PROJ: 8920980_003

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WH/2.5Q
A9 KI.15
/79.C6
A9 IMMOBILISER KI. 15
-S1.X1
+K4
-S1
/ 0
-S1.X2
-S1.X3
RD/2.5Q
-A4.X56
-S.4
-A4.X57
-T.3
-A4
=K
+K2
-KI.15.X
KI. 15
KI. 30
-K01
-V1
-F29
25A
WH
-R29
-L29
GND
-KI.30.X
-XMSP12
=K
-V2
MP
RD/25Q
BK/25Q
+K2
-XMSP6.2
+K2
-XMSP6.1
+H2
-XMSP1
BK.25Q,25Q
+H5
-XMSP4.2
+H5
-F01
100A
-XMSP4.1
+H
BK/70Q
+H5
-S15
+B
-G1
+B1
-G2
RD/70Q
+H5
-XMSP4.3
+M
-M1
M
50
31
BK/70Q
RD/25Q
KI. 30.F08
/23.B2
200A
-F03
+H5
WH/1.5Q
=K+K6-X1.S:65
Verb. -OLE1
+K6
-X1.S
-X1.B
+K6
ENGINE SIDE
105.B6
+M
-G3
W
B+
D+
B-
WH/1Q
/D+
/20.E3
+H2
-XMSP1c
BK/2.5Q
100A
-F02
+H
RD/6Q
+H5
-F07
10A
RD
-X1.B
-X1.S
RD/1.5Q
KI.30.F07
/27.A5
+H
ENGINE-ECU
ACKNOWLEDGEMENT
HEATER FLANGE
/93.E2
-A700D
+M
A700D.DI2
-A700D.X2
ENGINE-ECU
SELECTION
HEATER FLANGE
A700D.DO2
WH/1.5Q
+H5
-F010
5A
HBR
RD/25Q =H
+H5
-K04
30.2
50
30.1
31
WH/6Q
RD/25Q
BK/1.5Q
+H2
-XMSP1b
+M
-R701
/0
-A16a.X1
X1
24
A16a.UI15
A
KI 50a
ANALOGUE all-purpose Input15
CAN:
INPUT MODULE 1
+H3
-A16a
/86.D2
-A4.X57
-T.1
-A4
=K
+K2
-F8A
10A
RD
-F8
15A
BU
-R8A
-L8A
-R8
-L8
GND
GND
ELECTRICAL SOCKET
RADIO
F8
/34.B3
-A4.X57
-T.4
-A4.X55
-R.5
Verb. -OLE2
=K+K4-X3:1
/81.B6
WH/2Q
+K4
-X22b.S
-X22b.B
=K
-E2.X1
+K3
-E2
/ 0
-E2.X2
-E2.X3
=K
BK/2Q
+K3
-XMSP7a
-M7.X
+K2
-M7
M
-M7.X
BK/2Q
+K2
-XMSP6b

				Ersteller	Donninger J.
				Datum	26.03.2007 16:16
				Ausgabe	Ibhhae0
Zustand	Änderung	Datum	Name	Datum	27.03.2007 09:42

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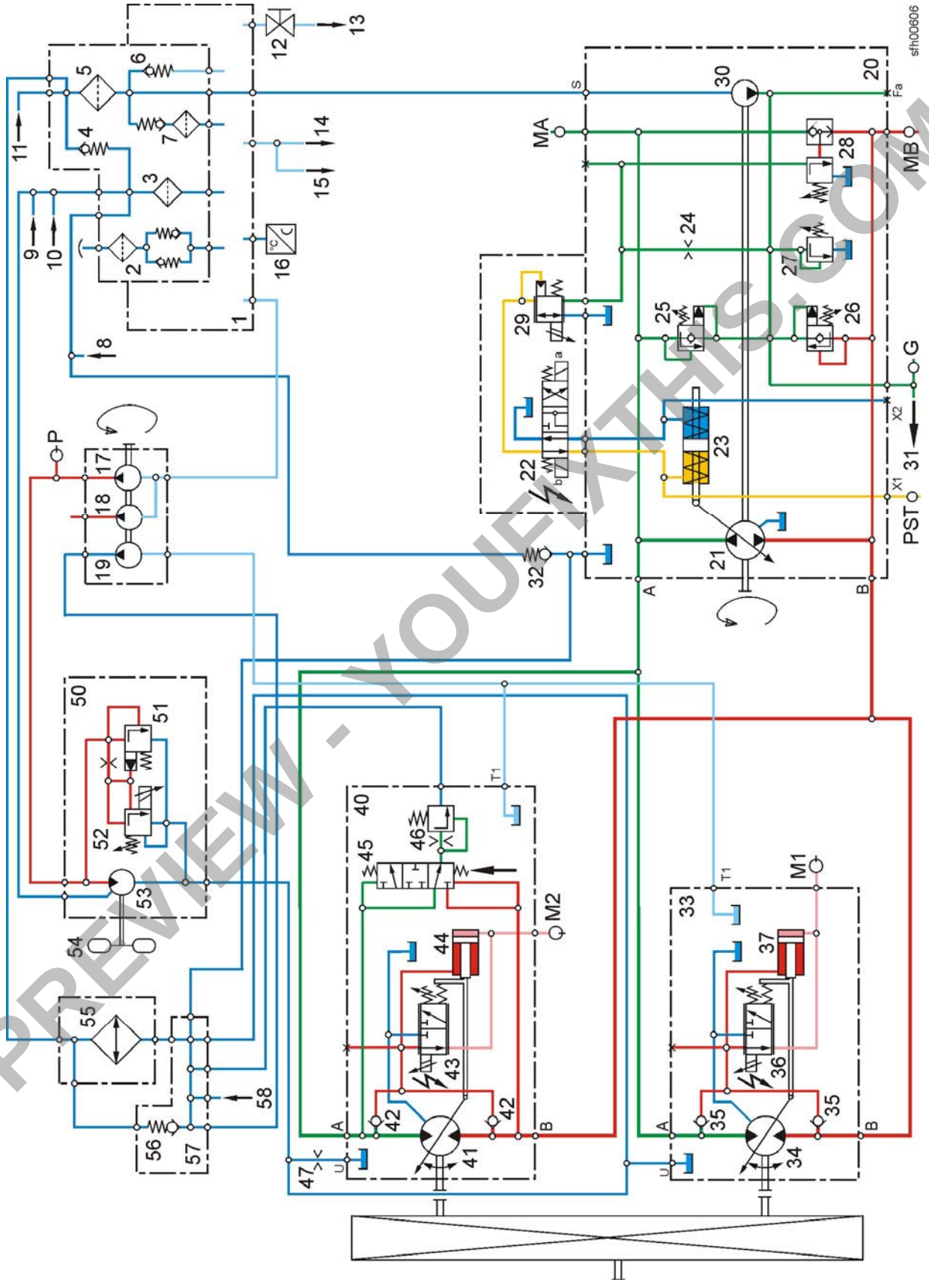
IGNITION LOCK ; BATTERIES ; GENERATOR ; MAIN FUSES

Ident.-Nr. 8920980
Anlage
Ort
Zeich-Nr. 460 9010 00 003
003
Blatt 19
von 114

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Function description

Basic function



Hydraulic plan of the travel hydraulics

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CRITICAL This kind of malfunction is accompanied by a 1-second warning tone

Service code	Effect	Cause	Remedy
C1002	The entire control system has been shut down due to a critical error.	System fault	Turn the ignition off and on again; if the problem persists, contact the manufacturer.
C1003	The entire control system has been shut down due to a critical error.	System fault	Turn the ignition off and on again; if the problem persists, contact the manufacturer.
C1004	The entire control system has been shut down due to a critical error.	System fault	Turn the ignition off and on again; if the problem persists, contact the manufacturer.
C1005	The entire control system has been shut down due to a critical error.	System fault	Turn the ignition off and on again; if the problem persists, contact the manufacturer.
C100E	The entire control system has been shut down due to a critical error.	System fault	Turn the ignition off and on again; if the problem persists, contact the manufacturer.
C1014	The entire control system has been shut down due to a critical error.	System fault	Turn the ignition off and on again; if the problem persists, contact the manufacturer.
C101C	The entire control system has been shut down due to a critical error.	System fault	Turn the ignition off and on again; if the problem persists, contact the manufacturer.
C101F	The entire control system has been shut down due to a critical error.	System fault	Turn the ignition off and on again; if the problem persists, contact the manufacturer.
C1025	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1033	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C103E	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C104A	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C104B	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C104C	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C104D	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C104E	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C104F	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1050	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again

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- If the oil level is too low:

Remove the sealing cap from the filler neck **2** and top up with oil.

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

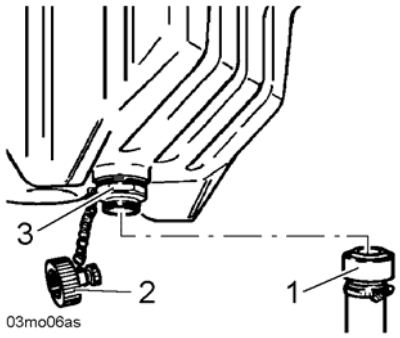
- Clean the sealing cap, place it on the filler neck **2** and tighten it.

3.5.7 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.



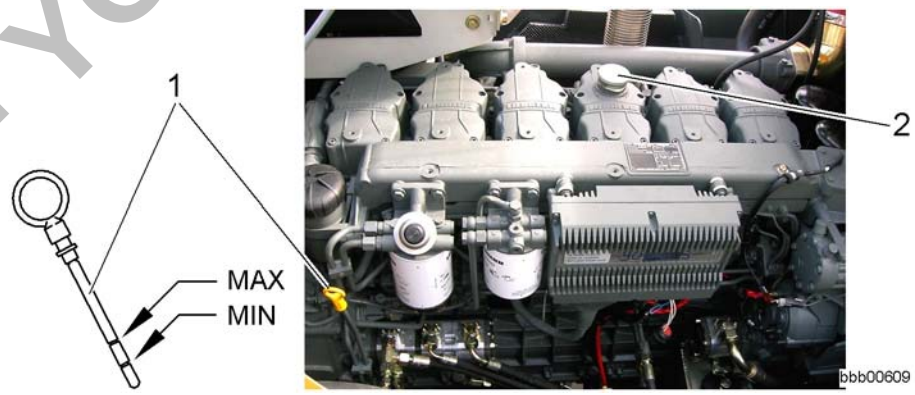
Procedure

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.



Diesel engine

- 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 and check the oil level on the dipstick.
- Top up with oil if necessary.

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1.2 Special tools for maintenance and repair work

1.2.1 Special tools in general

Description	ID no.	Use	Remarks
Anti-freeze and battery tester	7408922	All wheel loaders	For checking the acid concentration (battery charging state) and anti-freeze
24 volt vacuum pump	7408148	All wheel loaders	For preventing oil loss
Filling and testing device with case	8145359	All wheel loaders	For checking the hydro accumulator
Manometer 0 - 40 bar	7361288	All wheel loaders	For checking the hydraulic pressure
Manometer 0 - 250 bar	5002932	All wheel loaders	For checking the hydraulic pressure
Manometer 0 - 600 bar	5002866	All wheel loaders	For checking the hydraulic pressure
Manometer connection	7002436	All wheel loaders	Connection for the manometer
High pressure hose 1500 mm	7002475	All wheel loaders	High pressure hose for manometer
High pressure hose 4000 mm	7009134	All wheel loaders	High pressure hose for manometer
Screw connection M 10 x 1	5005180	All wheel loaders	For checking the hydraulic pressure
Draining hose	7005660	All wheel loaders	For draining oil via a drain valve
Drain piece	7402657	All wheel loaders	For the drain hose
Safety cap 10 mm	7009315	All wheel loaders	For securing the valves on the variable adjustment motor
Safety cap 13 mm	7615515	All wheel loaders	For securing the valves on the pumps
Safety cap 17 mm	7615589	All wheel loaders	For securing the valves on the pumps
Safety cap 19 mm	7009317	All wheel loaders	For securing the valves on the pumps
Safety cap 17 mm	7622068	All wheel loaders	For securing the valves on the control block
USB dongle	10333608	L550 - L580	With SERVICE authorisation
Diagnostic data cable	10035410	L550 - L580	For adjusting the travel hydraulics, and testing the electrical system and options
Adapter cable RS232<>USB	693190714	All wheel loaders	For communicating with the wheel loader electronics if there is an error with the RS232 interface on the notebook.
SDCF-03 memory card adapter	10223098	L550 - L580	For writing to the compact flash card
Compact flash card	10223095	L550 - L580	Blank compact flash card. Data medium for application software.

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4.1 Diesel engine

Technical data

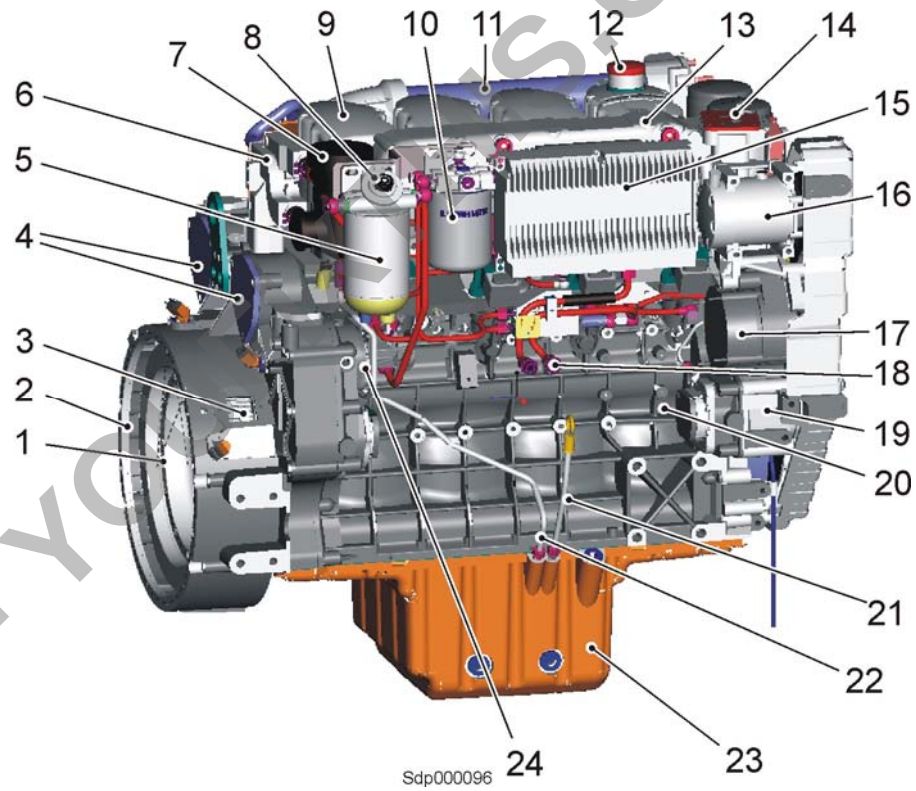
See section 2.1

Design

The diesel engine is a water-cooled, four-stroke in-line engine with pump-line-nozzle (PLD) direct injection, turbocharging and charge air cooling.

The engine is fitted lengthways in the rear section and elastically supported on rubber elements. The flywheel end faces to the rear.

Valid for: ***L550*** *- 456 / from 16978;* ***L556*** *- 454 / from 15653*



Diesel engine components / right view

1 Flywheel housing
2 Flywheel
3 Opening for cranking device
4 Auxiliary drives
5 Fuel pre-filter
6 Crankcase bleeder
7 Bleeder filter with oil separator
8 Hand pump
9 Cylinder head
10 Fuel fine filter
11 Charge air pipe
12 Lube oil filler neck
13 Air intake pipe
14 Flame glow plug
15 Engine electronics (LH-ECU)
16 Air conditioning compressor
17 Alternator
18 Fuel line connections
19 Auxiliary drive
20 Engine block
21 Dipstick
22 Oil separator return line
23 Oil pan
24 Fuel pump

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INFO
JUMPER X4 RESERVE 0 OHM EXCITATION

JUMPER X5 RESERVE

JUMPER X6 220Ohm/5Watt L550 - L586

-P1.X1 1
+K4
-P1 h
-P1.X2 2
BK /1Q
+K2
-XMSP6b 5

WH /1Q

+K2
-A4.X51 9 OLD -M.4
-M.9

-A4
=K
+K2

/51.A4 KI.15 F15.1
-V80
-R9A
-R9B 220Ω
-X4.J 10A
-X5.J 10A
-X6.J 10A
-V81
-V82
/51.A4 F15.2 KI.15
LED GREEN
-L77 -R77
-V8
86 30 -K5 85 87 87a

-O.1 1 -A4.X53
WH /1Q
+K6
-X1.S 2
-X1.B 2
WH /1Q
/D+ /19.F5
D+

ELECTRIC KEYPAD
CAN:
/94.D3 -A18 +K4 =K
OUTLET A6
PARKING LIGHT
A
A18.PWM6
X2 3
-A18.X2
WH /1Q
=K
-A4.X49 10 -K.10

-A4
=K
+K2

PROFILE LIGHT / PARKING LIGHT

-F6 3A VT -R6 -L6 GND
-F7 3A VT -R7 -L7 GND
-V10
86 30 -K2 85 87 87a
GND
KI.30
-F27 10A RD -R27 -L27 GND

-T.5 5 -A4.X57
-T.6 6 -A4.X57
-T.7 7 -A4.X57
-T.8 8 -A4.X57

+K6
-X1.S 3 4 5 6 19
-X1.B 3 4 5 6 19

WH /1.5Q
KI.58aL
KI.58aR

/25.E4
/25.D3
/25.D2
/25.E5
/25.D6
/25.D6
/25.C8

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				Datum	26.03.2007 16:16
				Ausgabe	Ibhhae0
Zustand	Änderung	Datum	Name	Datum	27.03.2007 09:42

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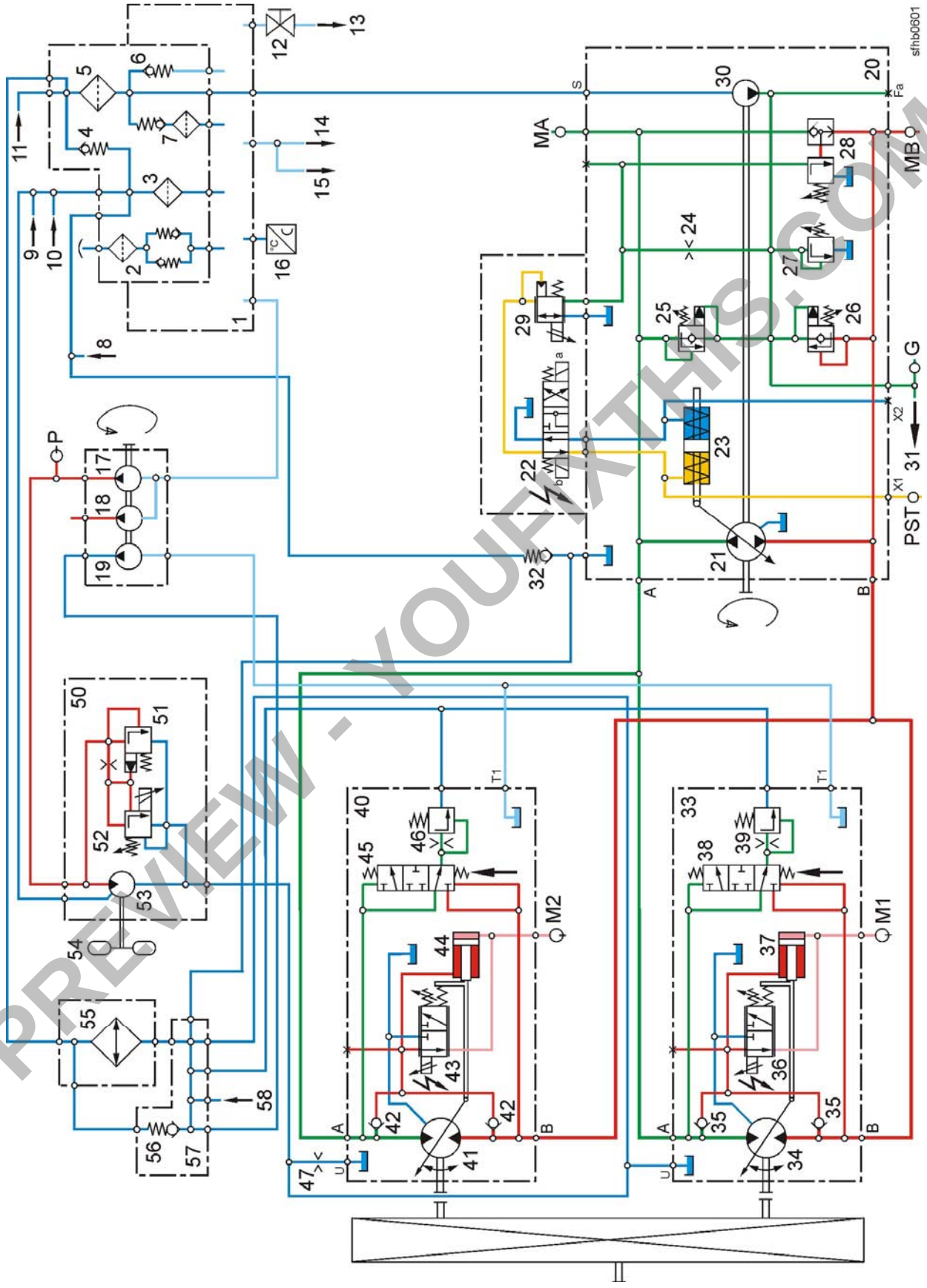
FUNCTION D+
PROFILE LIGHT; PARKING LIGHT

Ident.-Nr. 8920980
Zeich-Nr. 460 9010 00 003 003

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von 114

Function description

Basic function



Hydraulic plan of the travel hydraulics

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CRITICAL This kind of malfunction is accompanied by a 1-second warning tone

Service code	Effect	Cause	Remedy
C1051	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1052	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1053	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1054	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1055	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1056	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1057	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1058	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1059	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C105A	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C105C	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C105E	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C105F	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1060	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1061	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1063	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1064	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1065	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1066	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again

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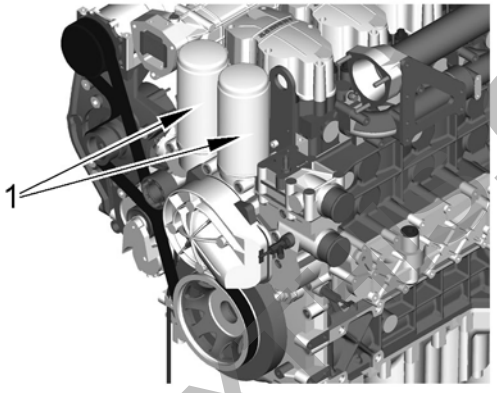
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3.5.8 Changing the diesel engine oil filter

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



bbb00610

- 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.
- 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).


bbb00009

- 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.

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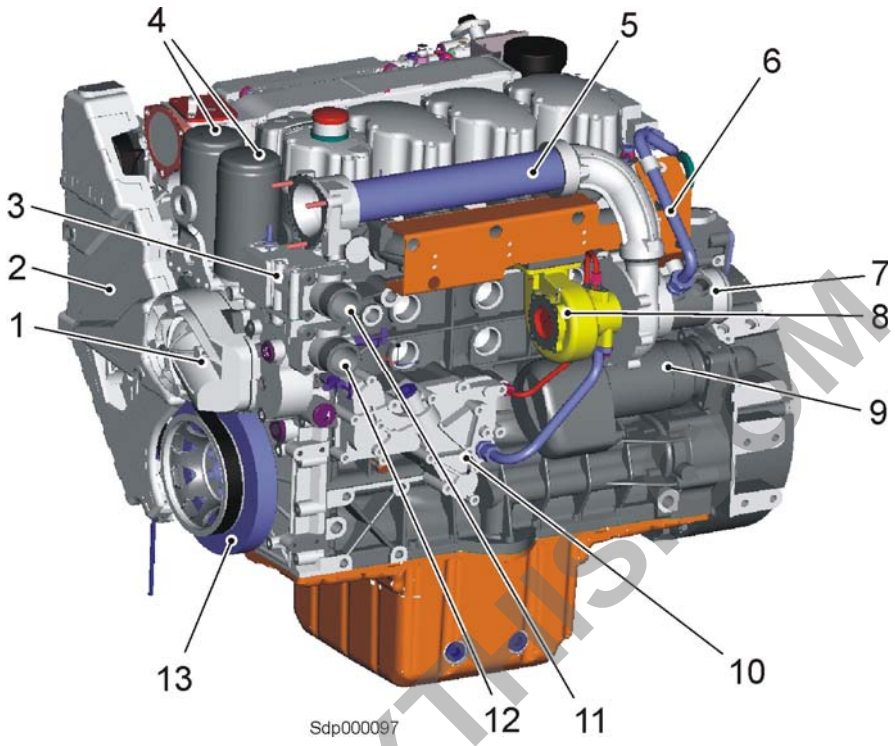
1.2.2 Special tools for Liebherr diesel engines

Description	ID no.	Use	Remarks
Mandrel	9078118	L550 - L556 engine	For installing the mass equalisation shafts (D 934)
Mandrel	9078119	L550 - L556 engine	For installing the mass equalisation shafts (D 934)
Rotary angle device	0524062	L550 - L580 engine	For installing and removing the cylinder head
Holder	0528464	L550 - L580 engine	For checking projection of the cylinder bushings
Dial gauge holder	10023885	L550 - L580 engine	For checking projection of the cylinder bushings
Compression tester	8008782	L550 - L580 engine	For checking the compression
Compression tester insert	10012817	L550 - L580 engine	For checking the compression
Adapter	10297211	L550 - L580 engine	For checking the compression
Claw	10117612	L550 - L580 engine	For checking the compression
Engine turner	0524045	L550 - L580 engine	For installing and removing the pistons and rods
Holder	0528464	L550 - L580 engine	For installing and removing the pistons and rods
Piston strap	8000592	L550 - L580 engine	For installing and removing the pistons and rods
Rotary angle device	0524062	L550 - L580 engine	For installing and removing the pistons and rods
Piston ring tongs	7009319	L550 - L580 engine	For installing and removing the piston rings
Extractor tool	0526855	L550 - L580 engine	For installing and removing the cylinder bushing
Extractor tool	0528462	L550 - L580 engine	For installing and removing the cylinder bushing
Mounting pin	0528470	L550 - L580 engine	For installing and removing crankshaft attachments
Hook and lever	7019858	L550 - L580 engine	For installing and removing the front crankshaft seal
Inserter	10116249	L550 - L580 engine	For installing and removing the front crankshaft seal
Mounting pin	0528470	L550 - L580 engine	For installing and removing the flywheel
Inserter	10116250	L550 - L580 engine	For installing and removing the rear crankshaft seal
Special spanner	10020852	L550 - L580 engine	For installing and removing the injection line
Adapter	0524029	L550 - L580 engine	For installing and removing the pressure pipe port and injection nozzles
Adapter	10220689	L550 - L580 engine	For installing and removing the pressure pipe port and injection nozzles
Hammer puller	0524072	L550 - L580 engine	For installing and removing the pressure pipe port and injection nozzles
Pusher tube	10289319	L550 - L580 engine	For installing and removing the injection pump and roller tappet
Pusher tube	10289320	L550 - L580 engine	For installing and removing the injection pump and roller tappet
Mounting pin	0528472	L550 - L580 engine	For installing and removing the exhaust pipe

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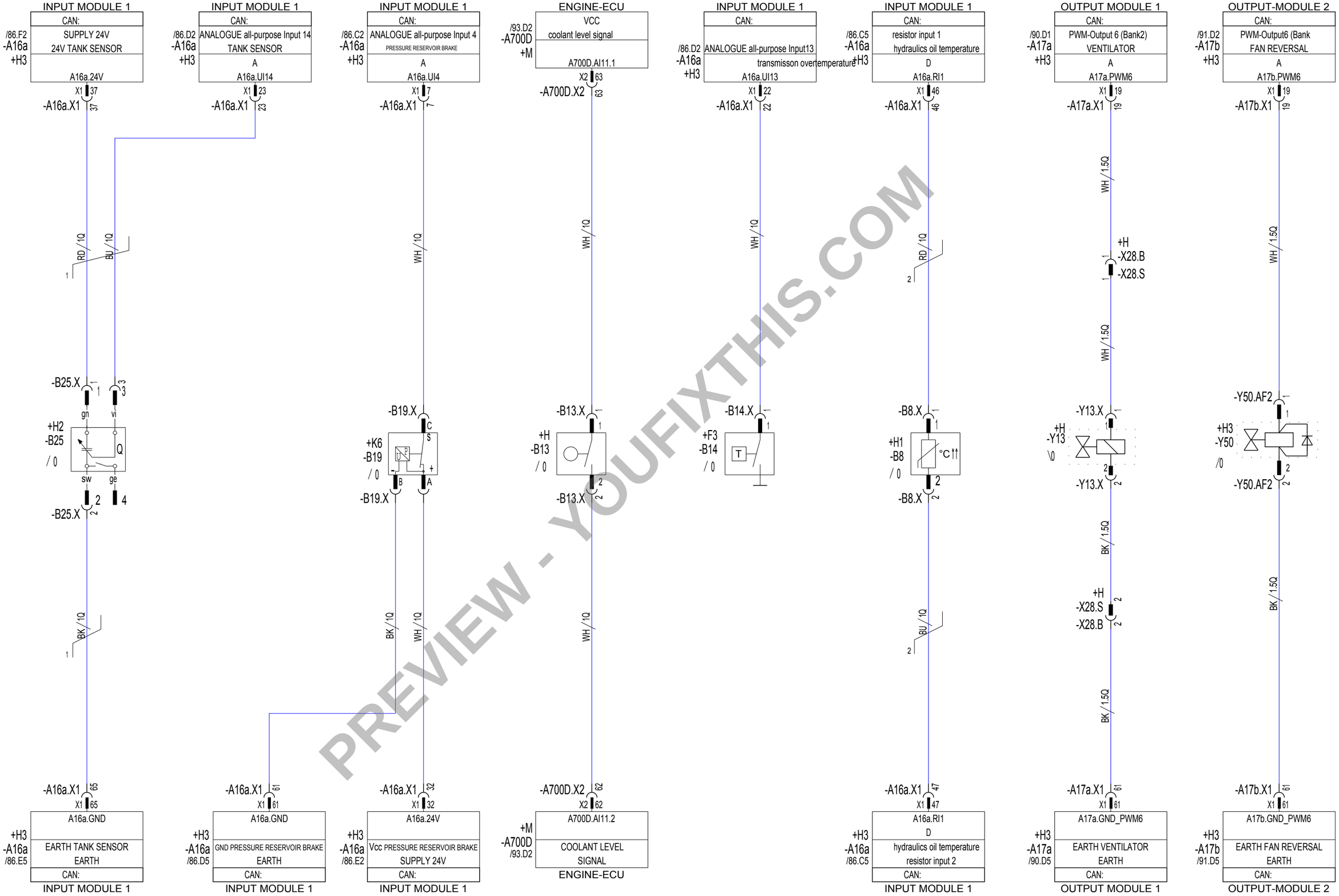
Diesel engine components / left view

1 Water pump
2 Belt drive cover
3 Thermostat housing
4 Oil filter
5 Charge air pipe
6 Housing bleeder
7 Turbocharger compressor
8 Turbocharger turbine
9 Starter
10 Oil cooler
11 Cooling water supply to cooler
12 Cooling water return from cooler
13 Crankshaft / vibration damper

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				Ersteller	Donninger J.
				Datum	26.03.2007 16:16
				Ausgabe	Ibhhae0
Zustand	Änderung	Datum	Name	Datum	27.03.2007 09:42

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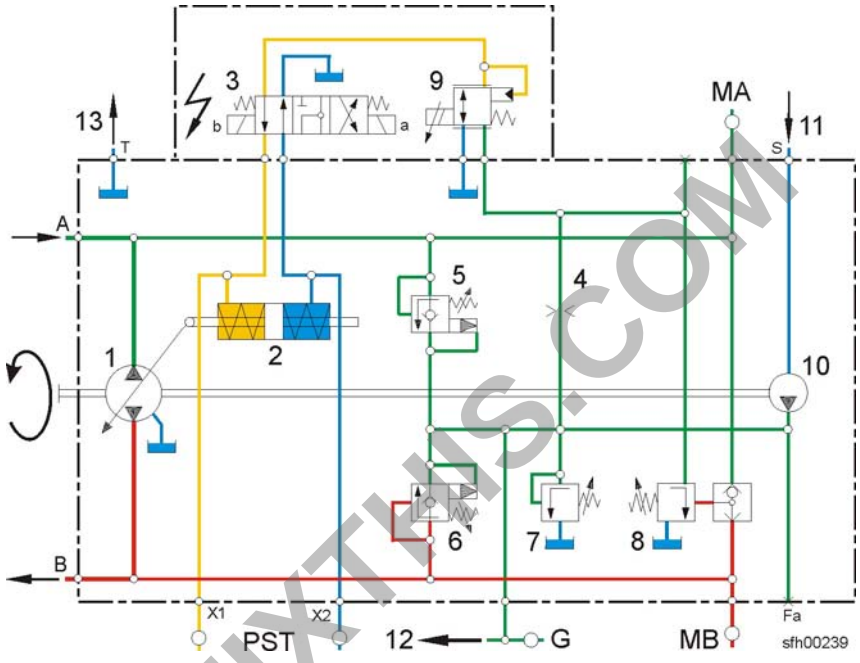
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TANK PIPE SENSOR ; TRANSMISSION- / HYDRAULIC OIL TEMPERATURE ; VENTILATOR ; COOLING WATER LEVEL , BRAKE ACCUMULATOR

Ident.-Nr. 8920980
Anlage
Ort
Zeich-Nr. 460 9010 00 003
003
Blatt 21
von 114

Function description

Basic function



Hydraulic plan of the variable displacement pump

1 Variable displacement pump
2 Servo cylinder
3 Travel direction valve
4 Restrictor
5 Pressure relief and replenishing valve A
6 Pressure relief and replenishing valve B
7 Replenishing pressure relief valve
8 Pressure cut-off
9 Control pressure proportional valve
10 Replenishing pump
11 Suction line from replenishing pump
12 To working hydraulics pilot control
13 To the oil cooler

The variable displacement pump is designed for hydrostatic drives in a closed circuit. The pump delivers directly to the variable displacement motors. The oil flowing back from the motors is fed back to the opposite side of the pump.

The main electronics (master) control the pump. Depending on the operating state of the machine, the control pressure proportional valve 9 is activated by the main electronics (master). The proportional valve regulates the control pressure and therefore the pump flow.

At high load, the pump is adjusted to a lower displacement by the reaction forces from the high pressure.

The travel direction valve determines the direction in which the displacement pump operates and the travel direction of the machine.

The pressure relief and replenishing valves A and B protect the travel drive from excessive pressure peaks. At the same time, the valves act as replenishing valves for the closed circuit.

The pressure cut-off limits the maximum operating pressure within the closed circuit.

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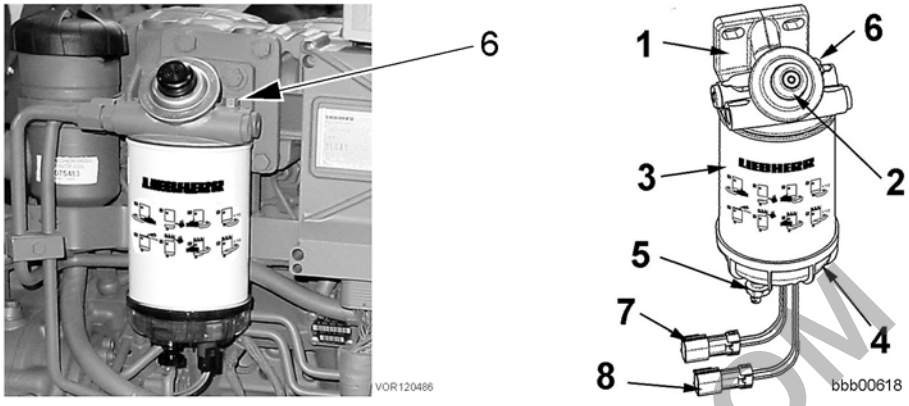
CRITICAL This kind of malfunction is accompanied by a 1-second warning tone

Service code	Effect	Cause	Remedy
C106D	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C106E	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1070	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1071	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1072	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1073	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C1074	The entire control system has been shut down due to a critical error.	Invalid boot card (CF1)	Copy software (see label) onto the card again
C2002	The entire control system has been shut down due to a critical error.	Invalid CAN module type	Check that the CAN modules and software board have the right ID numbers
C200E	The entire control system has been shut down due to a critical error.	Two CAN modules with the same module number but different serial numbers have been detected on a CAN bus; CAN module production error	Replace the CAN module
C200F	The entire control system has been shut down due to a critical error.	An essential CAN module has not reported on the CAN bus	Check the power supply to the CAN module F35, check the CAN wiring; then replace the CAN module
C2010	The entire control system has been shut down due to a critical error.	System fault	Turn the ignition off and on again; if the problem persists, contact the manufacturer.
C2011	The entire control system has been shut down due to a critical error.	None of the modules on a CAN line have reported on the CAN bus	Check the CAN bus connection, check the power supply to the modules
C2012	The entire control system has been shut down due to a critical error.	None of the modules on a CAN line have reported on the CAN bus	Check the CAN bus connection, check the power supply to the modules
C2014	The entire control system has been shut down due to a critical error.	System fault	Turn the ignition off and on again; if the problem persists, contact the manufacturer.
C2015	The entire control system has been shut down due to a critical error.	System fault	Turn the ignition off and on again; if the problem persists, contact the manufacturer.
C2017	The entire control system has been shut down due to a critical error.	System fault	Turn the ignition off and on again; if the problem persists, contact the manufacturer.
C2019	The entire control system has been shut down due to a critical error.	System fault	Turn the ignition off and on again; if the problem persists, contact the manufacturer.
C201A	The entire control system has been shut down due to a critical error.	System fault	Turn the ignition off and on again; if the problem persists, contact the manufacturer.

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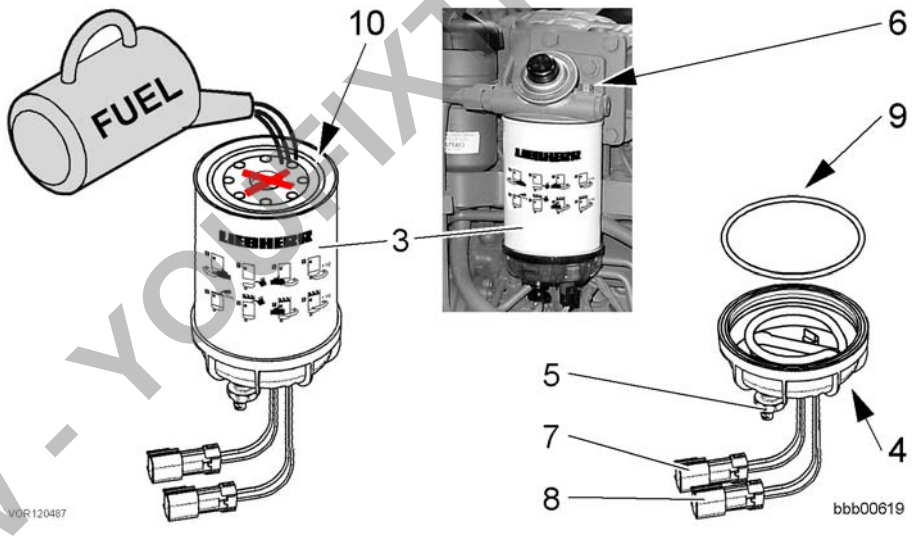
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Fuel prefilter cartridge

- Disconnect the electrical connections of the water level probe **8** and the fuel preheater **7** (optional).
- Drain the fuel:
  Unscrew the bleeder screw **6** and drain plug **5**.
- Release the filter cartridge **3** with a strap wrench or similar tools and unscrew it.



Fuel water separator container

- Unscrew the water separator container **4** from the filter cartridge **3**.
- Dispose of the old filter cartridge.
- Wash the water separator container and dry it with compressed air.
- Lightly oil the O-ring **9** of the water separator container.
- Screw the water separator container to the new filter cartridge until the O-ring touches the filter cartridge.
- Tighten the water separator container half a turn by hand.
- Screw in the drain plug **5**.
- Check the filter head is clean and ensure that the thread adapter is firmly in the filter head.
- If the filter head is dirty:
  Clean the filter head.
- Lubricate the sealing ring **10** of the new filter cartridge with clean fuel.
- Fill the filter cartridge via the holes on the outside and screw it on until the sealing ring lies on the filter head.
- Tighten the filter cartridge **3** half a turn by hand.
- Reconnect the electrical connections of the water level probe **8** and the fuel preheater **7** (optional).
- Close the bleeder screw **6**.

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1.2.3 Special tools for hydraulic cylinders

Description	ID no.	Use	Remarks
Assembly sleeve 80 mm	9227165	L550, L556 steering cylinder	For fitting the seals
Assembly sleeve 90 mm	9227161	L566, L576, L580 steering cylinder	For fitting the seals
Assembly sleeve 130 mm	9998624	L550, L556 lift cylinder	For fitting the seals
Assembly sleeve 150 mm	9998622	L550, L556 tilt cylinder L566, L576, L580 lift cylinder	For fitting the seals
Assembly sleeve 170 mm	9107931	L566, L576, L580 tilt cylinder	For fitting the seals
Expansion sleeve 80 mm	9227166	L550, L556 steering cylinder	For fitting the seals
Expansion sleeve 90 mm	9227162	L566, L576, L580 steering cylinder	For fitting the seals
Expansion sleeve 130 mm	9110408	L550, L556 lift cylinder	For fitting the seals
Expansion sleeve 150 mm	9110410	L550, L556 tilt cylinder L566, L576, L580 lift cylinder	For fitting the seals
Expansion sleeve 170 mm	9110412	L566, L576, L580 tilt cylinder	For fitting the seals
Bearing head assembly spanner 70/8 mm	9210219	L550, L556 steering cylinder	For fitting the piston rod bearing
Bearing head assembly spanner 75/12 mm	9239572	L566, L576, L580 steering cylinder	For fitting the piston rod bearing

1.2.4 Special tools for electronics

Description	ID no.	Use	Remarks
Digital multimeter	8502956	All wheel loaders	For measuring voltage, current, resistance and frequency
Test probe, red	884191214	All wheel loaders	For testing DEUTSCH connectors
Test probe, black	884191114	All wheel loaders	For testing DEUTSCH connectors
Magnet tester	8145743	All wheel loaders	For checking solenoid valves
Stripping and crimping pliers 0.5 – 6.0 mm^2	8460263	All wheel loaders	For MATE-N-LOK connectors
Crimping pliers	8503647	All wheel loaders	For DEUTSCH connectors
Wedge extractor tool	7026267	All wheel loaders	For DEUTSCH connectors
Extraction tool size 12 for pin and bushing	8145674	All wheel loaders	For DEUTSCH connectors
Extraction tool size 16 for pin and bushing	8145673	All wheel loaders	For DEUTSCH connectors
Extraction tool size 20 for pin and bushing	8503630	All wheel loaders	For DEUTSCH connectors

1.2.5 Special tools for axles

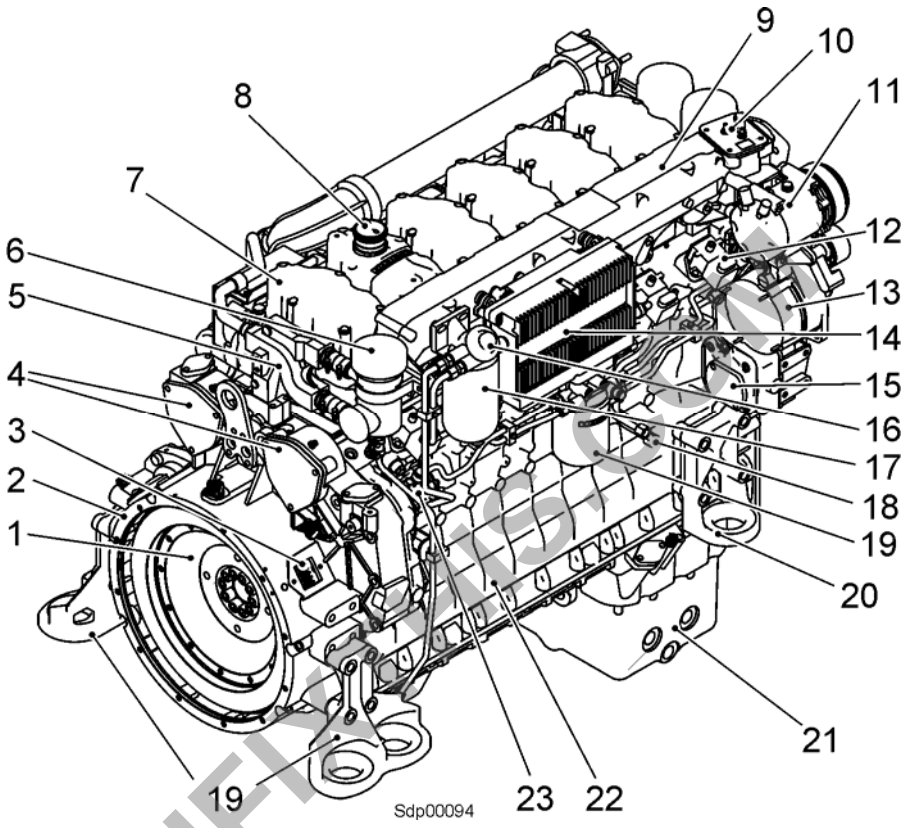
Description	ID no.	Use	Remarks
Hand pump	8145835	L550 - L580 axles	For finding leaks on disc brakes
Collet	7009536	L550 - L576 axles	For installing and removing the snap ring in the planetary drive
Spring hook	8145767	L550 - L576 axles	For attaching and detaching the return springs
Slip bushing 260 mm	7017559	L556 front axle L556 rear axle	For fitting the brake piston
Slip bushing 315 mm	7017556	L566, L576 front axle L566, L576 rear axle	For fitting the brake piston

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Valid for: ***L566*** *- 460 / from 14171;* ***L576*** *- 453 / from 14171;* ***L580*** *- 459 / from 14171*



Diesel engine components / right view

1 Flywheel
2 Flywheel housing
3 Opening for cranking device
4 Auxiliary drives
5 Crankcase bleeder
6 Bleeder filter with oil separator
7 Cylinder head
8 Lube oil filler neck
9 Combustion air intake manifold
10 Flame glow plug
11 Air conditioning compressor
12 Pump element with magnetic coil
13 Alternator
14 Engine electronics (LH-ECU)
15 Auxiliary drive
16 Hand pump
17 Fuel pre-filter
18 Fuel line connections
19 Fuel fine filter
20 Engine bearing
21 Oil pan
22 Engine block
23 Fuel pump

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1 General Informations

Chapter contents

1 General Informations 1.0-1

1.1 Safety regulations 1.1-1
1.1.1 Introduction 1.1-1
1.1.2 Overview of the safety regulations 1.1-2

1.2 Special tools for maintenance and repair work 1.2-1
1.2.1 Special tools in general 1.2-1
1.2.2 Special tools for Liebherr diesel engines 1.2-2
1.2.3 Special tools for hydraulic cylinders 1.2-3
1.2.4 Special tools for electronics 1.2-3
1.2.5 Special tools for axles 1.2-3
1.2.6 Special tools for the transmission 1.2-5
1.2.7 Central lubrication system 1.2-5
1.2.8 Special tools for the air conditioning system 1.2-5
1.2.9 Special tools for cab windows 1.2-5

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1.1 Safety regulations

Working on the machine poses safety risks to the operator, driver or maintenance engineers. You can prevent risks and accidents by regularly reading and observing the various safety instructions.

This is especially important for personnel who only occasionally work on the machine, for example, carrying out rigging or maintenance work. The safety regulations listed below, if conscientiously followed, will ensure your own safety and that of others, and will prevent the machine from being damaged.

Whenever tasks which could cause danger to personnel or damage to the machine are described, the necessary safety precautions are explained in this manual.

These are indicated by the headings Danger, Warning or Caution.

1.1.1 Introduction

1. **The symbols below have the following meanings:**



Danger

Risk of personal injury.

Denotes an impending dangerous situation which can lead to serious injury or death if not avoided.

! Note the warning.



Warning

Risk of personal injury.

Denotes a potentially dangerous situation which can lead to serious injury or death if not avoided.

! Note the warning.



Caution

Risk of personal injury.

Denotes a potentially dangerous situation which can lead to slight injury if not avoided.

! Note the warning.

Caution

Risk of damage to the machine.

Denotes actions or circumstances which may result in damage to the machine.

! Note the warning.



Note

Useful information

Denotes information on correctly handling the machine and the lubricants and fuels used.

! Observe the instructions.

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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

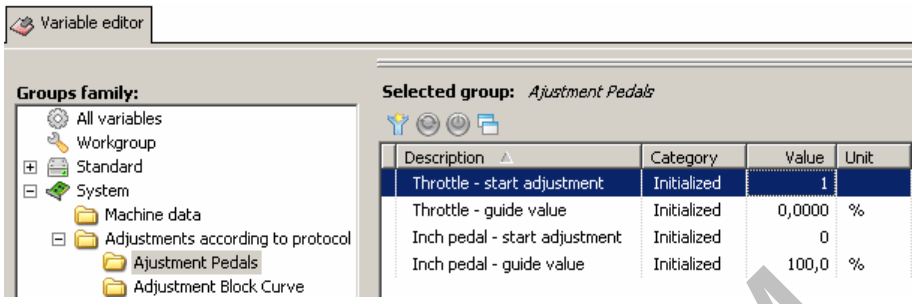
Always follow the safety regulations whenever you work on the machine. You will find a reference to this in the **“General Information”** section.

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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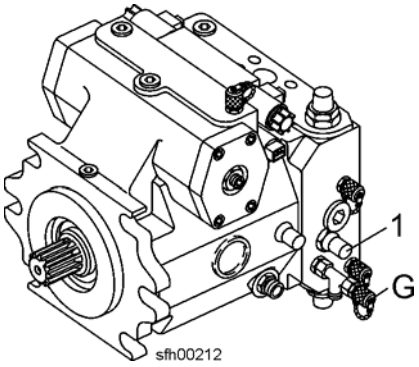


- Set ***Inch pedal - start adjustment*** to ***1***.
- Push the inch pedal all the way down.

The MIN and MAX positions of the gas pedal are stored. After 15 seconds the value automatically returns to ***0*** → and calibration is finished.

- Check that ***Inch pedal - guide value*** is ***0%*** when the pedal is not pressed and ***100%*** when the pedal is pressed all the way down.

3.6.7 Checking the replenishing pressure of the variable displacement pump



Measure the replenishing pressure at the test connection G.

Procedure

- Connect a manometer (40 bar) to the test connection **G**.
- Start the machine and let the engine run at top idling speed.
- Check that the replenishing pressure is correct.
- If it is not correct:
  Turn the adjusting screw on the replenishing pressure relief valve **1** until the replenishing pressure is correct.

Valid for: ***L550*** *- 456 / from 16978;* ***L556*** *- 454 / from 15653*

Description	Value	Unit
Replenishing pressure	$31^{\pm 1}$	bar

Valid for: ***L566*** *- 460 / from 14171;* ***L576*** *- 457 / from 14171;* ***L580*** *- 459 / from 14171*

Description	Value	Unit
Replenishing pressure	$34^{\pm 1}$	bar

3.6.8 Checking the pressure relief and replenishing valve of the variable displacement pump

The pressure relief and replenishing valves protect the variable displacement pump from pressure peaks. These can occur when braking the machine.

When a pressure peak occurs, oil flows from the high pressure side via the pressure relief and replenishing valve to the low pressure side in a closed circuit.

Procedure

To attain the set value for the pressure relief and replenishing valves, the pressure cut-off must be set to a higher value.

- Screw in the adjusting screw **1** on the pressure cut-off by one turn.
- Connect a manometer (600 bar) to the test connections MA and MB.
- Use SCULI to set the ***Inch pedal - function OFF*** variable to ***1*** → the inching function is disabled.

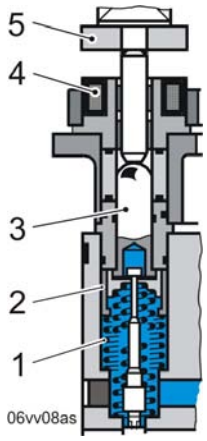
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tappet 7 and therefore to the position of the control lever. The pressure regulation which is proportional to the position of the control lever allows the spool valves in the control block to be moved proportionally to the pressure.

Electromagnetic locking



The following functions have electromagnetic locking:

– Lift kick-out
– Bucket return-to-dig
– Float position

The pressure spring 1 is attached under the tappet 3 and the spring sleeve 2. Just before the end of the stroke of the tappet and the control lever, the operator must apply additional force to tension the pressure spring 1. This shows the operator that the control lever is at its end position / maximum deflection.

At the end position (maximum deflection) of the control lever, the ring 5 comes into contact with the anchor magnet 4. When the solenoid is activated, its magnetic force holds the control lever in its end position.

Unlocking takes place automatically by switching off the solenoid current using the proximity switch or by pulling back the control lever.

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SUPPLY MASTER MODULE

-A4.X40 4 -A.4

-A4
=K
+K2

Kl. 30 — E — -F35 10A RD — A — -R35 — -L35 — GND

Kl. 15 — E — -F54 5A HBR — A — -R54 — -L54 — GND

8 -A4.X42 -C.8

-XMSP6b 9 +K2 — BK /1.5Q — -A15.X .PWR.X 1 — =K +K2 -A15 /85.B1 — A15.GND / A / EARTH / CAN: — MASTER MODULE

-XMSP6b 10 +K2 — BK /1.5Q — -A15.X .PWR.X 5 — =K +K2 -A15 /85.C1 — A15.Shield / A / HOUSING MASTER / CAN: — MASTER MODULE

WH /1.5Q — -A15.X .PWR.X 2 — =K +K2 -A15 /85.B1 — A15.DIGIN0 / A / Kl. 15 / CAN: — MASTER MODULE

RD /1.5Q — -A15.X .PWR.X 6 — =K +K2 -A15 /85.C1 — A15.VBat / A / Kl. 30 / CAN: — MASTER MODULE

SUPPLY DIAGNOSTIC PLUG

MASTER MODULE — CAN: — /85.C5 -A15 +K2 =K — SIGNAL Ground (S- / A / A15.GND — .COM4.X 5 — -A15.COM4.X 5 — =K

MASTER MODULE — CAN: — /85.B5 -A15 +K2 =K — Receive (RXD) / A / A15.RXD — .COM4.X 2 — -A15.COM4.X 2 — =K

MASTER MODULE — CAN: — /85.B5 -A15 +K2 =K — Transmit (TXD) / A / A15.TXD — .COM4.X 3 — -A15.COM4.X 3 — =K

-A4
=K
+K2

Kl. 30 — E — -F26 10A RD — A — -R26 — -L26 — GND

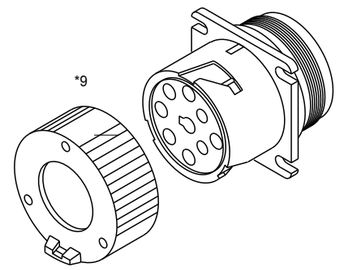
BK /0.5Q — BU /0.5Q — RD /0.5Q

9 -A4.X40 -A.9 — RD /1.5Q — /79.C6 A9 Kl.30 — IMMOBILISER Kl.30

10 -A4.X40 -A.10 — RD /1.5Q

-XMSP6b 4 +K2 — BK /1.5Q — +K2 -X60 A B G H I

*9



DIAGNOSTIC PLUG

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Zustand	Änderung	Datum	Name	Datum	27.03.2007 09:42		

LIEBHERR Werk Bischofshofen GmbH

SUPPLY MASTER
SUPPLY DIAGNOSTIC PLUG

Ident.-Nr. 8920980 | Anlage | Ort

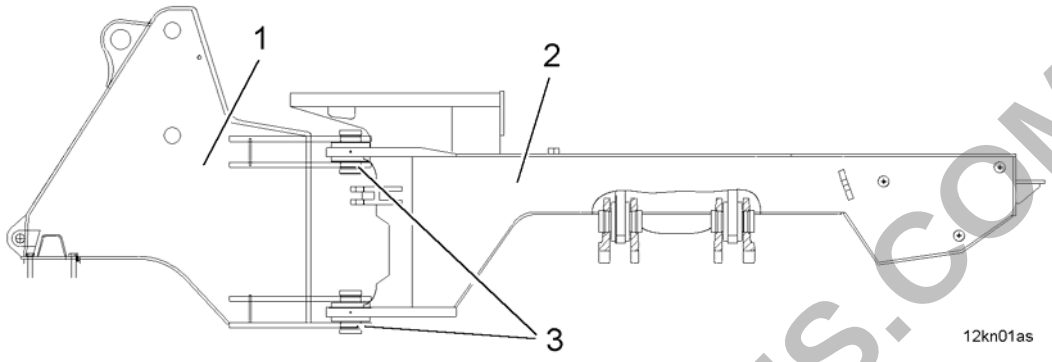
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13.2 Articulation bearing

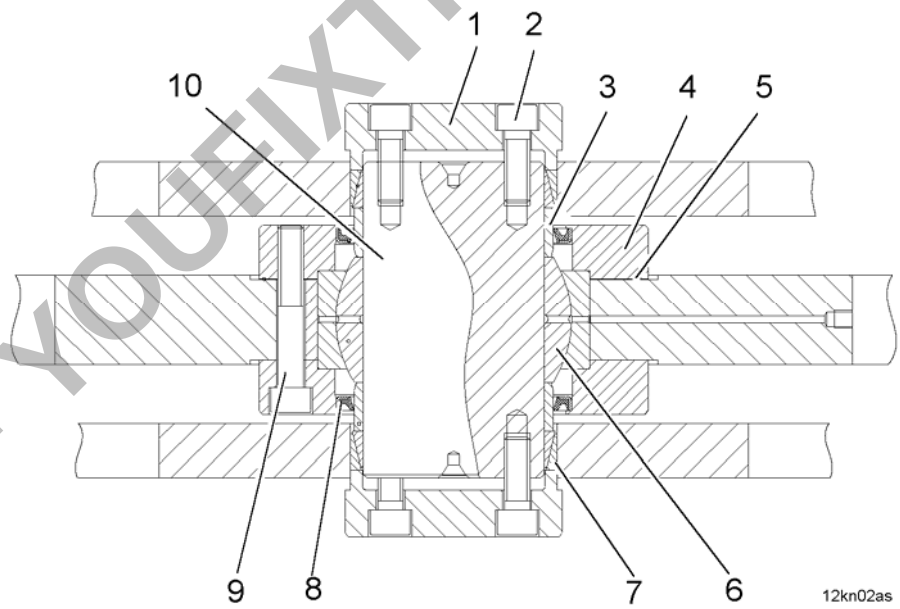
Design

The articulation bearing is installed between the front and rear sections.



Location of the articulation bearing

1 Front section
2 Rear section
3 Articulation bearing



Main components of the articulation bearing

1 Pressure flange
2 Cylinder screw
3 Bushing
4 Bearing cover
5 Shims
6 Swivel bearing
7 Cone tension element
8 Shaft seal ring
9 Cylinder screw
10 Bearing pin

Function description

Basic function

The articulation bearing connects the front and rear sections. It allows steering of the machine by articulating the machine frame to the left or right.

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