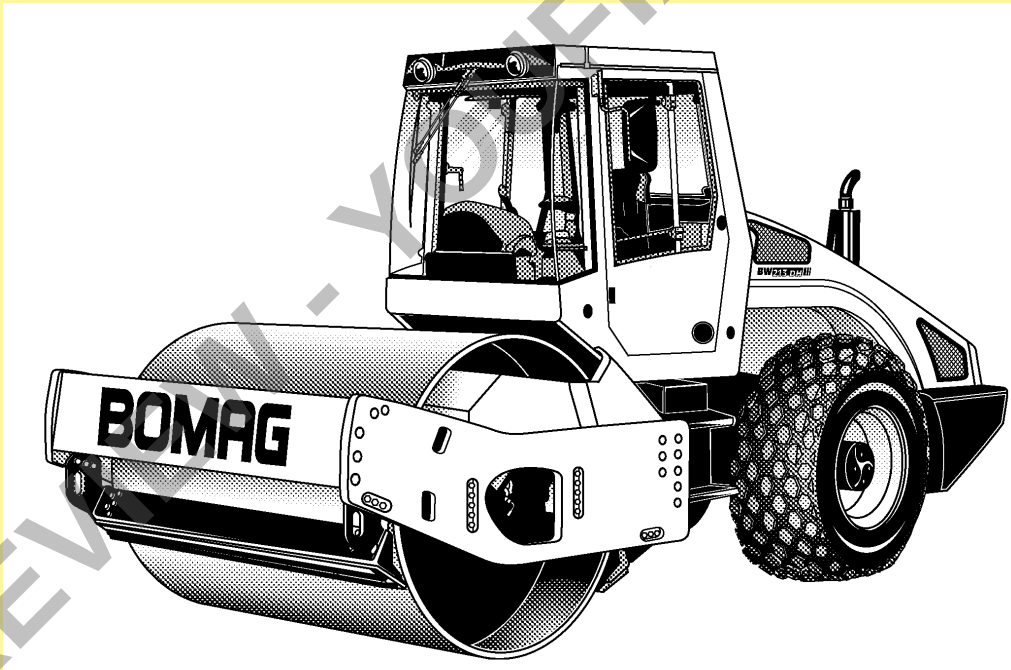
BOMAG

FAYAT GROUP

Service - Manual

BW 216 DHC-4 / BW 216 PDHC-4

S/N 101 583 21..... S/N 101 583 22 .....



Single drum roller

Catalogue number.
008 914 40

03/2010

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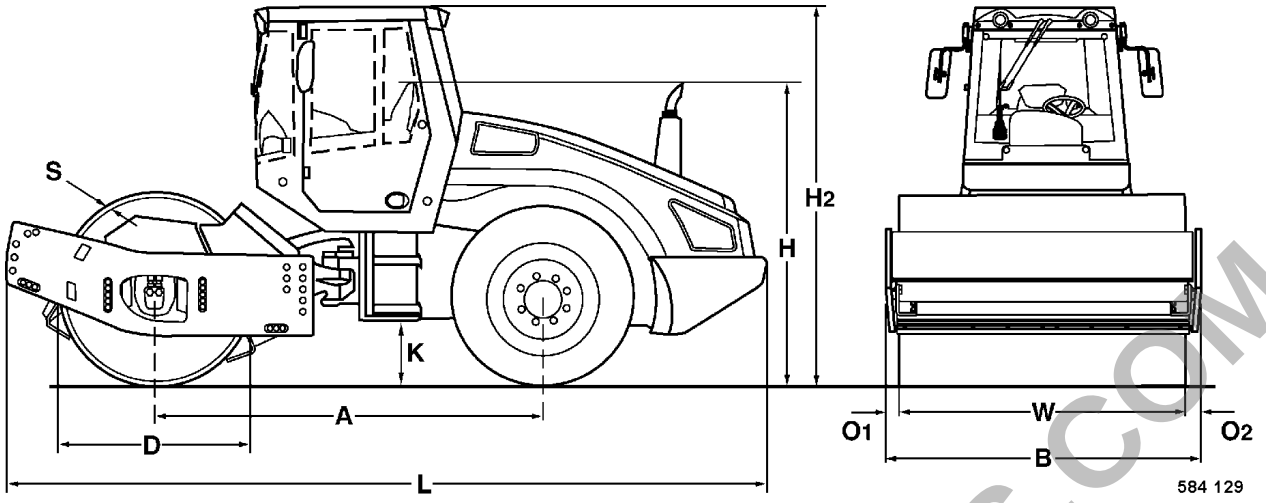


Fig. 13

Dimensions in mm	A	B	D	H	H2	K	L	O1	O2	S	W
BW 216 DHC-4	3110	2300	1500	2268	2970	490	6128	85	85	35	2130
BW 216 PDHC-4	3110	2300	1500	2268	2970	490	6128	85	85	25	2130

*		**BW 216 DHC-4**	**BW 216 PDHC-4**
Weights			
Operating weight (CECE) with ROPS and cabin	kg	16450	16850
Axle load, drum (CECE)	kg	11150	11550
Rear axle load (CECE)	kg	5300	5300
Static linear load	kg/cm	52,3	-
Travel characteristics			
Travel speed (1)	km/h	0 ... 3,5	0 ... 3,5
Travel speed (2)	km/h	0 ... 6,0	0 ... 6,0
Travel speed (4)	km/h	0 ... 12,0	0 ... 12,0
Max. gradability without/ with vibration (soil dependent)	%	58/55	60/58
Engine			
Engine manufacturer		Deutz	Deutz
Type		TCD 2013 L04 2V	TCD 2013 L04 2V
Cooling		Water	Water
Number of cylinders		4	4
Rated power DIN ISO 3046	kW	119	119
Rated speed	rpm	2200	2200
Fuel		Diesel	Diesel
Electrical equipment	V	12	12
Drive system		hydrostatic	hydrostatic
Driven axles		2	2
Permissible ambient temperatures	°C	-20 ... +50	-20 ... +50

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5.1 Special tools, tests and adjustments

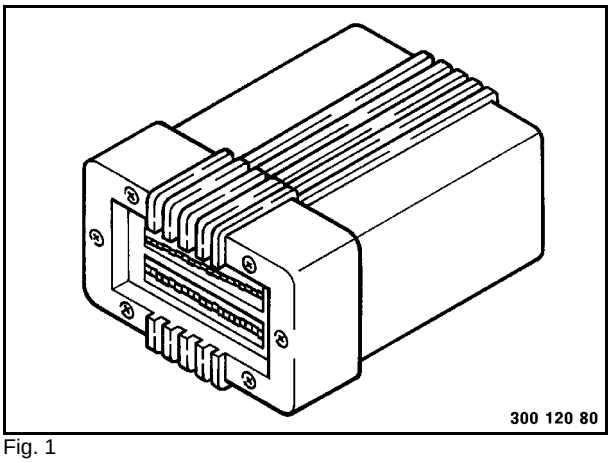


Fig. 1

1. Vibration reed frequency meter

   1000 - 4000 rpm

   17 - 67 Hz

   BOMAG part-no.: 300 120 80


Fig. 2

2. Sirometer (frequency meter)

   800 - 50.000 rpm

   14 - 750 Hz

   BOMAG part-no.: 059 710 02



Fig. 3

3. Anti-freeze tester, quick and accurate measuring, sturdy plastic housing, automatic temperature correction, no after-dripping, instructions for use on unit, reading down to -40 °C. Material: Plastic, Temperature range: down to -40 °C

   BOMAG part-no.: 050 100 75

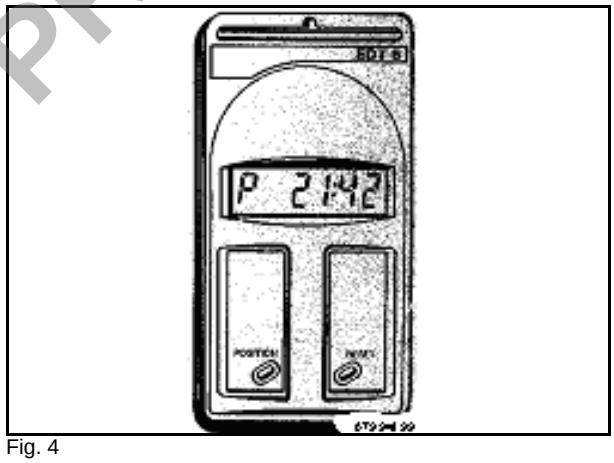


Fig. 4

4. Digital rpm-meter for petrol engines

   BOMAG part-no.: 079 948 99

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6.1 Special tools for flushing

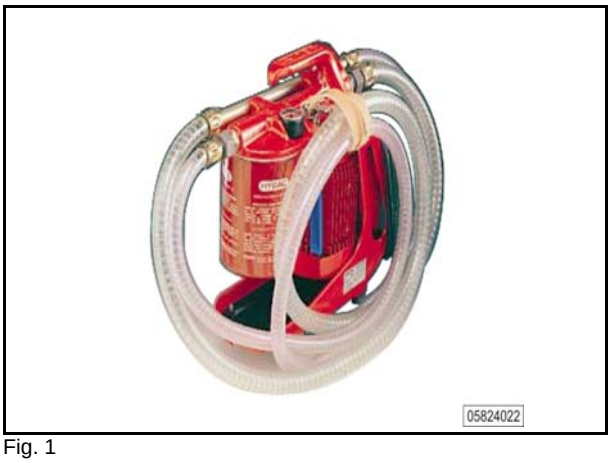


Fig. 1

1. Filling and filtering unit

   BOMAG part-no.: 058 240 22

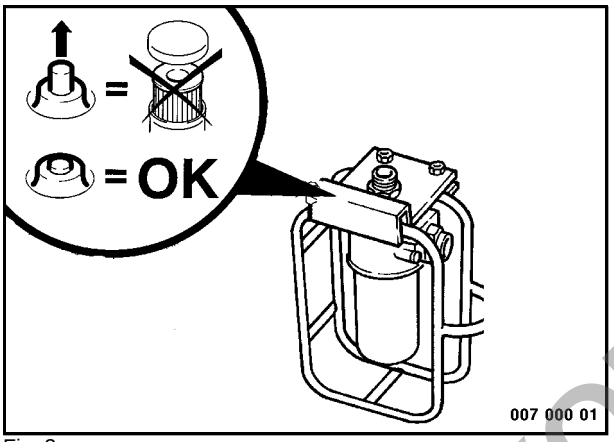


Fig. 2

2. Flushing filter (S connection)

   BOMAG part-no.: 007 000 01

3. Filter element 1µ

   BOMAG part-no.: 079 930 52

4. Flushing hose 20S - 25S (2 pieces)

   BOMAG part-no.: 055 509 19

5. Screw socket R1“ - 25S (2 pieces)

   BOMAG part-no.: 055 400 52

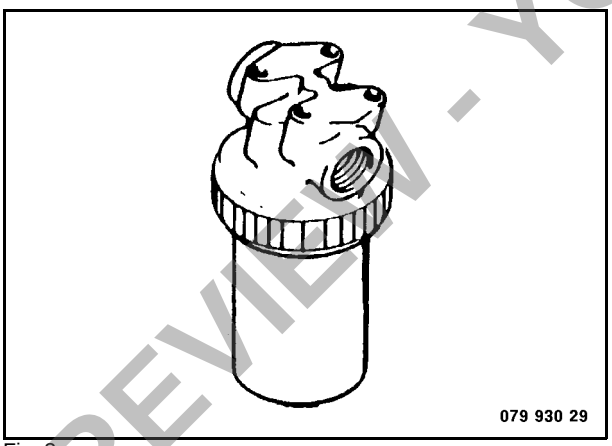


Fig. 3

6. Flushing filter (L connection)

   BOMAG part-no.: 079 390 29

7. Filter element

   BOMAG part-no.: 079 390 14

8. Flushing hose 15L (2 pieces)

   BOMAG part-no.: 055 510 09

9. Screw socket R3/4“ -- 15L (2 pieces)

   BOMAG part-no.: 055 400 89

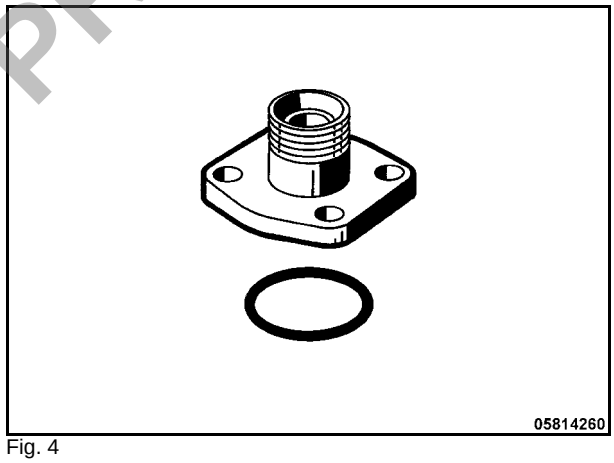


Fig. 4

10. SAE-flange 1“ - 20S

    BOMAG part-no.: 058 142 60

11. O-ring

    BOMAG part-no. 062 203 30

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7.1 Understanding circuit diagrams

Wiring diagrams are graphical representations of circuitry conditions, related to the electrical system. They do not contain any information about the actual type of wiring, they only serve the purpose of visualizing the circuitry logics.

The wiring diagram is indispensable for effective and systematic trouble shooting in the vehicle wiring system. This plan provides the following information:

- Number and type of individual elements in the examined electric circuit, such as plug connectors, fuses, switches, consumers, relays, ...
- The sequence in which current flows through the individual elements in the electric circuit.
- Connections between the examined, faulty electric circuit and other circuits in the vehicle wiring system.
- Pin assignment of plug-and-socket connections.

Structure

- Table of contents (Fig. 6)
- Function groups (Fig. 7)
- List of components (Fig. 9)

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8.1 Assembling the dust protection



Fig. 1

1. Unscrew the fastening screws for the control panel (Fig. 1).



Fig. 2

2. Lift the control panel up (Fig. 2) and.....



Fig. 3

3. ..... carefully pull the wiring loom out of the instrument carrier (Fig. 3).



Fig. 4

4. Pull the dust protection bag over the control panel (Fig. 4), ...

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9.1 EMR3 system components

Engine control unit

⚠ Caution

It is strictly prohibited to interchange control units from one production series or against another engine serial number. The warranty will in this case become null and void.

Sensors and actuators must not be connected to external power sources for testing, but must solely be operated in combination with the EMR3. Otherwise components may be permanently damaged.

Disconnecting the control unit plug connectors with the control unit switched on (i.e. with power supply to terminal 15), is not permitted. Correct procedure: Switch off the electric power supply (normally with the ignition switch), wait until the main relay has switched off (delayed by up to 15 s, listen for clicking sound), disconnect the plugs from the control unit.

The engine control unit is the central component of the EMR3-system. It has the function to assure optimal engine performance with the objectives

- good exhaust characteristic,
- low fuel consumption,
- smooth running of engine,
- long lifetime of engine,
- efficient service

. For this purpose the engine control unit runs a number of calculations using the detected measuring values and the parameters saved in the database, which for the basis for all functions provided. The most important functions include:

- exact control of injection process (among others the number, start and duration of injection processes),
- idle speed control,
- control of the exhaust gas recirculation quantity,
- optimization of smooth running (by means of correcting the injection quantity),
- engine monitoring,
- system diagnose.

Replacing the control unit

Each control unit is clearly designated to the engine, in accordance with the respective application. In case of a replacement the control unit therefore needs to be completed with the engine specific data set. When ordering a new control unit you must not only specify the part-number, but also the engine serial number (see sticker on EMR-control unit).

i Note

The Deutz part-number specified on the EMR-control unit is the part number without software specific for the engine. The correct part number can be found in the spare parts catalogue.

Replacing the EMR or DCR components

- On TCD-engines with Common Rail technology the system pressure is so high, that in case of leaks or repair all parts need to be replaced. When replacing sensors or other electric components, the new parts must be calibrated with the EMR control unit. This calibration must be performed with SERDIA (Level IIIa). (see also SERDIA manual).
- Any other EMR components (sensors etc) must under no circumstances be repaired, but must be replaced if they are defective.

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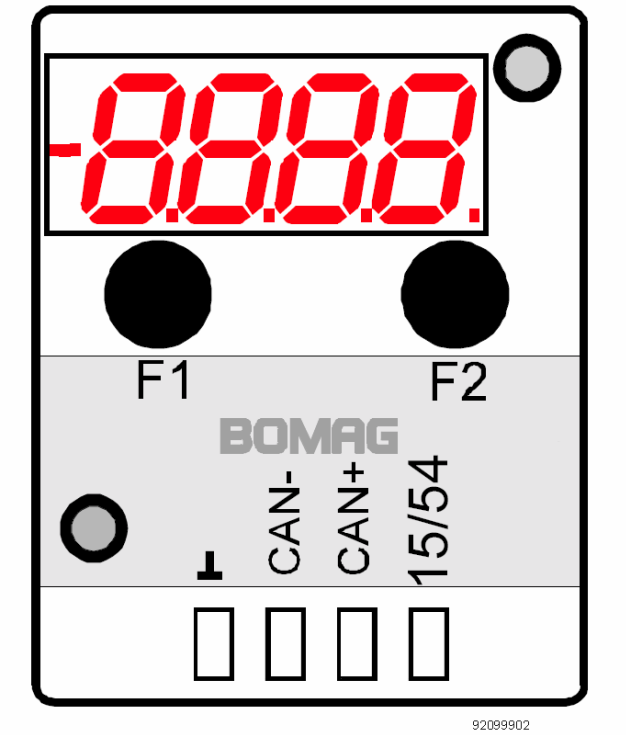


Bild 8

i Hinweis

The documentation "Service Training Electrics MESX" contains also the documentation BEM (BOMAG Evib-meter).

The BOP (BOMAG Operation Panel) is only installed in connection with BVC machines, BEM-machines are equipped wit display module. The display module is used for the output of fault codes and display values, as well as for the input of code numbers.

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11.1 Speedometer module

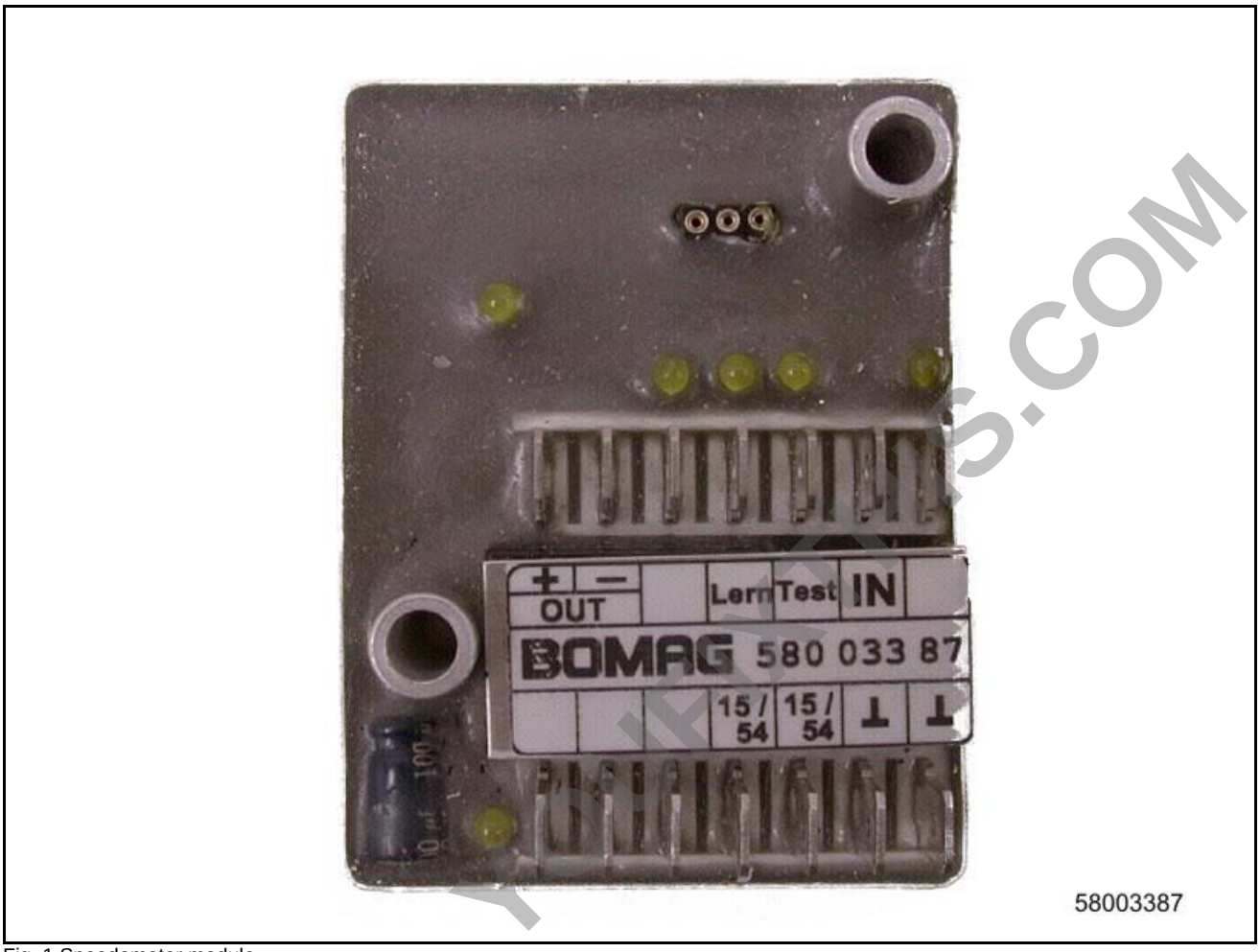


Fig. 1 Speedometer module

Description of function

With the programmable module BM UPM the software realizes a speedometer function. To ensure that the tachometer function is not only realized for one special roller, there is a possibility to adapt the module to any machine with the help of a self-teaching mode.

- Whenever the module is switched on the system runs a self-test by passing through the entire display range in both directions. The display self-test takes approx. 15 seconds.
- After this the module changes to measuring mode. The frequency of the travel pulses of the roller is detected and converted to a proportional output voltage that triggers the display.
- The output signal for the display is a PWM-signal.

Manual testing of the speedometer

When the module is in learning mode a manual display test can be performed via the input "Test". For this purpose the input "IN" must be energized with 12 Volt, whereupon the speedometer is constantly triggered with 3 Volt.

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BOMAG

Service Training Hydr.



Single Drum Roller

DHC- 4

BW 216 DHC-4

Teile-Nr. 008 xxx xx

07/2007

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13.1 Diesel engine

Series 4 single drum rollers are powered by 4 or 6 cylinder Deutz diesel engines type TCD 2013 or a 6-cylinder engine TCD 2012.

The engines are water cooled in-line engines with EMR3 electronics.

The engines are mainly designed in two-valve technology with turbo charging and intercooler. They are highly compact and come with a Deutz-Common-Rail injection system, called DCR in short.

All engines are designed with exhaust gas recirculation and thus reach emission values complying with EPA/ COM/ Tier/ stage lll

The engines are characterized by the following positive features:

- compact design
- low noise level
- almost vibration free operation
- low fuel consumption
- low exhaust emission EPA/COM III
- high power density
- excellent access to all service locations.
- high reliability
- low running costs,
- long lifetime

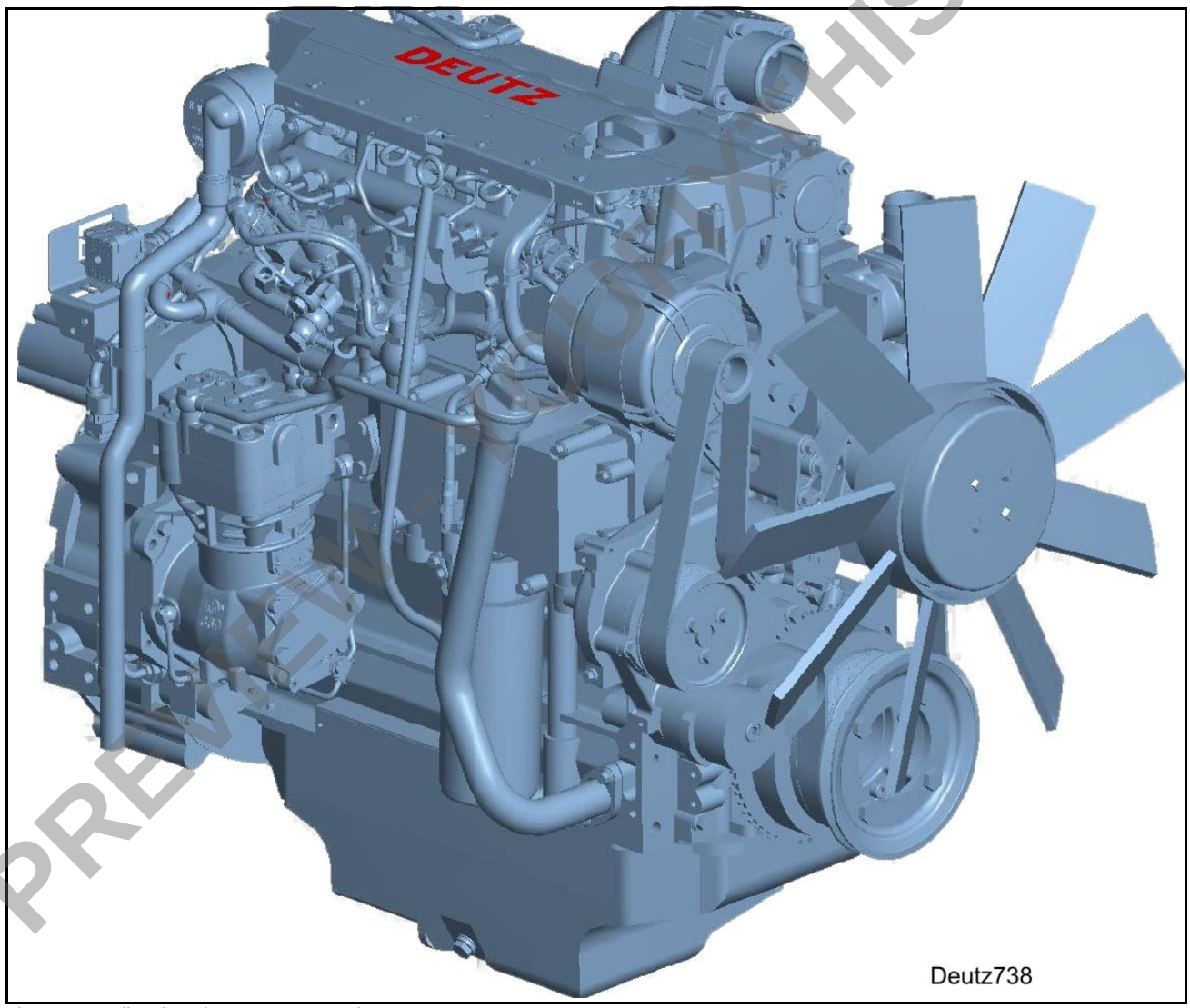


Fig. 1 Deutz diesel engine TCD 2012 and 2013

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14.1 Physical basics

In order to understand the working principle of an air conditioning system one must first become familiar with the physical basics of such a system.

The four well known physical conditions of water apply also for the refrigerant in the air conditioning system.

1. gaseous (invisible)

2. vaporous

3. liquid

4. solid

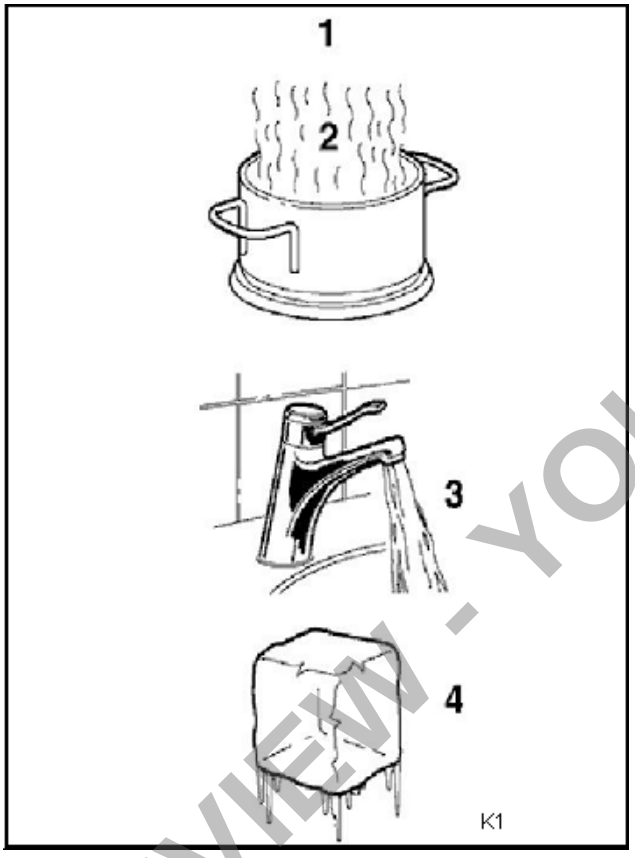


Fig. 1

If the water in a container is heated up (absorption of heat), the rising steam is visible. If the steam is heated up further, due to the absorption of heat, the visible steam will turn into invisible gas. This process is reversible. When withdrawing the heat contained in gaseous water, the gas will turn into steam, then into water and finally into ice.

A - heat absorption

B- Heat dissipation

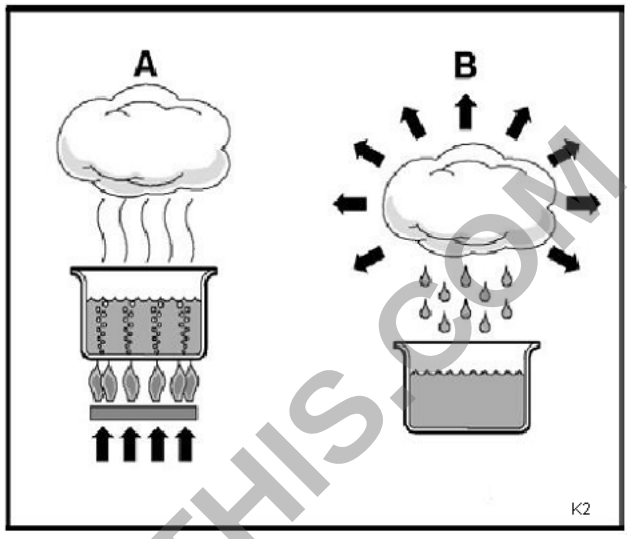


Fig. 2

Heat always flows from the warmer to the colder matter. Any matter consists of a mass of moving molecules. The rapidly moving molecules or a warmer matter dissipate part of their energy to the slower moving molecules with less heat. The movement of the molecules in the warmer matter becomes slower and the molecules in the cooler matter are accelerated. This process continued, until all molecules in the two matters move with identical speed. The matters have then reached an identical temperature and the transfer of heat stops.

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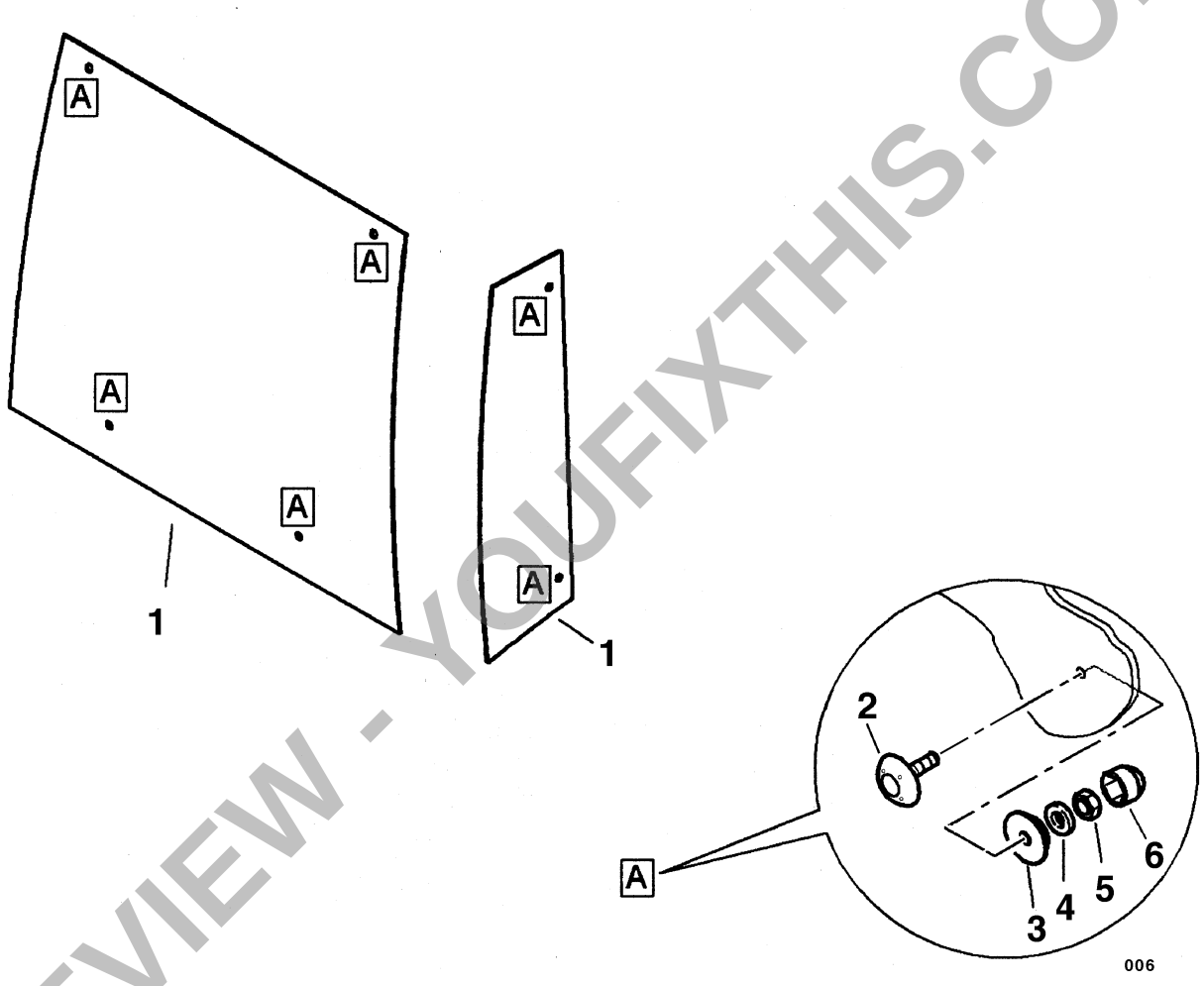


Fig. 1

1 Glass panes
2 Fastening element
3 Fixing washer and spacer
4 Washer
5 Hexagon nut, self locking
6 Protective cap

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16.1 Special tools, drum, single drum rollers

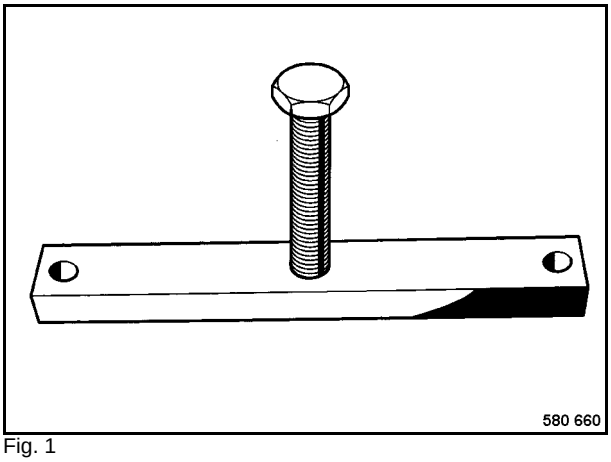


Fig. 1

1. Disassembly device for side plate

   BOMAG part-no.: 007 211 55

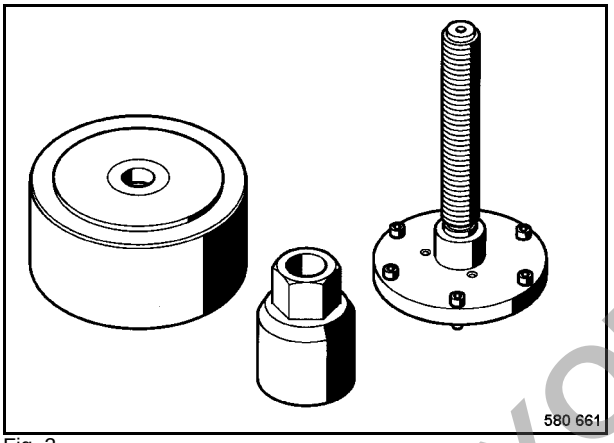


Fig. 2

2. Assembly device for side plate

   BOMAG part-no.: 971 079 21

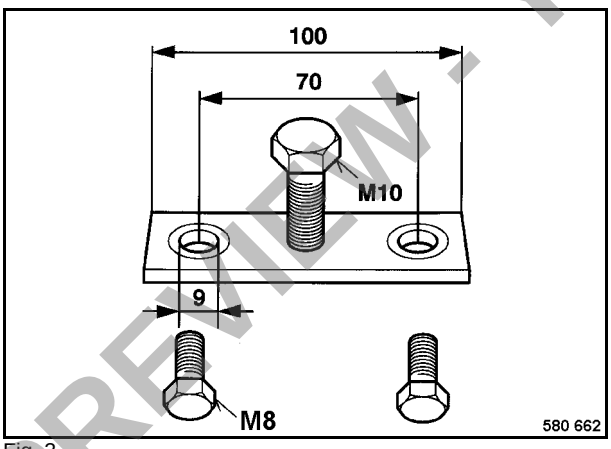


Fig. 3

3. Assembly device for coupling hub and flanged hub

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17.1 Special tools

1. Pressing mandrel for rocker bearings

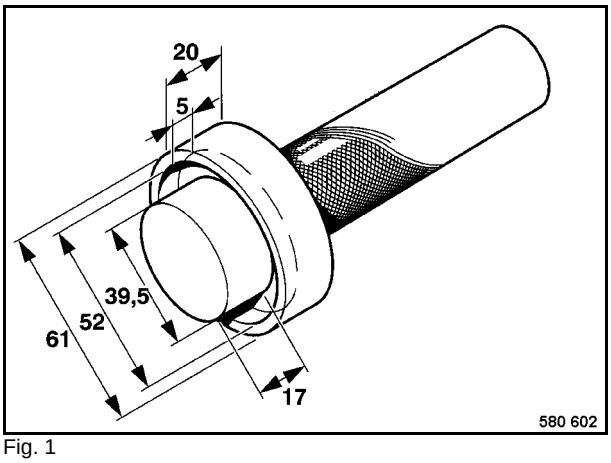


Fig. 1

2. Pressing sleeve for outer race of rocker bearing

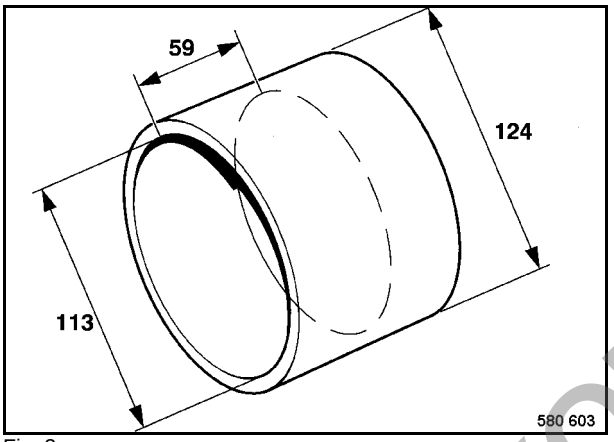


Fig. 2

3. Pressing sleeve for inner race of rocker bearing

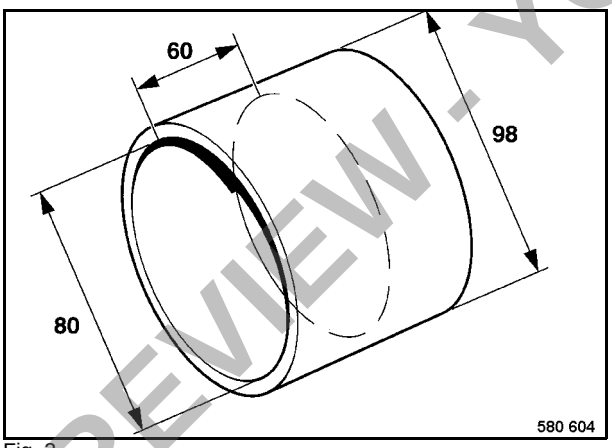


Fig. 3

4. Guide journal

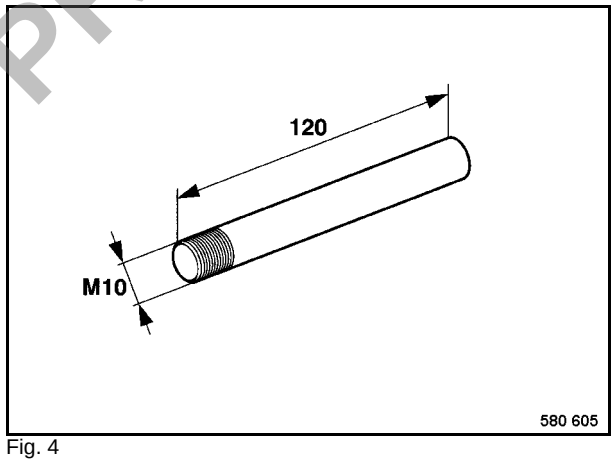


Fig. 4

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SAUER DANFOSS

Genuine Parts

Series 90 Pumps

Service Manual







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Genuine Parts

HISTORY OF REVISIONS

Table of Revisions

Date	Page	Changed	Rev.
April 2008	70	Torque for G45, G50, G52, G54, B70, B72, B82, B83 changed to 40 Nm [30 lbf•ft]	AB
September 2007	-	First printing - replaces BLN-9947	AA

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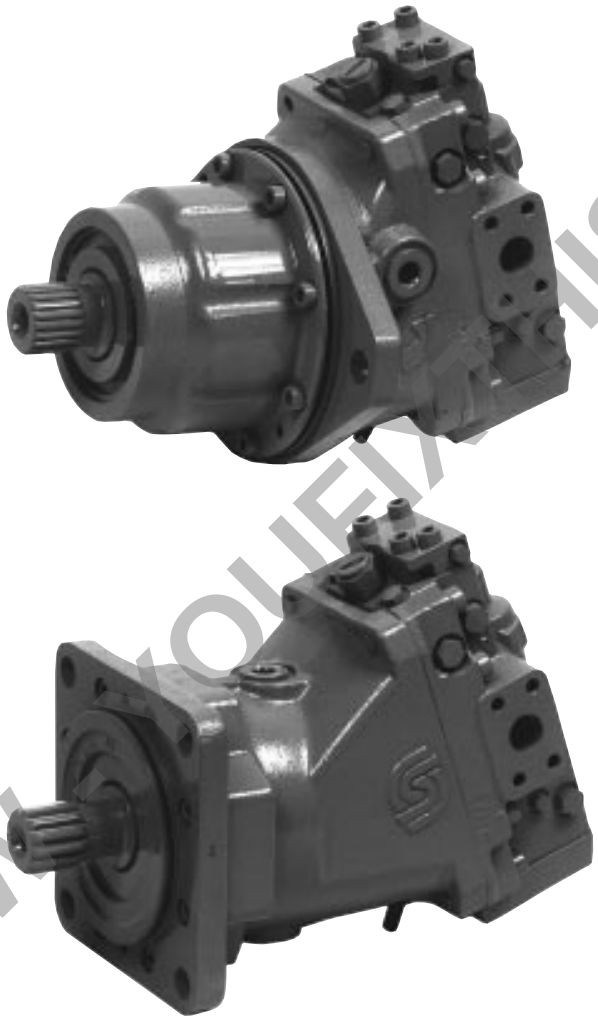
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SAUER SUNDSTRAND

Series 51



Bent Axis

Variable Motors

Service Manual

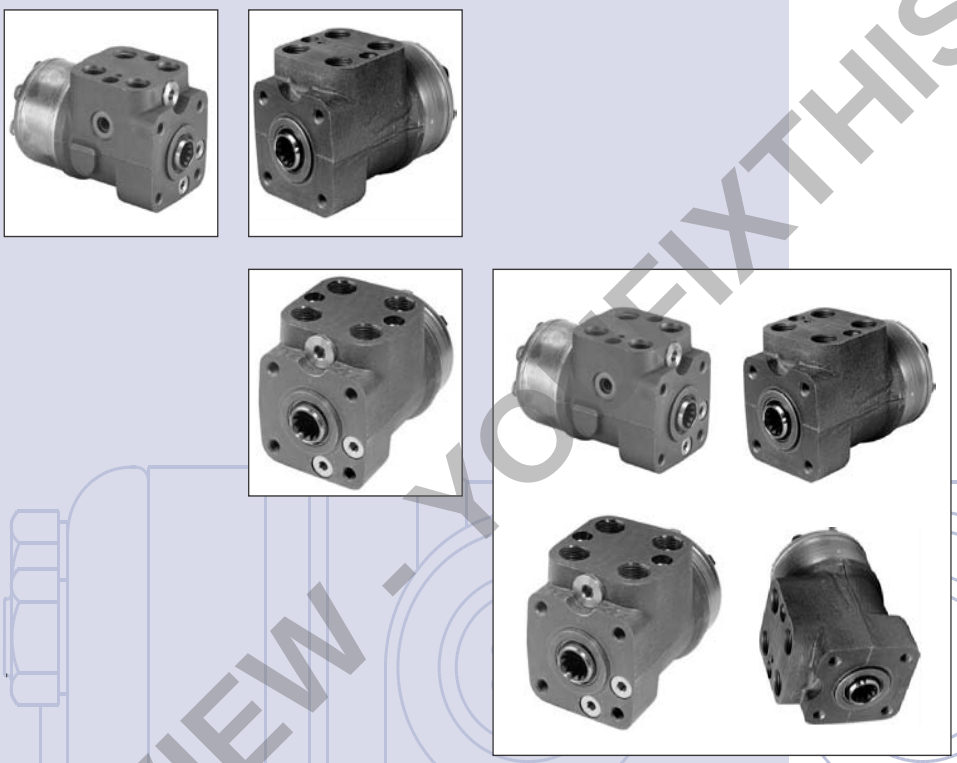
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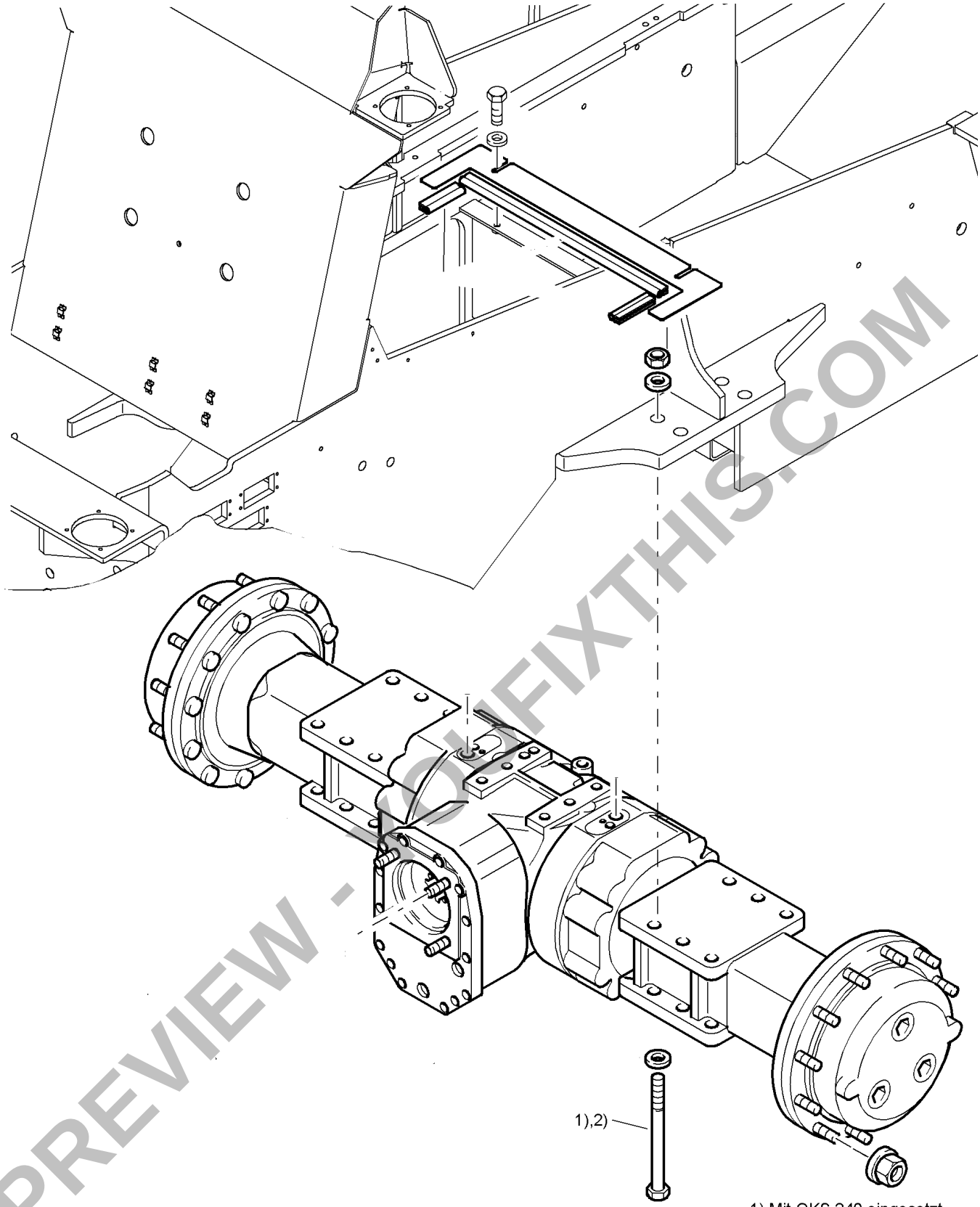
Hydrostatic Steering Unit Type OSPB, OSPC and OSPF

Service Manual



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582 826

1) Mit OKS 240 eingesetzt
With OKS 240 inserted
2) Anziehdrehmoment 710 Nm
Tightening torque 710 Nm

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Standardverkabelung: standard wireing:	dicke Linien thick lines	Platinenverdrahtung: connection on printed circuit board:	dünne Linien thin lines

Inhaltsverzeichnis: BW 216 DHC-4 Tier III
table of contents: BW 216 DHC-4 Tier III

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002	582 702 27	Versorgung, Starten, Hupe	supply, starting unit, signal horn
003	582 702 27	Motor Deutz EMR III	engine Deutz EMR III
004	582 702 27	Bremse, Kraftstoffheizung, Rückfahrw., Überwachung	brake, fuel pre-heating, back up alarm, monitoring (Iveka)
005	582 702 27	Überwachung (Bauser)	monitoring (Bauser)
006	582 702 27	Fahrstufen, Sitzkontaktsch., Vibration	speed-ranges, seat-switch, vibr.
007	582 702 27	Anti-Schlupfregelung	anti spin control
008	582 702 27	Anzeigen	indicators
009	582 702 27	Variocontrol, Messtechnik	Variocontrol, measurement equipm.
010	582 702 27	Bomag Compaction Management BCM, GPS	Bomag Compaction Management BCM, GPS
011	582 702 27	Diebstahlschutz System D-4, D-40, DHC-4, DH-40	anti - theft system
012	582 702 27	Beleuchtung und StvZO	illumination and StvZO
013	582 702 27	Kabinenausrüstung, Beleuchtung, Radio, Tachograph	cabin-equipment, headlights, radio, tachograph
014	582 702 27	Kabinenheizung, Klimaanlage, Zusatzheizung	cabin-heater, air conditioning, add. heater
101	582 702 27	Bauteilliste	component listing

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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

187 / 563 / MRlyCDMnRly2

Error description MAIN RELAY 2
Main relay 2 (in ECU): during the switching off, main relay does not switch on within an allowed time

Error codes
DEUTZ-Errorcode: 187
BlinkCode (short-long-short): 2 - 6 - 1
SPN: 563
possible FMI:
7: Mechanical system not OK
12: Defective component
12. Errormode not identifiable
12. Errormode not identifiable

Errordetection
Errorlamp shows permanent light. Entry in errormemory.

Possible reason for error
rapid shut-off of the ECU (without waiting till the end of the afterrun), ECU defective

Take actions for error repair
If error not removable, change ECU

other error properties
System reaction:
Behaviour error lamp: permanent light
Selfhealing: no
Signal Priority: 3
Measurement @ errortime: actual value

188 / 2634 / MRlyCDMnRly3

Error description MAIN RELAY
Main relay 3 (in ECU): during the switching off, main relay does not switch on within an allowed time

Error codes
DEUTZ-Errorcode: 188
BlinkCode (short-long-short): 2 - 6 - 1
SPN: 2634
possible FMI:
7: Mechanical system not OK
12: Defective component
12. Errormode not identifiable
12. Errormode not identifiable

Errordetection
Errorlamp shows permanent light. Entry in errormemory.

Possible reason for error
Short circuit to ground or emergency shut-off (relay 3 internal), rapid shut-off of the ECU (without waiting till the end of the afterrun), ECU defective

Take actions for error repair
Check cabling, check ECU, if error not removable, change ECU

other error properties
System reaction: Warning, shutoff the outputs MPROP (see BOSCH-Electricity operating plan)
Behaviour error lamp: permanent light
Selfhealing: no
Signal Priority: 3
Measurement @ errortime: actual value

189 / 523450 / MSSCD1

Error description MULTISTATE SWITCH 1
Multi state switch 1: the voltage measured by ECU is out of the target range or the swith setting is not plausible

Error codes
DEUTZ-Errorcode: 189
BlinkCode (short-long-short): 1 - 4 - 3
SPN: 523450
possible FMI:
3: Voltage to high or short circuit to +Ubatt
4: Voltage to low or short circuit to -Ubatt
12. Errormode not identifiable
2: data stream is defective

Errordetection
Errorlamp shows permanent light. Entry in errormemory.

Possible reason for error
Cable break or short circuit, input voltage outside target range (switch 1), switch defective, connection cable demaged

Take actions for error repair
Check cabling and sensor, check switch 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: 2
Measurement @ errortime: default value

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Reason of oil loss	Amount of oil lost
Loss when emptying	approx. 15 gr
Defective A/C hose	approx. 30 gr
Hose change	approx. 15 gr
Replacement of condenser	approx. 30 gr
Replacement of evaporator	approx. 30 gr
Replacement of liquid container	approx. 30 gr
Replacement of expansion valve	approx. 15 gr

⚠ Caution

Please bear in mind, that the new compressor is delivered with a filling of 207 gr. compressor oil. To avoid excessive oil in the A/C-system and thus a poor cooling effect, the oil level in the A/C-system must be adjusted accordingly.

The quantity depends on the amount of oil that may have been lost in connection with the possible replacement of other components.

The compressor oil quantity must be 10% of the refrigerant quantity in the complete system.

With a refrigerant filling of 1100 gr. the system requires a compressor oil / refrigerant oil filling of 100 gr.

Procedure:

Drain and measure the compressor oil from the old compressor.

Drain the compressor oil from the new compressor and only fill in the exact quantity that had been drained out of the old compressor. The compressor oil from the new compressor can be used for this purpose.

i Note

Topping up compressor oil / refrigeration oil is possible on a pressureless compressor directly into the oil pan, in a pressureless refrigeration system directly into the pressure side, but it is also possible to draw it into the pressure side of the refrigeration system during the evacuation process.

Condenser

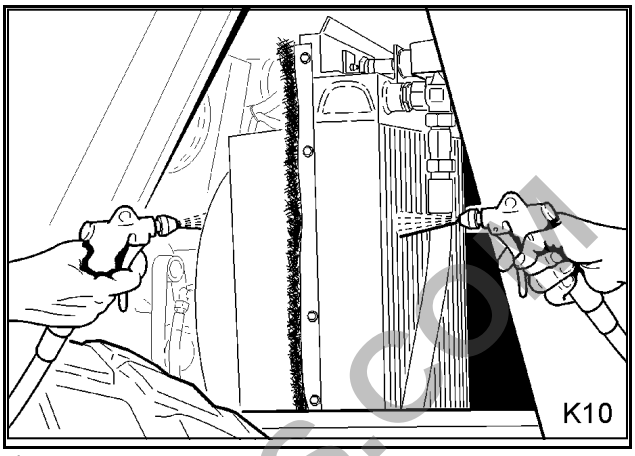


Fig. 1

The condenser is located in front of the the radiator for the machine. It emits heat energy from the system into the surrounding air and liquefies the gaseous refrigerant.

i Note

The fins must be free of dirt and damage.

⚠ Caution

When replacing a heat exchanger, e.g. evaporator or condenser, any compressor oil lost by exchanging the components, must be replaced with fresh oil.

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PRESSURE CONTROL PILOT (PCP) FOR ELECTRIC DISPLACEMENT CONTROL (EDC)

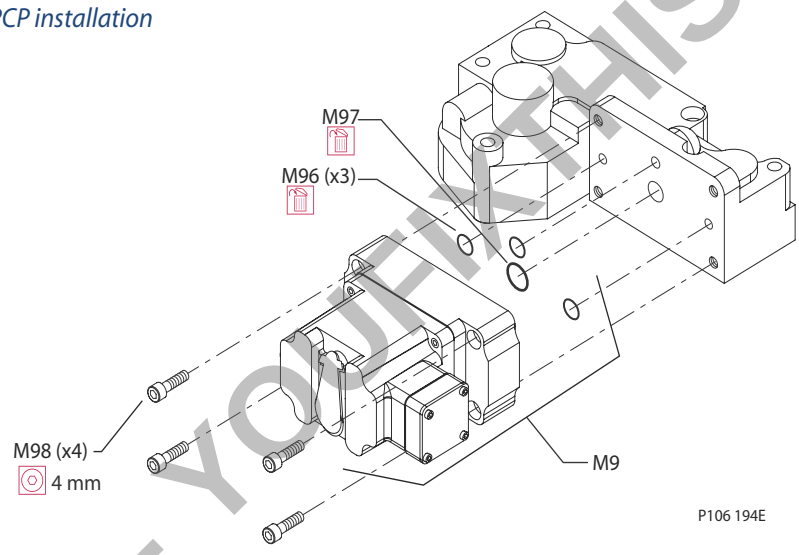
Assembly

1. Using petroleum jelly to retain them, install new O-rings (M96 and M97) in PCP Housing.

2. Place PCP against EDC housing and using a 4 mm internal hex, install the screws (M98). Torque to 5.4 N•m [4 lbf•ft].

Do not remove black plastic cover from the aluminum plate. This is not a serviceable item and removal voids the product warranty.

PCP installation



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