6.9 Injection pump replacement during service

6.9.1 Disassembling the injection pump

NOTICE!

Ensure strict cleanliness when working on the injection system.

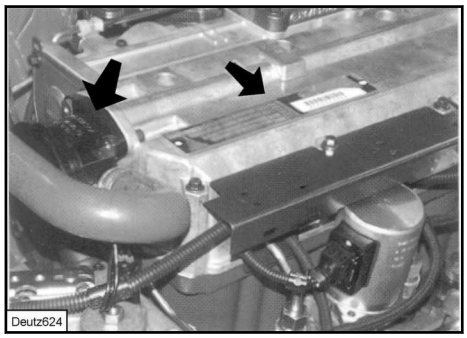


Fig. 204

1. Remove pressure control valve and cylinder head cover.
2. Disconnect the cable plugs from shut-down solenoid, governor and temperature sensor.
3. Swing the holding plate to the side.

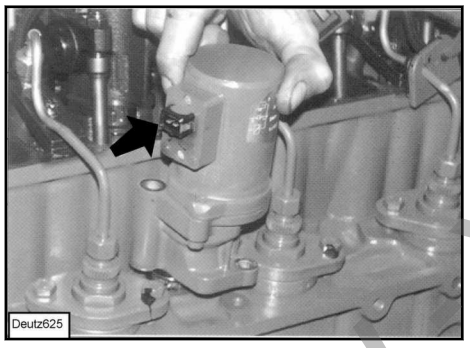


Fig. 205

4. Remove the engine shut-down assy.

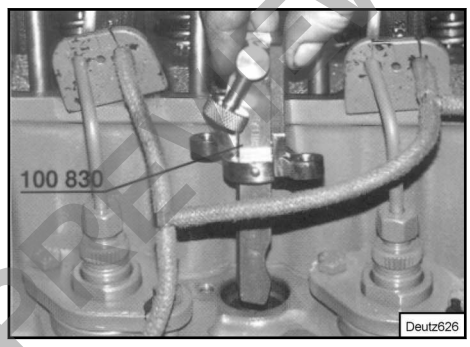


Fig. 206

5. Use the shut-down lever to push the governor rod to stop position.
6. Insert and fasten the pressing device 100 830.

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A Circuit diagrams

A.1 Water spraying diagram 921 133 28

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A.2 Hydraulic diagram 921 125 93

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8 Description of fault codes on the BMESX control

8.1 Overview

Fault code	Description of fault
0000 – 0999	General faults / warnings / machine tests
1000 – 1999	Fault in travel system
2000 – 2499	Fault in electric steering system
3000 – 3999	Faults in work functions (vibration, chip spreader, edge cutter or spraying system)
4000 – 4999	Fault in measuring systems
5000 – 5499	Fault diesel engine
5500 – 5999	Fault hydraulic system
6000 – 6999	Fault in exhaust gas aftertreatment system
7000 – 7499	Input of machine codes
7500 – 7899	Input of codes for measuring technology
7900 – 7999	Operating hours, load spectrum, etc.
8000 – 8999	Severe software error [1]
9000 – 9999	Faults of external IO-nodes on one of the CAN-buses (joystick, data collector, Display, BLM Module, engine control units, etc.)

[1] These faults are only broken down partly hereunder!

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1.3.1.1.5 Repair notes for ball and roller bearings



Fig. 28

- If one bearing of a pair of bearings shows defects, we highly recommend the replacement of both bearings.
- Remove any lubricant residues from the bearing to be examined by washing it with a suitable degreasing agent.
- Check balls or rollers, running surfaces, outer faces of outer races and inner faces of inner races for visible damage. If necessary, replace the bearing.
- Check the bearing for clearance and resistance between the inner and outer races, replace if necessary.
- Lubricate the bearing with the recommended type of grease before assembly or reassembly.
- On greased bearings (e.g. wheel bearings) fill the space between the bearing and the outer seal with the recommended type of grease before assembling the seal.
- Check shaft and bearing housing for discolouration or other signs of movement between bearing and seats.
- Make sure that shaft and housing are free of burrs before assembling the bearing.
- Always mark the individual parts of separable bearings (e.g. taper roller bearings) to enable correct reassembling. Never assemble the rollers to an outer race that has already been used, replace the complete bearing instead.

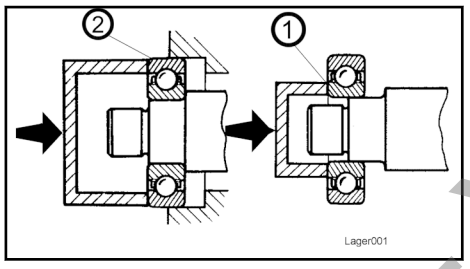


Fig. 29

NOTICE!

When assembling the ball or roller bearing to the shaft load must only be applied to the inner race (1).

When fitting the bearing into the housing load must only be applied to the outer race (2).

1.3.1.1.6 Feather keys and keyways

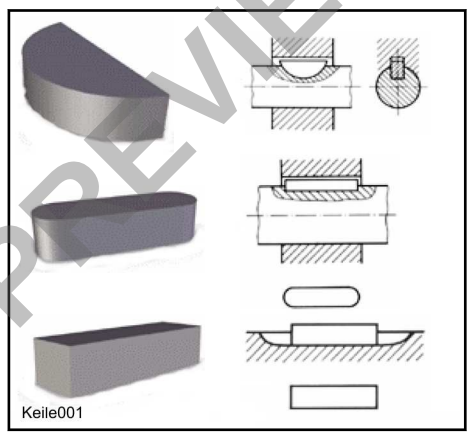


Fig. 30

1. Clean the feather key, examine it and only use it again if it had not been damaged.
2. Deburr and clean the edges of keyways thoroughly before reassembling the feather key.

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4 Overview of machine

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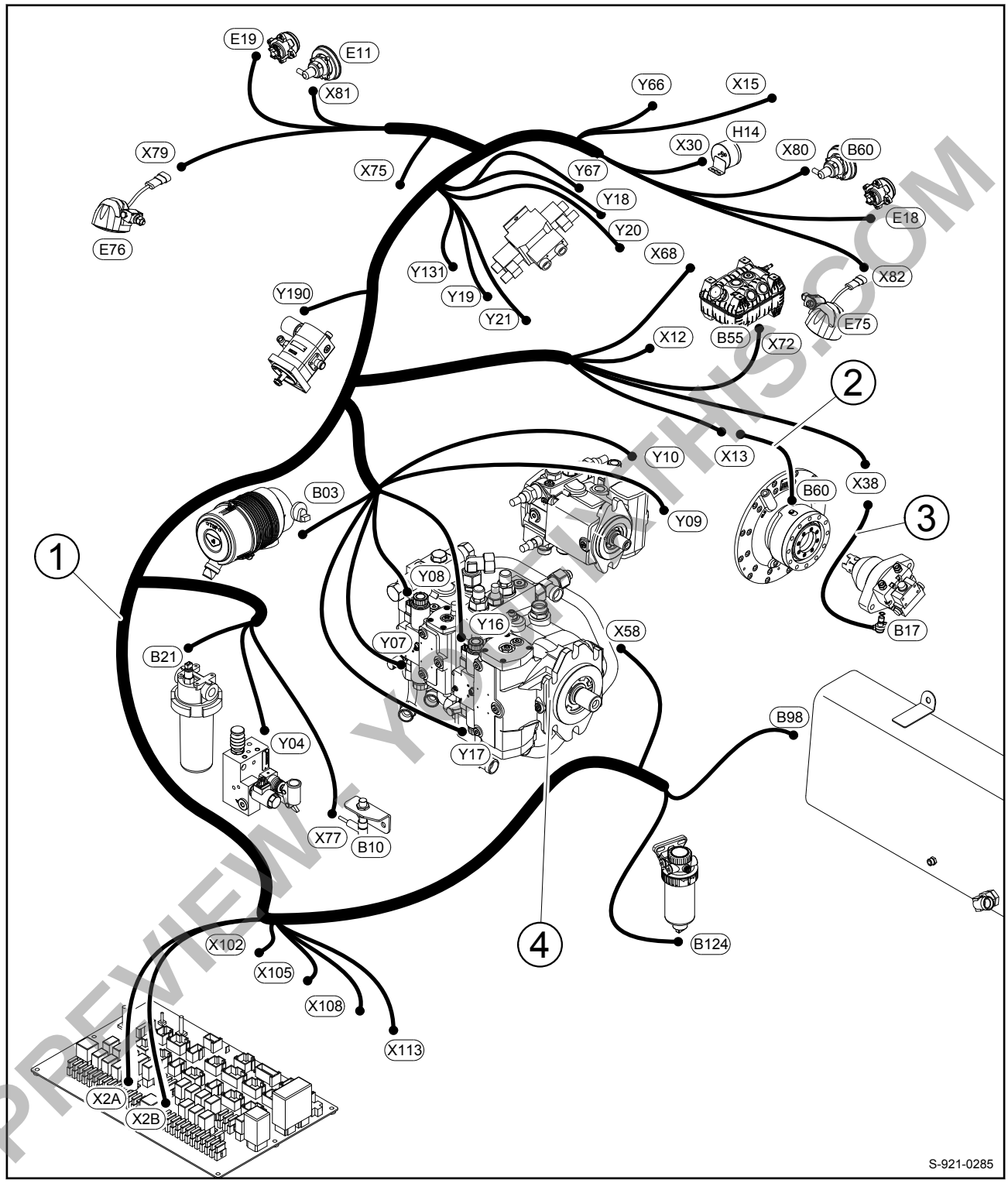


Fig. 95: Rear frame, tandem pump unit (4) new design rotated 180°

1 Wiring loom, rear frame
2 Wiring loom, speed sensor
3 Wiring loom, rotary speed sensor
4 Tandem pump unit - new design rotated 180°

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NOTICE!

Multiple activation of the heater control in short term operation (low generator running time) discharges the starter battery.

If the engine does not start properly in case of automatic starting of the heating flange because the starter does not get energized due to a fault and does not crank the engine, the starting process must be completely aborted (ignition key to OFF, voltage supply to heating flange interrupted). In order to avoid damage to heating flange or charge air hoses caused by overheating, another start of the engine must be avoided and trouble shooting should be performed instead.

Several successive starting attempts can cause overheating of the heating flange .



1 Coolant temperature sensor (B113)
2 Coolant temperature switch (B53)

Fig. 159

Designation	Technical data
Heating flange	With a coolant temperature of -30°C, the preheating time will be max. 52 seconds; with +5°C, the minimum time will be 38 seconds. With a coolant temperature of -30°C the after-heating time will be max. 180 seconds, with +25°C the minimum time will be 35 seconds. approx. 2000 Watt approx. 167 A. approx. 0.07 Ohm
B113, coolant temperature sensor	approx. 2 Ohm at 20°C
B30, coolant temperature switch	Contact switches to ground at approx. 110° C

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Fig. 225:

14.

Cover the O-ring slightly with oil.

Install a new loop ring .

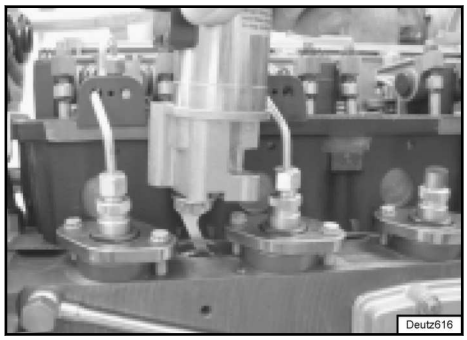


Fig. 226:

15. Use the shut-down lever to push the governor rod to stop position and hold it.

16. Install the engine shut-down assy.

17. Tighten the screws with 21 Nm.

18. Plug the cable plug onto the shut-down magneto.

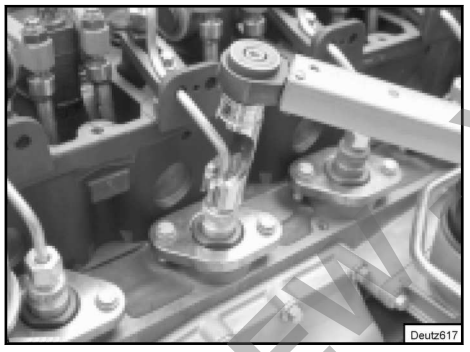


Fig. 227:

19.

NOTICE!

Take care that the sealing cones match exactly when assembling the injection line. Subsequent bending is not permitted. The injection line must never be used twice.

Install the new injection line with the sealing rubber.

20. Pre-tension the injection line cap nuts on injection pump and injection valve with a torque of approx. 5 Nm (use claw spanner 8018).

21. Tighten the cap nut with 25 ± 3.5 Nm.

22. Install the gasket.

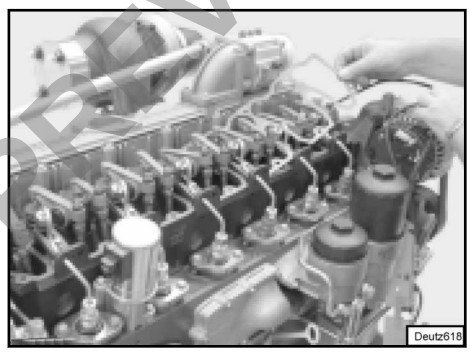


Fig. 228:

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3	Control piston	9	Cylinder
4	Control unit	10	Piston
5	Valve plate	11	Slipper pad
6	Low pressure side	12	Swashing cradle

Hydraulic diagram

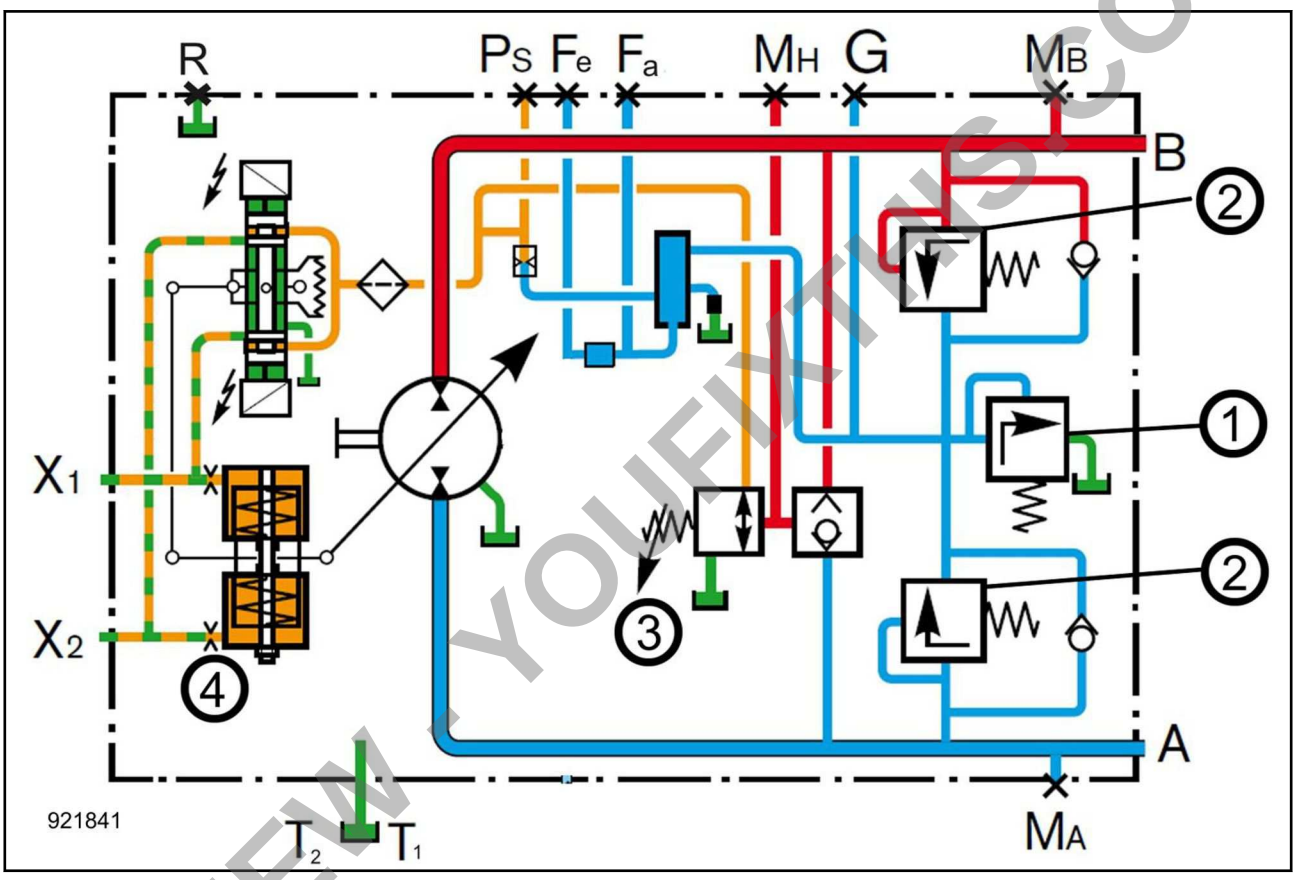


Fig. 319: Hydraulic diagram, A4VG EP

1	Charge pressure limitation	3	Pressure cut-off
2	High pressure limitation	4	Control unit

A	Work connection	P_S	Control pressure inlet
B	Work connection	R	Ventilation
G	Pressure port for charge circuit	T_1	Leak oil
M_A	Pressure test port, pressure A	T_2	Leak oil

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If the control valve is actuated out of neutral to one of the two active positions, the open oil flow passage is closed and the oil flows through the valve to the corresponding side of the crab-walk cylinder. The unlockable non-return valves lock the oil in the cylinder chambers, until a new control command opens these valves and allows the oil to flow out.

Oscillating articulated joint

Articulated tandem rollers have a central articulated oscillating joint between the drums. This ensures that both drums run in track, even when cornering. When using the crabwalk *(optional equipment)*, the rear drum is offset either to the left or the right. Due to their design, the tracks of tandem rollers can only be offset by < 170 cm.

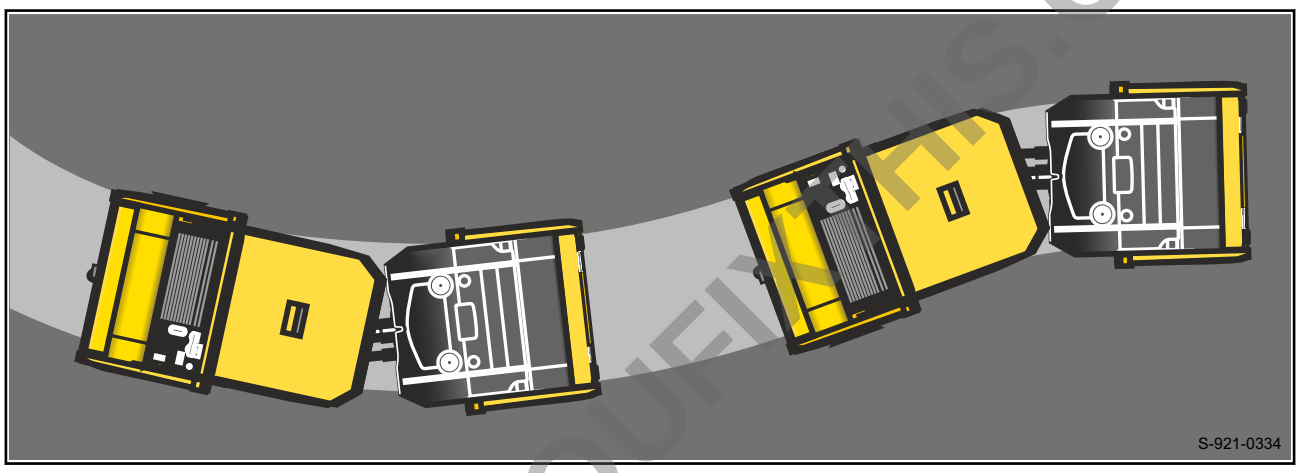


Fig. 363

Features of the oscillating articulated joint

- Very compact, low maintenance
- Track offset ± 170 cm; optional crabwalk adjustment
- Steering angle ± 35°
- Oscillating angle 6°

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7 Front vibration motor
8 Elbow union (tool)
9 Hose connection, vibration pump A <> vibration motor A, front

7.10.7 Flushing the front vibration circuit

Observe the chapter "Flushing - General"

Installing the flushing filter

NOTICE!

Before the installation of the filters check hoses and connections for cleanliness.

The flushing filter must be installed in the low pressure side in the return flow to the pump, so that only cleaned oil will enter the vibration pump.

For the connection schematic shown here the vibration must always be filtered with "high frequency / low amplitude".

1. Disconnect the high pressure hose (9) from the vibration pump (port A) and connect it with the flushing hose (5) (flushing filter inlet "IN"), see chapter "Flushing diagram front vibration circuit".
2. Connect the flushing hose (2 flushing filter outlet "OUT") to the high pressure port (A) on the vibration pump.

Disconnect the vibration motor

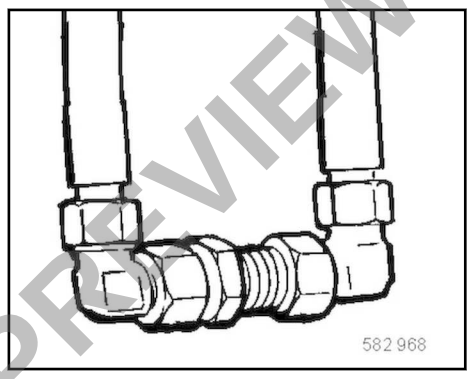


Fig. 445

1. Take the vibration motor (7) out of the hydraulic circuit, for this purpose join the hoses on the vibration motor together.

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9.5 Working principle of the air conditioning system

All air conditioning systems are based on the same principle. They extract heat from the surrounding environment. Everybody knows the effect: if a sweating body is exposed to wind it will cool down, because heat is extracted. For this purpose a refrigerant circulates in a closed circuit inside the vehicle. This refrigerant thereby continuously changes its physical state between liquid and gaseous.

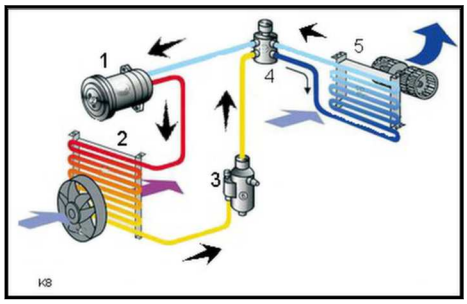


Fig. 521: Principle sketch of an air conditioning system

An engine driven compressor (1) draws in gaseous refrigerant from the evaporator (5) and compresses it. During this process the temperature of the refrigerant increases tremendously.

The refrigerant vapour is then pumped to the condenser (2). This condenser is arranged directly in front of the vehicle radiator, so that a sufficient air flow is assured. In the condenser (2) the gas is cooled down and consequently liquefied.

In the dryer / liquid container (3) the refrigerant is then collected and freed of moisture and contaminants.

The expansion valve (4) regulates the flow rate from the dryer / liquid container (3) back to the evaporator (5) and the circuit starts again.

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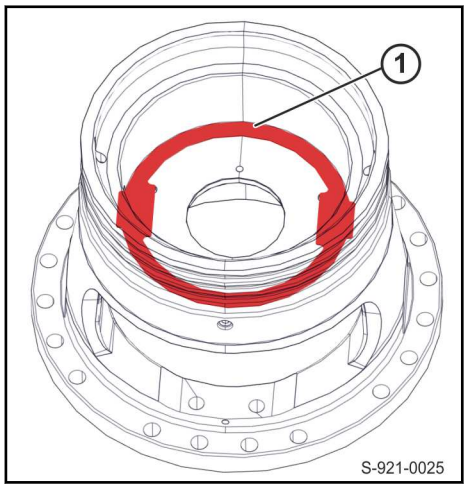


Fig. 593: Bearing flange on belt side

2. Assemble the spacer (1).

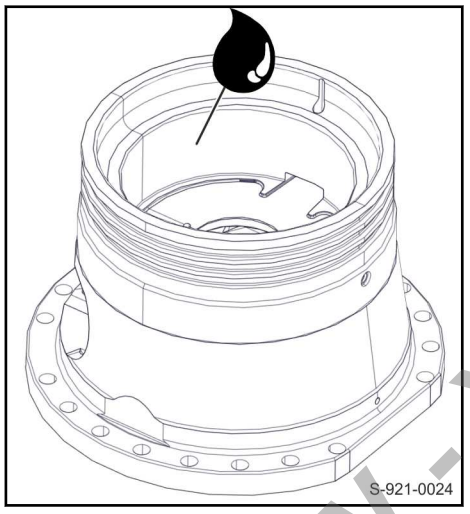


Fig. 594: Bearing flange on belt side

3. Apply some oil to the bearing seat area.

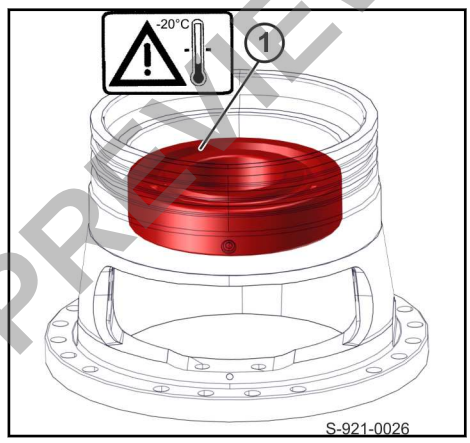


Fig. 595: Bearing flange on belt side

4. Drive the cylinder roller bearing (1) onto the bearing flange against the end stop.

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Dismantling the toothed belt

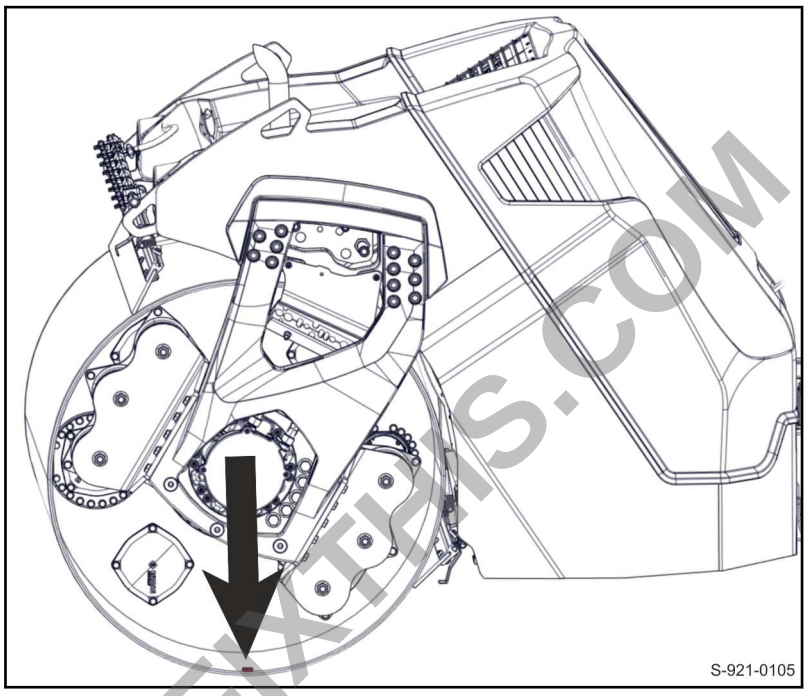


Fig. 699

1. Move the machine to bring the mark on the drum to bottom position ↳ Fig. 699.
2. Park the machine safely ↳ *Chapter 1.3.5 „Parking the machine in secured condition“ on page 68*.
3. Remove the cover ↳ Fig. 700.

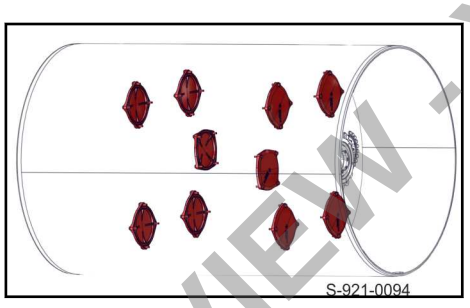


Fig. 700

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11.1 Preparations

WARNING!

Danger of accident!

For transport purposes the driver's seat must be tied down with cable straps thus to operate the seat contact switch. Before resuming operation of the machine these cable straps must strictly be removed to ensure safe and reliable function of the seat contact switch.

Check the 4 lifting eyes on the cabin roof for tight fit.

Fasten the lifting gear to all four lifting eyes.

Use lifting gear (chains or ropes) of sufficient load bearing capacity. The minimum load bearing capacity of the crane must be 1000 kg.

Do not stand or step under loads being lifted.

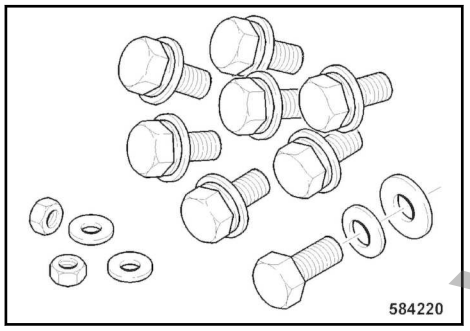


Fig. 809

1. Make sure that all fastening screws, washers, spacers and nuts to fasten the cabin are available .
2. Check whether rear rack, foot mat, step plate and fastening kit are available.

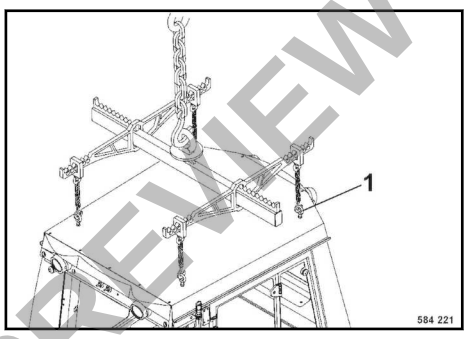


Fig. 810

3. Fasten the lifting gear to the four lifting eyes 1.
4. Loosen possible fastening on the transport pallet.
5. Slowly list the crane with a crane.

WARNING!

Danger of accident!

Do not stand or step under loads being lifted.

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Connection example to check the plus line between battery and plug pin 28

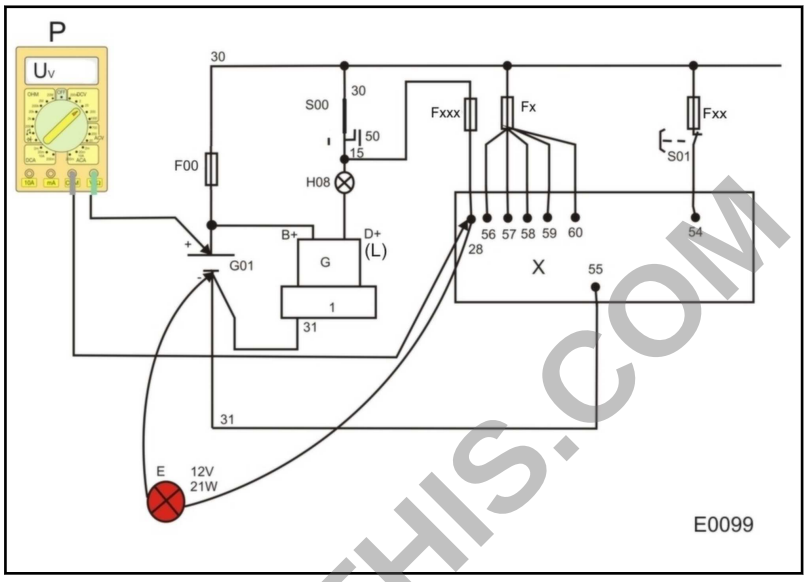


Fig. 875

X Wiring loom plug disconnected from control unit or Pinbox
P Multimeter
S00 Ignition switched on. *Nominal value: E is bright. U_V max. 0.5 Volt*
S00 Ignition switched off. *Nominal value: E is dark. U_V = 0.0 Volt*

Connection example to check the minus line between battery and plug pin 55

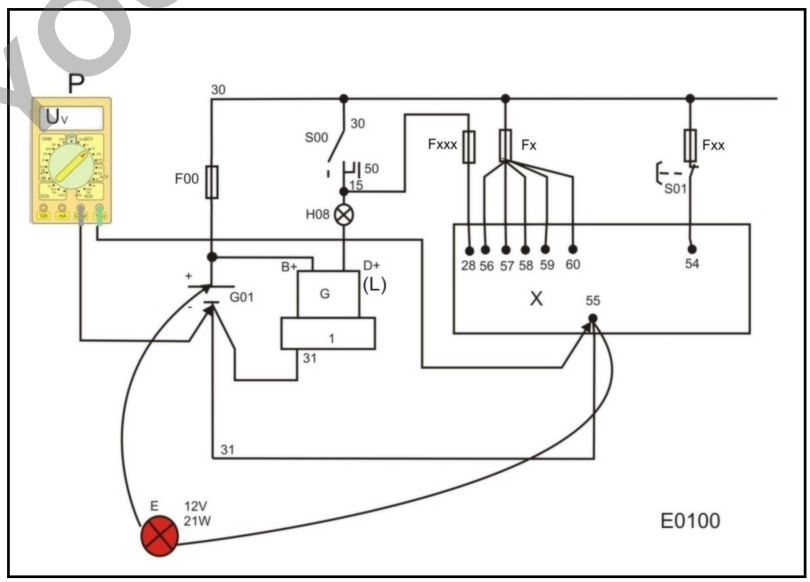


Fig. 876

P Multimeter
X Wiring loom plug disconnected from control unit or Pinbox
E Nominal value: E is bright. U_V max. 0.5 Volt

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FaultLocation	Input arm rest switch, B132				
FCode	**FaultDescription**	**Terminal**	**Possible Cause**	**Diag**	**Reac**
1320	Informative message, no fault! Left arm rest raised. Machine does not pick up throttle and is braked to stop.	X35:13			0
1321	Cable breakage or sensor defective	X35:13	Line breakage in current path Hardware defect sensors, replacement required	1320	2
1322	Short circuit	X35:13	Current path has connection to +Ub (15 or 30) Short circuit to ground (31) in the current path	1320	2
1323	System fault, replace control	X35:13	Software parameter fault, software update may be required. ESX hardware defect, hardware replacement may be necessary		2
8140	Hardware initializing error	System	Initialization fault		3

FaultLocation	Crabwalk adjustment				
FCode	**FaultDescription**	**Terminal**	**Possible Cause**	**Diag**	**Reac**
2010	No or too low current flow out of this output	X35:48	Valve coil defective Line breakage in current path		2
2011	Short circuit towards Ub	X35:48	Current path has connection to +Ub (15 or 30)		5
2012	Too high current flow out of this output Output was switched off!	X35:48	Short circuit to ground (31) in the current path Excessive current in current path		2
2015	No or too low current flow out of this output	X35:49	Line breakage in current path Valve coil defective		2
2016	Short circuit towards Ub	X35:49	Current path has connection to +Ub (15 or 30)		5
2017	Too high current flow out of this output Output was switched off!	X35:49	Short circuit to ground (31) in the current path Excessive current in current path		2

FaultLocation	Output steering valve Y92, front left steering				
FCode	**FaultDescription**	**Terminal**	**Possible Cause**	**Diag**	**Reac**

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FCode	FaultDescription	Terminal	Possible Cause	Diag	Reac
9004	Fault: CAN communication Bus 1, check bus hardware	System			1
9005	Fault: CAN communication Bus 1, check bus hardware	System			2
9006	Fault: CAN communication Bus 1, check bus hardware	System			1
9007	Internal fault	System			1
9008	Internal fault	System			1
9008	Internal fault	System			1
9009	Internal fault	System			4
9009	Internal fault	System			4
9011	Internal fault	System			3
9012	Internal fault	System			3
9013	Internal fault	System			3
9014	Internal fault	System			3
9015	Internal fault	System			3
9016	Internal fault	System			3
9017	Internal fault	System			3
9018	Internal fault	System			3
9019	Internal fault	System			3
9020	Internal fault	System			3
9021	Internal fault	System			3
9022	Internal fault	System			3
9023	Internal fault	System			3
9024	Internal fault	System			3
9025	Internal fault	System			3

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Pos	Designation	Pos	Designation
1	Hot gas line (overheated steam)	9	Evaporator
2	Deheating (overheated steam)	10	Overheating (overheated steam)
3	Condenser / liquefier	11	Suction steam line (overheated steam)
4	Condensation (wet steam)	12	Compressor
5	Fluid line (supercooled fluid)	13	Supercooling (fluid)
6	Expansion valve	14	Compaction
7	Injection line (wet steam)	15	Expansion
8	Evaporation (wet steam)		

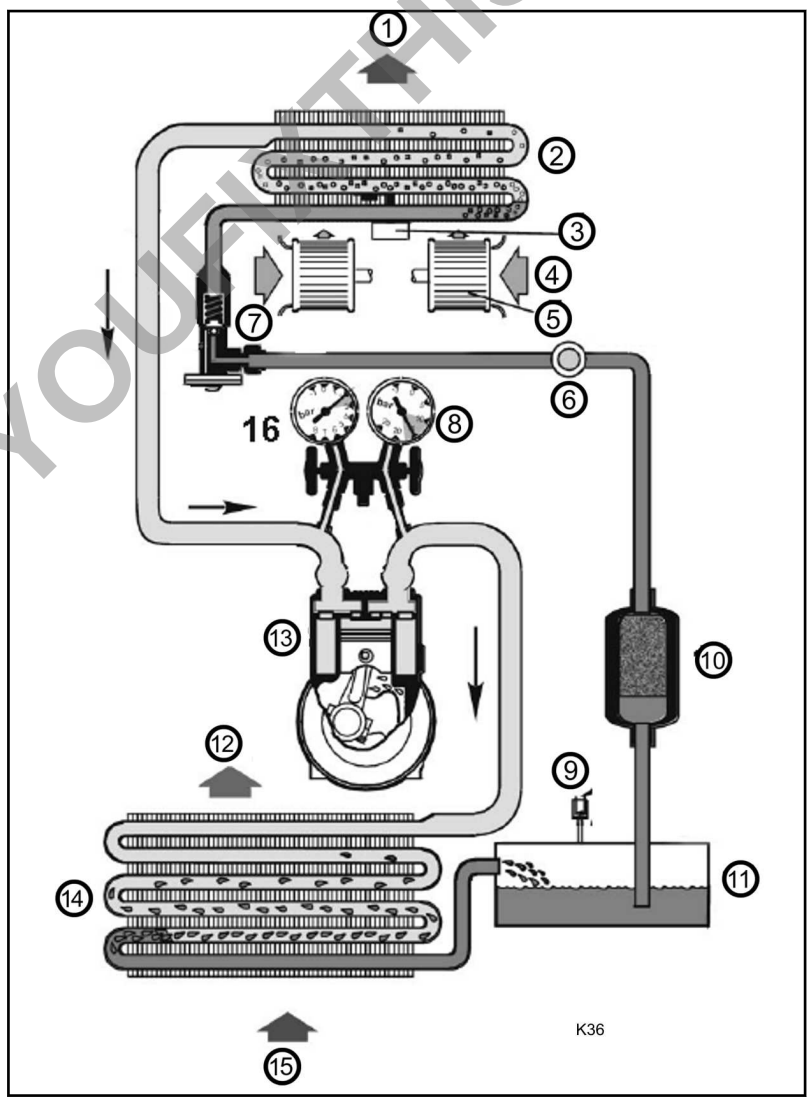
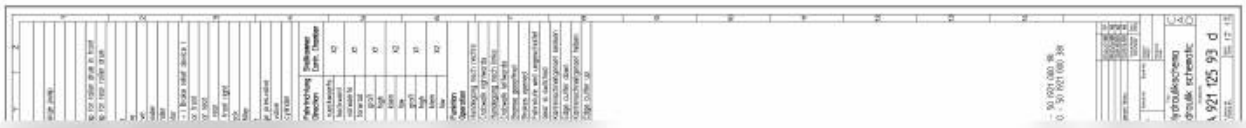


Fig. 887: Refrigerant circuit diagram

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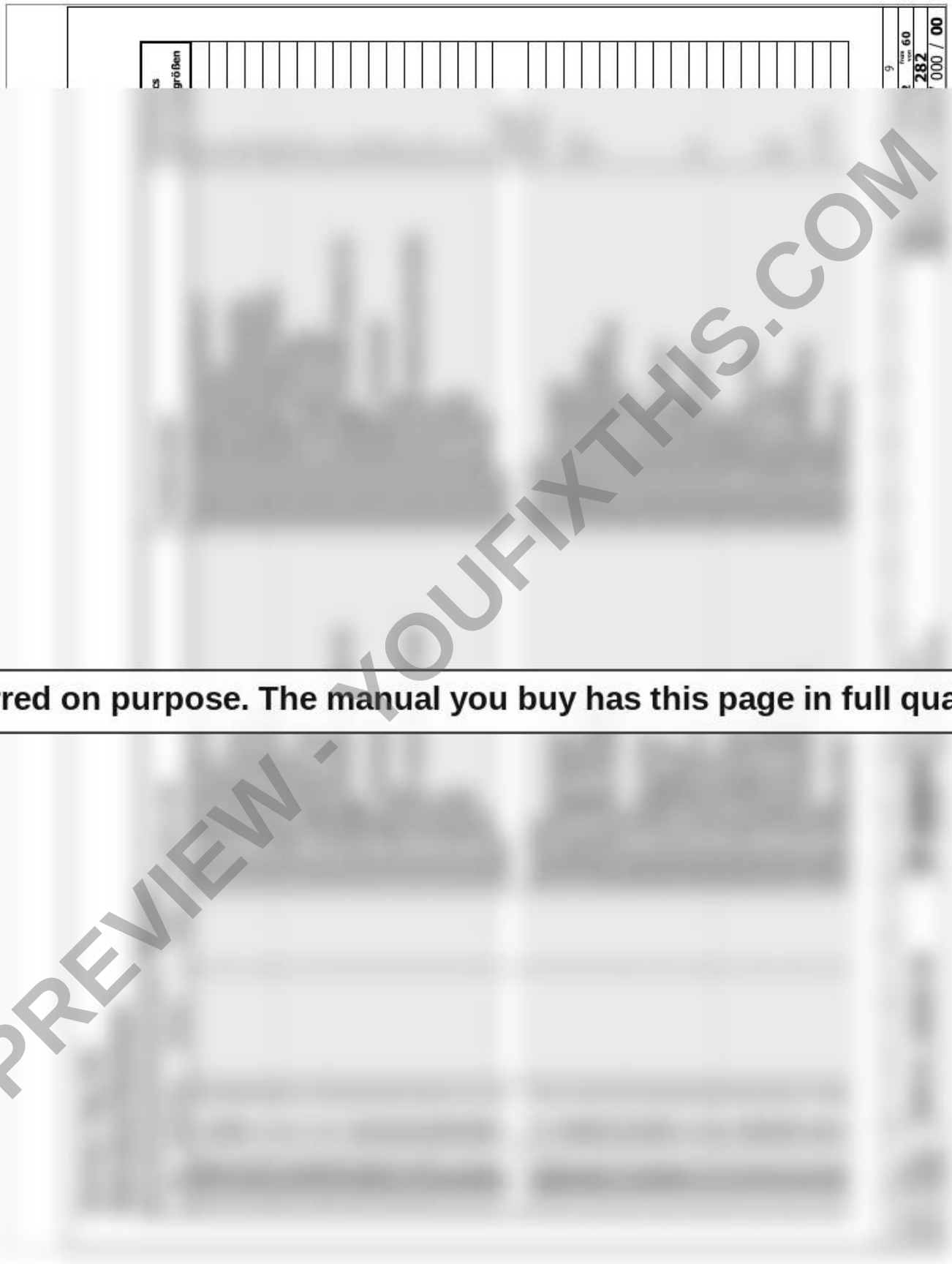
Circuit diagrams



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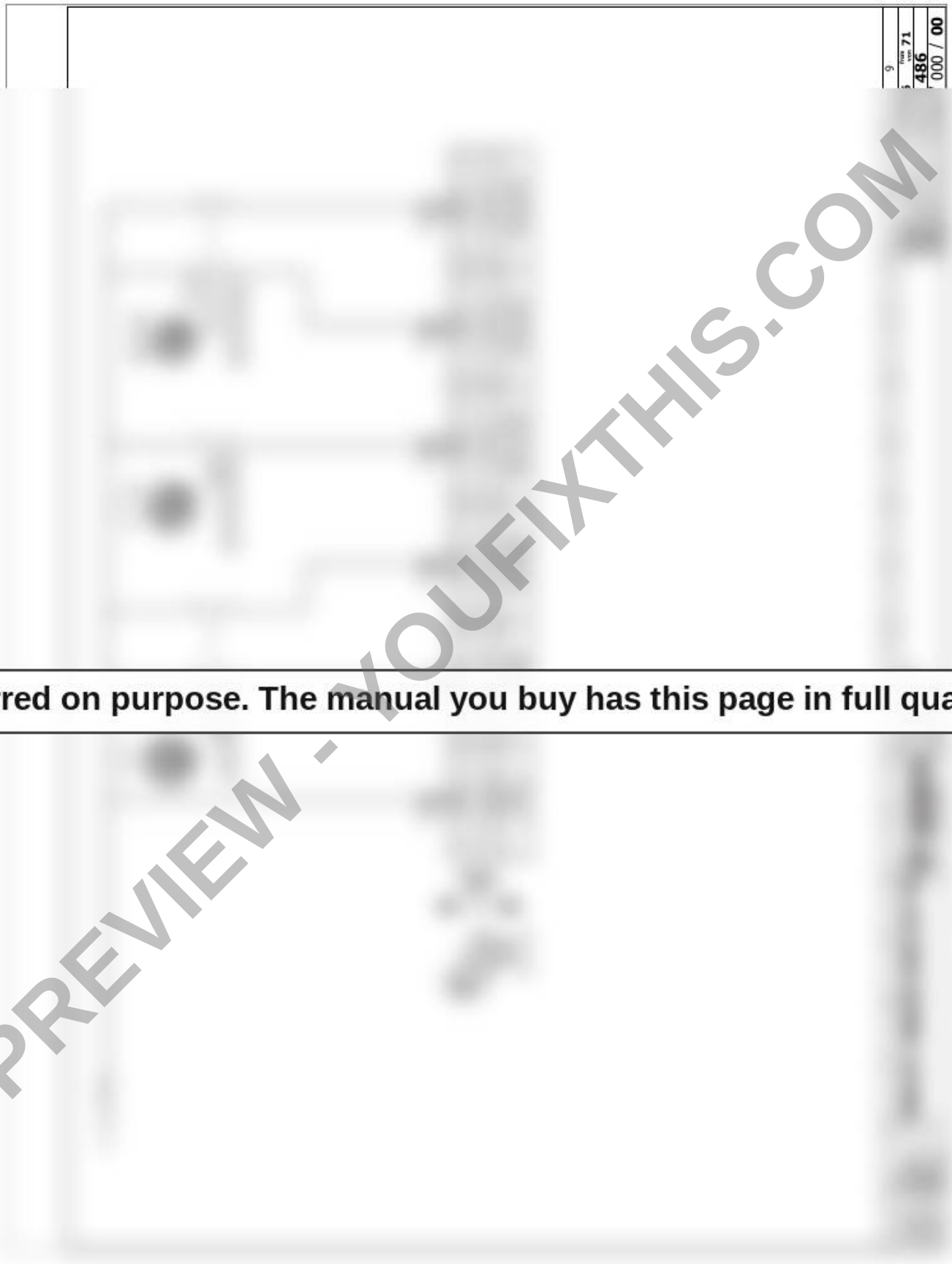


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