SECTION V
CLUTCH

Description

The clutch is a single plate, dry disc type. It consists of three main members; the flywheel, the clutch driven plate and the pressure plate and cover assembly.

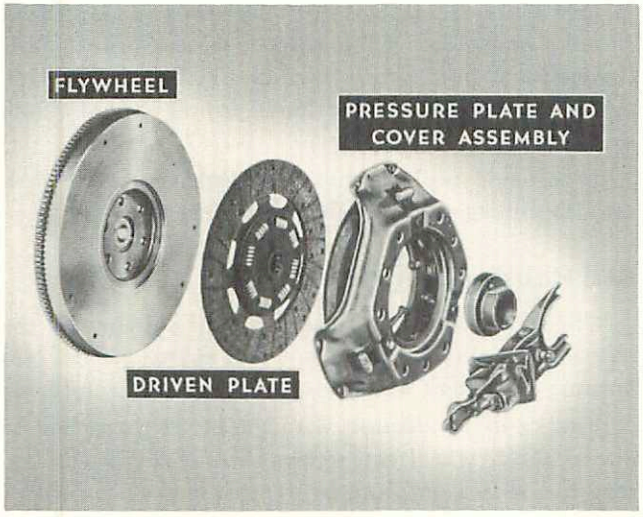

Figure 1—The Packard Clutch Consists of Three Main Members

The clutch driven plate is spring cushioned with a facing riveted to both sides. The vibration dampener coil springs which encircle the clutch hub absorb power shocks and prevent transmission of vibration from the engine to the transmission. The grooves on both sides of the clutch plate facings prevent the sticking of the plate to the flywheel and pressure plate due to vacuum between the members.

The clutch cover assembly is made up of the cover, pressure plate, springs and three release levers. No adjustment for wear is provided in the clutch itself. The screws in the three release levers are provided to properly adjust the pressure plate for smooth clutch engagement and disengagement. These screws are locked in place and should never be disturbed unless a proper tool fixture is available.

The clutch throw-out bearing is of the ball type, packed with lubricant at the time of manufacture, and requires no further lubrication.

The clutch shaft pilot bearing is of the ball type and can be repacked with lubricant, however, it should not require lubricant except when the clutch is removed for servicing.

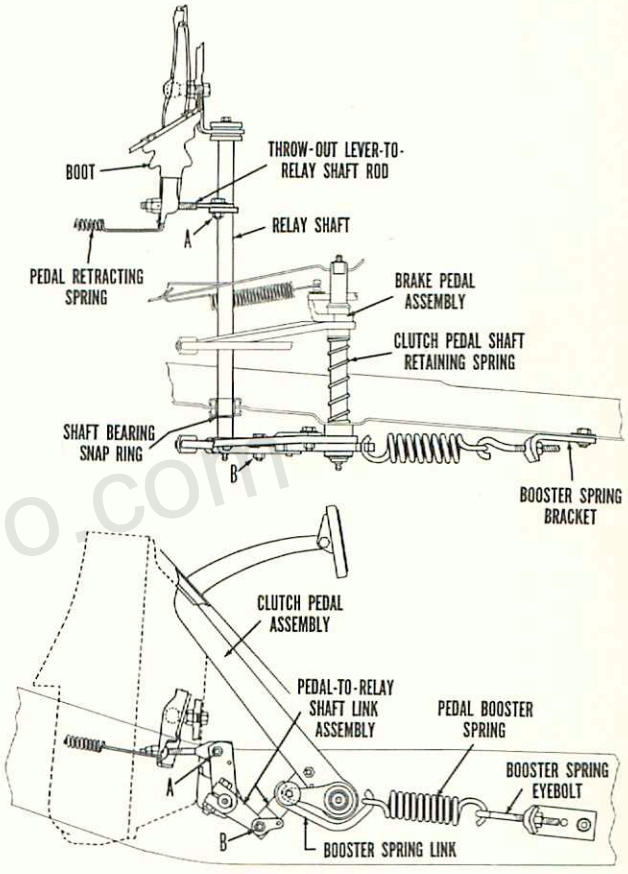

Figure 2—Clutch Release is Accomplished through the Pedal, Relay Shaft and Linkage

The clutch pedal linkage is equipped with an assist spring to reduce pedal release pressure. The adjusting nut on the link at the rear of the spring may be adjusted to provide the desired pedal pressure.

SERVICING THE CLUTCH

Transmission Removal

Disconnect the speedometer cable. Disconnect the propeller shaft at the rear universal joint and remove the propeller shaft completely by slipping the front universal joint flange off the transmission main shaft.

On Overdrive Equipped Cars

Disconnect the overdrive control cable from the lever on the left side of the overdrive case. Disconnect the electrical leads from the solenoid and the governor. Identify the leads with tags to be sure to connect them at their proper location on reassembly.

Use a jack or an auxiliary support bar to support the engine while the transmission is removed. Remove the rear engine support mounting and support cross members.

Remove the three screws that attach the shifter shafts bracket to the "X" member and move the bracket and shafts to the left away from the transmission.

Remove the two screws that attach the inner end of the clutch relay shaft to the bell housing. Remove the bolt "A" Fig. 2 which connects the clutch relay shaft lever to the throw out lever link. Remove the bolt "B" Fig. 2 that attaches the clutch relay shaft outer lever to the clutch pedal. Remove the snap ring that holds the outer half of the clutch relay shaft bearing on the shaft, work the outer half of the bearing out of the frame, the inner end of the clutch relay shaft will now drop down so as to clear the bell housing when the transmission is removed.

Remove the cap screws attaching the bell housing to the flywheel housing and remove the transmission and bell housing assembly.

NOTE: Remove the bell housing and throw out bearing with the transmission so that the throw out bearing pull-back spring will not be damaged.

Clutch Removal

Loosen the six cap screws that attach the clutch cover to the flywheel in succession until the clutch cover is free.

Remove the clutch cover and pressure plate and the clutch driven plate from the flywheel housing. Remove the clutch shaft pilot bearing using tool J-489.

Cleaning and Inspection

Clean the pressure plate and cover with a stiff brush. Blow out the dust particles. Clean the contact surface of the pressure plate and flywheel with cloth moistened with cleaning solvent.

Inspect the clutch shaft pilot bearing and clutch throw out bearing. Check by rotating the bearings by hand. If rotation is lumpy or not smooth, install a new bearing. If the pilot bearing runs smooth, repack it with a high melting point, short fiber, medium wheel bearing grease. The throw out bearing should be replaced if it appears to be low on grease.

Inspect the condition of the pressure plate and cover assembly. If the plate is worn, scored or checked, install a new pressure plate and cover assembly. Inspect the condition of the release levers and the clutch springs. If the release levers are worn or damaged, or if the clutch springs have become over-heated or lost their tension, install a new pressure plate and cover assembly. It is *not* recommended to attempt to service the pressure plate or cover.

Inspect the condition of the contact surface of the flywheel. If the flywheel is worn, scored or damaged, install a new flywheel. A flywheel that is not scored too badly may be resurfaced.

Inspect the condition of the clutch driven plate and facings. If the facings are worn, scored or grease soaked, install a new clutch plate. Inspect the condition of the driven plate hub torque springs. If they are broken, damaged or exceptionally loose, install a new clutch driven plate.

Inspect and replace any worn linkage parts, lubricate the linkage and the throw out lever ball stud.

Bell Housing Alignment

When checking for causes of hard shifting in the transmission and jumping out of gear, check the bell housing alignment with the clutch removed, as follows:

Install a dial indicator, with the bracket attached to one of the flywheel cap screws. Adjust the bracket so that the indicator plunger is against the flat milled surface at the rear end of the bell housing. See figure 3.

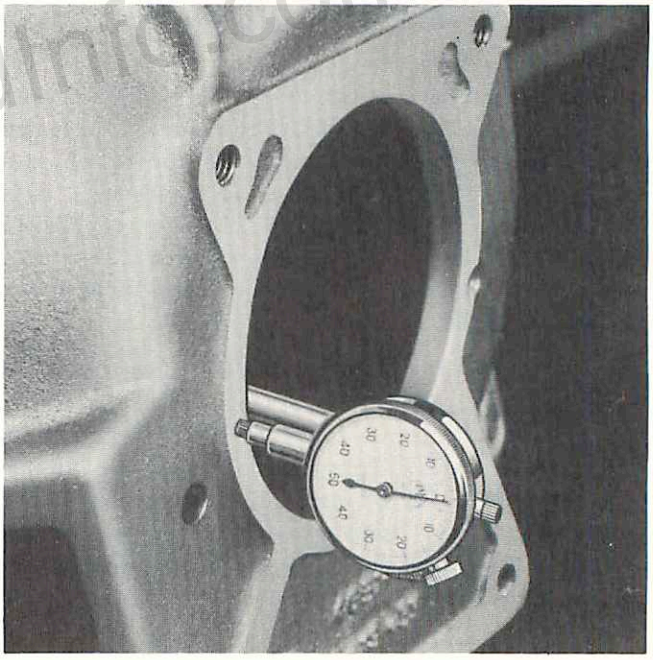

Figure 3—Checking the Bell Housing Alignment with Dial Indicator

Turn the indicator dial until the pointer reads zero. Rotate the engine crankshaft until the indicator circles the bell housing and a correct reading can be obtained. Run-out should not exceed .003 inch total indicator reading. If the reading is out of limits, check for dirt between the mating surfaces of the bell housing and flywheel housing. If no dirt is found, install a new housing.

Check the bell housing bore in the same manner, except place the indicator plunger on the inside of the bore. See figure 4. Out-of-round of the bore should not exceed .005" total indicator reading. Install a new bell housing if the reading is out of limits.

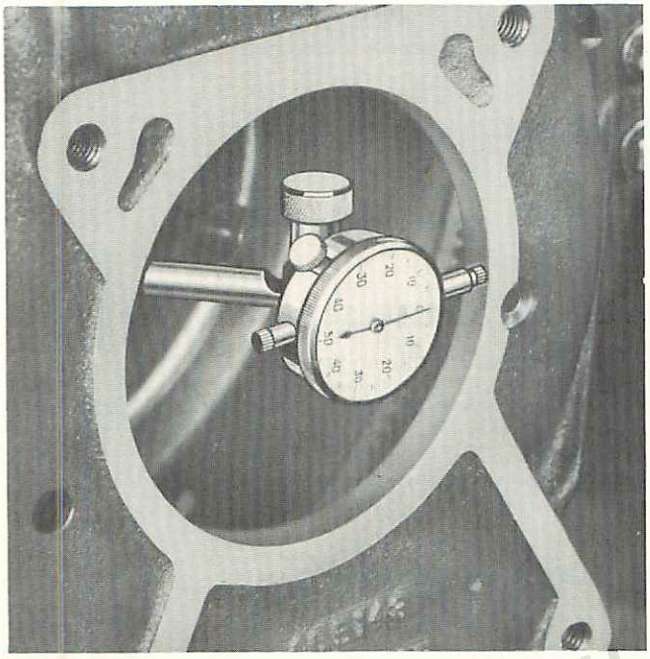

Figure 4—Checking the Bell Housing Bore

Clutch Installation

Pack the clutch shaft pilot bearing with short fiber wheel bearing grease and install the pilot bearing with the open side toward the front of the engine and shielded side toward the rear.

When installing a new clutch driven plate, try the splines of the plate on the splines of the clutch shaft for free movement. Coat the splines of the clutch shaft *very sparingly* with a medium cup grease or "Lubriplate."

Hold the clutch cover and pressure plate assembly and clutch driven plate in place, with the damper springs of the driven plate away from the flywheel. Start the clutch cover to flywheel cap screws.

Insert a suitable clutch driven plate aligning arbor or a clutch shaft through the clutch driven plate and into the clutch shaft pilot bearing.

Tighten the clutch cover to flywheel cap screws a few turns in progression until they are all tight. It is advisable to use a torque wrench, tightening these cap screws to 25 to 28 foot pounds.

Install the throw-out bearing assembly on the clutch shaft rear bearing retainer and connect the bearing pull back spring.

Install the transmission assembly by reversing the procedure outlined in Transmission Removal.

CAUTION: Care must be taken that the transmission clutch shaft does not rest on, bend, or dish the clutch driven plate when installing the transmission.

Adjust the clutch pedal free play to 1½".

Adjust the clutch pedal assist spring adjusting nut to provide easy pedal pressure. Do not tighten the nut so far that the clutch pedal has a slow jerky action when engaging the clutch. The pedal pressure should not be reduced to the point where all sense of feel is lost.

On Overdrive Equipped Cars

Connect the two wires to the solenoid and connect the governor wire. Connect the overdrive control cable to the lever on the left side of the overdrive case. Check the cable adjustment and clamp the cable conduit to the case.

TROUBLE SHOOTING

CLUTCH SLIPPING

Causes

(a) Insufficient or no clutch pedal free play.
(b) Sticking clutch release linkage.
(c) Weak or broken clutch pressure springs.
(d) Worn or burned driven plate facings.
(e) Grease or oil on driven plate facings.

CLUTCH GRABS WHEN STARTING IN LOW OR REVERSE

Causes

(a) Small amount of grease or oil on driven plate facings.
(b) Loose engine mountings.
(c) Hub of driven plate not sliding freely on clutch shaft.
(d) Broken driven plate facings or pressure plate.

CLUTCH

CLUTCH CHATTERS

Causes

(a) Small amount of grease or oil on driven plate facings.
(b) Clutch pedal linkage binding.
(c) Loose engine mountings.
(d) Driven plate facings loose.
(e) Pressure plate cover bolts loose.
(f) Broken driven plate facings or pressure plate.
(g) Worn or incorrect adjustment of release levers.

EXTREME CLUTCH PEDAL PRESSURE

Causes

(a) Clutch pedal assist spring missing or improperly adjusted.
(b) Clutch release linkage binding.

CLUTCH DRAGGING OR INCOMPLETE RELEASE

Causes

(a) Excessive pedal free play.
(b) Worn or incorrect adjustment of release levers.
(c) Broken driven plate facings or pressure plate.
(d) Distorted clutch driven plate.
(e) Driven plate splines not sliding freely on clutch shaft.
(f) Grease or oil on driven plate facings.

SPINNING, CAUSING GEAR CLASH IN REVERSE

Excessive driven plate spinning is generally caused by one or more of the causes listed for clutch dragging. Gear clash due to excessive spinning will be quite severe when shifting from neutral to reverse and hardly noticeable when shifting to second because of the synchronizer brake in the transmission.

A clutch which releases properly will spin for a few moments after it is released. This is caused by its own momentum.

CLUTCH NOISES

Causes

(a) Dry or rough throw out bearing.
(b) Dry or rough pilot bearing.
(c) Improperly adjusted release levers.
(d) "Clutch jazz"—Improper friction lag.