



ADJUSTING INSTRUCTION

Schulungszentrum

Tafel:

Name: Ro.

Datum: 0.94

1404 - Series 141 ...

1. Venting the system
2. Engine speed ,Load limit regulation
3. Measuring unions
4. Pilot controls
5. Power shift regulator
6. Pressure cut-off device
7. Secondary valves
8. Pressure adjustment table

General instructions:

- a) All adjustments must be made with an electronic measuring device. This must permit at least two pressure displays can be read off at once.
- b) Hydraulic fluid temperature must be 40° - 60° C.

The hydraulic system comes up to operating temperature by normal actuation of the individual operating movements, but the levers must only remain at their limit stops for brief periods.

- c) Before opening any drain plugs etc., relieve the preload pressure from the hydraulic fluid tank.
- d) Refer to the pressure adjustment table for relevant adjustment values.

SAFETY INSTRUCTION

Adjustment work is performed at high pressures. Take appropriate protective action, e.g. wear safety goggles. Refer to German accident prevention regulation VBG 1 Par. 4 or local equivalent.



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1. Bleeding the system

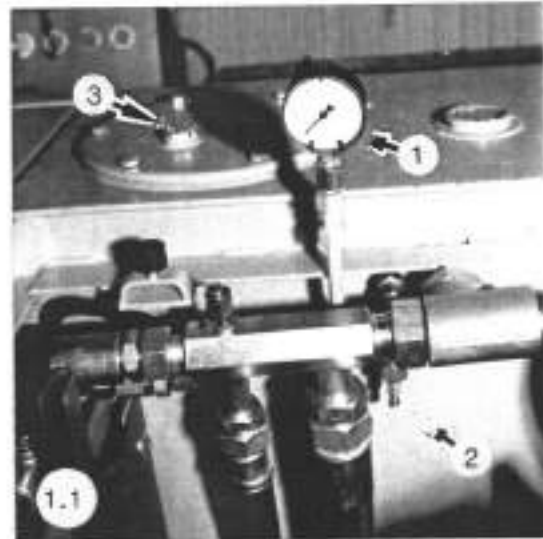
1.1 The system must be bled before starting up operation for the first time or after replacing the pump.

An external application of compressed air is necessary for bleeding purposes.

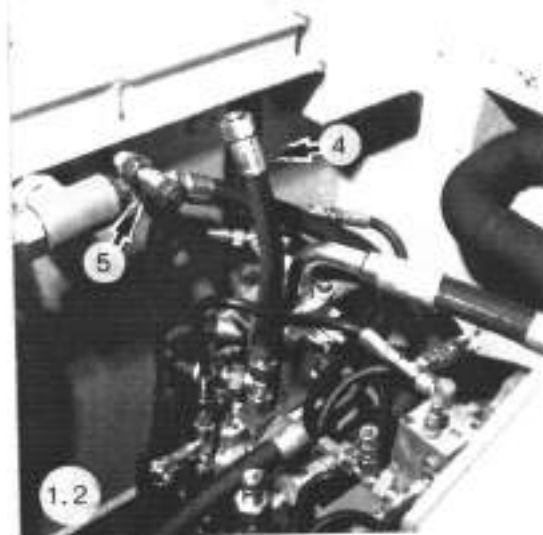
This takes place via the compressed air connection (2).

Important: The gauge display must not exceed 0,5 bar!

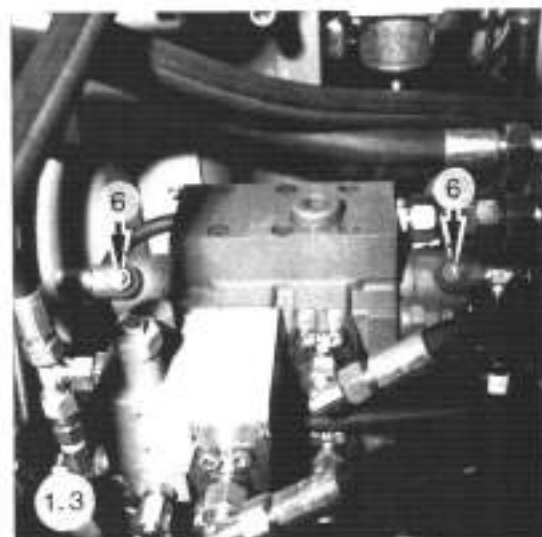
Compressed-air gauge (1) is not fitted, and must be installed for monitoring purposes. Undo bleed screw (3). Retighten it as soon as bubble-free hydraulic fluid starts to emerge.



1.2 Then bleed the pump. Unscrew the hose (4) and plug the adapter (5). Over the external application (2) compressed air has to be filled in until bubble-free hydraulic fluid starts to emerge. Release the compressed air from the hydraulic tank and connect the hose (4).



1.3 All valve caps must be bled before starting up operation for the first time. This is also necessary if the valve caps have to be opened during repair work. Valve caps are bled by undoing the relevant bleed screw (6). In case of bleed screws situated low down, the valve cap must also be undone.





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2. Engine speed

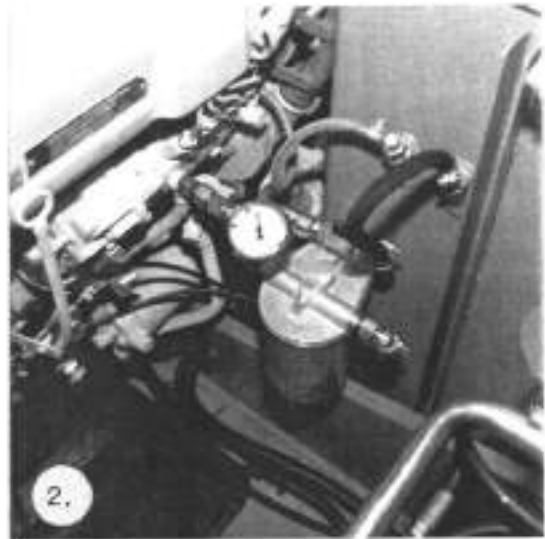
This check or adjustment is only required if a repair is carried out on the speed adjustment device or the electronics box is exchanged.

Connect up tachometer.

Check fuel delivery pressure on the injection pump:

Maximum engine speed - not under load = 0,5 bar.

Maximum engine speed - under load = 0,3 bar.



2.1 Minimum engine speed (1020 - 1070 rpm)

Start engine.

Move speed adjustment lever to learning point (A).

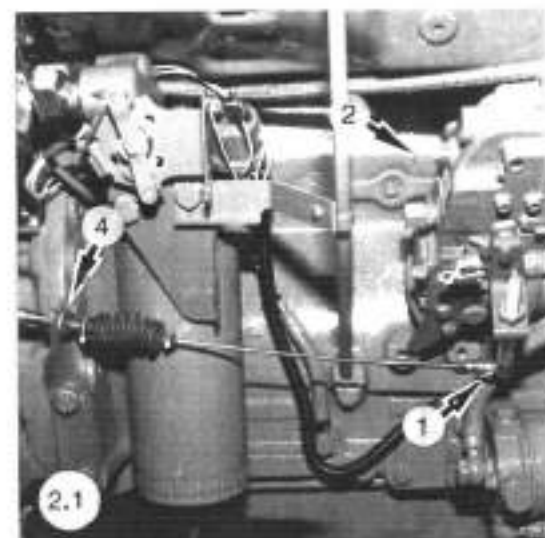
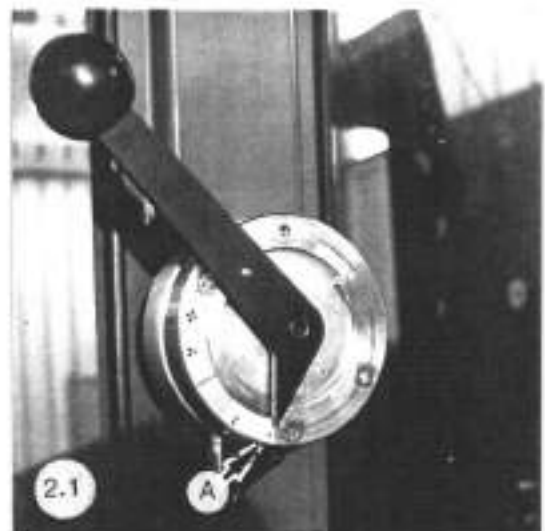
disconnect ball head (1).

The engine speed displayed must be 1020 - 1070 rpm.

Any correction required must be performed at the adjusting screw (2) on the injection pump.

Reconnect ball head (1) until there is no clearance.

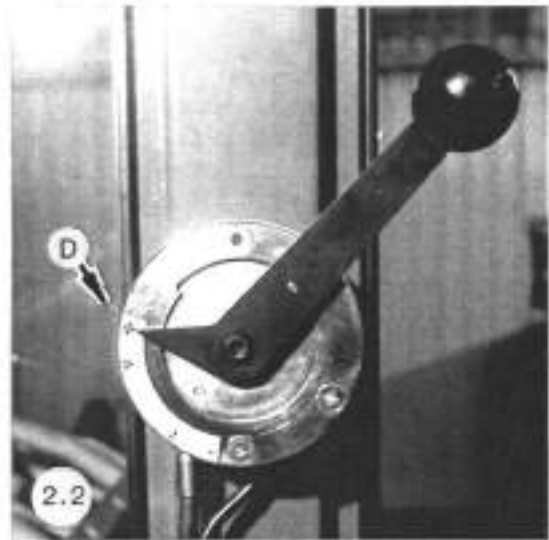
Any correction required must be performed using the adjusting nuts (4).





2.2 Maximum engine speed
(2400 - 2450 rpm)

Move speed adjustment lever to learning point (D).

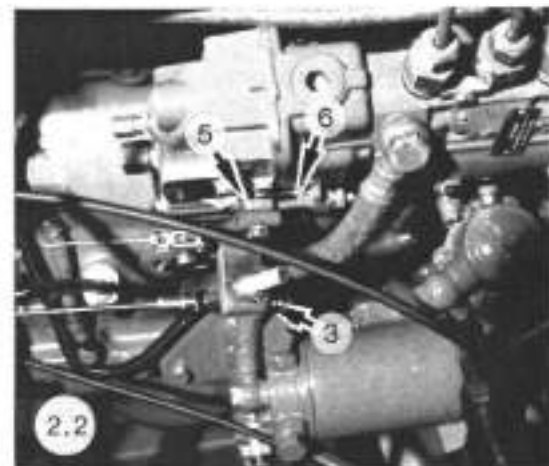


Lever (5) must make contact with detent screw (6).

If this position is not reached, check the basic setting of the adjusting screw (3).

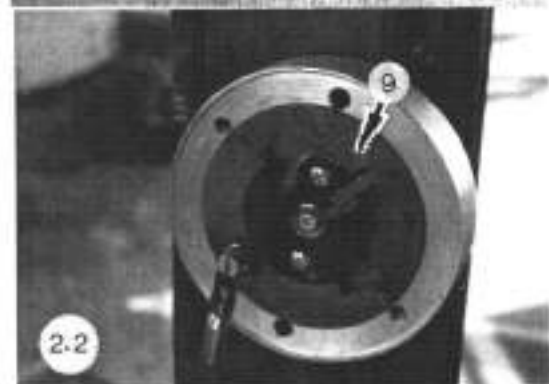
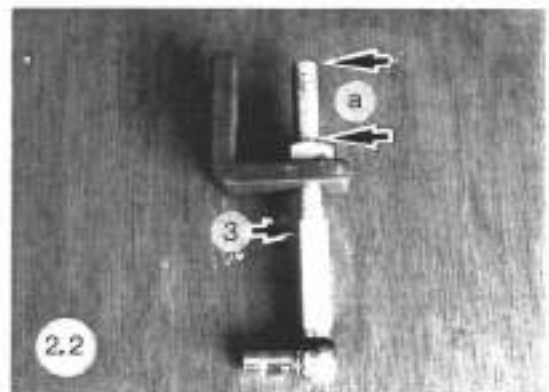
Basic dimension a = 33 mm

If a correction is required, turn lever (5) counter-clockwise until it contacts the detent screw (6).



NOTE: If the wire cable is replaced, please observe the following points:

1. Route wire cable without twisting.
2. Cut the wire cable directly behind the clamping screw in the speed adjustment unit.
3. During assembly, ensure that drive plate (9) is in the correct position.
4. Check basic dimension a = 33 mm.





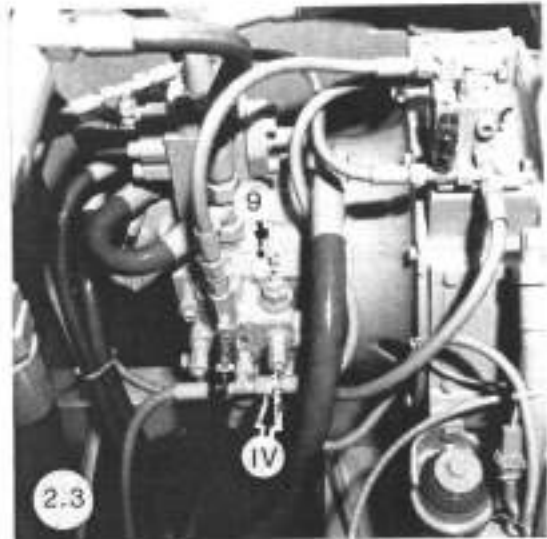
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2.3 Check load limit regulator valve and teach position into electronics box.

Connect electronic measuring device to measuring union (IV).



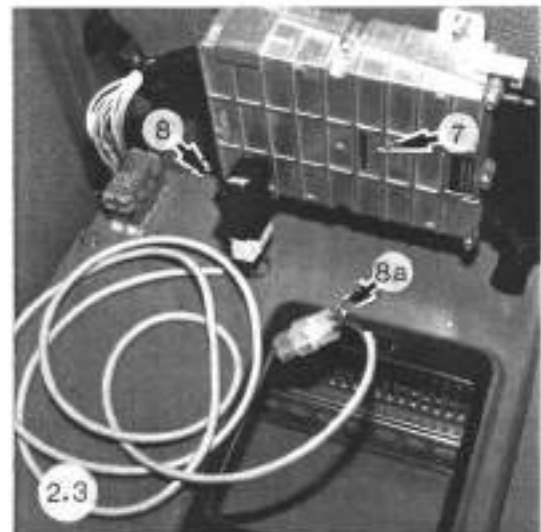
Connect learning switch (8) to connector (8a).

Move ignition key into „ON“ position.

The red LEDs (7) in the electronics box must light up (1-8).

LEDs 1 and 8 light up after 3 - 4 seconds whenever the electronic box is exchanged (not otherwise).

8 = learning phase
1 = speed sensor



Start engine.
LED 1 goes out.

Move speed adjustment lever to learning point (A).

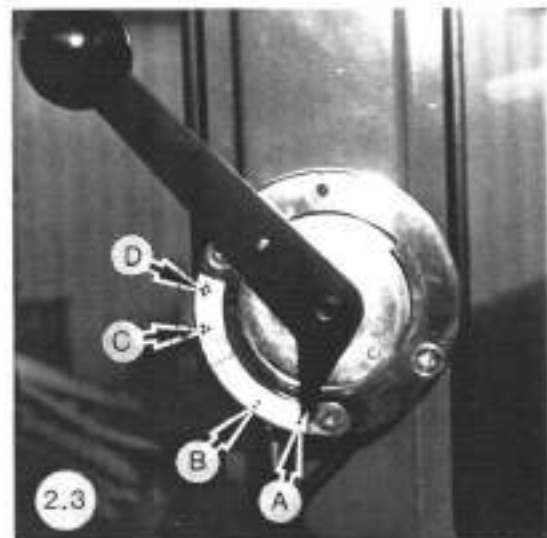
Depress learning switch (8) for approx. 10 seconds until inspection light in learning switch lights up.

A specified constant control current from the electronics box (300 mA) controls the load limit regulator valve.

The displayed control pressure drops to approx. 2 - 5 bar, then rises slowly to the adjustment value of $8,5 \pm 0,2$ bar plus tank preload.

If this value is not achieved (or is exceeded), corrections can be made at the adjusting screw (9).

When the learning switch (8) is depressed, this learning step is acknowledged: indicator lamp in learning switch (8) flashes once.





Press learning switch (8) (approx. 1 second). Learning step is acknowledged by double flash from indicator lamp in learning switch (8).

- set to learning point (8) and press learning switch (8) once again. Learning step is acknowledged by triple flash.

- set to learning point (C) and press learning switch (8) once again. Learning step is acknowledged by four flashes.

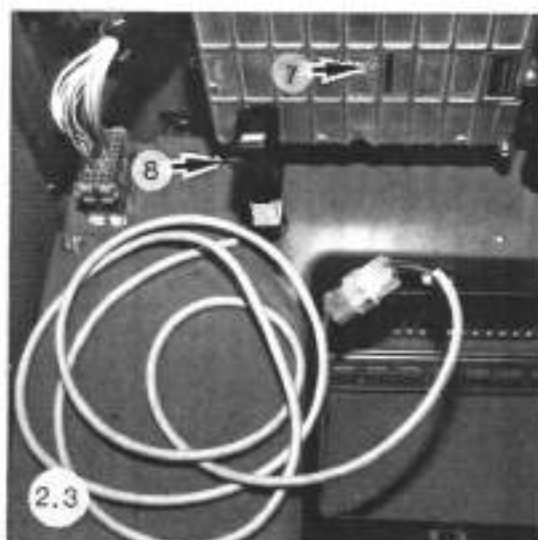
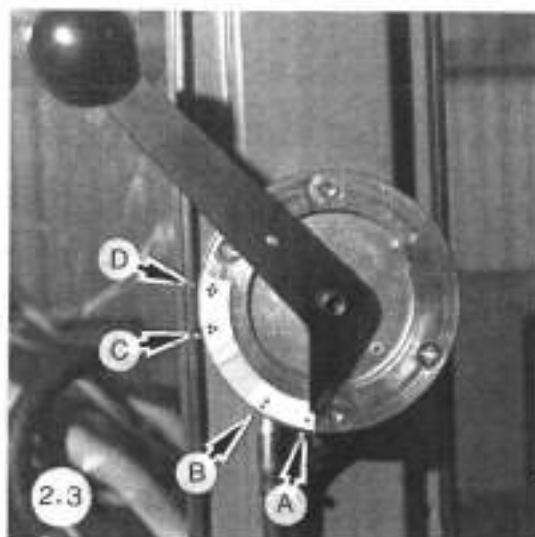
- set to learning point (D) and press learning switch (8) once again. Learning step is acknowledged by one extended flash.

LED - 8 (7) goes out. The learning phase is now over.

There is an option to interrupt the learning phase at any stage.

To do this, press the learning switch (8) until the indicator lamp in the learning switch (8) goes out. Keep depressed until the indicator lamp goes out. Now restart the learning phase as described in 2.3.

If the system refuses to accept any learning steps, this is indicated by a constant flashing.





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2.4 Error diagnosis

Can only be performed while engine is running!

Not all faults in the electronics unit and the load limit regulation system are displayed by a continuous light at the indicator lamps (GLR) on the display panel.

Fault displays are issued automatically; the appropriate LED in the cover of the electronics box lights up. It is possible to perform accurate troubleshooting on the basis of the LED number.

Once the ignition key has been switched into position "ON", this is usually followed by a bulb test of the diagnosis LEDs.

Troubleshooting table

Display is shown from top to bottom.

LED	Component	GLR indicator lamp
8	Electronics box learning phase not completed or faults occurred during the learning phase	lights up (flashing)
7	Signal, output load limit regulation on error message indicator lamp (GL.),	-
6	pressure swith - emergency control Power shift solenoid, load limit regulator valve	lights up
5	Electronics box	lights up
4	Voltage supply, potentiometer for speed adjustment lever , potentiometer fine mode	lights up
3	-	-
2	Pressure switch - driving, kickdown switch	-
1	Speed sensor	lights up

Note on diagnosis processes:

LED 8 (23)

This LED indicates various faults. The following faults are displayed by flashing in different ways.

- 1 flash = Minimum engine speed outside tolerance range
- 2 flashes = Maximum engine speed outside tolerance range
- 3 flashes = Engine-speed potentiometer voltage outside tolerance range
- 4 flashes = Engine-speed potentiometer faulty

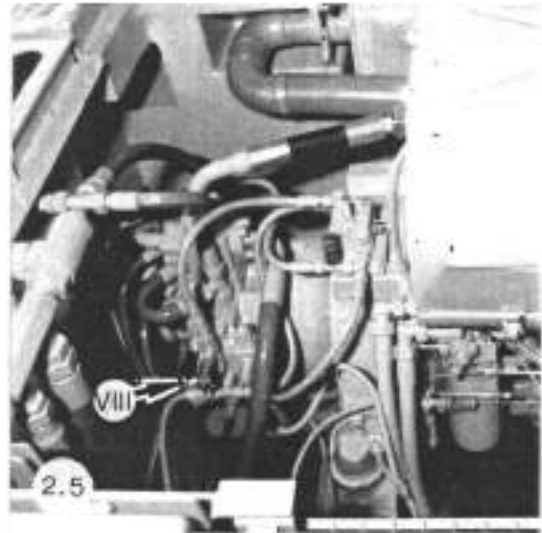
LED 2

The LED comes on for approx. 3 seconds when the contacts are opened or closed.



2.5 Emergency shift

Connect electronic measuring device to measuring union (VIII).



Ignition key in position „ZERO“.
Remove connector (9) from load limit regulator valve or connector (9a) from the electronics box.



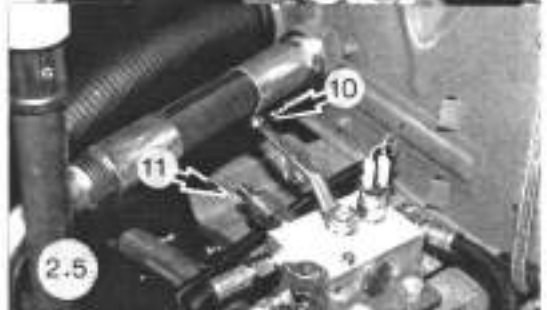
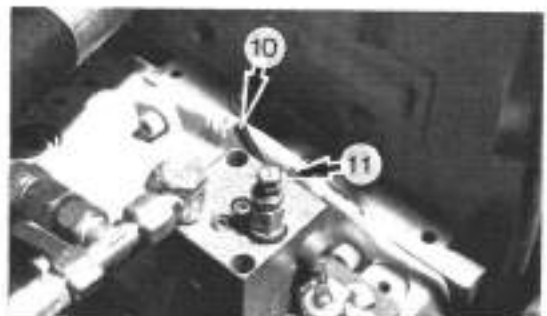
Switch on emergency shift using lever (10).

Switch on engine.

Corrections are made by screwing in or unscrewing the adjusting screw (11).

Stop engine.
Move ignition key into „ZERO“ setting.

Attach connector (9) and switch off emergency shift unit using lever (10).





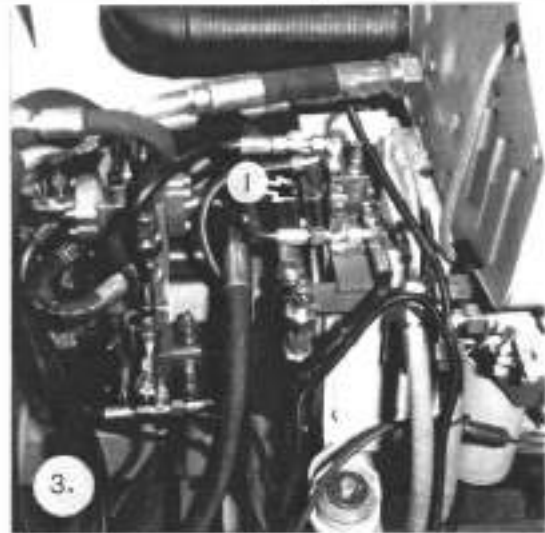
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3. Measuring unions

I - Pilot control



II - Pump

III - Power shift pressure



IV - Load limit pressure regulating valve

V - X pressure - pump

VI - Steering

VII - Delivery pressure / return pressure

VIII - Emergency shift



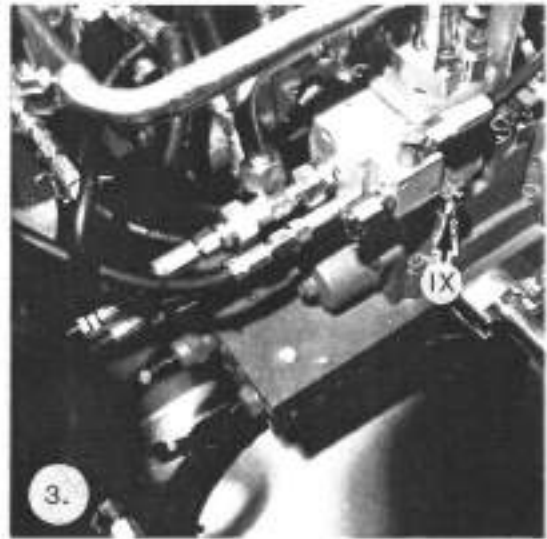


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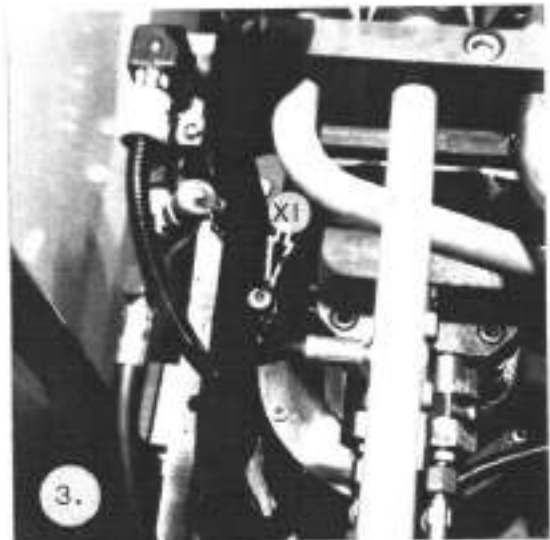
IX - Leak-free shut-off
„raising”



X - Leak-free shut-off
actuating ram „Extending”



XI - Slewing brake





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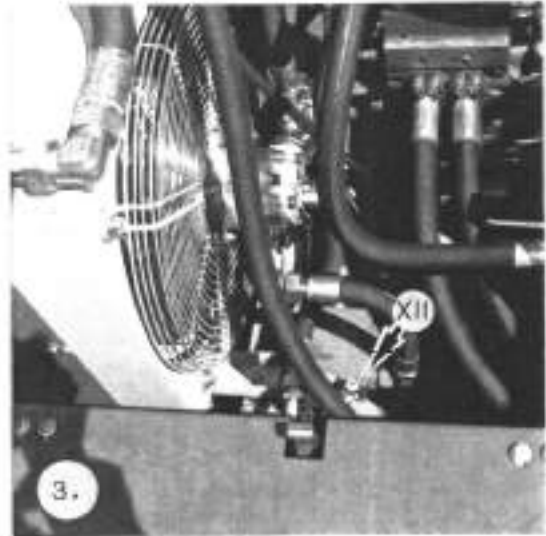
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XII - Fan pump



XIII - Overload warning device





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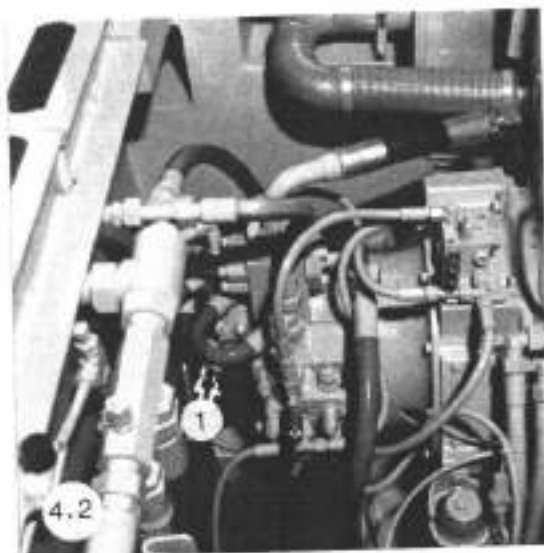
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4. Pilot control

- 4.1 Connect electronic measuring device to measuring union (1).



- 4.2 Corrections are made by screwing in or unscrewing the adjusting screws (1).





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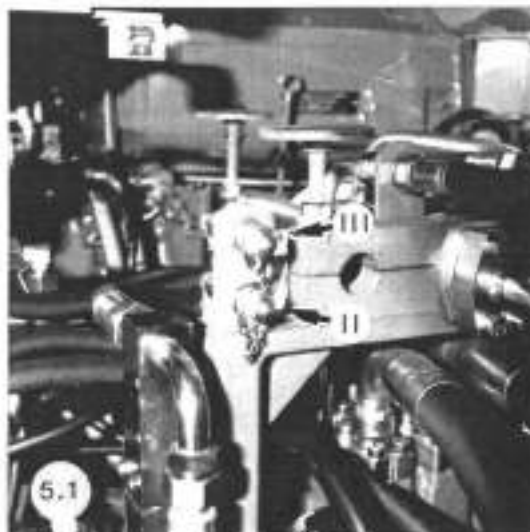
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5. Power shift regulator
- 5.1 Connect electronic measuring device to measuring unions (II and III).



Start the engine and select max. engine speed. Boom equipment extended. Switch on button (Δp) on the electronic measuring device. Slowly select „Raising“ and read off pressure (Δp). The power shift regulator is adjusted at screw (1).



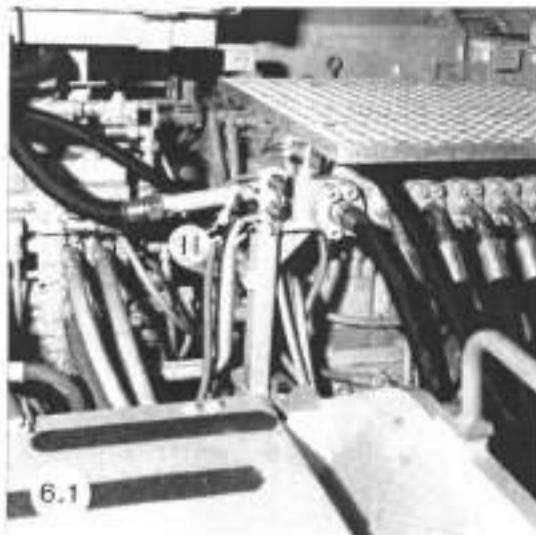


6. Pressure cut-out

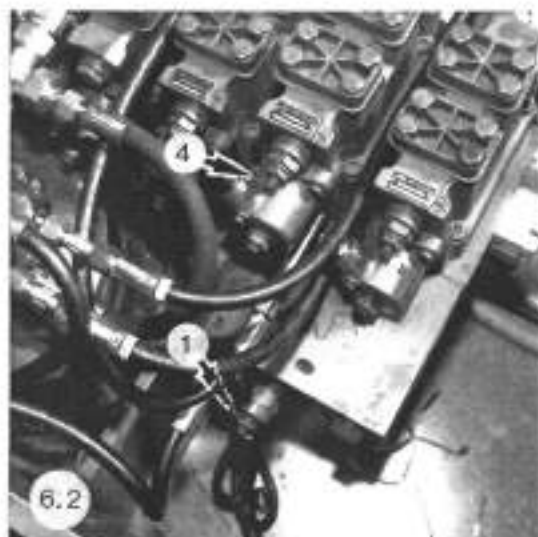
6.1 Connect electronic measuring device to measuring union (II).

Start engine and select max. engine speed.

With „Close grab“ function, move up to stop and hold position. The adjustment value on the pressure cut-out unit (1) is displayed. Corrections are made by screwing in or unscrewing the adjusting screw on the pressure cut-out device (1).



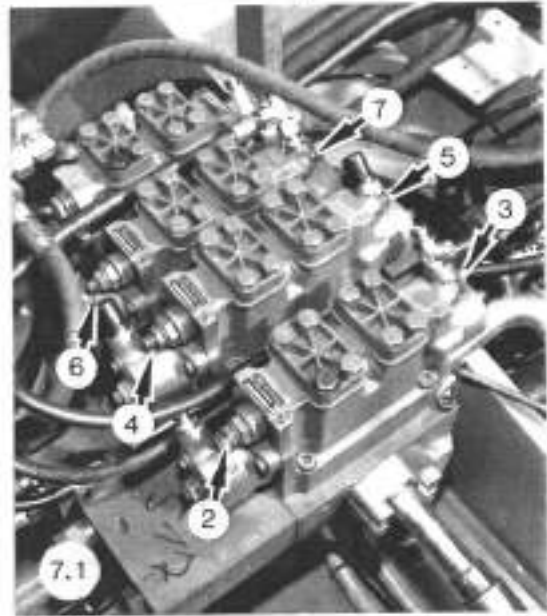
6.2 „Raising“ pressure cut-out device. With „Close grab“ function, move up to stop and hold position. The adjustment value on the pressure cut-out device is then displayed. Slowly screw in adjusting screw on pressure cut-out device until adjustment value on secondary valve (4) is displayed. Screw in adjusting screw on secondary valve (4) one complete turn. Screw in the adjusting screw of the pressure cut-out device (1) until adjustment value on secondary valve (4) is displayed. Tighten down adjustment screw on secondary valve (4) one complete turn. Screw in adjustment screw of pressure cut-out device (1). (20 bar above the maximum setting for secondary pressure).





7. Secondary valves

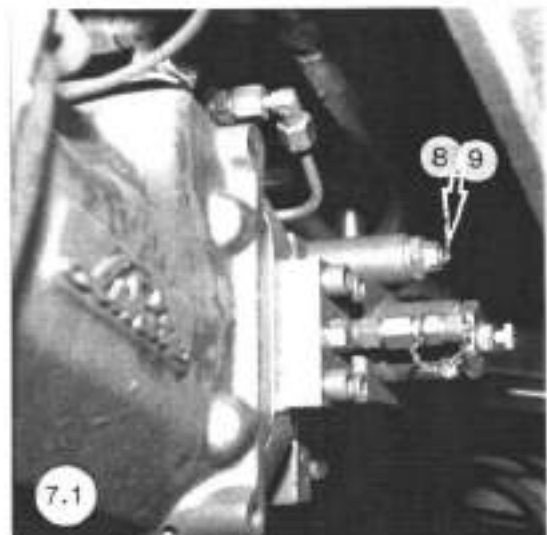
7.1 Inspection or adjustment is performed at minimum engine speed. At this point, all the secondary valves listed below can be checked and/or adjusted.



- 2 Raising
- 2a Raising - leak-free shut-off
- 3 Lowering
- 4 Closing grab
- 5 Opening grab
- 6 Folding in
- 7 Folding out



- 8 Driving - wheeled excavator
- 9 Driving - tracked excavator



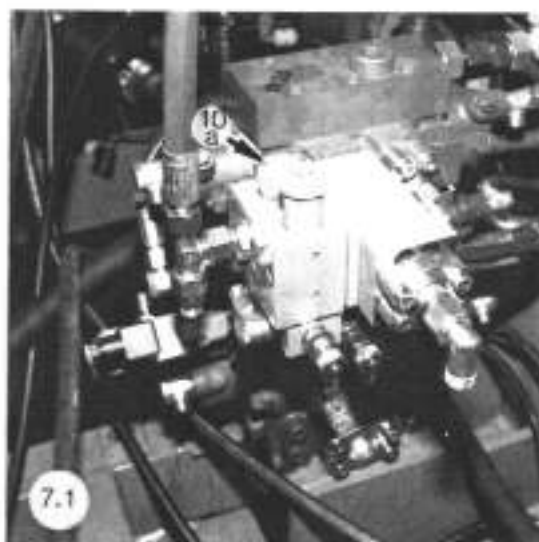
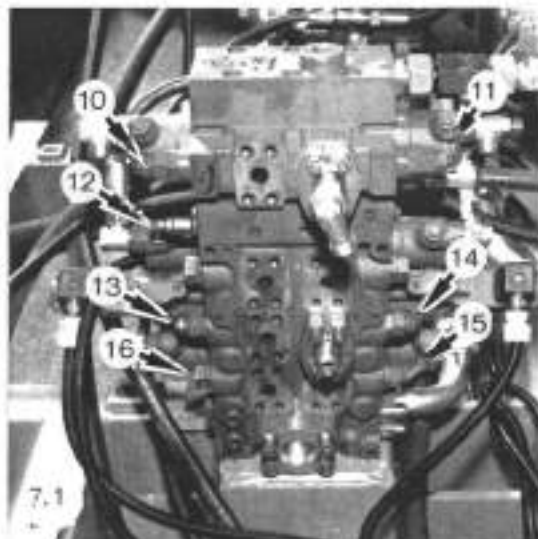


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- 10 Extend actuating ram
(driving - tracked excavator)
- 10a Extending actuating ram
- leak-free shut-off
- 11 Retracting actuating ram
(driving - tracked excavator)
- 12 Slewing - TC plate
- 13 Rotating grab - left
- 14 Rotating grab - right
- 15 Grading - raising
(driving - tracked excavator)
- 16 Grading - lowering (without)
(driving - tracked excavator)



10, 11, 15, 16 driving - tracked excavator.
On both sides in each case.

