GROUP

# CLUTCH SYSTEM 08

(7000)



# SECTION 08-00 Clutch System—Service



## VEHICLE APPLICATION

Capri.

## DESCRIPTION

This vehicle uses two types of clutch release systems. The turbocharged vehicles have a type G transaxle and use a mechanical system. The naturally aspirated vehicles have a type F2 transaxle and have a hydraulic clutch system. When performing any service procedures, be sure of the system being serviced.

## DIAGNOSIS

### Clutch and Clutch Cable

The vehicle should be road tested, if possible, to confirm any complaint. Some clutch conditions may be attributed to a misadjusted cable (turbocharged vehicles) or pedal height, linkage or shift mechanism. These should be checked (and corrected) prior to attempting major service procedures. Make sure the transaxle and clutch reservoir (naturally aspirated vehicles) are filled to the proper level with the specified lubricant. Refer to Section 07-03A or 07-03B for transaxle fluid level checking procedures. Refer to Section 08-02 for clutch reservoir fluid level checking procedures.

## DIAGNOSIS (Continued)

**CLUTCH AND CLUTCH CABLE DIAGNOSIS**

| CONDITION | POSSIBLE SOURCE | ACTION |
|---|---|---|
| • Not Disengaging | • Excessive clutch pedal play. | • Adjust. |
| | • Excessive deflection and distortion of clutch disc. | • Replace. |
| | • Clutch disc spline is worn or rusted. | • Replace, or remove the rust. |
| | • Low clutch fluid.① | • Fill to proper level. |
| | • Clutch cable worn or broken ②. | • Service or replace. |
| | • Diaphragm spring is weakened. | • Replace. |
| • Clutch Shudders When Starting | • Engine mount loose or weakened. | • Tighten or replace. |
| | • Oil in the facing surface. | • Service or replace. |
| | • Torsion spring weakened. | • Replace. |
| | • Disc surface hardened or distorted. | • Service or replace. |
| | • Diaphragm spring is weakened. | • Replace. |
| | • Pressure plate is excessively distorted. | • Replace. |
| | • Flywheel surface is hardened or damaged. | • Service or replace. |
| • Clutch Pedal Does Not Operate Smoothly | • Pedal pivot shaft is not properly lubricated. | • Lubricate or replace. |
| | • Cable is kinked or binding. | • Service or replace. |
| • Noise ③ | • Insufficient clutch pedal free play. | • Adjust. |
| | • Release bearing is damaged. | • Replace. |
| | • Poor lubrication on the release bearing sleeve. | • Lubricate or replace. |
| | • Torsion spring is weakened. | • Replace. |
| | • Excessive crankshaft end play. | • Replace engine thrust bearings. |
| • Slipping clutch | • Insufficient clutch pedal free play. | • Adjust. |
| | • Facing is worn excessively. | • Replace. |
| | • Facing surface is hardened or contaminated with oil. | • Service or replace. |
| | • Pressure plate is distorted. | • Service or replace. |
| | • Diaphragm spring is damaged or weakened. | • Replace. |
| | • Clutch pedal or cable does not function smoothly (Binding). | • Service or replace. |

① Naturally aspirated vehicles with hydraulic clutch
② Turbocharged vehicles with mechanical clutch
③ Refer to gear noise

CC4197-A

## DIAGNOSIS (Continued)

### Transaxle

Under normal operating conditions, a large percentage of transaxle complaints are due to misadjusted or damaged components outside of the transaxle, such as clutch, clutch release assembly and shift linkage. Before and during the road test, make sure that the clutch is operating properly, the shift linkage is properly adjusted and that the transaxle is filled to the proper level with lubricant. Refer to Section 07-03A or 07-03B.

The following diagnosis procedure is provided as a guide for locating concerns related to manual transaxles. Possible causes and corrective measures are listed in the order they should be checked. If the transaxle was removed, serviced and re-installed, make certain the clutch and all gear shift linkage is correctly installed. Road test the vehicle to be sure the condition has been completely corrected.

**TRANSAXLE DIAGNOSIS**

| CONDITION | POSSIBLE SOURCE | ACTION |
|---|---|---|
| • Shift Lever Does Not Operate Smoothly or Binds or Cannot Be Operated at All | • Selector rod joint stiff.<br>• Selector rod bent.<br>• Lack of lubrication on shift linkage pivots.<br>• Shift lever ball unit stiff.<br>• Gearshift gate incorrectly adjusted. | • Service or replace.<br>• Replace bent rod.<br>• Clean and lubricate with Multi-Purpose Grease D0AZ-19584-AA or equivalent.<br>• Service or replace.<br>• Adjust gate. |
| • Excessive Shift Lever Play | • Selector rod bushing worn.<br>• Loose or worn selector rod clamping bolts.<br>• The spring in the shift lever ball unit is weakened.<br>• The bushing in shift lever ball unit is worn. | • Replace<br>• Tighten or replace as necessary.<br>• Replace<br>• Replace. |
| • Hard Shifting | • Insufficient oil in transaxle.<br>• Incorrect oil quality.<br>• Selector rod bent.<br>• Transaxle shifting mechanism insufficiently lubricated.<br>• Excessive clutch pedal free play.<br>• Shift fork and shift rod worn.<br>• Synchronizer ring worn.<br>• Worn cone surface of gear.<br>• Improper contact between synchronizer ring and cone surface.<br>• Excessive play in the axial direction of each gear.<br>• Bearings worn.<br>• Synchronizer key is weakened. | • Add oil.<br>• Drain and fill with specified oil.<br>• Replace.<br>• Lubricate.<br>• Adjust.<br>• Replace.<br>• Replace.<br>• Replace.<br>• Replace.<br>• Replace worn component.<br>• Adjust or replace.<br>• Replace. |
| • Locked in Gear | • Shift gate out of adjustment or worn.<br>• Worn interlock sleeve or bent or damaged shift fork.<br>• Gear seizure.<br>• Synchronizer keys out of position. | • Service or replace as necessary and adjust.<br>• Check interlock sleeve for wear and service or replace as necessary.<br>• Replace worn parts.<br>• Service or replace as necessary. |
| • Jumping Out of Gear | • Worn or improperly installed engine mount.<br>• Loose or worn control rod clamping bolts or linkage.<br>• Bent shift control rod.<br>• Worn shift control rod bushing.<br>• Weakened lever ball spring.<br>• Improper installation of stabilizer bar.<br>• Worn synchronizer clutch hub.<br>• Worn synchronizer clutch hub sleeve.<br>• Worn steel ball sliding groove on control rod end.<br>• Weakened steel ball spring.<br>• Excessive backlash.<br>• Worn bearings. | • Service or replace.<br>• Service or replace and tighten as necessary.<br>• Replace.<br>• Replace.<br>• Replace.<br>• Install correctly and tighten.<br>• Replace.<br>• Replace.<br>• Replace.<br>• Replace.<br>• Replace components as required.<br>• Adjust or replace bearings. |

## DIAGNOSIS (Continued)

**TRANSAXLE DIAGNOSIS (Continued)**

| CONDITION | POSSIBLE SOURCE | ACTION |
|---|---|---|
| • Noise | • Insufficient oil in transaxle.<br>• Poor oil quality.<br>• Worn sliding surfaces at synchronizer.<br>• Excessive backlash.<br>• Surface of a gear is damaged.<br>• Foreign matter in transaxle.<br>• Differential gear is damaged. Backlash is excessive.<br>• Ring gear bolts loose.<br>• Bearings worn or out of adjustment. | • Add oil as required.<br>• Drain and refill with specified oil.<br>• Service or replace.<br>• Replace components as required.<br>• Replace.<br>• Service or replace as necessary.<br>• Service or replace as necessary.<br>• Tighten to specification.<br>• Service or adjust as necessary. |
| • Gear Clash | • Excessive engine idle speed.<br>• Inadequate clutch pedal release resulting in excessive spin time (cable system). Inadequate clutch disengagement.<br>• Disc binding on transaxle input shaft.<br>• Excessive disc runout.<br>• Flywheel housing misalignment.<br>• Oil or grease on clutch facings.<br>• Damaged or contaminated clutch lining.<br>• Weak or broken insert keys in the synchronizer assembly.<br>• Worn synchronizer rings and/or cone surfaces.<br>• Broken synchronizer rings. | • Adjust engine idle rpm.<br>• Check clutch adjustment, operating mechanisms or for excessive clutch disc runout—replace components as required.<br>• Check for burrs on splines, replace if necessary.<br>• Replace.<br>• Realign.<br>• Replace disc and correct cause of contamination.<br>• Replace disc.<br>• Replace components as required.<br>• Replace components as required.<br>• Replace. |

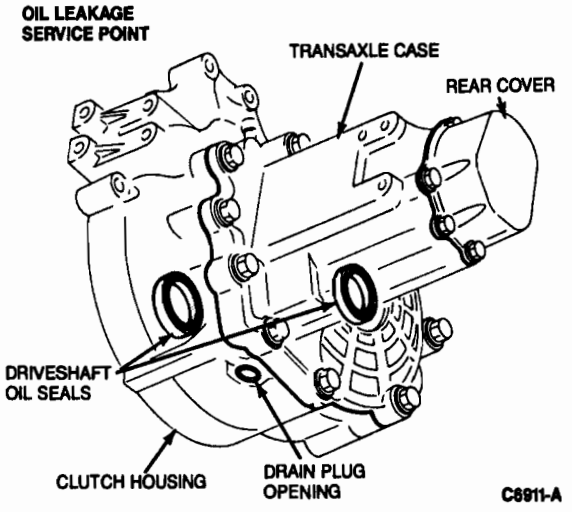
### Gear Noise

1. Gear rattle is a repetitive metallic impact or rapping noise which occurs on a manual transaxle powertrain when the vehicle is lugging in gear. The rattle noise intensity increases with transaxle operating temperature and engine torque and decreases with increasing vehicle speed. Since the gear ratios have been designed to achieve maximum fuel economy, there may be instances when gear rattle is distinctly noticeable under lugging conditions. This, however, is not detrimental to the engine or transaxle provided that the appropriate gear ratio is selected for the vehicle speed.
2. Neutral rollover rattle has the same characteristics as gear rattle except rollover occurs with the engine idling, transaxle in NEUTRAL and the clutch engaged. The rollover noise intensity increases with transaxle operating temperature and engine torque load resulting from engine driven accessories (air conditioning and alternator). Gear rollover noise is inherent in manual transaxles and is not detrimental to the engine or transaxle. However, in vehicles where the engine idling speed is below specification or rough, the rollover noise can deteriorate to a level where a harsh clattering noise similar to loose parts in the transaxle will become audible. Replacement of transaxle components will NOT correct this condition.
3. Gear rollover noise, caused by engine torsional vibrations, and clutch release bearing noise are sometimes mistaken for bearing noise. Gear rollover noise will disappear when the transaxle is engaged in gear. Due to a constant running release bearing noise caused by a worn or damaged release bearing will be noticeable only when the clutch is disengaged. When complaints of this nature are encountered, it will be necessary to check the vehicle to determine if bearing noise exists. Transaxle servicing will not eliminate gear rollover noise or clutch release bearing noise.

## DIAGNOSIS (Continued)

### Oil Leakage

To diagnose suspected transaxle leakage, the affected area should be cleaned of all grease, dirt and oil first. The vehicle should be operated long enough to bring the transaxle fluid to operating temperature. Inspect the areas shown. Remember to check the transaxle fluid level and fill to the full mark before performing the diagnosis. Refer to Section 07-03A or 07-03B.



# SECTION 08-01 Clutch/Pressure Plate



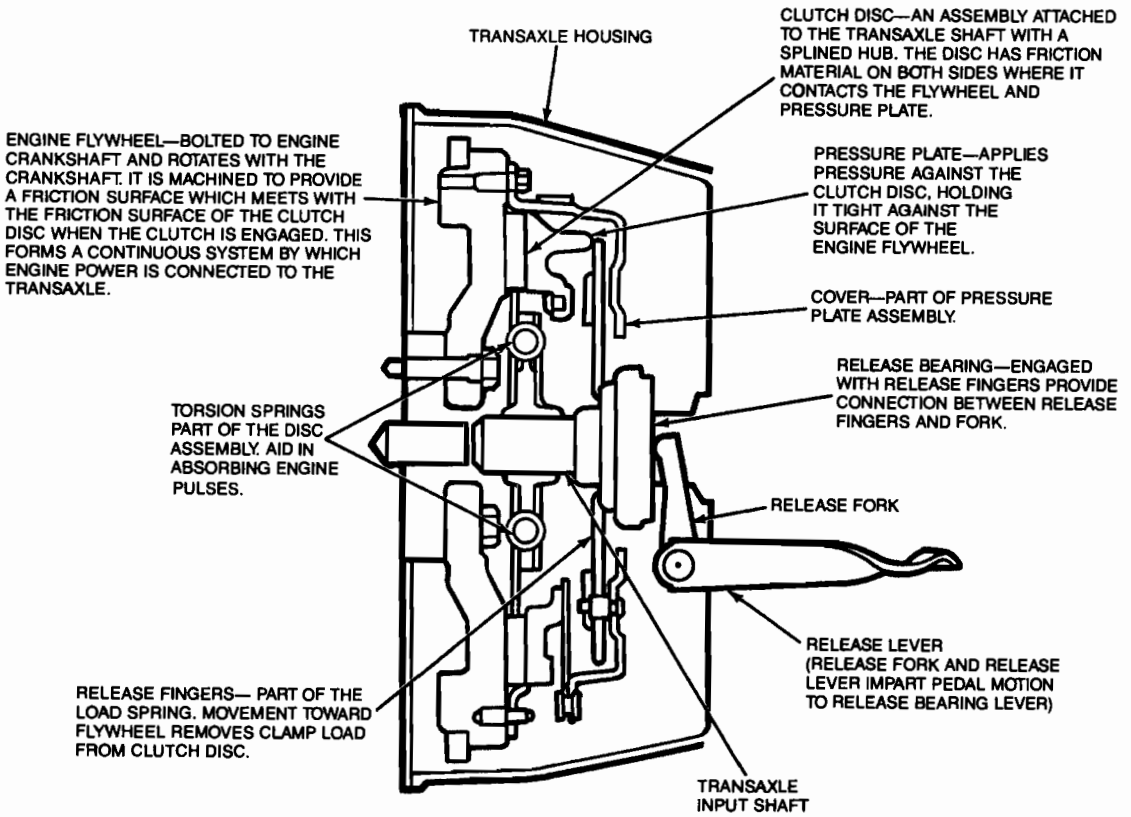
## VEHICLE APPLICATION

Capri.

## DESCRIPTION AND OPERATION

**WARNING: BRAKE FLUID CONTAINS POLYGLYCOL ETHERS AND POLYGLYCOLS. AVOID CONTACT WITH EYES. WASH HANDS THOROUGHLY AFTER HANDLING. IF BRAKE FLUID CONTACTS EYES, FLUSH EYES WITH RUNNING WATER FOR 15 MINUTES. GET MEDICAL ATTENTION IF IRRITATION PERSISTS. IF TAKEN INTERNALLY, DRINK WATER AND INDUCE VOMITING. GET MEDICAL ATTENTION IMMEDIATELY.**

The clutch is a single plate, dry disc-type friction plate with a diaphragm spring-type pressure plate.



## DESCRIPTION AND OPERATION (Continued)

The clutch cover uses a flat, diaphragm spring with an asbestos and glass fiber clutch disc.

The clutch operating system on turbocharged vehicles consists of the release bearing, release fork, cable and pedal.

The clutch operating system on naturally aspirated engines consists of the release bearing, release fork, slave cylinder, fluid reservoir and pedal.

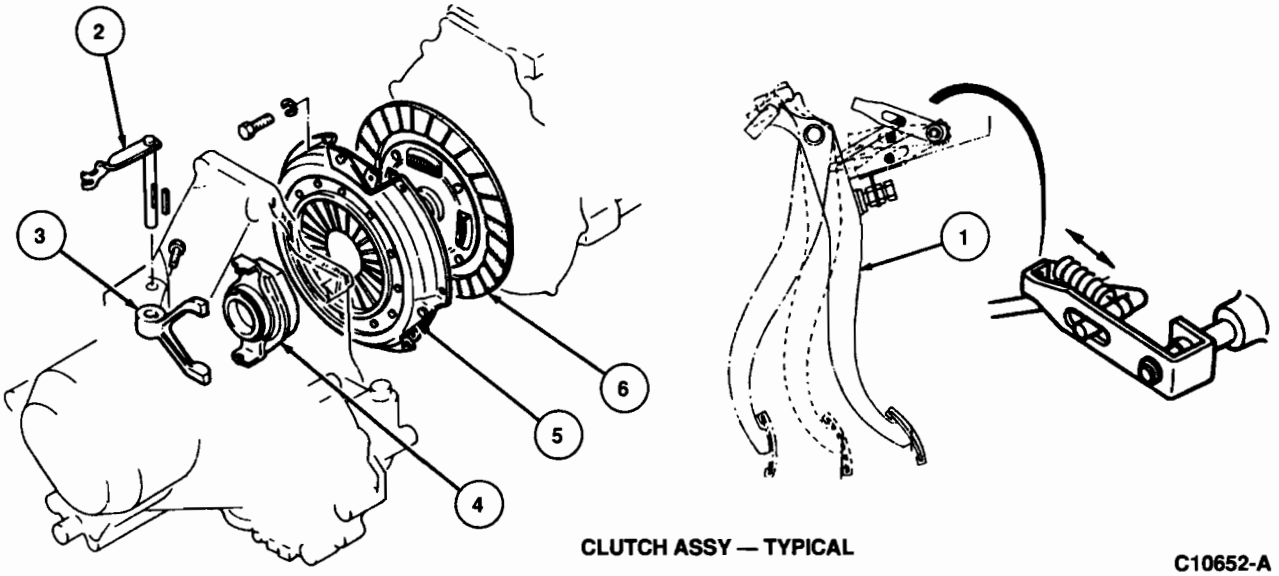
The diaphragm spring is located between two fulcrum rings, which are riveted to the clutch cover (part of the pressure plate assembly).

In the engaged position, the diaphragm spring holds the pressure plate against the clutch disc, so that the engine torque is transmitted to the input shaft of the transaxle. As the clutch pedal is depressed, the release bearing applies pressure on the diaphragm spring center, which is pressed toward the flywheel. The diaphragm spring tilts, thereby relieving the load on the pressure plate. At the same time, spring steel straps riveted to the clutch cover lift the pressure plate from the clutch disc, disengaging the engine drive from the transaxle, enabling the gears to be shifted. Torsion springs in the clutch disc help reduce disc drive vibration.

The clutch drives the transaxle input shaft through the splined hub. The input shaft is mounted in pre-lubed tapered roller bearings. These bearings are installed in the transaxle housing. The pilot bearing is located in the flywheel.

It is important that the engine-to-transaxle mounting bolts are evenly and securely tightened to prevent misalignment and poor mating of the housing surfaces.

Transaxle identification is determined by a serial number located on a plate attached to the clutch housing.




CLUTCH ASSY — TYPICAL

C10652-A

| Item | Part Number | Description |
|---|---|---|
| 1 | — | Clutch Pedal |
| 2 | — | Release Lever |
| 3 | — | Release Fork |
| 4 | — | Release Bearing |
| 5 | — | Pressure Plate Assembly |
| 6 | — | Clutch Disc |

Refer to Section 08-02 for information on clutch controls.

## ADJUSTMENTS

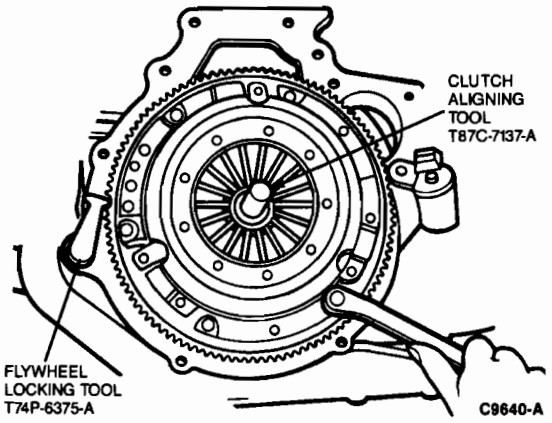
Refer to Section 08-02.

## REMOVAL AND INSTALLATION

### Clutch Pressure Plate, Disc and Flywheel

**Removal**

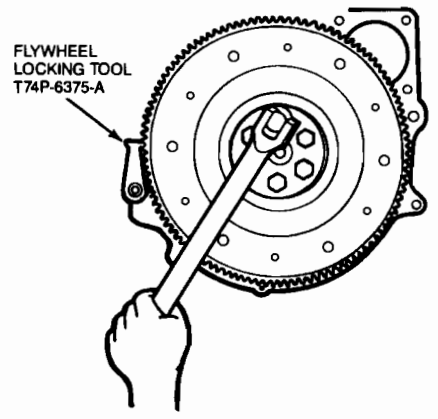
1. Remove transaxle. Refer to Section 07-03A or 07-03B.
2. Install Flywheel Locking Tool T74P-6375-A or equivalent as shown in a transaxle mounting hole on the engine and engage the tooth of the locking tool into the flywheel ring gear.




NOTE: To avoid dropping the disc when the bolts are removed from pressure plate, use Clutch Aligning Tool T87C-7137-A or equivalent.

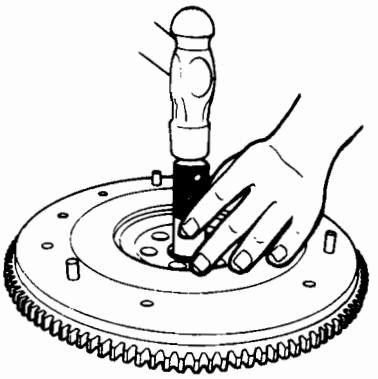
3. Remove bolts attaching the pressure plate to the flywheel, and remove pressure plate assembly.
4. Remove the clutch disc and clutch aligning tool.

   **CAUTION: Use care when removing the last bolt to prevent dropping flywheel.**
5. With the flywheel locking tool still engaged, remove the flywheel mounting bolts and then remove flywheel.

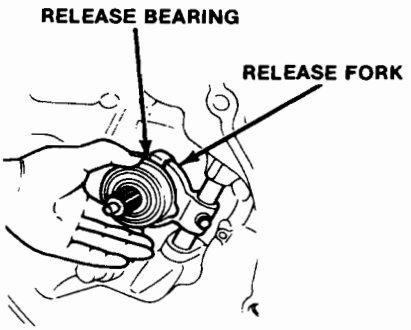



6. Inspect pilot bearing for excessive wear or scoring and replace if necessary, using a suitable drift and hammer as shown.

   NOTE: Do not remove pilot bearing if it is not necessary.



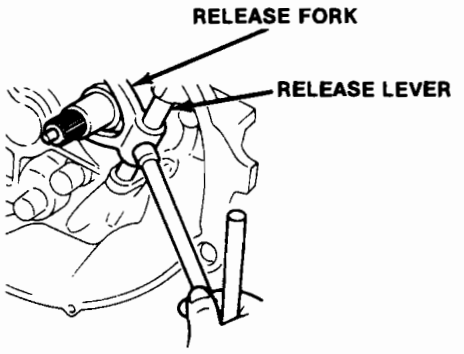

7. Remove the return spring from the release bearing lever and transaxle case.
8. Remove release bearing from transaxle input shaft.




9. Remove bolt attaching release fork to the release lever.

## REMOVAL AND INSTALLATION (Continued)

10. Slide the release lever shaft out through the top of the transaxle case approximately 76mm (3 inch). Remove release fork and set-key from the release lever shaft. Remove release lever from transaxle.




C7473-A

### Inspection

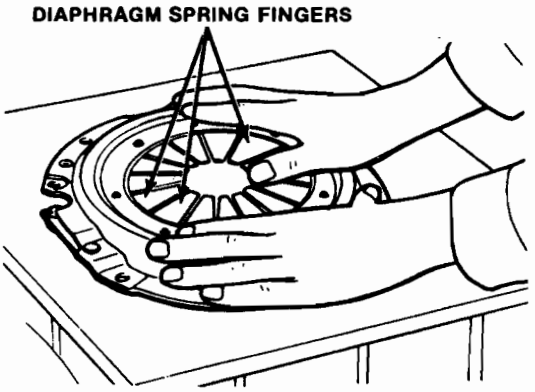
#### Clutch Cover

1. Check pressure plate surface for scoring, cracks or discoloration.

   NOTE: Minor scratches or discoloration should be removed with fine emery cloth.

2. Check the diaphragm spring fingers for discoloration, scoring, broken or bent segments, and spring ends that are higher or lower than the rest.

   NOTE: All spring ends must be in the same plane.

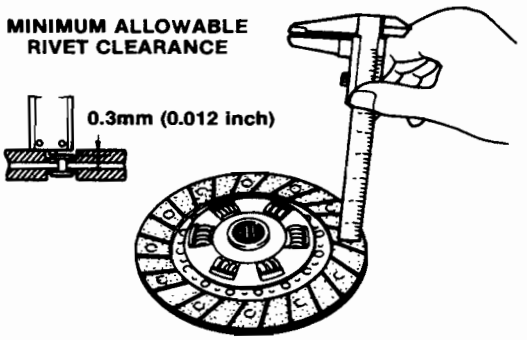



C7474-A

#### Clutch Disc

1. Check lining surface for hardening or presence of oil.

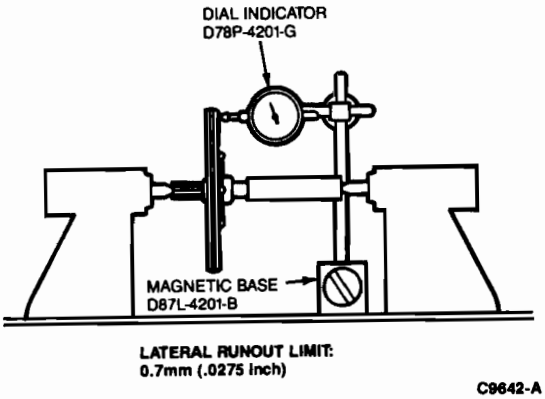
2. Check for worn clutch disc lining. Measure the depth to the rivet heads with a vernier caliper.




C7475-A

   NOTE: Use emery cloth to remove minor imperfections in the clutch lining surface.

3. Check for loose clutch lining rivets.
4. Check the run-out of the clutch disc. Lateral runout should not be more than 0.7mm (0.027 inch). Vertical runout should not be more than 1.0mm (0.039 inch). If either specification is exceeded, replace the clutch disc.



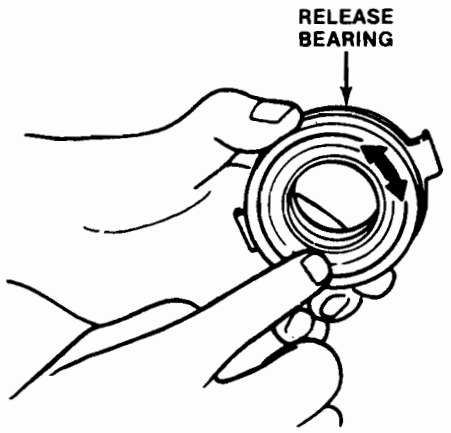

C9642-A

5. Check for wear or rust on the splines. Remove any rust with emery cloth.

## REMOVAL AND INSTALLATION (Continued)

### Clutch Release Bearing

1. Turn the bearing in both directions and check for any binding or abnormal noise.

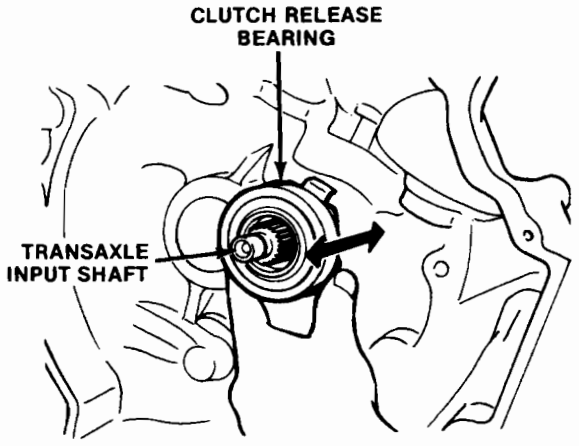



C7477-A

2. Check for worn or damaged release bearing fork contact surfaces.

   **CAUTION: The clutch release bearing is a sealed bearing and must not be immersed in any type of cleaning fluid.**

3. Check the sliding condition of the bearing. Install the bearing on the transaxle input shaft and check for smooth movement.

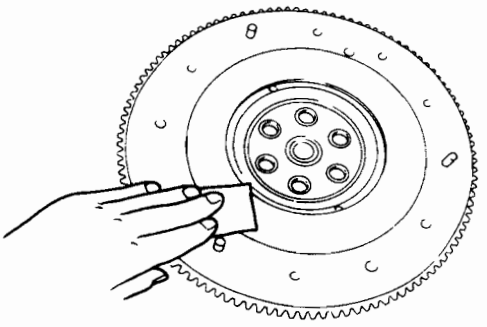



C7478-A

### Flywheel

1. Check for surface marks, scoring or discoloration of clutch contact surface.

   NOTE: Minor surface servicing/touch-ups can be made by cleaning with emery cloth.



C7479-A

2. The flywheel must be machined if scoring or discoloration is excessive. Do not exceed a machining cut of 0.5mm (0.020 inch).
3. Check for damaged or worn ring gear teeth. If necessary, replace ring gear as follows:

   **WARNING: AN EXPERIENCED ACETYLENE TORCH OPERATOR MUST PERFORM THIS OPERATION.**

   a. Heat ring gear evenly with a torch, and then tap around gear with a suitable drift and hammer to remove gear from the flywheel.

   b. Support flywheel, ring gear side up, on a solid flat surface.

      **WARNING: TO AVOID PERSONAL INJURY, USE TONGS OR ASBESTOS GLOVES WHEN PLACING HEATED RING GEAR ON THE FLYWHEEL.**

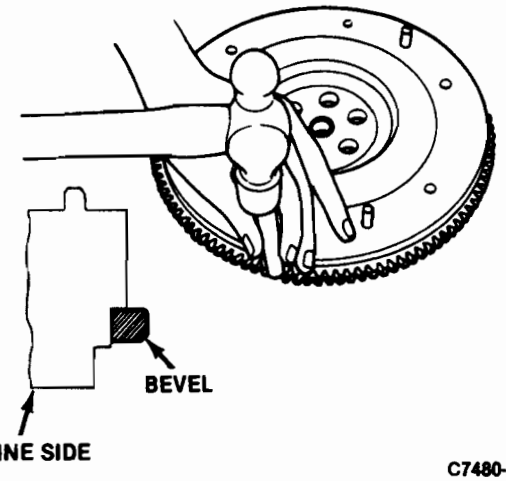
      **CAUTION: The beveled side of the ring gear must face toward the engine side.**

      NOTE: Do not, under any circumstances, heat the ring gear over 300°C (570°F); excessive heat may destroy the original heat treatment. Heat indicating "crayons" which are placed on the ring gear and melt at a predetermined temperature, may be obtained from most tool suppliers. Use of the "crayons" will ensure against overheating the ring gear.

   c. Place the new ring gear on a flat metal surface and heat ring gear uniformly with a torch. Keep torch moving around the gear to avoid hot spots.

## REMOVAL AND INSTALLATION (Continued)

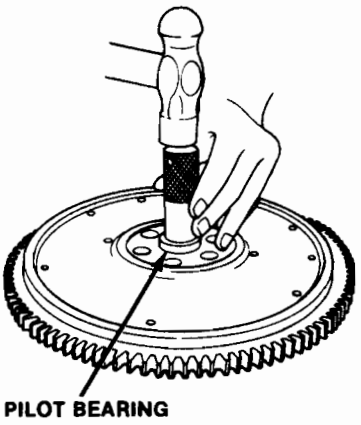
d. Use a pair of tongs or asbestos gloves to place ring gear on the flywheel. If necessary, lightly tap ring gear on the flywheel.




C7480-A

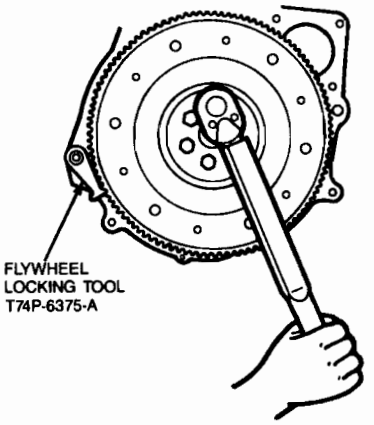
### Installation

1. If removed, install the pilot bearing in the flywheel with a suitable drift and a hammer.




C7481-A

2. Install the flywheel to the crankshaft with beveled ring gear facing the engine.
3. Install Flywheel Locking Tool T74P-6375-A or equivalent as shown, in a transaxle mounting hole on the engine and engage the tooth of the locking tool into the flywheel ring gear.

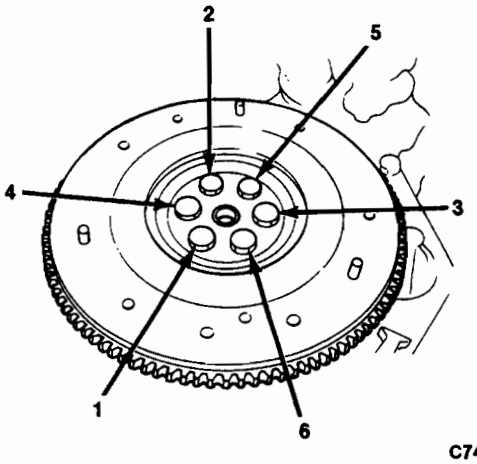



C9643-A

**CAUTION: If re-installing flywheel bolts, clean threads to remove old sealant. Apply Stud and Bearing Mount Sealant E0AZ-19554-B (ESE-M4G167-A2) or equivalent to bolts. If old sealant cannot be removed, replace with new bolts.**

4. Tighten flywheel retaining bolts using the sequence shown. Tighten to 96-103 N·m (71-75 lb-ft).

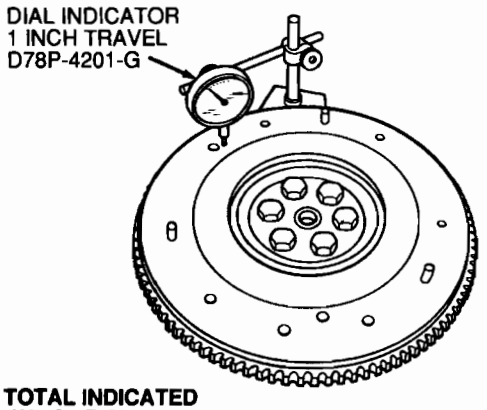
**TORQUE SPECIFICATION:**
**96-103Nm (71-75 lb-ft)**




C7483-A

## REMOVAL AND INSTALLATION (Continued)

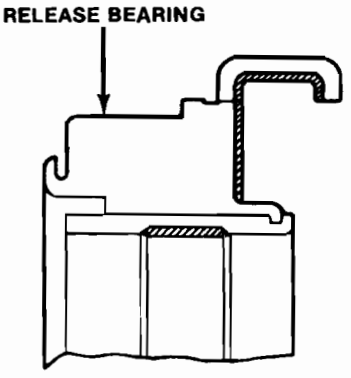
5. Check flywheel runout as follows:
   a. Set Dial Indicator 1 Inch Travel D78P-4201-G or equivalent, on the clutch disc contact surface, and then turn the flywheel to measure runout. Runout limit is 0.2mm (0.008 inch).




**TOTAL INDICATED RUNOUT (MAXIMUM) 0.2mm (0.008 INCH)**

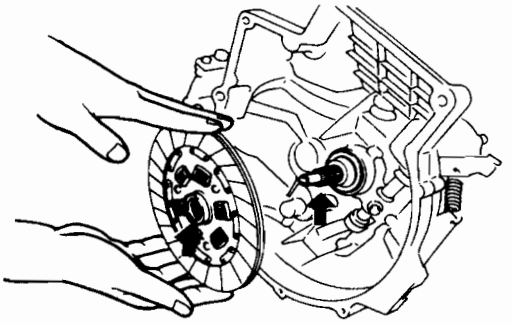
C9644-B

   b. If flywheel runout exceeds the limit, the flywheel surface must be machined.
6. Install release lever through the transaxle case and align groove in lever shaft and the groove in release fork with the set key.
7. Align release fork mounting bolt hole with hole in the release lever shaft.
8. Apply a coating of Stud and Bearing Mount Sealant E0AZ-19554-B or equivalent to the bolt. Install and tighten to 7.8-10.8 N·m (5.8-8.0 lb-ft).
9. Apply Premium Long-Life Grease C1AZ-19590-B (ESA-M1C75-B) or equivalent to the shaded areas of the release bearing as shown.




C7485-A

10. Install release bearing to clutch release fork.
11. Install the clutch release lever return spring to the transaxle case and release lever arm.
12. Clean the splines on the clutch disc and the transaxle input shaft and apply a small amount of Premium Long-Life Grease C1AZ-19590-B (ESA-M1C75-B) or equivalent to the clutch disc and input shaft splines. Use care to avoid getting grease on the clutch face.

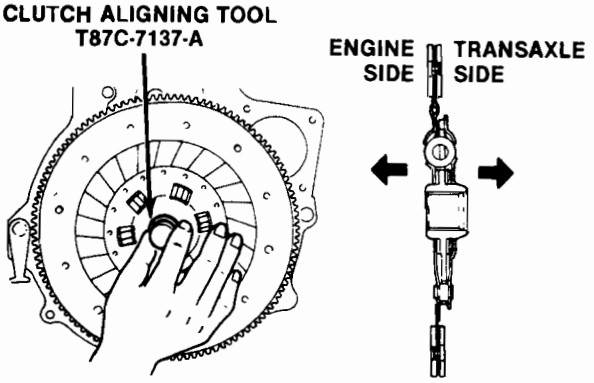


**APPLY SMALL AMOUNT OF CLUTCH GREASE AS SHOWN BY ARROWS**

C7486-A

13. Install clutch disc using Clutch Aligning Tool T87C-7137-A or equivalent.

    NOTE: Install clutch with the disc facing in the direction shown.

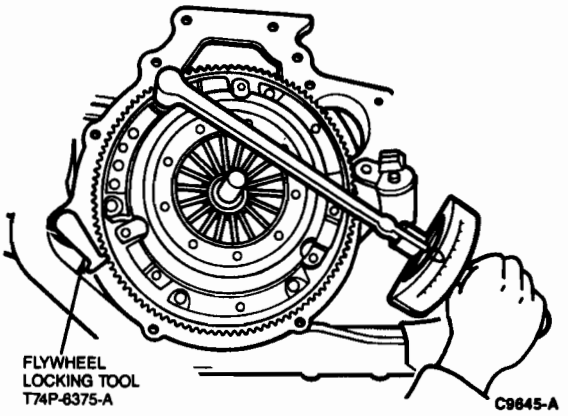



C7487-A

14. Install pressure plate assembly and bolts. Tighten bolts evenly in a diagonal sequence to 18-26 N·m (13-20 lb-ft). Use Flywheel Locking Tool T74P-6375-A or equivalent, to hold the flywheel while tightening the bolts.
15. Install transaxle. Refer to Section 07-03A or 07-03B.

## REMOVAL AND INSTALLATION (Continued)

16. Adjust clutch pedal height. Refer to Section 08-02.




## SPECIFICATIONS

### General Specifications

| | |
|---|---|
| Clutch Control<br>Turbocharged Vehicles | Cable Actuated |
| Naturally Aspirated Vehicles | Hydraulic |
| Clutch Cover Type | Conventional |
| Clutch Cover Set Load | 363 N<br>370 kg<br>814 lb |
| Clutch Cover | Flat Diaphragm Spring |
| Clutch Disc | Asbestos and Glass Fiber |
| Clutch Disc Outer Diameter | 190mm (7.48 inches) |
| Clutch Disc Facing Inner Diameter | 132 mm (5.20 inches) |
| Clutch Disc Thickness | 3.5mm (0.14 inch) |
| Clutch Disc Spline Inner Diameter | 20.11mm (0.792 inch) |
| Clutch Disc Number of Splines | 20 |
| Clutch Disc Thickness | 8.4mm (0.33 inch) |
| Number of Torsion Springs | 6 |
| Clutch Pedal Type | Suspended |
| Clutch Pedal Ratio | 6.2:1 |
| Clutch Pedal Full Stroke | 145mm (5.71 inches) |
| Clutch Pedal Height<br>Turbocharged Vehicles | 214—219mm (8.4—8.6 inches) |
| Naturally Aspirated Vehicles | 229—234mm (9.02—9.22 inches) |

CC6910-A

## SPECIFICATIONS (Continued)

**TORQUE SPECIFICATIONS**

| Description | N·m | Lb-Ft |
|---|---|---|
| Clutch Cover to Flywheel | 18-26 | 13-20 |
| Flywheel Retaining Bolts | 96-103 | 71-75 |
| Release Fork Mounting Bolt | 7.8-10.8 | 5.8-8.0 |

## SPECIAL SERVICE TOOLS

| Tool Number | Description |
|---|---|
| T74P-6375-A | Flywheel Locking Tool |
| T87C-7137-A | Clutch Aligning Tool |
| D78P-4201-G | Dial Indicator 1 Inch Travel |

# SECTION 08-02 Clutch Controls

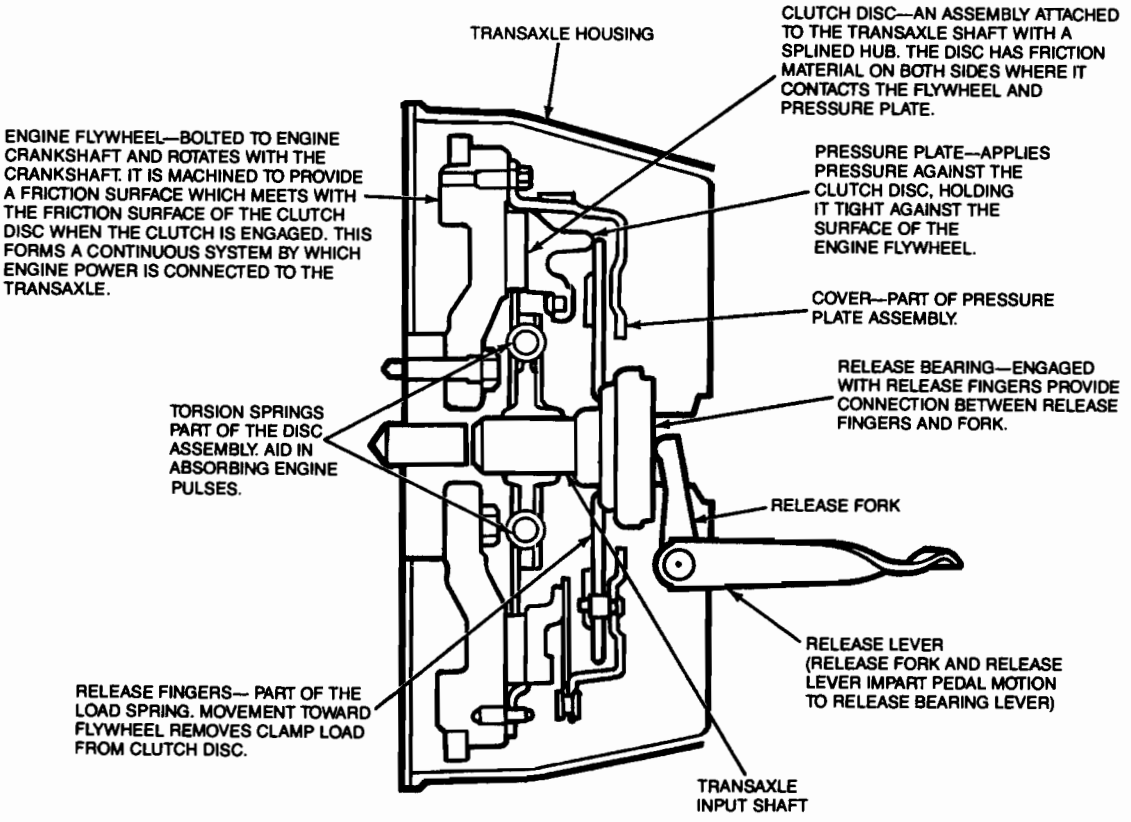


## VEHICLE APPLICATION

Capri.

## DESCRIPTION AND OPERATION

This vehicle uses two types of clutch release systems. The turbocharged vehicles with a type G transaxle use a mechanical cable system. The naturally aspirated vehicles with a type F2 transaxle use a hydraulic clutch system. When performing any service procedures, be sure of the system being serviced.



## DESCRIPTION AND OPERATION (Continued)

On turbocharged vehicles, pedal freeplay adjustment is performed at the release lever end of the cable. On naturally aspirated vehicles, pedal freeplay is adjusted at the brake pedal push rod. Pedal height is adjustable using the pedal stop bolt located on the clutch pedal.

## REMOVAL AND INSTALLATION

### Clutch Pedal Switch

**Removal and Installation**

1. Disconnect electrical connector.
2. Remove switch retaining nuts.
3. Remove switch from pedal bracket.
4. To install, reverse Removal procedure.

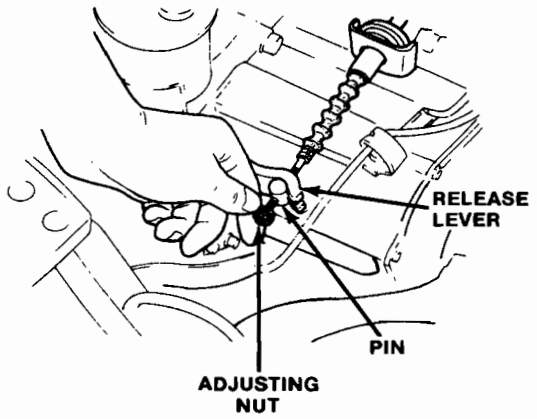
   NOTE: For switch testing, refer to Section 03-06.

### Clutch Cable

**Turbocharged Vehicles**

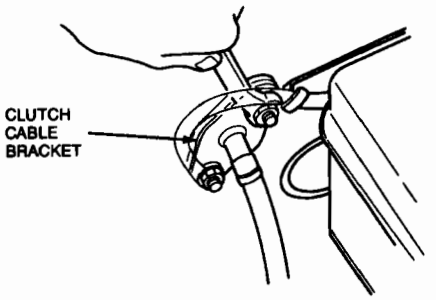
**Removal**

1. Remove the adjusting nut and pin so the cable can be removed from the release fork.



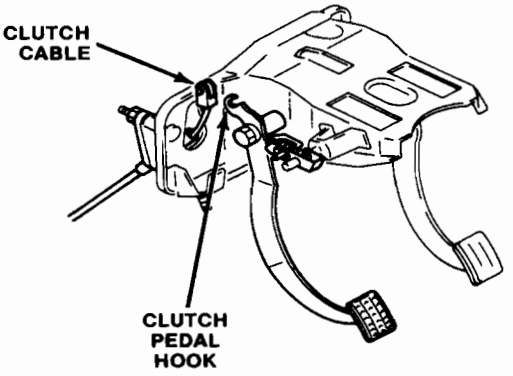

C7460-A

2. Remove the clutch cable bracket by removing the two nuts.




C6946-A

3. From underneath the instrument panel, remove the clutch cable from the top of the clutch pedal hook.
4. Remove the cable from the engine side.



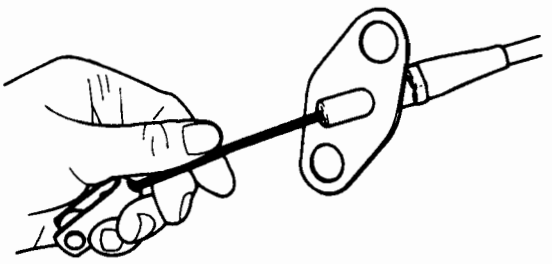

C7462-A

**Inspection**

Check for the following:

1. Damage to the cable or cable housing (frayed cable wire, worn or cracked housing).
2. Smooth operation of the cable (no binding).

   NOTE: Replace the cable if necessary.



C7463-A

## REMOVAL AND INSTALLATION (Continued)

### Installation

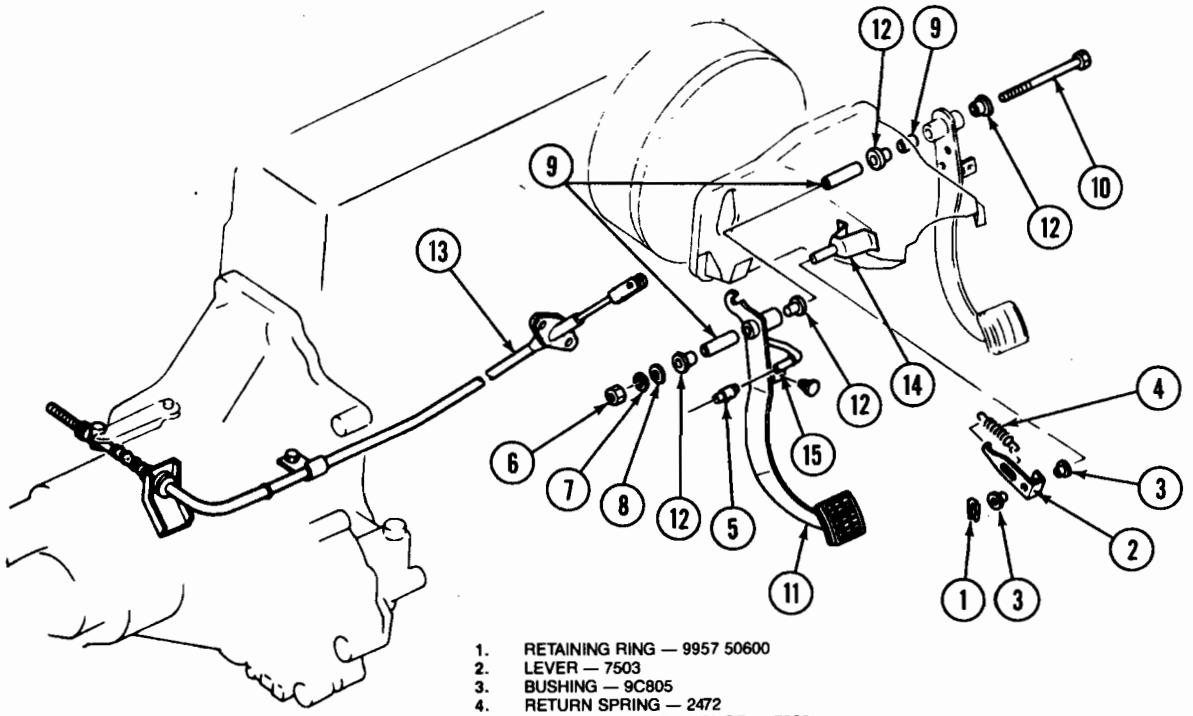
1. Apply Premium Long-Life Grease XG-1-C (ESA-M1C75-B) or equivalent to the pedal cable hook and the joint between the release lever and pin.
2. Install cable through the engine side.
3. From underneath the instrument panel, connect clutch cable over the top of the clutch pedal hook.
4. Install the clutch cable bracket to the dash panel. Install the two retaining nuts. Tighten to 16-23 N·m (12-16 lb-ft).
5. Install end of the cable through the slot in the release fork. Install the pin so that it rests in the groove of the release lever and attach the adjusting nut to the cable.
6. Adjust the pedal freeplay as outlined.

### Clutch Pedal

#### Removal

1. Remove left side window defogger duct by carefully pulling and slightly twisting.
2. On naturally aspirated vehicles, remove snap ring and pin retaining push rod to pedal.
3. Disengage the retaining ring from the clutch spring bracket. On turbocharged vehicles, grasp the lever at the bushings and pull the lever and spring assembly straight out.
4. Remove nut attaching clutch pedal to the through bolt.
5. While removing the through bolt, note position of the spring washer, flat washer (turbocharged vehicles), both bushings, and the spacers for installation.
6. On turbocharged vehicles, remove the clutch cable from the clutch pedal.
7. Remove the pedal.

#### Turbocharged Vehicles

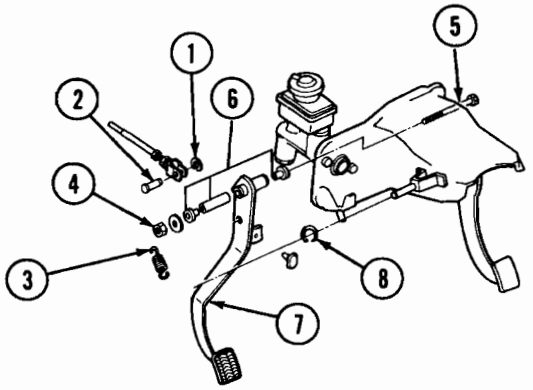



1. RETAINING RING — 9957 50600
2. LEVER — 7503
3. BUSHING — 9C805
4. RETURN SPRING — 2472
5. BUSHING, SPRING ANCHOR — 7526
6. NUT — 0603 34307
7. SPRING WASHER — 9987 11000
8. FLAT WASHER — 9995 21000
9. SPACER — 2461
10. THROUGH BOLT — 9981
11. CLUTCH PEDAL — 7519
12. BUSHING — 2481
13. CLUTCH CABLE — 7K553
14. CLUTCH SPRING BRACKET
15. CLUTCH SPRING ANCHOR

C4198-A

## REMOVAL AND INSTALLATION (Continued)

### Naturally Aspirated Vehicles



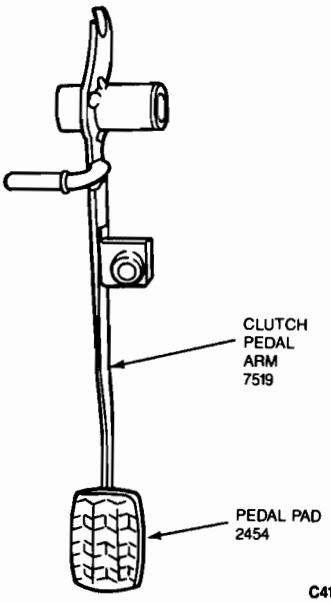

| ITEM | DESCRIPTION | PART NUMBER |
|---|---|---|
| 1. | SNAP RING | D001 43152 |
| 2. | PIN | 9923 20822 |
| 3. | RETURN SPRING | 2472 |
| 4. | NUT | 0603 34307 |
| 5. | THROUGH BOLT | 9981 31021 |
| 6. | BUSHING AND SPACER | 2481, 2461 |
| 7. | CLUTCH PEDAL | 7519 |
| 8. | SPRING RETAINING RING | 9957 50600 |

C6954-A

### Inspection

Check for the following:

- Worn or damaged pedal bushings
- Twisted or bent pedal
- Pedal pad worn or damaged



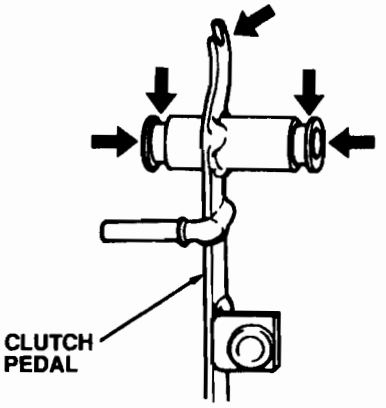

C4199-A

NOTE: Service or replace parts as required.

### Installation

1. Apply Multi-Purpose Grease D0AZ-19584-AA (ESR-M1C159-A and ESB-M1C93-A) or equivalent to the inner and outer surfaces of the pedal bushing, pedal cable (turbocharged vehicles), and hook unit.

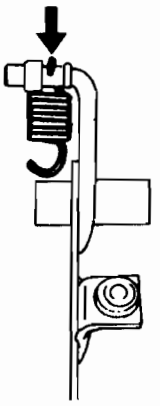
APPLY MULTI-PURPOSE GREASE AS SHOWN BY ARROWS




C10657-A

2. On turbocharged vehicles, install the end of clutch cable to the clutch pedal hook.
3. Install the through bolt into the support bracket, install the pedal and related parts (bushings, spacers, and washers) to the through bolt in the reverse order removed.
4. Slide the through bolt into the hole in the support bracket and attach the nut to the through bolt. Tighten the nut to 20-35 N·m (15-25 lb-ft).
5. On turbocharged vehicles, assemble the lever, spring and bushings.
6. On turbocharged vehicles, install lever assembly to the clutch spring bracket and the clutch spring anchor. Apply Multi-Purpose Grease D0AZ-19584-AA (ESR-M1C159-A and ESB-M1C93-A) or equivalent to the spring contact area as shown.

APPLY MULTI-PURPOSE GREASE



C10658-A

## REMOVAL AND INSTALLATION (Continued)

7. On naturally aspirated vehicles, attach the return spring to the spring bracket and clutch pedal.
8. Install the retaining ring to the clutch spring bracket.
9. On naturally aspirated vehicles, position the push rod, install the pin and install the snap ring.
10. After installing the clutch pedal, adjust the pedal height and pedal freeplay as outlined.

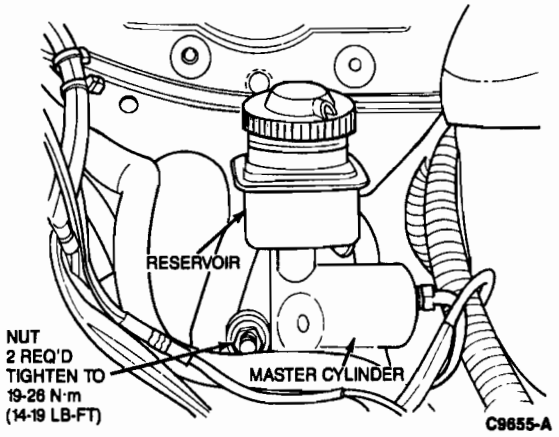
### Hydraulic Clutch Master Cylinder

**WARNING: BRAKE FLUID CONTAINS POLYGLYCOL ETHERS AND POLYGLYCOLS. AVOID CONTACT WITH EYES. WASH HANDS THOROUGHLY AFTER HANDLING. IF BRAKE FLUID CONTACTS EYES, FLUSH EYES WITH RUNNING WATER FOR 15 MINUTES. GET MEDICAL ATTENTION IF IRRITATION PERSISTS. IF TAKEN INTERNALLY, DRINK WATER AND INDUCE VOMITING. GET MEDICAL ATTENTION IMMEDIATELY.**

**Naturally Aspirated Vehicles**

**Removal**

1. Remove battery. Refer to Section 14-01.
2. Remove windshield wiper motor. Refer to Section 01-16.
3. Disconnect hydraulic line fitting at retaining bracket on transaxle case and drain fluid. Reconnect fitting after draining fluid.
4. Disconnect hydraulic line from master cylinder.
5. Remove master cylinder retaining nuts and remove master cylinder.




**Installation**

1. Position master cylinder to dash panel. Make sure clutch pedal push rod aligns properly.
2. Install retaining nuts. Tighten to 19-26 N·m (14-19 lb-ft).
3. Connect hydraulic line to master cylinder.
4. Fill reservoir. Bleed clutch system as outlined.
5. Install windshield wiper motor. Refer to Section 01-16.
6. Install battery. Refer to Section 14-01.

### Hydraulic Clutch Slave Cylinder

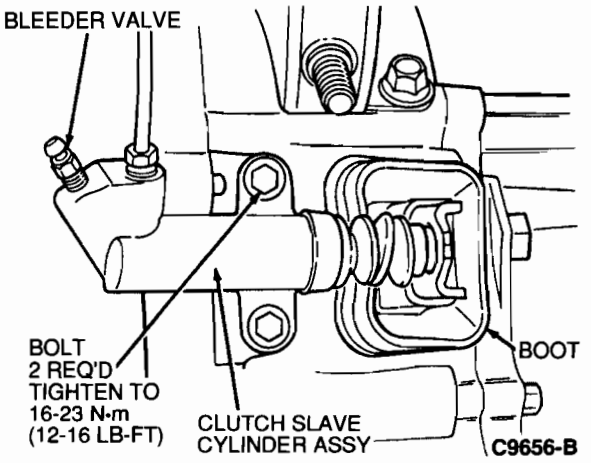
**Naturally Aspirated Vehicles**

**Removal**

1. Disconnect hydraulic line and plug to prevent fluid loss.
2. Remove two bolts retaining slave cylinder.
3. Remove slave cylinder.

**Installation**

1. Position slave cylinder.
2. Install two retaining bolts. Tighten to 16-23 N·m (12-16 lb-ft).
3. Connect hydraulic line.
4. Fill reservoir. Bleed clutch system as outlined.




## ADJUSTMENTS

### Clutch Pedal Height

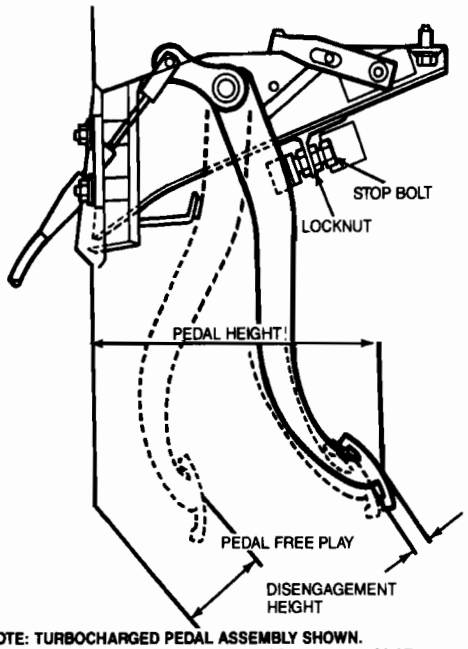
With the clutch pedal at the top of its travel, measure the distance from the upper center of the pedal pad to the dash panel and ensure the distance is 214-219mm (8.4-8.6 inch) on turbocharged vehicles or 229-234mm (9.02-9.21 inch) on naturally aspirated vehicles.

**Adjustment**

1. Loosen locknut located on clutch pedal.
2. Turn stop bolt to obtain correct pedal height.

## ADJUSTMENTS (Continued)

3. Tighten locknut.




NOTE: TURBOCHARGED PEDAL ASSEMBLY SHOWN. ADJUSTMENT FOR NATURALLY ASPIRATED SIMILAR.

C6952-A

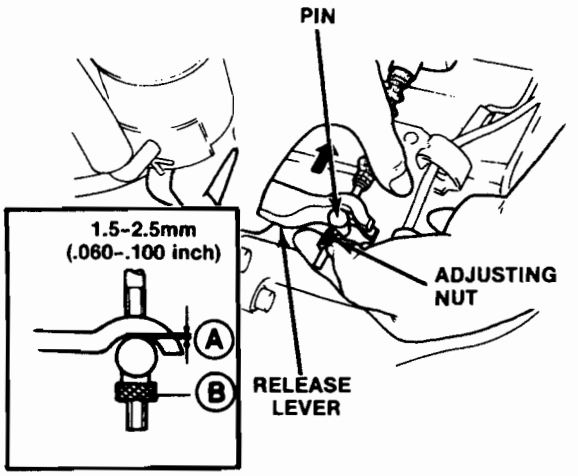
### Pedal Freeplay

#### Turbocharged Vehicles

Depress the pedal lightly by hand until all freeplay is removed and measure freeplay distance. Pedal freeplay distance should measure 9-15mm (0.354-0.590 inch).

#### Adjustment

1. Depress the clutch release lever and pull pin away from lever.
2. Adjust clearance "A" to 1.5-2.5mm (0.06-0.100 inch) by turning adjusting nut "B".




C7459-A

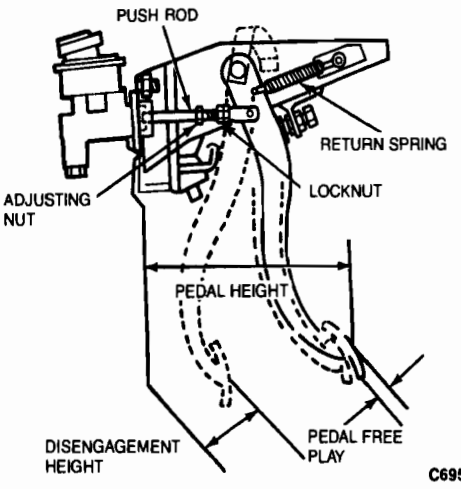
3. After the adjustment, make sure that when the clutch is disengaged, the pedal height is 214-219 mm (8.4-8.6 inches).

#### Naturally Aspirated Vehicles

Depress the pedal lightly by hand until all freeplay is removed and measure freeplay distance. Pedal freeplay distance should measure 0.6-3.0mm (0.02-0.12 inch).

#### Adjustment

1. Loosen locknut.
2. Turn push rod adjusting nut in direction required to achieve required clearance.
3. Tighten locknut to 12-17 N·m (9-12 lb-ft). Ensure that pedal height is 229-234mm (9.02-9.21 inch).




C6953-A

## ADJUSTMENTS (Continued)

### Hydraulic Clutch Bleeding

**WARNING: BRAKE FLUID CONTAINS POLYGLYCOL ETHERS AND POLYGLYCOLS. AVOID CONTACT WITH EYES. WASH HANDS THOROUGHLY AFTER HANDLING. IF BRAKE FLUID CONTACTS EYES, FLUSH EYES WITH RUNNING WATER FOR 15 MINUTES. GET MEDICAL ATTENTION IF IRRITATION PERSISTS. IF TAKEN INTERNALLY, DRINK WATER AND INDUCE VOMITING. GET MEDICAL ATTENTION IMMEDIATELY.**

**Naturally Aspirated Vehicles**

1. Raise vehicle on hoist. Refer to Section 00-02.
2. Attach a hose to bleeder valve on clutch slave cylinder.
3. Open bleeder valve one-half turn.
4. Watch for air bubbles in brake fluid at open end of hose.

   NOTE: Keep reservoir full of fluid while bleeding.
5. Close bleeder valve when bubbling stops.
6. Depress clutch pedal to floor and hold.
7. Open bleed valve one-quarter turn and push clutch pedal down as far as it will go. Close valve, then release pedal.
8. Top up fluid.
9. Check clutch for proper operation.

### Hydraulic Clutch Reservoir Fluid Level

NOTE: If hydraulic clutch fluid level is low, or requires replacement, fill to the max line on the reservoir. Use Heavy-Duty Brake Fluid C6AZ-19542-AA (ESA-M6C25-A) or equivalent.

## SPECIFICATIONS

**TORQUE SPECIFICATIONS**

| Description | N·m | Lb-Ft |
|---|---|---|
| Clutch Pedal Push Rod Locknut (Naturally Aspirated Vehicles) | 12-17 | 9-12 |
| Clutch Cable Bracket Nuts | 16-23 | 12-16 |
| Clutch Pedal Through Bolt Nut | 20-35 | 15-25 |
| Master Cylinder Retaining Nuts | 19-26 | 14-19 |
| Clutch Slave Cylinder | 16-23 | 12-16 |