

DODGE TRUCK

B-4 SERIES

SHOP MANUAL

**MODELS: B-4-B, B-4-C, B-4-D, B-4-PW, B-4-DU, B-4-EU, B-4-F,
B-4-G, B-4-GA, B-4-H, B-4-HA, B-4-HM, B-4-HMA, B-4-J, B-4-JA,
B-4-JM, B-4-JMA, B-4-K, B-4-KA, B-4-KMA, B-4-R, B-4-RA, B-4-T,
B-4-TA, B-4-V, B-4-VA, B-4-Y, B-4-YA, B-4-YX**

SECTION 10

FLUID DRIVE

**DODGE DIVISION
CHRYSLER CORPORATION
DETROIT 31, MICHIGAN**

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TIGHTENING REFERENCE

<i>Part Name</i>	<i>Size (inch) and number of threads per inch</i>	<i>Torque (foot-pounds)</i>
Fluid drive unit to crankshaft bolt nuts.....	$\frac{7}{16}$ — 20	55 to 60
Fluid drive runner hub nut.....	$1\frac{3}{8}$ — 16	135 to 145
Fluid drive seal retainer.....	$2\frac{3}{16}$ — 18	275 to 300

FLUID DRIVE

(EXTRA EQUIPMENT)

1. DESCRIPTION AND OPERATION

Fluid-drive (Fig. 1) eliminates all mechanical connections between the engine and rear wheels. It consists of a driving member and a driven member. The driving member is a steel stamping in which a number of steel fins are welded. This member is mounted on the end of the crankshaft with studs and a dowel pin. A cover plate is welded to the driving member, forming a housing which is oil tight and contains MOPAR Fluid Drive Fluid.

The driven member is a steel stamping equipped with a number of welded steel fins. This stamping is attached to a steel hub which is mounted on a tapered spline and is keyed to the clutch driving plate. The hub of the driven member rotates on a bearing, which is

submerged in the fluid in the assembly and requires no other lubrication.

Since the driving and driven members have no mechanical connection between each other, the energy (set up by the revolving motion of the driving member attached to the engine crankshaft) is transmitted to the driven member through the medium of the fluid within the fluid assembly. The fins of the driving member impart a swirling motion to the fluid, throwing it outward and away from the center of the unit across the gap to the driven member. There the fluid strikes sharply against the fins of the driven member, making it revolve. Thus, the energy of the engine is transmitted through the clutch, the transmission, the propeller shaft and the rear axle to the rear wheels.

SERVICING THE FLUID DRIVE

2. REMOVAL AND INSTALLATION OF FLUID DRIVE ASSEMBLY

a. Removal

- (1) Raise the truck to a convenient working height and support with stands.
- (2) Remove the transmission floor cover.
- (3) Disconnect the propeller shaft.
- (4) Disconnect the hand brake linkage and speedometer cable.
- (5) Remove the transmission by removing the mounting bolts. Lower transmission to the floor where it can be pulled from beneath the truck. (For Removal Procedure of 4-speed transmission, refer to Transmission section).
- (6) Remove the clutch housing (flywheel cover) pan.
- (7) Remove the clutch release bearing.
- (8) Mark the clutch pressure plate and driving plate with a prick punch.

SERVICE STANDARDS

MODEL DESIGNATION →	B, C, D, DU, EU
Fluid Drive Runner Bushing — Type — front and rear	Oilite
Fluid Drive Coupling — Diameter	13"
Coupling Hub Bearing	Ball

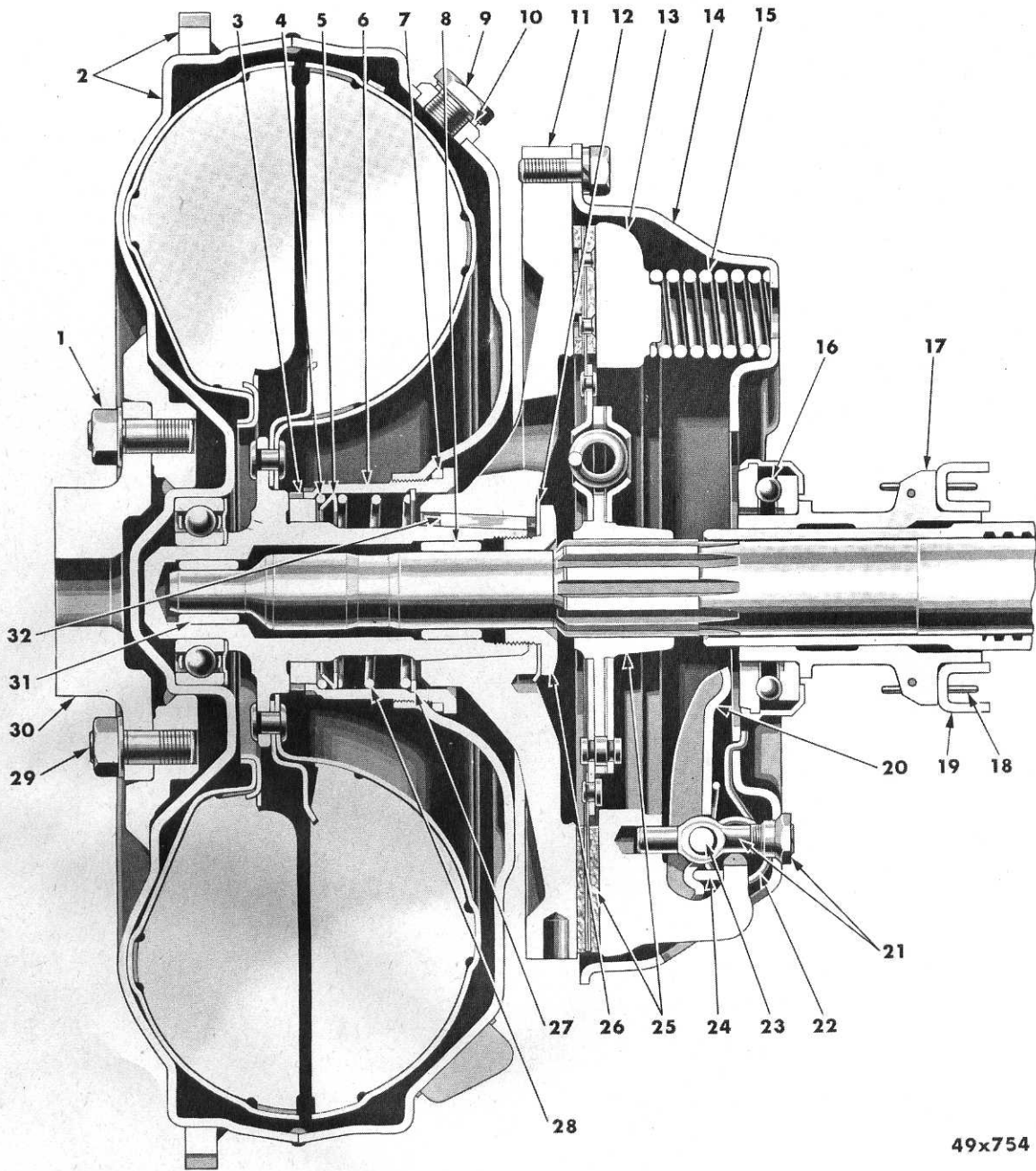


Fig. 1—Typical Clutch and Fluid Drive with Housing Type Seal
(Cross-Sectional View)

- 1 — Fluid drive flange stud nut
- 2 — Fluid drive assembly
- 3 — Fluid drive floating seal ring
- 4 — Fluid drive seal ring gasket
- 5 — Fluid drive seal ring gasket retainer
- 6 — Fluid drive seal housing gasket
- 7 — Fluid drive seal housing gasket
- 8 — Fluid drive runner bushing—rear
- 9 — Fluid drive filler plug
- 10 — Fluid drive filler plug gasket
- 11 — Fluid drive clutch driving plate
- 12 — Fluid drive driving plate lock washer
- 13 — Clutch pressure plate
- 14 — Clutch cover
- 15 — Clutch pressure spring
- 16 — Clutch release bearing

- 17 — Clutch release bearing sleeve
- 18 — Clutch release bearing sleeve pull-back spring
- 19 — Clutch release fork
- 20 — Clutch release lever
- 21 — Clutch release lever eyebolt and nut
- 22 — Clutch release lever spring
- 23 — Clutch release lever pin
- 24 — Clutch release lever strut
- 25 — Clutch disc assembly
- 26 — Fluid drive driving plate nut
- 27 — Fluid drive seal spring retainer snap ring
- 28 — Fluid drive seal spring
- 29 — Fluid drive driving flange stud
- 30 — Crankshaft
- 31 — Fluid drive runner bushing—front
- 32 — Fluid drive driving plate key

49x754

- (9) Remove the cap screws which hold the clutch cover to clutch driving plate.
- (10) Remove the clutch pressure plate assembly and clutch disc (Fig. 2).
- (11) Remove the driver flange stud nuts with Tool C-589 (Fig. 3).
- (12) Pull back the fluid drive unit until it is free from the crankshaft flange. Then, withdraw the fluid drive assembly from the clutch housing.

b. Installation

- (1) Clean thoroughly the back face of crankshaft flange and mating face of driving flange. Remove all burrs and other foreign particles.
- (2) Place the fluid drive assembly on the crankshaft flange and tighten the nuts. Tighten the nuts evenly to avoid misaligning the assembly.
- (3) Install the clutch disc, clutch cover and pressure plate assembly. Align the clutch disc, before tightening the clutch cover cap screws. For the 10 inch clutch, use Tool C-609 to align the clutch disc. For the 11 inch clutch, use a spare transmission drive pinion shaft to make certain that the

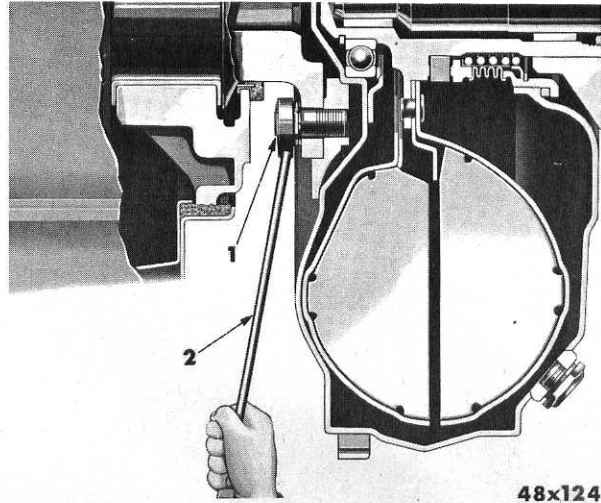


Fig. 3—Removing Driver Flange Stud Nuts (1) with Tool C-589 (2)

marks on the cover and driving plate line up before completing assembly of parts.

- (4) Install the clutch release bearing, housing pan, transmission, connect hand brake linkage and speedometer cable. Replace transmission floor cover plate.

c. Clutch Installation

When installing the clutch and related parts, observe the following precautions:

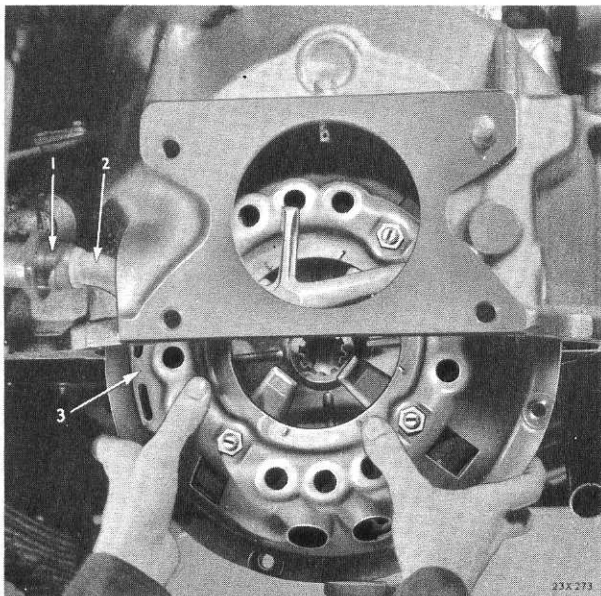


Fig. 2—Removing Clutch Assembly

1 — Clutch release fork flange 2 — Release fork 3 — Clutch assembly

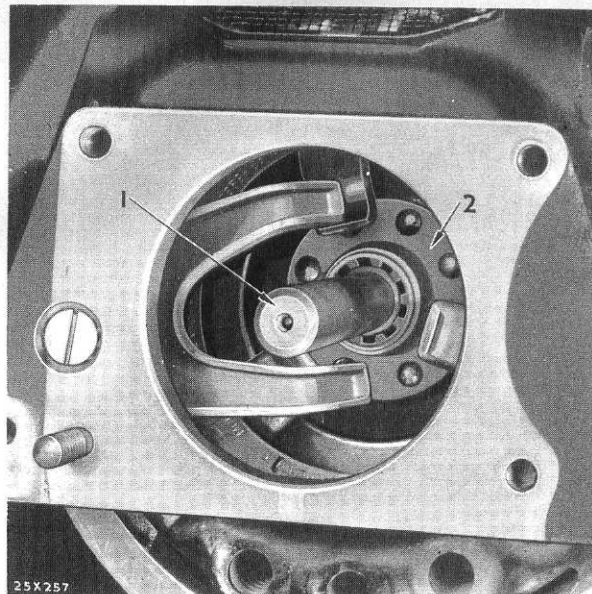
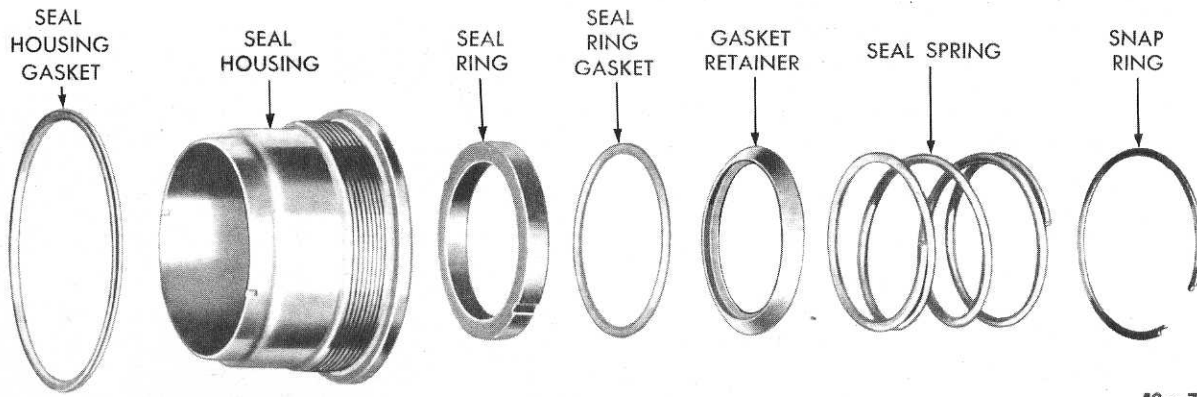


Fig. 4—Clutch Disc Aligning Arbor (11 Inch Clutch)

1 — Tool C-609 2 — Clutch disc



49 x 758

Fig. 5—Fluid Drive Seal (Housing Type)



Fig. 6—Removing Clutch Drive Plate Retainer Nut

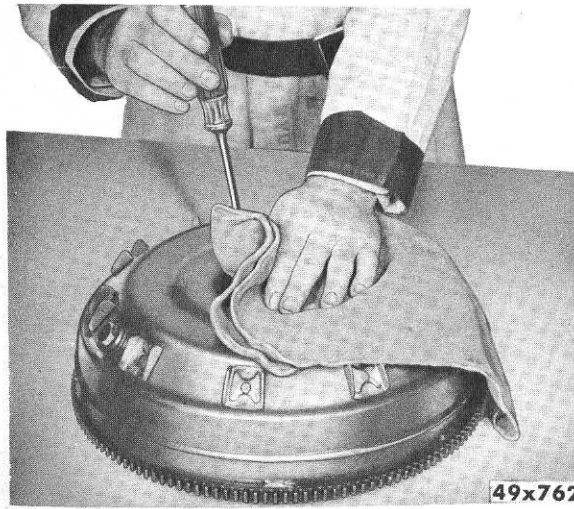


Fig. 8—Method of Retaining Snap Ring and Spring



Fig. 7—Removing Clutch Drive Plate

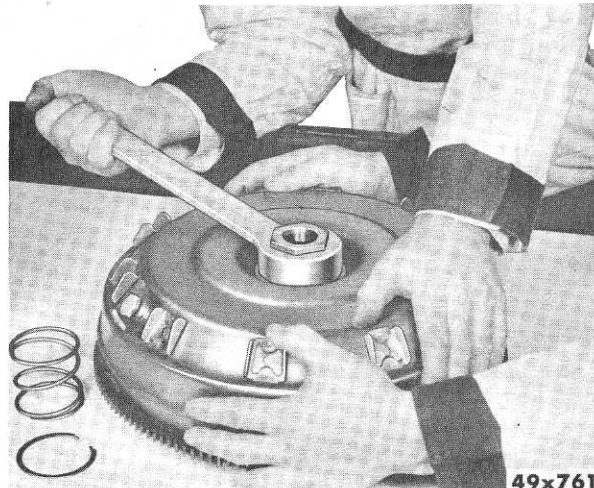


Fig. 9—Removing Or Installing Seal Housing

- (1) Clean thoroughly the surface of the clutch driving plate and clutch pressure plate, using a clean dry cloth. Make certain that no oil remains on these parts.

When installing new parts from the factory, use alcohol to remove the protective coating that covers the parts.

- (2) Hold the clutch disc in place and bolt the clutch cover and pressure plate assembly loosely to the clutch driving plate so that the marks on the cover and driving plate line up.
- (3) Special Clutch Aligning Tool C-609 should be placed through hub of driving disc and into drive pinion pilot bearings (fluid drive runner inner bearings) in the runner hub (Fig. 4, page 5).
- (4) Clutch cover cap screws should then be tightened a few turns (in progression) until they are tight. Then, install the transmission.

3. SERVICING FLUID DRIVE SEAL (HOUSING TYPE)

To service the fluid drive seal (fluid drive unit removed), refer to Figures 1 and 5, and then proceed as follows:

IMPORTANT

Throughout the servicing operations, cleanliness is of the utmost importance.

α. Disassembly

- (1) Remove the filler plug and drain the unit.
- (2) Bend back the tab on the lockwasher. Then, with socket wrench C-607, remove the drive plate retainer nut, as shown in Figure 6.
- (3) Holding the drive plate securely, remove the drive plate with puller C-665, as shown in Figure 7. Then, lift out the key.
- (4) Thoroughly clean the back surface of the fluid drive unit adjacent to the seal housing. Cover the seal housing opening with a clean shop towel to retain the snap ring and spring, as shown in Figure 8.
- (5) With a screw driver, pry one end of the

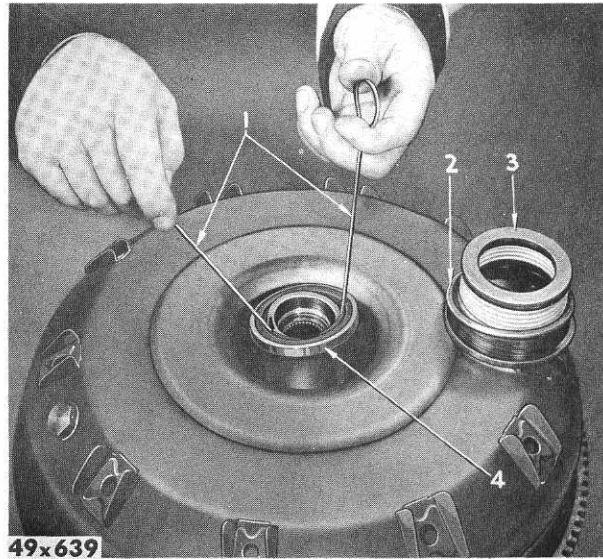


Fig. 10—Removing Seal Ring

- 1 - Wire hooks
- 2 - Seal retainer gasket
- 3 - Seal assembly
- 4 - Floating seal ring

snap ring up and out. Then, remove the snap ring and spring.

- (6) Using wrench C-545, unscrew the seal housing. (To assist in holding the wrench in place, screw the retainer nut on the hub, as shown in Figure 9.) The seal ring gasket and gasket retainer will come out with the seal housing.
- (7) With two pieces of wire (bent to form hooks) lift out the seal ring, as shown in Figure 10.

CAUTION

Do not attempt to remove the seal housing without first removing the snap ring and spring. Otherwise, the seal gasket will be damaged.

Before installing the seal ring, make certain that the sealing surfaces are perfectly clean and free from scratches or marks of any kind.

Do not attempt to recondition the sealing surfaces. If the surface of the seal ring is damaged, install a new one. If the mating surface of the runner hub is damaged, install a new fluid drive assembly.

Using the eraser end of a lead pencil, as shown in Figure 11, press a clean cloth against the seal surface, while rotating the runner hub.



Fig. 11—Cleaning Runner Hub Sealing Surface

Repeat this operation until no dirt or oil appears on the cloth.

Follow the same procedure with a new chamois to remove any remaining lint particles.

CAUTION

Never use a metallic object to apply the cloth or chamois against the runner hub seal surface. If this is done, damage may result.

b. Assembly

- (1) Inspect the seal housing for burrs, particularly in the spanner wrench slots, the chamfer, the top edge of bore and around the snap ring groove.



Fig. 12—Cleaning Contact Surfaces of Seal Ring

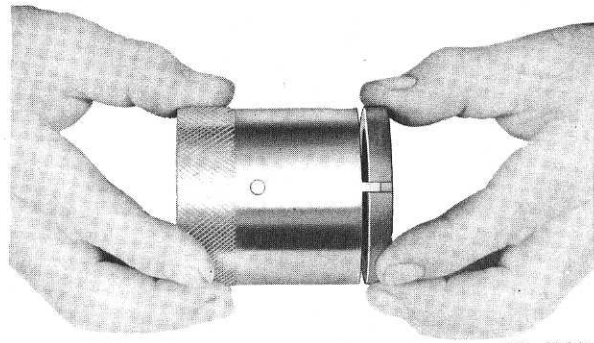


Fig. 13—Squaring Seal Ring on Locators

Carefully remove all burrs. Then, wash all parts (except gaskets and seal ring), including the tools needed for assembly purposes, in a solvent and dry with compressed air.

- (2) Screw the seal housing in place (finger tight), being sure that the seal housing gasket contacts both the seal housing and the machined face on the back plate of fluid drive unit.

NOTE

While assembling, every precaution must be maintained in order to assure absolute cleanliness of the sealing surfaces on the runner hub and seal ring.

- (3) Wipe both sides of the seal ring, rotating each face against a clean, new chamois, as shown in Figure 12.

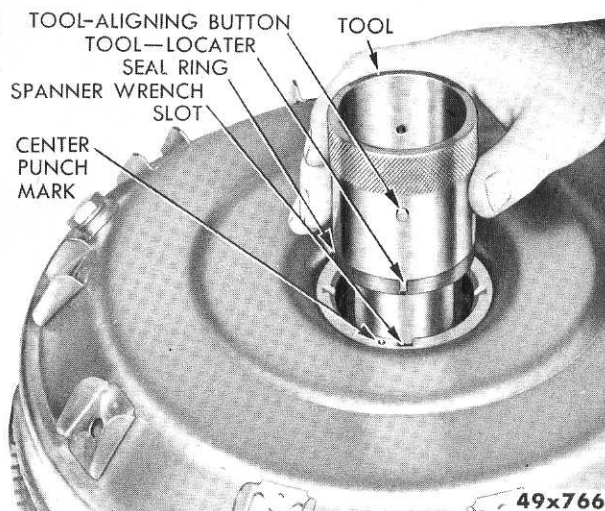


Fig. 14—Locating Seal Ring in Seal Housing
(Tool SP-791, Part of Tool C-885)

Special Tool C-885 can be used to install the seal ring. It consists of two parts: SP-788 and SP-791.

- (4) Using aligning Tool SP-791, place the seal ring squarely on the locators, as shown in Figure 13. Be sure to enter both locators at the same time. Enough tension should be maintained to hold the seal ring in place.
- (5) Slide aligning tool and seal ring assembly into the seal housing, as shown in Figure 14. Lower the assembly and, at the same time, align the button of the tool with the spanner wrench slot nearest the center-punch mark.
- (6) Slide the pilot sleeve SP-788 *gently* down inside Tool SP-791 in order to push the seal ring off the locators and onto the two small indentions at the bottom of the seal housing, as shown in Figure 15.

CAUTION

Do not drop the pilot tool into the aligning sleeve. This will cause the seal ring to crack or chip.

- (7) Remove the ring installing tools. Then, install the seal ring gasket, making certain that it is in full contact with the seal ring.
- (8) Install the seal ring gasket retainer with the angular face down. Then, install the spring.

NOTE

Special Tool C-884 can be used to compress the spring and, at the same time, install the snap ring. The tool consists of three parts: SP-738, SP-740 and SP-739.

- (9) Push the angular end of the inner sleeve out until approximately $\frac{1}{8}$ inch shows, as shown in Figure 16.
- (10) Place the angular end of the inner sleeve in the chamfer of the seal housing. Push the outside collar down so it seats on the face of the seal housing.
- (11) Place snap ring on top of spring and install pusher portion of Tool C-884 (Fig. 17).

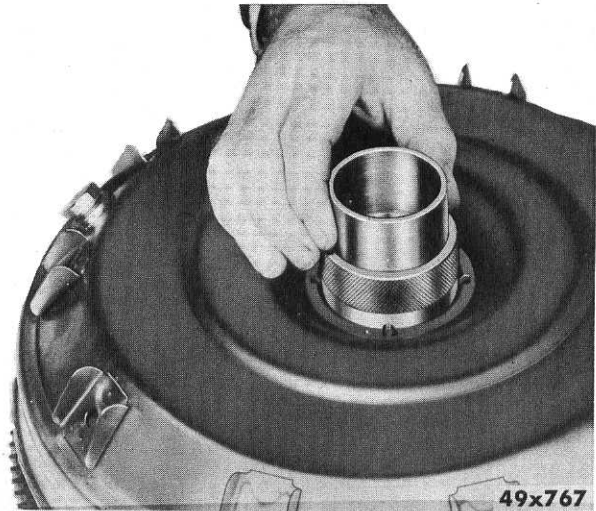


Fig. 15—Pushing Seal Ring off Locators, Using Pilot (Tool SP-788, Part of Tool C-885)

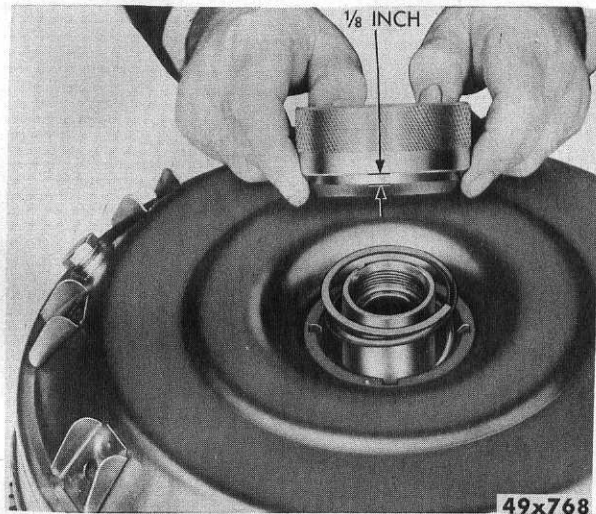


Fig. 16—Positioning Inner Sleeve of Tool C-884

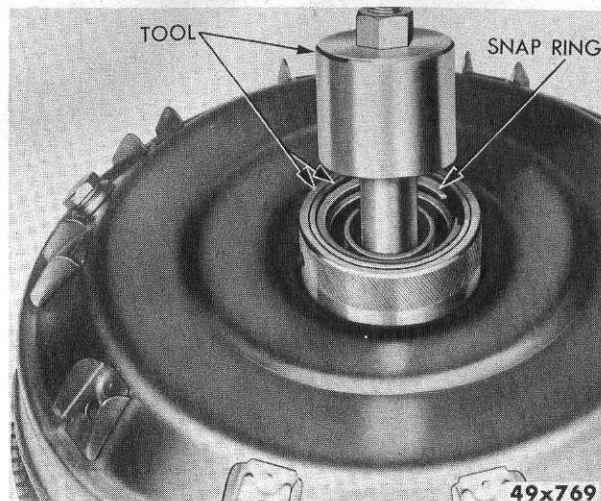


Fig. 17—Tool and Snap Ring Positioned for Installing (Tool C-884)



Fig. 18—Installing Snap Ring

- (12) Install the snap ring by pressing quickly and heavily on the top of the tool, as shown in Figure 18.
- (13) Tighten seal housing with wrench C-545 to the required torque of 270 foot-pounds. Install drive plate and key.
- (14) Install drive plate retainer nut and washer. With the aid of Tool C-784, as shown in Figure 6, tighten nut securely with wrench C-607. Lock retainer nut by bending edge of washer up. Then, center punch it at the small drive plate hole.

4. REMOVAL AND INSTALLATION OF FLUID DRIVE BUSHINGS

NOTE

When replacing bushings in the fluid drive unit, be sure to use only Oilite bushings.

To remove and replace the fluid drive runner hub bushings, proceed as follows:

Place fluid drive unit on bench and remove clutch driving plate nut (do not remove plate). Now, remove outer hub bushing, using puller sleeve and expansion jaw from Kit C-670. Remove inner bushing, using puller and expansion jaw without sleeve, as shown in Figure 19.

Clean all parts thoroughly. Place new inner and outer Oilite bushings on drift C-627 and insert in hub. Drive both bushings into hub until they are seated, as shown in Figure 20.

Line burnish the bushings with Tool C-648. Then, insert a small amount of short fiber

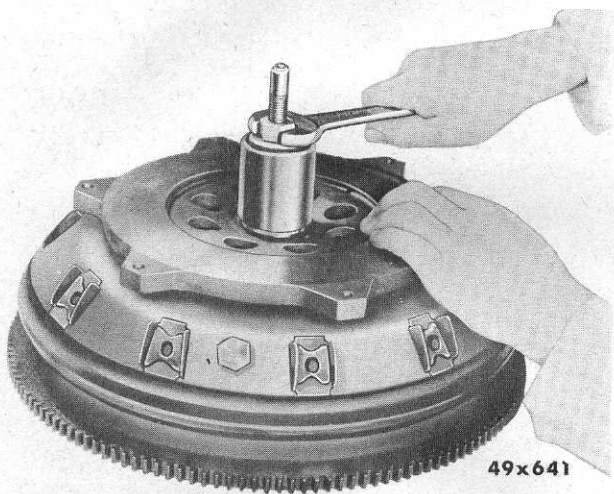


Fig. 19—Removing Bushing

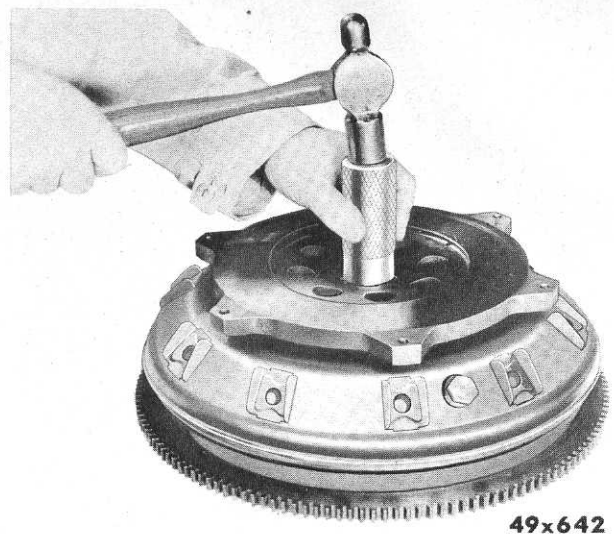


Fig. 20—Installing Bushing

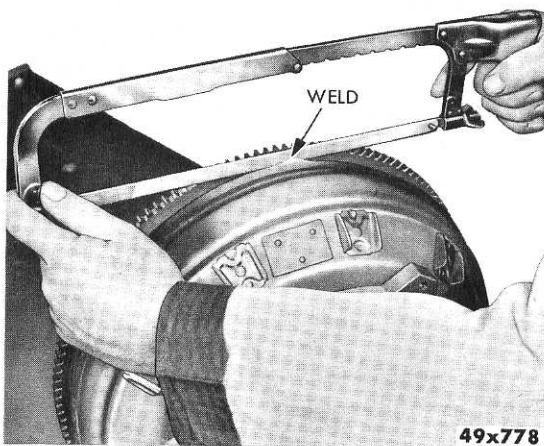


Fig. 21—Cutting Ring Gear to Housing Weld Spots

grease in bushings. Install nut on driving plate and bend tab to lock.

5. TESTING FLUID DRIVE FOR SLIPPAGE

In many cases, the occurrence of fluid drive slippage is a matter of opinion. However, to determine if slippage is actually occurring, make the following test:

Connect one wire of a motor analyzer tachometer to the distributor and the other wire to a good ground. With the engine properly tuned, place the transmission in direct speed and apply the hand brake as well as the foot brakes. Accelerate the engine and determine the maximum engine r.p.m. output with the throttle wide open.

IMPORTANT CAUTION

Take the tachometer reading as quickly as possible. The above test should not require more than one minute! If the test is prolonged, the seal may blow off and leakage may result, due to the overheating of the fluid in the fluid drive unit. Do not perform a repeat test until the fluid in the fluid drive unit reaches normal room temperature.

When this test is performed, if the engine turns over faster than 1,100 r.p.m., at normal operating temperature, slippage is occurring and the fluid in the unit is probably low. A physical check can not be made until the coupling has returned to normal room temperature. If, after making a physical check, the fluid is found to be low, check for a leak in the fluid coupling and correct as necessary. Refill unit to proper level.

6. REPLACING RING GEAR ON FLUID DRIVE UNIT

a. Removal of Ring Gear

- (1) Remove the fluid drive unit from the truck and clamp it in a swivel vise so that the weight rests on the bench.
- (2) Using a hacksaw, cut the weld spots parallel to the back face of the ring gear within $\frac{1}{16}$ to $\frac{3}{32}$ inch of the housing, as shown in Figure 21. *Do not cut too deep.*
- (3) Scribe a line around the housing (Fig. 22). This is for reassembly purposes. The mark-

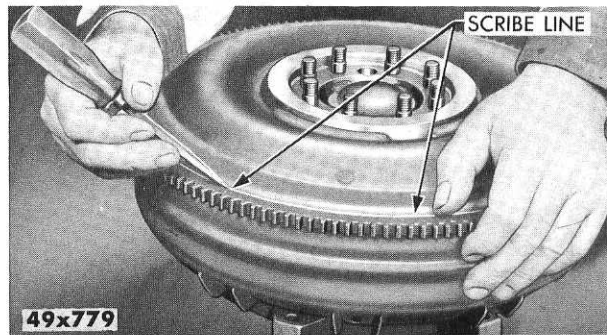


Fig. 22—Scribing Housing for Ring Gear Location

- ing will indicate the approximate position for the new ring gear.
- (4) With the front face down, use a heavy drift and hammer, and drive off the ring gear (Fig. 23).
 - (5) Position the fluid drive assembly in a vise and remove all of the remaining welded metal with a 12-inch bastard file. Be extremely careful when filing. Remove only the remaining weld (Fig. 24).

b. Installation of Ring Gear

The new ring gear (with a diameter of approximately .018 inch less than the diameter of the coupling) must be heated to a uniform temperature of not more than 212 degrees F. before installing. Bake oven C-794 can be used to heat ring gear.

NOTE

If oven C-794 is not available, the ring gear may be submerged in boiling water for approximately 5 minutes and then installed (chamfered teeth up). If a welding torch is used to heat the ring gear, use a medium-size welding

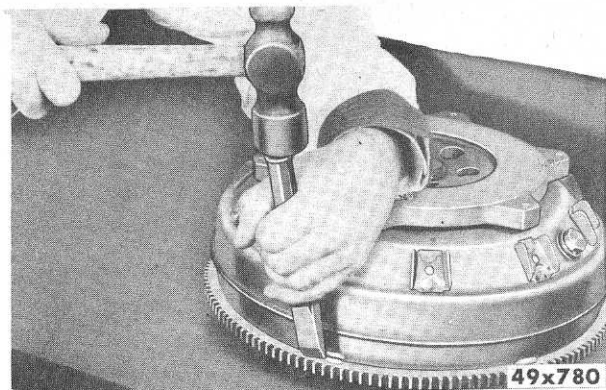


Fig. 23—Driving Off Ring Gear

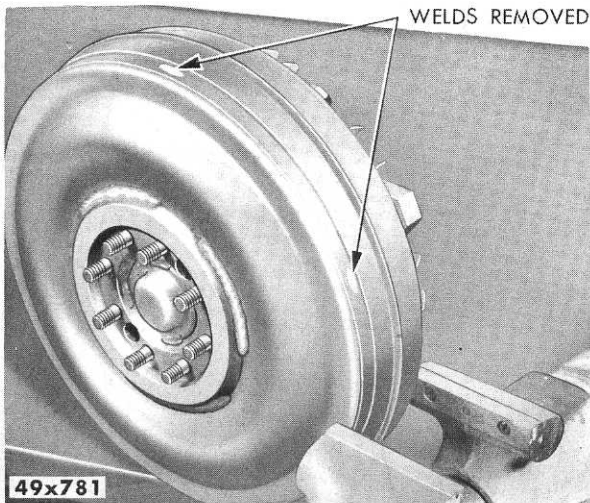


Fig. 24—Remaining Weld Removed

tip and direct the flame onto the outer face of the ring gear adjacent to the inside diameter. (DO NOT APPLY FLAME TO TEETH.) Place a few drops of water on the ring gear (as a temperature check) and rotate the coupling while applying the flame. In most instances, the ring gear will fit down in place before the drops of water boil. DO NOT OVERHEAT.

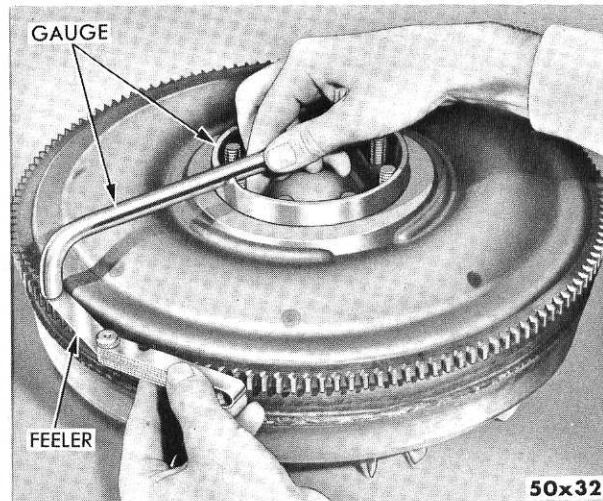
With ring gear heated, as described above, place it on the coupling (chamfered teeth up). Then, with a rawhide mallet or fiber block, drive the ring gear down so that the scribed mark on the coupling is just visible.

Place the aligning gauge C-896 in the crankshaft counter bore (Fig. 25).

The clearance, between the checking face of the gauge and the ring gear, should be uniform and should not exceed .020 inch. This clearance can be changed by tapping the ring gear up or down with a rawhide mallet. The .020 inch feeler gauge (Fig. 25) is actually the "No Go" limit.

Reweld the ring gear to housing, using the original spaces provided. Apply an equal amount of weld to each space in order to preserve the balance of the unit.

To prevent burning through the housing, the arc should be directed at approximately a 45

Fig. 25—Positioning Ring Gear on Fluid Coupling
(Tool C-896)

degree angle from the face of the gear. USE ONLY ARC WELDING EQUIPMENT. NEVER GAS WELD!

The following suggestions are offered as an aid in making the above weld: welding current—200 amps., straight polarity, D.C. or A.C. A good electrode to use is a $\frac{5}{32}$ inch diameter Fleet Weld number 47, or a $\frac{5}{32}$ inch diameter General Electric number W28, or the equivalent.

7. ELIMINATING MOISTURE FROM CLUTCH AFTER STEAM CLEANING ENGINE

Immediately after the steam cleaning operation, start the engine and "slip the clutch" in order to dry off the disc assembly, pressure plate, flywheel and/or driving plate.

Since the clutch housing is ventilated, steam vapor will condense and moisture will settle on the internal moving parts of the clutch mechanism. The facings on the disc will absorb moisture and, under the force exerted by the pressure plate, will bond the facings to the flywheel and/or driving plate and pressure plate—if the truck is allowed to stand for some time before use. If this condition occurs, it will necessitate complete replacement of disc, pressure plate, flywheel and/or driving plate.

SERVICE DIAGNOSIS

CONDITIONS — POSSIBLE CAUSES — REMEDIES

8. FLUID DRIVE SLIPPAGE

Possible Causes

- a. Fluid level low in coupling.
- b. Leak in fluid coupling.

Remedies

a. Check fluid drive coupling assembly for leak. Replace parts as required. Fill coupling to proper level, using only MOPAR Fluid Drive Fluid.

b. Check for leak at filler plug or seal at the install the snap ring with Tool C-884 (Fig. 26). Service fluid drive seal as necessary.

c. If noise is evident when engine is idling, or just after engine is shut off, install the new fluid drive seal spring (Part No. 1400211). This spring is available through Mopar Motor Parts Corporation.

To install the spring, remove the fluid coupling from the vehicle. Remove the clutch drive plate, snap ring and spring without disturbing the seal ring gasket retainer, the gasket or the carbon ring. Place new seal in position and install the snap ring with Tool C-884 (Fig. 26). Install fluid coupling on vehicle and refill.

9. FLUID DRIVE NOISE

Possible Causes

- a. Noise in fluid drive bearing.
- b. Noise in fluid drive inner or outer bushings.
- c. Squealing noise in fluid drive.

Remedies

a. Replace fluid drive coupling assembly. (The inner bearing is permanently assembled to the unit when manufactured.)

b. Replace worn bushings.



Fig. 26—Installing Snap Ring (Tool C-884)

NOTES
