Chapter 7 Part A
Manual transaxle

Contents

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Specifications

General

Transaxle oil type	See Chapter 1
Transaxle oil capacity	See Chapter 1

Torque specifications

	Ft-lbs	Nm
Transaxle-to-engine mounting bolts	33	45
Crossmember-to-subframe bolts	85	115
Longitudinal crossmember-to-subframe bolts	66	90

1 General information

The vehicles covered by this manual are equipped with either a 5-speed manual or a 4-speed automatic transaxle. This Part of Chapter 7 contains information on the manual transaxle. Service procedures for the automatic transaxle are contained in Part B. Information on the transfer case used on 4WD models can be found in Part C.

The transaxle is contained in a cast-aluminum alloy casing bolted to the engine's left-hand end, and consists of the gearbox and final drive differential - often called a transaxle. The transaxle unit type is stamped on a plate attached to the transaxle.

Transaxle overhaul

Because of the complexity of the assembly, possible unavailability of replacement parts and special tools necessary, internal repair procedures for the transaxle are not recommended for the home mechanic. The bulk of the information in this Chapter is devoted to removal and installation procedures.

2 Shift lever - removal and installation

2WD models

1 Apply the Parking brake. Place the shift lever in Neutral. Unscrew and remove the shift lever knob.
2 Remove the center console trim panel and rubber shift lever boot.
3 Use a pair of snap-ring pliers to remove the steel snap-ring. Remove the plastic clip from under the steel snap-ring.
4 Remove the rubber O-ring.
5 Raise the vehicle and support it securely on jackstands.
6 Remove the nut and through-bolt securing the shift linkage rod to the shift lever.
7 Lift the gearshift lever from the housing.
8 Installation is the reverse of removal.

4WD models

9 Apply the Parking brake. Place the shift lever in Neutral. Unscrew the shift lever knob.
10 Remove the center console trim panel and rubber shift lever boot.
11 Disconnect the shift cables from the shift lever by prying them off of the ballstuds.
12 Using a pair of pliers, remove the spring clips securing the cables to the shifter base.
13 Pull the shift cables forward to release them from the base, then position them out of the way.
14 Remove the four bolts securing the shifter base to the floor, then remove the shifter.
15 Installation is the reverse of removal.

3 Shift linkage (2WD models) - removal and installation

1 Raise the vehicle and support it securely on jackstands.
2 Remove the nut and through-bolt securing the shift linkage rod to the transaxle shift lever.
3 At the shift lever, remove the nut and through-bolt connecting the shift lever to the shift linkage rod.
4 Remove the shift linkage rod from the vehicle.
5 Installation is the reverse of removal.

4 Shift cables (4WD models) - removal and installation

1 Remove the gear shift lever (see Section 2).
2 Remove the center console (see Chapter 11).
3 Trace the cables to the floor and unbolt the interior grommet.
4 Working inside the engine compartment, remove the shift cable retaining clips then remove the shift cables from the transaxle levers.
5 Disconnect the cable retainer from the retainer bracket by pulling on the black pin then lifting the cable from the bracket.
6 Raise the front of the vehicle and support it securely on jackstands.
7 Remove the nuts securing the shift cable retaining bracket.
8 Inside the engine compartment, carefully remove the shift cables one at a time from the vehicle.
9 Installation is the reverse of removal.

5 Driveaxle oil seals - replacement

1 Oil leaks frequently occur due to wear of the driveaxle oil seals. Replacement of these seals is relatively easy, since the repair can be performed without removing the transaxle from the vehicle.
2 Driveaxle oil seals are located at the sides of the transaxle, where the driveaxles are attached. If leakage at the seal is suspected, raise the vehicle and support it securely on jackstands. If the seal is leaking, lubricant will be found on the sides of the transaxle, below the seals.
3 Refer to Chapter 8 and remove the driveaxles.
4 Use a screwdriver or prybar to carefully pry the oil seal out of the transaxle bore.
5 If the oil seal cannot be removed with a screwdriver or prybar, a special oil seal removal tool (available at auto parts stores) will be required.
6 Using a large section of pipe or a large deep socket (slightly smaller than the outside diameter of the seal) as a drift, install the new oil seal. Drive it into the bore squarely and make sure it's completely seated. Coat the seal lip with transaxle lubricant.
7 Install the driveaxle(s). Be careful not to damage the lip of the new seal.

6 Manual transaxle - removal and installation

Removal

1 Disconnect the cable from the negative terminal of the battery (see Chapter 5).
2 Remove the air filter housing (see Chapter 4).
3 Disconnect the electrical connector for the back-up light switch.
4 If you're working on a 4WD model, disconnect the shift cables from the transaxle shift levers (see Section 4).
5 Remove the transaxle front and rear wire harness brackets from the transaxle.
6 Disconnect the electrical connector for the vehicle speed sensor (see Chapter 6).
7 Attach an engine support fixture to the lifting hook at the transaxle end of the engine. If no hook is provided, use a bolt of the proper size and thread pitch to attach the support fixture chain to a hole at the end of the cylinder head. **Note:** *Engine support fixtures can be obtained at most equipment rental yards and some auto parts stores.*
8 Disconnect the clutch release cylinder and line from the transaxle (see Chapter 8).
9 Remove the left side transaxle mount and bracket.
10 Remove the front transaxle mount and bracket.
11 Remove the rear transaxle mount through bolt.
12 Remove the starter (see Chapter 5).
13 Remove the four upper transaxle-to-engine mounting bolts.
14 Loosen the driveaxle/hub nuts and the wheel lug nuts, raise the front of the vehicle and support it securely on jackstands. Remove the wheels.
15 Remove the driveaxles (see Chapter 8).
16 Drain the transaxle lubricant (see Chapter 1).
17 Remove the three bolts securing the transaxle support insulator bracket, then remove the bracket.
18 If you're working on a 2WD model, disconnect the shift linkage bar (see Section 3) and support bar.
19 Remove the subframe crossmember.
20 Remove the longitudinal crossmember.
21 Remove the upper and lower left-side splash shields.
22 If you're working on a 4WD model, remove the transfer case (see Chapter 7 Part C).
23 Support the transaxle with a jack - preferably a jack made for this purpose (available at most tool rental yards). Safety chains will help steady the transaxle on the jack.
24 Remove the seven remaining bolts securing the transaxle to the engine.
25 Move the transaxle to the rear to disengage it from the engine block dowel pins. Then carefully remove the transaxle.

Installation

26 Lubricate the input shaft with a light coat of high-temperature grease. With the transaxle secured to the jack, raise it into position behind the engine and carefully slide it forward, engaging the input shaft with the clutch. *Do not use excessive force to install the* transaxle - if the input shaft won't slide into place, readjust the angle of the transaxle or turn the input shaft so the splines engage properly with the clutch.
27 Once the transaxle is flush with the engine, install the transaxle-to-engine bolts. Tighten the bolts to the torque listed in this Chapter's Specifications. **Caution:** *Don't use the bolts to force the transaxle and engine together.*
28 The remainder of installation of the transaxle is a reversal of the removal procedure, but note the following points:

a) Tighten the suspension crossmember mounting bolts to the torque values listed in this Chapter's Specifications.

b) *Tighten the driveaxle/hub nuts to the torque value listed in the Chapter 8 Specifications.*
c) *Tighten the starter mounting bolts to the torque value listed in the Chapter 5 Specifications.*
d) *If installing the transfer case, refer to Chapter 7, Part C.*
e) *Tighten the wheel lug nuts to the torque listed in the Chapter 1 Specifications.*
f) *Fill the transaxle with the correct type and amount of transaxle fluid as described in Chapter 1.*

7 Manual transaxle overhaul - general information

1 Overhauling a manual transaxle is a difficult job for the 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 transaxle problems arise, it can be removed and installed by a competent do-it-yourselfer, but overhaul should be left to a transmission repair shop. Rebuilt transaxles 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.

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

3 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 transaxle stand will be required.

4 During disassembly of the transaxle, make careful notes of how each piece comes off, where it fits in relation to other pieces and what holds it in place.

5 Before taking the transaxle apart for repair, it will help if you have some idea what area of the transaxle is malfunctioning. Certain problems can be closely tied to specific areas in the transaxle, 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.

8 Transaxle mount - replacement

1 Insert a large screwdriver or prybar between the mount and the transaxle and pry up.

2 The transaxle should not move excessively away from the mount. If it does, replace the mount.

3 If you're working on a four-cylinder model, remove the battery (see Chapter 5).

4 Remove the air filter housing cover and air intake tube (see Chapter 4).

5 Support the transaxle with a jack, remove the nuts and bolts and remove the mount. It may be necessary to raise the transaxle slightly to provide enough clearance to remove the mount.

6 Installation is the reverse of removal. **Note:** *Install all of the mount fasteners before tightening any of them.*

Chapter 7 Part B
Automatic transaxle

Contents

	Section
Automatic transaxle - removal and installation	6
Automatic transaxle overhaul - general information	7
Auxiliary cooler - removal and installation	5
Diagnosis - general	2
General information	1
Shift cable - replacement and adjustment	4
Shift lever - replacement	3
Transaxle mount - replacement	See Chapter 7A

Specifications

General

Fluid type and capacity	See Chapter 1

Torque specifications

	Ft-lbs	Nm
Crossmember mounting bolts	35	48
Longitudinal crossmember mounting bolts	96	130
Longitudinal crossmember dampener	30	40
Torque converter-to-driveplate nuts	27	36
Transaxle-to-engine mounting bolts	30	40

1 General information

All information on the automatic transaxle is included in this Part of Chapter 7. Information for the manual transaxle can be found in Part A of this Chapter.

Because of the complexity of the automatic transaxles and the specialized equipment necessary to perform most service operations, this Chapter contains only those procedures related to general diagnosis, routine maintenance, adjustment and removal and installation.

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

2 Diagnosis - general

1 Automatic transaxle malfunctions may be caused by five general conditions:

a) *Poor engine performance*
b) *Improper adjustments*
c) *Hydraulic malfunctions*
d) *Mechanical malfunctions*
e) *Malfunctions in the computer or its signal network*

2 Diagnosis of these problems should always begin with a check of the easily repaired items: fluid level and condition (see Chapter 1), shift cable adjustment and shift lever installation. 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 performed by a dealer service department or other qualified transmission repair shop. Refer to the *Troubleshooting* Section at the front of this manual for information on symptoms of transaxle problems.

Preliminary checks

3 Drive the vehicle to warm the transaxle to normal operating temperature.

4 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 following).*
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 oil cooler walls that separate the coolant from the transmission fluid* (see Chapter 3).
c) *If the fluid is foaming, drain it and refill the transaxle, then check for coolant in the fluid, or a high fluid level.*

5 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.*

6 Check and adjust the shift cable, if necessary (see Section 4).

7 If hard shifting is experienced, inspect the shift cable under the steering column and at the manual lever on the transaxle (see Section 4).

Fluid leak diagnosis

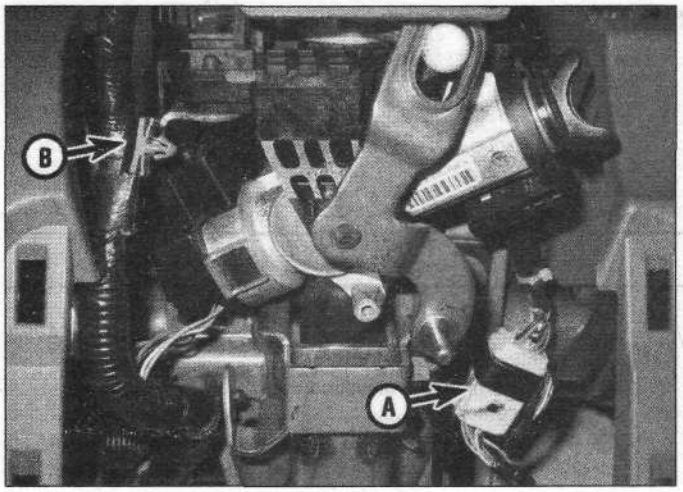
8 Most fluid leaks are easy to locate visually. Repair usually consists of replacing a seal or gasket. If a leak is difficult to find, the following procedure may help.

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

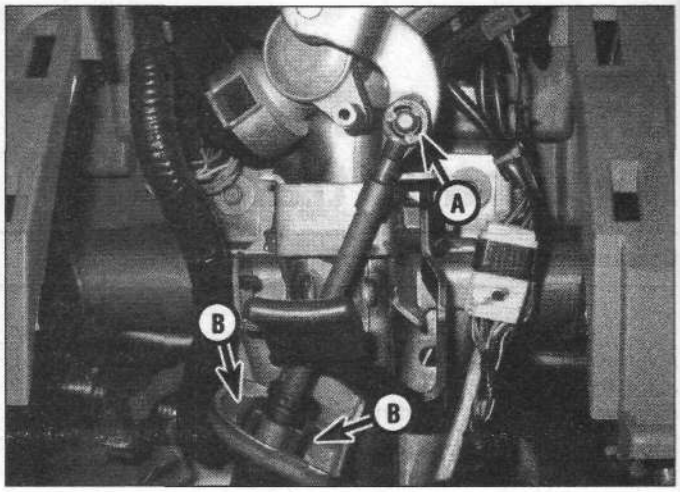
10 Try to pinpoint the source of the leak. Drive the vehicle several miles, then park it over a large sheet of cardboard. After a minute or two, you should be able to locate the leak by determining the source of the fluid dripping onto the cardboard.

11 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.

12 If the leak still cannot be found, clean the



3.7 Disconnect the electrical connector (A) and wiring harness (B)



4.3 Remove the C-clip (A) and pull the cable end off the lever, then squeeze the tabs to remove the cable from the bracket (B)

suspected area thoroughly with a degreaser or solvent, then dry it thoroughly.

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

14 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.

15 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 qualified transmission shop or a dealer service department.*

Gasket leaks

16 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).

17 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 transaxle housing may be damaged, the gasket may be damaged or the transaxle casting may be cracked or porous. If sealant instead of gasket material has been used to form a seal between the pan and the transaxle housing, it may be the wrong type of sealant.

Seal leaks

18 If a transaxle 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.

19 Make sure the dipstick tube seal is in good condition and the tube is properly seated. Periodically check the area around the sensors for leakage. If transmission fluid is evident, check the seals for damage.

Case leaks

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

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

Fluid comes out vent pipe or fill tube

22 If this condition occurs the possible causes are, the transaxle 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 lever - replacement

Column-mounted shifter

Refer to illustration 3.7

Warning 1: *These models are equipped with a Supplemental Restraint System (SRS), more commonly known as airbags. Always disable the airbag system before working in the vicinity of any airbag system component to avoid the possibility of accidental deployment of the airbag(s), which could cause personal injury* (see Chapter 12).

Warning 2: *Do not use a memory saving device to preserve the PCM or radio memory when working on or near airbag system components.*

1 Disconnect the cable from the negative battery terminal (see Chapter 5). Wait at least two minutes before proceeding.

2 Remove the steering wheel/airbag module (see Chapter 10).

3 Remove the steering column covers (see Chapter 11).

4 Remove the clockspring (see Chapter 10, Section 12).

5 Remove the multi-function switch and ignition switch (see Chapter 12).

6 Remove the shift cable from the steering column shift lever (see Section 4).

7 Disconnect the electrical connector and wiring harness **(see illustration).**

8 Remove the three shift lever mounting fasteners, then remove the lever.

9 Installation is the reverse of removal. After you've reconnected the battery, the Powertrain Control Module (PCM) must relearn its idle and fuel mixture trim strategy for optimum drivability and performance (see Chapter 5, Section 1 for this procedure).

Console-mounted shifter

10 Remove the shift lever trim ring by gently prying up on the four trim ring clips.

11 Remove the finish plate, then disconnect the electrical connector.

12 Disconnect the shift cable from the ball stud, then remove the cable from the shifter assembly.

13 Disconnect any remaining electrical connectors from the shifter.

14 Remove the four bolts, then lift the assembly out of the console.

15 Installation is the reverse of removal.

4 Shift cable - replacement and adjustment

Column-mounted shifter

Warning 1: *These models are equipped with a Supplemental Restraint System (SRS), more commonly known as airbags. Always disable the airbag system before working in the vicinity of any airbag system component to avoid the possibility of accidental deployment of the airbag(s), which could cause personal injury* (see Chapter 12).

Warning 2: *Do not use a memory saving device to preserve the PCM or radio memory when working on or near airbag system components.*

Replacement

Refer to illustrations 4.3, 4.4 and 4.5

1 Disconnect the cable from the negative battery terminal (see Chapter 5). Wait at least two minutes before proceeding.

2 Remove the steering column shrouds (see Chapter 11).

3 Disconnect the shift cable from the shift lever and steering column bracket **(see illustration).**

4 Working inside the engine compartment, remove the nuts securing the cable to the firewall **(see illustration).**

5 Disconnect the shift cable from the shift lever and transaxle mounting bracket **(see illustration),** then remove the cable from the vehicle.

6 Installation is the reverse of removal. Before installing the steering column shrouds and connecting the battery, be sure to adjust the cable as specified.

Adjustment

Refer to illustrations 4.7 and 4.9

7 With the steering column covers removed, place a 0.023 in. (0.6mm) feeler gauge between the shift lever and shift lever detent **(see illustration).**

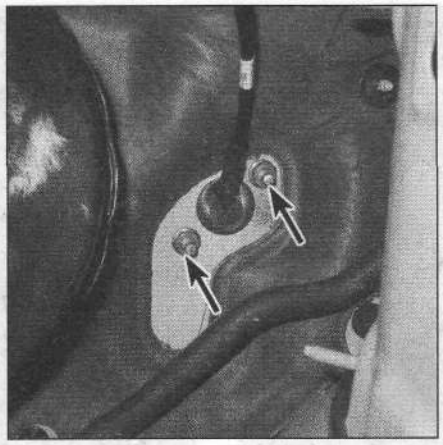
8 Put the shift lever in the DRIVE position, then have an assistant hold it firmly in position.

9 Inside the engine compartment, remove the cable from the selector ballstud, then loosen the cable adjuster and adjust the cable **(see illustration).** Be sure the transaxle selector lever is in the DRIVE position, then connect the cable to the ballstud.

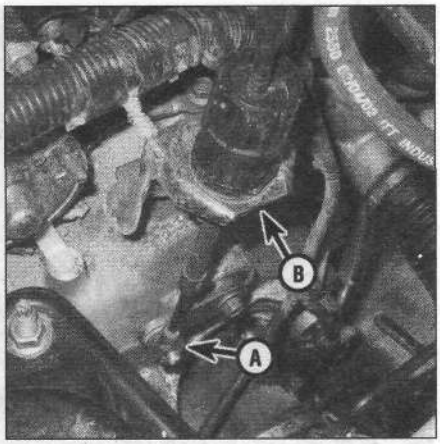
10 Tighten the cable adjuster then remove the feeler gauge and test the shift lever operation in each gear selection position.

11 Replace the steering column shrouds.

12 After you've reconnected the battery, the Powertrain Control Module (PCM) must relearn its idle and fuel mixture trim strategy for optimum drivability and performance (see Chapter 5, Section 1 for this procedure).



4.4 Inside the engine compartment, remove the two mounting nuts to release the cable from the firewall



4.5 Using a small screwdriver, carefully pry the shift cable from the lever ballstud (A), then squeeze the release tabs under the mounting bracket and slide the cable from the bracket (B)

Console-mounted shifter

Replacement

13 Disconnect the cable from the negative battery terminal (see Chapter 5).

14 Raise the vehicle and securely support it on jackstands

15 Remove the left splash shield.

16 Place the shifter in drive

17 Remove the snow shield from the transaxle.

18 Remove the adjustment bolts from the transaxle shift cable and disconnect the cable from the shifter lever adjustment screw.

19 Disconnect the cable retainers along the length of the cable.

20 Remove the floor console finish panel.

21 Remove the cable body pass through grommet nuts, disconnect the cable from the shifter ball stud and release the cable housing from the shifter.

22 Installation is the reverse of removal. Be certain to adjust the new cable after installation.

Adjustment

23 Disconnect the cable from the negative battery terminal (see Chapter 5)

24 Raise the vehicle and securely support it on jackstands

25 Remove the left splash shield.

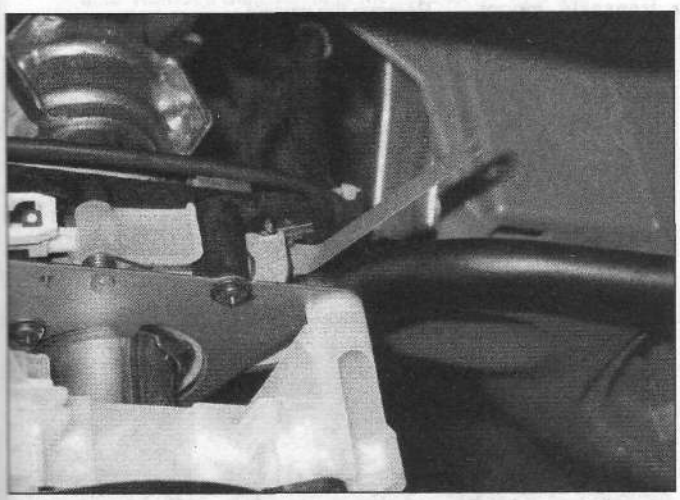
26 Place the shifter in drive.

27 Loosen the shifter cable adjustment screw and cable bracket nuts enough to allow easy movement of the cable

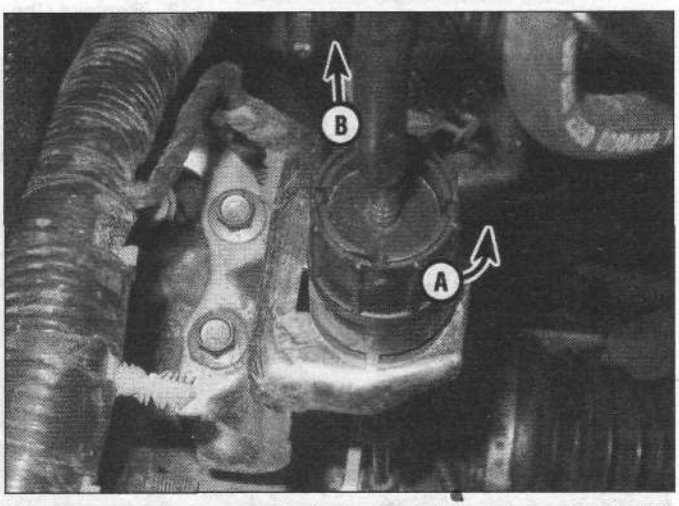
28 Align the shifter lever between the two ribs on the transaxle.

29 With the transmission shifter still in Drive, tighten the cable bracket nuts, then tighten the shifter cable adjustment screw.

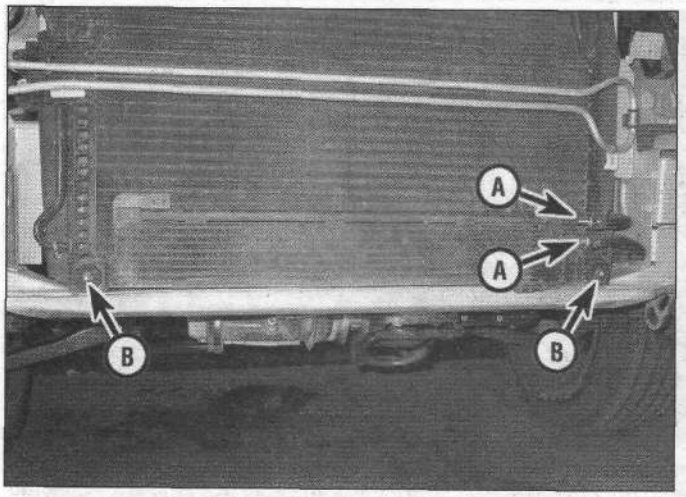
30 After installing any remaining components, apply the parking brake, lower the vehicle and operate the vehicle in each range to verify the adjustment is correct.



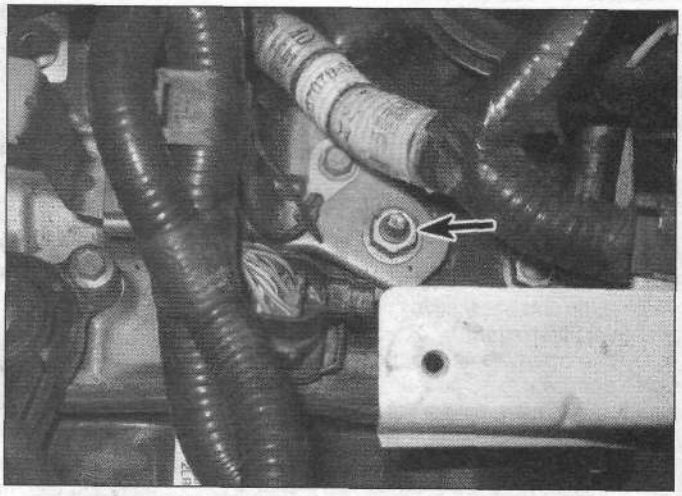
4.7 Insert a feeler gauge between the shift lever and the shift lever detent



4.9 Turn the adjuster counterclockwise to loosen the adjuster (A); the cable can then be adjusted by moving it up or down (B)



5.2 Using a pair of pliers, disconnect the clamps securing the hoses (A), then remove the two cooler mounting bolts (B)



6.5 Remove the nut securing the wire harness bracket to the transaxle, then pull the bracket and harness aside

5 Auxiliary cooler - removal and installation

Refer to illustration 5.2

1 To gain access to the cooler, remove the front bumper cover (see Chapter 11).

2 Disconnect the cooler lines and the bolts securing the cooler **(see illustration).**

3 Remove the cooler from the vehicle.

4 Installation is the reverse of removal. Be sure to tighten all fasteners securely.

6 Automatic transaxle - removal and installation

Refer to illustrations 6.5, 6.6, 6.8, 6.10a, 6.10b, 6.11, 6.12, 6.18, 6.22, 6.23, 6.24, 6.25a, 6.25b, 6.27 and 6.29

Removal

1 Disconnect the cable from the negative terminal of the battery (see Chapter 5).

2 Remove the air filter housing (see Chapter 4).

3 Disconnect the electrical connector for the transmission range sensor and the upstream oxygen sensor (see Chapter 6).

4 Disconnect the shift cable from the transaxle shift lever (see Section 4).

5 Remove the transaxle wire harness bracket from the transaxle **(see illustration).**

6 Remove the shift cable bracket from the transaxle **(see illustration).**

7 Remove the starter (see Chapter 5).

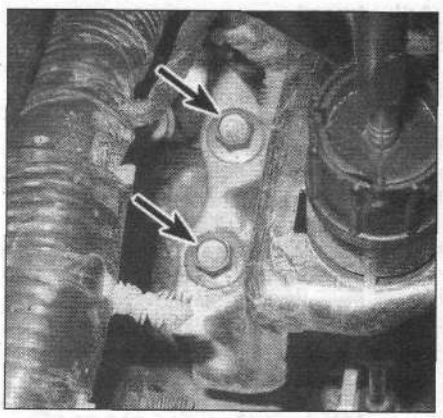
8 Disconnect the battery ground cable at the transaxle **(see illustration).**

9 Attach an engine support fixture to the lifting hook at the transaxle end of the engine. If no hook is provided, use a bolt of the proper size and thread pitch to attach the support fixture chain to a hole at the end of the cylinder head. **Note:** *Engine support fixtures can be obtained at most equipment rental yards and some auto parts stores.*

10 Remove the transaxle-to-engine bolts that are accessible from above **(see illustrations).**

11 Remove the upper transaxle mount **(see illustration).**

12 Remove the rear transaxle mount

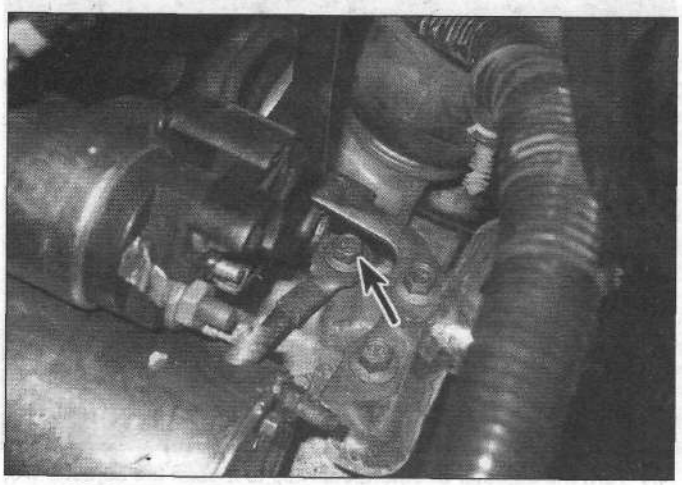


6.6 Disconnect the shift cable and bracket from the transaxle

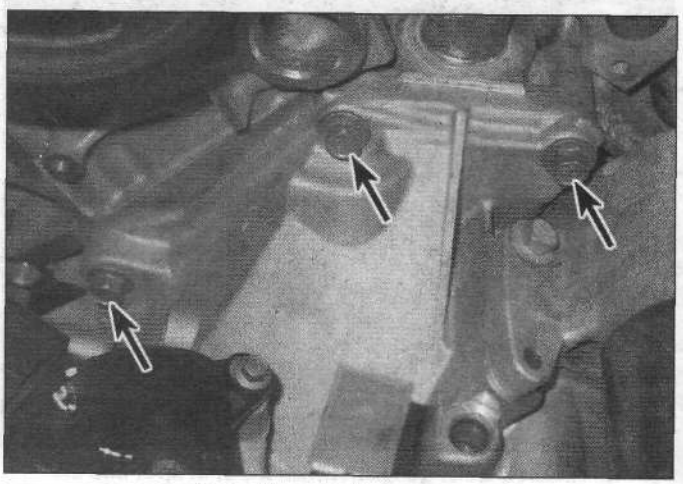
(see illustration).

13 Remove the upper engine mount bolt from the right side of the engine.

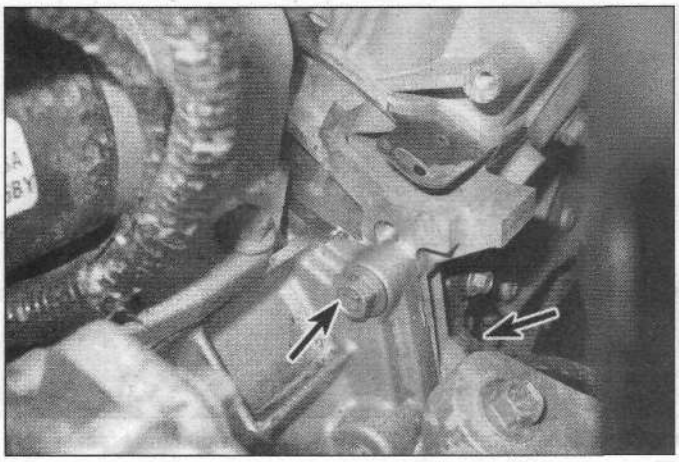
14 Loosen the driveaxle/hub nuts and the wheel lug nuts, raise the front of the vehicle and support it securely on jackstands. Remove the wheels.



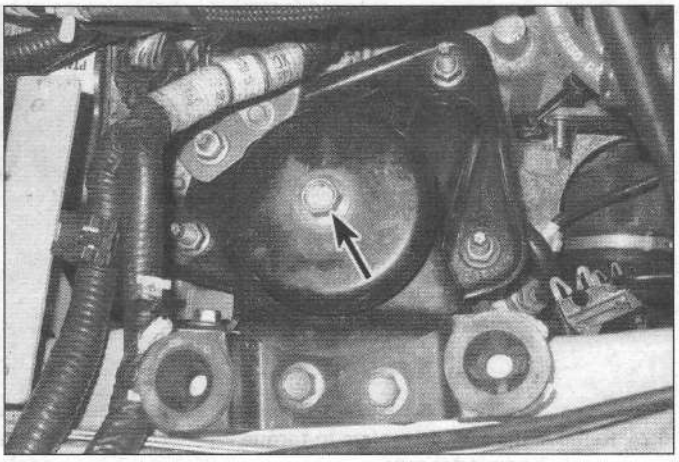
6.8 Remove the bolt securing the battery ground cable



6.10a Remove the upper . . .

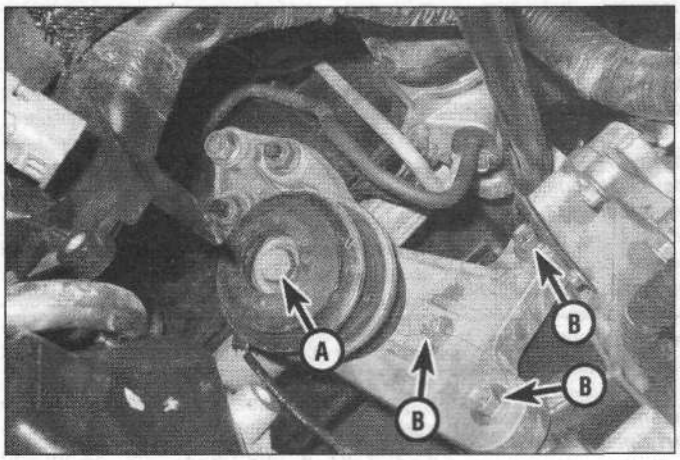


6.10b . . . transaxle-to-engine mounting bolts

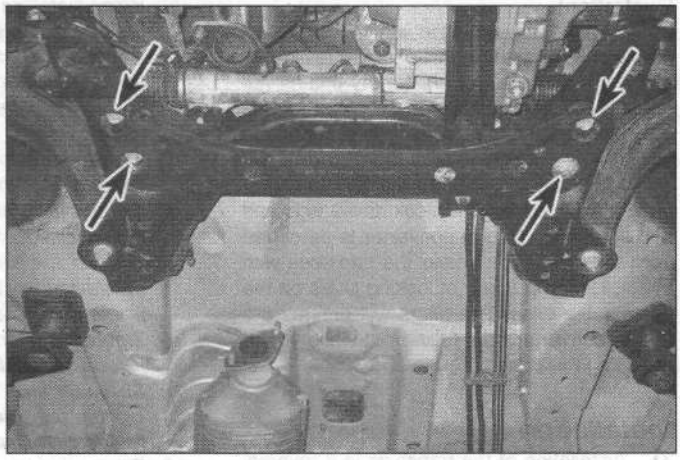


6.11 Remove the transaxle mount bolt and plate

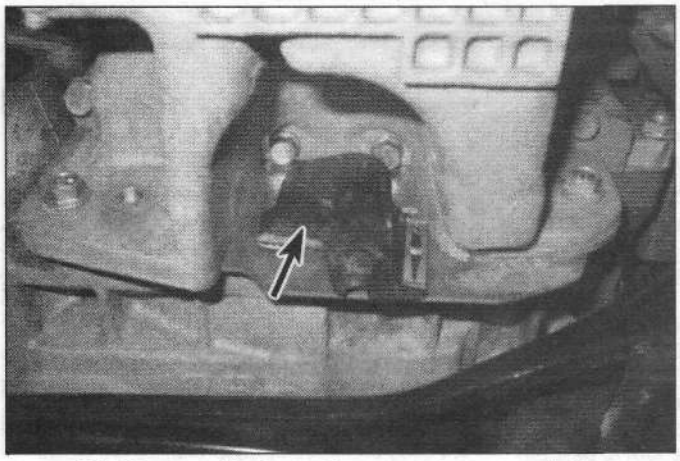
15 Remove the under-vehicle splash shield(s).
16 Drain the transaxle lubricant (see Chapter 1).
17 Remove the driveaxles (see Chapter 8).
18 Remove the subframe crossmember **(see illustration).**
19 Remove the front section of the exhaust system (see Chapter 4).
20 Remove the dampener from the longitudinal crossmember, then remove the crossmember.
21 On 4WD models, remove the transfer case (see Chapter 7, Part C).
22 Remove the torque converter inspection cover **(see illustration).**
23 Mark the relationship of the torque converter to the driveplate **(see illustration).**
24 Remove the four driveplate-to-torque converter nuts **(see illustration).** Turn the crankshaft for access to each nut. Turn the



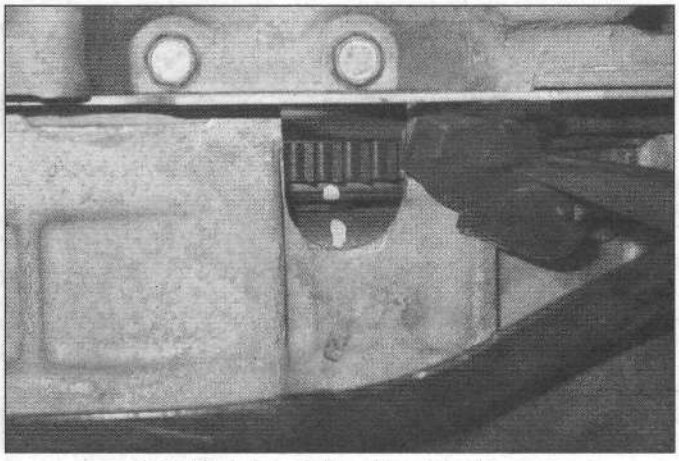
6.12 Remove the transaxle mount bolt (A) and the bracket bolts (B)



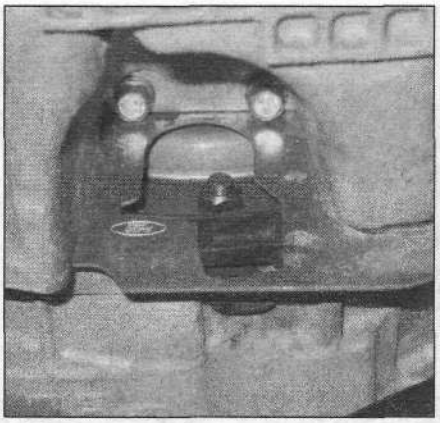
6.18 Remove the subframe crossmember bolts



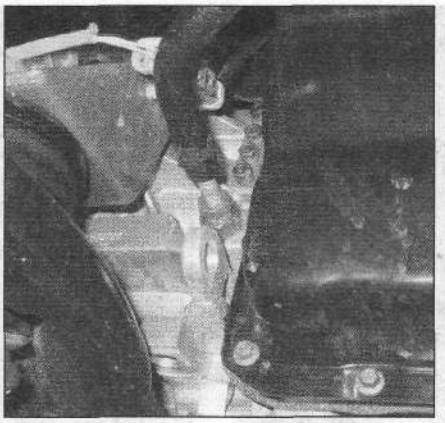
6.22 Remove the inspection cover for access to the torque converter retaining nuts



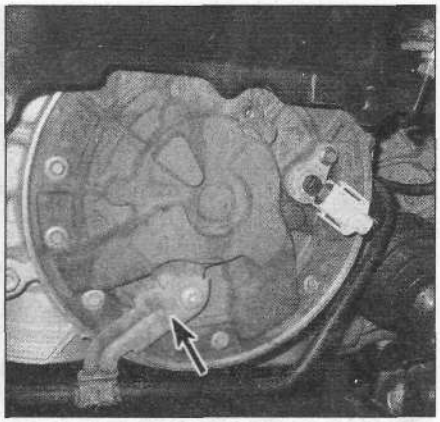
6.23 Mark the relationship of the torque converter to the driveplate



6.24 Remove the four driveplate-to-torque converter nuts



6.25a Disconnect the transaxle cooler lines . . .



6.25b . . . and mounting bracket

crankshaft in a clockwise direction only (as viewed from the front).

25 Disconnect the fluid cooler hoses from the transaxle **(see illustrations).** Be prepared for spillage, and plug the hoses and the lines on the transaxle.

26 Mark and disconnect any electrical connectors accessible from below.

27 Remove the transaxle vent tube **(see illustration).**

28 Support the transaxle with a jack - preferably a jack made for this purpose (available at most tool rental yards). Safety chains will help steady the transaxle on the jack.

29 Remove the remaining bolts securing the transaxle to the engine **(see illustration).**

30 Move the transaxle to the rear to disengage it from the engine block dowel pins and make sure the torque converter is detached from the driveplate. Lower the transaxle with the jack. Clamp a pair of locking pliers on the bellhousing case. The pliers will prevent the torque converter from falling out while you're removing the transaxle.

Installation

31 Installation of the transaxle is a reversal of the removal procedure, but note the following points:

a) As the torque converter is reinstalled, ensure that the drive tangs at the center of the torque converter hub engage with the recesses in the automatic transaxle fluid pump inner gear. This can be confirmed by turning the torque converter while pushing it towards the transaxle. If it isn't fully engaged, it will "clunk" into place.

b) When installing the transaxle, make sure the matchmarks you made on the torque converter and driveplate line up.

c) Install all of the driveplate-to-torque converter nuts before tightening any of them.

d) Tighten the driveplate-to-torque converter nuts to the specified torque.

e) Tighten the transaxle mounting bolts to the specified torque.

f) Tighten the suspension crossmember mounting bolts to the torque values listed in this Chapter's Specifications.

g) Tighten the driveaxle/hub nuts to the torque value listed in the Chapter 8 Specifications.

h) Tighten the wheel lug nuts to the torque listed in the Chapter 1 Specifications.

i) Fill the transaxle with the correct type and amount of automatic transmission fluid as described in Chapter 1.

j) On completion, adjust the shift cable as described in Section 4.

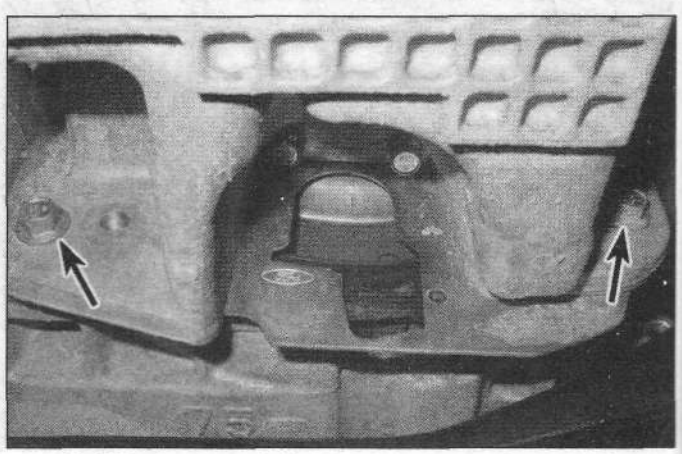
k) After you've reconnected the battery, the Powertrain Control Module (PCM) must relearn its idle and fuel mixture trim strategy for optimum driveability and performance (see Chapter 5, Section 1 for this procedure).

7 Automatic transaxle overhaul - general information

In the event of a problem occurring, it will be necessary to establish whether the fault is electrical, mechanical or hydraulic in nature, before repair work can be contemplated. Diagnosis requires detailed knowledge of the transaxle's operation and construction, as well as access to specialized test equipment, and so is deemed to be beyond the scope of this manual. It is therefore essential that problems with the automatic transaxle are referred to a dealer service department or other qualified repair facility for assessment.

Note that a faulty transaxle should not be removed before the vehicle has been diagnosed by a knowledgeable technician equipped with the proper tools, as troubleshooting must be performed with the transaxle installed in the vehicle.

6.27 Remove the transaxle vent tube from the valve body cover



6.29 With the transaxle jack in place remove the remaining transaxle-to-engine mounting bolts

Chapter 7 Part C
Transfer case

Contents

	Section
General information	1
Mode select switch	5
Transfer case - removal and installation	4
Transfer case driveaxle oil seal (right side) - removal and installation	3
Transfer case rear output shaft oil seal - removal and installation	2

Specifications

Transfer case fluid type	See Chapter 1

Torque specifications

	Ft-lbs	Nm
Crossmember mounting bolts	30	40
Transfer case-to-transaxle bolts/nuts	33	45
Transfer case bracket-to-engine block mounting bolts	30	40

1 General information

Due to the complexity of the transfer case covered in this manual and the need for specialized equipment to perform most service operations, this chapter contains only routine maintenance and removal and installation procedures.

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

2 Transfer case rear output shaft oil seal - removal and installation

1 Raise the vehicle and support it securely on jackstands.

2 Drain the transfer case lubricant (see Chapter 1).

3 Remove the driveshaft (see Chapter 8).

4 Mark the relative positions of the pinion, nut and flange.

5 Use a beam- or dial-type inch-pound torque wrench to determine the torque required to rotate the pinion. Record it for use later.

6 Count the number of threads visible between the end of the nut and the end of the pinion shaft and record it for use later.

7 Remove the flange mounting nut using a chain wrench to hold the pinion flange while loosening the locknut.

8 *Remove the companion flange; a small* puller may be required for removal.

9 Pry out the seal with a screwdriver or a seal removal tool. Don't damage the seal bore.

10 Lubricate the lips of the new seal with multi-purpose grease and tap it evenly into position with a seal installation tool or a large socket. Make sure it enters the housing squarely and is tapped into its full depth.

11 Align the mating marks made before dis-

assembly and install the companion flange. If necessary, tighten the pinion nut to draw the flange into place.
12 Tighten the nut carefully until the original number of threads are exposed and the marks are aligned.
13 Measure the torque required to rotate the pinion and tighten the nut in small increments until it matches the figure recorded in Step 5.
14 Connect the driveshaft, add the specified lubricant to the transfer case (see Chapter 1) and lower the vehicle.

3 Transfer case driveaxle oil seal (right side) - removal and installation

1 Remove the wheel cover or hub cap. Break the hub nut loose with a socket and large breaker bar.
2 Loosen the wheel lug nuts, raise the vehicle and support it securely on jackstands. Remove the wheel.
3 Remove the right driveaxle and intermediate shaft (see Chapter 8).
4 Remove the exhaust crossover pipe (see Chapter 4).
5 Remove the three bolts securing the heat shield then remove the heat shield.
6 Remove the dust shield.
7 Carefully pry out the oil seal with a seal removal tool or a large screwdriver; make sure you don't scratch the seal bore.
8 Using a seal installer or a large deep socket as a drift, install the new oil seal. Drive it into the bore squarely and make sure it's completely seated.
9 Lubricate the lip of the new seal with multi-purpose grease, then install a new dust shield.
10 Install the intermediate shaft and driveaxle (see Chapter 8).
11 The remainder of installation is the reverse of removal. Check the transfer case lubricant level and add some, if necessary, to bring it to the appropriate level (see Chapter 1).

4 Transfer case - removal and installation

Four-cylinder models

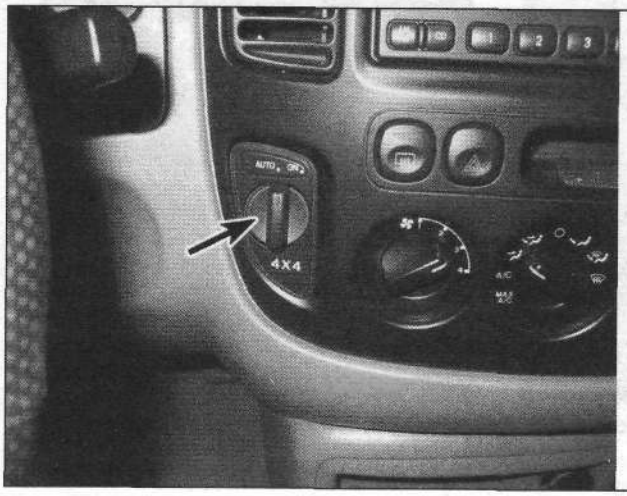
1 Loosen the right front wheel lug nuts. Raise the front of the vehicle and support it securely on jackstands. Remove the wheel.
2 Unbolt the front portion of the driveshaft (see Chapter 8) and suspend it from a piece of wire (don't let it hang from the center support bearing). Remove the right driveaxle and intermediate shaft (see Chapter 8).
3 Remove the four bolts securing the crossmember and remove the crossmember.
4 Working on the right side of the transfer case, remove the upper two mounting nuts and two lower mounting bolts. Remove the transfer case from the vehicle.
5 Installation is the reverse of removal, noting the following points:

a) Install a new O-ring seal to the case.
b) Tighten the driveshaft fasteners to the torque listed in the Chapter 8 Specifications.
c) Tighten the transfer case and crossmember fasteners to the torque listed in this Chapter's Specifications.
d) Refill the transfer case with the proper type and amount of fluid (see Chapter 1).
e) Tighten the wheel lug nuts to the torque listed in the Chapter 1 Specifications.

V6 models

6 Remove the wheel cover or hub cap. Break the hub nut loose with a socket and large breaker bar. Loosen the wheel lug nuts.
7 Raise the front of the vehicle and support it securely on jackstands. Remove the wheel.
8 Unbolt the front portion of the driveshaft (see Chapter 8), suspend it from a piece of wire (don't let it hang from the center support bearing).
9 Remove the right driveaxle and intermediate shaft (see Chapter 8). Then remove the exhaust system crossover pipe and rear exhaust manifold (see Chapter 4).
10 Remove the four bolts securing the crossmember and remove the crossmember.
11 Remove the alternator (see Chapter 5).
12 Remove the six bolts securing the transfer case bracket to the engine block.
13 Working on the right side of the transfer case, remove the three transfer case mounting bolts.
14 Working on the left side, remove the final mounting bolt then remove the transfer case from the vehicle.
15 Installation is the reverse of removal, noting the following points:

a) Install a new O-ring seal to the case.
b) Tighten the exhaust system fasteners to the torque listed in the Chapter 4 Specifications.
c) Tighten the driveshaft fasteners to the torque listed in Chapter 8 Specifications
d) Tighten the transfer case and crossmember fasteners to the torque listed in this Chapter's Specifications.
e) Refill the transfer case with the proper type and amount of fluid (see Chapter 1).
f) Tighten the wheel lug nuts to the torque listed in the Chapter 1 Specifications.



5.1 Pull the knob straight off from the mode select switch

5 Mode select switch - replacement

Refer to illustration 5.1

1 Pull the switch knob straight off **(see illustration).**
2 Remove the instrument center trim panel (see Chapter 11).
3 Disconnect the switch electrical connector.
4 Remove the two mounting screws then remove the switch.
5 Installation is the reverse of removal.

Chapter 8
Clutch and driveline

Contents

	Section		Section
Clutch - description and check	2	Differential (4WD models) - removal and installation	12
Clutch components - removal, inspection and installation	6	Differential lubricant level check (4WD models)	See Chapter 1
Clutch hydraulic system - bleeding	5	Driveaxle boot - replacement	9
Clutch master cylinder - removal and installation	3	Driveaxles - removal and installation	8
Clutch release bearing and lever - removal, inspection and installation	7	Driveshaft (4WD models) - removal and installation	10
Clutch release cylinder - removal and installation	4	General information	1
		Rear driveaxle oil seals (4WD models)	11

Specifications

Clutch fluid type	See Chapter 1

Torque specifications	Ft-lbs	Nm
Clutch		
Clutch master cylinder mounting nuts	17	23
Clutch pressure plate-to-flywheel bolts	21	29
Clutch release cylinder mounting bolts	15	20
Differential (4WD models)		
Differential mass damper bolts	40	54
Differential mounting bracket-to-subframe bolts	85	115
Differential-to-bracket bolts	59	80
Driveaxles		
Driveaxle/hub nut	214	290
Intermediate shaft bearing bracket nuts	20	27
Driveshafts		
Center bearing mounting nuts (4X4)	35	48
Universal joint cap bolts	17	23
Front driveshaft-to-transaxle bolts	27	37

1 General information

The information in this Chapter deals with the components from the rear of the engine to the drive wheels, except for the transaxle, which is dealt with in the previous Chapter.

Since nearly all the procedures covered in this Chapter involve working under the vehicle, make sure it's securely supported on sturdy jackstands or on a hoist where the vehicle can be easily raised and lowered.

2 Clutch - description and check

1 All vehicles with a manual transaxle have a single dry plate, diaphragm spring-type clutch. The clutch disc has a splined hub which allows it to slide along the splines of the transaxle input shaft. The clutch and pressure plate are held in contact by spring pressure exerted by the diaphragm in the pressure plate.

2 The clutch release system is operated by hydraulic pressure. The hydraulic release system consists of the clutch pedal, a master cylinder and a shared common reservoir with the brake master cylinder, a release (or slave) cylinder and the hydraulic line connecting the two components.

3 When the clutch pedal is depressed, a pushrod pushes against brake fluid inside the master cylinder, applying hydraulic pressure to the release cylinder, which pushes the release bearing against the diaphragm fingers of the clutch pressure plate.

4 Terminology can be a problem when discussing the clutch components because common names are in some cases different from those used by the manufacturer. For example, the driven plate is also called the clutch plate or disc, the clutch release bearing is sometimes called a throwout bearing, the release cylinder is sometimes called the slave cylinder.

5 Unless you're replacing components with obvious damage, do these preliminary checks to diagnose clutch problems:

a) *The first check should be of the fluid level in the clutch master cylinder. If the fluid level is low, add fluid as necessary and inspect the hydraulic system for leaks. If the master cylinder reservoir is dry, bleed the system as described in Section 8 and recheck the clutch operation.*

b) *To check "clutch spin-down time," run the engine at normal idle speed with the transaxle in Neutral (clutch pedal up - engaged). Disengage the clutch (pedal down), wait several seconds and shift the transaxle into Reverse. No grinding noise should be heard. A grinding noise would most likely indicate a bad pressure plate or clutch disc.*

c) *To check for complete clutch release, run the engine (with the parking brake applied to prevent vehicle movement) and hold the clutch pedal approximately 1/2-inch from the floor. Shift the transaxle between 1st gear and Reverse several times. If the shift is rough, component failure is indicated.*

d) *Visually inspect the pivot bushing at the top of the clutch pedal to make sure there's no binding or excessive play.*

3 Clutch master cylinder - removal and installation

Removal

1 Working under the dashboard, disconnect the clutch master cylinder pushrod from the pedal and unscrew the clutch master cylinder bracket nut.

2 Clamp a pair of locking pliers onto the clutch fluid feed hose, a couple of inches downstream of the brake fluid reservoir (the clutch master cylinder is supplied with fluid from the brake fluid reservoir). The pliers should be just tight enough to prevent fluid flow when the hose is disconnected. Disconnect the reservoir hose from the clutch master cylinder.

3 Using a flare-nut wrench, disconnect the hydraulic line fitting at the cylinder. Have rags handy, as some fluid will be lost as the line is removed. Cap or plug the ends of the line to prevent fluid leakage and the entry of contaminants.

4 Remove the remaining mounting nut and detach the cylinder from the firewall. **Caution:** *Don't allow brake fluid to come into contact with the paint, as it will damage the finish.*

Installation

5 Place the master cylinder in position on the firewall and install the mounting nut finger tight.

6 Connect the hydraulic line fitting to the clutch master cylinder and tighten it finger tight (since the cylinder is still a bit loose, it'll be easier to start the threads into the cylinder).

7 Tighten the mounting nut to the torque listed in this Chapter's Specifications, then tighten the hydraulic line fitting securely.

8 Attach the fluid feed hose from the reservoir to the clutch master cylinder and tighten the hose clamp. Remove the locking pliers.

9 Working under the dash, install the remaining mounting nut and tighten it to the torque listed in this Chapter's Specifications. Connect the pushrod to the clutch pedal.

10 Fill the reservoir with brake fluid conforming to DOT 3 specifications and bleed the clutch system as outlined in Section 5.

4 Clutch release cylinder - removal and installation

Removal

1 Disconnect the hydraulic line at the release cylinder using a flare-nut wrench. Have a small can and rags handy, as some fluid will be spilled as the line is removed. Plug the line to prevent excessive fluid loss and contamination.

2 Remove the release cylinder mounting bolts.

3 Remove the release cylinder.

Installation

4 Connect the hydraulic line fitting to the release cylinder, using your fingers only at this time (since the cylinder is still a bit loose, it'll be easier to start the threads into the cylinder).

5 Tighten the mounting bolts to the torque listed in this Chapter's Specifications.

6 Tighten the hydraulic fitting securely, using a flare-nut wrench.

7 Check the fluid level in the brake fluid reservoir, adding brake fluid conforming to DOT 3 specifications until the level is correct.

8 Bleed the system as described in Section 5, then recheck the brake fluid level.

5 Clutch hydraulic system - bleeding

1 Bleed the hydraulic system whenever any part of the system has been removed or the fluid level has fallen so low that air has been drawn into the master cylinder. The bleeding procedure is very similar to bleeding a brake system.

2 Fill the brake master cylinder reservoir with new brake fluid conforming to DOT 3 specifications. **Caution:** *Do not re-use any of the fluid coming from the system during the bleeding operation or use fluid which has been inside an open container for an extended period of time.*

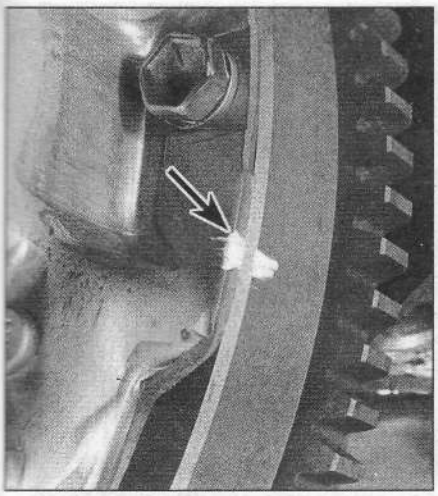
3 Have an assistant depress the clutch pedal and hold it. Open the bleeder valve on the release cylinder, allowing fluid and any air to escape. Close the bleeder valve when the flow of fluid (and bubbles) ceases. Once closed, have your assistant release the pedal.

4 Continue this process until all air is evacuated from the system, indicated by a solid stream of fluid being ejected from the bleeder valve each time with no air bubbles. Keep a close watch on the fluid level inside the brake master cylinder reservoir - if the level drops too far, air will get into the system and you'll have to start all over again. **Note:** *Wash the area with water to remove any excess brake fluid.*

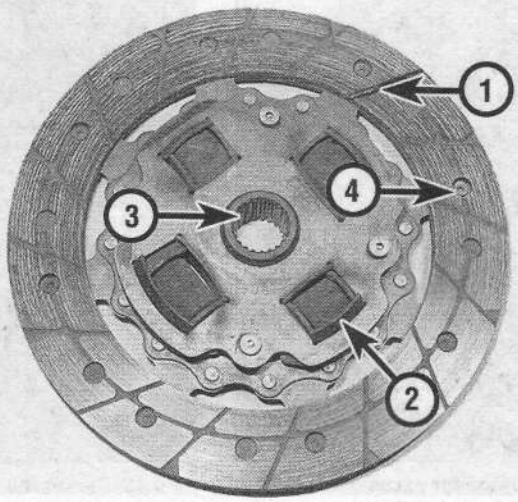
5 Check the brake fluid level again, and add some, if necessary, to bring it to the appropriate level. Check carefully for proper operation before placing the vehicle into normal service.

6 Clutch components - removal, inspection and installation

Warning: *Dust produced by clutch wear is*



6.5 Mark the relationship of the pressure plate to the flywheel (if you're planning to re-use the old pressure plate)



6.9 The clutch disc

1 ***Lining*** *- this will wear down in use*
2 ***Springs or dampers*** *- check for cracking and deformation*
3 ***Splined hub*** *- the splines must not be worn and should slide smoothly on the transaxle input shaft splines*
4 ***Rivets*** *- these secure the lining and will damage the flywheel or pressure plate if allowed to contact the surfaces*

hazardous to your health. DO NOT blow it out with compressed air and DO NOT inhale it. DO NOT use gasoline or petroleum-based solvents to remove the dust. Brake system cleaner should be used to flush the dust into a drain pan. After the clutch components are wiped clean with a rag, dispose of the contaminated rags and cleaner in a covered, marked container.

Removal

Refer to illustration 6.5

1 Access to the clutch components is normally accomplished by removing the transaxle, leaving the engine in the vehicle. If the engine is being removed for major overhaul, check the clutch for wear and replace worn components as necessary. However, the relatively low cost of the clutch components compared to the time and trouble spent gaining access to them warrants their replacement anytime the engine or transaxle is removed, unless they are new or in near-perfect condition. The following procedures are based on the assumption the engine will stay in place.

2 Remove the transaxle from the vehicle (see Chapter 7, Part A). Support the engine while the transaxle is out. Preferably, an engine support fixture or a hoist should be used to support it from above.

3 The clutch fork and release bearing can remain attached to the transaxle housing for the time being.

4 To support the clutch disc during removal, install a clutch alignment tool through the clutch disc hub.

5 Carefully inspect the flywheel and pressure plate for indexing marks. The marks are usually an X, an O or a white letter. If they cannot be found, scribe or paint marks yourself so the pressure plate and the flywheel will be in the same alignment during installation **(see illustration)**.

6 Turning each bolt a little at a time, loosen the pressure plate-to-flywheel bolts. Work in a criss-cross pattern until all spring pressure is relieved. Then hold the pressure plate securely and completely remove the bolts, followed by the pressure plate and clutch disc.

Inspection

Refer to illustrations 6.9, 6.11a and 6.11b

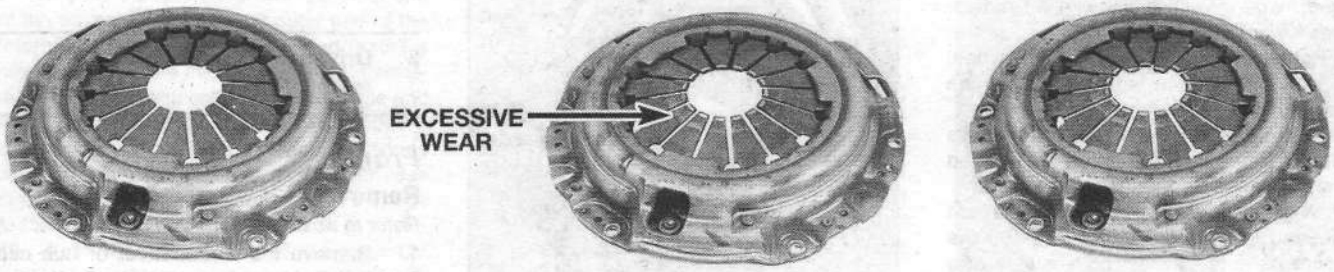
7 Ordinarily, when a problem occurs in the clutch, it can be attributed to wear of the clutch driven plate assembly (clutch disc). However, all components should be inspected at this time.

8 Inspect the flywheel for cracks, heat checking, grooves and other obvious defects. If the imperfections are slight, a machine shop can machine the surface flat and smooth, which is highly recommended regardless of the surface appearance. Refer to Chapter 2 for the flywheel removal and installation procedure.

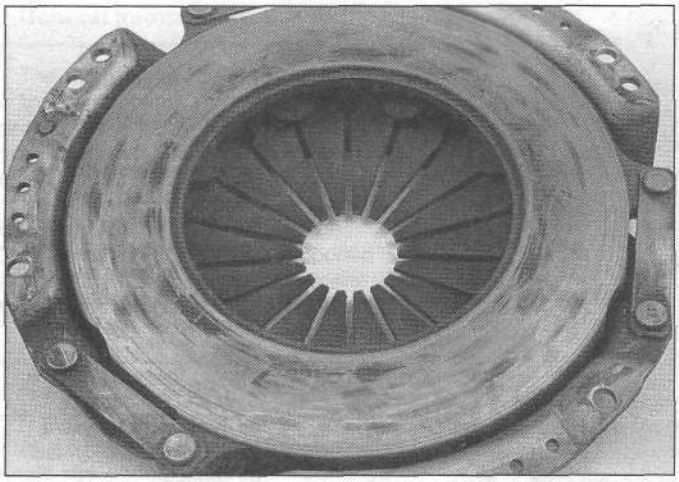
9 Inspect the lining on the clutch disc. There should be at least 1/16-inch of lining above the rivet heads. Check for loose rivets, distortion, cracks, broken springs and other obvious damage **(see illustration)**. As mentioned above, ordinarily the clutch disc is routinely replaced, so if in doubt about the condition, replace it with a new one.

10 The release bearing should also be replaced along with the clutch disc (see Section 7).

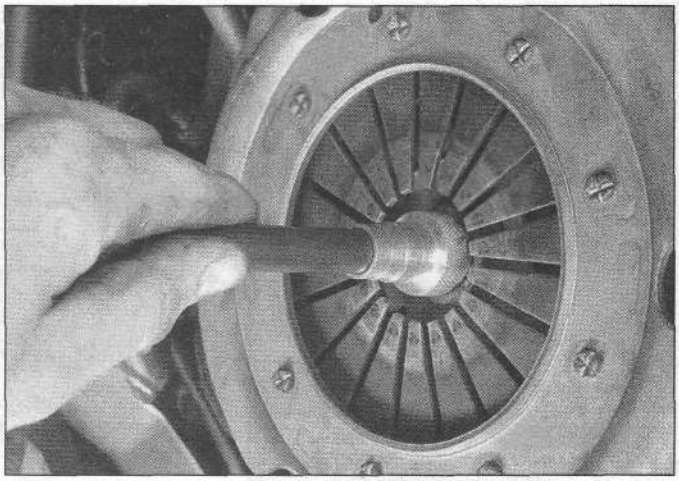
11 Check the machined surfaces and the diaphragm spring fingers of the pressure plate **(see illustrations)**. If the surface is grooved or otherwise damaged, replace the pressure plate. Also check for obvious damage, distortion, cracking, etc. Light glazing can be removed with emery cloth or sandpaper. If a new pressure plate is required, new and remanufactured units are available.



6.11a Replace the pressure plate if excessive wear or damage are noted



6.11b Inspect the pressure plate surface for excessive score marks, cracks and signs of overheating



6.16 Center the clutch disc in the pressure plate with a clutch alignment tool

12 Check the pilot bearing in the end of the crankshaft for excessive wear, scoring, dryness, roughness and any other obvious damage. If any of these conditions are noted, replace the bearing.

13 Removal can be accomplished with a slide hammer and puller attachment, which are available at most auto parts stores or tool rental yards. Refer to Chapter 2 for the flywheel removal procedure (it must be removed before the pilot bearing is removed).

Installation

Refer to illustration 6.16

14 To install a new pilot bearing, lightly lubricate the outside surface with grease, then drive it into the recess with a bearing driver or a socket **(see illustration)**. Install the flywheel (see Chapter 2).

15 Before installation, clean the flywheel and pressure plate machined surfaces with brake cleaner, lacquer thinner or acetone. It's important that no oil or grease is on these surfaces or the lining of the clutch disc. Handle the parts only with clean hands.

16 Position the clutch disc and pressure plate against the flywheel with the clutch held in place with an alignment tool **(see illustration)**. Make sure the disc is installed properly (most replacement clutch discs will be marked "flywheel side" or something similar - if not marked, install the clutch disc with the damper springs toward the transaxle).

17 Tighten the pressure plate-to-flywheel bolts only finger tight, working around the pressure plate.

18 Center the clutch disc by ensuring the alignment tool extends through the splined hub and into the pilot bearing in the crankshaft. Wiggle the tool up, down or side-to-side as needed to center the disc. Tighten the pressure plate-to-flywheel bolts a little at a time, working in a criss-cross pattern to prevent distorting the cover. After all of the bolts are snug, tighten them to the torque listed in this Chapter's Specifications. Remove the alignment tool.

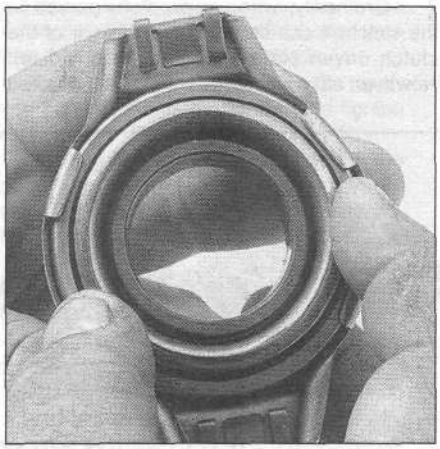
19 Using high-temperature grease, lubricate the inner groove of the release bearing (see Section 7). Also place a small amount of grease on the release lever contact areas and the transaxle input shaft bearing retainer.

20 Install the clutch release bearing (see Section 7).

21 Install the transaxle and all components removed previously.

7 Clutch release bearing and lever - removal, inspection and installation

Warning: *Dust produced by clutch wear is hazardous to your health. DO NOT blow it out with compressed air and DO NOT inhale it. DO NOT use gasoline or petroleum-based solvents to remove the dust. Brake system cleaner should be used to flush the dust into a drain pan. After the clutch components are wiped clean with a rag, dispose of the contaminated rags and cleaner in a covered, marked container.*



7.4 To check the bearing, hold it by the outer race and rotate the inner race while applying pressure; if the bearing doesn't turn smoothly or if it is noisy, replace the bearing

Removal

1 Remove the transaxle (see Chapter 7A).

2 Pull the clutch release fork off the ballstud and slide the release bearing off the input shaft along with the release fork.

Inspection

Refer to illustration 7.4

3 Wipe off the bearing with a clean rag and inspect it for damage, wear and cracks. Don't immerse the bearing in solvent - it's sealed for life and immersion in solvent will ruin it.

4 Hold the center of the bearing and rotate the outer portion while applying pressure **(see illustration)**. If the bearing doesn't turn smoothly or if it's noisy or rough, replace it. **Note:** *Considering the difficulty involved with replacing the release bearing, we recommend replacing the release bearing whenever the clutch components are replaced.*

Installation

5 Lightly lubricate the friction surfaces of the release bearing, ballstud and the input shaft bearing retainer with high-temperature grease.

6 Install the release lever and bearing onto the input shaft.

7 The remainder of installation is the reverse of removal.

8 Driveaxles - removal and installation

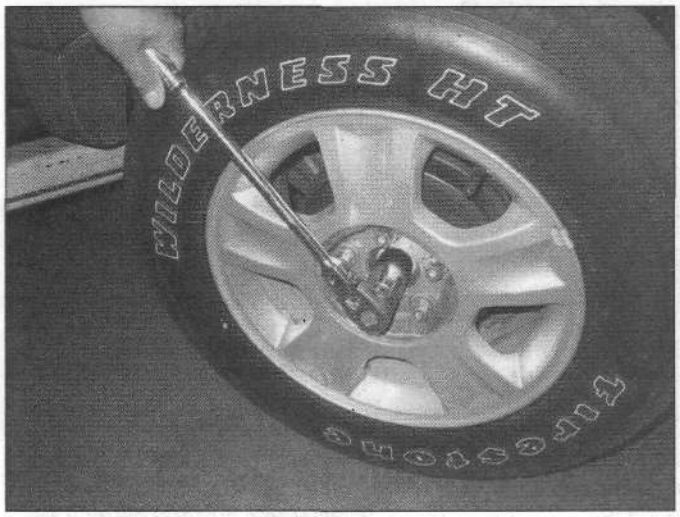
Front

Removal

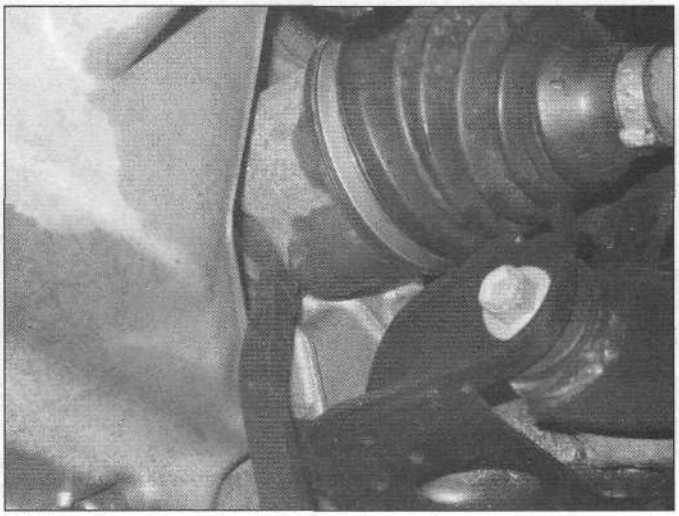
Refer to illustrations 8.1 and 8.7

1 Remove the wheel cover or hub cap. Break the driveaxle/hub nut loose with a socket and large breaker bar **(see illustration)**.

2 Loosen the wheel lug nuts, raise the vehicle and support it securely on jackstands. Remove the wheel.



8.1 Loosen the driveaxle/hub nut with a long breaker bar



8.7 Carefully pry the inner end of the driveaxle from the transaxle

3 Separate the lower control arm from the steering knuckle (see Chapter 10).

4 Remove the driveaxle/hub nut from the axle and discard it. If equipped with antilock brakes, remove the wheel speed sensor and set it aside.

5 Swing the knuckle/hub assembly out (away from the vehicle) until the end of the driveaxle is free of the hub. **Note:** *If the driveaxle splines stick in the hub, tap on the end of the driveaxle with a plastic hammer.* Support the outer end of the driveaxle with a piece of wire to avoid unnecessary strain on the inner CV joint.

6 If you're removing the right driveaxle, carefully pry the inner CV joint off the intermediate shaft using a large screwdriver or prybar positioned between the CV joint housing and the intermediate shaft bearing support.

7 If you're removing the left driveaxle, pry the inner CV joint out of the transaxle using a large screwdriver or prybar positioned between the transaxle and the CV joint housing **(see illustration)**. Be careful not to damage the differential seal.

8 Support the CV joints and carefully remove the driveaxle from the vehicle.

Installation

9 Pry the old spring clip from the inner end of the driveaxle (left side) or outer end of the intermediate shaft (right side) and install a new one. Lubricate the differential or intermediate shaft seal with multi-purpose grease and raise the driveaxle into position while supporting the CV joints. **Note:** *Position the spring clip with the opening facing up; this will ease insertion of the driveaxle and prevent damage to the clip.*

10 Push the splined end of the inner CV joint into the differential side gear (left side) or onto the intermediate shaft (right side) and make sure the spring clip locks in its groove.

11 Apply a light coat of multi-purpose grease to the outer CV joint splines, pull out on the steering knuckle assembly and install the stub axle into the hub.

12 Insert the balljoint stud into the steering knuckle and tighten the pinch bolt to the torque listed in the Chapter 10 Specifications.

13 Install a ***new*** driveaxle/hub nut. Tighten the hub nut securely, but don't try to tighten it to the actual torque specification until you've lowered the vehicle to the ground.

14 Grasp the inner CV joint housing (not the driveaxle) and pull out to make sure the driveaxle has seated securely in the transaxle or on the intermediate shaft.

15 Install the wheel and lug nuts, then lower the vehicle. Tighten the lug nuts to the torque listed in the Chapter 1 Specifications.

16 Tighten the driveaxle/hub nut to the torque listed in this Chapter's Specifications. Install the hub cap or wheel cover.

Intermediate shaft

Removal

Refer to illustration 8.23

17 Remove the right side wheel cover or hub cap. Break the hub nut loose with a socket and large breaker bar.

18 Loosen the wheel lug nuts, raise the vehicle and support it securely on jackstands. Remove the wheel.

19 Separate the lower control arm from the steering knuckle (see Chapter 10).

20 Remove the driveaxle/hub nut from the axle and discard it.

21 Swing the knuckle/hub assembly out (away from the vehicle) until the end of the driveaxle is free of the hub. **Note:** *If the driveaxle splines stick in the hub, tap on the end of the driveaxle with a plastic hammer.* Support the outer end of the driveaxle with a piece of wire to avoid unnecessary strain on the inner CV joint.

22 Remove the driveaxle (see Step 6).

23 Remove the bearing support nuts **(see illustration)** and slide the intermediate shaft out of the transaxle. Be careful not to damage the differential seal when pulling the shaft out.

24 Check the support bearing for smooth operation by turning the shaft while holding the bearing. If you feel any roughness, take the intermediate shaft to an automotive machine shop or other qualified repair facility to have a new bearing installed.

Installation

25 Lubricate the lips of the transaxle seal with multi-purpose grease. Carefully guide the intermediate shaft into the transaxle side gear *then install the mounting nuts for the bearing* support. Tighten the nuts to the torque listed in this Chapter's Specifications.

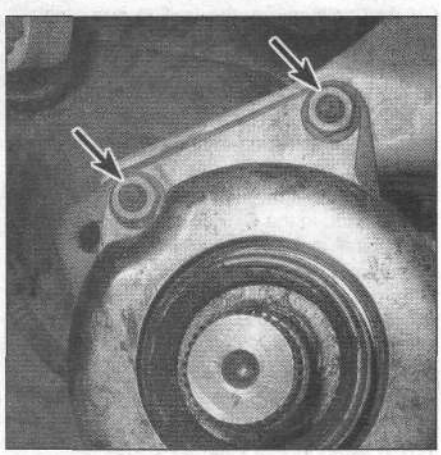
26 The remainder of installation is the reverse of removal.

Rear (4WD models)

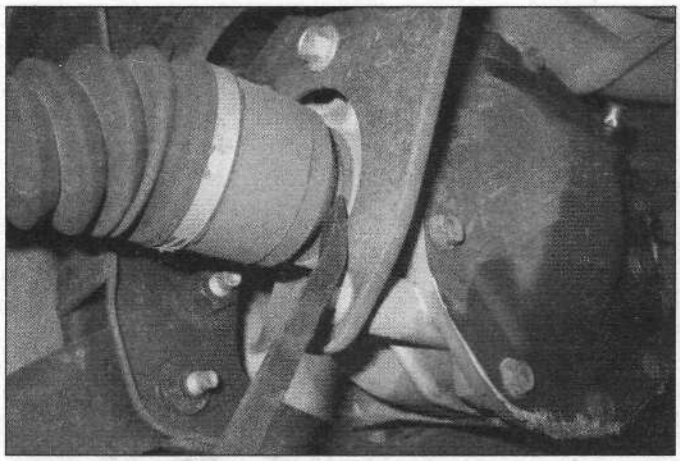
Removal

Refer to illustration 8.32

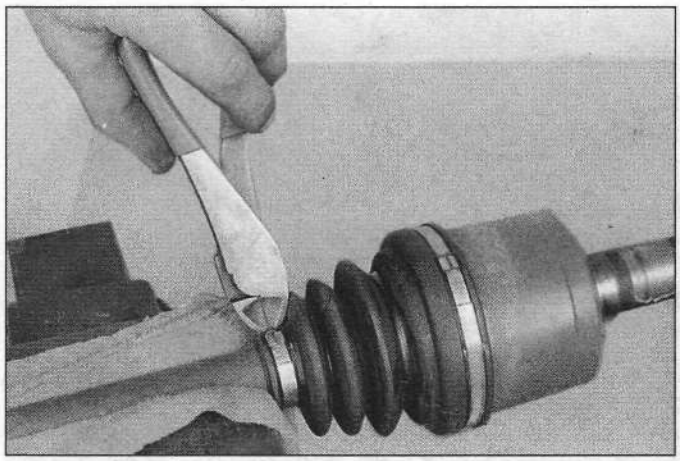
27 Remove the wheel cover or hub cap. Break the driveaxle/hub nut loose with a socket and large breaker bar **(see illustration 8.1)**.



8.23 Remove the nuts securing the intermediate shaft bearing support



8.32 Carefully pry the inner end of the driveaxle from the differential



9.3 Cut off the boot clamps and discard them

28 Block the front wheels to prevent the vehicle from rolling. Loosen the wheel lug nuts, raise the rear of the vehicle and support it securely on jackstands. Remove the wheel.
29 Remove the driveaxle/hub nut and discard it.
30 Remove the coil spring (see Chapter 10).
31 Remove the nut and detach the trailing arm from the lower suspension arm balljoint (see Chapter 10), then pry the trailing arm outward and remove the outer end of the driveaxle from the hub. **Caution:** *Don't let the driveaxle hang by the inner CV joint.*
32 Pry the inner end of the driveaxle out of the differential and remove it from the vehicle **(see illustration).**

Installation

33 Pry the old spring clip from the inner end of the driveaxle and install a new one.
34 Apply a light film of grease to the area on the inner CV joint stub shaft where the seal rides, then insert the splined end of the inner CV joint into the differential. Make sure the spring clip locks in its groove.
35 Apply a light film of grease to the outer CV joint splines, pry the trailing arm outward and insert the outer end of the driveaxle into the hub.
36 Install the coil spring see Chapter 10.
37 Connect the trailing arm to the lower suspension arm and install the nut. Using a floor jack, raise the trailing arm to simulate normal ride height, then tighten the nut to the torque listed in the Chapter 10 Specifications.
38 Install a ***new*** driveaxle/hub nut. Tighten the hub nut securely, but don't try to tighten it to the actual torque specification until you've lowered the vehicle to the ground.
39 Install the wheel and lug nuts, then lower the vehicle. Tighten the lug nuts to the torque listed in the Chapter 1 Specifications.
40 Tighten the driveaxle/hub nut to the torque listed in this Chapter's Specifications. Install the wheel cover or hub cap.

9 Driveaxle boot - replacement

Note 1: *If the CV joints are worn, indicating the need for an overhaul (usually due to torn boots), explore all options before beginning the job. Complete rebuilt driveaxles are available on an exchange basis, which eliminates much time and work.*
Note 2: *Some auto parts stores carry "split" type replacement boots, which can be installed without removing the driveaxle from the vehicle. This is a convenient alternative; however, the driveaxle should be removed and the CV joint disassembled and cleaned to ensure the joint is free from contaminants such as moisture and dirt which will accelerate CV joint wear.*
Note 3: *Models equipped with ABS are equipped with ABS sensor rings on the outer CV joints. Be sure to inspect the sensor rings for chipped or missing teeth. Replace the sensor ring if necessary.*
1 Remove the driveaxle from the vehicle (see Section 8).
2 Mount the driveaxle in a vise. The jaws of the vise should be lined with wood or rags to prevent damage to the driveaxle.

Front

Inner CV joint and boot

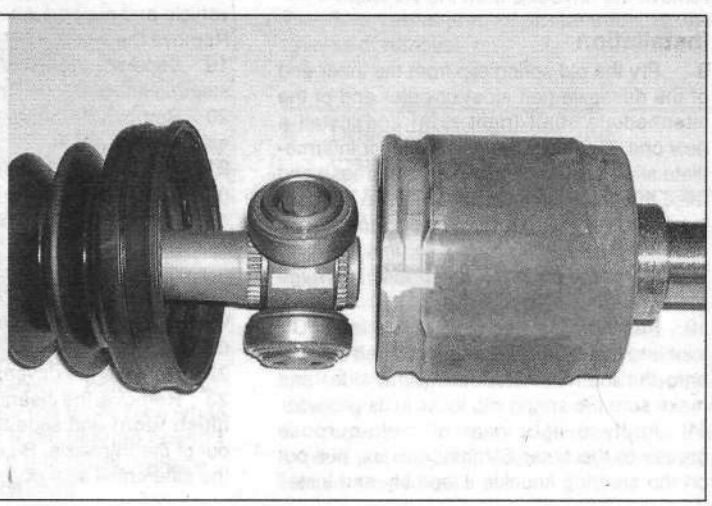
Refer to illustrations 9.3, 9.4, 9.5, 9.6a, 9.6b, 9.7, 9.11, 9.14, 9.16, 9.17a, 9.17b, 9.17c, 9.17d and 9.17e

Removal

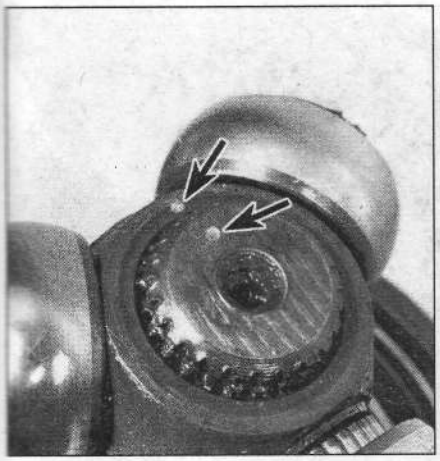
3 Remove the boot clamps **(see illustration).**
4 Pull the boot back from the inner CV joint and slide the joint housing off. Be sure to mark the relationship of the tri-pod to the outer race **(see illustration).**
5 Use a center punch to mark the tri-pod and axleshaft to ensure that they are reassembled properly **(see illustration).**
6 Spread the ends of the stop-ring apart, slide it towards the center of the shaft, then remove the retainer clip from the end of the axleshaft (see illustration).
7 Use a hammer and a brass punch to drive the tri-pod joint from the driveaxle **(see illustration).**
8 Remove the stop-ring from the axleshaft and discard it.

Inspection

9 Clean the old grease from the outer race

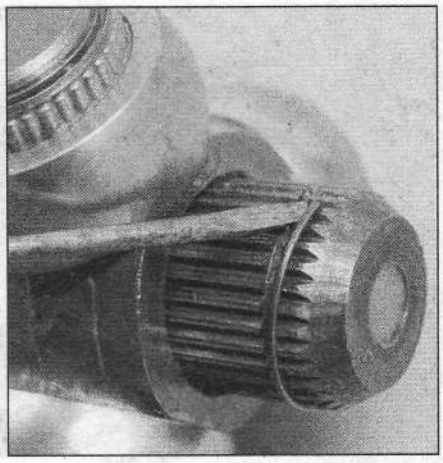


9.4 Mark the relationship of the tri-pod assembly to the outer race



9.5 Use a center punch to place marks on the tri-pod and the driveaxle to ensure that they are properly reassembled

9.6a Spread the ends of the stop-ring apart and slide it towards the center of the shaft . . .



9.6b . . . then slide the tri-pod assembly back and remove the retainer clip

and the tri-pod bearing assembly. Carefully disassemble each section of the tri-pod assembly, one at a time so as not to mix up the parts, and clean the needle bearings with solvent.

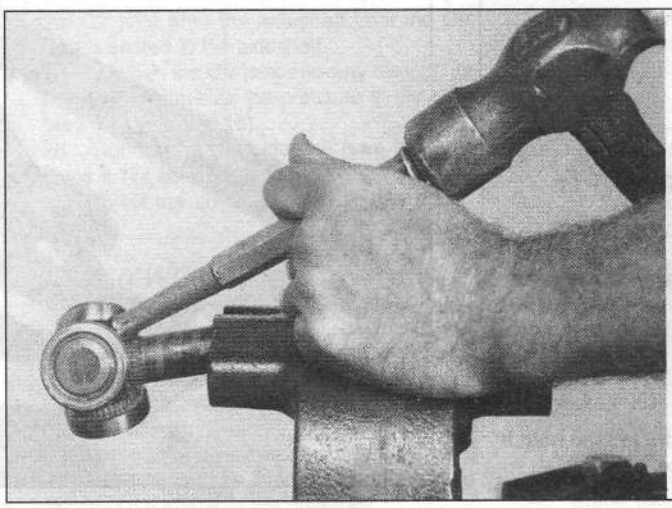
10 Inspect the rollers, tri-pod, bearings and outer race for scoring, pitting or other signs of abnormal wear, which will warrant the replacement of the inner CV joint.

Reassembly

11 Slide the clamps and boot onto the axleshaft. It's a good idea to wrap the axleshaft splines with tape to prevent damaging the boot **(see illustration).**

12 Install a new stop-ring on the axleshaft, but don't seat it in its groove; position it on the shaft *past* the groove.

13 Place the tri-pod on the shaft (making sure the marks are aligned) and install a new bearing retainer clip. Now slide the tri-pod up against the retainer clip and seat the stop-ring in its groove.



9.7 Drive the tri-pod joint from the axleshaft with a brass punch and hammer - make sure you don't damage the bearing surfaces or the splines on the shaft

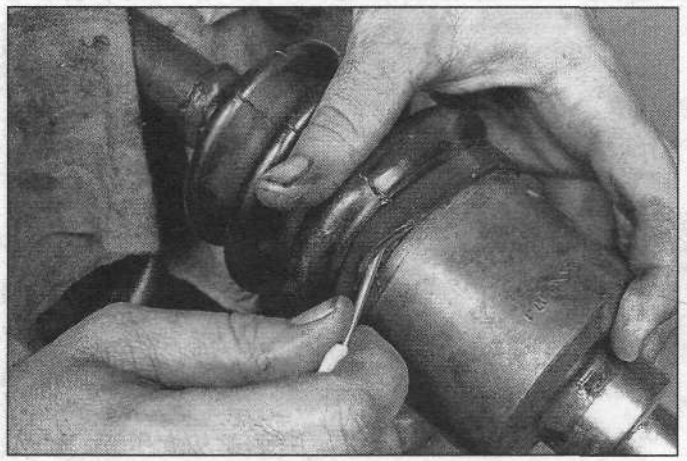
14 Apply CV joint grease to the tri-pod assembly, the inside of the joint housing and the inside of the boot **(see illustration).**

15 Slide the boot into place.

16 Position the CV joint mid-way through its

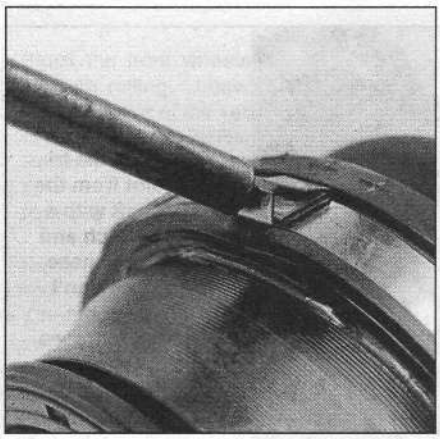
9.11 Wrap the splined area of the axleshaft with tape to prevent damage to the boot(s) when installing it

9.14 Pack the outer race with CV joint grease and slide it over the tri-pod assembly - make sure the match marks on the CV joint housing and tri-pod line up

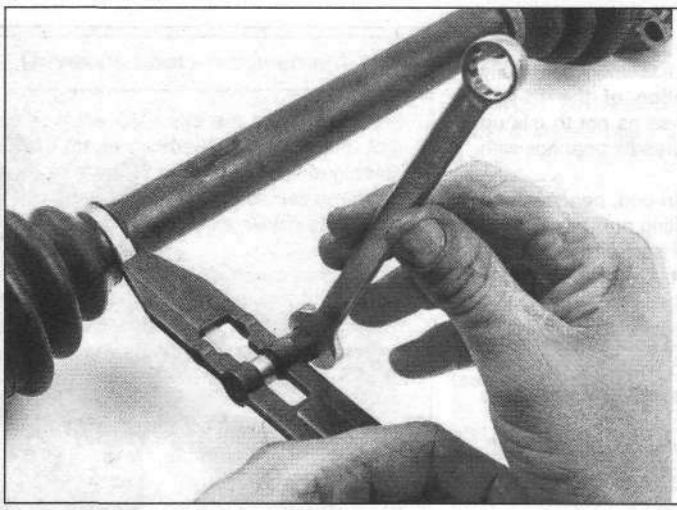


9.16 Equalize the pressure inside the boot by inserting a small, dull screwdriver between the boot and the outer race

9.17a To install new fold-over type clamps, bend the tang down . . .



9.17b . . . and flatten the tabs to hold it in place



9.17c To install band-type clamps you'll need a special tool; install the band with its end pointing in the direction of axle rotation and tighten it securely, then pivot the tool up 90-degrees and tap the center of the clip with a center punch . . .

travel, then equalize the pressure in the boot **(see illustration).**

17 Tighten the boot clamps **(see illustrations).**

18 Install the driveaxle assembly (see Section 8).

Outer CV joint and boot

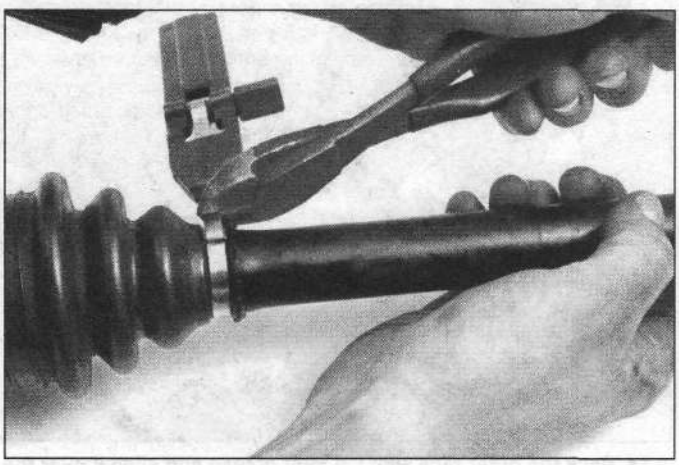
Refer to illustration 9.20, 9.25a, 9.25b and 9.25c

Removal

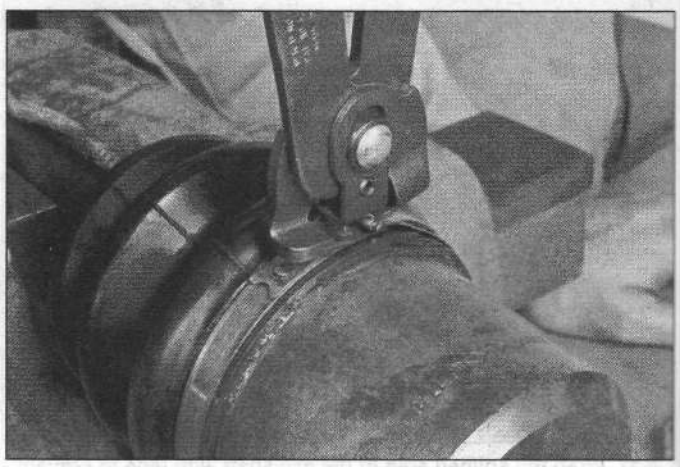
19 Remove the boot clamps **(see illustration 9.3).**

20 Strike the edge of the CV joint housing sharply with a soft-face hammer to dislodge the outer CV joint from the axleshaft **(see illustration).** Remove and discard the bearing retainer clip from the axleshaft.

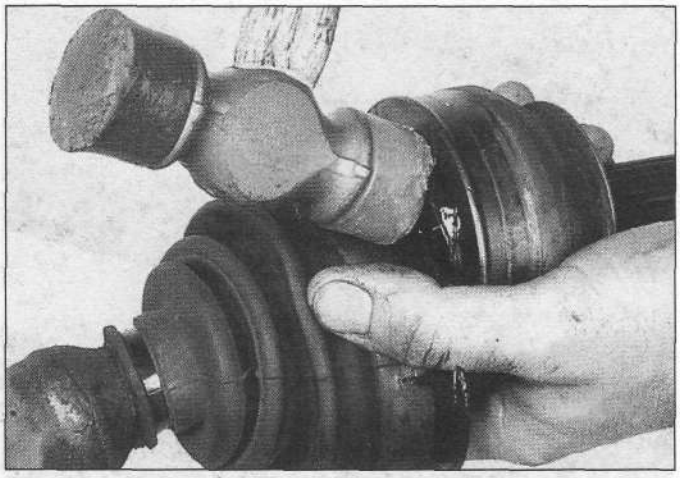
21 Slide the outer CV joint boot off the axle shaft.



9.17d . . . then bend the end of the clamp back over the clip and cut off the excess



9.17e If you're installing crimp-type boot clamps, you'll need a pair of special crimping pliers (available at most auto parts stores)



9.20 Strike the edge of the CV joint housing sharply with a soft-faced hammer to dislodge the CV joint from the shaft

9.25a Pack the outer CV joint assembly with CV grease . . .

Inspection

22 Thoroughly clean all components with solvent until the old CV grease is completely removed. Inspect the bearing surfaces of the inner tri-pods and housings for cracks, pitting, scoring, and other signs of wear. If any part of the outer CV joint is worn, you must replace the entire driveaxle assembly (inner CV joint, axleshaft and outer CV joint).

Reassembly

23 Slide a new sealing boot clamp and sealing boot onto the axleshaft. It's a good idea to wrap the axleshaft splines with tape to prevent damaging the boot **(see illustration 9.11)**.

24 Place a new bearing retainer clip onto the axle shaft.

25 Place half the grease provided in the sealing boot kit into the outer CV joint assembly housing **(see illustration)**. Put the remaining grease into the sealing boot **(see illustrations)**.

26 Align the splines on the axleshaft with the splines on the outer CV joint assembly and using a soft-faced hammer, gently drive the CV joint onto the axleshaft until the CV joint is seated to the axleshaft.

27 Position the CV joint mid-way through its travel, then equalize the pressure in the boot **(see illustration 9.16)**.

28 Tighten the boot clamps **(see illustrations 9.17a through 9.17e)**.

29 Install the driveaxle as outlined in Section 8.

Rear (4WD models)

Note: *This procedure applies to both the inner and outer CV joint boots.*

Removal

30 Remove the driveaxle from the vehicle (see Section 8).

31 Mount the driveaxle in a vise. The jaws of the vise should be lined with wood or rags to prevent damage to the driveaxle.

32 Remove the boot clamps **(see illustration 9.3)**.

33 Strike the edge of the CV joint housing sharply with a soft-face hammer to dislodge the outer CV joint from the axleshaft **(see illustration 9.20)**.

34 Remove and discard the bearing retainer clip and snap-ring from the axleshaft.

35 Slide the CV joint boot off the axleshaft.

Inspection

36 Thoroughly clean all components with solvent until the old grease is completely removed. Inspect the bearing surfaces of the inner tri-pods and housings for cracks, pitting, scoring, and other signs of wear. If any part of the CV joint is worn, you must replace the entire driveaxle assembly (inner CV joint, axleshaft and outer CV joint).

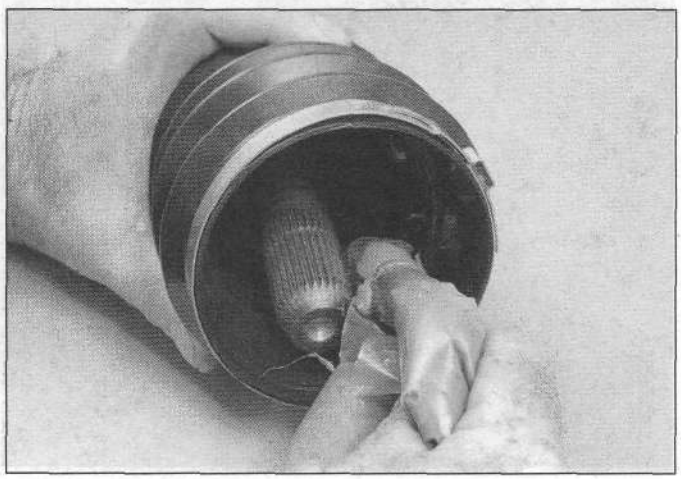
Reassembly

37 Slide a new sealing boot clamp and sealing boot onto the axleshaft.

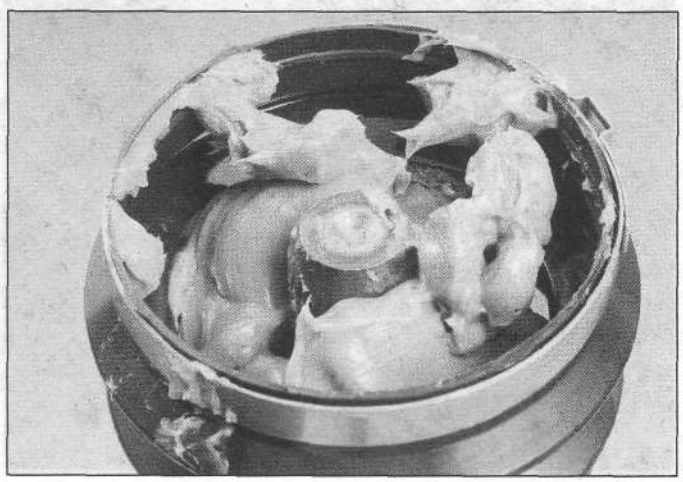
38 Install a new snap-ring and bearing retainer clip onto the axle shaft.

39 Place half the grease provided in the sealing boot kit into the outer CV joint assembly housing. Put the remaining grease into the sealing boot **(see illustrations 9.25a through 9.25c)**.

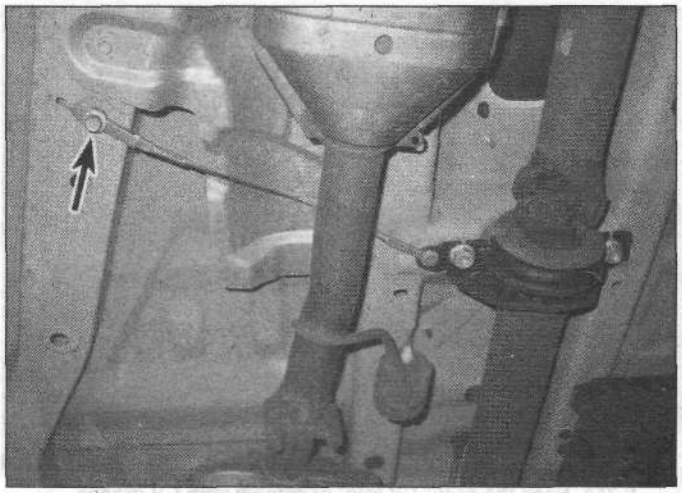
40 Align the splines on the axleshaft with the splines on the CV joint assembly and



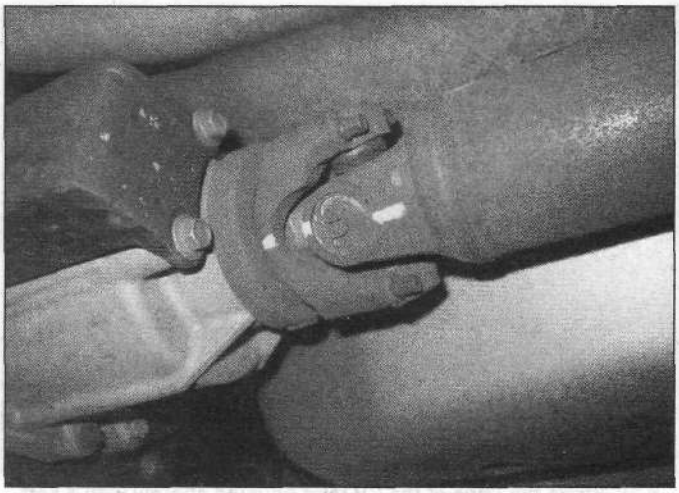
9.25b . . . then apply grease to the inside of the boot until . . .



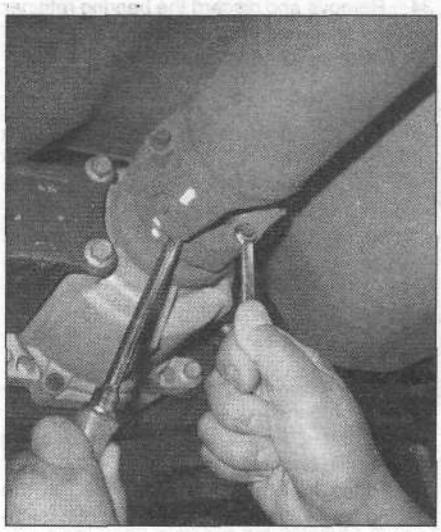
9.25c . . . the level is up to the end of the axle



10.2 Remove the ground strap mounting bolt



10.3 Mark the relationship of the driveshaft to the differential pinion yoke



10.4 Immobilize the driveshaft by placing a screwdriver into the universal joint while loosening the bolts

using a soft-faced hammer, gently drive the CV joint onto the axleshaft until the CV joint is seated to the axleshaft.

41 Position the CV joint mid-way through its travel, then equalize the pressure in the boot **(see illustration 9.16).**

42 Tighten the boot clamps **(see illustrations 9.17a through 9.17e).**

43 Install the driveaxle as outlined in Section 8.

10 Driveshaft (4WD models) - removal and installation

Removal

Refer to illustrations 10.2, 10.3, 10.4, 10.5 and 10.6

Note: *The manufacturer recommends replacing driveshaft fasteners with new ones when installing the driveshaft.*

1 Raise the vehicle and support it securely on jackstands, place the selector lever in Neutral.

2 Remove the bolt securing the ground strap **(see illustration).**

3 Use chalk or a scribe to "index" the relationship of the driveshaft to the differential pinion yoke. This ensures correct alignment when the driveshaft is reinstalled **(see illustration).**

4 Remove the bolts securing the universal joint clamps to the differential pinion yoke **(see illustration).**

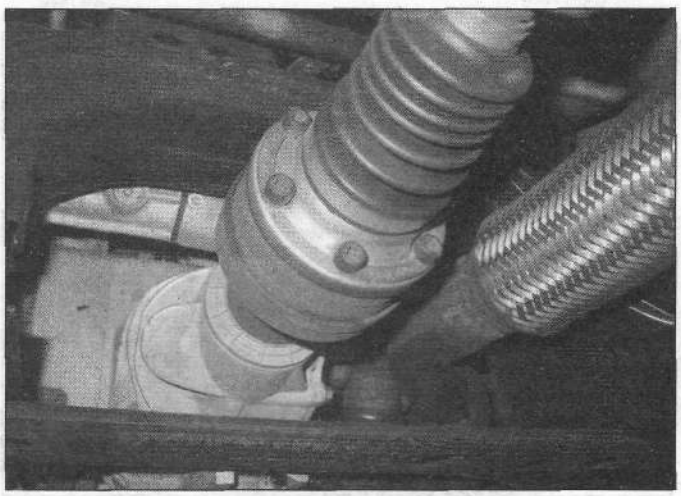
5 Working at the front of the drive shaft, remove the bolts securing the driveshaft to the transaxle/transfer case **(see illustration).**

6 Remove the nuts securing the center support bearing **(see illustration).**

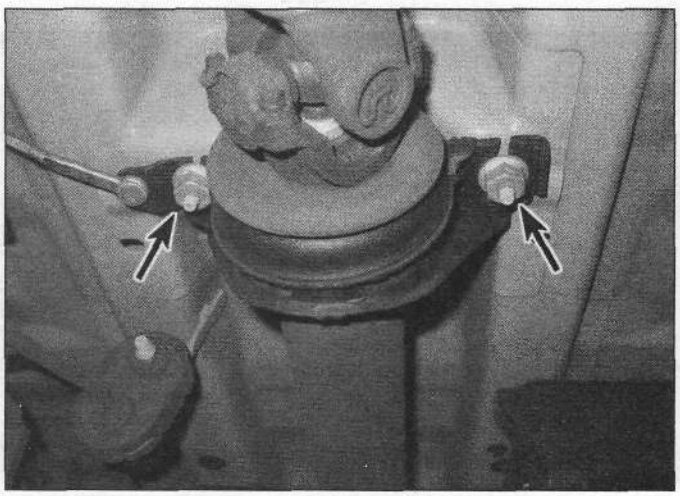
7 With the help from an assistant carefully remove the driveshaft from the vehicle.

Installation

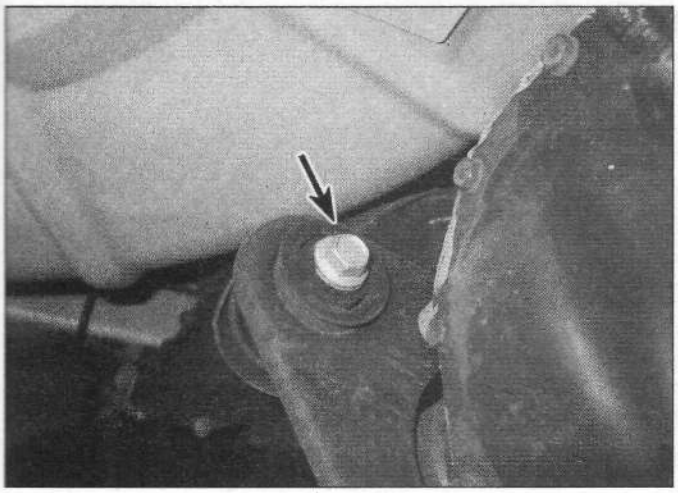
8 Installation is the reverse of removal. Make sure the universal joint caps are properly placed in the flange seat. Tighten the fasteners to the torque listed in this Chapter's Specifications.



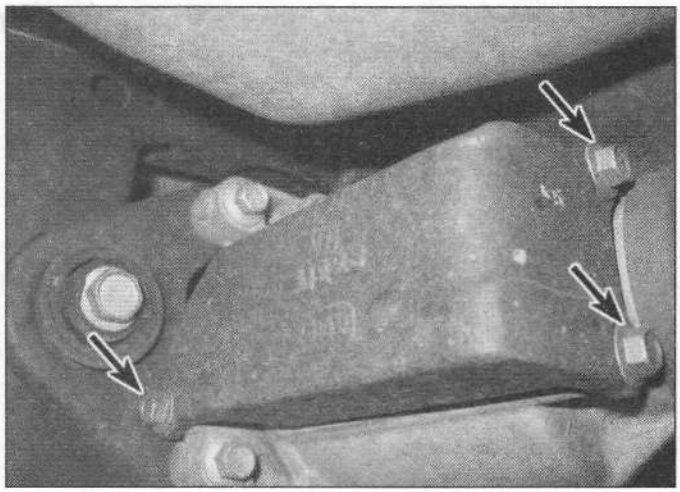
10.5 Remove the bolts securing the driveshaft to the transaxle/transfer case



10.6 Remove the nuts securing the center support bearing



12.4 Differential mounting bracket-to-subframe mounting bolt



12.5 Mass damper mounting bolts

11 Rear driveaxle oil seals (4WD models)

1 Raise the rear of the vehicle and support it securely on jackstands. Place the transaxle in Neutral with the parking brake off. Block the front wheels to prevent the vehicle from rolling.

2 Remove the driveaxle(s) (see Section 8).

3 Carefully pry out the driveaxle oil seal with a seal removal tool or a large screwdriver. Be careful not to damage or scratch the seal bore.

4 Using a seal installer or a large deep socket as a drift, install the new oil seal. Drive it into the bore squarely and make sure it's completely seated.

5 Lubricate the lip of the new seal with multi-purpose grease, then install the driveaxle. Be careful not to damage the lip of the new seal.

6 Check the differential lubricant level and add some, if necessary, to bring it to the appropriate level (see Chapter 1).

12 Differential (4WD models) - removal and installation

Removal

Refer to illustrations 12.4, 12.5 and 12.7

1 Raise the rear of the vehicle and support it securely on jackstands. Block the front wheels to prevent the vehicle from rolling.

2 Remove the driveshaft (see Section 10).

3 Remove the driveaxles (see Section 8)

4 Remove the bolt securing the differential bracket to the subframe **(see illustration).**

5 Remove the three bolts securing the differential mass damper **(see illustration).**

6 At the top of the differential, disconnect the electrical connector.

7 Support the rear of the differential with a floor jack. Remove the four bolts securing the differential to the mounting brackets **(see illustration).**

8 Loosen the bolts securing the brackets-to-subframe, rotate the brackets and carefully remove the differential.

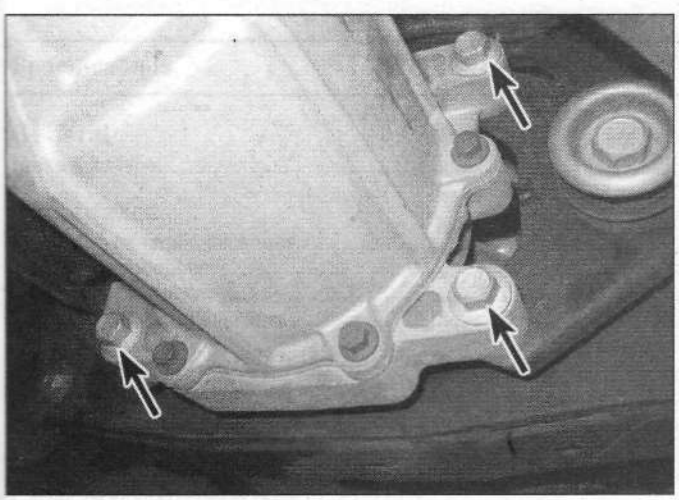
Installation

Refer to illustration 12.9

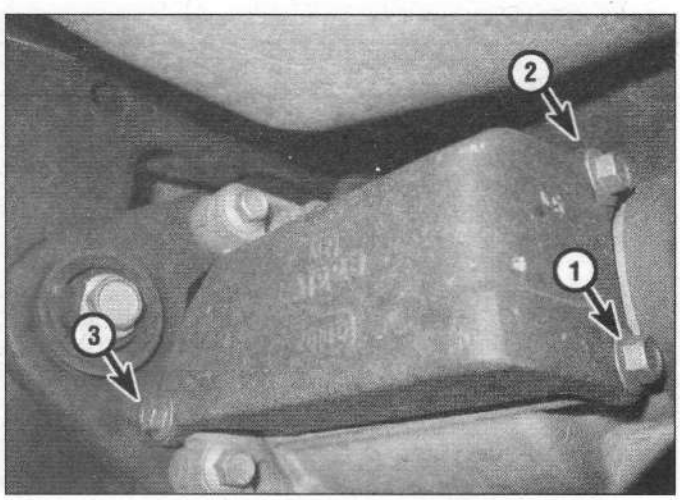
9 Installation is the reverse of removal, noting the following points:

a) Install all the mass damper bolts finger tight first, then tighten them in the proper sequence **(see illustration).**

b) Tighten all fasteners to the torque listed in this Chapter's specifications.



12.7 Remove the four bolts securing the differential to its mounting brackets (one bolt not visible in photo)



12.9 In the sequence shown, torque the bolts to the specification listed in this Chapter