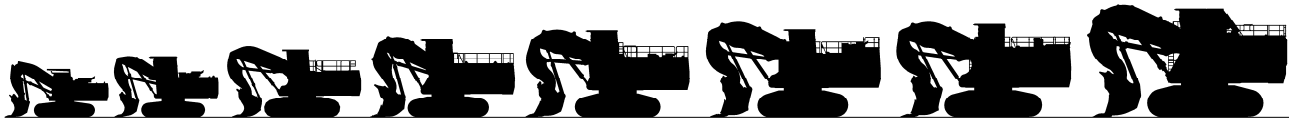
Operating Instructions

CE

Hydraulic Excavator

RH 30F No.

Bucyrus HEX GmbH



1 INTRODUCTION

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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**

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).

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:

Superstructure

9 – Radiator (engine cooling liquid)
10 - Fuel tank
11 - Engine
12 - Pump transfer gearbox
13 – Hydraulic pumps (main pumps)
14 - Hydraulic oil reservoir
15 - Slewing pump
16 – Pilot control pump
17 - Cooling oil pump
18 – Hydraulic oil cooler
19 – Slewing gear
20 – Batteries and battery main switch
21 – Driver`s cab with air conditioner
22 – Control panel
23 – Counterweight
24 – Grease container for central lubricating system
25 – Travel control block and rotor
26 – Air-intake system with vacuum-meter
27 – Exhaust system
28 - Ladder

Backhoe bucket

31 - Stick
33 - Boom cylinder
34 - Stick cylinder
37 - Monoblock boom
38 - Backhoe bucket
39 - Backhoe cylinder
40 - Toggle link
41 - Toggle lever
42 - Control valves

Cab interior lighting

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

The power supply to the lamp is not interrupted even after the electrical system has been shut off.

The batteries may be discharged if the interior lighting remains on for prolonged periods.

Therefore, shut off the interior lighting when leaving the machine.

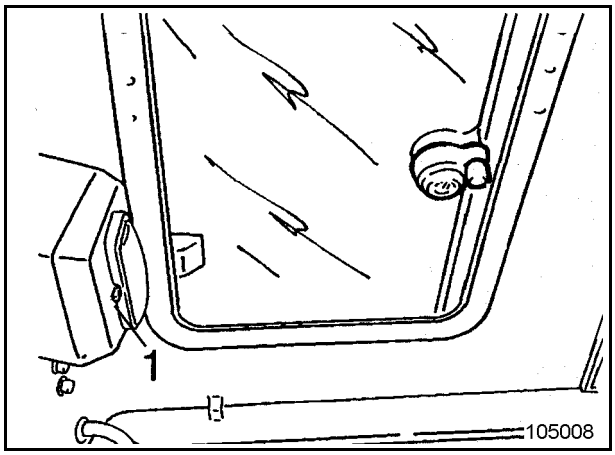

Fig. 2-17:

Screen-washer

The reservoir (1, Fig. 2-18:) for the screen-washer is located under the driver's seat.

- ➲ Open flap (2).
- ➲ Depending on the season, fill reservoir (1) either with water or with water and an antifreeze compound.

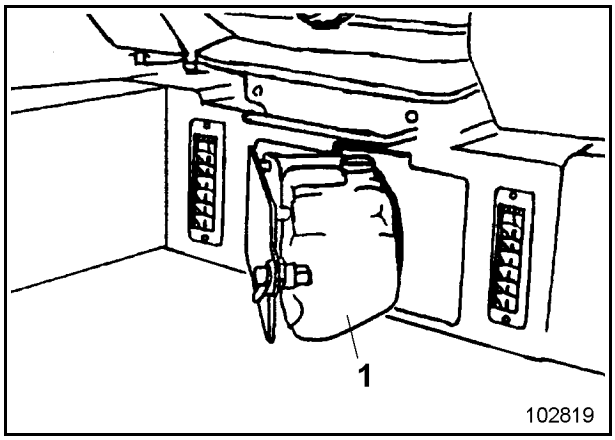

Fig. 2-18:

Fig. 2-23:

No.	Element	Function	Symbol
36	**Buzzer**	Sounds an acoustic warning when a malfunctionis reported continuous tone together with warning lamps 9,10,11,19 Intermittent tone with warning lamps 15,16,22,23 **Shut off the engine immediately and lower the working equipment to the ground when buzzer (36) sounds continuously and when one of the warning lamps indicates a fault. The buzzer continues to sound until the fault has been rectified.** **In the event of pump contamination or excessive slewing pump temperature, buzzer (36) sounds intermittently. The corresponding warning lamp lights up. The buzzer continues to sound until the fault has been rectified.**	

The refuelling system consists of an electrical pump,filling hose, switch box (2, Fig. 2-30:) and key-switch (3).

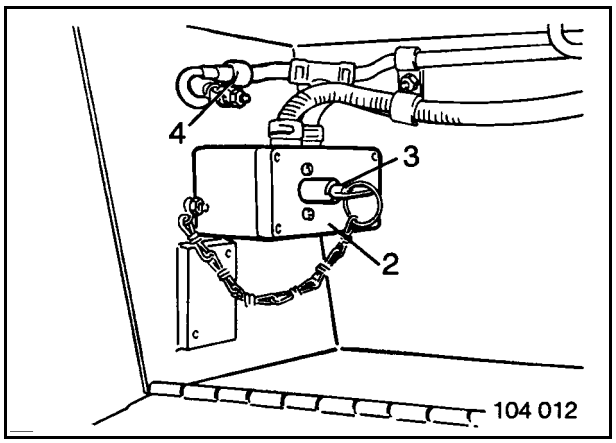

Fig. 2-30:

Check before refuelling that the earthing strap (4, Fig. 2-30:) is attached to the chassis. Sparking caused by static or electric charges may set fuel on fire.

Using the refuelling system

- Unscrew cap (16, Fig. 2-31:) from express coupling (17).
- Attach filling hose (18) to express coupling (17) and introduce into the fuel barrel. The electrical pump of the refuelling system is switched on with key-switch (14).

Switch on electrical pump only after the filling hose with the micro-filter has been immersed into the fuel barrel.

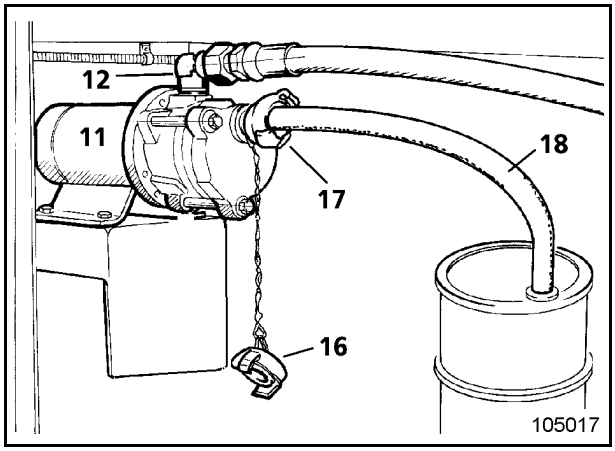

Fig. 2-31:

It is recommended to use a micro-filter in the filling line.Fuel should always be filled in through a screen.

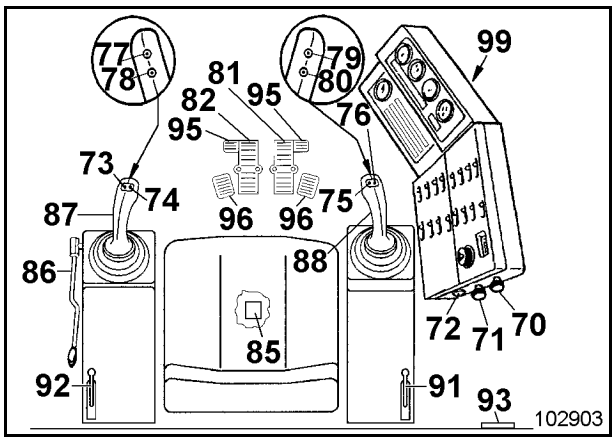

Fig. 2-51:

The superstructure is braked when control Lever (87, Fig. 2-51:) is shifted into the opposite direction (countering).

To brake a slewing movement to the right

➲ shift control lever (87) to the left.

To brake a slewing movement to the left

➲ shift control lever (87) to the right.

Working

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

Level a surface only in the bucket's digging direction. Never "beat" or "sweep" with the bucket.

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

Working in particular conditions

Turn potentiometer (71, Fig. 2-51:) clockwise until the maximum required working speed of the equipment (boom, stick, bucket or backhoe bukket).

Raising and lowering the boom

To raise the boom

➲ pull control lever (88, Fig. 2-51:) backwards.

To lower the boom

➲ push control lever (88) forwards.

Extending and retracting the backhoe bucket stick

To extend the stick

➲ push control lever (87) forwards.

To retract the stick

➲ pull control lever (87) backwards.

Filling and emptying the backhoe

To fill/tip back the bucket

➲ shift control lever (88) to the left.

To empty the bucket by dumping/tipping

➲ shift control lever (88) to the right.

Speed reduction function

Do not activate the speed reduction function when the machine is used for lifting operations and during travelling.

The speed reduction function can cause the hydraulic output to drop off suddenly.

The speed reduction sets the drive engine back to idling speed if the working equipment remains inactivated during more than 10 seconds.

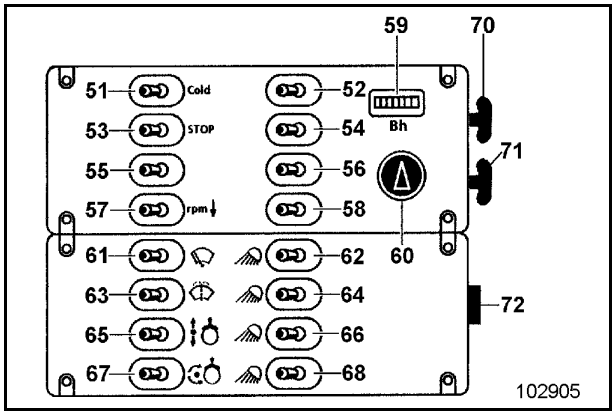

Fig. 2-58:

Switching on the speed reduction:

➲ Set toggle switch to the left (57, Fig. 2-58:)

Indicator lamp (27, Fig. 2-59:) lights up when the the speed reduction function is active.

Switching off the speed reduction:

➲ Set toggle switch (57) to the left.

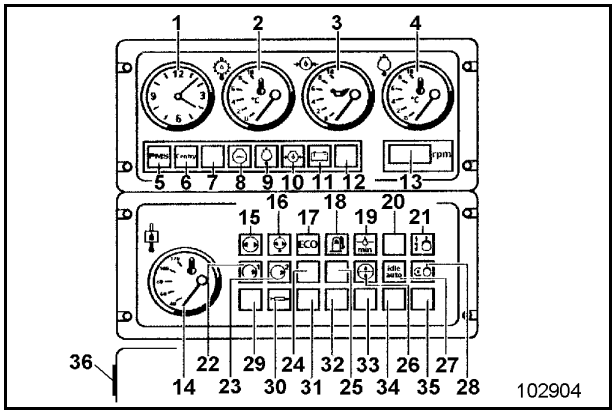

Fig. 2-59:

Hydraulic hammer

Working with the hydraulic hammer - Safety instructions

Nobody must stand in the hazard range of the hammer.

Risk of injury by splintering stones.

Stop the work immediately if persons enter the hazard range of the hammer or the machine.

Close the front window of the machine before putting the hammer into operation.

Mount a protective grid as a splinter protection.

Wear ear protectors.

Operate the hammer only when sitting in the driver's seat.

The power of the machine and that of the hydraulic hammer must be adapted to each other. In case of doubt, contact the Terex Germany Service.

Do not change the setting of the pressure-relief valves without approval and do not remove lead seals.

Observe the operating instructions of the hammer manufacturer.

Stop the work immediately when oil losse are detected. Collect escaping oil and discard without polluting the environment.

Report oil accidents immediately to the user or his representative.

Repair leaks and damage immediately or have them repaired.

Handling batteries

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

Batteries give off explosive gases.

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

Battery acid is toxic and corrosive.

Avoid any contact with the skin, mouth, eyes and clothing. Avoid spilling battery acid or inhaling the vapours.

Wear gloves, firm protective clothing and goggles when handling batteries.

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

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

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

Never wear metal necklaces, bracelets or watchstraps when working on the battery. The metal parts may induce a short-circuit resulting in burns.

Dispose of used batteries separately from other waste in the interests of environmental protection.

Before working on the electrical system

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

Disconnect first the negative and then the positive terminal.

After the work:

Reconnect first the positive and then the negative terminal.

Plan N

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

Location	Servicing work	Quantity/ No.
After 100 Bh		
Engine		
- Bearing		
- Fastening screws	Check for tightness	
Cooling system		
Water filter	Replace	1
Radiator		
- Bearing		
- Fastening screws	Check for tightness	
Hydraulic system		
Oil cooler		
- Bearing		
- Fastening screws	Check for tightness	
Return-flow filter	Replace	2
Magnetic rod	Clean	2
Pressure accumulator – emergency lowering	Check function	1
Pump transfer gearbox	Change oil	1 [3]
Slewing gearbox	Change oil	1 [3]
Fastening screws	Check for tightness	
Slewing ring		
Fastening screws (slewing ring, undercarriage and superstructure)	Check for tightness (cf. Technical handbook)	
Superstructure		
Fastening screws, especially at superstructure / pedestal / driver´s cab	Check for tightness	
All lines, fittings and connections	Inspect visually for leaks, wearing marks	

[3] cf. “Refilling quantities – Oil“ table

Lubricating chart – Grease / Backhoe bucket (legend)

No.	Greasing point	Number	Lubricant properties	Grease every .... operating hours
1	Central lubricating system – grease container	1		10
2	Cylinder/toggle link bearing	1		10
3	Toggle link/toggle lever bearing	2	**V** [11]	10
4	Stick/toggle lever bearing	2		10
5	Stick/backhoe bucket bearing	2x 2		10
6	Toggle link/toggle lever bearing	2		10
7	Slewing gearbox output pinion	1		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
Central lubricating system – grease container	**V** 11	5
Internal gearing – Roller-bearing slewing ring		20

[11] cf. "LUBRICANTS" section

Changing the engine oil

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

Risk of scalding from hot engine oil.

The engine may also be hot.

Wear protective gloves and firm working clothing.

Collect escaping oil and discard without polluting the environment.

- Bring engine oil to operating temperature.
- Park the machine on a horizontal surface and secure.
- Shut off the engine.
- Drain off engine oil using the oil draining hose. The use of the oil draining hose is described in the "Draining hose for oil changes" chapter.

After the engine oil has drained away:

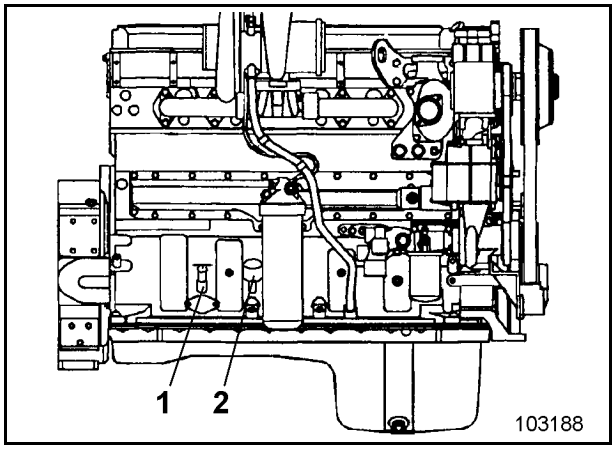

Fig. 3-11:

After draining of the oil:

- Replace the engine oil filter.
- Remove the hose line.
  The automatic drain coupling closes automatically.
- Screw on protective cap.
- Fill in engine oil through the filler tube (2, Fig. 3-11:) until the oil level reaches the "max" mark (Fig. 3-12:).
- Start the engine and allow to run for abt. 2 minutes at idling.
- Check oil level and top up with oil up to the "max" mark, if required.

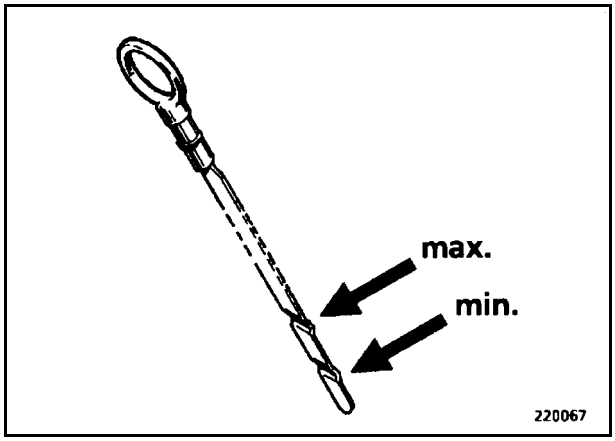

Fig. 3-12:

Replacing the fuel filter

Read and observe the "Inspection and servicing – Safety instructi-ons" chapter.

Collect escaping fuel and discard without polluting the environment.

Avoid skin contact with diesel fuel.

Diesel fuel may cause skin injury.

Wear firm working clothing.

Wear protective gloves or use a barrier cream.

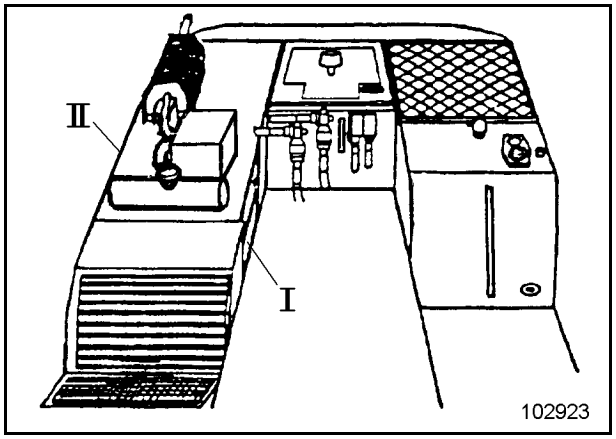

Fig. 3-33:

- ➲ Open hatch I (Fig. 3-33:) to gain access to the filters.
- ➲ Unscrew filters (3, Fig. 3-34:).
- ➲ Fill new filter with clean fuel and screw it onto the filter head by hand.
- ➲ Continue to tighten filter by a further 1/2 to 3/4 turn.

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

The fuel filters (3) serve at the same time as water

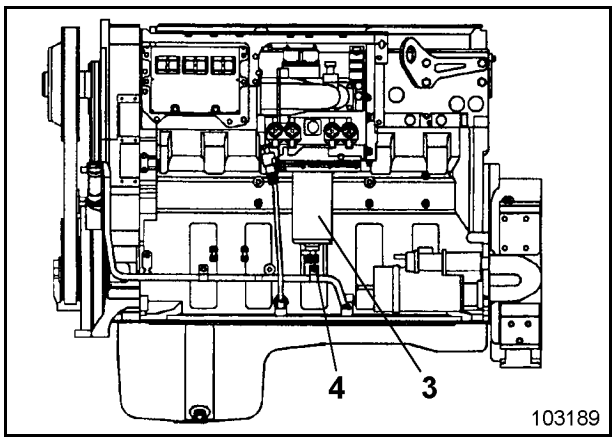

Fig. 3-34:

- ➲ Open valve (4) and drain off water until fuel emerges.
- ➲ Close valve (4).

Venting the fuel system

The fuel tanks are vented with breather valves (4, Fig. 3-35:).

Clean breather valves regularly.

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

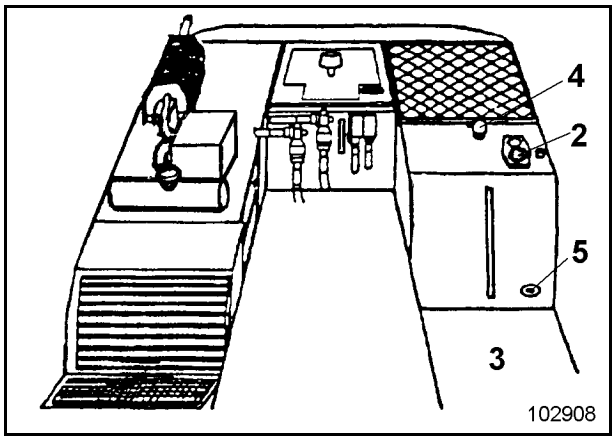

Fig. 3-35:

Breather filter

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

Shut off the engine.

Risk of scalding caused by hot hydraulic oil.

The hydraulic oil reservoir itself may also be hot.

Avoid skin contact.

Skin contact with hydraulic oil may cause skin injury.

Wear protective gloves and firm working clothing.

Replacing the filter elements

The breather filters (20, Fig. 3-51:) ensure venting of the hydraulic oil reservoir at varying hydraulic oil levels.

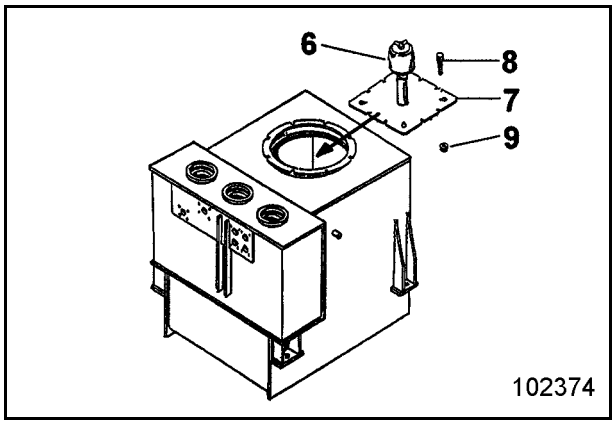

Fig. 3-51:

➲ Unscrew butterfly nut (50, Fig. 3-52:). Withdraw hood (51) and withdraw filter element (52) from the holding rod.

➲ Insert new sealing ring (53) and new filter element and secure hood (51) with nut (50).

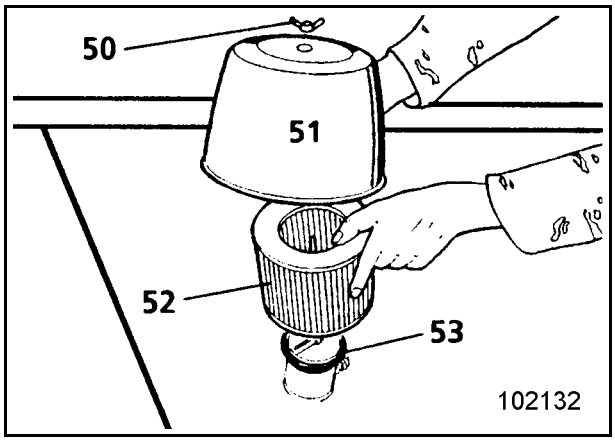

Fig. 3-52:

Gearbox venting

The gearbox is vented through breather filter (2, Fig. 3-67:).
Clean breather filter in accordance with the servicing plan.

- ➲ Unscrew breather filter, clean in white spirit or paraffin oil and blow dry with compressed air.
- ➲ Screw breather filter back in place.

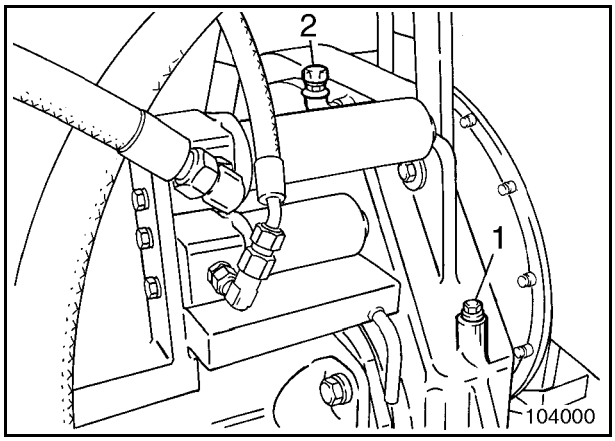

Fig. 3-67:

Cleaning the grease sieves

Check the grease sieves (13, Fig. 3-85:) for contamination and clean, if required. The grease sieves must also be cleaned after a blockage in one of the grease lines has been removed

Cleaning

- Loosen nut (12) by holding union (16) in place with a wrench.
- Unscrew disk (14).
- Remove sieve (13) and clean with white spirit or paraffin oil.
- Refit (13) and fasten with disk (14).
- Screw nut (12) onto the union.

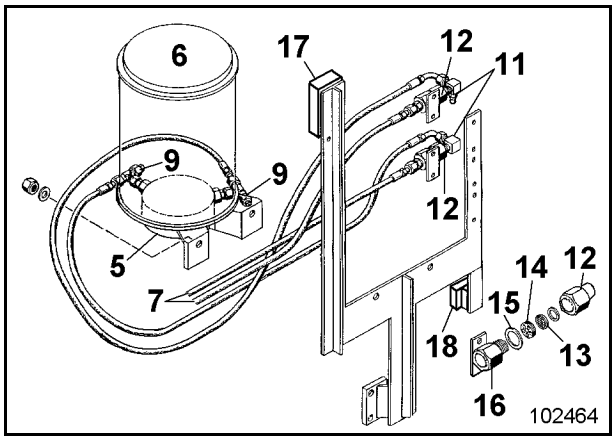

Fig. 3-85:

Lubricating the grease distributor of the working equipment

- Withdraw protective cap from greasing nipple.
- Clean greasing nipple.
- Press nozzle of the grease gun onto the greasing nipple.
- Inject grease until the fresh grease squeezes the used grease out of the bearing joints.

Make sure that used grease emerges from all greasing points connected to the distributor.

Only then have all greasing points connected to the grease distributor been properly greased.

- Wipe off used grease with cleaning rags.
- After greasing, place protective cap back on the greasing nipple.

Dispose of cleaning rags without polluting the environment.

FIRE AND EXPLOSION HAZARD

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Safety Instructions

Prior to commencing work, inform

- **on the national and corporate rules for prevention of accidents. Pay particular attention to hazards caused by combustible and easily flammable substances.**
- **on the safe handling of the fire extinguishers to be used.**

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

Combustible and easily flammable substances or liquids increase the fire and explosion hazard.
Do not store or handle any flammable substances during operation.

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

Such substances may spontaneously ignite if they get into the vicinity of hot units or objects such as turbo superchargers.
Even battery gases can ignite in open flames or fire.
Avoid parking the excavator in places where

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

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

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

Place suitable fire guardings (fire barriers) if open fire or flying sparks cannot be avoided during repair work. Apply special protection to cables, cable ducts as well as to hose and pipe lines.

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

Ensure sufficient ventilation.

Clean the excavator before starting a job.

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

Do not extinguish flammable liquids with water.
Use:

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

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

Call the fire brigade.

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

5 ANNEX

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	Operating instructions	Target group
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TECHNICAL DATA

2462197

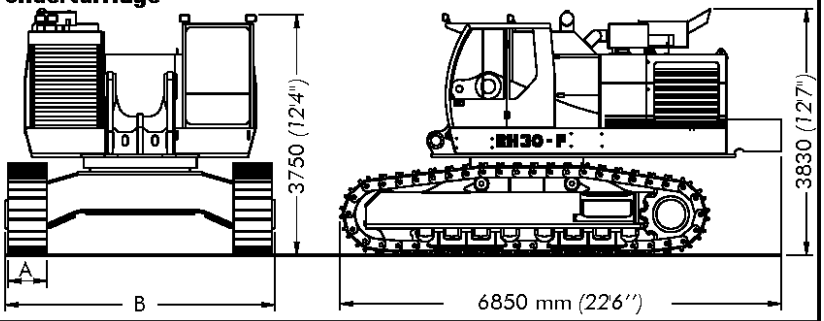
General packing list

Backhoe configuration

(Guiding values; details may vary depending on scope of supply, destination and kind of shipment.)

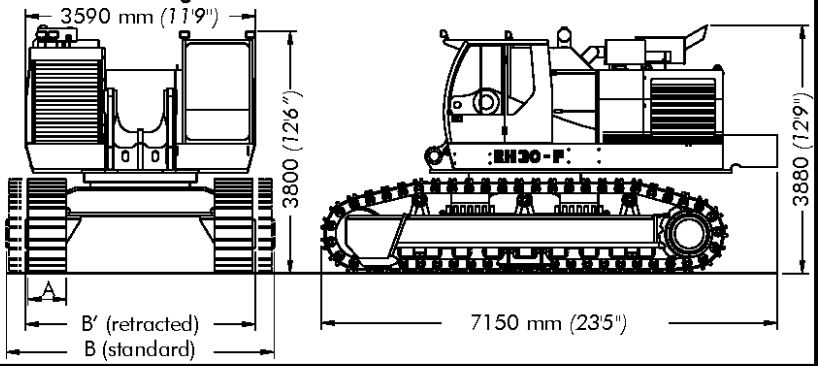
Basic machine - backhoe version with HD undercarriage

Pad type (A)	Width (B)	Gross weight
600 mm	4180 mm	47400 kg
2'	*13'9''*	*104500 lbs*
750 mm	4250 mm	48400 kg
2'6''	*13'11''*	*106700 lbs*
900 mm	4400 mm	49400 kg
2'11''	*14'5''*	*108910 lbs*



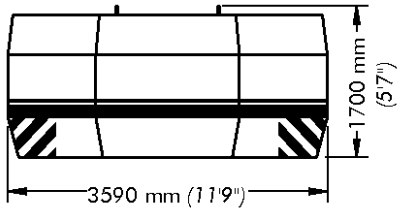
Basic machine - backhoe version with HD-RLC undercarriage

Pad type (A)	Width (B)	Width (B')	Gross weight
600 mm	4180 mm	3590 mm	50800 kg
2'	*13'9''*	*11'9''*	*111990 lbs*
750 mm	4250 mm	3660 mm	51900 kg
2'6''	*13'11''*	*12'*	*114420 lbs*
900 mm	4400 mm	3810 mm	53000 kg
2'11''	*14'5''*	*12'6''*	*116840 lbs*



Counterweight

Width 1000 mm (3'3") Gross weight 16300 kg (35930 lbs)

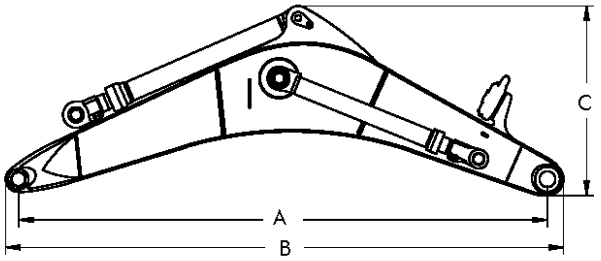


Crates with

Lenght mm (ft: in)	Width mm (ft: in)	Height mm (ft: in)	Gross weight kg (lbs)
Oil barrel			
700 (2'4")	700 (2'4")	1140 (3'9")	250 (550)
Operator' cab (if not installed on basic machine)			
1970 (6'6")	1380 (4'6")	2110 (6'11")	610 (1340)

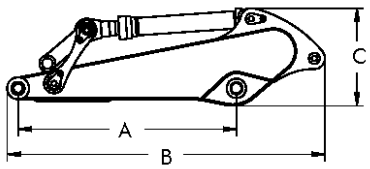
Monoboom incl. boom cylinder and arm cylinder

Size (A)	Length (B)	Width	Height (C)	Gross weight
7.25 m	7600 mm	1220 mm	2620 mm	10100 kg
23'9''	*24'11''*	*4'*	*8'7''*	*22270 lbs*
8.4 m	8850 mm	1300 mm	2700 mm	10800 kg
27'7''	*29'*	*4'3''*	*8'10''*	*23810 lbs*



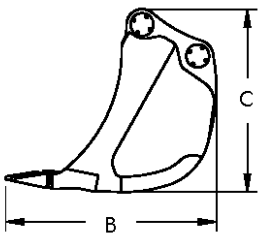
Arm (stick) incl. backhoe cylinder and linkage

Size (A)	Length (B)	Width	Height (C)	Gross weight
2.9 m	4450 mm	900 mm	1700 mm	5400 kg
9'6''	*14'7''*	*2'11''*	*5'7''*	*11900 lbs*
3.4 m	4950 mm	900 mm	1700 mm	5550 kg
11'2''	*16'3''*	*2'11''*	*5'7''*	*12240 lbs*
4.1 m	5700 mm	900 mm	1700 mm	6000 kg
13'5''	*18'8''*	*2'11''*	*5'7''*	*13230 lbs*



Bucket incl. pin (without hardfacing)

Capacity	Length (B)	Width	Height (C)	Gross weight
5.5 m^3	2300 mm	2710 mm	2050 mm	5200 kg
7.2 cuyd	*7'7''*	*8'11''*	*6'9''*	*11460 lbs*
5.1 m^3	2300 mm	2560 mm	2050 mm	5050 kg
6.7 cuyd	*17'7''*	*8'5''*	*6'9''*	*11130 lbs*
4.6 m^3	2300 mm	2280 mm	2050 mm	4800 kg
6.0 cuyd	*7'7''*	*7'6''*	*6'9''*	*10580 lbs*
3.5 m^3	2400 mm	1830 mm	1950 mm	4500 kg
4.6 cuyd	*7'10''*	*6'*	*6'5''*	*9920 lbs*



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