Electrical components in circuit diagram

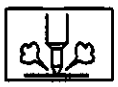
FX480 | Circuit diagram No. | T 2460251 - 002 / B 2460250 - 012

Part	Quantity	Description and function	Curr. Path	Location	Part no.
A10	1,000	LOAD LIMIT GOVERNOR	3 - 0/58 -	CONTROL PANEL	
A10X4	1,000	DIAGNOSTIC UNIT CONNECTOR	7 - 3/18 -	CONTROL PANEL	73172588
A10X4	1,000	FLANGE	7 - 3/18 -	CONTROL PANEL	73172589
A100	1,000	CENTRAL ELECTRONIC UNIT	3 - 1/16 -	CONTROL PANEL	73172003
A158	1,000	ELECTRONIC SPEED CONTROL	4 - 1/21 -	ENGINE	
A68	1,000	RESISTANCE MODULE	3 - 2/86 -	SEAT CONSOLE,RH	73175260
B10	1,000	PRESSURE SENSOR - TRAVEL	11 - 0/84 -	SUPERSTRUCTURE	
B10.1	1,000	SPEED SENSOR	3 - 9/89 -	ENGINE	
E3.2	1,000	WORKING LIGHT, TANK MODULE LEFT	9 - 3/87 -	HYD.OIL TANK	73172509
E3.2	1,000	BULB	9 - 3/87 -	HYD.OIL TANK	73172510
E3.4	1,000	WORKING LIGHT CAB L.H.(UP-AND DOWN)	9 - 1/87 -	CAB ROOF	73172509
E3.4	1,000	BULB	9 - 1/87 -	CAB ROOF	73172510
E3.5	1,000		9 - 4/87 -	MOTOR MODULE	73172509
E3.5	1,000	BULB	9 - 4/87 -	MOTOR MODULE	73172510
E4.2	1,000	WORKING LIGHT, TANK MODULE RIGHT	9 - 2/87 -	HYD.OIL TANK	73172509
E4.2	1,000	BULB	9 - 2/87 -	HYD.OIL TANK	73172510
E4.3	1,000	WORKING LIGHT, COUNTERWEIGHT RIGHT	9 - 4/87 -	COUNTERWEIGHT	73172509
E4.3	1,000	BULB	9 - 4/87 -	COUNTERWEIGHT	73172510
E4.4	1,000	WORKING LIGHT CAB R.H.(UP-AND-DOWN)	9 - 1/87 -	CAB ROOF	73172509
E4.4	1,000	BULB	9 - 1/87 -	CAB ROOF	73172510
E9	1,000	INTERIOR LIGHT	7 - 3/74 -	CAB	73172604
E9	2,000	BULB	7 - 3/74 -	CAB	73172605
F	1,000	FUSE	4 - 1/37 -	ENGINE	73175137
F	1,000	FUSE INSERT	4 - 2/37 -	ENGINE	73175137
F	1,000	FUSE INSERT	5 - 6/30 -	ENGINE	73175137
F1	1,000	FUSE	7 - 3/16 -	CONTROL PANEL	73172606
F11	1,000	FUSE	7 - 1/16 -	CONTROL PANEL	73172606
F12	1,000	FUSE	7 - 2/16 -	CONTROL PANEL	73172606
F2	1,000	FUSE	2 - 7/16 -	CONTROL PANEL	73172606
F20	1,000	FUSE: COLD STARTING SYSTEM	2 - 4/16 -	CONTROL PANEL	73172607
F20	1,000	FUSE HOLDER	2 - 4/16 -	CONTROL PANEL	73175261
F20	2,000	CONTACT SLEEVE	2 - 4/16 -	CONTROL PANEL	73175262
F3	1,000	FUSE	3 - 0/18 -	CONTROL PANEL	73172606

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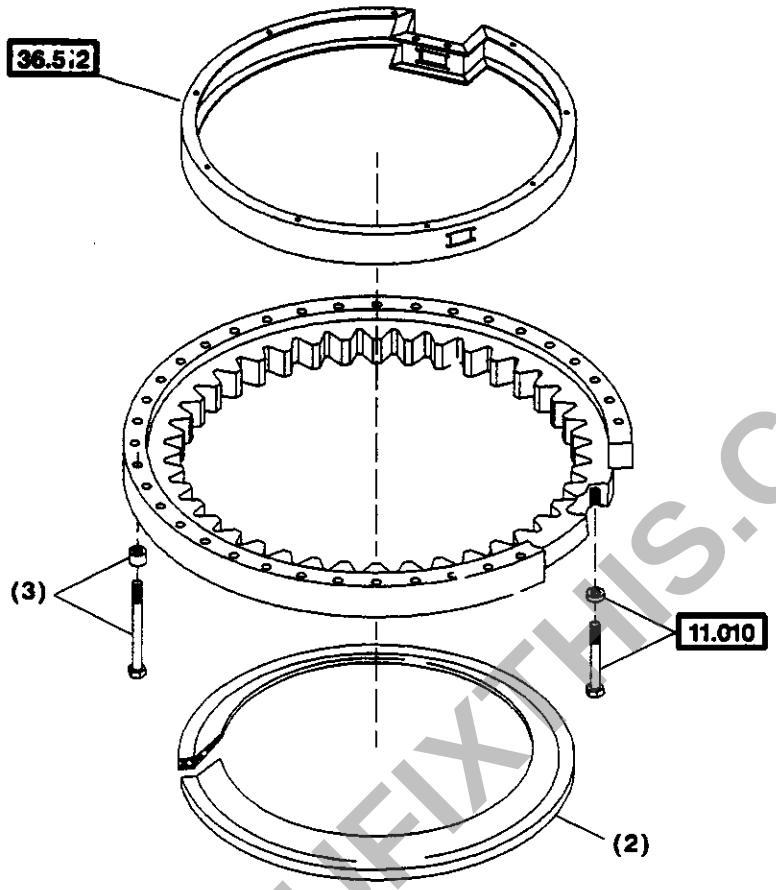
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Control panel (Fig. 5)

No.	Element		Function	Symbol
12	**Warning lamp**	**Hydraulic oil filter**	lit up when the return-flow filters in the hydraulic system are contaminated: replace return-flow filter.	
13	**Indicator lamp**		not used on this machine.	
14	**Warning lamp**	**Air intake system**	lit up when the filter element is contaminated: clean main filter element.	
15	**Key**	**Fan**	switches the fan to: OFF, ranges 1, 2, and 3.	
16	**Key**	**Service**	after depressing the key, the display (pos. 5) indicates the remaining operating hours until the next servicing interval is due. For other functions cf. "Service function (key 16)".	Service
17	**Key**	**Buzzer**	switches off the acoustic warning (buzzer) of all functions, except the overload warning system. (LED lit up when the buzzer is off). The buzzer is automatically re-activated for the next warning.	
18	**Key**	**Display**	selects the following indications of the multi-functional display: - time - engine speed see: "Display function (key 18) "	Display
19	**Key**	**Hydraulic hammer (optional equipment)**	switches the "hydraulic hammer" function on/off.	
20	**Key**	**POWER-system range**	POWER-system preselection of the maximum engine speed and hydraulic performance in three steps: H = HEAVY, 100% performance E = ECO, 88% performance L = LIFT, 65% performance	Power
21	**Key**	**Power assist**	switches increased hydraulic pressure for the working functions and the travelling drive on/off.	
22	**Key**	**AUTO IDLE**	switches the automatic speed reduction function on/off.	AUTO IDLE

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2 495 278.010

SWIVEL CONNECTION INSTALL.MATERIAL

11.010

FIATALLIS

FX480 / 77301 - .....

T 2495278 - 000
B 2495278 - 010

Item	Quan.	ME	Part No.	Description
002	1	00		**36.510 2495280** COVER SWING BEARING INSTALL.MATERIAL
003	1	00		**11.010 2495282** SWIVEL CONNECTION INSTALL.MATERIAL

ME: 00 = Stück/piece 13 = m 26 = m^2 39 = m^3 43 = kg 50 = l (litre)

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Item	Qty.	Description
002	1	Brake, Compl.
003	1	Locking Ring
004	1	Hub
005	11	Outer Disk
006	10	Inner Disk
007	1	Sleeve
008	1	Seal
009	1	Piston
010	1	Seal
011	14	Compression Spring
012	14	Compression Spring
013	1	Cylinder Cover
014	1	Snap Ring

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Secondary valves for travel motors 2800124

- Unscrew the control lines of the track brakes and close.
- Move travel motor forwards and backwards against the blocked brakes and check the secondary valves (4, Fig. 4) at 380 bars. Readjust, if necessary.
- Refit the control lines at the track brakes.

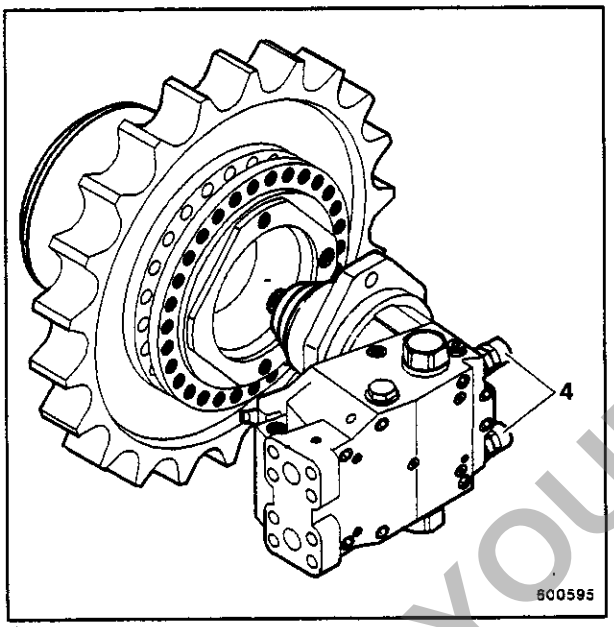


Fig. 4

Setting the primary valves and the pressure cut-off threshold

- The power boost function remains activated.
- Move stick cylinder against block.
- Adjust primary valves (2, Fig. 2) to 360 bars.
- De-activate the power boost function.
- Adjust the pressure cut-off value of pumps P1 and P2 (5, Fig. 5) to 320 bars. Check and readjust, if necessary.

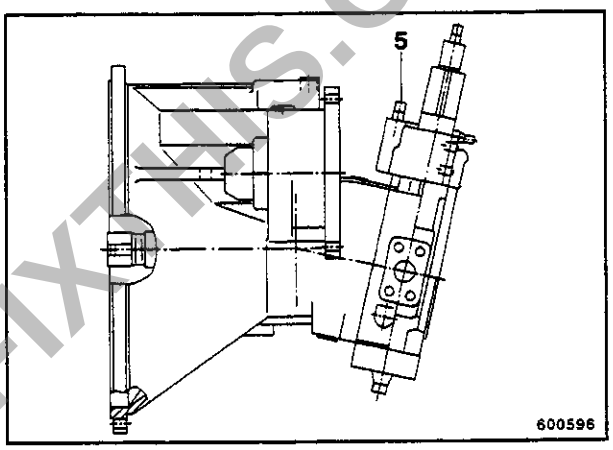


Fig. 5 □

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END POINT	CABLE NO.	℄ mm²	NO.	■ mm²	CABLE NO.	END POINT
X115: 5	152	0.5	1	0.38	wh	PUSH BUTTON DOWN (1)
X115: 6	153	0.5	2	0.38	br	PUSH BUTTON DOWN (4)
X117: 15	154	0.5	3	0.38	gn	PUSH BUTTON TOP (1)
X104: 12	129	0.5	4	0.38	ye	PUSH BUTTON TOP (2)
			5	0.38	gy	PUSH BUTTON TOP (4)
F8 (15)	80	0.5	6	0.38	pi	PUSH BUTTON LEFT (1)
X108: 4	116	0.5	7	0.38	bl	PUSH BUTTON LEFT (4)
X17: 9		0.5	8	0.38	rd	PUSH BUTTON LEFT (2)
X17: 8		0.5	9	0.38	bl	PUSH BUTTON RIGHT (1)
X108: 5	115	0.5	10	0.38	vi	PUSH BUTTON RIGHT (4)
X115: 7	155	0.5	11			RESERVE
X115: 8	156	0.5	12			RESERVE

CONNECTION TABLE
PLUG/SOCKET X17 PILOT CONTROL LEVER LEFT

END POINT	CABLE NO.	℄ mm²	NO.	■ mm²	CABLE NO.	END POINT
A100X2: 19	34	0.5	1	0.38	wh	PUSH BUTTON DOWN (1)
GROUND (-)	136	0.5	2	0.38	br	PUSH BUTTON DOWN (4)
A100X2: 8	23	0.5	3	0.38	gn	PUSH BUTTON TOP (1)
GROUND (-)	137	0.5	4	0.38	ye	PUSH BUTTON TOP (2)
		0.5	5	0.38	gy	PUSH BUTTON TOP (4)
F10 (15)	83	0.5	6	0.38	pi	PUSH BUTTON LEFT (1)
X104: 9	127	0.5	7	0.38	bl	PUSH BUTTON LEFT (4)
X18: 9		0.5	8	0.38	rd	PUSH BUTTON LEFT (2)
X18: 8		0.5	9	0.38	bl	PUSH BUTTON RIGHT (1)
X104: 11	128	0.5	10	0.38	vi	PUSH BUTTON RIGHT (4)
X115: 9	138	0.5	11			RESERVE
X115: 10	140	0.5	12			RESERVE

CONNECTION TABLE
PLUG/SOCKET X18 PILOT CONTROL LEVER RIGHT

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313	31	052	50						Datum/Date	Name
								Bearb./Written	07.11.97	Semlin
Typ	BG	UBG	CH	02	AM 539	29 05 98	Sem	Gear./Checked		
FX140-270				01	AM 114	01.02.98	Sem	Norm/St. Check		
				Ind	Ind.-Nr./Change-No	Datum/Date	Name	Bearb.Abt./Written department		

Urspr./Origin

Benennung/Description
WIRING DIAGRAM
X17 - X18

Sach-Nr./Part-No 2459343-12

4 Blatt/Sheet 19
Bl.-Nr./Sheets 21

Ers. für/Substitut for

Ers. durch/Substituted

Hints for handling of the special functions Log X1 option:

- connect tester and sensors and carry out measuring and setting.
- Hold stores the menu screens with measuring and setting values in the Temp.-$$ file
- save the file Temp.-$$ in the Log X1 menu screen with the "Saving" option under a new name

Attention New menu screens cannot be stored in this "namefile". They are again stored in the Temp.-$$ file.

Time program

Special functions submenu

```
PCS Special Functions:
Log                 :  F1
Time program        :  F2
Filemanagement      :  F3
Extension           :  F4

Control panel       :  F6
ESC-return
```

F2

Selection of the special functions pages required for general handling of data.

Keys F1, F2, F3, F4 and F6 are used to select the individual data items of the menu in the opposite column.

Esc goes back from all data screens to the special functions submenu.

Time program X2

```
PCS   - Time programm -   X2
<D>ate  : 15-10-1997   <T>ime : 11:18:56
Stopwatch:   0.0  —>stopped T.1:   0.0
                   stopped T.2:   0.0
                   stopped T.3:   0.0
ESC-return | Hold | Start/stop Enter
```

Stopwatch function: Esc to quit

Start: Enter Start timer 1.

depressing Enter once again: stop/display timer 1 and start timer 2.

depressing Enter once again: stop/display timer 2 and start timer 3.

depressing Enter once again: stop/display timer 3

Hold stores the times taken

Print >| prints out the times taken

Function: Setting time and date of the internal clock and stopwatch for three independent times.

Setting the date: Depess first A/N then Ins for letter "D" date select. The date can be edited with the numerical keys.

Attention: Depress A/N once again to enter numbers.

Depressing Esc quits the editing mode with the entries being adopted.

Setting the time: Depress first A/N then 0 for letter "Z" time select. The time can be edited with the numerical keys.

Attention: Depress A/N once again to enter numbers.

Esc quits the editing mode with the entries being adopted.

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Drive - forward / reverse

2732898

WARNING

Read and observe "Driving - Safety instructions".

While travelling the horn attached on the counterweight sounds acoustic warnings (Travel-Alarm).

In the following figures:

Deflection of travel pedals in direction of arrows = travelling movement in direction of arrows.

The information on direction of travel applies only if the machine is in basic position.

Travel forwards straight ahead

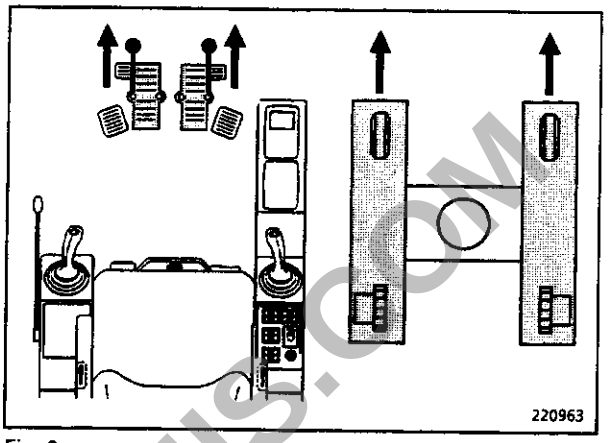


Fig. 6

Operate travel pedals in direction of arrows = machine travels in direction of arrows.

Small pedal travel = low speed.

Large pedal travel = high speed.

Travel reverse straight ahead

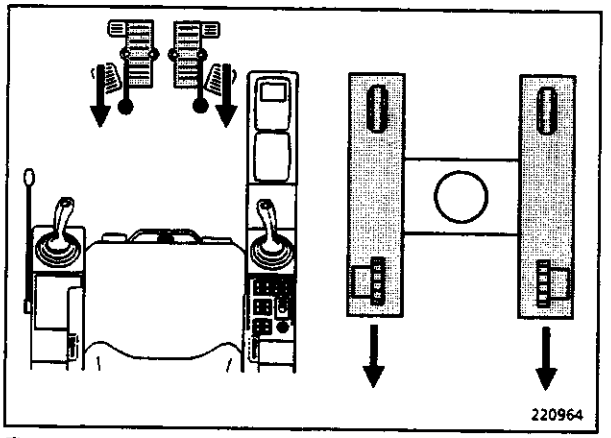


Fig. 7

Operate travel pedals in direction of arrows = machine travels in direction of arrows.

Small pedal travel = low speed.

Large pedal travel = high speed.

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Checking / changing safety filter element

2487584

⚠ CAUTION

Do not start the engine when the safety filter element has been removed.

The engine then sucks in unfiltered air and can thus be damaged.

- Remove main filter element (2, Fig. 6). The safety filter element (1) is then accessible.

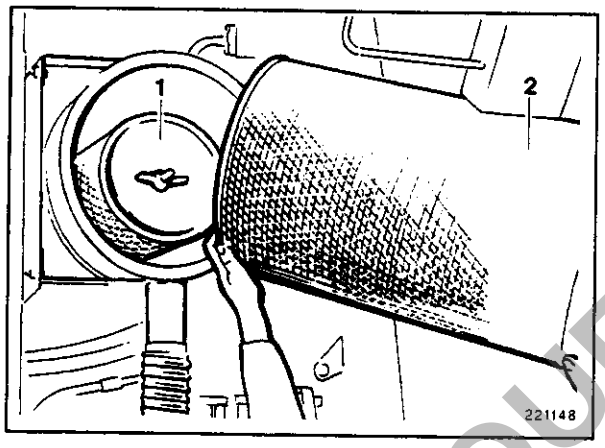


Fig. 6

- Release wing nut and remove safety filter element from the housing.
- Do not clean the safety filter element. Always replace if contaminated.
- The safety filter element must replaced after the main filter element has been cleaned three times, at the latest after one year operating time.
- Install new safety filter element (1).
- Reinstall main filter (2). □

Checking air intake lines

2472232

The engine must not be allowed to take in unfiltered air. Therefore:

- Check all hoses and pipes for leaks.
- Check that all clamps are in position and secure.

Replace damaged parts immediately (or have them replaced). □

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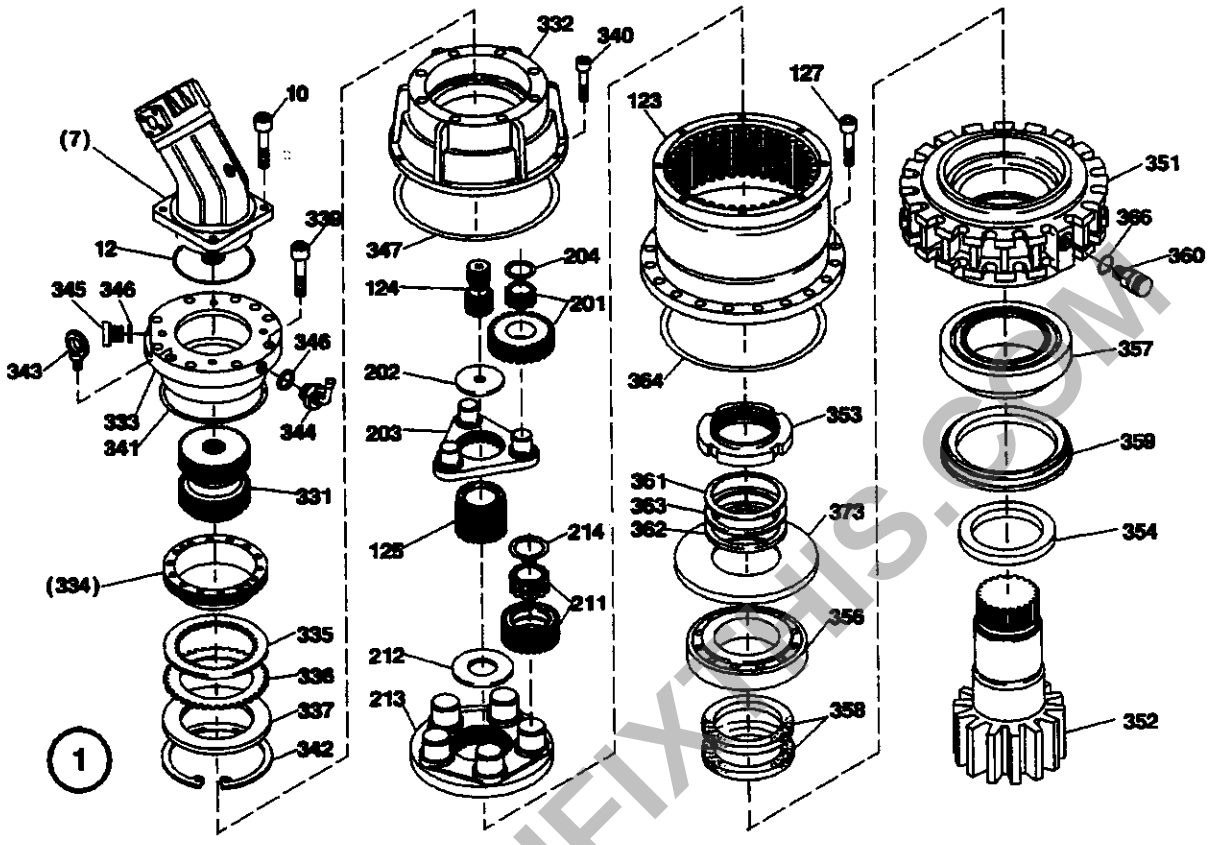
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No. ofassembly	Description
17.100 - 2496928	COUPLING/CLUTCH INSTALL.MATERIAL
36.512 - 2495281	COVER SWING BEARING
36.510 - 2495280	COVER SWING BEARING INSTALL.MATERIAL
36.540 - 2496877	COVER TRAVEL GEAR
36.500 - 2782657	COVER UPPER CARRIAGE
06.010 - 2495631	CRAWLER CHASSIS INSTALL.MATERIAL
31.600 - 2782775	DASHBOARD INSTALL.MATERIAL
91.010 - 2782884	DECAL KIT
91.010 - 2496959	DECAL KIT
22.402 - 2444968	DISTRIBUTOR
22.400 - 1708496	DISTRIBUTOR INSTALL.MATERIAL
22.020 - 2495156	DOUBLEPUMP
06.102 - 2495332	DRIVING CHAIN
31.050 - 2460251	ELECTRICAL COMPON. I.CIRCUIT DIAGRAMM
32.999 - 2782749	ELECTRICAL SYSTEM ADDITION OTHER
13.220 - 2496946	EXHAUST SYSTEM INSTALL.MATERIAL
22.202 - 2248164	FILTER
22.200 - 2283755	FILTER INSTALL.MATERIAL
22.200 - 2444372	FILTER INSTALL.MATERIAL
34.105 - 2495303	FOOT REST PLATFORM
01.620 - 2495266	FRAME TOOL-BOX
01.300 - 2782670	FRAME UPPER CARRIAGE WITH MOUNT. PARTS
01.300 - 2496925	FRAME UPPER CARRIAGE WITH MOUNT. PARTS
13.310 - 2783546	FUEL LINE
10.202 - 2782677	FUEL TANK
22.052 - 2496930	GEARED PUMP
22.050 - 2496929	GEARED PUMP INSTALL.MATERIAL
34.230 - 2495010	GLAZING OPERATOR'S CAB
34.230 - 2782254	GLAZING OPERATOR'S CAB
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06.160 - 2141752	GUIDE WHEEL INSTALL.MATERIAL
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27.010 - 2496798	HEATING INSTALL.MATERIAL
10.102 - 2495120	HYD. OIL TANK
10.101 - 2496803	HYD. OIL TANK MOUNTING PARTS
20.642 - 2496464	HYDRAULIC SYSTEM CASCADE
20.640 - 2496794	HYDRAULIC SYSTEM CASCADE INSTALL.MATERIAL
20.641 - 2782747	HYDRAULIC SYSTEM CASCADE MOUNTING PARTS
20.641 - 2496790	HYDRAULIC SYSTEM CASCADE MOUNTING PARTS
20.310 - 2496934	HYDRAULIC SYSTEM HIGH PRESSURE
20.320 - 2496919	HYDRAULIC SYSTEM LOW PRESSURE

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16.032

SLEWING GEAR COMPLETE

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FX480 / 77301 - .....

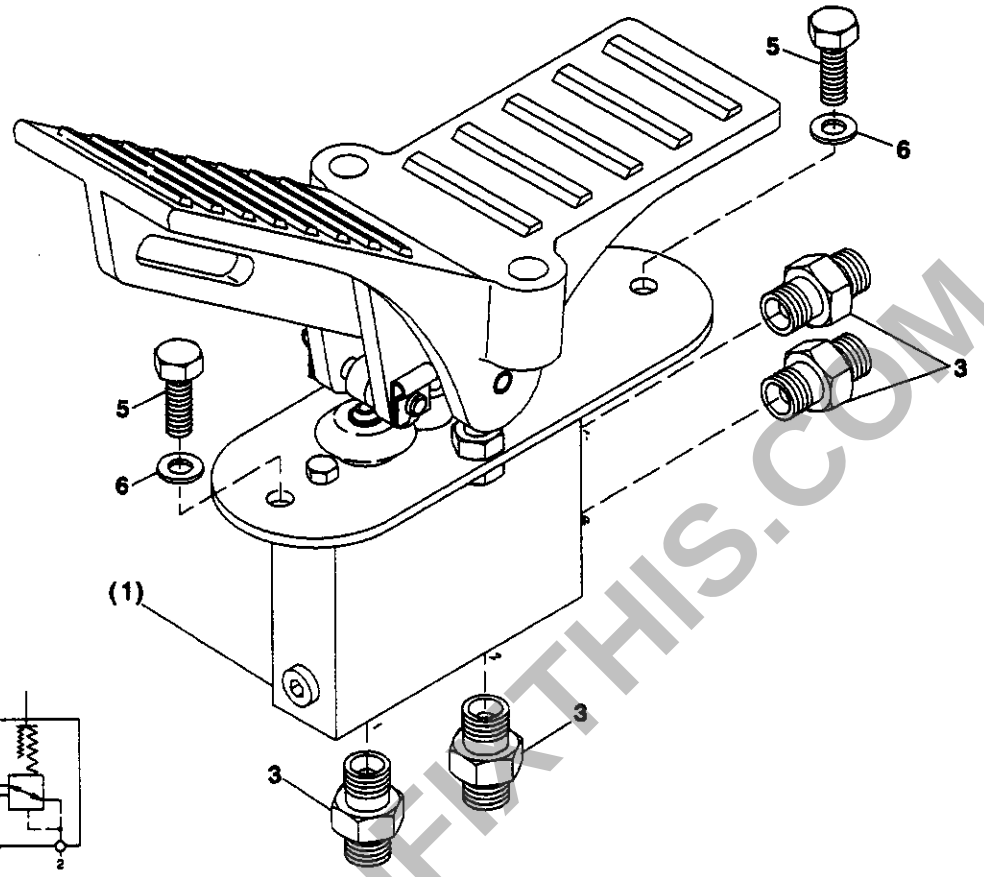
T 2495272 - 000
B 2495272 - 010

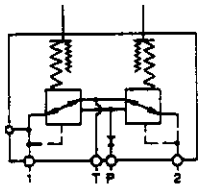
Item	Quan.	ME	Part No.	Description
001	1	00	**73172382**	TRANSMISSION GEAR
007	1	00		**22.110 2495271** AXIAL PISTON MOTOR
010	4	00	**73172383**	CYL.HEAD SCREW
012	1	00	**73172385**	O-RING
123	1	00	**73172387**	HOLLOW WHEEL
124	1	00	**73172388**	GEAR PINION
125	1	00	**73172389**	SPUR GEAR
127	2	00	**73172390**	CYL.HEAD SCREW
201	3	00	**73172392**	SET OF SPUR GEARS
202	1	00	**73172393**	DISK/WASHER
203	1	00	**73172394**	PLANETARY CARRIER
204	3	00	**73171737**	CIRCLIP
211	5	00	**73172395**	SET OF SPUR GEARS
212	1	00	**73172396**	DISK/WASHER
213	1	00	**73172397**	PLANETARY CARRIER
214	5	00	**73170059**	CIRCLIP
331	1	00	**73172398**	SLEEVE

ME: 00 = Stück/piece 13 = m 26 = m^2 39 = m^3 43 = kg 50 = l (litre)

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2 496 573.010

TREADLE VALVE INSTALL.MATERIAL

FX480 / 77301 - .....

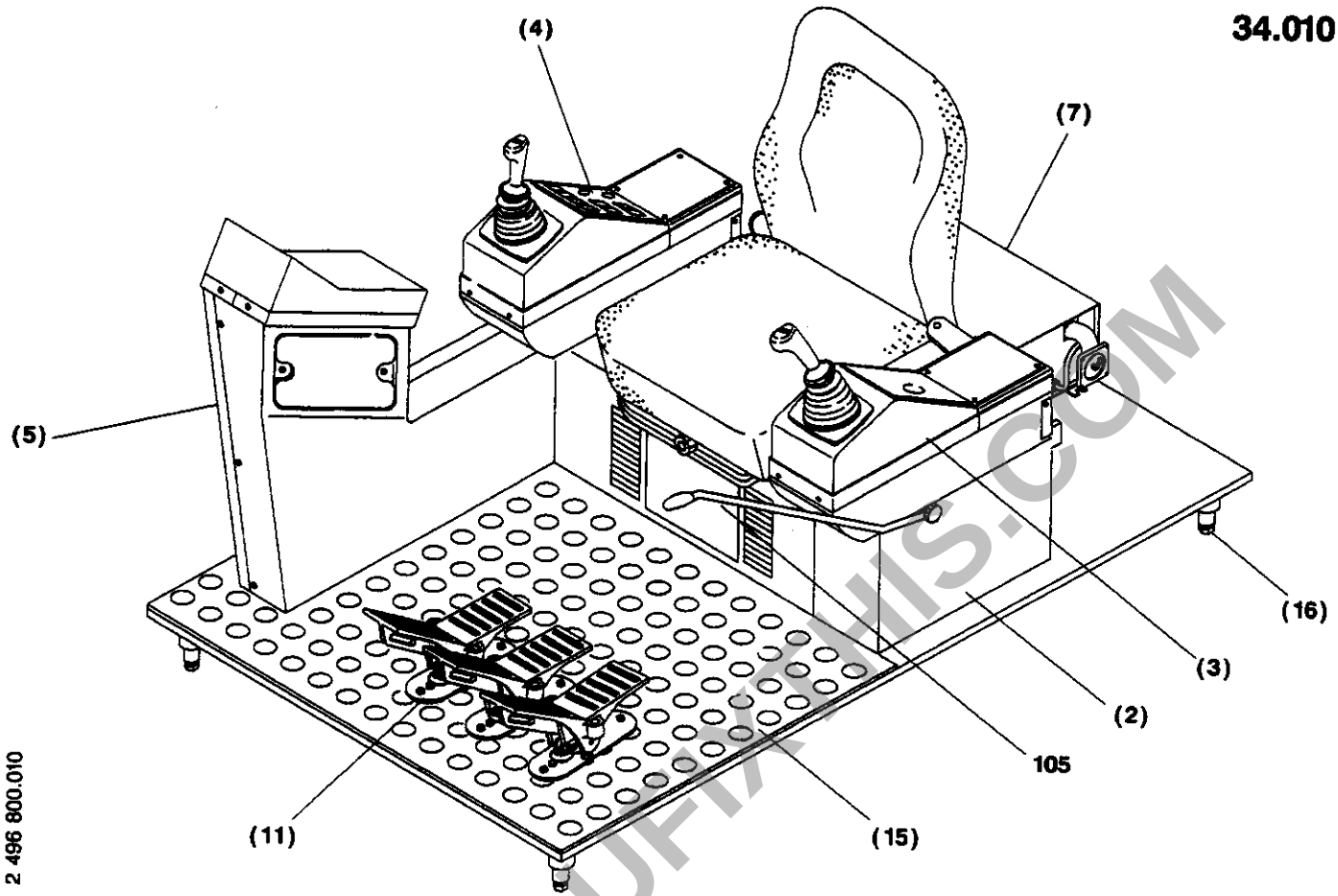
T 2496573 - 000
B 2496573 - 010

Item	Quan.	ME	Part No.	Description
001	1	00		**23.292 2496572** TREADLE VALVE
003	4	00	**73170380**	SOCKET
005	2	00	**73170205**	HEXAGON BOLT
006	2	00	**73170160**	DISK/WASHER

ME: 00 = Stück/piece 13 = m 26 = m^2 39 = m^3 43 = kg 50 = l (litre)

1998-09-10

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CAB MODULE INSTALL.MATERIAL

34.010

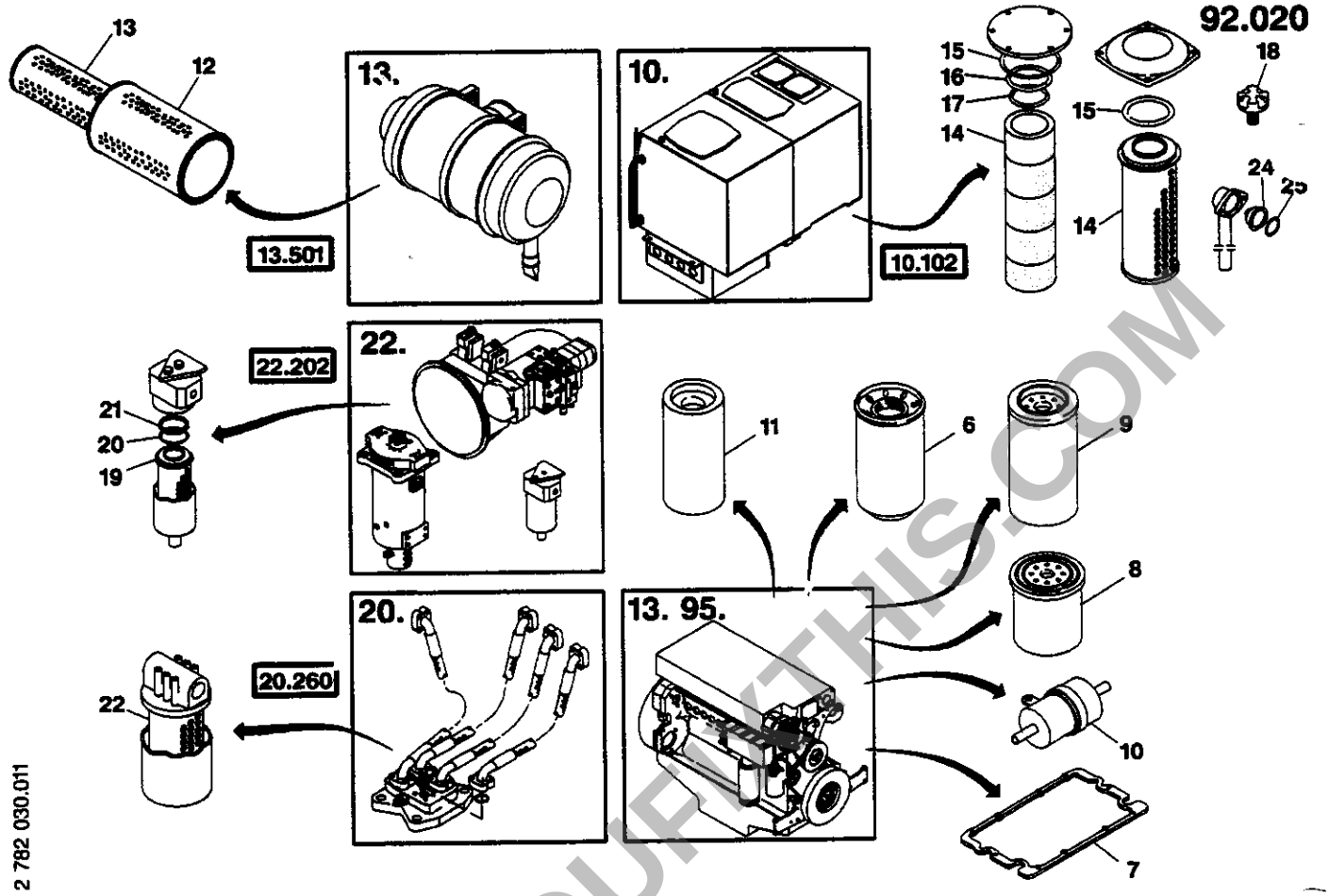
FX480 / 77301 - .....

T 2496800 - 002
B 2496800 - 010

Item	Quan.	ME	Part No.	Description
015	1	00		**90.100 2496594** LINING ARRANGEMENT
016	1	00		**34.100 1908540** PLATFORM PLATE INSTALL.MATERIAL
105	1	00		**34.640 2444852** WINDSCREEN WASHER INSTALL.MATERIAL

ME: 00 = Stück/piece 13 = m 26 = m^2 39 = m^3 43 = kg 50 = l (litre)

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92.020

MAINTENANCE MATER. FX480

FIATALLIS

FX480 / 77301 - .....

T 2782032 - 001
B 2782030 - 011

Item	Quan.	ME	Part No.	Description
005	1	00	**73175259**	MAINTENANCE MATER. 3000 BH POS/ITM: 6-9,12-25 .
006	1	00	**73175970**	ENGINE OIL FILTER
007	1	00	**73177872**	VALVE COVER SEAL
008	1	00	**73175973**	THROW-AWAY FILTER
009	2	00	**73175971**	FUEL-FILTER ELE.
012	1	00	**73170678**	FILTER INSERT
013	1	00	**73170676**	FILTER INSERT
014	2	00	**73170309**	ELEMENT
015	2	00	**73170280**	O-RING
016	2	00	**73170307**	ROUND SEALING RING
017	2	00	**73170308**	O-RING
018	1	00	**73170286**	FILTER
019	2	00	**73170668**	FILTER INSERT
020	2	00	**73170669**	O-RING
021	2	00	**73170671**	SUPPORT RING

ME: 00 = Stück/piece 13 = m 26 = m^2 39 = m^3 43 = kg 50 = l (litre)

1998-09-10

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ZEITGRÖSSEN
TIME-RELATED QUANTITIES

Größe Quantity	Formelzeichen Symbol	Einheit Unit			Umrechnung Conversion		Erläuterungen und Bemerkungen Explanations and Remarks
		alt old	neu new		Für genaue Rechnungen for exact calculation	für überschlägige Rechnungen (2 % Ungenauigkeit) for rough calculation appr. 2 % inexact	
			SI-Einheit SI-Units	Auswahl weitere Einheiten Selection of additional units			
Zeitdauer Time	t	s, min, h, d = day	s	ms, min, h, d			
Frequenz Frequency	f	Hz	Hz				1 Hz 1/s
Drehzahl Rate of revolutions	n	U/min	1/s	1/min			s = min/60
Geschwindigkeit Speed	v	m/s, km/h	m/s	km/h			
Beschleunigung Acceleration	a	m/s^2	m/s^2				
Volumenstrom Volume flow	V	m^3/s, m^3/min, m^3/h	m^3/s	m^3/min, l/h			
Massenstrom Mass flow	m	kg/s, kg/min, kg/h	kg/s				
Wärmestrom Heat flow	Φ	(kcal/h)	W	kW, MW	1 kcal/h = 1,163 W	1 kcal/h = 1,2 W	1 W = 1 J/s = 1 Nm/s
Spez. Kraftstoff- oder spez. Ölverbrauch Specific fuel and oil consumption	b, b_e	kg/PSh g/PSh	kg/J	g/(kW h)	1 g/(PS h) = 1,359 g/(kW h)	1 g/(PS h) = 1,36 g/(kW h)	

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⚠ WARNING

Conversions or modifications to the machine

Unauthorized conversions or modifications of the hydraulic excavator are forbidden for reasons of safety.

The nominal pressure of the pressure relief valves must not be modified.

Do not remove the lead seals from pressure-relief valves and pressure accumulators.

⚠ CAUTION

Recommissioning

Prior to recommissioning:

- **Grease all lubricating points.**
- **Check all oil levels and make the necessary corrections.**
- **Carry out function checks of all repaired components.**
- **Check all functions of the excavator including the brakes during a test run. Release the hydraulic excavator for recommissioning only after all functions have been found to work perfectly.**

□

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Swing gearbox components

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7.2 After limited cylinder damage acc. to 4.1 - 4.5

7.2.1 Insert new return flow filter element.

7.2.2 Connect connection lines of replaced cylinders directly with each other (short circuit).

7.2.3 Run drive motors at full speed.

Do not switch on control valve of replaced cylinder until oil filter control lamp has gone out.

7.2.4 Switch working functions of replaced cylinders on fully in each direction for ca. 1 minute, switching briefly back a few times to 0-position.

7.2.5 Replace return flow filter element.

7.2.6 Repeat flushing operation, switching on all consumers briefly in succession.

7.2.7 Check return flow filter again.

7.2.8 Connect and vent cylinder(s) as prescribed.

7.2.9 Check oil level in hydraulic reservoir.

7.2.10 Start up excavator.

7.3 After extensive damage acc. to 4.7

7.3.1 Insert new return flow filter element.

7.3.2 Fill in hydraulic oil through return flow filter.

7.3.3 Further procedures are detailed in 7.1.3 - 7.1.11.

7.4 After damage to hydraulic motor (e.g. travel motor, swing motor)

7.4.1 Install new return flow filter element.

7.4.2 Connect connection lines of replaced unit directly with each other (short circuit)..

7.4.3 Further procedures are detailed in 7.2.3 - 7.2.10.

8. Operations monitoring

After ca. 1 hour deployment, check return filter element. If chips are still present, install new filter element.

Repeat checks at increasing intervals.

If there is no clear-cut decrease in the quantity of chips, or if foreign bodies are found in large quantities, it has to be assumed that the defective unit has not yet been found, cleaned or replaced. Thorough check and flushing operation must be repeated. □

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Piston rod guide

Dismantling and checking:

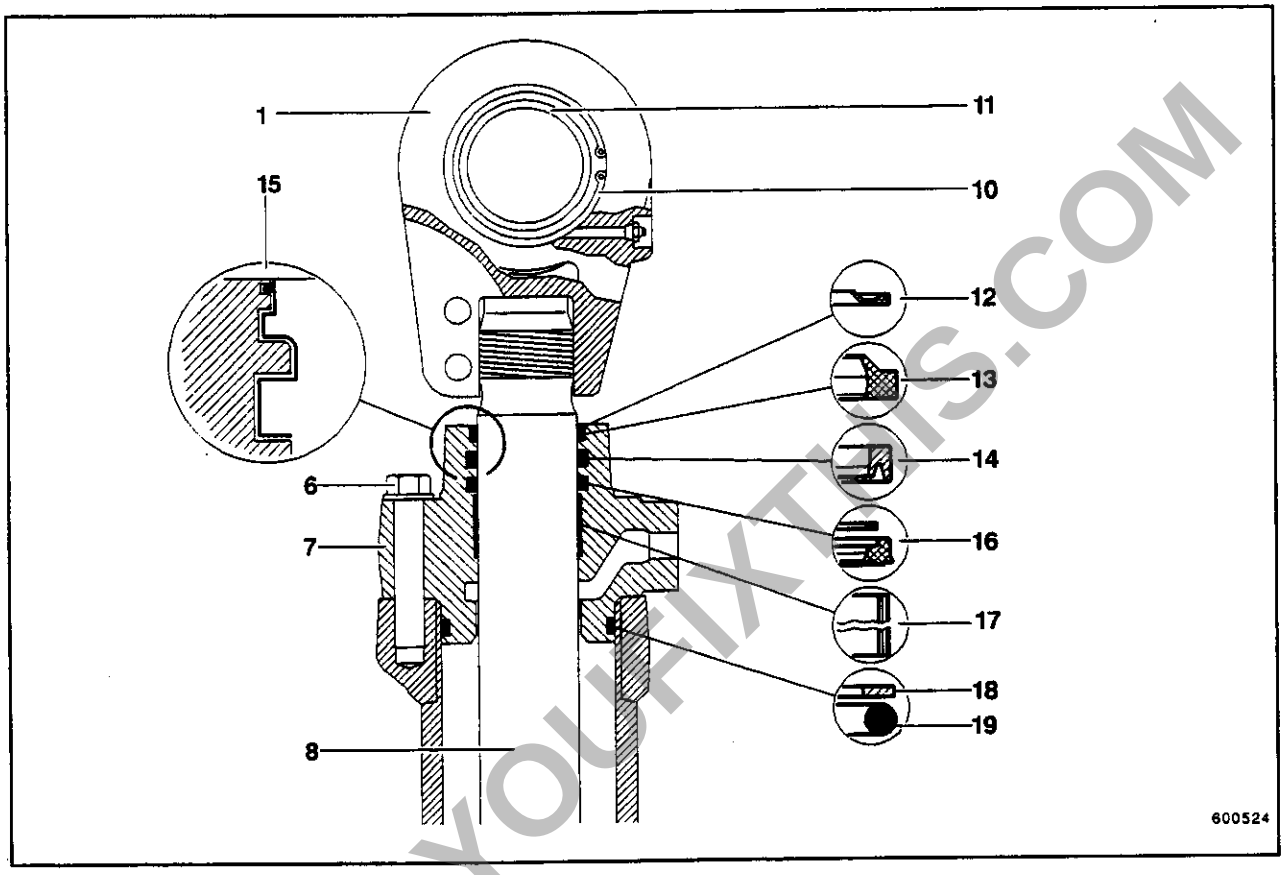


Fig. 20

- Drain hydraulic oil from the cylinder. Collect escaping oil in a suitable recipient.
- Remove the bearing eye (1, Fig. 20).
- Loosen the fastening screws (6).
- Dislodge guide (7) from the barrel by means of two M 12 x 150 jack screws or M 10 x 150.
- Withdraw the guide (7).
  Remove all sealing elements and wear parts using suitable tools such as, for instance, snub-nosed screwdrivers to prevent the sealing surfaces from being damaged.
- Check the guide (7). Replace if damaged. The other sealing elements and wear parts will otherwise be irreparably damaged in a very short time. Always replace all wear parts (wipers, lip seal, etc.).

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⚠ WARNING

Fuses

Working on the fuse holder involves the risk of sparking and short-circuits. Therefore:

Remove fuses only after the circuit has been de-energized:

Shut off the engine and turn the key-switch of the electrical system to 0.

For machines with main battery switch:

Switch off main battery switch.

Replace defective fuses only by those of the same current rating.

□

ELECTRICAL SYSTEM DOCUMENTATION

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For organizational reasons, the documentation for the electrical system of the machine has been annexed to the spare-parts list. The documentation includes:

- the circuit diagram
- the circuit diagram legend with the electrical components.

The components are identified in accordance with DIN 40 719 by letters. An extract of this standard is given in the ANNEX.

With the help of the above-mentioned documents and the present Technical Handbook, a qualified electrician should be able to rectify faults in the electrical system.

Simple works on the electrical system, e.g.

- the replacement of bulbs,
- of fuses and
- of relays

are described in the operating instructions of the machine. □

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ODC - On-Board Diagnostic Computer

The On-Board Computer ensures permanent monitoring of the coolant temperature and the hydraulic oil temperature by means of sensors (B10.1 and R14, Fig. 4).

The ODC signals a fault when the pre-established program limit values are exceeded (Fig. 5) and stores the event in a special failure memory.

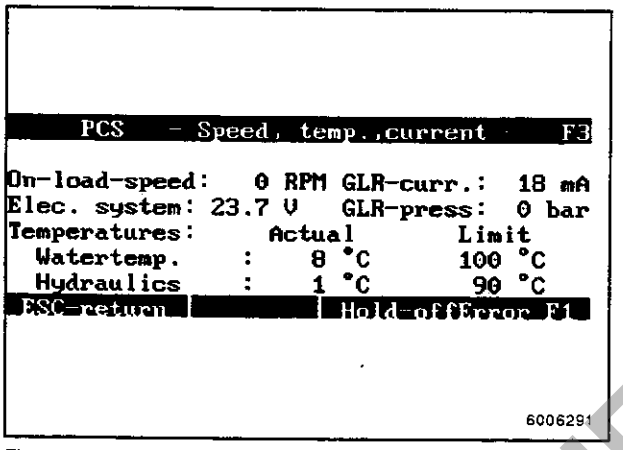


Fig. 5

The operator is informed of the fault by a special screen of the Control Panel display.
The temperature control integrated in the ODC lowers the pump output via the control flow from the proportional valve to reduce strain on the machine.

Condition: temperature too high

- Engine temperature
  stepless lowering down to minimum output
- Hydraulic oil temperature
  switching over into the LIFT mode

As a system protection measure, the ODC additionally monitors the control loop for broken cable and short-circuits (proportional valve / hydraulic oil sensor / coolant sensor)

Condition: cable broken / short-circuit

- Proportional valve
  Power limiting is not fuctional.
  Both pumps can no longer be adjusted via X3.
  In extreme cases, the diesel engine is overloaded when power is demanded.
- Hydraulic oil sensor
  In the LIFT mode, the pump output is reduced
- Coolant sensor
  In the LIFT mode, the pump output is reduced

Both conditions are sensed after a response time of 3 - 5 seconds by the ODC, automatically stored and displayed by an ERROR CODE appearing on the display screen.

Exception: Warm-up

- Hydraulic oil sensor and coolant sensor
  In this case, the response time after engine start is 5 minutes, the sensors not being able to distinguish between "Cable broken: yes / no" because of the high resistance of the sensors when the machine is cold. □

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Special Keys	
	To insert (text, to enter numbers).
	To delete (deletes the character under the cursor).
	Changeover key (alphabetical/numerical): the pilot light on the key indicates that letter mode is on.
	To switch on the display background illumination.
	Reset key; to move the cursor to the left and to delete the character left to the cursor.

Alphanumerical Keys	
	To enter numbers 0-9.
	To enter letters A-Z after pressing the changeover key.

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In case of leakage:

Tighten up bolts (5) evenly. Torque = 250 Nm (185 lbft). Otherwise change seal ring (2).

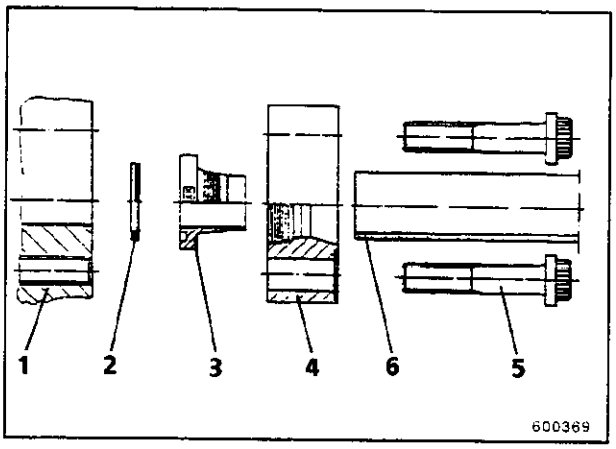


Fig. 5

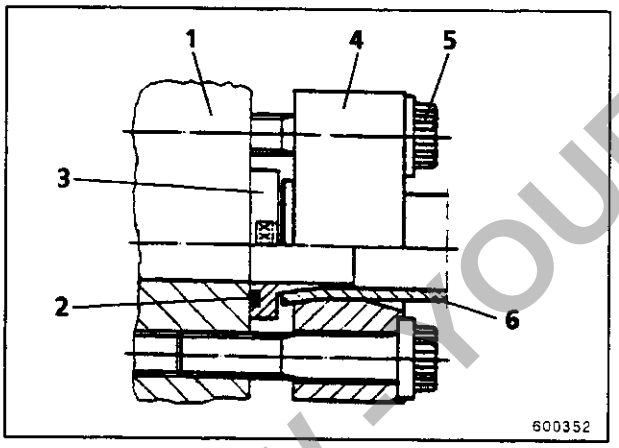


Fig. 6

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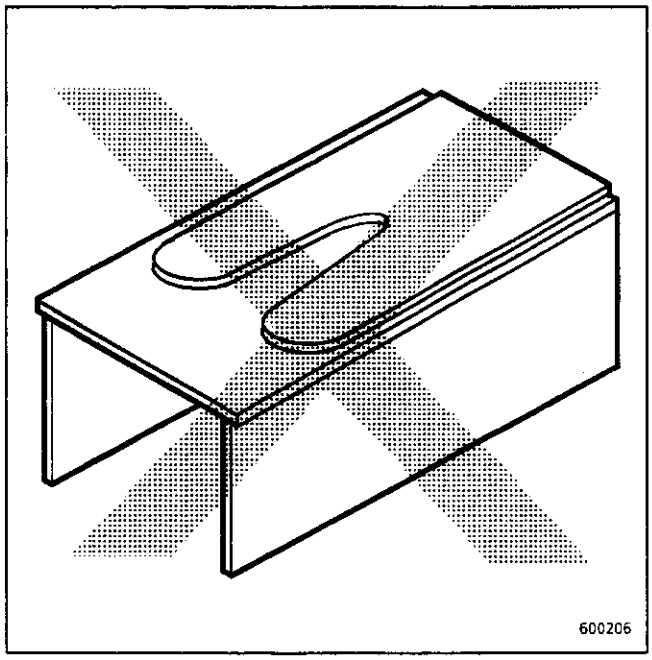


Fig. 8

4.1.3 Welding slots

In addition to the welding seams along the outer edges, the seams in welding slots are equally intended to enhance the connection of reinforcing plates (figs. 9 and 10).

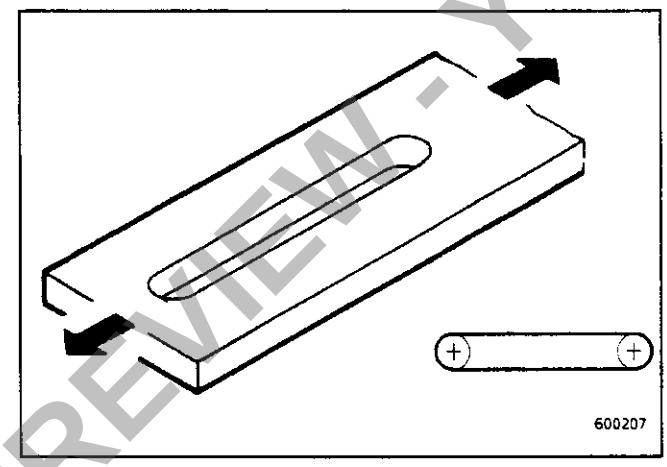


Fig. 9

Finish the ends of the slots by drilling stopper holes (fig. 9).

Slot width = 2 x plate thickness (fig. 9).

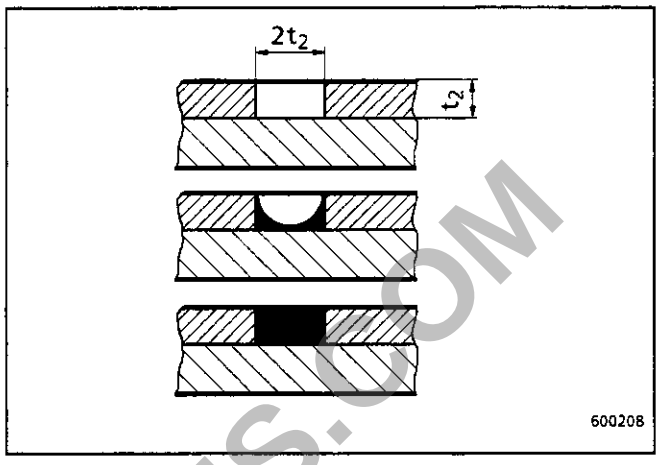


Fig. 10

The welding seams in the welding slots are ideal thrust connections between the reinforcing plate and the plate to be reinforced.

Circular welding holes are disadvantageous (fig. 11):

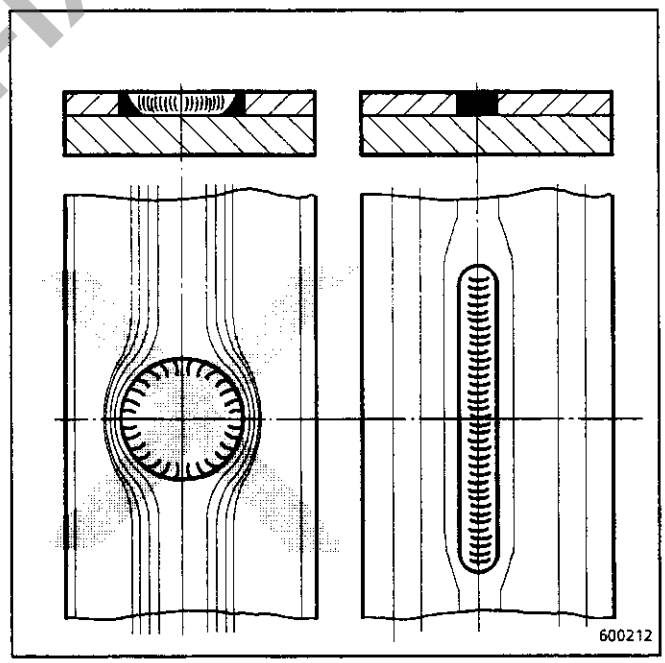


Fig. 11

The parts of the seam transverse to the lines of forces cannot bear any loads and can therefore not be considered for analysis.

The reinforcing plate's cross-section is strongly reduced.

The hole edges are subject to stress concentrations.

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