3.1 Maintenance and inspection schedule

All relevant **safety guidelines** must be followed when carrying out all servicing, inspection or repair work. Regional work safety regulations, industrial accident prevention regulations and national legislation must be observed.

You will find a list of spare parts that you need for servicing and inspection work in the "SERVICE PACK" in the spare parts list.

Use only **LIEBHERR original spare parts and servicing parts** for all servicing, inspection and repair work. If the operating company requires the installation of other parts purchased elsewhere, a separate note must be on the inspection documents that this may result in a loss of guarantee.

Do not exceed the stated **maintenance** and **inspection intervals** and **if necessary** these should be **reduced.**

CAUTION

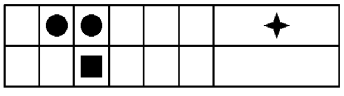
Careful servicing can only be carried out if the machine is clean.

► Clean the machine before you start any service work.

The following abbreviations are used in this section:

h = service hours

Various symbols (solid or empty circles, boxes and stars) are used to indicate the maintenance tasks, which fall into two main types.

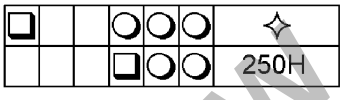


bsym0039

The symbols have the following meanings:

Table with **solid** circle, box or star

– Responsibility for carrying out the maintenance work lies with the machine operator or his maintenance personnel.
This affects the maintenance intervals every 10 and 50 service hours (h) and non-scheduled intervals.



bsym0040

The symbols have the following meanings:

Table with **empty** circle, box or star, or service hours (h)

– The maintenance and inspection work must be performed or supervised by authorised engineers from LIEBHERR or its authorised dealers.
This affects the maintenance intervals on delivery, every 500, 1000, 2000 service hours (h), and at unscheduled times.

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Note

Greasing the screw head base or washer alters the friction coefficient for the tightening torque.

! Make sure that you do not grease the screw head base and the washer.

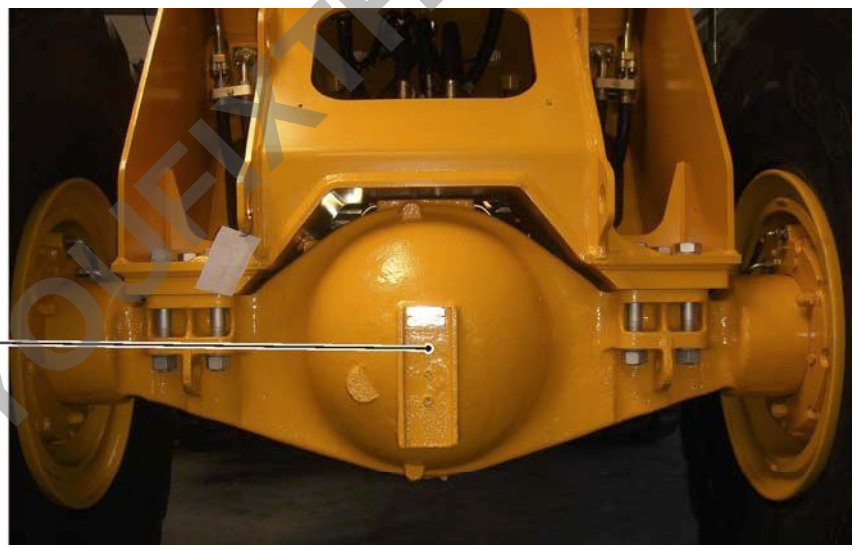
- Clean the centering 1 on the wheel hubs and grease it with Never Seez - Blue Moly (ID no. 811202814) before mounting the wheels.
- The front mounting face 2 must be clean and shiny.
- Grease the thread 4 on the cheese-head screws with Never Seez - Blue Moly (ID no. 811202814).
- Tighten the screws to a torque of 450 Nm.

3.5.51 Checking the oil level in the front axle

The differential and the wheel hubs have a common oil system.

Make sure that the machine is in maintenance position 1.

Procedure



- Open the plug **1** and check the oil level in the axle.
- If the oil level is too low:
  Top up with the axle oil prescribed in the section on lubricants and fuels.

3.5.52 Checking the oil level in the rear axle

The differential and the wheel hubs have a common oil system.

Make sure that the machine is in maintenance position 1.

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3.5.27 Checking the exhaust lines for leaks and tight fitting

Make sure that:

– The machine is in maintenance position 1.
– The engine compartment hood is open.

Procedure



- Check that the fixing screws **1** and clip **3** on the exhaust pipe between the turbocharger and the silencer are tightly fastened and do not leak.
- Check that the flexible pipe **2** of the exhaust pipe is laid straight.
- Check that the spacer **3** is tight.
- Check that the fastening clip **6** of the tail pipe **7** is tight.

3.5.28 Checking the oil level in the pump distributor gear

The dipstick **3** and the oil filling tube **2** are located in the engine compartment directly beside the hydraulic tank.

Access is from above the engine on the right-hand side.

Make sure that:

– The machine is in maintenance position 1.
– The engine compartment hood is open.
– The engine has been switched off for minimum 10 mins

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1.3 Standard

1.3.1 Tightening torques for screws

Pre-loading forces and tightening torques for screws with standard and fine metric threads.

Standard and fine metric threads All figures are for bolted connections with **at least one** Dacromet 500 coated element (screws, washers, nuts…)			
Surface: *- DACROMET 500*			
Thread	Class	Assembly pre-loading forces F_M in N	Tightening torques M_A in Nm
		for avg. coefficient of friction μ_G= 0.10	
M4	8.8	4 200	2,5
	10.9	6 200	3,7
	12.9	7 300	4,3
M5	8.8	6 900	4,9
	10.9	10 100	7,3
	12.9	11 900	8,5
M6	8.8	9 700	8,5
	10.9	14 300	12,5
	12.9	16 700	14,5
M7	8.8	14 200	14,0
	10.9	20 900	20,5
	12.9	24 500	24,0
M8	8.8	17 900	20,5
	10.9	26 000	30
	12.9	30 500	35
M8x1	8.8	19 600	22
	10.9	28 500	32
	12.9	33 500	38
M9x1	8.8	25 500	32
	10.9	38 000	46
	12.9	44 000	54
M10	8.8	28 500	41
	10.9	42 000	60
	12.9	49 000	71
M10x1	8.8	32 500	45
	10.9	48 000	67
	12.9	56 000	78
M10x1,25	8.8	30 500	43
	10.9	45 000	64
	12.9	53 000	74
M12	8.8	41 500	71
	10.9	61 000	104
	12.9	71 000	121
M12x1,25	8.8	46 500	77
	10.9	68 000	112
	12.9	80 000	130
M12x1,5	8.8	44 000	74
	10.9	65 000	108
	12.9	76 000	125
M14	8.8	57 000	113
	10.9	84 000	165
	12.9	98 000	195
M14x1,5	8.8	63 000	121
	10.9	92 000	175
	12.9	108 000	205

Standard and fine metric threads. All figures are for bolted connections **without any** Dacromet 500 coated elements (screws, washers, nuts…)			
Surface: *- black finish or phosphated* *- zinc-plated*			
Thread	Class	Assembly pre-loading forces F_M in N	Tightening torques M_A in Nm
		for avg. coefficient of friction μ_G= 0.12	
M4	8.8	4 050	2,8
	10.9	6 000	4,1
	12.9	7 000	4,8
M5	8.8	6 600	5,5
	10.9	9 700	8,1
	12.9	11 400	9,5
M6	8.8	9 400	9,5
	10.9	13 700	14,0
	12.9	16 100	16,5
M7	8.8	13 700	15,5
	10.9	20 100	23,0
	12.9	23 500	27
M8	8.8	17 200	23
	10.9	25 000	34
	12.9	29 500	40
M8x1	8.8	18 800	24,5
	10.9	27 500	36
	12.9	32 500	43
M9x1	8.8	24 800	36
	10.9	36 500	53
	12.9	42 500	62
M10	8.8	27 500	46
	10.9	40 000	68
	12.9	47 000	79
M10x1	8.8	31 500	52
	10.9	46 500	76
	12.9	54 000	89
M10x1,25	8.8	29 500	49
	10.9	43 000	72
	12.9	51 000	84
M12	8.8	40 000	79
	10.9	59 000	117
	12.9	69 000	135
M12x1,25	8.8	45 000	87
	10.9	66 000	125
	12.9	77 000	150
M12x1,5	8.8	42 500	83
	10.9	62 000	122
	12.9	73 000	145
M14	8.8	55 000	125
	10.9	80 000	185
	12.9	94 000	215
M14x1,5	8.8	61 000	135
	10.9	89 000	200
	12.9	104 000	235

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3.5.7 Checking the engine oil level

Make sure that:

– The machine is in maintenance position 1.
– The engine compartment hood is open.
– The engine is level and has not been running for 2 - 3 minutes.

Procedure



Diesel engine

- Pull out the dipstick **1**, wipe it clean, and re-insert it.
- Pull out the dipstick once again and read off the oil level.

The oil level must be between the **MIN** and **MAX** markings.

- If the oil level is too low:
  Remove the sealing cap from **2** the filler neck **2** and top up with oil.

Necessary oil quality: see the section on lubricants and fuels.

- Clean the sealing cap, place it on the filler neck **2** and tighten it.

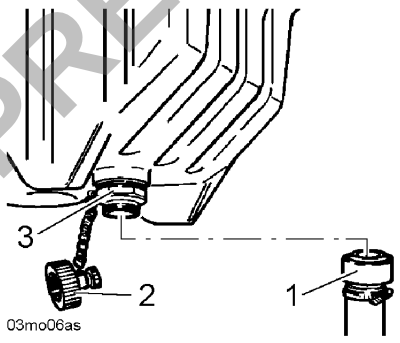
3.5.8 Changing the engine oil

Make sure that:

– The machine is in maintenance position 1.
– The engine compartment hood is open.
– The engine is level.
– The engine is warm.
– A suitable receptacle, an oil drain hose and the specified engine oil are at hand.

See the table of filling quantities for the required capacity of the receptacle.

Procedure



1 Oil drain hose
2 Cap
3 Oil drain valve

- Unscrew the cap of the oil drain valve on the oil pan.
- Screw the oil drain hose to the oil drain valve.
- Drain off the oil into the receptacle.
- Unscrew the oil drain hose.
- Screw the cap onto the oil drain valve.

When changing the engine oil and the oil filter:

Change the filter as described in the section on changing the engine oil filter.

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Customer: …… Machine type: ……..… Ser. no.: ……..…… Service hours: ……..…… Date: ……..……

Maintenance / inspection after service hours							TASKS TO BE PERFORMED
On handover	Every 10	Every 50	Every 500	Every 1000	Every 2000	Special intervals	**By maintenance staff** ■ Once-only activity ● Repeat interval ★ As necessary ❄ Annually before the winter **By authorised specialist staff** ❑ Once-only activity ❍ Repeat interval ☆ As necessary
❑							Have the driver lubricate the machine in accordance with the lubrication chart and instruct him on proper maintenance
❑							Instruct the driver in the operation of all functions
❑							Instruct the driver on the operating instructions and the safety regulations they contain.
	●	●	❍	❍	❍		Removing loose parts, dirt, ice and snow from the machine
❑	●	●	❍	❍	❍		Check the machine for external damage
						★	Make sure the bolted connections are tight
❑						★	Sealing leaks
			❑	❍	❍		Check the hydraulic pressure according to the testing and adjustment plan
							Diesel engine and pump distributor gear
❑	●	●	❍	❍	❍		Check the engine oil level
			❍	❍	❍		Change the engine oil (at least once a year): NOTE See the section on lubricants and fuels for the engine oil quality and complicating factors.
			❍	❍	❍		Change the engine oil filter (at least once a year):
			❍	❍	❍		Check the V-ribbed belt and replace it if necessary
				❍	❍		Check / adjusting the engine valve play
						❄	Check the diesel engine heating flange
				❍	❍		Lightly grease the ring gear on the engine starter flywheel
				❍	❍		Change the engine oil separator filter insert
			❍	❍	❍		Check the bearings and condition of the engine control units
			❍	❍	❍		Check the state of sensors and cable connections
			❍	❍	❍	★	Replace the fuel pre-filter (or in the event of a lack of output)
			❍	❍	❍	★	Replace the fuel fine filter (or in the event of a lack of output)
	●	●	❍	❍	❍	★	Draining off condensate from the fuel pre-filter (or if the corresponding service code appears)
						★	Bleed air from fuel system (CAUTION: do not loosen injection lines)
❑		●	❍	❍	❍	★	Drain off condensate and sediment from the fuel tank
		●	❍	❍	❍	★	Clean the air filter service cap and dust extraction valve
				❍	❍		Test the air filter vacuum switch
						★	Change the main air filter element when indicated by the vacuum switch (or every year at the latest)
						★	Clean or replace the air filter secondary element (after replacing the main element 3 times or every year at the latest)
			❍	❍	❍		Check the air suction hoses for leaks and tight fitting
			❍	❍	❍		Check the exhaust lines for leaks and tight fitting
❑		●	❍	❍	❍		Check the oil level in the pump distributor gear
			❑	❍	❍		Change the splitter box oil

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Procedure



- Open the plug **1** and check the oil level in the axle.
- If the oil level is too low:
  Top up with the axle oil prescribed in the section on lubricants and fuels.

3.5.53 Changing the oil in the front axle

Make sure that:

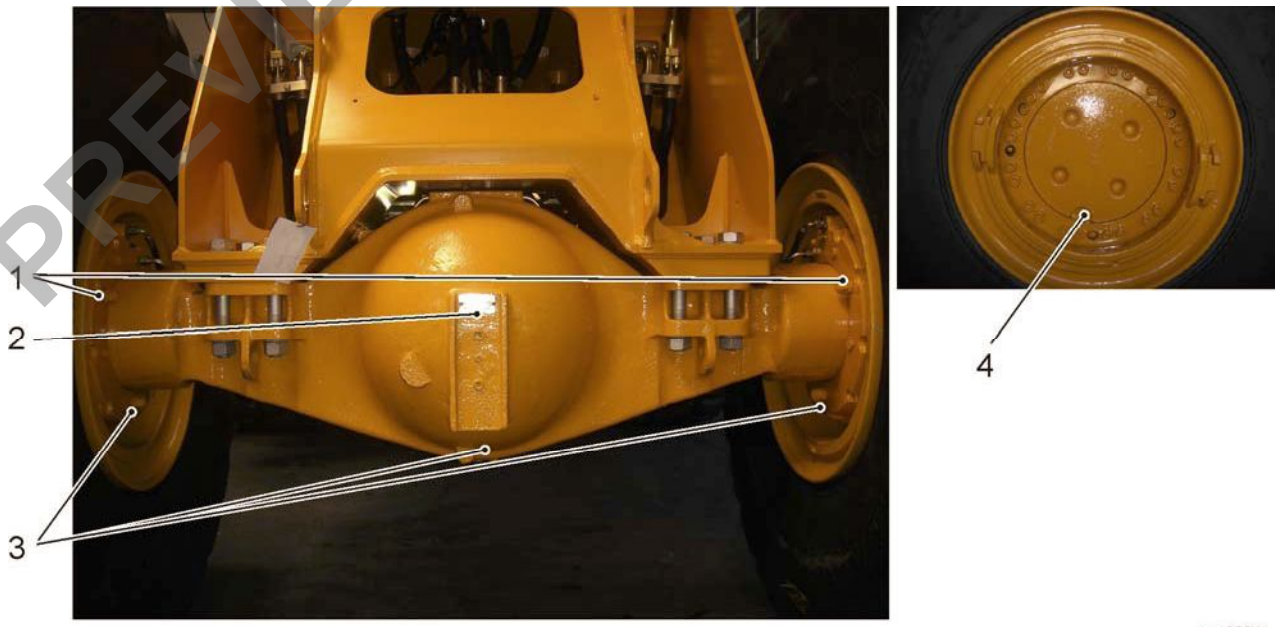
– The machine is in maintenance position 1.
– You have a sufficient quantity of the axle oil prescribed in the section on lubricants and fuels.
– You have a suitable oil receptacle ready for disposal.

Draining oil

CAUTION

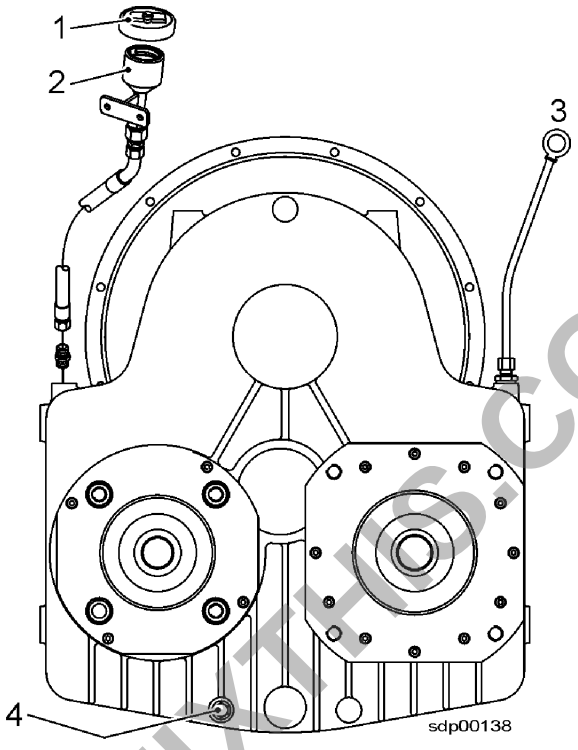
Running the engine makes the gear oil very hot!

► Always wear suitable gloves and goggles.



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Procedure



Pump distributor gear

1 Oil filler pipe plug
2 Filler neck
3 Dipstick
4 Drain plug

- Check the temperature of the splitter box. The mark on the dipstick is only accurate at 20° C. If the oil is hot, it is over the MAX mark.
- CAUTION! The engine must have been switched off for minimum 10 mins. before measurement.
- Pull out the dipstick **3**, wipe it clean, and re-insert it.
- Pull out the dipstick **3** once again and read off the oil level.

The oil level must be between the **MIN** and **MAX** markings.

- If the oil level is too low:

  Remove the sealing cap from the oil filling tube **2** and top up with oil.

For the oil quality, see the section on lubricants and fuels.

- Clean the sealing cap for the oil filling tube **2**, put it on the oil filling tube on the splitter box, and then tighten it up.

3.5.29 Changing the splitter box oil

Make sure that:

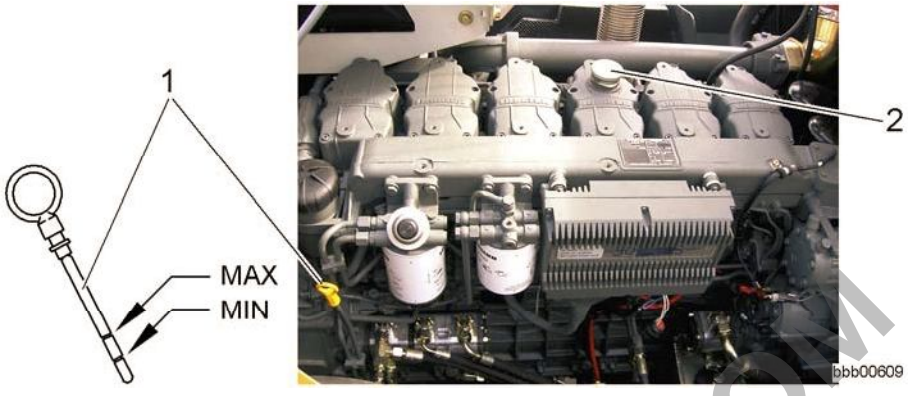
– The machine is in maintenance position 1.
– The engine compartment hood is open.
– The cover plate under the engine is open.
– You have a suitable oil receptacle (capacity approx. 10 l) and the drain hose ready.
– For the oil quality and quantity, see the section on lubricants and fuels.

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Thread	Class	Assembly pre-loading forces F_M in N	Tightening torques M_A in Nm
		for avg. coefficient of friction μ_G= 0.10	
M16	8.8	78 000	170
	10.9	115 000	250
	12.9	134 000	300
M16x1,5	8.8	85 000	180
	10.9	125 000	270
	12.9	147 000	310
M18	8.8	98 000	245
	10.9	140 000	350
	12.9	164 000	410
M18x1,5	8.8	114 000	270
	10.9	163 000	390
	12.9	191 000	450
M18x2	8.8	106 000	260
	10.9	151 000	370
	12.9	177 000	430
M20	8.8	126 000	350
	10.9	180 000	490
	12.9	210 000	580
M20x1,5	8.8	144 000	380
	10.9	206 000	540
	12.9	240 000	630
M22	8.8	157 000	470
	10.9	224 000	670
	12.9	260 000	780
M22x1,5	8.8	177 000	510
	10.9	255 000	720
	12.9	295 000	840
M24	8.8	182 000	600
	10.9	260 000	850
	12.9	305 000	1000
M24x1,5	8.8	215 000	700
	10.9	306 000	990
	12.9	358 000	1170
M24x2	8.8	203 000	640
	10.9	290 000	920
	12.9	340 000	1070
M27	8.8	239 000	880
	10.9	340 000	1250
	12.9	400 000	1450
M27x1,5	8.8	276 000	1010
	10.9	394 000	1440
	12.9	461 000	1690
M27x2	8.8	265 000	940
	10.9	375 000	1350
	12.9	440 000	1550
M30	8.8	290 000	1190
	10.9	415 000	1700
	12.9	485 000	2000
M30x1,5	8.8	346 000	1410
	10.9	493 000	2000
	12.9	576 000	2340
M30x2	8.8	332 000	1370
	10.9	472 000	1940
	12.9	553 000	2270
M33	8.8	360 000	1600
	10.9	520 000	2300
	12.9	600 000	2700
M33x1,5	8.8	423 000	1880
	10.9	603 000	2670
	12.9	705 000	3130
M33x2	8.8	410 000	1750
	10.9	580 000	2500
	12.9	680 000	2900
M36	8.8	425 000	2100
	10.9	600 000	3000
	12.9	710 000	3500
M36x1,5	8.8	508 000	2450
	10.9	724 000	3490
	12.9	847 000	4090

Thread	Class	Assembly pre-loading forces F_M in N	Tightening torques M_A in Nm
		for avg. coefficient of friction μ_G= 0.12	
M16	8.8	75 000	195
	10.9	111 000	280
	12.9	130 000	330
M16x1,5	8.8	82 000	205
	10.9	121 000	300
	12.9	141 000	360
M18	8.8	94 000	280
	10.9	135 000	390
	12.9	157 000	460
M18x1,5	8.8	110 000	310
	10.9	157 000	440
	12.9	184 000	520
M18x2	8.8	102 000	290
	10.9	146 000	420
	12.9	170 000	490
M20	8.8	121 000	390
	10.9	173 000	560
	12.9	202 000	650
M20x1,5	8.8	139 000	430
	10.9	199 000	620
	12.9	232 000	720
M22	8.8	152 000	530
	10.9	216 000	750
	12.9	250 000	880
M22x1,5	8.8	171 000	580
	10.9	245 000	820
	12.9	285 000	960
M24	8.8	175 000	670
	10.9	249 000	960
	12.9	290 000	1 120
M24x1,5	8.8	207 000	760
	10.9	295 000	1 090
	12.9	346 000	1 270
M24x2	8.8	196 000	730
	10.9	280 000	1 040
	12.9	325 000	1 220
M27	8.8	230 000	1 000
	10.9	330 000	1 400
	12.9	385 000	1 650
M27x1,5	8.8	267 000	1 110
	10.9	381 000	1 580
	12.9	445 000	1 850
M27x2	8.8	255 000	1 070
	10.9	365 000	1 500
	12.9	425 000	1 800
M30	8.8	280 000	1 350
	10.9	400 000	1 900
	12.9	465 000	2250
M30x1,5	8.8	335 000	1 540
	10.9	477 000	2 190
	12.9	558 000	2 560
M30x2	8.8	321 000	1 490
	10.9	457 000	2 120
	12.9	534 000	2 480
M33	8.8	350 000	1 850
	10.9	495 000	2 600
	12.9	580 000	3 000
M33x1,5	8.8	410 000	2 050
	10.9	584 000	2 920
	12.9	683 000	3 420
M33x2	8.8	395 000	2 000
	10.9	560 000	2 800
	12.9	660 000	3 300
M36	8.8	410 000	2 350
	10.9	580 000	3 300
	12.9	680 000	3 900
M36x1,5	8.8	492 000	2 680
	10.9	701 000	3 820
	12.9	820 000	4 470

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Engine with dipstick

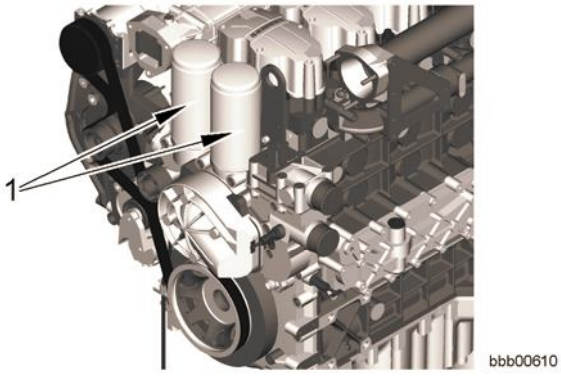
- Pour the new oil into the filler neck **2** to between the MIN and MAX markings on the dipstick**1**.
- Clean the filler cap, place it on the filler neck **2** and tighten it.
- Start the engine and check the oil pressure.
- Turn off the engine and after 1 or 2 minutes, check the oil level on the dipstick.
- Top up with oil if necessary.

3.5.9 Changing the diesel engine oil filter

Make sure that:

– The machine is in maintenance position 1.
– The engine compartment hood is open.
– The engine oil has been drained off.
– A strap wrench and a suitable container are in place.
– Only use genuine LIEBHERR spare parts (2 oil filter cartridges).

Procedure



- Place a suitable container under the diesel engine.

Note

Protect the V-ribbed-belt against emerging oil when changing the oil filter cartridge.

► After changing the oil filter, remove all traces of oil on the diesel engine, also behind the vibration damper so that this is not diagnosed as a leak in the leakage in the radial shaft seal at a later stage.

- Release the filter cartridges **1** with a strap wrench and unscrew them.
- Clean the seals on the filter bracket.
- Lightly coat the rubber gaskets on the new oil filter cartridges with engine oil.
- Screw on the new oil filter cartridge until the sealing ring touches the filter bracket.

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LBH/Version 01/07.2007/en/hd/31.03.2010

- Open the wheel hub bleeder screw **1**.
- Open the filling and inspection plug **2**.
- Open the drain plugs **3** and drain the oil.
- Open the drain plugs **4** on the wheel hubs by turning the wheels to the lowest level.
- Open the drain plugs **4** on the outside of the wheel hubs and drain the oil.
- Close the bleeder screws **1** and drain plugs **3, 4**.

Topping up oil

The wheel hubs and the differential have a common oil system. This means the oil can flow back and forth between the differential and the wheel hubs.

- Top up oil at the filling inlet **2**. (Until the correct level is reached)
- Close the filling inlet **2**.
- Start the engine and let it run for 60 seconds.
- Check the oil level at the filling inlet **2** and top up if necessary.
- Close the filling inlet **2** again.

3.5.54 Changing the oil in the rear axle

Make sure that:

– The machine is in maintenance position 1.
– You have a sufficient quantity of the axle oil prescribed in the section on lubricants and fuels.
– You have a suitable oil receptacle ready for disposal.

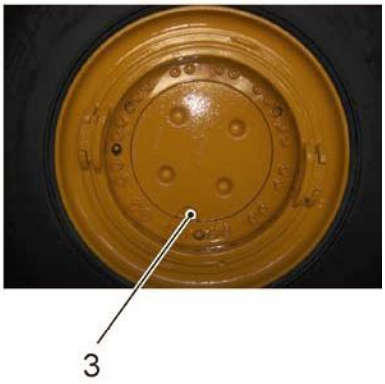
Draining oil

CAUTION

Running the engine makes the gear oil very hot!

► Always wear suitable gloves and goggles.

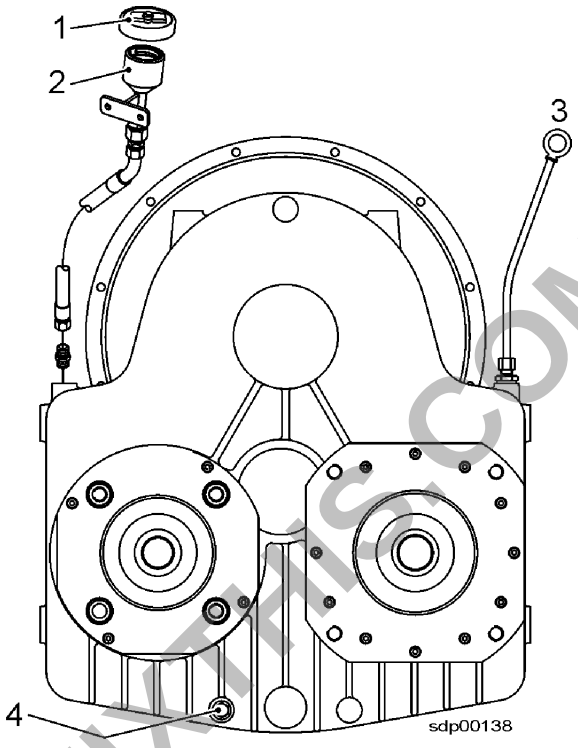




- Open the filling and inspection plug **1**.
- Open the drain plugs **3** on the wheel hubs by turning the wheels to the lowest level.
- Open the plugs **2** and **3** and drain the oil into a receptacle.
- Close the plugs **2** and **3** again.

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Procedure



Pump distributor gear

1 Oil filler pipe plug
2 Filler neck
3 Dipstick
4 Drain plug

- Pull out the dipstick **3** slightly (to read off the oil level more easily).
- Drain plug **4** on the splitter box.
- Drain the oil into the receptacle.
- Screw on the drain plug **4** with a new seal ring.
- Unscrew the sealing cap **1** from the oil filling tube **2** and top up with fresh oil.
- Clean the sealing cap **1**, screw it onto the oil filler tube **2** and tighten it.

The oil level must be up to the MAX mark. In addition, a subsequent check is required after a short period of operation (see the section on checking the oil level).

3.5.30 Checking the soot particle filter pressure monitor for function, leaks and blockages

This equipment is optional.

Observe the separate operating manual.

Make sure that:

– The machine is in maintenance position 1.
– The engine compartment hood is open.

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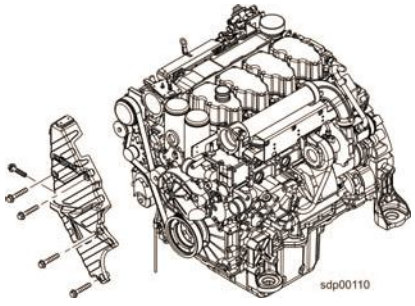
- When the sealing ring touches the filter bracket:
  Tighten the oil filter cartridge by a half to three-quarter turn. (Do not use a tool for tightening).
- Start the diesel engine:
  Check the oil pressure in the engine oil pressure display (see display unit).
- Shut down the diesel engine:
  Check the seals on the oil filters and the oil level.
- After 2 to 3 minutes, check the oil level on the dipstick.



3.5.10 Checking / replacing the V-ribbed belt

The V-ribbed belt is on the front of the engine, protected by a cover.

The engine has a tensioning device for the V-ribbed belt. This tensions itself and requires no maintenance. Only the V-ribbed belt needs to be checked for wear.



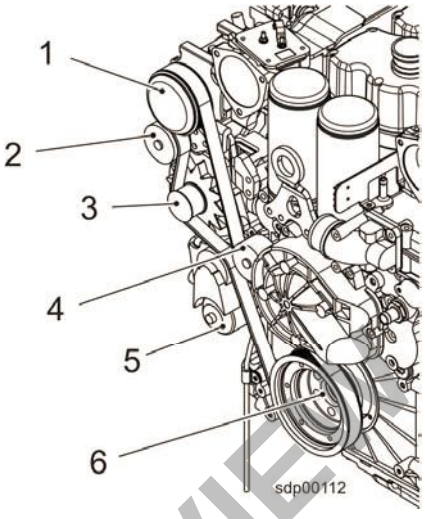
V-ribbed belt guard

Checking the V-ribbed belt

- Take off the V-ribbed belt guard.
- Check the V-ribbed belt for damage.

Damage to the V-ribbed belt can include:

– Torn belt
– Tears in several ribs
– Lumps of rubber on the base of the belt
– Accumulations of dirt and grit
– Ribs coming loose from the belt base
– Cracks on the back



Belt run

Replacing the V-ribbed belt

Make sure you have a DIN 3122 D 12.5 mm (1/2") ratchet wrench and a new V-ribbed belt.

- Pull back the tensioning device **5** against the spring force anticlockwise as far as it will go and take off the belt.
- With the tensioning device **5** swung back, put the new belt on the pulleys of the crankshaft **6**, air conditioning compressor **1**, alternator **3** and deflector roller **2**, **4**. Then return the tensioning device **5** to the tensioning position.

Note

When changing the belt, make sure the deflector rollers 2, 4 and the tensioning roller 5 move freely.

► Replace the tensioning roller or deflector rollers if defective.

3.5.11 Checking / adjusting the engine valve play

Check the valve play with the engine cold.

Make sure that:

– The machine is in maintenance position 1.
– The engine compartment hood and door are open.
– You have the special cranking device, a feeler gauge and cylinder head seals ready.

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General information 1
Product description 2
Maintenance 3
Diesel engine and pump distributor gear 4
Cooling system 5
Travel hydraulics 6
Working hydraulics 7
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Axles and cardan shaft 12
Machine frame and ballast weight 13
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Preface

Intended readership

This service manual is addressed to anyone whose task it is to ensure that the machines are ready for everyday use. This especially includes mechanics and workshop staff of Liebherr dealers and branches.

Contents

The first chapter contains information on safety regulations and on the special tools needed for maintenance and repairs.

Chapter 2 gives you an overview of all the most important technical data of the machine as a whole and its individual assemblies.

Next comes the maintenance chapter, with the maintenance and inspection schedule, the testing and adjustment checklists, lubrication charts, description of maintenance tasks, testing and adjustment tasks and specifications of fuel and lubricants.

The technical description of the machine is in the following chapters, structured according to fifteen function groups. The layout, function and technical data of the groups, components and parts are explained.

Chapter 19 contains information on troubleshooting, the service code table and a description of the “SCULI” service software.

Chapter 20 will be gradually updated with the latest options.

Instructions on use

This manual describes several types and versions of machines. The information generally applies to the types and serial numbers stated at the bottom of the page. The exception to this is information which only applies to specific types and serial numbers, which are stated at the beginning of the section concerned (for example technical data of parts).

Where possible, the ID numbers of parts and components are stated in the heading.

This manual is available in German, English, French, Spanish and Italian.

Working instructions

Always follow the safety regulations whenever you work on the machine. You will find a reference to this in the **“General Information”** section.

In order to perform these tasks you need a complete set of basic tools andcertain special tools, all in perfect working order. All tasks require absolute cleanliness.

Replace seals such as O-rings and surface seals during repairs.

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Procedure

DANGER

There is a risk of fire and explosions.

► Do not smoke

► Avoid naked flames.

► Only work with the engine switched off and cooled down.

- Bleed the fuel filter:
  See the section on bleeding the fuel filter.
- Activate the engine bleeding function.



Activation sequence:

– Turn the ignition on

– With the engine not running, press the button for 10 seconds.

– All 3 LEDs on the button light up when the engine bleeding function is activated.

- Turn the ignition key to position **II** and keep it in there until the engine starts.
- **Do not hold the key in the starting position for more than 20 seconds at a time.**

The ECU ends the engine bleeding function automatically as soon as the engine starts again.

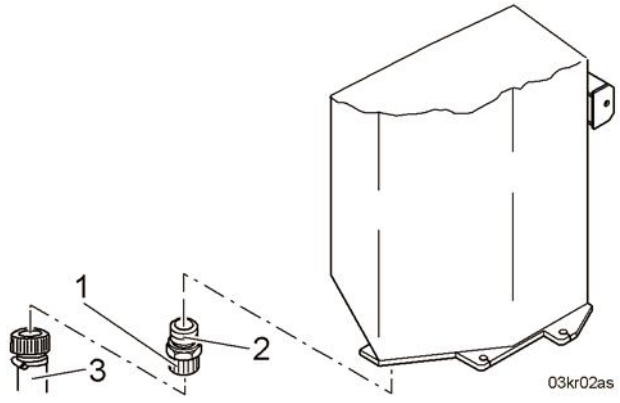
If the engine does not start:

- Wait a minute and repeat the procedure.
  In the meantime, continue to operate the hand pump until you feel strong resistance.

3.5.21 Draining off condensate and sediment from the fuel tank

Make sure that the machine is in maintenance position 1.

Procedure

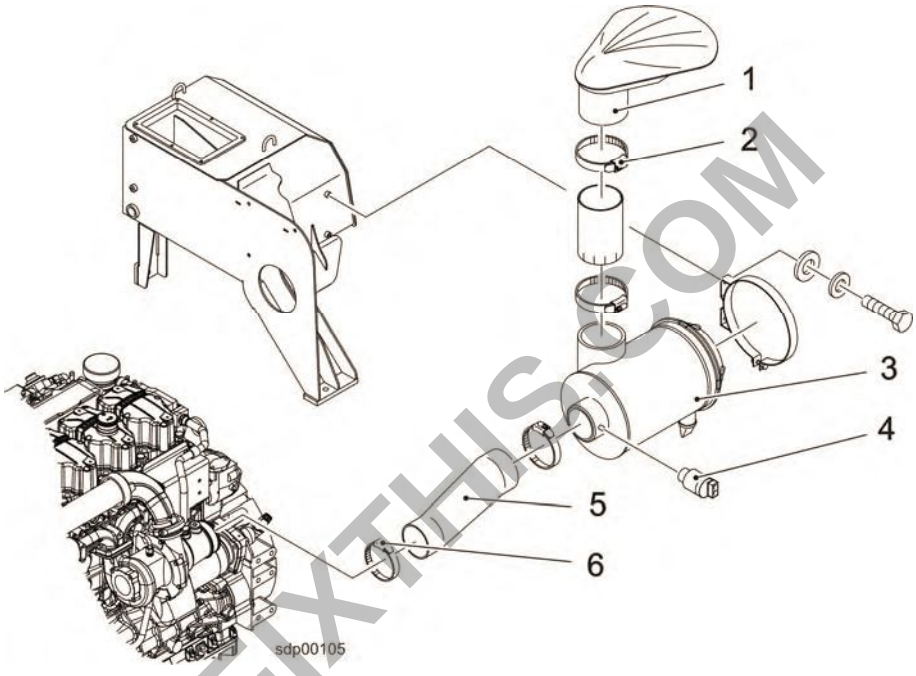


- Unscrew the sealing cap **1** on the drain valve **2** on the bottom of the diesel tank.
- Screw the drain hose **3** onto the drain valve **2**.
- Drain the condensation and sediment into a suitable receptacle until clean fuel begins to flow.
- Unscrew the oil drain hose.
- Screw the cap **1** onto the drain valve **2** and tighten it.

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4.3 Air filter system

Design



Air filter system

1 Rain cap
2 Fixing clips
3 Air filter
4 Vacuum switch
5 Filtered air intake manifold
6 Fixing clips

Function description

The engine takes in fresh air via the rain cap **1** and the air filter **3**. The filtered air is provided to the engine via the turbocharger.

4.3.1 Air filter

Design



Air filter

1 Secondary element
2 Primary element
3 Service cap
4 Fixing clips
5 Dust extraction valve
6 Air filter housing

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7 Working hydraulics

Chapter contents

7 Working hydraulics 7.0-1

7.0 Working hydraulics 7.0-1

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7.3.3 Pilot control hydro accumulator 7.3-10
7.3.4 Float position pressure switch 7.3-11

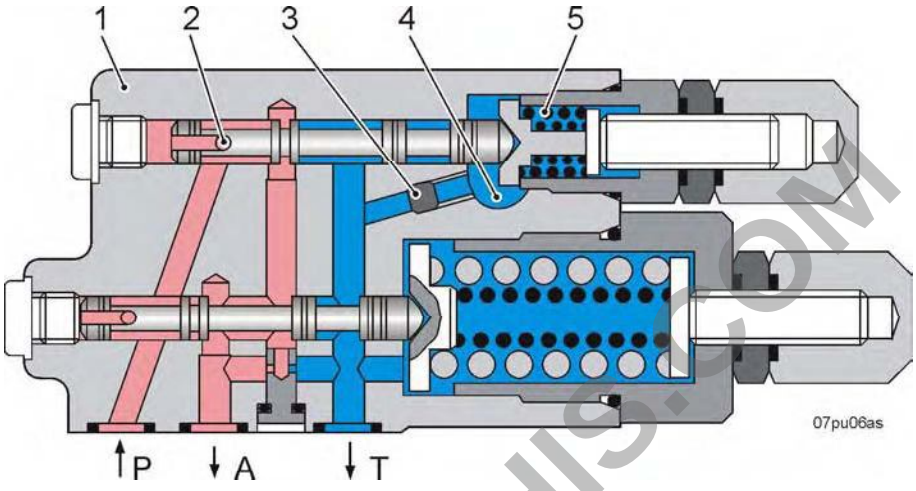
7.4 Ride control 7.4-1
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If the steering wheel is not moved, the load pressure at the connection 4 decreases. The pump pressure moves the piston 2 against the springs 5. The piston 2 opens the pump pressure duct P to the duct A and the return cylinder regulates the pump to the minimum flow.



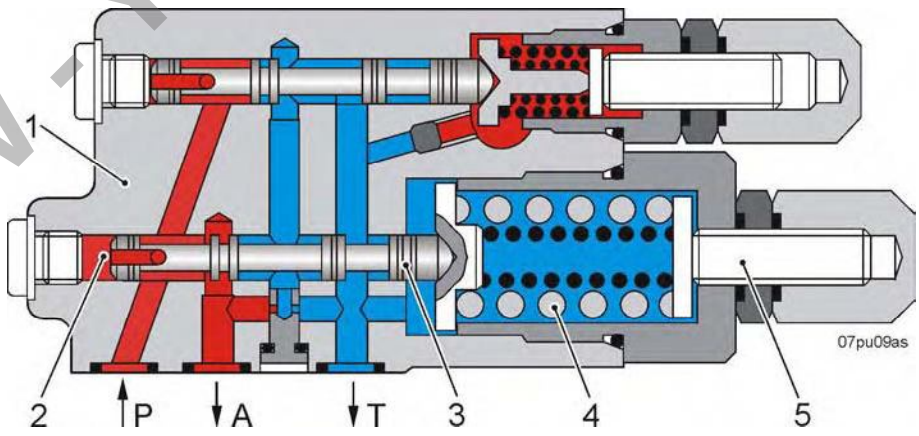
Flow controller with no steering movement (pump does not deliver oil)

Pressure cut-off

When the maximum operating pressure in the system has been reached, the pump moves back to the smallest angle and only delivers leak oil. The maximum operating pressure remains constant.

When the pump reaches its maximum operating pressure, the piston 3 in the pressure cut-off valve 1 moves against the spring 4. This opens the duct A and pressure oil flows to the return cylinder.

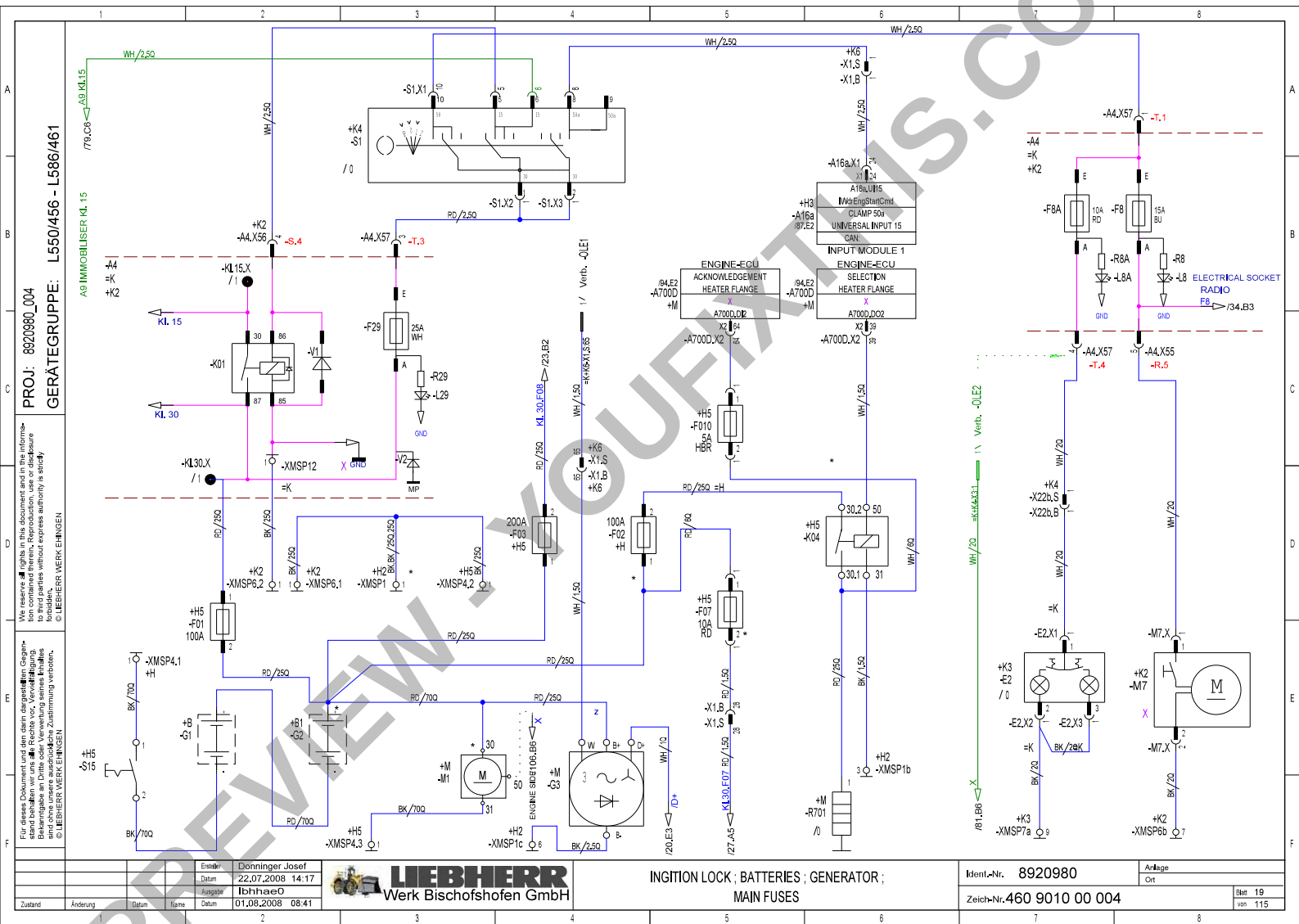
The return cylinder moves the swash plate and regulates the pump to the smallest angle.



Pressure cut-off valve at maximum system pressure

1 Pressure cut-off
2 Effective face
3 Valve piston
4 Pressure spring
5 Adjusting screw
P High pressure
A To the return cylinder
T Pump housing return line

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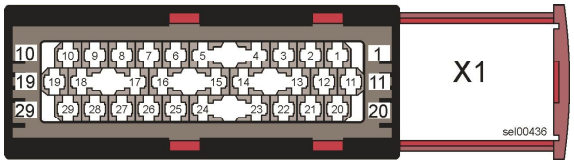
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HEAT- / AIR CONDITIONING SYSTEM VEHICLE SIDE

PROJ: 8920980_004
GERÄTEGRUPPE: L550/456 - L586/461

-A21 Modul Nr.:
+K4 Modulname: HEIZ-KLIMA

Phys. Adr.	Blatt	EA	Beschreibung	Stecker	Pin
A21.Kl30	/62.E1		CLAMP 30	0	1
A21.GND	/62.E3		SUPPLY EARTH	0	2
A21.Kl15	/62.E2		CLAMP 15	0	3
A21.PME	/81.E2		AUXILIARY HEATER	0	4
A21.PME	/62.A3		SWITCH HIGH- VACUUM	0	5
A21.PME			SWITCH MEDIUM PRESSURE	0	6
A21.PME			Schutzbelüftung on	0	7
A21.PME	/68.E1		Ventilator_Innenr.	0	8
A21.PME			Ventilator_Innenr.	0	9
A21.PME	/62.A4		Kompressorkupplung	0	10
A21.RxD			RxD	0	11
A21.TxD			TxD	0	12
A21.CAN1	/35.C6		CAN1_Low INPUT	0	13
A21.CAN1	/35.C7		CAN1_High INPUT	0	14
A21.CAN1			CAN1_Res	0	15
A21.CAN1	/35.D6		CAN1_Low OUT	0	16
A21.CAN1	/35.D7		CAN1_High OUT	0	17
A21.PME			SENSOR_Innenr.2 -	0	18
A21.PME			SENSOR_Innenr.2 +	0	19
A21.PME			SENSOR_Innenr.1 -	0	20
A21.PME			SENSOR_Innenr.1 +	0	21
A21.PME			Programmierpin	0	22
A21.CAN2			CAN2_Low	0	23
A21.CAN2			CAN2_High	0	24
A21.			Res.	0	25
A21.PME	/62.A6		SENSOR_Aussentemp	0	26
A21.PME	/62.A5		SENSOR_Aussentemp	0	27
A21.PME	/62.A8		SUN SENSOR-	0	28
A21.PME	/62.A7		SUN SENSOR+	0	29
				0	30
				0	31
				0	32
				0	33
				0	34
				0	35
				0	36
				0	37
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				0	39
				0	40



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		Ausgabe	Ibhhae0
		Datum	01.08.2008 08:41

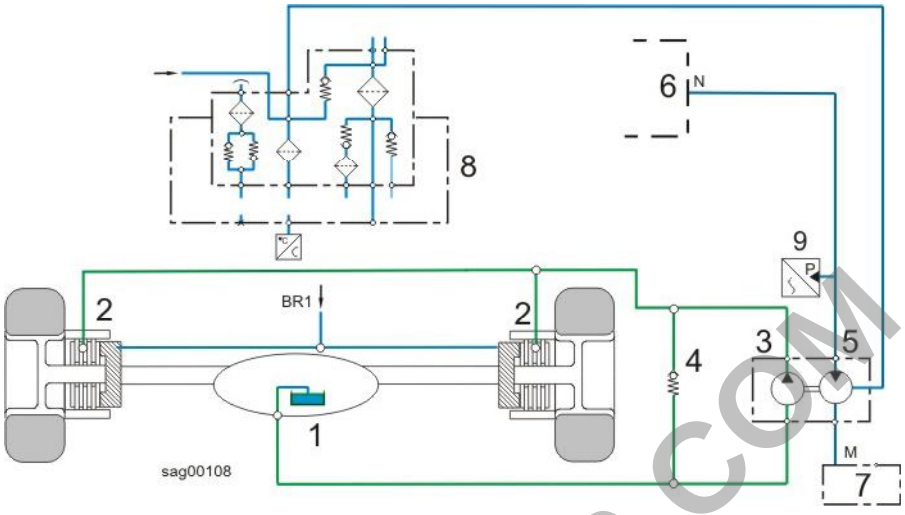
LIEBHERR Werk Bischofshofen GmbH

GENERAL OUTLAY HEAT- / AIR CONDITIONING SYSTEM

Ident.-Nr. 8920980
Zeich-Nr. 460 9010 00 004

Anlage
Ort
Blatt 97
von 115

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Flushing circuit hydraulic diagram

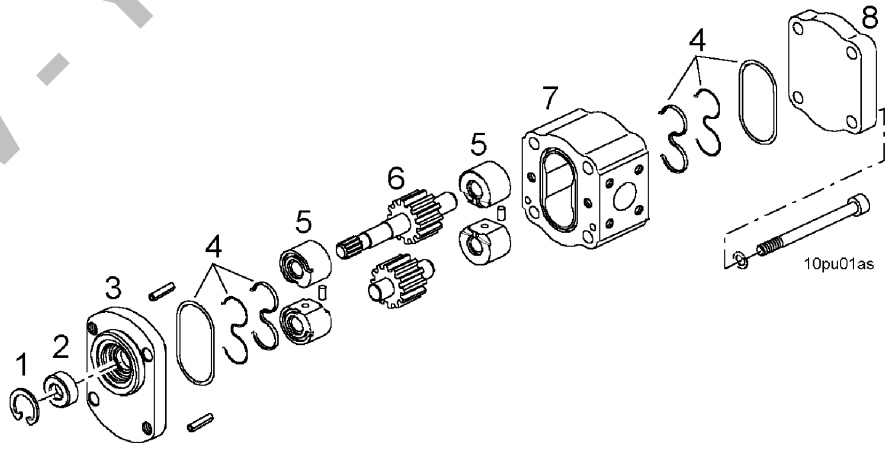
1 Differential housing
2 Brake housing
3 Flushing circuit gear pump
4 5 bar check valve
5 Flushing circuit gear motor
6 Compact brake block
7 Working hydraulics control block
8 Hydraulic tank
9 Pressure sensor B47
6 bar / 110 bar

12.2.1 Flushing circuit gear motor

Technical data

See section 2.1

Design



Flushing circuit gear motor components

1 Snap ring
2 Shaft seal ring
3 Flange
4 Seals
5 Bearing bushings
6 Gears
7 Housing
8 Housing cover

The flushing circuit gear pump is driven by the oil returning from the compact brake block. It drives the flushing circuit gear pump of the front axle via a mechanical connection.

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Functions of the compressor oil

There are the main functions of the compressor oil:

– Reducing friction, wear and noise
– Hydrostatic transmission of force to the various components of the air conditioning compressor
– Dissipating heat
– Increasing density
– Lubricating the drive components (piston, shaft seal, bearing)

Magnetic coupling

The pulley runs freely on the compressor shaft and is permanently driven by the V-ribbed belt.

The power transmission between the pulley and the compressor shaft is controlled by a magnetic coupling 4.

This is activated by the temperature switch in the evaporator or the pressure switch on the dryer collector unit.

By periodic activation of the compressor, the evaporator is kept at a temperature of between +1 °C (uncoupling) and +4 °C (coupling), this preventing the air conditioning unit from icing up.

If the pressure rises above 24 bar or below 2 bar on the pressure side of the compressor, it is also uncoupled.

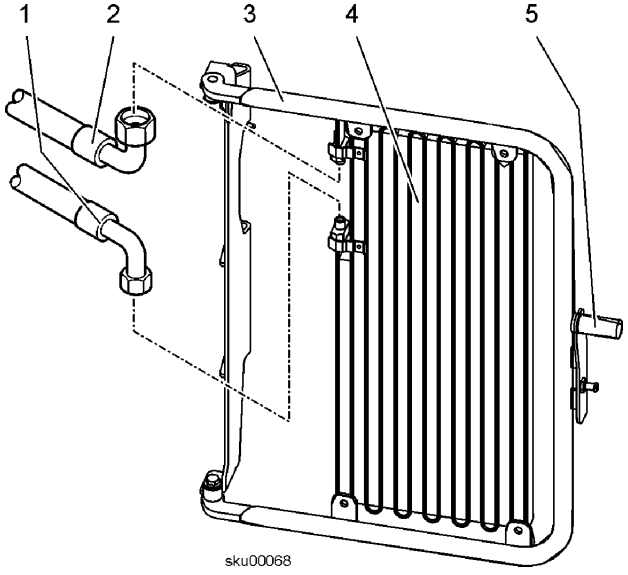
16.4.2 Condenser

Technical data

See section 2.1

Design

The condenser is part of the cooling system.



Condenser with connections

1 Intake
2 Outlet
3 Retaining frame
4 Condenser
5 Cleaning access cover

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