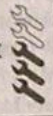
Chapter 7 Part B: Automatic transmission

Contents

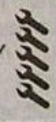
Degrees of difficulty

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:	
Phase I and Phase II models	Automatic, four forward speeds and reverse
Phase III models	Electronically controlled automatic, four forward speeds and reverse
Designation:	
Phase I and Phase II models	RL4F03A
Phase III models	RE4F03A

Torque wrench settings

	Nm	lbf ft
Drain plug	34	25
Engine-to-transmission fixing bolts:		
Bolts less than 45 mm long	18	13
Bolts 55 mm long, and longer	75	55
Left-hand engine/transmission mounting:		
Through-bolt	49	36
Mounting-to-transmission bolts	49	36
Rear engine/transmission mounting:		
Through-bolt	69	51
Mounting bracket retaining bolts	69	51
Selector cable fixings:		
Cable-to-transmission lever nut	21	15
Cable-to-selector lever nut	5	4
Outer cable-to-floor bolts	5	4
Torque converter-to-driveplate bolts	51	38

4 From underneath the vehicle, undo the two bolts securing the cable to the vehicle body.
5 Withdraw the rear end of the cable from the vehicle. Work along the cable, freeing it from any relevant ties and clips, whilst noting its correct routing.
6 Slacken and remove the nut and washer securing the cable to the transmission selector lever. Slide out the clip securing the outer cable to its mounting bracket, then free the cable from the transmission and remove it from underneath the vehicle. Note that the transmission selector lever must not be disturbed until the cable is refitted. As a precaution, mark the position of the lever in relation to the transmission housing.
7 Examine the cable, looking for worn end fittings or a damaged outer casing. Check 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, however, 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 of damage.

Refitting

8 Feed the cable up into position from underneath the vehicle. Refit the two bolts securing the cable to the floor, and tighten them to the specified torque setting.
9 From inside the vehicle, connect the cable to the selector lever, and clip the outer cable into its mounting bracket. Tighten the cable retaining nut to the specified torque setting, and secure the outer cable in position with the retaining clip.
10 From underneath the vehicle, work along the cable, securing it in position with all the relevant clips and ties, whilst ensuring that it is correctly routed.
11 Ensuring that the selector lever is in the 'P' position, and that the transmission selector lever is still in the 'Park' position, hook the inner cable onto the transmission selector lever. Clip the outer cable into position in its mounting bracket, and secure it in position with the retaining clip.
12 Hook a spring balance into the slot in the cable end fitting, and pull the cable forwards with a force of 6.9 N (0.7 kg, or 1.5 lbs).
13 From this position, remove the spring balance, and move the cable end fitting backwards by 1.0 mm. Hold the cable in this position, and tighten its retaining nut to the specified torque setting.
14 Check the operation of the selector lever, ensuring that it moves smoothly and easily, without any sign of the cable binding. If not, repeat the operations in paragraphs 12 and 13.
15 Once the selector lever is operating correctly, apply multi-purpose grease to the contact surfaces of the selector levers and cable, and lower the vehicle to the ground.
16 Refit the centre console as described in Chapter 11.

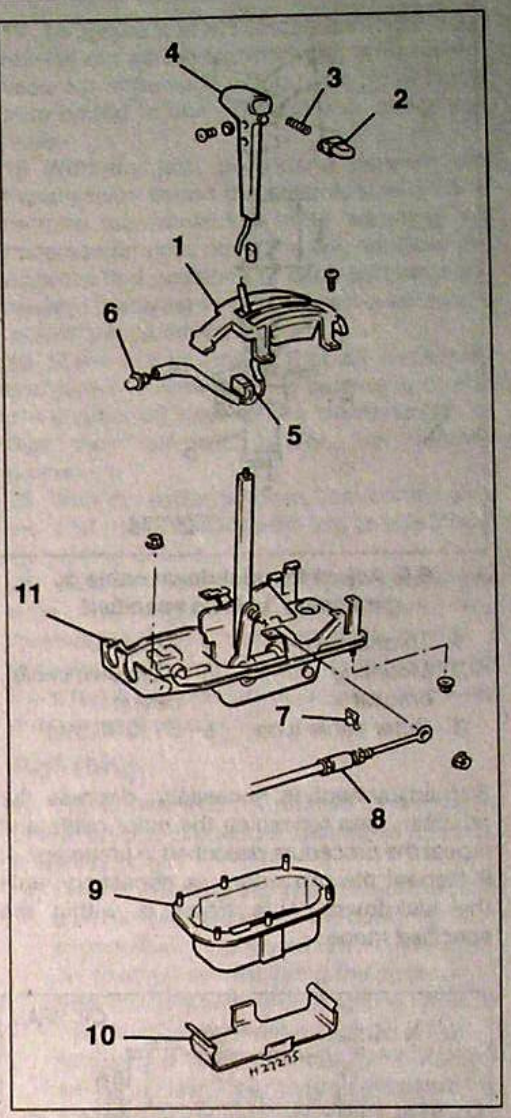
4 Selector lever assembly - removal and refitting

Removal

1 Apply the handbrake, then jack up the front of the car and support it on axle stands (see *Jacking and Vehicle Support*). Position the selector lever in the 'N' position.
2 Remove the centre console as described in Chapter 11.
3 Unscrew the nut securing the selector cable to the lever. Slide out the clip securing the outer cable to its mounting bracket, and free the selector cable from the selector lever **(see illustration)**.
4 Disconnect the wiring from the overdrive switch and gear indicator light bulb.
5 Undo the two retaining screws, depress the detent button, and slide the handle off the top of the selector lever. If necessary, the detent button and spring can then be withdrawn from the handle, as can the overdrive switch.
6 Undo the nuts, accessed both from inside and underneath the vehicle, securing the selector lever to the floor, and lift the lever assembly out of the vehicle. Do not attempt to dismantle the selector lever components; the lever assembly is a sealed unit, with no individual components being available separately.

Refitting

7 Refit the selector lever assembly to the vehicle, and securely tighten its retaining nuts.
8 Clip the overdrive switch, detent button and spring back into position in the selector lever handle (where removed).
9 Ensure that the switch wiring is correctly routed down through the handle, and refit the handle to the selector lever. Securely tighten its retaining screws, then check the operation of the lever detent mechanism.
10 Connect the overdrive switch and gear indicator light wiring connector.
11 Connect the cable to the selector lever, and clip the outer cable into its mounting bracket. Tighten the cable retaining nut to the specified torque setting, and secure the outer cable in position with the retaining clip.
12 Adjust the selector cable as described in Section 2, then refit the centre console as described in Chapter 11.



4.3 Selector lever components

1 *Gear indicator panel*
2 *Detent button*
3 *Spring*
4 *Selector lever handle*
5 *Wiring connector*
6 *Gear indicator light bulb*
7 *Cable clip*
8 *Selector cable*
9 *Dust cover*
10 *Dust cover support*
11 *Selector lever assembly*

5 Kickdown cable - adjustment

1 Ensure that the accelerator cable is correctly adjusted as described in the relevant Part of Chapter 4.
2 Depress the adjuster to release the outer cable locking mechanism, and move the outer cable fully towards the mounting bracket. Release the adjuster, so that the outer cable is locked in position.
3 Using a dab of white paint or a suitable marker pen, make a mark on the kickdown inner cable. This mark can then be used for measuring the cable travel.
4 Position a ruler next to the mark on the inner cable, then quickly move the throttle cam from its fully closed position to its fully open position, whilst measuring the travel of the kickdown cable. This should be within the range quoted **(see illustration overleaf)**.

10 Overdrive switch - testing, removal and refitting

Testing

1 Remove the centre console as described in Chapter 11.
2 Disconnect the wiring from the overdrive switch and gear indicator light.
3 Measure the resistance between terminals 1 and 2 of the connector **(see illustration)**. If the switch is functioning correctly, there should be continuity between the terminals only when the switch is 'on'. If not, the switch must be renewed.

Removal

4 Remove the centre console as described in Chapter 11.
5 Disconnect the wiring from the overdrive switch and gear indicator light.
6 Undo the two retaining screws, depress the detent button, and slide the handle off the top of the selector lever.
7 Unclip the overdrive switch, and remove it from the handle.

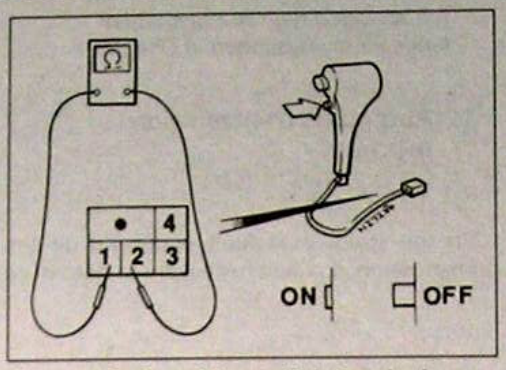
Refitting

8 Clip the overdrive switch back into position in the selector lever handle.
9 Ensure that the switch wiring is correctly routed down through the handle, and refit the handle to the selector lever. Securely tighten its retaining screws, then check the operation of the lever detent mechanism.
10 Connect the overdrive switch and gear indicator light wiring, then refit the centre console as described in Chapter 11.

11 Automatic transmission - removal and refitting

Removal

1 Apply the handbrake, then jack up the front of the car and support it on axle stands (see *Jacking and Vehicle Support*). Position the selector lever in the 'N' (neutral) position and remove both front roadwheels.
2 Drain the transmission fluid as described in Chapter 1, then refit the drain plug and tighten it to the specified torque.
3 Remove the battery and battery tray as described in Chapter 5A.
4 Remove the starter motor as described in Chapter 5A.
5 Remove the air cleaner housing inlet duct as described in the relevant Part of Chapter 4.
6 Remove the driveshafts as described in Chapter 8.
7 Disconnect the wiring connectors from the starter inhibitor/reversing light switch and the transmission solenoid wiring.
8 Slacken and remove the nut and washer securing the selector cable to the transmission selector lever. Slide out the clip securing the outer cable to its mounting bracket, then free the cable from the transmission.



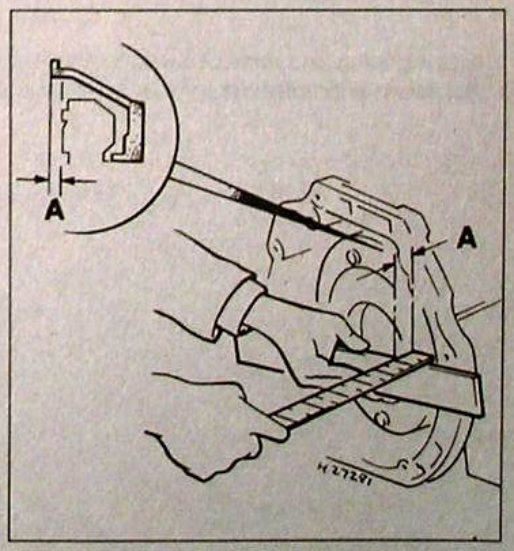
10.3 Overdrive switch terminal identification. Test switch as described in text

9 Using a hose clamp or similar, clamp both the fluid cooler hoses to minimise coolant loss. Slacken the retaining clips, and disconnect both hoses from the transmission - be prepared for some spillage. Wipe up any spilt fluid immediately.
10 Detach the kickdown inner cable from the throttle body cam. Slacken the outer cable locknuts, and unbolt the cable mounting bracket. Release the kickdown cable from any relevant retaining clips, so that it is free to be removed with the transmission.
11 Undo the retaining bolts, and remove the cover plate from the sump flange to gain access to the torque converter retaining bolts. Slacken and remove the visible bolt then, using a socket and extension bar to rotate the crankshaft pulley, undo the remaining bolts securing the torque converter to the driveplate as they become accessible. There are four bolts in total.
12 Place a jack with interposed block of wood beneath the engine, to take the weight of the engine. Alternatively, attach a hoist or support bar to the engine lifting eyes, and take the weight of the engine.
13 Place a jack and block of wood beneath the transmission, and raise the jack to take the weight of the transmission.
14 Slacken and remove the through-bolt from the rear engine/transmission mounting. Undo the bolts securing the mounting bracket in position, and manoeuvre it away from the engine/transmission. Recover the stopper ring which is fitted between the mounting bracket and mounting.
15 To improve access, undo the four bolts and washers and remove the front crossmember from underneath the engine/transmission.
16 Slacken and remove the through-bolt from the left-hand engine/transmission mounting. Undo the three bolts securing the mounting to the transmission, and manoeuvre the mounting out of position. Recover the rubbers from each side of the mounting bracket.
17 To ensure that the torque converter does not fall out as the transmission is removed, secure it in position using a length of metal strip bolted to one of the starter motor bolt holes.
18 With the jack positioned beneath the transmission taking the weight, slacken and remove the remaining bolts securing the transmission housing to the engine. Note the correct fitted positions of each bolt (and any relevant brackets) as they are removed, to use as a reference on refitting.
19 Make a final check that all necessary components have been disconnected, and are positioned clear of the transmission so that they will not hinder the removal procedure.
20 With the bolts removed, move the trolley jack and transmission to the left, to free it from its locating dowels.
21 Once the transmission is completely free from the engine, lower the jack and manoeuvre the unit out from under the car. If they are loose, remove the locating dowels from the transmission or engine, and keep them in a safe place.

Refitting

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

a) Prior to installing the transmission, ensure that the torque converter is correctly engaged with the transmission. This can be checked by measuring the distance from the converter mounting bolt holes to the transmission mating surface; if the converter is correctly seated, this distance will be at least 15.9 mm ***(see illustration).***
b) Ensure that the locating dowels are correctly positioned prior to installation.
c) Tighten all nuts and bolts to the specified torque (where given).



11.22 Prior to refitting, ensure that the distance (A) from the torque converter bolt holes to the transmission mating surface is at least 15.9 mm, indicating that the converter is correctly seated

d) Inspect the crossmember mounting rubbers for signs of damage or deterioration, and renew if necessary.

e) Prior to refitting the driveshafts, renew the driveshaft seals using the information given in Section 8.

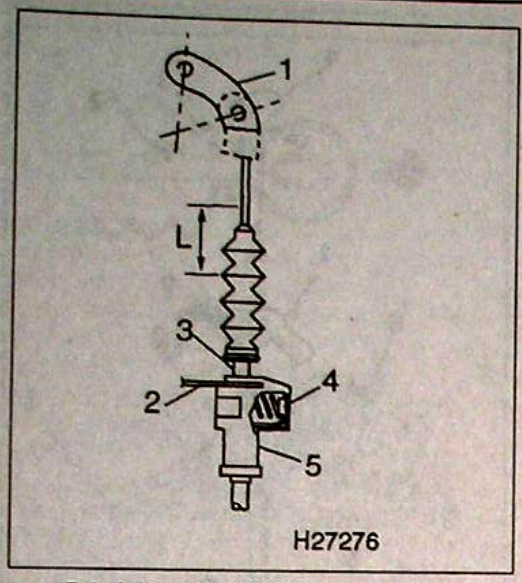
f) Adjust the selector cable and kickdown cable as described in Sections 2 and 5 of this Chapter.

g) On completion, refill the transmission with the specified type and quantity of lubricant, as described in Chapter 1.

12 Automatic transmission overhaul - general information

In the event of a fault occurring on the transmission, it is first necessary to determine whether it is of an electrical, 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 Nissan dealer if a transmission fault is suspected.

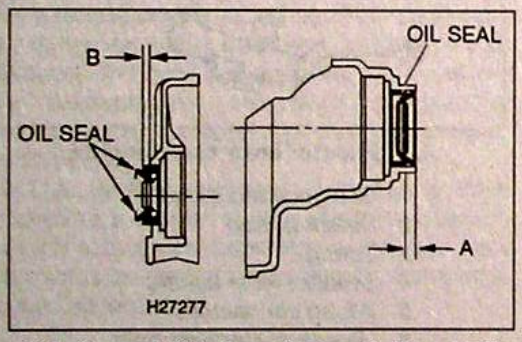
Do not remove the transmission from the car for possible repair before professional fault diagnosis has been carried out, since most tests require the transmission to be in the vehicle.



5.4 Adjust the kickdown cable so dimension 'L' is as specified

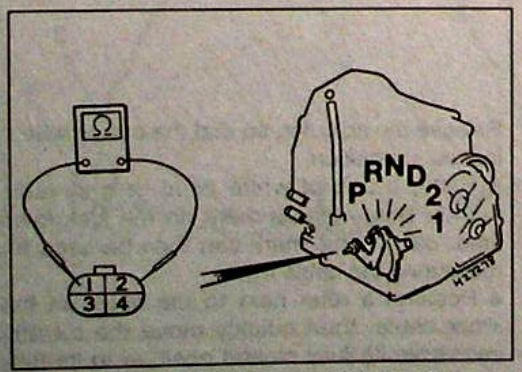
1 Throttle cam
2 Mounting bracket
3 Outer cable tube
4 Adjuster
5 Kickdown cable casing
L 39 to 43 mm

5 If adjustment is necessary, depress the adjuster, then reposition the outer cable and repeat the procedure described in paragraph 4.
6 Repeat the procedure as necessary, until the kickdown cable travel is within the specified range.



8.1 Correct fitted positions of driveshaft seals

Right-hand side seal (A) - 5.5 to 6.5 mm
Left-hand side seal (B) - 0.5 mm or less



9.4 Starter/inhibitor switch terminal identification. Test switch as described in text

6 Kickdown cable - removal and refitting

Renewal of the kickdown cable is complex task, which should be entrusted to a Nissan dealer. To detach the cable at the transmission end first requires the removal of the hydraulic control valve assembly, which is a task that should not be undertaken by the home mechanic.

7 Speedometer drive - removal and refitting

Refer to Chapter 7A, Section 7.

8 Fluid seals - renewal

Driveshaft seals

1 Refer to the information given in Section 4 of Chapter 7A, noting that the seals must be positioned as shown **(see illustration).**

Selector shaft seal

2 Renewal of the selector shaft seal is complex task, requiring much dismantling of the transmission, and should therefore be entrusted to a Nissan dealer.

9 Starter inhibitor/ reversing light switch - testing, removal and refitting

Testing

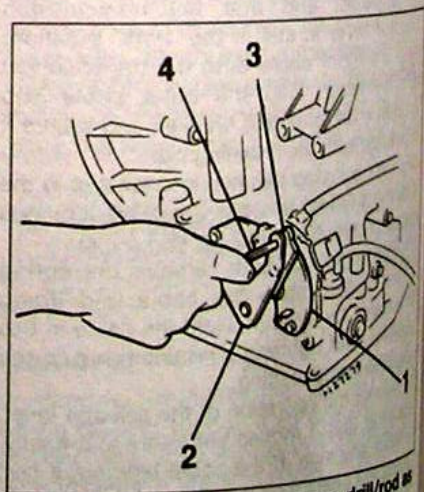
1 The starter inhibitor/reversing light switch is a dual-function switch which is screwed onto the front of the transmission housing. The inhibitor function of the switch ensures that the engine can only be started whilst the selector lever is in either the 'N' or 'P' positions, therefore preventing the engine being started whilst the transmission is in gear. If at any time it is noted that the engine can be started whilst the selector lever is in any position other than 'P' or 'N', then it is likely that the inhibitor function of the switch is incorrectly adjusted or faulty. The switch also performs the function of the reversing light switch, illuminating the reversing lights whenever the selector lever is in the 'R' position. If either function of the switch is faulty, the switch must be tested as follows.
2 To improve access to the switch, apply the handbrake, then jack up the front of the car and support it on axle stands (see *Jacking and Vehicle Support*).
3 Disconnect the wiring connector from the switch.
4 Measure the resistances between the various terminals of the switch **(see illustration)** with the selector lever in the 'P', 'N' and 'R' positions. If the switch is functioning correctly, there should be continuity between terminals 1 and 2 in the 'P' and 'N' positions, and continuity between terminals 3 and 4 in the 'R' position.
5 If this is not the case, slacken the switch retaining bolts, and adjust the switch as described in paragraphs 10 and 11. If the switch still fails to function properly after adjustment, it is faulty and must be renewed.

Removal

6 To improve access to the switch, apply the handbrake, then jack up the front of the car and support it on axle stands (see *Jacking and Vehicle Support*).
7 Disconnect the wiring connector from the switch.
8 Slacken and remove the three retaining bolts, then free the switch from the transmission selector mechanism and remove it from the vehicle.

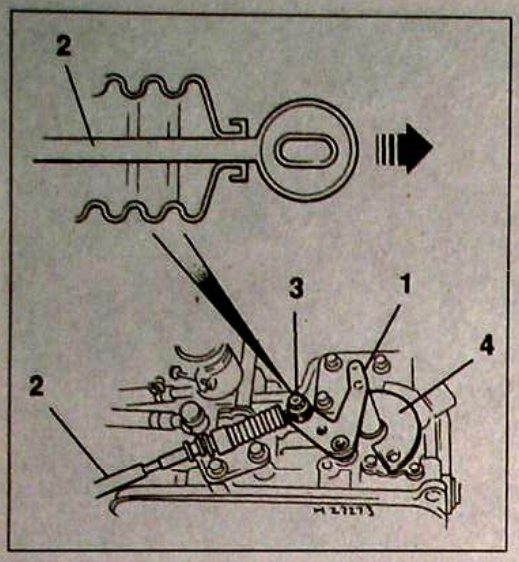
Refitting

9 Manoeuvre the switch into position, and engage it with the selector mechanism. Install the switch retaining bolts, tightening them loosely at this stage.
10 Position the selector lever in the 'N' position, and obtain a 4 mm diameter twist drill or rod.
11 Insert the drill/rod through the hole in the top of the selector lever, and also through the hole in the top of the switch lever **(see illustration)**. With the holes aligned, securely tighten the switch retaining bolts, then withdraw the drill/rod.
12 Reconnect the switch wiring, and check the operation of the switch.



9.11 Adjust the switch using a drill/rod as described in text

1 Starter/inhibitor switch
2 Transmission selector lever
3 Adjustment holes
4 4 mm diameter drill/rod



2.4 Selector cable adjustment details. Pull cable end fitting in the direction of the arrow with the specified force

1 Transmission selector lever
2 Selector cable
3 Cable retaining nut
4 Starter/inhibitor switch

1 General information

Most 2.0 litre models covered in this manual were offered with the option of a four-speed fully automatic transmission, consisting of a torque converter, an epicyclic geartrain, and hydraulically-operated clutches and brakes. On Phase III models the trans-mission is electronically controlled to provide enhanced driver control of the transmission shift speeds.

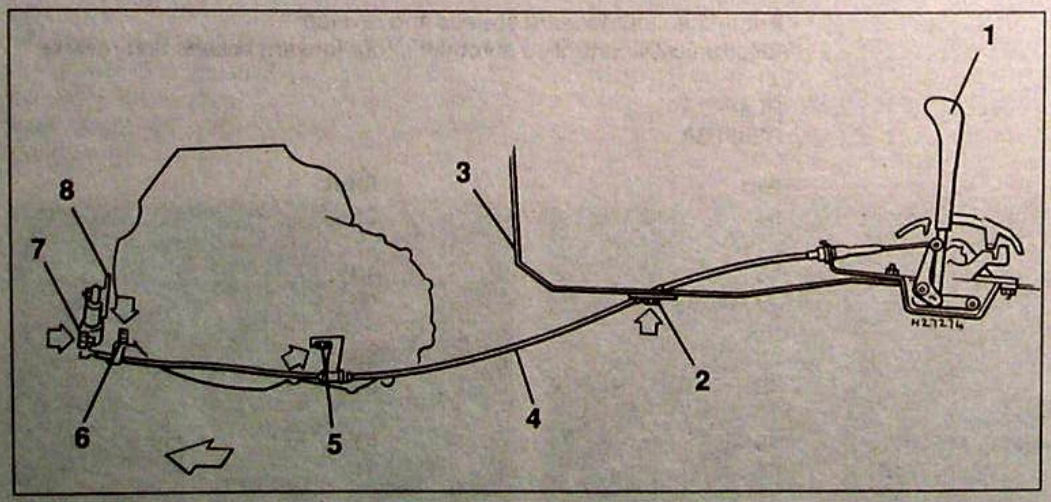
The torque converter provides a fluid coupling between engine and transmission which acts as an automatic clutch, and also provides a degree of torque multiplication when accelerating.

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

On Phase I and Phase II models, driver control of the transmission is by a seven-position selector lever. The transmission has a 'drive' option, and a 'hold' facility on the first three gear ratios. The drive option 'A' provides automatic changing throughout the range of all four gear ratios, and is the one to select for normal driving. An automatic kickdown facility will automatically shift the transmission down a gear if the accelerator pedal is fully depressed. The 'hold' options are very similar, but they limit the gear ratios available - ie, when the selector lever is in the '2' position, only the first two ratios can be selected, and in the '1' position, only the first ratio can be selected. The lower ratios can be used to provide engine braking whilst travelling down steep gradients. Note, however, that the transmission should never be shifted down into position '2' whilst the vehicle is travelling at 68 mph (110 km/h) or more, or into position '1' whilst travelling at 56 mph (90 km/h) or more.

On Phase III models, the transmission has an additional overdrive facility and a mode control function. The overdrive facility which is selected by means of a button on the selector lever, allows the transmission to shift into a higher (overdrive) gear as road speed increases. The mode control function is operated by a three-position switch on the centre console. The AUTO mode is used for normal driving, allowing the transmission to shift at relatively moderate road speeds. The SPORT mode is used for powerful acceleration or when ascending long inclines. In this position, engine performance is fully utilised with the transmission shifting at high engine RPM (and high road speeds). The SNOW mode is used for driving in slippery conditions and only allows the transmission to use the three highest gears. The overdrive and mode control functions are both controlled by an electronic control unit.

Due to the complexity of the automatic transmission, any repair or overhaul work must be left to a Nissan 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.



3.3 Selector cable fixing details

1 Selector lever
2 Selector cable-to-vehicle body fixing
3 Vehicle floorpan
4 Selector cable
5 Mounting bracket
6 Mounting bracket
7 Selector cable retaining nut
8 Transmission selector lever

2 Selector cable - adjustment

1 Position the selector lever firmly against its detent mechanism in the 'N' position (RL4F03A transmission), or 'P' position (RE4F03A trans-mission).
2 Apply the handbrake, then jack up the front of the car and support it on axle stands (see *Jacking and Vehicle Support*).
3 Working underneath the vehicle, slacken the nut securing the cable end fitting to the transmission selector lever.
4 Hook a spring balance into the slot in the cable end fitting, and pull the cable forwards with a force of 6.9 N (0.7 kg, or 1.5 lbs) **(see illustration)**.
5 From this position, remove the spring balance, and move the cable end fitting backwards by 1.0 mm. Hold the cable in this position, and tighten its retaining nut to the specified torque setting.
6 Check the operation of the selector lever, ensuring that it moves smoothly and easily, without any sign of the cable binding. If not, repeat the operations in paragraphs 3 to 5.
7 Once the selector lever is operating correctly, apply multi-purpose grease to the contact surfaces of the transmission selector lever and cable, and lower the vehicle to the ground.

3 Selector cable - removal and refitting

Removal

1 Apply the handbrake, then jack up the front of the car and support it on axle stands (see *Jacking and Vehicle Support*). Position the selector lever in the 'P' position.
2 Remove the centre console as described in Chapter 11.
3 Unscrew the nut securing the selector cable to the lever. Slide out the clip securing the outer cable to its mounting bracket, and free the selector cable from the selector lever **(see illustration)**.