CLUTCH

Description

General

A single plate dry clütch is mounted on the flywheel between the engine and gearbox. The spring cushioned double faced clutch plate slides on the splined gearbox main shaft. The clutch assembly consisting of a disc spring, clutch housing, and pressure plate is bolted to the flywheel. When the clutch is engaged the spring cushioned clutch plate is pressed against the flywheel by the disc spring which presses on the pressure plate. When the clutch plate is held firmly between the flywheel and pressure plate power can be transmitted to the gear box.

The cross shaft and clutch release bearing are mounted in the transmission housing. The clutch release bearing which requires no maintenance slides on a sleeve surrounding the gearbox main shaft.

Operation

The clutch is released by the force transmitted through the clutch pedal, cable, cross shaft, and release bearing. The clutch release bearing pushes against the 18 fingers of the disc spring thereby flattening the disc spring and releasing the pressure from the pressure plate lifting it from the clutch plate. This motion interrupts the power train from the engine to the gearbox.

Maintenance

The only maintenance the clutch requires is adjustment of free travel of the clutch pedal which should always be adjusted to 20 to 25 mm (¾ to 1 in.) as the clutch linings become thinner through wear. The clutch itself requires adjustment only if it has been repaired. This is accomplished with the engine removed from the car and the clutch mounted on the flywheel or preferably using the VW 254 clutch testing and adjusting device.

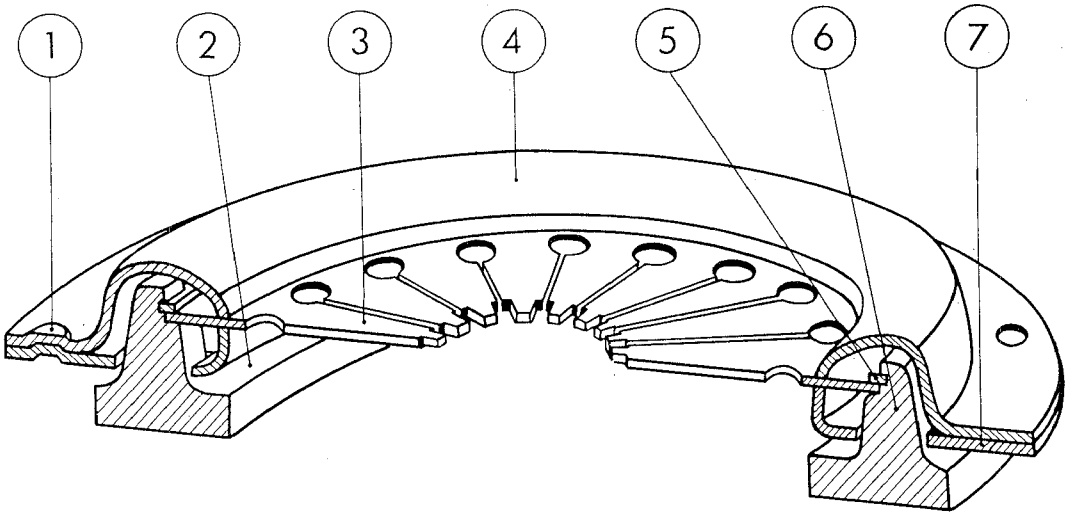

Fig. 251

① Index dent
② Pressure plate
③ Disc spring
④ Clutch cover
⑤ Lock ring
⑥ Spring carrier
⑦ Counter plate

57 EN

Removing and Installing Clutch

Special Tools: VW 219 Stub shaft for centering clutch plate

Removal

1. Remove engine (1 EN).

2. Loosen six clutch mounting screws several turns at a time until the spring pressure is released, thereby protecting the clutch cover and spring from uneven stresses and possible damage.

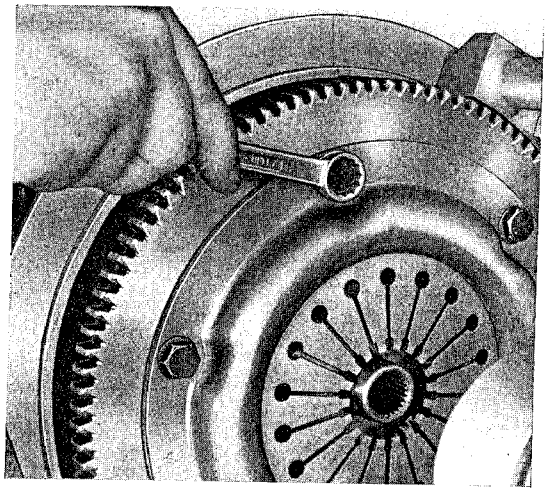

Fig. 252

3. Remove clutch.

4. Remove clutch plate.

Installation

The installation is accomplished in the reverse order of removal observing the following points:

1. Clean the flywheel surface on which the clutch bears and inspect for wear. If necessary reface, not to exceed 0.2 mm (.008 in.) and polish with super fine emery. If necessary install a new flywheel.

2. Inspect the clutch plate for lining wear, eccentricity, and proper alignment of the segments. Note especially the rivets holding the plate to the hub. If necessary install a new clutch lining or a complete plate.

3. Inspect clutch assembly.

4. Inspect release bearing for wear and replace if necessary.

5. Inspect cross shaft bearings in transmission housing.

6. Lubricate the bushing in the gland nut with approx. 2 cc. ($^1/_{10}$ cu. in.) special graphite grease.

7. Install the clutch plate using stub shaft VW 219 or a sawed off main shaft.

8. Install the clutch noting that the index dents of the cover and counter plate are in line.

9. Tighten the six mounting screws one turn at a time each until the clutch is tight against the flywheel, thereby avoiding clutch spring distortion or damage to the cover.

Disassembly

1. Remove cover.

2. Remove lock ring starting at one end (Fig. 255).

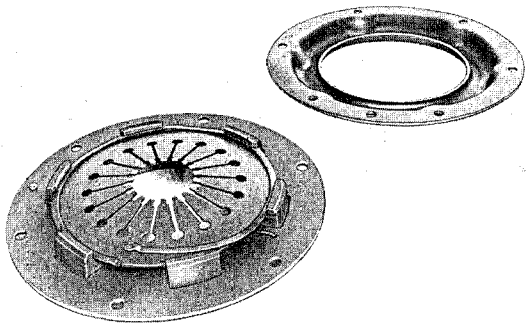

Fig. 255

3. Remove disc spring.

4. Mark counter plate and pressure plate since these parts have been balanced as a unit (Fig. 256).

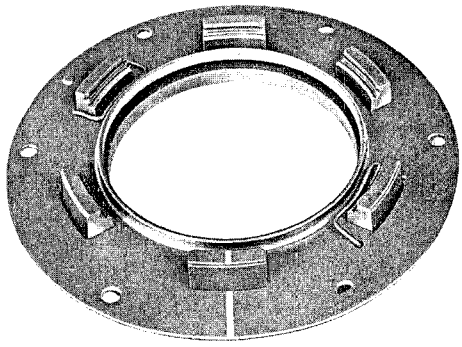

Fig. 256

5. Press pressure plate from the slots in the counter plate.

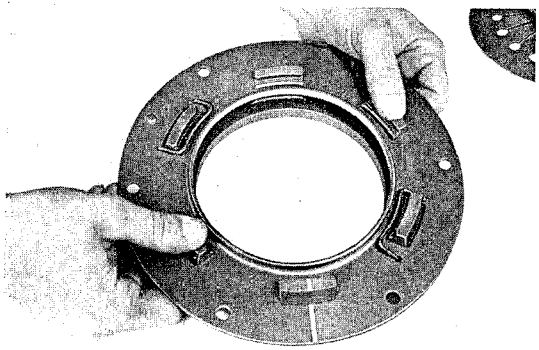

Fig. 257

59 EN

Pressure Plate Inspection

1. Clean parts with solvent.

2. Inspect the pressure plate for wear, distortion, and scored or burned areas. If necessary reface or replace. The pressure plate surface must not be ground down more than 0.2 mm (.008 in.). The refaced surface of the pressure plate must be parallel to the bearing surface of the disc spring carriers.

   The pressure plate must not be held in a vise or chuck by the spring carriers but should only be held by its outer rim.

   A pressure plate with uneven contact is conducive to clutch chatter.

3. Inspect disc spring for cracks and replace if necessary.

Assembling Clutch

60 EN

Special Tools: **P 79** **Gauge ring**
VW 254 **Clutch testing and adjusting drive**

1. Insert the pressure plate into the holes of the counter plate noting the marks (Fig. 256) previously scribed. Apply a light film of graphite grease to the sides of the spring carriers.

2. Insert the hooks of the tensioners into the counter plate. Raise the counter plate from pressure plate slightly and press the tensioner over the spring carrier (Fig. 258).

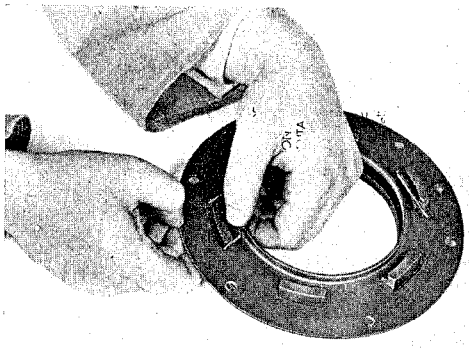

Fig. 258

3. Lubricate the bearing surface of the spring carriers with a light film of graphite grease and install the disc spring.

4. Insert the lock ring in the grooves of the spring carriers so that the flat sections lie in the grooves and the arched sections bear against the disc spring. Make certain that the lock ring is firmly seated in the root of the carrier grooves.

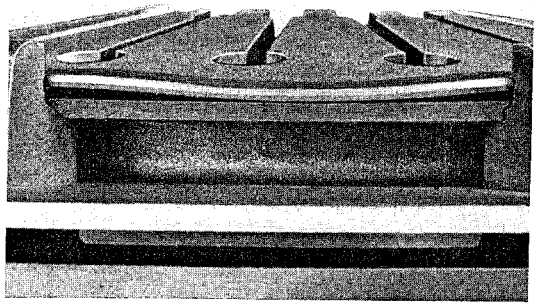

Fig. 259

5. Install the cover so that the index dent fits over the corresponding dent in the counter plate.

6. Screw the clutch assembly and the clutch spacer ring to the adjusting device VW 254. Place gauge ring P 79 on the disc spring fingers and compress clutch spring. Tighten the clutch mounting screws. Release and engage clutch several times by the actuating lever.

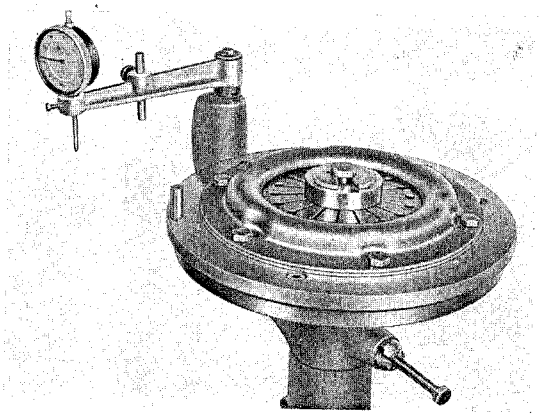

Fig. 260

7. Zero dial gauge on adjusting peg (26 mm high).

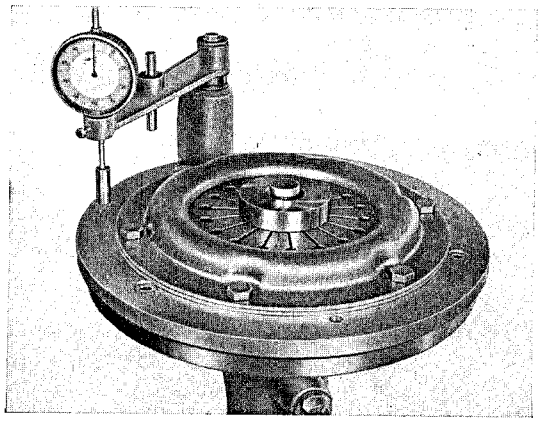

Fig. 261

When riveting new linings to the clutch plate it is very important that every second hole is countersunk through the lining, and that the linings are riveted to the tabs which are dished toward the respective lining as in Fig. 269.

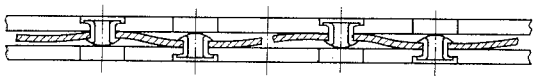

Fig. 269

6. Test clutch plate with new linings for alignment. Maximun permissible deflection: 0.5 mm (.020 in.).

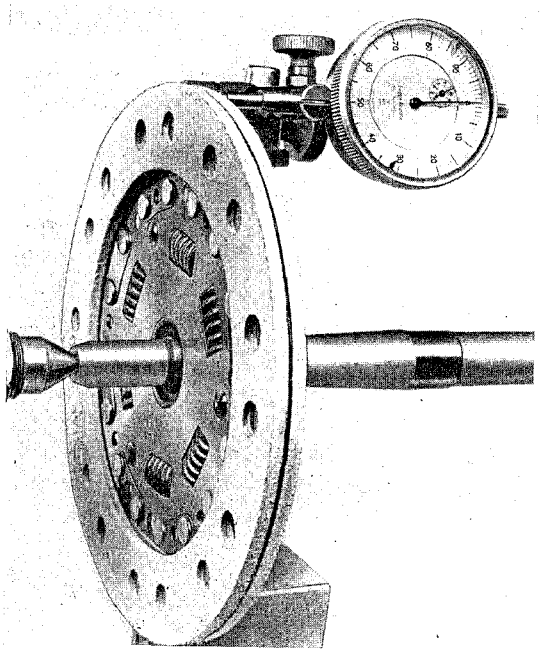

Fig. 270

7. Measure clutch plate uncompressed thickness.

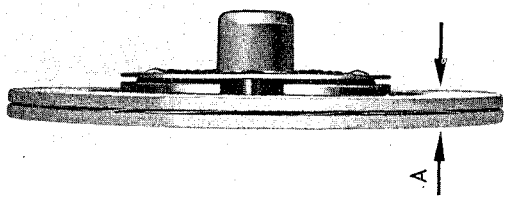

Fig. 271

Thickness: 8.6 to 9.2 mm (.339 to .362 in.).

8. Inspect torsional damper springs. If springs are slack or broken install a new clutch plate.

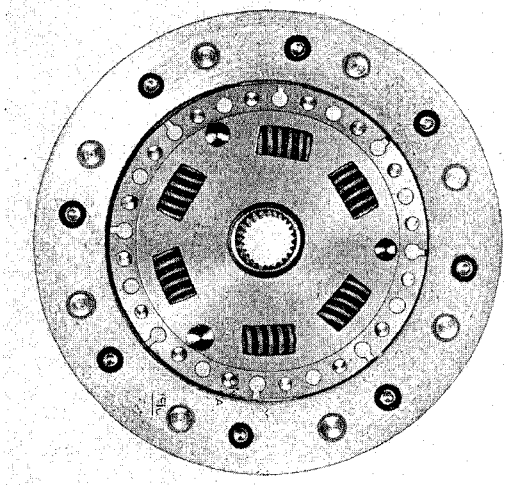

Fig. 272

62 EN

Removing and Installing Clutch Release Bearing

Special Tools: P 35a Adjusting gauge

Removal

1. Remove engine (1 EN).

2. Disconnect clutch pedal return spring.

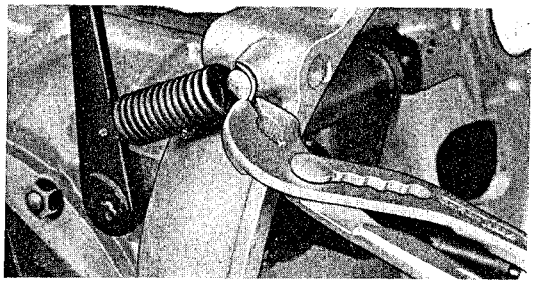

Fig. 273

3. Remove clutch release bearing from guide sleeve.

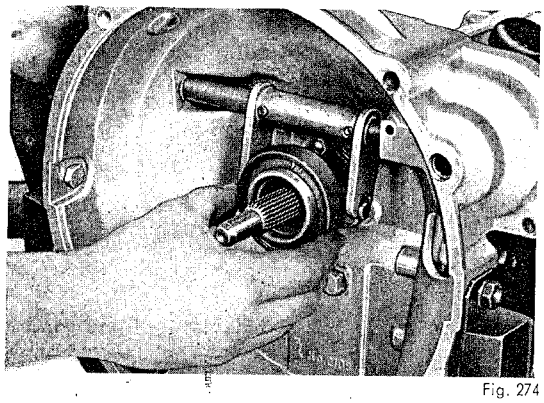

Fig. 274

Installation

The installation is accomplished in the reverse order of removal observing the following points:

1. Apply a thin film of graphite grease to the clutch release fork.
2. Install clutch release bearing.
3. Adjust the clutch release bearing 50 mm ($1^{31}/_{32}$ in.) back from face the clutch housing using tool P 35a. Adjustment is made by shortening or lengthening the clutch cable clevis (Fig. 275). Do not. tighten the cable clevis past the end of the threads where it will bind with the lever. Secure the clevis by tightening the lock nut, inserting the clevis pin locking it with the spring clip.

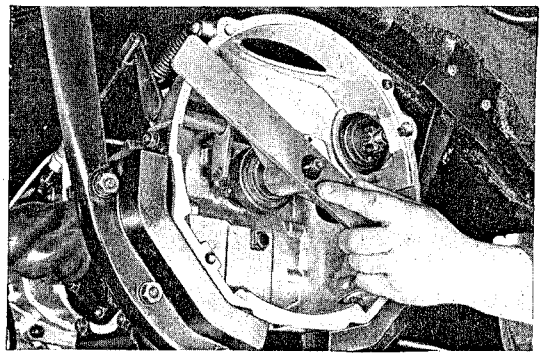

Fig. 275

4. Install engine.
5. Check clutch pedal travel and adjust if necessary.

Removing and Installing Clutch Cable

63 EN

Removal

1. Remove floor board behind clutch pedal.
2. Remove lock nut and adjusting nut from the clutch cable.

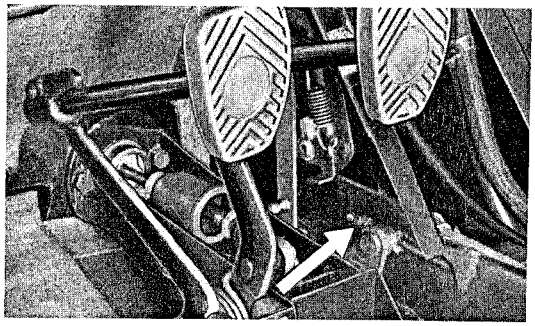

Fig. 276

3. Block up left rear of car and remove wheel.
4. Release spring clip of clevis pin and remove pin.

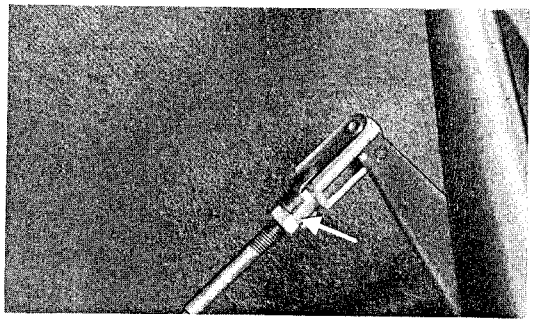

Fig. 277

5. Remove clevis and lock nut from clutch cable.
6. Remove cable housing from clamp on the gearbox.
7. Pull clutch cable out of channel to rear.

Installation

1. Grease clutch cable.
2. Slide cable through the flexible housing several times.
3. Pump grease into the channel in the frame with a grease gun until clean grease appears at the forward end (to be observed by a helper).
4. Install the clutch cable so that the threaded end of the cable housing faces the adjusting bracket on the gear box. While the cable is being inserted in the tube an assistant should hold the forward end of the tube shut to prevent the grease from being pushed out.

5. Pull the cable forward as far as possible and connect to link of clutch pedal lever.

6. Install adjusting and lock nuts. The bevel of the adjusting nut fits in the anchor bracket.

7. Insert the end of the flexible cable housing into the bracket on the gearbox so that at least three threads on which the rubber dust cap can be mounted protrude from the bracket (Fig. 278).

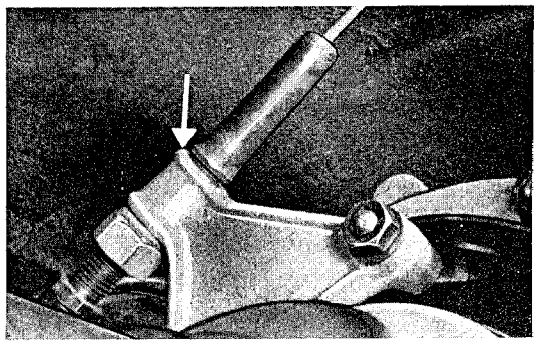

Fig. 278

8. Connect the greased clevis to the clutch release lever.

9. Adjust clutch travel.

10. Tighten lock nuts.

64 EN

Clutch Adjustment

General

The clutch cable is threaded on both ends and may be adjusted either at the clutch pedal or at the clutch lever. The clutch is correctly adjusted when the pedal has from 20 to 25 mm ($^3/_4$ to 1 in.) free travel.

Adjustment should be made carefully because incorrect clearance will cause clutch slip or drag and thereby burn the linings.

Adjustment at Clutch Pedal

1. Remove the floor mat and floor board from behind the pedals.

2. Loosen the lock nut and tighten or loosen the adjusting nut as necessary until a free travel of 20 to 25 mm ($^3/_4$ to 1 in.) is obtained. Hold the cable bolt with pliers if necessary.

3. Install floor board and floor mat.

Adjustment at Clutch Lever

1. Block up car and remove left rear wheel.

2. Loosen the lock nut of the clutch lever clevis and remove the clevis by releasing the spring clip.

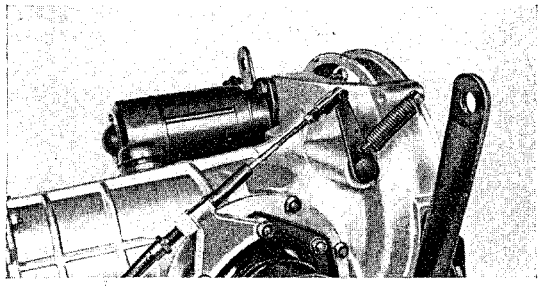

Fig. 279

3. By turning the clevis the clutch cable can be shortened or lengthened. The clevis may be tightened until the clutch cable bolt reaches the clutch lever. Connect the clevis to the clutch lever inserting the clevis pin from the outside so that the spring clip lies on top of the clevis.

   After pumping the clutch pedal serveral times check the free travel. 20 to 25 mm (3/4 to 1 in.).

4. After completing adjustment tighten the lock nut and check the spring clip of the clevis pin. Grease the adjustment threads to prevent rust.

   Adjustment should be made carefully because incorrect clearance will cause clutch slip or drag and thereby burn the linings.

Testing and Adjusting Clutch Pedal Travel

65 EN

Note:

The disc clutch spring requires accurate clutch release bearing travel for proper performance. After any clutch adjustment the pedal travel should be checked or adjusted.

Testing:

a) Run gearbox until warm.

b) Depress the clutch pedal to the stop. In this position the reverse gear must just be able to be engaged silently.

Adjustment

The pedal stop consists of a slotted steel plate attached to the pedal wall by two M 6 screws.

1. Remove floor mat.

2. Using a socket wrench loosen both pedal stop M 6 screws.

3. Adjust stop plate forward or back.

4. Tighten M 6 screws.

5. Check adjustment as in part (b) testing.

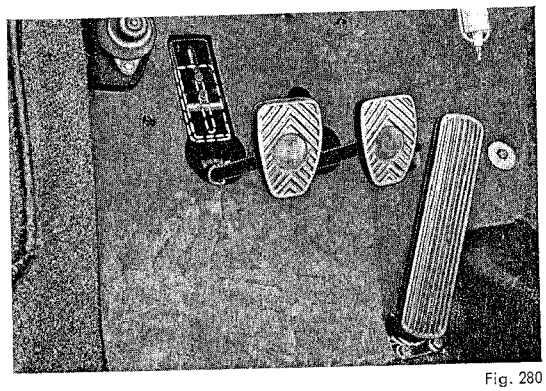

Fig. 280