

# Operating Instructions

CE

Hydraulic Excavator

RH 30E      No.

Bucyrus HEX GmbH



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## Preface

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

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

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

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

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

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

In addition to the operating instructions and the mandatory rules and regulations for accident prevention and environmental protection in the user's country and at 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 O&K-Mining mechanic or by attending an O&K-Mining training course for operators or maintenance personnel.

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

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

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

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

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

## Warranty

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O&K-Mining's warranty is subject among other things to the maintenance works described in the Owner's Manual having been performed by the O&K-Mining Service or by a workshop authorized in writing by O&K-Mining to perform such work. □

[1] Complies with VDMA recommendation "Operating instructions"


**PART 2 - OPERATION**

	Operating manual	Target group
<b>Part 1</b>	<b>INTRODUCTION</b>  <b>FUNDAMENTAL SAFETY INSTRUCTIONS</b>	<b>Operating personnel</b> + <b>Inspection and servicing personnel</b>  + <b>Repair personnel</b>
<b>Part 2</b>	<b>OPERATION</b>	<b>Operating personnel</b>  The operating personnel must have know-how relevant to the operation and the application of this or comparable machines.
<b>Part 3</b>	<b>INSPECTION AND SERVICING</b>	<b>Inspection and servicing personnel</b>  The inspection and servicing personnel must have know-how relevant to the inspection and servicing of this or comparable machines.
<b>Part 4</b>	<b>REPAIR WORK</b>	<b>Repair personnel</b>  The repair personnel must have know-how and experience relevant to the repair of this or comparable machines.
<b>Part 5</b>	<b>ANNEX</b>	<b>Operating personnel</b> + <b>Inspection and servicing personnel</b>  + <b>Repair personnel</b>
<b>Part 6</b>	<b>INDEX</b>	<b>Operating personnel</b> + <b>Inspection and servicing personnel</b>  + <b>Repair personnel</b>

□

## Signs

### Warning and instructions signs



**Observe the warning and instruction signs attached to the machine.**  
**Keep the signs legible and clean.**  
**Replace the signs immediately if they have become illegible.**

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

Fig. 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. 3 and Fig. 4).

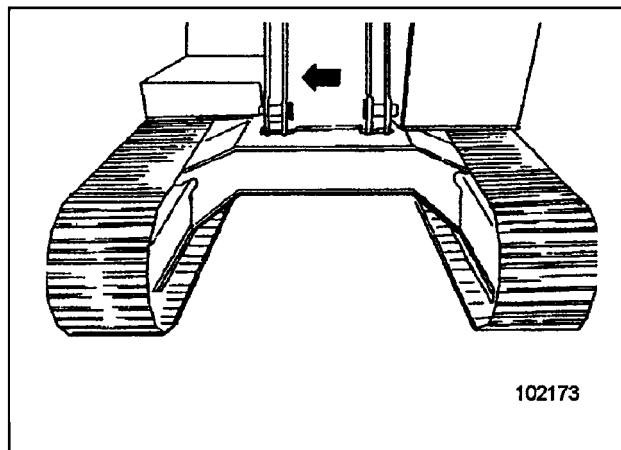


Fig. 3

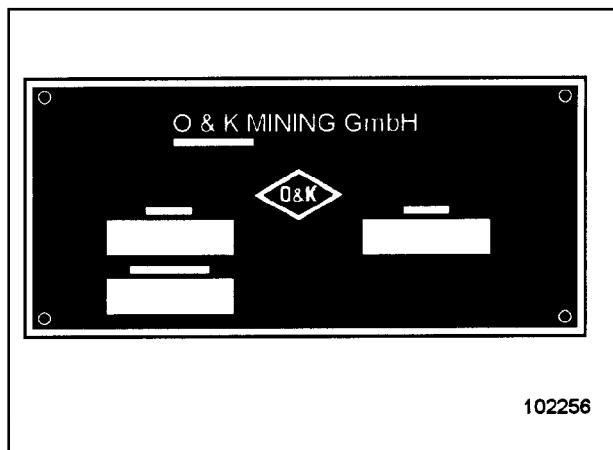


Fig. 4

### Engine number

The identification plate (Fig. 5) with the engine number is attached to the engine.

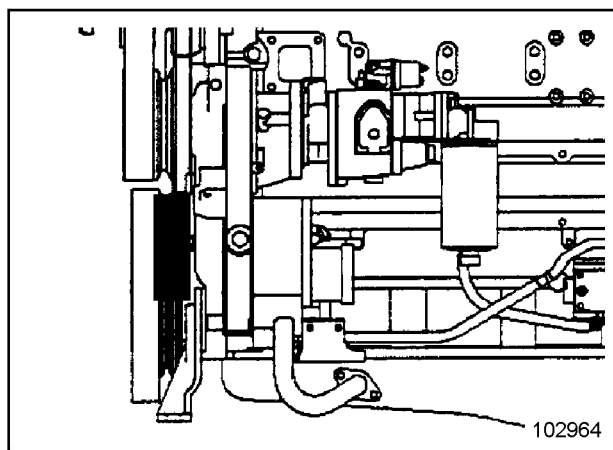




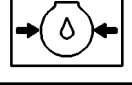
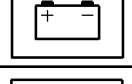

Fig. 5

### Component numbers







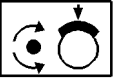

Also the other larger units have identification plates indicating, among other things, their serial number.

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

(Fig. 2)

No.	Element	Function	Symbol
9	<b>Warning lamp    Cooling-liquid level</b>	Lit when the cooling-liquid level is too low. <b>Shut off engine</b>	
10	<b>Warning lamp    Cooling-liquid temperature</b>	Lit when the temperature is too high <b>Shut off engine</b>	
11	<b>Warning lamp    Engine oil pressure</b>	Lit when the engine oil pressure is too low <b>Shut off engine</b>	
12	<b>Warning lamp    Alternator</b>	Lit when the alternator does not charge the battery.	
13	<b>Speedometer    (optional equipment)</b>	Indicates the engine revolutions	

(Fig. 7)

No.	Element	Function	Symbol
61	Switch      Windscreen wiper	Permanent / intermittent wiping	
62	Switch      Floodlamp	Front of superstructure on the right	
63	Momentary contact switch      Windscreen washer	Wipe/wash operation	
64	Switch      Floodlamp	Counterweight	
65		Free for optional equipment	
66	Switch      Floodlamp	Driver's cab, instrument illumination	
67	Momentary contact switch      Superstructure holding brake	Applies the holding brake of the superstructure  <b>Actuate the switch only when the superstructure is stationary. The holding brake is released automatically when the superstructure slewing function is activated.</b>	
68	Switch      Floodlamp	Driver's cab, rear right	

**Shutting off the engine**

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

**Do not shut off engine before the working equipment rests on the ground.**

- Turn speed control knob (70, Fig. 3) counter-clockwise to the limit stop (idling).

**Do not shut off the engine out of full load. The engine 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.**

- Turn key in key-switch (72) to position "0" (electrical system without current).

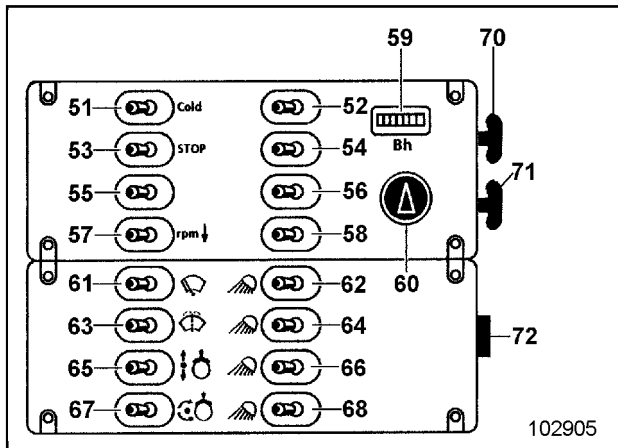


Fig. 3

**Emergency stop**

In case of emergency, e.g. if buzzer (36, Fig. 4) sounds, the engine can be shut off from full load.

To do so:

- actuate stop-button (53, Fig. 3) and hold in this position until the engine has come to a stand-still;
- turn key in key-switch (72) to position "0" (electrical system without current).

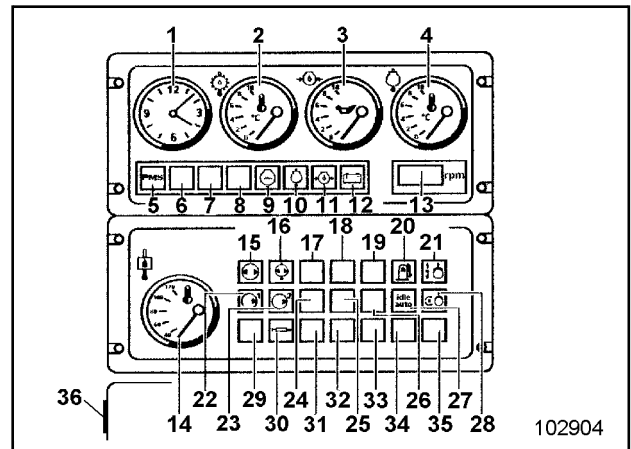


Fig. 4

- Lock the superstructure (Fig. 2).
- Place solid timbers between the low-bed platform and the center part of the undercarriage (Fig. 3).

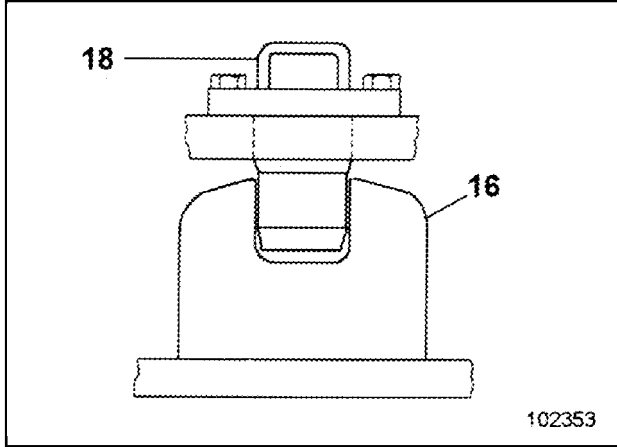


Fig. 2

- Couple the tractor to the low-bed trailer and raise the platform. The excavator is raised at the same time by the supporting timbers, so that the crawler tracks are clear of the ground (Fig. 3).

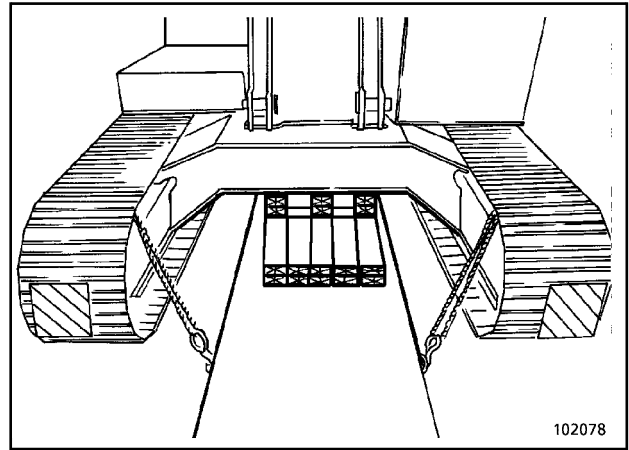


Fig. 3

- Secure the excavator with suitable means (chain hoists, wire ropes, chains, turn-buckles) (Fig. 3).

Unload the excavator in reverse order.



**Unlock the superstructure before slewing it for the first time.**

□

## Lifting-gear operation - Safety instructions



Never use the machine for lifting-gear operation unless it is equipped and approved for this purpose, i.e. the machine must be equipped with an overload warning system and a pipe break protection.

Read the sections "Fundamental safety instructions" and "Operation - safety instructions" with care and observe the instructions contained in them.

Switch the overload warning system on.

### Room for slingers

Slingers must approach the working gear from the side when the load is slung.

During the lifting and transporting of loads, slingers or other assistant personnel must stand in a safe position or go beside the machine to ensure that they are outside the hazard zone.

Ensure that slingers and other assistant personnel are always in sight.

### Slinging loads

Use only tested and efficient lifting gear with an adequate load capacity.

Hoist the load only from the hooks provided for that purpose.

Never use the teeth of backhoe buckets, shovels or grabs.

Cable lugs, thimbles or U-bolts may slip from the teeth, putting the load out of control.

Register the weight of the load. Sling only those loads not exceeding the load capacity of the lifting gear and of the machine (cf. "Technical data").



Sling the load in such a way as to prevent it from slipping or falling while being lifted or transported.

### Transporting the load

Never move the load above persons. Keep the load as close as possible to the ground.

Prevent the load from swinging

The machine must never be driven with a slung load unless the road surface is even and the roadway is clearly visible. Roadway visibility can be improved by adjusting the boom and slewing the superstructure to the right.

The built-in overload warning device cannot totally exclude accidents due to incorrect operation. This applies in particular to:

- inadequate hooking of the load or the load-carrying device,
- excessive deceleration or acceleration forces (hard braking or strong slewing with the load to be moved),
- loads dropping into the cable,
- oblique pull,
- driving the excavator into an area with steeply sloping ground,
- exposure to strong wind.

Avoid these risks by handling the machine carefully and with discretion.

## 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 days' instruction, e.g. by an O&K-Mining mechanic or by attending an O&K-Mining 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 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.

### Securing the machine

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

### Climbing onto and off the machine

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

Always keep steps, platforms 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.

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**Plan V - Once prior to initial commissioning**

Page 1 of 1

Location	Servicing work	Quantity/ No.
<b>Engine</b>	Check oil level	1
<b>Cooling system</b> Cooling liquid	Check level	1
<b>Electrical system</b> Battery Lighting	Check charge condition Check operation	2
<b>Monitoring, warning and control elements</b>	Check operation	
<b>Fuel system</b> Refuelling station (option) - Earthing strap (equipotential bonding)	Check tightness	1
<b>Hydraulic system</b> Hydraulic oil reservoir Hydraulic cylinders	Check pressure <sup>1)</sup> Check oil level Bleed systems	1
<b>Pump transfer gearbox</b>	Check oil level	1
<b>Slewing gearbox</b> Expansion reservoir	Check oil level	1
<b>Travel gearbox</b>	Check oil level	2
<b>Working equipment</b> Backhoe-bucket bearing	Grease	11
<b>Slewing ring</b> Internal gearing	Check grease filling	1
<b>Undercarriage</b> Track roller Support roller Track Idler	Check for leaks and free movement Check for leaks and free movement Check tension Check for leaks	16 4 2 2
<b>Central lubricating system</b> Grease container	Check filling level	1
<b>Air conditioner</b> Compressor	Check oil level; cf. Technical Information	1
<b>Central lubricating system</b> Grease container	Check filling level	1
<b>All lines, fittings and connections</b>	Inspect visually for leaks, wearing marks	
<b>All articulated joints and hinges</b>	Lubricate	

<sup>1)</sup>Contact the O&K-Mining Service





### III. Oils for gearboxes (selection)

Ambient temperature		°F	-22	-4	+14	+32	+50	+68	+86	+104	+122
		°C	-30	-20	-10	0	+10	+20	+30	+40	+50
Specification											
API	MIL - L										
GL 5	2105 C	<b>Multigrade Gear-Oil P/No.1 589 636</b>									
GL 5 GL 4	2105 B 2105	<b>GL 4 / GL 5 - 140</b>									
		<b>GL 4 / GL 5 - 90</b>									
		<b>GL 4 / GL 5 80 W</b>									

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**AIR-INTAKE SYSTEM**

2804244



Read and observe "Engine - Safety instructions".

Wear a safety harness.

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

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

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



Do not start the engine when parts of the air-intake system have been detached.

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

The air-intake system is equipped with a dry-air filter (Fig. 1) consisting of main and safety filter element.

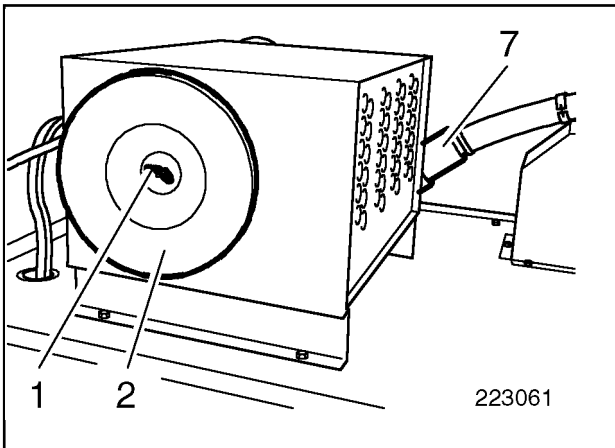


Fig. 1

**Main filter element**

An insufficient air-intake performance, caused by a contaminated main filter element, is indicated by the vacuum-meter (8, Fig. 2).



Clean or renew main filter element only if the vacuum-meter indication changes to "RED" with the engine running at high speed.

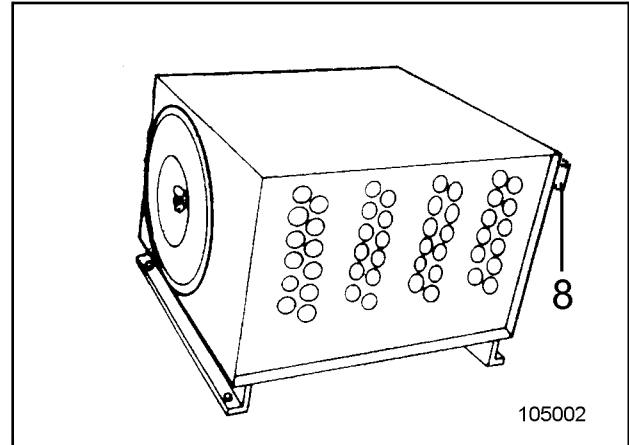


Fig. 2

**Removal and installation**

- Unscrew nut (1, Fig. 1) and remove cover (2).
- Unscrew nut (3, Fig. 3) and withdraw main filter element (4). Do not loose the washer under nut (3).
- Replace or clean main filter element. The vacuum-meter (arrow, Fig. 2) must now show a green segment.

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

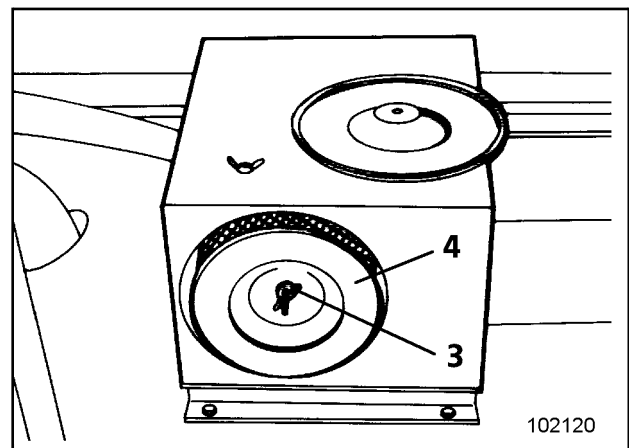


Fig. 3

## HYDRAULIC SYSTEM

2804241

### Hydraulic system - Safety instructions



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

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

Shut off the engine.

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 oils.

Contact with hydraulic oils 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 (Figs. 1) and with the drive engine stationary, there may still be a considerable residual pressure in parts of the hydraulic system, e.g. the primary pressure resulting from the last hydraulic movements before stopping the machine.

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:

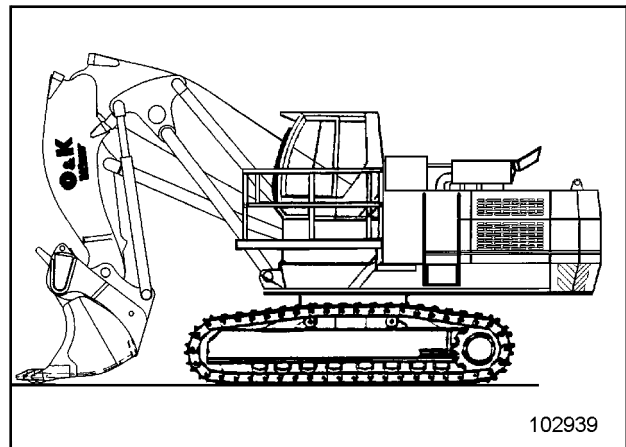


Fig. 1

- 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.

### Cleaning the hydraulic oil cooler



**Risk of injury caused by rotating cooler fan blades.**

**Shut off the engine.**

**Do not start cleaning before the cooler fan blades have stopped turning.**

**The hydraulic oil cooler is at the same temperature as the hydraulic oil. Risk of burning.**

**Allow the machine to cool down.**

**Wear protective gloves and firm working clothing.**



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

The speed of the fan motor is controlled by a thermostat. The fan motor runs at maximum speed when the hydraulic oil temperature reaches ca. 60°C.

### Cleaning

- Remove the grid (7, Fig. 18) above the cooler.
- Blow the cooling fins clean with compressed air proceeding from top to bottom. Loose dirt drops through the cooler down to the ground.

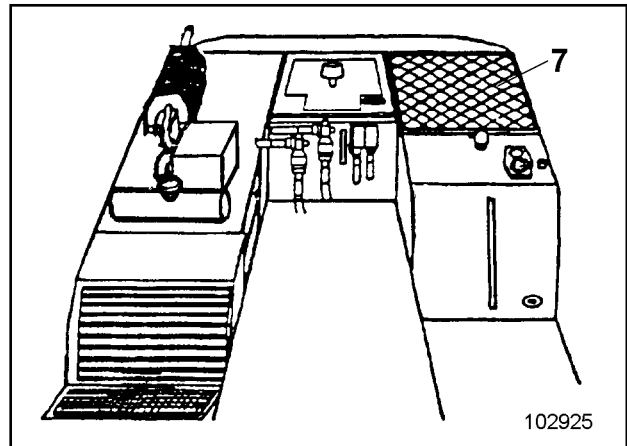


Fig. 18

## SLEWING RING



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

Shut off the engine.

Wear protective gloves and firm working clothing.

### Slewing ring - Instructions



The grease filling must be renewed:

- if 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 grease losses are detected, locate cause immediately to avoid damage to the slewing ring.

Greases and greasy cleaning rags must not be allowed to pollute the environment. Dispose of greases and cleaning rags without polluting the environment and separately from other waste.

### Internal gearing

The internal gearing and the pinion are enclosed in a housing (5, Fig. 2). The housing forms a grease-filled trough in which the pinion of the slewing mechanism moves.

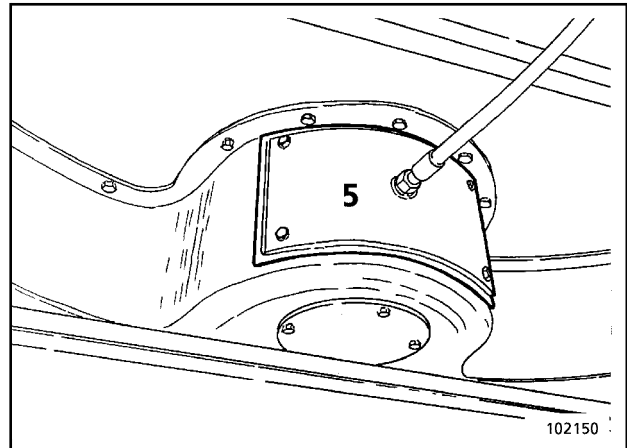


Fig. 2

The grease is pumped to the greasing port of the grease trough by the distributor (Fig. 1). The central lubricating system adds the amount of grease used up during operation.

The housings have a check opening which is closed with a cover (6, Fig. 3). For checking, the cover must be removed.

### Bearing races

The central lubricating system supplies continuously grease to the two roller bearing races and the internal gearing .

The grease is pumped to the greasing points of the bearing races by the distributor (Fig. 1).

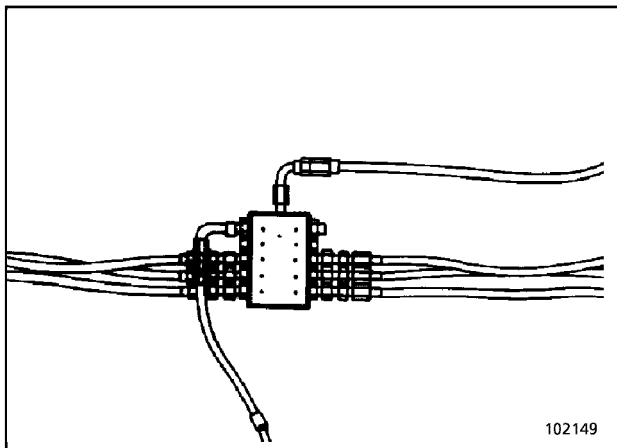


Fig. 1

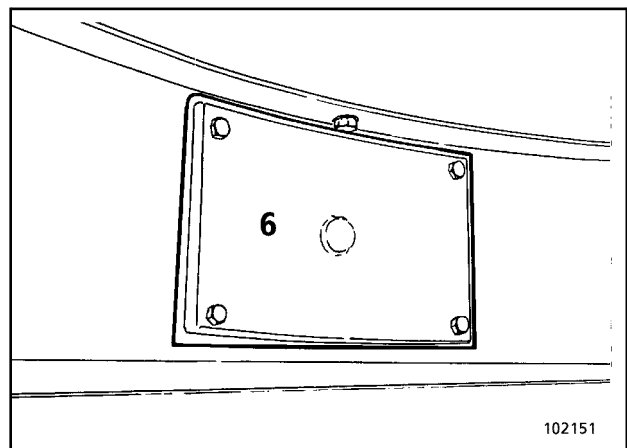


Fig. 3

**PART 4 - REPAIR WORK**

	Operating manual	Target group
<b>Part 1</b>	<b>INTRODUCTION</b>  <b>FUNDAMENTAL SAFETY INSTRUCTIONS</b>	<b>Operating personnel</b> + <b>Inspection and servicing personnel</b>  + <b>Repair personnel</b>
<b>Part 2</b>	<b>OPERATION</b>	<b>Operating personnel</b>  The operating personnel must have know-how relevant to the operation and the application of this or comparable machines.
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