2.1 Technical data, BC 473 RB -4

2.1.1 Technical data

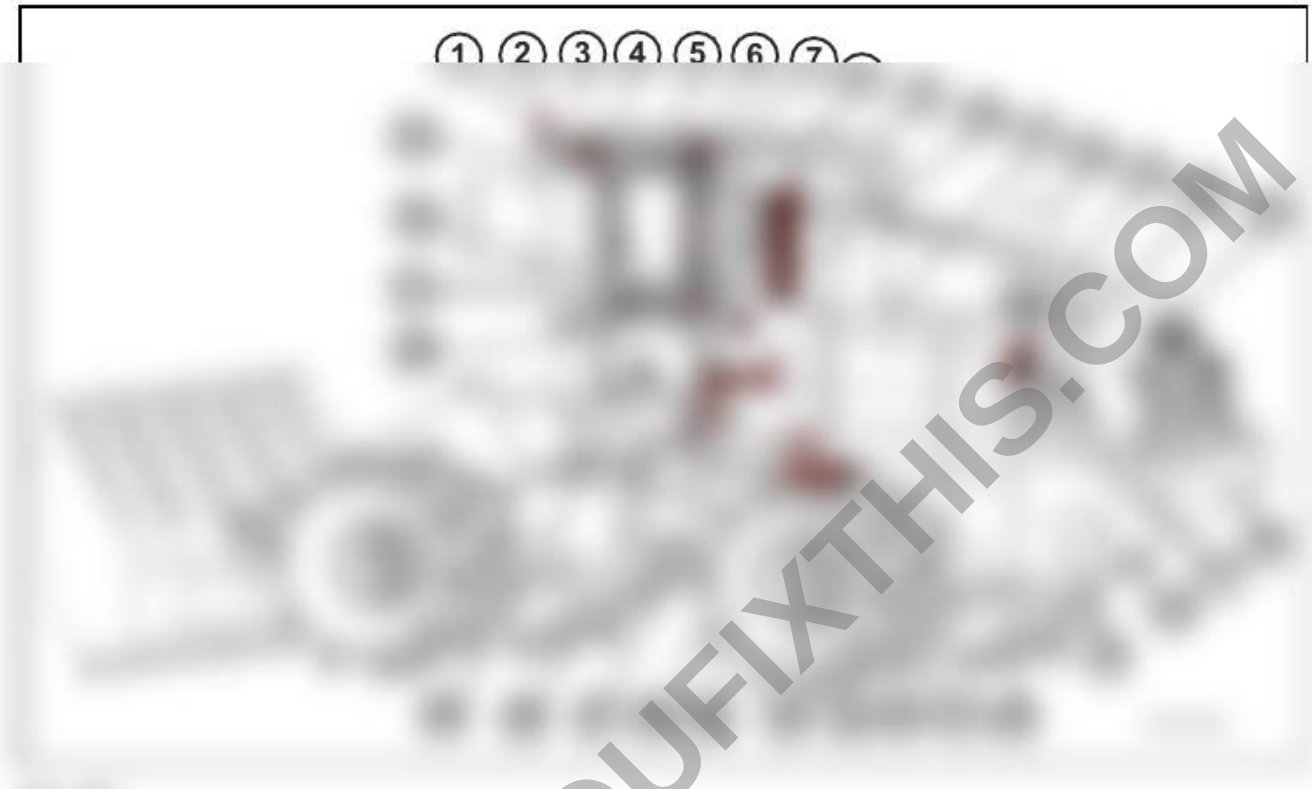


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3.2 Electric systems



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A Circuit diagrams

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A.1 Circuit diagram 246

Validity of circuit diagrams

Circuit diagram 246:

- *BC 473 RB-4*
  101 930 08 1001 ⇒ 101 930 08 1016
- *BC 473 RS-4*
  101 930 09 1001 ⇒ 101 930 09 1002
- *BC 573 EB-4*
  101 930 10 1001 ⇒ 101 930 10 1003

Circuit diagram 329:

- *As a standard, all machines are equipped with a camera and a display for monitoring the rear danger zone.*
- *BC 473 RB-4*
  101 930 08 1017 ⇒ 101 930 08 1025
- *BC 473 RS-4*
  101 930 09 1003 ⇒ 101 930 09 1004
- *BC 573 EB-4*
  101 930 10 1004 ⇒ 101 930 10 1010
- *BC 473 EB-4*
  101 930 11 1001 ⇒ 101 930 11 1008

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A.4 Hydraulic diagram 571 908 27

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Position "Right"	Engine emergency operation actuated. The machine can be driven in raised idle speed mode (e.g. to move the machine out of the danger zone).

Repetitive occurrence of exhaust gas related faults

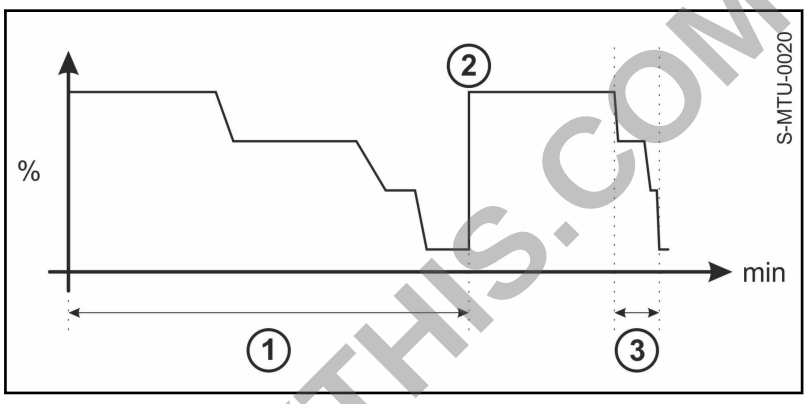


Fig. 492

1 First occurrence of a fault with power reduction over a period of 4 hours
2 Fault rectification
3 Power reduction over a period of only 30 minutes, should an exhaust related fault occur again.

Once the fault (2) has been rectified, the full engine power will be available again. Should the control detect a fault again within 40 operating hours, the time to final power reduction will be reduced to 30 minutes (3).

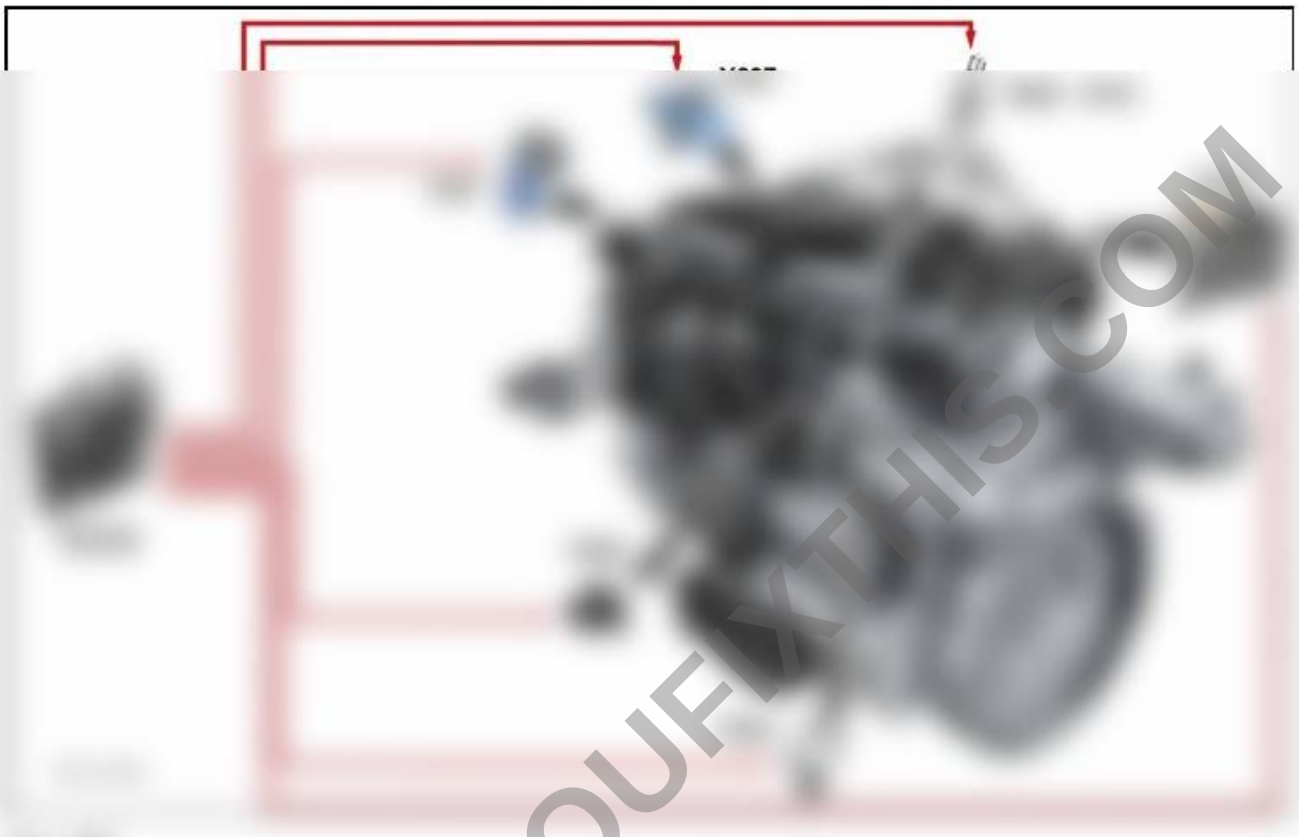
7.4.6 Fault code control units

MTU error code list - list MCM2

Fault code MCM2	Description of fault
10F0E3	Turbo Compound Valve Circuit Failed High
10F0E4	Turbo Compound Valve Circuit Failed Low
10F0E5	Turbo Compound Valve Circuit Failed Open
110B02	Park Brake Status Not Plausible (Vehicle Moving)
12F0E3	Function 19 Circuit Failed High
12F0E4	Function 19 Circuit Failed Low
12F0E5	Function 19 Circuit Failed Open
13150F	MU_RC4_IDLE_FUEL_QTY
13F0E3	Service Push Button Circuit Failed High
16F0E3	Function 22 Circuit Failed High

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6.1.9.4 Output signals, engine control unit



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7.8.7 Check the fuel supply..... 612
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7.1 Preliminary remarks

Malfunctions are frequently caused by incorrect operation of the machine or insufficient maintenance. Whenever a fault occurs you should therefore thoroughly read these instructions on correct operation and maintenance.

If you cannot locate the cause of a fault or rectify it yourself by following the trouble shooting chart, you should contact our customer service department.

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1.2 Concerning your safety

1.2.1 Basic prerequisites

1.2.1.1 General

This machine has been built in compliance with the latest technical standard and complies with the applicable regulations and technical rules.

However, dangers for persons and property may arise from this machine, if:

- it is used for purposes other than the ones it is intended for,
- it is operated by untrained personnel,
- it is changed or converted in an unprofessional way,
- the safety instructions are not observed.

Each person involved in the operation, maintenance and repair of the machine must therefore read and comply with these safety regulations. If necessary, the operating company must obtain the relevant signatures as confirmation.

Furthermore, the following obviously also applies:

- applicable accident prevention instructions,
- generally accepted safety and road traffic regulations,
- country/state specific safety regulations.

It is the duty of the operator to be acquainted with the safety regulations and to apply these accordingly. This also applies for local regulations and regulations concerning different types of handling activities. Should the recommendations in these instructions be different from the regulations valid in your country, you must comply with the safety regulations valid in your country.

1.2.1.2 Explanation of signal words used:



DANGER!

Danger to life if failing to comply!

Sections marked accordingly indicate an extremely dangerous situation that could lead to fatal or severe injuries, if this warning is disregarded.



WARNING!

Danger to life or danger of severe injuries if failing to comply!

Sections marked accordingly indicate a dangerous situation that could lead to fatal or severe injuries, if this warning is disregarded.

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Screw dimension	Tightening torques Nm (Coefficient of friction μ tot. = 0.14)		
	8.8	10.9	12.9
1 1/8″ - 12	1350	1900	2300
1 1/4″ - 12	1900	2700	3200
1 3/8″ - 12	2600	3700	4400
1 1/2″ - 12	3300	4600	5600

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3.4.4 Overview of maintenance flaps and doors

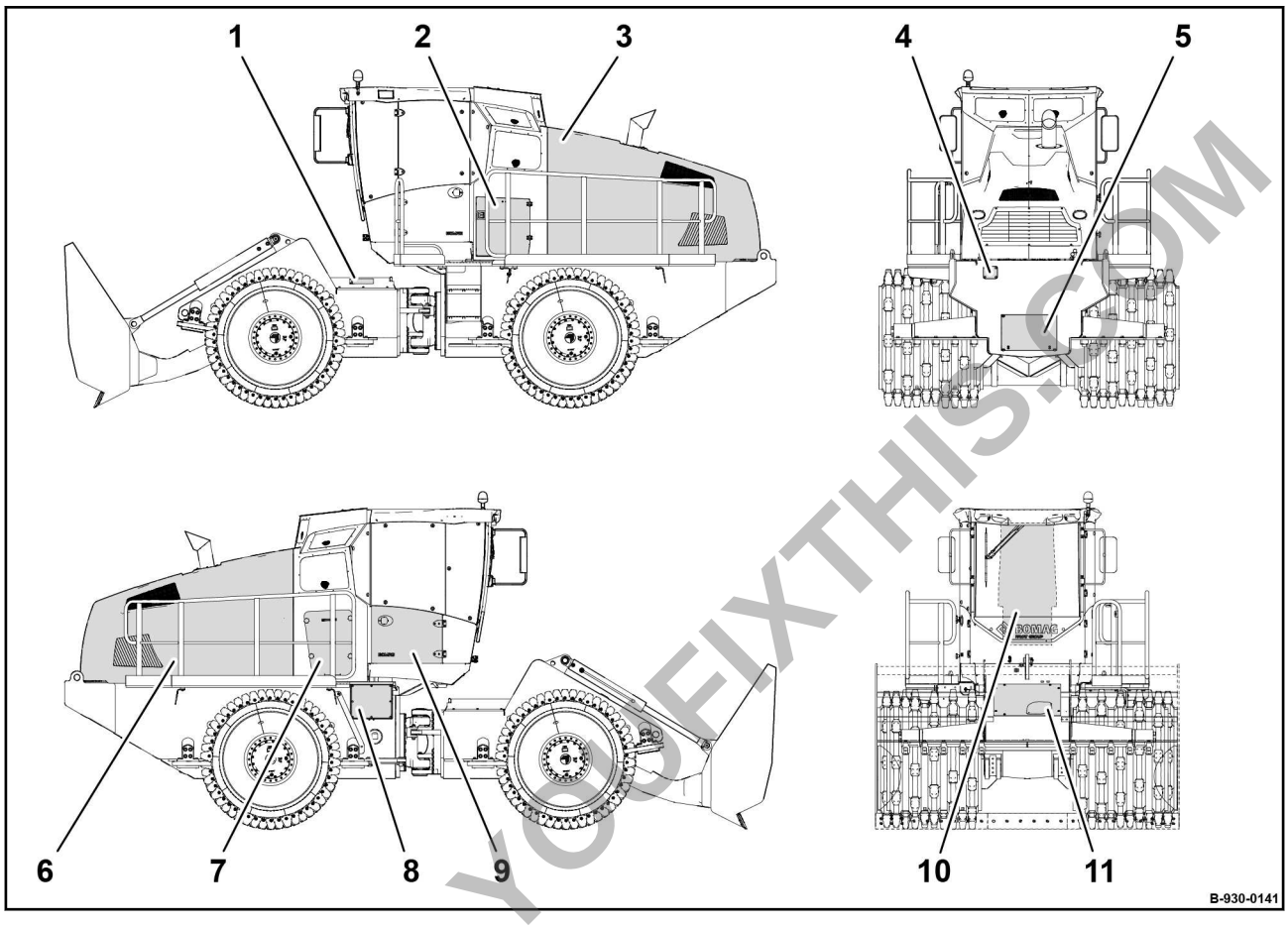


Fig. 79

1 Fuel tank, fuel filter for auxiliary heating
2 AdBlue®/DEF tank, AdBlue®/DEF filter, pump lever extension
3 Diesel engine, radiator module, hydraulic oil tank, hydraulic oil filter, transfer case oil filter, transfer case oil dipstick, grease container for central lubrication system, supply tank for windscreen washing system
4 Emergency operation of hood
5 Return flow filter, drainage points (engine oil, transfer case oil, hydraulic oil, coolant, contaminated fluids)
6 Radiator module, brake releasing valve
7 Condensers and driers/collector units in air conditioning, air intake side for radiator module
8 Battery, main fuses
9 Circulation air filter, fresh air filter
10 Central electrics
11 Drainage points (fuel tank, contaminated fluids)

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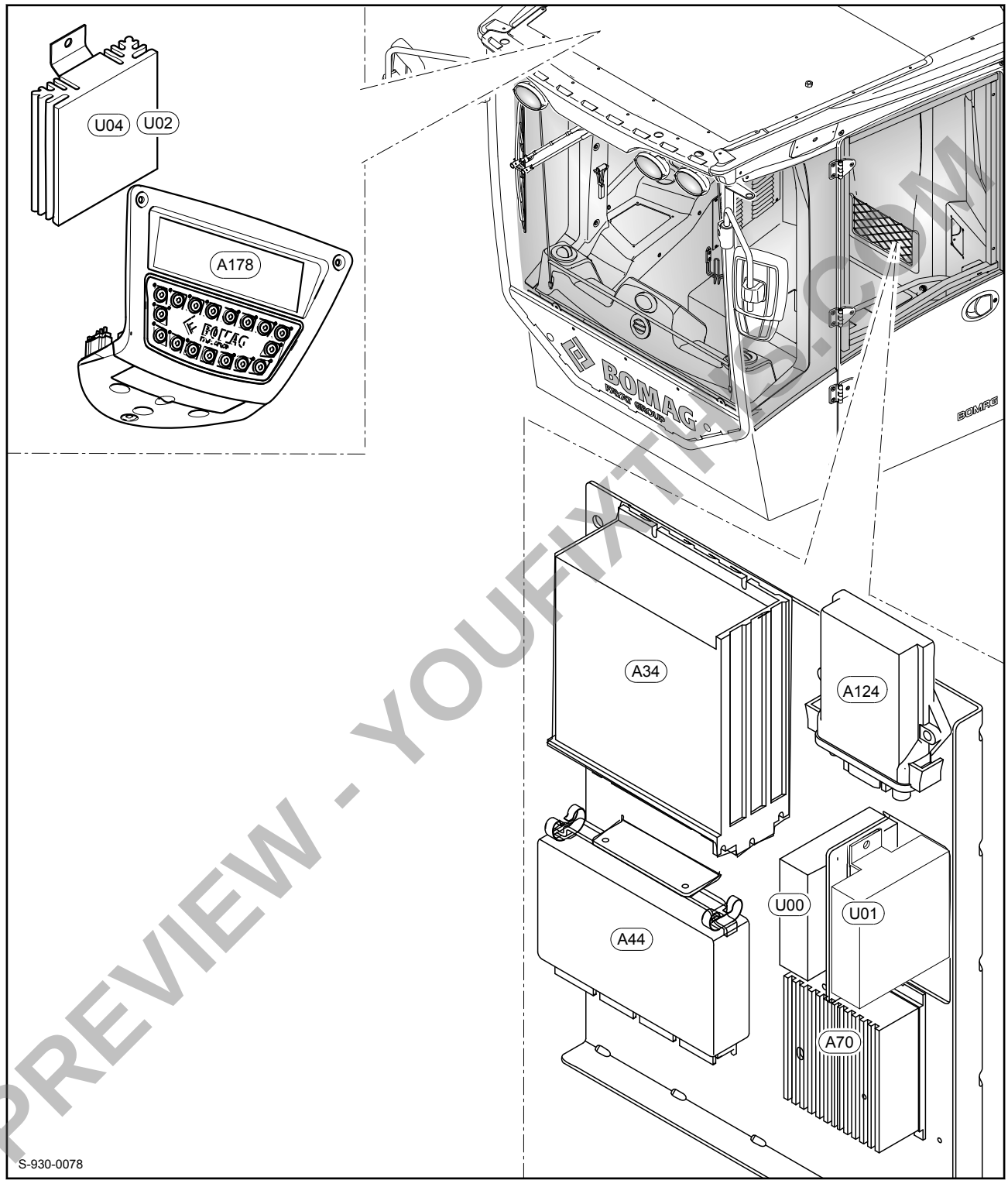


Fig. 148: Cabin central electrics

A34 ESX machine control
A44 Additional electronics CPC
A70 Reversible fan module
A124 Telematic module
A178 Controller for cabin operating console

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4176	Communication error	CAN1	CAN communication fault Faults on CAN line Poor contact of plug-in connection (intermittent contact) in current path or in supply lines	0
9102	Communication error	CAN1	Faults on CAN line No voltage supply (+Ub Pot 15 or 30)	3

FaultLocation Output engine shut-down, K22

FCode	FaultDescription	Terminal	Possible Cause	Diag	Reac
5010	Although the output is switched off, voltage is present	X35:24	Current path has connection to +Ub (15 or 30)		2
5011	Output to relay shorted to ground.	X35:24	Current path connected to ground		2
5012	Wire breakage at the output to the relay	X35:24	Line breakage in current path		2

FaultLocation Engine fault

FCode	FaultDescription	Terminal	Possible Cause	Diag	Reac
5013	Engine stalled or shut down by engine control unit	-	Engine overloaded		2

FaultLocation Input D+ detection

FCode	FaultDescription	Terminal	Possible Cause	Diag	Reac
5017	Engine running but no D+ signal present	X35:36	Line breakage in current path Current path connected to ground V-belt broken Generator or charge regulator defective		0

FaultLocation Input engine oil pressure monitoring

FCode	FaultDescription	Terminal	Possible Cause	Diag	Reac
5020	Warning: No oil pressure		Hardware defect sensors, replacement required Sensors not correctly installed or not adjusted		1

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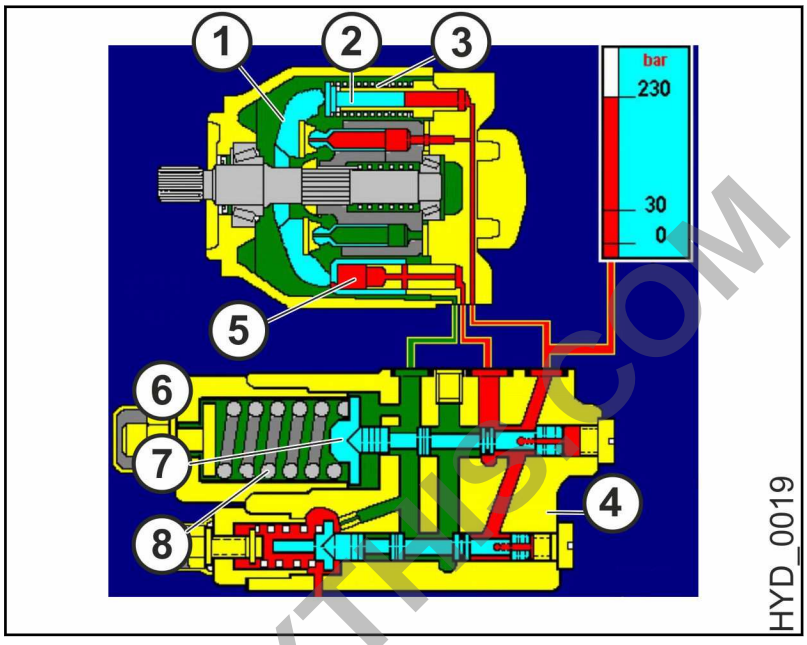


Fig. 209

1 Swash plate
2 Control piston
3 Spring
4 Pressure control
5 Resetting piston
6 Flow control valve
7 Spool
8 Spring

If the system pressure rises higher than the value set by the flow control valve (6), the spool (7) of the flow control valve is displaced against the spring (8). Maximum high pressure is applied to the resetting piston (5) and the swash plate (1) is set to the minimum adjusted displacement.

If the pressure drops below the set value of the flow controller, the swash plate will again return to maximum displacement.

5.3.4 Travel motor, A6VM HA2T

5.3.4.1 Description of function

Variable displacement axial piston motor, A6VM

The travel motors A6VM and A6VE just differ by a different housing.

The A6VM/VE is a variable displacement axial piston motor with a tapered axial piston drive in swash plate design for hydrostatic drives in open and closed hydraulic circuits. Due to this bent axle design the torque is generated directly on the drive shaft. The pistons only apply very little transverse forces to the cylinder, which has a favourable effect on wear, efficiency and starting torque.

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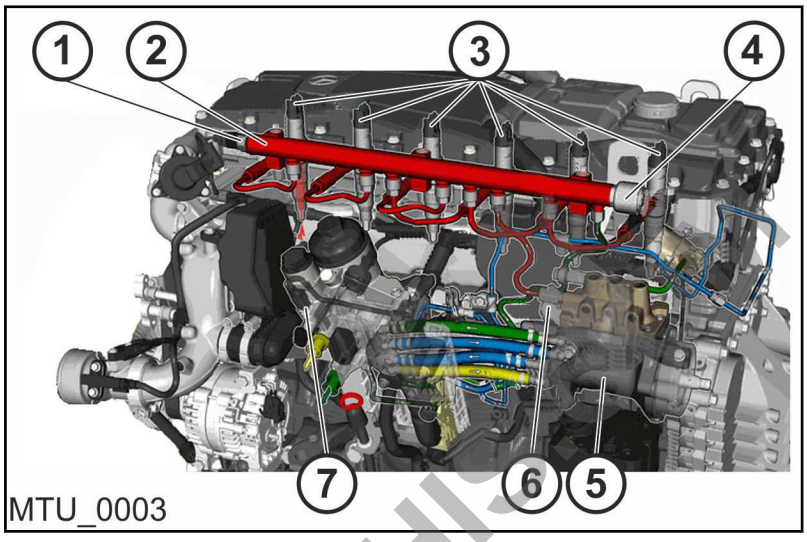


Fig. 259: Fuel system MTU 6R 1000

Low pressure side

The low pressure fuel pump (12) draws fuel from the fuel tank (13) through the fuel pre-cleaner (9) and delivers this fuel through the main fuel filter (10). In case of a blockage in the pressure side (e.g. caused by a clogged main fuel filter), the low pressure fuel pump delivers the fuel through a safety valve back into the suction side. After the main fuel filter the fuel flows to the flow control valve (6). The pressure control valve (11) regulates the pressure in the low pressure system. The control pressure is tapped by the flow control valve. The fuel quantity delivered by the low pressure pump is directed back to the suction side of the low pressure pump, depending on the position of the pressure control valve.

High pressure side

After the flow control valve the fuel flows to the high pressure fuel pump (5). This pump delivers the fuel into the Rail. The Rail pressure sensor (1) permanently monitors the pressure in the Rail. If necessary, the flow control valve (controlled by the engine control unit) regulates the flow volume to the high pressure pump. The injectors (3) are supplied with fuel from the Rail. The injectors subsequently inject the fuel into the individual cylinders. The engine control unit thereby determined injection quantity and timing in dependence on the operating status of the engine.

If the maximum permitted pressure in the Rail is exceeded,the pressure relief valve (4) will open. This valve also has the function to relieve the Rail pressure, which is necessary to relieve the high pressure side after the engine is shut down.

6.1.5 Crankcase ventilation

The cylinder crankcase ventilation has the function of reducing the pressure in the cylinder crankcase. Since the blow-by gases also carry engine oil, they are cleaned in the oil separator before they are discharged to the outside.

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3. Recharge the battery immediately after an open-circuit voltage of 12.25 V or less is reached. Do not perform boost charging.
   ⇨ The open-circuit voltage of the battery occurs approx. 10 hours after the last charging process or one hour after the last discharge.
4. Switch off the charging current before removing the charging clamps.
5. After each charging process allow the battery to rest for one hour before taking it into service.
6. For standstill periods of more than one month you should always disconnect the battery. Do not forget to perform regular open-circuit voltage measurements.

Measures before restarting

1. Replace the fuel filter.
2. Replace the air filter.
3. Change engine oil and oil filter.
4. For storage periods exceeding four months, empty the AdBlue®/DEF tank and fill it completely with new AdBlue®/DEF.
5. In case of storage periods exceeding four months you should renew the AdBlue®/DEF filter.
6. Check the coolant level.
7. Check the charge condition of the batteries, recharge if necessary. Check the battery fluid level before and after charging.
8. Connect the ground straps to the batteries.
9. Check the function of the electric system.
10. Check cables, hoses and lines for cracks and leaks.
11. Start the engine and run it for 15 to 30 minutes with idle speed.
12. While the engine is running keep an eye on the gauges for engine oil pressure and coolant temperature.
13. Check the oil levels.
14. Check the function of electric system, steering and brakes.
15. Clean the machine thoroughly.

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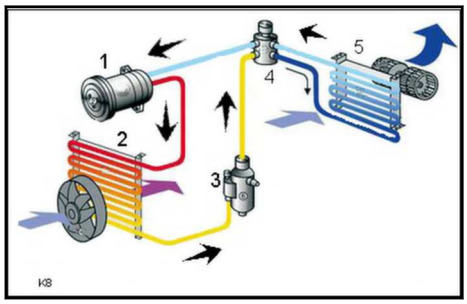


Fig. 415: Principle sketch of an air conditioning system

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.

6.5.7 Monitoring devices

Pressure switch, B105

The pressure switch (8) is used as monitoring feature for too high and too low pressures. The switching contacts (4 and 5) effect the magnetic clutch of the compressor via a relay (6).

If the system pressure increases excessively, e.g. because of a excessively soiled condenser, a failed fan or a defective expansion valve, the high pressure contact (5) will cut off the electric power supply to the magnetic clutch when the set pressure is reached. When the system pressure drops below the cut-off pressure by the set differential pressure, the magnetic clutch of the compressor is switched on again.

The low pressure contact (4) interrupts the electric power supply to the magnetic clutch when the set pressure is fallen short of (possible causes: lack of refrigerant, defective expansion valve, too low heat load, defective evaporator fan, ...). Since the refrigerant R134a has an evaporation temperature of 0 °C at an overpressure of 2 bar, the low pressure contact (4) is set to approx. 1.5 bar to avoid icing. The switch on pressure is 0.5 to 2 bar higher than the shut-off pressure (depending on system, see description of components).

Thermostat

A frost protection thermostat (3) protects the evaporator against icing. Similar to the pressure switch, the thermostat activates or deactivates the magnetic clutch for the compressor. Depending on the design, the feeler of the temperature control is mounted between the fins of the evaporator or attached to the evaporator outlet (suction side). With fixed temperature controls the control switches the compressor off at about 1 °C and back on again at about 2.5°C to 5.5 °C (depending on system, see description of components.)

With adjustable temperature regulators the switching point can be changed so that the compressor is already shut down at higher temperatures. This enables regulation of the air temperature.

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

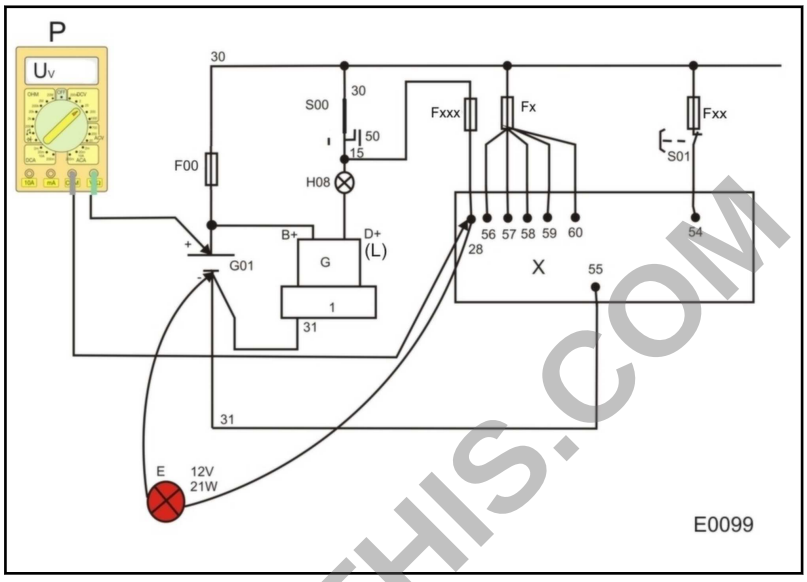


Fig. 477

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

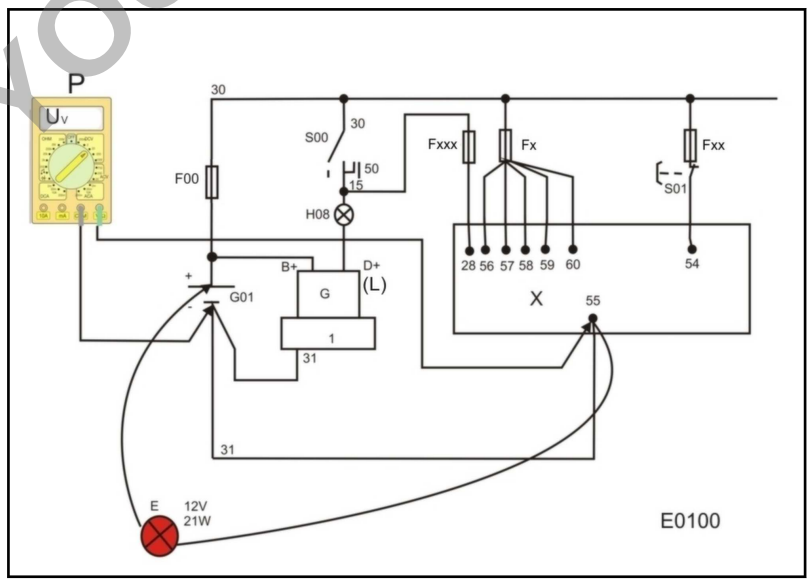


Fig. 478

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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Fault code ACM	Description of fault
F11004	DEF Temperature Sensor Circuit Failed Low
F20E00	Long term DEF consumption too high
F20E01	Long term DEF consumption too low
F31007	MU_DPF_FB_CTRL_ERR
F40E00	Short term DEF consumption too high
F40E01	Short term DEF consumption too low
F40E0F	MU_UCM_SC_CONSUM_SRH
F40E11	MU_UCM_SC_CONSUM_SRL
F80B07	High Idle Regeneration Not Complete
F80B0D	DPF System Parametrization Failure
F80B0E	Pressure drop accross the filter too low
FE0F1F	Improper DEF Quality
FF0EE	MU_DPF_RESERVE6

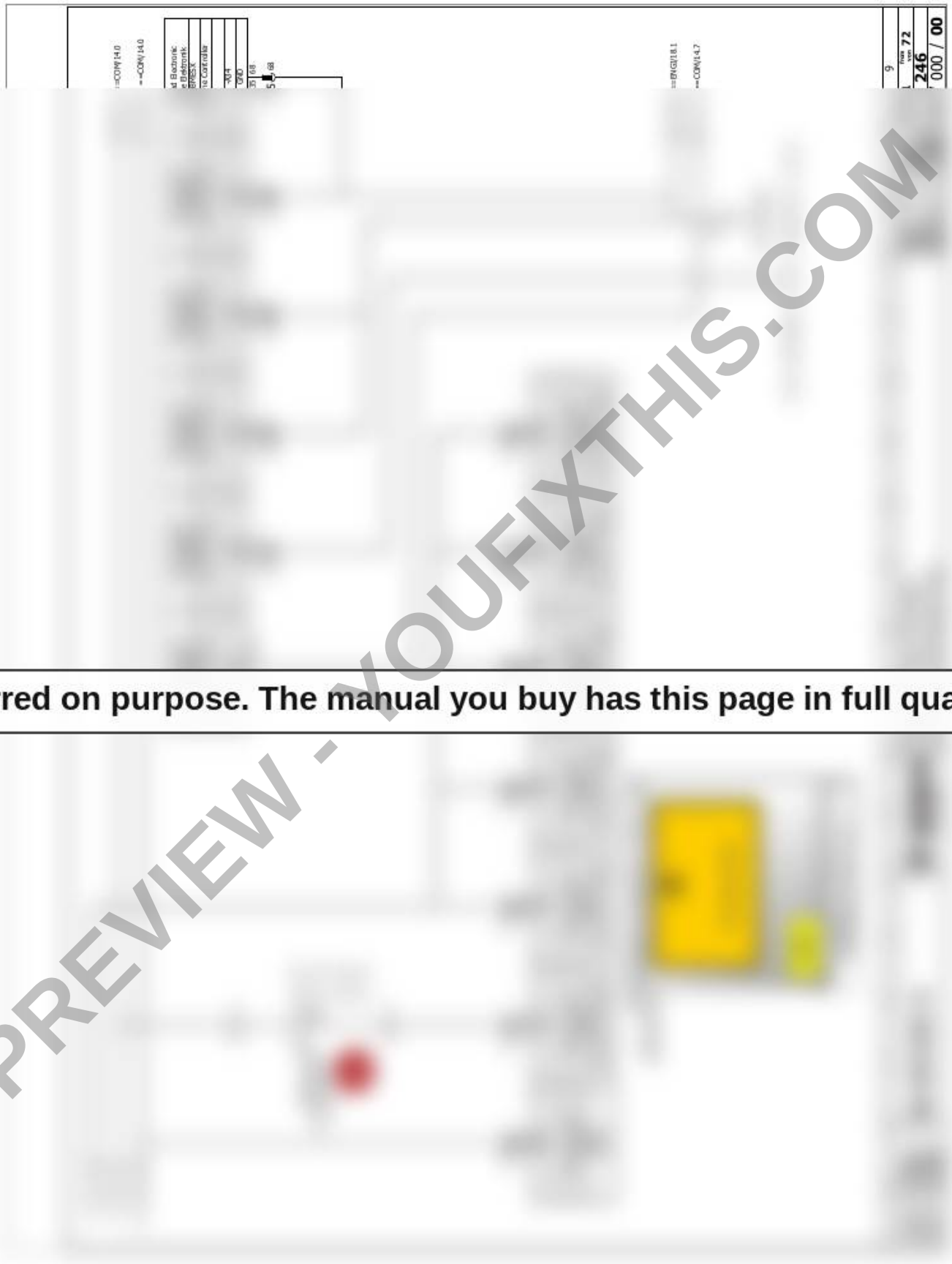
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Fault code	Description of fault	Remedy
091	External interference voltage	Disturbance of the control unit by interference voltage from the vehicle network. Possible cause: ■ Poor battery, battery charger → Rectify the interference voltage.
092	Control unit defective (ROM fault)	■ Replace the control unit.
094	Control unit defective (EEPROM fault)	■ Replace the control unit.
096	Internal temperature sensor defective	■ Replace the control unit or use an external temperature sensor.
097	Control unit defective	■ Replace the control unit.

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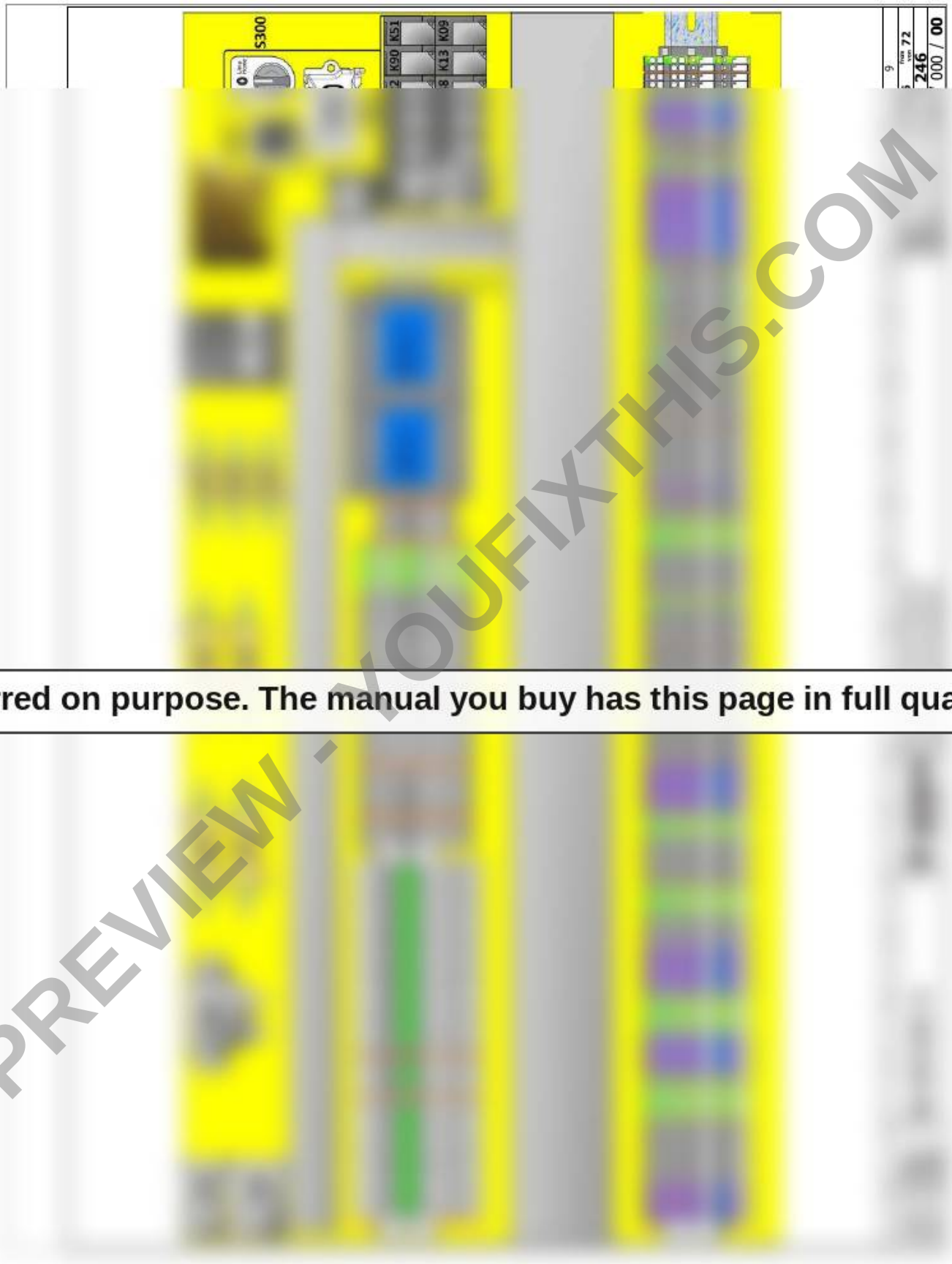


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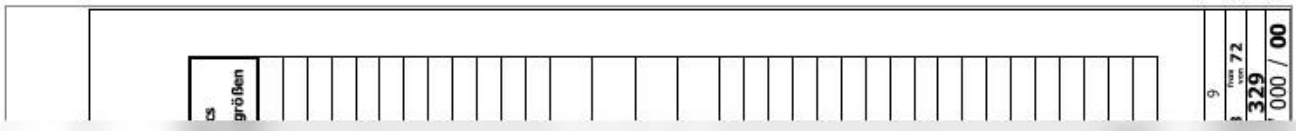
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