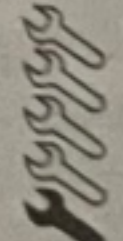
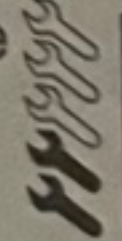
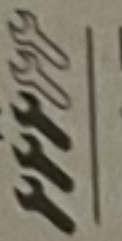
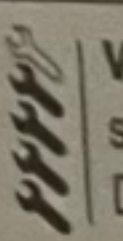
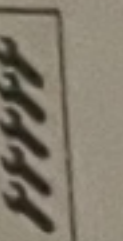


Chapter 7 Part B: Automatic transmission

Contents

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Fluid cooler – general information	7	Transmission – removal and refitting	9
General information	1	Transmission control system electrical components – removal and refitting	8
Oil seals – renewal	6	Transmission fluid – draining and refilling	2
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Selector lever assembly – removal and refitting	5		

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

General

Type

Five-speed electronically controlled automatic with manual Sentronic change function. Transmission code FA57

Torque wrench settings

	Nm	lbf ft
Drain plug	40	5
Driveplate/lower bellhousing cover plate	7	5
Engine-to-transmission unit bolts	See Chapter 2A or 2B	16
Fluid filler pipe retaining nut	22	18
Fluid temperature sensor	25	18
Fluid temperature sensor cover plate bolt	25	4
Input shaft speed sensor bolt	6	6
Gear selector position sensor:		18
Switch-to-transmission nut/bolt	8	
Lever to position sensor	25	
Left-hand engine mounting	See Chapter 2A or 2B	20
Oil cooler unions	27	4
Output shaft speed sensor bolt	6	
Subframe mounting bolts	See Chapter 10	22
Torque converter-to-driveplate bolts	30	

1 General information

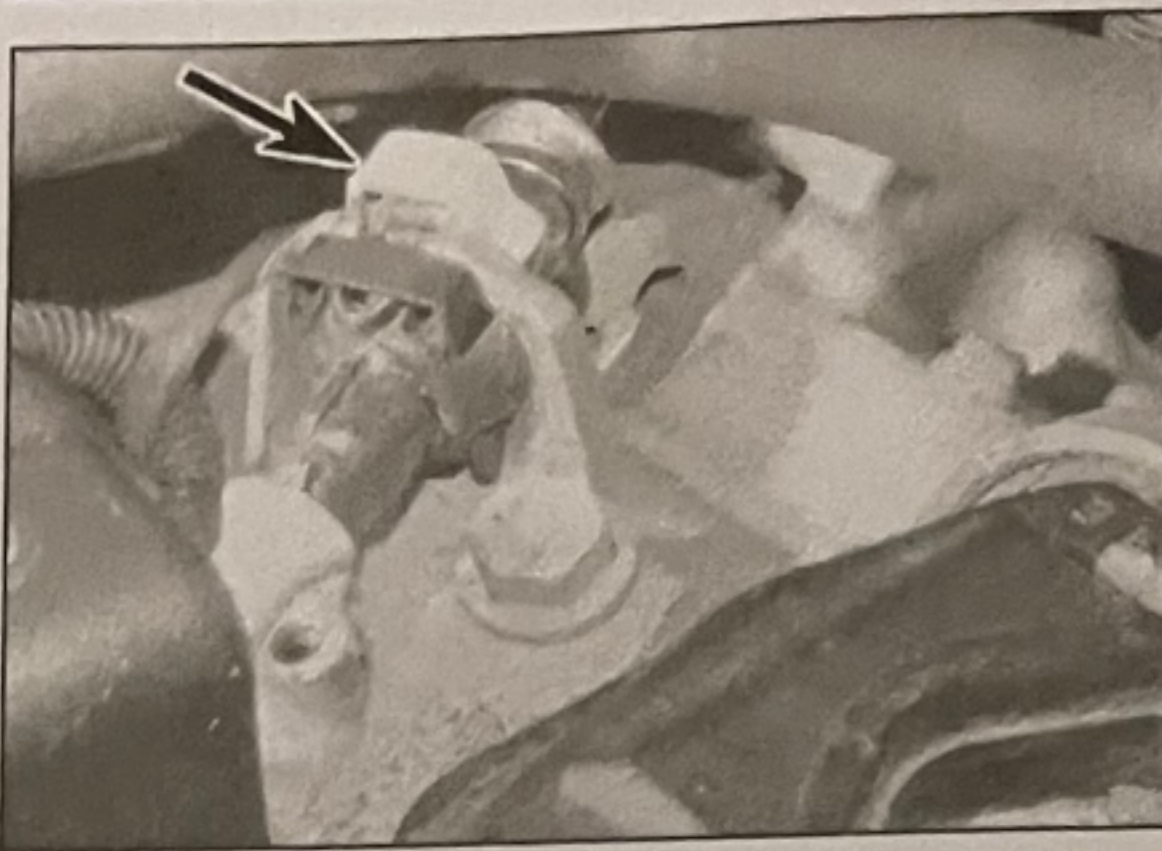
1 The automatic transmission is an electronically-controlled five-speed unit, incorporating a lock-up function. It consists mainly of a planetary gear unit, a torque converter with lock-up clutch, a hydraulic control system and an electronic control system. The unit is controlled by the electronic control module (ECM) via four electrically-operated solenoid valves. The transmission unit has three driving modes: normal (economy), sport and winter modes.

2 The normal (economy) mode is the standard mode for driving in which the transmission shifts up at relatively low engine speeds to combine reasonable performance with economy. If the transmission unit is switched into sport mode, using the button on the selector lever, the transmission shifts up only at high engine speeds, giving improved acceleration and overtaking performance. When the transmission is in sport mode, the indicator light in the instrument panel is illuminated. If the transmission is switched into winter mode, using the button on the selector lever indicator panel, the transmission will select third gear as the vehicle pulls away from a standing start; this helps to maintain traction on very slippery surfaces.

3 The torque converter provides a fluid coupling between engine and transmission, which acts as an automatic clutch, and also provides a degree of torque multiplication when accelerating.

4 The epicyclic gear train provides one of the forward or reverse gear ratios, according to which of its component parts are held stationary or allowed to turn. The components of the gear train are held or released by brakes and clutches that are activated by the control unit. A fluid pump within the transmission provides the necessary hydraulic pressure to operate the brakes and clutches.

5 Driver control of the transmission is by a seven-position selector lever. The 'drive' D position, allows automatic changing throughout the range of all five gear ratios. An automatic kickdown facility shifts the



3.4 Remove the locking clip (arrowed) from the selector cable

transmission down a gear if the accelerator pedal is fully depressed.

6 Due to the complexity of the automatic transmission, any repair or overhaul work must be left to a Saab dealer with the necessary special equipment for fault diagnosis and repair. The contents of the following Sections are therefore confined to supplying general information, and any service information and instructions that can be used by the owner.

2 Transmission fluid - draining and refilling

Refer to the information given in Chapter 1A or 1B.

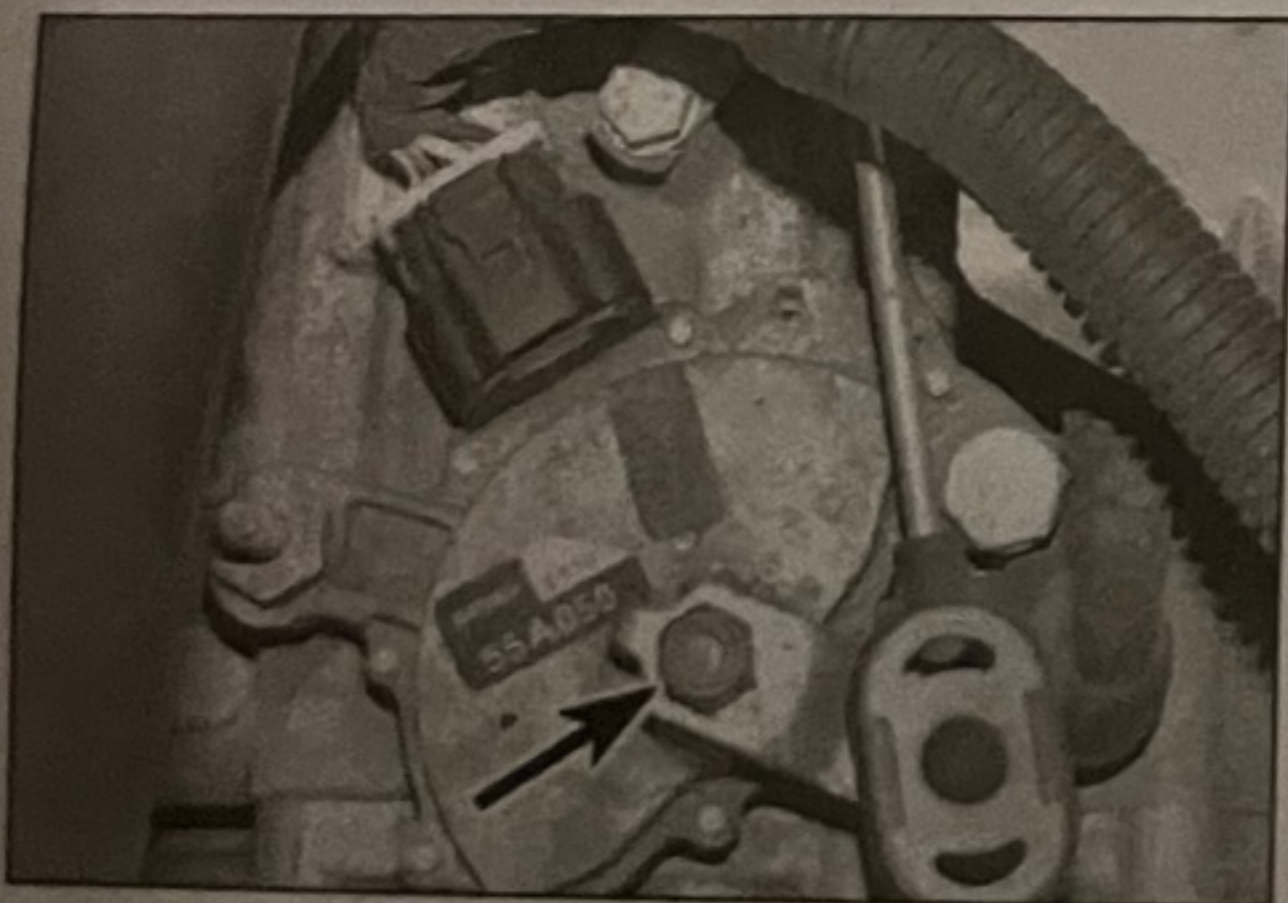
3 Selector cable - adjustment

1 Operate the selector lever throughout its entire range and check that the transmission engages the correct gear indicated on the selector lever position indicator.

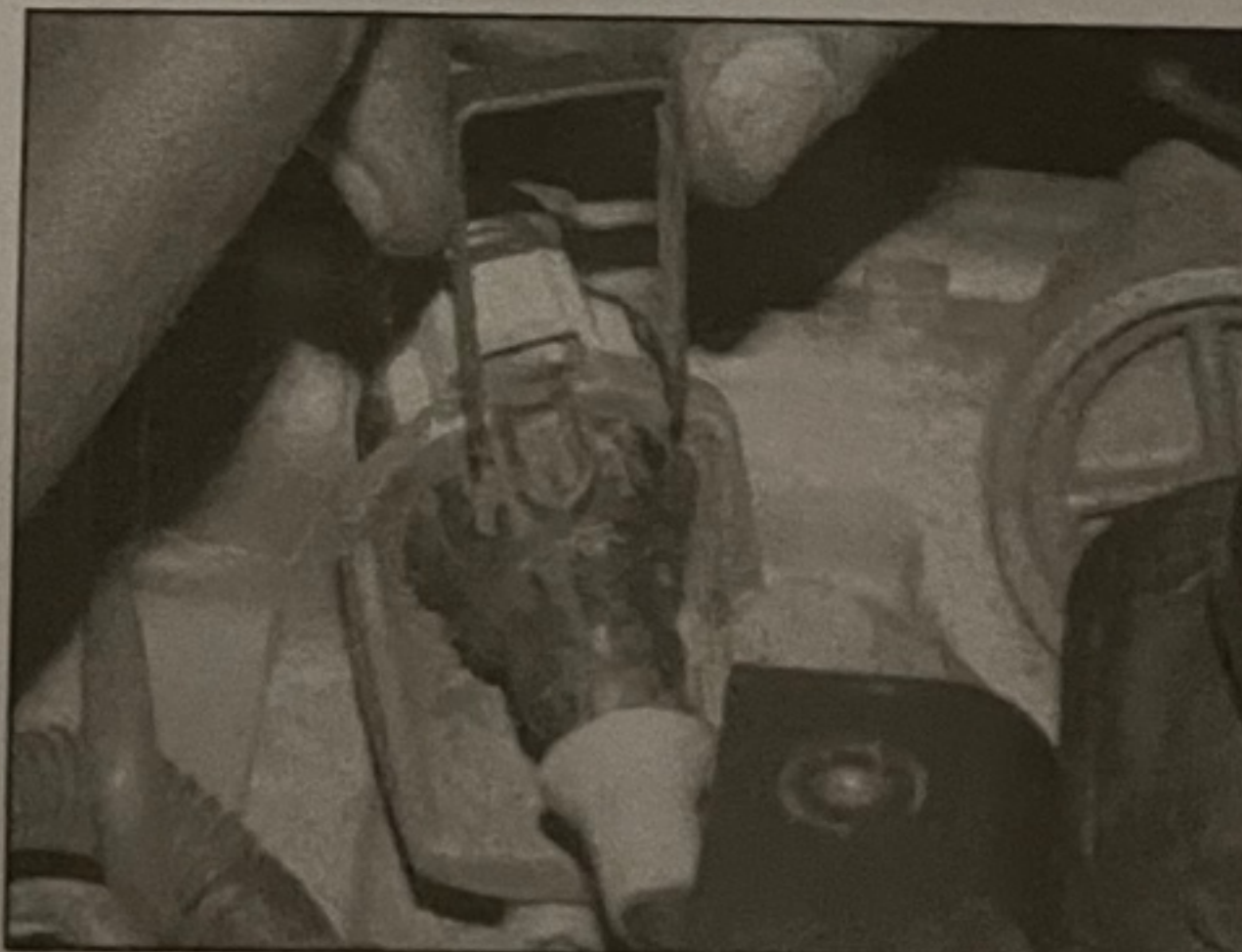
2 Check the play in the selector lever while it's in position N and position D. If it is not the same, then adjustment is necessary, continue as follows.

3 Inside the vehicle, position the selector lever in the P (Park) position.

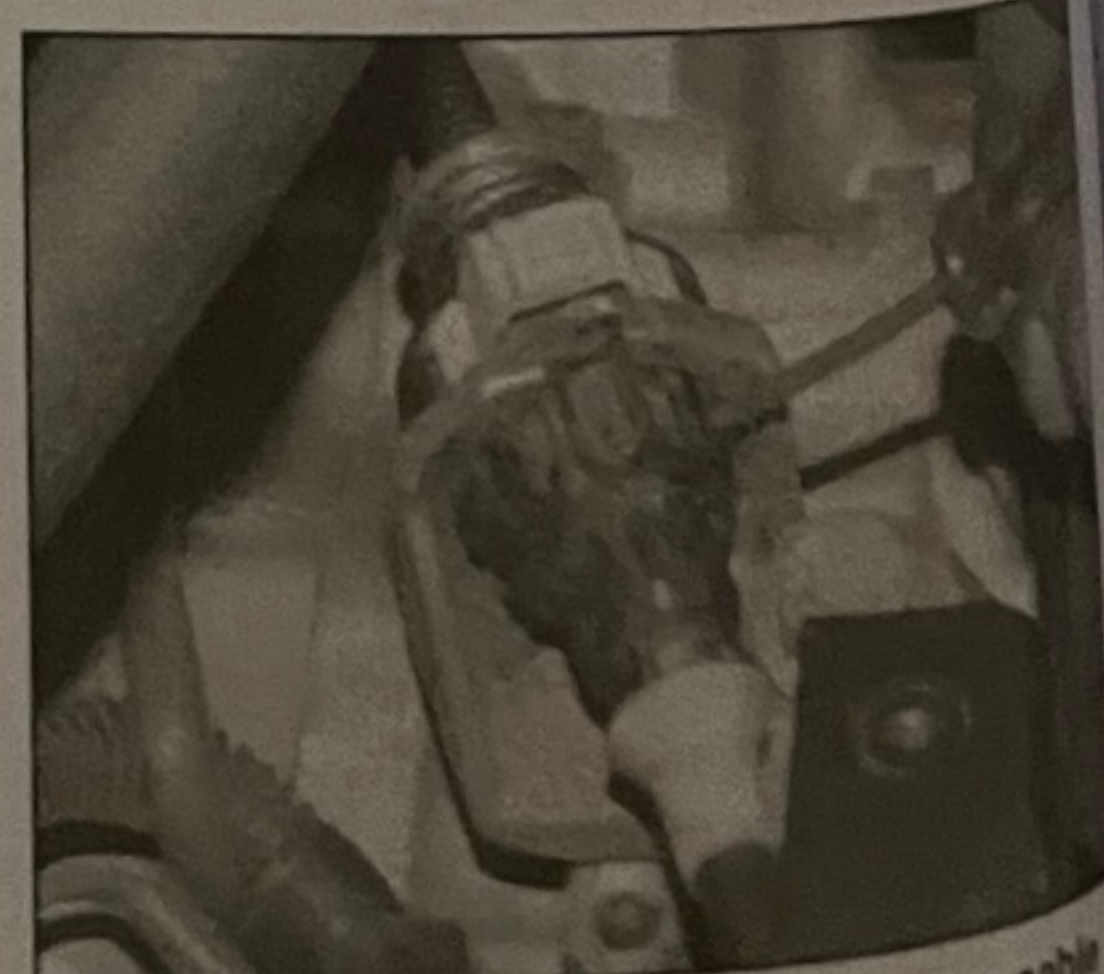
4 Working in the engine compartment, lift the adjustment retaining clip on the transmission end of the selector cable (see illustration).



4.2 Remove the retaining nut (arrowed) and detach the selector lever from the position sensor



4.3a Withdraw the locking clip . . .



4.3b . . . and release the selector cable from the bracket

5 Locate the lever on the transmission range switch, to which the selector cable is connected. Position the lever so the transmission is set in the Park position.

6 With the handbrake in the Park position, move the car until the Park interlock engages.

7 With the aid of an assistant, hold the selector lever rearward in the park position, take up the free play.

8 Working in the engine compartment, press down the adjustment clip at the transmission end to lock the cable.

9 Check the selector lever as described in paragraphs 1 and 2, if necessary, repeat the adjustment procedure.

10 On completion, road test the vehicle and check the correct operation of the gearchange.

4 Selector cable - removal and refitting

Removal

1 Working in the engine compartment, to gain access to the transmission end of the selector cable, remove the battery and battery tray (see Chapter 5A).

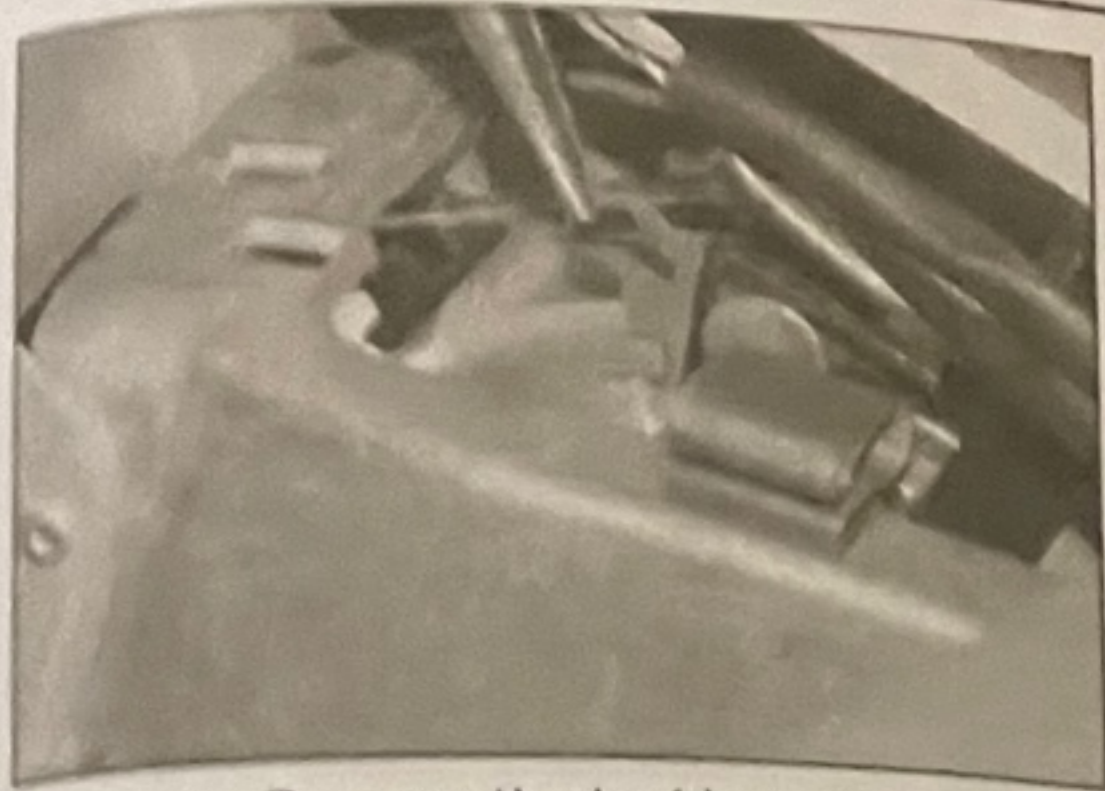
2 With the gear selector in the Park position, locate the lever on the transmission range switch, to which the selector cable is connected. Remove the retaining nut and detach the lever from the range switch (see illustration).

3 Withdraw the locking clip and disengage the selector cable from the transmission casing (see illustrations).

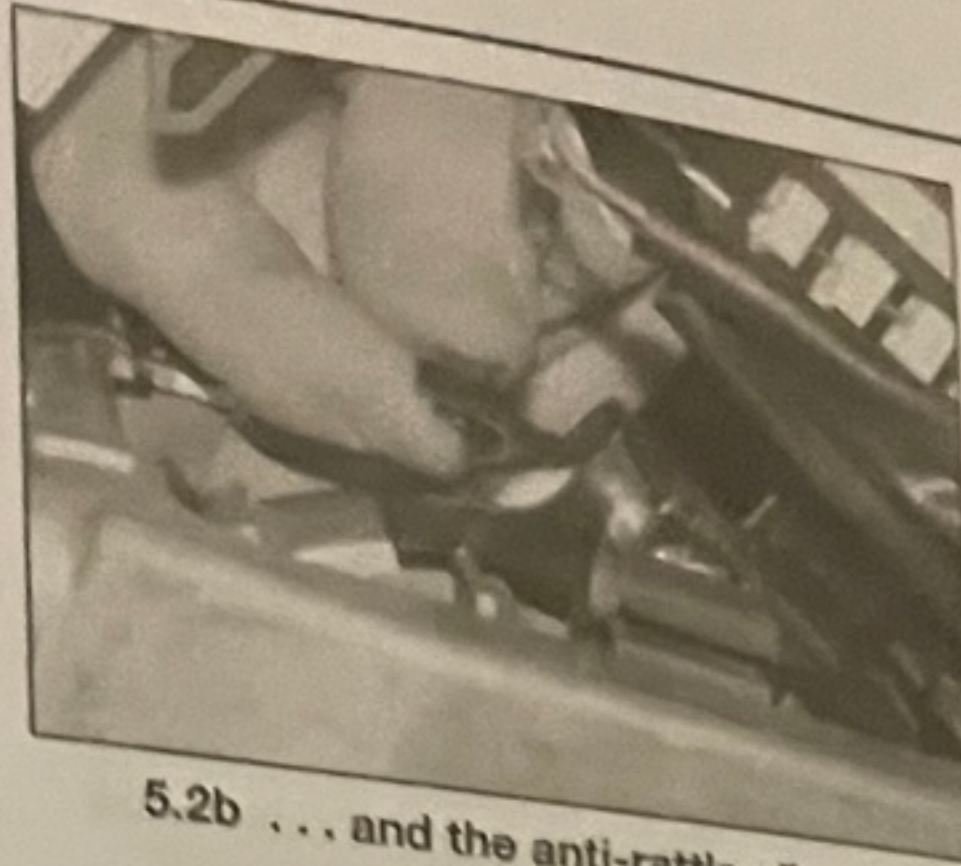
4 Remove the selector lever assembly, as described in Section 5.

5 Work back along the cable, noting its correct routing, and free it from all the relevant retaining clips. Free the cable grommet from the bulkhead and remove it from the vehicle.

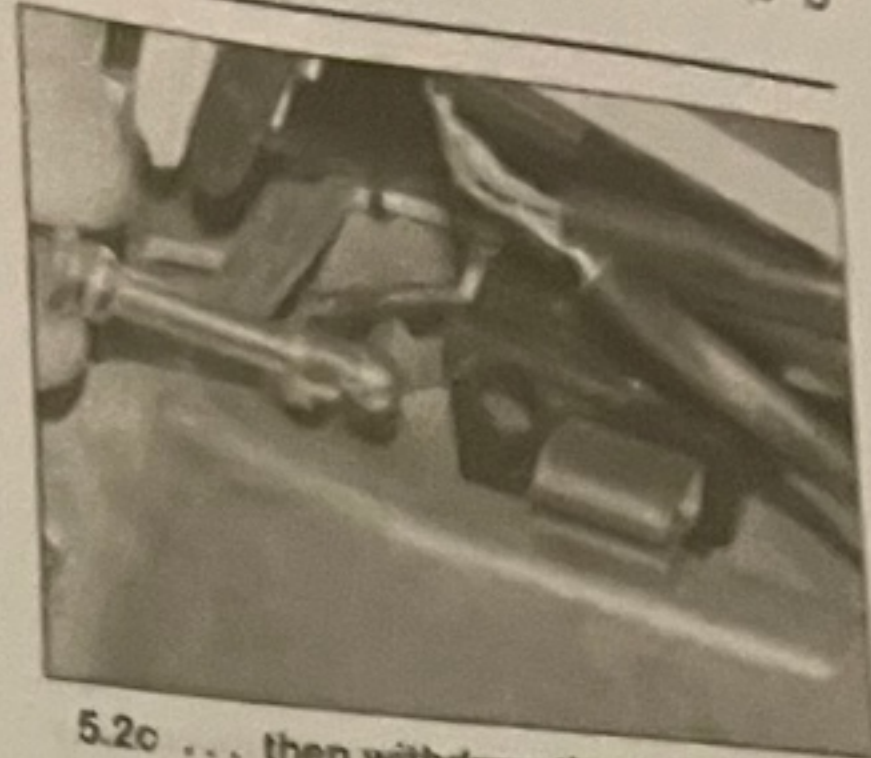
6 Examine the cable, looking for worn end fittings or a damaged outer casing, and for signs of fraying of the inner cable. Check the cable's operation; the inner cable should move smoothly and easily through the outer casing. Remember that a cable that appears serviceable when tested off the car may well be much heavier in operation when curved into its working position. Renew the cable if



5.2a Remove the locking clip ...



5.2b ... and the anti-rattle clip ...



5.2c ... then withdraw the pin from the selector

it shows any signs of excessive wear or any damage.

Refitting

- 7 Refitting is a reversal of removal, noting the following points.
- 8 Refit the selector lever assembly, as described in Section 5.
- 9 Ensure the cable is correctly routed and passes through the selector lever housing then located securely in the bulkhead.
- 10 Pass the transmission end of the cable through its mounting bracket and clip the outer ... securely in position. Connect the cable ... transmission lever then secure it in ... the locking clip. Fit the lever to ... on range switch, then fit the nut ... securely.

Selector lever assembly - removal and refitting

Removal

- 1 Remove the centre console, and rear compartment air ducts, as described in Chapter 11.
- 2 Remove the locking clip and anti-rattle clip, the drive out the pin while removing the end of the cable from the ball (see illustrations).
- 3 Slacken and remove the retaining bolts then lift the gear selector lever housing away from the floor pan.
- 4 Disconnect any wiring block connectors from the gear selector housing, release any cable-ties from the wiring loom (see illustrations).
- 5 Using a screwdriver, withdraw the securing clip and release the selector cable from the housing (see illustrations). Remove the gear selector housing from the vehicle.
- 6 Inspect the selector lever mechanism for signs of wear or damage.

Refitting

- 7 Refitting is a reversal of removal, noting the following points.
- 8 Refit the cable to the selector lever and housing, making sure all securing clips are correctly located.
- 9 Adjust the selector cable as described in Section 3.
- 10 On completion, refit the centre console,

as described in Chapter 11, and refit all components removed to gain access to the transmission end of the cable.

6 Oil seals - renewal

Driveshaft oil seals

- 1 Refer to Chapter 7A.

Torque converter oil seal

- 2 Remove the transmission as described in Section 9.
- 3 Carefully slide the torque converter off the transmission shaft whilst being prepared for fluid spillage.
- 4 Note the correct fitted position of the seal in the oil pump housing then carefully lever the

seal out of position taking care not to mark the housing or input shaft.

5 Remove all traces of dirt from the area around the oil seal aperture then press the new seal into position, ensuring its sealing lip is facing inwards.

6 Lubricate the seal with clean transmission fluid then carefully ease the torque converter into position.

7 Refit the transmission (see Section 9).

7 Fluid cooler - general information

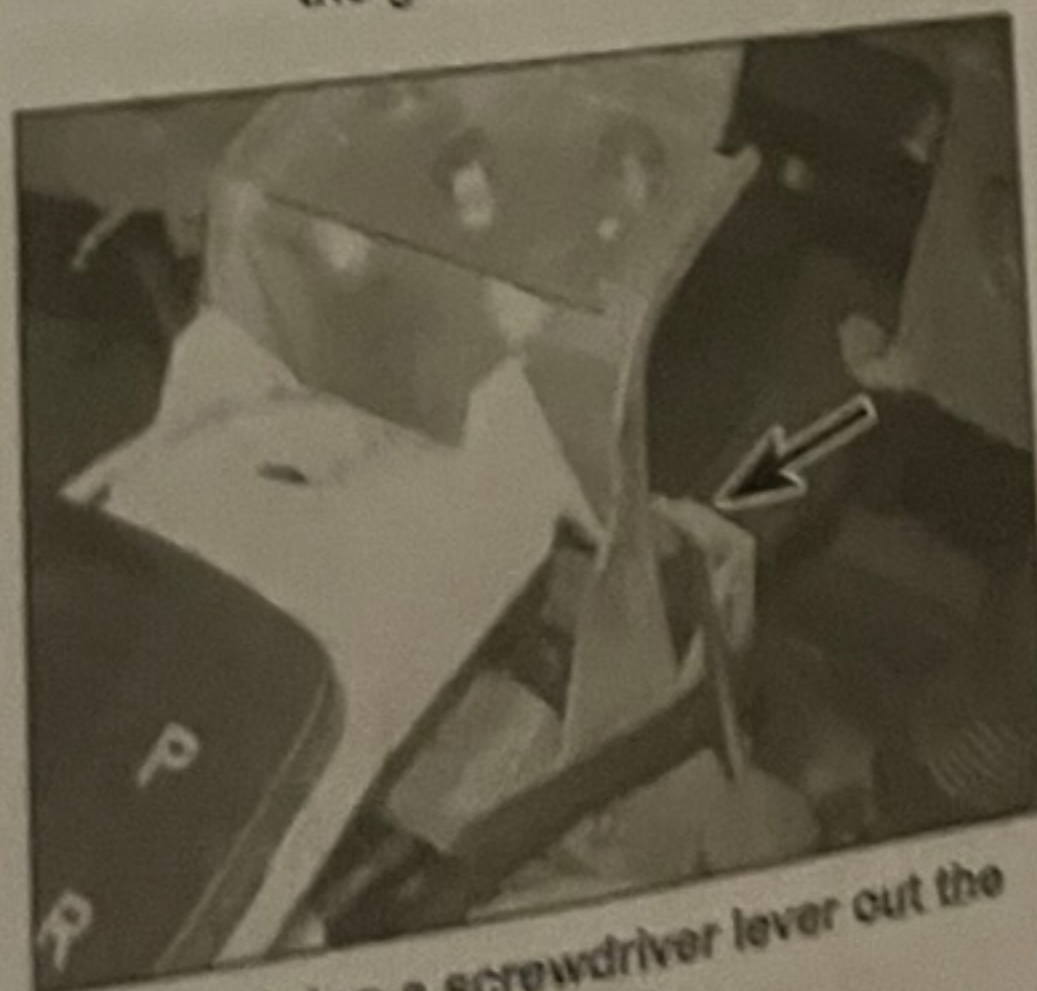
The transmission fluid cooler is an integral part of the radiator assembly. Refer to Chapter 3 for removal and refitting details. If the cooler is damaged the complete radiator assembly must be renewed.



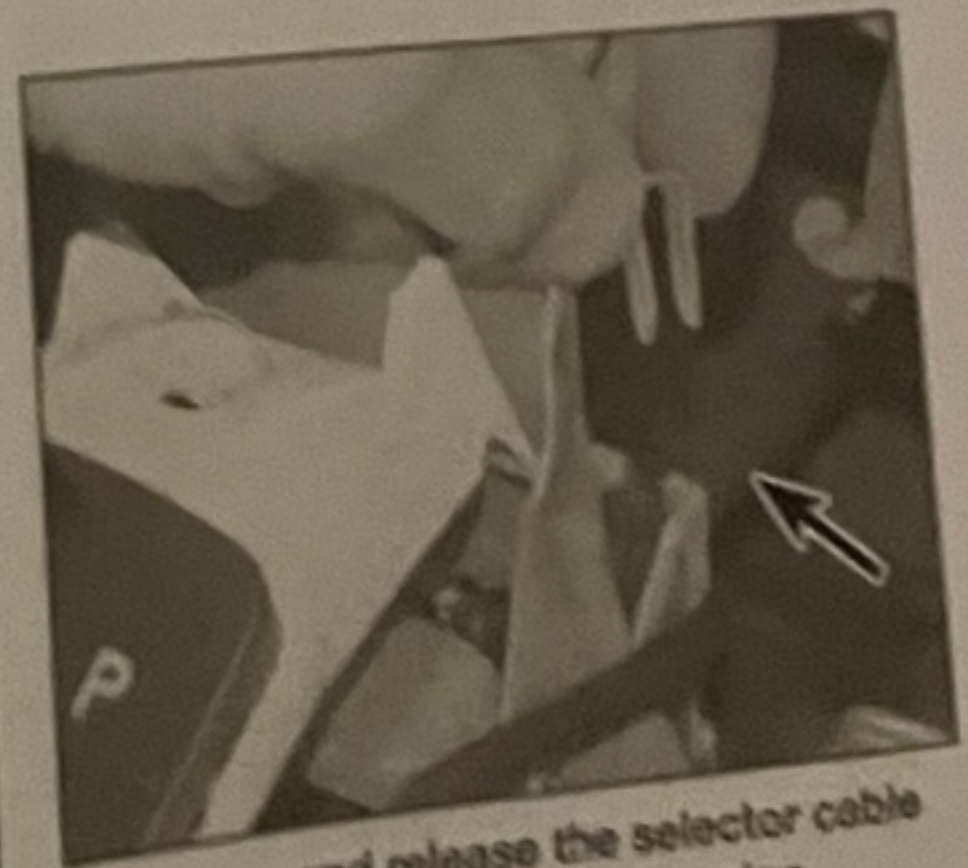
5.4a Disconnect the wiring connector from the gear selector ...



5.4b ... and the ignition switch



5.5a Using a screwdriver lever out the securing clip ...



5.5b ... and release the selector cable (arrowed) from the housing



8.4 Remove the securing nut (arrowed) to release the fluid dipstick tube

8 Transmission control system electrical components - removal and refitting

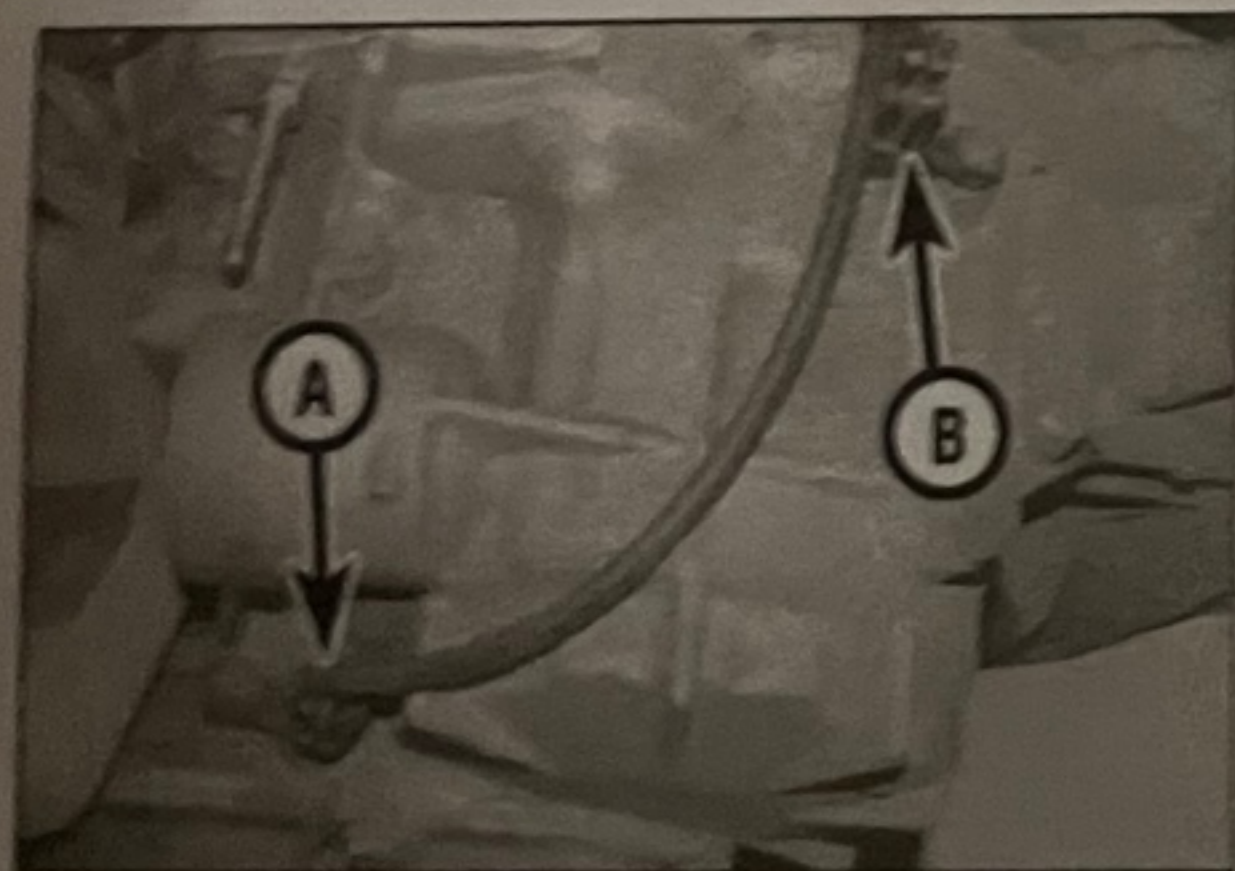
Gear selector position sensor

General information

1 As well as informing the transmission ECM which gear is currently selected, the gear selector position sensor also contains contacts which control the operation of the reversing lights relay, and the starter motor inhibitor relay.

Removal

- 2 Remove the battery from its mounting tray as described in Chapter 5A, then undo the retaining bolts and remove the battery tray.
- 3 Where necessary, release the power steering fluid hose from its mounting bracket and move it to one side.
- 4 Where applicable, undo the securing nut and release the transmission fluid dipstick tube from the side of the transmission position sensor (see illustration). *Note: Later models do not have a dipstick tube fitted.*
- 5 Select Park, then undo the retaining nut and disconnect the selector lever from the transmission position sensor (see illustration).
- 6 Slacken and remove the nuts/bolts that secure the gear selector position sensor to the transmission.
- 7 Unplug the position sensor wiring connector, then withdraw the position sensor from the transmission selector shaft and remove it from the engine compartment.



8.13 Automatic transmission input shaft speed sensor (A) and output shaft speed sensor (B) locations



8.5 Remove the retaining nut (arrowed) and detach the selector lever from the position sensor

Refitting

8 Refitting is a reversal of removal. Tighten the switch securing nut/bolt to the specified torque and on completion, check the adjustment of the selector cable with reference to Section 3.

Electronic control module (ECM)

Removal

- 9 The ECM is located in the front passenger footwell, behind the glovebox (see illustration). Prior to removal, disconnect the battery negative terminal.
- 10 Prise out the retaining clips and remove the undercover from the passenger side of the fascia. Remove the glovebox from the fascia (see Chapter 11) to gain access to the ECM.
- 11 Release the retaining clip and disconnect the wiring connector from the ECM. Release the mounting bracket from the body and remove the ECM from the vehicle.

Refitting

12 Refitting is the reverse of removal, ensuring that the wiring is securely reconnected.

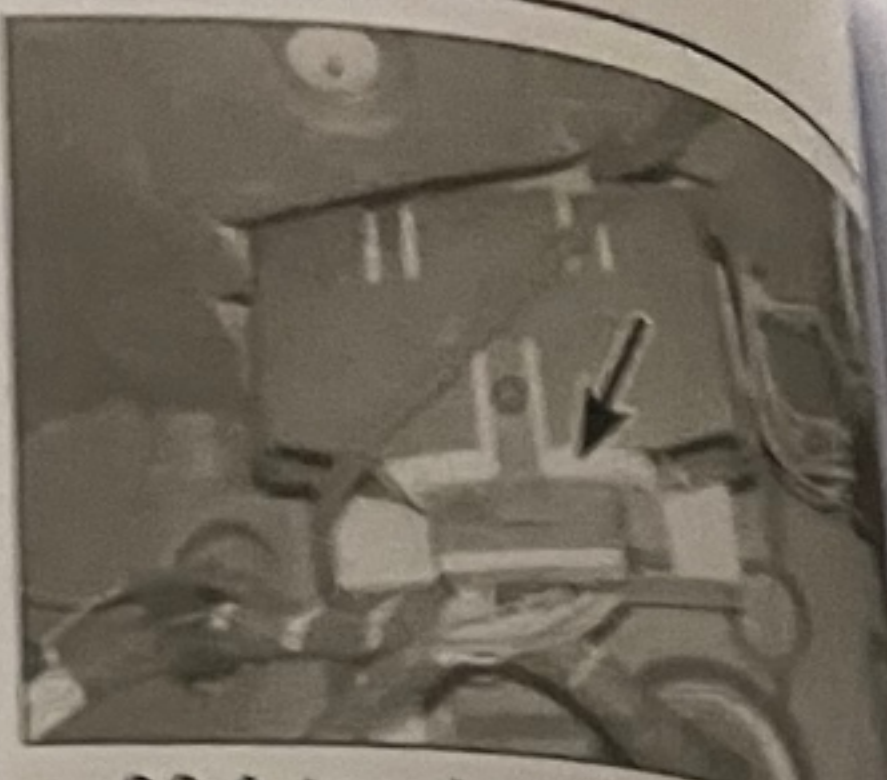
Input and output shaft speed sensors

Removal

- 13 The speed sensors are fitted to the top of the transmission unit. The input shaft speed sensor is the front of the two sensors and is nearest to the left-hand end of the transmission. The output shaft sensor is the rear of the two (see illustration).
- 14 To gain access to the sensors, remove the battery from its mounting plate as described in



8.23 Undo the retaining bolts (arrowed) and remove the cover plate ...



8.9 Automatic transmission control module (arrowed), next to the engine management control module

Chapter 5A. Access can be further improved by unclipping the coolant expansion tank from its mountings and positioning it clear.

15 Disconnect the wiring connector located on a mounting bracket at the left hand end of the cylinder head. Wipe clean the area around the relevant sensor.

16 Undo the retaining bolt and remove the sensor from the transmission. Remove the sealing ring from the sensor and discard it. A new one should be used on refitting.

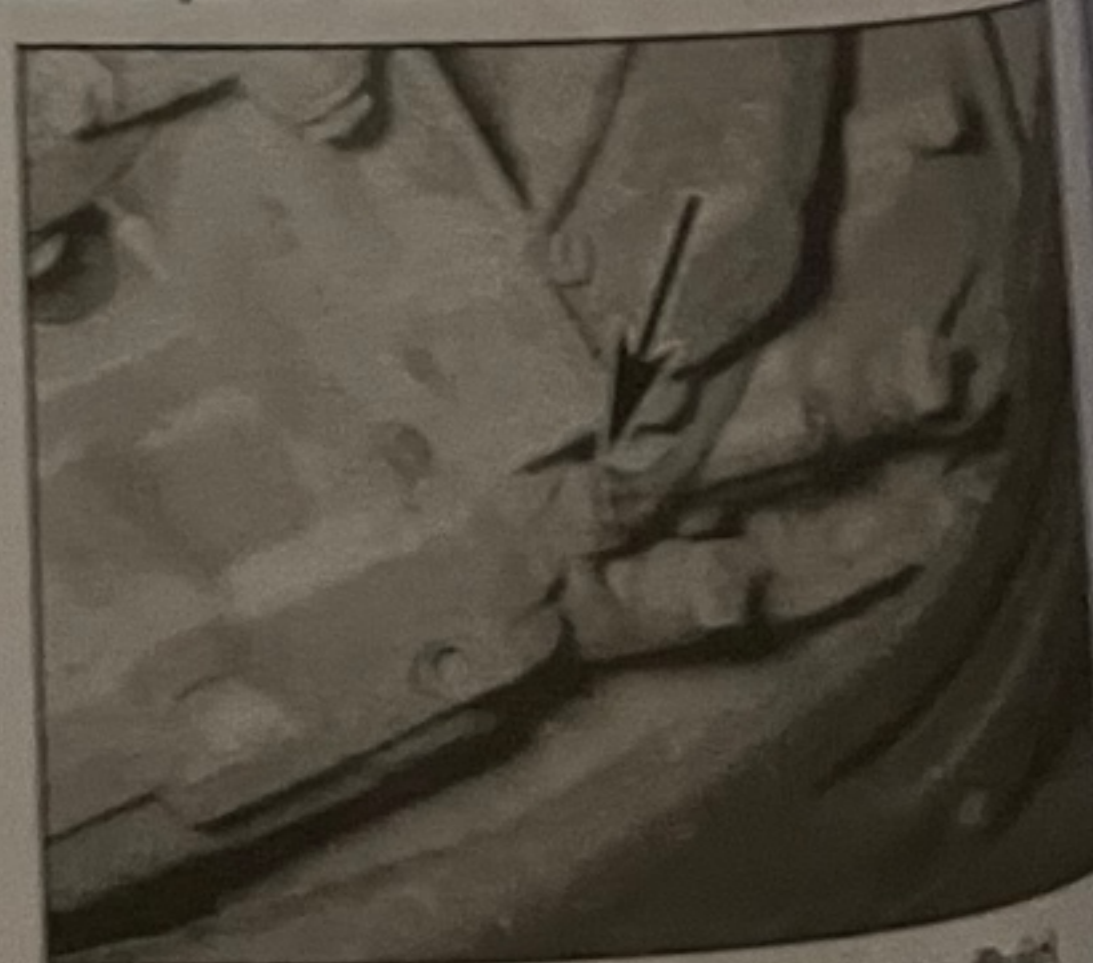
Refitting

- 17 Fit the new sealing ring to the sensor groove and lubricate it with a smear of transmission fluid.
- 18 Ease the sensor into position then refit the retaining bolt and tighten it to the specified torque setting. Reconnect the wiring connector.
- 19 Refit the battery and clip the expansion tank (where necessary) back into position.

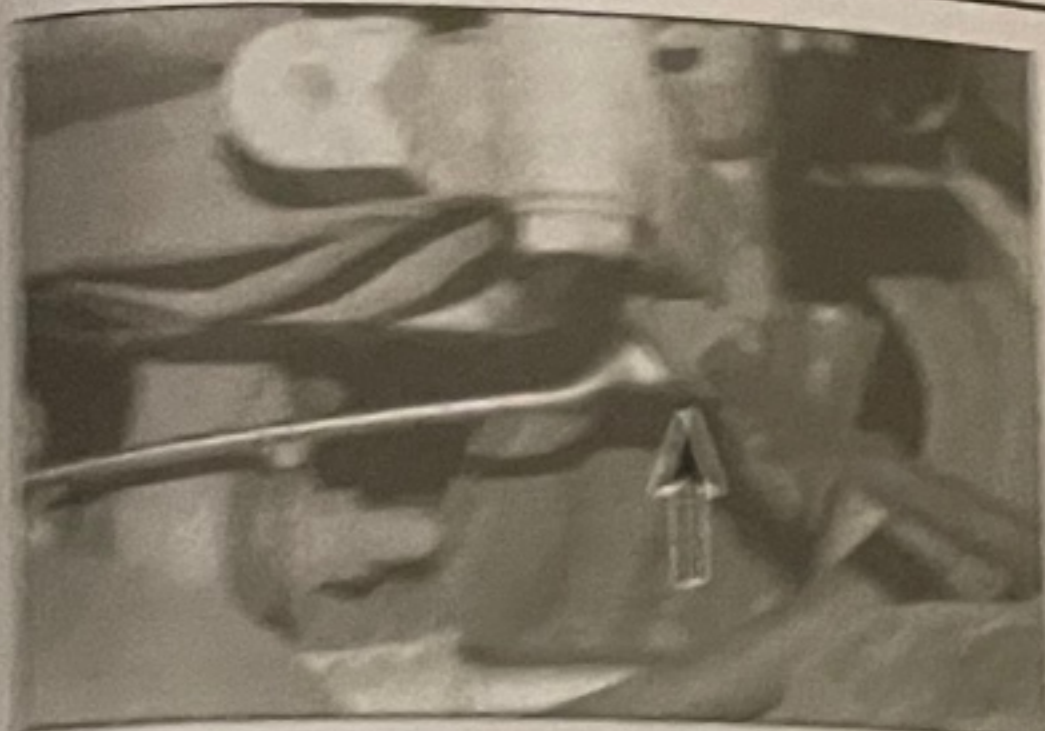
Fluid temperature sensor

Removal

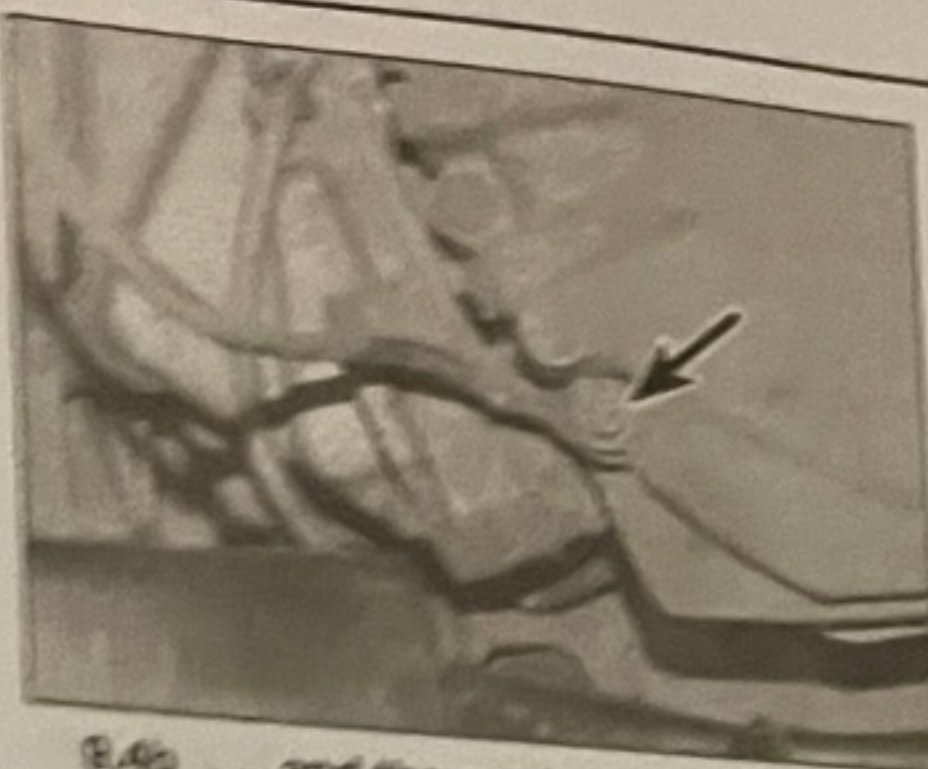
- 20 The fluid temperature sensor is screwed into the base of the transmission unit, at its front. Before removing the sensor, disconnect the battery negative terminal.
- 21 Firmly apply the handbrake then jack up the front of the vehicle and support it on axle stands (see *Jacking and vehicle support*).
- 22 Trace the wiring back from the sensor, noting its correct routing. Disconnect the wiring connector and free the wiring from its retaining clips.
- 23 Undo the retaining bolts and remove the cover plate from the sensor (see illustration).



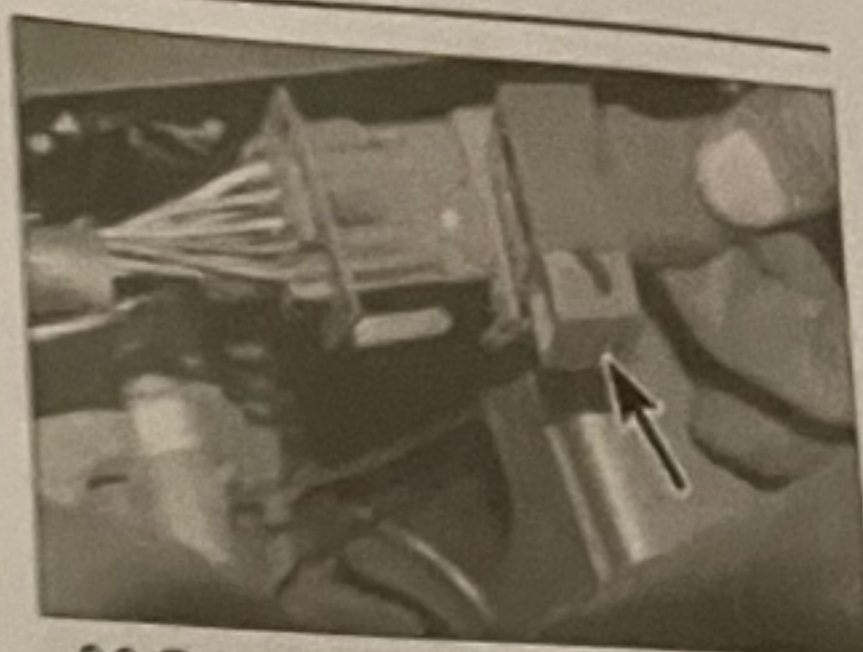
8.24 ... to gain access to the fluid temperature sensor (arrowed)



9.4a Disconnect the earth cable (arrowed) from the front of the transmission ...



9.4b ... and the earth cable (arrowed) from the end of the transmission



9.8 Release the securing clip (arrowed) and disconnect the wiring block connectors

24 Wipe clean the area around the sensor and have a suitable plug ready to minimise fluid loss as the sensor is removed (see illustration).

25 Unscrew the sensor and remove it from the transmission unit along with its sealing washer. Quickly plug the transmission aperture and wipe up any spill fluid.

Refitting

26 Fit a new sealing washer to the sensor then remove the plug and quickly screw the sensor into the transmission unit. Tighten the sensor to the specified torque and wipe up any spill fluid. Refit the cover plate and tighten its retaining bolts to the specified torque.

27 Ensure the wiring is correctly routed and retained by all the necessary clips then disconnect the wiring connector.

28 Lower the vehicle to the floor and disconnect the battery. Check the transmission oil level as described in Chapter 1A or 1B.

Transmission - removal and refitting

Note 1: Refer to Chapter 2C for details on removal of the engine and transmission as a complete assembly.

Note 2: New torque converter-to-driveplate bolts and fluid cooler union sealing rings will be required on refitting.

Removal

1 Check the rear wheels, apply the handbrake, and place the selector lever in the N (Neutral) position. Jack up the front of the vehicle, and securely support it on axle stands (see Jacking and vehicle support). Remove both front roadwheels then remove the retaining screws and fasteners and (where necessary) remove the undercover panels from beneath the engine/transmission unit.

2 Drain the transmission fluid as described in Chapter 1A or 1B, then refit the drain plug and tighten it to the specified torque.

3 Remove the battery from its mounting plate as described in Chapter 5A, then undo the retaining bolts and remove the battery tray.

4 Disconnect the battery earthing cable(s) from the transmission casing (see illustrations).

Release the cabling from the transmission fluid dipstick tube.

5 Withdraw the dipstick and its tube from the transmission casing and plug the open hole, to prevent contamination.

6 Disconnect the breather hose (where fitted) from the top of the transmission unit.

7 Disconnect the selector cable from the transmission as described in Sections 2 and 4.

8 Unplug the transmission control system wiring at the two connectors, located at the front of the battery tray (see illustration).

9 Trace the wiring back from the transmission switches and sensors, and disconnect the various connectors by lifting their retaining clips. Release the main wiring harness from any clips or ties securing it to the transmission unit.

10 Remove the air cleaner and intake ducting as described in Chapter 4A or 4B. Remove the cover panel from the top of the throttle body and remove the intercooler-to-throttle body ducting.

11 Position a lifting beam across the engine bay, locating the support legs securely in the sills at either side, in line with the strut top mountings. Hook the job onto the engine lifting eyelet and raise it, so that the weight of the engine is taken off the transmission mounting. Most people won't have access to an engine lifting beam, but it may be possible to hire one. Alternatively, an engine hoist may be used to support the engine, but when using this method, bear in mind that if the vehicle is lowered on its axle stands to adjust the working height, for example, then the hoist

will have to be lowered accordingly, to avoid straining the engine mountings.

12 Unbolt and remove the exhaust system front pipe and catalytic converter (see Chapter 4A or 4B).

13 Slacken the unions and disconnect the transmission fluid cooler pipes from the front of the transmission casing. Recover the sealing washers.

14 Slacken and remove the three upper transmission retaining bolts.

15 Slacken and remove the centre retaining nut from the rear engine mounting, and then slacken the three outer mounting bolts.

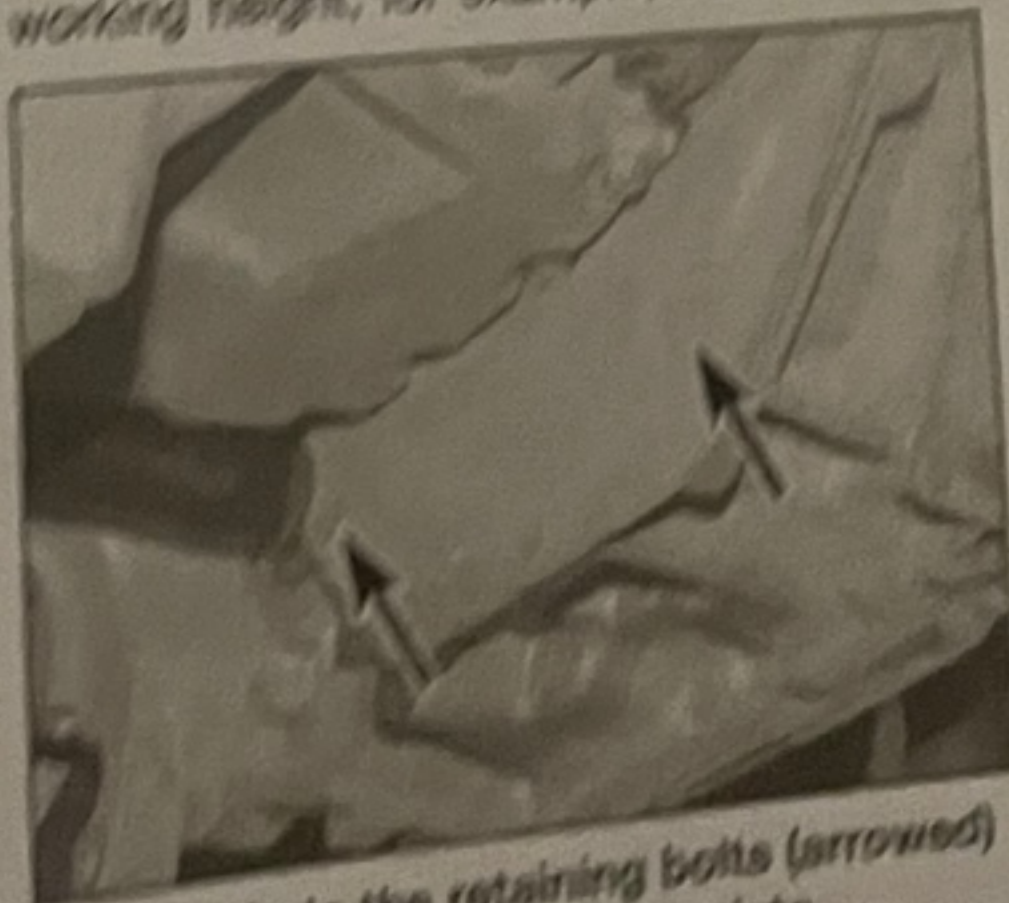
16 Remove the subframe from under the engine with reference to Chapter 10.

17 Remove the three retaining bolts from the rear engine mounting bracket and withdraw it from the engine bay.

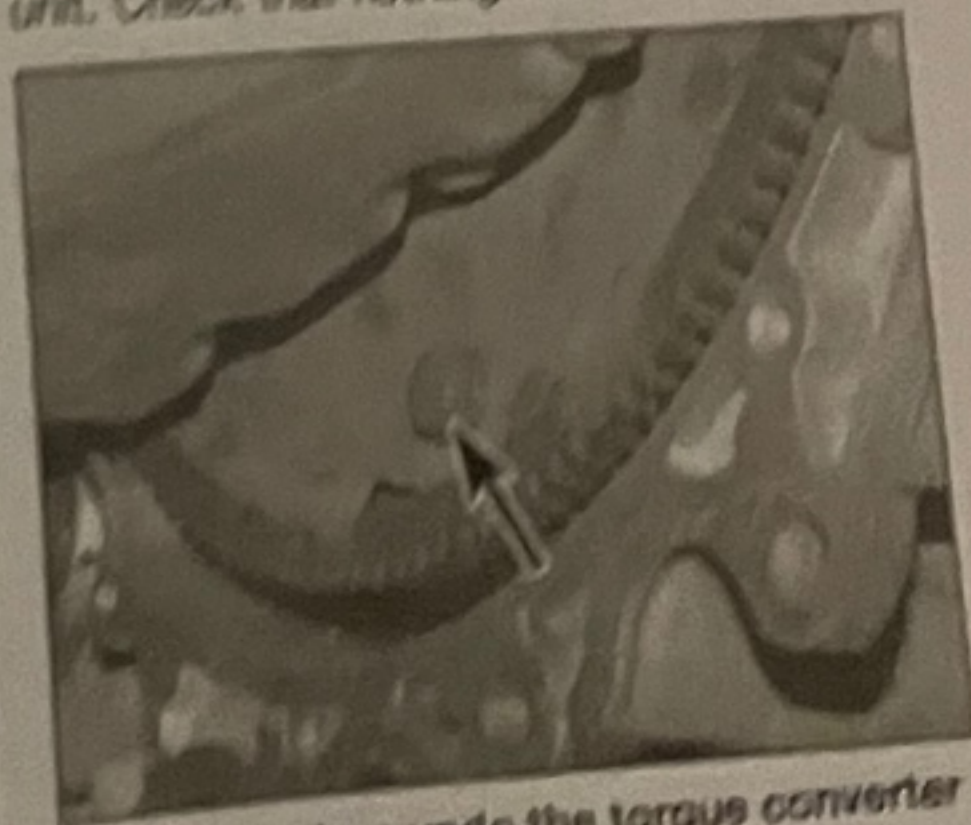
18 With reference to Chapter 8, remove the both driveshafts from the transmission.

19 Undo the retaining bolts and remove the lower cover plate from the flywheel. Using the crankshaft pulley to turn the engine, slacken and remove all the torque converter retaining bolts as they become accessible (see illustrations). Discard the retaining bolts; new ones must be used on refitting. *Note:* As the transmission is removed, the torque converter must stay in the transmission bellhousing and not slide off the transmission shaft. A bracket can be made and bolted to the bellhousing to hold the torque converter in place.

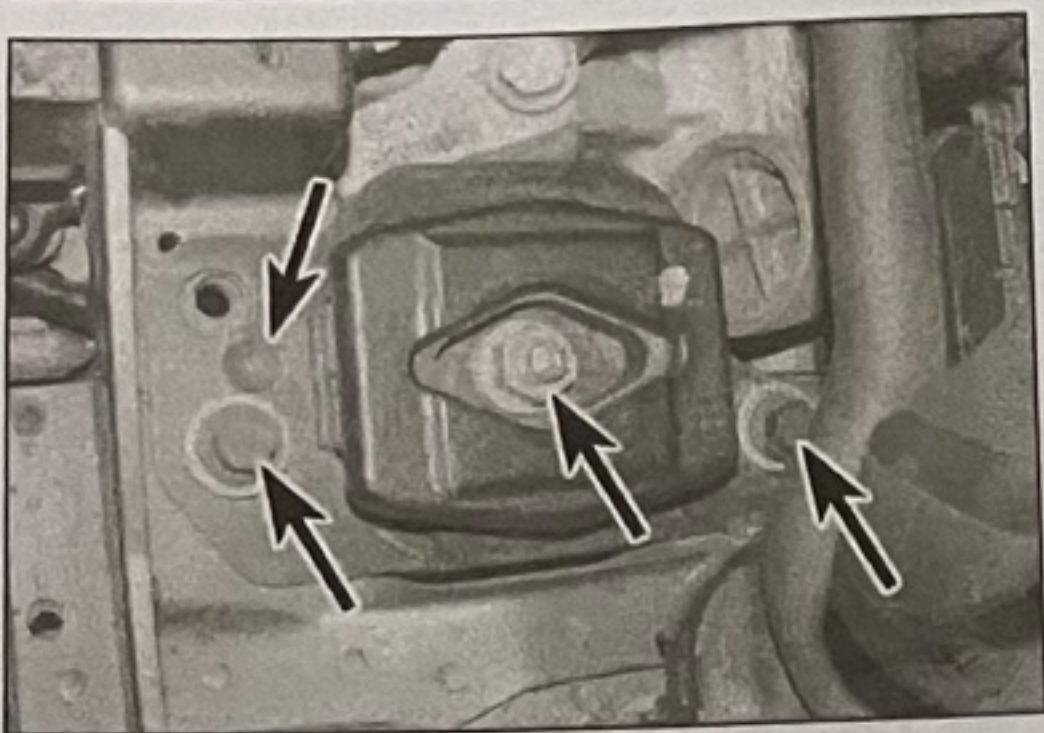
20 Position a jack underneath the transmission, and raise it to take the weight of the unit. Check that nothing remains connected



9.19a Undo the retaining bolts (arrowed) and remove the cover plate ...



9.19b ... then undo the torque converter bolts (one arrowed) - turn engine to access other bolts

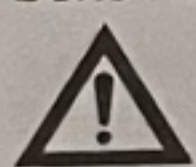


9.21 Undo the bolts and nut (arrowed) to remove mounting

to the transmission before attempting to separate it from the engine.

21 Unscrew the bolts securing the left-hand engine/transmission mounting bracket to the bodywork and the centre nut from the mounting (see illustration). Make sure the transmission is supported, taking care to avoid straining the other engine mountings as you do this. Withdraw the mounting from the inner wing panel and transmission.

22 Work around the circumference of the bellhousing, and remove the last retaining bolts from the bellhousing.



Warning: Maintain firm support on the transmission, to ensure that it remains steady on the jack head.

23 Make a final check that any components which would prevent the removal of the transmission from the car have been removed or disconnected. Ensure that components such as the gear selector cable are secured so that they cannot be damaged on removal.

24 Withdraw the transmission from the engine;

keep the unit horizontal until the bellhousing is clear of the driveplate and its mounting dowels. Make sure the torque converter does not slide off the transmission shaft.

25 Slowly lower the transmission assembly from the engine compartment, making sure that it clears the components on the surrounding panels. Lower the assembly to the ground and remove it from the underside of the engine compartment.

Refitting

26 The transmission is refitted by a reversal of the removal procedure, bearing in mind the following points.

- Prior to refitting, remove all traces of old locking compound from the torque converter threads by running a tap of the correct thread diameter and pitch down the holes. In the absence of a suitable tap, use one of the old bolts with slots cut in its threads.
- Prior to refitting, ensure the engine/transmission locating dowels are correctly positioned and apply a smear of molybdenum disulphide grease to the torque converter locating pin and its centring bush in the crankshaft end.
- Once the transmission and engine are correctly joined, refit the securing bolts, tightening them to the specified torque setting.
- Fit the new torque converter-to-driveplate bolts and tighten them lightly only to start then go around and tighten them to the specified torque setting in a diagonal sequence.
- Tighten all nuts and bolts to the specified torque (where given).

- Renew the driveshaft oil seals (see Chapter 7A) and refit the driveshafts to the transmission as described in Chapter 7A.
- Fit new sealing rings to the fluid cooler hose unions and ensure both unions are securely retained by their clips.
- When refitting the subframe, ensure the spacer washers are fitted to the rearmost bolts and observe the alignment markings made during removal. Do not tighten the subframe bolt to their final torque until the full weight of the engine and transmission assembly is resting upon it.
- Ensure that all earthing cables are securely refitted.
- On completion, refill the transmission with the specified type and quantity of fluid described in Chapter 1A or 1B and adjust the selector cable as described in Section 3.

10 Transmission overhaul - general information

1 In the event of a fault occurring with the transmission, it is first necessary to determine whether it is of a mechanical or hydraulic nature, and to do this, special test equipment is required. It is therefore essential to have the work carried out by a Saab dealer if a transmission fault is suspected.

2 Do not remove the transmission from the car for possible repair before professional fault diagnosis has been carried out, since most tests require the transmission to be in the vehicle.

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