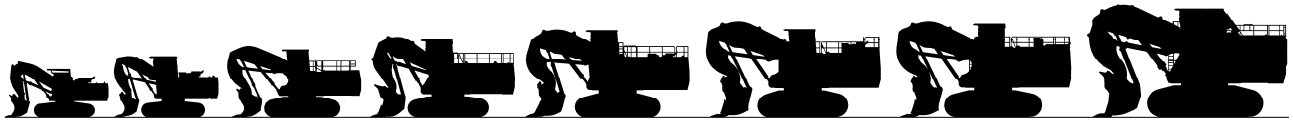
Operating Instructions

CE

Hydraulic Excavator

RH 170 No.

Bucyrus HEX GmbH



1 INTRODUCTION

	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**

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

Diesel engine exhaust and some of its constituents are known 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).

CALIFORNIA Proposition 65 Warning
Diesel fuel and Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

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 recommisioning procedure must be strictly in accordance with the operating instructions.

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

11 – Engine
12 - Radiator (engine cooling liquid)
13 - Air-intake system
14 - Exhaust system
15 - Fuel Tank
16 - Engine oil reservoir (optional)
17 - Hydraulic oil reservoir
18 – Hydraulic oil cooler
19 – Filter housing (cooling system)
20 – Pump transfer gearbox
21 - Working pump
22 – Slewing pump
23 - Servo system pump
24 - Gearbox circulating pump
25 - Filling pump (slewing circuit)
26 - Fan drive pump (engine radiator)
27 – Pump for fan drive and hydraulic oil cooling
28 – Cooling oil pump
29 - Slewing gear
30 - Travel block and rotor
31 - Driver's cab
32 - Control stand with BCS
33 - Control-cabinet
34 - Air conditioner
35 - Fire-extinguisher
36 - Control-cabinet with battery main switch
37 – Batteries
38 - Service-station (tank lift)
39 – On-board crane (optional)
40 – Crane engine (optional)
41 – Fuel tank (crane engine, optional)
42 – Battery (crane engine, optional)
43 – Hydraulic oil reservoir (crane engine, optional)
44 – Grease container of central lubricating system
45 – Tool cabinet (optional)
46 – Ladder
47 – Ladder
48 – Counterweight
49 – Air compressor drive (air conditioning)

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

Driver's seat

The driver's seat (Fig. 2-25:) 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"

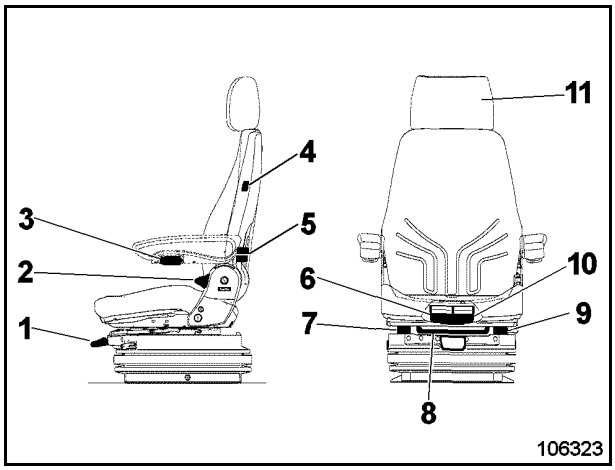


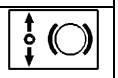
Fig. 2-25:

Pos.	Function
1	Height adjustment
2	Backrest adjustment
3	Armrest adjustment
4	Seat heating ON / OFF
5	Lumbar support, inflate / deflate the air chambers
6	Fore-and-aft position adjustment of the seat
7	Cushioning effect adjustment
8	Fore-and-aft position adjustment of the complete drivers seat
9	Longitudinal / horizontal cushioning adjustment
10	Inclination adjustment of the seat
11	Headrest height and inclination adjustment

(Fig. 2-42)

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:** ▪ 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 ▪ Swing pump temperature (1 and / or 2; left and / or right too high ▪ Swing 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.**	

(Fig. 2-47:)

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**	**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	

(Fig. 2-52:)

No.	Element		Function	Symbol
131	**Monitoring device**	**Engine monitoring (engine 2 right)**	Indicates different parameters on the display (E) Use push buttons (C and D) to scroll through parameter list. Indicator lamps (A and B) lit when an active fault occurs.	
132	**Thermometer**	**Engine temperature (engine 2 right)**	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	**Pressure gauge**	**Engine oil pressure (engine 1 left)**	Indicates the oil pressure in the diesel engine lubricating system	
135	**Thermometer**	**Engine temperature (engine 1 left)**	Indicates the cooling-water temperature	
136	**Warning lamp**	**Cooling water level (engine 1 left)**	Lits up when the cooling-water level is too low	
137	**Warning lamp**	**Alternator (engine 1 left)**	Lits up when the batteries are not recharged	
138	**Warning lamp**	**Cooling water level (engine 2 right)**	Lits up when the cooling-water level is too low	
139	**Warning lamp**	**Alternator (engine 2 right)**	Lits up when the batteries are not recharged	
140	**Monitoring device**	**Engine monitoring (engine 1 left)**	Indicates different parameters on the display (E) Use push buttons (C and D) to scroll through parameter list. Indicator lamps (A and B) lit when an active fault occurs.	

Assemblies resp. reservoirs	Measuring device	Remarks
Fuel tank	BCS fuel indicator (2, Fig. 2-62:)	Stop filling when the fuel tanks are full. Switch on the monitoring system by using toggle switch (23, Fig. 2-61:). The indicator light (22) comes on. The indicator light (32) comes on when the LH fuel tank is full. The indicator light (33) comes on when the RH fuel tank is full. Switch off the monitoring system by using toggle switch (23).

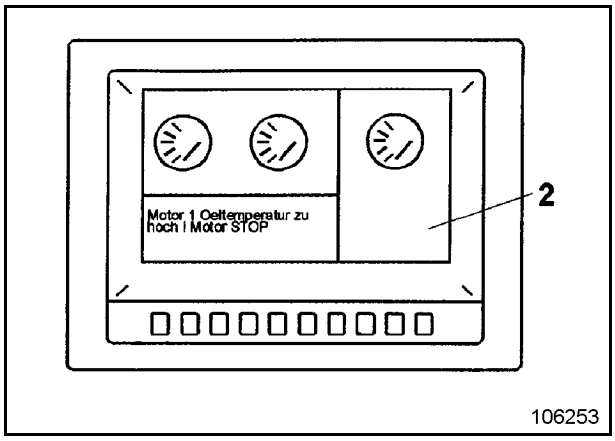


Fig. 2-60:

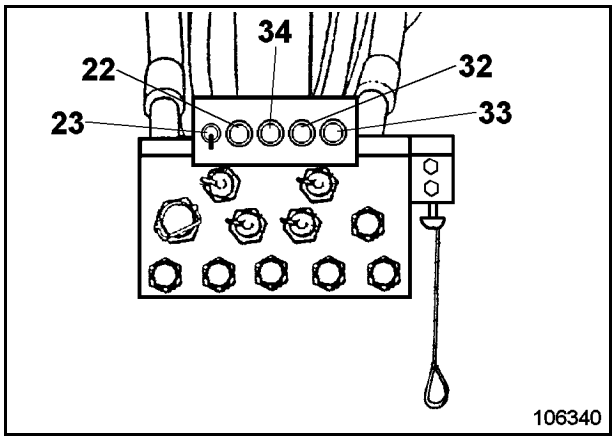


Fig. 2-61:

Back-up heating (option)

The back-up heating control elements are located in the satellite (182, Fig. 2-80:).

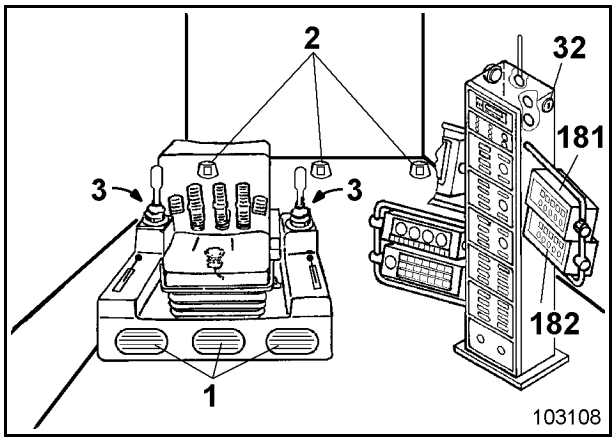


Fig. 2-80:

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

Control panel (Eberpächer)

(Fig. 2-81:)

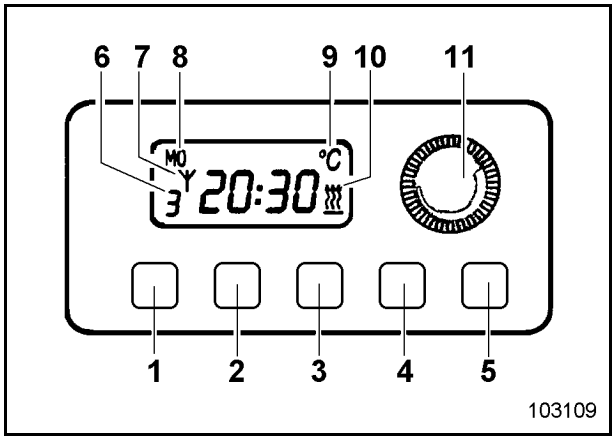


Fig. 2-81:

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

TRANSPORTING THE MACHINE

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 responsability 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.

NOTES

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.

Plan A – E

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)

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

Inspection plan – Oil (legend))

No.	Location	Number	Lubricant properties [17]	Check oil level every ... OH	Change oil every ... OH
1	Engine	2	I	10	250
3	Hydraulic system	1	II	10	10000 [18]
4	Pump transfer gearbox - pre chambers	2 2 x 5	III.a	60 10	1000 1000
5	Swing gearbox	3	III.b	10	1000
6	Travel gearbox - Pre-chambers - Brake chambers	2 2 x 1 2 x 2	III.c	500 500 500	5000 5000 5000
7	On-board crane (optional) - Crane drive engine - Hydraulic oil reservoir	 1 1	 I II	 10 10	 250 [19] 1000 [20]

[17] see "LUBRICANTS" section

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

[19] Change oil at least once a year.

[20] Change hydraulic oil at least once a year.

Checking the engine oil level / Topping up

The engine oil pressure and oil temperature are-constantly monitored by the BCS (2, Fig. 3-11:) when the machine is in operation.

The actual pressure and temperature of the engine oil can be displayed on the screen (2, Fig. 3-11:).

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

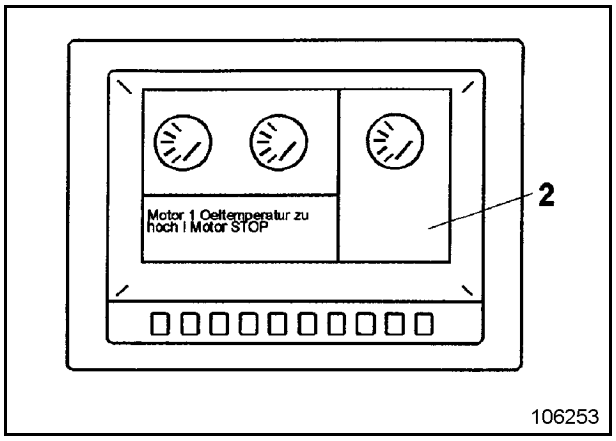


Fig. 3-11:

- Park the machine on a horizontal surface and secure against inadvertent movements.
- Shut off engines.
- Draw out oil dipstick (2, Fig. 3-13:).
- Wipe oil off the dipstick with a clean, lintfree cleaning rag and re-insert.

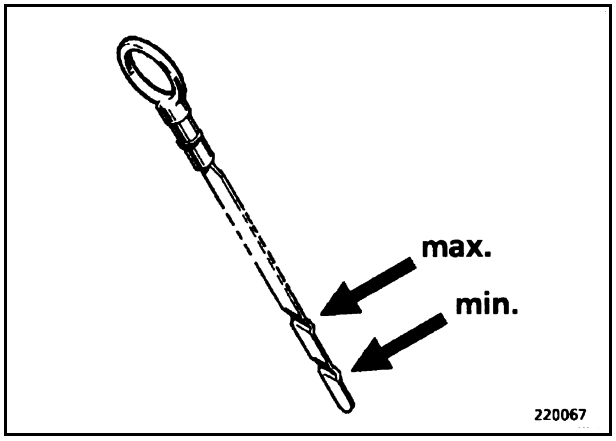


Fig. 3-12:

- Draw out dipstick a second time. The oil level should now lie between the marks (arrows, Fig. 3-12:). If the oil level is at the "min" mark or below, top up with engine oil through filler tube (1, Fig. 3-13:).

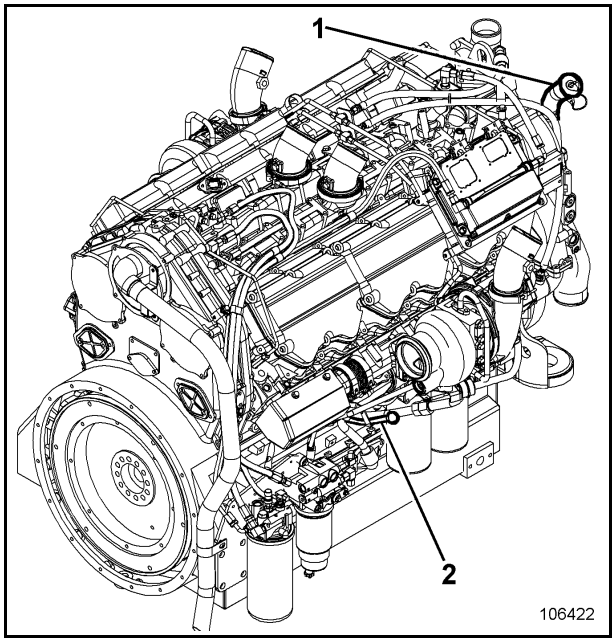


Fig. 3-13:

Engine oil can also be filled in from the service station (Fig. 3-14:) through

- express coupling (8) for the lefthand engine
- express coupling (9) for the righthand engine

(see chapter "Changing the engine oil")

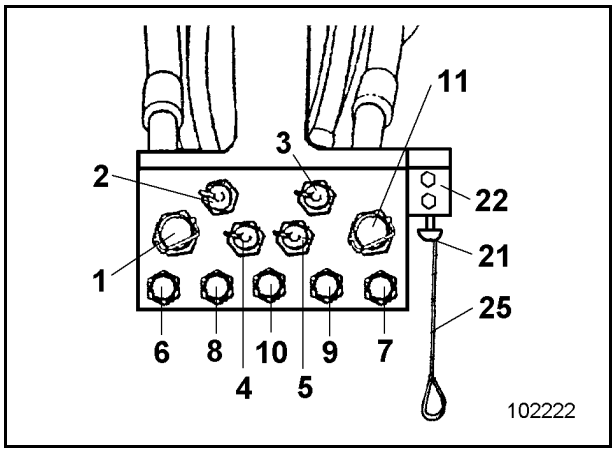


Fig. 3-14:

Before installing the filter element, clean contact faces at cover (2, Fig. 3-28:) 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. 3-29:) must remain in the filter housing.

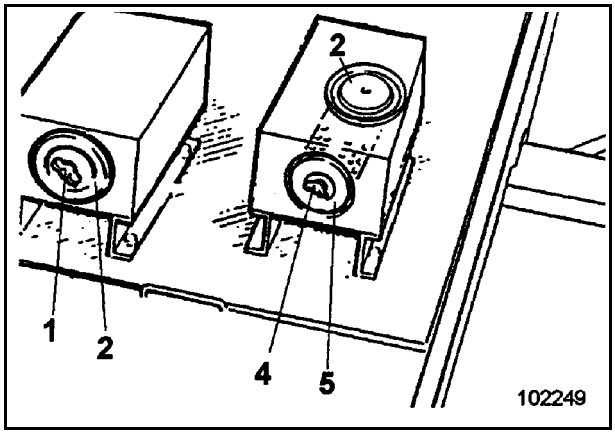


Fig. 3-28:

Checking and cleaning the main filter element

Examine the filter paper of the element with a lamp which is introduced into the element (Fig. 3-30:). 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.

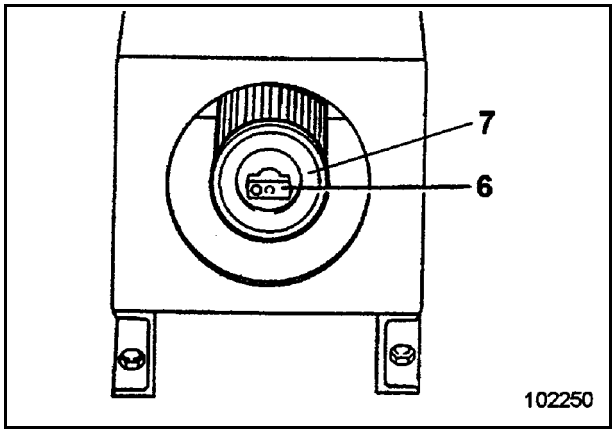


Fig. 3-29:

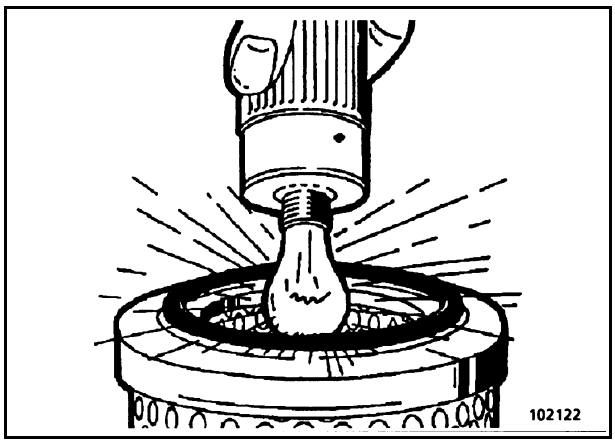


Fig. 3-30:

Blow filter element (Fig. 3-31:) 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 / 87psi.

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

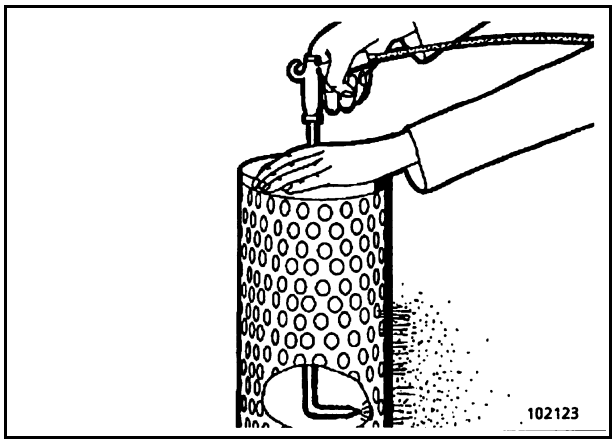


Fig. 3-31:

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.

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. 3-47:).
- ➲ 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 (0.4").
- ➲ If the fluid level is too low, top up with distilled water only

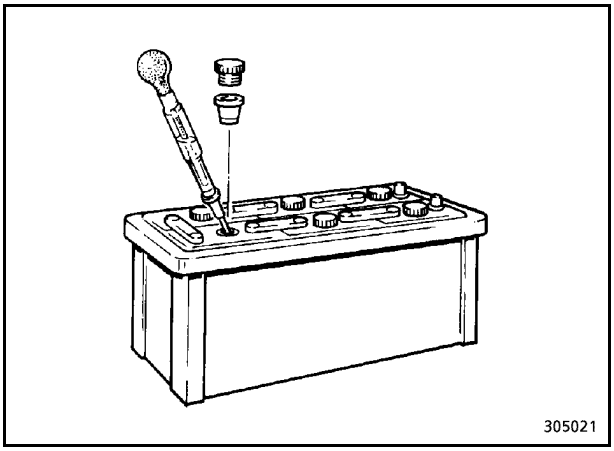


Fig. 3-47:

Removing and installing the battery

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

- ➲ Unscrew caps of the battery (Fig. 3-47:).
- ➲ Measure the acid density of the battery using a commercial acid tester (Fig. 3-47:). 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

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

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.

Replace the return-flow filters (25, Fig. 3-68:) together with the return-flow filters in the hydraulic oil reservoir.

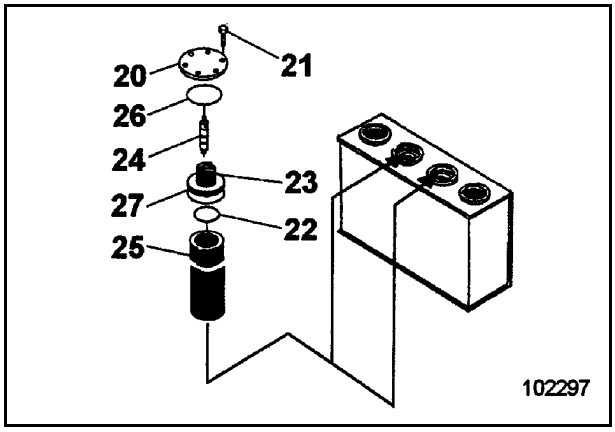


Fig. 3-68:

- ➲ Detach cover (20) together with sealing ring (26).
- ➲ Remove retaining disk (23) together with sealing ring (27).
- ➲ Withdraw filter element (25).
- ➲ Insert a new filter element.
- ➲ Clean the magnetic rod (24).

If metal filings are detected, locate cause and rectify.

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

- ➲ Refit cover (20) with new sealing ring (26).

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. 3-86: and Fig. 3-87:) must be either completely retracted or completely extended.

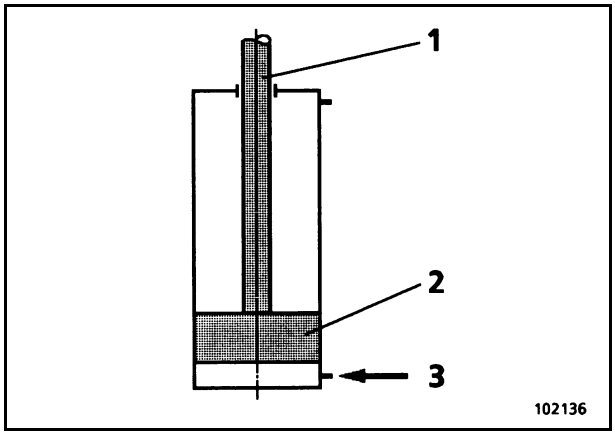


Fig. 3-86:

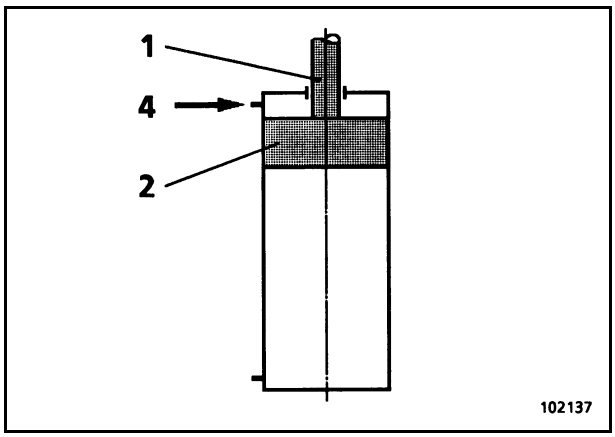


Fig. 3-87:

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. 3-86:),
- the rod-side port (4) when the piston rod is extended (1, Fig. 3-87:).

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).

Filling in new oil / Topping up

➲ Unscrew plug (4, Fig. 3-106:) and fill in new oil.

➲ Check oil level with dipstick (1, Fig. 3-106:).

➲ Screw in plug (4) again.

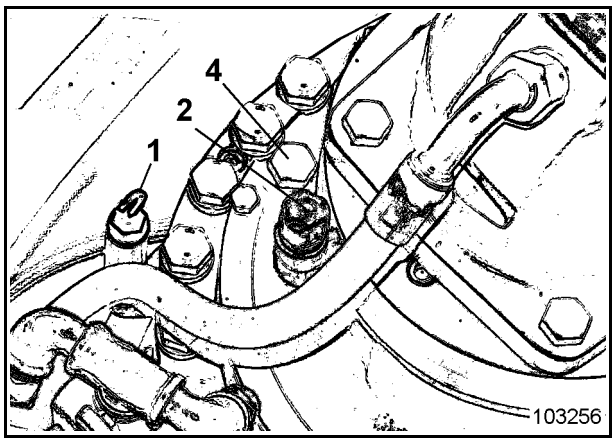


Fig. 3-106:

Gearbox venting

The gearbox is vented through breather filter (2, Fig. 3-106:).
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.

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 PLC.

The PLC is located in a switch box underneath the cab.

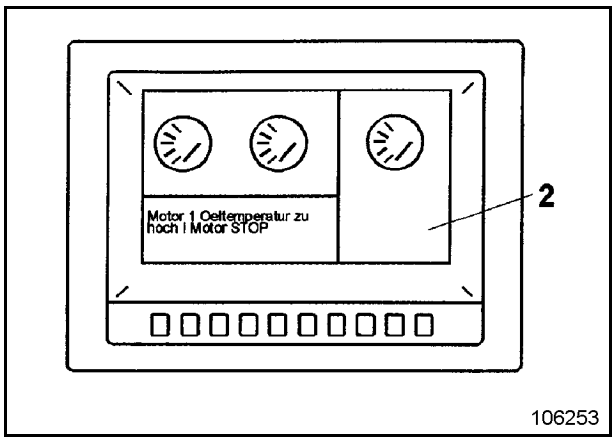


Fig. 3-121:

If a fault occurs, BCS gives a warning on the screen (2, Fig. 3-121:). Actuate the "Reset" button (73, Fig. 3-122:) to eleminate the fault. If this is not possible, call in servicing personal.

For further information on the function and setting refer to the „Technical Handbook – „Programmable logic controller“.

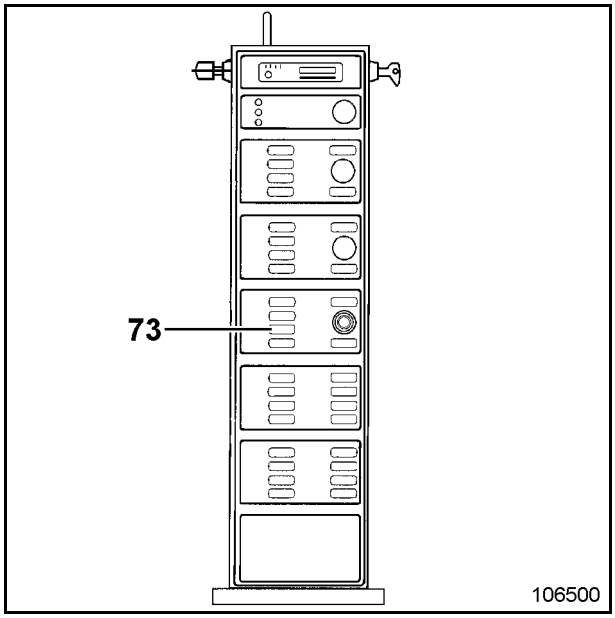


Fig. 3-122:

Pressure-accumulator inspection regulations

The following regulations are applicable only in Germany. Please observe the relevant regulations in force in your own country.

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 x 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**	
III $p \geq 1$ bar and $p \cdot x\ l \geq 200$ bars $p \cdot x\ l \leq 1000$ 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.

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 faciliate 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.

NOTES

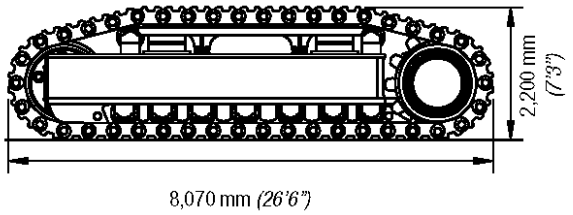
HYDRAULIC CIRCUIT DIAGRAM

Detailled information can be found in the „Technical Handbook“ chapter 8 or contact **Terex|O&K**.

General Packing List (approx. values; details may vary depending on scope of supply and destination)

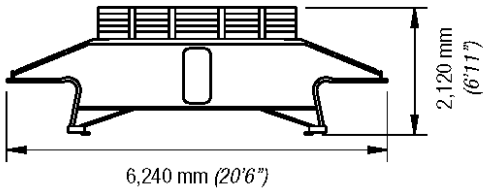
Crawler side frame with track pads (2 units)

Width 1,800 mm *(5'11")* Gross weight 51,500 kg *(113,540 lb)*



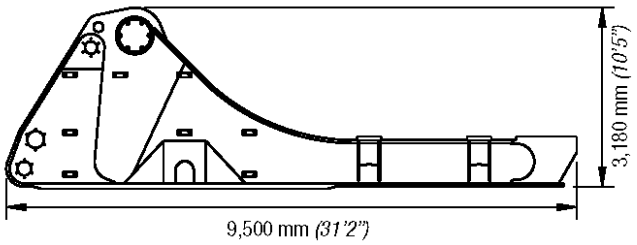
Undercarriage centre frame with swing roller bearing

Width 3,800 mm *(12'6")* Gross weight 33,700 kg *(74,300 lb)*



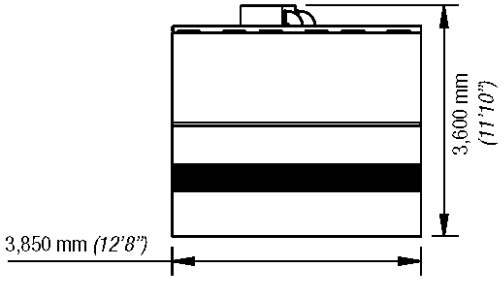
Superstructure centre frame

Width 3,610 mm *(11'10")* Gross weight 50,500 kg *(111,330 lb)*



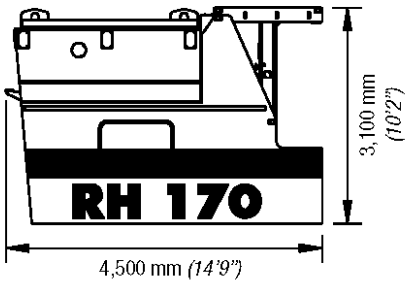
Engine module with diesel engines

Width 6,150 mm *(20'2")* Gross weight C32 33,000 kg *(72,750 lb)*
Gross weight KTA38 35,000 kg *(77,160 lb)*



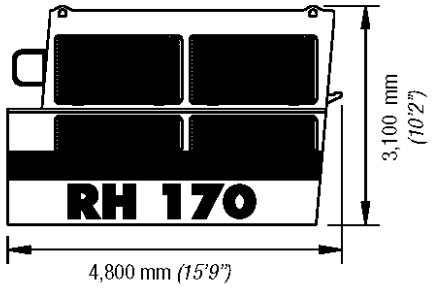
Cab pedestal module

Width 2,050 mm *(6'9")* Gross weight 5,550 kg *(12,240 lb)*



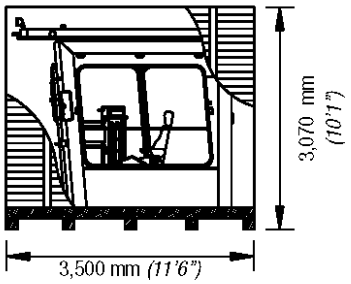
Oil cooler module

Width 1,980 mm *(6'6")* Gross weight 6,700 kg *(14,770 lb)*



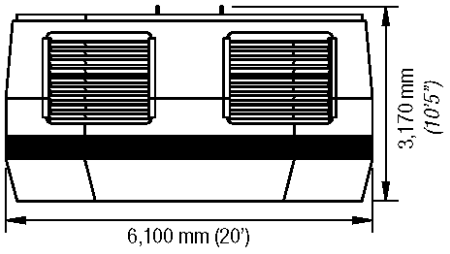
Crate with cabin and FOPS

Width 2,610 mm *(8'7")* Gross weight 3,500 kg *(7,720 lb)*



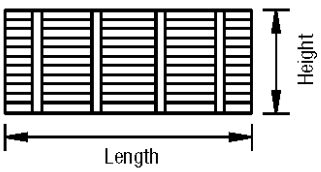
Counterweight incl. radiators

Width 1,300 mm *(4'3")* Gross weight 38,850 kg *(85,650 lb)*



Crates

Content	Length mm *(ft:in)*	Width mm *(ft:in)*	Height mm *(ft:in)*	Gross weight kg *(lb)*
Three swing gears	1,500 *(4'11")*	1,350 *(4'5")*	1,930 *(6'4")*	3,830 *(8,440)*
Swing ring cover	2,200 *(7'3")*	1,300 *(4'3")*	1,000 *(3'3")*	340 *(750)*
Swing ring bolts, access ladder, etc.	1,950 *(6'5")*	1,510 *(4'11")*	1,170 *(3'9")*	1,700 *(3,750)*
Grease container with pump	1,700 *(5'7")*	1,300 *(4'3")*	2,050 *(6'9")*	1,470 *(3,240)*
Barrels (hydraulic oil)	2,700 *(8'10')*	1,400 *(4'7")*	1,210 *(4')*	2,080 *(4,590)*
Barrels (grease; antifreeze)	1,400 *(4'7")*	1,400 *(4'7")*	1,300 *(4'3")*	860 *(1,900)*



All details provided are for general information only. Exact dimensions subject to selected machine configuration and final packing list.