

CLUTCH

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CLUTCH COMPONENTS

MECHANICAL COMPONENTS

The clutch mechanism in Grand Cherokee models with manual transmission consists of a single, dry-type clutch disc and a diaphragm style clutch cover. A hydraulic linkage is used to operate 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 cushion 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.

HYDRAULIC LINKAGE COMPONENTS

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

The clutch master cylinder push rod is connected to the clutch pedal. The slave cylinder push rod 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 LINKAGE FLUID

The clutch fluid reservoir, master cylinder, slave cylinder and fluid lines are prefilled with fluid at the factory during assembly operations.

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.**

If inspection or diagnosis indicates additional fluid may be needed, use Mopar brake fluid, or an equivalent meeting standards SAE J1703 and DOT 3. Do not use any other type of fluid.

CLUTCH COMPONENT LUBRICATION

Proper clutch component lubrication is important to satisfactory operation. Using the correct lubricant and not overlubricating are equally important. Apply recommended lubricant sparingly to avoid disc and pressure plate contamination.

Clutch and transmission components requiring lubrication are:

- pilot bearing
- release lever pivot ball stud
- release lever contact surfaces
- release bearing bore
- clutch disc hub splines
- clutch pedal pivot shaft bore
- clutch pedal bushings
- input shaft splines
- input shaft pilot hub
- transmission front bearing retainer slide surface

Never apply grease to any part of the clutch cover, or disc.

RECOMMENDED LUBRICANTS

Use Mopar multi-purpose grease for the clutch pedal bushings and pivot shaft. Use Mopar high temperature grease (or equivalent) for all other lubrication requirements. Apply recommended amounts and do not overlubricate.

CLUTCH DIAGNOSIS

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GENERAL DIAGNOSIS INFORMATION

Unless the cause of a clutch problem is obvious, a road test and component inspection will be required for accurate diagnosis.

A road test will help determine the type of fault while component inspection will identify the problem component.

During a road test, drive the vehicle at normal speeds. 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 is needed. The transmission or another driveline component may actually be at fault.

Careful observation during a road test will help narrow the problem area.

CLUTCH PROBLEM CAUSES

CONTAMINATION

Fluid contamination is a common cause of clutch malfunction. Oil, water, or clutch fluid on the clutch contact surfaces will result in chatter, slip, or grab.

During inspection, note if any components are contaminated with oil, hydraulic fluid, or water/road splash.

Oil contamination indicates a leak at either the rear main seal or transmission input shaft.

Oil leakage produces a residue of oil on the housing interior and on the clutch cover and flywheel.

Heat buildup caused by heavy duty operation, or slippage between the 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 and water are entering the clutch housing due to loose bolts, housing cracks, vent openings, or through the slave cylinder opening. Driving through deep water puddles can force water/road splash into the housing through such openings.

An additional problem caused by water contamination and especially by steam cleaning, involves clutch disc sticking and poor release.

Water and steam vapors can be absorbed by the clutch facing material. If the vehicle is idle for long periods after water contamination, the force exerted

by the pressure plate may cause the disc to bond itself to the flywheel or pressure plate.

Frequently, the only remedy for the above condition is component replacement. To avoid this problem, a vehicle should be driven as soon as possible to heat and dry the clutch components.

Clutch fluid leaks are from a loose or damaged slave cylinder line or connection. However, clutch fluid leaks will usually be noted and corrected before severe contamination occurs.

CLUTCH MISALIGNMENT

Clutch components must be in proper alignment with the crankshaft and transmission input shaft. Misalignment caused by excessive runout or warpage of any clutch component will cause grab, chatter and improper release.

Flywheel Runout

Common causes of runout are heat warping, improper machining, mounting the flywheel on a dirty crankshaft flange, incorrect bolt tightening, or improper seating on the crankshaft flange shoulder.

Very light scratches or surface roughness on the flywheel face can be cleaned up by scuff sanding with 180 grit emery cloth. However, if the surface is warped or severely scored, replace the flywheel.

Do not machine the flywheel. The flywheel face is manufactured with a unique surface contour. Machining would negate this feature and could result in unsatisfactory operation.

Clean the crankshaft flange before mounting the flywheel. Dirt and grease on the flange surface may cock the flywheel causing runout.

Use new bolts when remounting a flywheel and secure the bolts with Mopar Lock And Seal, or Loctite 242. Tighten flywheel bolts to specified torque only. Overtightening could distort the flywheel hub causing runout.

Clutch Cover And Disc Runout

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.

Check condition of the clutch 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 (and consequent misalignment) is improper bolt tightening. To avoid warping the cover, tighten the bolts alternately (in a diagonal pattern) and evenly (2-3 threads at a time) to specified torque.

Clutch Housing Misalignment

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

Misalignment can cause noise, incomplete clutch 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 the shaft bearing.

Housing face misalignment is generally caused by incorrect seating on the engine or transmission, loose housing bolts, missing alignment dowels or housing damage. Infrequently, misalignment may also be caused by housing mounting surfaces that are not parallel.

Installation Methods And Parts Usage

Distortion of clutch components during installation and the use of non-standard components are additional causes of clutch malfunction.

Improper clutch cover bolt tightening can distort the cover. The usual result is clutch grab, chatter and rapid wear. Tighten the cover bolts as described in Clutch Service section.

Improperly seated flywheels and clutch housings are other causes of clutch failure. Improper seating will produce misalignment and clutch problems.

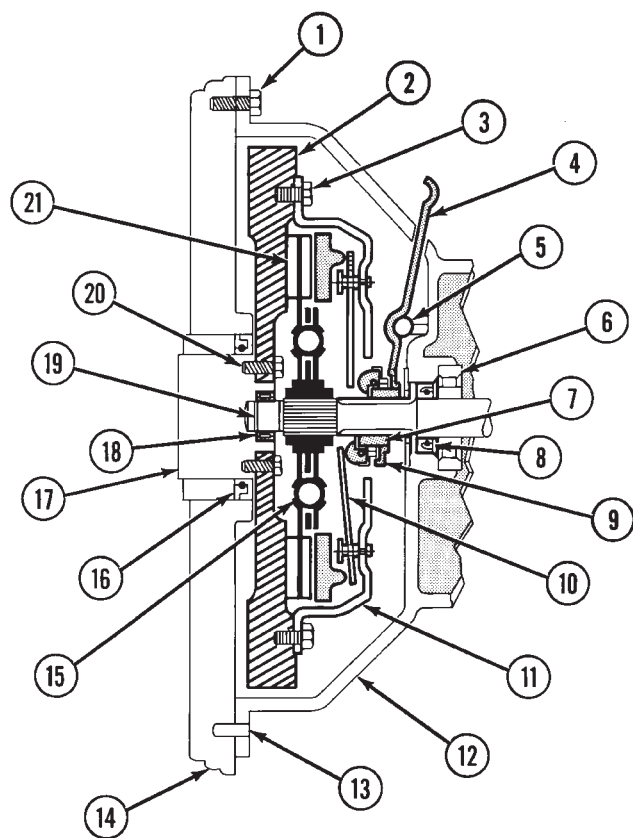
Tighten all the clutch housing bolts to proper torque before installing any struts. Also be sure alignment dowels are in place and seated in the block and housing before bolt tightening.

The use of non-standard or low quality parts can also lead to problems and wear. Use the recommended factory quality parts to avoid comebacks.

INSPECTION AND DIAGNOSIS CHARTS

The clutch inspection chart (Fig. 1) outlines items to be checked before and during clutch installation. Use the chart as a check list to help avoid overlooking potential problem sources during service operations.

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. Use the charts as a guide when diagnosing faulty clutch operation.



- 1 Check clutch housing bolts. Tighten if loose. Be sure housing is fully seated on engine block.
- 2 Check flywheel condition. Scuff sand flywheel face to remove glaze. Clean surface with a wax and grease remover afterward. Replace flywheel if severely scored, worn or cracked. Secure flywheel with new bolts (if removed). Do not reuse old bolts. Use Lock and Seal on bolts.
- 3 Tighten clutch cover bolts 2-3 threads at a time, alternately and evenly (in a diagonal pattern) to specified torque. Failure to do so could warp the cover.
- 4 Check release fork. Replace fork if distorted or worn. Make sure ball stud and release bearing contact surfaces are lubricated.
- 5 Check release fork pivot. Be sure pivot is tight 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 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.

- 8 Check input shaft seal if clutch cover and disc were oil covered. Replace seal if worn, or cut.
- 9 Do not replace release bearing unless actually faulty. Replace bearing only if seized, noisy, or damaged.
- 10 Check clutch cover diaphragm spring and release fingers. Replace cover if spring or fingers are bent, warped, broken, cracked. Do not tamper with factory clutch spring setting. Clutch problems will result.
- 11 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.
- 12 Inspect clutch housing. Be sure alignment dowels are in position and bolts are tight. Replace housing if cracked, or damaged. If clutch problems occurred, check runout, to be sure housing is square with flywheel and transmission input shaft.
- 13 Verify that housing alignment dowels are in position before installing housing.
- 14 Clean engine block surface before installing clutch housing. Dirt, grime can produce misalignment.
- 15 Make sure side of clutch disc marked "flywheel side" is toward flywheel.
- 16 Check rear main seal if clutch disc and cover were oil covered. Replace seal if necessary.
- 17 Check crankshaft flange (if flywheel is removed). Be sure flange is clean and flywheel bolt threads are in good condition.
- 18 Check pilot bearing. Replace bearing if damaged. Lube with high temp. Grease before installation.
- 19 Check transmission input shaft. Clutch disc must slide freely on shaft splines. Lightly grease splines before installation. Replace shaft if splines or pilot bearing hub are damaged.
- 20 Check flywheel bolt torque. If bolts are loose, replace them. Use Mopar Lock and Seal to secure new bolts.
- 21 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.).

Fig. 1 Clutch Inspection Points

| CLUTCH SLIPS | | |
|---|--|---|
| Condition Found | Cause | Correction |
| 1. Disc facing worn out. | a) Normal wear. b) Driver frequently "rides" (slips) clutch. Results in rapid wear overheating. c) Insufficient clutch cover diaphragm spring tension. | Replace clutch disc. Also replace cover if spring is weak or pressure plate surface is damaged. |
| 2. Clutch disc facing contaminated with oil, grease, or clutch fluid. | a) Leak at rear main seal or at transmission input shaft seal. b) Excessive amount of grease applied to input shaft splines. c) Road splash, water entering housing. d) Slave cylinder leaking. | a), b), c), d) Replace leaking seals. Apply less grease to input shaft splines. Replace clutch disc (do not clean and reuse). Clean clutch cover and reuse only if cover is in good condition. Replace slave cylinder if leaking. |
| 3. Clutch is running partially disengaged. | Release bearing sticking-binding. Does not return to normal running position. | Verify that bearing is actually binding, then replace bearing and transmission front bearing retainer if sleeve surface is damaged. |
| 4. Flywheel height incorrect. | Flywheel surface improperly machined. Too much stock removed or surface is tapered. | Replace flywheel. |
| 5. Wrong disc or pressure plate installed. | Incorrect parts order or model number. | Replace with correct parts. Compare old and new parts before installation. |
| 6. Clutch disc, cover and/or diaphragm spring, warped, distorted. | a) Rough handling (impact) bent cover, spring, or disc. b) Incorrect bolt tightening sequence and method caused warped cover. | Install new disc or cover as needed. Follow installation/tightening instructions. |
| 7. Facing on flywheel side of disc torn, gouged, worn. | Flywheel surface scored and nicked. | Reduce scores and nicks by sanding or surface grinding. Replace flywheel if scores-nicks are deeper than .002-.004 inch. |
| 8. Clutch disc facing burnt (charred). Flywheel and cover pressure plate surfaces heavily glazed. | a) Frequent operation under high loads or hard acceleration conditions. b) Driver frequently "rides" (slips) clutch. Results in rapid wear and overheating of disc and cover. | Scuff sand flywheel. Replace clutch cover and disc. Alert driver to problem cause. |

IMPROPER CLUTCH RELEASE

| Condition Found | Cause | Correction |
|--|---|--|
| 1. Clutch disc warped. | New disc not checked for axial runout before installation. | Replace disc. Be sure runout of new disc is less than .5 mm (.020 in.). |
| 2. Clutch disc binds on input shaft splines. | a) Clutch disc hub splines damaged during installation. b) Input shaft splines rough, damaged. c) Corrosion, rust formations on splines of disc and input shaft. | Clean, smooth and lubricate disc and shaft splines. Replace disc and/or input shaft if splines are severely damaged. |
| 3. Clutch disc rusted to flywheel and/or pressure plate. | Occurs in vehicles stored, or not driven for extended periods of time. Also occurs after steam cleaning if vehicle is not used for extended period. | Remove clutch cover and disc. Sand rusted surfaces clean with 180 grit paper. Replace disc cover, and flywheel if corrosion is severe. |
| 4. Clutch disc facing sticks to flywheel. | Vacuum may form in pockets over rivet heads in clutch disc. Occurs as clutch cools down after use. | Drill 1/16 inch diameter hole through rivets and scuff sand disc facing with 180 grit paper. |
| 5. Clutch disc too thick. | Wrong disc installed. | Replace disc. |
| 6. Pilot bushing seized or loose. | a) Bushing cocked during installation. b) Bushing defective. c) Bushing not lubricated. d) Clutch misalignment. | a), b), c), d) Lubricate and install new bushing. Check and correct any misalignment. |
| 7. Clutch will not disengage properly. | a) Low clutch fluid level. b) Clutch cover loose. c) Wrong clutch disc. d) Disc bent, distorted during installation. e) Clutch cover diaphragm spring bent or warped during transmission installation. f) Clutch disc installed backwards. g) Release fork bent or fork pivot is loose or damaged. h) Clutch master or slave cylinder fault. | a) Top off reservoir and check for leaks. b) Tighten bolts. c) Install correct disc. d) Replace disc. e) Replace cover. f) Remove and reinstall disc correctly. Be sure disc side marked "to flywheel" is actually toward flywheel. g) Replace fork and pivot if worn or damaged. h) Replace master and slave cylinder as assembly. |

CLUTCH GRAB/CHATTER

| Condition Found | Cause | Correction |
|--|---|---|
| 1. Clutch disc facing covered with oil, grease, or clutch fluid. | a) Oil leak at rear main or input shaft seal. b) Too much grease applied to splines or disc and input shaft. | a) Correct leak and replace disc (do not clean and reuse the disc). b) Apply lighter grease coating to splines and replace disc (do not clean and reuse the disc). |
| 2. Clutch disc and/or cover warped, or disc facings exhibit unusual wear or appear to be wrong type. | Incorrect or substandard parts. | Replace disc and/or cover with correct parts. |
| 3. Clutch master or slave cylinder plunger dragging-binding. | a) Master or slave cylinder components worn or corroded. | a) Replace both cylinders as assembly (and reservoir). |
| 4. No fault found with clutch components. | a) Problem actually related to suspension or driveline component. b) Engine related problem. | a) Further diagnosis required. Check engine/transmission mounts, propeller shafts and U-joints, tires, suspension attaching parts and other driveline components as needed. b) Check EFI and ignition systems. |
| 5. Partial engagement of clutch disc (one side worn-opposite side glazed and lightly worn). | a) Clutch pressure plate position setting incorrect or modified. b) Clutch cover, spring, or release fingers bent, distorted (rough handling, improper assembly). c) Clutch disc damaged or distorted. d) Clutch misalignment. | a) Replace clutch cover and disc. b) Replace clutch cover and disc. c) Replace disc. d) Check alignment and runout of flywheel, disc, or cover and/or clutch housing. Correct as necessary. |
| | | |

| CLUTCH NOISE | | |
|---|---|---|
| Condition Found | Cause | Correction |
| 1. Clutch components damaged or worn out prematurely. | Incorrect or sub-standard clutch parts. | Replace with parts of correct type and quality. |
| 2. Pilot bearing damaged. | a) Bearing cocked during installation. b) Bearing not lubricated prior to installation. c) Bearing defect. d) Clutch misalignment. | a), b), c) Replace bearing. Be sure it is properly seated and lubricated before installing clutch. d) Check and correct misalignment caused by excessive runout of flywheel, disc, cover or clutch housing. Replace input shaft if bearing hub is damaged. |
| 3. Loose components. | Attaching bolts loose at flywheel, cover, or clutch housing. | Tighten bolts to specified torque. Replace any clutch bolts that are damaged. |
| 4. Components appear overheated. Hub of disc cracked or torsion damper springs are distorted or broken. | Frequent high load, full throttle operation. | Replace parts as needed. Alert driver to condition causes. |
| 5. Contact surface of release bearing damaged. | a) Clutch cover incorrect, or release fingers are bent or distorted causing damage. b) Release bearing defect. c) Release bearing misaligned. | a) Replace clutch cover and bearing. b) Replace bearing. c) Check and correct runout of clutch components. Check front bearing retainer sleeve surface. Replace if damaged. |
| 6. Release bearing is noisy. | Release bearing defect. | Replace bearing. |
| 7. Clutch pedal squeak. | a) Pivot pin loose. b) Pedal bushings worn out or cracked. | Tighten pivot pin. Replace bushings if worn or damaged. Lubricate pin and bushings with silicone base lubricator chassis grease. |

CLUTCH SERVICE

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CLUTCH COVER AND DISC REMOVAL

- (1) Raise vehicle.
- (2) Remove transmission and clutch housing as assembly (Fig. 2). Refer to Group 21 for procedures.
- (3) If clutch cover will be reused, mark position of cover on flywheel with scribe, chalk, or center punch (Fig. 2).
- (4) Loosen clutch cover bolts evenly and in rotation to relieve spring tension. Loosen bolts a few threads at a time only to avoid warping cover. This is especially important if cover will be reused.
- (5) Remove cover bolts and remove cover and disc.

CLUTCH COVER AND DISC INSTALLATION

- (1) Reduce minor scratches or surface glazing on flywheel face with 120/180 grit emery cloth. Clean flywheel surface with Mopar brake cleaner or wax and grease remover afterward.
- (2) Check runout and free operation of new clutch disc. Install disc on transmission input shaft splines. Disc should slide freely on splines. Leave disc on shaft and check runout with dial indicator. Position indicator plunger about 6 mm (1/4 in.) from outer edge of facing. Runout should not exceed 0.5 mm (0.020 inch). Obtain another disc if runout exceeds this limit.
- (3) Lubricate crankshaft pilot bearing with Mopar high temperature grease, or equivalent.
- (4) Insert clutch alignment tool in disc and position disc on flywheel.
- (5) Verify that disc hub is positioned correctly. Side of hub marked "Flywheel Side" should face flywheel (Fig. 2).
- (6) Insert alignment tool or spare input shaft in pilot bushing and position disc on flywheel (Fig. 3).
- (7) Position clutch cover over disc and on flywheel. Verify that disc and cover are aligned before proceeding.
- (8) Install clutch cover bolts finger tight.
- (9) Tighten cover bolts evenly (and in rotation) a few threads at a time. **Cover bolts must be tightened evenly and to specified torque to avoid distorting cover.** Cover bolt torques are:
 - Tighten 5/16 in. diameter bolts to 23 N•m (17 ft. lbs.).

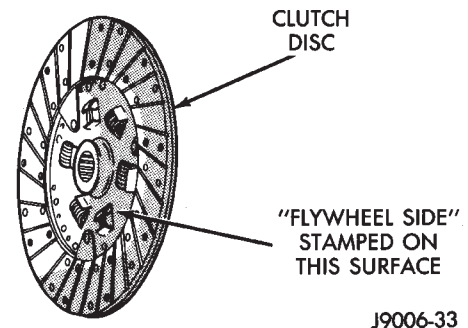


Fig. 2 Clutch Disc Position

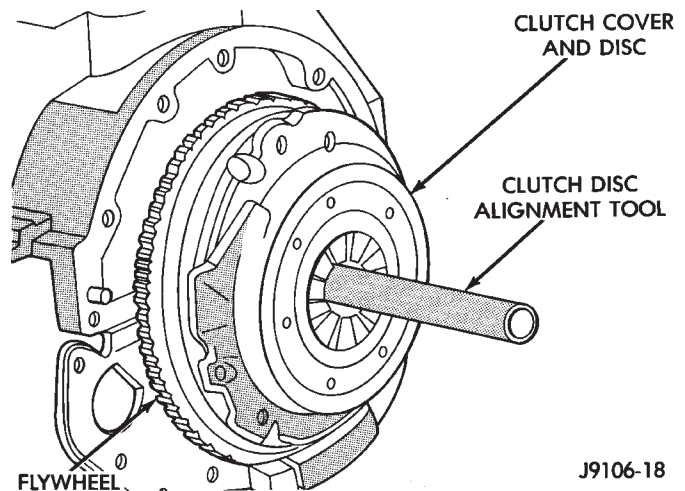


Fig. 3 Clutch Disc Alignment

- Tighten 3/8 in. diameter bolts to 41 N•m (30 ft. lbs.).
- (10) Apply light coating of Mopar high temperature grease to input shaft splines and to release bearing slide surface of front bearing retainer. **Do not over-lubricate shaft splines. This could result in grease contamination of disc.**
- (11) Install transmission and clutch housing as assembly. Refer to Figure 4 for attaching bolt torques.

CLUTCH HOUSING REMOVAL

- (1) Raise vehicle and remove transmission and clutch housing as assembly.

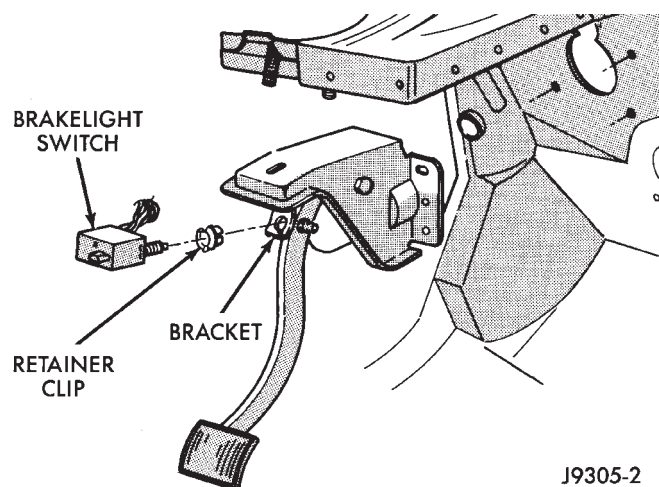


Fig. 4 Transmission And Clutch Housing Installation

- (2) Remove release bearing, release lever and boot and lever pivot ball stud from clutch housing (Fig. 5).
- (3) Remove clutch housing attaching bolts and remove housing from transmission (Fig. 5).

CLUTCH HOUSING INSTALLATION

- (1) Clean housing mounting surface of engine block with solvent.
- (2) Check alignment dowels in engine block. Be sure dowels are in good condition and properly seated.
- (3) Lubricate release bearing bore, release fork and pivot ball contact surfaces with Mopar high temperature grease.
- (4) Transfer pivot ball stud, release fork and boot and release bearing to new housing.

- (5) Align and install clutch housing on transmission. Tighten housing bolts to 33-43 N•m (24-32 ft. lbs.) torque.

- (6) Install transmission as described in Group 21. Install transmission-to-engine struts **after** clutch housing has been installed. Tighten bolts attaching struts to clutch housing first and strut-to-engine bolts last.

RELEASE BEARING REPLACEMENT

- (1) Remove transmission and clutch housing as an assembly.
- (2) Disconnect release bearing from the fork and remove bearing (Fig. 5).
- (3) Inspect bearing slide surface of transmission front bearing retainer. Replace retainer if slide surface is scored, worn, or cracked.
- (4) Inspect release fork and fork pivot. Be sure pivot is secure and in good condition. Be sure fork is not distorted or worn. Replace release fork retainer spring if bent or damaged in any way.
- (5) Lightly lubricate crankshaft pilot bushing, input shaft splines, bearing retainer slide surface, fork pivot and release fork pivot surface with Mopar high temperature grease.
- (6) Install release fork and new release bearing. Be sure fork and bearing are properly secured.
- (7) Install transmission and clutch housing as assembly.

PILOT BEARING REPLACEMENT

- (1) Remove transmission and clutch housing.
- (2) Remove clutch cover and disc.

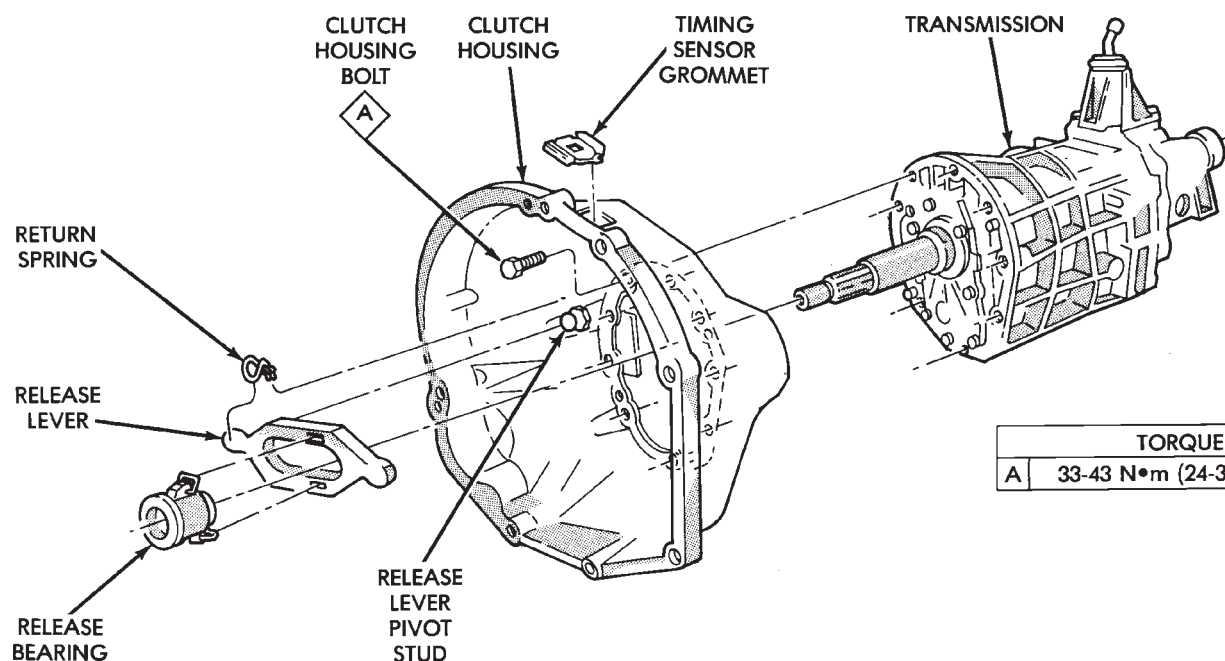


Fig. 5 Clutch Housing And Release Bearing Attachment

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(3) Remove pilot bearing. Use blind hole puller tools such as those included in Snap-On set CG40CB to remove bearing.

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

(5) Lubricate new pilot bearing with Mopar high temperature grease.

(6) Position and start new bearing in bearing bore by hand. **Note that pilot bearing has seal at one end. Install bearing so seal is facing out and toward transmission.**

(7) Seat pilot bearing with clutch alignment tool (Fig. 6). **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.**

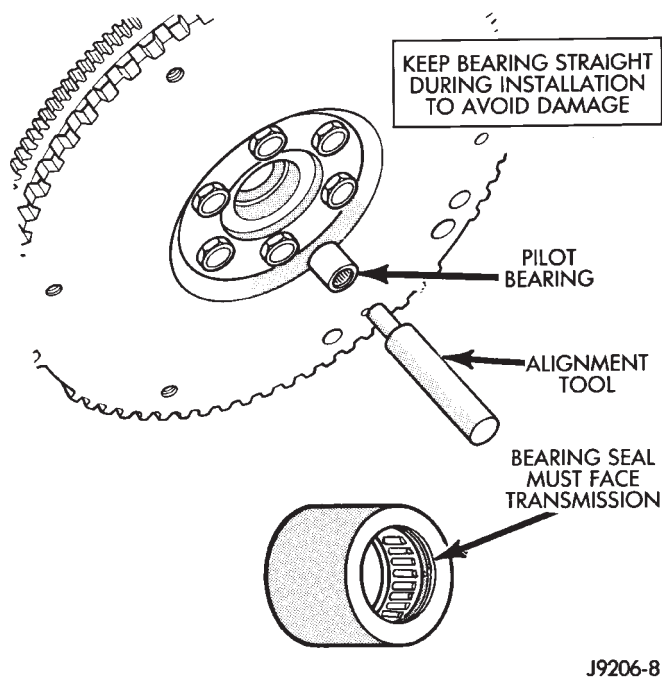


Fig. 6 Typical Method Of Installing Pilot Bearing

(8) Install clutch cover and disc.

(9) Install clutch housing and transmission as assembly.

(10) Install transfer case, propeller shafts, wire harnesses, vacuum hoses, crossmembers, shift linkage and remaining components removed during service.

CLUTCH HYDRAULIC LINKAGE REMOVAL

The clutch master cylinder, remote reservoir, slave cylinder and connecting lines are serviced as an assembly only. The linkage components cannot be overhauled or serviced separately. The cylinders and connecting lines are sealed units.

(1) Raise vehicle.

(2) Remove nuts attaching slave cylinder to clutch housing.

(3) Remove slave cylinder and clip from housing.

(4) Disengage hydraulic fluid line from body clips.

(5) Lower vehicle.

(6) Remove retaining ring, flat washer and wave washer that attach clutch master cylinder push rod to clutch pedal (Fig. 7).

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

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

(9) Verify that cap on clutch master cylinder reservoir is tight. This is necessary to avoid undue spillage during removal.

(10) Remove screws attaching clutch fluid reservoir to dash panel.

(11) Remove nuts attaching clutch master cylinder to stud nuts (Fig. 7).

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

CLUTCH HYDRAULIC LINKAGE INSTALLATION

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

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

(3) Install clutch master cylinder on mounting studs extending through dash panel (Fig. 7). Tighten attaching nuts to 23-34 N•m (200-300 in. lbs.) torque.

(4) Position reservoir on dash panel and install reservoir screws. Tighten screws to 5 N•m (40 in. lbs.) torque.

(5) Install replacement bushing on clutch pedal pin if necessary.

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

(7) Raise vehicle.

(8) Insert slave cylinder push rod through clutch housing opening and into release lever. Be sure cap on end of rod is securely engaged in lever. Check this before installing cylinder attaching nuts.

(9) Install and tighten slave cylinder attaching nuts to 23-34 N•m (200-300 in. lbs.) torque.

(10) Insert clutch fluid line in body clips and lower vehicle.

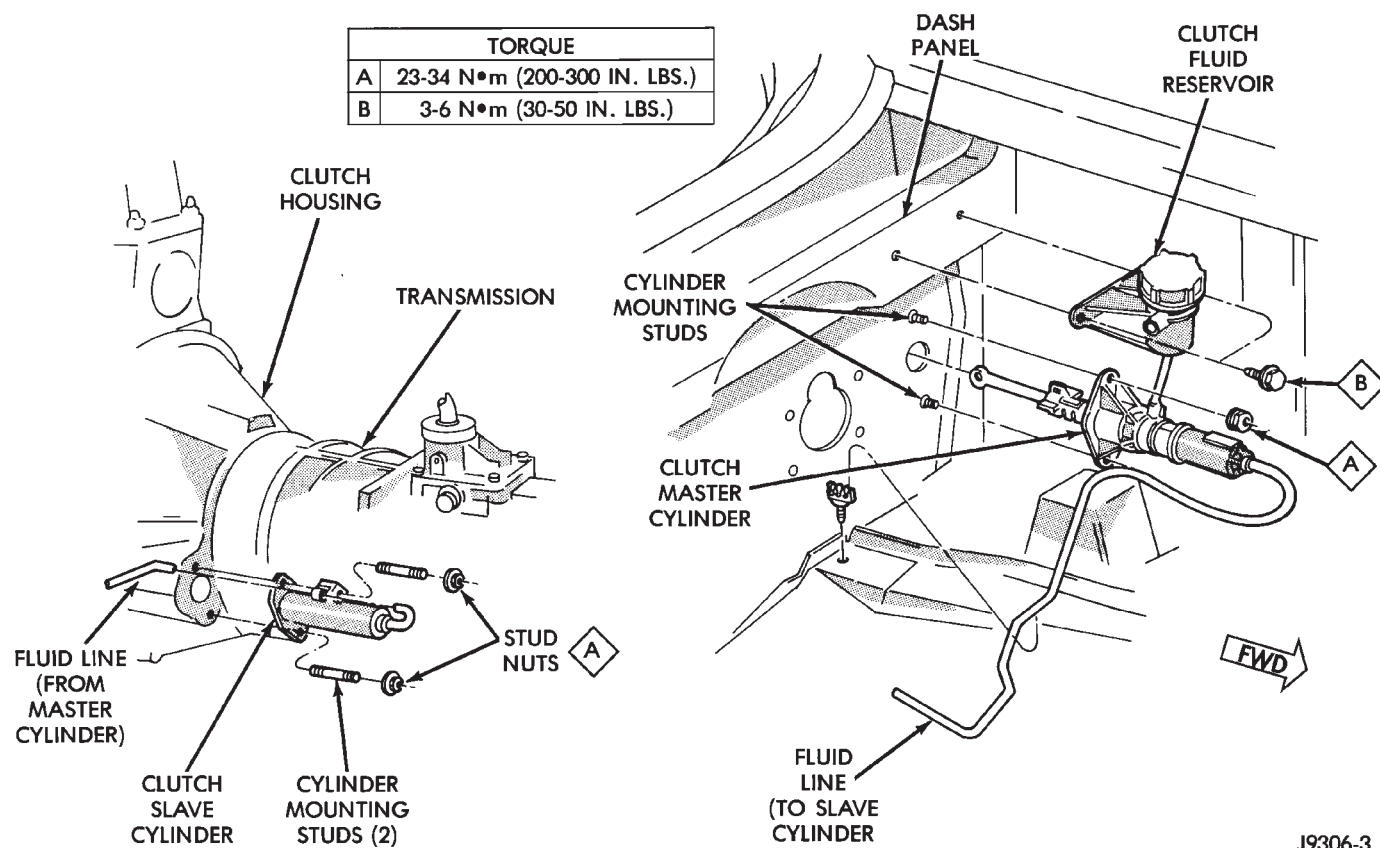
CLUTCH PEDAL REMOVAL

(1) Remove retaining ring, flat washer and wave washer that secure clutch master cylinder push rod to clutch pedal pin (Fig. 8).

(2) Remove fastener that secures pedal shaft to pedal support.

(3) Slide pedal shaft out left side of pedal support and out of clutch pedal.

(4) Slide push rod off clutch pedal pin and remove clutch pedal.



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Fig. 7 Clutch Hydraulic Linkage Components

(5) Remove and inspect bushings in clutch pedal shaft bore and on bushing on pedal pin. Replace any bushing that is worn or damaged.

CLUTCH PEDAL INSTALLATION

(1) Lubricate pedal shaft, pedal shaft bore and all bushings with Mopar multi-mileage grease, silicone grease, or lubriplate.

(2) Insert pedal pin into cylinder push rod. Then position clutch pedal in support.

(3) Slide pedal shaft through clutch pedal bore and bushings.

(4) Install bolt that retains pedal shaft in support.

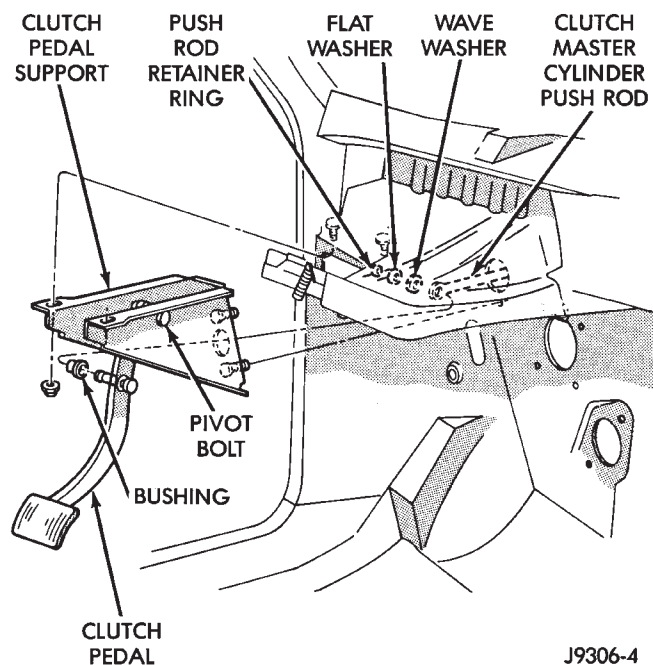
(5) Secure push rod to pedal pin with wave washer, flat washer and retaining ring.

FLYWHEEL SERVICE

Inspect the flywheel whenever the clutch disc, cover and housing are removed for service. Check condition of the flywheel face, hub, ring gear teeth, and flywheel bolts.

Minor scratches, burrs, or glazing on the flywheel face can be scuff sanded with 120/180 grit emery cloth. However, the flywheel should be replaced if the disc contact surface is severely scored, heat checked, cracked, or obviously worn.

Cleanup of minor flywheel scoring should be performed with surface grinding equipment. Remove



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Fig. 8 Clutch Pedal Mounting

only enough material to reduce scoring (approximately 0.001 - 0.003 in. maximum).

Heavy stock removal from the flywheel face 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.

Check flywheel runout if misalignment is suspected. 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 dial indicator on a stud installed in place of one of the flywheel attaching bolts.

Clean the crankshaft flange before mounting the flywheel. Dirt and grease on the flange surface may cock the flywheel causing excessive runout.

Check condition of the flywheel hub and attaching bolts. Replace the flywheel if the hub exhibits cracks in the area of the attaching bolt holes.

Install new attaching bolts whenever the flywheel is replaced and use Mopar Lock N' Seal, or Loctite 242 on replacement bolt threads.

Recommended bolt torque for 6-cylinder flywheel is 142 N•m (105 ft. lbs.).

Inspect the teeth on the starter ring gear. **If the teeth are worn or damaged, the flywheel should be replaced as an assembly. This is the recommended and preferred method of repair.**

In cases where a new flywheel is not readily available, a replacement ring gear can be installed. However, the following precautions must be observed to avoid damaging the flywheel and replacement gear.

(a) Mark position of the old gear for alignment reference on the flywheel. Use a scribe for this purpose.

(b) Wear protective goggles or approved safety glasses. Also wear heat resistant gloves when handling a heated ring gear.

(c) Remove the old gear by cutting most of the way through it (at one point) with an abrasive cut-off wheel. Then complete removal with a cold chisel or punch.

(d) The ring gear is a shrink fit on the flywheel. This means the gear must be expanded by heating in order to install it. **The method of heating and expanding the gear is extremely important.** Every surface of the gear must be heated at the same time to produce uniform expansion. An oven or similar enclosed heating device must be used. Temperature required for uniform expansion is 325-350° F.

CAUTION: Never use an oxy/acetylene torch to remove the old gear, or to heat and expand a new gear. The high temperature of the torch flame will cause localized heating and damage the flywheel. In addition, using the torch to heat a replacement gear will cause uneven heating and expansion. The torch flame will also anneal the gear teeth resulting in rapid wear and damage after installation.

(e) The heated gear must be installed evenly to avoid misalignment or distortion. A shop press and suitable press plates should be used to install the gear if at all possible.

(f) Be sure to wear eye and hand protection. Heat resistant gloves and safety goggles are needed for personal safety. Also use metal tongs, vise grips, or similar tools to position the gear as necessary for installation.

(g) Allow the flywheel and ring gear to cool down before installation. Set the assembly on a workbench and let it cool in normal shop air.

CAUTION: Do not use water, or compressed air to cool the flywheel. The rapid cooling produced by water or compressed air can distort, or crack the gear and flywheel.

