7

DRIVE TRAIN

MANUAL TRANSAXLE

Understanding the Manual Transaxle

Because of the way an internal combustion engine breathes, it can produce torque, or twisting force, only within a narrow speed range. Most modern, overhead valve pushrod engines must turn at about 2500 rpm to produce their peak torque. By 4500 rpm they are producing so little torque that continued increases in engine speed produce no power increases. The torque peak on overhead camshaft engines is generally much higher, but much narrower.

The manual transaxle and clutch are employed to vary the relationship between engine speed and the speed of the wheels so that adequate engine power can be produced under all circumstances. The clutch allows engine torque to be applied to the transaxle input shaft gradually, due to mechanical slippage. Consequently, the vehicle may be started smoothly from a full stop. The transaxle changes the ratio between the rotating speeds of the engine and the wheels by the use of gears. The gear ratios allow full engine power to be applied to the wheels during acceleration at low speeds and at highway/passing speeds.

In a front wheel drive transaxle, power is usually transmitted from the input shaft to a mainshaft or output shaft located slightly beneath and to the side of the input shaft. The gears of the mainshaft mesh with gears on the input shaft, allowing power to be carried from one to the other. All forward gears are in constant mesh and are free from rotating with the shaft unless the synchronizer and clutch is engaged. Shifting from one gear to the next causes one of the gears to be freed from rotating with the shaft and locks another to it. Gears are locked and unlocked by internal dog clutches which slide between the center of the gear and the shaft. The forward gears employ synchronizers; friction members which smoothly bring gear and shaft to the same speed before the toothed dog clutches are engaged.

Adjustments

SHIFT LINKAGE

1. Disconnect the shift linkage from the transaxle.
2. On the transaxle, put select lever in **N** and move the shift lever in **4th** gear. Depress the clutch, if necessary, to shift.
3. Move the shift lever in the vehicle to the **4th** gear position until it contacts the stop.
4. Turn the adjuster turnbuckle so the shift cable eye aligns with the eye in the gear shift lever. When installing the cable eye, make sure the flange side of the plastic bushing at the shift cable end is on the cotter pin side.
5. The cables should be adjusted so the clearance between the shift lever and the 2 stoppers are equal when the shift lever is moved to 3rd and 4th gear. Move the shift lever to each position and check that the shifting is smooth.

Back-Up Light Switch

REMOVAL & INSTALLATION

1. Disconnect the negative battery cable.
2. Remove any components necessary to access the back-up light switch.
3. Unplug the back-up light switch connector.
4. Remove the switch from the case using the appropriate size socket and drive tool.

To install:

5. Install the switch and tighten it to 22–25 ft. lbs. (30–35 Nm).
6. Attach the back-up light switch connector.
7. Install any components removed to access the back-up light switch.
8. Connect the negative battery cable.

Manual Transaxle Assembly

REMOVAL & INSTALLATION

Mirage

➡If the vehicle is going to be rolled while the halfshafts are out of the vehicle, obtain 2 outer CV-joints or proper equivalent tools and install to the hubs. If the vehicle is rolled without the proper torque applied to the front wheel bearings, the bearings will no longer be usable.

➡The suspension components should not be tightened until the vehicles weight is resting on the ground.

1. Remove the battery and battery tray.
2. Remove the air cleaner assembly and vacuum hoses.
3. Note the locations and disconnect the shifter cables.
4. If equipped with 1.6L engine, remove the tension rod.
5. Detach the backup lamp switch connector, speedometer cable connection and remove the starter motor.
6. Raise the vehicle and support safely.
7. Remove the front wheels and the inner wheel panels.
8. Remove the undercover and splash pan.
9. Drain the transaxle oil into a suitable container.
10. Support the engine and remove the crossmember.
11. Remove the upper transaxle mounting bolt and bracket.
12. Disconnect the stabilizer bar, tie rod ends and the lower ball joint connections.
13. Remove the clutch release cylinder and clutch oil line bracket. Do not disconnect the fluid lines and secure the slave cylinder with wire.
14. Disconnect the clutch cable, if equipped with cable controlled clutch system.
15. Remove the halfshafts by inserting a prybar between the transaxle case and the driveshaft and prying the shaft from the transaxle. Do not pull on the driveshaft. Doing so damages the inboard joint. Do not insert the prybar so far the oil seal in the case is damaged.

➡It is not necessary to disconnect the halfshafts from the steering knuckle. Remove the shaft with the hub and knuckle as an assembly. Tie the shafts aside. Note the circle clip on the end of the inboard shafts should not be reused.

16. Remove the bellhousing lower cover.
17. Remove the transaxle to engine bolts and lower the transaxle from the vehicle.

To install:

➡When installing the transaxle, be sure to align the splines of the transaxle with the clutch disc.

18. Install the transaxle to the engine and install the mounting bolts. Tighten the bolts to 31–40 ft. lbs. (43–55 Nm) on 1990–92 models and 35 ft. lbs. (48 Nm) on 1993–00 models.
19. Install the bellhousing cover.

➡When installing the halfshafts, use new circlips on the axle ends. Care must be taken to ensure that the oil seal lip of the transaxle is not damaged by the serrated part of the driveshaft.

20. Install and fully seat the halfshafts into the transaxle.
21. Install the slave cylinder.
22. Connect the ball joints, tie rod ends and the stabilizer bar connections.
23. Install the upper transaxle mounting bracket and bolt.
24. Install the crossmember.
25. Install the undercover.
26. Install the upper transaxle-to-engine mounting bolts. Tighten the bolts to 31–40 ft. lbs. (43–55 Nm) on 1990–92 models and 35 ft. lbs. (48 Nm) on 1993–00 models.
27. Install the starter motor.
28. Connect the backup light switch connector and speedometer cable.
29. Connect and adjust the shifter cables.
30. Install the air cleaner assembly.
31. Install the front wheels.
32. Make sure the vehicle is level when refilling the transaxle. Use Hypoid gear oil or equivalent, GL-4 or higher.
33. Connect the negative battery cable and check the transaxle for proper operation. Make sure the reverse lights operate when in reverse.

Galant

1990–93 MODELS

➡If the vehicle is going to be rolled on its wheels while the halfshafts are out of the vehicle, obtain two outer CV-joints or proper equivalent tools and install to the hubs. If the vehicle is rolled without the proper torque applied to the front wheel bearings, the bearings will no longer be usable.

1. Remove the battery and the air intake hoses.
2. If equipped with Active-ECS, unplug the compressor wiring.
3. Remove the auto-cruise actuator and underhood bracket, located on the passenger side inner fender well.
4. Drain the transaxle and transfer case fluid, if equipped, into a suitable waste container.
5. Remove the retainer bolt and pull the speedometer cable from the transaxle assembly.
6. Remove the cotter pin securing the select and shift cables and remove the cable ends from the transaxle.

7. Remove the connection for the clutch release cylinder and without disconnecting the hydraulic line, and secure it aside.
8. Disconnect the backup light switch harness and position aside.
9. Detach the starter electrical connections, if necessary, remove the starter motor and position aside.
10. Remove the transaxle mount bracket.
11. Remove the upper transaxle mounting bolts.
12. Raise the vehicle and support safely on jackstands.
13. Remove the undercover and the front wheels.
14. Remove the cotter pin and disconnect the tie rod end from the steering knuckle.
15. Remove the self-locking nut from the halfshafts.
16. Disconnect the lower arm ball joint from the steering knuckle.
17. Remove the halfshafts from the transaxle.
18. On AWD models, disconnect the front exhaust pipe.
19. On AWD models, remove the transfer case by removing the attaching bolts, moving the transfer case to the left and lowering the front side. Remove it from the rear driveshaft. Be careful of the oil seal. Do not allow the driveshaft to hang; once the front is removed from the transfer, tie it up. Cover the transfer case openings to keep out dirt.
20. Remove the cover from the transaxle bellhousing.
21. On AWD models, remove the crossmember and the triangular gusset.
22. Remove the transaxle lower coupling bolt. It is just above the halfshaft opening on FWD or transfer case opening on AWD.
23. Support the weight of the engine from above (chain hoist). Support the transaxle using a transmission jack and remove the remaining lower mounting bolts.
24. On turbocharged vehicle, be careful not to damage the lower radiator hose with the transaxle housing during removal. Wrap tape on both the lower hose and the transaxle housing to prevent damage. Move the transaxle assembly to the right and carefully lower it from the vehicle.

To install:

25. Install the transaxle to the engine and install the mounting bolts. Tighten the bolts to 35 ft. lbs. (48 Nm). Install the transaxle lower coupling bolt.
26. Install the underpan, crossmember and the triangular gusset.
27. Install the transfer case on AWD models and connect the exhaust pipe.
28. Install the halfshafts, using new circlips on the axle ends. Try to keep the inboard joint straight in relation to the axle. Be careful not to damage the oil seal lip of the transaxle with the serrated part of the halfshaft.
29. Connect the tie rod and ball joint to the steering knuckle.
30. Install the transaxle mount bracket.
31. Install wheels and lower vehicle. Retorque axle shaft nuts to 145–188 ft. lbs. (200–260 Nm).
32. Install the starter motor.
33. Connect the backup light switch and the speedometer cable.
34. Install the clutch release cylinder.
35. Connect the select and shift cables and install new cotter pins.
36. Install the air intake hose.
37. Install the auto-cruise actuator and bracket.
38. Install the battery.
39. If equipped with Active-ECS, connect the air compressor.
40. Make sure the vehicle is level when refilling the transaxle. Use Hypoid gear oil or equivalent, GL-4 or higher.
41. Check the transaxle and transfer case for proper operation. Make sure the reverse lights come on when in reverse.

1994–00 MODELS

1. Disconnect the negative battery cable and wait at least 90 seconds before performing any work.
2. Remove the air cleaner and intake hoses.
3. Drain the transaxle into a suitable waste container.
4. Remove the cotter pins and clips securing the select and shift cables and remove the cable ends from the transaxle.
5. If equipped with Active-ECS, disconnect the air compressor.
6. Disconnect the backup light switch harness and position aside.
7. Disconnect the speedometer electrical connector, from the transaxle assembly.
8. Remove the starter motor and position aside.
9. Using special tool MZ203827 or equivalent, support the engine assembly.
10. Remove the rear roll stopper mounting bracket.
11. Remove the transaxle mount bracket.
12. Remove the upper transaxle mounting bolts.
13. Raise and safely support the vehicle.
14. Remove the front wheel assemblies.
15. Remove the right hand undercover.
16. Remove the cotter pin and disconnect the tie rod end, from the steering knuckle.
17. Disconnect the stabilizer bar link, from the damper fork.
18. Disconnect the damper fork, from the lateral lower control arm.
19. Disconnect the later lower arm, and the compression arm, lower ball joints, from the steering knuckle.
20. Pry the halfshafts from the transaxle, and secure aside.
21. Remove the connection for the clutch release cylinder and without disconnecting the hydraulic line, secure aside.
22. Remove the cover from the transaxle bellhousing.
23. Remove the engine front roll stopper through-bolt.
24. Remove the crossmember and the triangular right hand stay.
25. Support the transaxle, using a transmission jack, and remove the transaxle lower coupling bolt.

➡The coupling bolt threads from the engine side, into the transaxle, and is located just above the halfshaft opening.

26. Slide the transaxle rearward and carefully lower it from the vehicle.

To install:

27. Install the transaxle to the engine. Install the mounting bolts and tighten to 35 ft. lbs. (48 Nm). Install the transaxle lower coupling bolt and tighten to 22–25 ft. lbs. (30–34 Nm).
28. Install the cover to the transaxle bellhousing and tighten the mounting bolts to 7 ft. lbs. (9 Nm).
29. Install the crossmember and tighten the front mounting bolts to 65 ft. lbs. (88 Nm) and the rear bolt to 54 ft. lbs. (73 Nm). Install the front engine roll stopper through-bolt and hand-tighten. Once the full weight of the engine is on the mounts, tighten the bolt to 42 ft. lbs. (57 Nm).
30. Install the triangular stay bracket and tighten the mounting bolts to 65 ft. lbs. (88 Nm).
31. Connect the clutch release cylinder.
32. Install the halfshafts, using new circlips on the axle ends.

⚠ WARNING

When installing the axleshaft, keep the inboard joint straight in relation to the axle, so not to damage the oil seal lip of the transaxle, with the serrated part of the halfshaft.

33. Connect the tie rod and ball joints to the steering knuckle. Tighten the ball joint self-locking nuts to 48 ft. lbs. (65 Nm). Tighten the tie rod end nut to 21 ft. lbs. (28 Nm) and secure with a new cotter pin.
34. Connect the damper fork to the lower control arm and tighten the through-bolt to 65 ft. lbs. (88 Nm).
35. Connect the stabilizer link to the damper fork, and tighten the self-locking nut to 29 ft. lbs. (39 Nm).
36. Install the underpan.
37. Install wheels and lower vehicle.
38. Install the transaxle mount bracket to the transaxle, and tighten the mounting nuts to 32 ft. lbs. (43 Nm).
39. Install the rear roll stopper mounting bracket.
40. Remove the engine support. Tighten the transaxle mount through-bolt to 51 ft. lbs. (69 Nm) and tighten the front engine roll stopper through-bolt.
41. Install the upper transaxle mounting bolts and tighten to 35 ft. lbs. (48 Nm).
42. Install the starter motor.
43. Attach the backup light switch and the speedometer connector.
44. Connect the select and shift cables and install new cotter pins.
45. Install the air cleaner and the air intake hose.
46. Connect the negative battery cable.
47. Make sure the vehicle is level, and refill the transaxle.
48. Check the transaxle for proper operation. Make sure the reverse lights come on when in reverse.

Halfshafts

REMOVAL & INSTALLATION

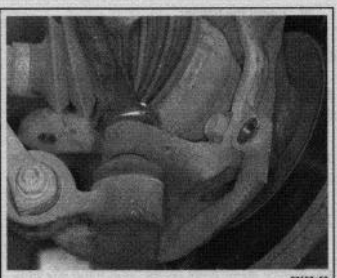
◗ See Figures 1 thru 13

93157p03

Fig. 1 Remove the cotter pin from the axle shaft . . .

93157p02

Fig. 2 . . . then loosen the axle nut while the vehicle is still on the ground



93158p50

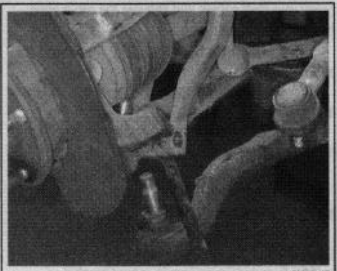
Fig. 3 Use a suitable wrench to loosen . . .

93158p49

Fig. 4 . . . the nuts from the lower ball joint-to-steering knuckle junctions

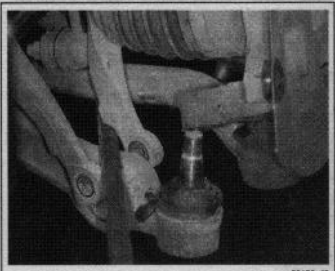
93158p48

Fig. 5 Remove the lower coil-over shock lower mounting bolt and nut from the control arm



93158p47

Fig. 6 Use a suitable prytool to separate . . .



93158p43

Fig. 7 . . . the lower ball joints from the steering knuckle

93157p07

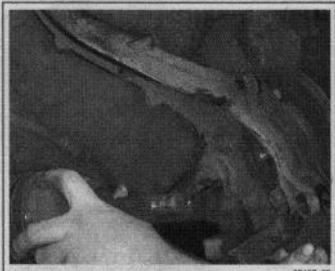
Fig. 8 Use a suitable prytool to release the inner CV-joint retaining ring from the transaxle by gently prying outward

93157p08

Fig. 9 Remove the inner joint from the transaxle until the spline completely clears the transaxle

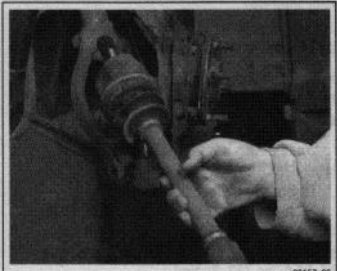
93157p09

Fig. 10 Using a suitable punch and hammer, gently tap the halfshaft out of the steering knuckle . . .



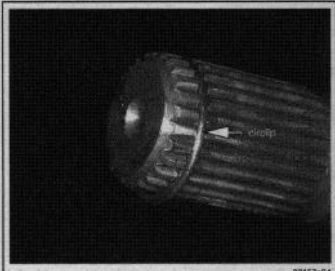
93157p05

Fig. 11 . . . then slide the halfshaft out of the knuckle



93157p06

Fig. 12 Remove the halfshaft from the vehicle



93157p04

Fig. 13 Always replace the circlip on the inner joint before installing the shaft into the transaxle

1. While the vehicle is still on the ground, remove the cotter pin, and loosen the axle nut.
2. Raise the vehicle and support it safely.
3. If equipped with ABS, remove the front wheel speed sensor.
4. If equipped with Active Electronic Control Suspension (Active-ECS), perform the following:
   a. Loosen the nut that secures the air line to the to the top of the strut and discard the O-ring.
   b. Remove the bolts that secure the actuator to the top of the strut and remove the component. Disconnect the wiring harness.
5. Disconnect the lower ball joint and the tie rod end from the steering knuckle.
6. Remove the axle nut and the washer.
7. If removing the left side axle with an inner shaft, remove the center support bearing bracket bolts and washers. Then, remove the halfshaft by setting up a puller on the outside wheel hub and pushing the halfshaft from the front hub. Tap the shaft union at the joint case with a plastic hammer to remove the halfshaft and inner shaft from the transaxle.
8. If removing right side axle shafts without an inner shaft, remove the halfshaft by setting up a puller on the outside wheel hub and pushing the halfshaft from the front hub. After pressing the outer shaft, insert a prybar between the transaxle case and the halfshaft and pry the shaft from the transaxle.

➡Do not pull on the shaft; doing so damages the inboard joint.

To install:

9. Replace the circlips on the ends of the halfshafts.
10. Insert the halfshaft into the transaxle. Be sure it is fully seated.
11. Pull the strut assembly out and install the other end to the hub.
12. Install the center bearing bracket bolts and tighten to 33 ft. lbs. (45 Nm).
13. Install the washer on the axle shaft so the chamfered edge faces outward. Install the axle nut, but do not tighten it fully at this time.
14. Connect the ball joint to the steering knuckle. Torque the new retaining nut to 43–52 ft. lbs. (60–72 Nm) and secure with a new cotter pin.
15. Connect the tie rod end to the steering knuckle. Torque the retaining nut to 21 ft. lbs. (29 Nm) and secure with a new cotter pin.
16. If equipped with ABS, install the front wheel speed sensor.
17. If equipped with Active-ECS, perform the following:
   a. Install the air line with a new O-ring.
   b. Install the actuator to the top of the strut.

   Connect the wiring harness.
18. Install the wheel and lower the vehicle to the floor.
19. Tighten the axle nut to 145–188 ft. lbs. (200–260 Nm) and secure with a new cotter pin.

CV-JOINTS OVERHAUL

See Figures 14 thru 27

These vehicles use several different types of joints. Engine size, transaxle type, whether the joint is an inboard or outboard joint, even which side of the vehicle is being serviced could make a difference in joint type. Be sure to properly identify the joint before attempting joint or boot replacement. Look for identification numbers at the large end of the boots and/or on the end of the metal retainer bands.

The 3 types of joints used are the Birfield Joint, (B.J.), the Tripod Joint (T.J.) and the Double Offset Joint (D.O.J.).

➡Do not disassemble a Birfield joint. Service with a new joint or clean and repack using a new boot kit.

The distance between the large and small boot bands is important and should be checked prior to and after boot service. This is so the boot will not be installed either too loose or too tight, which could cause early wear and cracking, allowing the grease to get out and water and dirt in, leading to early joint failure.

➡The driveshaft joints use special grease; do not add any grease other than that supplied with the kit.

Double Offset Joint

The Double Offset Joint (D.O.J.) is bigger than other joints and, in these applications, is normally used as an inboard joint.

1. Remove the halfshaft from the vehicle.
2. Side cutter pliers can be used to cut the metal retaining bands. Remove the boot from the joint outer race.


TCCS7030

Fig. 14 Check the CV-boot for wear

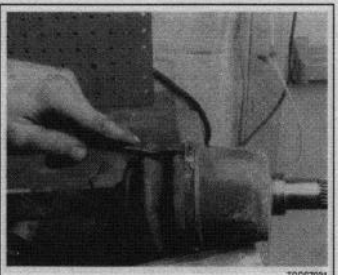

TCCS7031

Fig. 15 Removing the outer band from the CV-boot


TCCS7032

Fig. 16 Removing the inner band from the CV-boot


TCCS7033

Fig. 17 Removing the CV-boot from the joint housing


TCCS7034

Fig. 18 Clean the CV-joint housing prior to removing boot


TCCS7035

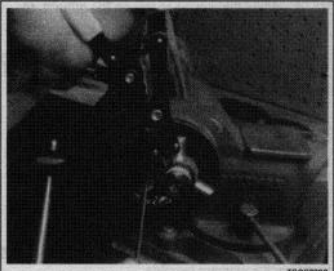
Fig. 19 Removing the CV-joint housing assembly

TCCS7036

Fig. 20 Removing the CV-joint

TCCS7037

Fig. 21 Inspecting the CV-joint housing



TCCS7038

Fig. 22 Removing the CV-joint outer snapring

TCCS7039

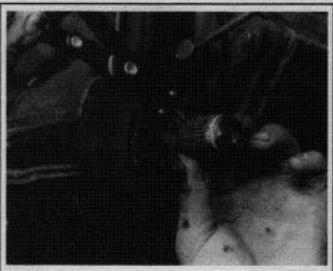
Fig. 23 Checking the CV-joint snapring for wear

TCCS7040

Fig. 24 CV-joint snapring (typical)

TCCS7041

Fig. 25 Removing the CV-joint assembly



TCCS7042

Fig. 26 Removing the CV-joint inner snapring

TCCS7043

Fig. 27 Installing the CV-joint assembly (typical)

3. Locate and remove the large circlip at the base of the joint. Remove the outer race (the body of the joint).

4. Remove the small snapring and take off the inner race, cage and balls as an assembly. Clean the inner race, cage and balls without disassembling.

5. If the boot is to be reused, wipe the grease from the splines and wrap the splines in vinyl tape before sliding the boot from the shaft.

6. Remove the inner (D.O.J.) boot from the shaft. If the outer (B.J.) boot is to be replaced, remove the boot retainer rings and slide the boot down and off of the shaft at this time.

To install:

7. Be sure to tape the shaft splines before installing the boots. Fill the inside of the boot with the specified grease. Often the grease supplied in the replacement parts kit is meant to be divided in half, with half being used to lubricate the joint and half being used inside the boot.

8. Install the cage onto the halfshaft so the small diameter side of the cage is installed first. With a brass drift pin, tap lightly and evenly around the inner race to install the race until it comes into contact with the rib of the shaft. Apply the specified grease to the inner race and cage and fit them together. Insert the balls into the cage.

9. Install the outer race (the body of the joint) after filling with the specified grease. The outer race should be filled with this grease.

10. Tighten the boot bands securely. Make sure the distance between the boot bands is correct.

11. Install the halfshaft to the vehicle.

Except Double Offset Joint

1. Disconnect the negative battery cable. Remove the halfshaft.

2. Use side cutter pliers to remove the metal retaining bands from the boot(s) that will be removed. Slide the boot from the T.J. case.

3. Remove the snapring and the tripod joint spider assembly from the halfshaft. Do not disassemble the spider and use care in handling.

4. If the boot is be reused, wrap vinyl tape around the spline part of the shaft so the boot(s) will not be damaged when removed. Remove the dynamic damper, if used, and the boots from the shaft.

To install:

5. Double check that the correct replacement parts are being installed. Wrap vinyl tape around the splines to protect the boot and install the boots and damper, if used, in the correct order.

6. Install the joint spider assembly to the shaft and install the snapring.

7. Fill the inside of the boot with the specified grease. Often the grease supplied in the replacement parts kit is meant to be divided in half, with half being used to lubricate the joint and half being used inside the boot. Keep grease off the rubber part of the dynamic damper (if used).

8. Secure the boot bands with the halfshaft in a horizontal position. Make sure distance between boot bands is correct.

9. Install the halfshaft to the vehicle and reconnect the negative battery cable.

CLUTCH

Understanding the Clutch

⁂ CAUTION

The clutch driven disc may contain asbestos, which has been determined to be a cancer causing agent. Never clean clutch surfaces with compressed air! Avoid inhaling any dust from any clutch surface! When cleaning clutch surfaces, use a commercially available brake cleaning fluid.

The purpose of the clutch is to disconnect and connect engine power at the transaxle. A vehicle at rest requires a lot of engine torque to get all that weight moving. An internal combustion engine does not develop a high starting torque (unlike steam engines) so it must be allowed to operate without any load until it builds up enough torque to move the vehicle. Torque increases with engine rpm. The clutch allows the engine to build up torque by physically disconnecting the engine from the transaxle, relieving the engine of any load or resistance.

The transfer of engine power to the transaxle (the load) must be smooth and gradual; if it weren't, drive line components would wear out or break quickly. This gradual power transfer is made possible by gradually releasing the clutch pedal. The clutch disc and pressure plate are the connecting link between the engine and transaxle. When the clutch pedal is released, the disc and plate contact each other (the clutch is engaged) physically joining the engine and transaxle. When the pedal is pushed inward, the disc and plate separate (the clutch is disengaged) disconnecting the engine from the transaxle.

Most clutches utilize a single plate, dry friction disc with a diaphragm-style spring pressure plate. The clutch disc has a splined hub which attaches the disc to the input shaft. The disc has friction material where it contacts the flywheel and pressure plate. Torsion springs on the disc help absorb engine torque pulses. The pressure plate applies pressure to the clutch disc, holding it tight against the surface of the flywheel. The clutch operating mechanism consists of a release bearing, fork and cylinder assembly.

The release fork and actuating linkage transfer pedal motion to the release bearing. In the engaged position (pedal released) the diaphragm spring holds the pressure plate against the clutch disc, so engine torque is transmitted to the input shaft. When the clutch pedal is depressed, the release bearing pushes the diaphragm spring center toward the flywheel. The diaphragm spring pivots the fulcrum, relieving the load on the pressure plate. Steel spring straps riveted to the clutch cover lift the pressure plate from the clutch disc, disengaging the engine drive from the transaxle and enabling the gears to be changed.

The clutch is operating properly if:

- It will stall the engine when released with the vehicle held stationary.
- The shift lever can be moved freely between 1st and reverse gears when the vehicle is stationary and the clutch disengaged.

Driven Disc and Pressure Plate

REMOVAL & INSTALLATION

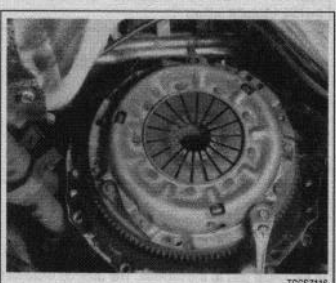
Galant and Mirage

See Figures 28 thru 41

⁂ CAUTION

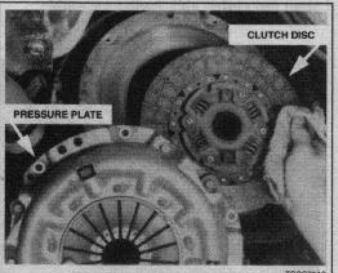
The clutch driven disc may contain asbestos, which has been determined to be a cancer causing agent. Never clean clutch surfaces with compressed air! Avoid inhaling any dust from any clutch surface! When cleaning clutch surfaces, use a commercially available brake cleaning fluid.

1. Disconnect the negative battery cable.
2. Raise and safely support the vehicle.
3. Remove the transaxle assembly from the vehicle. Refer to the procedure earlier in this section.
4. Remove the pressure plate attaching bolts, pressure plate and clutch disc. If the pressure plate is to be reused, loosen the bolts in a diagonal pattern, 1 or 2 turns at a time. This will prevent warping the clutch cover assembly.
5. Remove the return clip and the pressure plate release bearing. Do not use solvent to clean the bearing.
6. Inspect the clutch release fork and fulcrum for



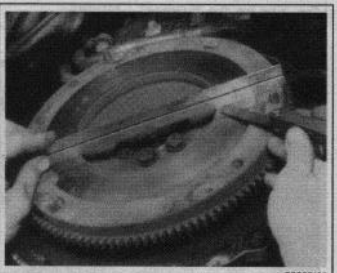
TCCS7116

Fig. 28 Loosen and remove the clutch and pressure plate bolts evenly, a little at a time . . .



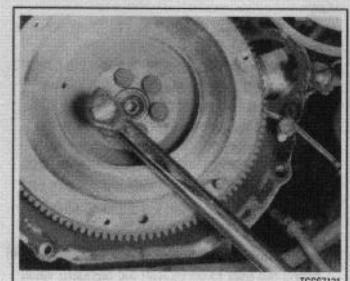
TCCS7118

Fig. 29 . . . then carefully remove the clutch and pressure plate assembly from the flywheel



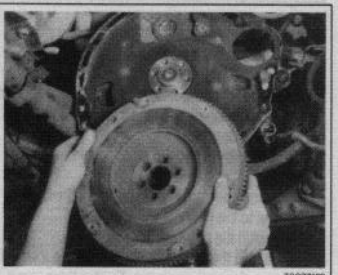
TCCS7125

Fig. 30 Check across the flywheel surface, it should be flat



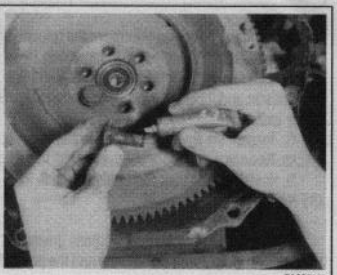
TCCS7121

Fig. 31 If necessary, lock the flywheel in place and remove the retaining bolts . . .



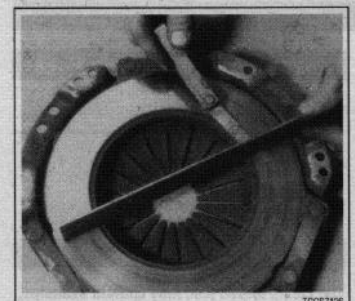
TCCS7122

Fig. 32 . . . then remove the flywheel from the crankshaft in order replace it or have it machined



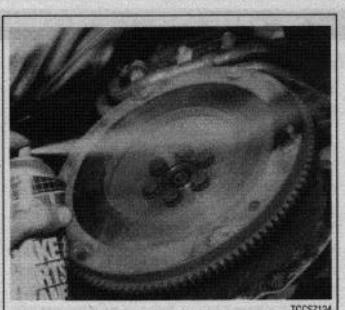
TCCS7123

Fig. 33 Upon installation, it is usually a good idea to apply a threadlocking compound to the flywheel bolts



TCCS7126

Fig. 34 Check the pressure plate for excessive wear



TCCS7124

Fig. 35 Be sure that the flywheel surface is clean, before installing the clutch

TCCS7142

Fig. 36 Typical clutch alignment tool, note how the splines match the transaxle's input shaft

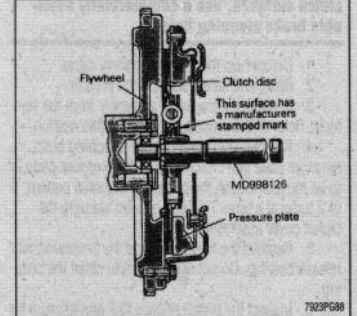


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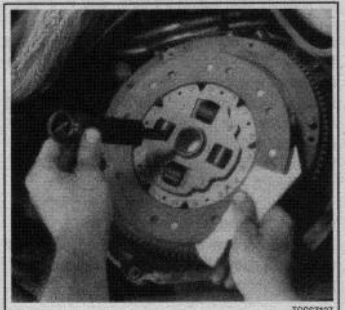
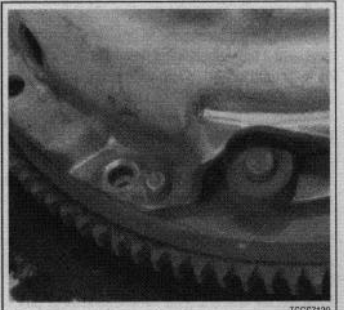
Fig. 37 Use the alignment dowel to center the disc on the flywheel—Mirage



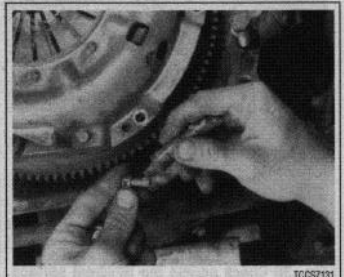
TCCS7127

Fig. 38 Use the clutch alignment tool to align the clutch disc during assembly



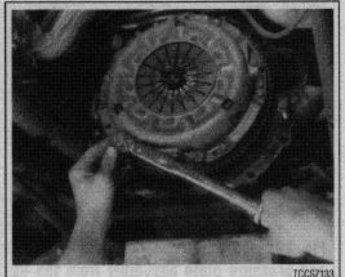
TCCS7130

Fig. 39 Pressure plate-to-flywheel bolt holes should align



TCCS7131

Fig. 40 You may want to use a threadlocking compound on the clutch assembly bolts



TCCS7133

Fig. 41 Be sure to use a torque wrench to tighten all bolts

damage or wear. If necessary, remove the release fork and unthread the fulcrum from the transaxle.

7. Carefully inspect the condition of the clutch components and replace any worn or damaged parts.

To install:

8. Inspect the flywheel for heat damage or cracks. Resurface or replace the flywheel as required.
9. Install the fulcrum and tighten to 25 ft. lbs. (35 Nm).
10. Install the release fork.
11. Apply a coating of multi-purpose grease to the point of contact with the fulcrum and the point of contact with the release bearing.
12. Apply a coating of multi-purpose grease to the end of the release cylinder pushrod and the pushrod hole in the release fork.
13. Apply multi-purpose grease to the clutch release bearing. Pack the bearing inner surface and the groove with grease. Do not apply grease to the resin portion of the bearing.
14. Place the bearing in position and install the return clip.
15. Using the proper alignment tool, install the clutch disc to the flywheel.
16. Install the pressure plate assembly.
17. Install the retainer bolts and tighten a little at a time, in a diagonal sequence. Tighten them to a final torque of 14 ft. lbs. (19 Nm) on 1994–98 Galant models and 16 ft. lbs. (22 Nm) on all other models. Remove the aligning tool.
18. Install the transaxle assembly.
19. Check for proper clutch operation.

ADJUSTMENTS

Pedal Free Play

1. Measure the clutch pedal height from the face of the pedal pad to the firewall. The desired distances are as follows:
   a. Mirage—6.61–6.8 in. (168–171mm)
   b. Galant —6.93–7.17 in. (176–182mm)
2. Measure the clutch pedal clevis pin play at the face of the pedal pad. The standard values are as follows:
   a. Mirage—0.04–0.12 in. (1–3mm)
   b. Galant—0.04–0.12 in. (1–3mm)
3. If the clutch pedal height or clevis pin play are not within the standard values, adjust as follows:
   a. For vehicles without cruise control, turn and adjust the bolt so the pedal height is the standard value, then tighten the locknut.
   b. For vehicles with the auto-cruise control system, detach the clutch switch connector and turn the switch to obtain the standard clutch pedal height. Then, lock with the locknut.
   c. Turn the pushrod to adjust the clutch pedal clevis pin play to agree with the standard value and secure the pushrod with the locknut.

When adjusting the clutch pedal height or the clutch pedal clevis pin play, be careful not to push the pushrod toward the master cylinder.

d. Check that when the clutch pedal is depressed all the way, the interlock switch switches over from ON to OFF.

Clutch Cable

ADJUSTMENT

See Figure 42

The following adjustment is for the cable actuated clutch system on the Mirage. The Hydraulic systems on all other models are self-adjusting.

1. Measure the clutch pedal height (measurement A). The specification is 6.38–6.50 in. (162–165mm).

The clutch pedal height is not adjustable. If not within specifications, part replacement is required.

2. Depress clutch pedal several times and check the pedal free-play (measurement B).
3. If measurement is not 0.67–0.87 in. (17–22mm), adjustment is required.
4. To adjust, turn the outer cable adjusting nut, located at the firewall, until free-play is within range.
5. Depress the clutch pedal several times and recheck the measurement.

REMOVAL AND INSTALLATION

1. Rotate the adjusting wheel counterclockwise to loosen the cable.
2. Remove the cable retaining clamps.
3. Remove the cotter pin from the clutch actuating arm at the transaxle and disconnect the cable.
4. Disconnect the cable at the pedal and remove the cable from the vehicle.

In order to prevent cable binding or abrasion, be sure to take note of the cable routing, so that it can be reinstalled in the same position.

To install:

5. Route the cable and make the connection at the clutch pedal.
6. Make the connection at the transaxle and secure the cable with the retaining clamp. Install a new cotter pin.
7. Lubricate all pivot points.
8. Adjust the cable to achieve proper free-play.

Clutch Master Cylinder

REMOVAL & INSTALLATION

1. Disconnect the negative battery cable.
2. Remove necessary underhood components in order to gain access to the clutch master cylinder.

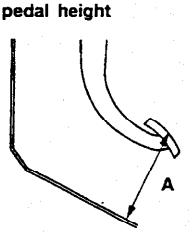


Fig. 42 Clutch pedal height (A) measurement—Mirage

3. Place a suitable drain pan under the vehicle to catch the fluid once the line is disconnected, or place a rag or shop towel under the fluid line of the master cylinder.
4. Loosen the line at the cylinder and allow the fluid to drain.

WARNING

Clean, high quality brake fluid is essential to the safe and proper operation of the brake system. You should always buy the highest quality brake fluid that is available. If the brake fluid becomes contaminated, drain and flush the system, then refill the master cylinder with new fluid. Never reuse any brake fluid. Any brake fluid that is removed from the system should be discarded. Also, do not allow any brake fluid to come in contact with a painted surface; it will damage the paint.

5. Remove the clevis pin retainer at the clutch pedal and remove the washer and clevis pin.
6. Remove the 2 nuts and pull the cylinder from the firewall. A seal should be between the mounting flange and firewall. This seal should be replaced.
7. The installation is the reverse of the removal procedure.
8. Lubricate all pivot points with grease.
9. Bleed the system at the slave cylinder using DOT 3 brake fluid and check the adjustment of the clutch pedal.

Clutch Slave Cylinder

REMOVAL & INSTALLATION

1. Disconnect the negative battery cable.
2. Remove necessary underhood components in order to gain access to the clutch release cylinder.
3. Place a suitable drain pan under the vehicle, then remove the hydraulic line and allow the system to drain.

WARNING

Clean, high quality brake fluid is essential to the safe and proper operation of the brake system. You should always buy the highest quality brake fluid that is available. If the brake fluid becomes contaminated, drain and flush the system, then refill the master cylinder with new fluid. Never reuse any brake fluid. Any brake fluid that is removed from the system should be discarded. Also, do not allow any brake fluid to come in contact with a painted surface; it will damage the paint.

4. Remove the bolts and pull the cylinder from the transaxle housing. On some 1.5L engines, instead of a pushrod bearing against the clutch arm, a clevis pin and yoke is used. Simply remove the circlip, pull out the clevis pin and remove the cylinder.
5. The installation is the reverse of the removal procedure.
6. Lubricate all pivot points with grease.
7. Bleed the system using DOT 3 brake fluid.

HYDRAULIC SYSTEM BLEEDING

See Figure 43

With Hydraulic Clutch

1. Fill the reservoir with clean brake fluid meeting DOT 3 specifications.

WARNING

Clean, high quality brake fluid is essential to the safe and proper operation of the brake system. You should always buy the highest quality brake fluid that is available. If the brake fluid becomes contaminated, drain and flush the system, then refill the master cylinder with new fluid. Never reuse any brake fluid. Any brake fluid that is removed from the system should be discarded. Also, do not allow any brake fluid to come in contact with a painted surface; it will damage the paint.

2. Press the clutch pedal to the floor, then open the bleeder screw on the slave cylinder.
3. Tighten the bleed screw and release the clutch pedal.
4. Repeat the procedure until the fluid is free of air bubbles.

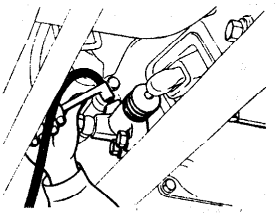


Fig. 43 Bleeding a typical clutch hydraulic system

AUTOMATIC TRANSAXLE

Understanding the Automatic Transaxle

The automatic transaxle allows engine torque and power to be transmitted to the front wheels within a narrow range of engine operating speeds. It will allow the engine to turn fast enough to produce plenty of power and torque at very low speeds, while keeping it at a sensible rpm at high vehicle speeds (and it does this job without driver assistance). The transaxle uses a light fluid as the medium for the transmission of power. This fluid also works in the operation of various hydraulic control circuits and as a lubricant. Because the transaxle fluid performs all of these functions, trouble within the unit can easily travel from one part to another. For this reason, and because of the complexity and unusual operating principles of the transaxle, a very sound understanding of the basic principles of operation will simplify troubleshooting.

Fluid Pan

REMOVAL & INSTALLATION

Pan removal, fluid and filter changes are covered in Section 1 of this manual.

Park/Neutral Position Switch

REMOVAL & INSTALLATION

1990–97 Mirage and 1990–93 Galant

See Figure 44

1. Disconnect the negative battery cable.
2. Disconnect the selector cable from the lever.
3. Remove the two retaining screws and lift off the switch.

To install:

4. Mount and position new switch. Do not tighten the bolts until the switch is adjusted.
5. Connect selector cable and adjust switch.
6. After installation and adjustment make sure the engine only starts in the **P** and **N** selections. Also check that the reverse lights operate only in the **R** selection.

1994–00 Galant and 1998–00 Mirage

See Figure 44

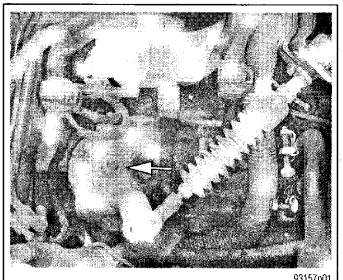


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Fig. 44 Typically, the park/neutral position switch is located on the top of the transaxle

1. Disconnect the negative battery cable.
2. Remove the nut attaching the shift control cable from the transaxle manual shaft lever. Position the control cable out of the way.
3. Place the manual shaft lever in the Neutral position, remove the nut and the manual shaft lever.
4. Detach the park/neutral switch electrical connector.
5. Remove the park/neutral switch mounting bolts and remove the switch from the transaxle manual shaft.

To install:

6. Install the park/neutral switch to the transaxle manual shaft and install the switch mounting bolts. Do not tighten the mounting bolts until the switch is adjusted.
7. Install the manual shaft lever to the park/neutral switch with the nut. Make sure that the shaft lever is in the Neutral position.
8. Adjust the switch in the following manner: turn the switch body until the hole in the body of the switch aligns with the hole in the manual shaft lever. Insert a drill bit or equivalent into the holes. Tighten the switch mounting bolts to 8 ft. lbs. (11 Nm).
9. Attach the electrical connector.
10. Install the control cable to the manual shaft lever with the nut. Adjust the cable so that there is no slack in the cable and that the selector lever moves smoothly.
11. Reconnect the negative battery cable. Check for proper starting and proper reverse light operation.

Diamante

See Figure 44

1. Disconnect the negative battery cable.

CAUTION

Wait at least 90 seconds after the negative battery cable is disconnected to prevent possible deployment of the air bag.

2. Disconnect the selector cable from the lever.
3. Remove the two retaining screws and lift off the switch.

To install:

4. Install the lever, tighten the bolts only hand tight.
5. Rotate switch body so the manual control lever 0.20 inch (5mm) hole and the switch body 0.20 inch (5mm) holes are aligned.
6. Tighten the mounting bolts to 7–8 ft. lbs. (10–12 Nm).
7. Connect the selector cable to the lever.
8. Connect the negative battery cable.
9. After installation and adjustment make sure the engine only starts in the **P** and **N** selections. Also check that the reverse lights operate only in the **R** selection.

ADJUSTMENT

1990–97 Mirage and 1990–93 Galant

1. Disconnect the negative battery cable and locate the neutral safety switch on the top of the transaxle.

➡Apply parking brake and chock wheels before placing transaxle into the N position

2. At the transmission, loosen the shift cable adjustment nut. Inside the vehicle place the gearshift selector lever in **N**.
3. Place the manual shift control lever in **N**.
4. Loosen neutral safety switch mounting screws and rotate switch body so the manual control lever 0.20 in. (5mm) hole and the switch body 0.20 in. (5mm) holes are aligned.
5. Tighten switch body mounting bolts to 7–8 ft. lbs. (10–12 Nm).
6. At the shift cable adjusting nut, gently pull cable to remove any slack. Tighten locknut to 8 ft. lbs. (12 Nm).
7. Verify that the switch lever moves to positions corresponding to each position of the selector lever. Connect the negative battery terminal.
8. Make sure the engine only starts in the **P** and **N** positions. Also make sure the reverse lights operate only in **R** selection.

Automatic Transaxle Assembly

REMOVAL & INSTALLATION

Diamante

See Figures 45, 46, 47, and 48

1. Properly disarm the SRS system (air bag). Refer to Section 6.
2. Raise and safely support the vehicle.
3. Remove the front wheels.
4. Remove the engine side cover and undercovers.
5. Drain the transaxle assembly into a suitable container.
6. If equipped, remove the front catalytic converter.
7. Remove the exhaust pipe, main muffler and catalytic converter.
8. Disconnect the tie rod end and ball joint from the steering knuckle.
9. Unbolt the support bearing for the left side halfshaft.
10. Remove the halfshafts by inserting a prybar between the transaxle case and the driveshaft and prying the shaft from the transaxle.
11. Remove the air cleaner assembly and adjoining duct work.
12. Detach the engine harness connection.
13. If the vehicle is equipped with Active Electronic Controlled Suspension (Active-ECS), remove the compressor assembly from the transaxle and suspend with wire. Do not allow the compressor to hang from the air hose.
14. If equipped, remove the roll stopper stay bracket.
15. Disconnect the speedometer cable from the transaxle.
16. Remove the clip that secures the shifter and disconnect the shifter control cable from the transaxle.
17. Disconnect and plug the oil cooler hoses from the transaxle.
18. Detach the following:

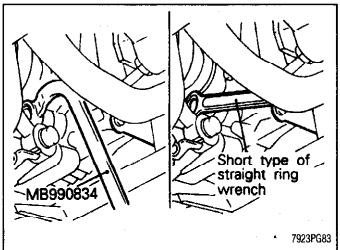


Fig. 45 Location of 4-wheel steering oil pump mounting bolts—Diamante with a F4A33 automatic transaxle

- Park/neutral switch electrical harness
- Kickdown servo switch
- Pulse generator
- Oil temperature sensor electrical harness
- Shift control solenoid valve harness.

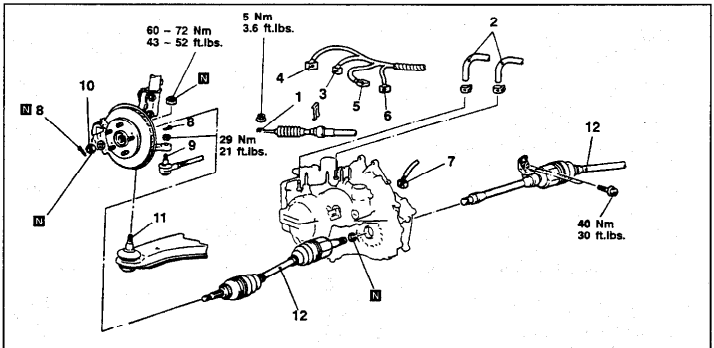
19. Support the transaxle and remove the transaxle mounting bracket.
20. Remove the three upper transaxle-to-engine mounting bolts.
21. For vehicles with 4WS, remove the heat shield for the 4WS oil pump and remove the pump. Do not allow the pump to hang from the oil hoses.
22. For vehicles equipped with Active-ECS, disconnect the height sensor rod from the lower control arm.
23. Remove the bolt that secures the Heated Oxygen (HO_2S) sensor harness to the right side crossmember.
24. Remove the starter assembly.
25. Remove the mounting brackets for access to the bell housing cover.
26. Remove the bell housing/oil pan covers assembly.
27. Remove the bolts holding the flexplate to the torque converter.
28. Remove the lower transaxle to engine bolts and remove the transaxle assembly.

To install:

29. Install the transaxle assembly to the engine block, install the mounting bolts and tighten to 54 ft. lbs. (75 Nm).
30. Install the bolts that secure the torque converter to the driveplate. Tighten the bolts to 34–38 ft. lbs. (46–53 Nm).
31. Install the bell housing/oil pan covers.
32. Install the transaxle stay brackets that were removed for access to the bell housing cover.
33. Install the starter assembly and connect the wiring.
34. Install the bolt that secures the HO_2S sensor harness to the right side crossmember and tighten the bolt to 7–9 ft. lbs. (10–12 Nm).
35. For vehicles equipped with Active-ECS, connect the height sensor rod from the lower control arm. Check the height sensor rod for a length (A) of 10.59–10.63 in. (269–270mm).
36. If removed, install the 4WS oil pump and tighten the mounting bolts to 17 ft. lbs. (24 Nm).
37. If removed, install the 4WS oil pump heat shield and tighten the mounting bolts to 17 ft. lbs. (24 Nm).
38. Install the three upper transaxle-to-engine mounting bolts. Tighten the mounting bolts to 54 ft. lbs. (75 Nm).

➨One of the upper bolts has a grounding strap to secure under the bolt.

39. Install and connect the transaxle mounting bracket. Tighten the mounting nut and bolts to 51 ft. lbs. (70 Nm).
40. Connect the shift control solenoid valve harness.
41. Connect the kickdown servo switch, pulse generator and oil temperature sensor electrical harness.
42. Connect the park/neutral switch electrical harness.
43. Using new hose clamps, install the oil cooler hoses to the transaxle.
44. Install shifter control cable to the transaxle and secure the cable with clip.
45. Connect the speedometer cable to the transaxle.
46. If removed, install the roll stopper stay bracket and tighten the one through nut and bolt to 36–43 ft. lbs. (50–60 Nm). Tighten the two mounting bolts to 16 ft. lbs. (22 Nm).
47. If removed, install the Active-ECS compressor assembly. Tighten the mounting bolts to 48 inch lbs. (5 Nm) and connect the electrical harness.
48. Attach the engine harness connection.
49. Install the air cleaner assembly and adjoining duct work.
50. Using new circlips, install the halfshafts and seat halfshafts into the transaxle. Install the bolt that secure the left side support bearing and tighten the bolts to 33 ft. lbs. (45 Nm).
51. Connect the ball joint and tie rod end to the steering knuckle. Using new nuts, tighten the ball joint castle nut to 43–52 ft. lbs. (60–72 Nm) and tighten the tie rod castle nut to 22 ft. lbs. (30 Nm). Install new cotter pins.
52. Using new gaskets, install the exhaust system.
53. If removed, install front catalytic converter.
54. Install the engine undercovers.
55. Connect the negative battery cable.
56. Fill the transaxle to the correct level.
57. Start the engine and check for leaks.



Removal steps

1. Transaxle control cable connection
2. Transaxle oil cooler hoses connection
3. PNP switch connector
4. A/T control solenoid valve connector
5. Input shaft speed sensor connector
6. Output shaft speed sensor connector
7. Vehicle speed sensor connector
8. Split pin
9. Connection of the tie rod end
10. Drive shaft nut
11. Connection for the lower arm ball joint
12. Drive shaft and inner shaft assembly (RH) and the drive shaft (LH)

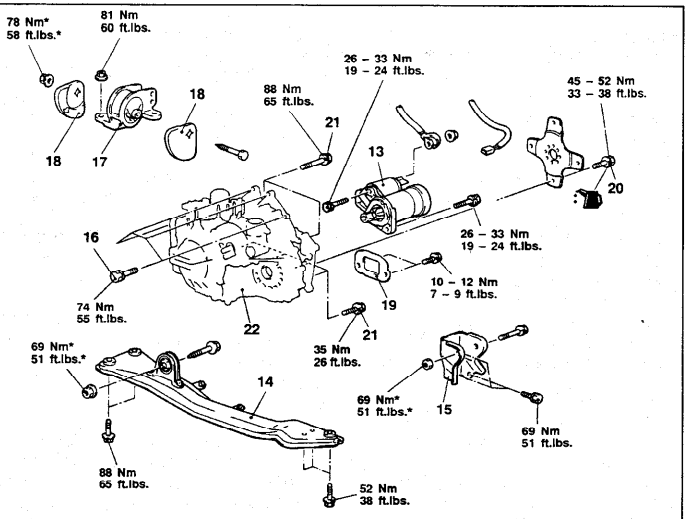
Caution
Mounting locations marked by * should be provisionally tightened, and then fully tightened when the body is supporting the full weight of the engine.

Fig. 46 Transaxle removal (1 of 2)—Diamante with F4A51 transaxle

Galant

1990–1993 MODELS

1. On vehicles equipped with auto-cruise, remove the control actuator and bracket.
2. If equipped with an active ECS, disconnect the air compressor.
3. Drain the transaxle fluid into a suitable container.
4. Remove the air cleaner assembly, intercooler and air hose, as required.
5. Mark the shift cable. Remove the adjusting nut and disconnect the shift cable.
6. Tag and detach the electrical connectors for the solenoid, neutral safety switch (inhibitor switch), the pulse generator kickdown servo switch and oil temperature sensor.
7. Disconnect the speedometer cable and oil cooler lines.
8. Disconnect the wires to the starter motor and remove the starter.
9. Remove the upper transaxle to engine bolts.
10. Support the transaxle and remove the transaxle mounting bracket.
11. Raise the vehicle and support safely. Remove the sheet metal under guard.
12. Remove the tie rod ends and the ball joints from the steering knuckle.
13. Remove the halfshafts by inserting a prybar between the transaxle case and the driveshaft and prying the shaft from the transaxle. Do not pull on the driveshaft. Doing so damages the inboard joint. Use



Lifting up of the vehicle

13. Starter motor
14. Center member assembly
15. Rear roll stopper bracket
16. Transaxle upper portion fixing bolt
17. Transaxle mounting bracket
18. Transaxle mount stopper
    * Support the engine and transaxle assembly
19. Bell housing cover
20. Drive plate attaching bolt
21. Transaxle lower portion fixing bolt
22. Transaxle assembly

Caution
Mounting locations marked by * should be provisionally tightened, and then fully tightened when the body is supporting the full weight of the engine.

7923PG85

Fig. 47 Transaxle removal (2 of 2)—Diamante with F4A51 transaxle

the prybar. Do not insert the prybar so far the oil seal in the case is damaged. Tie the halfshafts aside.

14. On AWD vehicles, disconnect the exhaust pipe and remove the transfer case.

15. Remove the lower bellhousing cover and remove the special bolts holding the flexplate to the torque converter. To remove, turn the engine crankshaft with a box wrench and bring the bolts into a position appropriate for removal, one at a time. After removing the bolts, push the torque converter toward the transaxle so it doesn't stay on the engine allowing oil to pour out the converter hub or cause damage to the converter.

16. Remove the lower transaxle to engine bolts and remove the transaxle assembly.

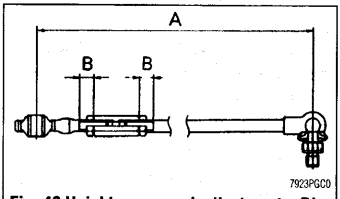


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Fig. 48 Height sensor rod adjustment—Diamante with a F4A33 automatic transaxle

To install:

17. After the torque converter has been mounted on the transaxle, install the transaxle assembly on the engine. Tighten the driveplate bolts to 34–38 ft. lbs. (46–53 Nm). Tighten the transaxle-to-engine bolts to 35 ft. lbs. (48 Nm). Install the bellhousing cover.

18. On AWD vehicles, install the transfer case and frame pieces. Connect the exhaust pipe using a new gasket.

19. Replace the circlips and install the halfshafts to the transaxle.

20. Install the tie rods and ball joint to the steering arm.

21. Install the transaxle mounting bracket.

22. Install the under guard.

23. Install the starter.

24. Connect the speedometer cable and oil cooler lines.

25. Connect the solenoid, neutral safety switch (inhibitor switch), the pulse generator kickdown servo switch and oil temperature sensor.

26. Install the shift control cable.

27. Install the air hose, intercooler and air cleaner assembly.

28. If equipped with an active ECS, connect the air compressor.

29. If equipped with auto-cruise, install the control actuator and bracket.

30. Refill with Dexron II, Mopar ATF Plus type 7176, Mitsubishi Plus ATF or equivalent, automatic transaxle fluid. If vehicle is AWD check and fill the transfer case.

31. Start the engine and allow to idle for 2 minutes. Apply parking brake and move selector through each gear position, ending in **N**. Recheck fluid level and add if necessary. Fluid level should be between the marks in the HOT range.

1994–00 MODELS

1. Disconnect the negative battery cable.
2. Remove the air cleaner and intake hoses.
3. Drain the transaxle into a suitable waste container.
4. Remove the nut securing the shifter lever to the transaxle. Remove the cable retaining clip and remove the cable from the transaxle.
5. Remove the shifter cable mounting bracket.
6. Tag and detach the electrical connectors for the speedometer, solenoid, neutral safety switch (inhibitor switch), the pulse generator, kickdown servo switch, and the oil temperature sensor.
7. Tag and disconnect the oil cooler lines at the transaxle.
8. Remove the bolt securing the fluid dipstick tube to the transaxle. Remove the dipstick and tube from the transaxle.
9. Remove the starter motor and position it aside.
10. Using special tool MZ203827 or equivalent, support the engine assembly.
11. Remove the rear roll stopper mounting bracket.
12. Remove the transaxle mount bracket.
13. Remove the upper transaxle mounting bolts.
14. Raise and safely support the vehicle.
15. Remove the front wheel assemblies.
16. Remove the right hand undercover.
17. Remove and discard the cotter pin, then disconnect the tie rod end from the steering knuckle.
18. Disconnect the stabilizer bar link from the damper fork.
19. Disconnect the damper fork from the lateral lower control arm.
20. Disconnect the lateral lower arm, and the compression arm lower ball joints from the steering knuckle.
21. Pry the halfshafts from the transaxle, and secure aside.
22. Remove the cover from the transaxle bellhousing.
23. Remove the engine front roll stopper through-bolt.
24. Remove the crossmember and the triangular right hand stay.
25. Remove the bolts holding the flexplate to the torque converter with a box wrench. Rotate the engine to bring the bolts into a position appropriate for removal, one at a time. After removing the bolts, push the torque converter toward the transaxle. This will prevent the converter from remaining intact with the engine, possibly damaging the converter.
26. Support the transaxle, using a transmission jack, and remove the transaxle lower coupling bolt.

➡The coupling bolt threads from the engine side, into the transaxle, and is located just above the halfshaft opening.

27. Slide the transaxle rearward and carefully lower it from the vehicle.

To install:

28. After the torque converter has been mounted on the transaxle, install the transaxle assembly to the engine. Install the mounting bolts and tighten to 35 ft. lbs. (48 Nm).

29. Install the transaxle lower coupling bolt and tighten to 21–25 ft. lbs. (29–34 Nm).

30. Connect the torque converter to the flexplate and tighten the bolts to 33–38 ft. lbs. (45–52 Nm).

31. Install the cover to the transaxle bellhousing and tighten the mounting bolts to 7 ft. lbs. (9 Nm).

32. Install the crossmember and tighten the front mounting bolts to 65 ft. lbs. (88 Nm) and the rear bolt to 54 ft. lbs. (73 Nm). Install the front engine roll stopper through-bolt and lightly tighten. Once the full weight of the engine is on the mounts, tighten the bolt to 42 ft. lbs. (57 Nm).

33. Install the triangular stay bracket and tighten the mounting bolts to 65 ft. lbs. (88 Nm).

34. Install the halfshafts, using new circlips on the axle ends.

⁂ WARNING

When installing the axleshaft, keep the inboard joint straight in relation to the axle, so as not to damage the oil seal lip of the transaxle with the serrated part of the halfshaft.

35. Connect the tie rod and ball joints to the steering knuckle. Tighten the ball joint self-locking nuts to 48 ft. lbs. (65 Nm). Tighten the tie rod end nut to 21 ft. lbs. (28 Nm) and secure with a new cotter pin.

36. Connect the damper fork to the lower control arm and tighten the through-bolt to 65 ft. lbs. (88 Nm).

37. Connect the stabilizer link to the damper fork, and tighten the self-locking nut to 29 ft. lbs. (39 Nm).

38. Install the undercover.

39. Install the wheels and carefully lower the vehicle.

40. Install the transaxle mount bracket to the transaxle, and tighten the mounting nuts to 32 ft. lbs. (43 Nm).

41. Install the rear roll stopper mounting bracket.

42. Remove the engine support. Tighten the transaxle mount through-bolt to 51 ft. lbs. (69 Nm) and tighten the front engine roll stopper through-bolt.

43. Install the upper transaxle mounting bolts and tighten to 35 ft. lbs. (48 Nm).

44. Install the starter motor.

45. Install the dipstick tube and the dipstick.

46. Install the shifter cable mounting bracket.

47. Connect the shifter lever and tighten the retaining nut to 14 ft. lbs. (19 Nm).

48. Connect the oil cooler lines and secure with clamps.

49. Attach the electrical connectors for the speedometer, solenoid, neutral safety switch (inhibitor switch), the pulse generator, kickdown servo switch and oil temperature sensor.

50. Install the air cleaner and the air intake hose.

51. Connect the negative battery cable.

52. Make sure the vehicle is level, and refill the transaxle. Start the engine and allow to idle for 2 minutes. Apply parking brake and move selector through each gear position, ending in **N**. Recheck fluid level and add if necessary. Fluid level should be between the marks in the HOT range.

53. Check the transaxle for proper operation. Make sure the reverse lights come on when in reverse and the engine starts only in **P** or **N**.

Mirage

➡If the vehicle is going to be rolled on its wheels while the halfshafts are out of the vehicle, obtain two outer CV-joints or proper equivalent tools and install to the hubs. If the vehicle is rolled without the proper torque applied to the front wheel bearings, the bearings will no longer be usable.

1. Disconnect the negative battery cable then the positive battery cable.
2. Remove the battery and battery tray.
3. Remove the air hose and air cleaner assembly.
4. Raise the vehicle and support safely.
5. Remove the under guard pan.
6. Drain the transaxle oil into a suitable container.
7. If equipped with 1.6L engine, remove the tension rod.
8. Disconnect the control cable and cooler lines.
9. On 3-speed transaxles, disconnect the throttle control cable.
10. On 4-speed transaxles, perform the following:
    a. Detach the shift control solenoid valve connector.
    b. Disconnect the inhibitor switch and kickdown servo switch.
    c. Disconnect the pulse generator and oil temperature sensor.
11. Disconnect the speedometer cable and remove the starter.
12. Remove the transaxle mounting bolts and bracket.
13. Disconnect the stabilizer bar from the lower control arm.
14. Disconnect the steering tie rod end and the ball joint from the steering arm.
15. Remove the halfshafts at the inboard side from the transaxle. Tie the joint assembly aside.

➡It is not necessary to disconnect the halfshafts from the wheel hubs.

16. Support the engine and remove the center member.
17. Remove the bellhousing cover and remove the driveplate bolts.
18. Remove the transaxle assembly lower connecting bolt, located just over the halfshaft opening.
19. Properly support the transaxle assembly, then lower it, moving it to the right for clearance.

To install:

20. After the torque converter has been mounted on the transaxle, install the transaxle assembly on the engine. Install the mounting bolts and tighten to 31–40 ft. lbs. (43–55 Nm) on 1990–92 models and 35 ft. lbs. (48 Nm) on 1993–00 models.
21. Tighten the driveplate bolts to 33–38 ft. lbs. (46–53 Nm). Install the bellhousing cover.
22. Install the center member.
23. Replace the circlips and install the halfshafts to the transaxle.
24. Install the tie rods, ball joints and stabilizer links to the steering arm.
25. Install the transaxle mounting bracket and bolts.
26. Install the starter.
27. Connect the speedometer cable.
28. Connect the inhibitor switch, kickdown servo switch, the pulse generator and oil temperature sensor, if disconnected.
29. Connect the shift control solenoid valve connector.
30. Connect the control cables and oil cooler lines.
31. Install the tension rod, if removed.
32. Install the air cleaner assembly.
33. Install the battery tray and battery.
34. Connect the positive then the negative terminal.
35. Refill with Dexron® II, Mopar ATF Plus type 7176 or equivalent, automatic transaxle fluid.
36. Start the engine and allow to idle for two minutes. Apply parking brake and move selector through each gear position, ending in **N**. Recheck fluid level and add if necessary. Fluid level should be between the marks in the HOT range.

ADJUSTMENTS

Shifter Control Cable Adjustment

1. The shifter cable adjustment is done at the neutral safety switch (inhibitor switch). Locate the switch on the transaxle and note the alignment holes in the arm and the body of the switch. Place the selector lever in **N**. Place the manual lever of the transaxle in the neutral position.
2. Check alignment of the hole in the manual control lever to the hole in the inhibitor switch body. If the holes do not align, adjustment is required.
3. To adjust, loosen the nut on the cable end and pull the cable end by hand until the alignment holes match. Tighten the nut. Check that the transaxle shifts and conforms to the positions of the selector lever.

Throttle Valve Cable

The throttle valve adjustment applies only to the 1990–96 Mirage.

1. Place selector lever and manual control lever in **N** position.
2. Loosen adjusting nut. While lightly pulling on control cable tighten mounting nut to 7–10 ft. lbs. (10–14 Nm).
3. When adjustment is complete, be sure selector lever is still in the **N** position. Verify all functions correspond to the position indicated on the selector lever.

Halfshafts

The halfshaft removal and installation and overhaul are the same as a manual transaxle. Please refer to Manual Transaxle in this Section

TRANSFER CASE

The only model covered by this manual equipped with a transfer case is the 1990–93 AWD Galant.

Rear Output Shaft Seal

REMOVAL & INSTALLATION

See Figures 49 and 50

1. Raise and support the vehicle safely.
2. Remove the propeller shaft from the transfer assembly. Place a drain pan under the rear of the transfer assembly to catch any fluid that leaks out.
3. Using a flat-bladed prying tool, carefully remove the oil seal from the transfer dust seal guard.

To install:

4. Using proper size seal driver tool, install the seal into the dust seal guard and the transfer assembly.
5. Install the rear propeller shaft.
6. Carefully lower the vehicle and inspect the transfer assembly fluid level.

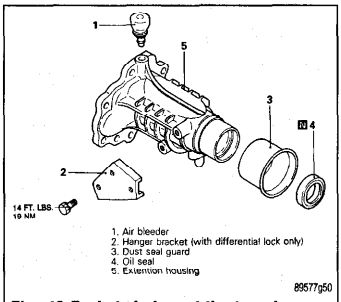

Fig. 49 Exploded view of the transfer case extension housing and related components

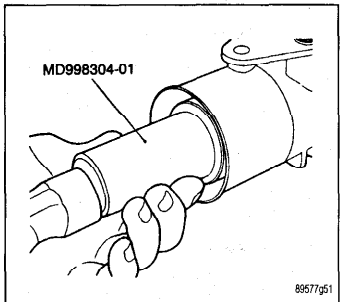

Fig. 50 Install the oil seal using the proper sized driver and a hammer

Transfer Case Assembly

REMOVAL & INSTALLATION

1. Disconnect the battery negative cable.
2. Raise the vehicle and support safely. Drain the transfer oil.
3. Disconnect the front exhaust pipe.
4. Unbolt the transfer case assembly and remove by sliding it off the rear driveshaft. Be careful not to damage the oil seal in the transfer case output housing. Do not let the rear driveshaft hang; suspend it from a frame piece. Cover the opening in the transaxle and transfer case to keep oil from dripping and to keep dirt out.
5. Lubricate the driveshaft sleeve yoke and oil seal lip on the transfer extension housing. Install the transfer case assembly to the transaxle. Use care when installing the rear driveshaft to the transfer case output shaft.
6. Tighten the transfer case to transaxle bolts to 40–43 ft. lbs. (55–60 Nm) with manual transaxle; 43–58 ft. lbs. (60–80 Nm) with automatic transaxle.
7. Install the exhaust pipe using a new gasket. Install removed bumper components.
8. Refill the transfer case and check oil levels in transaxle and transfer case.

DRIVELINE

The only model covered by this manual equipped with a driveshaft is the 1990–93 AWD Galant.

Driveshaft and U-Joints

REMOVAL & INSTALLATION

See Figures 51 and 52

1. Disconnect the negative battery cable. Raise the vehicle and support safely.
2. The rear driveshaft is a 3-piece unit, with a front, center and rear propeller shaft. Remove the nuts and insulators from the center support bearing. Work carefully. There will be a number of spacers which will differ from vehicle to vehicle. Check the number of spacers and write down their locations for reference during reassembly.
3. Matchmark the rear differential companion flange and the rear driveshaft flange yoke. Remove the companion shaft bolts and remove the driveshaft, keeping it as straight as possible so as to ensure that the boot is not damaged or pinched. Use care to keep from damaging the oil seal in the output housing of the transfer case.

➡Damage to the boot can be avoided and work will be easier if a piece of cloth or similar material is inserted in the boot.

4. Do not lower the rear of the vehicle or oil will flow from the transfer case. Cover the opening to keep dirt out.

To install:

5. Position the driveshaft in the vehicle, making sure to align the matchmarks at the rear yoke.
6. Install the bolts at the rear differential flange and tighten to 22–25 ft. lbs. (30–35 Nm).
7. Install the center support bearing with all spacers in place. Tighten the retaining nuts to 22–25 ft. lbs. (30–35 Nm).
8. Check the fluid levels in the transfer case and rear differential case.

U-JOINT REPLACEMENT

1. Make mating marks on the yoke and the universal joint that is to be disassembled. Remove the snaprings from the yoke with snapring pliers.
2. Force out the bearing journals from the yoke using a large C-clamp. Install a collar on the fixed side of the C-clamp. Press the journal bearing into the collar by applying pressure with the C-clamp, on the opposite side.
3. Pull the journal bearing from the yoke.

➡If the journal bearing is hard to remove, strike the yoke with a plastic hammer.

4. Press the journal shaft using C-clamp or similar tool, to remove the remaining bearings.

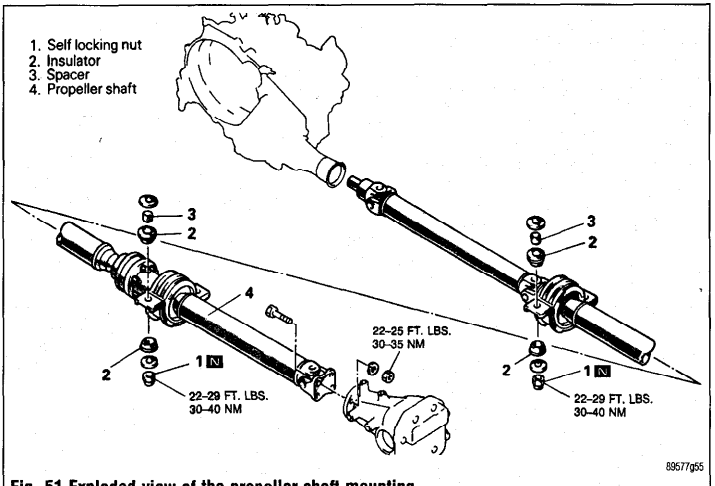

Fig. 51 Exploded view of the propeller shaft mounting

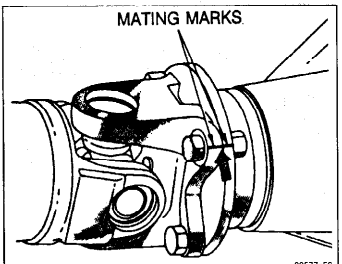

Fig. 52 Apply mating marks on the flange yoke and differential companion flange

5. Once all bearings are removed, remove the journal.

To install:

6. Apply multi-purpose grease to the shafts, grease sumps, dust seal lips and needle roller bearings of the replacement U-joint. Do not apply excessive grease. Otherwise, faulty fitting of bearing caps and errors in selection of snaprings may result.

7. Press fit the journal bearings to the yoke using a C-clamp as follows:

a. Install a solid base onto the bottom of the C-clamp.

b. Insert both bearings into the yoke. Hold and press fit them by tightening the C-clamp.

c. Install snaprings of the same thickness onto both sides of each yoke.

d. Press the bearing and journal into one side, using a brass bar with diameter of 0.59 in. (15mm).

8. Measure the clearance between the snapring and the groove wall of the yoke with a feeler gauge. If the clearance exceeds 0.0008–0.0024 in. (0.02–0.06mm), the snap rings should be replaced.

DRIVESHAFT BALANCING

Driveshaft balancing is a process best left for a professional with the proper equipment. Makeshift methods using hose clamps or similar devices can work, but the process of correcting the imbalance in this manner is very tough and extremely time consuming.

Many machine shops can balance driveshafts; some parts stores and jobbers can also balance driveshafts using outside contractors.

Center Bearing

REMOVAL & INSTALLATION

1. Place mating marks on the companion flange and the Lobro joint assembly.

2. Remove the Lobro joint installation bolts. Separate the Lobro joint from the companion flange.

3. Place mating marks on the center yoke and center propeller shaft, and the companion flange and the rear propeller shaft.

4. Remove the self-locking nuts. Remove the center yoke and companion flange.

5. Place mating marks on the center bearing assembly front bracket and the center propeller shaft, and the center bearing assembly rear bracket and the rear propeller shaft. Remove the center bearing bracket.

➡The mounting rubber can not be removed from the center bearing bracket.

6. Pull out the front and rear center bearings with a commercially available puller.

To install:

7. Apply multi-purpose grease to the center bearing front and rear grease grooves and to the dust seal lip. Be sure to fit the bearing into the rubber mount groove on the center bearing bracket.

➡Face the bearing dust seal to the side of the center bearing bracket mating mark.

8. Assemble the center bearing to the center propeller shaft and rear propeller shaft. Face the side onto which the center bearing bracket mating marks is placed and the dust seal is installed toward the side of the center propeller shaft and rear propeller shaft.

9. Apply a thin and even coat of the grease, enclosed with the repair kit, to the rubber packing on the companion flange. Align the mating marks on the center propeller shaft and the companion flange, then press fit the center bearing with self-locking nuts.

10. Install the Lobro joint assembly installation bolts. Secure the companion flange and Lobro joint assembly with the installation bolts. Check for grease leakage from the Lobro joint boot and companion flange installation parts.

REAR AXLE DIFFERENTIAL

The only model covered by this manual equipped with a rear axle differential is the 1990–93 AWD Galant.

Rear Halfshaft and Seal

REMOVAL & INSTALLATION

◆ See Figures 53 and 54

1. Disconnect the negative battery cable. Raise the vehicle and support safely.

2. Remove the bolts that attach the rear halfshaft to the companion flange.

3. Use a prybar to pry the inner shaft out of the differential case. Don't insert the prybar too far or the seal could be damaged.

4. Remove the rear driveshaft from the vehicle.

5. If necessary, carefully pry the oil seal from the rear differential using a flat tipped prying tool.

To install:

6. Install a new oil seal into the rear differential housing using proper size driver.

7. Replace the circlip and install the rear driveshaft to the differential case. Make sure it snaps in place.

8. Install the companion flange bolts and tighten to 40–47 ft. lbs. (55–65 Nm).

9. Check the fluid level in the rear differential.

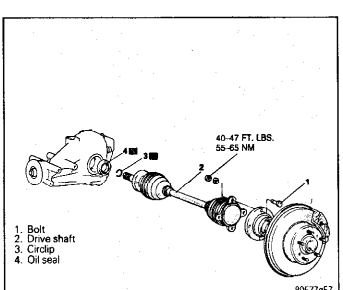

Fig. 53 Rear driveshaft mounting

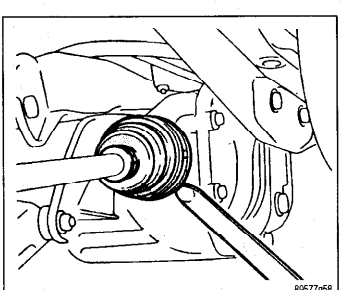

Fig. 54 Remove the driveshaft from the differential carrier with a prybar

Stub Axle Shaft, Bearing and Seal

REMOVAL & INSTALLATION

1. Disconnect the negative battery cable.

2. Raise and support the vehicle safely.

3. Remove the tire and wheel assembly from the vehicle.

4. If equipped with ABS, remove the rear wheel speed sensor.

➡Be cautious to ensure that the tip of the pole piece on the rear speed sensor does not come in contact with other parts during removal. Sensor damage could occur.

5. Remove the rear caliper and support assembly out of the way. Remove the brake disc.

6. Remove the driveshaft and companion flange installation bolts, nuts and washers. Move the end of shaft slightly to access the self-locking nut.

7. Using axle holding tool MB9b11-01 or equivalent, secure the rear axle shaft in position, then remove the self-locking nut.

8. Using puller and adapter MB9b11-01 and MB9b41-01 or equivalents, remove the rear axle shaft from the trailing arm.

9. If equipped with ABS, remove the rear rotor from the axle assembly using collar and press. The rotor is a press fit.

10. Remove the outer bearing and dust cover concurrently from the axle shaft using a press.

11. Using puller, remove the oil seal and inner bearing from the trailing arm.

12. Inspect the companion flange and axle shaft for wear or damage. Inspect the dust cover for deformation or damage. Inspect the bearings for burning or declaration. Replace components as required.

To install:

13. Using the proper driver, press fit the inner bearing onto the trailing arm. Press fit the oil seal onto the trailing arm with the depression in the oil seal facing upward, and until it contacts the shoulder on the inner arm.

➡When tapping the oil seal in, use a plastic hammer to lightly tap the top and circumference of the seal installation tool, press fitting gradually and evenly.

14. Press fit the dust covers onto the axle until it contacts the axle shaft shoulder. Install the innermost cover so the depression is facing upward.

➡When tapping the oil seal in, use a plastic hammer to lightly tap the top and circumference of the seal installation tool, press fitting gradually and evenly.

15. Apply multi-purpose grease around the entire circumference of the inner side of the outer bearing seal lip. Press fit the outer bearing to the axle shaft so that the bearing seal lip surface is facing towards the axle shaft flange.

16. Press fit the rear rotor to the axle shaft with the rear rotor groove surface towards the axle shaft flange.

17. Install the rear axle shaft to the trailing arm temporarily. Install the companion flange to the rear axle shaft, then install a new self-locking nut.

18. While holding the rear axle shaft in position using holding fixture tool MB9g67-01 or equivalent, tighten a new self-locking nut to 159 ft. lbs. (220 Nm).

19. Install the drive shaft nuts, washers and bolts. Tighten to 40–47 ft. lbs. (55–65 Nm).

20. Install the rear brake disc, caliper assembly and parking brake.

21. Install the tire and wheel assembly and lower the vehicle. Check the parking brake stroke and adjust as required.

22. Before moving the vehicle, pump the brakes until a firm pedal is achieved.

Pinion Seal

REMOVAL & INSTALLATION

1. Raise the vehicle and support safely.
2. Matchmark the driveshaft and companion flange and remove the shaft. Don't let it hang from the transaxle. Tie it up to the underbody.
3. Hold the companion flange stationary and remove the large self-locking nut in the center of the companion flange.
4. Using a puller, remove the flange. Pry the old seal out.

To install:

5. Apply a thin coat of multi-purpose grease to the seal lip and the companion flange seal contacting surface. Install the new seal with an appropriate driver.
6. Install the companion flange. Install a new locknut and torque to 116–159 ft. lbs. (157–220 Nm). The rotation torque of the drive pinion should be about 4 inch lbs. for new or reused, oiled bearings.
7. Install the driveshaft.

Axle Housing Assembly

REMOVAL & INSTALLATION

1. Raise the vehicle and support safely.
2. Drain the differential gear oil and remove the center exhaust pipe.
3. Matchmark and remove the rear driveshaft.
4. Remove the rear halfshafts.
5. Remove the center exhaust pipe and muffler assembly, as required.
6. Remove or disconnect the 4 wheel steering oil pump.
7. The large mounting bolts that hold the differential carrier support plate to the underbody may use self-locking nuts. Before removing them, support the rear axle assembly in the middle with a transaxle jack. Remove the nuts, then remove the support plate(s) and the square dynamic damper from the rear of the carrier.
8. Lower the differential carrier and remove from the vehicle.

To install:

9. Raise the rear differential carrier into position and install support member bolts. Install new locknuts on all support bolts.
10. Install the 4 wheel steering oil pump.
11. Install new circlips on both rear driveshafts and install.
12. Install the propeller shaft.
13. Install the center exhaust pipe and muffler.
14. Lower the vehicle.
15. With the vehicle level, fill the rear differential.

TORQUE SPECIFICATIONS

Components	English	Metric
Automatic transaxle-to-engine mounting bolts		
Diamante models	54 ft. lbs.	75 Nm
1990-92 Mirage	31-40 ft. lbs.	43-55 Nm
1993-00 Mirage	35 ft. lbs.	48 Nm
1990-93 Galant	32-39 ft. lbs.	43-55 Nm
1994-00 Galant	35 ft. lbs.	48 Nm
Axle hub nuts	145-188 ft. lbs.	200-260 Nm
Back-up lamp switch	22-25 ft. lbs.	30-35 Nm
Clutch release fork fulcrum	25 ft. lbs.	35 Nm
Driveshaft-to-rear differential flange bolts	22-25 ft. lbs.	30-35 Nm
Driveshaft center bearing support bracket mounting nuts	22-25 ft. lbs.	30-35 Nm
Halfshaft center bearing support bracket	33 ft. lbs.	45 Nm
Manual transaxle-to-engine mounting bolts		
1990-92 Mirage	31-40 ft. lbs.	43-55 Nm
1993-00 Mirage	35 ft. lbs.	48 Nm
1990-93 Galant	32-39 ft. lbs.	43-55 Nm
1994-00 Galant	35 ft. lbs.	48 Nm
Manual transaxle lower coupling bolt	22-25 ft. lbs.	30-35 Nm
Manual transaxle mount retaining nuts	32 ft. lbs.	48 Nm
Manual transaxle mount through-bolt	51 ft. lbs.	69 Nm
Park/neutral safety switch retaining bolts		
1990-97 Mirage and 1990-93 Galant	7-8 ft. lbs.	10-12 Nm
1994-00 Galant and 1998-00 Mirage	8 ft. lbs.	11 Nm
Diamante models	7-8 ft. lbs.	10-12 Nm
Pinion nut	116-159 ft. lbs.	157-220 Nm
Pressure plate-to-flywheel bolts		
1994-98 Galant	14 ft. lbs.	19 Nm
All other models	16 ft. lbs.	22 Nm
Rear halfshaft-to-companion flange bolts	40-47 ft. lbs.	55-65 Nm
Stub axle shaft hub nut	159 ft. lbs.	220 Nm
Throttle valve cable mounting nut	7-10 ft. lbs.	10-14 Nm
Torque converter-to-driveplate bolts	34-38 ft. lbs.	46-53 Nm
Transfer case-to-transaxle mounting bolts		
Manual transaxle	40-43 ft. lbs.	55-60 Nm
Automatic transaxle	43-58 ft. lbs.	60-80 Nm

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