINTS



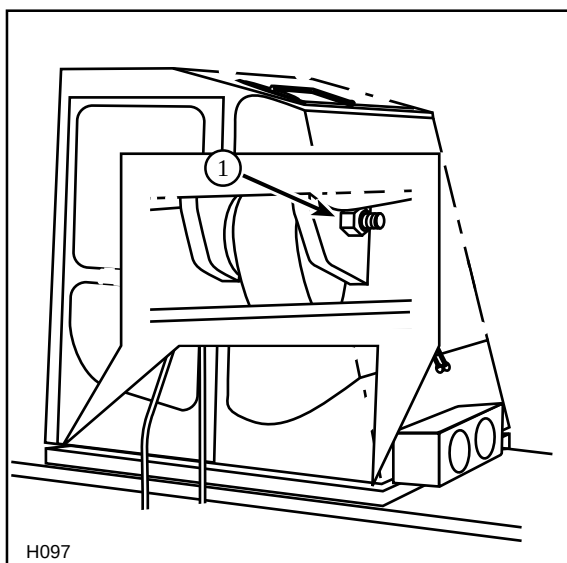
Drive axle suspension

- (1) M30, 10.9 150 kpm



Hydraulic pump

- (1) 5/8" UNC 8.8 25 kpm

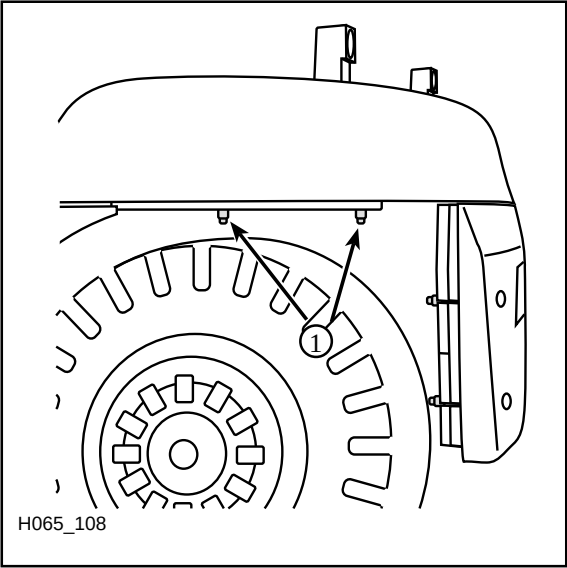


Cab fastening

- (1) M24, 8.8 25 kpm

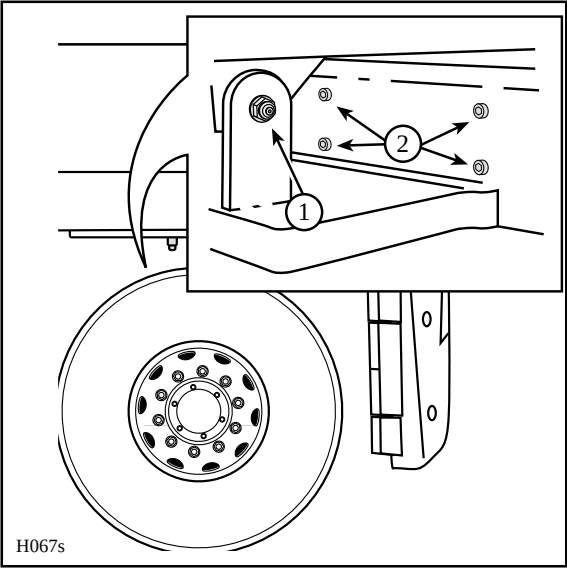


TIGHTENING BOLTED JOINTS



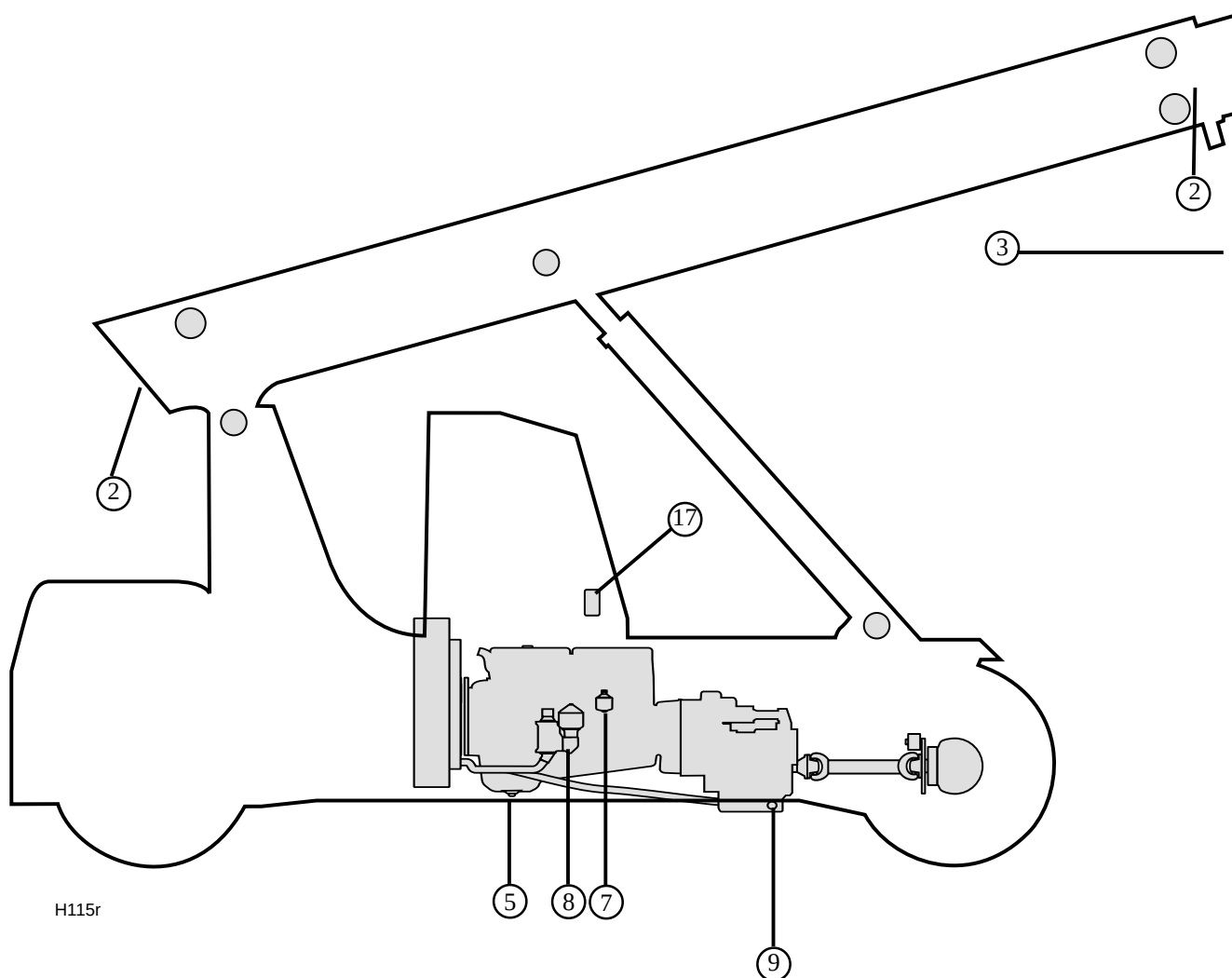
Counterweights

- (1) M24 8.8 75 kpm

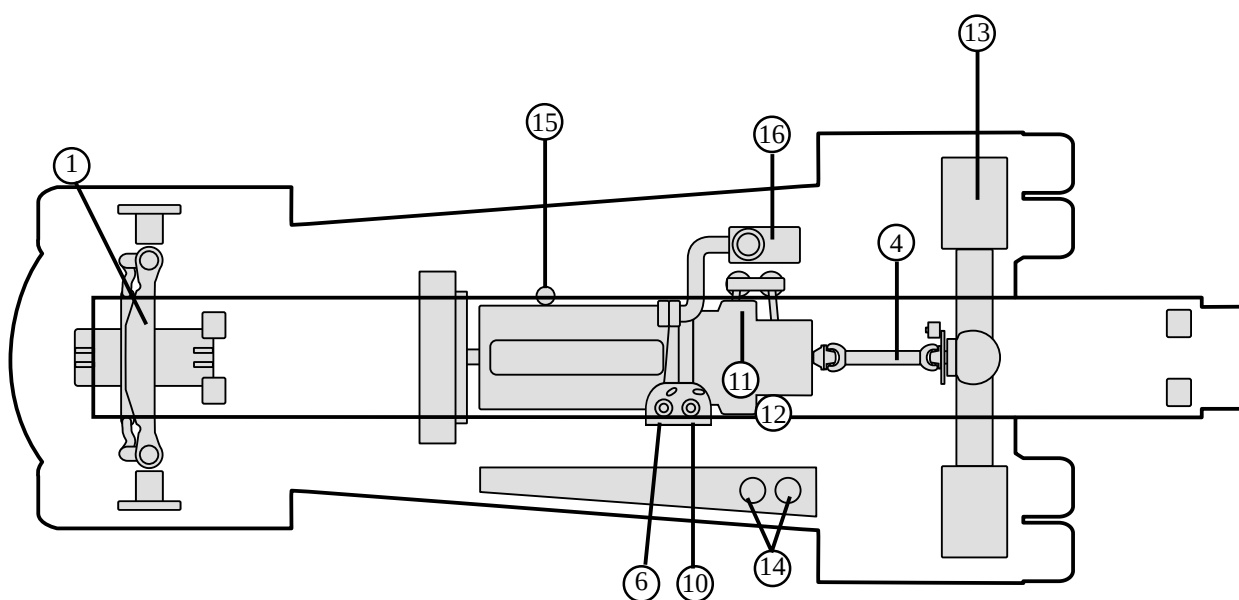


Steer axle

- (1) M30 75 kpm
- (2) M30 8.8 150 kpm

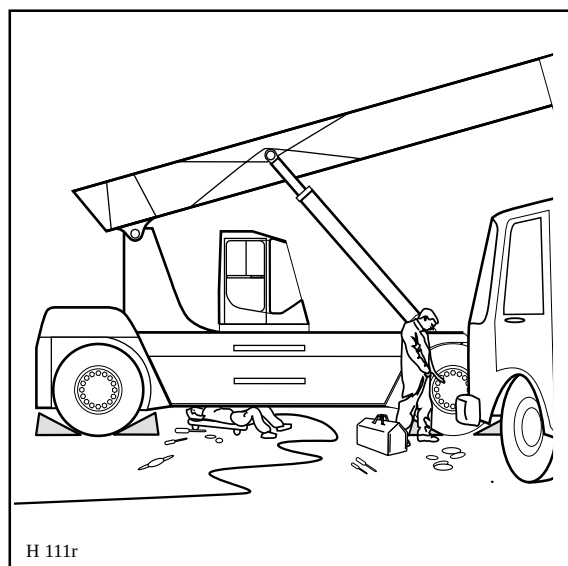


H115r



H116r

LUBRICATION/MAINTENANCE POINTS			
Position no	Description	Illustration number	Page number
1.	Steer axle	H 048	56
2.	Boom	H 1040	56
3.	Spreader	H 1001	52
4.	Universal drive shaft	H 089	57
5.	Drain plug, engine	H 085	58
6.	Filler cap engine oil	H 083	58
7.	Turbo filter	H 041	58
8.	Oil cleaner	H 038+H 039+H040	59
9.	Oil plug, gearbox	H 128	60
10.	Filler cap transmission	H 084	60
11.	Transmission oil filter	H 1476	60
12.	Transmission breathing filter	H 1048	61
13.	Drive axle	H 027+H 032	61
14.	Hydraulic filter	H 102r	62
15.	Fuel filter	H 701	62
16.	Air filter	H 1073+H 1074	64
17.	Cab filter	H 1077	29

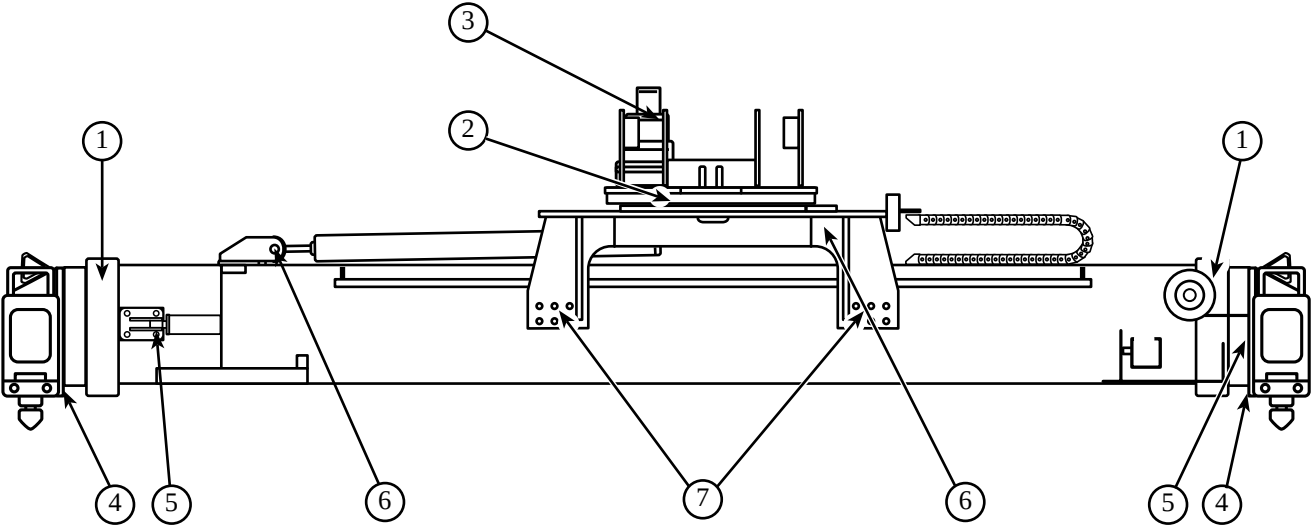


General rules which apply to lubrication

- Clean off old grease and clean nipples.
- Lubricate until fresh grease penetrates.
- Use only recommended grease.
- All slide bearings must be free of pressure for the grease to be able to penetrate.
- Slide bearings require frequent lubrication with a small amount of grease. Roller bearings require more grease less often.
- Slide surfaces using plastic wear pads requires special grease. Gleitmo 805. See recommendations on page 76
- Also check the function and bearing slackness when lubricating.
- Specified lubrication periods apply in favourable conditions. More frequent lubrication is recommended in more demanding conditions, particularly of the slide bearings.

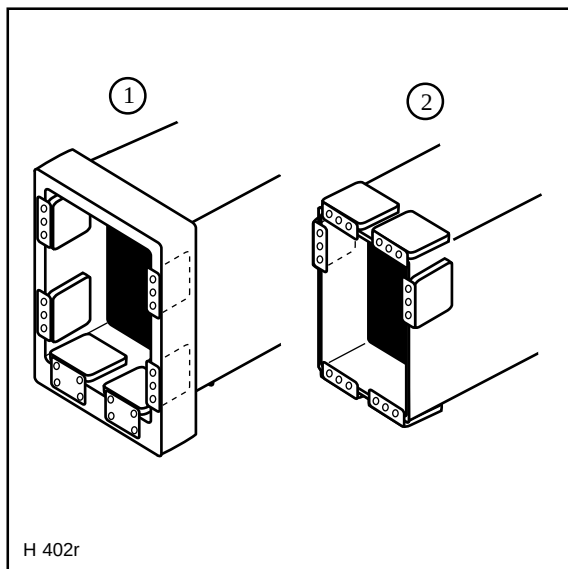


LUBRICATION SPREADER



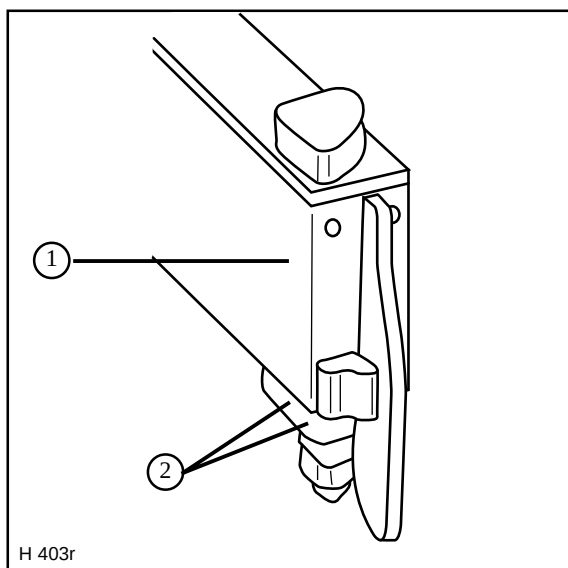
1001

LUBRICATION/MAINTENANCE POINTS			
Position no	Description	Illustration number	Page number
1.	Slider pads extention	H 402r	53
2.	Slewing ring bearing and gear	H 1218	54
3.	Slew brake	H 410r	55
4.	Twist locks	H 403r	53
5.	Extention cylinder	H 404r	53
6.	Side shift cylinders	H 408r	55
7.	Slider pads side shift	H 406r	54
	(See individual description of each lubrication point).		



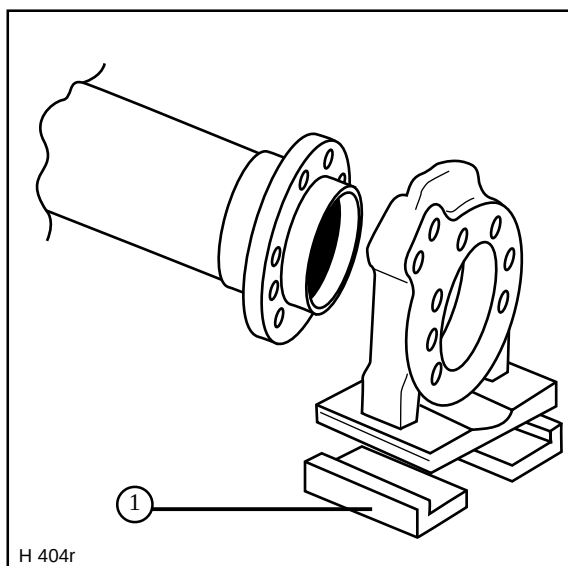
Wear pads for main beams and extending beams

- No. of grease points 24.
- Interval - every 250 hours or 3 months.
- 6 tracks on each extending beam (2).
- 6 tracks on the inside of each main beam (1).



End beams and twist locks

- No. of grease points 12.
- 3 grease nipples in each end box.
- Inside end box on top of twist lock support bracket, see pos (1).
- On the outside bottom edge of the end box see pos (2).

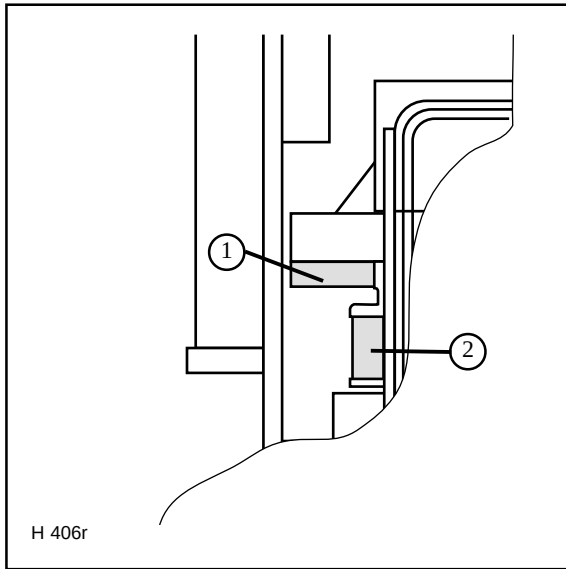


Extention cylinder support wear pads and tracks

- No. of grease points 4.
- 2 tracks in each extention beam.

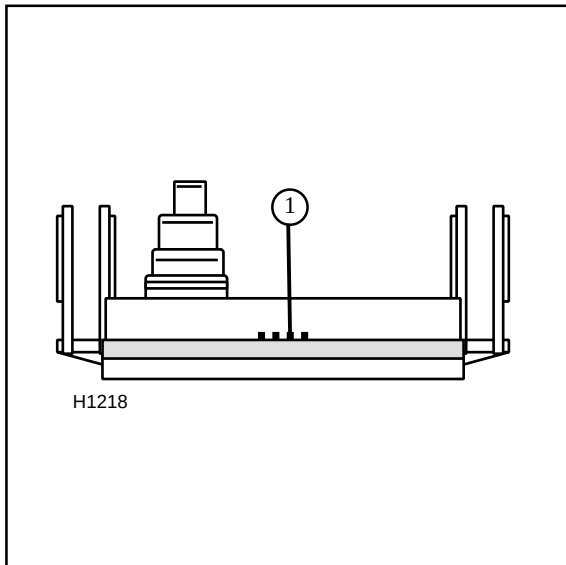


LUBRICATION POINTS SPREADER



Side shift slider pads

- No. of grease points 4.
- 2 tracks on each side of the spreader pos (1) and (2).

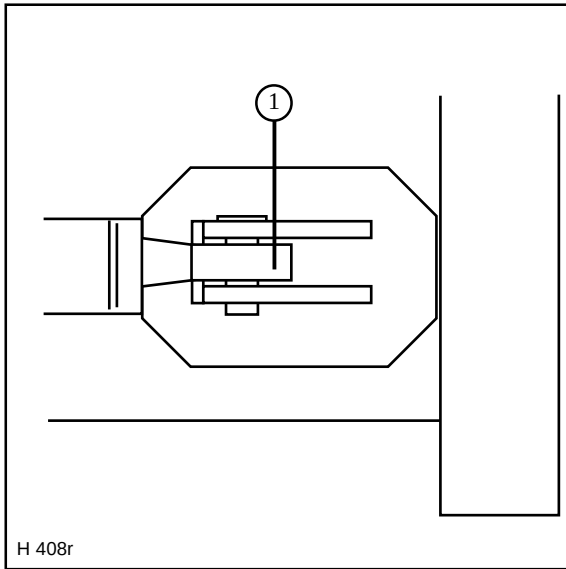


Slewing ring bearing and gear

- 4 grease nipples position (1) mounted at one central point on the upper rotator frame plate for greasing the bearing.

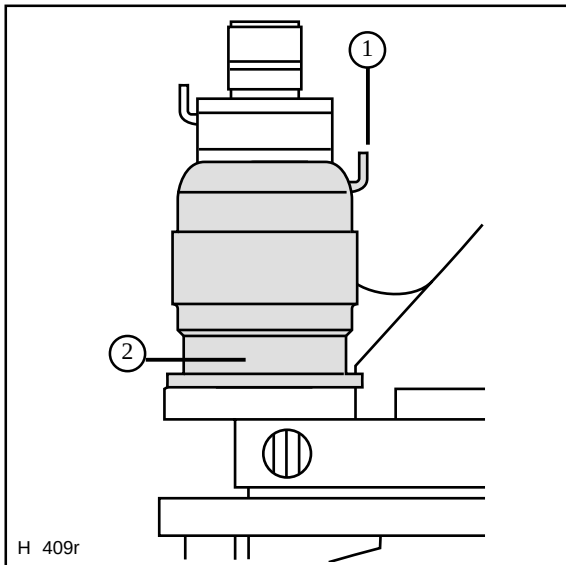


LUBRICATION POINTS SPREADER



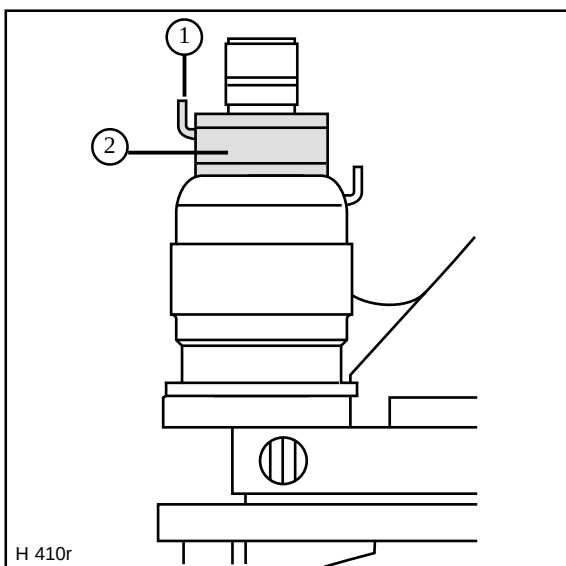
Side shift cylinder bearings

- No. of grease points 4.
- 1 grease nipples on each cylinder tube bearing position (1).



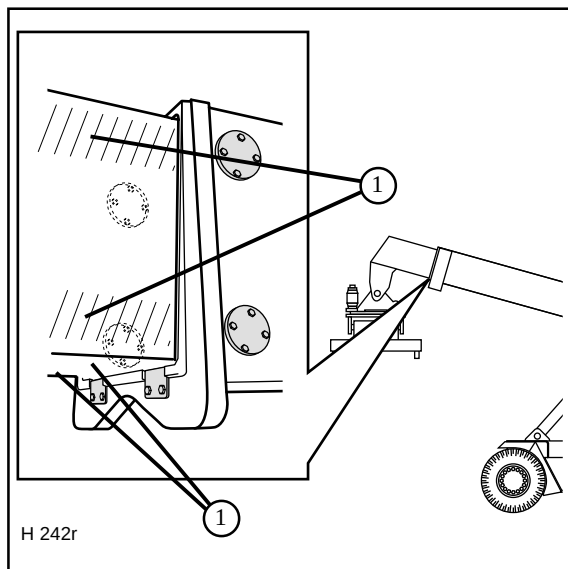
Slewing gearbox

- Plug (1) in elbow at top of gearbox = filler and level plug.
- Plug (2) in the bottom of the box = drain plug.
- Lubricant
- Drive axle oil. See specification page 85.



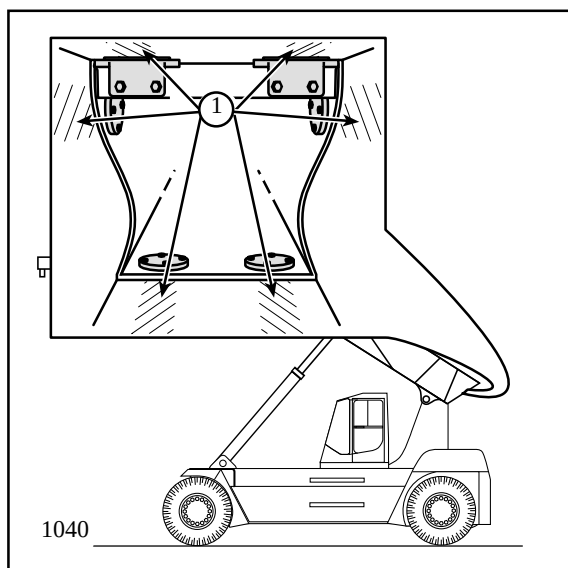
Slewing brake

- Points - one filler and level plug in the elbow at the top of the brake position (1). One drain plug at position (2).
- Lubricant hydraulic oil. See specification page 85.



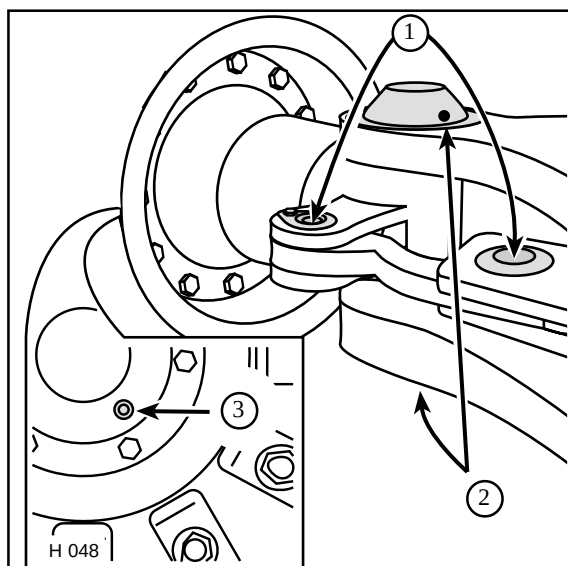
Lubricating the front section of the boom

- Fully extend the boom.
- Lubricate the surface of the sliding pads (1) using a special grease (Gleitmo 805). Apply a thin, even layer over the whole length of the pads using a brush or a spatula.



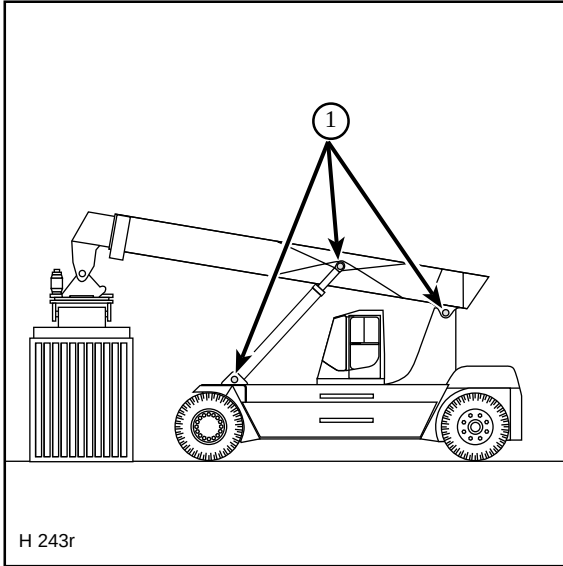
Lubricating the rear section of the boom

- Fully extend the boom.
- Lubricate the sliding surfaces (1) using a special grease (Gleitmo 805).
- Apply a thin, even layer over the whole length of the surface.
- Use a long brush or a spatula.



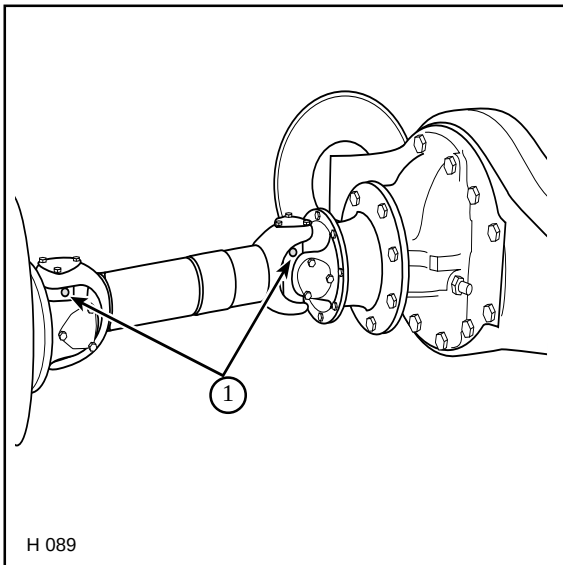
Lubricating the steer axle

- Clean of old grease and clean nipples.
- Lubricate the parallel tie-rods, four points (1) - two points on each parallel tie-rod (slide bearings).
- Lubricate the spindle nuts (2), one upper and one lower on each side.
- Lubricate the hub bearings (3), one on each side. Grease penetrates onto the inside.



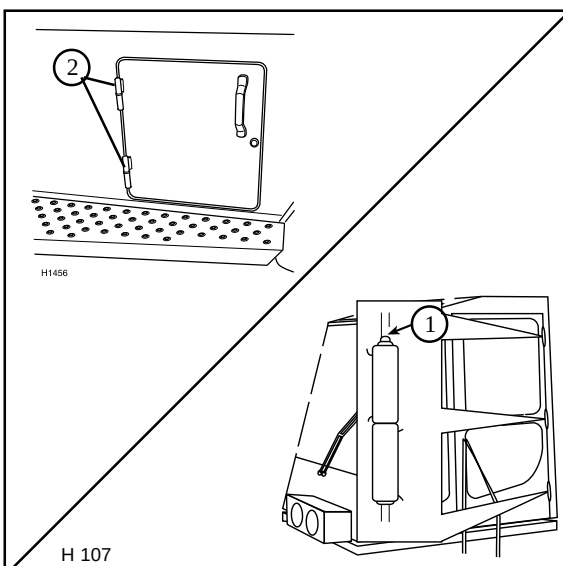
Lubricating the boom suspension

- Unload the boom using a container or lifting the front edge of the boom.
- Clean the nipples before lubricating.
- Lubricate the points (1), a total of 6 nipples.



Lubricating the drive shaft

- Clean the nipples before greasing.
- No of grease points 2.

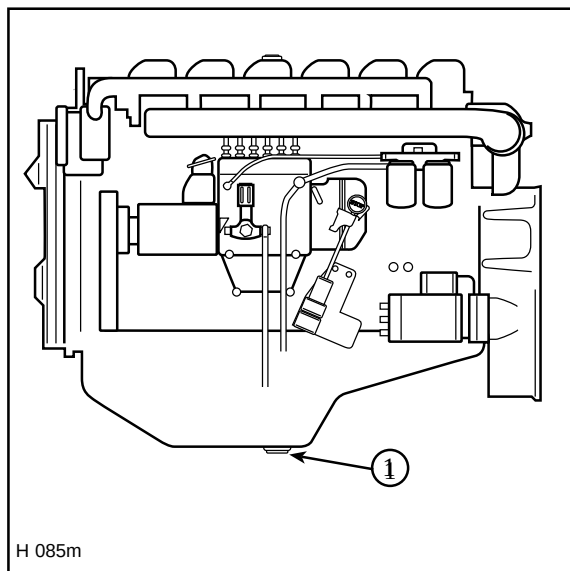


Lubricating the door hinges

- Inspect and clean the hinges of the cabin door and emergency exit.
- Lubricate the hinges (1) and open and close the doors in order to check that all parts of the hinges have been lubricated.
- Also lubricate the hinges of the battery compartment (2).



CHANGING OIL AND FILTERS



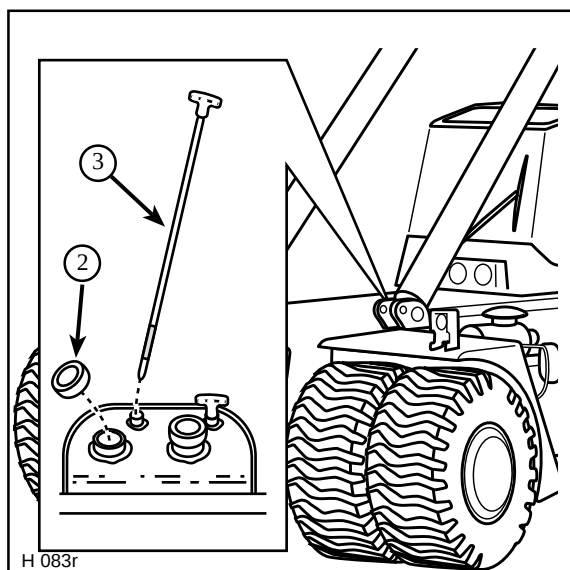
Changing the engine oil

NOTE

Oil should be replaced when the engine is at operational temperature.

Replace the oil at least once a year.

- Open the engine cover.
- Place a suitable container underneath the drain plug (1).
- Unscrew the drain plug (1).
- Allow the oil to run out.
- Check that the seal is not damaged. Renew if necessary.
- Refit the drain plug (1).



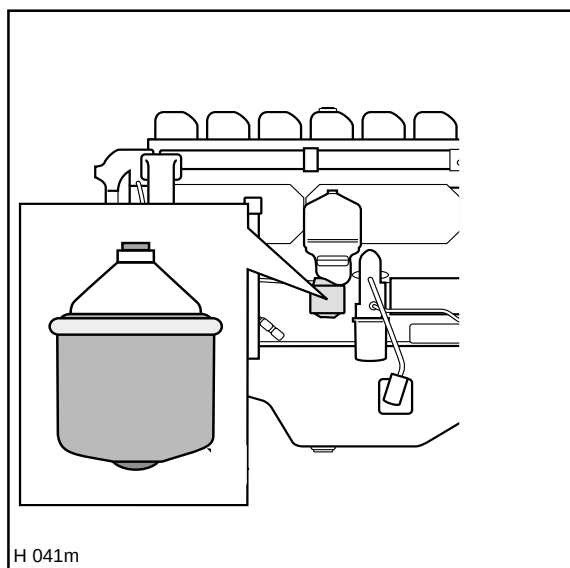
Topping up the engine oil

- Remove the filler cap (2).
- Pour oil through the opening.
- Check the oil level using the dipstick (3). Fill up to the maximum indicator level.
- Replace the cap.
- Close the engine cover.

NOTE

When test running after changing the oil and filter, observe the oil pressure indicator and the warning light on the instrument panel. Also check that there are no leaks from the drain plug or the oil filter.

In order to check the oil level carefully, particularly when the oil filter is replaced, turn off the engine and check the oil level after around one minute.



Changing the turbo filter

- Remove and dispose of the old filter.
- Lubricate the rubber seal and fit a new original filter.
- Secure the filter by hand.

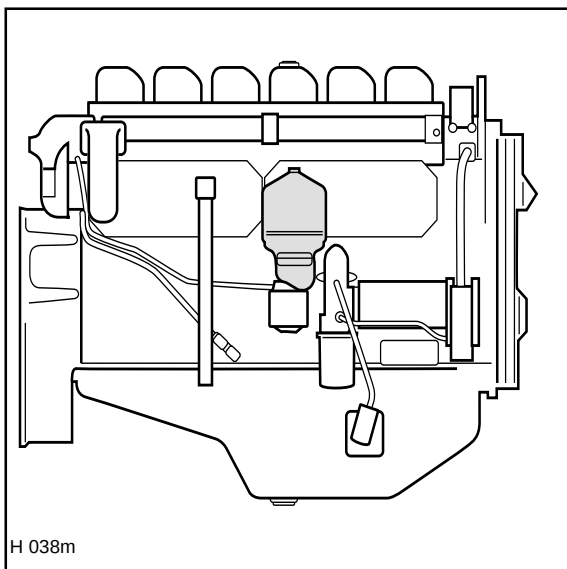
NOTE

Never use tools. The filter could be damaged and the circulation obstructed.

- Start up the engine and check whether the filter is secure.



CHANGING OIL AND FILTERS

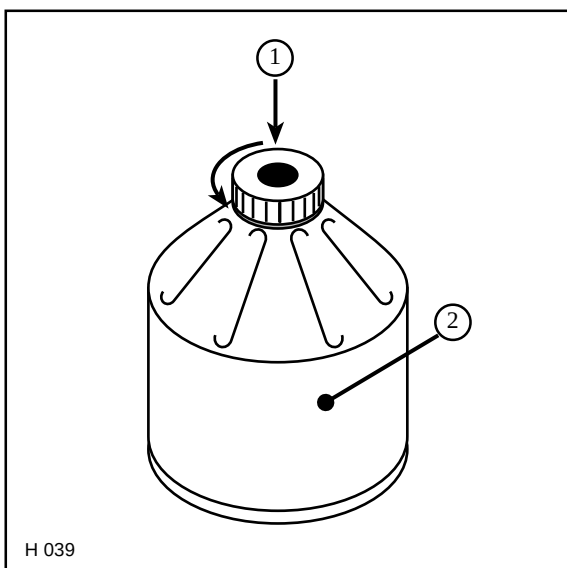


Cleaning the engine oil filter



WARNING

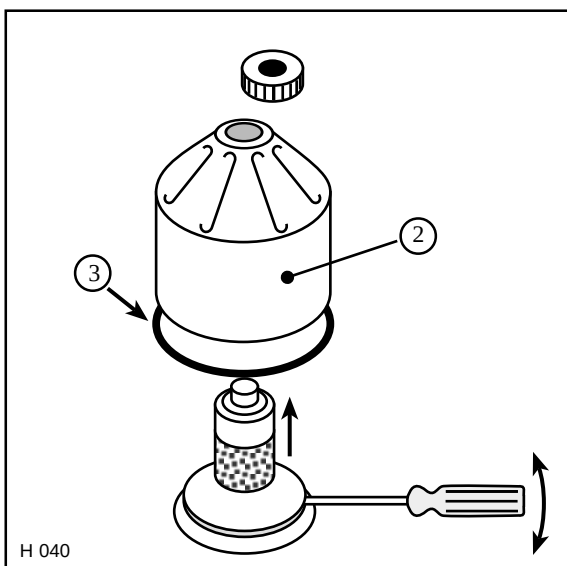
Open the cap carefully! The oil may be hot.



- Unscrew the nut (1) and remove the cap.
- Lift the rotor out and turn the nut of the rotor cap three times to loosen it.

NOTE

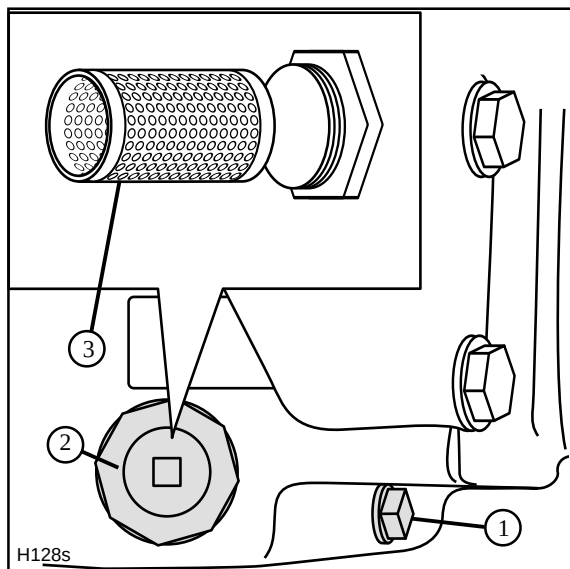
- If the nut is stuck, fasten it (1), **but not the rotor**, in a vice and turn the rotor three times by hand or using a screwdriver.
- Tap the nut with your hand or a plastic mallet to loosen the rotor cap from the bottom plate.



- Loosen the nut and remove the rotor cap (2). Carefully prise to loosen the filter from the bottom plate.
- Scrape off the deposits inside the rotor cap. If there are no deposits, the cleaner is not working.
- If the deposits are thicker than 20mm, clean more often.
- Wash all parts in diesel fuel oil.
- Position the o-ring (3) in the rotor cap. It must not be damaged. Replace if necessary.



CHANGING OIL AND FILTERS



Changing the oil in the gearbox

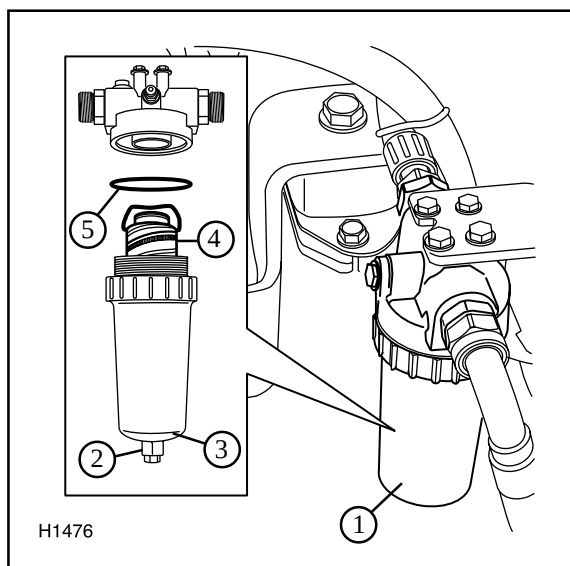
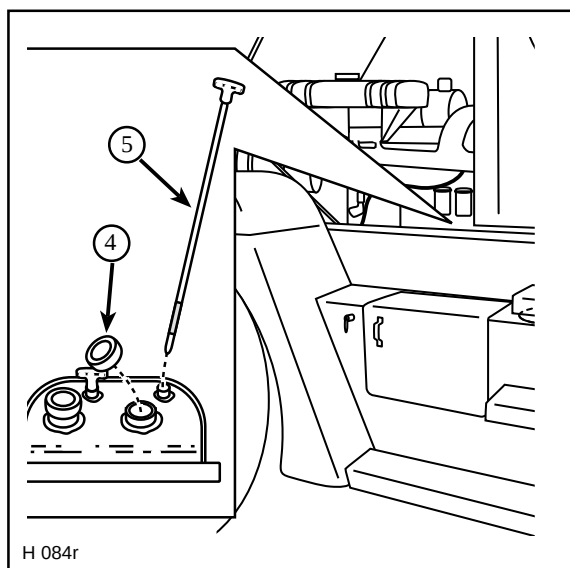
It is of advantage if the oil is at operating temperature when the oil is replaced.

- Clean around the drain plug and sump valve.
- Place a suitable container underneath the drain plug (1).
- Remove the drain plug and allow the oil to run out.

NOTE

The oil may be hot.

- Place a suitable container underneath the sump valve plug (2).
- Drain the transmission through plug (1) and remove sump screen (2).
Clean screen thoroughly and replace, using new gaskets.
- Dry the sump filter using dry compressed air at a maximum of 5 bar.
- Refit the sump filter (3), seal and the plug (2).
- Refit the drain plug (1).
- Remove the oil cap (4).
- Fill the gearbox with oil to the maximum mark on the dipstick (5).
- Run the engine at 500 - 600 rpm for one minute to fill the torque converter and pipes.
- Check the level of the oil when the engine has been running for one minute and then fill up with oil to the minimum mark.
- Check the oil level again when the operating temperature has reached 82 - 93°C. Fill to the maximum level mark.
- Refit the dipstick (5) and the oil cap (4).

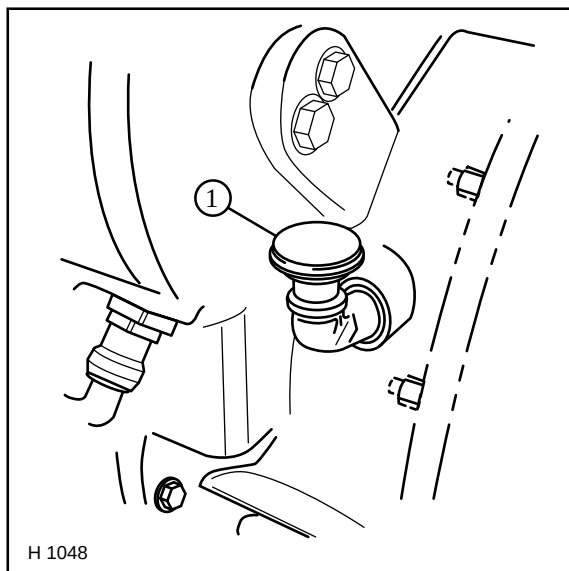


Changing the gearbox filter, Series No. 32000

- Carefully clean outside of oil filter.
- Place a container underneath the filter (1)
- Loosen the drain plug (2) and drain oil.
- Loosen the cannister using a spanner at the hexagon. (3).
- Remove the filter insert (4).
- Clean the cannister.
- Install a new filter.
- Replace the O-ring (5). Lubricate lightly.
- Install the cannister.
- Tighten the cannister (1) until the seale is in contact.

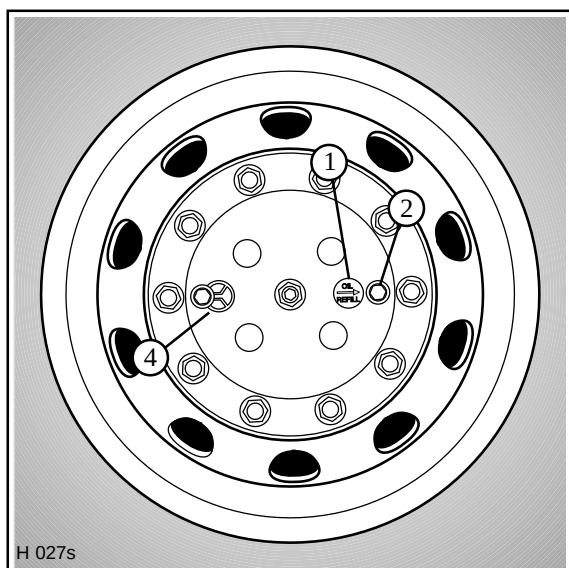
N. B. Do not overtight.

- Start the engine and check for leaks.



Changing of transmission breathing filter

- Unscrew the breathing filter
- Replace with new



Checking the oil in the drive axle

NOTE

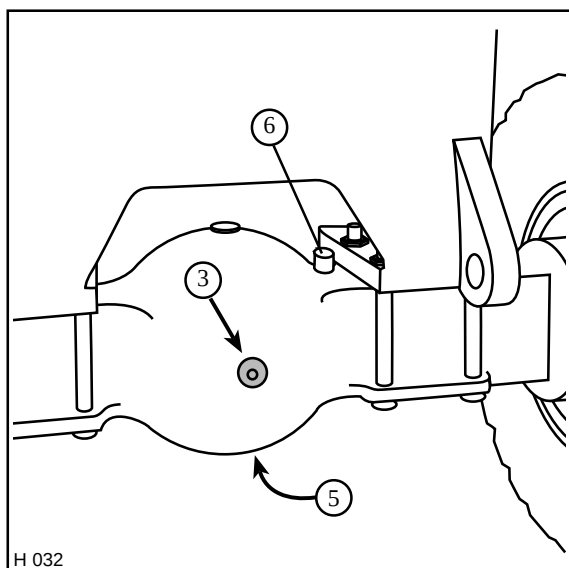
Both hubs and the diff casing to be checked.

- Park the machine on level ground.
- Place the machine so that the hub level mark (1) is horizontal.
- Carefully unscrew the filling/level plug (2) and check the oil level.
- If oil runs out from the plug, screw it back in.
- If no oil runs out, fill up with oil until it begins to seep out from the filling/level plug (2).
- Repeat the procedure for the other hub.
- Check the level in the banjo cap by unscrewing the filling/level plug (3).
- If oil runs out of the plug, screw it back in.
- If no oil runs out, fill it with oil until it begins to seep out.

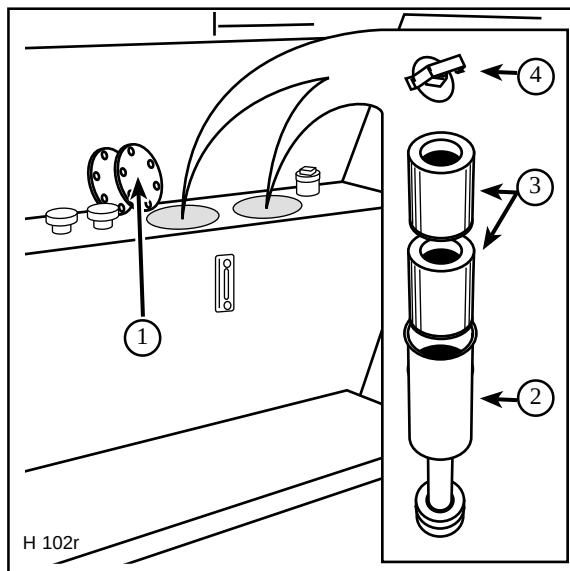
Changing the oil in the drive axle

NOTE

Both hubs and the diff casing must be replaced.



- Park the machine on level ground.
- Make a drain hose using a thread which fit through the draining hole (4).
- Fix the hose in the drain hole whilst the drain plug is in its uppermost position.
- Carefully drive the truck forwards/backwards so that the drain plug returns to its lowest position.
- Allow the oil to run out through the hose into a suitable vessel.
- Repeat the procedure on the other side.
- Drain the diff casing through the drain plug (5).
- Since the oil is of high viscosity, it is suitable to drain when the oil is warm or overnight.
- Refit all three drain plugs (4 and 5).
- Fill the drive axle with oil through the three filling/level holes (2 and 3).
- Replace the three filling/level plugs (2 and 3).
- Check the breathing valve (6) and clean if necessary.



Changing the return filter, hydraulic oil

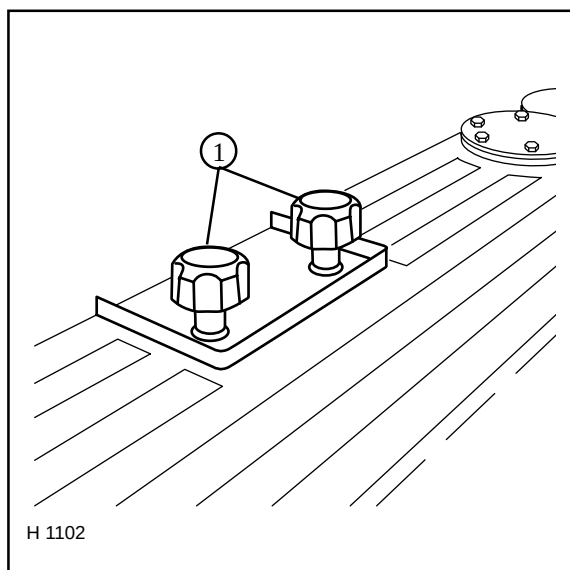
The return filters are situated on the right-hand side of the hydraulic tank by the filling cap.

- Clean carefully around the filter cap (1).
- Remove the filter cap.
- Loosen the four screws of the filter housing in the return chamber.
- Lift up the filter housing (2,3,4) as a complete unit.

NOTE

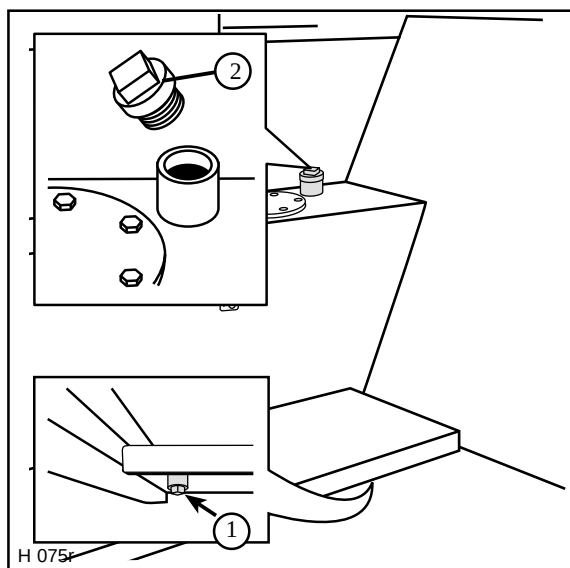
Do not disassemble the filter housing in the tank.

- Remove the element by pressing and turning the bypass valve (4).
- Check that the valve is closed.
- If the tank is empty: Also check the bottom of the tank for any impurities.
- Clean the filter housing.
- Fit new filters and close with the bypass valve (4). Press and turn to the correct position.
- Fit the filter housing in the tank.
- Fill with oil if it has been drained.
- Fit the filter cap.
- Start the engine and check for leakage.
- Turn off the engine and check the level.



Changing of hydraulic tank breathing filter

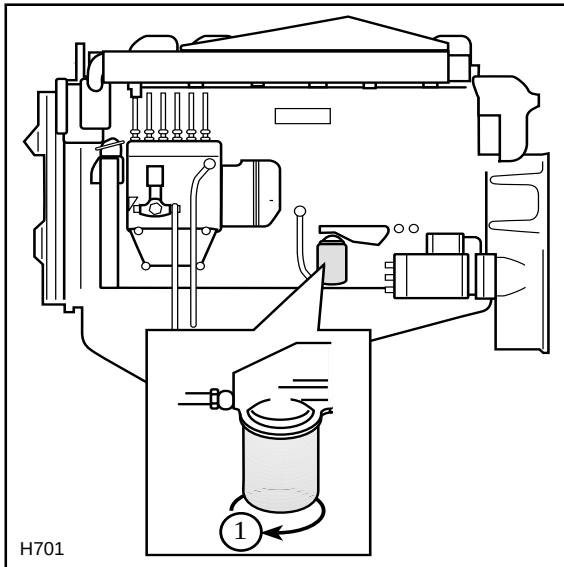
- Unscrew the breathing filters (1).
- Replace with new



Changing the hydraulic oil

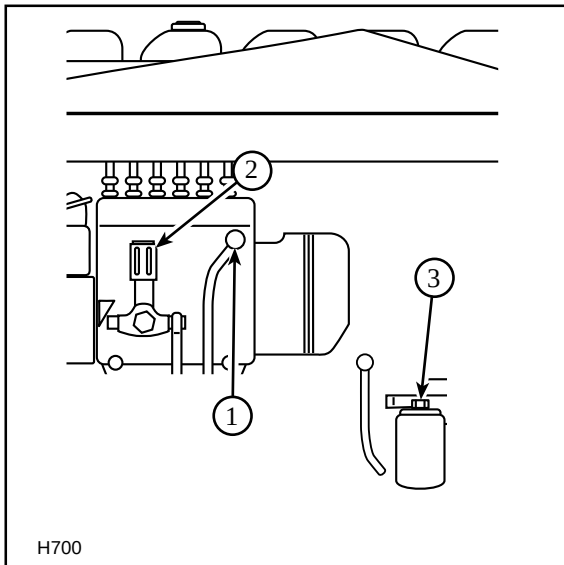
The hydraulic oil is replaced at the same time as the filter. It is recommended that the oil be replaced after 2 000 hours of operation. This may vary, depending on the truck's working environment.

- Drain the oil out through the drain plug (1), using a suitable vessel. See oil volume, Page 82.
- Alternatively, the oil can be sucked up through the filter housings if the filters have been removed.
- Inspect the bottom of the tank for any impurities.
- Assemble the filters and caps as above.
- Fill with hydraulic oil (2).
- It is advisable for the oil to be filled under some pressure.



Changing the fuel filters

- Open the engine casing.
- Clean the outside of the filter unit carefully.
- Place a container underneath the fuel filter (1) to catch any spilled fuel.
- Loosen the fuel filter with a filter key.
- Unscrew and remove the filter by hand.
- Inspect the new filter and check that the covers are in good condition.
- Lightly lubricate the new seals with fuel.
- Screw in the new filters by hand until the seals are in contact with the cap.
- Turn the filters a half circle by hand.
- Bleed the fuel system.
- Close the engine housing.
- After a test run, check that there are no leakages.



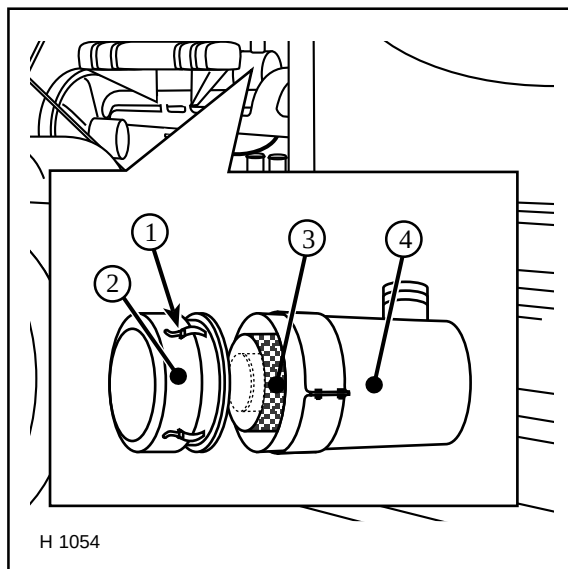
Bleeding the fuel system

Air can penetrate the fuel system when:

- the fuel tank runs completely empty.
- the fuel pipes are disconnected.
- the fuel filter is replaced.

Do as follows in order to bleed the fuel system:

- Place a suitable vessel underneath the bleeder screws.
- Loosen the bleeder screw (3) above the fuel filter cap.
- Use the hand pump (2) to pump fuel until no air is coming out (3).
- Close the bleeder screw (3) whilst fuel is still pouring out.
- Continue pumping until the feed pressure is achieved.
- If further bleeding is required, loosen the relief valve connection (1) and pump the fuel hand pump (2) until air free fuel is forced out through the connection (3).
- Close the relief valve connection (3) whilst fuel is still pouring out.
- Continue to pump until feed pressure is achieved.



Cleaning/changing the air filter



WARNING

A protective mask must always be worn when servicing the air intake system. Do not inhale the dust particles. Consider the environment when carrying out this work.

NOTE

Do not clean the inside of the filter casing with compressed air. All maintenance on the air intake system must be carried out whilst the engine is turned off. This is a dry filter element and must not be cleaned with water.

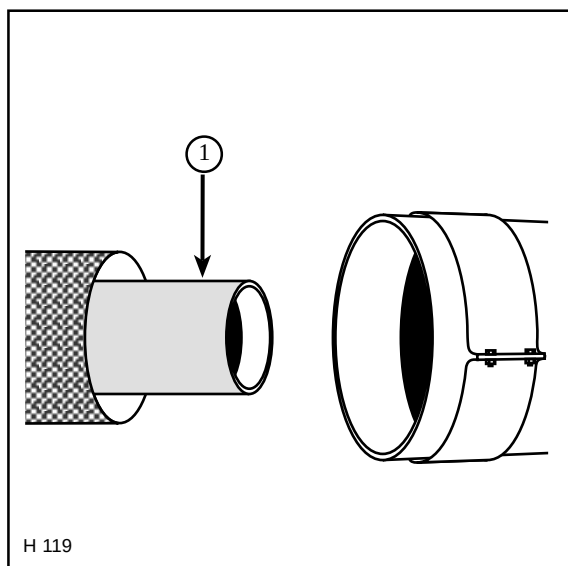
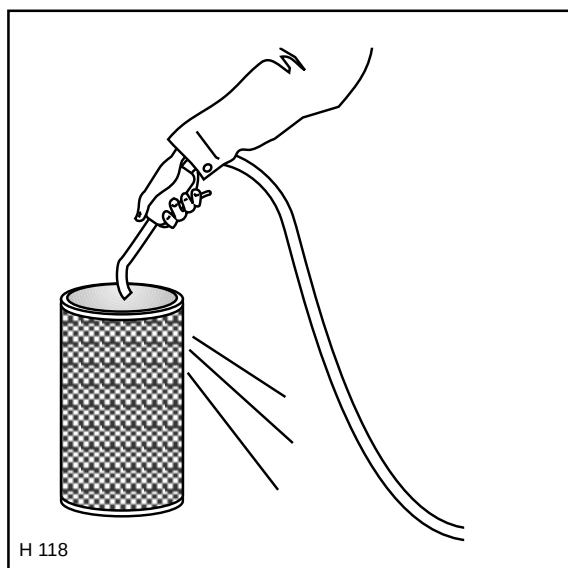
- Open all of the clips (1) and remove the cap (2).
- Empty out the dust which has collected in the cap and dry the cap using a damp cloth.
- Remove the element carefully (3).
- Clean the inside of the filter casing (4) clean using a damp cloth.
- Blow dry compressed air over the filter element to clean it, a maximum of 5 bar, from the inside until no more dust comes out.

NOTE

Discard the filter element;

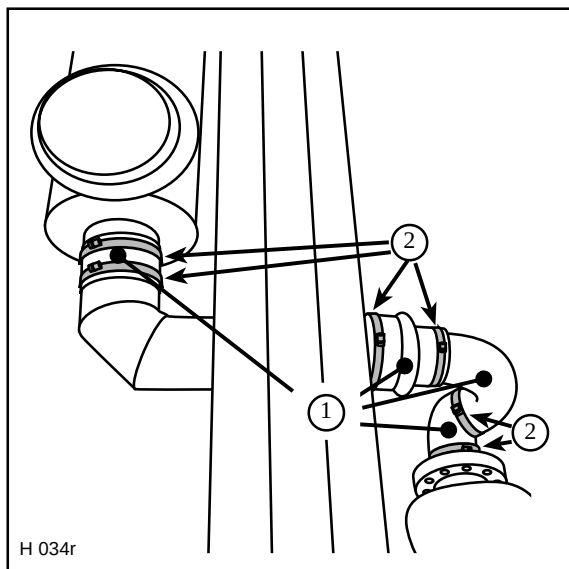
- if it has been cleaned 5 times.
- if it is damaged.
- after 1 000 hours of use.
- after 12 months of use, maximum.

Record each service carried out on the filter element.



Safety cartridge

- The safety cartridge is normally replaced after around 3 000 hours of use, or if there has been any damage to the main filter.
- Disassemble the filter lining as above.
- Fit in a new safety cartridge.



Checking the air intake system

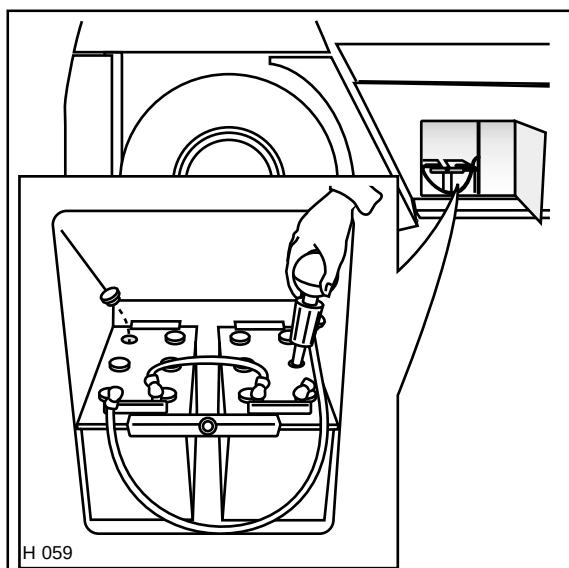
It is of paramount importance for the air intake system to be intact. Broken and leaking pipes can drastically shorten the life of the engine.

Check the system regularly.

- Check the hoses (1) for fissures and damage. If necessary, replace them.
- Ensure that all hose clips (2) are tightened and fit snugly.
- Check that the filter container is intact.

Checking the battery

The batteries are located in the compartment on the right hand side of the machine.



- Check that the battery is not faulty and that electrolyte is not leaking.
- Remove the cap and check that the electrolyte level is 10 - 15mm above the plates.
- If necessary, fill with distilled water only.
- Remove corrosion from the battery connections and check that the cable connections are tightened.
- Lubricate the battery terminals using acid-free grease.
- Check the specific gravity of the electrolyte using a hydrometer. It should be between 1.24 and 1.28.

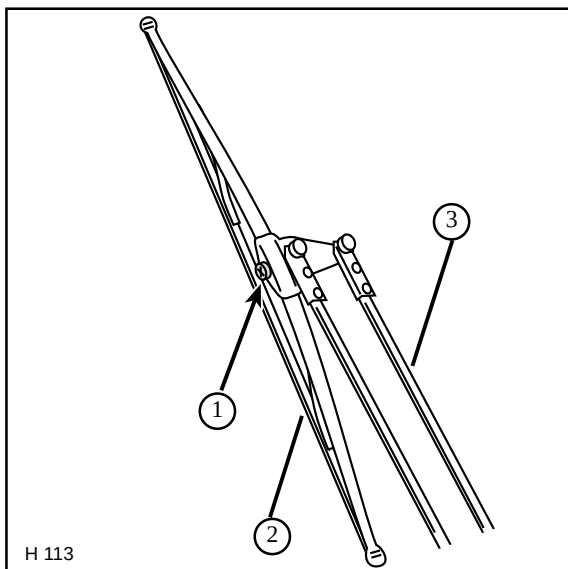


WARNING

The battery contains corrosive acid. Always use the necessary protective equipment. Batteries generate explosive hydrogen when charged. Ensure that there is good ventilation and avoid sparking.

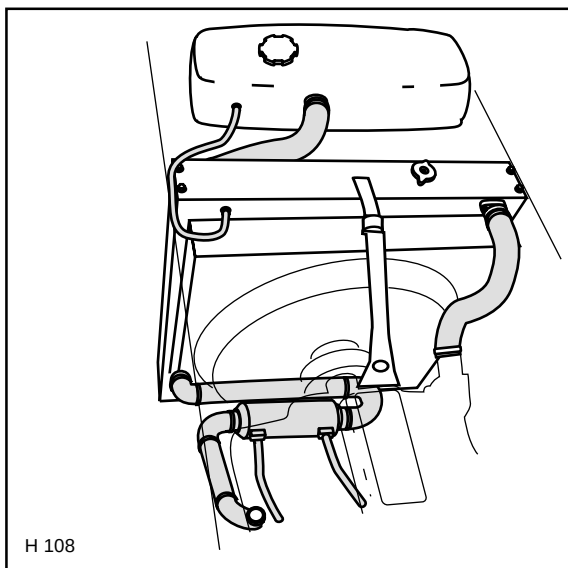


CHECKING AND OTHER MAINTENANCE



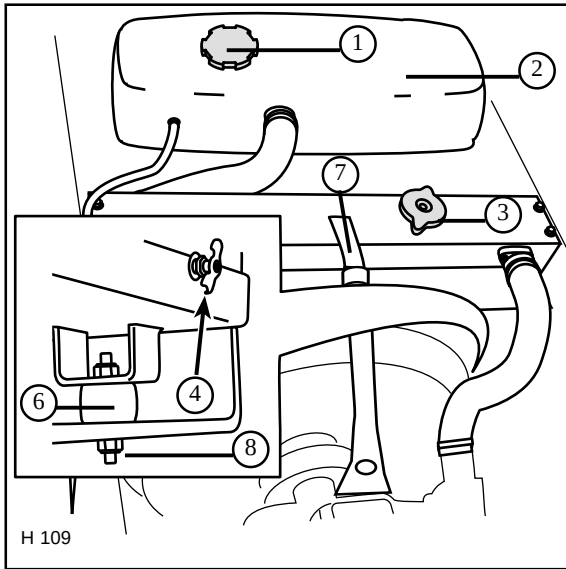
Changing the windscreen wipers

- Remove the bolt (1).
- Remove the blade (2) from the arm (3).
- Insert the new blade (2) into the arm (3).
- Replace the bolt.
- Lower the wiper back onto the windscreen.



Checking the cooling system

- Check all hoses by pressing them to find any fissures and leaks. If in doubt, replace them.
- Check the radiator for damage, leaks and blockages. See page 40 for cleaning.
- Check the function of the cab heater.
- Check the level of the coolant: see below, glycol content, see page 84, and for any impurities.
- Replace the coolant if it is not clean and clear.



- Check the rubber pads in the radiator fittings (6) on the bottom of the radiator and the upper bracing (7) - replace if necessary.
- Check that the nuts (8) are tight.

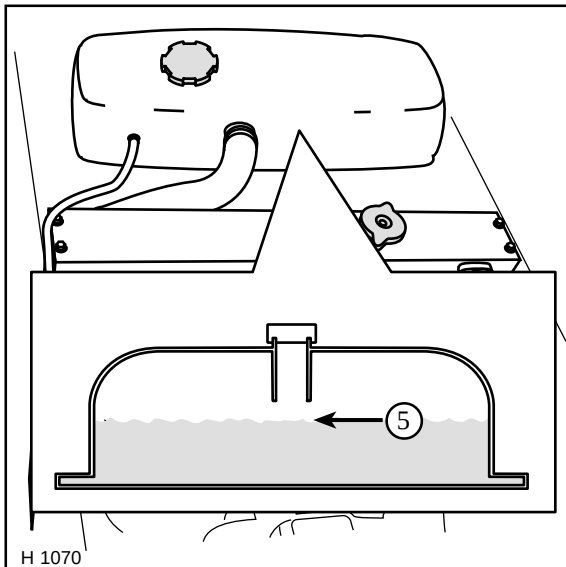
Replacing the coolant



WARNING

The system may be pressurised, even if it is not the pressure type.

- Open the cap of the expansion tank (1) with care - first turn it 1/4 of a turn to ensure that the system is not under pressure when the cap has been removed.
- It can only be refilled through an expansion vessel (2). The cap of the cooler (3) is only used for filling when the system has been completely drained.
- Drain the whole system through the tap (4) when replacing the hoses and system components.
- Turn the cab heater control to maximum. Place a suitable container underneath the drainage tap.
- Open the tap and drain the system fully.
- Turn off the tap.
- Fill the system through the radiator filler cap (3).
- Screw on the cap.
- Fill up through the expansion tank (1) to the maximum level.
- Start the engine and let it idle.
- Observe the level during this period and top up if necessary.
- When the operating temperature is reached, the level should have stabilised.
- The level should be up to the lower edge of the filling tube (5).



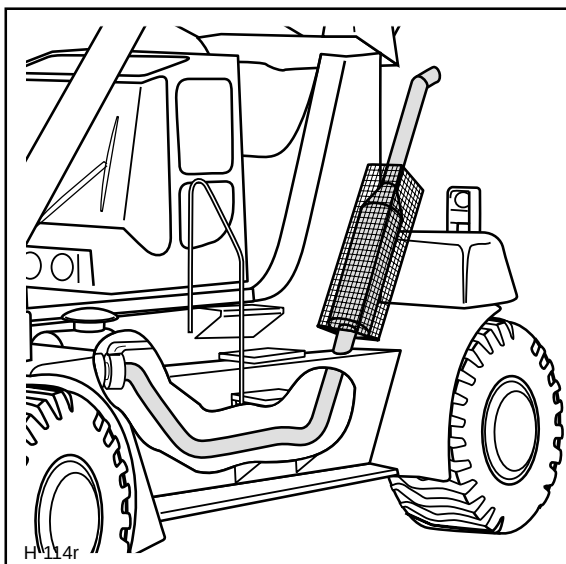
Checking the exhaust system for leaks



WARNING

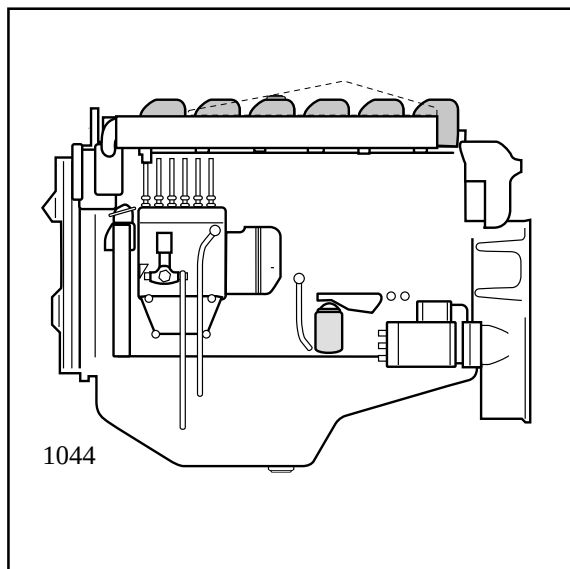
Wait until the exhaust system has cooled before starting work.

- Check the overall condition of the exhaust system, replace pipes or the silencer if they are leaking due to corrosion.
- Check all joints and screw joints.
- Check the exhaust manifold.
- Check the rubber silencer suspension. Replace if necessary.
- Start the engine.
- Check for any leaks in the exhaust system.





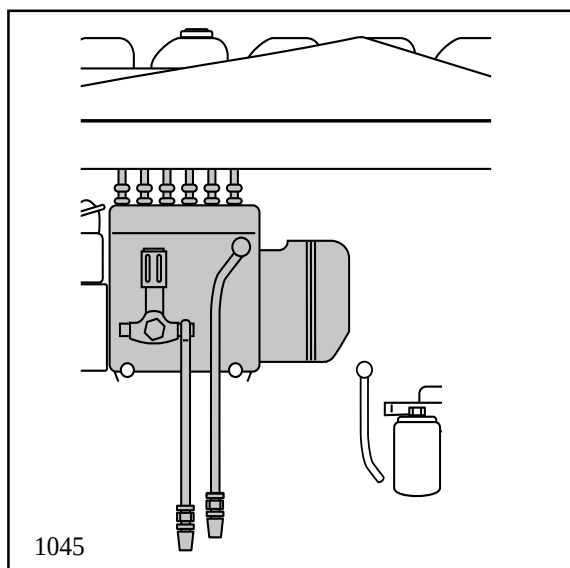
CHECKING AND OTHER MAINTENANCE



Valve clearance

NOTE

The valve clearance should be checked when the engine is cold. Follow the instructions in the engine manufacturer's instruction book.



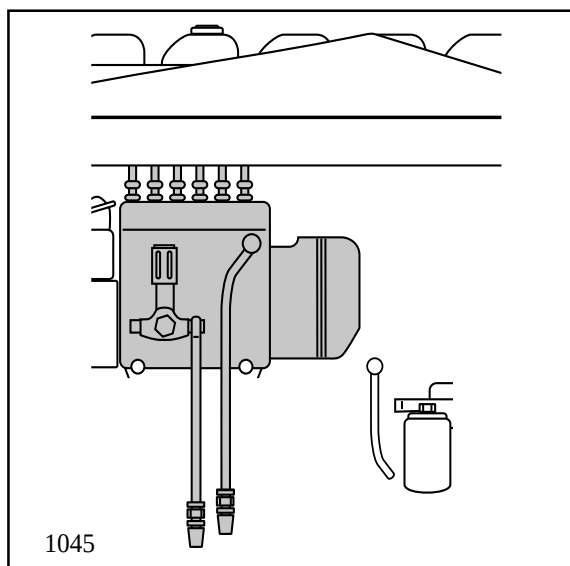
Checking the fuel injector

Check and adjust the injectors before the usual engine service is due to be carried out only if the engine is:

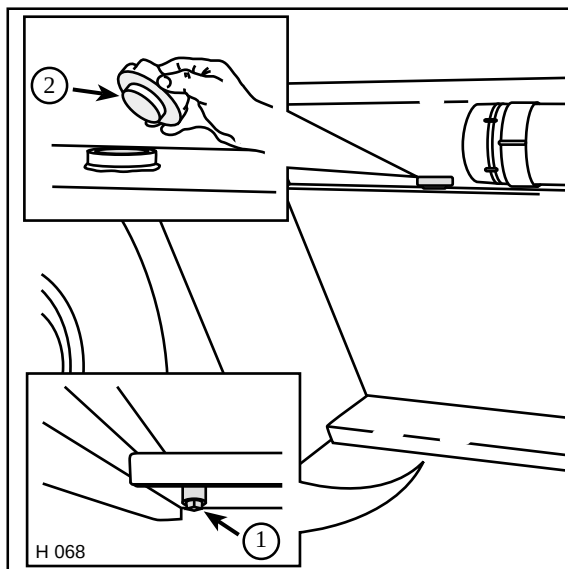
- misfiring.
- knocking on one or more of the cylinders.
- overheating.
- losing power.
- emitting black smoke from the exhaust.
- uses too much fuel.

NOTE

The injectors must be checked and adjusted by an authorised dealer which has the necessary special equipment.

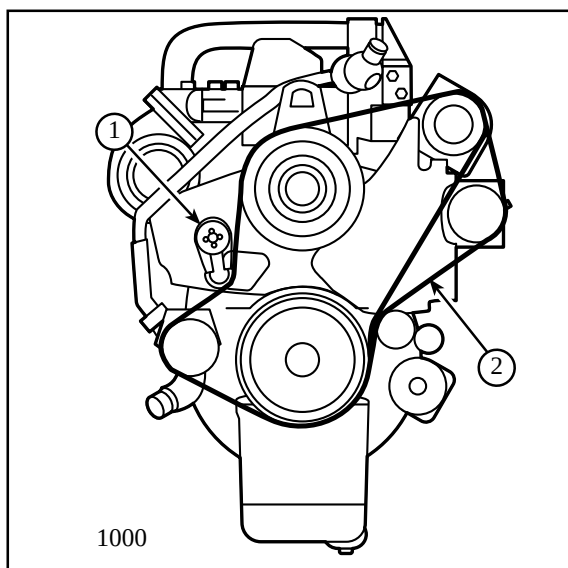


Check fuelsystem for leakage



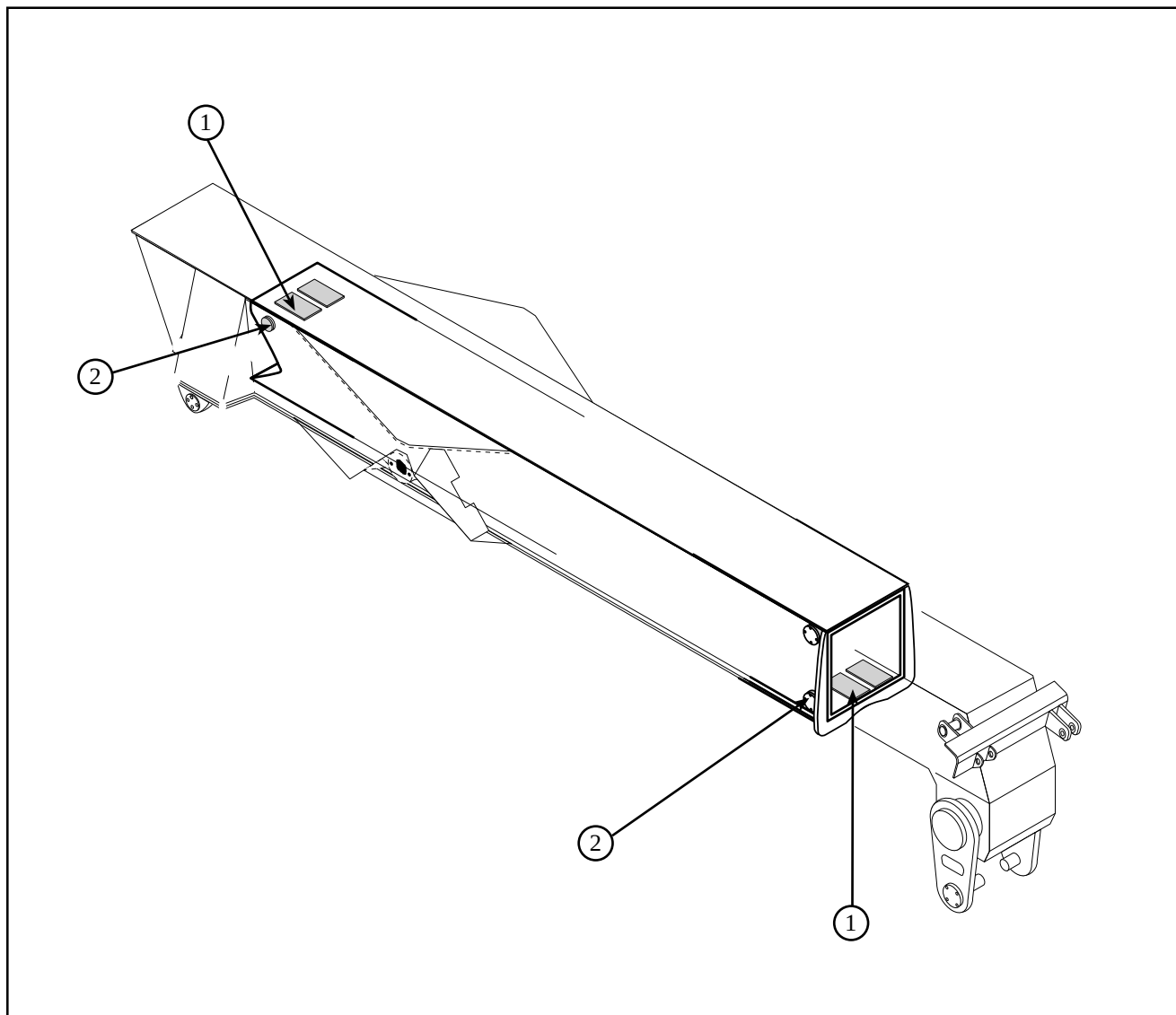
Checking the fuel tank

- Check the tank for any leaks.
- Drain the tank of any grime and water through the drain plug (1).
- Place a suitable vessel underneath the end plug.
- When clear fuel comes through, replace the drain plug.
- Check the seal around the fuel cap (2).



Checking of poly-v belts

If the poly-v-belt (2) is worn or damaged, it should be replaced.
Check also the automatic belt tensioner (1) for function.

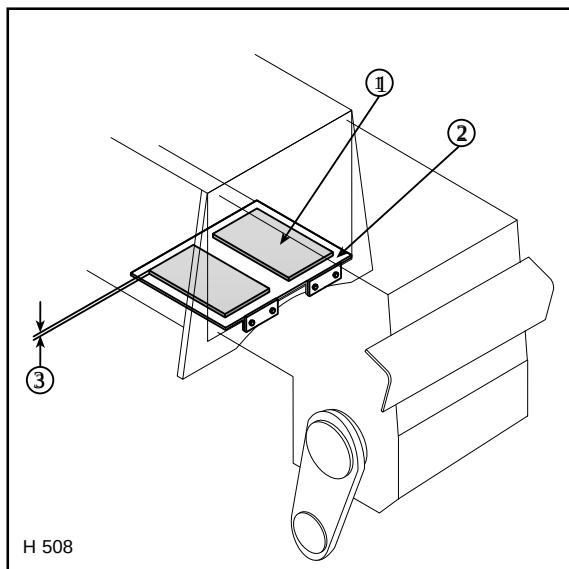


Boom wear pads

Pads and wearing surfaces must be lubricated at least every 250 hrs. Check pads and retainers for wear and damages at each service. Excessive wear or damaged retainers or pads may cause severe damage to the corresponding wearing surfaces. These surfaces are treated with a special graphite paint and should under no circumstances make metal to metal contact.

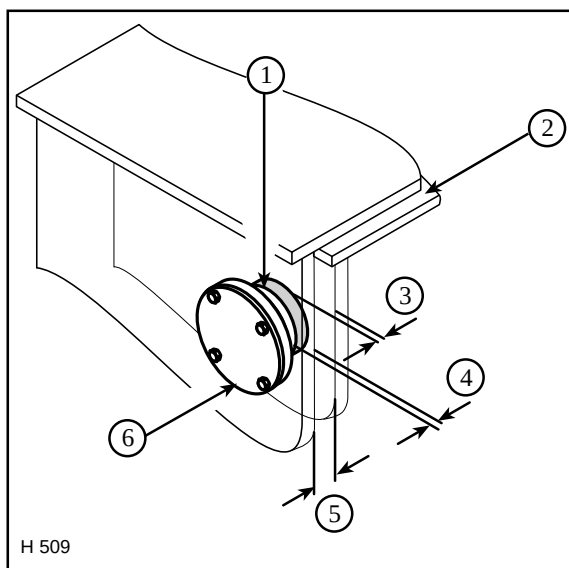
The main pads (1) square 275 x 150 x 15 mm, are located at front bottom and rear top. Total four.

The guide pads (2) OD 100 X 40 mm are located at front, two on each side and at the rear two at bottom and one on each side. Total eight.



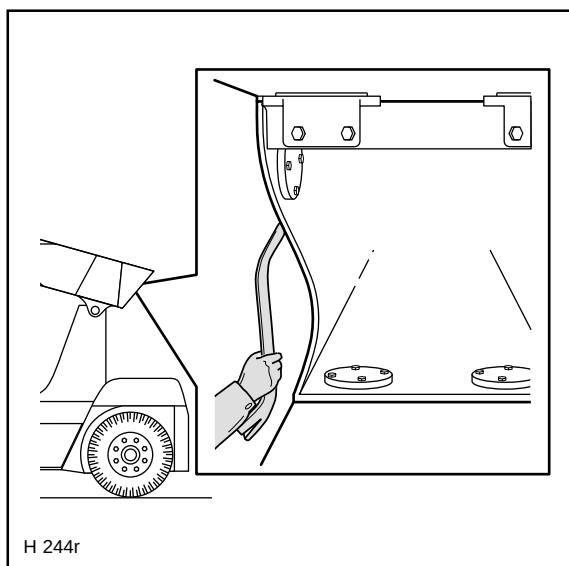
Main pads

The main pads (1) are not adjustable and are fixated by a bolted bracket (2). Original thickness of pads is 15 mm. Thickness of bracket is 9 mm. Minimum allowable thickness of pad is 11-12 mm. I.E pad should be at least 2-3 mm higher than bracket (3). Worn pads must be replaced.

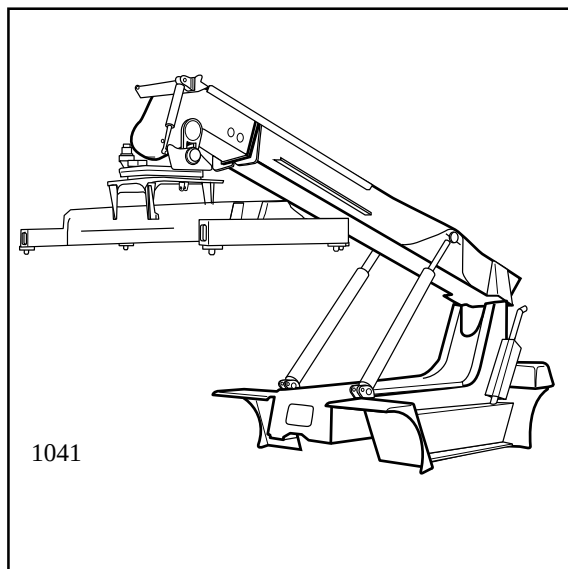


Side guide pads

The guide pads are adjustable by shims (1). Before opening the cover (6) make sure that pads are unloaded. Front pads should be adjusted while the innerboom is completely retracted. Rear pads should be adjusted with the boom extended until the lower pads are unloaded. Add shims in order to get pads tighter. Side play (3) in boom should be kept between minimum 0-1 mm and maximum 4 mm. Original thickness of pad (4) is 40 mm. Minimum thickness 20 mm **or** when there is only 10 mm left to the bracket. When shimming pads make sure that the innerboom lines up "center to center" with the outer boom. I.E (5) should be equal right side and left side.

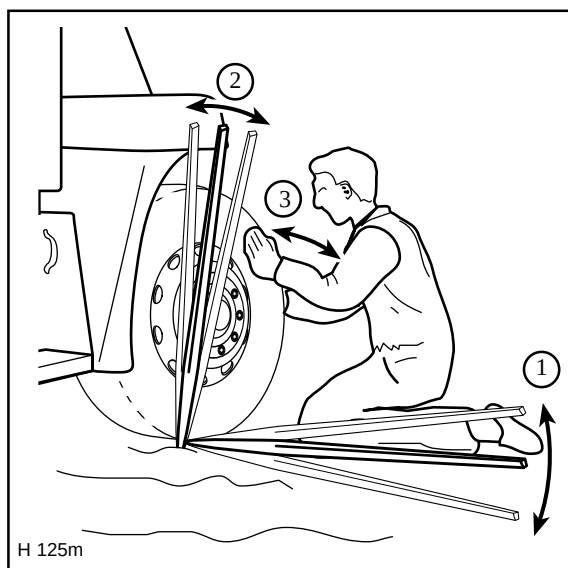


- Use a claw wrench or crowbar to check the room between inner and outer boom.



Checking weld constructions

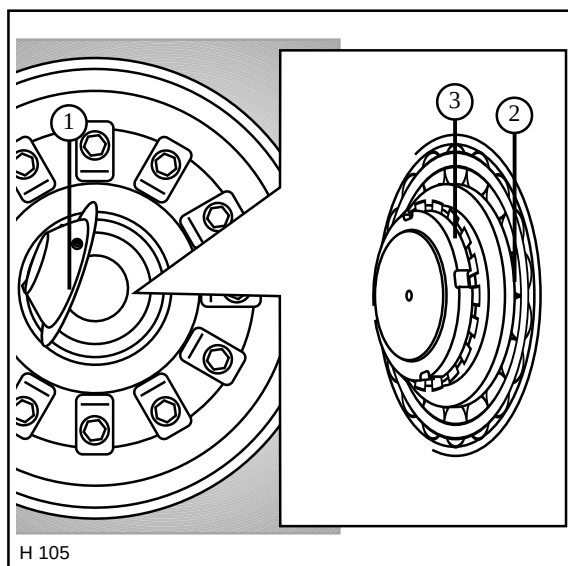
Check the boom, spreader, chassis and all welded parts to see if there are any visible signs of damage, deformation, metal fatigue, etc. This should be done at least once a year, more often if the machine does shift work. If there are any doubts, contact the SMV dealer.



Checking of the steer axle bearings

Check the wheel and spindle bearings regularly and always when the tyres are replaced. Important during the running in period. As these bearings are exposed to high loads and shocks it is of greatest importance that there is no play whatsoever in these bearings. Any play will result sooner or later in bearing breakdown. Bearings are adjustable, see next page. Play in link bearings are acceptable to 1-2 mm per each bearing, this is however not adjustable. Use a jack to lift up each side (see page 41) and check as follows:

- Check the spindle bearings by lifting the wheel with a prybar (1).
- Check the hub bearings by prying the wheel vertically (2).
- Check the link bearings by turning the wheels in the steering direction (3).

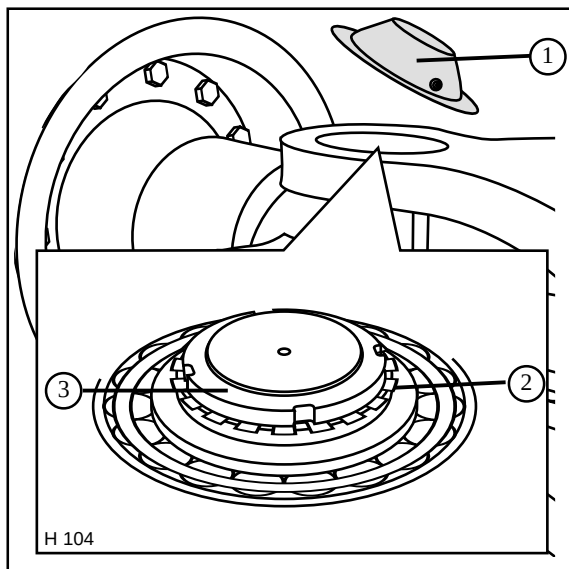


Checking and adjusting steer axle bearings

This is best done when the tyres are replaced..

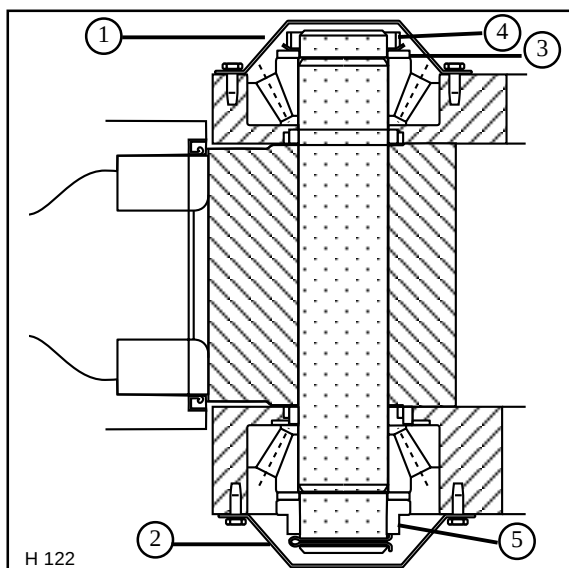
Use a jack to lift up the side of the machine to be checked.

Any gap can be checked when the wheel rises from the ground. Use a crowbar to lift the wheel and locate the gap. There should be no gap in wheel and spindle bearings (adjustable). In the steering leads' link bearings, a 1 - 2 mm gap per bearing is acceptable (non-adjustable).



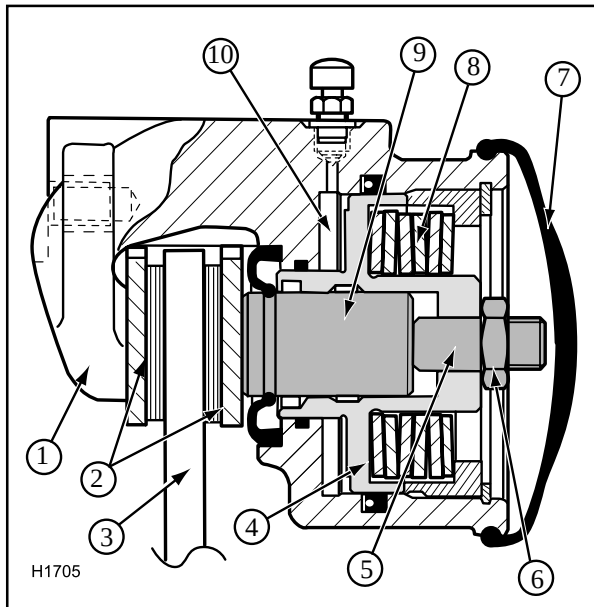
Adjusting wheel bearings

- Undo the cap (1).
- Check that the bearing grease is clean and free from particles. If not, the reason for the gap may be a damaged bearing.
- Turn up the lock washer (2).
- Tighten the nut (3); the correct tightening torque is 25 - 30 kpm.
- Rotate the hub. This should only offer light resistance. A noise or irregular rotation signifies a broken down bearing. Replace the bearing.
- Check the gap.
- Lock the nut (3) using the lock washer (2).
- Fit the cap (1).



Adjusting the spindle bearings

- Remove the steering link.
- Remove the cap (1).
- Check the grease.
- Turn down the lock washer (2).
- Unscrew the nut (3) a few turns.
- Check that the lower nut (5) is tightened; the correct torque is around 100 kpm.
- **NOTE** The nut (5) is not used to preload the bearing. All bearing preload is adjusted with the upper nut (3).
- Tighten the upper nut (3) to around 25 - 30 kpm.
- Check that there is no gap and that the spindle can easily be turned without it making a noise or offering irregular resistance.
- Remount the caps (1).



PARKING BRAKE

The parking brake consist of brake calliper and a brake disc which is mounted on the drive axle. The brake calliper consists of housing (1), piston (4), spring washers (7) which press on the piston, brake pads (2) and disc (3).

The brake is normally applied.

The brake calliper is opened by hydraulic pressure in the oil chamber (9). Hydraulic pressure moves the piston and compresses the springs.

At least 100 bar is required to open the brake.

Pressure is coming from the accumulator system via a solenoid valve, controlled by the parking switch.



The brake is a pure parking brake and should be used as such - to keep the machine stationary. Due to the gear ratio through the drive axle, the brake is very

powerful, however if the brake is used to stop the machine it will wear the pads rapidly .

Use the parking brake to stop the machine with only in emergency. After such a braking the brake should be checked, adjusted and if necessary pads replaced.

As being an emergency brake, the function of it has to be checked daily by the operator. To ensure the function and to make the following adjusting procedures to go easy , it's necessary to keep the calliper well lubricated and all parts in good condition. In case of any doubts, dismantle, clean and lubricate.

Adjustment of parking brake

Note. It is important that the parking brake is activated (released) during adjustment.

- Park the vehicle on a level surface.



WARNING

Block the wheels to prevent the vehicle from moving.

- Start the machine to ensure correct brake system pressure.
- Release the parking brake by using the switch in the cabin.

The oil chamber (10) should now be pressurised. The piston assembly, consisting of push rod (9), piston (4), adjusting screw (5), and lock nut (6) should be totally extruded, compressing the spring washers (8).

To ensure that the brake pressure is maintained it may be necessary to run the engine.

- Remove the cap (7).
- Release lock nut (6) and turn the adjuster screw (5) clockwise until both brake pads (2) are in contact with the brake disc (3).
- Turn the adjuster screw counterclockwise until the disc (3) is just moving freely.
- Tighten lock nut (6) and recheck by moving the disc (3).
- Apply the parking brake.
- Remove the blockage from the wheels.
- Test the function of the parking brake.
- Install the cap (7).

Parking brake emergency release



WARNING

When the parking brake is released, the vehicle does not have any park brake function. You must block the wheels to prevent the vehicle from moving. Serious personal injury and damage to components can result.

If hydraulic pressure is not available, the parking brake can be manually released using the following procedure.

- Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving.
- Remove the cap (7).
- Loosen the lock nut (6).
- Turn the adjusting screw counterclockwise until the brake is released. Emergency release requires approximately 30 lb-ft (40 Nm) torque on the adjusting screw (5).
- Tighten the lock nut (3). Install the cap.
- Before you return the vehicle to service, adjust the brake using the procedure in this section.



Daily maintenance and service before operation

Points to check:

- Water level of the radiator Page 8
- Washer level 8
- The level of the engine oil 8
- The air filter indicator (the engine's air filter) 9
- The gear box oil level 9
- Hydraulic oil level 9
- The fuel level 10
- Tyre pressure and condition 11
- Brake operation 26
- Steering operation 27
- Lights/Horn

Running in service after the first 50-100 hours of operation

- Checking and tightening of all bolted joints. Page 46-49
- Lubricating the machine according to lubrication table. 50-57
- Changing engine oil 58
- Cleaning the engine oil filter. 59
- Changing the turbo filter. 58
- Changing the fuel filter. 63
- Checking (ev. cleaning) air filter and intake. 64
- Checking the oil level in the transmission 60-61
- Checking the battery. 65
- Checking the V-belts. 69
- Checking the function of hydraulic and electrical systems.

Additional servicepoints after the first 1000 running hours

- Adjustment of valve clearance engine. See manufactures manual.



MAINTENANCE TABLE

INSPECTION AND MAINTENANCE TABLE

Service	When necessary	Every 250 hour	Every 500 hours	Every 1 000 hours	Every 2 000 hours
Cleaning the machine	p.39				
Replacing windscreen wipers.	p.66				
Cleaning the radiator	p.39				
Checking the function of the hydraulic and electrical systems		p.81-			
Checking the oil level in the drive axle and cleaning the breathing valve		p.61			
Lubricating in accordance with		p. 50-57			
Checking the condition of the battery and the electrolyte level		p.65			
Checking the tension and condition of the V-belts		p.69			
Checking of boom wear pads		p.70-71			
Changing the engine oil			p.58		
Cleaning the engine oil filter	p.59		p.59		
Changing the turbo filter			p.52		
Changing the transmission filter			p.60		
Checking the fittings of the engine and transmission	p.47		p.47		
Checking the steer axle bearings				p.72-73	
Cleaning the air intake filter	p.64-65			p.64-65	
Changing the element in the air filter (engine).....	p.64			p.64	
Changing the hydraulic oil filter				p.62	
Checking the cooling system				p.66	
Checking the exhaust system				p.67	
Changing the fuel filter.....	p.63			p.63	
Changing the oil in the gearbox				p.60	
Tightening bolted joints.....	p.46-49				p.46-49
Cleaning the fuel tank.....	p.69				p.69
Changing the hydraulic oil and filter					p.62
Changing the oil in the drive axle					p.61

INSPECTION AND MAINTENANCE DATA					
Nr.	Unit	Material/oil /lubricant			
1.	Engine	Engine oil	D19	Min 20 l	Max 25 l
2.	Air filter	cleaning air pressure max. 5 bar			
3.	Fueltank	Diesel		520 l	
4.	Cooling system	Glycol/water mixture		50 l	
5.	Hydraulic tank	Hydraulic oil Complete system		450 l	
				Each hub	Diff.
6.	Drive axle	Drive axle oil		7 l	20 l
7.	Gearbox	ATF or Engine oil		21 l	
8.	Battery	Distilled water	When necessary		
9.	Tyres	Air	9.0 bar (Michelin 10 bar)		
10.	Wheel nuts	-	Page 46		
11.	All lubrication points	Grease	When necessary		
12.	Valve clearance (engine)	-	Intake. 0.45 mm Exhaust. 0.80mm		
13.	Fuel inj.	Diesel	Open pressure	300 bar	
14.	Belt tension fan/generator)	-	Automatic		



FUEL AND OIL RECOMMENDATIONS

Quality of the engine oil

The engine oil must comply with one of below classifications for oil;

- ACE E3, E4, or E5
- TBN-value should at least be 12-13 (ASTM 2896)

Check with your oil supplier the your oil meets these demands. Sted oil change intervals are valid if the sulphur content of the fuel is below 0.3%.

If the sulphur content is higher the 0.3%, but less than 1%, the oil change intervals must be divided in half (200 h).

NOTE

No oil additives are approved. The oils should not be effected by ambient temperatures between oil change intervals.

When the engine is in use, some of the oil which serves as a lubricant will be burned (used) prior to reaching the pistons.

The combustion products in combination with the high temperatures lead to "oil wear", particularly for the chemical additives.

Since this oil wear depends on operating conditions, the quality of the oil (the productivity of the oil) and the fuel used, the intervals between changing the oil may vary in length.

The longest possible time before the engine lubricating oil is replaced is one year, i.e. the oil should be replaced after a maximum of one year's operation.

The viscosity of the oil

Since the viscosity of the oil varies according to temperature, the temperature in the place where the truck is being used is vital to the choice of the engine oil viscosity range (see diagram).

In order to ensure that the engine starts from cold without any problems, it is important to select SAE class according to the prevalent surrounding temperature when the engine is started.

Changing the oil due to a replace in season may be avoided by using what are known as multi-grade oils. Specified intervals for changing the oil also apply to multi-grade oils.

If the surrounding temperature should happen to fall below the temperature limit (e.g. for SAE 15 W/40 down to -15° C), the capacity of the engine to start from cold is reduced, but there is no damage to the engine.

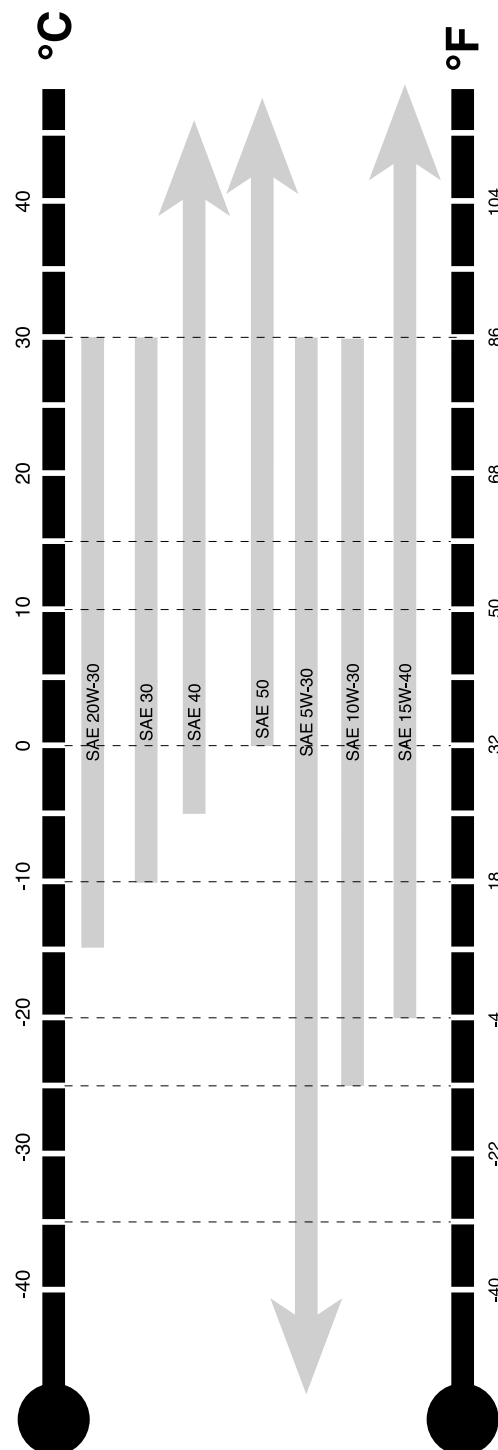
NOTE

No oil additives of any sort must be added to those oils recommended! Using such additives could invalidate the engine warranty.

Mixing different brands of oil should be avoided.

Since the temperature ranges for adjacent SAE classes overlap, the oil does not need to be replaced when short-term temperature replaces occur.

For temperatures below -10° C, the use of SAE 5W30 oil is recommended for starting from cold without problems.





QUALITY OF GEARBOX OIL

OIL SPECIFICATION, GEARBOX

These recommendations are valid for Spicer Hurth hydraulic transmissions, Clark HR 32 000, HR 36 000 and T 40 000.

Transmission lubricant must be qualified by one of the following specifications in order of preference:

- Caterpillar TO-4
- John Deere J20 C,D
- MIL-PRF-2104G
- Allison C-4
- •Dexron IID equivalent

NOTE!

Lubricants equivalent to •Dexron IID are not approved for use in transmissions or converters with graphic friction material.

The following oils are not approved:

- •Dexron III
- Engine oil
- GL-5 oils

•Dexron is a General Motors registered trademark

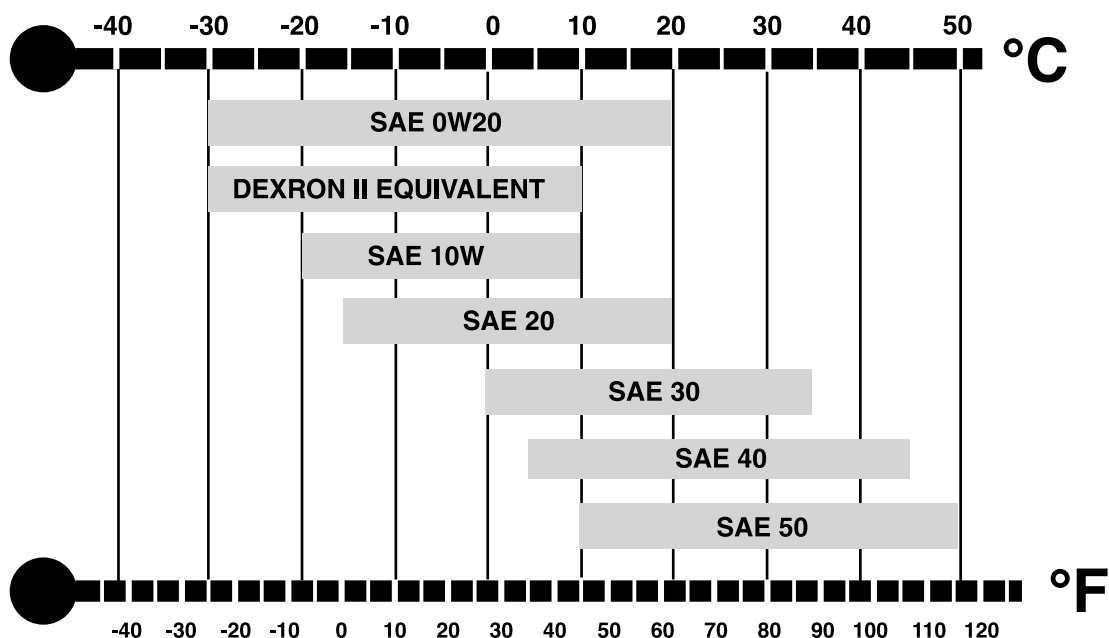
Oil viscosity

Use mono-grade oils with highest viscosity according to the diagram below, if possible.

At fluctuant temperature, multi-viscosity oils are approved if the viscosity does not span over more than a 10 point range, for example 10W/20, 20W/30.

NOTE

This recommendation is not valid for transmissions with electronic gearshift, i.e. TE 17, TE 27, TE 32.





RECOMMENDED FUELS AND HYDRAULIC OILS

Diesel

Use only fuel in accordance with DIN 51601 with a cetane rating not below 45.

The diesel sulphur content must not exceed 0.5%. If the sulphur content lies between 0.5 and 1.0% the service intervals in the maintenance table must be reduced.

If the values are higher, contact the manufacturer of the machine or the lubricant.

NOTE

As the surrounding temperature falls, the flow characteristics of the diesel are reduced to a point where paraffin begins to precipitate. If "summer quality" diesel is used, this may cause trouble in operation. For this reason, "winter quality" diesel should be used during the cold part of the year, as it operates in the cold better and functions reliably at -15°C. Using additives to improve the flow is not recommended. They may reduce the capacity to start from cold.

Hydraulic oil

API CE/SF, GI 4
CCMC D 4
MIL-L-2104 D (from factory)
Use hydraulic oil from a well-known oil company for mobile applications. Engine oil with a viscosity of SAE 10 may also be used. Viscosity: SHS 37 at normal operating temperature. Additive: 6% LUBRIZOL should always be added. This is necessary for the wet disc brakes to work optimally.

Grease

Multi purposetype E.P. acc to NLGI grade 2

For plastic sliding pads use Gleitmo 805. SMV part no: 6062.002

Coolant

Use only monoethylene glycol-based coolants with an additive to prevent corrosion.

Do not mix with anti-freeze liquid containing ethanalamine.

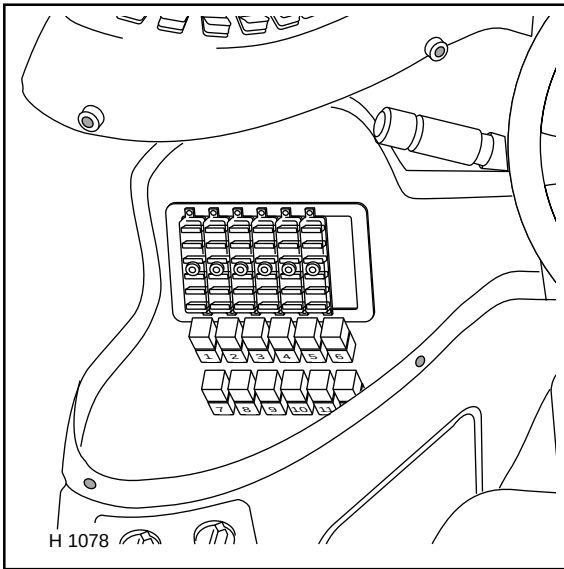
Drive axle oil

API GL 5 SAE 80W-140

NOTE

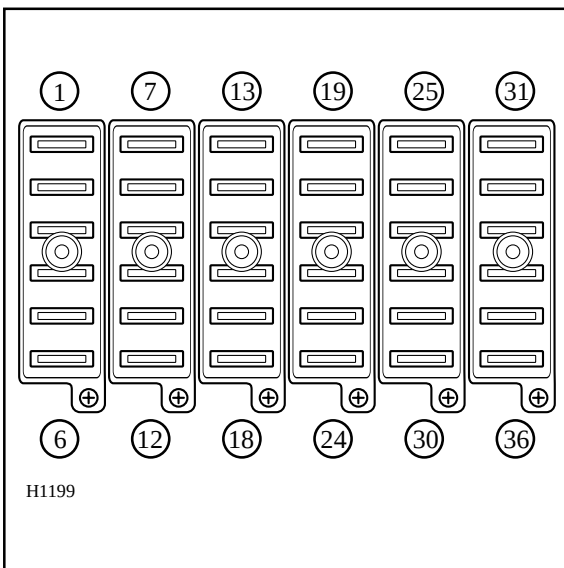
The above are only recommendations. In the event of doubts, we recommend that you seek advice from an SMV dealer.

Liquid anti-freeze at the lowest temperature	% volume mixture liquid anti-freeze	Mixture of anti-freeze and water
-12°	25	1:3
-18°	30	1:2
-25°	40	1:1,5
-37°	50	1:1
-60°	66	2:1



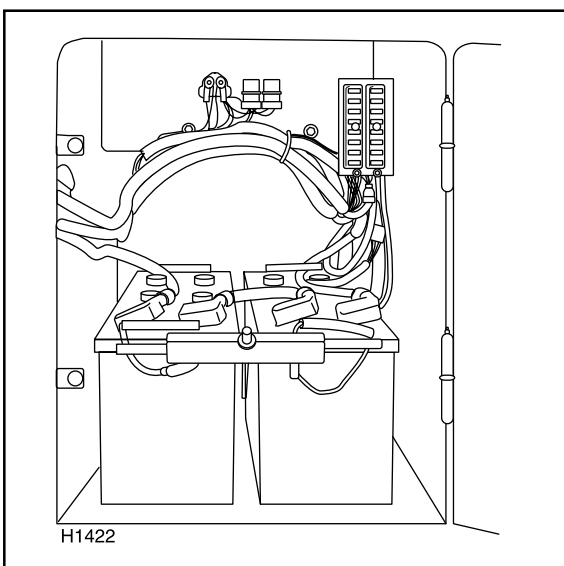
Fuses

Fuses are located below the left hand dash board. They are numbered (1), upper left to (36), lower right.



Fuses below the dash board

Fuses are located below the dash board. They are numbered (1), upper left to (30), lower right.



Fuses and relays in the battery compartment.



Fuses

Fuses are located below left hand dashboard. They are numbered (1), upper left to (36), lower right. *Italic = optional.*

Fuse No.	Size	Function
F1	7,5 amp.	Stop solenoid, charging indicator and manouver for working lights
F2	7,5 amp.	Brake light, pos. light, cab. light and switch lights.
F3	15 amp.	<i>Airconditioner</i>
F4	5 amp.	<i>Fuel solenoid, lubricating pump</i> and parking brake
F5	15 amp.	<i>AC-condensor fan</i>
F6	7,5 amp.	Road lights, high beam
F7	7,5 amp.	Road lights, low beam
F8	10 amp.	IQAN-MG
F9	10 amp.	IQAN-MG
F10	10 amp.	IQAN-XP
F11	10 amp.	IQAN-XP
F12	7,5 amp.	Hazard and <i>airconditioner</i>
F13	7,5 amp.	Main supply ignition switch, unloading valve <i>and preheater</i>
F14	10 amp.	Roadlights
F15		
F16	10 amp.	Wipers, washers and horn
F17	7,5 amp.	Directionals and seat heater
F18		
F19	7,5 amp.	Working light attachment
F20	7,5 amp.	<i>Rotating beacon, rear view heater, map light and search light.</i>
F21	7,5 amp.	Back up lights and <i>back up alarm</i>
F22	10 amp.	<i>Radio, com.radio and converter 24/12V</i>
F23	15 amp.	24V AUX. and seat compressor
F24	7,5 amp.	IQAN-M (+RTC), <i>timer engine preheater</i>
F25	3 amp.	Left positionlight
F26	3 amp.	Right positionlight
F27	7,5 amp.	Working light boom right
F28	7,5 amp.	Working light boom left
F29	7,5 amp.	Working light (option)
F30	7,5 amp.	Working light (option)
F31	7,5 amp.	Working light attachment
F32	7,5 amp.	Working light attachment

The following fuses are located in the battery compartment

Fuse No.	Size	Function
F51	10 amp.	Main for fuse F12 and F24
F52	10 amp.	Spare
F53	1 amp.	<i>Radio memory</i>
F54	10 amp.	<i>Fuel heater</i>
F55	10 amp.	<i>Fuel heater</i>
F56		Spare
F57		Spare
F58		Spare
F61	30 amp.	Main for fuse F1, F3, F4, and F5
F62	30 amp.	Main for fuse F8, F9, F10 and F11
F63	30 amp.	Main for fuse F16, F17, F18, F21, F31 and F32
F64	30 amp.	Main for fuse F2, F13, F27 and F28
F65	30 amp.	Main for fuse F14, F15, F29 and F30
F66	30 amp.	Main for fuse F20, F22 and F19
F67	30 amp.	Main for fuse F23, Stop solenoid
F68	30 amp.	Start relay


RELAY AND BRIDGE SPECIFICATIONS

Relays K1 - K13 are located below the dashboard. Relays K31, K32 and K33 are located at the engine.

Relay No.	Function
K1	Mainrelay ignition switch
K2	Mainrelay ignition switch
K3	Mainrelay ignition switch
K4	Working light boom
K5	Working light extra
K6	Working light attachment
K7	Back up lights, back up alarm,
K8	Direction selector
K9	Stop solenoid
K10	Intermittent wiper rear
K11	Intermittent wiper roof
K12	Intermittent wiper front
K13	Directionals
K14	
K15	
K16	Interlock forward (no EMC)
K17	Interlock backward (no EMC)
K18	Neutral safety switch (no EMC)
K31	Start engine
K32	Stop solenoid
K33	Restart relay

Bridge No.	Cable No.	Function
X100:1	08 000	Supply IQAN-MG, + BAT A
X100:2	08 000	Supply IQAN-MG, + BAT A
X100:3	08 011	+AREF, IQAN-MG
X100:4	08 012	-AREF, IQAN-MG
X100:5	10 013	+AREF, IQAN-XP
X100:6	10 014	-AREF, IQAN-XP
X100:7	09 714	Parking brake
X100:8	16 014	Horn
X100:9	21 001	Rotating beacon
X100:10	02 002	Brake light
X100:11	02 003	Instrument lights
X100:12	22 001	12V from converter
X100:13	23 000	24V aux.
X100:14	20 001	Rotating beacon
X100:15	13 004	Start unload
X100:16	16 000	Supply for wiper and washer
X100:17	-12V	Ground radio (-12V)
X100:18		
X100:19	17 002	Directional left
X100:20	17 003	Directional right
X100:21	13 003	Unloading valve

EXPLANATION OF THE SCHEMATICS

The format of the electrical schematics

The electrical schematics are designed for the purpose of simplifying the location of faults and servicing. The various electrical schematics are divided into circuits, work lighting, heating and ventilation, etc. This means that, when locating faults, it is only necessary to use the electrical schematics which cover that particular circuit. Only in a few exceptional cases is it necessary to use more than one electrical schematic. If this is necessary, there are coordinate axes around the schematic which can indicate the correct position. The vertical axis has letters and the horizontal one the numbers which are linked to the number of the electrical schematic.

The numbering of the leads

The numbering of a lead aims to simplify the location of faults and servicing. The number of a lead is based on which fuse it comes from. The first digit (or the first two digits of a five-digit number) indicates which fuse the lead comes from. If the last three numbers are 000, this means that the lead comes directly from the relevant fuse. For example, cable no. 12000 means that this lead comes directly from fuse 12. Every time the lead is interrupted via a part, the last two digits of the consecutive order are changed, e.g. 12001, 12002, 12003, etc.



WARNING

**The main disconnect do not cut the power to the alternator.
Always disconnect the ground (minus) cable at the battery when
working near or on the alternator.**

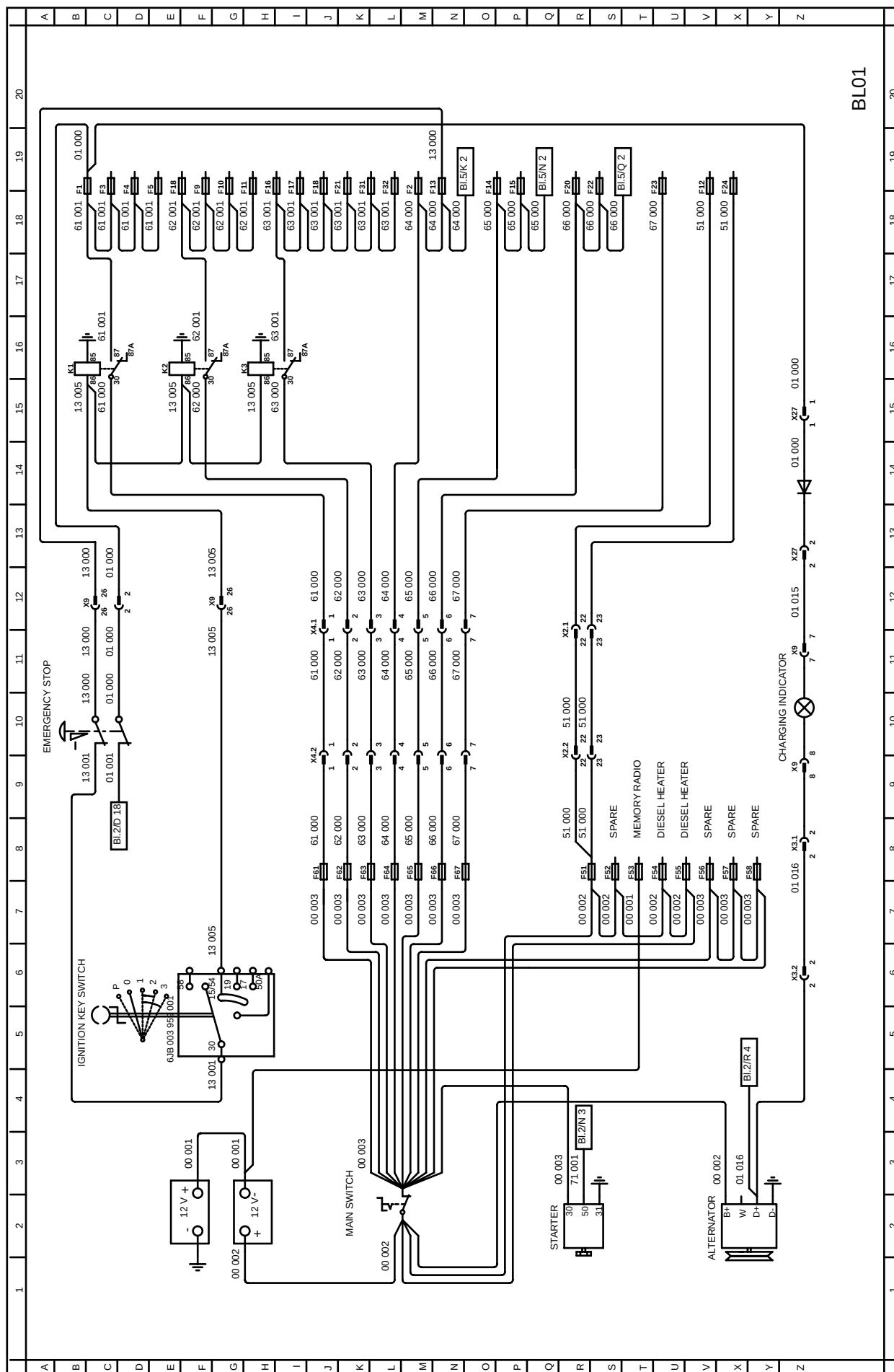


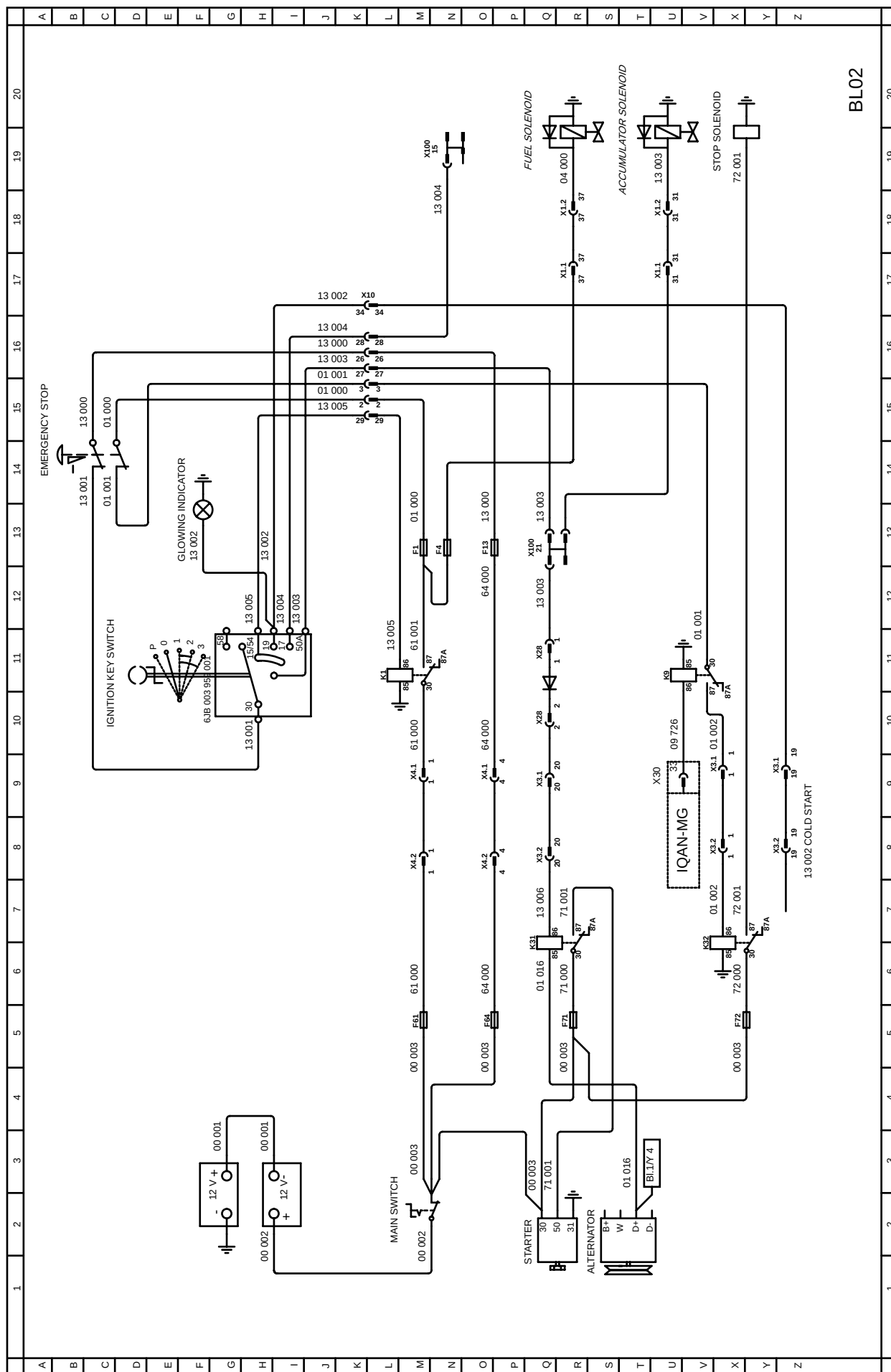
CONTENTS

The following electrical schematic forms a complete schematic electrical system for the SMV Reachstacker.

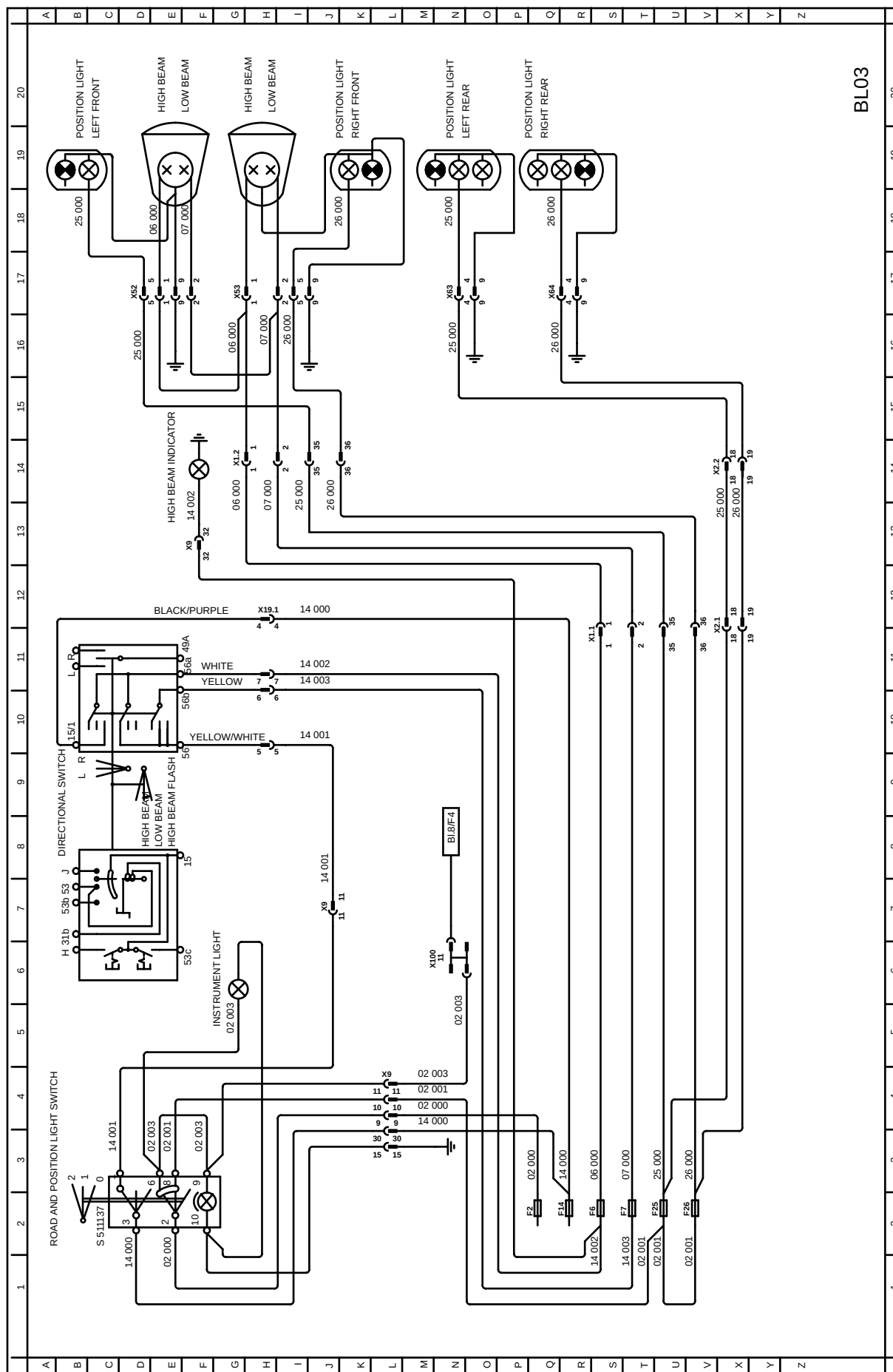
Function

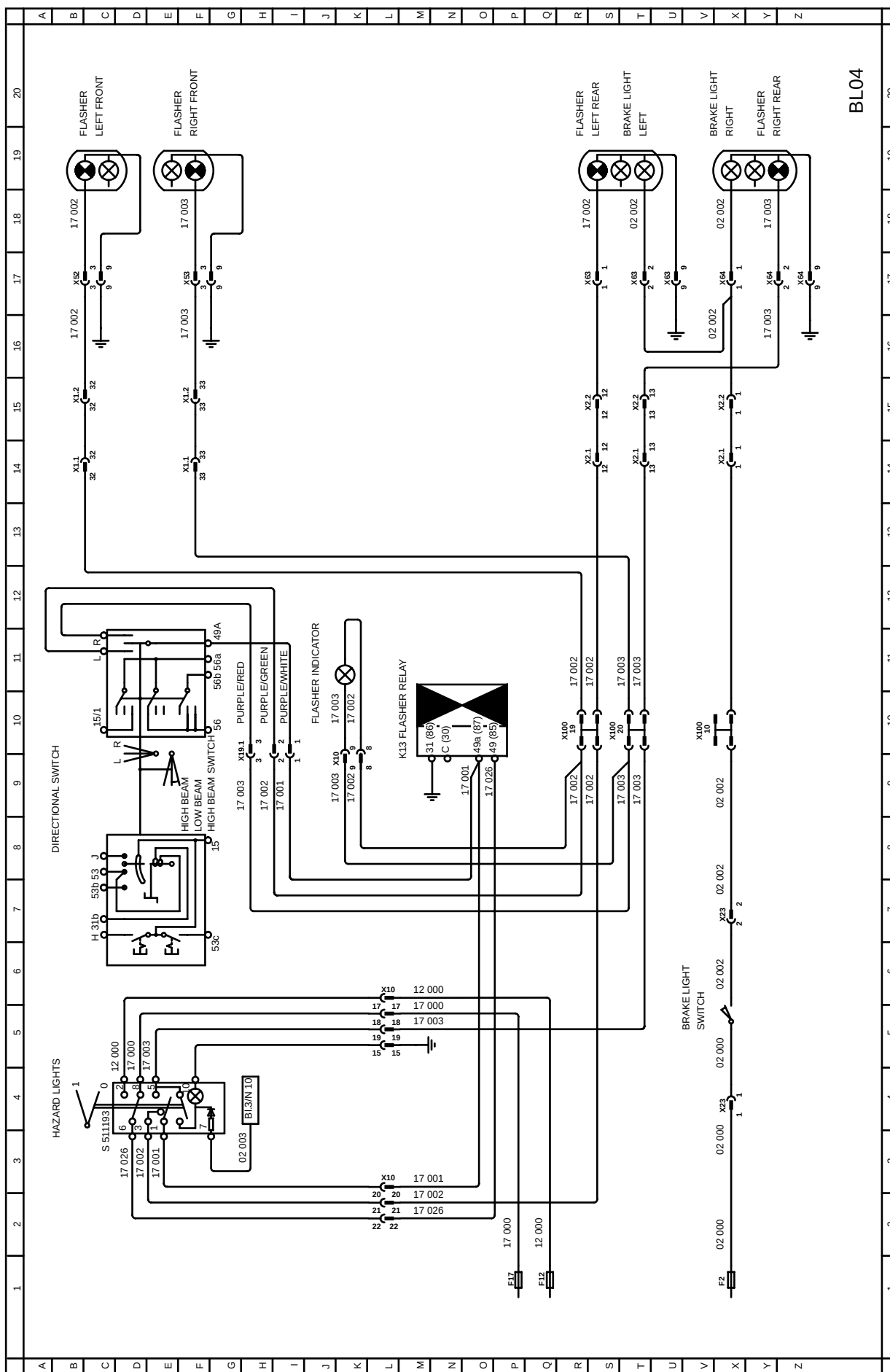
Power supply	Page 86
Start and stop of engine	Page 87
Road and position lights	Page 88
Brake light, flashers and hazards	Page 89
Work lights	Page 90
Windscreen wipers	Page 91
Washer	Page 92
Heating, ventilation and air condition	Page 93
Cab light, seat heating, buzzer and rotating beacon	Page 94
Seatcompressor, Radio and 12/24 V outlet	Page 95
Speed and rpm. controls	Page 96
Speed and rpm. controls DEC2	Page 97
Transmission	Page 98
Brakes	Page 99
Joystick steering	Page 100
Lift boom	Page 101
Container attachment	Page 102
Lubrication system	Page 103
Engine control	Page 104
Canbus, PC-aux and power supply	Page 105
Sliding cab	Page 106
Support legs	Page 107
Container attachment extra functions	Page 108

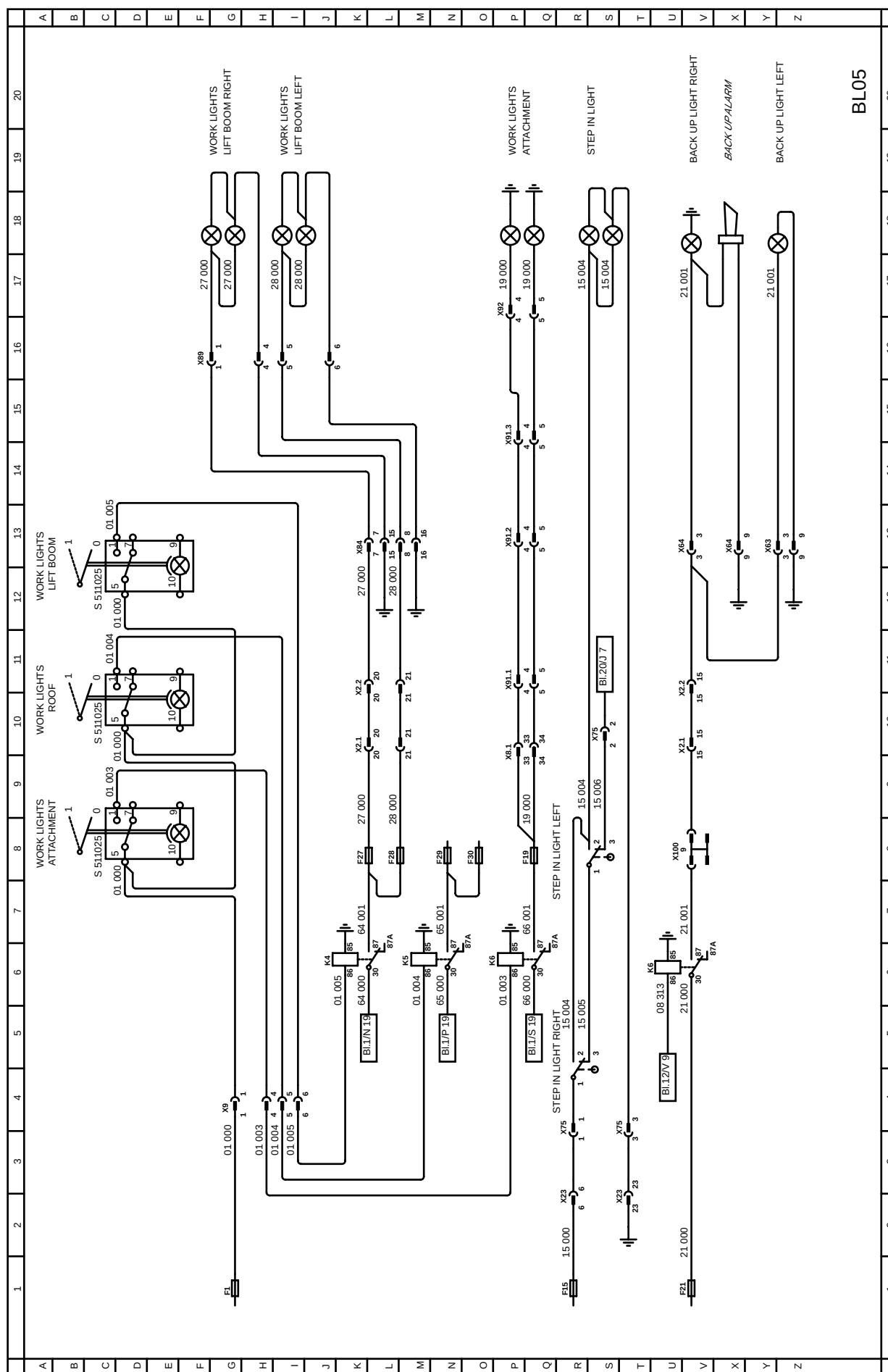


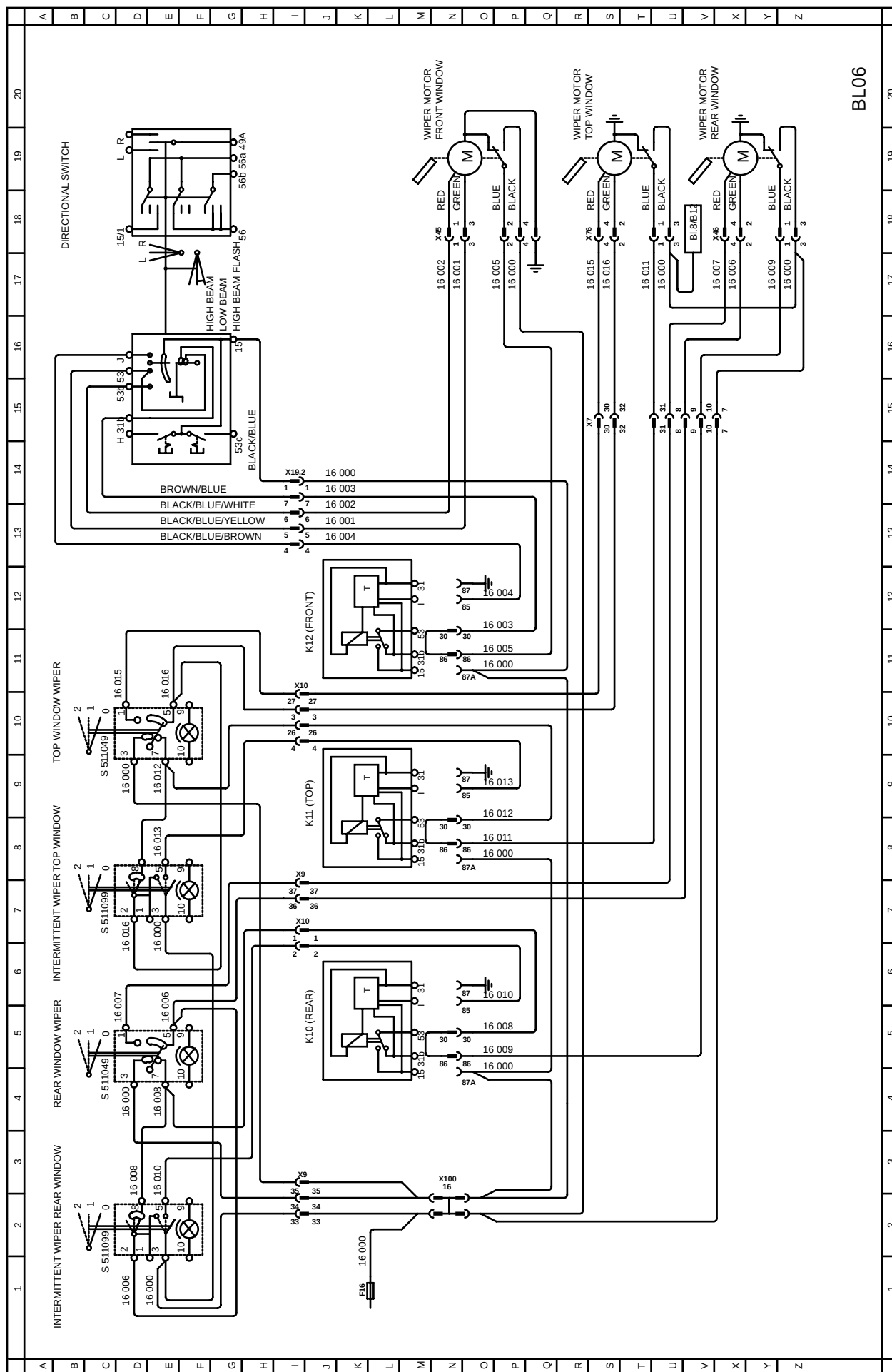


BL02

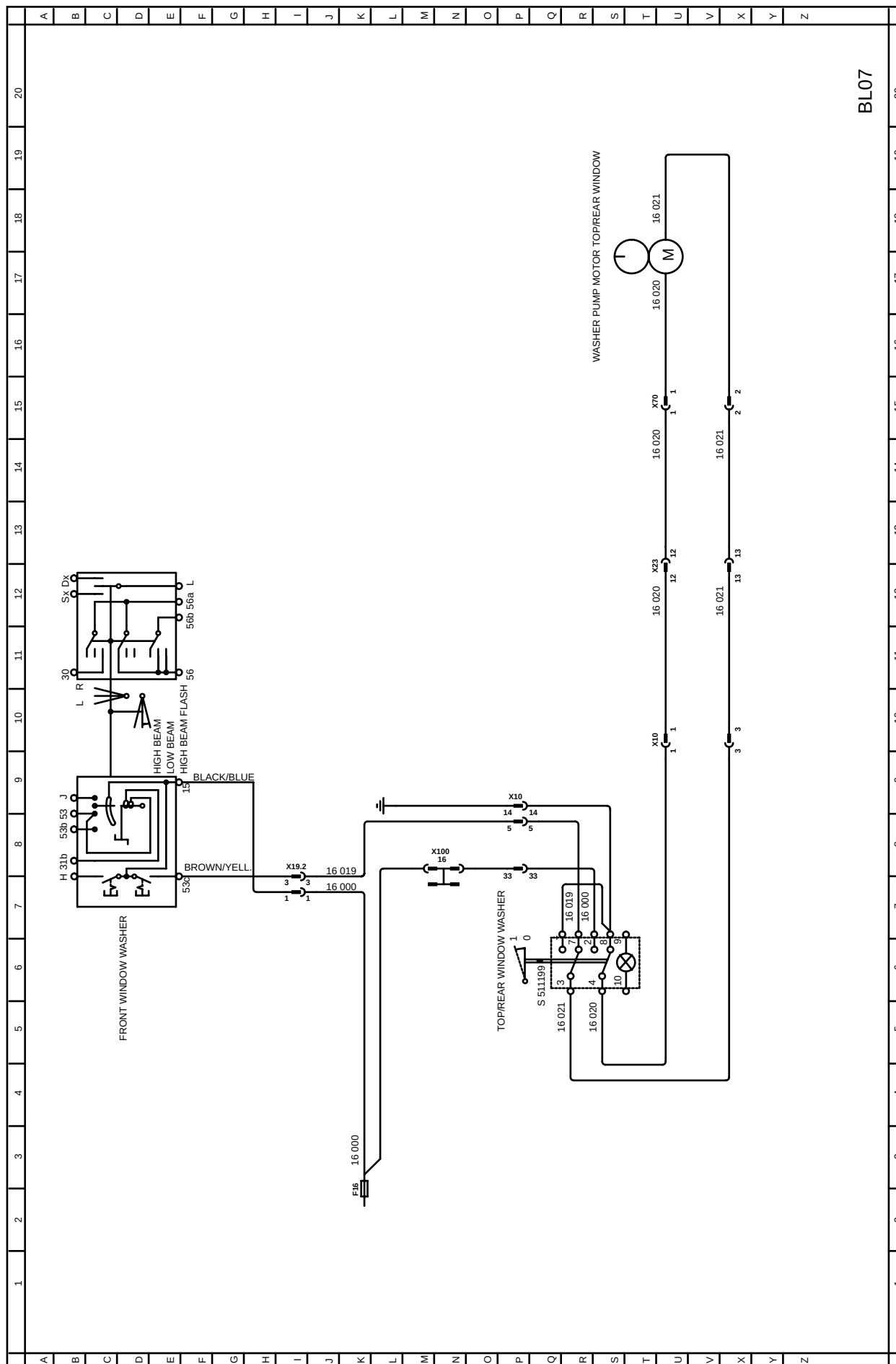




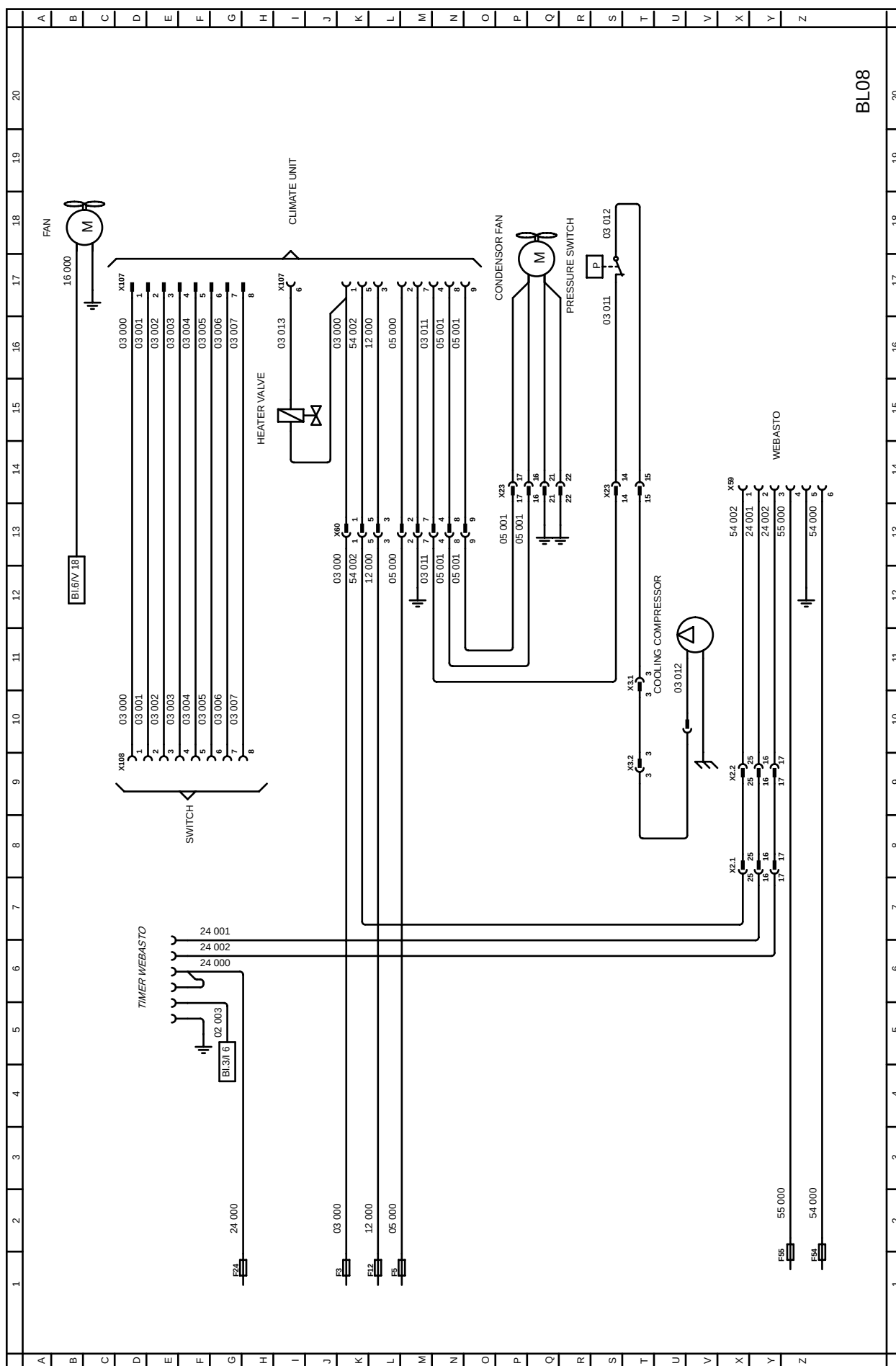


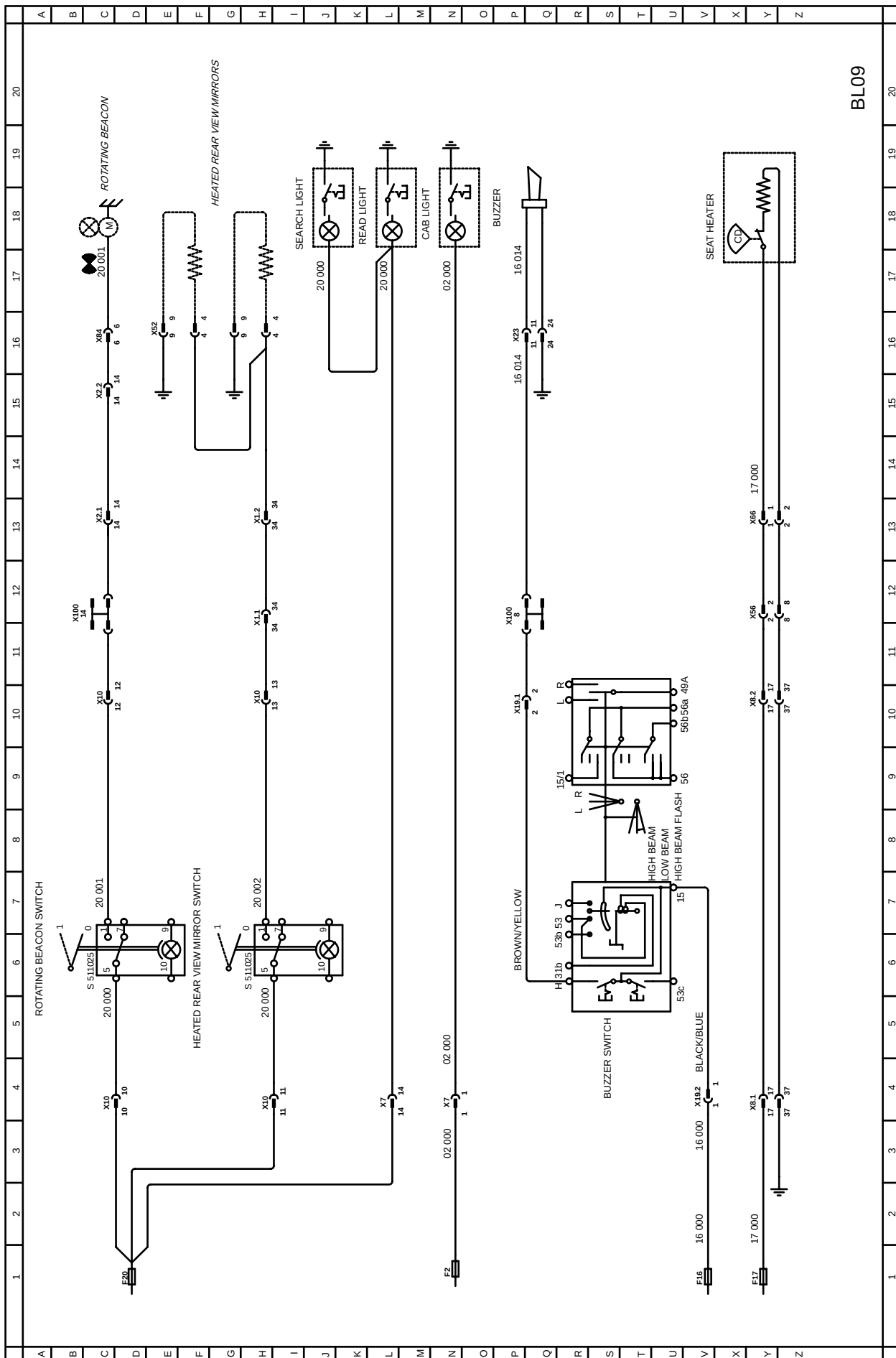


BL06



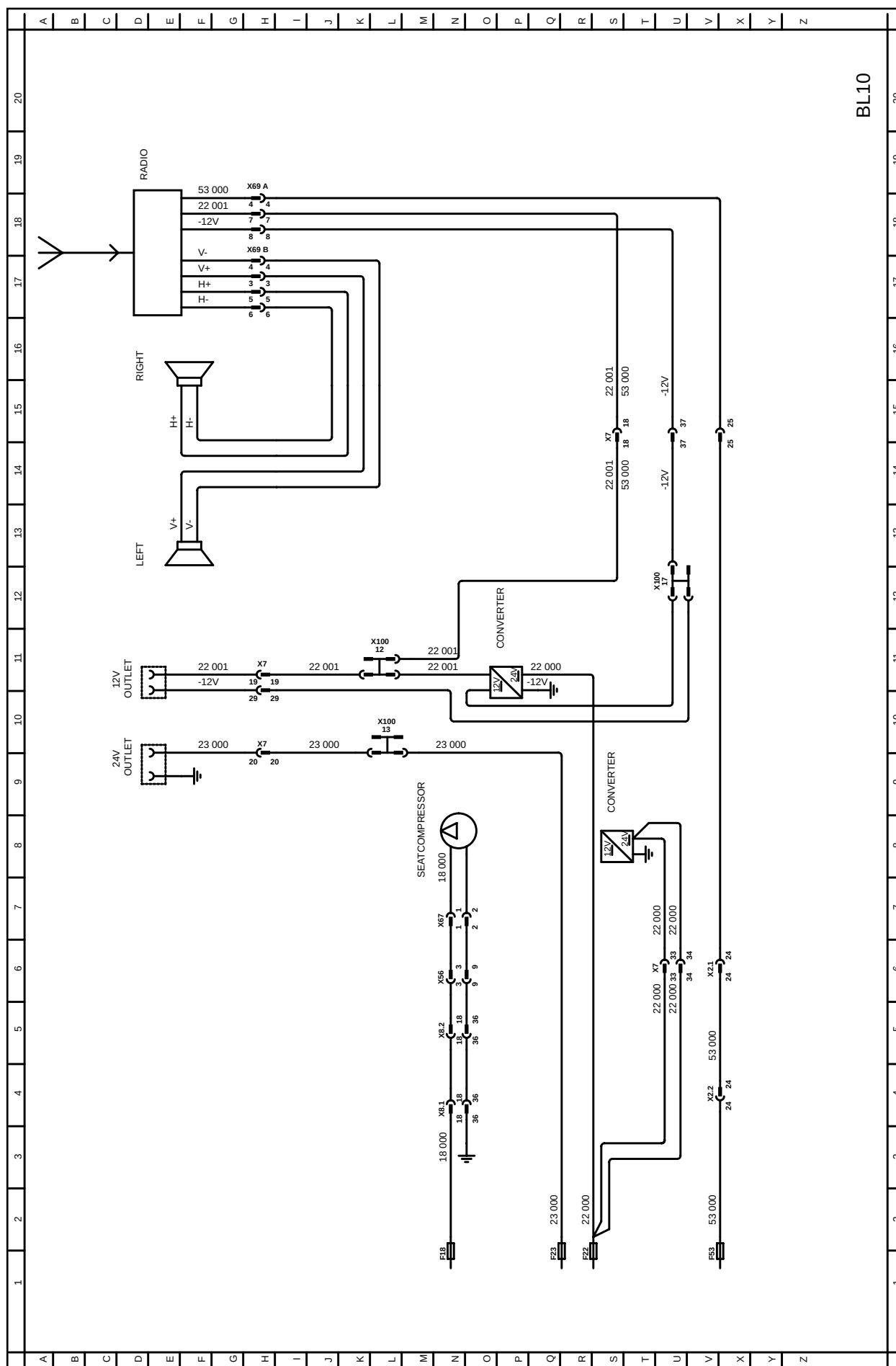
BL07



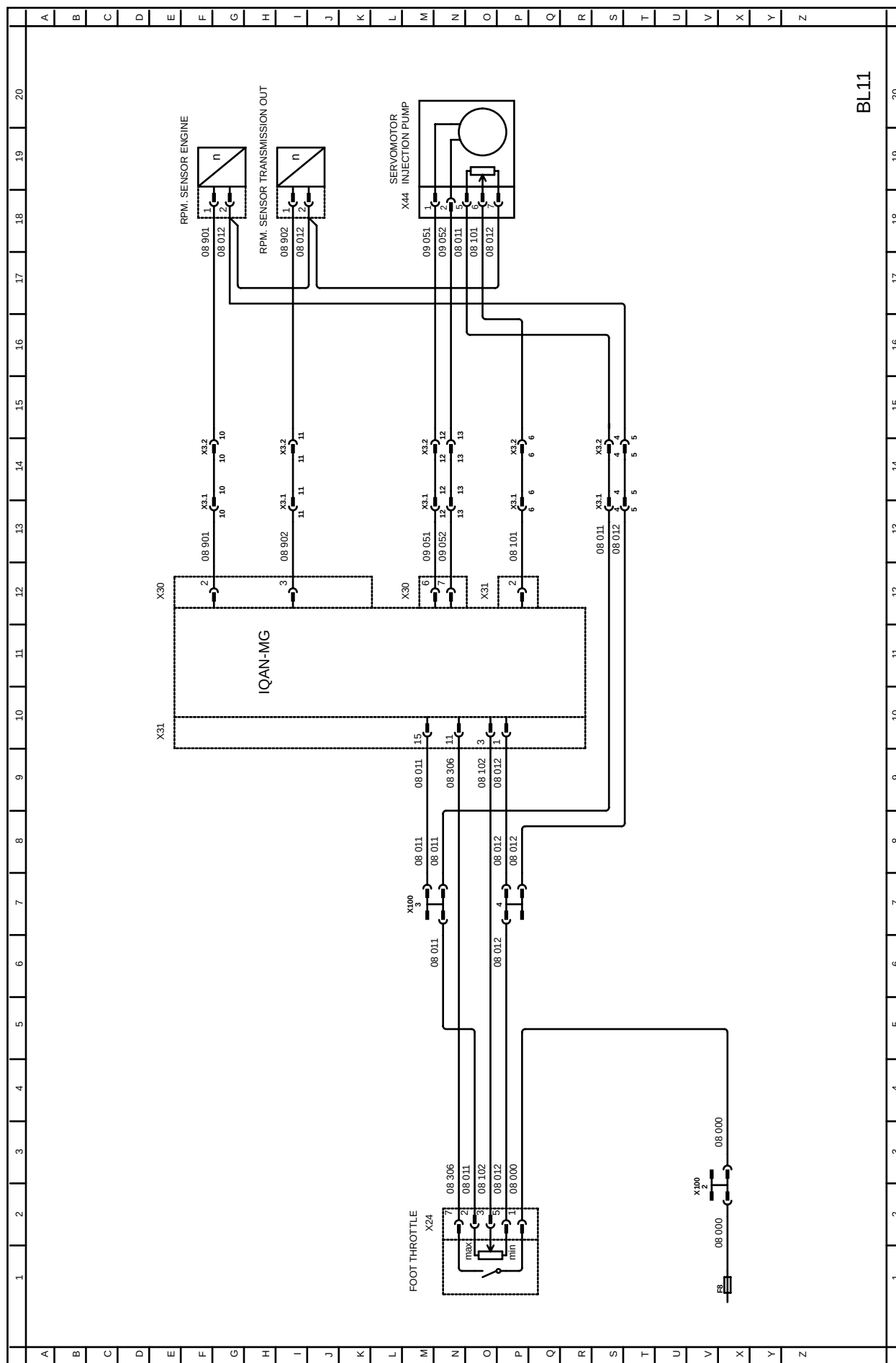


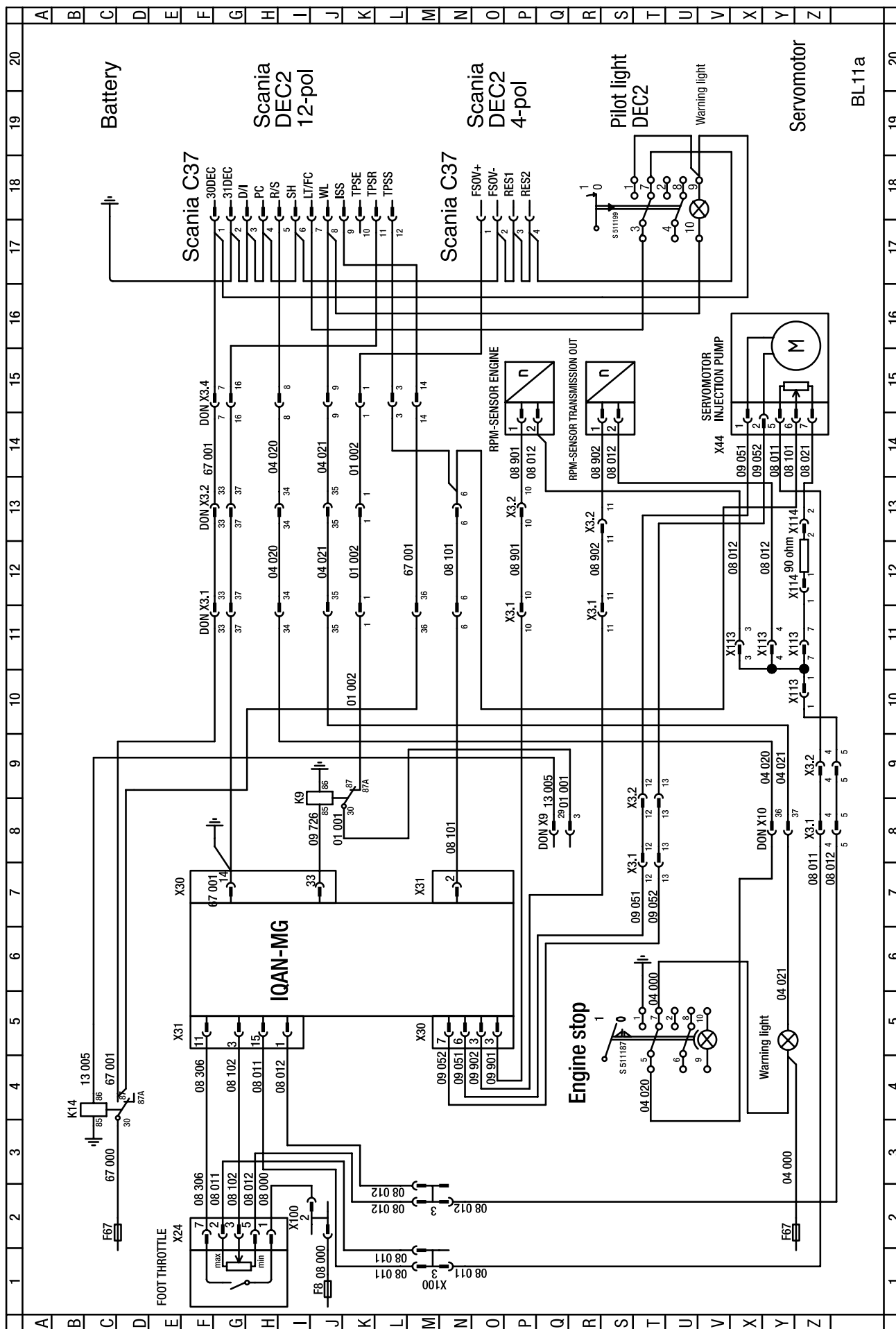


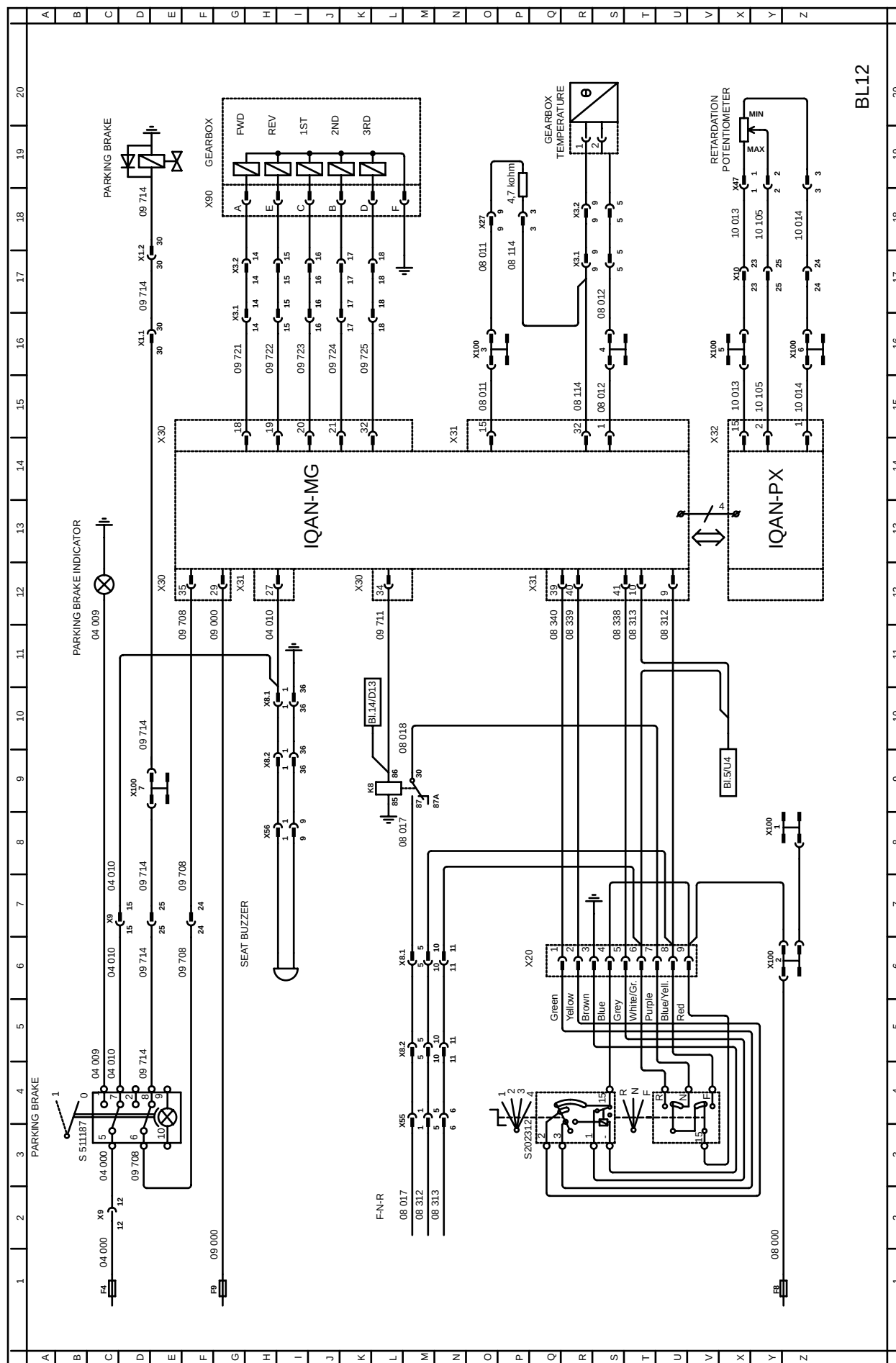
SEAT COMPRESSOR, RADIO AND 12/24 V OUTLET

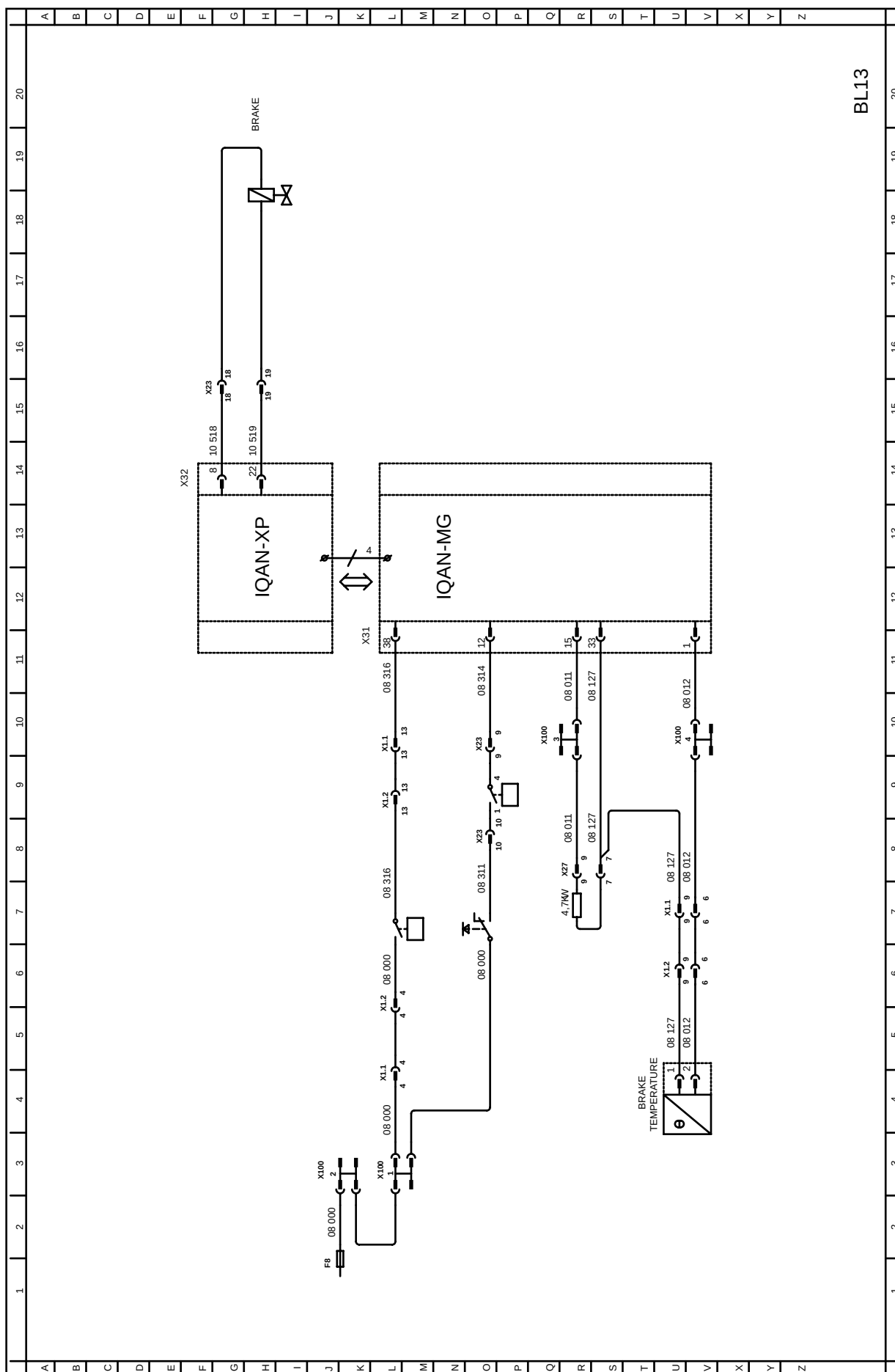


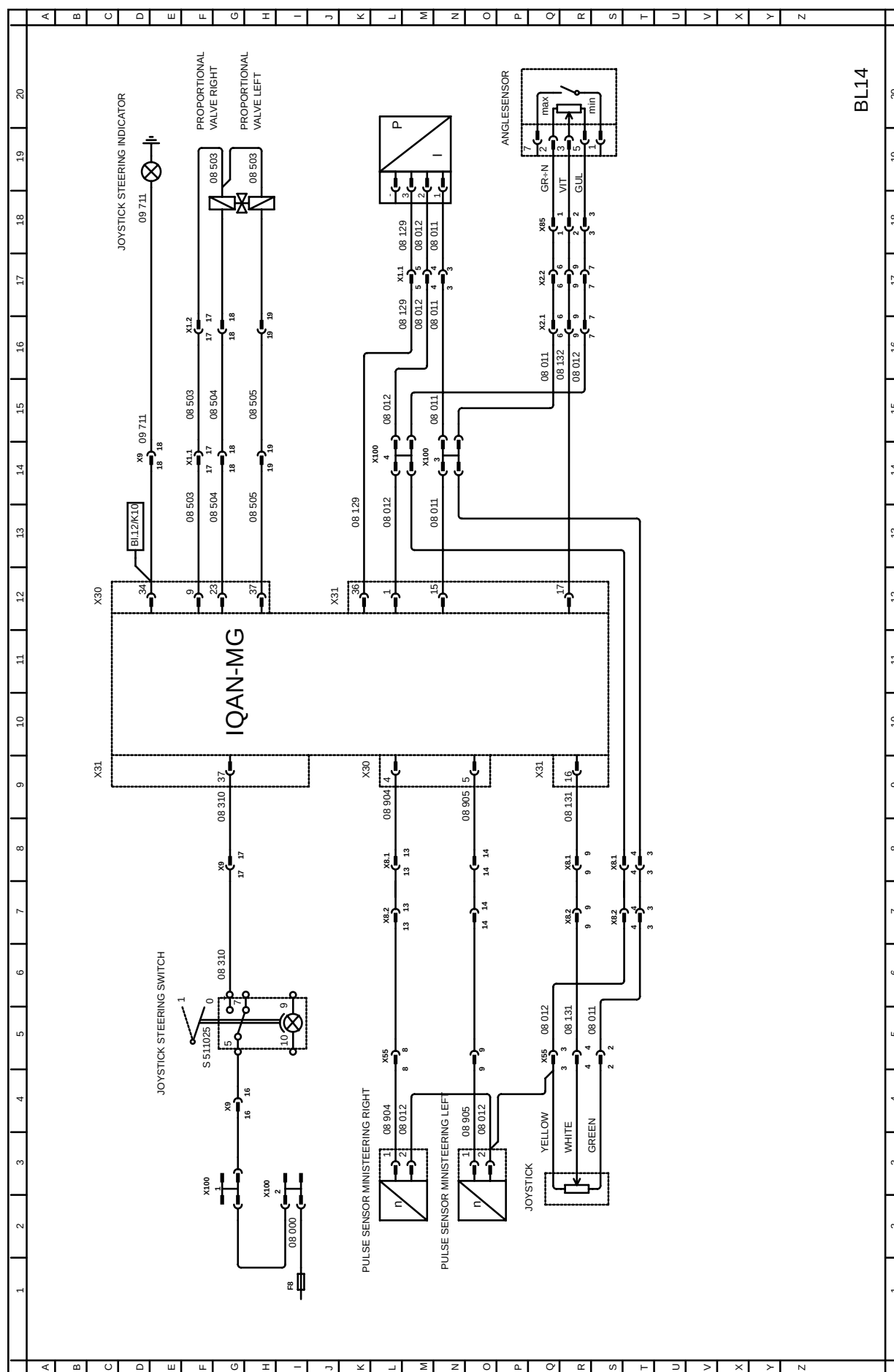
BL10

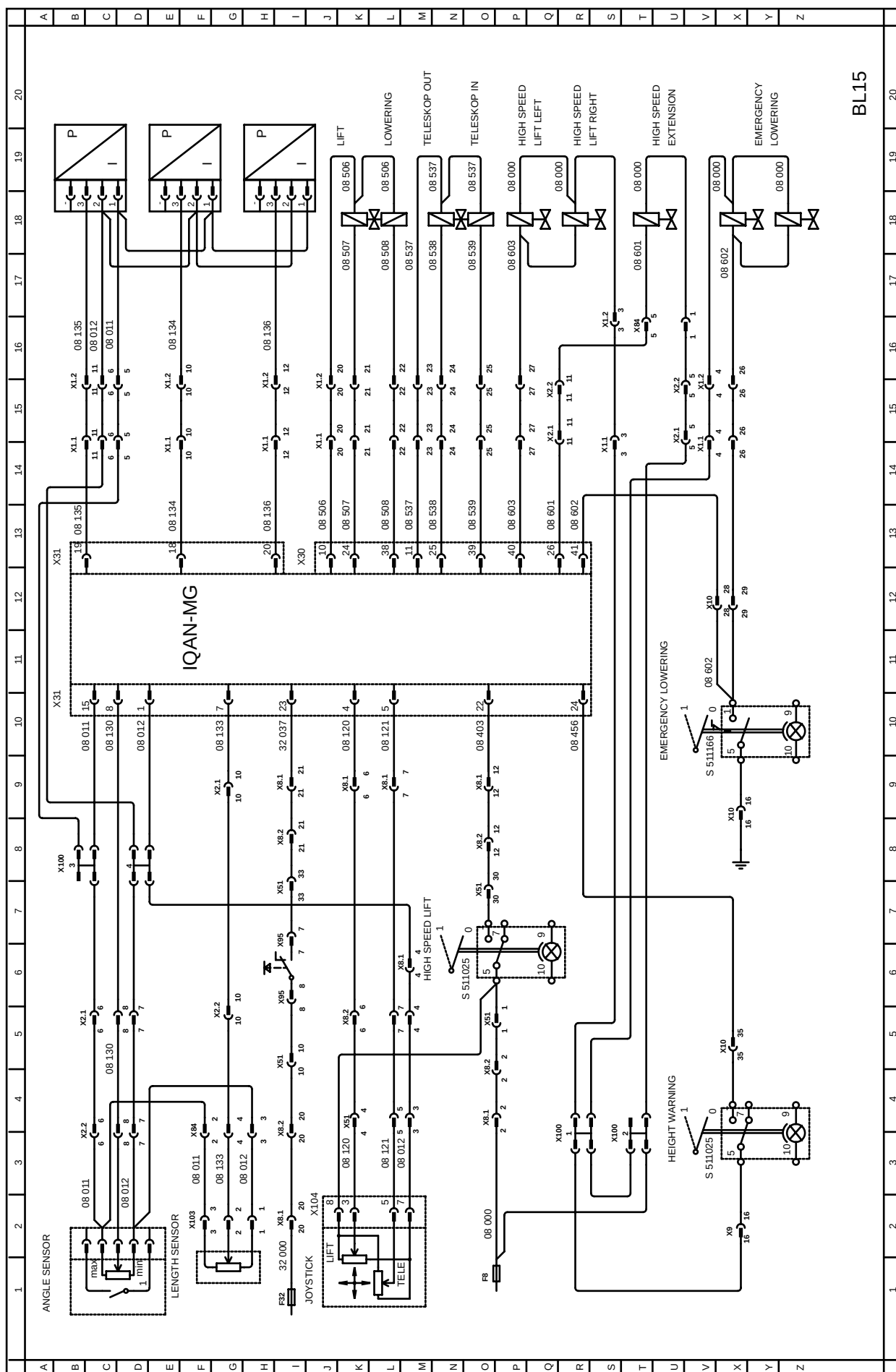






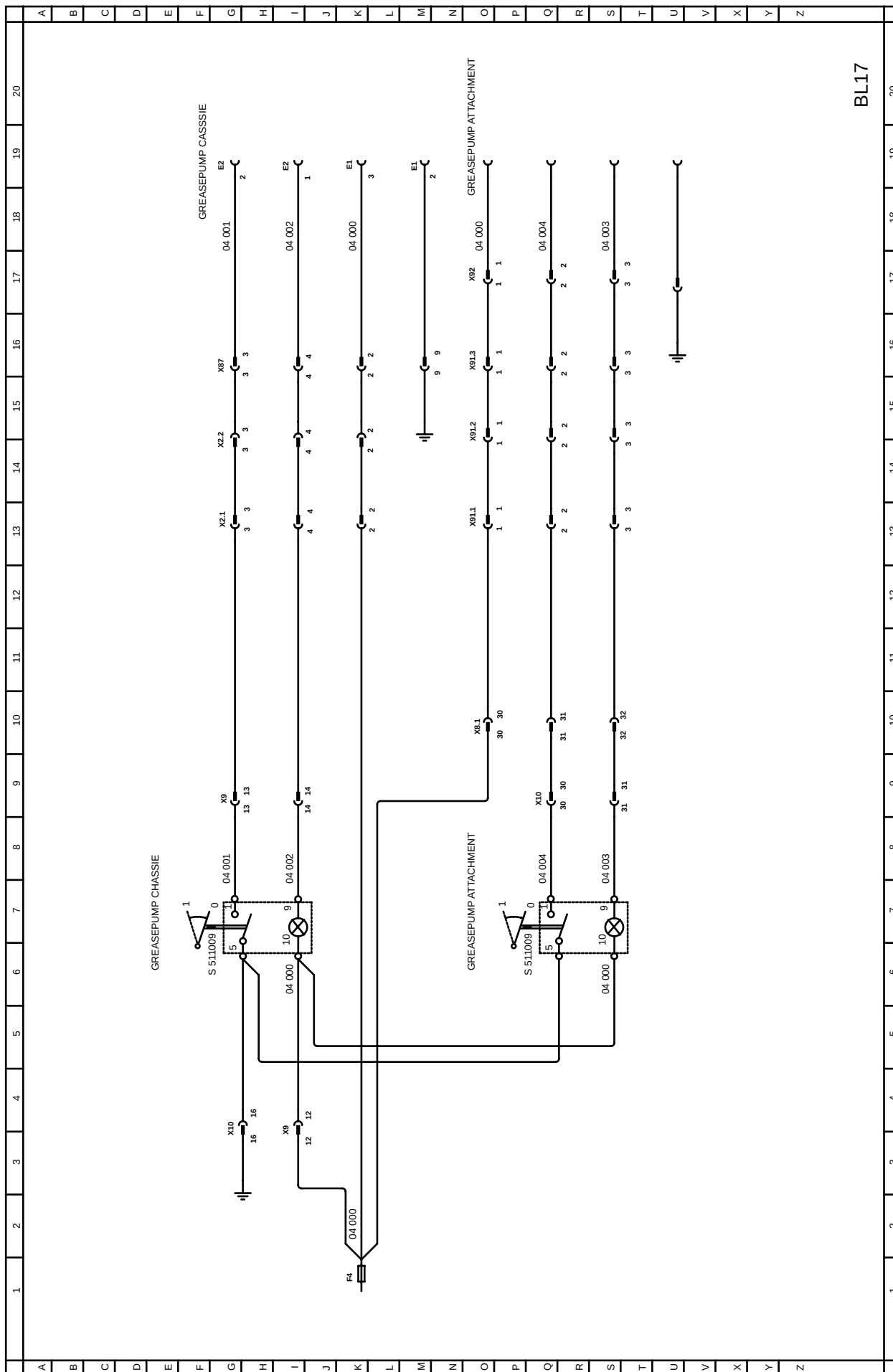


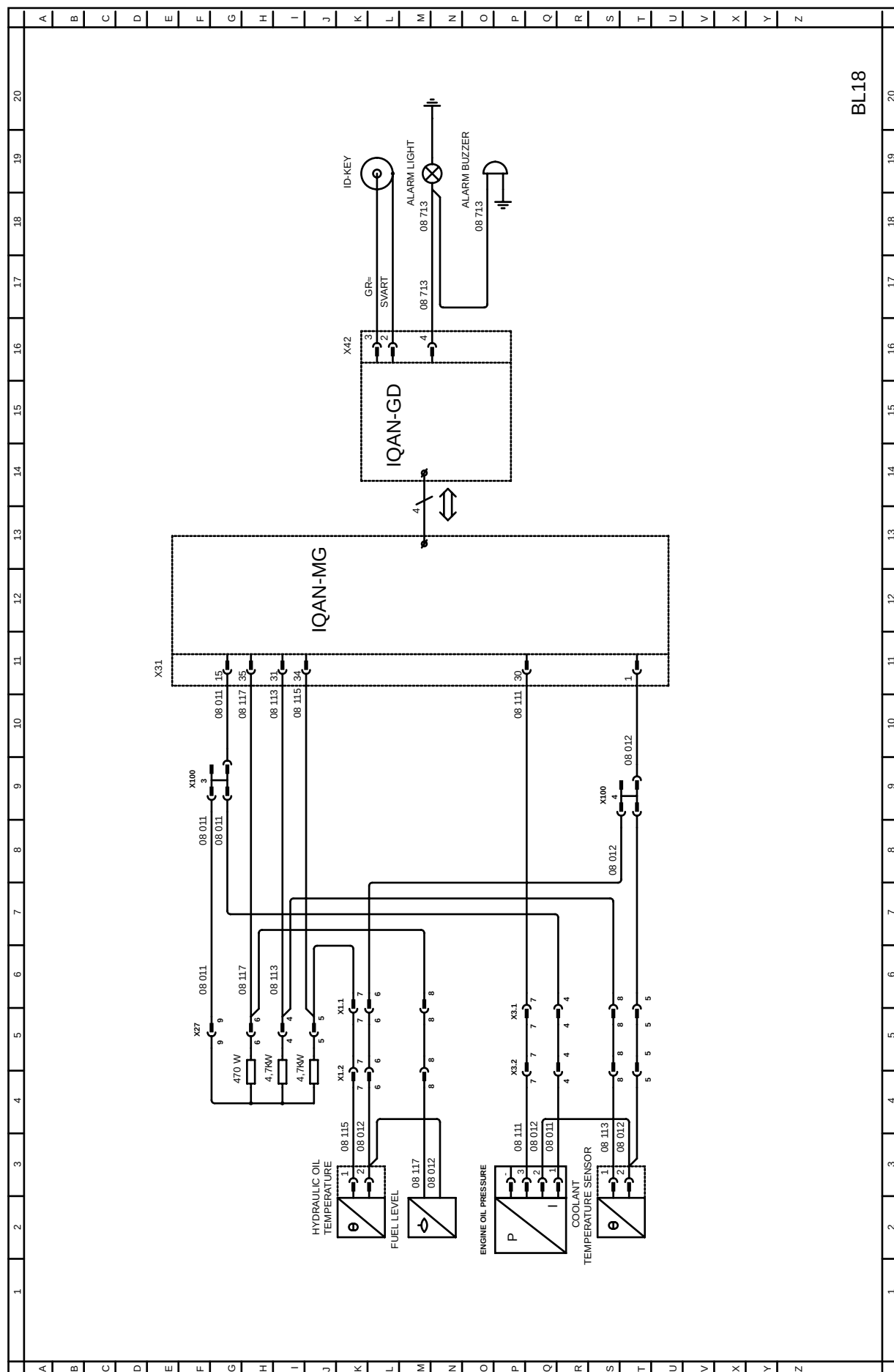




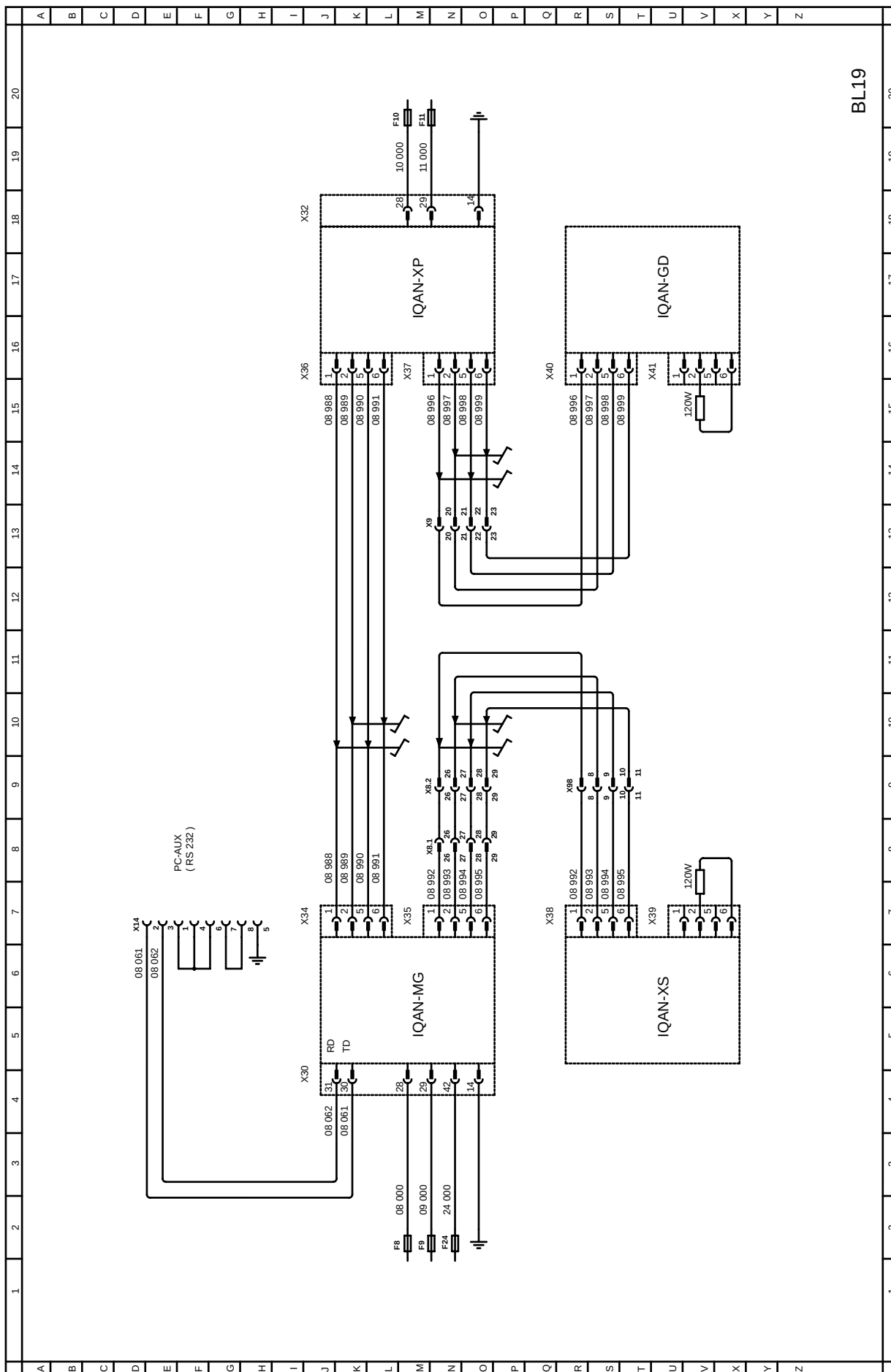
BL15



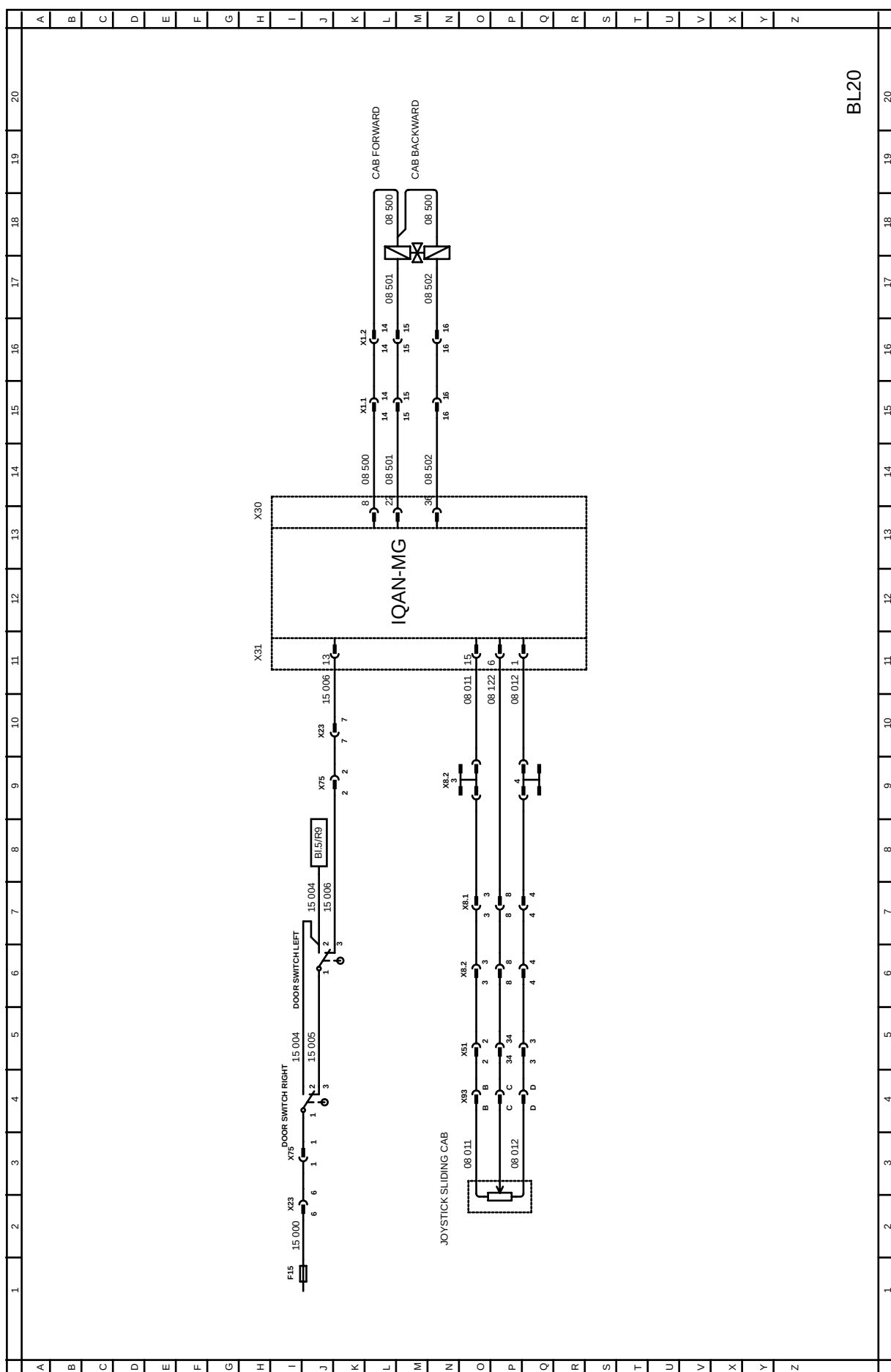


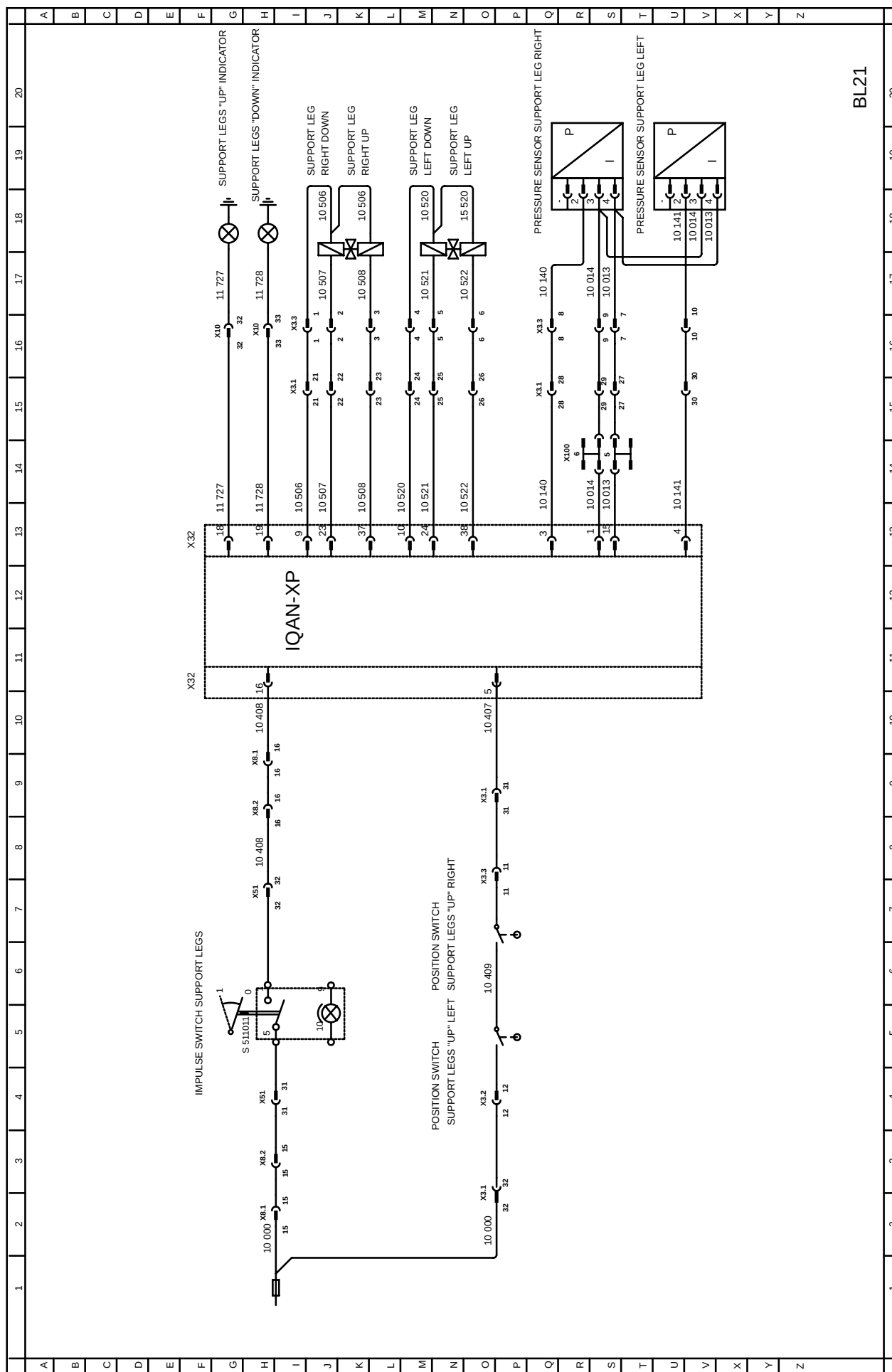


BL18



BL19





BL21

