

Chapter 5 Clutch

For modifications, and information applicable to later models, see Supplement at end of manual

Contents

Clutch adjustments	2	Clutch release bearing – removal, inspection and refitting	11
Clutch and flywheel assembly – removal and refitting	9	Clutch slave cylinder – dismantling, inspection and reassembly	5
Clutch hydraulic system – bleeding	3	Clutch slave cylinder – removal and refitting	4
Clutch – inspection and renovation	10	Fault diagnosis – clutch	13
Clutch master cylinder – dismantling, inspection and reassembly	7	General description	1
Clutch master cylinder – removal and refitting	6	Primary gear oil seal – removal and refitting	12
Clutch pedal – removal and refitting	8		

Specifications

Type	Borg and Beck single dry plate, diaphragm spring, hydraulically actuated	
Clutch disc diameter	7.125 in (180.9 mm)	
Master cylinder bore diameter	0.75 in (19.05 mm)	
Slave cylinder bore diameter	0.875 in (22.2 mm)	
Clutch return stop clearance	0.020 in (0.50 mm)	
Clutch hydraulic fluid type/specification	Hydraulic fluid to SAE J1703 (Duckhams Universal Brake and Clutch Fluid)	
Torque wrench settings	lbf ft	Nm
Flywheel centre bolt	112	152
Diaphragm spring housing to pressure plate	16	22
Driving strap to flywheel	16	22

1 General description

All manual transmission models covered by this book are equipped with a single dry plate diaphragm spring clutch. The design of the clutch is slightly unusual because there are major parts of the clutch assembly on both sides of the flywheel.

The main parts of the clutch assembly on the outside of the flywheel are the spring housing, the thrust plate, the release bearing, the diaphragm spring and the three dividing straps. Located on the inside of the flywheel are the clutch disc and the pressure plate.

The spring housing is firmly bolted to the pressure plate by bolts and spring washers. The spring housing is held to the flywheel by dividing straps which are held a little away from the outer clutch by spacing washers.

The clutch disc is free to slide along the splines of the primary gear which is fitted to the end of the crankshaft. Friction lining material is riveted to the clutch disc, which has a segmented hub to help absorb transmission shocks and to ensure a smooth take-off.

The clutch is actuated hydraulically. The pendant clutch pedal is connected to the clutch master cylinder and hydraulic fluid reservoir by a short pushrod. The master cylinder and hydraulic reservoir are mounted on the engine side of the bulkhead in front of the driver. Depressing the clutch pedal moves the piston in the master cylinder forwards, so forcing hydraulic fluid through the clutch hydraulic pipe to the slave cylinder. The piston in the slave cylinder moves forward on the entry of the fluid and actuates the clutch operating lever by means of a short pushrod. The opposite end of the operating lever slots, by means of a balljoint, into a throw-out plunger. As the pivoted operating lever moves backwards, it bears against the release bearing, pushing it forwards. This in turn bears against the clutch thrust plate, the spring

housing, and the pressure plate which all move forward slightly, thus disengaging the pressure plate face from the clutch disc.

When the clutch pedal is released, the pressure plate springs force the pressure plate spring housing outwards, which, because it is attached to the pressure plate, brings the pressure plate into contact with the high friction linings on the clutch disc. At the same time the disc is forced firmly against the inner face of the flywheel and so the drive is taken up.

Although space is limited, removal of the clutch and flywheel assembly, for inspection or overhaul, can be carried out with the engine and transmission assembly still in position in the car.

2 Clutch – adjustments

Return stop – adjustment

Note: As friction linings of the clutch disc wear, the distance between the clutch release bearing and the clutch thrust plate will decrease. The pressure plate will then move in closer to the clutch disc to compensate for wear. Unless the wear is taken up by adjustment of the stop located between the flywheel housing and the operating lever, the clutch will start to slip.

1 To carry out the adjustment, first disconnect the clutch operating lever return spring.

2 Pull the operating lever away from the engine until all the free play is eliminated.

3 Hold the lever in this position and measure the gap between the lever and the head of the stop using feeler gauges (photo).

4 If necessary, slacken the locknut and adjust the stop bolt until the specified gap is achieved. Then tighten the locknut.

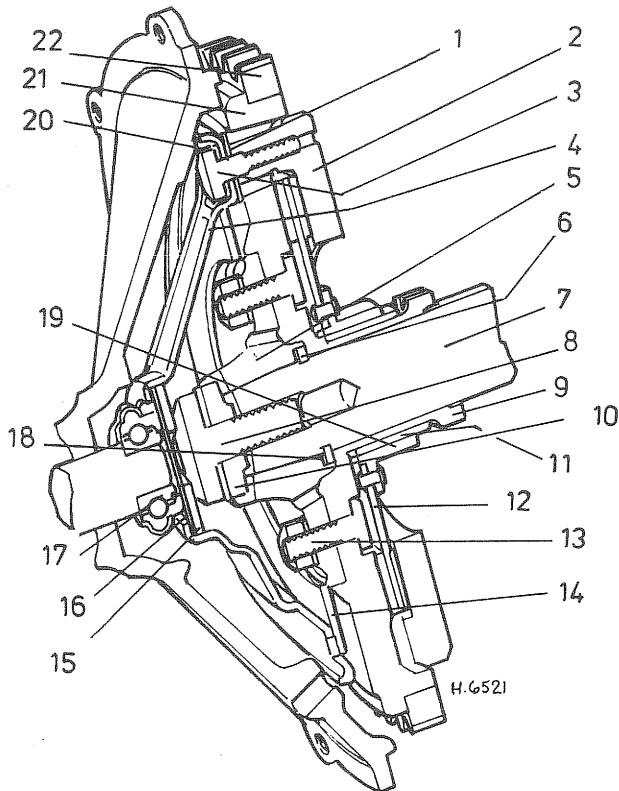


Fig. 5.1 Sectional view of the clutch and flywheel assembly (Sec 1)

- | | |
|---------------------------|--------------------------|
| 1 Driving strap | 12 Clutch disc |
| 2 Pressure plate | 13 Driving bolt |
| 3 Driving bolt | 14 Diaphragm spring |
| 4 Spring housing | 15 Thrust plate |
| 5 Flywheel hub | 16 Retaining spring clip |
| 6 C-washer | 17 Release bearing |
| 7 Crankshaft | 18 C-washer |
| 8 Flywheel retaining bolt | 19 Clutch disc hub |
| 9 Primary gear | 20 Lockwasher |
| 10 Keyed washer | 21 Flywheel |
| 11 Primary gear bearing | 22 Starter ring |

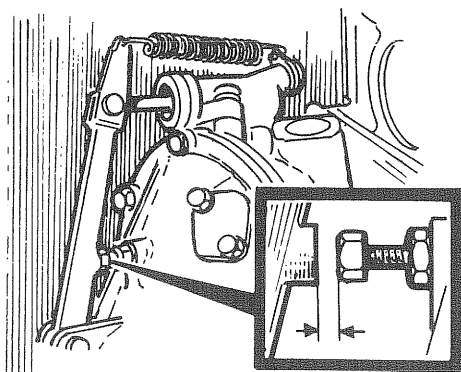
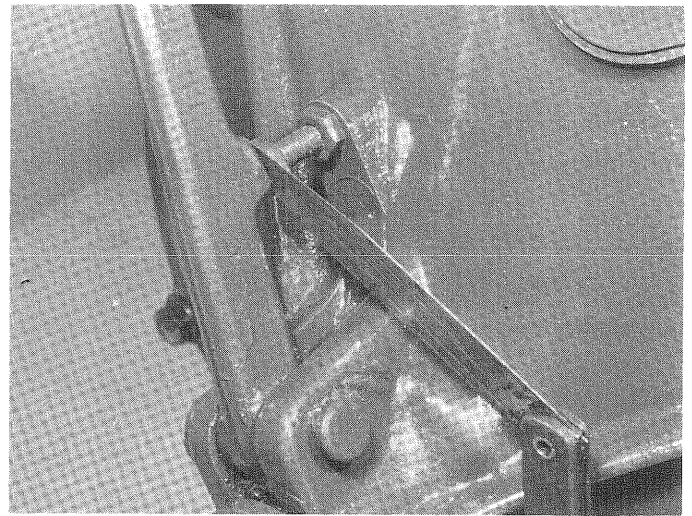


Fig. 5.2 Clutch lever adjustment (Sec 2)
Inset shows clearance measurement-point

Throw-out stop – adjustment

Note: At the base of the clutch lever there is an adjustable collar and locknut threaded onto the end of the throw-out plunger. The position of this collar and locknut (known as the throw-out stop) determines the amount of travel of the operating lever when the clutch pedal is depressed. Throw-out stop adjustment is normally only necessary after clutch overhaul and is carried out as described below.

- Slacken the throw-out stop and locknut and unscrew them to the end of their travel.



2.3 Using feeler gauges to measure the clutch return stop clearance

- Engage the help of an assistant to depress the clutch pedal several times and then hold it down.
- Screw in the throw-out stop and locknut until the stop contacts the boss on the flywheel housing cover.
- Release the pedal, screw in the throw-out stop one further flat and then tighten the locknut.

3 Clutch hydraulic system – bleeding

Note: If any of the clutch hydraulic system components have been disconnected on removal, or if the fluid level in the master cylinder reservoir has fallen appreciably, air will have been introduced into the system. For the clutch to function correctly all air must be removed from the system, and this process is known as bleeding.

- To bleed the system first gather together a clean jar, a suitable length of rubber or clear plastic tubing, which is a tight fit over the bleed screw on the clutch slave cylinder, and a tin of the specified hydraulic fluid. The help of an assistant will also be required. (If a one-man do-it-yourself bleeding kit for bleeding the brake hydraulic system is available, this can be used quite satisfactorily for the clutch also. Full information on the use of these kits may be found in Chapter 9 Section 3).
- Remove the filler cap from the master cylinder reservoir, and if necessary top up the fluid. Keep the reservoir topped up during subsequent operations.
- Wipe clean the area around the bleed screw on the slave cylinder and remove the dust cap (if fitted).
- Connect one end of the bleed tube to the bleed screw, and insert the other end of the tube in the jar containing sufficient clean hydraulic fluid to keep the end of the tube submerged.
- Open the bleed screw half a turn and have your assistant depress the clutch pedal and then slowly release it. Continue this procedure until clean hydraulic fluid, free from air bubbles, emerges from the tube. Now tighten the bleed screw at the end of a downstroke.
- Check the operation of the clutch pedal. After a few strokes it should feel normal. Any sponginess would indicate air still present in the system.
- On completion remove the bleed tube and refit the dust cover. Top up the master cylinder reservoir if necessary and refit the cap. Fluid expelled from the hydraulic system should now be discarded as it will be contaminated with moisture, air and dirt, making it unsuitable for further use.

4 Clutch slave cylinder – removal and refitting

- Disconnect the clutch operating lever return spring from the lever and the tag on the slave cylinder bleed screw.