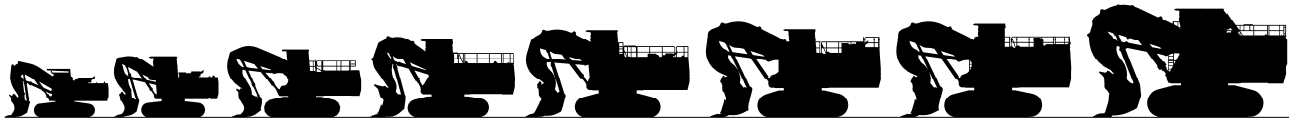
Operating Instructions

CE

Hydraulic Excavator

RH 120E No.

Bucyrus HEX GmbH



PREFACE

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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"

The machine contractor must provide all the necessary protective equipment and adopt the necessary safety procedures. He must ensure that the safety equipment is used and the safety procedures observed.

The excavator operator and all personnel working on the excavator must use the protective equipment and carry out the specified safety procedures.

It is absolutely forbidden to work on any systems or components while they are conducting current. Fatal injury can occur.

If work has to be done in special cases on systems or components conducting current, appropriate safety measures must be taken. Work must not be done on "live" systems and components except by the electrician in charge. The machine contractor must also be notified.

The excavator and its electrical systems must not be switched on again until the above safety procedures have been cancelled and all working areas are prepared for the resumption of operations. Start-up can be ordered only by the person in charge (qualified electrician). Time-based switch-on agreements are absolutely forbidden.

FIRE AND EXPLOSION HAZARD

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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.

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.

Access lighting

The access can be illuminated in the dark.

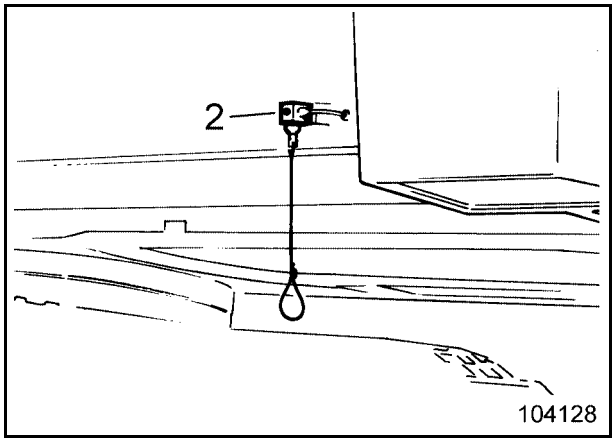

Fig. 2-10:

The access lighting is switched on by a pull switch (2, Fig. 2-10:). and switch (5, Fig. 2-11:)

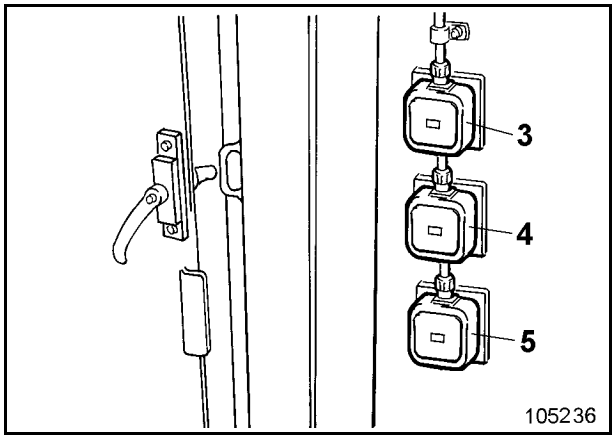

Fig. 2-11:

Cab interior lamp

The interior lamp is switched on and off with switch (1, Fig. 2-12:).

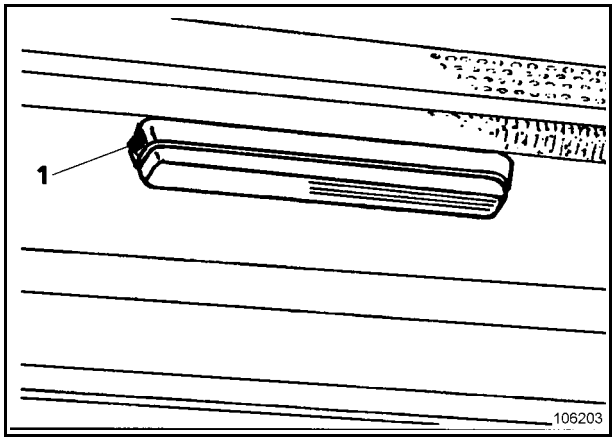

Fig. 2-12:

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. 2-11:).

(Fig. 2-25:)

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	UP
4	**DOWN button**		Selects the BCS program Positions the Cursor	DOWN
5	**ENTER button**		Confirms a program Activates a desired program	ENTER
6	**BACK button**		Recalls the Service Menu	BACK
7	**HOLD button**		Freezes actual service data	HOLD
8	**Print button**		Recalls the Print Menu	PRINT
9	**SERV. button**		Recalls the Service Menu	SERV.
10	**HELP button**		Recalls the Help Menu	HELP
11	**BL + button**		Adjusts BCS monitor background lighting	BL +
12	**BL - button**		Adjusts BCS monitor background lighting	BL-

Fig. 2-30:

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	

- **EMERGENCY STOP mush room-head pushswitvh (6, Fig. 2-42:) unlocked**
- **Circuit breaker (1, Fig. 2-43:) ON**

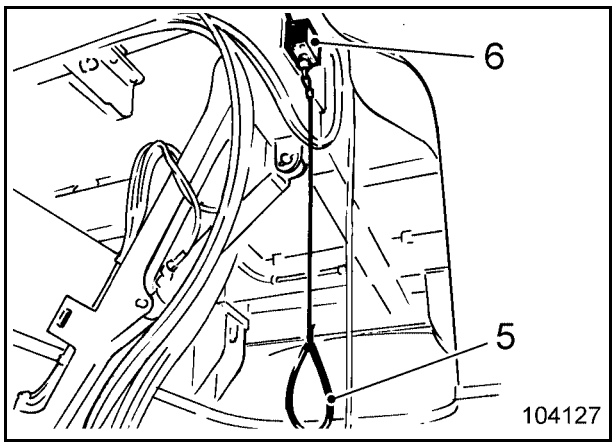

Fig. 2-42:

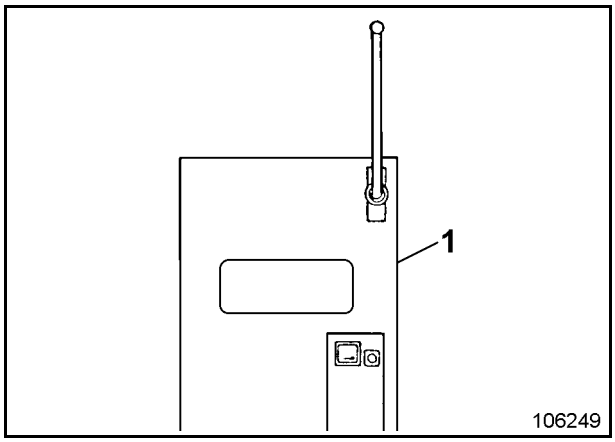

Fig. 2-43:

Cornering

To take a right-hand corner forwards

depress only pedal(112, Fig. 2-64:) 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.

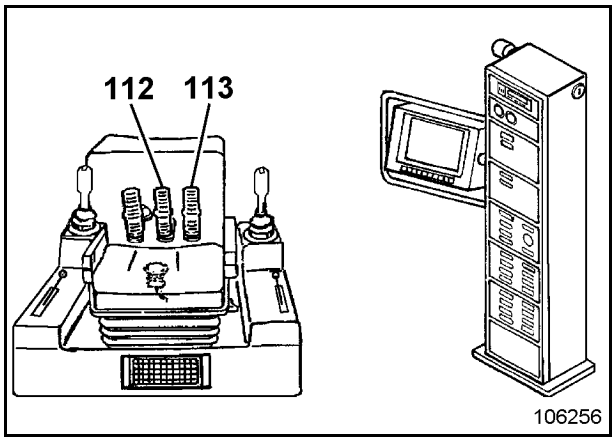

Fig. 2-64:

Note

Change the position of the undercarriage - parallel or perpendicular to the working face - only by cornering forwards/backwards (Fig. 2-65:).

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. 2-66:):

Cornering to the left	from pos. 1 to pos. 2
Cornering to the right	from pos. 2 to pos. 3

Never use the working equipment to raise one side of the undercarriage and then turn the undercarriage by initiating the slewing and/or the travelling function.

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 or bucket back-wall and the front part of the bucket are subjected to inadmissibly high stresses.

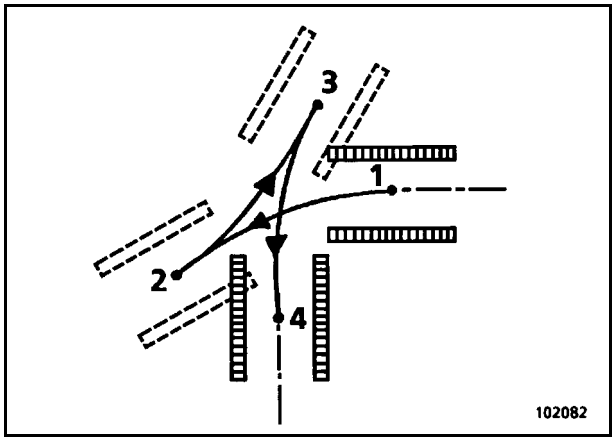

Fig. 2-65:

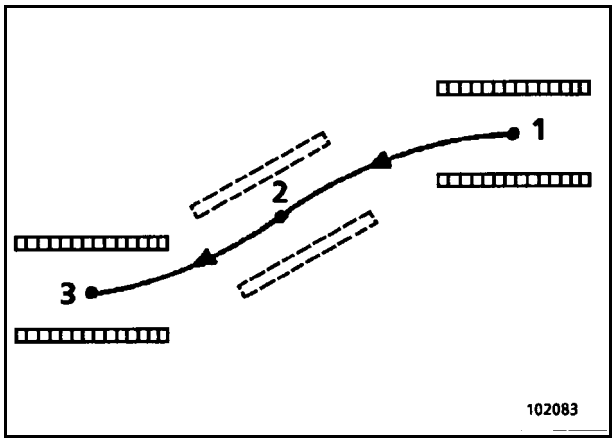

Fig. 2-66:

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.
- Switch off the electrec motor.
- 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.
- Inspect the engines, the hydraulic system, the track rollers, support rollers, idlers and gearboxes visually for leaks.
- Set the battery main switch to OFF.

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.

3 INSPECTION AND SERVICING

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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**

FIRE AND EXPLOSION HAZARD

Safety Instructions

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

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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.

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.

Plan A – E

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)

Location	Servicing work	Menge / No.		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 [4]			●	●	●
- Pedal							
- Control spool (machine with loading shovel)	oil lightly	3 x 2 [4]			●	●	●
Electric motor	Check for vibration			●	●	●	●
	Visual inspect interior of machine for degree of dirt deposits				●	●	●
	Lubricate	2			●	●	●
Rotor (inside and outside of machine)	Visual inspect all accessible places for rust	1					●
Terminals	Check tightness			●	●	●	●
	Check for degree of dirt deposits				●	●	●
Coupling	Check for alignment and record measurements (see „Technical handbook“ chapt. 5						●
Screw connections	Check condition and tightness					●	●
	cf Electric motor manufacturer´s servicing instructions			●	●	●	●

[4] apply a thin layer of hydraulic oil

LUBRICANTS

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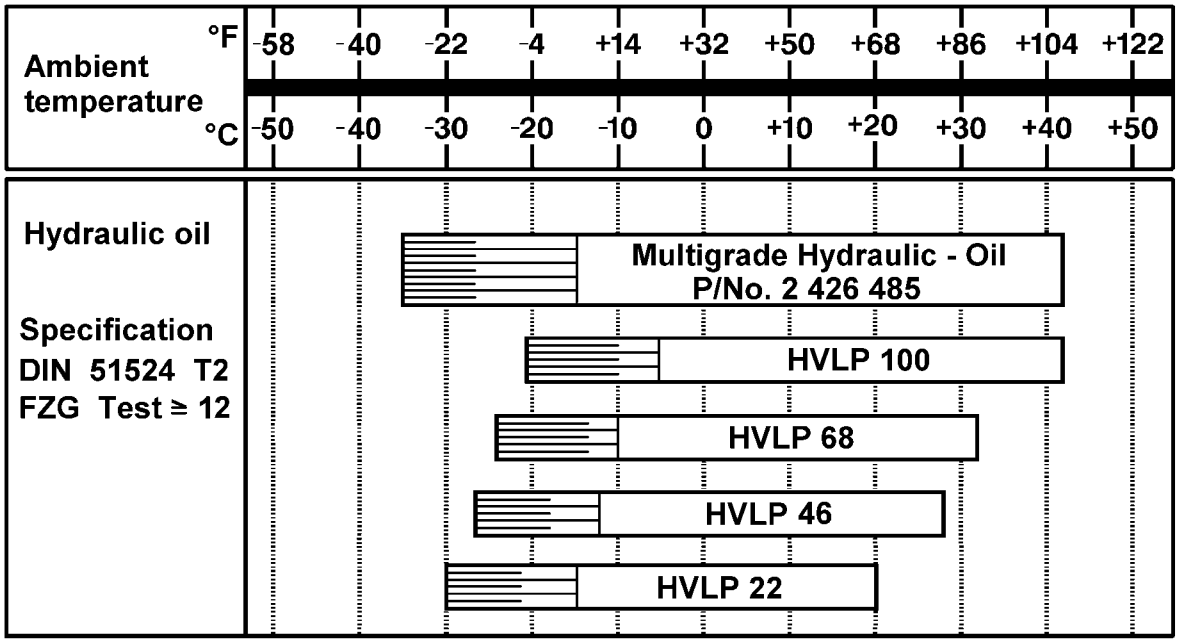
II. Oils for hydraulic system (selection)



Warming – up phase necessary before commencing operation.
Warm up hydraulic system for approx. 10 minutes, running at half speed and with repeated actuation of control valves.

Oils for lower temperatures can be quoted on request.

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Fig. 3-9:

Emptying dust trap

➲ Press dust trap (14, Fig. 3-25:) and hold until the dust trap is empty.

Emptying the dust collector

➲ Loosen clips (11, Fig. 3-25:).

➲ Remove dust collector (12) and empty.

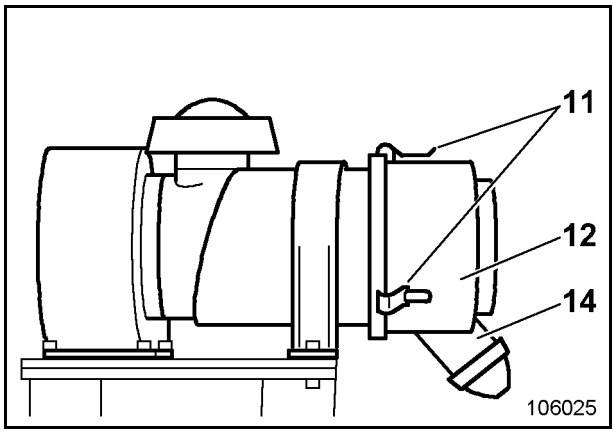

Fig. 3-25:

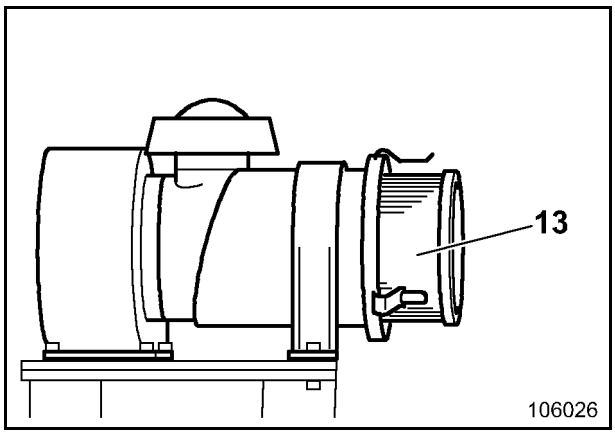

Fig. 3-26:

Filter element

➲ Remove dust collector (12, Fig. 3-25:).

➲ Withdraw filter element (13, Fig. 3-26:).

➲ Replace or clean filter element (13).

➲ Refit dust collector (12, Fig. 3-25:).

Bypass valves (filter housing - cooling system)

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

Switch off the electric motor.

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.

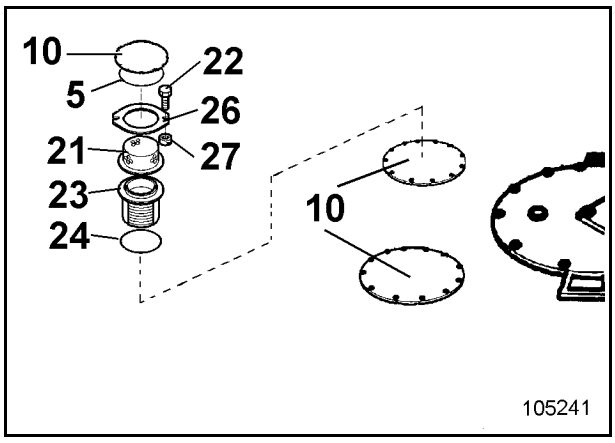

Fig. 3-47:

Cleaning the screens

Clean/replace the bypass valves (Fig. 3-47:) together with the bypass valves in the hydraulic oil reservoir.

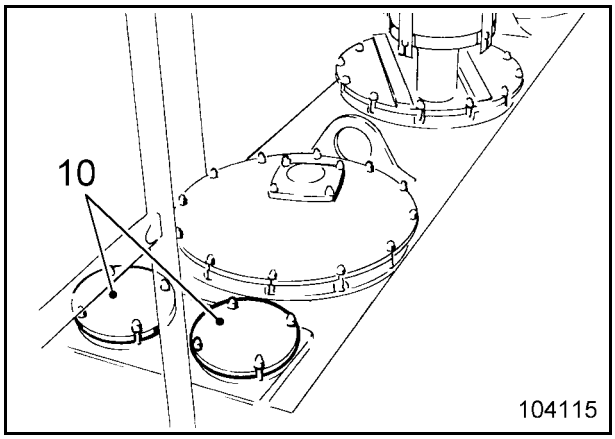

Fig. 3-48:

- Detach cover (10, Fig. 3-48: resp. Fig. 3-47:) 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).

Cleaning the hydraulic oil cooler

Risk of injury from rotating cooler fan blades.

Switch off the electric motor.

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. 3-66:) 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.

- Switch off the electric motor
- 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.

In winter-time, check that the fans (2) turn freely and that the cooling fins are free from ice and snow.

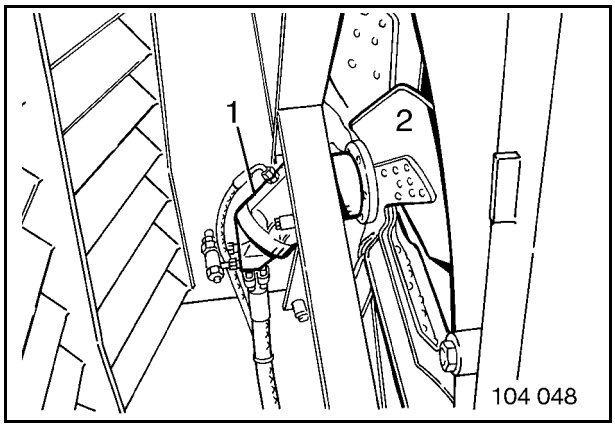

Fig. 3-66:

TRAVEL GAERBOX

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.

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. 3-83:) 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.

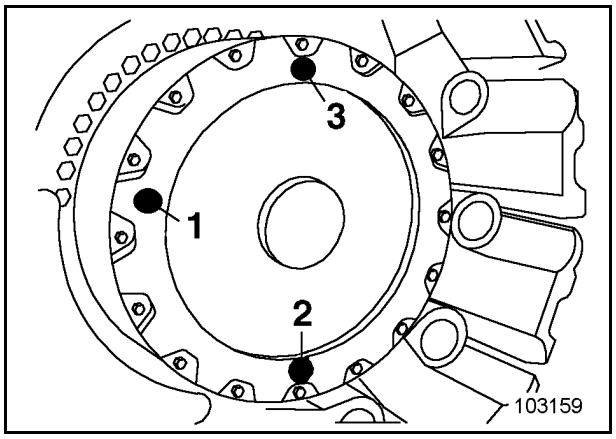

Fig. 3-83:

Pre-chamber - Check the oil level / Top up with oil

➲ Unscrew control plug (2,(Fig. 3-84:).
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.

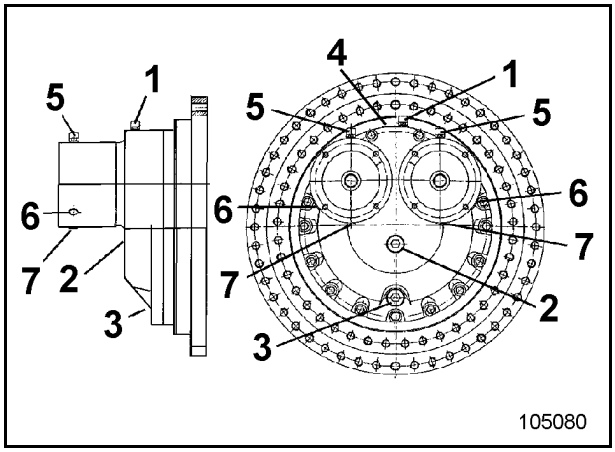

Fig. 3-84:

Brake chamber - Checking the oil level / Topping up with oil

➲ Unscrew checking screw (6, Fig. 3-84:).

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.

Function

The grease is pumped by the pump (2, Fig. 3-98:) via greasing lines from the grease container to the main distributors on the superstructure.

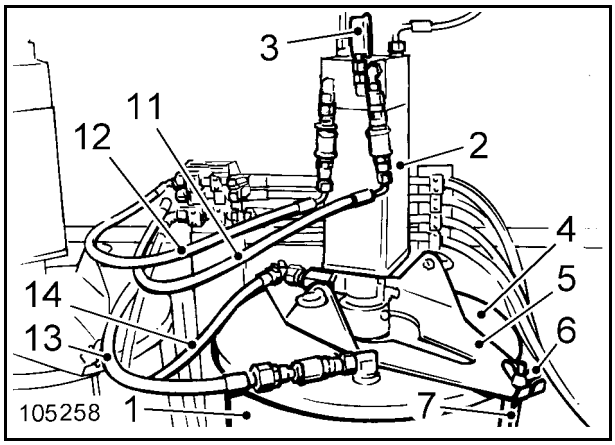

Fig. 3-98:

The control elements of the lubricating system are installed on the panel (3, Fig. 3-99:)

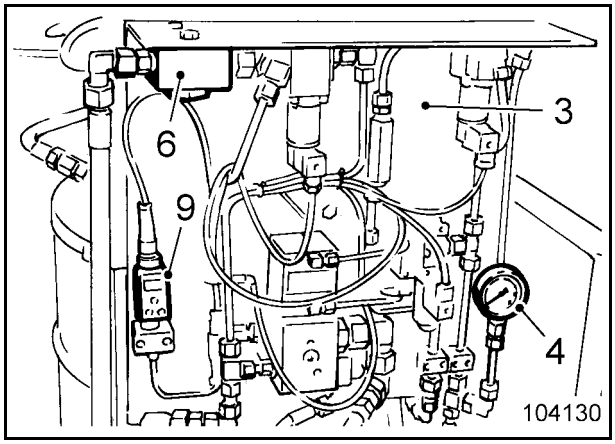

Fig. 3-99:

The control elements of the lubricating system are installed on the panel (3, Fig. 3-99:).

As soon as the grease container is empty, the BCS (Fig. 3-100) 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.

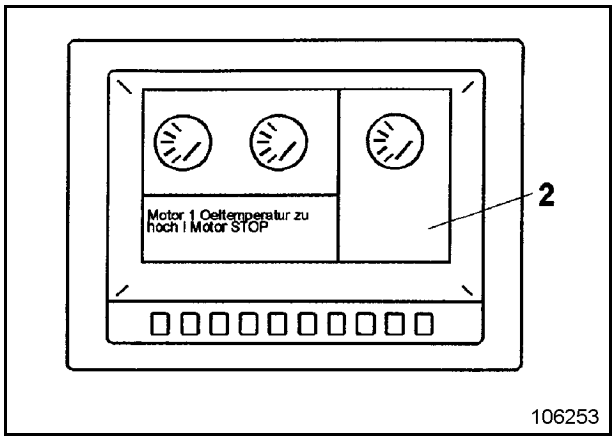

Fig. 3-100

NOTES

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PRESSURE ACCUMULATORS - SAFETY INSTRUCTIONS

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The hydraulic system is equipped with pressure accumulators containing nitrogen under high initial pressure.

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

Central lubricating system – Fault table

Fault					Remedial action	
Grease pump not working, the BCS does not indicate a warning Automatic circuit breaker on					Check Adjust Replace Top up Reduce Clean Vent 1) Contact the Terex|O&K Service	P E W A S R L
	Grease pump not working, pilot lamp lit					
		Grease pump working, no grease delivered				
			Greasing pressure too high or too low			
				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**