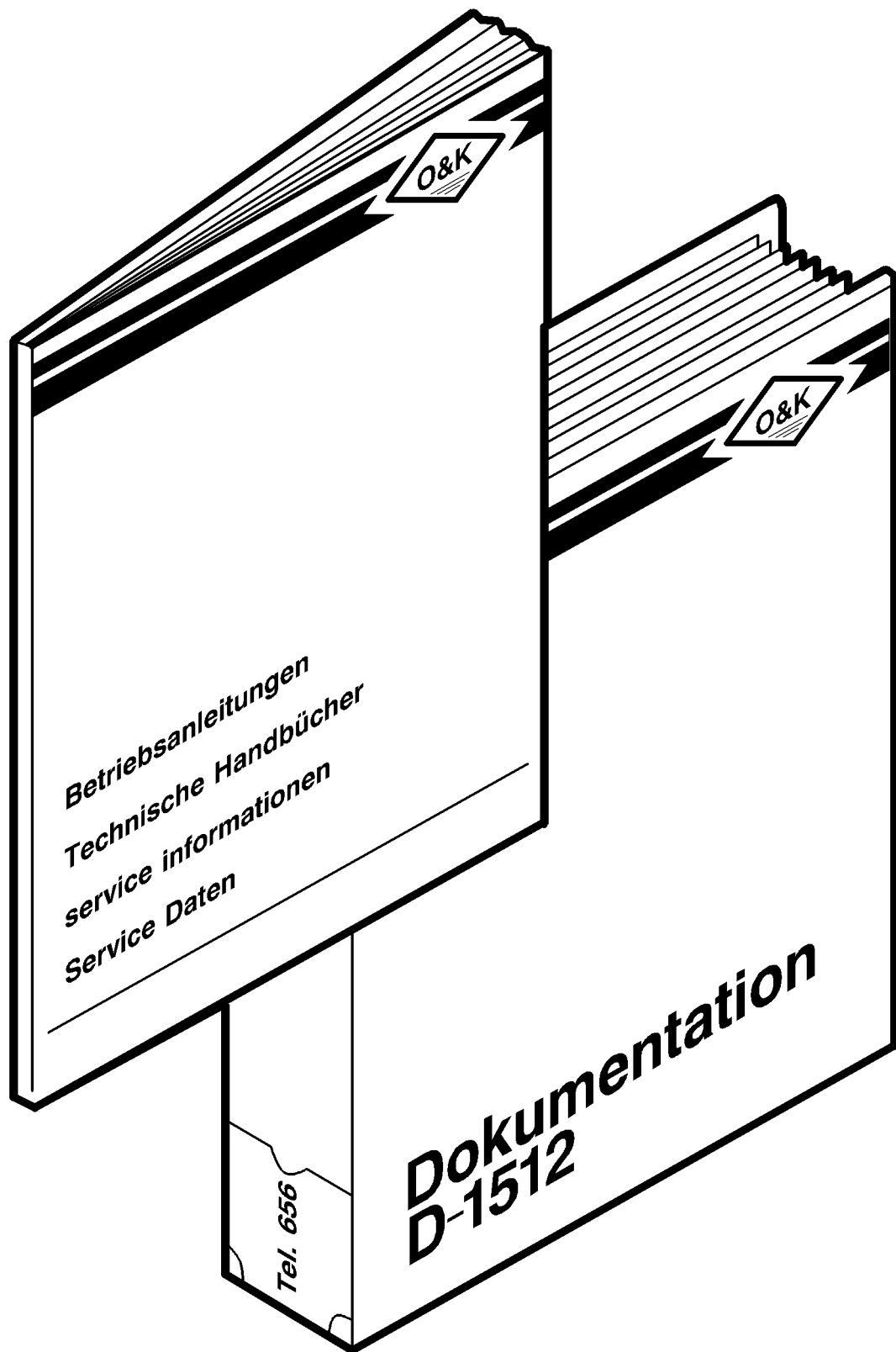




O&K

Operating Instructions

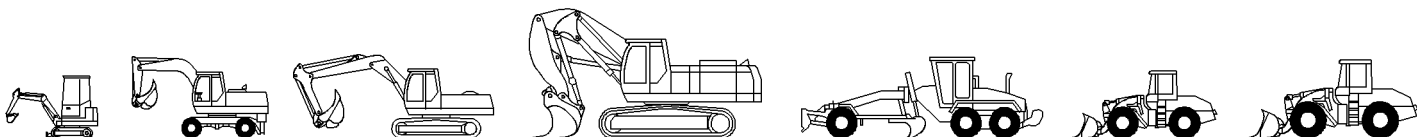
Grader

CE

F106.6/A

No.

O&K Orenstein & Koppel AG



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**The O&K operating manual is in 5 sections;
the sections are designed for different target groups:** 2261175

Operating manual		Target group
Part 1	INTRODUCTION FUNDAMENTAL SAFETY INSTRUCTIONS	Operating personnel + Inspection and servicing personnel + Repair personnel
Part 2	OPERATION	Operating personnel The operating personnel must have know-how relevant to the operation and the application of this or comparable machines.
Part 3	INSPECTION AND SERVICING	Inspection and servicing personnel The inspection and servicing personnel must have know-how relevant to the inspection and servicing of this or comparable machines.
Part 4	REPAIR WORK	Repair personnel The repair personnel must have know-how and experience relevant to the repair of this or comparable machines.
Part 5	ANNEX	Operating personnel + Inspection and servicing personnel + Repair personnel

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PART 1 - INTRODUCTION

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Operating manual		Target group
Part 1	INTRODUCTION FUNDAMENTAL SAFETY INSTRUCTIONS	Operating personnel + Inspection and servicing personnel + Repair personnel
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Part 5	ANNEX	Operating personnel + Inspection and servicing personnel + Repair personnel

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PREFACE

2261163

These operating instructions are designed to familiarize the operator with the machine and its designated use.

The instruction manual contains important information on how to operate the machine safely, properly and with maximum efficiency. Observing these instructions helps to prevent hazardous situations, to reduce repair costs and downtimes and to increase the reliability and service life of the machine.

The instruction manual must be supplemented by the respective national rules and regulations for accident prevention and environmental protection.

The operating instructions must always be available in the operator's cab of the machine.

The operating instructions must be read and put into practice by any person in charge of carrying out work with or on the machine, such as

- **operation**, including setting-up, troubleshooting in the course of work, care, evacuation of production waste and disposal of fuels and consumables.
- **maintenance** (inspection, servicing, repair) and / or
- **transport**.

In addition to the operating instructions and the mandatory rules and regulations for accident prevention and environmental protection in the user's country and at place where the machine is to be used, the generally recognized technical rules for safe and proper working must be observed. [1]

The operating instructions are directed to the construction-machine specialist. They cannot provide basic know-how. This can be acquired, for example, in several days' instruction by a qualified O&K mechanic or by attending an O&K training course for operators or maintenance personnel.

The **O&K after-sales service** will be pleased to deal with any queries you may have after reading through the operating instructions.

All O&K operating manuals are issued in German and then translated. Even a good translation may give rise to questions which O&K will be pleased to answer.

The operating instructions are not work instructions for carrying out major **repairs**. Such work is willingly done for you by the **O&K after-sales service**.

The documentation relating to the machine is listed according to scope, quantity and language in the shipping note of the machine or in the covering letter if supplied separately. The operating instructions and spare-parts list are marked with the serial number of the machine.

On taking receipt of the consignment, please check that the documentation is complete and in the language requested by you. □

Warranty

20000005

O&K's warranty is subject among other things to the following compulsory maintenance works having been performed by the O&K Service or by a workshop authorized in writing by O&K to perform such work.

1. Compulsory maintenance **N** 250 operating hours after commissioning.
2. Compulsory maintenance **B** 500 operating hours after commissioning.

The execution of the compulsory maintenance works in due course must be documented on the O&K service check-lists. □

[1] Complies with VDMA recommendation "Operating Instructions"

FUNDAMENTAL SAFETY INSTRUCTIONS

2261165

Complies with VDMA recommendation "Operating Instructions"

Warnings and symbols

The following signs are used in the manual to designate instructions of particular importance:

	Precautionary rules and measures designed to protect the machine operator and other persons from life-threatening danger or injuries and to prevent extensive damage.
	Information and precautionary measures designed to prevent damage to the machine or other property.

□

Designated use

2800105

The machine has been built with state of the art technology and in accordance with the officially recognised safety regulations. Nevertheless, its use may constitute a risk to life and limb for the operator or third parties, or cause damage to the machine and other property.

The machine must be used only in technically perfect condition in accordance with its designated use and the instructions set out in the operating manual, and only by safety-conscious persons who are fully aware of the risks involved in operating the machine. Important notices are to be found at the beginning of the chapters. Functional disorders should be rectified immediately, especially those which could affect safety conditions.

The grader is intended mainly for:

- Creating fine-graded surfaces
- Clearing away top soil
- Tearing up old road surfaces and hard ground
- Cutting slopes
- Clearing away ice and snow
- Gathering, spreading, mixing and compacting materials.

The grader can also be used with other working equipment for special purposes. The technical data offer clear instructions in this respect.

Designated use includes following the operating instructions and fulfilling the inspection and maintenance conditions.

	Using the machine for purposes other than or extending beyond those stated above, e.g.: - for the transportation of persons, - as a working platform, - for pulling or transporting loads without the working equipment being approved for such purposes, is considered contrary to the designated use. Improper use may involve a life-threatening risk for operators or other personnel or may cause injury or extensive damage.
---	--

The manufacturer/supplier cannot be held liable for any damage arising out of improper use. The risk involved in improper use lies entirely with the user.

Noise emission specification in accordance with the 3rd Ordinance of the Machine Safety Act (18/01/1991) and EC Machine Directive, 89/392/EEC.

If the earth-moving machine is operated in accordance with its designated use, the installation of driver's seats complying with ISO 7096 ensures that the considered vibration accelerations a_{zw} (measured as per ISO 2631, Part 1) fulfil the requirements of protecting the driver against wholebody vibration. □

Organizational measures

2261965

The operating instructions must always be at hand at the place of use of the machine, e.g. by stowing them in the tool compartment or tool-box provided for such purpose.

In addition to the operating instructions, observe and instruct the user in all other generally applicable legal and other mandatory regulations relevant to accident prevention and environmental protection.

These compulsory regulations may also deal with the handling of hazardous substances, issuing and/or wearing of personal protective equipment or traffic regulations.

The operating instructions must be supplemented by instructions covering the duties involved in supervising and notifying special organizational features, such as job organization, working sequences or the personnel entrusted with the work.

Personnel entrusted with work on the machine must have read the operating instructions and in particular the chapter on safety before beginning work. Reading the instructions after work has begun is too late. This applies especially to persons working only occasionally on the machine, e.g. during setting up or maintenance.

Check - at least from time to time - whether the personnel is carrying out the work in compliance with the operating instructions and paying attention to risks and safety factors.

For reasons of security, long hair must be tied back or otherwise secured, garments must be close-fitting and no jewellery, such as rings, may be worn. Injury may result from being caught up in the machinery or from rings catching on moving parts.

Use protective equipment wherever required by the circumstances or by law.

Observe all safety instructions and warnings attached to the machine.

See to it that safety instructions and warnings attached to the machine are always complete and perfectly legible.

In the event of safety-relevant modifications or changes in the behaviour of the machine during operation, stop the machine immediately and report the malfunction to the competent authority/person.

Never make any modifications, additions or conversions which might affect safety without the supplier's approval. This also applies to the installation and adjustment of safety devices and valves as well as to welding work on load-bearing elements.

Spare parts must comply with the technical requirements specified by the manufacturer. Spare parts from original equipment manufacturers can be relied upon to do so.

Replace hydraulic hoses within stipulated and appropriate intervals, even if no safety-relevant defects have been detected.

Adhere to prescribed intervals or those specified in the operating instructions for routine checks and inspections.

For the execution of maintenance work, tools and workshop equipment adapted to the task on hand are absolutely indispensable.

The personnel must be familiar with the location and operation of fire extinguishers.

Observe all fire-warning and fire-fighting procedures.

Selection and qualification of personnel - basic responsibilities

Any work on and with the machine must be executed by reliable personnel only. Statutory minimum age limits must be observed.

Employ only trained or instructed staff and set out clearly the individual responsibilities of the personnel for operation, set-up, maintenance and repair.

Make sure that only authorized personnel works on or with the machine.

Define the machine operator's responsibilities - also with regard to observing traffic regulations - giving the operator the authority to refuse instructions by third parties that are contrary to safety.

Do not allow persons to be trained or instructed or persons taking part in a general training course to work on or with the machine without being permanently supervised by an experienced person.

Work on the electrical system and equipment of the machine must be carried out only by a skilled electrician or by instructed persons under the supervision and guidance of a skilled electrician and in accordance with electrical engineering rules and regulations.

Work on chassis, brake and steering systems must be performed by skilled personnel only, which has been specially trained for such work.

Work on the hydraulic system must be carried out only by personnel with special knowledge and experience of hydraulic equipment.

Safety instructions governing specific operational phases

Standard operation

Avoid any operational mode that might be prejudicial to safety.

Before beginning work, familiarize yourself with the surroundings and circumstances of the site, such as obstacles in the working and travelling area, the soil bearing capacity and any barriers separating the construction site from public roads.

Take the necessary precautions to ensure that the machine is used only when in a safe and reliable state.

Operate the machine only if all protective and safety-oriented devices, such as removable safety devices, emergency shut-off equipment, sound-proofing elements and exhausters, are in place and fully functional.

Check the machine at least once per working shift for obvious damage and defects. Report any changes (incl. changes in the machine's working behaviour) to the competent organization/person immediately. If necessary, stop the machine immediately and lock it.

In the event of malfunctions, stop the machine immediately and lock it. Have any defects rectified immediately.

Start the machine from the driver's seat only.

During start-up and shut-down procedures always watch the indicators in accordance with the operating instructions.

Before setting the machine in motion, make sure that nobody is at risk.

Before starting work or travelling with the machine, check that the braking, steering, signalling and lighting systems are fully functional.

Before setting the machine in motion always check that the accessories have been safely stowed away.

When travelling on public roads, ways and places always observe the valid traffic regulations and, if necessary, make sure beforehand that the machine is in a condition compatible with these regulations.

In conditions of poor visibility and after dark always switch on the lighting system.

Persons accompanying the driver must be seated on the passenger seats provided for this purpose.

When crossing underpasses, bridges and tunnels or when passing under overhead lines always make sure that there is sufficient clearance.

Always keep at a distance from the edges of building pits and slopes.

Avoid any operation that might be a risk to machine stability.

Never travel across slopes; always keep the working equipment and the load close to the ground, especially when travelling downhill.

On sloping terrain always adapt your travelling speed to the prevailing ground conditions. Never change to a lower gear on a slope but always before reaching it.

Before leaving the driver's seat always secure the machine against inadvertent movement and unauthorized use.

Special work in conjunction with utilization of the machine - maintenance and repairs during operation - disposal of parts and consumables

Observe the adjusting, maintenance and inspection activities and intervals set out in the operating instructions, including information on the replacement of parts and equipment. These activities may be executed by skilled personnel only.

Brief operating personnel before beginning special operations and maintenance work, and appoint a person to supervise the activities.

In any work concerning the operation, conversion or adjustment of the machine and its safety-oriented devices or any work related to maintenance, inspection and repair, always observe the start-up and shut-down procedures set out in the operating instructions and the information on maintenance work.

Ensure that the maintenance area is adequately secured.

If the machine is completely shut down for maintenance and repair work, it must be secured against inadvertent starting by:

- removing the ignition key and
- attaching a warning sign.

Carry out maintenance and repair work only if the machine is positioned on stable and level ground and has been secured against inadvertent movement and buckling.

To avoid the risk of accidents, individual parts and large assemblies being moved for replacement purposes should be carefully attached to lifting tackle and secured. Use only suitable and technically perfect lifting gear and suspension systems with adequate lifting capacity. Never work or stand under suspended loads.

The fastening of loads and the instructing of crane operators should be entrusted to experienced persons only. The marshaller giving the instructions must be within sight or sound of the operator.

For carrying out overhead assembly work always use specially designed or otherwise safety-oriented ladders and working platforms. Never use machine parts as a climbing aid.

Wear a safety harness when carrying out maintenance work at greater heights.

Keep all handles, steps, handrails, platforms, landings and ladders free from dirt, snow and ice.

Clean the machine, especially connections and threaded unions, of any traces of oil, fuel or preservatives before carrying out maintenance/repair. Never use aggressive detergents. Use lint-free cleaning rags.

Before cleaning the machine with water, steam jet (high-pressure cleaning) or detergents, cover or tape up all openings which - for safety and functional reasons - must be protected against water, steam or detergent penetration. Special care must be taken with electric motors and switchgear cabinets.

Ensure during cleaning of the machine that the temperature sensors of the fire-warning and fire-fighting systems do not come into contact with hot cleaning agents as this might activate the fire-fighting system.

After cleaning, remove all covers and tapes applied for that purpose.

After cleaning, examine all fuel, lubricant, and hydraulic fluid lines for leaks, loose connections, chafe marks and damage. Any defects found must be rectified without delay.

Always tighten any screwed connections that have been loosened during maintenance and repair.

Any safety devices removed for set-up, maintenance or repair purposes must be refitted and checked immediately upon completion of the maintenance and repair work.

Ensure that all consumables and replaced parts are disposed of safely and with minimum environmental impact.

Warning of special dangers

Electric energy

Use only original fuses with the specified current rating. Switch off the machine immediately if trouble occurs in the electrical system.

When working with the machine, maintain a safe distance from overhead electric lines. If work is to be carried out close to overhead lines, the working equipment must be kept well away from them. Caution, danger! Check out the prescribed safety distances.

If your machine comes into contact with a live wire

- do not leave the machine
- drive the machine out of the hazard zone
- warn others against approaching and touching the machine
- have the live wire de-energized
- do not leave the machine until the damaged line has been safely de-energized.

The electrical equipment of machines is to be inspected and checked at regular intervals. Defects such as loose connections or scorched cables must be rectified immediately.

Gas, dust, steam and smoke

Operate internal combustion engines and fuel-operated heating systems only on adequately ventilated premises. Before starting the machine on enclosed premises, make sure that there is sufficient ventilation.

Observe the regulations in force at the respective site.

Carry out welding, flame-cutting and grinding work on the machine only if this has been expressly authorized, as there may be a risk of explosion and fire.

Before carrying out welding, flame-cutting and grinding operations, clean the machine and its surroundings from dust and other inflammable substances and make sure that the premises are adequately ventilated (risk of explosion).

Hydraulic and pneumatic equipment

Check all lines, hoses and screwed connections regularly for leaks and obvious damage. Repair damage immediately. Splashed oil may cause injury and fire.

Depressurize all system sections and pressure pipes (hydraulic system, compressed-air system) to be removed in accordance with the specific instructions for the unit concerned before carrying out any repair work.

Hydraulic and compressed-air lines must be laid and fitted properly. Ensure that no connections are interchanged. The fittings, lengths and quality of the hoses must comply with the technical requirements.

Noise

During operation, all sound baffles of the machine must be closed.

Always wear the prescribed ear protectors.

Oil, grease and other chemical substances

When handling oil, grease and other chemical substances, observe the product-related safety regulations.

Be careful when handling hot consumables (risk of burning or scalding).

Transporting and towing - recommissioning

The machine must be towed, loaded and transported only in accordance with the operating instructions.

For towing the machine observe the prescribed transport position, admissible speed and itinerary.

Use only appropriate means of transport and lifting gear of adequate capacity.

The recommissioning procedure must be strictly in accordance with the operating instructions. □

2800145

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PART 2 - OPERATION

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Operating manual		Target group
Part 1	INTRODUCTION FUNDAMENTAL SAFETY INSTRUCTIONS	Operating personnel + Inspection and servicing personnel + Repair personnel
Part 2	OPERATION	Operating personnel The operating personnel must have know-how relevant to the operation and the application of this or comparable machines.
Part 3	INSPECTION AND SERVICING	Inspection and servicing personnel The inspection and servicing personnel must have know-how relevant to the inspection and servicing of this or comparable machines.
Part 4	REPAIR WORK	Repair personnel The repair personnel must have know-how and experience relevant to the repair of this or comparable machines.
Part 5	ANNEX	Operating personnel + Inspection and servicing personnel + Repair personnel

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Operation - Safety instructions

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Operating instructions

Never operate the machine before having read and understood the operating instructions.

Pay special attention to:

"Fundamental Safety Instructions" and all warnings and safety instructions attached to the machine.

Familiarize yourself with the layout, the functioning and the activating devices of the control elements prior to starting up the machine.

Activate the control elements from the driver's seat only.

Keep the operating instructions with the machine at all times.

Operating personnel

The operating personnel must be fully informed of the operation and application of this or comparable machines.

The necessary know-how can be acquired in several days' instruction, e.g. by an O&K mechanic or by attending an O&K operators' training course.

Personal protective gear and working clothing

Wear a safety helmet and working footwear with non-slip soles. Smooth soles may slip from steps and pedals, resulting in injury or incorrect operation.

Wear closely fitting working clothing when operating the machine. Loose, wide garments may result in the control lever being inadvertently activated.



Safety belt

For machines with a safety belt for operating personnel:

Check safety belt attached to driver's seat. In the event of damage or after an accident, have it replaced immediately.

Apply safety belt before starting work.

State of the machine

Operate the machine only in a safe state and only in accordance with its designated use. Always observe the safety instructions.

Always have inspection and maintenance work carried out on schedule.

Operate the machine only with the equipment and component combinations approved by O&K. Clear-cut data are given in the technical specifications.

Never install and commission other equipment and component combinations without O&K having first inspected and approved the project.

Before starting work or travelling with the machine, check that the braking, steering, signalling and lighting systems are fully functional.

Poor visibility may result in accidents. Always clean the windows and the glass covers of all lights before starting up the machine.

Check that all warnings and safety instructions attached to the machine are present and legible.

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Entering and leaving the machine

Use only the steps, platforms and handrails provided when entering and leaving the machine.

Always keep steps, platforms, handles and handrails in a non-slip, safe state and remove any oil, grease, soil, clay, snow, ice and other foreign matter immediately.

Always face the machine when entering and leaving.

Hazard range

The hazard range is that zone around the machine in which persons are within reach of falling loads or falling attachments due to operational movements by the machine, to its equipment and attachments or to swinging loads.

Persons within the hazard zone

Always use the horn to warn persons in the immediate vicinity of the machine before starting up the machine.

Ensure that no one sets foot in the hazard zone of the machine. Interrupt work until such persons have left the hazard zone.



Marshallers

The marshall must keep outside the hazard zone.

Have a marshall to assist you:

- when you have no clear overview over the hazard zone of the machine,
- when reversing,
- when shunting.

Use only those communication signals which you and the marshall understand, or use aids for communication (e.g. walkie-talkie / camera). Calls cannot be understood by the marshall because of the noise made by the machine during operation.

Keep in constant contact with the marshall.

Stop the machine immediately if you lose contact with the marshall.

Securing the machine

Secure the machine as described in the section "Securing the Machine" before:

- mounting or dismantling the attachment,
- parking the machine after daily operation,
- carrying out any servicing or repair work.

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DESCRIPTION OF THE MACHINE

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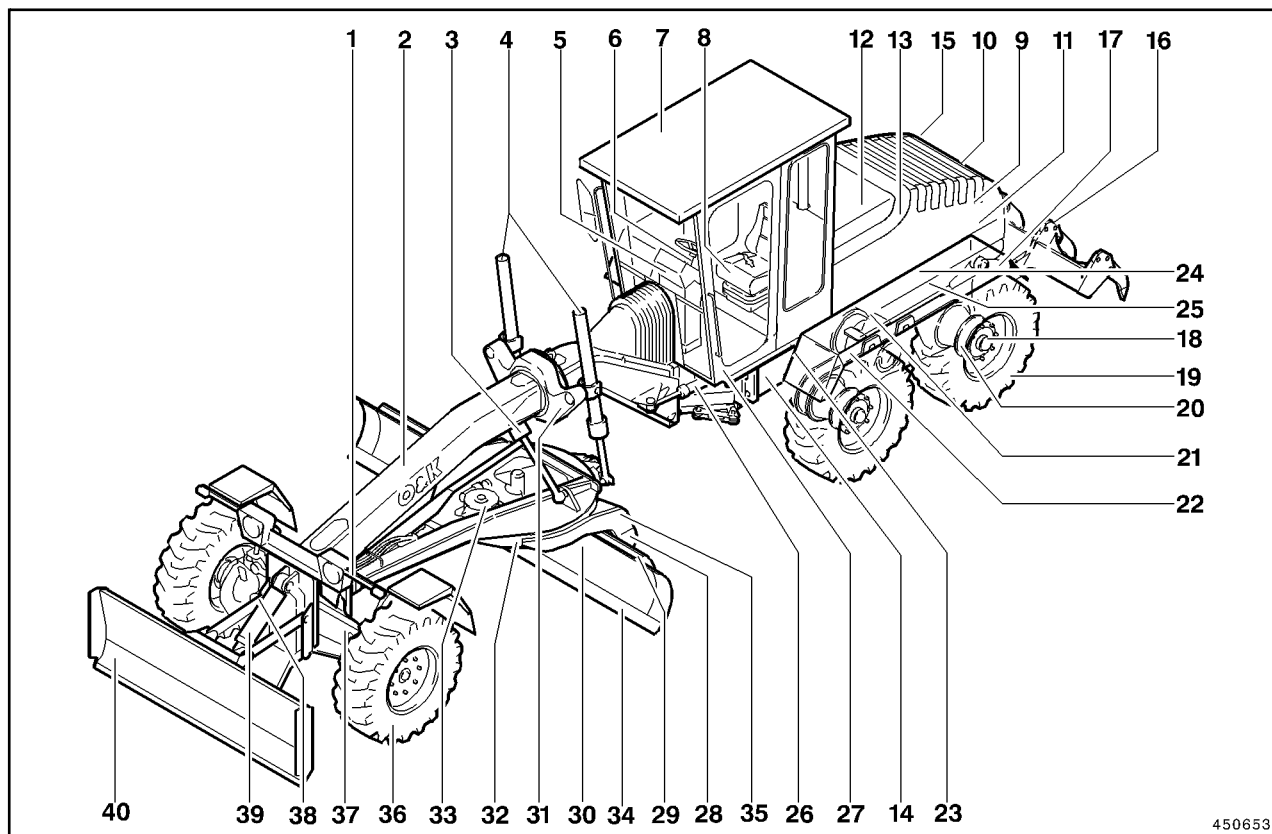


Fig. 1

Machine layout (Fig. 1)

- | | |
|--|---|
| 1 - Steering cylinder | 21 - Rear axle gear |
| 2 - Front frame | 22 - Tandem case |
| 3 - Blade swivelling cylinder | 23 - Rear frame |
| 4 - Blade lifting cylinder | 24 - Cardan shaft - powershift transmission - rear axle |
| 5 - Control block | 25 - Parking brake (disk brake) |
| 6 - Steering, hydrostatic | 26 - Center-pivot joint cylinder |
| 7 - Driver's cab | 27 - Center-pivot joint |
| 8 - Driver's seat | 28 - Pitch adjustment cylinder |
| 9 - Speed-change gearbox, 6 gears | 29 - Blade ripper (option) |
| 10 - Multi-purpose radiator gearbox/hydraulic oil/coolant/charge air | 30 - Blade sideshift cylinder |
| 11 - Torque converter | 31 - Swivel arm, 5 adjustable positions |
| 12 - Engine air filter | 32 - Blade slewing ring |
| 13 - Diesel engine | 33 - Blade slewing gear |
| 14 - Fuel tank | 34 - Blade |
| 15 - Hydraulic reservoir | 35 - Blade carrier |
| 16 - Rear ripper cylinder (option) | 36 - Front wheels |
| 17 - Rear ripper cylinder (option) | 37 - Front axle |
| 18 - Wheel-hub | 38 - Wheel rake cylinder |
| 19 - Rear wheels | 39 - Front grading blade cylinder (option) |
| 20 - Service brake | 40 - Front grading blade (option) |

Basic machine

The basic machine comprises the following major components:

- Frame
- Drive
- Operator's platform
- Equipment

Frame

The frame consists of a front and a rear frame. These are interconnected with bearings and bolts and can be pivoted about a vertical axis.

Drive

The grader is equipped with a water-cooled diesel engine driving the four rear wheels via a torque converter, 6-speed powershift transmission, cardan shaft, axle gear and tandem chain drive.

F106.6 A with all-wheel drive

In addition to the rear-wheel drive, a hydrostatic electronically controlled front-wheel drive can be switched on.

Rear axle, tandem drive

Axle gear with automatic NoSpin-differential.

Floating tandem chain cases with roller chains for power transmission to the wheel hubs.

Front axle

Swing axle with king-pin steering and hydraulic wheel camber adjustment.

Brakes

The service brake is a hydraulic dual-circuit accumulator brake with four submerged multiple-disk brakes acting on the rear axle.

A mechanically operated disk brake on the powershift transmission output shaft serves as a parking brake.

Steering

Hydrostatic front-wheel steering with emergency steering.

Hydraulic system

The working hydraulics is a load-sensing system.

The oil is supplied by a variable displacement pump which is controlled as required (load sensing) via directly operated control blocks. Two hydraulic functions can be carried out simultaneously without either affecting the other.

The hydraulic system is protected against overloading by means of pressure relief valves.

Electrical system

The electrical system operates on 24 volts.

Equipment

Middle blade with hydraulic adjustment of all functions and sealed ball-bearing slewing ring.

The following equipment is available as an option: front grading blade, rear ripper, front ripper and blade ripper.

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Noise emissions

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Outside the machine

The sound power level L_{WA} during working is 104 dB(A), evaluated on.

identical machines in compliance with standard 2000/14/EC.

Inside the machine

The sound pressure level L_{pA} inside the driver's cab is 81 dB(A).

The noise emissions listed apply to machines with standard settings.

In machines with other settings, e.g. increased cooling capacity, the acoustic pressure level and acoustic power level may be higher. □

CE Mark

1946704

The CE sign (Fig. 1) certifies that the machine has been built in accordance with the CE-directives 89/392, 91/368, 93/44, 93/68 and 98/37.

CE is short for "Communauté Européenne".

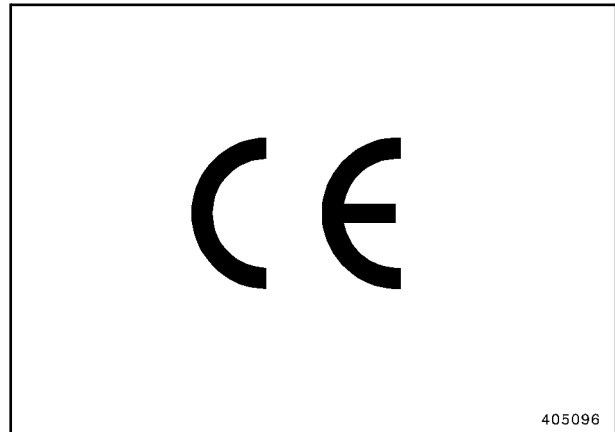


Fig. 1

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OPERATING INSTRUCTIONS F106.6/A



Warning and instruction signs

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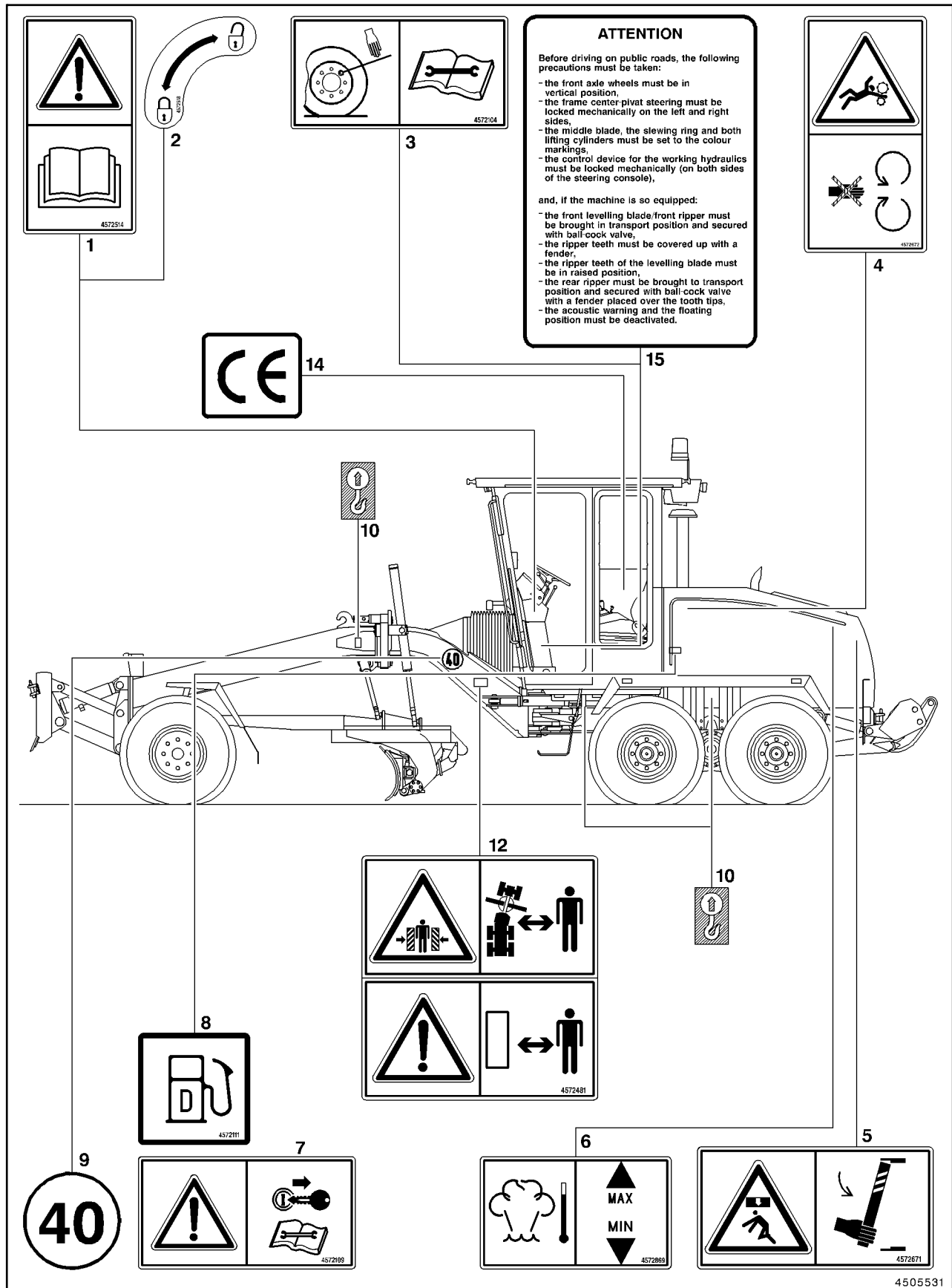


Fig. 1



Always observe the warning and instruction signs attached to the machine.

Keep signs clean and legible.

Replace signs immediately if they have become illegible.

New warning and instruction signs can be ordered from the O&K Spare-Parts Service. The Part nos. required for orders can be found in the spare-parts list of your machine.

Legends to Fig. 1

- 1 - The machine must not be started up unless the operating instructions have been read and understood.
- 2 - The equipment can be secured at this point against inadvertent activation.
- 3 - Check wheel nuts at regular intervals; see operating instructions.
- 4 - **Risk of injury** through hot or rotating components in the engine compartment. Never open engine hood until engine is stationary.
- 7 - **Risk of injury** by unauthorized starting of the machine. Before undertaking any work on the machine shut off the engine and withdraw the key.
- 9 - This sign indicates the admissible maximum speed for driving on public roads.
- 10 - Fixing points for fastening chains and ropes for machine transport.
- 11 - **Risk of injury** through hot or pressurized hydraulic oils. Observe the operating instructions.
- 12 - **Risk of injury** through crushing. Never start up the machine without ensuring that nobody is standing within the range of the center-pivot joint.
 - **Risk of injury** through crushing. Never start up the machine without ensuring that nobody is standing in the area between the machine and a nearby obstacle.
- 14 - The CE sign indicates that this machine has been built in conformity with the European prescriptions for the safety of machines.

L_{WA} is the level of noise emissions specified in dB_A (in acc. with standard 2000/14/EC).
- 15 - **Driving on public roads**

This sign specifies measure to be taken before driving on public roads.

Warning and instruction signs

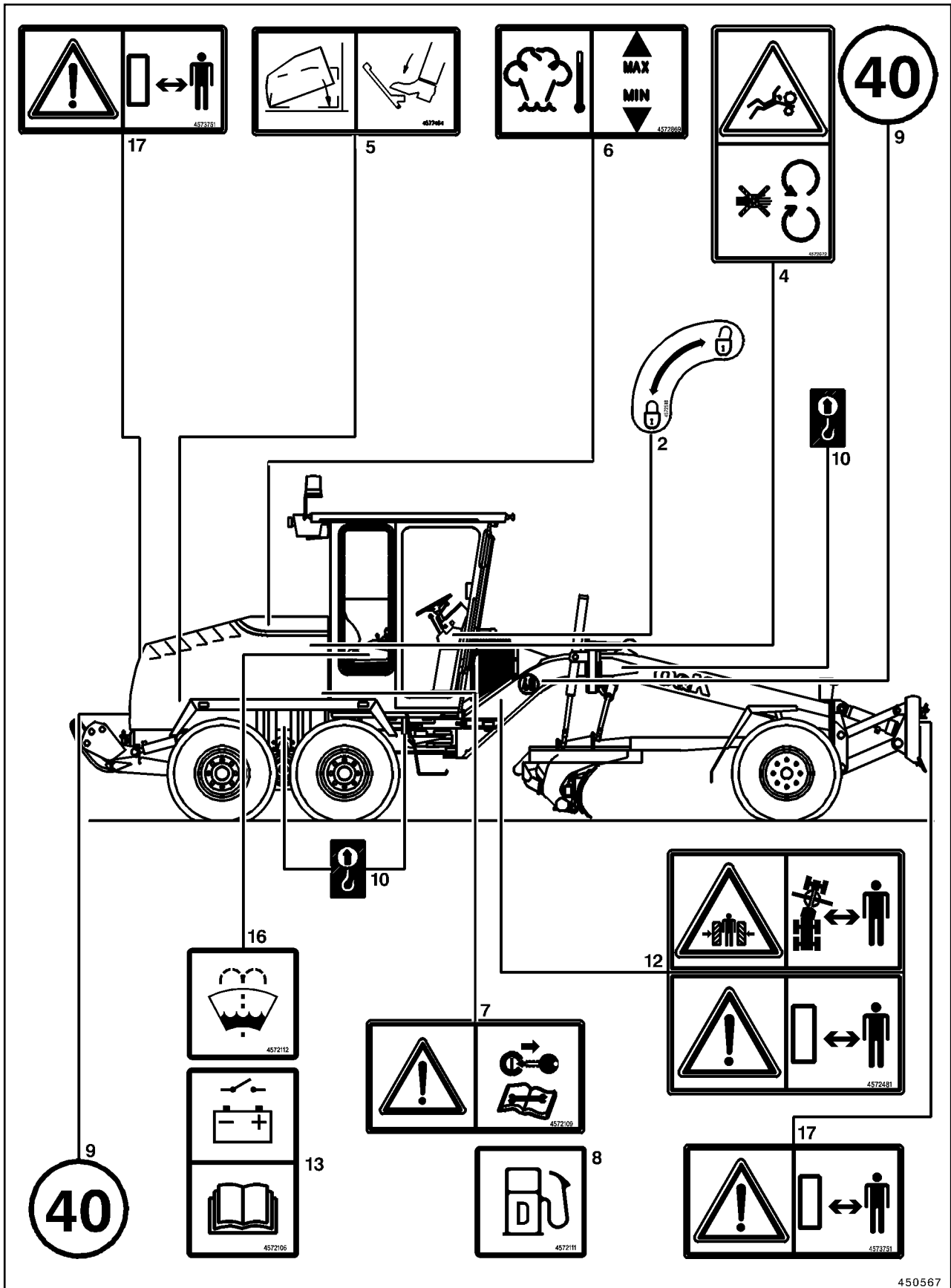


Fig. 2



Always observe the warning and instruction signs attached to the machine.

Keep signs clean and legible.

Replace signs immediately if they have become illegible.

New warning and instruction signs can be ordered from the O&K Spare-Parts Service. The Part nos. required for orders can be found in the spare-parts list of your machine.

Legends to Fig. 2

- 2 - The equipment can be secured at this point against inadvertent activation.
- 4 - **Risk of injury** through hot or rotating components in the engine compartment. Never open engine hood until engine is stationary.
- 5 - **Risk of injury** through engine hood slamming closed.
Close engine hood by disengaging the safety bar with your foot.
Read operating instructions before carrying out any repair / servicing work.
- 6 - **Risk of injury** through hot coolant. Open cap on radiator only after the radiator has cooled down.
 - Coolant level indicators.
- 7 - **Risk of injury** by unauthorized starting of the machine. Before undertaking any work on the machine shut off the engine and withdraw the key.
- 8 - Fuel tank, fill in diesel only.
- 9 - This sign indicates the admissible maximum speed for driving on public roads.
- 10 - Fixing points for fastening chains and ropes for machine transport.
- 12 - **Risk of injury** through crushing. Never start up the machine without ensuring that nobody is standing within the range of the center-pivot joint.
 - **Risk of injury** through crushing. Never start up the machine without ensuring that nobody is standing in the area between the machine and a nearby obstacle.
- 13 - **Damage** to the alternator, regulator and electronic modules may result from the battery being disconnected while the engine is running. Always stop the engine before disconnecting and removing batteries.
- 16 - **Screen washer**
Filler opening of screen-washer reservoir. Top up with water.
- 17 - **Risk of injury** through crushing. Never start up the machine without ensuring that nobody is standing in the area between the machine and a nearby obstacle.

□

Machine number

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The nameplate with the machine number is located under the right-hand driver's cab door (Fig. 1).

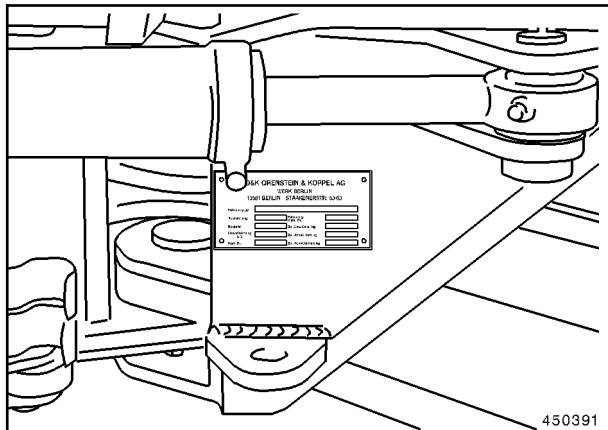


Fig. 1

The machine number is also stamped into the frame below the left-hand cab door (Fig. 2).

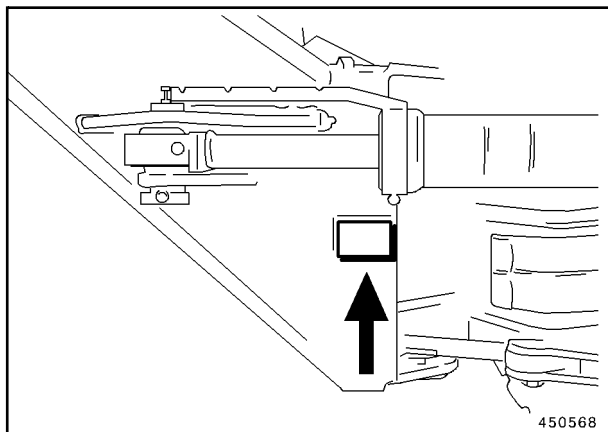


Fig. 2

Engine number

The nameplate (Fig. 3) with the engine number is attached to the engine.

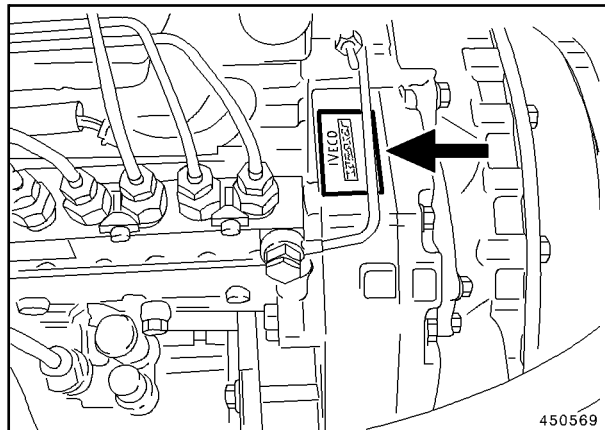


Fig. 3

Powershift transmission number

The nameplate (Fig. 4) with the powershift transmission number is attached to the gear case.

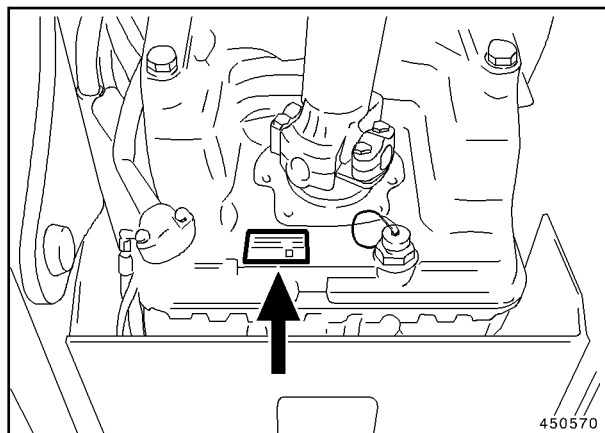


Fig. 4

Component numbers

Other larger components also have nameplates giving, among other data, their serial number.

On steel components the O&K part no. or the serial number is stamped into the metal in an eye-catching position.

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DRIVER'S CAB

2747798

Cab door



Close the cab doors before driving on public roads.

Opening the door

- Unlock the door with the key (Fig. 1).

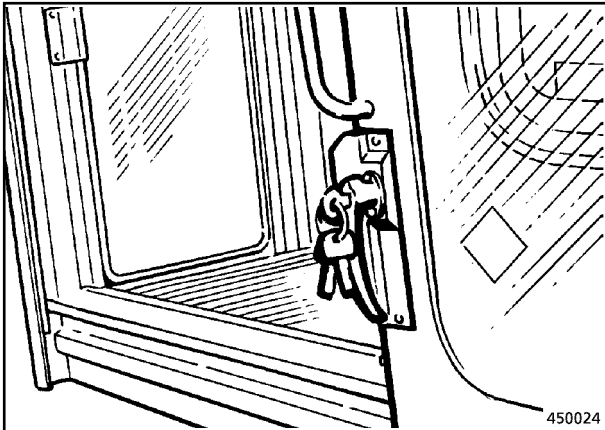


Fig. 1

- Using the door handle, pull the door open to its limit position until the hook (1, Fig. 2) engages.



The door must be engaged when the driver enters the cab. There is otherwise the risk of the door closing again if the handle (2, Fig. 2) is used.



When driving with the door open, the door must be engaged in its limit position .

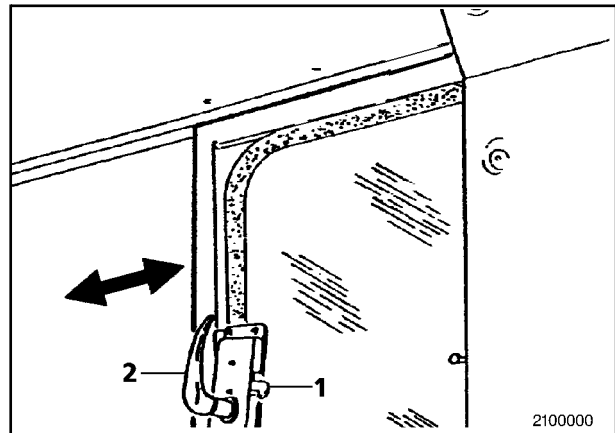


Fig. 2

Closing the door

- Release the open, secured door with the door handle and close it.
- Lock the door with the key.

□

Entering and leaving the cab

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Remove any oil, grease, earth, clay, snow, ice and other foreign matter immediately.

When entering and leaving the cab, use only the steps, platforms and grab handles (Figs. 1 and 2) provided for this purpose.

Keep steps, platforms and grab handles in a non-slip, safe state.

Always face the cab when entering or leaving the machine.

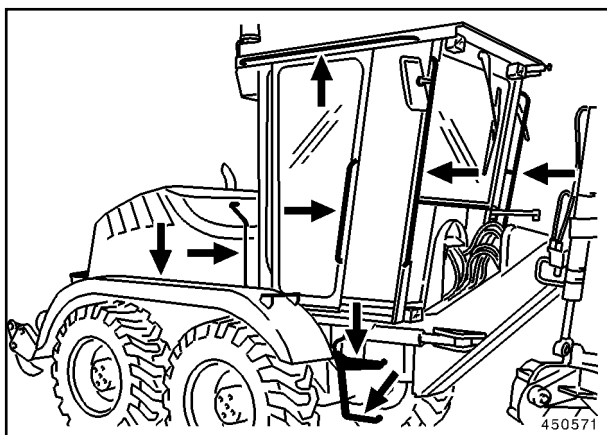


Fig. 1

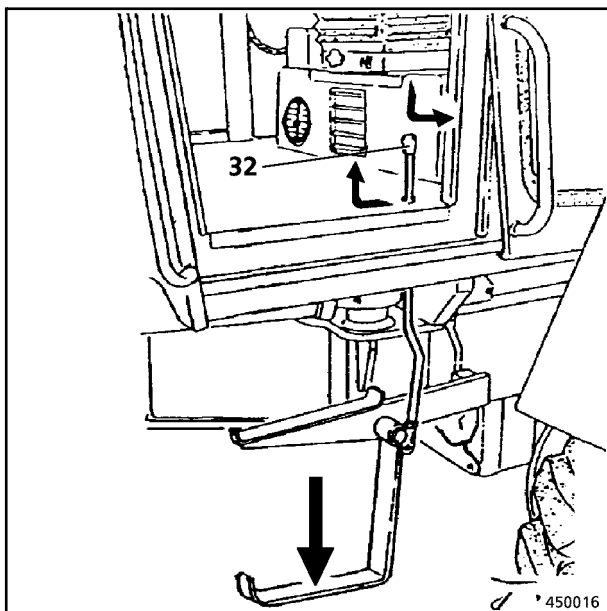


Fig. 2

Access ladder



During driving and during the work, the access ladder must be in raised position.

The lowest step of the access ladder to the driver's cab can be raised or lowered (Fig. 2) by means of the foot-operated lever (32).

Foot-operated lever (32) up

- step lowered

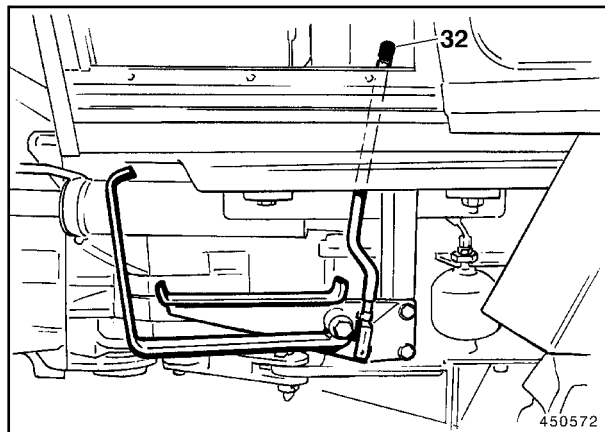


Fig. 3

Foot-operated lever (32) down

- step raised.

□

Adjusting the driver's seat

2747852

The inclination, height and fore-and-aft position of the driver's seat are adjustable. The seat suspension can be adjusted according to the driver's weight.



Never adjust the seat while driving. Concentrate on the road to avoid accidents.

Before adjusting the seat:

- Stop the machine
- Shift the powershift transmission to neutral
- Apply the parking brake.

Adjusting the suspension according to the driver's weight

Set the driver's weight with the rotary knob (5, Fig. 4) according to the weight scale. The suspension is then adjusted automatically.

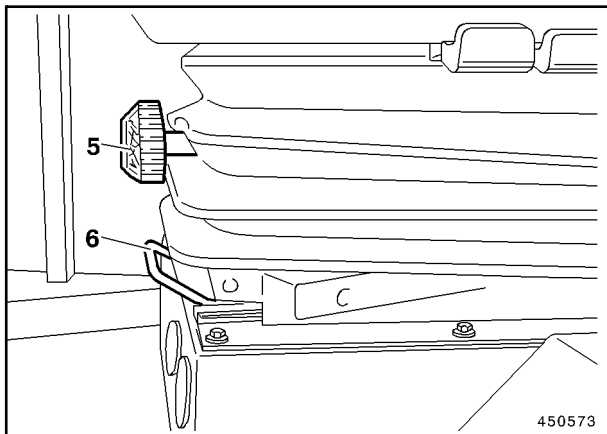


Fig. 4

Fore-and-aft adjustment

Pull lever (6) upwards - slide seat to desired position and engage lever (6).

Backrest

Adjust backrest inclination (7, Fig. 5) with lever (8). Pull lever (8) upwards and push/pull backrest forwards or backwards. Release lever (8) when desired position is reached.

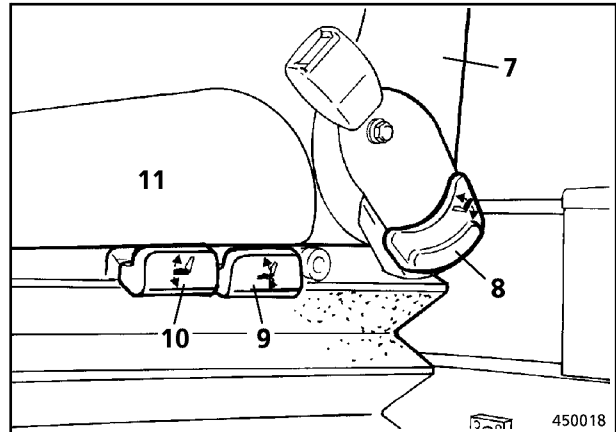


Fig. 5

Adjusting the seat inclination

Pull lever (9, Fig. 5) upwards - tilt seat (11) as desired. Release lever (9).

Adjusting the seat height

Pull lever (10, Fig. 5) upwards - slide seat (11) to desired position. Release lever (10).

Driver's seat - optional equipment

The machine can be equipped with an air-cushioned driver's seat and with armrests as an option.

The operation of this seat is described in a separate instruction manual.

Adjusting the mirrors

The two external mirrors on the driver's cab should be set so that as much as possible of the working area can be seen from the driver's position.

Windows

Front hinged windows

The two front hinged windows (Fig. 6) permit a good view of the blade. They also allow optimal ventilation of the driver's cab.

The windows are locked and unlocked by means of the lock-bar (12, Fig. 6) and knurled knob (13).

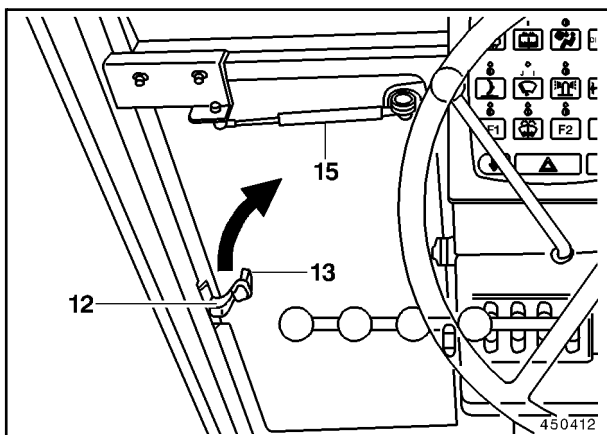


Fig. 6

They can be opened and closed approx. half-way against the resistance of the gas compression spring (15).

Sliding windows (option)

To improve the ventilation in the driver's cab, sliding windows can be installed on the right-hand and left-hand side of the cab.

Press the handles (6, Fig. 7) together and push the window (3) up or down as required. When the required position is reached, release the handles (6) and engage the window in the nearest notch.

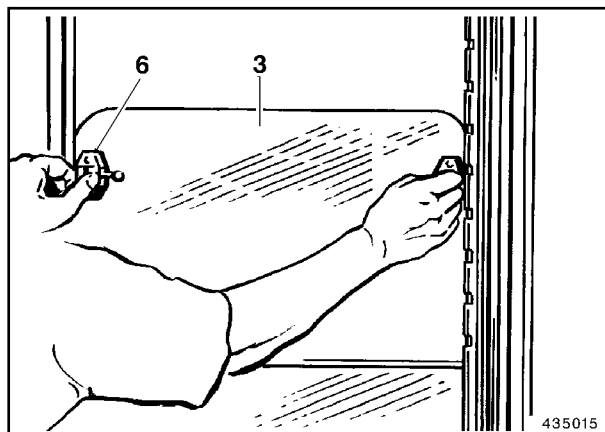


Fig. 7

Driver's cab interior light

The interior light (Fig. 8) is switched on and off with an integrated switch.

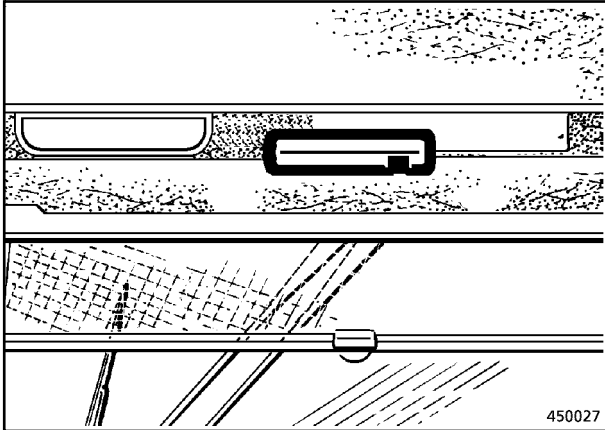


Fig. 8

The interior light is activated when the key is in position **P** or **I**.

Sunblind

The sunblind is mounted above the front and rear window (Fig. 9).

Letting down the sunblind

- Pull the strap to let down the sunblind continuously.

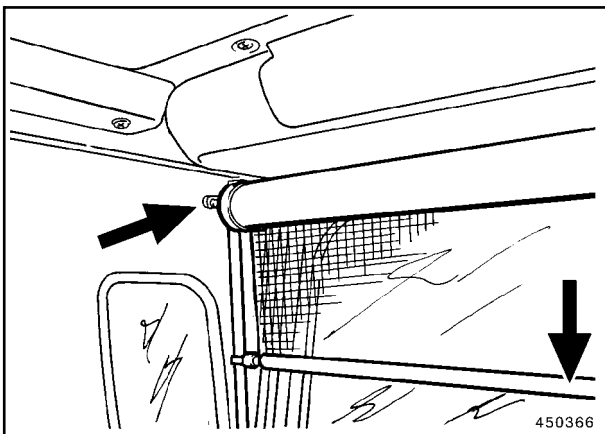


Fig. 9

Letting up the sunblind

- Press the red lever on the lefthand sunblind pin upwards. The sunblind rolls up.

Documentation

A storage compartment (Fig. 10) for the operation instructions and the spare parts list is provided on the righthand side of the driver's cab.

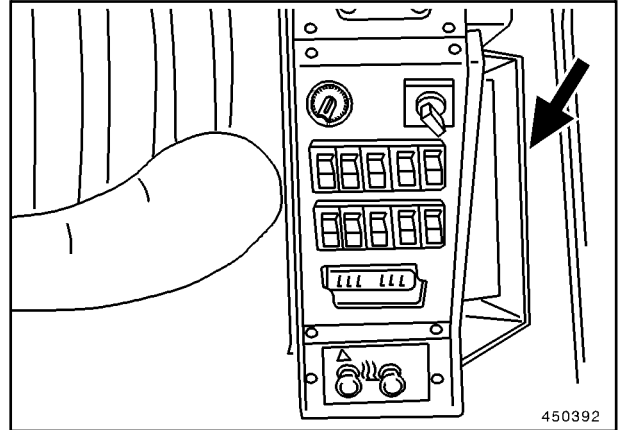


Fig. 10

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General layout of controls(Fig. 1)

No.	Element	Function	Symbol
1	Control console column with steering wheel		
2	Control panel		
3	Right-hand console		
5	Fuses		
6	Gearbox control Equipment control		
7	Relays		

MONITORING, WARNING AND CONTROL ELEMENTS

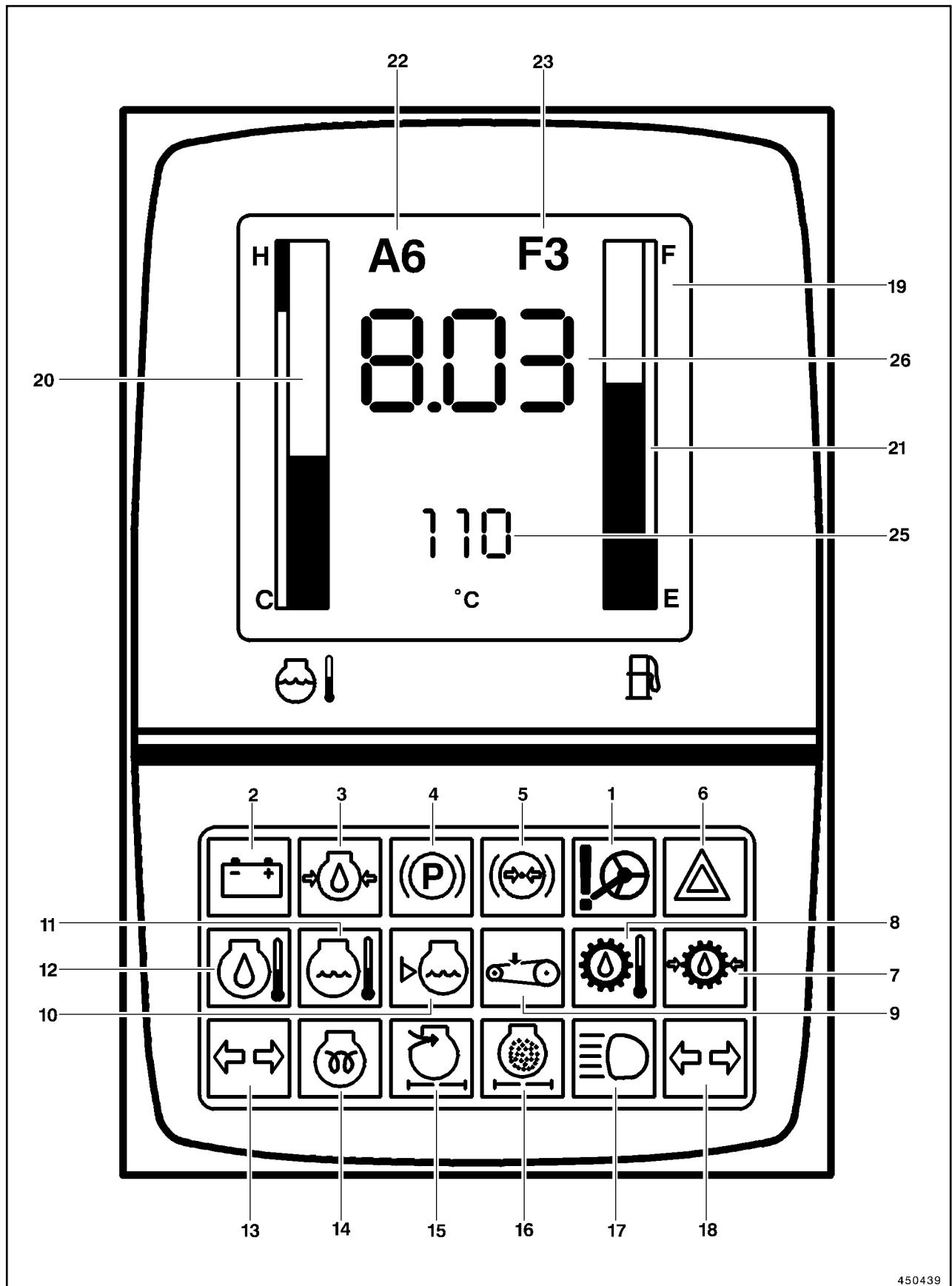
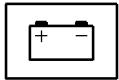
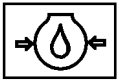
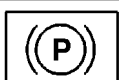
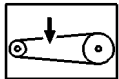
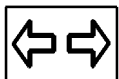


Fig. 2

Instrument panel, indicator and warning lamps (Fig. 2)

Page 1 of 3

No.	Element	Function	Symbol
1	Warning lamp Steering pump/Emergency steering pump	lights up when steering pump fails and when emergency steering pump is activated (approx. 3 km/h). Stop grader and rectify fault	
2	Warning lamp Alternator	lights up: - when the battery is not being charged - when the alternator is defective Shut off engine and rectify fault	
3	Warning lamp Engine oil pressure	lights up when the engine oil pressure is too low. Shut off engine and rectify fault	
4	Warning lamp Parking brake	lights up when the parking brake is applied	
5	Warning lamp Brake accumulator pressure	lights up when the brake accumulator pressure is too low. Stop grader immediately and rectify fault	
6	Indicator lamp Hazard-warning system	lights up when the hazard-warning system is on	
7	Warning lamp Gearshift pressure	lights up when the gearshift pressure is too low. Stop grader immediately and rectify fault	
8	Warning lamp Gearbox oil temperature	lights up when the gearbox oil temperature is too high. Stop grader immediately and rectify fault	
9	Warning lamp V-belt	not connected	
10	Warning lamp Coolant level	not connected	
11	Warning lamp Coolant temperature	lights up when the coolant temperature is too high. Stop grader immediately and run engine at idling speed to cool down.	
12	Warning lamp Engine oil temperature	not connected	
13	Indicator lamp Direction indicator	lights up when the direction indicator is on	

MONITORING, WARNING AND CONTROL ELEMENTS

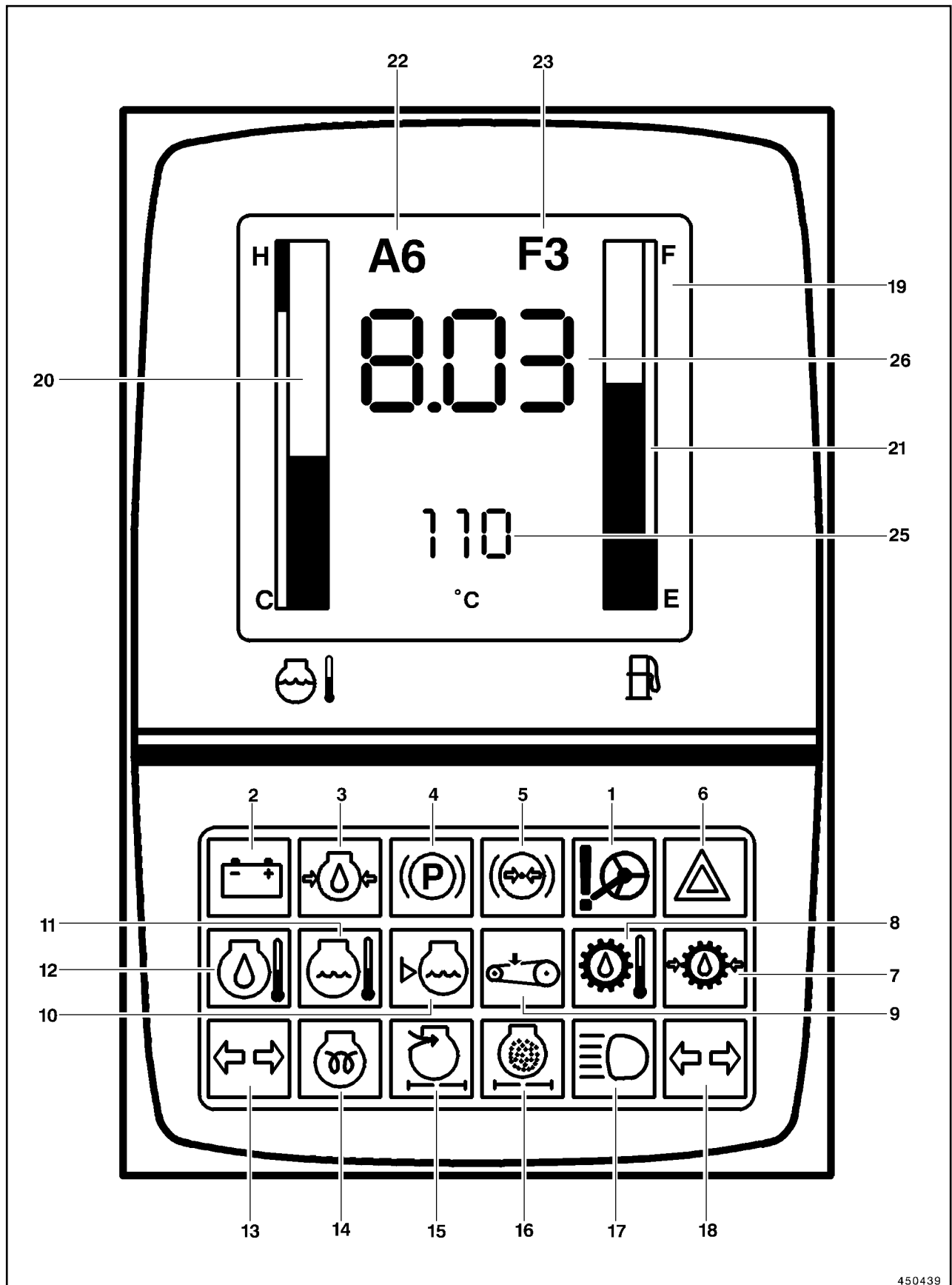
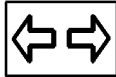


Fig. 3

Instrument panel - Indicator and warning lamps (Fig. 3)

Page 2 of 3

No.	Element	Function	Symbol
14	Indicator lamp Preheating (optional)	lights up when the grid heater is on; goes out when intake air preheating is terminated. Only then can the engine be run at full load.	
15	Warning lamp Air filter	lights up when the filter cartridge is contaminated	
16	Warning lamp	not connected	
17	Indicator lamp Main beam	lights up when the headlamps are on main beam	
18	Indicator lamp Direction indicator	lights up when the direction indicator is on	
19	Display screen	with the following functions: - fuel gauge - operating hours - travelling speed - gearbox oil temperature - gearbox filter contamination - time - fault message - immobilizer - engine revs - gears - automatic mode	
20	Bar-graph display Coolant temperature	indicates the coolant temperature. display in light area = temperature ok display in dark area = temperature too high The warning lamp (11) flashes and the buzzer sounds. Stop grader immediately and run engine at idling speed to cool down.	
21	Bar-graph display Fuel reserve	indicates the amount of fuel in the tank. display in light area = ok display in dark area = refuelling necessary F = full E = empty	
22	Display segment Powershift transmission	indicates the selected gear. A = automatic F = manual	

MONITORING, WARNING AND CONTROL ELEMENTS

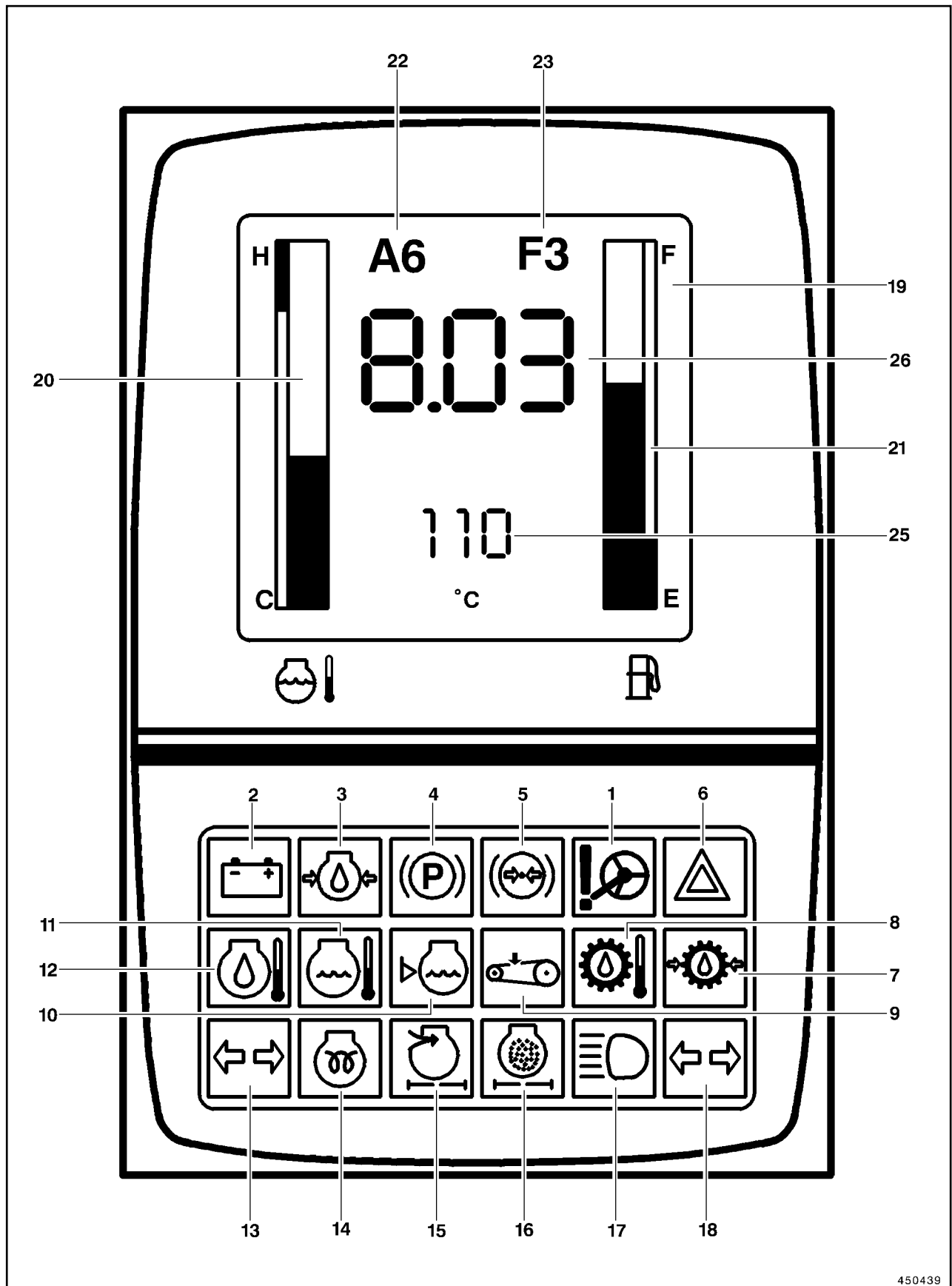


Fig. 4

Instrument panel, indicator and warning lamps (Fig. 4)

Page 3 of 3

No.	Element	Function	Symbol
23	Display segment Transmission ranges and gears, powershift transmission	indicates the transmission range (V-N-R) and the engaged gear (1 - 6). F = forward N = neutral (0) R = reverse 1 - 6 = gears	
25	Display segment indicates the following functions: - gearbox temperature in degrees	- fault codes with machine stationary - service information - operating hours	
26	Display segment indicates the following functions: - travelling speed	with machine stationary - time - engine revs - contrast	
	Buzzer (inside control console)	sounds an acoustic warning: short tone when: - the alternator supplies no power - the air filter is contaminated continuous tone when: - the engine oil pressure is too low - the coolant temperature is too high - the coolant level is too low - the machine is moving although the parking brake is applied - the min. braking pressure is too low - the gearbox oil temperature is above 105°C - the gearbox oil pressure is too low The buzzer is active when the engine is running and when a self-test is being performed.	

MONITORING, WARNING AND CONTROL ELEMENTS

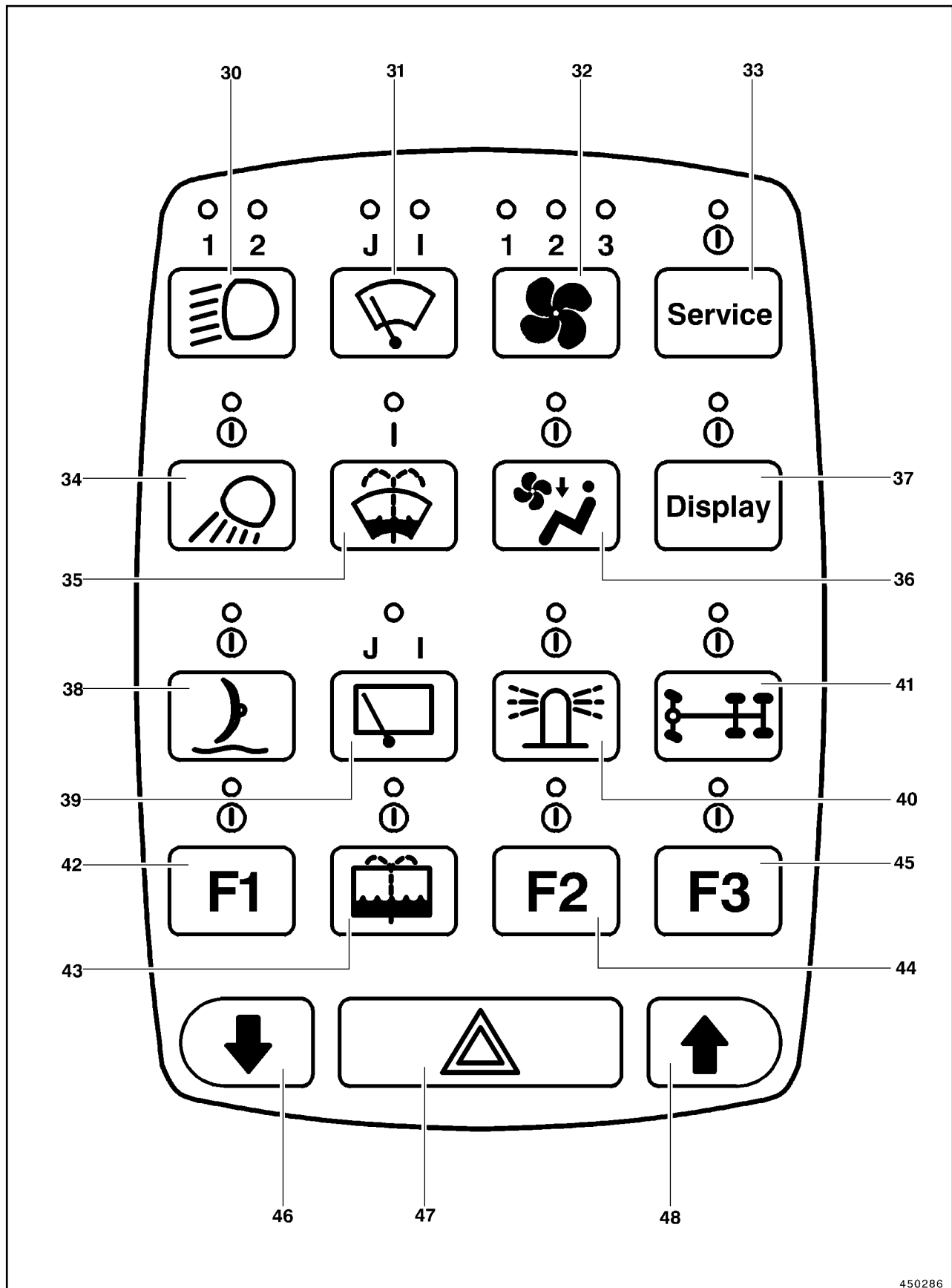


Fig. 5

OPERATING INSTRUCTIONS F106.6/A



Keys (Fig. 5)

Page 1 of 2

No.	Element	Function	Symbol
30	Key Lighting	LED off = lighting OFF LED 1 = parking lights ON LED 2 = headlamps ON	
31	Key Windscreen wiper, front	LED off = front windscreen wiper OFF LED J = front windscreen wiper intermittent wiping ON LED I = front windscreen wiper ON = permanent wiping	
32	Key Heating blower	switches the blower OFF and selects intensities 1, 2, 3	
33	Key Service	depressing the key displays different functions in segments 25 and 26 (see section "Service function")	
34	Key Floodlamp	LED off = floodlamp OFF LED on = floodlamp ON (only when parking lights or headlamps are ON) (see section "Floodlamps")	
35	Key Front windscreen washer	LED off = front windscreen washer OFF LED on = front windscreen washer ON	
36	Key Roof fan (optional)	LED off = roof fan OFF LED on = roof fan ON	
37	Key Display	activates the diverse functions of segments (25 and 26)	
38	Key Floating position	LED off = floating position OFF LED on = floating position ON	
39	Key Rear screenwiper	LED off = rear screenwiper OFF LED J = rear screenwiper intermittent wiping ON LED 1 = rear screenwiper, permanent wiping ON	
40	Key Rotary beacon (optional)	LED off = rotary beacon OFF LED on = rotary beacon ON	

MONITORING, WARNING AND CONTROL ELEMENTS

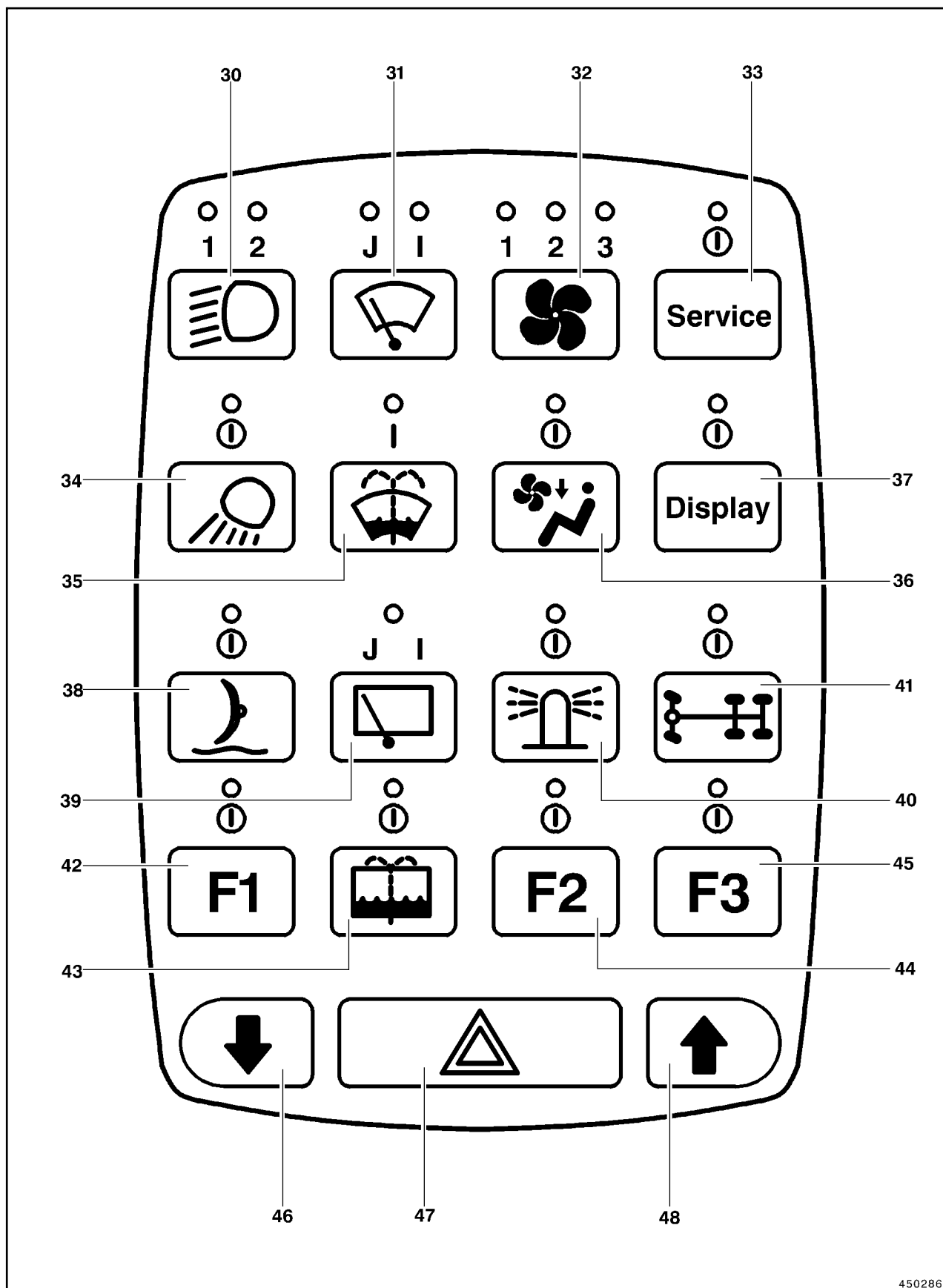


Fig. 6

OPERATING INSTRUCTIONS F106.6/A



Keys (Fig. 6)

Page 2 of 2

No.	Element	Function	Symbol
41	Key Front-wheel drive (optional)	LED off = front-wheel drive OFF LED flashing = front-wheel drive cannot be switched on or off LED on = front-wheel drive ON	
42	Key Floodlamp, front (optional)	LED off = floodlamp OFF LED on = floodlamp ON (only when parking lights or headlamps are ON) (see section "Floodlamps")	
43	Key Rear screenwiper	LED off = rear screenwiper OFF LED on = rear screenwiper ON	
44	Key Floodlamp, rear (optional)	LED off = floodlamp OFF LED on = floodlamp ON (only when parking lights or headlamps are ON) (see section "Floodlamps")	
45	Key Acoustic reversing signal (optional)	activates the acoustic reversing signal LED off = acoustic reversing signal activated LED on = acoustic reversing signal deactivated	
46	Key Coding Time Contrast	The immobilizer code, the time of day and the contrast can be set with this key.	
47	Key Hazard-warning system	Key depressed - hazard-warning system ON, lamp (6) flashes key depressed a second time - hazard-warning system OFF, key illuminated when electrical system is on.	
48	Key Code Time Contrast	The immobilizer code, the time of day and the contrast can be set with this key.	

MONITORING, WARNING AND CONTROL ELEMENTS

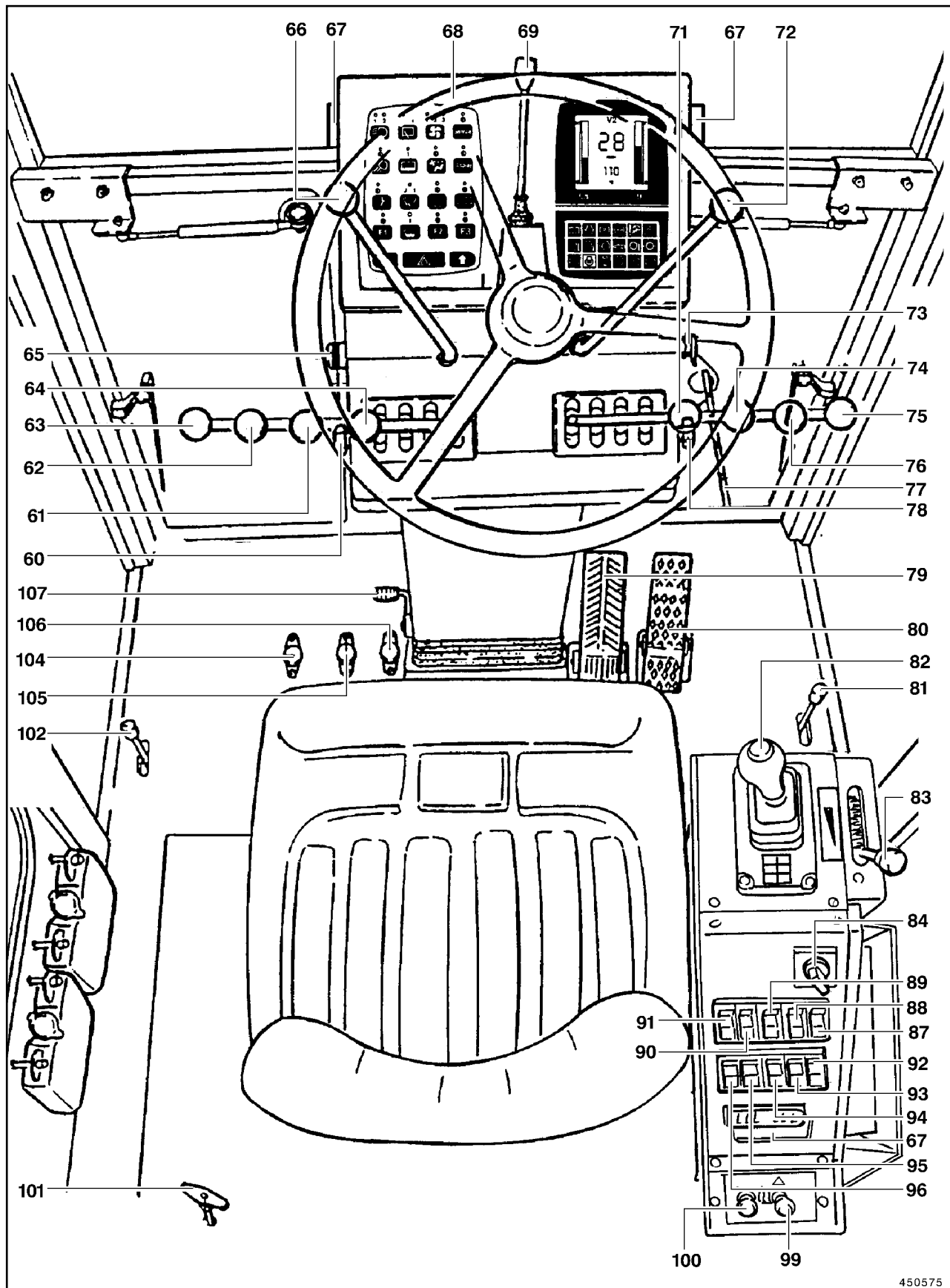


Fig. 7

OPERATING INSTRUCTIONS F106.6/A

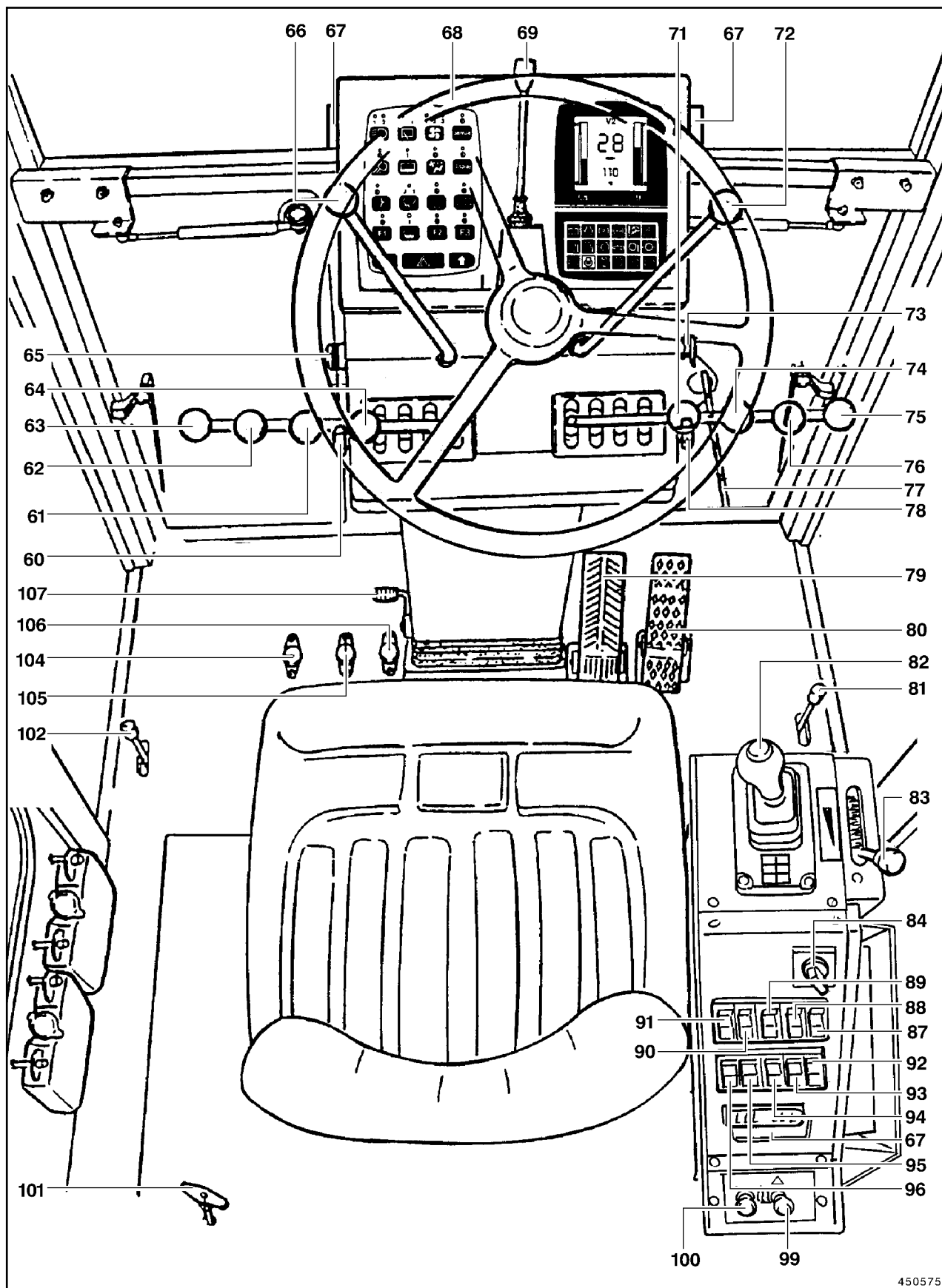


Driver's cab (Fig. 7)

Page 1 of 4

No.	Element	Function	Symbol
60	Lock Control levers for working equipment	locking device for control levers (61 - 64)	
61	Control lever Blade pitch adjustment	adjustment of blade pitch	
62	Control lever Blade rotation	blade rotation to right and left	
63	Control lever Blade shift	blade shift to right and left	
64	Control lever Rear ripper (optional)	rear ripper up and down	
65	Socket outlet 24V / Cigarette lighter		
66	Control lever Center-pivot joint	chassis center-pivot steering	
67	Fuse box		
68	Steering wheel and steering column	transfer of steering movements to steered axle	
69	Multi-function switch	direction indicator, horn dipped and main beam headlamp flasher	
71	Control lever Front levelling blade (optional)	front levelling blade up and down	
72	Control lever Wheel rake	adjustment of front-wheel rake	
73	Key-switch Electrical system	electrical system on and off / engine start and shut-off	

MONITORING, WARNING AND CONTROL ELEMENTS

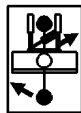
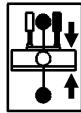
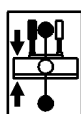
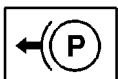


450575

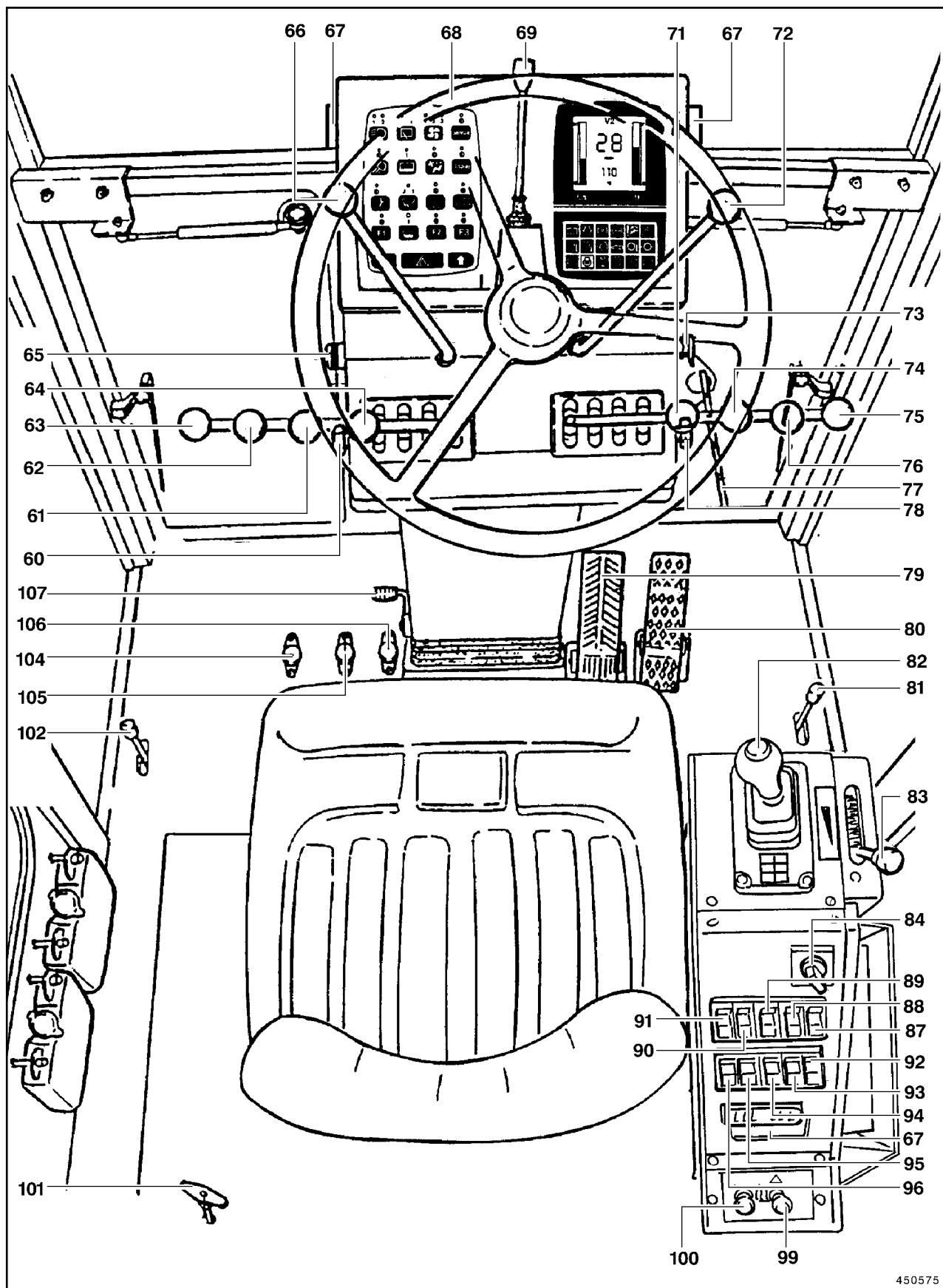
Fig. 8

Driver's cab (Fig. 8)

Page 2 of 4

No.	Element	Function	Symbol
74	Control lever Blade swivelling	swivelling of blade to right and left	
75	Control lever Blade lifting and lowering, right	lifting and lowering of right side of blade	
76	Control lever Blade lifting and lowering, left	lifting and lowering of left side of blade	
77	Indicator Center-pivot steering	indicates the position of the front frame	
78	Lock Control lever working equipment	locking of control levers (71, 74 - 76)	
79	Pedal Service brake	actuation of service brake pedal depressed - engine speed increases	
80	Pedal Accelerator	adjustment of engine speed pedal depressed - engine speed increases	
81	Foot-control Stepladder, right	raising and lowering of right-hand stepladder to cab	
82	Gearshift lever	selection of forward and reverse travel shifting of 6 forward and 3 reverse gears	
83	Lever Engine speed adjustment	forward - max. speed back - idling speed	
84	Rotary switch F 106.6 A	selects the positive and negative castor angles of the front-wheel drive	
87	Rocker switch Parking brake	applying the parking brake - (actuate switch only when machine is stationary) depress blank face of switch (rocker switch is being locked at the same time; indicator lamp (4, Fig. 4) lights up) releasing the parking brake - unlock switch and depress symbol face of switch (indicator lamp (4) goes out)	

MONITORING, WARNING AND CONTROL ELEMENTS



450575

Fig. 9

OPERATING INSTRUCTIONS F106.6/A

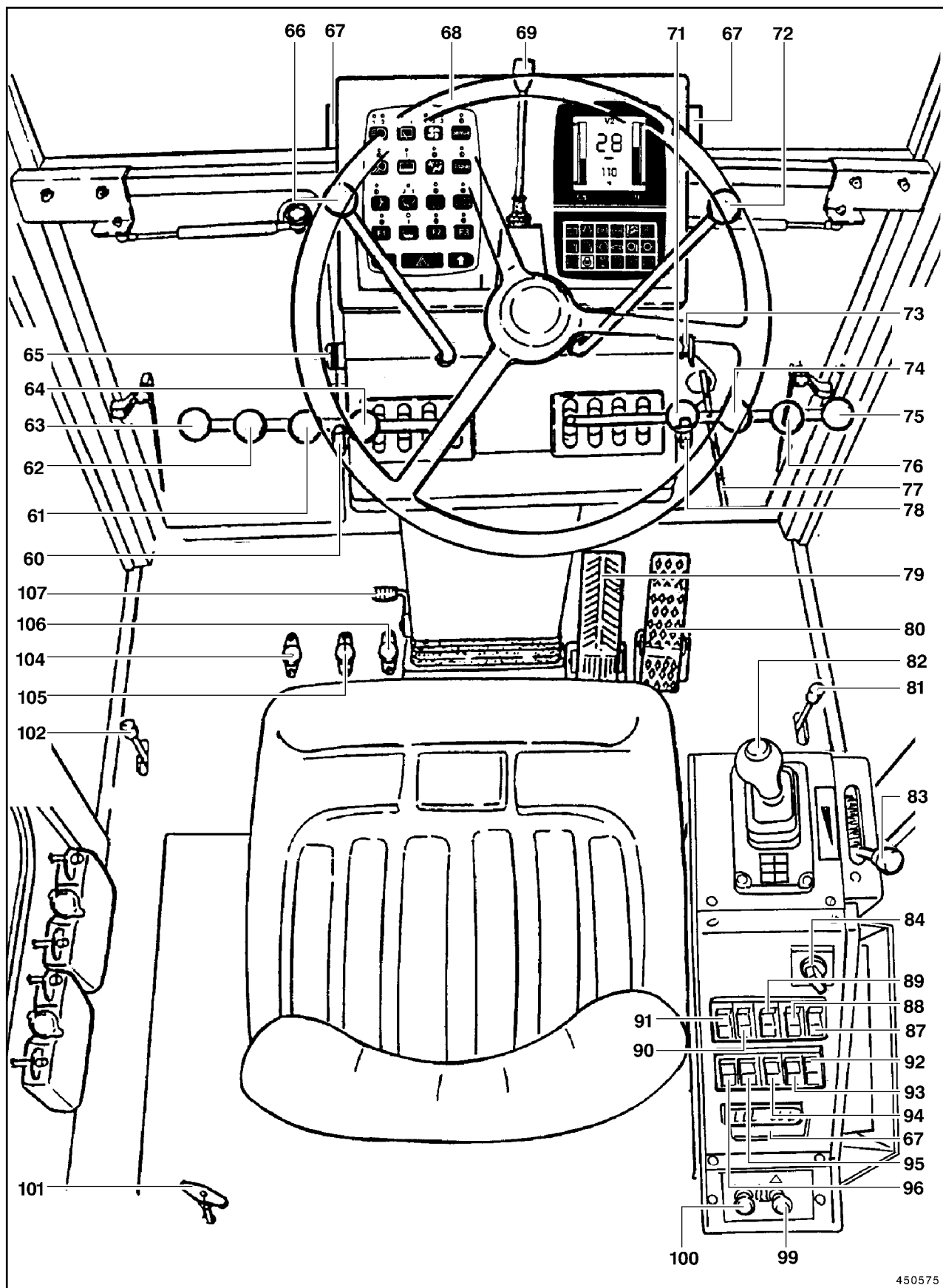


Driver's cab (Fig. 9)

Page 3 of 4

No.	Element	Function	Symbol
88	Rocker switch Transmission switch-over	switches the transmission into the manual or the automatic mode. Depress symbol face of switch - symbol lit up Manual mode ON Depress blank face of switch - symbol extinguished Automatic mode ON	
89	Rocker switch Brake-pressure-dependent transmission cut-out (optional)	Brake-pressure-dependent transmission cut-out activated - depress symbol face of switch, symbol lit up Brake-pressure-dependent transmission cut-out deactivated - depress blank face of switch, symbol face extinguished	
90	Blind switch	free for optional equipment	
91	Rocker switch Air conditioner (optional)	Air conditioner activated - depress symbol face of switch Air conditioner deactivated - depress blank face of switch (see: "Air conditioner, activation / deactivation")	
92	Rocker switch with lock Refuelling system (optional)	refuelling system on - set switch surface with symbol to neutral position, unlock switch and press switch surface with symbol briefly. (switch goes back to neutral position when released) refuelling system off - press blank face of switch	
93		free for optional equipment	
94		free for optional equipment	
95		free for optional equipment	
96		free for optional equipment	

MONITORING, WARNING AND CONTROL ELEMENTS



450575

Fig. 10

OPERATING INSTRUCTIONS F106.6/A



Driver's cab (Fig. 10)

Page 4 of 4

No.	Element	Function	Symbol
99	Draw-button Heating	continuously variable heat regulation Up = max. heating Down = heating OFF	
100	Draw-button Fresh air / recirculated air	continuously variable mixing of fresh and recirculated air Up = fresh air only Down = recirculated air only	
101	Lock Engine hood	unlocking the engine hood	
102	Foot-control Stepladder, left	raising and lowering of lefthand stepladder to cab	
104	Button Swivel arm locking pin	engaging and disengaging of locking pin in swivel arm	
105	Switch High speed - working hydraulics	increases the working speed	
106	Button Floating position (optional)	switches the floating position on and off (see: "Floating position")	
107	Lever Steering column lock	locks the steering column in the required position	

□

STARTING UP THE MACHINE

2413786

Prior to starting up the machine each day, carry out the works listed in maintenance schedule **T** (cf. Section 3 of these operating instructions "Inspection and Servicing"). □

Refuelling

2747854

Refuelling - safety instructions



Explosion hazard

Fuels and fuel vapours are highly flammable and likely to explode. Therefore, avoid the formation of sparks and do not use open flames such as lighters or matches for illumination purposes.

Possible health hazard

Diesel fuel and the fuel vapours are a health hazard.
Fuels must not be swallowed.
Avoid prolonged contact with the skin.
Do not inhale the fumes.
Wear protective gloves or use a barrier cream.
Do not eat, drink or smoke during refuelling.

Avoid environment pollution

Avoid spilling fuel. Do not let fuel get into the ground, it pollutes the environment.

Soak up any overflowing fuel immediately with cleaning rags or binding agents and discard without polluting the environment

Report fuel accidents immediately to the owner of the machine or to his representative.



Securing the machine

Secure the machine against unauthorized starting during refuelling:

- park the machine on level and firm ground,
- lower the working equipment to the ground,
- switch off any fuel-operated auxiliary heaters and air conditioners,
- shut off the engine,
- apply the parking brake,
- withdraw the key from the key-switch of the electrical system,

Refuelling must always be performed from the ground.

Filling in fuel



Read and observe "Refuelling - safety instructions" before filling in fuel.

Refuelling from cans

If the machine is filled up frequently or regularly with fuel from cans or drums, there is an increased risk of dirt particles and water getting into the fuel system.

In this case:

- always fill in fuel through a fine-meshed strainer;
- use only microfilter-equipped suction hoses;
- dewater the fuel filter more often than specified in the servicing plan;
- drain water and deposits from the tank bottom at shorter intervals;
- replace all fuel filters at shorter intervals.



Never fill in "Bio-diesel"

The injection system and the engine are at risk of being damaged if "Bio-diesel" is used.

Fill up the machine only with diesel fuel made from mineral oils acc. to the EN 590 standard.

For more information please contact your dealer service.

□

Filling in fuel

2747855



Fuel specification see engine operating instructions.

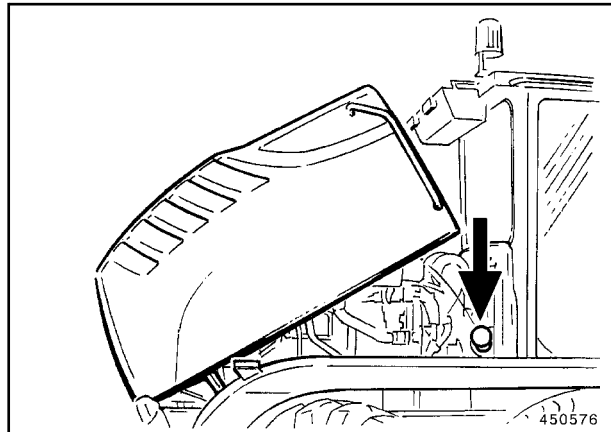


Fig. 1

Opening the engine hood

- The filler tube (4, Fig. 2) is located in the engine compartment. The filler tube is accessible after opening of the engine hood (Fig. 1).

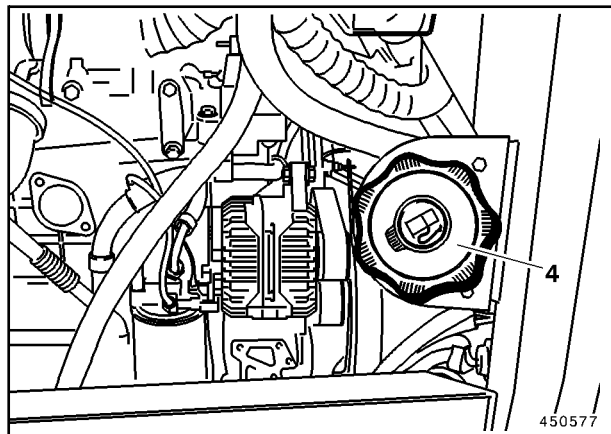


Fig. 2

- Unscrew the cap of the filler tube.
- Fill in fuel through the strainer in the tube. Do not remove the strainer.

□

Refuelling system(Optional)

20000001

Refuelling using the refuelling station, safety instructions



Risk of explosion

Do not smoke and do not use naked flames. Fuels and fuel vapours are flammable. Risk of fire.

Switch off fuel-operated auxiliary heating systems and air conditioners.

Health and environment protection

Fuel may damage the skin. Wear protective gloves or use a barrier cream.

Do not spill fuel. Do not let fuel seep into the ground. Fuel pollutes the environment.

Soak up any overflowing fuel immediately with cloths or binding agents. Then discard without polluting the environment.

Report any accidents involving fuels immediately to the owner of the machine or his authorized representative.



Securing the machine

Secure the machine against unauthorized starting during refuelling:

- Lower the working equipment to the ground
- Shut off the engine
- Withdraw the key from the electrical system key-switch.

Increased risk of contamination

If the machine is refilled frequently or regularly with fuel from cans or barrels, there is an increased risk of contamination for the fuel system.

In this case, the fuel prefilter must be drained and cleaned more often than specified in the servicing plans.

The fuel filter must be replaced at shorter intervals.

□

Refuelling using the refuelling station

20000002



Read and observe:
"Refuelling using the refuelling station, safety instructions".

The grader can be equipped with a refuelling station as an option.

The refuelling station can be used to pump fuel from a bulk storage tank into the fuel tank of the machine.

The refuelling station is installed on the rear wall of the engine compartment on the right side of the machine (Fig. 1).

The refuelling station includes the intake hose (3), the electrically driven fuel pump (2) and the filler hose to the fuel tank of the grader (1).

The intake hose is accessible when the engine hood is raised to the service position I notch.

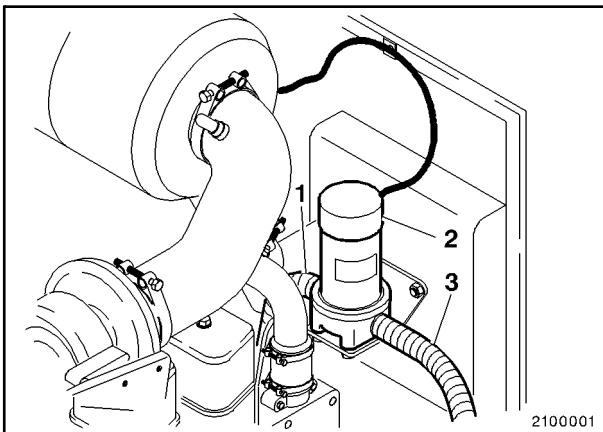


Fig. 1

2100001

- Connect the suction hose to the bulk storage tank.
- Switch on the pump with rocker button (92, Fig. 2) by
 - Set rocker face with the symbol to center position,
 - Shift slider (arrow) towards the rear and depress the symbol face briefly to start up the pump.
 After releasing the rocker button goes back to center position.

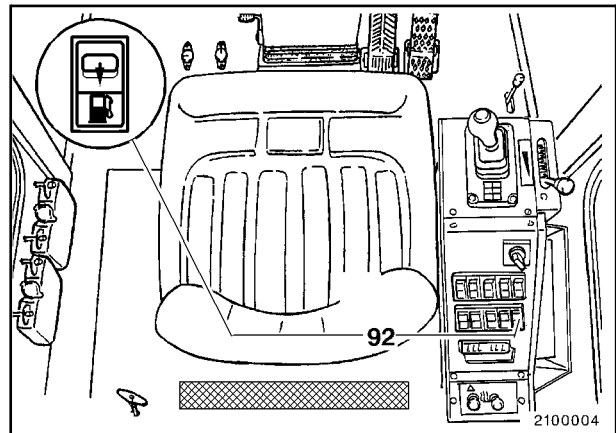


Fig. 2

2100004

The pump is switched off automatically when the fuel tank is full.

- Switch off the pump with rocker switch (92) by
 - depressing the blank face of the rocker.
 The rocker switch is now at rest (the switch face with the symbol is up).



The pump can be irreparably damaged when allowed to run dry for prolonged periods.

The pump must therefore not be switched on unless it is to be used for refuelling.

□

Switching the electrical system on and off

2747925

Battery main switch



Never set the battery main switch to the OFF position when the engine is running. Voltage peaks might cause irreparable damage to electronic components.

The battery main switch (27, Fig. 1) is located in the cab, in the right-hand console.

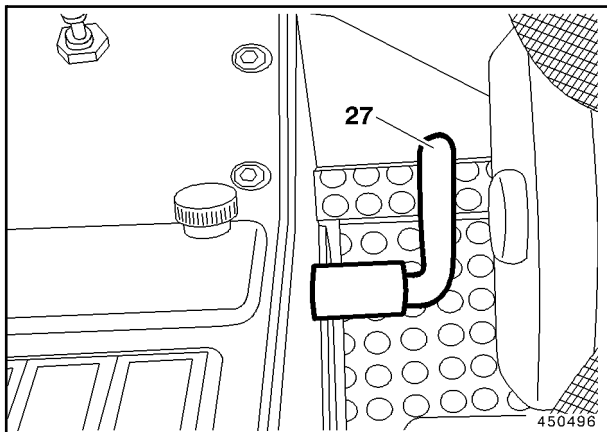


Fig. 1

The battery main switch (27) is used for disconnecting the entire electrical system from the battery. The switch positions shown in Fig. 2 have the following meaning:

I = ON = key pointing rearwards

II = OFF = key pointing upwards

In the **OFF** position the battery main switch (27) protects

- the machine from unauthorized starting
- the battery from inadvertent discharge.

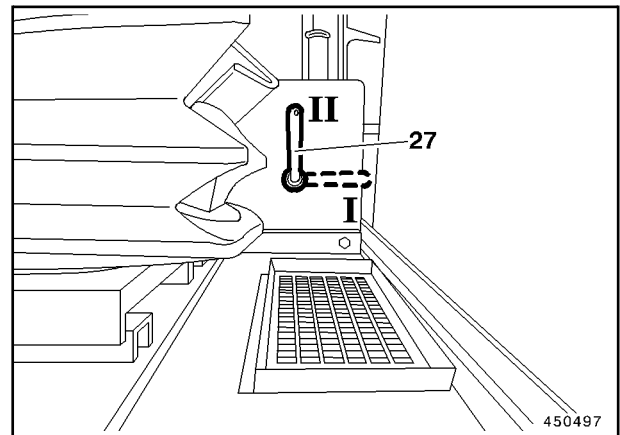


Fig. 2

□

Electronic immobilizer - Entering the code

2905381

This machine is equipped with an electronic immobilizer to prevent it from being started up by unauthorized persons.

However, the immobilizer is not activated on delivery ex works. At the request of the customer it can be activated by the mechanic on transfer of the machine.

When the key-switch "Electrical system" has been set to ON, the central electronic system requests the operator to enter a code (Fig. 1). Only when the code has been correctly entered can the engine be started up.

The immobilizer can be deactivated during the working shift (see: "Electronic immobilizer - suppressing / activating the code request").

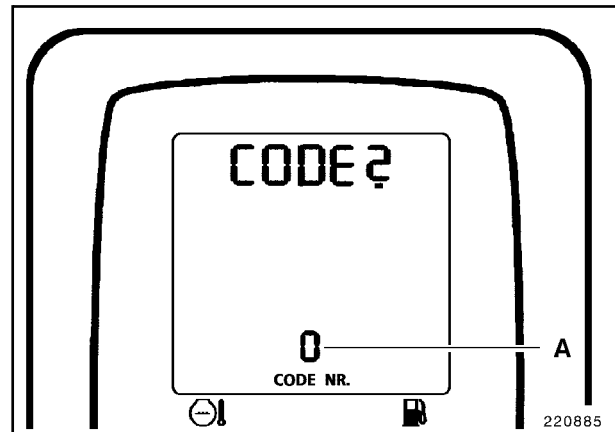


Fig. 1

Enter code (e.g. "5"):

- Set key-switch to **1**.
- Display **A** shows **0**.
- Depress key (48, Fig. 2) 5 times; one unit is added to the display **A** each time the key is pressed.
- Depress key (46) 5 times; one unit is deducted from the display **A** each time the key is pressed.

Once the code has been entered, the immobilizer is deactivated. The machine can be started up.

If an incorrect code is entered, the procedure is interrupted. A new start has to be made by setting the key-switch to **0** before repeating the entire procedure (see: "Electronic immobilizer - suppressing / activating the code request").

Note:

The code preset at the factory can be changed. However, a special equipped tester is required for this purpose.

So contact your local O&K dealer if the code is to be changed.

The new code is entered as described above.

Make sure the information on the new code is not accessible to unauthorized persons.

This ensures that your machine cannot be started up by unauthorized persons.

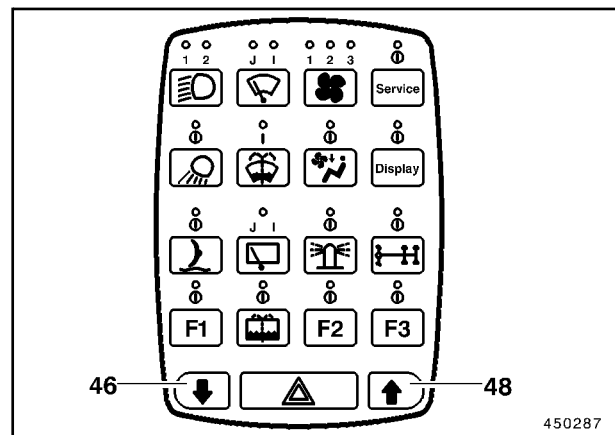


Fig. 2

Switching the electrical system on and off

2747856

Key-switch (73, Fig. 1) selects the following functions:

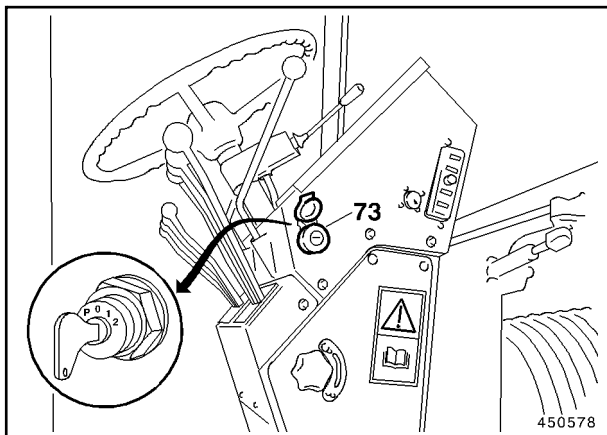


Fig. 1

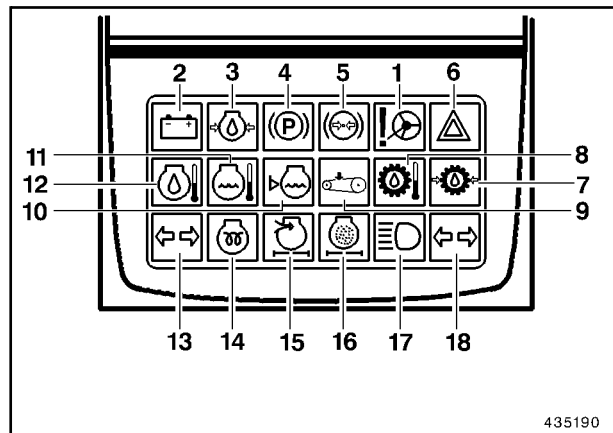


Fig. 2

P = Only the interior light and the radio can be switched on.

0 = Electrical system OFF.

All electrical consumers, except for the sidelamps, the hazard warning system and the refuelling station are without electrical power, the engine is off.

1 = Electrical system ON / self-test.

All indicator and warning lamps and the indicator LEDs are activated for ca. 1 second.

When the immobilizer is activated, the operator is now requested to enter the code (see "Electronic immobilizer - Entering the code").

Thereafter only warning lamps (2, 3, 4, 5 and 7, Fig. 2) are lit up.

Warning lamp (4) is lit up only when the parking brake is applied.

The indicator LEDs of stored key functions such as

- blower
- rear wiper
- rotary beacon (optional)

are also lit up.

2 = Starting the engine.

All warning and indicator lamps must go out when the engine is running. When the parking brake is applied, indicator lamp (4) is lit up.

□

OPERATING INSTRUCTIONS F106.6/A



2747857

Starting and stopping the engine

Starting the engine



Engine exhaust fumes are a health hazard.

Never start up the engine except in the open air or on premises with an exhaust extraction system.



Never set the key-switch to position 2 while the engine is running. This would damage the starter.

- Apply the parking brake, using switch (87, Fig. 1). Indicator lamp (4, Fig. 3) lights up.

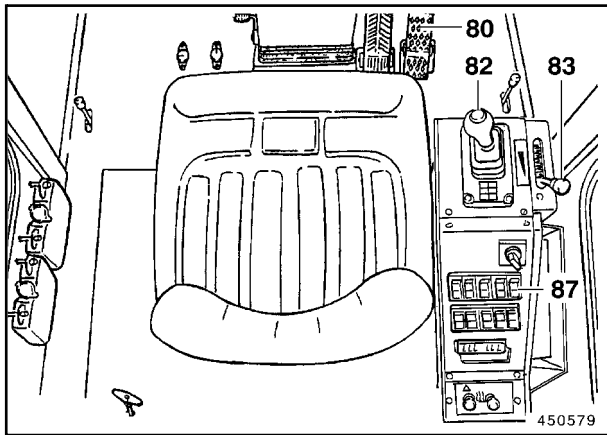


Fig. 1

- Move gearshift lever (82) to neutral position; see section "Gearshift lever - powershift transmission".
- Turn key-switch (73, Fig. 2) to position 1. All warning and indicator lamps and the LEDs light up for ca. 1 second. When the immobilizer is activated, the operator is now requested to enter the code (see "Electronic immobilizer - Entering the code"). Thereafter only warning lamps (2, 3, 4, 5 and 7, Fig. 3) and the indicator LEDs of stored function keys such as
 - blower
 - rear wiper
 - rotary beacon (optional) are lit up.
- Pedal (80, Fig. 1) or lever (83) must be in idling position.

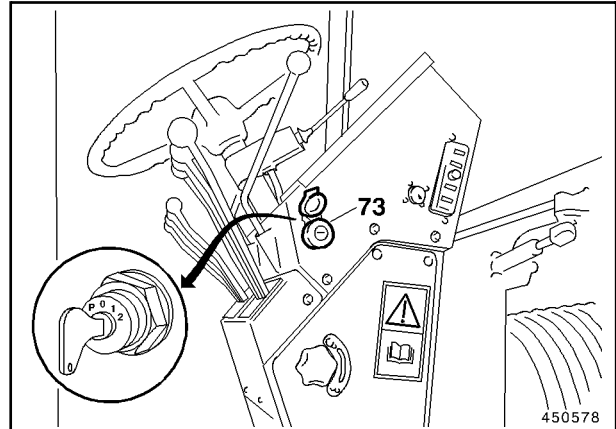


Fig. 2

- Turn key-switch (73) to position 2, the engine starts up.
- Release the key. It goes back to position 1. Warning lamps (2, 3, 5, 7) go out. Warning lamp (5) goes out after max. 45 seconds. Let the engine run for 3-5 minutes without load at about 1.000 rpm. Load the engine only thereafter.

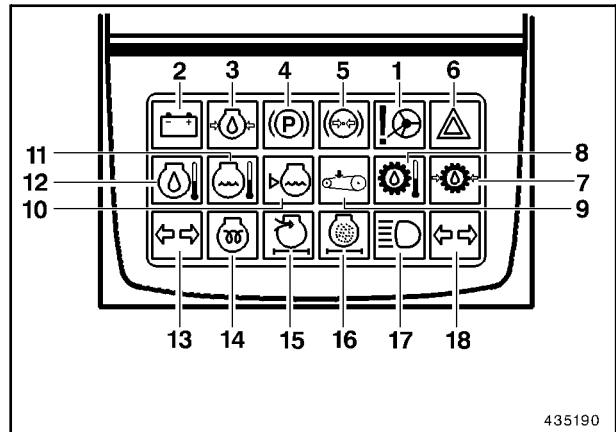


Fig. 3



If the warning lamps do not go out when the engine is running, shut off the engine immediately.

Locate the cause of the fault and rectify before restarting the engine.

□

OPERATING INSTRUCTIONS F106.6/A



Engine speed adjustment

2747858

The engine speed can be adjusted continuously with pedal (80, Fig. 1) and with hand throttle (83).

With hand throttle (83), the engine speed can be adjusted to a fixed level.

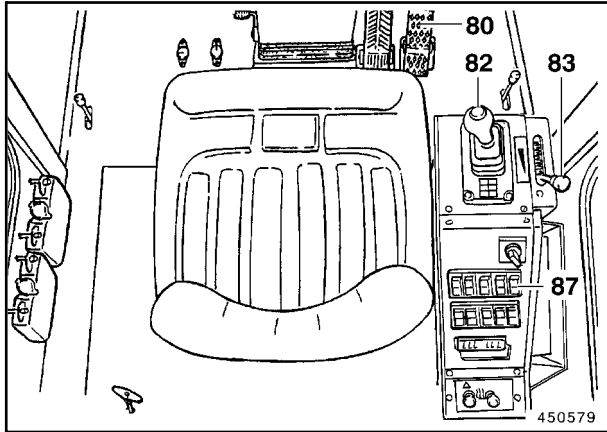


Fig. 1

Hand throttle pushed fully forward = maximum engine speed

Hand throttle pushed fully back = idling speed.

□

Engine fails to start

2747859

If the engine fails to start, turn the key-switch (73, Fig. 1) back to position 0 (mechanical repeat-start inhibitor), then repeat the starting procedure.

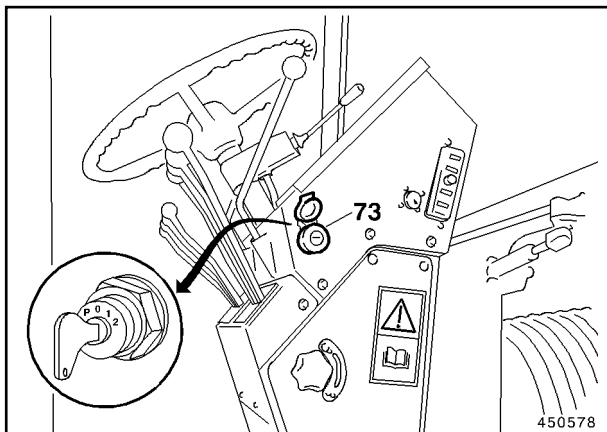


Fig. 1

Uninterrupted starting attempts should not exceed 20 seconds. Wait two minutes between starting attempts.

Determine and rectify the cause of the failure, using the troubleshooting table.

Further information is given in the "Engine operating and maintenance manual".



The engine cannot be started by towing the machine.

Attempting to start the engine in this way may result in transmission damage.

Stopping the engine

- Lower the working equipment to the ground.
- Apply the parking brake with switch (87, Fig. 2) and move gearshift lever (82) to neutral position

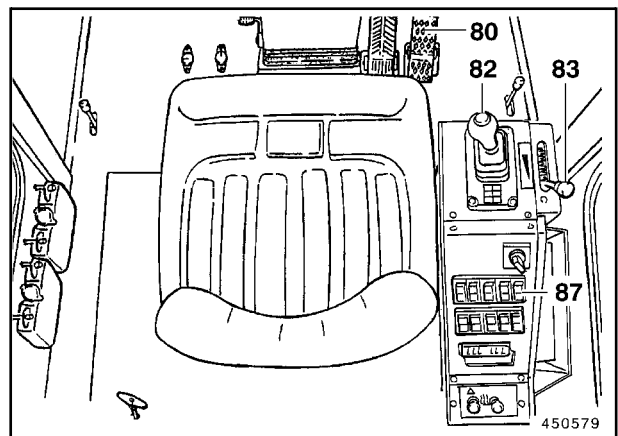


Fig. 2



Never shut off the engine abruptly when it is running at full load. Let the engine run for another 3 minutes at idling speed to reduce the temperature.

- Set key-switch (73, Fig. 1) to 0 . The engine is stopped
- Withdraw the key.

□

OPERATING INSTRUCTIONS F106.6/A



2747860

Ventilation and heating

The driver's cab is ventilated by 2 sliding windows (optional), 2 front hinged windows and an electric blower. It is heated by an engine-water heating system.

As the coolant flows through the heat exchanger of the cab, the heating performance is dependent on the engine temperature. The full heating performance is not available until the engine has reached running temperature.

Ventilation

- With the engine stationary, turn key-switch (73, Fig. 1) to position 1.

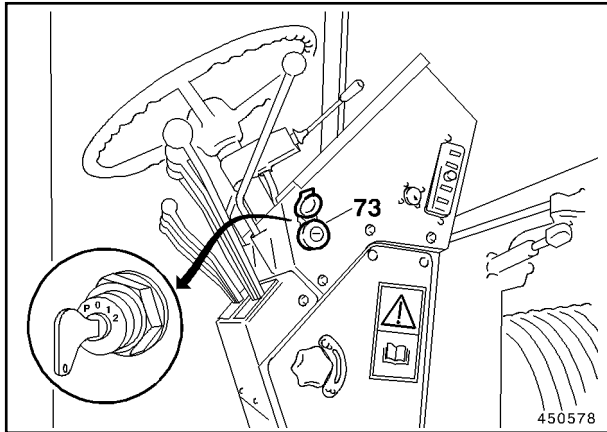


Fig. 1

- Push in heating control draw-button (99, Fig. 2) completely. The heating is off.

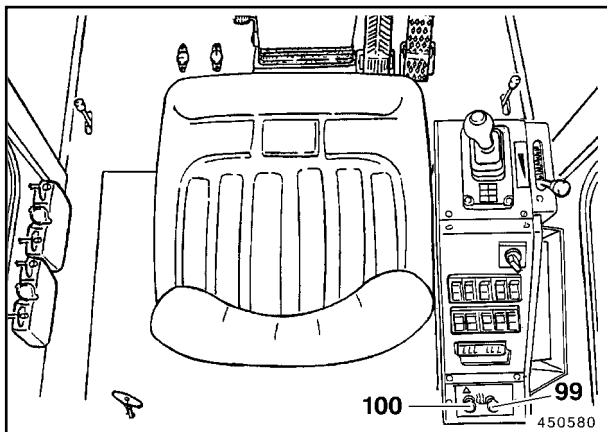


Fig. 2

- The blower for heating and ventilation is switched on with key (32, Fig. 3).

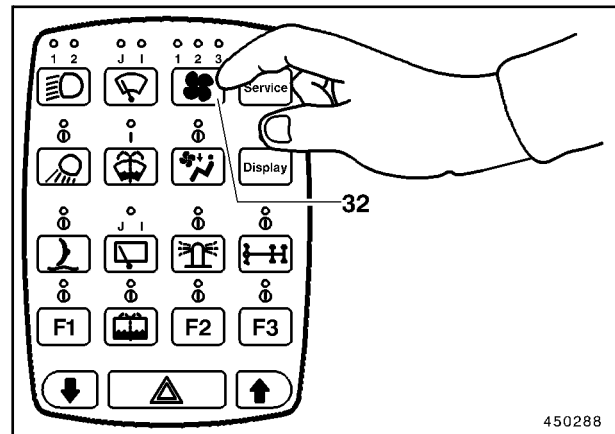


Fig. 3

Depending on the quantity of air required, switch the blower with key (32) to stages 1 - 3.

LED OFF = blower OFF

Depress key (32) once - LED 1 on = blower stage 1 (low).

Depress key (32) twice - LED 2 on = blower stage 2 (moderate).

Depress key (32) three times - LED 3 on = blower stage 3 (high).

Continue depressing key (32) until all LEDs are off = blower off.

The fan can be operated in the following modes:

- | | |
|--------------------------|--|
| Fresh air | - draw-button (100, Fig. 2) pulled up completely |
| Recirculated air | - draw-button (100) pushed in completely |
| Fresh / recirculated air | - mixture depending on intermediate position of draw-button (100). |

Heating

The heating performance can be continuously regulated by means of the draw-button (99).

Max. heating = draw-button pulled up completely

Heating off = draw-button pushed in completely



Run the heating at least once a week for about 5 minutes at max. performance to mix the water in the heat exchanger of the heating system and in the engine.

Inlet openings

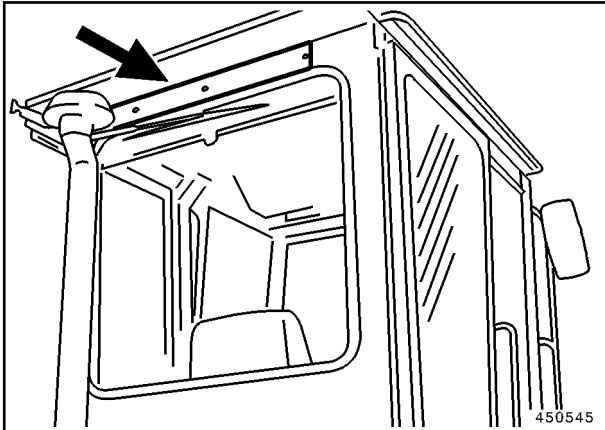


Fig. 4

The inlet opening for fresh air is located externally in the upper cab area (Fig. 4).

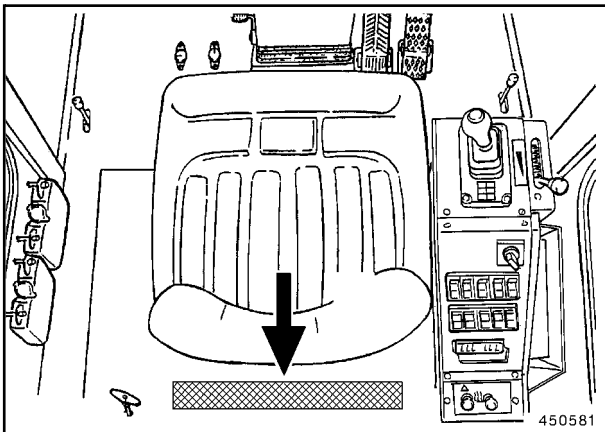


Fig. 5

The inlet openings for recirculated air are located in the cab behind the driver's seat (Fig. 5).

The inlet openings (Fig. 4, 5) for fresh and recirculated air must always be unobstructed.

Outlet nozzles

The air is blown through outlet nozzles (Fig. 6 and 7) into the driver's cab. All nozzles can be rotated and closed.

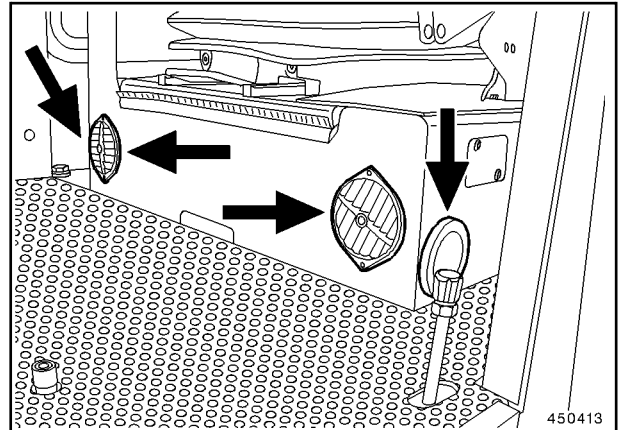


Fig. 6

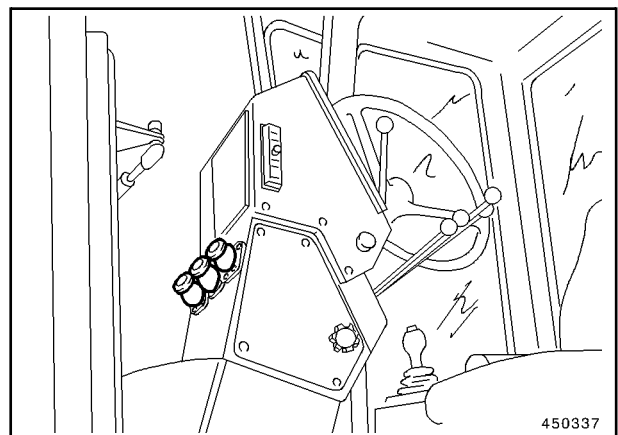


Fig. 7

□

OPERATING INSTRUCTIONS F106.6/A



Screen wiper / washer

2747861

The windscreen wiper can be used in the permanent and intermittent wiping mode. The windscreen wiper is operated with key (31, Fig. 1).

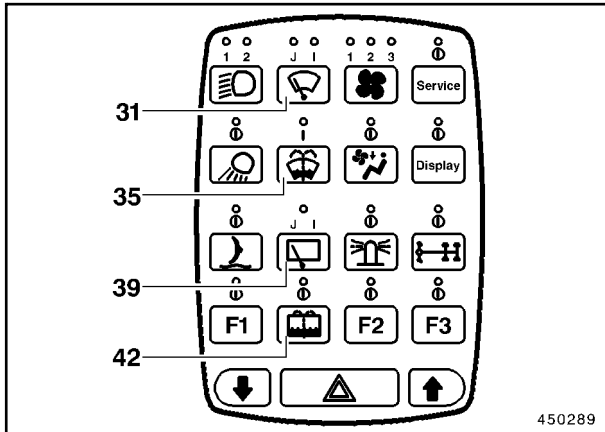


Fig. 1

- Press key (31) once: LED J lights up = intermittent wiping ON
- Press key (31) twice: LED I lights up = permanent wiping ON

The windscreen washer is activated with key (35).

- Press key (35) once: LED I lights up = screen-washer ON.

Make sure the two reservoirs (Fig. 2) are always filled with water and a window cleaning agent. In winter, antifreeze must be added.

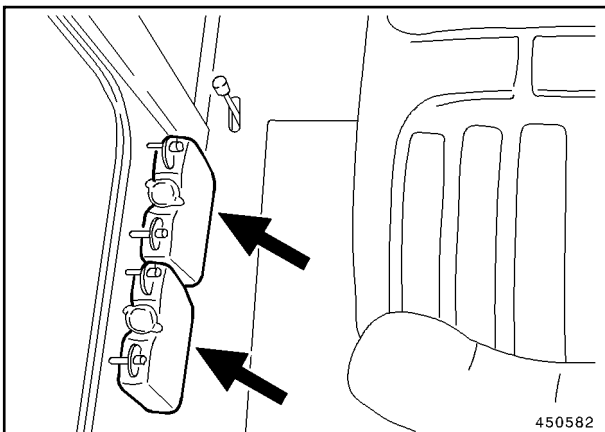


Fig. 2

The rear-window wiper is activated with key (39, Fig. 1).

- Press key (39) once: LED J lights up = intermittent wiping ON
- Press key (39) twice LED I lights up = permanent wiping ON

The rear-window screenwasher is activated with key (42).

- Press key (42) once: LED I lights up = rear-window screenwasher ON □

Lighting

2905357

The lights are switched on with the button (30, Fig. 1).

- Press button (30) once - LED 1 lights up = parking and marker lights ON.
- Press button (30) twice - LED 2 lights up = headlamps ON.
- Press button (30) three times - LED OFF = lights OFF.

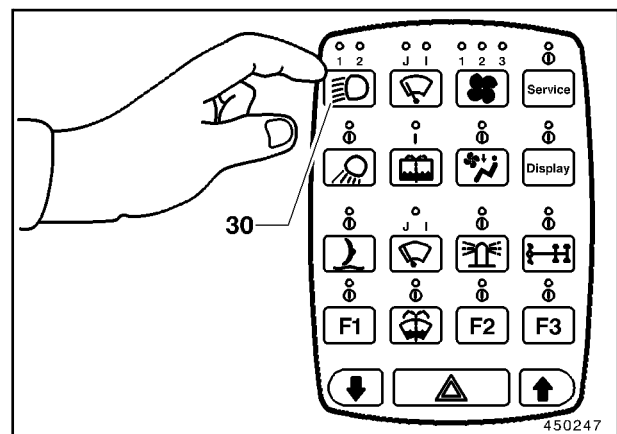


Fig. 1

OPERATING INSTRUCTIONS F106.6/A



Horn, direction indicator, main beam and headlamp flasher

2905358

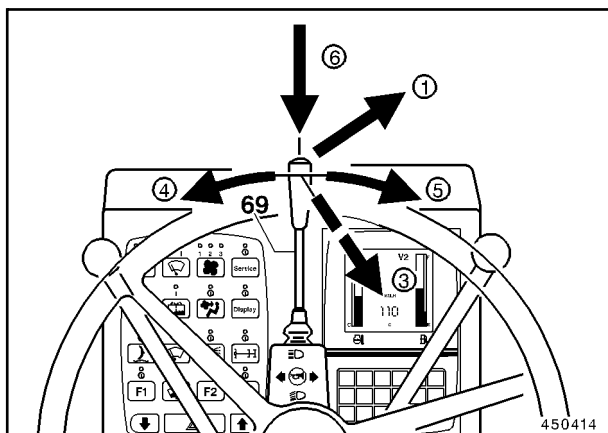


Fig. 1

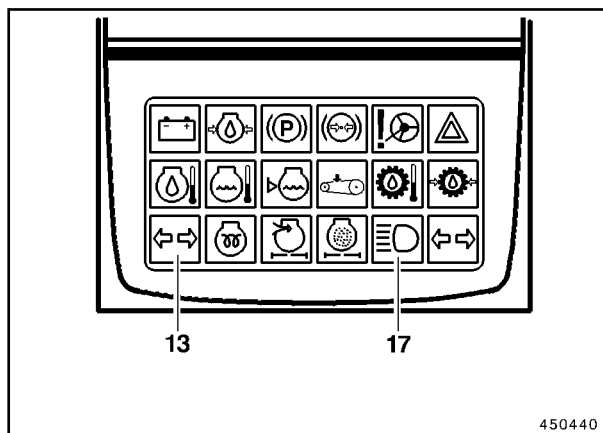


Fig. 2

Position	Function	Symbol	Remarks
1	Main beam		Move lever (69) to position 2 (Fig. 1). Indicator lamp (17, Fig. 2) lights up in blue. Main beam with dipped beam on
3	Headlamp flasher		Move lever towards position 3. Indicator lamp (17, Fig. 2) lights up
4	Direction indicator left turn		Move lever towards position 4. Indicator lamp (13, Fig. 2) lights up
5	Direction indicator right turn		Move lever towards position 5. Indicator lamp (13, Fig. 2) lights up
6	Horn		Depress button in lever

□

Floodlamps on cab

2747862

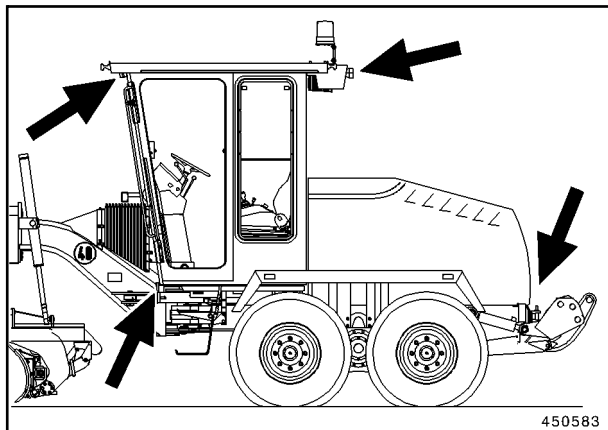


Fig. 1

The floodlamps (arrow, Fig. 1) are switched on and off with the pushbuttons (34, Fig. 2) and (42 + 43, Fig. 3).

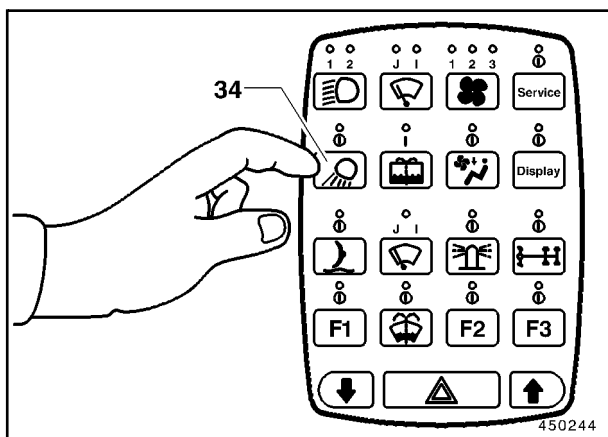


Fig. 2

The floodlamps can be used only when the headlamps are on dipped beam or when the sidelamps are on.

- LED off = floodlamps OFF
- Depress key (34) once: LED I is lit up = front floodlamp, ON.
- Depress key (34) twice: LED I is lit up = front and rear floodlamps ON.
- Depress key (34) three times: LED I is lit up = rear floodlamp ON.
- Depress key (34) four times: LED I is not lit up = floodlamps OFF.

The display LED is lit up in all active positions.

Floodlamps (option) front / rear

The floodlamps are switched on and off with key F1 or F2 (42 and 43, Fig. 2).

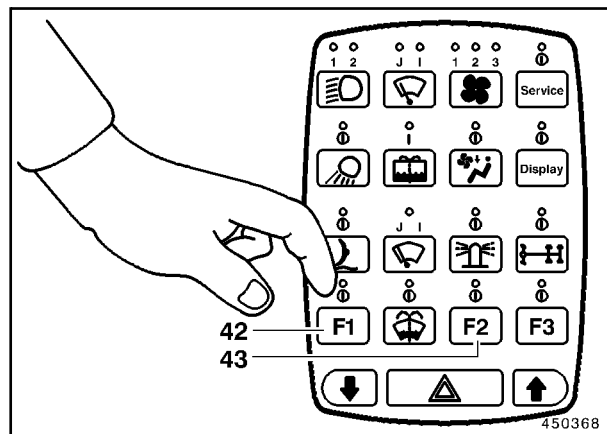


Fig. 3

The floodlamps can be used only when the headlamps are on dipped beam or when the sidelamps are on.

Front floodlamps operator platform, key F1 (42)

- Depress key (42) once: LED I is lit up = floodlamps ON
- Depress key (42) again: LED I goes out = floodlamps OFF

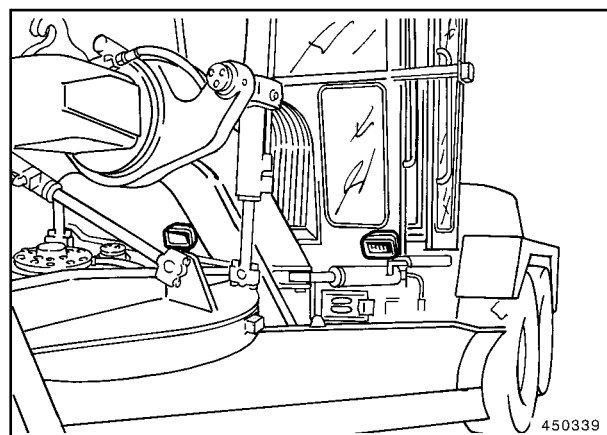


Fig. 4

Rear floodlamps on engine cover, key F2 (43)

- Depress key (43) once: LED I is lit up = floodlamps ON
- Depress key (43) again: LED I goes out = floodlamps OFF

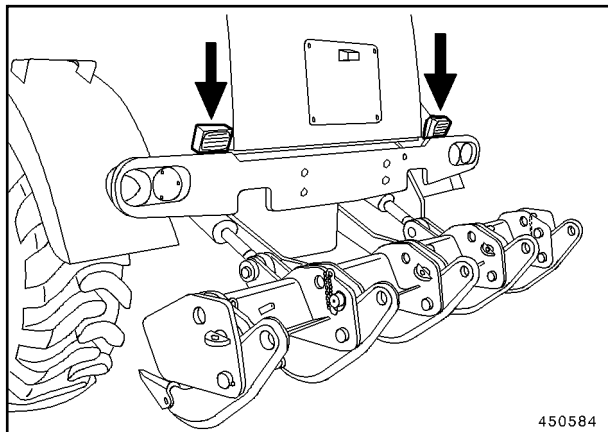


Fig. 5



DRIVING

2747923

Driving - Safety instructions



Before setting off

Clean off any earth, mud, snow, ice, grease and oil adhering to your working footwear before operating the machine. There is otherwise a risk of slipping off the pedals and initiating inadvertent movements.

Adjust the driver's seat, steering column and mirrors and fasten the safety belt before setting off.

Do not let other persons accompany you on the machine.

Warn anyone in the vicinity with the horn before setting off.

Do not tow trailers

The machine is not suited for towing trailers or other vehicles. Risk of damage to gearboxes and axles. The tow-bar coupling is provided only for towing or recovering the machine out of hazard areas or for fastening of the machine on transport vehicles; see also "Machine towing / recovery".



Driving on slopes

Make sure the wheels have sufficient grip; only then are the machine's full steering and braking capabilities available.

Do not drive across slopes.

Never turn on slopes.

Never steer with the pivot steering on slopes.

Reversing

During reversing operations, your view of the hazard zone is restricted. Therefore, seek the assistance of experienced marshalls. Instruct the marshaller in order to ensure that you understand his signals correctly.



Parking the machine

Machines parked on sloping terrain may start moving inadvertently.

Park the machine therefore on a level surface and lower the working equipment to the ground.

Driving long distances

The blade must not interfere with the steering range of the front wheels or with the steering linkage.

Do not start the machine when the central warning lamp is flashing; locate the cause of the fault beforehand and rectify.

When driving on public roads:

- Observe the requirements of the machine's general operating permit.
- Close the cab door.
- The first-aid kit, the warning triangle and the warning lamp must be on board.
- Check that the contents of the first-aid kit is complete, replacing missing or old parts.

Check when the engine is running:

- When making short left / right turns the steering wheel must move easily and the steering must react.
- After driving a short distance, the braking effect of the service brake must be tested.

Never idle the machine with the gear lever in neutral position, e.g. when driving downhill.

When driving with the door open, it must be locked in its limit position.



Bring the machine to operating temperature as described in the section "Warming up the machine" before setting off.

Never demand full performance from the engine unless the machine is at operating temperature.

□

Braking system

Service brake

The four brakes on the rear axle are used as a service brake. The service brake is operated hydraulically with pedal (79, Fig. 1). The braking force is dependent on the pressure exerted on the pedal.

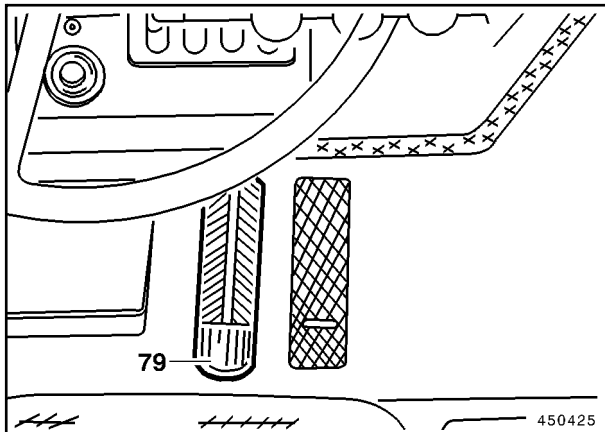


Fig. 1



When the operating pressure of the braking system is too low, warning lamp (5, Fig. 2) lights up.

Stop the machine immediately, locate the cause of the fault and rectify before continuing to use the machine.

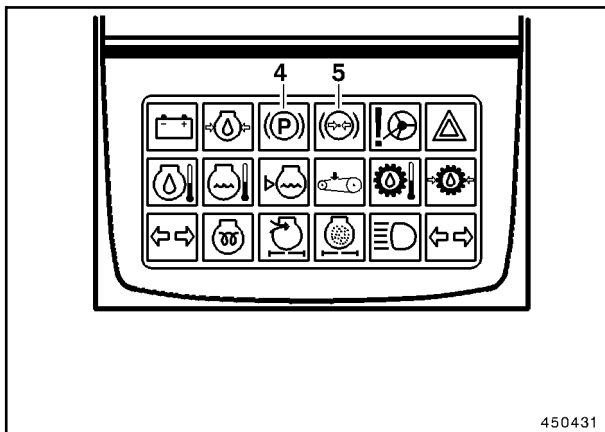


Fig. 2

Parking brake



Do not apply the parking brake unless the machine is stationary. Only in an emergency may the parking brake be applied while the machine is moving, for instance, after a failure of the service brake. In this case, the machine is braked abruptly.

The parking brake consists of a disk brake which is flange-mounted on the powershift transmission. This brake is operated electrically.

Applying the parking brake

- The parking brake is operated with rocker switch (87, Fig. 3) by depressing the switch face with the locking slider. The rocker switch is locked. The parking brake is applied and cannot be released inadvertently. Indicator lamp (4, Fig. 2) lights up.

The transmission is then in neutral position. In this way it is avoided that the machine is being driven against the applied parking brake.

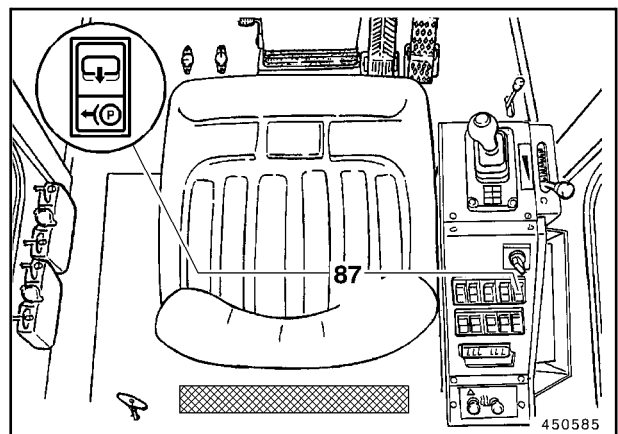


Fig. 3

Releasing the parking brake

- Unlock the rocker switch (87, Fig. 3) by sliding the locking slider in the direction of the arrow and by then depressing the symbol face of the switch. The parking brake is released and indicator lamp (4, Fig. 2) goes out.

□

Seat belt

2411979

The driver's seat is fitted with a lap-type seat belt (Fig. 4).

Seat belt - Safety instructions



Always belt up before driving.

Never run belt over rigid or fragile objects such as bunches of keys or spectacles. This may result in injury.

The belt must always be flat and firm against the body and must not be jammed.

The buckle opening must not be locked, e. g. with paper, as the buckle can then not engage.

Damaged seat belts and those stretched in an accident must be replaced.

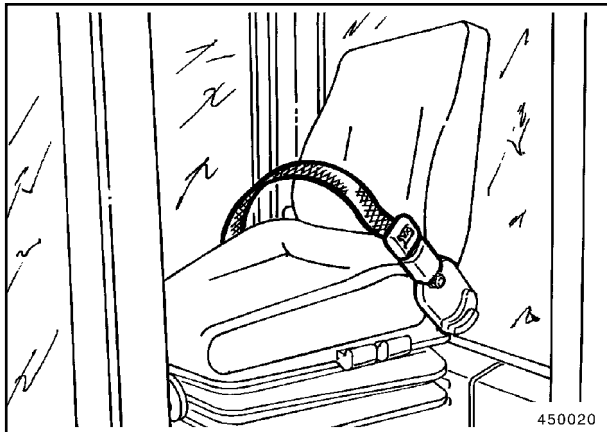


Fig. 4

□

Adjusting the steering column

2747926

Steering column, safety instructions



Do not adjust the steering column while driving. Concentrate on the road to avoid accidents.

Before adjusting the steering column:

- Stop the machine
- Set the gearshift lever to neutral position
- Apply the parking brake.

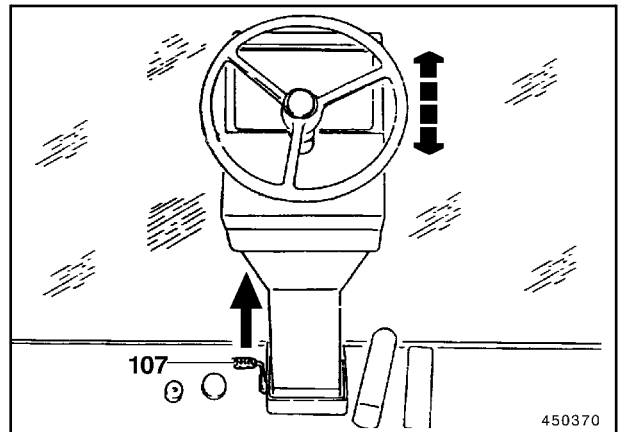


Fig. 5

The inclination of the steering column can be adjusted to four different position for adaptation to the driver's size and posture:

- Push lever (107, Fig. 5) forwards with your foot to unlock the steering column.
- Tilt the steering column to the desired position.
- Release lever (107) to relock the steering column.
- Make sure the steering column is perfectly locked.

□

OPERATING INSTRUCTIONS F106.6/A



F106.6 drive

2904933

The F106.6 grader is equipped with a drive acting on all 4 wheels of the rear axle (tandem axle).

F106.6 A all-wheel drive

The F106.6 A grader can be equipped with a front-axle drive (front-wheel drive) in addition to the rear-axle drive.

F106.6 A front-wheel drive

The front-wheel drive can be switched on only when the machine is in gear.

The front-wheel drive is switched on and off with the key (41, Fig. 6).

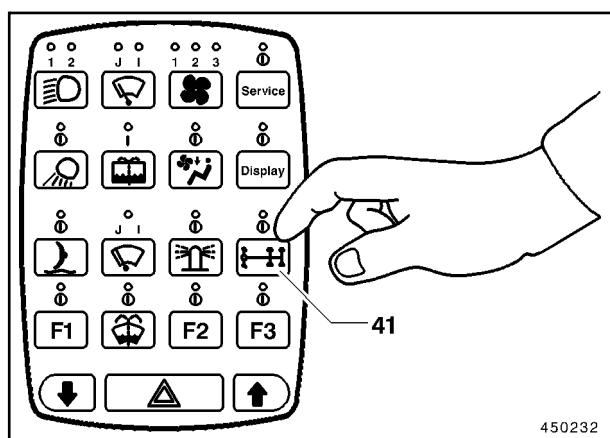


Fig. 6

Switching on the front-wheel drive

Depress key (41) once

LED I flashes = front-wheel drive activated

LED I lights up = front-wheel drive on

Switching off the front-wheel drive

Depress key (41) again

LED I flashes = front-wheel drive deactivated

LED I off = front-wheel drive off

The LED I flashes if the front-wheel drive cannot be switched on or off.

Activation and deactivation are possible in all operating conditions.

The drive can be switched on or off

- when the machine is stationary and in gear
- at travelling speeds of below 2 km/h

When the front-wheel drive is switched on, the power shift transmission cannot be put into 6th gear.

When the machine is in 6th gear, the front-wheel drive cannot be activated.

A microprocessor monitors the front-wheel drive and harmonizes it with the rear-axle drive.

When the front-wheel drive is off, the front wheels run independently of the drive.



If the hydraulic pump of the front-wheel drive is defective and therefore no longer driven, the machine must be shut off.

The machine must then not be used even with the front-wheel drive deactivated.

Locate the cause of the fault and rectify.

F106.6 A front-wheel drive, speed levels

To adapt the front-wheel drive to the working and driving conditions, the speed of the front wheels can be adjusted in 8 levels independent of the speed of the rear wheels.

The speed levels are selected with the rotary switch (84, Fig. 7).

Position 0 = front and rear wheels have the same speed

Positions 1 to 5 = front wheels turning at higher speed (lead)
The tractive force of the front axle is increased.

Positions -1 and -2 = front wheels turning at lower speed (lag)
The tractive force of the front axle is reduced.

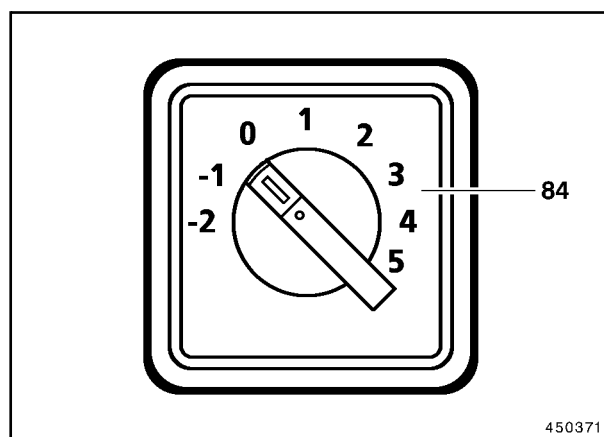


Fig. 7

Steering

20000006

The machine is equipped with a hydrostatic front-wheel steering operated with steering wheel (68, Fig. 8).

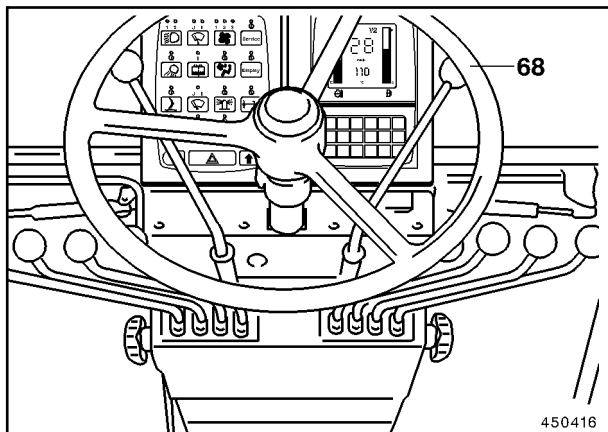


Fig. 8

Emergency steering

In the event of steering pump or engine failure, the machine can still be steered as long as it is in motion. Steering under these circumstances requires, however, a higher effort to turn the steering wheel.

The emergency steering can be used:

- for driving the machine out of the hazard area, and
- for towing of the machine onto a low-be trailer.

The emergency steering cannot be used for working operations.

Center-pivot joint steering

The center-pivot joint steering permits substantial reduction of the machine's turning circle.

The center-pivot joint steering is operated with control lever (66, Fig. 9).

Position 17 = center-pivot steering to the left

Position 18 = center-pivot steering to the right

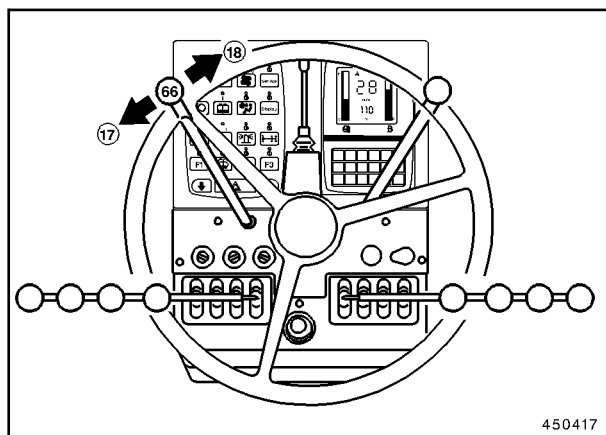


Fig. 9

The position of the articulated frame is indicated by markings on the center-pivot steering cylinders (arrow, Fig. 10).

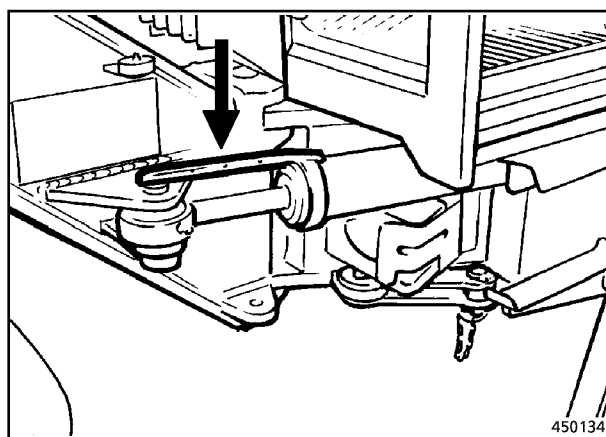


Fig. 10

□

Gearshift lever - power shift transmission

2747927



Never allow the machine to roll with the gearshift lever in neutral position (N), e.g. when driving downhill.

The forward and reverse driving direction and the 6 forward and 3 reverse gears are shifted with the gearshift lever (82, Fig. 1).

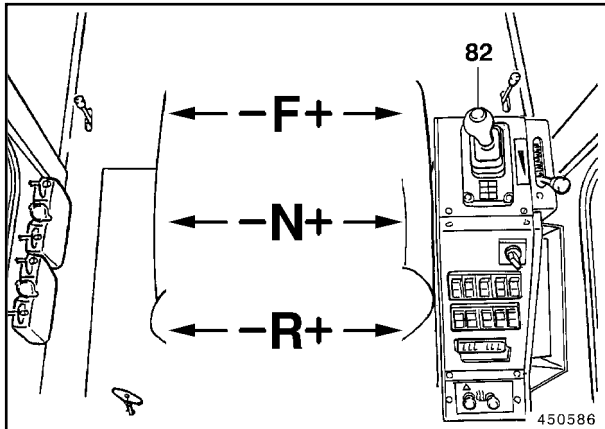


Fig. 1

All gears can be shifted under load.

The electronic gearshift control is active only within the speed ranges of the individual gears.

Automatic mode:

When the engine has been started up, the gearshift is in automatic neutral position.

• Gear selection:

Engine speed below 1,500 rpm
Release the parking brake

Press button on gearshift lever (82, Fig. 1) and move gearshift lever forward to forward gear or back to reverse gear. Release button.

The automatic gear system now shifts into 2nd forward or 1st reverse gear. Only if the driving conditions so require, e.g. for setting off under load, does the system shift down automatically into 1st forward gear.

Depending on speed range, the automatic gear system now shifts automatically up or down, either into the 6th forward gear or into the 3rd reverse gear.

Change from automatic to manual mode

The automatic mode can be cancelled by pressing the button. The gearshift remains in the gear currently selected by the automatic system.

The automatic mode can also be cancelled by slight lateral movement of the gearshift lever. The next gear upwards or downwards is then selected.

In the further course, a manual change into the next gears downwards can be made by moving the gearshift lever slightly to the left.

Changes to the next gears upwards can be made by moving the gearshift lever slightly to the right.

The gearbox can be returned to automatic mode either by pressing the button on the gearshift lever briefly or by moving the gearshift lever beyond the neutral position.

Maximum speed on horizontal asphalt surfaces (applicable to machines fitted with standard tyres 405/70R20EM).

Gears	Speeds in km/h	
	Forward	Reverse
1.	5,0	5,3
2.	7,6	12,5
3.	11,8	27,9
4.	17,7	
5.	26,4	
6.	37,8	

Forwards-reverse shifting



Reduce the engine speed before changing the driving direction (reversing).

Risk of accidents when changing to reverse direction while driving at high speed.

Shifting from forward to reverse gears (reversing) is also possible while driving.

The machine is braked smoothly and starts off in the opposite direction after stopping.

- Reduce the engine speed before reversing.
- Shift into opposite driving direction.

□

Warming up the machine

2747864

Warming up the engine

For starting up the engine, see section "Starting the engine" in the engine operating instructions.

Gearshift lever in neutral position

Parking brake applied

Start engine

For starting the engine at temperatures below 0°C, see section "Starting the engine with cold-start aid"

Run engine at ca. 1,000 rpm for 3 - 5 minutes before increasing engine speed.

Warming up the power shift transmission

Observe section

"Driving - Safety instructions"

Warm up the engine (as described under "Warming up the machine")

Gearbox temperatures below -11°C

Warm up gearbox in neutral position at engine idling speed until the electronic system releases the gearbox.

Gearbox temperatures above -11°C

In this case the electronic system releases the gearbox. No warming up is needed.

Warming up the working hydraulics

Warm up the working hydraulics during power shift transmission warm-up by extending and retracting all hydraulic cylinders slowly. □

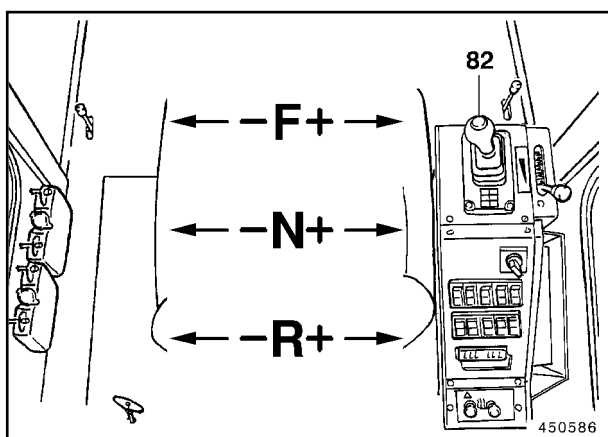


Fig. 1

Center-pivot joint

2747865

Blocking the center-pivot joint



Shut off the engine before installing or removing the center-pivot joint.

The center-pivot joint between front and rear frame can be locked mechanically on both sides, if the machine is to be driven on public roads or transported on a low-bed trailer.

Position the grader in such a way that the front and the rear frame are in alignment.

- Shut off the engine
- Apply the parking brake.
- Release the retaining rod (Fig. 2) from the rear shackle of the rear frame, swing forwards and attach to the front frame shackle and secure (Fig. 3).

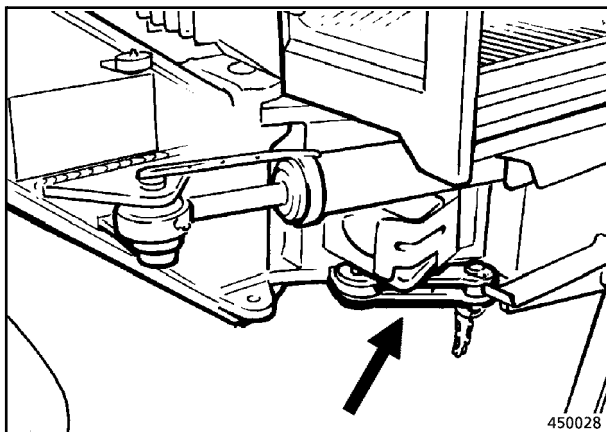


Fig. 2

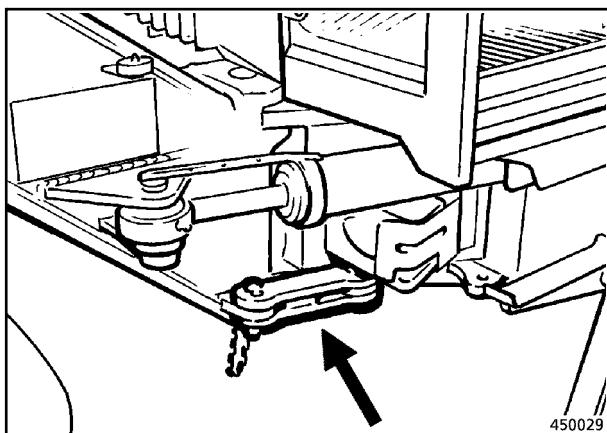


Fig. 3

Unblocking the center-pivot joint

- Bring the retaining rods (Fig. 3) on both sides of the machine back to their original position as shown in Fig. 2.

□

Driving

2747866



Read and observe the chapter "Driving - Safety instructions".

Driving on the public highway (option)

Observe the Road Traffic Regulations in force in the country of use.

Before driving the grader on the public highway:

- Clean the machine to remove any gross dirt.
- Lock the center-pivot joint.
- Check the condition of brakes, steering, tyres and lighting.
- Switch off the floodlamps.
- Lower the front-wheel splashguards (Fig. 1).

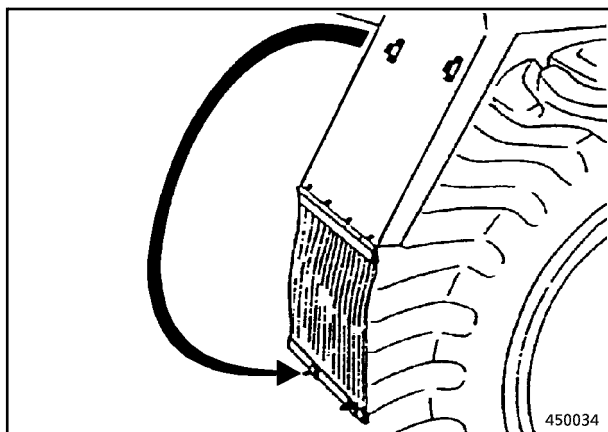


Fig. 1

- Bring levelling blade into transport position (Fig. 2) by turning the blade until the markings (arrows in Fig. 3 and 4) are in alignment.

- When driving on the public highway, the braking-pressure-dependent gearbox cut-out must be switched off. See section "Braking-pressure-dependent gearbox cut-out".

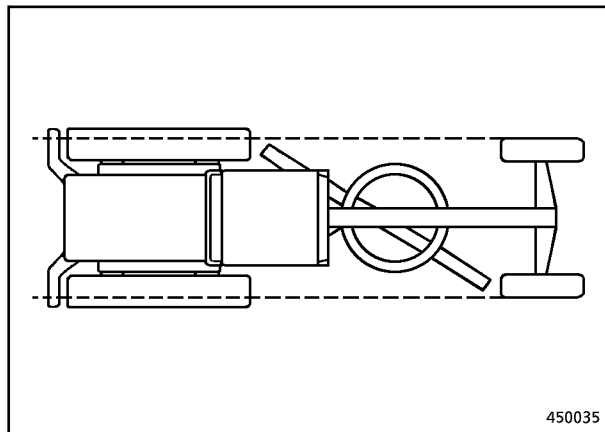


Fig. 2

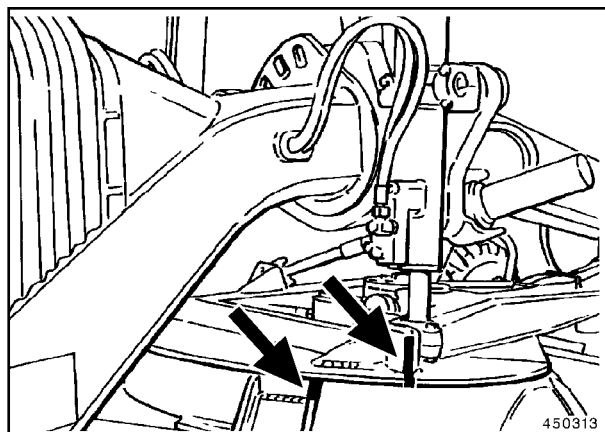


Fig. 3

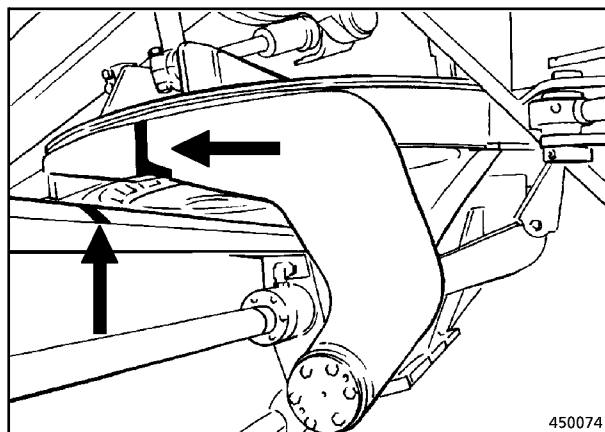


Fig. 4

OPERATING INSTRUCTIONS F106.6/A



- Raise the blade on both sides until the mark on the respective pointer (Fig. 5) is at the same level as the mark on the lifting cylinder tube.

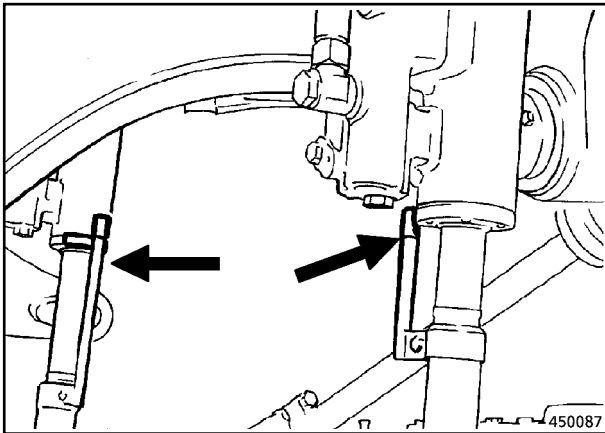


Fig. 5

- Check the wheel camber hydraulics for proper operation by moving the control lever (72, Fig. 6) several times to the upper and lower limit stop.

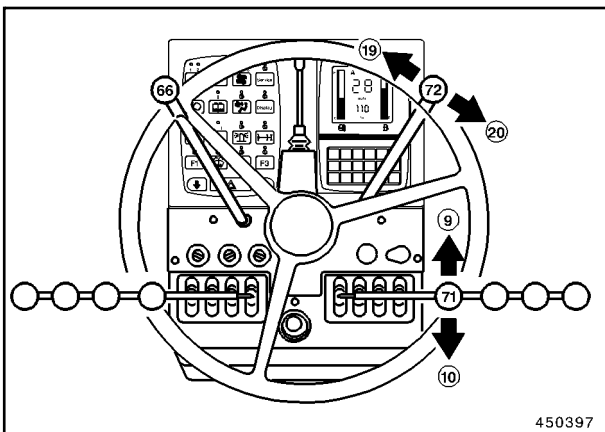


Fig. 6

- When the front blade is attached:

- Raise front blade with control lever (71, position 10) until the blade position pointer (Fig. 7) aligns with the yellow mark for travel on the highway.

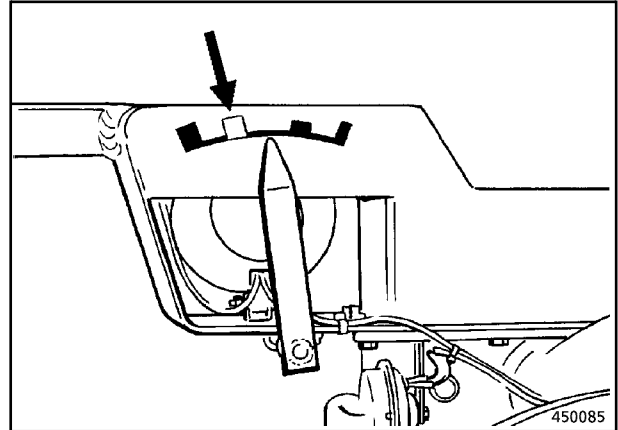


Fig. 7

- Set the shut-off valve of the front-blade cylinder to position 0 (Fig. 8).

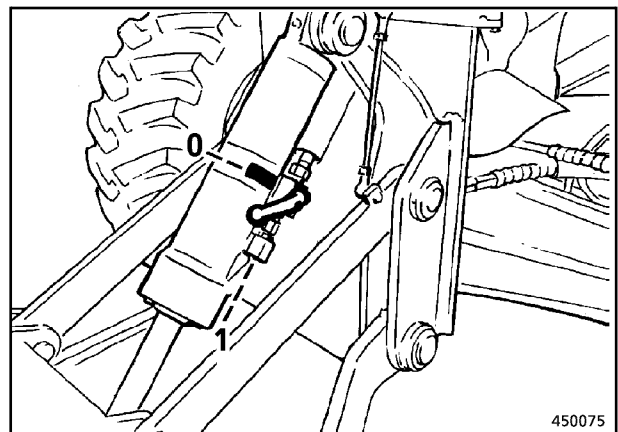


Fig. 8

OPERATING INSTRUCTIONS F106.6/A



- When the rear ripper is attached (1, Fig. 9) bring teeth (6) to transport position. Fold tooth protection (2) over tooth ends.

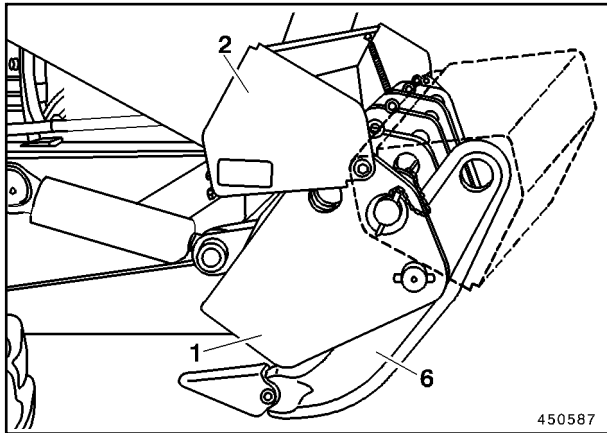


Fig. 9

Use control lever (64, Fig. 10) to bring the rear ripper into transport position. The position is reached when the green indicator lamp (1, Fig. 11) in the roof panel lights up. Never lift the rear ripper higher, as the rear lamps are otherwise concealed.

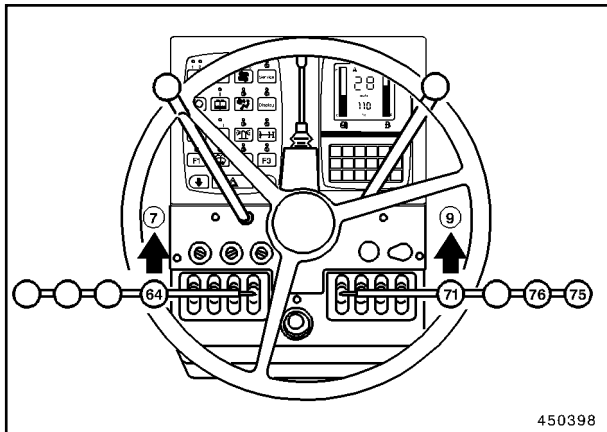


Fig. 10

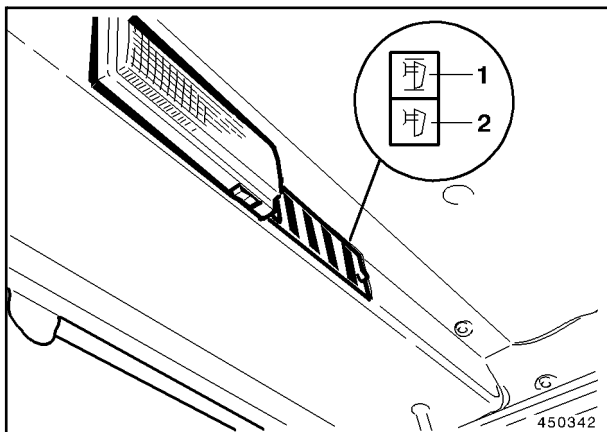


Fig. 11

Set lever (4, Fig. 12) on ripper cylinder (5) to position "B" to secure the rear ripper against inadvertent movements.

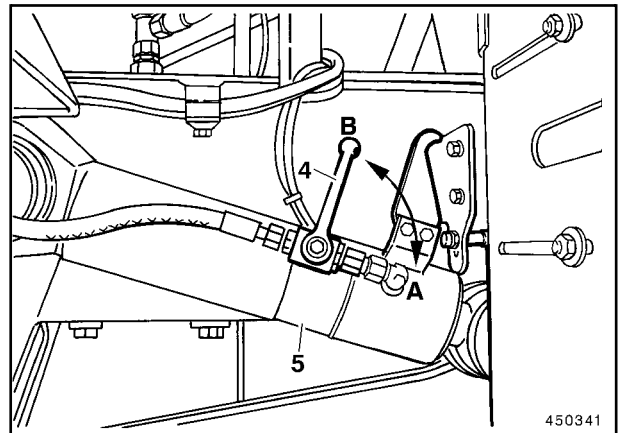


Fig. 12

- Disable all working equipment functions by turning locking knobs (60 and 78, Fig. 13) in opposite direction. Check that the control levers are locked in position.

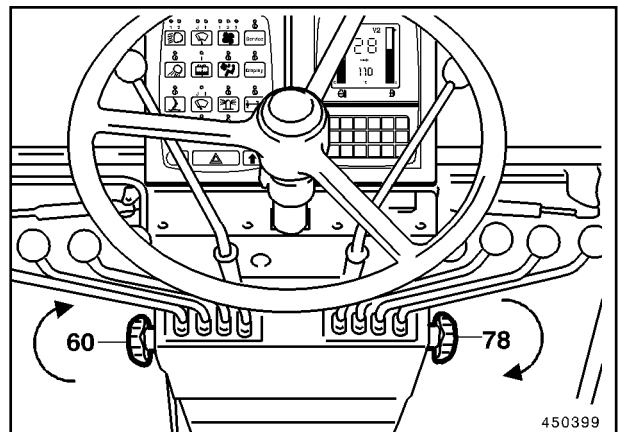


Fig. 13

First-aid kit

The first-aid kit can be stowed away in the storage compartment to the right of the driver's seat.

Fire extinguisher

The fire extinguisher can be attached on the right behind the driver's seat.

Have the fire extinguisher inspected at the prescribed intervals by an authorized testing institution.

Warning triangle

The warning triangle can be stowed away to the left of the driver's seat. □

Starting up

2747867

- Release parking brake
- Stop machine with service brake
- Engine speed must be below 1,500 rpm
- Set gearshift lever (82, Fig. 14) to forwards or reverse travel.

Never start up in a higher gear. Doing so increases the fuel consumption and the temperature of the oil in the powershift transmission unnecessarily.

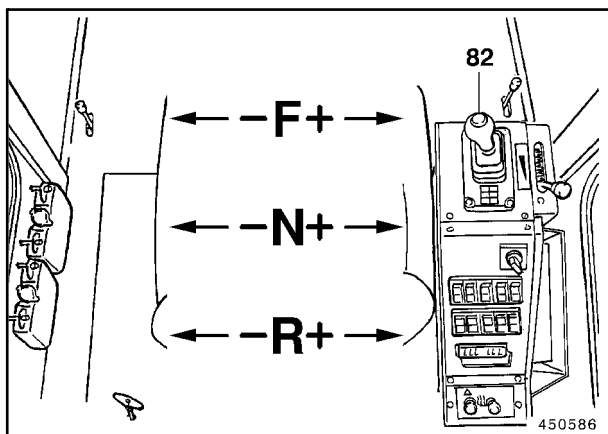


Fig. 14

- Increase engine speed with pedal (80, Fig. 15) to set the machine in motion.

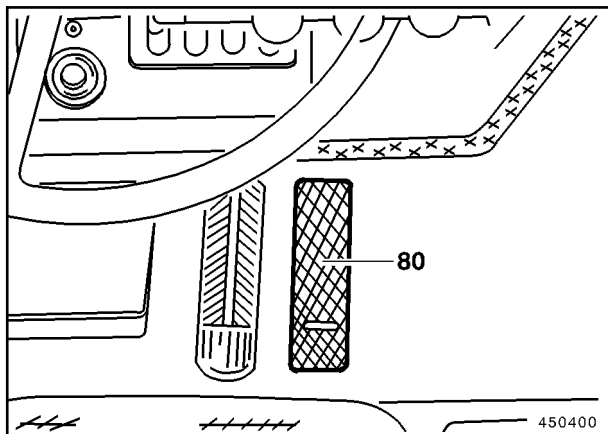


Fig. 15

When the machine is in motion, the display (24) changes from time display (Fig. 16) to speed display (Fig. 17).

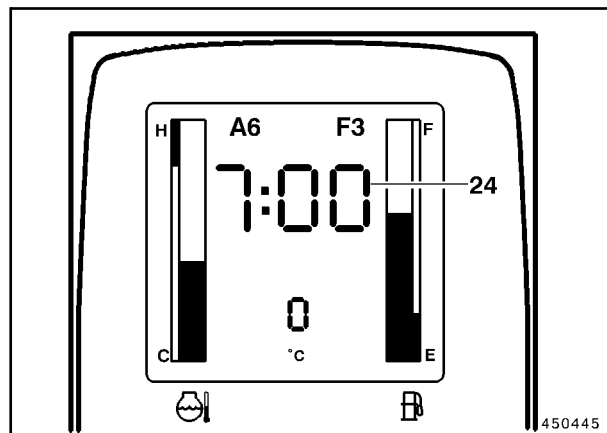


Fig. 16

The speed is displayed as an integer, e.g. 12.

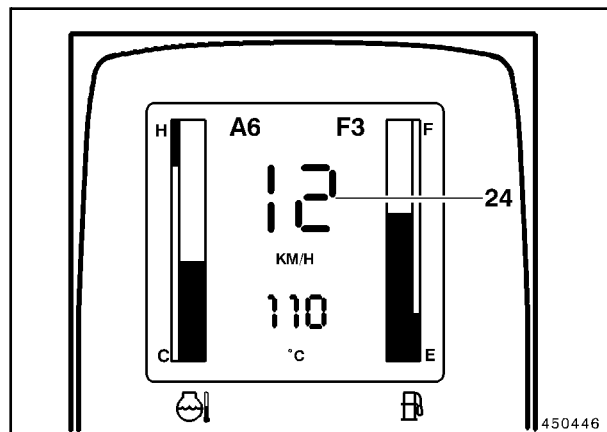


Fig. 17

Checks in the course of driving

Check the following points while driving:

- side and height indicator of the blade,
- height indicator when the front blade is attached,
- height indicator when the rear ripper is attached.

If the working attachments are found to be slipping down, use the corresponding control levers to bring the blade or the front blade back to transport position.

Stopping

- Reduce engine speed.
- Apply service brake until the machine is stationary.
- Set the powershift transmission to neutral.
- Apply the parking brake.

Downhill driving

Friction losses in the transmission produce a braking action in 1st and 2nd gears (permanent brake). When descending a slope with slight to medium gradient, shift into 2nd gear. For steep gradients, select the 1st gear.

Reduced engine revolutions result in a better braking action but also in a higher temperature of the oil in the powershift transmission.

Depressing the accelerator by an appropriate amount permits optimal braking efficiency together with the right oil temperature.

Under these circumstances, the service brake needs to be operated only from time to time to maintain the desired road speed. □

Display monitoring

Observe the warning lamps while driving. The grader works perfectly as long as none of the warning lamps lights up, the acoustic warning does not sound and no fault codes are shown on the display (25, Fig. 1).

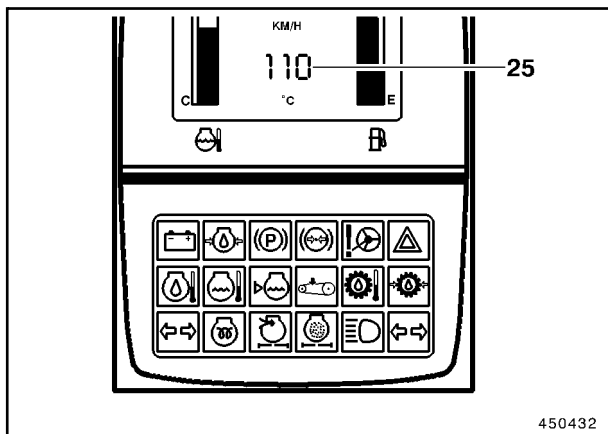


Fig. 1



Stop the grader immediately if a warning lamp lights up and if the acoustic warning sounds.

If necessary, shut off the engine, locate the fault and rectify.

Braking pressure



If the braking pressure drops below the admissible level, the warning lamp (5, Fig. 2) lights up and an acoustic signal sounds. Stop the grader immediately.

Locate the fault and rectify.

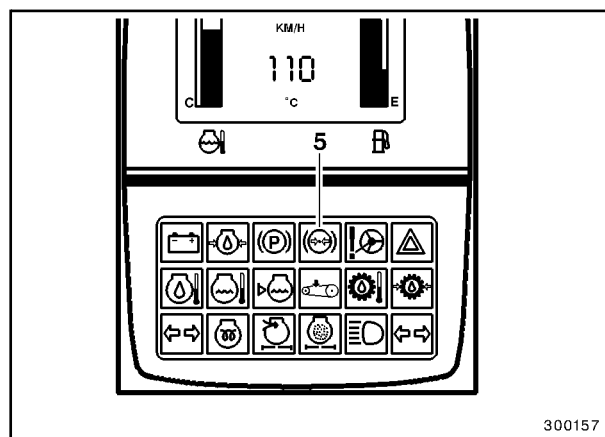


Fig. 2

Fault code display (25)

Besides the power shift failure indication, the following fault codes may appear on the display (25, Fig. 3):

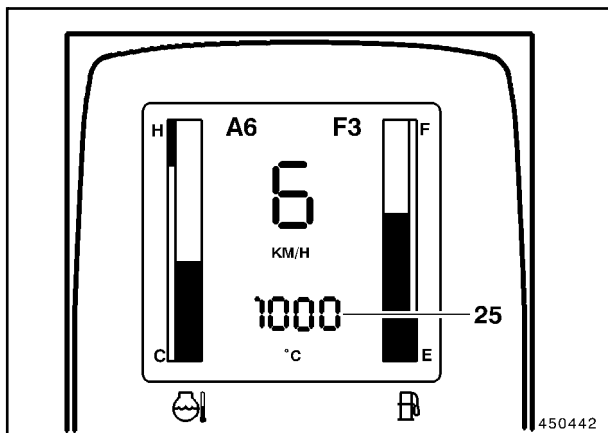


Fig. 3

Alternator

In the event of an **alternator** fault, the warning lamp (2, Fig. 4) lights up.

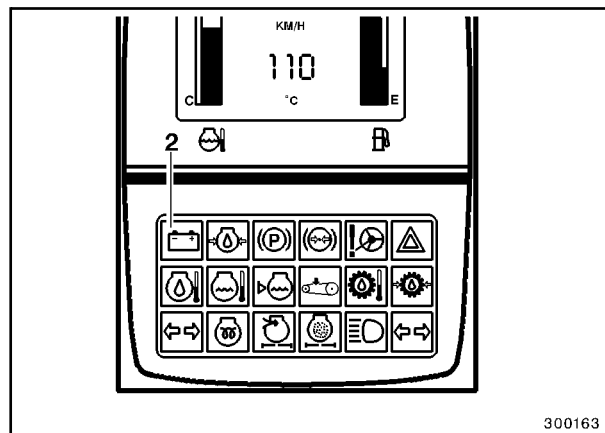


Fig. 4

Fault code	Fault
80	Gearbox temperature too high
1000	Coolant temperature too high
2000	Fault in transmission or in control Contact the O&K after-sales service, quoting the fault code
4000	Fault in front-wheel drive Contact the O&K after-sales service, quoting the fault code
8000	Fault in transmission oil supply Contact the O&K after-sales service, quoting the fault code

Powershift transmission

Gearbox oil temperature

The gearbox oil temperature is normally between 80 and 120°C and is shown on the gearbox oil temperature display (25, Fig. 1). The temperature may rise briefly to 120°C, e.g. when outdoor temperatures are very high, when driving uphill in the wrong gear, and in harsh working conditions. If this is the case:

- stop the grader
- set the gearshift lever (82) to neutral
- apply the parking brake with rocker switch (87, Fig. 5)

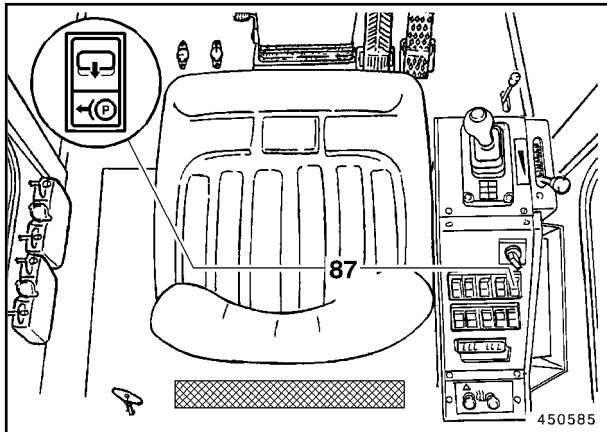


Fig. 5

- Run engine at low speed (1200 - 1500 rpm). The engine speed can be checked when the machine is stationary by pressing key (37, Fig. 6) "Display". The display (24) now indicates the engine speed. The speed is indicated in RPM = min⁻¹ (Fig. 7).

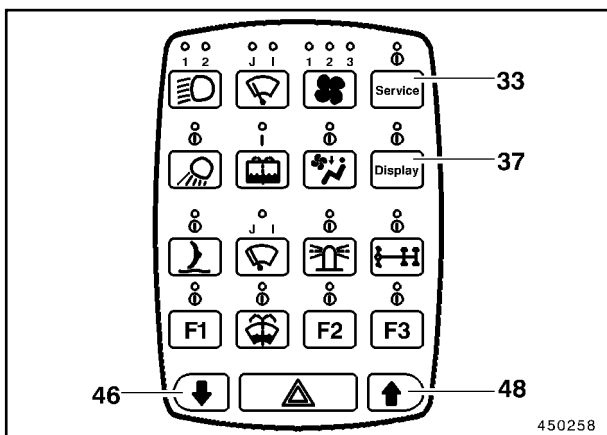


Fig. 6

The temperature must then drop to normal values within ca. 2 - 3 minutes. If this is not the case, shut off the engine. Locate the cause of the fault and rectify before restarting the grader.

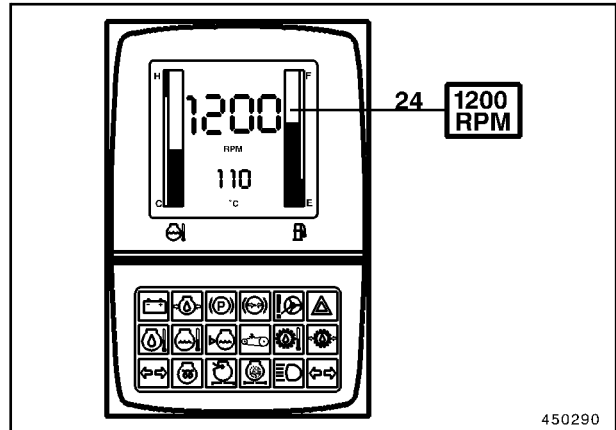


Fig. 7

□

Brake-pressure-dependent transmission cutout (optional)

2747869

The grader can be equipped with a brake-pressure-dependent transmission cutout function which is activated at a brake pressure of 25 bars. This function can be switched on and off.

The brake-pressure-dependent transmission cutout is activated only in 1st, 2nd and 3rd forward gear and in 1st reverse gear.

The brake-pressure-dependent transmission cutout is switched on with rocker switch (89, Fig. 1).

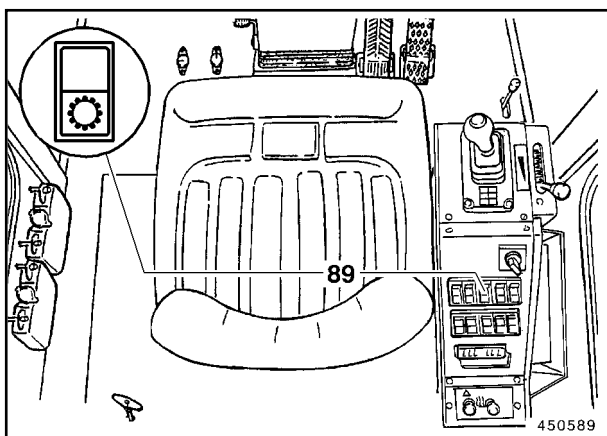


Fig. 1

Depress the symbol face of the switch
The symbol is lit up -

Brake-pressure-dependent
transmission cutout ON

Depress blank face of the switch
The symbol is extinguished -

Brake-pressure-dependent
transmission cutout OFF

□

Machine recovery / towing

2747870

Recovery and towing - Safety instructions



Tow the machine with a tow-rod or towing cable only.

The tow rod or cable must be undamaged. They must be dimensioned in such a way that the calculated breaking load is equal to three times the tractive power of the towing machine.

The towing vehicle must have adequate tractive power. Drive slowly and carefully.

All persons must keep clear of the tow rod or cable.

Tow only if the brakes and steering of the machine are functioning properly and if the machine cannot be transported in another way.

Tow defective machines only as far as is needed to recover the machine from hazard zones.

After being recovered, the machine must be secured against inadvertent movement and unauthorized starting.

Repair the machine before transporting it over longer distances, or load it onto a transport vehicle.



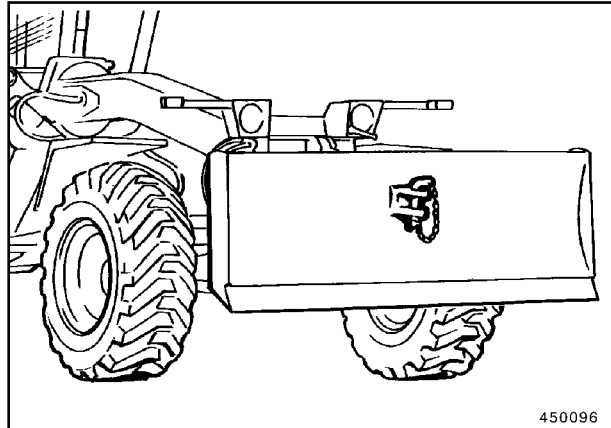
The towing speed must not exceed 10 km/h. Tow the machine only out of the hazard zone or transport it on a low loader.

Excessive trailing may damage the transmission.

Tow rod coupling



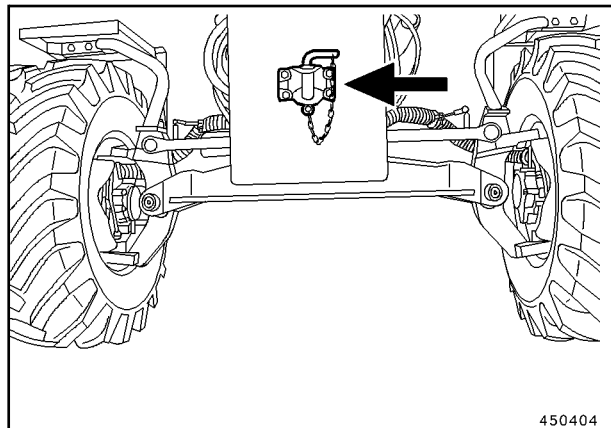
The tow rod couplings must not be used to tow trailers.



450096

Fig. 1

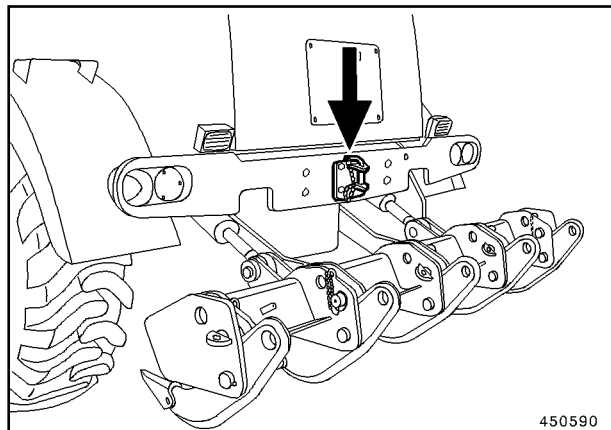
Tow rod coupling on front bulldozer



450404

Fig. 2

Tow rod coupling on front frame



450590

Fig. 3

Tow rod coupling at rear (option).

□

Transport

2747871

Transport - Important notes



The machine may be loaded and transported only if all safety regulations are complied with.

Entrust loading and transporting of the machine to a company experienced in the transport of heavy equipment.

The responsibility for loading and transporting lies with the transport company or their representative.

Remove oil, grease, soil, mud, snow, ice and other materials from the machine's wheels and from ramps and loading platforms of the transport vehicle to minimize slipping.

Use only tying equipment of sufficient strength (the weights of the machine are set out in the "Technical Specifications")

- Drive the machine onto the low-bed trailer and lower the working attachments (Fig. 1).

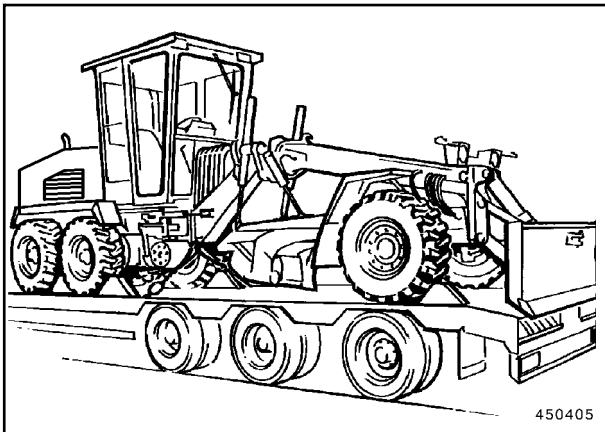


Fig. 1

- Block the pivot joint.
- Secure the machine properly with suitable material (lifting tackle, wire ropes, chains, tensioners, chocks).

Tie-down points: see figures 2 to 4.

- Lower the rear ripper if the machine is so equipped, close the stopcock and tie the machine down at the rear ripper.
- If the rear ripper is not attached, the machine can be tied down using the openings (1 and 2) shown in figs. 2 and 3.

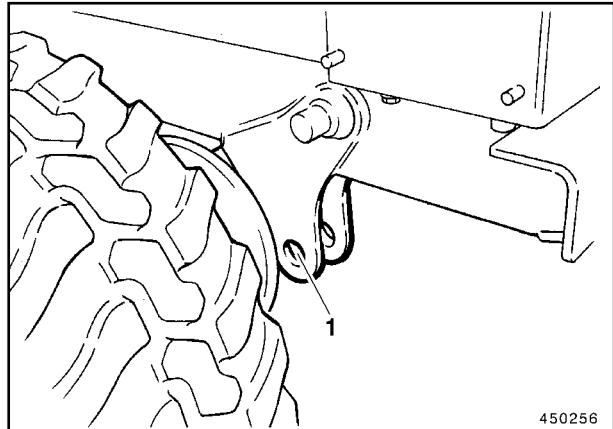


Fig. 2

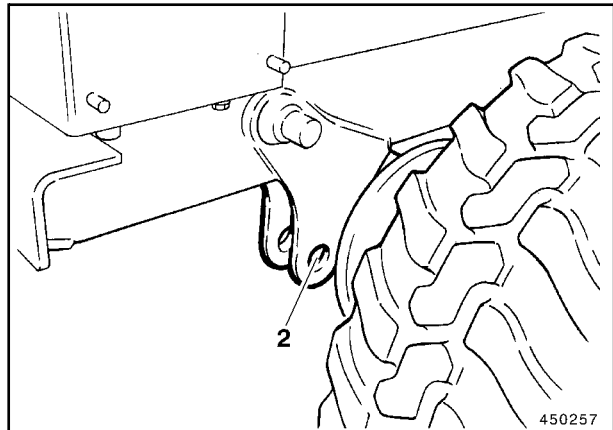


Fig. 3

Unblock the pivot joint after transport, but before unloading the machine.

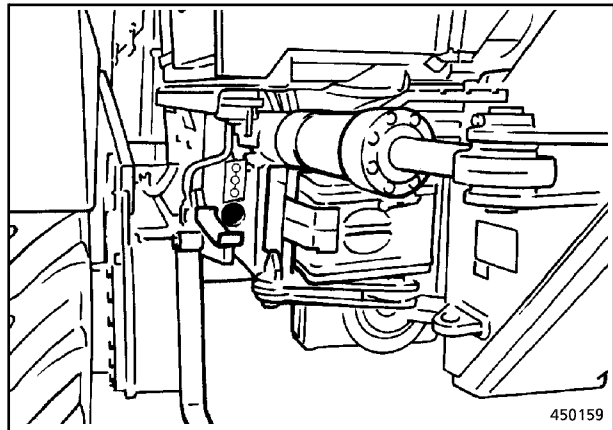


Fig. 4

Crane loading



Block the pivot joint if the machine is to be lifted by a crane for loading.

Loading by crane requires lifting tackle. Required lifting capacity: see "Technical Specifications".

The points of attachment are marked on the machine (Figs. 5 and 6).

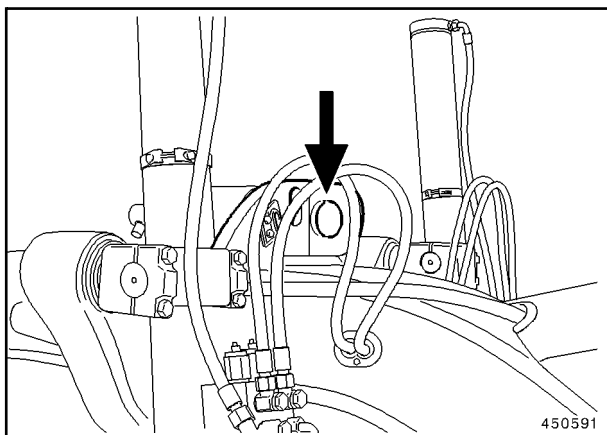


Fig. 5

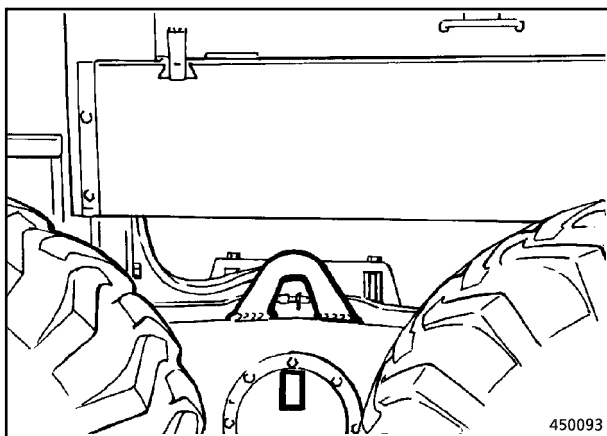


Fig. 6



OPERATING INSTRUCTIONS F106.6/A



WORKING OPERATION

2747872

Working operation, safety instructions



Read the sections "Fundamental safety instructions" and "Operation - Safety instructions" carefully and observe the instructions given in these sections.

Inspect the site for underground gas, power and water lines before starting work. Any damage to such lines is a life-threatening risk.

Clean off any earth, mud, snow, ice, grease and oil adhering to your working footwear before operating the machine. There is otherwise a risk of slipping off the pedals and initiating inadvertent movements.

When driving with the door open, it must be locked in its limit position.

Sound the hooter to warn persons in the immediate vicinity of the machine before starting work.

Never drive across slopes.

Never turn on slopes.

Never steer with the pivot steering on slopes.

Stop work if anyone is in the hazard range of the machine. Continue working only after such persons have left the hazard range.

Always use and operate the machine in such a way as to guarantee its stability.

Trenches and building pits may cave in. Keep well clear of them.

□

Grader deployment

2747873

The versatility of the graders and the wide range of materials handled allow many different applications and working methods.

We therefore recommend initial operator instruction by O&K.



Read and observe: "Warming up the machine".

Never exceed the admissible transverse and longitudinal inclination of the machine. This affects or interrupts the engine lubrication.

The admissible engine inclinations are:

Transverse:	left	/	right
	35°		35°
Longitudinal:	deep	/	high
	35°		35°

Lower the working equipment immediately and shut off the engine if the warning lights for engine temperature, engine oil pressure or alternator light up.

□

Control levers for working attachments

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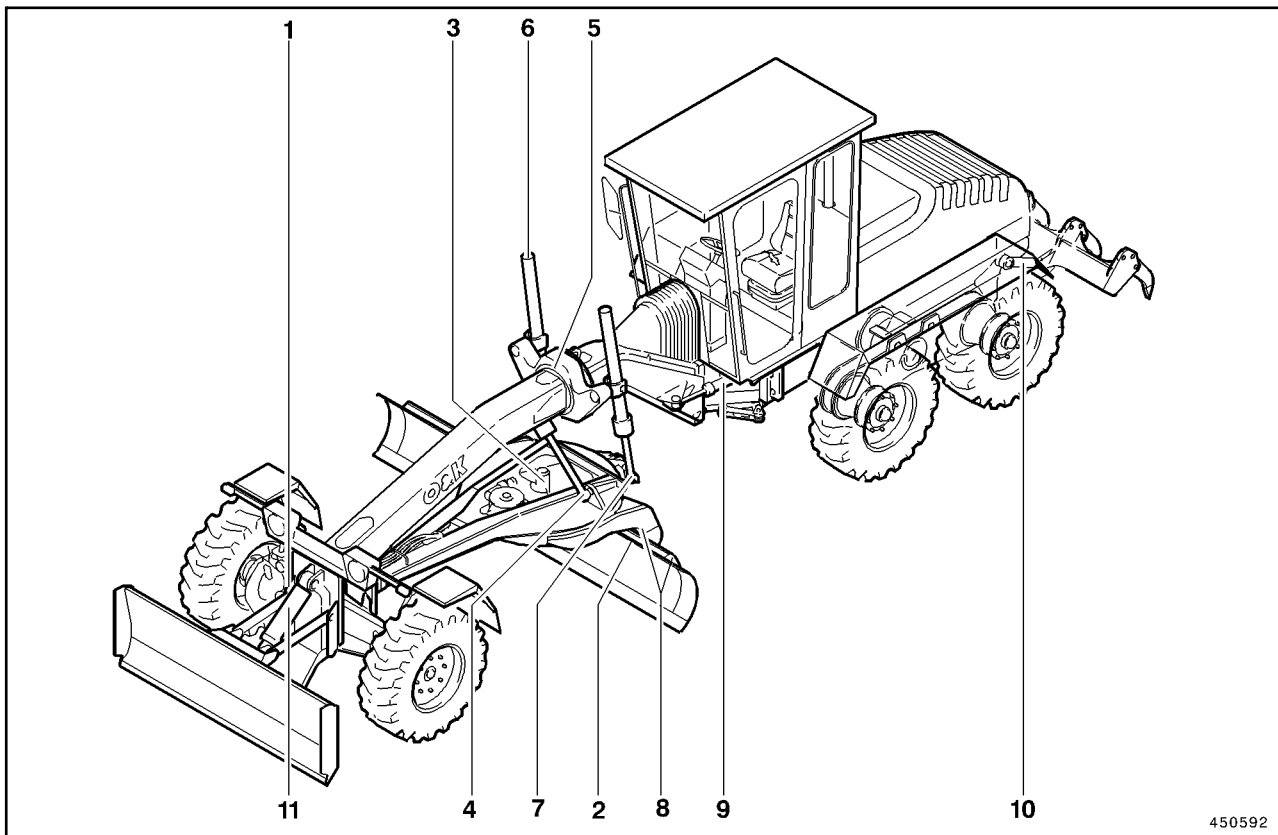


Fig. 1

The position of the working attachments (Fig. 1) is adjusted hydraulically by means of the following hydraulic components:

- 1 - Wheel-rake adjustment cylinder
- 2 - Blade sideshift cylinder
- 3 - Hydraulic motor of blade rotation mechanism
- 4 - Blade swivelling cylinder
- 5 - Swivel arm lock cylinder
- 6 - Blade lifting cylinder, righthand
- 7 - Blade lifting cylinder, lefthand
- 8 - Pitch adjustment cylinder
- 9 - Center-pivot steering cylinder
- 10 - Rear ripper cylinder (optional)
- 11 - Front blade cylinder (optional)

Control layout (Fig. 2)

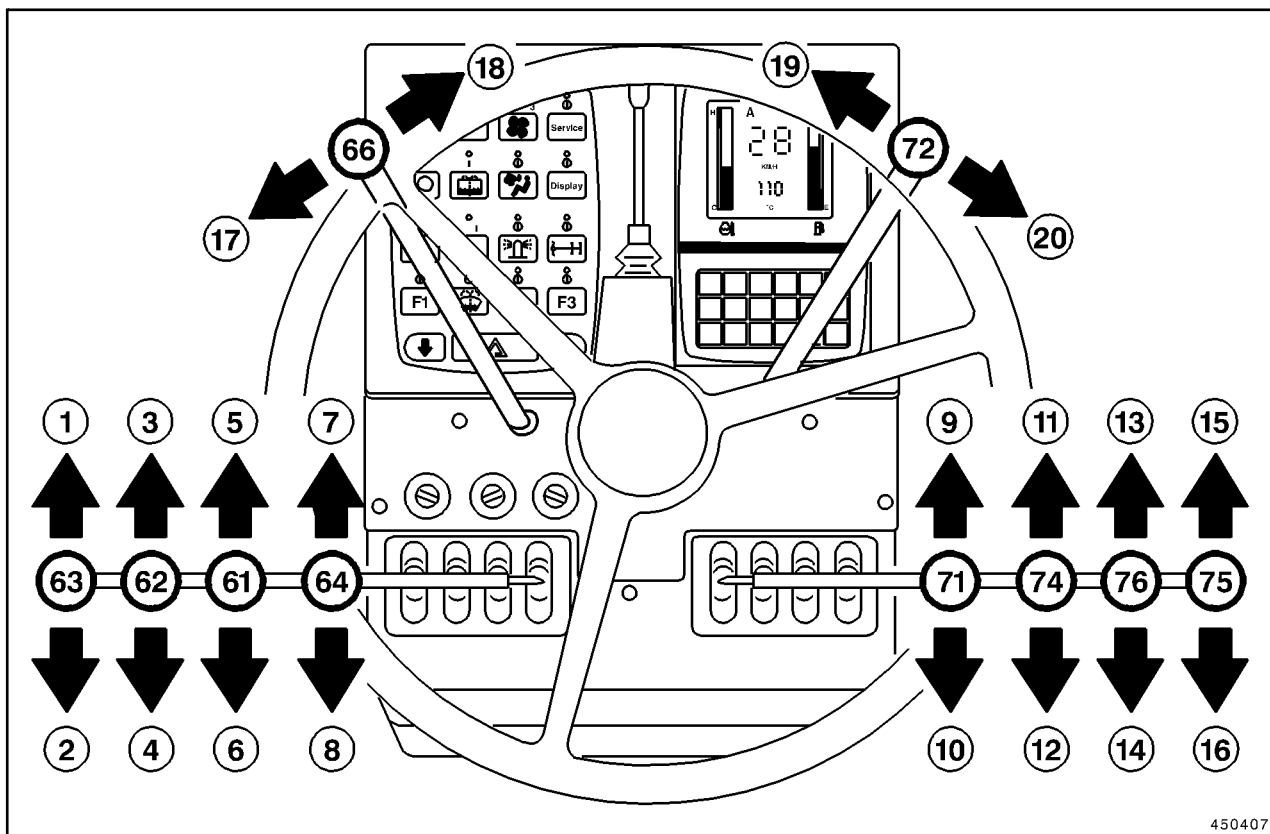


Fig. 2

OPERATING INSTRUCTIONS F106.6/A



Control lever	Function	Position O	Control action	Symbol
61	Blade pitch adjustment	5	blade pitch steeper	
		6	blade pitch flatter	
62	Blade slewing	3	blade slewing to the right	
		4	blade slewing to the left	
63	Blade shift	1	blade shift to the right	
		2	blade shift to the left	
64	Rear ripper (optional)	7	rear ripper down	
		8	rear ripper up	
66	Center-pivot joint	17	center-pivot steering to the left	
		18	center-pivot steering to the right	
71	Front levelling blade (optional)	9	front levelling blade down	
		10	front levelling blade up	
72	Wheel rake	19	wheel rake left	
		20	wheel rake right	
74	Blade swinging	11	blade swung out to the right	
		12	blade swung out to the left	
75	Blade lifting / lowering, right-hand	15	right-hand side of blade lower	
		16	right-hand side of blade higher	
76	Blade lifting / lowering, left-hand	13	left-hand side of blade lower	
		14	left-hand side of blade higher	

Working hydraulics - highspeed function

The working speed of the attachments can be increased with the highspeed function.

The highspeed function achieves its full effect only at higher engine speeds.

Increasing the working speed

- Depress button (105, Fig. 3).
As long as button (105) is kept depressed, the respective attachments work with higher speed.

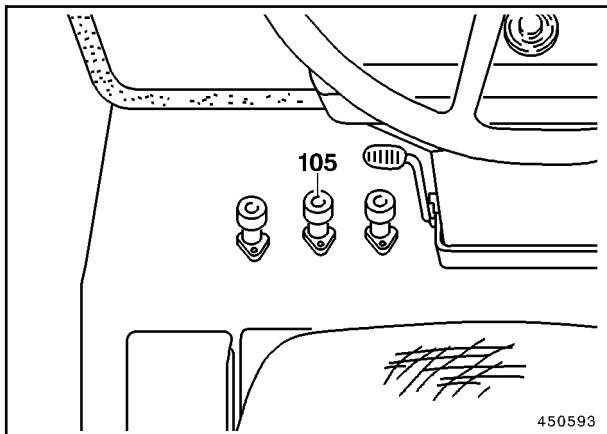


Fig. 3

Blade

The blade

- has good ground clearance,
- can be extended far out to both sides,
- can be rotated continuously through 360° and
- has an adjustable pitch.

For a description of the functions see control layout.



- When rotating the blade make sure**
- the step-ladder to the cab is in raised position,
 - the blade does not hit the chassis, the wheels or the track rods.

Swivel arm

Swivel arm lock

The swivel arm carrying the blade-rotation mechanism (Fig. 4) can be moved to 5 different positions and locked there.

The locking pin is disengaged hydraulically and engaged by spring force.

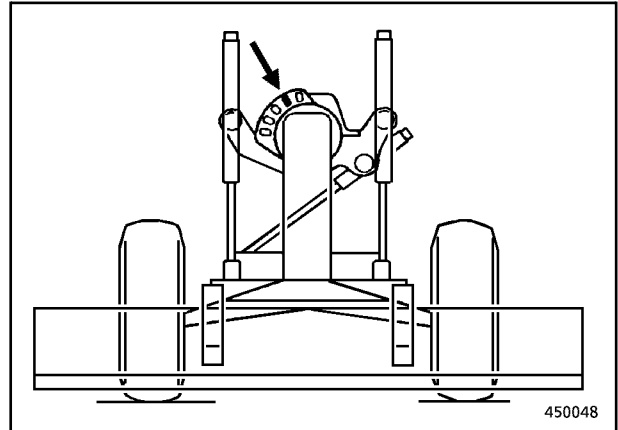


Fig. 4

Disengaging the swivel arm lock:

- Let the blade sink to the ground.
- Depress button (104, Fig. 5) and hold. The locking pin is disengaged by means of a hydraulic cylinder.

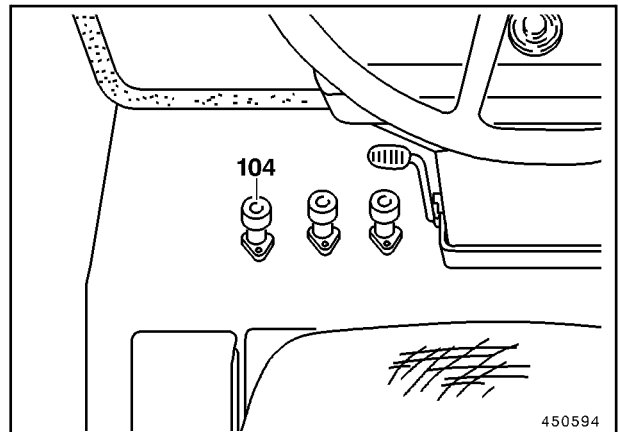


Fig. 5

Engaging the swivel arm lock:

- Release button (104) shortly before reaching the desired swivel arm position. The locking pin engages by spring force in the corresponding detent.

OPERATING INSTRUCTIONS F106.6/A



Readjusting the swivel arm

The swivel arm is locked in position 4, when the blade is in horizontal position (Fig. 6).

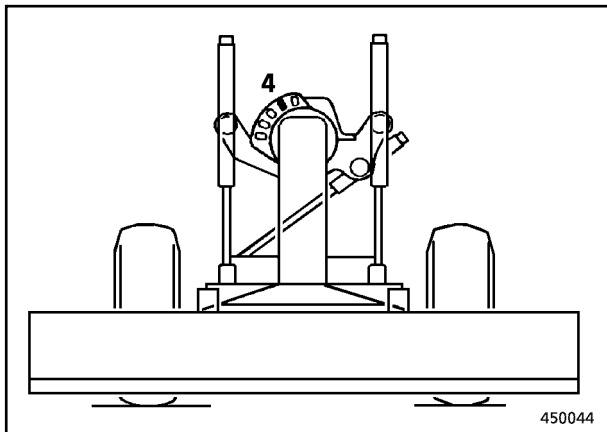


Fig. 6

Readjusting the swivel arm to the right:

- Retract blade swivel cylinder with control lever (74, Fig. 7) completely before setting the blade with control levers (75 and 76) on the ground to relieve the hydraulic system.

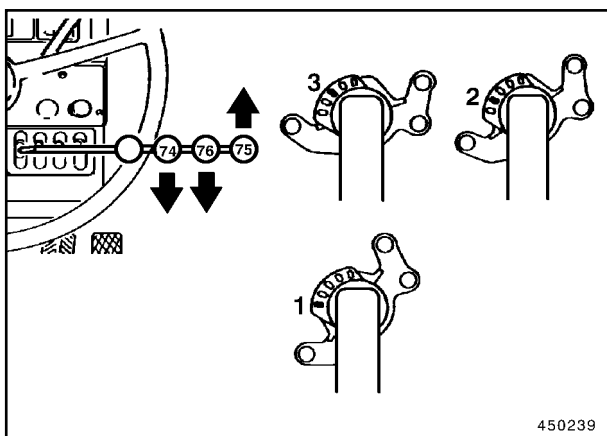


Fig. 7

- Disengaging the swivel arm lock.
To do so, depress button (104, Fig. 5) and hold. The locking pin disengages from the arm.
- Bring the swivel arm to one of the desired positions 1, 2 or 3 by means of control levers (74 - 76, Fig. 7). Release button (104, Fig. 5) shortly before reaching the desired position. The locking pin engages the corresponding detent by spring force.

Readjusting the swivel arm to the left:

- Extend blade swivel cylinder with control lever (74, Fig. 8) completely. Set blade on the ground with control levers (75 and 76) to relieve the hydraulic system.

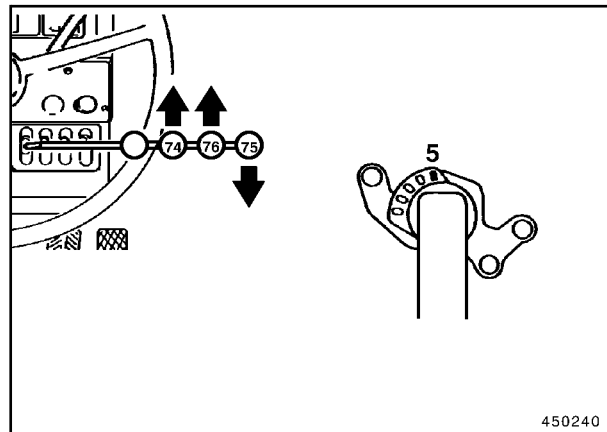


Fig. 8

- Disengaging the swivel arm lock.
To do so, depress button (104, Fig. 5) and hold. The locking pin disengages from the arm.
- Bring swivel arm to positions 5 using control levers (74 - 76, Fig. 8). Release button (104, Fig. 5) shortly before reaching position 5. The locking pin engages the corresponding detent by spring force.

Wheel rake

The wheel rake can be hydraulically adjusted (Fig. 9) with control lever (72, Fig. 10):

Position 19 = adjust wheel rake to the left

Stellung 20 = adjust wheel rake to the right.

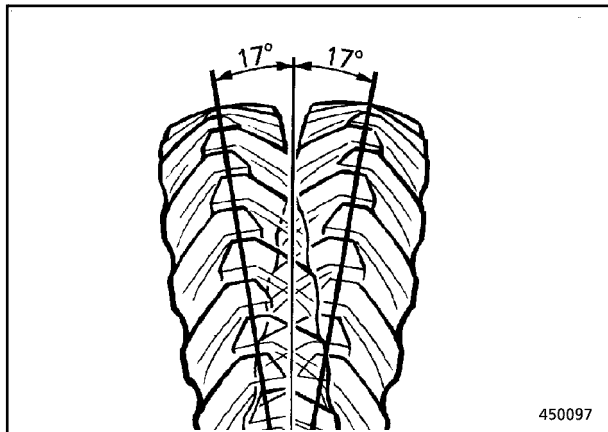


Fig. 9

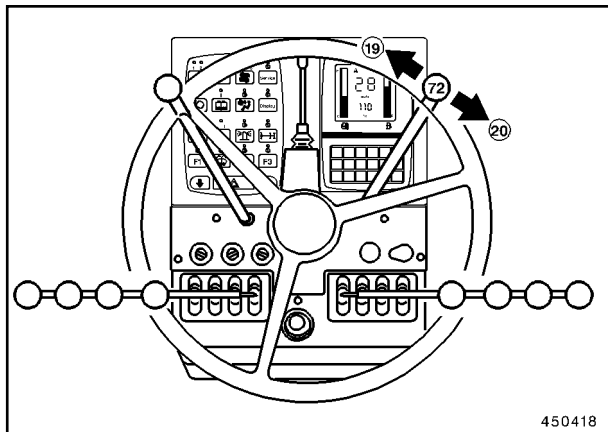


Fig. 10

The wheel rake adjustment:

- reduces the machine's turning circle,
- compensates lateral thrust during scraping,
- gives better grip on the ground.

If the wheel rake is adjusted when the steering is at either of the limit stops, the steering wheel turns back by a slight amount.

□

Emergency lowering of the working attachments

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It must be possible to raise or to lower the working attachments even in the event of engine or control failures.

Emergency lowering of the blade

The blade can be lowered in an emergency by actuating the valves (3 and 4) attached to the blade lifting cylinders (1 and 2, Fig.1).

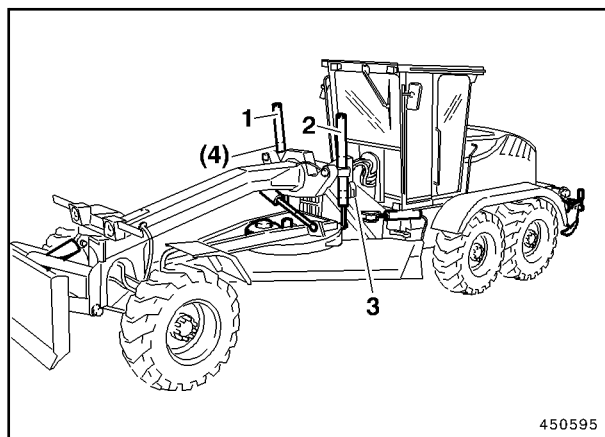


Fig. 1



**During emergency lowering nobody must stand in the blade's moving range.
When lowering the blade, keep clear of all obstacles.**

Lowering the left-hand side of the blade

To lower the left-hand side of the blade, actuate the valve (3, Fig. 1 and 2) on the left blade lifting cylinder (2).

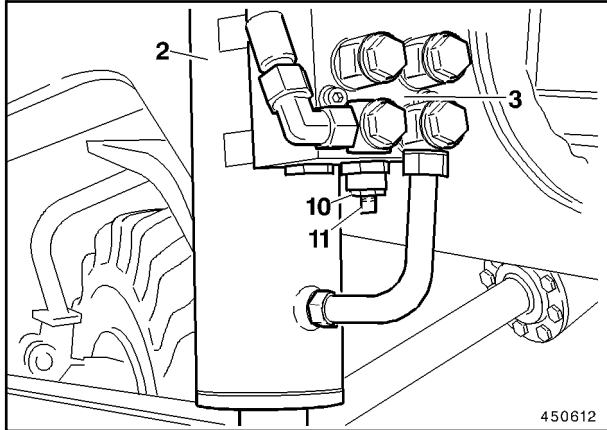


Fig. 2

To actuate the valve, loosen lock-nut (10, Fig. 2) and lower the blade by turning out setscrew (11) with an Allan key (part of the tool-kit).

Lowering the right-hand side of the blade

To lower the right-hand side of the blade, actuate the valve (4, Fig. 1 and 3) on the right blade lifting cylinder (1).

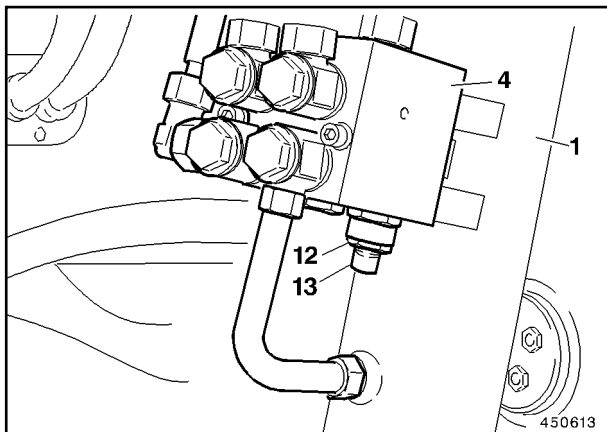


Fig. 3

To actuate the valve, loosen lock-nut (12, Fig. 3) and lower the blade by turning out setscrew (13) with the Allan key.

Emergency lowering of the blade out of floating position

The blade can be lowered in an emergency by actuating the valves (3 and 4) attached to the blade lifting cylinders (1 and 2, Fig.1).



**During emergency lowering nobody must stand in the blade's moving range.
When lowering the blade, keep clear of all obstacles.**

Lowering the left-hand side of the blade

To lower the left-hand side of the blade, actuate the valve (3, Fig. 1 and 4) on the left blade lifting cylinder.

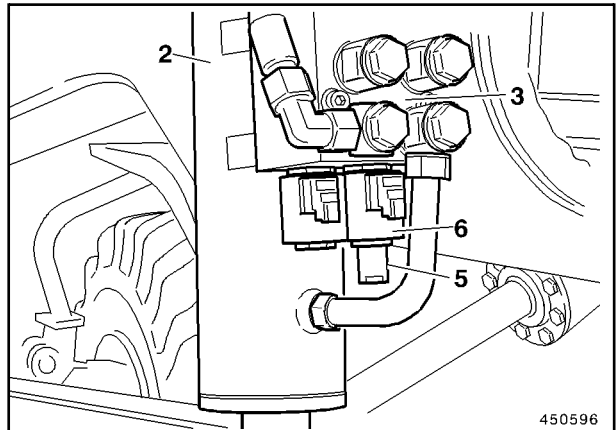


Fig. 4

To actuate the valve, unscrew protective cap (5, Fig. 4), holding the solenoid element (6) in its position. Lower the blade by pulling out the red valve shaft (7, Fig. 5).

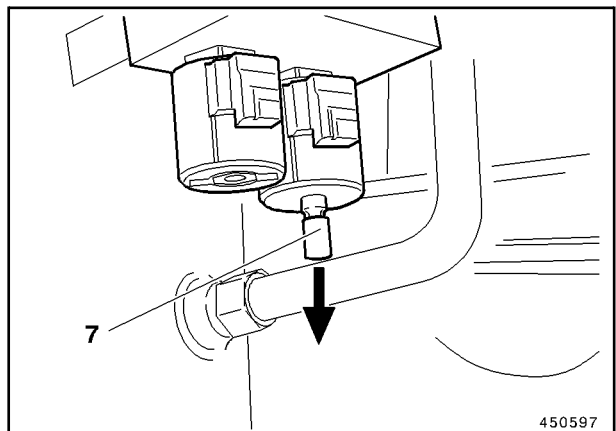


Fig. 5

Lowering the right-hand side of the blade

To lower the right-hand side of the blade, actuate the valve (4, Fig. 1 and 6) on the left blade lifting cylinder (1).

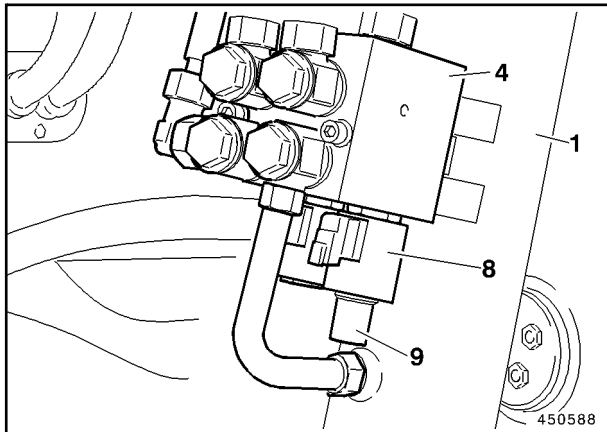


Fig. 6

To actuate the valve, unscrew protective cap (9, Fig. 6), holding the solenoid element in its position. Lower the blade by pulling out the red valve shaft (7, Fig. 5).

Emergency lowering of front blade / rear ripper

If the machine is equipped with a front blade and/or rear ripper, these can be lowered in an emergency by means of control levers (71 resp. 64, Fig. 7).

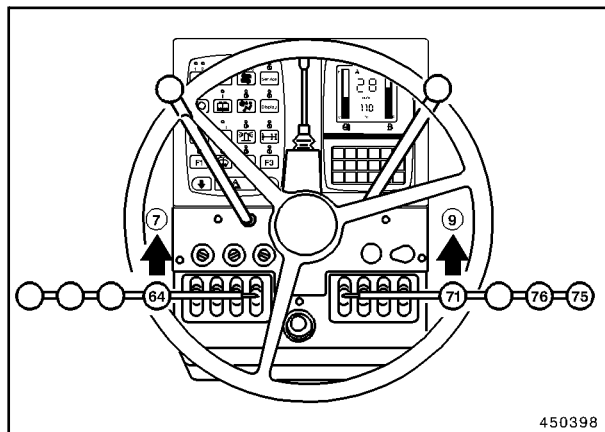


Fig. 7

Lifting the blade



Secure the raised blade. Risk of accident through uncontrolled lowering of the blade.

If the blade is to be lifted, proceed as described for lowering the right/left side of the blade. After pulling out the pertinent red valve shaft (7, Fig. 5), the respective side of the blade can be lifted.

OPERATING INSTRUCTIONS F106.6/A



After daily operation

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Parking the machine

- Park the machine on level, firm ground.
- Set all working equipment down on a support or on the ground.
- If the machine has to be parked on a slope:
Park machine facing downhill and press the equipment into the ground.



Never shut off the engine out of full load, but continue running for ca. three minutes at idling speed to cool down.

- Turn off the engine.
- Apply the parking brake.
- Set key-switch electrical system to position **1**.
- Move control levers and gearshift lever to position **N**.
- Withdraw key from the key-switch of the electrical system.
- Switch off battery main switch and remove switching lever.
- Close windows of driver's cab.
- Secure the wheels with chocks.
- Remove coarse dirt from machine.
- Fill fuel tank.
- Conduct a visual inspection of the engine, the hydraulic system, the axles and the transmission gears for leaks.



Escaping oil pollutes the environment.

Repair leaks (or have them repaired) immediately.

Report any oil accidents to the owner of the machine.

- Lock the driver's cab door and all lockable flaps and guards on the machine.
- Check machine and equipment for damage and check all steel components for cracks or fractures.
Inform the owner immediately of any damage found. □

WORKING EQUIPMENT

Assembly of working equipment - safety instructions



Personnel

Assembly work may be performed only by operating or repair personnel possessing the necessary know-how.

In the case of insufficient know-how, meticulous instruction must be given by experienced personnel, e.g. by O&K.

The personnel must have read and understood the operating instructions, especially the section "Fundamental safety instructions".

These people only may operate the machine during installation, in order to make corrections to the working equipment.

Misuse or improper operation of the machine or its working equipment can be highly dangerous.

Personal protective equipment and working clothes

Wear closely fitting working clothes when working on the machine. Loose, wide working clothes can catch in machine parts and cause injury.

Wear a safety helmet, protective working boots and gloves.



Tools and auxiliaries

Tools, lifting equipment, slings, chocks and other equipment must be in safe operating and working condition.

Metal splinters can cause injury when accessory bolts are being driven in and out. Therefore, a brass or copper mandrel should be used and protective goggles must be worn.

When entering and leaving the cab, use only the intended steps, platforms and handrails.

Keep steps, platforms and handles in safe condition for footholds and handholds. Remove any oil, grease, earth, clay, snow, ice other substances immediately.

Securing working equipment

Set all working equipment down on the ground, so that no movements can occur if mechanical or hydraulic connections become detached.

When working in jointed areas lock the pivot joints. Remove the locks when work is finished.

Secure any equipment or components which are to be attached or detached or whose position is to be altered, with hoists or suitable slinging/supporting devices to prevent them from moving, slipping or falling.



Securing the machine

Work on the working equipment should only be carried out if the machine has been secured as described in the section "Securing the machine".

Selecting the working equipment

The machine can be fitted with a variety of working equipment. The working equipment components are assembled with hydraulic cylinders and connectors. The components can be combined in a variety of ways so that the working equipment can be best adapted to the specific task.

Operate the machine only with equipment and component combinations approved by O&K for this machine.

Install and commission equipment and component combinations only after O&K has checked the proposal and given its approval in writing.

Attachments from other manufacturers subject to the EC Machine Directive 89/392 EEC may be mounted and put into operation only if

- the manufacturer's declaration of conformity and
- the declaration of compatibility from O&K are at hand.

□

Securing the machine

2905385



Risk of injury

The machine must not be started by unauthorised persons.

Therefore, secure the machine.

Secure the machine as described below:

- before carrying out any servicing or repair work on the machine, and
- before fitting or changing the working equipment.
- Park the machine on level, firm ground.
- Set working equipment down on the ground.
- Apply parking brake.



Never shut off the engine out of full load, but continue running for ca. three minutes at idling speed to cool down.

- Turn off engine.
- Remove key from the key switch in the electrical system.
- Depressurize the hydraulic system.
- Lock the pivot joint.
- Secure open hood.
- Secure the machine from rolling away by placing chocks under the wheels.
- Switch off battery main switch and remove switching lever.
- Disconnect batteries before work on the electrical system or before welding work.
- When doing welding jobs on the machine, observe "Welding operations - Safety instructions".

□

Floating position (optional)

2747876



Never switch on the floating position when the working equipment is lifted. The equipment will otherwise be lowered too fast.

The grader can be supplied with a floating position as an option. This function permits easier working, e.g. when the machine is used as a snow plough, as the main blade automatically follows the irregularities of the ground.

The swivel arm must be locked in position 4 (Fig. 1). For swivel arm adjustment, see "Adjusting the swivel arm".

The floating position is activated with the button (38, Fig. 2).

Press main blade firmly on the ground.

Depress key (38) - LED I flashes - floating position activated.

Depress button (106, Fig. 3) - LED I is lit up - the main blade is now freely movable on the ground, bearing only its own weight.

Depress button (106) again - LED I flashes - floating position cancelled.

Depress key (38) - LED I stops flashing - floating position deactivated.

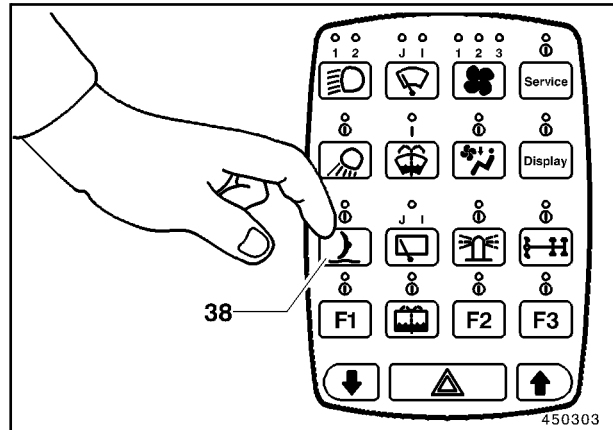


Fig. 2

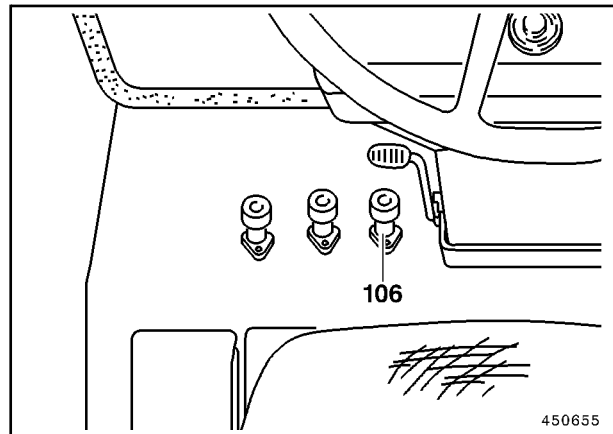


Fig. 3

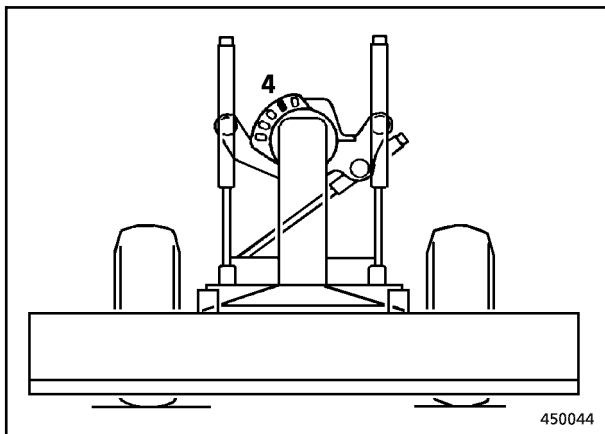


Fig. 1

Front blade (option)

The front blade is raised and lowered with control lever (71, Fig. 4)

Position 9 = lowering the front blade

Position 10 = raising the front blade

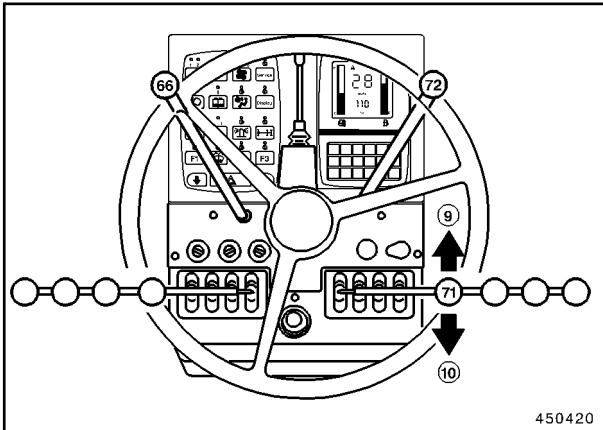


Fig. 4

The shut-off valve (Fig. 5) must be open, i.e. the lever must be in position 1.

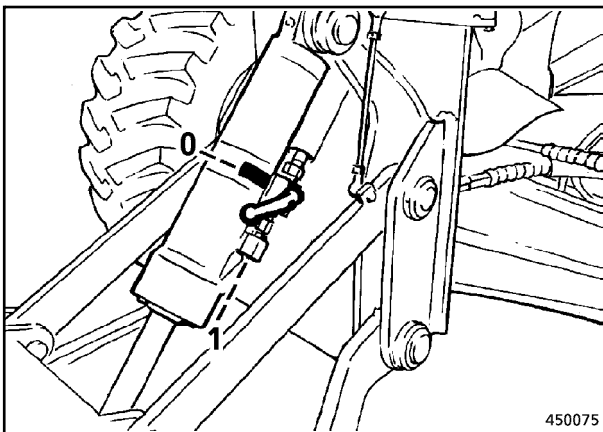


Fig. 5

The position of the front blade is indicated by a pointer (Fig. 6).

Position 1 = blade completely raised

Position 2 = for road travel (yellow)

Position 3 = blade resting on the ground

Position 4 = max. scraping depth

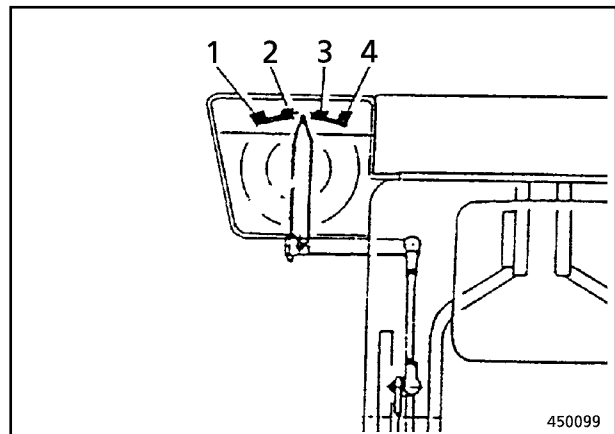


Fig. 6



Rear ripper (option)

2747928



Read and observe: "Working operation - safety instructions".

The rear ripper is equipped with up to 5 ripper teeth for heavy ripping work.



Use the ripper teeth only in symmetrical arrangement.



Before lowering the rear ripper, set ballcock (4, Fig. 6) to position A.

Rear ripper - working position

- Swing tooth guard (2, Fig. 1) upwards (Fig. 2). It is held in this position by springs.

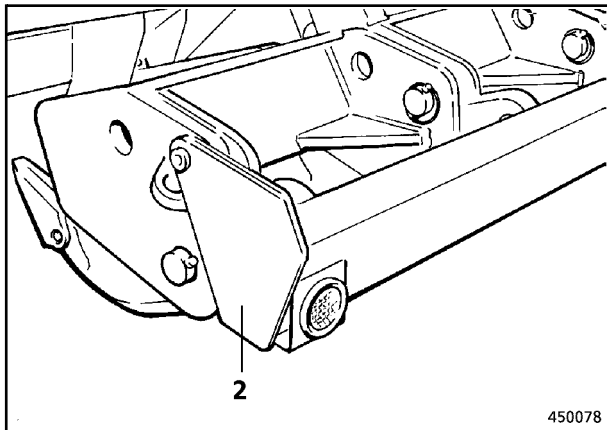


Fig. 1

- Remove the locking pins (4, Fig. 2) and remove retaining bolts (3).

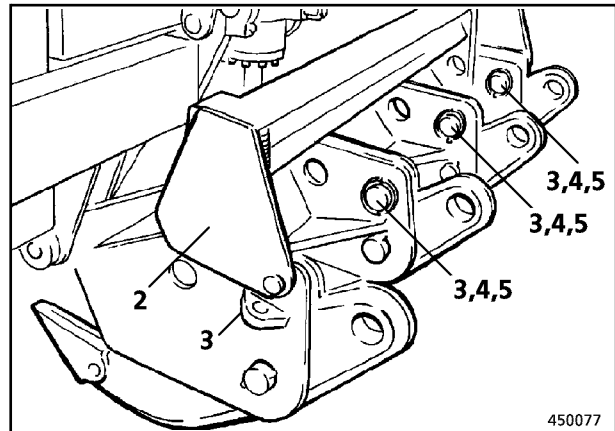


Fig. 2

- Swing tooth into working position (Fig. 3) and reinsert retaining bolts (3). Secure retaining bolts with locking pin (4, Fig. 2) and ring (5).

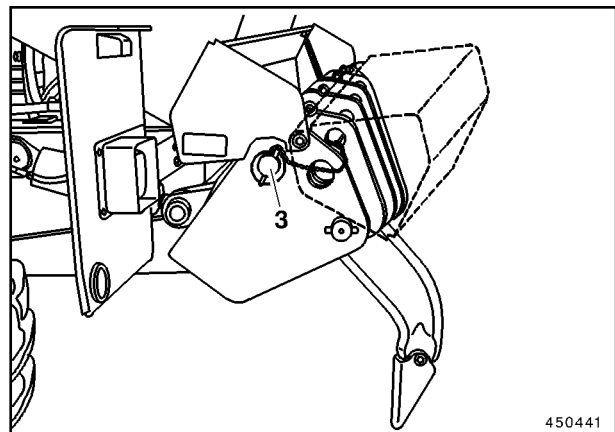


Fig. 3

Rear ripper - working operation

The rear ripper is operated with control lever (64, Fig. 4).

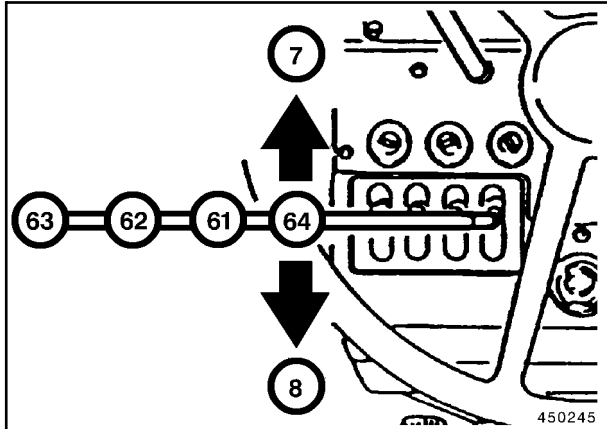


Fig. 4

The actual position of the rear ripper is indicated by lamps (1 and 2, Fig. 5).

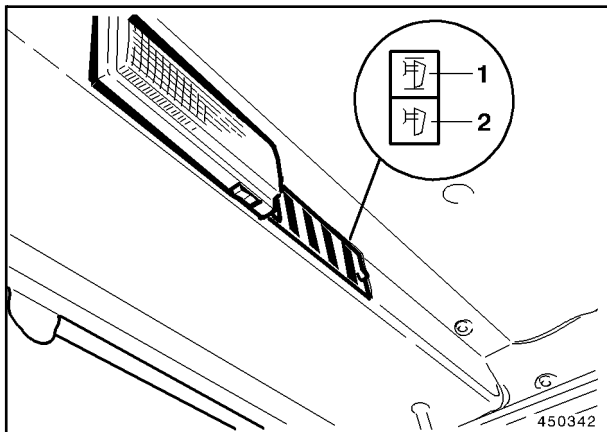


Fig. 5

Lamp (1) lights up green - ripper in transport position.

Lamp (2) lights up yellow - ripper in working position.



Take ripper out of the ground before turning the grader and before reversing.

- To lower rear ripper - control lever (64, Fig. 4) in position 7.
- To raise rear ripper - control lever (64) in position 8.

The number of teeth used, the ripping depth and driving speed vary with the condition of the material to be ripped.

For ripping, set grader in motion and press teeth into the ground.

Rear ripper - transport position

Use control lever (64) to bring rear ripper into such a position that indicator lamp (1, Fig. 5) is lit up green. Never raise rear ripper up to limit position. The rear lamps are otherwise concealed. When the transport position is reached set lever (4, Fig. 6) on the rear ripper cylinder to position B.

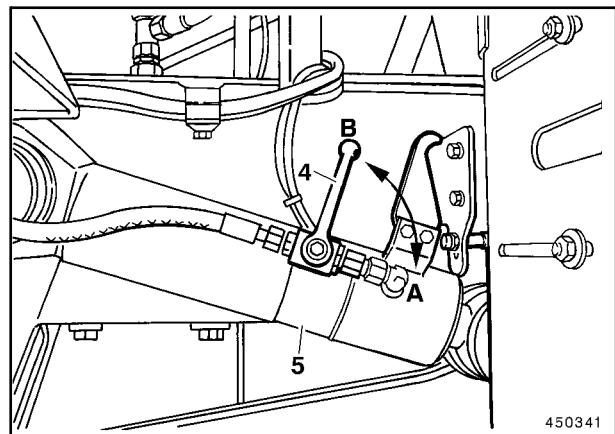


Fig. 6

Bring teeth to transport position (Fig. 2).

- Lower tooth protection (2).

□

Levelling blade ripper (option) 2800054



Read and observe: "Working - Safety instructions".

For ripping operations, 1 to 4 teeth (3, Fig. 1) can be brought into ripping position.

By rotating the slewing ring through 180°, ripping is possible while driving forwards or backwards.

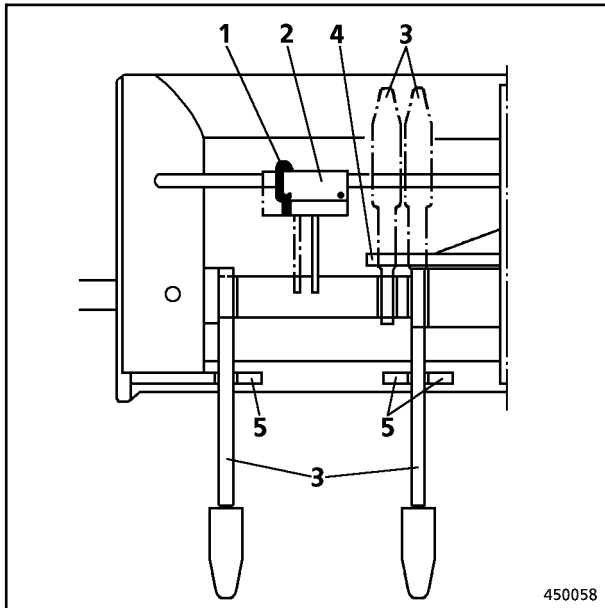


Fig. 1

Levelling blade ripper - working position

- Pull out locking spring (1, Fig. 1).
- Remove spacer (2).
- Push ripper teeth (3) outwards over the retaining bar (4), fold downwards and press into the guide (5).
- Refit the spacer (2) and secure with locking spring (1).

Levelling blade ripper - working operation

- Set off and press blade ripper into the ground by extending the lifting cylinders.
- The number of teeth, the ripping depth and the driving speed depend on the nature of the material to be ripped up. □

Rotary beacon (option) 2904939

The rotary beacon can be adjusted in its height and position by turning the two spring bearings.

The rotary beacon can be switched on only when the Electrical System key-switch is set to position 1 (ignition ON).

The rotary beacon is switched on with the button (36, Fig. 2).

Press button (36) once - LED lights up = rotary beacon ON.

Press button (36) twice - LED goes out = rotary beacon OFF.

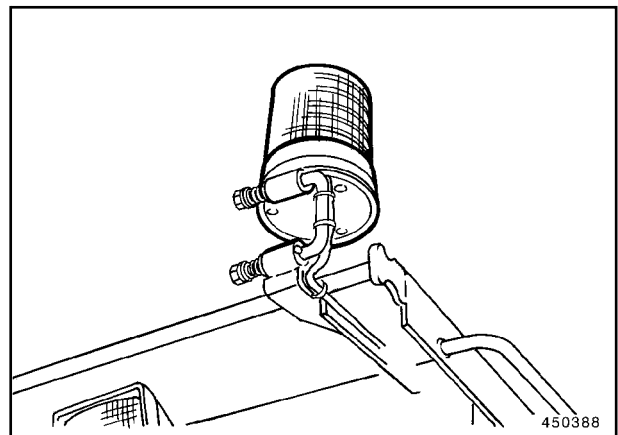


Fig. 1

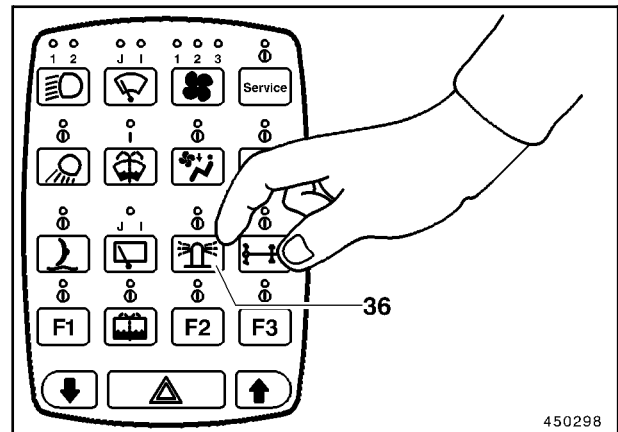


Fig. 2

OPERATING INSTRUCTIONS F106.6/A

**Cab roof fan (option)**

2904941

The roof fan for additional fresh air is activated with key (36, Fig. 3).

LED off = roof fan OFF

Press key (36) once = roof fan ON

Press key (36) until the LED is extinguished = roof fan OFF.

The fresh air nozzles (Fig. 8) above the rear window can be rotated and closed, if desired.

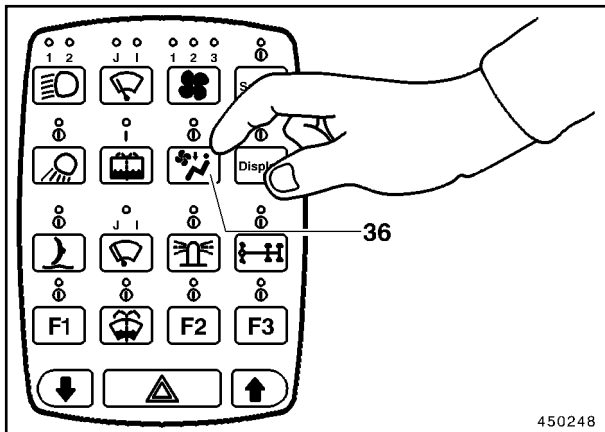


Fig. 3

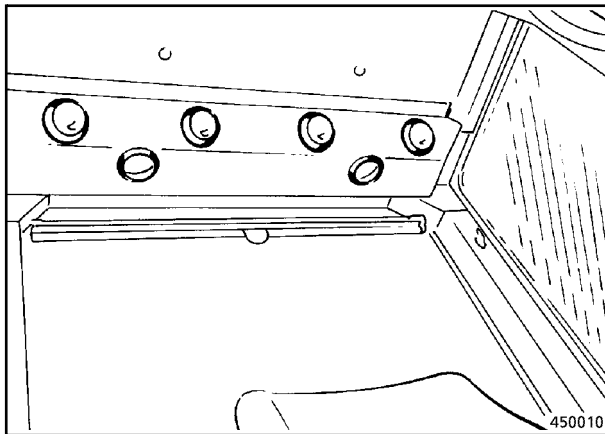


Fig. 4

Radio (option)

2904943



The radio is connected to the electrical system when the ignition key is in position P or I.

The radio is located at the top right in the roof compartment.

Different types of radio can be installed. Operating instructions are provided with the respective radio.

The 24V vehicle voltage is reduced to the 12V required for radio operation by means of a voltage transformer.

□

Environmentally compatible hydraulic fluid (option)

2905559

Environmentally compatible hydraulic fluid, operating instructions

The hydraulic system of this machine can be filled ex works with environmentally compatible, synthetic hydraulic fluid (non-standard). Stickers with corresponding instructions are then attached to the machine.

For the initial filling, O&K uses only: **PANOLIN HLP SYNTH 46** (O&K-SN: 7230413).

This synthetic hydraulic fluid has been tested by O&K and approved for application in O&K machines.

A change from mineral hydraulic oil to this synthetic hydraulic fluid can, however, be made at a later date.

Environmentally compatible hydraulic fluid, too, must not be simply poured away but disposed of in the same way as used oil.

If hydraulic fluid seeps into the ground, the machine owner and the competent authorities must be informed.

HLP SYNTH 46 is suitable only for hydraulic systems.

As HLP SYNTH 46 is not soluble in water, condensate may be deposited in the hydraulic oil tank.

It must therefore be drained off at regular intervals and after lengthy downtimes, then disposed of in the same way as used oil.

Use only HLP SYNTH 46 for changing or topping up the hydraulic fluid.

The hydraulic fluid must not be mixed with hydraulic oils or hydraulic fluids by other manufacturers, as this affects its biodegradability.

Operating equipment and attachments driven with mineral hydraulic oil must not be mounted until thoroughly emptied, cleaned and flushed.

Analysis will show whether the hydraulic fluid can be used beyond the standard changing intervals.

See section: "Environmentally compatible hydraulic fluid, sampling".

Environmentally compatible hydraulic fluid, conversion



Read and note: "Inspection and Servicing, Safety Instructions".

- Bring hydraulic system to operating temperature.
- Retract all hydraulic cylinders.
- Drain off hydraulic oil (see operating instructions, section 3 "Inspection and Servicing").
- Fill hydraulic oil tank with HLP SYNTH 46 up to halfway mark.
- Activate all hydraulic functions including travelling for about 30 minutes. The hydraulic system is flushed.
- Then drain off the hydraulic fluid.
It can be used repeatedly for flushing. Otherwise it must be properly disposed of. A disposal expert must be consulted in this case, as this is a mixture of synthetic hydraulic fluid and mineral hydraulic oil.
- Change all filters in the hydraulic system.
- Fill the hydraulic oil tanks with new HLP SYNTH 46.

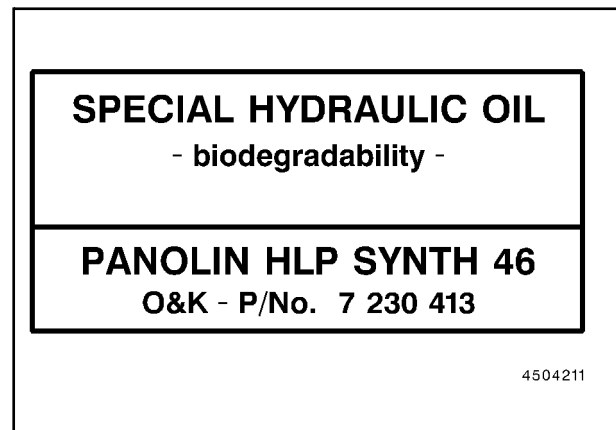


Fig. 1

Fix an instruction sticker (Fig. 1):

- in the cab,
- on the hydraulic oil tank and
- on the additional hydraulic operated equipment (eeg. gripper or hydraulic hammer).

- Start up the machine. Check level in hydraulic tank according to servicing plan.
- The hydraulic fluid may dissolve deposits in the hydraulic system.
So change all filters 30 - 50 operating hours after making the change.
Make further filter changes according to servicing plan.
- Sample the hydraulic fluid after 30 - 50 operating hours and send in for analysis. (See section: "Environmentally compatible hydraulic fluid, sampling").

Environmentally compatible hydraulic fluid, sampling

Complete kits are compiled for hydraulic fluid analysis. They contain all necessary parts.

Kits are available from the O&K central Parts Service:

Part No.: 1 465 077.

- Hydraulic fluid analyses are performed by:

WEARCHECK GmbH
Bahnhofstrasse 75
D-83098 Brannenburg

- After 30 - 50 operating hours with environmentally compatible hydraulic fluid, take a sample of the hydraulic fluid.
Send this sample in to the above address for analysis. The company will then notify you of the result of the analysis.
- After this, O&K recommends sending in a sample for analysis every 1000 operating hours or once a year.

It is essential that the hydraulic fluid should be analysed no later than after 3000 operating hours.

The results of the analysis show whether the hydraulic fluid is still serviceable and the changing interval can be extended. □

Driver's seat with air cushioning (option)

2905386



Risk of accidents

**Never adjust the seat while driving.
Before adjusting the seat, stop the machine.**

The driver's seat is adjustable in inclination, height and fore-and-aft direction.

The seat has air cushioning. The cushioning can be adjusted to suit the driver's weight.

The lumbar region is supported by air cushions installed in the backrest. These air cushions and the seat cushioning are supplied with compressed air by an electrically driven compressor. The compressor and valves are installed in the seat.

Adjusting the air cushioning

- The air cushioning can be adjusted to suit the operator's weight by means of the toggle switch (3, Fig. 1):
 - Press switch on **+** = cushioning harder.
 - Press switch on **-** = cushioning softer.

Fore-and-aft seat adjustment

- Pull lever (8) upwards, adjust seat and engage lever.

Seat adjustment

- Height and forward/rear inclination:
Pull handles (9 or 10) upward, adjust seat and engage handles.

Backrest adjustment

- Pull lever (7) upwards, adjust backrest and engage lever (7).

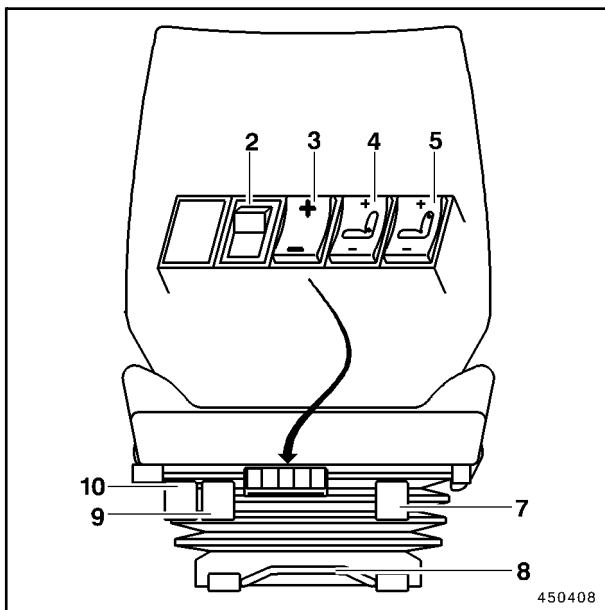


Fig. 1

Lumbar support adjustment

Two air cushions are integrated in the backrest. They can be inflated or deflated independently of each other. An electrically driven compressor and valves are installed in the seat.

The system is controlled by toggle switches (4 and 5, Fig. 2):

- Switch 4 = bottom air cushion,
- Switch 5 = top air cushion.

Applicable to both switches:

- Press switch on **+** = cushion is inflated.
- Press switch on **-** = cushion is deflated.

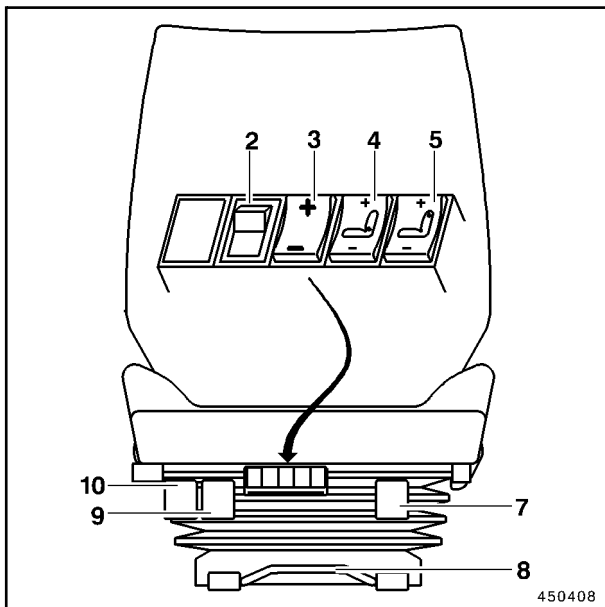


Fig. 2

□

Armrests (option)

2905387

The seat can be fitted with armrests.

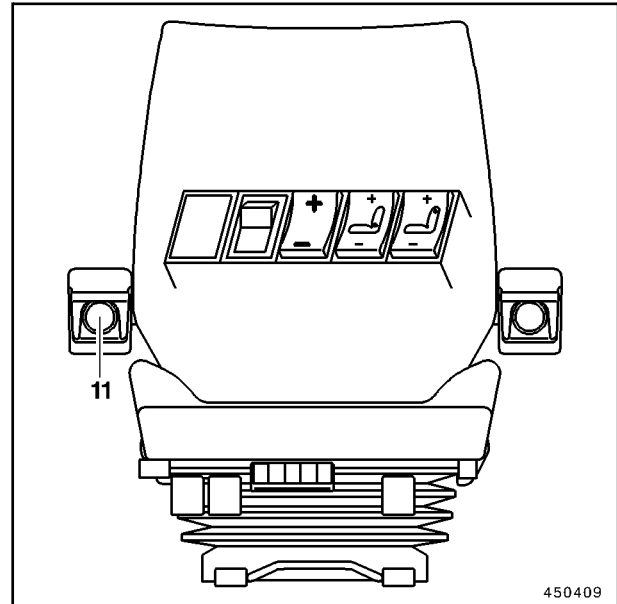


Fig. 1

The armrests can be folded back. The inclination can be adjusted with the rotary knobs (11, Fig. 1). □

Battery main switch

2747929



Never set the battery main switch to the OFF position when the engine is running. Voltage peaks might cause irreparable damage to electronic components.

The battery main switch (27, Fig. 1) is located in the cab, in the right-hand console.

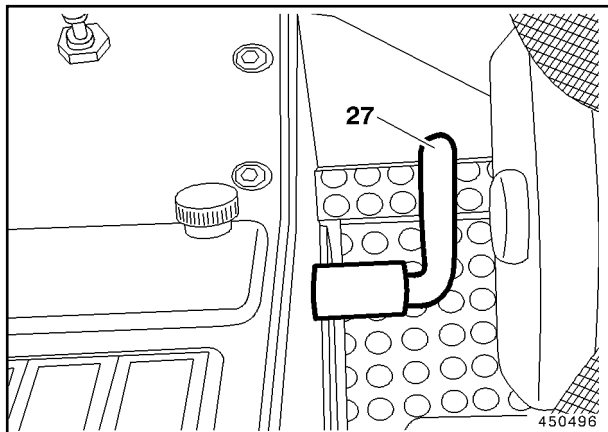


Fig. 1

The battery main switch (27) is used for disconnecting the entire electrical system from the battery. The switch positions shown in Fig. 2 have the following meaning:

I = ON = key pointing rearwards

II = OFF = key pointing upwards

In the **OFF** position the battery main switch (27) protects

- the machine from unauthorized starting
- the battery from inadvertent discharge.

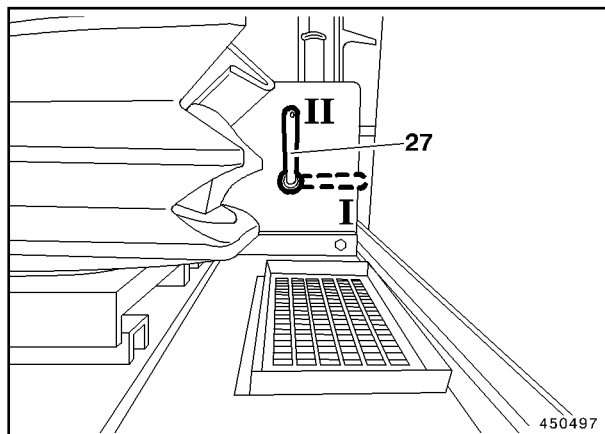


Fig. 2

□

Air conditioner (option)

2747877

The machine can be equipped with an optional integrated air conditioner.

Switching on the air conditioner

- Starting the engine (see: "Operating Instruction").
- Switch on toggle switch (91, Fig. 1) by pressing the switch surface showing a symbol. The control lamp below the symbol lights up. The air conditioner is activated. It is switched on with the blower switch (32, Fig. 2). If more air is required, the air conditioner can be switched with the button (32) to stages 2 and 3.

Setting the air temperature

- The temperature of the air blown out by the air conditioner can be set with the Heating draw-button (99, Fig. 1). Meanings:
 - Draw-button pressed in (min) = cooled air flows out,
 - Draw-button pulled out (max) = heated air flows out.
 Between these two extremes, the required temperature can be set continuously. For an increased cooling or heating performance, the blower can be switched to stages 2 and 3.

To obtain a good cooling performance, make sure:

- the fresh air intake at the back of the cab is not covered up or contaminated,
- the filter mat and the lamellas of the evaporator are clean, and
- the door and the windows of the cab are closed.

Important:

Further information (e.g. on adjusting the air outflow) is given under "Ventilation and heating".

Switching off the air conditioner

- Switch off toggle switch (91, Fig. 1) by pressing the switch surface with no symbol.

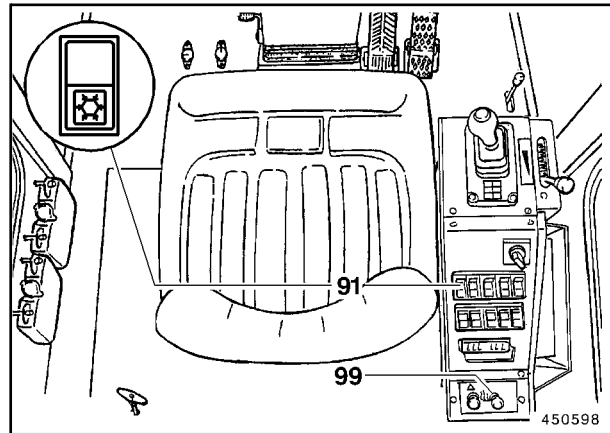


Fig. 1

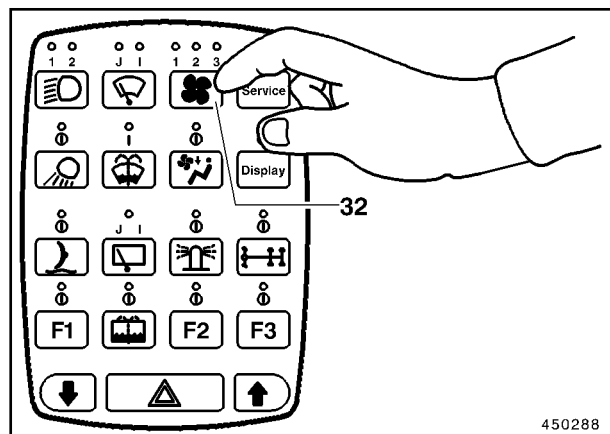


Fig. 2

Air outlets

The integrated air conditioner has additional outlets (Fig. 3) that can be rotated and closed as required.

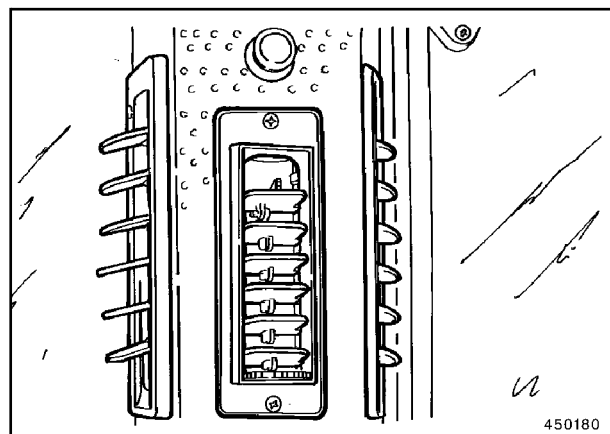


Fig. 3

KEYBOARD PANEL - FURTHER FUNCTIONS

2800732

Service function (button 33)



The functions detailed in the following sections can be activated only when the machine is stationary.

Apply the parking brake.

With the "Service" button (33, Fig. 2):

- the operating hours can be shown on the display (25, Fig. 1).
The gearbox oil temperature reappears after ca. 5 seconds.

- a check can be made to find out when the next service is due (option).

If a servicing interval has been exceeded, **"NEXT SERVICE"** is automatically displayed when the key switch is switched on (Fig. 1).

- the time can be set
(see: "Setting the time"),

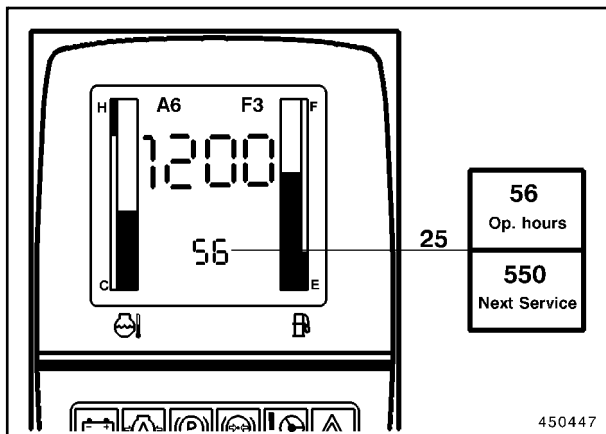


Fig. 1

Button (33, Fig. 2) is active as soon as the key switch has been switched on and the self-test terminated.

Press button (33) once - operating hours.

Press button (33) twice - service interval (option).

Press button (33) three times - service mode, LEDs (33 and 37) light up. The following functions can then be set:

- Use key (46) to suppress / to activate the start inhibit code. See section "Electronic immobilizer - suppressing / activating the code request"
- Use keys (37, 46 and 48) to set time and display contrast, see section "Setting of display contrast" and "Setting of time".

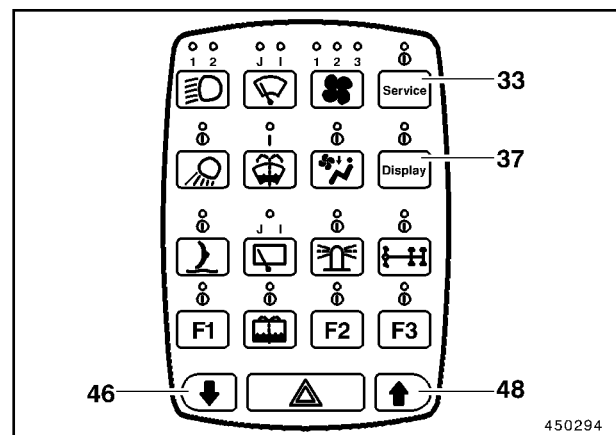


Fig. 2

Displaying the next service (option):

- Press button (33) repeatedly until **"NEXT SERVICE"** is displayed; the LED lights up. Instead of the operating hours, the display shows when the next service is due (option).

The display remains visible until button (33) is pressed once again. The total operating hours are then displayed. □

Display (button 37) function

2800733

With the "Display" button (37, Fig. 3) the following information can be called up on the display (24, Fig. 4):

- time in hours:minutes (standard display),
- engine speed in RPM ($\text{RPM} = \text{min}^{-1}$),

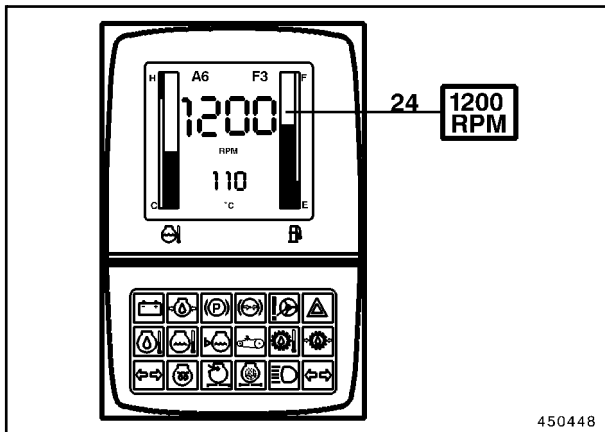


Fig. 3

Button (37) is active as soon as the key switch has been switched on and the self-test of the central electronic system completed.

The display (24) then displays the information until other information is called in with button (37).

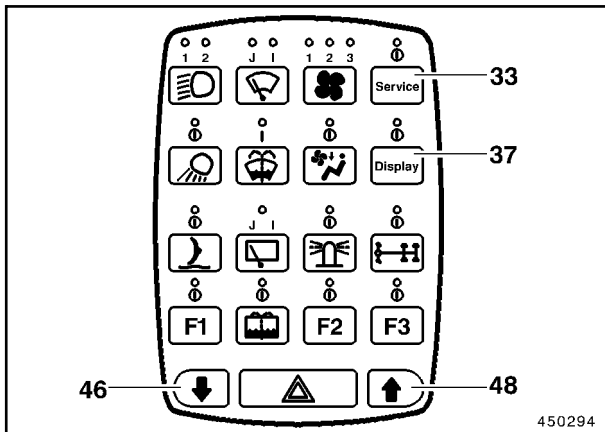


Fig. 4

Displaying the engine speed:

- Press button (37), LED lights up.
The engine speed in RPM ($\text{RPM} = \text{min}^{-1}$) is shown in four digits on the display (24).

Displaying the time:

- Press button (37) repeatedly until LED is no longer lit up.
The time in hours:minutes is again shown on the display (24).

When the machine is travelling, neither time nor engine speed is displayed. A switchover is then made to travelling speed.

Buttons (33 and 37) cannot be actuated when the machine is being driven. □

Display - contrast setting

2905391

In unfavourable light conditions, bright sunshine or extreme cold, it may be necessary to adjust the contrast of the display to make the information on the display more legible.

The current contrast setting is displayed as a numerical value. A moderate contrast (120) is set at the factory, but the setting range extends from 110 (strong contrast) to 150 (weak contrast).

The "contrast setting" function is active when:

- the key-switch is set to position **1** (the engine must be stationary) and
- the self-test of the central electronic system is completed.

Setting the contrast:

- Press button (33, Fig. 5) until **"CODE Y/N"** is displayed; LED above button lights up.

Press button (37) until **"CONTRAST"** is displayed, LED above button lights up.

The display is then as in Fig. 6.

The contrast can then be adjusted by pressing button (46) or (48) until the required contrast is achieved:

- Button (46) = each time the button is pressed, the numerical value increases by one; the display is darker.
- Button (48) = each time the button is pressed, the numerical value decreases by one; the display is lighter.
- Press button (37) to store the modified setting. The display once again shows the time in hours:minutes .

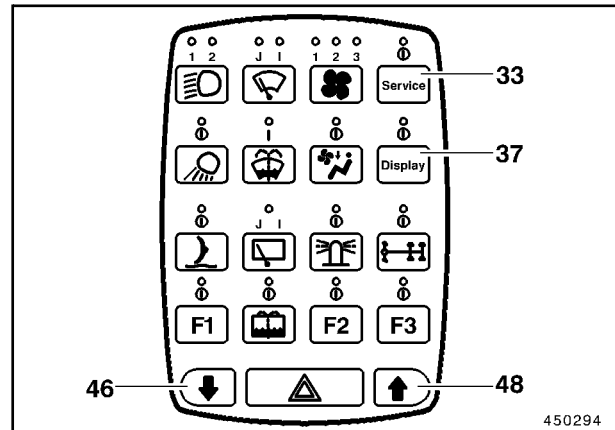


Fig. 5

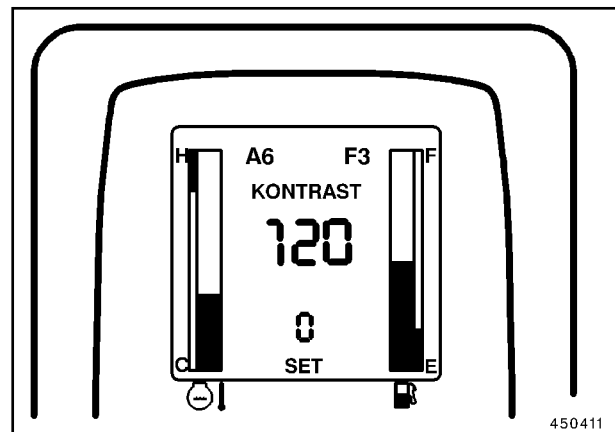


Fig. 6

Time resetting

For various reasons it may be necessary to reset the time stored in the central electronic system and shown on the display (e.g. for the change from summer time to winter time).

The "time resetting" function is active when:

- the key switch is set to **1** position (engine must not be started up) and when
- the self-test of the central electronic system is completed.

- Press button (33, Fig. 7) until **"Code Y/N"** appears. LED above button lights up.

- Press button (37); LED above button lights up.

The display shows **"SET STD"** as in Fig. 8. The display for hours can be set by pressing button (46) or (48) until the required display for hours is reached:

- Button (48) = each time the button is pressed, the display increases by one.
- Button (46) = each time the button is pressed, the display is reduced by one.

Setting the display for minutes:

- Press button (37).

The display changes from

"SET STD" to **"SET MIN"**.

Now press button (46) or (48) repeatedly until the required display is reached.

- Press button (37); the changed setting is stored.

The display once again shows the time in hours: minutes.

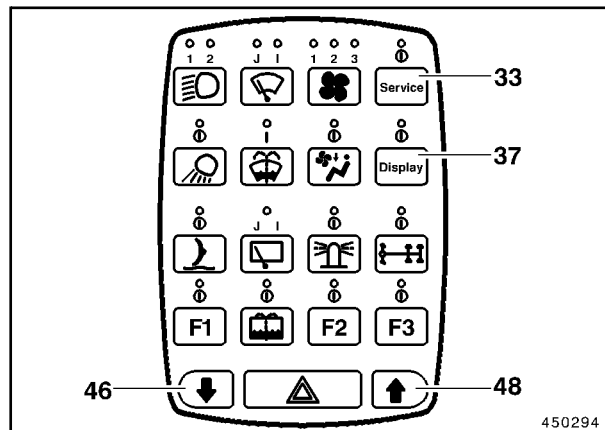


Fig. 7

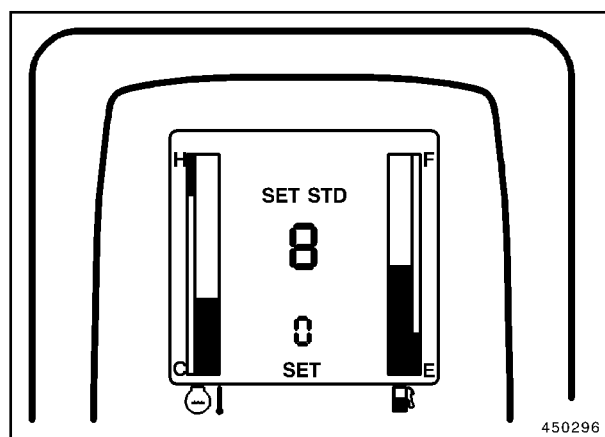


Fig. 8

Electronic immobilizer - suppressing / activating the code request

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The central electronic system demands that the code be entered each time the machine is started up. In order not to have to carry out this procedure each time work is interrupted, the code request can be suppressed provided, however, that the code has once been correctly entered.

- Switch key switch to **1** position
- Press button (33, Fig. 9) repeatedly until **"SET"** and **"Code Y/N"** are shown on the display (Fig. 10), then
 - Press button (46) to suppress the code request.
The display (B) changes from **I** to **0**.
 - Press button (46) to activate the code request.
The display (B) changes from **0** to **I**.
- Press button (37) four times; the operating hours and the time reappear on the display.

If the machine is to be parked or at the end of the shift, the code request function should be reactivated.

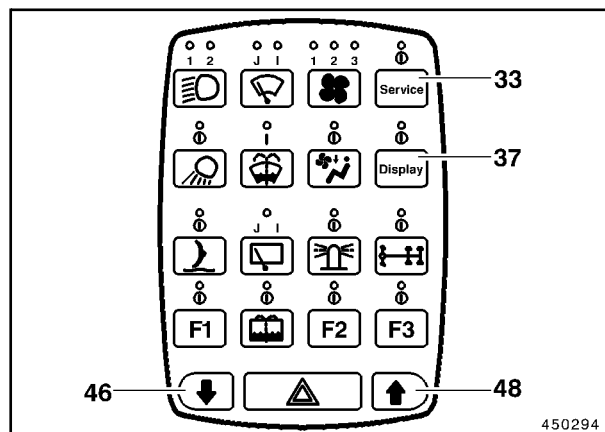


Fig. 9

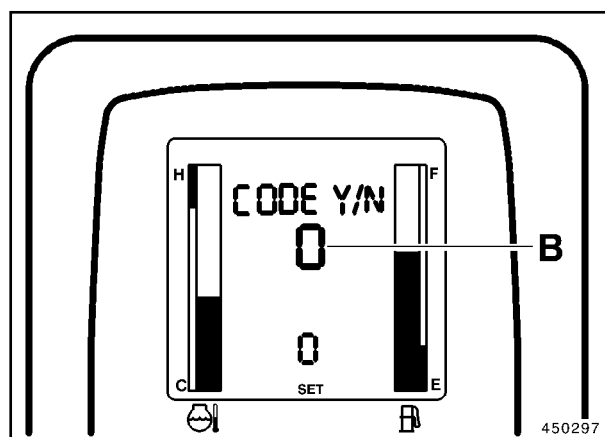


Fig. 10

PART 3 - INSPECTION AND SERVICING

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Operating manual		Target group
Part 1	INTRODUCTION FUNDAMENTAL SAFETY INSTRUCTIONS	Operating personnel + Inspection and servicing personnel + Repair personnel
Part 2	OPERATION	Operating personnel The operating personnel must have know-how relevant to the operation and the application of this or comparable machines.
Part 3	INSPECTION AND SERVICING	Inspection and servicing personnel The inspection and servicing personnel must have know-how relevant to the inspection and servicing of this or comparable machines.
Part 4	REPAIR WORK	Repair personnel The repair personnel must have know-how and experience relevant to the repair of this or comparable machines.
Part 5	ANNEX	Operating personnel + Inspection and servicing personnel + Repair personnel

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Inspection and servicing - safety instructions

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Operating manual

No inspection and servicing work may be carried out until the operating manual has been read and understood.

Pay special attention to the:

"Fundamental Safety Instructions" and all warnings and safety instructions attached to the machine.

The operating manual lists all jobs to be done. The descriptions of job sequences, however, provide only experienced personnel with the necessary instructions.

The operating manual must be kept with the machine at all times.

Inspection and servicing personnel

Inspection and servicing personnel must have the necessary know-how on the inspection and servicing of this or comparable machines.

The necessary know-how can be acquired in several days' instruction, e.g. by an O&K mechanic or by attending an O&K training course.

"O&K" Jobs marked with this symbol can be carried out by the O&K after-sales service department.

Personal protective equipment and working clothing

Wear closely fitting working clothing when working on the machine. Loose, wide garments may catch on machine parts and result in injury.

Wear a safety helmet, safety footwear, gloves and, in the event of high noise levels, ear protectors.



Securing working equipment

Stand working equipment on the ground in such a way that no movements can be made if mechanical or hydraulic connections become detached.

When working in jointed areas, block off the joints. Remove the blocks on finishing work.

If the machine has to be jacked up, the front axle must first be wedged in place to prevent it from moving.

Secure any equipment or component which is to be mounted or dismantled, or whose position is to be changed, with hoists or appropriate slinging/supporting devices to prevent them from moving, slipping or falling inadvertently.

Securing the machine

Carry out servicing work only if the machine is secured as described in the section "Securing the Machine".

Climbing onto and off the machine

Use only the steps, platforms and handrails provided when climbing onto or off the machine.

Always keep steps, platforms, handles and handrails in a non-slip, safe state and remove any oil, grease, soil, clay, snow, ice and other foreign matter immediately.

Always face the machine when climbing on and off.

Check state of tools

Use only fully functional, reliable tools.

Select the right tool for the job.

Wrenches of the wrong size, for example, may slip and cause injury.



Cleaning jobs

Clean the units within the working range before starting work. Select the cleaning agent according to the material constituting the parts to be cleaned.

Example: Never clean rubber or electrical parts with solvents or steam jets.

Use lint-free cleaning rags when working on the hydraulic system or the engine.

Cleaning agents and solvents may give off harmful, readily flammable vapours.

Never work with such agents except on well ventilated premises; never inhale the vapours and never smoke.

Prevent solvents and cleaning agents from coming into contact with the skin.

Wear solvent-resistant gloves.

Observe the instructions on the packaging.

Handling flammable liquids

When handling flammable liquids:

- never smoke,
- keep away from unshielded light sources and naked flames.

Fuel and other consumables often have low flash points and are readily ignited.

Never attempt to extinguish burning liquids with water. Use

- dry powder,
- carbon dioxide or
- foam extinguishers.

Water used for extinguishing purposes would vapourize instantaneously on contact with burning substances and spread burning oil, for example, over a wide area. Water generates short circuits in the electrical system, possibly producing new hazards.

Notify the fire brigade.



Fastening and securing elements

Check fastening and securing elements, e.g. bolts, nuts, washers, before using them again.

Replace any damaged parts.

Handling oils and greases

Hot lubricant or hydraulic oil emerging uncontrolled from the system may result in severe burns.

Cool any burns immediately with running water and apply a dry dressing.

Never set foot within reach of the emerging oil jet.

Avoid contact with the skin. Wear gloves and firm protective clothing.

Used oil may be harmful to the skin.

Clean soiled skin thoroughly with warm soapy water and apply a barrier cream. Never use fuels or solvents for cleaning the skin.

If you have swallowed any oil, avoid vomiting but consult a doctor or a hospital immediately.

Visible loss of oil

Have any visible leakage repaired immediately.

Escaping oil is an environmental hazard.

Soak up any oil that has escaped with a binding agent. Sweep up binding agent and dispose of it separately from other waste.



Relieving residual pressure in the hydraulic system

Only unpressurized hydraulic systems may be opened. Even when a machine is parked on a horizontal surface with its attachments supported on the ground and its driving motor switched off, there may still be substantial residual pressure in parts of the hydraulic system, e.g. primary pressure from the last hydraulic movements prior to stopping the machine.

Residual pressure is reduced only gradually. If an intervention into the hydraulic system is to be undertaken immediately after stopping, depressurize the system as described in the section "Depressurizing the Hydraulic System".

Screwed connections, piping, hydraulic hoses

Repair any leakages in the piping and hose system immediately.

A fine, highly pressurized jet of hydraulic oil can penetrate the skin.

Never search for leakages with the fingers, but use a piece of cardboard and always wear goggles.

If oil has penetrated into the skin, consult a doctor immediately.

Never repair damaged piping; always replace it.

Replace hydraulic hoses immediately on detecting any damage or moist areas.

Tighten leaking screw plugs only when the system is depressurized.

Escaping oil is an environmental hazard.



Environmentally compatible disposal

Oils, greases, brake fluids, cleaning agents, solvents and oily components, e.g. filters, cleaning rags, replaced wear parts and unserviceable machine parts, must be disposed of separately in the interests of environmental protection.

Never dispose of such substances with standard household refuse.

Empty substances into the containers provided for this purpose.

Even biodegradable, "environmentally friendly" hydraulic oil has to be disposed of separately like any other oil.

Never allow oils and oily waste to get into the soil or into water: environmental hazard!

Sealing faces

Clean sealing faces prior to assembly.

Exhaust gases

Exhaust gases are a health hazard: never inhale them.

When working on enclosed premises, draw off exhaust gases with a suction plant and ventilate the premises well.



Handling batteries

Batteries give off explosive gases. Never handle batteries close to naked flames and unshielded light sources, never smoke.

Remove batteries if welding or grinding is to be done at close quarters and store them in a safe place.

Battery acid is toxic and corrosive.

Avoid any contact with the skin, mouth, eyes and clothing. Avoid spilling battery acid or inhaling the vapours.

Wear solvent-resistant gloves, firm protective clothing and goggles when handling batteries.

If acid splashes onto the skin, rinse off thoroughly with water, then seek medical advice at a medical practice or hospital.

If the eyes are splashed with acid, rinse thoroughly with running water, then seek medical advice immediately at an ophthalmological practice or a hospital.

Never wear metal necklaces, bracelets or watch-straps when working on the battery. The metal parts may induce a short circuit, resulting in burns.

Dispose of used batteries separately from other waste in the interests of environmental protection.

Prior to work on the electrical system

Prior to any work on the electrical system involving tools, spares etc. coming into contact with electric cables or contacts, disconnect the battery.

Disconnect first the negative pole, then the positive pole.

After work:

Connect first the positive pole, then the negative pole.

Read and observe "Electrical system - Safety instructions".



Selecting oils and greases

Use the recommended qualities only, matching viscosities with the temperature level.

Filters

Replace all filter elements or filter cartridges within the specified periods.

All filters are coordinated carefully with the equipment. Original O&K parts must be used to ensure smooth running and a long service life of the engine and the hydraulic units

Sealing elements

When dismantling parts, pay attention to sealing elements.

Check sealing elements prior to installation and replace any that are even slightly damaged.

When assembling, ensure a perfect fit.

Oil-level check and oil change

Position the machine horizontally.

Change the oil when the machine is at operating temperature.

Warm oil flows better and carries suspended particles (carbon or abraded matter) better.

Lubricating

Clean the lubricating nipple, then lubricate as scheduled.



After servicing

To prevent corrosion, coat all bright metal parts with a grease film.

On completing work, reinstall all protective devices.

Never start up the drive motor while work is being done on the machine.

Carry out a performance test with the machine.

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Inspection and servicing plans - Instructions

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Intervals

The inspection and servicing plan lists all jobs which have to be done on the machine at regular intervals.

The individual inspection and servicing plans are marked with letters.

These letters provide a link between the operating hours (OH) recorded by the hours-run meter and the inspection and servicing plans.

Meanings:

Plan	Do all jobs
V	 once prior to initial commissioning
N	 once at 250 OH after initial commissioning
T	 every 10 OH or every working shift ¹⁾ .
W	 every 50 OH or once a week ¹⁾ .
A	 every 250 OH
B	 every 500 OH
C	 every 1000 OH
D	 every 3000 OH
¹⁾ whichever occurs first OH = operating hours	

Cleaning work

Carry out cleaning, especially of cooling systems, at shorter intervals if the machine is used in a very dusty working environment.

Warranty

One of the preconditions for the O&K warranty is that the following compulsory servicing work has been performed by the O&K Service or by a workshop authorized in writing by O&K to perform such work:

1. Compulsory servicing **N** at 250 operating hours after commissioning
2. Compulsory servicing **B** at 500 operating hours after commissioning

The proper execution of the compulsory servicing works must be documented on the O&K Service check-lists.

Change of engine oil

The intervals for **engine oil change** are valid for fuels with a sulphur content of $\leq 0,5\%$ and a permanent ambient temperature down to -10°C . Shorter intervals must be observed for higher sulphur contents and/or permanent ambient temperatures below -10°C (see engine operating manual).

If the engine oil change intervals are not reached within **one year**, the oil must be changed at least **once a year**.

Coolant change

If the coolant change intervals are not reached within 2 years, the coolant must be changed at least every 2 years.

Oils / Greases

The specifications of the oils and greases to be used are set out under "Lubricants".

Meanings:

I	Oils for combustion engines and compressors
II	Oils for hydraulic systems
III	Oils for gearboxes and axles
IV	Oils for powershift transmissions
V	Greases for bearings and revolving joints

Regular oil analyses

Oil change intervals can be prolonged and wear of components detected at an early stage, if **regular oil analyses** are performed. Contact our after-sales service in this matter.

Servicing material

The servicing material required for regular servicing work is listed in the spare parts list under module 92.020.

Further servicing works

Optional equipment may require the supplementary inspections and servicing works prescribed by the manufacturer of the respective equipment. They can then be found under the corresponding keyword in the table of contents, e.g. "Air conditioner, inspection and servicing work" or in an annexed brochure.

□

OPERATING INSTRUCTIONS F106.6/A



Plan V - once before initial commissioning

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Page 1 of 1

Component designation	Servicing activity	Quantity/ Number
Engine	Check oil level in acc. with "Lubricating plan - Oil"	1
Cooling system	Check coolant level	
Electrical system Battery Battery Lights	Check acid level ¹⁾ Check charge Check operation	2 2
Monitoring, warning and control elements	Check operation	
Hydraulic system Oil reservoir Operating pressure	Check operation Check oil level in acc. with "Lubricating plan - Oil" check (after-sales service)	1
Brake Service brake Parking brake	Check operation Check operation	
Wheel Tyres Wheel nuts	Check pressure Check tightness (torque wrench)	
Axle Front axle Rear axle - Axle gear - Tandem gear	Grease in acc. with "Lubricating plan - Grease" Check oil level Check oil level	 1 2
Blade slewing gear	Check oil level	1
Equipment	Grease in acc. with "Lubricating plan - Grease"	
Cardan shaft	Grease	2
All lines, fittings and connections	Visual inspection for leaks	
Frame	Grease in acc. with "Lubricating plan - Grease"	
Steering Steering cylinder bearing	Grease	2 x 2
Power shift transmission	Check oil level in acc. with "Lubricating plan - Oil"	1
All articulated joints and hinges	Grease	

¹⁾ not required for maintenance-free batteries

OPERATING INSTRUCTIONS F106.6/A



Plan N - once at 250 OH after initial commissioning

Page 1 of 1

Component designation	Servicing activity	Quantity / Number
At 250 OH (once)		
Cooling system	Visual inspection for leaks	
Coolant level	Check	
Air intake system		
Main filter element	Check, clean	
Dust collector	Clean	
Suction and clean-air line	Check for tightness and leaks	
Hydraulic system	Check operation	
Return-flow filter	Visual inspection for leaks	
Front-wheel drive oil filter ^{1,2)}	Replace	1
Operating pressure	Replace	1
	Check pressure	
Brake		
Parking brake	Check / adjust	
Wheel		
Wheel nuts	Check tightness (torque wrench)	
Axle		
Front axle	Grease in acc. with "Lubricating plan - Grease"	
Rear axle		
- Axle gear	Change oil	1 ³⁾
- Tandem gear	Change oil	2 ³⁾
- Tandem gear chain tension	Check / adjust	2 x 2
Blade slewing gear	Change oil	1 ²⁾
Equipment	Grease in acc. with "Lubricating plan - Grease"	
Cardan shaft	Grease	2
All lines, fittings and connections	Check for tightness and leaks	
Frame	Grease in acc. with "Lubricating plan - Grease"	
Steering		
Operating pressure	Check	
All nuts and screws	Check for tightness	
Packings of ball joints on steering rod and steering cylinder	Check visually for condition	
Steering cylinder bearing	Grease	2 x 2
All screws	Check for tightness	
Power shift transmission	Change oil	1 ³⁾
Oil filter	replace	1

1) F106.6 A only

2) option

3) see table "Refilling quantities - oil"

OPERATING INSTRUCTIONS F106.6/A



Plan T - every 10 OH or once every working shift (whichever occurs first)

Plan W - every 50 OH or once a week (whichever occurs first)

Page 1 of 2

Component designation	Servicing activity	Quantity / Number	Plan T	Plan W
Machine	Visual inspection of the machine and its units for defects, leaks and loss of consumables		•	•
Motor Engine	Check oil level in acc. with oil inspection plan	1	•	•
Cooling system	Check / clean combined radiator Check coolant level		• •	• •
Fuel system Fuel tank	Drain off water and bottom deposits	1	•	•
Air-intake system Main filter element Dust collector Suction and clean-air line	Check / clean Check / clean Check for tightness and leaks	1 1	• • •	• • •
Electrical system Connections and cables Battery Lighting system	Check visually for condition Check acid level ¹⁾ Check operation	2	• •	• •
Monitoring, warning and control elements	Check operation		•	•
Hydraulic system Oil reservoir Oil cooler	Inspect visually for leaks Check oil level in acc. with oil inspection plan Check / clean		•	• • •
Brake Service brake Parking brake	Check operation Check operation		• •	• •
Wheel Tyres Wheel nuts	Inspect visually for condition Check pressure Check for tightness (torque wrench)		•	• • •
Axle Front axle	Grease in acc. with "Lubricating plan - Grease"			•
Blade slewing gear	Check oil level	1		•
Equipment	Grease in acc. with "Lubricating plan - Grease"			•

¹⁾ not required for maintenance-free batteries

OPERATING INSTRUCTIONS F106.6/A



Plan T - every 10 OH or once every working shift (whichever occurs first)

Plan W - every 50 OH or once a week (whichever occurs first)

Page 2 of 2

Component designation	Servicing activity	Quantity / Number	Plan T	Plan W
Frame	Grease in acc. with "Lubricating plan - Grease			●
Steering	Check operation		●	●
Powershift transmission	Check oil level	1		●
Grader	General cleaning			●

¹⁾ not required for maintenance-free batteries

OPERATING INSTRUCTIONS F106.6/A

**Plan A - after every 250 OH**

(at 250, 750, 1250 ... OH)

Plan C - after every 1000 OH

(at 1000, 2000, 4000 ... OH)

Plan B - after every 500 OH

(at 500, 1500, 2500 ... OH)

Plan D - after every 3000 OH

(bei 3000, 6000, 9000 ... OH)

Page 1 of 2

Component designation	Servicing activity	Quantity / Number	Plan A	Plan B	Plan C	Plan D
Maintenance in accordance with W or T			•	•	•	•
Engine Poly-V drive belt Engine oil Engine oil filter Engine bearing	Check Change ¹⁾ Replace ¹⁾ Check bolts for tightness (torque wrench) Additional maintenance interval for the engine after 2000 OH or 24 months: Replace Poly-V drive belt		• • • •	• • • •	• • • •	• • • •
Cooling system Combined radiator Coolant lines Coolant Coolant	Inspect visually for leaks Check / clean Check for condition and tightness Check antifreeze concentration Change ²⁾		• • • • •	• • • • •	• • • • •	• • • • •
Air-intake system Main filter element Safety filter element	Replace ³⁾ Replace ³⁾				• •	• •
Fuel system Fuel filter Tank	Replace Clean	2 1		•	•	• •
Electrical system Battery and cable connections Battery terminals	Check for tightness Coat with terminal grease		• •	• •	• •	• •
Hydraulic system Return-flow filter Front-wheel drive - Oil filter ^{4,5)} Oil reservoir breather valve Oil reservoir	Replace Replace Replace Change oil ⁶⁾ in acc. with oil inspection plan	1 1 1 1 ⁷⁾	•	• • • •	• • • •	• • • •

¹⁾ oil change interval can be prolonged to 500 OH if engine oil in acc. with specification ACEA - E3 is used

²⁾ change coolant after 2 years at the latest

³⁾ replace filter element after 1 year at the latest

⁴⁾ F106.6 A only

⁵⁾ option

⁶⁾ change hydraulic oil after 3 years at the latest

⁷⁾ see table "Refilling quantities - Oil"

OPERATING INSTRUCTIONS F106.6/A

**Plan A - after every 250 OH**

(at 250, 750, 1250 ... OH)

Plan C - after every 1000 OH

(at 1000, 2000, 4000 ... OH)

Plan B - after every 500 OH

(at 500, 1500, 2500 ... OH)

Plan D - after every 3000 OH

(at 3000, 6000, 9000 ... OH)

Page 2 of 2

Component designation	Servicing activity	Quantity / Number	Plan A	Plan B	Plan C	Plan D
Brake Service brake Parking brake	Check lining thickness Check operation		•	• •	• •	• •
Axle Front axle - Front-wheel bearing ¹⁾ Rear axle - Tandem gear - Tandem gear chain case - Axle gear - Tandem gear - Axle gear	Regrease Check clearance / adjust Check oil level Check tension Check oil level Change oil Change oil	2 1 1 2 ²⁾ 1 ²⁾	 • •	 • • •	• • • • • • •	• • • • • • •
Blade slewing gear	Change oil	1 ²⁾			•	•
Cardan shaft	Grease	2		•	•	•
All lines, fittings and connections	Inspect visually for leaks		•	•	•	•
Heater	Inspect visually for leaks			•	•	•
Driver's cab Fastening screws Filter mat	Check for tightness Clean / replace	1		• •	• •	• •
Steering All nuts and bolts Packings of ball joint on steering rod and steering cylinder	Check for tightness Inspect visually for condition		• •	• •	• •	• •
Powershift transmission Oil filter	Change oil Replace	1 ²⁾ 1			• •	• •
All articulated joints and hinges	Grease		•	•	•	

¹⁾ F106.6 only²⁾ see table "Refilling quantities - Oil"

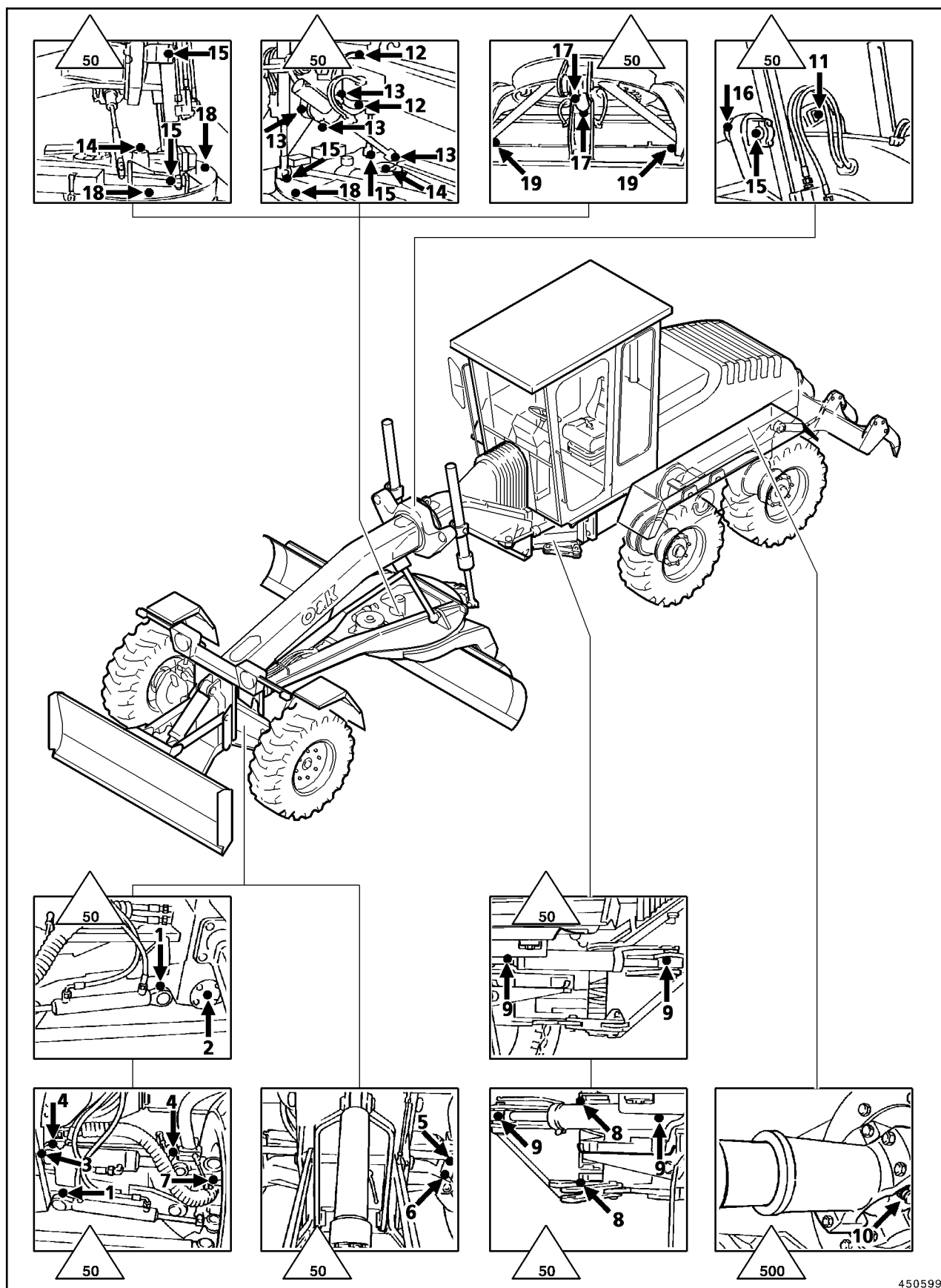
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LUBRICATING PLAN - GREASE

△ = Operating hours

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Fig. 1

OPERATING INSTRUCTIONS F106.6/A



Lubricating plan - grease (legends: Fig. 1)

Pos.	Greasing point	Number	Lubricant properties	Greasing every ... OH
1	Steering cylinder	2 x 2	V ¹⁾	50
2	Axle bearing	2 x 1		50
3	Blade circle frame bearing	1		50
4	Wheel lean bearing	2 x 1		50
5	Wheel lean rod	2 x 1		50
6	Wheel lean joint	2 x 1		50
7	Front wheel joint	2 x 2		50
8	Pivot joint	2 x 1		50
9	Pivot joint cylinder bearing	2 x 2		50
10	Cardan shaft	2		500
11	Swivel lever arrestor bolts	1		
12	Swivel lever bearing	2		50
14	Blade pivot cylinder bearing	4		50
14	Blade slewing bolt	1		50
15	Blade lifting cylinder bearing	2 x 3		50
16	Blade lifting cylinder mounting	2 x 1		50
17	Pitch adjustment cylinder bearing	2 x 1		50
18	Blade slewing ring	3		50
19	Blade pitch adjustment bearing	2 x 1		50

1) See chapter "LUBRICANTS"

□

LUBRICATING CHART - GREASE

△ = Operating hours

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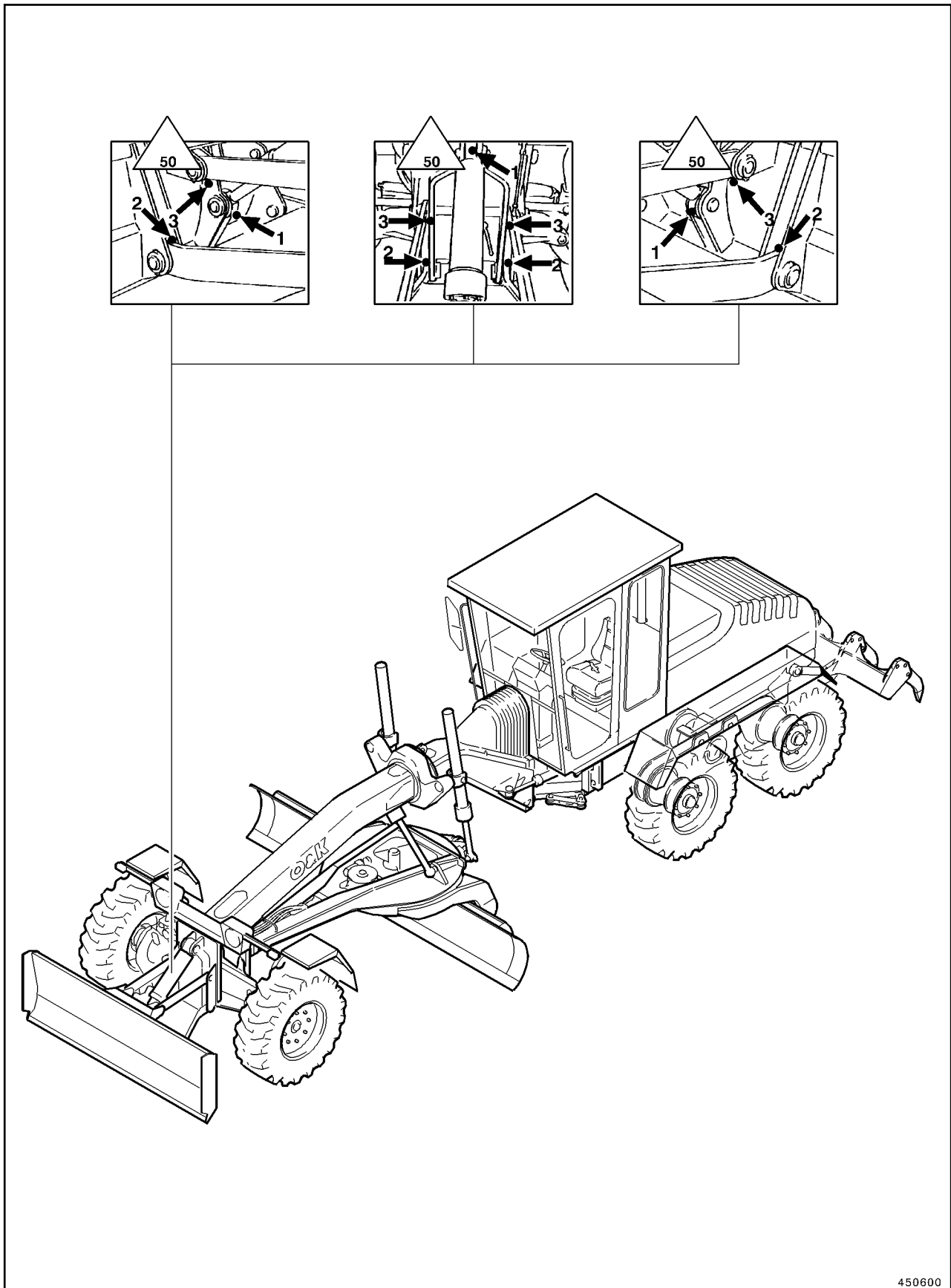


Fig. 2

450600

Lubricating chart - grease (option) (legends: Fig. 2)

Pos.	Greasing point	Number	Lubricant properties	Greasing every ... OH
1	Front-blade cylinder	2		50
2	Toggle-lever bearing	2 x 2		50
3	Connecting-rod bearing	2 x 2		50

□

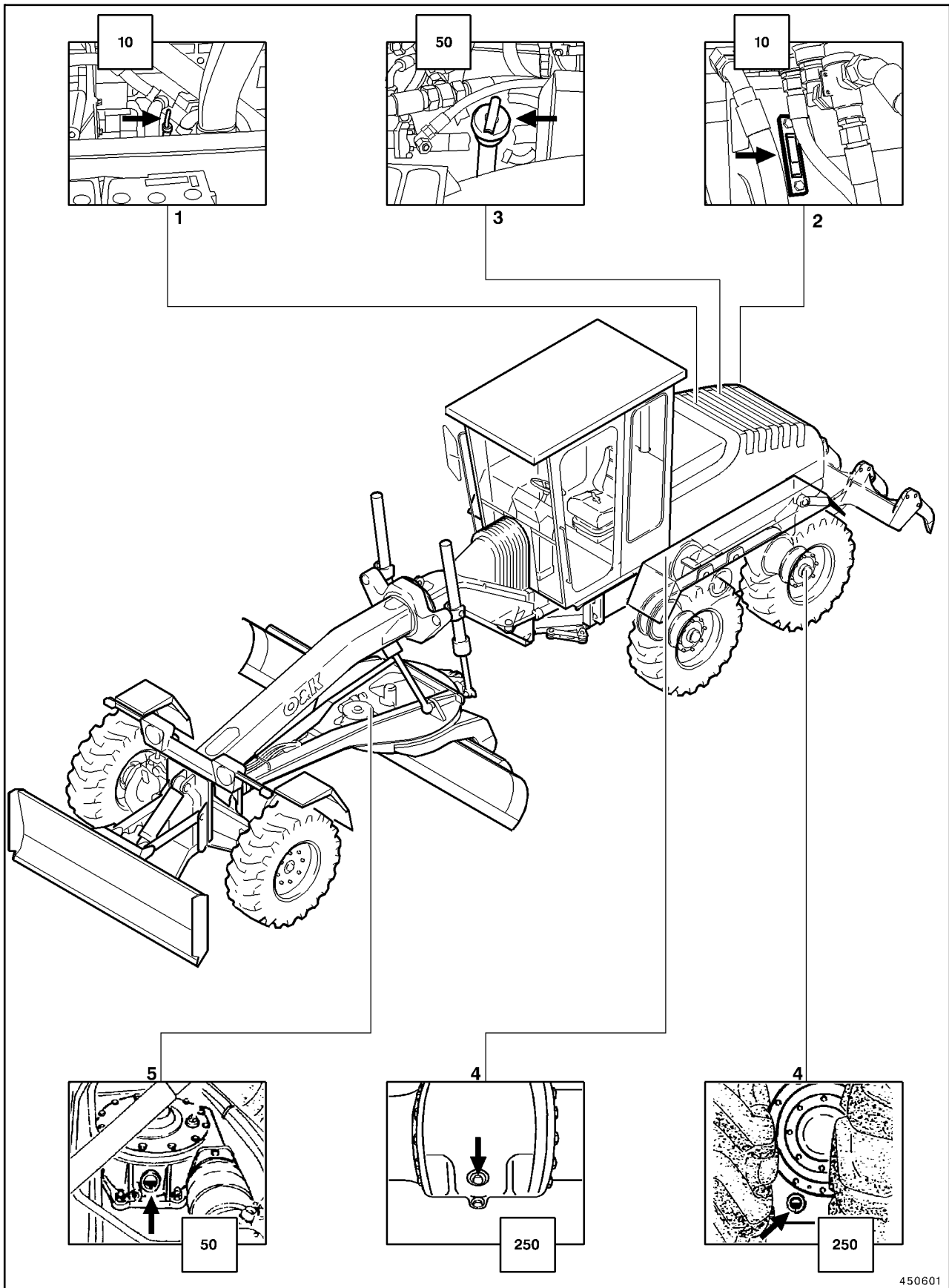
OPERATING INSTRUCTIONS F106.6/A



OIL - INSPECTION PLAN

 = operating hours

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450601

Fig. 3

OPERATING INSTRUCTIONS F106.6/A

**Oil - Inspection plan** (legends for Fig. 3)

Pos.	Component	Number	Lubricant properties ¹⁾	Oil level checking every... OH	Oil change every... OH
1	Engine	1	I	10	250 ²⁾
2	Hydraulic system	1	II	10	3000
3	Powershift transmission	1	IV	50	1000
4	Rear axle - axle drive - tandem (chain-box)	1 2	III	250	1000
5	Blade slewing gear	1	III	50	1000

¹⁾ see chapter "LUBRICANTS"

²⁾ oil change interval can be increased to 500 OH, if engine oil in acc. with specification ACEA - E3 is filled in

Refilling quantities - oil

Component		Refilling quantity ²⁾ (litres)
Engine with lubricant filter		approx. 12,5
Hydraulic system	Initial filling At oil change	approx. 170 (F106.6) / approx. 185 (F106.6A) approx. 70
Powershift transmission	Initial filling At oil change	approx. 27 approx. 21
Rear axle - axle drive - tandem (chain-box)		ca. 13 2 x approx. 37
Blade slewing gear		approx. 2

²⁾ The consumables refilling quantities stated are approximate values intended as a planning help. Each assembly has its own checking facilities, e.g. dipstick, inspection glass or checking plugs permitting exact checking of the filling level.

COOLANT - INSPECTION PLAN

☐ = operating hours

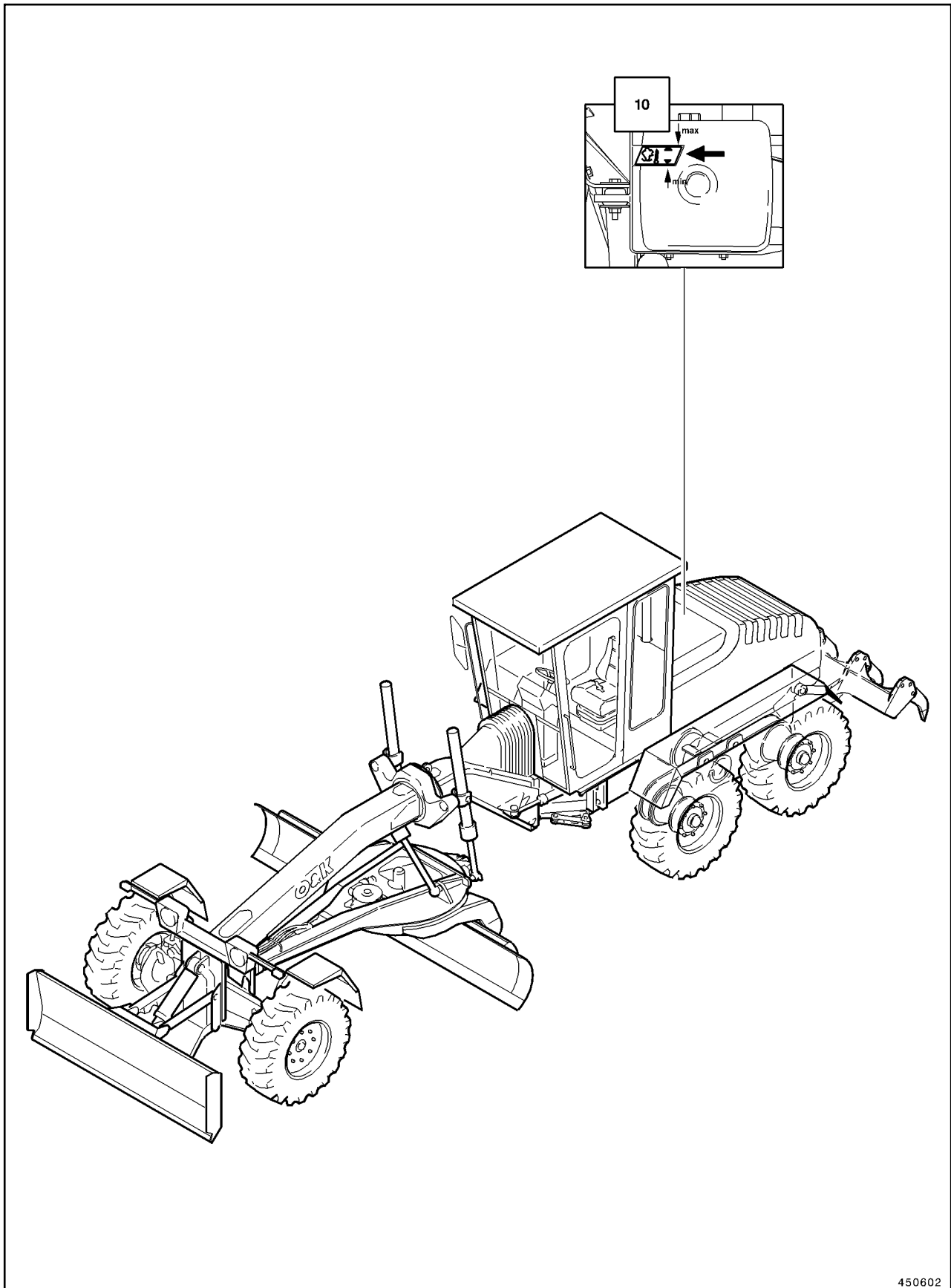


Fig. 4

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Coolant - Inspection plan (legends for Fig. 4)

Pos.	Component	Number	Check coolant level every ... operating hours	Change coolant every ... operating hours
1	Engine	1	10	2000 ¹⁾

¹⁾ change of coolant after 2 years at the latest

Refilling quantities - other

Component	Refilling quantity ²⁾ (litres)
Fuel system	approx. 189
Cooling system with heating	approx. 37

²⁾ The consumables refilling quantities stated are approximate values intended as a planning help. Each assembly has its own checking facilities, e.g. dipstick, inspection glass or checking plugs permitting exact checking of the filling level.

□

LUBRICANTS

I. Oils for internal combustion engines (change interval: 250 OH)

2747745

Ambient temperature	°F	-22	-4	+14	+32	+50	+68	+86	+104	+122
	°C	-30	-20	-10	0	+10	+20	+30	+40	+50
Specification										
API - CF4 ACEA - E2										

8001541

API: American Petroleum Institute

ACEA: Association des Constructeurs Européen d'Automobiles g.i.e.



Engine preheating necessary. Cold-starting aid may be sufficient in upper range. Start warm-up cycle increasing engine speed and load gradually.

When using single-range or multi-range engine oils and at lower temperatures observe the oil recommendations of the engine manufacturer. For details please refer to the engine operating instructions. □

I. Foot-operated lever (change interval 500 OH)

2747809

Ambient temperature	°F	-22	-4	+14	+32	+50	+68	+86	+104	+122
	°C	-30	-20	-10	0	+10	+20	+30	+40	+50
Specification										
API - CG4 ACEA - E3										

8001551

API: American Petroleum Institute

ACEA: Association des Constructeurs Européen d'Automobiles g.i.e.

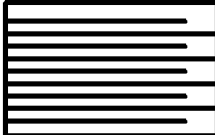


Engine preheating necessary. Cold-starting aid may be sufficient in upper range. Start warm-up cycle increasing engine speed and load gradually.

When using single-range or multi-range engine oils and at lower temperatures observe the oil recommendations of the engine manufacturer. For details please refer to the engine operating instructions. □

II. Oils for hydraulic systems, mineral

2801009

Ambient temperature	°F	-22	-4	+14	+32	+50	+68	+86	+104	+122
	°C	-30	-20	-10	0	+10	+20	+30	+40	+50
Hydraulic oil mineral-based Specification MIL-H-24459 or DIN 51524 T2 FZG Test ≥ 10	 Multigrade Hydraulic - Oil									
	 HLP 100									
	 HLP 68									
	 HLP 46									
	 HLP 32									

8002541



Warming-up phase necessary before commencing operation. Warm up hydraulic system for approx. 10 minutes by running engine at half speed and by actuating all control valves repeatedly.

□

II. Oils for hydraulic systems, synthetic (biodegradable)

2905625

Ambient temperature	°F	-22	-4	+
	°C	-30	-20	-1
Oils for hydraulic systems, synthetic (biodegradability)				

Warming-up phase necessary before commencing operation. Warm up hydraulic system for approx. 10 minutes by running engine at half speed and by actuating all control valves repeatedly.

□

OPERATING INSTRUCTIONS F106.6/A

III. Oils for axles and gearboxes (selection)

20000008

API: American Petroleum Institute

MIL: US armed forces fuel specifications for engine and machine manufacturers

□

OPERATING INSTRUCTIONS F106.6/A

IV. Oils for powershift transmissions

2905402

API: American Petroleum Institute

ACEA: Association des Constructeurs Européens d'Automobiles g.i.e.

Automatic powershift transmissions-preheating

□

OPERATING INSTRUCTIONS F106.6/A

V. Greases for bearings and slewing rings

2731439

**for centralized lubricating systems and tensioning systems,
e.g. track chain**

Minimum requirement

Grease base	:	lithium
Solid lubricant content (MoS₂ or graphite)	:	max. 3%
NLGI - class	:	see above
Corrosion protection acc. to ASTM D 1743 (CRC)	:	code No. 1

OPERATING INSTRUCTIONS F106.6/A

MAINTENANCE WORK

Draining hose for oil changes

2411336

Collect escaping oil and evacuate it without polluting the environment.

Carry out oil changes when the engine is at operating temperature; warm oil drains away more easily.

The engine, hydraulic oil reservoir and gearboxes may be equipped with special oil drain valves (1, Fig. 1).

These plugs allow oil changes to be made in a clean and non-polluting way.

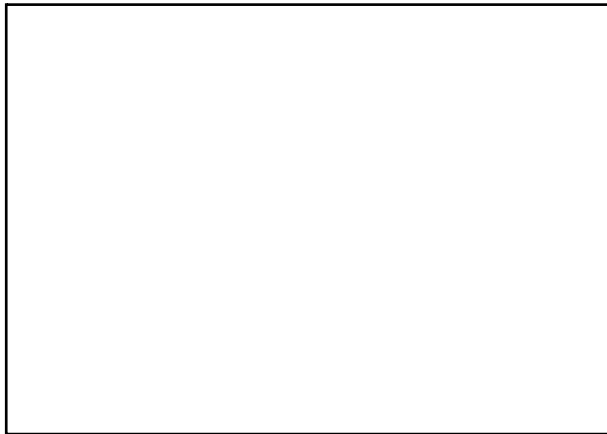


Fig. 1

Carry out oil changes as follows:

- Place a recipient for waste oil under the drain opening (for the capacity see under "Refilling quantities").
- Choose the proper drain hose from the tool kit.
- Unscrew protective cap from oil drain valve.
- Screw on drain hose (2); the valve opens and the oil drains away.
- After the oil has drained away unscrew drain hose; the valve closes automatically.
- Screw protective cap back in place. □

ENGINE

2747814

Engine, safety instructions for inspection and servicing

Risk of injury

from rotating fan blades and running V-belts.

Shut off the engine before opening the engine compartment.

Risk of burning due to hot parts on engine, exhaust and radiator.

Risk of scalding from hot engine oil or coolant.

Never begin servicing and repair work until engine, exhaust and radiator have cooled down.

Used engine oil is considered as potentially cancerogenic and as a hereditary risk. Swallowing oil, inhaling oil fumes and prolonged skin contact must therefore be avoided by all means.

Wear working gloves.

When performing work in the engine compartment in windy weather with the machine parked outside, there is a risk of the engine hood being slammed shut by a gust; this is especially the case if the gas-filled springs are defective.

Therefore, the following rules should be observed:

- when working under the above circumstances, prop up the engine hood additionally by means of bars.
- check the gas-filled springs regularly for proper functioning. Have defective gas-filled springs replaced immediately.

Secure the machine as described under "Securing the machine" before carrying out any work in the engine compartment.

Read and observe: "Inspection and servicing, safety instructions" and the engine operating instructions.

□

OPERATING INSTRUCTIONS F106.6/A

Engine hood

2747884

Opening the engine hood

The engine hood has 2 opening positions. The closed engine hood can be unlocked from the driver's cab by means of the locking handle (101, Fig. 1).



Fig. 1

Service position I



Fig. 2

To open the engine hood for service position I, pull locking handle (101, Fig. 1) upwards. The engine hood goes to service position I.

Service position II

Risk of injury from engine hood slamming shut.

For service position II, it must be ensured that the engine hood is secured with the safety rod (1, Fig. 3).

Read and observe:
"Inspection and servicing - Safety instructions".



Fig. 3

Open engine hood further out of service position I (arrow, Fig. 3) until the safety rod (1) engages in the lock position.

Closing the engine hood

Push the engine hood slightly in the direction against the arrow (Fig.3).



Fig. 4

Hold the hood as shown in Fig. 4 and unlock the safety rod (1) with your foot (arrow). Pull the hood down into service position I, then press down and engage. □

OPERATING INSTRUCTIONS F106.6/A

Checking the engine oil level / Topping up oil

2747885

- Park the machine on a horizontal surface and secure against inadvertent movement.
- After shutting off the engine, wait about 5 minutes before checking the oil level. During that time the oil can flow back into the reservoir.
- Pull out oil dipstick (arrows, Fig. 1) and wipe with a clean, lint-free cleaning rag before inserting again.
- Withdraw the dipstick again.
Check oil level, then top up through the filler opening (Fig. 2) as far as the "max" mark (Fig. 3). (For oil quality, see "LUBRICANTS").

If the oil level is only just above the "min" mark (Fig. 3), it must be topped up.

3 liters can be filled in between the "min" and "max" marks.

The oil level must not be allowed to fall below the "min" mark nor to rise above the "max" mark.



Fig. 1

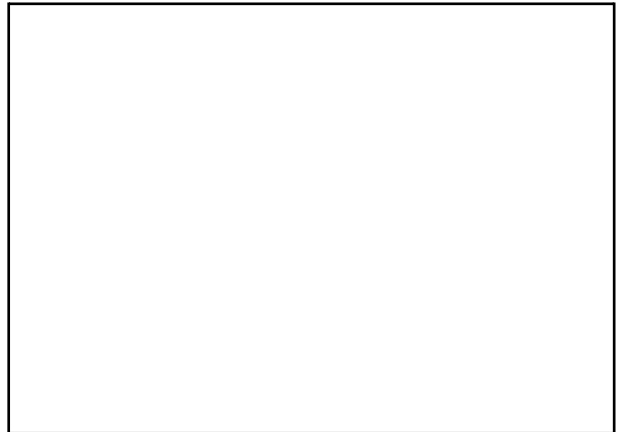


Fig. 2



Fig. 3

□

OPERATING INSTRUCTIONS F106.6/A

Changing the engine oil

2904948

Risk of scalding through hot engine oil.

Collect escaping oil and discard in accordance with local environmental protection regulations.

Read and observe: "Inspection and servicing - Safety instructions".

- Bring engine oil to operating temperature.
- Park machine on a horizontal surface and secure against inadvertent movement.
- Shut off the engine.

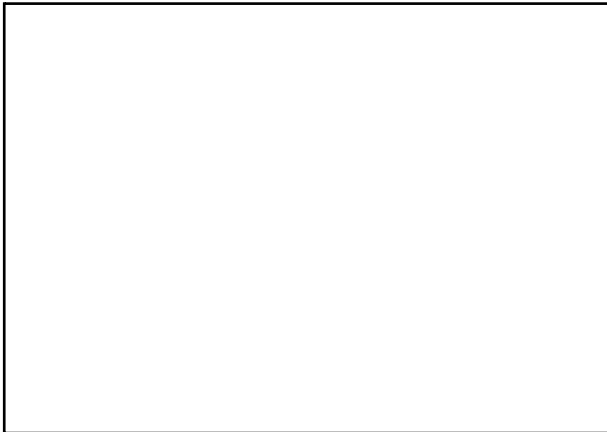


Fig. 4

- Drain off engine oil at the drain plug (Fig. 4), using the oil-drainage hose. See "Draining hose for oil changes".

Once the engine oil has been drained off:

- Unscrew oil-drainage hose, screw cap back on drain plug.
- Replace engine oil filter.
- Fill engine oil in through filler opening (Fig. 2) until oil level reaches "max" mark on dipstick (Fig. 3).
(For quality and quantity of oil, see: "LUBRICANTS" and "Filling quantities for oil change").
- After running engine briefly, check oil level (see: "Checking the engine oil level/Topping up oil").

□

Replacing the engine oil filter

2747886

Risk of scalding through hot engine oil.

Collect escaping oil and discard in accordance with local environmental protection regulations.

Read and observe: "Inspection and servicing - Safety instructions".

- Unscrew filter cartridge (4, Fig. 5).
- Clean sealing surface on engine.
- Fill filter cartridge with engine oil.
- Oil the rubber seal of the new filter cartridge lightly.



Fig. 5

- Screw filter cartridge in place until the rubber seal is in contact, then tighten by hand.
- Fill engine oil in through filler opening (Fig. 2) until oil level reaches "max" mark on dipstick (Fig. 3).
- Start up engine and check that the cartridge/engine interface is oil-tight.
- Check oil level (see: "Checking the engine oil level/Topping up oil").

□

OPERATING INSTRUCTIONS F106.6/A

Drive belt, visual inspection

1946526

Risk of injury through rotating fan blades and running V-belts.

Shut off the engine before opening the engine compartment.

Risk of burning on hot engine components, exhaust and radiator.

Do not start servicing and repair work unless engine, exhaust and radiator have cooled down.

- Open the cover of the engine compartment.
- Check all drive belts visually.
- Check drive belts for intersecting cracks.
Transverse cracking (1, Fig. 6) perpendicular to the belt width is acceptable.
Longitudinal cracks intersecting with transverse cracks (2) are not acceptable.
- In this case, the belt must be replaced.
The drive belt must also be replaced when the edges are frayed or when part of the material is missing.

- Check the drive belt for shiny or worn sections. They are a sign that the drive belt is too slack and slipping on the pulley.
Have the belt tension checked and readjusted by our Service.



Fig. 6



OPERATING INSTRUCTIONS F106.6/A

Checking the coolant level

2747887

Risk of scalding

through hot coolant and steam.

So unscrew the cap of cooling system only when the engine is cold and stationary.

Never fill cold coolant into a hot engine. Parts of the engine may be damaged by the sudden change of temperature. Let the engine cool down to below 50°C before adding coolant.

Never mix sealing additives into the coolant when leaks are detected. The additives might clog up the cooling system. The reduced flow of coolant can in this case cause overheating of the engine.

Have the cooling system repaired immediately.

The coolant must be checked at least once a day to ensure that coolant losses are detected without delay and damage is thus avoided.

- Open the engine hood.

When the engine is cold, the coolant level must be between the **min** and **max** marks (arrow, Fig. 7).

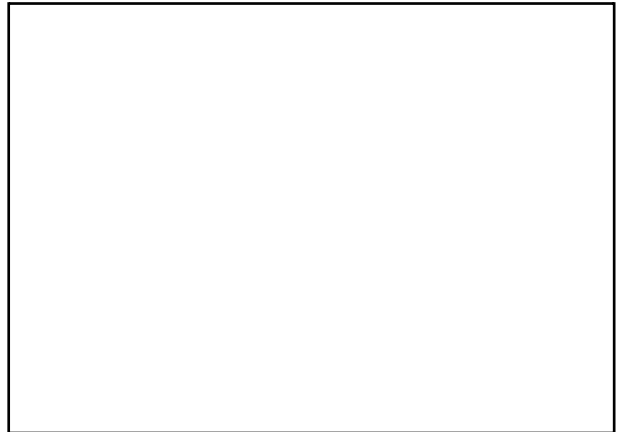


Fig. 7

When the coolant level has fallen to the **min** mark, more coolant must be filled in.

- Unscrew the cap carefully by approx. half a turn. Any excessive pressure is discharged.
- Unscrew the cap completely.
- Top up coolant only to the **max** mark.
(For quality and mixing ratio, see engine operating instructions).
- Screw cap back in place.
- Close the engine hood.

Kühlflüssigkeit nachfüllen

The coolant is to consist of a mixture of 50% clean and soft water and of 50% antifreeze (ethylene glycol) .

(Refilling quantity see: "Refilling quantities - other").

This mixture offers frost protection down to about -30° and -35°C. A higher proportion of antifreeze in the mixture hardly improves the frost protection properties, but rather impairs the coolant's capacity to carry off heat.

Mix the proportions in a clean recipient before filling them into the cooling system. If the proportions are filled into the cooling system one after another, you have no control over the correct mixing ratio. There is moreover the risk of the proportions not being mixed properly.

□

OPERATING INSTRUCTIONS F106.6/A

AIR INTAKE SYSTEM

Read and observe: "Inspection and servicing - Safety instructions".

Risk of injury through hot engine components.

Never carry out servicing or repair work unless the machine is secured as described in this manual under "Securing the machine".

Never start up the engine if parts of the air intake system have been removed.

The engine may be damaged if it draws in unfiltered air.

The grader has a dry-air filter with one main filter element, one safety filter element and one dust extraction valve.

The dry-air filter is located under the engine hood behind the driver's cab. It is accessible from the lefthand side of the vehicle when the engine hood has been opened.



Fig. 1

Dust extraction valve

2747889

Check once a day that the extraction slit in the dust extraction valve (3, Fig. 2) is free.

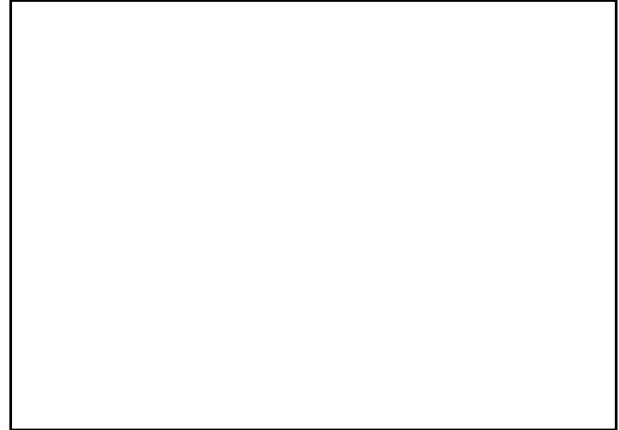


Fig. 2

Remove any dust deposits by squeezing the valve.

If the air filter has no dust extraction valve, it is equipped with a maintenance-free ejector (option).

OPERATING INSTRUCTIONS F106.6/A

Main filter element

Clean or replace the main filter element if the warning lamp (15, Fig. 3) lights up.

The main filter element must be cleaned or replaced even if the servicing interval has not yet expired.



Fig. 3

Removing and checking the main filter element

If the warning lamp (15, Fig. 3) lights up, the main filter element is so heavily soiled that insufficient air can flow through.

If this is the case, clean or replace the main filter element.

- Release clip (2, Fig. 4), remove lid (4) and clean.

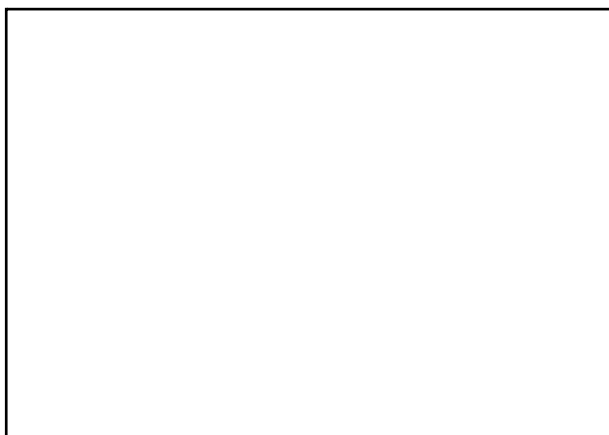


Fig. 4

- Withdraw main filter element (6, Fig. 5) with care.



Fig. 5

- The safety filter element (7, Fig. 6) remains in place.



Fig. 6

- Reverse the procedure to install the new or cleaned main filter element.

OPERATING INSTRUCTIONS F106.6/A

Prior to installation:

- Check the filter paper with a filament lamp (Fig. 7). Any damage is indicated by a bright light shining through. Replace damaged filter elements immediately.

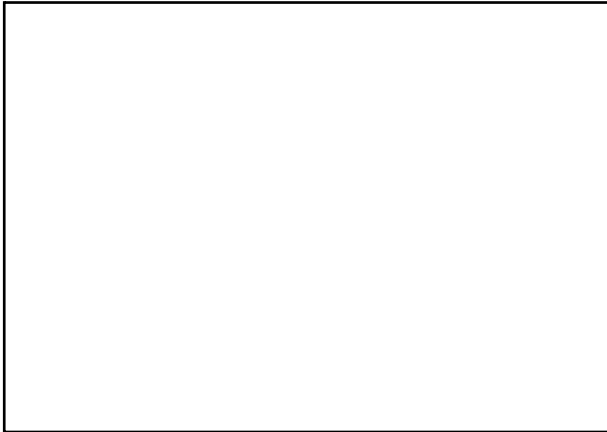


Fig. 7

- Carry out a visual inspection of the sealing surface (arrow, Fig. 8). If the seal is damaged, replace the main filter element immediately.
- Carry out a visual inspection of the inlet pipe between filter and engine for air-tightness and firm fit. No damage should be visible on the inlet pipe.
- Check that the hose connection between filter and inlet pipe fits firmly and is intact.



Fig. 8

Cleaning the main filter element

Never clean the filter element by knocking it against hard objects or by beating it.

The main filter element must be replaced once it has been cleaned 5 times, and at the latest after one year of operation.

It is advisable to clean the filter element with compressed air if it is to be used again immediately afterwards.

The pressure at the nozzle must not exceed 5 bars.

First blow dry compressed air diagonally onto the filter surface from outside (Fig. 9).



Fig. 9

Then clean the inside of the element in the same way.

The filter element is clean when no more dust is seen to emerge.

Never knock filter elements against hard objects.

Never clean filters with petrol or with flammable or hot liquids.

OPERATING INSTRUCTIONS F106.6/A

Checking / replacing the safety filter

Never start the engine when the safety filter element has been removed.

The engine then draws in unfiltered air and may be damaged.

The main filter element must be replaced with a new element once it has been cleaned 5 times, but no later than after 2 years.

If it becomes clear during the servicing of the dry-air filter that a servicing fault has occurred or that the main filter element is damaged, the safety filter element must also be replaced.

If the warning lamp (15, Fig. 3) responds again, i.e. lights up, when the main filter element (7, Fig. 10) has been serviced, the safety filter element must be replaced.

- Remove the main filter element.



Fig. 10

- Pull the safety filter element out with the yellow ring and replace.
- Before installing a new safety filter element, use your fingers to check the piping connection in the filter housing and the accessible section of the inlet pipe for dust. If dust is found in the inlet pipe to the engine, consult the O&K After-sales service immediately.

Checking the air inlet pipe

No unfiltered air must be allowed into the engine, so:

- Check all hoses and pipes for leaks.
- Check that all clips are in place and securely fastened. □

OPERATING INSTRUCTIONS F106.6/A

FUEL SYSTEM

2747273

Fuel system, safety instructions

Explosion hazard due to vapours

Fuel vapours are easily flammable and likely to explode. Therefore, avoid the formation of sparks and do not use open flames such as lighters or matches for illumination purposes.

When you have to work on the fuel system:

- shut off the engine and the auxiliary heating,
- secure the machine,
- avoid open flames,
- do not eat, drink or smoke.

Possible health hazard

Diesel fuel and the water / fuel mixture drained off are a health hazard.

These liquids must not be swallowed.

Avoid prolonged contact with the skin.

Do not inhale the fumes.

Wear protective gloves or use a barrier cream.

Avoid environment pollution

Collect escaping fuel and discard without polluting.

Fuel filter cartridges and fuel-stained cleaning rags must be disposed of separately from other waste.

Never fill in "Bio-diesel"

The injection system and the engine are at risk of being damaged if "Bio-diesel" is used.

Fill up the machine only with diesel fuel made from mineral oils acc. to the EN 590 standard.

For more information please contact your dealer service.

Refuelling from cans

If the machine is filled up frequently or regularly with fuel from cans or drums, there is an increased risk of dirt particles and water getting into the fuel system.

In this case:

- always fill in fuel through a fine-meshed strainer;
- dewater the fuel filter more often than specified in the servicing plan;
- drain water and deposits from the tank bottom at shorter intervals;
- replace all fuel filters at shorter intervals.

□

OPERATING INSTRUCTIONS F106.6/A

Replacing the fuel filter

2747890

**Read and observe:
"Fuel system, safety instructions".**

Replace the fuel filter every 500 OH according to the servicing plan **B**.

- Secure the machine as detailed under "Securing the machine".
- Unscrew fuel filter cartridges (1 and 2, Fig. 1) and discard without polluting the environment.

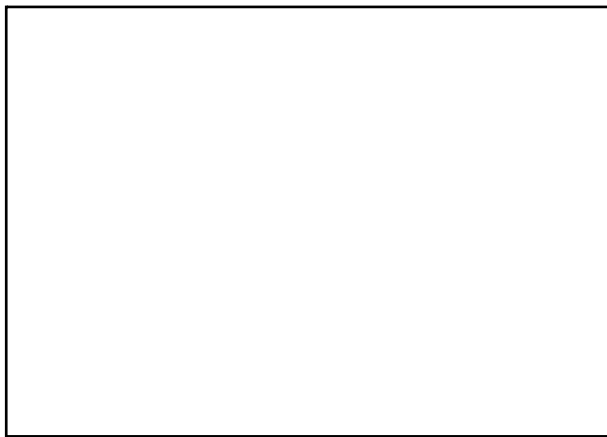


Fig. 1

- Clean sealing surface of filter head.
- Fill new filter cartridges with fuel.
- Oil sealing ring of new filter cartridges lightly.
- Screw on new fuel filter cartridges until the gasket is in contact, then tighten by hand.
- Check after some time that the engine/fuel filter interface is leakproof.

Excessive tightening of the filter may damage the thread or the seal.

□

Fuel tank, draining off water and deposits

2747891

Risk of explosion

Diesel fuel, too, can give off highly flammable and explosive gases.

When working on the fuel system:

- shut off the engine and any auxiliary heating,
- secure the machine,
- do not use open flames,
- do not smoke.

Collect the contaminated fuel and discard without polluting the environment.

Diesel fuel can damage the skin. Wear protective gloves or use a barrier cream.

Impurities and water settle on the bottom of the fuel tank. This is the case especially if the machine is filled up frequently or regularly with fuel from cans or drums or when the machine is used on sites with strong fluctuations of daytime / nighttime temperatures.

The result is the formation of condensed water, especially if the tank is not full. At temperatures below 0°C, this water freezes and can no longer be drained off via the drain plug.

For this reason, water and deposits must be drained off at the end of the workshift and the tank subsequently filled.

- Park the machine as described in the section "Securing the machine".
- Place a recipient under the drain plug (arrow, Fig. 2). The drain plug opens when the draining hose is screwed onto the valve (arrow, Fig. 2).
- Drain off water and deposits and discard without polluting the environment.
- Screw off the draining hose.
- The drain plug closes automatically.
- Fill in fuel through the strainer in the filler tube after having cleaned the strainer beforehand with paraffin oil.

□

OPERATING INSTRUCTIONS F106.6/A

Cleaning the fuel tank

2747892

Risk of explosion

Never use white spirit, petroleum or other solvents to clean the tank.

Readily flammable, explosive gases are formed.

Therefore use only diesel fuel or a special-purpose cleaning oil to clean the tank.

Observe the instructions issued by the manufacturer of the cleaning oil.

Be sure to prevent fuel and cleaning oil from seeping into the ground.

Keep for re-use or discard in accordance with local environmental regulations.

- Run the machine until the fuel tank is almost empty.
- Check how much fuel is left in the tank and place an adequately large receptacle below the drain plug of the tank.
- Drain off diesel fuel at the drain plug (Fig. 2), using the oil draining hose. See "Draining hose for oil changes".



Fig. 1

- Place a receptacle below the plug to catch the cleaning fluid.
- Unscrew tank cap (4, Fig. 3)
- Remove filler strainer.
- Clean tank cap (4) and filler strainer thoroughly with diesel fuel.

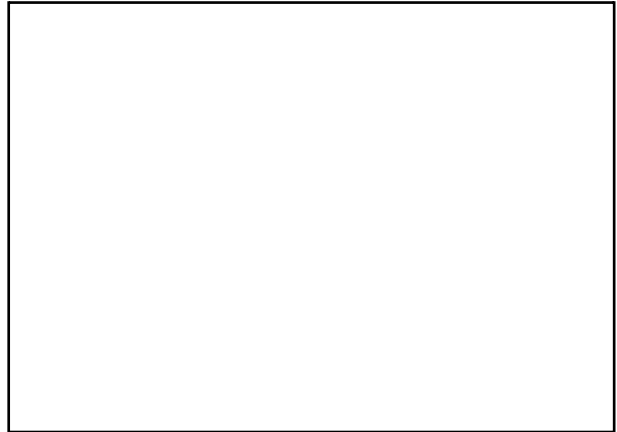


Fig. 2

- Clean and flush tank with cleaning device.
- When the cleaning fluid has drained off: Unscrew oil draining hose, screw cap onto drain plug.
- Insert filler strainer in filler tube.
- Fill in fuel through filler strainer in filler tube.

□

OPERATING INSTRUCTIONS F106.6/A

ELECTRICAL SYSTEM

2905975

Electrical system - Safety instructions

Risk of injury from battery acid and gases.

Wear goggles, protective gloves and strong working clothes.

Prior to working on the electrical system

Shut off the engine.

Set 'Electrical System' key switch to 0 and withdraw key.

Set battery main switch to OFF and withdraw switching lever.

Disconnect control elements and control console from machine circuit.

Prior to working on the electrical system where tools, spare parts, etc. may come into contact with electrical cables or contacts, turn off the battery main switch or disconnect the battery.

Disconnect the negative pole first, then the positive pole.

After work:

Reconnect the positive pole first, then the negative pole.

Read and observe "Alternator, control elements and control console - Instructions".

Read and observe "Inspection and servicing - Safety instructions".

Always use a meter for voltage and continuity testing.

Do not use any test lamp.

Do not "tap against ground".

This will cause a short circuit with consequent damage to the generator or to the PCS electronic system.

Alternator - instructions

2732215

Never disconnect electrical connections on the alternator, regulator and battery when the engine is running.

This would damage the alternator and regulator.

When connecting the batteries, never interchange the cables (pay attention to polarity).

Voltage and continuity tests must be done with a meter only.

Never use a test lamp.

Never check by touching ground with a bare wire.

The resulting short circuit damages the alternator and the regulator.

When starting up the engine, the alternator is controlled (pre-excited) by an electronic circuit. This ensures that the alternator can discharge power.

The circuit is an integral part of the central electronic system in the console.

A LED in the console (load control) shows that the alternator is functioning correctly. This LED must light up when the key-switch is switched on and go out when the engine is running.

If this is not the case, there is a fault in the alternator circuit or in the console.

To prevent further damage, the cause of the fault must be located and rectified as quickly as possible.

Consult you local O&K subsidiary.

OPERATING INSTRUCTIONS F106.6/A

Control assemblies - Instructions 2905976

Prior to carrying out work on the electrical system or to welding:

- set "Electrical System" key switch to 0 and withdraw key.
- set battery main switch to OFF and withdraw switching lever.
- disconnect the electronic control assemblies for the equipment and gearbox control by disconnecting the central plug from the machine circuit.

Electrical interfaces may be connected or disconnected only by using the respective halves of the plug.

Control assemblies

The control assemblies are housed in the right lateral console.

Unplugging the control assemblies

Remove the 4 screws (arrow) of the document compartment and remove the compartment (Fig. 1).



Fig. 1

Push toggle (2, Fig. 2) at plug (3) of lefthand control assembly (1) outwards (arrow). The plug (3) is lifted out and can be removed.

Push metal clip (5) at plug (6) of righthand control assembly (4) outwards (arrow). The plug is unlocked and can be removed from the front guide (7) by lifting at the rear.

Inserting the control assembly plug

Push plug (6) of righthand control assembly (4) diagonally from above into the front guide (7) and press plug down until it engages.

Place plug (3) of lefthand control assembly (1) onto control assembly and push toggle (2) inwards. The plug (3) is pushed into the control assembly (1) and locked.



Fig. 2

□

OPERATING INSTRUCTIONS F106.6/A

Control console - Instructions

2905977

Prior to carrying out work on the electrical system or to welding, the control console must be unplugged from the machine circuit.

Set 'Electrical System' key switch to 0 and withdraw key.

Set battery main switch to OFF and withdraw switching lever.

Electrical interfaces may be connected or disconnected only by using the respective halves of the plug.

The control console plugs are housed in the control console column.

Unplugging the control console plugs

Remove the 5 screws of the rear plate (Fig. 1) and move the plate forward.

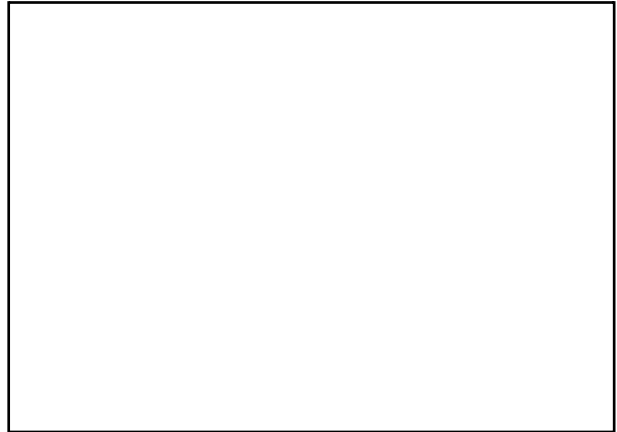


Fig. 1

Remove screws at plugs (1, 2 and 3, Fig. 2) and withdraw plugs (4).



Fig. 2

Reassembly in reverse sequence.

□

OPERATING INSTRUCTIONS F106.6/A

Battery

2747893

The batteries are accessible after opening the engine hood (Fig. 1).

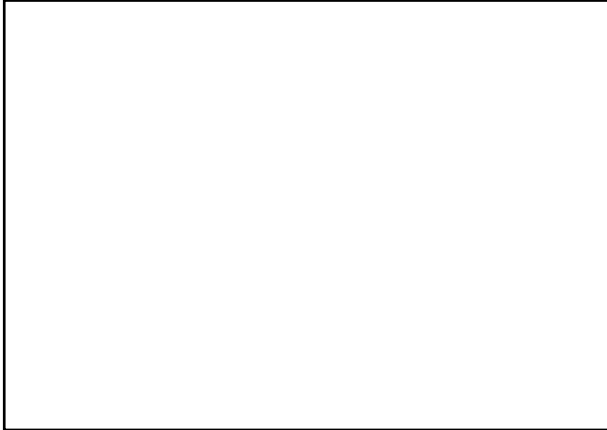


Fig. 1

The batteries are located at the right of the engine.

Series connection of the two 12V batteries yields a system voltage of 24V.

□

Checking the battery fluid level

2732234

(Not required for maintenance-free batteries)

- Unscrew caps.
- If control inserts are installed, the battery fluid must reach up to their base.
- If no control inserts are installed, insert a clean wooden rod into the battery until it contacts the upper edge of the cell plates. The rod must be moistened for at least 10 mm (0.39").
- If the fluid level is too low, top up with distilled water only.

Checking the battery charge

The acid temperature should be 20°C (68°F).

- Unscrew battery caps (Fig. 2).
- Measure the battery acid density with a commercially available tester (Fig. 2).

The acid density is in direct correlation with the battery charge.

Acid density		
in kg / dm ³		Charge
Normal conditions	Tropical conditions	
1.28	1.23	fully charge
1.20	1.12	half charged, recharge
1.12	1.08	discharge, recharge immediately



Fig. 2

□

OPERATING INSTRUCTIONS F106.6/A

Removing and installing batteries

2747894

Stop the engine before removing batteries, to prevent damage to the alternator and regulator or electronic modules.

Set Electrical System key-switch to 0 and withdraw key.

Release and attach pole terminals in the prescribed sequence.

There is otherwise a risk of short-circuiting.

- Switch off battery main switch and withdraw switch lever.

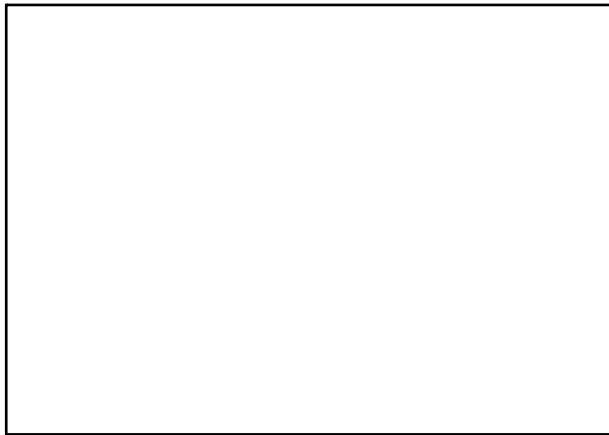


Fig. 3

- Detach pole terminal at negative pole of battery.
- Remove cable bridge between batteries.
- Detach pole terminal at positive pole of battery.
- Insulate pole terminals.
- Unscrew battery holder (arrows, Fig. 3).
- Lift battery out of battery box.

Before installing the new battery, polish the contact surfaces of the battery poles and the pole terminals.

- Install new battery.
- Screw battery holder.
- Connect pole terminal at positive pole of battery.
- Restore cable bridge between batteries.

Tighten clamping screws of pole terminals, but without force in order to prevent damage.

- Connect pole terminal at negative pole of battery.
- Coat battery poles and pole terminals with pole grease or non-acidic Vaseline.

Loose or corroded pole terminals overload the alternator and regulator. □

OPERATING INSTRUCTIONS F106.6/A

HYDRAULIC SYSTEM

2747931

Hydraulic system - Safety instructions

Risk of injury

from hydraulic oil under high pressure.

from hydraulic fluid or hot parts of the engine.

Before working on the hydraulic system, make sure the system has been depressurized and that any residual pressure has also been released (see: "Depressurizing the hydraulic system").

Shut off the engine and let the machine cool down.

Secure the machine as described in the section "Securing the machine".

Avoid skin contact with hydraulic oils. Skin contact with hydraulic oils is a health hazard.

Wear gloves and firm working clothing.

Read and observe: "Inspection and servicing, safety instructions".

□

Hydraulic system - checking and adjusting of pressures

2747895

Read and observe:

"Hydraulic system, safety instructions".

All pressure relief valves in the hydraulic system have been set at the factory to the prescribed operating pressure and protected by seals.

Have the operating pressures checked and readjusted by our after-sales service.

□

Checking the hydraulic oil level

2747898

For checking the hydraulic oil

- the working attachments must be lowered to the ground
- the engine must be off
- the hydraulic oil must be cold

The oil level must be visible around the mark in the middle of the inspection glass (arrow, Fig. 1). Top up with hydraulic oil if necessary.

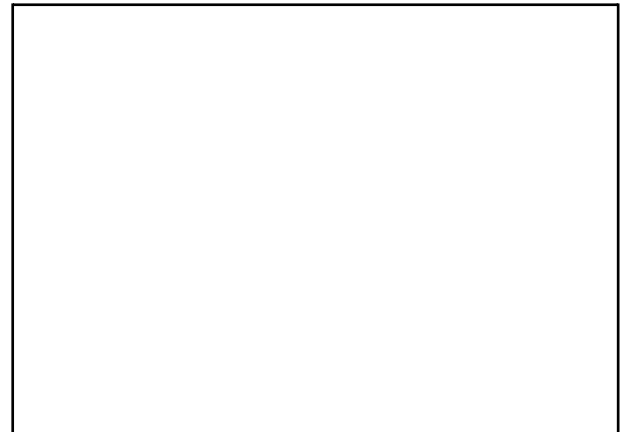


Fig. 1

□

OPERATING INSTRUCTIONS F106.6/A

Depressurizing the hydraulic system

2747896

Read and observe :
"Hydraulic system, safety instructions".

Depressurize the hydraulic system before starting work:

- Apply the parking brake, move powershift transmission to neutral position.
- Retract the blade pitch adjustment cylinder completely.
- Lower the blade to the ground.
- Bring the wheel rake on one side to the limit stop.
- If the machine is fitted with a front grading blade and/or a rear ripper, set it/them down onto the ground.
- Shut off the engine and secure the machine as described in the section "Securing the machine".
- Move the control levers for the following functions
 - blade rotation,
 - blade shift,
 - center-pivot steering,
 - front blade (optional),
 - rear ripper (optional)
 several times from limit to limit stop.
 The aforementioned systems (cylinders and lines) are then depressurized.
- Move control levers for both blade lifting cylinders several times from limit stop to limit stop.
 The lines between the control block and the lowering brake valves flange-mounted on the cylinders are then depressurized.

Pressure remains, however, in the blade lifting cylinders and the lowering brake valves flange-mounted on them. Depressurize the blade lifting cylinder as described under "Emergency lowering of the blade".

Pressure also remains in the system sections wheel camber, blade rotation gear and blade pitch adjustment where the pressure is released by careful loosening of the threaded line connections.

□

Depressurizing the hydraulic reservoir

2747897

Read and observe:
"Hydraulic system, safety instructions".

The hydraulic reservoir (1, Fig. 1) is under a light precharging pressure of max. 0.8 bars. This pressure must be removed before the tank is opened.



Fig. 1

- Open the hood.
- Open the breather valve (2, Fig. 1) by abt. $\frac{1}{2}$ turn to let the air escape.
- Reclose the breather valve after the air has escaped.

□

OPERATING INSTRUCTIONS F106.6/A

Filling in hydraulic oil

2747903

Read and observe:
"Hydraulic system, safety instructions".

- Stand all working attachments on the ground.
- Shut off the engine.
- Clean the reservoir surface and structures.
- Remove the reservoir precharging pressure as described under "Depressurizing the hydraulic reservoir".
- Unscrew the caps of the filler tube (3, Fig.2) and of the breather valve (2, Fig.2)

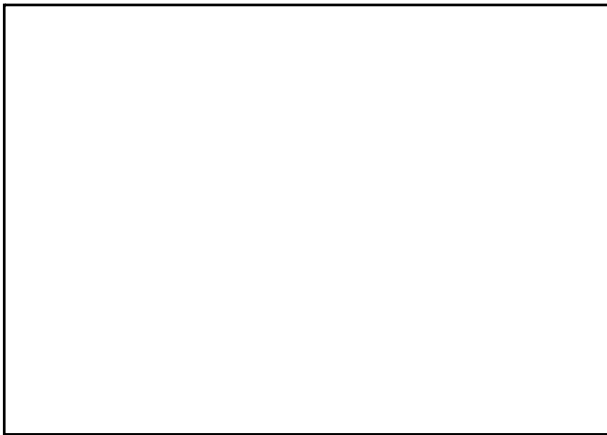


Fig. 2

- Fill in hydraulic oil through the strainer until the oil level reaches the mark in the middle of the inspection glass.
The oil grade is set out in the "Refilling quantities - oil" section.
- Screw caps back in place.
- Start the engine and actuate the control levers of all attachments several times from limit stop to limit stop.
These movements help to fill up and vent the hydraulic system.
- Stand working attachments back on the ground and shut off the engine.

□

Replacing the breather valve

2413622

The breather valve (2, fig. 2) ensures the aeration and deaeration of the hydraulic reservoir if the hydraulic oil level fluctuates.

It ensures a reservoir charging pressure of approx. 0.8 bars.

The breather valve contains a filter element. This filter element cannot be changed or cleaned.

Therefore, replace breather valve completely in accordance with the servicing schedule D. □

OPERATING INSTRUCTIONS F106.6/A

Changing the hydraulic oil

2747902

Risk of scalding

due to hot hydraulic oil .

Avoid skin contact with hydraulic oil.

Wear protective gloves.

Collect escaping oil and discard without polluting the environment.

Secure the machine against unauthorized starting as described in the section "Securing the machine".

Read and observe: "Inspection and servicing - safety instructions".

Do not start the drive engine when the hydraulic oil tank is empty.

The hydraulic pumps can be irreparably damaged by dry running.

□

Draining off the hydraulic oil

2747899

Read and observe:

"Hydraulic system, safety instructions".

- Lower all attachments to the ground.
- Shut off the engine.
- Release the reservoir charging pressure, as described in the section "Depressurizing the hydraulic reservoir".
- Place a collecting vessel under the drain plug of the hydraulic reservoir (8, Fig. 3). To ascertain the required capacity of the collecting vessel refer to "Refilling quantities - oil".



Fig. 3

- Drain off the hydraulic oil with the oil draining hose.
Use of the oil draining hose is described in the section "Draining hose for oil changes".
- When the oil has drained off, unscrew the draining hose.
Screw the protective cap back in place.
- Fill in new hydraulic oil as described under "Filling in hydraulic oil".
For oil grade and quantity refer to "Refilling quantities - oil"

□

OPERATING INSTRUCTIONS F106.6/A

Replacing the hydraulic oil return-flow filter

2747904

Read and observe:
"Hydraulic system, safety instructions".

The return-flow filter must be replaced:

- during servicing in acc. with the servicing schedule,
- after repairs of the hydraulic system.
- Clean the reservoir surface and structures.
- Remove the reservoir precharging pressure as described under "Depressurizing the hydraulic reservoir".
- Unscrew cap (3, Fig. 4) and remove.



Fig. 4

- Withdraw the return-flow filter (4, Fig. 5).



Fig. 5

- Insert new filter cartridge (4, Fig. 6) carefully into the hydraulic reservoir (Fig. 6). Check gas-ket (6) and spring (5) of cap (3) for damage and replace, if necessary. Put cap (3) back in place and tighten.

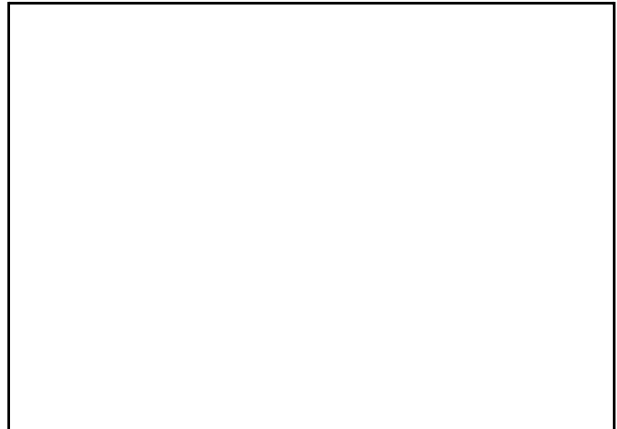


Fig. 6

□

OPERATING INSTRUCTIONS F106.6/A

Cleaning the hydraulic reservoir

2747906

Risk of explosion

Do not use white spirit, paraffin oil or other solvents for cleaning of the reservoir.

These substances form easily flammable and explosive gases.

Use only hydraulic oil or a special cleaning agent for cleaning and flushing of the reservoir.

Observe the handling instructions of the cleaning oil manufacturer.

Do not let hydraulic oil get into the ground.

Keep the cleaner for reuse or discard without polluting the environment.



Fig. 7



- Drain off hydraulic oil, see section "Draining off the hydraulic oil".
- Unscrew the breather filter (2, Fig. 7) and remove the return-flow filter (see "Hydraulic oil - replacing the return-flow filter").
- Place a collecting vessel for flushing oil under the hydraulic reservoir.
- Clean the inside of the reservoir with hydraulic oil or with flushing oil. Remove all deposits and also the residues of the cleaning agent thoroughly.
- Replace the O-ring below cap (2).
- Put the cap back in place.
- Refit the cover plate below the hydraulic reservoir.
- Fill in hydraulic oil.

OPERATING INSTRUCTIONS F106.6/A

Cleaning the multi-purpose radiator

2747907

Risk of injury

from rotating fan blades and moving V-belts.

Shut off the engine before opening the engine compartment.

Risk of burning from hot parts of engine, exhaust and radiator.

Start cleaning only after the engine, the exhaust and the radiator have cooled down. Wear protective gloves.

Put on goggles before working with compressed air.

When the machine is used on sites with heavily contaminated ambient air, the multi-purpose radiator must be cleaned more often than indicated in the maintenance plans.

Do not use pointed or hard tools such as wire brushes or screwdrivers for cleaning. Such tools may damage the radiator fins.

The multi-purpose radiator (Fig. 8) contains - from left to right - cooling sections for hydraulic oil and gearbox oil, for engine coolant and for engine charge air.

- Bring engine hood to service position II (see "Engine hood").
- Swing back the air duct (13, Fig. 8).
- Brush and suck off dirt from the radiator fins. Remove firmly adhering dirt with compressed air or a water jet. When water is used, the batteries must be covered up watertight or removed altogether. There is otherwise a risk of short-circuits. Clean the radiator working from top to bottom, removing detached dirt.



Fig. 8



OPERATING INSTRUCTIONS F106.6/A

F106.6 A front-wheel drive- changing the oil filter

2747905

The oil filter for the F 106.6 A front-wheel drive is accessible after opening the engine hood. It is located on the left side of the engine.



Fig. 9

- Clean filter head and housing.
- Unscrew filter housing (14, Fig. 9), taking care not to spill hydraulic oil.
- Withdraw filter element from filter head (15) and discard without polluting the environment.
- Clean filter housing and sealing surfaces on filter head.
- Press new filter element with one turn onto the filter head.
- Fill filter housing with hydraulic oil.
- Screw filter housing back into head.
- After putting the hydraulic system into operation, check the filter housing for leaks.

□

OPERATING INSTRUCTIONS F106.6/A

POWERSHIFT TRANSMISSION

2747908

Powershift transmission, safety instructions

Read and observe: "Inspection and servicing - Safety instructions".

As the torque converter of the powershift transmission may be emptied into the transmission while the engine is stationary, the oil level must be checked while the engine is running.

It is vital therefore to respect the safety instructions set out in the following sections.

Powershift transmission - checking the oil level

- Park the machine as detailed under "Securing the machine".
- Check that the powershift transmission is set to neutral position.
- Start the engine and run it at idling speed.
- Warm up the powershift transmission until the oil temperature is 80°C; see "Warming up the powershift transmission".

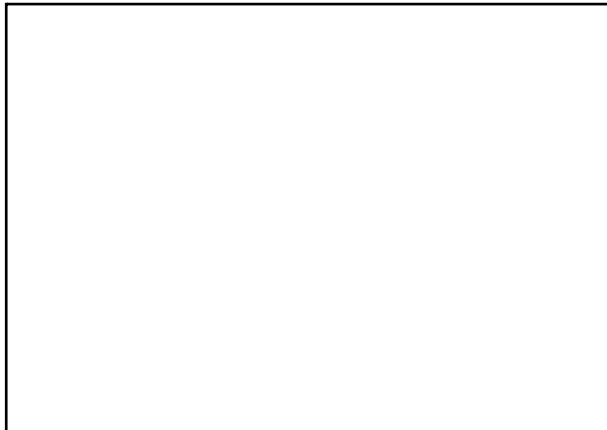


Fig. 1

- Move gearshift back to neutral, bring engine to 1,000 rpm. See "Display key - Function".

Running engine

Risk of injury from hot or rotating parts of the engine.

- Open engine hood and bring into service position II.
- Clean oil dipstick and filler tube.
- Loosen dipstick (1) by turning the handle to the left, draw out of tube and wipe clean using a lint-free cleaning rag.

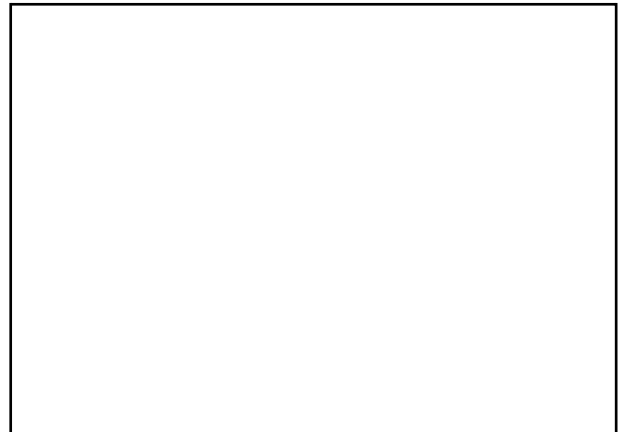


Fig. 2

- For checking, reinsert the dipstick completely into filler tube (2). Withdraw the dipstick: the oil must reach the upper mark "hot max." (Fig. 3).



Fig. 3

- Top up if necessary. For oil grade, refer to "Refilling quantities - oil".
- 1 liter of oil can be filled in between the "min" and "max" marks.

After checking, reinsert the dipstick and tighten by turning the handle to right. □

OPERATING INSTRUCTIONS F106.6/A

Powershift transmission - changing the oil

Risk of scalding through hot gearbox oil.

Wear working gloves.

Collect escaping oil and discard without polluting the environment.

**Each time the oil has been changed, the gearbox must be re-set with an ADFP starter.
Contact your local O&K agent.**

- Park the machine as detailed under "Securing the machine".
- Prepare a collecting vessel for waste oil. For required quantities, see "Refilling quantities - oil".
- Clean the powershift transmission around the oil drain plug (4, Fig. 4), the oil dipstick (1 and 2, Fig. 2) and the oil filter (3 and 5, Fig. 5) thoroughly.
- Unlock the dipstick handle (1, Fig. 2) and withdraw dipstick from filling pipe (2).
- Drain off the gearbox oil through drain plug (4, Fig. 4), using the draining hose. See chapter "Draining hose for oil changes".



Fig. 4

After draining off the gearbox oil :

2747909

- Unscrew the draining hose and screw the protective cap back onto the drain valve
- Replace the gearbox oil filter as detailed under "Powershift transmission - changing the oil filter".
- Pour fresh gearbox oil into the filling pipe (2, Fig. 2) up to the lower mark "cold min.". For oil grade and quantity, see "Refilling quantities - oil".
- Check that the powershift transmission is set to neutral position.
- Start the engine and run it at idling speed.
- After running the engine for some minutes, top up with gearbox oil to the lower dipstick "cold min." mark.
- Warm up powershift transmission until oil temperature is ca. 80°C; see "Warming up the powershift transmission".
- Move gearshift back to neutral, bring engine to idling speed.
- Check oil level.

If necessary, top up again with gearbox oil to the top "hot max." mark of the dipstick.

□

OPERATING INSTRUCTIONS F106.6/A

Powershift transmission - changing the oil filter

2747910

The oil filter must also be replaced each time the gearbox oil is changed.

- Loosen oil filter (3, Fig. 5) with a releasing wrench, unscrew by hand and discard in accordance with local environmental regulations.



Fig. 5

- Clean sealing surface at filter head (5).
- Apply a light coating of oil to the seal of the new oil filter. Fill oil filter with oil. For oil quality, see "Oils for powershift transmissions".
- Screw oil filter on carefully and tighten by hand.
- Check for leaks during the trial run.

□

OPERATING INSTRUCTIONS F106.6/A

REAR AXLE

20000003

Rear axle - checking the oil levels

Read and observe: "Inspection and servicing - safety instructions".

- Park the machine as described in the section "Securing the machine".
- Axle gear:
 - Check the oil level. It must reach up to the lower edge of the bore of screw plug (1, Fig.1).
 - Fill up with gearbox oil if necessary. To do so, unscrew screw plug (1) and pour fresh gearbox oil into the bore.
For oil grade refer to "Refilling quantities - oil".
Screw the screw plug (1), with a new sealing ring, back in.



Fig. 1

- Tandem (chain case)
 - Check the oil levels. They must reach the centre of the inspection glass (3, Fig. 2).

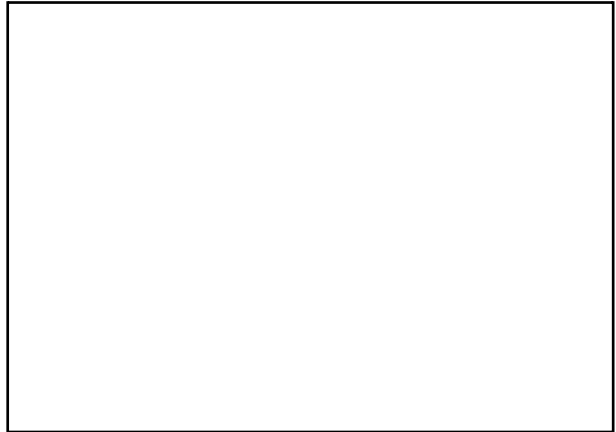


Fig. 2

- Fill up with gearbox oil if necessary. To do so, unscrew bleeder (4, Fig. 3) and pour fresh gearbox oil into the bore.
For oil grade refer to "Refilling quantities - oil".
Screw bleeder (4, Fig. 3), with a new sealing ring, back in.



Fig. 3

OPERATING INSTRUCTIONS F106.6/A

Rear axle, changing the oil

Read and observe: "Inspection and servicing - safety instructions".

Risk of scalding due to hot gearbox oil.

After a long drive, the gearbox housing can be hot, too.

Wear protective gloves and allow the transmission gear to cool off.

Collect escaping oil and discard without polluting the environment.

- Park the machine as described in the section "Securing the machine".
- Place a collecting vessel for waste oil under the drain plug.
To ascertain the necessary capacity of the collecting vessel refer to "Refilling quantities oil".
- Axle gear:
 - Unscrew drain plug (2, Fig. 4), the oil drains off.
Screw the drain plugs, with new sealing rings, back in.
 - Fill up with fresh gearbox oil, as described in "Rear axle - oil levels".
For oil grade and quantity refer to "Refilling quantities - oil".



Fig. 4

- Tandem (chain case):
 - Unscrew both drain plugs (7, Fig. 5), the oil drains off.
Screw the drain plugs, with new sealing rings, back in.
 - Fill up with fresh gearbox oil, as described in "Rear axle - checking the oil levels".
For oil grade and quantity refer to "Refilling quantities - oil".



Fig. 5

Rear axle - checking the chain tension

Read and observe: "Inspection and servicing - safety instructions".

Check the chain tension in the tandem (chain case) in accordance with the servicing schedule.

- Remove both covers (5, Fig. 3).
- Raise the rear axle until the rear wheels are just clear of the ground.
Prop up rear axle with squared timber beams so that it cannot sink in.
- Pull chains up through the cover openings. If they knock against the housing (6), the tension must be increased.

Have the chain tension adjusted by the O&K Service .

□

OPERATING INSTRUCTIONS F106.6/A

BLADE SLEWING GEAR

2413611

Read and observe: "Inspection and servicing - safety instructions".

Blade slewing gear - checking the oil level

- Park the machine as described in the section "Securing the machine".
- Check that the blade slewing gear (Fig. 1) is in a horizontal position.

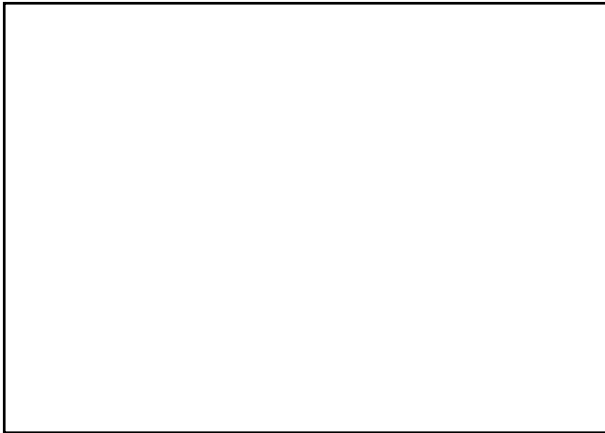


Fig. 1

- Check the oil level. It must reach the centre of the sight glass (3, Fig. 1).
- Fill up with gearbox oil if necessary. To this end, unscrew screw plug (2) and pour gearbox oil into the bore.
For oil grade refer to "Refilling quantities - oil".
- Screw the screw plug (2), with a new sealing ring, back in.

Blade slewing gear - changing the oil

Read and observe: "Inspection and servicing - safety instructions".

Collect draining oil and dispose of it in an environmentally friendly manner.

- Park the machine as described in the section "Securing the machine".
- Provide a collecting vessel for waste oil. To ascertain the necessary capacity of the collecting vessel refer to "Refilling quantities - oil".
- Unscrew drain plug (1, Fig. 1), the oil drains off.
Screw the drain plug, with a new sealing ring, back in.
- Fill up with fresh gearbox oil, as described in "Blade slewing gear - checking oil level".
For oil grade and quantity refer to "Refilling quantities - oil".

□

OPERATING INSTRUCTIONS F106.6/A

BRAKES

Working on brakes - Safety instructions

2747911

Personal

Do not carry out inspection and maintenance work on brakes unless you are qualified for working on brake systems.

If in doubt, have the work performed by our after-sales service.

Read and observe the instructions in the section: "Inspection and servicing - safety instructions".

Securing the machine

Inspection and maintenance work on brakes should only be carried out if the machine has been secured as described in the section "Securing the machine".

Health precautions

Do not inhale abraded particles from brake linings. Wear a breathing mask.

□

Accumulators, safety instructions

Accumulators are installed in the hydraulic system. These accumulators contain nitrogen under high initial pressure.

Even when the hydraulic pressure in the system is reduced, the nitrogen remains in the accumulator.

The accumulators are completely safe in operation. If incorrectly handled, however, there is a risk of explosion.

So:

- Never handle accumulator mechanically, never weld or solder it.
- Testing and servicing work must be carried out by experts only.
- Prior to any testing and servicing work, depressurize the hydraulic part of the system.
- To dismantle the accumulator, always wear goggles and working gloves.
- Fill accumulator with nitrogen only, never with compressed air or oxygen.
- Report any defects or damage to the machine owner without delay.
- Prior to recommissioning, an inspection by a specialist or expert is essential if the accumulator was damaged or if the admissible operating temperature or operating pressure was exceeded.

Never remove or paint over warning and information plates, rating plates or type identification markings. Replace illegible or damaged plates immediately.

□

OPERATING INSTRUCTIONS F106.6/A

Service brake

20000004

Checking the service brake

Read and observe:
"Working on brakes, safety instructions".

The submerged multiple-disk brakes installed in the wheel-hubs are low-wear brakes and largely maintenance-free.

Nevertheless, the following points must be observed:

- Abnormal noise from the wheel-hubs may be a sign of damaged disks.

In this case, have the brake checked by the O&K after-sales service.

Bleeding the service brake

When air has penetrated into the brake system - caused, for instance, by detaching the brake lines - the braking system must be bled.

Have bleeding performed by the O&K after-sales service.

Service brake, checking the thickness of the brake disks

Check the lining thickness of the brake disks in acc. with servicing schedule B.

Have the lining thickness of the brake disks checked by the O&K after-sales service.

Service brake, replacing the the brake disks

Have the brake disks replaced by the O&K after-sales service.

□

OPERATING INSTRUCTIONS F106.6/A

Parking brake

2747912

Read and observe:
"Working on brakes - Safety instructions".

Parking brake - Adjusting the play

After replacement of the brake linings or after mechanical release of the parking brake 1, Fig. 1), the play between brake linings and brake disk must be readjusted.

- Park the machine as described under "Securing the machine".
- Unscrew screw cap (2) and remove.

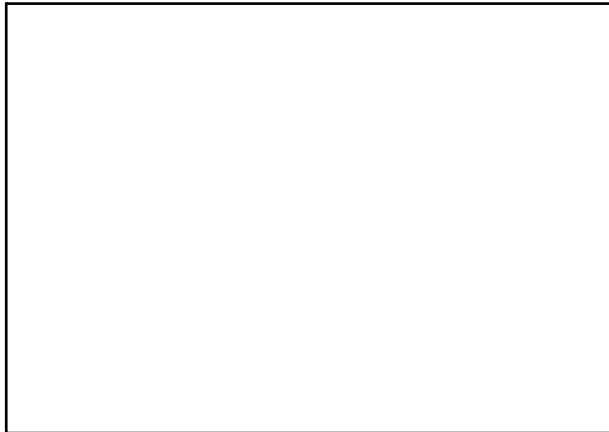


Fig. 1

- Switch on the electrical system and release the parking brake.
- Loosen locknut (3, Fig. 2 / SW 30).
- With setscrew (4, Fig. 2 / SW 10), adjust a play of 1 mm between brake disk (5, Fig. 2) and each brake lining (6).



Fig. 2

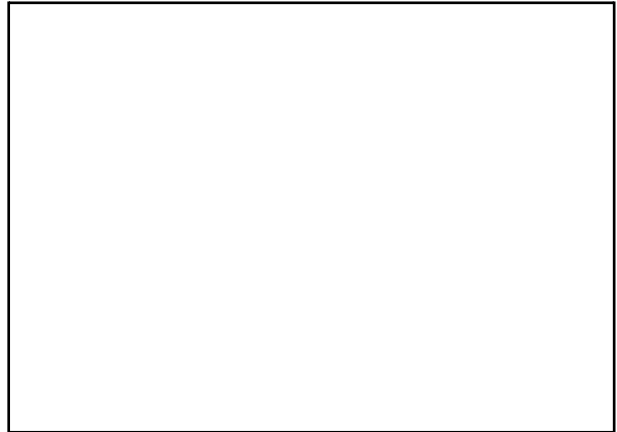


Fig. 3

- Secure setscrew (4, Fig. 3) with locknut (3, SW 30).
Tightening torque for locknut (3):
150 ± 10 Nm.
- Put screw cap (2, Fig. 1) back in place and tighten by hand.

Parking brake - Replacing the brake linings

Have the brake linings replaced by the O&K after-sales service.

Parking brake - mechanical release

In an emergency, e.g. for recovering of the machine, the parking brake can be mechanically released.

- Park the machine as described under "Securing the machine".
- Unscrew screw cap (2, Fig. 1) and remove.
- Loosen locknut (3, Fig. 3).
- Loosen setscrew (4, Fig. 3).
- After this operation, the play must be readjusted as described under "Parking brake - Adjusting the play".

□

OPERATING INSTRUCTIONS F106.6/A

TYRES AND WHEELS

1946824

Tyres and wheels - Safety instructions

Risk of injury

Heat-induced combustion of gas inside the tyre may lead to explosions in air-inflated tyres. This heat may be due, for instance, to frequent use of the brakes or to welding work carried out on the machine. A heat-induced tyre explosion is more violent than that occurring during normal bursting of tyres. Such an explosion can eject parts of the tyre and the rim over several hundreds of meters. Exploding and/or bursting tyres and ejected parts of tyres and rims may cause severe or sometimes even fatal injuries.

Therefore:

- If a tyre is suspected to be too hot, secure the machine and wait some distance away until the tyre has cooled down.
- Before inflating the tyre, check the tyre itself, the rims and rim components for damage, penetrated foreign objects and perfect fit.
- Have detected faults always rectified immediately by specialized workshops.
- If you are in doubt about the safe condition of the tyre, the rims or rim components, do nothing yourself but have the complete wheel removed by a special workshop.
Changing of tyres, rims or rim components requires special tools and procedures and must therefore always be carried out by a workshop with special equipment for this kind of work.
- Never carry out works on rims and tyres unless you are qualified to do so.

Tyre pressure

- Check the tyre pressure only when the tyre is cold; the pressures indicated are higher when the tyre is warm.
- Use a tyre inflator with a long filling hose, snap-on valve and pressure gauge (Fig. 1).
- Use only compressed ambient air for inflating the tyres. Never use flammable gases: risk of explosion.
- When inflating the tyre, keep at some distance from the wheel facing in the direction of travel.
- Watch the tyre and the gauge of the filling gear permanently during inflation and never exceed the specified tyre pressures.
- Place a safety cage around dismantled wheels.
- When pumping up, make sure all persons are well clear of the tyre.

Always pump up the tyre to the specified air pressure:

- Excessive tyre pressure makes for poor off-the-road handling with a risk of bursting tyres.
- Insufficient tyre pressure causes greater tyre wear and affects the stability of the machine.

□

OPERATING INSTRUCTIONS F106.6/A

Tyre pressure - Safety instructions

1946841

Bursting tyres and parts splintering away from the rims or from the tyre itself may cause severe injury.

The following instructions must therefore be strictly observed:

- Before inflating the tyre, check the tyres, rims and rim parts for damage, penetrated foreign objects and proper fitting.
- Have all damage detected repaired by a qualified workshop.
- Check the tyre inflation pressure only when the tyres are cold. After warming up, the pressures indicated are higher than usual.
- Use filling equipment with long filling hose, self-fixing nozzle and pressure gauge.
- Inflate the tyres with compressed ambient air only. Never use inflammable gases: Risk of explosion.
- Keep away from the tyre during inflation and always stand besides the tyre tread.
- Keep an eye on the tyre and on the pressure gauge of the filling equipment when inflating the tyre. Never exceed the prescribed tyre inflation pressures.
- Place a safety cage around dismantled wheels.
- Make sure nobody is standing near the tyre when it is being inflated.

Always inflate the tyres to the prescribed pressure:

- Excessive pressures result in poor off-road handling properties and tyres may burst.
- Insufficient tyre pressures lead to increased tyre wear and to inadequate stability of the machine.

Wheel-nuts

Always tighten the wheel-nuts with a torque wrench. Recheck with a torque wrench for tightness after several hours of operation.

Driving on roads

When driving on the road check that the tyres have the prescribed minimum tread and the correct air pressure.

Always make sure that both axles are equipped with tyres of the same size and same degree of wear.

Tyres with different diameters may cause damage to the differentials.

To avoid excessive tyre wear:

- inflate to the correct air pressure,
- do not start or brake abruptly,
- take corners slowly.

Clean the tyres and the gaps between the tyres before driving on public roads. This helps to avoid putting other road users at risk from soiled traffic lanes or from lumps of soil or stones ejected from the wheels.

□

OPERATING INSTRUCTIONS F106.6/A

Checking the tyre pressure - Reinflating the tyre

1946825

Read and observe:
"Tyre inflation pressure - Safety instructions".

- Park the machine on firm and level ground.
- Stand the working equipment on the ground.
- Apply the parking brake.
- Shut off the engine.
- Attach the self-fixing nozzle of the filling equipment to the tyre valve (Fig. 1).
- Inflate all tyres with the prescribed pressure (see: "Table of tyre inflation pressures")

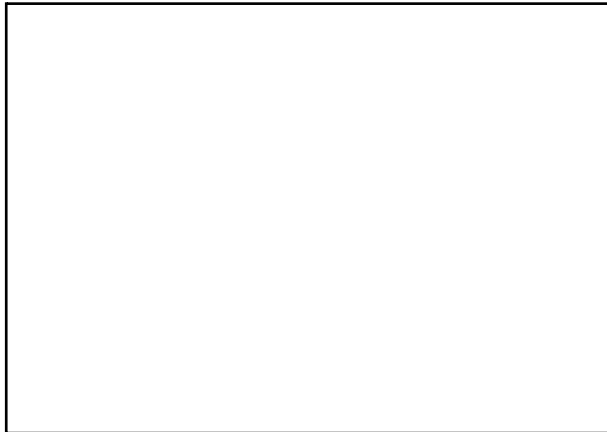


Fig. 1

□

Tyre pressures

20000000

The machine can be fitted with various tyres from a variety of manufacturers.

Tyre size	Profile	PR	Service designation	Air pressure bar	
				Front	Rear
DUNLOP 405/70R20 EM 16/70R20 EM	SPT 9		132 B	2.75	3.00
MICHELIN 425/75R20 X 16.5/75R20 X	M 27		155 B	1.4	1.4
DUNLOP 455/70R20 EM	SPT 9		150 B	2.25	2.5
CONTINENTAL 20/60-20 EM 18-20 EM	E 58	8	142 B	1.5	1.5
CONTINENTAL 22-20 SS	E7GRIB	6	132 D	1.6	1.6

The tyre pressures apply to graders with one of the tyre sizes described above, with equipment installed, full fuel tank and weights given for this purpose in the technical data. □

OPERATING INSTRUCTIONS F106.6/A

Changing a wheel

2747914

Read and observe:

"Wheels and tyres - Safety instructions".

"Tyre pressure - Safety instructions".

- Park the machine on firm and level ground.

Block the articulated joint.

Apply the parking brake.

- Loosen the wheel-nuts on the wheel to be replaced by about one turn.
- If a rear wheel is damaged, raise the relevant side of the machine with the blade, turning the blade in such a way that one end of the blade is in front of the damaged wheel. Then raise the machine with the appropriate lifting cylinder.
- If a front wheel is damaged, raise the machine with the blade or with the front grading blade (optional equipment).
- Prop up the raised axle with squared timber so that it cannot sink back down.
- Secure the machine as described under "Securing the machine".
- Deflate the tyres.
- Unscrew the wheel nuts and take off the wheel, taking care not to damage the threads of the wheel nuts.
Do not lose the centering rings, spring washers and wheel-nuts. Reuse them when refitting the wheel.
- Fitting the new wheel:
 - Inflate the tyre with a pressure of approx. 1 bar.
 - Observe the instructions set out under "Tyre tread position".
 - Be sure not to damage the threads of the wheel studs.

- Tighten the wheel nuts by hand.
- Remove the supports under the lifted axle and lower the axle.
- Tighten the wheel nuts crosswise with the prescribed torque. Torques cf. "Fastening of wheels".
- Inflate the tyres with the correct pressure. See "Tyre inflation pressures" and "Tyre pressure - Safety instructions".
- Check the wheel nuts after 5 operating hours with a torque wrench for tightness.

Fastening of wheels

Check the wheel nuts for tightness after 5 OPERATING HOURS and retighten using a torque wrench.

Check all wheels in accordance with servicing plan **W** for tightness.

Flat collar nut with **spring washer**
black or galvanized

450 Nm

Flat collar nut with **pressure plate**
black or galvanized

500 Nm

OPERATING INSTRUCTIONS F106.6/A

Tyre tread position

When fitting wheels with tread direction-dependent tyres, pay attention to the direction of the tyre tread .

O&K recommends fitting the four rear wheels as shown in Fig. 1. This tyre tread position yields the highest traction performance for forward travel .

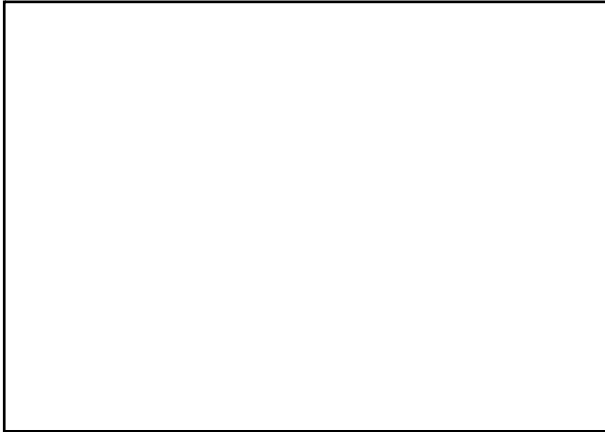


Fig. 1

Fit the free-wheeling front wheels with the tread against the tread direction of the rear wheels.

For all-wheel driven machines, set the front-wheel tyre tread pattern facing in the same direction as that of the rear wheels.

□

Readjusting the speedometer after a tyre change

2800222

The speedometer is appropriately set at the factory, to suit the tyre size/type fitted. If the machine is fitted with a different tyre size or type, the speedometer setting must be checked and adjusted if necessary. Only then is a correct speed display possible.

If re-adjustment is necessary, contact the O&K after-sales service.

□

Putting the machine out of operation

20000007

Take the following measures if the machine is to be immobilized for some time:

- Clean the machine.
- Park the machine on firm, level ground.
Store the machine preferably in a hall, so that the tyres are protected from sunlight, heat and moisture. Otherwise protect the tyres from direct sunlight by covering them.
- Blocking the center-pivot joint
- Jack up the machine so that the tyres do not touch the ground, reduce tyre pressure by approx. 50 %.
- Release the parking brake.
- Set working equipment down on the ground.
- Move all control elements to 0 position.
- Conduct a visual test for leaks and damage and have any such damaged repaired.
- Protect all bright metal parts (e.g. piston rods) against rust and dirt with a thin layer of grease.
- Preserve engine in accordance with engine operating instructions.
- Switch off battery main switch and withdraw key.
- Disconnect the battery for downtimes of more than 2 weeks (see "Removing and installing batteries").
- Remove battery, refer to section "Storing the battery" and "Removing and installing batteries".
- Secure the machine against unauthorized start-up:
 - Remove key from the key switch in the electrical system.
 - Close and lock windows.
 - Lock doors to driver's cab.
 - Secure all lockable flaps.
 - Cover openings.

OPERATING INSTRUCTIONS F106.6/A

Preserving the engine

2905869

(cf. engine operating instructions)

- Clean the engine with a high-pressure cleaner.
- Run engine warm and shut off.
- Drain off engine oil and fill engine with rust-proofing oil (cf. engine operating instructions).
- Drain off fuel from fuel tank.
- Mix a fluid consisting of 90 % diesel fuel and 10 % rust-proofing oil and fill into the tank.
- Allow engine to run for abt.10 minutes.
- Shut off engine.
- Turn engine several times by hand to allow preservation fluid to get into the cylinders and combustion chambers.
- Take off V-belt and store it well-packed.
- Spray corrosion inhibitor into the grooves of the V-belt pulley.
- Close suction and exhaust openings. □

Battery storage

2411346

For extended outage periods, remove battery / batteries and store on dry, well ventilated premises at ca. 20°C. Observe the following maintenance points:

- Clean battery/batteries.
- Check acid density and battery fluid level once a fortnight.
- Charge batteries when acid density has fallen to 1.23 kg/dm³ or earlier.
- Keep battery / batteries clean and dry externally. □

Recommissioning

2905981

After an immobilization of approx. 1 year, the oil must be changed in

- the hydraulic system,
- the power shift transmission,
- the rear axle
- and the blade slewing gear.

After an immobilization period of less than 1 year, all oil levels must be checked.

- Preserve engine in accordance with engine operating instructions. Fill in new engine oil.
- Check acid density and battery fluid level.
- Install and connect battery.
- Check tyre pressure.
- Remove grease from piston rods in hydraulic cylinders.
- Remove jacks from under machine.
- Switch on battery main switch (option).
- Check performance of electrical system.
- Release the pivot joint lock.
- Check performance of braking and steering system.
- Bring machine into travelling position and apply parking brake.
- Vent the hydraulic system.
- Carry out works according to the servicing plan V. □

Removing the engine preservation agent

2905871

(cf. engine operating instructions)

- Remove corrosion inhibitor from V-belt pulley grooves.
- Install V-belt and retighten after a short period of operation.
- Remove plugs from suction and exhaust openings.
- Put engine into operation. □

OPERATING INSTRUCTIONS F106.6/A

Lubricating the greasing points

2413760

Read and observe the instructions given in the section "Inspection and servicing - safety instructions".

Before beginning lubrication:

- **Secure the machine as described in the section "Securing the machine".**

Do not discard greasy cleaning rags, but dispose of them separately from other waste.

Use a grease gun to lubricate the working equipment and the machine.

- Remove protective cap from respective greasing nipple.
- Clean greasing nipple.
- Press the filler nozzle of grease gun onto the greasing nipple.
- Inject grease until the old grease is forced out of the bearing joints by new grease.
- Wipe off old grease with cleaning rags.
- After lubrication, replace protective cap on lubricating nipple.

Lubricating the cardan shaft

Lubricate the universal joints of the cardan shaft according to the servicing plan.

The cardan shafts are equipped with stoppers (1, Fig. 1) in the sliding part areas. They are permanently lubricated in this area.

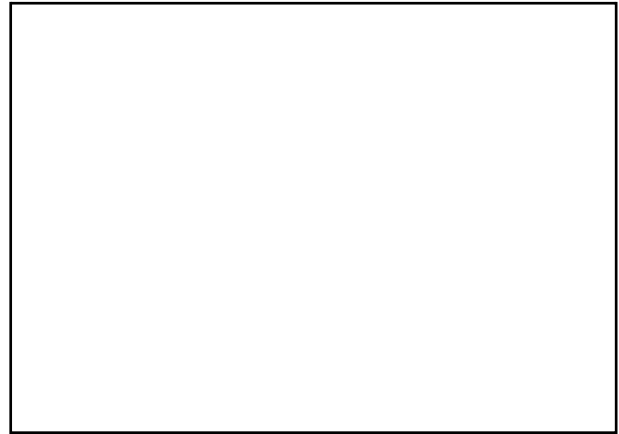


Fig. 1

Do NOT replace the stopper (1) with a greasing nipple.

Lubrication of permanently greased sliding parts can cause irreparable damage.

Only if a greasing nipple has been installed at the factory instead of a stopper should the sliding parts be lubricated according to the servicing plan.

□

OPERATING INSTRUCTIONS F106.6/A

DRIVER'S CAB VENTILATION

2905982

Cleaning the filter mat

Clean filter mat according to servicing plan **B**, or at more frequent intervals in the event of severe dust accumulation. The filter mat can be blown clean with compressed air or else wet-cleaned.

Removing the filter mat.

Remove screw (1, Fig. 1) and pull away guard (2) slightly.

Remove hose (4, Fig. 2) from screen washer nozzle (3) and remove guard (2).

Remove filter mat (5).

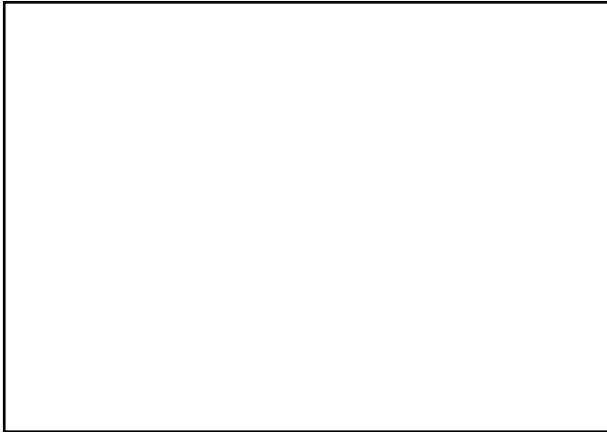


Fig. 1

Dry cleaning

Blow out mat with compressed air. The pressure at the nozzle should not exceed 5 bars.

Excessively high pressure may damage the filter mat.

Wet cleaning

Clean filter mat with clear water (with no cleaning additives). Dry filter mat before reinstalling it.

Replace filter mat when it has been cleaned 5 times.

Install filter mat.

Fit filter mat (5) over hose (4) and insert filter mat (5). Fit hose (4) onto screen washer nozzle (3) and screw guard (2) in place.

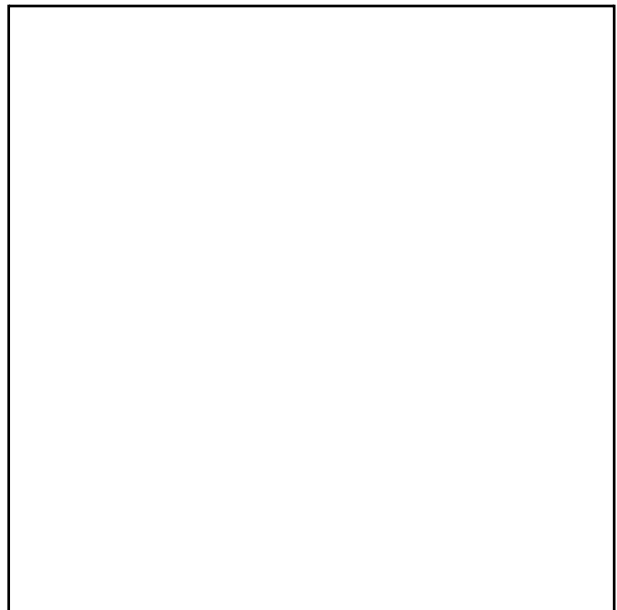


Fig. 2

□

OPERATING INSTRUCTIONS F106.6/A

AIR CONDITIONER (Option)

Safety instructions for inspection and servicing work

2904630

The present section describes inspection and servicing work that can be performed by the machine operator.

Any other work on the air conditioner requires special knowledge and special tools and may therefore be performed by qualified and specially trained personnel only. Entrust the work in these cases to a specialized workshop for air conditioners.

Observe the following instructions for your personal safety:

Never stick your hand or other objects into the air conditioner.

Shut off the engine and let it cool down before performing any servicing work.

Disconnect the fan from the power supply to avoid injury when the fan starts up inadvertently.

Some air conditioner components (e.g. heat exchanger and the resistor on the fan) can still be very hot after shut-off and may cause severe burns. Wait until these components have cooled down before working on them when the machine is open.

Work on the refrigerant circuit (qualified personnel):

The refrigerating agent (R 134a) used in this system is known as a safety refrigerant. This means that it is non-combustible, non-explosive, non-toxic, non-irritating, odourless and tasteless. Nevertheless, the following points must be observed:

Avoid any contact with liquid coolant. Parts of the skin that have been in contact with refrigerant must be treated like chilblains.

Wear safety goggles to protect your eyes. In the event of refrigerant coming into contact with your eyes seek medical advice immediately.

When carrying out repairs on the air conditioner, the system must be emptied. Never allow refrigerant to escape into the environment. For sucking off refrigerant use only approved suction units.

It is strictly forbidden to carry out welding work on parts of the closed system or in the immediate vicinity thereof. Heat leads to strong over-pressure and may cause damage or even an explosion of the system independent of whether the system is filled with refrigerant or empty.

When filled, refrigerant bottles must not be handled roughly and not exposed for prolonged periods to direct sunlight or to other sources of heat. The temperature to which a filled refrigerant bottle is exposed must not exceed 45°C.

It is essential to keep the refrigerant system free from chlorine and chloric substances as well as from oils or greases. Evacuation and filling units for R134a should not be used for other substances.

□

OPERATING INSTRUCTIONS F106.6/A

Air conditioner - Inspection and servicing work

2747915

Read and observe: "Inspection and servicing work - Safety instructions".

Location of components in the machine

In the cab:

In the cab, the heater / air conditioner (Fig. 1) is installed below the driver's seat, where the components

- blower (1),
- heat exchanger (2),
- evaporator (3),
- condensation outlet (5)

are assembled.

They are accessible after removal of the top cover. Except for cleaning, the heat exchanger, the evaporator and the blower do not require any servicing.

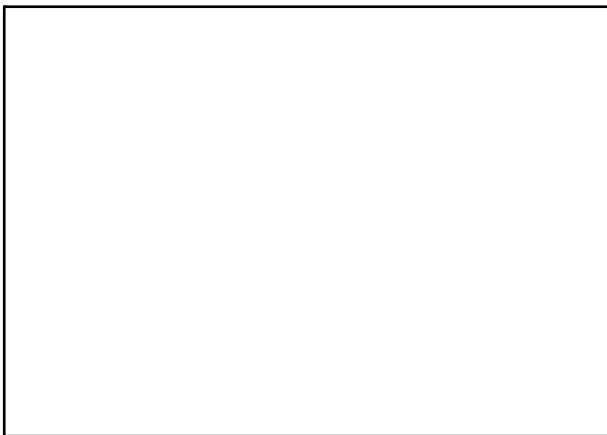


Fig. 1

In the cab:

The condenser unit is mounted at the driver's cab (Fig. 2) and comprises the following components:

- condenser (6)
- coolant tank (7)
- dryer (8)
- blower (9)
- filter mat (10)



Fig. 2

OPERATING INSTRUCTIONS F106.6/A

In the engine compartment:

The following components are installed in the engine compartment:

- compressor (11, Fig. 3)
- heating valve (12, Fig. 4).

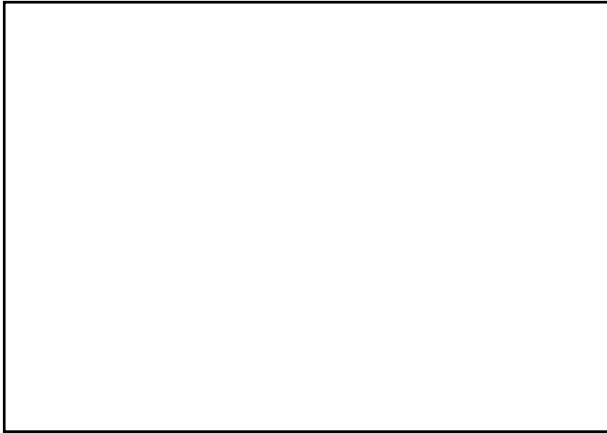


Fig. 3

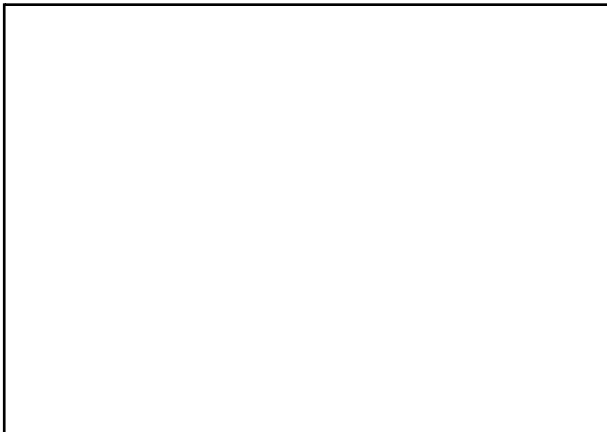


Fig. 4

Work to be carried out every month (Machine operator)

The visual checks should be carried even in those cases where the air conditioner is not used. The air conditioner should moreover be activated once every month for 10 - 15 minutes to prevent drying out and embrittlement of the shaft seal in the compressor with the risk of refrigerant leaking out of the unit. This measure also ensures regular lubrication of the compressor components.

OPERATING INSTRUCTIONS F106.6/A

In the cab:

- Evaporator (3, Fig. 1) contaminated or ribs deformed?
Blow out dirt and suck off, straighten the ribs.
- Antifreeze protection sensor on evaporator kinked or leaking? Have sensor repaired.
- Can condensed water (5) run off freely?
Remove obstructions in hose or replace.
- Filter mat (10, Fig. 2) contaminated?
Depending on the conditions of use, the filter mat must also be checked more often and cleaned by blowing out or beating. The mat is accessible when the cover over the suction opening for fresh air (back wall of cab) is removed (Fig. 2).
(Cf. "Driver's cab ventilation".)
- Heating valve fully closed when draw-button for heating is in "OFF" position?
This can be determined by opening the engine hood (Fig. 4). The heating valve is mounted at the rear wall of the driver's cab. The selection lever at the heating valve must be in the lower, "closed" position.
- Draw-button for temperature adjustment (99, Fig. 5) readily movable?
If it is difficult to actuate, check the Bowden cable for kinking or corrosion and replace if necessary.



Fig. 5

In the engine compartment:

- V-belt of compressor (Fig. 6) in good condition?
Replace defective V-belt.
- V-belt properly tensioned?
Readjust, if necessary.
- Compressor safely fastened?
Tighten loosened screw.



Fig. 6

- Chafing marks on hoses and lines?
Have damaged hoses and lines replaced. Lay / fasten new ones in a safer place.
(This work must be carried out by a specialized workshop).

In the cab:

- Condenser (Fig. 2) contaminated?
Contaminated condensers have a bad condensing performance. Clean by blowing out or by flushing with water (do not use high-pressure cleaners). Deformed ribs can be restraightened.

OPERATING INSTRUCTIONS F106.6/A

- Sufficient refrigerant (Fig. 7) in the system?
When the engine is running and the system is switched on, the refrigerant must be bubble-free in the inspection window on the underside of the refrigerant tank (arrow, Fig. 7). If bubbles are seen in the inspection window, there is insufficient refrigerant in the system. The system must be checked for leakages by an authorized air-conditioning systems company and then refilled.

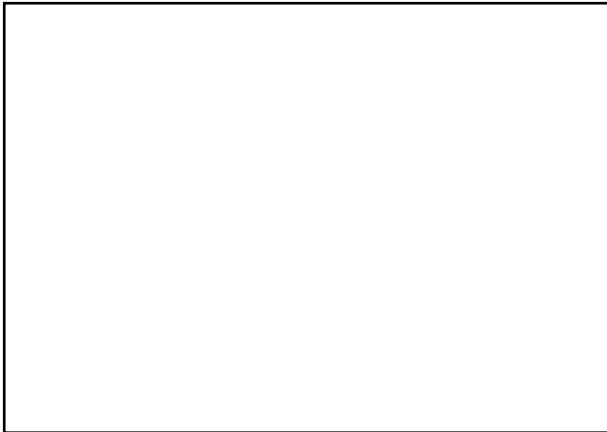


Fig. 7

Work to be performed every 6 months (Approved special workshop)

Check refrigerant circuit and refrigerant level. (Replace contaminated refrigerant).

Check hoses and screwed connections for fastening, tightness and proper laying.

Check compressor and magnetic clutch for proper operation (noise-free running, oil level, safe fastening of compressor).

Check electrical lines and connectors for perfect condition and tight fit.

Check the complete system.

The refrigerant container should be replaced whenever work has been carried out on the refrigerant circuit.

Work to be performed every 2 years (Approved special workshop)

All works described in "Work to be performed every 6 months" must be performed.

Check of the complete system.

Replacement of refrigerant container with drier.

□

OPERATING INSTRUCTIONS F106.6/A

Air conditioner - Checking / retensioning the compressor V-belt

2747916

Risk of injury

by rotating or hot parts of the engine.

Shut off the engine before opening the engine compartment.

After operation, the compressor may be hot, too. Wait until the compressor has cooled down before working on it.

Read and observe: "Inspection and servicing work - Safety instructions".

Improper tensioning of the the V-belt affects the performance of the compressor. The V-belt itself and / or the compressor may also be damaged.

- Depress the V-belt in the middle between the pulleys with your thumb. The belt must give in by about 10 mm. If the tension does not correspond to this value, the V-belt must be retensioned or slackened. To do so:
 - Slacken clamping screw (13) and adjust the V-belt tension with an appropriate tool. Retighten the clamping screw.



Fig. 1

□

The compressor (11, Fig. 1) is flange-mounted on the engine block. The V-belt tension can be checked at the left of the engine.

- Open the engine compartment.
- Check that the retaining screws between compressor and mounting bracket and between mounting bracket and engine block are properly tightened. Retighten these screws, if necessary.
- Check the V-belt and replace if damaged.

OPERATING INSTRUCTIONS F106.6/A

Air conditioner - Troubleshooting

2905985

Blower in heater / air conditioner:

Page 1 of 4

Malfunction	Cause	Remedial action
Blower not working	Fuse defective or loose	Check fuse contact, if necessary, plug in correctly. Replace defective fuse. Reappearance of the defect after a short time indicates a short-circuit.
		Check blower for blocking or other defects and rectify.
	Connector loose	Check that connector at the bottom of the unit is firmly in place. Plug in properly, if necessary.
		Check connections at blower switch.
		Open the unit and check electrical connections inside.
	Connecting cable damaged or ripped off	Replace cable, observing correct cable run and connection.
	Wrong electrical connections	Check connecting cables and, if necessary, reconnect properly.
	Blower switch defective	Replace by OEM part.
	Blower assembly blocked	Eliminate cause of blockage, e.g. by removing foreign object from rotor. If necessary, install new blower.
	Blower motor defective	Replace blower.
Blower cannot be stopped	Blower switch internally short-circuited	Replace blower switch.
Blower performance reduced	Wrong nominal supply voltage	Nominal voltage of conditioner and of vehicle system must be identical. Replace blower.
	Contacts dirty	Clean connector contacts. Work carefully to avoid short-circuits.
	Insufficient cross-section of electrical cables	Lay cables with the recommended cross-sections.
	Heat exchanger very dirty	Clean carefully to avoid any damage to the exchanger resulting in consequential leaks.
	Blower ducts obstructed	Check air ducts and outlets for obstructions and remove any foreign objects.

OPERATING INSTRUCTIONS F106.6/A

Insufficient cooling performance

Page 2 of 4

Malfunction	Cause	Remedial action
Compressor not working	Open circuit in compressor solenoid	Check power supply to the clutch.
	Thermostat defective	Replace thermostat.
	V-belt loose or broken	Adjust belt tension, replace belt.
	Belt pulley not turning although magnetic clutch is engaged	Check compressor and replace, if necessary.
	Compressor clutch slipping	Repair clutch or replace compressor.
Evaporator flooded	Expansion valve jammed or stuck in open position	Replace expansion valve.
Evaporator frozen up	Thermostat sensor in wrong position	Install sensor in another place.
Evaporator clogged up	Cooling fins dirty	Clean evaporator.
Loss of refrigerant	Refrigerant line defective	Check all lines for defects caused by external influences or chafing.
	Leaks in the system	Evacuate the system, refill, check for leaks and repair.
Air filter	Air filter clogged up	Clean air filter or replace.
Heating is on	Bowden cable wrongly centered or defective	Adjust Bowden cable (see: "Heating valve, adjustment of Bowden cable") or replace.

OPERATING INSTRUCTIONS F106.6/A

Insufficient heating performance

Page 3 of 4

Malfunction	Cause	Remedial action
Heating not working	Cooling agent still cold	Wait until the engine has reached its operating temperature.
	Water valve closed	Open the valve (see "Heating" section in Operator's Manual)
	Water lines kinked or crushed	Eliminate the causes.
	Pressure of water pump insufficient	No coolant flowing through heat exchanger. Install an auxiliary or more powerful main pump.
Heating working with reduced performance	Heat exchanger or filter strongly contaminated	Clean carefully to avoid any damage resulting in consequential leaks.
	Amount of water flowing through heat exchanger insufficient	Water lines crushed or kinked. Change position of hoses. Insufficient pressure of water pump (remedial action see above).
	Air in heat exchanger	The radiator is self-venting when the pump pressure is high enough. Install an auxiliary or more powerful water pump.
	Conditioning unit under-dimensioned	Consider installing an additional heating or a more powerful conditioning unit.
Heating cannot be stopped	Bowden cable controlling the water valve wrongly adjusted	Readjust the Bowden cable.
	Valve not installed correctly in flow and/or reflow line	Check valve mounting position with respect to flow and reflow direction and correct if necessary.
	Control element, i.e. Bowden cable defective	Check control / Bowden cable and replace if necessary.
Air distribution flaps uncontrollable	Adjustment no longer possible due to kinking of Bowden cables	Check Bowden cables.
	Flap hinges sluggish	Check flap and lubricate, if necessary.
	Flap deformed	Check flap.
	Flap blocked by foreign object	Check flap and remove foreign object if necessary.

OPERATING INSTRUCTIONS F106.6/A

Conditioner very noisy

Page 4 of 4

Malfunction	Cause	Remedial action
Conditioner very noisy	V-belt loose or excessively worn	Retension V-belt or replace.
	Clutch noisy	Repair clutch.
	Compressor supporting bracket loose or worn-out parts inside the compressor	Repair bracket, replace compressor.
	Blower motor excessively worn	Replace blower.
	System overfilled	Evacuate refrigerant until the high pressure reading is normal again.
	Not enough refrigerant in the system	Check for leaks, refill the system.

□

OPERATING INSTRUCTIONS F106.6/A

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OPERATING INSTRUCTIONS F106.6/A

PART 4 - REPAIR WORK

2261179

Operating manual		Target group
Part 1	INTRODUCTION FUNDAMENTAL SAFETY INSTRUCTIONS	Operating personnel + Inspection and servicing personnel + Repair personnel
Part 2	OPERATION	Operating personnel The operating personnel must have know-how relevant to the operation and the application of this or comparable machines.
Part 3	INSPECTION AND SERVICING	Inspection and servicing personnel The inspection and servicing personnel must have know-how relevant to the inspection and servicing of this or comparable machines.
Part 4	REPAIR WORK	Repair personnel The repair personnel must have know-how and experience relevant to the repair of this or comparable machines.
Part 5	ANNEX	Operating personnel + Inspection and servicing personnel + Repair personnel

□

OPERATING INSTRUCTIONS F106.6/A

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OPERATING INSTRUCTIONS F106.6/A

Repair work - safety instructions

2905612

Operating instructions

Never carry out repair work without having read and understood the operating instructions.

Pay special attention to:

"Fundamental Safety Instructions", "Inspection and servicing - safety instructions" and all warnings and safety instructions attached to the machine.

The descriptions of job sequences provide only experienced personnel with the necessary instructions.

The operating manual must be kept with the machine at all times.

Repair personnel

Repair personnel must have know-how and experience relevant to repairing this or comparable machines.

In the absence of such know-how, meticulous training must be given by experienced repair personnel, e.g. from O&K.

"O&K" Have work marked in this way done by the O&K after-sales service.

Working at greater heights

Always wear safety harnesses when working at greater heights.

Wear an approved safety harness; it must be equipped with stabilizers and safety cables.

Blocking the pivot joint

When carrying out repair work in the pivoting range, block the pivot joint. Remove the block on completing work.

Blocking the axles

If the machine has to be jacked up, the front / rear axle must first be wedged in place to prevent it from moving.

When work is completed, lower machine and remove wedges.

Prestressed units

Never open defective prestressed units but replace them as an entirety.

In exceptional cases, open only when the system and the operating sequence are precisely known and any special tools required are available.

The operating manual contains no information on this point.

Dismantling components

Never dismantle while the machine is at operating temperature.

Oils, greases, brake fluid or coolants may have a high temperature and result in burning or scalding.

Leave time for the machine to cool down.

Before starting work, depressurize piping and hoses, cylinders, radiator, hydraulic tank, air-brake reservoir and other systems or units.

Replace defective components in good time to prevent major damage.

Clean the defective component carefully before dismantling it.

Mark the dismantled parts in the correct sequence to facilitate assembly.

When dismantling the component, close off exposed hose and piping connections, exposed drill holes and housing carefully to prevent any dust from penetrating.

OPERATING INSTRUCTIONS F106.6/A

Never remove lead seals

Never change rated pressure of pressure relief valves without the explicit authorization of O&K.

Never remove lead seals from pressure relief valves and accumulators.

After the repair work

To prevent corrosion, coat all bright metal machine parts with a grease film.

On completing the work, reassemble all protective devices, covers, and sound- and vibration-insulation material.

Never start up the driving motor while work is being done on the machine.

Check the repaired components and all machine functions with a trial run.

Never release the machine for re-commissioning until it is fully functioning.

□

OPERATING INSTRUCTIONS F106.6/A

ENGINE

2411967

Engine - repair instructions

Before working on the engine, read and observe: "Repair, safety instructions" and the operating instructions for the engine.

Risk of injury from rotating or hot engine parts.

Switch off engine and leave to cool down.

Do repair work only if machine is secured as described in "Securing the machine" of these operating instructions.

Check and replace V-belts only when engine is stationary.

Repair work on the engine demands extensive know-how and special tools.

In cases of doubt, have the repair work carried out by the O&K Service dept. or by your local O&K agent.

□

Replacing V-belts

The repair work is detailed in the operating instructions for the engine.

Assisted starting (jump-starting)

2904912

Assisted starting (jump-starting) - Safety instructions

Risk of explosion

Battery gases contain hydrogen and are readily flammable. Keep ignition sources such as unshielded light or lighted cigarettes away from the batteries.

Risk of injury through splashing acid and battery gases.

Never lean over the batteries when jump-starting.

Wear eye protection.

Never jump-start the machine if the batteries are defective or frozen.

Never connect batteries (battery sets) unless they have the same voltage.

Use only approved jumper cables with insulated terminal clips and an adequate lead diameter.

Ensure that the bodies of the supplying and the receiving machines are not in contact. Otherwise a current flow could result from connecting the positive poles. Risk of short-circuiting.

Never use starting aids with excess voltage, e.g. three or four batteries connected in series or auxiliary units generating a voltage in excess of 24V.

Never use welding generators or welding transformers as a power supply.

Position jumper cables in such a way that they cannot be caught in rotating parts of the machine.

Read and observe: "Inspection and servicing - Safety instructions", paying special attention to "Handling batteries".

□

OPERATING INSTRUCTIONS F106.6/A

Assisted starting (jump-starting)

2904913

Prior to assisted starting

Read and observe: "Assisted starting - Safety instructions".

- Check that the batteries of the receiving machine (discharged batteries) are functional.
 - Switch off electrical consumers (headlamps, fan).
 - Turn key-switch to "On". The engine monitoring lamps must light up.
 - If the monitoring lamps fail to light up, the batteries are defective (exhaustive discharge or internal short-circuit).

In this case the machine must not be started, to prevent damage to the alternator and the electronic modules.

Install functional batteries before jump-starting the machine.

- Switch off all electrical consumers in the receiving machine and turn key-switch to **0**.
- Switch off all consumers in the supplying machine (booster batteries) and shut off the engine.

Connecting the jumper cables



Fig. 1

- Connect the red jumper cable to the positive terminal of the discharged battery (1) and then to the positive terminal of the booster battery (2).
- Connect the black jumper cable first to the negative terminal of the booster battery (3) and then to bright metal in the receiving machine (4).

Risk of explosion

A high current flows when connecting the cable to earth. Sparks occurring at the contact point may ignite gases at the discharged battery.

So connect the grounding terminal at the greatest possible distance from the discharged battery.

Starting the engines

- Start the engine of the supplying machine and run it with stepped-up revolutions.
- Start the engine of the receiving machine. If the engine fails to start up after 15 seconds, wait for one minute before restarting.
- Once the engine has started up, continue running both machines in no-load operation for two to three minutes with the jumper cables still connected.
- Once the engine has started up, proceed as follows:
 - Switch some high-consumption units, e.g. complete lighting system, on to stage **3** and switch on air-conditioning system if present. This prevents peak voltages, which might damage electronic modules, from occurring when disconnecting the jumper cable.
 - Disconnect jumper cable in the following sequence:
 - negative terminal at receiving machine (4)
 - negative terminal at supplying machine (3)
 - positive terminal at supplying machine (2)
 - positive terminal at receiving machine (1)
 - Switch off high-consumption units again.
 - Work with engine at moderate revolution count for about 30 minutes. The batteries are partially charged.

Have the electrical system of the machine checked out to determine why the batteries were discharged. □

OPERATING INSTRUCTIONS F106.6/A

ELECTRICAL SYSTEM

2747917

Checking / replacing the fuses

Shut off the engine and turn the key-switch of the electrical system to 0 before removing the fuses.

Replace defective fuses only with those of the same current rating.

The fuses are located in the control console and in the right-hand lateral console.

Fuses in control console

The fuses are located on the left side (Fig. 1)

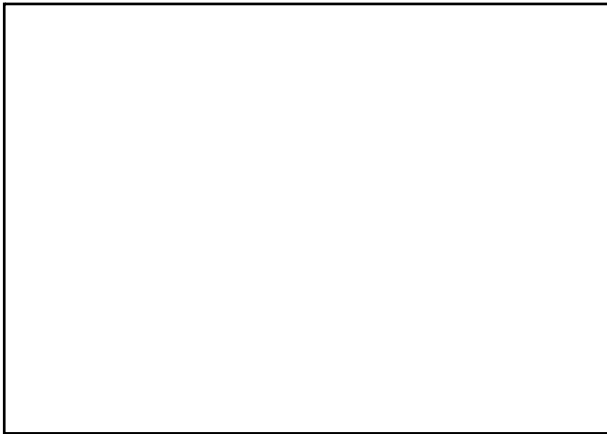


Fig. 1

and on the right side (Fig. 2).



Fig. 2

When an electrical function fails check first the corresponding fuse

- Remove the fuse from the fuse-holder.
- Check the fuse. In most cases an inspection with the naked eye will reveal whether the fusible wire is burnt out (Fig. 3). If in doubt, check the fuse with an ohmmeter or replace right away by a new one.
- Replace a defective fuse by inserting a new one with the same current rating into the holder.
- When the fuse is O.K. check the corresponding electrical unit, the connectors and the cables or have them checked by qualified personnel.



Fig. 3

OPERATING INSTRUCTIONS F106.6/A

Fuses - assigned functions

Fuse box on left side of steering column
(Fig. 1)

F1	15A	Central electronic unit
F2	10A	Horn, ignition lock, reversing alarm (option)
F3	5A	Stop lights - blade floating position (option)
F4	15A	Rear screen washer, front screen washer, FWD all-wheel steering
F5	5A	Tank sensor, rear ripper initiator (option)
F6	15A	Heating blower

Fuse-box on right side of steering column
(Fig. 2)

F7	15A	Start enable
F8	15A	Cigarette lighter
F9	10A	CAN diagnosis socket
F10	10A	Headlamp flasher
F11	15A	Turn signal, horn, air - driver's air-cushioned seat (option) floodlamp (option)
F12	10A	Cab interior lighting, radio (option)

Fuses in the lateral control console

The fuses are located in 2 fuse boxes under the cover (67, Fig. 4).

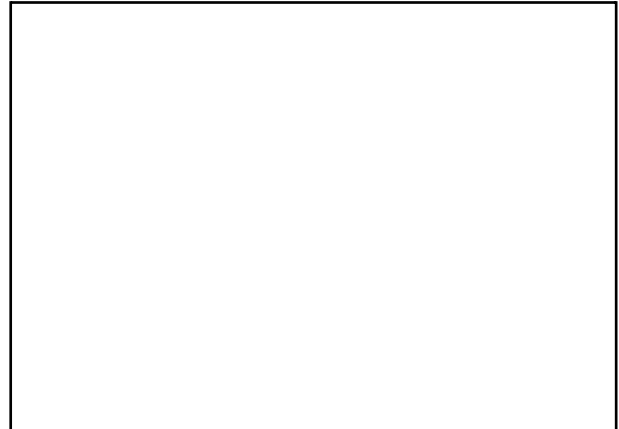


Fig. 4

Unscrew the cover to gain access to the fuses. Remove the transparent cover to change the fuses.

Fuses - assigned functions

front fuse box

F13	25A	Engine stop
F14	7,5A	EST-37 (Gearbox control)
F15	20A	Refuelling station (option)
F16	10A	Grid-Heater (option)
F17	15A	Grid-Heater filter (option)
F18	15A	Grid-Heater filter (option)

rear fuse box

F19	7,5A	Lock bolt, working hydraulics fas speed, sidelamps (option)
F22	7,5A	EST-37 (Gearbox control), automatic/manual switching
F23	15A	Air conditioner (option), hydraulic control, parking brake
F24	5A	Air conditioner (freeze protection, under-pressure / over-pressure protection)
F25	15A	Air conditioner (fan, condenser)
F26	5A	Air conditioner (magnetic clutch, compressor)

□

OPERATING INSTRUCTIONS F106.6/A

Replacing bulbs

2905444

Shut off engine and set key-switch to "0" before replacing any bulbs.

Replace defective bulbs only with bulbs with the same ratings.

Never touch new bulbs with bare fingers. Finger marks and dirt will burn in when the bulb is hot and may reduce the service life of the bulb.

Before installing a new bulb:

Remove all traces of corrosion from the holder and the electrical contacts.

This helps avoid contact problems and high contact resistances.

□

Bulbs - table

2747918

Headlamps	55/50W/24V
Sidelamps	4W/24V
Floodlamps	70W/24V
Turn signal lamps	21W/24V
Stop light	21W/24V
Tail light	10W/24V
Cab interior lamp	10W/24V
Rotary beacon	55W/24V

□

OPERATING INSTRUCTIONS F106.6/A

Lighting

2747919

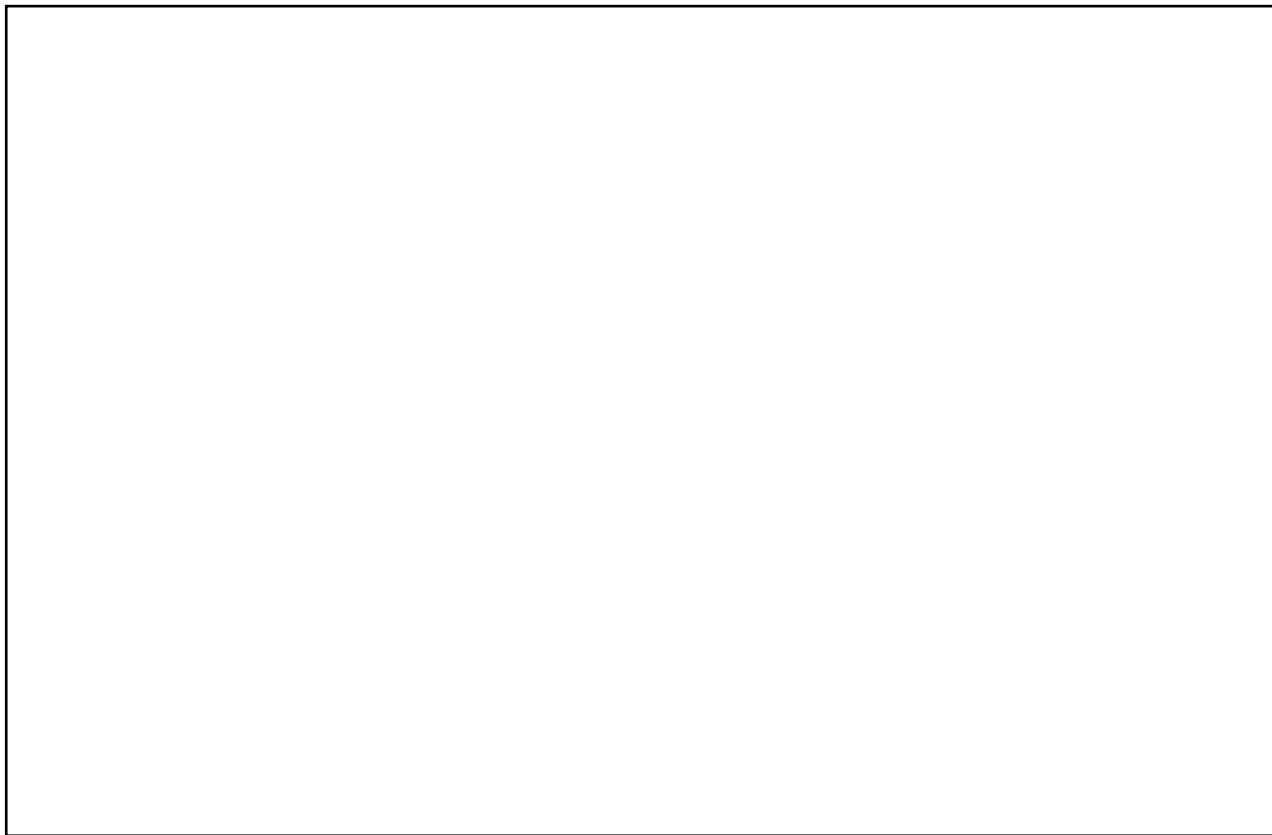


Fig. 1

- 1 - Headlamps
- 2 - Turn signal lamps
- 3 - Tail lamp, stop lamp, turn signal lamps
- 4 - Reversing lamp
- 5 - Licence plate lamp
- 6 - Turn signal lamp, sidelamp
- 7 - Floodlamp
 - Driver's cab
 - front (option)
 - rear (option)
- 8 - Rotary beacon

OPERATING INSTRUCTIONS F106.6/A

Headlamp - main beam / sidelight (1, Fig.1)



Fig. 2

Remove screw (9, Fig. 2) and withdraw headlamp unit (10) carefully.



Fig. 3

Turn bulb holder (11, Fig. 3) counterclockwise and remove from lamp unit (10).

Main beam



Fig. 4

Remove defective bulb (12, Fig. 4) from holder (13) and replace by a new one.

Sidelamp

Remove holder (14) headlamp unit (10) and replace bulb (15) by a new one.
Fit bulb holder (11) on headlamp unit and fix in position by turning clockwise.

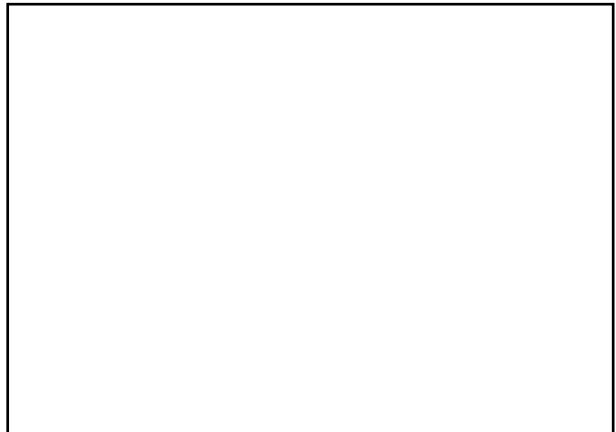


Fig. 5

Fit lamp unit (10, Fig. 5) with clip (16) into headlamp housing (17), press headlamp unit (10) into place and screw up tightly.

Turn-signal lamp(2, Fig.1)



Fig. 6

Remove screw (18, Fig. 6) and unsnap housing (19).
Replace defective bulb. Reassemble in reverse order.

OPERATING INSTRUCTIONS F106.6/A

Tail / stop / turn-signal lamp (3, Fig. 1)



Fig. 7

Remove screws (20, Fig. 7) and withdraw glass (21) carefully from housing.

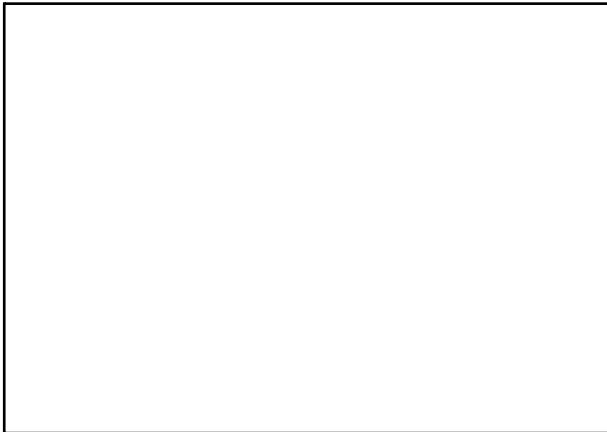


Fig. 8

Replace defective bulbs (23, 24, Fig. 8).

23 = bulb turn-signal lamp
24 = bulb stop lamp / tail lamp

Fit glass (21, Fig. 7) onto lamp housing and tighten.

Reversing lamp(4, Fig. 1)



Fig. 9

Remove screws (27, Fig. 9) and withdraw glass (28) carefully from housing.

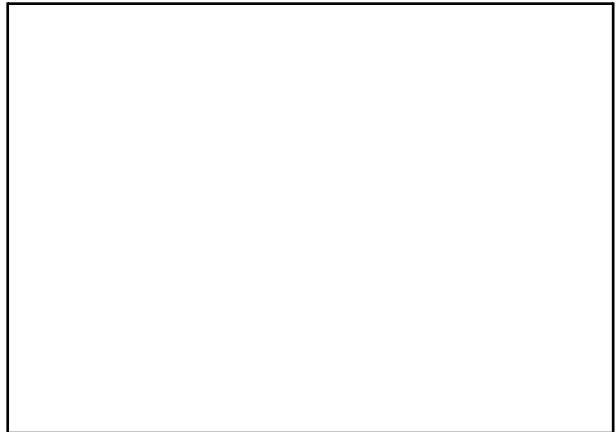


Fig. 10

Replace defective bulb (30, Fig. 10).

OPERATING INSTRUCTIONS F106.6/A

Licence plate lamp (5, Fig. 1)



Fig. 11

Remove screws (32, Fig. 11) and withdraw lamp housing (33).

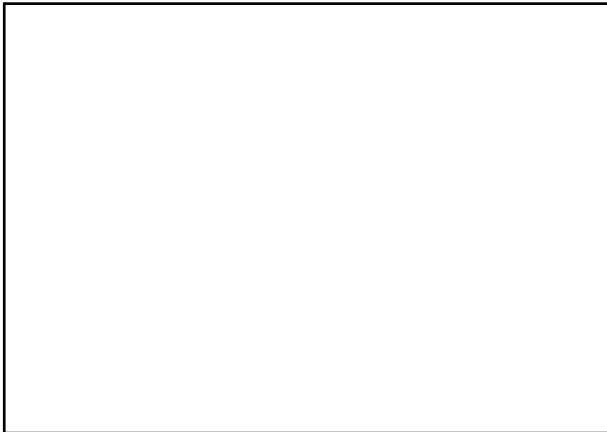


Fig. 12

Replace defective bulb (34, Fig. 12) and reassemble in reverse order.

Sidelamp / turn-signal lamp (6, Fig. 1)



Fig. 13

Remove screw (36, Fig. 13) and withdraw lamp housing (37) .

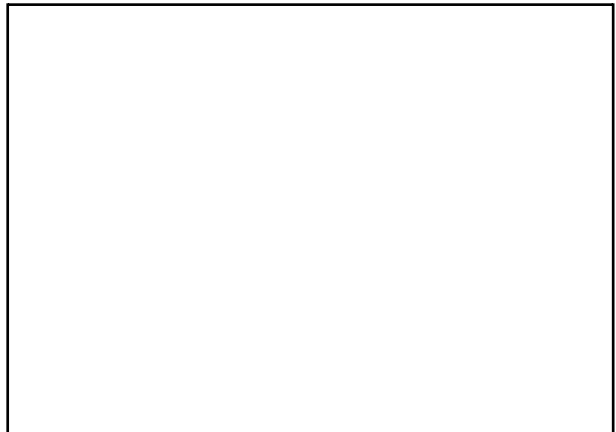


Fig. 14

Replace defective bulb.

38 = bulb - turn signal
39 = bulb - sidelamp

Reassemble in reverse order.

OPERATING INSTRUCTIONS F106.6/A

Floodlamp (7, Fig. 1)

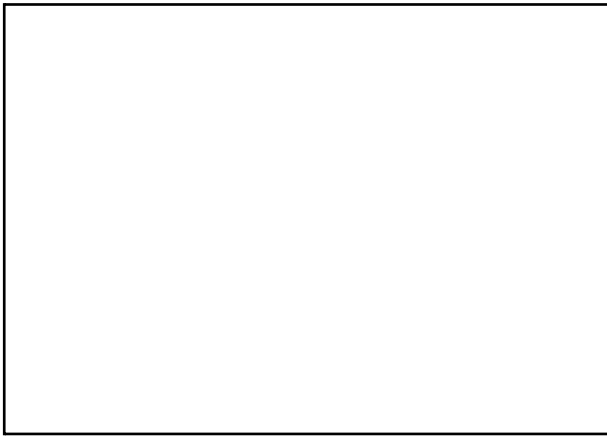


Fig. 15

Remove screws (40, Fig. 15) and withdraw lamp unit (41) carefully from housing.

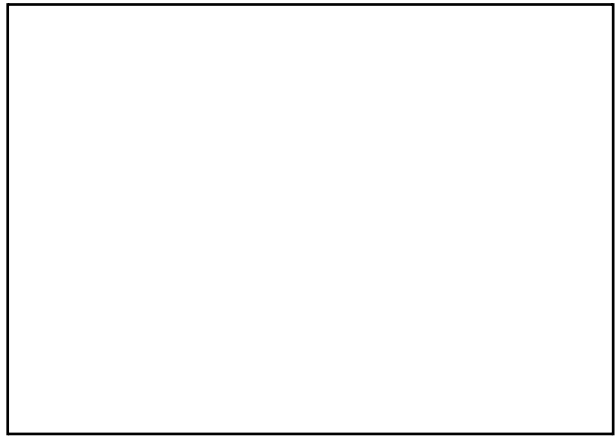


Fig. 16

Push spring clip (42, Fig. 16) in the direction of the arrow and swing backwards.



Fig. 17

Remove bulb (43, Fig. 17) from lamp unit (41) and replace by a new one. Fit new bulb into lamp unit (41) and engage spring clip in lamp unit (41). Screw lamp unit (41) into housing.

□

OPERATING INSTRUCTIONS F106.6/A

Rotary beacon (Option)

(8, Fig. 1)

2747920

Depress catch (21, Fig. 18) and take off cover (22).

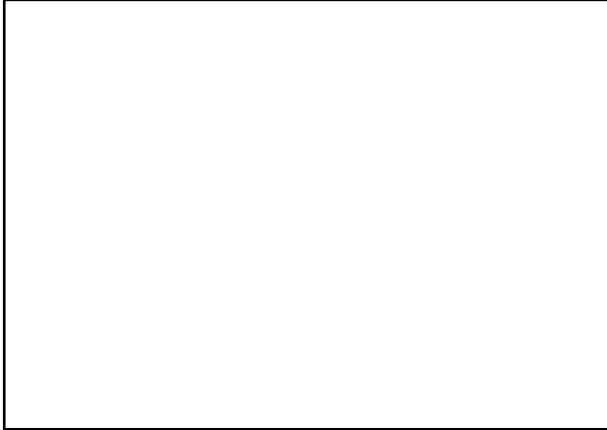


Fig. 1

Take out bulb (23, Fig. 19) and replace by a new one.



Fig. 2

Put on cover (22), depress catch (21) and allow cover (22) to engage.

Rotary beacon - replacing the reflector

Detach cover (22) as described above.

Withdraw clip (24, Fig. 20) using small pincers. The reflector can then be completely withdrawn together with motor (25).

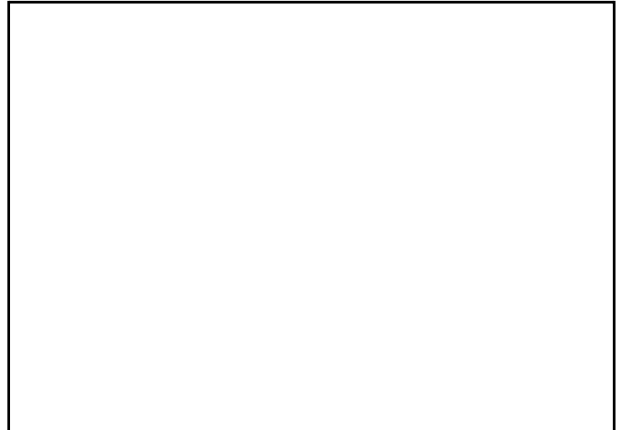


Fig. 3

Install new reflector with motor (25). Insert clip (24) and put on cover (22).

□

OPERATING INSTRUCTIONS F106.6/A

Diagnosis jack

2800355

A diagnosis jack (2) is installed on the right side of the instrument panel (1, Fig. 1).

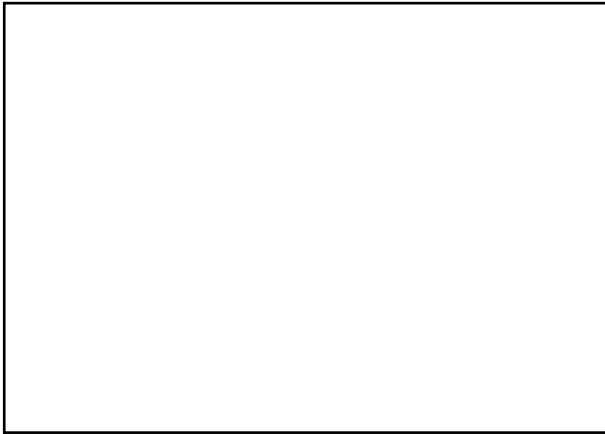


Fig. 1

The jack permits a tester to be connected to the machine. □

EQUIPMENT

2413754

Blade - replacing the cutting edges

Read and observe: "Repair work - safety instructions".

- Raise the blade and prop it up with wood, so that the side blades (2, Figs. 1 and 2) and the scraping blades can be replaced.
- Unscrew the countersunk bolts (4), remove blades.
- Attach new blades and secure with counter-sunk bolts (4).



Fig. 1



Fig. 2

□

OPERATING INSTRUCTIONS F106.6/A

WELDING OPERATIONS

Welding operations - Safety instructions

2905398

Never perform welding operations unless you are qualified to do so.

Observe the accident prevention regulations.

Any welding work on receptacles which contain or have contained substances

- that are flammable or encourage combustion,
- that are susceptible to explosion,
- that may develop noxious gases, vapours, mists or dusts during welding operations,

may be performed only under expert supervision and only by experienced personnel authorized to do such work.

Detailed information on the proper execution of welding operations is given in the technical manual "Welding for maintenance and repair".

Contact the O&K Service with any problems or questions arising.

If machine components have to be dismantled, read and observe:

"Assembly of working equipment - Safety instructions",
"Inspection and servicing - Safety instructions",
"Repair - Safety instructions".

Before any welding operations on the machine:

- Disconnect the battery, first at the negative and then at the positive pole.
- Disconnect the positive pole at the alternator.
- Unplug the "control units" of the electronically controlled front-wheel drive and the power-shift transmission. Unplug the control console. See "Unplugging the control units" and "Unplugging the control console".

Protect disconnected terminals and plugs from short-circuiting and contamination by covering them with foil or adhesive strips.

Bring the welding current terminals as close as possible to the welding point.

The welding current must not flow through the slewing ring, pin couplings, link joints or hydraulic cylinders.

Restore all electrical connections after completion of welding operations.

When connecting the battery, connect first the positive pole and then the negative pole.

□

OPERATING INSTRUCTIONS F106.6/A

Unplugging the control units

2905399

Slacken the 4 screws (arrow) of the document compartment and withdraw compartment (Fig. 1).

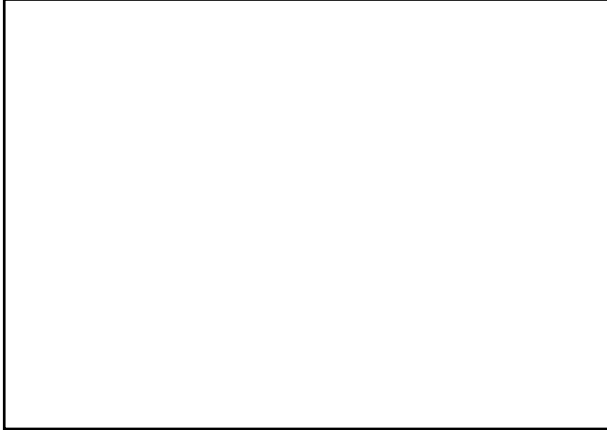


Fig. 1

Push toggle (2, Fig. 2) at plug (3) of lefthand control unit (1) outwards (arrow). The plug (3) is lifted out and can be removed.

Push metal clip (5) at plug (6) of righthand control unit (4) outwards (arrow). The plug is unlocked and can be removed from the front guide (7) by lifting at the rear.

Plugging in the control units

Push plug (6) of righthand control unit (4) diagonally from above into the front guide (7) and press plug down until it engages.

Place plug (3) of lefthand control unit (1) on box and push toggle (2) inwards. The plug (3) is pushed into the box (1) and locked.

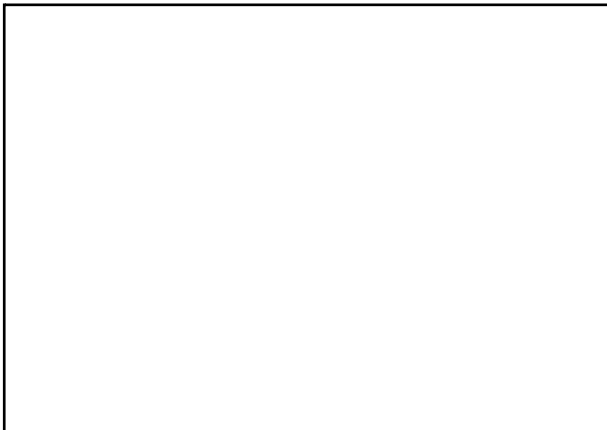


Fig. 2

Unplugging the control console

Unscrew the 5 screws of the rear plate (Fig. 3) and move plate forward.

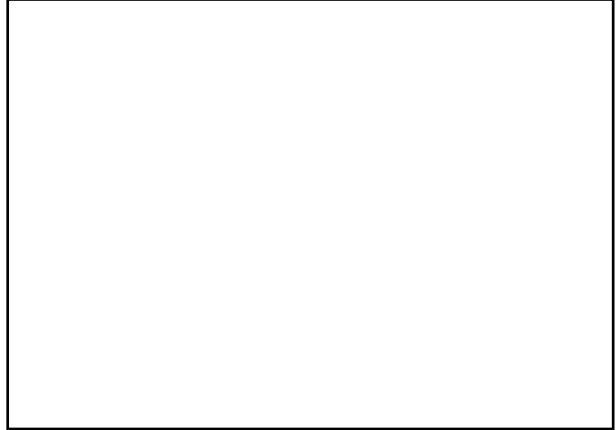


Fig. 3

Slacken screws at plugs (1, 2 and 3, Fig. 4) and unplug plugs. Unplug plug 4.

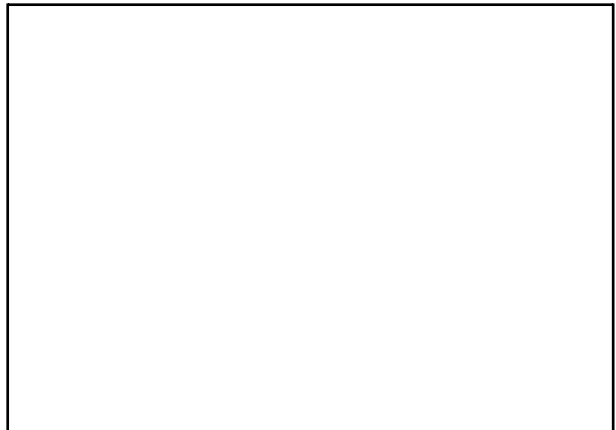


Fig. 4

Installation in reverse sequence.

□

OPERATING INSTRUCTIONS F106.6/A

PART 5 - ANNEX

2261969

Operating manual		Target group
Part 1	INTRODUCTION FUNDAMENTAL SAFETY INSTRUCTIONS	Operating personnel + Inspection and servicing personnel + Repair personnel
Part 2	OPERATION	Operating personnel The operating personnel must have know-how relevant to the operation and the application of this or comparable machines.
Part 3	INSPECTION AND SERVICING	Inspection and servicing personnel The inspection and servicing personnel must have know-how relevant to the inspection and servicing of this or comparable machines.
Part 4	REPAIR WORK	Repair personnel The repair personnel must have know-how and experience relevant to the repair of this or comparable machines.
Part 5	ANNEX	Operating personnel + Inspection and servicing personnel + Repair personnel

□

OPERATING INSTRUCTIONS F106.6/A

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OPERATING INSTRUCTIONS F106.6/A

TROUBLESHOOTING

2261173

Instructions on troubleshooting

Faults are often due to the machine not being correctly operated or serviced.

For this reason, it is vital to read through the relevant section of the operating manual once again before rectifying any faults.

If you are unable to detect the cause of the fault or rectify it, apply to the O&K after-sales service.

Describe the fault and all accompanying circumstances as precisely as possible when calling on the O&K after-sales service. Exact data allow for fast troubleshooting.

Never do any jobs for which you are not qualified.

This fault table lists all faults which have been reported to date and outlines their possible causes and rectifying measures. In exceptional cases, a described fault may also have a different cause.

Layout of the fault table

Fault

The fault is described here as the outcome of an observation or a previous activity.

Therefore make careful observations.

Study the problem carefully; First think, then act.

Ask yourself the following questions:

- Which warning signals preceded the fault?
- What repair and servicing work was carried out previously?
- Has this defect already occurred?
- Is it one of several simultaneously occurring faults?

Possible causes

The possible causes of the observed fault are outlined in this group. They are arranged in order of probability, i.e. the possible cause occurring in most cases heads the list.

Measure

This describes the troubleshooting procedure.

Section

This specifies where information on troubleshooting is given in the operating manual. If there is no entry, the O&K after-sales service should be consulted. □

Fault table - combustion engine

Fault										Remedial action		
Engine fails to start or starts only with difficulty										Check Adjust Replace Top up Reduce Clean	P E W A S R	
Engine does not turn												
Starter not working												
Engine starts, but runs unevenly or intermittently												
Engine getting too hot, temperature warning activated												
Engine not working with full power												
Engine without oil pressure or oil pressure too low, warning lamp lit up												Contact O&K Service
Engine not working with all cylinders												
Engine oil consumption too high												
Engine emits blue smoke												
Engine emits white smoke												
Engine emits black smoke												
Cause										Section		
●		●						●	Temperature below limit starting temperature, Åtherpatrone leer		P	
	●								Travel direction selector lever not in neutral position		P	
		●		●					Oil level too low		A	
		●			●	●			Oil level too high		S	
				●	●	●			Inclination of engine too great		P	
●				●					Wrong SAE class of engine oil		W	
●		●		●				●	Fuel grade does not correspond to operating manual specifications		W	
●			●					●	Air filter contaminated, Charge air cooler contaminated		P	
●									Engine shut-off relay jams		P	
		●	●	●				●	Turbo-charger contaminated / defective		P	
			●	●				●	Charge air line untight		P	
				●				●	LDA defective		P	
			●						Oil cooler / cooling fins contaminated		R	
			●						Cooler fan defective		P/W	
			●						Cooling air preheating / heat build-up		P	
●	●								Battery defective or discharged		P	
●	●								Loose or corroded cable connections in starter circuit		P	
●	●								Starter defective or pinion not engaged		P	
								●	Flame-glow starter defective		O&K	
●		●	●	●				●	Incorrect valve clearance		E	
●		●	●	●	●				Injection line leaking		P	
●		●	●	●	●		●	●	Injection valve defective		P/W	
		●	●						Fuel filter or fuel lines contaminated		P	
					●	●			Frequent operation at minimum load		P	
				●					Oil pressure switch defective		P/W	
			●						Speed-adjusting lever not in contact with full-load limit stop		E	
●									Engine internally blocked		O&K	
●									Combustion engine blocked at output side		O&K	

OPERATING INSTRUCTIONS F106.6/A

Fault table - Steering system

1946607

Fault					Remedial action	
Steering "wobbling"					Check	P
Steering sluggish					Adjust	E
Steering noisy					Replace	W
No response from steering and "rattling" noise when steering wheel is turned fast					Top up	A
					Reduce	S
					Clean	R
					Contact O&K Service	
Cause					Section	
•				Steering pump defective		O&K
•				Steering gear (servostat) defective		O&K
•				Steering cylinder bearing worn out		O&K
		•		Steering system drawing in air		O&K
		•	•	Oil level in reservoir too low		A
			•	Air in steering system		O&K
			•	Steering system leaking		O&K

OPERATING INSTRUCTIONS F106.6/A

Fault table - Brake system

1946608

Fault						Remedial action	
Indicator lamp for accumulator charge lit up						Check	P
Indicator lamp for parking brake lit up when brake is not applied						Adjust	E
Stoplight not working						Replace	W
Poor braking performance						Top up	A
Poor braking performance of parking brake						Reduce	S
Heavy wear of parking brake lining						Clean	R
Ursache						Contact O&K Service	
						Abschnitt	
•					Brake accumulator defective		O&K
•					Pressure accumulator unit defective		O&K
	•				Parking brake sensor defective		O&K
•		•			Pressure switch defective		O&K
•	•	•			Fault in electrical system		O&K
			•		Air in brake hydraulics		O&K
			•	•	Linings worn out		O&K
				•	Machine driven with parking brake applied		P

OPERATING INSTRUCTIONS F106.6/A

Fault table - Travelling gearbox (manual transmission)

1946609

Fault						Remedial action	
Gearshift pressure too low in all gears, indicator lamp lit up						Check	P
Gearshift pressure too low in individual gears						Adjust	E
Converter oil temperature too high						Replace	W
No response in all gears						Top up	A
No response in individual gears						Reduce	S
Gearshift pressure ok., indicator lamp remains on						Clean	R
						Contact O&K Service	
Cause						Section	
		•				Oil level too high	P
•		•	•			Oil level too low	P
					•	Gearshift pressure switch defective	O&K
•			•			Converter pump defective	O&K
•			•			Shifting pressure valve defective	O&K
•			•			Pressure control valve defective	O&K
•			•			Gearbox control spool defective	O&K
	•					Sealing rings on respective gear couplings worn	O&K
		•				Converter safety valve defective	O&K
		•				Gearbox oil cooler contaminated	R
		•				Wrong gear selected	P
			•			Engine / converter connection defective	O&K
			•	•		Solenoid valves in gearbox control spool defective	O&K
			•	•	•	Fault in the electrical system	O&K

OPERATING INSTRUCTIONS F106.6/A

Fault table - Gearshift

1946610

Fault				Remedial action	
No response from gearshift actuation				Check	P
Individual gears not functional				Adjust	E
				Replace	W
				Top up	A
				Reduce	S
				Clean	R
Occasional shifting trouble				Contact O&K Service	
Cause				Section	
	•	•	Gear shift unit defective		O&K
	•	•	Cable harness and / or connector defective		O&K
	•		Solenoid valves incorrectly controlled		O&K
•			Gearshift fuse blown		P
•			Engine speed higher than 1,500 rpm		P

□

OPERATING INSTRUCTIONS F106.6/A

Fault table - Attachments

1946611

Fault										Remedial action	
Attachment does not respond to control operations										Check Adjust Replace Top up Reduce Clean	P E W A S R
Working hydraulics coasting											
Attachment sinking slowly to the ground											
Attachment moving too slowly											
Blade moving to and fro											
Blade cannot be moved sideways											
Hydraulic pump noisy in operation										Contact O&K Service	
No highspeed function of working hydraulics available											
Cause										Section	
●						●	Hydraulic oil level too low				A
●		●					Attachment cylinder leaking internally				O&K
				●			Too much play in blade guide				P/W
					●		Blade guiderails contaminated / damaged				R/W
●			●			●	Hydraulic pump defective				O&K
	●	●					Resetting springs in control block defective				O&K
●			●			●	LS regulation defective				O&K
						●	No tank pressure				O&K
						●	Electrical system defective				O&K
●	●						Linkage / pistons sluggish / defective				O&K
		●					Replenishing valves contaminated or defective (if the machine is so equipped)				O&K
						●	Intake line leaking				O&K
●							Operating pressure too low				O&K
●							Electrical fault (locking pin)				O&K

□

OPERATING INSTRUCTIONS F106.6/A

Fault table - F 106 A front-wheel drive (EDCV)

1946612

Fault										Remedial action		
No traction of front wheels										Check Adjust Replace Top up Reduce Clean	P E W A S R	
Insufficient traction of front wheels												
Excessive traction of front wheels												
Front wheels blocking during straight-ahead driving												
Front wheels blocking during gear change from 3rd to 4th gear												
Front wheels braking in 4th and 5th gear												
Front wheels blocking with front-wheel drive shut off												Contact O&K Service
Rattling noise from wheel motors												
Pump shaft seal defective												
Front wheel spinning freely or blocking												
Hydrostatic drive getting too hot												
Cause										Section		
								●	Pressure in pump housing too high		O&K	
						●	●		Pressure in wheel-motor housing too low		O&K	
				●					Air in control line to wheel-motor drive		O&K	
●									EDCV power supply interrupted		O&K	
●									On/Off switch or solenoid valve defective		O&K	
●			●						Incorrect signals from gearbox control block		O&K	
●	●	●	●						EDCV control defective		O&K	
●									Pressure cut-off valve defective		O&K	
●									High-pressure limiting valve defective		O&K	
●								●	Scavenging valve defective		O&K	
●	●			●					Supply pressure too low		O&K	
●								●	Wheel motor defective		O&K	
●									Pump drive coupling defective		O&K	
	●	●	●						Programmed values incorrect		O&K	
	●	●							Speed level switch defective		O&K	
	●	●							Proportional valve defective		O&K	
		●		●	●				Wheel-motor control defective		O&K	
			●						Incorrect signal from inductive pick-up		O&K	
								●	Hydraulic differential lock defective		O&K	
			●						Accumulator pre-charge pressure too high (F106.5A and F106.6A only)		O&K	

□

OPERATING INSTRUCTIONS F106.6/A

ABBREVIATIONS

2261966

A	Ampere (SI base unit of electric current)	i	Transmission ratio
A	Four-wheel drive	i.e.	id est = that is
A2	2-point bracing (claws)	IFN	ISO service rating, blocked
A4	4-point bracing (claws)	incl.	including, inclusive of
abt.	about	ISO	International Standardization Organization
acc.	according to	kg	Kilogram (unit of weight)
Ad. 1	with reference to 1	kg/dm ³	Kilograms per cubic decimeter (= unit of specific density)
Ah	Ampere hours (SI base unit of quantity of electricity)	km/h	Kilometers per hour
API	American Petroleum Institute	kNm	KiloNewtons per meter (1 kNm = 1000 Nm) = unit of torque
approx.	approximately	kW	Kilowatt (1 kW = 1.36 hp)
BA	= OI = Operating instructions	l	Liter
bar	unit of pressure measurement (1 bar = 14.5 psi)	Lb/in ²	Pounds per square inch (= psi)
Bh	= OH = Operating hour	LC	Long crawler
CE	Communaute Européenne = European Community	LDA	Charge pressure-dependent full-load limiter
CECE	Committee for European Construction Equipment (Defines a measure for bucket, grab, or scoop filling)	LED	Light-emitting diode
CEN	European Standardization Committee	l/min	Liters per minute
cf.	refer to	LpA	Sound pressure at workplace
cm	centimeter (= 1/100 m)	LPS	Load-sensing Power System
cm ³ /rev	Cubic centimeters per revolution	LS	Limited slip
dB(A)	Decibel (Sound intensity according to measuring method A)	LS	Load sensing
dia.	Diameter	LwA	Sound power level of the machine in stationary operation
DIN	German Standardization Organization	m	Meters
EDCV	Electronic drive control (Grader)	M _A	Tightening torque
EDS	Electronic diagnostic system	mA	Milliampere (= 1/1000 A)
eff.	effective	max.	maximal, maximum
e.g.	for example	MH	Mobile hydraulics (excavator)
etc.	etcetera	MHS	Mobile hydraulic excavator for road and rail operation
fig.	Figure, serial number of illustration	min.	minimal, minimum
FOPS	Falling objects protective structures	min ⁻¹	Revolutions per minute
GLR	Full-load controller (electronic module for PMS)	mm	Millimeter (= 1/1000 m)
HD	Heavy duty	N	Normal, standard version
HDS	Heavy duty small	N, kN	Newton, kiloNewton (unit of force)
hp	Horsepower /1 hp = 0.7457 kW)	NLGI	National Lubricating Grease Institute (USA)
Hydr.	Hydraulic, Hydraulics	NLGI-Klasse	Consistency - lubricant classification acc. to DIN 51 818
		Nm	Newtonmeter (unit of torque)
		No./Nos.	number/numbers

OPERATING INSTRUCTIONS F106.6/A

ABBREVIATIONS

OH	Operating hour
OLS	O&K load stabilization
op. inst.	Operating Instructions
OW	Superstructure
O&K	Orenstein & Koppel AG
PLA	Bulldozer blade
PMS	Pump Managing System
P/No.	Part number (O&K)
PS	Metric horsepower (1 PS = 0.74 kW)
Qty.	Quantity
R, r	Radius
resp.	Respectively
RH	Crawler hydraulics (excavator)
ROPS	Roll-over protective structures
rpm	Revolutions per minute (= min ⁻¹)
SAE	Society of Automotive Engineers (USA)
sec.	Second
SN	Item number
SW	Width across flats
t	Metric ton (= 1000 kg)
THB	Technical Manual
TL	Backhoe dipper (attachment)
tm	Tons by meters (obsolescent unit of slewing torque)
typ.	Typical
U/min	Revolutions per minute
V	Volt (unit of electric voltage)
VDMA	Association of Germany Machinery and Systems Manufacturers
W	Watt (unit of electric power)
°C	Degrees Celsius (temperature)
°kW	Degrees crank angle
>	greater than
<	less than

□



A

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