4.5 Maintenance table

No.	Maintenance work	Comment	every 10 operating hours, daily	every 500 oper. hours	every 1000 oper. hours	every 2000 oper. hours	every 4000 oper. hours	every 6000 oper. hours	as required
5.6	Check the engine oil level	Dipstick mark	X						
5.7	Check the fuel level	Instrument cluster	X						
5.8	Check the hydraulic oil level	Inspection glass	X						
5.9	Check the coolant level	Instrument cluster	X						
5.10	Check the oil level in the transfer case	Inspection glass	X						
5.11	Visual inspection of the machine for damage and leaks		X						
5.12	Lubricate joints and bearings on the bucket (RS).		X						
5.13	Change engine oil and oil filter cartridge*	min. 1x per year see foot note		X					
5.14	Check, clean the water separator	when the "water in fuel" warning light lights up		X					
5.15	Service the generator V-belt			X					
5.16	Service the V-belt for the air conditioning compressor			X					
5.17	Service the fan V-belt			X					
5.18	Service the battery, check the battery main switch	pole grease		X					
5.19	Check the engine mounts			X					
5.20	Service the air conditioning			X					
5.21	Clean radiator, intercooler and hydraulic oil cooler	also if the engine temperature or hydraulic oil temperature warning lights light up		X					
5.22	Check the fastening of the scrapers			X					
5.23	Check the oil level in the travel gear			X					
5.24	Check the central lubrication system, top up			X					

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Error code SERDIA	Component / Location	Description (Error location)	Defined for DCR	Defined for DMV	ID	Blink code	SPN	FMI	Self-curing[1]
11	Air filter condition	Pressure loss above target range with system reaction	●	●	AirFltSysReac	1-3-6	107	0, 11	●
12	Accelerator pedal	Cable break or short circuit, signal implausible compared to signal of idle sensor (analog pedal)	●	●	APP1	2-2-6	91	2, 3, 4, 11	
14	Accelerator pedal	Cable break or short circuit, bad PWM signal range or frequency (digital pedal)	●	●	APPPwm	2-2-2	91	2, 8	●
15	Accelerator pedal	Bad PWM pulse-width repetition rate (digital pedal)	●	●	APPPwmPer	2-2-2	91	8, 11	●
16	ECU internal error	Ambient pressure sensor defective	●	●	APSCD	2-9-2	108	2, 3, 4, 11	●
17	Air heater relay	Cable break or short circuit	●	●	ArHt1	2-6-3	729	3, 4, 5, 11	●
18	Air heater magnetic valve	Cable break or short circuit	●	●	ArHt2	2-6-3	730	3, 4, 5, 11	●
19	Air heater relay	Cable break or wrong connection	●	●	ArHtCD_NoLd	2-6-3	676	4, 11	
20	Air heater relay	Inoperable during shut-off	●	●	ArHtCD_RlyErr	2-6-3	676	2, 5, 11	
22	Battery	Voltage below target range	●	●	BattCD	3-1-8	168	0, 1, 11	●
23	Battery voltage	Above target range with system reaction	●	●	BattCDSysReac	3-1-8	168	2, 11	●
24	Begin of injection period	Outside target range or missing (cylinder 1)		●	BIPCyl1	5-3-1	523561	2	●
25	Begin of injection period	Outside target range or missing (cylinder 2)		●	BIPCyl2	5-3-2	523562	2	●
26	Begin of injection period	Outside target range or missing (cylinder 3)		●	BIPCyl3	5-3-3	523563	2	●
27	Begin of injection period	Outside target range or missing (cylinder 4)		●	BIPCyl4	5-3-4	523564	2	●
28	Begin of injection period	Outside target range or missing (cylinder 5)		●	BIPCyl5	5-3-5	523565	2	●
29	Begin of injection period	Outside target range or missing (cylinder 6)		●	BIPCyl6	5-3-6	523566	2	●
30	Begin of injection period	Outside target range or missing (cylinder 7)		●	BIPCyl7	5-3-7	523567	2	●
31	Begin of injection period	Outside target range or missing (cylinder 8)		●	BIPCyl8	5-3-8	523568	2	●
32	Charge air pressure sensor	Cable break or short circuit	●	●	BPSCD	2-2-3	102	2, 3, 4	●
33	Charge air pressure	Outside target range with system reaction	●	●	BPSCDSysReac	2-2-3	102	2, 11	●
37	Coolant level	Outside target range with system reaction	●	●	CLSCDSysReac	2-3-5	111	1, 11	
38	Single cylinder	Misfire detected (cylinder 1)	●	●	CmbChbMisfire1	2-4-1	1323	11, 12	
39	Single cylinder	Misfire detected (cylinder 2)	●	●	CmbChbMisfire2	2-4-1	1324	11, 12	
40	Single cylinder	Misfire detected (cylinder 3)	●	●	CmbChbMisfire3	2-4-1	1325	11, 12	
41	Single cylinder	Misfire detected (cylinder 4)	●	●	CmbChbMisfire4	2-4-1	1326	11, 12	
42	Single cylinder	Misfire detected (cylinder 5)	●	●	CmbChbMisfire5	2-4-1	1327	11, 12	
43	Single cylinder	Misfire detected (cylinder 6)	●	●	CmbChbMisfire6	2-4-1	1328	11, 12	
44	Single cylinder	Misfire detected (cylinder 7)		●	CmbChbMisfire7	2-4-1	1450	11, 12	
45	Single cylinder	Misfire detected (cylinder 8)		●	CmbChbMisfire8	2-4-1	1451	11, 12	
46	Multiple cylinders	Misfire detected	●	●	CmbChbMisfireMul	2-4-1	1322	11, 12	
47	Misfire	Misfire detected with system reaction	●		CmbChbSysReac	2-4-1	1346	0, 11	

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Fig. 17 The bucket makes the refuse compactor a universal tool

The refuse bucket developed in close cooperation with sanitary landfill site operators is perfectly suitable for distributing and levelling, but also for any loading tasks which may be necessary on a sanitary landfill site.

The BOMAG loading bucket is characterized by its extremely robust design, which makes sure that the refuse compactor will always reach its high pushing power. The low centre of gravity of the machine, combined with its excellent tractive characteristics, make the machine also suitable for use on slopes. The high bucket volume additionally enables economical distribution and loading of covering material and, also in this case, helps to reduce costs.

The bucket is equipped with a cutting edge as standard. On request the bucket can also be equipped with two-part teeth.

The refuse compactor tools

The degree of compaction of refuse is decisive for the utilization period of a sanitary landfill site. The high operating weight of a refuse compactor on its own does not guarantee high compaction output. The optimum can only be achieved in connection with a suitable wheel concept.

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5.3 Main battery switch

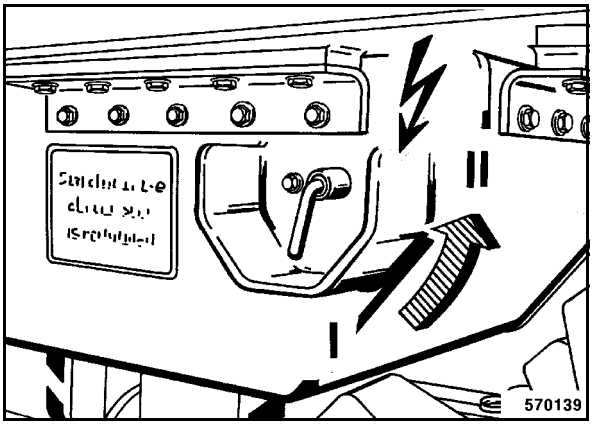


Fig. 32

No. 1 = Main battery switch

Position "I" = Normal position, operation

Position "II" = Separates batteries from the on-board electrics in case of cable fire and fire in the engine compartment as well as protection against unauthorized use.

⚠ Caution

In events of emergency do not use the main battery switch to shut down the engine. This will result in damage to engine and electronic engine control units.

Pull out the main battery switch at the earliest 40 seconds after switching off the ignition, except in cases of emergency.

With engine-independent air heating systems* allow the heating to run for another 2 minutes.

5.4 Main fuse

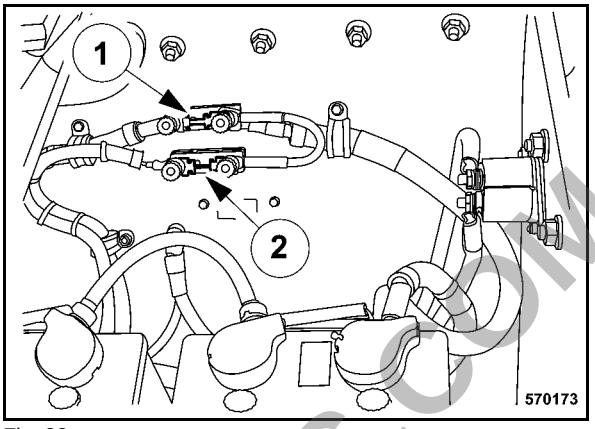


Fig. 33

Main fuses for battery

(1) 250A = (F00) main fuse for battery

(2) 80A = (F48) Main fuse for pre-heating system

i Note

The batteries with the main fuses are located inside the battery compartment under the cover in front of the driver's door.

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* Optional equipment

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Input travel direction switch

Fault code	Description of fault	Possible cause	Terminal on ESX	Inputcode for diag-nose	Fault reaction
0 2 1	The voltage applied to the input is below the specified range (see signal description).	☞ Wire breakage in current path ☞ Current path has short circuit to ground ☞ No supply voltage applied to switch ☞ Fuse FM 6 has tripped or wire breakage in supply voltage current path ☞ Switch defective	X0:32	0 2 1	6
0 2 2	The voltage applied to the input is above the specified range (see signal description).	☞ Current path has connection to +24 V / +8.5 V ☞ Switch not connected to ground ☞ Switch defective	X0:32	0 2 1	6
0 2 5	The voltage applied to the input is excessively fluctuating.	☞ Poor contact of plug-in connection (intermittent contact) in current path or in supply lines ☞ Switch defective	X0:32	0 2 1	6

Input code	Description of display function	Display values
2 5 0	**Arm rest (optional)** Shows position determined by position switch	0 0 0 ☞ Arm rest top position (joystick steering inactive) 0 0 1 ☞ Arm rest bottom position
2 5 1	**Limit switch steering left (only electronic end position damping)** Shows position determined by position switch	0 0 0 ☞ End position reached 0 0 1 ☞
2 5 2	**Limit switch steering right (only electronic end position damping)** Shows position determined by position switch	0 0 0 ☞ End position reached 0 0 1 ☞
2 5 5	**Arm rest switch left arm rest** Use (see "Use of arm rest switch" page 20)	0 0 0 ☞ Arm rest switch not used (not installed) 0 0 1 ☞ Arm rest switch function active
2 5 6	"Use of arm rest switch"	see setting instructions on page 20 and 79!
2 5 7	"Use of arm rest switch"	see setting instructions on page 20 and 79!
2 5 8	"Use of arm rest switch"	see setting instructions on page 20 and 79!

Input code	Description of display function	Display values
2 7 1	**Steering valve right** Shows specified current value of proportional solenoid left.	Display value = current in mA
2 7 2	**Steering valve right** Shows actual current value of proportional solenoid left.	Display value = current in mA
2 7 6	**Steering valve left** Shows specified current value of proportional solenoid right.	Display value = current in mA
2 7 7	**Steering valve left** Shows actual current value of proportional solenoid right.	Display value = current in mA

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referrenced ECU-Software
P490_: 220, 310, 501
P491_: 220, 310, 400, 501
P492_: 213
P513_: 214, 300

131 / 523500 / FrmMngTxTO

Error description CAN MESS. TIMEOUT
CAN message: the ECU detects a timeout for one or more posted message

Error codes
DEUTZ-Errorcode: 131
BlinkCode (short-long-short): 2 - 7 - 1
SPN: 523500
possible FMI:
12. Errormode not identifiable
12. Errormode not identifiable
12: Defective component
12. Errormode not identifiable

Errordetection
Errorlamp shows permanent light. Entry in errormemory.

Possible reason for error
Timeout for sent messages

Take actions for error repair

other error properties
System reaction:
Behaviour error lamp: permanent light
Selfhealing: yes
Signal Priority: 1
Measurement @ errortime: -

133 / 174 / FTSCD

Error description FUEL TEMP. SENSOR
Fuel temperature sensor: the voltage measured by ECU is out of the target range

Error codes
DEUTZ-Errorcode: 133
BlinkCode (short-long-short): 2 - 2 - 7
SPN: 174
possible FMI:
3: Voltage to high or short circuit to +Ubatt
4: Voltage to low or short circuit to -Ubatt
12. Errormode not identifiable
12. Errormode not identifiable

Errordetection
Errorlamp shows permanent light. Entry in errormemory.

Possible reason for error
Fuel temp. sensor: cable break or short circuit, sendor defective, connection cable demaged

Take actions for error repair
Check cabling, if sensor not working, check sensor and if necessary replace it, check connection cable and if necessary repair or replace it

other error properties
System reaction: Warning, substitute value
Behaviour error lamp: permanent light
Selfhealing: yes
Signal Priority: 4
Measurement @ errortime: default value

134 / 174 / FTSCDSysReac

Error description FUEL TEMP. SENSOR
Fuel temperature: the fuel temperature calculated by ECU is above the target range; the ECU activates a system reaction

Error codes
DEUTZ-Errorcode: 134
BlinkCode (short-long-short): 2 - 3 - 7
SPN: 174
possible FMI:
0: data valid, but above normal working area
0: data valid, but above normal working area
12. Errormode not identifiable
12. Errormode not identifiable

Errordetection
Errorlamp shows permanent light
oder
blinking. Entry in errormemory.

Possible reason for error
Above target range with system reaction, interruption of fuel loop (for example, rail pressure relief valve defective), sensor defective, connection cable demaged

Take actions for error repair
Check fuel system and if necessary repair it, check sensor and if necessary replace it, check connection cable and if necessary repair or replace it

other error properties
System reaction: Advice: FTSCD_stSysReacReq
Behaviour error lamp: permanent light
oder
blinking
Selfhealing: yes
Signal Priority: 4
Measurement @ errortime: actual value

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DTC-List
Diagnosis- and Errorcodes

referrenced ECU-Software
P490_: 220, 310, 501
P491_: 220, 310, 400, 501
P492_: 213
P513_: 214, 300

253 / 523657 / FrmMngRapeOilIn

Error description RAPEOILSYSTEM
CAN messageRapeOilIn (Rape oil input): the message can not be received by ECU

Error codes
DEUTZ-Errorcode: 253
BlinkCode (short-long-short): 5 - 6 - 1
SPN: 523657
possible FMI:
12: Defective component
12. Errormode not identifiable
12: Defective component
12. Errormode not identifiable

Errordetection
Errorlamp shows permanent light. Entry in errormemory.

Possible reason for error
CAN bus wrong cabled, wiring is demaged, receiver (sender of the message) work inaccurately, parametering inaccurate

Take actions for error repair
Check CAN Bus cabling (Bus sheduling, polarity, short circuit, power interrupt), test protocol of receiver, check CAN functional range

other error properties
System reaction: Warning, substitute values
Behaviour error lamp: permanent light
Selfhealing: yes
Signal Priority: 3
Measurement @ errortime: default value

254 / 523658 / FrmMngRapeOilLvl

Error description RAPEOILSYSTEM
Status RapeOilLvl (Rape oil tank level): the voltage of the sensor measured by ECU is out of the target range

Error codes
DEUTZ-Errorcode: 254
BlinkCode (short-long-short): 5 - 6 - 2
SPN: 523658
possible FMI:
3: Voltage to high or short circuit to +Ubatt
4: Voltage to low or short circuit to -Ubatt
12. Errormode not identifiable
12. Errormode not identifiable

Errordetection
Errorlamp shows permanent light. Entry in errormemory.

Possible reason for error
Cable break or short circuit, lamp defective, connection cable demaged

Take actions for error repair
Check cabling, if sensor not working, check sensor and if necessary replace it, check connection cable and if necessary repair or replace it

other error properties
System reaction: Warning, substitute value
Behaviour error lamp: permanent light
Selfhealing: yes
Signal Priority: 3
Measurement @ errortime: default value

255 / 523659 / FrmMngRapeOilVlv1

Error description RAPEOILSYSTEM
Status RapeOilVlv1 (Valve 1): the current drain measured by ECU is out of the target range or the maximum permissible temperature of the ECU component is exceeded

Error codes
DEUTZ-Errorcode: 255
BlinkCode (short-long-short): 5 - 6 - 3
SPN: 523659
possible FMI:
12. Errormode not identifiable
12. Errormode not identifiable
12: Defective component
12. Errormode not identifiable

Errordetection
Errorlamp shows permanent light. Entry in errormemory.

Possible reason for error
Cable break or short circuit, valve defective, connection cable demaged

Take actions for error repair
Check cabling, if valve not working, check valve and if necessary replace it, check connection cable and if necessary repair or replace it

other error properties
System reaction: Warning and switchover to Diesel operation mode
Behaviour error lamp: permanent light
Selfhealing: yes
Signal Priority: 3
Measurement @ errortime: default value

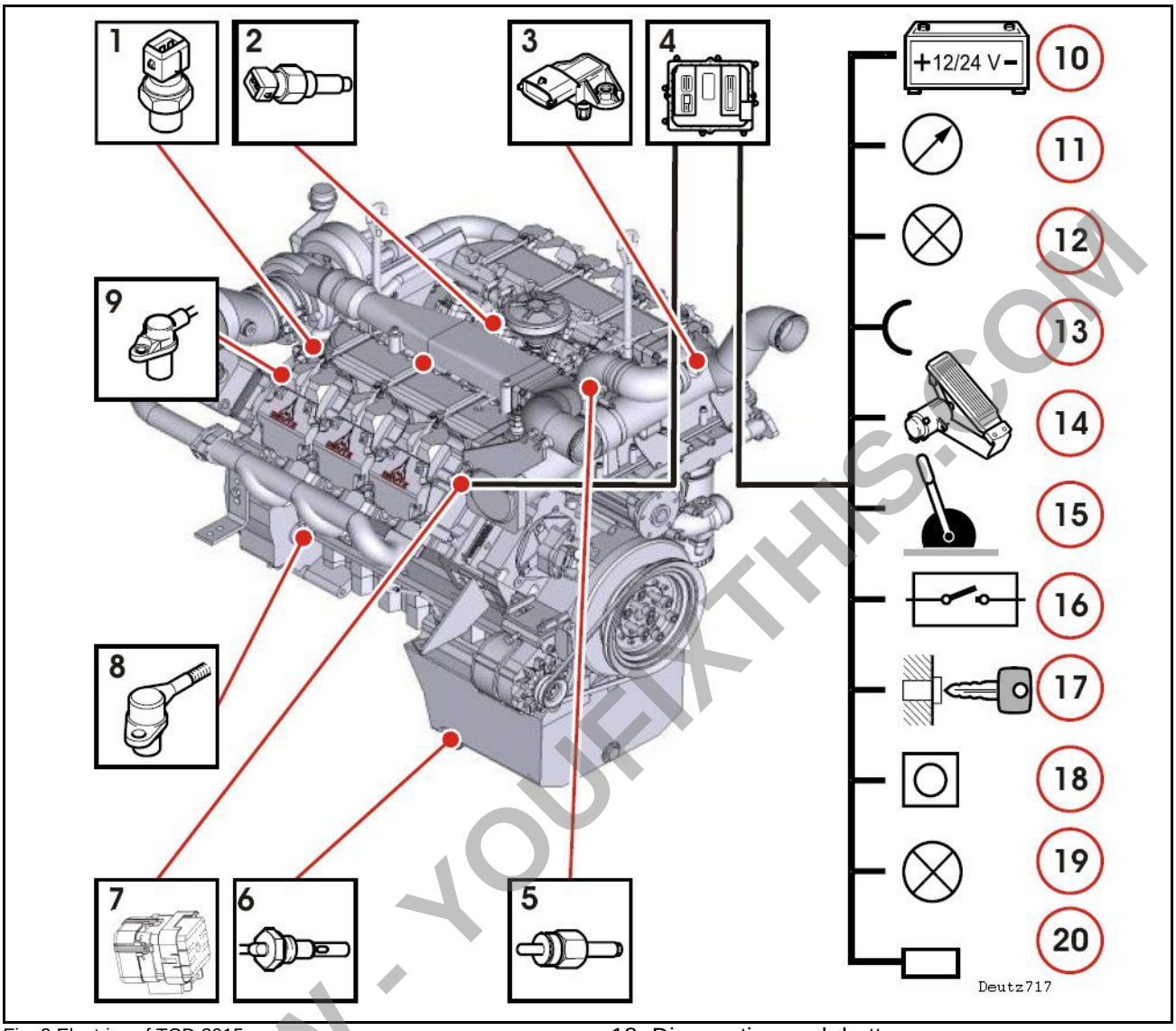


Fig. 2 Electrics of TCD 2015

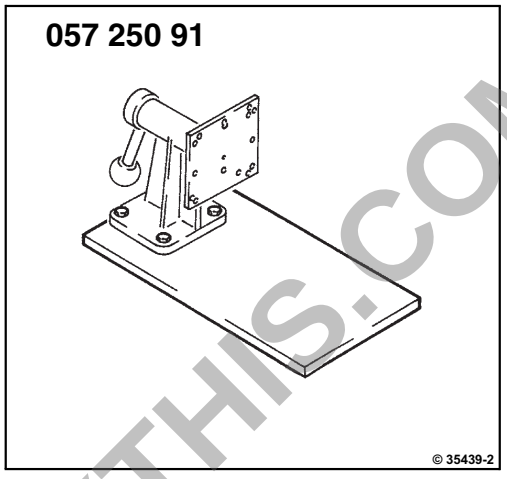
1 Oil pressure sensor
2 Fuel temperature sensor
3 Sensor for charge air temperature and charge air pressure
4 Engine control unit
5 Coolant temperature sensor
6 Oil level sensor
7 Central plug
8 Rotary speed sensor for crankshaft
9 Rotary speed sensor for camshaft
10 Power supply
11 Multi-function display
12 Outputs (configurable)
13 Inputs (configurable) (PWM/Digital/Analog)
14 Travel pedal
15 Manual throttle (optional)
16 Changeover function
17 Key switch Start/Stop
18 Diagnostics push button
19 Fault lamp with flashing code
20 Diagnostics interface/CAN-Bus

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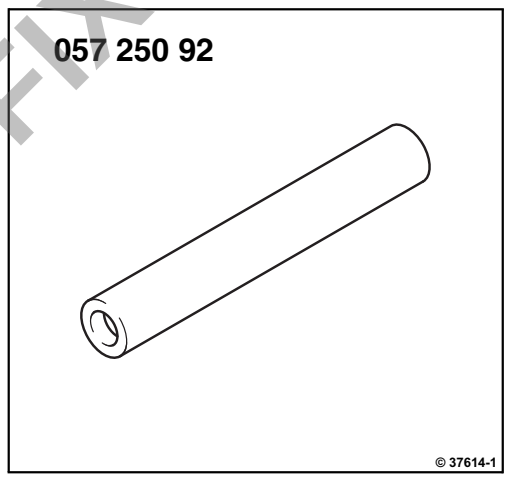
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Special tools TCD 2015

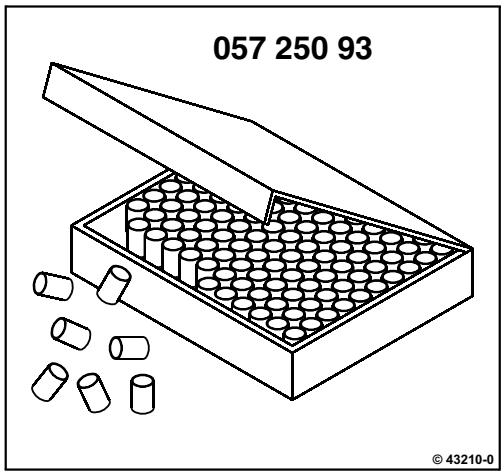
120910
Base plate
(in conjunction with support bracket 120900 if support bracket is not screwed tightly)



121410
Assembly tool
Assembling valve stem gasket



121420
Assembly sleeves
Set of assembly sleeves for valve stem gasket



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A	Work connection	R	Ventilation
B	Work connection	S	Suction
G	Pressure port for charge circuit	T_1	Tank
F_a	Charge pressure inlet	T_2	Tank
F_e	Charge pressure outlet	X_1 X_2	Port for control pressures, pressure in front of nozzle
M_A	Pressure test port, pressure A	X_3	Pilot pressure
M_B	Pressure test port, pressure B	X_4	Pilot pressure
M_H	High pressure measurement	Y_{ST}	Control pressure outlet
P_S	Control pressure inlet, constant throttle option	Y_{HT}	Control pressure outlet

Closed loop control

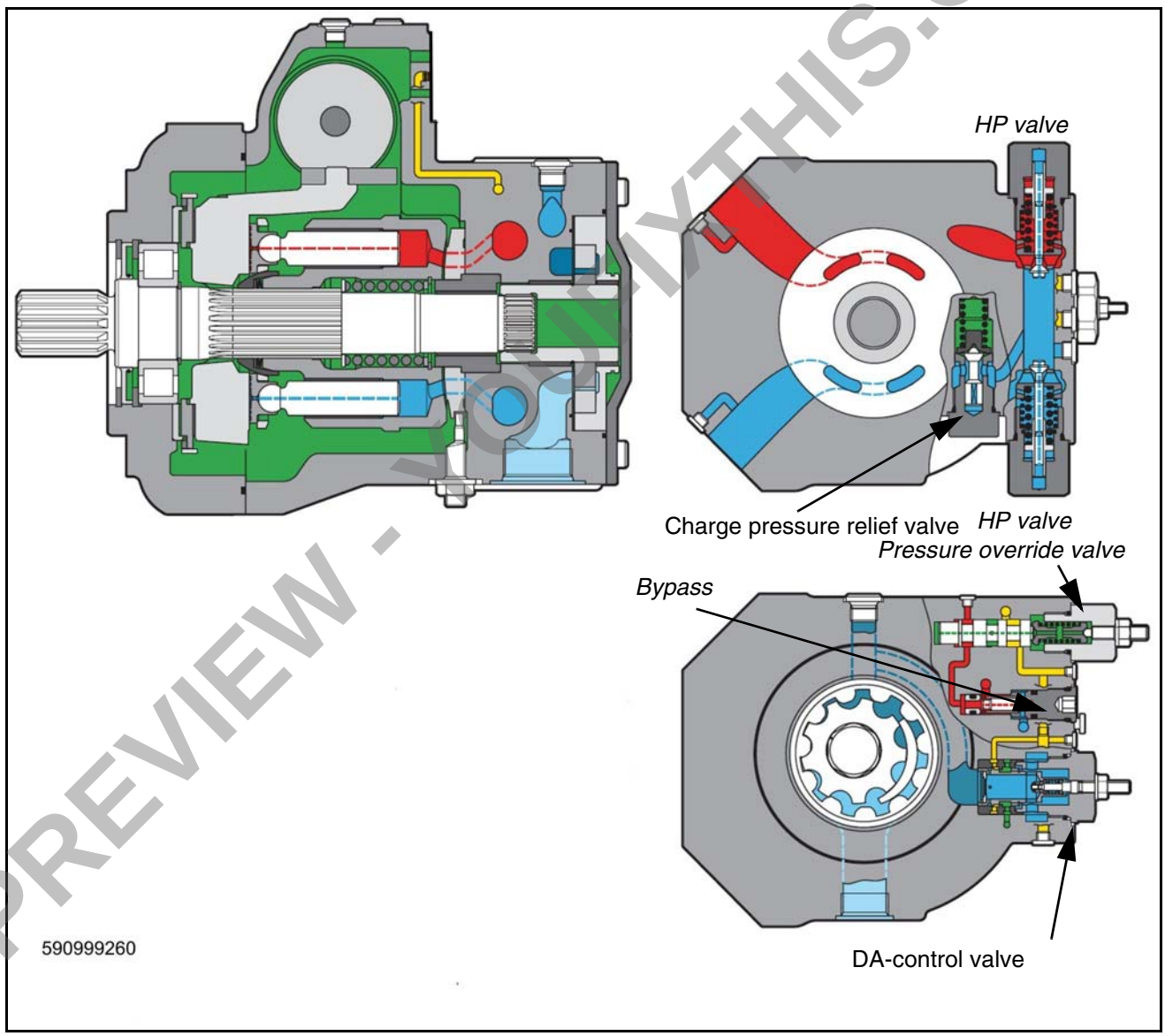


Fig. 16

With the direct controlled control (HT) the displacement of the pump is influenced by a hydraulic control pressure, which acts directly on the control piston via X_1 or X_2.

The flow direction depends on the pressure applied to the control pressure port.

The displacement of the pump is infinitely adjustable and proportional to the applied control pressure, but is influenced by the system pressure and the pump speed.

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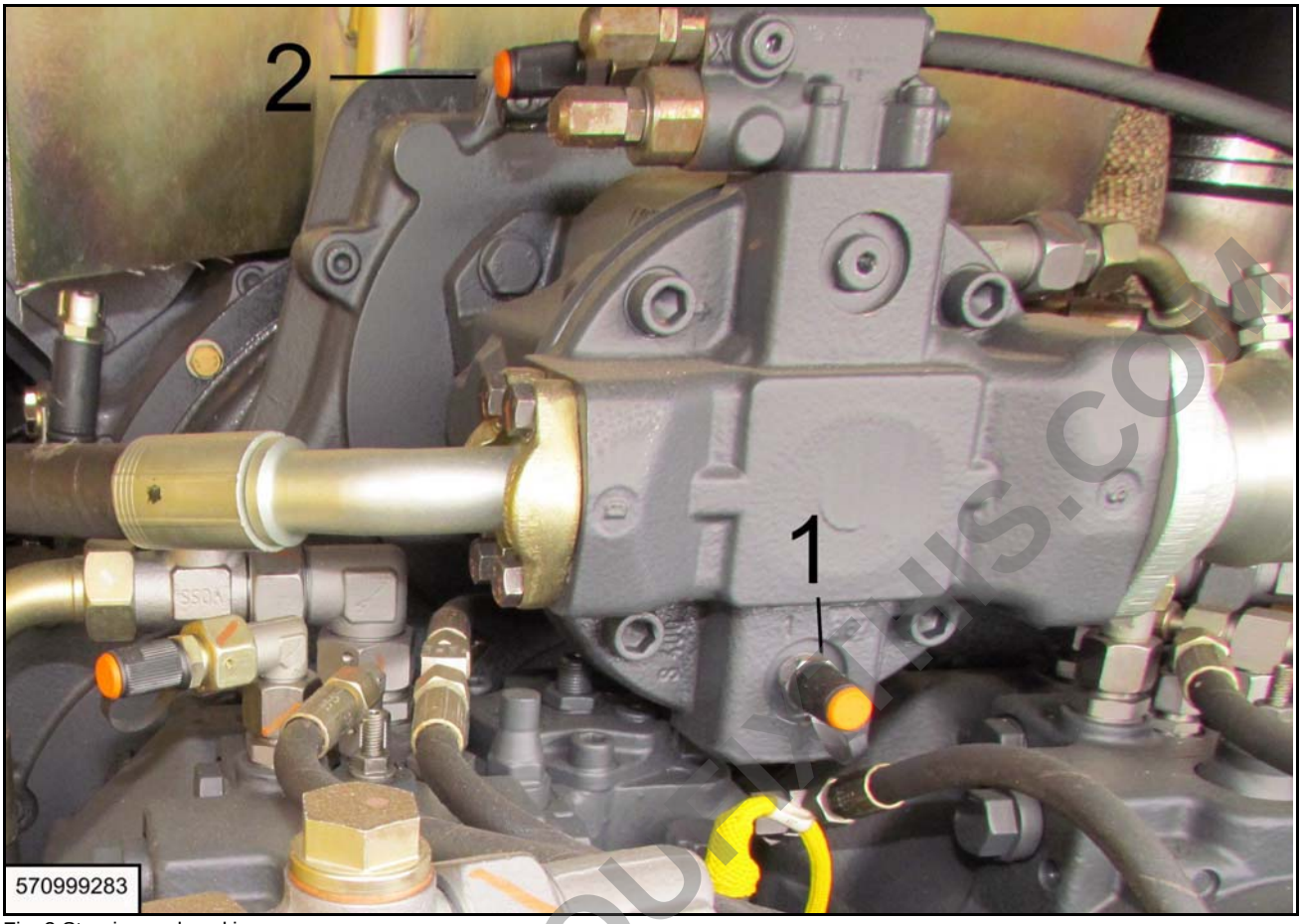


Fig. 3 Steering and working pump

1 Pressure test port working pressure M9, 230 + 10 bar

2 LS pressure working pump M8, 210 +10 bar

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Pressure and boiling point

The boiling point is the temperature at which fluid changes to gaseous state.

Changing the pressure above a fluid also changes the boiling point. It is a well known fact, that e.g. the lower the pressure applied to water, the lower the boiling point.

When looking at water, the following values do apply:

- Atmospheric pressure, boiling point 100°C
- Overpressure 0.4 bar, boiling point 126°C
- Vacuum -0.6 bar, boiling point 71°C

For an optimal exchange of heat, liquid refrigerants must have a low boiling point, so that they can absorb and dissipate heat quickly.

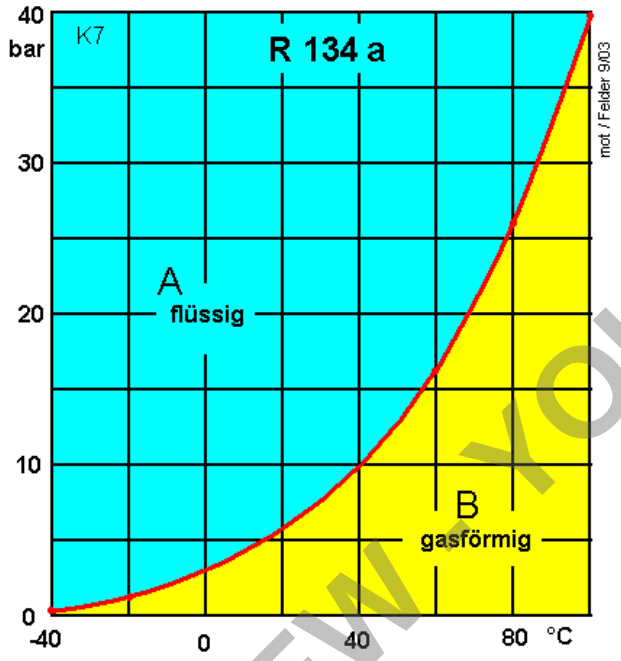


Fig. 3 Steam pressure curve

Steam pressure curve for refrigerant R134a

The steam pressure curve is a means for explaining the operation principle of an air conditioning system.

A- liquid

B- gaseous

The diagram shows the evaporation curve of R134a. The diagram for example shows, that R134a is liquid at 0°C and a pressure of 5 bar, but becomes gaseous at 40°C and 5 bar.

For better understanding one must also be aware of the following:

1. A gas heats up when being compressed (e.g. air pump, turbo charger, ...).

2. When relieving gas it will cool down (e.g. white frost forms on the valve when relieving air pressure from a car tire).

3. Condensing gas dissipates a lot of heat energy.

4. If a fluid evaporates it requires a lot of heat, i.e. the fluid thereby cools down the surrounding environment (e.g. alcohol on skin)

i Note

At absolute pressure 0 bar correspond with an absolute vacuum. The normal ambient pressure (overpressure) corresponds with 1 bar absolute pressure. On the scales of most pressure gauges 0 bar corresponds with an absolute pressure of 1 bar (indicated by the statement -1 bar below the 0).

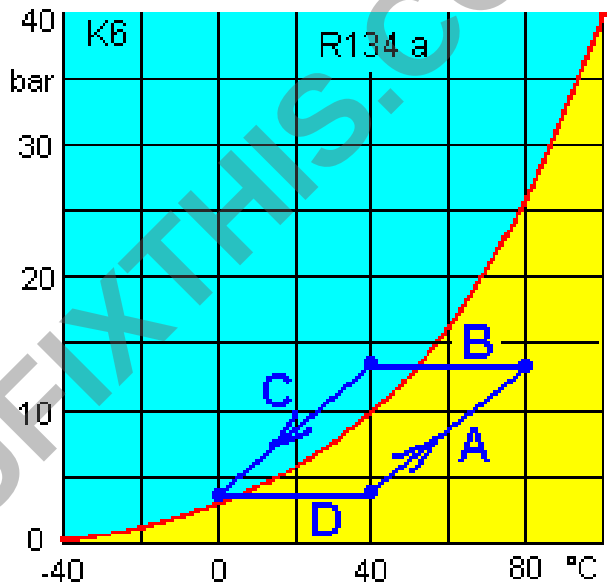


Fig. 4 Pressure - Temperature Diagram

In the pressure - temperature diagram for the refrigerant the drawn in closed curve shows the cycle of the refrigerant. This cycle permanently continues in direction of the arrow.

The characters A, B, C, D stand for:

A - compression

B- condensation

C- relaxation

D- evaporation.

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11.19 Trouble shooting, refrigerant circuit diagram

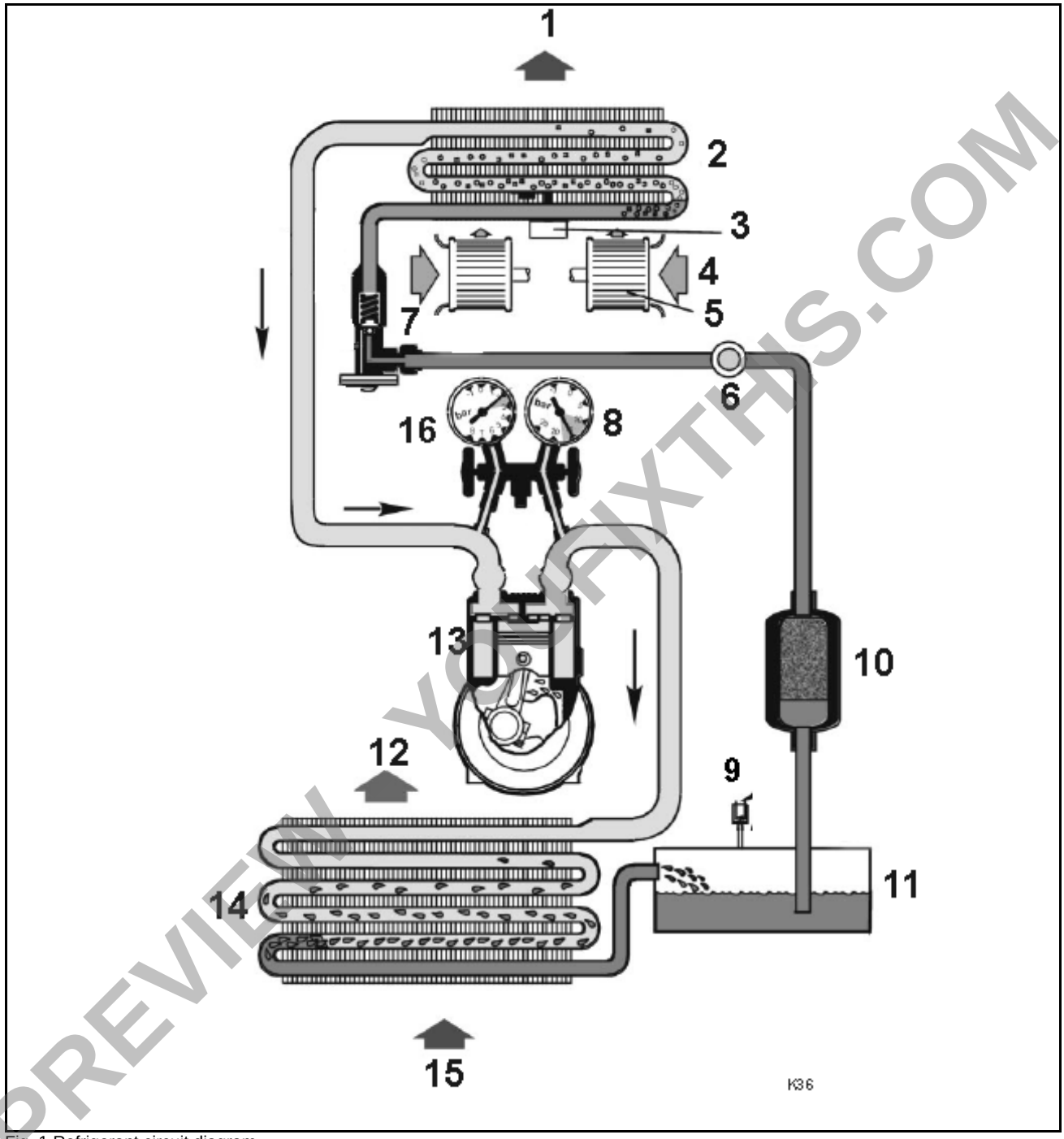


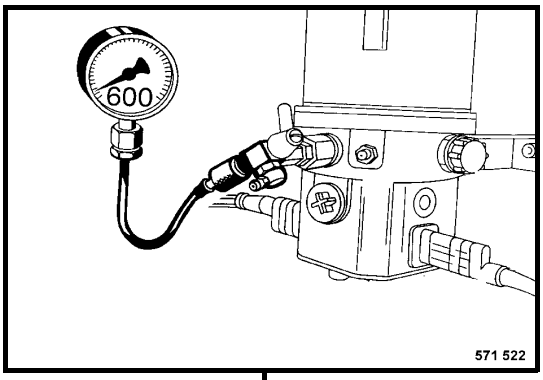
Fig. 1 Refrigerant circuit diagram

Pos.	Designation	Pos.	Designation
1	Cold air	9	Pressure switch with high and low pressure contacts
2	Evaporator	10	Dryer
3	Thermostat	11	Fluid container
4	Warm air	12	Hot air
5	Gebläse	13	Compressor
6	Inspection glass	14	Condenser
7	Expansion valve	15	Cooling air
8	Pressure gauge, high pressure	16	Pressure gauge, low pressure

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Central lubrication system not working (lubricant emerging from the relief valve)



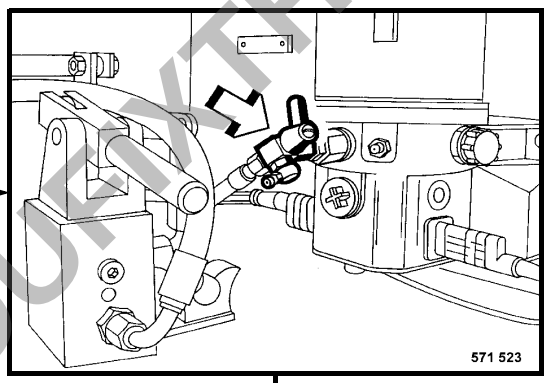
Check the grease pump

- Remove the lubrication hose
- Connect a 600 bar pressure gauge
- Close the lubrication hose with a plug
- Switch the pump on and press the push button several times

Nominal value:
Raise the pressure to approx. 350 bar, grease emerging from the relief valve

Pressure OK?

no



yes

Check the pressure relief valve

valve OK?

no

Replace the pressure relief valve

yes

Replace the lubrication pump

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16

O - Ring entfernen.

Remove the O - ring.



17

Lagerschalen herausheben.

Disassemble beaaring shells.



18

Kugellager Ab- und Auszieher (handelsüblich) für Kegelrollenlager - Außenring (antriebswellenseitig).

Use bearing puller to remove outer bearing race of front bearing.



19

Steuerplatte abheben.

Remove the control plate.



20

Kugellager Ab- und Auszieher (handelsüblich) des Kegelrollenlager - Außenringes (anschlußplattenseitig)

Use bearing puller to remove outer bearing race of rear bearing.

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4. Demontage • *4. Disassembly*




Bild /fig. 11

Entfernen Sie die Sicherungsringe Pos. 92 von den Planetenrädern Pos. 90. Entfernen Sie die Planetenräder Pos. 90 mit Hilfe einer Vorrichtung.

Remove snap rings item 92.Pull planet wheels item 90. Use fixture



Bild / fig. 12

Entfernen Sie den Sonnenradwelle Pos. 87.

Remove sun gear shaft item 87.



Bild / fig. 13

Heben Sie den Planetensteg Pos. 89 mit Sonnenrad Pos. 88 aus dem Getriebe.

Remove planet carrier item 89 with sun gear shaft item 88.



Bild / fig. 14

Heben Sie die komplette Planetenstufe (Pos. 54, 53, 55, 17) aus dem Getriebe.

Remove complete planet stage (item 54, 53, 55, 17).

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Achten Sie darauf, daß kein Schmutz oder Fremdkörper in das Getriebe gelangt.

Bauen Sie den Hydromotor an. Beachten Sie unbedingt die Angaben des Herstellers.

- **Achten Sie beim Anbau des Motors auf sorgfältige Abdichtung (O-Ring Pos. 22).**

Beachten Sie unbedingt die Sicherheitshinweise des Herstellers.

Entfernen Sie die Schutzstopfen vor dem Anschrauben der Hydraulikölleitungen.

Achten Sie darauf, daß kein Schmutz oder Fremdkörper in die Hydraulikanlage gelangen.

- **Schließen Sie den Hydromotor an.**

Beachten Sie unbedingt die Sicherheitshinweise des Herstellers.

- **Schließen Sie die Lamellenhaltebremse an.**

Die Lamellenhaltebremse ist eine Sicherheitseinrichtung des Getriebes.

- **Schließen Sie die Bremslüftleitung an. Entfernen Sie dafür den Schutzstopfen (Pos. 120).**

Achten Sie darauf, daß kein Schmutz oder Fremdkörper in den Bremslüftanschluß gelangt.

Sorgfältige Abdichtung des Bremslüftanschlusses beachten.

- **Es darf kein Staudruck in der Bremsleitung vorhanden sein.**

Überprüfen Sie noch einmal den ordnungsgemäßen Sitz und die Festigkeit aller Verbindungselemente.

Make sure that no dirt or foreign bodies are allowed to enter the gearbox.

Mount the hydraulic motor. Carefully observe the respective instructions given by the manufacturer.

- **When mounting the hydraulic motor make sure that it is properly sealed off (o-ring item 22).**

The preceding safety notes of customer must be carefully observed.

Remove the plugs before connecting the hydraulic oil lines.

Make sure that no dirt or foreign bodies are allowed to enter the hydraulic system.

- **Connect the hydraulic motor.**

The preceding safety notes of customer must be carefully observed.

- **Connect the multi-plate parking brake.**

The multi-plate parking brake is a safety device of the gearbox.

- **Connect the brake release line after removing the plug (item 120).**

Make sure that no dirt or foreign bodies are allowed to enter the brake release port.

Make sure that the brake release port is properly sealed.

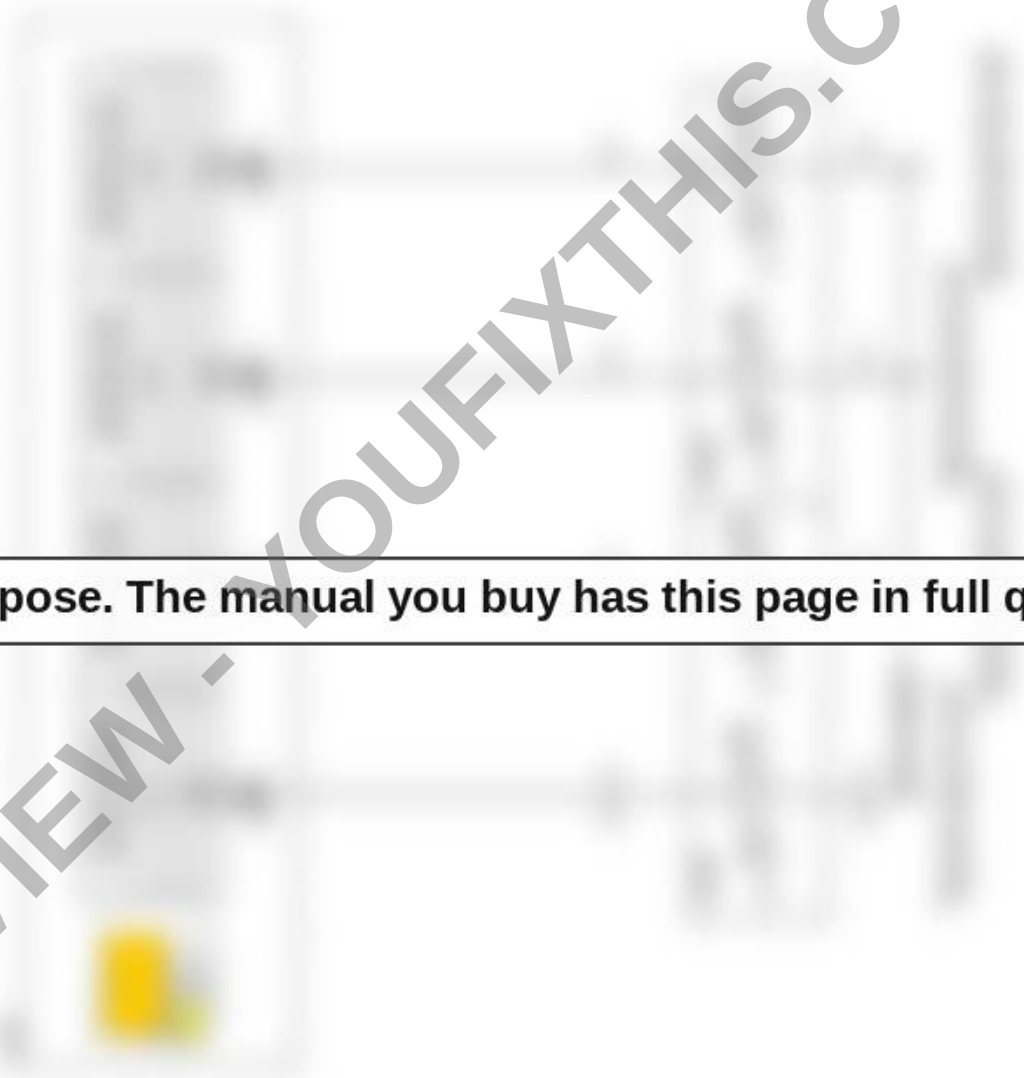
- **Back pressure is not allowed in the brake release line.**

Check once again tight fit of all joining elements.

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