

Chapter 6

Clutch

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Degrees of difficulty

Easy, suitable for novice with little experience		Fairly easy, suitable for beginner with some experience		Fairly difficult, suitable for competent DIY mechanic		Difficult, suitable for experienced DIY mechanic		Very difficult, suitable for expert DIY or professional	
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Specifications

Type	Single dry plate with diaphragm spring. Cable-operated release mechanism
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Adjustment data

Phase I and Phase II models:

Clutch pedal height:	
Right-hand drive models	171.0 to 181.0 mm
Left-hand drive models	159.5 to 169.5 mm
Clutch pedal free play (measured at pedal pad)	10.8 to 15.1 mm

Phase III models:

Clutch pedal height:	
Right-hand drive models	159.0 to 169.0 mm
Left-hand drive models	153.0 to 163.0 mm
Clutch pedal free play (measured at pedal pad)	11.0 to 15.0 mm

Friction plate

Diameter:	
1.6 litre models	200.0 mm
2.0 litre models	215.0 mm
Friction material thickness (new)	7.7 to 8.3 mm
Minimum friction material-to-rivet head depth	0.3 mm
Maximum friction plate run-out:	
1.6 litre models (measured 95 mm out from plate centre)	1.0 mm
2.0 litre models (measured 102.5 mm out from the plate centre)	1.0 mm

Torque wrench settings

	Nm	lbf ft
Clutch cable retainer-to-bulkhead nuts	10	7
Clutch pedal height adjustment bolt locknut	10	7
Clutch pedal pivot bolt	19	14
Pressure plate retaining bolts	25	18

1 General information

The clutch consists of a friction plate, a pressure plate assembly, a release bearing and the release mechanism. All of these components are contained in the large cast-aluminium alloy bellhousing, sandwiched between the engine and the transmission. The release mechanism is mechanical, being operated by a cable (see illustration).

The friction plate is fitted between the engine flywheel and the clutch pressure plate, and is allowed to slide on the transmission input shaft splines. It consists of two circular facings of friction material riveted in position to provide the clutch bearing surface, and a spring-cushioned hub to damp out transmission shocks.

The pressure plate assembly is bolted to the engine flywheel, and is located by three dowel pins. When the engine is running, drive is transmitted from the crankshaft via the flywheel to the friction plate (these components being clamped securely together by the pressure plate assembly), and from the friction plate to the transmission input shaft.

To interrupt the drive, the spring pressure must be relaxed. This is achieved by a sealed release bearing fitted concentrically around the transmission input shaft; when the driver depresses the clutch pedal, the release bearing is pressed against the fingers at the centre of the diaphragm spring. Since the spring is held by rivets between two annular fulcrum rings, the pressure at its centre causes it to deform, so that it flattens and thus releases the clamping force it exerts, at its periphery, on the pressure plate.

Depressing the clutch pedal pulls the control cable inner wire, and this in turn rotates the release fork by acting on the lever at the fork's upper end, above the bellhousing. The fork itself is clipped to the left of the release bearing.

As the friction plate facings wear, the pressure plate moves towards the flywheel; this causes the diaphragm spring fingers to push against the release bearing, thus reducing the clearance which must be present in the mechanism. To ensure correct operation, the clutch cable must be regularly adjusted.

Note: In certain Sections of this Chapter references are made to Phase I, Phase II and Phase III models according to year of production. This classification has been necessary where modifications to the model range affect the repair procedure being described. The Phases relate to the model years as follows:

Phase I - 1990 to June 1993

Phase II - June 1993 to October 1996

Phase III - October 1996 to September 1999

2 Clutch - adjustment

1 The clutch adjustment is checked by first by setting the clutch pedal height, and then by adjusting the pedal free play.

2 Peel back the carpet from underneath the clutch pedal, and ensure that there are no obstructions between the pedal and floor panel. Measure the distance from the centre of the clutch pedal pad to the floor (see illustration). **Note:** This measurement can be taken with the carpet in position, so long as the thickness of the carpet is added onto the pedal height measurement. The pedal height should be within the range given in the Specifications at the start of this Chapter.

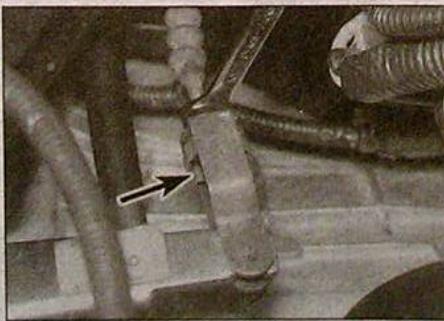
3 If height adjustment is necessary, reach up behind the facia, and slacken the pedal height adjusting bolt locknut. If necessary, remove the lower facia panel (see Chapter 11) to improve access to the bolt. Position the bolt as required, so that the pedal height is correctly set, then tighten the locknut to the specified torque.

4 With the pedal height correctly set, check the pedal free play as follows.

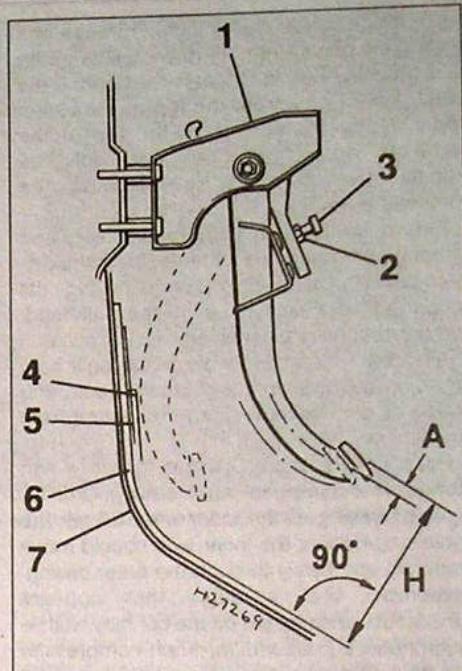
5 Slowly depress the clutch pedal, and measure the distance that the clutch pedal pad travels from the at-rest position to the point where resistance is felt (see illustration 2.2). This is the pedal free play, and should be within the range given in this Chapter's Specifications.

6 If free play adjustment is necessary, working within the engine compartment, locate the clutch release lever, which is situated on the top of the transmission. Slacken the cable locknut, then rotate the knurled adjusting nut until the release lever travel from the at-rest position to the position where resistance is felt is approximately 2.5 to 3.5 mm (see illustration). Recheck the clutch pedal free play as described in paragraph 5, and readjust if necessary. Once the pedal free play is correctly set, securely tighten the cable locknut.

7 With the pedal height and free play correctly adjusted, refit all components removed for access.



2.6 Slacken the locknut, and adjust the clutch cable by rotating the knurled adjusting nut (arrowed)



2.2 Clutch pedal height adjustment details

Dimension 'H' - pedal height measurement
Dimension 'A' - pedal free play measurement

1 Pedal mounting bracket	4 Carpet
2 Locknut	5 Insulator sheet
3 Pedal height adjustment bolt	6 Insulator sheet
	7 Floor panel

3 Clutch cable - removal and refitting



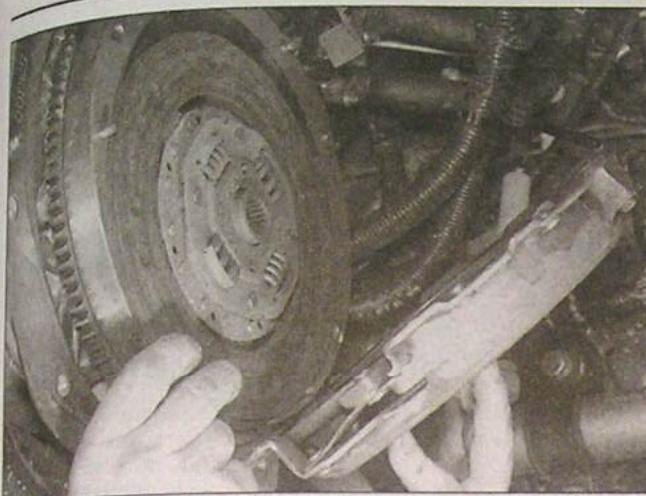
Removal

1 Working in the engine compartment, locate the clutch release lever which is situated on the top of the transmission, then slacken the locknut and knurled adjuster nut situated on the cable end fitting.

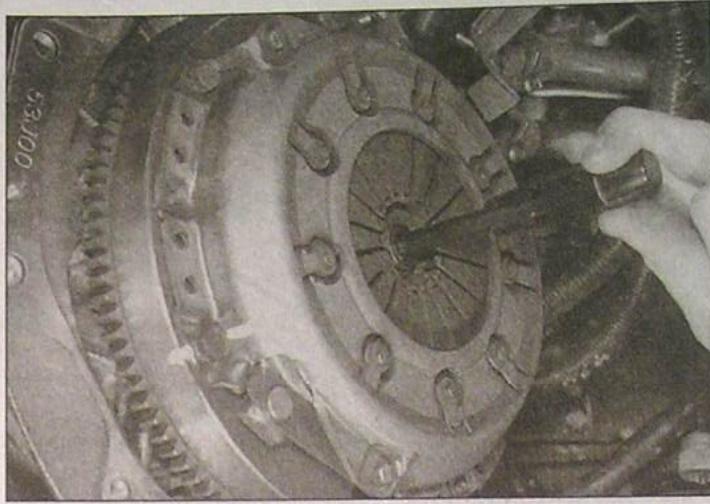
2 Release the inner cable end fitting from the release lever, and the outer cable fitting from its mounting bracket on the transmission (see illustration).



3.2 Detach the clutch inner cable from the release lever, then free the outer cable from its mounting bracket



5.14 Fit the friction plate with its spring hub assembly facing away from the flywheel, and install the pressure plate



5.17 Using a clutch-aligning tool to centralise the friction plate

4 Prise the pressure plate assembly off its locating dowels, and collect the friction plate, noting which way round the friction plate is fitted.

Inspection

Note: Due to the amount of work necessary to remove and refit clutch components, it is usually considered good practice to renew the clutch friction plate, pressure plate assembly and release bearing as a matched set, even if only one of these is actually worn enough to require renewal.

5 Remove the clutch assembly.

6 When cleaning clutch components, first read the warning at the beginning of this Section. Remove the dust only as described - working with dampened cloths will help to keep dust levels to a minimum. Wherever possible, work in a well-ventilated atmosphere.

7 Check the friction plate facings for signs of wear, damage or oil contamination. If the friction material is cracked, burnt, scored or damaged, or if it is contaminated with oil or grease (shown by shiny black patches), the friction plate must be renewed. Measure the depth of the rivets below the friction material surface. If depth of any rivet is equal to, or less than, the service limit given in the Specifications, then the friction plate must be renewed.

8 If the friction material is still serviceable, check that the centre boss splines are unworn, that the torsion springs are in good condition and securely fastened, and that all the rivets are tightly fastened. If excessive wear or damage is found, the friction plate must be renewed.

9 If the friction material is fouled with oil, this must be due to an oil leak from the crankshaft left-hand oil seal, from the sump-to-cylinder block joint, or from the transmission input shaft. Renew the seal or repair the joint, as appropriate, as described in Chapter 2 or 7

before installing the new friction plate, or the new plate will quickly go the same way.

10 Check the pressure plate assembly for obvious signs of wear or damage; shake it to check for loose rivets, or worn or damaged fulcrum rings. Check that the drive straps securing the pressure plate to the cover do not show signs (such as a deep yellow or blue discolouration) of overheating. If the diaphragm spring is worn or damaged, or if its pressure is in any way suspect, the pressure plate assembly should be renewed.

11 Examine the machined bearing surfaces of the pressure plate and of the flywheel; they should be clean, completely flat, and free from scratches or scoring. If either is discoloured from excessive heat, or shows signs of cracks, it should be renewed; however, minor damage of this nature can sometimes be polished away using emery paper.

12 Check that the release bearing contact surface rotates smoothly and easily, with no sign of noise or roughness, and that the surface itself is smooth and unworn, with no signs of cracks, pitting or scoring. If there is any doubt about its condition, the bearing must be renewed.

Refitting

13 On reassembly, ensure that the bearing surfaces of the flywheel and pressure plate are completely clean, smooth, and free from oil or grease. Use solvent to remove any protective grease from new components.

14 Fit the friction plate so that its spring hub assembly faces away from the flywheel; there may also be a marking showing which way round the plate is to be refitted (see illustration).

15 Refit the pressure plate assembly, aligning the marks made on dismantling (if the original pressure plate is re-used), and locating the pressure plate on its three locating dowels. Fit the pressure plate bolts, but tighten them only finger-tight so that the friction plate can still be moved.

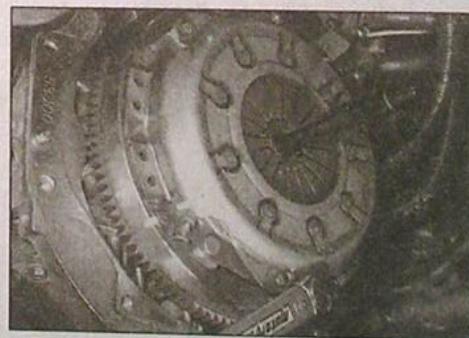
16 The friction plate must now be centralised, so that when the transmission is refitted, its input shaft will pass through the splines at the centre of the friction plate.

17 Centralisation can be achieved by passing a screwdriver or other long bar through the friction plate, and into the hole in the crankshaft. The friction plate can then be moved around until it is centred on the crankshaft hole. Alternatively, a clutch-aligning tool can be used to eliminate the guesswork. These can be obtained from most accessory shops, or can be made up from a length of metal rod or wooden dowel which fits closely inside the crankshaft hole, and has insulating tape wound around it to match the diameter of the friction plate splined hole (see illustration).

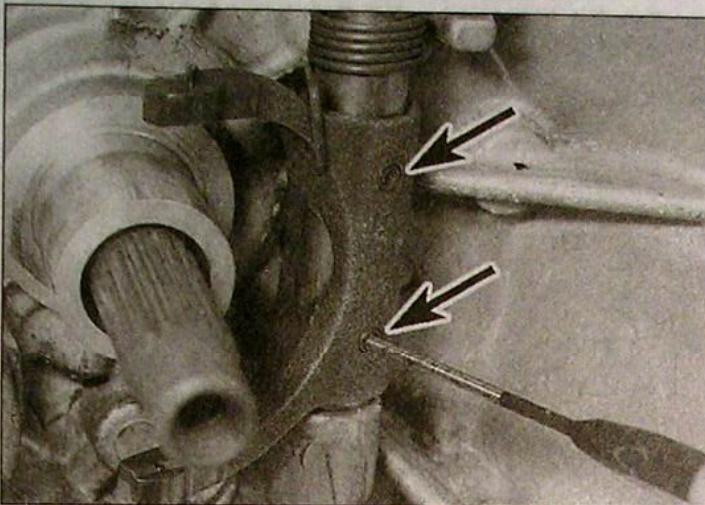
18 When the friction plate is centralised, tighten the pressure plate bolts evenly and in a diagonal sequence to the specified torque setting (see illustration).

19 Apply a thin smear of high-melting point grease to the splines of the friction plate and the transmission input shaft, also to the release bearing bore and release fork shaft.

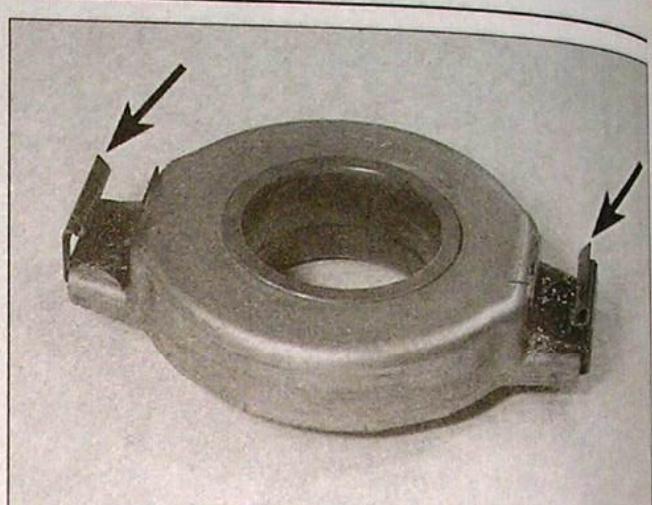
20 Refit the transmission as described in Chapter 7A.



5.18 Once the friction plate is correctly centralised, tighten the pressure plate retaining bolts to the specified torque



6.3 Clutch release fork is secured to the release lever shaft by two dual-roll pin arrangements (arrowed)



6.12a Ensure that the retaining clips (arrowed) are correctly fitted to the release bearing ...

6 Clutch release mechanism - removal, inspection and refitting



Note: Refer to the warning concerning the dangers of asbestos dust at the beginning of Section 5.

Removal

1 Unless the complete engine/transmission is to be removed from the car, and separated for major overhaul (see Chapter 2C), the clutch release mechanism can be reached by removing the transmission as described in Chapter 7A.

2 Lift the retaining clips, then slide the release bearing from the fork and remove it from the transmission. Note the correct fitted direction of each clip on the bearing.

3 Rotate the release fork then, using a hammer and suitable punch, drive out the roll pins securing the release fork to the shaft (drive out the small inner pins first, then remove the outer pins) (see illustration). Discard the roll pins; new ones should be used on refitting.

4 Note the correct fitted position of the return spring, then withdraw the release lever; recover the release fork and spring from the transmission housing.

Inspection

5 Check the release mechanism, renewing any component which is worn or damaged. Carefully check all bearing surfaces and points of contact.

6 Inspect the bush and dust seal fitted to the transmission housing for signs of damage and deterioration, and renew if necessary. The old bush can be tapped out of position, and the new one installed using a hammer and suitable tubular socket.

7 When checking the release bearing itself, note that it is often considered worthwhile to renew it as a matter of course, given that a significant amount of work is required to gain access to it. Check that the contact surface rotates smoothly and easily, with no sign of noise or roughness. Also check that the surface itself is smooth and unworn, with no signs of cracks, pitting or scoring. If there is any doubt about its condition, the bearing must be renewed.

Refitting

8 Apply a smear of high-melting point grease to the shaft pivot points and the contact surfaces of the release fork.

9 Slide the release lever partially into position in the transmission.

10 Offer up the release fork and spring, aligning them with the lever shaft, and push the release lever fully into position.



6.12b ... then fit the bearing to the transmission, making sure the clips are correctly engaged with the release fork ends

11 Align the release fork holes with the holes in the lever shaft, and drive the two new roll pins into position.

12 Fit the retaining clips (where removed) to the release bearing, making sure that they are fitted the correct way round. Apply a smear of high-melting point grease to the contact surfaces of the bearing and input shaft, then slide the bearing along the shaft and clip it onto the release fork (see illustrations).

13 Check the operation of the release mechanism, ensuring that it moves smoothly, and returns easily under the pressure of the return spring, then refit the transmission as described in Chapter 7A.

3 Working inside the vehicle, remove the lower facia panel from the driver's side of the facia as described in Chapter 11. Unhook the clutch inner cable from the top of the clutch pedal. Note that access to the top of the pedal is very poor, but can only be significantly improved by removing the complete facia.

4 Return to the engine compartment, and withdraw the cable from the engine compartment bulkhead. If necessary, undo the two nuts securing the cable retainer to the bulkhead, and remove the retainer along with the cable.

5 Work back along the cable, releasing it from any relevant retaining clips and guides, and noting its correct routing, and remove it from the vehicle.

6 Examine the cable, looking for worn end fittings or a damaged outer casing, and for signs of fraying of the inner wire. Check the cable's operation; the inner wire should move smoothly and easily through the outer casing. Remember that a cable that appears serviceable when tested off the car may well be much heavier in operation, when compressed into its working position. Renew the cable if it shows any signs of excessive wear or damage. If the cable has seen several years' service, it would be best to renew it anyway, as a precaution against it breaking in service.

Refitting

7 Apply a thin smear of multi-purpose grease to the cable end fittings, then pass the cable through the engine compartment bulkhead. Locate the cable retainer on its studs (where removed), and tighten its retaining nuts to the specified torque.

8 From inside the vehicle, hook the inner cable over the clutch pedal end, and check that it is securely retained.

9 Work along the cable, ensuring that it is correctly routed, and retained by all the relevant retaining clips and guides. Clip the outer cable into its mounting bracket on the transmission.

10 Hook the inner cable end fitting over the end of the clutch release lever, and adjust the clutch pedal settings as described in Section 2. If a new cable has been fitted, fully depress and release the clutch pedal approximately 50 times to pre-stretch the cable before carrying out the adjustment.

4 Clutch pedal - removal and refitting



Note: Access to the pedal and spring is very poor, and can only be significantly improved by removing the facia as described in Chapter 11.

Removal

1 Working as described in Section 2, slacken the clutch cable locknut and knurled adjuster nut, to obtain maximum free play in the cable.

2 Working inside the vehicle, remove the lower facia panel from the driver's side of the facia (see Chapter 11). Unhook the clutch inner cable from the top of the clutch pedal.

3 Carefully unhook the ends of the clutch pedal assist spring from its locations in the pedal mounting bracket, and recover the spring seats (see illustration).

4 Slacken and remove the nut and pivot bolt, then withdraw the clutch pedal and assist spring from the mounting bracket. If necessary, the pedal and spring can then be separated.

5 Carefully clean all components, and renew any that are worn or damaged. Check the bearing surfaces of the pivot bushes and bolt with particular care; the bushes can be renewed separately if worn.

Refitting

6 Press the pivot bushes into the pedal bore, then apply a smear of multi-purpose grease to their bearing surfaces. Ensure that the clutch pedal and assist spring are correctly mated.

7 Refit the spring seats to the pedal mounting

bracket, and install the pedal assembly. Refit the pivot bolt and nut, and tighten it to the specified torque setting.

8 Locate each end of the assist spring in its relevant seat.

9 Hook the clutch cable onto the end of the pedal, then adjust the clutch pedal settings as described in Section 2.

5 Clutch assembly - removal, inspection and refitting



Warning: Dust created by clutch wear and deposited on the clutch components may contain asbestos, which is a health hazard. DO NOT blow it out with compressed air, or inhale any of it. DO NOT use petrol or petroleum-based solvents to clean off the dust. Brake system cleaner or methylated spirit should be used to flush the dust into a suitable receptacle. After the clutch components are wiped clean with rags, dispose of the contaminated rags and cleaner in a sealed, marked container.

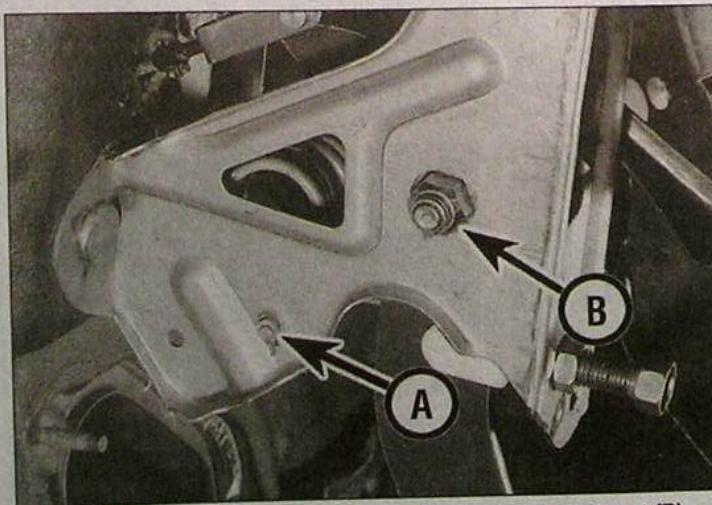
Note: Although some friction materials may no longer contain asbestos, it is safest to assume that they DO, and to take precautions accordingly.

Removal

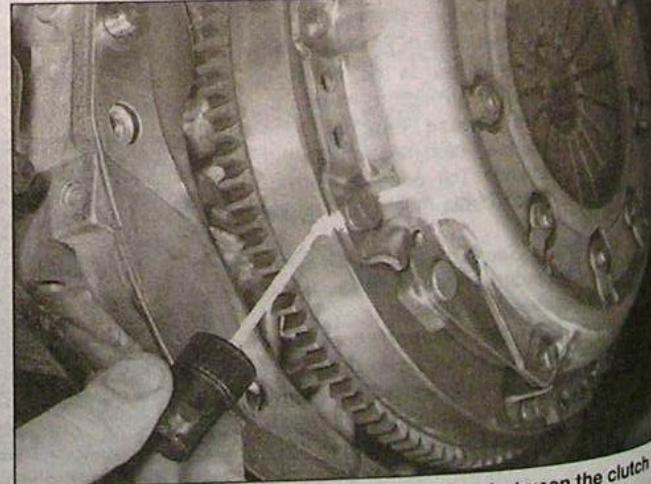
1 Unless the complete engine/transmission is to be removed from the car, and separated for major overhaul (see Chapter 2C), the clutch can be reached by removing the transmission as described in Chapter 7A.

2 Before disturbing the clutch, use chalk or a marker pen to mark the relationship of the pressure plate assembly to the flywheel (see illustration).

3 Working in a diagonal sequence, slacken the pressure plate bolts by half a turn at a time, until the spring pressure is released and the bolts can be unscrewed by hand.

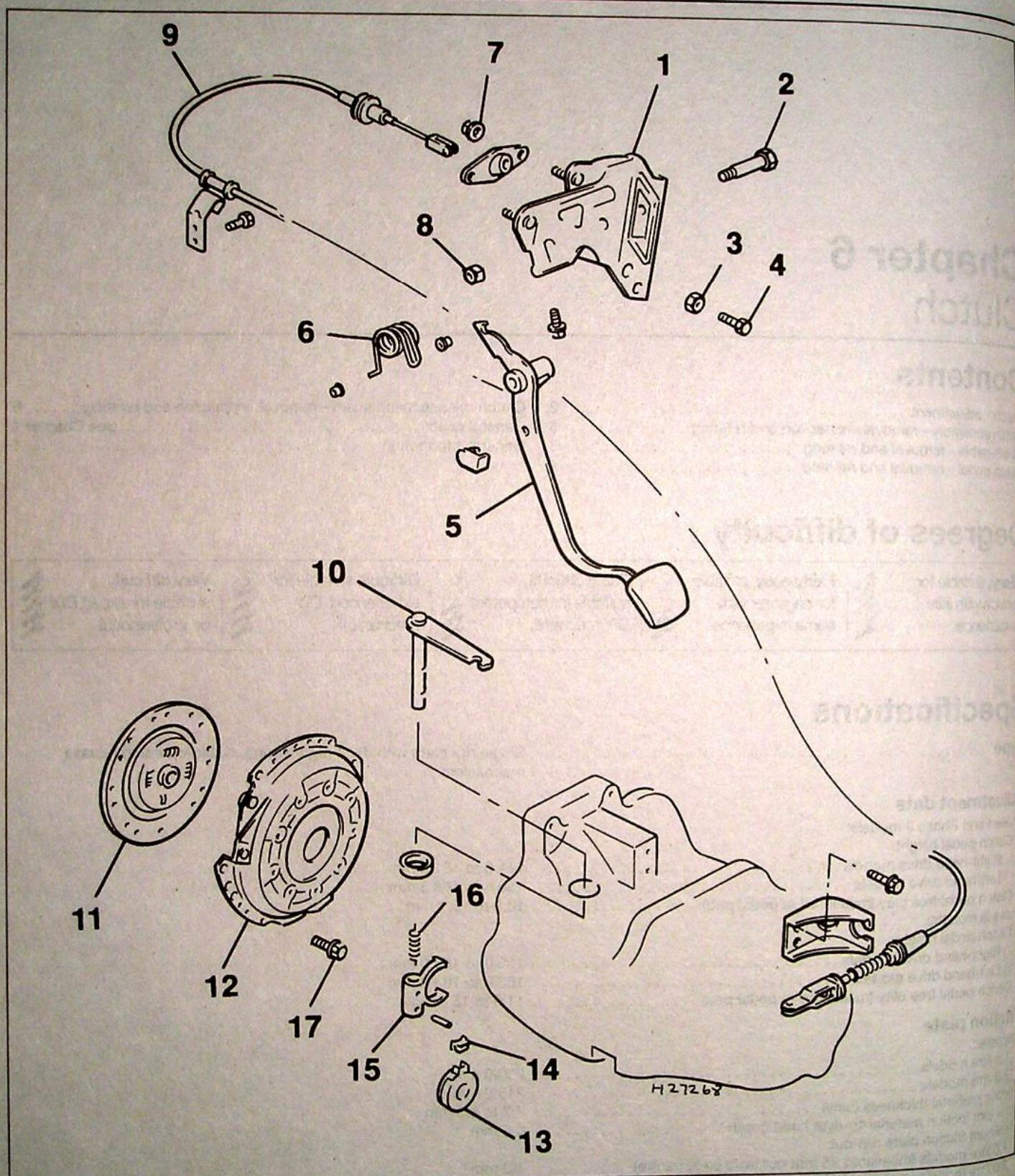


4.3 Clutch pedal assist spring end (A) and pivot bolt nut (B) (shown with facia removed)



5.2 Prior to removal, make alignment marks between the clutch pressure plate and flywheel

6•2 Clutch



1.1 Exploded view of the clutch and associated components

- 1 Pedal mounting bracket
- 2 Pedal pivot bolt
- 3 Pedal height adjusting bolt locknut

- 4 Pedal height adjusting bolt
- 5 Clutch pedal
- 6 Assist spring
- 7 Cable-to-bulkhead nut

- 8 Pedal pivot bolt nut
- 9 Cable
- 10 Release lever
- 11 Friction plate
- 12 Pressure plate

- 13 Release bearing
- 14 Retaining clip
- 15 Release fork
- 16 Return spring
- 17 Pressure plate bolt