

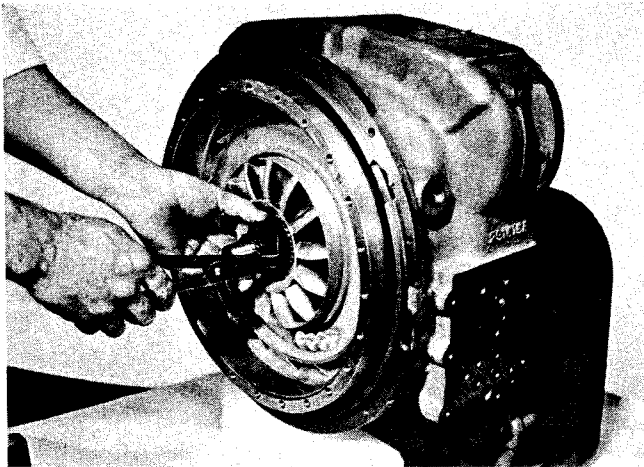


Figure 155
Install reaction member retainer ring.

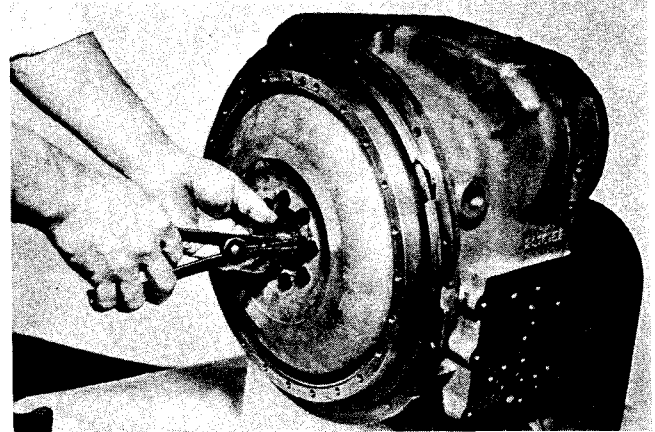


Figure 158
Install turbine to turbine shaft retainer ring.

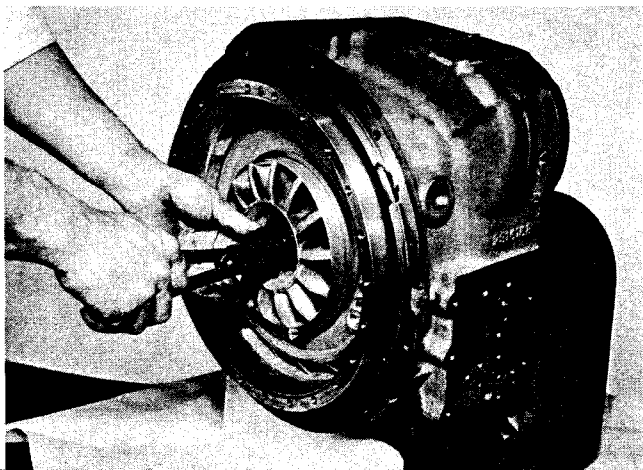


Figure 156
tall turbine locating ring on turbine shaft.

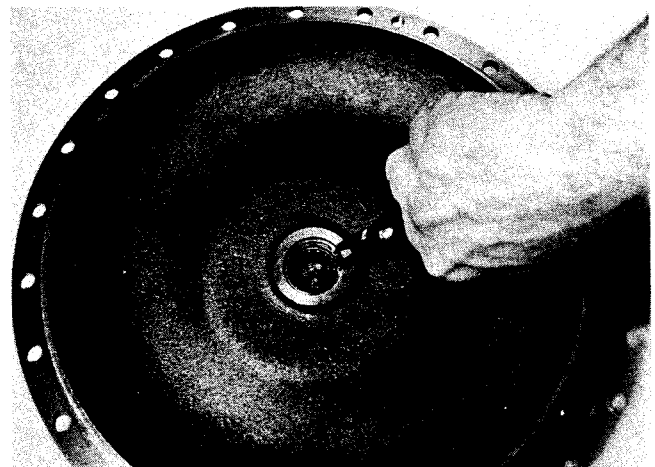


Figure 159
If impeller cover bearing was removed, press bearing in position and secure with retainer ring.

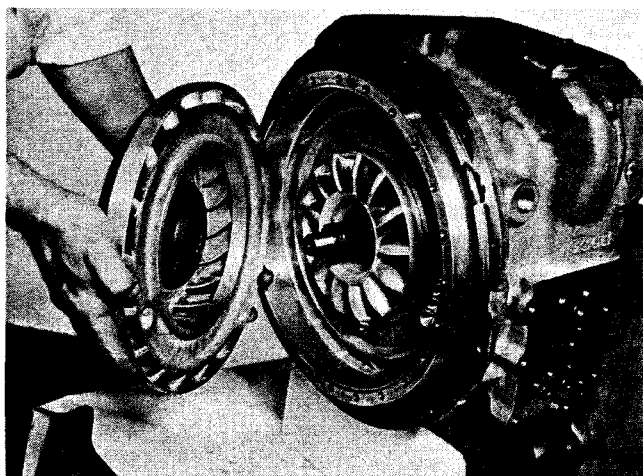


Figure 157
Install turbine.



Figure 160
Install a new impeller cover "O" ring and grease lightly to facilitate reassembly.

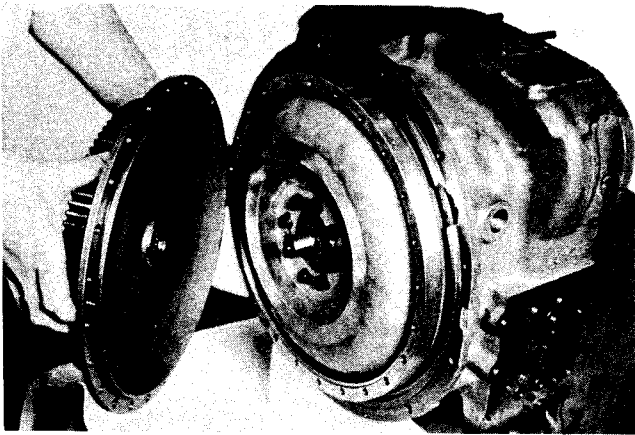


Figure 161

Align holes in impeller cover with holes in impeller. Install bolts and washers and tighten to specified torque.

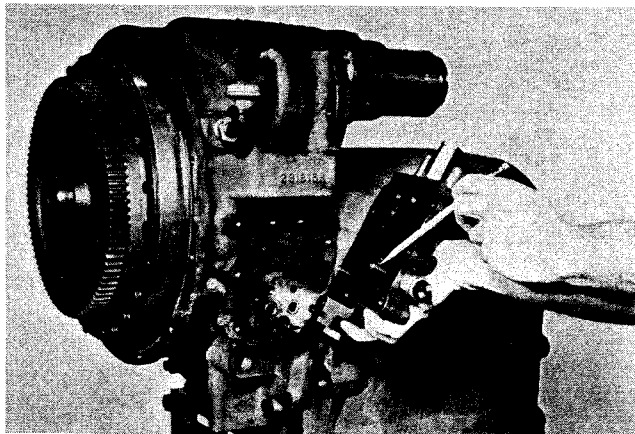


Figure 162

Locate detent balls and springs in control valve. Position new gasket. Secure valve with bolts and washers. Tighten to specified torque.

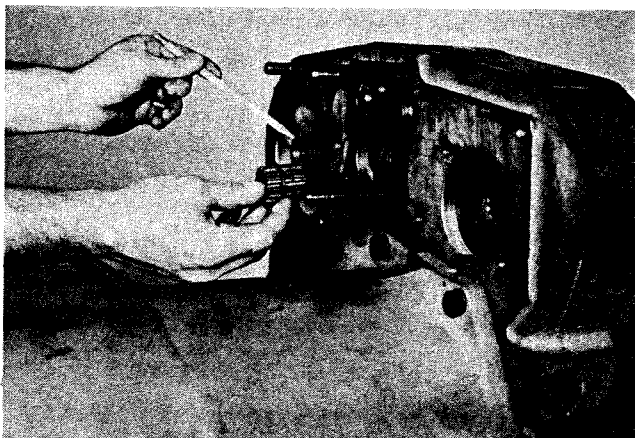


Figure 163

Install pump drive sleeves

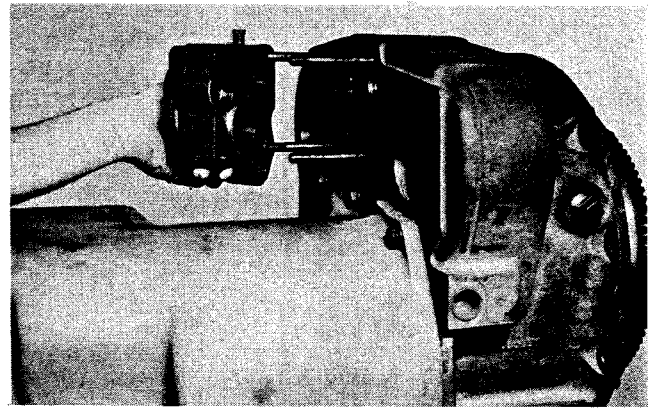


Figure 164

Position new gasket and "O" rings on pressure regulator valve. Install valve on studs.

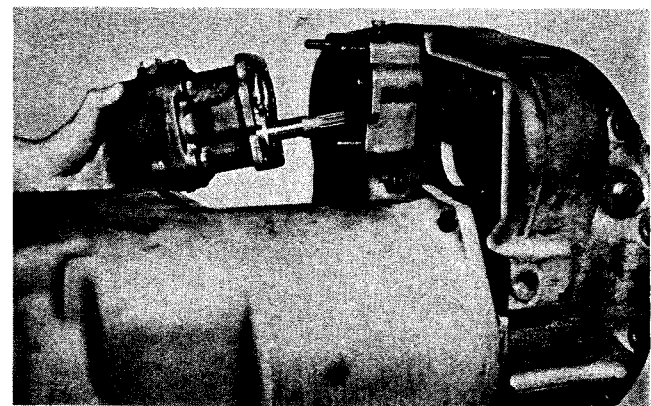


Figure 165

With new valve body to pump gasket in position insert pump drive shaft through valve body. Use caution as not to damage valve body oil seal. It may be necessary to turn impeller one way or the other to align pump shaft with drive sleeves.

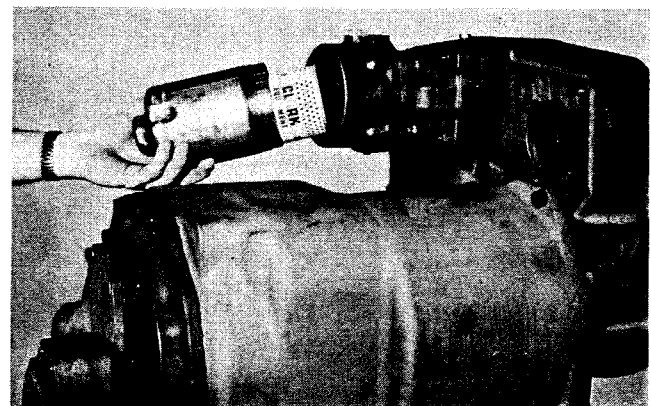


Figure 166

Install new "O" ring in filter adaptor housing. Install filter element and housing. Tighten filter housing 20 to 25 ft. lbs. torque. [27,2 - 33,8 N.m.]

SERVICING MACHINE AFTER TRANSMISSION OVERHAUL

The transmission, torque converter, and its allied hydraulic system are important links in the drive line between the engine and the wheels. The proper operation of either unit depends greatly on the condition and operation of the other; therefore, whenever repair or overhaul of one unit is performed, the balance of the system must be considered before the job can be considered completed.

After the overhauled or repaired transmission has been installed in the machine, the oil cooler, and connecting hydraulic system must be thoroughly cleaned. This can be accomplished in several manners and a degree of judgment must be exercised as to the method employed.

The following are considered the minimum steps to be taken:

1. Drain entire system thoroughly.
2. Disconnect and clean all hydraulic lines. Where feasible, hydraulic lines should be removed from machine for cleaning.
3. Replace oil filter elements, cleaning out filter cases thoroughly.
4. The oil cooler must be thoroughly cleaned. The cooler should be "back flushed" with oil and compressed air until all foreign material has been removed. Flushing in direction of normal oil flow will not adequately clean the cooler. If necessary, cooler assembly should be removed from machine for cleaning, using oil, compressed air and steam cleaner for that purpose. **DO NOT** use flushing compounds for cleaning purposes.

5. On remote mounted torque converters remove drain plug from torque converter and inspect interior of converter housing, gears, etc. If presence of considerable foreign material is noted, it will be necessary that converter be removed, disassembled and cleaned thoroughly. It is realized this entails extra labor; however, such labor is a minor cost compared to cost of difficulties which can result from presence of such foreign material in the system.

6. Reassemble all components and use only type oil recommended in lubrication section. Fill transmission through filler opening until fluid comes up to **LOW** mark on transmission dipstick. **NOTE:** If the dipstick is not accessible oil level check plugs are provided.

Remove **LOWER** check plug, fill until oil runs from **LOWER** oil hole. Replace filler and level plug.

Run engine two minutes at 500-600 RPM to prime torque converter and hydraulic lines. Recheck level of fluid in transmission with engine running at idle (500-600 RPM).

Add quantity necessary to bring fluid level to **LOW** mark on dipstick or runs freely from **LOWER** oil level check plug hole. Install oil level plug or dipstick. Recheck with hot oil (180-200° F.) [82, 2-93, 3° C].

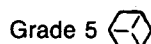
Bring oil level to **FULL** mark on dipstick or runs freely from **UPPER** oil level plug.

7. Recheck all drain plugs, lines, connections, etc., for leaks and tighten where necessary.

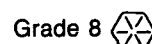
TORQUE IN (LBS.-FT.) BOLTS, CAPSCREWS, STUDS AND NUTS

Grade 5 Identification, 3 Radial
Dashes 120° Apart on Head of Bolt

Grade 8 Identification, 6 Radial
Dashes 60° Apart on Head of Bolt



Torque Specification for Lubricated
or Plated Screw Threads



NOM. SIZE	FINE THREAD		COARSE THREAD		FINE THREAD		COARSE THREAD	
	LB-FT	[N·m]	LB-FT	[N·m]	LB-FT	[N·m]	LB-FT	[N·m]
.2500	9 - 11	[12,3 - 14,9]	8 - 10	[10,9 - 13,5]	11 - 13	[15,0 - 17,6]	9 - 11	[12,3 - 14,9]
.3125	16 - 20	[21,7 - 27,1]	12 - 16	[16,3 - 21,6]	28 - 32	[38,0 - 43,3]	26 - 30	[35,3 - 40,6]
.3750	26 - 29	[35,3 - 39,3]	23 - 25	[31,2 - 33,8]	37 - 41	[50,2 - 55,5]	33 - 36	[44,8 - 48,8]
.4375	41 - 45	[55,6 - 61,0]	37 - 41	[50,2 - 55,5]	58 - 64	[78,7 - 86,7]	52 - 57	[70,6 - 77,2]
.5000	64 - 70	[86,8 - 94,9]	57 - 63	[77,3 - 85,4]	90 - 99	[122,1 - 134,2]	80 - 88	[108,5 - 119,3]
.5625	91 - 100	[123,4 - 135,5]	82 - 90	[111,2 - 122,0]	128 - 141	[173,6 - 191,1]	115 - 127	[156,0 - 172,2]
.6250	128 - 141	[173,5 - 191,2]	113 - 124	[153,2 - 168,1]	180 - 198	[224,0 - 268,5]	159 - 175	[215,6 - 237,3]
.7500	223 - 245	[302,3 - 332,2]	200 - 220	[271,2 - 298,3]	315 - 347	[427,1 - 470,5]	282 - 310	[382,3 - 420,3]

SPECIFICATIONS AND SERVICE DATA—POWER SHIFT TRANSMISSION AND TORQUE CONVERTER

CONVERTER OUT PRESSURE	Converter outlet oil temp. 180° - 200° F. [82,3° - 93,3° C]. Transmission in NEUTRAL . Operating specifications: 25 P.S.I. [172,4 kPa] minimum pressure at 2000 R.P.M. engine speed AND a maximum of 70 P.S.I. [482,6 kPa] outlet pressure with engine operating at no-load governed speed.
CONTROLS	Forward and Reverse — Manual Speed Selection — Manual
CLUTCH TYPE	Multiple discs, hydraulically actuated, spring released, automatic wear compensation and no adjustment. All clutches oil cooled and lubricated.
CLUTCH INNER DISC	Friction.
CLUTCH OUTER DISC	Steel.

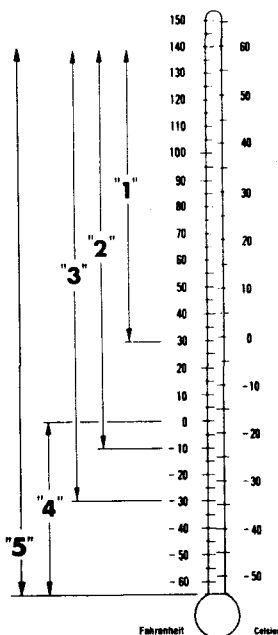
OIL FILTRATION	Full flow oil filter safety by-pass, also strainer screen in sump at bottom of transmission case.
CLUTCH PRESSURE	240 - 300 psi [1654,8 - 2068,4 kPa] — With parking brake set (see note), oil temperature 180° - 200°F. [82,2° - 93,3°C], engine at idle (400 to 600 RPM), shift thru direction and speed clutches. All clutch pressure must be equal within 5 psi. [34,5 kPa]. If clutch pressure varies in any one clutch more than 5 psi [34,5 kPa] repair clutch. NOTE: Never use service brakes while making clutch pressure checks. Units having brake ac- tuated declutching in forward and/or reverse will not give a true reading. ALWAYS USE PARKING BRAKE WHEN MAK- ING CLUTCH PRESSURE CHECKS.

LUBRICATION

RECOMMENDED LUBRICANTS FOR CLARK POWER SHIFTED TRANSMISSION AND TORQUE CONVERTERS

Prevailing Ambient Temperature

TYPE OF OIL	See Lube Chart.
CAPACITY	Consult Operator's Manual on applicable machine model for system capacity. Torque Converter, Transmission and allied hydraulic system must be considered as a whole to determine capacity.
CHECK PERIOD	Check oil level DAILY with engine running at 500-600 RPM and oil at 180° to 200° F. [82,2 -93,3° C]. Maintain oil level to FULL Mark.
NORMAL * DRAIN PERIOD	Every 500 hours, change oil filter element. Every 1000 hours, drain and refill system as follows: Drain with oil at 150° to 200° F. [65,6 -93,3° C]. NOTE: It is recommended that filter elements be changed after 50 and 100 hours of operation on new and rebuilt or repaired units. (a) Drain transmission and remove sump screen. Clean screen thoroughly and replace, using new gaskets. (b) Drain oil filters, remove and discard filter elements. Clean filter shells and install new elements. (c) Refill transmission to LOW mark. (d) Run engine at 500-600 RPM to prime converter and lines. (e) Recheck level with engine running at 500-600 RPM and add oil to bring level to LOW mark. When oil temperature is hot (180-200° F.) [82,2-93,3° C] make final oil level check. BRING OIL LEVEL TO FULL MARK.



*Dexron is a registered trademark of
General Motors Corporation.

Temperature Range "1"	C-2 Grade 30 C-3 Grade 30 Engine Oil: Grade 30 API-CD/SE or CD/SF MIL-L-2104C-Grade 30 MIL-L-2104D-Grade 30
Temperature Range "2"	MIL-L-2104C-Grade 10 MIL-L-2104D-Grade 10 C-2 Grade 10 C-3 Grade 10 Engine Oil: Grade 10 API-CD/SE or CD/SF Quintolubric 822-220 (Non Phosphate Ester Fire Resistant Fluid)
Temperature Range "3"	*Dexron *Dexron II D - See Caution Below
Temperature Range "4"	MIL-L-46167 MIL-L-46167 A
Temperature Range "5"	Conoco High-Performance Synthetic Motor Oil — Spec. No. 6718

PREFERRED OIL VISCOSITY: Select highest oil viscosity compati-
ble with prevailing ambient temperatures and oil application chart.
Temperature ranges "2" and "3" may be used to lower ambient
temperatures when sump preheaters are used.
Temperature range "4" should be used only in ambient temperature
range shown.

MODULATED SHIFT TRANSMISSIONS: T12000, 18000, 24000,
28000 & 32000 series transmissions with modulated shift use only
C-3 or temperature range 3 items (a) & (b) *Dexron or *Dexron
II D. **SEE CAUTION BELOW.** 3000, 4000, 5000, 6000, 8000,
16000 & 34000 series transmissions with modulated shift use only
C-3 or temperature range 3 item (a) only *Dexron. Do NOT use
*Dexron II D. **SEE CAUTION BELOW.**

CAUTION: *Dexron II D is not compatible with graphitic clutch
plate friction material **UNLESS IT MEETS THE APPROVED C-3
SPECIFICATIONS.** *Dexron II D cannot be used in the 3000,
4000, 5000, 6000, 8000, 16000 or 34000 series power shift
transmissions, or the HR28000 & HR32000 series having con-
verter lock-up, or the C270 series converter having lock-up
UNLESS IT MEETS THE APPROVED C-3 SPECIFICATIONS.

Any deviation from this chart must have written approval from
the application department of the Clark-Hurth Components
Engineering and Marketing Department.

*Normal drain periods and filter change intervals are for average environmental and duty-cycle conditions. Severe or sustained high operating temperatures or very dusty atmospheric conditions will cause accelerated deterioration and contamination. For extreme conditions judgment must be used to determine the required change intervals.

TROUBLE SHOOTING GUIDE

For The
R and HR Model, 28000 Transmission

The following data is presented as an aid to locating the source of difficulty in a malfunctioning unit. It is necessary to consider the torque converter charging pump, transmission, oil cooler, and connecting lines as a complete system when running down the source of trouble since the proper operation of any unit therein depends greatly on the condition and operations of

the others. By studying the principles of operation together with data in this section, it may be possible to correct any malfunction which may occur in the system.

TROUBLE SHOOTING PROCEDURE BASICALLY CONSISTS OF TWO CLASSIFICATIONS: MECHANICAL AND HYDRAULIC.

MECHANICAL CHECKS

Prior to checking any part of the system from a hydraulic standpoint, the following mechanical checks should be made:

1. A check should be made to be sure all control lever linkage is properly connected and adjusted at all connecting points.

2. Check shift levers and rods for binding or restrictions in travel that would prevent full engagement. Shift levers by hand at control valve, if full engagement cannot be obtained, difficulty may be in control cover and valve assembly.

HYDRAULIC CHECKS

Before checking on the torque converter, transmission, and allied hydraulic system for pressures and rate of oil flow, it is essential that the following preliminary checks be made:

Check oil level in transmission. This should be done with oil temperatures of 180 to 200° F. [82,2-93,3° C]. DO NOT ATTEMPT THESE CHECKS WITH COLD OIL. To bring the oil temperature to this specification it is necessary to either work the machine or "stall" out

the converter. Where the former means is impractical, the latter means should be employed as follows:

Engage shift levers in forward and high speed and apply brakes. Accelerate engine half to three-quarter throttle.

Hold stall until desired converter outlet temperature is reached. **CAUTION: FULL THROTTLE STALL SPEEDS FOR AN EXCESSIVE LENGTH OF TIME WILL OVERHEAT THE CONVERTER.**

LOW CLUTCH PRESSURE

Cause	Remedy
1. Low oil level.	1. Fill to proper level.
2. Clutch pressure regulating valve spool stuck open.	2. Clean valve spool and housing.
3. Faulty charging pump.	3. Replace pump.
4. Broken or worn clutch shaft or piston sealing rings.	4. Replace sealing rings.
5. Clutch piston bleed valve stuck open.	5. Clean bleed valves thoroughly.

LOW CONVERTER CHARGING PUMP OUTPUT

1. Low oil level.	1. Fill to proper level.
2. Suction screen plugged.	2. Clean suction screen.
3. Air leaks at pump intake hose and connections or collapsed hose. (R-28000 only)	3. Tighten all connections or replace hose if necessary.
4. Defective oil pump.	4. Replace pump.

OVERHEATING

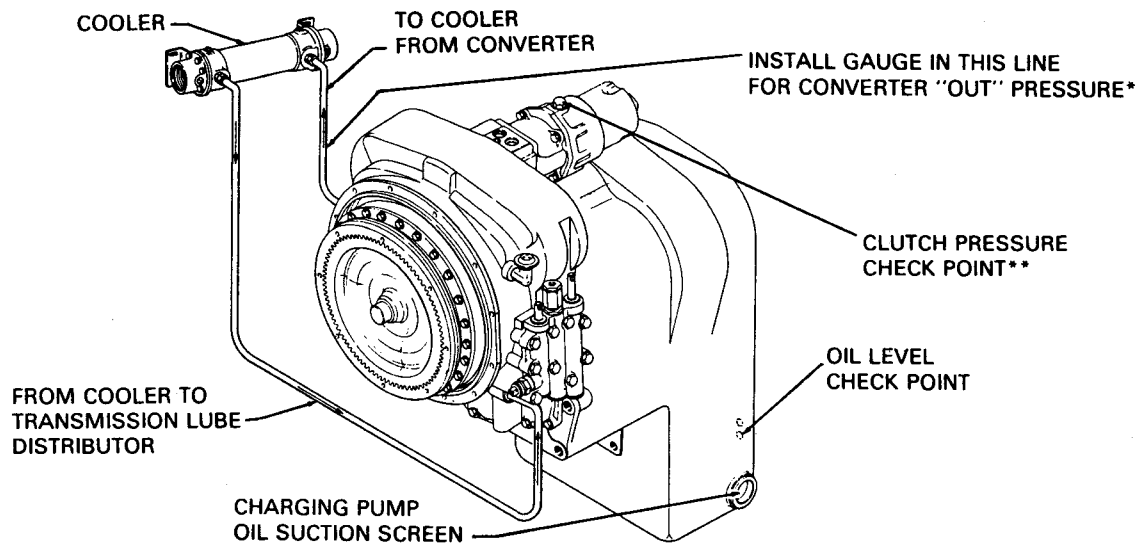
1. Worn oil sealing rings.	1. Remove, disassemble, and rebuild converter assembly.
2. Worn oil pump.	2. Replace.
3. Low oil level.	3. Fill to proper level.
4. Pump suction line taking air. (R-28000 only)	4. Check oil line connections and tighten securely.

NOISY CONVERTER

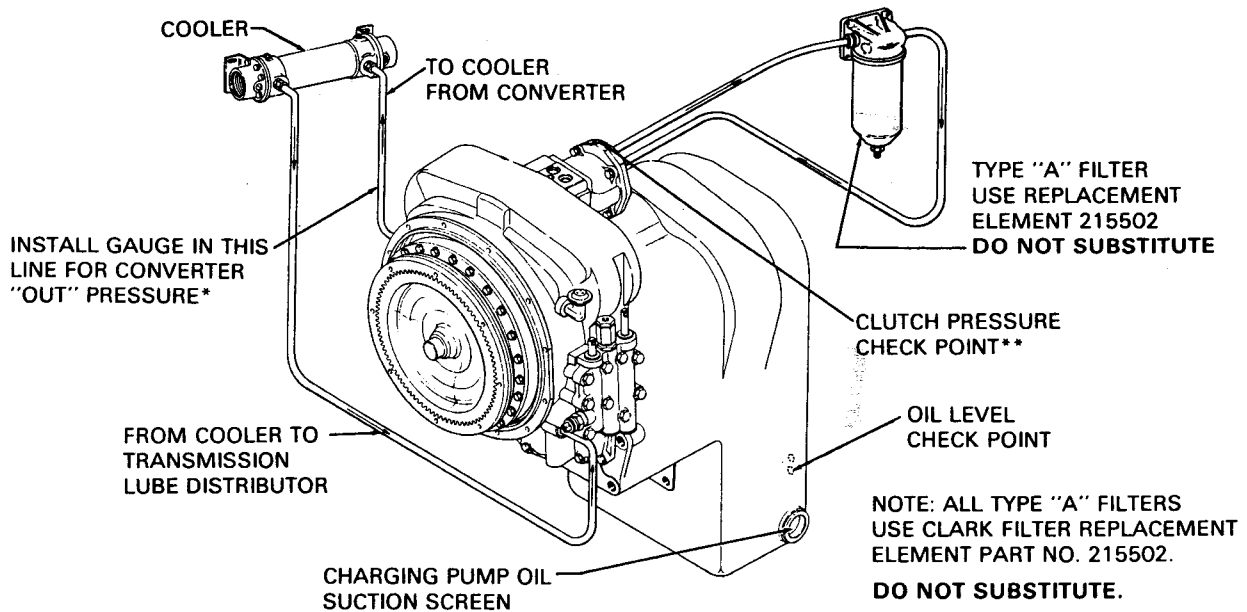
1. Worn coupling gears.	1. Replace.
2. Worn oil pump.	2. Replace.
3. Worn or damaged bearings.	3. A complete disassembly will be necessary to determine what bearing is faulty.

LACK OF POWER

1. Low engine RPM at converter stall.	1. Tune engine check governor.
2. See "Overheating" and make same checks.	2. Make corrections as explained in "Overheating."



28000 SERIES PLUMBING DIAGRAM



**28000 SERIES PLUMBING DIAGRAM
(WITH REMOTE FILTER)**

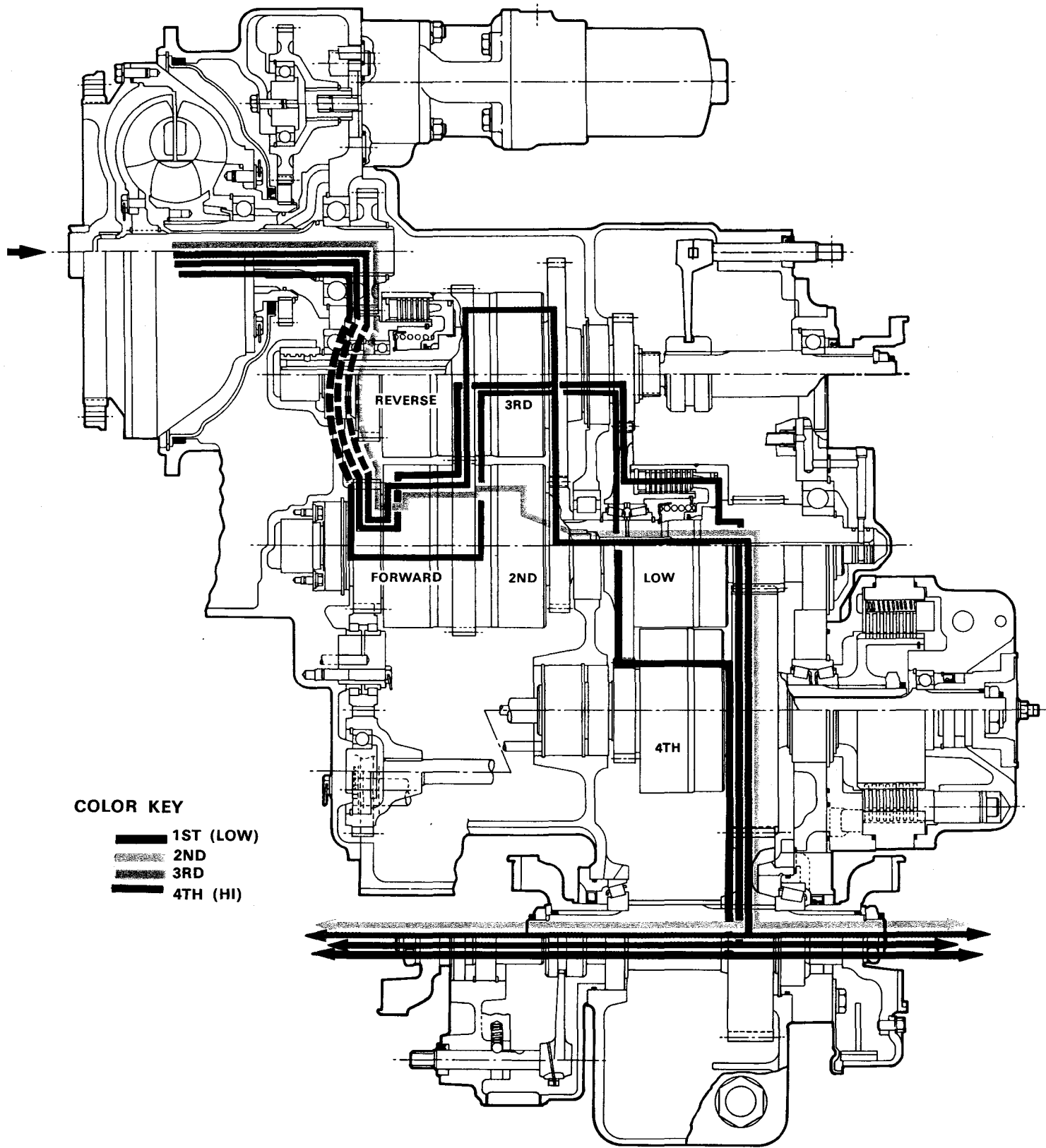
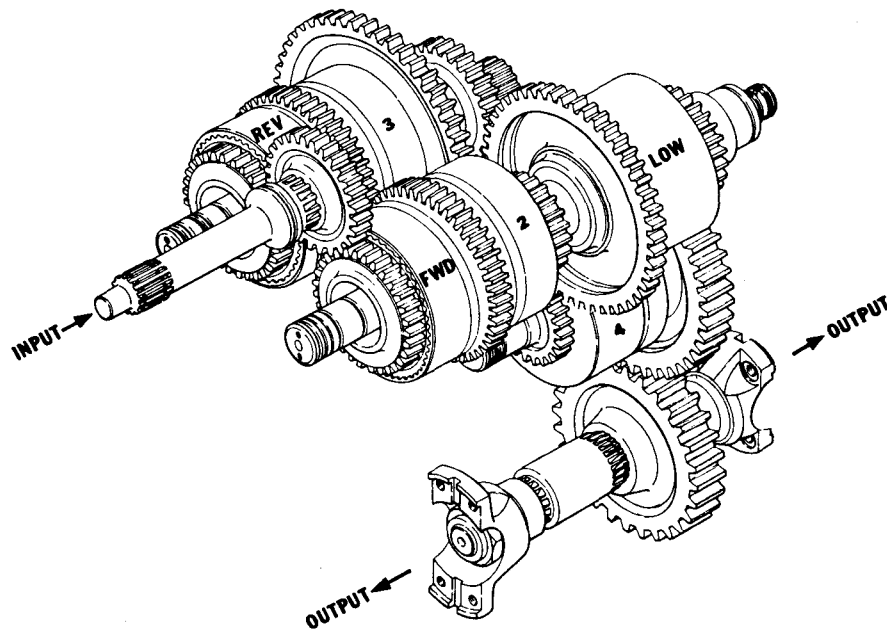


FIG. K

4 SPEED TRANSMISSION

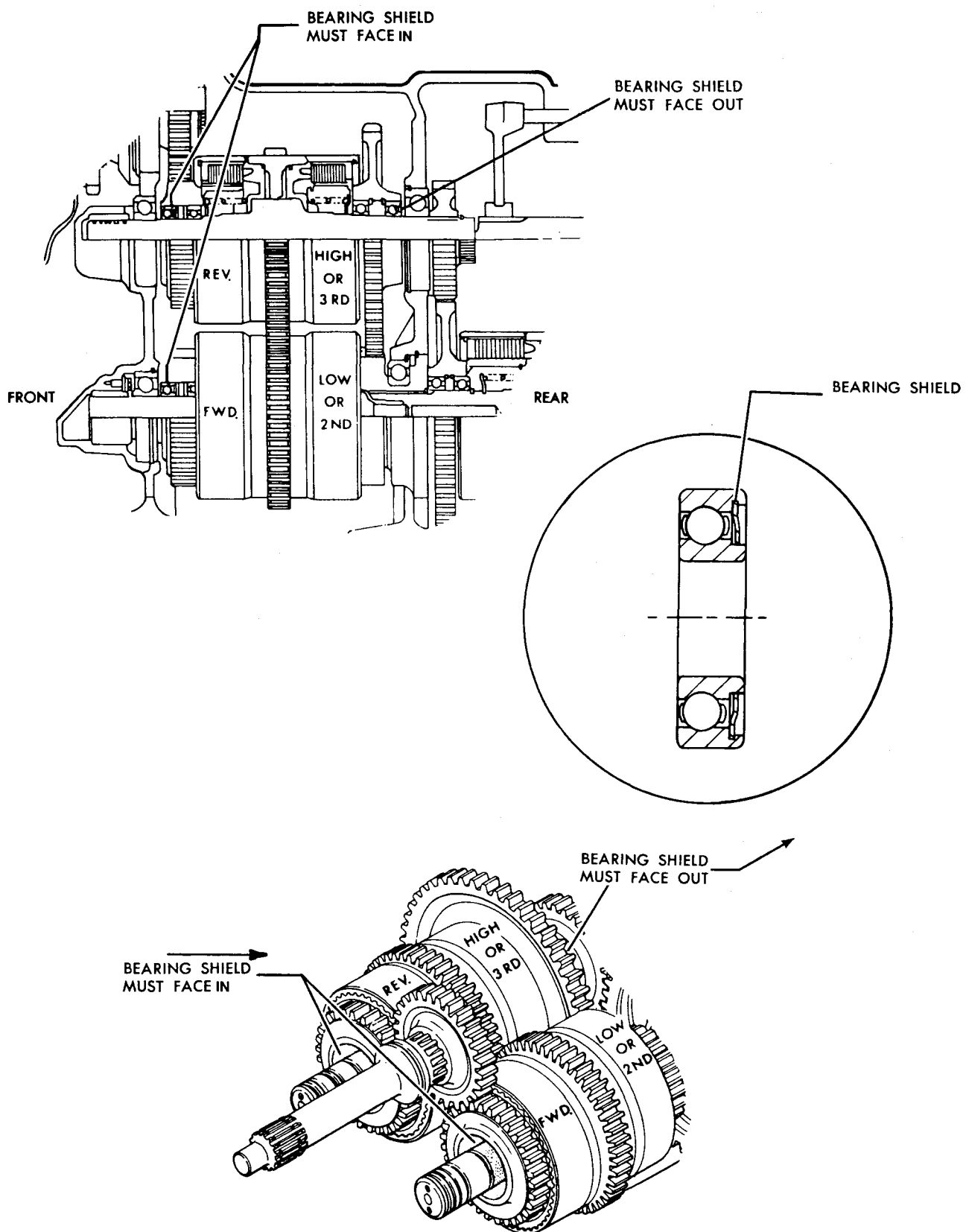


**28000 SERIES - 4 SPEED
CLUTCH & GEAR ARRANGEMENT**

CONVERTER CHARGE PUMP REPLACEMENT AND PRIMING PROCEDURE

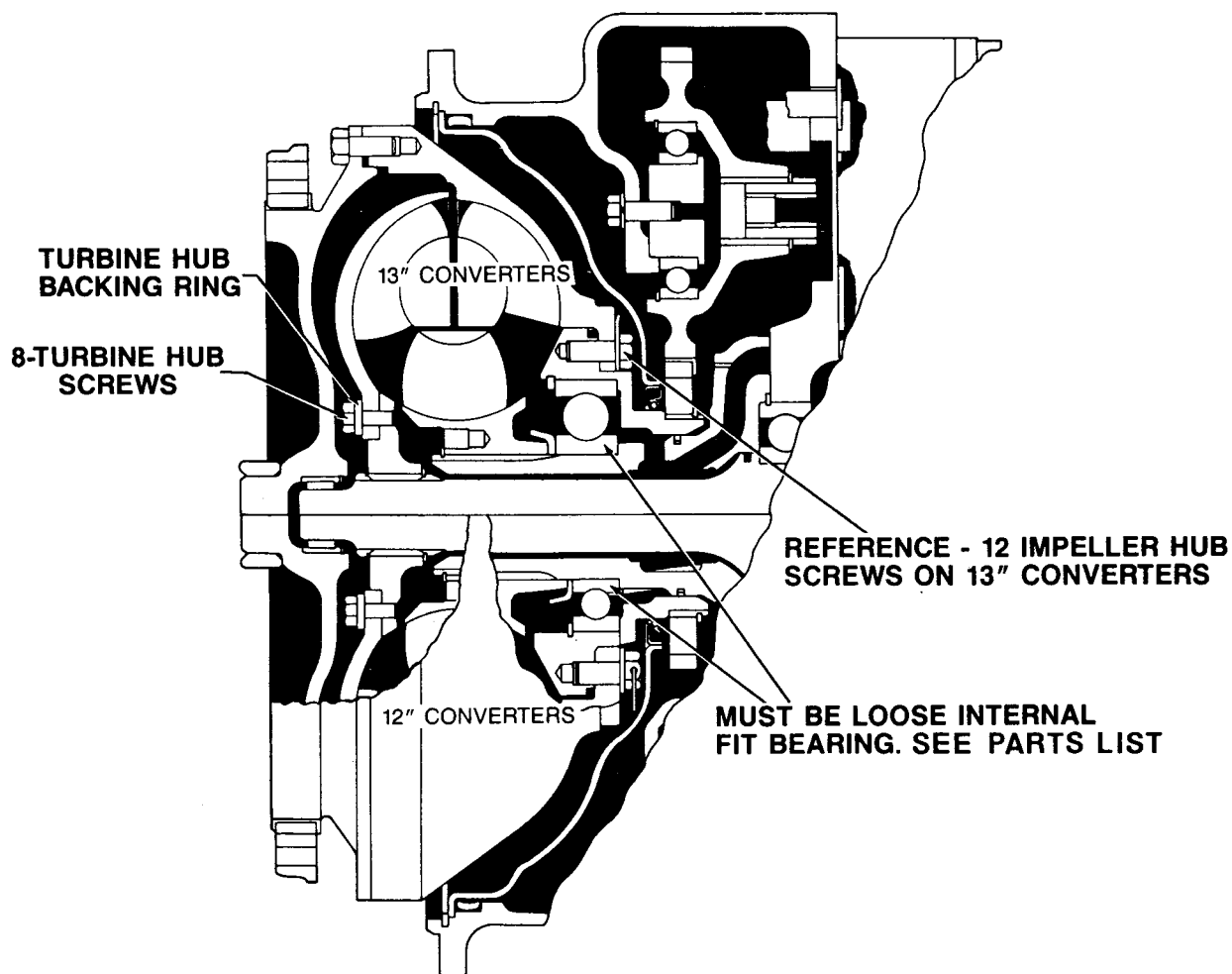
1. The cause for pump failure must be found and corrected before a replacement pump is installed. Check all of the hoses, tubes, "O" rings, adaptors and split flanges.
2. Replace any collapsed or damaged hoses, damaged split flange "O" rings, tube "O" rings and adaptors.
3. After all checks have been made and corrections completed install the pump.
4. See filling instructions on page 31.
5. Start the engine. Run the engine at low idle for two minutes, watch the clutch pressure gage and listen for cavitation of the pump.
6. If the pressure does not come up, check the oil level and bleed off air from system as follows.
7. To bleed off the air from the system, loosen the pressure gage line at the pressure regulating valve or loosen the pressure hose at the oil filter or pressure regulating valve. Crank the engine over until the air is displaced with oil. **DO NOT START THE ENGINE.**
8. If bleeding the lines does not correct the problem it may become necessary to prime the pump. Disconnect the suction hose or pressure hose, whichever is higher, and fill the port with transmission oil, reconnect the hose and tighten.
9. Start the engine and check pressure.
10. Recheck oil level with hot oil (180-200°F) with engine at idle. Add oil as necessary to bring oil level to full mark.

FIG. L



SHIELDED BEARING INSTALLATION

FIG. M



IMPELLER HUB, TURBINE HUB AND BACKING RING WITH SPECIAL SCREWS

1. CLEAN HUB MOUNTING SURFACE AND TAPPED HOLES WITH SOLVENT. DRY THOROUGHLY BEING CERTAIN TAPPED HOLES ARE DRY AND CLEAN.

2. INSTALL BACKING RING AND SPECIAL SELF-LOCKING SCREWS TO APPROXIMATELY .06 INCH [1,5] OF SEATED POSITION. WITH A CALIBRATED TORQUE WRENCH, TIGHTEN SCREWS 40 TO 45 LBS. FT. [54,3 - 61,0 N-m.] TORQUE.

NOTE: ASSEMBLY OF HUB MUST BE COMPLETED WITHIN A FIFTEEN MINUTE PERIOD FROM START OF SCREW INSTALLATION. THE SCREWS ARE PREPARED WITH AN EPOXY COATING WHICH BEGINS TO HARDEN AFTER INSTALLATION. IF NOT TIGHTENED TO PROPER TORQUE WITHIN THE FIFTEEN MINUTE PERIOD, INSUFFICIENT SCREW CLAMPING TENSION WILL RESULT. THIS SPECIAL SCREW IS TO BE USED FOR ONE INSTALLATION ONLY. IF THE SCREW IS REMOVED FOR ANY REASON IT MUST BE REPLACED. THE EPOXY LEFT IN THE HUB HOLES MUST BE REMOVED WITH THE PROPER TAP AND CLEANED WITH SOLVENT. DRY HOLE THOROUGHLY AND USE A NEW SCREW FOR REINSTALLATION.

ASSEMBLY INSTRUCTIONS FOR 28000 CONVERTER WITH SPECIAL APPLICATION IMPELLER HUB BEARING.

DISASSEMBLY OF LOW CLUTCH UTILIZING REAR DOUBLE TAPER BEARING (HELICAL GEARS)

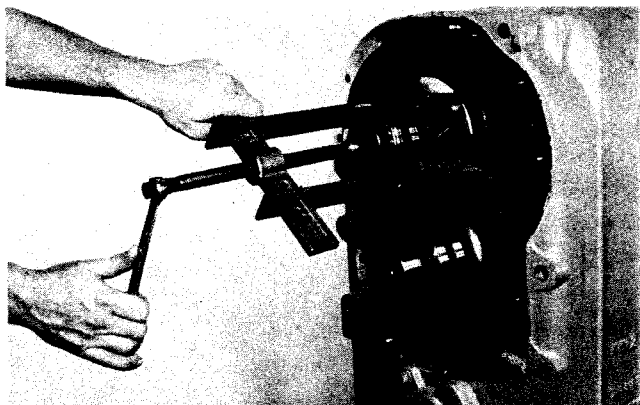


Figure A

Remove low clutch double bearing cup, outer cone and spacer.

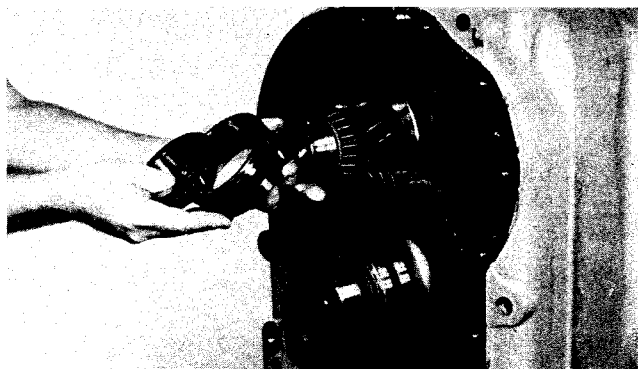


Figure B

CAUTION: Outer cone, double bearing cup, spacer and inner bearing cone are replaced as a set.

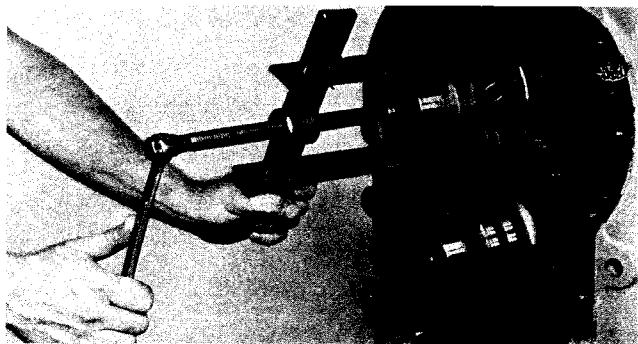


Figure C

Remove low clutch inner bearing cone. **NOTE:** To remove the inner cone bearing without damage, a special bearing puller must be made (see diagram Fig. D) or the outer cage and rollers may be pulled from the bearing inner race and the inner race can be removed after the low clutch assembly has been removed from the transmission. See caution in Figure B.

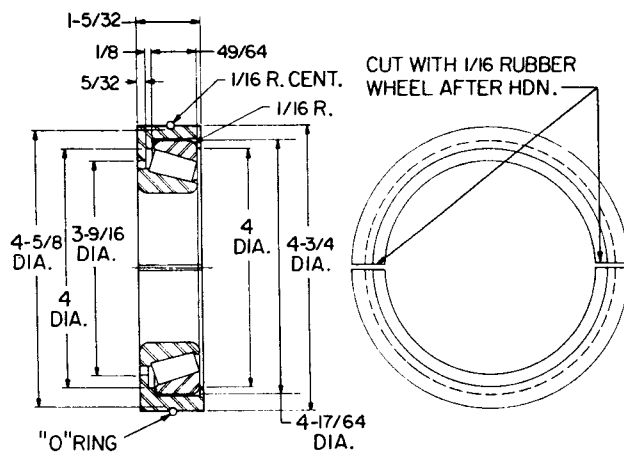


Figure D

A timken bearing cup, No. 29520 must be used with the above bearing puller.

REASSEMBLY

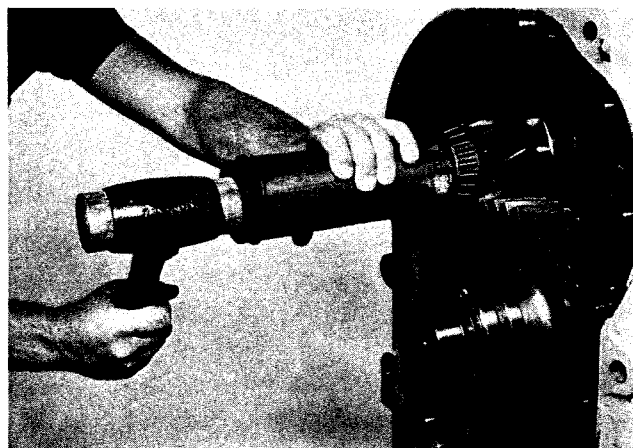


Figure E

Install low clutch inner taper bearing. **NOTE:** Heat bearing in hot oil bath prior to installation.

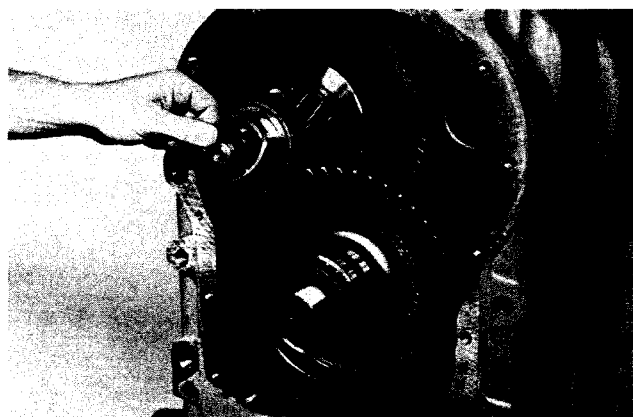


Figure F

Install bearing spacer.

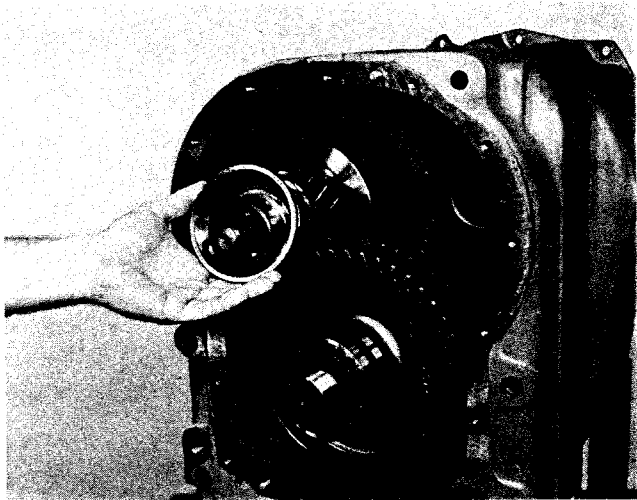


Figure G

Install bearing cup.

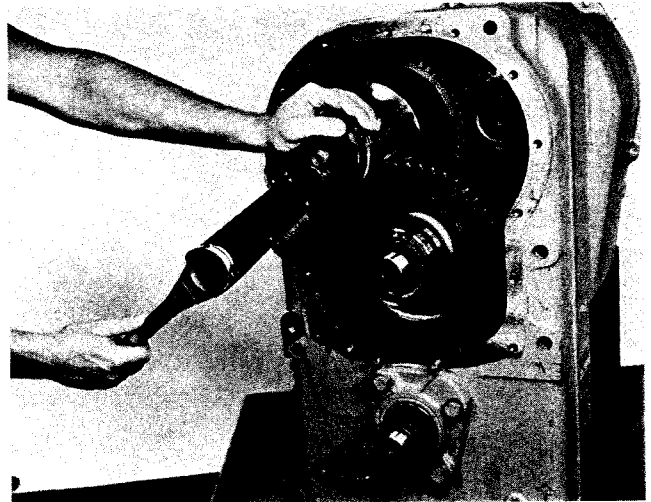


Figure J

Install bolts and block gears. Torque bolts to specifications and lock wire together.

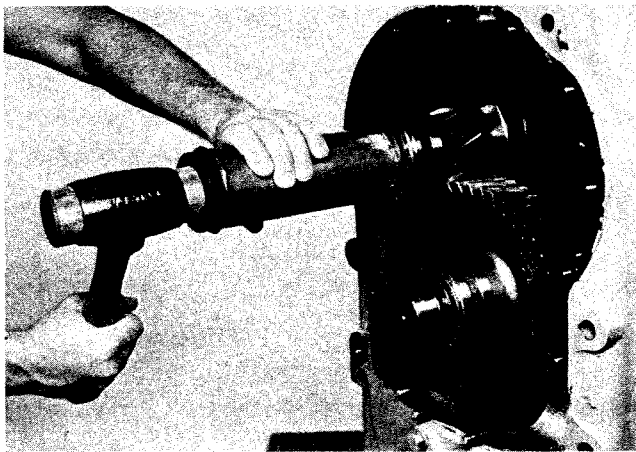


Figure H

Install outer taper bearing. **NOTE:** Heat bearing in hot oil bath prior to installation.

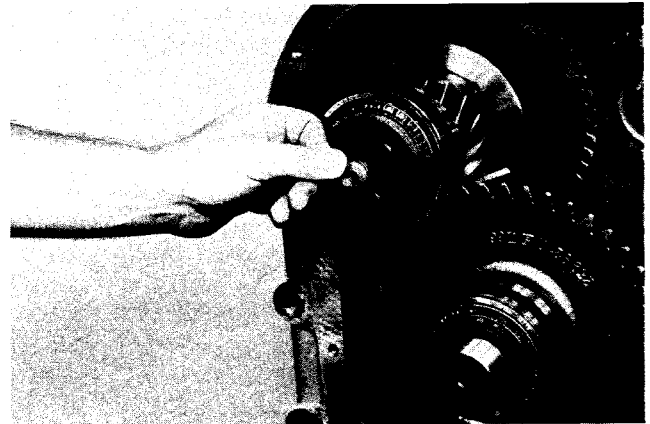


Figure K

Install low clutch shaft sealing ring.

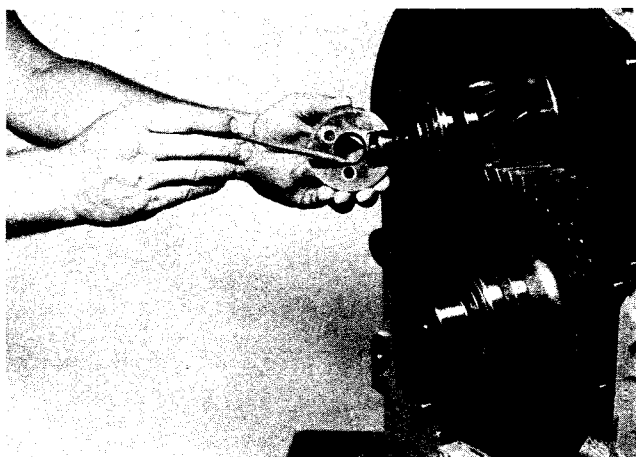


Figure I

Install retainer plate, inner diameter chamfer toward bearing.

16 SCREW RING GEAR INSTALLATION PROCEDURE (Non-Asbestos Ring Gear)

1. Remove all burrs from flywheel mounting face and pilot bores. Clean the torque converter ring gear flywheel mounting surface and the ring gear screw tapped holes with solvent. Dry thoroughly, being certain ring gear screw holes are dry and clean.
2. Check engine flywheel and housing or housing adaptor for conformance to standard S.A.E. No. 3 — SAE J927 and J1033 tolerance specifications for pilot bores size, pilot bores eccentricities and mounting face deviations. Measure and record engine crankshaft end play.
3. Install torque converter ring gear as shown.

NOTE: Assembly of the ring gear must be completed within a fifteen minute period from start of screw installation. The screws are prepared with an epoxy coating which begins to harden after installation in the flywheel mounting holes. If not tightened to proper torque within the fifteen minute period insufficient screw clamping tension will result.

4. Install backing ring and sixteen (16) special screws to approximately .06 inch [1,5 mm] of seated position. It is permissible to use a power wrench for this installation phase. With a calibrated torque wrench tighten screws 30 to 33 pounds feet of torque [40,7 - 44,7 N.m].

To obtain maximum effectiveness of the special screw's locking feature, a minimum time period after screw installation of twelve (12) hours is suggested before engine start-up.

The special screw is to be used for **ONE** installation only. If the screw is removed for any reason it **MUST BE REPLACED**. It is recommended that the epoxy left in the flywheel hole be removed with the proper tap and cleaned with solvent. Dry hole thoroughly and use a **NEW** screw for re-installation.

5. Assemble torque converter to engine flywheel by sliding converter into position by hand before fastening housing attachment screws. This may require more than one trial to match the drive gear teeth. Pulling the converter into position with housing attachment bolts is not recommended.
6. Measure engine crankshaft end play after assembly of torque converter. This value must be within one thousandth (.001) of an inch [0,0254mm] of end play recorded (in Paragraph #2) before assembly of torque converter.

802553 — 1.5 INCH [38,1] 16 SCREW RING GEAR KIT

1	249341	Torque Converter Ring Gear
16	236288	Ring Gear Screw 1.5 Inch [38,1]
1	802555	Installation Instruction Sheet

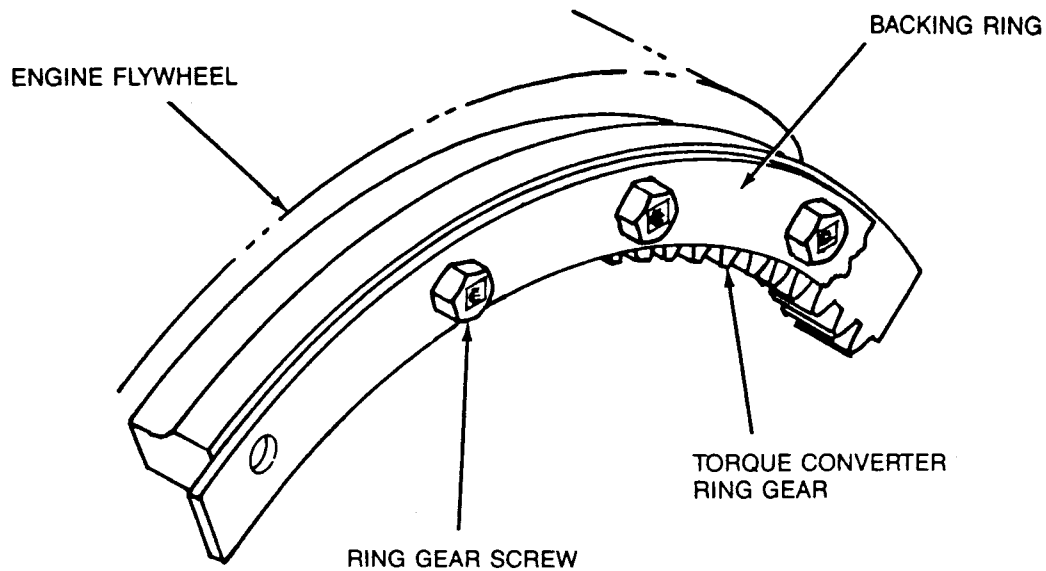
802554 — 1.5 INCH [38,1] 16 SCREW RING GEAR KIT

1	249341	Torque Converter Ring Gear
16	236288	Ring Gear Screw 1.5 Inch [38,1]
1	243767	Backing Ring
1	802555	Installation Instruction Sheet

243767 Backing Ring not included in 802553 Ring Gear Kit. Must be Ordered Separately.

Dimensions are in inches — Dimensions in [] are mm.

SEE PAGE 36 FOR INSTALLATION ILLUSTRATIONS



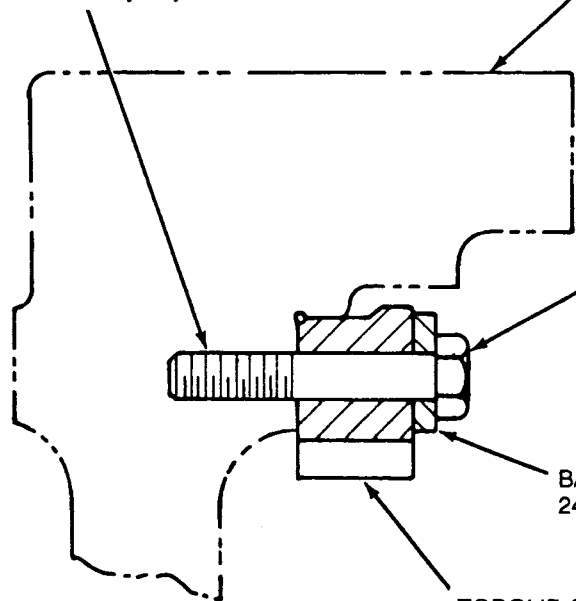
RING GEAR SCREW
(16) 236288 1.500 [38,1]

ENGINE FLYWHEEL

SEE PAGE 35
FOR INSTALLATION
PROCEDURE AND
BOLT TORQUE

BACKING RING
243767

TORQUE CONVERTER
RING GEAR 249341



32 SCREW RING GEAR INSTALLATION PROCEDURE (Non-Asbestos Ring Gear)

1. Remove all burrs from flywheel mounting face and pilot bores. Clean the torque converter ring gear flywheel mounting surface and the ring gear screw tapped holes with solvent. Dry thoroughly, being certain ring gear screw holes are dry and clean.
2. Check engine flywheel and housing or housing adaptor for conformance to standard S.A.E. No. 3 — SAE J927 and J1033 tolerance specifications for pilot bores size, pilot bores eccentricities and mounting face deviations. Measure and record engine crankshaft end play.
3. Install torque converter ring gear as shown.

NOTE: Assembly of the ring gear must be completed within a fifteen minute period from start of screw installation. The screws are prepared with an epoxy coating which begins to harden after installation in the flywheel mounting holes. If not tightened to proper torque within the fifteen minute period insufficient screw clamping tension will result.

4. Install backing ring and thirty-two (32) special screws to approximately .06 inch [1,5 mm] of seated position. It is permissible to use a power wrench for this installation phase. With a calibrated torque wrench tighten screws 23 to 25 pounds feet of torque [31,2 - 33,8 N.m].

To obtain maximum effectiveness of the special screw's locking feature, a minimum time period after screw installation of twelve (12) hours is suggested before engine start-up.

The special screw is to be used for **ONE** installation only. If the screw is removed for any reason it **MUST BE REPLACED**. It is recommended that the epoxy left in the flywheel hole be removed with the proper tap and cleaned with solvent. Dry hole thoroughly and use a **NEW** screw for re-installation.

5. Assemble torque converter to engine flywheel by sliding converter into position by hand before fastening housing attachment screws. This may require more than one trial to match the drive gear teeth. Pulling the converter into position with housing attachment bolts is not recommended.
6. Measure engine crankshaft end play after assembly of torque converter. This value must be within one thousandth (.001) of an inch [0,0254mm] of end play recorded (in Paragraph #2) before assembly of torque converter.

802544 — 1.5 INCH [38,1] 32 SCREW RING GEAR KIT

1	249265	Torque Converter Ring Gear
32	243970	Ring Gear Screw 1.5 Inch [38,1]
1	802550	Installation Instruction Sheet

802547 — 2.5 INCH [63,5] 32 SCREW RING GEAR KIT

1	249265	Torque Converter Ring Gear
32	237153	Ring Gear Screw 2.5 Inch [63,5]
1	802550	Installation Instruction Sheet

802545 — 1.75 INCH [44,4] 32 SCREW RING GEAR KIT

1	249265	Torque Converter Ring Gear
32	244903	Ring Gear Screw 1.75 Inch [44,4]
1	802550	Installation Instruction Sheet

802548 — 3.0 INCH [76,2] 32 SCREW RING GEAR KIT

1	249265	Torque Converter Ring Gear
32	236938	Ring Gear Screw 3.0 Inch [76,2]
1	802550	Installation Instruction Sheet

802546 — 2.0 INCH [50,8] 32 SCREW RING GEAR KIT

1	249265	Torque Converter Ring Gear
32	240318	Ring Gear Screw 2.0 Inch [50,8]
1	802550	Installation Instruction Sheet

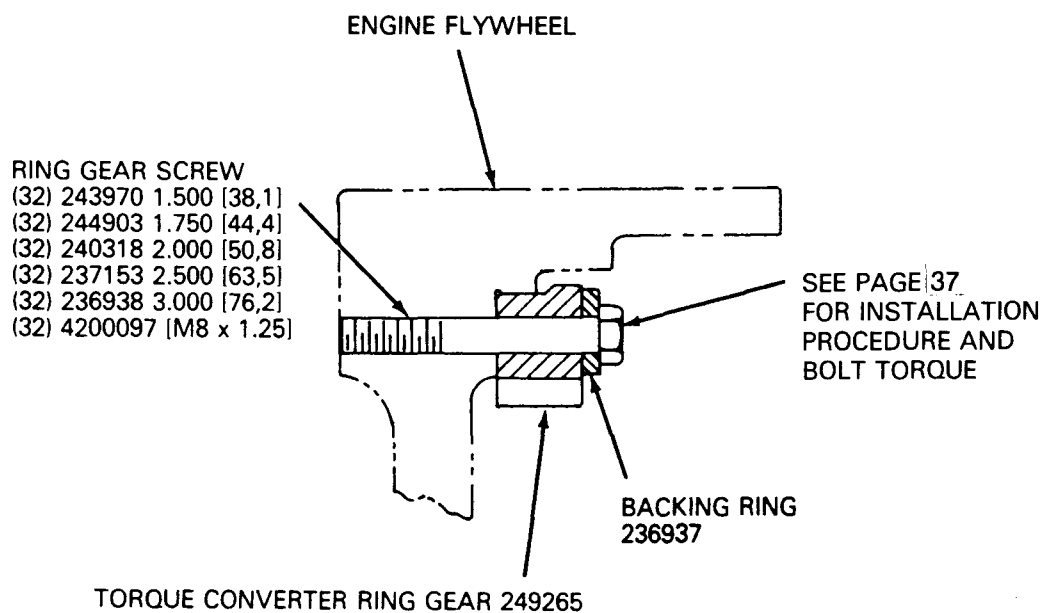
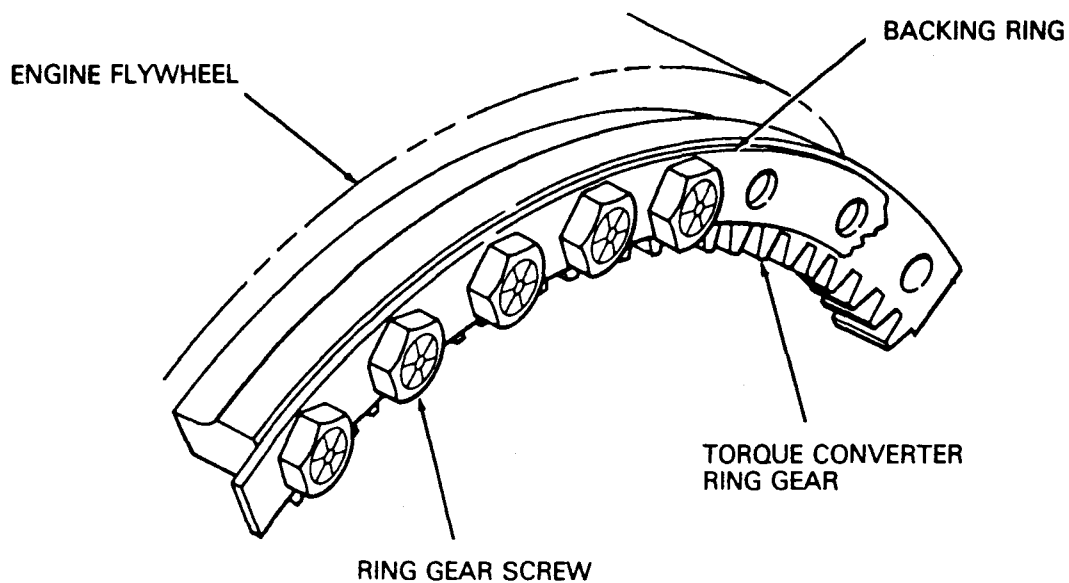
802549 — M8-32 SCREW RING GEAR KIT

1	249265	Torque Converter Ring Gear
32	4200097	Ring Gear Screw [M8 x 1.25]
1	802550	Installation Instruction Sheet

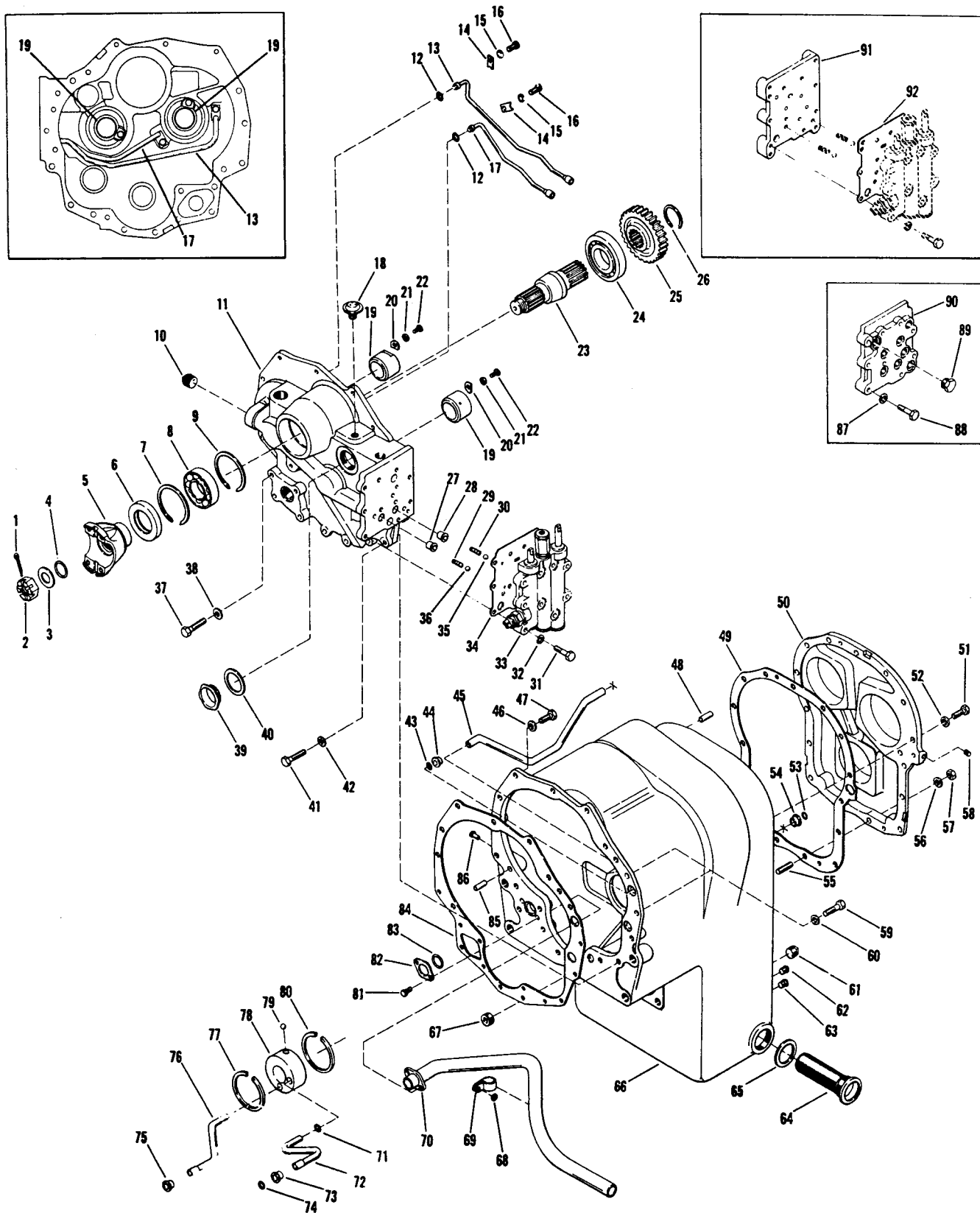
236937 Backing Ring Not Included in Ring Gear Kit. Must be Ordered Separately.

NOTE: The initial installation drive gear mounting kit includes a converter air breather. This breather is used on C & CL 270/C & CL 320 converters only and is not required for the HR & LHR 28000/HR & LHR 32000 applications.

SEE PAGE 38 FOR INSTALLATION ILLUSTRATIONS



R-MODEL SECTION



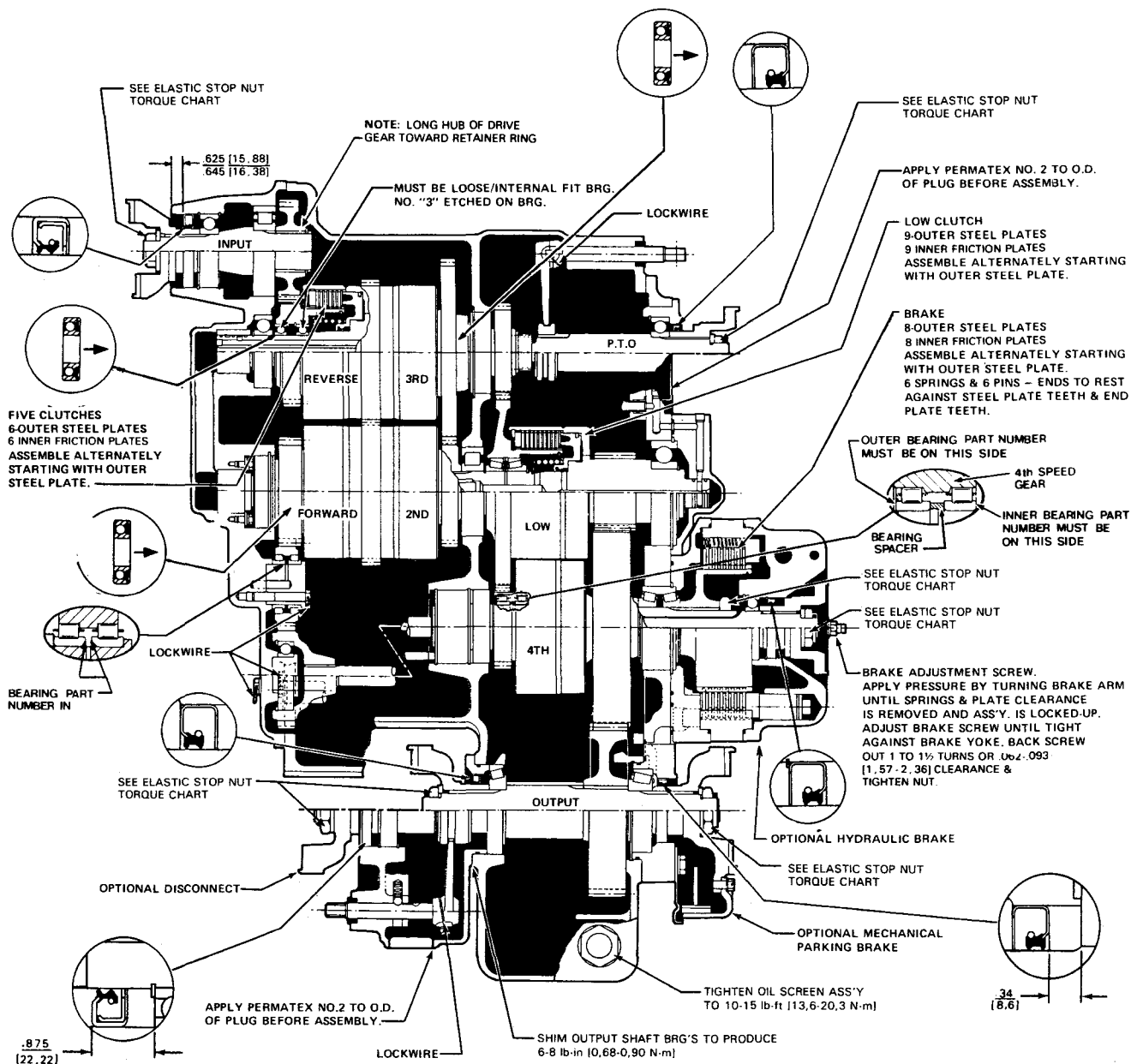
R 28000 CASE AND FRONT COVER GROUP

ITEM	DESCRIPTION	QTY.	ITEM	DESCRIPTION	QTY.
1	Input Flange Nut Cotter.....	1	47	Front Cover to Case Screw.....	5
2	Flange Nut.....	1	48	Rear Cover Dowel Pin.....	2
3	Flange Nut Washer.....	1	49	Rear Cover to Transmission Case Gasket.....	1
4	Input Flange "O" Ring.....	1	50	Rear Cover.....	1
5	Input Flange.....	1	51	Rear Cover to Transmission Case Screw.....	13
6	Flange Oil Seal.....	1	52	Rear Cover to Transmission Case Screw Lockwasher.....	13
7	Input Shaft Front Bearing Retainer Ring.....	1	53	Clutch Pressure Tube "O" Ring.....	1
8	Input Shaft Front Bearing.....	1	54	Tube Sleeve.....	1
9	Input Shaft Front Bearing Retainer Ring.....	1	55	Rear Cover to Case Stud.....	2
10	Pipe Plug.....	1	56	Rear Cover to Case Stud Lockwasher.....	2
11	Front Cover and Tube Assembly.....	1	57	Rear Cover to Case Stud Nut.....	2
12	"O" Ring.....	2	58	Rear Cover Pipe Plug.....	1
13	3rd Speed Tube Assembly.....	1	59	Front Cover to Transmission Case Screw.....	5
14	Tube Clip.....	2	60	Front Cover to Transmission Case Screw Lockwasher.....	5
15	Tube Clip Screw Lockwasher.....	2	61	Magnetic Drain Plug.....	1
16	Tube Clip Screw.....	2	62	Oil Level Plug.....	1
17	Reverse Tube Assembly.....	1	63	Oil Level Plug.....	1
18	Breather Assembly.....	1	64	Screen Assembly.....	1
19	Front Cover Sleeve.....	2	65	Screen Assembly Gasket.....	1
20	Front Cover Sleeve Lock.....	2	66	Transmission Case and Tube Assembly.....	1
21	Sleeve Lock Screw Lockwasher.....	2	67	Plug.....	1
22	Sleeve Lock Screw.....	2	68	Tube Clip Washer.....	1
23	Input Shaft.....	1	69	Suction Line Tube Clip.....	1
24	Input Shaft Rear Bearing.....	1	70	Suction Tube Assembly.....	1
25	Input Shaft Gear.....	1	71	Pressure Tube "O" Ring.....	1
26	Input Shaft Gear Retainer Ring.....	1	72	4th Speed Pressure Tube.....	1
27	Tube Sleeve.....	1	73	Tube Sleeve.....	1
28	Tube Sleeve.....	1	74	Pressure Tube "O" Ring.....	1
29	Detent Spring.....	1	75	Tube Sleeve.....	1
30	Detent Spring.....	1	76	4th Speed Clutch Lube Tube.....	1
31	Valve to Housing Screw.....	9	77	Oil Distributor Retainer Ring.....	1
32	Valve to Housing Screw Lockwasher.....	9	78	4th Clutch Front Oil Distributor.....	1
33	Control Valve Assembly.....	1	79	Locking Ball.....	1
34	Control Valve Gasket.....	1	80	Oil Distributor Retainer Ring.....	1
35	Detent Ball.....	1	81	Suction Line Screw.....	2
36	Detent Ball.....	1	82	Suction Line Washer.....	1
37	Front Cover to Transmission Case Screw.....	4	83	Suction Line "O" Ring.....	1
38	Front Cover to Transmission Case Screw Lockwasher.....	4	84	Front Cover Gasket.....	1
39	Front Cover Plug.....	1	85	Front Cover Dowel Pin.....	2
40	Front Cover Plug Gasket.....	1	86	Rivet.....	1
41	Front Cover to Transmission Case Screw.....	4	87	Remote Valve Plate Screw Lockwasher.....	9
42	Front Cover to Transmission Case Screw Lockwasher.....	4	88	Remote Valve Plate Screw.....	9
43	Clutch Pressure Tube "O" Ring.....	1	89	Valve Plate Plug.....	1
44	Tube Sleeve.....	1	90	Valve Plate.....	1
45	Low Speed Clutch Pressure Tube.....	1	91	Control Valve Remote Mounting Plate.....	1
46	Front Cover to Case Screw Lockwasher.....	5	92	Control Valve to Plate Gasket.....	1

ELASTIC STOP NUT TORQUE

THREAD SIZE	LB.-FT.	[N·m]
1" - 20	150 - 200	[203,4 - 271,1]
1 1/4" - 18	200 - 250	[271,2 - 338,9]
1 1/2" - 18	300 - 350	[406,8 - 474,5]
1 3/4" - 12	400 - 450	[542,4 - 610,1]

1. USE PERMATEx & CRANE SEALER ONLY WHERE SPECIFIED.
2. ALL LEAD IN CHAMFERS FOR OIL SEALS, PISTON RINGS & "O" RINGS MUST BE SMOOTH & FREE FROM BURRS. INSPECT AT ASSEMBLY.
3. LUBRICATE ALL PISTON RING GROOVES & "O" RINGS WITH OIL BEFORE ASSEMBLY.
4. APPLY VERY LIGHT COAT OF PERMATEx NO.2 TO O.D. OF ALL OIL SEALS BEFORE ASSEMBLY.
5. AFTER ASSEMBLY OF PARTS USING PERMATEx OR CRANE SEALER, THERE MUST NOT BE ANY FREE OR EXCESS MATERIAL THAT COULD ENTER THE OIL CIRCUIT.
6. APPLY LIGHT COAT OF CRANE SEALER TO ALL PIPE PLUGS.
7. APPLY A THIN COATING OF GREASE BETWEEN SEAL LIPS ON LIP TYPE SEALS PRIOR TO ASSEMBLY.
8. APPLY LIGHT COAT OF PERMATEx NO. 2 TO ALL THRU STUD THREADS.



R-28420 SERIES POWER SHIFT TRANSMISSION WITH VARIOUS OPTIONS

**28000 4 SPEED LONG DROP
R MODEL (REMOTE MOUNTED) TRANSMISSION FRONT COVER REMOVAL,
DISASSEMBLY, REASSEMBLY AND INSTALLATION ON TRANSMISSION**

FRONT COVER REMOVAL

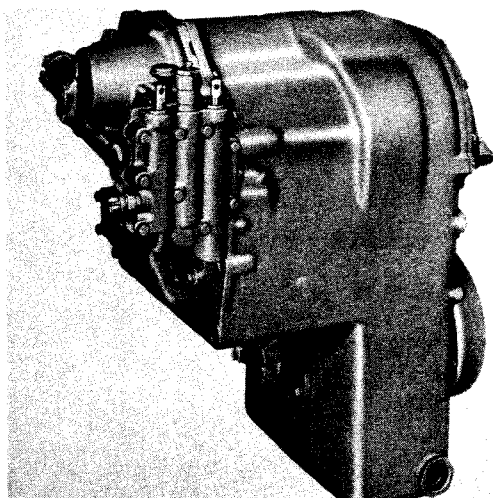


Figure 1
Side view of R 28000

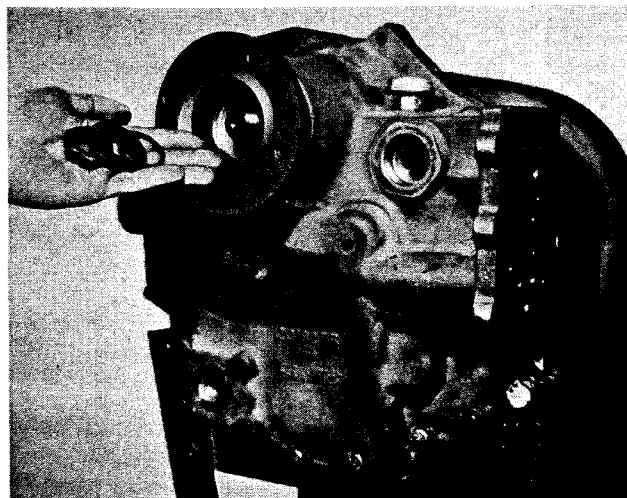


Figure 3
Remove companion flange nut, washer and "O" Ring.

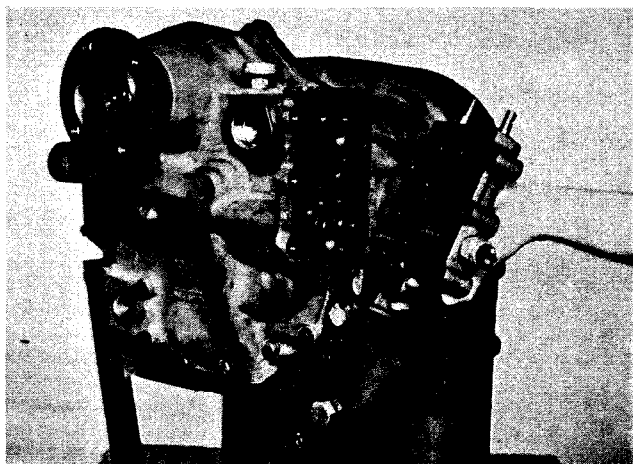


Figure 2
Remove control valve bolts and washers. Remove control valve. Use caution as not to lose detent springs and balls.

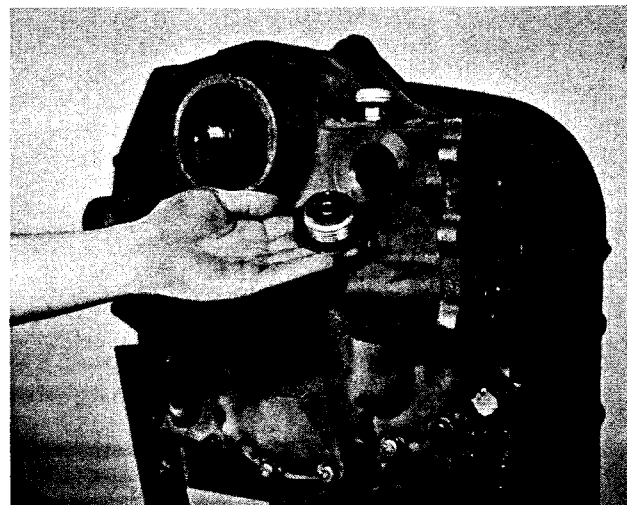


Figure 4
Remove front cover plug.

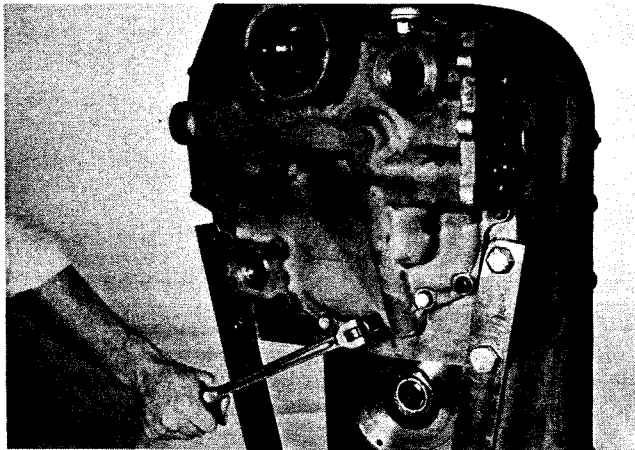


Figure 5

Remove bolts securing front cover to transmission housing.

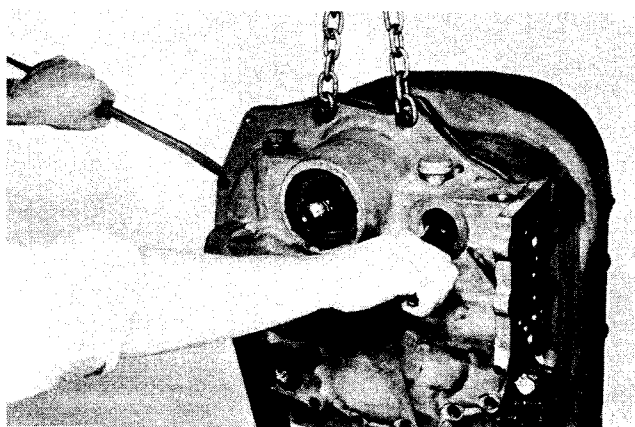


Figure 6

Support front cover with a chain fall. Using spreading type snap ring pliers, spread ears on forward clutch front bearing retaining ring. Holding snap ring open pry front cover from transmission housing.

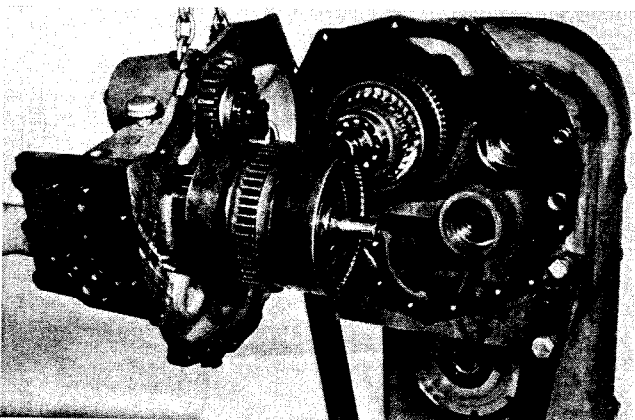


Figure 7

If forward and 2nd clutch comes out with front cover, spread ears on front bearing snap ring and separate clutch from front cover.

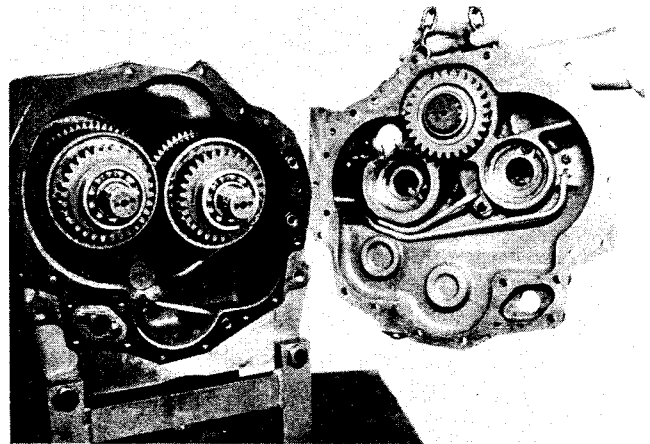


Figure 8

Front cover removed with forward and 2nd and reverse and 3rd clutch in transmission case.

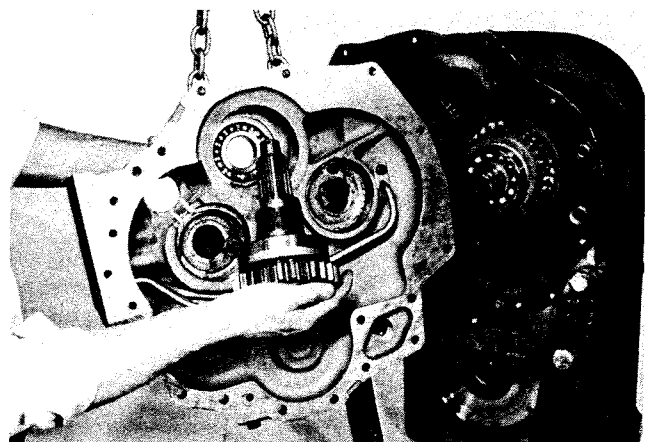


Figure 9

If input shaft is to be removed, tap on threaded end of shaft, remove input shaft, gear and bearing. See page 6, Figure 34 for complete transmission disassembly.

FRONT COVER ASSEMBLY

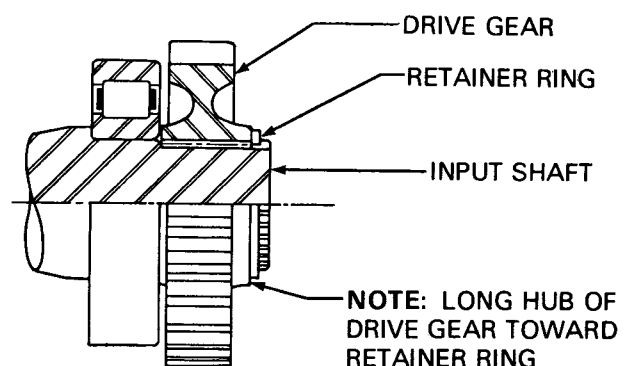


Figure 10

Input shaft, rear bearing, drive gear and snap ring.

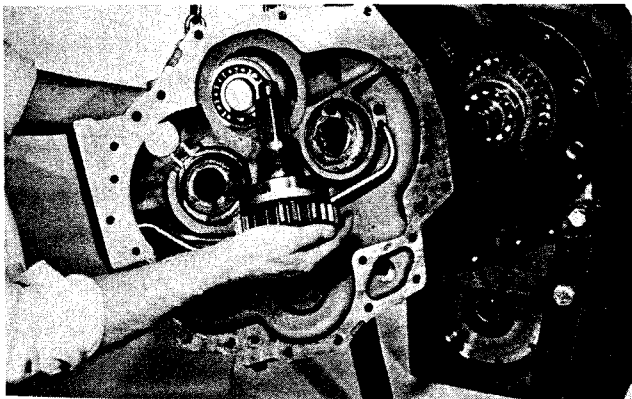


Figure 11
Install input shaft into front bearing.

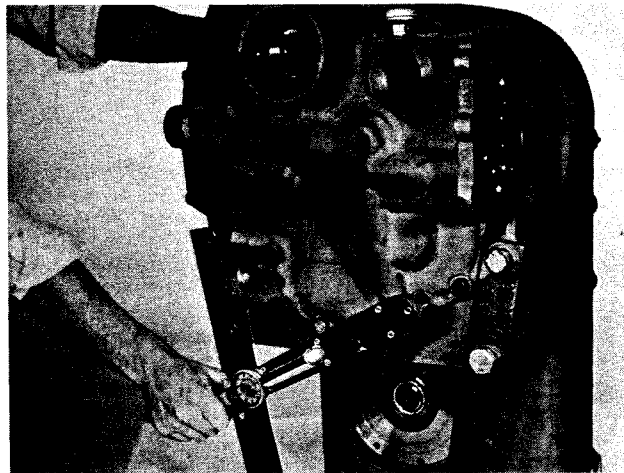


Figure 14
Install cover to case bolts. Tighten to specified torque.

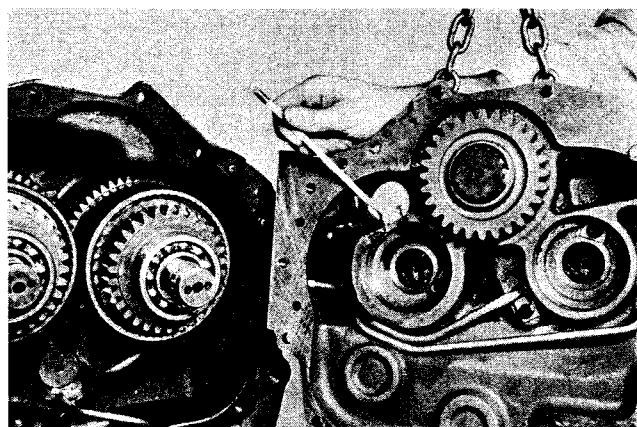


Figure 12
Forward clutch front bearing locating ring.

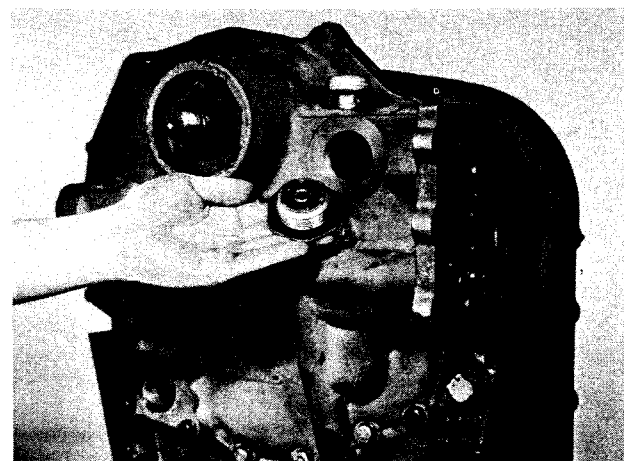


Figure 15
Install front cover plug.

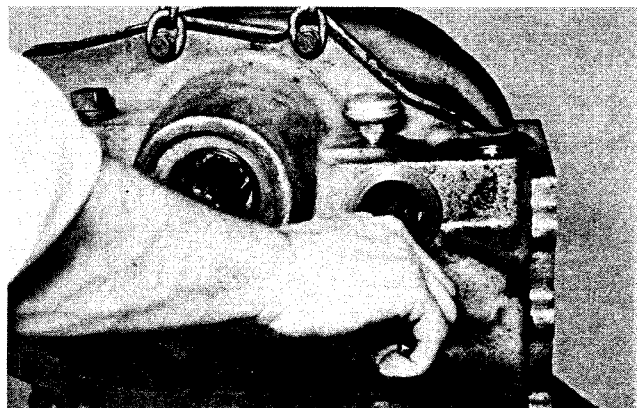


Figure 13
Support front cover with a chain fall. Spread forward clutch front bearing retainer ring. Position front cover to transmission case. Tap cover into place using caution as not to damage any of the clutch shaft piston rings.

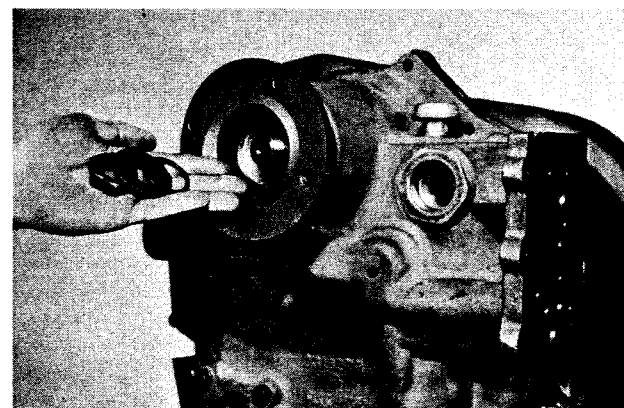
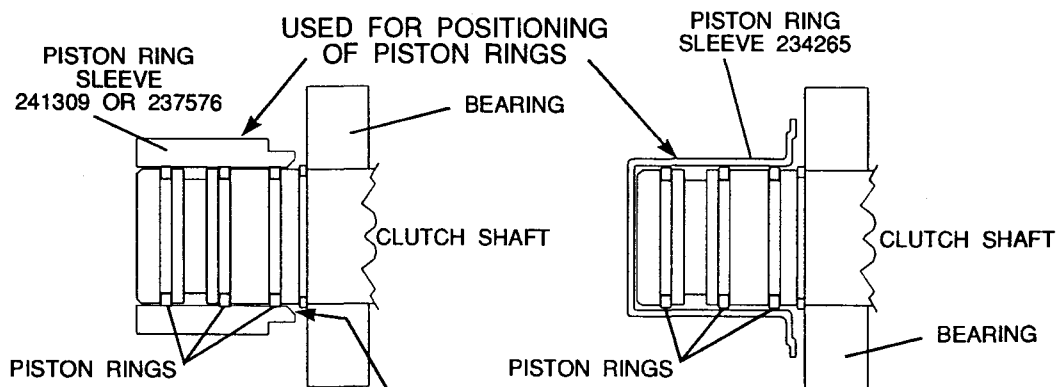


Figure 16
Install companion flange, flange "O" ring, washer and nut. Tighten standard slotted nut or elastic stop nut to specified torque. (See elastic stop nut torque chart.)

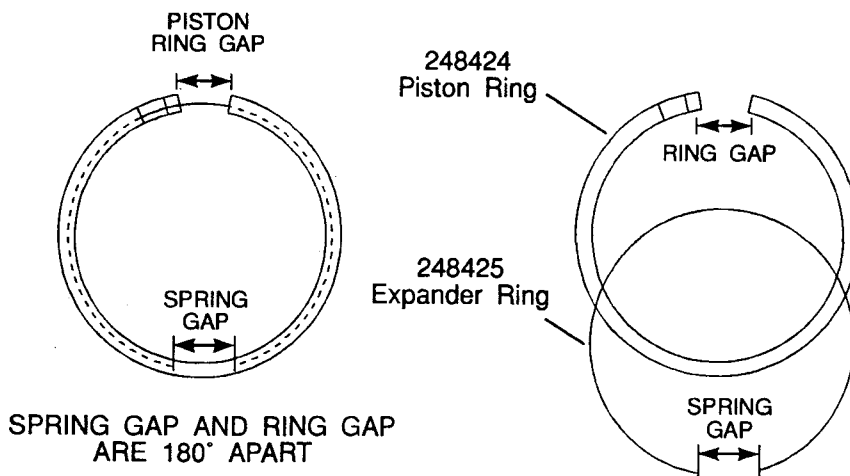
PROPER INSTALLATION OF TEFLON PISTON RING AND PISTON RING EXPANDER SPRINGS

NOTE: NOT ALL TRANSMISSIONS WILL HAVE TEFLON PISTON RINGS AND EXPANDER SPRINGS

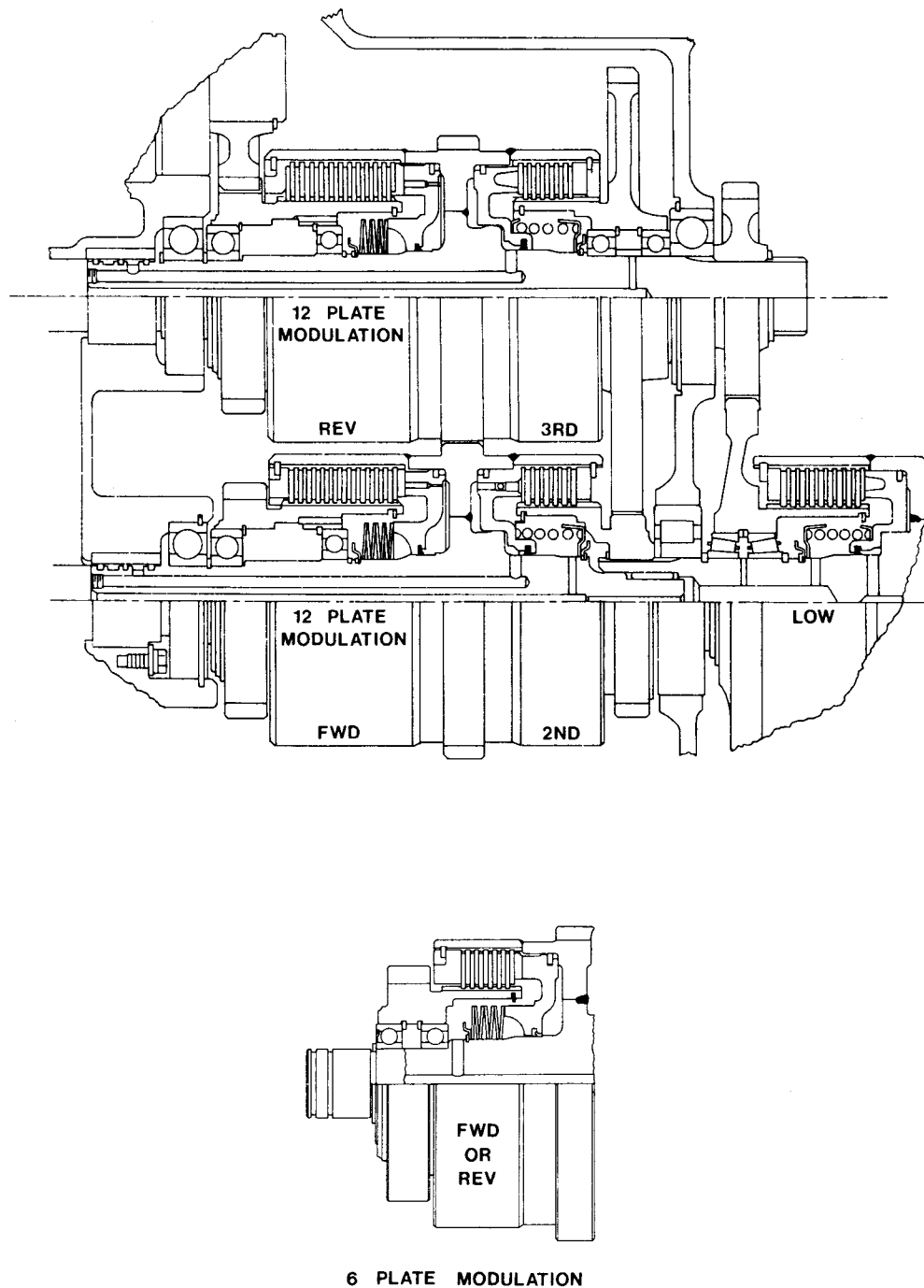
1. Fill the oil sealing ring grooves with a good grade of grease, this will help stabilize the teflon ring and expander spring in the ring groove for installation.
2. Position the expander spring in the inner groove of the new piston ring, with the expander spring gap 180° from the hook joint gap of the piston ring.
3. Carefully position the piston ring and expander spring on the clutch shaft in the inner most ring groove. Hook the piston piston ring joint.
4. Repeat steps 1, 2 and 3 for the remaining ring or rings making certain all hook joints are fastened securely.
5. Apply a heavy coat of grease to the outer diameter of the rings and clutch shaft. Center the piston ring's in the ring groove.
6. Before installing the clutch assembly in the front cover or converter housing it is recommended a piston ring sleeve P/N's 241309, 237576 or 234265 be used to center all of the piston rings in their respective ring grooves. Use extreme caution to not damage piston rings when installing the clutch shaft in the front trasnmission cover or converter housing.



Be sure that lead in chamfer and intersection of lead in chamfer to piston ring bore is free of burrs and nicks.

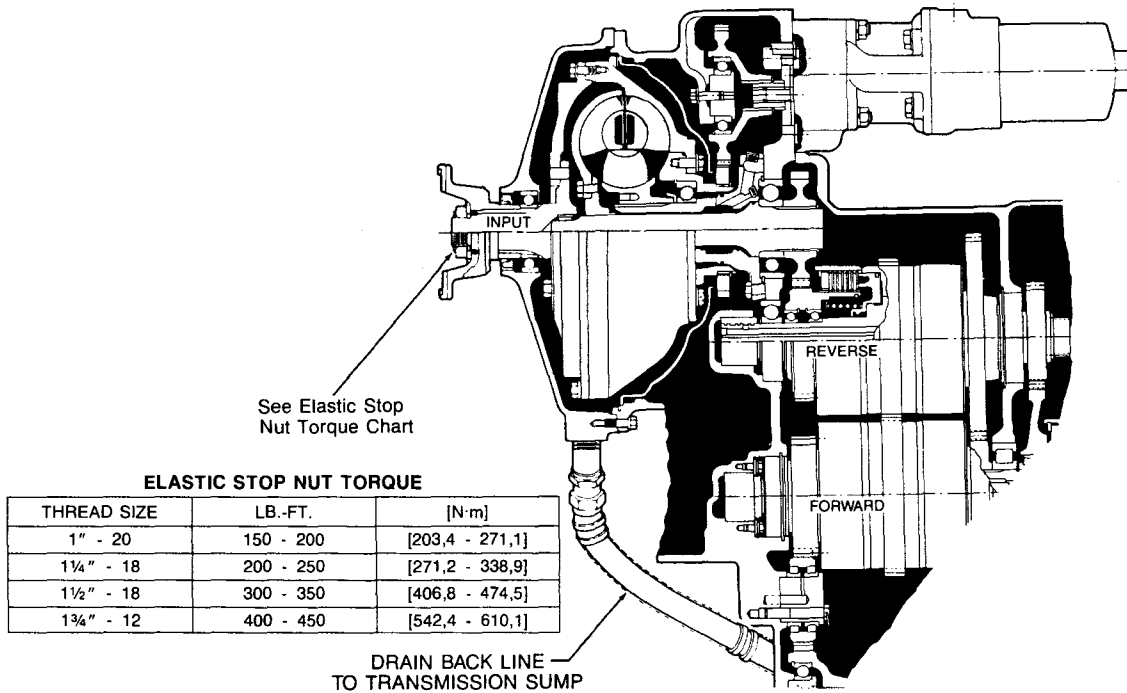


Clutch Modulation Cross Section

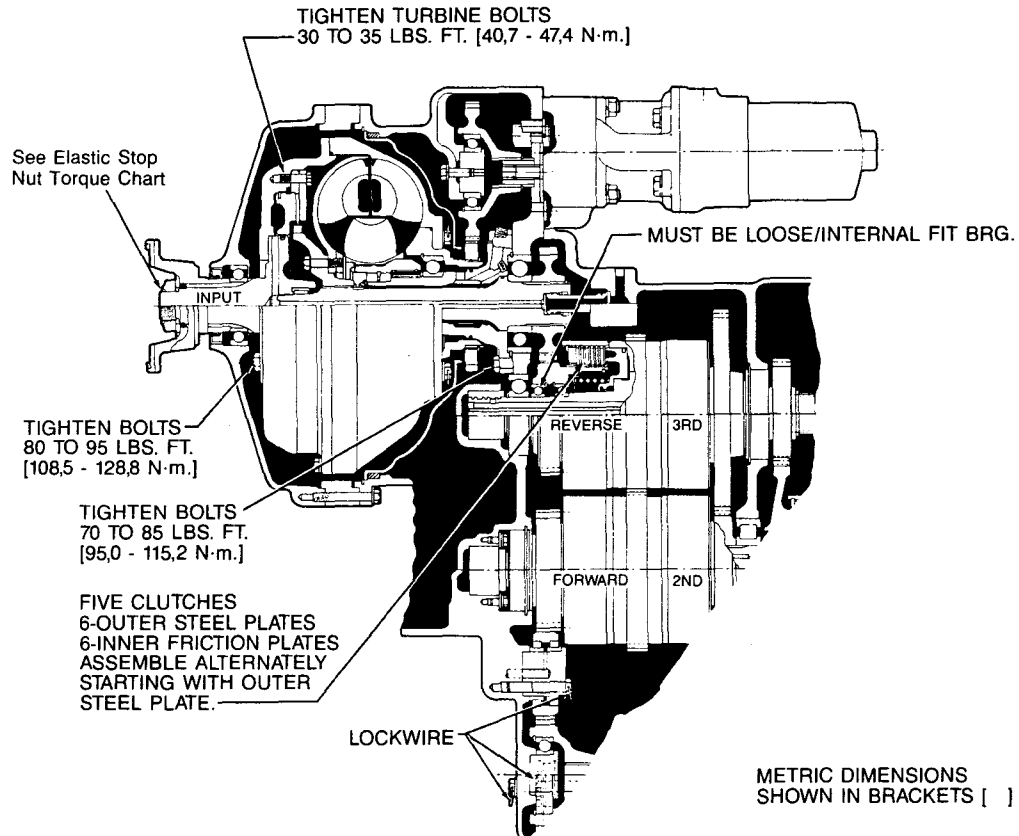


NOTE: The disc spring packs are to be used as complete assemblies and care should be taken not to intermix the individual disc springs with disc springs in another clutch or disc spring pack. Service replacement assemblies are banded together and must be replaced as assembly.

MHR SECTION



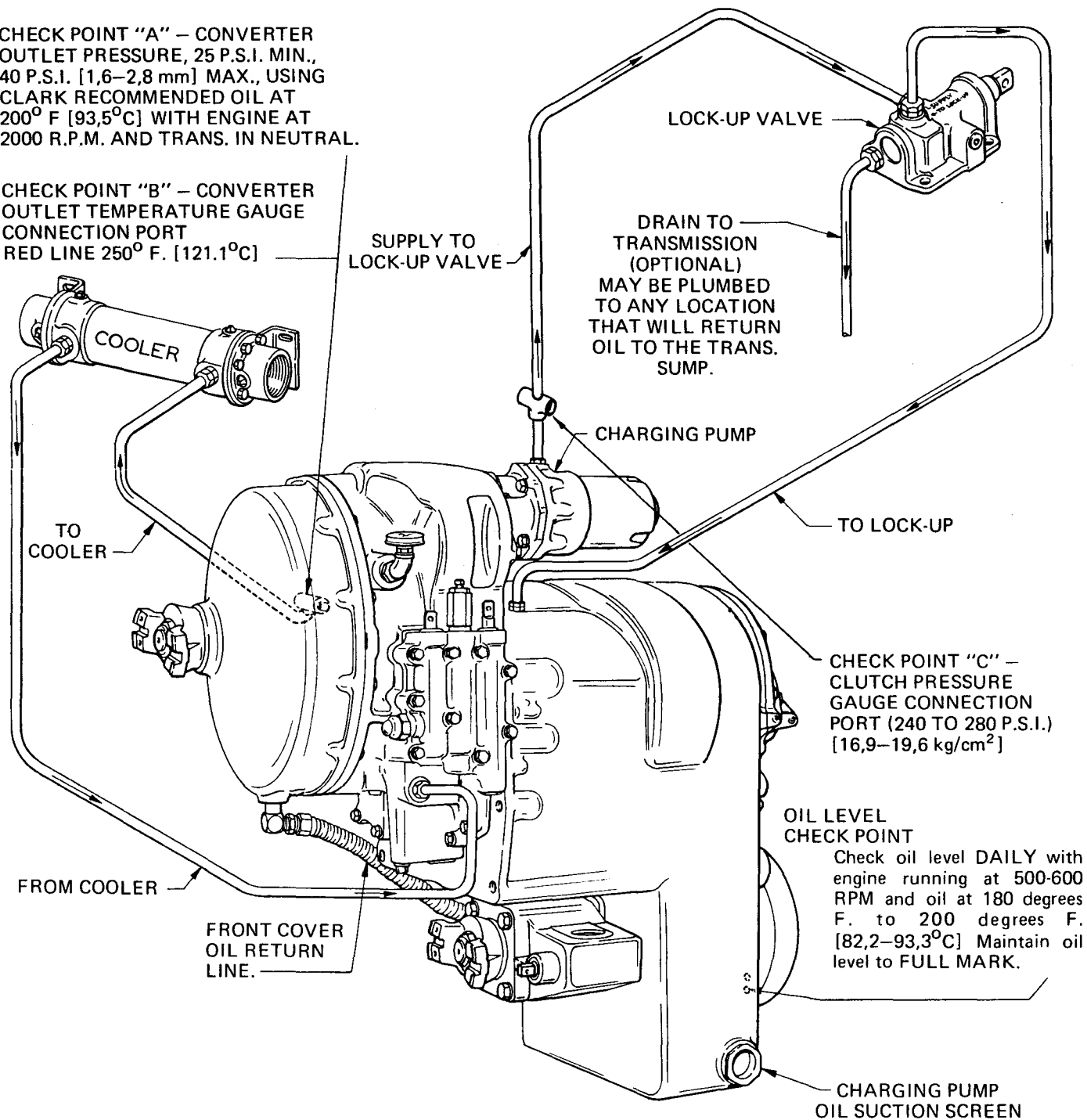
MHR SERIES POWER SHIFT TRANSMISSION



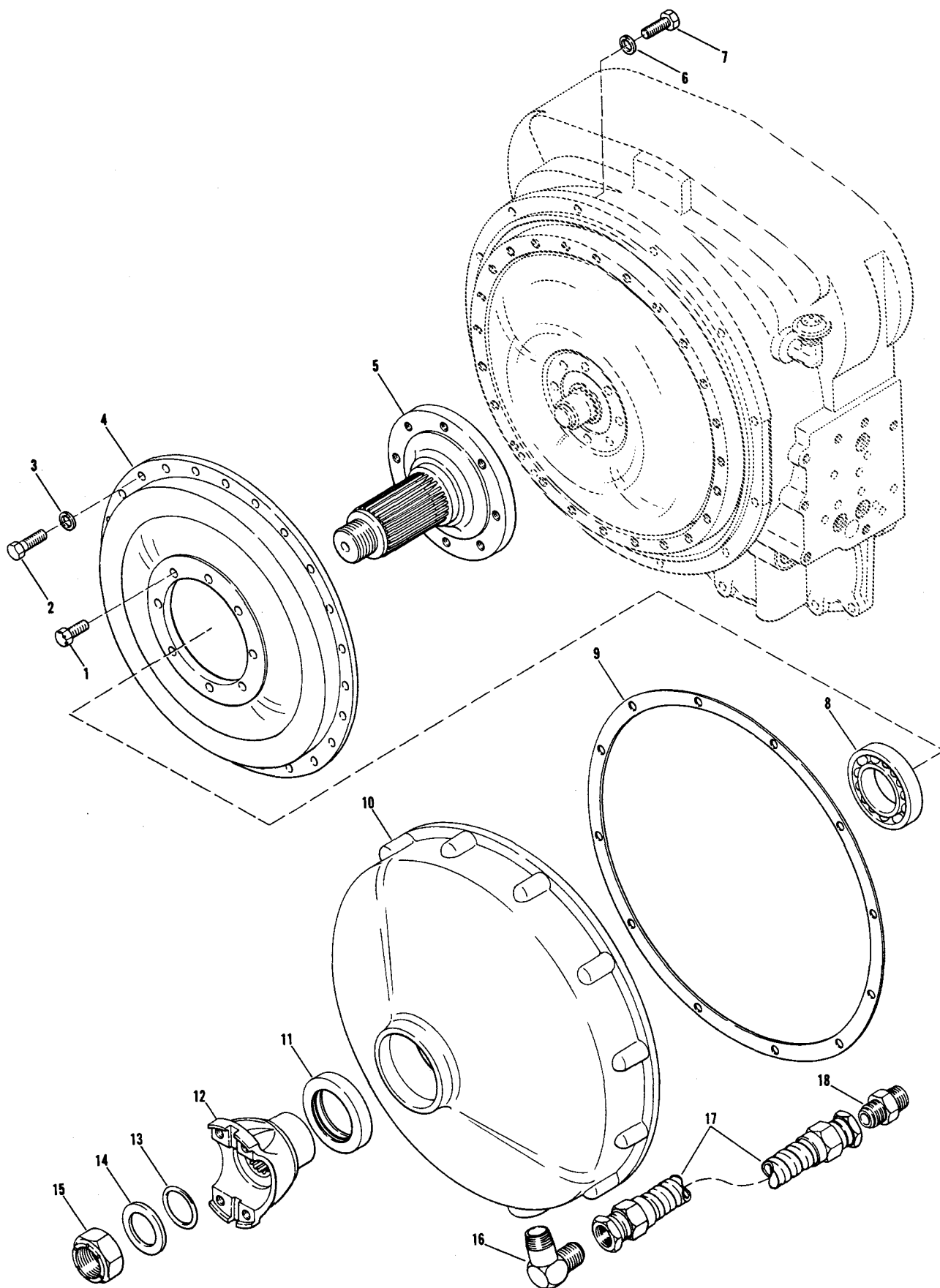
FLMHR SERIES POWER SHIFT TRANSMISSION

CHECK POINT "A" — CONVERTER
OUTLET PRESSURE, 25 P.S.I. MIN.,
40 P.S.I. [1,6–2,8 mm] MAX., USING
CLARK RECOMMENDED OIL AT
200° F [93,5°C] WITH ENGINE AT
2000 R.P.M. AND TRANS. IN NEUTRAL.

CHECK POINT "B" — CONVERTER
OUTLET TEMPERATURE GAUGE
CONNECTION PORT
RED LINE 250° F. [121,1°C]

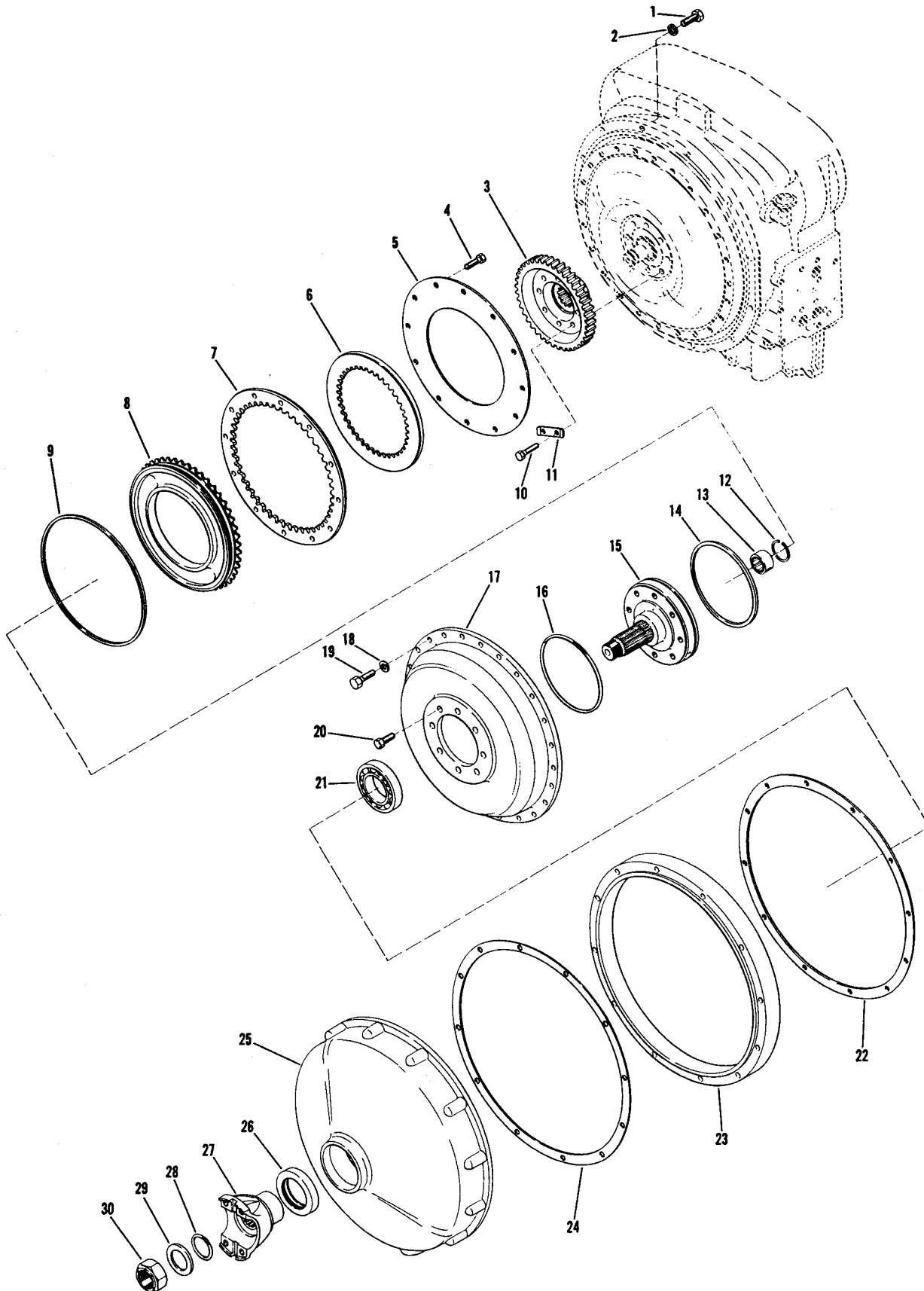


LMHR 28000 SERIES PLUMBING DIAGRAM



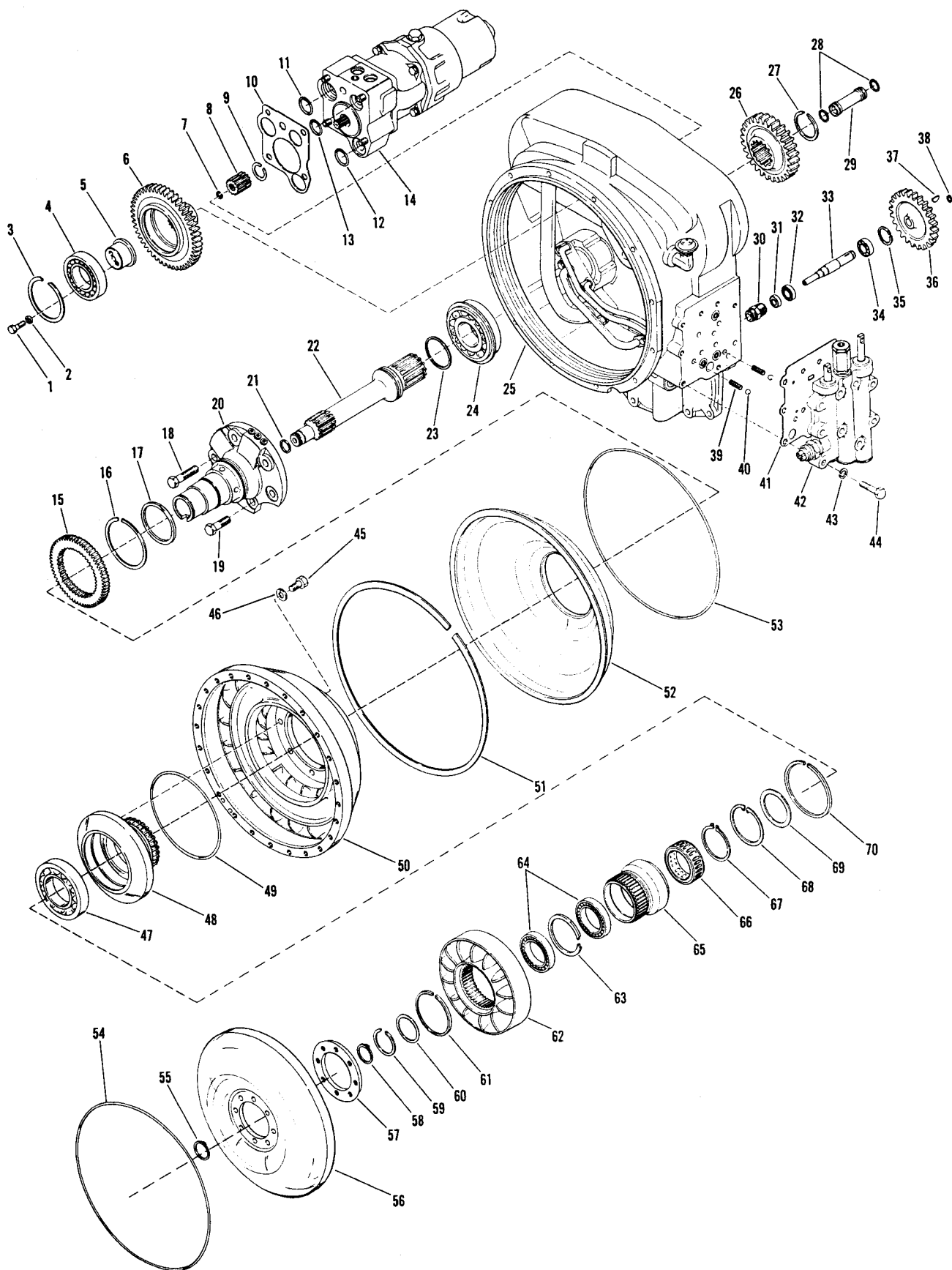
MHR COVER GROUP

Item	Description	Qty.
1	Input Shaft to Impeller Cover Screw	8
2	Impeller to Cover Screw	24
3	Impeller to Cover Screw Lockwasher	24
4	Impeller Cover	1
5	Input Shaft	1
6	Housing Cover Screw Lockwasher	12
7	Converter Housing to Cover Screw	12
8	Input Shaft Bearing	1
9	Converter Housing Front Cover Gasket	1
10	Converter Housing Front Cover	1
11	Front Cover Oil Seal	1
12	Input Flange	1
13	Flange O-Ring	1
14	Flange Washer	1
15	Flange Nut	1
16	Hose Fitting (Converter End)	1
17	Hose Assembly	1
18	Hose Fitting (Transmission End)	1



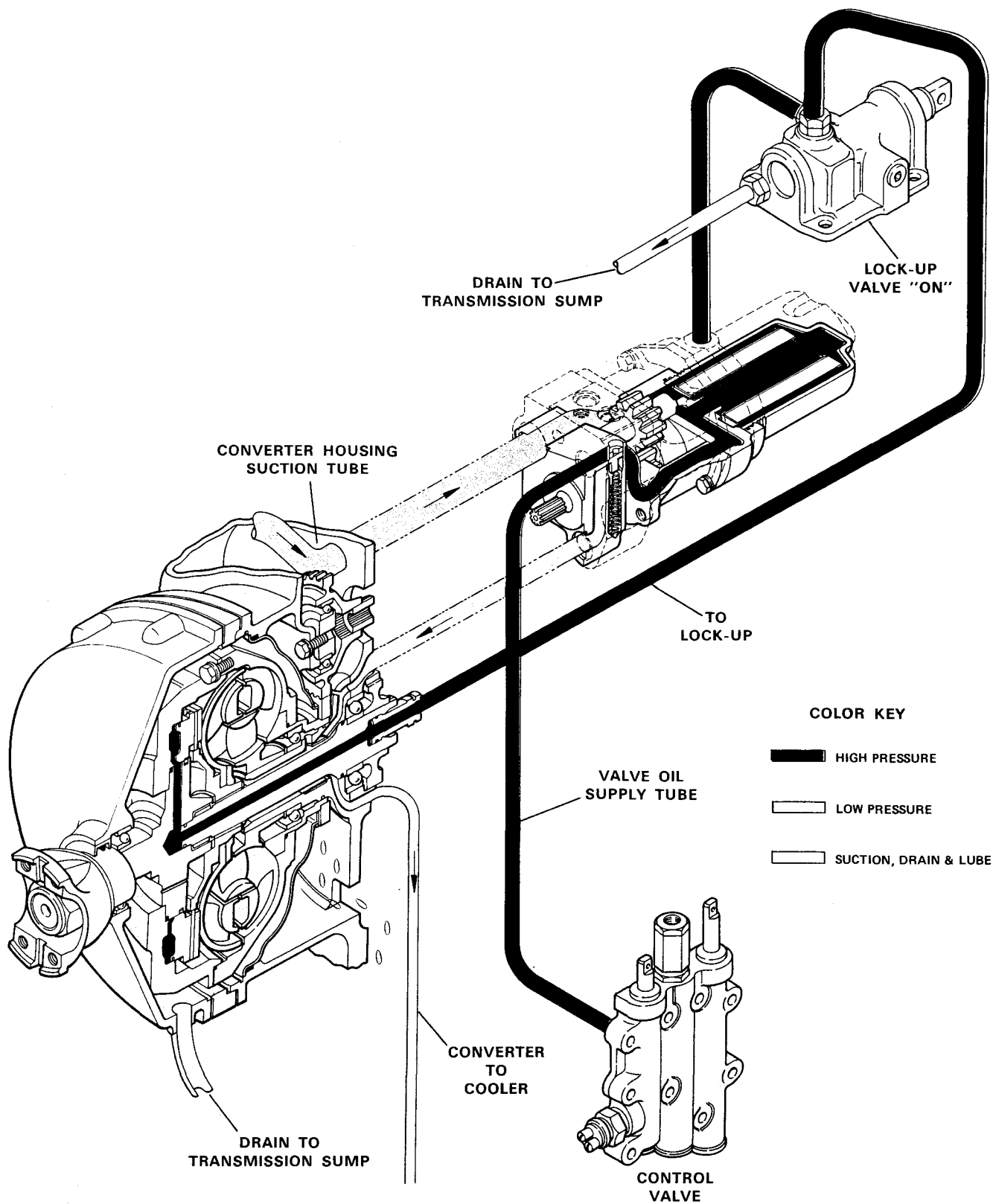
CONVERTER HOUSING SECTION WITH LOCKUP

Item	Description	Qty.
1	Converter Housing to Cover Screw	7
2	Converter Housing to Cover Screw Washer	12
	Converter Housing to Cover Studs & Nuts (Not Shown)	5
3	Turbine & Clutch Disc Hub	1
4	End Plate to Disc Screw	12
5	End Plate	1
6	Clutch Disc	1
7	Outer Drive Disc	1
8	Lock-Up Piston	1
9	Outer Piston Ring	1
10	Turbine & Clutch Disc Hub Screw	8
11	Disc Hub Screw Lock Plate	4
12	Bearing Snap Ring	1
13	Impeller Cover Bearing	1
14	Inner Piston Ring	1
15	Input Shaft	1
16	Input Shaft to Drive Disc O-Ring	1
17	Input Drive Disc	1
18	Impeller to Drive Disc Screw Washer	24
19	Impeller to Drive Disc Screw	24
20	Input Shaft to Drive Disc Screw	8
21	Input Shaft Bearing	1
22	Converter Housing Front Cover Gasket	1
23	Converter Housing Adaptor Ring	1
24	Converter Housing Front Cover Gasket	1
25	Converter Housing Front Cover	1
26	Front Cover Oil Seal	1
27	Input Flange	1
28	Input Flange O-Ring	1
29	Input Flange Washer	1
30	Input Flange Nut	1



CONVERTER SECTION WITH FREEWHEEL REACTION MEMBER

Item	Description	Qty.	Item	Description	Qty.
1	Bearing Support Screw	2	36	Drive Gear	1
2	Lockwasher	2	37	Woodruff Key	1
3	Drive Gear Snap Ring	1	38	Gear Retaining Ring	1
4	Drive Gear Bearing	1	39	Detent Spring	2
5	Drive Gear Bearing Support	1	40	Detent Ball	2
6	Drive Gear	1	41	Valve to Converter Gasket	1
7	Snap Ring (internal) — See item 8	1	42	Control Valve Assembly	1
8	Pump Drive Sleeve Assembly — Inc. items 7 and 9 .	1	43	Valve to Converter Housing Washer	9
9	Snap Ring (external) — See item 8	1	44	Valve to Converter Housing Screw	9
10	Valve Body to Converter Housing Gasket	1	45	Hub to Impeller Screw	8
11	Valve Body O-Ring	1	46	Hub to Impeller Screw Washer	8
12	Valve Body O-Ring	1	47	Impeller Hub Bearing	1
13	Valve Body O-Ring	1	48	Impeller Hub	1
14	Regulator Valve, Charging Pump & Filter Assy	1	49	Impeller Hub O-Ring	1
15	Impeller Hub Gear	1	50	Impeller	1
16	Impeller Hub Gear Snap Ring	1	51	Oil Baffle Retainer Ring	1
17	Piston Ring	1	52	Oil Baffle	1
18	Stator Support Screw	3	53	Oil Baffle Seal Ring	1
19	Stator Support Screw	3	54	Impeller to Drive Disc O-Ring	1
20	Stator Support & Sleeve Assembly	1	55	Snap Ring	1
21	Turbine Shaft Piston Ring	1	56	Turbine	1
22	Turbine Shaft	1	57	Turbine Ring	1
23	Piston Ring	1	58	Snap Ring	1
24	Turbine Shaft Bearing	1	59	Thrust Washer Snap Ring	1
25	Converter Housing & Tube Assembly	1	60	Thrust Washer	1
26	Turbine Shaft Gear	1	61	Reaction Member Snap Ring	1
27	Turbine Shaft Gear Snap Ring	1	62	Reaction Member	1
28	Piston Ring	2	63	Bearing Spacer	1
29	Turbine Shaft Piston Ring Race	1	64	Bearing	2
30	Tachometer Drive Tube Nut	1	65	Outer Race	1
31	Drive Shaft Oil Seal	1	66	Sprag Assembly	1
32	Drive Shaft Front Bearing	1	67	Snap Ring	1
33	Drive Shaft	1	68	Bearing Washer Snap Ring	1
34	Drive Shaft Rear Bearing	1	69	Bearing Washer	1
35	Bearing Retaining Ring	1	70	Bearing Snap Ring	1



**LMHR 28000 SERIES CONVERTER
AND LOCK-UP OIL FLOW DIAGRAM**

MHR & LFMHR 28000 SERVICE INFORMATION

The information contained herein must be used in conjunction with the HR28000 4 speed maintenance and service section of this manual for complete disassembly and reassembly.

The MHR Model is the midship mounted 28000 series transmission with a integral torque converter unit.

The LFMHR is the midship mounted 28000 series transmission with a integral torque converter unit, including a lock-up and free-wheel option. Converter lock-up permits direct engine drive for high speed hauling. Converter free-wheel offers torque converter drive for vehicle heavy work cycles, as well as peak output performance for high speed travel cycles.

MHR DISASSEMBLY

Midship Mounted – Closed Front End

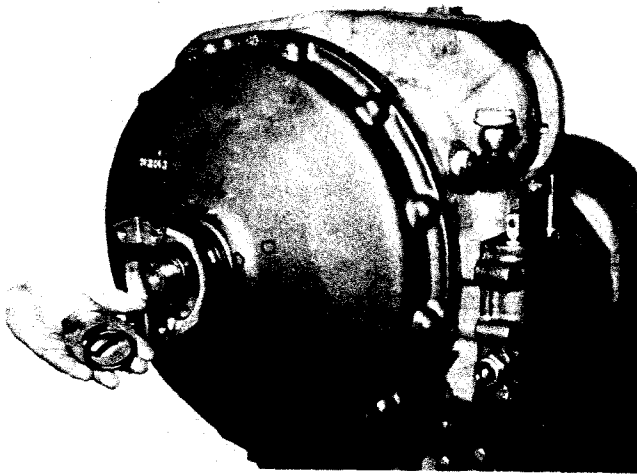


Figure 1

Remove front cover to transmission sump drain back line. Remove input flange retaining nut, washer, O-Ring, and flange.

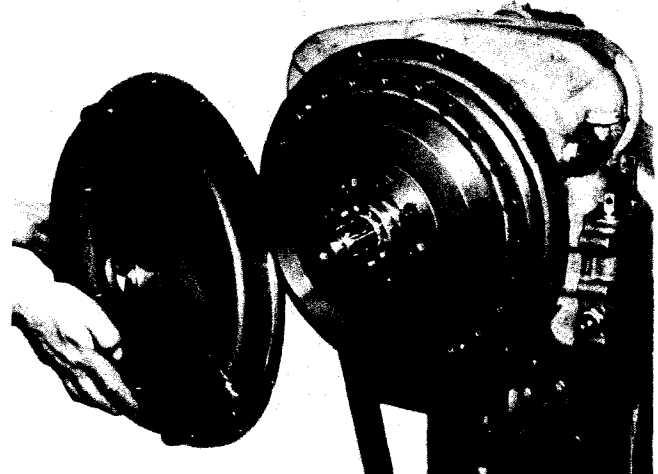


Figure 3

Remove converter housing front cover.

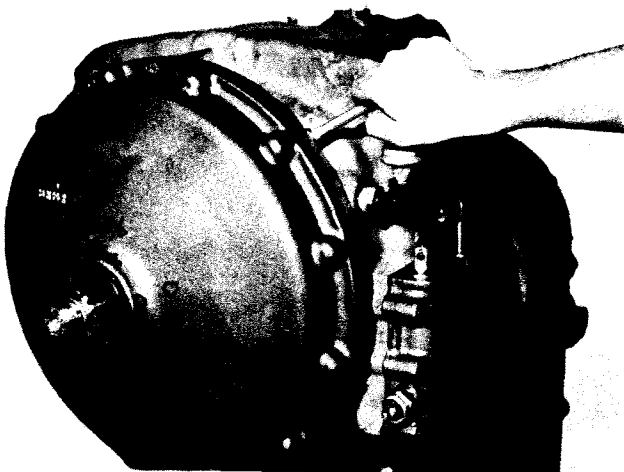


Figure 2

Remove bolts and washers securing converter housing front cover to converter housing.

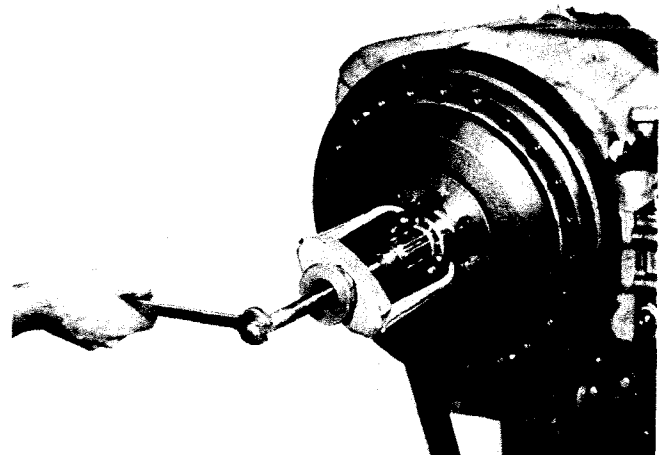


Figure 4

Remove input shaft support bearing.

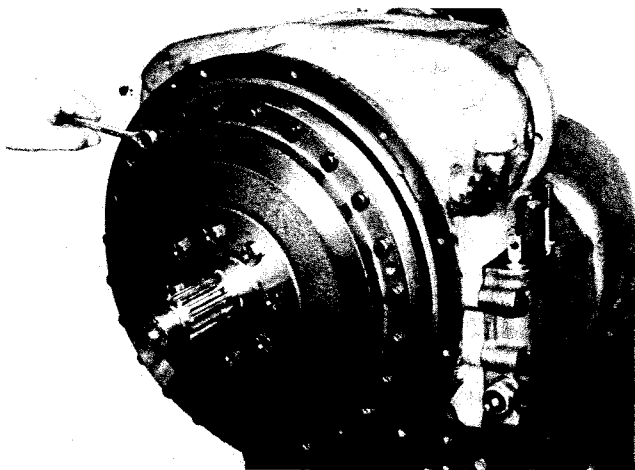


Figure 5
Remove impeller cover to impeller bolts.

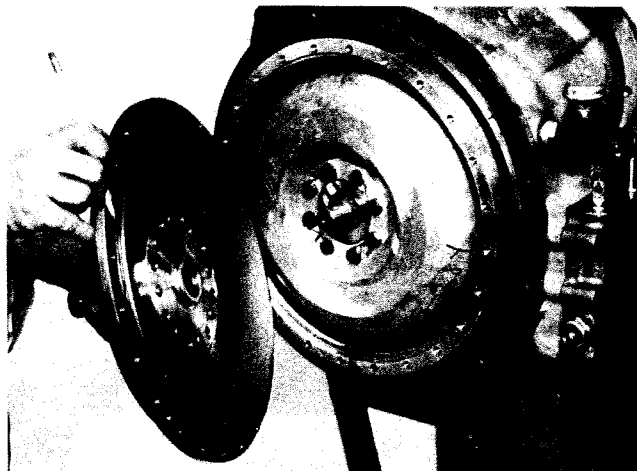


Figure 7
Position a new impeller cover O-Ring on cover and grease lightly to facilitate reassembly.

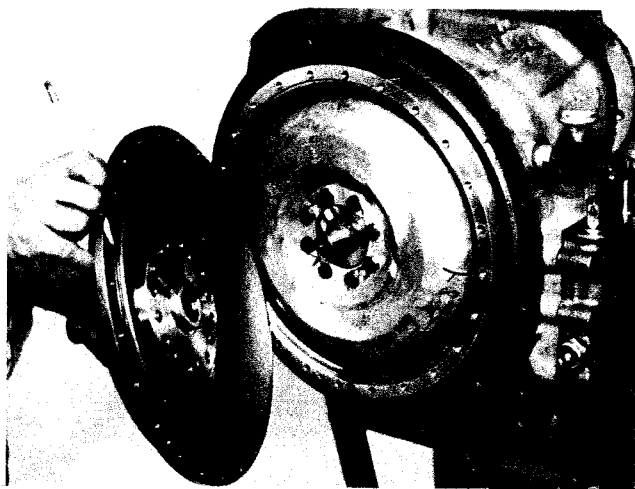


Figure 6
Remove impeller cover.

Proceed with disassembly of the transmission by using the information explained in the specific 2, 3, 4 or 6 speed HR28000 series maintenance manual.

REASSEMBLY

Reassemble transmission following step by step procedures as explained in the HR28000 manual up to and including "install turbine to turbine shaft retainer ring."

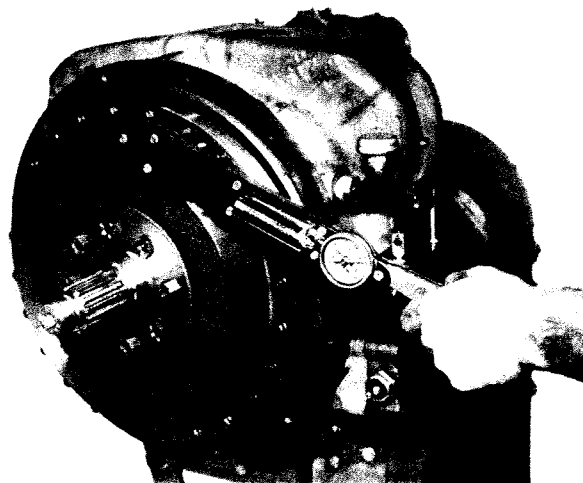


Figure 8
Align holes in impeller cover with holes in impeller. Install bolts and washers and tighten 23 to 25 lbs.ft. torque [31,2–33,9 N·m.]

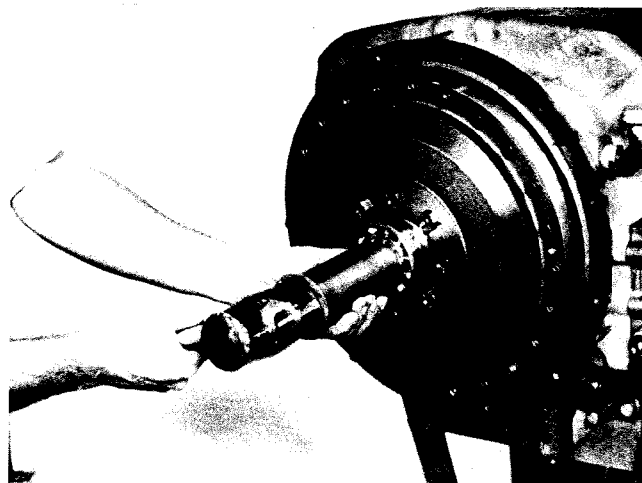


Figure 9
Install input shaft bearing on input shaft.

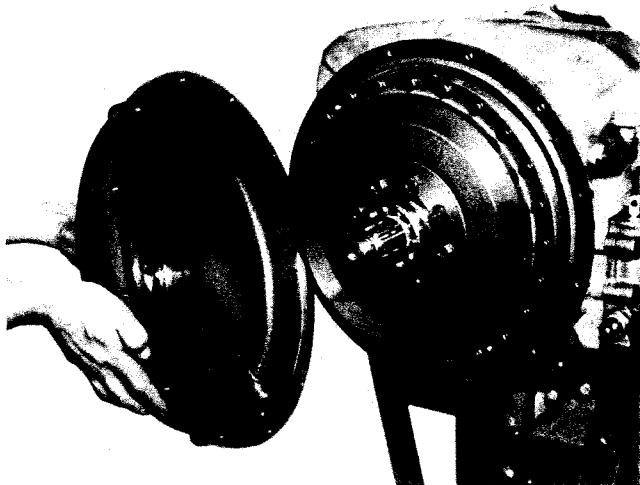


Figure 10

Install new converter housing to front cover gasket. Align holes in front cover with holes in converter housing.

NOTE: Drain back hole in the front cover must be in the lowest position when the transmission is reinstalled in the machine. This is to allow leakage oil to return to the transmission oil sump.

Install bolts and washers, tighten 23 to 25 lbs.ft. torque [31,2–33,9 N·m.]

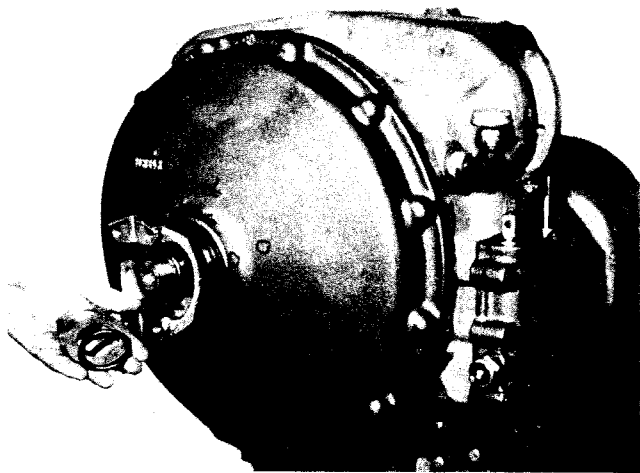


Figure 11

Install companion flange, flange O-Ring, washer and nut. Tighten nut 200 to 250 lbs.ft. torque [271,2–338,9 N·m.] Install front cover to transmission sump drain back line. (see note in Figure 10)

LFMHR DISASSEMBLY

Lock-up – Free-wheel Reaction Member –
Midship Mounted – Closed Front End.

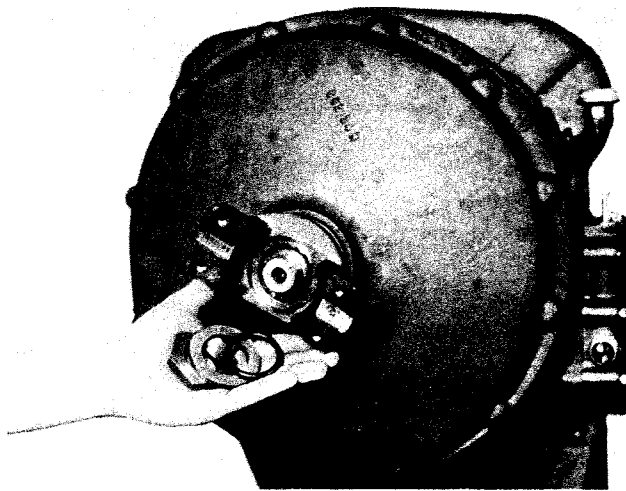


Figure 1

Remove front cover to transmission sump drain back line. Remove input flange retaining nut, washer, O-Ring and flange.

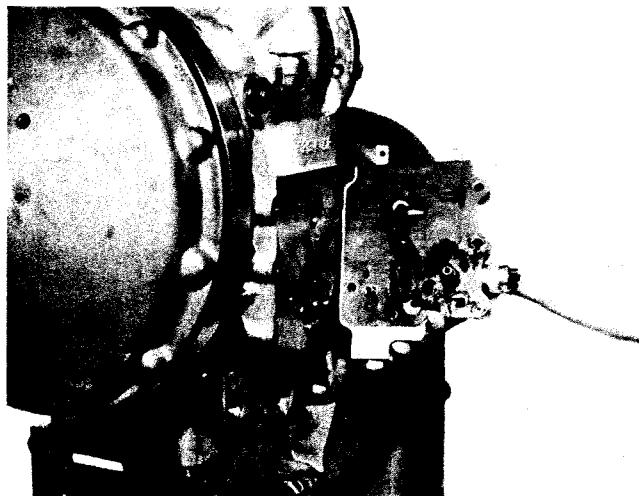


Figure 2

Remove control valve assembly.

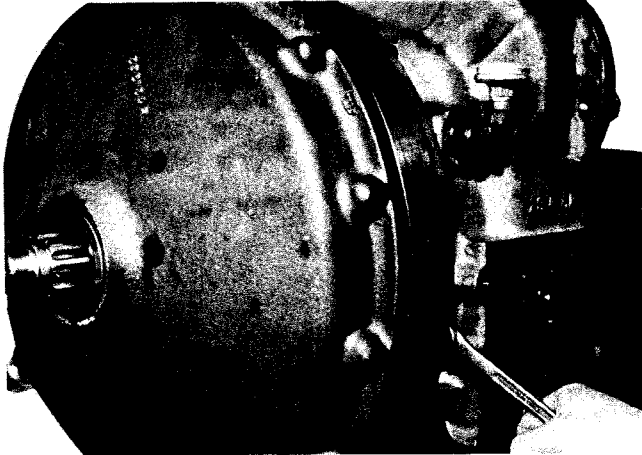


Figure 3

Remove front cover and adaptor ring bolts and stud nuts.

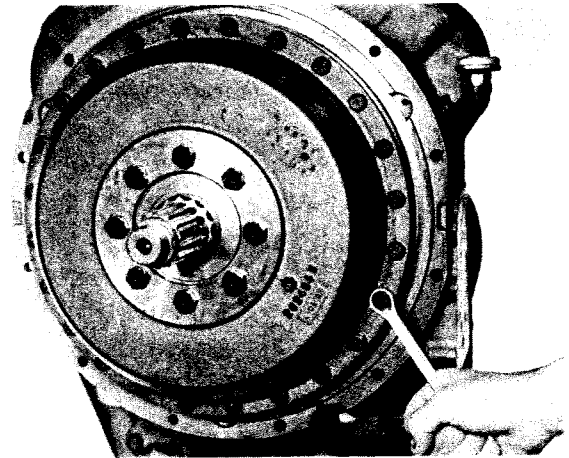


Figure 6

Remove impeller cover to impeller bolts.

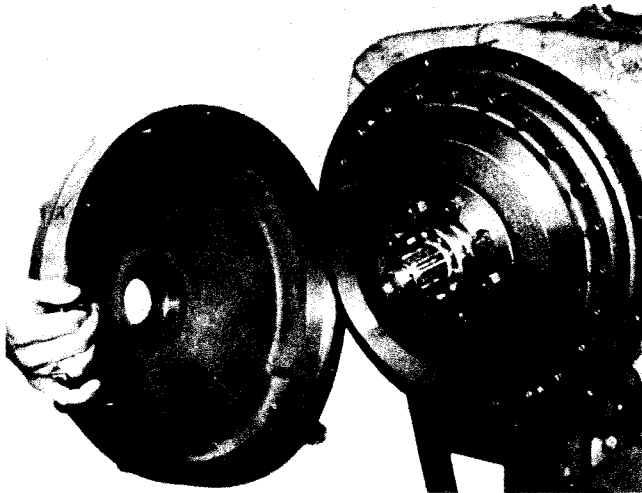


Figure 4

Remove front cover and adaptor ring.

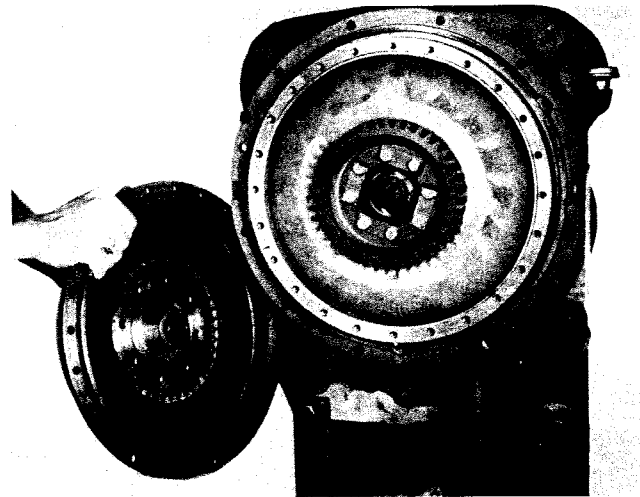


Figure 7

Remove impeller cover.

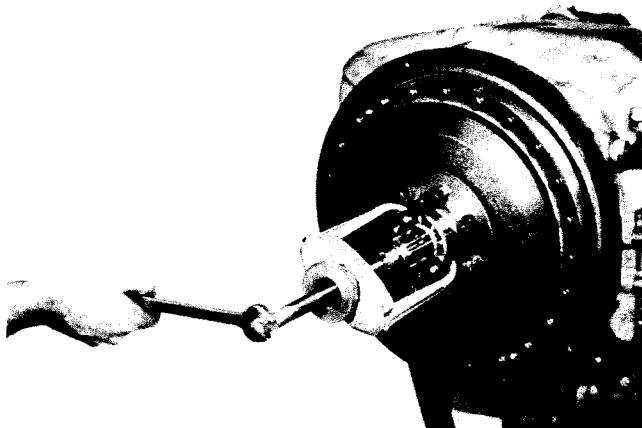


Figure 5

Remove input shaft bearing.

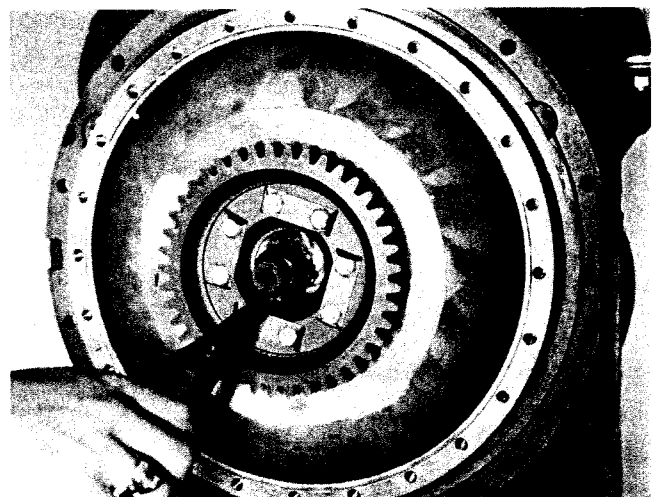


Figure 8

Remove turbine retainer ring.

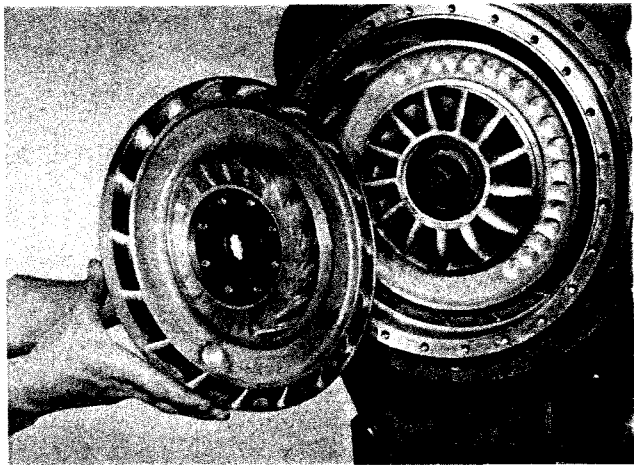


Figure 9

Remove turbine.

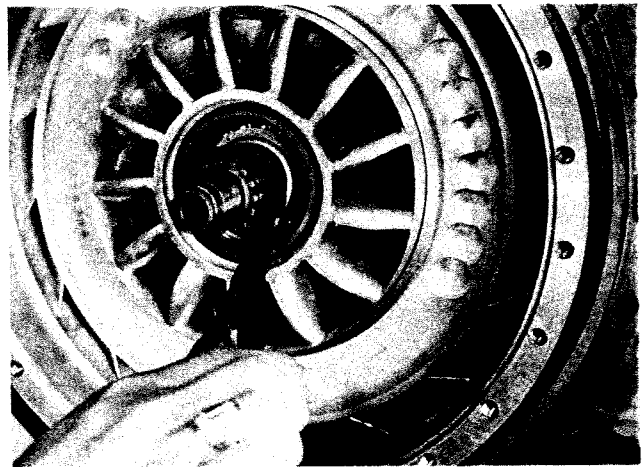


Figure 12

Remove reaction member retainer ring.

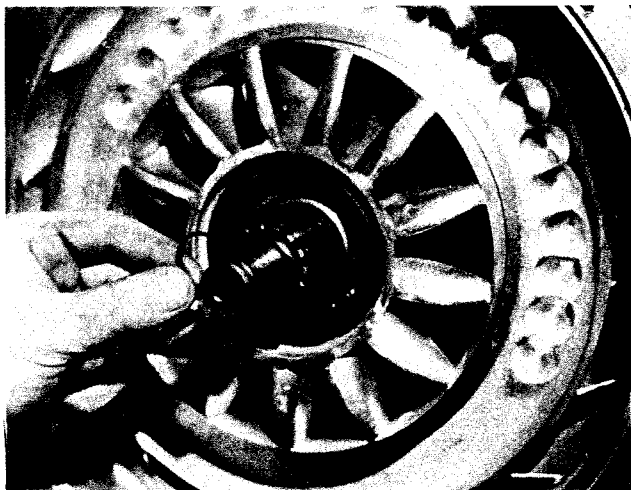


Figure 10

Remove turbine shaft front oil sealing ring. (Used with lock-up only)

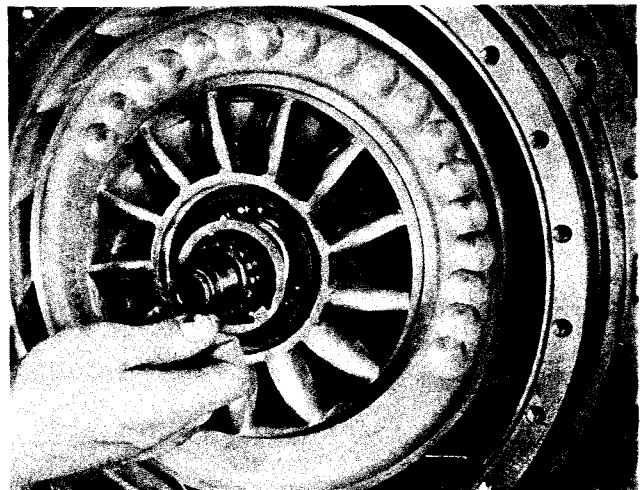


Figure 13

Remove reaction member thrust washer.

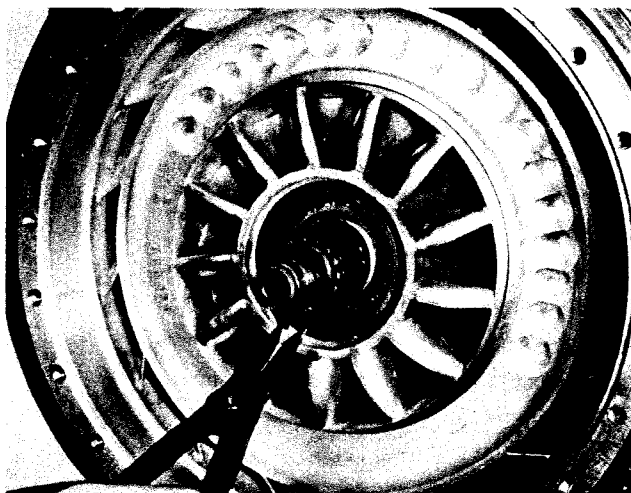


Figure 11

Remove turbine locating ring.

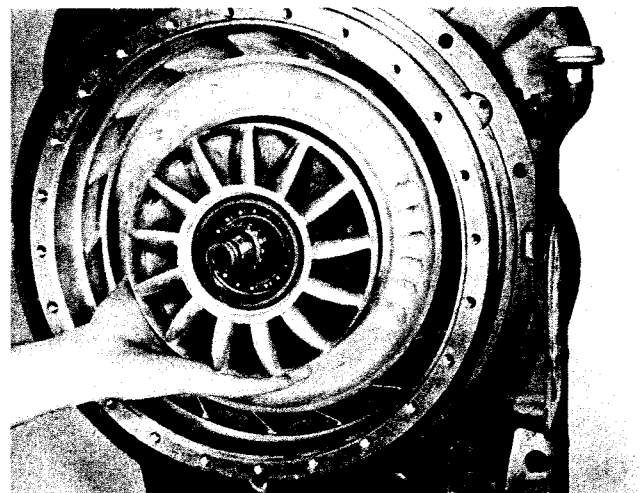


Figure 14

Remove reaction member, bearing and sprag assembly as a unit.

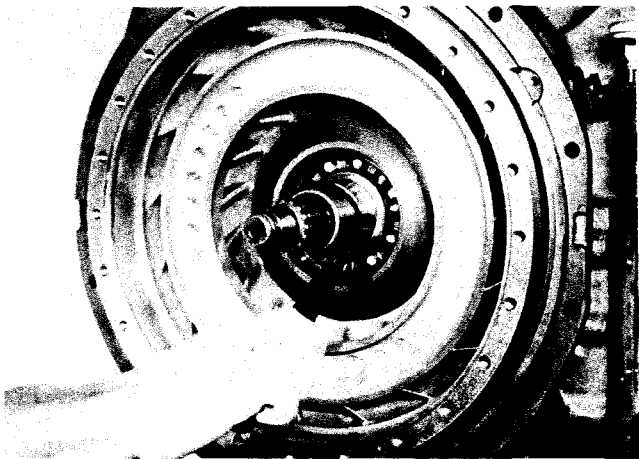


Figure 15
Remove impeller hub bearing washer retainer ring.

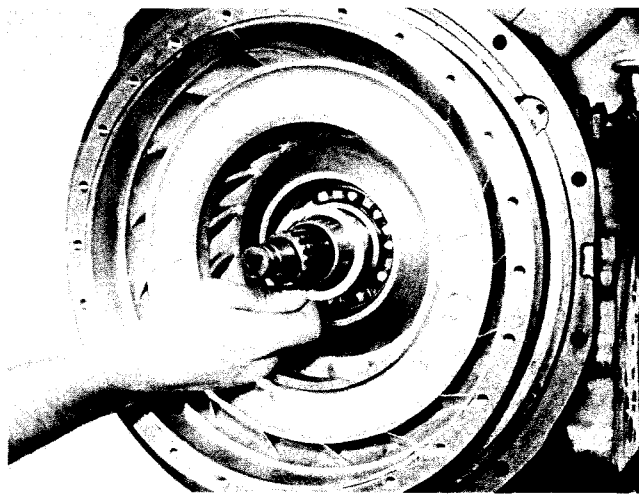


Figure 16
Remove hub bearing washer.

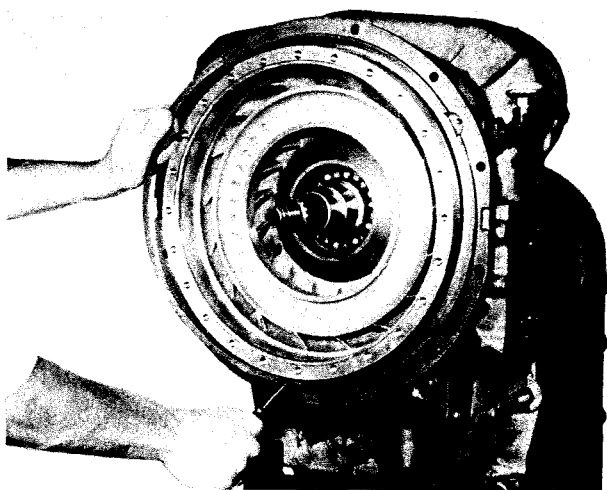


Figure 17
Remove oil baffle retainer ring.

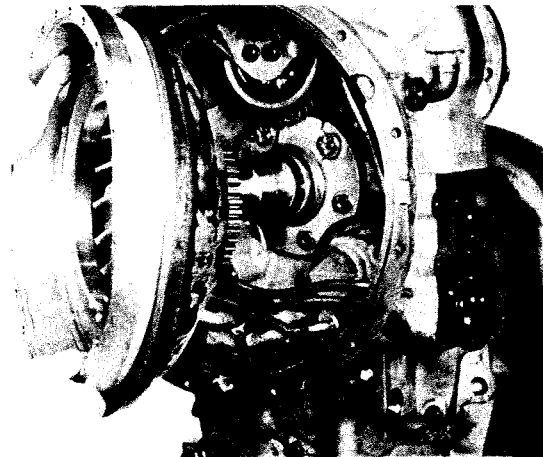


Figure 18
Pry oil baffle and impeller from housing.

NOTE: Impeller, oil baffle and impeller hub gear are removed as an assembly.

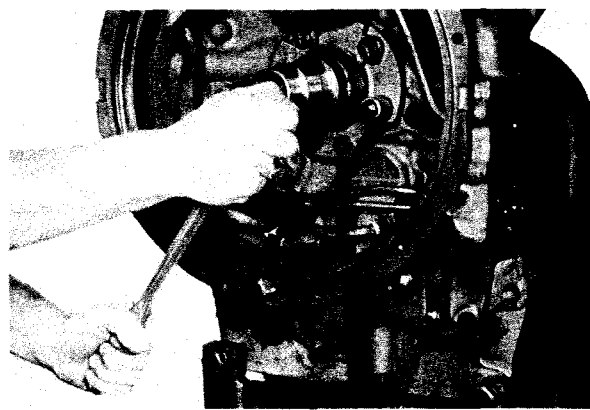


Figure 19
Remove stator support to housing bolts.

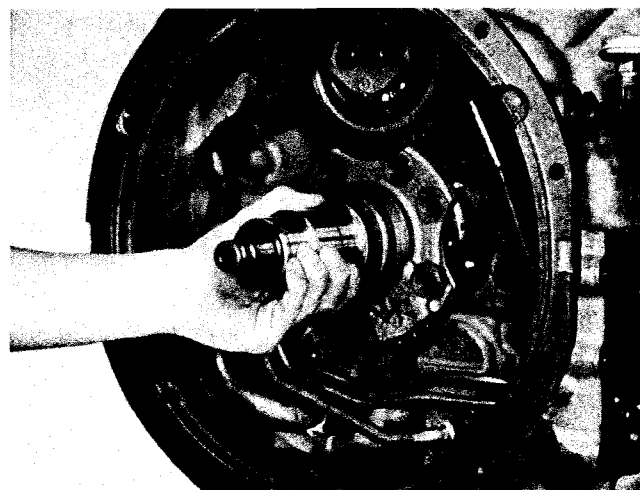


Figure 20
Remove stator support.

NOTE: Support must be turned to clear pump drive gear.

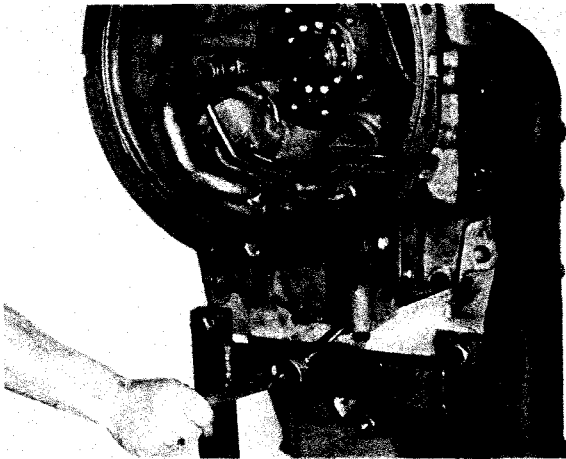


Figure 21

Remove bolts securing converter housing to transmission housing.

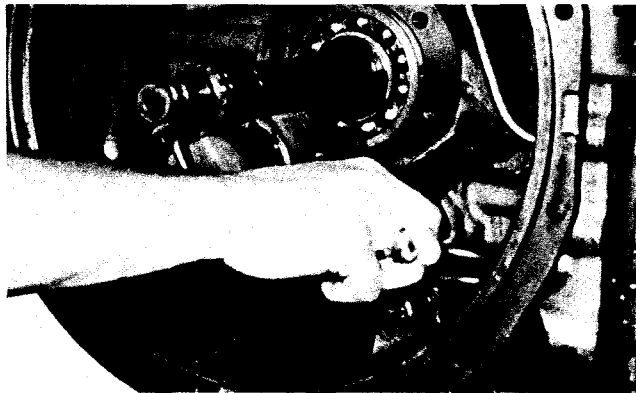


Figure 22

Support converter housing with a chain fall. Using spreading type snap ring pliers, spread ears on forward clutch front bearing retaining ring. Holding snap ring open tap converter housing from transmission housing.

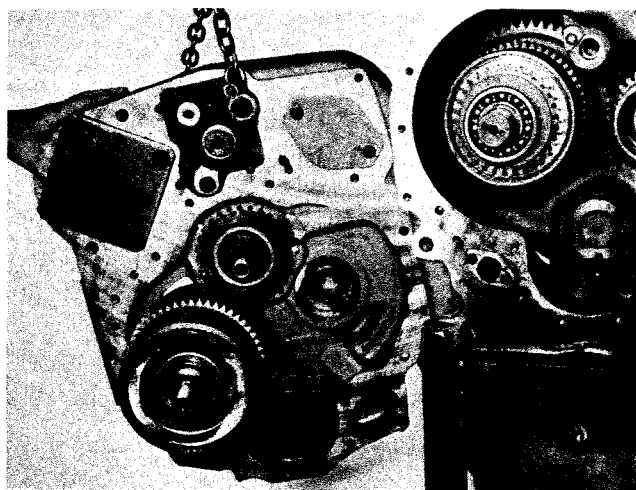


Figure 23

If forward and second clutch remains in converter housing, spread ears on the front bearing and pry clutch assembly from converter housing.

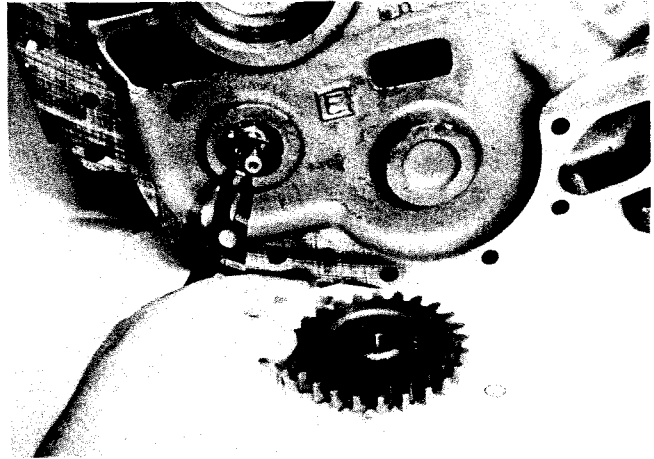


Figure 24

If a tachometer drive is incorporated, remove the tachometer drive gear retainer ring. Remove drive gear. Remove drive shaft bearing retaining ring.

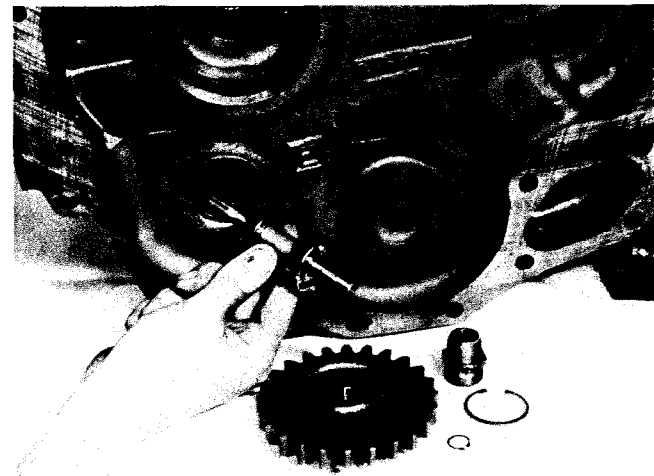


Figure 25

At the front of the converter housing remove tachometer drive tube nut. Tap drive shaft and bearing assembly from housing. Reverse procedure for reassembly.

Proceed with disassembly of the transmission by using the information explained in HR28000 section of this maintenance manual.



DISASSEMBLY OF FREE-WHEEL UNIT

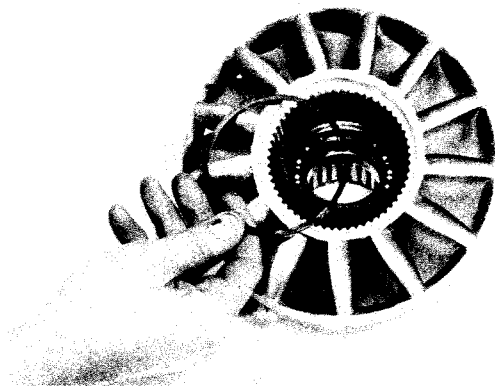


Figure 26

Remove outer race to reaction member retainer ring. Press outer race from reaction member.

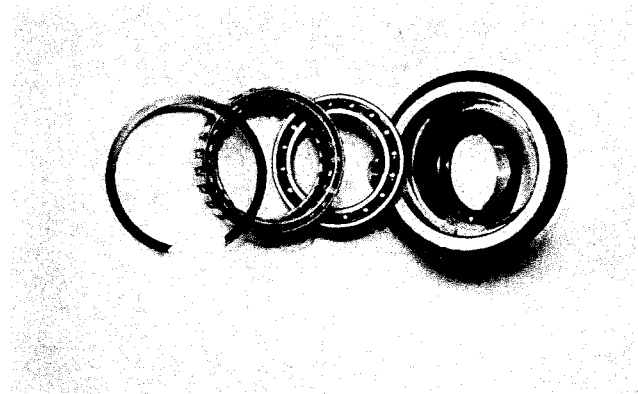


Figure 27

Remove sprag assembly to outer race retainer ring. Remove sprag assembly. Remove inner and outer bearings.

NOTE: Bearings are separated by a locating ring and must be removed, inner bearing to the rear and outer bearing to the front.

REASSEMBLY OF FREE-WHEEL UNIT

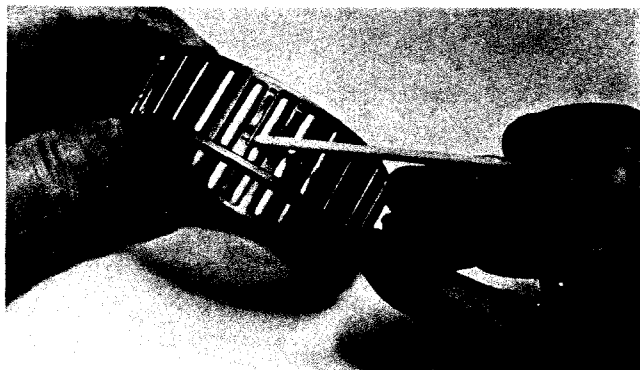


Figure 28

Free-wheel sprag assembly showing drag clip.

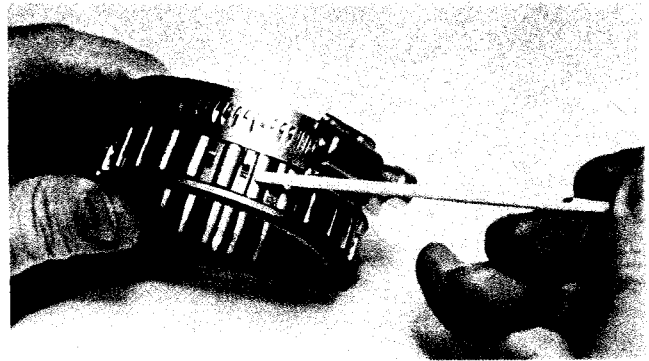


Figure 29

Sprag assembly drag clip lightly compressed with a hose clamp. This will prevent the ends of the drag clip from catching in the sprag assembly retainer ring groove.

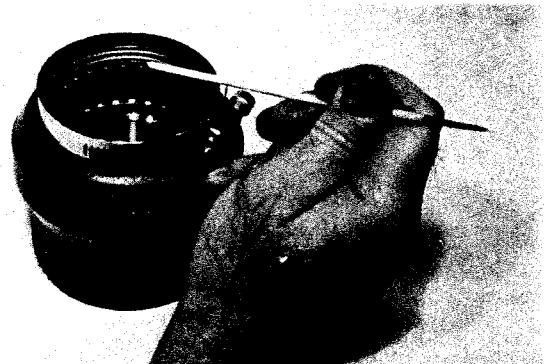


Figure 30

With the inner and outer bearings pressed in place against the locating ring, position sprag assembly and hose clamp on free-wheel outer race with the three drag strips at the top.

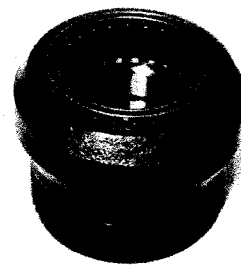


Figure 31

Press sprag assembly from hose clamp and into outer race.

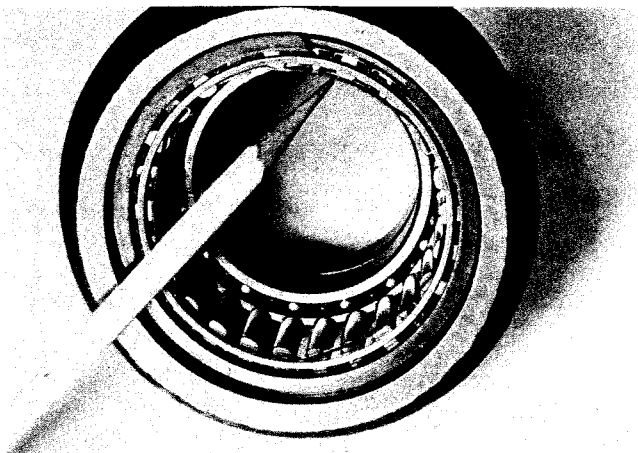


Figure 32
Install sprag assembly retainer ring. Note drag strips at top.

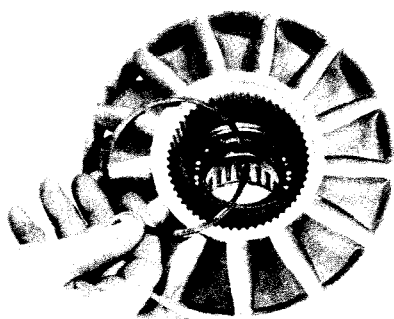


Figure 33
Press free-wheel race assembly into reaction member and secure with retainer ring.

DISASSEMBLY OF LOCK-UP COVER

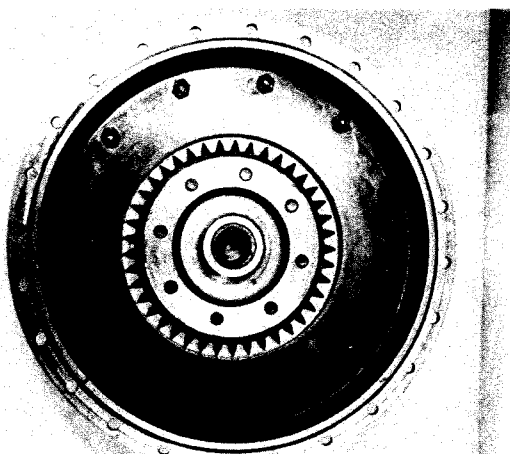


Figure 34
Remove end plate to lock-up cover bolts.

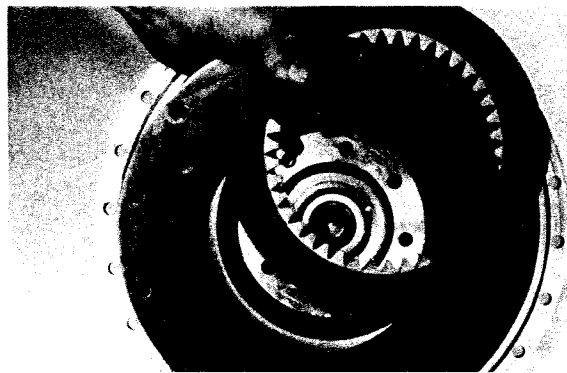


Figure 35
Remove end plate and clutch disc.

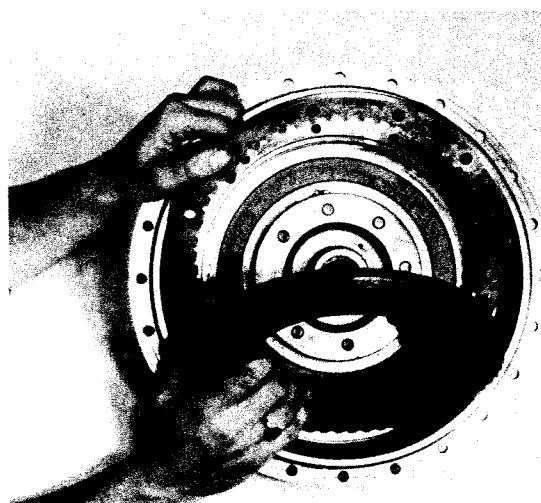


Figure 36
Remove piston and outer drive disc.



REASSEMBLY OF LOCK-UP COVER

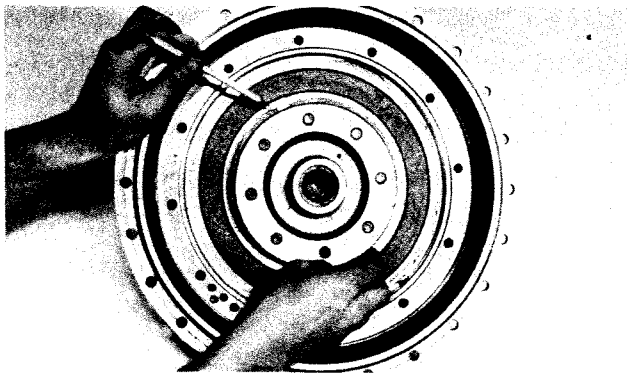


Figure 37

Position new oil sealing ring on input hub. Grease ring lightly to facilitate reassembly.

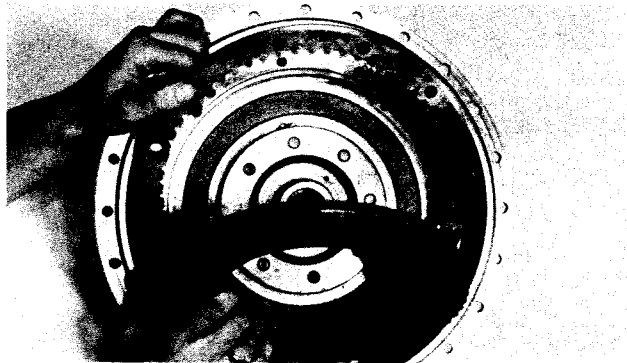


Figure 38

Install new oil sealing ring on outer diameter of actuating piston and grease lightly. Position piston over input hub, use caution as not to damage oil sealing rings. Locate outer drive disc teeth with teeth on the outer diameter of the piston.

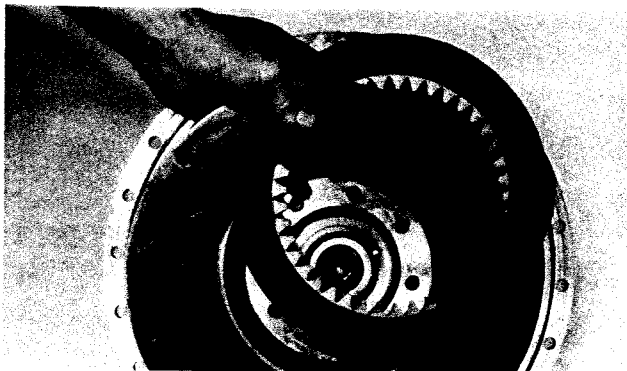


Figure 39

Lubricate clutch disc lightly and position in cover. Align holes of end plate with holes in driving disc and lock-up cover. Install bolts and tighten 30 to 35 lbs.ft. torque [40,7–27,4 N·m.]

REASSEMBLY OF TRANSMISSION

Reassemble transmission following step by step procedures as explained in the HR28000 manual up to and including "From the front of the transmission case install the forward and second clutch assembly."

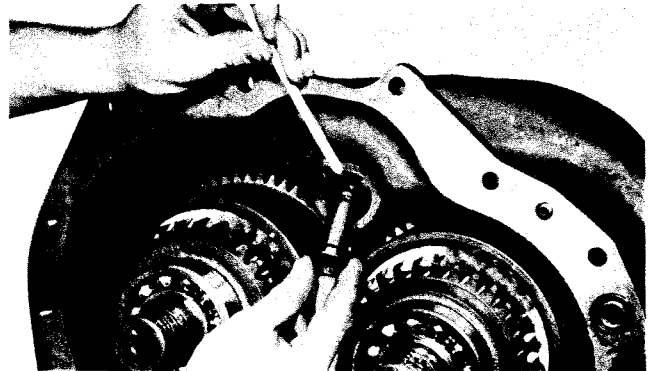


Figure 40

Install new oil sealing rings on the turbine shaft piston ring race. Grease rings lightly and position race in transmission housing.

Position the converter housing on the transmission housing as explained in the HR28000 maintenance manual. Proceed with reassembly of transmission up to and including "Position oil baffle in housing. Secure with oil baffle retain-er ring, being sure ring is in full position in ring groove."

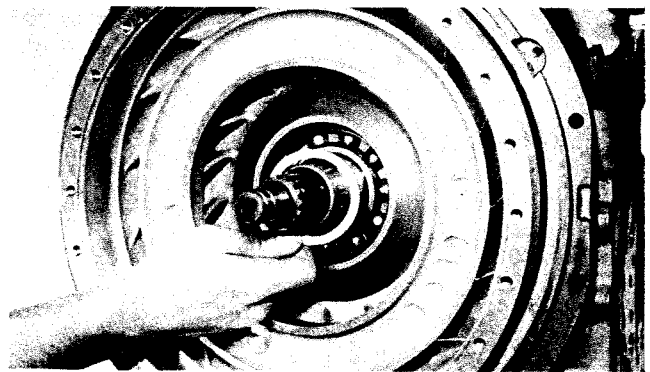


Figure 41

Install impeller hub bearing spacer.

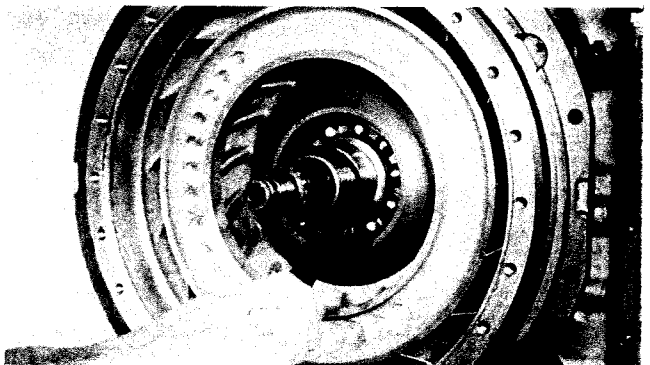


Figure 42

Install bearing spacer retainer ring.

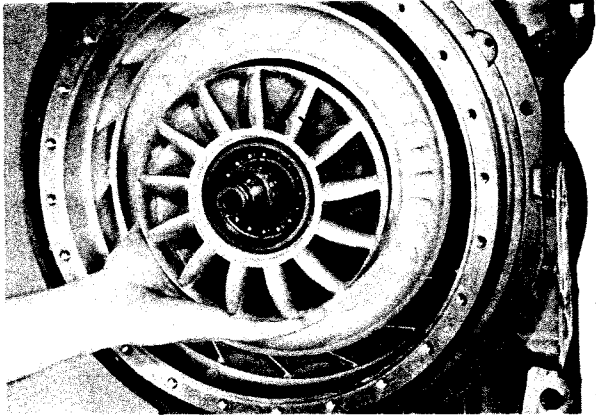


Figure 43

Install free-wheel assembly on free-wheel support.

NOTE: With reaction member in full position on support it must free-wheel in a clockwise direction.

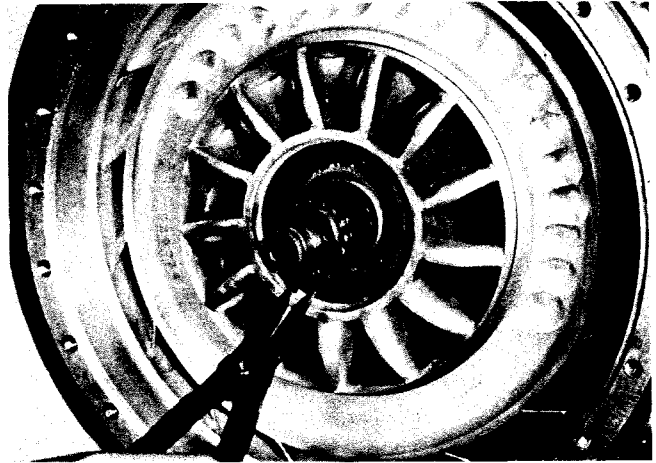


Figure 46

Install turbine locating ring.

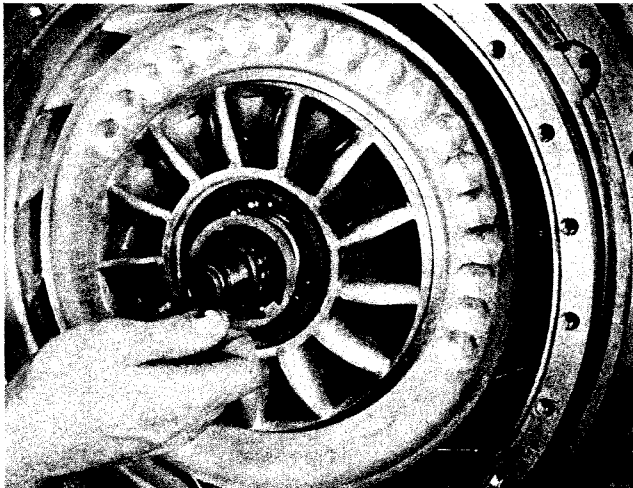


Figure 44

Install reaction member thrust washer.

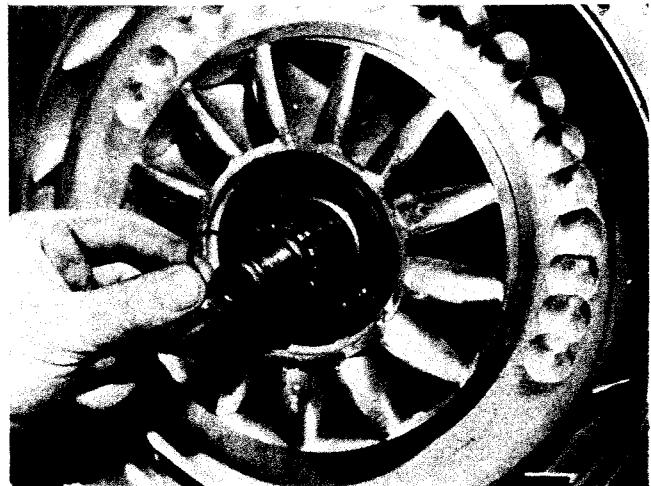


Figure 47

Install turbine shaft front piston ring.

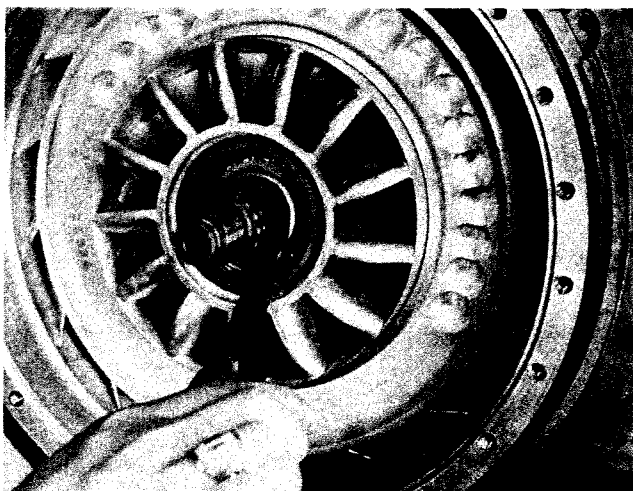


Figure 45

Install thrust washer retainer ring.

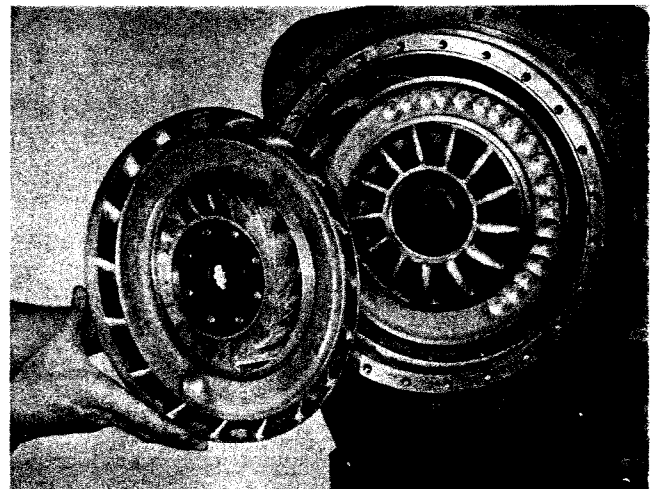


Figure 48

Position turbine on turbine shaft.

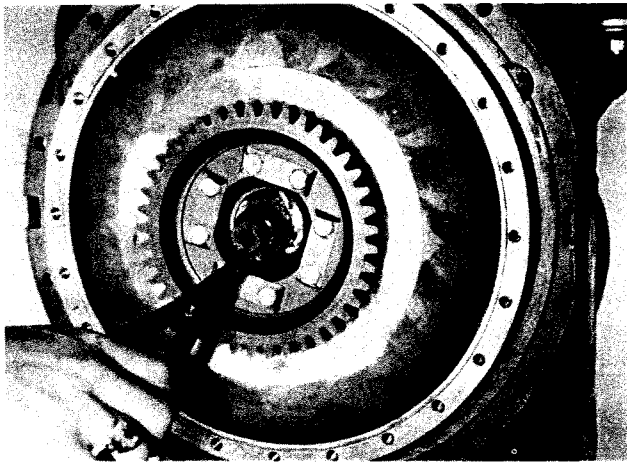


Figure 49

Install turbine retainer ring.

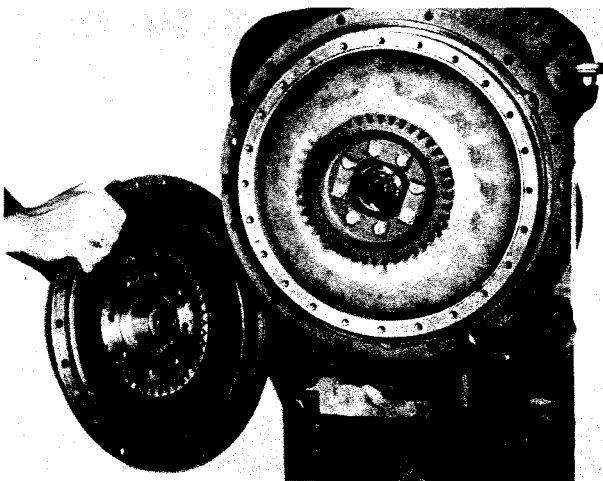


Figure 50

With new O-Ring in position and lightly lubricated, install lock-up cover to impeller. Align teeth on clutch disc turbine hub with internal teeth in clutch disc.

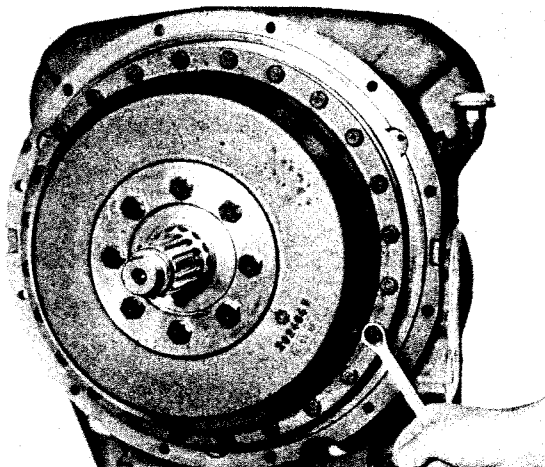


Figure 51

Install lock-up cover to impeller bolts and tighten to specified torque.

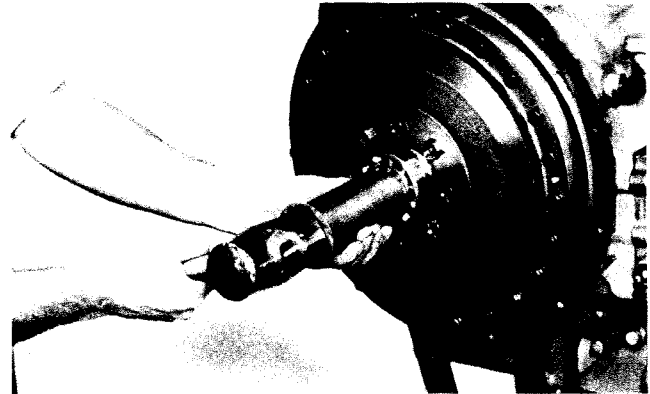


Figure 52

Install input shaft front bearing.

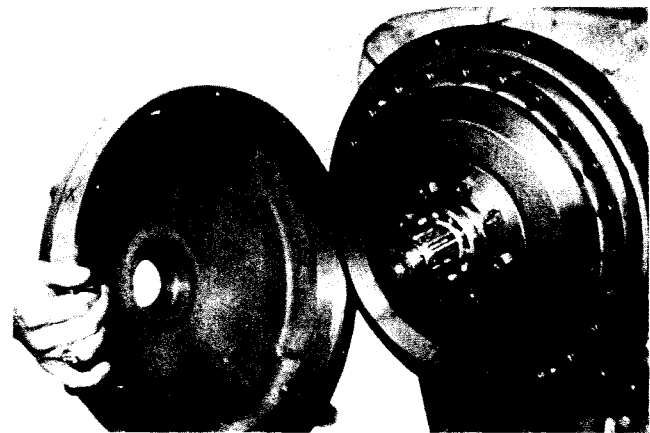


Figure 53

Using new gaskets install adaptor ring and front cover to converter housing.

NOTE: Drain back hole in front cover must be in the lowest position when the transmission is reinstalled in the machine, this is to allow leakage oil to return to the transmission oil sump.

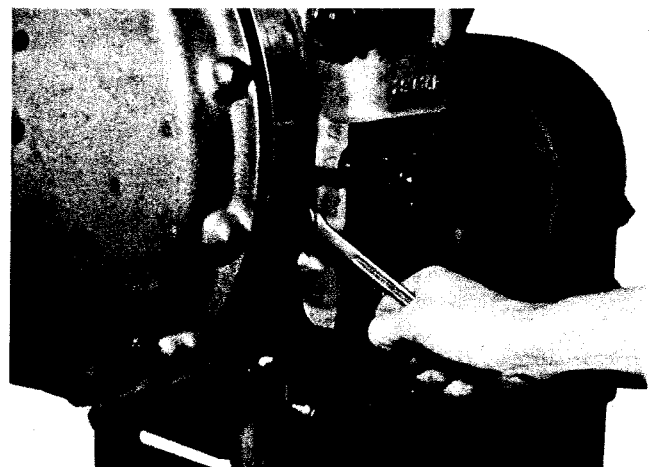


Figure 54

Install washers, bolts and nuts. Tighten 23 to 25 lbs.ft. torque [31,2–33,9 N·m.]

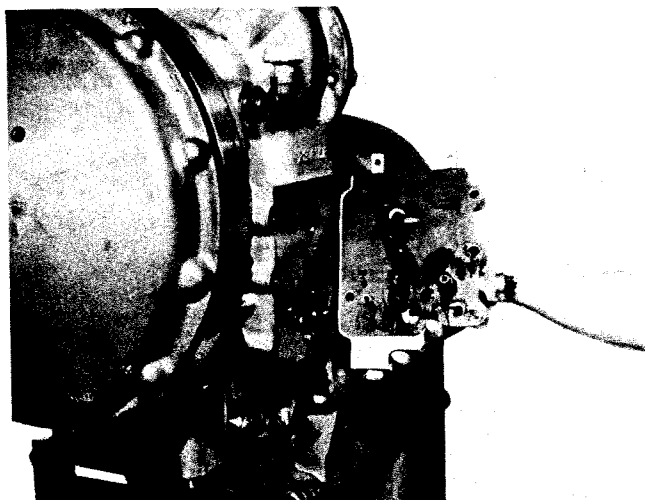


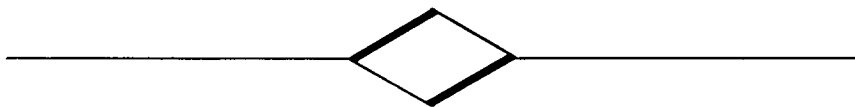
Figure 55

Locate detent balls and springs in control valve. Position new gasket. Secure valve with bolts and washers. Tighten to specified torque.



Figure 56

Install companion flange, flange O-Ring, washer and nut. Tighten nut 200 to 250 lbs.ft. torque [271,2–338,9 N·m.] Install front cover to transmission sump drain back line. (see note Figure 53)

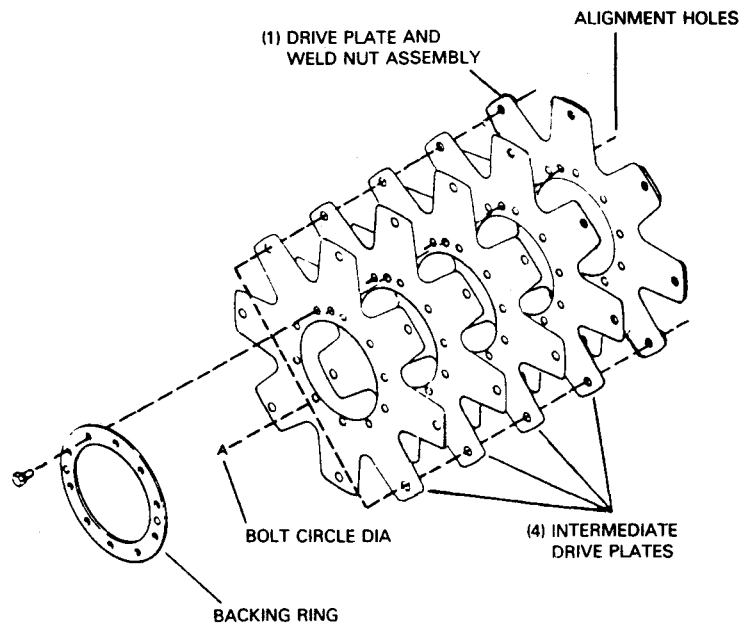


DRIVE PLATE INSTALLATION

SUBJECT: 28000/32000 Series Transmission and C-270/C-320 Series Converter Drive Plate Kits.

REASON FOR BULLETIN: Proper Identification by Bolt Circle Diameter.

Measure the "A" dimension (Bolt Circle diameter) and order Drive Plate Kit listed below.



"A" Dimension (Bolt Circle Diameter)

13.125" [333,375 mm] Diameter
Kit No. 802335

13.50" [342,900 mm] Diameter
Kit No. 802333

17.00" [431,800 mm] Diameter
Kit No. 802454

Each kit will include the following parts:

- 4 Intermediate Drive Plates
- 1 Drive Plate and Weld Nut Assembly.
- 1 Backing Ring.
- 10 Screw and Lockwasher Assembly.
- 1 Instruction Sheet.

TO FACILITATE ASSEMBLY, ALIGN SMALL HOLES IN DRIVE PLATES — SEE ILLUSTRATION ABOVE.

Position drive plate and weld nut assembly on impeller cover with weld nuts toward cover. Align intermediate drive plate and backing ring with holes in impeller cover. **NOTE:** Two dimples 180° apart in backing ring must be out (toward engine flywheel). Install capscrews and washers. Tighten 23 to 25 ft. lbs. torque [31,2 - 33,8 N.m].

**SEE PAGE 70 FOR TRANSMISSION TO ENGINE
INSTALLATION PROCEDURE**

TRANSMISSION TO ENGINE INSTALLATION PROCEDURE

1. Remove all burrs from flywheel mounting face and nose pilot bore. Clean drive plate surface with solvent.
2. Check engine flywheel and housing for conformance to standard S.A.E. #3 - S.A.E. J-927 tolerance specifications for pilot bore size, pilot bore runout and mounting face flatness. Measure and record engine crankshaft end play.
3. Install two 3.50 [88,90 mm] long transmission to flywheel housing guide studs in the engine flywheel housing as shown. Rotate the engine flywheel to align a drive plate mounting screw hole with the flywheel housing access hole.
4. Install a 4.00 [101,60 mm] long drive plate locating stud .3750-24 fine thread in a drive plate nut. Align the locating stud in the drive plate with the flywheel drive plate mounting screw hole positioned in step No. 3.
5. Locate transmission on flywheel housing aligning drive plate to flywheel and transmission to flywheel housing.

Install transmission to flywheel housing screws. Tighten screws to specified torque. Remove transmission to engine guide studs. Install remaining screws and tighten to specified torque.

6. Remove drive plate locating stud.
7. Install drive plate attaching screw and washer. Snug screw but **do not tighten**. Some engine flywheel housings have a hole located on the flywheel housing circumference in line with the drive plate screw access hole. A screwdriver or pry bar used to hold the drive plate against the flywheel will facilitate installation of the drive plate screws. Rotate the engine flywheel and install the remaining seven (7) flywheel to drive plate attaching screws. Snug screws but do not tighten. After all eight (8) screws are installed torque each one 25 to 30 ft. lbs. torque [33,9 - 40,6 N.m.]. This will require torquing each screw and rotating the engine flywheel until the full amount of eight (8) screws have been tightened.
8. Measure engine crankshaft end play after transmission has been completely installed on engine flywheel. This value must be within .001 [0,025 mm] of the end play recorded in step No. 2.

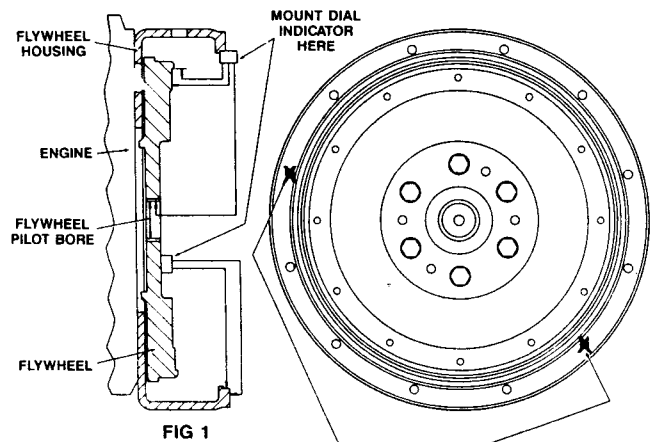


FIG 1

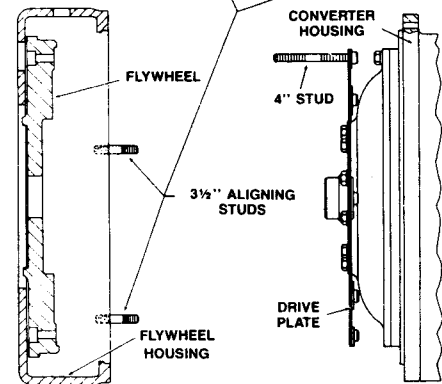
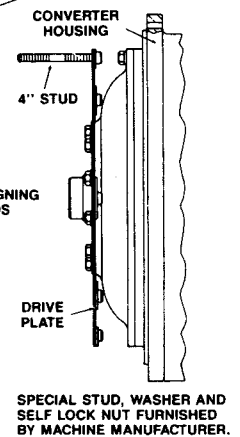


FIG 2



SPECIAL STUD, WASHER AND SELF LOCK NUT FURNISHED BY MACHINE MANUFACTURER.

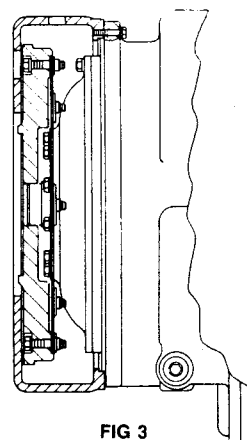


FIG 3

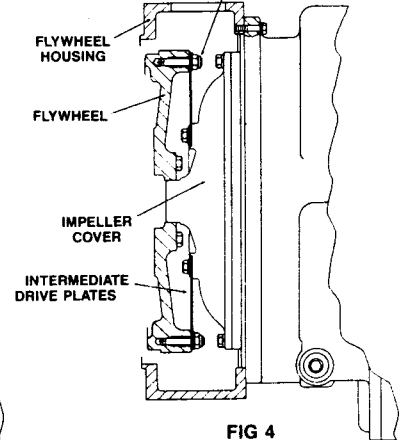
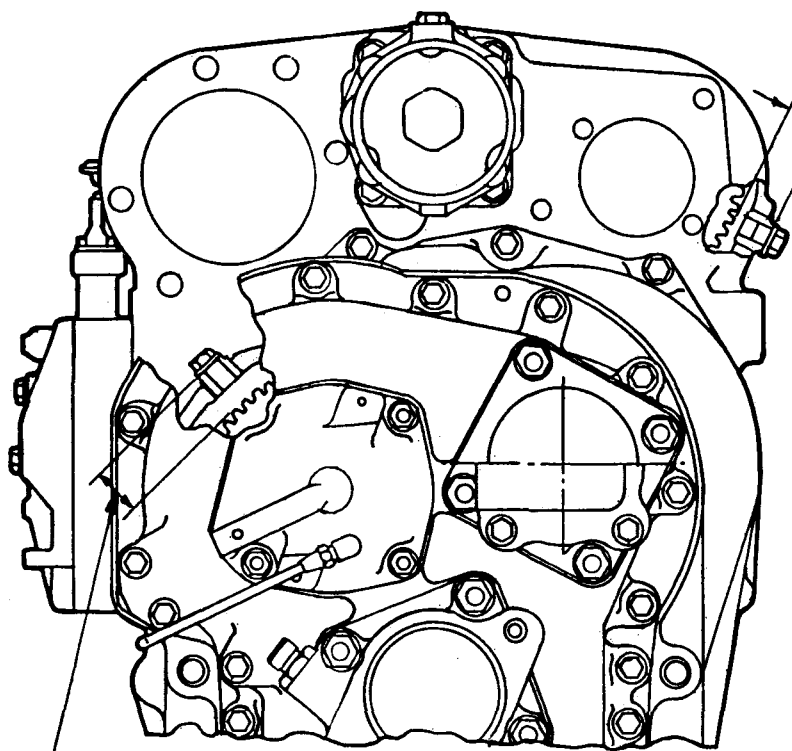


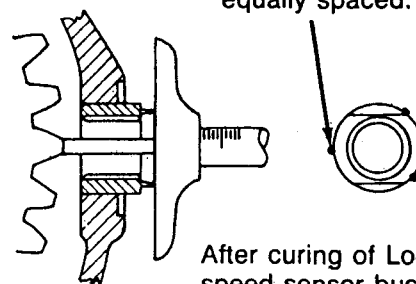
FIG 4



$1.390 \pm .007$ [35.3 $\pm$.17]

REAR VIEW

$1.060 \pm .007$ [26.9 $\pm$.17]



Stake 3 places approx.
equally spaced.

After curing of Loctite,
speed sensor bushing
must be secure with 40
Ft. Lb. [54.2 N·m] torque.

Assemble Speed Sensor Bushing in housing to specified
dimension with Loctite 262 and stake (3) three places.

SPEED SENSOR BUSHING INSTALLATION