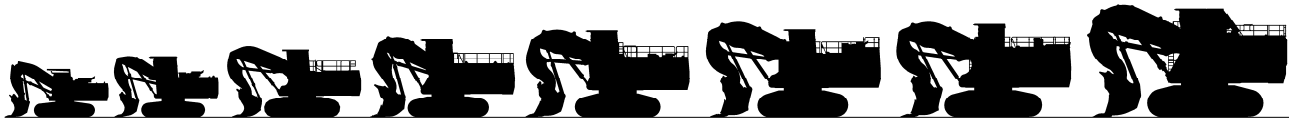
Operating Instructions

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).

Ether

The machine can be equipped with pressure vessels for cold-starting fluid (ether) installed in the engine compartment. Ether is toxic and highly flammable; the vessels are under pressure. These pressure vessels can explode if exposed to high temperatures (above 49°C / 120°F) or in the event of damage. Protect the vessels against damage and high temperatures.

Do not store pressure vessels with cold-starting fluid (ether) on the excavator.

Do not eat, drink or smoke when replacing pressure vessels with cold-starting fluid (ether). Observe the instructions on the pressure vessels. Provide for sufficient ventilation (see also Part 3 "Inspection and servicing").

Do not open empty cold-starting fluid pressure vessels (ether). Have the vessels disposed of properly.

For further details please refer to the instructions and safety data-sheets of the manufacturer / supplier of pressure vessels with cold starting fluid (ether).

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 - Swing 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

EMERGENCY STOP switch

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

In an emergency, press the EMERGENCY STOP.

The EMERGENCY STOP switches are located:

- in the control column in the driver's cab (31, Fig. 2-23:) and
- in the control cabinet (2, Fig. 2-24:) and
- on the righthand side at the counterweight. This latter one is to operate with the rope (3, Fig. 2-25:).

The electrical system of the excavator can be switched on after the EMERGENCY STOP switches are activated.

➲ Pull the switches out.
The switching pin of the rope operated switch (Fig. 2-25:) must be pushed in.

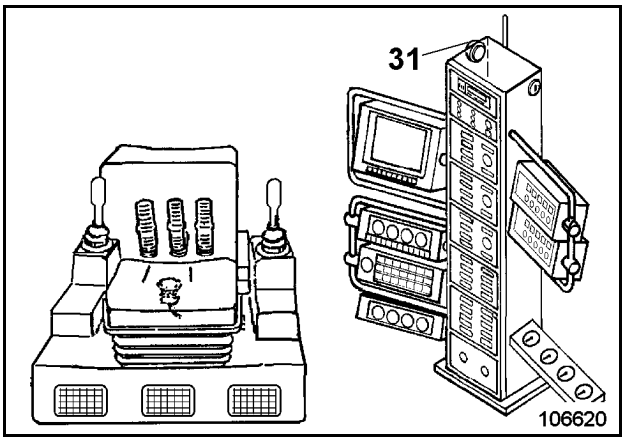


Fig. 2-23:

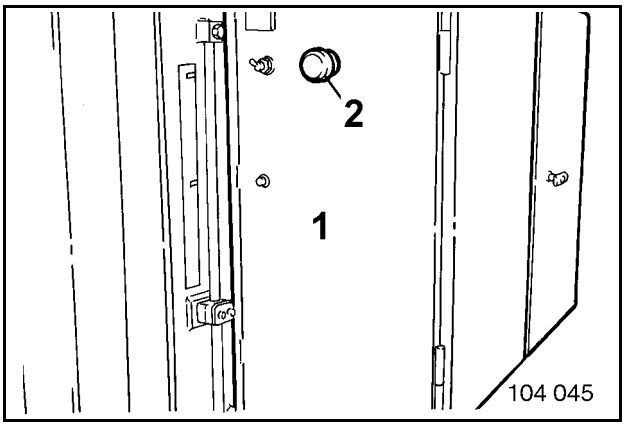


Fig. 2-24:

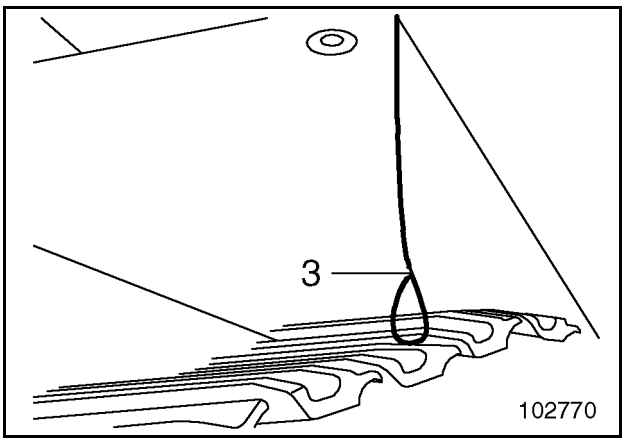


Fig. 2-25:

(Fig. 2-45:)

No.	Element		Function	Symbol
1	**BCS**	**Electronic measuring-data collection and processing system**	Collection, storing and displaying 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 brighter.	BL +
12	**BL - button**		Adjusts BCS monitor background lighting darker.	BL-

Fig. 2-50:

No.	Element		Function	Symbol
61	**Switch**	**Starting (right engine 2)**	Starts the engine: Hold switch approx. 5 – 7 sec. This is necessary to start and pressurize the engines prelube system. After then the engine starts automatically.	
62	**Switch**	**Stopping (right engine 2)**	Shuts off the engine.	
63	**Switch**	**Idling (right engine 2)**	Shuts off the engine with 5 minutes after run.	
64	**Switch**		Not connected.	
65	**Momentary switch**	**Diagnostic ON / OFF**	With the engine at standstill push momentary switch to the left and hold: Stored faults in the right engines electronic unit can be displayed. Faults are displayed by warning lamp no. 46 as flashing sequences (see: "Engine electronic unit, displaying stored fault codes").	
66	**Speed adjustment**	**Potentiometer (right engine 2)**	Changes engine speed: ▪ turn CCW to limit stop - idling speed. ▪ turn CW to limit stop - full-load speed.	
67	**Momentary switch**	**Diagnostic increment / decrement**	Not connected.	

(Fig. 2-55:) (Options. Depending on the options ordered with the machine, the described elements can be found on different positions on the control column).

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 eng.	
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	

Express couplings are provided for refilling the following consumables:

Note:
Connections used may vary depending on how the machine is equipped.

Pos. Fig. 2-62:	Fluid	Express coupling for
1	Diesel fuel for lefthand and righthand fuel tank	filling
2	Cooling fluid for left engine	Filling and/or draining
3	Cooling fluid for right engine	Filling and/or draining
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	not used	
7	not used	
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

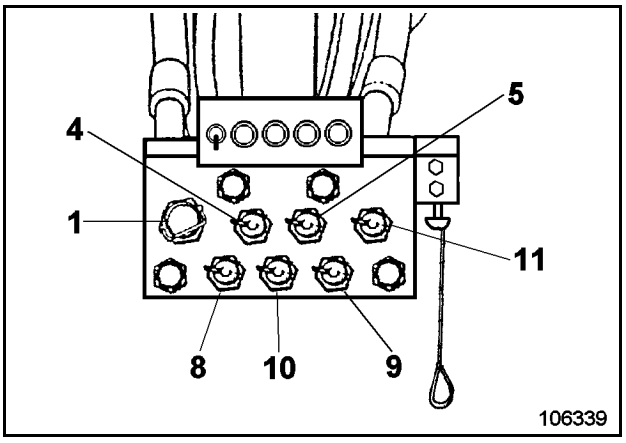


Fig. 2-62:

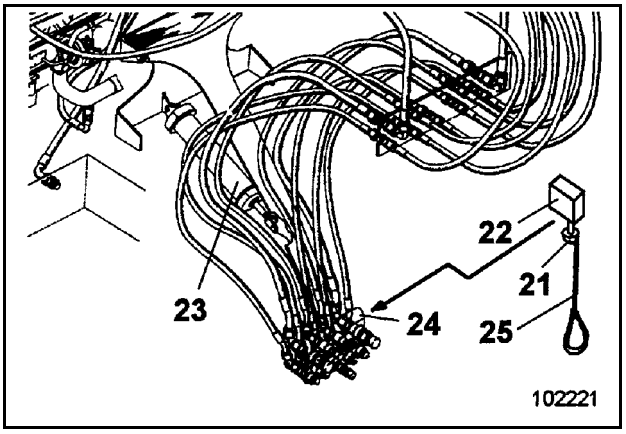


Fig. 2-63:

Lowering the service station

Draw out control knob (21, Fig. 2-63:) 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. 2-62:).

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.

Back-up heating (option)

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

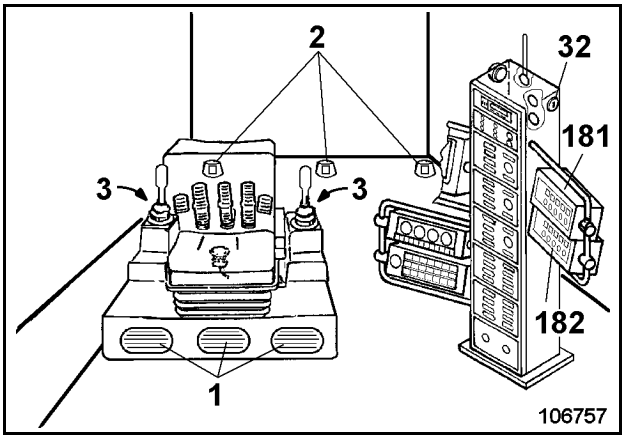


Fig. 2-84:

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

Control panel (Eberspächer)

(Fig. 2-85:)

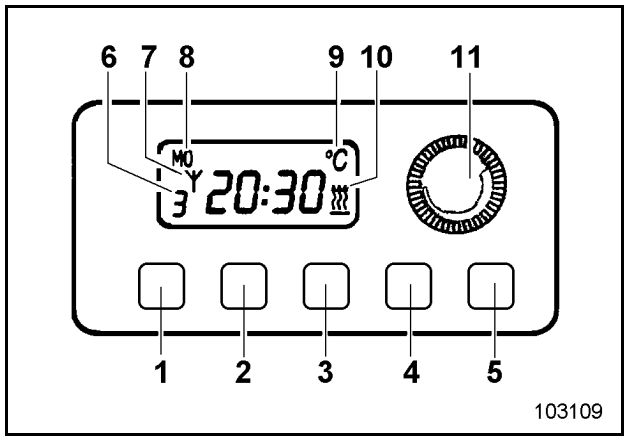


Fig. 2-85:

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

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 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 excavators components and modules must be dismantled beforehand.

Suspensions points as well as the center of gravity are marked on the modules (see example, Fig. 2-104:).

Dimensions and weights of the machines modules can be found in the annex, chapter “Technical Data” as well as in the “Technical Handbook”.

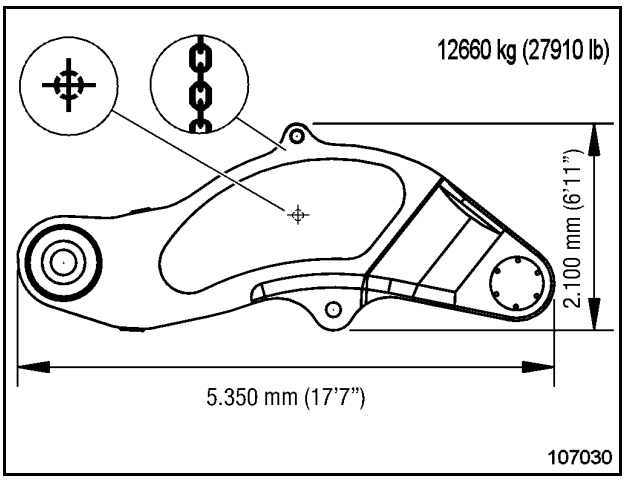


Fig. 2-104:

NOTES

INSPECTION AND SERVICING WORK, FIRE AND EXPLOSION HAZARD

Safety instructions

Prior to commencing work, obtain informationon the national and corporate rules for the prevention of accidents and avoiding fires.

Pay particular attention to hazards caused by combustible and easily flammable substances.

Obtain information on the safe handling of the fire extinguishers to be used.

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

Even battery gases can ignite in open flames or fire.

Combustible and easily or highly inflammable substances or liquids increase the risk of fire and explosion. This is also valid for pressure vessels containing flammable substances as, for instance, spray oil or cold-starting fluid (ether). They are heat-sensitive and can explode even if exposed only to intensive sunlight.

These substance can also ignite themselves if they come close to hot units or objects as, for instance, a turbocharger.

Do not store these substances on the excavator. If combustible, easily or highly flammable substances or liquids were used during maintenance operations, they must be completely removed from the excavator at the end of the work.

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.

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

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

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

The engine compartment can be equipped with pressure vessels containing cold-starting fluid (ether). Ether is toxic and highly flammable; the vessels are under pressure. These pressure vessels can explode if exposed to high temperatures (above 49°C / 120°F) or in the event of damage. Protect the pressure vessels against damage before beginning to work in or close to the engine compartment.

Ensure sufficient ventilation.

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.

Clean the excavator carefully after the maintenance, if oil, grease, fuel, detergents or cold-starting fluid have been spilt over the machine. If possible, use a steam-jet cleaner for cleaning.

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	Quant. / Nos.	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 [6]			●	●	●
- Pedal							
- Control spool (machine with loading shovel)	oil lightly	3 x 2 [6]			●	●	●
- Control spool (machine with backhoe bucket)	oil lightly	2 x 2 [6]			●	●	●

[6] apply a thin layer of hydraulic oil

Lubricating chart – Grease (legend)

No.	Greasing point	Number	Lubricant properties	Grease every .... operating hours
1	Central lubricating system – grease container	1	**V** [19]	10
3	Track roller (Option)	2 x 7	**Tribol** Bucyrus HEX part no. 2764564	1000
4	Ramp-type ladder (optional)		**V** [20]	1000
5	On-board crane		**V** [20]	250
	- Bearing	4		250
	- Joint (column / boom)	2		250
	- Cylinder bearing	5		250
	- Swing ring	1	**Graphi-tespray**	250
6	Monitoring, warning and control elements			
	- Joystick	2 x 4 [20]	**II** [20]	1000
	- Pedal	3 x 2 [20]		1000

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

Filling quantities - Grease

Greasing point	Lubricant properties	Filling quant. in	
		kg	lb
Central lubricating system – grease container (different containers available)	**V** [20]	appr. 1000	appr. 2205
Internal gearing – Roller-bearing swing ring		appr. 300	appr. 662
Idler (permanent grease filling)	**Tribol** Bucyrus HEX part no. 2764564	2 x appr. 25	2 x appr. 55
Track rollers (permanent grease filling)		14 x appr. 15	14 x appr. 33
Support rollers (permanent grease filling)		4 x appr. 14	4 x appr. 31

[19] see: "LUBRICANTS" section.

[20] apply a thin layer of hydraulic oil

V. Greases for bearings and swing rings

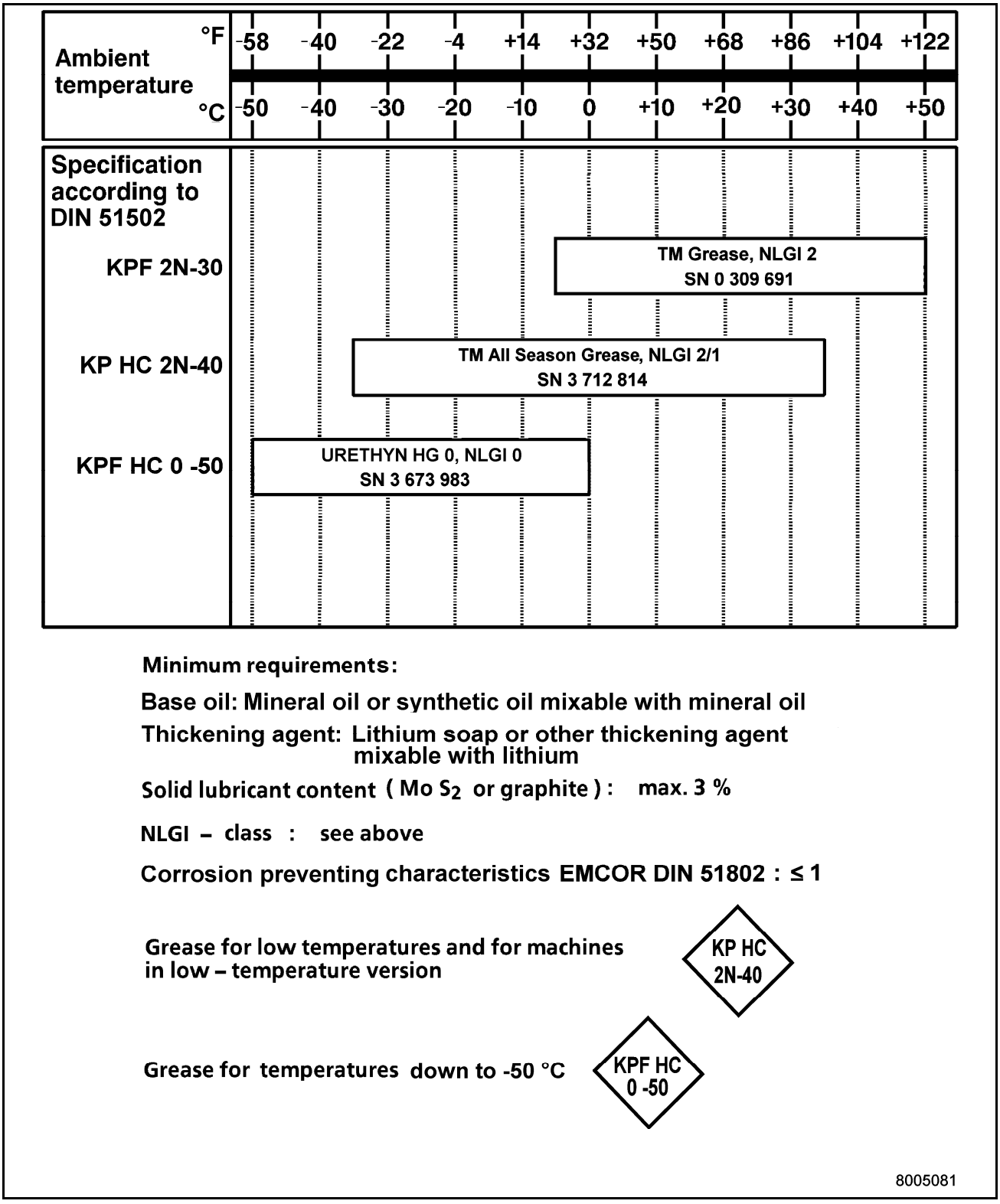


Fig. 3-8:

Engine oil reservoir (optional), replacing the oil filters

Risk of scalding from hot engine oil.

Read and observe: "Inspection and servicing – Safety instructions".

The filter housing may also be hot. Wear protective gloves and firm working clothing.

Collect escaping oil and discard with-out polluting the environment.

Replacing the oil filter

Carry out servicing of the oil filters (2, Fig. 3-27:) together with the engine oil reservoir.

Replacement:

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

Thereafter:

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

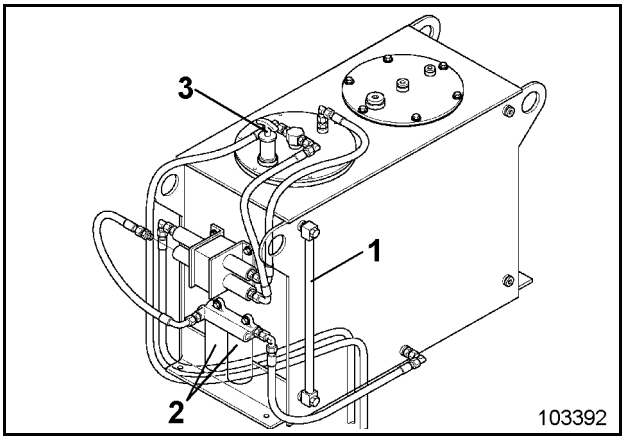


Fig. 3-27:

Filling in cooling liquid

➲ Shut off the engines.

➲ Fill in cooling liquid with the service station (Fig. 3-44:) through:

- express coupling (2) for the lefthand cooling circuit,
- express coupling (3) for the righthand cooling circuit.

➲ Unscrew cap of express coupling.
Connect hose of the service vehicle.

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

➲ Remove hose from express coupling.
The coupling closes automatically.

➲ Screw on protective cap.

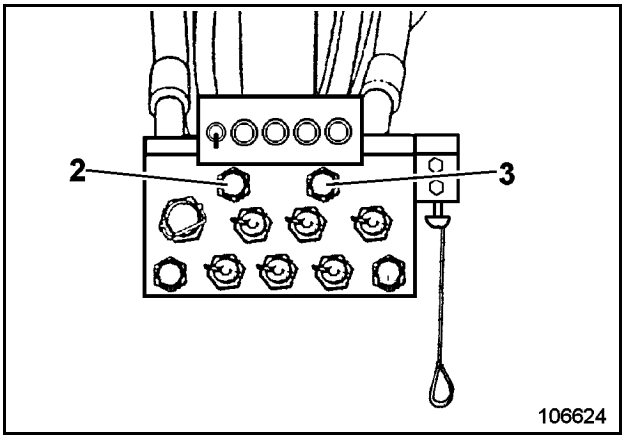


Fig. 3-44:

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 trap (option)

Water contained in the fuel is removed by the water trap (Fig. 3-62:).

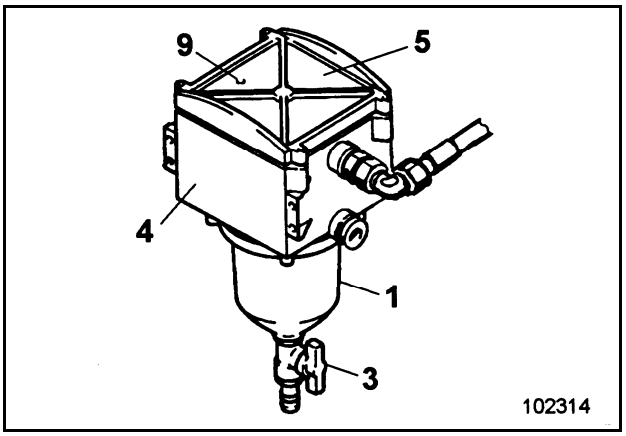


Fig. 3-62:

Draining off water

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

➲ Loosen venting plug (9, Fig. 3-63:) and leave drain valve (3) open until there is no more water in the diesel fuel flowing out of the valve.

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

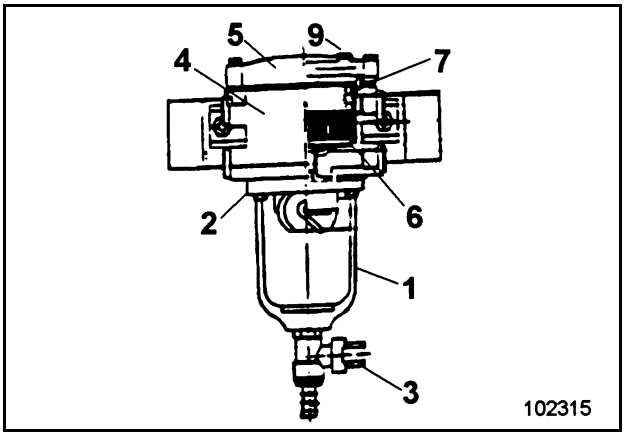


Fig. 3-63:

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).

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, keep sitting on the operator's seat.
- ➲ Do not switch off the electrical system

Sections 1 and 2: servo control and working hydraulics

- ➲ Shift both control levers and all pedals repeatedly into all directions (Fig. 3-76:).

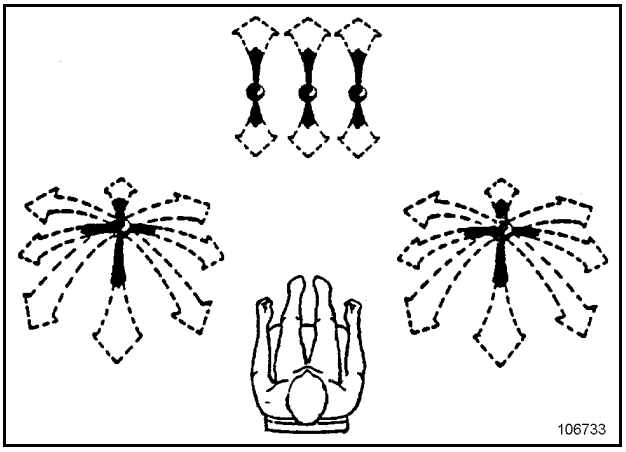


Fig. 3-76:

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.

Detailled information can be found in the Technical Handbook, chapter 8: Hydraulic System".

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 ½ and ¾ marks of the inspection glass (1, Fig. 3-77:).

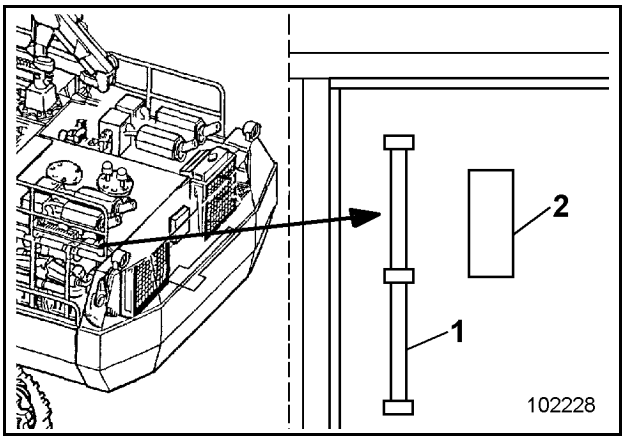


Fig. 3-77:

The hydraulic oil level is monitored by the BCS. The BCS displays a warning on the screen (Fig. 3-78:) if the hydraulic oil level is too low or too high.
Shut off the engines, locate cause and rectify.

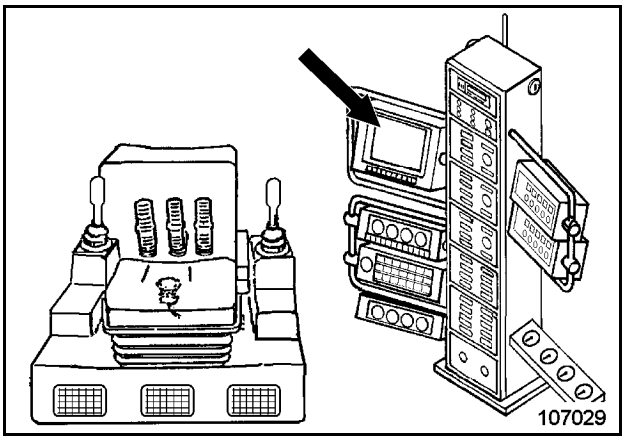


Fig. 3-78:

High-pressure filters for the servo circuit

The excavator is equipped with two high-pressure filters (Fig. 3-95:) for the servo circuit. Both filters are located in front of the hydraulic oil reservoir.

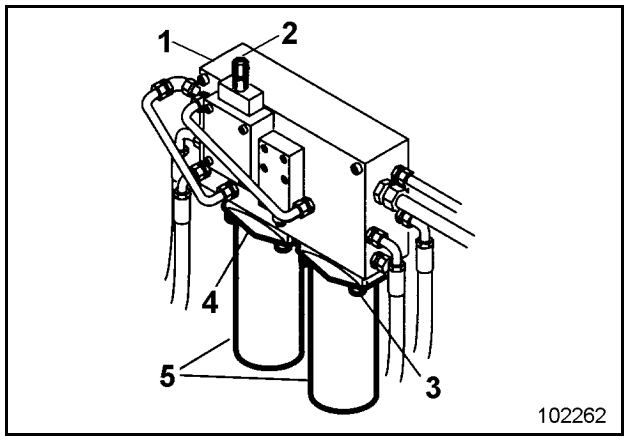


Fig. 3-95:

Risk of scalding caused by hot hydraulic oil.

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

Shut off the engines.

The hydraulic oil reservoir itself may also be hot. Wear protective gloves and firm working clothing.

Avoid skin contact. Skin contact with hydraulic oil may cause skin injury.

Collect escaping hydraulic oil and discard without polluting the environment.

Checking/cleaning the filter elements

- ➲ Detach flange (4, Fig. Fig. 3-96:).
- ➲ Remove filter housing and pour out used oil.
- ➲ Withdraw filter element (6) from filter housing (5).
- ➲ Clean filter housings and sealing faces at filter head with white spirit or paraffin oil.
- ➲ Insert new filter element into filter housing (5) and refit to filter head with a new, lightly oiled sealing ring (8).

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

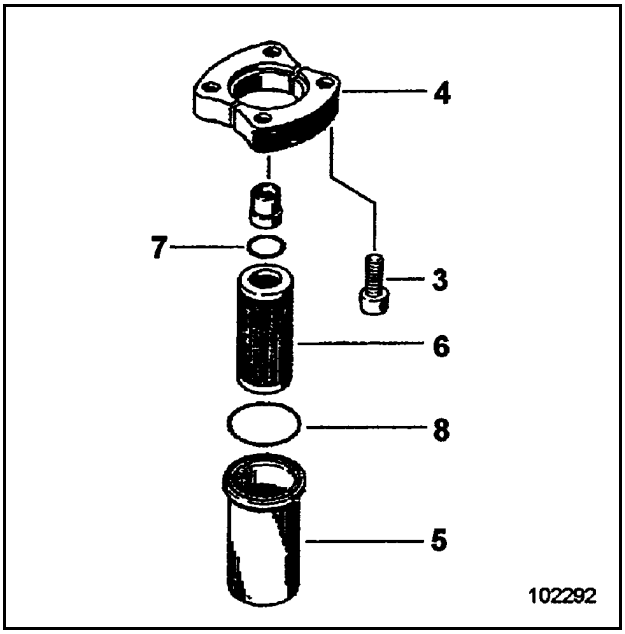


Fig. 3-96:

Replacing the filter elements

- ➲ Detach the filter elements as described under "Checking the filter elements".
- ➲ Install new filter element (6, Fig. 3-96:) and reassemble with a new, lightly oiled sealing ring (7).

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

Changing the gearbox oil

Draining off oil

Drain oil through express coupling (3, Fig. 3-115:).

➲ Place a suitable recipient for used oil under the drain.
The required recipient capacity is set out in the "Filling quantities - Oil" table.

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

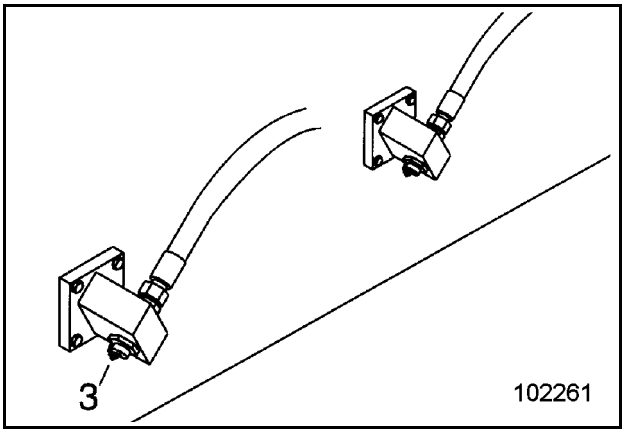


Fig. 3-115:

➲ Remove hose line after the oil has been drained from the gearbox.
The express coupling closes automatically.

➲ Screw on protective cap.

Drawing off oil (optional)

The gearbox oil is drained with the service station (Fig. 3-116:) through

- express coupling (4) for the lefthand pump transfer gearbox,
- express coupling (5) for the righthand pump transfer gearbox.

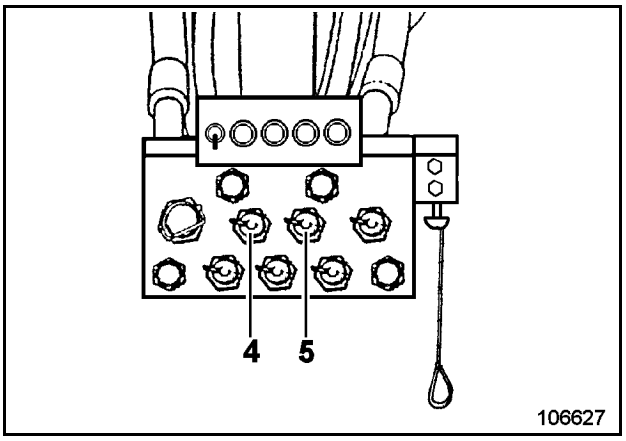


Fig. 3-116:

➲ 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 changes" section.

➲ Remove hose after the oil has been drawn off.
The coupling closes automatically.

➲ Screw on protective cap.

Track roller, Support roller

The track rollers and support rollers (1 and 2, Fig. 3-137:) are supported with grease by means of the automatic undercarriage greasing system.

Optional they could have a permanent grease filling. In this case it is necessary to press in grease filling at regular intervals.

It is necessary to be sure that there is always sufficient grease in the roller bearings.

Inspect all track and support rollers visually for leaks and free movement at regular intervals.

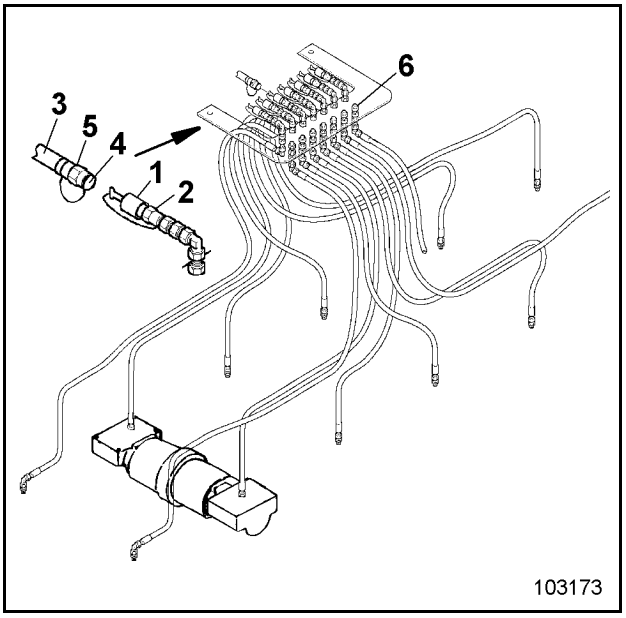


Fig. 3-136:

- ➲ Unscrew plug (6, Fig. 3-136:) from breather line.
- ➲ Remove dust cap (1) from coupling (2).
- ➲ Remove dust cap (4) from plug (5).
- ➲ Connect grease hose (3) to couling (2).
- ➲ Press in grease as long as used grease emerges from breather line.
- ➲ Screw on plug (6) to breather line.
- ➲ Disconnect the grease hose (3).
- ➲ Fix dust caps (1 and 4) back in place.

Track roller fastening

Check fastening screws (4, Fig. 3-137:) regularly for tightness:

- ➲ Tighten screws with a torque wrench to the prescribed tightening torque (see: "Technical Handbook").

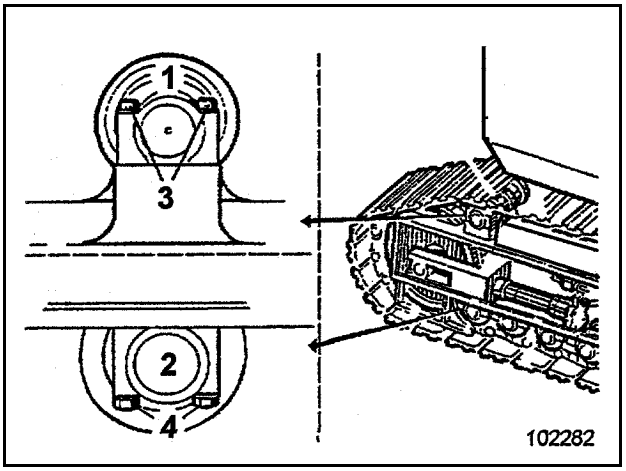


Fig. 3-137:

Support roller fastening

Check fastening screws (3, Fig. 3-137:) regularly for tightness

Tighten screws with a torque wrench to the prescribed tightening torque (see: "Technical Handbook")..

Oilfilter (hydraulic circuit grease pump)

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.

For filtering of the hydraulic oil, high pressure filter (11, Fig. 3-155:).is installed in the pumping line.

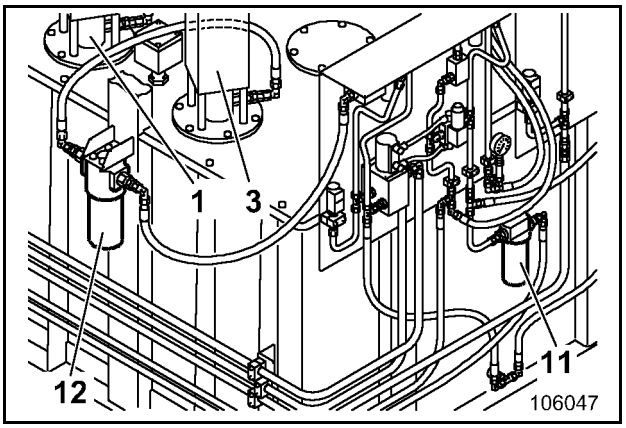


Fig. 3-155:

Replacing the filter element

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

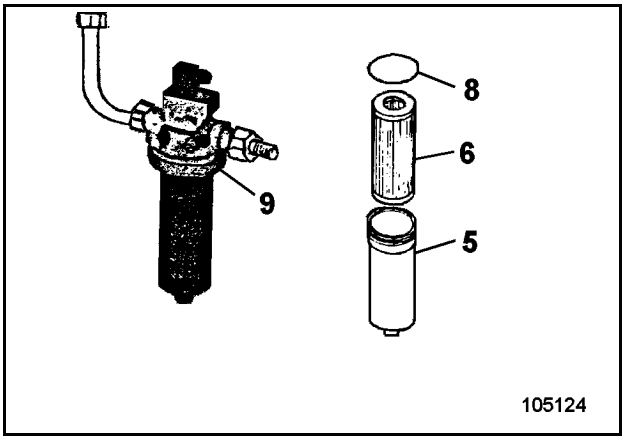


Fig. 3-156:

- Unscrew filter housing (5, Fig. 3-156:).
- 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.

NOTES

HYDRAULIC SYSTEM

Repair instructions

Always depressurize the hydraulic system before disconnecting any hydraulic hoses or pipes.

Read and observe also the chapters "Inspection and servicing - Safety instructions" and "Repair - Safety instructions".

Replace damaged and leaking hydraulic hoses and pipes as soon as possible by new ones.

Use original spare parts from Bucyrus HEX. They are adapted to the respective function.

Do not re-use old hoses.

Never repair damaged hoses.

Discard escaped oil and oily wastes without polluting the environment. These substances must not be allowed to penetrate into the soil.

Hydraulic hoses – Instructions

Even hoses that have been properly stored or used are subject to natural ageing. Their useful life is therefore limited.

Hydraulic hoses must replaced after a service life of six years (including a storage time of 2 years). Check the date of manufacture on the hose or on the hose fitting regularly.

The recommended interval after which hydraulic hoses - and especially those used in harsh conditions - must be replaced depends on the number of operating hours and on pressure loading.

The use of hoses close to their recommended load limit shortens the replacement interval (e.g. high temperatures, frequent working cycles, extremely high pulse frequencies as well as multi-shift operation and round-the-clock work).

Hydraulic hoses must be replaced, if one of the following defects is detected during a visual inspection:

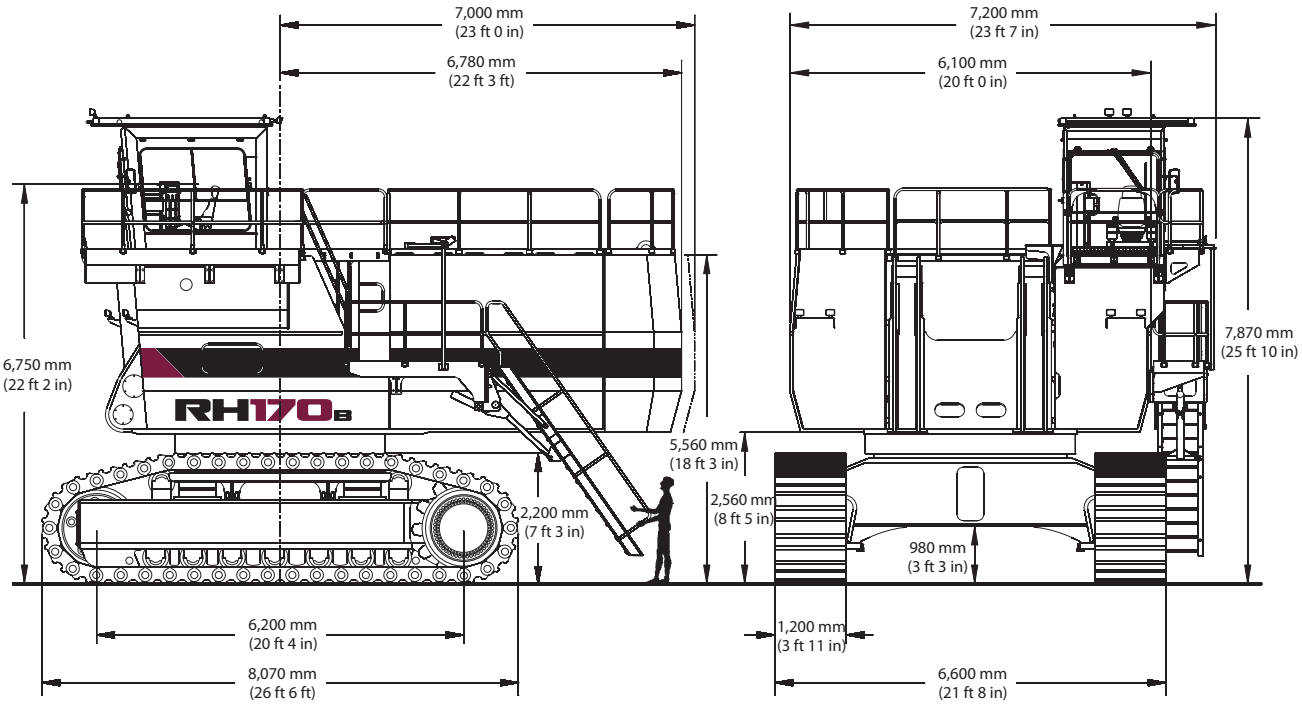
- Damage to the outer fibre reinforcement layer reaching down to the inner layer (cuts, chafe marks, cracks).
- Embrittlement of the outer fibre reinforcement layer (cracks in the hose material).
- Changes in the ususal shape of the hose under pressure or in pressureless condition in bends or curves such as detachment of fibre layers, formation of bubbles or bulges.
- Leaks.
- Non-observance of fitting requirements.
- Damage to or deformation of hose fittings that may result in a reduction of the strength of the screwed union.
- Detachment of the hose from the fitting.
- Corrosion in fittings reducing the strength of the function of the fitting.

Working hydraulics – Fault table

Fault								Remedial action	
Working and swing functions not operational									
	No boom function							Check	**P**
		No bucket function						Adjust	**E**
			No backhoe function					Replace	**W**
				No stick function				Top up	**A**
					Working movements too slow			Reduce	**S**
						Power loss in working hydraulics		Clean	**R**
							Uncontrolled working movements	1) Contact the Bucyrus HEX Service	
							Cause	**Abschnitt**	
•							Electronic excavator control not activated/defective	Working	**P**
•	•	•	•	•		•	Malfunction of pressure-relief valve		**1)**
•						•	Servo system pump defective		**1)**
	•	•	•	•	•		Malfunction of primary / sencondary 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		

RH170B

Hydraulic Mining Excavator



RH170B HYDRAULIC MINING EXCAVATOR

General Data:

Operating Weight		
Face Shovel	397 t	438 sht
Backhoe	397 t	438 sht
Engine Output SAE J1995		
Caterpillar® C32	1,516 kW	2,032 HP
Cummins® KTA 38C	1,492 kW	2,000 HP
Standard Bucket Capacity		
Face Shovel (SAE 2:1)	22.0 m^3	28.8 yd^3
Backhoe (SAE 1:1)	22.0 m^3	28.8 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

Product Specification Sheet