CLUTCH

CONTENTS

GENERAL INFORMATION

CLUTCH COMPONENTS

The clutch mechanism in BR models with a gas or diesel engine consists of a single, dry-type clutch disc and a diaphragm style clutch cover. A hydraulic linkage is used to engage/disengage the clutch disc and cover.

The transmission input shaft is supported in the crankshaft by a bearing. A sleeve type release bearing is used to engage and disengage the clutch cover pressure plate.

The release bearing is operated by a release fork in the clutch housing. The fork pivots on a ball stud mounted inside the housing. The release fork is actuated by a hydraulic slave cylinder mounted in the housing. The slave cylinder is operated by a clutch master cylinder mounted on the dash panel. The cylinder push rod is connected to the clutch pedal.

The clutch disc has damper springs in the disc hub. The clutch disc facing is riveted to the hub. The facing is made from a non-asbestos material. The clutch cover pressure plate is a diaphragm type with a one-piece spring and multiple release fingers. The pressure plate release fingers are preset during manufacture and are not adjustable.

CLUTCH DISC APPLICATION

Two clutch disc diameters and four different thicknesses are used.

A 281 mm (11 in.) diameter clutch disc is used with a 3.9L, 5.2L, or 5.9L gas engines (Fig. 1) and (Fig. 2).

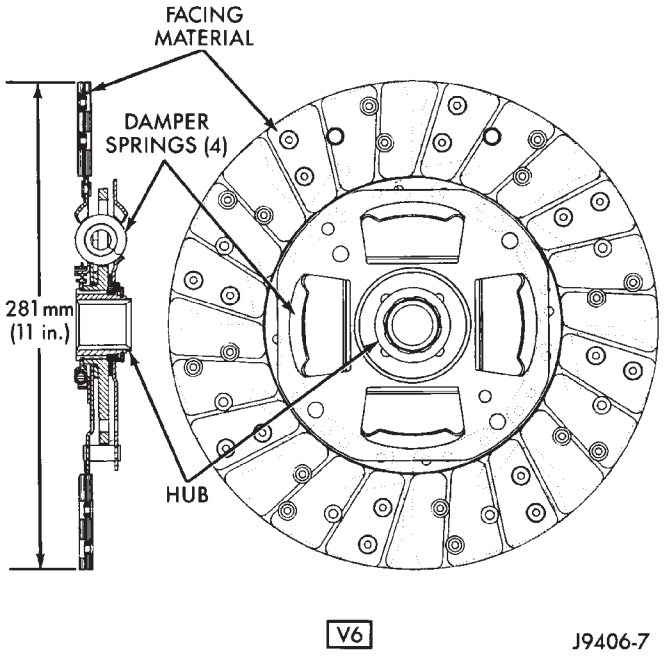


Fig. 1 Clutch Disc—V6 Engine

GENERAL INFORMATION (Continued)

A 312.5 mm (12.3 in.) diameter clutch disc is used

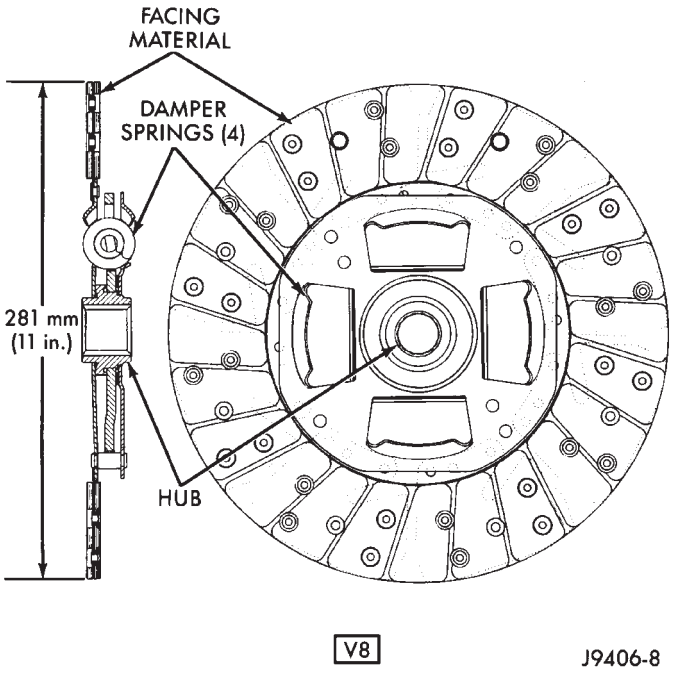


Fig. 2 Clutch Disc—V8 Engine

with diesel and V10 engines (Fig. 3) and (Fig. 4).

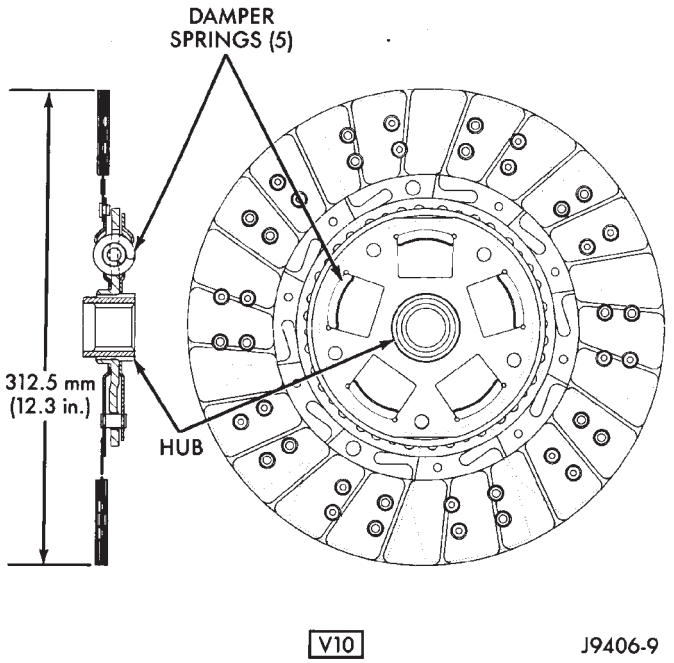


Fig. 3 Clutch Disc—V10 Engine

All the discs have damper springs in the hub. The 281 mm discs have four springs while the 312.5 mm disc has five springs. The damper springs provide smoother torque transfer and disc engagement.

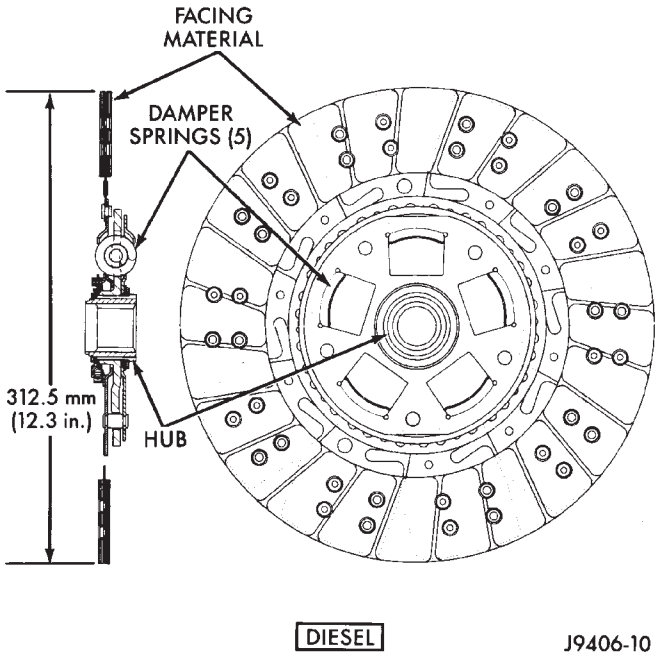


Fig. 4 Clutch Disc—Diesel Engine

CLUTCH COVER APPLICATION

Two clutch covers are used for all applications. The 281 mm cover (Fig. 5) is used for 3.9L, 5.2L and 5.9L gas engine applications.

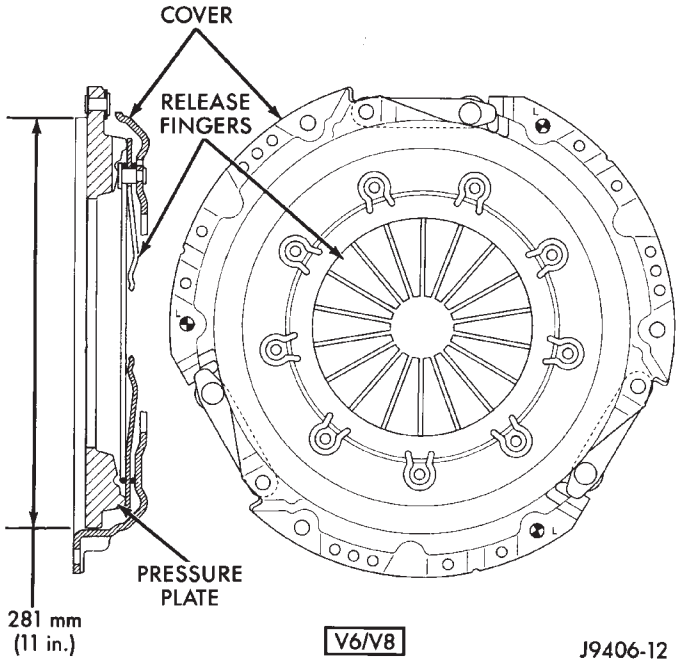


Fig. 5 Clutch Cover—V6/V8 Gas Engine

The 312.5 mm cover (Fig. 6), is used for 5.9L diesel and V10 gas engine applications.

GENERAL INFORMATION (Continued)

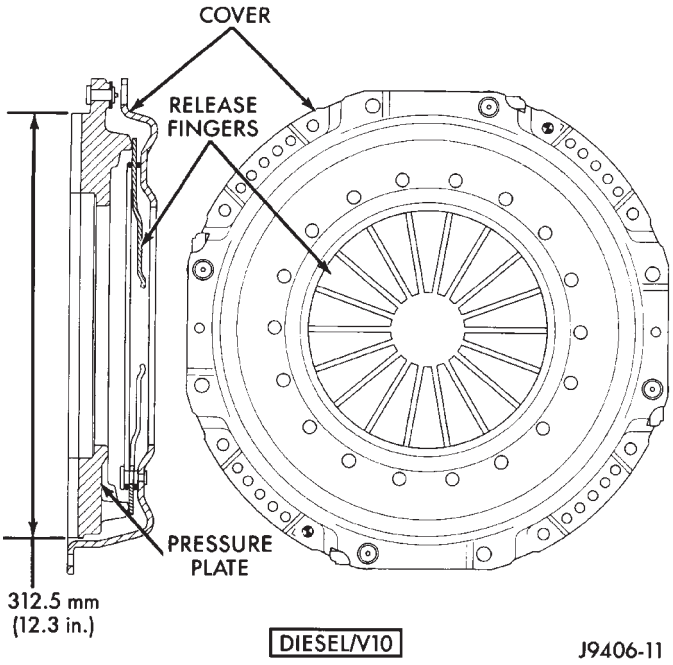


Fig. 6 Clutch Cover—V10 and Diesel Engine

CLUTCH HYDRAULIC LINKAGE

The hydraulic linkage consists of a remote reservoir, clutch master cylinder, clutch slave cylinder and interconnecting fluid lines (Fig. 7).

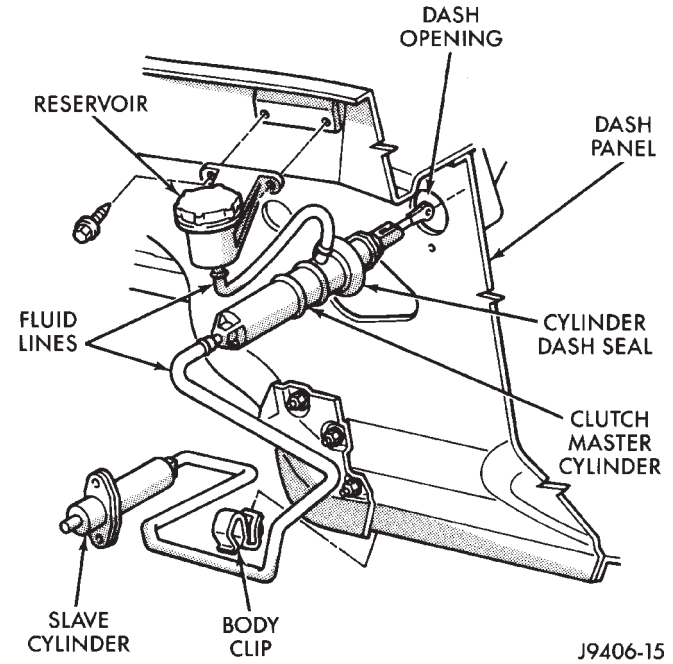


Fig. 7 Clutch Hydraulic Linkage

The clutch master cylinder is connected to the clutch pedal and the slave cylinder is connected to the clutch release fork. The master cylinder is mounted on the drivers' side of the dash panel adjacent to the brake master cylinder.

CLUTCH HYDRAULIC FLUID

The clutch hydraulic linkage cylinders and lines are prefilled with fluid at the factory.

The hydraulic system should not require additional fluid under normal circumstances. In fact, the reservoir fluid level will actually increase as normal clutch wear occurs. For this reason, it is important to avoid overfilling, or removing fluid from the reservoir. This action will cause clutch release problems.

If inspection or diagnosis indicates additional fluid may be needed, it will be necessary to replace the complete hydraulic linkage assembly.

CLUTCH LUBRICATION

Proper clutch component lubrication is important to satisfactory operation. Using the correct lubricant and avoiding over lubrication are also equally important.

During service, apply recommended lubricant sparingly. Do not overlubricate as this could result in clutch disc and pressure plate contamination.

Clutch and transmission components requiring lubrication are:

- pilot bearing.
- release lever pivot ball stud.
- release lever pivot surfaces.
- release bearing bore.
- clutch pedal pivot bore and bushings.
- transmission input shaft splines and pilot hub.
- release bearing slide surface of front bearing retainer.
- master cylinder bushing at the clutch pedal.

Do not apply grease to any part of the clutch cover or disc.

Use Mopar® multi-mileage grease or a silicone grease for the clutch pedal bushings and pivot shaft.

Use Mopar® high temperature bearing grease or equivalent for the pilot bearing, release bearing bore, transmission input shaft and release fork components. Apply recommended amounts only and do not overlubricate.

GENERAL INFORMATION (Continued)

CLUTCH PEDAL POSITION SWITCH

All BR models are equipped with a clutch pedal position switch (Fig. 8). The switch is in circuit with the starter relay and is mounted on the clutch master cylinder push rod. The switch is actuated by clutch pedal movement. The clutch pedal must be fully depressed in order to start the engine.

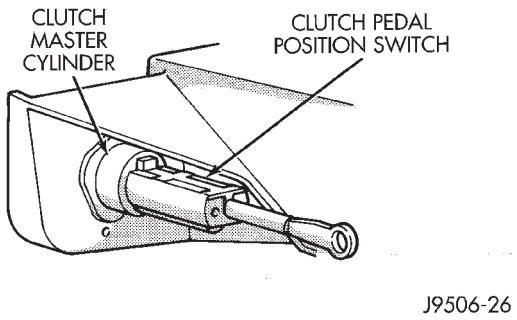


Fig. 8 Clutch Pedal Position (Interlock) Switch

The position switch is an integral part of the clutch master cylinder push rod and is not serviced separately.

Refer to Group 8W, Wiring Diagrams for component locations and circuit information.

DIAGNOSIS AND TESTING

GENERAL INFORMATION

Problem diagnosis will generally require a road test to determine the type of fault. Component inspection will then determine the problem cause after road testing.

Drive the vehicle at normal speeds during the road test. Shift the transmission through all gear ranges and observe clutch action.

If chatter, grab, slip, or improper release is experienced, remove and inspect the clutch components. However, if the problem is noise or hard shifting, further diagnosis may be needed. The transmission or another driveline component may actually be at fault. Careful observation during the test will help narrow the problem area.

CLUTCH CONTAMINATION

Fluid contamination is a frequent cause of clutch malfunctions. Oil, grease, water, or other fluids on the clutch contact surfaces will cause faulty operation. The usual result is chatter, slip and grab.

During inspection, note if any components are contaminated. Look for evidence of oil, grease, clutch hydraulic fluid, or water/road splash on clutch components.

Oil contamination indicates a leak at either the rear main seal or transmission input shaft. Oil leaks produce a residue of oil on the housing interior and on the clutch cover and flywheel. Heat buildup caused by slippage between the clutch cover, disc, and flywheel can sometimes bake the oil residue onto the components. The glaze-like residue ranges in color from amber to black.

Road splash contamination means dirt/water is entering the clutch housing. This may be due to loose bolts, housing cracks, or through the slave cylinder opening. Driving through deep water puddles can force water/road splash into the housing through such openings.

Clutch fluid leaks are from loose or damaged clutch linkage fluid lines or connections. However, most clutch fluid leaks will usually be noted and corrected before severe contamination occurs.

Grease contamination is usually a product of excessive lubrication during clutch service. Apply only a small amount of grease to the input shaft splines, bearing retainer, pilot bearing, release fork and pivot stud. Excess grease can be thrown off during operation and contaminate the disc.

IMPROPER CLUTCH RELEASE OR ENGAGEMENT

Clutch release or engagement problems are caused by wear, or damage to one or more clutch components. A visual inspection of the release components will usually reveal the problem part.

Release problems can result in hard shifting and noise. Items to look for are: leaks at the clutch cylinders and interconnecting line; loose slave cylinder bolts; worn/loose release fork and pivot stud; damaged release bearing; and a worn clutch disc, or pressure plate.

Normal condensation in vehicles that are stored or out of service for long periods of time can generate enough corrosion to make the disc stick to the flywheel, or pressure plate. If this condition is experienced, correction only requires that the disc be loosened manually through the inspection plate opening.

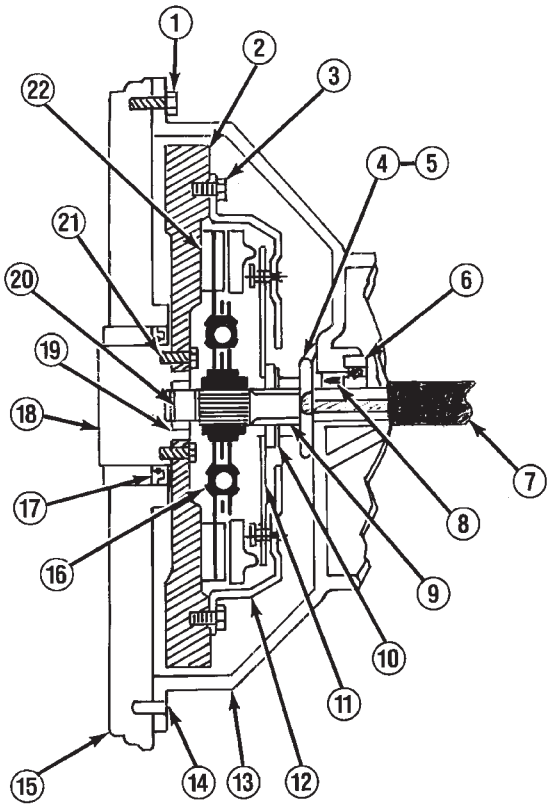
Engagement problems usually result in slip, chatter/shudder, and noisy operation. The primary causes are clutch disc contamination; clutch disc wear; misalignment, or distortion; flywheel damage; or a combination of the foregoing. A visual inspection is required to determine the part actually causing the problem.

CLUTCH RUNOUT

CLUTCH DISC

Check the clutch disc before installation. Axial (face) runout of a new disc should not exceed 0.5 mm (0.020 in.). Measure runout about 6 mm (1/4 in.) from the outer edge of the disc facing. Obtain another disc if runout is excessive.

DIAGNOSIS AND TESTING (Continued)



1 Check clutch housing bolts. Tighten if loose. Be sure housing is fully seated on engine block.

2 Check flywheel. Scuff sand face to remove glaze. Clean surface with wax and grease remover. Replace flywheel if severely scored, worn or cracked. Secure flywheel with new bolts (if removed). Do not reuse old bolts. Use Mopar Lock N'Seal on bolts.

3 Tighten clutch cover bolts 2-3 threads at a time, alternately and evenly (in a star pattern) to specified torque. Failure to do so could warp the cover.

4 Check release fork. Replace fork if bent or worn. Make sure pivot and bearing contact surfaces are lubricated.

5 Check release fork pivot (in housing). Be sure pivot is secure and ball end is lubricated.

6 Transmission input shaft bearing will cause noise, chatter, or improper release if damaged. Check condition before installing transmission.

7 Check slave cylinder. Replace it if leaking. Be sure cylinder is properly secured in housing and cylinder piston is seated in release fork.

8 Check input shaft seal if clutch cover and disc were oil covered. Replace seal if worn, or cut.

9 Inspect release bearing slide surface of trans. front bearing retainer. Surface should be smooth, free of nicks, scores. Replace retainer if necessary. Lubricate slide surface before installing release bearing.

10 Do not replace release bearing unless actually faulty. Replace bearing only if seized, noisy, or damaged.

11 Check clutch cover diaphragm spring and release fingers. Replace cover if spring or fingers are bent, warped, broken, cracked. Do not tamper with factory spring setting as clutch problems will result.

12 Check condition of clutch cover. Replace clutch cover if plate surface is deeply scored, warped, worn, or cracked. Be sure cover is correct size and properly aligned on disc and flywheel.

13 Inspect clutch housing. Be sure bolts are tight. Replace housing if damaged.

14 Verify that housing alignment dowels are in position before installing housing.

15 Clean engine block surface before installing clutch housing. Dirt, grime can produce misalignment.

16 Make sure side of clutch disc marked "flywheel side" is toward flywheel.

17 Check rear main seal if clutch disc and cover were oil covered. Replace seal if necessary.

18 Check crankshaft flange (if flywheel is removed). Be sure flange is clean and flywheel bolt threads are in good condition.

19 Check pilot bearing. Replace bearing if damaged. Lube with Mopar high temp. bearing grease before installation.

20 Check transmission input shaft. Disc must slide freely on shaft splines. Lightly grease splines before installation. Replace shaft if splines or pilot bearing hub are damaged.

21 Check flywheel bolt torque. If bolts are loose, replace them. Use Mopar Lock N'Seal to secure new bolts.

22 Check clutch disc facing. Replace disc if facing is charred, scored, flaking off, or worn. Also check runout of new disc. Runout should not exceed 0.5 mm (0.02 in.).

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Clutch Components

DIAGNOSIS AND TESTING (Continued)

CLUTCH COVER

Check condition of the clutch cover before installation. A warped cover or diaphragm spring will cause grab and incomplete release or engagement. Be careful when handling the cover and disc. Impact can distort the cover, diaphragm spring, release fingers and the hub of the clutch disc.

Use an alignment tool when positioning the disc on the flywheel. The tool prevents accidental misalignment which could result in cover distortion and disc damage.

A frequent cause of clutch cover distortion is improper bolt tightening. To avoid warping the cover, the bolts must be tightened in a diagonal pattern and only 2–3 threads at a time to the specified torque.

FLYWHEEL

Flywheel runout should not exceed 0.08 mm (0.003 in.). Measure runout at the outer edge of the flywheel face with a dial indicator. Mount the indicator on a stud installed in place of one of the clutch housing bolts.

Common causes of runout are:

- heat warpage.
- improper machining.
- incorrect bolt tightening.
- improper seating on crankshaft flange shoulder.
- foreign material on crankshaft flange.

Flywheel machining is not recommended. The flywheel clutch surface is machined to a unique contour and machining will negate this feature. However, minor flywheel scoring can be cleaned up by hand with 180 grit emery, or with surface grinding equipment. Remove only enough material to reduce scoring (approximately 0.001 - 0.003 in.). Heavy stock removal is **not recommended.** Replace the flywheel if scoring is severe and deeper than 0.076 mm (0.003 in.). Excessive stock removal can result in flywheel cracking or warpage after installation; it can also weaken the flywheel and interfere with proper clutch release.

Clean the crankshaft flange before mounting the flywheel. Dirt and grease on the flange surface may cock the flywheel causing excessive runout. Use new bolts when remounting a flywheel and secure the bolts with Mopar® Lock And Seal. Tighten flywheel bolts to specified torque only. Overtightening can distort the flywheel hub causing runout.

NV4500 CLUTCH HOUSING

CHECKING RUNOUT

Only the NV4500 clutch housing can be checked using the following bore and face runout procedures. The NV3500 clutch housing is an integral part of the transmission front case and can only be checked off the vehicle.

MEASURING CLUTCH HOUSING BORE RUNOUT

(1) Remove the clutch housing and strut.

(2) Remove the clutch cover and disc.

(3) Replace one of the flywheel bolts with an appropriate size threaded rod that is 10 in. (25.4 cm) long (Fig. 9). The rod will be used to mount the dial indicator.

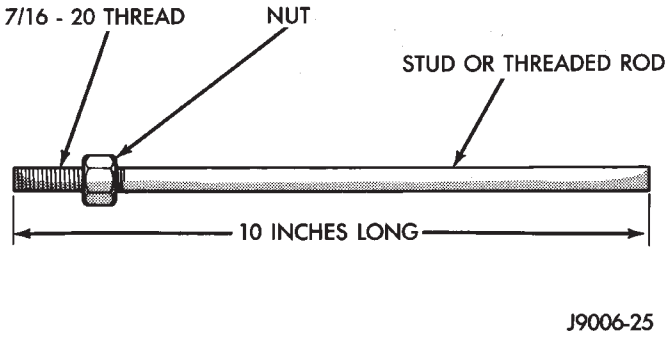


Fig. 9 Dial Indicator Mounting Stud Or Rod

(4) Remove the release fork from the clutch housing.

(5) Reinstall the clutch housing. Tighten the housing bolts nearest the alignment dowels first.

(6) Mount the dial indicator on the threaded rod and position the indicator plunger on the surface of the clutch housing bore (Fig. 10).

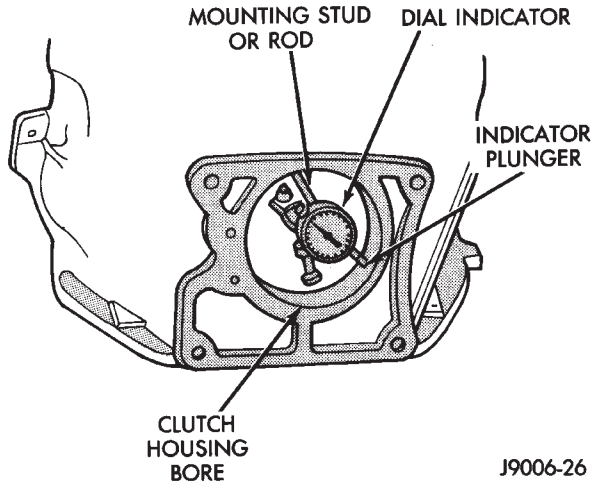


Fig. 10 Checking Clutch Housing Bore Runout

(7) Rotate the crankshaft until the indicator plunger is at the top center of the housing bore. Zero the indicator at this point.

(8) Rotate the crankshaft and record the indicator readings at eight points (45° apart) around the bore (Fig. 10). Repeat the measurement at least twice for accuracy.

(9) Subtract each reading from the one 180° opposite to determine magnitude and direction of runout. Refer to (Fig. 11) and following example.

DIAGNOSIS AND TESTING (Continued)

Bore runout example:
0.000 – (–0.007) = 0.007 in.
+0.002 – (–0.010) = 0.012 in.
+0.004 – (–0.005) = 0.009 in.
–0.001 – (+0.001) = –0.002 in. (= 0.002 inch)

In the above example, the largest difference is 0.012 in. and is called the total indicator reading (TIR). This means that the housing bore is offset from the crankshaft centerline by 0.006 in. (which is 1/2 of 0.012 in.).

On gas engines, the acceptable maximum TIR for housing bore runout is 0.010 inch. If measured TIR is more than 0.010 in. (as in the example), bore runout will have to be corrected with offset dowels. Offset dowels are available in 0.007, 0.014 and 0.021 in. sizes for this purpose (Fig. 11). Refer to Correcting Housing Bore Runout for dowel installation.

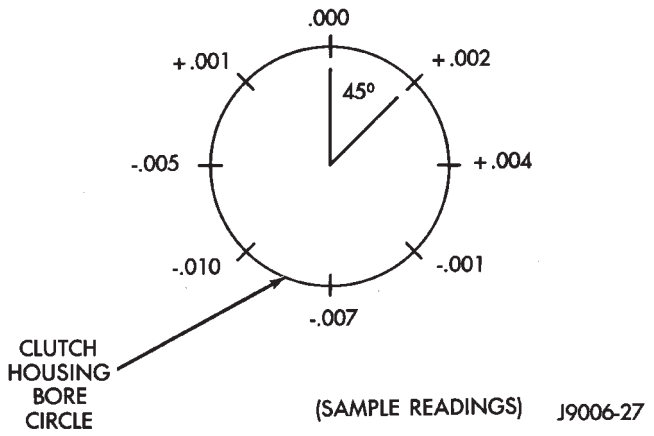


Fig. 11 Housing Bore Measurement Points And Sample Readings

On diesel engines, the acceptable maximum TIR for housing bore runout is 0.015 inch. However, unlike gas engines, offset dowels are not available to correct runout on diesel engines. **If bore runout exceeds the stated maximum on a diesel engine, it may be necessary to replace either the clutch housing, or transmission adapter plate.**

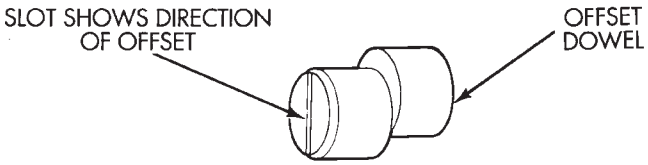
Correcting Clutch Housing Bore Runout— Engine Only

On gas engine vehicles, clutch housing bore runout can be corrected with offset dowels.

The dial indicator reads positive when the plunger moves inward (toward indicator) and negative when it moves outward (away from indicator). As a result, the lowest or most negative reading determines the direction of housing bore offset (runout).

In the sample readings shown (Fig. 12) and in Step 7 above, the bore is offset toward the 0.010 inch reading. To correct this, remove the housing and original dowels. Then install the new offset dowels in the direction needed to center the bore with the crankshaft centerline.

In the example, TIR was 0.012 inch. The dowels needed for correction would have an offset of 0.007 in. (Fig. 12).



DOWEL SELECTION

TIR VALUE	OFFSET DOWEL REQUIRED
0.011 – 0.021 inch	0.007 inch
0.022 – 0.035 inch	0.014 inch
0.036 – 0.052 inch	0.021 inch

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Fig. 12 Housing Bore Alignment Dowel Selection

Install the dowels with the slotted side facing out so they can be turned with a screwdriver. Then install the housing, remount the dial indicator and check bore runout again. Rotate the dowels until the TIR is less than 0.010 in. if necessary.

If a TIR of 0.053 in., or greater is encountered, it will be necessary to replace the clutch housing.

Measuring Clutch Housing Face Runout

(1) Reposition the dial indicator plunger on the housing face (Fig. 13). Place the indicator plunger at the rim of the housing bore as shown.

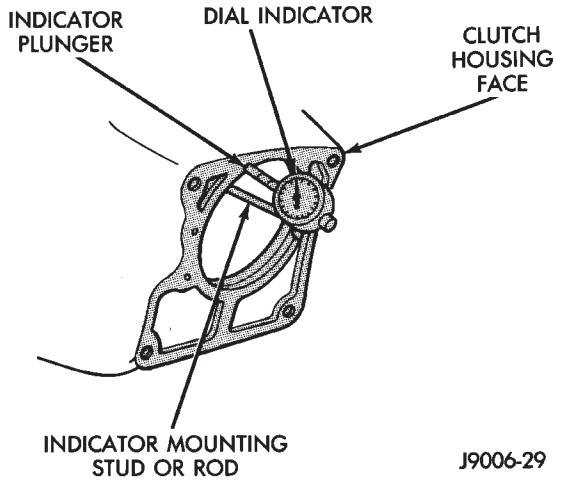

Fig. 13 Measuring Clutch Housing Face Runout

(2) Rotate the crankshaft until the indicator plunger is at the 10 O'clock position on the bore. Then zero the dial indicator.

DIAGNOSIS AND TESTING (Continued)

(3) Measure and record face runout at four points 90° apart around the housing face (Fig. 14). Perform the measurement at least twice for accuracy.

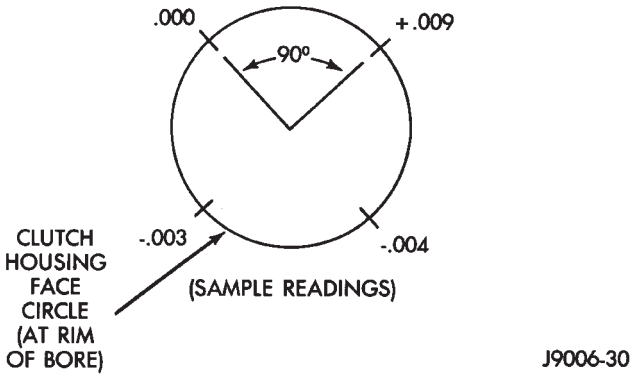

Fig. 14 Housing Face Measurement Points And Sample Readings

(4) Subtract the lowest reading from the highest to determine total runout. As an example, refer to the sample readings shown (Fig. 16). If the low reading was **minus** 0.004 in. and the highest reading was **plus** 0.009 in., total runout is actually 0.013 inch.

(5) Total allowable face runout is 0.010 inch. If runout exceeds this figure, runout will have to be corrected. Refer to Correcting Clutch Housing Face Runout.

CORRECTING CLUTCH HOUSING FACE RUNOUT

Housing face runout, on gas or diesel engines, can be corrected by installing shims between the clutch housing and transmission (Fig. 15). The shims can be made from shim stock or similar materials of the required thickness.

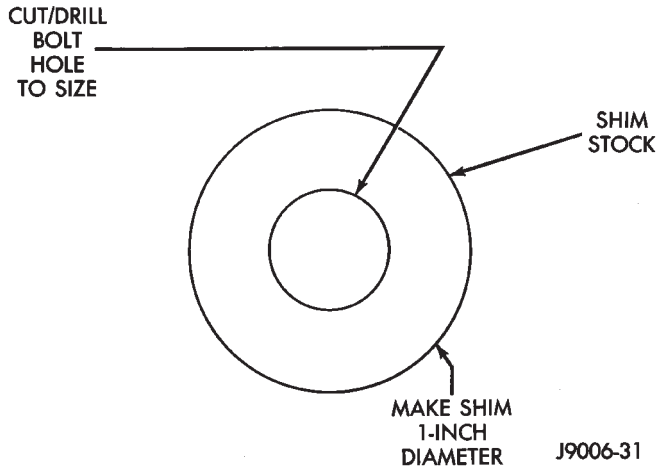

Fig. 15 Housing Face Alignment Shims

As an example, assume that face runout is the same as shown in (Fig. 16) and in Step 4. In this case, three shims will be needed. Shim thicknesses should be 0.009 in. (at the 0.000 corner), 0.012 in. (at the –0.003 corner) and 0.013 in. (at the –0.004 corner).

After installing the clutch assembly and housing, tighten the housing bolts nearest the alignment dowels first.

Clutch housing preferred bolt torques are:

- 41 N·m (30 ft. lbs.) for 3/8 in. diameter bolts
- 68 N·m (50 ft. lbs.) for 7/16 in. diameter bolts
- 47 N·m (35 ft. lbs.) for V10 and diesel clutch housing bolts

During final transmission installation, install the shims between the clutch housing and transmission at the appropriate bolt locations.

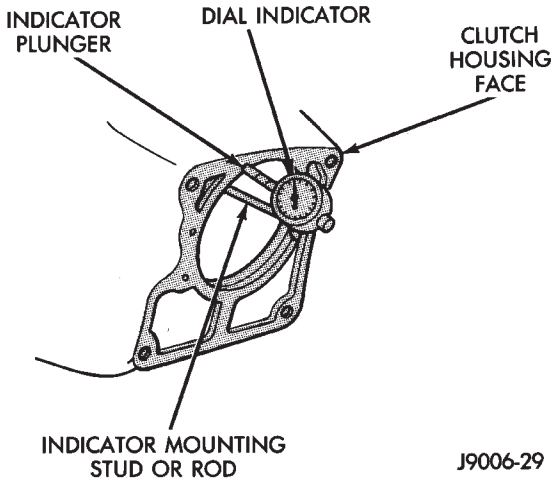

Fig. 16 Measuring Clutch Housing Face Runout

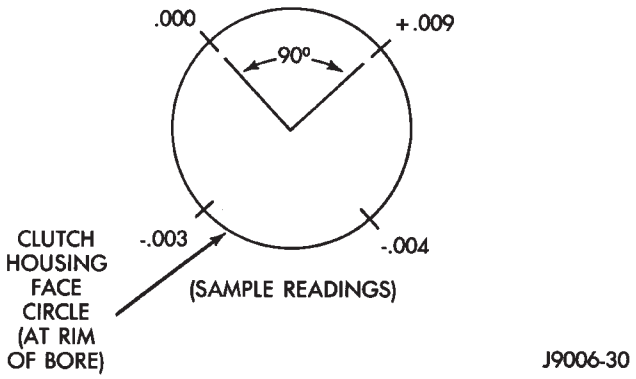

Fig. 17 Housing Face Measurement Points And Sample Readings

MISALIGNMENT

Clutch housing alignment is important to proper clutch operation. The housing maintains alignment between the crankshaft and transmission input

DIAGNOSIS AND TESTING (Continued)

shaft. Misalignment can cause clutch noise, hard shifting, incomplete release and chatter. It can also result in premature wear of the pilot bearing, cover release fingers and clutch disc. In severe cases, misalignment can also cause premature wear of the transmission input shaft and front bearing.

Housing misalignment is generally caused by incorrect seating on the engine or transmission, loose housing bolts, missing alignment dowels, or housing damage. Tighten all the clutch housing bolts to proper torque before installing any struts. Also be sure alignment dowels are in place and seated in the block and housing before bolt tightening. Infrequently, misalignment may also be caused by housing mounting surfaces that are not completely parallel. Misalignment can be corrected with shims.

DIAGNOSTIC CHARTS

The diagnosis charts describe common clutch problems, causes and correction. Fault conditions are listed at the top of each chart. Conditions, causes and corrective action are outlined in the indicated columns

DIAGNOSIS CHARTS

CONDITION	POSSIBLE CAUSES	CORRECTION
Disc facing worn out	1. Normal wear. 2. Driver frequently rides (slips) the clutch. Results in rapid overheating and wear. 3. Insufficient clutch cover diaphragm spring tension.	1. Replace cover and disc. 2. Replace cover and disc. 3. Replace cover and disc.
Clutch disc facing contaminated with oil, grease, or clutch fluid.	1. Leak at rear main engine seal or transmission input shaft seal. 2. Excessive amount of grease applied to the input shaft splines. 3. Road splash, water entering housing. 4. Slave cylinder leaking.	1. Replace appropriate seal. 2. Remove grease and apply the correct amount of grease. 3. Replace clutch disc. Clean clutch cover and reuse if in good condition. 4. Replace hydraulic clutch linkage.
Clutch is running partially disengaged.	1. Release bearing sticking or binding and does not return to the normal running position.	1. Verify failure. Replace the release bearing and transmission front bearing retainer as necessary.
Flywheel below minimum thickness specification.	1. Improper flywheel machining. Flywheel has excessive taper or excessive material removal.	1. Replace flywheel.
Clutch disc, cover and/or diaphragm spring warped or distorted.	1. Rough handling. Impact bent cover, spring, or disc. 2. Improper bolt tightening procedure.	1. Replace disc or cover as necessary. 2. Tighten clutch cover using proper procedure.
Facing on flywheel side of disc torn, gouged, or worn.	1. Flywheel surface scored or nicked. 2. Clutch disc sticking or binding on transmission input shaft.	2. Correct surface condition if possible. Replace flywheel and disc as necessary. 2. Inspect components and correct/replace as necessary.
Clutch disc facing burnt. Flywheel and cover pressure plate surfaces heavily glazed.	1. Frequent operation under high loads or hard acceleration conditions. 2. Driver frequently rides (slips) clutch. Results in rapid wear and overheating of disc and cover.	1. Correct condition of flywheel and pressure plate surface. Replace clutch cover and disc. Alert driver to problem cause. 2. Correct condition of flywheel and pressure plate surface. Replace clutch cover and disc. Alert driver to problem cause.

DIAGNOSIS AND TESTING (Continued)

DIAGNOSIS CHART (CONTINUED)

CONDITION	POSSIBLE CAUSES	CORRECTION
Clutch disc binds on input shaft splines.	1. Clutch disc hub splines damaged during installation.	1. Clean, smooth, and lubricate hub splines if possible. Replace disc if necessary.
	2. Input shaft splines rough, damaged, or corroded.	2. Clean, smooth, and lubricate shaft splines if possible. Replace input shaft if necessary.
Clutch disc rusted to flywheel and/or pressure plate.	1. Clutch not used for and extended period of time (e.g. long term vehicle storage).	1. Sand rusted surfaces with 180 grit sanding paper. Replace clutch cover and flywheel if necessary.
Pilot bearing seized, loose, or rollers are worn.	1. Bearing cocked during installation. 2. Bearing defective. 3. Bearing not lubricated. 4. Clutch misalignment.	1. Install and lubricate a new bearing. 2. Install and lubricate a new bearing. 3. Install and lubricate a new bearing. 4. Inspect clutch and correct as necessary. Install and lubricate a new bearing.
Clutch will not disengage properly.	1. Low clutch fluid level. 2. Clutch cover loose. 3. Clutch disc bent or distorted. 4. Clutch cover diaphragm spring bent or warped. 5. Clutch disc installed backwards. 6. Release fork bent or fork pivot loose or damaged. 7. Clutch master or slave cylinder failure.	1. Replace hydraulic linkage assembly. 2. Follow proper bolt tightening procedure. 3. Replace clutch disc. 4. Replace clutch cover. 5. Remove and install clutch disc correctly. 6. Replace fork or pivot as necessary. 7. Replace hydraulic linkage assembly.
Clutch pedal squeak.	1. Pivot pin loose. 2. Master cylinder bushing not lubricated. 3. Pedal bushings worn out or cracked.	1. Tighten pivot pin if possible. Replace clutch pedal if necessary. 2. Lubricate master cylinder bushing. 3. Replace and lubricate bushings.

.

REMOVAL AND INSTALLATION

CLUTCH COVER AND DISC

REMOVAL

(1) Raise and support vehicle.

(2) Support engine with wood block and adjustable jack stand (Fig. 18). Supporting engine is necessary to avoid undue strain on engine mounts.

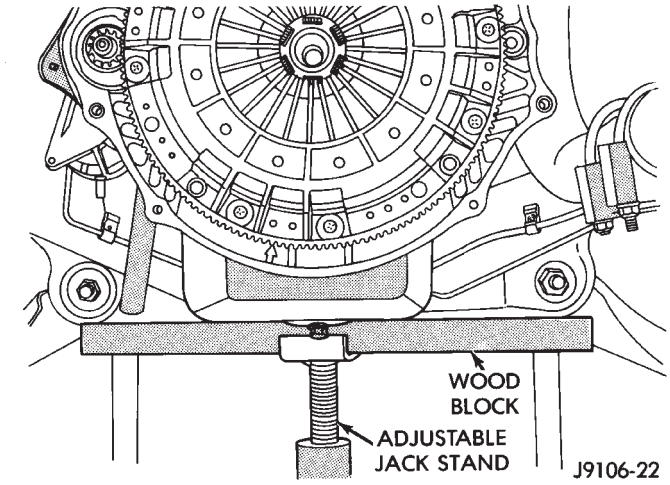

Fig. 18 Supporting Engine With Jack Stand And Wood Block—Diesel Model Shown

(3) Remove transmission and transfer case, if equipped. Refer to Group 21, Transmission and Transfer Case, for proper procedures.

(4) If clutch cover will be reused, mark position of cover on flywheel with paint or scriber (Fig. 19).

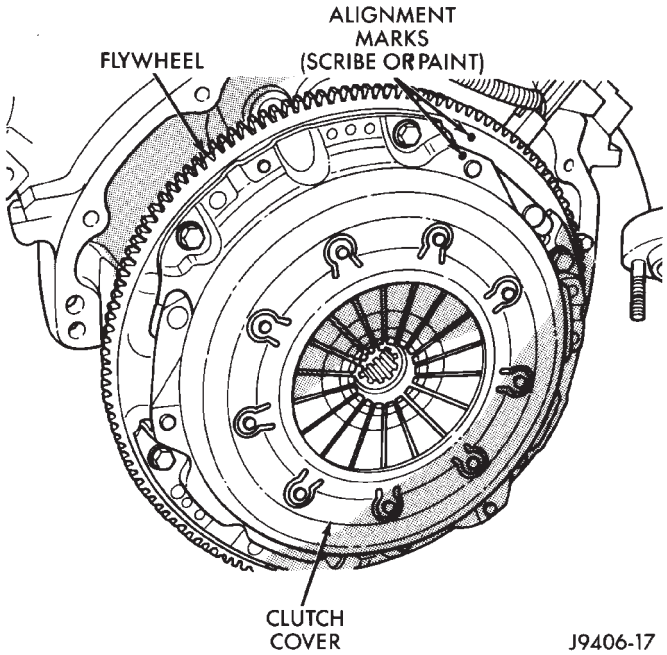

Fig. 19 Marking Clutch Cover Position

(5) Insert clutch alignment tool in clutch disc and into pilot bushing. Tool will hold disc in place when cover bolts are removed.

(6) If clutch cover will be reused, loosen cover bolts evenly, only few threads at a time, and in a diagonal pattern (Fig. 20). This relieves cover spring tension evenly to avoid warping.

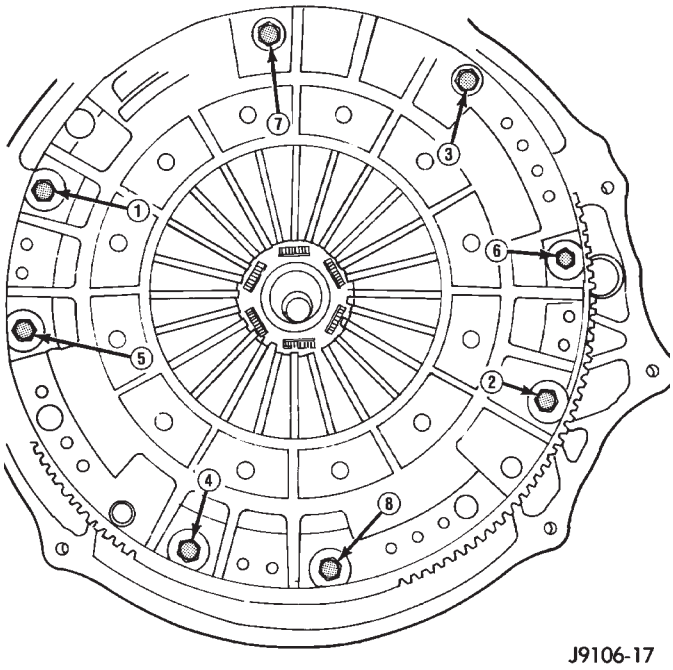

Fig. 20 Clutch Cover Bolt Loosening/Tightening Pattern

(7) Remove cover bolts completely and remove cover, disc and alignment tool.

INSTALLATION

(1) Check runout and free operation of new clutch disc.

(2) Lubricate crankshaft pilot bearing with Mopar® high temperature bearing grease.

(3) Insert clutch alignment tool in clutch disc hub.

(4) Verify that disc hub is positioned correctly. The raised side of hub is installed away from the flywheel.

REMOVAL AND INSTALLATION (Continued)

(5) Insert alignment tool in pilot bearing and position disc on flywheel surface (Fig. 21).

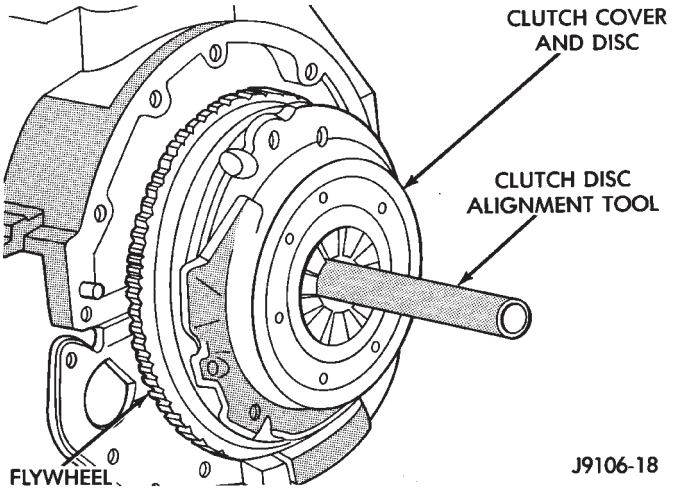

Fig. 21 Clutch Disc And Cover Alignment/ Installation

(6) Position clutch cover over disc and onto flywheel (Fig. 21).

(7) Align and hold clutch cover in position and install cover bolts finger tight.

(8) Tighten cover bolts evenly and a few threads at a time. Cover bolts must be tightened evenly and to specified torque to avoid distorting cover.

(9) Tighten clutch cover bolts to following:

- 5/16 in. diameter bolts to 23 N·m (17 ft. lbs.).
- 3/8 in. diameter bolts to 41 N·m (30 ft. lbs.).

(10) Remove release lever and release bearing from clutch housing. Apply Mopar® high temperature bearing grease to bore of release bearing, release lever contact surfaces and release lever pivot stud (Fig. 22).

(11) Apply light coat of Mopar® high temperature bearing grease to splines of transmission input shaft (or drive gear) and to release bearing slide surface of the transmission front bearing retainer (Fig. 23). Do not over lubricate shaft splines. This can result in grease contamination of disc.

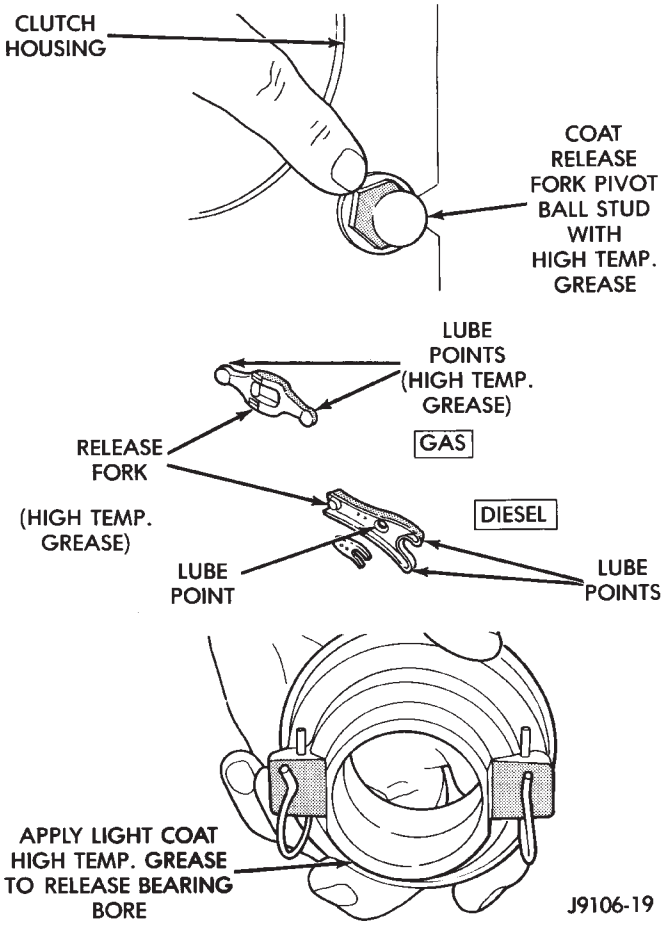

Fig. 22 Clutch Release Component Lubrication Points

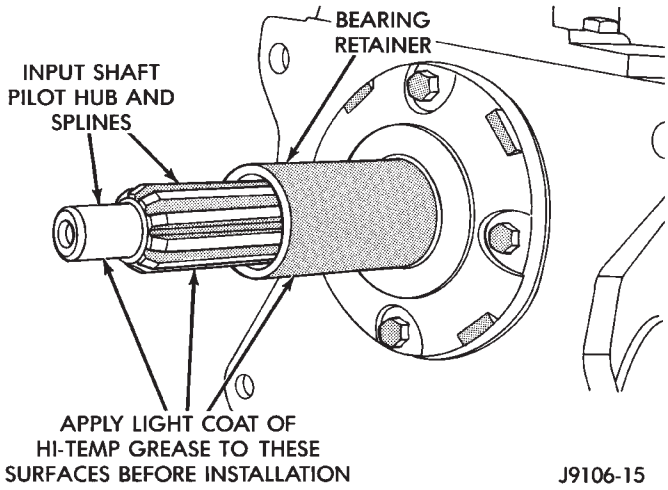

Fig. 23 Input Shaft Lubrication Points—Typical

REMOVAL AND INSTALLATION (Continued)

(12) Install release lever and bearing in clutch housing. Be sure spring clips that retain fork on pivot ball and release bearing on fork are properly installed and (Fig. 24).

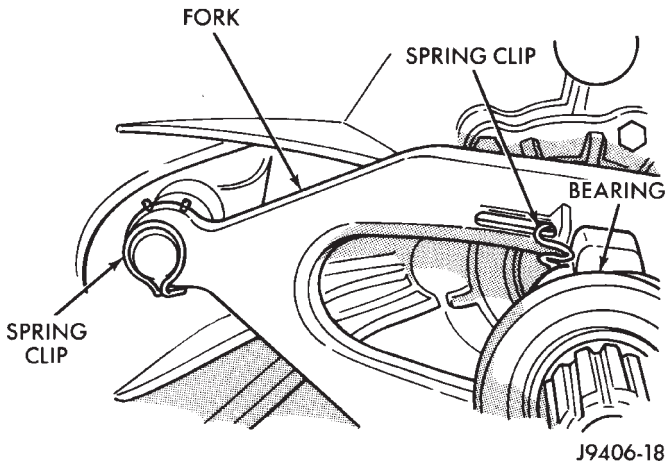

Fig. 24 Release Fork And Bearing Spring Clip Position

(13) Install transmission. Refer to Group 21, Transmission and Transfer Case, for proper procedures.

(14) Check fluid level in clutch master cylinder.

CLUTCH HOUSING—NV4500

REMOVAL

(1) Raise and support vehicle.

(2) Remove transmission and transfer case, if equipped. Refer to Group 21, Transmission and Transfer Case, for proper procedures.

(3) Remove clutch housing bolts and remove housing from engine (Fig. 25) and (Fig. 26).

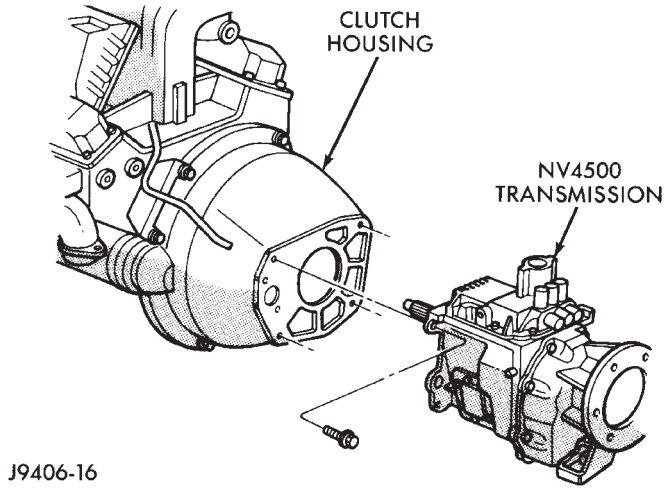

Fig. 25 Transmission/Clutch Housing—NV4500

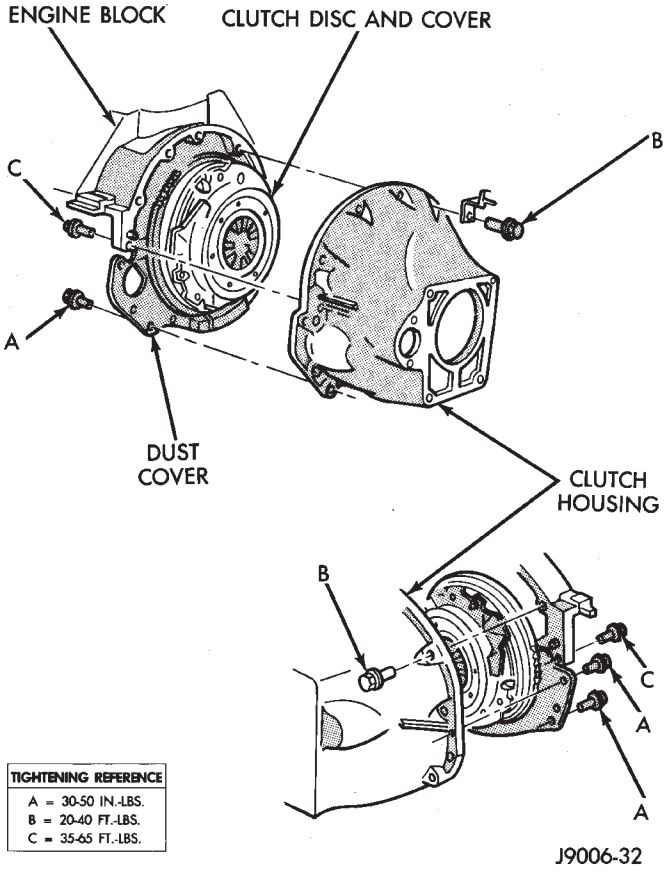

Fig. 26 Clutch Housing Installation—NV4500

INSTALLATION

(1) Clean housing mounting surface of engine block with wax and grease remover.

(2) Verify that clutch housing alignment dowels are in good condition and properly seated.

(3) Transfer slave cylinder, release fork and boot, fork pivot stud, and wire/hose brackets to new housing.

(4) Lubricate release fork and pivot contact surfaces with Mopar® High Temperature wheel bearing grease before installation.

(5) Align and install clutch housing on transmission. Tighten housing bolts closest to alignment dowels first and to torque values indicated (Fig. 25) and (Fig. 26).

(6) Install transmission–to–engine strut after installing clutch housing. Tighten bolt attaching strut to clutch housing first and engine bolt last.

(7) Install transmission and transfer case, if equipped. Refer to Group 21, Transmission and Transfer Case, for proper procedures.

CLUTCH LINKAGE

The clutch master cylinder, remote reservoir, slave cylinder and connecting lines are all serviced as an assembly. These components cannot be serviced separately. The linkage cylinders and connecting lines

REMOVAL AND INSTALLATION (Continued)

are sealed units. They are pre-filled with fluid during manufacture and must not be disassembled nor disconnected.

REMOVAL

(1) Raise and support vehicle.

(2) On diesel models, remove slave cylinder shield from clutch housing, if equipped.

(3) Remove nuts attaching slave cylinder to studs on clutch housing.

(4) Remove slave cylinder from clutch housing.

(5) Disengage slave cylinder fluid line from body retainer clips.

(6) Lower vehicle.

(7) Disconnect clutch pedal interlock switch wires.

(8) Remove locating clip from clutch master cylinder mounting bracket (Fig. 27).

(9) Remove retaining clip, flat washer and wave washer that attach clutch master cylinder push rod to clutch pedal (Fig. 28).

(10) Slide clutch master cylinder push rod off pedal pin.

(11) Inspect condition of bushing on clutch pedal pin (Fig. 28). Remove and replace bushing if worn or damaged.

(12) Verify that cap on clutch master cylinder reservoir is tight. This will avoid spillage during removal.

(13) Remove screws that attach clutch fluid reservoir to dash panel.

(14) Remove reservoir mounting bracket screws and remove reservoir from dash panel.

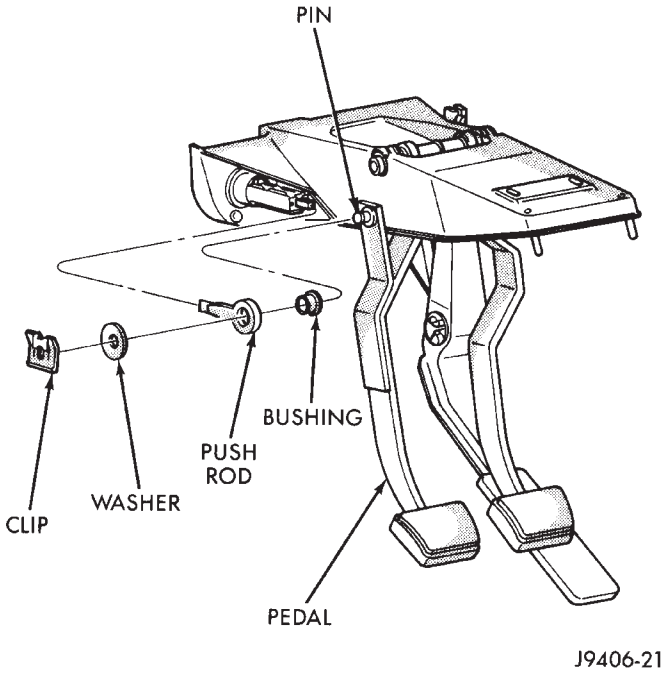

Fig. 28 Clutch Cylinder Push Rod Attachment

(15) Rotate clutch master cylinder 45° counterclockwise to unlock it. Then remove cylinder from dash panel.

(16) Remove clutch master cylinder rubber seal from dash panel (Fig. 27).

(17) Remove clutch cylinders, reservoir and connecting lines from vehicle.

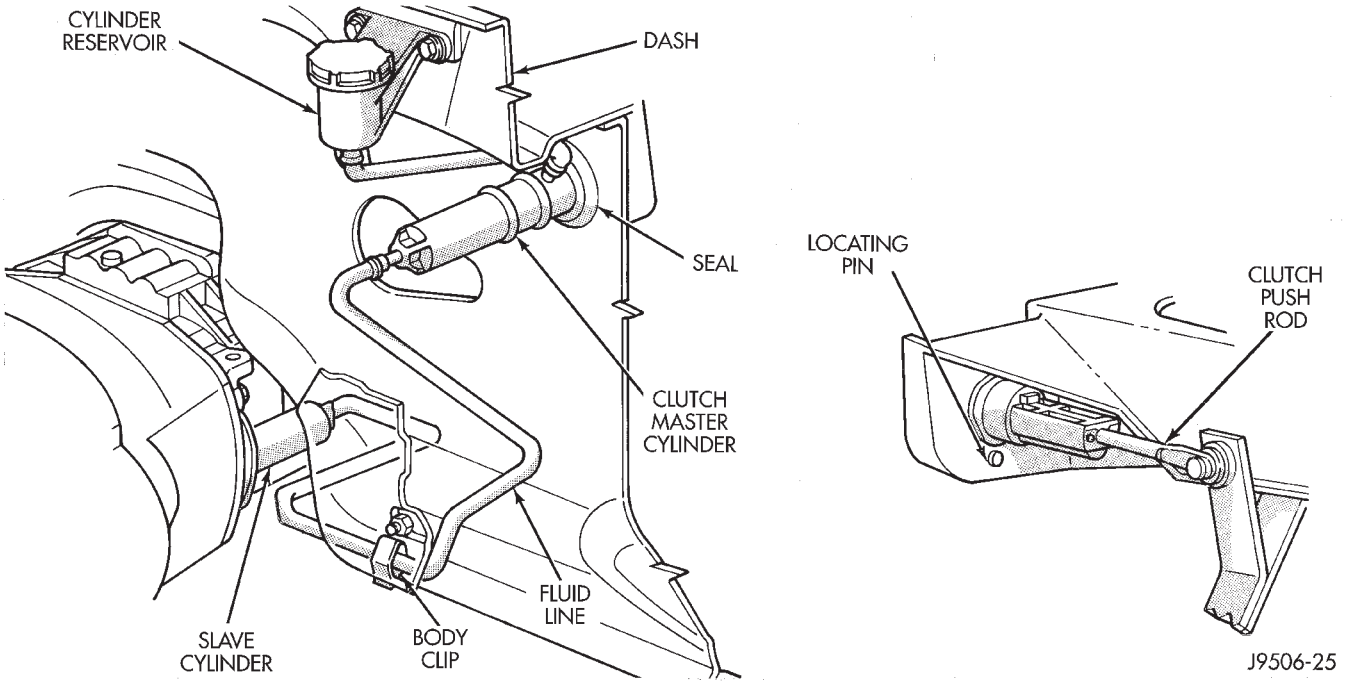

Fig. 27 Clutch Hydraulic Linkage

REMOVAL AND INSTALLATION (Continued)

INSTALLATION

(1) Tighten cap on clutch fluid reservoir to avoid spillage during installation.

(2) Position cylinders, connecting lines and reservoir in vehicle engine compartment.

(3) Lubricate cylinder seal with liquid dish soap to ease installation. Then seat seal in dash and around cylinder.

(4) Insert clutch master cylinder in dash panel. Rotate cylinder 45° clockwise to lock it in place.

(5) If cylinder seal is hard to seat, unlock cylinder and reseat seal if necessary. Then lock cylinder afterward.

(6) Position clutch fluid reservoir on dash panel and install reservoir screws. Tighten screws to 5 N·m (40 in. lbs.) torque.

(7) Install reservoir mounting bracket on dash panel, if removed.

(8) Apply a light coating of grease to the inside and outside diameter of the master cylinder bushing.

(9) Install bushing on clutch pedal pin.

(10) Install clutch master cylinder push rod on clutch pedal pin. Secure rod with wave washer, flat washer and retainer ring.

(11) Connect clutch pedal position (interlock) switch wires.

(12) Install locating clip in clutch master cylinder mounting bracket.

(13) Raise vehicle.

(14) Install slave cylinder. Be sure cap at end of cylinder rod is seated in release lever. Check this before installing cylinder attaching nuts.

(15) Install and tighten slave cylinder attaching nuts to 23 N·m (200 in. lbs.) torque.

(16) Lower vehicle.

(17) If new linkage has been installed, remove plastic shipping stop from master cylinder push rod. Do this after installing slave cylinder and before operating linkage.

(18) Operate linkage several times to verify proper operation.

RELEASE BEARING

REMOVAL

(1) Remove transmission and transfer case, if equipped. Refer to Group 21, Transmission and Transfer Case, for proper procedures.

(2) On models with gas engine and new style release fork, remove clutch housing for access to release fork and release bearing retainer springs.

(3) Disconnect release bearing from release fork and remove bearing (Fig. 29).

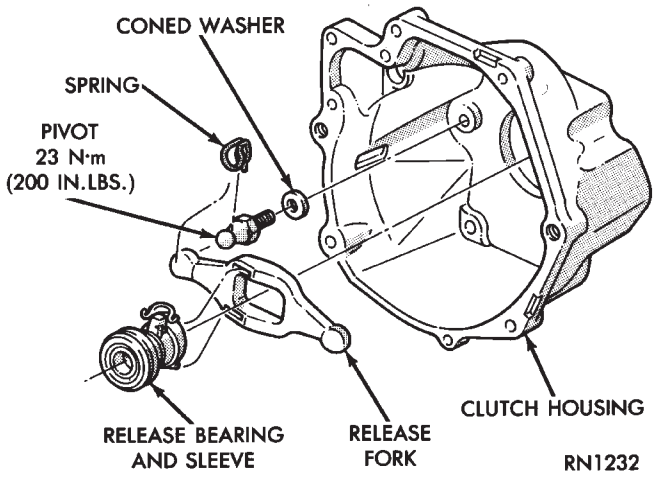

Fig. 29 Clutch Release Components

INSTALLATION

(1) Inspect bearing slide surface on transmission front bearing retainer. Replace retainer if slide surface is scored, worn, or cracked.

(2) Inspect release lever and pivot stud. Be sure stud is secure and in good condition. Be sure fork is not distorted or worn. Replace fork spring clips if bent or damaged.

(3) Lubricate crankshaft pilot bearing, input shaft splines, bearing retainer slide surface, lever pivot ball stud and release lever pivot surface with Mopar® high temperature bearing grease.

(4) Install release fork and release bearing (Fig. 30). Be sure fork and bearing are properly secured by spring clips.

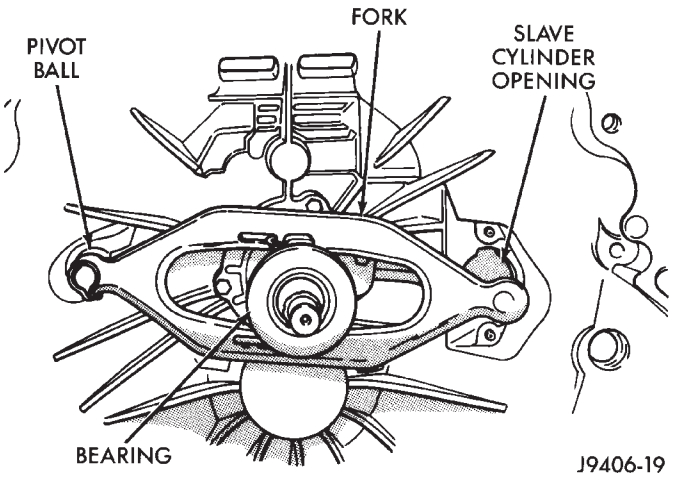

Fig. 30 Clutch Release Fork And Bearing Installation

(5) Install clutch housing, if removed.

(6) Install transmission and transfer case, if equipped. Refer to Group 21, Transmission and Transfer Case, for proper procedures.

REMOVAL AND INSTALLATION (Continued)

PILOT BEARING

REMOVAL

(1) Remove transmission, transfer case, if equipped, and clutch housing. Refer to Group 21, Transmission and Transfer Case, for proper procedures.

(2) Remove clutch cover and disc.

(3) Using a suitable blind hole puller, remove pilot bearing.

INSTALLATION

(1) Clean bearing bore with solvent and wipe dry with shop towel.

(2) Install new bearing with clutch alignment tool (Fig. 31). Keep bearing straight during installation. Do not allow bearing to become cocked. Tap bearing into place until flush with edge of bearing bore. Do not recess bearing.

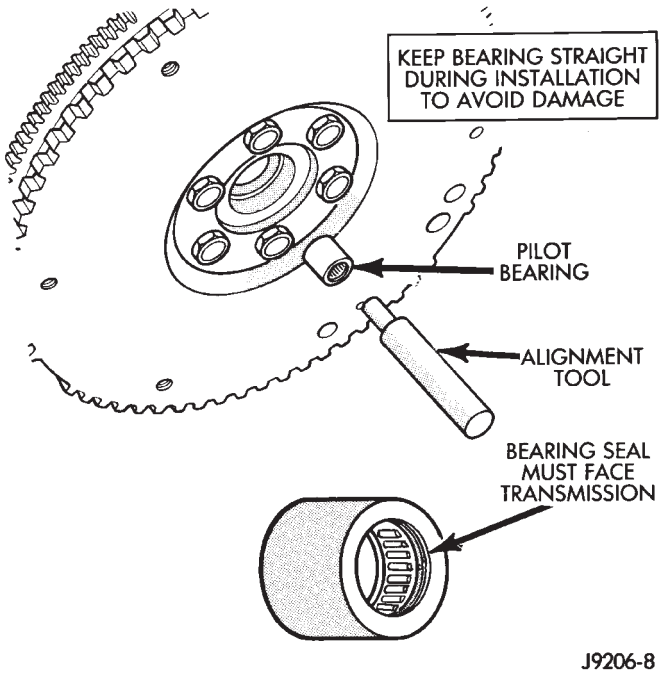

Fig. 31 Typical Method Of Installing Pilot Bearing

(3) Lubricate bearing with Mopar® high temperature grease, or an equivalent quality grease.

(4) Install clutch cover and disc.

(5) Install clutch housing, transmission and transfer case, if equipped. Refer to Group 21, Transmission and Transfer Case, for proper procedures.

CLUTCH PEDAL

REMOVAL

(1) Remove retaining ring, flat washer and wave washer that secure brake and clutch pedals to push rods (Fig. 32).

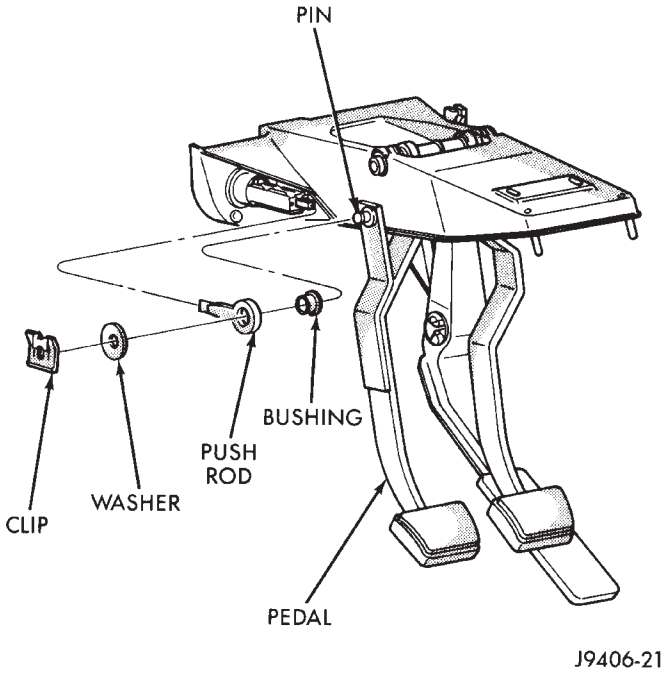

Fig. 32 Clutch Cylinder Push Rod Attachment

(2) Remove knee bolster (Fig. 33) for access to pedal pivot shaft.

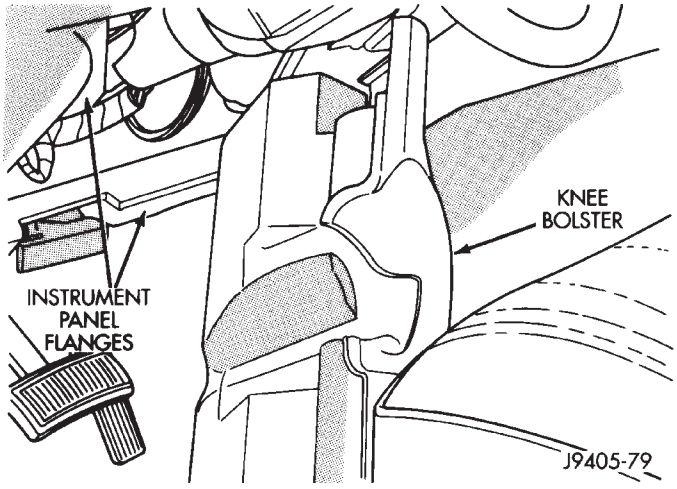

Fig. 33 Knee Bolster Removal

(3) Remove brake light switch. Turn switch clockwise about 30° to release it then remove switch from bracket.

(4) Remove retainer from passenger side of pedal pivot shaft (Fig. 34).

(5) Push pedal pivot shaft toward driver side of support only enough to remove clutch pedal. It is not necessary to remove shaft from pedal support entirely.

(6) Remove clutch pedal.

REMOVAL AND INSTALLATION (Continued)

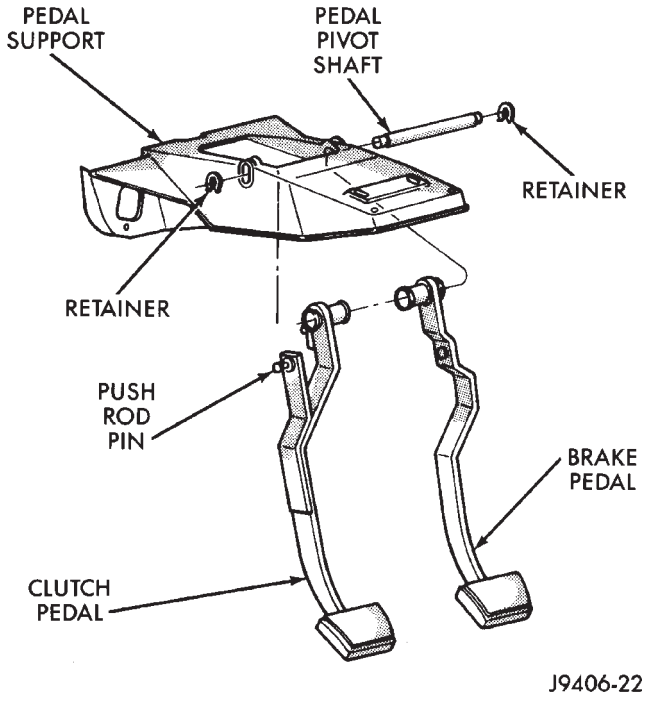

Fig. 34 Clutch/Brake Pedal Mounting

INSTALLATION

(1) Inspect bushings in clutch and brake pedals (Fig. 35). Replace bushings if worn, cracked, or distorted.

(2) Lubricate pedal shaft, pedal shaft bore (Fig. 34) and (Fig. 35) and all bushings with Mopar® Multi Mileage, or high temperature bearing grease.

(3) Position clutch pedal in support. Align pedal with pivot shaft and slide shaft through pedal bushings. Then repeat process for brake pedal.

(4) Slide pedal shaft through support and install shaft retainer.

(5) Secure push rods to clutch and brake pedals.

(6) Install brake light switch in bracket. Rotate switch into place to lock it in bracket.

(7) Install knee bolster.

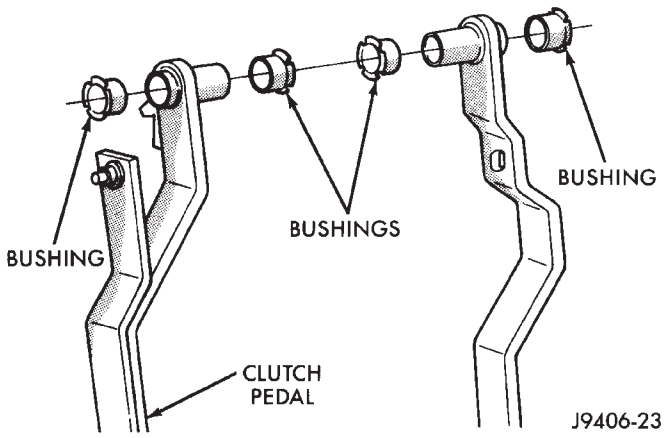

Fig. 35 Clutch/Brake Pedal Bushings

SPECIFICATIONS

TORQUE

DESCRIPTION	TORQUE
Nut, slave cylinder	19-26 N·m (170-230 in. lbs.)
Bolt, clutch cover—5/16 in.	23 N·m (17 ft. lbs.)
Bolt, clutch cover—3/8 in.	41 N·m (30 ft. lbs.)
Pivot, release bearing	23 N·m (17 ft. lbs.)
Bolt, housing to engine—3/8 in.	45 N·m (33 ft. lbs.)
Bolt, housing to engine—7/16 in.	68 N·m (50 ft. lbs.)
Bolt, housing to engine—V-10	47 N·m (35 ft. lbs.)
Screw, fluid reservoir	5 N·m (40 in. lbs.)