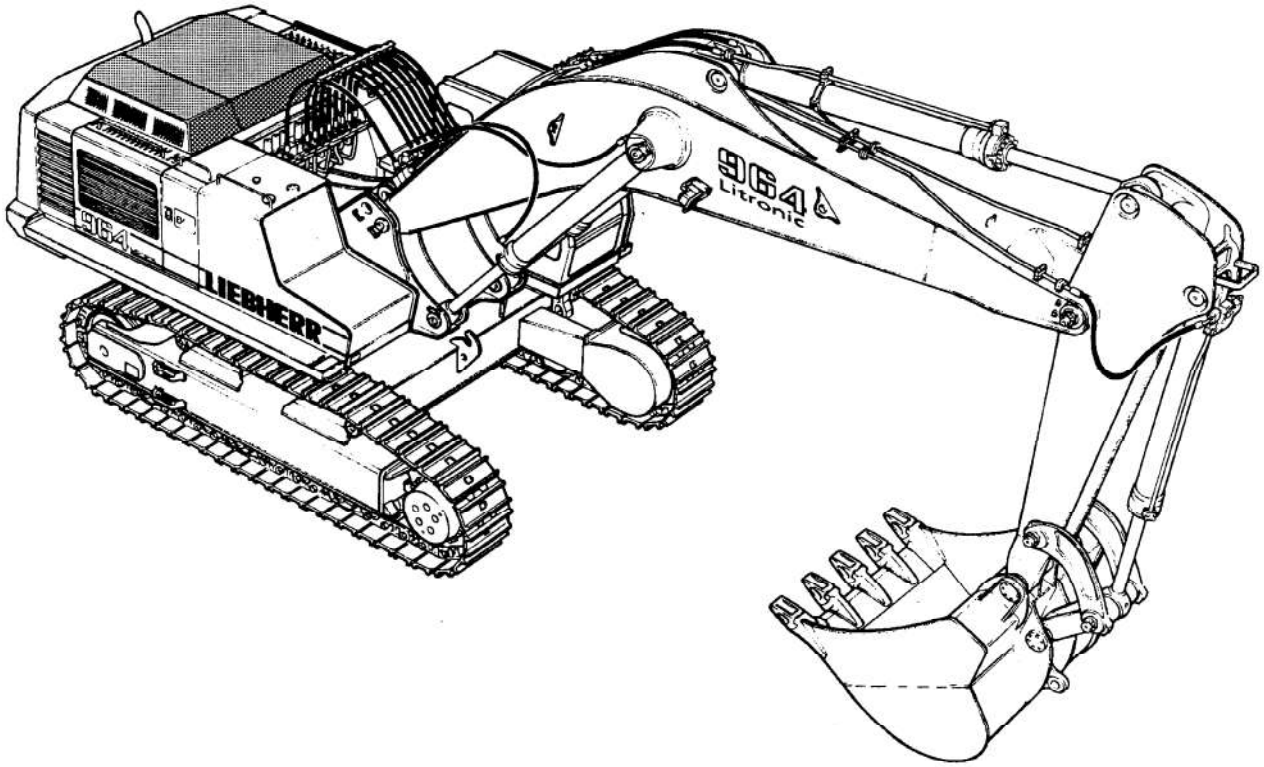
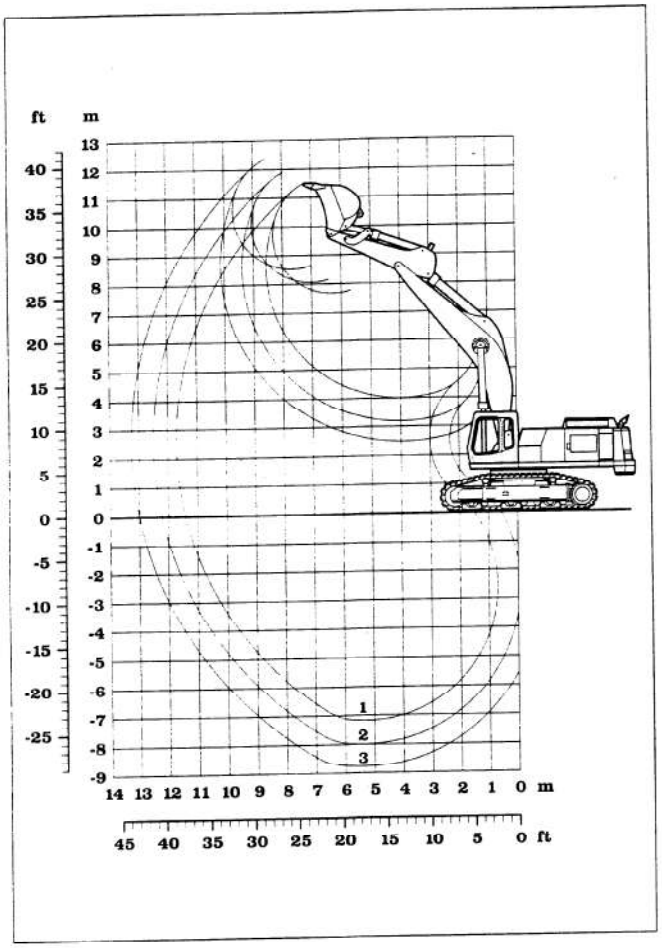
Operation and Maintenance Manual

R 964 B

Litronic





Digging envelope

1 with stick 2,60 m
2 with stick 3,40 m
3 with stick 4,20 m

Stick lengths	m	2,60	3,40	4,20
Max. digging depth	m	7,20	8,00	8,40
Max. reach at ground level	m	11,40	12,20	13,00
Max. dump height	m	7,70	8,10	8,50
Max. teeth height	m	11,40	11,80	12,30
Digging force	kN/t	273/27,8	232/23,6	204/20,8
Breakout force	kN/t	329/33,5	329/33,5	329/33,5

Operating Weight and Ground Pressure

Operating weight includes basic machine with 7,00 m gooseneck boom, 2,60 m stick and 3,50 m³ bucket.

Undercarriage		HD			HD-SL		
Pad width	mm	500	600	750	500	600	750
Weight	kg	59500	60200	61300	61000	61800	63000
Ground pressure	kg/cm²	1,27	1,06	0,86	1,22	1,03	0,84

Buckets

Cutting width	mm	1500[2]	1450[1]	1700[2]	1650[1]	1900[2]	1850[1]	2100[2]	2050[1]	2250[3]	2450[3]
Capacity ISO 7451	m³	2,20	2,30	2,60	2,70	3,00	3,10	3,40	3,50	4,30	5,20
Weight	kg	2700	2300	2950	2400	3150	2550	3400	2800	3050	3400
Suitable for material up to a specific weight of											
with stick 2,60 m	t/m³	–	–	–	–	2,20	2,20	1,80	1,80	1,50	1,20
with stick 3,40 m	t/m³	–	–	2,20	2,20	1,80	1,80	1,50	1,50	1,20	–
with stick 4,20 m	t/m³	2,20	2,20	1,80	1,80	1,50	1,50	–	1,20	–	–

1) Medium-duty bucket with teeth size 25 C (appropriate for materials up to classification 5, according to VOB, Section C, DIN 18300)
2) Heavy-duty rock bucket with teeth size 25 C (appropriate for materials above classification 6, according to VOB, Section C, DIN 18300)
3) Loading bucket with teeth size 20 C

Note:
Installation of optional side cutters onto medium-duty and loading buckets with Liebherr-teeth size 25 and 20 increase cutting width by approx. 160 and 170 mm respectively.

Side cutters installation kit consist of:
- Weld-on set of adapters (Id. No. 9352588)
- Set of bolt-on side cutters (Id. No. 9352587)

Backhoe Attachment with Gooseneck Boom 7,00 m

LIEBHERR-FRANCE S.A. 2, Avenue Joseph Rey, B.P. 287, F-68005 Colmar-Cedex, ☎ 03 89 21 30 30, Fax 03 89 23 81 58

With compliments:

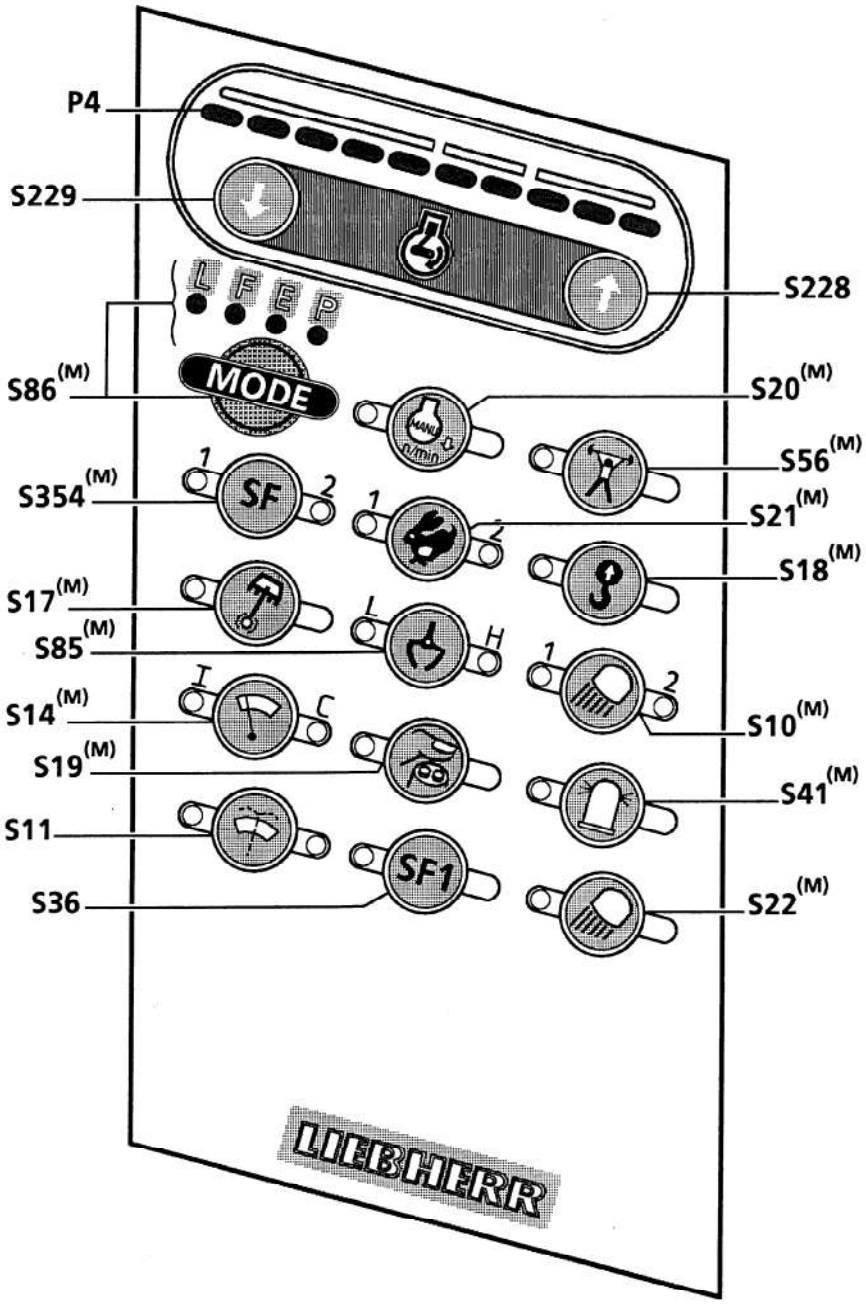
Additional safety guidelines for excavators fitted with a cab elevation

When operating an excavator with a cab elevation, observe the following safety instructions which complete the general safety information provided in the operation and maintenance manual for the machine.

- Keep ladders, footsteps, handles and handrail in clean condition and always free them from mud, oil, grease, ice, snow or any other obstacles.
- To guarantee an easy opening of the cab door in all weather conditions, coat the rubber seals around the door with silicon oil or talcum every two months and more often if necessary.
  Regularly grease the hinges and lock of the cab door as well the fixing device of the door in opened position.
  During maintenance works, always wear safety glasses and proper protective clothes.
- To climb up or down the cab, the excavator must be parked on firm, flat and level ground and the uppercarriage must be swung so to align ladders and steps on upper and undercarriage.
- Face the excavator when climbing up and always hold on to the machine at three points, i. e. keep the contact with the access components at the same time with two hands and one foot or with one hand and the two feet.
- As soon as you can reach the handle of the door with your free hand unlock and open the door before climbing up any more .

  Keep and guide the door all the way with your hand and lock it in its opened position, making sure it is securely fixed in this position, so it can not be slammed by the wind.

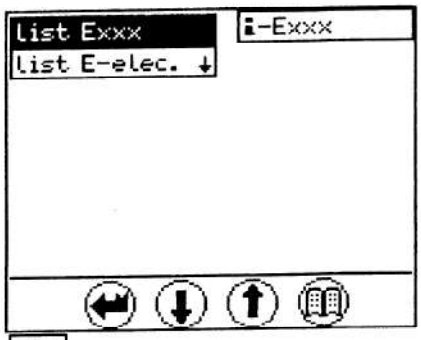
  Take care to keep yourself apart from the slewing range of the door during the whole of its opening motion.
  Some external influences, and especialy the wind, may make the opening of the door uneasy.
- Go on climbing up, always holding yourself by three points, enter the cab and seat down to the seat.
  If applying fasten the seat belt. Unlock the door using the unlocking lever and close the door holding it by the handle designed for this purpose.
  Only thereafter lower the safety lever and start the machine.
- It is essential to have your seat belt fastened if you want to operate the machine with the cab door opened.
  Should the belt be missing on your machine, so you must compulsorily get one installed before you start working with opened cab door.
- Before climbing down the cab, you must make sure the machine is parked on a flat, firm and level ground and the ladders and steps are aligned on upper and undercarriage.
- Then open the cab door and lock it in opened position and make sure it is securely fixed in this position.
  Be aware of difficult weather conditions and anticipate their possible consequences. The wind for example could slam the cab door.
- If necessary unfasten the seat belt.
- Carefully begin climbing down, facing the machine and always holding the contact at three points, until you reach the height where you can close the cab door in the best conditions, keeping yourself apart from its slewing range and guiding it with the hand until closed.
  If you want so lock the door and take away the key.
- Slowly and carefully go down to the floor.



P4	LED indicator for engine RPM
S10	Lights on uppercarriage and working attachment
S11	Windshield washer
S14	Windshield wiper
S17	Swing brake
S18	Overload warning device *
S19	Rotating device*
S20	Automatic low idle
S21	Travel speed increase
S22	Auxiliary floodlights*
S36	Special function - not used -
S41	Beacon*
S56	Pressure cut-in stage boom*
S85	Grapple operation*
S86	Operation mode selection
S228	Engine RPM increase
S229	Engine RPM reduce
S354	Not used

* Optional installation

(M) The function of the push buttons marked with (M) are memorized when stopping the excavator.
This means that the controled function recovers the previous state (on, off, 1/2, L/H, ...) before the machine had been turned off.



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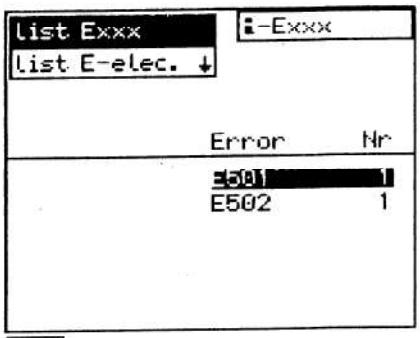
MENU i-Exxx ("i-errors")

INFORMATION ABOUT DETECTED ERRORS (OPERATING AND ELECTRICAL SYSTEM ERRORS)

In this menu (fig.53):

- select **"list Exxx"** to list all the operating errors detected by the switches and sensors for machine parameters monitoring (fig. 54),
- select **"list S-Exxx"**, to show a listing of the above mentioned errors which occured during service operation,
- select **"list E-elec."**, to show a listing of all the electrical errors (system errors) detected during operation of the machine,



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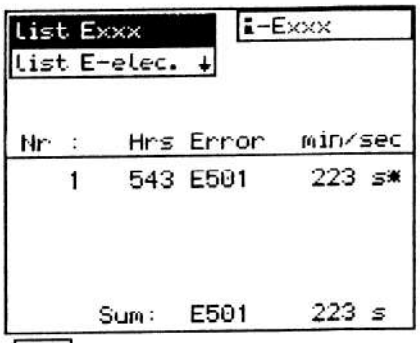
When selecting the operating errors **"list Exxx"** all the errors according to the list on pages no. 3.9 and 3.10 are listed, with error code and number of occurence (fig. 54).

Move the arrow keys "UP" and "DOWN" to select the desired error.



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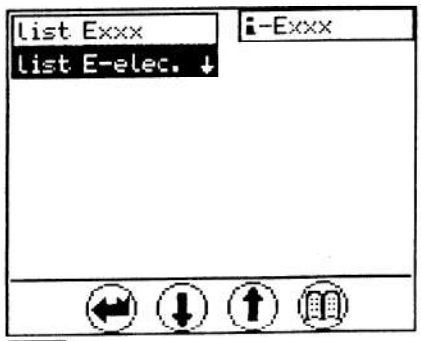
By pressing the "MENU" key, the overview of the selected error appears (fig. 55), with the indication of the operating hour and duration for the 10 first and the 10 lest occurences of the error.

Move the arrow keys "UP" and "DOWN" to page in this overview.



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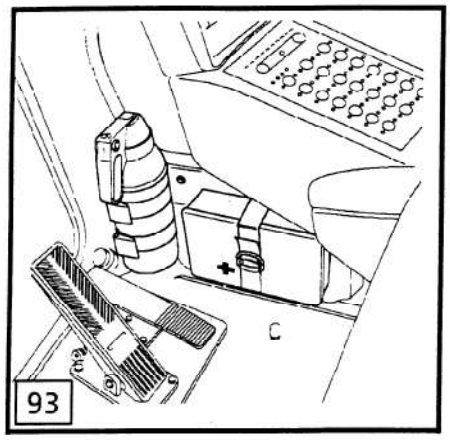
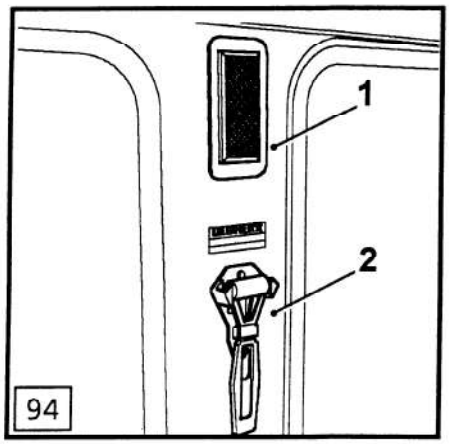
When selecting the electrical errors **"list E-elec"** all the system errors according to the list on page no. 3.11 are listed, with error code and number of occurence (fig. 56 and 57).



FIRE EXTINGUISHER / FIRST AID KIT*

Optional installation

The storage space for the fire extinguisher and the first aid kit is to be found at the bottom right of the operator's cab (fig. 93).
***Operator's prescription!**



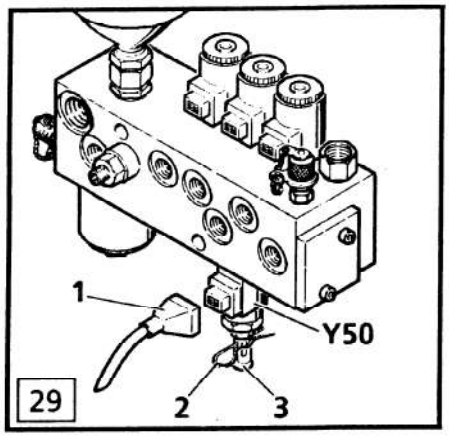
INTERIOR LIGHTING

The interior lighting (fig. 94, pos. 1) is switched on and off by pushing the lamp panel.

EMERGENCY HAMMER

The emergency hammer is located on the window, in the operator's cab (fig. 94, pos. 2).

In emergencies, one of the panels of the operator's cab can be smashed with it.



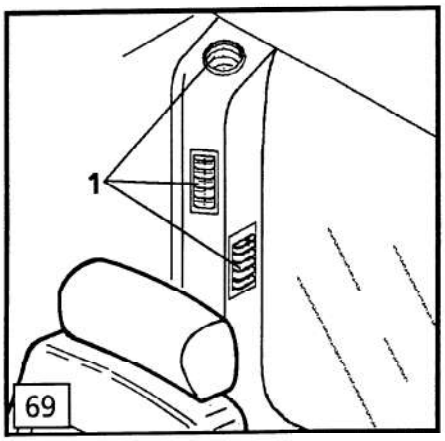
HYDRAULIC PUMPS SAFETY OPERATION

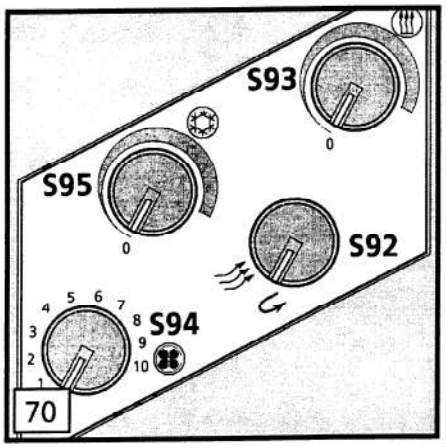
During normal operation of the excavator, the electronic horsepower control continuously adjusts the pumps flow to the pressure level of the working circuits.

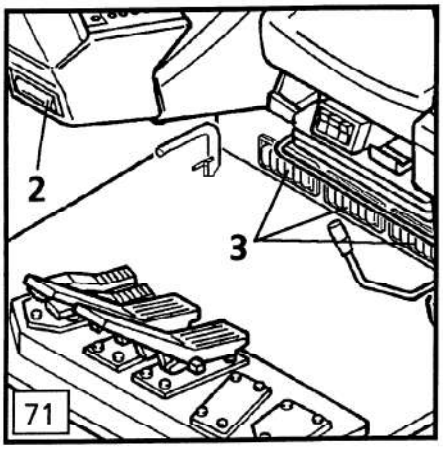
If a trouble occurs in the circuit of the regulator, the pumps are swivelled back to minimal flow.

However, it remains possible in this case to carry on the working with the machine (with somewhat reduced pump power) by changing over the lever 3 on the servo oil unit which is mounted to the rear face of the spool valve console.

Disconnect the connector 1 from the solenoide valve, pull out the pin 2 and tilt the lever 3 in horizontal position (safety position).







THE HEATER AND AIR CONDITIONER

As standard equipment the driver's cab is fitted with a heater and air conditioner unit (fig.76) which can be used for heating, cooling off and also as a fresh air ventilation for the cab.

CONTROL SWITCHES FOR HEATER AND AIR CONDITIONER (fig. 70)

S92 Fresh air admission on / off

S93 Adjustment of heating capacity

S94 Adjustment of blower fan RPM

S95 Air conditioner thermostat

FRESH AIR VENTILATION

Turn the regulating knob S94 between position 1 and 10 to start the blower fan and adjust its RPM.

In position 0 the blower fan is turned off.

The fresh air enters the cab via the adjustable louvers 3 at the seat console, 2 at the instrument panel and 1 at the rear wall of the cab.

AMOUNT OF FRESH AND RECIRCULATED AIR

The heater and air conditioner can be operated with 100% recirculated air, but also with a mixing of fresh air (F) and recirculated air (R).

The knob S92 controls the flow of fresh air entering the cab:

- In position "recirculated air" the fresh air flap 7 (fig. 76) located in the rear cab wall is closed.
- In position "fresh air" this flap is open, and about 10% fresh air is admitted into the cab (depending on the contamination of the filters 4 and 5).

HEATER OPERATION

With the regulator S93 in position "0" the heating is off.

The heating of the cab is started when turning the knob to select the desired heating capacity (amount of warm water flowing through the heater).

If the heating is started with the blower fan knob S94 in position "0", the fan will automatically start with the lowest RPM (position 1 of S94).

AIR CONDITIONER OPERATION

With the thermostat S95 in position "0" the air conditioner is off.

To start the air conditioner, turn the thermostat to the desired room temperature (regulation range between 27 and 14 °C).

The electronic control system will turn the compressor on and off if required.

If the air conditioner is started with the blower fan knob S94 in position "0", the fan will automatically start with the lowest RPM (position 1 of S94).

INSTALLATION AND REMOVAL OF GRAPPLE TO STICK

INSTALLATION

Before installation of a two shell or multi shell grapple, make sure that all necessary hydraulic lines are installed on the stick.

If necessary, remove the bucket as described on page 4.24.

Retract the bucket cylinder all the way and turn the engine off.

Push the bracket carrier 8 between connector bracket 7 and push in right lever 9, secure with cotter pin 10.

Position the grapple with shells open. Draw the O-rings 9 laterally up onto the bushing 1.1 on the grapple 1.

Start the engine and move the attachment until the lower bore holes of the stick fits between the bore holes of the grapple suspension.

⚠ DANGER

If another person is used as a guide during this installation procedure, the operator must follow the signals given by this person.

Insert pin 4 and reinstall the covers 5 or the plate 6.

Slip the O-rings 9 laterally until they are in the grooves between bushings 1.1 and 2.1 (see detail D) and install the two piece protection rings 8.

Connect the hydraulic hoses 11 and 12 for the shell cylinder to the hydraulic lines of the bucket cylinder circuit.

For grapple with hydraulic rotator, hoses 13 and 14 must be connected to the hydraulic lines for added functions on the stick.

Grapple operation:

Move the shut off lever on block 15 to position A to cut off the oil flow to the piston bottom side of the bucket cylinder.

Lubricate the different lube points on pin 4 and on the grapple mechanism.

Perform all attachment functions several times without load (open and close bucket, turn the grapple in both directions) to release air from the hydraulic system.

REMOVAL

Position the grapple with shells open on flat ground surface.

Turn the engine off, turn the ignition key to contact position and tilt the safety lever down, move the right joystick (for tilt cylinder) to the left and right, and release pressure in the hydraulic tank.

For grapple with hydraulic rotator, push also both buttons on the joystick to relieve the pressure in the swing circuit.

Disconnect the two hoses 11 and 12, and if present, the two hoses 13 and 14 from hydraulic lines on stick, and immediately close off open lines to prevent contamination.

Support the grapple properly.

Remove the covers 5 or the plate 6.

Remove the protection rings 8 of all the bearing points and draw the O-rings 9 up onto the bushing 1.1 on the grapple.

Drive out the pin 4.

If necessary, start the engine and lift the attachment slightly to remove the pin 4.

To put the bucket cylinder back in operation, move the shut off lever in block 15 again to position B.

3) ENGINE COOLANT - Specifications for anticorrosion and antifreeze protection

Using a mixture of antifreeze and anticorrosion with "DCA 4" anticorrosion additive.

To assure the protection from corrosion of the cooling system, the coolant must contain at least 50% corrosion / antifreeze mixture all year round. This protects the cooling system to about - 35° C (- 33° F).

When fluid is added to the coolant mixture, it must be assured that the mixture maintains a 50% antifreeze content.

Caution : The percentage of antifreeze should not exceed 60 % . A higher concentration would lead to reduced antifreeze and cooling properties.

In addition, the cooling system must contain DCA4 (DCA = Diesel Coolant Additive) from FLEETGUARD. The prescribed concentration is from 0.3 to 0.8 DCA units per liter of coolant (1.2 to 3.0 units per US Gallon).

The coolant must be changed every 2 years. Before adding new coolant, check the circuit for cleanness and if necessary flush it with water.

Using a mixture of water and DCA4 (without antifreeze and anticorrosion)

In certain circumstances, and if ambient temperatures are constantly above the freezing point, for instances in tropical regions, and if there are no corrosion or antifreeze fluids available, then a mixture of water and DCA4 additives may be used.

To maintain sufficient anticorrosion properties however, the DCA4 concentration of thecoolant must in this case be about doubled in comparison with the one prescribed when using a mixture also containing antifreeze and anticorrosion, it equals a concentration from 0.6 to 1.6 DCA units per liter of coolant (2.4 to 6.0 units per US Gallon) .

Important !

If employing a mixture consisting only of water and DCA4 additives :

- the use of coolant refiners (corrosion protective oils) is not authorized,
- the coolant change interval must be reduced to once a year.

Checking and maintaining the right DCA4 concentration in the cooling circuit

To check the DCA4 concentration, we recommend the use of the test kit CC 2602 M from FLEETGUARD (LIEBHERR order Nb 5608459).

The water fliter mounted in the cooling circuit contains from 4 up to 8 DCA4 units, see the following schedule. When changing the filter, the corresponding units are addad to the cooling circuit.

If there are no significant coolant leakages, regularly replacing the water filter every 500 working hours is sufficient to maintain the correct concentration of anticorrosive agent.

The DCA concentration has to be checked before each filter change, after each important coolant make up, and at regular intervals if smaller coolant quantities are refilled frequently.

If the concentration is too low, or when changing the coolant in the system, the remaining necessary DCA4 units must be added to the system in liquid form (see schedule).

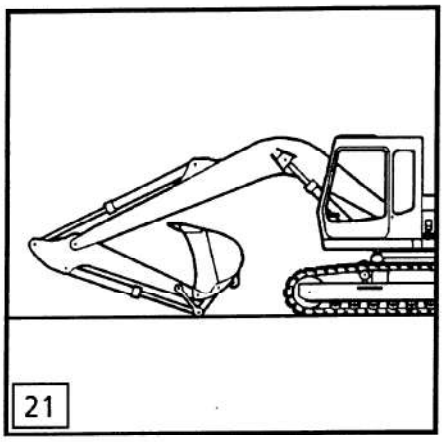
The LIEBHERR order number for a 0,5 liter can containing 5 DCA4 units is 7363898.

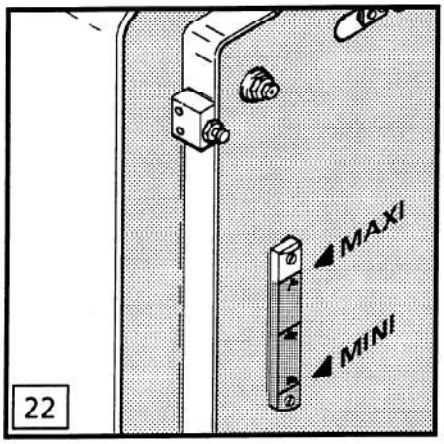
Cooling system capacity (liter / US.Gallons)	DCA4-Water Filter			Quantity of DCA4 liquid(1)	
	Designation	LIEBHERR order nb	DCA4 units	0,5 liter cans	DCA4 units
24 - 39 / 6.3-10.4	WF 2071	7367045	4	3	15
40 - 59 / 10.5-15.7	WF 2072	7381493	6	4	20
60 - 79 / 15.8-20.9	WF 2073	7367052	8	5	25
80 - 115 / 21.0-30.4	WF 2073	7367052	8	8	40

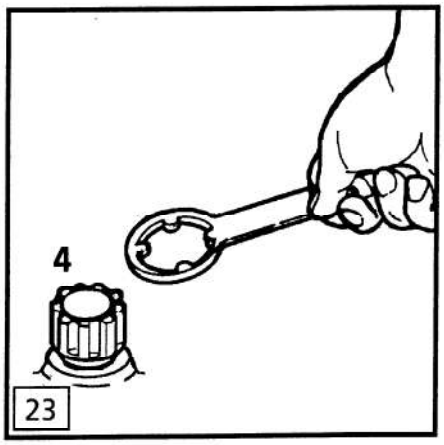
(1) For use with a mixture containing 50% antifreeze and anticorrosion

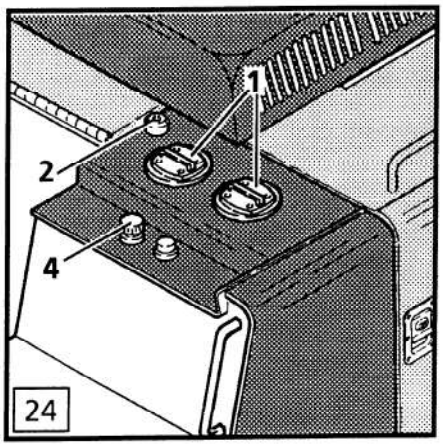
Fresh water guidelines:

To mix the coolant fluid, only clean, preferably soft water should be used. Often, but not always, regular drinking water can be used. Sea water, brackish waters, sole water or industrial waste water may not be used.









OIL IN THE HYDRAULIC SYSTEM

When checking the oil level or adding oil,

- Park the machine on level ground,
- rest the attachments on the ground with stick and tilt cylinders fully extended and, if applying, with bottom dump bucket closed.
- turn the engine off.

CHECK HYDRAULIC OIL LEVEL

In this position the oil level may not drop below middle level on the sight gauge or oil must be added to the tank until reaching this level.

Level "MAXI" shows the maximum oil level when all cylinders are retracted.

Level "MINI" shows the minimum oil level when all cylinders are all the way extended.

TO DRAIN AND TO ADD OIL TO THE HYDRAULIC TANK

⚠ CAUTION

Before draining the oil or opening the hydraulic tank, you always must first unscrew the breather filter 4 one turn to relieve tank pressure.

The hydraulic system should always be refilled or drained using a filler pump.

To drain oil

Remove the cover of the return filter 1 or the cover 2.

The oil must be drained via the two drain valves 5 and 6 in the bottom of the tank (fig. 27).

Attach a drain hose to the valves and suck off or let flow out the oil.

Adding oil to the tank

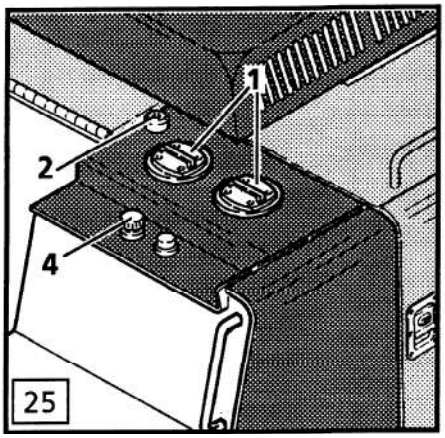
Unscrew the breather filter 4 one turn.

Add the oil via the filter cover 1 or via the cover 2, until the oil level reaches middle level on the sight gauge.

Close the breather filter.

Add some more oil to fill the tank up to the top. If refilling through the opening of the filter cover 1, pay attention to refill also the return oil compartment R (fig. 26) around the filter centering tube 7 completely.

Reinstall the filter cover 1 or the cover 2.



THE HYDRAULIC SYSTEM

Maintenance of the hydraulic system is limited to the hydraulic tank.

None of the other components in the hydraulic system require special maintenance.

However, hydraulic lines and hoses must be regularly checked for leaks.

Cleanliness in the hydraulic system is especially important.

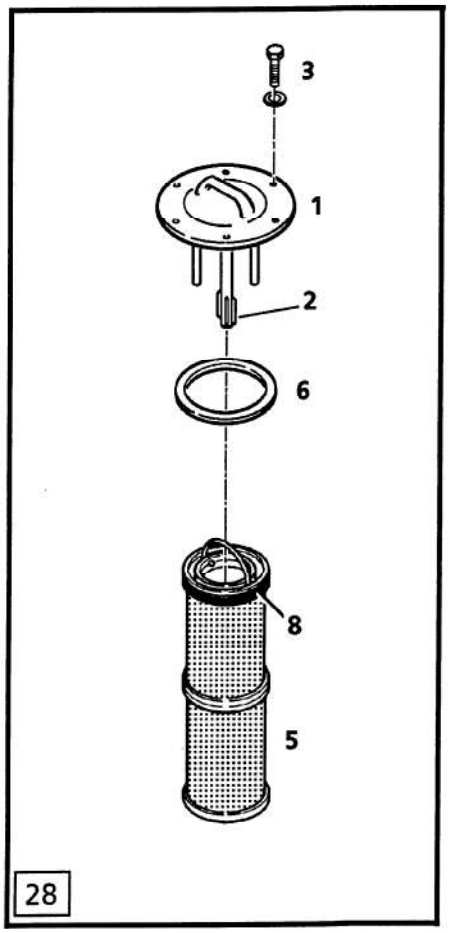
For this reason, the given maintenance intervals to replace the return filter, to clean the oil cooler, and to change the oil need to be strictly observed.

⚠ DANGER

DO NOT ALLOW YOUR SKIN TO COME INTO CONTACT WITH HOT OIL OR COMPONENTS CONTAINING HOT OIL.
At or near operating temperature, engine and hydraulic oil is hot and can be under pressure.

Always relieve the hydraulic pressure before working on the hydraulic system.

Apply both joysticks (with ignition key in contact position) and then unscrew breather filter (Fig. 29, pos 4) one turn to depressurize the hydraulic tank.



OIL COOLER

A clean oil cooler is necessary to achieve optimum hydraulic oil cooling.
Clean the cooling circuit with air or steam at the intervals specified in maintenance schedule, and more often if the working conditions make it necessary.

RETURN FILTERS

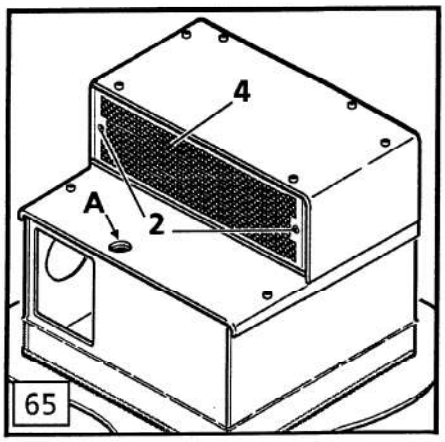
The magnetic rod in the return filter (Fig. 28, pos. 2) should be cleaned daily during the first 300 operating hours, then every week.

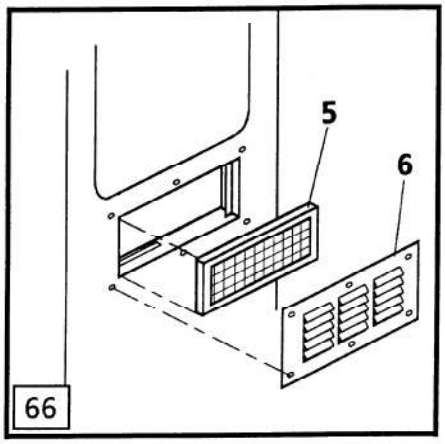
Change fibre glass filter element 5 after the first 500 and 1000 operating hours.

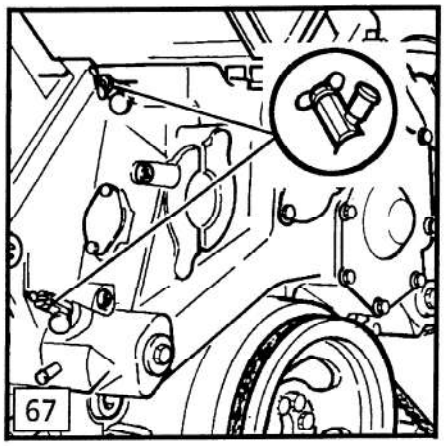
Further changes of this element

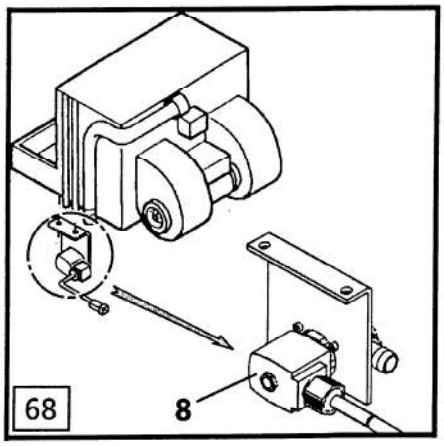
- every 1000 operating hours,
- and with every occurrence of damage caused by contamination of the hydraulic system.

Notice : When working under very dusty conditions observe the special recommandations concerning the element change on page 5.9.









THE HEATER AND AIR CONDITIONER

HEATER AND AIR CONDITIONER UNIT

Remove and clean the recirculated air filter 4 and the fresh air filter 5 of the air conditioner unit every 500 working hours and more often in very dusty conditions.

If the filters are contaminated, the air flow through the exchangers is reduced, this causing frequent icing and stop of the airco plant.

Blow out the filter elements with pressure air, or clean them in cold or lukewarm water. Never wash the elements with warm water or using a steam jet. Filter elements which are damaged or in bad condition must be replaced at once.
Never operate the machine, even for a short time when the filters are removed, this would cause a very quick clogging of the heat exchangers of the unit.

To remove the recirculated air filter 4, tilt the backrest of the driver's seat foreward and turn both quick locks (pos.2, fig. 65) by 90 degrees.
The fresh air filter 5 is accessible from the outside of the cab, after removal of the deflector 6 (fig. 66).

Heater circuit

The following maintenance should be performed annually before the beginning of the cold season:

- check the heater water circuit for leaks, check and retighten all connections, hose clamps and the seals on the water valves,
- if dirty, the heat exchanger has to be cleaned or blown out with pressure air immediately.

The heater should only be used with an antifreeze and anticorrosive mixture.
When changing the engine coolant, close the heater valves on the engine (fig. 67). Otherwise the heater core must be vented correctly after refilling the circuit.

To vent the circuit, remove the red cap at bleeder valve through the opening A (fig.65), press the valve to let the air escape.

In addition, annually before the beginning of the cold season, and at least if insufficiant heating is noticed, remove and clean the solenoid valve 8 (fig. 68) which controls the warm water flow.
Clean the membrane of the solenoid valve with clear water and check that the compensation orifice at the membrane is not clogged.