



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



Specifications

General

Type Single dry plate with diaphragm spring, cable or hydraulic operation

Torque wrench setting

	Nm	lbf ft
Pressure plate retaining bolts	20	15

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, and is operated by a self-adjusting cable on all petrol models. On diesel models, the release mechanism is operated hydraulically by means of a master and slave cylinder and interconnecting hydraulic pipework.

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.

The pressure plate assembly is bolted to the engine flywheel. 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 pressure plate spring fingers must be relaxed. On the models

covered in this manual, two different types of clutch release mechanism are used. The first is a conventional 'push-type' mechanism, where an independent clutch release bearing, fitted concentrically around the transmission input shaft, is pushed onto the pressure plate assembly; this type is fitted to all models except the 2.5 turbo diesel. The second is a 'pull-type' mechanism, where the clutch release bearing is an integral part of the pressure plate assembly, and is lifted away from the friction plate; this type is fitted to 2.5 litre turbo diesel models.

On models with the conventional 'push-type' mechanism, at the transmission end of the clutch cable, the outer cable is retained by a fixed mounting bracket, and the inner cable is attached to the release fork lever. Depressing the clutch pedal pulls the control cable inner wire, and this rotates the release fork by acting on the lever at the fork's upper end. The release fork then presses the release bearing against the pressure plate spring fingers. This causes the springs to deform and releases the clamping force on the pressure plate.

On 2.5 litre turbo diesel models with the 'pull-type' mechanism, the clutch pedal is connected to the clutch master cylinder by a pushrod. The master cylinder is mounted on the engine compartment bulkhead with the

slave cylinder mounted on the side of the transmission. A hydraulic fluid reservoir is also remotely mounted on the bulkhead and connected to the master cylinder by means of a fluid hose. 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 under hydraulic pressure and actuates the release fork by means of a short pushrod. The release fork then lifts the release bearing, which is attached to the pressure plate springs, away from the friction plate, and releases the clamping force exerted at the pressure plate periphery.

The clutch master cylinder, fluid reservoir, slave cylinder, and interconnecting fluid pipework are all part of a maintenance-free, sealed assembly. The fluid reservoir cannot be opened and the fluid level does not require topping-up. In the event of fluid leakage or any malfunction of the hydraulic system, all the components must be renewed as a complete assembly.

On Diesel models, adjustment of the clutch to compensate for wear of the friction plate linings is automatically taken up by the hydraulic clutch components. For petrol models consult the following section for clutch cable adjustment.

2 Clutch cable - removal, refitting and adjustment



Removal

- 1 Disconnect the battery negative terminal.
- 2 Slacken and withdraw the retaining screws, then remove the driver's side lower panel from the facia.
- 3 Remove the air cleaner housing and intake duct components as described in the relevant Part of Chapter 4.
- 4 Working in the engine compartment, release the inner cable and outer cable fittings from the clutch release lever and mounting bracket and free the cable from the transmission housing.
- 5 Working inside the vehicle, release the inner cable from the pedal. On some models it may be necessary to depress a plastic guide clip, at the top of the pedal, to release the cable.
- 6 Return to the engine compartment, then release the cable guide from the bulkhead and withdraw the cable forwards, releasing it from any relevant retaining clips and guides. Note its correct routing, and remove it from the vehicle. Note that on right hand drive vehicles, the cable has an integral right-angled bracket assembly, which directs the run of the cable across the bulkhead to the left hand side of the engine compartment.
- 7 Examine the cable, looking for worn end fittings or a damaged outer casing, and for signs of fraying of the inner wire. Renew the

cable if it shows signs of excessive wear or any damage.

Refitting

- 8 Apply a thin smear of multi-purpose grease to the cable end fittings, then pass the cable through the engine compartment bulkhead.
- 9 Hold the clutch pedal in its raised position by wedging a suitable tool beneath it.
- 10 Guide the end of the cable into the pedal end (or plastic clip) making sure that it is fully engaged.
- 11 In the engine compartment refit the cable to the transmission housing and release lever. Re-secure the cable with any relevant retaining clips and guides.
- 12 Depress and release the clutch pedal at least thirty times, to allow the cable to stretch and settle. On completion, check the clutch adjustment.
- 13 Refit the lower panel to the facia then refit the air cleaner components and reconnect the battery.

Adjustment

- 14 The clutch cable has no integral self-adjusting mechanism; the pedal stroke can be adjusted as follows.
- 15 Using a tape measure, measure the distance between the clutch pedal rubber pad and the bottom of the steering wheel rim, when the pedal is at rest.
- 16 Now take the measurement again, but this time with the pedal fully depressed. Subtract the second measurement from the first.
- 17 Compare your results with the pedal travel

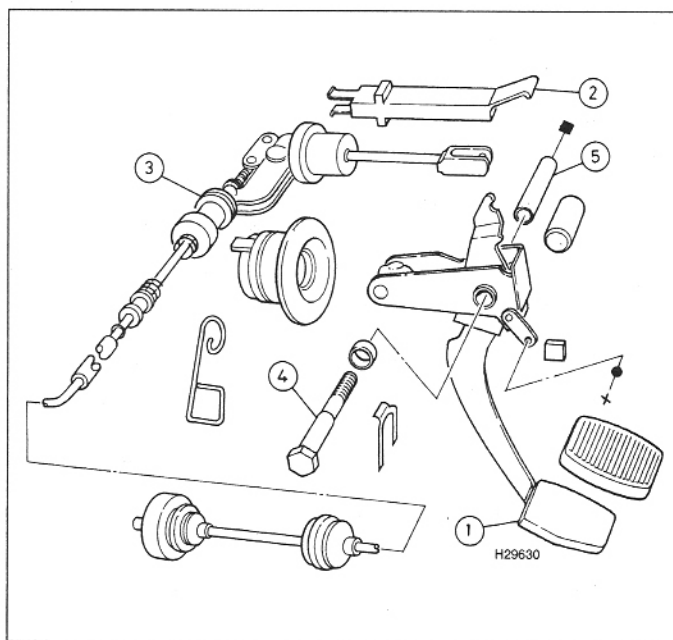
figure given in the specifications of Chapters 1A or 1B. If the figure is incorrect, adjust the pedal travel by slackening the locknut at the transmission end of the clutch cable, and turning the adjuster nut. When the travel is correct, tighten the locknut securely.

3 Clutch pedal - removal and refitting



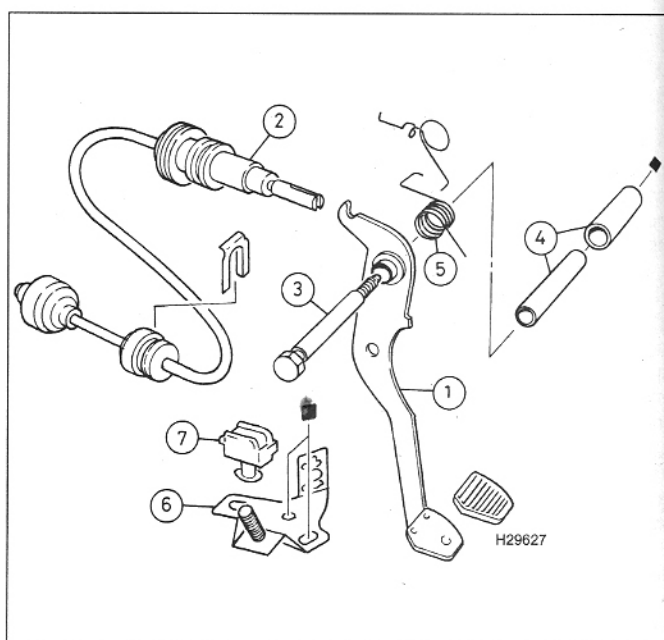
Removal

- 1 Disconnect the battery negative terminal.
- 2 Slacken and withdraw the retaining screws and remove the driver's side lower panel from the facia.
- 3 On models with a cable-operated clutch, release the inner cable from the pedal. On some models it may be necessary to depress a plastic clip located just beneath the top of the pedal to release the cable. Where applicable, carefully release the pedal-assist spring assembly from the pedal (see illustrations).
- 4 On models with a hydraulically-operated clutch, release the master cylinder pushrod balljoint from the pedal and allow the pedal to rise until it reaches its stop.
- 5 Slacken and remove the pivot bolt and nut, and remove the clutch pedal from the vehicle. Slide the spacer out from the pedal pivot. Examine all components for signs of wear or damage, renewing them as necessary.



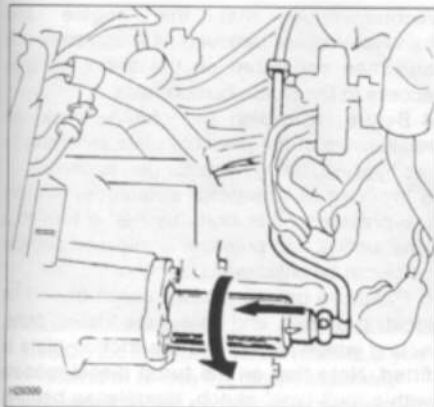
3.3a Clutch pedal and cable mounting details - right hand drive models

- | | | |
|----------------|-------------------------|--------------|
| 1 Clutch pedal | 3 Clutch cable assembly | 4 Pivot bolt |
| 2 Cable guide | 5 Spacer | |



3.3b Clutch pedal and cable mounting details - left hand drive models

- | | | |
|----------------|-----------------|--------------------|
| 1 Clutch pedal | 4 Spacer | 6 Mounting bracket |
| 2 Cable guide | 5 Return spring | 7 Clip |
| 3 Pivot bolt | | |



4.3a Release the clutch slave cylinder from the transmission by pushing it in by hand and at the same time turning it 90° anti-clockwise

Refitting

- 6 Apply a smear of multi-purpose grease to the spacer, and insert it into the pedal pivot bore.
- 7 Manoeuvre the pedal into position, and insert the pivot bolt. Refit the nut to the pivot bolt and tighten it securely.
- 8 Reconnect the clutch cable end/master cylinder pushrod (as applicable) to the pedal. Where applicable on cable-operated versions, refit the pedal assist spring assembly.
- 9 Depress and release the clutch pedal several times and check for correct operation.
- 10 Refit the lower panel to the facia and reconnect the battery.

4 Clutch hydraulic system components - removal and refitting

Note: The hydraulic system components (master cylinder, slave cylinder, reservoir and pipework) are supplied as two sealed assemblies that cannot be dismantled.

Note: The master cylinder bulkhead union incorporates a quick-release fitting and Citroën recommend the use of a special slotted socket (tool 9040-TH) for this purpose. A suitable alternative can be fabricated from a folded strip of metal with a slot cut in it, to accommodate the hydraulic hose and union.

Removal

Left hand drive models

- 1 Carry out the following to gain access to the slave cylinder:

- a) Disconnect the negative and positive battery cables, then remove the battery and battery tray.
- b) Raise the front of the vehicle, support it securely on axle stands then remove the front left hand road wheel.
- c) Extract the fixings and remove the lower section of the moulded wheel arch liner.



4.3b Withdraw the slave cylinder, together with its pushrod from the transmission

- d) Remove the air cleaner housing and intake duct components as described in the relevant Part of Chapter 4.

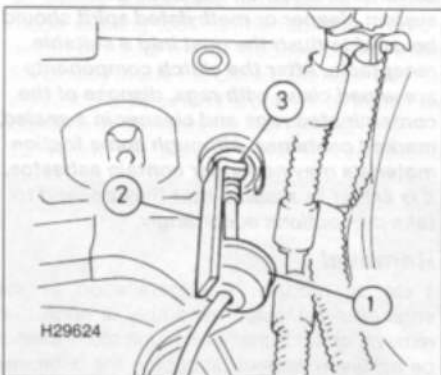
- 2 Unclip the clutch hydraulic pipe from the bodywork and the transmission casing.

- 3 Release the clutch slave cylinder from the transmission by pushing it in by hand and at the same time turning it 90° anti-clockwise. Withdraw the slave cylinder, together with its pushrod from the transmission. With the slave cylinder removed, retain the pushrod in place using cable ties or a similar arrangement (see illustrations). **Do not** depress the clutch pedal with the slave cylinder removed or the push rod will be ejected. It is advisable to place a block of wood under the clutch pedal to prevent it being accidentally depressed.

- 4 Engage the Citroën special tool, or the home-made alternative over the master cylinder union and uncouple the master cylinder hydraulic union at the bulkhead (see illustration).

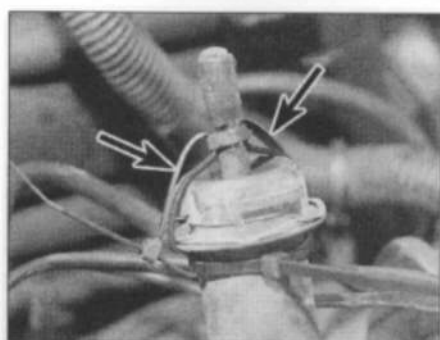
- 5 Release the hydraulic pipework from the retaining clips and attachments in the engine compartment and remove it, together with the slave cylinder from the vehicle.

- 6 Working inside the car, remove the trim



4.4 Engage the Citroën special tool, or the home-made alternative over the master cylinder union and uncouple the master cylinder hydraulic union at the bulkhead (left hand drive models)

- 1 Rubber protector
- 2 Special tool
- 3 Quick release union



4.3c Retain the pushrod in place using cable ties (arrowed) or similar

panel from the underneath the drivers side of the facia.

- 7 Refer to Chapter 11 and carry out the following:

- a) Remove the drivers airbag (where applicable), paying close attention to the related warnings.
- b) Remove the steering wheel.
- c) Remove the lower section of the steering column shroud panel
- d) Remove the four securing nuts and lower the steering column support bracket away from its mountings.

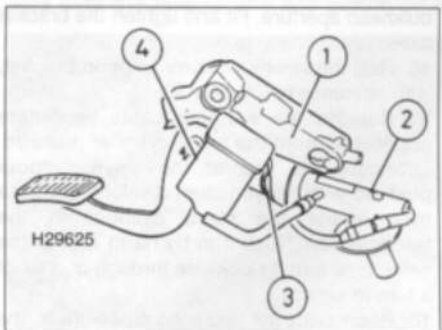
- 8 Slacken and remove the three nuts and detach the clutch pedal bracket from the bulkhead, complete with the clutch pedal and master cylinder.

- 9 Unclip the fluid reservoir from the pedal bracket, then unhook the master cylinder pushrod from the top of the clutch pedal.

- 10 Grasp the master cylinder and twist it anticlockwise through about quarter of a turn to release it from the clutch pedal bracket (see illustration).

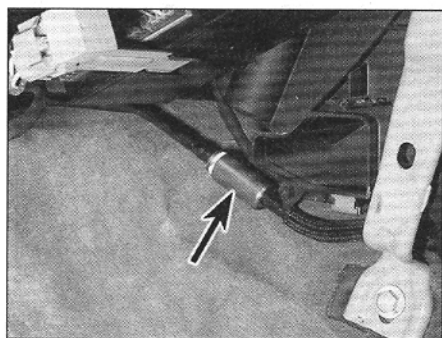
Right hand drive models

- 11 The removal/refitting procedure is essentially the same as that described for left hand drive models, with the exception that the quick release union is located on the right hand side of the passengers footwell, rather than at the engine compartment bulkhead. The clutch hydraulic pipe runs from the pedal



4.10 Clutch pedal, master cylinder and fluid reservoir assembly

- 1 Pedal bracket
- 2 Master cylinder
- 3 Pushrod
- 4 Fluid reservoir



4.11 Location of the quick release union on right hand drive models

assembly along the underside of the fascia and underneath the front of the centre console; access can be gained by removing the trim panels from the underside of the fascia (see illustration).

Refitting

Note: On a new assembly, the slave cylinder pushrod is retained in the cylinder by a plastic collar which will automatically break off when the clutch pedal is depressed for the first time. Do not attempt to release this collar manually prior to fitting or the pushrod may be ejected.



Warning: The hydraulic system is made up of two matched assemblies - the master cylinder assembly, and the pipework and slave cylinder assembly. Do not attempt to repair the system by renewing either of these assemblies individually.

Left hand drive models

12 Locate the master cylinder in the clutch pedal mounting bracket, press and turn it clockwise through quarter of a turn to lock it in position.

13 Connect the end of the master cylinder pushrod to the clutch pedal by means of the clip.

14 Clip the fluid reservoir to the side of the pedal bracket.

15 Place the pedal bracket assembly in position on the bulkhead, ensuring that the union grommet locates correctly in the bulkhead aperture. Fit and tighten the bracket assembly securing nuts.

16 Refit the steering column support bracket, with reference to Chapter 10.

17 Remove the securing cable tie (where applicable) from the slave cylinder pushrod. Lubricate the end of the slave cylinder pushrod with molybdenum disulphide grease then locate the slave cylinder in the transmission. Push it in by hand and at the same time turn it clockwise through quarter of a turn to secure.

18 Reconnect the hydraulic pipework to the retaining clips and attachments in the engine compartment.

19 Connect the hydraulic pipework to the master cylinder, by pushing the two halves of the quick-release union together at the

bulkhead.

20 With the assembly installed, slowly depress the clutch pedal to the floor, then slowly lift it again by hand. Wait for ten seconds, then repeat this procedure twice. Depress the pedal again, release it and check that it rises correctly after being released.

21 The remainder of the refitting procedure is a reversal of the removal procedure, as follows:

- a) Refit the steering column shroud panel, steering wheel and airbag, with reference to Chapter 11.
- b) Refit the fascia lower trim panel.
- c) Refit the air cleaner housing and intake duct components, as described in the relevant Part of Chapter 4.
- d) Refit the battery tray and battery, then reconnect the positive and negative battery cables.
- e) Refit the moulded wheel arch liner.
- f) Refit the roadwheel, lower the car to the ground and tighten the wheel bolts to the specified torque.

22 Note the hydraulic system is sealed and as such needs no bleeding or further maintenance.

Right hand drive models

23 Refer to the information given in paragraph 11.

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

Removal

1 On all models, the installation of the engine/transmission assembly is such that removal of the transmission unit alone cannot be achieved without disturbing the subframe and the associated front suspension components.

2 Note that on petrol engined models and 2.1 litre diesel engined models only, it is possible to separate the engine and transmission in situ (without actually removing the transmission), to allow access to the clutch components, as described in Chapter 7A.

3 On 2.5 litre diesel engined models, it is

recommended that the engine and transmission are removed as a complete unit and then separated on the bench to gain access to the clutch components.

4 Before disturbing the clutch, mark the relationship of the pressure plate assembly to the flywheel, using a marker pen or similar.

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

6 Prise the pressure plate assembly off its locating dowels, and collect the friction plate, noting which way round the friction plate is fitted. Note that on 2.5 turbo diesel models with a 'pull-type' clutch, the release bearing remains attached to the centre of the pressure plate assembly.

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. It is also worth considering the renewal of the clutch components on a preventative basis if the engine and/or transmission have been removed for some other reason.

7 Separate the pressure plate and friction plate and place them on the bench.

8 When cleaning clutch components, read first the warning at the beginning of this Section; remove dust using a clean, dry cloth, and working in a well-ventilated atmosphere.

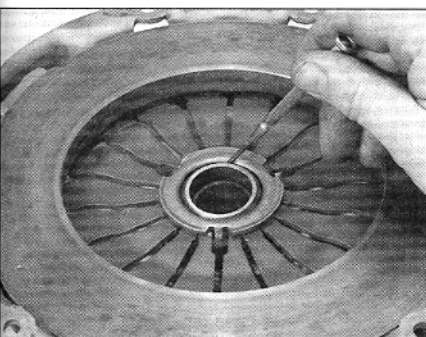
9 Check the friction plate facings for signs of wear, damage or oil contamination. If the friction material is cracked, burnt, scored or damaged, or if it is contaminated with oil or grease (shown by shiny black patches), the friction plate must be renewed.

10 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 tight. If any wear or damage is found, the friction plate must be renewed.

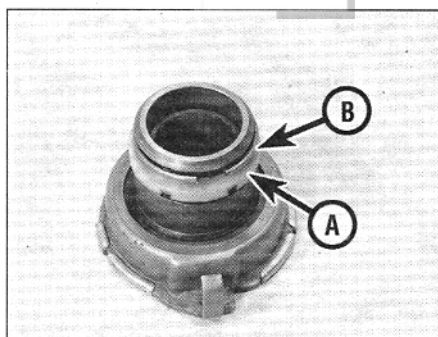
11 If the friction material is fouled with oil, this must be due to an oil leak from the crankshaft left-hand oil seal, from the sump-to-cylinder block joint, or from the transmission input shaft. Renew the seal or repair the joint, as appropriate, as described in Chapters 2A, 2B or 7A, before installing the new friction plate.

12 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, and check that the drive straps securing the pressure plate to the cover do not show signs of overheating (such as a deep yellow or blue discoloration). If the diaphragm spring is worn or damaged, or if its pressure is in any way suspect, the pressure plate assembly should be renewed.

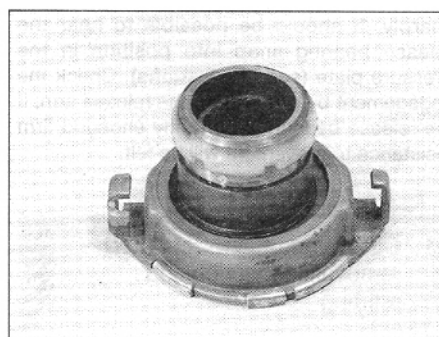
13 Examine the machined bearing surfaces



5.15 On 2.5 litre turbo diesel models, if you intend to re-use the clutch assembly complete, it will be necessary to separate the release bearing from the pressure plate, by prising out the securing circlip with a small flat bladed screwdriver



5.17a On 2.5 litre turbo diesel models, position the integral plastic collar (A) over the circlip (B) at the end of release bearing



5.17b Plastic collar in place over the circlip

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 - although minor damage of this nature can sometimes be polished away using emery paper.

14 Check that the release bearing 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.

15 On 2.5 litre turbo diesel models, if you intend to re-use the clutch assembly complete, it will be necessary to separate the release bearing from the pressure plate, by prising out the securing circlip with a small flat bladed screwdriver (see illustration).

Refitting

16 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.

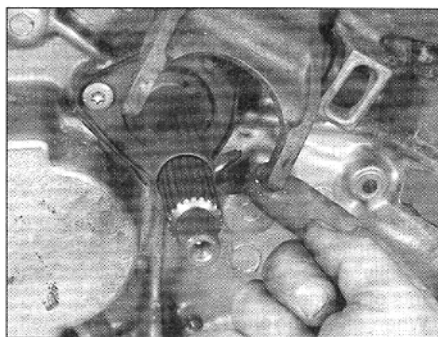
17 On 2.5 litre turbo diesel models, position the integral plastic collar over the circlip at the end of release bearing. Apply a smear of high temperature grease to the release fork arms, then slide the release bearing over the transmission input shaft, engaging the clips at the side of the bearing with the release fork arms (see illustrations).

All models

18 Fit the friction plate so its spring hub faces away from the flywheel; there may also be a marking to show which way round the plate is to be refitted.

19 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 locating dowels. Fit the pressure plate bolts, but tighten them only finger-tight, so that the friction plate can still be moved.

20 The friction plate must now be

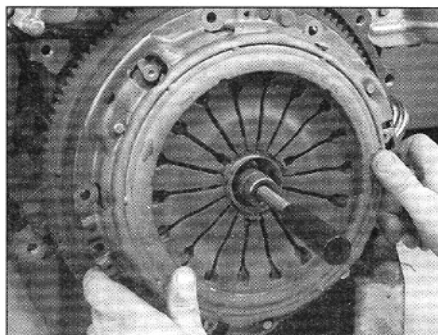


5.17c Apply a smear of high temperature grease to the release fork arms . . .

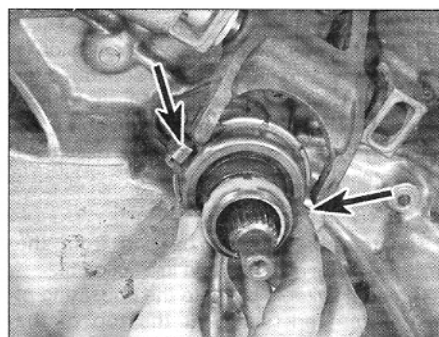
centralised, so that when the transmission is refitted, its input shaft will pass through the splines at the centre of the friction plate.

21 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 (see illustration). A home-made aligning tool can be fabricated 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.

22 When the friction plate is centralised,



5.21 Using a clutch alignment tool to fit the clutch pressure and friction plate



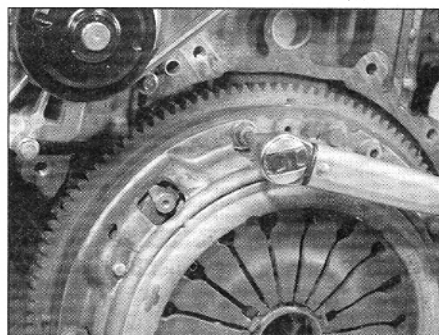
5.17d then slide the release bearing over the transmission input shaft, engaging the clips at the side of the bearing with the release fork arms (arrowed)

tighten the pressure plate bolts evenly and in a diagonal sequence to the specified torque setting (see illustration).

23 On 2.5 litre models, check that the release fork and bearing are still correctly engaged, and that bearing slide easily when the release fork is operated by hand.

24 Refit the transmission as described in Chapter 7A. On 2.5 litre diesel models refit the engine/transmission assembly as described in Chapter 2C.

25 On 2.5 litre turbo diesel models, the release bearing must be engaged with the pressure plate after the transmission has been refitted. Do this by hooking a piece of stout wire over the release arm and pulling on it



5.22 Tighten the pressure plate bolts evenly and in a diagonal sequence to the specified torque setting

sharply. It should be possible to hear the release bearing snap into position in the pressure plate (see illustrations). Check the engagement by pushing on the release arm; if the release bearing is correctly engaged firm resistance to movement will be felt.

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 only, as described in Chapter 7A.

2.5 litre turbo diesel models

2 Separate the release bearing from the pressure plate, as described in Section 5.

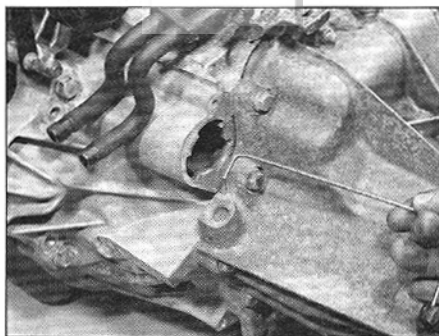
3 Thread a suitable bolt into the upper end of the release fork shaft, at the top of the transmission casing. Extract the shaft by pulling on the bolt with a pair of grips. Catch the release fork as it slides off the lower end of the shaft.

4 Depress the retaining tabs and extract the upper and lower release shaft bushes from the transmission casing.

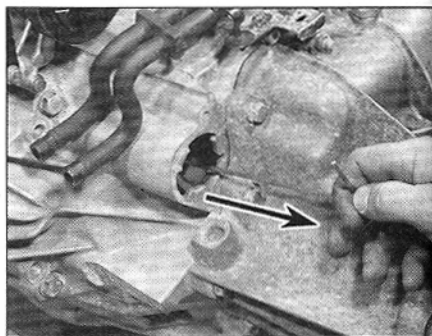
All other models

5 Unhook the release bearing from the fork, and slide it off the input shaft. Drive out the roll pin, and remove the release lever from the top of the release fork shaft. Discard the roll pin - a new one must be used on refitting.

6 On models with a cable operated clutch, depress the retaining tabs, then slide the upper bush off the end of the release fork



5.25a On 2.5 litre turbo diesel models, the release bearing can be engaged with the pressure plate using a hooked piece of wire



5.25b Hook the wire over the release arm and pull it sharply

shaft. Disengage the shaft from its lower bush, and manoeuvre it out from the transmission. Depress the retaining tabs, and remove the lower pivot bush from the transmission housing (see illustrations).

Inspection

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

8 When checking the release bearing itself, note that it is often considered worthwhile to renew it as a matter of course. Check that the 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

2.5 litre turbo diesel models

9 Fit the release shaft upper and lower bushes into place in the transmission casing. Apply a smear of molybdenum disulphide grease to each bush.

10 Slide the release shaft into position,

engaging it with the release fork.

11 Slide the release bearing onto the input shaft, and engage it with the release fork. Apply a smear of molybdenum disulphide grease to the contact surfaces of the release fork.

12 Refit the transmission, then engage the release bearing with the clutch pressure plate, using the method described in Chapter 7A.

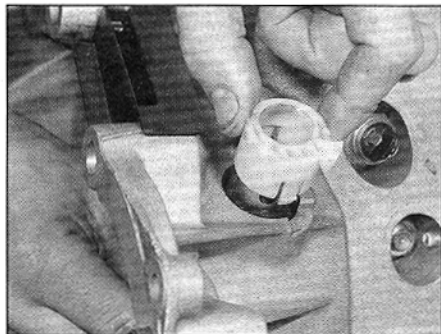
All other models

13 Apply a smear of molybdenum disulphide grease to the shaft pivot bushes and the contact surfaces of the release fork.

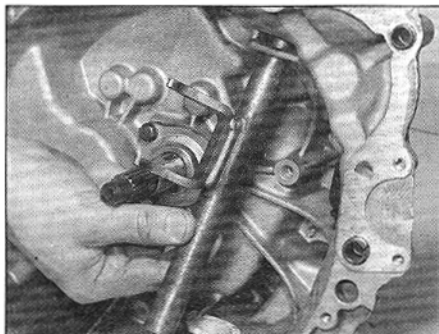
14 Locate the lower pivot bush in the transmission, ensuring that it is securely retained by its locating tangs, and refit the release fork. Slide the upper bush down the shaft, and clip it into position in the transmission housing.

15 Refit the release lever to the shaft. Align the lever with the shaft hole, and secure it in position by tapping a new roll pin fully into position. Slide the release bearing onto the input shaft, and engage it with the release fork.

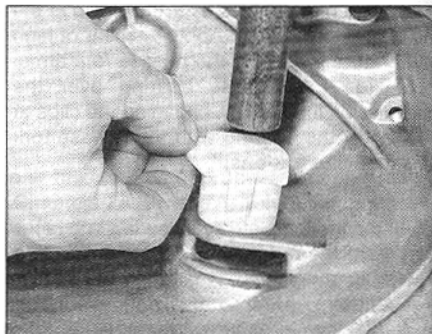
16 Refit the transmission as described in Chapter 7A.



6.6a Removing the upper bush ...



6.6b ... release fork shaft ...



6.6c ... and lower release bearing