

Section 6. REBUILD OF SUBASSEMBLIES

6-1. SCOPE OF SECTION 6

a. This section contains the rebuild procedures for the subassemblies which were removed in Section 5.

b. The subassemblies are presented in this section in the same order as they were removed in Section 5.

6-2. GENERAL INFORMATION FOR SUBASSEMBLY REBUILD

a. **Tools, Parts, Methods.** Refer to paragraph 4-3 through 4-5.

b. **Cleaning, Inspection.** Refer to paragraph 4-6.

c. **Torque Specifications.** The specific torque value for each threaded fastener installed in this section is stated in the applicable assembly paragraph. Torque values are also presented in paragraph 4-10 and figure 6-17.

d. **Wear Limits, Spring Data.** Refer to Section 8 for wear limits and spring data.

e. Lubrication

(1) Soak each friction (faced) clutch plate in transmission fluid for a minimum of 2 minutes prior to assembly.

(2) Use oil-soluble grease (petroleum jelly) with a low melting point when it is required to facilitate assembly.

(3) Pack the ID of metal-encased, lip-type oil seals with high-temperature grease (MIL—G-3545A, or equivalent).

6-3. CONTROL VALVE BODY ASSEMBLY

a. Disassembly (B, foldout 9)

(1) Remove plug 6 and gasket 7 that retain main-pressure regulator valve 8. Remove the main-pressure regulator valve.

(2) Remove plug 18 and gasket 17 that retain trimmer plug 16. Remove the trimmer plug, and main-pressure regulator spring 14, spring retainer 13, and trimmer spring 15.

(3) Remove main-pressure check plug 36. Remove selector valve plug 35 and gasket 34.

(4) Remove plug 33. Remove plug 31 and gasket 32 (or neutral start switch and its aluminum washer).

(5) Remove retainer plug 24. Remove cutoff valve plug 21 from retainer plug 24. Remove sealring 22 from plug 21. Remove clutch cutoff valve 20 and valve spring 19 from control valve body 9.

(6) Remove plug 28 and gasket 29, and remove one spring 30 and ball 27. At the inner (mounting) side of control valve body 9, remove valve stop 12 from its position on range selector valve 25.

(7) Insert a bolt through the linkage pin hole in selector valve 25. Pull the selector valve and seal 26 from the bore and remove the seal from the selector valve. Remove the remaining detent ball 27 and spring 30 which were freed during removal of the selector valve.

(8) Do not remove plug 11 and ball 10 from control valve body 9 unless parts replacement is necessary.

NOTE

Refer to paragraph 6-2, above.

b. Assembly (B, foldout 9)

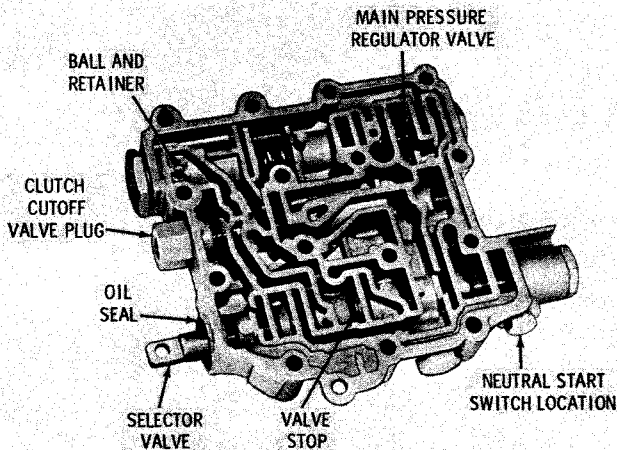
(1) If the retainer plug and ball were removed from the control valve body, install a new ball and retainer (fig. 6-1). Place the retainer plug, open end upward, over the ball. Press the retainer plug until it is flush with, to 0.010 inch (0.25 mm) below, the surface of the three supporting bosses.

(2) Install one spring 30 (B, foldout 9) and detent ball 27 into control valve body 9. Depress the ball against the spring, and install selector valve 25, linkage end last, through the seal bore of the control valve body.

(3) Install the remaining detent ball 27 and spring 30; install gasket 29 and plug 28 to retain the ball and spring. Tighten the plug securely.

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Fig. 6-1. Control valve body assembly-mounting side

(4) Position the selector valve in the middle detent position (neutral), and install the valve stop in the location shown in figure 6-1.

(5) Coat the outer circumference of the new selector valve oil seal with nonhardening sealer. Install the seal, spring-loaded lip first, over the linkage end of the selector valve into its bore (fig. 6-1). Press the seal into the bore until it is flush with, to 0.030 inch (0.76 mm) below, the surrounding surface. Install gasket 34 and plug 35. Tighten the plug securely.

NOTE

At assembly, all spool valves must move freely by their own weight within their bores.

(6) Install main-pressure regulator valve 8 (B, foldout 9), and install gasket 7 and plug 6. Tighten plug 6 securely. Install plug 36, and tighten sufficiently to prevent leakage.

(7) Install spring retainer 13, concave side first, onto the stem end of main-pressure regulator valve 8. Install main-pressure regulator spring 14, trimmer spring 15, and trimmer plug 16 into the valve bore. Install gasket 17 and plug 18, and tighten the plug securely.

(8) Assemble valve spring 19 onto clutch cutoff valve 20 and install them, spring first, into valve body 9. Install sealing 22 onto cutoff valve plug 21. Lubricate and install the assembled cutoff valve plug, seal first, into the smooth bore end of retainer plug 24. Install retainer plug 24 and gasket 23, and tighten the plug securely. Cover the exposed orifice in the retainer plug until the hydraulic brakeline is to be attached.

(9) Install gasket 32 and plug 31 (or the neutral start switch and its aluminum washer). Tighten the plug (or switch) securely.

6-4. TRANSMISSION FRONT COVER

a. Disassembly (B, foldout 2)

(1) If replacement of oil seal 1 is necessary, drive the seal out of the front of front cover 3.

(2) Clean the bore from which the seal was removed.

NOTE

Refer to paragraph 6-2, above.

b. Assembly (B, foldout 2)

(1) Coat the outer diameter of oil seal 1 with nonhardening sealer. Install seal, spring-loaded lip first, straight into the bore in front cover 3. Press oil seal 1 into cover 3 until it is 0.230 to 0.290 inch (5.8 to 7.3 mm) past the chamfer in the bore.

6-5. TORQUE CONVERTER DRIVE COVER

a. Disassembly (B, foldout 2)

(1) Remove ball bearing 5 from input shaft 8.

(2) Flatten the corners of lockstrips 7. Remove six bolts 6.

(3) Remove input shaft 8 from drive cover 10.

NOTE

Refer to paragraph 6-2, above.

b. Assembly (B, foldout 2)

(1) Install input shaft 8 onto torque converter drive cover 10. Install three lockstrips 7 and six 1/2-13 x 1-1/8-inch bolts 6. Tighten the bolts to 67 to 80 pound feet (91-108 Nm) torque. Bend the corners of lockstrips 7 against the heads of bolts 6.

(2) Install bearing 5, manufacturer's identification upward, onto input shaft 8. Press the bearing firmly against the shoulder of the input shaft.

6-6 FIRST- AND SECOND-TURBINE ASSEMBLY

a. Disassembly (B, foldout 3)

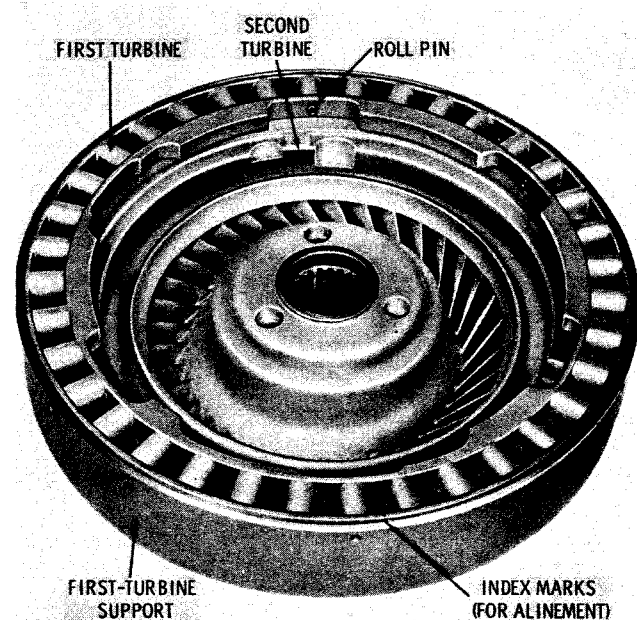
(1) Locate the index marks (V-groove) in the outer rims of the first-turbine support and the first turbine (fig. 6-2). Make sure these marks are well defined in both parts. If the marks are not prominent, deepen them to 0.040 inch (1 mm), maximum, before continuing with disassembly.

(2) Drive the six roll pins 4 (B, foldout 3) inward toward the hub until they clear the holes in the first-turbine support (fig. 6-2). Remove the roll pins only if replacement is necessary.

(3) Remove the first turbine from its support (fig. 6-3). Remove the second turbine and its bearing from the first-turbine support.

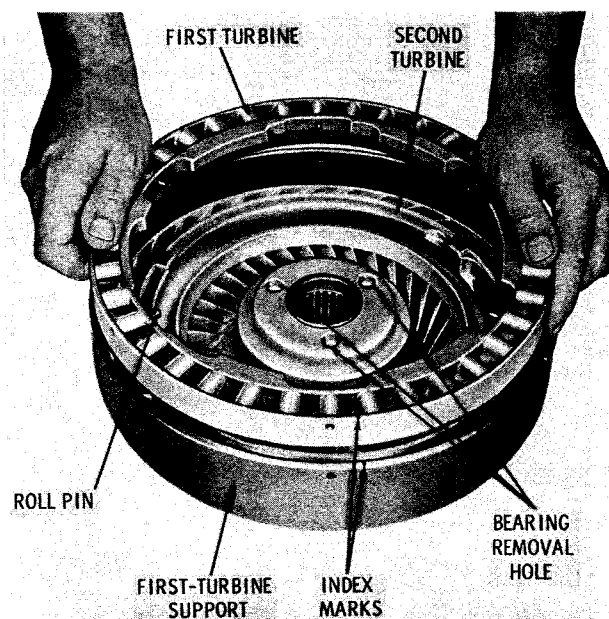
(4) Remove bearing 7A (B, foldout 3) from second turbine 7 only if replacement is necessary. If replacement is necessary, bearing 7A may be removed by pressing lengths of drill rod through the three removal holes in the hub of second turbine 7. Remove snapping 6 from second turbine 7 only if replacement is necessary.

(5) Remove bearing 1 from the first-turbine support only if replacement is necessary. If replacement is necessary, bearing 1 may be removed by pressing lengths of drill rod through the removal holes in the hub of the first-turbine support.



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Fig. 6-2. First- and second-turbine assembly



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Fig. 6-3. Removing first turbine

NOTE

Refer to paragraph 6-2, above.

b. Assembly (B, foldout 3)

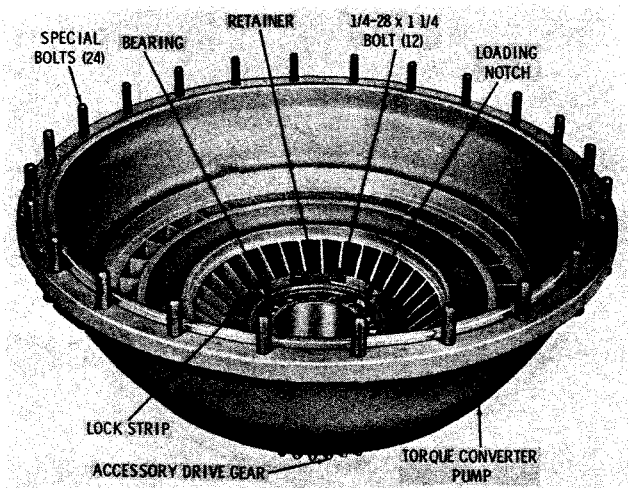
(1) If bearing 1 was removed from first-turbine support, install its replacement. Position the bearing, manufacturer's identification outward, and press the bearing firmly against its seat on the hub of support.

(2) If bearing 7A was removed from second turbine 7, install its replacement. Position the bearing, manufacturer's identification outward, and press the bearing firmly onto its seat in the turbine hub. If snapping 6 was removed, install its replacement.

(3) Install the second-turbine (and bearing) into the first-turbine support (fig. 6-3).

(4) Install the first turbine, thinner ends of vanes first, into the first-turbine support and align the V-groove index marks (fig. 6-3).

(5) Drive the six roll pins outward until they are flush with, to 0.030 inch (0.76 mm) below, the outer surface of the first-turbine support (fig. 6-3).



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Fig. 6-4. Torque converter pump assembly

6-7. TORQUE CONVERTER PUMP

a. Disassembly (fig. 6-4)

(1) Straighten the ears of the six lockstrips. Remove the 12 bolts that attach the pump retainer and input accessory drive gear to the torque converter pump. Remove the six lockstrips, pump retainer, input accessory drive gear, and bearing. Remove gasket 16 (B, foldout 3) if present.

(2) Inspect the 24 special bolts around the circumference of the pump. Remove any defective bolts by pressing them from the pump flange.

NOTE

Refer to paragraph 6-2, above.

b. Assembly (fig. 6-4)

(1) If any of the special bolts were removed from the pump, install their replacements. Aline the flat side of the bolt head next to the pump and press the new bolt into place.

(2) Install the double-row ball bearing, loading notch upward, into the input accessory drive gear (fig. 6-4).

(3) Place gasket 16 (B, foldout 3) onto the input accessory drive gear and aline the bolt holes. Install the converter pump onto the drive gear, bearing, and gasket, alining the bolt holes in the pump with those in the gear and gasket.

(4) Install the pump retainer, and install the six lockstrips and twelve 1/4-28 x 1-1/4-inch bolts. Tighten the bolts to 10 to 12 pound feet (14 to 16 Nm) torque. Bend the lockstrip ears against the bolt heads.

6-8. TORQUE CONVERTER HOUSING

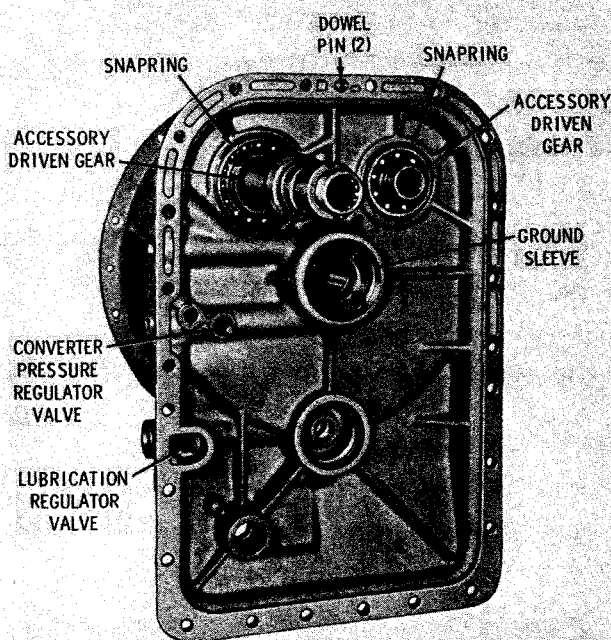
a. Disassembly (A, foldout 4)

(1) Remove step-joint sealing 19 (B, foldout 3) from converter housing sleeve 6 (A, foldout 4). If replacement of the converter housing sleeve is necessary, remove it from the front of the housing.

(2) If parts replacement is necessary, remove the inner race and rollers of bearing 15 (A, foldout 4) from gear 4. Remove the snaprings from the accessory driven gear bearings (fig. 6-5). Tap the accessory driven gears forward and remove them and their attached parts from the housing.

(3) Remove snapring 14 (A, foldout 4) and bearing 13 from gear 4.

(4) Remove snapring 3 (A, foldout 5) and bearing 2 from gear 1.



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Fig. 6-5. Torque converter housing assembly—rear view

(5) If replacement of the ground sleeve 16 (A, foldout 4) is necessary, remove the four attaching bolts 17 and press the sleeve from the converter housing. Use care during this operation to prevent damage to the protruding converter pressure regulator valve.

(6) If converter pressure regulator valve components 30, 31, and 32 (A, foldout 4) require replacement, remove them by twisting pin 30 from the converter housing.

(7) If lubrication regulator valve components 27, 28 and 29 require replacement, remove them by twisting pin 27 from the converter housing.

(8) Do not remove plug 9 unless necessary for cleaning or replacement. Do not remove dowel pins 8 unless necessary for replacement.

NOTE

Refer to paragraph 6-2, above.

b. Assembly (A, foldout 4)

(1) If plug 9 was removed, replace it. Tighten the plug sufficiently to prevent leakage. If dowel pins 8 were removed, install new dowel pins. Press the pins into their bores until they protrude 0.430 to 0.450 inch (10.92 to 11.43 mm) above the housing splitline.

(2) If lubrication regulator valve 29 (A, foldout 4) was removed, install spring 28 and valve 29 onto guide pin 27. Install the assembled parts, pressing pin 27 into housing 7 until it projects 1.18 to 1.20 inches (29.9 to 30.4 mm) above the valve seat.

NOTE

If the press fit of pins 27 or 30 is not satisfactory, apply Loctite Grade B (Loctite Corp., Newington, Conn.), or equivalent. Clean the bore and pin of all oil residue. Apply the sealant to the bore and mating surface of pin and install as described above. Allow the sealant to cure for 2 hours at room temperature.

(3) If ground sleeve 16 was removed, chill the replacement sleeve in dry ice for at least 1 hour. Aline the bolt holes in ground sleeve 16 and those in housing 7, and press the sleeve to a firm seat against the rear of the housing. Install four 5/16-18 x 3/4-inch self-locking bolts 17, and tighten them to 17 to 20 pound feet (23 to 27 Nm) torque.

(4) Install bearing 2 (A, foldout 5), with snapping groove away from the gear, onto gear 1. Install snapping 3 to retain bearing 2.

(5) Install accessory drive gear 1 and assembled bearing (outer race snapping removed) into the front of the converter housing. Install the snapping onto the outer race of the bearing.

(6) Install bearing 13 (A, foldout 4), with its snapping groove away from the gear, onto accessory driven gear 4. Install snapping 14 to retain bearing 13. Press bearing 15 against the rearward seat on accessory driven gear 4.

(7) Install accessory driven gear 4 and assembled bearings (outer race snapping removed) into the front of housing 7. Install the snapping onto the outer race of bearing 13.

(8) If converter housing sleeve 6 was removed from housing 7, install a new sleeve. Heat the sleeve for ease of replacement. Install converter housing sleeve 6, sealing groove last, and press it onto the hub of housing 7. Seat the sleeve firmly against the shoulder of the hub. Install stepjoint sealing 19 (B, foldout 3) into the groove in the converter housing sleeve. Retain the sealing with oil-soluble grease.

6-9. TURBINE-DRIVEN GEARS AND FREEWHEEL CLUTCH

a. Disassembly (B, foldout 4)

(1) Press the second-turbine driven gear out of the assembled unit (fig. 6-6). This will free bearing 22 (B, foldout 4), races 19 and 21, and bearing 20 which may be removed. Remove fifteen rollers 11, also freed.

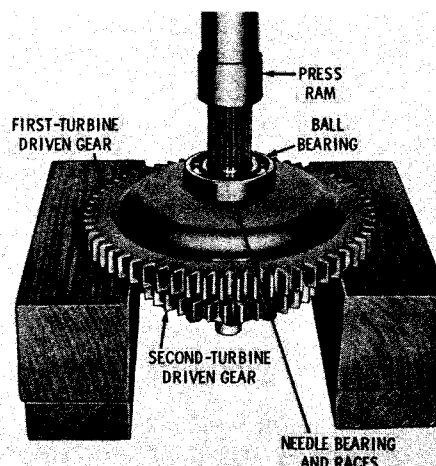


Fig. 6-6. Pressing second-turbine driven gear from freewheel unit

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(2) Remove bearings 17 from gear 18. Remove twelve nuts 2 from bolts 15.

(3) Using a screwdriver, pry cam assembly 12 away from gear 3. Remove spring plate 7 and roller cage 10. Remove three spring pins 8 and springs 9 from the roller cage. Remove bolts 15 from cam assembly 12. Remove roll pin 13 from cam 14 if replacement is necessary.

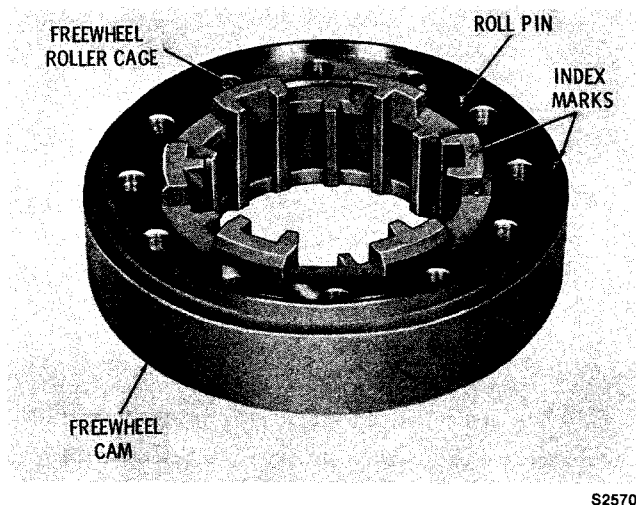
(4) If replacement is necessary, remove bearings 1 and 5, and races 4 and 6 from gear 3.

NOTE

Refer to paragraph 6-2, above.

NOTE

Observe the small index marks (X) on the spring plate and roller cage (fig. 6-7). If necessary, rescribe these marks for positive identification during reassembly.



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Fig. 6-7. Freewheel roller cage installed in freewheel cam

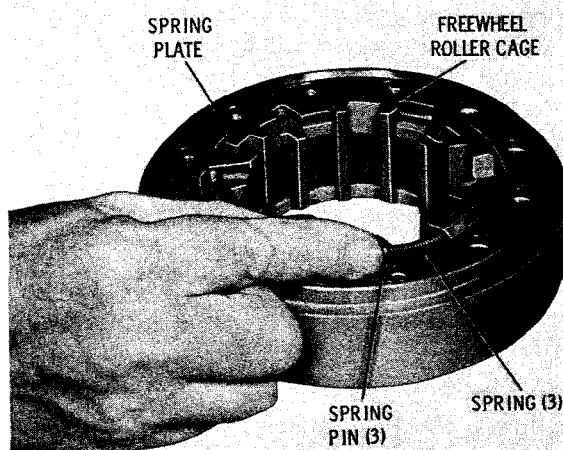
b. Assembly (B, foldout 4)

(1) If bearing 1 was removed from gear 3, install the bearing by pressing it against the shoulder on the gear.

(2) Install the roll pin into the cam and press it to the bottom of the bore (fig. 6-7).

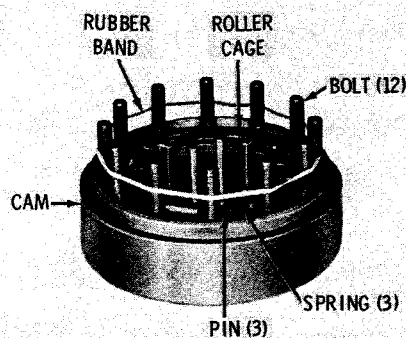
(3) Insert the roller cage into the freewheel cam, and align the index marks on the cam and cage as shown in figure 6-7. Install spring retainer plate 7 (B, foldout 4) onto the cam, indexing the small hole with the roll pin.

(4) Install the three springs and spring pins into the drilled ears of the roller cage (fig. 6-8).



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Fig. 6-8. Installing spring and spring pin into roller cage



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Fig. 6-9. Assembled freewheel cam, roller cage and spring plate

(5) Insert the twelve bolts (fig. 6-9) and stretch a rubber band around the circle of bolts to retain them.

(6) Install the assembled second-turbine driven gear onto the assembled cam (fig. 6-10).

(7) Secure the assembled parts with twelve self-locking nuts (fig. 6-11). Tighten the nuts to 41 to 49 pound feet (56 to 66 Nm) torque.

(8) Install bearing thrust race (B, foldout 4), bearing 5 and thrust race 6 onto the second-turbine driven gear shaft (fig. 6-12).

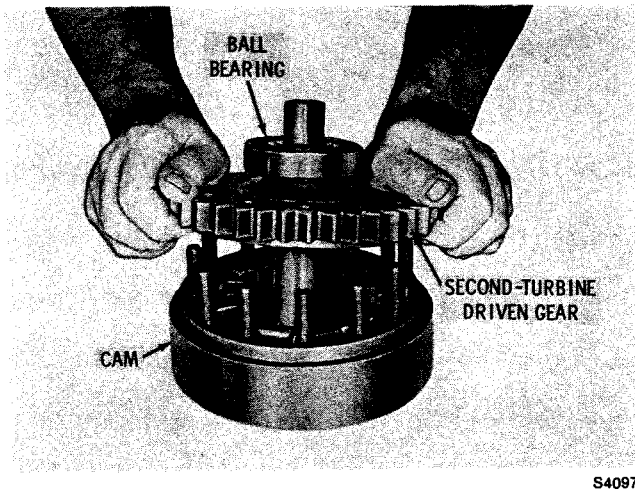


Fig. 6-10. Installing second-turbine driven gear

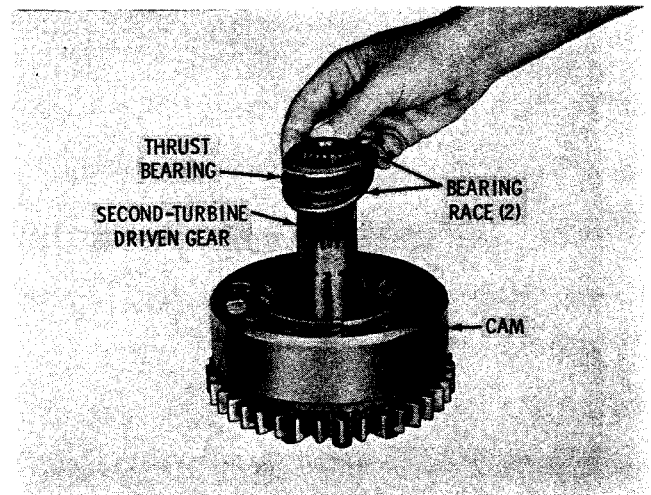


Fig. 6-12. Installing thrust races and bearing onto second-turbine driven gear

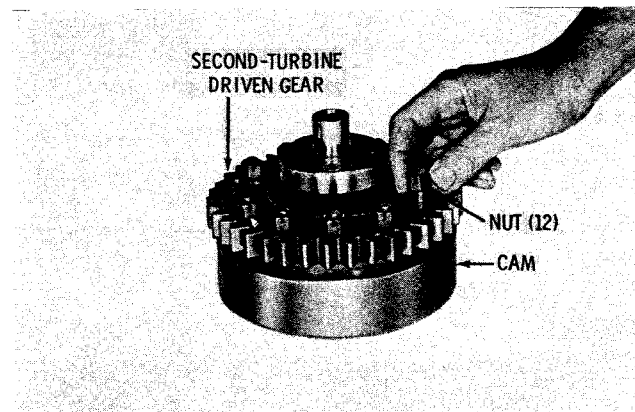


Fig. 6-11. Installing nuts to retain the second-turbine driven gear

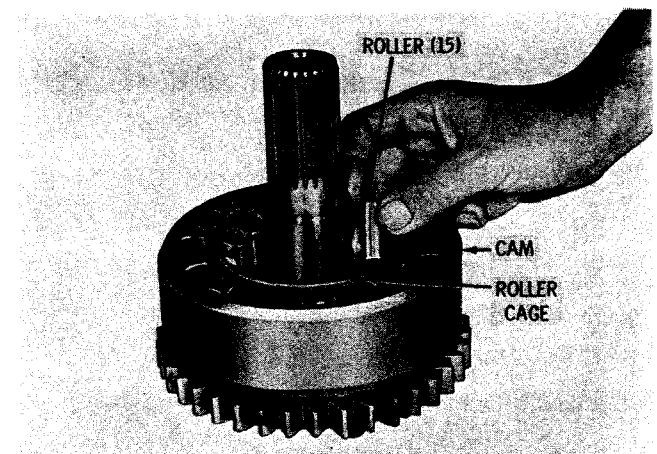


Fig. 6-13. Installing freewheel rollers

(9) Install fifteen rollers into the cam pockets; use oil-soluble grease to retain the rollers in the cage (fig. 6-13).

(10) If roller bearings 17 (B, foldout 4) were removed from gear 18, install new bearings. Press only on the numbered ends of the bearings, positioning them even with, or up to 0.030 inch (0.76 mm) past, the end of the chamfers at each end of the gear bore.

(11) Install the first-turbine driven gear by placing the lead chamfer on the gear hub against the rollers, and while pressing downward, rotate the first-turbine driven gear in a counterclockwise direction (fig. 6-14).

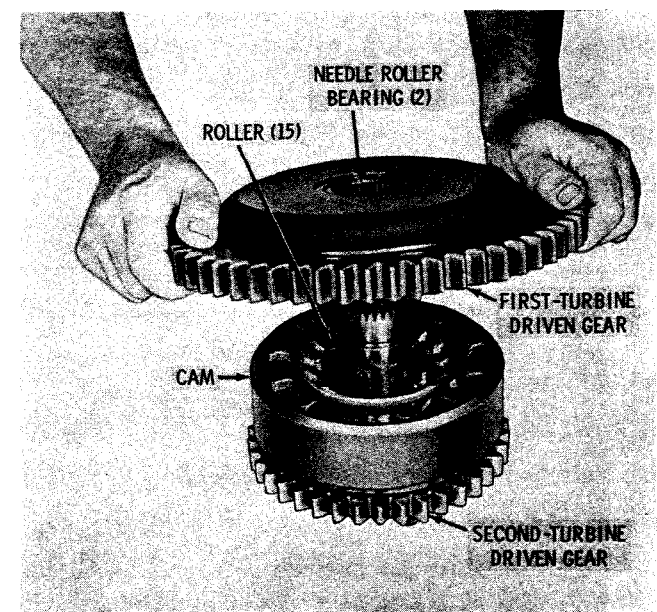


Fig. 6-14. Installing first-turbine driven gear

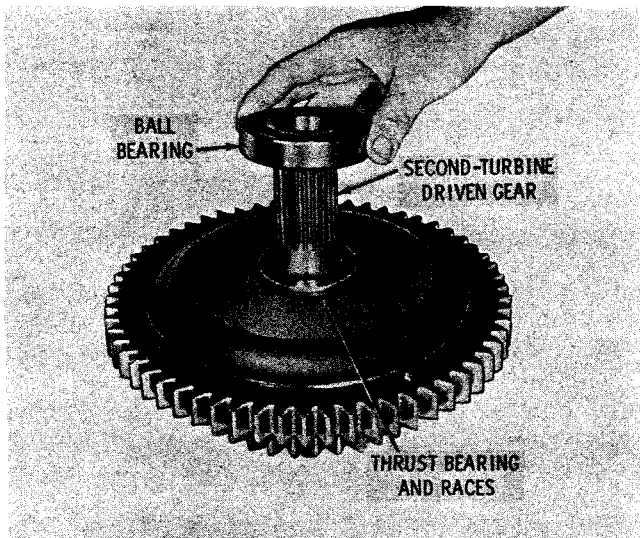


Fig. 6-15. Installing ball bearing onto second-turbine driven gear shaft

(12) Install bearing race 19 (B, foldout 4), bearing 20, and bearing race 21 onto the second-turbine driven gear shaft (fig. 6-15).

(13) Install the remaining bearing as shown in Figure 6-15, onto the shaft of the second-turbine driven gear. Press the bearing firmly into place while supporting the second-turbine driven gear.

6-10 FIRST-TURBINE DRIVE GEAR AND BEARING ASSEMBLY

NOTE

Not all bearings are installed with Loctite. If the bearing can be easily pressed from the drive gear, remove the bearing. If unusual resistance is encountered, refer to a, below.

a. Disassembly (A, foldout 4)

(1) Heat inner race of bearing 26 to 450°F (232°C) and press first-turbine drive gear 25 from bearing.

(2) Discard bearing 26 and clean the journal of gear 25.

NOTE

Refer to paragraph 6-2, above.

b. Assembly (B, foldout 3)

(1) Apply Loctite Retaining Compound (Loctite Corp., Newington, Conn.), or equivalent to the ID of new bearing 26 and its journal on first-turbine drive gear 25.

(2) Press bearing firmly against its seat on first-turbine drive gear 25. Allow assembled parts to cure for two hours at room temperature.

6-11. HIGH-RANGE CLUTCH HOUSING

a. Disassembly (A, foldout 7)

(1) Remove bearing 25. Place high range clutch housing 20 and attached parts, piston side upward, in a press. Support the housing at the outer circumference. Using a suitable press tool, compress spring 14 sufficiently to allow removal of snapping 13. Remove snapping and spring.

(2) Remove piston 16 and sealring and expander 17 from high-range clutch piston housing 20. Refer to paragraph 6-13 for clutch piston rebuild instructions.

(3) Remove hook-type sealring 15 from the inner hub of housing 20.

NOTE

Refer to paragraph 6-2, above.

b. Assembly (A, foldout 7)

(1) If bushing 19 (A, foldout 7) requires replacement, press the new bushing to a position 0.040 to 0.080 inch (1.02 to 2.03 mm) below the machined surface surrounding the bore of hub 20.

(2) If pins 21 require replacement, press the new pins in until they project 0.375 to 0.395 inch (9.53 to 10.03 mm) above the surface adjacent to the pins.

(3) Install hook-type sealring 15 onto the inner hub of housing 20. Install piston 16 (with sealring and expander 17), flatter side first, into piston housing 20. Install spring 14, concave side first, onto the piston. Depress the piston return spring, and install snapping 13.

(4) Install sealring 22 and bearing 25 onto the rear hub of high-range clutch piston housing 20.

6-12. TRANSFER DRIVE GEAR

a. Disassembly (A, foldout 7)

(1) Remove bearing 1 and six pins 4 from transfer drive gear 3 only if replacement is necessary.

(2) If bearing replacement is necessary, pull bearing 1 from transfer drive gear assembly 2.

(3) If pins 4 must be replaced, place gear 3 into a press, small diameter upward (front), and press out six pins.

NOTE

Refer to paragraph 6-2, above.

b. Assembly (A, foldout 7)

(1) If pins 4 were removed, place transfer drive gear 3, hub (front) downward, in a press and install new pins. Press the pins until they project 0.74 to 0.76 inch (18.8 to 19.3 mm) above the surface into which they are pressed.

(2) If bearing 1 was removed from the transfer drive gear assembly 2, install new bearing, outer snapping first, onto the gear hub. Seat the bearing firmly against the shoulder on the gear hub.

6-13. CLUTCH PISTON ASSEMBLIES

NOTE

Warming the Teflon sealrings in oil at 150°F (65°C) will make them easier to remove and install.

a. Disassembly

(1) Do not use sharp-edged or pointed tools to remove Teflon seal rings. Rather, slip a very thin, flat blade into piston groove, between the sealring and side of the groove and work the seal out of the groove until it can be grasped with the fingers.

(2) Remove the sealrings. Do not stretch or deform sealrings more than necessary, if they are to be reused.

(3) Remove expanders from grooves in the high-range clutch piston.

(4) Check the three holes in reverse- and low-range clutch pistons. One hole should be clear. The other two holes have ball check valves. The balls should be clean and seat properly.

NOTE

Refer to paragraph 6-2, above.

b. Assembly

(1) Install the sealring expanders into the grooves in the high-range clutch piston. Make sure the free ends of the expander turn away from the sealring. The ends of some expanders may require additional bending to insure they turn toward the bottom of the groove.

(2) Oil the installed expander and sealring. Start the sealring into the piston groove at a point directly opposite the gap in the expander.

(3) Carefully work the sealring into the groove, compressing the expander while moving both directions from the starting point to the expander gap location. Do not stretch or distort the sealring more than absolutely necessary.

(4) Install lip-type sealrings (no expanders required) into the grooves of the low-range and reverse clutch pistons. Make sure that the lip of each sealring is toward the oil-pressure side of the piston.

CAUTION

Improperly installed sealrings (lip in wrong direction) will cause improper clutch application or leakage.

(5) After installation, adjust the sealrings in their grooves to center them radially in the piston.

6-14. LOW-RANGE PLANETARY CARRIER ASSEMBLY (B, foldout 6)

NOTE

Do not disassemble low-range planetary carrier assembly 3 (B, foldout 6) unless there is evidence of undue wear or failure. The failure of one pinion requires replacement of all pinions in the carrier assembly.

a. Disassembly (B, foldout 5)

(1) Drill into the ends of the four pinion spindles 4 to weaken the swage. Use a 1-inch drill at spindle ends near the smaller, splined hub (rear) of the carrier.

CAUTION

Do not drill into the carrier. The diameter of the spindles is 1-inch. Centering the drill accurately will prevent drilling into the carrier.

(2) Place carrier assembly 2, small hub upward, in a press, and press out four spindles 4.

(3) Remove two thrust washers 5, pinion 7, and two roller bearings 6.

(4) Repeat step (3), above, for removal of the remaining three pinion assemblies.

NOTE

Refer to paragraph 6-2, above.

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b. Assembly (B, foldout 5)

(1) Chill four new spindles 4 in dry ice for one hour, or heat carrier 3 in an oil bath or oven to 300-350°F (150-176°C).

(2) Install bearings 6 into each end of pinion. Assemble washers 5 onto opposite faces of the pinion and retain them with oil soluble grease.

(3) Position carrier 3 in a press, larger spline upward, and install the assembled pinion group. Aline the pinion with the spindle bore in the carrier. Install spindle 4 into the carrier. Press the spindle into the bore until it is flush with, or up to 0.010 inch (0.25 mm) below, the surface adjacent to the spindle.

(4) Support the spindle and swage it securely at both ends with an octagon punch. The pinion must rotate freely after assembly.

(5) Install the remaining three pinion assemblies in the same manner as described in (2) through (4), above.

(6) If chilled spindles were installed into the rebuilt carrier, and the carrier will not be installed into a transmission in the near future, apply a coating of oil around spindle locations to avoid rust.

6-15. REVERSE- AND LOW-RANGE CLUTCH ANCHOR ASSEMBLY

a. Disassembly (A, foldout 6)

(1) Place anchor assembly 14, flat side upward, in a press.

(2) Press eight pins 16 from anchor 15.

NOTE

Refer to paragraph 6-2, above.

b. Assembly (A, foldout 6)

(1) Coat pins 16 with white lead.

(2) Place anchor 15, flat side upward, in a press.

(3) Press eight pins 16 into anchor 15 until they project 1.490 to 1.510 inches (37.84 to 38.35 mm) above the flat side of the anchor.

6-16. REVERSE-RANGE PLANETARY CARRIER ASSEMBLY

NOTE

Do not disassemble reverse-range planetary carrier assembly 7 (A, foldout 6) unless there is evidence of undue wear or failure. The failure of one pinion requires replacement of all pinions in the carrier assembly.

a. Disassembly (A, foldout 6)

(1) Drill into the ends of four pinion spindles 12 to weaken the swage. Use a 1-inch drill at the ends, which are swaged to hub of carrier 8.

CAUTION

Do not drill into the carrier. The diameter of spindles is 1 inch. Centering the drill accurately will prevent drilling into the carrier.

(2) Place the carrier assembly 7 in a press, and press out four spindles 12.

(3) Remove two thrust washers 9, pinion 10 and roller bearings 11.

(4) Repeat step (3), above, for removal of remaining three pinion assemblies.

NOTE

Refer to paragraph 6-2, above.

b. Assembly (A, foldout 5)

(1) Chill four new spindles 12 in dry ice for one hour, or heat carrier 8 in an oil bath or oven to 300-350°F (150-176°C).

(2) Install bearings 11 into each end of pinion. Assemble washers 9 onto opposite faces of pinion 10 and retain them with oil soluble grease.

(3) Position carrier 8, hub upward, on a level surface. Aline the pinion with the spindle bore in the carrier. Start spindles 12 into the chamfered spindle bore in the carrier. Press the spindle into the bore until it is flush with, or up to 0.010 inch (0.25 mm) below the front surface of carrier 8.

(4) Install the remaining three pinion assemblies in the same manner as described in (2) and (3), above.

(5) Support ends of spindle 12 (A, foldout 6) and swage it securely with an octagon punch. Repeat the swaging at the opposite end of spindle. The pinions must rotate freely after assembly.

(6) Swage the remaining three spindles in the same manner as described in (5), above.

(7) If chilled spindles were installed into the rebuilt carrier, and the carrier will not be installed into a transmission in the near future, apply a coating of oil around the spindle locations to prevent rust.

6-17. OIL PUMP

a. Disassembly (B, foldout 8)

(1) Remove the pump cover 7 and cover gasket 8 from pump body 18 (fig. 6-16).

(2) Remove drive gear 12 (B, foldout 8) and two driven gear assemblies 9 and 13.

(3) Inspect roller bearings 11 and 15. If replacement is necessary, remove them from the driven gears.

(4) Inspect oil seal 20. If replacement is necessary, remove the seal by driving or pressing it toward the rear of the pump. If driven gear

shaft 17 or 19, pump body 18, drive gear 12, or driven gears 10 or 14 required replacement, a new pump assembly must be used.

NOTE

Refer to paragraph 6-2, above.

b. Assembly (B, foldout 8)

(1) If the oil seal was removed, install a new seal, spring-loaded lip first, into the pump body (see para 4-6h (2) for seal preparation). Press the seal until it seats lightly against the shoulder in the bore.

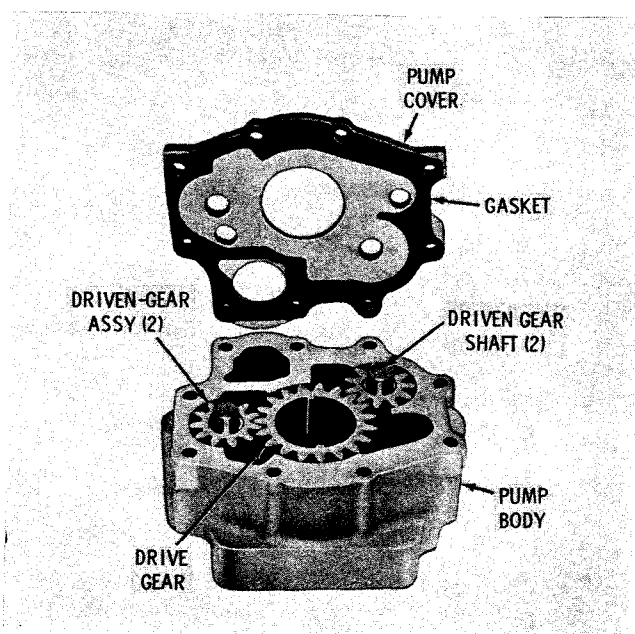
(2) If roller bearings were removed from the driven gears, install new bearings. Position each bearing so that the replacer tool drives against the numbered end of the bearing cage. Press each bearing flush with, to 0.020 inch (0.50 mm) below the end surface of the gear.

(3) Install each driven gear assembly onto a gear shaft making sure that they are properly seated in the pump body. Install the drive gear.

NOTE

The end faces of the three gears must project 0.002 to 0.003 inch (0.05 to 0.07 mm) above the front surface of the pump body (measured before gasket is installed). If the end faces are below the flush line of the pump body, the pump will not perform satisfactorily, and should be replaced.

(4) Apply a liberal amount of transmission fluid onto the pump gears, and install cover gasket 8 and cover 7. Position the pump assembly front upward until ready for installation onto the transmission housing.



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Fig. 6-16. Oil pump assembly, with cover and gasket removed

6-18. TRANSMISSION HOUSING

a. Disassembly (B, foldout 5)

(1) Remove six bolts 14 and lockwashers 13, and remove core hole cover 12 and gasket 11.

(2) Remove plug 8, but do not remove filter plug 7 unless replacement is necessary. If necessary, measure and record the depth of installed plug 7, prior to removal of plug.

(3) Remove breather 10.

(4) Remove oil level plugs 24 and 25 from the front face of housing 9.

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Para 6-18/6-19

(5) Remove accessory drive orifice plug 6 (A, foldout 5) and cup plug 7 on transmissions not equipped with PTO, only if replacement is necessary.

b. Assembly (B, foldout 5)

(1) Install breather 10 and tighten it sufficiently to prevent leakage.

(2) If plug 7 was removed, apply non-hardening sealant onto the outside diameter of the new plug. Install the new plug, closed end first, into the passage. Press the plug to the exact depth recorded prior to removal (a (2), above). Install plug 8 and tighten it sufficiently to prevent leakage.

(3) If plug 6 (A, foldout 5) was removed, install a new plug, closed end first, and drive it

flush with, to 0.200 inch (5.08 mm) below the surface. If plug 7 was removed, apply nonhardening sealer to the outer circumference of the new plug and install it, closed end first, into the bore. Drive the plug against the shoulder in the bore.

(4) Install core hole cover 12 (B, foldout 5) and gasket 11, and retain them with six 3/8-16 x 7/8-inch bolts 14 and lockwashers 13. Tighten the bolts to 26 to 32 pound feet (35 to 43 Nm) torque.

6-19. TORQUE VALUES — ILLUSTRATED

Figure 6-17, which follows, shows the torque values for the threaded fasteners visible in the illustration.

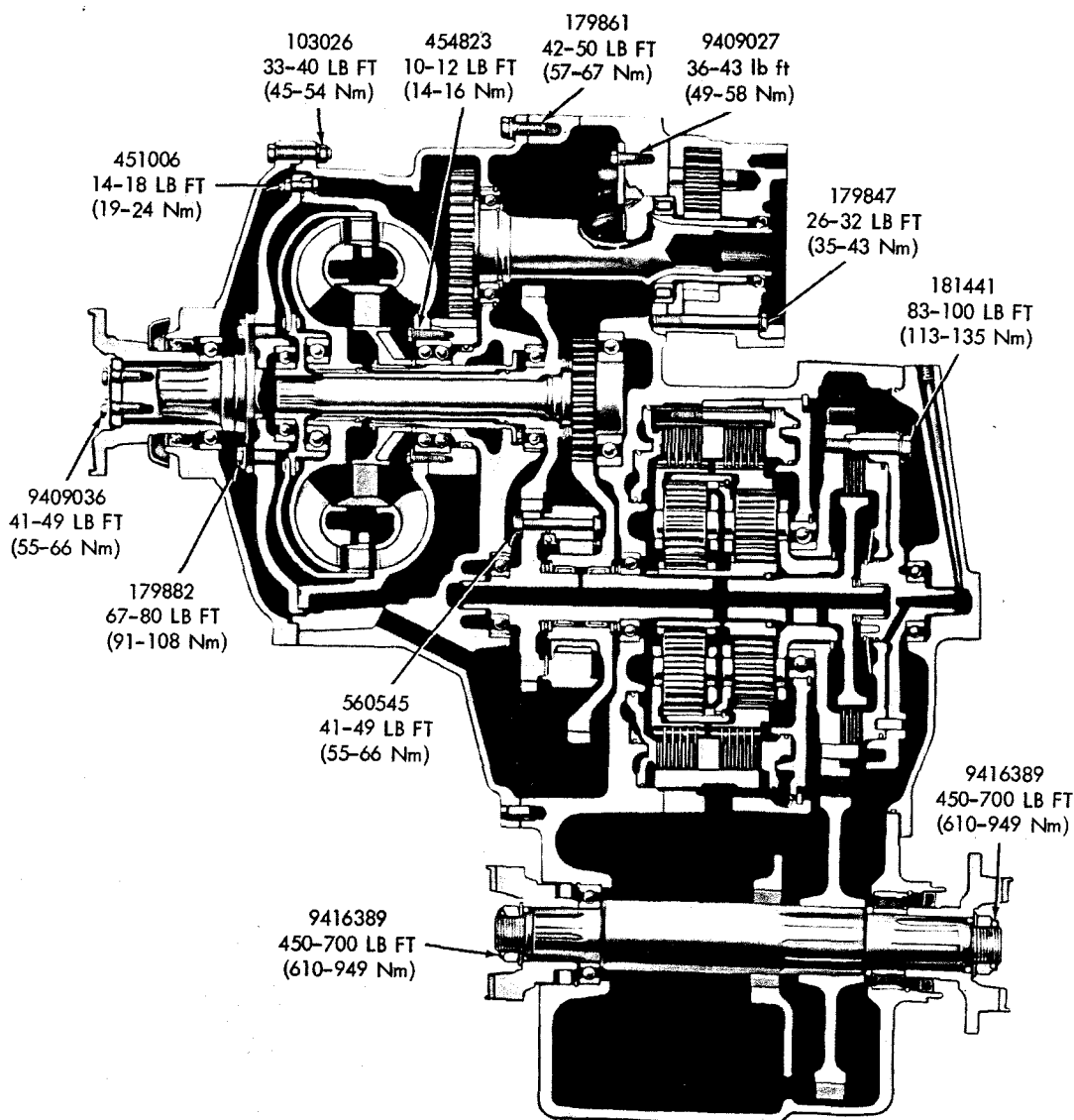


Fig. 6-17. Torque values for threaded fasteners

S4104

Section 7. ASSEMBLY OF TRANSMISSION FROM SUBASSEMBLIES

7-1. SCOPE OF SECTION 7

a. The procedures in this section describe the assembly of the transmission from the parts removed in Section 5 and the subassemblies rebuilt in Section 6.

b. Whenever possible, the sequence of assembly is presented in reverse order of the removal sequence in Section 5. Procedures also are presented for installation of components in a vehicle-mounted transmission.

7-2. GENERAL INFORMATION FOR FINAL ASSEMBLY

a. **Tools, Parts, Methods.** Refer to paragraphs 4-3 through 4-5.

b. **Cleaning, Inspection.** Refer to paragraph 4-6.

c. **Torque Specifications.** The specific torque value for each threaded fastener installed in this section is stated in the applicable paragraph. Torque values are also presented in paragraphs 4-10 and 6-19.

d. Lubrication

(1) Soak each friction (faced) clutch plate in transmission fluid for at least two minutes prior to assembly.

(2) Use oil-soluble grease with a low melting point (petroleum jelly) when it is required to facilitate assembly.

(3) Pack the inside diameter groove of the metal-encased, lip-type oil seals with high-temperature grease (MIL-G-3545A, or equivalent).

(4) During final assembly, lubricate all moving parts with transmission fluid. The lubricant film will protect the friction surfaces and ferrous metals until the transmission is in service.

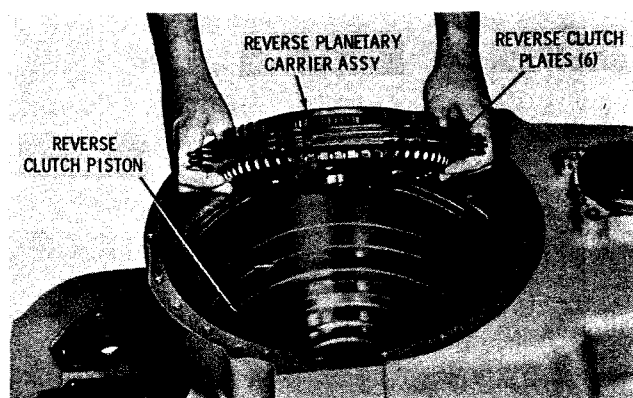
e. **Component Cleanliness.** Continually check each of the components during assembly to ensure that they are free of lint, dirt, and foreign particles.

7-3. INSTALLATION OF RANGE CLUTCHES, GEARING

a. Reverse-range Clutch, Planetary

(1) Position the transmission housing on blocks on its front splitline. Install the reverse-range clutch piston 4 (A, foldout 6) (as assembled in para 6-13) into the transmission housing.

(2) Beginning with an internal-splined clutch plate, alternately install three internal-splined clutch plates and three external-tanged clutch plates onto the front of the reverse-planetary carrier assembly (fig. 7-1). Install the reverse-range planetary carrier assembly, with clutch plates, onto the piston (fig. 7-1).



S4108

Fig. 7-1. Installing reverse planetary carrier assembly

(3) Beginning with an external-tanged clutch plate, alternately install two external-tanged plates and two internal-splined plates onto the rear of the reverse-range planetary carrier assembly.

(4) Install the reverse-and-low-range sun gear (fig. 7-2). Install with the small gear first to mesh with the reverse-range planetary gears.

(5) Aline the slots of the five reverse-range, external-tanged clutch plates to receive the pins in the clutch anchor assembly (fig. 7-3). Install the clutch anchor pin into the control valve mounting pad on the left side of the transmission housing. Alining the anchor pin slot with the clutch anchor pin hole within the transmission housing, install the reverse-and-

Para 7-3

low-range clutch anchor assembly, extended pins downward, and engage the slots of the five external-tanged clutch plates. Be sure that the eight notches of the five external-tanged plates are engaged by the eight anchor pins in the anchor assembly.

(6) Push the clutch anchor pin into the slot in the reverse-and-low-range clutch anchor assembly (fig. 7-4). Temporarily install a 3/8-16 x 1-inch bolt and flat washer to retain the anchor pin during subsequent assembly operations.

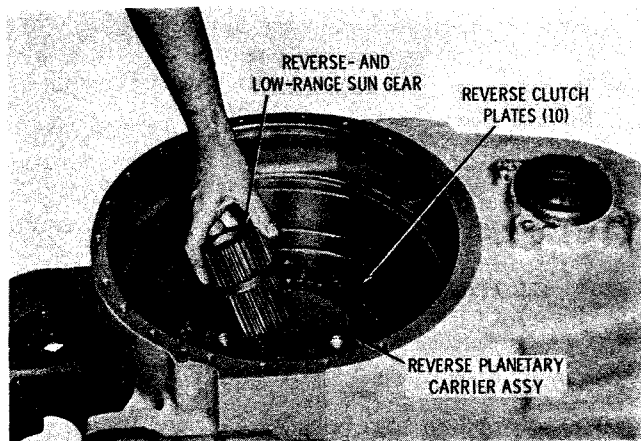


Fig. 7-2. Installing reverse- and low-range sun gear

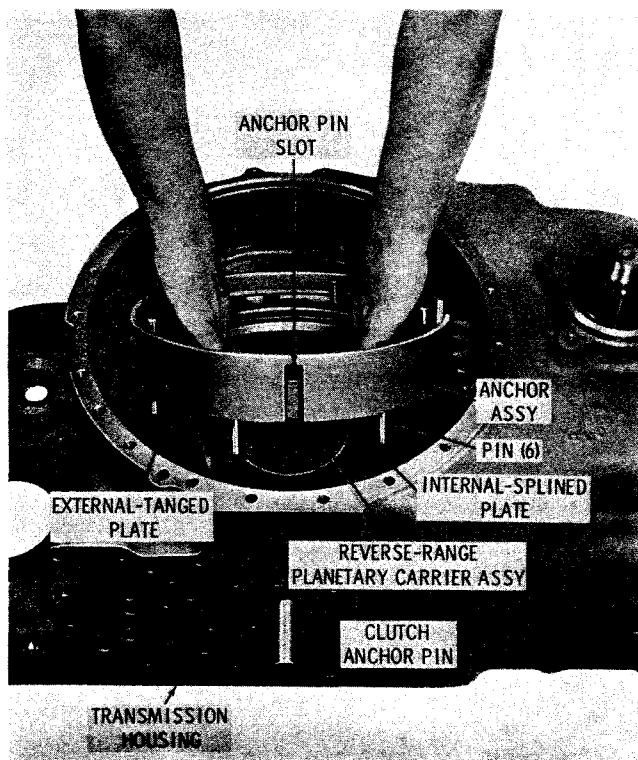


Fig. 7-3. Installing reverse- and low-range clutch anchor assembly

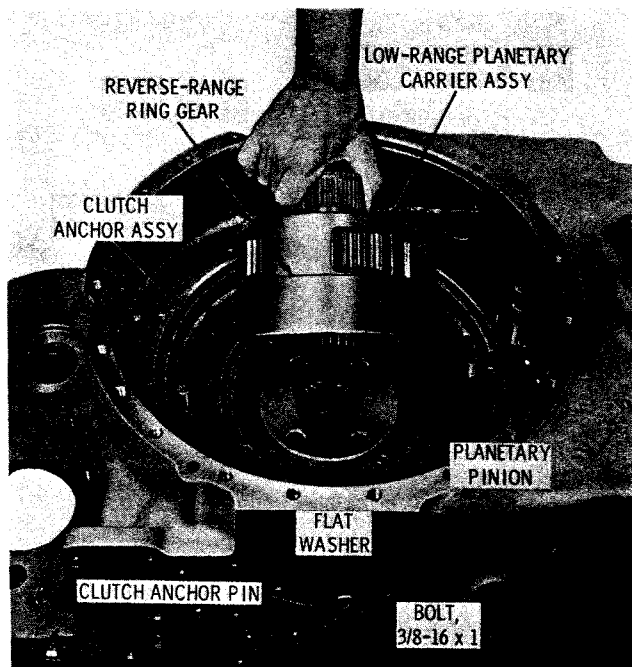


Fig. 7-4. Installing low-range planetary carrier assembly with reverse ring gear

b. Low-range Clutch and Planetary

(1) Assemble the low-range planetary carrier assembly onto the reverse-range ring gear (fig. 5-33). Install the snapring.

(2) Install the assembled reverse-range ring gear and low-range planetary carrier, engaging the reverse-range ring gear teeth with the planetary pinion teeth (fig. 7-4).

(3) Install one external-tanged plate and one internal-splined plate onto the low-range ring gear (fig. 7-5). Install the assembled clutch plates and ring gear onto the low-range planetary carrier assembly, and engage the slots of the external-tanged plate with the eight clutch anchor pins.

(4) Starting with an internal-splined clutch plate, alternately install four internal-splined clutch plates and four external-tanged clutch plates onto the low-range ring gear.

(5) Install the fifteen piston return springs and spring guide pins into the holes in the clutch anchor assembly (fig. 7-6).

(6) If insert 17 (B, foldout 6) was removed from low-range clutch piston housing 18, replace it.

(7) Install low-range clutch piston 12 (B, foldout 6) and sealrings 13, 14 and 15 (as assembled in para 6-13) into the piston housing (fig. 7-7). Install the assembled housing and

piston, piston downward, aligning the anchor key slots (fig. 7-8). Install anchor key 16 (B, foldout 6). Using a suitable compressor, compress the piston housing sufficiently against the springs to expose the snapping groove in the transmission housing (fig. 5-31). Install the snapping to retain the piston housing.

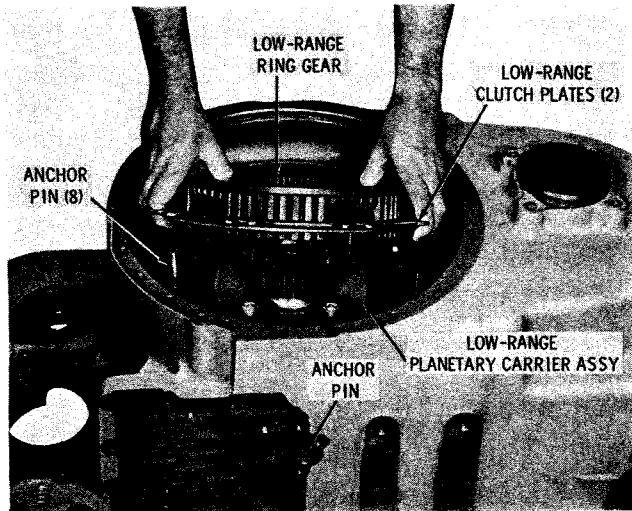


Fig. 7-5. Installing low-range ring gear

S4110

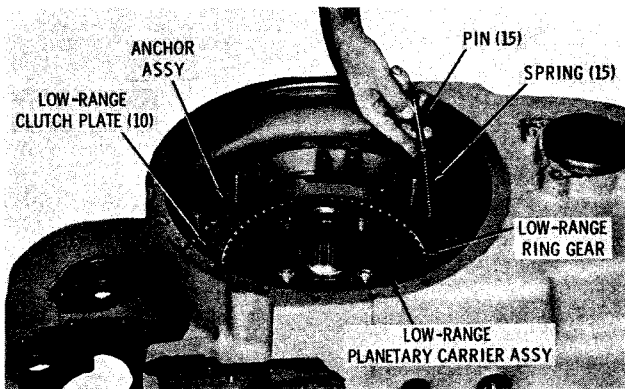


Fig. 7-6. Installing piston return springs and guide pins

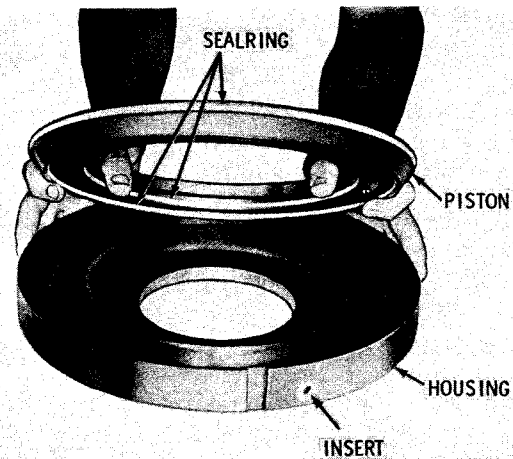
S4111

7-4. INSTALLATION OF OUTPUT COMPONENTS, TRANSFER GEARS

a. One-piece Output Shaft (A, foldout 8)

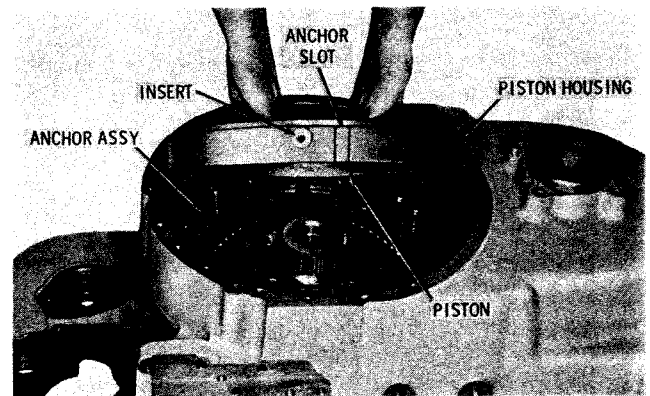
(1) Install the transfer driven gear into the rear of the housing (fig. 7-9).

(2) If the shifter shaft hole plug 21 (A, foldout 8) was removed, install a new plug (fig. 7-10). Apply nonhardening sealant onto the outside diameter of the new plug. Install the plug, closed end first, and seat it against the shoulder in the housing bore.



S4112

Fig. 7-7. Installing low-range clutch piston



S4113

Fig. 7-8. Installing low-range clutch piston housing

(3) Install output shaft 22 (A, foldout 8), double-splined end first, through the front of the housing and through the splined hub of the transfer driven gear (fig. 7-10).

(4) Start bearing 3 (A, foldout 8), shield side last, into the front bore of the housing.

(5) Install spacer 12 onto the rear end of the output shaft (fig. 7-11). Start the double-row rear bearing into its bore in the housing, pushing the spacer toward the transfer gear hub.

(6) Supporting the shaft at the front end surface, drive the rear housing and spacer forward until they are firmly seated against the transfer gear hub.

(7) At the front of the transmission housing, drive the bearing rearward and set it firmly against the shoulder in the bore. Install the snapping to retain the bearing (fig. 7-12).

(8) Reseat the rear bearing, if necessary.

Para 7-4

(9) Apply nonhardening sealant onto the outside diameter of lip-type oil seal 1 (A, foldout 8), and install the seal, spring-loaded lip first, into the front output bore. Press or drive the seal squarely but lightly against the counterbore in the housing.

(10) Apply nonhardening sealant onto the outside diameter of lip-type oil seal 20 (A, foldout 8), and install the seal, spring-loaded lip first, into the rear output bore. Press or drive the seal squarely but lightly against the counterbore in the housing.

b. Two-piece Output Shaft

(1) If the front output shaft bearing was removed, install it, unshielded side first, onto the shaft. Press it against the shaft shoulder.

(2) Install one ball 5 (A, foldout 8), spring 6, and other ball 5 into front output shaft 4. While holding these balls against the spring pressure, slide disconnect coupling 7, grooved end first, onto shaft 4 until the rear end of the coupling is flush with the shaft rear splines.

(3) If the shifter shaft oil seal was removed, apply nonhardening sealant onto the outside diameter of a new seal. Install the seal, spring-loaded lip first, and press it squarely into the bore at the front of the housing, until it is lightly seated against the counterbore shoulder (fig. 7-13).

(4) Install the assembled shaft (fig. 7-13). Install the snapping that retains the front bearing. Tap progressively around the circle of the snapping to position the bearing so that the snapping will seat in its groove.

(5) Apply nonhardening sealant onto the outside diameter of a new seal. Install the seal, spring-loaded lip first, and press it squarely into the bore until it is lightly seated against the counterbore shoulder (fig. 7-18).

(6) Install the output shaft center bearing, loading notch first, into the web of the transmission housing (fig. 7-15). Press or tap on the bearing outer race to seat it against the shoulder in the housing web bore.

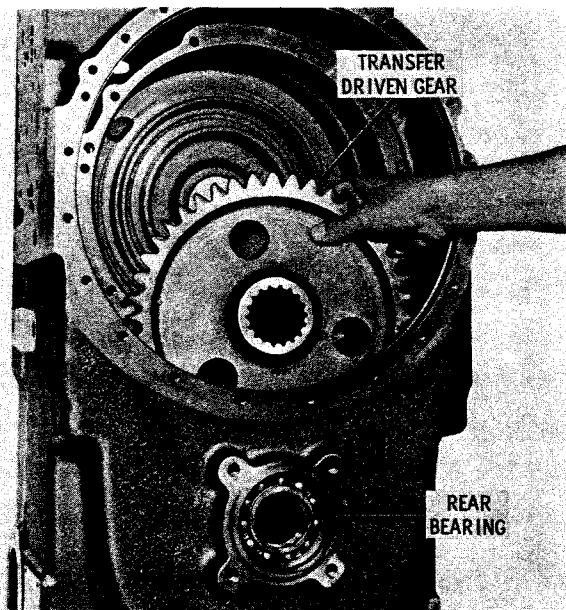
(7) Install the transfer driven gear (fig. 7-14).

(8) If bushing 15 (A, foldout 8) was removed from the rear output shaft 16, install a new bushing. Press the bushing into the front bore of the shaft until it is recessed 0.160 to 0.200 inch (4.06 to 5.08 mm) below the shaft end surface.

(9) Install spacer 12 in front of the transfer drive gear (fig. 7-16). Install spacer 17 (A, foldout 8) and bearing 18, loading notch last, onto shaft 16. Seat the bearing firmly against the spacer.

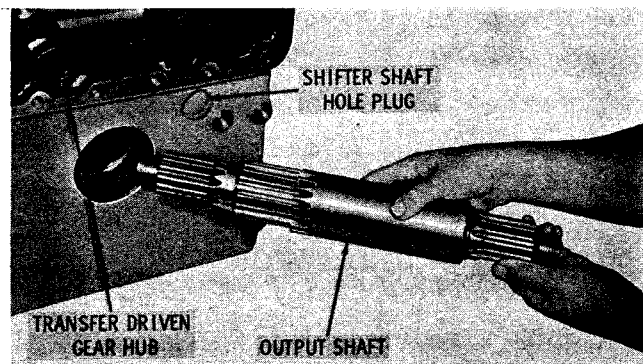
(10) Install the assembled rear output shaft, splined end first, through the splined hub of the gear, the spacer, and the center support bearing (fig. 7-16).

(11) Support the transfer driven gear and drive the rear output shaft assembly and bearing forward (fig. 7-17). If necessary, reseal the rear bearing by driving on its inner race until the outer race clears the snapping groove in the bore.



S2560

Fig. 7-9. Installing transfer driven gear (one-piece shaft)



S2585

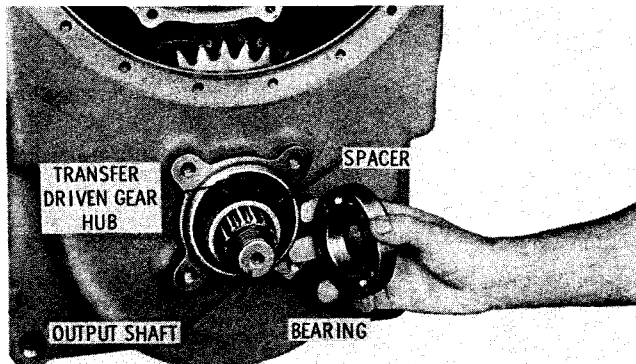
Fig. 7-10. Installing one-piece output shaft

(12) Install snapping 19, and tap progressively around its circumference until it snaps into place against the bearing.

(13) Apply nonhardening sealant onto the outside diameter of a new lip-type oil seal 20.

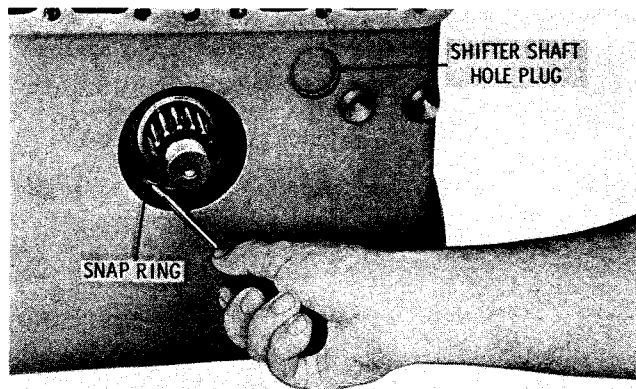
Install the new seal, spring-loaded lip first, and press it squarely into the bore until it is lightly seated against the counterbore shoulder.

(14) Position the disconnect shifter fork in the groove of the disconnect coupling (fig. 7-18). While holding the fork in position, install the shifter fork shaft, threaded end first, through the oil seal in the front of the housing and fully engage the threads in the shifter fork. Refer to paragraph 3-7b for final adjustment of the shifter fork shaft.



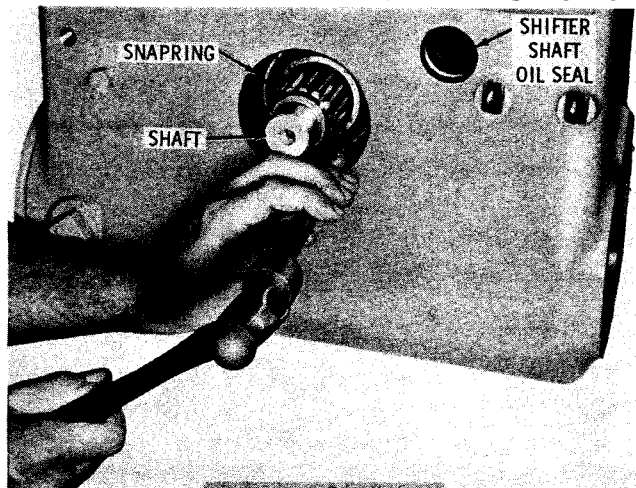
S2586

Fig. 7-11. Installing output shaft rear spacer and bearing



S1453

Fig. 7-12. Installing output shaft front bearing snapping



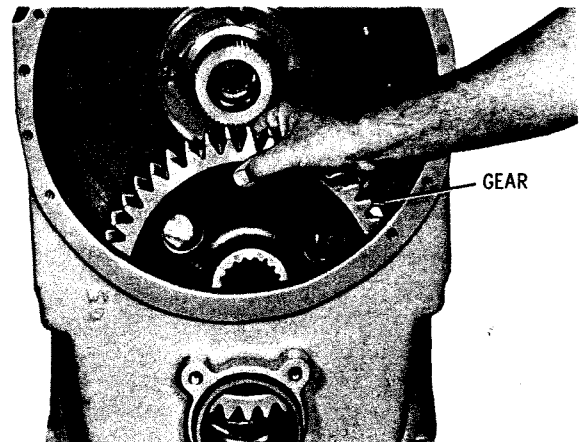
S4140

Fig. 7-13. Seating front bearing snapping

c. Transfer Drive Gear

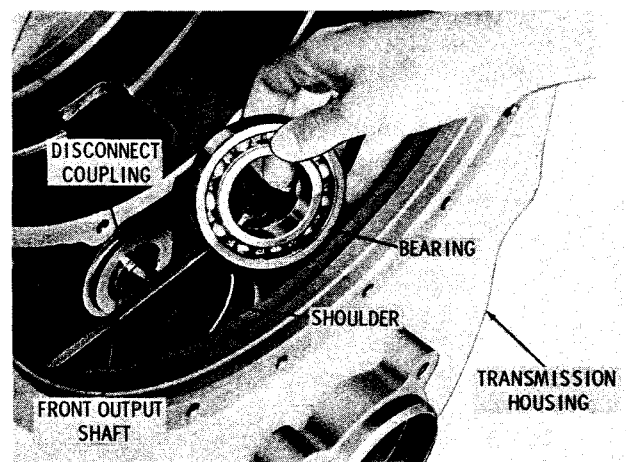
(1) Install the transfer drive gear (as assembled in para 6-12), bearing first, onto the splined hub of the low-range planetary carrier (fig. 7-19).

(2) Using a suitable hook-type tool, raise the low-range planetary carrier sufficiently to expose the snapping groove in the splined hub, and install the snapping (fig. 7-20).



S4088

Fig. 7-14. Installing transfer driven gear



S2589

Fig. 7-15. Installing output shaft center bearing

7-5. INSTALLATION OF HIGH-RANGE CLUTCH, REAR COVER

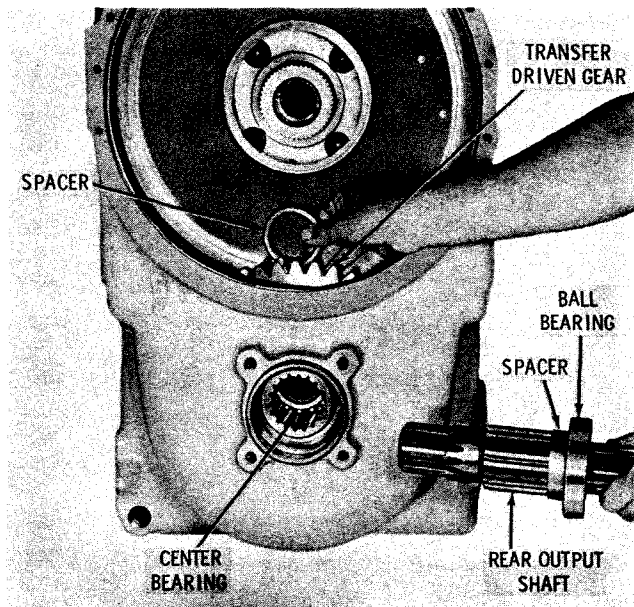
a. High-range Clutch

(1) Install snapping 6 (A, foldout 7) onto clutch hub 9. Install the high-range clutch hub onto the transfer drive gear (fig. 7-21). Install thrust bearing and races as shown in figure 7-21.

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Para 7-5

(2) Beginning with an internal-splined clutch plate, alternately install three internal-splined clutch plates and two external-tanged clutch plates. Install the five clutch plates onto the high-range clutch hub (fig. 7-22). The external tangs must engage the six pins in the transfer drive gear assembly (fig. 7-22).



S4105

Fig. 7-16. Installing transfer driven gear front spacer

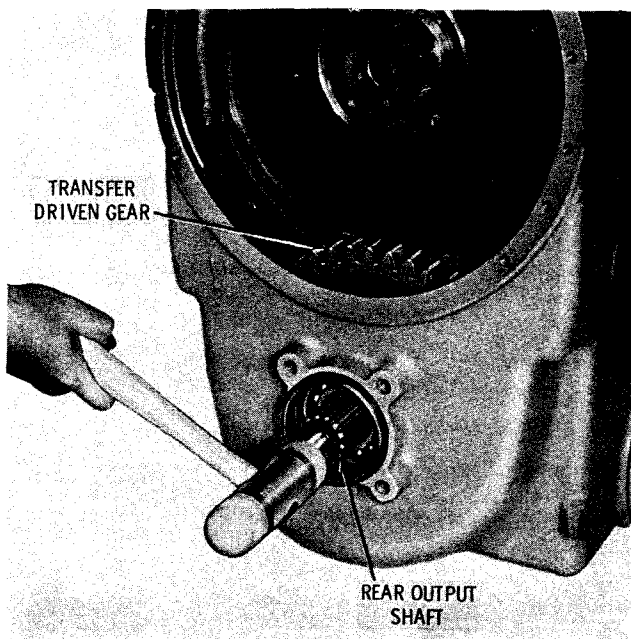
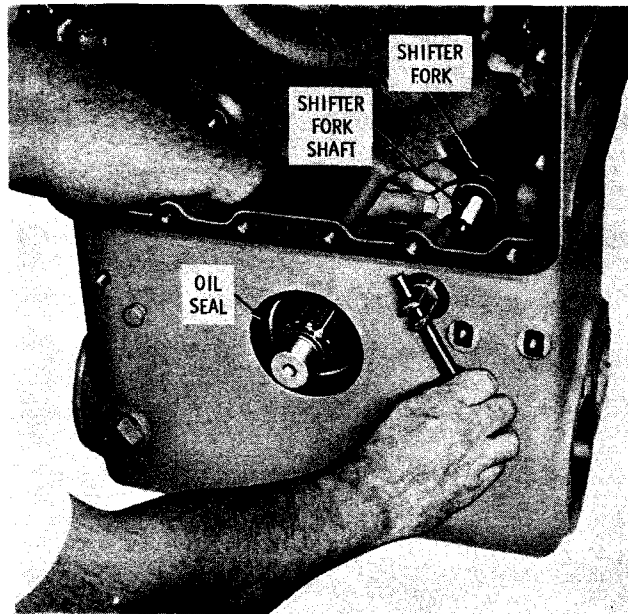
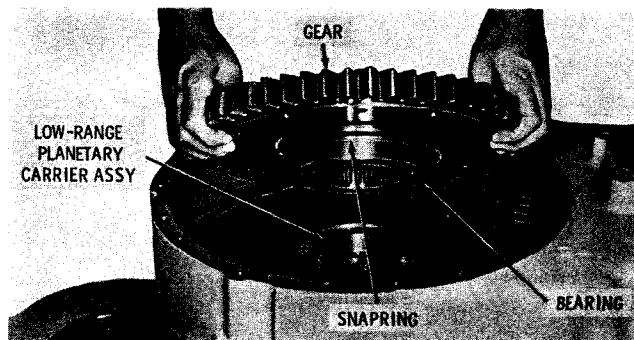


Fig. 7-17. Driving rear output shaft into center bearing



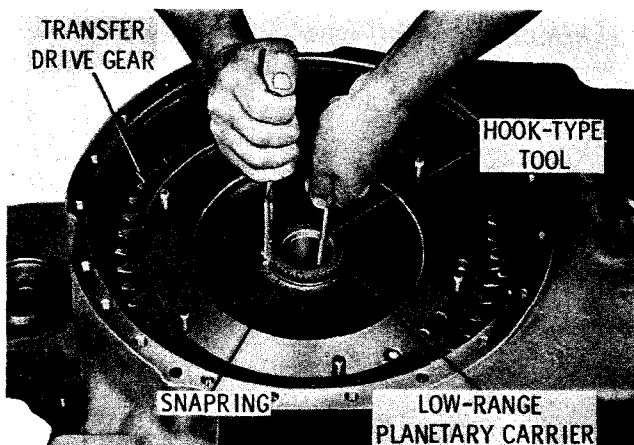
S4107

Fig. 7-18. Installing shifter fork shaft and fork



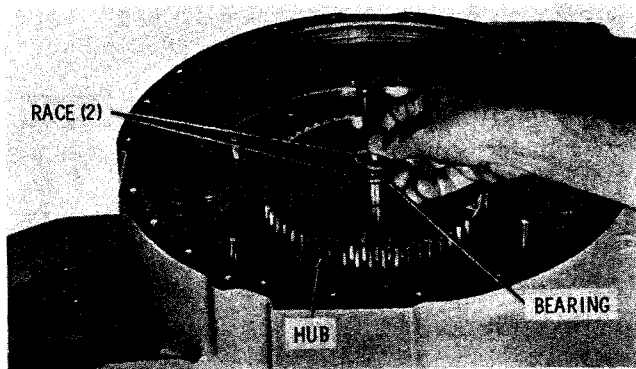
S4114

Fig. 7-19. Installing transfer drive gear



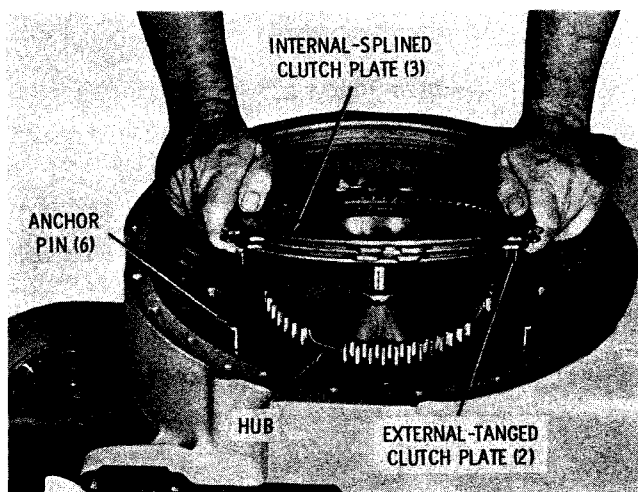
S2602

Fig. 7-20. Installing transfer drive gear snapring



S4115

Fig. 7-21. Installing high-range clutch hub bearing and races



S4116

Fig. 7-22. Installing high-range clutch plates

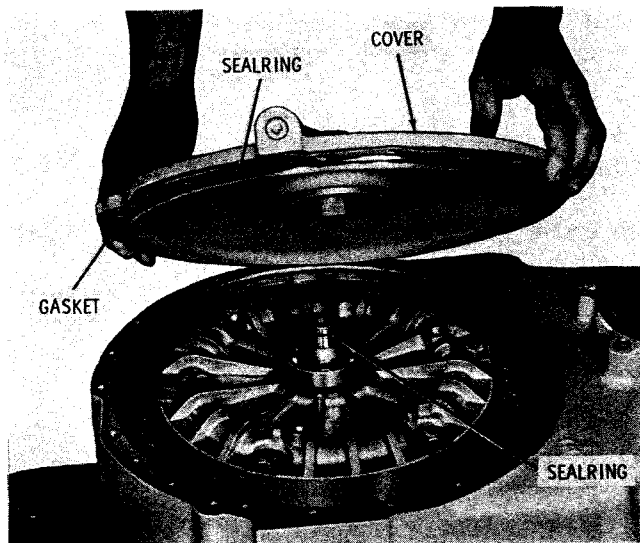
(3) Install the high-range clutch piston housing and attached parts (as assembled in para 6-11) onto the transfer drive gear (fig. 7-23). During installation, align and engage the recesses in the piston with the drive pins in the transfer drive gear.

(4) Using a soft hammer, seat the piston housing in the counterbore of the drive gear, and install the six locktabs and six 1/2-20 x 2-3/4-inch bolts (fig. 7-23). Tighten the bolts to 83 to 100 pound feet (113 to 135 Nm) torque. Bend the lock tabs against the bolt heads (fig. 7-23).

b. Rear Cover (B, foldout 6)

(1) If pipe plug 3 was removed from the rear cover, replace it (fig. 7-23). Apply non-hardening sealant onto the plug threads and install the plug into the rear cover.

(2) Lubricate the sealring 2 and install it into the groove in the rear cover (fig. 7-23). Apply oil-soluble grease onto the gasket and install the gasket onto the rear cover.



S4117

Fig. 7-23. Installing transmission rear cover

(3) Install the rear cover onto the transmission housing (fig. 7-23) and retain it with sixteen 3/8-16 x 1-1/8-inch bolts and lockwashers. Tighten the bolts to 26 to 32 pound feet (35 to 43 Nm) torque.

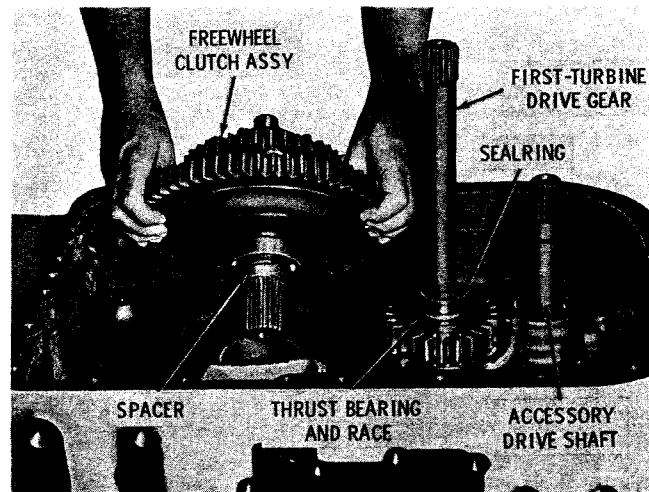
7-6. INSTALLATION OF TURBINE GEARING

a. Accessory Drive Shaft Assembly (A, foldout 5)

(1) If bearing 5 was removed from accessory drive shaft 4, replace it.

(2) Install bearing 5 onto drive shaft 4 and seat the bearing firmly against the shaft shoulder. Apply Molykote Type G grease, or equivalent, to the drive splines of the shaft.

(3) Install the accessory drive shaft and bearing into the transmission housing (fig. 7-24).



S4118

Fig. 7-24. Installing freewheel clutch assembly

b. Turbine Gears, Freewheel Clutch

(A and B, foldout 4)

(1) Install the first turbine drive gear 25 (A, foldout 4) and bearing 26 (as assembled in paragraph 6-10) as a unit (fig. 7-24). Install the step-joint sealring into the groove in the drive gear hub. Use oil-soluble grease to retain the sealring in its groove. Install rear thrust bearing race 24 (A, foldout 4) and the roller bearing 23 onto the drive gear.

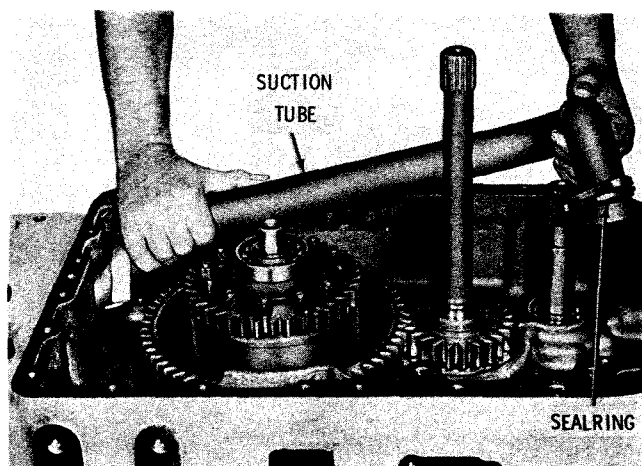
(2) Install spacer 23 (B, foldout 4) onto the shaft of the freewheel unit. Install the turbine-driven gears and freewheel clutch assembly (as assembled in paragraph 6-9) as a unit (fig. 7-24). Rotate the assembly to engage the second-turbine driven gear splines and those of the reverse-and-low-range sun gear.

(3) Install seal 5 (B, foldout 5) onto suction tube 4. Install the suction tube (fig. 7-25). Retain the tube with bolts 1, 2 and 3 (B, foldout 5). Tighten the bolts to 36 to 43 pound feet (49 to 58 Nm) torque.

(4) Install lubrication tube assembly 26 (B, foldout 5). Retain the tube with bolt 27. Tighten the bolt to 36 to 43 pound feet (49 to 58 Nm) torque (fig. 5-14).

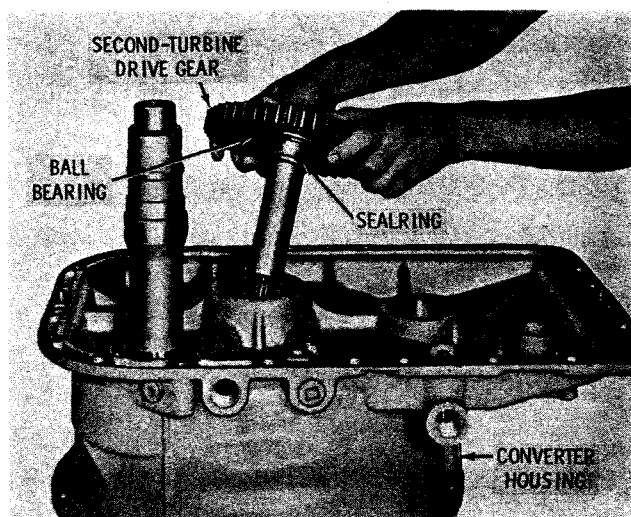
(5) Install the oil strainer and gasket (fig. 5-2). Secure the oil strainer with six 3/8-16 x 7/8-inch bolts 18 (B, foldout 5) and lockwashers 19. Tighten the bolts to 26 to 32 pound feet (35 to 43 Nm) torque. Install drain plug 15 and tighten it sufficiently to prevent leakage.

(6) Press bearing 19 (A, foldout 4) onto the front shaft of gear 20. Seat it against the gear shoulder. Install hook-type sealring 18 onto the gear shaft. Install gear 20, with bearing and



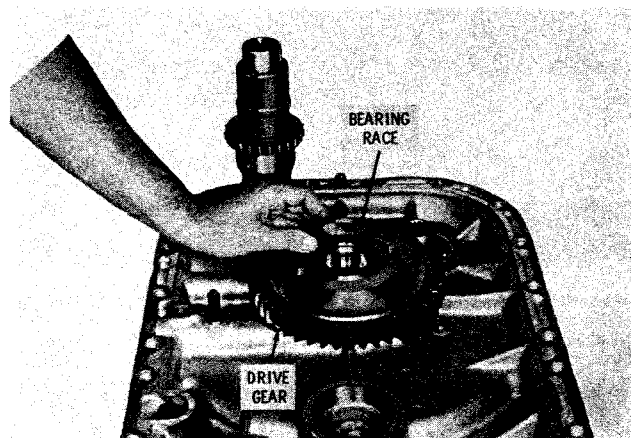
S4119

Fig. 7-25. Installing oil suction tube



S4120

Fig. 7-26. Installing second-turbine drive gear



S4121

Fig. 7-27. Installing bearing race onto second-turbine drive gear

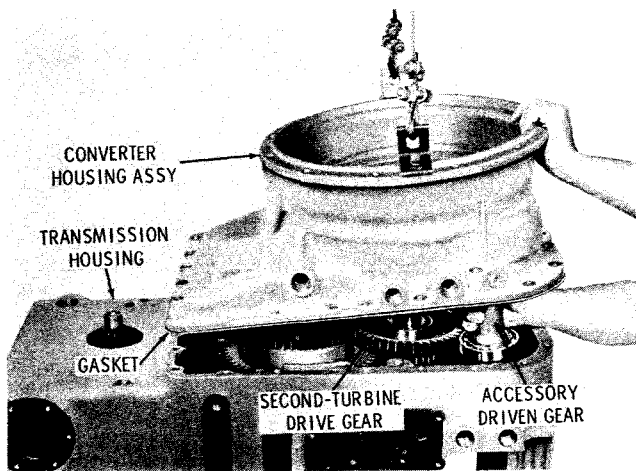
sealring, into the converter housing (fig. 7-26). Install thrust bearing race 22 (A, foldout 4), onto second-turbine drive gear 20. Use oil-soluble grease to retain the bearing race on the drive gear.

(7) Install bearing race 19 (B, foldout 4) onto the hub of second-turbine drive gear (fig. 7 27).

7-7. INSTALLATION OF CONVERTER HOUSING, CONVERTER COMPONENTS

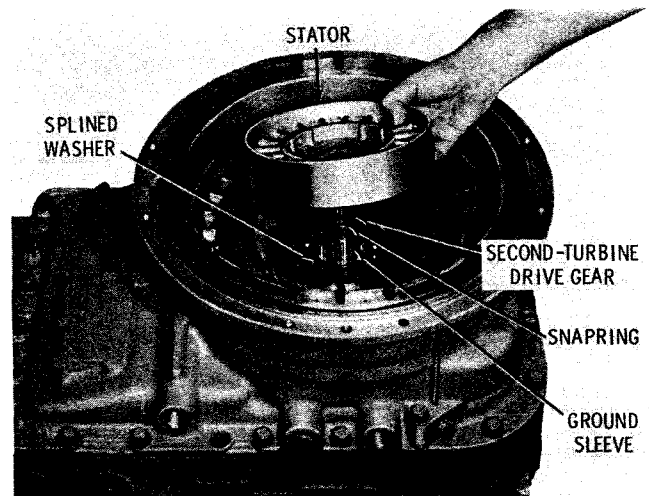
a. Converter Housing

(1) Install the converter housing gasket onto the transmission housing (fig. 7-28). Use oil-soluble grease to retain the gasket during in-



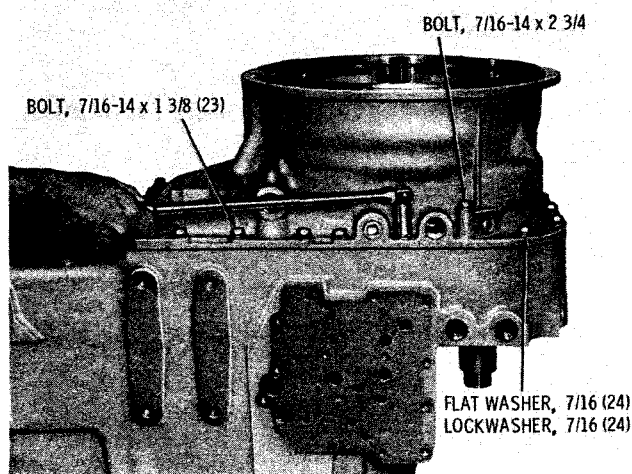
S1497

Fig. 7-28. Installing torque converter housing assembly



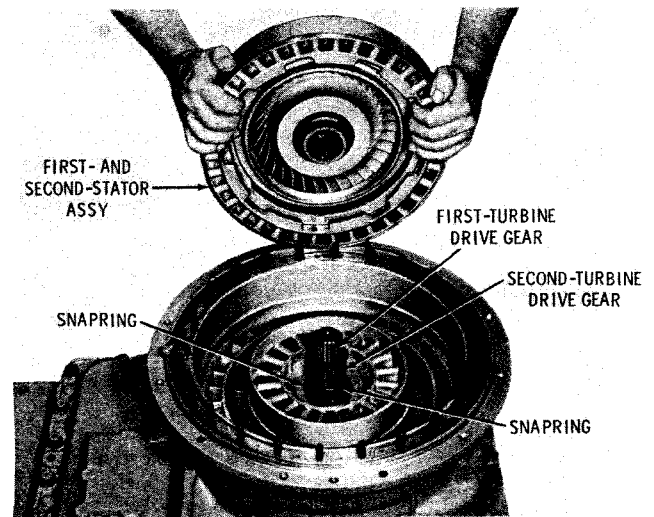
S4123

Fig. 7-30. Installing torque converter stator



S4122

Fig. 7-29. Installing torque converter housing bolts



S4124

Fig. 7-31. Installing first- and second-turbine assembly

stallation of the housing. Attach a sling to the housing front flange and, while lowering the converter housing (as assembled in para 6-8) onto the transmission housing, guide the accessory driven gear into place in the transmission housing.

(2) To attach the converter housing, install one 7/16-14 x 2-3/4-inch bolt, twenty-three 7/16-14 x 1-3/8-inch bolts, twenty-four 7/16-inch flat washers, and twenty-four 7/16-inch lockwashers (fig. 7-29). Tighten the bolts to 42 to 50 pound feet (57 to 67 Nm) torque.

b. Converter Components

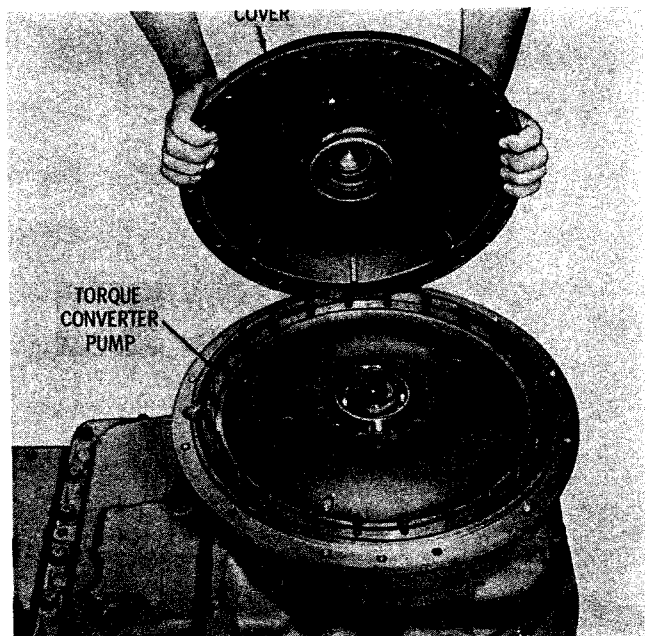
(1) Check to insure that the sealing (installed in para 6-8) is firmly seated in the converter housing ground sleeve.

(2) Install the torque converter pump (as assembled in para 6-7) onto the converter ground sleeve (fig. 7-30). Install the splined, flat stator spacer and stator, hub projection first, onto the ground sleeve.

(3) Install snapring 8 (B, foldout 3) onto the converter ground sleeve to retain the stator (fig. 7-31). Install the first- and second-turbine assembly (as assembled in para 6-6) onto the turbine drive gear shafts (fig. 7-31).

TT 3000 SERIES POWERSHIFT TRANSMISSIONS

Para 7-8



S4125

Fig. 7-32. Installing torque-converter drive cover

7-8. INSTALLATION OF INPUT COMPONENTS

a. Direct Mount

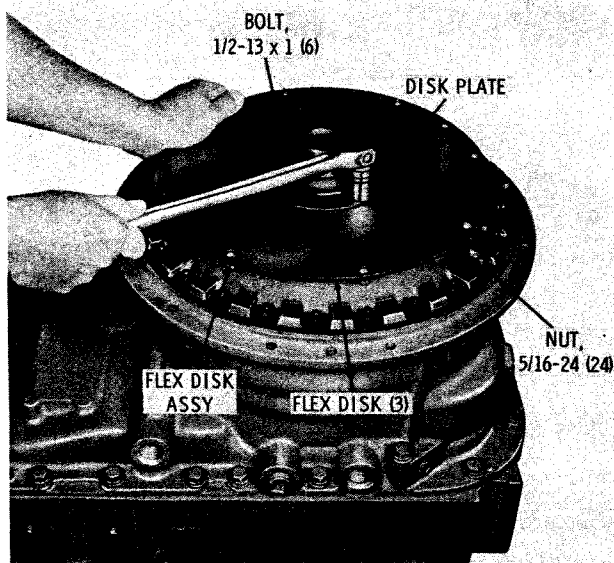
(1) Install torque converter drive cover (fig. 7-32).

(2) Install twenty-four 5/16-24, self-locking nuts to retain the cover (fig. 7-33). Tighten the nuts to 14 to 18 pound feet (19 to 24 Nm) torque.

(3) Install the flex disk and washer assembly, washer side first, onto the hub of the converter cover (fig. 7-33). Assemble the three flex disks so that the cone (if coned) of each will be parallel to the flex disk and washer assembly and install the three disks as a unit. Install the disk plate and align all the disk holes with the tapped holes in the converter drive cover. Install six 1/2-13 x 7/8-inch, self-locking bolts, and tighten them to 81 to 97 pound feet (110 to 131 Nm) torque.

b. Remote Mount

(1) Install torque converter drive cover 10 (B, foldout 2) and attached parts (as assembled in para 6-5) onto the converter pump. Install twenty-four 5/16-24 self-locking nuts 9 to retain the cover. Tighten the nuts to 14 to 18 pound feet (19 to 24 Nm) torque.



S2615

Fig. 7-33. Installing flex disk assembly

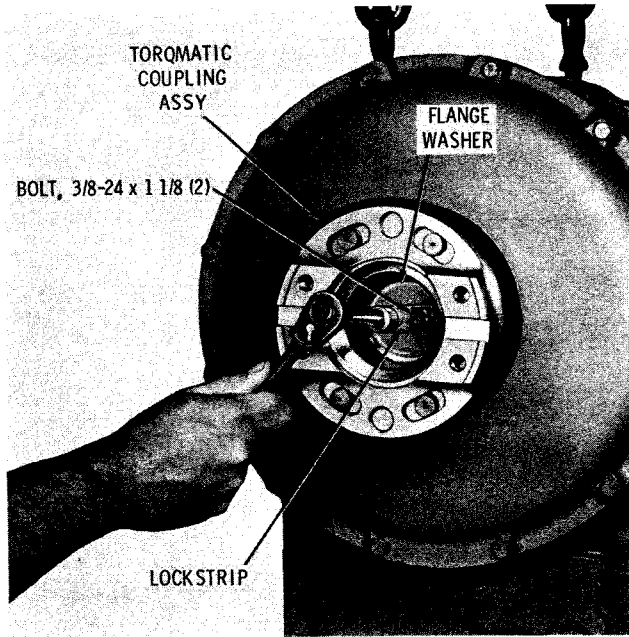
(2) Install gasket 4 onto the converter housing front splitline. Install transmission front cover 3 and oil seal 1 (as assembled in para 6-4) and secure it with twelve 3/8-24 x 2-inch bolts 2, lockwashers 11, and 3/8-24 nuts 12. Tighten the nuts to 33 to 40 pound feet (45 to 54 Nm) torque (fig. 7-34).

(3) Install Torqmatic coupling assembly 6 (A, foldout 2) onto the input shaft (fig. 7-35). Refer to paragraph 4-8b. Add shims 4 or 5 (A, foldout 2). Refer to figure 3-2. A combination of shims 4 and 5 is required in the space between the front of the input shaft and the rear face of washer 3. The thickness of the shim pack should



S4126

Fig. 7-34. Installing front cover bolts



S4127

Fig. 7-35. Installing input coupling bolts

be 0.007 inch (0.17-0.18 mm) less than the space measured with a depth micrometer. Install the shims and washer 3. Install lockstrip 2 and secure the coupling assembly with two 3/8-24 x 1-1/8-inch bolts 1. Tighten the bolts to 41 to 49 pound feet (56 to 66 Nm) torque (fig. 7-35). Bend corners of the lockstrip against the bolt heads.

7-9. INSTALLATION OF EXTERIOR COMPONENTS

a. Oil Pump

(1) Install outer bearing race of roller bearing 15 (A, foldout 4) into the transmission housing (fig. 7-36).

(2) Install two 3/8-16 x 5-inch guide studs into the transmission housing (fig. 7-37).

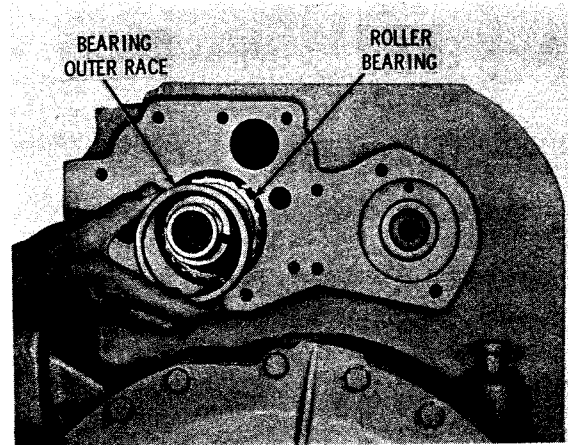
(3) Install the oil pump gasket and the oil pump assembly onto the pump mounting pad (fig. 7-37).

(4) Remove the 3/8-16 x 5-inch guide studs.

(5) Retain the pump with seven 3/8-16 x 4-inch bolts and lockwashers and two 3/8-16 x 2-inch bolts and lockwashers. Tighten the bolts to 26 to 32 pound feet (35 to 43 Nm) torque.

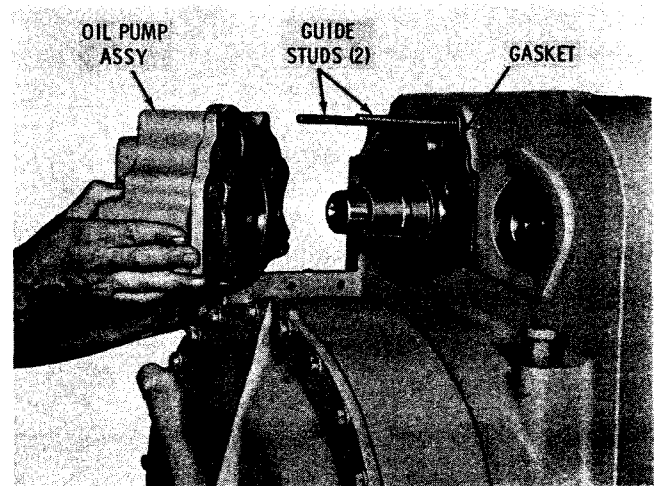
b. Control Valve Body

(1) Remove the temporarily-installed bolt and washer from the valve body mounting pad (para 7-4a(5)). Install the valve body gasket and retain it with oil-soluble grease (fig. 7-38). Install the control valve body assembly.



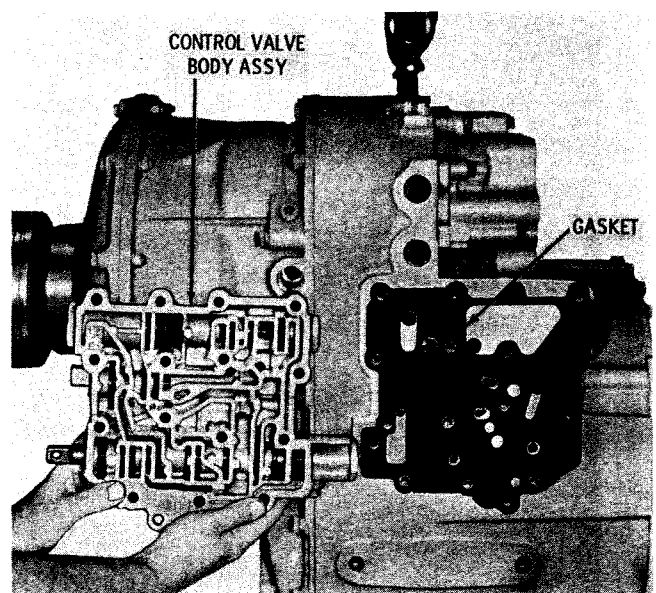
S4128

Fig. 7-36. Installing accessory drive bearing outer race



S4129

Fig. 7-37. Installing oil pump assembly



S4130

Fig. 7-38. Installing control valve body assembly

TT 3000 SERIES POWERSHIFT TRANSMISSIONS

Para 7-9/7-10

(2) Install fifteen 3/8-16 x 2-1/2-inch bolts, one 3/8-16 x 1-inch bolt, and sixteen 3/8-inch lockwashers (fig. 5-4). Progressing from the center of the valve body outward, tighten the bolts evenly to 26 to 32 pound feet (35 to 43 Nm) torque.

c. Parking Brake, Output Flanges

(1) Install parking brake assembly 1 (A, foldout 9) onto its mounting pad. Secure it with four 1/2-13 x 7/8-inch, self-locking bolts. Tighten the bolts to 81 to 97 pound feet (110 to 131 Nm) torque.

(2) Install rear output flange 19 (A, foldout 2). Install shaft sealring 18 making sure that it is well seated in the cavity between the shaft and flange. Refer to para 4-8b for flange installation procedure.

(3) Apply molybdenum disulfide grease (Molykote Type G, or equivalent) onto the threads of 1-1/4-12 flange retaining nut 21 (A, foldout 2) and install washer 20 and nut 21 onto the output shaft. Attach an improvised holder to the flange ears, and tighten the nut to 450 to 700 pound feet (610 to 949 Nm) torque.

(4) Install the brake drum onto the output flange. Attach the brake drum with six self-locking bolts. Tighten the bolts to 41 to 49 pound feet (56 to 66 Nm) torque.

(5) Install front output flange 16 (A, foldout 2). Install shaft sealring 17 (A, foldout 2) making sure that it is well seated in the cavity between the shaft and flange. Apply molybdenum disulfide grease (Molykote Type G, or equivalent) onto the threads of 1-1/4-12 flange retaining nut 14 and install washer 15 and nut 14 onto the output shaft.

(6) Using an improvised holder and torque wrench, tighten the nut to 450 to 700 pound feet (610 to 949 Nm) torque.

7-10 ASSEMBLY PROCEDURES FOR VEHICLE-MOUNTED TRANSMISSION

a. Similar Procedures. Components are installed into the transmission in the vehicle by methods similar to those used when the transmission is removed. The methods and sequence outlined in the manual are a general guide, but may require some variation because of positioning and space limitations.

b. Clutch Installations

Special care is required to install clutch assemblies into a transmission mounted in the vehicle. Make sure that all clutch plates are properly engaged with their mating components, and that all clutch springs are properly positioned.

Section 8. WEAR LIMITS AND SPRING DATA

8-1. WEAR LIMITS DATA

a. Maximum Variations. The wear limits information in this section shows the maximum wear at which components are expected to function satisfactorily.

b. Cleaning, Inspection. Parts must be clean to permit effective inspection for wear or damage. Refer to paragraph 4-6, above.

c. Bearings, Bearing Journals, Bores. The application of bearings to any product is based on the recommendations of the bearing manufacturer and, therefore, no diametral dimensional deviation should be permitted in the bearing or mated parts. Bearings should be carefully checked for signs of distress before reinstalling in the transmission.

d. Gears. Gears should be inspected for load pattern and signs of distress. Any distress indicates a possible future failure, and the reuse of such gears should be the decision of the individual customer, based on experience. Backlash cannot be used to establish critical wear of a gear. The backlash tolerances are of such nature that a gear usually pits, scuffs, scores, or galls long before the gear wear becomes critical.

e. Splines. Unless severe, spline wear is not considered detrimental except where it affects tightness of an assembly such as a driveline flange. Here, again, backlash cannot be used to establish critical wear because both mating parts must be concentrically located to obtain accurate measurement of backlash.

f. Hook-type Sealrings. Sides of sealring should be smooth (maximum wear 0.005 inch (0.12 mm)). The sides of the groove into which the sealrings fit should be smooth (50 micro inch (1.25 μ m) equivalent), and square with the axis of rotation within 0.002 inch (0.05 mm). A new sealring should be installed if grooves are reworked, or sealring outside diameter wear causes the possibility of a closed gap between sealring hooks when the ring is installed.

8-2. WEAR LIMITS CHART

The chart which follows lists the wear limits data and is referenced to the exploded views (foldouts 2 through 9) in the back of the manual. The millimeter equivalent is shown parenthetically after the inch value.

8-3. SPRING DATA

Springs must be clean to permit effective inspection. Springs should be replaced if there are signs of overheating, wear due to rubbing adjacent parts, or permanent set. Discard springs which do not meet the load-height specifications in the spring chart.

8-4. SPRING CHART

Inspection criteria (load versus height) and identification characteristics of the springs are presented in the chart following the wear limits chart. The spring chart data are keyed to the exploded views (foldouts 2 through 9) in the back of the manual.

TT 3000 SERIES POWERSHIFT TRANSMISSIONS

Para 8-4

WEAR LIMIT CHARTS

Illustration	Description	Part Number	Wear Limit in.	(mm)
A, foldout 4	TORQUE CONVERTER HOUSING AND TURBINE DRIVE GEARS			
22	Thrust bearing race thickness	8619652	0.028	(0.71) min
24	Thrust bearing race thickness	8619650	0.120	(3.05) min
B, foldout 4	TURBINE DRIVEN GEARS AND FREEWHEEL CLUTCH			
4,6	Bearing thrust race	9436605	0.121	(3.07) min
11	*Freewheel roller diameter	6770574	0.498	(12.65) min
12	*Freewheel cam surface wear	6880504	0.005	(0.12) max
18	*First-turbine driven gear hub outside diameter	6880502	3.0327	(77.02) min
A, foldout 6	REVERSE-RANGE CLUTCH AND PLANETARY			
5	Clutch plate thickness	6839914	0.1066	(2.708) min
	Cone		0.015	(0.38) max
6	Clutch plate thickness	6830293	0.130	(3.30) min
	Cone		0.015	(0.38) max
	**Minimum clutch pack thickness		1.183	(30.05) min
9	Thrust washer thickness	6830225	0.060	(1.52) min
10	Pinion end play in carrier	6880514	0.050	(1.27) max
15	Clutch anchor face wear	6880523		
	reverse-range face		0.010	(0.25) max
	low-range face		0.010	(0.25) max
B, foldout 6	LOW-RANGE CLUTCH AND PLANETARY			
5	Thrust washer thickness	6830225	0.060	(1.52) min
7	Pinion end play in carrier 3	6835181	0.050	(1.27) max
9	Clutch plate thickness	6830293	0.130	(3.30) min
	Cone		0.015	(0.38) max
10	Clutch plate thickness	6839914	0.1066	(2.708) min
	Cone		0.015	(0.38) max
	**Minimum clutch pack thickness		1.183	(30.05) min

* Total wear of freewheel parts (2 x roller wear + sum of cam surface wear at two opposing points + gear hub wear) must not exceed 0.010 inch (0.25 mm). (Determine cam surface wear by measuring depth of groove caused by roller contact in the cam pocket.)

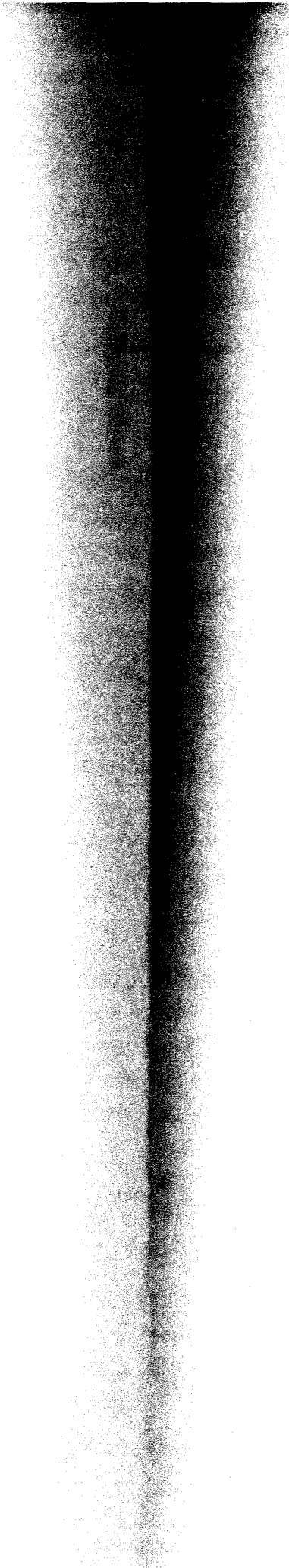
** Total of individual plate thicknesses. Replace plates having the most wear with new plates to increase pack thickness.

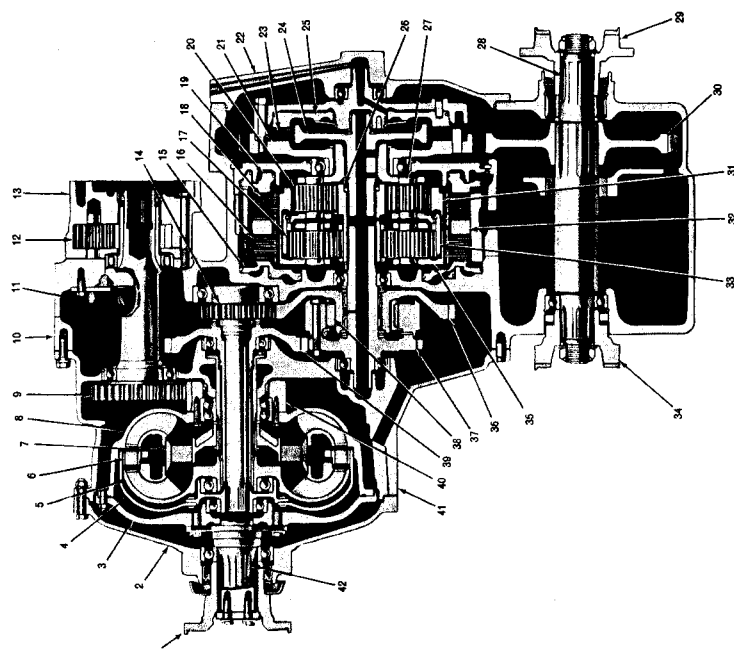
WEAR LIMITS CHART (Cont'd)

Illustration	Description	Part Number	Wear Limit in. (mm)
A, foldout 7	HIGH-RANGE CLUTCH AND PISTON HOUSING		
3	Transfer gear clutch face wear	6880533	0.010 (0.25) max
7	Clutch plate thickness	6830221	0.130 (3.30) min
	Cone		0.015 (0.38) max
8	Clutch plate thickness	6837690	0.097 (2.46) min
	Cone		0.015 (0.38) max
	**Minimum clutch pack thickness		0.584 (14.83) min
	Diametral Clearance between:		
9	high-range clutch hub and bushing in piston housing 20	6880536 6883736	0.010 (0.25) max
10, 12	Bearing thrust race thickness	9425295	0.090 (2.286) min
16	Piston face wear	6839403	0.010 (0.25) max
A, foldout 8	OUTPUT SHAFTS AND DISCONNECT ASSEMBLY		
	Diametral clearance between:		
4	front output shaft	6880537	
15	and bushing in output shaft 16	6756835	0.010 (0.25) max
** Total of individual plate thicknesses. Replace plates having the most wear with new plates to increase pack thickness.			
B, foldout 8	OIL PUMP ASSEMBLY		
7	Cover	6838646	(no scoring permissible)
17	Driven gear shaft OD	6776428	0.749 (19.02) min
18	Body	6839464	(no scoring or wear permissible)
19	Driven gear shaft OD	6838636	0.749 (19.02) min
B, foldout 9	CONTROL VALVE ASSEMBLY		
8	Valve clearance in body 9	6831187	0.004 (0.10) max
16	Plug clearance in body 9	6835502	0.0035 (0.09) max
20	Valve clearance in body 9	6880946	0.004 (0.10) max
21	Valve plug clearance in plug 24	6758305	0.04 (0.10) max
25	Valve clearance in body 9	6839891	0.003 (0.07) max

SPRING CHART

Foldout	Ref	Spring	Part No.	No.	Diameter of wire		Outside diameter		Free length			Length under load		Newtons
				Coils	Inches	Millimetres	Inches	Millimetres	Inches	Millimetres	Inches	Millimetres	Pounds	
4A	28	Lubrication pressure regulator valve	6773689	13.5	0.047	(1.19)	0.403	(10.23)	1.44	(36.57)	1.00	(25.4)	5.58 to 6.82	(24.8-30.3)
	31	Converter pressure regulator valve	6773551	10	0.080	(2.03)	0.468	(11.88)	1.206	(30.63)	1.00	(25.4)	23.4 to 28.6	(104.1-127.2)
4B	9	Freewheel clutch	6835343	27	0.033	(0.83)	0.185	(4.69)	1.58	(40.13)	1.14	(28.95)	6.05 to 7.25	(26.91-32.2)
6A	17	Reverse-, low-range clutch piston return	6880526	35.5	0.105	(2.67)	0.625	(15.87)	5.55	(141)	4.30	(109.22)	44.9 to 49.7	(199.7-221.06)
7A	14	High-range clutch piston return	6756134	----	Belleville spring		5.14	(130.55)	0.275	(6.98)	----	----	----	----
8A	6	Disconnect detent	6773464	14	0.062	(1.57)	0.353	(8.96)	1.32	(33.52)	1.15	(29.21)	11.88 to 14.52	(52.8-64.6)
9B	14	Main-pressure regulator valve	6835705	16	0.1250	(3.175)	0.787	(19.98)	3.60	(91.44)	2.50	(63.50)	96 to 106	(427-471.5)
	15	Trimmer	6830365	8	0.128	(3.25)	1.110	(28.19)	2.58	(65.53)	1.43	(36.32)	72.20 to 82.20	(321.2-365.6)
	19	Clutch cutoff valve	6765710	18.5	0.080	(2.03)	0.625	(15.87)	3.04	(76.30)	2.08	(52.83)	18.9 to 23.1	(84.1-102.7)
	30	Selector valve detent	6833934	10	0.054	(1.37)	0.490	(12.45)	1.47	(37.30)	0.80	(20.30)	11.90 to 13.10	(53-58)

- 
- 1 - Input flange
 - 2 - Front cover
 - 3 - Converter drive cover
 - 4 - First-turbine support
 - 5 - Second turbine
 - 6 - First turbine
 - 7 - Stator
 - 8 - Converter pump
 - 9 - Accessory driven gear
 - 10 - Transmission housing
 - 11 - Oil suction tube
 - 12 - Oil pump gears
 - 13 - Oil pump assembly
 - 14 - First-turbine drive gear
 - 15 - Reverse clutch piston
 - 16 - Reverse clutch
 - 17 - Reverse planetary pinion
 - 18 - Low-range clutch
 - 19 - Low-range clutch piston
 - 20 - Low-range planetary pinion
 - 21 - Transfer drive gear
 - 22 - Rear cover
 - 23 - High-range clutch
 - 24 - High-range clutch hub
 - 25 - High-range clutch piston
 - 26 - Reverse- and low-range
sun gear
 - 27 - Low-range planetary carrier
 - 28 - Output shaft
 - 29 - Rear output flange
 - 30 - Transfer driven gear
 - 31 - Low-range ring gear
 - 32 - Reverse- and low-range
clutch anchor
 - 33 - Reverse ring gear
 - 34 - Front output flange
 - 35 - Reverse planetary carrier
 - 36 - First-turbine driven gear
 - 37 - Second-turbine driven gear
 - 38 - Freewheel roller
 - 39 - Second-turbine drive gear
 - 40 - Accessory drive gear
 - 41 - Torque converter housing
 - 42 - Input shaft



Foldout 1. TT 3420-1 transmission—cross-section view

A

GROUP A — LOCATION A

- 1 - Bolt, 3/8-24 x 1-1/8 (2)
- 2 - Locking strip
- 3 - Washer
- 4 - Shim, 0.025 (as required)
- 5 - Shim, 0.005 (as required)
- 6 - Torqmatic coupling flange assembly
- 7 - Flange and bushing assembly
- 8 - Flange
- 9 - Bushing
- 10 - Coupling
- 11 - Dowel pin
- 12 - Hub
- 13 - Retainer

GROUP B — LOCATION C

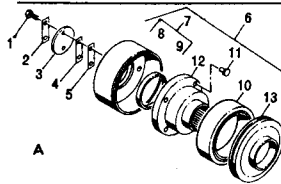
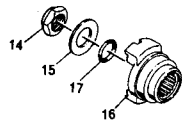
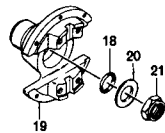
- 14 - Flange retaining nut
- 15 - Flange washer
- 16 - Output flange
- 17 - Oil Seal

GROUP C — LOCATION D

- 18 - Oil seal
- 19 - Output flange
- 20 - Flange retaining washer
- 21 - Flange retaining nut

B

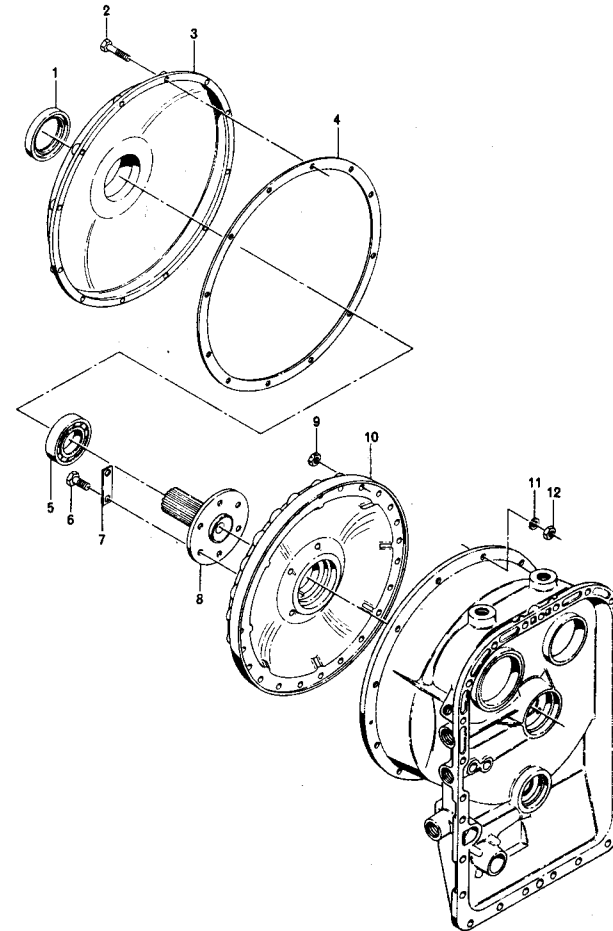
- 1 - Oil Seal
- 2 - Bolt, 3/8-24 x 2 (12)
- 3 - Transmission front cover
- 4 - Front cover gasket
- 5 - Ball Bearing
- 6 - Bolt, 1/2-13 x 1-1/8 (6)
- 7 - Lockstrip (3)
- 8 - Input shaft
- 9 - Self-locking nut, 5/16-24 (24)
- 10 - Torque converter drive cover
- 11 - Lockwasher, 3/8 (12)
- 12 - Nut, 3/8-24 (12)

A**A****B****C**

NOTE
Letters in parenthesis identify locations and variety of flanges available and should not be confused with the alphabetical group listings.

A, foldout 2. Input, output flanges

14551

B

B, foldout 2. Input components, remote mount

14507

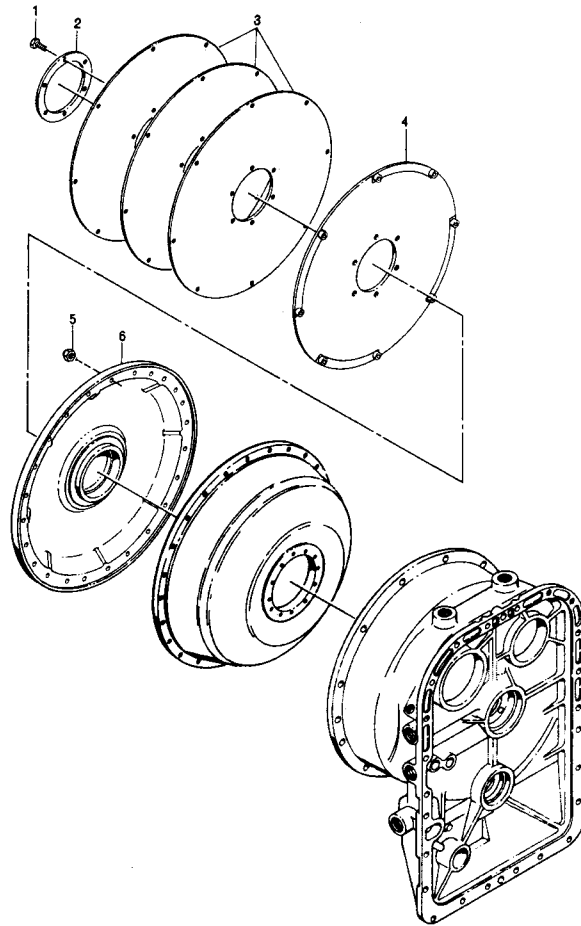
A

- 1 - Self-locking bolt, 1/2-13 x 7/8 (6)
- 2 - Flex disk plate
- 3 - Flex disk (3)
- 4 - Flex disk and washer assembly
- 5 - Nut, 5/16-24 (24)
- 6 - Torque converter drive cover

B

- 1 - Ball bearing
- 2 - First turbine and support assembly
- 3 - First turbine assembly
- 4 - First-turbine retaining pin (6)
- 5 - First turbine
- 6 - Internal snapring
- 7 - Second turbine
- 7A - Ball bearing
- 8 - External snapring
- 9 - Torque Converter stator
- 10 - Spacer
- 11 - Self-locking bolt, 1/4-28 x 1-1/4 (12)
- 12 - Lockstrip (6)
- 13 - Torque converter pump retainer
- 14 - Torque converter pump assembly
- 15 - Bolt, 5/16-24 x 1.30 (24)
- 16 - Torque converter pump gasket
- 17 - Double-row ball bearing
- 18 - Input accessory drive gear
- 19 - Sealring

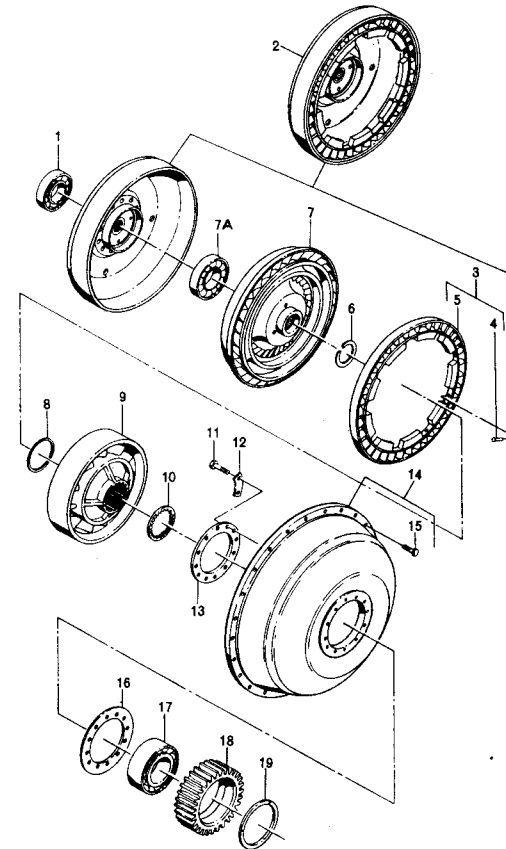
A



A, foldout 3. Input components, direct mount

14525

B



B, foldout 3. Torque converter

14510

- 1 - Bolt, 7/16-14 x 1-3/8 (23)
- 2 - Lockwasher, 7/16 (23)
- 3 - Flat washer, 7/16 (23)
- 4 - Accessory driven gear
- 5 - Converter housing assembly
- 6 - Converter housing sleeve
- 7 - Converter housing
- 8 - Dowel pin (2)
- 9 - Pipe plug, 3/4 NPTF
- 10 - Bolt, 7/16-14 x 2-3/4
- 11 - Lockwasher, 7/16
- 12 - Flat washer, 7/16
- 13 - Ball bearing
- 14 - External snapping
- 15 - Ball bearing
- 16 - Converter ground sleeve
- 17 - Self-locking bolt, 5/16-18 x 3/4 (4)

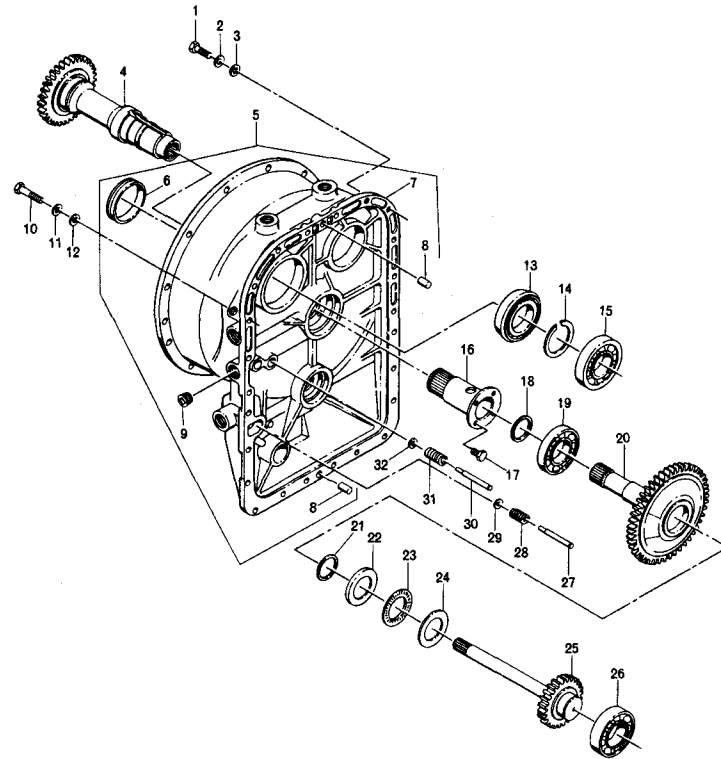
A

- 18 - Sealring
- 19 - Ball Bearing
- 20 - Second-turbine drive gear
- 21 - Sealring
- 22 - Thrust race
- 23 - Thrust roller bearing
- 24 - Thrust race
- 25 - First-turbine drive gear
- 26 - Ball Bearing
- 27 - Lubrication regulator valve guide pin
- 28 - Lubrication regulator valve spring
- 29 - Lubrication regulator valve
- 30 - Converter pressure regulator valve guide pin
- 31 - Converter pressure regulator valve spring
- 32 - Converter pressure regulator valve

B

- 1 - Ball bearing
- 2 - Self-locking nut, 3/8-24 (12)
- 3 - Second-turbine driven gear
- 4 - Bearing thrust race
- 5 - Thrust bearing
- 6 - Bearing thrust race
- 7 - Freewheel retainer spring plate
- 8 - Freewheel spring pin (3)
- 9 - Freewheel spring (3)
- 10 - Freewheel roller cage
- 11 - Freewheel roller (15)
- 12 - Freewheel cam assembly
- 13 - Freewheel cam pin
- 14 - Freewheel cam
- 15 - Bolt, 3/8-24 x 3-1/16 (12)
- 16 - First-turbine driven gear assembly
- 17 - Roller bearing (2)
- 18 - First-turbine driven gear
- 19 - Thrust bearing race
- 20 - Thrust bearing
- 21 - Thrust bearing race
- 22 - Ball bearing
- 23 - Spacer

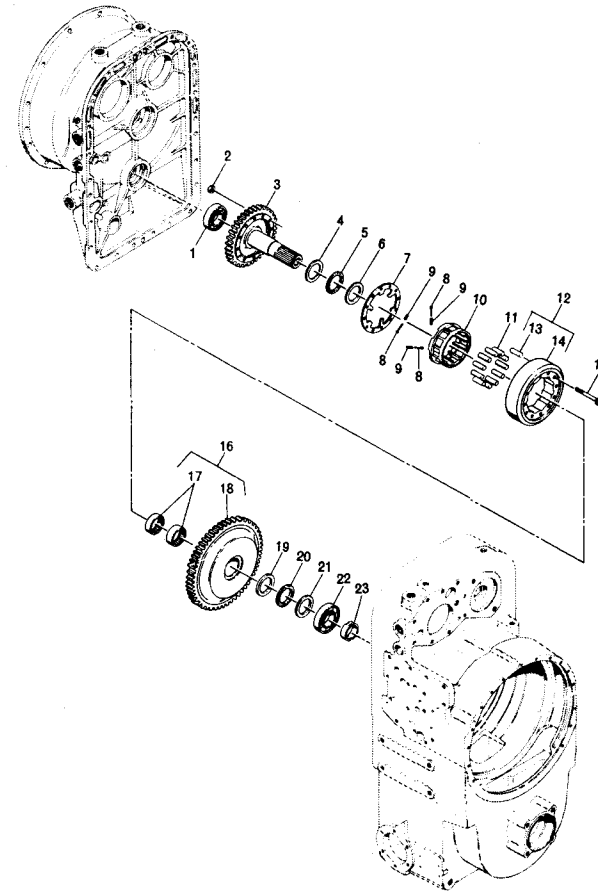
A



A, foldout 4. Torque converter housing, gearing

14504

B



B, foldout 4. Freewheel components

14522

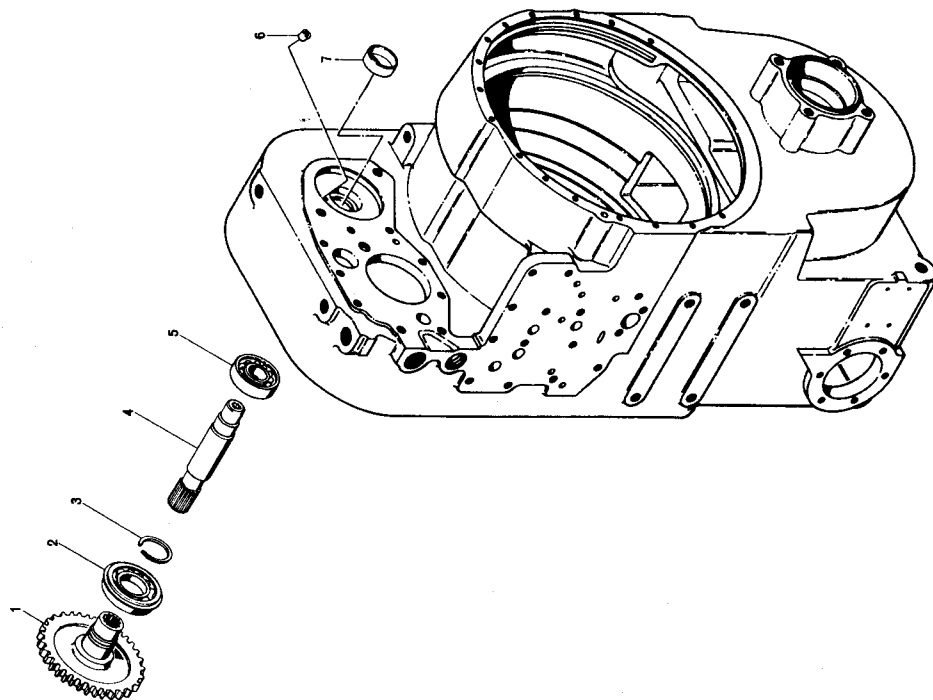
A

- 1 - Accessory driven gear
- 2 - Ball bearing
- 3 - Snapring
- 4 - Accessory drive shaft
- 5 - Ball bearing
- 6 - Plug
- 7 - Cup plug

B

- | | |
|---------------------------------|-----------------------------------|
| 1 - Bolt, 3/8-16 x 3/4 | 15 - Drain plug |
| 2 - Bolt, 3/8-16 x 3/4 | 16 - Nameplate |
| 3 - Bolt, 3/8-16 x 3/4 | 17 - Drive screw, no. 4 x 1/4 (4) |
| 4 - Suction tube | 18 - Bolt, 3/8-16 x 7/8 (6) |
| 5 - Suction tube seal | 19 - Lockwasher, 3/8 (6) |
| 6 - Transmission housing gasket | 20 - Oil Strainer |
| 7 - Remote filter plug | 21 - Oil strainer gasket |
| 8 - Plug | 22 - Anchor pin |
| 9 - Transmission housing | 23 - Oil filler plug |
| 10 - Breather | 24 - Add-level oil plug |
| 11 - Core hole cover gasket | 25 - Full-level oil plug |
| 12 - Core hole cover | 26 - Auxiliary lubrication tube |
| 13 - Lockwasher, 3/8 (6) | 27 - Bolt, 3/8-16 x 3/4 |
| 14 - Bolt, 3/8-16 x 7/8 (6) | |

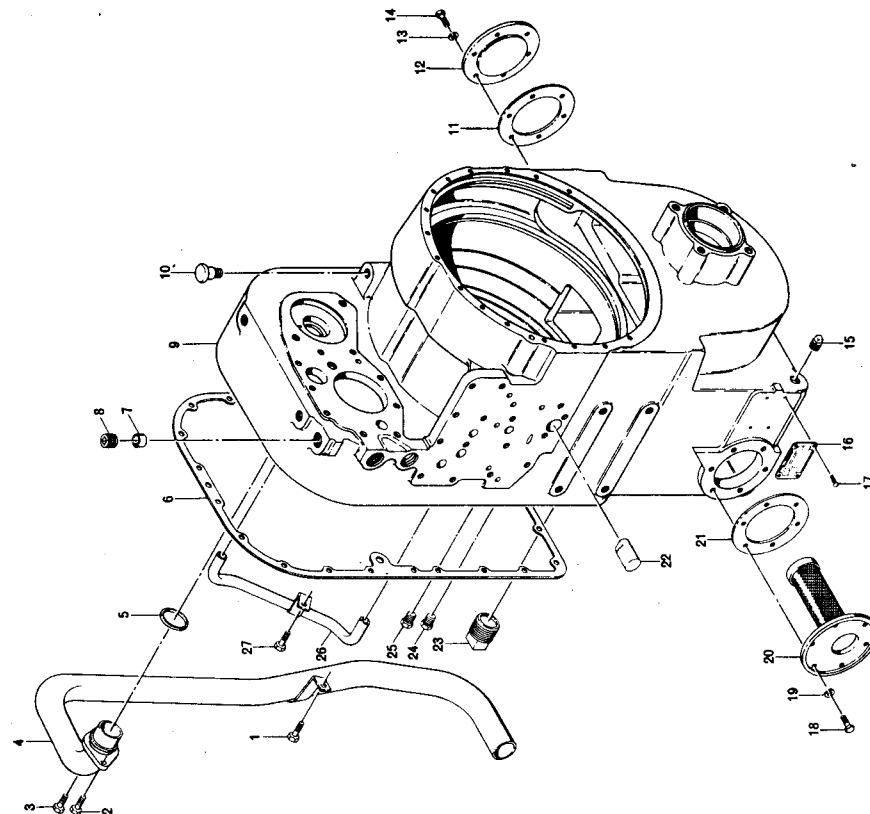
A



A, foldout 5. Accessory drive

14548

B



B, foldout 5. Transmission housing

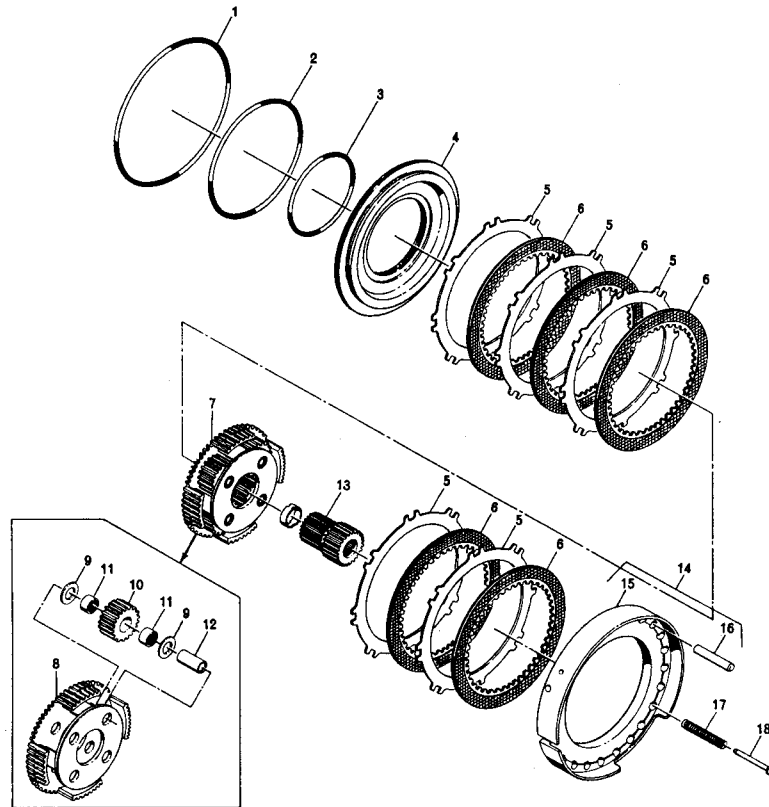
14518

A

- 1 - Lip type sealring
- 2 - Lip type sealring
- 3 - Lip type sealring
- 4 - Reverse piston assembly
- 5 - External-splined clutch plate (5)
- 6 - Internal-splined clutch plate (5)
- 7 - Reverse planetary carrier assembly
- 8 - Reverse planetary carrier
- 9 - Thrust washer (8)
- 10 - Planetary pinion (matched set of 4)
- 11 - Bearing assembly (8)
- 12 - Spindle (4)
- 13 - Reverse-and-low-range sun gear
- 14 - Reverse-and-low-range clutch anchor assembly
- 15 - Reverse-and-low-range clutch anchor
- 16 - Anchor pin (8)
- 17 - Piston return spring (15)
- 18 - Return spring guide pin (15)

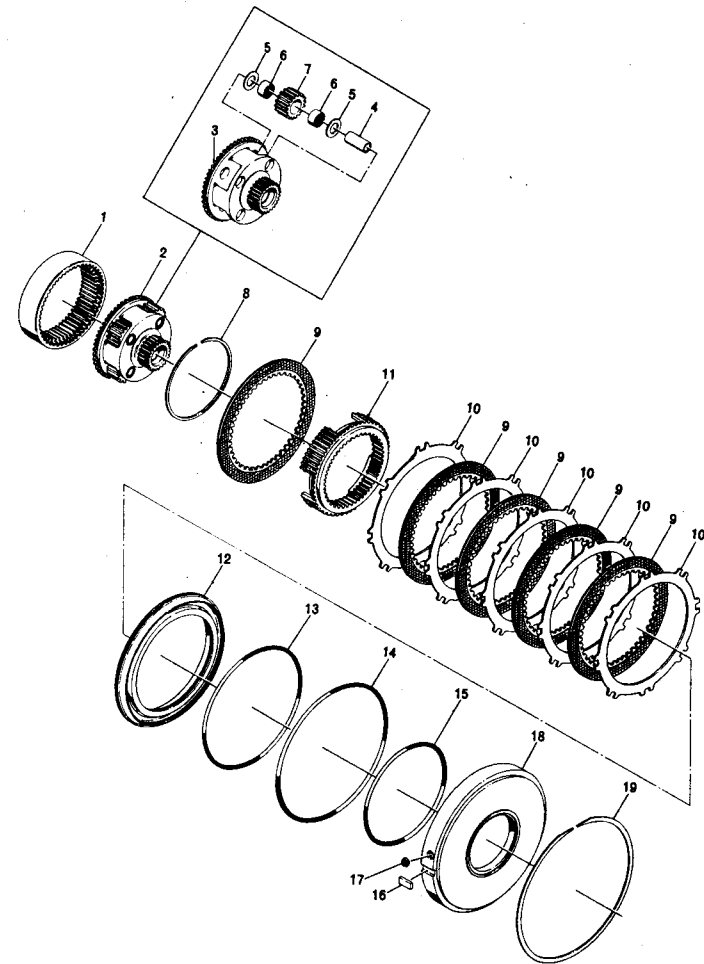
B

- 1 - Reverse ring gear
- 2 - Low-range planetary carrier assembly
- 3 - Low-range planetary carrier
- 4 - Spindle (4)
- 5 - Thrust washer (8)
- 6 - Planetary pinion roller bearing assembly (8)
- 7 - Planetary pinion (4)
- 8 - Snapring
- 9 - Internal-splined clutch plate (5)
- 10 - External-splined clutch plate (5)
- 11 - Low-range ring gear
- 12 - Low-range clutch piston
- 13 - Lip type sealring
- 14 - Lip type sealring
- 15 - Lip type sealring
- 16 - Anchor key
- 17 - Low-range clutch piston housing insert
- 18 - Low-range clutch piston housing
- 19 - Snapring

A

A, foldout 6. Reverse clutch, planetary

14523

B

B, foldout 6. Low-range clutch, planetary

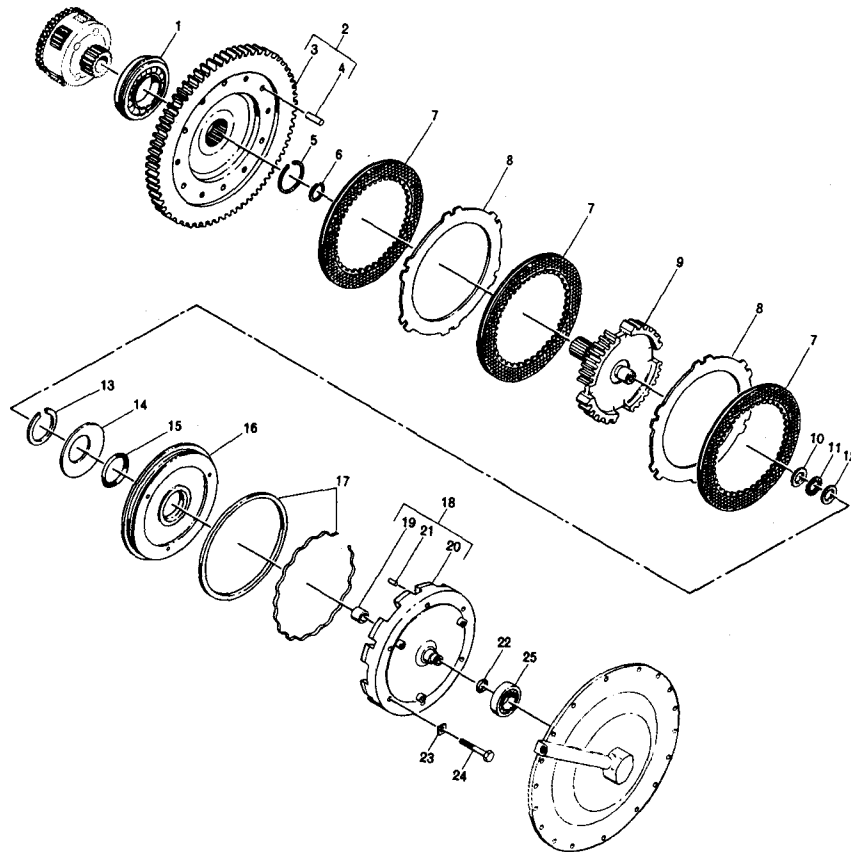
14546

A

- | | |
|---------------------------------------|---|
| 1 - Ball bearing | 14 - Piston return spring |
| 2 - Transfer drive gear assembly | 15 - Sealring |
| 3 - Transfer drive gear | 16 - High-range clutch piston |
| 4 - Pin (6) | 17 - Seal and expander kit |
| 5 - External snapping | 18 - High-range clutch housing assembly |
| 6 - External snapping | 19 - Bushing |
| 7 - Internal-splined clutch plate (3) | 20 - High-range clutch piston housing |
| 8 - External-tanged clutch plate (2) | 21 - Pin (3) |
| 9 - High-range clutch hub | 22 - Sealring |
| 10 - Thrust bearing race | 23 - Locktab (6) |
| 11 - Thrust bearing | 24 - Bolt, 1/2-20 x 2-3/4 (6) |
| 12 - Thrust bearing race | 25 - Ball bearing |
| 13 - External snapping | |

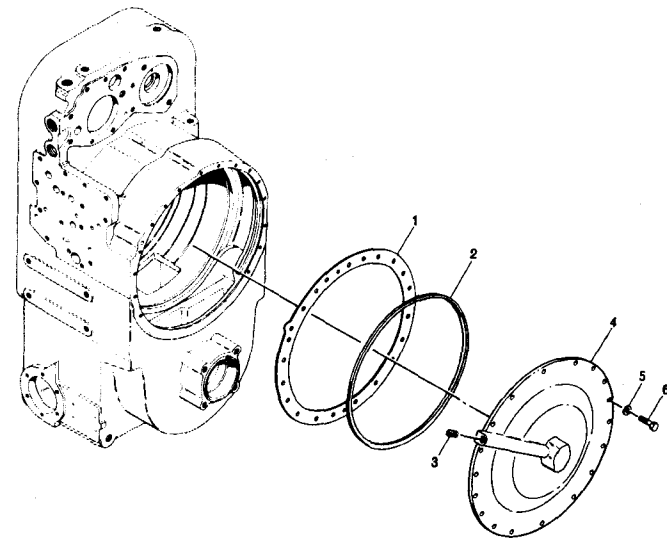
B

- 1 - Rear cover gasket
- 2 - Sealring
- 3 - Plug
- 4 - Rear cover
- 5 - Lockwasher, 3/8 (16)
- 6 - Bolt, 3/8-16 x 1-1/8 (16)

A

A, foldout 7. High-range clutch, transfer drive gear

14515

B

B, foldout 7. Rear cover

14524

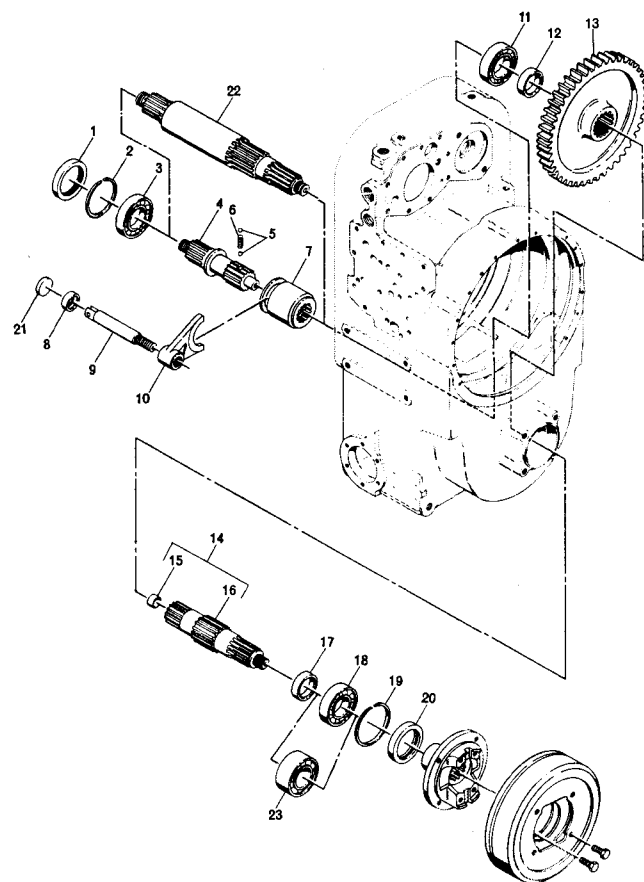
A

- 1 - Oil seal
- 2 - Internal snapping
- 3 - Ball bearing
- 4 - Front output shaft
- 5 - Detent ball (2)
- 6 - Detent spring
- 7 - Disconnect coupling
- 8 - Oil Seal
- 9 - Shifter fork shaft
- 10 - Shifter fork
- 11 - Ball bearing
- 12 - Spacer

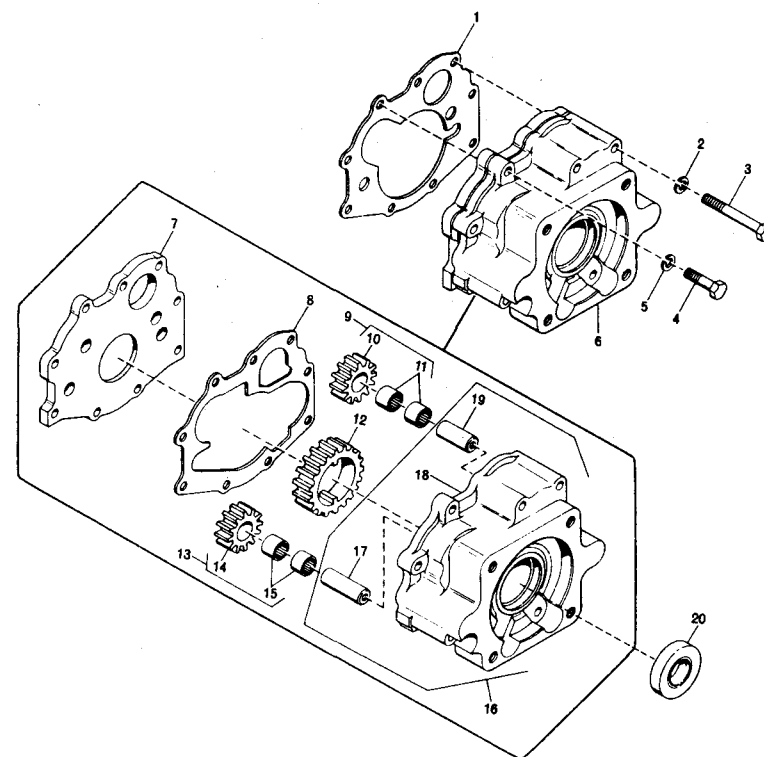
- 13 - Transfer driven gear
- 14 - Rear output shaft assembly
- 15 - Bushing
- 16 - Rear output shaft
- 17 - Spacer
- 18 - Ball bearing
- 19 - Internal snapping
- 20 - Oil seal
- 21 - Cap
- 22 - Front and rear output shaft
- 23 - Double-row ball bearing

B

- 1 - Oil pump gasket
- 2 - Lockwasher, 3/8 (7)
- 3 - Bolt, 3/8-16 x 4 (7)
- 4 - Bolt, 3/8-16 x 2 (2)
- 5 - Lockwasher, 3/8 (2)
- 6 - Oil pump assembly
- 7 - Oil pump cover
- 8 - Oil pump cover gasket
- 9 - Driven gear assembly
- 10 - Driven gear
- 11 - Roller bearing (2)
- 12 - Drive gear
- 13 - Driven gear assembly
- 14 - Driven gear
- 15 - Roller bearing (2)
- 16 - Oil pump body assembly
- 17 - Driven gear shaft
- 18 - Oil pump body
- 19 - Driven gear shaft
- 20 - Oil seal

A


A, foldout 8. Transfer driven gear, output shafts

B


B, foldout 8. Oil pump assembly

14519

14506

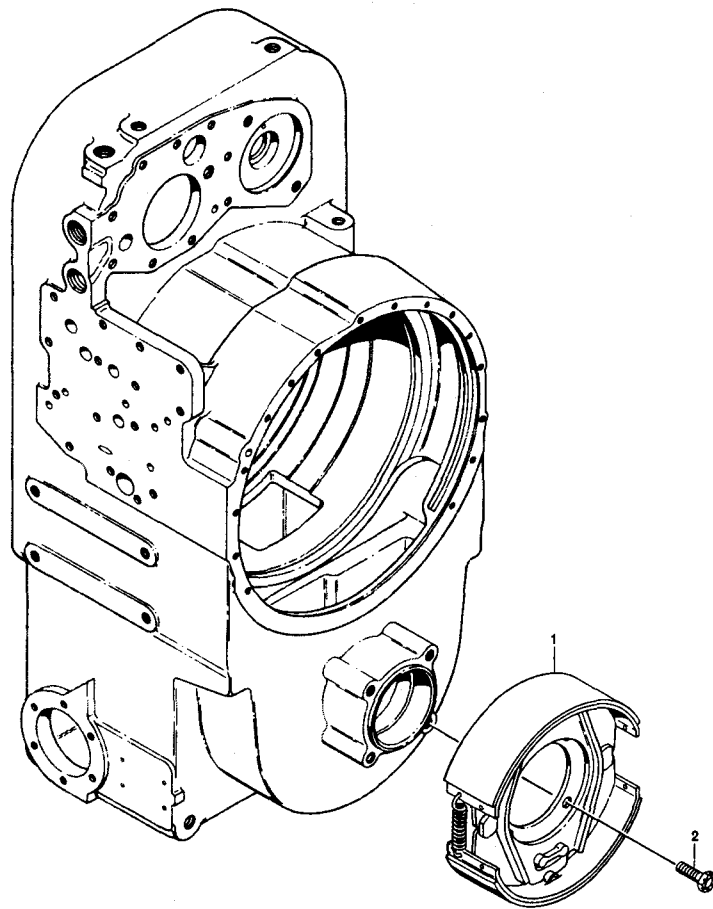
A

- 1 - Brake shoe and lining (2)
- 2 - Self-locking bolt, 1/2-13 x 7/8 (4)

B

- | | |
|-------------------------------------|----------------------------------|
| 1 - Control valve body gasket | 19 - Clutch cutoff valve spring |
| 2 - Lockwasher, 3/8 (16) | 20 - Clutch cutoff valve |
| 3 - Bolt, 3/8-16 x 1 | 21 - Plug |
| 4 - Bolt, 3/8-16 x 2-1/2 (15) | 22 - Sealring |
| 5 - Control valve body assembly | 23 - Gasket |
| 6 - Plug | 24 - Cutoff valve plug |
| 7 - Gasket | 25 - Manual range selector valve |
| 8 - Main-pressure regulator valve | 26 - Oil seal |
| 9 - Control valve body | 27 - Detent ball (2) |
| 10 - Ball | 28 - Plug |
| 11 - Ball retainer plug | 29 - Gasket |
| 12 - Valve stop | 30 - Detent spring (2) |
| 13 - Spring retainer | 31 - Plug (neutral switch hole) |
| 14 - Main-pressure regulator spring | 32 - Gasket |
| 15 - Trimmer spring | 33 - Plug |
| 16 - Trimmer plug | 34 - Gasket |
| 17 - Gasket | 35 - Plug |
| 18 - Plug | 36 - Plug |

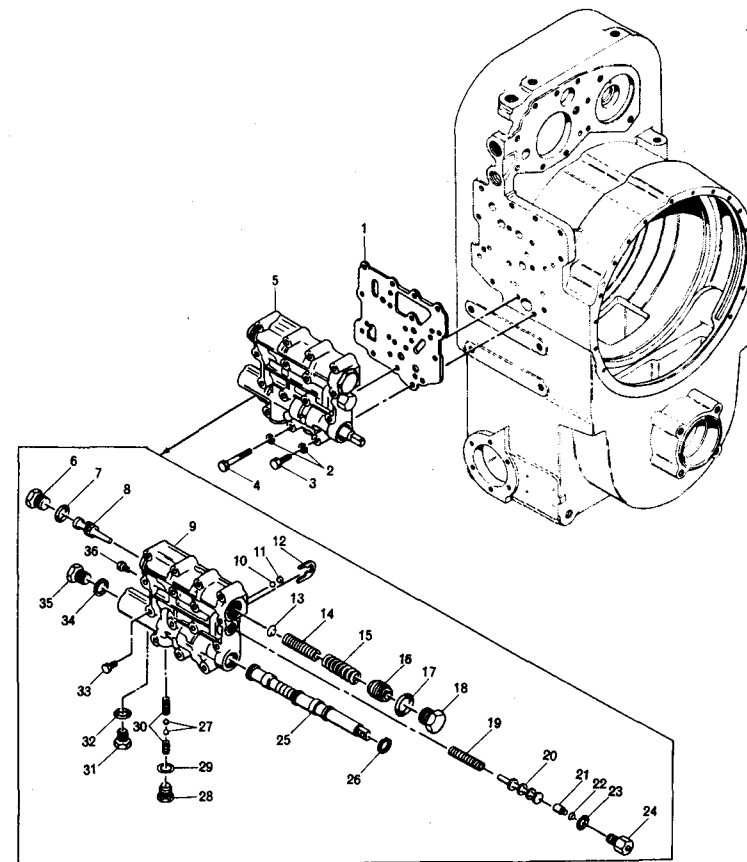
A



A, foldout 9. Parking brake

14552

B



B, foldout 9. Control valve assembly

14549