CLUTCH . . . . . SECTION 5

CONTENTS

GENERAL DESCRIPTION

Henry J models are equipped with a single plate, dry-disc type clutch mounted on the engine flywheel. When engaged, the clutch disc is pressed against the flywheel by the spring loaded clutch pressure plate. The disc, splined to the transmission drive pinion shaft, includes the clutch facings and is designed to cushion shock and chatter through damper springs around the disc hub.

The pressure plate assembly is bolted directly to the flywheel. It contains three levers which operate in parallel to disengage the clutch when actuated by the clutch release mechanism.

Two types of pressure plates are used interchangeably in the Henry J models; they will be identified in this manual as three and six spring pressure plates. Both pressure plates have been proven through test to have equal durability, performance and a long service life when properly installed and adjusted.

Differences in appearance will readily identify the type of pressure plate used. The most prominent difference being in the shape of the covers and the number of springs used (Fig. 104 and 105).

The clutch assembly is actuated through linkage from the clutch pedal to a release fork mounted in the clutch housing. A clutch release bearing and sleeve assembly is moved by the clutch release fork to engage the pressure plate levers when the clutch pedal is depressed. As pressure is applied to the pedal the pressure plate levers are moved inward by the release bearing and the pressure plate is moved away from the

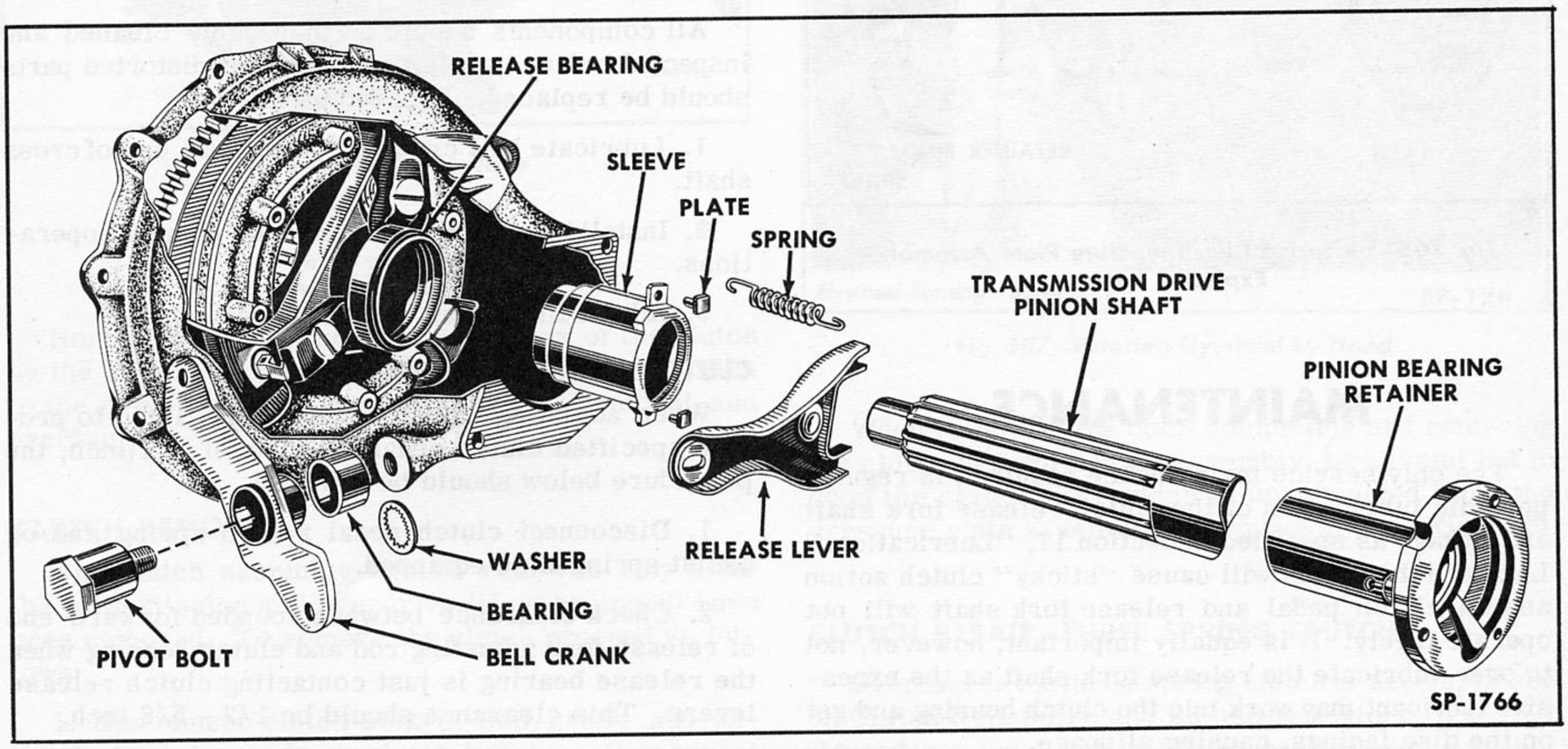

Fig. 103—Typical Clutch Installation—Exploded View

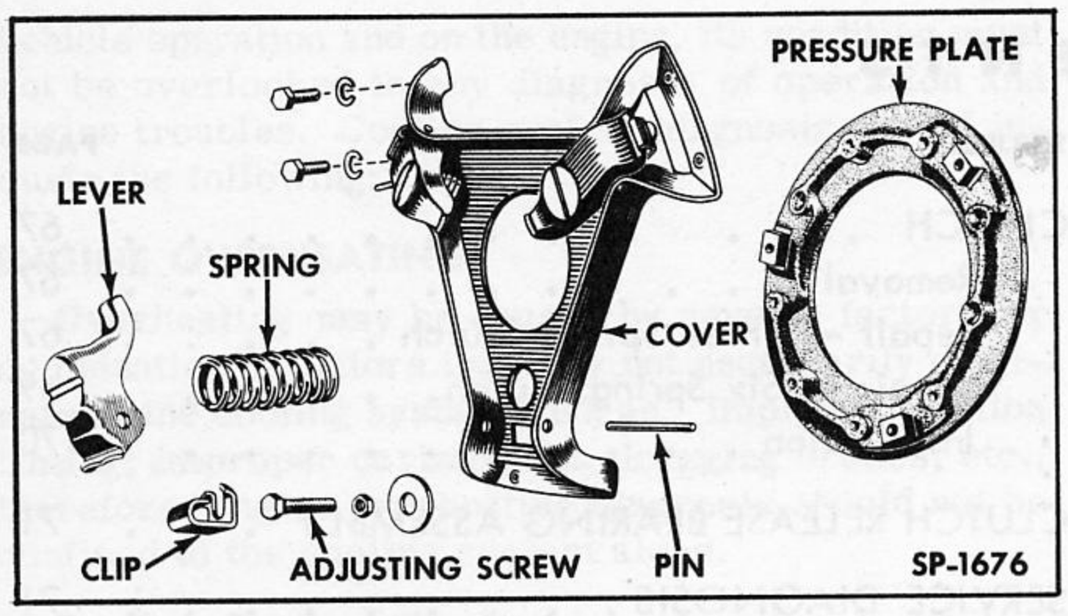

Fig. 104—Three Spring Clutch Pressure Plate Assembly—Exploded View

clutch disc and engine flywheel, disengaging the clutch. When pressure on the clutch pedal is released, the release bearing moves away from the pressure plate levers, releasing the pressure against them. The pressure plate springs then move the pressure plate against the disc and flywheel to engage the clutch.

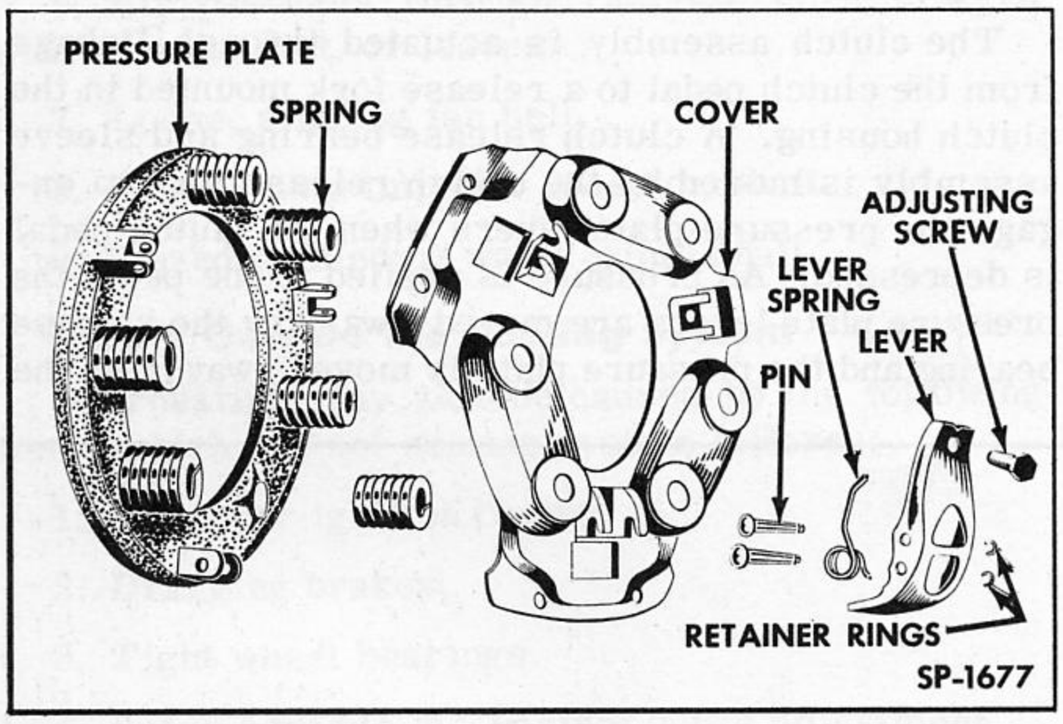

Fig. 105—Six Spring Clutch Pressure Plate Assembly—Exploded View

MAINTENANCE

The only service maintenance required is regular periodic lubrication of the clutch release fork shaft and linkage as specified in Section 17, "Lubrication." Lack of lubrication will cause "sticky" clutch action and the clutch pedal and release fork shaft will not operate freely. It is equally important, however, not to over-lubricate the release fork shaft as the excessive lubricant may work into the clutch housing and get on the disc facings, causing slippage.

The only adjustment required while the clutch is in the vehicle is linkage adjustment to obtain the correct amount of clutch pedal free movement.

CLUTCH LINKAGE

The clutch linkage on later production models may vary in slight details from those of early production. As these differences are slight, they will not be discussed.

CLUTCH LINKAGE REMOVAL

The clutch linkage can be completely removed as follows:

1. Lift front floor mat and remove clutch pedal dust seal and floor plates.

2. Disconnect pedal return spring, remove bolt attaching pedal to cross shaft and remove pedal.

3. Remove clutch pedal adjusting rod.

4. Remove bell crank from its attachment on clutch housing. (Clutch release fork adjusting rod can be removed with bell crank.)

5. Remove cross shaft support from lower side of transmission. Note direction of offset so support can be installed in same position.

6. Remove cross shaft bushing from frame side rail.

7. Remove cross shaft.

CLUTCH LINKAGE INSTALLATION

All components should be thoroughly cleaned and inspected before installation. Worn or distorted parts should be replaced. Proceed as follows:

1. Lubricate bell crank pivot and ball end of cross shaft.

2. Install linkage by reversing the removal operations.

3. Adjust linkage as detailed below.

CLUTCH LINKAGE ADJUSTMENT

When adjusting clutch linkage (Fig. 106), to provide specified clutch pedal free travel of 1 inch, the procedure below should be followed.

1. Disconnect clutch pedal return spring and/or assist spring if so equipped.

2. Check clearance between rounded forward end of release fork adjusting rod and clutch housing when the release bearing is just contacting clutch release levers. This clearance should be 1/2 - 5/8 inch.

3. If clearance is less than 1/2 inch, adjust release fork adjusting rod to provide 5/8 inch clearance.

Rod can be made more accessible by removing bell-crank from its pivot with the rod still attached. Grease bell crank pivot before reassembling.

4. Remove clutch pedal adjusting rod: Lengthen or shorten the adjusting rod until 1 inch free travel of the clutch pedal at the pedal pad is established. Connect adjusting rod to bell crank and cross shaft.

5. Install clutch pedal assist spring and return spring.

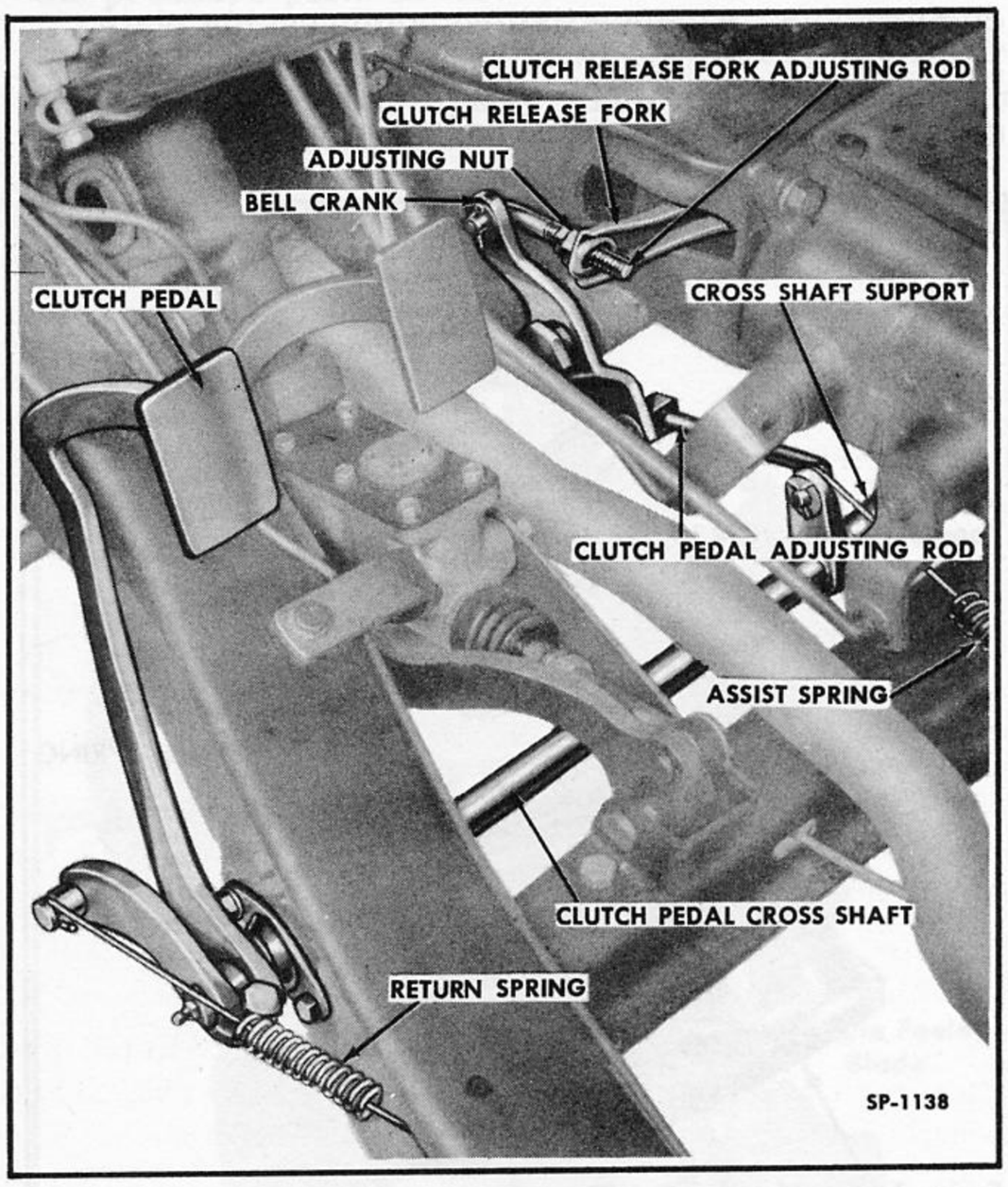

Fig. 106—Clutch Linkage

CLUTCH

Normal wear or improper operation of the clutch by the owner or operator may impair clutch function to the point which may necessitate its removal and overhaul.

CLUTCH REMOVAL

The clutch assembly can be removed only after the transmission and overdrive (if so equipped) have been removed. To remove the clutch proceed as follows:

1. Disconnect clutch control bell crank and exhaust pipe support from clutch housing. Disconnect exhaust pipe at manifold.

2. Remove transmission. (Refer to Section 6, "Transmission and Overdrive.")

3. Remove clutch housing from engine.

4. The crankshaft, flywheel, and clutch assembly are dynamically balanced, both individually and as a unit. To maintain this balanced condition, the position of the clutch on the flywheel must be marked before removal. Make a prick punch mark on clutch cover and a corresponding mark on flywheel to identify proper position for assembly.

5. Rotate flywheel, using Flywheel Turning Tool C-771 (Fig. 107) so that each pressure plate cover mounting bolt is accessible. Loosen bolts alternately and only one turn at a time to relieve spring pressure which could otherwise cause cover distortion.

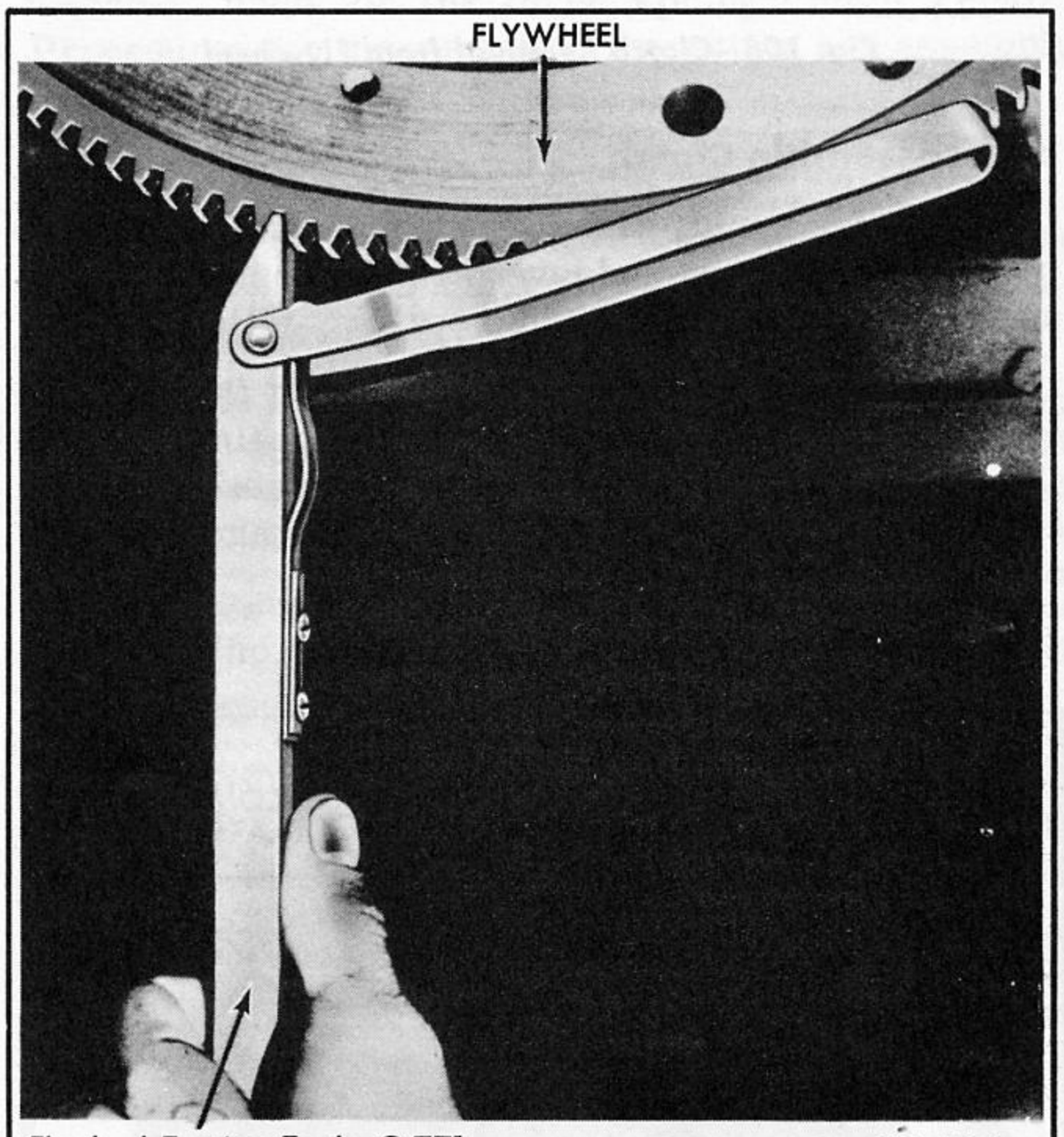

Fig. 107—Rotating Flywheel by Hand

When removing the bolts completely and removing the clutch pressure plate assembly, be careful not to drop the clutch disc, which is unsupported when the pressure plate assembly is removed. (See Fig. 108).

CLUTCH REPAIR—THREE SPRING CLUTCH

Overhaul of the three spring clutch is accomplished on Clutch Rebuilding and Adjusting Fixture C-585-C. Procedures for disassembly, inspection and assembly of the clutch follow:

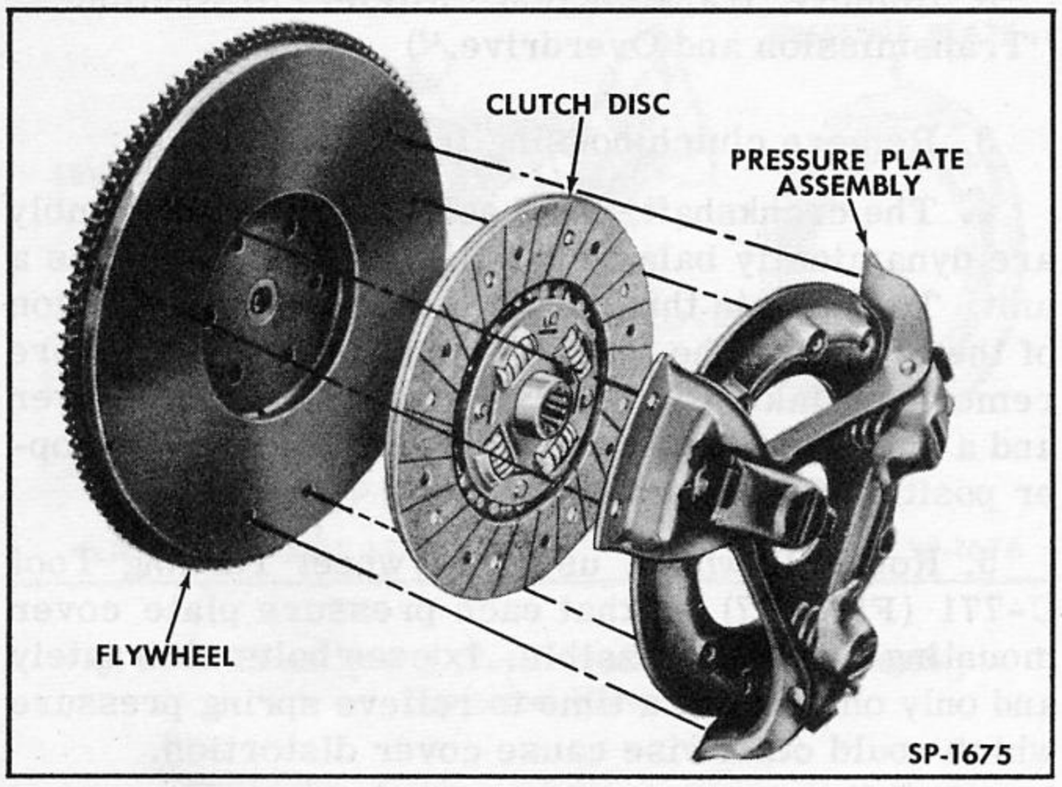

Fig. 108—Clutch Removal from Flywheel

a. Disassemble Clutch

The three spring clutch pressure plate, pressure plate cover, springs and levers can be completely disassembled for inspection or repair as follows:

1. Place cover support plate (part of fixture) and clutch on Clutch Rebuilding and Adjusting Fixture C-585-C. Mark pressure plate and pressure plate cover with prick punch to assure alignment in the original position when assembling.

2. Place fixture compression plate on centering screw so that it rests evenly on all three pressure plate levers (Fig. 109).

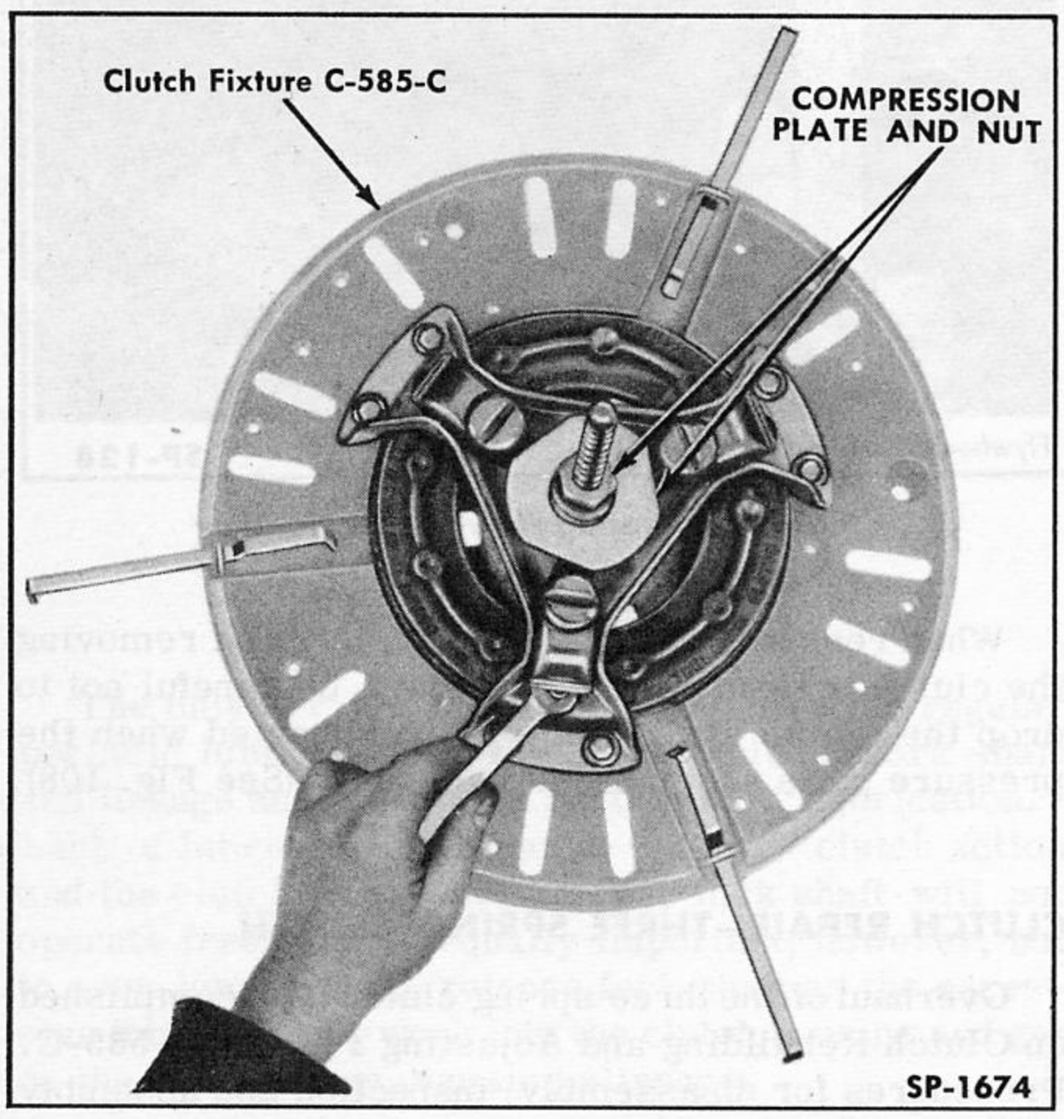

Fig. 109—Disassembling Three Spring Clutch

3. Install and tighten nut against compression washer to relieve pressure at the heel of levers.

4. Remove pressure plate lever clip, adjusting screw, lock nut and flat washer from heel of each lever.

5. Carefully back off fixture compression nut all the way until pressure plate springs are no longer compressed. Remove fixture compression plate.

6. Remove pressure plate springs and lift pressure plate cover from pressure plate.

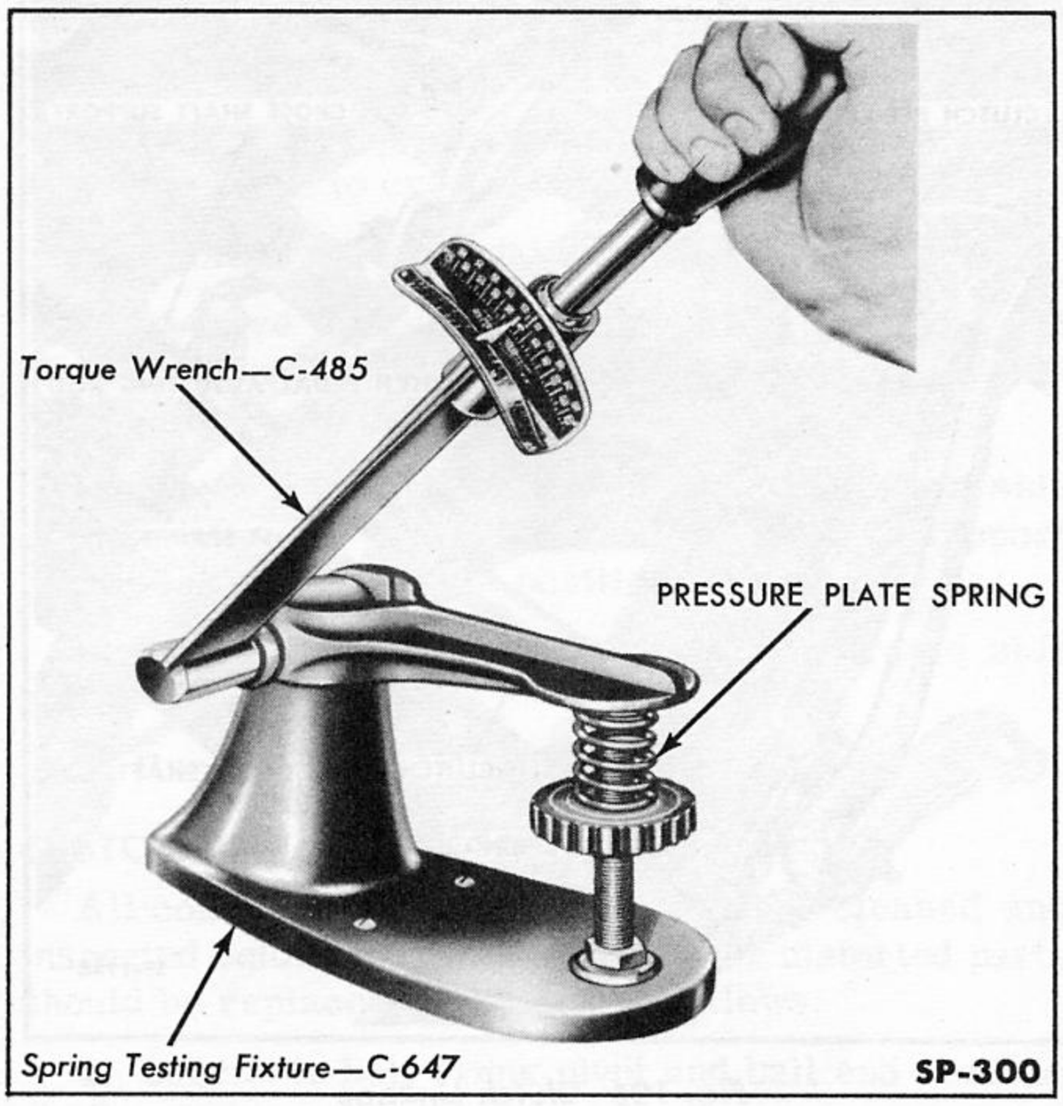

Fig. 110—Checking Pressure Plate Springs

b. Inspect Clutch

After clutch is disassembled, inspect each part for wear and replace if necessary. Check pressure plate for warpage and for scored surface. Check each pressure plate spring using Spring Testing Fixture C-647 and Torque Indicating Wrench C-485 (Fig. 110).

At 1-9/16 inches height, the correct spring load is 220-240 pounds for a blue spring and 200-222 pounds for a pink or a black spring.

When using the recommended spring checking fixture, the "pounds" pressure is obtained by multiplying the torque wrench reading (in "foot-pounds") by two.

c. Assemble and Adjust Clutch

Proper assembly and adjustment of the clutch is as follows:

1. Place pressure plate and pressure plate cover on Clutch Rebuilding and Adjusting Fixture C-585-C. Make sure punch marks made during disassembly are lined up.

2. Install pressure plate springs under levers on the pressure plate cover.

3. Press down on the toe of each lever and insert a fixture support block under the heel of each lever to hold springs in place.

4. Install fixture compression plate and nut and tighten down as far as possible.

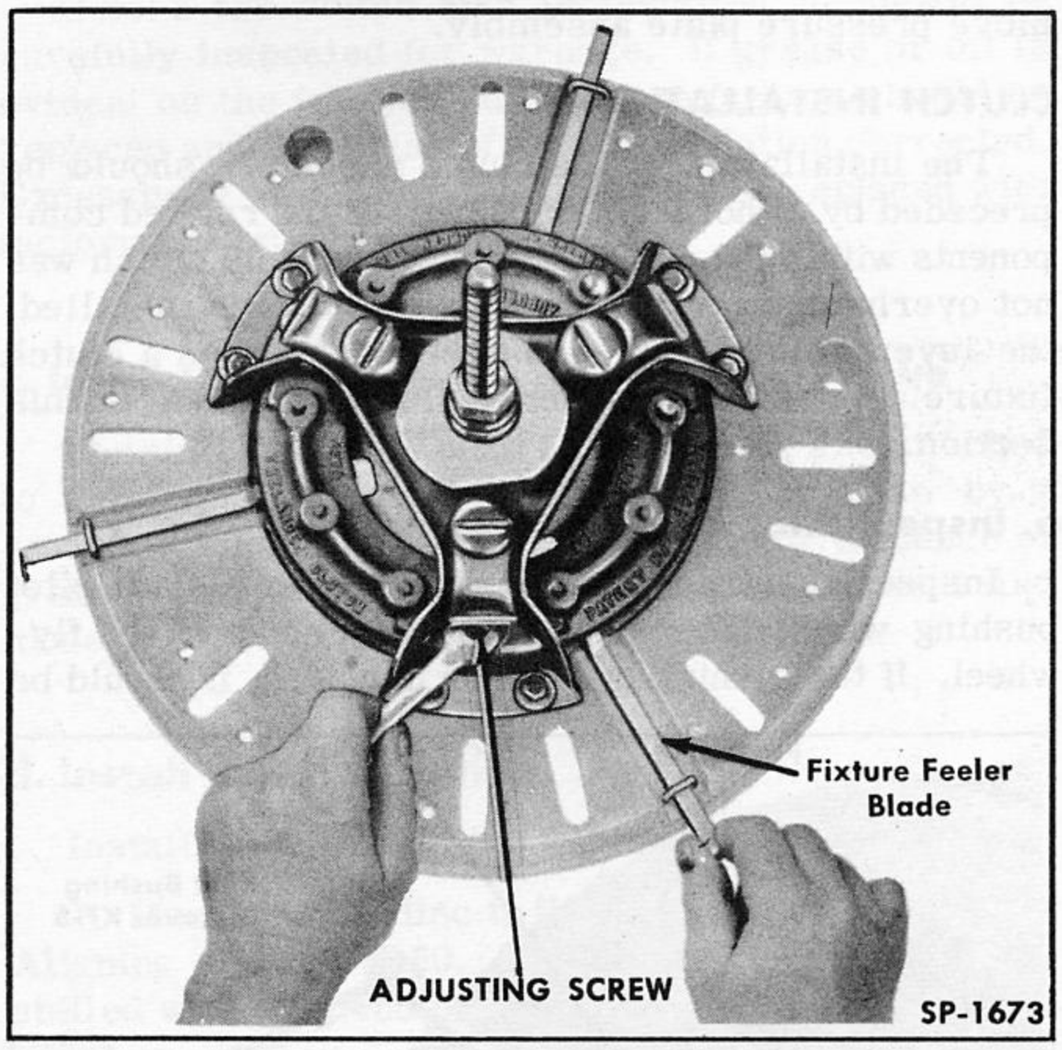

Fig. 111—Adjusting Levers on Three Spring Clutch

5. Remove support blocks from under levers and install clutch adjusting screws, washers, locknuts and pressure plate lever clips. Tighten adjusting screws into pressure plate as far as possible.

NOTE: Apply Lubriplate sparingly to all contact and pivot surfaces of levers.

6. Back off and remove fixture nut and compression plate.

7. Lift clutch off fixture, remove cover support plate and place clutch back on fixture.

8. Install fixture thickness spacers C-585-17 on fixture centering screw.

9. Install compression plate, self-aligning washer, thrust washer and nut. Tighten nut to its full extent to properly position pressure plate levers.

10. Install and tighten bolts holding cover plate to fixture.

11. Adjust pressure plate levers by turning lever adjusting screws (Fig. 111) until each of the three fixture feeler blades have the same slight drag or "feel" when pushed in and out. Tighten lock nuts.

12. Remove clutch from fixture. The assembly is now ready for installation.

CLUTCH REPAIR—SIX SPRING CLUTCH

Overhaul of the six spring clutch is accomplished on the same Clutch Rebuilding and Adjusting Fixture C-585-C used for the three spring clutch repair. Procedures for disassembly, inspection and assembly of the clutch follow:

a. Disassemble Clutch

The six spring clutch pressure plate, pressure plate cover, springs and levers can be completely disassembled for inspection or repairs as follows:

1. Plate clutch on Clutch Rebuilding and Adjusting Fixture C-585-C. Mark pressure plate and pressure plate cover with prick punch to assure alignment in the original position when assembling.

2. Place compression spider and nut on fixture centering screw and tighten nut to relieve clutch spring pressure.

3. Remove retainer ring from the outer pin on each lever. Drive out the outer pins only. (Fig. 112).

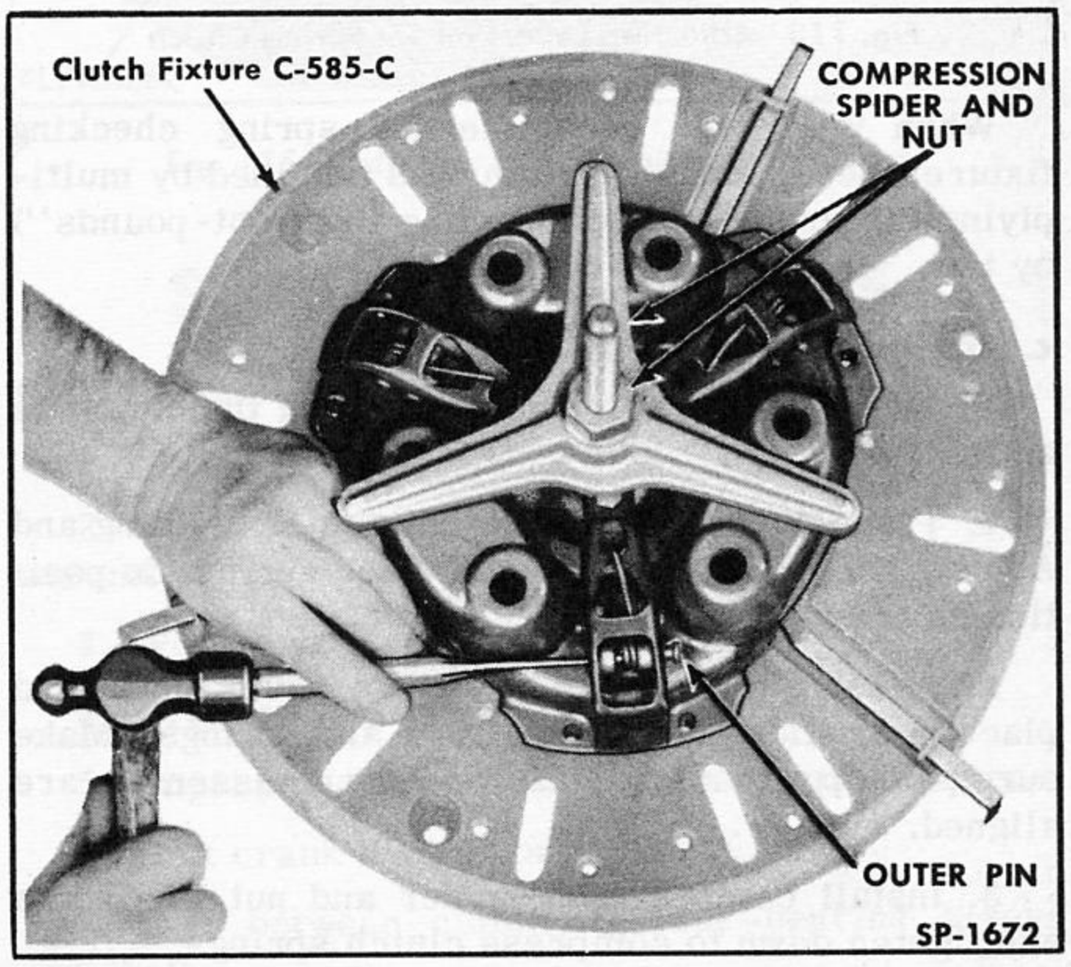

Fig. 112—Disassembling Six Spring Clutch

4. Carefully back off compression spider and nut all the way until pressure plate springs are no longer compressed. Remove spider and nut.

5. Lift off pressure plate cover and levers from pressure plate.

b. Inspect Clutch

After the clutch is disassembled, inspect each part for wear and replace if necessary. Check pressure plate for warpage and for scored surface. Check each pressure plate spring using Spring Testing Fixture C-647 (Fig. 110). At 1-7/16 inches height, the correct spring load is 200-210 pounds.

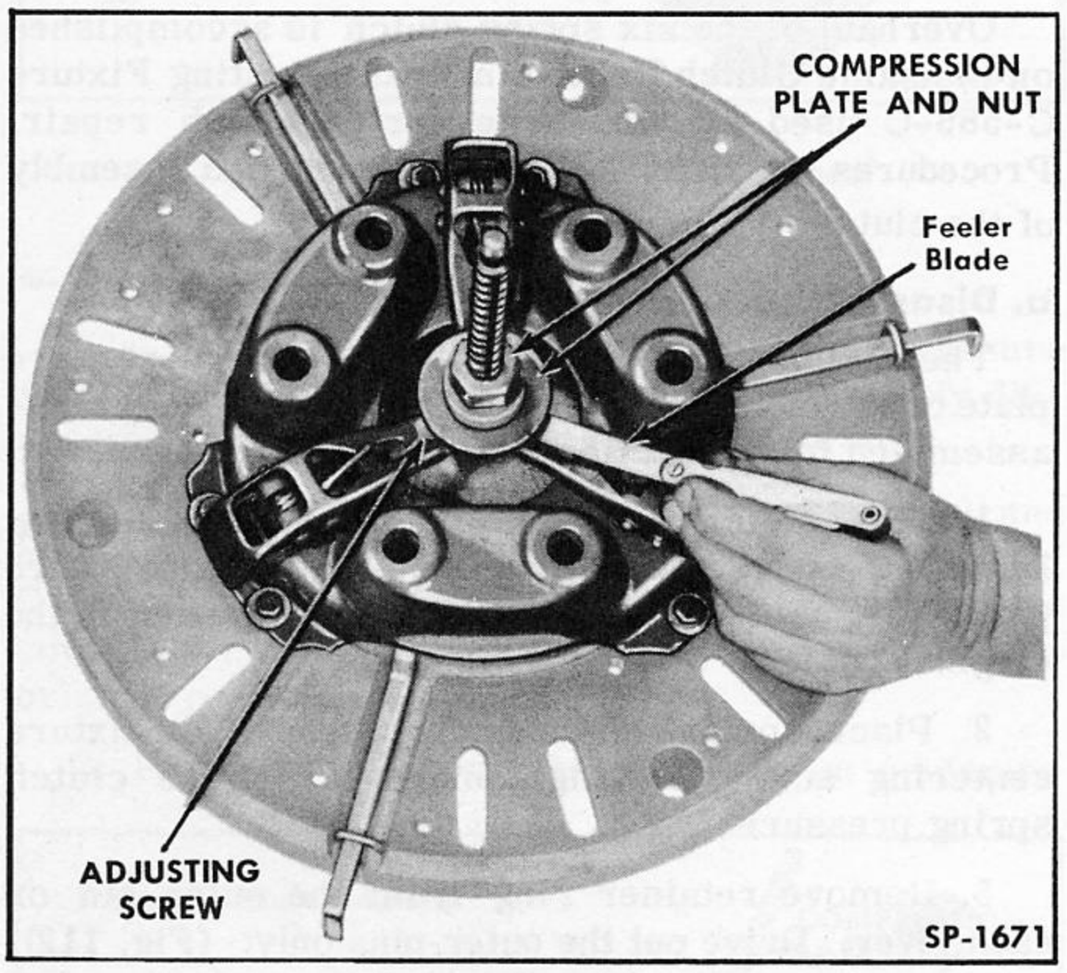

Fig. 113—Adjusting Levers on Six Spring Clutch

When using the recommended spring checking fixture, the "pounds" pressure is obtained by multiplying the torque wrench reading (in "foot-pounds") by two.

c. Assemble and Adjust Clutch

Proper assembly and adjustment of the clutch is as follows:

1. Place pressure plate on Clutch Rebuilding and Adjusting Fixture C-585-C and place springs in position on pressure plate.

2. Assemble levers to pressure cover plate and place in position on pressure plate and springs. Make sure prick punch marks made during disassembly are aligned.

3. Install compression spider and nut to fixture and tighten down to compress clutch springs.

4. Install and tighten bolts to hold pressure plate cover against fixture. Remove compression spider and nut.

5. Install outer pins and retainer rings to each lever. NOTE: Apply Lubriplate SPARINGLY to all contact and pivot surfaces of levers.

6. Place fixture thickness spacers C-585-16 on fixture centering screw, then install the fixture compression plate and nut. Tighten nut until compression plate contacts No. 16 spacer.

7. Adjust the three lever adjusting screws until a .002 feeler blade has a slight drag between the compression plate and each adjusting screw (Fig. 113).

8. Remove compression plate and nut, remove bolts holding pressure plate cover to fixture and remove pressure plate assembly.

CLUTCH INSTALLATION

The installation of the clutch assembly should be preceded by a thorough inspection of the related components within the clutch housing. If the old clutch was not overhauled, or if a new clutch is to be installed, the lever adjustment should be checked on a clutch fixture as described under "Clutch Repair" in this section.

a. Inspect Pilot Bushing in Flywheel

Inspect the transmission drive pinion shaft pilot bushing which is pressed into the center of the flywheel. If the bushing is worn or damaged, it should be

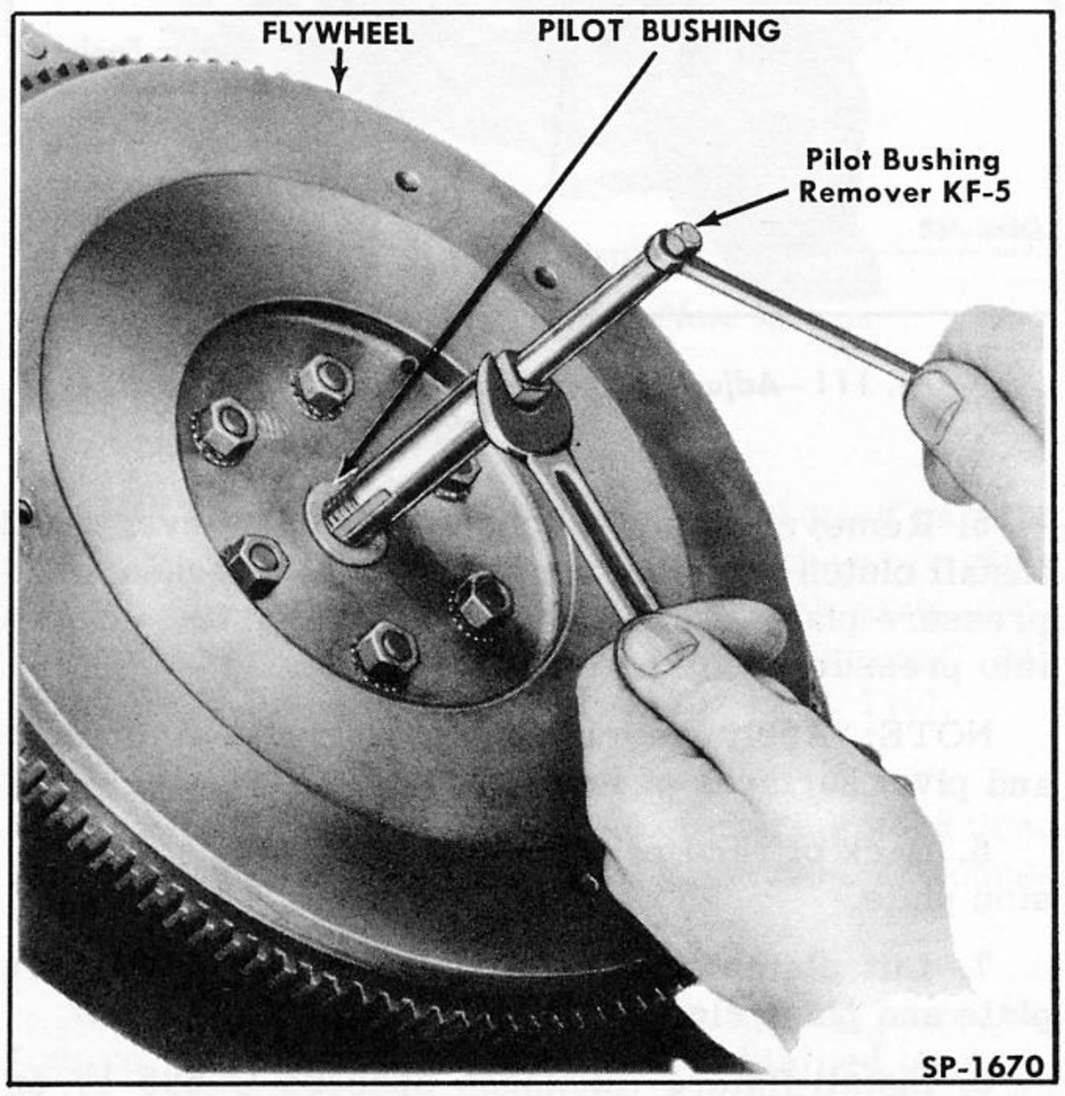

Fig. 114—Removing Pilot Bushing from Flywheel