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Lubricants and process chemicals.....1.51

R 934 C from serial number 22 965

R 944 C from serial number 22 915

R 954 C from serial number 23 166

- 1 General information on changing lubricants and operating fluids. 1.51.1
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Product description	Manufacturer	Country
Coolelf Auto Supra -37 °C	Total, Paris	F
Havoline XLC, 50/50	Arteco	B
Havoline DEX-COOL Extended Life Prediluted 50/50 Anti-Freeze/Coolant	Chevron Texaco	*
Premix = ready-mixed product (50% water and 50% corrosive inhibitor/antifreeze agent) * = global		

6.6 Permitted corrosion inhibitors without antifreeze agent

In **exceptional circumstances** and at **ambient temperatures that are always above freezing points**, e.g. during use in tropical areas where there are no corrosion inhibitors/antifreeze agents available, the following inhibitors must be added to the coolant:

DCA 4 (Diesel Coolant Additives 4)

Caltex / Chevron / Havoline / Total

In this case, the coolant must be changed annually.

As part of regular maintenance work, check the concentration and correct it, if necessary.



Note!

The admixture of certain corrosion inhibitors might negatively affect the properties of the coolant.

- Do not mix different products.
- Drain off a coolant before changing from a corrosion inhibitor with antifreeze agent to a standard corrosion inhibitor and vice versa.

Product description	Manufacturer	Country
DCA 4 Diesel Coolant Additives	Fleetguard / Cummins Filtration	*
Caltex CL Corrosion Inhibitor Concentrate	Chevron Texaco	*
Chevron Texaco Heavy Duty Extended Life Corrosion Inhibitor Nitrite Free	Chevron Texaco	*
Havoline Extended Life Corrosion Inhibitor (XLI)	Chevron Texaco	*
Total WT Supra	Total, Paris	F
* = global		

7 Hydraulic liquids



Hydraulic oils must meet the requirement outlined below.

Non-compliance with these requirements shall void all warranty and liability by LIEBHERR.

Maximum water content of hydraulic oil: < 0,1%.

The operator can switch off the buzzer signal manually.

- Press and hold the button **OK** for approx. 1 second.
 - ↪ The buzzer is switched off.
 - ↪ The fault/warning message remains displayed.

Display message/indicator	LED	Description	Remedy
Inspection due	-	The operating hours counter has reached the value of the next service time.	Carry out service/clean filter. After completion of the service, preset the subsequent interval in the "Service" menu, in group "Data logger".
Thermocouple 1 (or 2) defective	yellow (B)	Temperature sensor defective or malfunctioning.	Press the button OK : deactivation of warning buzzer sound. Check temperature sensors B306/B346, reconnect or replace.
ERROR idle run / temp.	yellow (B)	Prolonged operation at insufficiently high exhaust gas temperature/at idle speed. There is a risk that the exhaust gas backpressure might increase above the set limit.	Press the button OK : deactivation of warning buzzer sound. Increase machine / motor load (full-load operation). Operate machine at a higher speed.
Lead pressure reached	red (A)	The particle filter is blocked. The backpressure is above the limit value and is likely to rise further. Risk of damage to the diesel engine.	Regenerating particle filter: operate machine at full load until the pressure begins to drop. If there is no pressure drop: shut down machine, dismantle filter and have it cleaned.
Main charging pressure reached This signal is accompanied by a warning buzzer sound.	red (B) (flashing)	The particle filter is very dirty and the exhaust backpressure is too high. Risk of damage to the diesel engine.	Switch off machine, clean the filter, see 5.1.4.
Filter defective or pressure line blocked This signal is accompanied by a warning buzzer sound.	All LEDs flashing	Particle filter defective, pressure line blocked or leak in pressure line and exhaust gas system.	Switch off machine, check particle filter and pressure line/exhaust gas system. If necessary, check pressure sensor with hand pump from service case. Replace filter module or eliminate blockage/leak in pressure line/exhaust gas system.
Pressure offset	yellow	The system can only measure the exhaust gas pressure (no engine speed and charge voltage values).	Press the button OK : deactivation of warning buzzer sound. Check data logger settings. Check whether speed monitoring is activated. Check ignition voltage threshold.
ERROR pressure & charge voltage	yellow	No measurements for exhaust gas pressure and charge voltage.	Press the button OK : deactivation of warning buzzer sound. Check backpressure from the particle filter to the data logger. Check data logger settings. If required, check the pressure sensor using the hand pump from the service case.
ERROR charge voltage	yellow	No measurement for charge voltage.	Check ignition voltage threshold.
ERROR voltage threshold	yellow	The system can only measure the charge voltage (no exhaust gas pressure and engine speed values).	Press the button OK : deactivation of warning buzzer sound. Check backpressure line from particle filter to data logger. Check electrical connections from the generator (terminal W).
Defect/wire break at Terminal W	yellow	No measurement of engine speed. Incorrect engine/generator transmission ratio.	Press the button OK : deactivation of warning buzzer sound. Check electrical connections of the generator (terminal W). Restore default settings.

**Caution**

Make sure the side without shoulder of the bearing inner races points to the center of the spur gear.

- ▶ Push the spacer **20** into its centering in the gear housing **1**.
- ▶ Fit gear shaft **18** with a new o-ring **61**.
- ▶ Install complete gear through the opening of the removed adapter flange **6** and fix it by inserting and pressing in all the way the shaft **18**.
- ▶ Secure the shaft with washers **21** and screws **39***.

Installation of spur gear 14:

- ▶ Press bearings **29** and **31** on both sides onto gear **14**.

**Caution**

Make sure that the snap rings **29** of both bearings always point to the center of the spur gear.

- ▶ Push spur gear **14** into adapter flange **6**.
- ▶ Mount both o-rings **63** and **66** to adapter flange **6** and then push flange **6** complete with the spur gear **14** into adapter Housing **1**.

**Caution**

Make sure lubrication holes in flange are situated above.

- ▶ Push adapter flange **6** all the way into housing, either with a press or by regularly tightening the nuts **49***.
- ▶ Push the gear oil pump **80** onto stud bolts **42** and fix it with nuts **45** and washers **50***.

**Note**

Make sure the woodruff key **74** engages correctly.

- ▶ Reinstall the suction pipe and the both couplings*.

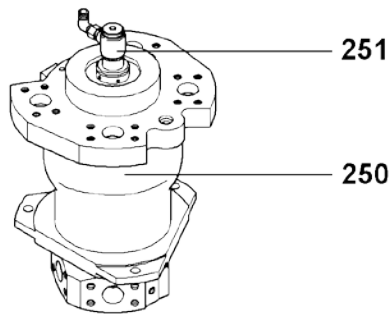
Installation of dipstick 4:

- ▶ Insert dipstick guide **2** with seal **56**, using Loctite 243 and torque*.
- ▶ Insert dipstick **4**.
- ▶ Install and torque oil filler tube **85***.

4 Installation of splitterbox

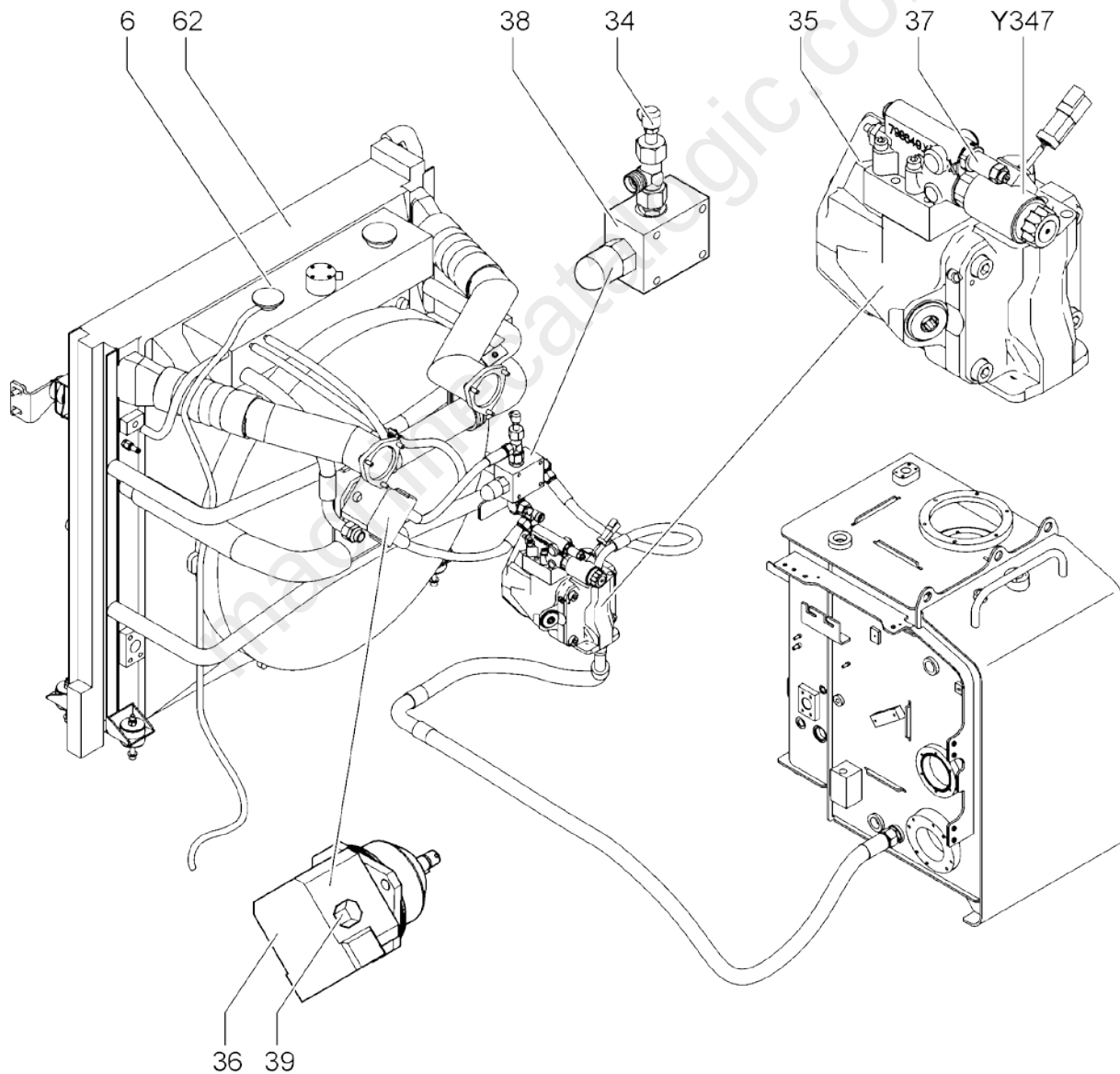
- ▶ Lightly lubricate the teeth on the splitterbox drive shaft and on the coupling (preferably with «Optimol white T, ident Nr 8500307).
- ▶ Install the splitterbox to the engine flywheel housing and tighten with screws **95***.
- ▶ Install hydraulic pumps
- ▶ Connect suction, pressure, control and leak oil lines.
- ▶ Open shut off valve on hydraulic tank.
- ▶ Add gear oil to the mark on the dipstick.

6 Hydraulic rotary connections



250 Rotary connection 5 ways - high pressure **251** Rotary connection way - servo pressure

7 Hydraulic cooler fans drive



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2 Working parameters. 8.60.1

3 Power circuit for the electrical excavators 8.60.2

Electrical diagrams 8.100

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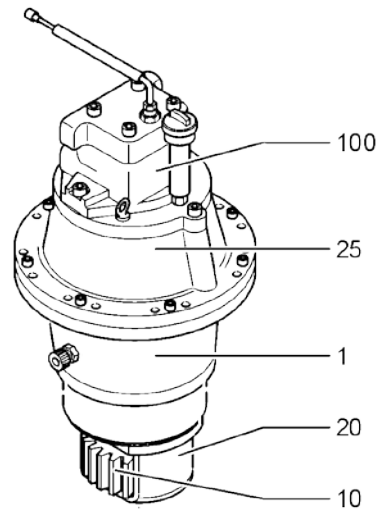


Fig. 2 *Swing gear*

4 Function and power flow

4.1 Function / implantation

The input torque is transferred to the sun gear **60** by the hydraulic oil motor **100**.

The sun gear **60** drives the sun gear **40** via the planetary gears **47** and the planetary carrier **45** with the reduced speed by planetary stage I.

The sun gear **40** drives at the same time via planetary gear **47** and the planetary carrier **45** the output shaft **10** with the reduced speed by planetary gear II.

The gear ratio is combined by both planetary gears. The output torque increases in the same ratio as the output speed is reduced.

4.2 Function of lubrication system

The grease cap **20**, mounted on the housing **1**, covers the pinion of the drive shaft **10** to the connection on the swing ring. The cap is filled with grease via a lubrication line. It releases grease to the pinion and swing gears every time the uppercarriage turns.

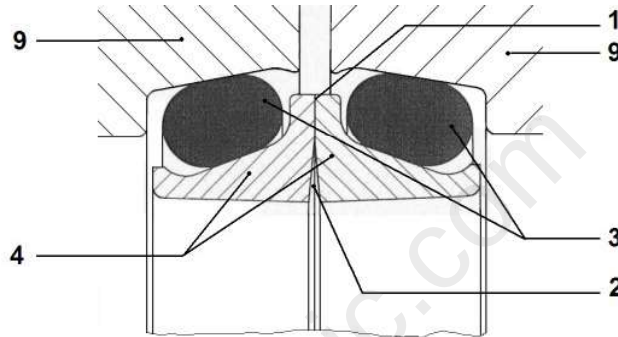
On R954 C the swing gear centring is grease by a tube coming from the secondary distribution block **W**.

12.80: Slipring seals

1 Handling and installation instructions for slipring seals

The slipring seals have been developed to ensure a lasting tightness on components having to support very heavy loads, exposed to severe abrasive and corrosive conditions (sand, mud, water, ...) and at relative low rotation speeds.

The slipring seals are thus particularly well adapted to guarantee the sealing of the components of the tracks of our hydraulic excavators.



A slipring seal consists of two metallic sliding rings 4, which have the same geometric contour and are flexibly supported in elastomeric rings 3.

The seal is assembled so that one of the metallic rings is rotating and the other is mounted stationary. The relative movement between the rotating part and the immobile part takes place at the lapped contact face 1 between the both sliding rings 4.

There is no relative movement in the area of the elastomeric ring 3.

The tightness is permitted by the axial forces exerted by the elastomeric rings 3 due to their compression in the housing parts 9 at the installation.

The sliding contact face 1 is lubricated in permanence thanks to the oil contained inside the housing of the sealed component, the inflow of oil is improved by the wedge shaped gap created by the assembly of the conically designed contact faces 2 of the sliding rings 4.

Depending on constructive features, the section of the elastomeric rings 3 can be either circular (seal with toric sealing elastomeric rings, see figure above) or have a trapezoid shape (seal with trapezoidal elastomeric rings, see figure 2).

2 Installation instructions for slipring seals



Warning!

Slipring seals are precision components made out of chilled cast iron. Therefore sharp knocks and blows should be avoided!

- ▶ Do not remove slipring seals from protective packing until they are ready to be used. Protect the polished seal faces 1 from damage and dirt.
- ❑ Slipring seals are delivered wrapped per pair since the both halfseals have been lapped together. New slipring seals must always be installed per pair, as wrapped.
- ❑ The seal housings 9 (receiver parts) must be clean and free of burrs and machining residues. All edges in the housing bore must be smooth and chamfered.
- ▶ When ever possible, always employ a special installation tool **10** to insert slipring seals with toric rings into their seat in the receiver parts 9.
The installation tool consists of two half shells that are closed around the sliding ring 4 and push the elastomeric ring 3 back from the metallic ring 4.
Employing the tool allows to apply the force necessary for seal installation evenly around the cir-

Fault code	Error description	Remedial measures
065	Flame scanner: Short circuit, over-load, earth fault The inspection can only be carried out if the heater is still installed in the machine if no test rig is available.	► Dismantle the control unit and check the connecting cable of the flame scanner for damage. Drive train OK: ► Remove the 14-pin plug at the control unit. ► Unplug pin 1 (0.5² blue) and pin 2 (0.5² brown). ► Plug in 14-pin plug at the control unit. ► Switch on the heating. If fault code 064 is displayed: ► Dismantle and check the flame scanner. If fault code 065 is displayed: ► Check the control unit, replace as necessary.
071	Overheating gauge: Interruption The inspection with a bridge in the 14-pin plug can only be carried out if the heater is still installed in the machine or if a test rig is available.	► Dismantle the control unit and check the connecting cable of the overheating gauge for damage. Drive train OK: ► Change the 14-pin plug pin 5 over to pin 6. ► Switch on the heating. If fault code 072 is displayed: ► Dismantle and check the overheating gauge. If fault code 071 is displayed: ► Check the control unit, replace as necessary.
072	Overheating gauge: Short circuit, over-load, earth fault The inspection can only be carried out if the heater is still installed in the machine if no test rig is available.	► Dismantle the control unit and check the connecting cable of the overheating gauge for damage. Drive train OK: ► Remove the 14-pin plug at the control unit. ► Unplug pin 5 (0.5² red) and pin 6 (0.5² red). ► Plug in 14-pin plug at the control unit. ► Switch on the heating. If fault code 071 is displayed: ► Dismantle and check the overheating gauge. If fault code 072 is displayed: ► Check the control unit, replace as necessary.
090 092 - 103	Control unit faulty	► Replace control unit.
091	External interference voltage	Disruption of control unit due to interference voltages from the onboard power supply from poor batteries, charging equipment, other fault sources. ► Remedy the fault sources.
Faults which are not displayed by the diagnostic equipment		
Fault description		Remedial measures

Full Version Available

Liebherr R 954 C Excavator Service Manual

Liebherr R 954 C excavator service manual covering repair procedures, adjustments and troubleshooting for the main systems. 914-page PDF.

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