

Operating Instructions

CE

Hydraulic Excavator

RH 120 E No.

Terex GmbH



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The Terex|O&K operating manual is in 6 sections;
the sections are designed for different target groups:

	Operating instructions	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
Part 6	INDEX	Operating personnel + Inspection and servicing personnel + Repair personnel

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1 INTRODUCTION

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Introduction



PREFACE

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

The operating instructions contain 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 operating instructions 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 driver'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 the 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 Terex|O&K mechanic or by attending an Terex|O&K training course for operators or maintenance personnel.

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

All Terex|O&K operating manuals are issued in German and then translated. Even a good translation may give rise to questions which Terex|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 **Terex|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.

¹ Complies with VDMA recommendation "Operating instructions"

WARRANTY

The warranty of **Terex|O&K** presupposes among other things that the servicing works as described in the operating instructions have been performed:

- by the Terex|O&K Service

or

- in a workshop authorized in writing by **Terex|O&K**,

and

- by using the original spare parts of **Terex|O&K**.

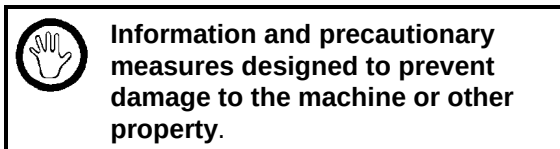
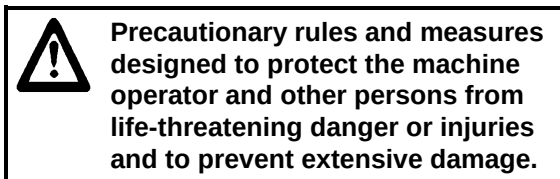
The proper execution of the servicing works must be documented on the **Terex|O&K** Service check-lists.

FUNDAMENTAL SAFETY INSTRUCTIONS

Complies with VDMA recommendation "Operating Instructions"

Warnings and symbols

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



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DESIGNATED USE

The machine has been built in accordance with state-of-art standards and the recognized safety rules. Nevertheless, its use may constitute a risk to life and limb for the user or third parties or cause damage to the machine and to other material property (acceptable risk)

An acceptable risk is present, e.g.: loose material or material to be loaded may drop out of the bucket or backhoe while the working equipment is being swivelled.

The machine must be used only in technically perfect condition in accordance with its designated use and the instructions set out in the operating instructions, and only by safety-conscious persons who are fully aware of the risks involved in operating the machine. Any functional disorders, especially those affecting the safety of the machine, should therefore be rectified immediately.

The excavator with backhoe or loading bucket attachment is designed solely for excavating and loading:

- excavated soils,
- sand,
- gravel,
- blasted rock,
- ore,
- coal,

and other raw materials.

Operating the machine within the limits of the designated use also involves observing the instructions set out in the operating instructions and complying with the inspection and maintenance directives.



Using the excavator or its attachments for purposes other than or extending beyond those stated above, e.g.:

- for lifting or transporting persons,
- as a working platform,
- for lifting crane loads without the equipment being approved for this purpose,
- for driving in posts, sheetpile supports, etc. without the equipment being approved for this purpose,

is considered contrary to the designated use.



Lifting eyes on the lower carriage

- are settled for transporting with a crane only.
- must not be used for towing a machine.

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 resulting from other than the designated use. The risk involved in such misuse lies with the user.

Noise emission specifications in acc. with the 3rd Ordinance of the Machine Safety Act of 18th January 1991 resp. with EC Machine Directive, Annex I, para. 1.7.4 f.

If the earth-moving machine is operated in accordance with the 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) fulfill the requirements of protecting the driver against whole-body vibration.

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ORGANIZATIONAL MEASURES

The operating instructions must always be at hand at the place of use of the machine, e.g. by stowing them in the place 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 operating 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.

Personal protective equipment and the working clothing

Depending on the cleaning, servicing and/or repair activities to be performed, the personal protective equipment and the working clothing may consist of the following items:

- fall arresters
- protective suit
- helmet
- goggles
 - e. g. for cleaning work
 - or for welding work
- protective gloves
 - e.g. for work on hot units
 - for grinding and welding work
- protective working gloves
 - e.g. for fitting work
 - for grinding and welding work
- ear protectors

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.

Use only the original parts parts of **Terex|O&K**.

They are the only ones to fulfill the technical specifications of the machine.

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.

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

Work on hydraulic systems 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 area and the bearing capacity of the soil.

Take the necessary precautions to ensure that the machine is 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 malfunction, 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 braking, signalling and lighting systems are fully functional.

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

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

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

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

Always keep a distance from the working face and from slopes.

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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.

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

Special work in conjunction with utilization of the machine and maintenance and repairs as well as troubleshooting during work; 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 movements.

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

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Wear a safety harness when carrying out maintenance work at heights above 1 m.

Wear an approved harness equipped with fall arresters and safety lines.

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 switch-gear 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, brake and hydraulic fluid lines for leaks, loose connections, chafe marks and damage. Any defect 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 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 or contacted 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.

High-voltage system

Floodlamps equipped with gas discharge lamps require a high-voltage supply (ca. 25 kV).

The high voltage is generated by a ballast unit. Switch off the electrical system of the excavator before touching the lamp or the ballast unit.

Battery

Warning! Battery Posts, terminals and related accessories contain lead and lead compounds, chemicals known to cause cancer and reproductive harm. Wash hands after handling

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Gas, dust, steam and smoke

Always start and operate the engine in a well-vented area;

If in an enclosed area, vent the exhaust to the outside;

Do not modify or tamper with the exhaust system

California Proposition 65 WARNING

Diesel engine exhaust and some of its constituents are known in the state of California to cause cancer, birth defects, and other reproductive harm.

Operate 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 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) to be removed in accordance with the specific instructions for the unit concerned before carrying out any repair work.

Hydraulic 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 or other chemical substances, observe the product-related safety regulations (see safety specifications).

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

Transporting and recommissioning

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

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

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

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FIRE AND EXPLOSION HAZARD



Prior to commencing work, obtain information on the national and corporate rules for the prevention of accidents.

Pay particular attention to hazards caused by combustible and easily flammable substances on the safe handling of the fire extinguishers to be used.

Avoid smoking and open fire on, next to and below the excavator.

Combustible and easily flammable substances or liquids increase the fire and explosion hazard.

Do not store or handle any flammable substances during operation.

Clean the excavator thoroughly, if possible, with a steam jet (rubber parts and electric components with compressed air - refer to information label), when, for example, oil, grease, fuel or cleaner was spilled.

Such substances may spontaneously ignite if they get into the vicinity of hot units or objects such as turbo superchargers.

Even battery gases can ignite in open flames or fire.

Avoid parking the excavator in places where

- combustible substances such as coal dust or tar are present.
- open or smouldering fire may occur.

Remove the excavator from such an area where combustible or easily flammable liquids have spilled from the excavator onto the ground.

Flying sparks (caused by welding, flame cutting, grinding, electrical short-circuit) may cause fire on the ground that can spread to the excavator.

Place suitable fire guardings (fire barriers) if open fire or flying sparks cannot be avoided during repair work.

Apply special protection to cables, cable ducts as well as to hose and pipe lines.

If necessary, also cover the ground with fire-protective blankets.

Ensure sufficient ventilation.

Clean the excavator before starting a job.

Do not keep any fire extinguishers that are not suitable or have not been tested.

Do not extinguish flammable liquids with water. Use:

- dry-powder,
- carbon-dioxide or
- foam extinguishing compounds.

When getting into contact with burning substances, the fire-fighting water would abruptly evaporate and distribute the substance such as oil over a wide area. Water causes short-circuits in the electrical system thus possibly entailing new hazards.

Call the fire brigade.

Have all your welding, flame cutting and grinding work approved.

OPERATING INSTRUCTIONS RH 120 E

Introduction



2 OPERATION

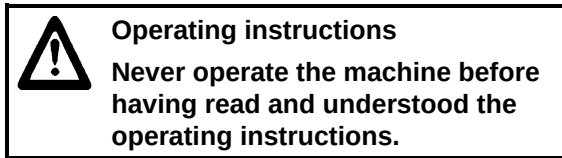
	Operating instructions	Target group
Part 1	INTRODUCTION FUNDAMENTAL SAFETY INSTRUCTIONS	Operating personnel + Inspection and servicing personnel + Repair personnel
Part 2	OPERATION	Operating personnel The operating personnel must have know-how relevant to the operation and the application of this or 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
Part 6	INDEX	Operating personnel + Inspection and servicing personnel + Repair personnel

OPERATING INSTRUCTIONS RH 120 E

Operation



OPERATION - SAFETY INSTRUCTIONS



Pay special attention to:

the "Fundamental Safety Instructions" and to all warning and instruction signs attached to the machine.

Familiarize yourself with the layout, the functioning and the sense of actuation 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 Terex|O&K mechanic or by attending an Terex|O&K operator's 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 control levers being inadvertently activated

Safety belt

For machines with a safety belt for operating personnel:

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

Apply the 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 Terex|O&K. Clear-cut data are given in the technical specification.

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

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

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

Check that all warning and instruction signs attached to the machine are present and legible.

Entering and leaving the machine

Always face the machine when entering or leaving it.

Use only the ladders, steps, platforms and grab handles provided when entering and leaving the machine.

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

OPERATING INSTRUCTIONS RH 120 E

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Hazard range

The hazard range is that zone around the machine in which persons are within reach of loads or attachments falling as a result of operational movements by the machine, of its equipment and attachments or of 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 marshaller must keep outside the hazard zone.

Have a marshaller 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 marshaller understand, or use aids for communication (e.g. walkie-talkie/camera). Calls cannot be understood by the marshaller because of the noise made by the machine during operation.

Keep in constant contact with the marshaller.

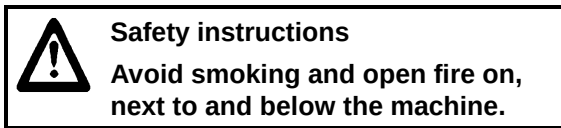
Stop the machine immediately if you lose contact with the marshaller.

Securing the machine

Secure the machine as described under "Securing the machine" before:

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

FIRE AND EXPLOSION HAZARD



Combustible and easily flammable substances or liquids increase the fire and explosion hazard.

Do not store such substances on the excavator.

Clean the excavator thoroughly, if possible, with a steam jet (rubber parts and electric components with compressed air - refer to information label), when, for example, oil, grease, fuel or cleaner was spilled.

Such substances may spontaneously ignite if they get into the vicinity of hot units or objects such as turbo superchargers.

Even battery gases can ignite in open flames or fire.

Avoid parking the excavator in places where

- combustible substances such as coal dust or tar are present,
- open or smouldering fire may occur.

Remove the excavator from such an area where combustible or easily flammable liquids have spilled from the excavator onto the ground.

Flying sparks may cause fire on the ground that can spread to the excavator.

DESCRIPTION OF THE EXCAVATOR

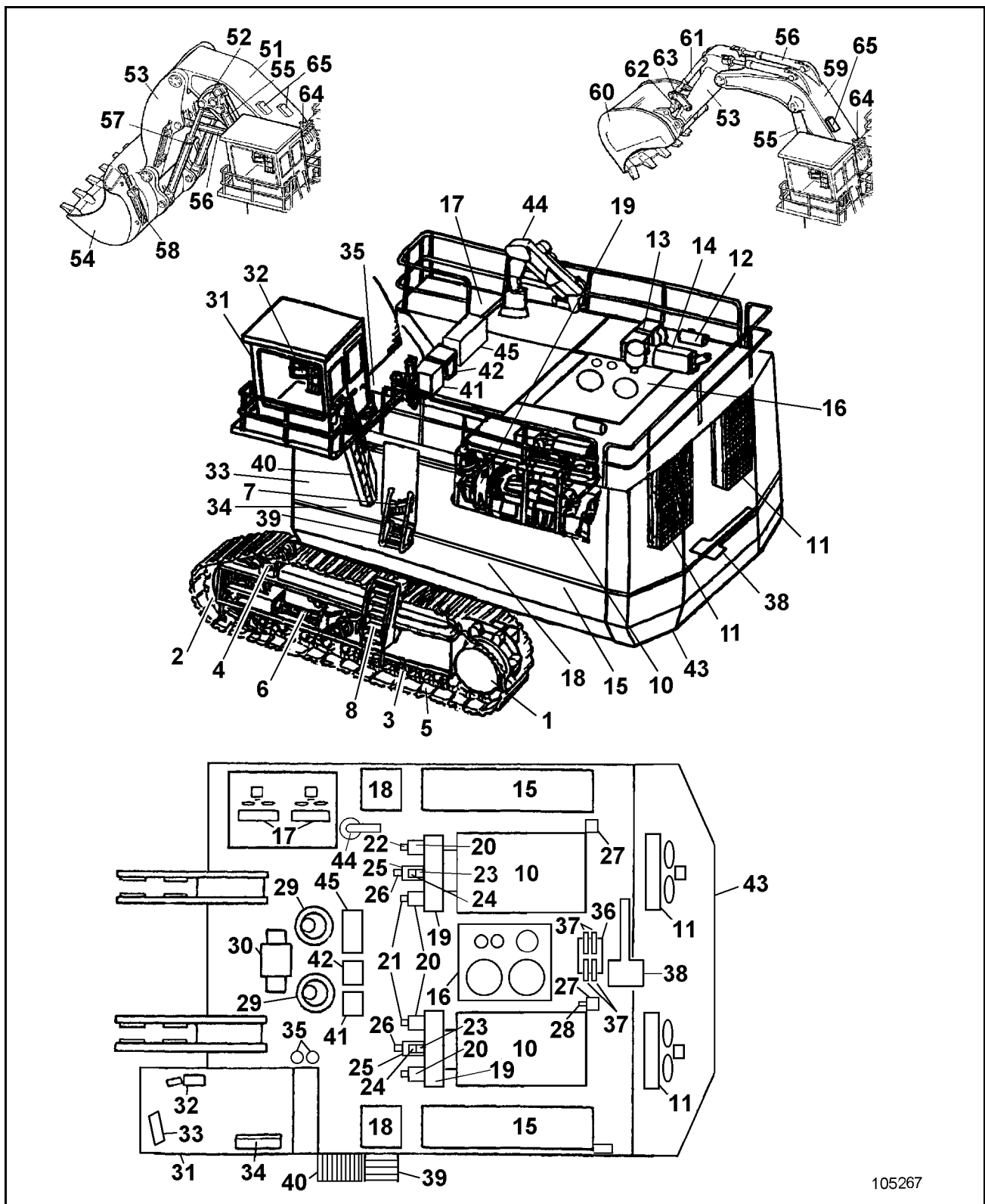


Fig. 2-1:

OPERATING INSTRUCTIONS RH 120 E

Operation



Excavator layout

Fig. 2-1:

Undercarriage

- 1 - Track drive
- 2 – Idler
- 3 - Track roller
- 4 - support roller
- 5 - Crawler track
- 6 - Track tensioner
- 7 - Slewing ring
- 8 - Ladder

Superstructure

- 10 - Engine
- 11 - Radiator (engine cooling liquid)
- 11 - Reservoir (cooling liquid)
- 13 - Air-intake system
- 14 - Exhaust system
- 15 - Fuel tank
- 16 - Hydraulic oil reservoir
- 17 - Hydraulic oil cooler
- 18 - Engine oil reservoir (optional)
- 19 - Pump transfer gearbox
- 20 - Working pump
- 21 - Cooling oil pump
- 22 - Servo system pump
- 23 - Servo system pump
- 24 - Gearbox circulating pump
- 25 - Slewing pump
- 26 - Fan drive pump (cooler, hydraulic oil)
- 27 - Fan drive pump (radiator, engine cooling liquid)
- 28 - Air compressor drive (air conditioning system)
- 29 – Slewing gear
- 30 – Travel block and rotor
- 31 – Driver`cab
- 32 – Control stand with BCS
- 33 – Control cabinet
- 34 – Air conditioner (optional)

- 35 – Fire-extinguisher
- 36 – Control cabinet with battery main switch
- 37 - Batteries
- 38 - Service-station, (tanklift)
- 39 - Ladder
- 40 - Ladder
- 41 - Grease container for central lubricating system
- 42 - Tool cabinet (optional)
- 43 - Counterweight
- 44 - On-board crane (optional)
- 45 - Drive unit (onboard crane, optional)

Loading bucket

- 51 – Boom
- 52 - TriPower linkage
- 53 – Stick
- 54 - Bottom-dump bucket
- 55 - Boom cylinder
- 56 - Stick cylinder
- 57 - Tipping cylinder
- 58 - Bottom-dump cylinder
- 64 - Control valves
- 65 - Quick-action valve

Backhoe bucket

- 53 - Stick
- 55 - Boom cylinder
- 56 - Stick cylinder
- 59 - Monoblock boom
- 60 - Backhoe bucket
- 61 - Backhoe cylinder
- 62 - Toggle link
- 63 - Toggle lever
- 64 - Control valves
- 65 - Quick-action valve

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Operation



Undercarriage

The undercarriage of the hydraulic excavator serves as a stable base and for travelling. The crawler tracks are driven hydraulically with oil motors and travel gearboxes. Undercarriage and superstructure are connected by means of a slewing ring.

Superstructure

The superstructure accommodates the drive and part of the hydraulic and electrical equipment.

Drive

The drive unit comprises diesel engines, pump transfer gearboxes, hydraulic pumps, hydraulic cylinders and hydraulic motors.

Hydraulic system

All working and travelling movements are performed hydraulically. The movements are controlled by servovalves. The working commands are initiated by hand and transmitted to the valves via control circuits. The oil supply from the superstructure to the undercarriage is ensured by the rotor. The hydraulic system is overload-protected by pressure-relief valves. The hydraulic pumps are supplied with oil from a hydraulic reservoir.

Pump Managing System (PMS)

The Pump Managing System (PMS) with overlimit regulation ensures optimum utilization of the installed or preset engine power. The electronic pump demand control prevents the machine from demanding more hydraulic power than the diesel engines can furnish. A microprocessor ensures that the hydraulic output power of the pump is optimally suited to the actual operation conditions.

The PMS box (load-limit regulator) is installed in a control cabinet in the driver's cab.

Programmable Logic Controller (PLC)

The PLC controls the functions

- Engine Start
- Engine Stop
- Engine Idle
- Central lubricating system
- Further auxiliary functions

Further information is given in **the Technical Handbook**: "Programmable Logic Controller".

Central Management System (CMS)

The CMS is an electrohydraulic servocontrol. Together with the PMS, it provides for optimum interaction between drive hydraulic circuit and working movements.

The required working movements are recognized by microcontroller-assisted scanning of the operating elements (hand levers, pedals) and transmitted to electrohydraulic valves.

In the system sequence, the drive regulation is first activated to provide hydraulic working energy. Only then are working movements enabled.

Further information is given in **the Technical Handbook**: "Central Management System".

Demand control / Zero-flow regulation

In the fine-control range, swivelling of the hydraulic pumps, and thus the variation of oil flow, are proportional to control lever and pedal valve travel. This means that during the work, the pumps supply only as much hydraulic oil as required to perform the working movement. In the neutral position of the control levers, the pumps are automatically swivelled to zero flow.

These special features offer the following advantages:

- reduced fuel consumption
- minimum power losses
- reduced temperature of the hydraulic oil
- greater service life of hydraulic pumps and diesel engines.

Automatic engine speed reduction

If the control pedals and control levers and thus the

Servovalves are not actuated for a period of 10 seconds or more (programmable), the speed of the engines is automatically reduced to idling. This function is a further contribution to fuel economy.

Board-Control-System (BCS)

The BCS is a data-evaluating and data-processing system whose function is to collect, evaluate and store data about the excavator's operating status and to display these to the operator.

The BCS is based on a micro-processor. The measured values (actual values) supplied by sensors and transducers installed in the excavator are compared to preset nominal values. Out-of-limit

conditions are displayed in the form of error messages in the cab.

Critical operating conditions are additionally indicated by optical and acoustic warning signals.

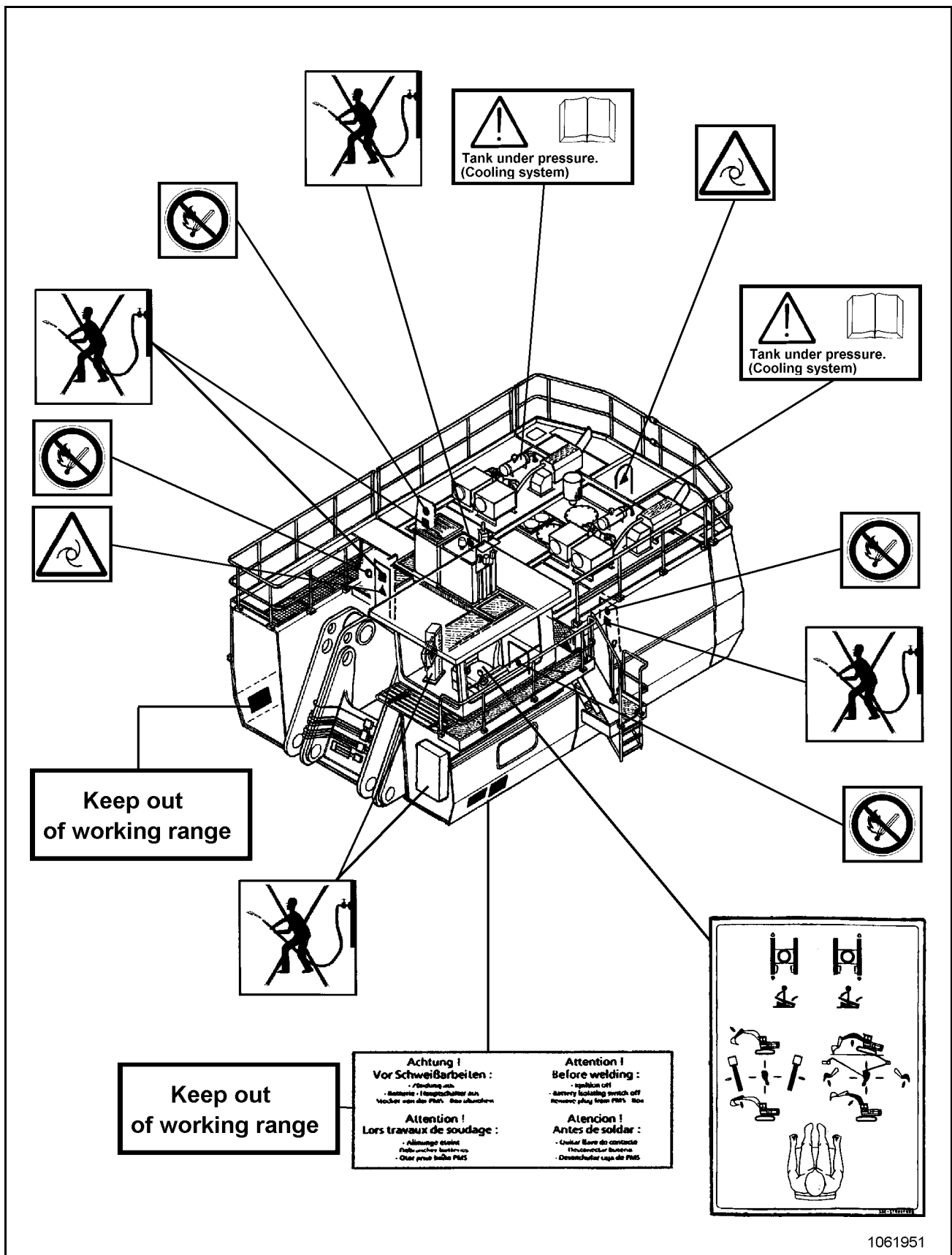
Further details are set out in the **Board-Control-System operating instructions**.

Electrical system

The electrical system operates on 24 volts

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Operation



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Fig. 2-2:

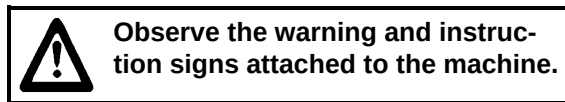
OPERATING INSTRUCTIONS RH 120 E

Operation



Sign

Warning and instruction signs



Keep the signs legible and clean.

Replace signs immediately if they have become illegible.

New warning and instruction signs can be ordered from the Terex|O&K Spare Parts Service. The ordering part numbers are set out in the spare-parts list of the machine.

Fig. 2-2: shows the location of warning and instruction signs on the machine.

Machine number

The identification plate with the machine number is attached to the front side of the A-frame (arrow, Fig. 2-3: and/or Fig. 2-4:)

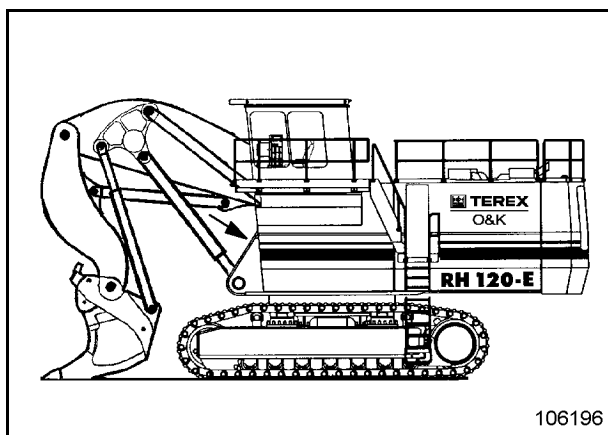


Fig. 2-3:



Fig. 2-4:

Engine number

The serial number plate (Fig. 2-5:) for the diesel engine is located on the diesel engine.

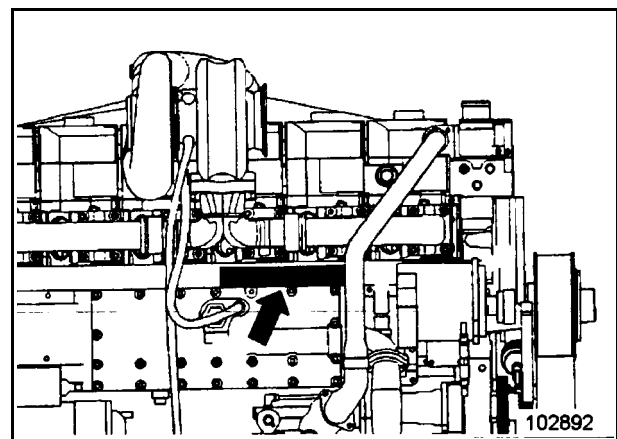


Fig. 2-5:

Component numbers

Other larger units also have identification plates indicating, among other things, their serial number.

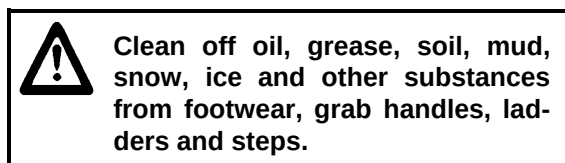
On steel components, the Terex|O&K part number or the serial number may be stamped into the metal at a clearly visible place.

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Operation



Entering and leaving the machine Safety instructions



Keep ladders, steps, platforms and grab handles in a non-slippery condition.

Risk of injury due to slipping.

For entering and leaving use only the ladders, steps, platforms and grab handles provided (see illustration in Fig. 2-6:).

Always face the machine when entering or leaving it

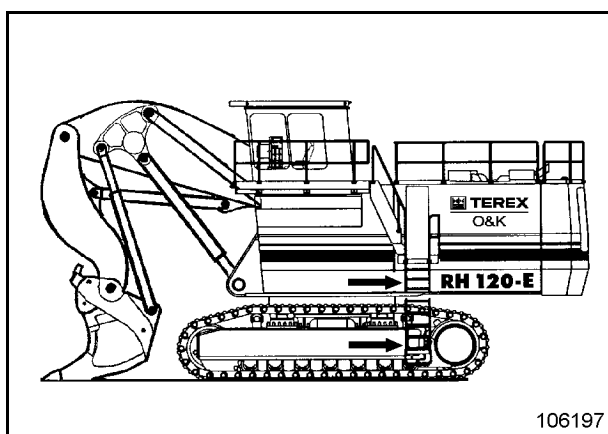


Fig. 2-6:

Ramp lighting

The ramp-type ladder can be illuminated in the dark. The lighting system switch (1, Fig. 2-7:) is located behind the left hand fuel tank. The lighting switch is a pull switch operated with a string from the ground (1, Fig. 2-8:).

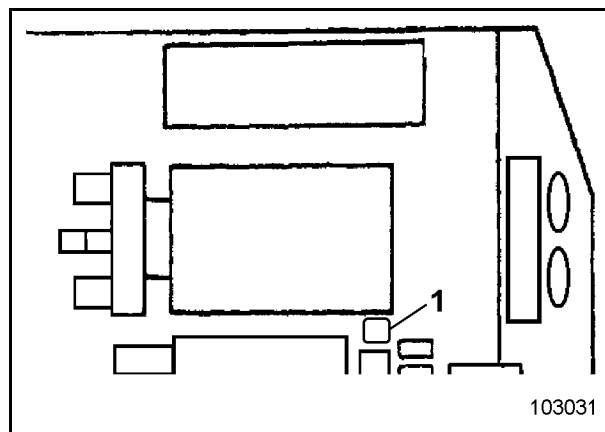


Fig. 2-7:

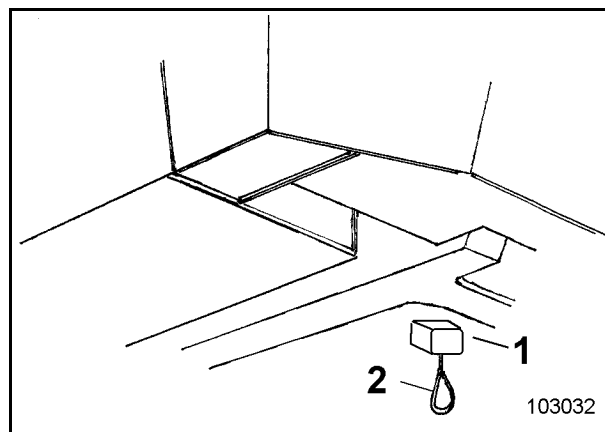


Fig. 2-8:

Ramp-type ladder (optional)

Raising resp. lowering the folding ladder (Fig. 2-9:).

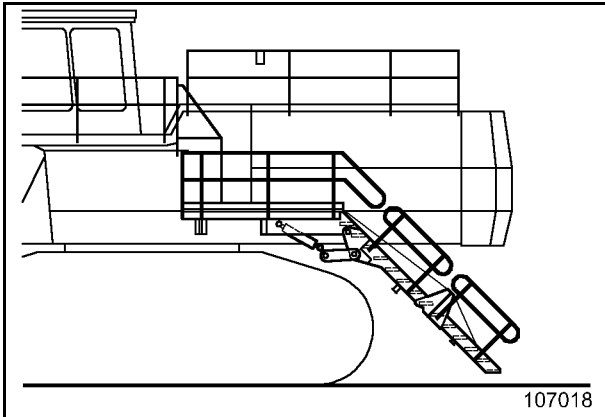


Fig. 2-9:

Raising the folding ladder (from the upper carriage)

- ➡ Start engine.
- ➡ Pull lever (1, Fig. 2-10:) on control valve (2) upwards to position "I".
The folding ladder is raised (Fig. 2-11:)

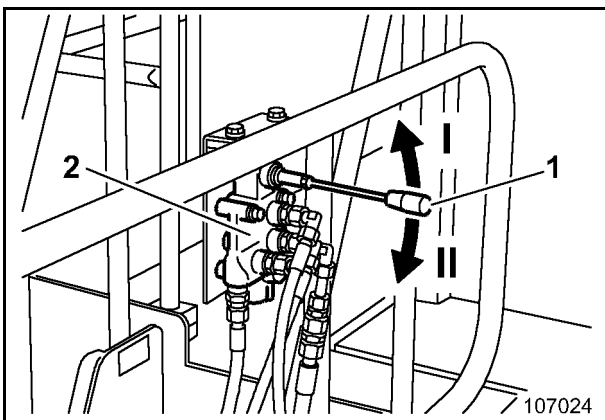


Fig. 2-10:



The upper carriage can only be swung when the folding ladder is raised completely (Fig. 2-11:).

Lowering the folding ladder (from the upper carriage)

- ➡ Start engine.
- ➡ Push lever (1, Fig. 2-10:) on control valve (2) downwards to position "II".
The folding ladder is lowered (Fig. 2-9:)

The folding ladder can also be lowered when the engine is stopped.

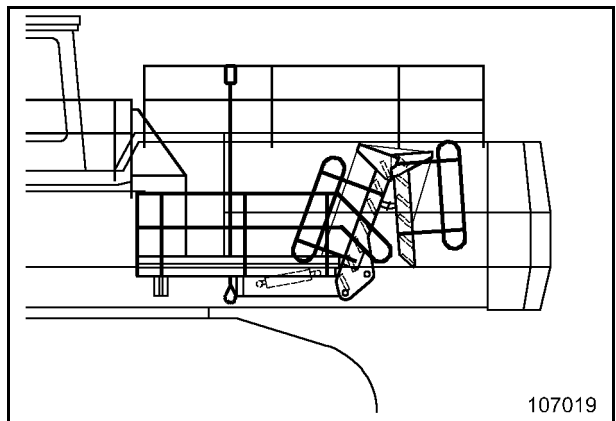


Fig. 2-11:

Lowering the folding ladder (from the bottom)

- ➡ Pull down rope (3, Fig. 2-12:).
The folding ladder is lowered (Fig. 2-9:).

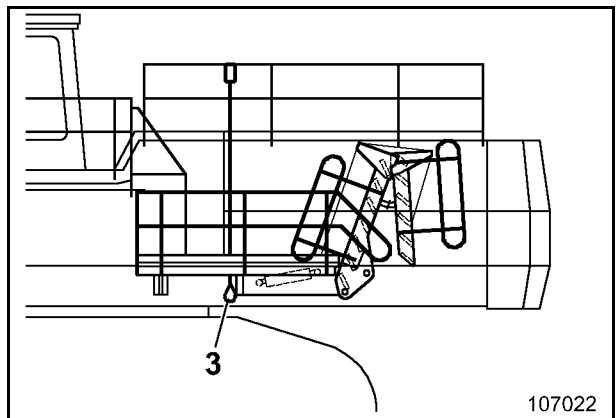


Fig. 2-12:

OPERATING INSTRUCTIONS RH 120 E

Operation



Ramp-type ladder (optional)

Raising resp. lowering the swinging ladder (Fig. 2-13:).

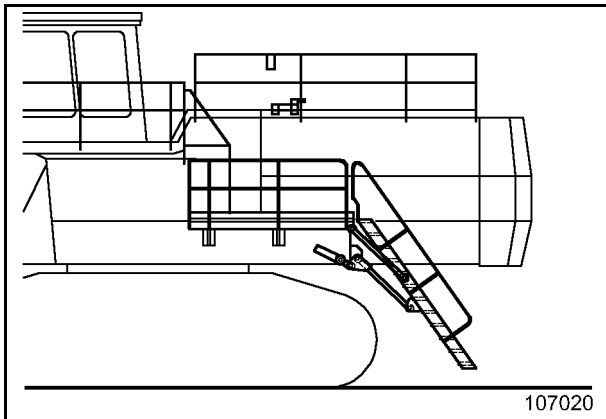


Fig. 2-13:

Raising the swinging ladder (from the upper carriage)

- Start engine.
- Pull lever (1, Fig. 2-14:) on control valve (2) upwards to position "I".
The swinging ladder is raised (Fig. 2-15:)

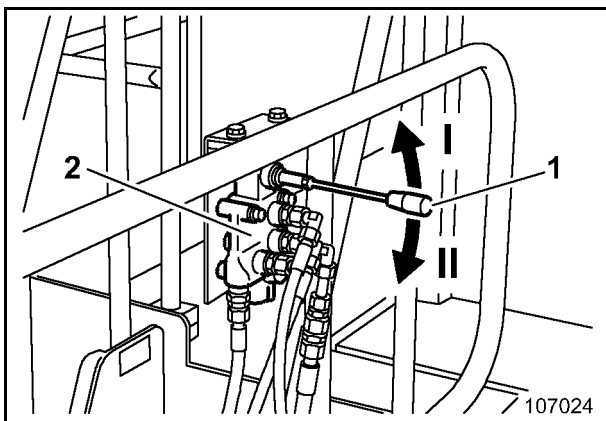


Fig. 2-14:



The upper carriage can only be swung when the folding ladder is raised completely (Fig. 2-15:).

Lowering the swinging ladder (from the upper carriage)

- Start engine.
- Push lever (1, Fig. 2-14:) on control valve (2) downwards to position "II".
The swinging ladder is lowered (Fig. 2-13:)

The swinging ladder can also be lowered when the engine is stopped.

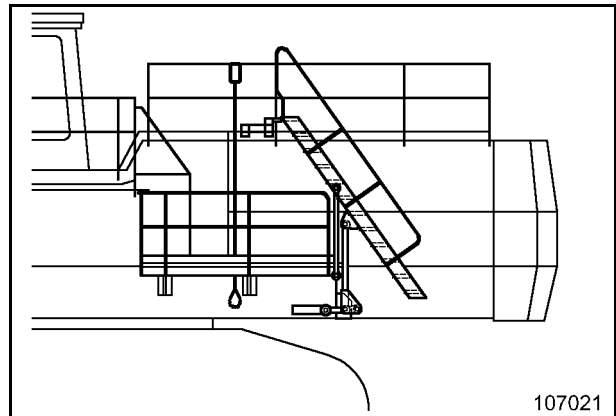


Fig. 2-15:

Lowering the swinging ladder (from the bottom)

- Pull down rope (3, Fig. 2-16:).
The swinging ladder is lowered (Fig. 2-13:).

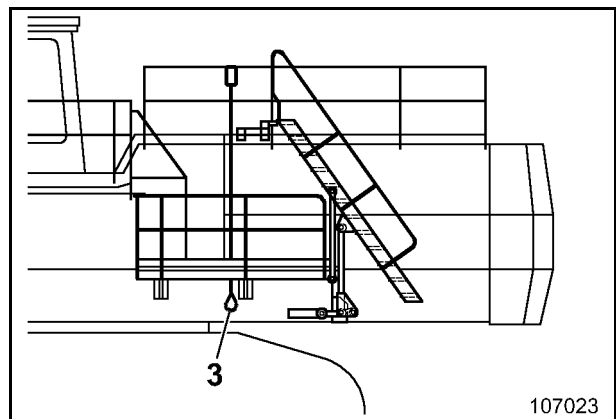


Fig. 2-16:

OPERATING INSTRUCTIONS RH 120 E

Operation



Cab interior lamp

The interior lamp is switched on and off with switch (1, Fig. 2-17:).

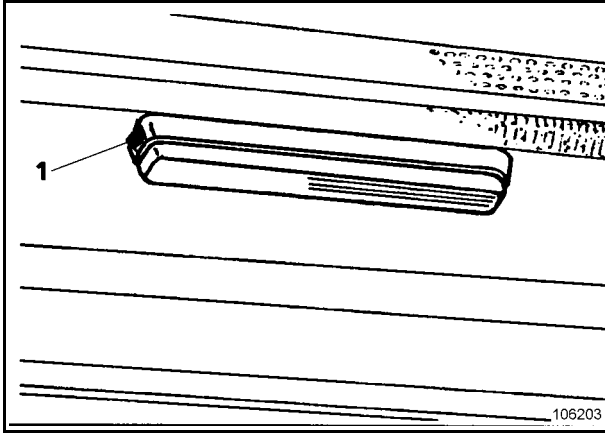


Fig. 2-17:

Switch position

0 - lamp off

1 - lamp on.

The interior lamp can be used even if the electrical system is switched off.

Therefore, switch off the interior lamp when leaving the machine. The batteries may be discharged if the interior lamp is left on for prolonged periods.

The interior lamp is also switched on and off with switch (3, Fig. 2-18:).

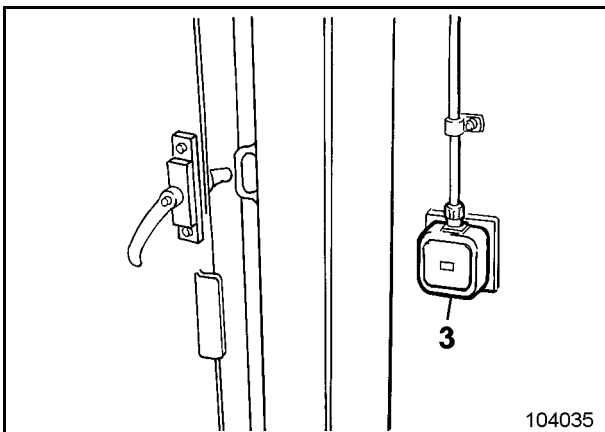


Fig. 2-18:

Servicing lighting

Switch on the lamps in the modules with switches (95, Fig. 2-19: and 3, Fig. 2-20:).

Switch (95, Fig. 2-19:) is located in the control column in the driver's cab.

Switch (3, Fig. 2-20:) is located beside the entrance door in the platform.

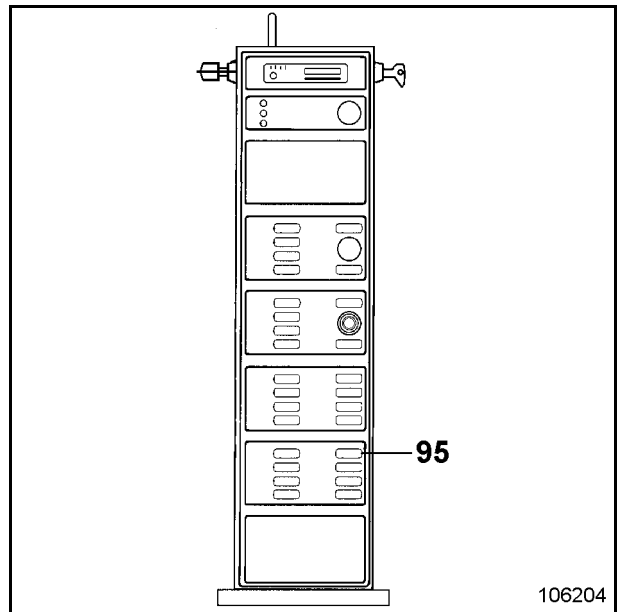


Fig. 2-19:

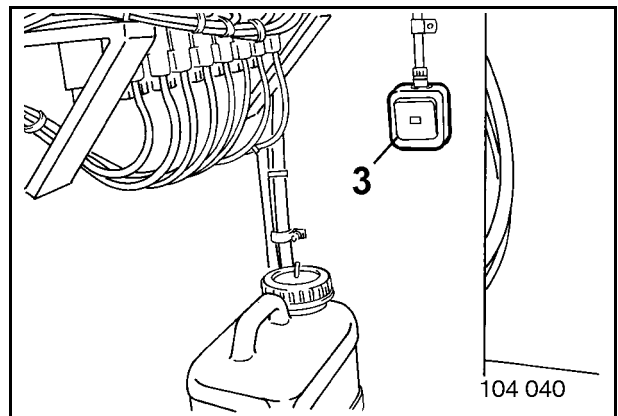


Fig. 2-20:

OPERATING INSTRUCTIONS RH 120 E

Operation



EMERGENCY STOP pushbuttons

The entire electrical system is switched off with the EMERGENCY STOP pushbuttons.

In an emergency, press the EMERGENCY stop.

The EMERGENCY STOP pushbuttons are located

- in the control column in the driver's cab (31, Fig. 2-21:)

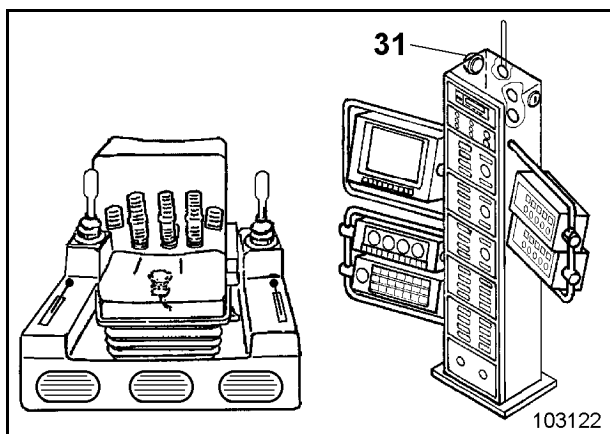


Fig. 2-21:

- in the control cabinet (2, Fig. 2-22:)

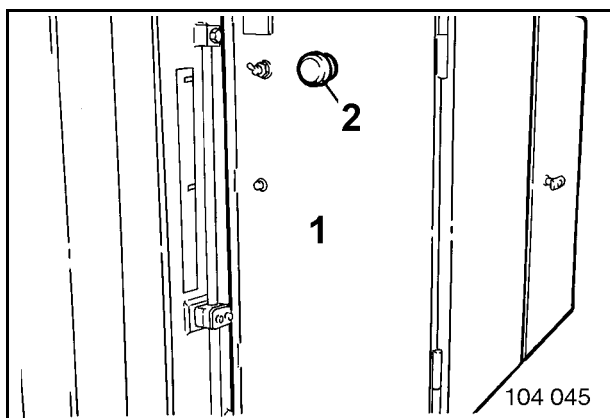


Fig. 2-22:

The electrical system of the excavator can be switched on after the EMERGENCY SHUTOFF buttons are activated.

➡ Pull the buttons out

Windscreen washer

The reservoir of the windscreen washing system (1, Fig. 2-23:) is installed in the cab module. For the reservoir capacity refer to the "Refilling quantities - Other" table.

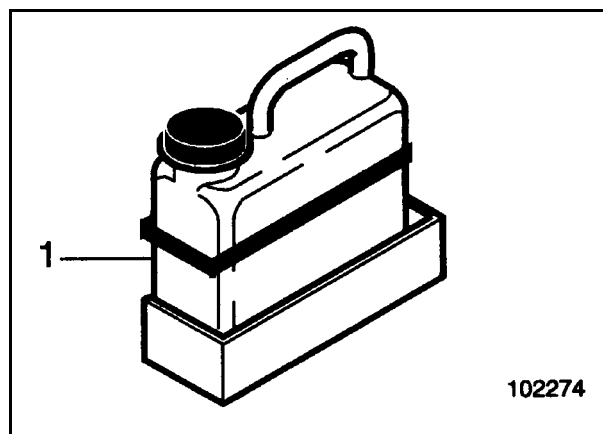


Fig. 2-23:

OPERATING INSTRUCTIONS RH 120 E

Operation



Driver's seat

The driver's seat (Fig. 2-24:) can be adjusted in inclination, height and fore-and-aft position. The seat suspension can be adjusted to suit the driver's weight.



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

Before carrying out any seat adjustments:

- stop the machine
- set the control lever to "0"

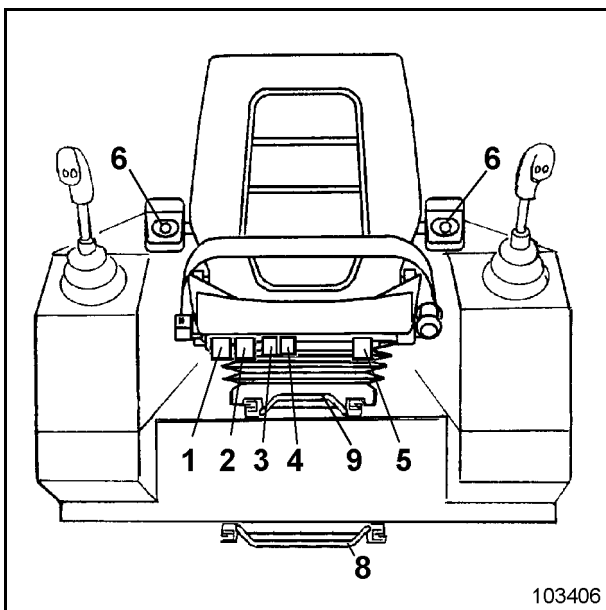


Fig. 2-24:

Adjusting the backrest

Adjust the inclination of the backrest with button (5) verstellen. Lean against the backrest or move your body forwards to bring the backrest into the desired position. Release button (5).

Adjusting the lumbar support

The backrest is equipped with an upper and a lower air chamber.

Pull knob (7) upwards - the lower chamber is inflated with air

Pull knob (3) upwards - the upper chamber is inflated with air

Push knobs (3 and 7) downwards - the air chambers are deflated

Adjusting the seat cushion

Adjust the inclination of the seat cushion with buttons (1 and 2).

Button (1) – lower frontside of cushion

Button (2) – lower backside of cushion

Bring the seat cushion into the desired position by moving the body forwards or backwards. Release button (1 or 2).

Adjusting the armrests

The armrests can be raised or lowered as required.

To adjust the armrest inclination, turn knobs (6) to the right or left.

Fore-and-aft position

The fore-and-aft position of the seat can be adjusted with lever (9).

Pull lever (9) upwards, slide seat to the desired position and allow lever (9) to engage.

Fore-and-aft adjustment of the seat plate

The fore-and-aft position is adjusted with lever (8).

Pull lever (8) upwards, slide seat plate to the desired position and allow lever (8) to engage.

Adjusting the control consoles



Do not adjust the control consoles during travelling.

Concentrate on the road to avoid accidents.

Do not adjust the control consoles when the hydraulic pilot control is activated.

Risk of moving the control levers inadvertently and of triggering uncontrolled movements of the working equipment.

The control consoles on the right and left of the driver's seat can be shifted parallel to the seat by abt. 16 cm (6.3 in) forwards and backwards so that the driver can select the position best suited to him for fatigue-free working.

Adjusting the right control console:

- Push lever (124) outwards against the pressure of the spring and maintain while shifting the console into the desired position.
- Release the lever and check that the console locking mechanism has engaged.

Adjusting the left control console:

- Push lever (123) outwards against the pressure of the spring and maintain while shifting the console into the desired position.

Before adjusting the consoles:

- stop the machine by releasing the travelling pedals (112 and 113, Fig. 2-25:); they will return to 0.
- stand working equipment on the ground.
- stop the engine.

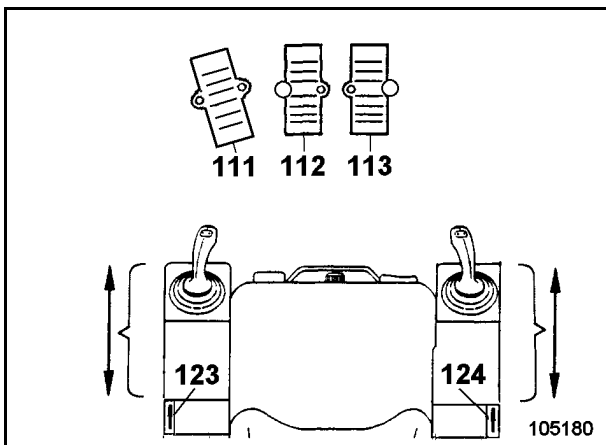


Fig. 2-25:

OPERATING INSTRUCTIONS RH 120 E

Operation



Fire extinguisher

The excavator is equipped with two fire extinguishers (arrow Fig. 2-26:)

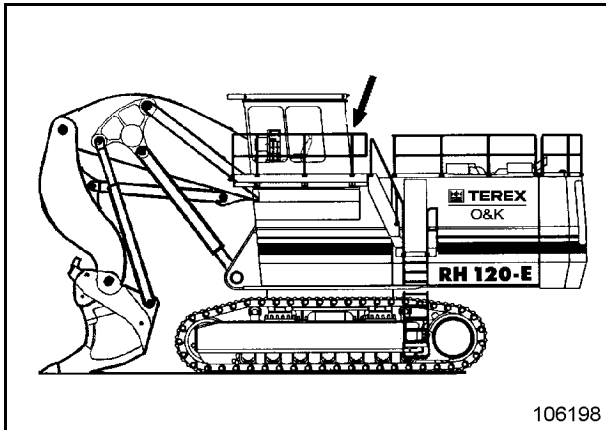


Fig. 2-26:

The excavator driver and the maintenance personnel must inform themselves about how to handle the fire-extinguisher in order to be able to act fast and efficiently in case of beginning fires. Such instruction should be given by a qualified instructor.

Extinguishing agent

Each fire-extinguisher is filled with 12 kg (26.4 lb) Glutex. This extinguishing agent is used for fighting fires of classes A, B and C. Fires are extinguished fast, perfectly and without residues.

Fire extinguisher (option)

The fire extinguishers can be installed, for instance, at the places indicated by the arrows (Fig. 2-27:).

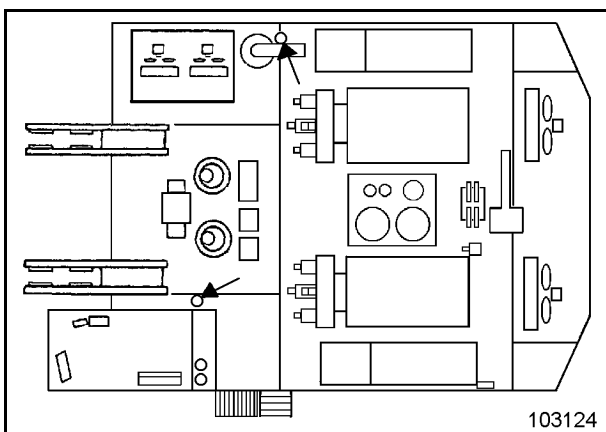


Fig. 2-27:

Handling

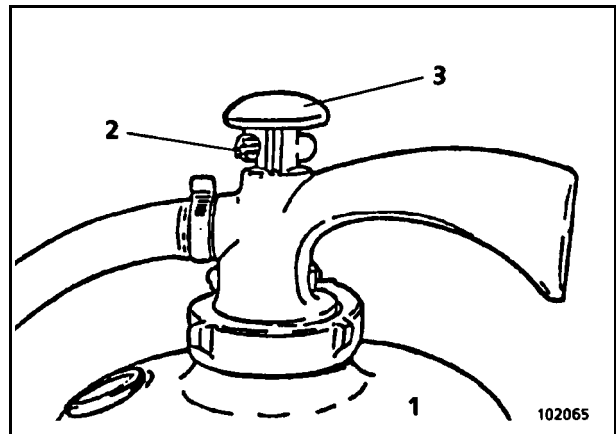


Fig. 2-28:

- Pull out securing pin (2, Fig. 2-28:).
- Strike knob (3) hard, then release again.
- Operate the extinguishing gun.

Inspection

Have the extinguisher inspected at regular intervals by an expert. This is required by local authorities and insurance companies and is in the interest of your own safety.



Have the fire-extinguisher checked at the prescribed intervals by authorized testing agencies

Automatic fire-extinguishing system (optional)



The automatic fire-extinguishing system prevents fire from spreading. It is, however, assumed that the machine is thoroughly cleaned of combustible and easily flammable substances.

The excavator operator and the maintenance personnel must familiarize themselves with the automatic fire-extinguishing system.

Such instruction should be given by a qualified instructor.

The fire-extinguishing system is activated automatically in an emergency.

Refill extinguishers immediately after use ready for further deployment.

In an emergency the fire-extinguishing system is actuated automatically.

Nevertheless particular extinguishing circuit e. g. engine 1 or 2 (LH or RH) can be actuated manually.

Inspection

Have the extinguishing system inspected regularly by an expert. This is required by authorities and insurance companies and is in the interest of your own safety.



Have the fire-extinguishing system checked at the prescribed intervals by authorized testing agencies.

Manual activation

- ➔ Pull out ring (1, Fig. 2-29:) on activating unit for corresponding extinguishing circuit.
- ➔ Strike knob (2) hard.

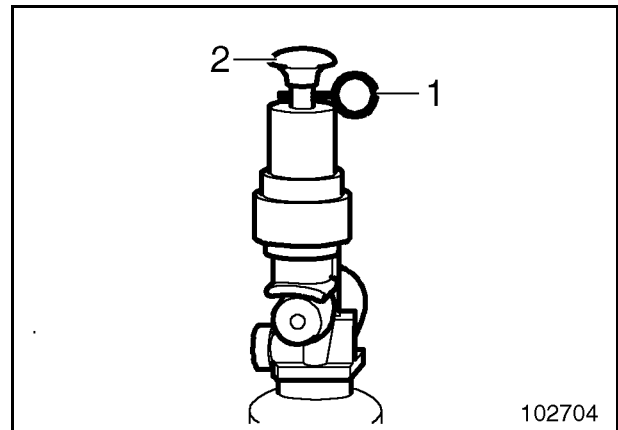


Fig. 2-29:

Fig. 2-30: shows a activating unit.

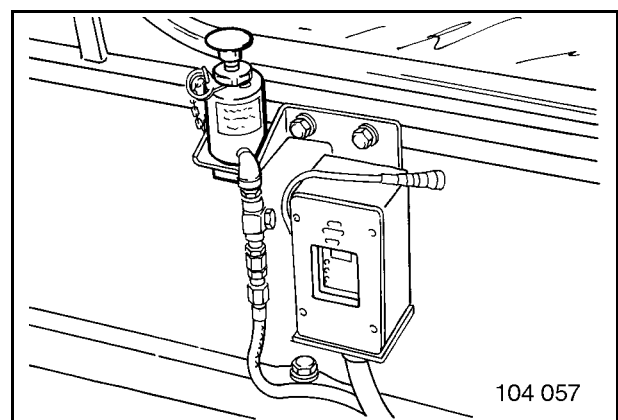


Fig. 2-30:

Harness (optional)

Elements of the harness

(Fig. 2-31:- Fig. 2-33:)

Pos.	Designation
1	Back support
2	Shoulder belt
3	Shoulder belt
4	Loop (chest belt)
5	Loop (chest belt)
6	Loop (back support)
11	Holding device
12	Fall arrester
13	Guidance line
14	Hanging up line
15	Handbag with harness
16	Snap hook
17	Hook safety device

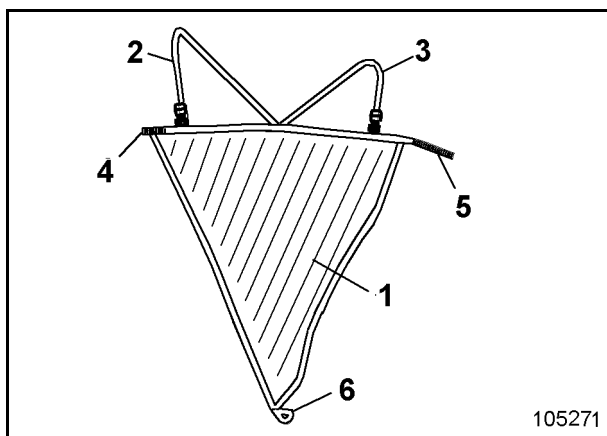


Fig. 2-31:

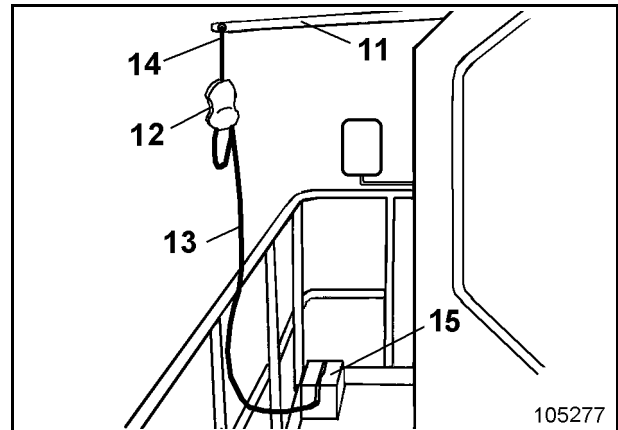


Fig. 2-32:

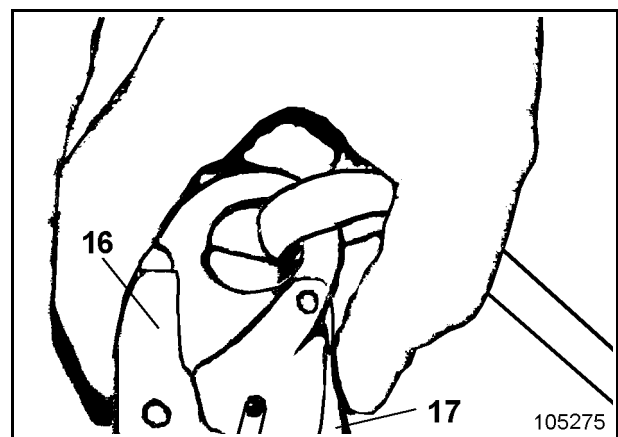


Fig. 2-33:



See Description of the supplier

Important hints

Before using operator shall have received adequate training

The harness must be used by one person only.

He is responsible for the appropriate use and maintenance.

Visual inspection is recommended prior to each use; if necessary it must be checked by an expert.

Harness must be checked annually (every 12 month) by an expert.

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Taking on harness

- Take harness out of handbag (15, Fig. 2-34:)

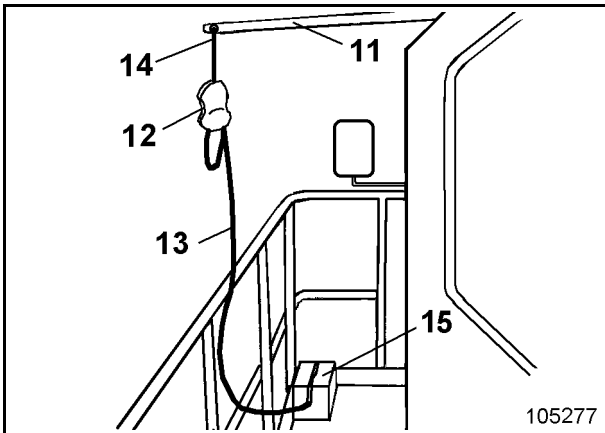


Fig. 2-34:

- Take on shoulder belts (2 and 3, Fig. 2-35:)

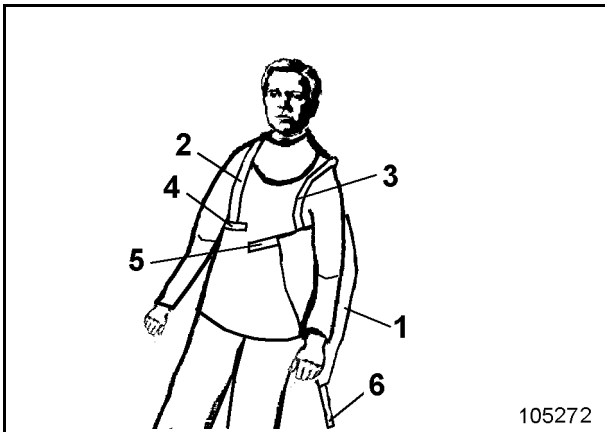


Fig. 2-35:

- Pull back support (1, Fig. 2-35:) behind your body (Fig. 2-36:)

The loops (4 and 5) are in front of your body.

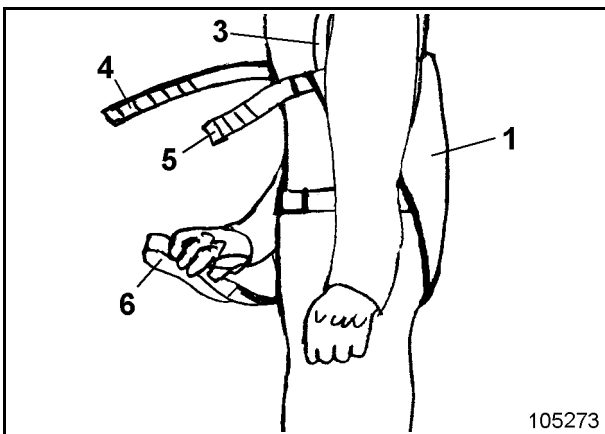


Fig. 2-36:

- Pull loop (6) of the back support (1) between your legs to the front (Fig. 2-36:)
- Pull loop (5, Fig. 2-37:) through loop (6).

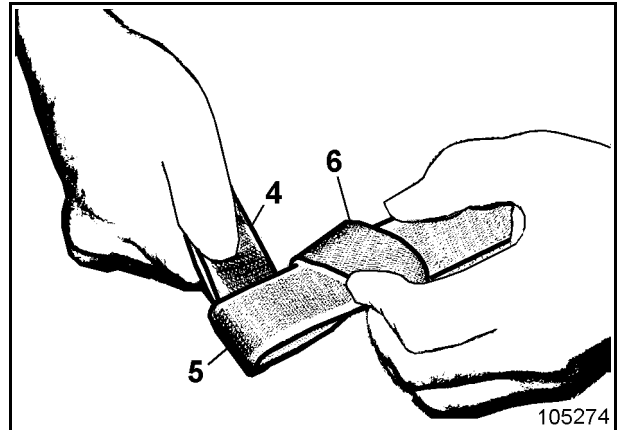


Fig. 2-37:

- Pull loop (4, Fig. 2-37:) through loop (5).
- Press the hooking safety device (17, Fig. 2-37:) of the snap hook (16).

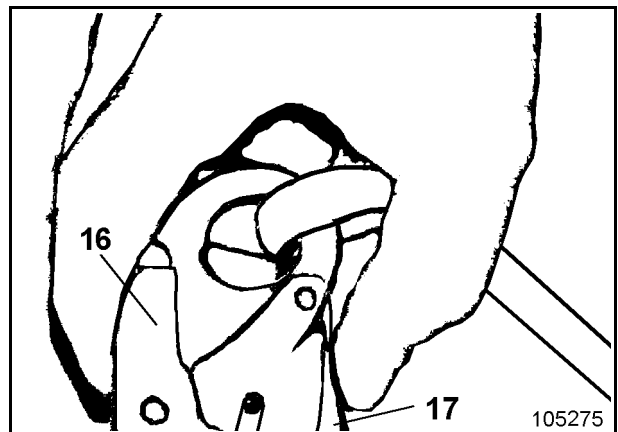


Fig. 2-38:

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- ➡ Hang up loop (4, Fig. Fig. 2-39:) into snap hook (16)

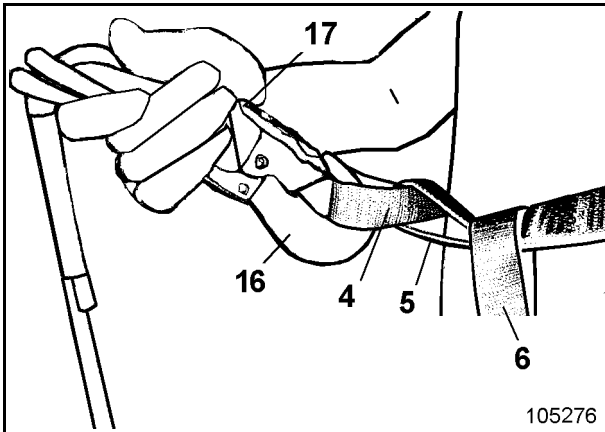


Fig. 2-39:

- ➡ Release hooking safety device (17, Fig. 2-40:)

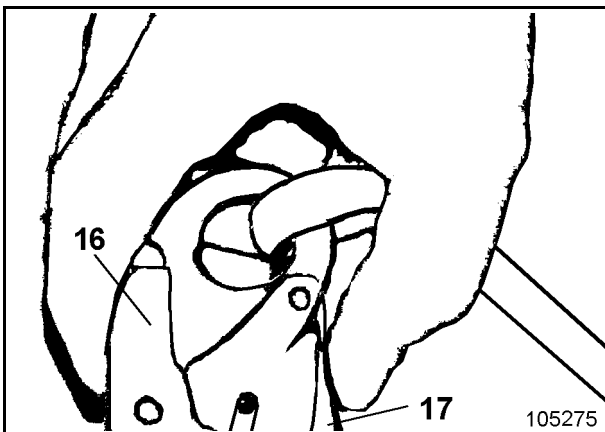


Fig. 2-40:

If you have the harness put on in such a way in case of danger you can escape from the excavator (Fig. Fig. 2-41:).

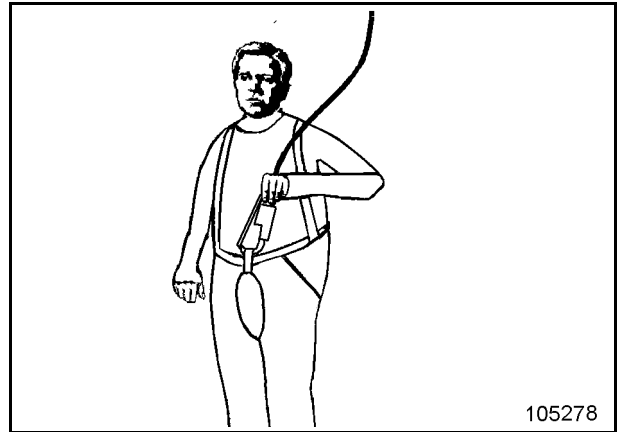


Fig. 2-41:

MONITORING, WARNING AND CONTROL ELEMENTS

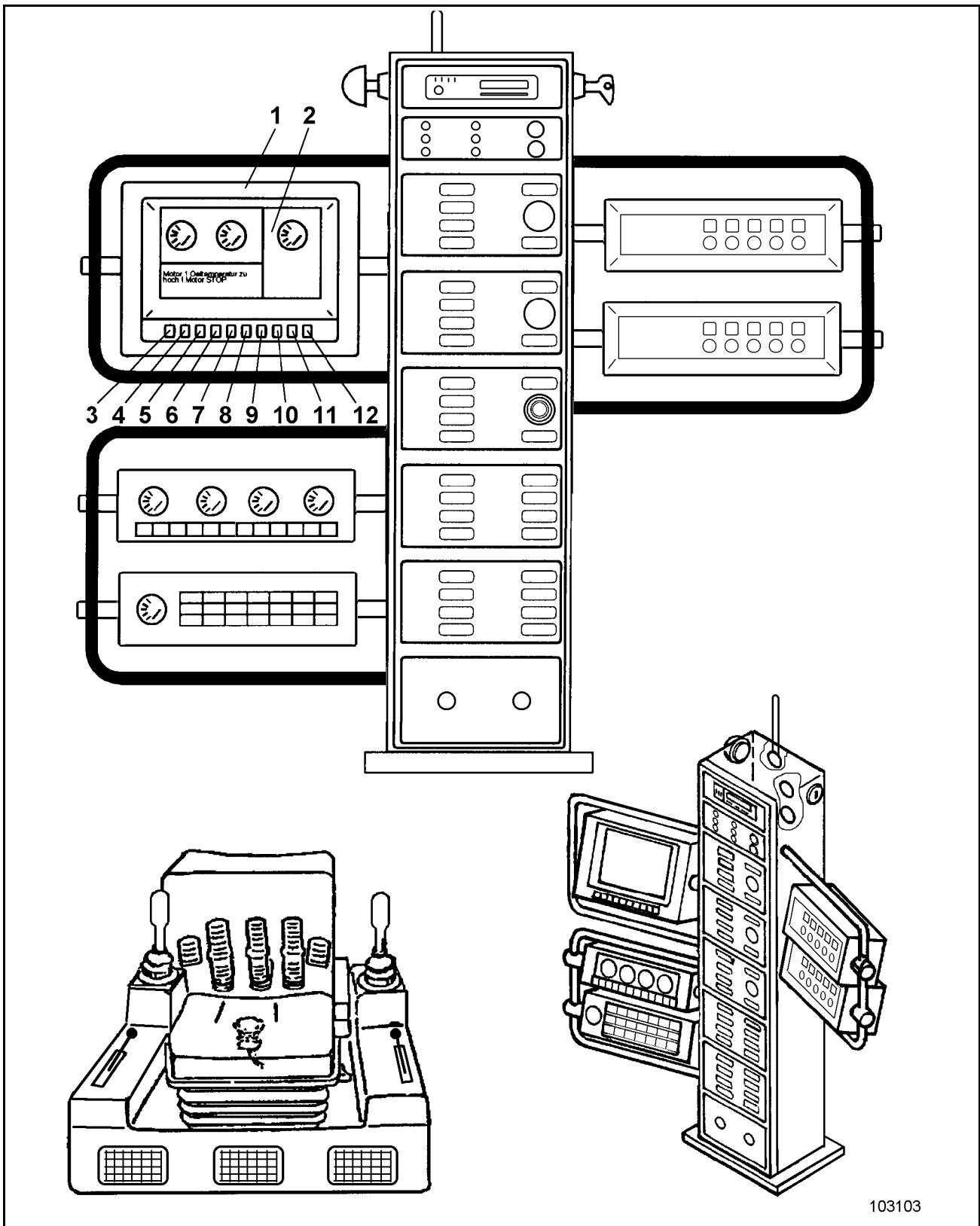


Fig. 2-42:

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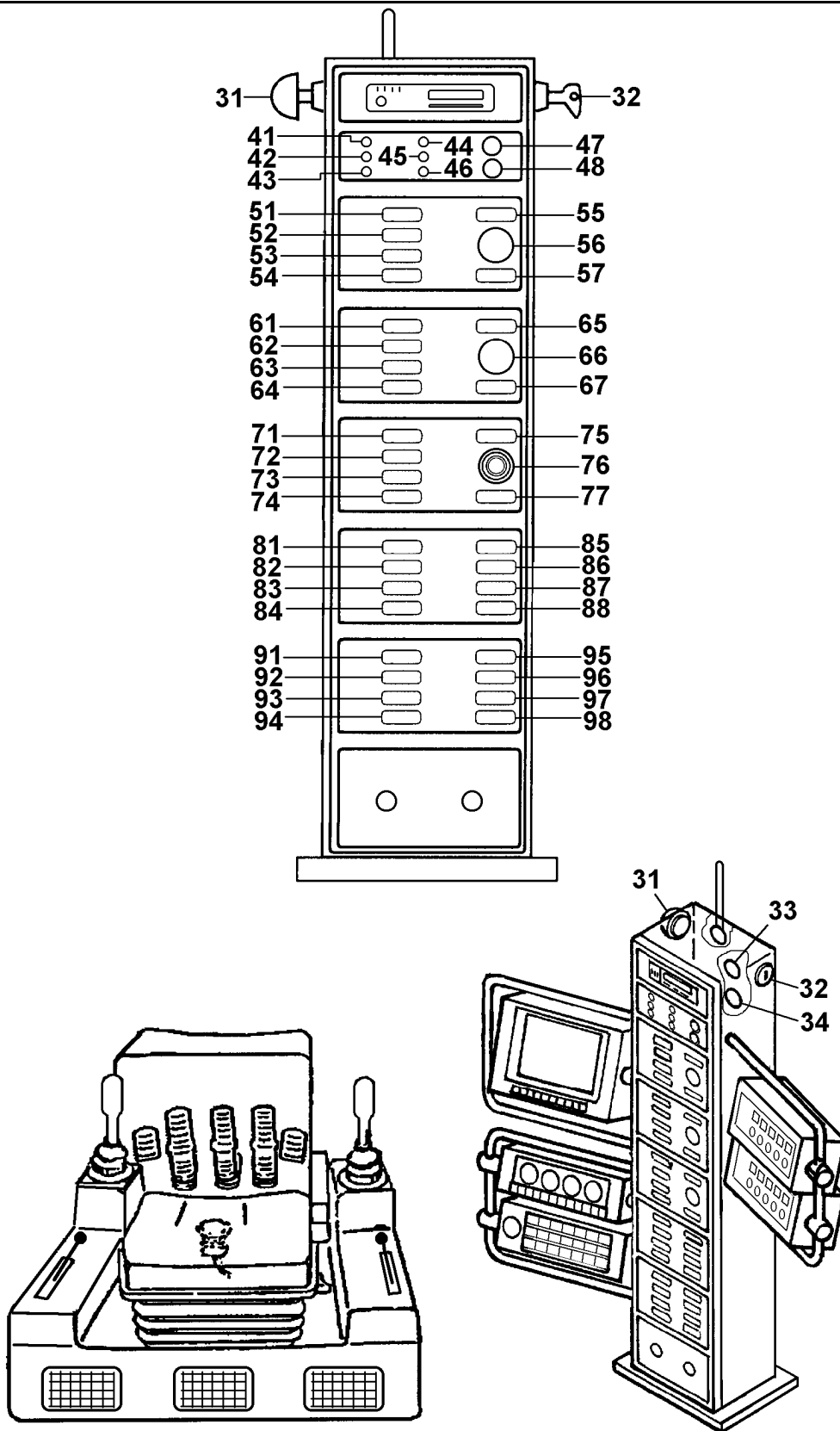


(Fig. 2-42:)

No.	Element	Function	Symbol
1	BCS Electronic measuring-data collection and processing system	Collection of essential operating data of the excavator	
2	Monitor BCS	Displays the data collected. Gives warnings and provides help, if desired.	
3	UP button	Selects the BCS program Positions the Cursor	
4	DOWN button	Selects the BCS program Positions the Cursor	
5	ENTER button	Confirms a program Activates a desired program	
6	BACK button	Recalls the Service Menu	
7	HOLD button	Freezes actual service data	
8	Print button	Recalls the Print Menu	
9	SERV. button	Recalls the Service Menu	
10	HELP button	Recalls the Help Menu	
11	BL + button	Adjusts BCS monitor background lighting	
12	BL - button	Adjusts BCS monitor background lighting	

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Fig. 2-43

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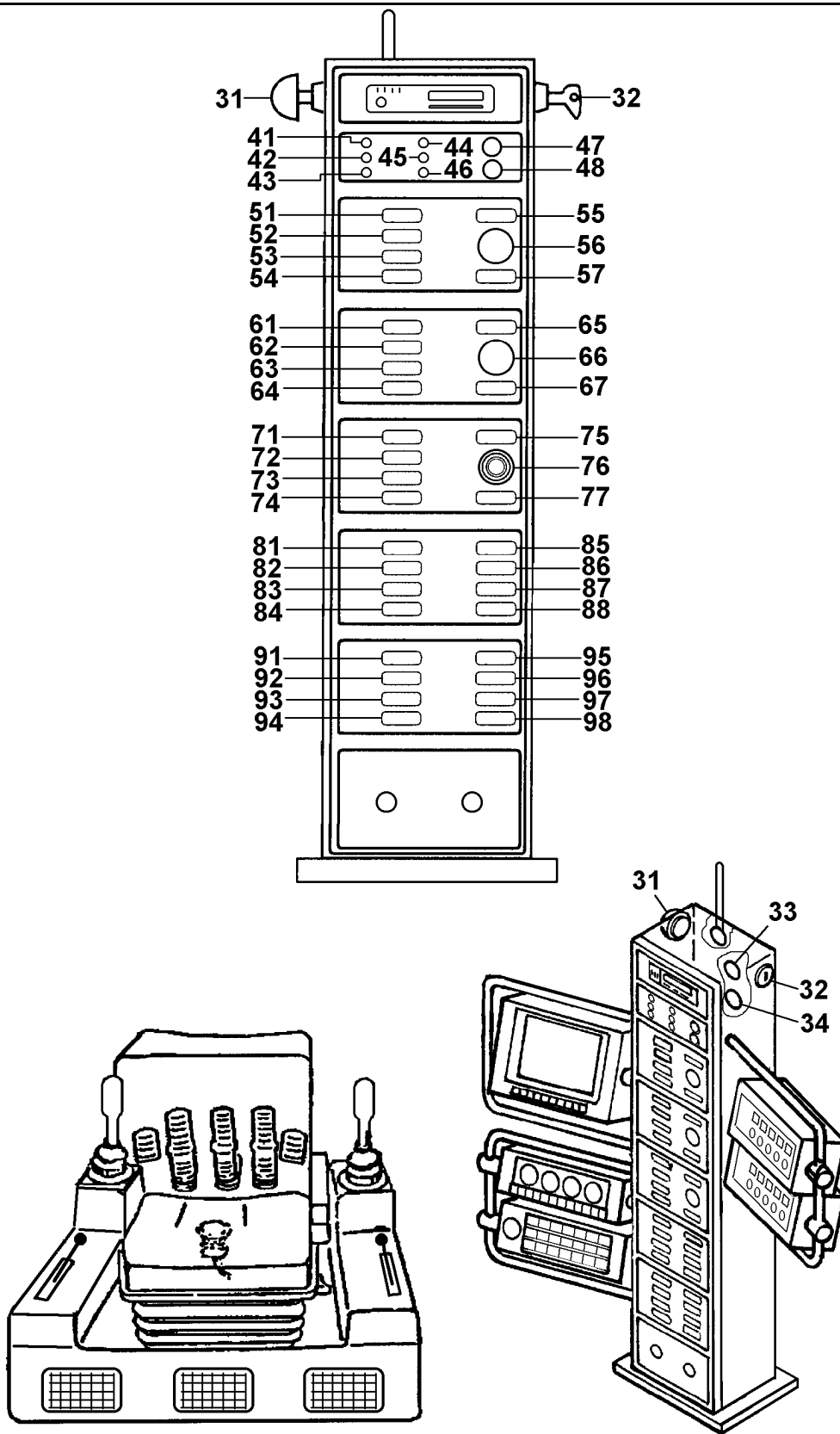


Fig. 2-43

No.	Element	Function	Symbol
31	Botton Emergency OFF	Shuts off the whole electrical system	
32	Key-switch	Switches the electrical system on and off	
33	Buzzer	Gives an acoustic warning signal if a fault is reported - Fault in engine system (engine 1 and/or 2; left and/or right) - Coolant level (engine 1 and / or 2; left and / or right) too low - Engine oil pressure (engine 1 and / or 2; left and / or right) too low - Engine oil temperature (engine 1 and / or 2; left and / or right) too high - Hydraulic oil level too low - Distributor gearbox temperature (1 and / or 2; left and / or right) too high - Slewing pump temperature (1 and / or 2; left and / or right too high - Slewing gearbox temperature (1 and / or 2) too high - Fault in lubricating system  Lower the equipment to the ground and shut off engin immediately if the buzzer (33) sounds and the BCS indicates a fault. The buzzer (33) continues to sound until the fault has been retified.	

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Fig. 2-44:

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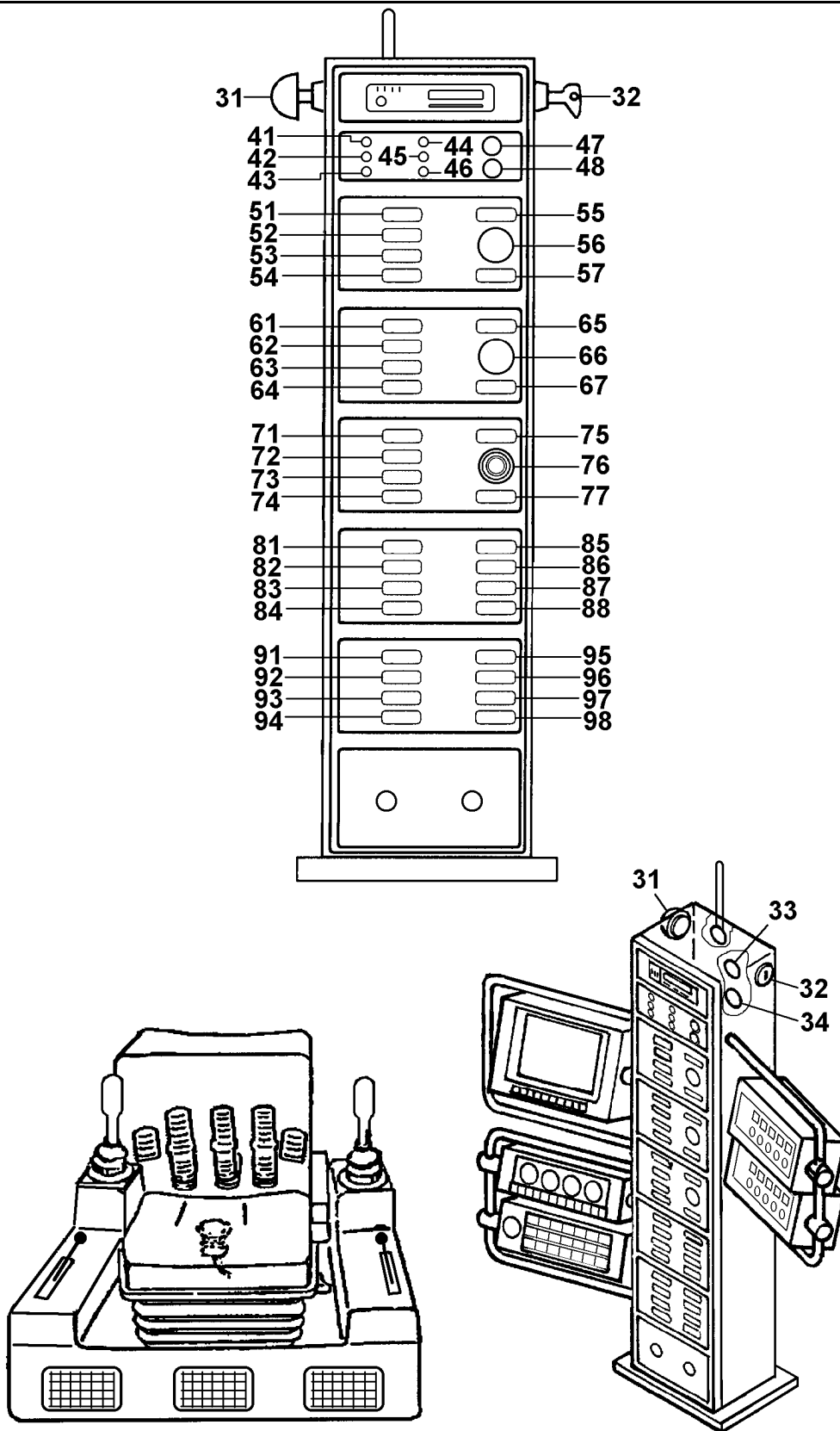


Fig. 2-44:

No.	Element	Function	Symbol
33	Buzzer (continued)	Gives an acoustic warning signal if a fault is reported ▪ Engine oil level (engine 1 and / or 2; left and / or right) too low ▪ Distributor gearbox (1 and / or 2; left and / or right) contaminated ▪ Working pump (1, 2, 3, and / or 4; left and / or right) contaminated ▪ Slewing motor (1, and / or 2) contaminated ▪ Slewing circuit temperature (1 and / or 2) too high ▪ Lubricating system pressure too low ▪ Grease level in lubricating system too low ▪ On-board voltage 24 V too low  The buzzer (33) continues to sound until the fault has been rectified.	
34	Buzzer	Gives an acoustic warning signal when the stick/boom angle is too small.	

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Fig. 2-45:

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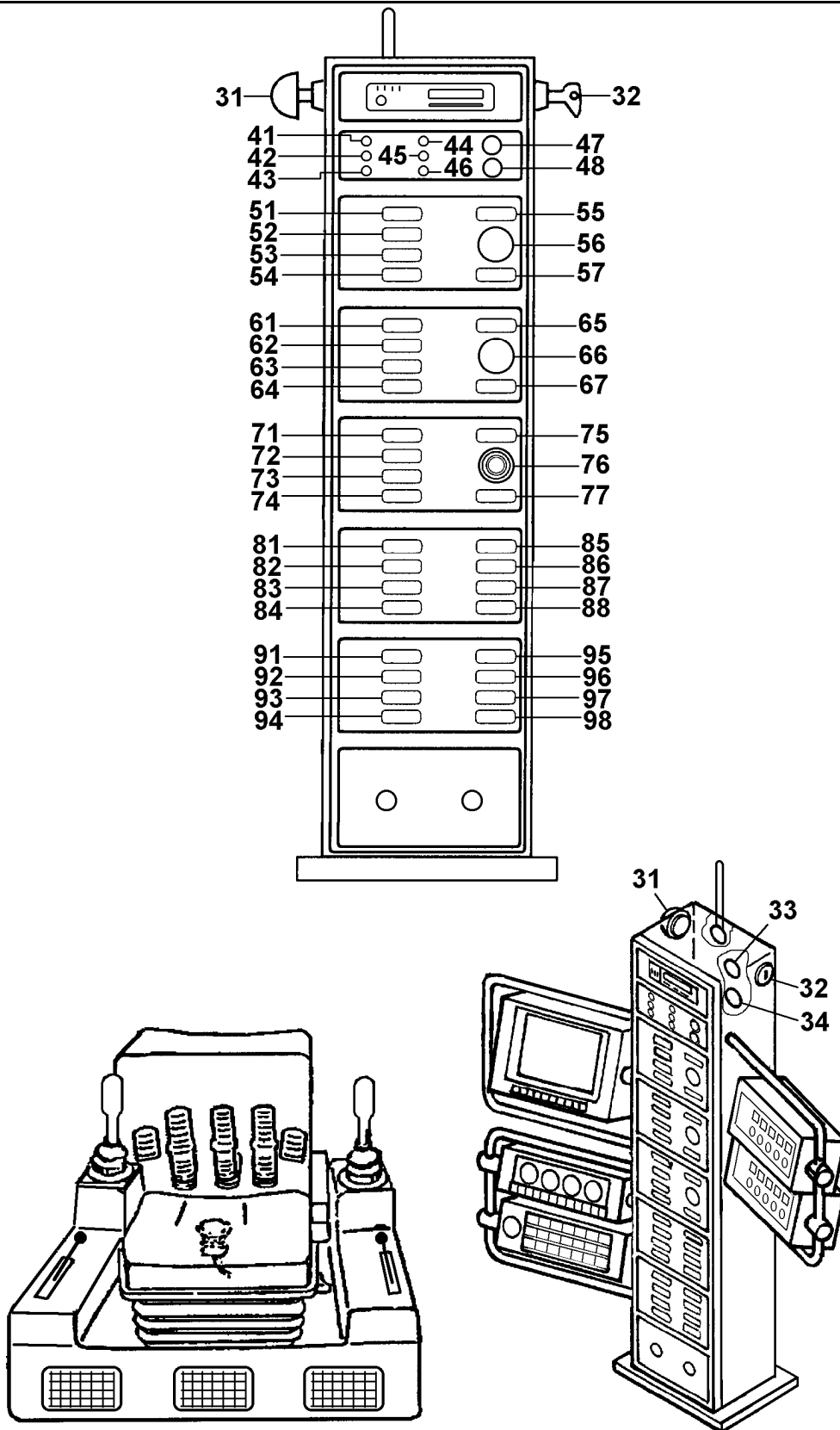


Fig. 2-45:

No.	Element		Function	Symbol
41	Warning lamp	CELECT warning (left engine 1)	Lamp is lit up in the event of an Celect fault. The lamp moreover indicates the fault code. Contact Terex O&K after-sales service or engine manufacturer. (see switches 55 and 57)	CELECT Warning
42	Warning lamp	CELECT warning (left engine 1)	Lamp is lit up in the event of an Celect fault. The lamp moreover indicates the fault code. Shut off the engine Stop working Contact Terex O&K after-sales service or engine manufacturer. (see switches 55 and 57)	CELECT Stop
43	Warning lamp	CELECT warning (left engine 1)	Lamp is lit up (e.g.): - when the engine oil pressure is too low - when the cooling water temperature is too high Shut off the engine	CELECT Engine Protection
44	Warning lamp	CELECT warning (right engine 2)	Lamp is lit up in the event of an Celect fault. The lamp moreover indicates the fault code. Contact Terex O&K after-sales service or engine manufacturer. (see switches 65 and 67)	CELECT Warning
45	Warning lamp	CELECT warning (right engine 2)	Lamp is lit up in the event of an Celect fault. The lamp moreover indicates the fault code. Shut off the engine Stop working Contact Terex O&K after-sales service or engine manufacturer. (see switches 65 and 67)	CELECT Stop
46	Warning lamp	CELECT warning (right engine 2)	Lamp is lit up (e.g.): - when the engine oil pressure is too low - when the cooling water temperature is too high Shut off the engine	CELECT Engine Protection
47	Indicator lamp	Boom/stick angle (optional)	Lamp is lit up when the boom/stick angle is in normal working range.	
48	Indicator lamp	Boom/stick angle (optional)	Lamp is lit up when the boom/stick angle is in hazard range. (the tracks may be damaged by the working equipment) Increase the angle. The buzzer (34) sounds until the angle has resumed the normal working range.	

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Fig. 2-46:

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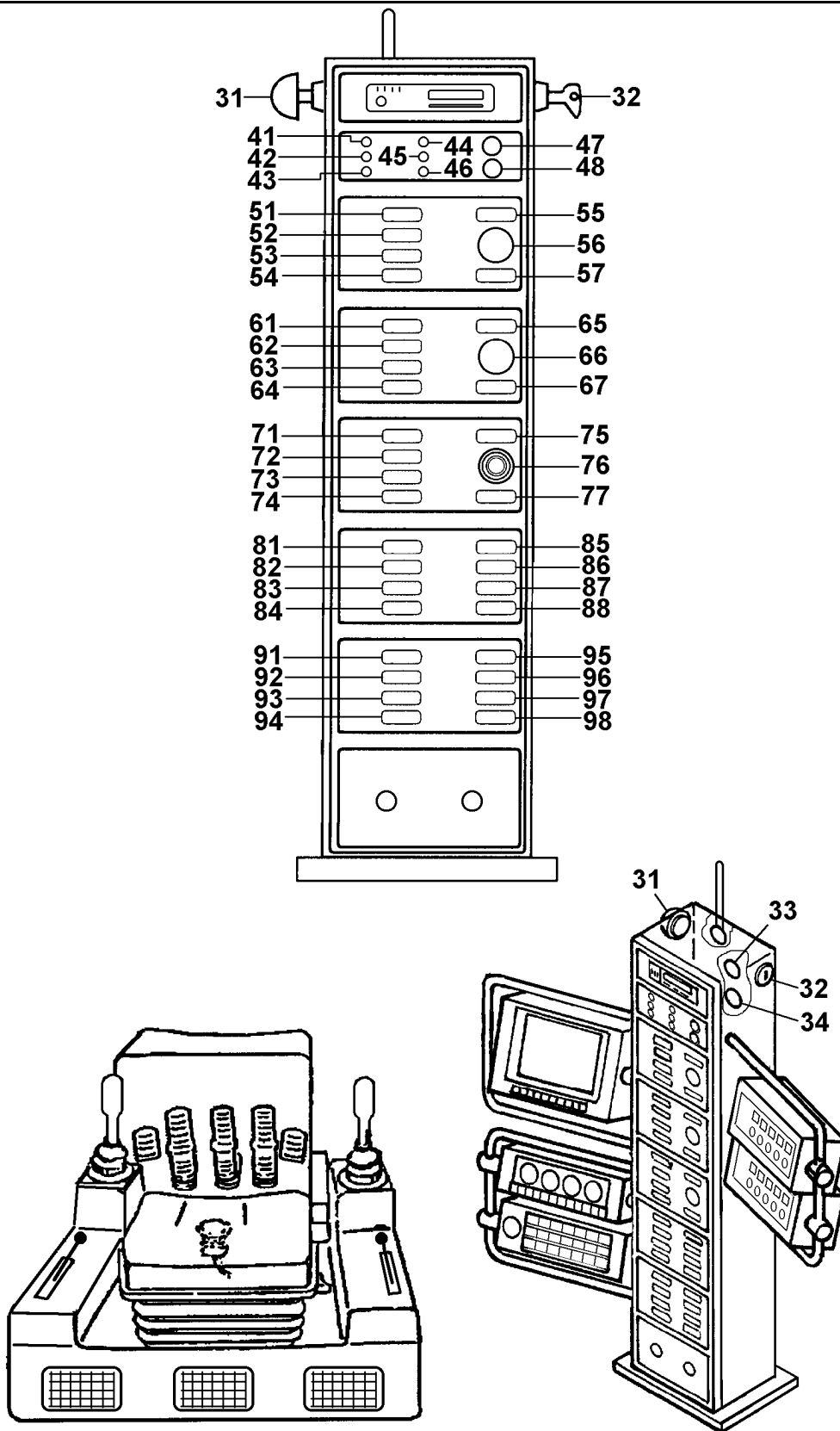


Fig. 2-46:

No.	Element	Function	Symbol
51	Button	Not connected	
52	Button Starting (left engine 1)	Starts the engine Hold switch approx. 5 – 7 sec. This is necessary to start and pressurize the engine`prelup system After then the engine starts automatically.	
53	Button Stopping (left engine 1)	Shuts off the engine	
54	Switch Idling (left engine 1)	Shuts off the engine with 5 minutes`after run.	
55	Button Engine monitor (left engine 1)	Diagnose ON/OFF	
56	Speed adjustment Potentiometer (left engine 1)	Regulates the engine speed ▪ turn CCW to limit stop: idling speed ▪ turn CW to limit stop: full-load speed	
57	Button Engine monitor (left engine 1)	Listing of fault codes see warning lamps (41 and 42) Increment Decrement	

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Fig. 2-47:

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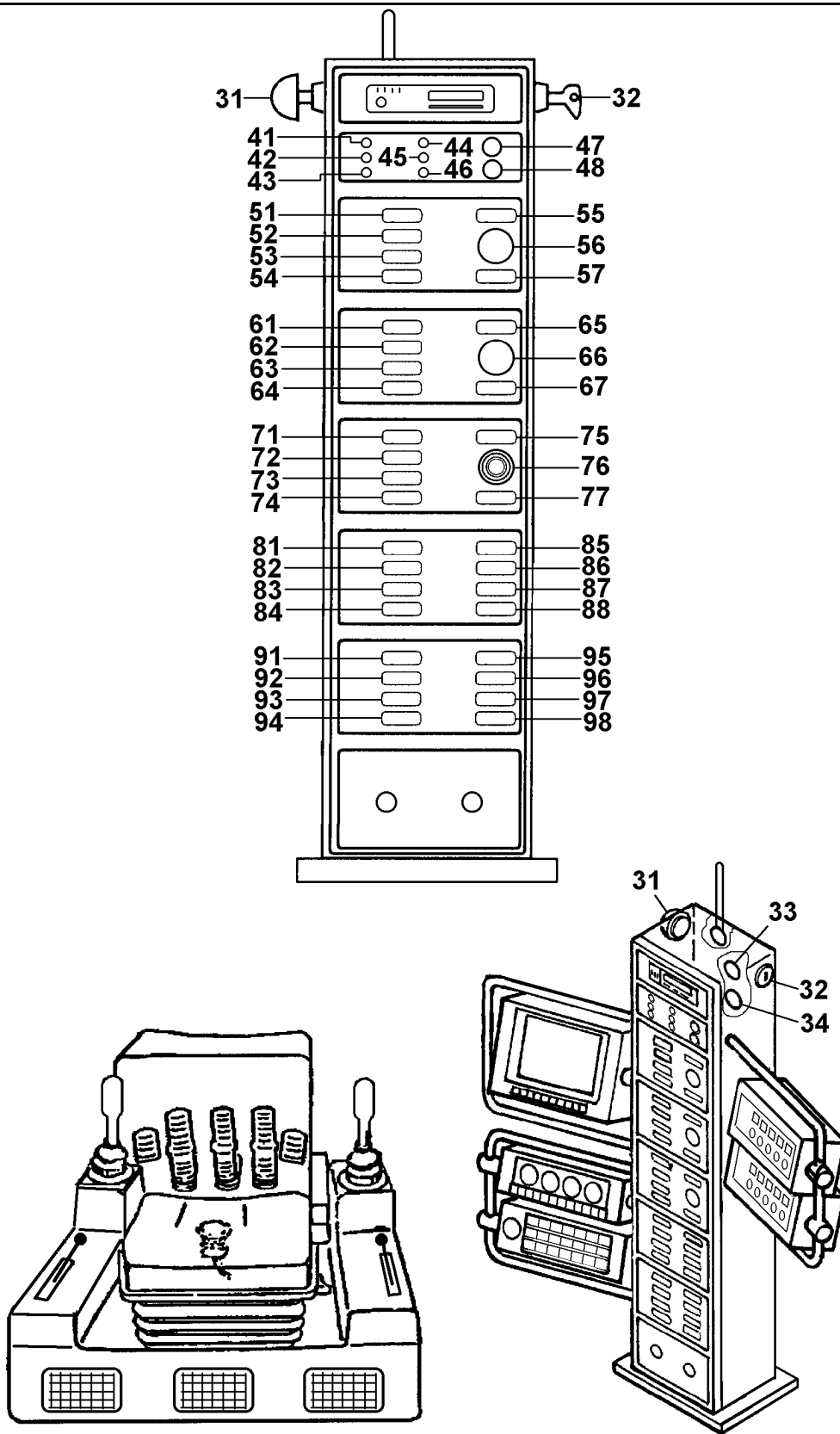


Fig. 2-47:

No.	Element	Function	Symbol
61	Button	Not connected	
62	Button Starting (right engine 2)	Starts the engine Hold switch approx. 5 – 7 sec. This is necessary to start and pressurize the engine`prelup system After then the engine starts automatically.	
63	Button Stopping (right engine 2)	Shuts off the engine	
64	Switch Idling (right engine 2)	Shuts off the engine with 5 minutes`after run.	
65	Button Engine monitor (right engine 2)	Diagnose ON/OFF	
66	Speed adjustment Potentiometer (right engine 2)	Regulates the engine speed ▪ turn CCW to limit stop: idling speed ▪ turn CW to limit stop: full-load speed	
67	Button Engine monitor (right engine 2)	Listing of fault codes see warning lamps (44 and 45) Increment Decrement	

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Fig. 2-48:

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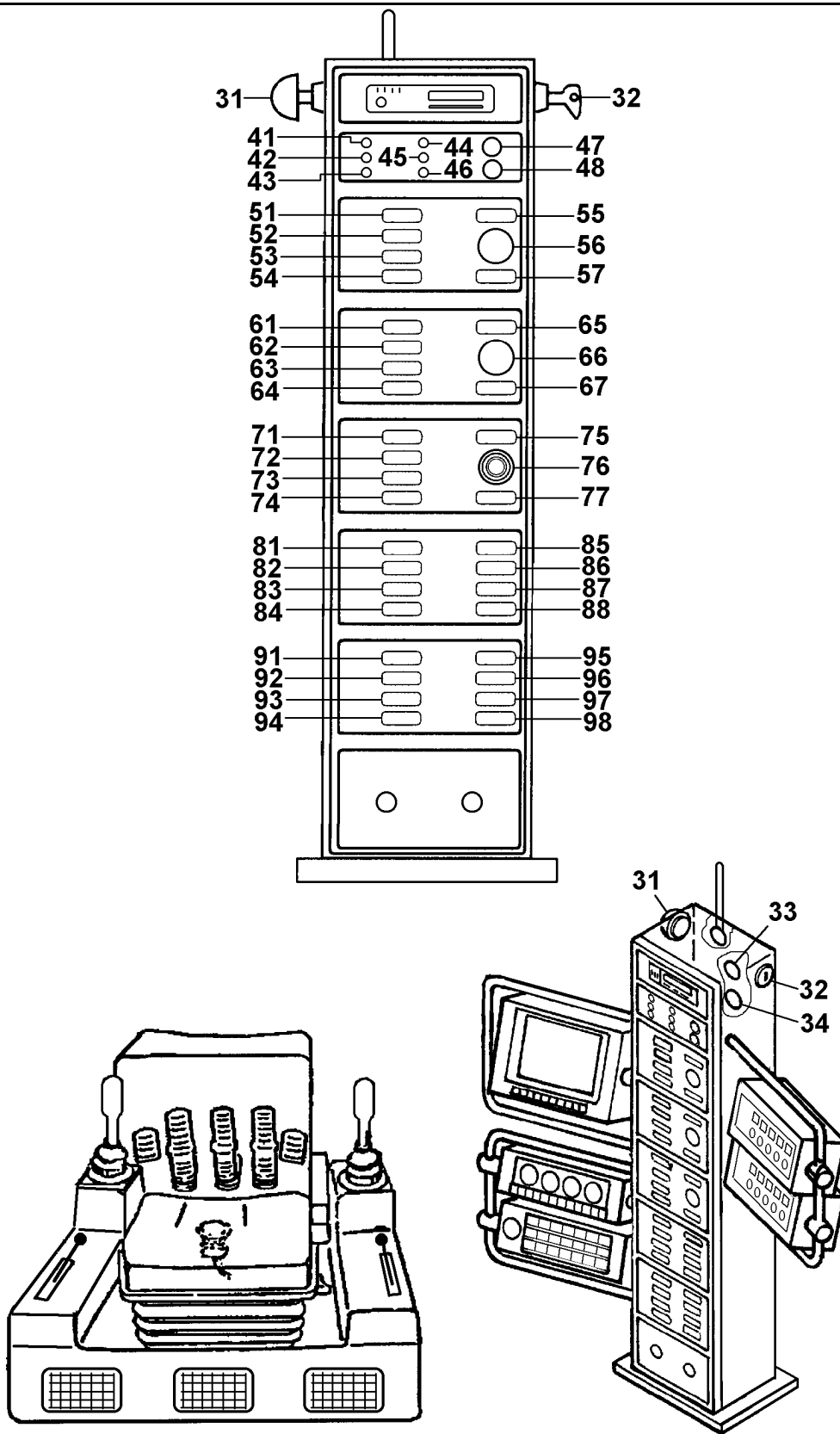


Fig. 2-48:

No.	Element	Function	Symbol
71	Switch Travel motors	Preselection: CW: 1st gear stage forward / reverse travel CCW: 2nd gear stage (fast gear) Only parallel forward travel is possible. When the switch is in this position and another travel function (e.g. reverse travel) is switched on, there is an automatic change to 1st gear.	
72	Switch Undercarriage holding brake	CCW: brake permanently applied The excavator can not be driven CW: Every time the excavator stops, the undercarriage brake is automatically applied after approx. 8 sec. The undercarriage brake is automatically released when the travel function is activated. Actuate switch only when the excavator is stationary. Do not use as service brake.	
73	Taster Reset	Activate after a fault in the central lubricating system	
74	Switch Electronic excavator control	Switches on the electronic servo control	
75	Switch ECO (Power Control)	Adjusts the hydraulic power (flow rate) CCW – 80 % of hydraulic power CW 100 % of hydraulic power	
76	Cigarette lighter		
77	Switch Engine speed reduction	CCW: normal operation with automatic diesel engine speed reduction; active during operation pauses. CW: automatic speed reduction off	

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Fig. 2-49:

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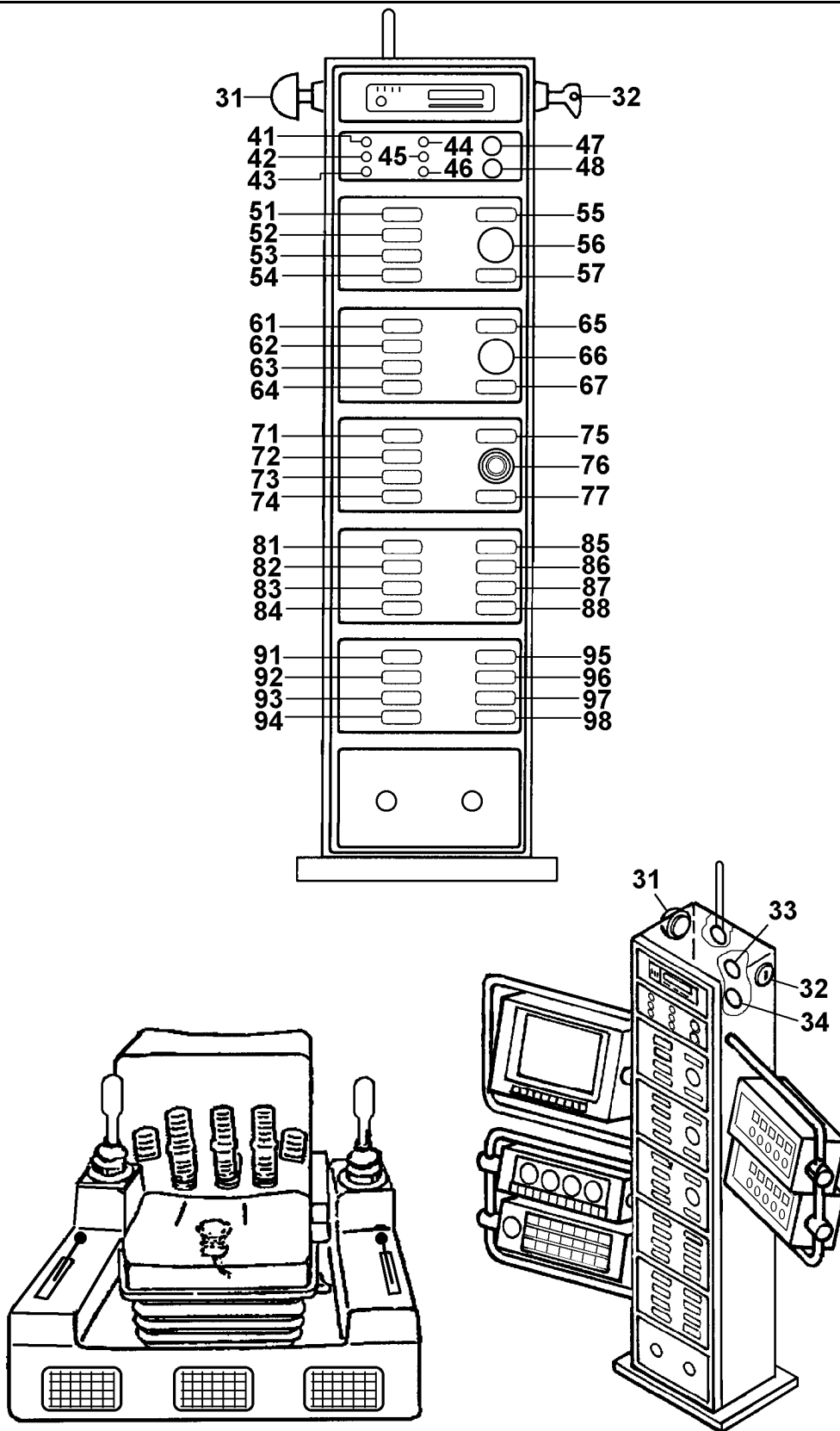


Fig. 2-49:

No.	Element	Function	Symbol
81	Switch	free for options	
82	Switch Superstructure holding brake	Blocks the superstructure  Actuate switch only when the excavator is stationary. Do not use as service brake.	
83	Switch Windscreen wiper	Activates permanent / intermittent wiping	
84	Switch Screen washer	Activates the wipe / wash function	
85	Switch Floodlamps	Switches on the floodlamps on the driver's cab	
86	Switch Floodlamps	Switches on the floodlamps on the hydraulic oil cooler	
87	Switch Floodlamps	Switches on the floodlamps on the counter-weight	
88	Switch Floodlamps	Switches on the floodlamps on the platform	

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Fig. 2-50:

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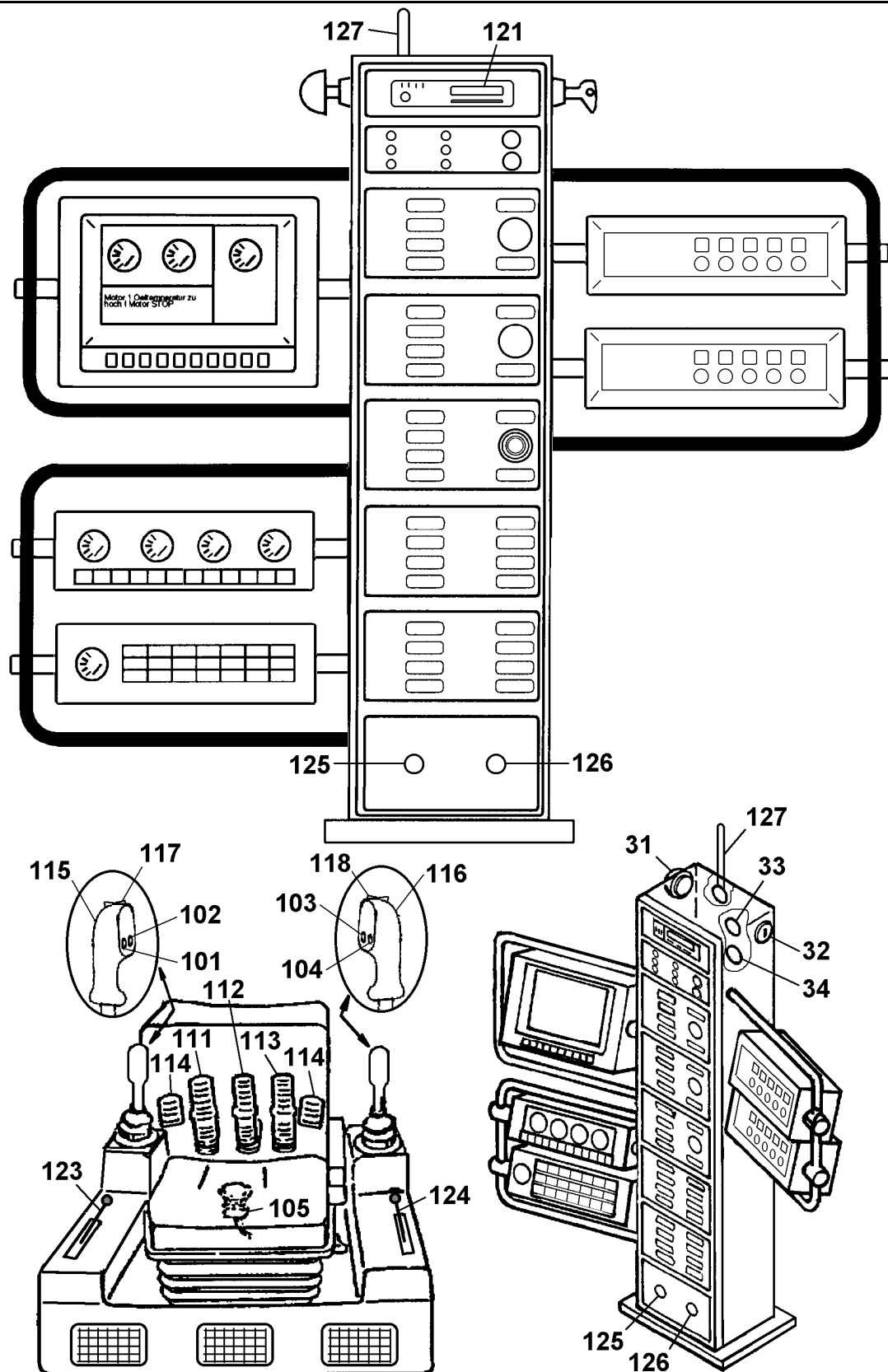


Fig. 2-50:

No.	Element	Function	Symbol
91	Switch Emergency Operation Boom/Stick	Lowens the boom and stick when actuated in an emergency.	
92	Button Counting dumper	RESET	
93	Switch Stick cylinder switch-off (optional) bypass		
94	Switch Fuel pre-heating (optional)	Switches on the the pre-heating system for the fuel	
95	Switch Lighting	Switches on the lighting for servicing work.	
96	Switch Lighting	Switches the cab lighting on and off.	
97	Switch Windscreen wiper rear window (optional)	Activates permanent wiping	
98	Switch Beacon (optional)	Switches the beacon on and off.	

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Fig. 2-51:

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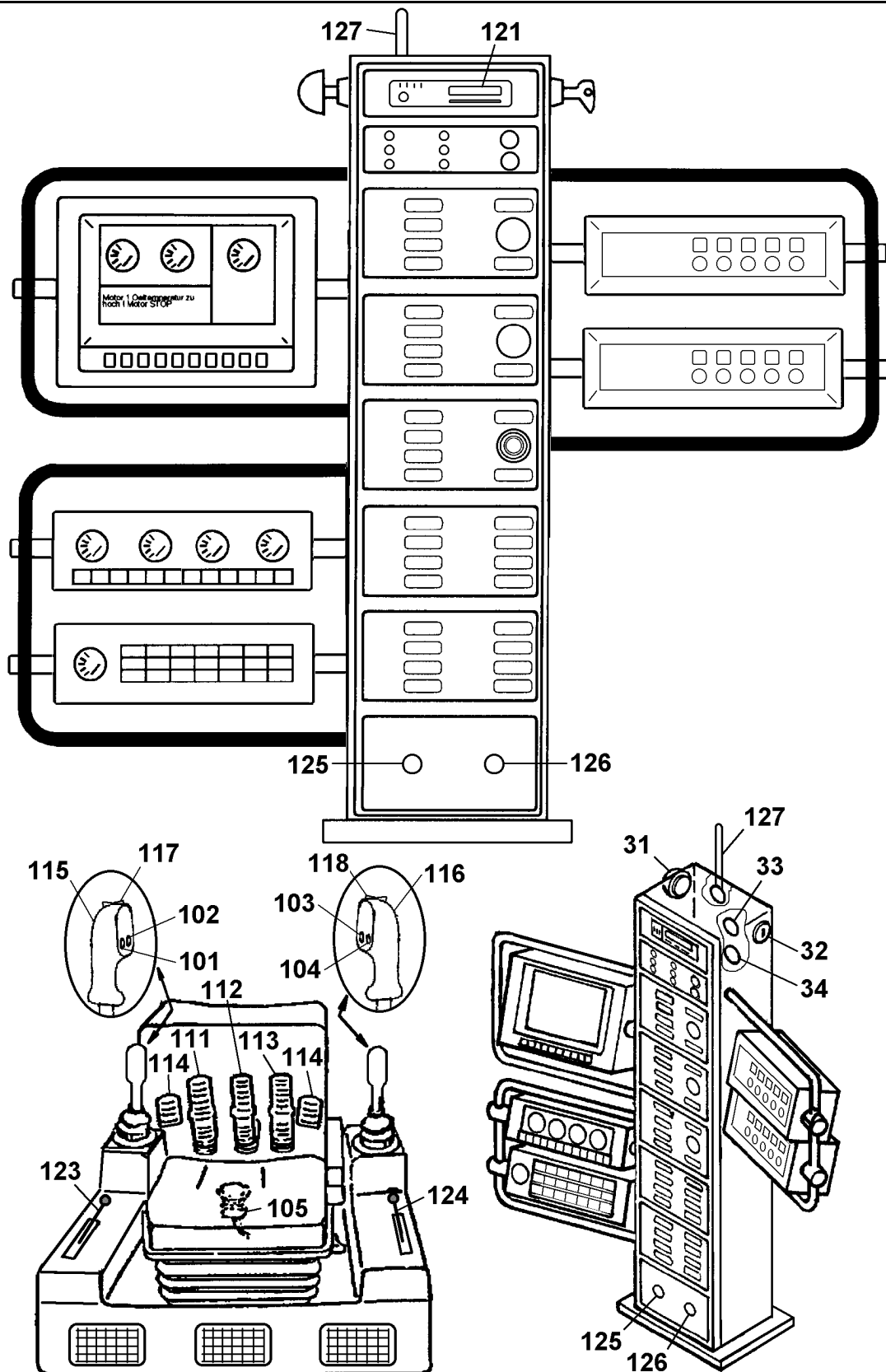


Fig. 2-51:

No.	Element	Function	Symbol
101	Button Counting dumper	Reset with switch (92)	
102	Button Stick floating position (only for loading shovel equipment)	If actuated: stick cylinders are pressurized when retracted  Actuate button (102) only when control lever (115) is in "0" position.	
103	Button Boom floating position	If actuated: boom cylinders are pressurized when retracted  Actuate button (103) only when control lever (116) is in "0" position.	
104	Button Warning signal	Activates the horn	
105	Button Electronic excavator control	Switches the electronic excavator control on and off.	
111	Pedal Bottom-dump bucket (only for loading shovel equipment)	Opens / closes the bottom-dump bucket.	
112	Pedal Travelling, left track	forwards / reverse	
113	Pedal Travelling, right track	forwards / reverse	
114	Foot rest		
115	Control lever	Lifts and lowers the bucket / backhoe bucket stick; Slews and brakes the superstructure.	
116	Control lever	Raises and lowers the boom; Tipping and rearward tilting of bucket resp. backhoe bucket.	
117	Button (from machine 120 025 no. onwards) Bottom-dump bucket (only for loading shovel equipment)	To the left – opens the bottom-dump bucket. To the right – closes the bottom-dump bucket.	
118	Button (from machine 120 025 no. onwards) Dumper count	To the left – increment count. To the right – decrement count.	

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Fig. 2-52:

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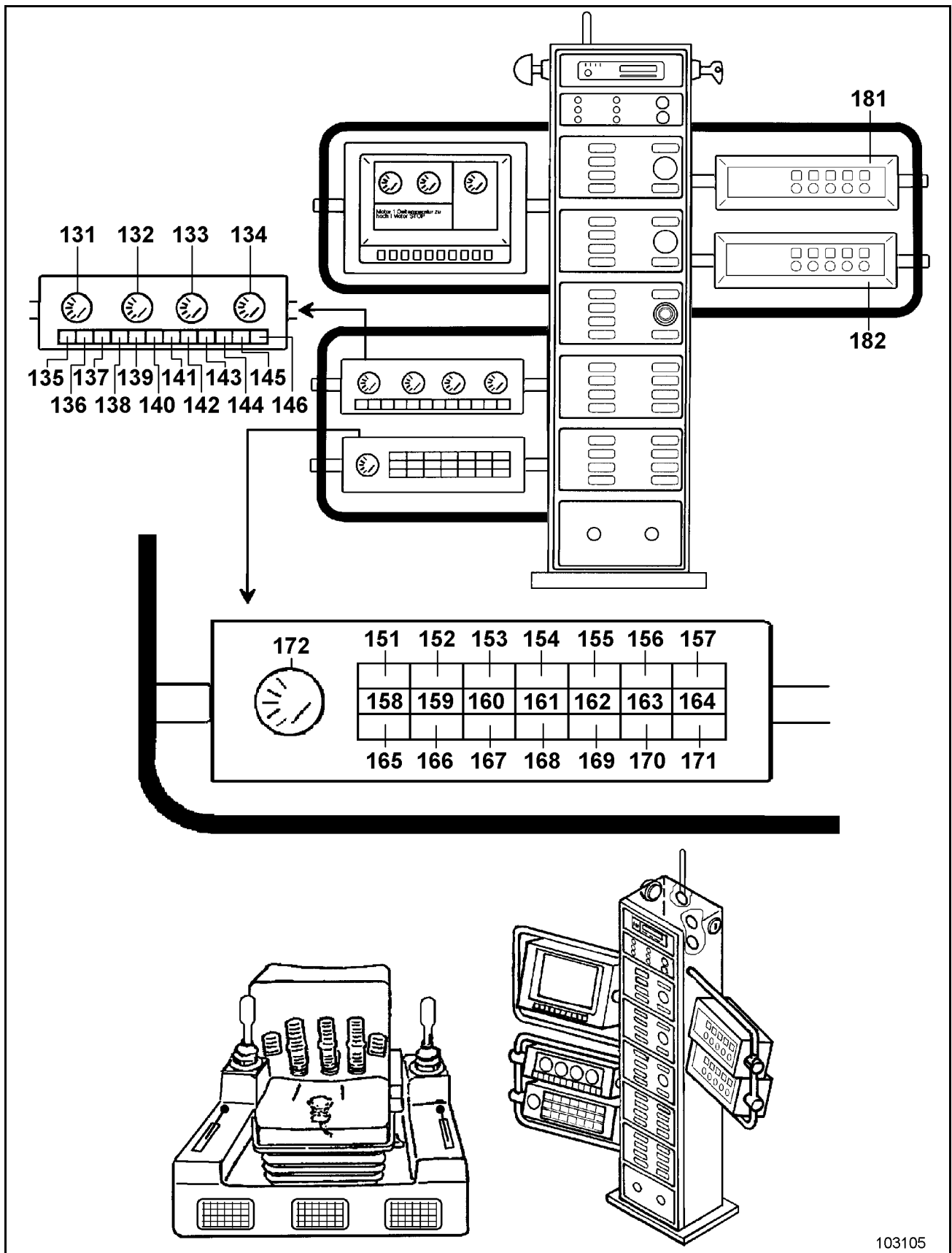


Fig. 2-52:

No.	Element	Function	Symbol
121	Radio (optional)		
123	Lever Locking the left console	Lever vertical – console locked. Pushed forward – locking released. Console can be displaced.	
124	Lever Locking the right console	Lever vertical – console locked. Pushed forward – locking released. Console can be displaced.	
125	Warning lamp Oil interval prolonging (left engine 1, optional)	lamp is lit up, when one oil pump is running flashes or pulsates, when both oil pump are running	
126	Warning lamp Oil interval prolonging (right engine 2, optional)	lamp is lit up, when one oil pump is running flashes or pulsates, when both oil pump are running	
127	Antenna (optional)		

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Fig. 2-53:

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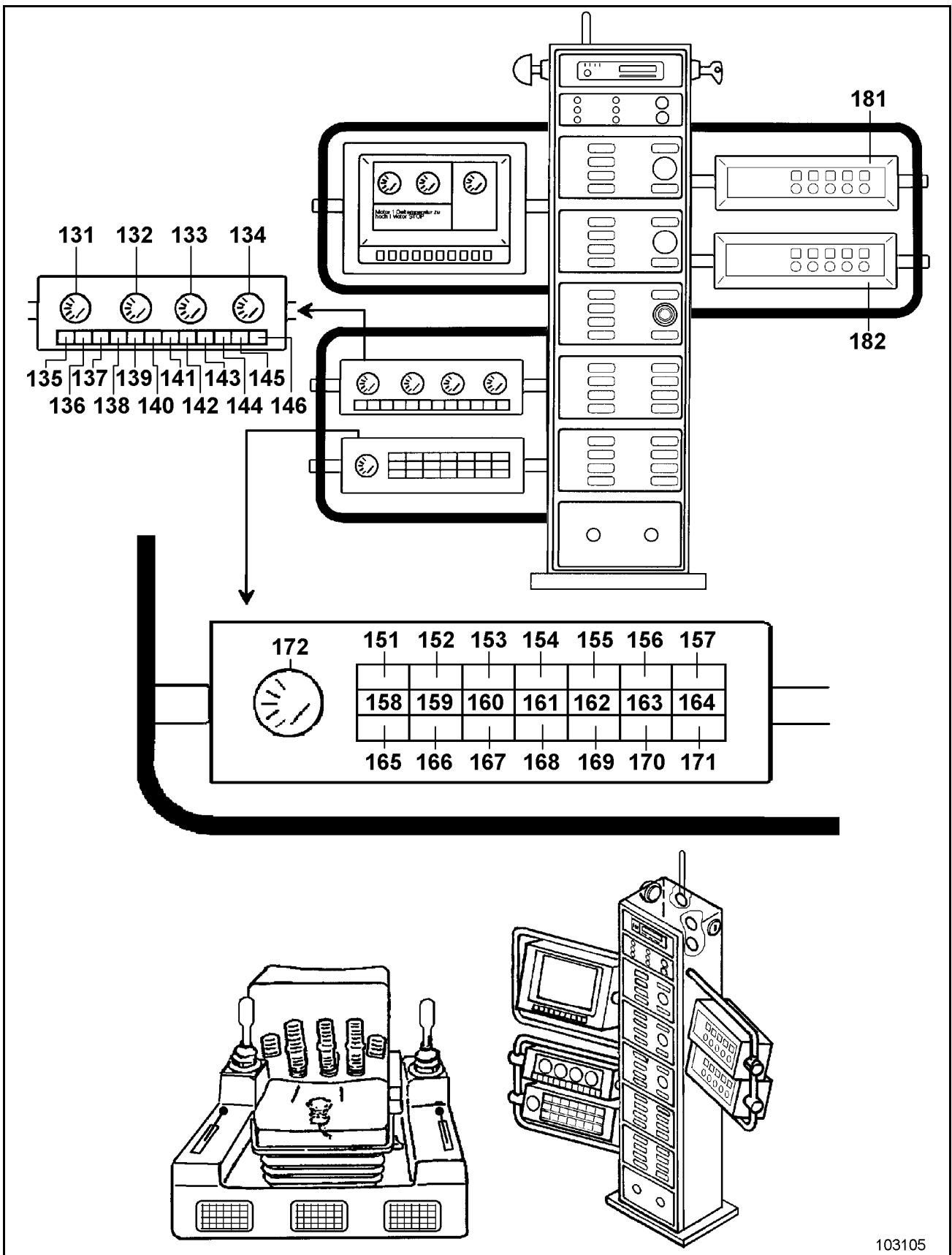


Fig. 2-53:

No.	Element	Function	Symbol
131	Pressure gauge Engine oil pressure (engine 1 left)	Indicates the oil pressure in the diesel engine lubricating system	
132	Thermometer Engine temperature (engine 1 left)	Indicates the cooling-water temperature	
133	Pressure gauge Engine oil pressure (engine 2 right)	Indicates the oil pressure in the diesel engine lubricating system	
134	Thermometer Engine temperature (engine 2 right)	Indicates the cooling-water temperature	
135	Warning lamp Alternator (engine 1 left)	Lits up when the batteries are not recharged	
136	Warning lamp Engine oil pressure (engine 1 left)	Lits up when the engine oil pressure is too low	
137	Warning lamp IDLE-Auto (engine 1 left)	Lights during the engine's run-down phase of 5 minutes	
138	Warning lamp Engine temperature (engine 1 left)	Lits up when the engine temperature is too high	
139	Warning lamp Cooling water level (engine 1 left)	Lits up when the cooling-water level is too low	
140		free for optional	
141	Warning lamp Alternator (engine 2 right)	Lits up when the batteries are not recharged	
142	Warning lamp Engine oil pressure (engine 2 right)	Lits up when the engine oil pressure is too low	
143	Warning lamp IDLE-Auto (engine 2 right)	Lights during the engine's run-down phase of 5 minutes	
144	Warning lamp Engine temperature (engine 2 right)	Lits up when the engine temperature is too high	
145	Warning lamp Cooling water level (engine 2 right)	Lits up when the cooling-water level is too low	
146		free for optional	

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Fig. 2-54:

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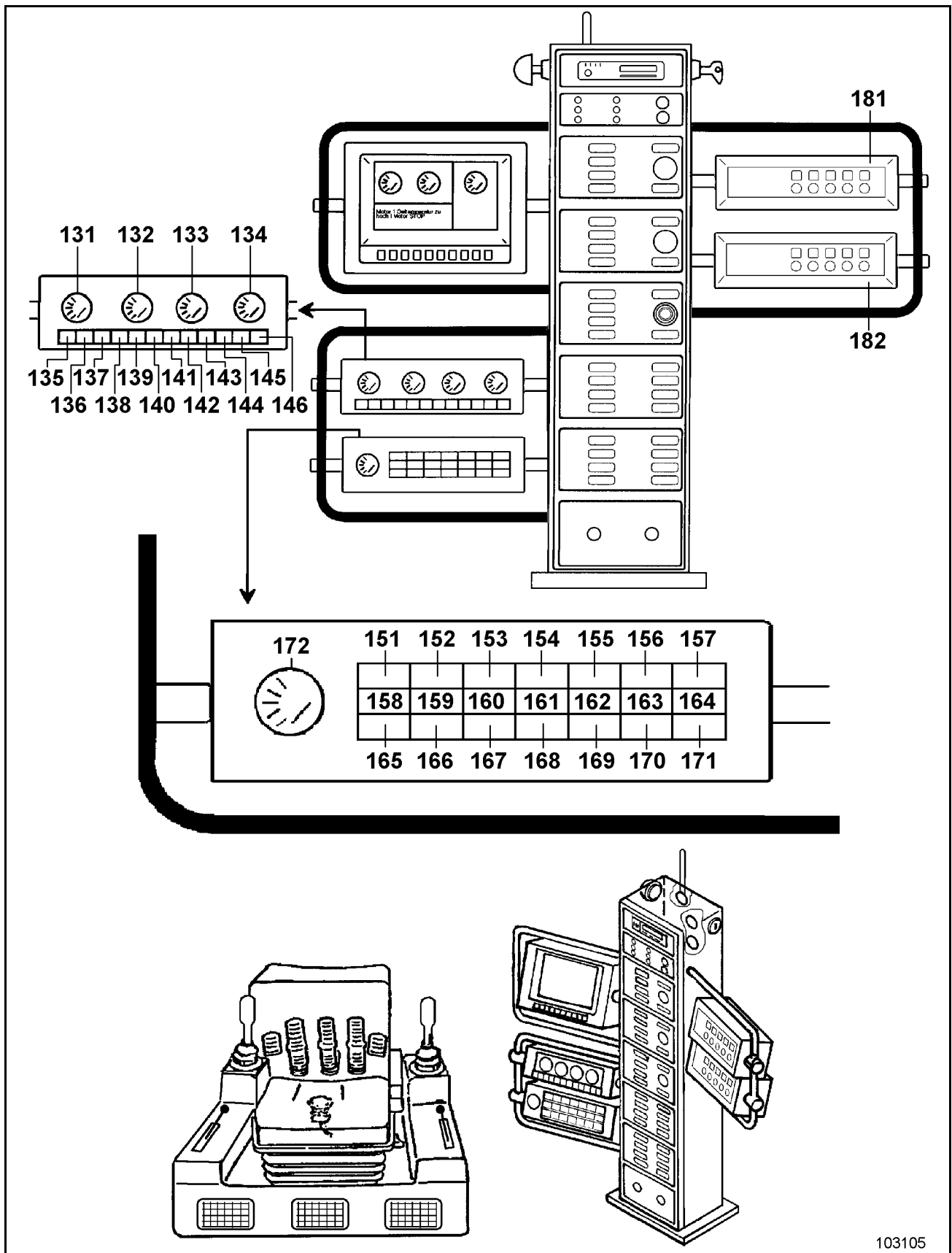


Fig. 2-54:

No.	Element	Function	Symbol
151	Warning lamp Slewing pump contaminated	1 Lights up when the slewing pump is contaminated with metal particles.	
152	Warning lamp Slewing pump contaminated	2 Lights up when the slewing pump is contaminated with metal particles.	
153	Warning lamp Slewing pump contaminated	3 Lights up when the slewing pump is contaminated with metal particles.	
154	Warning lamp Slewing pump contaminated	4 Lights up when the slewing pump is contaminated with metal particles.	
155	Warning lamp Main pump 1 contaminated	Lights up when the main pump is contaminated with metal particles.	
156	Warning lamp Main pump 2 contaminated	Lights up when the main pump is contaminated with metal particles.	
157	Warning lamp Distributor gearbox 1 left contaminated	Lights up when the distributor gearbox is contaminated with metal particles.	
158	Warning lamp Slewing pump temperature	1 Lights up when the temperature in the slewing pump is too high	
159	Warning lamp Slewing pump temperature	2 Lights up when the temperature in the slewing pump is too high	
160	Warning lamp Slewing pump temperature	3 Lights up when the temperature in the slewing pump is too high	
161	Warning lamp Slewing pump temperature	4 Lights up when the temperature in the slewing pump is too high	
162	Warning lamp Main pump 3 contaminated	Lights up when the main pump is contaminated with metal particles.	
163	Warning lamp Main pump 4 contaminated	Lights up when the main pump is contaminated with metal particles.	
164	Warning lamp Distributor gearbox 2 right contaminated	Lights up when the distributor gearbox is contaminated with metal particles.	

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Fig. 2-55:

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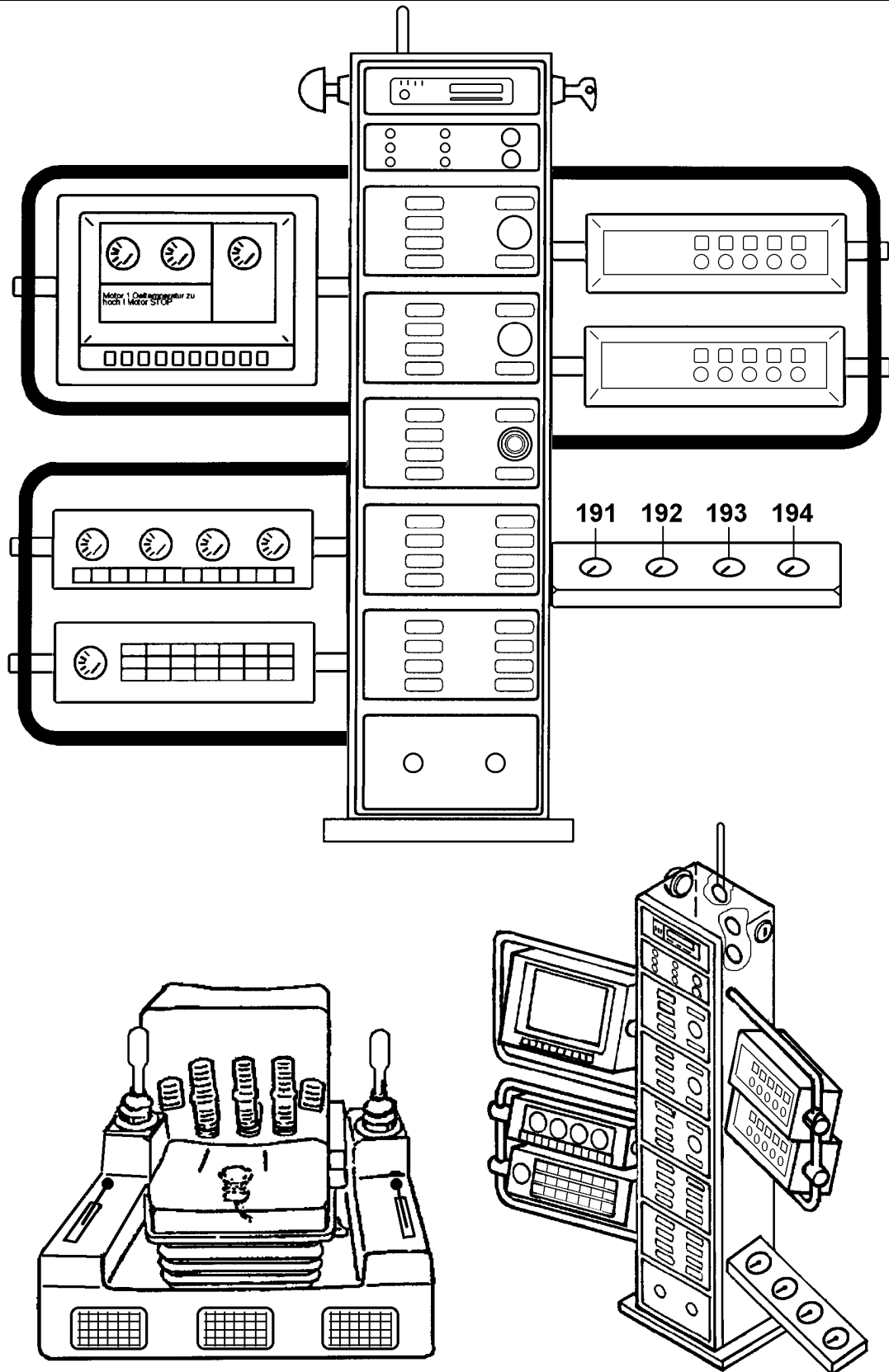


Fig. 2-55: (optional)

No.	Element	Function	Symbol
165	Warning lamp Slewing motor contaminated 1	Lights up when the slewing motor is contaminated with metal particles.	
166	Warning lamp Slewing motor contaminated 2	Lights up when the slewing motor is contaminated with metal particles.	
167	Warning lamp	free for optional	
168	Warning lamp Hydraulic oil filter contaminated	Lights up when the flow resistance in the filter is too high. Replace filter elements if the warning lamp fails to go out when the oil is at operating temperature.	
169	Warning lamp Min. hydraulic oil level	Lights up when the hydraulic oil level in the hydraulic tank is too low.	
170	Warning lamp Electronic excavator control ON	Lights up when the electronic excavator control is switched on.	
171	Indicator light Hydraulic oil tank	Lights up when one of the shut-off valves of the hydraulic oil tank is closed  When the left valve is closed, the LH engine cannot be started. When the right valve is closed, the RH engine cannot be started. When the center valve is closed none of the two engines can be started. When a shutoff valve is closed with the engines running, the respective engine or both engines are stopped.	
172	Thermometer Hydraulic oil	Indicates hydraulic oil temperature in hydraulic tank	
181	Control unit Air conditioner (optional)		
182	Control unit Heating (optional)		

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Fig. 2-56:

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Fig. 2-56: (optional)

No.	Element		Function	Symbol
191	Underpressure gauge	Air filter (left engine 1, outside)	Indicates the underpressure in the air filter. Underpressure must be less than 635 mm water column.	
192	Underpressure gauge	Air filter (left engine 1, inside)	Indicates the underpressure in the air filter. Underpressure must be less than 635 mm water column.	
193	Underpressure gauge	Air filter (left engine 2, inside)	Indicates the underpressure in the air filter. Underpressure must be less than 635 mm water column.	
194	Underpressure gauge	Air filter (left engine 2, outside)	Indicates the underpressure in the air filter. Underpressure must be less than 635 mm water column.	

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PUTTING THE MACHINE INTO OPERATION

Before daily start-up, carry out works in accordance with servicing plan T (see Part 3 "Inspection and servicing")



Prior to your daily start-up, make sure the machine has been cleaned of combustible and easily flammable substances.

Otherwise, increased fire and explosion hazard will exist.



Check the grounding straps (equipotential bonding) at the tank lift regularly for proper fastening.

Grounding straps can remove voltages and prevent fire during refuelling only when properly fastened.

Refuelling

Refuelling - Safety instructions



Explosion hazard

Avoid open flames and stop smoking. Fuels and fuel gases are inflammable. Risk of fire.

Fuel may cause skin injury. Wear protective gloves or use a barrier cream.

Stand working equipment on the ground.

Shut off the engines.

Do not spill fuel and do not allow fuel to penetrate into the soil. Fuel pollutes the environment.

Wipe off spilt fuel immediately with cleaning rags or soak up with binding agents.

Fuel and cleaning material must be disposed of without polluting the environment.

Report fuel accidents immediately to the user or his representative.

OPERATING INSTRUCTIONS RH 120 E

Operation



Filling in fuel

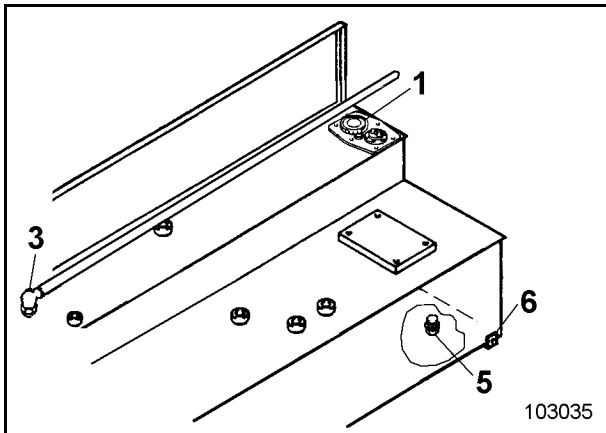


Fig. 2-57:

- ➔ Unscrew cap of filler tube (1, Fig. 2-57:).
- ➔ Fill in fuel through the filter sieve in the filler tube. Do not remove the sieve. A micro filter in the filling line is recommended.

Service station (tanklift)

The excavator is equipped with a central service station (Fig. 2-58: resp. Fig. 2-59:) for refuelling. The service station is attached to the frame and accessible from the ground below the uppercarriage.

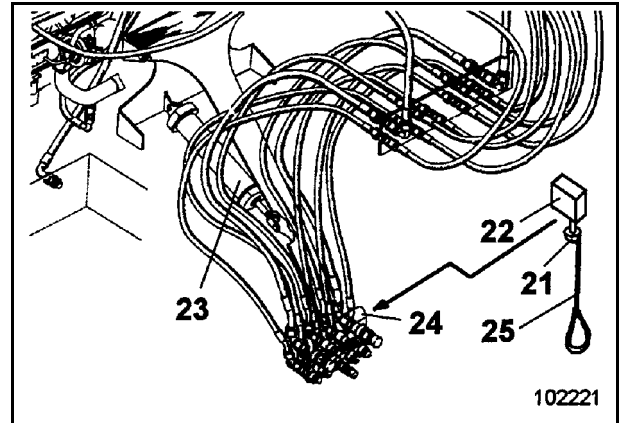


Fig. 2-58:

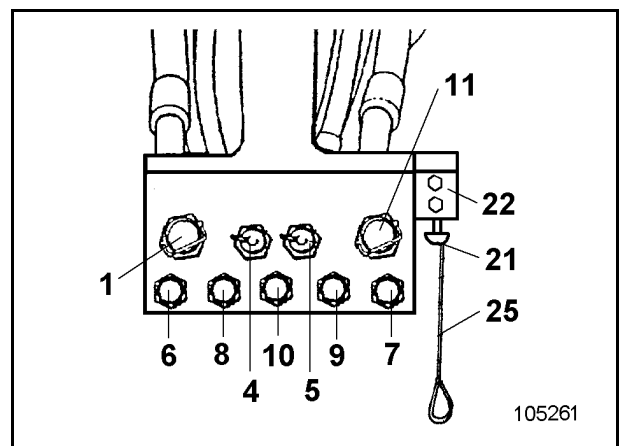


Fig. 2-59:

OPERATING INSTRUCTIONS RH 120 E

Operation



Express couplings are provided for refilling the following consumables (fluids).

Pos. Fig. 2-60:	Fluid	Express coupling for
1	Diesel fuel for lefthand and righthand fuel tank	filling
4	Gearbox oil for left pump transfer gearbox	Filling and/or draining
5	Gearbox oil for right pump transfer gearbox	Filling and/or draining
6	Engine oil for lefthand engine oil tank	Filling and/or draining
7	Engine oil for righthand engine oil tank	Filling and/or draining
8	Engine oil for lefthand engine	Filling and/or draining
9	Engine oil for righthand engine	Filling and/or draining
10	Hydraulic oil tank	Filling and/or draining
11	Grease container	filling

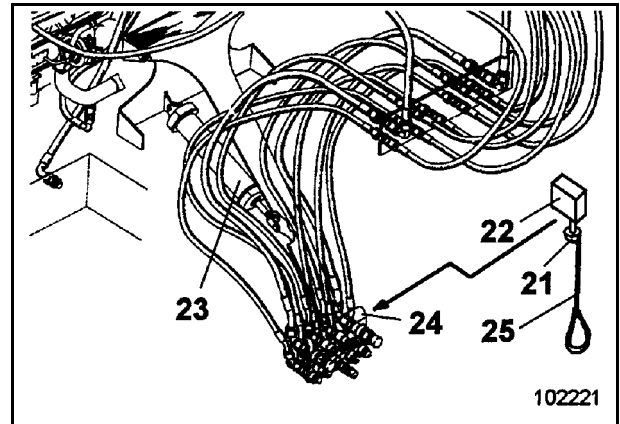


Fig. 2-61:

Lowering the service station

Draw out control knob (21, Fig. 2-61:) of valve (22) with rope (25). The service station is brought down to the lower position. Turn knob (21) by 90° and engage.

Raising the service station

Disengage control knob (21) of valve (22), turn by 90° and press in. The service station is raised to the top position.

Refilling and draining

For filling in or for draining fluids, unscrew the cap of the corresponding express coupling (Fig. 2-60:).

Attach express coupling of filling hose from the service vehicle to the corresponding express coupling at the service station. Fill in or drain off fluid.

Take off filling hose and refit cap on the express coupling.

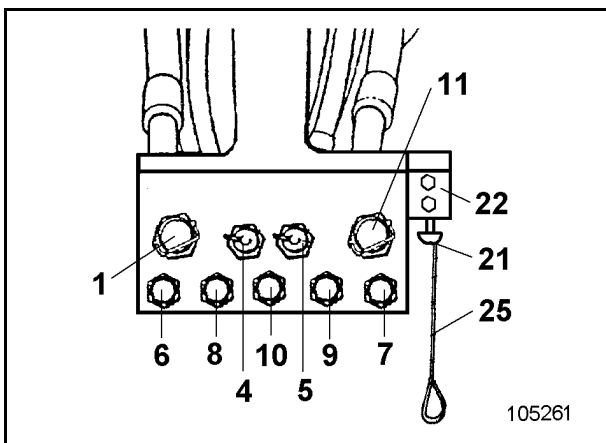


Fig. 2-60:

A service vehicle is needed for filling and/or draining of the fluids.

OPERATING INSTRUCTIONS RH 120 E

Operation



Assemblies resp. reservoirs	Measuring device	Remarks
Fuel tank	BCS fuel indicator (2, Fig. 2-62:)	Stop filling when the fuel tanks are full (service station shuts off automatically by counter-pressure). Optional The fuel level is also indicated on the fuel level gauges (21, Fig. 2-63:) for the right fuel tank and (22) for the left fuel tank. When the battery main switches are in position OFF the immersed tube sensors in both tanks are then electrical activated by toggle switch (23). This is necessary to check the fuel level in both tanks after all.

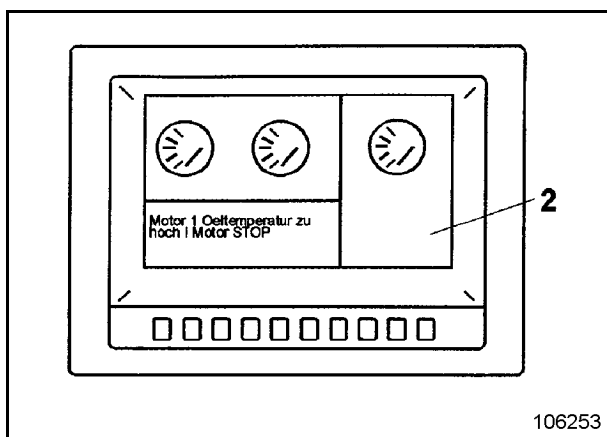


Fig. 2-62:

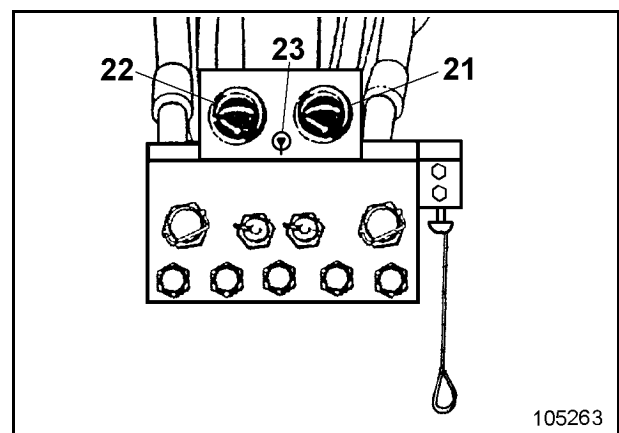


Fig. 2-63:

OPERATING INSTRUCTIONS RH 120 E

Operation



Assemblies resp. reservoirs	Measuring device	Remarks
Pump transfer gearbox	Dipstick (1, Fig. 2-64:)	Stop filling when the oil reaches the "max" mark on the dipstick (see Part 3, chapter "Pump transfer gearbox - Checking the gearbox oil level/Filling in oil").
Engine	Dipstick (1, Fig. 2-65:)	Stop filling when the oil reaches the "max" mark on the dipstick (see chapter "Engine - engine oil level/filling in oil").
Engine oil tank	Dipstick (2, Fig. 2-66:)	Stop filling when the oil reaches the "max" mark on the dipstick (see chapter "Engine - oil tank Checking the oil level in the engine oil tank/Filling in oil").

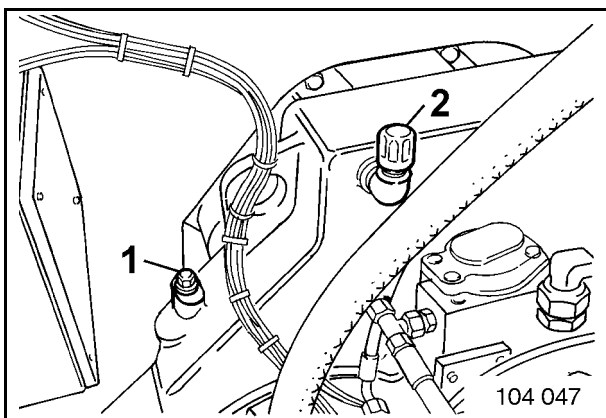


Fig. 2-64:

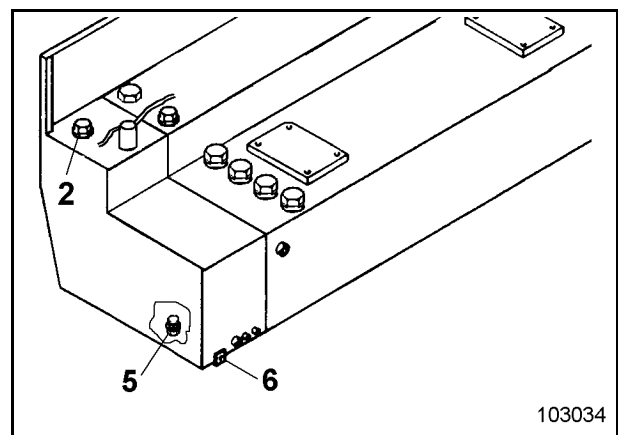


Fig. 2-66:

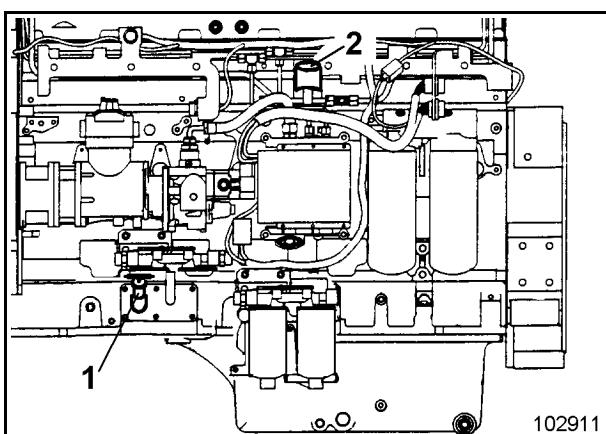


Fig. 2-65:

OPERATING INSTRUCTIONS RH 120 E

Operation



Assemblies resp. reservoirs	Measuring device	Remarks
Hydraulic oil tank	Inspection glass (1, Fig. 2-67:), sign (2. Fig. 2-67: and Fig. 2-68:)	Checking the oil level: Extend the piston rods of stick and bucket cylinders halfway. Stand working equipment on the ground. Check oil level at an oil temperature of ca. 50 °C (68°F), with the engines stationary. Fill in oil when the oil level in the inspection glass has dropped below the "min" mark. Stop filling if the oil reaches the "max" mark on the dipstick (see chapter "Hydraulic system - Checking the hydraulic oil level / Refilling hydraulic oil"). Switch the display system (optional) on with toggle switch (31, Fig. 2-69:). Stop filling when the oil level in the inspection glass reaches "max". The indicator lamp (32) lights up. On completion of filling, switch the display system off again with the toggle switch (31).

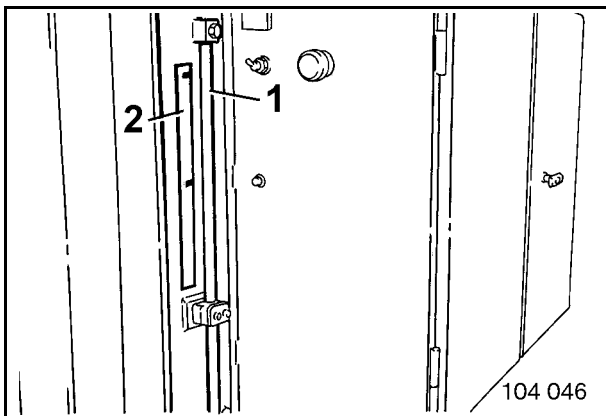


Fig. 2-67:

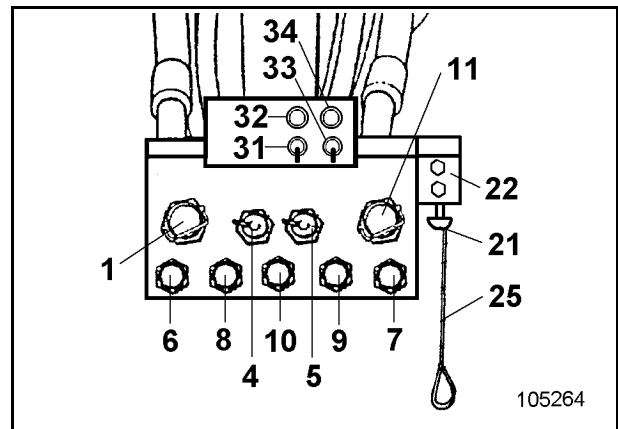


Fig. 2-69:

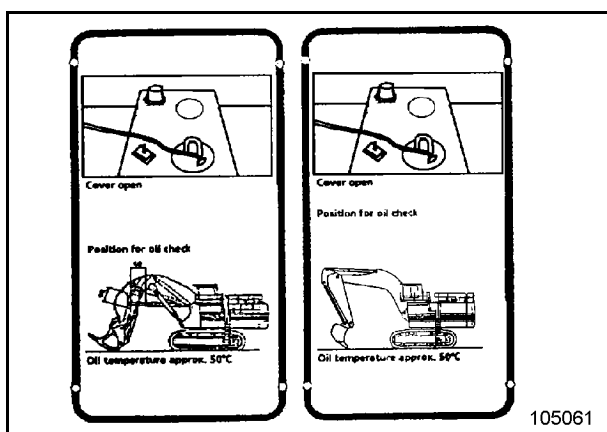


Fig. 2-68:

OPERATING INSTRUCTIONS RH 120 E

Operation



Assemblies resp. reservoirs	Measuring device	Remarks
Cooling system reservoir	Level indicator (4, Fig. 2-70:)	Stop filling when the level indicator indicates maximum filling level. (see chapter "Cooling system - Cooling liquid").
Grease container – central lubricating system	BCS display (2, Fig. 2-71:)	Stop filling when the BCS indicates „grease container is full“. Switch on the display system (optional) with the toggle switch (33, Fig. 2-72:). Stop filling when the grease container is full. The indicator lamp (34) lights up. On completion of filling, switch the display system off again with the toggle switch (33).

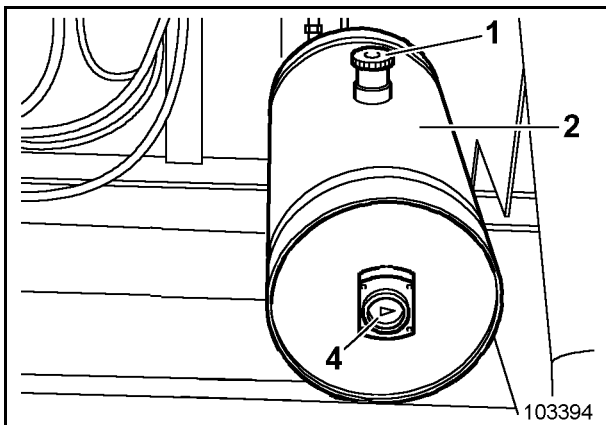


Fig. 2-70:

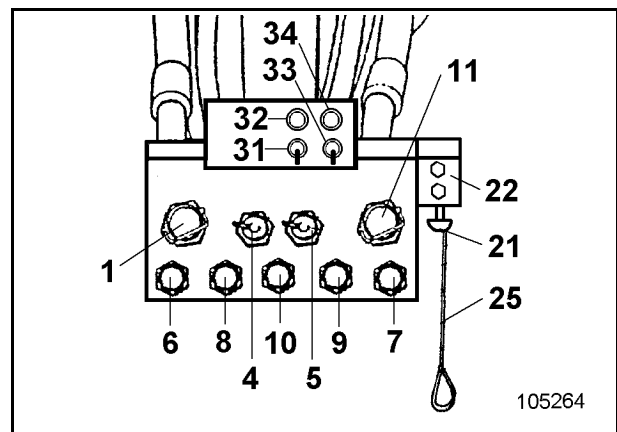


Fig. 2-72:

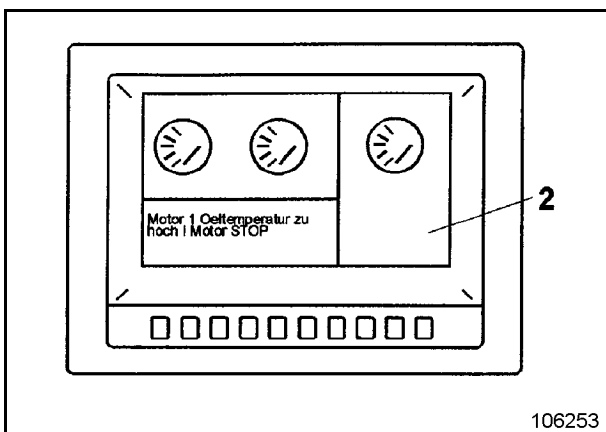


Fig. 2-71:

OPERATING INSTRUCTIONS RH 120 E

Operation



Switching the electrical system on and off

The electrical system is switched on with key-switch (32, Fig. 2-73:). Insert key into key-switch and turn to the right.

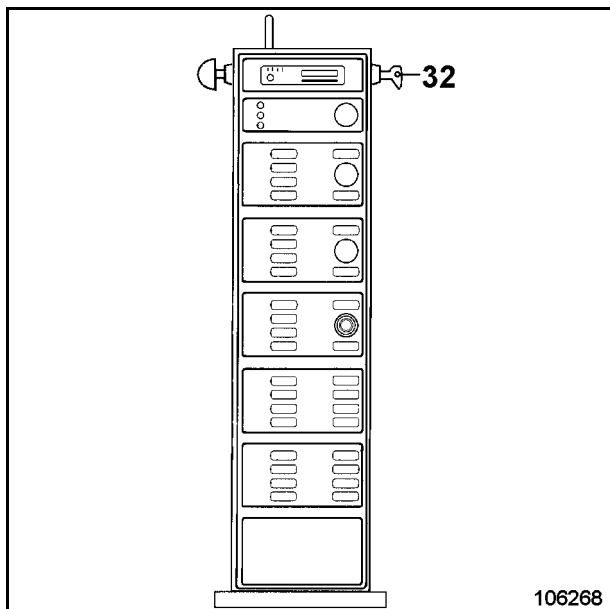


Fig. 2-73:

Battery main switch

The battery main switch is installed in the control cabinet (1, Fig. 2-74:) behind the hydraulic reservoir. The battery main switch disconnect the complete electrical system from the batteries. In the "OFF" position, the battery main switch

- prevent unauthorized starting of the engines
- protect the batteries against inadvertent discharge.

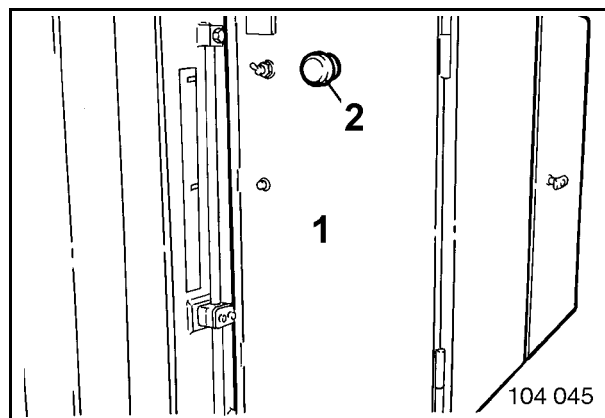


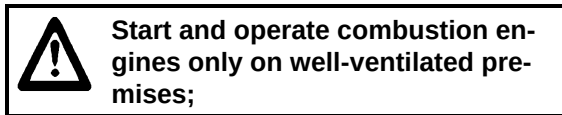
Fig. 2-74:

Only the automatic fire-extinguishing system (optional) remains connected to the power supply even when the battery main switch is in the "OFF" position.

The battery main switch is automatically set to OFF when the the electrical system is switched off with key switch (32, Fig. 2-73:).

STARTING AND STOPPING THE ENGINES

Starting the engines



In closed rooms, exhaust gases must be evacuated to the outside.

Do not work on the exhaust system and do not make any modifications to it;

Exhaust gases from diesel engines and some of their constituents may cause cancer, birth defects and other reproductive harm.

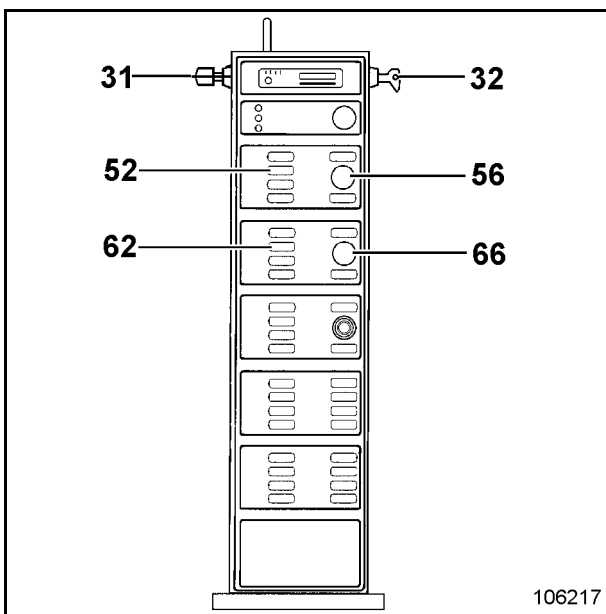


Fig. 2-75:

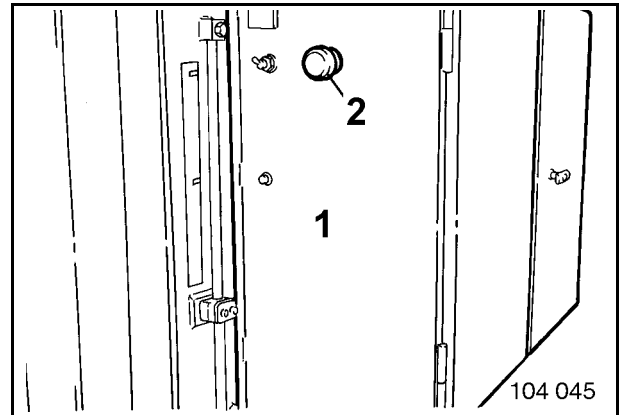
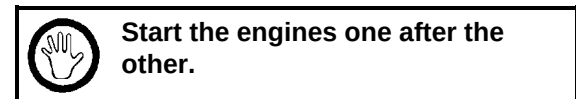


Fig. 2-76:



- Activate the EMERGENCY SHUT-OFF buttons (31, Fig. 2-75: and 2, Fig. 2-76:).
- Turn engine speed control (56 and 66, Fig. 2-75:) to the left against the limit stop (idling speed).
- Insert the key into the key-switch (32) and turn clockwise.

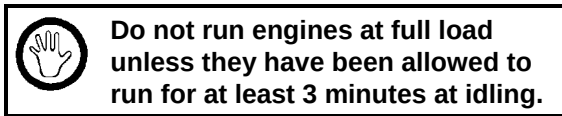


The engine starts up only after the lubricating pressure has built up in the engine. An acoustic warning signals sounds.

- Press button (52) for the lefthand engine. Release button (52) as soon as the engine has fired.
- Press button (62) for the righthand engine. Release button (62) as soon as the engine has fired.

OPERATING INSTRUCTIONS RH 120 E

Operation



Repeat the starting procedure if one of the engines does not fire. Repeat starting procedure not more often than three to four times. Do not operate the starter for more than 10 seconds.

If, after starting, the BCS (2, Fig. 2-77:) indicates a fault

- of the PMS
- because of insufficient engine oil pressure
- of the alternator

stop the engine concerned immediately.

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

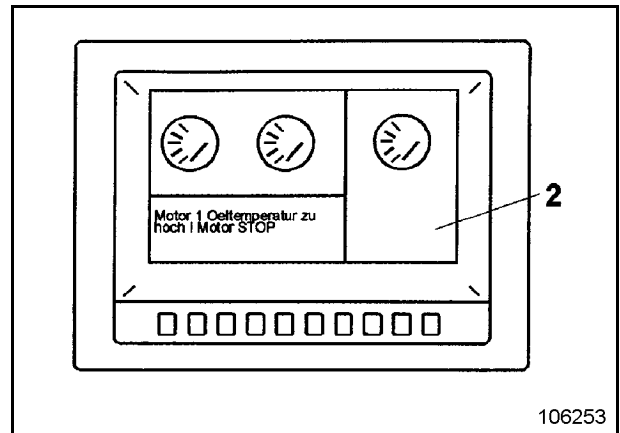


Fig. 2-77:

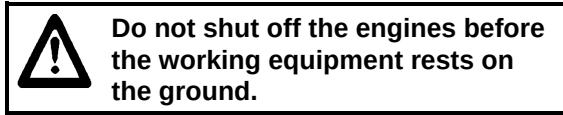
OPERATING INSTRUCTIONS RH 120 E

Operation



Shutting off the engines

During interruptions of the work and after the work, stand working equipment on the ground.



- Turn speed control knob (56 and 66, Fig. 2-78:) counter-clockwise to the limit stop (idling speed).

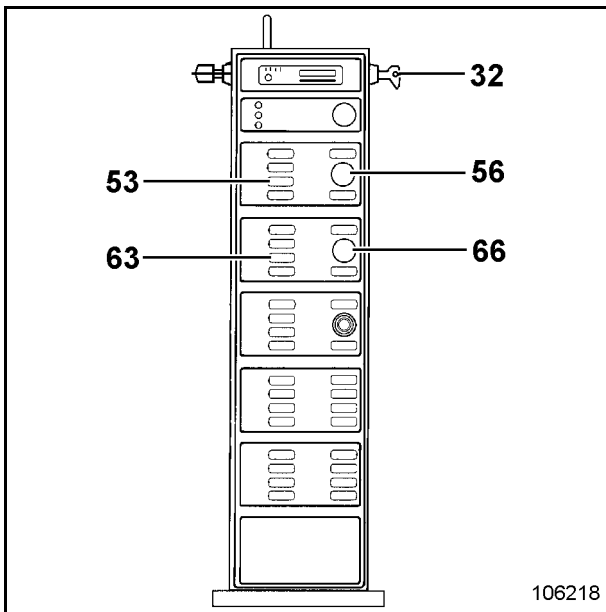
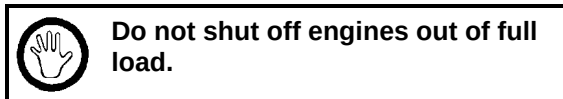


Fig. 2-78:



The engines should be run at idling for another 5 minutes to allow the lubricating oil and the cooling liquid to dissipate the combustion heat from the combustion chamber and from bearings and shafts.

- Depress key (53) for the lefthand engine.
- Depress key (63) for the righthand engine.
- Turn key in key-switch (32) counter-clockwise and withdraw (electrical system without current).

Emergency - stop

In case of emergency, e.g. if buzzer (33, Fig. 2-79:) sounds, the engine can be shut off from full load.

To do so:

- Depress stop-button (31) (the whole electrical system is switched off).
- Turn key in key-switch (32) counter-clockwise and withdraw.

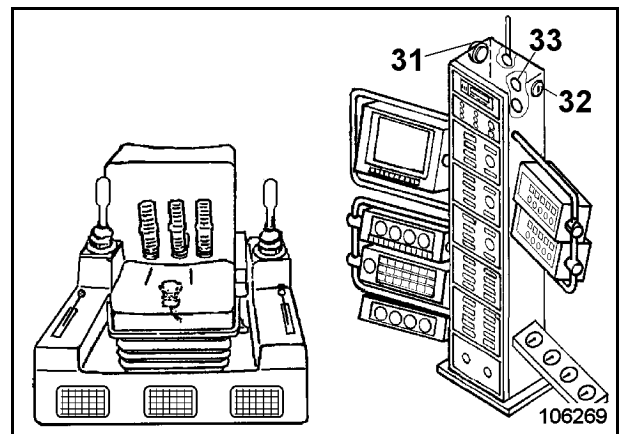


Fig. 2-79:

AIR CONDITIONER (OPTION)

Ventilation / Heating

The air needed for ventilation and/or heating is sucked in from outside the cab by a blower and ducted to the air outlets (Fig. 2-80:).

- air outlets (2) at the bottom of the cab
- air outlets (3) in the console of the driver's seat
- air outlets (4) under the cab roof

Each outlet can be adjusted independently for the amount and direction of air required.

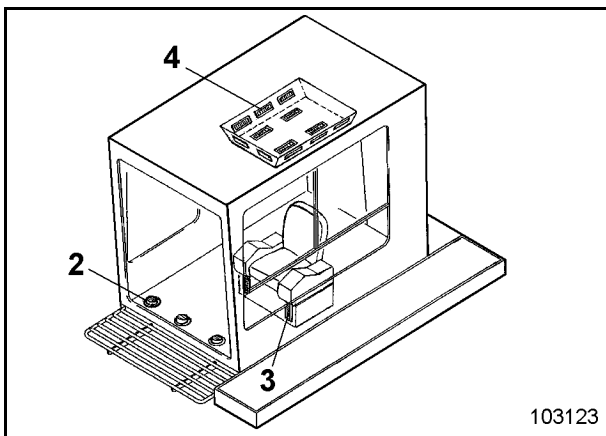


Fig. 2-80:

If necessary, the air in the cab is sucked in through the (1, Fig. 2-81:) and recirculated.

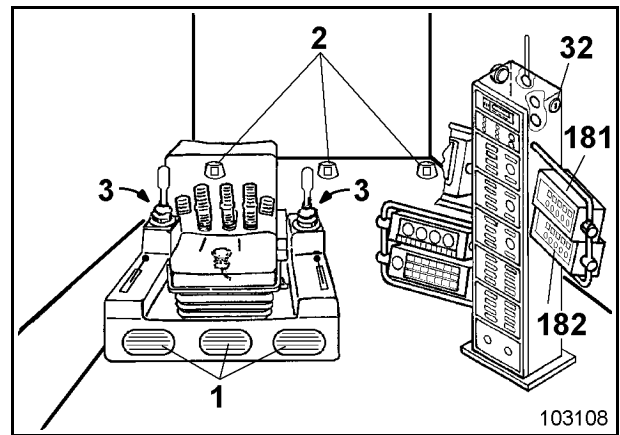


Fig. 2-81:

The air conditioner control elements are located in the satellite (181).



Do not switch the air conditioner to "cooling" when the back-up heating is on.

OPERATING INSTRUCTIONS RH 120 E

Operation



Control panel (Greentop)

(Fig. 2-82:)

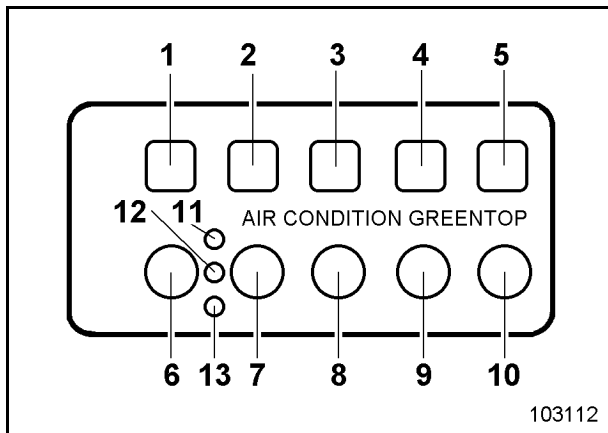


Fig. 2-82:

- | | | |
|----|----------------|---|
| 1 | Indicator lamp | lights up when the air conditioner is on |
| 2 | Indicator lamp | lights up when the blower is running |
| 3 | Indicator lamp | Leuchtet, wenn die Klimaanlage heizt. |
| 4 | Indicator lamp | lights up when the air conditioner is set to cooling |
| 5 | Indicator lamp | lights up when the air conditioner is in the automatic temperature control mode |
| 6 | Switch | switches the air conditioner on and off |
| 7 | Switch | selects the intensity level of the blower (3 levels) |
| 8 | Switch | air conditioner in cab-heating mode. |
| 9 | Switch | air conditioner in cab-cooling mode. |
| 10 | Switch | air conditioner in automatic cab temperature control mode. |
| 11 | Indicator lamp | lights up when the first blower level is selected |
| 12 | Indicator lamp | lights up when the second blower level is selected. |
| 13 | Indicator lamp | lights up when the third blower level is selected |

Control panel (Sigma)

(Fig. 2-83:)

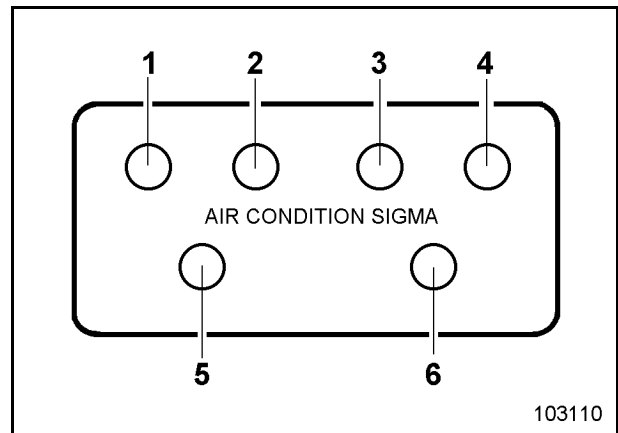


Fig. 2-83:

- | | | |
|---|---------------|--|
| 1 | Rotary switch | selects the intensity level of the blower (3 levels) |
| 2 | Rotary switch | selects the desired control function (heating, cooling, ventilation, defrosting) |
| 3 | Rotary switch | selects the intensity level of the blower (3 levels) |
| 4 | Rotary switch | selects the desired control function (heating, cooling, ventilation, defrosting) |
| 5 | Thermostat | sets the desired temperature inside the cab |
| 6 | Thermostat | sets the desired temperature inside the cab |

OPERATING INSTRUCTIONS RH 120 E

Operation



Back-up heating (option)

The back-up heating control elements are located in the satellite (182, Fig. 2-84:).

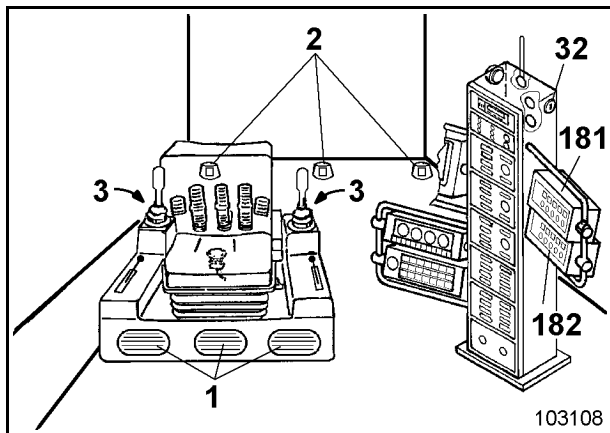
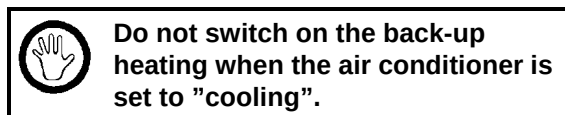


Fig. 2-84:



Control panel (Eberpächer)

(Fig. 2-85:)

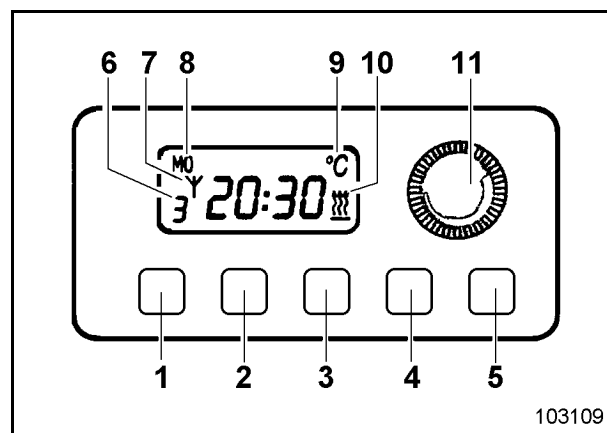


Fig. 2-85:

- | | | |
|----|------------|--------------------------|
| 1 | Pushbutton | set heating time |
| 2 | Pushbutton | heating time preselect |
| 3 | Pushbutton | heating on / off |
| 4 | Pushbutton | change set data |
| 5 | Pushbutton | Einstelldaten verändern |
| 6 | Symbol | change set data |
| 7 | Symbol | radio remote-control |
| 8 | Symbol | time and day of the week |
| 9 | Symbol | temperature |
| 10 | Symbol | operation |
| 11 | Selector | temperature |

OPERATING INSTRUCTIONS RH 120 E

Operation



Control panel

(Fig. 2-86:)

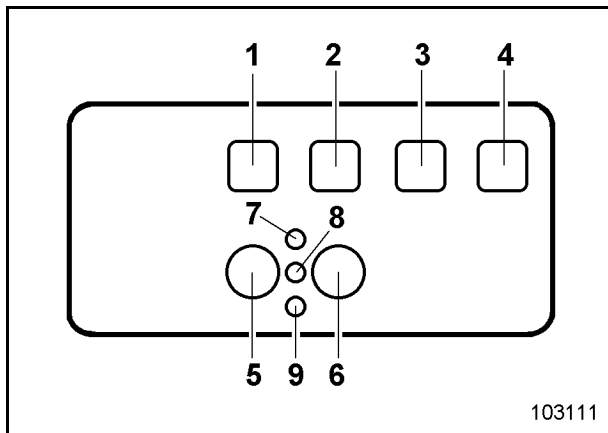


Fig. 2-86:

- | | | |
|---|----------------|----------------|
| 1 | Indicator lamp | heating ON |
| 2 | Indicator lamp | blower ON |
| 3 | Indicator lamp | heating |
| 4 | Indicator lamp | cooling |
| 5 | Switch | heating ON |
| 6 | Switch | blower ON |
| 7 | Indicator lamp | blower level 3 |
| 8 | Indicator lamp | blower level 2 |
| 9 | Indicator lamp | blower level 1 |

OPERATING INSTRUCTIONS RH 120 E

Operation



DRIVING SAFETY INSTRUCTIONS

Have the attachment raised only so far as to permit the machine to be driven under overhead power lines without any risk.

Close the cab door.

If the machine is fitted with a safety belt for the operator, fasten the belt.

If the superstructure is turned by more than 90° from the BASIC POSITION, the excavator travels in the opposite

direction to that selected.

If the position of the superstructure in relation to the undercarriage is not exactly known, touch the accelerator

lightly to see which direction the machine takes, before initiating the full travelling movement.

Warn persons in the immediate vicinity by sounding the horn before setting off.

Never drive across slopes.

Take the utmost care on slippery, greasy ground.

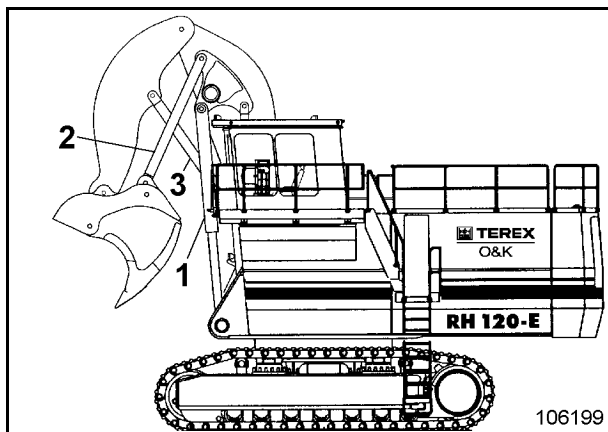


Fig. 2-87:

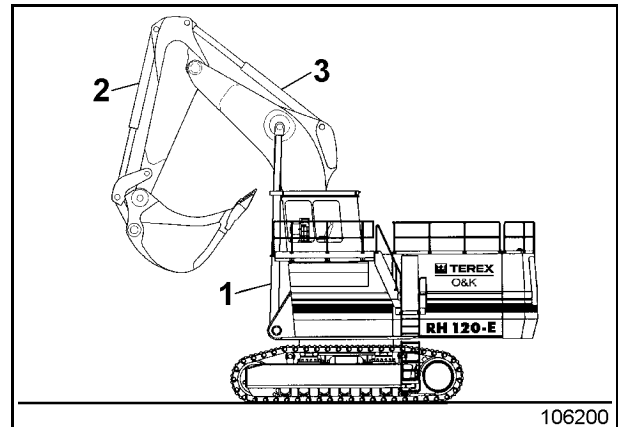


Fig. 2-88:

Running-in specifications for components of the crawler tracks:

Prior to initial commissioning and/or after repair work, run in the idlers, track rollers and support rollers as follow:

- Raise the equipment (Fig. 2-87:and Fig. 2-88:)
- Drive the excavator in revers approx. 50 m (164 ft).
- Drive the excavator in forwards approx. 50 m (164 ft).
- Stop the excavator.
- Measure the temperature at each idler, track roller and support roller with an infrared thermometer. (at a temperature of approx. 100° C (212°F) wait for idlers, track rollers and support rollers to cool down).
- Repeat this running-in procedure up to 10x.
- Check all idlers, track rollers and support rollers for leaks.

The engines must be at operating temperature before being subjected to full load. If the machine is to be driven a longer distance, the superstructure must be secured against turning by means of the superstructure holding brake.

OPERATING INSTRUCTIONS RH 120 E

Operation



TRAVELLING

Superstructure basic position

Travel direction and sense of actuation of pedals (112 and 113, Fig. 2-90:) are identical only when the excavator is in its BASIC POSITION (Fig. 2-89:).

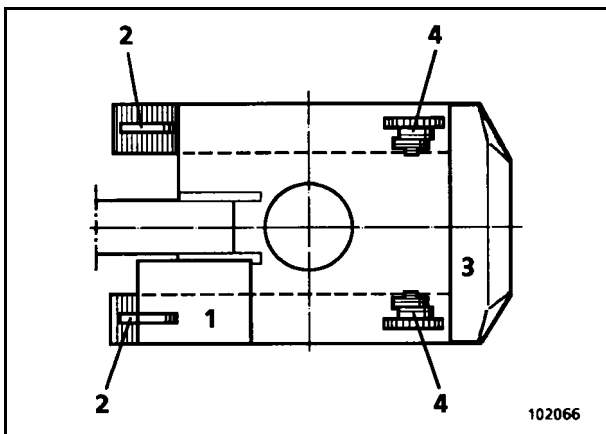


Fig. 2-89:

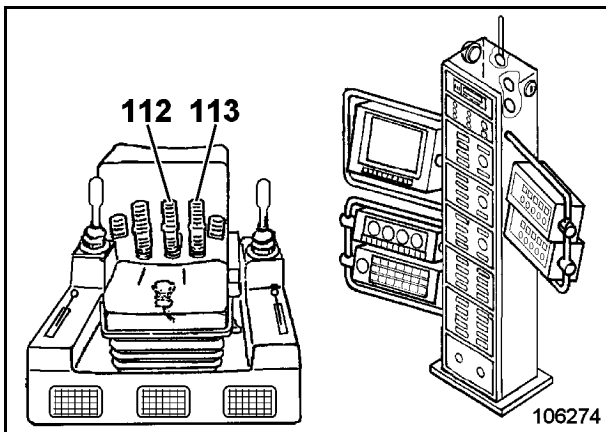
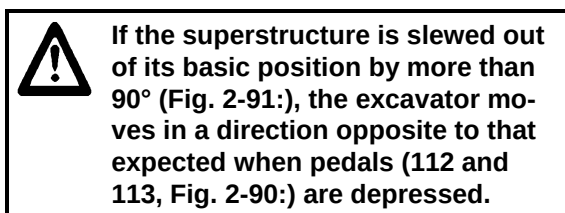


Fig. 2-90:

If the operator is not completely sure of the position of the superstructure with regard to the undercarriage, pedals (112 and 113) should be depressed slightly in order to find out which way the excavator moves before initiating the full travelling movement.

Travelling forwards/backwards

Travelling forwards:

- ➡ depress pedals (112 and 113) forwards.

The excavator travels in the direction of the idler (2, Fig. 2-89:).

Travelling backwards:

- ➡ depress pedals (112 and 113, Fig. 2-90:) backwards.

The excavator travels in the direction of the drive sprocket (4, Fig. 2-89:).

During travelling an acoustic warning signal sounds (Travel Alarm)

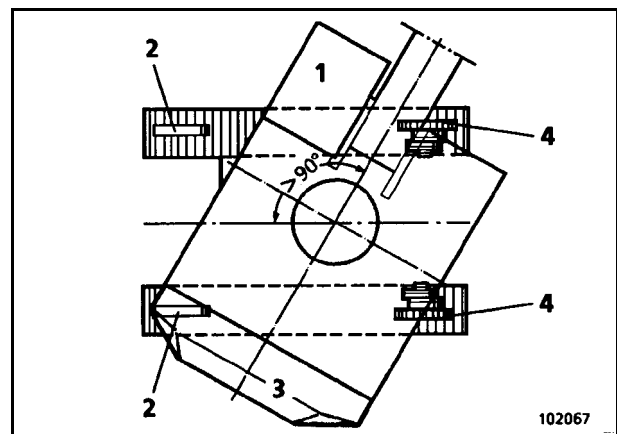
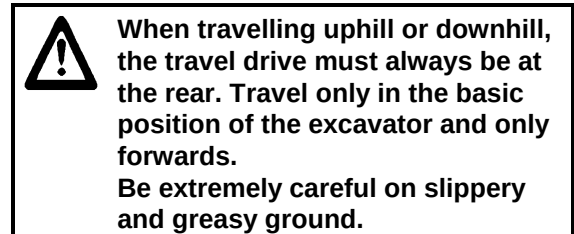


Fig. 2-91:

The pedals return automatically to their "0" positions when released.

Reverse the excavator only over short distances and with the assistance of marshallers because of restricted rear-view conditions.

Do not travel across slopes.



All instructions with regard to travelling speed regulation and travel direction control are applicable only as long as the crawler tracks have sufficient grip and do not slip.

OPERATING INSTRUCTIONS RH 120 E

Operation



Regulating the travelling speed

Travelling on level ground

Regulate the travelling speed with

- pedals (112 and 113, Fig. 2-92:) and
- Switch (71, Fig. 2-93:) to the right (slow gear)
All forward/reverse travel movements are possible with this gear.
- Switch (71, Fig. 2-93:) to the left (fast gear)
The excavator can be driven only parallel forwards with this fast gear.
The travel gearbox changes automatically into the 1st gear as soon as another travelling function (e.g. reversing, cornering) is initiated.

Turn speed regulator (56 and 66) fully clockwise (full-throttled position)

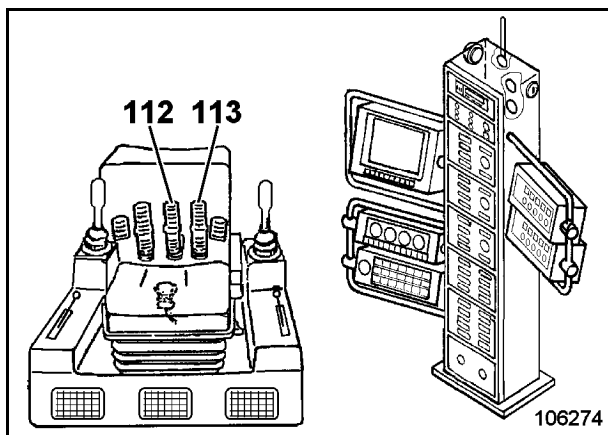
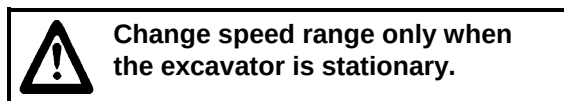


Fig. 2-92:

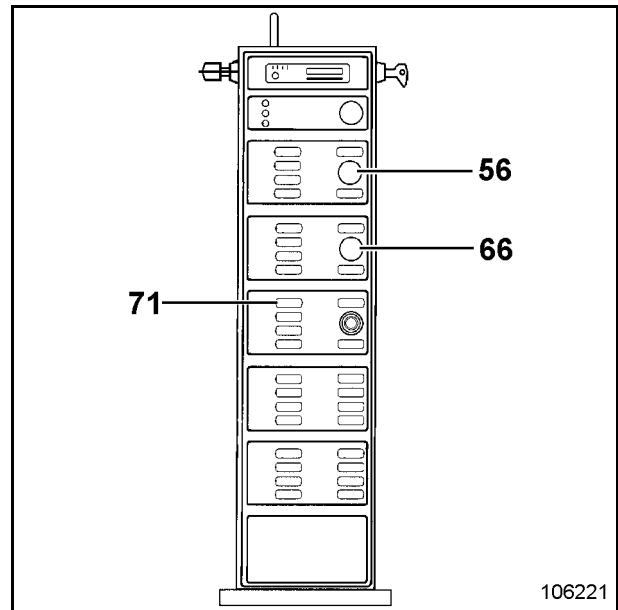
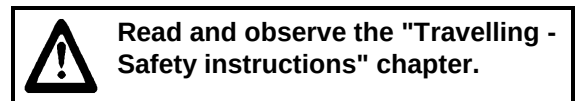


Fig. 2-93:

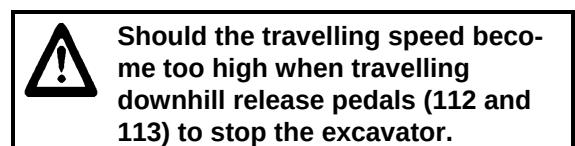
Travelling uphill and downhill



- Depress pedals (112 and 113, Fig. 2-92:) fully to the limit stop.
- Regulate the travel speed only with the engine speed control.

When travelling downhill, the travel retarder valve acts as a speed limiter.

The travel retarder valve works correctly if pedals (112 and 113) are fully depressed down to the limit stop.



OPERATING INSTRUCTIONS RH 120 E

Operation



Cornering

To take a right-hand corner forwards

- ➡ depress only pedal(112, Fig. 2-94:) forwards

To take a lefthand corner forwards -

- ➡ depress only pedal (113) forwards -

Turning

To turn to the right

- ➡ depress pedal (112) forwards and pedal (113) backwards

To turn to the left

- ➡ depress pedal (113) forwards and pedal (112) backwards.

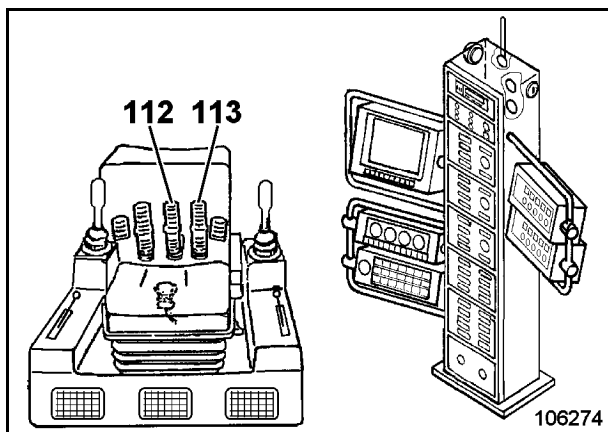


Fig. 2-94:

Note

Change the position of the undercarriage - parallel or perpendicular to the working face - only by cornering forwards/backwards (Fig. 2-95:).

Cornering to the left:

forwards from pos. 1 to pos. 2

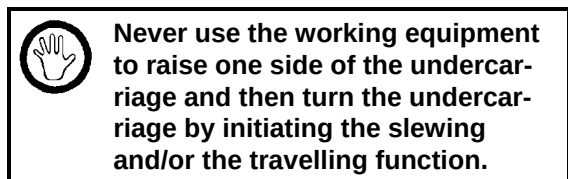
backwards from pos. 2 to pos. 3

forwards from pos. 3 to pos. 4

The same procedure should be adopted if the excavator is to be driven out of depressions (Fig. 2-96:):

Cornering to the left from pos. 1 to pos. 2

Cornering to the right from pos. 2 to pos. 3



This way of working is contrary to the excavator's-designated use.

There is a risk of accident. Moreover, the tracks, slewing gear, roller bearing slewing ring, backhoe or bucket back-wall and the front part of the bucket are subjected to inadmissibly high stresses.

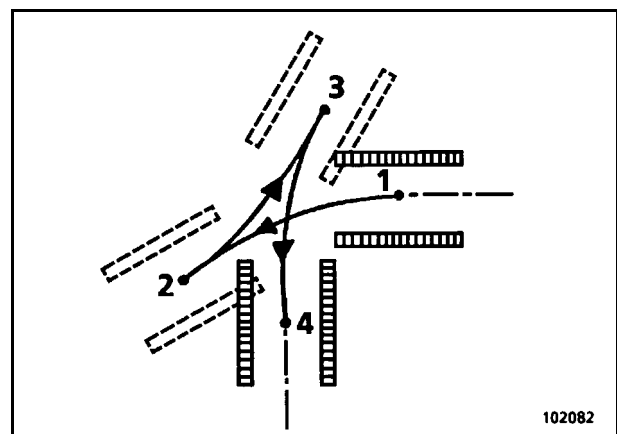


Fig. 2-95:

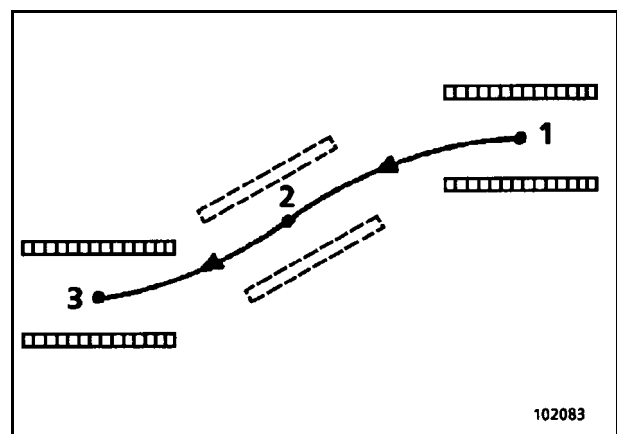


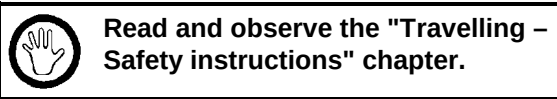
Fig. 2-96:

OPERATING INSTRUCTIONS RH 120 E

Operation



Travelling over long distances



Travel only forwards with the excavator in its basic position.

When travelling, pay attention to sufficient head-room, e. g. under

- cable bridges
- high-tension cables.

Keep the loading or the backhoe bucket close to the ground (Fig. 2-97: / Fig. 2-98:). For a more uniform loading of the tracks, the equipment must, however, be kept at a steep angle.

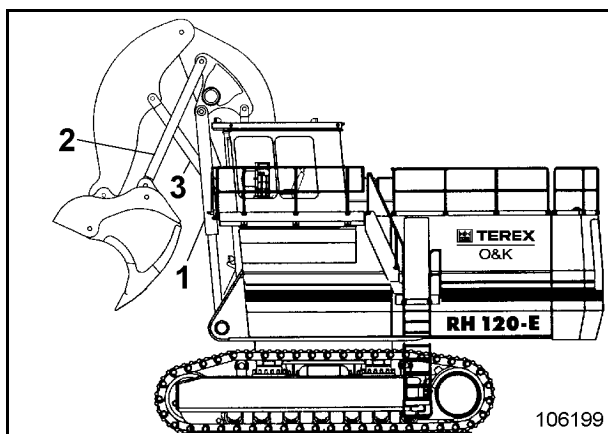


Fig. 2-97:

Loading bucket equipment (Fig. 2-97:)

- ➔ Fully extend boom cylinder (1).
- ➔ Extend bucket cylinder 2.
- ➔ Extend stick cylinder 3.
- ➔ Retract bucket cylinder 2 and stick cylinder (3) to such an extent as to reach the position of the equipment (Fig. 2-97:).

Backhoe bucket equipment (Fig. 2-98:)

- ➔ Fully extend boom cylinder 1.
- ➔ Retract backhoe cylinder 2.
- ➔ Retract stick cylinder 3.
- ➔ Extend backhoe cylinder 2 and stick cylinder (3) to such an extent as to reach the position of the equipment shown in Fig. 2-98:

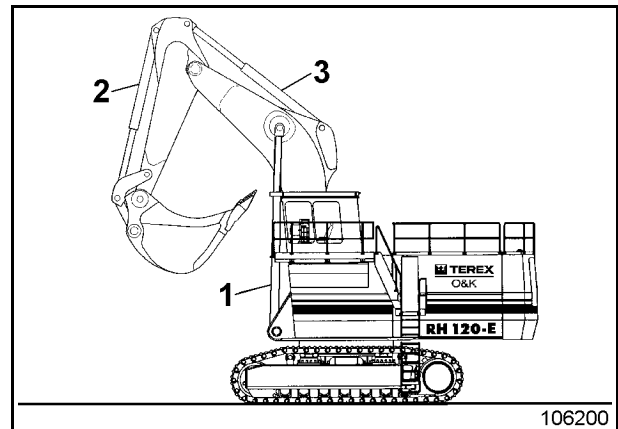


Fig. 2-98:

Lower the equipment when travelling underneath obstacles.

If the equipment position must be changed:

- ➔ stop the excavator
- ➔ change the position
- ➔ continue to travel.

After travelling for 15 minutes without interruption, stop the excavator and check the temperature of the track rollers.

If the temperature does not exceed ca. 100° C: (212°F) continue travelling.

In case of higher temperatures:

- ➔ Stop travelling. Resume travelling only after the track rollers have cooled down to ca. 40° C (104°F).

OPERATING INSTRUCTIONS RH 120 E

Operation



Emergency machine drive

Moving the excavator after failure of the hydraulics

The weight of the excavator, the resistance of the crawler tracks and the high reduction in the travel gearboxes make towing or pushing of the excavator in the event of a failure or of defects in the hydraulic system impossible.

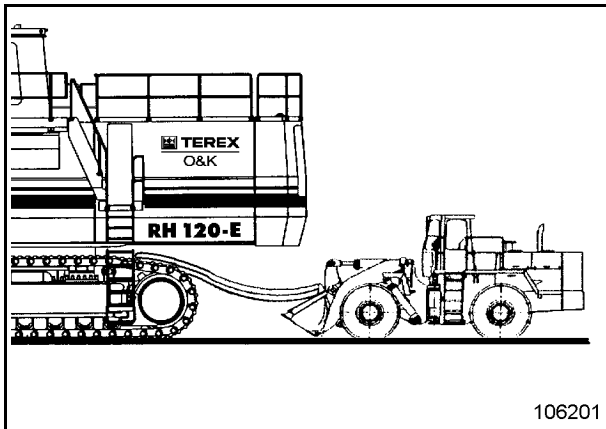


Fig. 2-99:

The excavator can therefore only be moved with the help of another machine (Fig. 2-99:) (wheel loader or grader). The machine used as auxiliary machine must be equipped with a dual-circuit hydraulic system.

Required equipment

- a self-propelled machine with a dual-circuit hydraulic system
- | | | |
|-----------------------|-----------|--------------|
| max. working pressure | 380 bars | 5511psi |
| min. working pressure | 220 bars | 3191 psi |
| pump discharge rate | 150 l/min | 39.6 gal/min |

These are minimum values. The pump discharge rate indicated corresponds to an excavator travelling speed of ca. 3 m/min (10 ft/min).

- 4 high-pressure hoses ca. 11 m (36 ft) long; DN 40 1 ½" SAE Connection at one end; ready for connection to the auxiliary machine at the other.
- 4 plugs (high-pressure type) for 6000 PSI 1 ½" SAE connections.

OPERATING INSTRUCTIONS RH 120 E

Operation



Positioning of the machines

The auxiliary machine is driven close to the RH 120 E from behind (Fig. 2-99:).

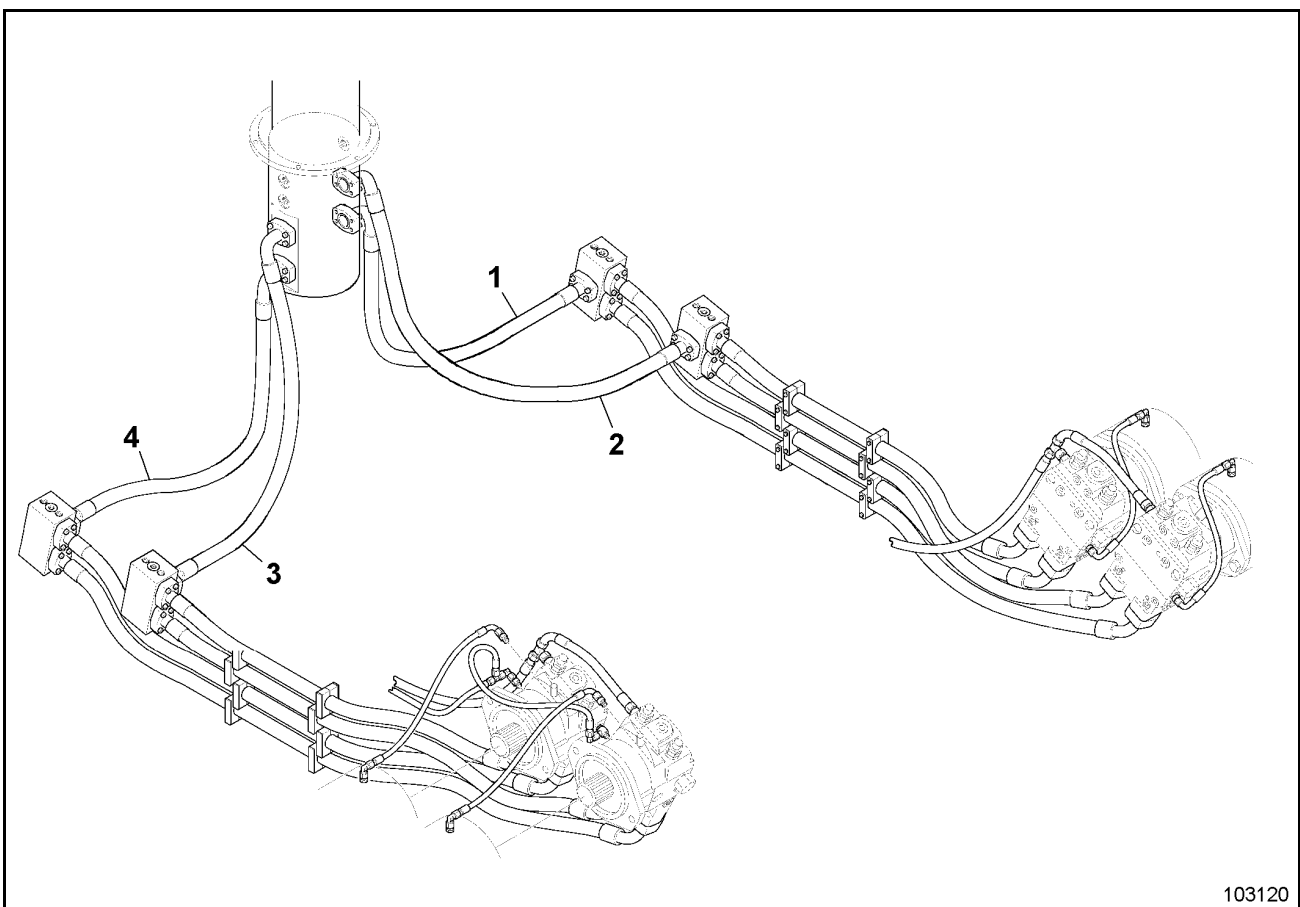
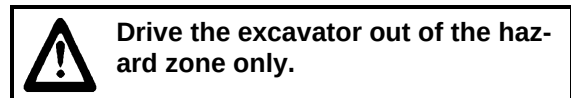
Loosen the high-pressure lines (1, 2, 3 and 4, Fig. 2-100) and close the open ends of the hoses.

- Connect the hoses from the auxiliary machine to the ports of the "travel hydraulics" of the excavator.
- High-pressure hoses (1 and 2) - circuit 1 on auxiliary machine
- High-pressure hoses (3 and 4) - circuit 2 on auxiliary machine

Emergency travel

- Start up the engine of the auxiliary machine. The brakes of the RH 120 E are released by travel pressure.
- Initiate the travelling movements carefully with the control levers. Adjust the direction and travelling speed of both tracks accordingly.
- Shift the control lever to the final position. Make sure the auxiliary machine is able to "follow"

The RH 120 E can be steered as usual by releasing the one or the other control lever briefly.



103120

Fig. 2-100

:

OPERATING INSTRUCTIONS RH 120 E

Operation



Locking the superstructure

The excavator is equipped with two superstructure holding brakes. The superstructure holding brakes are used to block the superstructure and the undercarriage.

The superstructure holding brakes are parking brakes.

- Switch the parking brakes on
- when the excavator is parked
- when travelling over longer distances
- to activate the parking brakes, press switch (82, Fig. 2-101:).

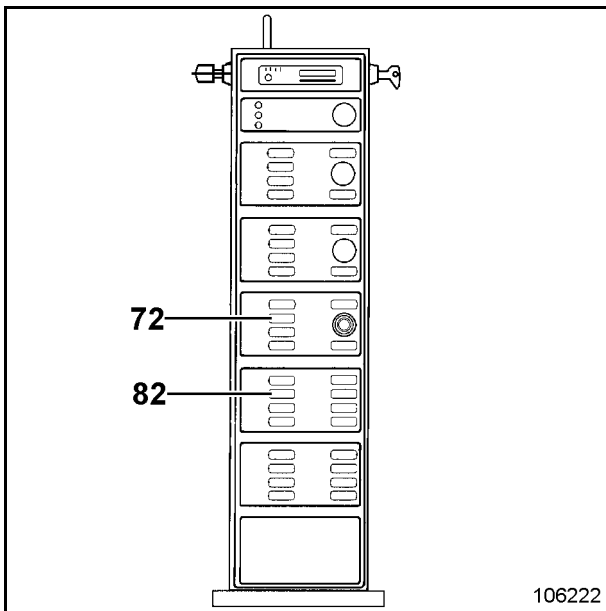


Fig. 2-101:

Track parking brake

The excavator is equipped with four track brakes integrated in the track drives.

The track brakes are parking brakes which relieve the hydro-static travel drives during working operation and which protect the excavator against rolling forwards and backwards.

The brakes are controlled by means of the travel pedals (112 and 113, Fig. 2-102:). In neutral position of the pedals, the brakes are applied and the excavator is braked. During travelling, the brakes are released.

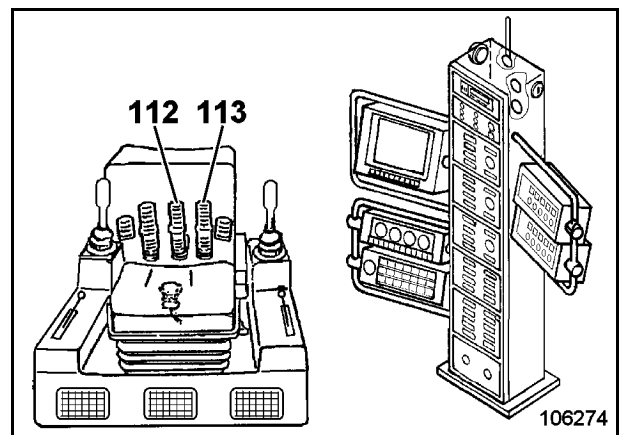


Fig. 2-102:

The track brakes can also be activated with switch (72, Fig. 2-101:).

Depending on switch position, the brakes are permanently engaged or

are automatically applied after ca. 8 sec. each time the excavator stops.

With this switch position, the brakes are released as soon as the "Travel" function is activated.

TRANSPORTING THE MACHINE

Transport - Safety instructions

The machine must be loaded and transported only after all safety regulations have been observed and 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 excavator's crawler tracks and from ramps and loading platforms of the transport vehicle to minimize slipping.

Secure the transport vehicle against rolling away.

Use only tying equipment of sufficient strength (the weights and dimensions of the excavator are set out in the "Technical specifications").

Transport

The dimensions and the service weight of the fully assembled excavator do not allow the excavator to be transported in an undismantled state on a low-bed trailer over public roads.

Therefore, the following components and modules must be dismantled beforehand.

Weights and suspensions points are marked on the modules.

WORKING OPERATION - SAFETY INSTRUCTIONS



Read the sections "Fundamental safety instructions" and "Operation, safety instructions" carefully and observe the instructions given in them.

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

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.

Sound the horn to warn persons in the immediate vicinity before starting work.

Stop work if anyone is in the hazard range of the machine. Make sure they have left the hazard range before resuming work.

Never operate the machine unless it is standing on a reasonably horizontal, flat surface. The stability of the machine is otherwise at risk.

Ensure that the attachment has adequate clearance below overhead power lines and structures.

Trenches and working faces may give way. Keep well clear of them.



Running-in instructions for hydraulic cylinders

Compression of an oil/air compound in a hydraulic cylinder may result in detonations which might damage pistons and sealing rings.

Prior to initial commissioning and/or after repairs, run in the hydraulic cylinders as follows:

- Start up the engines and run at low speed. The pressure-limiting valve in the hydraulic system must not respond
- In the first two working cycles, retract and extend the pistons of the hydraulic cylinders to max. $\frac{1}{2}$ to $\frac{3}{4}$ (not to the limit stop). Never change direction suddenly. The waiting time between changes of direction must be at least 4 seconds.
- In the next eight working cycles, retract and extend the pistons of the hydraulic cylinders to the limit stop. The waiting time between changes of direction must be at least 4 seconds.
- When all hydraulic cylinders have been run in, the excavator can operate at a higher engine speed.

OPERATING INSTRUCTIONS RH 120 E

Operation



At low temperatures, bring the engines down to moderate speed, then activate all hydraulic functions for about 10 minutes (bring to service temperature). For further instructions, see section "Lubricants".

If the BCS indicates problems with the cooling liquid temperature, engine oil pressure, coolant level, alternator or hydraulic oil filter control (with hydraulic oil at service temperature) light up:

Lower the working equipment and shut off engines.

Parts of the attachment may damage the machine if they are moved into extreme positions (see illustrations Fig. 2-103 - Fig. 2-107).

Work carefully, avoiding extreme positions of this kind.

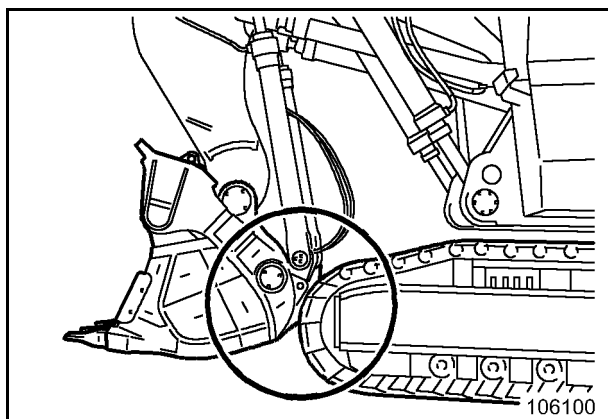


Fig. 2-103

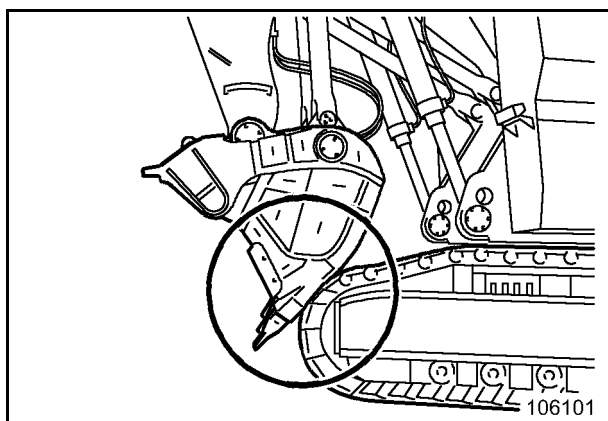


Fig. 2-104

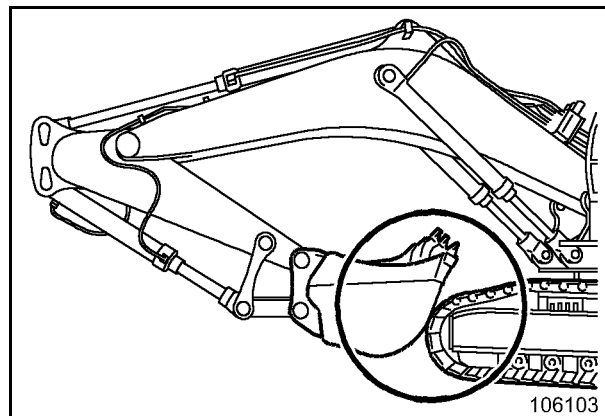


Fig. 2-105

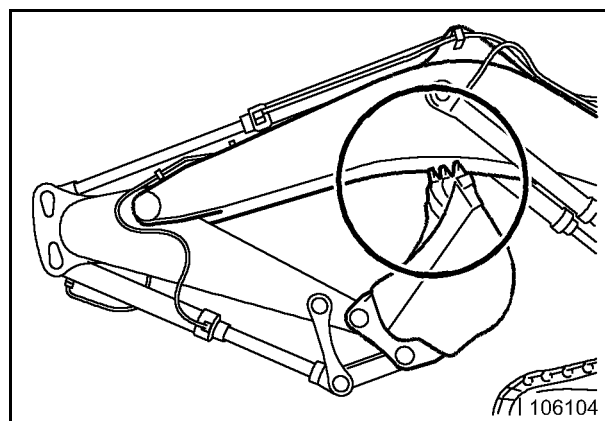


Fig. 2-106

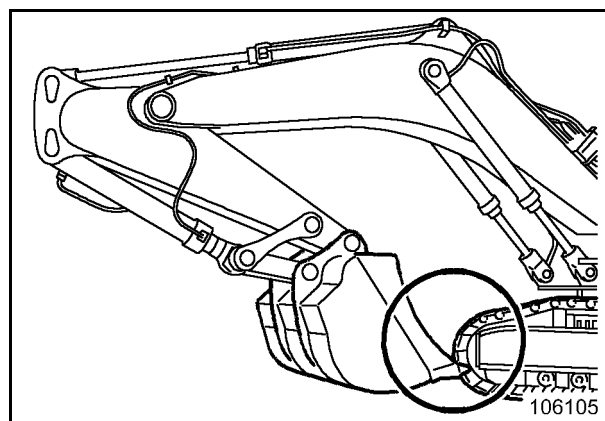


Fig. 2-107

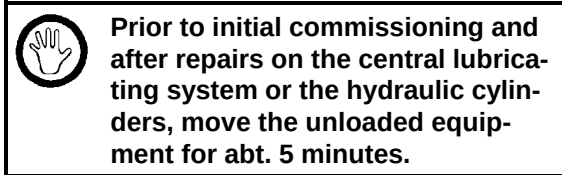
OPERATING INSTRUCTIONS RH 120 E

Operation



WORKING OPERATION

Before starting work



This is required to ensure an adequate supply of grease to the cylinder bearings when the work starts.

Warming up

At low outside temperatures it is necessary to run the hydraulic system up to operating temperature. The temperatures at which warming up is necessary depend on the type of hydraulic oil used; see also "Oils for hydraulic systems".

To warm up the system: Run the diesel engines at ca. 2/3 full speed and start to perform no-load working movements for abt. 10 minutes with the excavator.

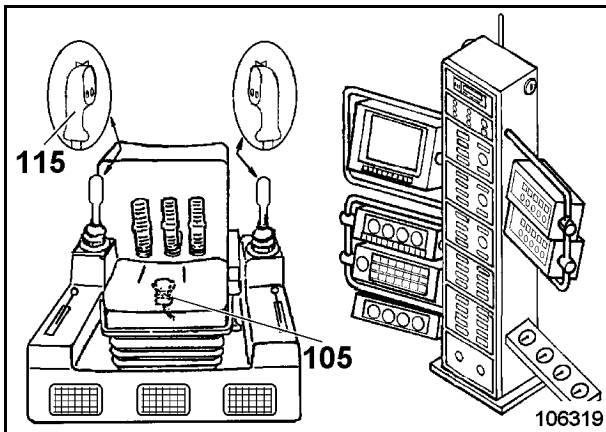


Fig. 2-108:

Switching on the electronic excavator control

The electronic excavator control is switched on and off with switch (105, Fig. 2-108:).

Electronic excavator control activated - operator is sitting on his seat.

Electronic excavator control deactivated - driver's seat is empty.

Slewing and braking the superstructure

The superstructure can only be slewed if the superstructure holding brake is released.

To slew the superstructure to the right:

➡ shift control lever (115) to the right.

To slew the superstructure to the left:

➡ shift control lever (115) to the left.

After releasing, the control lever returns automatically to position "0".

Braking the superstructure

The superstructure is braked only by setting control lever (115) into the opposite direction (countering).

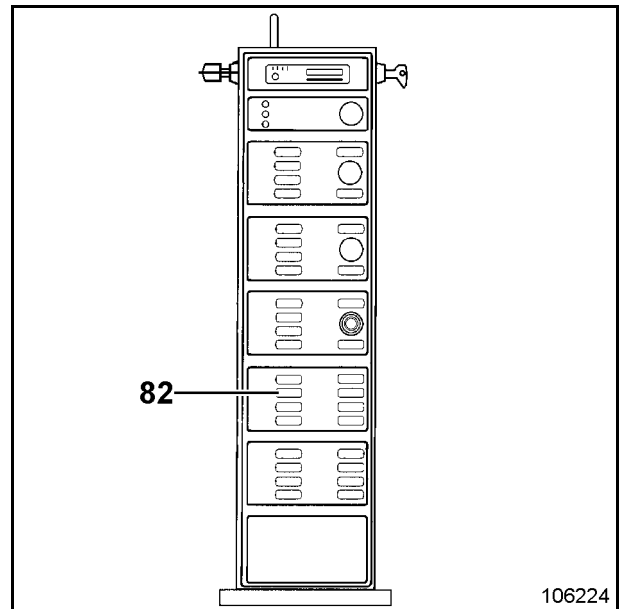
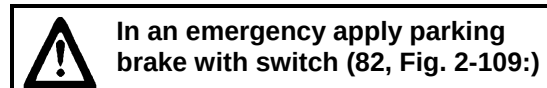


Fig. 2-109:

OPERATING INSTRUCTIONS RH 120 E

Operation



Working

When released, all control levers for working operation return automatically to position "0".



Loading bucket: Close bucket completely before beginning to dig. Do not level off a surface with the front shell of the bucket open.

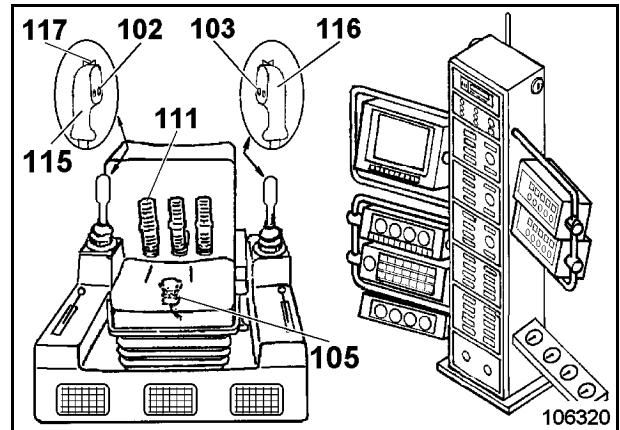


Fig. 2-110:

Raising and lowering the boom

To raise the boom:
pull control lever (116, Fig. 2-110:) backwards.

To lower the boom:
push control lever (116) forwards.

To lower the boom with pressure:
depress button (103) and
push control lever (116) forwards.

Filling and emptying the bucket or the backhoe

To fill/tip back the bucket:
shift control lever (116) to the left.

To empty the bucket by dumping/tipping:
shift control lever (116) to the right.

Extending and retracting the bucket or backhoe bucket stick

To extend the stick:
push control lever (115) forwards.

To retract the stick:
pull control lever (115) backwards.

To retract the stick with pressure:
(only on bottom-dump bucket equipment)
depress button (102) and
push control lever (115) backwards.

Opening and closing the bottom-dump bucket

To open the bucket:
press pedal (111) forwards or press button (117) to the left.

To close the bucket:
press pedal (111) backwards or press button (117) to the right.

OPERATING INSTRUCTIONS RH 120 E

Operation



After daily operation

Parking the machine

- Park the machine on level and stable ground. This is particularly important in winter to avoid freezing of the tracks.
- Stand the working equipment on the ground.
- Shut off the engines.
- Shift both control levers into all directions to depressurize the hydraulic cylinders.
- Withdraw the key from the electrical system key-switch.
- Close the cab window.
- Lock the cab door and all lockable hatches and covers on the machine.
- Clean the machine of coarse dirt as well as of combustible and easily flammable substances, if possible with a stream jet (rubber parts and electric components with compressed air - refer to information label) Otherwise, the fire and explosion hazard will exist.
- Fill up the fuel tanks.
- Inspect the engines, the hydraulic system, the track rollers, support rollers, idlers and gearboxes visually for leaks.



Escaping oil pollutes the environment.

Repair leaks immediately (or have them repaired). Report oil accidents to the user of the machine.

- Check the superstructure, undercarriage and the working equipment for damage and all steel components for cracks or fractures.
- Report detected damage immediately to the user.
- Clean off gross dirt, ice and snow from the fins and the fan wheel of the hydraulic oil cooler.

OPERATING INSTRUCTIONS RH 120 E

Operation



ASSEMBLING WORKING EQUIPMENT - SAFETY INSTRUCTIONS

Personel

Assembly work may be carried out only by operating or maintenance personnel who have the necessary know-how at their disposal.

If such know-how is lacking, meticulous instruction must be given by experienced personnel, e.g. from Terex|O&K.

The operating manual, and in particular the section headed "Fundamental Safety Instructions", must have been read and understood.

Only such persons may start up the machine during assembly work in order to adjust the attachments.

Incorrect operation of the machine or the attachments may give rise to life-threatening situations.

Personal protective gear and working clothes

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 and gloves.

Tools and auxiliaries

Tools, hoists, slings, trestles and other devices must be in a reliable, safe state.

Metal splinters may cause injury when accessory bolts are being driven in or out. A brass or copper mandrel should therefore be used for this purpose, and goggles must be worn.

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

Always keep steps and platforms in a non-slip state. Remove any oil, grease, earth, clay, snow, ice and other foreign matter immediately.

Securing the 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.

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.

OPERATING INSTRUCTIONS RH 120 E

Operation



Securing the machine

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

Securing the machine

Selecting the attachments

The machine can be equipped with various attachments. The components of the attachments are assembled with hydraulic cylinders and connectors. Components can be combined in various ways for optimum adaptation of the attachments to the specific application.

Operate the machine only with the equipment and component combinations expressly approved by Terex|O&K for this type of machine.

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

Protective roof against falling objects

The machine is equipped with an integrated cab-protection roof (FOPS).

OPERATING INSTRUCTIONS RH 120 E

Operation



Securing the machine

Risk of injury.

The machine must not be started by unauthorized persons.

Therefore, secure the machine.

Observe the accident prevention regulations.

Depressurize pipeline systems, on which work is to be carried out, by appropriate measures.

Protective shrouds of moving machine parts may only be opened or removed when the drive unit is stationary and protected against inadvertent starting.

Before carrying out fitting works, the machine and the equipment must be protected against inadvertent starting by placing chocks under the tracks and by standing the working equipment on the ground.

Hydraulic and lubricating systems: Close all open bores, pipe and hose connections with pressure-resistant plugs.

Refill collected hydraulic oil back into the hydraulic system only through the return-flow filters. Dispose of non re-usable oils without polluting the environment.

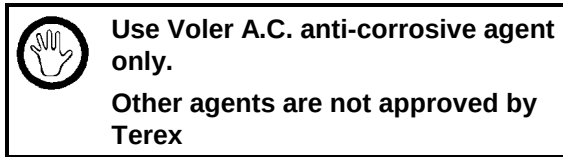
All components of Terex|O&K machines have been carefully purpose-coordinated. Trouble-free operation and a long service life can only be achieved with original Terex|O&K spare parts.

Respect the sequence of working operations when fitting or replacing the attachments. The sequence has been determined and tested by qualified experts.

Secure the machine as described below:

- before carrying out any fitting and modification work on the working equipment,
- before carrying out any servicing and repair work on the machine.
- ➡ Park the machine on level and stable ground.
- ➡ Lock the superstructure.
- ➡ Stand the working equipment on the ground.
- ➡ Shut off the engines.
- ➡ Depressurize the hydraulic system.
- ➡ Withdraw the key from the key-switch.

CORROSION PROTECTION FOR PINS AND BEARINGS (BUS- HINGES AND HUBS)



All pins and bearings (bushings and hubs) of the working equipment or in equipment components must be treated **Voler A.C.** anti-corrosive agent before fitting.

Voler A.C.:

- permits easy fitting and dismantling
- protects against rust, oxidation and similar wear
- prevents seizing and fretting corrosion in non-moving parts of bearings.

This is achieved by aluminium and copper particles forming a protective layer on the metal. This layer removes surface irregularities and does not sweat, seize or harden.

Part nos. for Voler A.C.

SN 0 271 554 - 0,5 l (16.9 oz) spray can (CSC free)

SN 1 438 473 - 0,5 kg (1.1 lb) tin

SN 1 438 219 - 4,5 kg (9.9 lb) bucket

Available from Terex|O&K Spare-Parts Service

Application of Voler A.C.

- ➔ Clean off grease, oil, dirt and corrosion protection agents from pins and bearings using white spirit or diesel fuel.
Rust patches must be thoroughly removed, if any.
All parts must present a dry, bright metal surface.
- ➔ Apply a thin layer of Voler A.C. on pins and all bearings using a brush or a spray can. Pin shafts and bearings must be completely covered by the protective layer.
If the protective layer of a pin already treated with Voler A.C. is damaged, these areas must be touched up before fitting the part.

Fitting and securing of pins

If the pin is too heavy to be fitted manually, apply Voler A.C. at first only on abt. a quarter of the pin's length

Then position pin by means of a lifting gear ready for fitting.

Apply Voler A.C. on the remaining length of pin shaft, fit pin and secure.

OPERATING INSTRUCTIONS RH 120 E

Operation



3 INSPECTION AND SERVICING

	Operating instructions	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
Part 6	INDEX	Operating personnel + Inspection and servicing personnel + Repair personnel

OPERATING INSTRUCTIONS RH 120 E
Inspection and servicing



INSPECTION AND SERVICING - SAFETY INSTRUCTIONS

Operating manual

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

Pay special attention to:

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 a several day's instruction, e.g. by an Terex|O&K mechanic or by attending an Terex|O&K training course.

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 the working equipment

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

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

Always keep ladders, steps, platforms 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.

Checking the 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.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Cleaning jobs

Prior to commencing work, clean your working area, if necessary and possible, with a stream jet (rubber parts and electric components with compressed air - refer to information label).

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

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 your skin.

Wear 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 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.

Spare parts

Use only the original sparts parts of **Terex|O&K**.

They are the only ones to fulfill the technical specifications of the machine.

Handling oils and greases

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

Never set foot withing 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 immediately.

Visisble oil losses

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.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



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 motors 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, the system must be depressurized:

(do not leave the driver's seat)

- ➡ Stand working equipment on the ground
- ➡ Shut off the engines
- ➡ Move all control levers and pedals repeatedly into all directions.

Screwed connections, piping, hydraulic hoses

Repair any leakage 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 them.

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.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Non-polluting disposal

Dispose of oils, greases, cooling liquids, detergents, solvents and oil-containing components, such as filters, cleaning rags, replaced wearing parts and unusable machine parts, without polluting the environment and separately from other waste.

Do not dispose of these substances together with household wastes.

Fill these substances into the containers provided for such purposes.

Like any other oil, also bio-degradable, "environmental-friendly" hydraulic oil must be disposed of separately.

Do not allow oils and oily wastes to penetrate into the soil or into water. They are an environmental hazard

Seals

Individual spares may contain asbestos. Such spares or their packaging are marked with: 

Never process spares containing asbestos mechanically. Inhaling asbestos dust is a health hazard.

Clean sealing faces prior to assembly.

Engine exhaust gases

Start and operate combustion engines only on well-ventilated premises;

In closed rooms, exhaust gases must be evacuated to the outside;

Do not work on the exhaust system and do not make any modifications to it;

Exhaust gases from diesel engines and some of their constituents may cause cancer, birth defects and other reproductive harm.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Handling batteries

Battery Posts, terminals and related accessories contain lead and lead compounds, chemicals known to cause cancer and reproductive harm. Wash hands after handling

Batteries give off explosive gases.

Never handle batteries close to naked flames and unshielded light sources, never smoke.

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 gloves, firm protective clothing and goggles when handling batteries.

If the skin is splashed with acid, rinse thoroughly with running water and consult a doctor.

If the eyes are splashed with acid, rinse thoroughly with running water and consult a doctor immediately.

Never set tools down on the battery. They may induce a short circuit, causing irreparable damage to the battery and injuring persons.

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.

Before working on the electrical system

Before performing work on the electrical system where tools, spare parts, etc. can come into contact with electrical conductors or contacts, the battery must be disconnected.

Disconnect first the negative and then the positive terminal.

After the work:

Reconnect first the positive and then the negative terminal.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Selecting oils and greases

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

Filters

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

All filters are coordinated carefully with the equipment. Original Terex|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, watch for 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, re-install all protective devices.

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

Carry out performance tests with the machine.

FIRE AND EXPLOSION HAZARD

Safety Instructions

Avoid smoking and open fire on, next to and below the machine.

Combustible and easily flammable substances or liquids increase the fire and explosion hazard.

Do not store such substances on the excavator.

Clean the excavator thoroughly, if possible, with a steam jet (rubber parts and electric components with compressed air - refer to information label), when, for example, oil, grease, fuel or cleaner was spilled.

Such substances may spontaneously ignite if they get into the vicinity of hot units or objects such as turbo superchargers.

Even battery gases can ignite in open flames or fire.

Avoid parking the excavator in places where

- combustible substances such as coal dust or tar are present.
- open or smouldering fire may occur.

Remove the excavator from such an area where combustible or easily flammable liquids have spilled from the excavator onto the ground.

Flying sparks may cause fire on the ground that can spread to the excavator.

OPERATING INSTRUCTIONS RH 120 E
Inspection and servicing



OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



INSPECTION AND SERVICING PLANS - INSTRUCTIONS

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 providing a link between the operating hours (OH) recorded by the hours-run meter of the machine and the inspection and Servicing plans.

Plan	Do all jobs
V	...once prior to initial commissioning.
N	...after initial commissioning and during the running-in period.
T	...every 10 OH or every working shift ¹⁾
W	...every 60 OH or weekly ²⁾
A	...after every 250 OH.
B	...after every 500 OH.
C	...after every 1000 OH.
D	...after every 5000 OH.
E	...after every 10000 OH.
OH = Bh = Operating hours	

Change of engine oil I

The intervals stated for **changing the engine oil** apply to fuels with a sulphur content of $\leq 0.5\%$ and a permanent ambient temperature down to -10°C (14°F).

In case of higher sulphur content and/or a permanent ambient temperature of below -10°C (14°F), shorter intervals are required.

If the engine oil change intervals are not reached within **6 months**, the oil must be changed at least **after 6 months**.

Air-intake system

The air filter must be serviced only if the BCS so

indicates. Replace the filter elements after one year at the latest.

Oils / Greases

For the specification of oils and greases to be used refer to the "Lubricants" section.

The numerals mentioned in the "Oil / Grease" column in the inspection and Servicing plans have the following meaning:

I	Oils for combustion engines and compressors
II	Oils for hydraulic systems
III	Oils for gearboxes
V	Greases for bearings and slewing rings

Cleaning jobs

Cleaning jobs, especially on cooling systems, must be done at shorter intervals if the machine is exposed to severe dust build-up.

Components

The maintenance intervals for components, e.g. engine and gearbox, are listed in the following **Terex|O&K** maintenance schedules.

It is possible that the manufacturer's documentation for these components states intervals deviating from the above-mentioned intervals.

In such case, only the maintenance intervals specified by Terex|O&K shall apply.

² Whichever comes first.

OPERATING INSTRUCTIONS RH 120 E
Inspection and servicing



OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Plan V

Plan V - Once prior to initial commissioning

Page 1 von 2

Location	Servicing work	Quantity/ No.
Engine	Check oil level	2
Engine oil reservoir (optional)	Check oil level	2
Cooling system		
Cooling liquid	Check	2
Electrical system		
Battery	Check liquid level	6
Lighting	Check operation	
Grounding cable (potential compensation)	Check for tightness	14
Monitoring, warning and control elements	Check function of monitoring, warning and control elements	
	Check emergency OFF function	
BCS	Check function	1
Hydraulic system	Check function of working and travelling movement	
	Check pressure (see Technical handbook)	
Hydraulic oil reservoir	Check oil level	1
Hydraulic cylinders	Vent (see chapter "venting hydraulic system")	
Pump transfer gearbox	Check oil level	2
- Pre-chambers		
- Expansion reservoir	Check oil level	2
Slewing gearbox	Check oil level	2
Travel gearbox	Check oil level	2
- Pre-chambers	Check oil level	2 x 1
- Brake chambers	Check oil level	2 x 2
Slewing ring		
Internal gearing	Check grease filling	1
Undercarriage		
Track roller	Check for leaks and free movement	2 x 7
Support roller	Check for leaks and free movement	2 x 2
Track	Check pressure	2
Idler	Check for leaks and free movement	2

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Plan – V Once prior to initial commissioning

Page 2 von 2

Location	Servicing work	Quantity/ No.
Central lubricating system		
Grease container	Check filling level	1
Greasing and pause cycles	Check setting	
Level control	Check function	1
Service – Station (tanklift)	Check operation	1
Air conditioner (optional)		
Compressor	Check oil level	1
Ramp-type ladder (optional)		
- Guide pulleys	Lubricate	3
- Locking bolt	Grease	1
- Safety shut-off	Check and readjust, if necessary	1
On-board crane (optional)		
- Bearings	Lubricate	4
- Joint (column / boom)	Lubricate	2
- Cylinder bearing	Lubricate	5
- Slewing ring	Grease	1
Hydraulic oil reservoir	Check oil level	1
	(see “On-Board Crane“ operating instructions)	
Crane drive engine	Check oil level	1
	(see “Crane drive Engine“ operating instructions)	
- Battery	Check liquid level	2
All lines, fittings and connections	Inspect visually for leaks, wearing marks	
All articulated joints and hinges	Grease	

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Plan N

Plan N – After initial commissioning and during the running-in period

Page 1 von 2

Location	Servicing work	Quantity/ No.
After 100 Bh Engine - Bearing - Fastening screws	Check for tightness	
Cooling system Water filter Radiator - Bearing - Fastening screws	Replace Check for tightness	2 x 1
Hydraulic system Oil cooler - Bearing - Fastening screws Return-flow filter Return-flow filter (cooling circuit) Magnetic rod Pressure accumulator – emergency lowering Pressure accumulator - ramp-type ladder (optional)	Check for tightness Replace Replace Clean Check function Check function	 7 2 1 1 1
Pump transfer gearbox - Pre-chambers	Change oil Change oil	2 ³ 2 x 3 ³
Slewing gearbox Fastening screws	Change oil Check for tightness	2 ³
Travel gearbox - Pre-chambers - Brake chambers Fastening screws	Change oil Change oil Change oil Check for tightness	2 ³ 2 x 1 ³ 2 x 2 ³

³ see "Refilling quantities – Oil" table

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Plan N – After initial commissioning and during the running-in period

Page 2 von 2

Location	Servicing work	Quantity/ No.
Slewing ring Fastening screws (slewing ring, undercarriage and superstructure)	Check for tightness (see Technical handbook)	
Superstructure Fastening screws, especially at superstructure / pedestal / driver's cab	Check for tightness	
All lines, fittings and connections	Inspect visually for leaks, wearing marks	

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Plan T

(Every 10 OH or every working shift
(whichever comes first)

Every 60 OH or every working shift
(whichever comes first)

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Location	Servicing work	Quantity/ No.	Plan T	Plan W
Engine	Check oil level	2	●	●
Engine oil reservoir (optional)	Check oil level	2	●	●
Cooling system				
Cooling fluid level	Check	2	●	●
Radiator	Check / clean	2	●	●
Fuel system				
Fuel filter	Drain off water	2 x 2	●	●
Water trap (optional)	Drain off water	2 x 1	●	●
Air-intake system	Check BCS - indication	1		●
Intake and clean-air lines	Check for tightness and leaks			●
Electrical system				
Lighting	Check operation		●	●
Switchgear cabinet		2		●
- Breather filter				
- Dust trap	Remove dust	1		●
- EMERGENCY OFF button	Check function	2		●
Monitoring, warning and control elements	Check function of monitoring, warning and control elements		●	●
BCS	Check function	1	●	●
Hydraulic system	Check function of working and travelling movement		●	●
	Inspect visually for leaks			●
Hydraulic oil reservoir	Check oil level	1	●	●
Oil cooler	Check / clean	2		●
Fan wheel	Check condition	2	●	●
Pump transfer gearbox	Check oil level	2		●
- pre-chambers	Check oil level	2	●	●
Oil filter (tell-tale)	Check	2 x 1		●
Slewing gearbox	Check oil level	2	●	●
Travel gearbox	Check for leaks	2	●	●

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



(Every 10 OH or every working shift

(whichever comes first)

Every 60 OH or every working shift

(whichever comes first)

Page 2 von 2

Location	Servicing work	Quantity/ No.	Plan T	Plan W
Undercarriage				
Tracks	Inspect track tension visually	2	●	●
Track roller	Check for leaks and free movement	2 x 7		●
Support roller	Check for leaks and free movement	2 x 2		●
Idler	Check for leaks	2		●
Central lubricating system				
Grease container	Check filling level	1	●	●
Lubricating points	Check visually		●	●
Air conditioner (optional)	(see "Air Conditioning manual")	1		●
On-board crane (optional) ⁴				
Crane drive engine	Check oil level (see "Crane drive Engine" operating instructions)	1		
Hydraulic oil reservoir	Check oil level	1		
- Reflow filter (contamination indicator)	Check	1		
Fire extinguisher	Check condition	2	●	●
Automatic fire-extinguishing system (optional)	Check control module	1	●	●
All lines, fittings and connections	Inspect visually for leaks, wearing marks		●	●
Excavator	Overall cleaning			●

⁴ before each deployment

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Plan A – E

Plan A - after every 250 OH
(at 250, 750, 1250 ... OH)

Plan C - after every 1000 OH
(at 1000, 2000, 3000, 4000 ... OH)

Plan E - after every 10000 OH
(at 10000, 20000, 30000, ... OH)

Plan B - after every 500 OH
(at 500, 1500, 2500 ... OH)

Plan D - after every 5000 OH
(at 5000, 15000, 25000 ... OH)

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Location	Servicing work	Menge / No.	Plan A	Plan B	Plan C	Plan D	Plan E
Servicing in acc. with W or T			●	●	●	●	●
Monitoring, warning and control elements							
- Joystick							
- Control spool	oil lightly	2 x 4 ⁵			●	●	●
- Pedal							
- Control spool (machine with loading shovel)	oil lightly	3 x 2 ⁵			●	●	●
- Control spool (machine with backhoe bucket)	oil lightly	2 x 2 ⁵			●	●	●

⁵ apply a thin layer of hydraulic oil

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Plan A - after every 250 OH
(at 250, 750, 1250 ... OH)

Plan B - after every 500 OH
(at 500, 1500, 2500 ... OH)

Plan C - after every 1000 OH
(at 1000, 2000, 3000, 4000 ... OH)

Plan D - after every 5000 OH
(at 5000, 15000, 25000 ... OH)

Plan E - after every 10000 OH
(at 10000, 20000, 30000, ... OH)

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Location	Servicing work	Menge / No.	Plan A	Plan B	Plan C	Plan D	Plan E
Engine	Change oil	2 ⁶		●	●	●	●
	Clean				●	●	●
- Bearing							
- Fastening screws	Check tightness				●	●	●
- Rubber bearing	Check condition				●	●	●
Oil filter	Replace	2 x 2		●	●	●	●
V-belt	Check tension		●	●	●	●	●
	Check condition		●	●	●	●	●
Centrifuge (optional)	Clean	2 x 1			●	●	●
- Rotor seal	Replace	2 x 1			●	●	●
- Casing seal	Check /replace	2 x 1			●	●	●
Inspection and servicing	(see Operating and maintenance manual for engine)	2	●	●	●	●	●

⁶ see "Refilling quantities – Oil" table

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Plan A - after every 250 OH
(at 250, 750, 1250 ... OH)

Plan B - after every 500 OH
(at 500, 1500, 2500 ... OH)

Plan C - after every 1000 OH
(at 1000, 2000, 3000, 4000 ... OH)

Plan D - after every 5000 OH
(at 5000, 15000, 25000 ... OH)

Plan E - after every 10000 OH
(at 10000, 20000, 30000, ... OH)

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Location	Servicing work	Menge / No.	Plan A	Plan B	Plan C	Plan D	Plan E
Engine with engine oil re- servoir - Bearing - Fastening screws - Rubber bearing Oil filter Engine oil reservoir Oil filter (interval prolongation) V-belt Centrifuge (optional) - Rotor seal - Casing seal Inspection and servicing	Carry out oil analysis	2	●	●	●	●	●
	Change oil	2 ⁷			●	●	●
	Clean				●	●	●
	Check tightness				●	●	●
	Check condition				●	●	●
	Replace	2 x 2			●	●	●
	Change oil	2 ⁷			●	●	●
	Replace	2 x 2			●	●	●
	Check tension		●	●	●	●	●
	Check condition		●	●	●	●	●
	Clean	2 x 1			●	●	●
	Replace	2 x 1			●	●	●
	Check /replace	2 x 1			●	●	●
	(see Operating and maintenance manual for engine)	2	●	●	●	●	●

⁷ see "Refilling quantities – Oil" table

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Plan A - after every 250 OH
(at 250, 750, 1250 ... OH)

Plan C - after every 1000 OH
(at 1000, 2000, 3000, 4000 ... OH)

Plan E - after every 10000 OH
(at 10000, 20000, 30000, ... OH)

Plan B - after every 500 OH
(at 500, 1500, 2500 ... OH)

Plan D - after every 5000 OH
(at 5000, 15000, 25000 ... OH)

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Location	Servicing work	Menge / No.	Plan A	Plan B	Plan C	Plan D	Plan E
Cooling system							
Water filter	Inspect visually for leaks Replace	2 x 1	● ●	● ●	● ●	● ●	● ●
Radiator							
- Check tightness	Check tightness				●	●	●
- Fastening screws	Check condition				●	●	●
- Rubber bearing					●	●	●
Cooling liquid	Check DCA4-concentration Change	1 ⁸		●	●	●	●
Anti-freeze	Check				●	●	●
Lines	Check for leaks				●	●	●
Hose clamps	Check tightness				●	●	●
Fuel system							
Fuel filter	Replace	2 x 2	●	●	●	●	●
Water trap (optional)	Clean	2 x 1	●	●	●	●	●
- Filterelement	Change	2 x 1			●	●	●
Air-intake system							
Main filter element	Check / replace	2 x 2 ⁹			●	●	●
Safety filter element	Replace	2 x 2 ¹⁰			●	●	●
Air-intake line and clean-air line	Check for tightness and leaks				●	●	●
Hoses	Replace					●	●
Electrical system							
Battery cable connections	Check for tightness		●	●	●	●	●
Battery	Check fluid level	6		●	●	●	●
Grounding cable	Check for tightness	14	●	●	●	●	●
Switchgear cabinet							
- Breather filter							
- Filter element	Clean	1		●	●	●	●
	Replace	1				●	●

⁸ Cooling-liquid replacement after 2 years at the latest

⁹ Replacement of safety filter element after one year resp. after 3 cleaning cycles of the main filter element at the latest.

¹⁰ Unless it is regularly analyzed, the hydraulic oil must be changed every 5000 OH or after 3 years at the latest

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Plan A - after every 250 OH
(at 250, 750, 1250 ... OH)

Plan C - after every 1000 OH
(at 1000, 2000, 3000, 4000 ... OH)

Plan E - after every 10000 OH
(at 10000, 20000, 30000, ... OH)

Plan B - after every 500 OH
(at 500, 1500, 2500 ... OH)

Plan D - after every 5000 OH
(at 5000, 15000, 25000 ... OH)

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Location	Servicing work	Menge / No.	Plan A	Plan B	Plan C	Plan D	Plan E
Hydraulic system	Check pressure (see Technical handbook)				●	●	●
Oil cooler							
- Bearing							
- Fastening screw	Check for tightness				●	●	●
- Rubber bearing	Check condition				●	●	●
Return-flow filter	Replace	7			●	●	●
Return-flow filter (cooling circuit)	Replace	2			●	●	●
Filter (control circuit)	Check for contamination and damage	1			●	●	●
	Replace	1				●	●
Filter (auxiliary control circuit)	Check for contamination and damage	1			●	●	●
	Replace	1				●	●
High-pressure filter	Check / clean	4			●	●	●
	Replace	4				●	●
High-pressure filter (slewing circuit)	Check / clean	2			●	●	●
	Replace	2				●	●
Magnetic rod	Check / clean	1			●	●	●
Bypass valve	Check / clean filter sieve	4			●	●	●
Bypass valve (cooling circuit)	Check / clean filter sieve	1			●	●	●
Breather filter	Replace	2				●	●
Hydraulic oil reservoir	Carry out oil analysis	1		●	●	●	●
	Change oil	1 ^{11 12}					●
Pressure accumulator	Check pressure (see Technical handbook)	1					●
Cylinder (seals and guide rings)	Rplace						●

¹¹ see "Refilling quantities – Oil" table

¹² Unless it is regularly analyzed, the hydraulic oil must be changed every 5000 OH or after 3 years at the latest

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Plan A - after every 250 OH
(at 250, 750, 1250 ... OH)

Plan B - after every 500 OH
(at 500, 1500, 2500 ... OH)

Plan C - after every 1000 OH
(at 1000, 2000, 3000, 4000 ... OH)

Plan D - after every 5000 OH
(at 5000, 15000, 25000 ... OH)

Plan E - after every 10000 OH
(at 10000, 20000, 30000, ... OH)

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Location	Servicing work	Menge / No.	Plan A	Plan B	Plan C	Plan D	Plan E
Pump transfer gearbox	Carry out oil analysis	2		●	●	●	●
	Change oil	2 ¹³			●	●	●
	- Breather filter	2 x 1			●	●	●
	Replace	2 x 1				●	●
	- Pre-chamber	2 x 3			●	●	●
	- Breather filter	2 x 1			●	●	●
	Oil filter	2 x 1			●	●	●
	Check for contamination and damage	2 x 1				●	●
Slewing gearbox	Carry out oil analysis	2		●	●	●	●
	Change oil	2 ¹³			●	●	●
	- Breather filter	2 x 1				●	●
Travel gearbox	Carry out oil analysis	2		●	●	●	●
	Check oil level	2		●	●	●	●
	Change oil	2 ¹³				●	●
	- Magnetic rod	2 x 1			●	●	●
	Pre-chambers	2 x 1		●	●	●	●
	Change oil	2 x 1 ¹³				●	●
	- Magnetic rod	2 x 1			●	●	●
	Brake chambers	2 x 2		●	●	●	●
	Change oil	2 x 2 ¹³				●	●
	Breather filter	2 x 3			●	●	●
	Replace	2 x 3				●	●

¹³ see "Refilling quantities – Oil" table

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Plan A - after every 250 OH
(at 250, 750, 1250 ... OH)

Plan C - after every 1000 OH
(at 1000, 2000, 3000, 4000 ... OH)

Plan E - after every 10000 OH
(at 10000, 20000, 30000, ... OH)

Plan B - after every 500 OH
(at 500, 1500, 2500 ... OH)

Plan D - after every 5000 OH
(at 5000, 15000, 25000 ... OH)

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Location	Servicing work	Menge / No.	Plan A	Plan B	Plan C	Plan D	Plan E
Slewing ring Gearing / pinion Fastening screws (slewing ring, undercarriage and superstructure)	Check grease filling Check condition Check for tightness (see Technical Handbook)	1		● ●	● ●	● ● ●	● ● ●
Undercarriage Diaphragm accumulator	Check wear (see Technical Handbook) Check pressure (see Technical handbook)	2			●	● ●	● ●
Central lubricating system Oilfilter (hydraulic circuit grease pump) Grease filter (filling grease container) Grease filter (grease lines) Grease sieve	Check function Check for contamination and damage Replace Check for contamination and damage Replace Check for contamination and damage Replace Check / clean	1 1 1 1 1 2 x 2		●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ● ●
Air conditioner resp. heating - Air suction (Backside driver's seat) - Filter mat	(see "Manual") Change	1 3			● ●	● ●	● ●
Ramp-type ladder (optional) - Guide pulleys - Locking bolt	Lubricate Lubricate	3 1			● ●	● ●	● ●

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Plan A - after every 250 OH
(at 250, 750, 1250 ... OH)

Plan C - after every 1000 OH
(at 1000, 2000, 3000, 4000 ... OH)

Plan E - after every 10000 OH
(at 10000, 20000, 30000, ... OH)

Plan B - after every 500 OH
(at 500, 1500, 2500 ... OH)

Plan D - after every 5000 OH
(at 5000, 15000, 25000 ... OH)

Page 8 von 8

Location	Servicing work	Menge / No.	Plan A	Plan B	Plan C	Plan D	Plan E
On-board crane (Option)¹⁴							
- Bearing	Lubricate	4					
- Joint (column / boom)	Lubricate	2					
- Cylinder bearing	Lubricate	5					
- Slewing ring	Grease	1					
Hydraulic system	Change oil	1 ¹⁵					
- Return-flow filter	Replace	1					
- Breather filter	Replace	1					
	see "On-Board Crane" operating instructions		•	•	•	•	•
Crane drive engine	Clean	1					
	Change oil	1 ¹⁵					
- Oil filter	Replace	1					
- Fastening screws	Check for tightness	1					
- Fuel filter	Replace	1					
- Air filter	Replace	1					
- Battery cable connection	Check for tightness	2					
	see "Crane Drive Engine" operating instructions		•	•	•	•	•
Steel components	Carry out visual check				•	•	•
Modules							
- Fastening screws	Check for tightness				•	•	•
All articulated joints and hinges	Grease				•	•	•

¹⁴ Do all servicing jobs at least once a year and when necessary

¹⁵ see "Refilling quantities – Oil" table

OPERATING INSTRUCTIONS RH 120 E
Inspection and servicing



LUBRICATING CHART – GREASE (LOADING BUCKET)

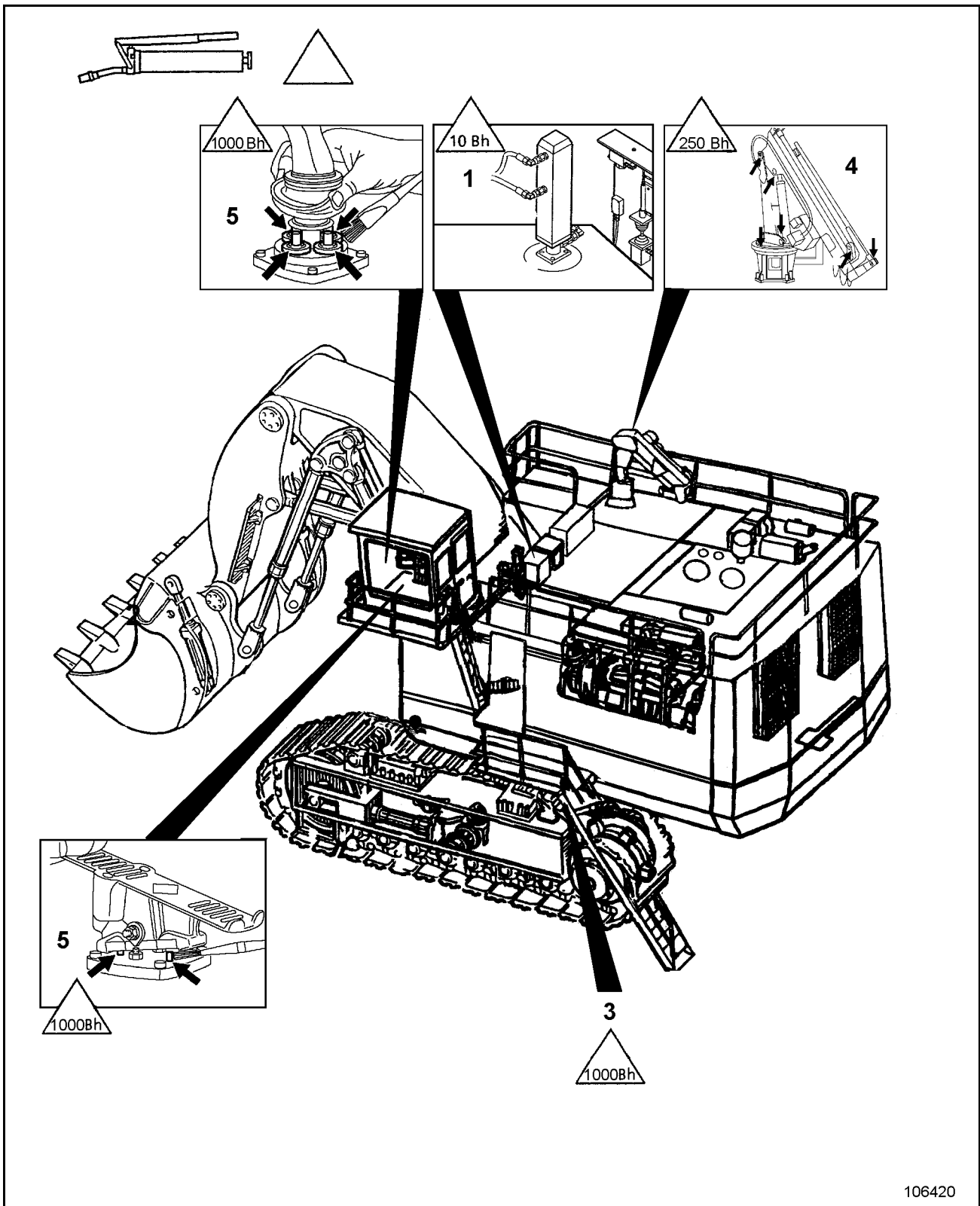


Fig. 3-1:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Lubricating chart – Grease / Backhoe bucket (legend)

No.	Greasing point	Number	Lubricant properties	Grease every operating hours
1	Central lubricating system – grease container	1	V ¹⁶	10
3	Ramp-type ladder (optional) - central greasing point	1	V ¹⁶	1000
4	On-board crane			
	- Bearing	4	V ¹⁶	250
	- Joint (column / boom)	2		250
	- Cylinder bearing	5		250
	- Slewing ring	1	Graphitspray	250
5	Monitoring, warning and control elements			
	- Joystick	2 x 4 ¹⁷	II ¹⁶	1000
	- Pedal	3 x 2 ¹⁷		1000

All other greasing points are supplied with grease by the central lubricating system.

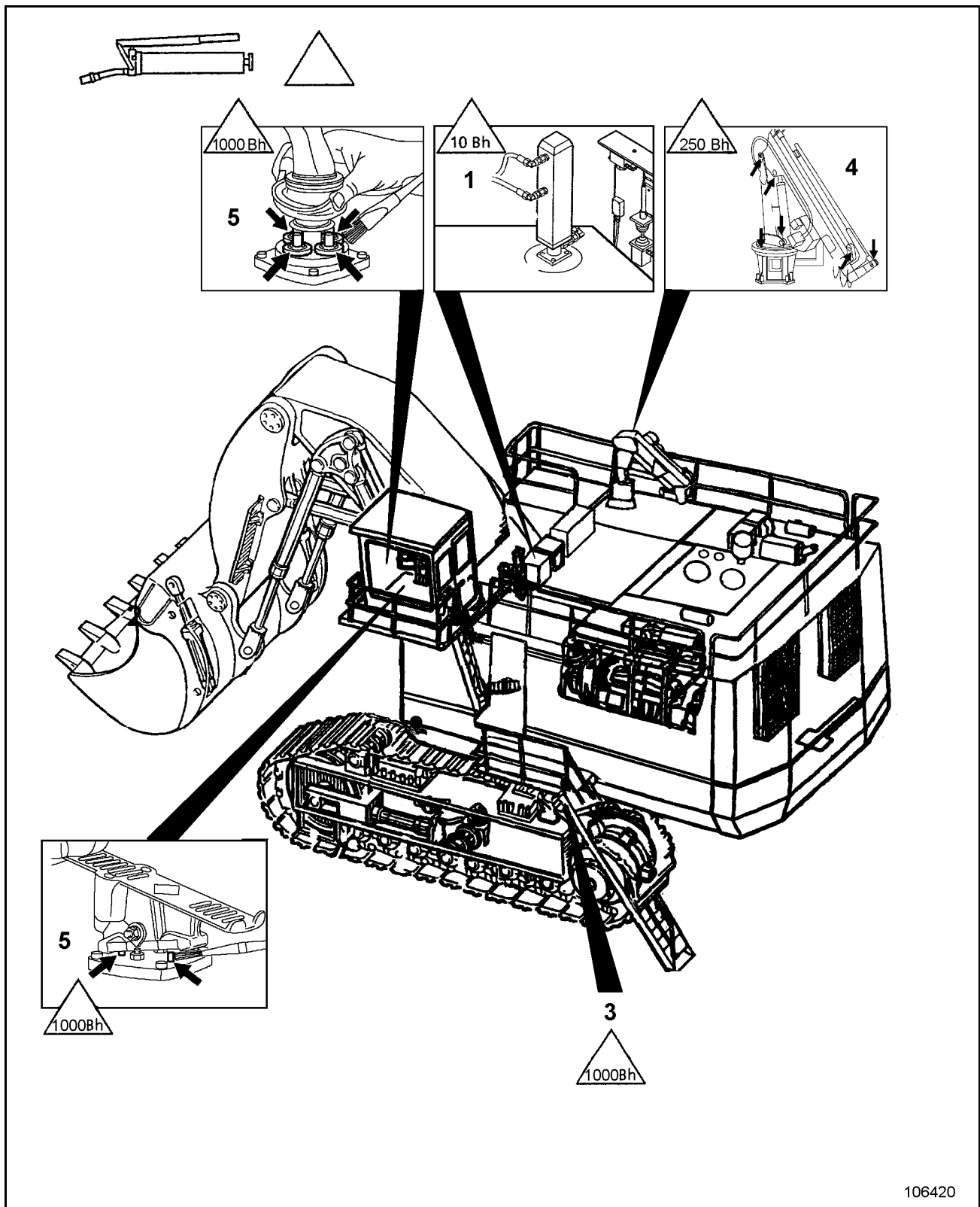
Filling quantities - Grease

Greasing point	Lubricant properties	Filling quant.	
		kg	lb
Central lubricating system – grease container	V ¹⁶	500	1102
Internal gearing – Roller-bearing slewing ring		150	330.7
Idler (permanent grease filling)	Tribol Terex O&K part no. 2764564	2 x 4.4	2 x 9.7
Track rollers (permanent grease filling)		14 x 14	14 x 30.9
Support rollers (permanent grease filling)		4 x 1.3	4 x 2.9

¹⁶ see "LUBRICANTS" section.

¹⁷ apply a thin layer of hydraulic oil

Lubricating chart – Grease / Backhoe bucket



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Fig. 3-2:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Lubricating chart – Grease / Backhoe bucket (legend)

No.	Greasing point	Number	Lubricant properties	Grease every operating hours
1	Central lubricating system – grease container	1	V ¹⁸	10
3	Ramp-type ladder (optional) - central greasing point	1	V ¹⁸	1000
4	On-board crane			
	- Bearing	4	V ¹⁸	250
	- Joint (column / boom)	2		250
	- Cylinder bearing	5		250
	- Slewing ring	1		250
			Graphitspray	
5	Monitoring, warning and control elements		II ¹⁸	
	- Joystick	2 x 4 ¹⁹		1000
	- Pedal	2 x 2 ¹⁹		1000

All other greasing points are supplied with grease by the central lubricating system.

Filling quantities - Grease

Greasing point	Lubricant properties	Filling quant.	
		kg	lb
Central lubricating system – grease container	V ¹⁸	500	1102
Internal gearing – Roller-bearing slewing ring		150	330.7
Idler (permanent grease filling)	Tribol Terex O&K part no. 2764564	2 x 4.4	2 x 9.7
Track rollers (permanent grease filling)		14 x 14	14 x 30.9
Support rollers (permanent grease filling)		4 x 1.3	4 x 2.9

¹⁸ see "LUBRICANTS" section.

¹⁹ apply a thin layer of hydraulic oil

INSPECTION PLAN - OIL

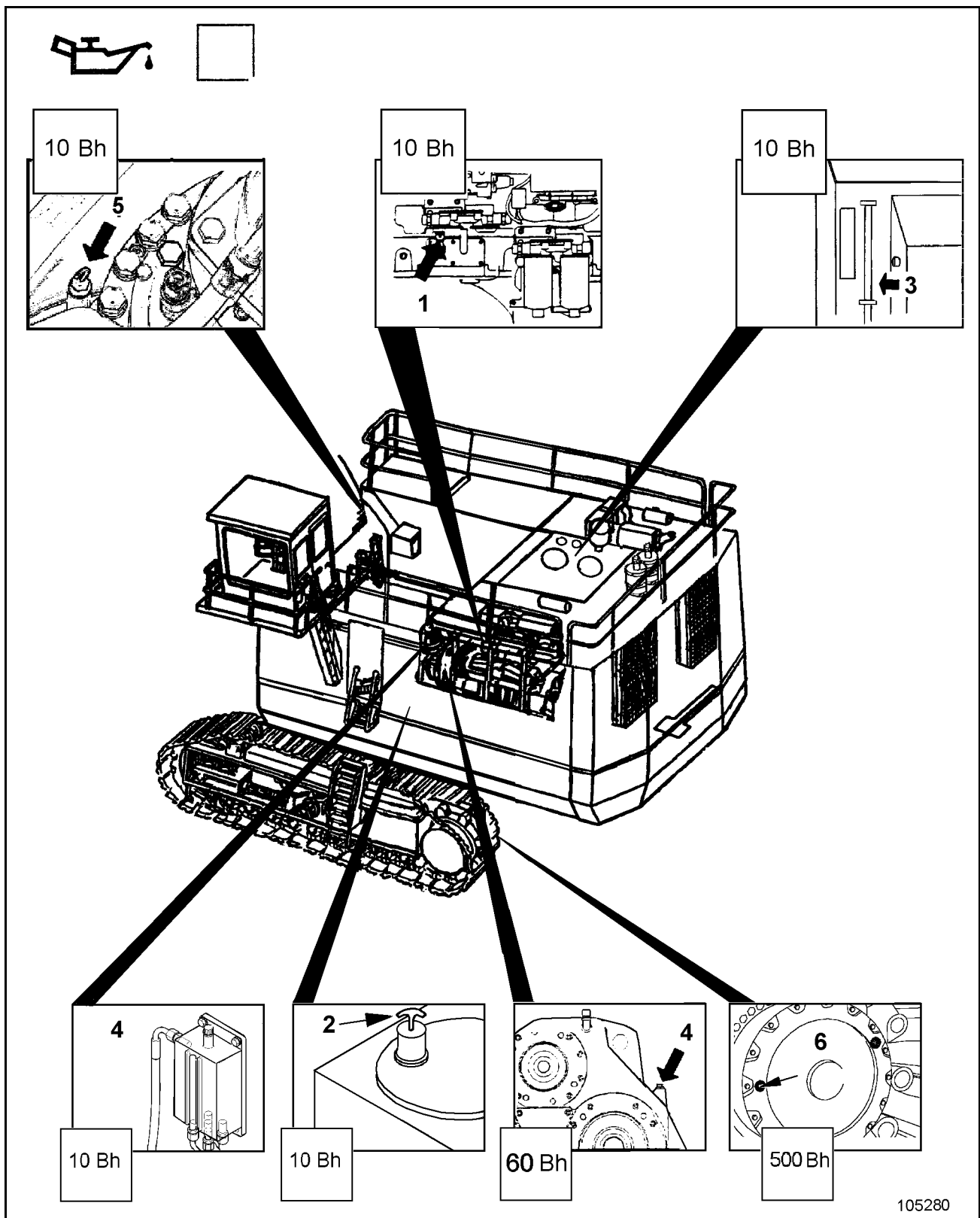


Fig. 3-3:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Inspection plan – Oil (legend)

No.	Location	Number	Lubricant properties ²⁰	Check oil level every ... OH	Change oil every ... OH
1	Engine	2	I	10	500
1	Engine with reservoir (option)	2	I	10	1000
2	Engine oil reservoir (optional)	2	I	10	1000
3	Hydraulic system	1	II	10	10000 ²¹
4	Pump transfer gearbox	2	III.a	60	1000
	- Pre-chambers	2 x 3		10	1000
5	Slewing gearbox	2	III.b	10	1000
6	Travel gearbox	2	III.c	500	5000
	- Pre-chambers	2 x 1		500	5000
	- Brake chambers	2 x 2		500	5000
7	On-board crane (optional)				
	- Crane drive engine	1	I	10	250 ²²
	- Hydraulic oil reservoir	1	II	10	1000 ²³

²⁰ see "LUBRICANTS" section

²¹ Change hydraulic oil every 5000 OH unless the oil is analyzed at regular intervals, but not later than every 3 years.

²² Change oil at least once a year.

²³ Change hydraulic oil at least once a year.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Filling quantities - oil

Location	Filling quantities		Oil
	litres	gal	
Engine	2 x 66	2 x 17.4	I
Engine oil reservoir (optional)	2 x 260	2 x 68.7	I
Hydraulic oil reservoir	2500	660.4	II
Pump transfer gearbox	2 x 15.5	2 x 4.1	III.a
- Pre-chambers (working pumps)	4 x 1,4	4 x 0.37	
- Pre-chambers (hydraulic pumps)	2 x 0.2	2 x 0.05	
Slewing gearbox	2 x 26	2 x 6.87	III.b
Travel gearbox	2 x 60	2 x 17.43	III.c
- Pre-chambers	2 x 7	2 x 1.85	
- Brake chambers	4 x 0,5	4 x 0.13	
On-board crane (optional)			
- Crane drive engine	5.5	1.45	I
- Hydraulic oil reservoir	50	13.2	II

Filling quantities - other

Location	Filling quantities	
	litres	gal
Cooling system - engine	2 x 150	2 x 39.6
Fuel tank	2 x 2680	2 x 708
Fuel tank, crane drive engine (optional)	20	5.3
Screen washer	13	3.4

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



LUBRICANTS

I. Oils for combustion engines

Ambient temperature °F	-58	-40	-22	-4	+14	+32	+50	+68	+86	+104	+122
Ambient temperature °C	-50	-40	-30	-20	-10	0	+10	+20	+30	+40	+50

Specification:

API CI-4
ACEA E7
CAT ECF-1
CES 20076
CES 20077
CES 20078



TM Super 500 MC 10W40
Terex|O&K PN 6 002 055

API: American Petroleum Institute

ACEA: Association des Constructeurs Européens d'Automobiles

CAT ECF: Caterpillar Engine Crankcase Fluid Specification

CES: Cummins Engineering Specification



Engine pre - heating necessary. Cold - starting aid may be sufficient in upper range.

Follow with a warming - up phase.

When warming up, increase engine speed and loading gradually.

In case of lower temperatures, the engine manufacturers oil recommendations must be observed. Please contact the Terex|O&K Technical Service.

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Fig. 3-4:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



III.a Oils for pump gearboxes

Ambient temperature	°F	-58	-40	-22	-4	+14	+32	+50	+68	+86	+104	+122
	°C	-50	-40	-30	-20	-10	0	+10	+20	+30	+40	+50
Specification: Mineral oil: DIN 51 517-3: CLP ISO 6743-6: CKC Synthetic oil: DIN 51 517-3: CLP ISO 6743-6: CKC FZG Test > 12												
	TM Special Gearoil CLP 220 PLUS Terex O&K P/N 2 482 891											
	CLP 220											
	TM Gearoil CLP 220 LT Terex O&K P/N 6 002 885											

In case of using TM Gearoil CLP 220 LT Terex|O&K P/N 6 002 885:

Oil analysis after 1000 oh.
Oil change after 2000 oh.

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Fig. 3-6:

III.b Oils for swing gearboxes

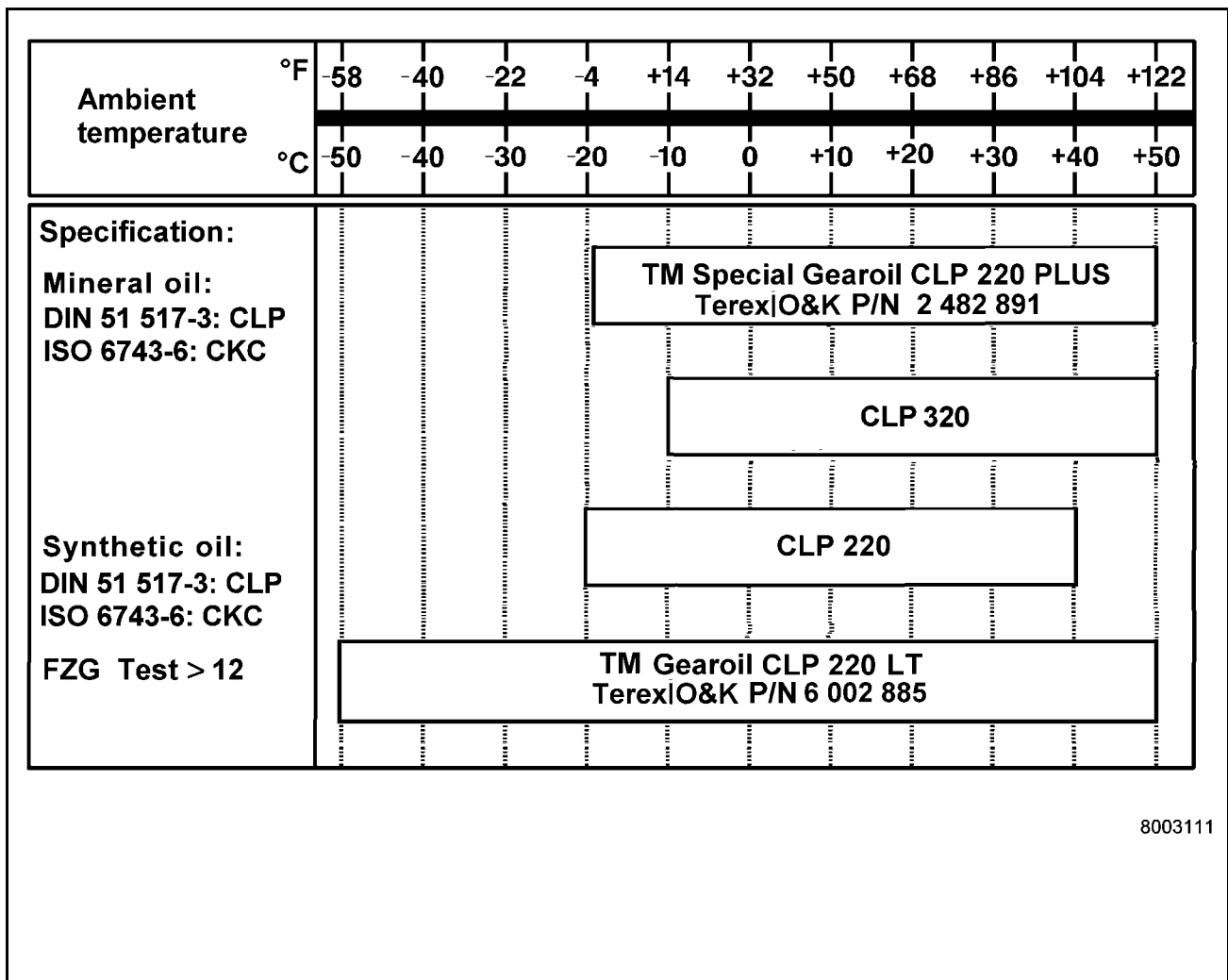


Fig. 3-7:

III.c Oils for travel gearboxes

Ambient temperature	°F	-58	-40	-22	-4	+14	+32	+50	+68	+86	+104	+122
	°C	-50	-40	-30	-20	-10	0	+10	+20	+30	+40	+50
Specification: Mineral oil: DIN 51 517-3: CLP ISO 6743-6: CKC Synthetic oil: DIN 51 517-3: CLP ISO 6743-6: CKC FZG Test > 12												

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Fig. 3-8:

V. Greases for bearings and slewing rings

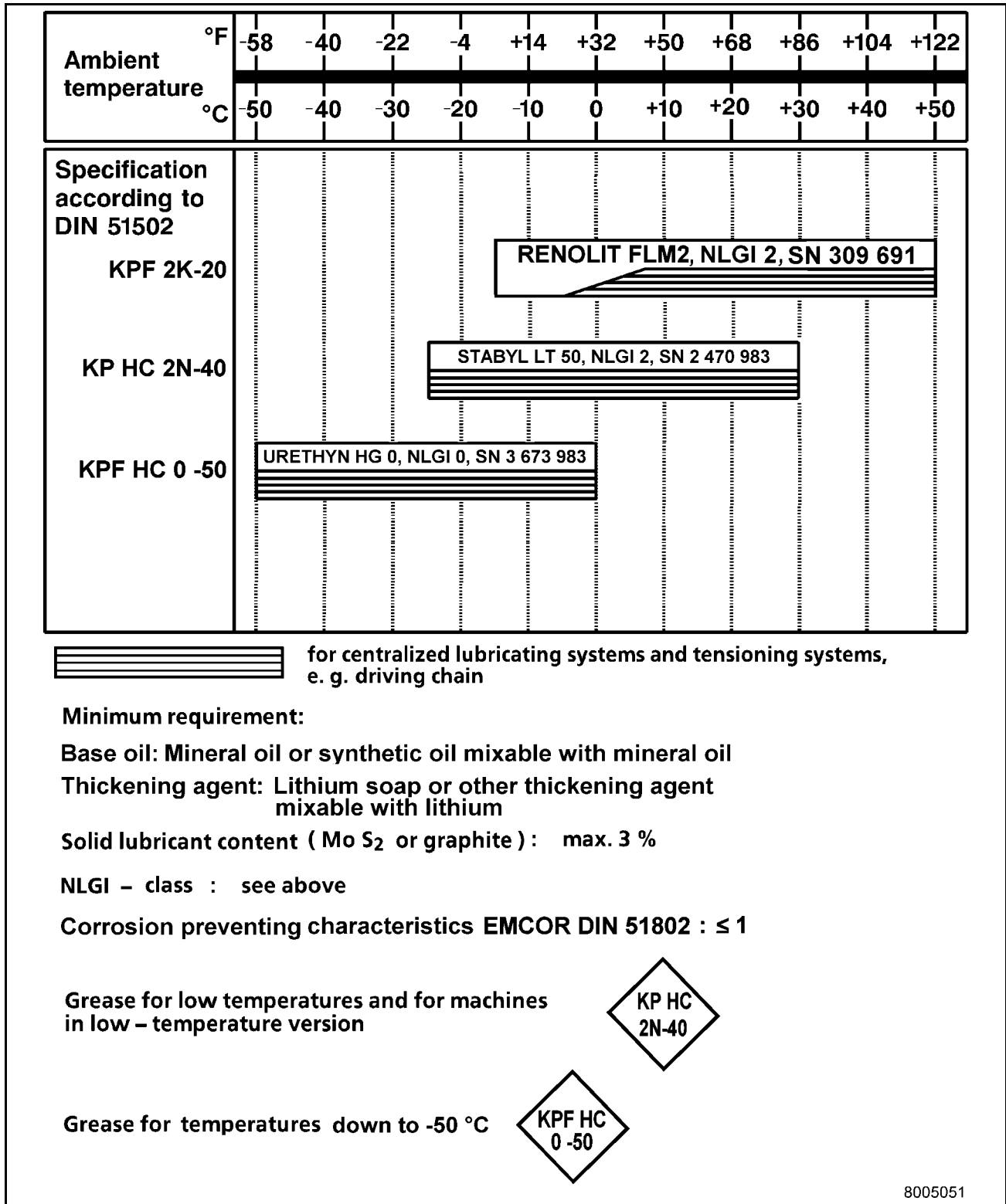


Fig. 3-9:

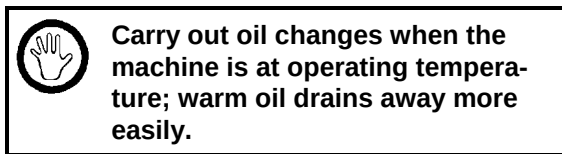
OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



SERVICING WORK

Hose line for oil and cooling liquid changes



Filling and draining is can be done by means of a hose through the service station (tanklift) (Fig. 3-10:).

For filling and draining, a flexible hose is connected to the express coupling on the service station and to the service vehicle at the other end.

The filling operations require an overpressure, whereas the draining operations require low pressure.

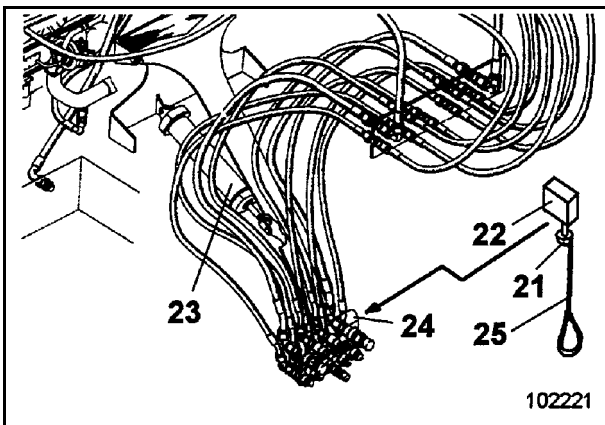


Fig. 3-10:

The engines, the hydraulic oil reservoir, the pump transfer gearboxes, the slewing gearboxes and the radiators (engine cooling liquid) are moreover equipped with automatic drain valves (1, Fig. 3-11:)

These automatic drain valves permit oil- and cooling-liquid changes without polluting the environment.

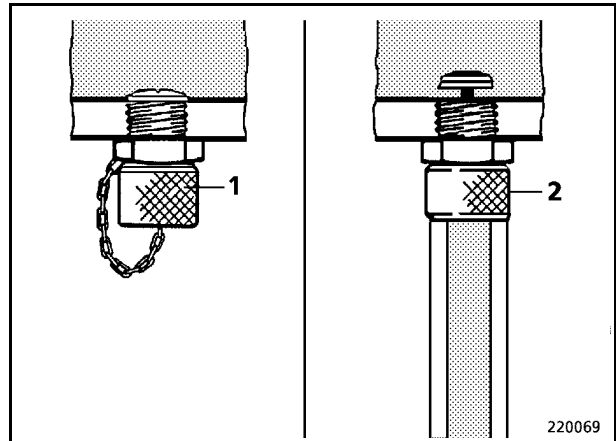


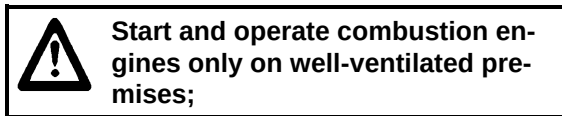
Fig. 3-11:

Change oil or cooling liquid as follows:

- Place a collecting recipient for used oil or cooling liquid under the corresponding automatic drain valve. For the recipient capacity refer to the "Re-filling quantities - Oil" table or to the "Refilling quantities - Other" table.
- Unscrew protective cap from automatic drain valve.
- Screw on hose line (2) to open the valve, so that the oil or the cooling liquid can flow out.
- When the oil or the cooling liquid has drained away, unscrew hose line to allow the valve to close automatically.
- Screw protective cap back in place.

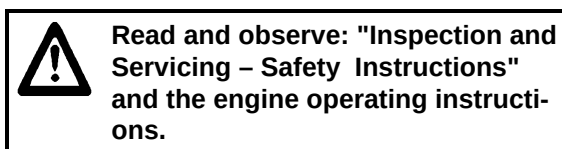
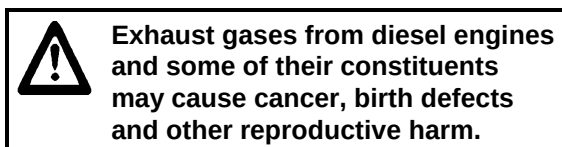
ENGINE

Engine - Safety instructions



In closed rooms, exhaust gases must be evacuated to the outside;

Do not work on the exhaust system and do not make any modifications to it;



Risk of injury from hot or rotating parts of the engine.
Shut off engines and allow to cool down.
Secure the machine as described in the "Securing the machine" section.
Protect the skin from potentially harmful contact with engine oil.
Wear protective gloves and firm working clothing.

Retensioning the alternator/fan belt

Checking and adjusting the valve clearance

These and other servicing works are described in the engine manufacturer's operating instructions.

Checking the engine oil level / Topping up

The engine oil pressure and oil temperature are constantly monitored by the BCS when the machine is in operation.

The actual pressure and temperature of the engine oil can be displayed on the screen (2, Fig. 3-12:).

The BCS warns the operator if the engine oil pressure is too low and the oil temperature too high.

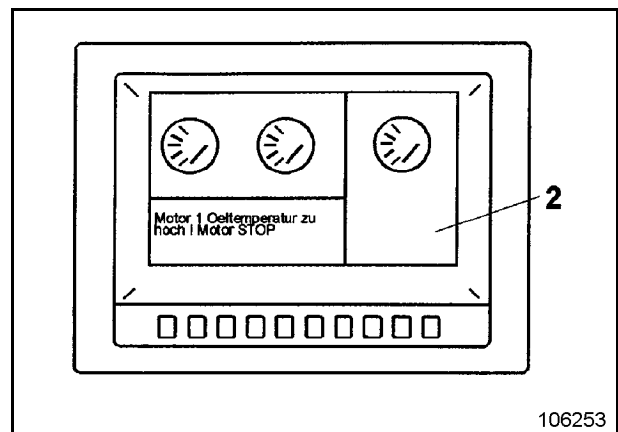


Fig. 3-12:

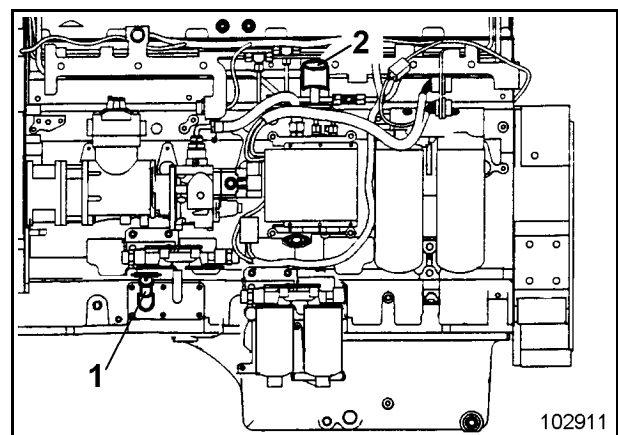


Fig. 3-13:

- Park the machine on a horizontal surface and secure against inadvertent movements.
- Shut off engines.
- Draw out oil dipstick (1, Fig. 3-13:).
- Wipe oil off the dipstick with a clean, lintfree cleaning rag and re-insert.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



- Draw out dipstick a second time. The oil level should now lie between the marks (arrows, Fig. 3-14:). If the oil level is at the "min" mark or below, top up with engine oil through filler tube (2, Fig. 3-16:).

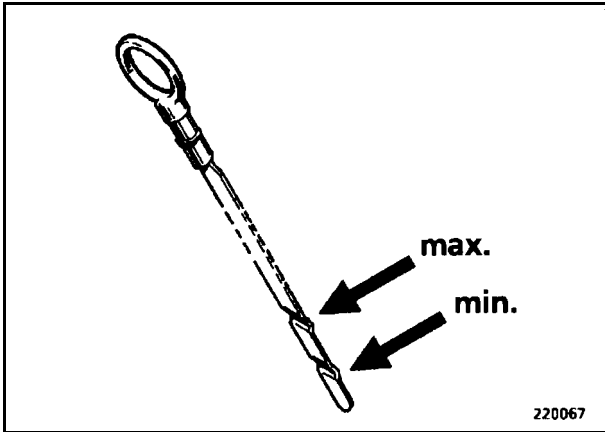


Fig. 3-14:

Engine oil can also be filled in from the service station (Fig. 3-15:) through

- express coupling (8) for the lefthand engine
 - express coupling (9) for the righthand engine
- (see chapter "Changing the engine oil")

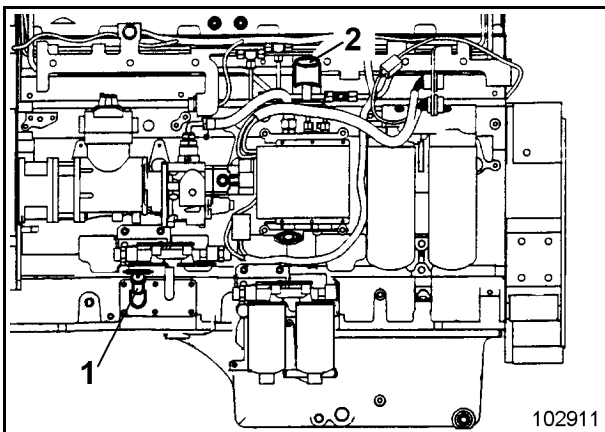


Fig. 3-15:

Checking the oil level in the engine oil reservoir / topping up (optional)

- Park the machine on a horizontal surface and secure against inadvertent movements.
- Shut off engines.

- Unlock the oil dipstick (2, Fig. 3-17:) and withdraw.
- Wipe oil off the dipstick with a clean, lintfree cleaning rag and re-insert.

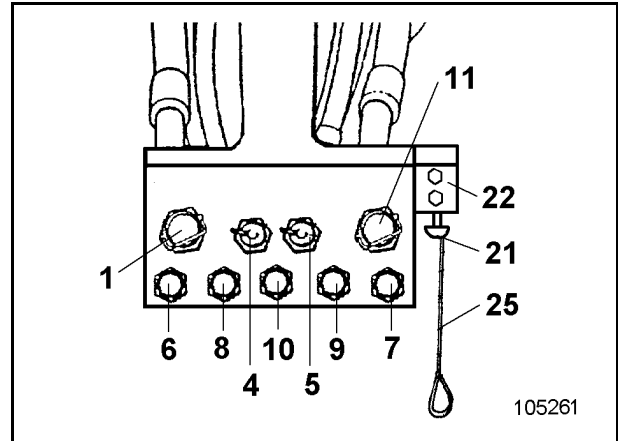


Fig. 3-16:

- Draw out dipstick a second time. The oil level should lie at the mark. If the oil level is below, the engine oil is filled in from the service station (Fig. 3-16:) through
 - express coupling (6) for the lefthand engine oil reservoir
 - express coupling (7) for the righthand engine oil reservoir

(see chapter "Engine oil reservoir - Changing the oil")

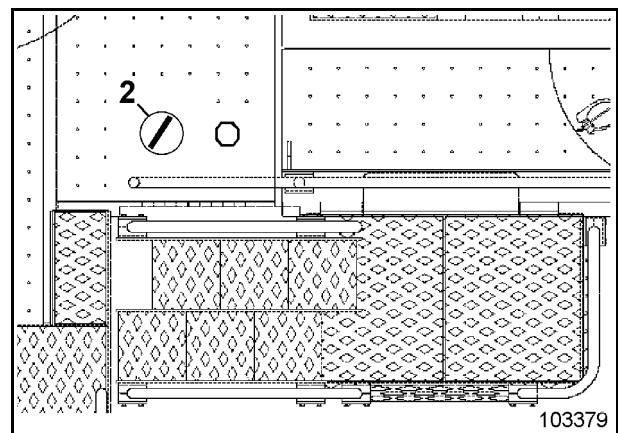
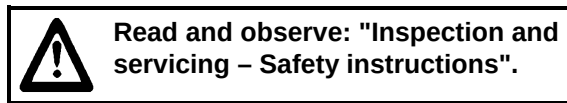


Fig. 3-17:

Changing the engine oil



Risk of scalding from hot engine oil.

The engines may also be hot.

Wear protective gloves and firm working clothing.

Collect escaping oil and discard without polluting the environment.

Drawing off engine oil with the service station.

- ➡ Bring engine oil to operating temperature.
- ➡ Park the machine on a horizontal surface and secure.
- ➡ Shut off the engines.

Draw off the engine oil through

- express coupling (8, Fig. 3-18:) for the lefthand engine
- express coupling (9) for the righthand engine.
- ➡ Unscrew cap of express coupling and connect hose line of the service vehicle.

The hose line and its use are described in the "hose line for oil and cooling liquid change" section.

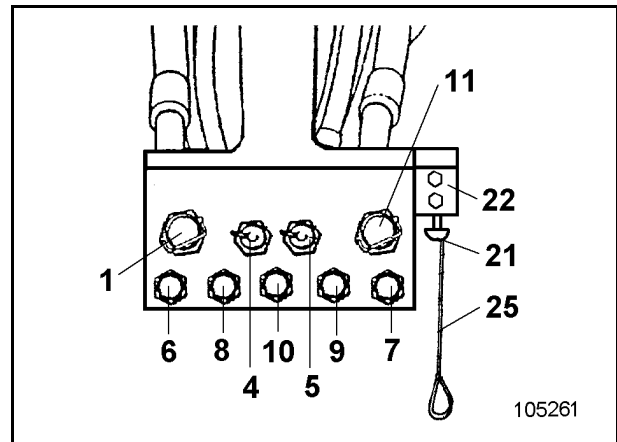


Fig. 3-18:

After the engine oil has been drawn off:

- ➡ Replace the engine oil filter.
- ➡ Remove the hose line. The express coupling closes automatically.
- ➡ Screw on protective cap.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Filling in engine oil

- ➔ Fill in engine oil through filler tube (2, Fig. 3-19:) until the oil level has reached the "max" mark (Fig. 3-20:) on dipstick (1).

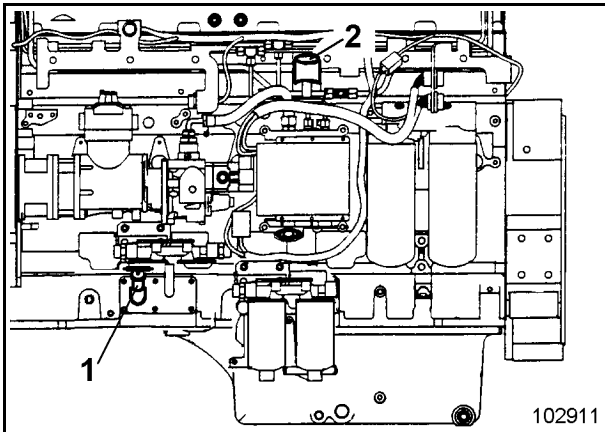


Fig. 3-19:

Filling in engine oil through the service station (optional)

Fill in engine oil through

- express coupling (8, Fig. 3-21:) for the lefthand engine
 - express coupling (9) for the righthand engine
- until the oil level has reached the "max." mark (Fig. 3-20:) on dipstick (1, Fig. 3-19:).

- ➔ Unscrew cap of epress coupling and connect filling hose of the service vehicle.

The hose line and its use are described in the "hose line for oil and cooling liquid change" section.

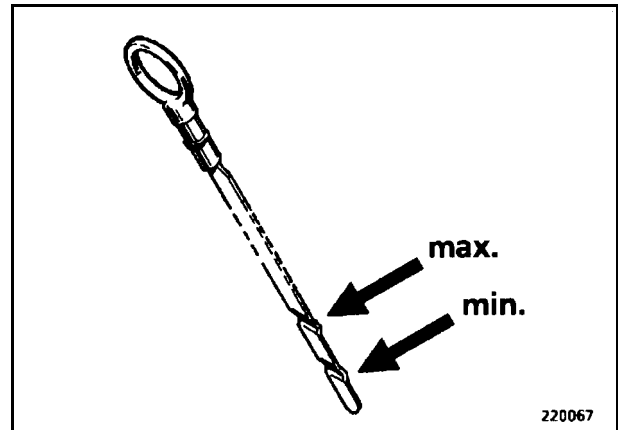


Fig. 3-20:

- ➔ Start the engines and allow to run at idling for abt. 2 minutes.
- ➔ Check oil level at dipstick (1, Fig. 3-19:) and top up with oil to the "max" mark (Fig. 3-20:) if required.

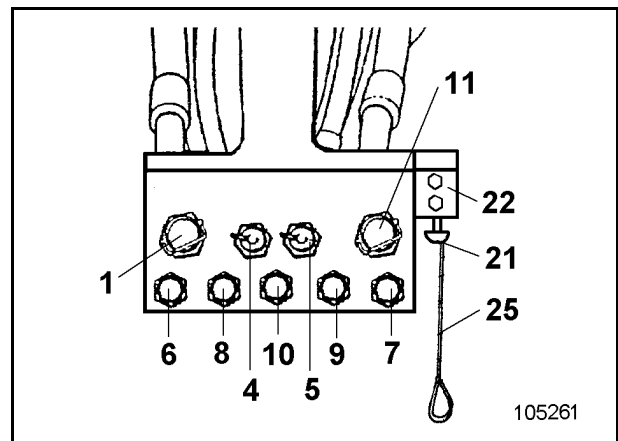


Fig. 3-21:

- ➔ Remove the filling hose. The epress coupling closes automatically.
- ➔ Screw on protective cap.

Draining the oil off the engine oil reservoir (optional)



Risk of scalding from hot engine oil.

The engine oil reservoirs may also be hot.

Wear protective gloves and firm working clothing.

Collect escaping oil and discard without polluting the environment

Drawing the oil off the engine oil reservoir (optional)

- ➔ Bring engine oil to operating temperature.
- ➔ Park the machine on a horizontal surface and secure engine oil reservoir
- ➔ Shut off the engines.

Draw off engine oil with the service station (Fig. 3-22:) through

- express coupling (6) for the lefthand engine oil reservoir
- express coupling (7) for the righthand engine oil reservoir
- ➔ Unscrew cap of express coupling and connect hose line of the service vehicle

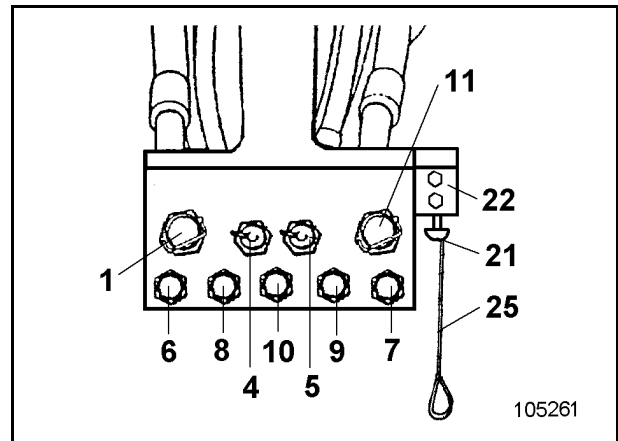


Fig. 3-22:

The hose line and its use are described in the "hose line for oil and cooling liquid change" section.

- ➔ Remove the hose line.
The express coupling closes automatically.
- ➔ Screw on protective cap.
- ➔ After the engine oil has been drawn off:
Replace the engine oil filter.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Filling in engine oil

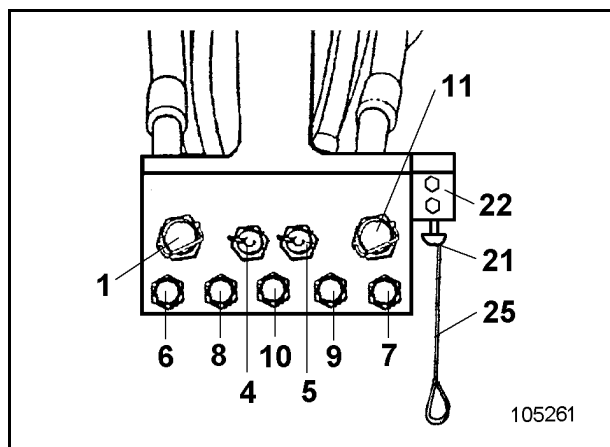


Fig. 3-23:

The engine oil is filled in with the service station (optional) (Fig. 3-23:) through

- express coupling (6) for the lefthand engine oil reservoir
- express coupling (7) for the righthand engine oil reservoir

until the oil level has reached the mark on dipstick (2, Fig. 3-24:).

- ➔ Unscrew cap of express coupling and connect hose line of the service vehicle

The hose line and its use are described in the "hose line for oil and cooling liquid change" section.

- ➔ Start the engines and allow to run at idling for abt. 2 minutes.
- ➔ Check oil level and top up with engine oil until the oil level has reached the mark on dipstick (2, Fig. 3-24:).
- ➔ Remove the hose line.
The express coupling closes automatically.
- ➔ Screw on protective cap.

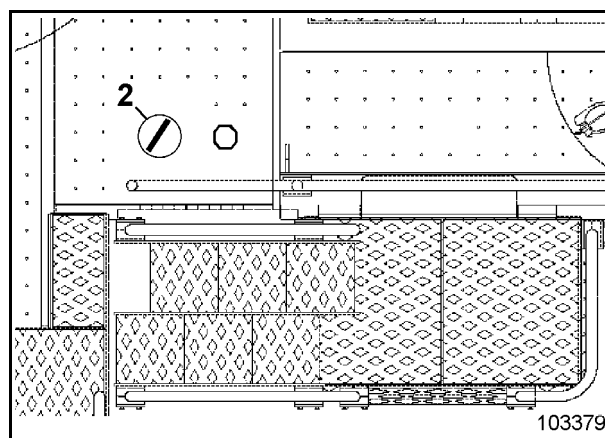


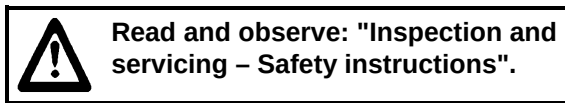
Fig. 3-24:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Replacing the oil filter



Risk of scalding from hot engine oil.

The filter housing may also be hot.

Wear protective gloves and firm working clothing.

Collect escaping oil and discard with-out polluting the environment

Oil filters

Carry out servicing of the full-flow oil filters (1, Fig. 3-25:) in accordance with the engine operating instructions.

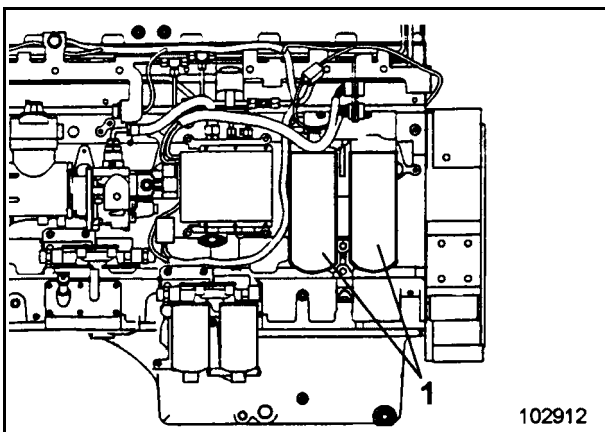


Fig. 3-25:

Replacement

- Shut off the engines
- Unscrew the filters
- Install new filter together with slightly oiled sealing ring and tighten by hand.

Replacing the oil filter (oil interval prolonging)



Risk of scalding from hot engine oil.

The filter housing may also be hot.

Wear protective gloves and firm working clothing.

Collect escaping oil and discard with-out polluting the environment

Oil filters

Carry out servicing of the oil filters (1, Fig. 3-25:) in accordance with the engine operating instructions.

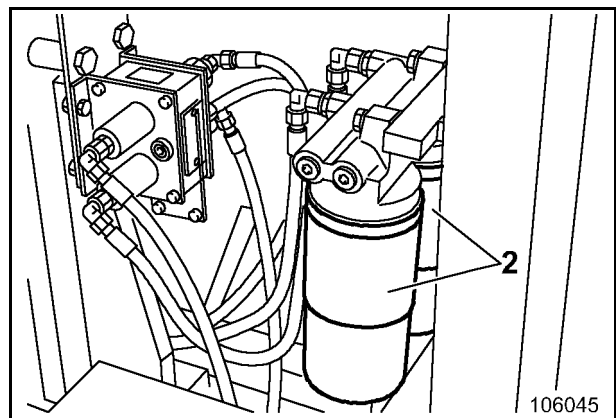


Fig. 3-26:

Replacement

- Shut off the engines
- Unscrew the filters
- Install new filter together with slightly oiled sealing ring and tighten by hand.

Centrifuge (optional)

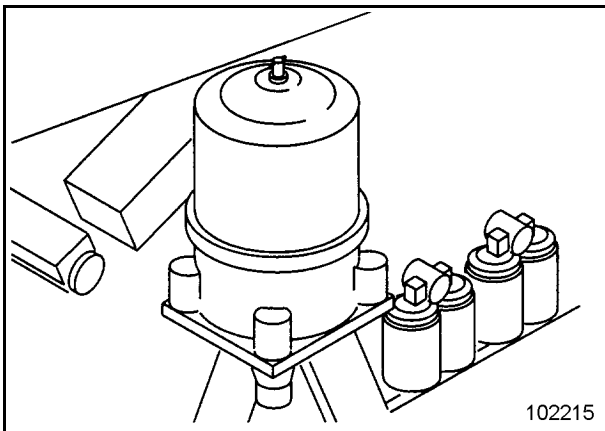


Fig. 3-27:

The centrifuge (Fig. 3-27:) filters out engine oil impurities in the bypass line by centrifugal forces.

Servicing

- Shut off the engines
- Wait 5 minutes



The rotor of the centrifuge must be stationary.

The pressure in the centrifuge must have disappeared.

The centrifuge may also be hot.

Wear protective gloves and firm working clothing.

- Loosen clamp (2, Fig. 3-28:) and withdraw housing (1).
- Check housing seal (8) and replace, if required.
- Unscrew knurled nut (3) and draw off rotor cap (4).
- Remove dirt from the rotor cap by tapping lightly against the cap.
- Clean rotor cap (4) and vertical tube (5) thoroughly with white spirit and dry.

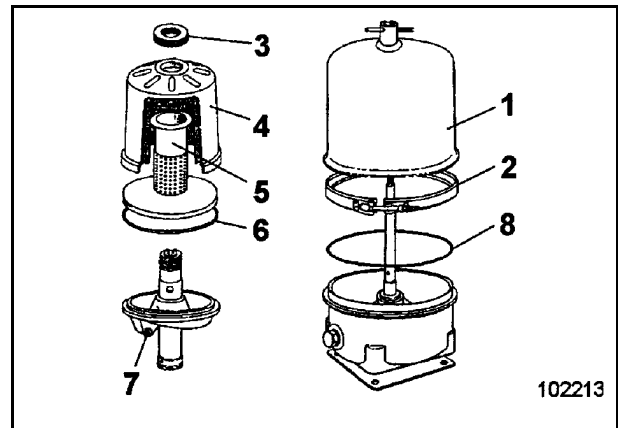


Fig. 3-28:



Adhering dirt causes the rotor to run unbalanced. Any unbalance may damage the bearings.

- Replace seal (6) inserting it slightly smeared with oil.
- Check nozzle (7) for free passage. If necessary, open up nozzle with a wire or with compressed air.
- Place paper filter into the rotor cap.



The paper filter must adhere uniformly to the rotor casing.

Thereafter

- Allow engines to run for short while and check centrifuge for tightness and leaks before shutting off the engines.
- Check oil level after abt. 10 minutes and top up, if required.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



COOLING SYSTEM



Secure the machine as described in the "Securing the machine" section.

Shut off the engines and allow to cool down.

Risk of scalding from hot cooling liquid.

Collect escaping cooling liquid and discard without polluting the environment.

Protect the skin from contact with cooling liquid.

Skin contact with cooling liquid is a potential health hazard.

Wear protective gloves and firm working clothing.

Temperature

The cooling liquid circuit is controlled by a thermostat. The max. admissible temperature is ca. 100° C (212°F). In case of higher temperatures, the BCS displays a warning on the screen (2, Fig. 3-29:).

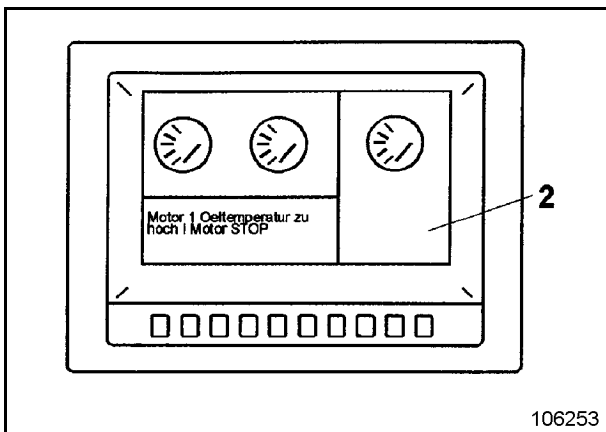


Fig. 3-29:

Radiators

The radiators are located on the superstructure in the counterweight module.

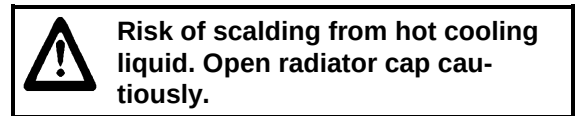
Weekly checks:

- ➔ Check radiator fins for dirt and clean, if required..

Cooling-liquid level

An insufficient cooling-liquid level is displayed on the BCS screen (Fig. 3-29:).

The radiator caps (1, Fig. 3-30:) are accessible from above.



- ➔ Turn radiator cap (1) back to the first notch.
- ➔ When the pressure has been released turn cap into the "open" position and remove.

The cooling-liquid level should reach up to the lower edge of the filler tube. Top up with cooling liquid, if required.

The level indicator (4, Fig. 3-30:) shows the liquid level.

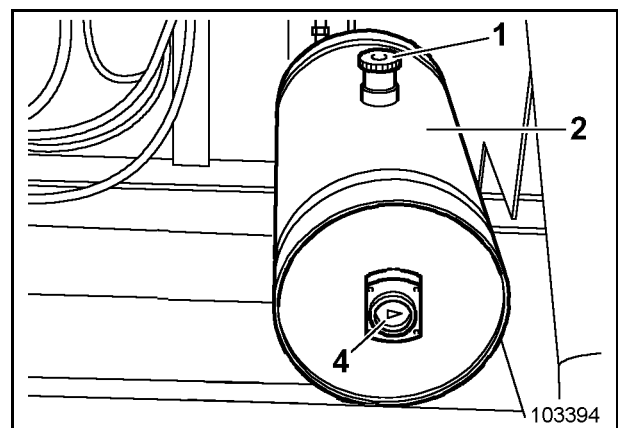


Fig. 3-30:

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Topping up cooling liquid

Fill cooling liquid through filler tube (1, Fig. 3-31:) or through express coupling (7, Fig. 3-32:) into the cooling system.

- ➔ Unscrew cap of express coupling. Connect the filling hose.

The hose line and its use are described in the "hose line for oil and cooling liquid change" section.

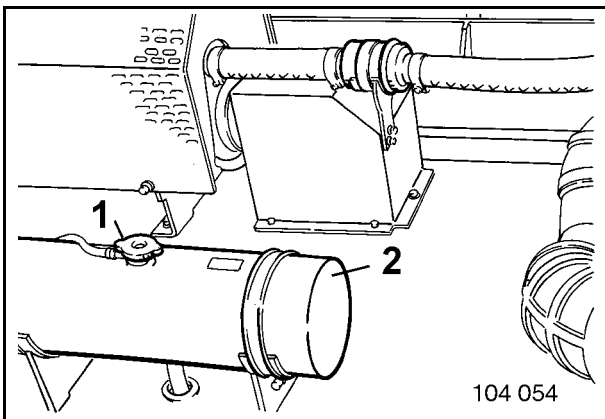


Fig. 3-31:



Do not fill in cold cooling liquid when the engine is at operating temperature.

Before refilling, allow engine to cool down to below 50° C / 122°F.

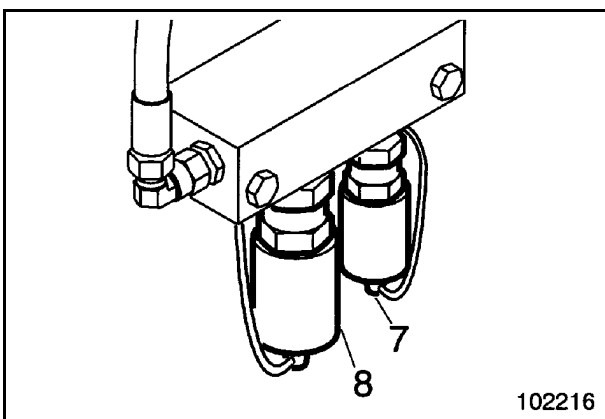


Fig. 3-32:

For topping up of the cooling system use specially prepared water only.

Specially prepared water must consist of:

- calcium-free water, distilled water, rain water
- anti-freeze compound



The anti-freeze compound must always be filled into the system independent of climatic conditions.

In this case, it serves as corrosion protection for the aluminium cooler.

The mixing ratio of anti-freeze / cooling water must be at least 50 % : 50 % (anti-freeze protection down to -40 °C).

For use at lower temperatures, the amount of anti-freeze must be increased accordingly.

After filling in cooling liquid allow the engines to run for short period to eliminate air voids before topping up with cooling liquid to the lower edge of the filler tube.

- ➔ Remove hose from express coupling. The express coupling closes automatically.
- ➔ Screw on protective cap.

In case of significant cooling-liquid losses, the whole cooling system must be checked for leaks.

Check regularly:

- ➔ all lines for leaks and all hose clamps for tightness.

Checking the DAC concentration



Observe the instructions of the engine manufacturer with regard to the DAC concentration (see engine manufacturer's operating instructions).

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Cooling liquid



Risk of scalding from hot cooling liquid. The radiators may also be hot. Wear protective gloves and firm working clothing.

Collect escaping cooling liquid and discard without polluting the environment.

The cooling liquid must be changed regularly and after two years at the latest.

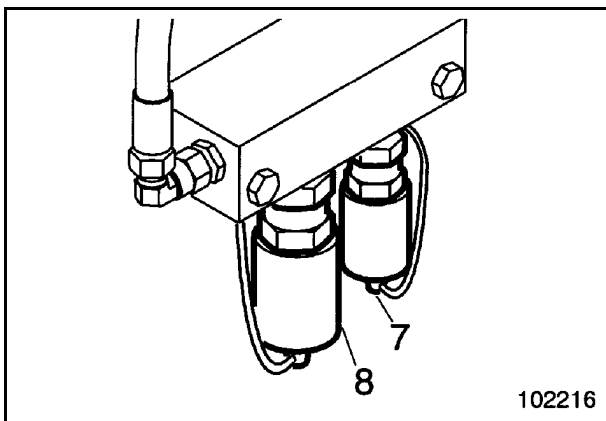


Fig. 3-33:

Draining off cooling liquid

- ➔ Shut off the engines

Drain cooling liquid through express coupling (8, Fig. 3-33:).

- ➔ Place a collecting recipient for used cooling liquid under the automatic drain valve. (The required recipient capacity is set out in the "Refilling quantities - Other" table)
- ➔ Unscrew cap of express coupling.
- ➔ Connect hose.

The hose line and its use are described in the "hose line for oil and cooling liquid change" section.

- ➔ Remove hose. The express coupling closes automatically.
- ➔ Screw on protective cap.

Filling in cooling liquid

See chapter „Topping up cooling liquid

Testing the cooling liquid composition

The engine operating instructions contain a detailed description of how to prepare and test the cooling liquid composition. In case of imminent frost check that the factory-adjusted anti-freeze concentration is sufficient for the expected temperatures.

Check the cooling liquid in the cooling system regularly to ensure that the water filter replacement interval resp. the DCA4 mixture is sufficiently concentrated to prevent corrosion under the corresponding operating conditions.

Water filter



Risk of scalding from hot cooling liquid.

The filter housings may be hot, too.

Wear protective gloves and firm working clothing.
Collect escaping cooling liquid and discard without
polluting the environment.

Replace water filter regularly.

- ➞ Close valve (2, Fig. 3-34:).
- ➞ Unscrew water filter (3).
- ➞ Screw on new water filter until the sealing ring contacts the filter head. Continue to tighten the filter by another $\frac{1}{2}$ to $\frac{3}{4}$ turn.
- ➞ Open valve (2).

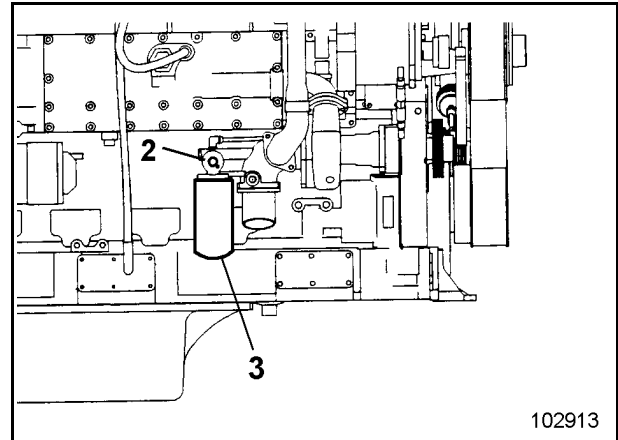
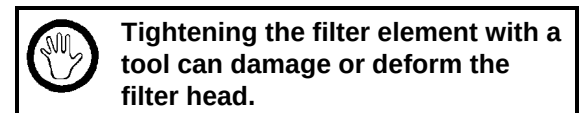
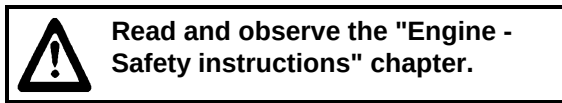


Fig. 3-34:



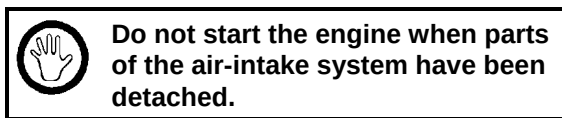
AIR-INTAKE SYSTEM



Risk of injury caused by rotating or hot parts of the engine.

Shut off the engines before working on the air-intake system.

Secure the machine as described in the "Securing the machine" section.



Engine damage may occur if the engine is allowed to draw in unfiltered air.

Each engine is equipped with two dry-air filters (Fig. 3-35:) consisting of main and safety filter element.

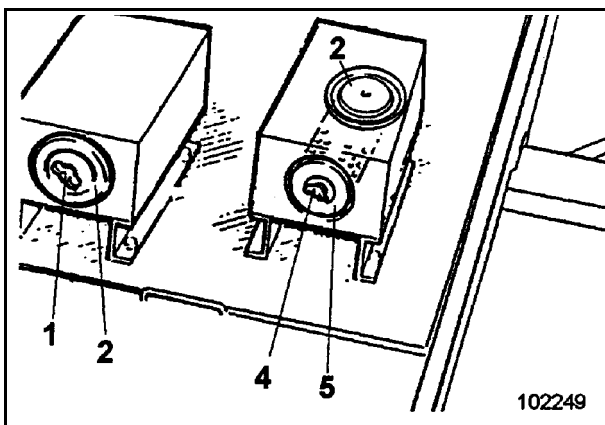


Fig. 3-35:

Main filter elements

Insufficient air-intake performance, caused by a contaminated main filter element, is displayed on the BCS-screen (Fig. 3-36:).

Clean or renew main filter elements only if the BCS displays a warning on the screen (2, Fig. 3-36:) with the engines running at high speed.

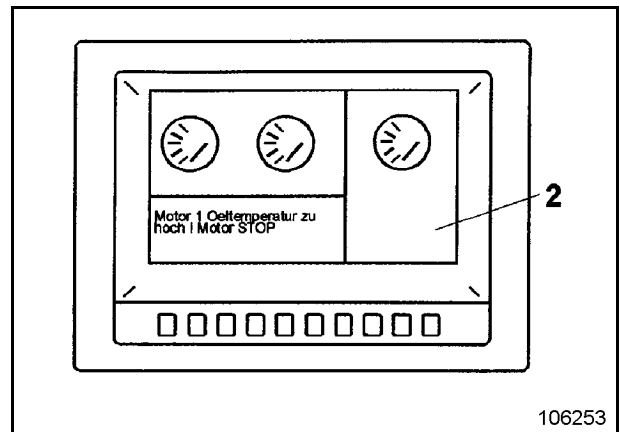


Fig. 3-36:

Removal and installation

- Unscrew nut (1, Fig. 3-35:) and remove cover (2).
- Unscrew nut (4) and withdraw main filter element (5). Do not loose the washer under nut (4).
- Replace or clean main filter element

New or cleaned main filter elements should always be at hand to shorten excavator downtimes.

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Before installing the filter element, clean contact faces at cover (2, Fig. 3-37:) and at filter housing.

➡ Put on cover (2) and tighten nut (1).

During the removal of the main filter element, the safety element (7, Fig. 3-38:) must remain in the filter housing.

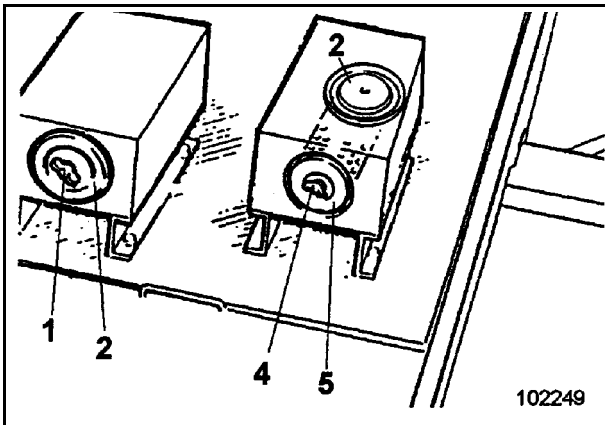


Fig. 3-37:

Checking and cleaning the main filter element

Examine the filter paper of the element with a lamp which is introduced into the element (Fig. 3-39:). Any damage is then clearly visible.

 **Replace damaged or deformed elements immediately.**

Check element seal. When the seal is damaged, the filter element must be replaced, too.

Cleaning with compressed air is suitable if the filter element is to be re-used immediately.

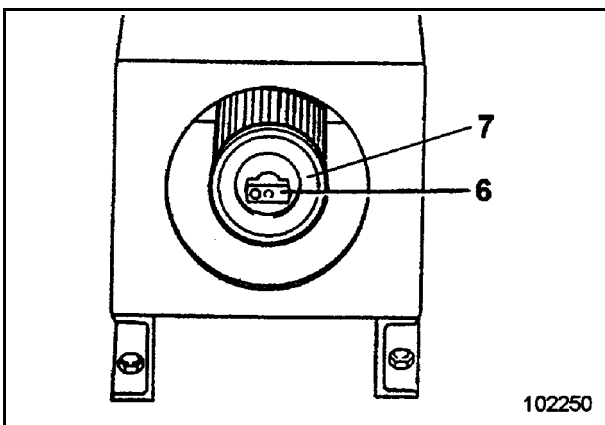


Fig. 3-38:

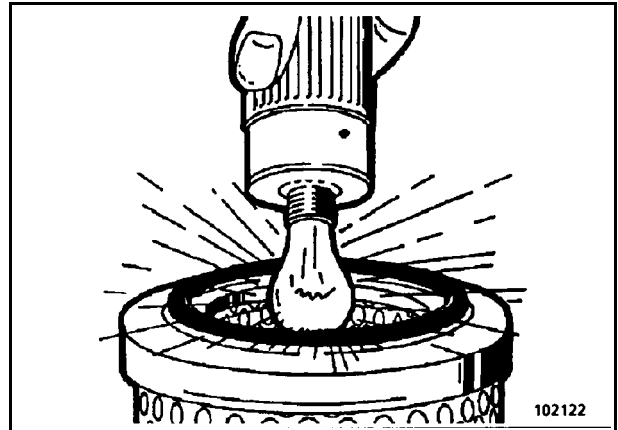


Fig. 3-39:

Blow filter element (Fig. 3-40:) clean with dry compressed air from the inside by moving the compressed-air gun up and down.

The pressure at the nozzle must not exceed 6 bars.

Cleaning is terminated when all visible dust has been blown out of the filter element.

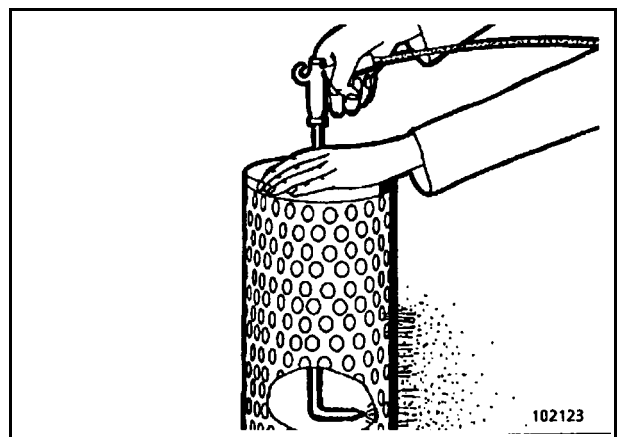


Fig. 3-40:

 **Never clean filter element by beating against hard objects.**

Replace the main filter element after 1000 operating hours or 3 cleaning cycles; and, after one year of operation at the latest.

Safety filter element

Replacement

Replace the safety filter elements (7, Fig. 3-41:) after 1000 operating hours or 3 cleaning cycles; after one year of operation at the latest.

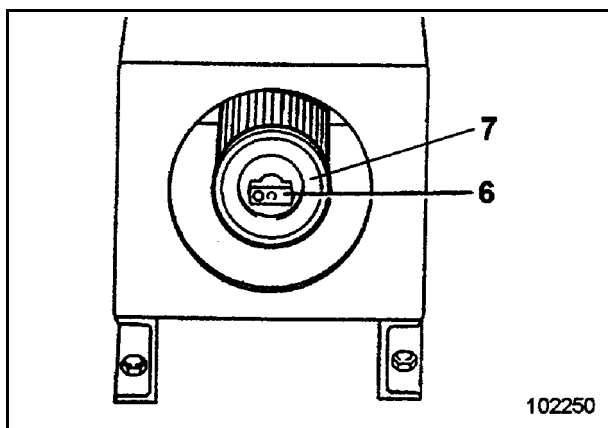
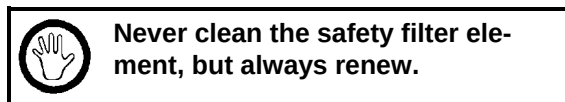


Fig. 3-41:

- ➔ Remove main filter element (5, Fig. 3-42:) as described above.
- ➔ Check the vacuum indicator (6, Fig. 3-41: resp. arrow Fig. 3-43:) whether
 - the green spot is visible; in this case the safety filter must not be replaced
 - the green spot is not visible; in this case the safety filter must be replaced.
- ➔ Unscrew vacuum indicator (6) and withdraw safety filter element (7).
- ➔ Install the new safety filter element and a cleaned or a new main filter element.

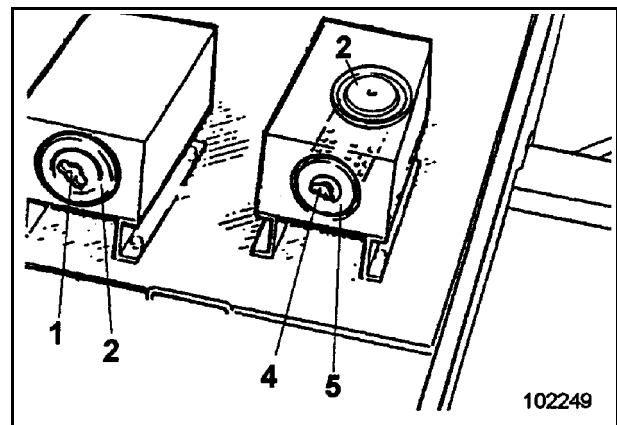


Fig. 3-42:

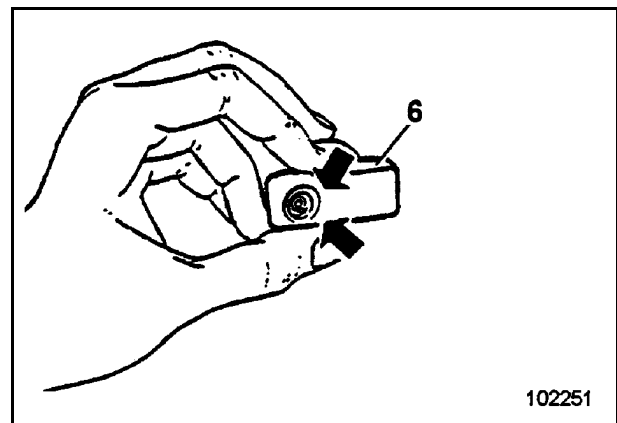


Fig. 3-43:

Air-intake lines

At regular intervals:

- check intake lines for leaks and hose clamps for tightness;
- replace hoses between filter housing and engine.

During all works on the air-intake system ensure proper sealing to prevent unfiltered air from reaching the engines.

Dust collection

Dust accumulating on the filter-housing bottom is constantly sucked away by the exhaust system during operation.

The non-return valves (1, Fig. 3-44:) in the suction lines prevent engine exhaust gases from being sucked in.

At regular intervals:

- check suction lines for leaks and hose clamps for tightness.

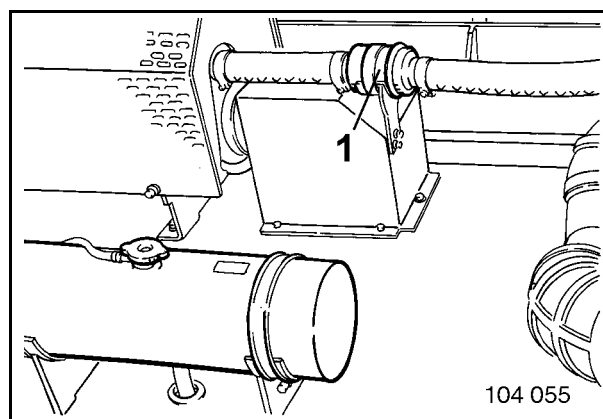


Fig. 3-44:

FUEL SYSTEM

Fuel system - Safety instructions



Read and observe the "Inspection and servicing – Safety instructions" chapter.

When working on the fuel system:

shut off the engines

secure the machine as described in the "Securing the machine" section

keep away naked flames

do not smoke.

Collect escaping fuel and discard without polluting the environment.

Avoid skin contact with diesel fuel.

Diesel fuel may cause skin injury.

Wear firm working clothing.

Wear protective gloves or use a barrier cream.

Replacing the fuel filters



Read and observe the "Inspection and servicing – Safety instructions" chapter.

Collect escaping fuel and discard without polluting the environment.

Avoid skin contact with diesel fuel.

Diesel fuel may cause skin injury.

Wear firm working clothing.

Wear protective gloves or use a barrier cream.

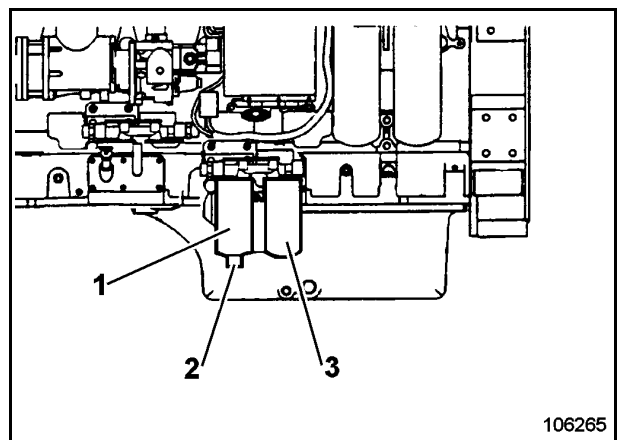


Fig. 3-45:

- Unscrew primary filter (1, Fig. 3-45:) and secondary filter (3).
- Fill new primary filter with clean fuel and screw onto the filter head by hand. Continue to tighten filter by a further $\frac{1}{2}$ to $\frac{3}{4}$ turn.



Tightening the filter element with a tool may damage or deform the filter head.

- **Do not** fill new secondary filter (3) with fuel, screw onto the filter head as described above. This prevents the injection system from being contaminated by unfiltered fuel after fuel filter change.

The primary filter (1) serves at the same time as a water separator:

- Open valve (2) and drain off water until fuel emerges.
- Close valve (2).

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Venting the fuel system

The fuel tanks are vented with breather valves (3, Fig. 3-46:).

Clean breather valves regularly.

- ➔ Remove breather valve, flush with paraffin oil and blow clean with compressed air.

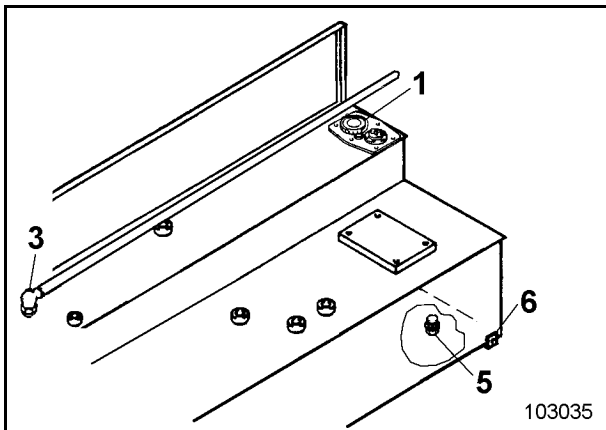


Fig. 3-46:

Cleaning the fuel tanks



Explosion hazard.

Read and observe the "Inspection and servicing. Safety instructions" chapter.

Do not use white spirit, paraffin oil or other solvents.

For flushing and cleaning use diesel fuel.

Avoid skin contact.

Skin contact with diesel fuel may cause skin injury.

Wear firm working clothing.

Wear protective gloves or use a barrier cream.



Fuel must be prevented from penetrating into the soil. Keep fuel for re-use or discard without polluting the environment.

- ➔ Use up as much fuel as possible.
- ➔ Check how much fuel remains in the tank and place a collecting recipient of sufficient size under the drain plugs of the tanks.
- ➔ Loosen drain plug (6) at fuel the tank and drain off fuel.
- ➔ Flush tank with diesel fuel.
- ➔ Screw automatic drain plug backs (6) in place.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



- Fill in fuel through the strainer in filler tube (1, Fig. 3-47:)
- Fuel can also be filled into both fuel tanks through the service station (1, Fig. 3-48:).

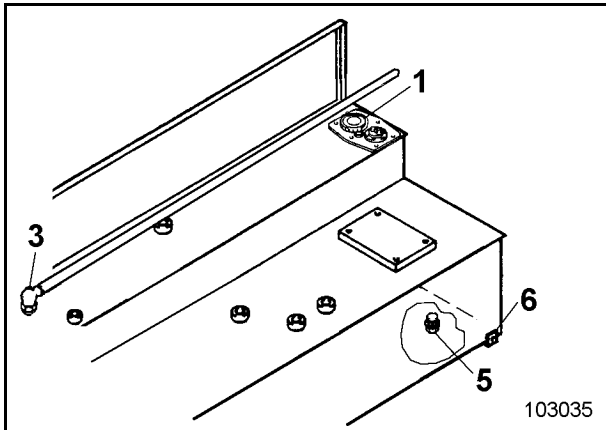


Fig. 3-47:

- Unscrew cap of express coupling. Connect filling hose of the service vehicle.

The hose line and its use are described in the "hose line for oil and cooling liquid change" section.

The filling level is displayed on the BCS screen (2, Fig. 3-49:).

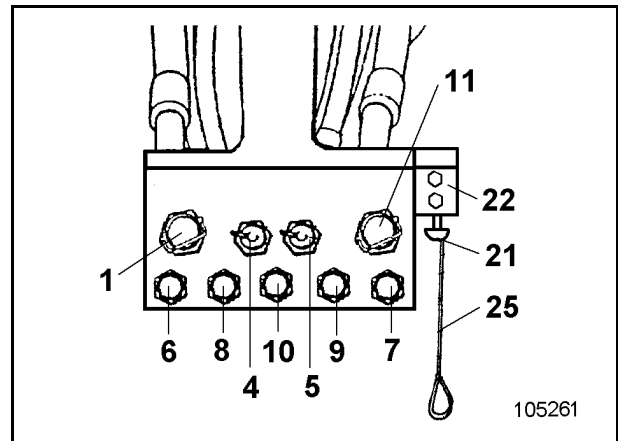


Fig. 3-48:

- Remove filling hose. The express coupling closes automatically.
- Screw on protective cap.

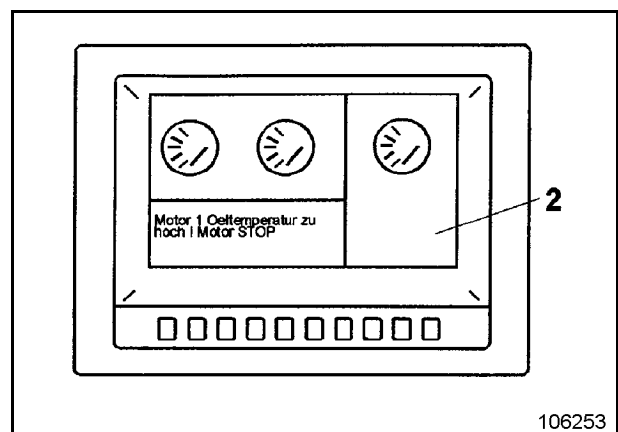


Fig. 3-49:

Water trap (option)

Water contained in the fuel is removed by the water trap (Fig. 3-50:).

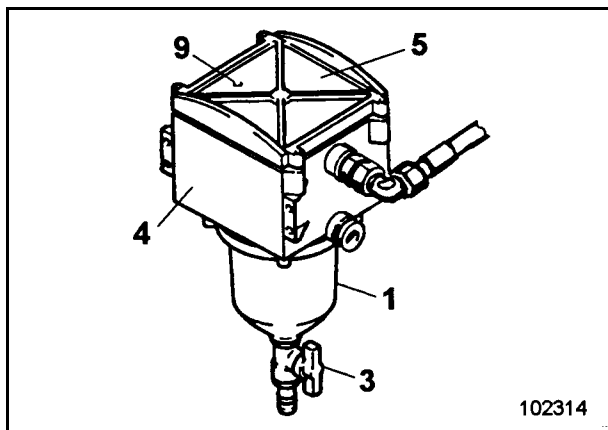


Fig. 3-50:

Servicing

Draining off water

Carry out the following works in accordance with the servicing schedule and at regular intervals:

- Loosen venting plug (9, Fig. 3-51:) and leave drain valve (3) open until there is no more water in the diesel fuel flowing out of the valve.

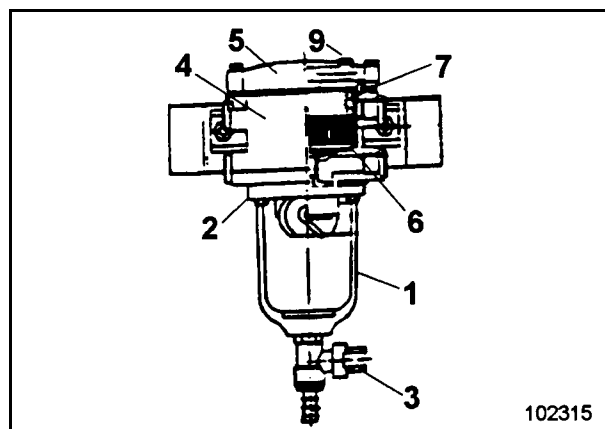


Fig. 3-51:



Collect escaping liquid in a recipient suitable for diesel fuel and discard without polluting the environment.

The liquid flowing out of the valve flushes and cleans the filter element(6) von from top to bottom.

- Close drain valve (3) and tighten venting plug (9).

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Checking / cleaning the filter element

Replace filter element (6, Fig. 3-52:) only when the suction resistance is too high.

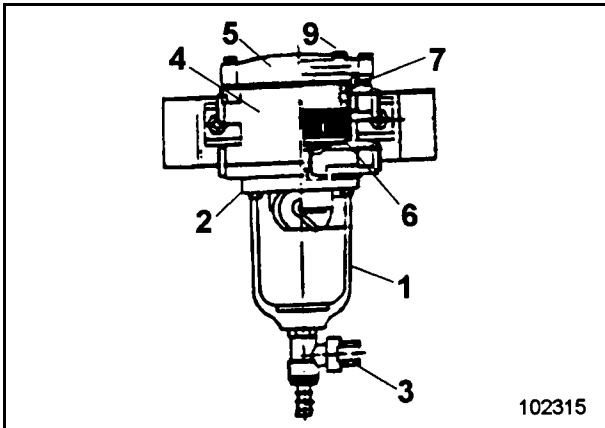
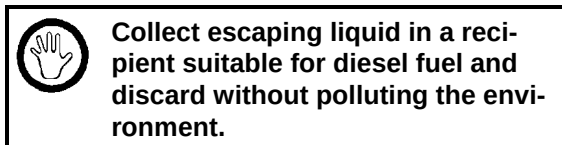


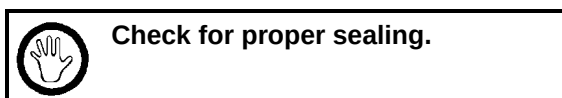
Fig. 3-52:

- Loosen venting plug (9) and leave drain valve (3) open until the reservoir is completely empty.

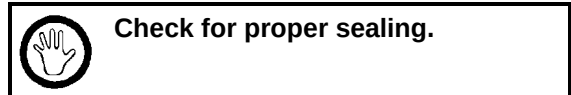


➤

- Remove cover (5).
- Remove spring holder (7) and filter element (6) from filter housing (4).
- Check / replace filter element (6)
- Clean filter housing (4) using diesel fuel.
- Check cover sealing and replace, if necessary.
- Insert filter element (6) and spring housing (7) into filter housing (4).
- Fasten cover (5) on filter housing (4).



- Clean recipient (1) and filter housing (4).
- Loosen flange (2).
- Take off recipient (1) and clean with diesel fuel
- Check cover sealing and replace, if necessary.
- Attach recipient (1) with flange (2) at filter housing (4).



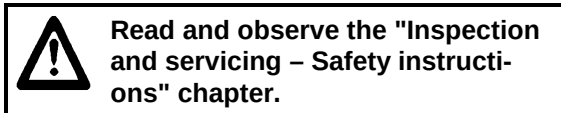
OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



ELECTRICAL SYSTEM

Electrical system - Safety instructions



Read and observe the "Inspection and servicing – Safety instructions" chapter.

Risk of injury caused by battery acid and gases.

Wear goggles, working gloves and firm working clothing.

Carry out voltage and continuity checks only by means of a test lamp or a measuring instrument. Do not check by "touching ground" with a bare wire. The short-circuit thus produced damages the alternator and the electronic modules of the PMS.

Alternator - Instructions

Never disconnect cables from the alternator, regulator and the battery when the engine is running to avoid damage to the alternator and regulator.

Do not interchange the cables when connecting the battery (observe polarity).

Carry out voltage and continuity checks only by means of a test lamp or a measuring instrument. Do not check by "touching ground" with a bare wire. The short-circuit thus produced damages the alternator and the regulator.

The electrical circuit diagrams are annexed to the spare-parts list. Further information can be found in the Terex|O&K booklet "Working with circuit diagrams".

The electrical system switch-cabinet is located behind the hydraulic reservoir. The cabinet is described in the spare-parts list together with the designation of the electrical components.

Cables and cable lugs must not get in contact with other metal parts. Replace broken or damaged cables and the respective cable lugs.

If a bulb does not work after replacement, the pertaining fuses, connection cables and contacts must be checked.



Gas-discharge lamps (optional) are operated with high voltage.

OPERATING INSTRUCTIONS RH 120 E

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Battery

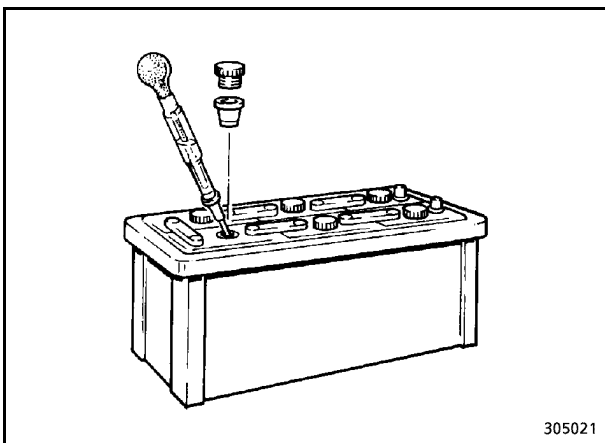


Warning! Battery Posts, terminals and related accessories contain lead and lead compounds, chemicals known to cause cancer and reproductive harm. Wash hands after handling

Checking the battery fluid level

(Not applicable in case of maintenance-free batteries)

- Unscrew caps (Fig. 3-53:).
- If checking inserts are provided, the battery acid must reach up to their bottom.
- If no checking inserts are provided, insert a clean wooden rod into the battery until it contacts the upper edge of the cell plates. The rod must be moistened over at least 10 mm (4.4").
- If the fluid level is too low, top up with distilled water only



305021

Fig. 3-53:

Removing and installing the battery

The acid temperature must be 20 ° C (68°F).

- Unscrew caps of the battery (Fig. 3-53:).
- Measure the acid density of the battery using a commercial acid tester (Fig. 3-53:). The acid density measured is in direct correlation with the battery charge.

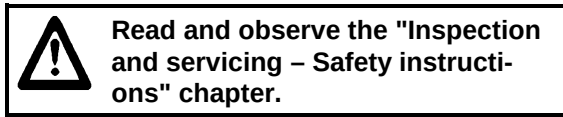
Acid density		
kg / dm ³		Charge
Normal condition	Tropical conditions	
1,28	1,23	fully charged
1,20	1,12	half charged, recharge
1,12	1,08	discharged, recharge immediately

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Removing and installing the battery



Wear protective gloves and firm working clothing.

Shut off the engines before removing the batteries to avoid damaging the alternator and the regulator.

Turn key in key-switch to position "0" and withdraw.

Disconnect and reconnect the terminal clamping lugs in the prescribed order.

Disconnecting and connecting in the wrong order may cause short-circuits.

The batteries (1, Fig. 3-54:) are located behind the hydraulic reservoir. The 12-volt batteries are connected in series and in parallel, so that the system voltage is 24 volts.

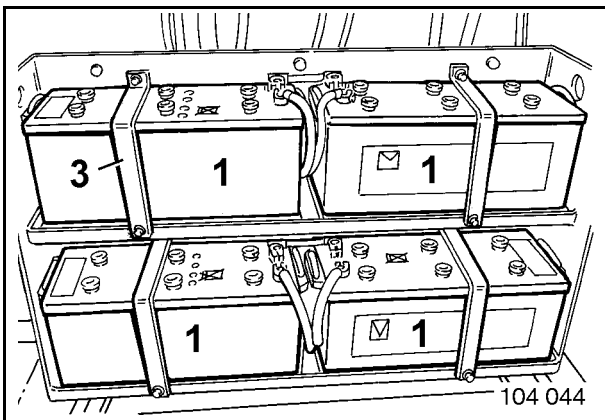


Fig. 3-54:

- Detach battery holder (3).
- Disconnect the cable lug from the negative terminal of the battery.
- Disconnect the cable lug from the positive terminal of the battery.
- Insulate the cable lugs.
- Lift battery out of battery box.

Before installing new batteries, the contact faces of the battery terminal posts and the cable lugs must be cleaned down to the bright metal.

- Install the new batteries.
- Connect the cable lug to the positive terminal of the battery. Tighten the clamping screws of the cable lugs. Do not use too much force to avoid deformation.
- Connect the cable lug to the negative terminal of the battery.
- Apply special terminal grease or acid-free vaseline on the battery terminal posts and clamping lugs. Loose or corroded clamping lugs will lead to alternator or regulator overloading.

Switchgear cabinet

Breather filter

In the switchgear cabinet, the air is drawn in by a ventilator via the filter (Fig. 3-55:).

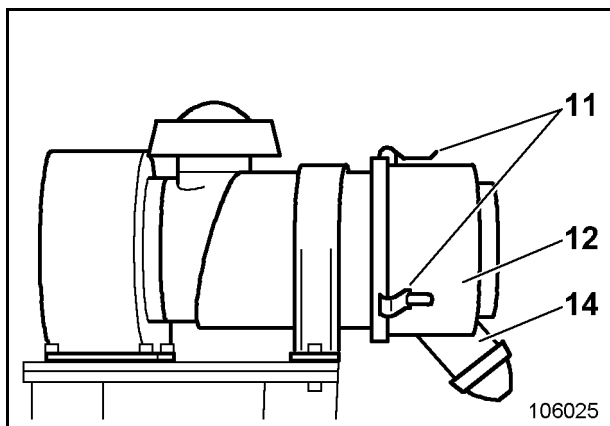


Fig. 3-55:

Emptying dust trap

- ➔ Press dust trap (14, Fig. 3-55:) and hold until the dust trap is empty.

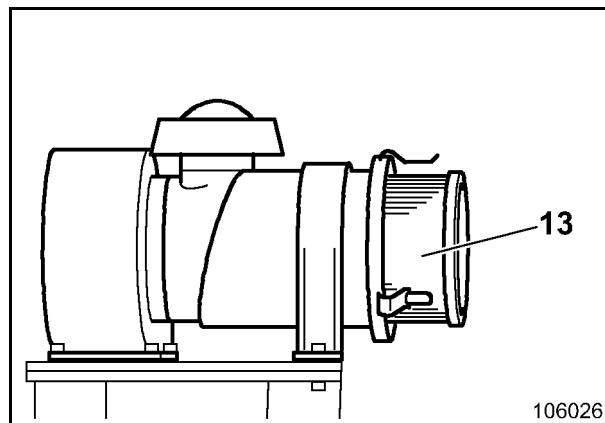


Fig. 3-56:

Emptying the dust collector

- ➔ Loosen clamps (11, Fig. 3-55:).
- ➔ Remove dust collector (12) and empty.

Filter element

- ➔ Remove the dust collector (12, Fig. 3-55:).
- ➔ Withdraw filter element (13, Fig. 3-147:).
- ➔ Replace or clean filter element (13).
- ➔ Refit dust collector (12, Fig. 3-146:).

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Checking and cleaning the filter element

Check the filter paper of the element by inserting a lamp into the element (Fig. 3-57:). Any damage can then be seen.

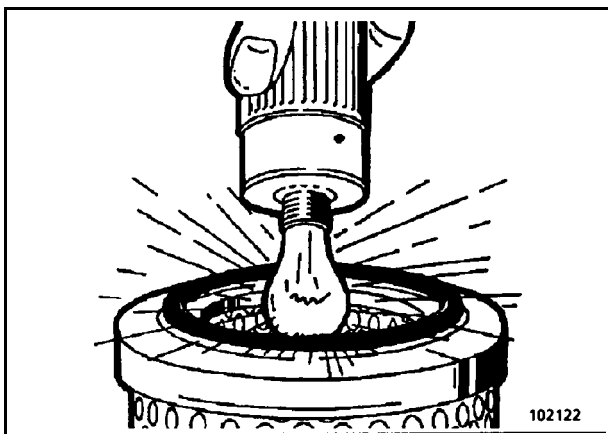


Fig. 3-57:

Check element seal. If damaged, replace filter element too.

Cleaning with compressed air allows the filter element to be re-used immediately.

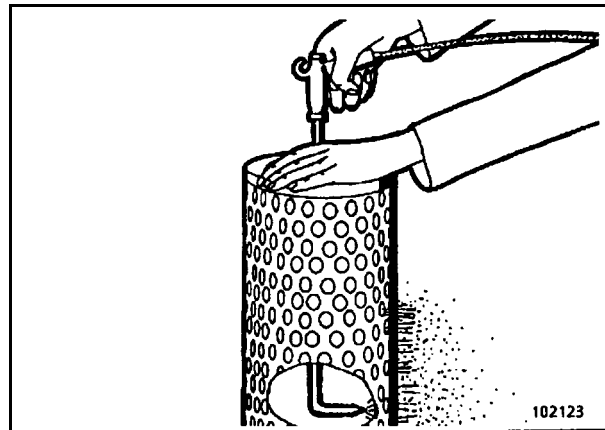


Fig. 3-58:

Blow filter element (Fig. 3-58:) dry with compressed air by moving the compressed-air piston up and down inside it.

The pressure at the nozzle must not exceed 6 bars (87 psi).

Cleaning is completed when no more dust is seen to leave the filter element.



Replace main filter element after 1000 operating hours or 3 cleaning cycles, but not later than after one year of operation.

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Equipotential bonding

The frame of the excavator is used as electrical ground.

The electric current must be able to flow undisturbed to the frame.

The individual modules of the machine are therefore interconnected by electrical wires (equipotential bonding).

Position of electrical connections

(Fig. 3-59:)

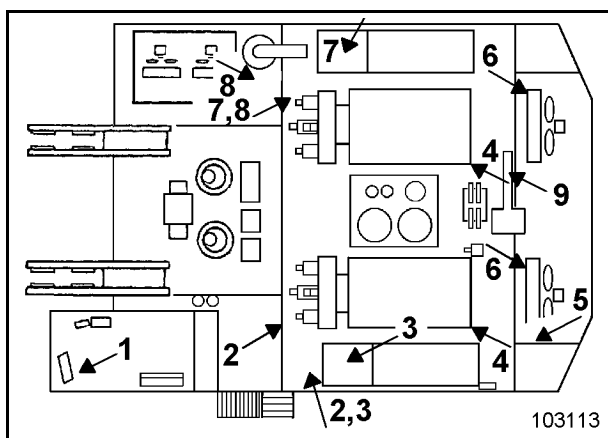


Fig. 3-59:

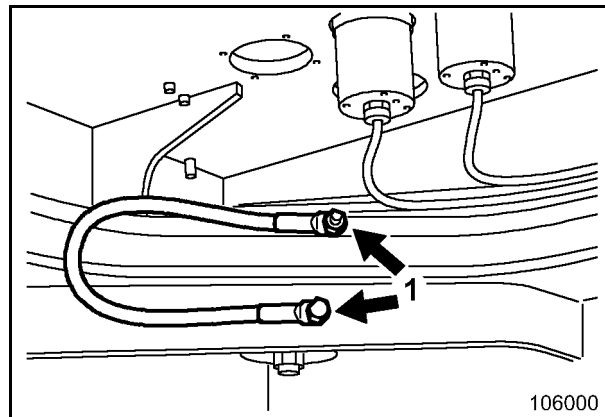


Fig. 3-60:

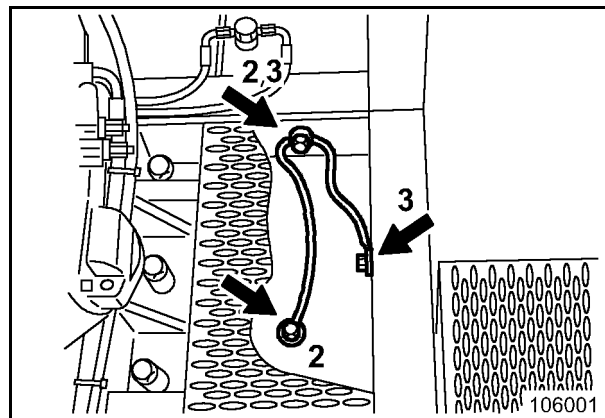


Fig. 3-61:

Item.	Bonding	Fig.
1	Driver's cab – pedestal	Fig. 3-60:
2	Driver's cab module – frame	Fig. 3-61:
3	Fuel tank, left – frame	Fig. 3-61:
4	Engine, LH and RH – frame	Fig. 3-62:
5	Counterweight – frame	Fig. 3-63:
6	Water cooler LH and RH – frame	Fig. 3-64:
7	Fuel tank, right – frame	Fig. 3-65:
8	Oil cooler module – frame	Fig. 3-65:
9	Tanklift – frame	Fig. 3-66:

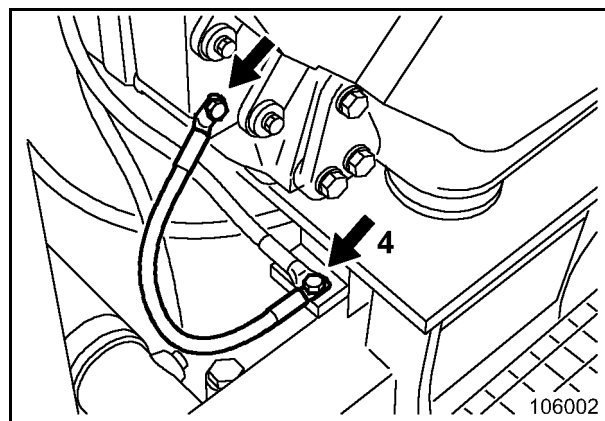


Fig. 3-62:

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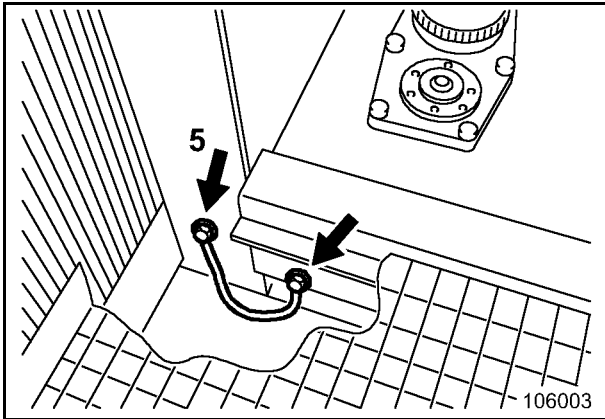


Fig. 3-63:

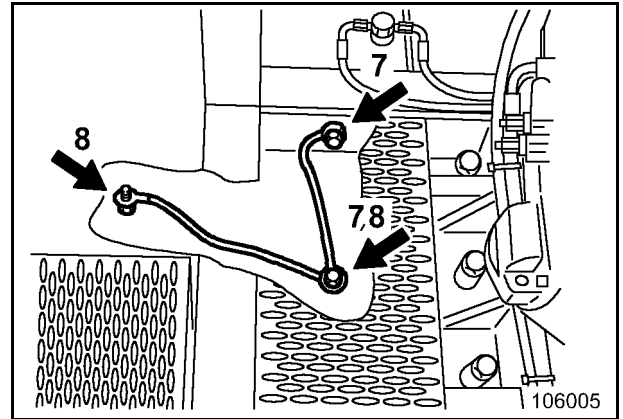


Fig. 3-65:

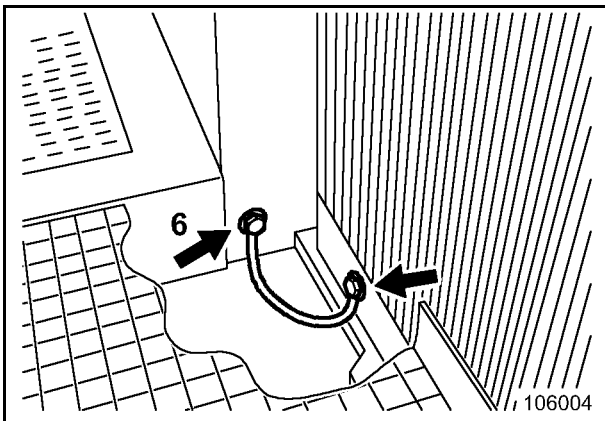


Fig. 3-64:

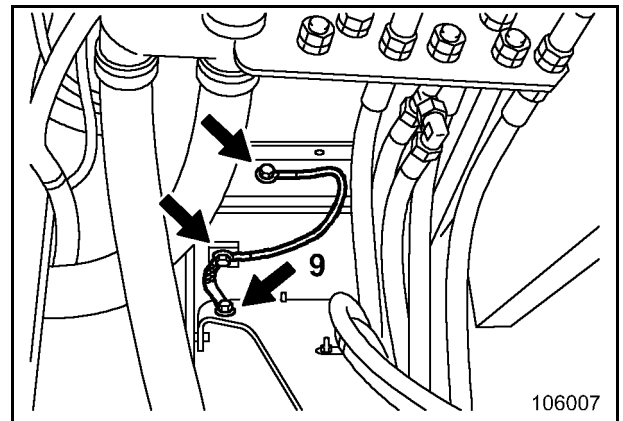
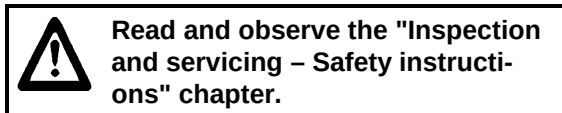


Fig. 3-66:

HYDRAULIC SYSTEM

Hydraulic system - Safety instructions



Before working on the hydraulic system, make sure that the system is without pressure and that the residual pressures have also been eliminated.

Shut off the engines.

Risk of burning caused by hot hydraulic components (e.g. hydraulic oil reservoir, cylinder, valves).

Secure the machine as described in the "Securing the machine" section.

Avoid skin contact with hydraulic oil.

Contact with hydraulic oil can cause skin injury. Wear protective gloves and firm working clothing.

Depressurizing the hydraulic system

Hydraulic systems may only be opened if they are completely depressurized. Even when an excavator is parked on a horizontal surface with the working equipment resting on the ground (Fig. 3-67: and Fig. 3-68:) and with its drive engines stationary, there may still be a considerable amount of residual pressure in parts of the hydraulic system, as e.g. the primary pressure resulting from the last hydraulic movements before the immobilization.

Residual pressures disappear only gradually. If work is to be carried out on the hydraulic system immediately after the immobilization, the system must be freed from pressure, i.e. depressurized:

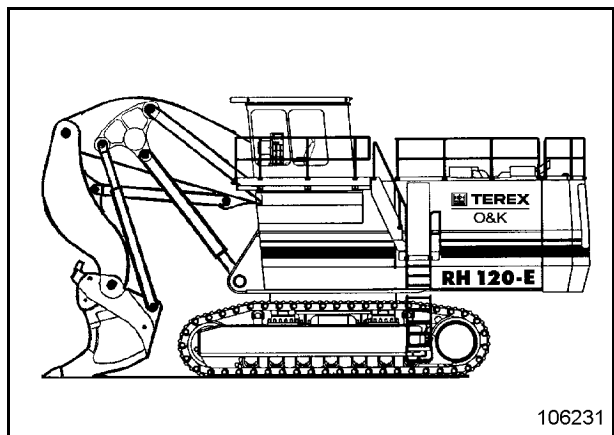


Fig. 3-67:

- Locate the system section to be opened.
- Depressurize the section to be opened. If required, the necessary measures described must be combined
- Open the depressurized system section with caution.

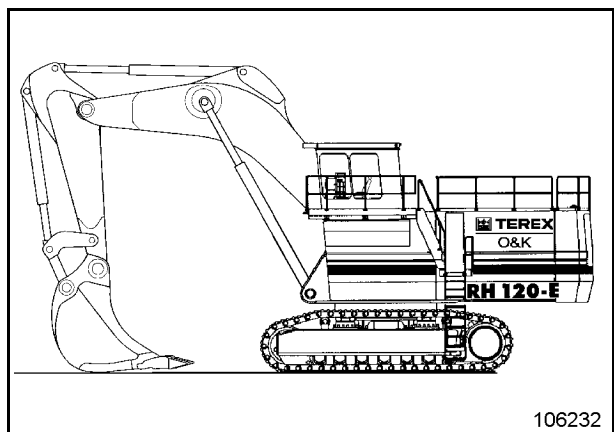


Fig. 3-68:

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Examples of system sections:

- 1) working hydraulics
- 2) servo control circuit
- 3) precharged return-flow line

Depressurizing

- Park the excavator on a horizontal surface.
- Set the working equipment on the ground.
- Shut off the drive engines.
- Do not switch off the electrical system

Sections 1 and 2: servo control and working hydraulics

- Shift both control levers repeatedly into all directions (Fig. 3-69:).

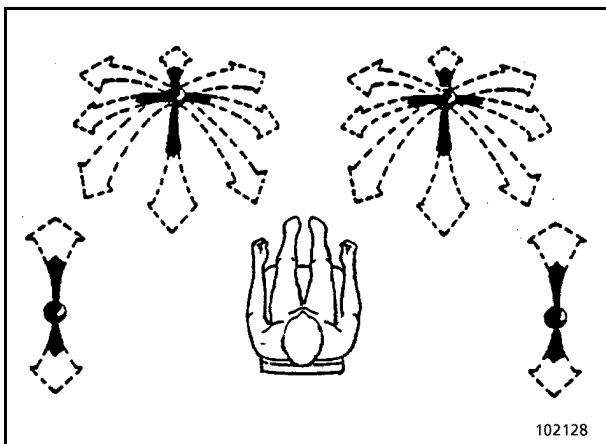


Fig. 3-69:

Section 3: return-flow line

After shutting down the engine, the precharging pressure decreases rapidly through the precharging valve. No measures are required before opening the return-flow line.

Checking the hydraulic oil level

- Bring hydraulic oil to operating temperature (abt. 50 °C / 122°F).
- Park the machine on a horizontal surface.
- Move all hydraulic cylinders to their central positions.

The oil level must lie between the $\frac{1}{2}$ and $\frac{3}{4}$ marks of the inspection glass (1, Fig. 3-70:).

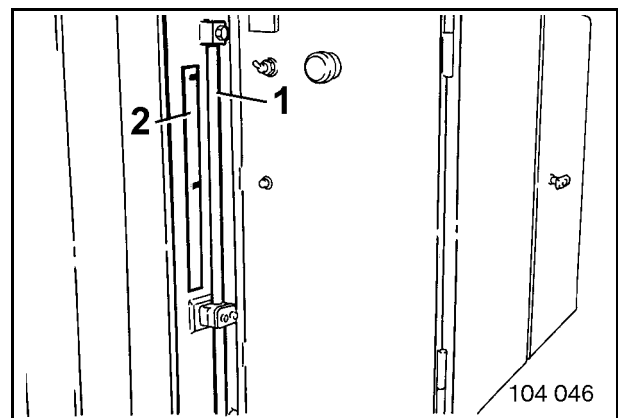


Fig. 3-70:

The hydraulic oil level is monitored by the BCS. The BCS displays a warning on the screen (2, Fig. 3-71:) if the hydraulic oil level is too low or too high.

Shut off the engines, locate cause and rectify.

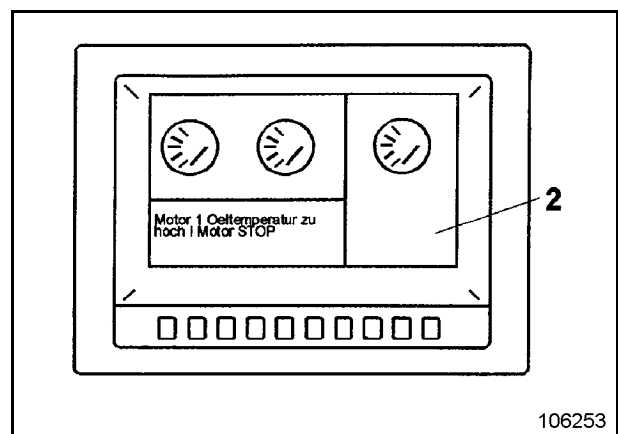


Fig. 3-71:

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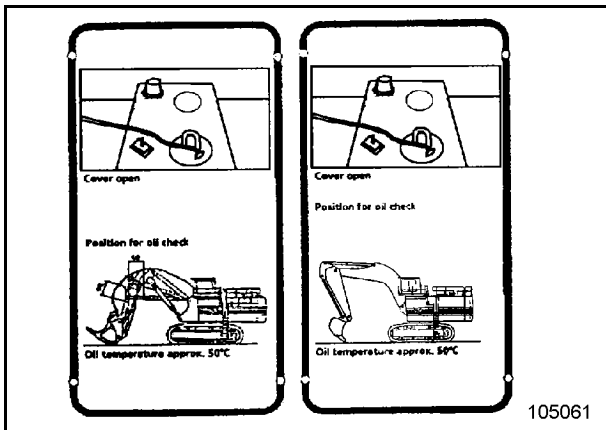


Fig. 3-72:

Stand working equipment on the ground as shown on the sign (Fig. 3-72:).

Sign (2, Fig. 3-73:) is attached beside the level indicator tube (1).

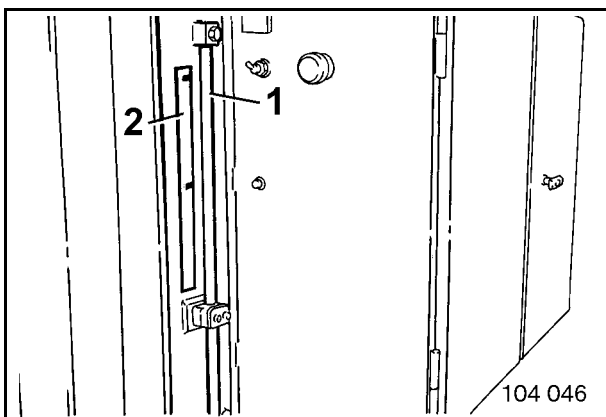


Fig. 3-73:

Fill in hydraulic oil through the return-flow filters.

- Remove cover (19, Fig. 3-74:). abnehmen.
- Fill in hydraulic oil through the opening until the oil level lies between the $\frac{1}{2}$ and the $\frac{3}{4}$ marks of the inspection glass (oil grade see "Refilling quantities - Oil").
- Before fitting the cover (19), check the sealing ring and replace, if damaged.
- Fit cover together with sealing ring.

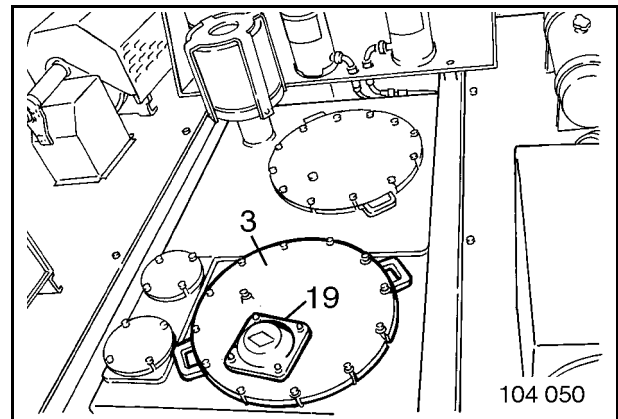


Fig. 3-74:

Hydraulic oil can also be filled in by means of the service station (Fig. 3-75:).

- Unscrew cap of express coupling (10). Connect filling hose express coupling of the service vehicle.

The use of the hose line is described in the "Hose line for oil and cooling liquid changes" section.

- Fill in hydraulic oil until the oil level lies between the $\frac{1}{2}$ and the $\frac{3}{4}$ marks of the inspection glass (1, Fig. 3-73:) (oil grade see "Refilling quantities - Oil").
- Unscrew the hose line; the express coupling closes automatically.
- Screw protective cap back in place

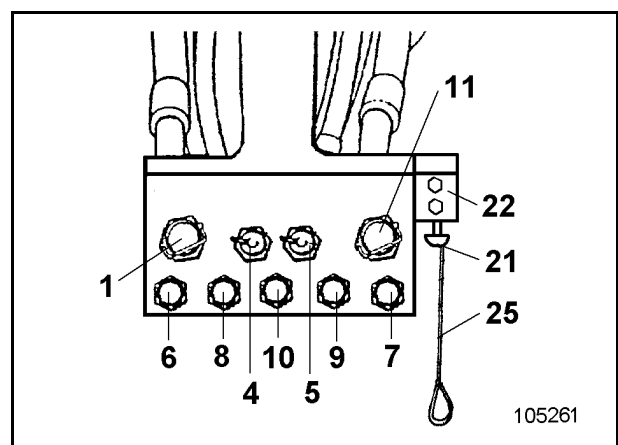
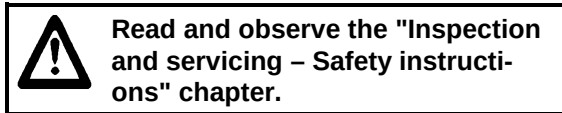


Fig. 3-75:

Changing the hydraulic oil re- turn-flow (hydraulic oil reservoir)



Shut off the engines.

Risk of scalding caused by hot hydraulic oil.

The hydraulic oil reservoir itself may also be hot.

Avoid skin contact.

Skin contact with hydraulic oil may cause skin injury.

Wear protective gloves and firm working clothing.

Collect escaping hydraulic oil and discard without polluting the environment.

The return-flow filters must be replaced:

- when servicing works in accordance with the servicing plan are carried out;
- when the BCS displays a warning on the screen (2, Fig. 3-76:). In this case, the filter elements (9, Fig. 3-77:) are heavily contaminated;
- after repairs on the hydraulic system;
- in case of damage.

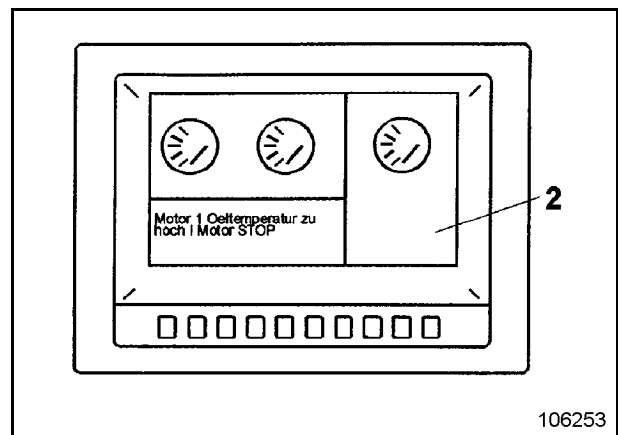


Fig. 3-76:

- ➔ Remove cover (3) together with sealing ring (5) and retaining disk (7).
- ➔ Remove cap (8) and sealing ring (10).
- ➔ Withdraw filter element (9) and sealing ring (11) from basket (12).
- ➔ Insert a new filter element.

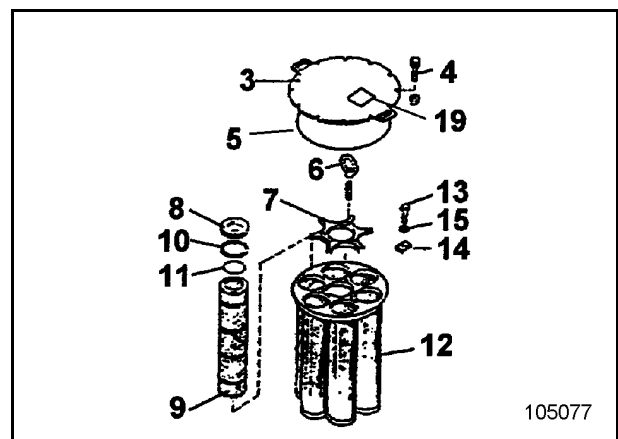


Fig. 3-77:

If a filter element (9) is damaged, remove basket (12) and check/clean.

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- Loosen screws (13, Fig. 3-78:) and take off spring clip (14) and disk (15).
- Remove basket (12) and clean in paraffin oil.
- Install basket (12).
- Insert filter element (9) together with sealing ring (11) and cap (8) with sealing ring (10).
- Refit cover (3).
- Clean the magnetic rod
The magnetic rod is located under cap (19).

If metal filings are detected, locate cause and rectify.

Contact the Terex|O&K Service, if required.

- Replace also the return-flow filter in the filter housing (cooling-system).
The return-flow filters are located under the caps (10, Fig. 3-79:).
(See under "Hydraulic oil return-flow filter / Filter housing (cooling-system)").

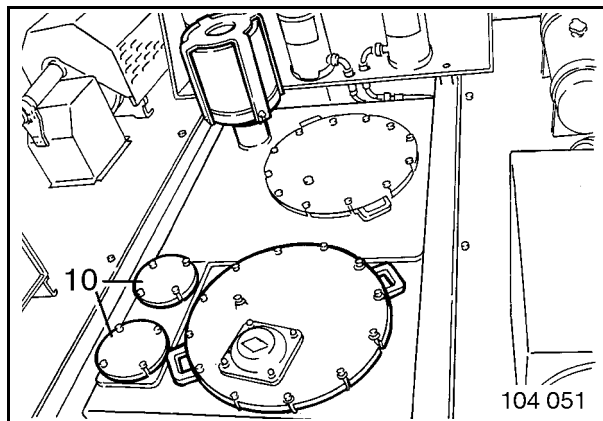


Fig. 3-79:

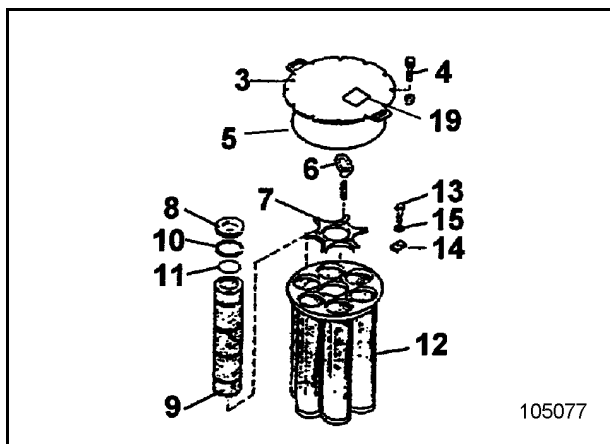


Fig. 3-78:

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Bypass valves (hydraulic oil reservoir)



Read and observe the "Inspection and servicing – Safety instructions" chapter.

Shut off the engines.

Risk of scalding caused by hot hydraulic oil.

The hydraulic oil reservoir itself may also be hot.

Avoid skin contact.

Skin contact with hydraulic oil may cause skin injury.

Wear protective gloves and firm working clothing.

Collect escaping hydraulic oil and discard without polluting the environment.

Cleaning the filter screens

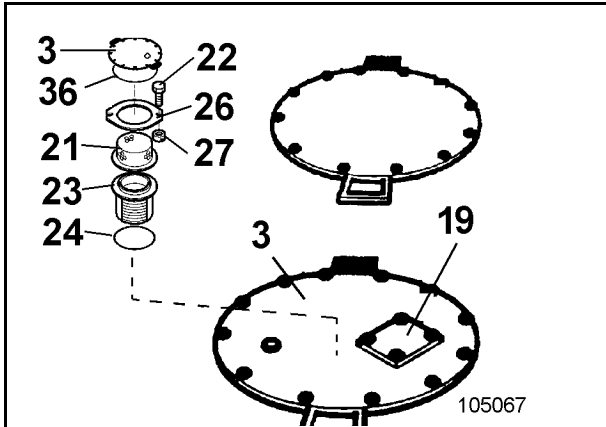


Fig. 3-80:

- Remove cover (3, Fig. 3-80:) together with sealing ring (36).
- Unscrew screws (22). Withdraw bypass valve.
- Take off screen (23) together with sealing ring and clean in white spirit or paraffin oil. Replace, if required.

- Check sealing ring for damage and replace, if required.
- Re-assemble the bypass valve.
- Check sealing ring (24) for damage and replace, if required.
- Insert bypass valve and fasten with screws (22).
- Clean also the screen of the bypass valve in the filter housing (cooling-system). The bypass valve is located under the cover (10, Fig. 3-81:). (See under "Bypass valves / Filter housing (cooling-system)").

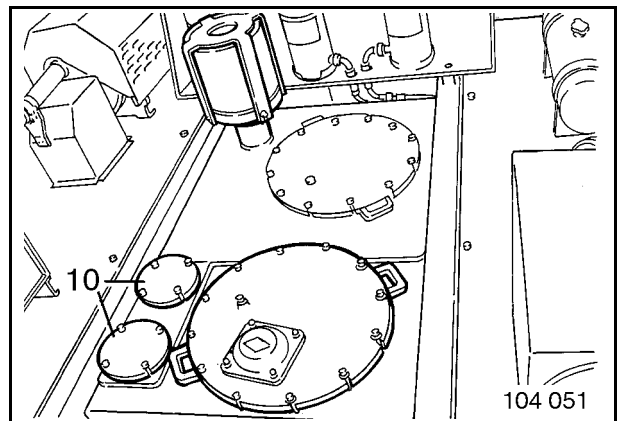
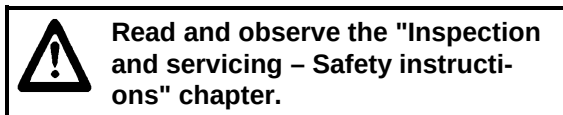


Fig. 3-81:

Replacing the bypass valves and sealing rings

- Remove bypass valve as described under "Cleaning the screens".
- Re-assemble the bypass valve with a new screen (23, Fig. 3-80:) and a new sealing ring.
- Insert bypass valve with new sealing ring (24) and fasten with screws (22).
- Replace also the bypass valve and sealing ring in the filter housing (cooling-system). The bypass valve is located under the cover (10, Fig. 3-81:). (See under "Bypass valves / Filter housing (cooling-system)").

Replacing the hydraulic oil return-flow filters (filter housing)



Shut off the engines.

Risk of scalding caused by hot hydraulic oil.

The hydraulic oil reservoir itself may also be hot.

Avoid skin contact.

Skin contact with hydraulic oil may cause skin injury.

Wear protective gloves and firm working clothing.

Collect escaping hydraulic oil and discard without polluting the environment.

Replace the return-flow filters (15, Fig. 3-82:) together with the return-flow filters in the hydraulic oil reservoir.

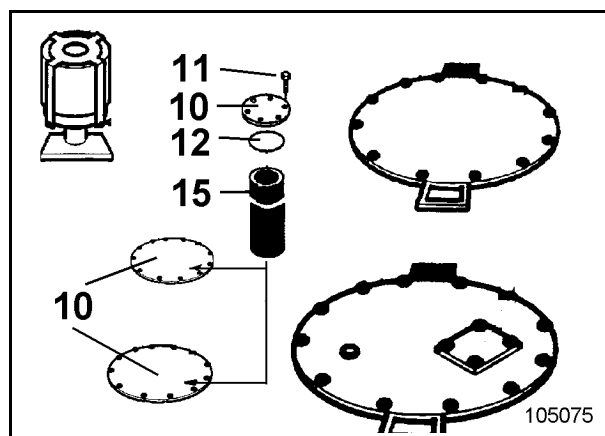


Fig. 3-82:

- ➔ Detach cover (10) together with sealing ring (12).
- ➔ Withdraw filter element (15).
- ➔ Insert a new filter element.

If metal filings are detected, locate cause and rectify.

Contact the Terex|O&K Service, if required.

- ➔ Refit cover (10) with new sealing ring (12).

Bypass valves (filter housing - cooling system)



Read and observe the "Inspection and servicing - Safety instructions" chapter.

Shut off the engines.

Risk of scalding caused by hot hydraulic oil.

The hydraulic oil reservoir itself may also be hot.

Avoid skin contact.

Skin contact with hydraulic oil may cause skin injury.

Wear protective gloves and firm working clothing.

Collect escaping hydraulic oil and discard without polluting the environment.

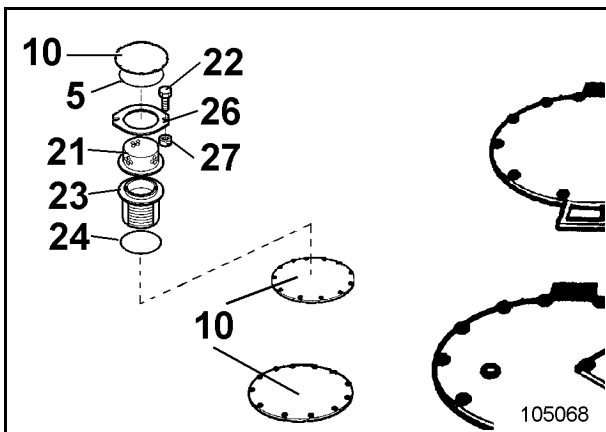


Fig. 3-83:

Cleaning the screens

Clean/replace the bypass valves (Fig. 3-83:) together with the bypass valves in the hydraulic oil reservoir.

- Detach cover (10) together with sealing ring (5).
- Unscrew screws (22) and withdraw bypass valve.
- Take off screen (23) together with sealing ring (24) and clean in white spirit or paraffin oil; replace, if required.
- Re-assemble the bypass valve.
- Insert bypass valve and fasten with screws (22).
- Refit cover (10) with a new sealing ring (5).

Replacing the bypass valves and sealing rings

Replace the bypass valves and sealing rings together with the bypass valves in the hydraulic oil reservoir.

- Remove the bypass valve as described under "Cleaning the screens".
- Re-assemble the bypass valve with a new screen (23) and a new sealing ring (24).
- Insert bypass valve with new sealing ring (24) and fasten with screws (22).
- Refit cover (10) with a new sealing ring (5).

Breather filter



Read and observe the "Inspection and servicing - Safety instructions" chapter.

Shut off the engines.

Risk of scalding caused by hot hydraulic oil.

The hydraulic oil reservoir itself may also be hot.

Avoid skin contact.

Skin contact with hydraulic oil may cause skin injury.

Wear protective gloves and firm working clothing.

Replacing the filter elements

The breather filters (20, Fig. 3-84:) ensure venting of the hydraulic oil reservoir at varying hydraulic oil levels.

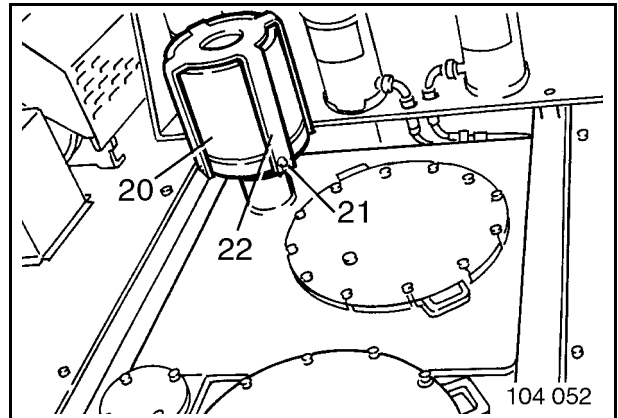


Fig. 3-84:

- ➡ Unscrew screws (21). Remove holder (22) and withdraw filter element (20).
- ➡ Check filter element and replace, if required.

Filter (control circuit and auxiliary control circuit)

Each of the control circuits is equipped with a high-pressure filter (Fig. 3-85:)



Read and observe the "Inspection and servicing - Safety instructions" chapter.

Shut off the engines.

Risk of scalding caused by hot hydraulic oil.

The filter housings may also be hot.

Avoid skin contact.

Skin contact with hydraulic oil may cause skin injury.

Wear protective gloves and firm working clothing.

Replacing the filter element

Change filter element regularly and when the BCS indicates a contamination.

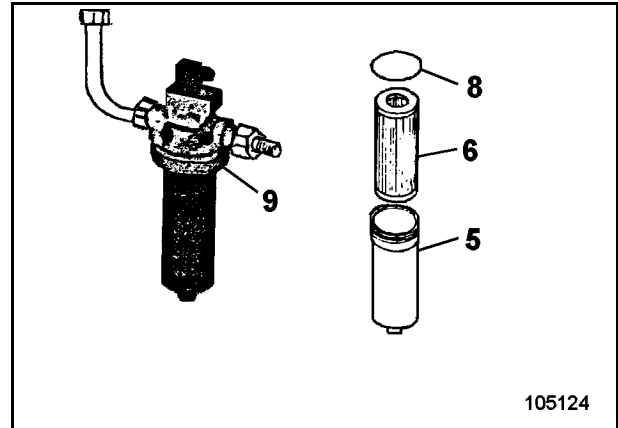


Fig. 3-85:

- Unscrew filter housing (5, Fig. 3-85:).
- Withdraw filter element (6) from filter housing (5).
- Clean filter housing (5) and the sealing face at the filter head (9) with white spirit or paraffin oil.
- Check seals (10 and 14) and replace, if required.
- Insert new filter element into filter housing (5) and refit to the filter head with new, lightly oiled sealing ring (8).
- Check for leaks after putting the filter into operation.

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High-pressure filter for working hydraulics

To filter the hydraulic oil on the high-pressure side of the working hydraulic system, the machine is equipped with four high-pressure filters (9, Fig. 3-86:).

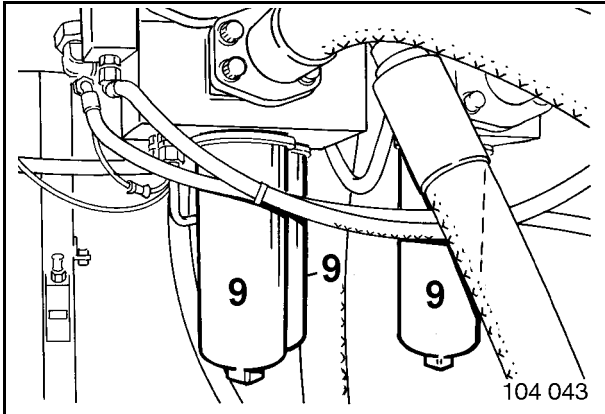


Fig. 3-86:



Read and observe the "Inspection and servicing – Safety instructions" chapter.

Shut off the engines.

Risk of scalding caused by hot hydraulic oil.

The filter housings themselves may also be hot.

Avoid skin contact.

Skin contact with hydraulic oil may cause skin injury.

Wear protective gloves and firm working clothing.

Collect escaping hydraulic oil and discard without polluting the environment.

Checking/cleaning the filter elements

- Unscrew drain plug (11, Fig. 3-87:) and drain the hydraulic oil from the filter housing (9). (Place a suitable recipient under the filter housing).
- Unscrew filter housing (9).
- Disengage filter element (15) with a slight turn from its retaining catch and withdraw from filter housing (9).
- Clean filter element (15) in white spirit or paraffin oil.
- Replace filter element (15) if it is damaged.
- Check seals (10 and 14) and replace, if required.
- Re-assemble the filter element in reverse order.
- Check for leaks after putting the filter into operation.

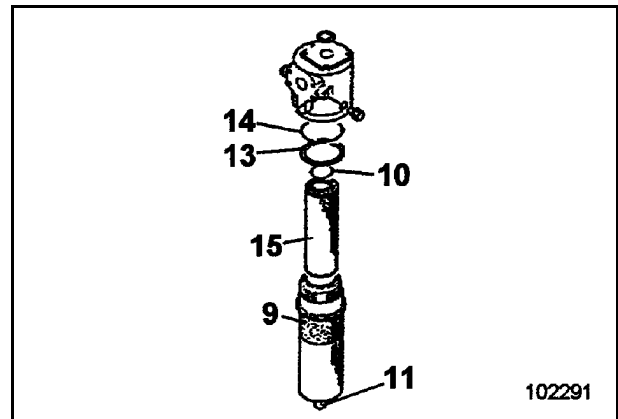


Fig. 3-87:

Replacing the filter elements

- Detach the filter element as described under "Checking the filter elements".
- Clean filter housing (9, Fig. 3-87:) and the sealing faces at the filter head with white spirit or paraffin oil.
- Insert new filter element into filter housing (9) and refit to the filter head with new, lightly oiled sealing rings (10 and 14) and a new retaining ring (13).

Check high-pressure filter for leaks after putting it into operation.

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High-pressure filters for slewing circuit

Each of the two slewing circuits is equipped with a high-pressure filter (Fig. 22).

The filter elements (2, Fig. 23) are only to be cleaned/changed if necessary.

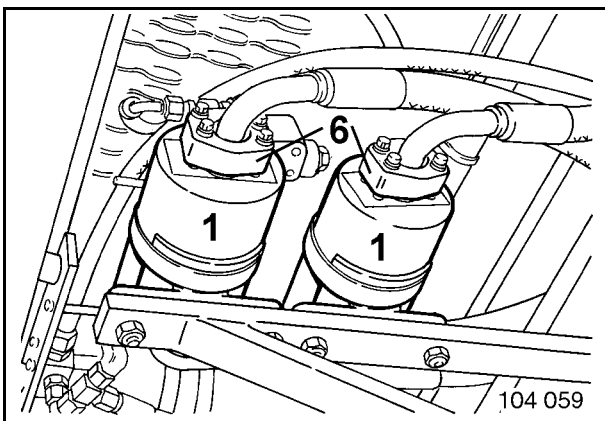


Fig. 3-88:

Shut off the engines.

Risk of scalding from hot hydraulic oil.

The filter housings may also be hot.

Avoid skin contact.

Skin contact with hydraulic oil may cause skin injury.

Wear protective gloves and firm protective clothing.

Collect escaping hydraulic oil and discard without polluting the environment.

Checking/cleaning the filter elements

- Loosen flange (6, Fig. 3-88:).
- Unscrew cover (5, Fig. 3-89:).
- Withdraw filter element (2) together with sealing ring (3) and retaining ring (4) from housing (1).
- Clean filter element (2) with white spirit or paraffin oil.
- Insert filter element into filter housing (1) and refit with new, lightly oiled sealing ring (10) and a new retaining ring (4).
- Screw cover (5) into housing (1).
- Refit flange (6, Fig. 3-88:) to housing (1).
- Check high-pressure filter for leaks after putting it into operation.

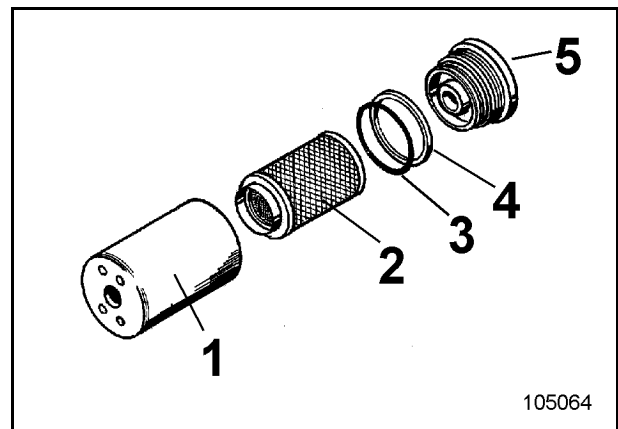


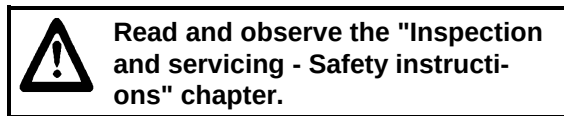
Fig. 3-89:

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Changing the hydraulic oil



Shut off the engines.

Risk of scalding caused by hot hydraulic oil.

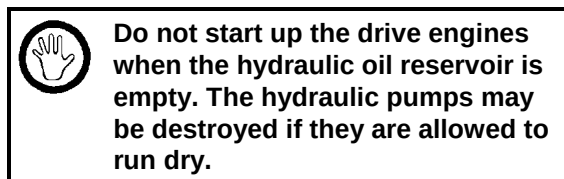
The hydraulic oil reservoir itself may also be hot.

Avoid skin contact.

Skin contact with hydraulic oil may cause skin injury.

Wear protective gloves and firm working clothing.

Collect escaping oil and discard without polluting the environment.



Drain the hydraulic oil at express couplings (1, Fig. 3-90:).

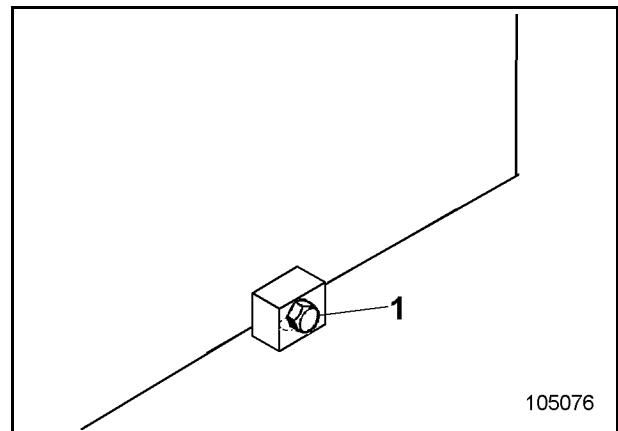


Fig. 3-90:

- ➔ Place suitable recipients under the drain valve (1) of the hydraulic oil reservoir. For the required capacity refer to the "Refilling quantities - Oil" table.

The use of the hose line is described in the "Hose line for oil and cooling-liquid changes" section.

- ➔ Unscrew the hose line; the oil drain valve closes automatically.
- ➔ Screw protective cap back in place.

Drawing off hydraulic oil

- ➔ Bring the hydraulic oil to operating temperature (abt. 50 ° C / 122°F).
- ➔ Retract the hydraulic cylinders as far as possible and stand the working equipment on the ground.
- ➔ Shut off the engines.

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Drawing off hydraulic oil

The hydraulic oil can also be drawn off through the service station (Fig. 3-91:).

- Bring hydraulic oil to operating temperature (ca. 50° C / 122°F).
- Retract hydraulic cylinders as far as possible and stand working equipment on the ground.
- Shut off the engines.
- Unscrew cap of express coupling (10).
- Connect hose line of the service vehicle.

The hose line and its use are described in the "hose line for oil and cooling liquid change" section.

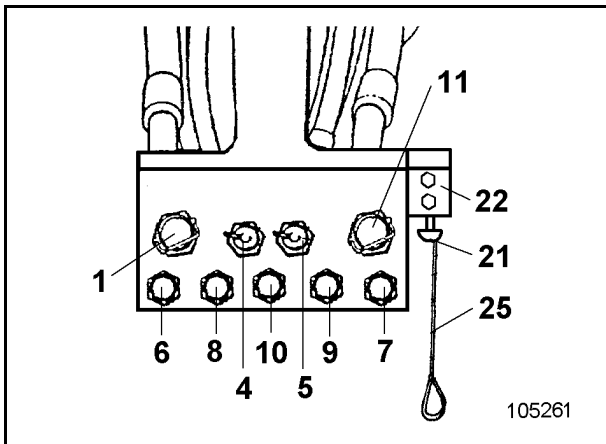


Fig. 3-91:

- Remove hose line. The coupling closes automatically.
- Screw on protective cap.

Cleaning the hydraulic oil reservoir



Explosion hazard.

Read and observe the "Inspection and servicing - Safety instructions" chapter.

Shut off the engines.

Do not use white spirit, paraffin oil or other solvents for cleaning.

Use diesel fuel or a special flushing oil.

Avoid skin contact.

Skin contact with hydraulic oil may cause skin injury.

Wear protective gloves and firm working clothing.

Dispose of contaminated hydraulic oil without polluting the environment and separately from other waste.

- Drain off hydraulic oil as described under "Draining off the hydraulic oil".
- Remove cap (3, Fig. 3-92:).
- Detach the return-flow filter.

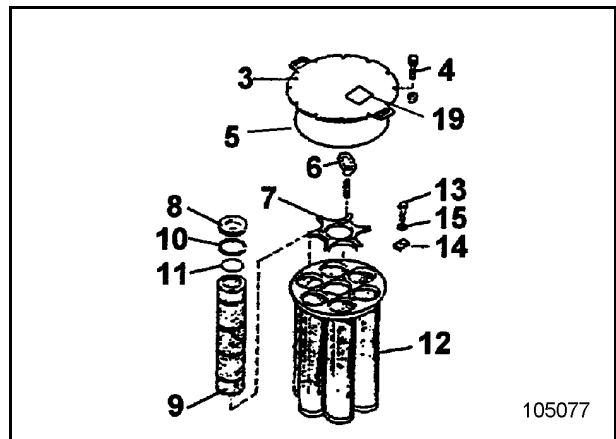


Fig. 3-92:

- Place a collecting recipient for the flushing oil under the hydraulic oil reservoir.
- Clean the inside of the hydraulic oil reservoir with diesel fuel or flushing oil. Remove all sediments and also the residues of the cleaning agent thoroughly
- Refit cap (3).

Filling in hydraulic oil

Fill in hydraulic oil through the return-flow filters.

- Remove cap (19, Fig. 3-93:).
- Fill in hydraulic oil through the opening until the oil level lies between the $\frac{1}{2}$ and the $\frac{3}{4}$ marks of the inspection glass (1, Fig. 3-94:) (oil grade see "Refilling quantities - Oil").

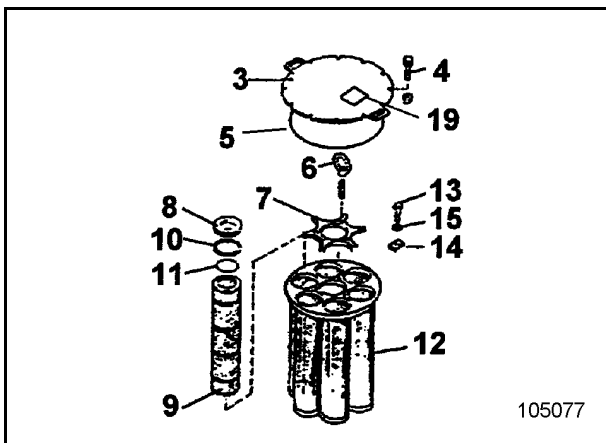


Fig. 3-93:

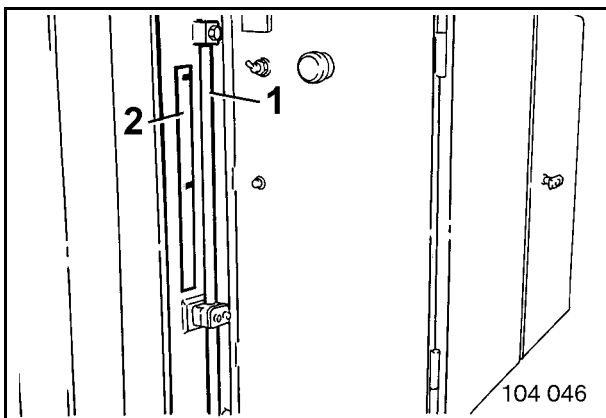


Fig. 3-94:

- Vent the hydraulic system.
- Check the oil level in the hydraulic oil reservoir. Top up with oil, if required..
- Refit cap (19, Fig. 3-93:).

Hydraulic oil can also be filled by means of the service station (Fig. 3-95:).

- Unscrew cap of express coupling (10).
- The use of the hose line is described under "hose line for oil and cooling-liquid changes". Connect filling hose express coupling of the service vehicle. Fill in hydraulic oil until the oil level lies between the $\frac{1}{2}$ and the $\frac{3}{4}$ marks of the inspection glass (1, Fig. 3-94:) (oil grade see "Refilling quantities - Oil").

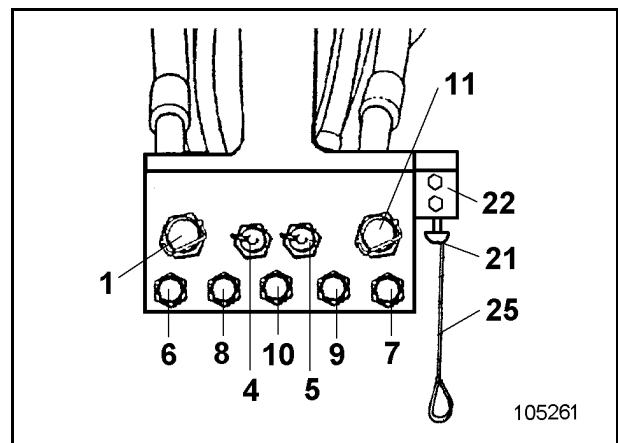


Fig. 3-95:

- The oil level is also displayed on the BCS-screen (2, Fig. 3-96:).
- Vent the hydraulic system.
- Check the oil level in the hydraulic oil reservoir. Top up with oil, if required.
- Unscrew the hose line. The express coupling closes automatically.
- Screw protective cap back in place.

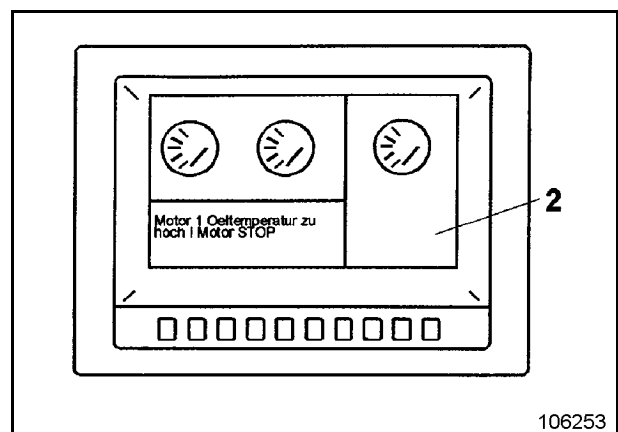


Fig. 3-96:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Venting the hydraulic system

Hydraulic pumps, hydraulic motors, hydraulic cylinders, travel brake valves, suction lines of hydraulic pumps, oil cooler manifolds and the servo control system must be vented

- after assembly on site and prior to initial commissioning,
- before each recommissioning of the excavator, e.g. after extensive repair work to the hydraulic system or after prolonged downtimes,
- after each hydraulic oil change,
- after replacement of hoses or lines.

Venting the hydraulic components

- Hydraulic pumps and hydraulic motors (with electric motors shut off).

Open the highest leakage oil port and fill in clean hydraulic oil up to the lower edge of the opening.

Check the hydraulic system under load. Pay attention to noises produced by the hydraulic pump or the hydraulic motors. Abrupt movements of the working equipment are a sign of entrapped air in the system. Remaining air pockets can be eliminated by actuating all hydraulic functions.

- **Hydraulic cylinder**

Before the initial admission of the cylinder with oil, the piston must be in either of the two extreme piston positions. In other words, the piston rod (1, Fig. 3-97: and Fig. 3-98:) must be either completely retracted or completely extended.

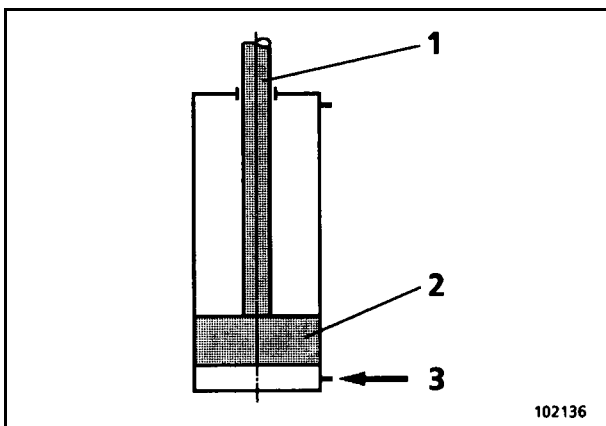


Fig. 3-97:

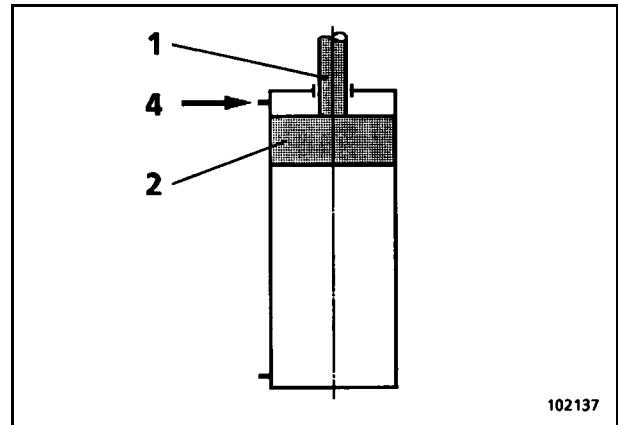


Fig. 3-98:

Always admit oil first to that side of the cylinder where the piston (2) is. This is

- the piston-side port (3) when the piston rod is retracted (1, Fig. 3-97:),
- the rod-side port (4) when the piston rod is extended (1, Fig. 3-98:).

If, for assembly reasons, the piston rod is in middle position, admit oil first to the piston-side port (4).

When oil is admitted for the first time to the cylinder, the oil flow must be reduced. Therefore extend or retract the piston rod as slowly as possible.

The screws/nozzles of the following components must be opened until oil emerges bubble-free from the opening:



Always vent only the system section that has been opened.

- the travel brake valve at the venting screw,
- the oil cooler manifold at the mini-measuring ports,
- the servo system at the venting screws of the control blocks (under the servo caps),
- the intake line at the venting screw (with drive motors stationary).

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Cleaning the hydraulic oil cooler



Shut off the engines.

Never start cleaning work until the cooler fan blades have stopped turning.

The hydraulic oil coolers reach the same temperature as the hydraulic oil. Risk of burning.

Allow the hydraulic oil cooler to cool down.

Wear protective gloves and firm protective clothing.

If the machine is used in places with heavily contaminated ambient air, the hydraulic oil coolers must be cleaned more often than specified in the servicing plan.

The speeds of the fan motors (1, Fig. 3-99:) are thermostat-controlled. The fan motors run at maximum speed when the hydraulic oil temperature reaches ca. 60°C (140°F).

Cleaning

The hydraulic oil coolers are located in the oil cooler module.

Clean the hydraulic oil coolers at regular intervals.

- Shut off the engines.
- Remove any accumulated dirt.
- Clean the fan blades (2).
- Clean the radiators with a jet of water or compressed air from outside to inside.
- Leave hydraulic oil coolers to dry.
- Check the hydraulic motors (1) for free movement.

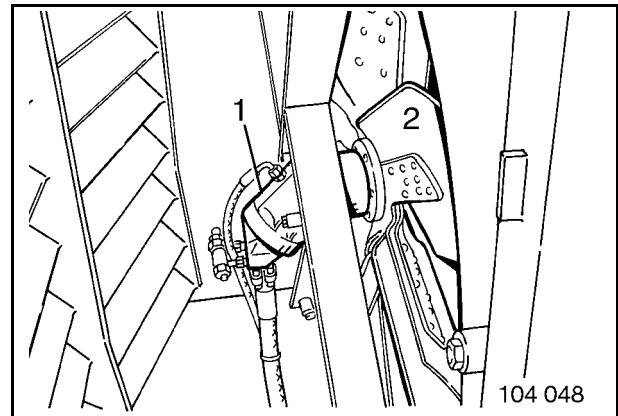
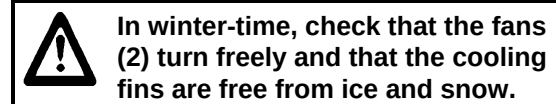


Fig. 3-99:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Electronic excavator control

Joystick

Apply a thin layer of hydraulic oil regularly on the control spools of the joysticks (arrows, Fig. 3-100:) to prevent jamming of the joysticks.

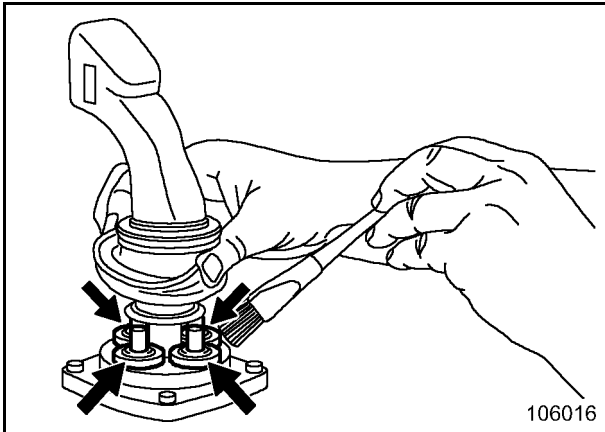


Fig. 3-100:



Make sure the hydraulic oil does not flow down along the control spools into the electronic control circuits where it might cause damage.

Pedal

Apply a thin layer of hydraulic oil regularly on the control spools of the pedals (arrows, Fig. 3-101:) to prevent jamming of the control spools.

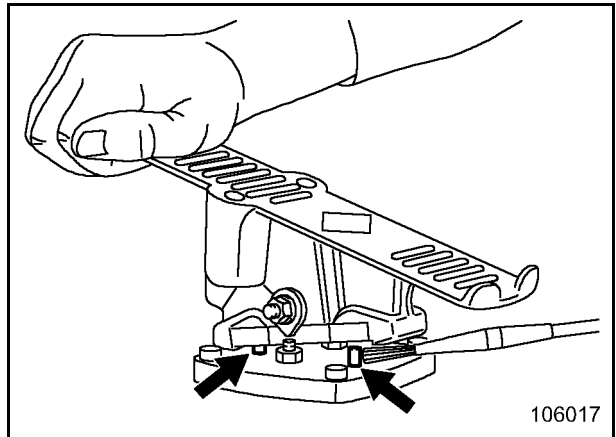


Fig. 3-101:



Make sure the hydraulic oil does not flow down along the control spools into the electronic control circuits where it might cause damage.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Pressure accumulator - Emergency lowering

To permit the working equipment to be lowered in an emergency, the machine is equipped with a pressure accumulator (1, Fig. 3-102:).

The pressure accumulator (1) is located in the superstructure and is accessible from the ground.

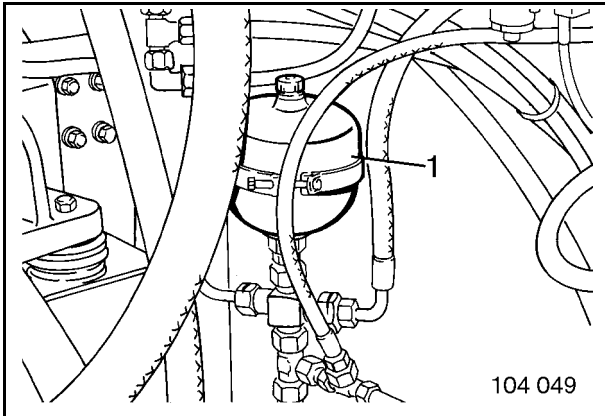
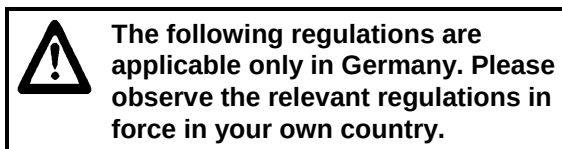


Fig. 3-102:

Pressure-accumulator inspection regulations



Extract from the German regulations

The accumulator vessel must not be subjected to welding, soldering or any other mechanical work. Work on systems containing accumulators (repairs, connection of pressure gauges or similar work) may be carried out only when the fluid pressure has been released.

Extract from the German acceptance regulations

Hydraulic accumulators are pressure vessels and are therefore subject to the "Druckbehälterverordnung (DruckbehV)" [Pressure Vessel Regulations]. Their installation, equipment and operation are governed by the "Technische Regeln Druckbehälter (TRB)" [Technical Rules for Pressure Vessels]. The pressure vessels of hydraulic accumulators are classified by the admissible operating pressure p in bars, the capacity l in liters and the product of pressure and capacity $p \times l$. Depending on the class to which the accumulator belongs, the following inspections are mandatory:

Checking the gas charging pressure in the pressure accumulator

After commissioning (new installation or repair), the gas charging pressure in the pressure vessel must be checked at least once during the first week. If no pressure loss is detected, the second pressure test must be performed after ca. 3 months. If no pressure loss is detected in this test either, the testing interval can be fixed at once pressure test each year.

Group	Inspections prior to commissioning		Regular inspections
	at the factory	at the place of use	
II $p \geq 1 \text{ bar}$ and $p \times l \leq 200$	Pressure testing Prototype and pressure test certified by the manufacturer	Inspection certificate (Check of correctness and correct installation) issued by an expert	Inspection schedule to be drawn up by end user, based on experience with type of operation and fluid.

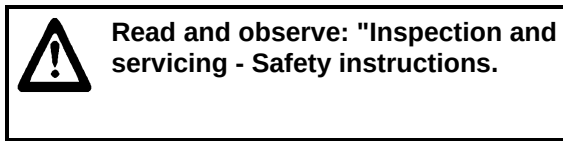
OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



PUMP TRANSFER GEARBOX

7



Read and observe: "Inspection and servicing - Safety instructions."

Shut off the engines

The gearbox housings may be hot, too.

Secure the machine as described in the "Securing the machine" section.

Protect the skin from contact with gearbox oil.

Skin contact with cooling liquid is a potential health hazard.

Wear protective gloves and firm working clothing.

Checking the gearbox oil level / Topping up with oil

Park the machine as described in the "Securing the machine" section.

- Unscrew dipstick (1, Fig. 3-103:) and wipe.
- Insert dipstick (1) fully again and withdraw a second time.
Oil level should lie between the two dipstick markers. Top up with oil if required.
- Screw in dipstick (1) again.

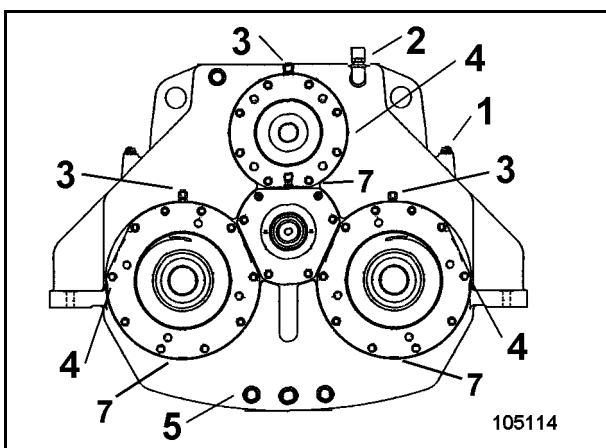


Fig. 3-103:

Pre-chamber

Checking oil level

The oil level in the pre-chambers is visually at the inspection glass (3, Fig. 3-104) in expansion reservoir (1).

The oil level should reach up at least to the middle of the inspection glass (3). Top up with gearbox oil, if required.

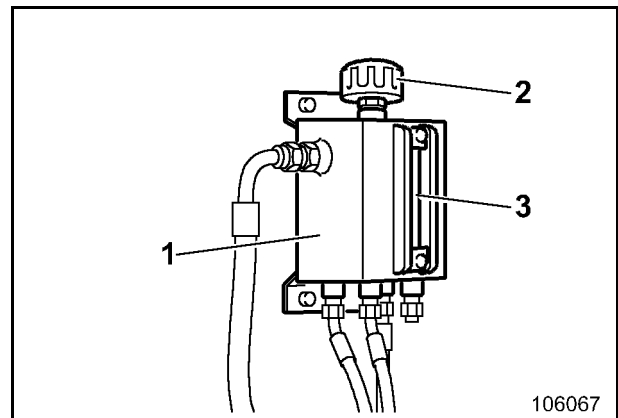


Fig. 3-104

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Drawing off oil

The gearbox oil is drained with the service station (Fig. 3-105:) through

- express coupling (4) for the lefthand pump transfer gearbox
- express coupling (5) for the righthand pump transfer gearbox

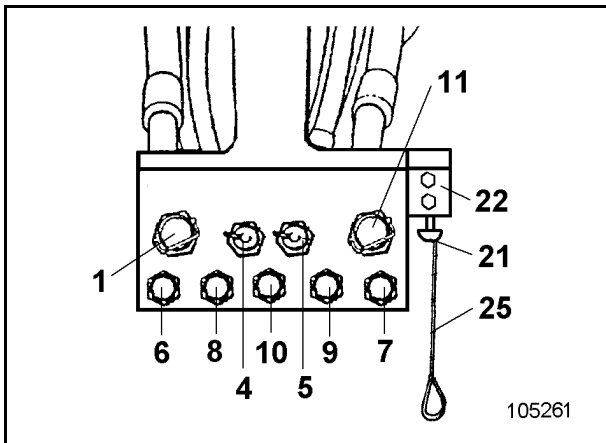


Fig. 3-105:

- ➔ Unscrew cap of express coupling and connect hose line of the service vehicle.

The hose line and its use are described in the "hose line for oil and cooling liquid change" section.

- ➔ Remove hose after the oil has been drawn off. The coupling closes automatically.
- ➔ Screw on protective cap.

Filling in oil

Fill in oil through the bore in breather valve (2, Fig. 3-106:).

The oil level must reach the upper mark on dipstick (1).

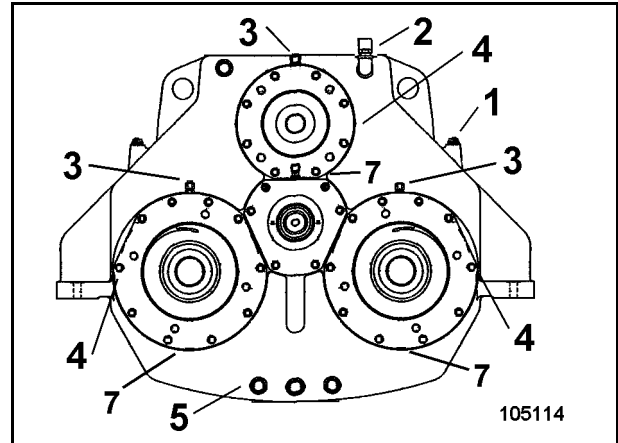


Fig. 3-106:

The gearbox oil can also be filled in with the service station (Fig. 3-105:) through

- express coupling (4) for the lefthand pump transfer gearbox
- express coupling (5) for the righthand pump transfer gearbox
- ➔ Unscrew cap of express coupling and connect hose line of the service vehicle.

The hose line and its use are described in the "hose line for oil and cooling liquid change" section.

The oil level must reach the upper mark on dipstick (1, Fig. 3-106:).

- ➔ Remove hose after the oil has been filled in. The coupling closes automatically.
- ➔ Screw on protective cap.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Pre-chamber

Draining off oil

- Prepare a collecting recipient for used oil.

Choose the required capacity in accordance with the "Refilling quantities - Oil" table.

- Unscrew plug (7, Fig. 3-107) and drain off oil.
- Screw plug (7) back in place.

Filling in oil

Filling in oil see "Check oil level"

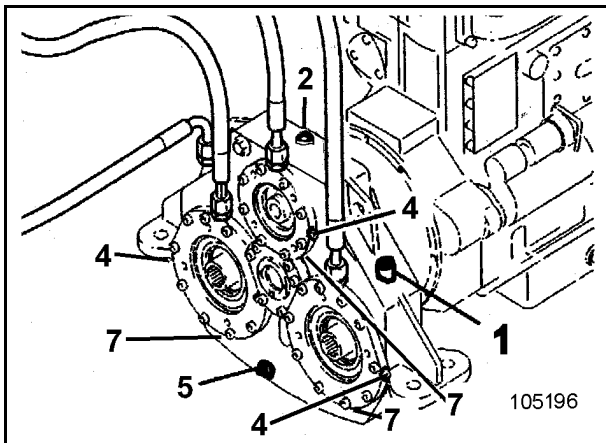


Fig. 3-107

Gearbox venting

The gearbox is vented through breather valve (2, Fig. 3-108:).

Clean breather valve (2) in accordance with the servicing plan.

- Unscrew breather filter (2), clean with white spirit or paraffin oil and blow dry with compressed air.
- Screw breather filter (2) back in place.

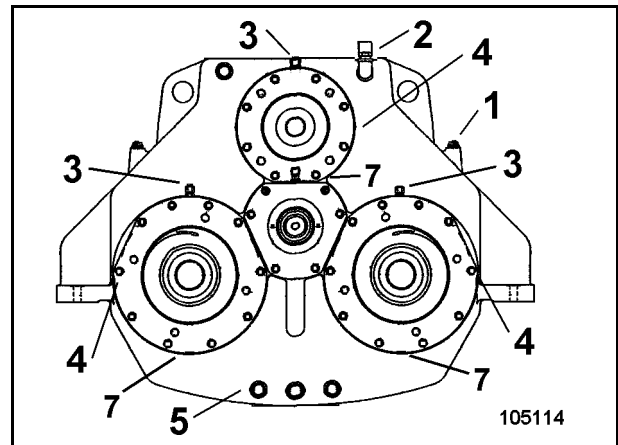


Fig. 3-108:

Pre-chamber

The gearbox is vented through breather valve (2, Fig. 3-109:).

Clean breather valve (2) in accordance with the servicing plan.

- Unscrew breather filter (2), clean with white spirit or paraffin oil and blow dry with compressed air.
- Screw breather filter (2) back in place.

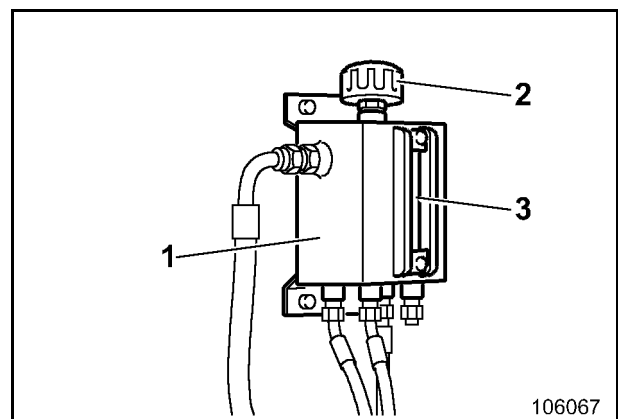


Fig. 3-109:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Pump transfer gearbox lube oil filters

Check filter tell-tales (1, Fig. 3-110:) regularly - at operating temperature - for indication of contamination.

If the red sector is visible through transparent cap (2), the filter element must be cleaned or changed.

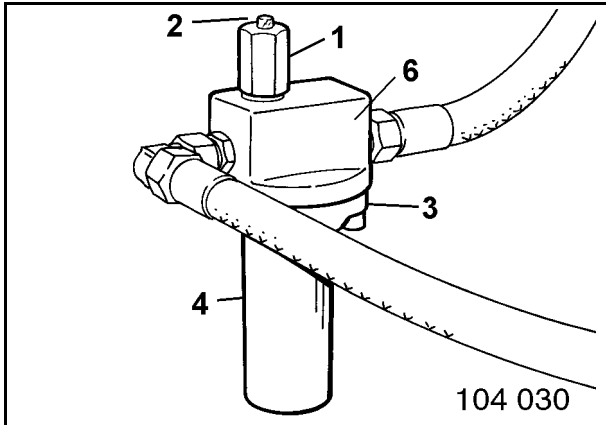


Fig. 3-110:

- Remove flange (3, Fig. 3-111:).
- Pour oil out of filter pot (4) and remove filter element (5).
- Clean filter element in spirits or petroleum;
- change if damaged
- Clean filter head (6, Fig. 3-110:) and filter pot (4). Check o-ring (7, Fig. 3-111:) for damage; change if necessary.
- Oil the o-ring lightly. Place filter element into filter pot and re-assembly.
- Check filters for leakages after recommencing operation.

Filter element (5) must be changed after having been cleaned 8 - 10 times; at the latest however, after 1000 operating hours.

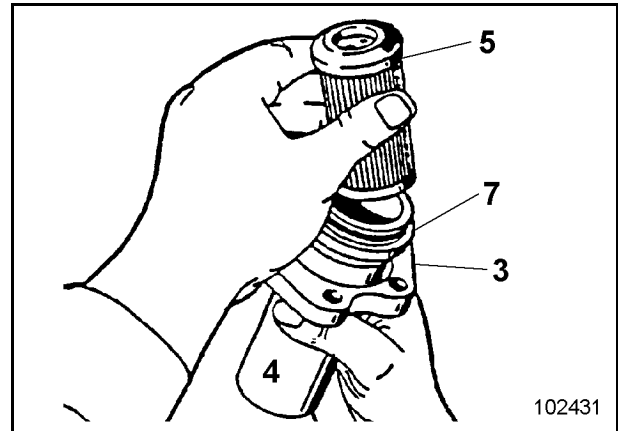


Fig. 3-111:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



SLEWING GEARBOX



Shut off the engine

The gearbox housings may be hot, too.

Secure the machine as described in the "Securing the machine" section.

Protect the skin from contact with gearbox oil.

Skin contact with cooling liquid is a potential health hazard.

Wear protective gloves and firm working clothing.

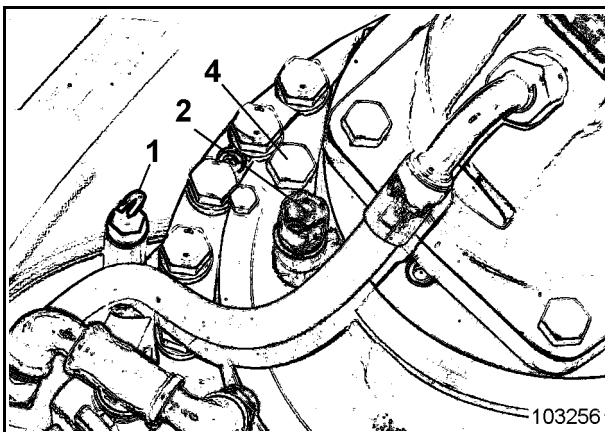


Fig. 3-112:

Gearbox - Checking the oil level / Topping up with oil

- Park the machine as described under "Securing the machine".
- Screw out dipstick (1, Fig. 3-103:) and wipe clean.
- Insert dipstick (1) fully again (do not screw in) and withdraw a second time.

The oil level must reach up at least to the lower mark on dipstick (1). Top up with gearbox oil, if required.

- Screw dipstick (1) back in place.

Changing the gearbox oil

- Prepare a collecting recipient for used oil.

Choose the required capacity in accordance with the "Refilling quantities - Oil" table.

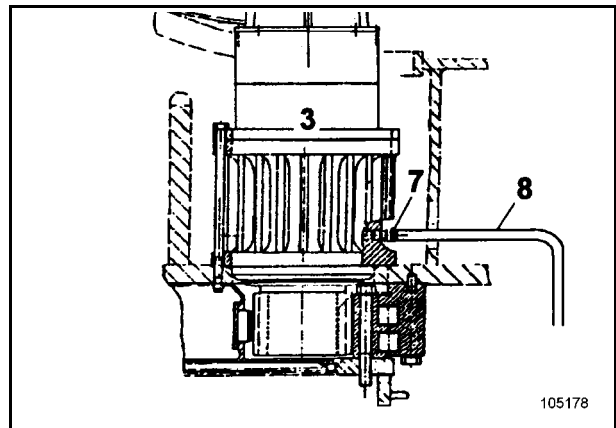


Fig. 3-113:

Draining off oil

- Attach hose (8, Fig. 3-113:) to drain valve (7) and drain off oil completely.

The use of the oil draining hose is described in the "Draining hose for oil changes" chapter.

The drain valve (7, Fig. 3-113:) is accessible from the undercarriage.

- Remove hose. The oil drain valve closes automatically. for oil and cooling liquid change" section.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Filling in new oil / Topping up

- Unscrew plug (4, Fig. 3-114:) and fill in new oil.
- Check oil level with dipstick (1, Fig. 3-114:).
- Screw in plug (4) again.

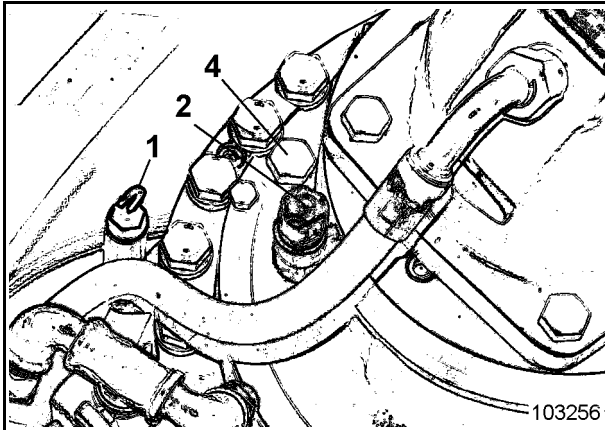


Fig. 3-114:

Gearbox venting

The gearbox is vented through breather filter (2, Fig. 3-114:).

Clean breather filter in accordance with the servicing plan.

- Unscrew breather filter (2), clean in white spirit or paraffin oil and blow dry with compressed air.
- Screw breather filter (2) back in place.

TRAVEL GAERBOX



Shut off the engines

The gearbox housings may be hot, too.

Secure the machine as described in the "Securing the machine" section.

Protect the skin from contact with gearbox oil.

Skin contact with cooling liquid is a potential health hazard.

Wear protective gloves and firm working clothing.

Gearbox - Checking the oil level / Topping up with oil

- Move the excavator into such a position that the screw plugs (1, 2 and 3, Fig. 3-115:) are in the displayed position.
- Unscrew checking screw (1).
The oil level should reach up to the lower edge of the opening. Top up with oil, if required.
- Screw checking plug (1) back in place.

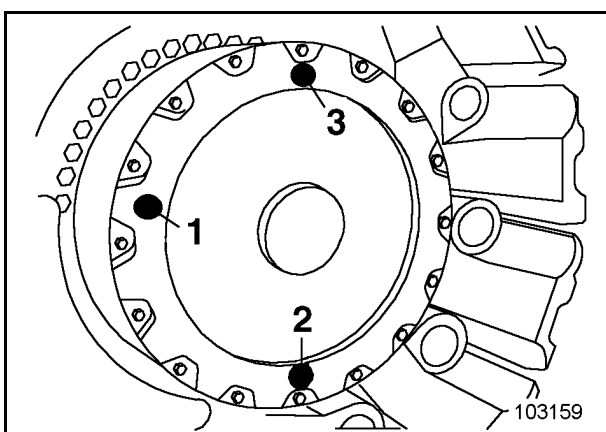


Fig. 3-115:

Pre-chamber - Check the oil level / Top up with oil

- Unscrew control plug (2, Fig. 3-116:).
The oil level should reach up to the lower end of the opening. Top up with oil through the opening if required.
- Screw in plug (2) back in place.

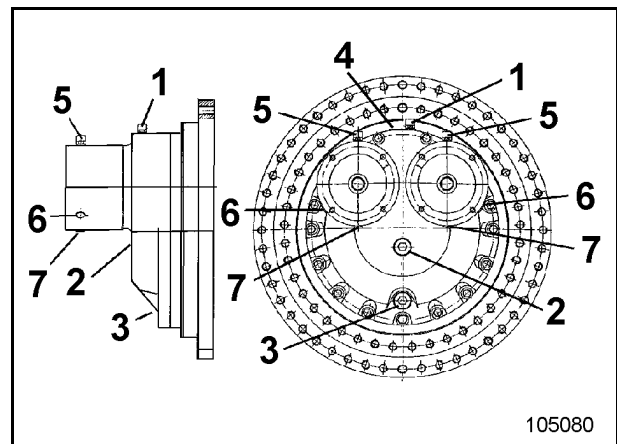


Fig. 3-116:

Brake chamber - Checking the oil level / Topping up with oil

- Unscrew checking screw (6, Fig. 3-116:).
- The oil level should reach up to the lower edge of the opening. Top up with oil, if required.
- Screw checking plug (6) back in place.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Travel gearbox - Changing oil

Draining off oil

- Move the excavator into such a position that the screw plugs (1, 2 and 3, Fig. 3-117:) are in the displayed position.
- Place a collecting recipient for used oil under the travel gearbox.
Choose the required capacity in accordance with the "Refilling quantities - Oil" table.
- Unscrew drain plug (2) and drain off the oil completely.
Slackening plug (3) allows the oil to run out more readily.
- Clean screw plugs (2 and 3)
- Screw screw plug (2) back in place.

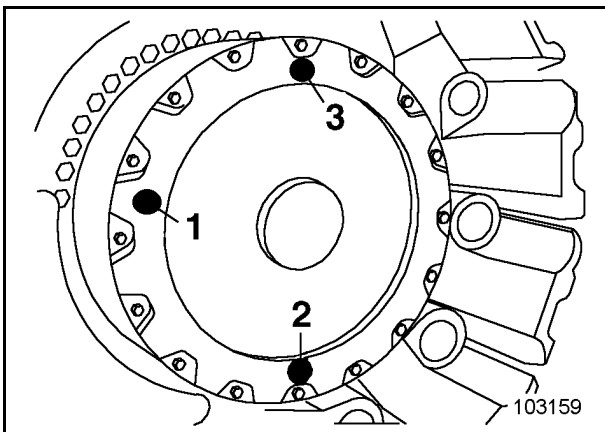


Fig. 3-117:

Filling in oil

- Unscrew screw plug (1 and 3).
- Fill in oil through opening in plug (3) until it flows out of opening in plug (1).
- Screw plugs (1 and 3) back in place.

Pre-chamber - Changing the oil

Draining off oil

- Place a collecting recipient for used oil under the pre-chamber.
Choose the required capacity in accordance with the "Refilling quantities - Oil" table.
- Unscrew drain plug (3, Fig. 3-118:) and drain off the oil completely.
Slackening plug (4) allows the oil to run out more readily.
- Clean screw plugs (3 and 4)
- Screw screw plug (3) back in place.

Filling in oil

- Unscrew screw plugs (2).
- Fill in oil through opening in plug (4) until it flows out of opening in plug (2).
- Screw plugs (2 and 4) back in place.

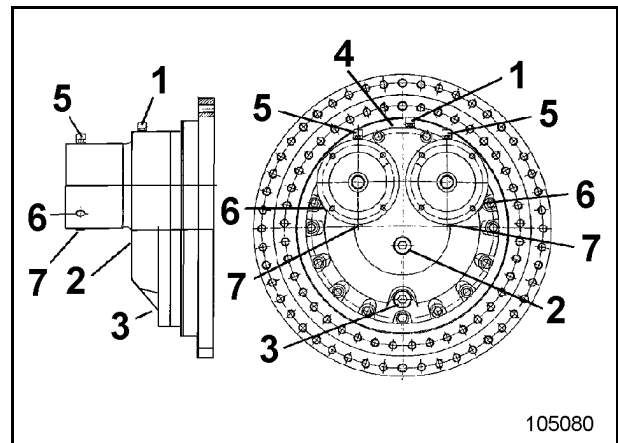


Fig. 3-118:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Brake chamber - Changing oil

Draining off oil

- Place a collecting recipient for used oil under the pre-chamber.
Choose the required capacity in accordance with the "Refilling quantities - Oil" table.
- Unscrew drain plug (7, Fig. 3-119:) and drain off the oil completely.
Slackening breather filter (5) allows the oil to run out more readily.
- Clean screw plug (7).
- Screw screw plug (7) back in place.

Breather filter

- Unscrew breather filter (1 and 5, Fig. 3-119:) and clean in white spirit or parafin.

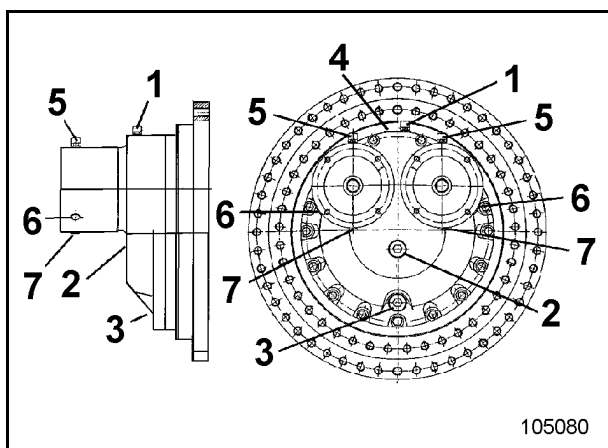


Fig. 3-119:

Filling in oil

- Unscrew screw plug (6).
- Fill in oil through opening of breather filter (5) until it flows out of opening in plug (6).
- Screw plug (6) and breather filter (5) back in place.

CRAWLER TRACKS

Cleaning

Clean tracks, track and support rollers, sprockets and idlers regularly and whenever required. Cleaning is especially important in winter to prevent

- the tracks from being thrown off
- oil from leaking out of track and support rollers, sprockets and idlers
- excessive wear
- the track from breaking.

To clean the tracks:

- raise one side of the excavator with the working equipment and allow track to turn;
- clean the side member supporting the track;
- clean track and support rollers (1 and 2 ,Fig. 3-120:) thoroughly;
- clean the sliding planes on the idler guides.

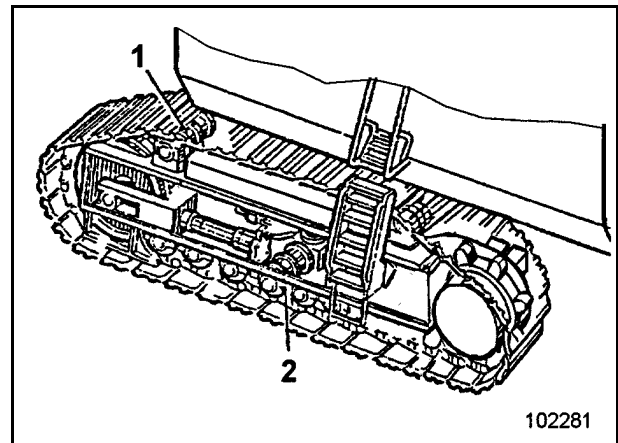


Fig. 3-120:

Track roller, Support roller

Inspect all track and support rollers visually for leaks and free movement at regular intervals.

Track roller fastening

Check fastening screws (4 Fig. 3-121:) regularly for tightness:

- ➡ Tighten screws with a torque wrench to the prescribed tightening torque (see "Technical Handbook").

Support roller fastening

Check fastening screws (3, Fig. 3-121:) regularly for tightness

Tighten screws with a torque wrench to the prescribed tightening torque (see "Technical Handbook").

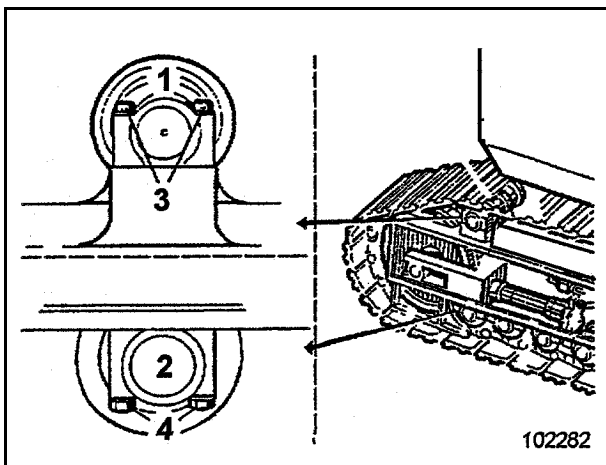


Fig. 3-121:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Track tensioner

Design

The tracks are tensioned with the help of the hydraulic pressure created during travelling. Fig. 3-122: and Fig. 3-123: show parts of the tracks and the tensioner:

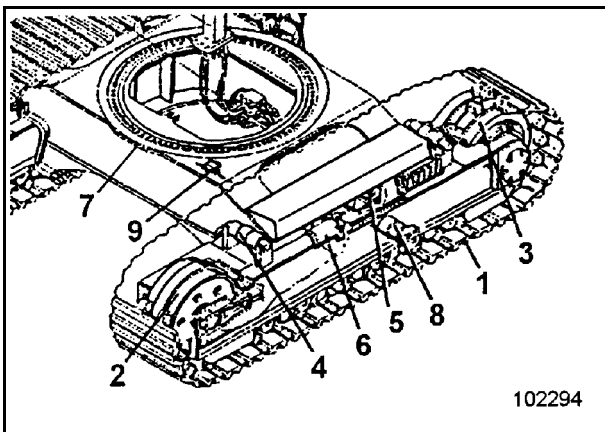


Fig. 3-122:

- 1 Crawler track
- 2 Idler
- 3 Drive sprocket
- 4 Support roller
- 5 Pressure accumulator
- 6 Pressure cylinder
- 7 Pressure limiting valve
- 8 Track roller
- 9 Mini-measuring port
- 10 Stop cock

Technical data

Track tensioning pressure	70 bars	1015 psi
Pressure limiting valve	330 bars	4786 psi
Gas pressure in pressure accumulator (nitrogen filling pressure)	48 bars	696 psi

Function

The tensioning system is under permanent pressure of ca. 70 bars / 1015 psi which keeps both tracks permanently tensioned. Pressure losses are compensated as soon as the engines have been started. Retensioning is not required.

For cleaning and servicing work, the tracks can be slackened.

To do so:

- stop the engines
- open both pressure limiting valves (7, Fig. 3-123:) to slacken the tracks.
- After the work, screw down the pressure limiting valves (7) to the limit stop.

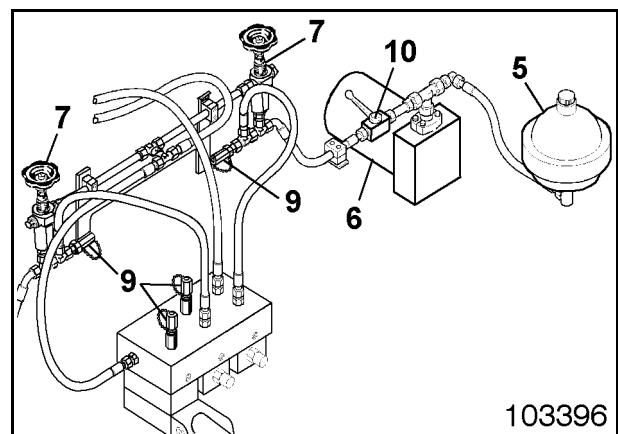
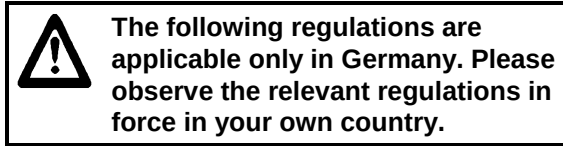


Fig. 3-123:

The pressure-limiting valves (7) are preset to a pressure of 330 bars / 4786 psi and sealed in this position. The lead seal must not be removed and the pressure setting of 330 bars / 4786 psi must not be changed.

The track tensioners are maintenance-free.

Pressure-accumulator inspection regulations



Extract from the German regulations

The accumulator vessel must not be subjected to welding, soldering or any other mechanical work. Work on systems containing accumulators (repairs, connection of pressure gauges or similar work) may be carried out only when the fluid pressure has been relieved.

Extract from the German acceptance regulations

Hydraulic accumulators are pressure vessels and are therefore subject to the "Druckbehälterverordnung (DruckbehV)" [Pressure Vessel Regulations]. Their installation, equipment and operation are governed by the "Technische Regeln Druckbehälter (TRB)" [Technical Rules for Pressure Vessels]. The pressure vessels of hydraulic accumulators are classified by the admissible operating pressure p in bars, the capacity I in liters and the product of pressure and capacity $p \times I$. Depending on the class to which the accumulator belongs, the following inspections are mandatory:

Checking the gas charging pressure in the pressure accumulator

After commissioning (new installation or repair), the gas charging pressure in the pressure vessel must be checked at least once during the first week. If no pressure loss is detected, the second pressure test must be performed after ca. 3 months. If no pressure loss is detected in this test either, the testing interval can be fixed at once pressure test **each year**.

The above-mentioned pressure tests are required to ensure the functioning of the track tensioner. They are **no substitute** for the inspections as required by the "Pressure Vessel Regulations".

Before checking the gas charging pressure (nitrogen filling pressure) in the pressure accumulator, the track must first be slackened, i.e. the hydraulic part of the tensioning system must be depressurized. See under "Function".

Tab. 3-1

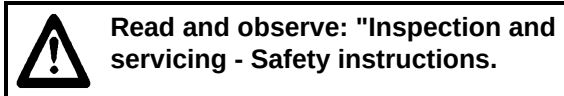
Group	Inspections prior to commissioning		Regular inspections
	at the factory	at the place of use	
IV $p \geq 1 \text{ bar}$ $p \times I \geq 1000$	Preliminary inspection by an expert Prototype and pressure test certified by the manufacturer (type approval) or the expert	Acceptance inspection by an expert	Internal inspection: every 10 years for non-corrosive fluids; otherwise pressure testing every 5 years: every 10 years by an expert

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



SLEWING RING



Shut off the engines.
Wear protective gloves and firm protective clothing.

Slewing ring - Instructions

The grease filling must be replaced:

- when repairs have been carried out on the slewing ring, the slewing ring seals or the slewing ring housing.

Remove old grease completely before filling in new grease.

If greater losses are detected, locate cause immediately to prevent damage to the slewing ring. Greases and greasy cleaning rags must not be allowed to pollute the environment. Discard grease and greasy cleaning rags separately from other waste without polluting the environment.

Bearing races

The **central lubricating system** supplies grease continuously to the two **roller bearing races** and the **internal gearing**.

The grease is pumped to the greasing points of the bearing races by a distributor (Fig. 3-124:).

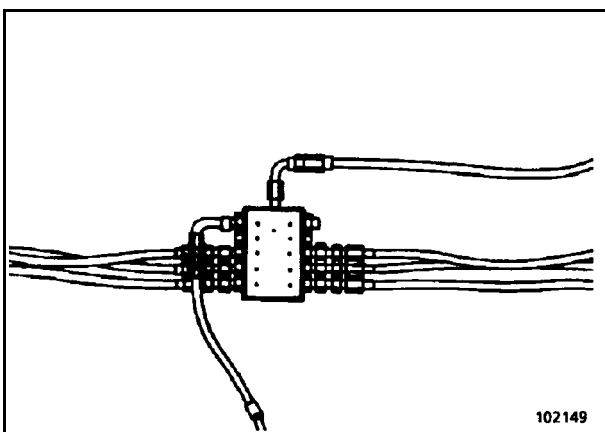


Fig. 3-124:

Internal gearing

The internal gearing (1, Fig. 3-125:) and the pinion (2) are enclosed in a housing (3, Fig. 3-126:). The housing forms a grease-filled trough in which the pinion of the slewing mechanism moves.

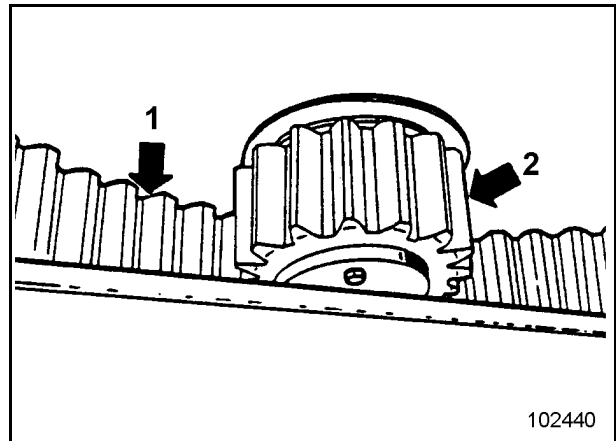


Fig. 3-125:

The grease is pumped to the greasing port of the grease trough by the distributor (Fig. 3-124:). The amount of grease used up during operation is replenished by the central lubricating system.

The housings have a check opening which is closed with a cover (2, Fig. 3-126:). For checking, the cover must be removed.

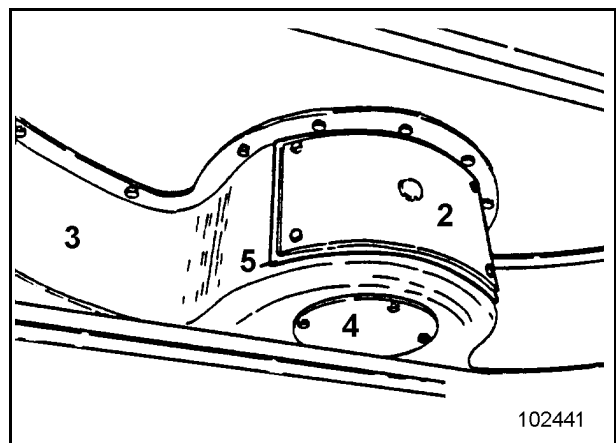


Fig. 3-126:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Slewing ring - Checking the grease filling



Shut off the engines

Wear protective gloves and firm protective clothing.

At regular intervals

- ➞ check internal gearing and teeth of slewing mechanism pinion for condition
- ➞ check that the grease filling is sufficient.

The housing must always contain enough grease for the gearing - measured from its lower edge - to run in **at least 20 mm / 0.78"** of grease over its whole circumference (Fig. 3-127:).

In the event of greater grease losses, eliminate cause immediately and add grease to prevent the internal gearing and the pinion from being damaged by continued slewing movements.

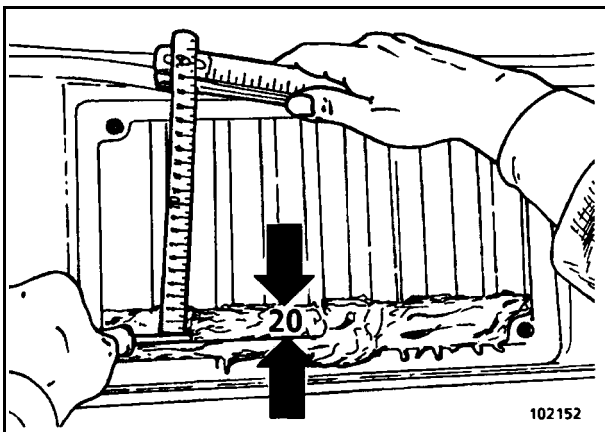


Fig. 3-127:

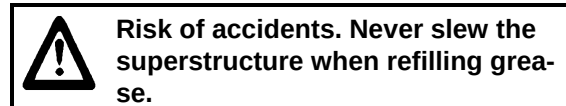
Slewing ring - Filling in grease

Prior to initial commissioning, the grease trough of the internal gearing must be filled with grease.

Add grease when

- the housing has been replaced
- old grease has been removed in the course of other work.

Always fill in fresh grease by hand.



Slewing ring - Checking the screws for tightness

The fastening screws of the slewing ring in the superstructure and the undercarriage are tightened with their respective check torque (see „Technical Handbook“).

When these values are reached, the fastening screws are perfectly tight.

Loosen slack screws before tightening them with a torque wrench to the prescribed torque (see „Technical Handbook“).

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



CENTRAL LUBRICATING

Design

The excavator is equipped with an automatic central lubricating system which provides grease regularly to all greasing points except those mentioned in the "Lubricating chart - Grease".

The central lubricating system is activated when the electrical system is switched on with the key-switch and the engines are running. All greasing points connected to the system are greased at regular intervals.

The automatic greasing is interrupted when the engines are stopped with the idle timers.

The central lubricating system is controlled electro-hydraulically by the programmable SPC controller.

The SPC is located in a switch box underneath the cab.

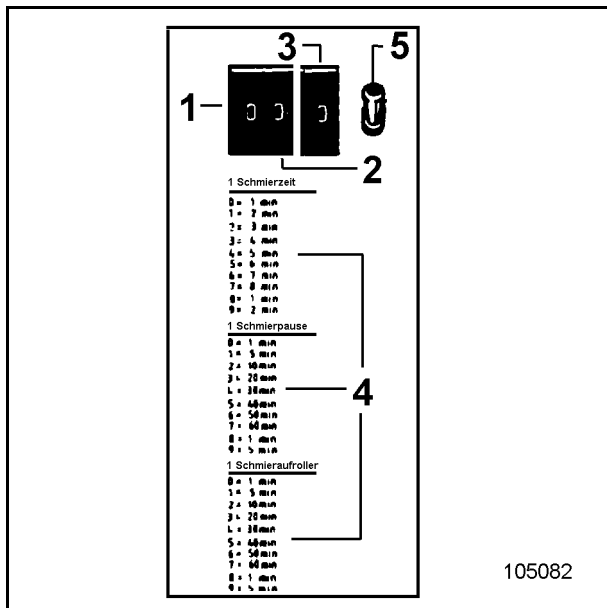


Fig. 3-128:

The facia on the SPC controller has coding switches that can be used to set the length of lube cycle and pause period as listed on the setting scales (3, Fig. 3-128:)

Lube cycle / Pause period

➤ To set length of lube cycle, alter the code number in window (1)

➤ To set length of pause period, alter code with switch in window (2)

Lube cycle manual lubricating (optional)

➤ To set length of lube cycle, alter the code number in window (3)

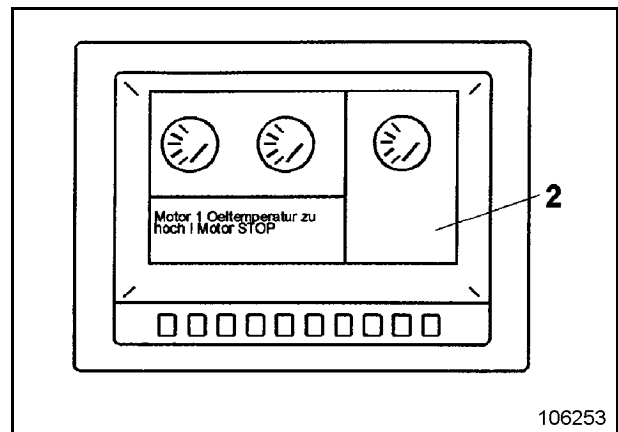


Fig. 3-129:

If a fault occurs, BCS gives a warning on the screen (2, Fig. 3-129:). Actuate the "Reset" button (5, Fig. 3-128:) to eliminate the fault. If this is not possible, call in servicing personal.

For further information on the function and setting refer to the TECHNICAL HANDBOOK – SPC (storage-programmable control)

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Function

The control elements of the lubricating system are installed on the panel (3).

The grease is pumped by the pumps (1 and 3, Fig. 3-130:) via greasing lines from the grease container to the main distributors on the superstructure and on the undercarriage.

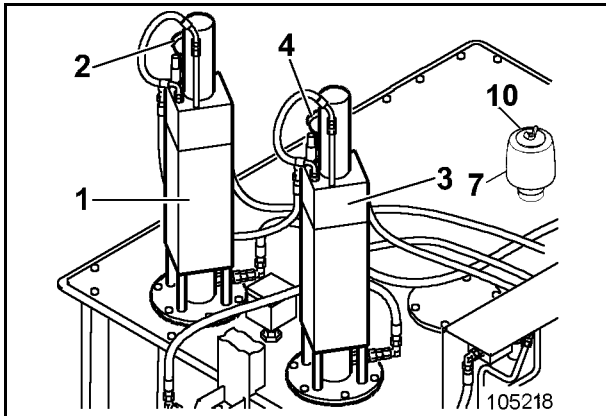


Fig. 3-130:

The control elements of the lubricating system are installed on the panels (3 and 21, Fig. 3-131:).

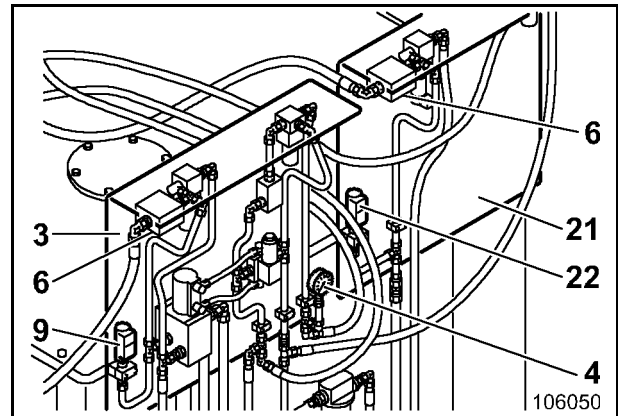


Fig. 3-131:

As soon as the grease container is empty, the BCS (2, Fig. 3-132:) gives a warning signal. In the event of a fault, the "dumping" function is switched off automatically after 15 min.

Work can be continued when the grease container is filled with grease.

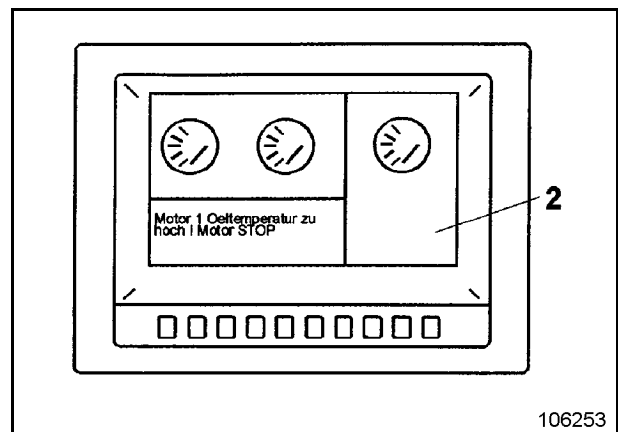


Fig. 3-132:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Filling up the grease container

Fill up the grease container through the service station (Fig. 3-133:).

The use of the hose is described in the chapter "Flexible hose for the change of oil and cooling water"

- Switch on the indicator system with toggle switch (33, Fig. 3-133:).
- Unscrew the cap of the express coupling (11).
- Connect the filling hose of the service vehicle.
- When the grease container is full, the indicator lamp (34) lights up.
- Remove the flexible hose.
- The express coupling closes automatically.
- Refit the protective cap.

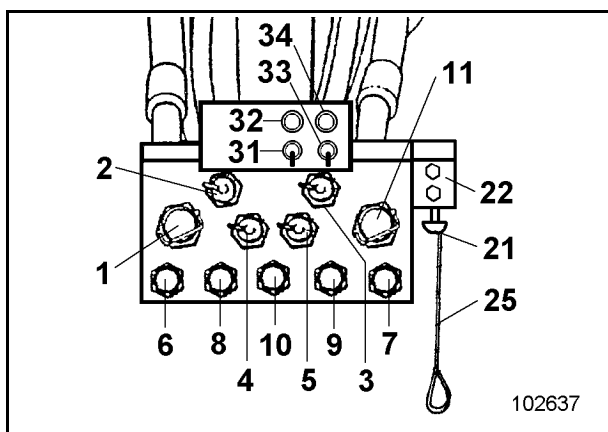


Fig. 3-133:



Breather filter

Check/change the breather filter at regular intervals.

- Unscrew wing nut (10, Fig. 3-134:).
- Withdraw cover (7, Fig. 3-135:) and filter element (8).
- Check filter element. Replace if necessary.
- Re-install breather filter.

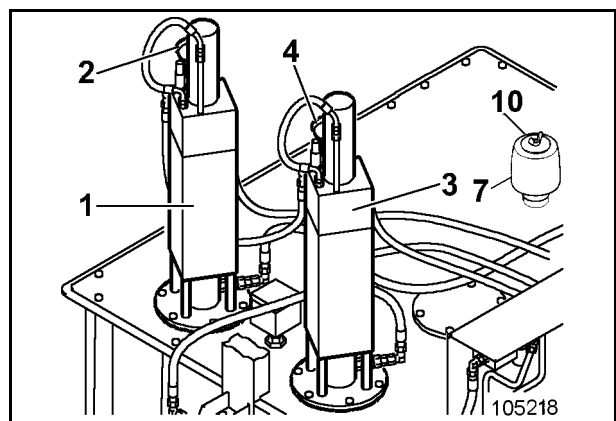


Fig. 3-134:

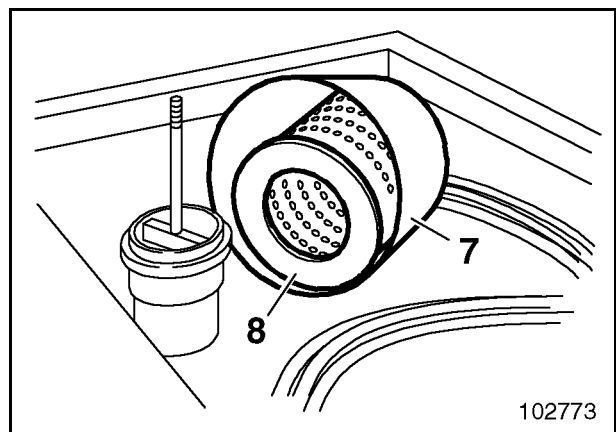


Fig. 3-135:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Checking the greasing pressure

Check every week, whether the oil pressure indicated by pressure gauge (4, Fig. 3-136:) is 60 bars / 870 psi (the pressure is depending on temperature and viscosity of the oil and may vary).

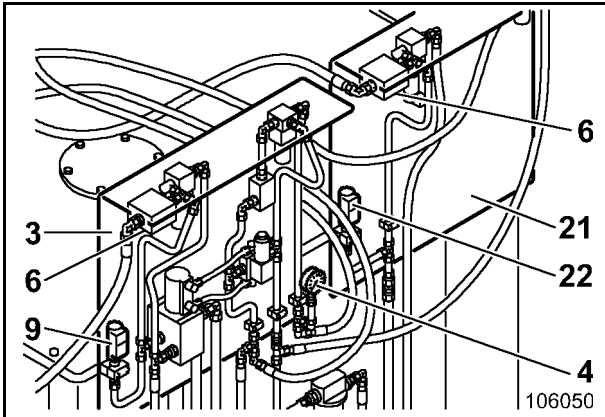


Fig. 3-136:

This oil pressure is reduced so that the pressure indicated by pressure gauge (2, Fig. 3-137:) is 35 – 40 bars / 507 – 580 psi and by pressure gauge (4) is 49 – 51 bar / 711 – 740 psi.

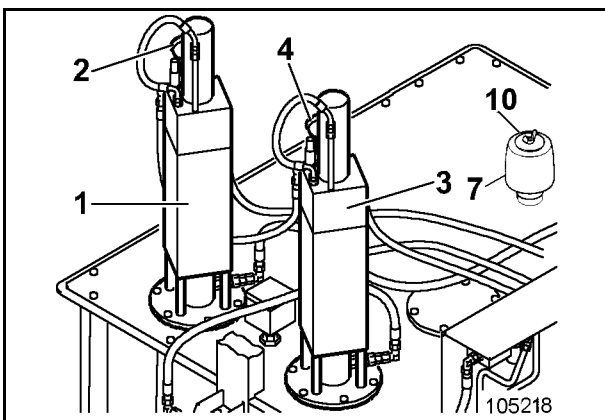


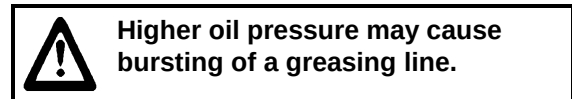
Fig. 3-137:

The necessary greasing pressure of 320 bar / 4641 psi for the superstructure and 180 bar / 2611 psi for the lower carriage is generated by means of a pressure translator.

The greasing pressure is indicated by pressure gauge (9).

In the event of deviating pressure values, shut off the engines and check the central greasing system.

Lower oil pressure means that not all of the greasing points are supplied with grease.



Always refill the grease container in time to avoid air from penetrating into the greasing system. Air in the greasing may cause malfunctions.

Unblocking a grease line.

Put the excavator back into operation only after the lubricating system works properly and after having actuated the unloaded working equipment for abt. 5 minutes. This is necessary in order to supply sufficient amounts of grease to the cylinder bearings.

Check the grease sieve regularly for contamination and clean, if required. The grease sieve must also be cleaned after an obstruction in one of the grease lines.

Cleaning

- Loosen nut (6, Fig. 3-138:).
- Withdraw sieve and clean with white spirit or paraffin oil.
- Re-insert sieve and fasten with nut (6).

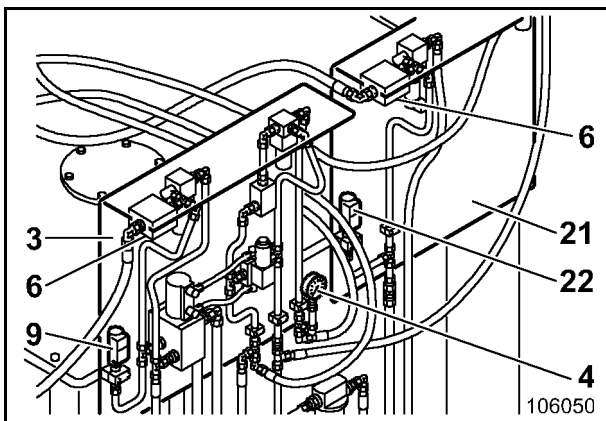


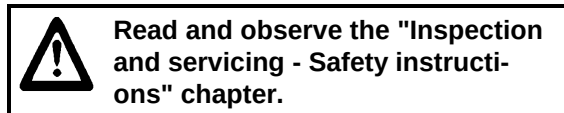
Fig. 3-138:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Oilfilter (hydraulic circuit grease pump))



Shut off the engines.

Risk of scalding caused by hot hydraulic oil.

The filter housings may also be hot.

Avoid skin contact.

Skin contact with hydraulic oil may cause skin injury.

Wear protective gloves and firm working clothing.

For filtering of the hydraulic oil, high pressure filter (11, Fig. 3-139:) is installed in the pumping line.

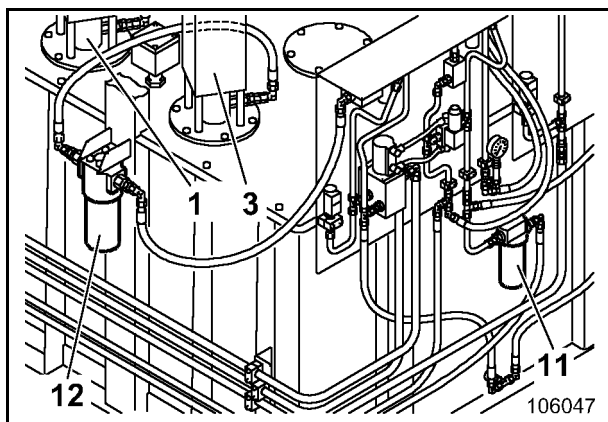


Fig. 3-139:

Replacing the filter element

Change filter element regularly and when the BCS indicates a contamination.

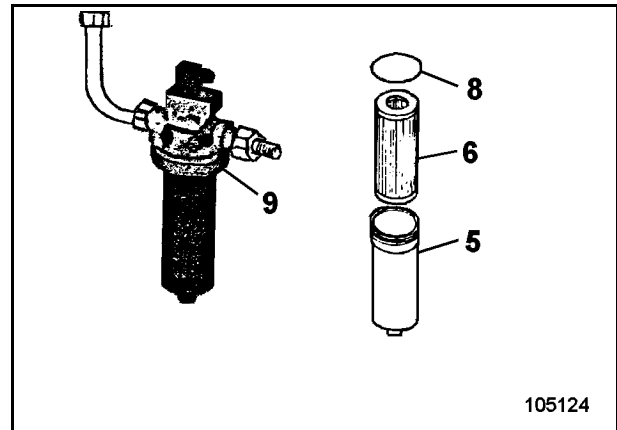


Fig. 3-140:

- Unscrew filter housing (5, Fig. 3-140:).
- Withdraw filter element (6) from filter housing (5).
- Clean filter housing (5) and the sealing face at the filter head (9) with white spirit or paraffin oil.
- Check seals (10 and 14) and replace, if required.
- Insert new filter element into filter housing (5) and refit to the filter head with new, lightly oiled sealing ring (8).
- Check for leaks after putting the filter into operation.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Grease filter (Filling the grease container)



Shut off the engines.

Grease filter (13, Fig. 3-141:) is installed in the greasing line to the grease container.

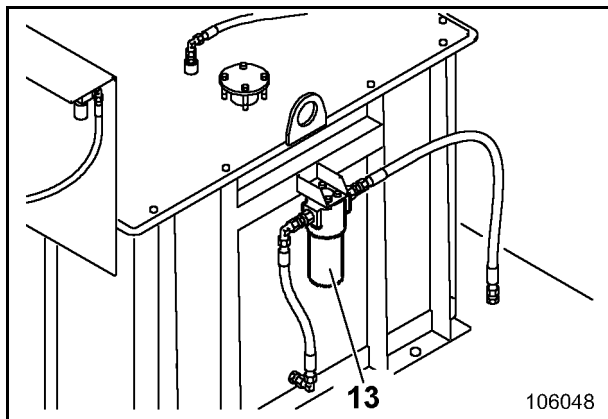


Fig. 3-141:

Checking the filter element

- Unscrew filter housing (32, Fig. 3-142:).
- Withdraw filter element (33) from housing (32).
- Remove the grease.
- Clean filter housing and contact faces at the filter head with white spirit or paraffin oil.
- Insert filter element into housing (32) and attach to the filter head with a new, slightly oiled sealing ring (36).
- Check the high-pressure filter for leaks after the system has been put into operation.

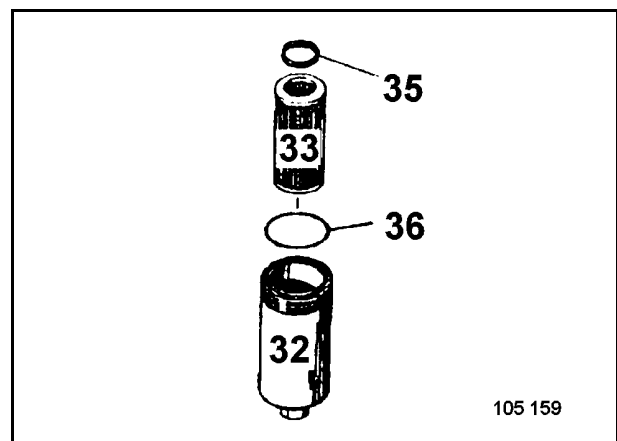


Fig. 3-142:

Replacing the filter element

- Remove filter element as described under "Checking the filter element".
- Insert new filter element and reassemble.
- Check high-pressure filter for leaks after the system has been put into operation.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Grease filter (Grease lines)



Shut off the engines.

Grease filter (12, Fig. 3-143:) is installed in the greasing line to the grease container.

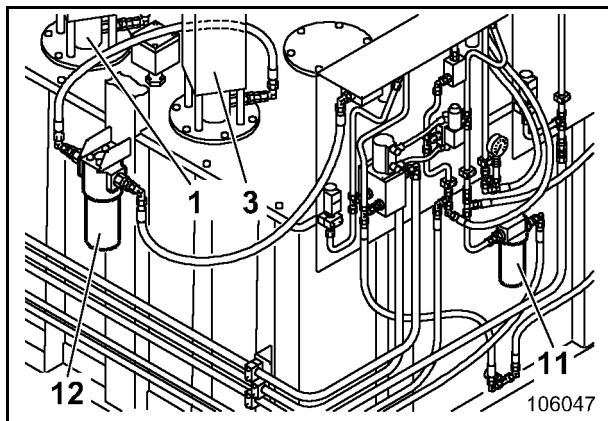


Fig. 3-143:

Checking the filter element

- Unscrew filter housing (42, Fig. 3-144:).
- Withdraw filter element (43) from housing (42).
- Remove the grease.
- Clean filter housing and contact faces at the filter head with white spirit or paraffin oil.
- Insert filter element into housing (42) and attach to the filter head with a new, slightly oiled sealing ring (46).
- Check the high-pressure filter for leaks after the system has been put into operation.

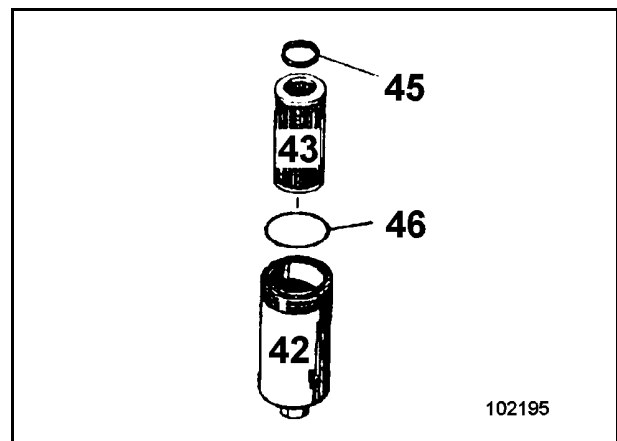


Fig. 3-144:

Replacing the filter element

- Remove filter element as described under "Checking the filter element".
- Insert new filter element and reassemble.
- Check high-pressure filter for leaks after the system has been put into operation.

OTHER MAINTENANCE

Engine

Information about maintenance can be found in the engine operating instructions.

Further servicing works not described are carried out by the Terex|O&K Service or the engine manufacturer.

Cleaning

Check the engines regularly.

- If the engine is cleaned with a steam-jet cleaner, make sure that the jet is not directed towards electrical components.
- If no steam-jet cleaner is available, the engines must be cleaned with suitable cleaning agents (cold cleaners).

Means of fastening

- ➔ Check fastening screws regularly for tightness.

The seating planes of the screws must be free from paint, dirt and rust.

Cooling system

Check the radiators regularly.

- ➔ Shut off the engines.
- ➔ Remove any accumulated dirt.
- ➔ Clean the fan blades.
- ➔ Clean the radiators with a jet of water or compressed-air from the outside.
- ➔ Dry up coolers.

Do not clean radiators with a wire brush or similar hard objects.

In case of firmly adhering dirt, remove radiator and clean.

Exhaust system

Check the fastening screws regularly for tightness when the exhaust system is cold.

Heating and air conditioning

Change the filter mats in the air suction regularly.

The filter mats are located under the driver's seat.

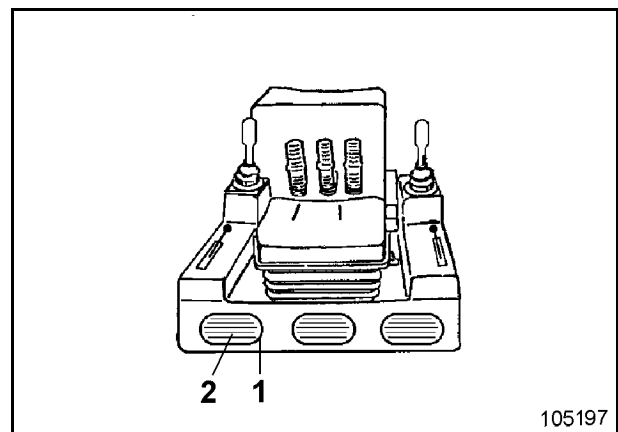


Fig. 3-145:

- ➔ Remove cover (1, Fig. 3-145):-
- ➔ Change filter mats (2)
- ➔ Fasten cover (1) again.

RAMP-TYPE LADDER (OPTIONAL)

To allow the ramp-type ladder (Fig. 3-146: and Fig. 3-147:) to be lowered in an emergency, the ladder mechanism is equipped with a pressure accumulator (1, Fig. 3-148:).

The pressure accumulator (1) is located in the superstructure and is accessible from the ground.

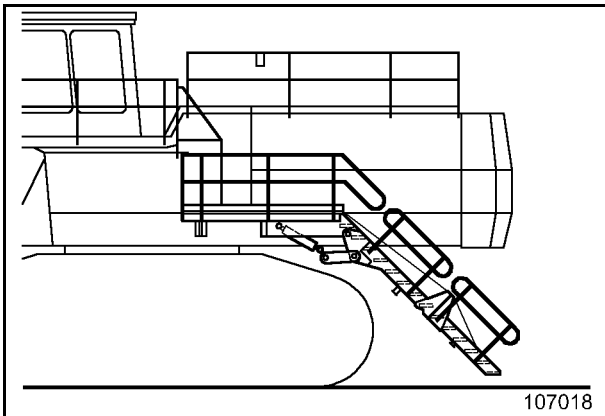


Fig. 3-146:

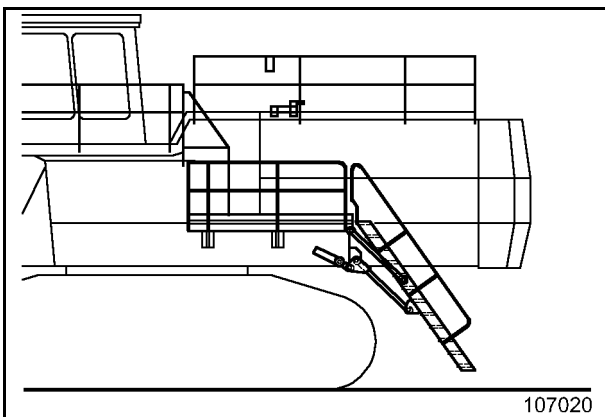


Fig. 3-147:

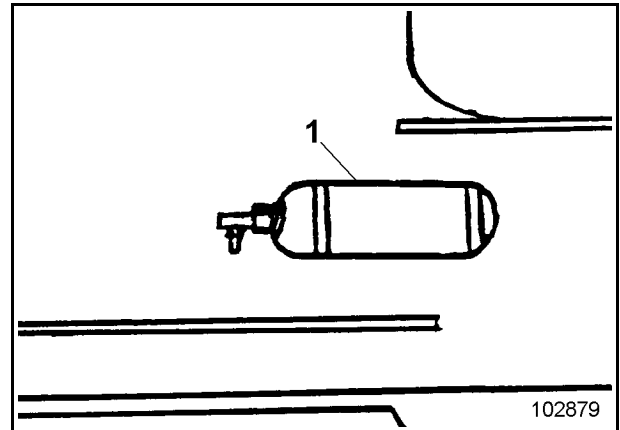


Fig. 3-148:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Pressure-accumulator inspection regulations



The following regulations are applicable only in Germany. Please observe the relevant regulations in force in your own country.

Checking the gas charging pressure in the pressure accumulator

After commissioning (new installation or repair), the gas charging pressure in the pressure vessel must be checked at least once during the first week. If no pressure loss is detected, the second pressure test must be performed after ca. 3 months. If no pressure loss is detected in this test either, the testing interval can be fixed at once pressure test **each year**.

Extract from the German regulations

The accumulator vessel must not be subjected to welding, soldering or any other mechanical work. Work on systems containing accumulators (repairs, connection of pressure gauges or similar work) may be carried out only when the fluid pressure has been relieved.

Extract from the German acceptance regulations

Hydraulic accumulators are pressure vessels and are therefore subject to the "Druckbehälterverordnung (DruckbehV)" [Pressure Vessel Regulations]. Their installation, equipment and operation are governed by the "Technische Regeln Druckbehälter (TRB)" [Technical Rules for Pressure Vessels]. The pressure vessels of hydraulic accumulators are classified by the admissible operating pressure p in bars, the capacity l in liters and the product of pressure and capacity $p \times l$. Depending on the class to which the accumulator belongs, the following inspections are mandatory:

Group	Inspections prior to commissioning		Regular inspections
	at the factory	at the place of use	
III $p \geq 1$ bar and $p \times l \geq 200$ bars $p \times l \leq 1000$ bars	Preliminary inspection by an expert Prototype and pressure test certified by the manufacturer (type approval) or the expert	Acceptance inspection by an expert	Inspection schedule to be drawn up by end user, based on experience with type of operation and operating fluids.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



ON-BOARD CRANE (OPTIONAL)

Monitoring, warning and control elements

(Fig. 3-149:)

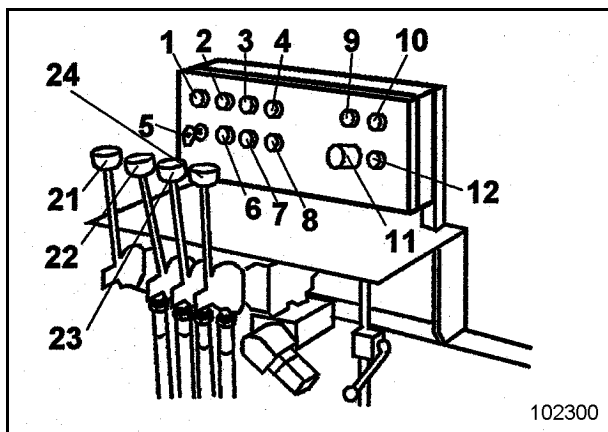


Fig. 3-149:

1	Monitoring lamp	alternator
2	Warning lamp	engine oil pressure
3	Warning lamp	engine temperature
4	Monitoring lamp	air filter
5	Key-switch	electrical system ON/OFF
6	Button	engine start
7	Monitoring lamp	preheating system (option)
8	Button	speed variation
9	Monitoring lamp	crane in operation
10	Warning lamp	malfunction
11	Button	EMERGENCY STOP
12	Button	emergency lowering of winch
21	Control lever	extending and retracting of boom extension
22	Control lever	folding the boom
23	Control lever	slewing the boom
24	Control lever	winch ON/OFF

Checking the on-board crane

Extract from the inspection and testing regulations



The on-board crane is approved in accordance with the Accident Prevention Regulations for Cranes (VBG 9, applicable only in Germany).

The on-board crane must be inspected regularly in accordance with the regulations in force in the country of use.

The inspections must be requested by the user of the crane. The expert or specialist entrusted with the inspection can be appointed at the user's discretion.

The user must ensure, however, that the appointed person meets the requirements.

The user is obliged to make available all documents required for the inspection and to ensure the smooth running of the inspection. He is furthermore obliged to provide, if required, crane operators and auxiliary personnel and the required test loads.

The result of the inspection is to be documented in an inspection record signed by the inspector.

The inspection record serves as proof on the part of the user that the inspections have been carried out. The inspection record must contain all data required for crane identification and for the performance of further regular inspections.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Drive unit

The drive unit comprises:

- crane engine
- hydraulic system

Crane engine

See operating instructions for the crane engine.

- Fill up fuel tank through filler (5, Fig. 3-150:) after each deployment.
- Prior to each deployment check the engine oil level with the dipstick; top up if necessary.
- regularly, at least once a year
 - change engine oil
 - replace engine oil filter
 - check / replace air filter
 - replace fuel filter
- Check batteries (7) and cable connections at regular intervals.

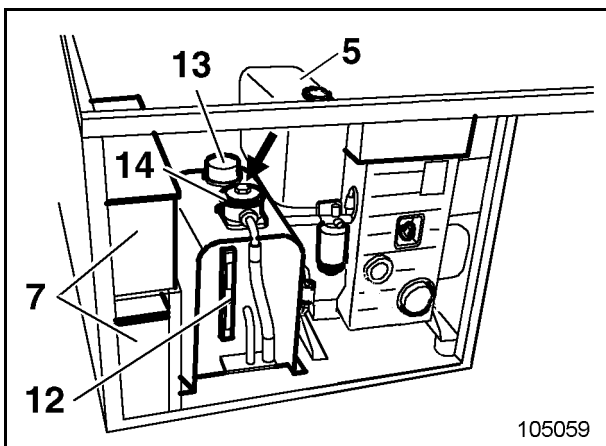


Fig. 3-150:

Air-intake system

Never start up the engine when the air filter is removed.

Hydraulic system

See crane operating instructions.

- Prior to each deployment, check the hydraulic oil level at the inspection glass (12, Fig. 3-150:); top up if necessary.
- Check contamination of hydraulic oil filter regularly at contamination indicator (arrow, Fig. 3-150:).
- Regularly, but at least once a year replace the hydraulic oil filter (14) and the breather filter (13).

On-board crane

Servicing

- Lubricate all bearings regularly and as required, and spray slewing ring with a graphite spray (Fig. 3-151:)

- | | |
|-------------------------|---------------|
| 1 - bearing | 4 lube points |
| 2 - joint (column/boom) | 2 lube points |
| 3 - cylinder bearing | 5 lube points |
| 4 - slewing ring | |

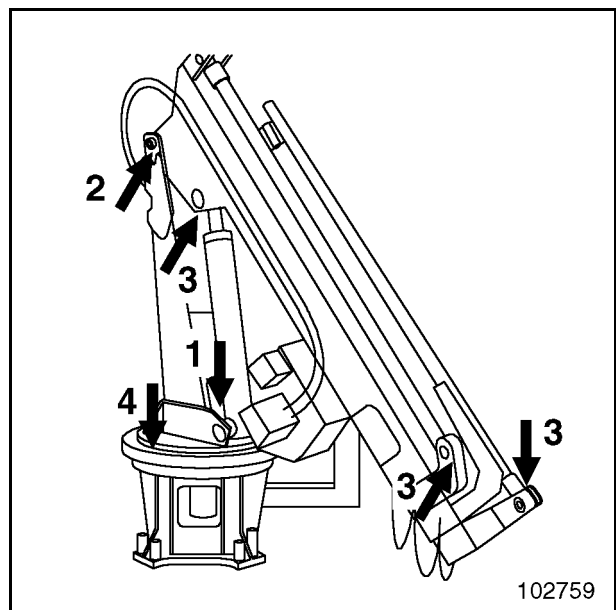


Fig. 3-151:

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



PUTTING THE EXCAVATOR OUT OF OPERATION AND RECOMMISSIONING

Putting the excavator out of operation

- Park the excavator on firm and level ground.
- Set the working equipment down on the ground, retracting the piston rods of the hydraulic cylinders as far as possible.
- Set all control element to "0".
- Clean the machine.
- Lock the superstructure
- Carry out a visual inspection of the excavator.
- Remove coarse dirt, snow and ice from the fins and fan wheel of the hydraulic oil cooler.
- Carry out engines preservation
- Protect all bright metal parts (e.g. piston rods) from rust and dirt.
- Check anti-freeze concentration of the cooling liquid to avoid freezing during the cold season.
- Fill up the fuel tanks.
- Remove the batteries; see "Battery storage".
- Secure the machine against unauthorized starting by:
 - withdrawing the key from the key-switch
 - locking the cab door
 - securing all lockable hatches.
- Cover up all openings

Battery storage

During prolonged machine downtimes, remove the batteries and store in a dry room at an ambient temperature of ca. 20°C / 68°F. Observe the following points with regard to maintenance:

- Clean the batteries.
- Check the acid density and the electrolyte level of the battery every two weeks.
- Recharge the batteries at the latest, when the acid density has dropped to 1.23 kg/dm³.
- Keep the batteries clean and dry on the outside.

OPERATING INSTRUCTIONS RH 120 E

Inspection and servicing



Recommissioning

- ➔ Remove the covers.
- ➔ Degrease / clean all protected components.
- ➔ Remove engines preservation in acc. with the engine operating instructions
- ➔ Check the fuel level in tanks
- ➔ Check track tension (visual inspection)
- ➔ Check level and condition of the cooling liquid in the cooling system.
- ➔ Check grease filling in grease container.
- ➔ Oil level
 - drive engines
 - slewing gearboxes
 - pump transfer gearboxes
 - travel gearboxes
- ➔ Check oil level in hydraulic oil reservoir.
- ➔ Check battery acid density and level.
- ➔ Install batteries and reconnect.
- ➔ Function checks:
 - superstructure holding brake
 - track brake
 - lighting system
 - signalling equipment

Vent the hydraulic system.

OPERATING INSTRUCTIONS RH 120 E
Inspection and servicing



4 REPAIR WORK

	Operating instructions	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
Part 6	INDEX	Operating personnel + Inspection and servicing personnel + Repair personnel

OPERATING INSTRUCTIONS RH 120 E
Repair work



OPERATING INSTRUCTIONS RH 120 E

Repair work



REPAIR WORK - SAFETY INSTRUCTIONS

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 Terex|O&K.

Working in greater heights

Always wear safety harnesses when working at greater heights.

Wear an approved safety harness; it must be equipped with fall arresters and safety cables.

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 do dismantling while the machine is at operating temperature.

Oils, greases, 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 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 re-assembly.

When dismantling the component, close off exposed hose and piping connections, exposed drill holes and housings carefully to prevent any dirt from penetrating.

OPERATING INSTRUCTIONS RH 120 E

Repair work



Never remove lead seals

Never change rated pressure of pressure relief valves without the explicit authorization of Terex.

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, re-assemble all protective devices, covers and noise- and vibration-insulation material.

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

Check the repaired components and all machine functions in a trial run.

Never release the machine for recommissioning until it is fully functioning.

FIRE AND EXPLOSION HAZARD



Safety Instructions

Prior to commencing work, inform

- **on the national and corporate rules for prevention of accidents. Pay particular attention to hazards caused by combustible and easily flammable substances.**
- **on the safe handling of the fire extinguishers to be used.**

Avoid smoking and open fire on, next to and below the excavator.

Combustible and easily flammable substances or liquids increase the fire and explosion hazard. Do not store or handle any flammable substances during operation.

Clean the excavator thoroughly, if possible, with a steam jet (rubber parts and electric components with compressed air - refer to information label), when, for example, oil, grease, fuel or cleaner was spilled.

Such substances may spontaneously ignite if they get into the vicinity of hot units or objects such as turbo superchargers.

Even battery gases can ignite in open flames or fire.

Avoid parking the excavator in places where

- combustible substances such as coal dust or tar are present.
- open or smouldering fire may occur.

Remove the excavator from such an area where combustible or easily flammable liquids have spilled from the excavator onto the ground.

Flying sparks (caused by welding, flame cutting, grinding, electrical short-circuit) may cause fire on the ground that can spread to the excavator.

Place suitable fire guardings (fire barriers) if open fire or flying sparks cannot be avoided during repair work. Apply special protection to cables, cable ducts as well as to hose and pipe lines.

If necessary, also cover the ground with fire-protective blankets.

Ensure sufficient ventilation.

Clean the excavator before starting a job.

Do not keep any fire extinguishers that are not suitable or have not been tested.

Do not extinguish flammable liquids with water. Use:

- dry-powder,
- carbon-dioxide or
- foam extinguishing compounds.

When getting into contact with burning substances, the fire-fighting water would abruptly evaporate and distribute the substance such as oil over a wide area. Water causes short-circuits in the electrical system thus possibly entailing new hazards.

Call the fire brigade.

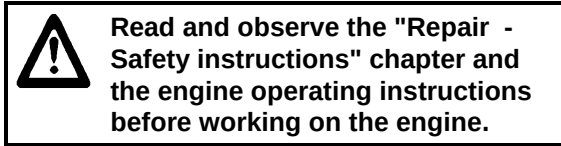
Have all your welding, flame cutting and grinding work approved.

OPERATING INSTRUCTIONS RH 120 E

Repair work



ENGINE



Read and observe the "Repair - Safety instructions" chapter and the engine operating instructions before working on the engine.

Risk of injury caused by rotating or hot parts of the engine.

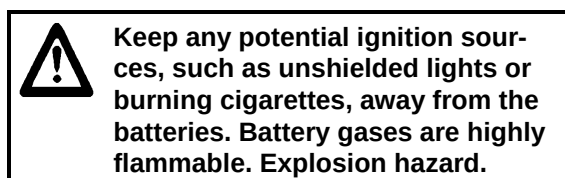
Shut off the engine and allow to cool down.

Carry out repair work only if the machine has been secured as described in the "Securing the machine" section of these operating instructions.

Check and replace V-belts only when the engine is stationary.

ELECTRICAL SYSTEM

Assisted starting (with jumper cables) – Safety instructions



Do not lean over the batteries when starting the machine from another vehicle.

Risk of injury from acid splashes and battery gases.

Never use assisted starting when the batteries are defective or frozen.

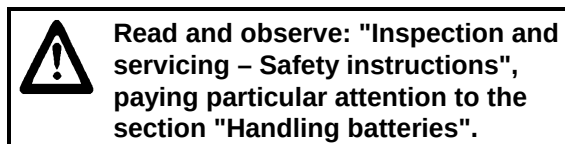
Never connect batteries (battery assemblies) unless they have the same voltage.

Use only tested jumper cables with insulated terminal clips and an adequate lead diameter.

Ensure that the bodies of the supplying and receiving machines are not in contact. Otherwise a current flow could result from connecting the positive poles. Risk of short-circuiting.

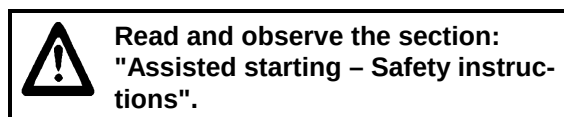
Never use welding generators or welding transformers as a source of current.

Position the jumper cables in such a way that they cannot be caught by rotating engine components.



Assisted starting (with jumper cables)

Prior to assisted starting



Starting the engine with jumper cables (external batteries)

Before connecting the jumper cables (external batteries) check the own batteries for proper operation. Checking is done by switching on the excavator's electrical system.

Do not switch on electrical consumers (e.g. flood-lamps) when checking the batteries. In case of doubt, remove the batteries and have them tested.

Assisted starting with batteries installed

- Connect first the positive terminal of the jumper cable to the batteries and then to the supplying unit.
- Connect the negative terminals in the same order.
- After starting, disconnect the jumper cable in reverse order, i.e. first the negative terminal and then the positive terminal.

Assisted starting without batteries installed (only for engine trial run)

Do not disconnect the starting aid when the engine is running.

After disconnecting, the alternator runs without batteries.

- Connect the jumper cable in the above- described order and disconnect after starting.
- Switch off all consumers at the receiving machine and turn the key-operated switch to "0"
- Switch off all consumers at the supplying machine (charged batteries) and shut off the engine.

OPERATING INSTRUCTIONS RH 120 E

Repair work



Connecting the jumper cables

- Connect the red jumper cable to the positive pole of the empty battery (1, Fig. 4-1:), then to the positive pole of the charged battery (2).
- Connect the black jumper cable first to the negative pole of the charged battery (3), then to the negative pole of the empty battery (4).



Explosion hazard

When the negative terminal is connected to ground, a strong current flows through the jumper cable.

The sparks produced in the contact area can ignite the gases emanating from the discharged battery.

The negative terminal must therefore be connected to ground at a place as far away from the discharged batteries as possible.

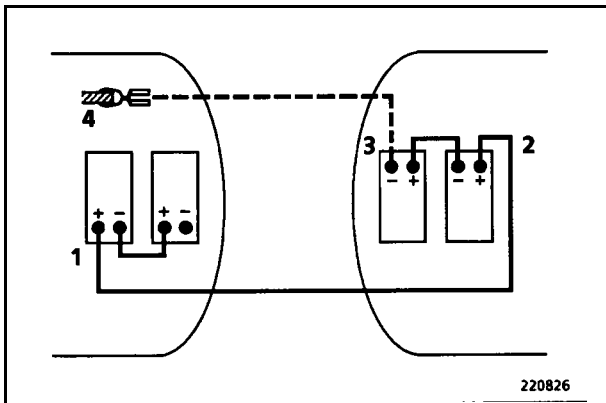


Fig. 4-1:

Starting up the engine

- Start up the engines of the supplying machine and run at high speed.
- Start up the engine of the receiving machine. If the engine fails to start up after 15 seconds, wait for one minute and then start again.
- When the engine has started up, continue running both machines in no-load operation for about two or three minutes with the jumper cables still connected.

Disconnecting the jumper cables

- Negative pole at the receiving machine (4)
- Negative pole at the supplying machine (3)
- Positive pole at the supplying machine (2)
- Positive pole at the receiving machine (1)
- For machines with electronic modules:

- Run engine for about half an hour at low speed. The batteries are partially charged.

- Shut off engine

- Make all electrical connections to the modules.

- Start up engine without jumper cables.

HYDRAULIC SYSTEM

Repair

Always depressurize the hydraulic system before disconnecting any hydraulic hoses.

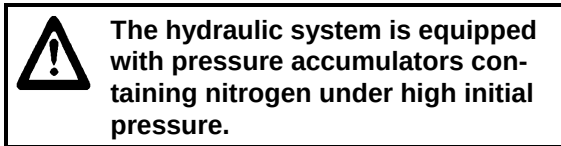
Replace damaged or leaking hydraulic hoses by new ones. Use original Terex|O&K spare parts. These parts are specially suitable for the respective function. Do not re-use used hoses.

Dispose of spilt oil and oily wastes without polluting the environment. These wastes must not be allowed to penetrate into the soil.

Hydraulic hoses should be replaced after a service life of 6 years.

Read and observe also the "Inspection and servicing - Safety instructions" chapter.

PRESSURE ACCUMULATORS - SAFETY INSTRUCTIONS



Even when the hydraulic pressure in the system is reduced, the nitrogen in the accumulator will remain under pressure.

The accumulators are completely safe in operation. If incorrectly handled, however, there is a risk of explosion.

So:

- Never handle accumulators mechanically, never weld or solder.
- 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.

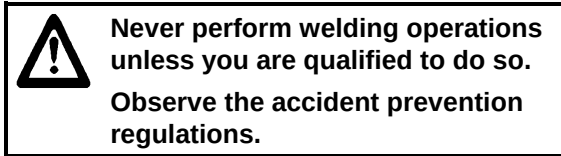
Never remove or paint over warning and information plates, rating plates or type identification markings. Replace illegible or damaged plates immediately

OPERATING INSTRUCTIONS RH 120 E

Repair work



WELDING OPERATIONS - SAFETY INSTRUCTIONS



Wear protective clothing

- protective suit
- protective gloves
- face protection

Any work on receptacles that contain or have contained substances

- which are combustible or which encourage combustion,
- which are susceptible to explosion,
- or which may develop health-hazardous gases, vapours, mist or dust

during welding operations must be carried out only under expert supervision and only by experienced persons authorized to do such work.

Detailed information on the correct execution of welding operations is given in the technical manual "Welding for maintenance and repair".

Should you have any problems or queries, apply to the Terex|O&K after-sales service department.

If parts of the machine have to be dismantled, read and take note of the following sections:

Assembling attachments - safety instructions",

"Inspection and servicing - safety instructions",

"Repair - safety instructions".

Prior to any welding operations on the machine:

- Set the battery main switch to OFF

Protect the disconnected terminals and plugs from short-circuiting and soiling by covering them with foil or adhesive tape.

Attach the welding-current pincers close to the welding zone (max. 2 - 3 m / 6.5 – 10 ft).

The welding current must not flow via the ball resp. the roller bearing slewing ring, via pin couplings, articulated joints or hydraulic cylinders.

An electric current flowing over an air gap (in an articulated joint, for instance) generates sparks that damage metallic surfaces.

On completion of the welding operation, restore all electrical connections.

- Set the battery main switch to ON

OPERATING INSTRUCTIONS RH 120 E
Repair work



▪

OPERATING INSTRUCTIONS RH 120 E
Repair work



5 ANNEX

	Operating instructions	Target group
Part 1	INTRODUCTION FUNDAMENTAL SAFETY INSTRUCTIONS	Operating personnel + Inspection and servicing personnel + Repair personnel
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OPERATING INSTRUCTIONS RH 120 E
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TROUBLESHOOTING

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 instructions once again before rectifying any faults.

If you are unable to detect the cause of the fault or to rectify it, apply to the Terex|O&K after-sales service.

Describe the fault and all accompanying circumstances as precisely as possible when calling on the Terex|O&K after-sales service. Exact data allow for fast troubleshooting.

Never do any jobs for which you are not qualified.

The 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 or 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.

Measures

This describes the troubleshooting procedure.

Section

This specifies where information on troubleshooting is given in the operating instructions. If there is no entry, the Terex|O&K after-sales service should be consulted

OPERATING INSTRUCTIONS RH 120 E

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FAULT TABLES

Combustion engine - Fault table

Fault										Remedial action		
Engine fails to start or starts only with difficulty										Check		P
Engine does not turn										Adjust		E
										Replace		W
Engine starts, but runs evenly or intermittently										Top up		A
										Reduce		S
Engine gets too hot, temperature warning activated										Clean		R
Engine not working at full power										1) Contact the Terex O&K Service		
Engine not working on full cylinder capacity												
Engine without oil pressure or oil pressure too low												
Engine oil consumption too high												
Engine emits blue smoke												
Engine emits white smoke												
Engine emits black smoke												
Engine cannot be stopped												
Engine throttled down strongly												
Cause												
		•		•						Oil level too low	Engine oil level	A
		••		••						Oil level too high	Engine oil level	S
				•••						Engine inclination too big	Engine Op. Instr.	P
•										Engine oil of wrong SAE-class	Lubricants	W
•	•	•			•					Fuel quality not corresponding to specification	Engine Op. Instr.	W
•	•	•			•	•				Air filter contaminated / turbo-charger defective	Air intake syst.	P
		•								Fuel filter contaminated	Fuel filter	P/W
		••				•				Charge-air line leaking		P
		•								Radiator / cooling fins contaminated	Cooler cleaning	R
		•								Cooling fan or water pump defective or loose	Engine Op. Instr.	P/W
		•								Cooling air gets too hot / heat build-up		P
•										Battery defective or discharged	Battery	P
•										Cable connections in starter circuit loose or corroded		P
•										Starter defective or pinion not in mesh		P
•								•		Shut-off relay jamming		1)
•	•	•	•	•			•			Incorrect valve setting	Engine Op. Instr.	E
•	•	•	•							Injection line leaking		P
•	•	•	•			•	•			Injection valve defective	Engine Op. Instr.	P/W
	•									Combustion engine blocked on output side		1)
								•		PMS malfunction		1)
	•	•				•	•			Select coding lamp flashing/lit		1)
	•									Select defective (software error)		1)

Working hydraulics – Fault table

Fault											Remedial action	
Working and slewing functions not operational											Check Adjust Replace Top up Reduce Clean 1) Contact the Terex O&K Service	P E W A S R
No boom function												
No bucket function												
No backhoe function												
No stick function												
Working movements too slow												
Power loss in working hydraulics												
Uncontrolled working movements												
Cause											Abschnitt	
•							Electronic excavator control not activated/defective				Working	P
•	•	•	•	•	•		Malfunction of pressure-relief valve					1)
•						•	Servo system pump defective					1)
•	•	•	•	•	•	•	Malfunction of primary / secondary pressure-relief valves					1)
						•	Engine speed too low					P
						•	ECO-power switch in 80%-position					P
						•	Fuel filter contaminated				Fuel filter	P/W
						•	Insufficient engine power				Engine malfunction	1)
						•	Hydraulic oil temperatur too high (warning lamp lit, PMS fault indicator lamp lit) oil cooler contaminated				Hydraulic oil cooler cleaning	P/R
						•	Engine coolant temperature too high (warning lamp lit and PMS fault indicator lamp flashing)					1)
						•	Malfunction of solenoid valves					1)
						•	Malfunction of control spool					1)
•							Engine coupling defective					

OPERATING INSTRUCTIONS RH 120 E

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Slewing mechanism – Fault table

Fault				Remedial action	
No slewing possible				Check	P
No righthand or lefthand slewing				Adjust	E
Slewing performance insufficient				Replace	W
Uncontrolled slewing movement				Top up	A
				Reduce	S
				Clean	R
				1) Contact the Terex O&K Service	
Cause				Chapter ref.	
•			Electronic excavator control not activated / defective	Working	P
•			Limiting switch optional, ramp-type ladder not complete retracted	Operation	P
•			Superstructure holding brake applied		P
•		•	Pressure-relief valve adjusted too low level / defective		1)
•			Servo system pump defective		1)
•		•	Malfunction in feed-pressure circuit of slewing pump		1)
		•	Malfunction in high-pressure circuit of slewing system		1)
	•	•	Malfunction of moment-regulating valve		1)
	•	•	Malfunction in slewing pump displacement cylinder		1)
		•	Excessive leakage in slewing motor		1)

Central lubricating system – Fault table

Fault					Remedial action	
Grease pump not working, the BCS does not indicate a warning Automatic circuit breaker on					Check	P
					Adjust	E
					Replace	W
					Top up	A
					Reduce	S
Grease pump not working, pilot lamp lit					Clean	R
Grease pump working, no grease delivered					Vent	L
Greasing pressure too high or too low					1) Contact the Terex O&K Service	
Cause					Chapter ref.	
•	•			Timer defective		P/W
•				Lines between timer and hydraulic motor defective		P/W
•	•			Hydraulikmotor defektive		P/W
•	•	•	•	Grease pump defective		P/W
			•	Grease sieve clogged		P/R
			•	Distributor defective		P/W
		•		Grease container empty		P/A
		•		Grease pump does not suck grease		P/L
		•		Leaky lines		P/L
		•		Non-return valve defective		P/W
		•		Pressure switch defective		E

HYDRAULIC CIRCUIT DIAGRAM

Further information can be found in the „Technical Handbook“ chapter 8.

OPERATING INSTRUCTIONS RH 120 E

Annex



ABBREVIATIONS

A	Ampere (SI base unit of electric current)
abt.	about
acc.	according to
Ah	Ampere hours (SI base unit of quantity of electricity)
API	American Petroleum Institute
approx.	approximately
BA	= OI = Operating instructions
Bh	= OH = Operating hour
CE	Communauté Européenne = European community
CECE	Committee for european Construction Equipment (Defines a measure for bucket, grab or scoop filling)
CEN	European Standardization Committee
cm	centimeter (= $\frac{1}{100}$ m)
cm ³ /rev	Cubic centimeters per revolution
dB(A)	Decibel (sound intensity according to measuring method A)
dia.	Diameter
DIN	German Industrial Standard
eff.	effective
e.g.	for example
etc.	etcetera
Fig.	Figure, serial number of illustration
FOPS	Falling objects protective structures
FS	Face shovel (working equipment)
ft	foot
gal	gallon (3.71 litres)
GLR	Full-load controller (electronic module for PMS)
HD	Heavy duty
Hydr.	Hydraulic, Hydraulics
i	Transmission ratio
i.e.	id est = that is
IFN	ISO service rating, blocked

Incl.	including, inclusive of
ISO	International Standardization Organization
kg	Kilogram (unit of weight)
kg/dm ³	Kilograms per cubic decimeter (= unit of specific density)
km/h	Kilometers per hour
kNm	KiloNewtons per meter (1 kNm = 1000 Nm) = unit of torque
kW	Kilowatt (1 kW = 1.36 hp)
l	Liter
lb	pound
Lb/in ²	Pounds per square inch (= psi)
LC	Long crawler
LED	Light-emitting diode
l/min	Liters per minute
LpA	Sound pressure at workplace
LS	Limited slip
LS	Load sensing
LwA	Sound power level of the machine in stationary operation
m	Meters
M _A	Tightening torque
MA	Milliampere (= $\frac{1}{1000}$ A)
max.	maximal, maximum
min.	minimal, minimum
min ⁻¹	Revolutions per minute
mm	Millimeter (= $\frac{1}{1000}$ m)
N	Normal, standard version
N, kN	Newton, kiloNewton (unit of force)
NLGI	National Lubricating Grease Institute (USA)
NLGI--Klasse	Consistency - lubricant classification acc. to DIN 51 818
Nm	Newtonmeter (unit of torque)
No.	Number
OH	Operating hour
op.inst.	Operating instructions
OW	Superstructure

ABBREVIATIONS

PMS	Pump Managing System
P/No.	Part number (Terex)
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./s.	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
UW	Undercarriage
V	Volt (unit of electric voltage)
VDMA	Association of German Machinery and Systems Manufacturers
W	Watt (unit of electric power)
°C	Degrees Celsius (temperature)
°F	Degrees Fahrenheit (temperature)
°kW	Degrees crank angle
>	greater than
<	less than

OPERATING INSTRUCTIONS RH 120 E

Annex



TECHNICAL DATA

Hydraulic Mining Excavator

General Data

Operating weight

Face shovel	283 t	312 sht
Backhoe	285 t	314 sht

Engine output SAE J 1995

Caterpillar	1,044 kW	1,400 HP
Cummins	1,008 kW	1,350 HP

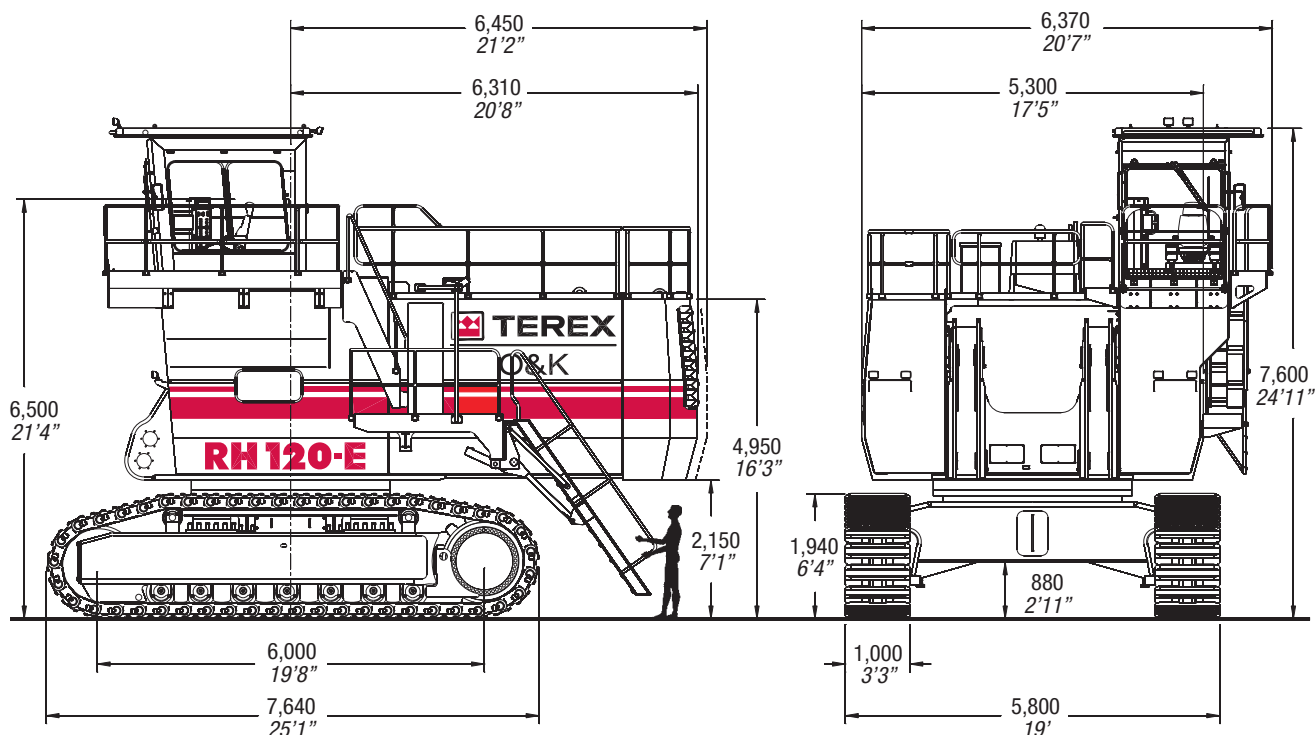
Standard bucket capacity

Face shovel (SAE 2:1)	15.0 m ³	19.6 yd ³
Backhoe (SAE 1:1)	15.0 m ³	19.6 yd ³

Features

- ▶ TriPower shovel attachment
- ▶ Independent oil cooling system
- ▶ Spacious walk-through machine house
- ▶ 5-circuit-hydraulic system
- ▶ Electronic-hydraulic servo control
- ▶ Board Control System (BCS)
- ▶ Torque control in closed-loop swing circuit
- ▶ Automatic central lubrication system
- ▶ Xenon working lights

General Dimensions



Operating Weight - Shovel

Standard track pads	1,000 mm	3'3"
Operating weight	283,000 kg	623,900 lbs
Ground pressure	21.2 N/cm ²	30.7 psi
Further track pads on request		

Operating Weight - Backhoe

Standard track pads	1,000 mm	3'3"
Operating weight	285,000 kg	628,310 lbs
Ground pressure	21.3 N/cm ²	30.9 psi
Further track pads on request		

Diesel Engines

Version 1 - Caterpillar

Make and model	2 x Caterpillar C18
Total rated net power ISO 3046/1	1,044 kW (1,400 HP) 1,800 min ⁻¹
Total rated net power SAE J1349	1,044 kW (1,400 HP) 1,800 min ⁻¹
Total rated gross power SAE J1995	1,044 kW (1,400 HP) 1,800 min ⁻¹
Total max. gross power SAE J1995	1,170 kW (1,568 HP) 2,100 min ⁻¹
No. of cylinders (each engine)	6
Bore	145 mm (5.7 in)
Stroke	183 mm (7.2 in)
Displacement	18.1 l (1,105 in ³)
Aspiration	Turbocharged and charge air cooled
Max. altitude without deration	1,500 m (4,900 ft) a.s.l.
Emission certification	US EPA Tier 3; Europe NRMM Tier 3
Fuel tank capacity	5,360 l (1,416 US gal)

Version 2 - Cummins

Make and model	2 x Cummins QSK 19-C
Total rated net power ISO 3046/1	1,008 kW (1,350 HP) 1,800 min ⁻¹
Total rated net power SAE J1349	1,008 kW (1,350 HP) 1,800 min ⁻¹
Total rated gross power SAE J1995	1,008 kW (1,350 HP) 1,800 min ⁻¹
Total max. gross power SAE J1995	1,120 kW (1,500 HP) 2,100 min ⁻¹
No. of cylinders (each engine)	6
Bore	159 mm (6.25 in)
Stroke	159 mm (6.25 in)
Displacement	19 l (1,159 in ³)
Aspiration	Turbocharged and charge air cooled
Max. altitude without deration	2,438 m (8,000 ft) a.s.l.
Emission certification	US EPA Tier 3; Europe NRMM Tier 3
Fuel tank capacity	5,360 l (1,416 US gal)

- Hydraulically driven radiator fan with electronically controlled fan speed
- Microprocessed engine management
- Automatic rev. reduction
- Heavy duty air-filters, STRATA 1 with automatic dust evacuation
- Two-stage fuel filter incl. water separator
- Additional high capacity water separator
- Pre-lube starting system (Cummins engines only)

Electric Motor (optional)

Type	Squirrel cage induction motor
Output	1,000 kW
Voltage	4.5 - 6.6 kV ± 10 %
Rated current I _N	109 A (at 6.3 kV)
Frequency	50 Hz (or 60 Hz optional)
Revolutions	1,500 min ⁻¹ (or 1,800 min ⁻¹ optional)
Starting current	450% of I _N (350% of I _N optional)
▸ Custom-made electric motor with increased gap between rotor and stator to withstand severe mining conditions	
▸ Power limit control by Pump Management System	

Electrical System (diesel drive)

System voltage	24 V	
Version:	Cat	Cummins
Batteries (12 V each)	4 x 244 Ah	4 x 170 Ah
in series/parallel installation	488 Ah - 24 V	340 Ah - 24 V
Alternators	2 x 150 A each	2 x 175 A each
Working spot lights	8 x high brightness Xenon lights	
▶ Battery isolation relays		
▶ Emergency stop switches accessible from ground level, in engine module and in operator's cab		

Hydraulic System with PMS

Main pumps	4 x variable swash plate pumps
Max. oil flow	4 x 552 l/min (4 x 146 US gal/min)
Max. pressure, attachment	31 MPa = 310 bar (4,495 psi)
Max. pressure, travel	37 MPa = 370 bar (5,365 psi)
Swing pumps	4 x reversible swash plate pumps
Max. oil flow	4 x 197 l/min (4 x 52 US gal/min)
Max. pressure, swing circuit	35 MPa = 350 bar (5,080 psi)
Total volume of hydraulic oil	approx. 3,500 l (925 US gal)
Hydraulic tank capacity	approx. 2,500 l (660 US gal)

▸ Pump Managing System (PMS) contains:

- Electronic load limit control
- Flow on demand from main pumps depending on joystick position
- Automatic regulation of main pumps to zero flow without demand
- Automatic rpm reduction of engine speed during working breaks
- Reduced oil flow of main pumps at high hydraulic oil temperature or at low and high engine temperature
- Pressure cut-off for main pumps

▸ Filters:

- Full-flow high-pressure filters (100 µm) for the main pumps, installed directly behind each pump
- High pressure filters (100 µm) for the closed swing circuit
- Full-flow filters (10 µm) for the complete return circuit
- Full-flow filters (10 µm) for the cooling return circuit
- Pressure filters (40 µm and 6 µm) for servo circuit
- Transmission oil filters (40 µm)

Hydraulic Oil Cooling

Oil flow of cooling pumps	2 x 467 l/min (2 x 123 US gal/min)
Diameter of fans	2 x 1,220 mm (2 x 48")
▸ Cooling system is fully independent of all main circuits, i.e. controlled cooling capacity is available whenever engine is running	
▸ Gear type cooling pumps supplying high volume low pressure oil to aluminium coolers	
▸ Variable axial piston pumps supplying low volume high pressure oil to fans	
▸ Fan speed is thermostatically controlled	
▸ Extremely high cooling efficiency to ensure optimum oil temperature	

Undercarriage

Travel speeds (2 stages):	Max. 2.7 km/h (1.68 mph) Max. 1.4 km/h (0.87 mph)
Max. tractive force:	1,680 kN (171 t = 377,770 lbs)
Gradability:	Approximately 62 %
Track pads (each side)	47
Bottom rollers (each side)	7
Support rollers (each side)	2 plus a skid plate in between
Travel drives (each side)	1 planetary transmission with 2 two-stage axial piston motors
Parking brakes	Wet multiple disc brake, spring-loaded / hydraulically released
▸ Cast double-grouser combined pad-links with bushings connected by hardened full floating pins	
▸ All running surfaces of sprockets, idlers, rollers and pad links as well as teeth contact areas of sprocket and pad links are hardened	
▸ Fully hydraulic self-adjusting track tensioning system with membrane accumulator	
▸ Automatic hydraulic retarder valve to prevent overspeed on downhill travel	
▸ Acoustic travel alarm	

Swing System

Swing drives	2 compact planetary transmissions with axial piston motors
Parking brakes	Wet multiple disc brake, spring loaded / hydraulically released
Max. swing speed	4.7 rpm
Swing ring	Triple race roller bearing with sealed internal gearing
▶ Closed-loop swing circuit with torque control ▶ Hydraulic braking of the swing motion by counteracting control ▶ All race ways of swing ring as well as grease bath for internal gearing supplied by automatic central lubrication system	

Operator's Cab

Operator's eye level	6.5 m (21'4") approx.
Internal dimensions of cab	
Length	2,200 mm (7'3")
Width	1,600 mm (5'3")
Height	2,150 mm (7'1")
▶ Pneumatically cushioned and multi-adjustable comfort seat with lumbar support, safety belt, head and arm rests ▶ Safety switch in seat cushion to neutralize automatically the hydraulic controls when operator leaves the seat ▶ Joystick controls integrated in independently adjustable seat consoles ▶ Fold-away auxiliary seat ▶ FOPS (rock guard; approved acc. to DIN ISO 3449) integrated into cab structure ▶ All-round tinted safety glass, armoured windshield and sliding side window ▶ Windshield with parallel intermittent wiper/washer ▶ Roller blind at windshield ▶ Robust instrument panel incl. large colored BCS screen with transflective technology ▶ TEREX O&K Board Control System (BCS) electronic monitoring and data logging system for vital signs and service data of engines, hydraulic system and lubrication system ▶ Machine access via retractable boarding ladder, hydraulically operated ▶ Emergency exit harness kit	

Retractable Service Station

▶ Retractable service station installed underneath the engine module and easily accessible from ground. Equipped with:	
▶ Quick couplings for: ▶ Diesel fuel ▶ Engine coolant - left/right ▶ Pump transmission gear oil - left/right ▶ Engine oil (oil pan) - left/right ▶ Engine oil (additional tank - optional) - left/right ▶ Hydraulic oil tank ▶ Grease container ▶ CAT jump start socket ▶ Indicator lights for "fuel tanks left / right full" and "grease container full"	

Automatic Lubrication System

Capacity of grease container	450 l (120 US gal)
▶ Dual-circuit system with hydraulically driven heavy-duty pump and electronic time relay control to adjust the pause/lube times ▶ Connected to the lubrication system are the swing roller bearing with internal gearing and all pivot points of attachment, bucket and cylinders ▶ System failures displayed by Board Control System ▶ Grease filters (200 µm) between service station and container as well as directly behind grease pump	

Attachments

▶ Booms and sticks are torsion resistant, welded box design of high tensile steel with solid steel castings at pivot areas ▶ Welding procedures allow for internal counter-welding (double prep weld) wherever possible ▶ Booms and sticks are stress relieved after welding ▶ Catwalks with rails at boom (FS and BH) ▶ "Pressure-free lowering" of boom (FS and BH) and stick (FS) by means of a float valve ▶ Shovel attachment with TEREX O&K's patented TriPower kinematics ensuring the following main features: ▶ Horizontal automatic constant-angle bucket guidance ▶ Vertical automatic constant-angle bucket guidance ▶ Automatic roll-back limiter to prevent material spillage ▶ Kinematic assistance to hydraulic forces ▶ Constant boom momentum throughout the whole lift arc ▶ Crowd force assistance ▶ All buckets (FS and BH) are equipped with a universal wear package suitable for all standard applications, which consists of: ▶ Special liner material covering main wear areas inside and outside of bucket ▶ Lip shrouds between teeth ▶ Wing shrouds on side walls ▶ Heel shrouds at bottom edges	
Special wear packages for highly abrasive materials on request	

Optional Equipment

General

▶ Export crating ▶ Finishing other than TEREX O&K std. colours (TEREX O&K colour quality) ▶ Customizing of logos as per customer's specification	
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Superstructure

▶ Mechanical service crane on superstructure ▶ Hydraulic service crane on superstructure with auxiliary engine ▶ Mesabi radiators instead of standard radiators ▶ Automatic fire suppression system ▶ Oil change interval extension for engine oil up to 1,000 hrs (Cummins engines only) ▶ Engine oil burn system (Cummins engines only) ▶ Centrifuges for engine oil filtration (Cummins engines only) ▶ Folding access stairway, stairway angle approx. 45° ▶ Grease barrel 200 l (instead of grease container) ▶ Lubricated pinion for greasing of internal gearing of swing ring ▶ Various cold weather packages	
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Cab

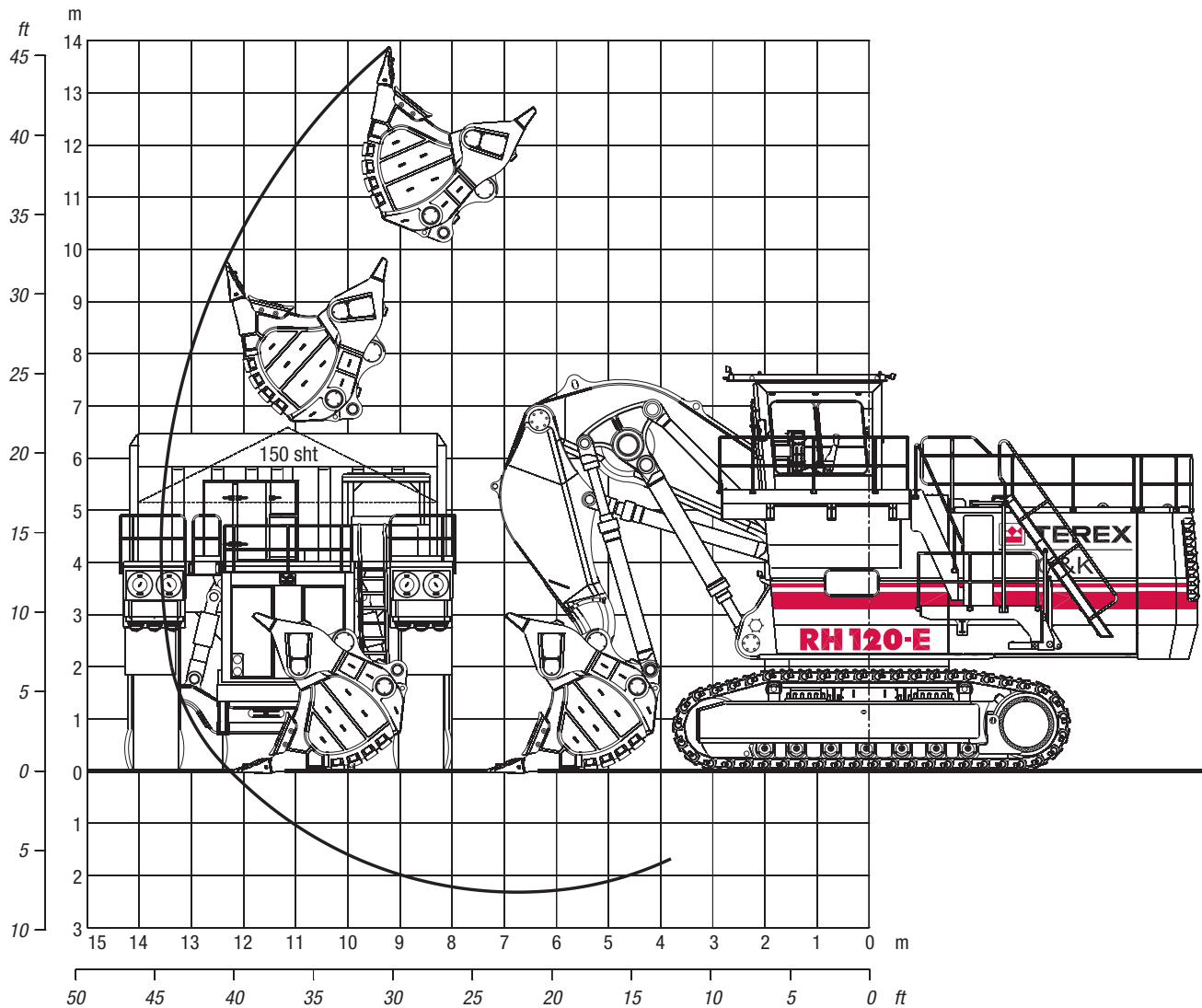
▶ Various heating and airconditioning systems ▶ Roller blinds at all windows ▶ Rear windscreen wiper ▶ BCS data-transfer-system via radio ▶ Additional instrumentation	
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Undercarriage

▶ Track pad width 800 mm or 1,200 mm ▶ Automatic lubrication of rollers by central lube system	
---	--

Attachment

▶ Guards for shovel cylinders of FS-attachment ▶ Xenon lighting on boom ▶ Special wear packages	
Further optional equipment on request	

Working Diagram - Face Shovel (FS) - Boom 6.2 m (20'4") - Stick 4.4 m (14'5")

Digging Forces

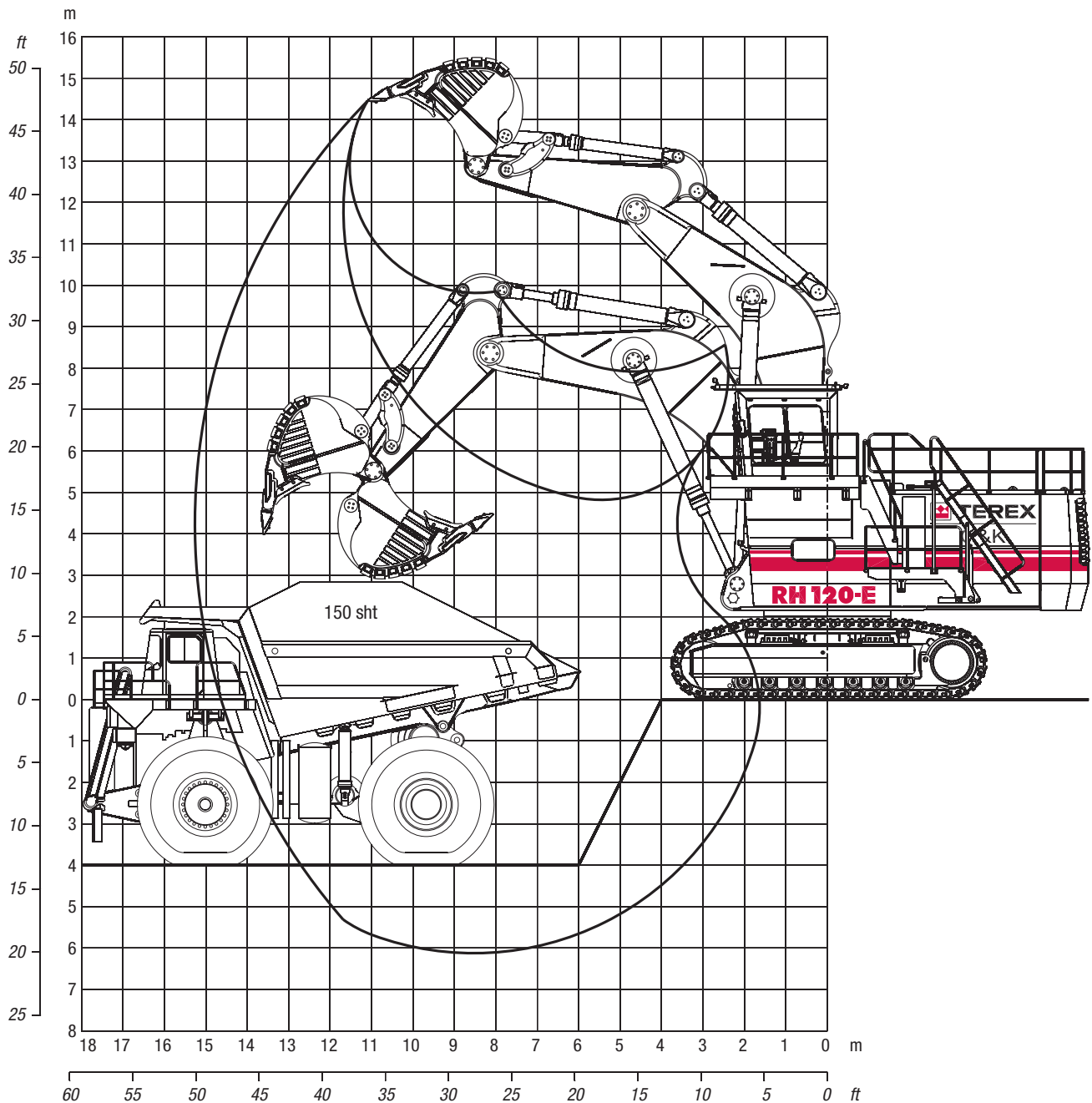
Max. crowd force	1,370 kN	307,880 lbs
Max. crowd force at ground level	1,210 kN	271,920 lbs
Max. breakout force	920 kN	206,750 lbs

Working Range

Max. digging height	13.9 m	45'7"
Max. digging reach	13.6 m	44'7"
Max. digging depth	2.3 m	7'7"
Max. dumping height	10.7 m	35'1"
Crowd distance on level	4.9 m	16'1"

Face Shovels

Type	Heavy rock shovel		Standard rock shovel	
Tooth system	ESCO S 95		ESCO S 95	
Capacity SAE / PCSA 1:1	m ³	cuyd	15.4	20.1
Capacity SAE / CECE 2:1	m³	cuyd	13.5	17.7
Total width	mm	ft:in	3,900	2'10"
Opening width	mm	ft:in	1,700	5'7"
No. of teeth	6		6	
Weight incl. universal wear kit	kg	lbs	27,200	59,970
Max. material density (loose)	t/m ³	lbs/cuyd	2.1	3,540

Working Diagram - Backhoe (BH) - Boom 8.5 m (27'11") - Stick 4.0 m (13'9")

Digging Forces

Max. crowd force	880 kN	197,760 lbs
Max. breakout force	870 kN	195,520 lbs

Working Range

Max. digging depth	6.1 m	20'0"
Max. digging reach	15.3 m	50'2"
Max. digging height	14.4 m	47'3"

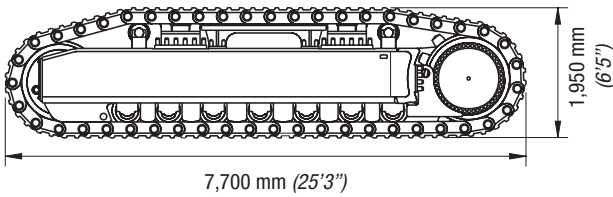
Backhoes

Type	Standard rock bucket		Light rock bucket	
Tooth system	ESCO V 81		ESCO V 81	
Capacity SAE 1:1	m³	cuyd	15.0	19.6
Capacity CECE 2:1	m ³	cuyd	13.6	17.8
Capacity struck	m ³	cuyd	12.3	16.1
Total width	mm	ft:in	3,700	12'2"
No. of teeth	5		6	
Weight incl. universal wear kit	kg	lbs	16,600	36,600
Max. material density (loose)	t/m ³	lbs/cuyd	1.8	3,030
			17,900	39,460
			1.6	2,700

General Packing List (approx. values; details may vary depending on scope of supply and destination)

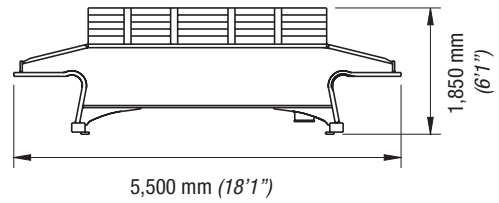
Crawler side frame with track pads (2 units)

Width 1,550 mm (5'1") Gross weight 36,800 kg (81,130 lbs)



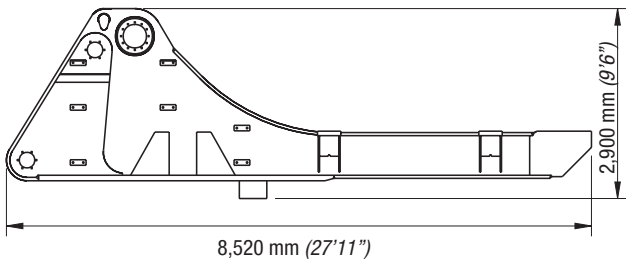
Undercarriage centre frame with swing roller bearing

Width 3,800 mm (12'6") Gross weight 24,900 kg (54,890 lbs)



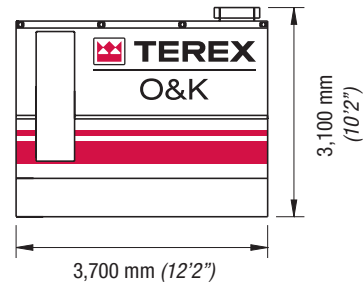
Superstructure centre frame

Width 3,120 mm (10'3") Gross weight 37,300 kg (82,230 lbs)



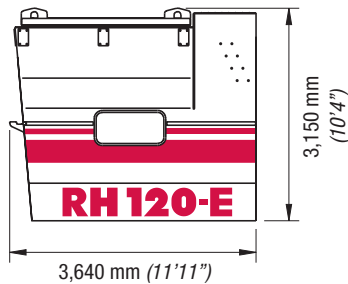
Engine module with diesel engines

Width 5,300 mm (17'5") Gross weight 23,500 kg (51,810 lbs)



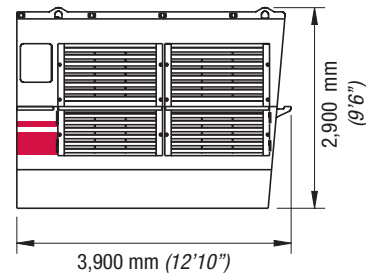
Cab pedestal module

Width 2,000 mm (6'7") Gross weight 5,000 kg (11,020 lbs)



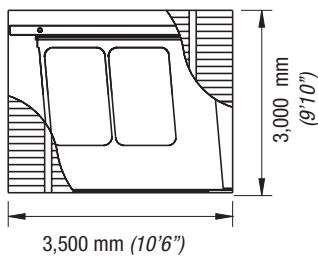
Oil cooler module

Width 1,550 mm (5'1") Gross weight 4,600 kg (9,480 lbs)



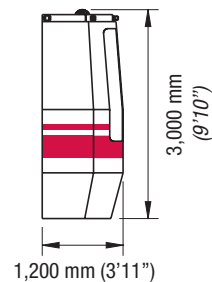
Crate with cabin and FOPS

Width 2,610 mm (8'7") Gross weight 3,800 kg (8,380 lbs)



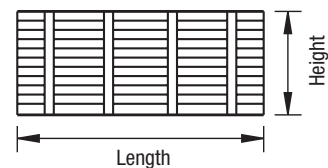
Counterweight incl. radiators

Width 5,300 mm (17'5") Gross weight 33,700 kg (74,300 lbs)



Crates

Content	Length mm (ft:in)	Width mm (ft:in)	Height mm (ft:in)	Gross weight kg (lbs)
Grease container with pump	1,600 (5'3")	1,100 (3'7")	2,330 (7'8")	1,470 (3,240)
Barrels (hydraulic oil; grease; antifreeze)	2,700 (8'10")	1,400 (4'7")	1,120 (4')	1,500 (3,310)
Swing ring cover	2,200 (7'3")	1,300 (4'3")	1,020 (3'4")	340 (750)

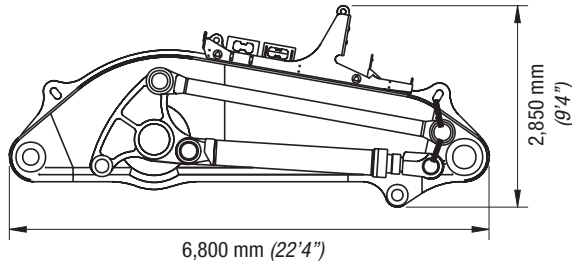


All details provided are for general information only. Exact dimensions subject to selected machine configuration and final packing list.

TriPower Shovel Attachment

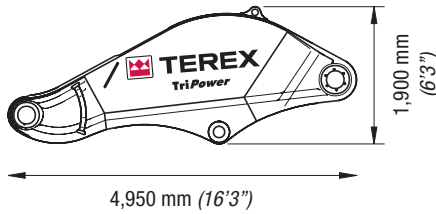
Boom with main valve block, TriPower linkages and rods

Width 2,600 mm (8'6") Gross weight 26,400 kg (58,200 lbs)



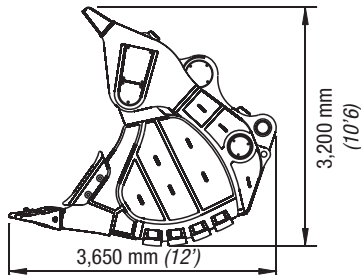
Stick

Width 1,840 mm (6') Gross weight 9,000 kg (19,840 lbs)



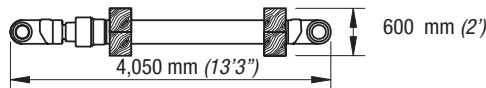
Face shovel incl. pin for stick

Capacity (2:1) 15.0 m³ (19.6 cuyd) Width 3,900 mm (12'10") Gross weight 28,100 kg (61,950 lbs)



Bundle with 2 stick cylinders

Width 1,100 mm (3'7") Gross weight 3,800 kg (8,380 lbs)



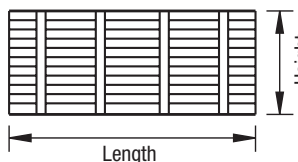
Bundle with 2 bucket cylinders

Width 1,100 mm (3'7") Gross weight 3,800 kg (8,380 lbs)



Crates with catwalks, railings and other parts

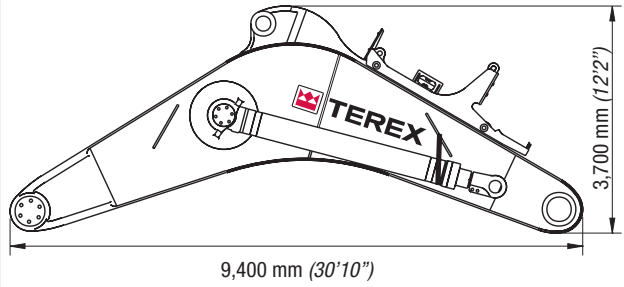
Length mm (ft.in)	Width mm (ft.in)	Height mm (ft.in)	Gross weight kg (lbs)
3,900 (12'10")	1,600 (5'3")	1,250 (4'1")	1,300 (2,870)
4,500 (14'9")	1,900 (6'3")	1,740 (5'9")	2,400 (5,290)



Backhoe Attachment

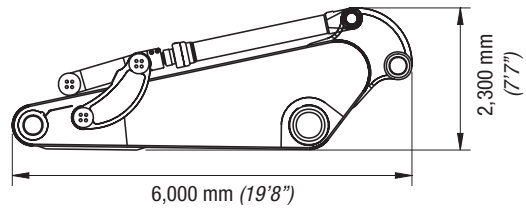
Monoboom with main valve block and boom cylinders

Width 2,700 mm (8'10") Gross weight 32,700 kg (72,090 lbs)



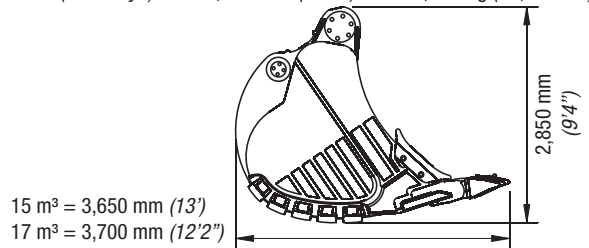
Stick with linkage and bucket cylinders

Width 2,100 mm (6'11") Gross weight 16,200 kg (35,710 lbs)



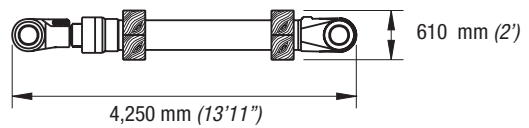
Backhoe bucket incl. pins for stick and linkage

Capacity (1:1) 15.0 m³ (19.6 cuyd) Width 3,800 mm (12'6") Gross weight 17,700 kg (39,020 lbs)
17.0 m³ (22.2 cuyd) 4,150 mm (13'7") 19,000 kg (41,890 lbs)



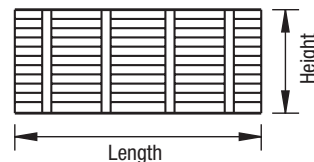
Bundle with 2 stick cylinders

Width 1,200 mm (3'11") Gross weight 6,350 kg (14,000 lbs)



Crates with catwalks, railings and other parts

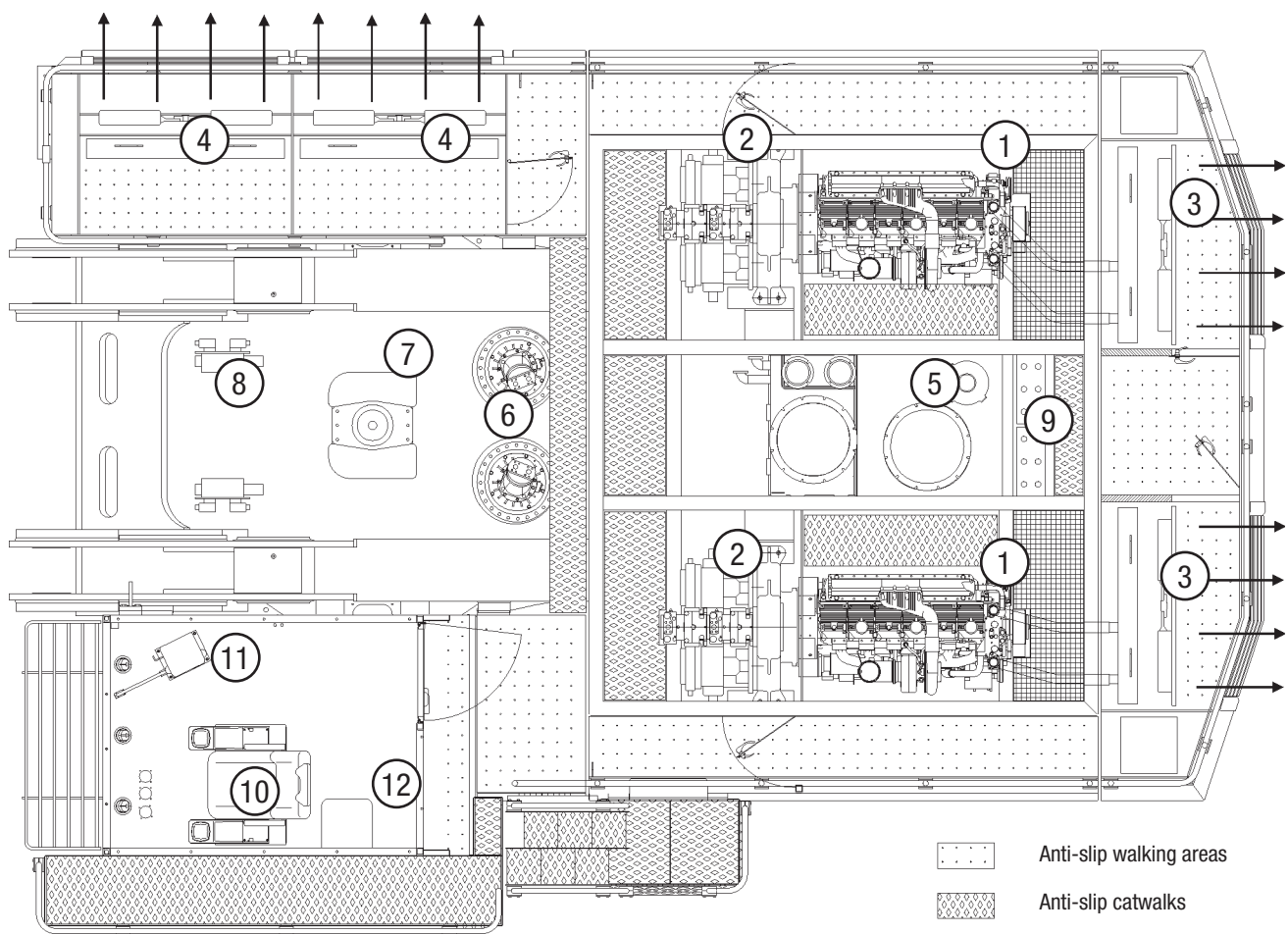
Length mm (ft.in)	Width mm (ft.in)	Height mm (ft.in)	Gross weight kg (lbs)
4,950 (16'3")	1,900 (6'3")	1,750 (5'9")	2,500 (7,050)
3,000 (9'10")	1,250 (4'1")	1,350 (4'5")	1,550 (3,420)



Hydraulic Mining Excavator RH 120-E

Component accessibility on superstructure

- | | |
|--|----------------------|
| 1 Diesel engines | 7 Rotary distributor |
| 2 Gearboxes with hydraulic pumps | 8 Travel valves |
| 3 Engine radiators with hydraulically driven fan | 9 Batteries |
| 4 Oil coolers | 10 Operator's seat |
| 5 Hydraulic tank | 11 BCS tower |
| 6 Swing drives | 12 Auxilliary seat |



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OPERATING INSTRUCTIONS RH 120 E
Annex



Optional equipment

Monitoring cameras (Optional)

This excavator is equipped with two monitoring cameras:

- one mounted on the counterweight, looking backwards;
- one mounted on the hydraulic oil cooler module, looking to the right.

The two cameras and the belonging LCD-display are operational after the electrical system of the machine has been activated with the key operated switch.

Both cameras transmit their images to the same LCD-display. The display is mounted near the control column.

For toggling between the camera images beeing displayed, press the key in the left joystick (arrow, Fig. 1).

Additional information can be found in the manuals of the camera manufacturer (see Volume 5 of the Technical Documentation "Components").

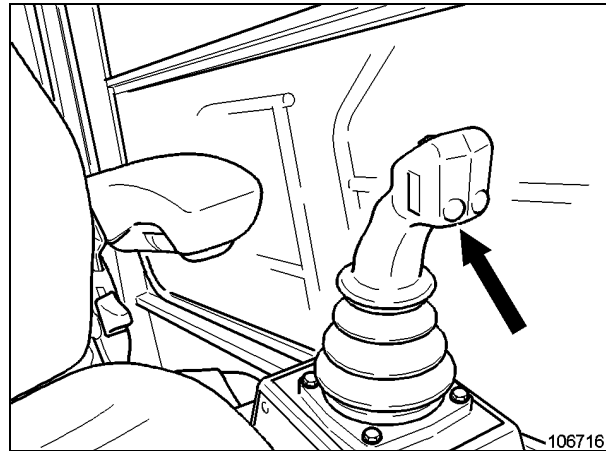


Fig. 1



OPERATING INSTRUCTIONS RH 120 E

Annex



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	Operating instructions	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
Part 6	INDEX	Operating personnel + Inspection and servicing personnel + Repair personnel

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