Chapter 7 Part A Manual transmission

Contents

Specifications

Torque specifications	Ft-lbs
Clutch bellhousing-to-engine bolt	
1600/1800/2000/2200 engine	51 to 65
2600 engine	27 to 38

1 General information

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

Due to the complexity, unavailability of replacement parts and the special tools necessary, internal repair procedures for the manual transmission is not recommended for the home mechanic. The information contained within this manual will be limited to general information, seal replacement and removal and installation procedures.

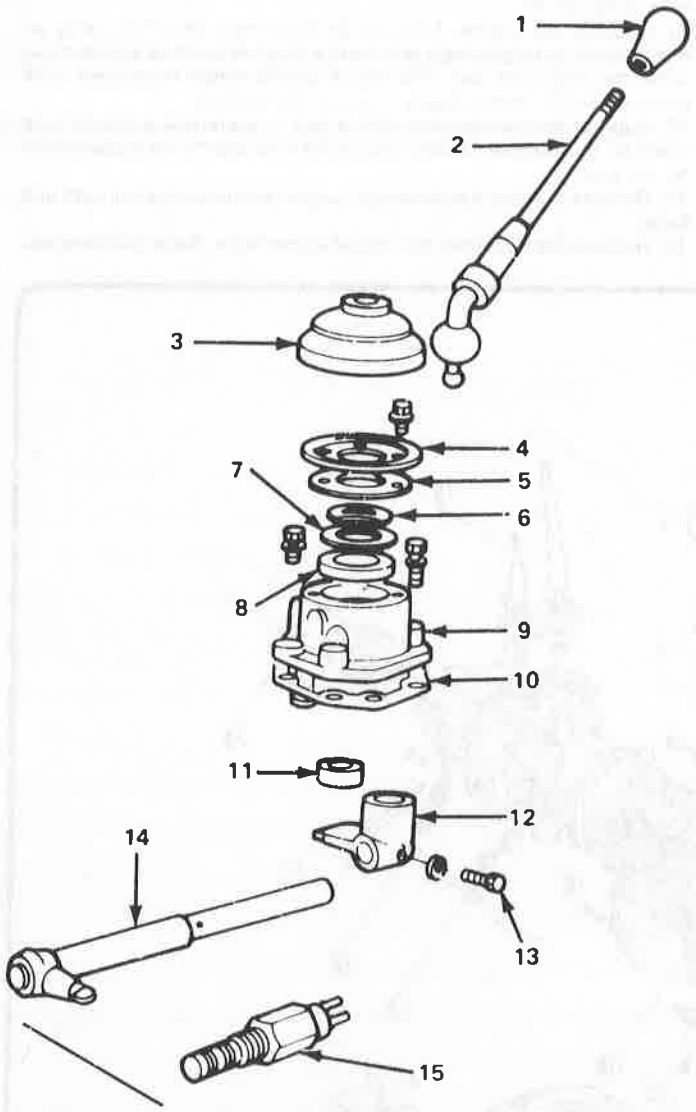
Depending on the expense involved in having a faulty transmission overhauled, it may be an advantage to consider replacing the unit with either a new or rebuilt one. Your local dealer or transmission shop should be able to supply you with information concerning cost, availability and exchange policy.

Regardless of how you decide to remedy a transmission problem, you can still save considerable expense by removing and installing the unit yourself.

2 Shift lever — removal and installation

Refer to illustration 2.3

1 Remove the console (if equipped) and shift boot screws.
2 Place the shift lever in Neutral.
3 Remove the shift lever cover-to-transmission bolts/screws **(see illustration)**.



2.3 Typical shift lever components — exploded view

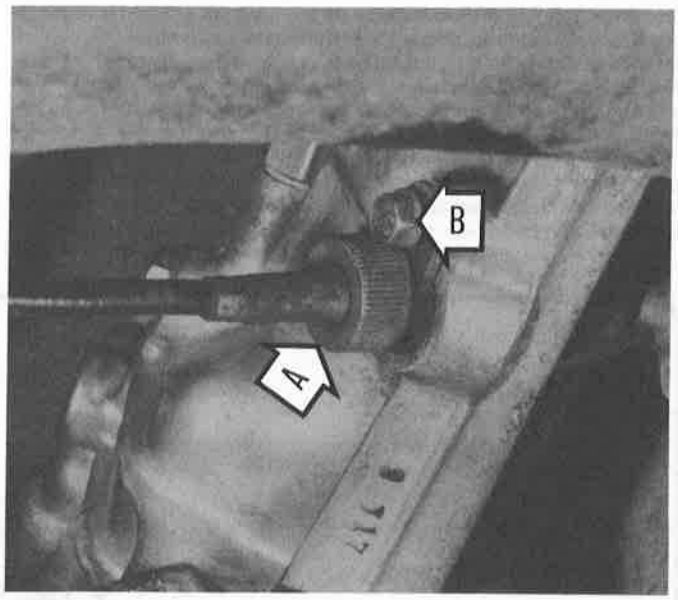
1 Knob	*9 Shift lever retainer*
2 Shift lever	*10 Gasket*
3 Boot	*11 Ball seat*
4 Cover	*12 Control lever end*
5 Gasket	*13 Bolt*
6 Spring	*14 Transmission control lever*
7 Shim	*15 Backup lamp switch*
8 Bushing	

4 Grasp the shift lever securely and pull it straight up and out of the transmission, taking care not to drop the cover, gasket, spring, shims and other components which will come out with the lever **(see illustration 2.3)**.
5 Installation is the reverse of removal.

3 Oil seal replacement

Refer to illustration 3.9

1 Oil leaks frequently occur due to wear of the extension housing oil seal and bushing, and/or the speedometer drive gear oil seal and/or O-ring. Replacement of these seals is relatively easy, since the repairs can usually be performed without removing the transmission from the vehicle.



3.9 Unscrew the speedometer cable collar (A) and then remove the gear retaining bolt (B)

Extension housing

2 The extension housing oil seal is located at the extreme rear of the transmission, where the driveshaft is attached. If leakage at the seal is suspected, raise the rear of the vehicle and support it securely on jackstands. Be sure to block the front wheels to keep the vehicle from rolling. If the seal is leaking, transmission lubricant will be built up on the front of the driveshaft and may be dripping from the dust shield at the rear of the transmission.
3 Refer to Chapter 8 and remove the driveshaft.
4 Using a screwdriver or pry bar, carefully pry the oil seal and bushing out of the rear of the transmission. Do not damage the splines on the transmission output shaft.
5 Using a large section of pipe or a very large deep socket as a drift, install the new oil seal. Drive it into the bore squarely and make sure that it is completely seated. Install a new bushing using the same method.
6 Reinstall the dust shield by carefully tapping it into place. Lubricate the splines of the transmission output shaft and the outside of the driveshaft sleeve yoke with lightweight grease, then install the driveshaft. Be careful not to damage the lip of the new seal.

Speedometer gear

7 The speedometer cable and driven gear housing is located on the side of the extension housing. Look for transmission oil around the cable housing to determine if the seal and O-ring are leaking.
8 Unscrew the cable housing with pliers.
9 Using a wrench, remove the speedometer driven gear housing **(see illustration)**.
10 Remove the driven gear from the housing.
11 Using a hook, remove the seal.
12 Using a small socket of the appropriate diameter or other similar tool as a drift, install the new seal.
13 Install a new O-ring to the driven gear housing and reinstall the driven gear housing and cable assembly to the extension housing.

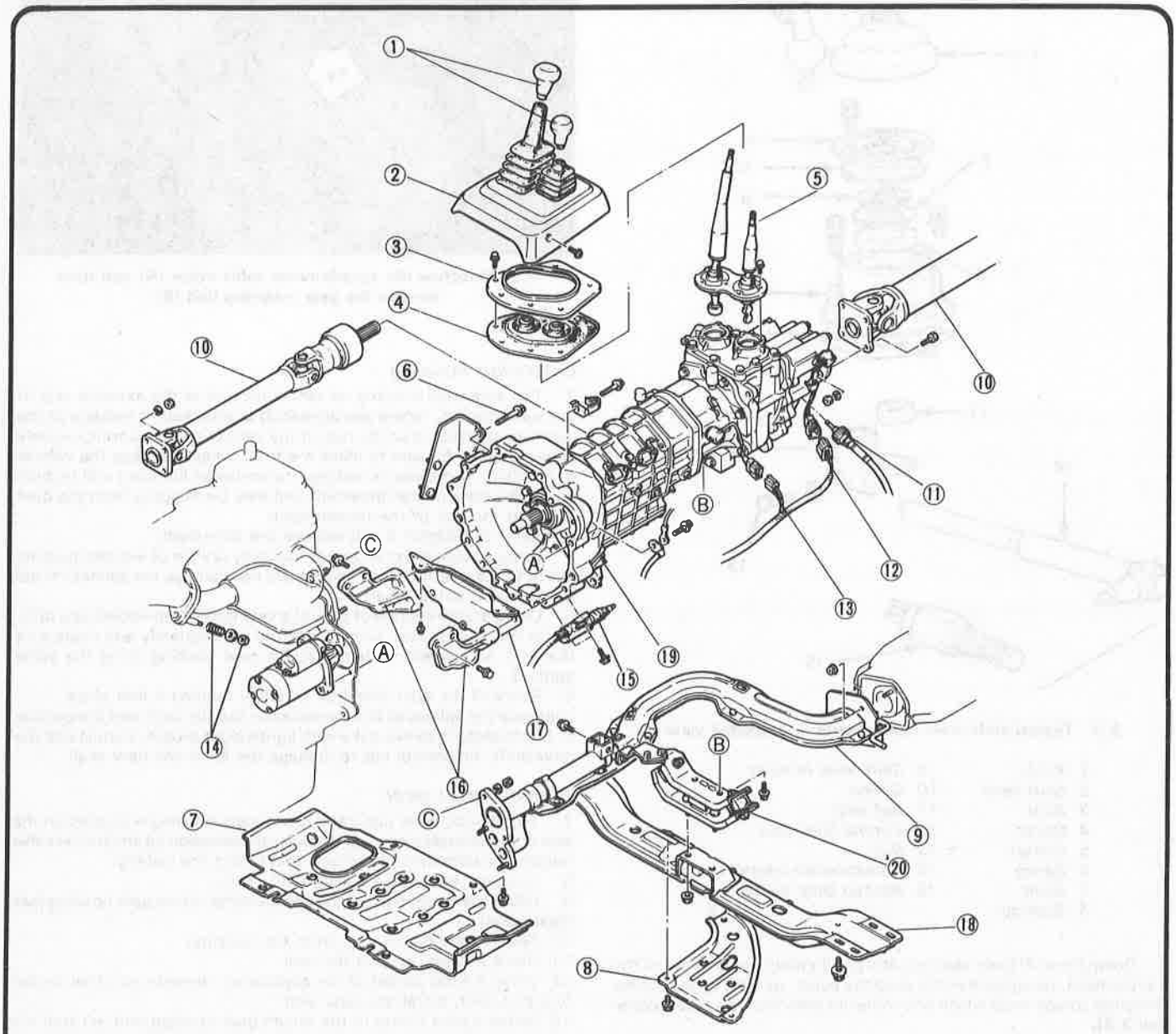
4 Manual transmission — removal and installation

Refer to illustrations 4.5a and 4.5b

Removal

1 Disconnect the negative cable at the battery. Place the cable out of the way so it cannot accidentally come in contact with the negative terminal of the battery, as this would once again allow power into the electrical system of the vehicle.

2 From inside the vehicle, remove the shift lever (Section 2).
3 On 4WD models, remove the shift lever assembly.
4 Raise the vehicle and support it securely on jackstands.
5 Disconnect the speedometer cable and electrical connections from the transmission and, if equipped, the transfer case **(see illustrations)**.
6 Drain the transmission and, if equipped, the transfer case.
7 Remove the starter motor.
8 Unbolt the clutch release cylinder and fasten it out of the way.
9 Remove the driveshaft (Chapter 8). Use a plastic bag to cover the end of the transmission to prevent fluid loss and contamination.
10 Remove the exhaust system components as necessary for clearance (Chapter 4).
11 Support the engine. This can be done from above by using an engine hoist, or by placing a jack (with a block of wood as an insulator) under the engine oil pan. The engine should remain supported at all times while the transmission is out of the vehicle.
12 Support the transmission with a jack — preferably a special jack made for this purpose. Safety chains will help steady the transmission on the jack.
13 Remove the rear transmission support-to-crossmember nuts and bolts.
14 Remove the nuts from the crossmember bolts. Raise the transmis-



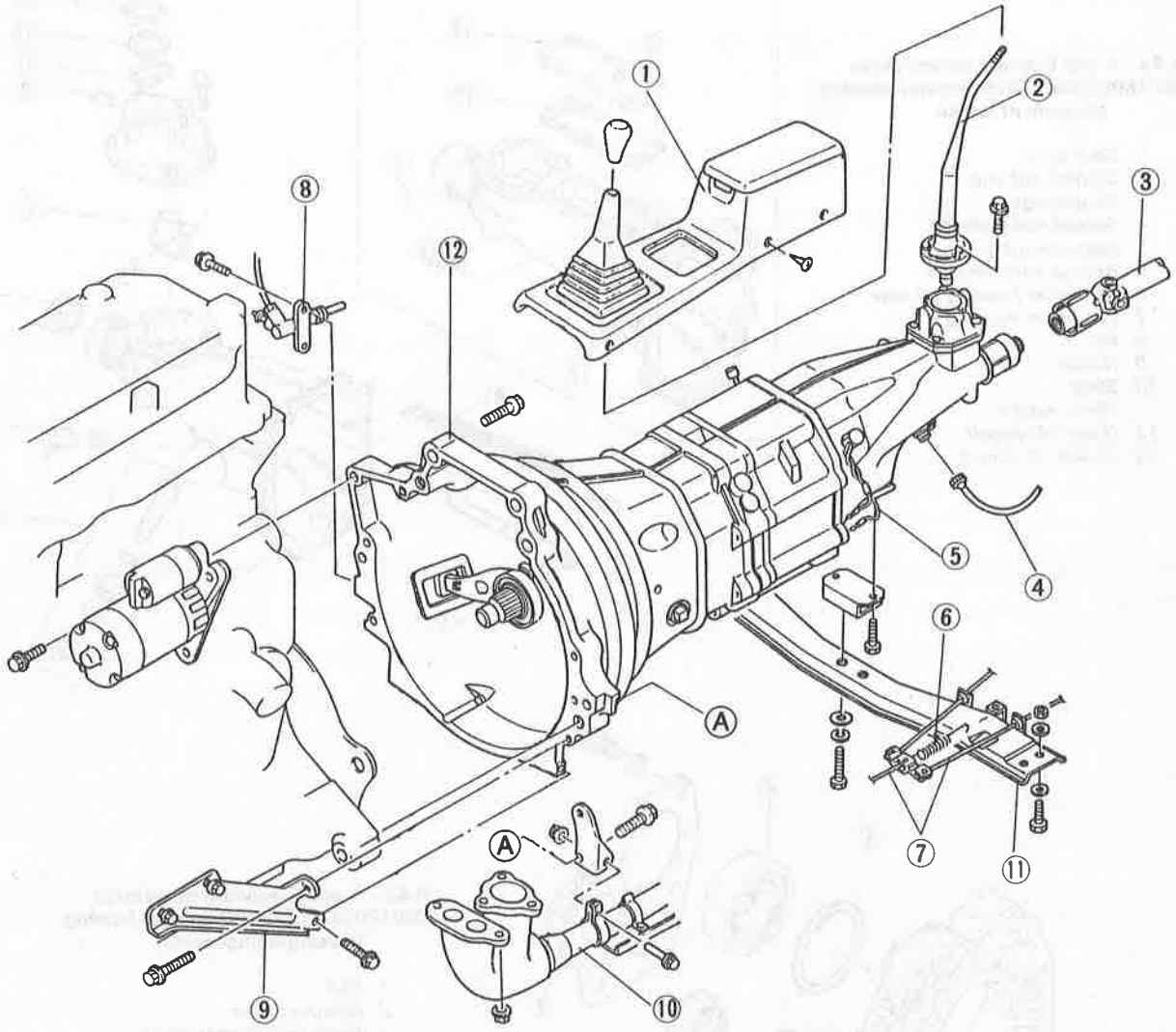
4.5a Typical transmission/transfer case installation details (4WD models)

1 Shift leaver knobs
2 Shift console
3 Insulator plate
4 Shift boot
5 Shift lever assembly
6 Bracket bolt
7 Rear undercover
8 Transfer case cover
9 Exhaust pipe
10 Driveshafts
11 Speedometer cable
12 Transfer case indicator switch
13 Backup switch connector
14 Exhaust pipe bolts
15 Clutch release cylinder
16 Gusset plates
17 Undercover
18 Crossmember
19 Transmission/clutch housing assembly
20 Transmission mount bracket

sion slightly and remove the crossmember.
15 Remove the bolts securing the transmission/clutch housing to the engine.
16 Make a final check that all wires and hoses have been disconnected from the transmission and transfer case (4WD models) and then move the transmission and jack toward the rear of the vehicle until the transmission and clutch housing assembly are clear of the engine. Keep the transmission level as this is done.
17 Once it is clear, lower the transmission/clutch housing assembly and remove it from under the vehicle. **Caution:** *Do not depress the clutch pedal while the transmission is removed from the vehicle.*
18 The clutch components can now be inspected (Chapter 8). In most cases, new clutch components should be installed as a matter of course if the transmission is removed.

Installation

19 If removed, install the clutch components (Chapter 8).
20 With the transmission secured to the jack as on removal, raise the transmission into position behind the engine and then carefully slide it forward, engaging the clutch housing with the engine dowel pins. Do not use excessive force to install the transmission — if the dowel pins do not slide into place, readjust the angle of the transmission so it is level.
21 Install the transmission/clutch housing-to-engine bolts. Tighten the bolts to the specified torque.
22 Install the crossmember and transmission support. Tighten all nuts and bolts securely.
23 Remove the jacks supporting the transmission and the engine.



4.5b Typical transmission installation details (2WD models)

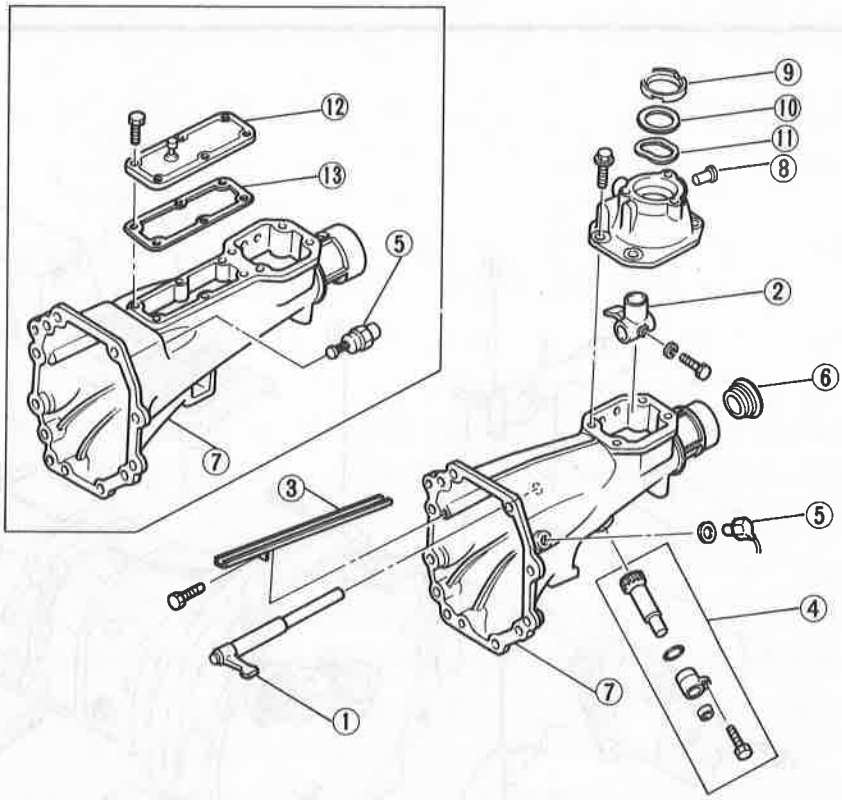
1 Console
2 Shift lever
3 Driveshaft
4 Speedometer cable
5 Wiring harnesses
6 Return spring
7 Parking brake cables
8 Clutch release cylinder
9 Gusset plate
10 Exhaust pipe
11 Crossmember
12 Transmission/clutch housing assembly

24 Install the various items removed previously, referring to Chapter 8 for the installation of the driveshaft and Chapter 4 for information regarding the exhaust system components.
25 Make a final check that all wires, hoses and the speedometer cable have been connected and that the transmission and transfer case (4WD models) have been filled with lubricant to the proper level (Chapter 1). Lower the vehicle.
26 From inside the vehicle connect the shift lever (see Section 2).
27 On 4WD models, install the transfer case shift lever assembly.
28 Connect the negative battery cable. Road test the vehicle for proper operation and check for leakage.

5 Manual transmission overhaul — general information

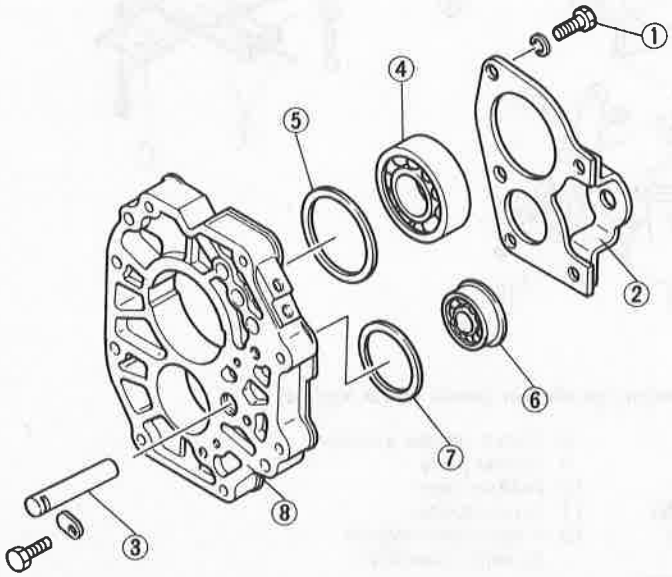
Refer to illustrations 5.4a, 5.4b, 5.4c, 5.4d, 5.4e, 5.4f, 5.4g, 5.4h, 5.4i and 5.4j

Overhauling a manual transmission is a difficult job for a do-it-yourselfer. It involves the disassembly and reassembly of many small parts. Numerous clearances must be precisely measured and, if necessary, changed with select fit spacers and snap-rings. As a result, if transmission problems arise, it can be removed and installed by a competent



5.4a 4 and 5-speed transmission (1600/1800/2000/2200 engine) housing component layout

1 Shift lever
2 Control rod end
3 Oil passage
4 Speedometer driven gear assembly
5 Backup lamp switch
6 Extension housing oil seal
7 Extension housing
8 Pin
9 Holder
10 Shim
11 Wave washer
12 Cover (4-speed)
13 Gasket (4-speed)



5.4b 4 and 5-speed transmission (1600/1800/2000/2200 engine) bearing housing components

1 Bolt
2 Bearing cover
3 Reverse idle gear shaft (4-speed)
4 Ball bearing
5 Adjustment shim
6 Ball bearing
7 Adjustment shim
8 Bearing housing

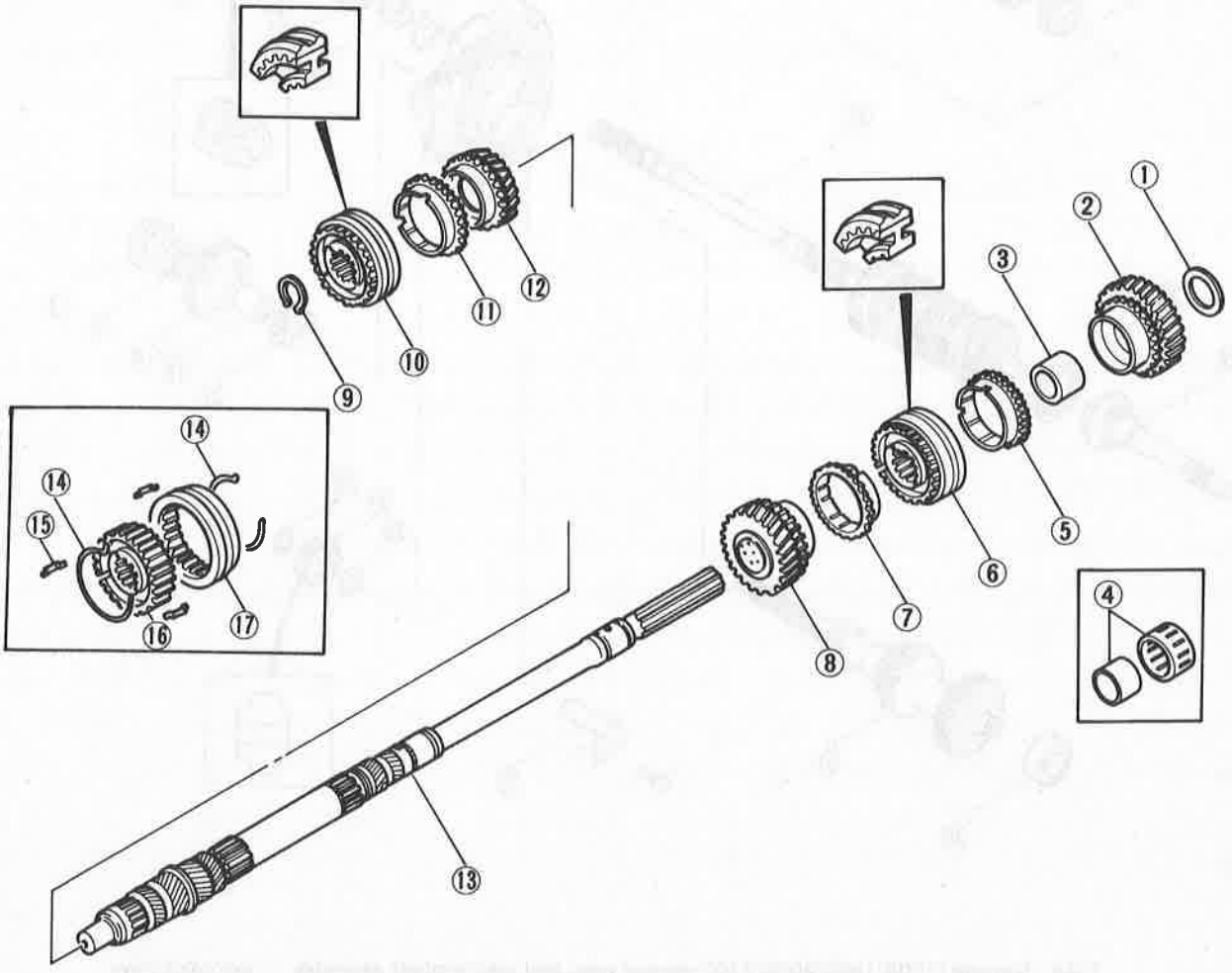
do-it-yourselfer, but overhaul should be left to a transmission repair shop. Rebuilt transmissions may be available — check with your dealer parts department and auto parts stores. At any rate, the time and money involved in an overhaul is almost sure to exceed the cost of a rebuilt unit.

Nevertheless, it's not impossible for an inexperienced mechanic to rebuild a transmission if the special tools are available and the job is done in a deliberate step-by-step manner so nothing is overlooked.

The tools necessary for an overhaul include internal and external snap-ring pliers, a bearing puller, a slide hammer, a set of pin punches, a dial indicator and possibly a hydraulic press. In addition, a large, sturdy workbench and a vise or transmission stand will be required.

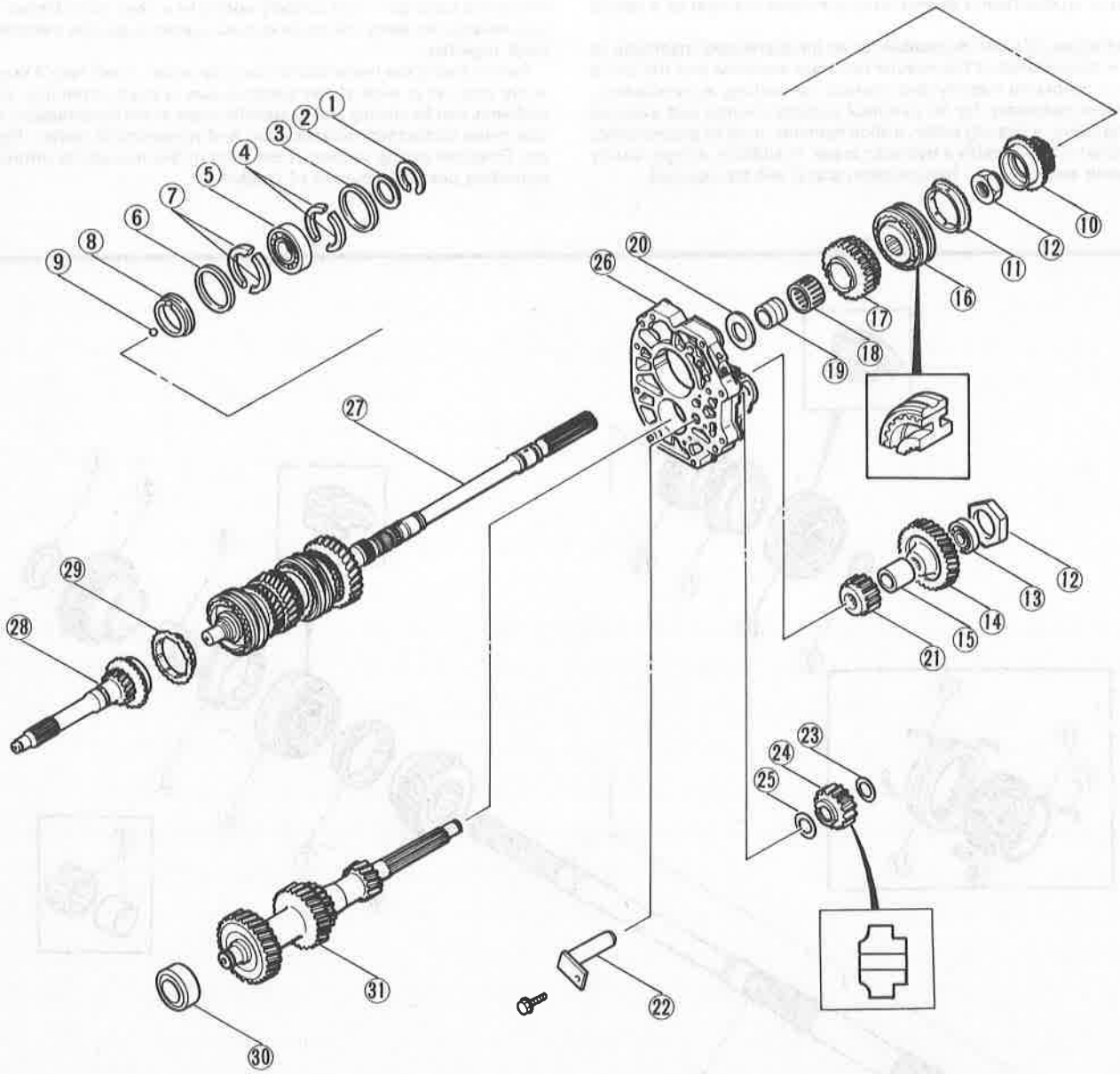
During disassembly of the transmission, make careful notes of how each piece comes off, where it fits in relation to other pieces and what holds it in place. Exploded views are included **(see illustrations)** to show where the parts go — but actually noting how they are installed when you remove the parts will make it much easier to get the transmission back together.

Before taking the transmission apart for repair, it will help if you have some idea what area of the transmission is malfunctioning. Certain problems can be closely tied to specific areas in the transmission, which can make component examination and replacement easier. Refer to the *Troubleshooting* section at the front of this manual for information regarding possible sources of trouble.



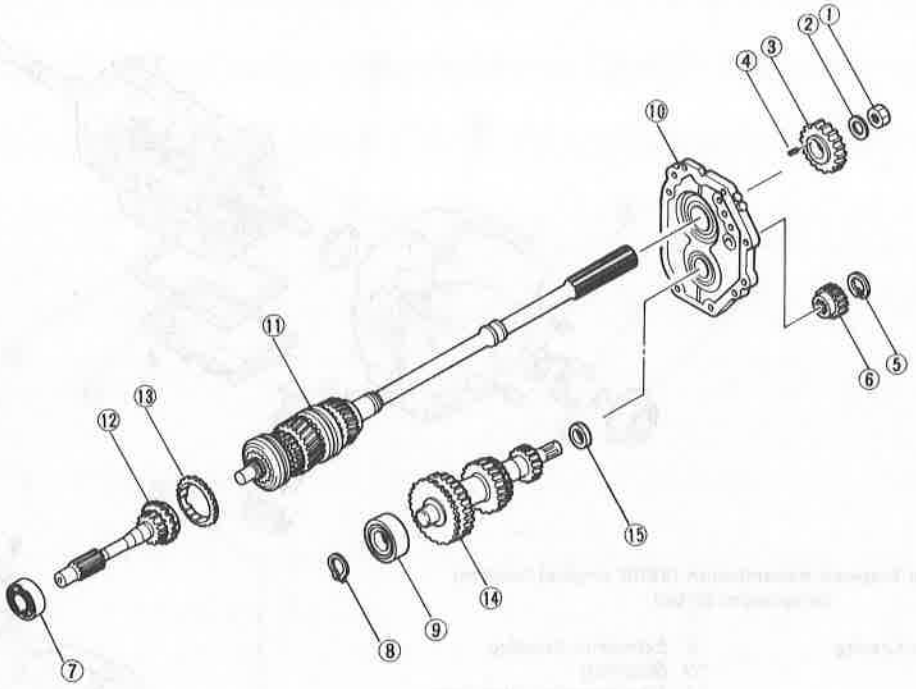
5.4c 4 and 5 speed transmission (1600/1800/2000/2200 engine) mainshaft component layout

1 Washer
2 1st gear
3 Gear sleeve
4 Needle bearing and inner race
5 1st gear synchronizer ring
6 1st and second gear clutch hub assembly
7 2nd gear synchronizer ring
8 2nd gear
9 Snap-ring
10 3rd/4th clutch hub assembly
11 3rd gear synchronizer hub
12 3rd gear
13 Mainshaft
14 Synchronizer key springs
15 Synchronizer key
16 Clutch hub
17 Clutch hub sleeve



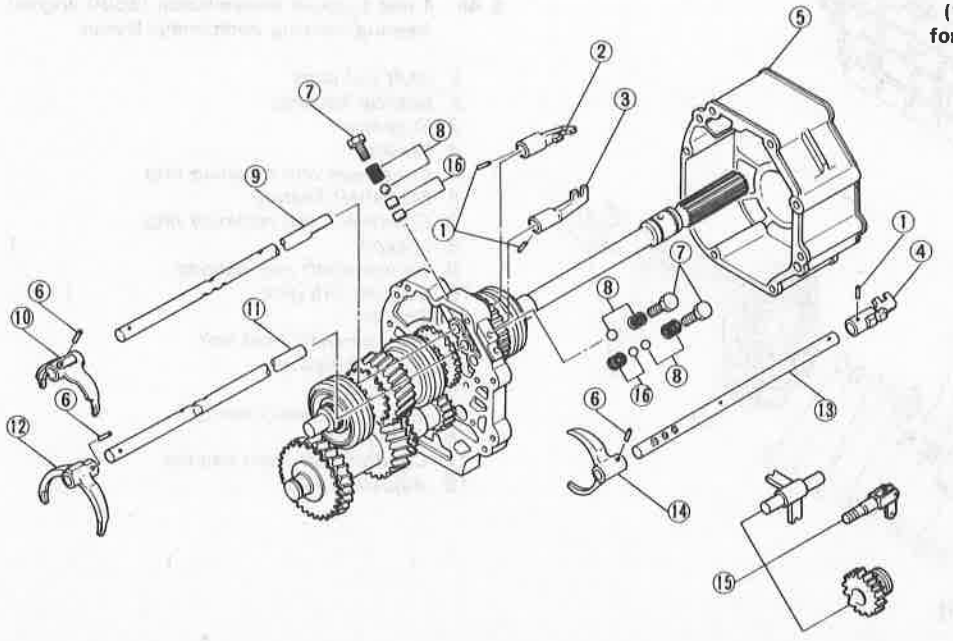
5.4d 5-speed (1600/1800/2000/2200 engine) main and countershaft assembly — exploded view

1 *Snap ring*
2 *Washer*
3 *Retaining ring*
4 *C-washers*
5 *Ball bearing*
6 *Retaining ring*
7 *C-washers*
8 *Thrust lock washer*
9 *Ball*
10 *5th gear*
11 *Synchronizer ring*
12 *Locknut*
13 *Ball bearing*
14 *Countergear*
15 *Spacer*
16 *5th/reverse clutch hub assembly*
17 *Reverse gear*
18 *Needle bearing*
19 *Inner race*
20 *Washer*
21 *Counter reverse gear*
22 *Reverse gear idler shaft*
23 *Washer*
24 *Reverse idle gear*
25 *Washer*
26 *Bearing housing assembly*
27 *Mainshaft and gear assembly*
28 *Main drive gear*
29 *Synchronizer ring*
30 *Ball bearing*
31 *Countershaft gear*



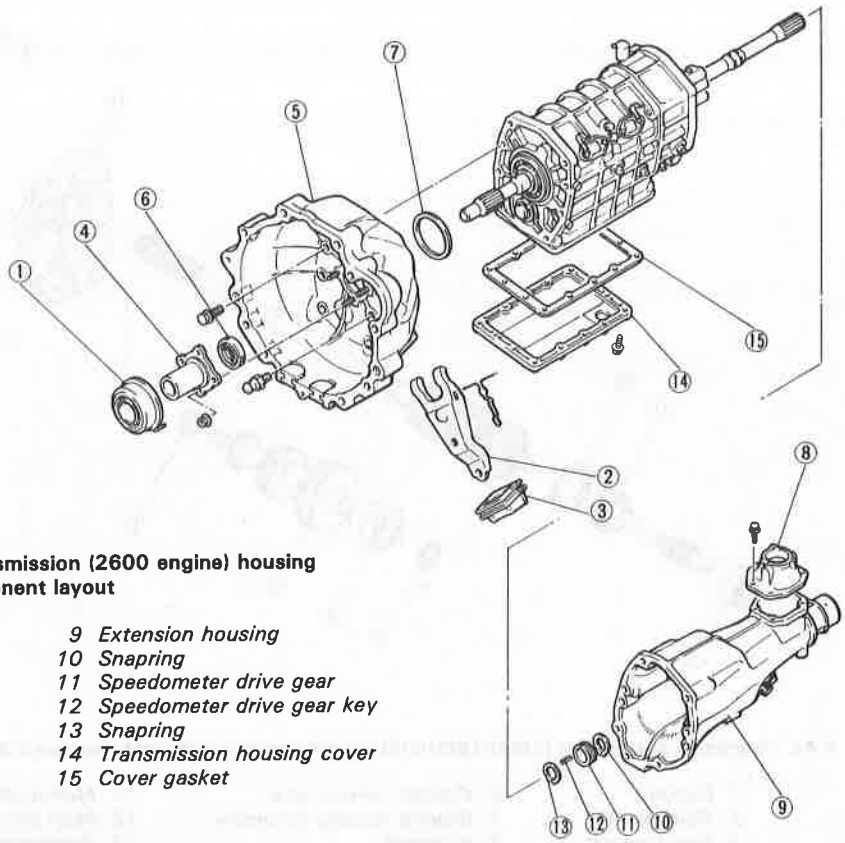
5.4e 4-speed transmission (1600/1800/2000/2200 engine) main and countershaft assembly — exploded view

1 Locknut
2 Plain washer
3 Reverse gear
4 Woodruff key
5 Snapring
6 Counter reverse gear
7 Bearing housing assembly
8 Snapring
9 Ball bearing
10 Bearing housing assembly
11 Mainshaft and gear assembly
12 Main drive gear
13 Synchronizer ring
14 Countershaft gear
15 Spacer



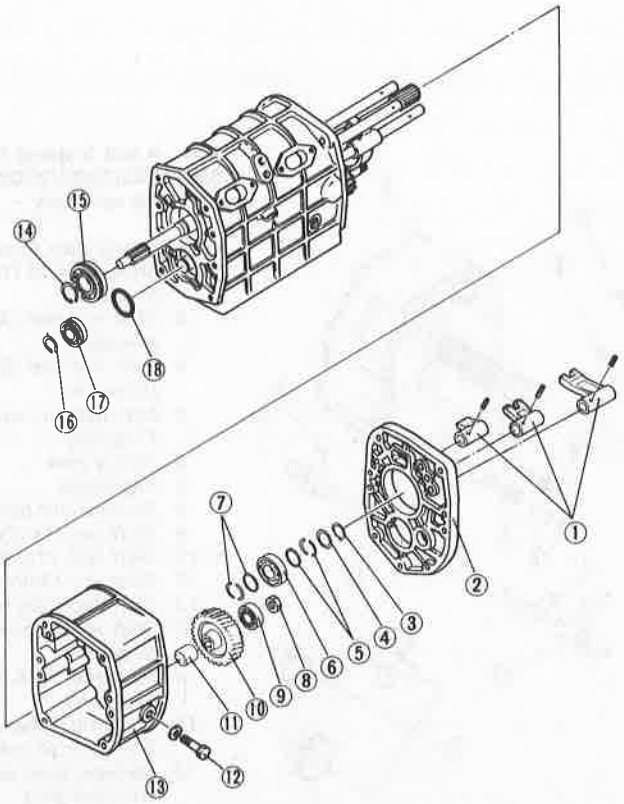
5.4f 4 and 5-speed transmission (1600/1800/2000/2200 engine) shift fork and rod assembly — exploded view

1 Spring pins (5-speed)
2 Shift rod end (1st/2nd) (5-speed)
3 Shift rod end (3rd/4th) (5-speed)
4 Shift rod end (5th/reverse) (5-speed)
5 Intermediate housing (5-speed)
6 Spring pins
7 Cap plugs
8 Springs and balls
9 Shift rod (1st/2nd)
10 Shift fork (1st/2nd)
11 Shift rod (3rd/4th)
12 Shift fork (3rd/4th)
13 Shift rod (5th/reverse) (5-speed)
14 Shift fork (5th/reverse) (5-speed)
15 Shift rod, lever and reverse idler gear (4-speed)
16 Springs, balls and interlock pins



5.4g 4 and 5-speed transmission (2600 engine) housing component layout

1 *Clutch release bearing*
2 *Release fork*
3 *Boot*
4 *Front cover*
5 *Clutch housing*
6 *Oil seal*
7 *Adjusting shim*
8 *Shift control cover assembly*
9 *Extension housing*
10 *Snapring*
11 *Speedometer drive gear*
12 *Speedometer drive gear key*
13 *Snapring*
14 *Transmission housing cover*
15 *Cover gasket*

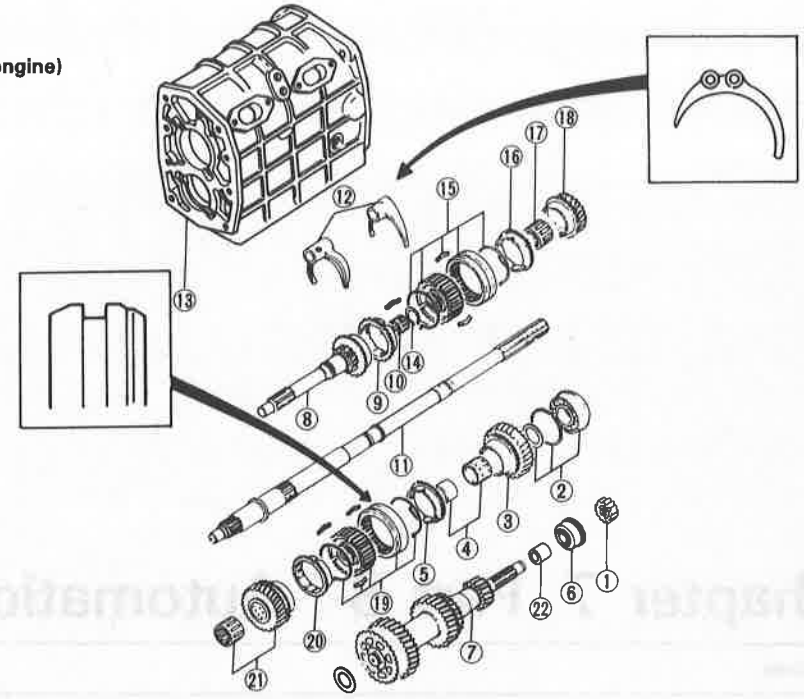


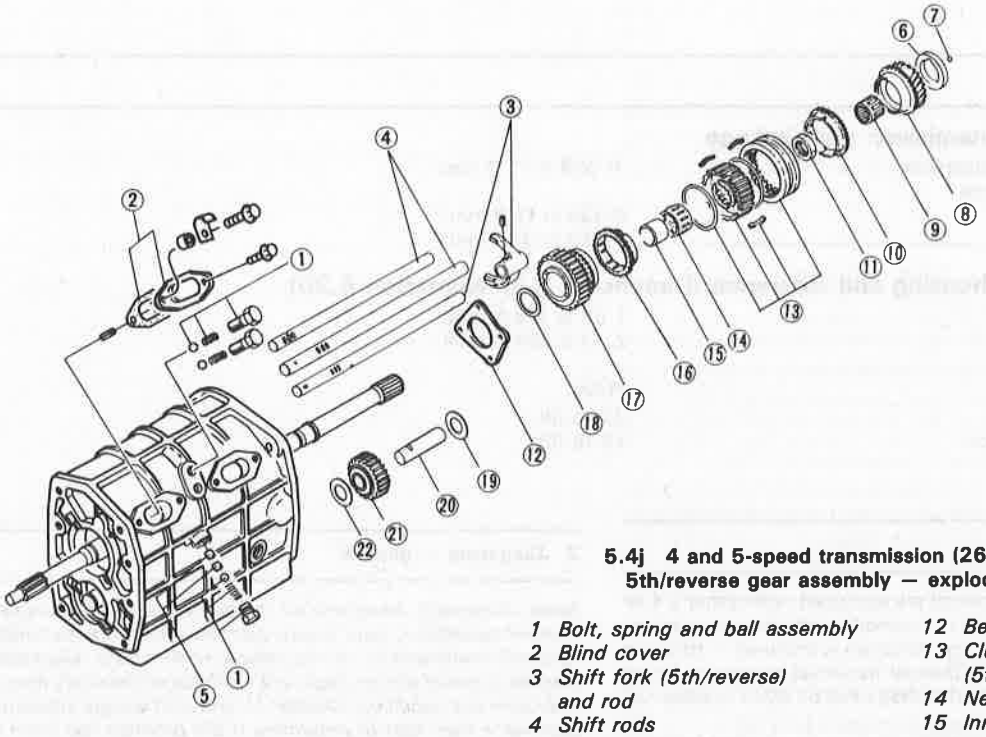
5.4h 4 and 5-speed transmission (2600 engine) bearing housing component layout

1 *Shift rod ends*
2 *Bearing housing*
3 *Snapring*
4 *Washer*
5 *C-washers and retaining ring*
6 *Mainshaft bearing*
7 *C-washers and retaining ring*
8 *Locknut*
9 *Countershaft rear bearing*
10 *Counter 5th gear*
11 *Spacer*
12 *Idle gearshaft hold bolt*
13 *Center housing*
14 *Snapring*
15 *Main drive gear bearing*
16 *Snapring*
17 *Countershaft front bearing*
18 *Adjusting shim*

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*