

SERVICE MANUAL

TRUCKS

L 385

Export Service Department

AKTIEBOLAGET

VOLVO

GÖTEBORG . SWEDEN

PART 2

CLUTCH

DESCRIPTION

L 385 series trucks are fitted with a single dry plate clutch. The clutch consists of an attaching plate (2), a pressure plate (1), three release levers (5) and a thrust washer (6). See Fig. 2-1.

The attaching plate, which is bolted to the flywheel, serves as a bracket for the other clutch components. The pressure plate is located between the attaching plate and the friction disk. It transfers the pressure of the springs (3) to the friction disk. The pressure plate is actuated by the release levers which are operated by the clutch pedal through the release bearing.

The friction disk has a diameter of 14". It is fitted with a spring hub to absorb crankshaft speed variations at low speeds. The clutch controls consist of the pedal assembly, the pushrod system, the intermediary shaft and the release components. See Figs. 2-15, 2-16 and 2-17.

The clutch release bearing slides on a shaft extending from the cover over the drive pinion ball bearing. A guide pin attached to the same cover prevents the bearing housing from rotating.

REPAIR INSTRUCTIONS

REMOVING THE CLUTCH

1. Remove the transmission according to the instructions in Part 3.
2. Loosen the eight bolts retaining the clutch attaching plate to the flywheel. These bolts should be loosened a couple of turns at a time, diametrically opposed bolts being taken at the same time. This is to avoid stresses in the attaching plate. When all the bolts have been removed, the clutch and friction disk are removed. Removal is facilitated if a clamp, as shown in Fig. 2-2, is fitted between the three pressure pads and the attaching plate. The thickness of the clamp is 4.5 mm (0.177").
3. Remove the clutch bearing from the transmission.

REPLACING THE FRICTION DISK FACINGS

1. Before removing the facings, check that the friction disk, hub and springs are in good condition. If there are any cracks in the hub or the friction disk or if the springs are broken or weak then the friction disk must be replaced. The same applies if the disk has become distorted through excessive clutch slippage.
2. Remove the old facings by drilling out the rivet heads. Use a drill with the same diameter as the rivets (3.5 mm = 9/64"). Neither a hammer and drift nor a press may be used. Otherwise the friction disk may be damaged.
3. Rivet the new facings in position. Use a rivet press, a drift and support corresponding to the size of the rivets. Note that the rivets are inserted from the recessed side and are riveted on the other side towards the disk.
4. When riveting is completed, check the deformation of the friction disk by fitting the disk on the shaft. Fit a dial indicator with the point as near the outer disk edge as possible. Permissible deformation 0.4 mm (0.016").

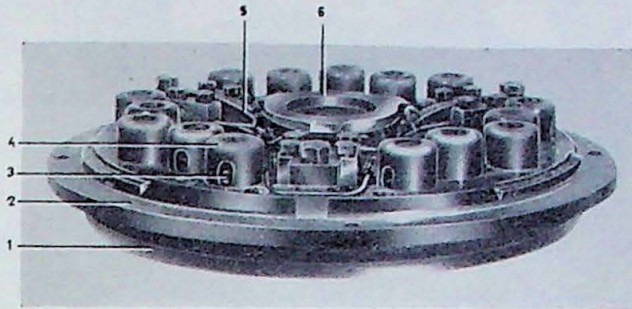
INSPECTION OF BALL BEARING ON DRIVE PINION

The ball bearing can be removed after the lock washer for the flywheel attaching bolts has been removed. Use puller SVO 1819 for the bearing as shown in Fig. 2-3.

Clean the bearing in fuel oil and check it. If it rotates easily without chafing and without any looseness being noticed, it should be packed with heat-resistant ball bearing grease and re-fitted. When fitting, use drift SVO 1801 and SVO 2013, see Fig. 2-4. Always fit a new lock washer.

DISASSEMBLING THE CLUTCH

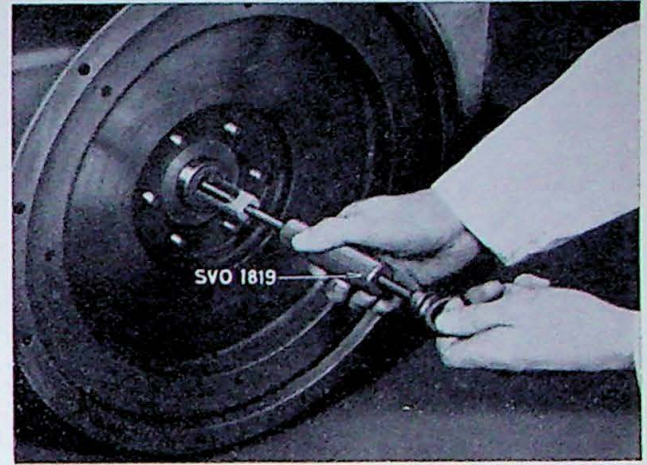
1. Before disassembling the clutch, mark the attaching plate and the pressure plate as shown in Fig. 2-5.
2. Remove the thrust washer from the release levers.
3. Fit the clutch in a press with two planks under the pressure plate. Lay two blocks (about 40 x 60 x 80 mm = 1.1/2" x 2.1/2" x 3") on top of the attaching plate and press down with a bit of wood against the press tool until the release levers are almost horizontal. See Fig. 2-6.
4. Remove the bolts retaining the pressure pads. Do not lose the shims under every pad and lay them with their respective washers so that they are put back in the same place.
5. Release the press slowly and then lift off the attaching plate. Fig. 2-7.
6. Remove the spring covers (4, Fig. 2-1) and the springs (3) from the pressure plate.



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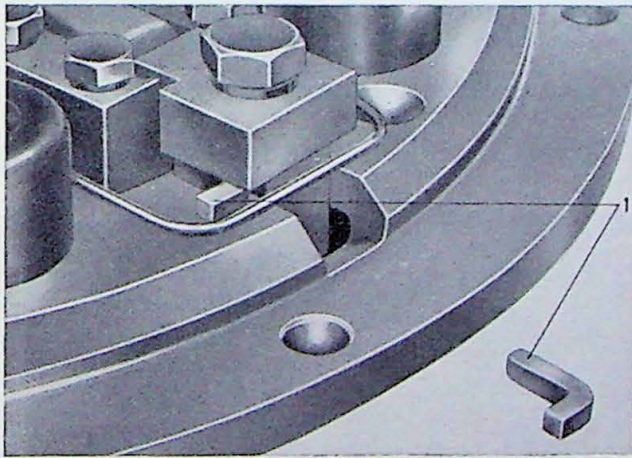
Fig. 2—1. Clutch.

1. Pressure plate
2. Attaching plate
3. Thrust spring
4. Cover for spring
5. Clutch release lever
6. Thrust washer



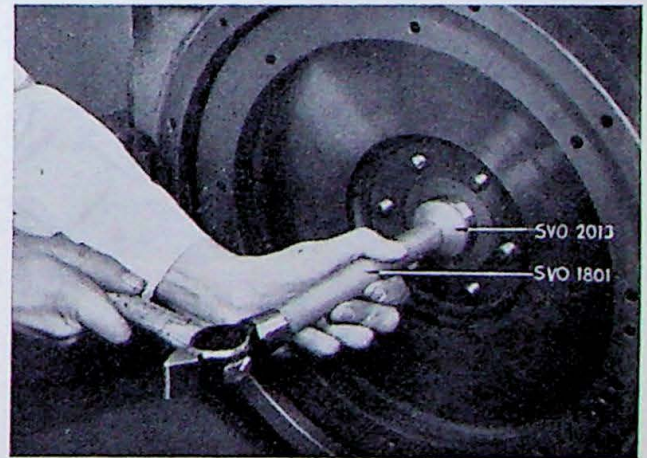
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Fig. 2—3. Removal of drive pinion bearing.



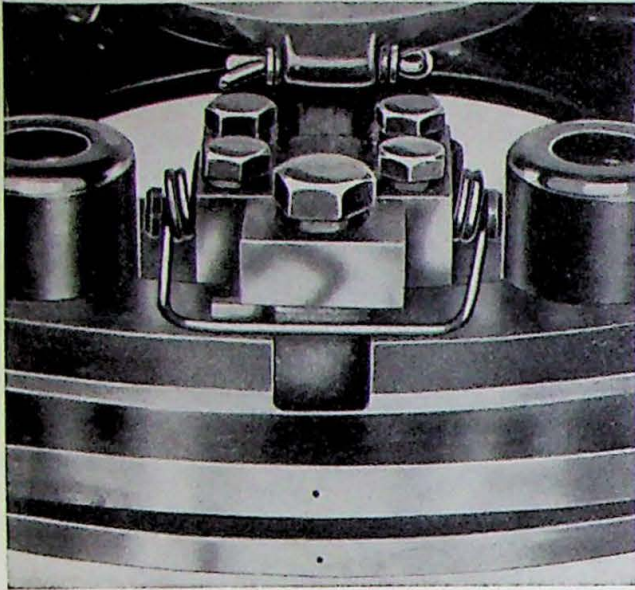
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Fig. 2—2. Clamp.



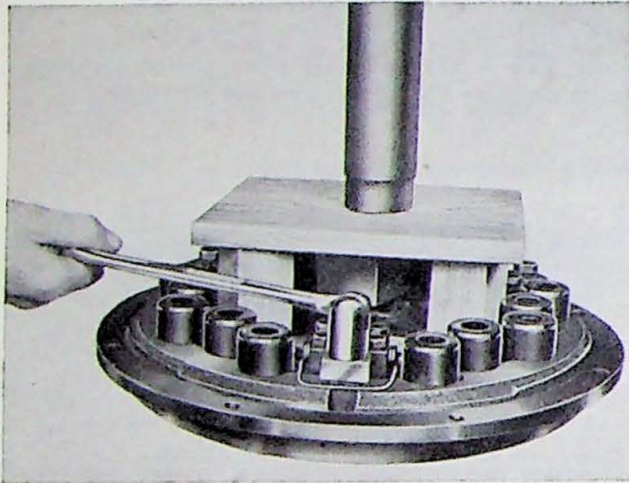
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Fig. 2—4. Fitting of drive pinion bearing.



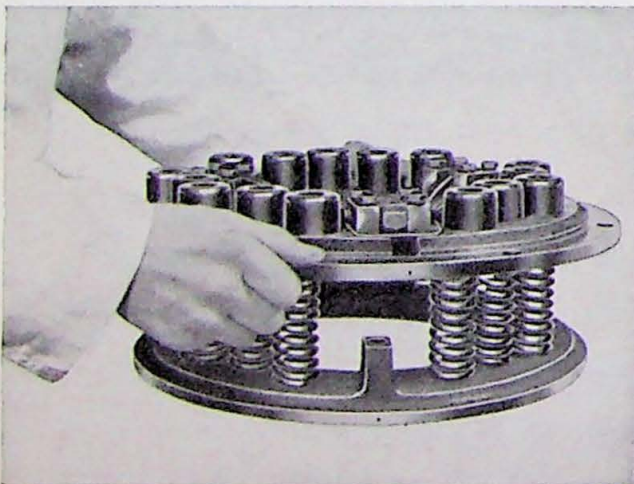
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Fig. 2-5. Marking of clutch.



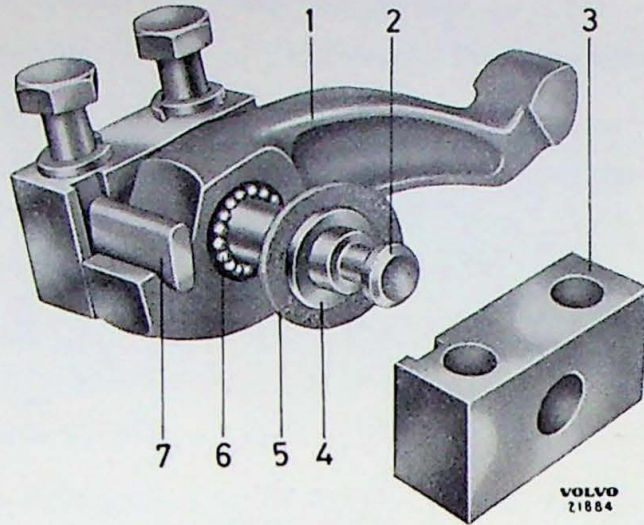
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Fig. 2-6. Disassembly of clutch.



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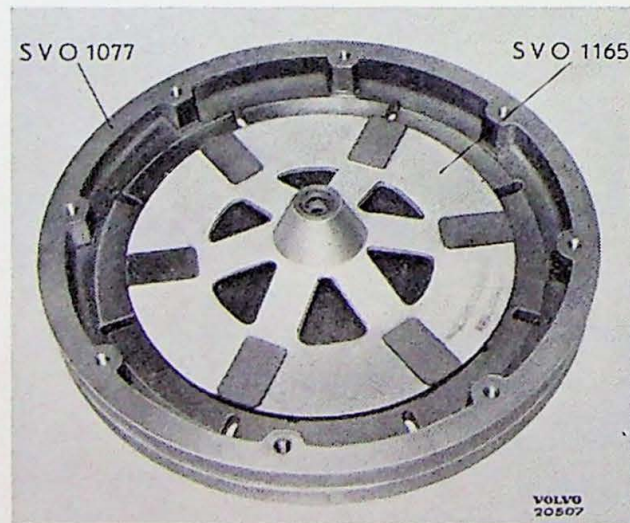
Fig. 2-7. Lifting off attaching plate.



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Fig. 2-8. Clutch release lever.

1. Release lever
2. Shaft
3. Shaft retainer
4. Washer
5. Packing
6. Needle bearing
7. Lever pin



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Fig. 2-9. Fixtures for clutch adjustment.

7. Remove the release levers. See Fig. 2-8.
8. Clean all parts thoroughly.

INSPECTION

Check the pressure plate for deformation. Lay it on a facing plate or against a new pressure plate and check with a feeler gauge 0.08 mm (0.003") thick. It should not be possible to insert this under the pressure plate. The plate should not show any signs of cracks or other damage. Check that the flywheel is not damaged either. If the flywheel friction surface is only slightly scored or blued, it can be restored by grinding it in a lathe with a slide grinding machine. No more than 0.5 mm (0.02") of the material may be ground away. The depth of the flywheel must be maintained so that the corresponding amount of material must be removed from the surface of the flywheel in contact with the attaching plate.

Test the spring tension. If they do not come up to the specifications under loading (see specifications), they must be replaced.

Check the release levers and replace those showing signs of considerable wear.

The clutch release bearing is examined by rotating it several turns with light pressure. The bearing should rotate easily without chafing or binding at any point. Also check the bearing on the shaft upon which it should run easily. The contact surface on the thrust washer should be flat and should show no signs of scoring.

ASSEMBLING THE CLUTCH

1. Smear the release lever pins (7) and the needle bearing (6) - see Fig. 2-8 with suitable grease. Fit the release levers and pins.
2. Lay the pressure plate on the wooden blocks in the press used for disassembly. Put the springs and the spring covers on the pressure plate and lay the pressure plate in position. Note the markings.
3. Place the wooden blocks on top of the attaching plate as during disassembly and press it carefully downwards until the release levers are about horizontal. Make sure that the pressure plate is pressed down evenly. The heads in the pressure plate must not stick in the attaching plate recesses.
4. Place the shims which were under the pressure pads before disassembly back in position. Smear the release lever contact surfaces with grease and then tighten the pressure pads to the pressure plate.
5. Fit the springs for the thrust washer. The adjustment of the release levers may now be carried out.

ADJUSTING THE RELEASE LEVERS

The release levers must be correctly adjusted if the clutch is to function in a satisfactory way. Adjustment is carried out by using a special fixture SVO 1165 together with a universal fixture SVO 1077.

Place the adjuster fixture in the universal fixture, Fig. 2-9. Make sure that the adjuster fixture lies concentrically. Lay the clutch over the two fixtures in such a way that the release levers are over the heads of the adjuster fixture. Bolt the clutch onto the universal fixture. Tighten the bolts a few turns at a time, taking diagonally opposed bolts at the same time.

Check that the release levers are in their operating positions by pressing them down a couple of times with a wooden block (Fig. 2-10).

Adjust the levers so that they are 6 mm (15/64") over the hub of the adjuster fixture ("A" in Fig. 2-11) within ± 1.5 mm (1/16") and within 0.25 mm (0.010") of each other. Adjustment is carried out by using shims (see specifications for size) which are placed under the pressure pads, Fig. 2-12.

After adjusting work is completed, the three clamps are fitted, see Fig. 2-2, and the clutch is removed from the fixture. Fit the thrust washer.

CHECKING THE FLYWHEEL

The runout of the flywheel may not exceed 0.12 mm (0.0047") either on the friction disk contact surface or on the surface facing the attaching plate. Use a dial indicator with a magnetic attachment, see Fig. 2-13. Zero the indicator, then rotate the flywheel and read off the highest figure shown on the indicator. If the degree of deformation is large, the flywheel should be removed. Examine to see if there is dirt or signs of unevenness between the flywheel and the crankshaft flange.

CHECKING THE FLYWHEEL HOUSING

The contact surfaces between the clutch housing and the flywheel must be checked in relation to the crankshaft before the clutch is fitted. This contact surface should be at right angles to the crankshaft within 0.2 mm (0.0080"). The inner edge of the flywheel housing should be concentric with the flywheel within 0.2 mm (0.0080"), see Fig. 2-14. If the result obtained by measurement differs from the above max. tolerances, the contact between the flywheel housing and the cylinder block should be examined.

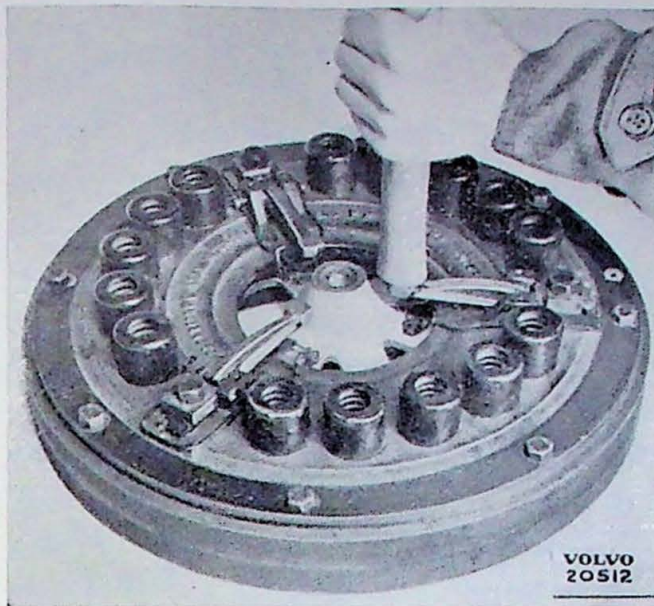


Fig. 2—10. Pressing down release levers.

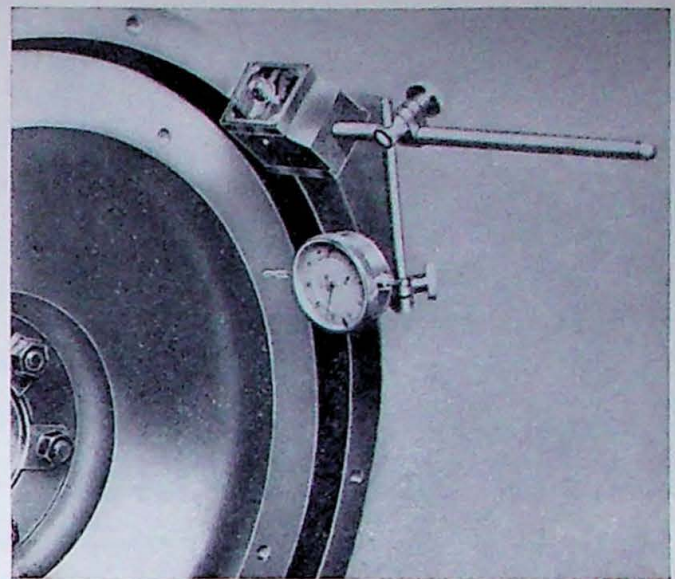


Fig. 2—13. Checking flywheel for deformation.

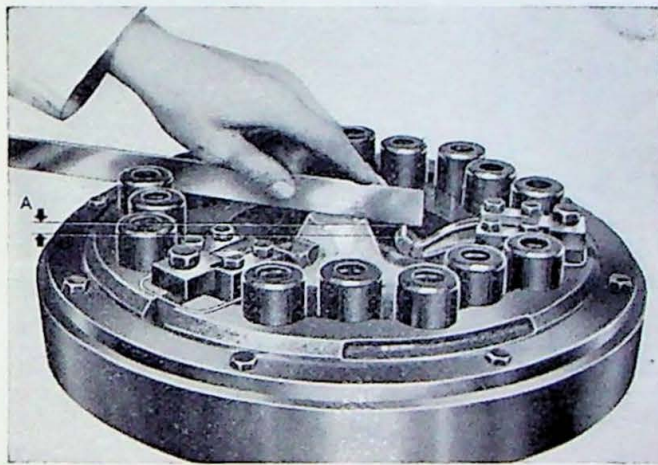


Fig. 2—11. Adjustment of release levers.

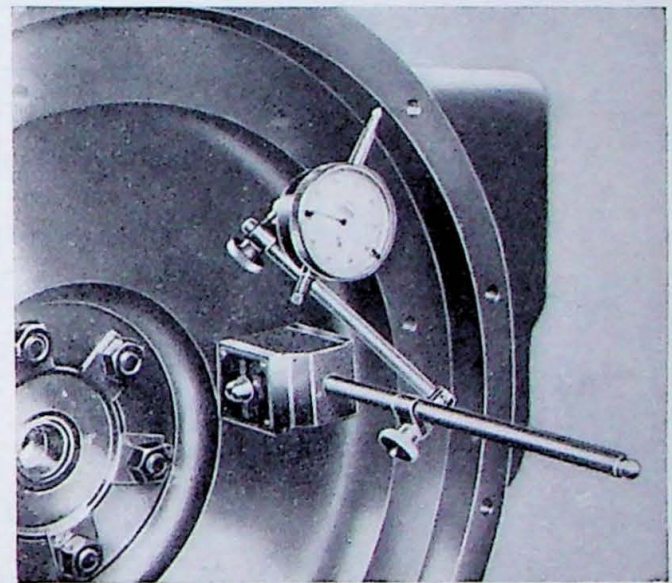


Fig. 2—14. Checking flywheel housing.

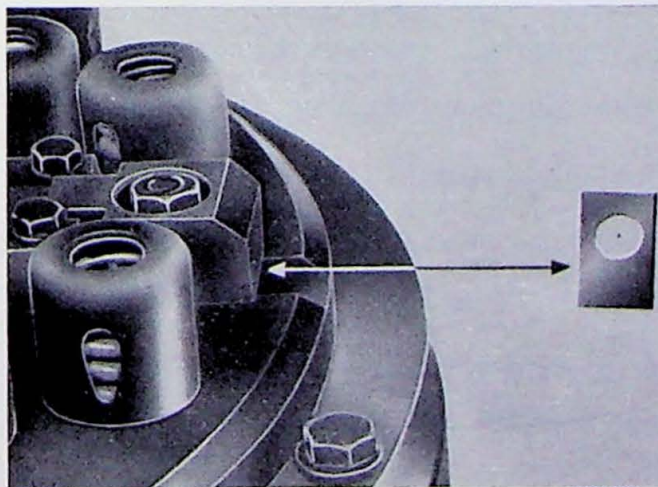


Fig. 2—12. Location of shims.

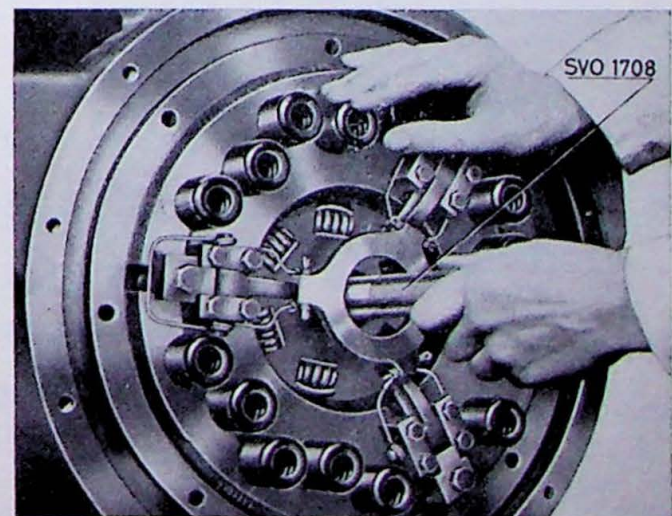


Fig. 2—15. Alignment of friction disk.

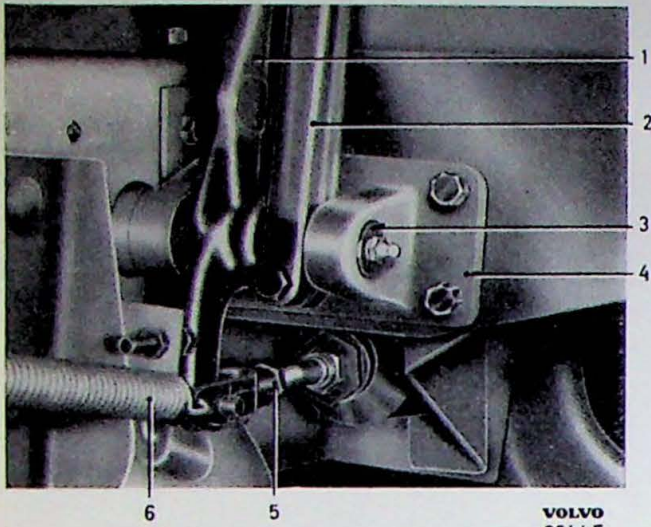


Fig. 2—16. Clutch pedal assembly.

1. Brake pedal
2. Clutch pedal
3. Pedal shaft
4. Pedal attachment
5. Pull rod
6. Return spring for brake pedal

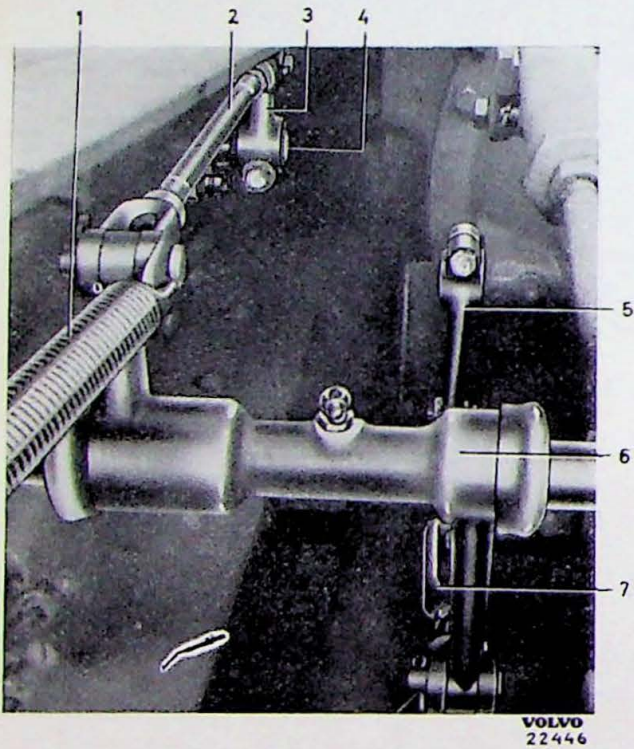


Fig. 2—17. Clutch controls.

1. Return spring
2. Pull rod
3. Lever
4. Pedal shaft
5. Lever
6. Intermediary shaft
7. Pull rod

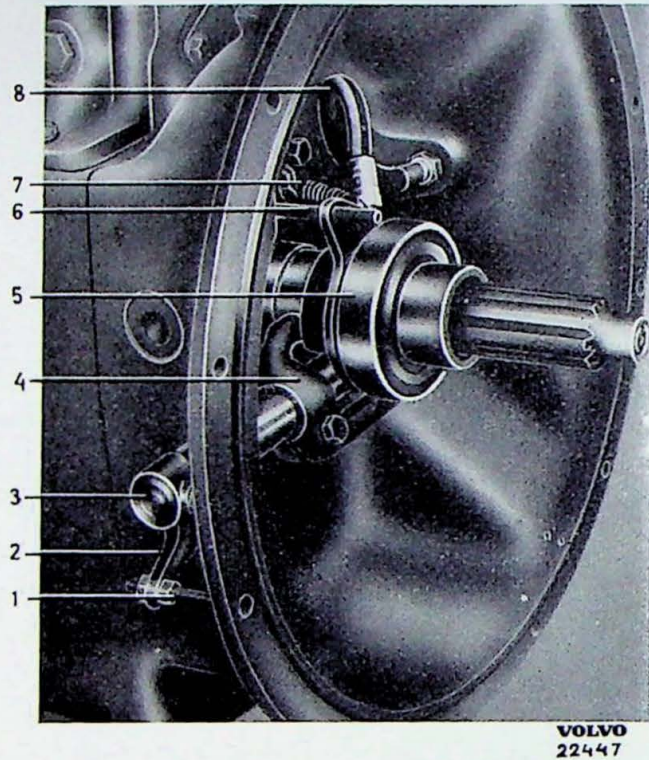


Fig. 2—18. Clutch release assembly.

1. Adjuster screw
2. Control arm
3. Release shaft
4. Release yoke
5. Release bearing
6. Guide pin
7. Return spring
8. Lubricating hose

FITTING THE CLUTCH

If the drive pinion ball bearing was not greased when fitted, it should be greased with heat-resistant ball-bearing grease. Check before fitting that the friction disk facings, flywheel and pressure plate are clean and free from oil. Any oil present should be removed by using gasoline and then drying off with a clean rag.

1. Place the friction disk in the flywheel and fit the clutch in position. Place the aligning tool SVO 1708 in the friction disk and press it in until the guide pin engages in the pilot bearing. Fig. 2-15.
2. Bolt the clutch in position on the flywheel. Tighten diametrically opposed bolts at the same time, giving each a few turns at a time. The clutch must be tensioned evenly. Remove the aligning tool and any clamps that may have been used.
3. If the clutch release bearing has not been secured on the transmission, do this. Grease the bearing with heat-resistant ball bearing grease.
4. Fit the transmission in accordance with the instructions given in Part 3.

RECONDITIONING THE CLUTCH CONTROLS

Removing

1. Remove the plate over the pedals. Loosen the pull rod (2, Fig. 2-17) from the lever (3) and the intermediary shaft (6).
2. Loosen the pull rod (7) from the intermediary shaft (6) and from the lever (5).
3. Loosen the intermediary lever bearing from the frame-member and remove the intermediary lever. Be careful not to lose the ball sockets, seals and the spring.
4. Remove the lever (3) from the pedal shaft.
5. Loosen the attaching screw for the clutch pedal (2, Fig. 2-16). Disconnect the brake pedal return spring (6) and pull rod (5). Push the pedal shaft out of the pedal attachment.
6. Lift up the pedals. Remove the pedal attachment (4).
7. If the transmission has been removed, the clutch release lever can also be reconditioned. Remove the lever (5, Fig. 2-17) from the release shaft.
8. Disconnect the lubricating hose (8, Fig. 2-18) and the return spring (7) from the clutch release bearing. Remove the bearing.
9. Remove the control arm (2) by loosening its lock screw. Loosen the lock screws on the release yoke (4) and drive out the release shaft (3) by using a suitable tool.
10. Examine all parts and replace those that are worn.

Replacing the Bushings

1. Press out the old bushings from the pedal attachment and brake pedal using tool SVO 1784 and standard handle SVO 1801.
2. Ream the bushings to a light push fit on the pedal shaft.

Fitting

1. Fit the release shaft with the release yoke, control arm and other parts in the reverse order to that used when removing.
2. Fit the clutch controls and the pedal assembly in the reverse order to that used when removing.

Adjusting Clutch Pedal free Play

1. Adjust the pull rod (2, Fig. 2-17) so that the upper lever on the intermediary shaft (6) points straight up when the clutch pedal is released.
2. With the help of the adjuster screw (1, Fig. 2-18) and the pull rod (7, Fig. 2-17), adjust the pedal free play to 25-30 mm (about 1").