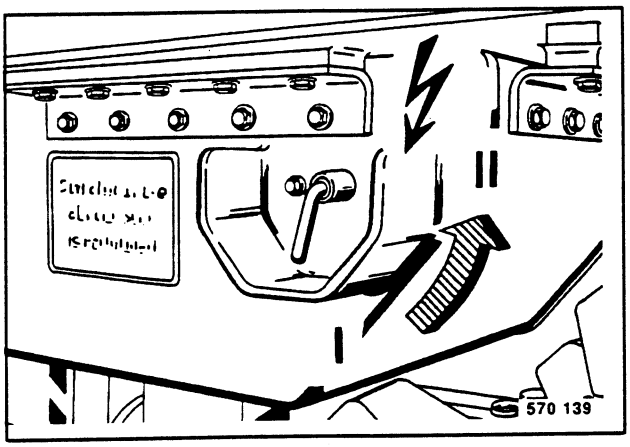



Fig. 1

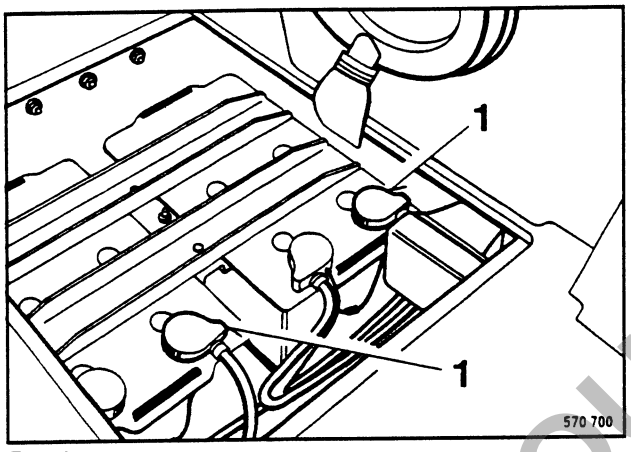



Fig. 2

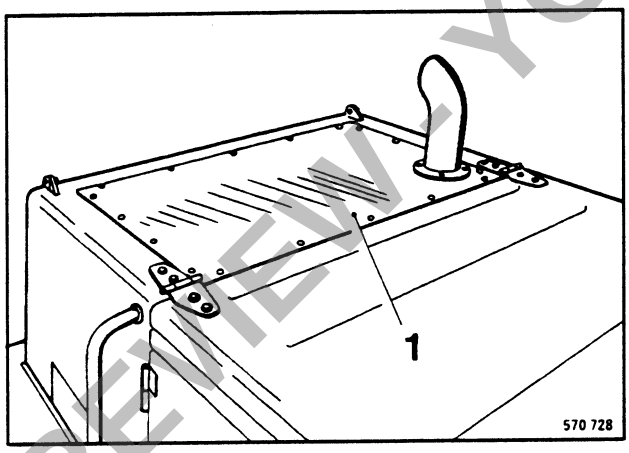



Fig. 3

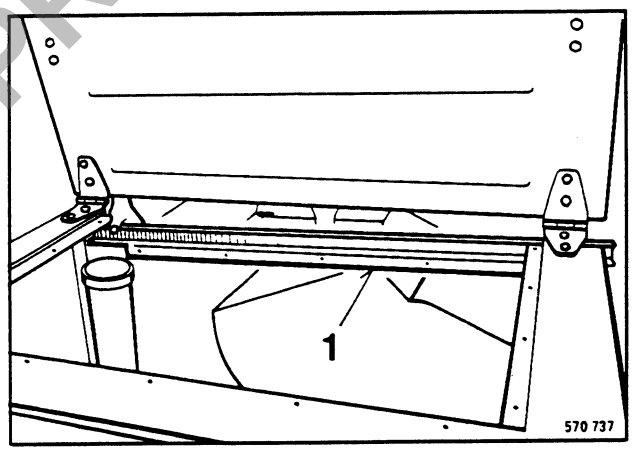



Fig. 4

## 2.03 Removing and Installing the Engine

**Special Tools:**
Lifting tackle, 2 long eye bolts, vacuum pump
**Installation Weight:**
Engine 1300 kg

**Note for Installation:**
To prepare the engine for operation refer to the corresponding chapter.

1. Set the battery disconnector to position II (Fig. 1) or disconnect the batteries.

**Note**

*If no battery disconnector is installed, open the battery compartment cover. Remove the protective cover 1 (Fig. 2) and disconnect the terminal clamps 1 (Fig. 2) from the minus poles of the batteries.*

**Danger**

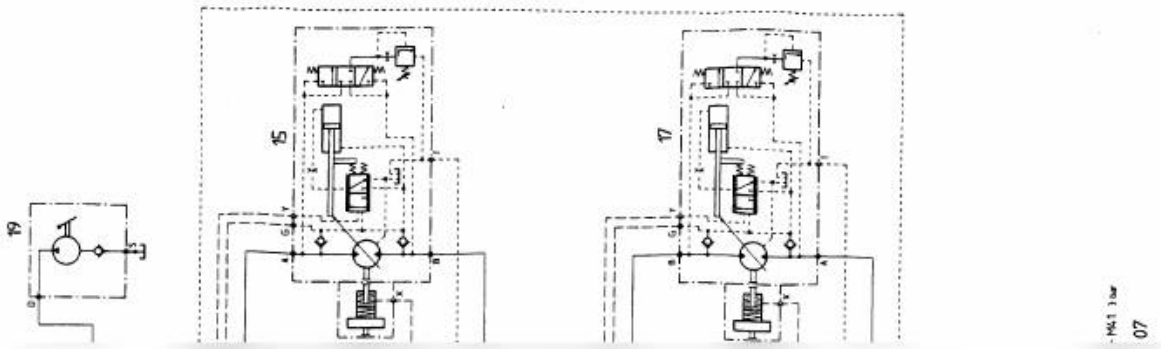
**When working on the batteries no open fire, do not smoke! Do not let skin or clothes get in contact with acid! Wear protective goggles! Do not place any tools on the batteries.**

2. Dismount the upper 1 (Fig. 3) and lower covers.

3. Remove the channel bar 1 (Fig. 4).

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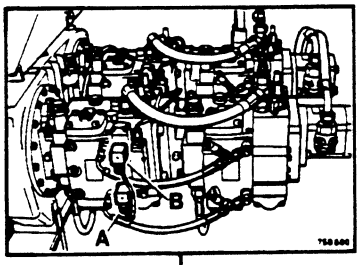



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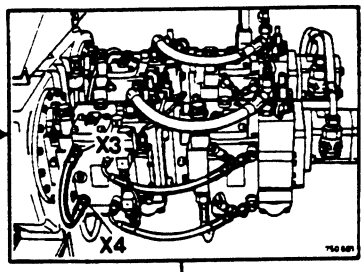
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Machine moves with the travel lever in "neutral"




Check the control current to the solenoids
- Disconnect the plugs from the solenoids of the control one after the other

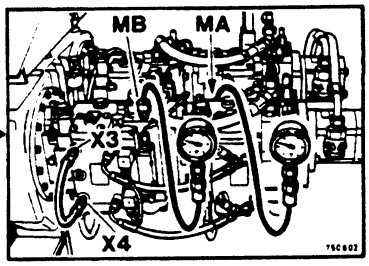
Machine stops?
no
yes




Check the neutral position of the pump
- Connect the control chamber ports X3 and X4 of one pump with a hose
- Start the engine
- Repeat this test on all other pumps

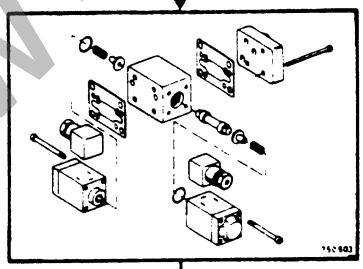
Perform trouble shooting in the electric system

Machine stops?
no
yes




Check, adjust the mechanical neutral position
- Connect the control chamber ports X3 and X4 with a hose
- Install 600 bar pressure gauges to MA and MB
- Check which pump delivers
- Adjust the neutral position on this pump until the pressure is lower than 60 bar
- Repeat the test and adjustment with 60 bar pressure gauges until the lowest possible value is obtained
- Remove the connecting hose and repeat the pressure test

Check the control unit
- Remove the control unit
- Test the moveability of the control piston



Exchange the control unit

Control unit OK?
no
yes

Replace/ repair the travel pump

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**Torques for bolts with metric unified threads**

| Dimension of bolt | Torques Nm* (ft-lb) | | |
|---|---|---|---|
| | 8.8 | 10.9 | 12.9 |

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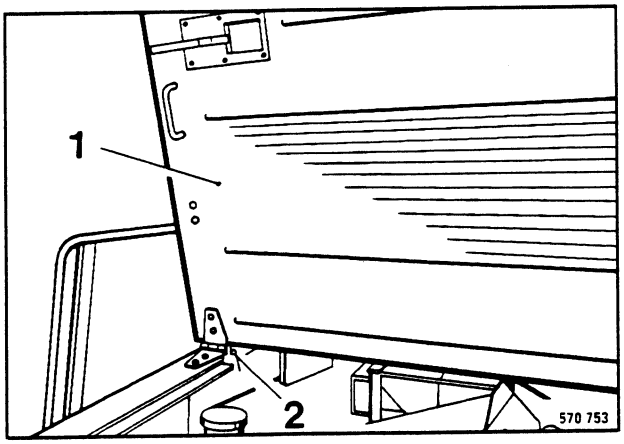


Fig. 5

4. Attach the lifting tackle to the rear engine compartment cover 1 (Fig. 5). Detach the shock absorbers. Unscrew the mounting bolts from the hinges 2 (Fig. 5) and take the cover off.

**Danger**

**Do not step or work under loads being lifted.**

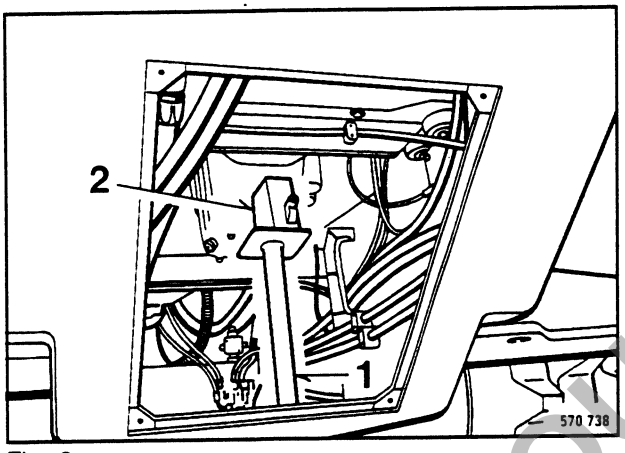


Fig. 6

5. Support the rear of the engine by placing an appropriate jack 1 and 2 (Fig. 6) under the SAE-flange.

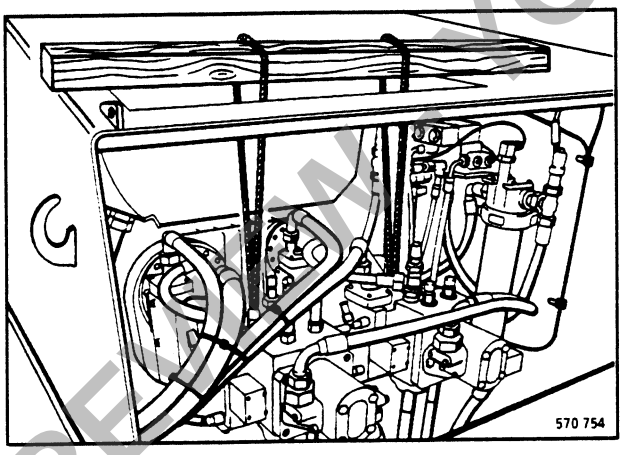


Fig. 7

6. Place a girder above the travel pumps. Attach the lifting tackle to the lifting eyes on the travel pumps and tension it.

**Danger**

**Danger of injury!**

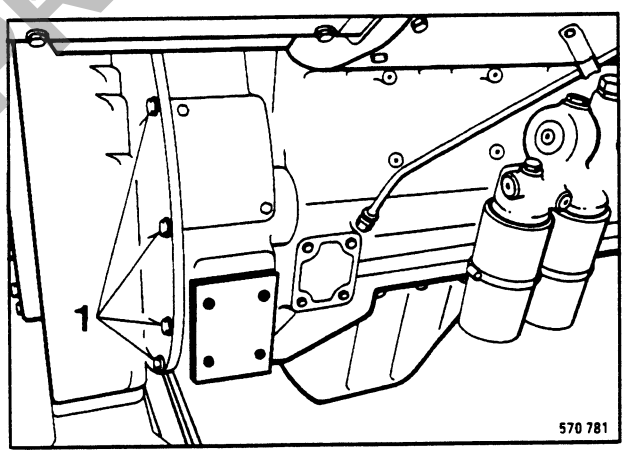


Fig. 8

7. Unscrew the mounting bolts for the distributor gear from the SAE-flange.


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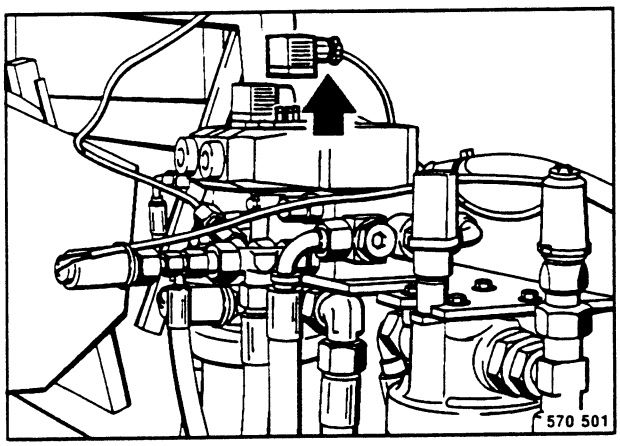


Fig. 1

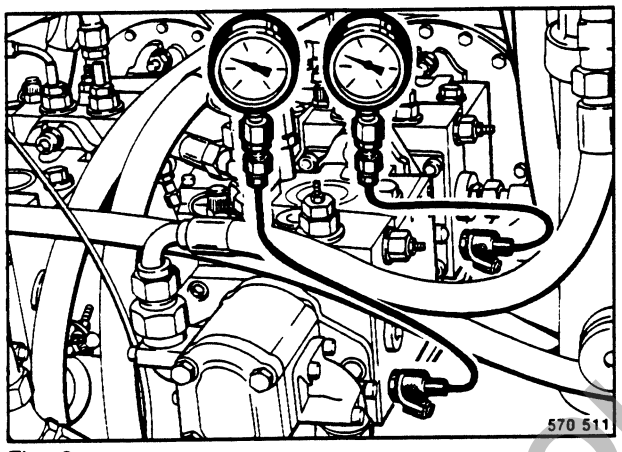


Fig. 2

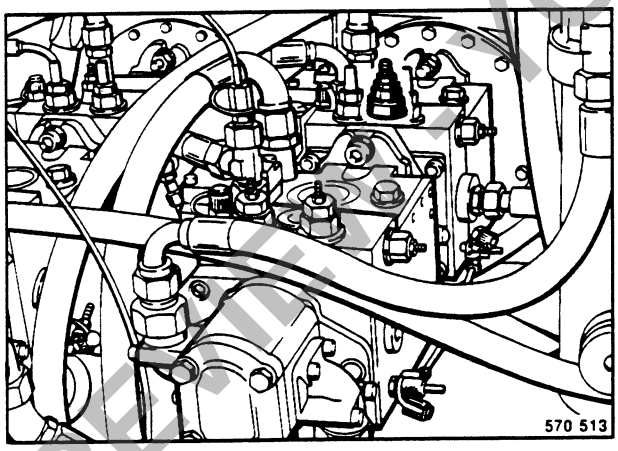


Fig. 3

## 4.06 Checking the Setting of the DA-Control Valve

1. Drive the machine until operating temperature is achieved.

2. Pull the plug (Fig. 1) off the solenoid valve for the brake, in order to keep the brake applied.

3. Select the 2nd speed range.

4. Install 600 bar pressure gauges to always two high pressure test ports (MA resp. MB) on each tandem pump (Fig. 2).

5. Start the diesel engine and raise the engine speed to 1150 rpm. Select travel direction forwards and read the pressure gauges.

   **Note**
   *Do not operate the foot brake or the emergency stop.*

   **Nominal value:**
   High pressure at an average of 50 bar

6. Raise the engine speed to 1850 rpm.

   **Nominal value:**
   High pressure 410 to 420 bar

7. In case of deviations from the nominal values, the pressure must be corrected on the DA-control valve (Fig. 3).

   **Note**
   *Turning clockwise = control start at a higher engine speed.*
   *Turning counter clockwise = control start at a lower engine speed.*

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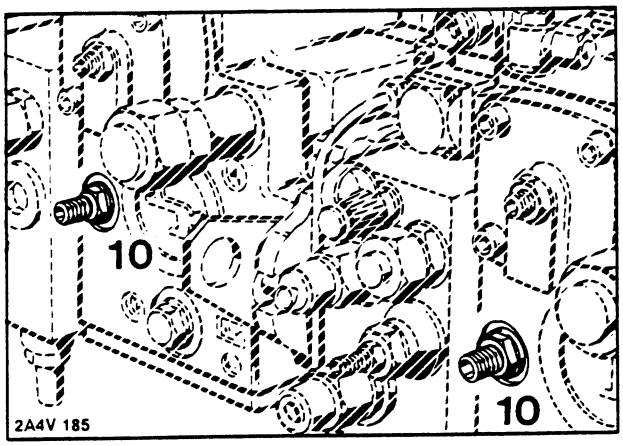



Fig. 1

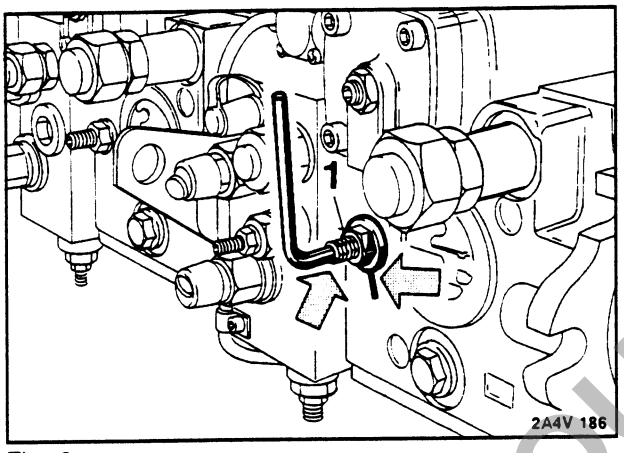



Fig. 2

## 4.22 Sealing the timing screw 10 (Fig. 1).

1. Mark the position of the groove in the timing screw to the housing.

2. Hold the timing screw and change the seal-lock nut 1 (Fig. 2).

**Caution**

**Do not alter the setting of the timing screw.**

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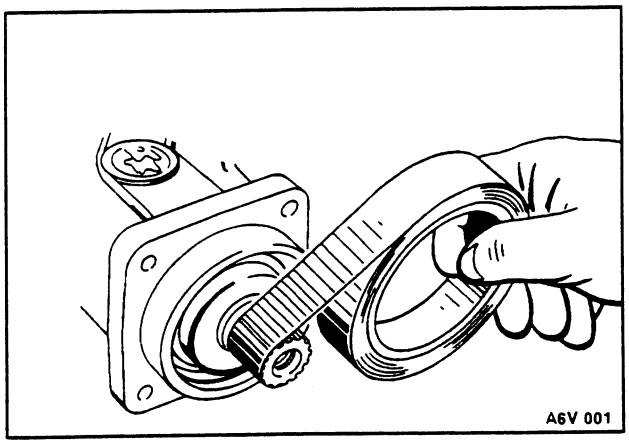



Fig. 1

## 4.37 Sealing the drive shaft

1. Cover the splined section of the drive shaft with adhesive tape to prevent the new radial seal from being damaged (Fig. 1).

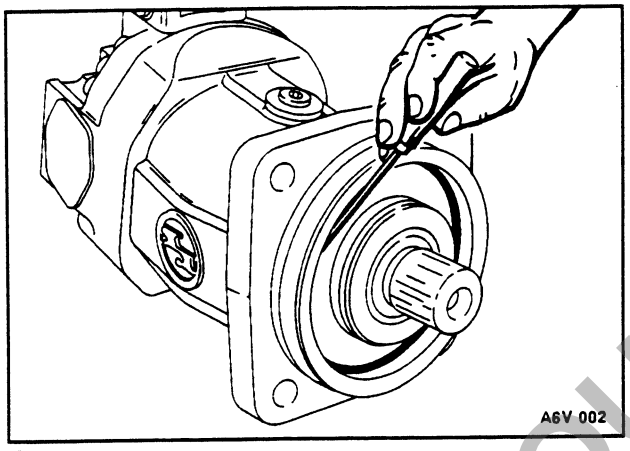



Fig. 2

2. Take the snap ring out (Fig. 2).

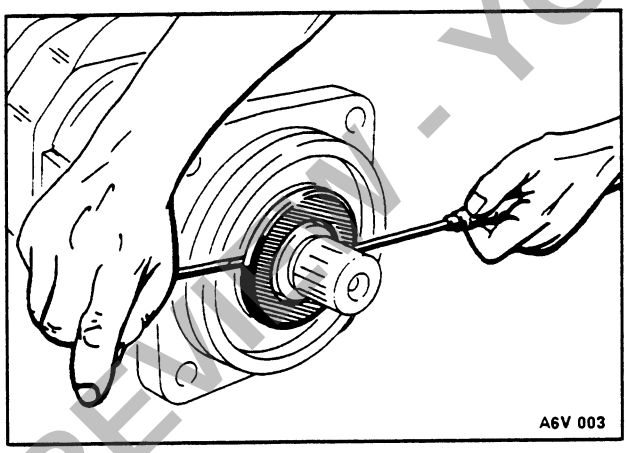



Fig. 3

3. Force the locking ring out (Fig. 3).

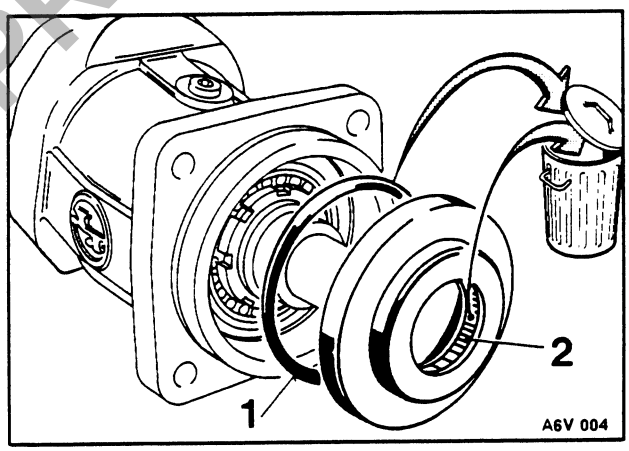



Fig. 4

4. Remove the O-ring 1 (Fig. 4) and the radial seal (2).

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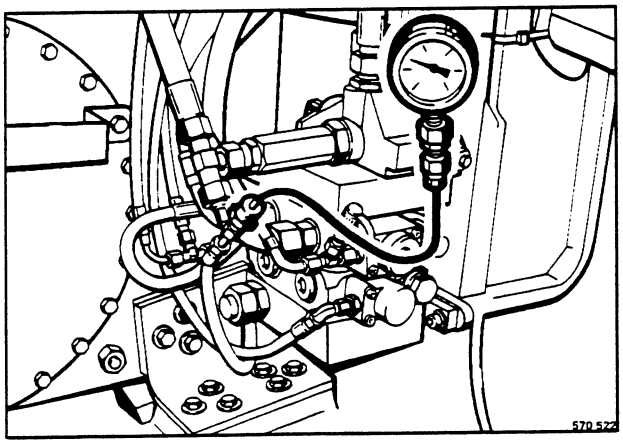



Fig. 1

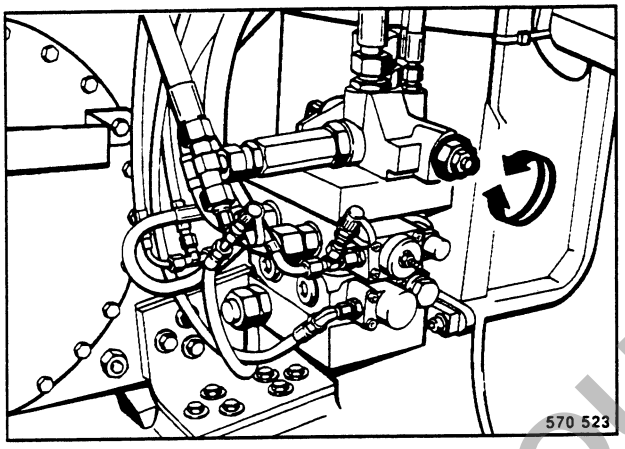



Fig. 2

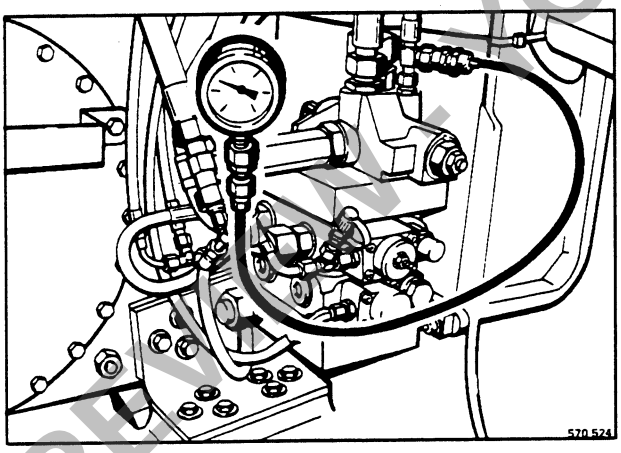



Fig. 3

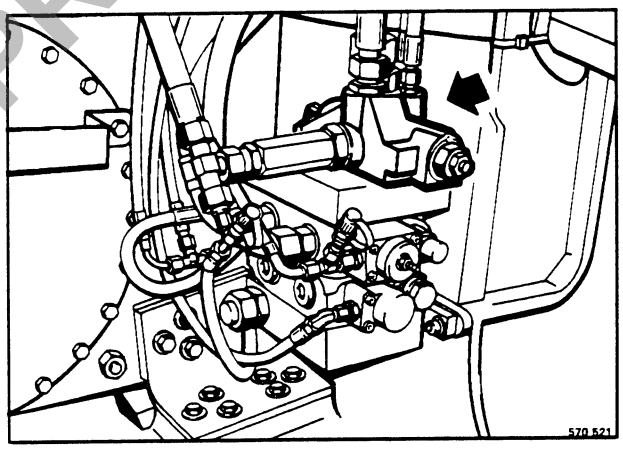



Fig. 4

## 6.05 Checking the Steering Hydraulics and the Steering pressure

1. Install a 600 bar pressure gauge to the steering pressure test port (Fig. 1).

2. Start the diesel engine and turn the steering to one of the end positions.

3. Read the pressure gauge

   **Nominal value:**
   190 bar

4. In case of deviations adjust the pressure relief valve (Fig. 2).

## Checking the Load Signal from the Steering Valve

1. Install a test port with a 600 bar pressure gauge to the connection X (Fig. 3) on the priority valve.

2. Actuate the steering with the engine running and read the pressure gauge. Depending on the load the pressure must raise up to 190 bar.

   **Analysis of test:**
   If no pressure increase can be noticed, check and if necessary replace the steering valve.

## Checking the Priority Valve

1. Lift the dozer blade and actuate the steering.

   **Note**
   *If the steering does not move, replace the priority valve (Fig. 4).*

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1 Grub screw
2 Piston rod
3 Cylinder tube
4 Guide
5 Dirt scraper
6 Guide ring
7 Seal ring
8 O-ring
9 Back-up ring
10 Piston
11 Intermediate ring
12 O-ring
13 Locking wire

## Disassembling

1. Unscrew the grub screw 1 (Fig. 1) from the cylinder tube 3 (Fig. 1).
2. Unscrew the guide 4 (Fig. 1) by using an appropriate spanner.
3. Pull the piston rod out of the cylinder pipe.
4. Remove the locking wire 13 (Fig. 1) and unscrew the piston 10 (Fig. 1) from the piston rod 2 (Fig. 1).
5. Mark the position of all seal rings and remove seal rings, guide rings and scraper.
6. Check all parts for wear and replace them if necessary.

## Assembling

1. Install new parts into the guide by observing the correct assembly positions:
   O-ring 8 (Fig. 1)
   Back-up ring 9 (Fig. 1)
   Guide rings 6 (Fig. 1)
   Dirt scraper 5 (Fig. 1).
2. Insert the O-ring 12 (Fig. 1) into the piston.
3. Cover the parts with oil.
4. Push the preassembled guide 4 (Fig. 1) onto the piston rod.
5. Screw the piston 10 (Fig. 1) onto the piston rod and secure it with the locking wire 13 (Fig. 1).
6. Install the intermediate ring 11 (Fig. 1) to the piston.
7. Cover the inside of the cylinder tube with oil.
8. Insert the preassembled piston rod carefully into the cylinder tube 3 (Fig. 1). Do not damaged the seal rings.
9. Screw the guide 4 (Fig. 1) in and tighten it.
10. Install a new grub screw 1 (Fig. 1).
11. Close the connection bores on the cylinder tube with suitable plugs.

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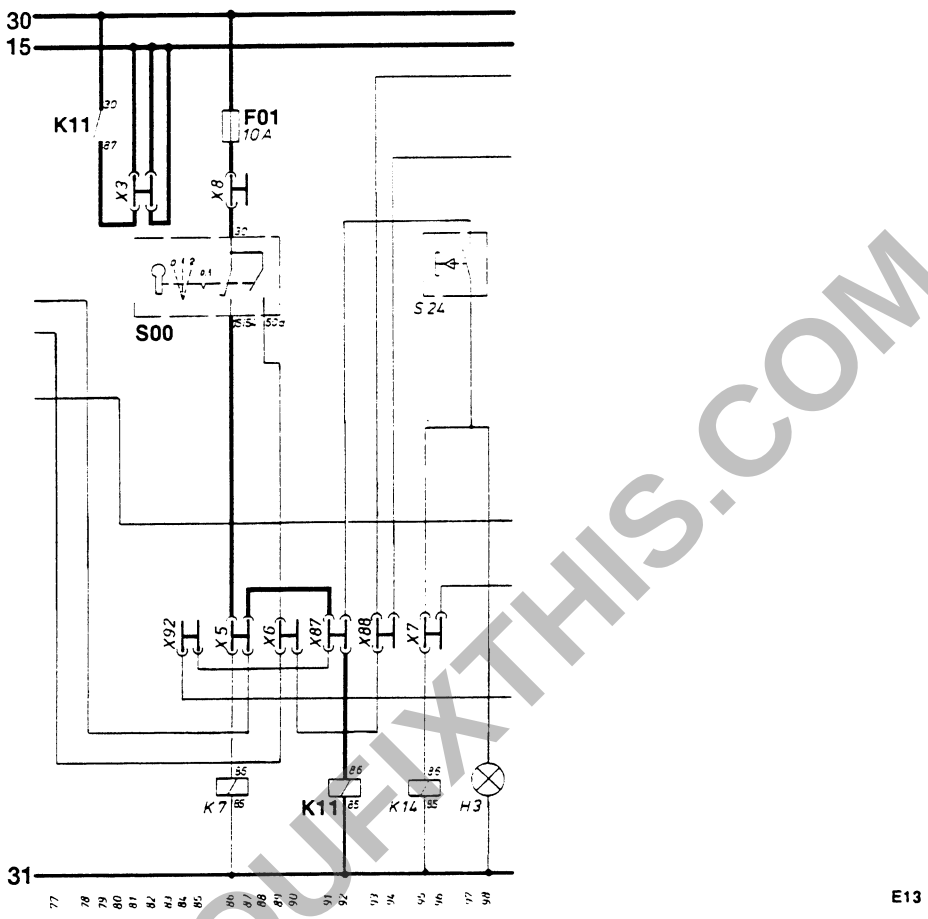



Fig. 2

K11 Relay terminal 30 to 15
F01 Fuse for ignition switch
S00 Ignition switch

## Ignition switch (S00) in position "1" (ignition on).

- The voltage supply for the ignition switch (S00/86) is provided from terminal 30 via fuse (F01/86) and connector (X8/86).
- From the ignition switch (S00/86) to connector (X5/86),
- via a bridge to connector (X87/92) and to the coil of relay (K11/92).
- The contact (K11/78) is closed,
- terminal 30 is connected with terminal 15 via the connector (X3/82). All elements connected to terminal 15 will be supplied with current.

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## 8.13 Trouble shooting heating system

### Heater switched on, heater does not ignite, blower motor does not run

**Check:**

- Fuse (F3)
- Fuse in the control unit (A13)
- Glow plug
- Voltage to control unit terminal 4
- Voltage to switch (S28)

### Blower motor runs for max. five seconds, then heating shuts off

**Check:**

- Overheating protection switch

### Blower motor runs for max. 20 seconds, then heating shuts off

**Check:**

- Voltage on control unit during start

### Blower motor runs, fuel metering pump (Y14) runs, heating shuts off after three minutes

**Check:**

- Temperature switch
- Fuel line and filter
- Fuel level in tank

### Blower motor runs, fuel metering pump does not work

**Check:**

- Voltage to pump
- Voltage (impulse) from the control unit
- Pump frozen

### Heater ignites, heater shuts off at random

**Check:**

- Overheating protection switch
- Press the reset switch on the overheating protection switch in. Check inlet and outlet hoses for blockages.
- Fuel system
- Fuel level in tank

### Heater smokes and carbons up

**Check**

- Fuel supply quantity
- Combustion air intake and exhaust outlet blocked
- Blower motor speed

### Heater runs longer than 3 ...4 minutes normal cool down purge cycle

**Check:**

- Temperature switch

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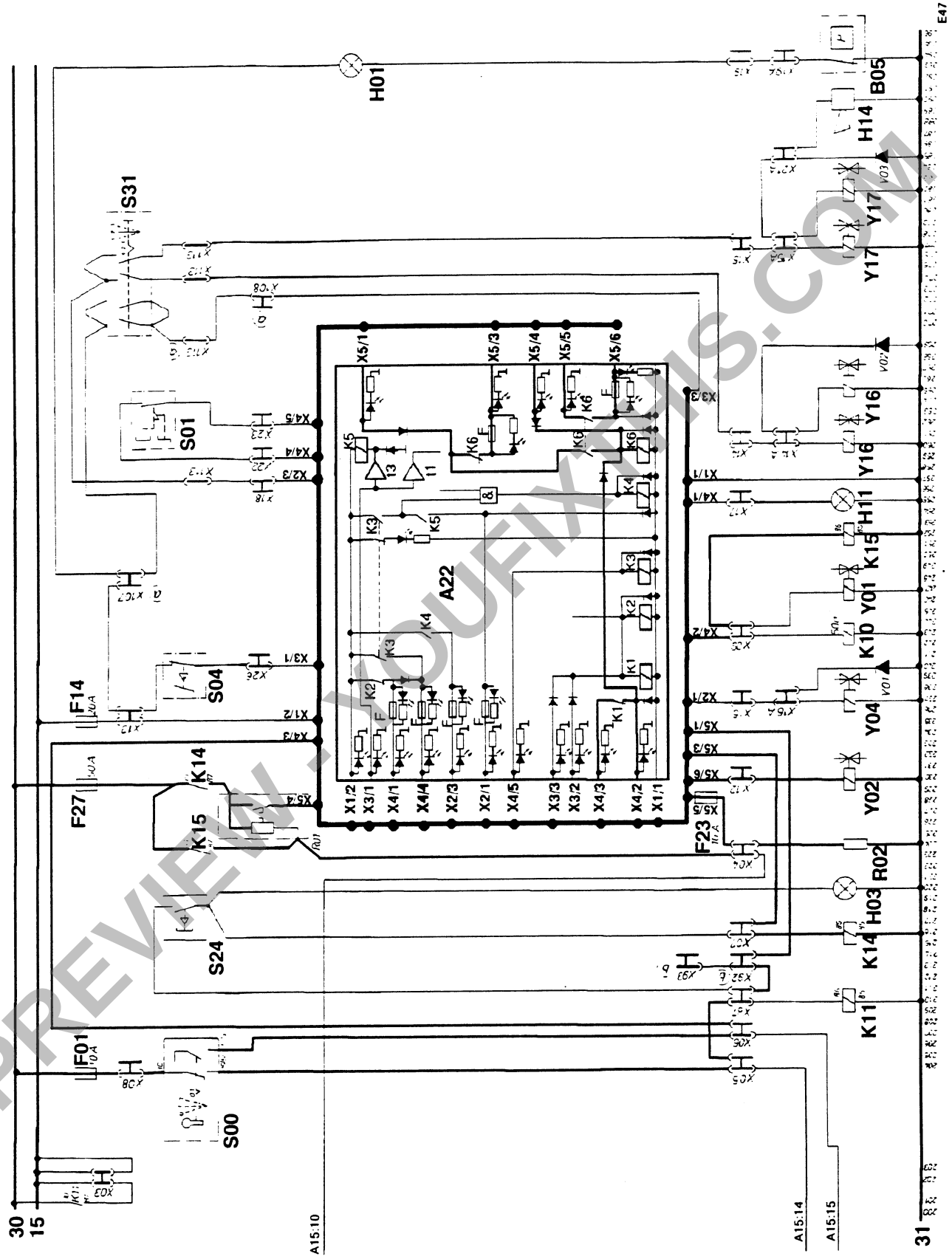
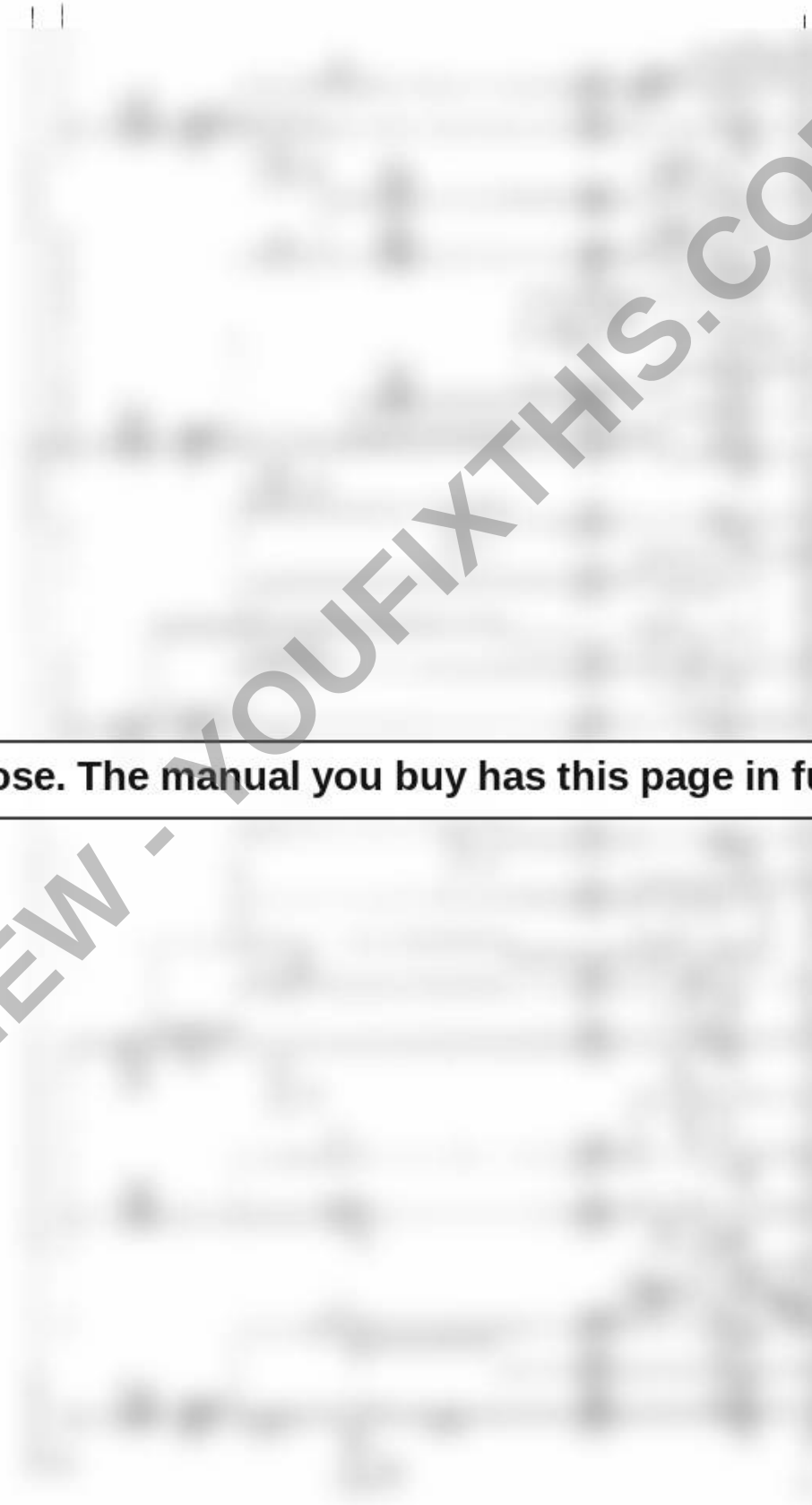



Fig. 4

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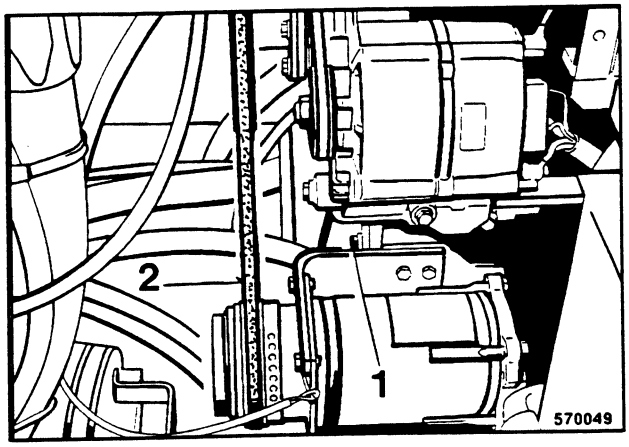


Fig. 1

## 10.11 Air conditioning unit, visual inspection

**NOTE**

*The air conditioning system must be examined visually by the operator or the service mechanic at least once every week and before each maintenance and repair work.*

1. The entire circumference of the V-belt 2 (Fig. 1) must be examined for damages and cracks. Faulty V-belts must be changed immediately.

2. Check by thumb pressure that the V-belt cannot be depressed for more than 10 to 15 mm 1 (Fig. 1) between the V-belt pulleys. Tighten if necessary.

3. Mounting of the refrigerant compressor

4. Hoses and pipes for chafes

5. Condenser for tight fit and dirt

6. Air filter and and evaporator for dirt

7. Air channels and air nozzles for leaks and blockages

8. Liquid level in the system.
   The ball in the sight glass must be floating in the middle or the upper half of the inspection glass 1 (Fig. 2).

**Caution**

**If the inspection glass looks brown, the system needs to be flushed, the drier and the refrigeration oil in the compressor needs to be changed.**

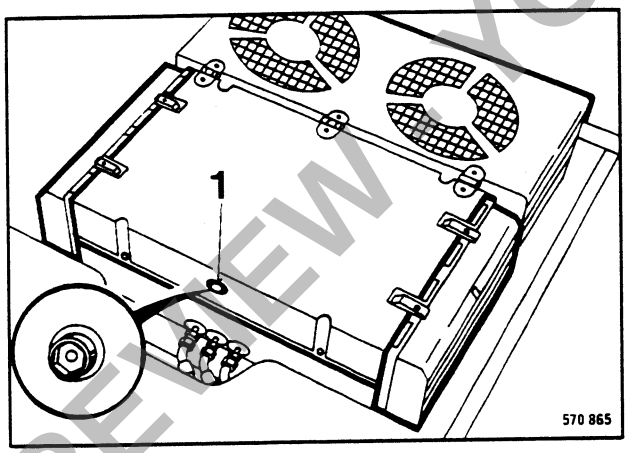


Fig. 2

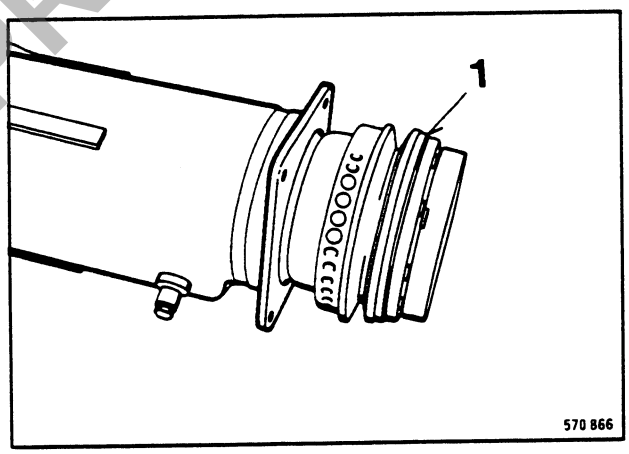


Fig. 3

9. The gap between the V-belt pulley and the spring plate 1 (Fig. 3) must not exceed 1.5 mm.



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