Chapter 7 Part B Automatic transmission

Contents

Specifications

Four-speed automatic transmission shift linkage

Adjustment lever-to-locknut A clearance	0.039 in (1.0 mm)
Guide pin-to-guide plate clearance	
Front side	0.039 in (1.0 mm)
Rear side	0.020 in (0.5 mm)

Torque converter end-to-housing end clearance (Dimension A in illustration 6.20)

2600 engine	1.53 in (38.8 mm)
2200 engine	2.13 in (54.2 mm)

Torque specifications

	Ft-lbs
Transmission-to-engine bolt	27 to 38
Torque converter-to-flywheel bolt	25 to 36

1 General information

All vehicles covered in this manual are equipped with either a 4 or 5-speed manual transmission or a 3 or 4-speed automatic transmission. All information on the automatic transmission is included in this Part of Chapter 7. Information for the manual transmission can be found in Part A. Information on the transfer case used on 4WD models can be found in Part C.

Specialized techniques and equipment are required when working on automatic transmissions, due to their complexity. Consequently, this Chapter addresses only those procedures concerned with routine maintenance, general diagnosis and removal and installation.

If the transmission requires major repair work, it should be left to a dealer service department or an automotive transmission repair shop. You can, however, remove and install the transmission yourself and save the expense, even if the repair work is done by a transmission specialist.

2 Diagnosis — general

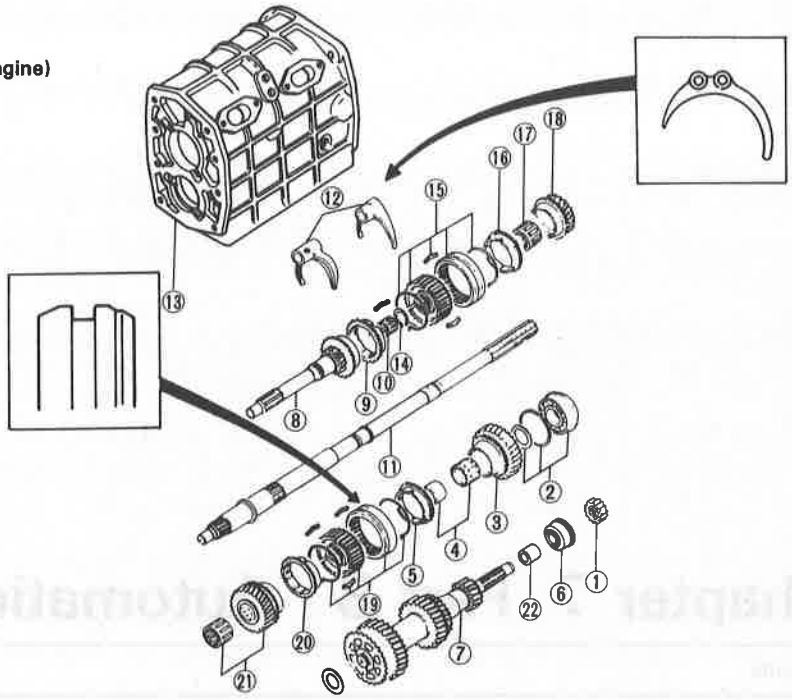
Note: *Automatic transmission malfunctions may be caused by five general conditions: poor engine performance, improper adjustments, hydraulic malfunctions, or mechanical malfunctions. Diagnosis of these problems should always begin with a check of the easily repaired items: fluid level and condition (Chapter 1), and shift linkage adjustment. Next, perform a road test to determine if the problem has been corrected or if more diagnosis is necessary. If the problem persists after the preliminary tests and corrections are completed, additional diagnosis should be done by a dealer service department or transmission repair shop. Refer to the Troubleshooting Section at the front of this manual for information on symptoms of transmission problems.*

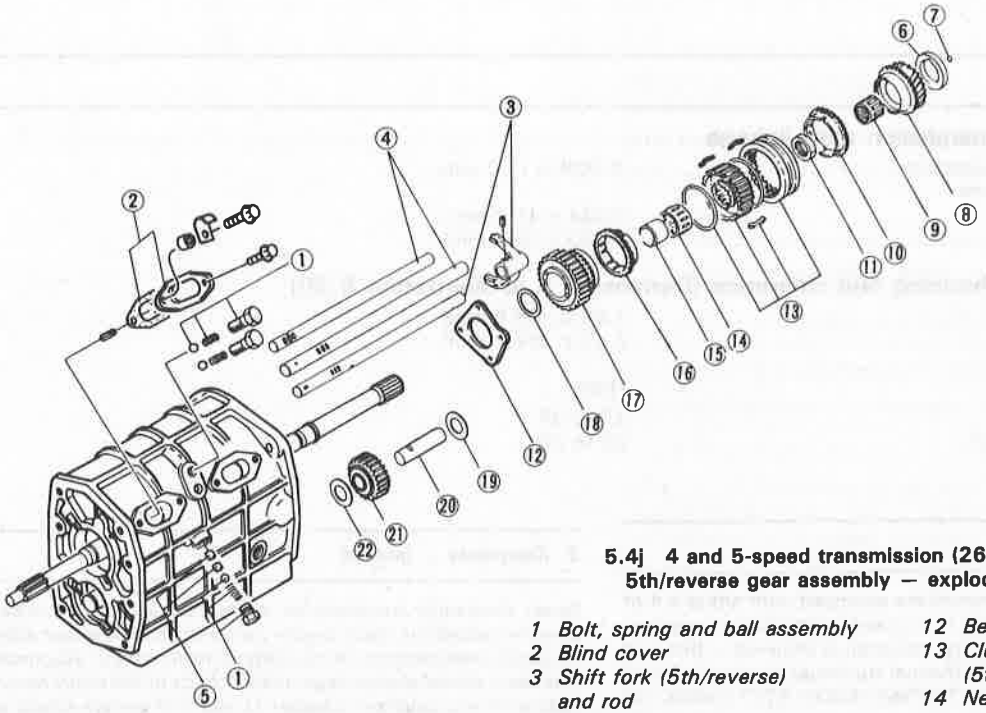
Preliminary checks

1 Drive the vehicle to warm the transmission to normal operating temperature.

5.4i 4 and 5-speed transmission (2600 engine) mainshaft component layout

1 *Counter reverse gear*
2 *Mainshaft bearing, adjusting shim and thrust washer*
3 *1st gear*
4 *Needle bearing and inner race*
5 *Synchronizer ring (1st)*
6 *Countershaft center bearing*
7 *Countershaft*
8 *Main drive gear*
9 *Synchronizer ring (4th)*
10 *Needle bearing*
11 *Mainshaft*
12 *Shift forks*
13 *Transmission case*
14 *Snapring*
15 *Clutch hub assembly (3rd/4th)*
16 *Synchronizer ring (3rd)*
17 *Needle bearing*
18 *3rd gear*
19 *Clutch hub assembly (3rd/4th)*
20 *Synchronizer ring (2nd)*
21 *2nd gear and needle bearing*
22 *Inner race*





5.4j 4 and 5-speed transmission (2600 engine) 5th/reverse gear assembly – exploded view

1 *Bolt, spring and ball assembly*
2 *Blind cover*
3 *Shift fork (5th/reverse) and rod*
4 *Shift rods*
5 *Interlock pin*
6 *Thrust lock washer*
7 *Countershaft*
8 *5th gear*
9 *Needle bearing*
10 *Synchronizer ring*
11 *Locknut*
12 *Bearing cover*
13 *Clutch hub assembly (5th/reverse)*
14 *Needle bearing*
15 *Inner case*
16 *Synchronizer ring*
17 *Reverse gear*
18 *Thrust washer*
19 *Thrust washer*
20 *Reverse idle gear shaft*
21 *Reverse idle gear*
22 *Thrust washer*

2 Check the fluid level as described in Chapter 1:
a) If the fluid level is unusually low, add enough fluid to bring the level within the designated area of the dipstick, then check for external leaks (see below).
b) If the fluid level is abnormally high, drain off the excess, then check the drained fluid for contamination by coolant. The presence of engine coolant in the automatic transmission fluid indicates that a failure has occurred in the internal radiator walls that separate the coolant from the transmission fluid (see Chapter 3).
c) If the fluid is foaming, drain it and refill the transmission, then check for coolant in the fluid or a high fluid level.

3 Check the engine idle speed. **Note:** *If the engine is malfunctioning, do not proceed with the preliminary checks until it has been repaired and runs normally.*

4 Inspect the shift control linkage (Section 3). Make sure that it's properly adjusted and that the linkage operates smoothly.

Fluid leak diagnosis

5 Most fluid leaks are easy to locate visually. Repair usually consists of replacing a seal or gasket. If a leak is difficult to find, the following procedure may help.

6 Identify the fluid. Make sure it's transmission fluid and not engine oil or brake fluid (automatic transmission fluid is a deep red color).

7 Try to pinpoint the source of the leak. Drive the vehicle several miles, then park it over a large sheet of cardboard. After a minute or two, you should be able to locate the leak by determining the source of the fluid dripping onto the cardboard.

8 Make a careful visual inspection of the suspected component and the area immediately around it. Pay particular attention to gasket mating surfaces. A mirror is often helpful for finding leaks in areas that are hard to see.

9 If the leak still cannot be found, clean the suspected area thoroughly with a degreaser or solvent, then dry it.

10 Drive the vehicle for several miles at normal operating temperature and varying speeds. After driving the vehicle, visually inspect the suspected component again.

11 Once the leak has been located, the cause must be determined before it can be properly repaired. If a gasket is replaced but the sealing flange is bent, the new gasket will not stop the leak. The bent flange must be straightened.

12 Before attempting to repair a leak, check to make sure that the following conditions are corrected or they may cause another leak. **Note:** *Some of the following conditions cannot be fixed without highly specialized tools and expertise. Such problems must be referred to a transmission repair shop or a dealer service department.*

Gasket leaks

13 Check the pan periodically. Make sure the bolts are tight, no bolts are missing, the gasket is in good condition and the pan is flat (dents in the pan may indicate damage to the valve body inside).

14 If the pan gasket is leaking, the fluid level or the fluid pressure may be too high, the vent may be plugged, the pan bolts may be too tight, the pan sealing flange may be warped, the sealing surface of the transmission housing may be damaged, the gasket may be damaged or the transmission casting may be cracked or porous. If sealant instead of gasket material has been used to form a seal between the pan and the transmission housing, it may be the wrong sealant.

Seal leaks

15 If a transmission seal is leaking, the fluid level or pressure may be too high, the vent may be plugged, the seal bore may be damaged, the seal itself may be damaged or improperly installed, the surface of the shaft protruding through the seal may be damaged or a loose bearing may be causing excessive shaft movement.

16 Make sure the dipstick tube seal is in good condition and the tube is properly seated. Periodically check the area around the speedometer gear or sensor for leakage. If transmission fluid is evident, check the O-ring for damage.

Case leaks

17 If the case itself appears to be leaking, the casting is porous and will have to be repaired or replaced.

18 Make sure the oil cooler hose fittings are tight and in good condition.

Fluid comes out vent pipe or fill tube

19 If this condition occurs, the transmission is overfilled, there is coolant in the fluid, the case is porous, the dipstick is incorrect, the vent is plugged or the drain back holes are plugged.

3 Shift linkage – adjustment

Refer to illustrations 3.5, 3.7, 3.12 and 3.15

1 Place the shift lever in each detent and make sure that the transmission shifts into the corresponding gear as the indicator is moved.

2 If adjustment is required, proceed as follows.

Three-speed transmission

3 Raise the vehicle and support it securely on jackstands.

Early models

4 Working from under the vehicle, place the shift position indicator in Neutral, then disconnect the T-joint from the lower end of the shift operating arm.

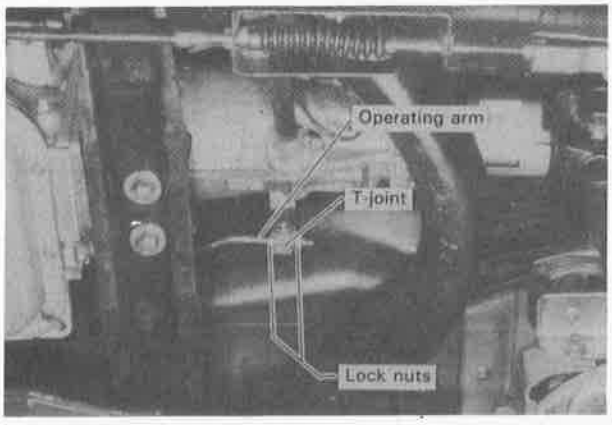
5 Loosen the T-joint locknuts and adjust the T-joint so that it freely enters the lever operating arm **(see illustration)**.

6 Tighten the locknuts to secure the adjustment. Connect the T-joint to the shift operating arm.

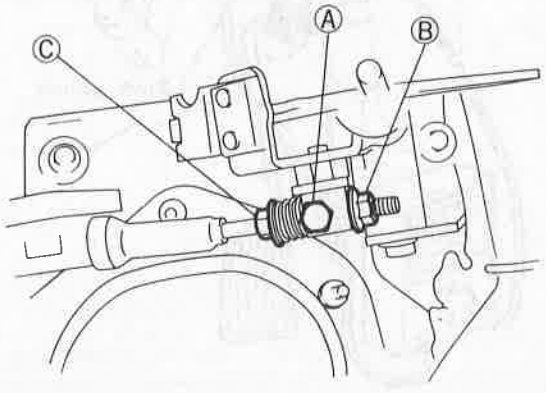
Later models

7 Working from under the vehicle, loosen the locknuts B and C and lockbolt A **(see illustration)**.

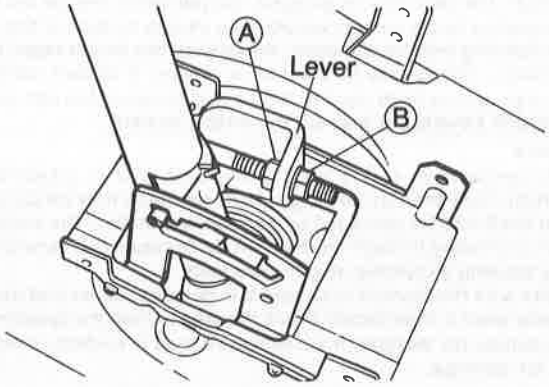
8 Have an assistant position the shift lever in the Park position detent and hold it so it cannot move. Push the transmission control rod to



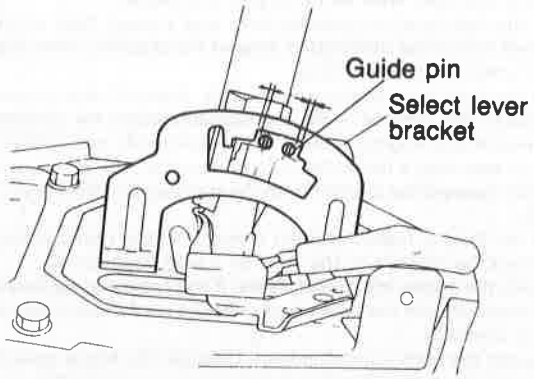
3.5 On earlier three-speed models, the automatic transmission linkage adjustment is done at the T-joint on the operating arm



3.7 Later model three-speed transmission shift linkage adjustment points – locknuts B and C, lockbolt A



3.12 Four-speed transmission adjustment locknut locations

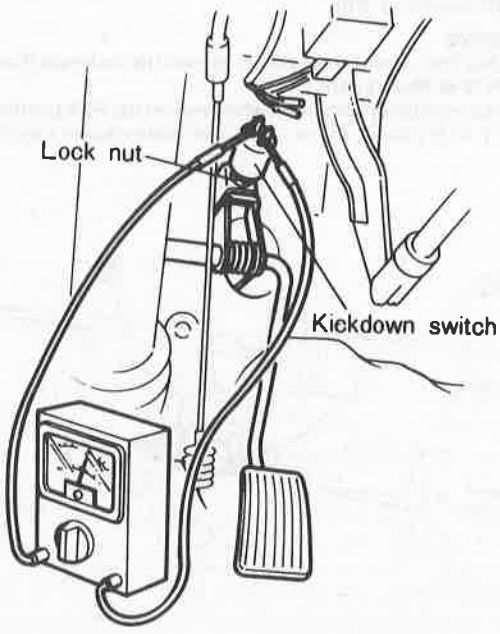


3.15 Shift linkage guide pin details — see specifications for proper clearances

the Park position and tighten the lockbolt A securely.
9 Tighten locknut C finger tight until it just touches the spacer and then tighten locknut B securely.
10 Check the shift lever operation and position indicator alignment.

Four-speed transmission

11 Remove the console.
12 Place the selector lever in the Park position and loosen locknuts A and B **(see illustration)**.
13 Working under the vehicle, move the transmission shift lever to the Park position.
14 With the bolt at 90° to the lever, adjust the distance between the adjustment lever and locknut A to the specified clearance (see specifications).
15 With the shift lever in Park, measure the clearance between the guide plate and the guide pin **(see illustration)**.
16 Move the selector to the Neutral and Drive ranges and make sure that the clearances are as specified. Readjust the A and B locknuts as necessary to obtain the specified clearances.
17 Check the shift lever operation and position indicator alignment.



4.2 Check the kick-down switch for continuity with the throttle depressed

4 Kick-down switch — check, adjustment and replacement

Refer to illustrations 4.2 and 4.4

1 The kick-down switch is attached to the throttle pedal bracket, under the instrument panel.

Check

2 Unplug the switch wires and connect an ohmmeter or self-powered test light to the switch terminals **(see illustration)**.
3 With the throttle pedal fully depressed, there should be continuity across the switch.

Adjustment

4 Depress the throttle pedal fully, loosen the locknut, then rotate the switch until the threaded case just contacts the stopper on the pedal **(see illustration)**. If there is no continuity after the switch has been adjusted, replace it with a new one.

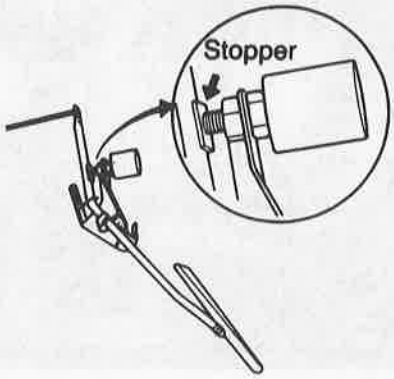
Replacement

5 Remove the locknut, unplug the connector and lift the switch from the vehicle.
6 Installation is the reverse of removal. Adjust the switch before fully tightening the locknut.

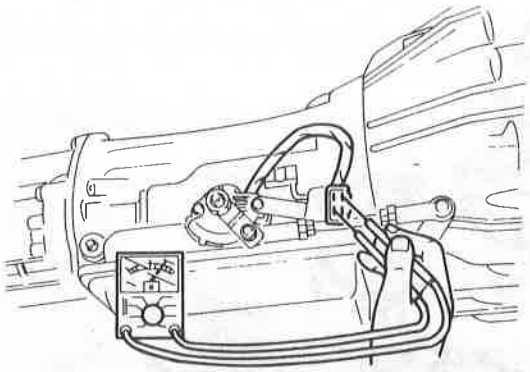
5 Neutral safety switch — check, adjustment and replacement

Refer to illustrations 5.4a, 5.4b, 5.4c, 5.7 and 5.8

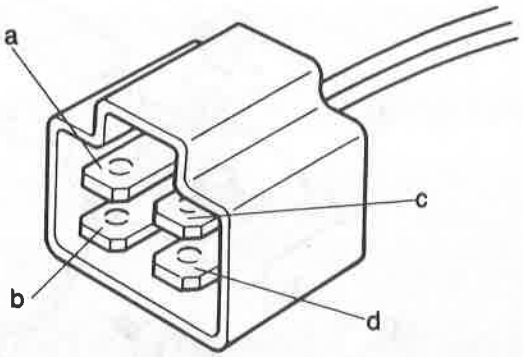
1 The neutral safety switch, located on the right-hand side of the transmission, prevents the engine from starting with the transmission in gear.



4.4 Adjust the kick-down switch so that it just comes into contact with the stopper when the throttle pedal is fully depressed



5.4a Unplug the neutral safety switch electrical connector and check for continuity with an ohmmeter



5.4b Neutral safety switch connector terminals

Check

2 Make sure the engine will start only with the selector lever in Park and Neutral. With the key in the On position, make sure the backup lights function when the lever is in Reverse only.
3 If a malfunction is noted, raise the vehicle and support it on jackstands.
4 Disconnect the switch wire harness, attach the leads of an ohmmeter to the terminals and check for continuity **(see illustrations)**.
5 Adjust the switch (see below) and then check that continuity is indicated between the switch terminals. If the switch does not operate properly after adjustment, replace it with a new one.
6 Disconnect the ohmmeter and reconnect the wire harness.

Adjustment

7 Loosen the retaining bolts and remove the screw from the switch body **(see illustration)**.
8 Rotate the switch and insert a 5/64-inch (2.0 mm) diameter pin into the alignment hole and through the internal rotor **(see illustration)**.
9 Tighten the mounting bolts, then remove the pin and install the screw in the hole.
10 Recheck the switch operation as described above.

Replacement

11 Disconnect the negative battery cable.
12 Shift the transmission into Neutral.
13 Remove the retaining nut that secures the shift lever to the lever shaft and separate the lever from the shaft.
14 Unplug the electrical connector, remove the two retaining bolts and lift the switch off.

Connection guide

Position	Connector terminal			
	a	b	c	d
P			○—○	
R	○—○			
N			○—○	
D, 1, 2				

○—○ indicates continuity

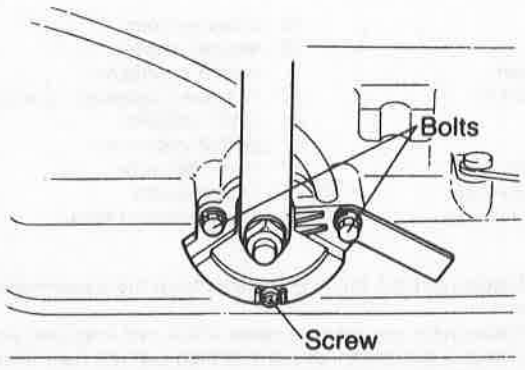
5.4c Continuity should exist between the neutral safety switch terminals connected by the line when the switch is in the indicated position

15 Installation is the reverse of removal. Do not tighten the retaining bolts fully until the switch has been adjusted.
16 Connect the battery negative cable.
17 Start the engine in both Park and Neutral to verify that the switch is properly adjusted.

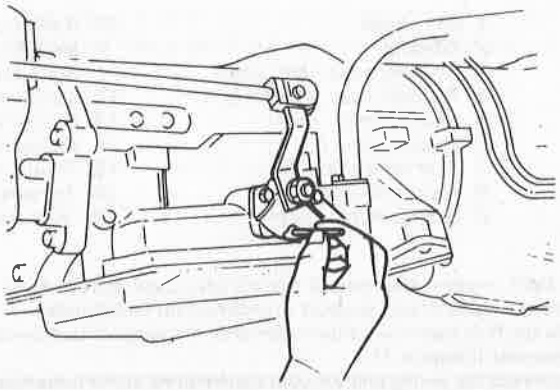
6 Automatic transmission — removal and installation

Refer to illustrations 6.8a, 6.8b and 6.20

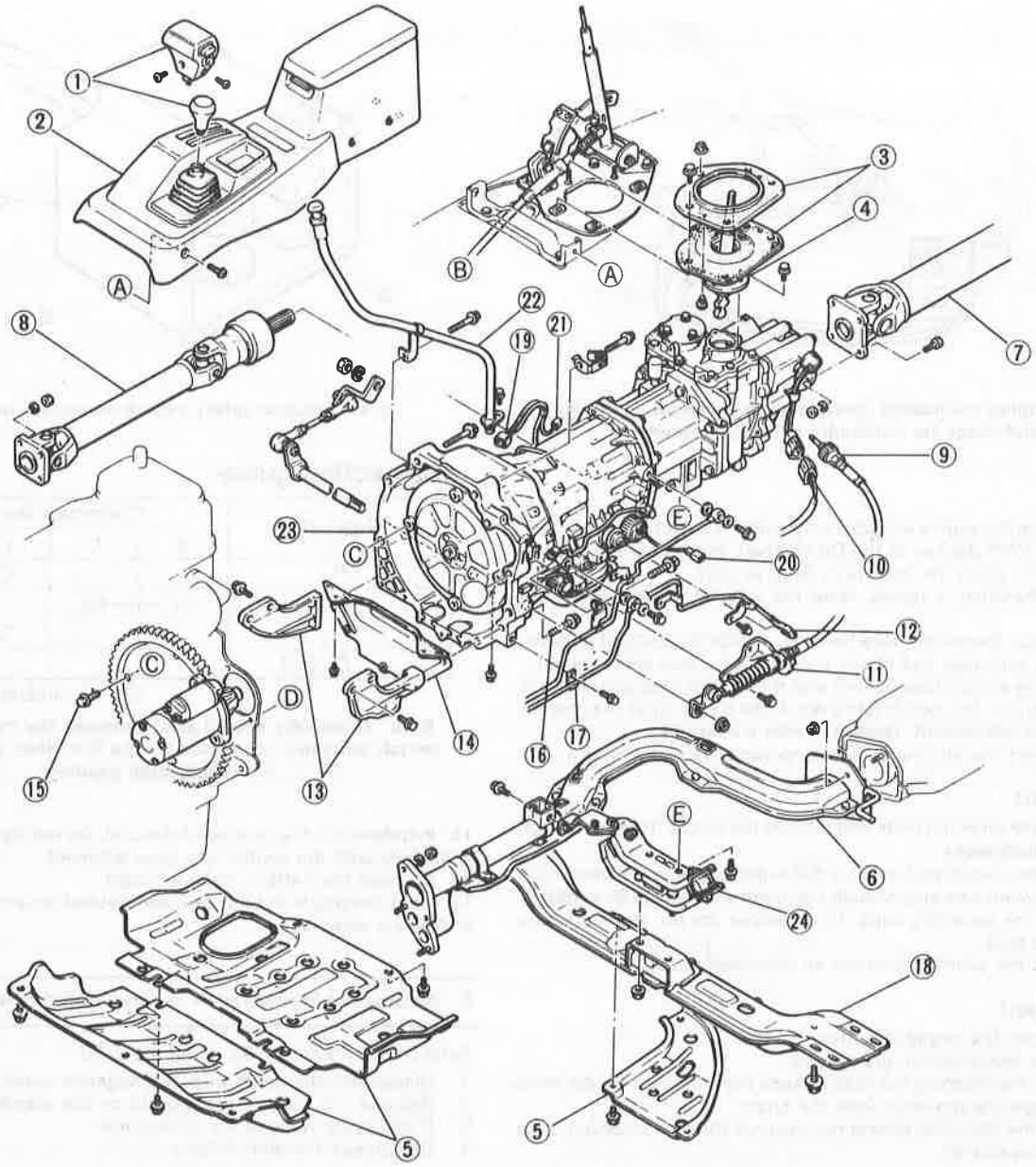
1 Disconnect the cable from the negative battery terminal.
2 Remove the upper mounting nut on the starter.
3 If equipped, remove the undercover.
4 Disconnect the shift linkage.



5.7 Neutral safety switch retaining bolt and adjustment hole screw locations



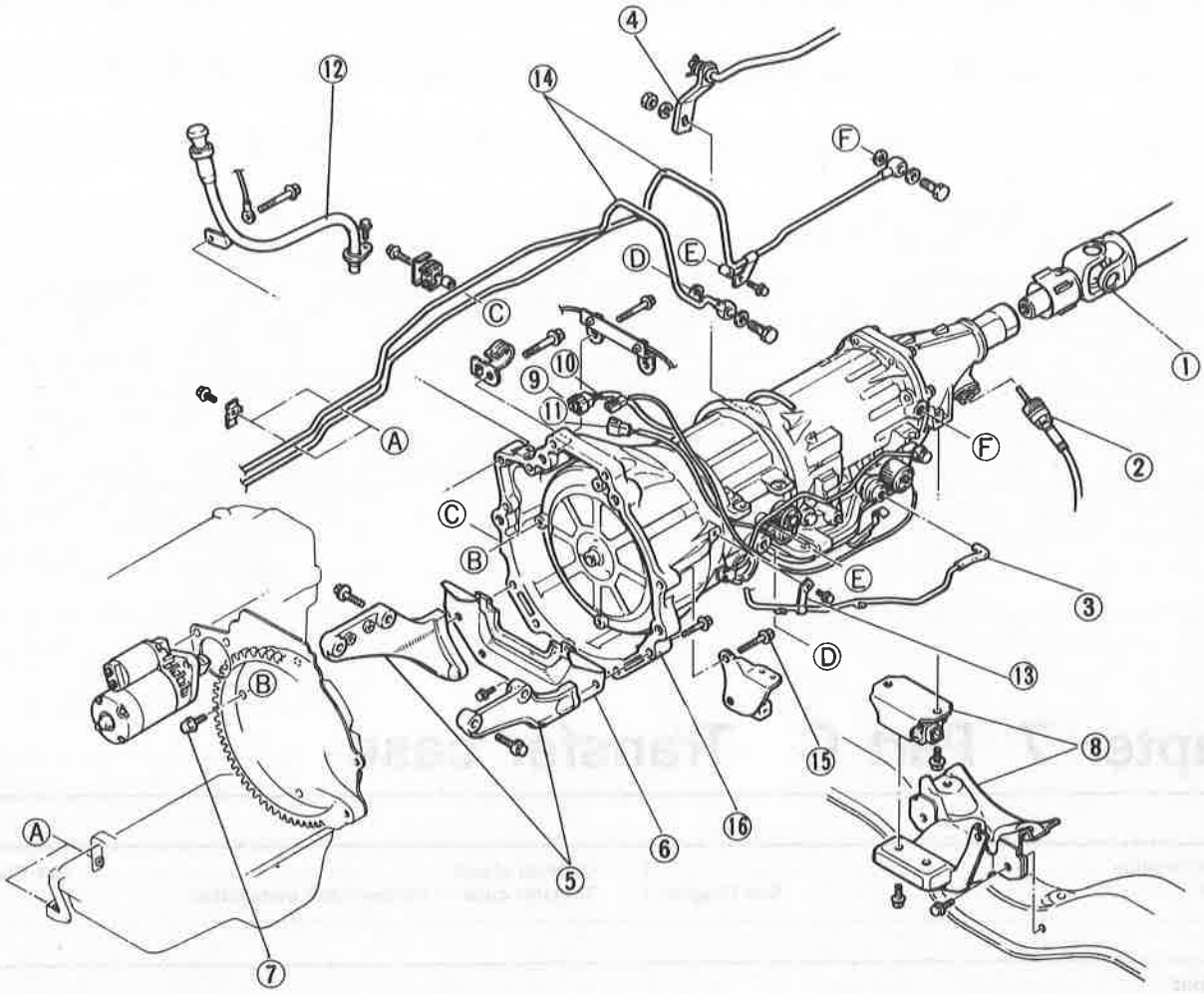
5.8 Insert the alignment pin into the neutral safety switch hole



6.8a Typical automatic transmission installation details (4WD model with transfer case)

1 *Shift knob*
2 *Console*
3 *Transfer case shift plate*
4 *Transfer case shift lever*
5 *Under cover*
6 *Exhaust pipe*
7 *Rear driveshaft*
8 *Front driveshaft*
9 *Speedometer cable*
10 *4WD indicator switch connector*
11 *Shift cable and bracket*
12 *Vacuum diaphragm hose*
13 *Gusset plate*
14 *Driveplate cover*
15 *Torque converter bolt*
16 *Transmission-to-engine bolt*
17 *Fluid cooler line and bracket*
18 *Crossmember*
19 *Neutral safety switch connector*
20 *Kickdown solenoid connector*
21 *4WD indicator switch connector*
22 *Fluid filler tube*
23 *Transmission*
24 *Transmission mount*

5 On 4WD models, disconnect the transfer case shift linkage.
6 Raise the vehicle and support it securely on jackstands.
7 Drain the fluid from the transmission and, if equipped, transfer case (4WD models) (Chapter 1).
8 Disconnect the wiring and vacuum connections at the transmission and, if equipped, transfer case **(see illustrations)**.
9 Remove the starter motor (see Chapter 5).
10 Remove the driveshaft(s) (Chapter 8).
11 Disconnect the speedometer drive cable.
12 Disconnect the fluid cooler lines from the transmission and plug them.
13 Disconnect any exhaust pipes which will interfere with removal.
14 Remove the retaining bolt and then pull the fluid filler tube from the transmission, taking care not to lose the O-ring(s).
15 Remove the driveplate cover.
16 Support the automatic transmission with a jack, then remove the rear support crossmember and mount. Through the open lower half of the torque converter housing, remove the four bolts which join the



6.8b Typical automatic transmission installation details (2WD model)

1 *Driveshaft*
2 *Speedometer cable*
3 *Vacuum hose*
4 *Shift lever*
5 *Gusset plate*
6 *Driveplate cover*
7 *Torque converter bolt*
8 *Transmission mount*
9 *Neutral safety switch connector*
10 *Kick-down solenoid connector*
11 *Overdrive cancel connector*
12 *Fluid filler tube*
13 *Vacuum pipe bracket*
14 *Oil cooler pipe*
15 *Transmission mount bolt*
16 *Transmission*

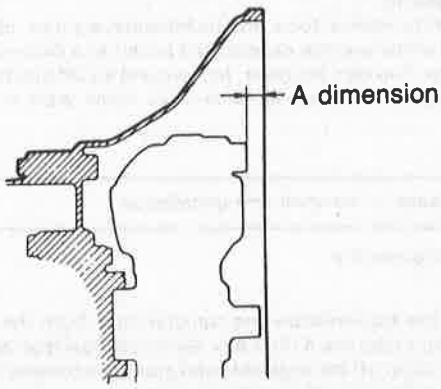
driveplate and converter together. Remove them one at a time by rotating the driveplate. To do this, turn the crankshaft with a wrench attached to the pulley securing bolt.

17 Place a jack under the engine oil pan (use a block of wood to protect it), and remove the bolts which attach the torque converter housing to the engine.

18 Lower both jacks progressively until the transmission will clear the lower edge of the firewall. Catch the fluid which may run from the torque converter during this operation.

19 The torque converter can now be pulled forward to remove it from the housing. The driveplate can be unbolted from the crankshaft flange if it has to be replaced because of a worn starter ring gear (see Chapter 2).

20 The installation procedure is basically the reverse of removal. Measure the distance between the end of the torque converter and the end of the bellhousing to make sure it is as specified before raising the transmission into place **(see illustration)**. Tighten all bolts and nuts securely, using a torque wrench where necessary. Be sure to refill the transmission and, if equipped, transfer case with the required fluids (see Chapter 1). Adjust the shift linkage and neutral safety switch as described in this Chapter before road testing the vehicle.



6.20 The distance from the end of the torque converter to the end of the housing (dimension A) must be as specified in the Specifications at the front of this Chapter for the torque converter to be properly installed