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5.9 Change engine oil and oil filter cartridge

⚠ Caution

The oil change at 250 operating hours refers to the use of oils of quality class Cat DEO 10W-30 ECF-1 or API: CI-4/ECF1.

Refer also to the chapter 5.2, fuels and lubricants.

Drain the engine oil only when the engine is warm.

⚠ Danger

Danger of scalding!

When draining off hot oil.

By hot oil when unscrewing the engine oil filter.

Environment

Catch running out oil and dispose of environmentally together with the engine oil filter cartridge.

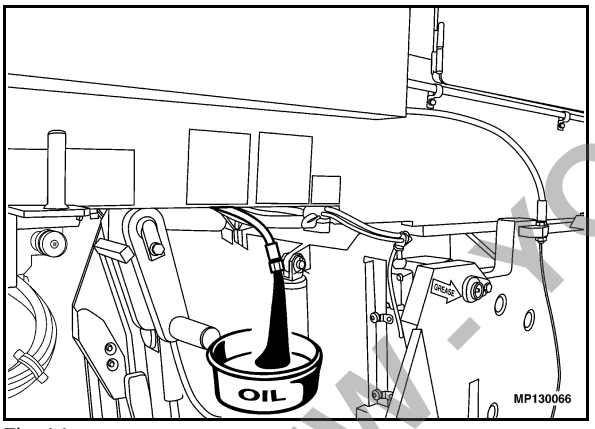


Fig. 14

- Unscrew the drain hose (Fig. 14) and catch running out oil.
- Reassemble the drain hose.

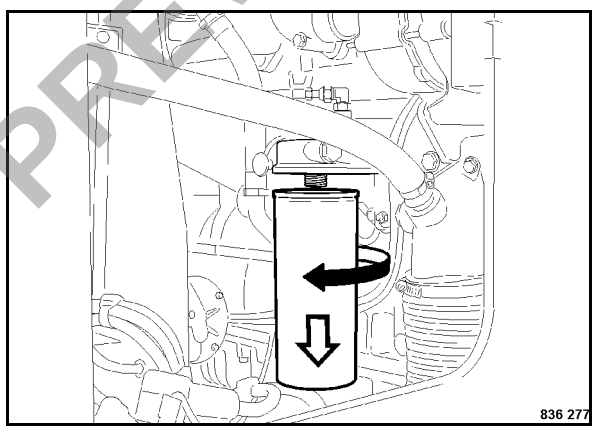


Fig. 15

- Unscrew the filter cartridge (Fig. 15) using an appropriate filter wrench.
- Clean the sealing face on the filter carrier from any dirt.
- Slightly oil the rubber seal on the new filter cartridges.

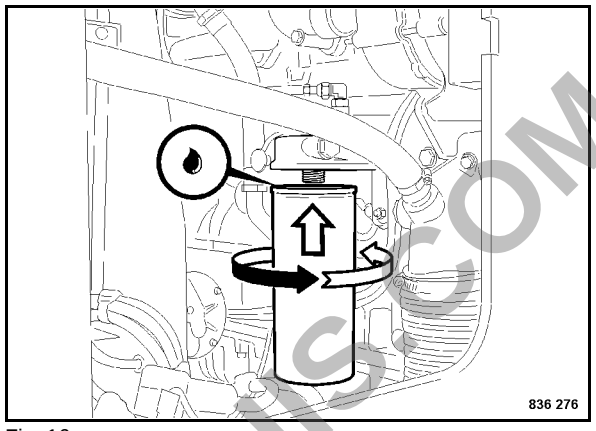


Fig. 16

- Turn the new filter cartridges (Fig. 16) on by hand, until the seal contacts.
- Tighten the filter element for another half turn.

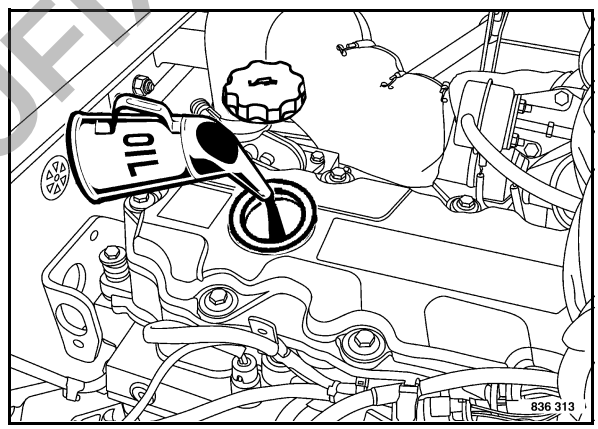


Fig. 17

- Fill in new engine oil (Fig. 17).

For quality and quantity of oil refer to the table of fuels and lubricants.

- Tighten the oil filler cap properly.

⚠ Caution

Before starting crank the engine with the starter motor until the oil pressure warning light goes out.

- After a short test run check the oil level on the dipstick, if necessary top up to the top dipstick mark.
- Check filter cartridge and drain plug for leaks after a short test run.
- Shut the engine down and wait for about 15 minutes, so that all oil can flow back into the oil sump.
- Check the oil level again , if necessary fill up to the Max.-mark.

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8 9

BAT-50A /200.2

BAT-150A /246.6

BAT-EME /246.8

AIR HEATER /122.2

STARTER /122.2

NEG-ENGINE /122.2

NEG /200.2

122

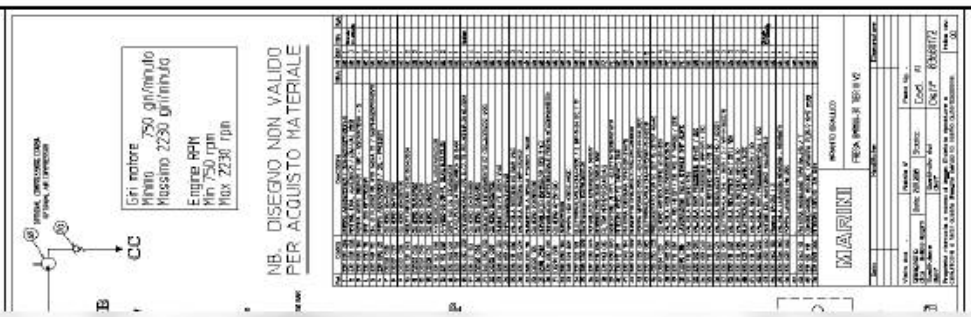
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DISTMACC3.SKD

NOME NAME	QUANTITA' AMOUNT	PAGINA/COLONNA PAGE/COLUMN	TESTO FUNZIONALE FUNCTION TEXT
	0	234. 1	
AD	0	200. 2. 6	
AS	0	200. 2. 3	
B1	0	100. 1	STEER ADJUST
B1-C17	0	264. 1. 3	STEER ADJUST
B2	0	100. 1	AIR COMPRESSOR BOX
B2-S1	0	289. 3	AIR COMPRESSOR
B3	0	100. 2	LEFT REAR BOX
B3-C21	0	226. 3. 2	
B3-C23	0	226. 4. 3	
B3-C66	0	226. 5. 1	COLUMNS
B3-S1	0	200. 2. 3	EMERGENCY PUSH BUTTON
B4	0	100. 2	RIGHT REAR BOX
B4-C67	0	226. 5. 4	COLUMNS
B4-C68	0	226. 3. 3	
B4-C69	0	226. 4. 5	
B4-H1	0	214. 1	BACK DOOR
B4-S1	0	200. 2. 6	EMERGENCY PUSH BUTTON
B4-S2	0	214. 2	BACK DOOR
B4-S3	0	214. 3	BACK DOOR
B4-S4	0	264. 7	STEER
B5	0	100. 6	LEFT FRONT BOX
B5-H1	0	236. 5	LEFT SIDE DOOR
B5-H2	0	234. 2	BREAK BAR
B5-S1	0	200. 2. 3	EMERGENCY PUSH BUTTON
B5-S2	0	236. 1	LEFT SIDE DOOR
B5-S3	0	234. 0	BREAK BAR
B5-S4	0	262. 1	HORN
B6	0	100. 5	BACK DASH PANEL
B6-X12V	0	202. 4	SOCKET 12V
B7	0	100. 6	RIGHT FRONT BOX
B7-H1	0	236. 1. 6	RIGHT SIDE DOOR
B7-H2	0	234. 5	BREAK BAR
B7-S1	0	200. 2. 6	EMERGENCY PUSH BUTTON
B7-S2	0	236. 1. 1	RIGHT SIDE DOOR
B7-S3	0	234. 4	BREAK BAR
B7-S4	0	262. 2	HORN
B9	0	100. 5	HANDSET
B9-C54	0	206. 3	
B9-S1	0	236. 3	LEFT SIDE DOOR

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Design.: Luca Zuccarino date: 15. Dic. 2010 Resp. USER: ING. ZANIBONI	BOMAG FAYAT GROUP	BM/30-2	BILL OF MATERIALS DISTINTA BASE	D: DE013005	pag. 1000

General		**7**
	1.1 Introduction	8
	1.2 Safety regulations	9
	1.3 General repair instructions	13
	1.4 Tightening torques	23
Technical data		**27**
	2.1 Technical data	28
Maintenance		**37**
	3.1 Fuels and lubricants	38
	3.2 Running-in instructions	40
Electrics		**41**
	4.1 Designation of components in the wiring diagram	42
	4.2 Terminal designations in wiring diagram	43
	4.3 Control elements	45
	4.4 Main fuse	45
	4.5 Fuses	46
	4.6 Component overview	47
	4.7 Control elements	48
	4.8 View of operator's stand	48
	4.9 View rear right hand control panel (B4)	49
	4.10 View rear left hand control panel (B3)	50
	4.11 View front right hand control console (B7)	51
	4.12 View front left hand control console (B5)	52
	4.13 View control panel for auxiliary control / limp home control (B10)	53
	4.14 Multi-function display (MFD)	54
	4.15 Levelling control console, general	56
	4.16 Levelling control console, description	57
	4.17 Viewing switching states of switches and valves	59
	4.18 Work parameters for engine load and height control	63
	4.19 Rope sensors for height control, C22 and C24	68
	4.20 Operating conditions for height regulation	69
	4.21 Rope sensor, front steering, 264R1	75
	4.22 Cable sensor, rear steering, C16	76
	4.23 Operating conditions for rear steering	78
	4.24 Height limitation, rear	84
	4.25 Operating conditions for rear posts	85
	4.26 Limit switch on scraper, C48 and C49	87
	4.27 Functional conditions for scraper	89
	4.28 Water sprinkling system	92
	4.29 Operating condition for sprinkling system	94
	4.30 Differential pressure switch for hydraulic oil	95
	4.31 Speed sensor, C53	97
	4.32 Operating conditions for travel drive	99
	4.33 Functional conditions for hold-down	107
	4.34 Functional conditions right side plate	109
	4.35 Functional conditions for milling drum drive	111

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Important notes

These safety regulations must be read and applied by every person involved in the repair /maintenance of this machine. The applicable accident prevention instructions and the safety regulations in the operating and maintenance instructions must be additionally observed.

Repair work shall only performed by appropriately trained personnel or by the after sales service of BOMAG.

Workshop equipment and facilities as well as the use and waste disposal of fuels and lubricants, cleaning agents and solvent as well as gases and chemicals are subject to legal regulations, which are intended to provide a minimum on safety. It is obviously your own responsibility to know and adhere to these regulations.

This manual contains headers like "Note", "Attention", "Danger" and "Environment", which must be strictly complied with in order to inform about and avoid dangers to persons, property and the environment.

i Note

Paragraphs marked like this contain technical information for the optimal economical use of the machine.

⚠ Caution

Paragraphs marked like this highlight possible dangers for machines or parts of the machine.

⚠ Danger

Paragraphs marked like this highlight possible dangers for persons.

Environment

Paragraphs marked like this point out practices for safe and environmental disposal of fuels and lubricants as well as replacement parts.

Observe the regulations for the protection of the environment.

General

- For repair and maintenance work move the machine on a firm base and shut it down.
- Always secure the machine against unintended rolling.
- Secure the engine reliably against unintentional starting.
- Mark a defective machine and a machine under repair by attaching a clearly visible warning label to the dashboard.
- Block the articulated joint with the articulation lock.
- Use protective clothes like hard hat, safety boots and gloves.
- Keep unauthorized persons away from the machine during repair work.
- Tools, lifting gear, lifting tackle, supports and other auxiliary equipment must be fully functional and in safe condition.
- Use only safe and approved lifting gear of sufficient load bearing capacity to remove and install parts or components from and to the machine.
- Do not use easily inflammable or harmful substances, such as gasoline or paint thinners for cleaning.
- Do not smoke or use open fire and avoid sparks when cleaning or repairing a tank.
- When performing welding work strictly comply with the respective welding instructions.

Transport work with cranes and lifting tackle

i Note

Cranes must only be operated by instructed persons who had been trained in handling cranes.

- Follow the operating instructions of the manufacturer when working with cranes.
- Follow the operating instructions of the operator when working with cranes.
- Always comply with the applicable accident prevention instructions when working with cranes and lifting tackle.

Precautions and codes of conduct for welding work

Welding work must only be carried out by properly trained personnel.

⚠ Danger

Electric shock!

Sparks, fire hazard, burning of skin!

Infrared or ultraviolet radiation (arc), flashing of eyes!

Health hazard caused by welding work on highly alloyed work pieces, metal coatings, paint coatings, plastic coatings, oil containing dirt deposits, grease or solvent residues, etc.!

- Check welding equipment and cables for damage before use (also the validity of inspection stickers).
- Ensure good conductivity between ground cable and workpiece, avoid joints and bearings.

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4.36 Functional conditions for conveyor belts 112
4.37 Engine speed sensor, C8 114
4.38 Terminal box 116
4.39 Pin assignment for control 119
Engine 123
5.1 General information on diesel engine 124
5.2 Engine attachment parts 126
5.3 Engine electrics 128
5.4 Checking the cylinder head ground cable 132
5.5 Engine diagnostics lamps, H8 and H9 133
5.6 General notes on flashing codes 135
5.7 Table of flashing codes 136
5.8 Check the engine oil level 137
5.9 Change engine oil and oil filter cartridge 138
5.10 Check, clean the water separator 139
5.11 Change the fuel pre-filter cartridge 139
5.12 Replace the fuel filter cartridge 140
5.13 Checking the combustion air filter 141
5.14 Service the combustion air filter 142
5.15 Check the coolant level 144
5.16 Checking the condition of the coolant hoses 144
5.17 Change the coolant 145
5.18 Clean the cooling fins on engine and hydraulic oil cooler 145
5.19 Checking, tensioning the V-belt for the generator system 146
5.20 Cleaning the crankcase ventilation 147
5.21 Check the engine mounts 147
5.22 Checking the valve clearance 148
5.23 Engine problems 149
Milling drive, description 153
6.1 Milling drive 154
Milling unit, description 163
7.1 Description of milling unit 164
Travel drive, description 173
8.1 Travel system 174
Conveyor belt, description 179
9.1 Conveyor belts 180
9.2 Folding / unfolding the loading conveyor belt 183
Hydraulics 185
10.1 Hydraulic circuit 186
10.2 Component overview -- hydraulics 188
10.3 Description of travel pump 191
10.4 View of the machine 198
10.5 Description of working pump 199
10.6 View of the machine 203
10.7 Description of conveyor belt pump 204
10.8 View of the machine 211
10.9 Troubleshooting axial piston pumps 213

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Conveyor belt pump

Manufacturer		Bosch-Rexroth
Type		A10VG
Quantity		1
System		Swash plate
Displacement	cm^3/rev	28
Max. flow capacity	l/min	109
Maximum pressure	bar	260 - 280
Charge pressure	bar	25 - 31
High pressure limitation	bar	270

Conveyor belt motor

Manufacturer		Sauer Danfoss
Type		OMT 200
Quantity		2
System		Orbital
Displacement	cm^3/U	201.4
Maximum pressure	bar	300
Nominal pressure	bar	210
Rated speed	rpm	350 - 390

Fan pump

Manufacturer		Haldex
Type		WP09
Quantity		1
System		Gear
Displacement	cm^3/rev	27
Max. flow capacity	l/min	60
High pressure limitation	bar	185

Fan motor

Manufacturer		Haldex
Type		WM09
System		Gear
Displacement	cm^3/U	27
Maximum pressure	bar	150 - 170
Top speed (at 150-170 bar)	rpm	2050 - 2110
Low speed (at 10-30 bar)	rpm	655 - 685

Pump high pressure cleaner

Manufacturer		Neron International
Type		HWB 250
Quantity		1
System		Axial piston

Pump sprinkling water

Manufacturer		Hypro
Type		9303C-HM2C
Quantity		1
System		Centrifugal
Minimum flow rate	l/min/nozzle	1.6 - 1.8
Maximum flow rate	l/min/nozzle	2.4 - 2.6

Steering valve

Manufacturer		Sauer Danfoss
Type		OSPC 160

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Pos.	Description	Designation in circuit diagram	Terminal in circuit diagram	Pin on control U5	Measuring values
AI1.4	Cable sensor, grade shoe right	C24	X1:52	12	0 - 10 V
AI1.5	Cable sensor, grade shoe right	C22	X1:55	21	0 - 10 V
AI1.6	Inclination sensor	C19	X1:59	22	0.5 - 4.5 V
AI1.7	Travel lever potentiometer	R1	XD:5	23	0 - 10 V
AI2.1	Potentiometer for conveyor belt speed	R2	X1:27	33	0 - 10 V
AI2.2	not used			34	
AI2.3	not used			35	
AI2.4	not used			36	
AI2.5	not used			45	
AI2.6	not used			46	
AI2.7	not used			47	
AI2.8	not used			48	

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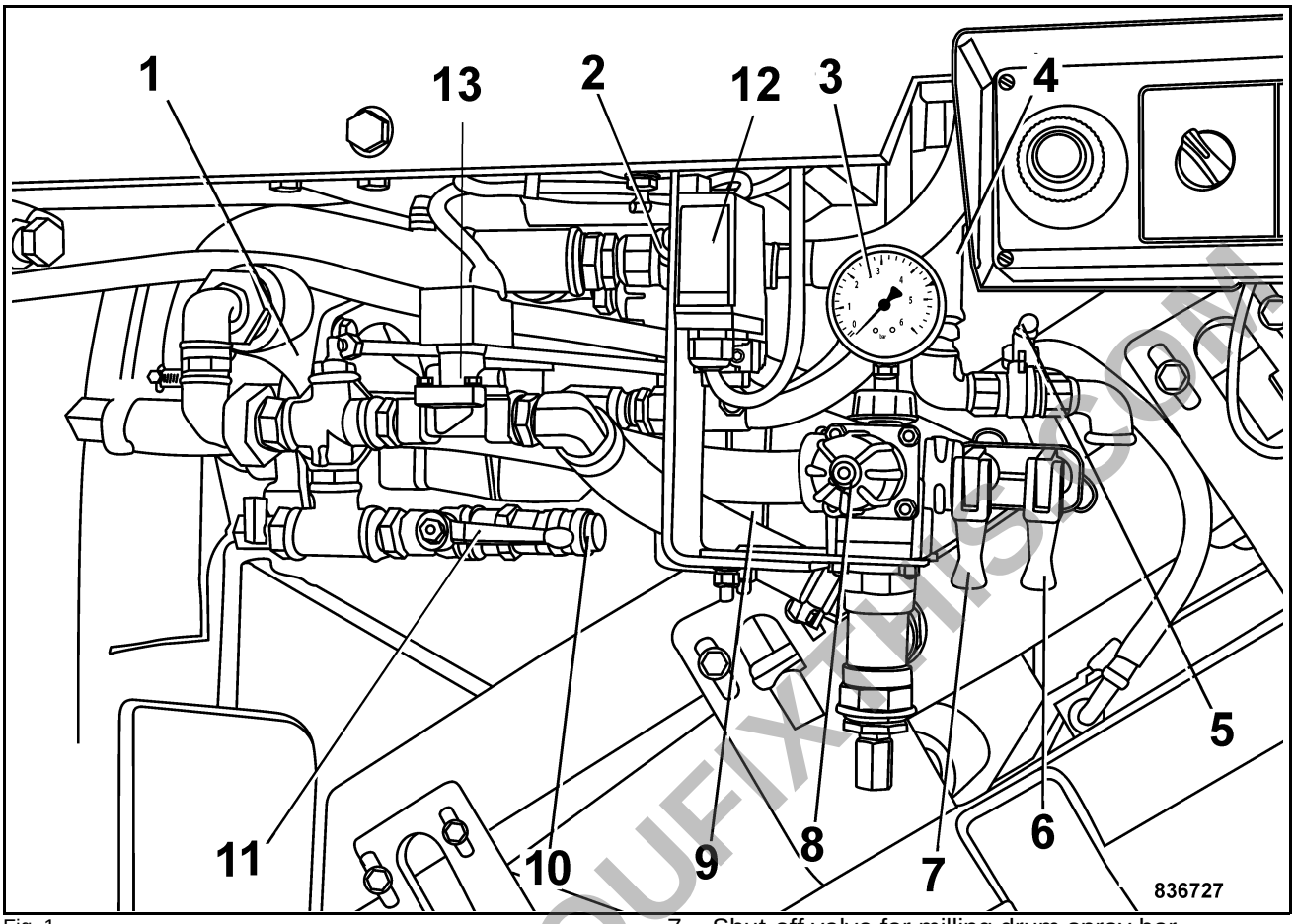


Fig. 1

1 **YA10** Solenoid valve for water pump
2 Shut-off valve, supply for high pressure cleaner*
3 Pressure gauge for spraying pressure
4 Main shut-off valve
5 Press drain tap
6 Shut-off valve for gathering belt spray bar
7 Shut-off valve for milling drum spray bar
8 Flow control valve
9 Water filter
10 Connecting socket for external connection (low pressure)
11 Shut-off valve for external connection (cleaning)
12 **C40** Pressure switch for water sprinkling system
13 **YB10** Solenoid valve for water sprinkling system

* Optional equipment

Pos.	Designation in circuit diagram	Description	Terminal in electrical junction box	Measuring value
1	YA10	Solenoid valve for water pump	XS:72	0 / 24 V
12	C40	Pressure switch for water sprinkling system	XD:52	0 / 24 V
13	YB10	Solenoid valve for water sprinkler system	X1:51	0 / 24 V

The pressure switch (12) serves the purpose of monitoring the water reservoir. This monitoring ensures that the water pump will not run dry and thus be damaged.

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Pin on control	Description	Designation in circuit diagram	Terminal in circuit diagram	Measuring values
54	Solenoid valve, lift cylinder front left down	YB22	X1:9	0 / 24V
55	Timer relay for milling drum clutch; solenoid valve for milling drum clutch	YB14; H1; K6	X1:45	0 / 24V
56	Solenoid valve for brake	YA7	X1:44	0 / 24V
57	Ground connection	U5	Ground connection	GND
58	Ground connection	U5	Ground connection	GND
59	Voltage supply for sensors		X10V:1	0 - 10V
60	Ground connection	U5	Ground connection	GND
61	Solenoid valve, forward travel	YA25	XD:9	PWM
62	Solenoid valve, reverse travel	YB25	XD:10	PWM
63	Solenoid valve, conveyor belt forward	YA26	XD:39	PWM
64	Solenoid valve, conveyor belt back	YB26	XD:40	PWM
65	not used			
66	Signal lamp, conveyor belt ON	H4	X1:25	0 / 24V
67	Solenoid valve for sprinkling system + solenoid valve for sprinkling pump + control lamp	YA10; YB10; H5	X1:51	0 / 24V
68	Warning buzzer	HU1	X1:36	0 / 24V
69	Voltage supply	U5	X1:43	0 / 24V
70	Voltage supply	U5	X1:43	0 / 24V
71	Input RS485 TXRX from levelling control consoles	B3; B4		not measurable
72	Output RS485 TXRXN from levelling control consoles	B3; B4		not measurable

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Fault	Possible cause	Remedy
Engine overheating, temperature warning system responds	Bleeding line clogged	Clean ventilation line
	Injector defective	Replace
	Coolant heat exchanger soiled	Clean
	Coolant pump defective (V-belt torn or loose)	check, whether torn or loose
	Lack of coolant	Fill up
	Charge air pipe leaking	Check the charge air pipe
	V-belt/ribbed V-belt (fuel pump in belt drive)	check, whether torn or loose
	Lubrication oil filter soiled	Replace
	Lubrication oil level too low	Fill up lubrication oil
	Lubrication oil level too high	Check the lubrication oil level, drain off if necessary
	Air filter clogged / exhaust turbocharger defective	Check/replace
	Fan defective / V-belt torn or loose	Check fan / V-belt, replace if necessary
	Short circuit of heat in cooling system	Check the cooling system
	Resistance in cooling system too high / flow quantity too low	Check the cooling system
Engine has to low or no oil pressure	Lubrication oil level too low	Fill up lubrication oil
	Engine oil with wrong SAE viscosity class	Change the lubrication oil
Insufficient engine power	Engine oil level too high	Drain the engine oil down to the top dipstick mark
	Fuel quality not as specified in the operating instructions	Change the fuel
	Air filter clogged / exhaust turbocharger defective	Check/replace
	Charge air pipe leaking	Check the charge air pipe
	Intercooler soiled	Clean
	Injection line leaking	Check the injection line
	Injector defective	Replace
	Injection valve defective	Check the injection valve
Insufficient engine power and diagnostic lamp lights	Engine electronics reduces the power	Check fault by fault code, repair as necessary
Engine does not work with all cylinders	Injection line leaking	Check the injection line
	Injection valve defective	Check / replace the injection valve

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9.1 Conveyor belts

General

Two belts are used to load up the milled material. The **gathering belt** picks up the milled material from the milling box and transports it to the **loading belt**, which conveys the milled material to the transport truck.

The belt speed can be infinitely adjusted by a potentiometer on the control console. Here we must emphasize that the pick-up belt runs **slightly** slower than the loading belt This makes sure that the loading belt will not be congested by material, because it always discharges more material than the gathering belt is able to deliver.

For optimal loading of the milled material the loading belt can be infinitely swivelled, lowered or lifted.

Gathering belt

The gathering belt is fastened to the hold-down. This unit can be hydraulically lifted or can glide in floating mode.



Fig. 1 Gathering belt with hold-down and gathering foot

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EP - control

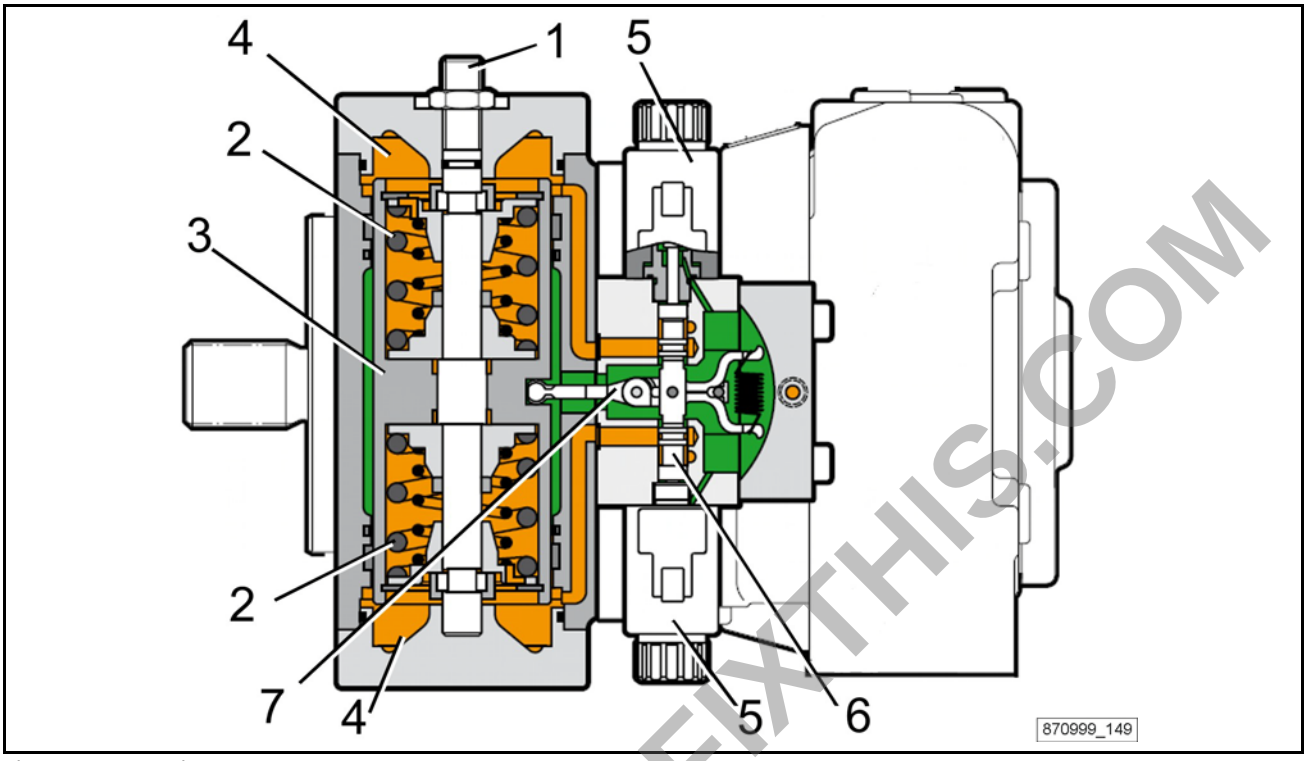


Fig. 31 EP - control

1	Setscrew for mechanical neutral position	5	Proportional solenoid valve
2	Neutral setting spring	6	Valve spool
3	Control piston	7	Feedback lever
4	Control chamber		

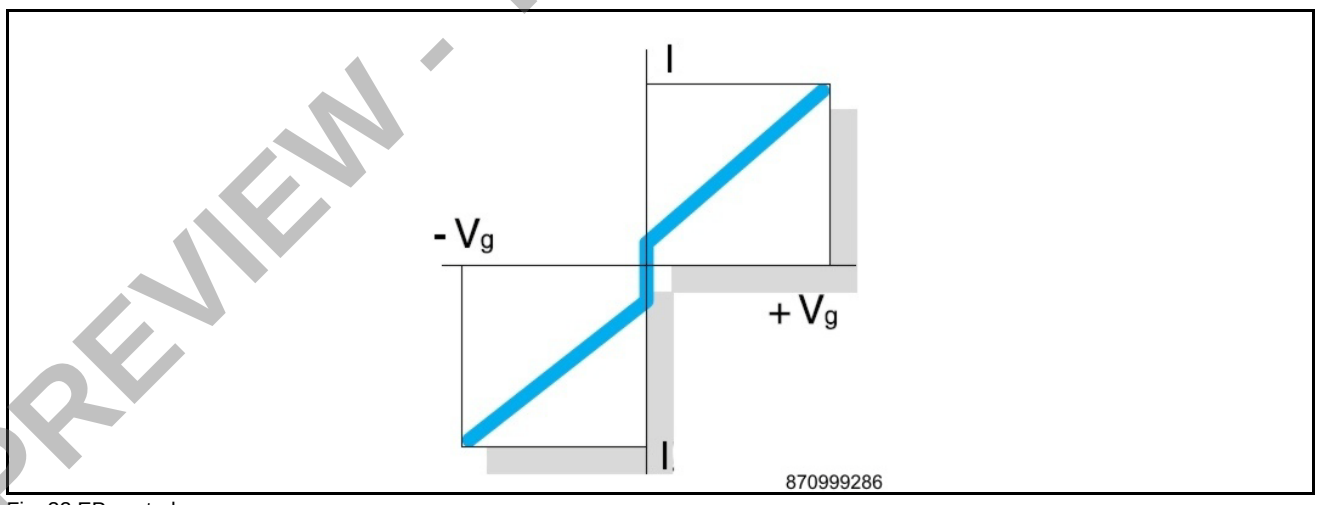


Fig. 32 EP control

Depending on the pre-selected ampacity "I" on the two proportional solenoids, the control cylinder on the pump is supplied with control pressure through the EP control unit. This way the swash plate and thus the displacement of the pump can be infinitely varied. Each proportional solenoid has a flow direction assigned.

⚠ Caution

The spring reset in the control unit is no safety feature.

Internal contamination – like e.g. contaminated hydraulic fluid, abrasion or dirt residues from system components – can cause blockage of the spool valve in the control unit. The flow volume from the variable displacement pump will in this case no longer follow the instructions of the operator.

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Side plates - viewed on the machine



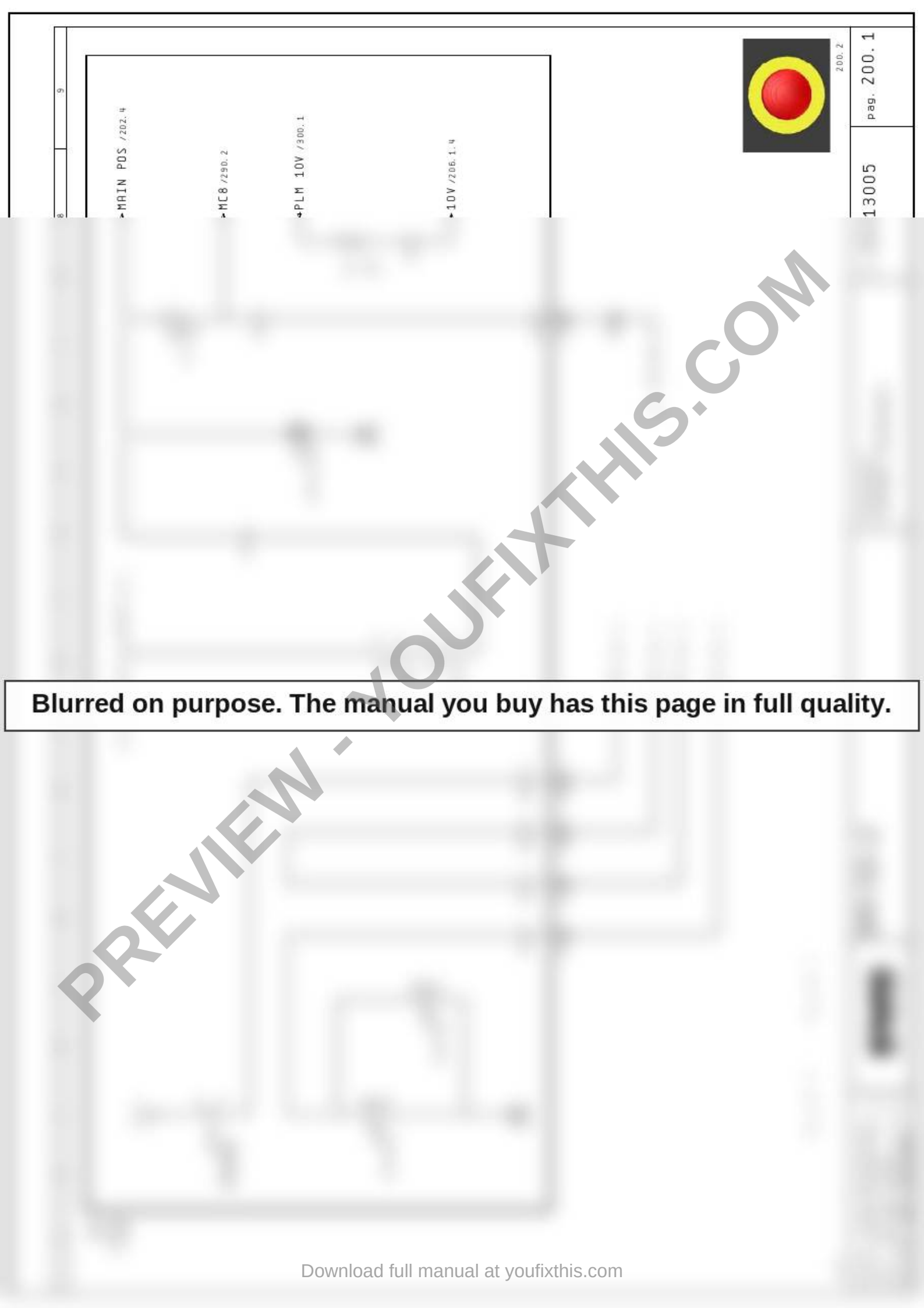
Fig. 58 Side plate BM 1x00/30-2

i Note

Right hand side plate shown. Left hand side plate accordingly.

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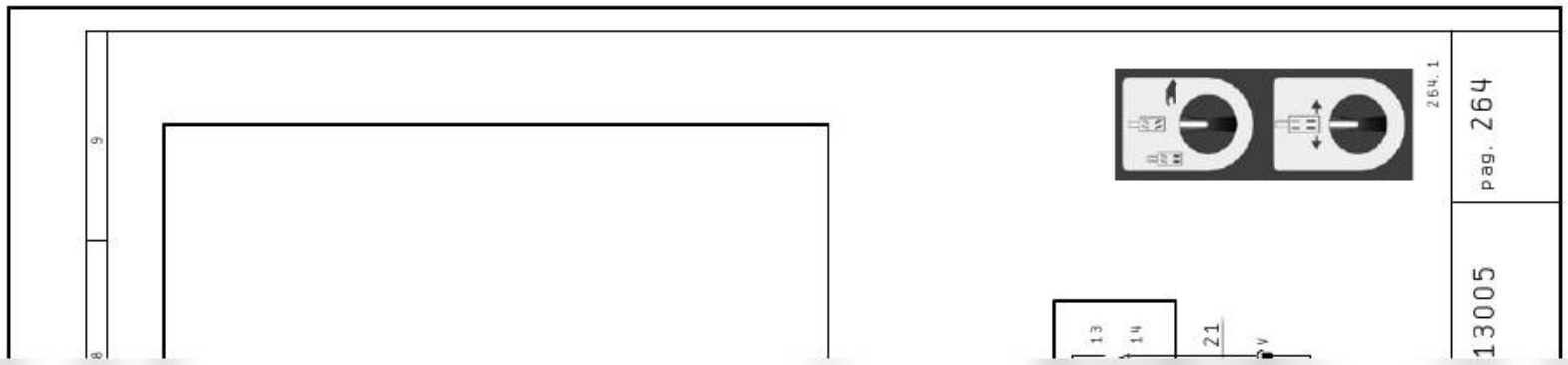
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