



CLUTCH INSTALLATION INSTRUCTIONS

INSTALLATION OF THIS CLUTCH SET SHOULD ONLY BE PERFORMED BY PROPERLY TRAINED, PROFESSIONAL TECHNICIANS.

THE INFORMATION ON THIS SHEET IS INTENDED FOR REFERENCE ONLY AND DOES NOT DETAIL ALL POSSIBLE CLUTCH R&I SCENARIOS. THIS SHEET STRESSES SAFETY AND GENERAL SERVICE PRACTICES TO PROMOTE A SAFE AND SUCCESSFUL INSTALLATION. CONSULT A MODEL-SPECIFIC SERVICE MANUAL FOR MANUFACTURER'S TORQUE SPECIFICATIONS AND ADDITIONAL INFORMATION.

TEST-DRIVE

It is important to test drive a vehicle whenever possible. Listen for any abnormal noises. Note when they occur and whether or not the noise is consistent with a particular action, vehicle or ambient temperature. This will give you an idea of what you'll see when the vehicle is disassembled. This will also prevent you from neglecting other clutch or driveline system components that may be causing the clutch to not function properly.

VEHICLE DISASSEMBLY: WEAR EYE PROTECTION

If the vehicle has a hydraulic clutch release system, check the fluid level and condition. Check for leaks. Inspect the clutch master cylinder cap gasket. If it does not resemble its original molded shape or will not pop back into shape, suspect dissimilar fluid contamination and be prepared to replace all hydraulic clutch release system components. If the clutch master cylinder reservoir has dark sediment present, flush and refill the system with approved fluid.

NOTE: Many FWD and FWD based 4WD/AWD vehicles require the engine to be supported from the top with an engine support fixture (see manufacturer's recommendations).

Disconnect negative battery cable. Raise and support vehicle. Check the transmission (transaxle) fluid level and condition. On 4WD/AWD vehicles, check the transfer case fluid level and condition. If the vehicle is equipped with a clutch release cable, disconnect it. Remove the driveshaft(s) or CV axles. On 4WD and RWD vehicles, use a tire crayon or permanent marker to make alignment marks between the driveshaft(s) and yoke(s). This will prevent possible driveline vibration and clutch chatter upon reassembly.

Remove the starter as needed. Disconnect speedometer cable (if equipped). If the vehicle is equipped with rod and bell crank ("Z-bar") release linkage, disconnect it. If vehicle is equipped with a hydraulic release mechanism, remove slave cylinder (external slave) or disconnect hydraulic hose from slave cylinder (internal slave). While supporting the transmission with a jack, remove the transmission mount(s) and/or cross member. Lower the transmission jack (or engine support fixture) to gain access to bolts and wiring connectors necessary for transmission (transaxle) removal. Disconnect sensor wires leading to the transmission (transaxle) and tie them out of the way. Remove transmission (transaxle) to engine bolts. If transmission separates from bell housing, it will ease removal and installation to take them apart. Remove the pressure plate by loosening the bolts a little at a time in a star pattern. This prevents undue damage to the pressure plate so that diagnosis of the clutch failure may be accurate. When lifting the pressure plate off of the flywheel, do not allow the disc to fall. This way you know which side of the disc goes toward the flywheel. Markings on discs are not always obvious. Mark the flywheel side of the old disc, then compare to the new disc. If the new disc does not show its flywheel side, mark it and set it aside.

BALANCING

The Pressure Plate is a stamped steel product which is balanced to a tolerance, but you should always check the balance of the pressure plate with the flywheel and your particular engine.

ESPECIALLY IF IT IS AN EXTERNALLY BALANCED CONFIGURATION.

FLYWHEEL

The flywheel should be marked in relation to the crankshaft with a punch before removal to prevent possible engine vibration upon reassembly. Check for bluing (hot spots), heat cracks, taper, warp, and starter ring gear wear. Replace the flywheel as necessary.

NOTE: Some OEM flywheels are tapered (concave) This feature cannot be duplicated by standard flywheel machining practices (see manufacturer's recommendations). The flywheel must be resurfaced when unit is serviceable (see manufacturer's recommendations).

SANITATION AND INSPECTION: WEAR EYE PROTECTION

While the flywheel is removed, check the engine's rear main bearing seal for leaking. Closely inspect any freeze plugs, oil gallery plugs, or cam plug in the back of the engine for seepage. Check all other non-clutch system related components for fluid leaks (i.e.; brake master cylinder, valve cover gaskets, or cam sensor seal). Fluid leaks from these sources often make their way into the bell housing ruining the clutch. Check the transmission input shaft seal for leaking. Repair all fluid leaks.

It is important to thoroughly clean the bell housing and the back of the engine block before tubing and reassembling the parts (brake cleaner works best). Clean the flywheel. Inspect the transmission input shaft bearing retainer (quill) for straightness, taper, out of round, and scoring. Make sure the new release bearing slides easily on bearing retainer without being loose. Carefully inspect the fork and its pivot(s) (where applicable) for flat spots. Look for gouging on the contact points (back) of the old release bearing. Carefully inspect the pilot running surface of the transmission input shaft. Make sure it is round and there are no burrs or galling. Use manufacturer's specifications to check the transmission input shaft for run-out and end-play. Thoroughly clean the splines of the input shaft with brake cleaner. Make sure the splines are not tapered or burred. Lightly scrape any rust. If the vehicle has a hydraulic release mechanism, recheck the clutch master and slave cylinders for leaks (now that the vehicle is in the air). Inspect the clutch hydraulic hose for cracks, dry rot, and ballooning. On vehicles with a release cable, inspect cable ends for fraying. Check the cable casing for cracks. Make sure it operates smoothly. On vehicles with a rod and bell crank ("Z-bar") linkage check to see if any bushings are worn or missing. Carefully inspect bell crank arms for straightness and welds for cracking. Make sure linkage rods are not bent and the adjuster threads work smoothly. On all vehicles, check for worn or missing clutch pedal bushings. On 4WD and RWD vehicles, inspect universal joints for wear, damage and proper lube. Inspect the driveshaft(s) for dents and damaged yokes. On FWD vehicles, check the CV joints for torn boots and excessive (torsional) movement. Replace all worn or damaged parts.



CLUTCH INSTALLATION INSTRUCTIONS cont.

PILOT BEARING/BUSHING

When a vehicle is so equipped, the pilot must be replaced. The pilot is located in either the engine's crankshaft or in the center of the flywheel. To remove a flywheel-fit pilot, remove the flywheel from the engine and drive or press out the pilot from the backside of the flywheel. Press or gently tap new pilot into flywheel after flywheel has been machined (where applicable). For crankshaft-fit pilots, an effective means for removal is to select a drift punch or wooden dowel that fits snugly into the old pilot. Then, pack the old pilot tightly with grease. Using the drift punch (or dowel) and a hammer, drive the grease toward the engine. The grease will not compress and will in turn push the old pilot out of the crankshaft. Install the new pilot carefully using a bearing driver.

NOTE: Do not grease new pilots. New pilot bearings come pre-greased (often with special synthetic grease). Bronze pilot bushings have oil in the pores the material that grease will clog. For bushings, a few drops of SOW oil can be used if desired.

PRESSURE PLATE AND DISC

Install flywheel (refer to flywheel section above). Always tighten flywheel to crankshaft bolts in a star pattern to manufacturer's torque specification. Before installing the disc, make sure that it slides smoothly on the transmission input shaft. **DO NOT USE ANTI-SEIZE!** It does not cling to rotating parts. Slide the disc back and forth on the input shaft and remove any extra grease that squishes out of the splines of the disc. Do not get grease or oil on the disc facing. Any grease or oil on a disc facing can be removed with alcohol or brake cleaner if done quickly. Lay the disc on the flywheel noting the flywheel side of the disc and hold it in place with the alignment tool. Clean the pressure ring of the pressure plate with brake cleaner to remove the rust inhibiting coating. Do not spray the entire pressure plate with brake cleaner as lube for internal parts will be removed. Set the pressure plate on the flywheel dowel pins (if equipped) and hand tighten the hold-down bolts. With hand tools, tighten pressure plate bolts Vs turn at a time in a star pattern until they have reached manufacturer's torque specifications for OEM flywheels or 35 ft lbs. for aluminum flywheels. Remove the alignment tool.

NOTE: Different brands of the same pressure plate may have a difference in appearance and uninstalled lever height. These are not issues. Appearance can vary greatly and the installed lever height will be the same.

RELEASE BEARING (fork mounted)

Lightly grease all contact points of the fork, pivot ball and release bearing. Assemble noting the proper position of any clips or retainers. If the bell housing separates from the transmission, it is helpful to install the bell housing and the linkage to check for proper clutch release before the transmission is installed. Do not attempt to start the vehicle when doing this.

RELEASE BEARING (concentric slave cylinder)

A concentric slave cylinder assembly takes the place of a fork, pivot(s), linkage, conventional release bearing, and the quill of the transmission input shaft bearing retainer. Slide assembly over input shaft and torque fasteners to specification.

VEHICLE REASSEMBLY

Make sure alignment dowel pins are secured in the back of the engine block. Make sure engine and transmission mating surfaces are clean and free from burrs. Put the transmission in gear. Using a transmission jack, lift transmission into position. Carefully mate the transmission to the engine and bolt together. If the transmission will not easily mate up to the engine, slip the driveshaft onto the transmission output shaft (RWD) or partially insert CV shaft into differential (FWD) and turn slightly to align the input shaft splines with the disc. It may also be necessary to adjust the transmission angle. Do not force the transmission into place. This will likely damage the disc.

NEVER USE BOLTS TO DRAW THE ENGINE AND TRANSMISSION TOGETHER

Make sure no engine or transmission sensors, wiring harnesses, or hoses come between the engine and transmission. This will cause misalignment, and ultimately clutch failure. Reverse removal procedure for assembling the rest of the vehicle. Properly torque all fasteners. Check transmission (transaxle) fluid level and add the recommended fluid as necessary. On 4WD/AWD vehicles, check transfer case fluid level and add the recommended fluid as necessary.

NOTE: On vehicles with a manually adjustable cable or rod and bell crank release linkage, adjust to move the release bearing to within approximately 3/8 of the pressure plate levers (fine adjustment may be necessary to get clutch to engage at the desired pedal travel). On vehicles with a self adjusting cable it may be necessary to cycle the clutch pedal several times and/or pull up on the clutch pedal to make the clutch work properly. On vehicles with a hydraulic release mechanism, it is good practice to bleed the system.

NOTE: On RWD and 4WD vehicles, align the mark(s) on the driveshaft(s) with those made on the yoke(s) during disassembly to prevent possible driveline vibration and clutch chatter during engagement.

TEST DRIVE

Make sure clutch engages smoothly within the desired pedal travel. Make sure there are no unusual noises. Drive until vehicle reaches normal operating temperature cycling through all gears. Some burnt clutch smell is normal on the initial test drive. When practical, allow vehicle to cool down and drive a second time. The clutch should be burnished in and ready for a torque capacity field test. Drive up hill in the highest gear the engine will allow without bogging down and fully depress the accelerator. This puts maximum strain on the clutch and would reveal any problem with its holding power. Watch the tachometer to check for clutch slippage.

NOTE: Never perform a live clutch test (engine running) with the wheels of the vehicle off of the ground. The backlash effect of the unloaded driveline could bend the drive straps of the pressure plate causing poor or no release and/or chatter upon engagement.