

Section VII ASSEMBLY OF TRANSMISSION FROM SUBASSEMBLIES

1. GENERAL

a. Scope

(1) The assembly procedures in this section describe the assembly of the transmission from subassemblies. Rebuild of the subassemblies is described in sect. VI. Para 2, below, describes assembly of the engine mount model, while para 3 describes the assembly of the remote mount model. Para 4 describes the assembly of the reverse-, forward-, and high-range clutch when the transmission is installed in the vehicle.

(2) Refer to the cross-section drawing (foldout 1) for functional location of parts. Refer to disassembly and assembly pictures and exploded views (foldouts 2 through 7) for parts identification.

b. Instructions for Assembly

(1) Refer to sect. IV, para 3 for tools and equipment before beginning assembly.

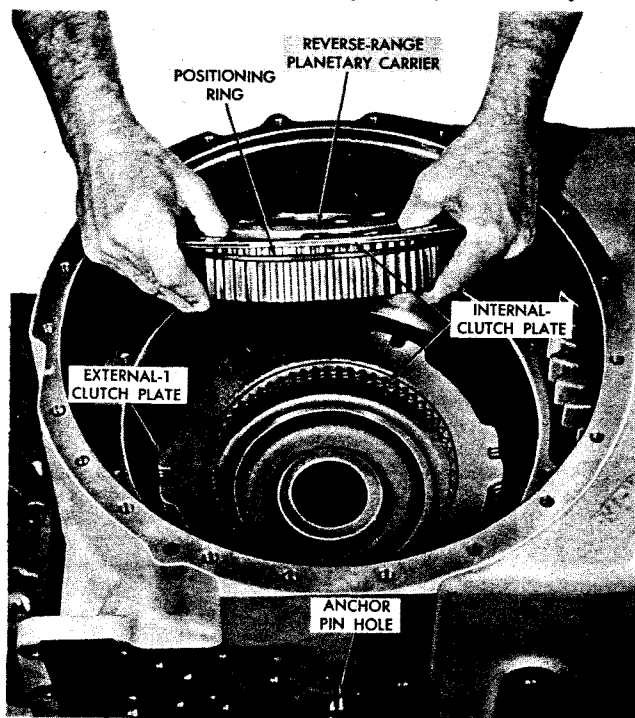


Fig. VII-1. Installing reverse-range planetary carrier and clutch plates

(2) Refer to sect. IV, para 10 for torque specifications.

(3) To assure proper lubrication of clutch plates during initial operation of new or rebuilt transmissions, each friction (internal-splined) plate should be dipped in transmission oil before assembling each clutch pack. The same oil as will be used for filling the transmission should be used for pre-assembly lubrication. It is also recommended that all moving parts be lubricated as the transmission is assembled.

2. ASSEMBLY OF ENGINE MOUNT MODEL

a. Assembly of Forward- and Reverse-range Clutch Anchor and Reverse-range Clutch and Planetary

(1) Position the transmission main housing on blocks on front split line. Install the reverse-range clutch piston and seal rings (fig. V-29). Coat the outside diameter of the seal rings with petroleum jelly to aid in installation into the piston bore. Rings that hang up should be removed and inspected for damage.

(2) Starting with an external-tanged clutch plate, install five external-tanged clutch plates and four internal-splined clutch plates alternately (fig. VII-1).

(3) Install the reverse-range planetary carrier assembly (fig. VII-1), and one internal-splined clutch plate on the positioning ring.

(4) Install the forward- and reverse-range clutch anchor assembly (fig. V-27). Make certain to align the anchor pin slot in the anchor with the anchor pin. Be sure the pins in the anchor assembly are indexed with the slotted tangs on the external clutch plates.

b. Assembly of Forward-range Clutch and Planetary

(1) Starting with an internal-splined clutch plate, alternately install two internal-

and two external-tanged clutch plates (fig. VII-2).

(2) Install forward-range planetary carrier and reverse-range ring gear (fig. VII-2).

(3) Install the forward-range ring gear (fig. VII-2).

(4) Install one internal-splined and one external-tanged clutch plate (fig. VII-2).

(5) Install 12 springs and 12 springpins (fig. VII-2). The correct springs have green paint on one end.

(6) Install the forward-range piston housing and piston assembly by pressing on the housing to compress the clutch springs, and start two 3/8-16 x 1 1/2 self-locking bolts 180° apart in the holes (fig. VII-3). Install the remaining eight bolts and pull the housing down evenly. Due to one bolt hole not being symmetrical with the other nine, the housing can be installed in one position only. This is to prevent improper installation with respect to the clutch oil apply line in the main housing and piston housing.

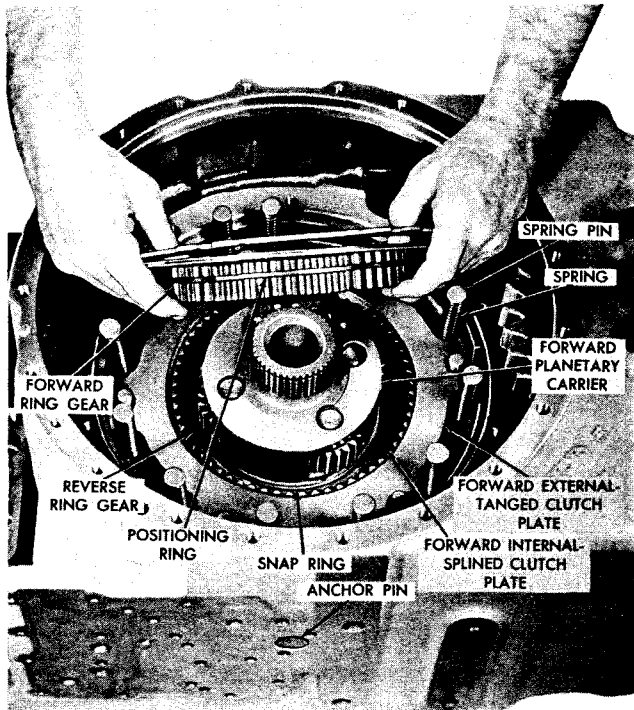


Fig. VII-2. Installing forward-range clutch plates, ring gear, springs and pins

c. Assembly of Rear Cover and High-range Clutch Assembly

(1) Install the transfer drive gear assembly and ball bearing (fig. VII-3).

(2) Install the snap ring that retains the transfer drive gear to the forward-range planetary carrier (fig. V-23).

(3) Install high-range clutch hub 7 (A, foldout 6), ball bearing 8, and snap ring 6 (fig. VII-4).

(4) Install two internal- and two external-tanged clutch plates starting with an internal plate (fig. VII-4).

(5) Install high-range clutch piston housing, piston and associated parts (fig. VII-4).

(6) Install six 1/2-20 x 2 3/4 bolts and six lock tabs. Bend the lock tabs to lock bolts (fig. VII-5).

(7) Install rear-cover gasket and rear cover (fig. VII-5). Aline the clutch oil apply line in the cover with the oil apply line in the housing.

(8) Install twenty-one 3/8-16 x 1 1/8 bolts and 21 lock washers.

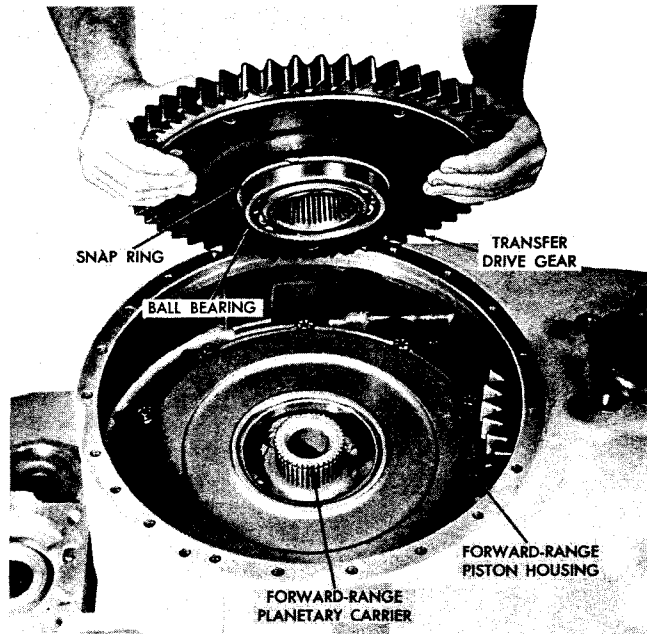


Fig. VII-3. Installing (or removing) transfer drive gear assembly

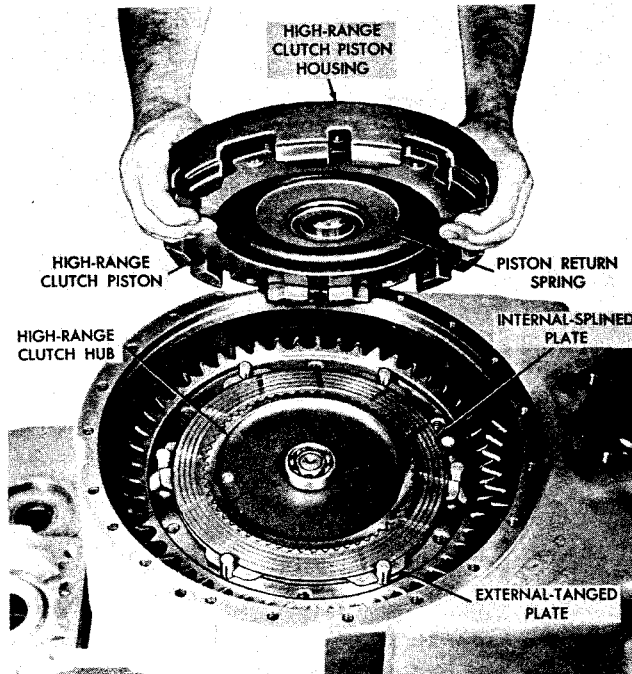


Fig. VII-4. Installing high-range clutch piston and housing

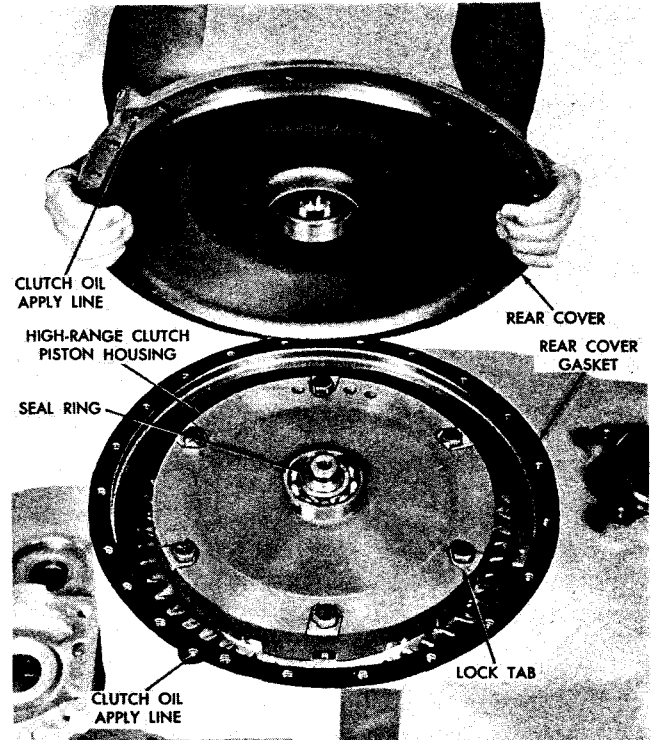


Fig. VII-5. Installing rear cover and gasket

d. Assembly of Input Gears and Freewheel Unit

(1) Position the transmission on the back side. Do not allow the transmission to rest on the rear-output shaft. Install the accessory drive shaft assembly and bearing (fig. VII-6).

(2) Install the first-turbine drive gear and seal ring (fig. VII-6).

(3) Install the roller bearing and two thrust races (fig. VII-6).

(4) Install the forward- and reverse-range sun gear (fig. V-18).

(5) Install the second-turbine driven gear, first-turbine driven gear and freewheel unit as an assembly (fig. VII-6).

(6) Install second-turbine drive gear, seal ring, snap ring and ball bearing (fig. V-17).

e. Assembly of Torque Converter Housing

(1) Install the gasket on the main housing, properly aligning the holes (fig. V-16).

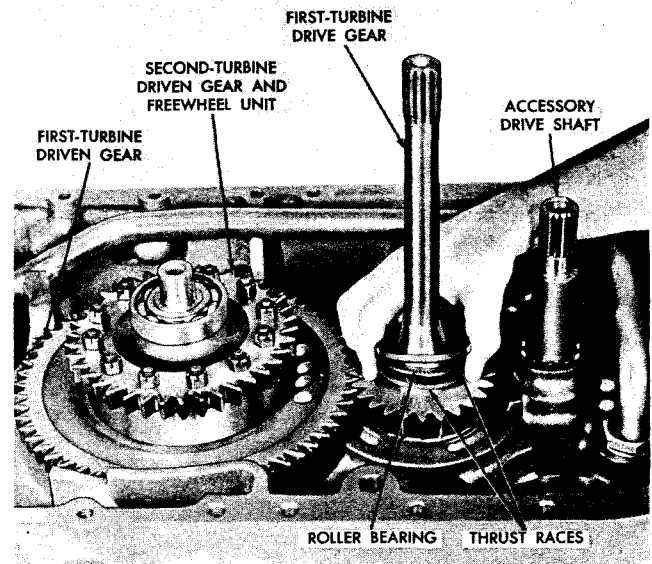


Fig. VII-6. Installing thrust race and bearing on first-turbine drive gear

(2) Attach a suitable sling to the engine mounting face and use a hoist to lower the torque converter housing assembly in place on the main housing (fig. V-16).

(3) Install twenty-three 7/16-14 x 1 3/8 and one 7/16-14 x 2 3/4 bolts and 24 lock washers and 24 flat washers (fig. V-15).

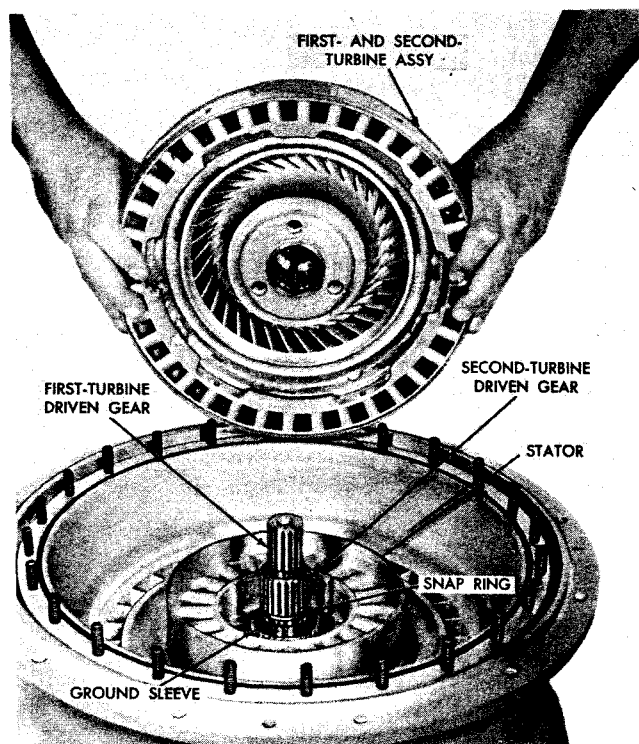


Fig. VII-7. Installing first- and second-turbine assembly

f. Assembly of Torque Converter Elements

(1) Install converter pump assembly 14 (A, foldout 3), bearing 17, accessory drive gear 18, retainer 13, gasket 16 and associated parts as an assembly. It may be necessary to heat bearing 17 in the assembly for easy installation. If necessary, heat the assembly in a furnace at 200° for 1 hour.

(2) Install spacer on the ground sleeve splines (fig. V-14).

(3) Install the stator on ground sleeve splines (fig. VII-7).

(4) Install the snap ring on the ground sleeve (fig. VII-7).

(5) Install the first- and second-turbine assembly, engaging the splines on the first-turbine driven gear and second-turbine driven gear.

g. Assembly of Flex Disks and Torque Converter Cover Assembly

(1) Make certain that the seal ring is

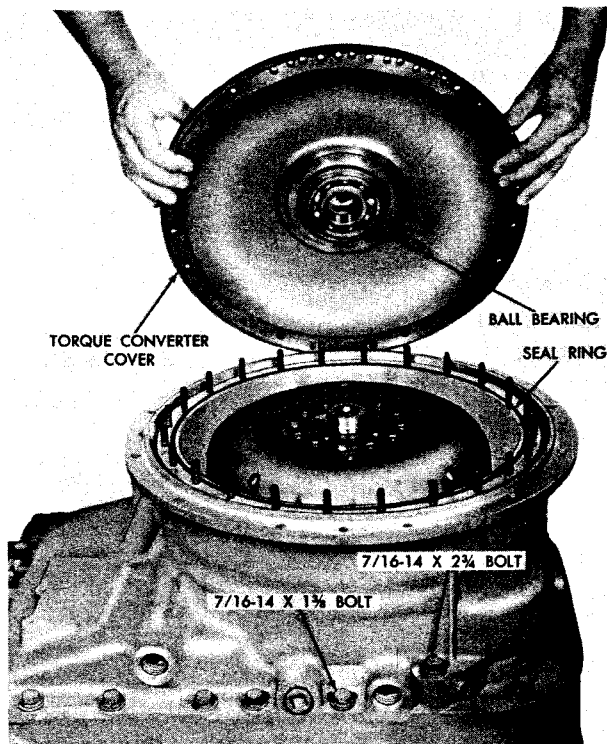


Fig. VII-8. Installing torque converter cover

properly installed in its groove in the converter pump (fig. VII-8).

(2) Install the converter cover and ball bearing on the converter pump (fig. VII-8).

(3) Install twenty-four 5/16-24 nuts on the pump studs, and tighten (fig. V-10).

(4) Install one flex disk assembly and three flex disks in that order, a plate and six 1/2-13 x 1 bolts and tighten bolts (fig. V-9).

h. Assembly of Valve Body

(1) Using a suitable sling and hoist, set the transmission upright on a work table.

(2) Install the valve body and gasket with fifteen 3/8-16 x 2 1/2, and one 3/8-16 x 1 bolts and 16 lock washers (fig. V-7).

**i. Assembly of Brake Assembly
(B, foldout 6)**

(1) Install brake back plate 25 with four 1/2-13 x 7/8 self-locking bolts 35.

(2) Install a spacer 26, brake apply arm 29, two brake shoes 27, and two springs 28.

j. Assembly of Output Flanges

(1) Coat the splines of the rear output shaft and the lip of seal 23 (B, foldout 6), with a thin layer of bearing grease and install output flange 34. If the flange is a tight fit, heat the flange to a minimum of 250° F prior to assembly. Two methods for heating are suggested as follows:

(a) Heat in a controlled furnace for a minimum of 30 minutes.

(b) Submerge the flange in a container of oil and heat the oil (if an acetylene torch is used, heat for 15 minutes).

(2) Immediately upon removing flange from the heat source, install the flange on the shaft.

Caution: Do not allow flange to cool before installing on shaft.

Make sure that the flange is tight against its shoulder. The flange should slide freely onto the shaft. Coat the shaft threads very lightly with molybdenum disulphide grease.

(3) Install flange washer 32 and flange nut 30 and torque nut to 600 to 800 pound feet.

(4) Install front output flange 3, washer 2 and nut 1 in the same manner.

k. Assembly of Charging Oil Pump

(1) Fill the oil pump assembly with oil before assembling.

(2) Install oil pump assembly 6 (A, foldout 7), gasket 1 and secure with seven 3/8-24 x 2 bolts 3, two 3/8-16 x 2 1/2 bolts 4 and nine lock washers 2 and 5.

l. Assembly of Minor Assemblies
(B, foldout 6)

(1) Install brake drum 30 and four 1/2-13 x 5/8 bolts 31.

(2) Install oil strainer gasket 25 (A, foldout 4) and oil strainer assembly 24 and secure it with six 3/8-16 x 7/8 bolts and lock washers (fig. V-2).

(3) Install oil drain plug 19 (A, foldout 4) (fig. V-2).

(4) Install breather 9 (A, foldout 4).

(5) On models that do not have the accessory drive option, install accessory drive cover gasket 11, cover plate 12, two 3/8-16 x 1 bolts 14 and two lock washers 13.

(6) If core hole cover 16 (A, foldout 4) was removed, install gasket 15, cover 16, two lock washers 17 and two 3/8-16 x 7/8 bolts 18.

3. ASSEMBLY OF REMOTE MOUNT MODEL

a. General. The assembly procedures described in para 2, above, also apply to the remote mount model, except for the installation of the transmission front cover, converter drive and related parts. Para 3b, below, describes the assembly of the remote mount transmission.

b. Assembly (A, foldout 2)

(1) Follow the same general procedures as described in para 2a through 2f, above.

(2) After completing the assembly procedures referred to in (1), above, continue with (3) through (7), below.

(3) Install torque converter cover 13 and align the bolt holes. Secure the cover with twenty-four 5/16-24 self-locking nuts 12.

(4) If ball bearing 8 was removed from input shaft 11, press the bearing in place on the shaft. Install the shaft and bearing as an assembly on the converter cover and align the bolt holes. Secure with six 1/2-13 x 1 1/8 bolts 9 and three lock strips 10. Bend the lock strips against the bolt heads.

(5) If the oil seal 4 was removed from transmission front cover 6, install a new seal. Install gasket 7 on torque converter housing 40 (B, foldout 3) and align bolt holes. Install front cover 6 (A, foldout 2) and align bolt holes. Secure front cover with twelve 3/8-24 x 2 bolts 5, lock washers 14 and nuts 15.

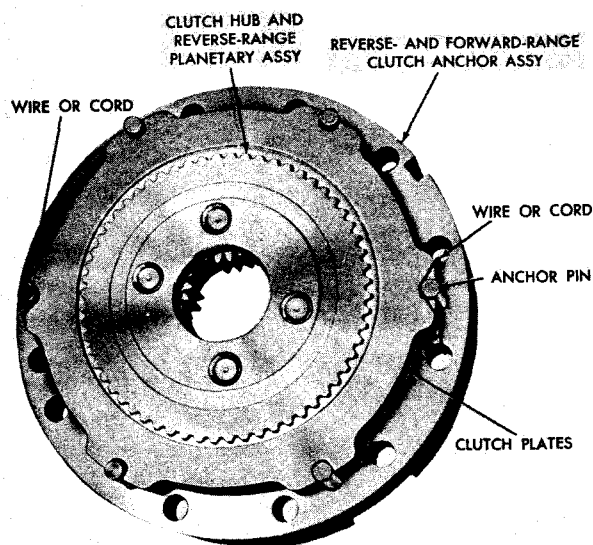


Fig. VII-9. Reverse-range clutch plates on reverse-range planetary carrier and hub, wired in position on reverse- and forward-range anchor

(6) Install input flange 3 in the same manner described in para 2j, above, which describes output flange installation.

(7) Install flange washer 2 and flange nut 1 and torque nut to 600 to 800 pound feet.

4. ASSEMBLY OF HIGH-RANGE CLUTCH, FORWARD-RANGE CLUTCH AND PLANETARY, REVERSE-RANGE CLUTCH AND PLANETARY - WITH TRANSMISSION IN VEHICLE

a. Condition. It is possible to install the high-range clutch, the forward-range clutch and planetary, and the reverse-range clutch and planetary, while the transmission is installed in the vehicle. The assembly is described as follows:

b. Assembly

(1) Assemble reverse-range clutch plates 7 and 8 (A, foldout 5) on clutch hub 11 which is part of reverse-range planetary carrier assembly 9, and position these in place on reverse- and forward-range clutch anchor assembly 16 (A, foldout 5), (fig. VII-9). Insert a soft wire or cord through one spring hole in the anchor, around the anchor pin and over

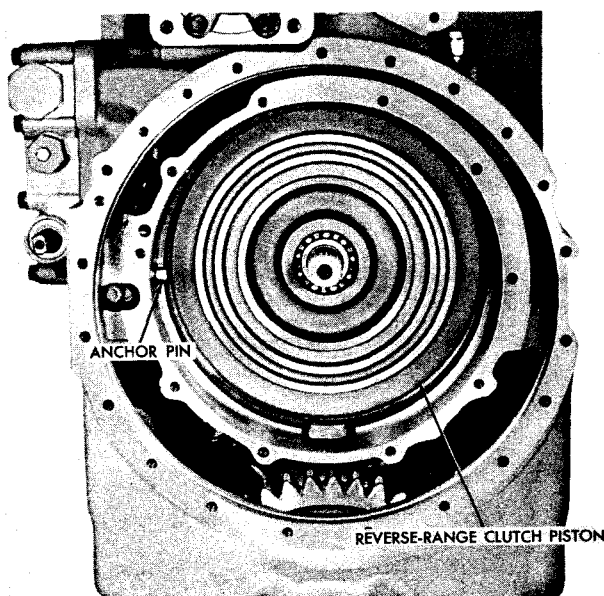


Fig. VII-10. Reverse-range piston and anchor pin installed

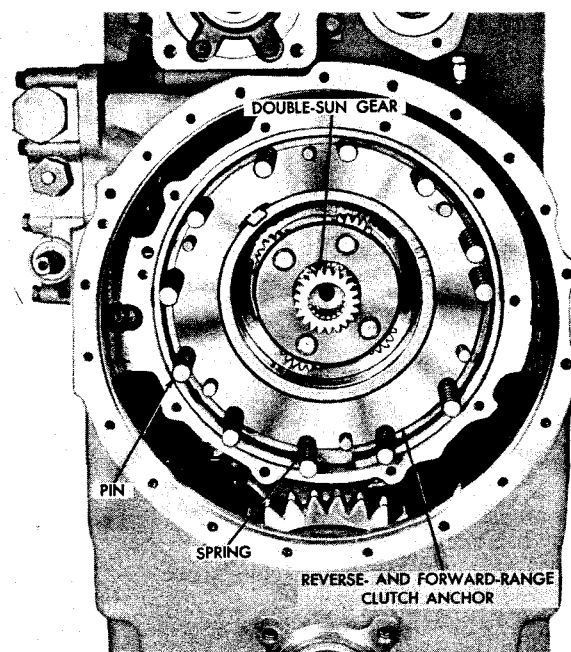


Fig. VII-11. Double-sun gear, springs and pins installed the tangs of the external clutch plate and then through the adjacent spring hole. Then tie the wire or cord to hold the plates in place.

(2) Repeat this operation 180° away (fig. VII-9).

(3) With reverse-range piston in place, slide the above wired assembly into place, aligning the anchor to the anchor pin (fig. VII-10 and -11).

(4) Make certain the assembly is securely seated and remove the wire or cord.

(5) Install the double-sun gear, forward-range planetary carrier, forward-range ring gear and clutch plates (fig. VII-11), (fig. VII-2).

(6) Install the piston return springs and pins (fig. VII-11).

(7) Install the forward-range piston and housing and 10 self-locking 3/8-16 x 1/2 bolts (fig. VII-3).

(8) Install the transfer gear and bearing assembly with snap ring (fig. V-23), (fig. VII-3).

(9) Install the high-range hub (with snap ring in place), clutch plate, piston and housing assembly (fig. VII-4).

(10) Install the rear cover and gasket and twenty-one 3/8-16 x 1 1/8 bolts and lock washers (fig. VII-5).

(11) If the unit is equipped with a brake assembly, install as instructed in 2i, 2j and 2l (1), above.

Section VIII WEAR LIMITS

1. KEYED TO EXPLODED VIEWS

The wear limits data, below, are keyed to the exploded views (foldouts 2 through 7) in the back of this manual.

2. WEAR LIMITS DATA

a. Maximum Variations. The following wear limits information shows the maximum variations at which the components are expected to function satisfactorily. The tolerances do not include a life factor for further periods of operation without replacing or reworking worn parts.

b. See Cleaning, Inspection. All wear limits information must be used in conjunction with the cleaning and inspection instructions given in sect. IV, para 6.

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

d. Gears. Gears should be inspected for load pattern and signs of distress. Any distress indicates a possible future failure and the re-using of such gears should be the decision of the individual customer, based on previous experience. Backlash cannot be used to establish critical wear of a gear since production backlash tolerances are of such nature that a gear usually pits, scuffs, scores or

galls long before the gear wears sufficiently that such wear could be determined by backlash measurements.

e. Splines. Unless severe, spline wear is not considered detrimental except where it affects tightness of an assembly such as drive line flanges. Here again, backlash cannot be used to establish critical wear of splines since both parts (male and female) must be centrally located in respect to each other in order to obtain a correct measurement.

f. Oil Seals. Seals should be replaced if there are signs of excessive hardening, scoring, or other indications of deterioration.

g. Springs. Springs should be replaced if they show signs of overheating, permanent set (see individual part wear limits for load versus height dimensions), or wear due to rubbing adjacent parts.

h. Piston-type Seal Rings. The sides of the seal ring should be smooth; maximum wear 0.005. The sides of the shaft groove in which the seal ring runs should be smooth (50 micro inch equivalent), and square with the axis of rotation within 0.002. A new seal ring should be installed if shaft grooves are reworked, or seal ring outside diameter wear causes the possibility of closing the gap between seal ring hooks when the ring is installed.

3. WEAR LIMITS CHART

The following chart covers the tabulated wear limits data and is referenced to the exploded views (foldouts) in back of the manual.

(Wear Limits Chart follows on next page)

WEAR LIMITS CHART

<u>Illustration</u>	<u>Description</u>	<u>Dimension</u>	<u>Wear Limit</u>	<u>Cone</u>
B, foldout 3 TORQUE CONVERTER HOUSING				
24	Converter safety spring			
	— free height	1.206 approx	*	
	— height under load	26.0 lb \pm 2.6 at 1.00 in.	*	
		44.9 lb \pm 4.4 at 0.85 in.	*	
27	Lube spring			
	— free height	1.440 approx	*	
	— height under load	6.20 lb \pm 0.620 at 1.00 in.	*	
30	Thrust race	0.030/0.032	0.028	
32	Thrust race	0.123/0.126	0.120	
B, foldout 4 TURBINE DRIVEN GEARS, FREEWHEEL UNIT				
**6	Freewheel cam — surface wear		0.005	
**7	Roller clutch assembly—roller	0.3480/0.3477 dia	0.3472	
**11	First-turbine driven gear race	3.4377/3.4372 dia	3.4272	
A, foldout 5 REVERSE CLUTCH AND PLANETARY				
7	Reaction plate	0.123/0.107	0.097	0.030 max
8	Friction plate	0.156/0.150	0.130	0.012 max
9	Reverse-range carrier assembly	Gear end play	0.055	
17	Anchor — clutch plate reaction surface	Face wear	0.020	
19	Piston return spring			
	— free height	6.127 approx	*	
	— height under load	47.5 lb \pm 2.4 at 4.80 in.	*	
		60.0 lb \pm 3.0 at 4.45 in.	*	
	Minimum clutch plate pack thickness permissible		1.185	
B, foldout 5 FORWARD CLUTCH AND PLANETARY				
2	Forward-range carrier assembly	Gear end play	0.055	
9	Friction plate	0.156/0.150	0.130	0.012 max
10	Reaction plate	0.123/0.107	0.097	0.030 max

* Replace if not within dimension given

** Total wear of freewheel parts (2 x roller wear + 2 x cam surface wear + race wear) shall not exceed 0.010 inch. All rollers must be free in cage but must not fall out.

(Continued on next page)

WEAR LIMITS CHART - (Continued)

<u>Illustration</u>	<u>Description</u>	<u>Dimension</u>	<u>Wear Limit</u>	<u>Cone</u>
FORWARD CLUTCH AND PLANETARY - Continued				
A, foldout 5				
17	Anchor - clutch plate reaction surface	Face wear	0.020	
	Minimum clutch plate pack thickness permissible		0.691	
A, foldout 6 HIGH-RANGE CLUTCH				
3	Gear - clutch plate reaction surface	Face wear	0.020	
9	Reaction plate	0.123/0.107	0.097	0.030 max
10	Friction plate	0.156/0.150	0.130	0.012 max
12	Piston return spring - free height	0.250/0.300	*	
13	Piston	Face wear	0.020	
	Minimum clutch plate pack thickness permissible		0.367	
B, foldout 6 FRONT-OUTPUT DISCONNECT CLUTCH				
9	Disconnect shaft detent spring			
	- free height	1.320 approx	*	
	- height under load	13.2 lb \pm 1.32 at 1.150 in.	*	
A, foldout 7 CHARGING OIL PUMP				
11	Pump gear driven shaft	0.750 dia	0.749 dia	
B, foldout 7 CONTROL VALVE BODY				
8 and 9	Main pressure regulator valve to control valve body (valve clearance)		0.004	
15	Main regulator spring			
	- free height	3.055 approx	*	
	- height under load	7.90 lb \pm 0.40 at 2.70 in.	*	
		28.50 lb \pm 0.50 at 1.77 in.	*	
16	Trimmer spring			
	- free height	2.900 approx	*	
	- height under load	28.40 lb \pm 2.80 at 2.384 in.	*	
		80.00 lb \pm 8.00 at 1.450 in.	*	

* Replace if not within the dimension given

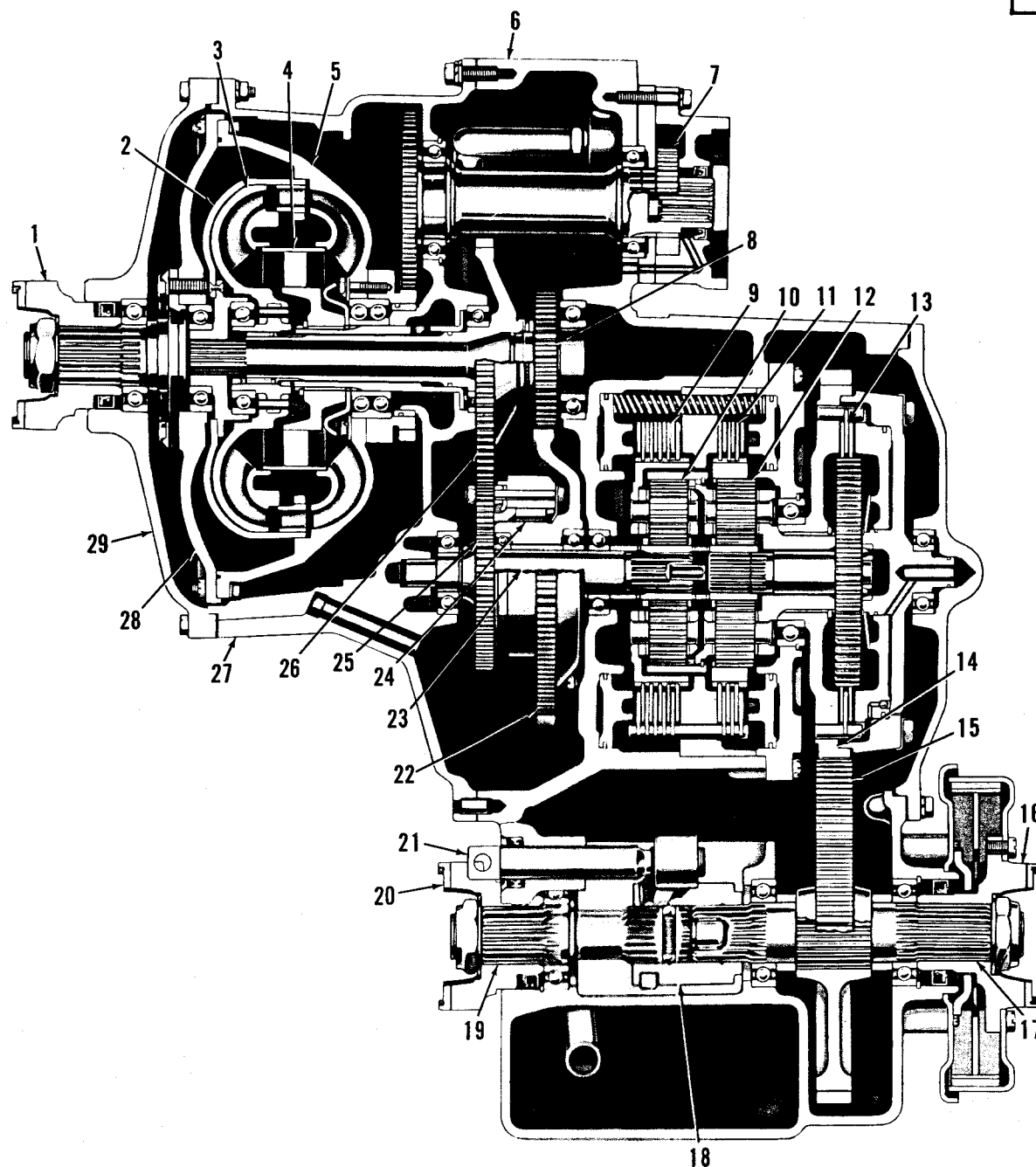
(Continued on next page)

WEAR LIMITS CHART - (Continued)

<u>Illustration</u>	<u>Description</u>	<u>Dimension</u>	<u>Wear Limit</u>	<u>Cone</u>
B, foldout 7 - Continued				
17 and 9	Trimmer valve to control valve body (valve clearance)		0.0035	
20	Clutch cutoff valve spring			
	— free height	3.200 approx	*	
	— height under load	31 lb \pm 3.10 at 2.38 in.	*	
21 and 9	Clutch cutoff valve to control valve body (valve clearance)		0.004	
22 and 26	Clutch cutoff valve plug to clutch cutoff valve retainer plug (valve clearance)		0.004	
29 and 9	Selector valve to control valve body (valve clearance)		0.003	
33	Selector detent spring			
	— free height	1.140 approx	*	
	— height under load	13.80 lb \pm 0.20 at 0.78 in.	*	
38	Inching valve control spring			
	— free height	1.295/1.265 approx	*	
	— height under load	4.00 lb \pm 0.07 at 0.78 in.	*	
39 and 9	Inching regulator valve to control valve body (valve clearance)		0.003	
41	Inching pressure regulator spring			
	— free height	3.80 approx	*	
	— height under load	26.50 lb \pm 1.30 at 2.00 in.	*	
42 and 9	Inching valve to control valve body (valve clearance)		0.003	
43	Inching valve control spring			
	— free height	5.750 approx	*	
	— height under load	30.00 lb \pm 1.50 at 4.04 in.	*	

* Replace if not within the dimension given

- | | |
|--------------------------------|--|
| 1 - Input flange | 16 - Rear-output flange |
| 2 - First turbine | 17 - Rear-output shaft |
| 3 - Second turbine | 18 - Disconnect splined collar |
| 4 - Stator | 19 - Front-output shaft |
| 5 - Converter pump | 20 - Front-output flange |
| 6 - Transmission main housing | 21 - Disconnect shifter shaft |
| 7 - Charging oil pump assembly | 22 - First-turbine driven gear |
| 8 - First-turbine drive gear | 23 - Range gear input shaft (second-turbine driven gear) |
| 9 - Reverse-range clutch | 24 - Freewheel clutch |
| 10 - Reverse-range planetary | 25 - Second-turbine driven gear |
| 11 - Forward-range clutch | 26 - Second-turbine drive gear |
| 12 - Forward-range planetary | 27 - Converter housing |
| 13 - High-range clutch | 28 - Converter pump cover |
| 14 - Transfer drive gear | 29 - Converter housing cover |
| 15 - Transfer driven gear | |



Foldout 1 TT 2220-1 Torqmatic Hydro POWERSHIFT transmission, remote mounted—cross section

A

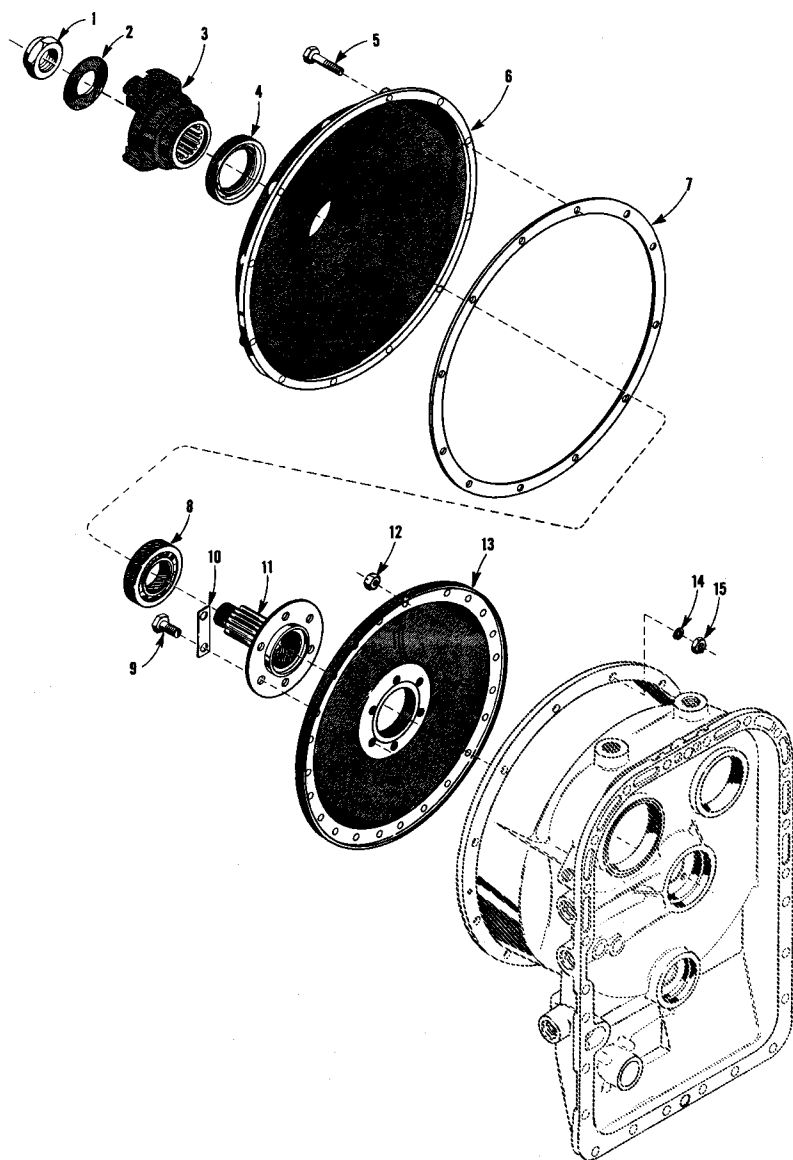
- 1 - Flange retaining nut
- 2 - Flange washer
- 3 - Flange
- 4 - Seal
- 5 - Bolt, 3/8-24 x 2 (12)
- 6 - Transmission front cover
- 7 - Front-cover gasket
- 8 - Single-row ball bearing
- 9 - Bolt, 1/2-13 x 1 1/8 (6)
- 10 - Lock strip (3)
- 11 - Input shaft
- 12 - Self-locking nut, 5/16-24 (24)
- 13 - Torque converter cover
- 14 - Lock washer, 3/8 (12)
- 15 - Nut, 3/8-24 (12)

B

- 1 - Self-locking bolt, 1/2-13 x 1 (6)
- 2 - Flex disk plate
- 3 - Flexible disk (3)
- 4 - Flexible disk assembly
- 5 - Nut, 5/16-24 (24)
- 6 - Torque converter cover assembly
- *7 - Torque converter cover
- 8 - Plug
- 9 - Seal ring
- 10 - Oil seal
- 11 - Converter diaphragm
- 12 - Plug

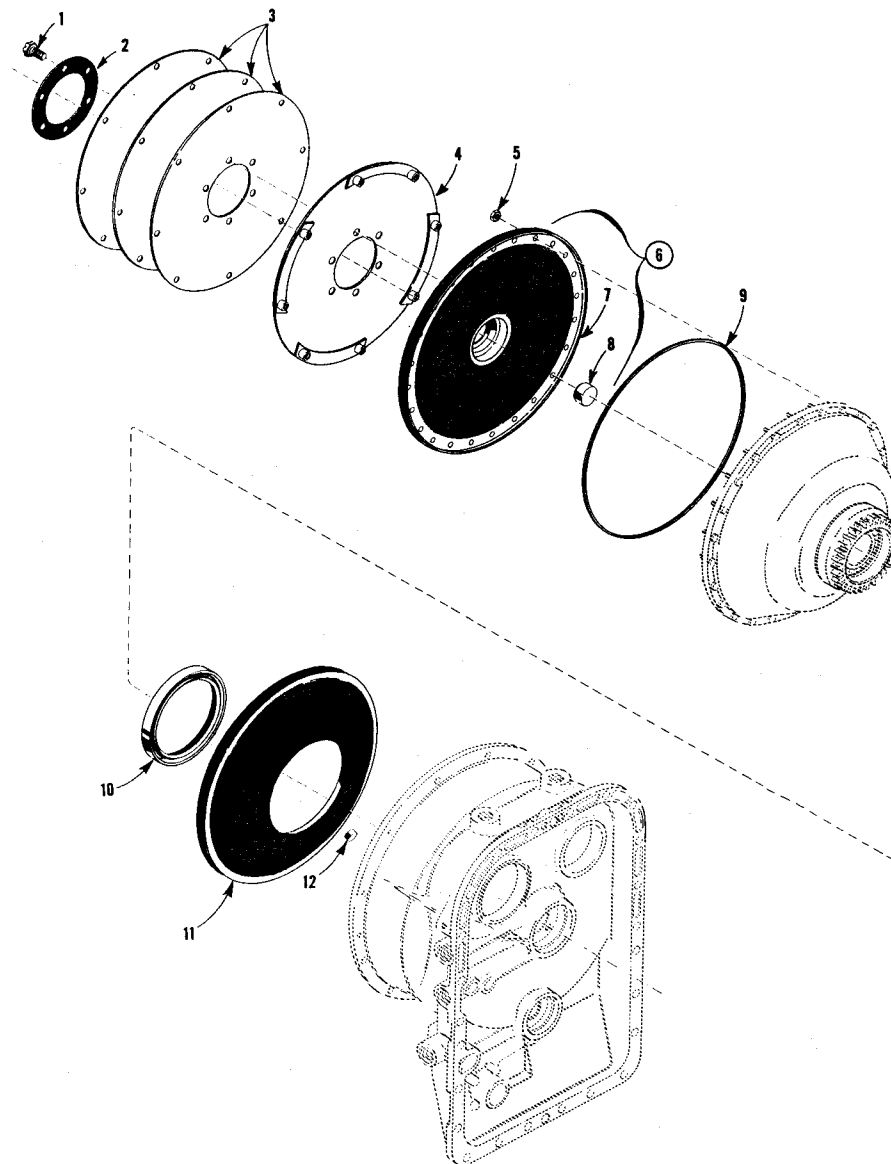
* Serviced as an assembly only — not as a detail part

A



A, foldout 2 Transmission front cover and converter drive—exploded view

B



B, foldout 2 Flex disk, converter drive and dry converter housing—exploded view

A

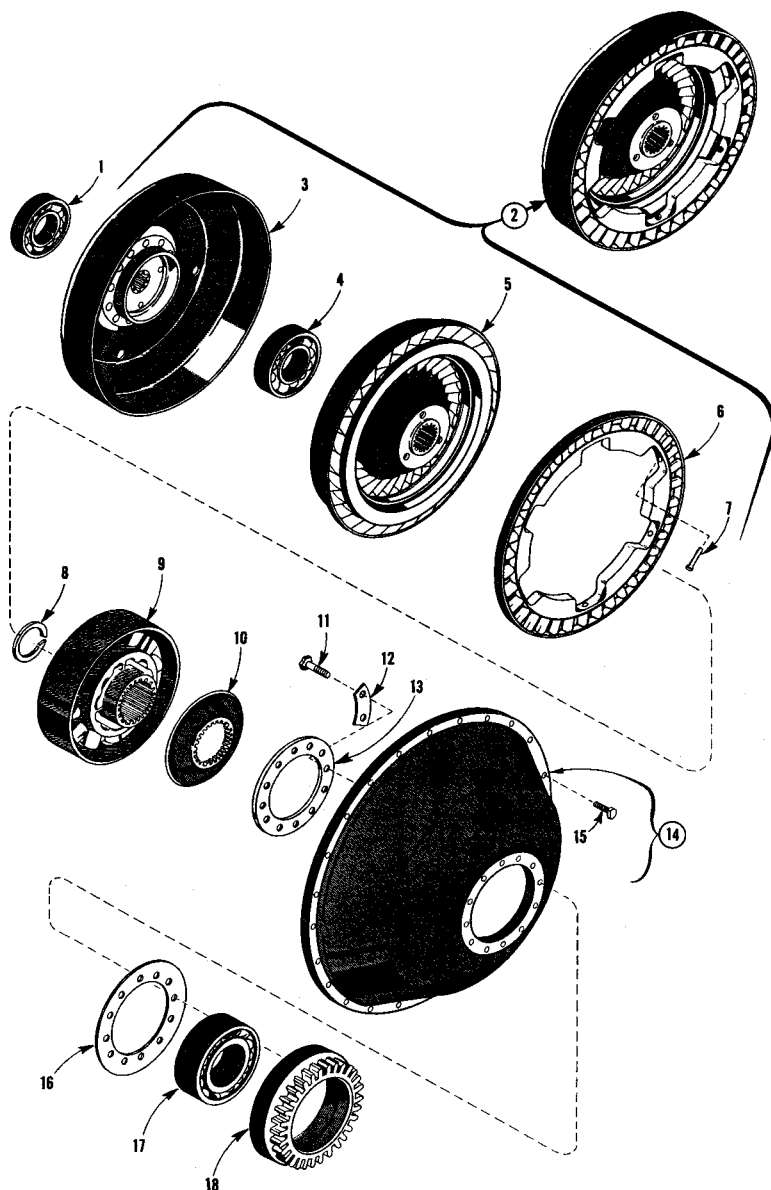
- 1 - Single-row ball bearing
- 2 - First- and second-turbine assembly
- 3 - First-turbine support
- 4 - Single-row ball bearing
- 5 - Second turbine
- 6 - First turbine
- 7 - Pin (6)
- 8 - External-snap ring
- 9 - Torque converter stator
- 10 - Spacer
- 11 - Bolt, 5/16-24 x 1 (12)
- 12 - Lock strip (6)
- 13 - Pump retainer
- 14 - Torque converter pump assembly
- 15 - Bolt, 5/16-24 x 1.30 (24)
- 16 - Pump gasket
- 17 - Double-row ball bearing
- 18 - Input accessory drive gear

B

- | | |
|---|--------------------------------------|
| 1 - Accessory drive gear | 23 - Converter regulator valve |
| 2 - Bolt, 7/16-14 x 1 3/8 (23) | 24 - Converter regulator spring |
| 3 - Lock washer, 7/16 (23) | 25 - Valve guide pin |
| 4 - Flat washer (23) | 26 - Lube regulator valve |
| 5 - Bolt, 7/16-14 x 2 3/4 | 27 - Lube regulator spring |
| 6 - Lock washer | 28 - Valve guide pin |
| 7 - Flat washer | 29 - Seal ring |
| 8 - Single-row ball bearing | 30 - Thrust race |
| 9 - Snap ring | 31 - Thrust roller bearing |
| 10 - Accessory drive shaft assembly | 32 - Thrust race |
| 11 - Plug | 33 - First-turbine drive gear |
| 12 - Accessory drive shaft | 34 - Single-row ball bearing |
| 13 - Single-row ball bearing | 35 - Converter housing assembly |
| 14 - Single-row ball bearing | 36 - Converter housing dowel pin (2) |
| 15 - External-snap ring | 37 - Plug |
| 16 - Single-row ball bearing | 38 - Plug |
| 17 - Converter ground sleeve | 39 - Converter housing sleeve |
| 18 - Self-locking bolt, 5/16-18 x 3/4 (4) | *40 - Converter housing |
| 19 - Seal ring | 41 - Plug (2) |
| 20 - Single-row ball bearing | 42 - Seal ring |
| 21 - Snap ring | 43 - Accessory driven gear |
| 22 - Second-turbine drive gear | |

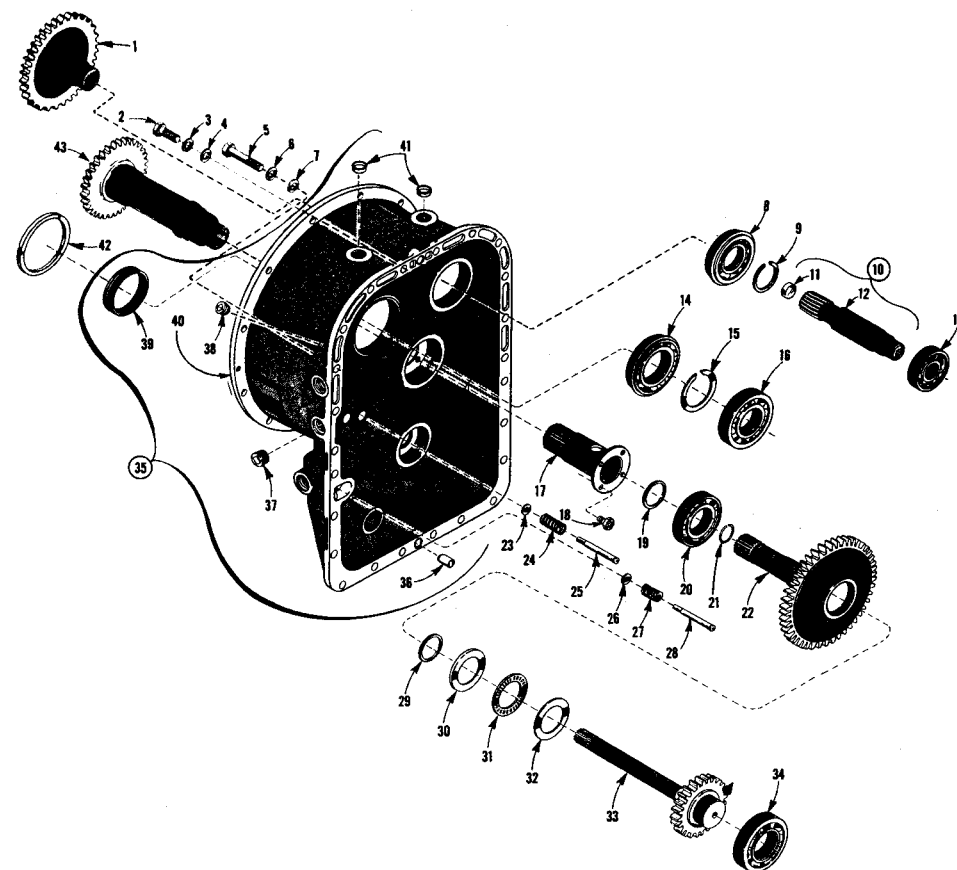
* Serviced as an assembly only — not as a detail part

A



A, foldout 3 Torque converter—exploded view

B



B, foldout 3 Torque converter housing—exploded view

A

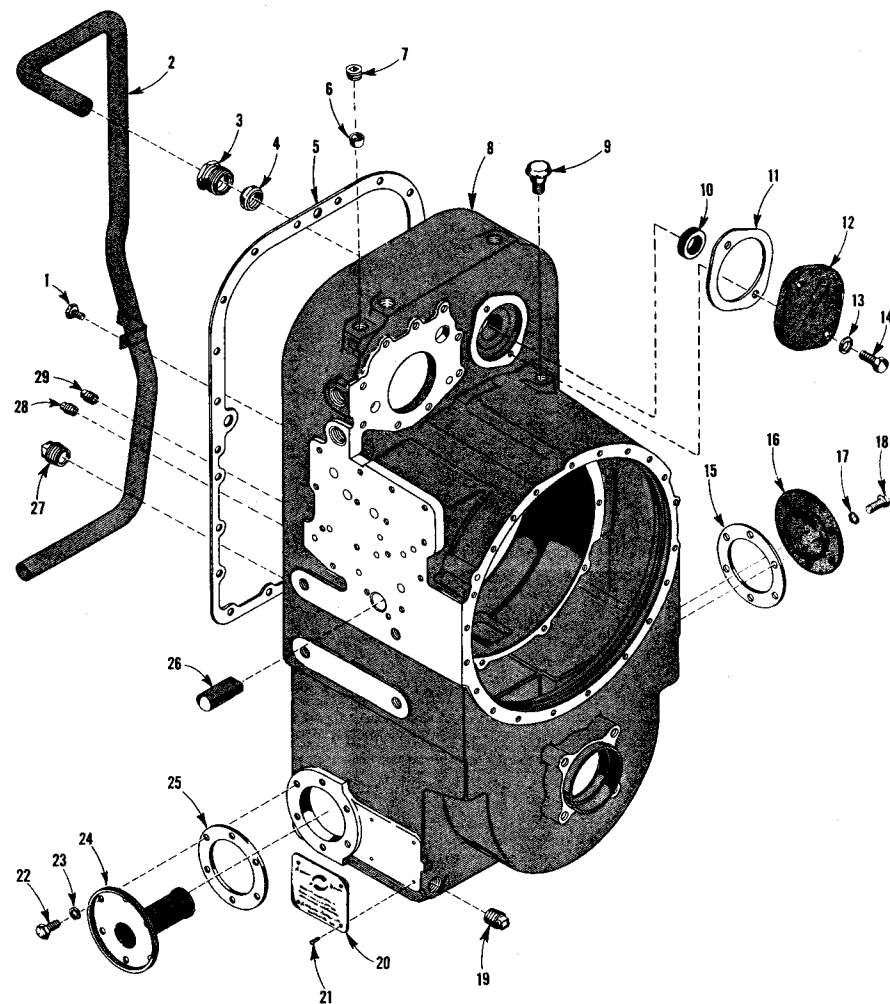
- | | |
|-------------------------------------|-------------------------------|
| 1 - Self-locking bolt, 3/8-16 x 5/8 | 16 - Core hole cover |
| 2 - Suction tube | 17 - Lock washer, 3/8 (6) |
| 3 - Suction tube male nut | 18 - Bolt, 3/8-16 x 7/8 (6) |
| 4 - Seal ring | 19 - Drain plug |
| 5 - Transmission housing gasket | 20 - Name plate |
| 6 - Remote filter plug | 21 - Drive screw, 4 x 1/4 (4) |
| 7 - Plug | 22 - Bolt, 3/8-16 x 7/8 (6) |
| 8 - Transmission housing | 23 - Lock washer, 3/8 (6) |
| 9 - Breather | 24 - Strainer assembly |
| 10 - Oil seal | 25 - Gasket |
| 11 - Accessory drive cover gasket | 26 - Anchor pin |
| 12 - Accessory drive cover plate | 27 - Oil filler plug |
| 13 - Lock washer, 3/8 (2) | 28 - Oil level add plug |
| 14 - Bolt, 3/8-16 x 1 (2) | 29 - Oil level full plug |
| 15 - Gasket | |

B

- | | |
|--|-----------|
| 1 - Single-row ball bearing | |
| 2 - Self-locking nut, 3/8-24 (12) | |
| *3 - Second-turbine driven gear assembly | |
| 4 - Single-row ball bearing | |
| 5 - Freewheel cam |) |
| 6 - Roller clutch assembly |) S/N 101 |
| 7 - Freewheel cam washer |) thru |
| 8 - Bolt, 3/8-24 x 2 1/4 (12) |) S/N 151 |
| 9 - Freewheel spring (3) |) |
| 10 - Spring plate |) |
| 11 - Freewheel roller cage |) |
| 12 - Freewheel roller (15) |) After |
| 13 - Freewheel cam |) S/N 151 |
| 14 - Freewheel oil collector |) |
| 15 - Bolt, 3/8-24 x 3 (12) |) |
| 16 - First-turbine driven gear | |
| 17 - Bearing spacer | |
| 18 - Single-row ball bearing | |
| 19 - Spacer | |
| 20 - Single-row ball bearing | |

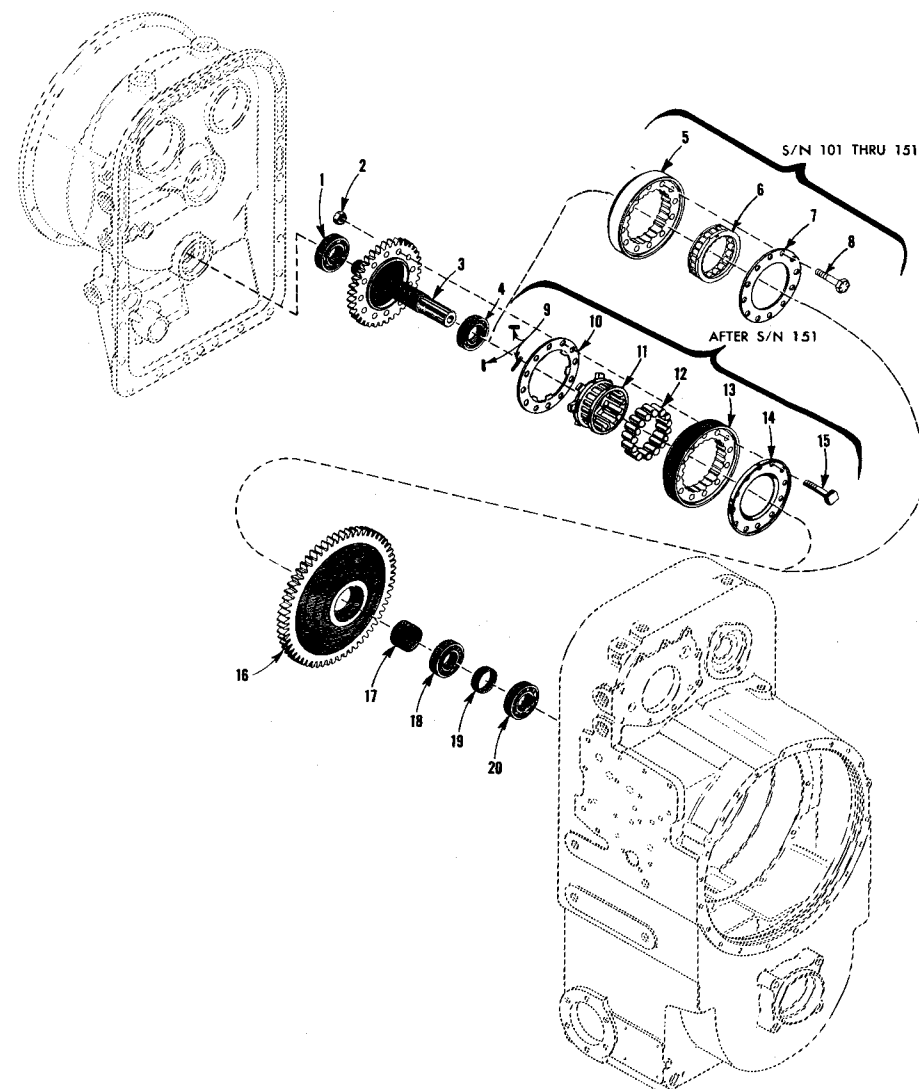
* Serviced as an assembly (including orifice tube) – not as a detail part – in all transmissions up to S/N 137. S/N 137 and later do not have an orifice tube.

A



A, foldout 4 Transmission housing—exploded view

B



B, foldout 4 Turbine driven gears and freewheel unit—exploded view

A

- 1 - Reverse piston
- 2 - Expander
- 3 - Teflon seal ring
- 4 - Expander
- 5 - Teflon seal ring
- 6 - Forward- and reverse-range sun gear
- 7 - External-tanged plate (5)
- 8 - Internal-splined plate (5)
- 9 - Reverse-range planetary carrier assembly
- 10 - Reverse-range carrier
- 11 - Reverse-range clutch hub
- 12 - Thrust washer (8)
- *13 - Planetary pinion (4)
- 14 - Planetary pinion roller (88)
- 15 - Spindle (4)
- 16 - Reverse- and forward-range clutch anchor assembly
- **17 - Reverse- and forward-range clutch anchor
- 18 - Pin (6)
- 19 - Spring (12)
- 20 - Pin (12)

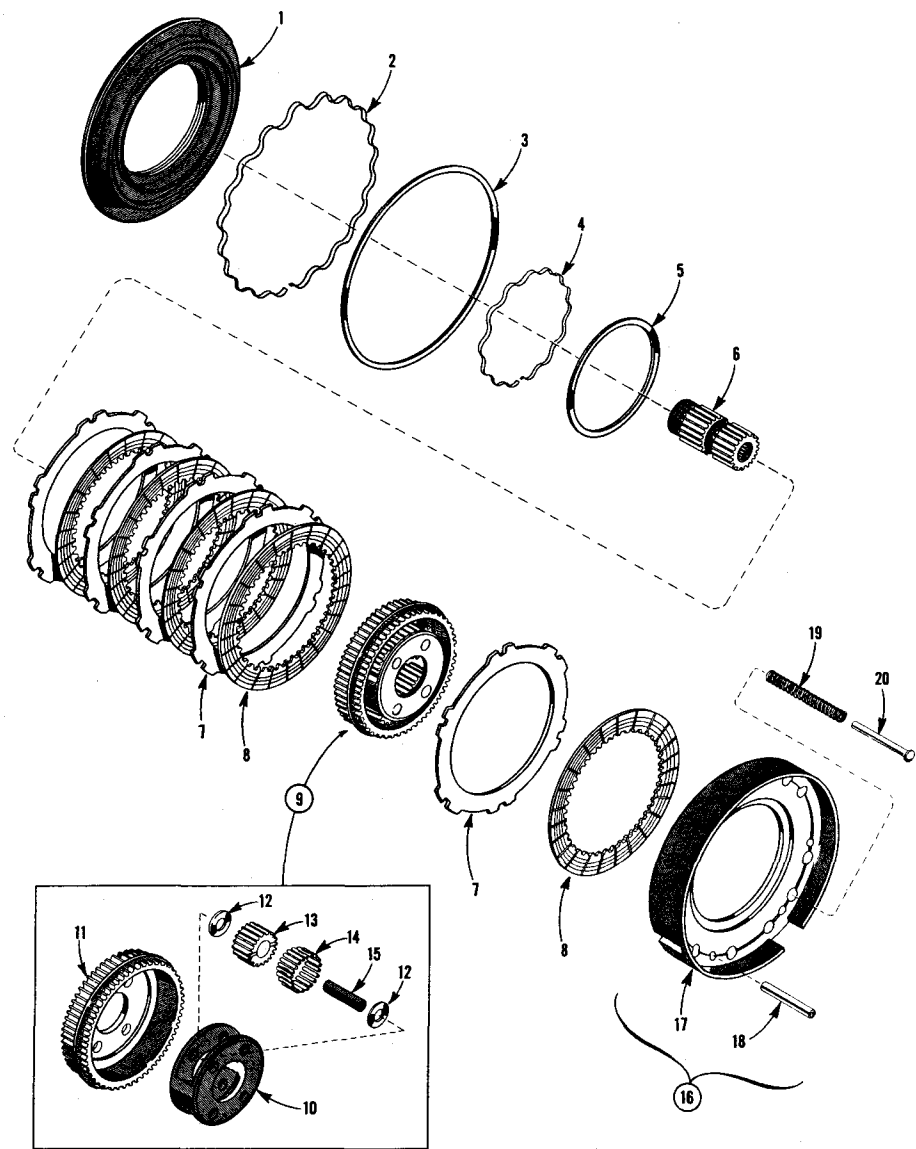
B

- 1 - Reverse-range ring gear
- 2 - Forward-range planetary carrier assembly
- 3 - Forward-range planetary carrier
- 4 - Spindle (2)
- 5 - Thrust washer (8)
- 6 - Planetary pinion roller (88)
- 7 - Planetary pinion (4)
- 8 - Snap ring
- 9 - Internal-splined plate (3)
- 10 - External-tanged plate (3)
- 11 - Forward-range ring gear
- 12 - Teflon seal ring
- 13 - Expander
- 14 - Teflon seal ring
- 15 - Expander
- 16 - Forward-range piston
- 17 - Forward-range piston housing
- 18 - Self-locking bolt, 3/8-16 x 1 1/2 (10)
- 19 - Plug

* Matched set of 4 pinions

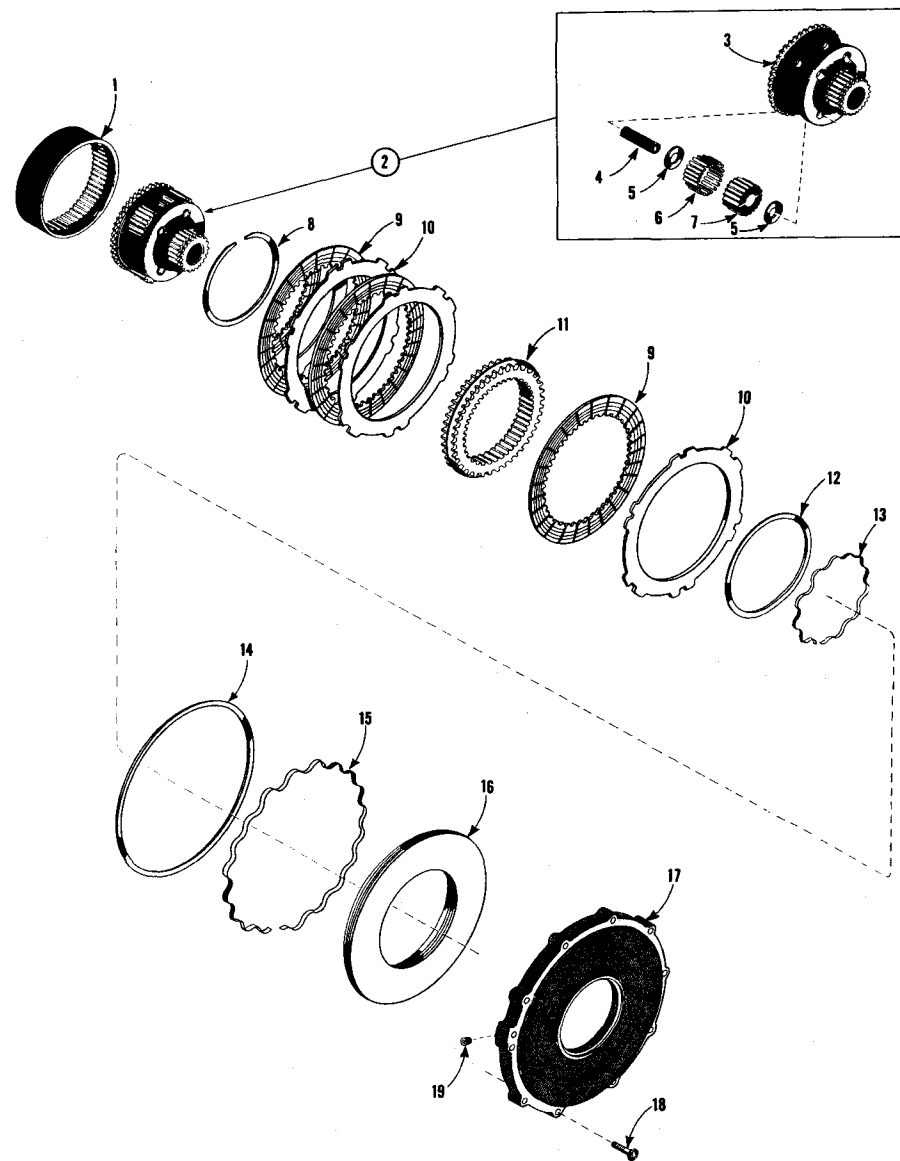
** Serviced as an assembly only -- not as a detail part

A



A, foldout 5 Reverse-range clutch and planetary—exploded view

B



B, foldout 5 Forward-range clutch and planetary—exploded view

A

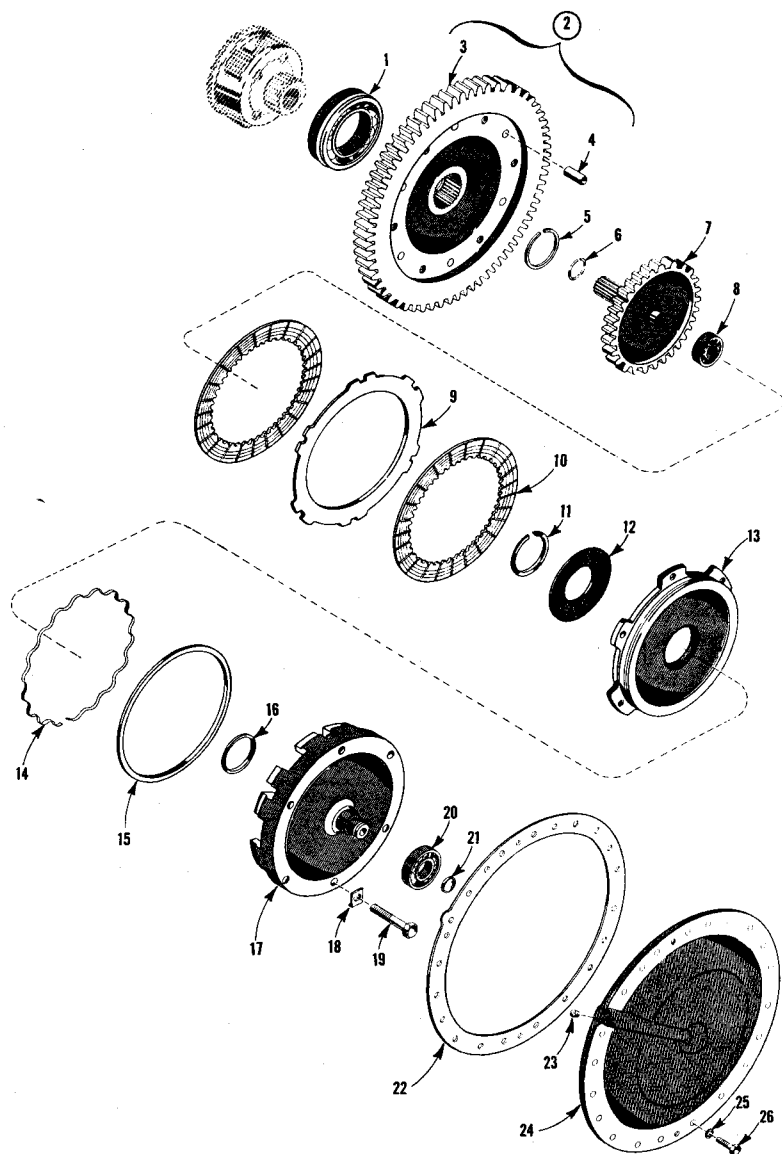
- | | |
|----------------------------------|--------------------------------|
| 1 - Single-row ball bearing | 14 - Expander |
| 2 - Transfer drive gear assembly | 15 - Teflon seal ring |
| *3 - Transfer drive gear | 16 - Seal ring |
| 4 - Pin (6) | 17 - High-range piston housing |
| 5 - Snap ring | 18 - Tab lock (6) |
| 6 - Snap ring | 19 - Bolt, 1/2-20 x 2 3/4 (6) |
| 7 - High-range clutch hub | 20 - Single-row ball bearing |
| 8 - Single-row ball bearing | 21 - Seal ring |
| 9 - External-tanged plate | 22 - Rear cover gasket |
| 10 - Internal-splined plate (2) | 23 - Plug |
| 11 - External-snap ring | 24 - Rear cover |
| 12 - Piston return spring | 25 - Lock washer, 3/8 (21) |
| 13 - High-range clutch piston | 26 - Bolt, 3/8-16 x 1 1/8 (21) |

B

- | | |
|---------------------------------|--|
| 1 - Flange retaining nut | *19 - Rear-output shaft |
| 2 - Flange washer | 20 - Spacer |
| 3 - Flange | 21 - Single-row ball bearing |
| 4 - Oil seal | 22 - Internal-snap ring |
| 5 - Internal-snap ring | 23 - Oil seal |
| 6 - Single-row ball bearing | 24 - Parking brake assembly |
| 7 - Front-output shaft | 25 - Back plate |
| 8 - Ball (2) | 26 - Spacer |
| 9 - Spring | 27 - Brake shoes (2) |
| 10 - Disconnect coupling | 28 - Spring (2) |
| 11 - Shifter fork shaft | 29 - Brake apply arm |
| 12 - Oil seal | 30 - Brake drum |
| 13 - Shifter fork | 31 - Self-locking bolt, 3/8-24 x 5/8 (4) |
| 14 - Single-row ball bearing | 32 - Flange washer |
| 15 - Spacer | 33 - Flange retaining nut |
| 16 - Transfer driven gear | 34 - Flange |
| 17 - Rear-output shaft assembly | 35 - Self-locking bolt, 1/2-13 x 7/8 (4) |
| 18 - Bushing | |

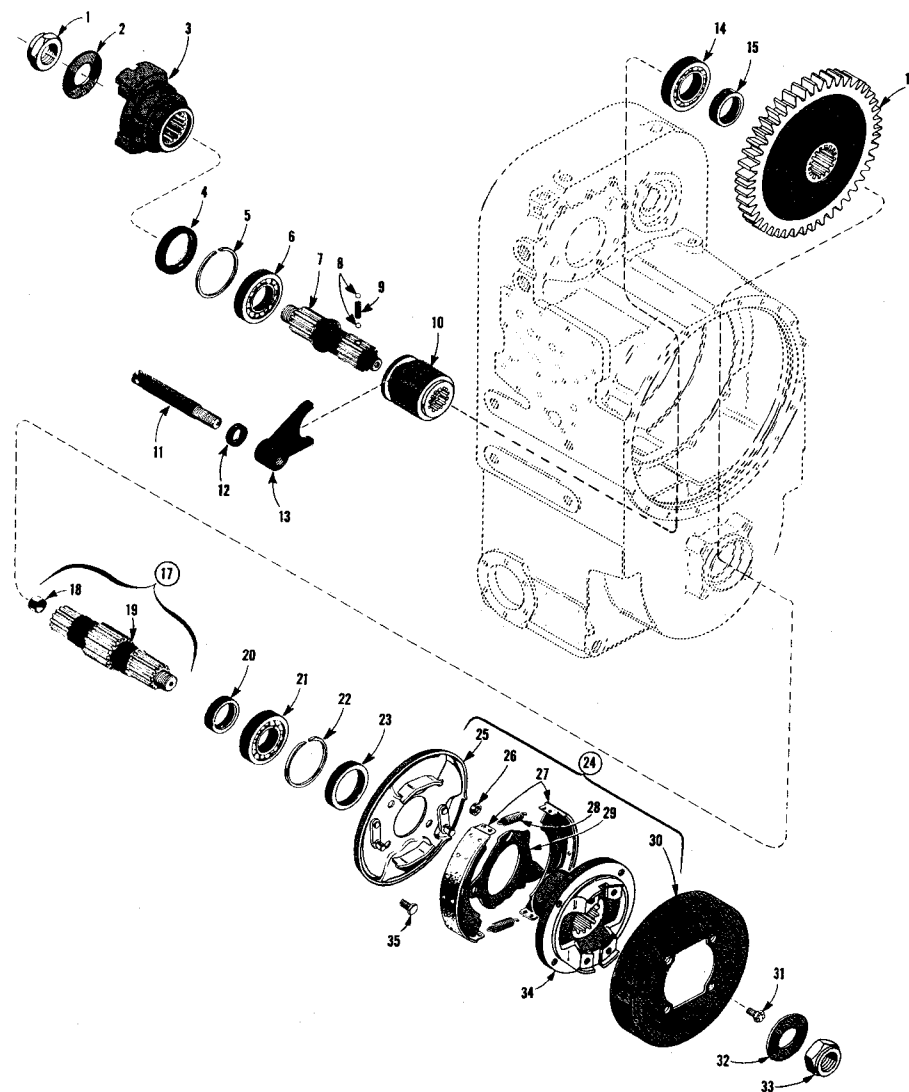
* Serviced as an assembly only — not as a detail part

A



A, foldout 6 High-range clutch—exploded view

B



B, foldout 6 Front-output disconnect clutch, rear-output shaft and parking brake—exploded view

A

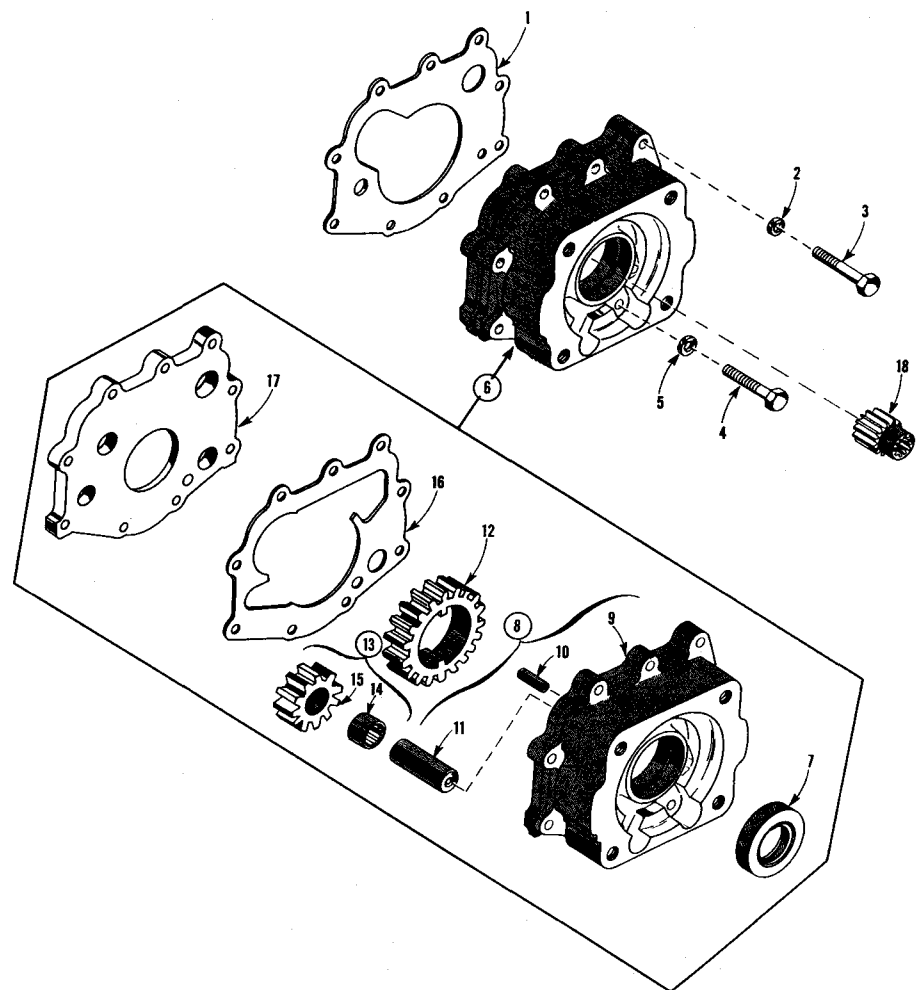
- | | |
|--------------------------------|------------------------------------|
| 1 - Oil pump gasket | 10 - Pin |
| 2 - Lock washer, 3/8 (7) | 11 - Pump driven gear shaft |
| 3 - Bolt, 3/8-16 x 2 (7) | 12 - Drive gear |
| 4 - Bolt, 3/8-16 x 2 1/2 (2) | 13 - Oil pump driven gear assembly |
| 5 - Lock washer, 3/8 (2) | 14 - Roller bearing |
| 6 - Charging oil pump assembly | *15 - Driven gear |
| 7 - Oil seal | 16 - Oil pump cover gasket |
| 8 - Oil pump body assembly | 17 - Oil pump cover |
| *9 - Oil pump body | 18 - Implement pump drive coupling |

B

- | | |
|-------------------------------|------------------------------|
| 1 - Control valve gasket | 24 - Gasket |
| 2 - Lock washer, 3/8 (16) | 25 - Cup |
| 3 - Bolt, 3/8-16 x 1 | 26 - Cutoff valve plug |
| 4 - Bolt, 3/8-16 x 2 1/2 (15) | 27 - Plug |
| 5 - Control valve assembly | 28 - Oil seal |
| 6 - Plug | 29 - Range selector valve |
| 7 - Plug gasket | 30 - Detent ball (2) |
| 8 - Regulator valve | 31 - Plug |
| 9 - Control valve body | 32 - Gasket |
| 10 - Orifice plug | 33 - Spring (2) |
| 11 - Ball | 34 - Plug gasket |
| 12 - Ball retainer plug | 35 - Plug |
| 13 - Valve stop | 36 - Plug |
| 14 - Spring retainer | 37 - Stop |
| 15 - Regulator valve spring | 38 - Regulator valve spring |
| 16 - Trimmer valve spring | 39 - Inching regulator valve |
| 17 - Trimmer valve plug | 40 - Stop |
| 18 - Gasket | 41 - Inching valve spring |
| 19 - Plug | 42 - Inching valve |
| 20 - Spring | 43 - Valve return spring |
| 21 - Clutch cutoff valve | 44 - Seal ring |
| 22 - Plug | 45 - Plug |
| 23 - Seal ring | 46 - Oil seal |

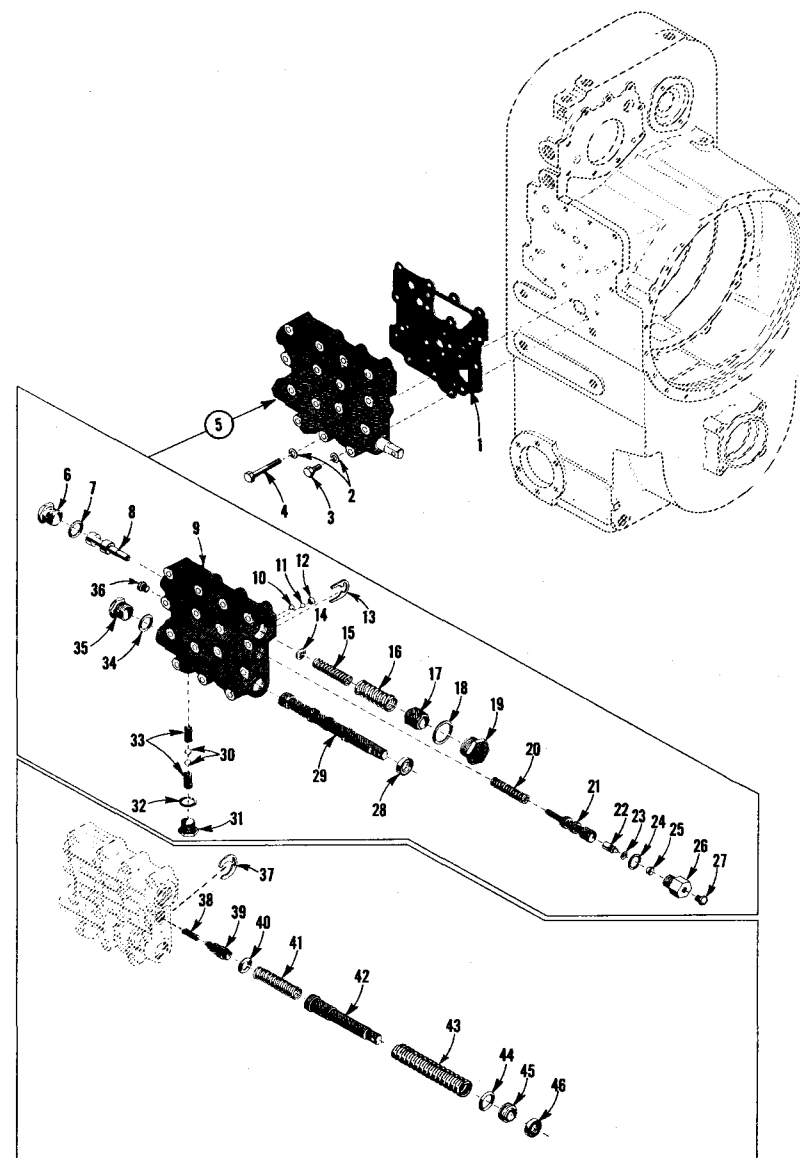
* Serviced as an assembly only — not as a detail part

A



A, foldout 7 Charging oil pump—exploded view

B



B, foldout 7 Control valve body—exploded view