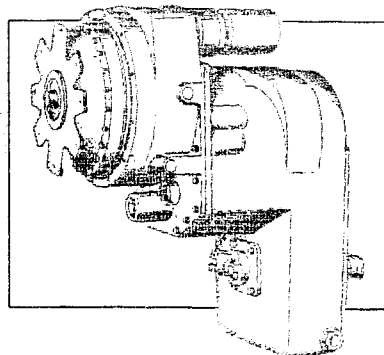
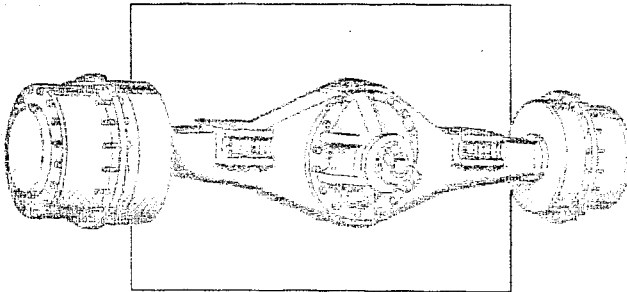
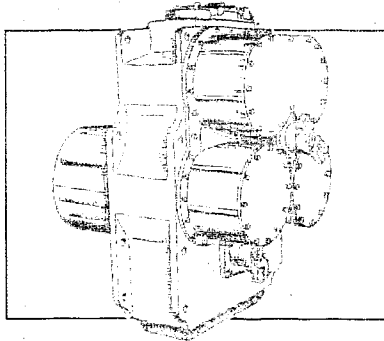


C 270 Torque Converter



CLARK-HURTH 
COMPONENTS

FOREWORD

This manual has been prepared to provide the customer and the maintenance personnel with information and instructions on the maintenance and repair of the **CLARK-HURTH COMPONENTS** product.

Extreme care has been exercised in the design, selection of materials and manufacturing of these units. The slight outlay in personal attention and cost required to provide regular and proper lubrication, inspection at stated intervals, and such adjustments as may be indicated will be reimbursed many times in low cost operation and trouble free service.

In order to become familiar with the various parts of the product, its principal of operation, trouble shooting and adjustments, it is urged that the mechanic study the instructions in this manual carefully and use it as a reference when performing maintenance and repair operations.

Whenever repair or replacement of component parts is required, only **Clark-Hurth Components**-approved parts as listed in the applicable parts manual should be used. Use of "will-fit" or non-approved parts may endanger proper operation and performance of the equipment. **Clark-Hurth Components** does not warrant repair or replacement parts, nor failures resulting from the use of parts which are not supplied by or approved by **Clark-Hurth Components**. **IMPORTANT: Always furnish the Distributor with the serial and model number when ordering parts.**

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NOTE: Metric Dimensions Shown in Brackets [].

SERVICING MACHINE AFTER TORQUE CONVERTER 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.

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 in paragraph 6 above.
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.

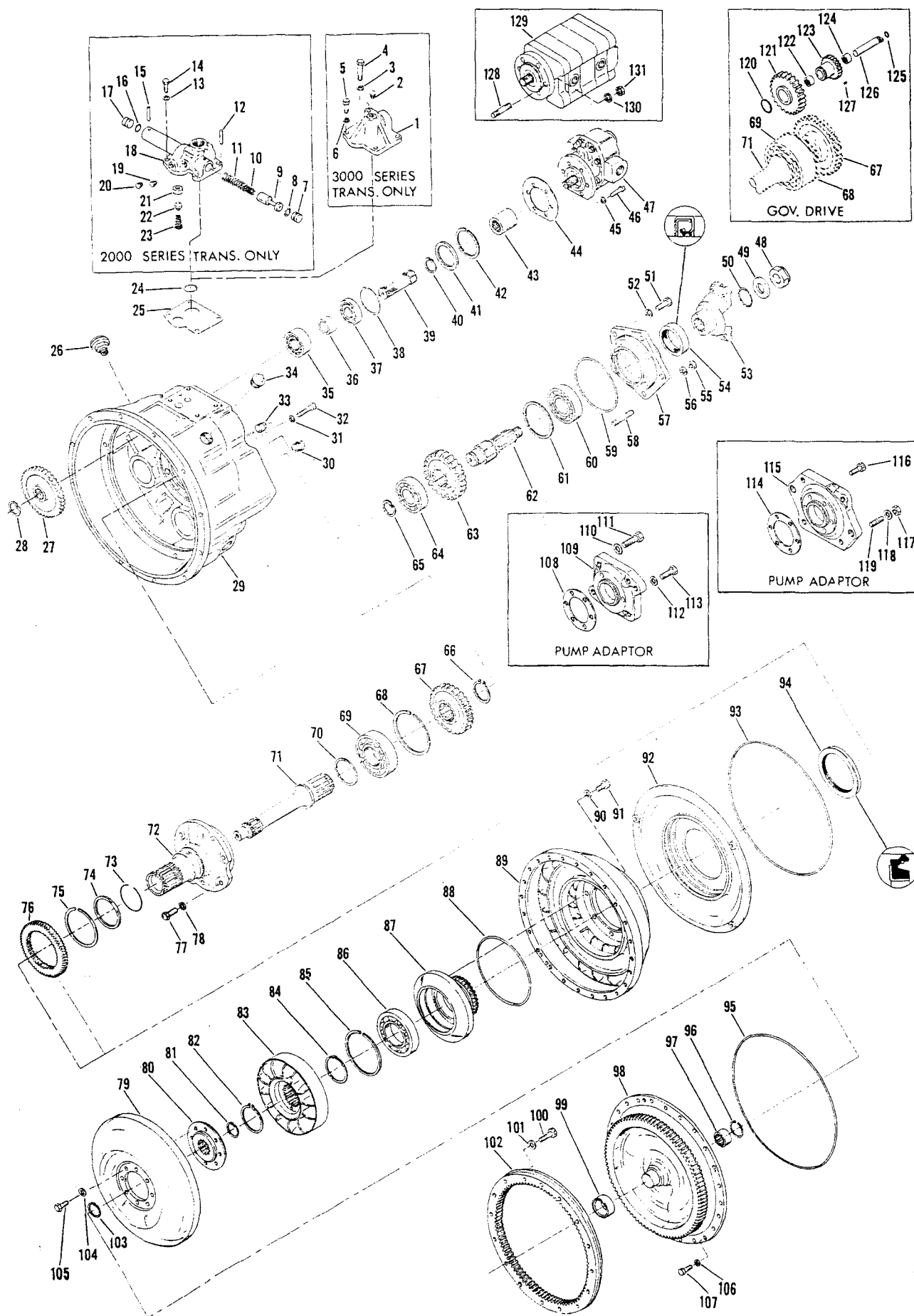


Figure A

C-270 CONVERTER WITH OFFSET OUTPUT

ITEM	DESCRIPTION	QTY.	ITEM	DESCRIPTION	QTY.
1	Inlet Cover (3000 Trans. only)	1	67	Turbine Shaft Gear	1
2	Inlet Cover Plug (3000 Trans. only)	1	68	Turbine Shaft Snap Ring	1
3	Cover Bolt Lockwasher (3000 Trans. only)	1	69	Turbine Shaft Bearing	1
4	Cover Bolt—Long (3000 Trans. only)	1	70	Turbine Shaft Piston Ring	1
5	Cover Bolt—Short (3000 Trans. only)	3	71	Turbine Shaft	1
6	Cover Bolt Lockwasher (3000 Trans. only)	3	72	Stator Support & Sleeve Assembly	1
7	Valve Stop	1	73	Piston Ring Expander Spring	No Longer Used
8	Valve Stop "O" Ring	1	74	Stator Support Piston Ring	1
9	Valve Piston	1	75	Impeller Hub Gear Snap Ring	1
10	Valve Spring — Inner	1	76	Impeller Hub Gear	1
11	Valve Spring — Outer	1	77	Stator Support Screw	6
12	Valve Stop Roll Pin	1	78	Stator Support Screw Lockwasher	6
13	Regulator Valve to Housing Screw Lockwasher	4	79	Turbine	1
14	Regulator Valve to Housing Screw	4	80	Turbine Hub	1
15	Valve Stop Roll Pin	1	81	Turbine Shaft Snap Ring	1
16	Valve Stop "O" Ring	1	82	Reaction Member Snap Ring	1
17	Valve Stop	1	83	Reaction Member	1
18	Regulating Valve Assembly	1	84	Reaction Member Spacer	1
19	Valve Housing Pipe Plug	1	85	Impeller Bearing Snap Ring	1
20	Valve Housing Pipe Plug	1	86	Impeller Hub Bearing	1
21	Safety Valve Seat	1	87	Impeller Hub	1
22	Safety Valve Plunger	1	88	Impeller Hub "O" Ring	1
23	Safety Valve Spring	1	89	Impeller	1
24	Regulator Valve to Housing "O" Ring	1	90	Hub to Impeller Screw Washer	8
25	Regulator Valve to Housing Gasket	1	91	Hub to Impeller Screw	8
26	Air Breather Check Valve Assembly	1	92	Oil Baffle	1
27	Pump Drive Gear	3	93	Oil Baffle "O" Ring	1
28	Pump Drive Gear Snap Ring	3	94	Oil Baffle Oil Seal	1
29	Converter Housing	1	95	Impeller to Cover "O" Ring	1
30	Converter Housing Pipe Plug	1	96	Impeller Cover Bearing Snap Ring	1
31	Oil Baffle Screw Lockwasher	3	97	Impeller Cover Bearing	1
32	Oil Baffle Screw	3	98	Impeller Cover	1
33	Converter Housing Pipe Plug	1	99	Impeller Cover Sleeve	1
34	Converter Housing Pipe Plug	2	100	Ring Gear Screw	16
35	Pump Drive Shaft Bearing	3	101	Plain Washer	16
36	Pump Drive Shaft Spacer	3	102	Flywheel Ring Gear	1
37	Pump Drive Shaft Bearing	3	103	Turbine Shaft Snap Ring	1
38	Bearing Locating Ring	3	104	Turbine Hub Screw Lockwasher	8
39	Pump Drive Shaft	3	105	Turbine Hub Screw	8
40	Pump Drive Shaft Snap Ring	3	106	Impeller to Cover Screw Lockwasher	24
41	Pump Shaft Washer	3	107	Impeller to Cover Screw	24
42	Pump Shaft Snap Ring	3	108	Pump Adaptor Gasket	1
43	Charging Pump Sleeve	1	109	Pump Adaptor	1
44	Pump Gasket	1	110	Pump Adaptor Screw Lockwasher	2
45	Pump Mounting Screw Lockwasher	3	111	Pump Adaptor Screw	2
46	Pump Mounting Screw	3	112	Pump Adaptor Screw Lockwasher	3
47	Converter Charging Pump	1	113	Pump Adaptor Screw	3
48	Output Shaft Nut	1	114	Pump Adaptor Gasket	1
49	Output Shaft Washer	1	115	Pump Adaptor	1
50	Output Shaft "O" Ring	1	116	Pump Adaptor Screw	6
51	Bearing Retainer Screw	3	117	Pump Adaptor Stud Nut	4
52	Bearing Retainer Screw Lockwasher	3	118	Pump Adaptor Stud Lockwasher	4
53	Companion Flange	1	119	Pump Adaptor Stud	4
54	Bearing Retainer Oil Seal	1	120	Idler Shaft Snap Ring	1
55	Bearing Retainer Stud Nut	2	121	Idler Shaft Drive Gear	1
56	Bearing Retainer Stud Lockwasher	2	122	Idler Shaft Bearing	1
57	Bearing Retainer	1	123	Governor Drive Gear	1
58	Output Shaft Bearing Retainer Stud	2	124	Idler Shaft Bearing	1
59	Bearing Retainer "O" Ring	2	125	Idler Shaft "O" Ring	1
60	Output Shaft Rear Bearing	1	126	Idler Shaft	1
61	Output Shaft Bearing Snap Ring	1	127	Idler Shaft Key	1
62	Output Shaft	1	128	Pump Stud	6
63	Output Shaft Gear	1	129	Charging Scavenger Pump (Optional)	1
64	Output Shaft Front Bearing	1	130	Pump Stud Lockwasher	6
65	Bearing Snap Ring	1	131	Pump Stud Nut	6
66	Output Gear Snap Ring	1			

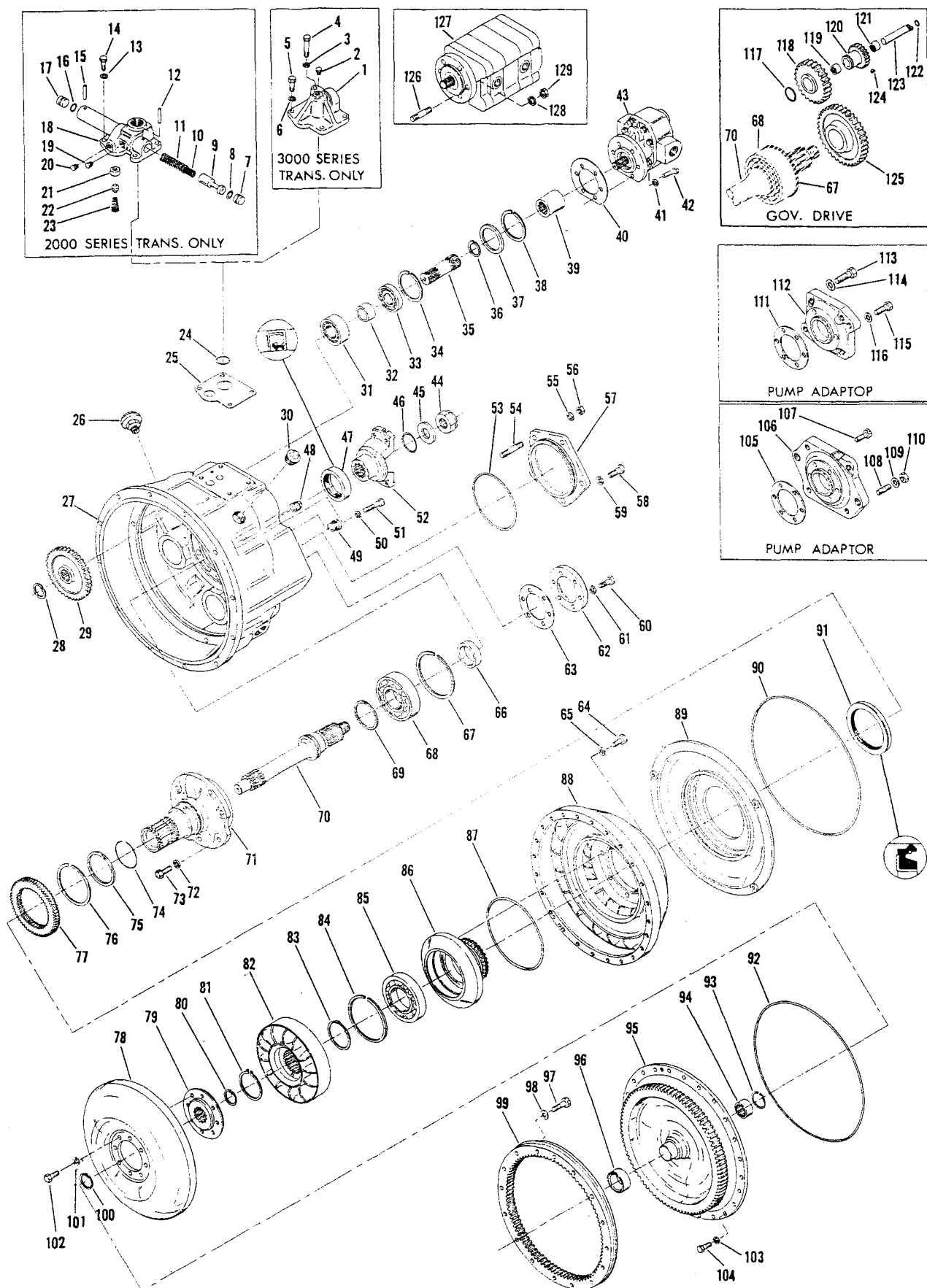
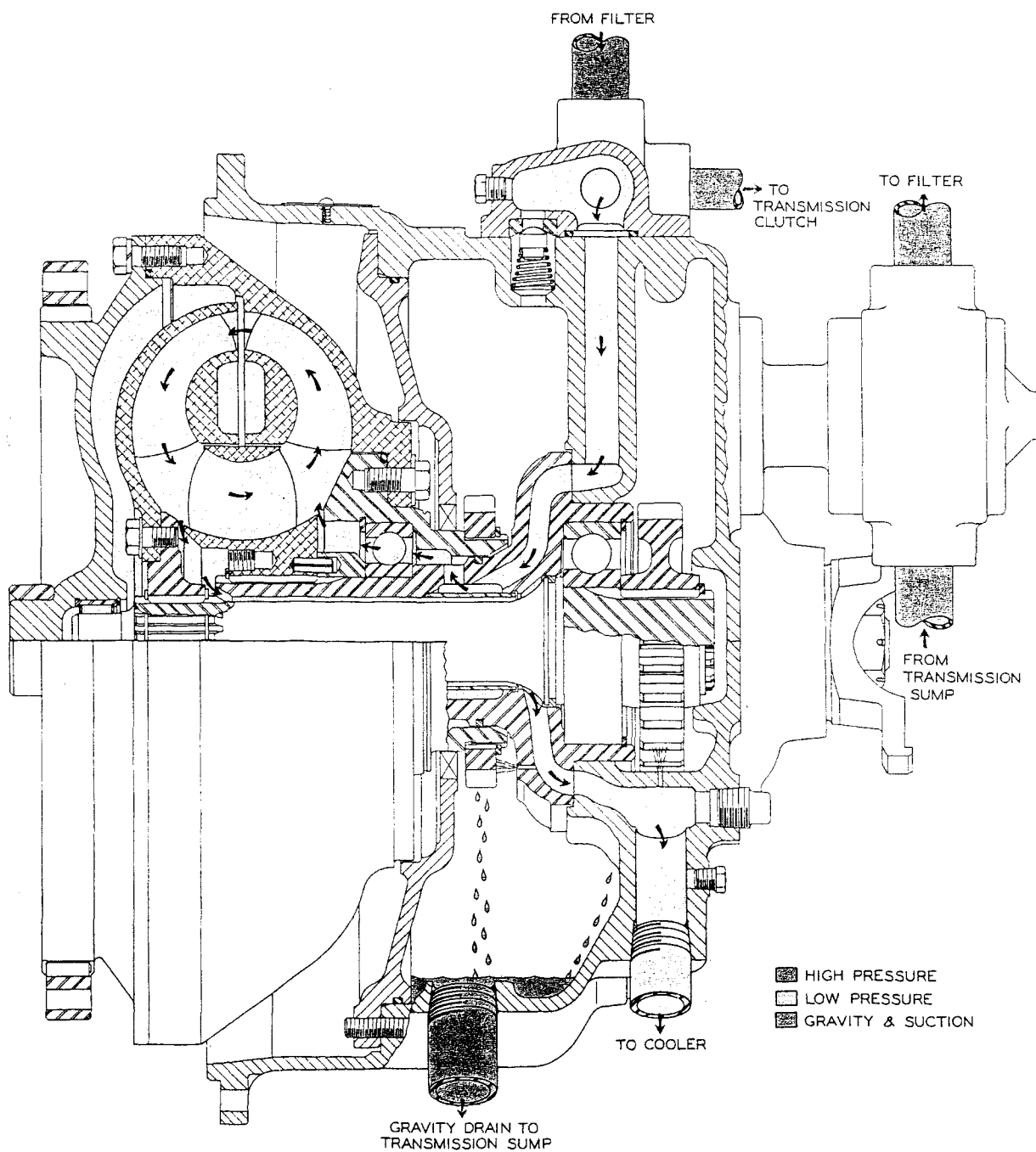


Figure C

C-270 CONVERTER WITH INLINE OUTPUT

ITEM	DESCRIPTION	QTY.	ITEM	DESCRIPTION	QTY.
1	Inlet Cover (3000 Trans. only)	1	66	Companion Flange Spacer	1
2	Inlet Cover Plug (3000 Trans. only)	1	67	Snap Ring	1
3	Cover Bolt Lockwasher (3000 Trans. only)	1	68	Turbine Shaft Bearing	1
4	Cover Bolt—Long (3000 Trans. only)	1	69	Piston Ring	1
5	Cover Bolt—Short (3000 Trans. only)	3	70	Turbine Shaft	1
6	Cover Bolt Lockwasher (3000 Trans. only)	3	71	Stator Support & Sleeve Assembly	1
7	Valve Stop	1	72	Stator Support Screw Lockwasher	6
8	Valve Stop "O" Ring	1	73	Stator Support Screw	6
9	Valve Piston	1	74	Piston Ring Expander Spring	No Longer Used
10	Valve Spring — Inner	1	75	Piston Ring	1
11	Valve Spring — Outer	1	76	Impeller Hub Gear Snap Ring	1
12	Valve Stop Roll Pin	1	77	Impeller Hub Gear	1
13	Regulator Valve to Housing Screw Lockwasher	4	78	Turbine	1
14	Regulator Valve to Housing Screw	4	79	Turbine Hub	1
15	Valve Stop Roll Pin	1	80	Turbine Locating Snap Ring	1
16	Valve Stop "O" Ring	1	81	Reaction Member Snap Ring	1
17	Valve Stop	1	82	Reaction Member	1
18	Regulating Valve Assembly	1	83	Reaction Member Spacer	1
19	Valve Housing Pipe Plug	1	84	Bearing Snap Ring	1
20	Valve Housing Pipe Plug	1	85	Impeller Hub Bearing	1
21	Safety Valve Seat	1	86	Impeller Hub	1
22	Safety Valve Plunger	1	87	Impeller Hub "O" Ring	1
23	Safety Valve Spring	1	88	Impeller	1
24	Regulator Valve to Housing "O" Ring	1	89	Oil Baffle	1
25	Regulator Valve to Housing Gasket	1	90	Oil Baffle "O" Ring	1
26	Air Breather Check Valve Assembly	1	91	Oil Seal	1
27	Converter Housing	1	92	Impeller to Cover "O" Ring	1
28	Pump Drive Gear Snap Ring	3	93	Bearing Snap Ring	1
29	Pump Drive Gear	3	94	Impeller Cover Bearing	1
30	Converter Housing Pipe Plug	2	95	Impeller Cover	1
31	Pump Drive Shaft Bearing	3	96	Impeller Cover Sleeve	1
32	Pump Drive Shaft Spacer	3	97	Ring Gear to Flywheel Bolt	16
33	Pump Drive Shaft Bearing	3	98	Ring Gear to Flywheel Bolt Washer	16
34	Bearing Locating Ring	3	99	Ring Gear	1
35	Pump Drive Shaft	3	100	Turbine Retaining Snap Ring	1
36	Pump Drive Shaft Snap Ring	3	101	Turbine Hub Screw Lockwasher	8
37	Pump Shaft Washer	3	102	Turbine Hub Screw	8
38	Pump Shaft Snap Ring	3	103	Impeller to Cover Bolt Lockwasher	24
39	Charging Pump Sleeve	1	104	Impeller to Cover Bolt	24
40	Pump Gasket	1	105	Pump Adaptor Gasket	1
41	Pump Mounting Screw Lockwasher	3	106	Pump Adaptor	1
42	Pump Mounting Screw	3	107	Pump Adaptor Screw	6
43	Converter Charging Pump	1	108	Pump Adaptor Stud	4
44	Turbine Shaft Nut	1	109	Pump Adaptor Stud Lockwasher	4
45	Turbine Shaft Washer	1	110	Pump Adaptor Stud Nut	4
46	Flange "O" Ring	1	111	Pump Adaptor Gasket	1
47	Oil Seal	1	112	Pump Adaptor	1
48	Converter Housing Plug	1	113	Pump Adaptor Screw	2
49	Converter Housing Plug	1	114	Pump Adaptor Screw Lockwasher	2
50	Oil Baffle Screw Lockwasher	3	115	Pump Adaptor Screw	3
51	Oil Baffle Screw	3	116	Pump Adaptor Screw Lockwasher	3
52	Output Flange	1	117	Idler Shaft Snap Ring	1
53	Offset Drive Hole Cover "O" Ring	1	118	Idler Shaft Drive Gear	1
54	Cover Stud	2	119	Idler Shaft Bearing	1
55	Cover Stud Nut Lockwasher	2	120	Governor Drive Gear	1
56	Cover Stud Nut	2	121	Idler Shaft Bearing	1
57	Offset Drive Hole Cover	1	122	Idler Shaft Bearing "O" Ring	1
58	Cover Screw	3	123	Idler Shaft	1
59	Cover Screw Lockwasher	3	124	Idler Shaft Key	1
60	Pump Hole Cover Screw	6	125	Turbine Shaft Gear	1
61	Pump Hole Cover Screw Lockwasher	6	126	Pump Stud	6
62	Pump Hole Cover	2	127	Charging Scavenger Pump (Optional)	1
63	Pump Hole Cover Gasket	2	128	Pump Stud Lockwasher	6
64	Hub to Impeller Screw	8	129	Pump Stud Nut	6
65	Hub to Impeller Screw Lockwasher	8			



C-270 SERIES CONVERTER OIL FLOW DIAGRAM

Figure E

IRREGULARITIES IN PERFORMANCE

C-270 Series Converters

Make all checks with converter outlet temperature at least 180° - 200° F. [82,3° - 93,3° C.]

TROUBLE	PROBABLE CAUSE	REMEDY
1. Low converter OUT pressure (Below 25 P.S.I. [172,4 kPa] with engine at 2000 RPM — NO LOAD) (See Converter Pressure Specifications)	Worn oil sealing and "O" rings Worn oil pump. Safety Valve stays open.	A. Trouble is internal and will require a complete tear-down of the converter. B. Replace. C. Clean and check valve spring and valve.
2. Suction line taking air.	Low oil level. Suction line connections taking air. Worn oil pump.	D. Fill to proper level. E. Check oil line connections and tighten securely. F. Replace.
3. High converter OUT pressure (Above 70 P.S.I. [482,6 kPa] with engine at 2000 RPM — NO LOAD) (See Converter Pressure Specifications)	Oil cooler or oil lines restricted. Oil too heavy Cold oil.	G. Check oil cooler line and oil cooler for restrictions. Clean or replace. H. Check oil weight. See oil recommenda- tions. I. Converter pressure in cold weather will vary. As soon as converter gets hot, pres- sure should drop.
4. Over-heating	See items No. 1 & 2. Oil cooler or oil cooler lines restricted causing safety valve to stay open. Oil cooler too small. Worn oil pump Converter drain line to transmission or oil sump not installed properly.	J. Clean and check oil cooler and oil cooler lines. Replace if necessary. K. Replace with larger cooler. L. Replace oil pump. M. Install at lowest drain opening in conver- ter housing. Line must maintain constant gradual drop to oil sump for gravity drain.
5. Noisy Converter.	Worn coupling gear. Worn oil pump Damaged bearing. Worn drive gears.	N. Replace. O. Replace. P. A complete teardown will be necessary to determine this. Replace if necessary. Q. Replace.
6. Low clutch pressure. (See pressure specifications)	Transmission malfunc- tion. Worn oil pump. Regulator valve stuck open.	R. Close pressure line to transmission con- trol valve. If clutch pressure returns to normal, trouble is in transmission. S. Replace. T. Clean and check valve for worn or dirty parts, replace if necessary.

IRREGULARITIES IN PERFORMANCE (Cont'd.)

C-270 Series Converters

TROUBLE	PROBABLE CAUSE	REMEDY
7. High clutch pressure. (See pressure specifications)	Regulator valve stuck closed.	U. See item T.
8. Lack of power.	Improper engine function.	V. Tune engine.
	Engine stall speed below normal.	W. Tune engine. Check governor.
	Low converter out pressure.	X. See item No. 1.
	Air in the oil.	Y. See item No. 2.
	Improper oil.	Z. See oil recommendations.
9. Oil in engine flywheel housing.	"O" ring between impeller cover and impeller damaged.	AA. Replace.
	Oil baffle "O" ring damaged.	BB. Replace.
	Oil baffle oil seal damaged.	CC. Replace.

GENERAL INFORMATION:

Use Clark 1533614 Oil Filter only.

Use Clark 215502 Oil Filter Element only.

Use minimum number of Pipe and Hose Fittings.

Gravity drain from Converter Sump to Transmission must be of minimum length and have no "U" bends to trap air or oil.

Cooler capacity for normal application, 30 per cent of net Engine Horsepower at Governed Speed.

Check oil level with engine idling and transmission in neutral.

CHANGE OIL FILTER ELEMENT EVERY 500 HOURS. DRAIN AND REFILL SYSTEM EVERY 1000 HOURS.

TRANSMISSION CLUTCH OIL PRESSURE P.S.I.

The C-270 Converter will be equipped with one of three variations involving the clutch regulating valve. They are as follows:

1. Inlet cover for **Converter oil only** with clutch pressure valve in transmission control cover. **180 to 220 P.S.I. [1241,1 - 1516,8 kPa]** pressure range. (See note).

2. Pressure regulator valve on Converter with a **240 to 280 P.S.I. [1654,8 - 1930,5 kPa]** pressure range. (See Note).

3. Pressure regulator valve on Converter with a **180 to 220 P.S.I. [1241,1 - 1516,8 kPa]** pressure range. (See Note).

NOTE: All pressure must be equal within **5 P.S.I. [34,5 kPa]**. If clutch pressure varies in any one clutch more than **5 P.S.I. [34,5 kPa]** repair clutch. All pressures must be taken with two clutches engaged.

OIL PRESSURE AND LUBRICATION SPECIFICATIONS for C-270 SERIES CONVERTERS

Converter Out Pressure

Converter outlet oil temperature 180° - 200° F. [32,3° - 93,3° C].
Transmission in NEUTRAL.

Operating specifications:

25 P.S.I. [172,4 kPa] minimum pressure at 2000 RPM engine speed AND a maximum of 70 P.S.I. [482,6 kPa] outlet pressure with engine operating at no-load governed speed.

Converter outlet pressure equals the total pressure drop of the cooler, cooler lines and back pressure of the transmission lubrication systems.

Converter Lube Flow Disconnect CONVERTER DRAIN BACK line at transmission with engine running at 2000 RPM and measure oil into a gallon container. Measure oil leakage for 15 seconds and multiply the volume of oil by four to get gallons per minute leakage.

Leakage in Converter Leakage in C-270 series not to exceed 2 gallons maximum per minute.

LUBRICATION

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.

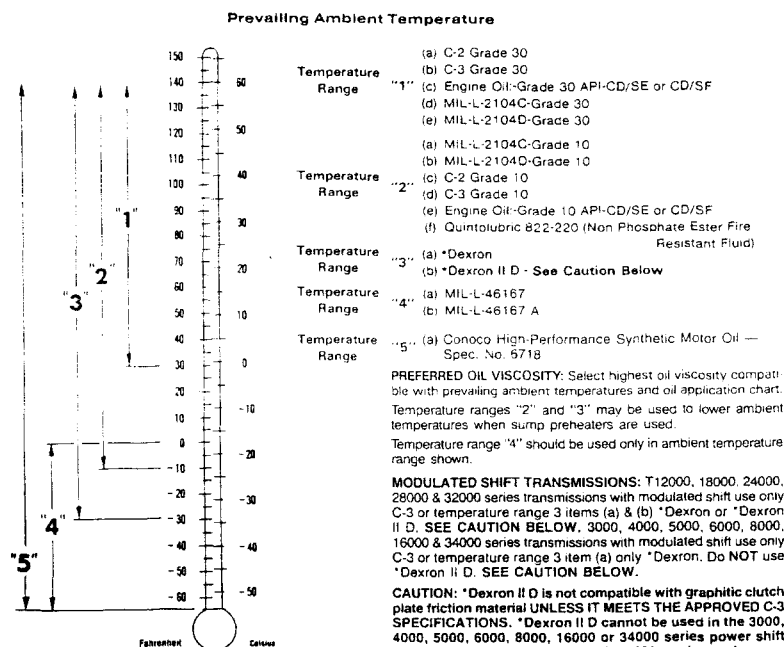
CHECK PERIOD Check oil level DAILY with engine running at 500-600 RPM and oil at 180° to 200° F. [82,2 - 93,3° C]. Maintain oil level to FULL mark.

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.**

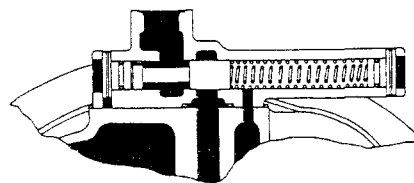
RECOMMENDED LUBRICANTS FOR CLARK-HURTH COMPONENTS POWER SHIFTED TRANSMISSION AND TORQUE CONVERTERS



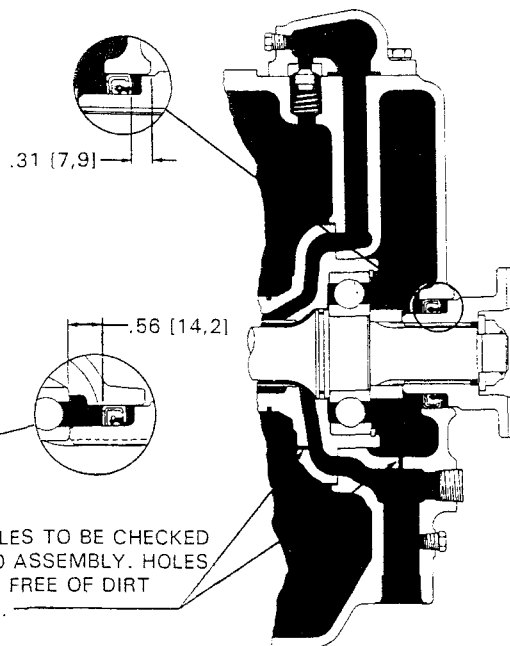
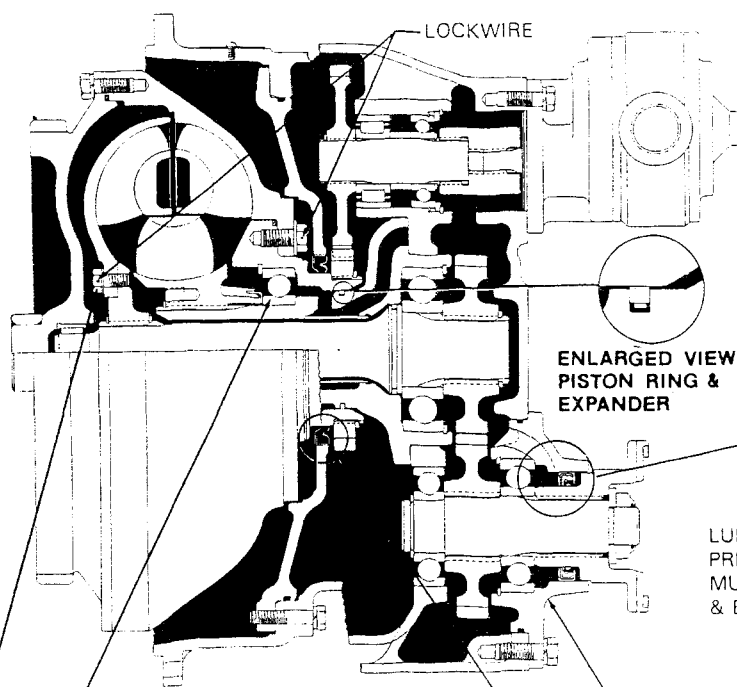
*Dexron is a registered trademark of General Motors Corporation.

*** 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.**

1. TORQUE OUTPUT SHAFT NUT TO 200-250 lb-ft [271,2-338,9 N·m.]
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 RINGS & "O" RINGS AT ASSEMBLY.
4. APPLY THIN COATING OF GREASE BETWEEN SEAL LIPS ON LIP TYPE SEALS PRIOR TO ASSEMBLY.
5. USE PERMATEx & CRANE SEALER ONLY WHERE SPECIFIED.
6. APPLY VERY LIGHT COAT OF PERMATEx NO. 2 TO O.D. OF ALL OIL SEALS BEFORE ASSEMBLY.
7. AFTER ASSEMBLY OF PARTS USING PERMATEx OR CRANE SEALER THERE MUST BE NO FREE OR EXCESS MATERIAL THAT COULD ENTER THE OIL CIRCUIT.
8. HEAT NOSE BUSHING TO 200° F. [93° C] BEFORE ASSEMBLY OF BUSHING TO COVER.
9. GOVERNOR DRIVE NEEDLE BEARINGS TO BE PRESSED 0.031 [0.79] BELOW ENDS OF GEAR.
10. LUBE HOLES TO BE CHECKED PRIOR TO ASSEMBLY. HOLES MUST BE FREE OF DIRT & BURRS.



REGULATOR VALVE



STRAIGHT THRU DRIVE

LUBE HOLES TO BE CHECKED PRIOR TO ASSEMBLY. HOLES MUST BE FREE OF DIRT & BURRS.

OFFSET DRIVE

MUST BE LOOSE INTERNAL FIT BEARING. NO. "3" ETCHED ON BEARING.

PERMATEx 2 STUDS USED ON REAR BEARING CAP.

SEAL TO BE FLUSH WITH REAR SURFACE

NOTE: METRIC DIMENSIONS SHOWN IN BRACKETS []

TORQUE TURBINE BOLTS TO 30-35 LBS./Ft. [40,7-47,4 N·m.]

Grade 5 

Torque Specification for Lubricated or Plated Screw Threads

Grade 8 

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]

ASSEMBLY INSTRUCTIONS FOR C-270 CONVERTER WITH INLINE AND OFFSET OUTPUT

C-270 SERIES CONVERTER

The following instructions will cover the disassembly and assembly of the C-270 Converter in a sequence that would normally be followed after the Converter has been removed from the vehicle.

CAUTION: Cleanliness is of extreme importance and an absolute must in the repair and overhaul of the Converter. Before attempting any repairs the exterior of the unit must be thoroughly cleaned to prevent the possibility of dirt and foreign matter entering the mechanism.

DISASSEMBLY

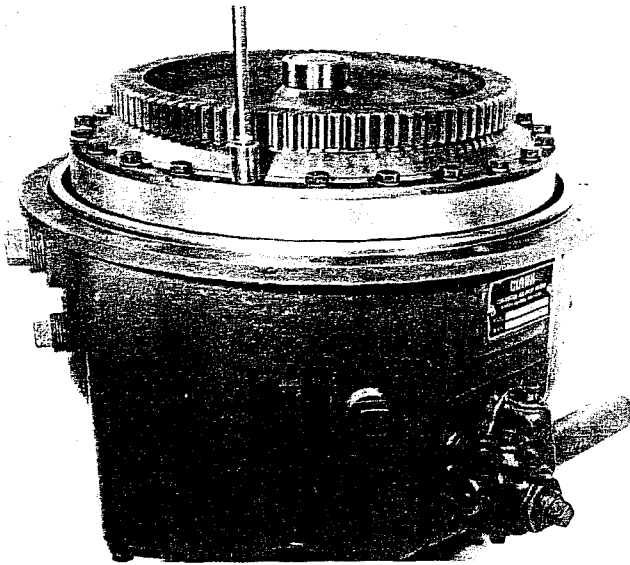


Figure 1

Remove bolts securing impeller cover to impeller.

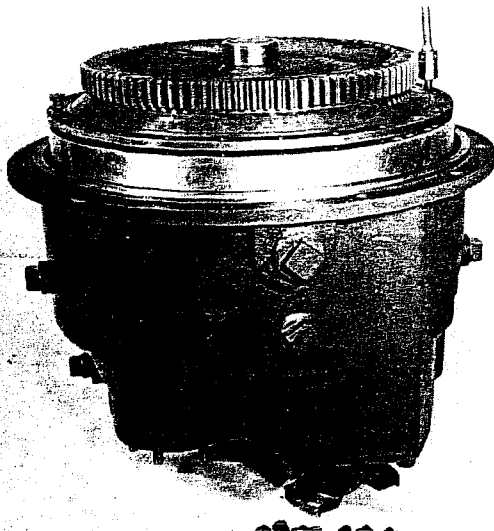


Figure 2

Use two bolts in threaded puller holes 180° apart to remove impeller cover from impeller. **NOTE:** some units may have pry slots instead of threaded holes.

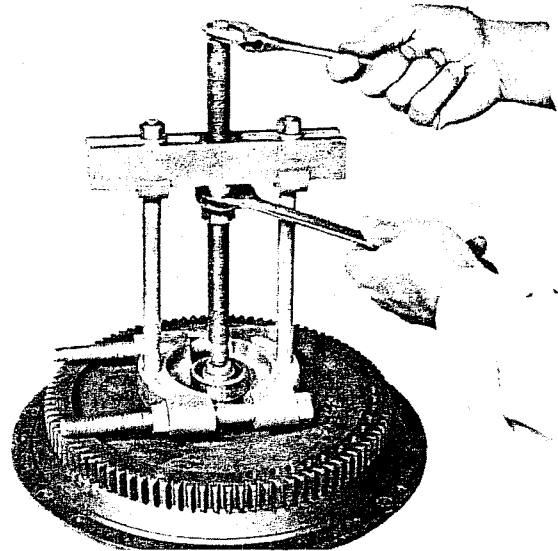


Figure 3

If pilot bushing sleeve is to be replaced use procedure as shown above.

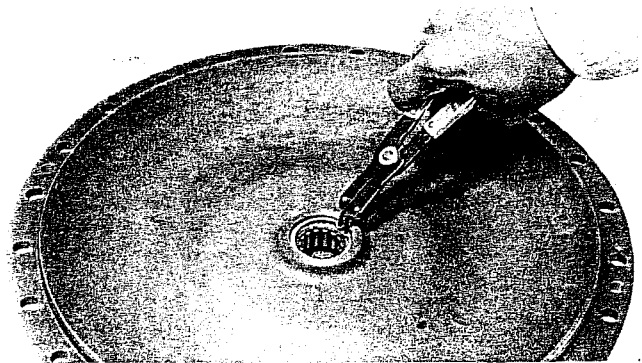


Figure 4

If necessary to replace pilot bearing, remove retain-er ring and use small inside bearing puller.

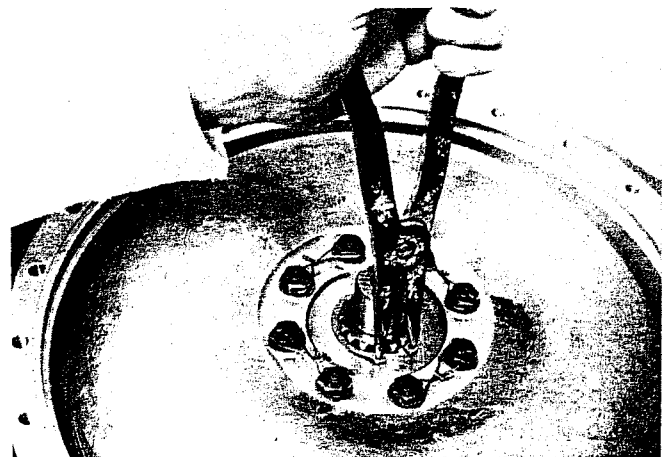


Figure 5

Remove outer turbine hub retain-er ring.

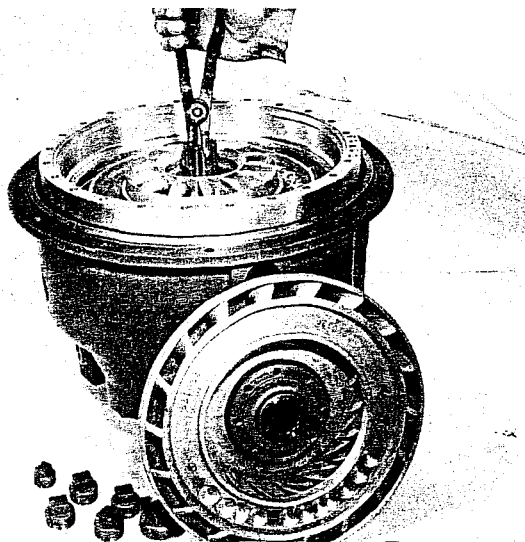


Figure 6

Remove turbine and hub assembly from turbine shaft. Remove turbine locating ring.

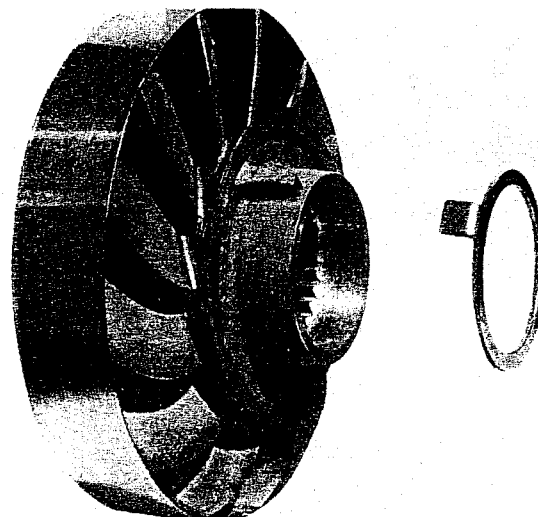


Figure 9

Reaction member and spacer.

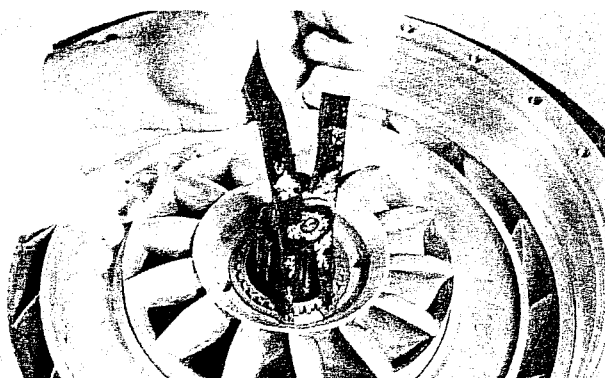


Figure 7

Remove reaction member retainer ring.

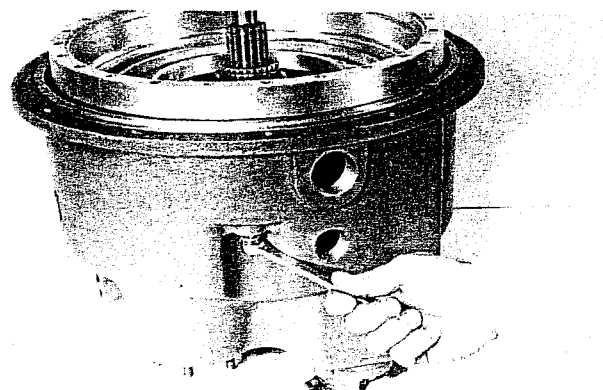


Figure 10

Remove three bolts that secure oil baffle to converter housing.

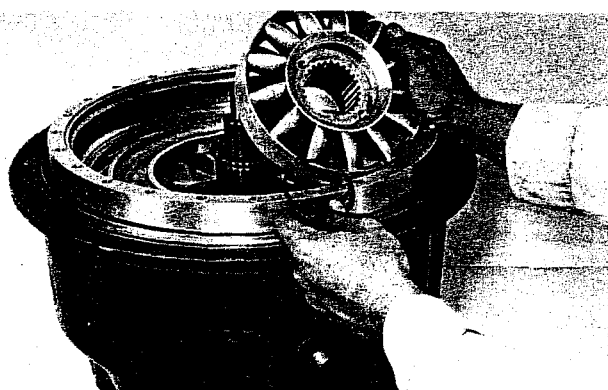


Figure 8

Remove reaction member from stator support threaded puller holes are provided should reaction member be too tight to be removed by hand.

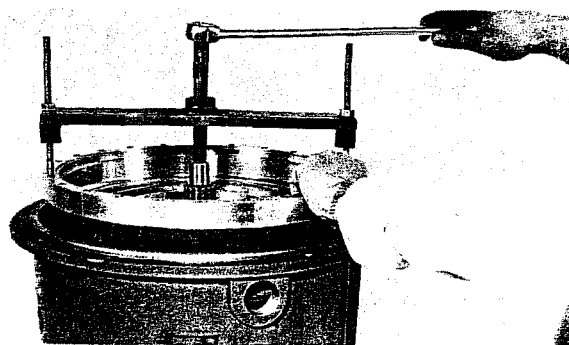


Figure 11

Install special puller tool as shown above, turn jack screw pulling oil baffle and impeller from stator support as an assembly. Special tool can be made for easier removal of impeller assembly but it is not necessary. (See Figure 12).

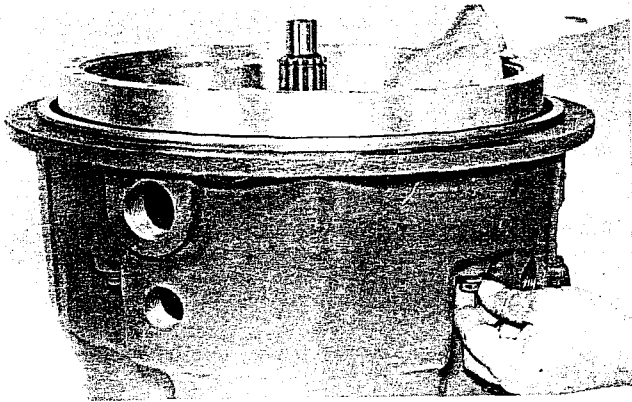


Figure 12

If special tool is not available, remove oil baffle bolts part way. Tap lightly on each bolt, this will loosen oil baffle from converter housing, remove oil baffle and impeller from housing as an assembly.

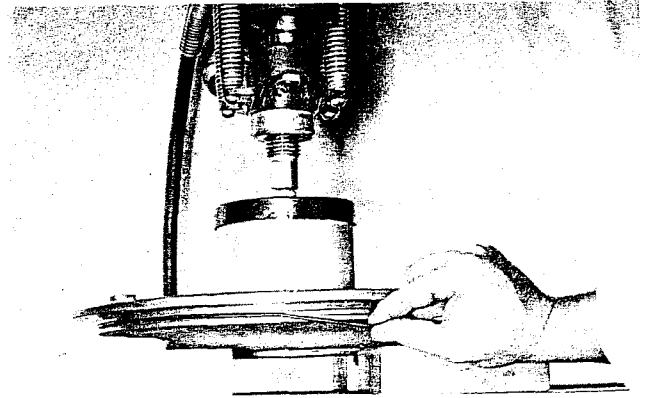


Figure 15

Remove oil baffle oil seal and "O" ring. **NOTE:** Oil seal should be removed only if it is to be replaced.

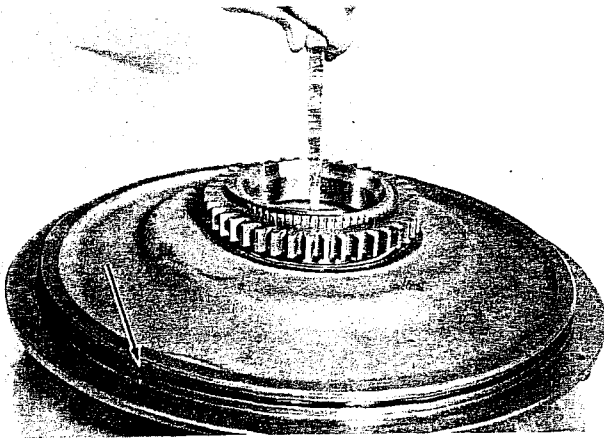


Figure 13

Remove impeller hub gear retainer ring.

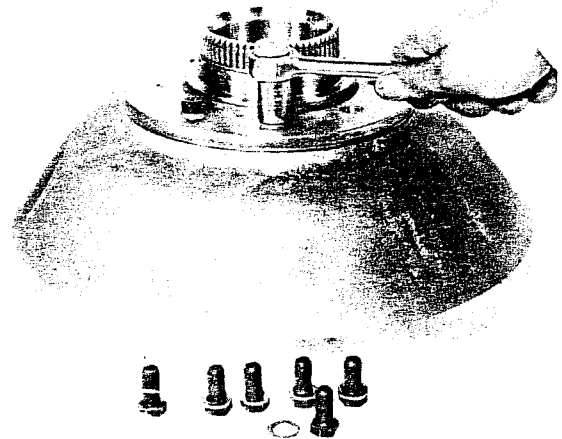


Figure 16

Remove impeller hub bolts and washers.

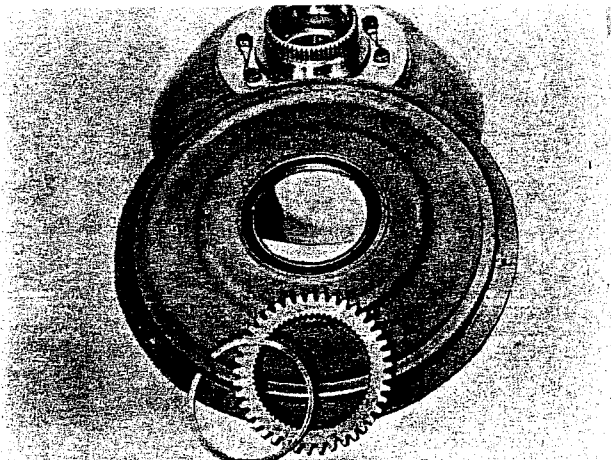


Figure 14

Remove impeller hub gear and oil baffle from impeller.



Figure 17

Remove impeller hub from impeller. Remove hub "O" ring.

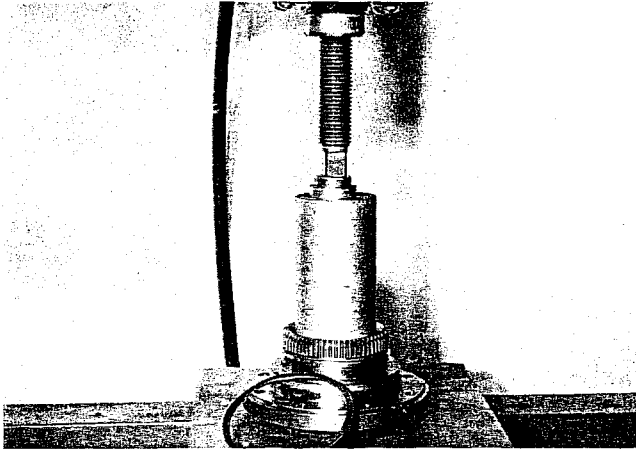


Figure 18

Remove hub bearing retainer ring and press bearing from hub.

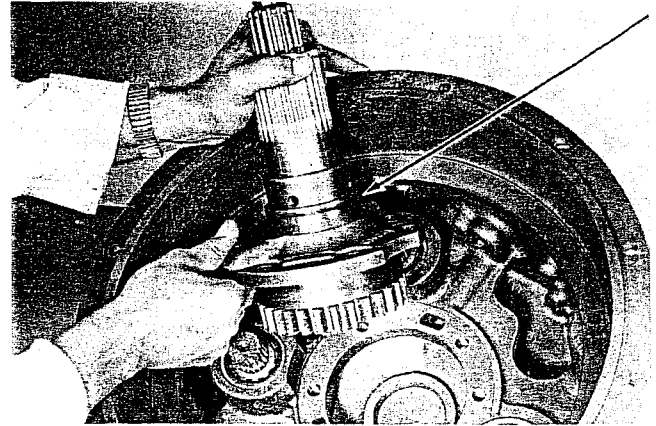


Figure 21

On offset output, remove stator support and turbine shaft assembly from converter housing.

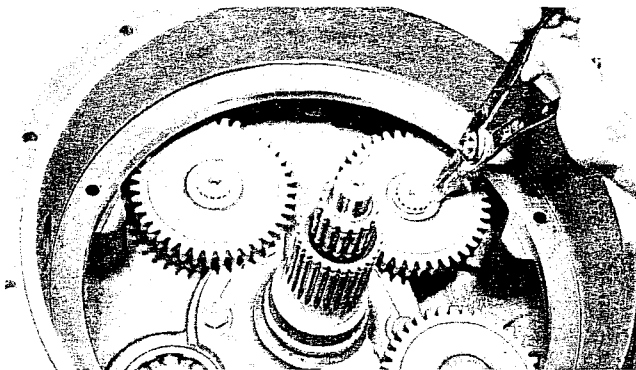


Figure 19

PUMP DRIVES VARY IN QUANTITY FROM ONE TO THREE — ALL DRIVES DISASSEMBLE THE SAME.

Remove oil pump drive gear retaining rings. Remove drive gears from pump shafts.

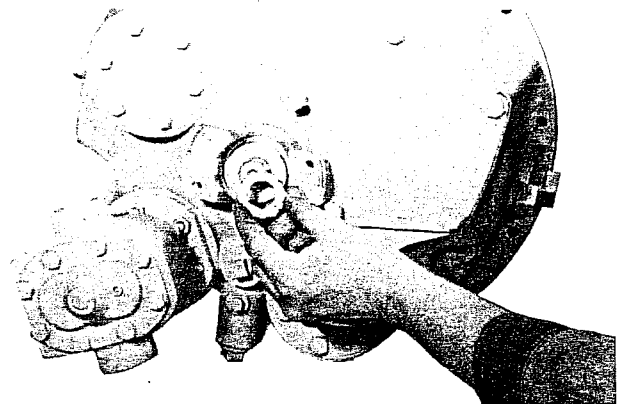


Figure 22

On inline output, remove companion flange cotter, nut, washer, "O" ring, and companion flange from inline turbine shaft.

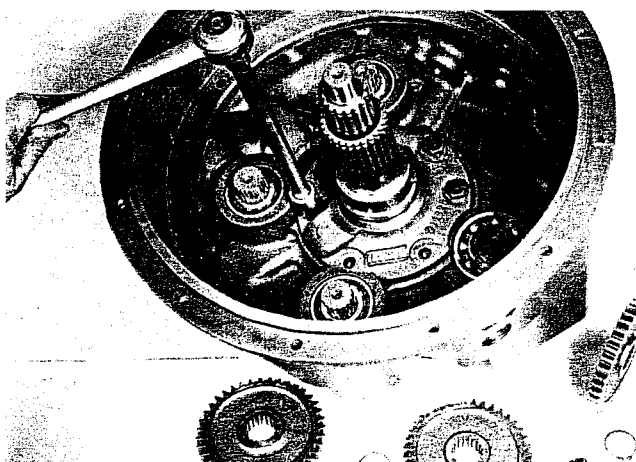


Figure 20

Remove stator support bolts.

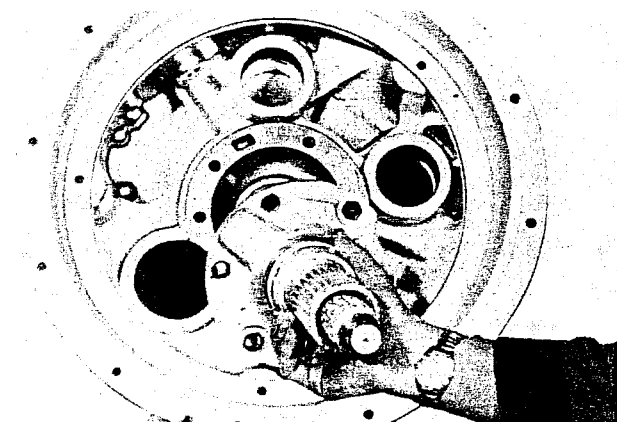


Figure 23

Remove inline turbine shaft by using a brass hammer and tapping on threaded end of shaft. Stator support and turbine shaft will come out as a unit.

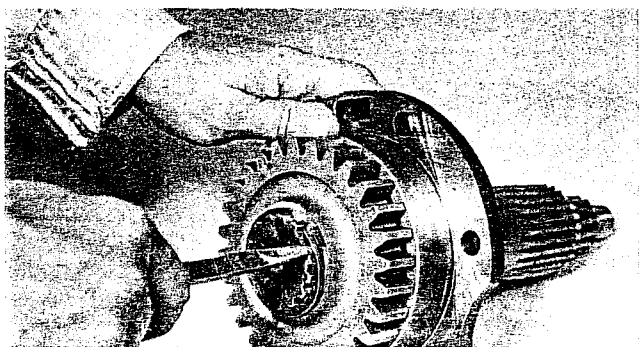


Figure 24

On offset output remove turbine shaft gear retainer ring and turbine shaft gear.

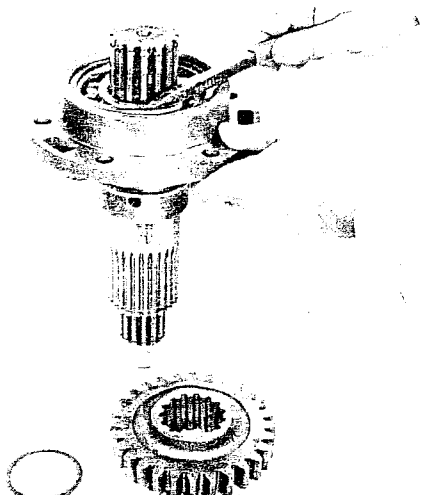


Figure 25

Remove turbine shaft bearing retainer ring from stator support. **NOTE:** Use same procedure on inline output or offset output.

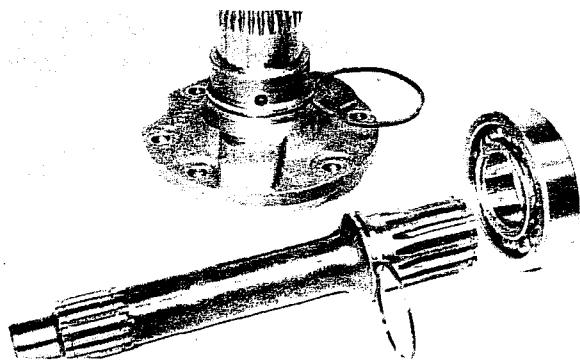


Figure 26

Press turbine shaft from stator support. Press turbine bearing from turbine shaft. Remove oil sealing rings from stator support and turbine shaft. **NOTE:** Use same procedure on inline output or offset output.

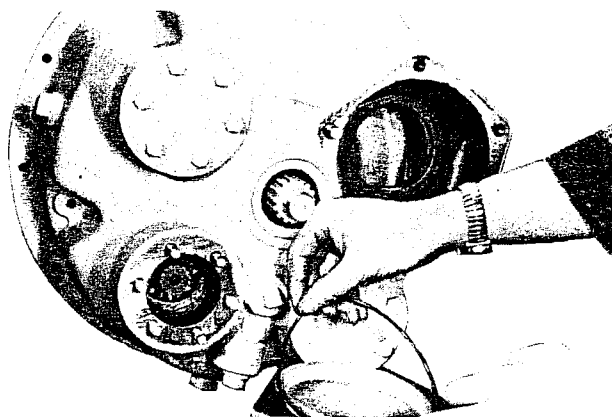


Figure 27

On the inline output converter, the offset output shaft cover need not be removed unless "O" ring is to be changed.

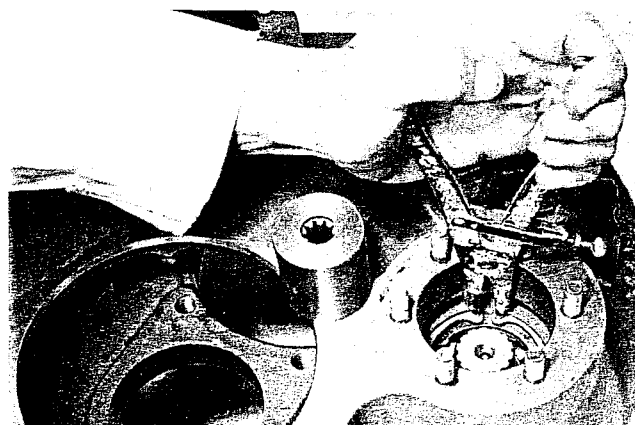


Figure 28

Remove pump adaptor sleeve from pump shaft. Remove pump shaft washer retainer ring and pump shaft washer.

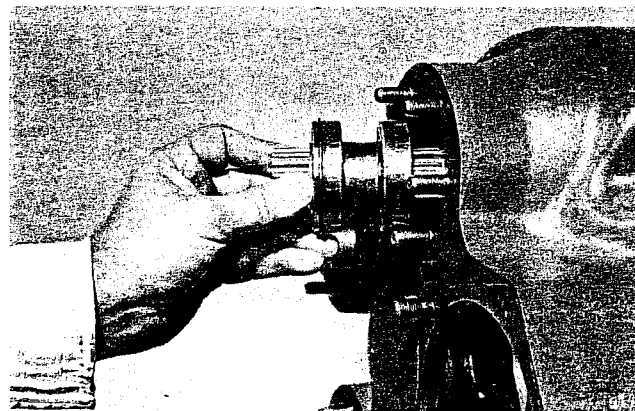


Figure 29

Tap on pump shaft from inside converter housing, pump shaft and bearings will come out as an assembly.

CLEANING AND INSPECTION

CLEANING

Clean all parts thoroughly using solvent type cleaning fluid. It is recommended that parts be immersed in cleaning fluid and moved up and down slowly until all old lubricant and foreign material is dissolved and parts are thoroughly cleaned.

CAUTION: Care should be exercised to avoid skin rashes, fire hazards and inhalation of vapors when using solvent type cleaners.

Bearings

Remove bearings from cleaning fluid and strike flat against a block of wood to dislodge solidified particles of lubricant. Immerse again in cleaning fluid to flush out particles. Repeat above operation until bearings are thoroughly clean. Dry bearings using moisture-free compressed air. Be careful to direct air stream across bearing to avoid spinning. Do not spin bearings when drying. Bearings may be rotated slowly by hand to facilitate drying process.

Housings

Clean interior and exterior of housings, bearing caps, etc., thoroughly. Cast parts may be cleaned in hot solution tanks with mild alkali solutions providing these parts do not have ground or polished surfaces. Parts should remain in solution long enough to be thoroughly cleaned and heated. This will aid the evaporation of the cleaning solution and rinse water. Parts cleaned in solution tanks must be thoroughly rinsed with clean water to remove all traces of alkali. Cast parts may also be cleaned with steam cleaner.

CAUTION: Care should be exercised to avoid inhalation of vapors and skin rashes when using alkali cleaners.

All parts cleaned must be thoroughly dried immediately by using moisture-free compressed air or soft, lintless absorbent wiping rags free of abrasive materials such as metal filings, contaminated oil or lapping compound.

INSPECTION

The importance of careful and thorough inspection of all parts cannot be overstressed. Replacement of all parts showing indication of wear or stress will eliminate costly and avoidable failures at a later date.

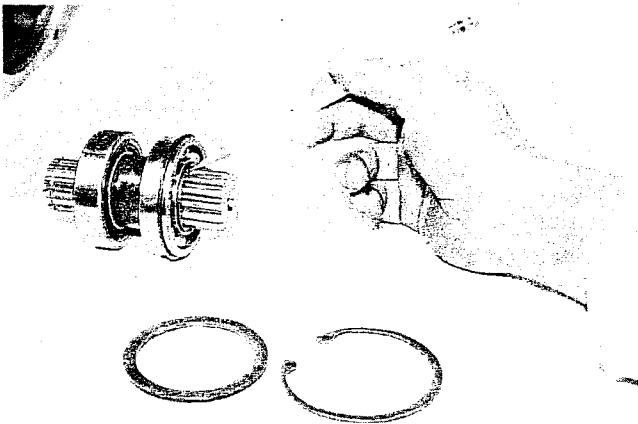


Figure 30

Remove pump shaft bearing locating ring. Press bearings from pump shaft.

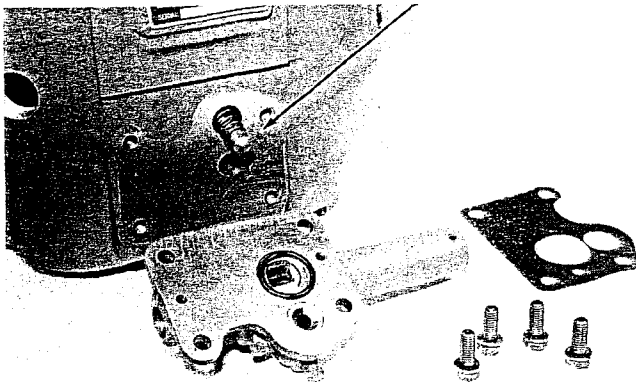


Figure 31

Remove pressure regulator valve assembly. Use caution as not to lose safety valve plunger or spring (See arrow).

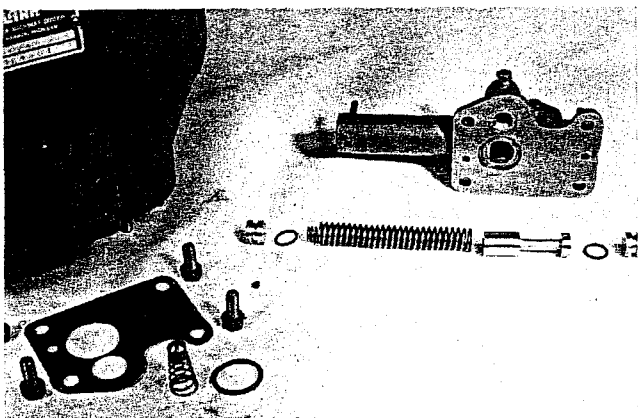


Figure 32

Depress piston stop and remove piston stop roll pin. Remove piston stop and inner and outer spring. Remove roll pin at opposite end. Remove valve stop and valve piston.

Bearings:

Carefully inspect all rollers, cages and cups for wear, chipping or nicks to determine fitness of bearings for further use. Do not replace a bearing cone or cup individually without replacing the mating cup or cone at the same time. After inspection, dip bearings in recommended type Automatic Transmission Fluid and wrap in clean lintless cloth or paper to protect them until installed.

Oil Seals, Gaskets, Etc.

Replacement of spring load oil seals, "O" rings, metal sealing rings, gaskets and snap rings is more economical when unit is disassembled than premature overhaul to replace these parts at a future time. Further loss of lubricant through a worn seal may result in failure of other more expensive parts of the assembly. Sealing members should be handled carefully, particularly when being installed. Cutting, scratching, or curling under of lip of seal seriously impairs its efficiency. Apply a thin coat of Permatex No. 2 on the outer diameter of the oil seal to assure an oil tight fit into the retainer. When assembling new metal type sealing rings, same should be lubricated with coat of chassis grease to stabilize rings in their grooves for ease of assembly of mating members. Lubricate all "O" rings and seals with recommended type Automatic Transmission Fluid before assembly.

Gears and Shafts

If magna-flux process is available, use process to check parts. Examine teeth on all gears carefully for wear, pitting, chipping, nicks, cracks or scores. If gear teeth show spots where case hardening is worn through or cracked, replace with new gear. Small nicks may be removed with suitable hone. Inspect shafts and quills to make certain they are not sprung, bent, or splines twisted, and that shafts are true.

Housing, Covers, etc.

Inspect housings, covers and bearing caps to be certain they are thoroughly cleaned and that mating surfaces, bearing bores, etc., are free from nicks or burrs. Check all parts carefully for evidence of cracks or condition which would cause subsequent oil leaks or failures.

REASSEMBLY OF TORQUE CONVERTER

Instructions given below on reassembly of components are given in the sequence that must be followed in rebuilding.

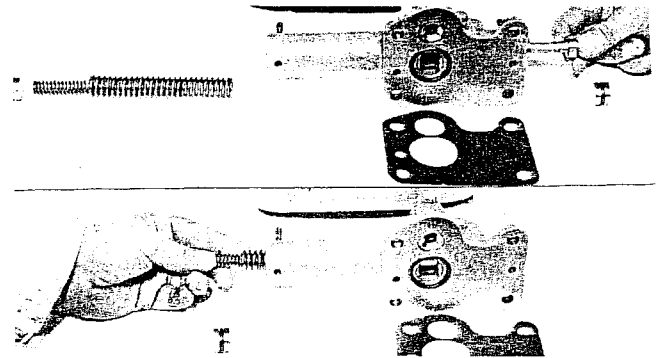


Figure 33

Install valve piston (top view Figure 33). Install valve stop and new "O" ring in valve housing and secure with roll pin. Install inner and outer valve spring in valve housing. Install valve spring stop and new "O" ring in valve housing. Depress spring stop and install spring stop roll pin.

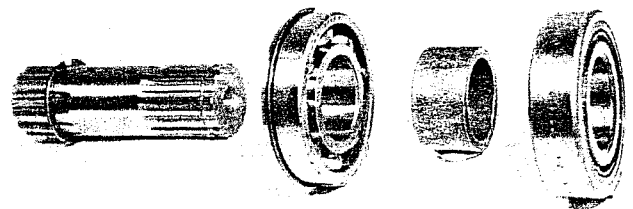


Figure 34

Install pump shaft rear bearing locating ring. Press rear bearing on pump shaft with bearing snap ring toward rear of shaft. Install bearing spacer and press front bearing on shaft until it shoulders against bearing spacer.

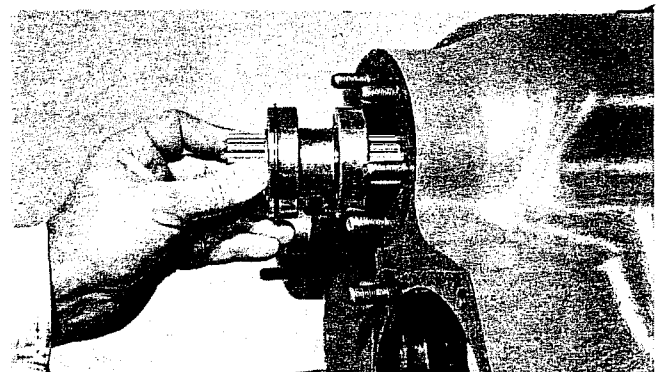


Figure 35

Install pump shaft and bearing assembly in converter housing.

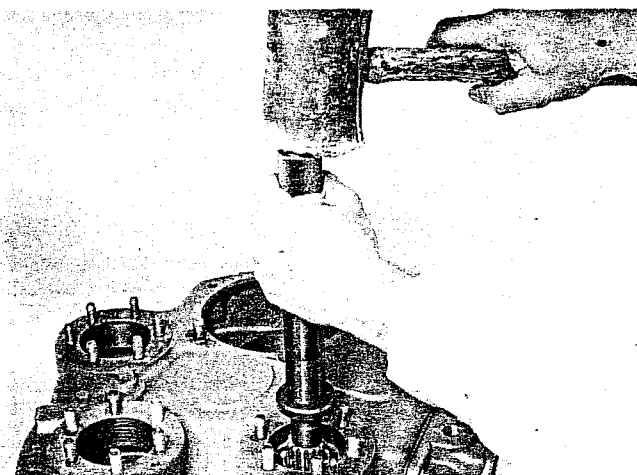


Figure 36

Tap pump shaft and bearing assembly in converter housing until rear bearing snap ring shoulders against bearing bore.

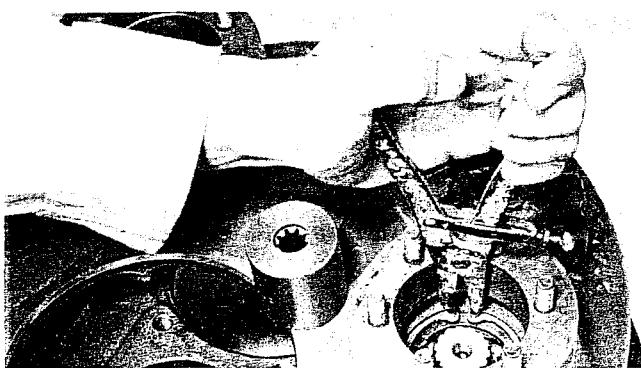


Figure 37

Install pump shaft washer and washer retainer ring. Pump adaptor sleeve can be installed just before pump.

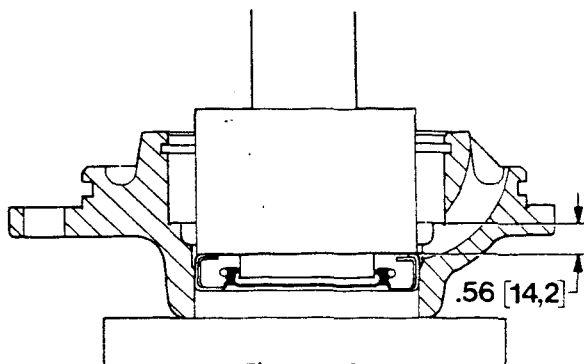


Figure 38

Apply a light coat of Permatex on the outer diameter of the output shaft oil seal. Press oil seal in bearing retainer from inside of retainer as shown and to dimension shown. Press inline output shaft oil seal in converter housing. Lip of seal in. **NOTE:** Oil seal must be pressed 5/16" [7,93 mm] below rear face of converter housing.

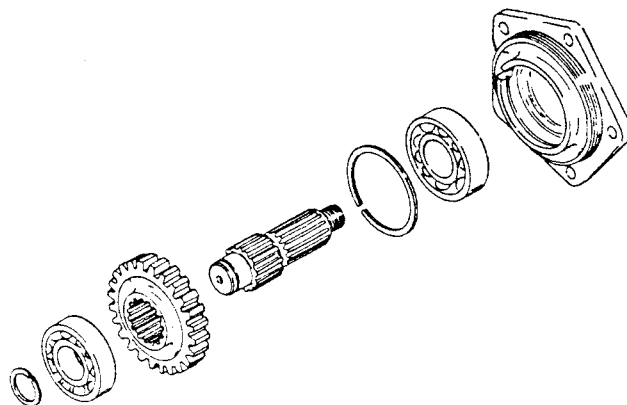


Figure 39

Press output rear bearing in bearing retainer. Secure with retainer ring. Press output shaft into bearing retainer. Use caution as not to damage oil seal. Position output gear on shaft. Press front output bearing on shaft. Install bearing retainer ring.

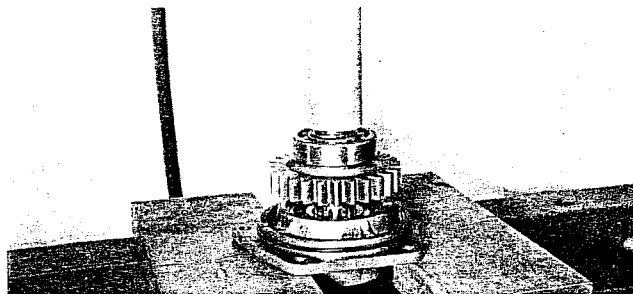


Figure 40

Press offset output shaft, gear and bearing assembly through rear bearing and bearing retainer. Secure output shaft gear in vise equipped with soft jaws. Install companion flange, new flange "O" ring, flange washer and flange nut, tighten nut 200 to 250 foot pounds torque [271,2 - 338,9 N.m.].

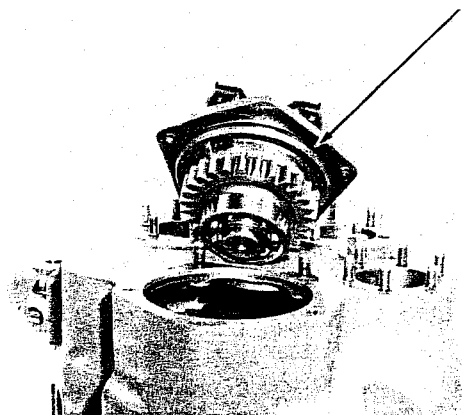


Figure 41

Install new "O" ring (See arrow) on offset output shaft bearing retainer. Install output shaft assembly to converter housing and secure with nuts, bolts and lock-washer. Tighten to specified torque.

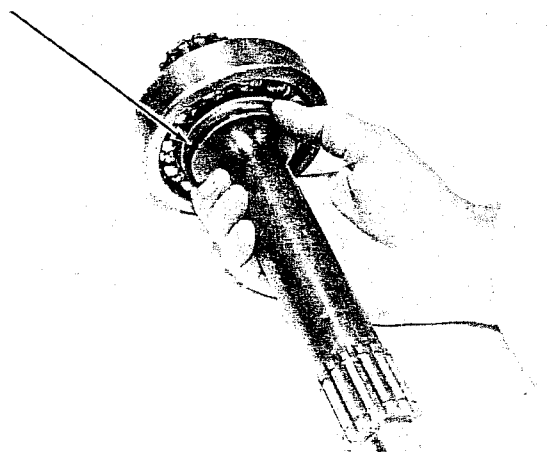


Figure 42

Press rear bearing on turbine shaft, this is also the output shaft for the inline output converter, install shaft oil sealing ring (See arrow).

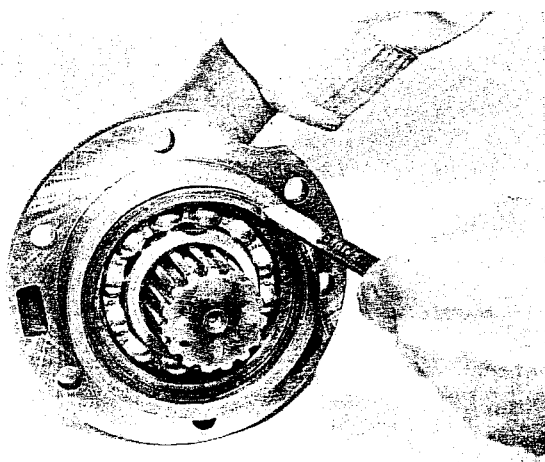


Figure 43

Press shaft and bearing assembly in stator support. Use caution as not to damage oil sealing ring. Secure bearing with retainer ring. Use same procedure on inline output or offset output.

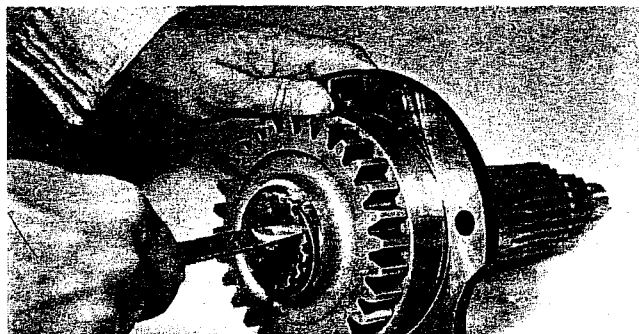


Figure 44

Install output shaft gear on offset output shaft and secure with retainer ring.

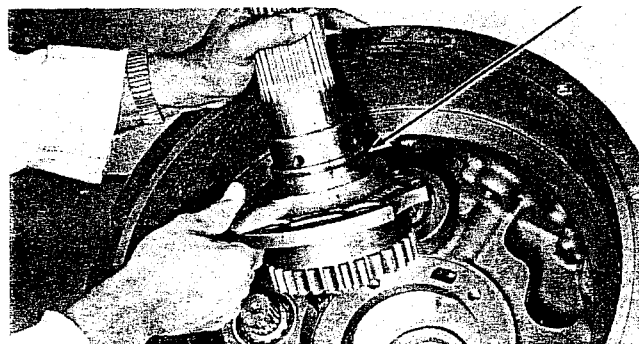


Figure 45

Install new oil sealing ring on support.

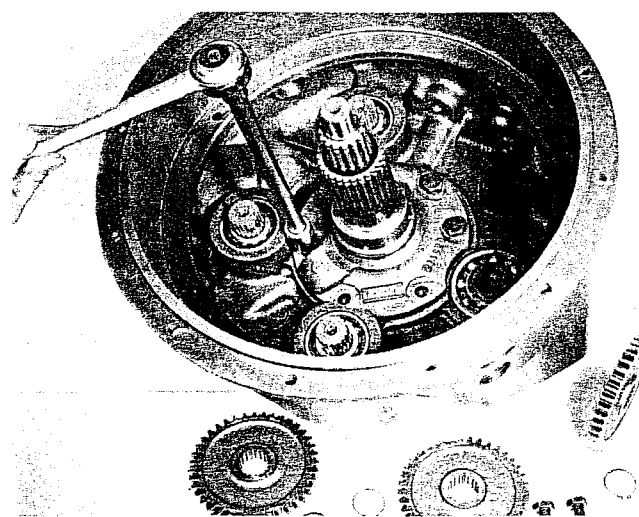


Figure 46

Install companion flange spacer on threaded end of inline output shaft. **NOTE:** Spacer must be put on shaft before shaft installation in converter housing, as spacer will not pass through oil seal. Align holes in stator support with holes in converter housing. Install bolts and tighten to specified torque.

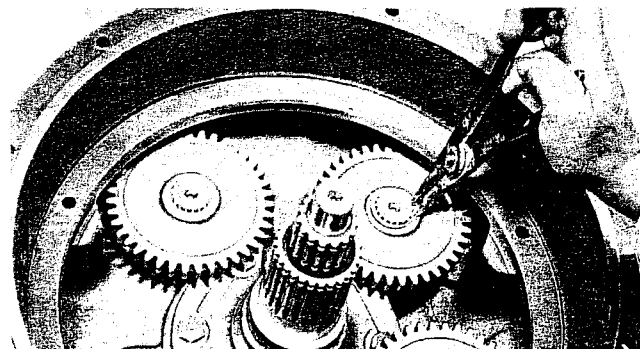


Figure 47

Install oil pump drive gears and secure with retainer rings.

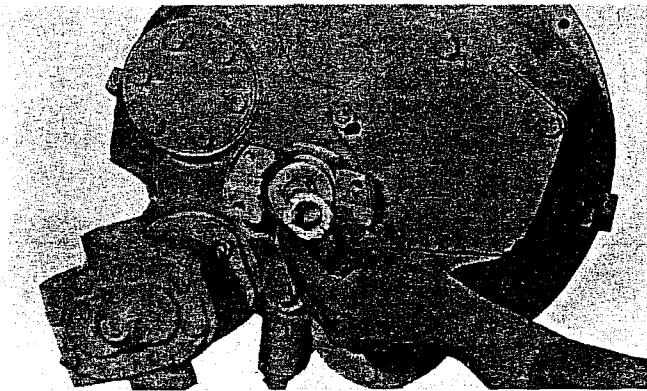


Figure 48

On inline output shaft install companion flange, new flange "O" ring, flange washer and flange nut. Tighten nut 200 to 250 foot pounds torque [271,2 - 338,9 N.m.].

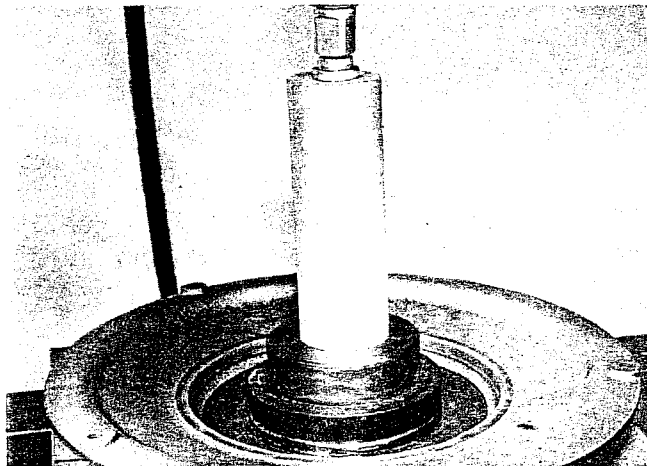


Figure 49

Press new oil seal in oil baffle with lip of seal down. (See Fig. 1).

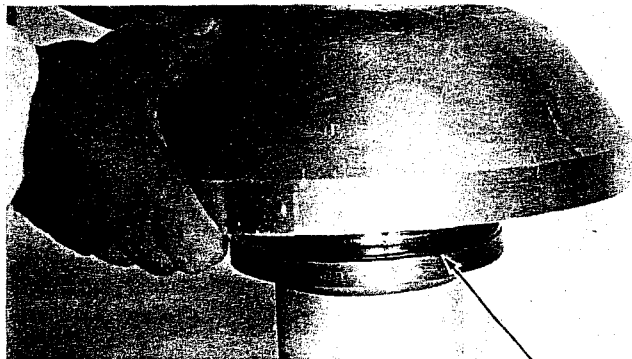


Figure 50

Press impeller bearing in impeller hub and secure with retainer ring. Install new "O" ring (see arrow) on impeller hub. Align holes in impeller hub with holes in impeller.

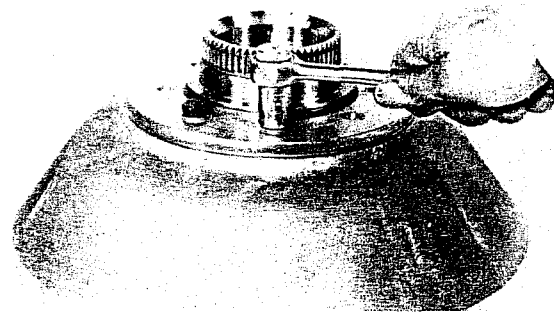


Figure 51

NOTE: See page 23 for 13 inch special impeller hub bearing and 12 bolt assembly instructions.

Install bolts and tighten to specified torque. Lockwire in pairs to prevent loosening.

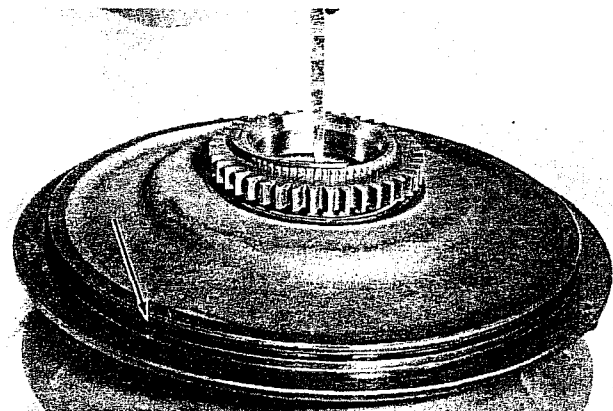


Figure 52

Install oil baffle on impeller assembly. Install impeller hub gear on impeller hub and secure with retainer ring. Install new "O" ring on oil baffle (See arrow).

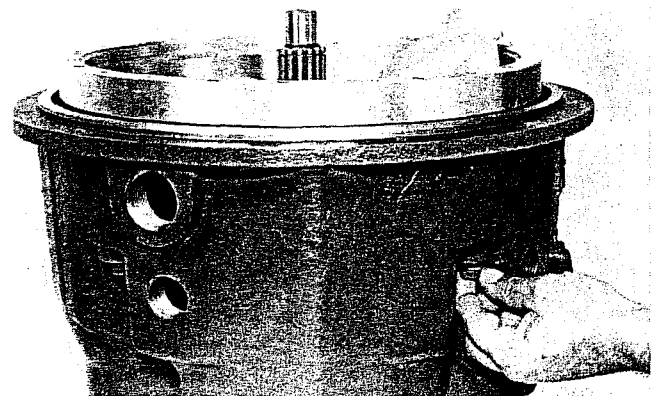


Figure 53

Install impeller and oil baffle assembly over stator support and into converter housing. Align holes in oil baffle with holes in converter housing. Install bolts and lockwashers into oil baffle. Tighten baffle bolts evenly to prevent damaging oil baffle "O" ring. Tighten to specified torque.

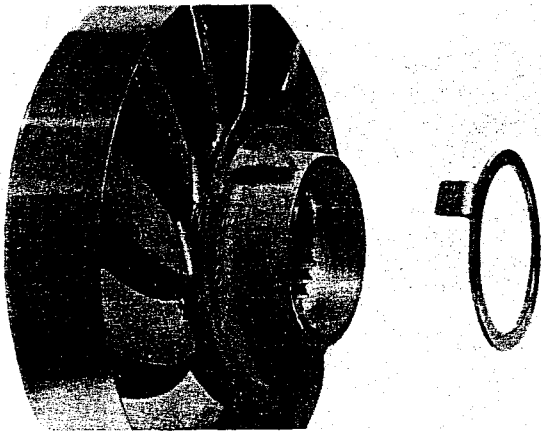


Figure 54

Install reaction member spacer with tang of spacer out. Install reaction member. **NOTE:** Casted knob on reaction member must be positioned between the 3 & 6 o'clock location on support, preferably between 4 & 5 o'clock.

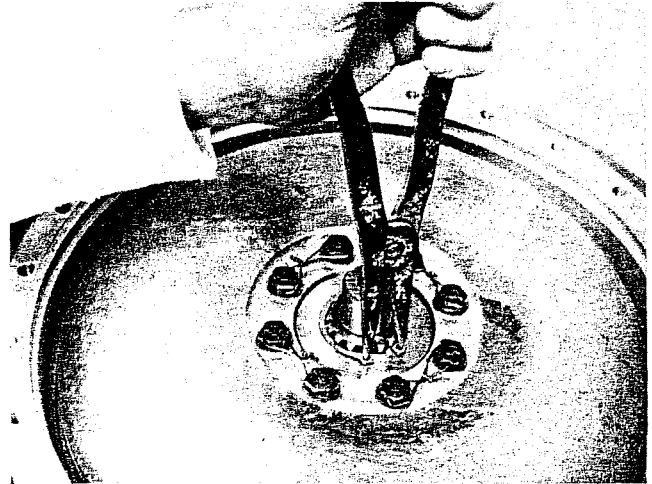


Figure 57

Install turbine and hub assembly on turbine shaft and secure with outer retaining ring.

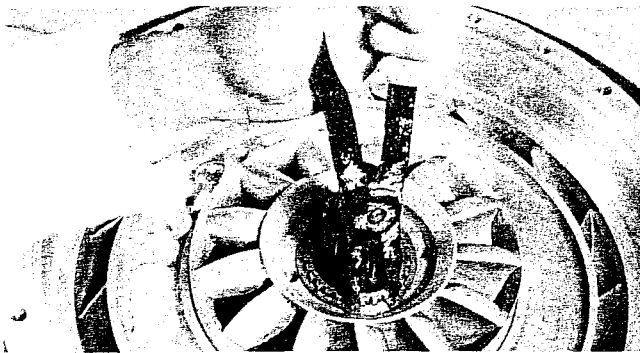


Figure 55

Install reaction member on stator support and secure with retaining ring.

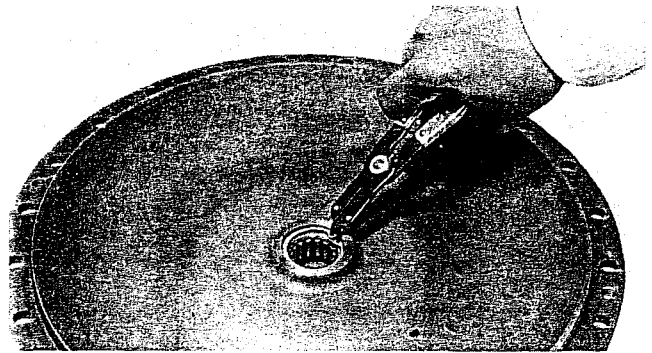


Figure 58

Press pilot bearing in impeller cover and secure with retainer ring.

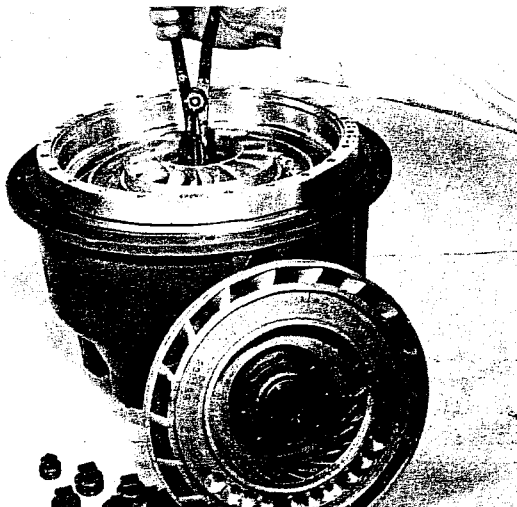


Figure 56

Install inner turbine locating ring on turbine shaft.

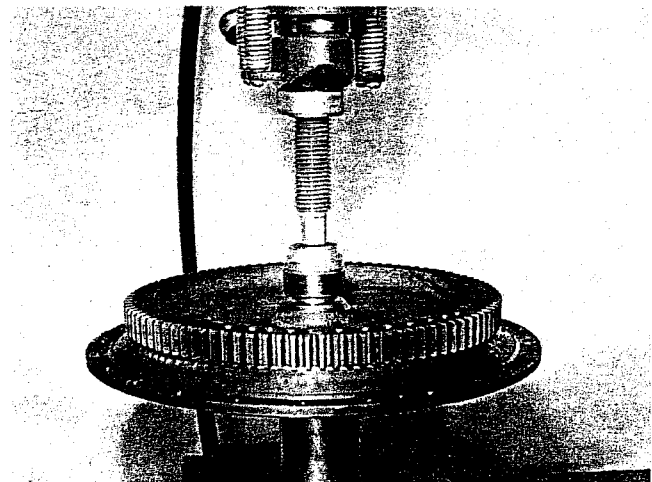


Figure 59

Heat impeller cover sleeve to 200° [93° C.] and press on impeller shaft.

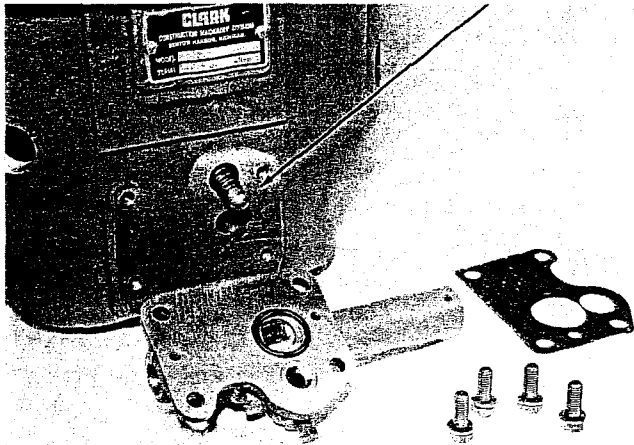


Figure 60

Install spring and plunger in converter housing (See arrow). Install new gasket on valve assembly. Install new "O" ring on valve assembly. Secure valve assembly to converter housing with bolts and lockwashers. Tighten to specified torque.

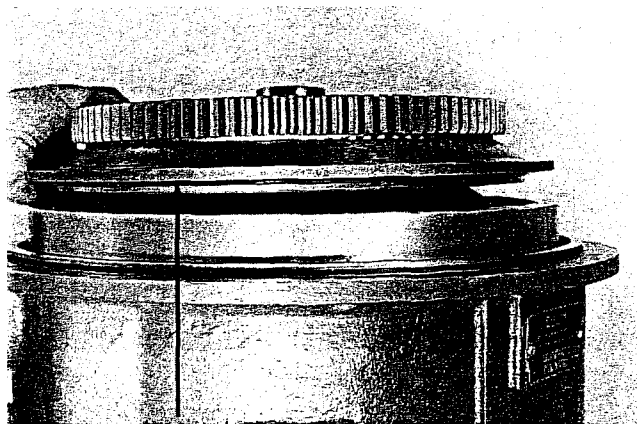


Figure 61

Install new "O" ring (See arrow) on impeller cover. Align holes in impeller cover with holes in impeller.

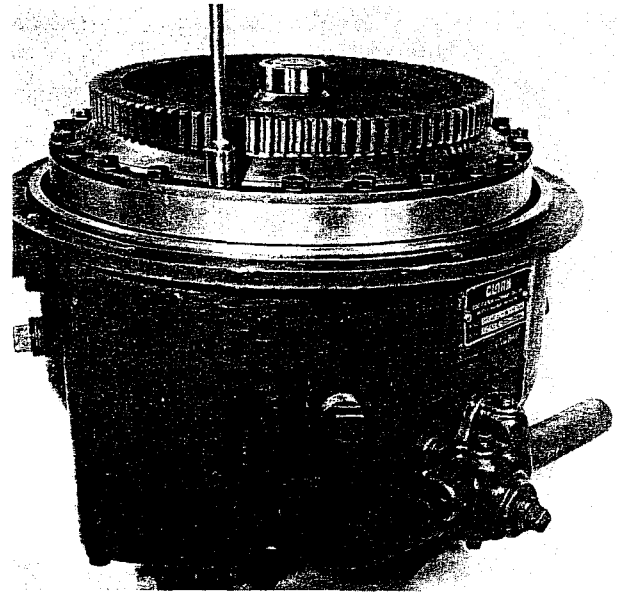


Figure 62

Install impeller cover to impeller bolts and lockwashers, tighten to specified torque.

SEE PAGE 26 FOR SPEED SENSOR INSTALLATION

16 SCREW STABLE DRIVE CONNECTION NON-ASBESTOS CONVERTER DRIVE RING GEAR INSTALLATION PROCEDURE

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. Refer to CLARK-HURTH form number 802563 for measuring procedures.
3. Measure and record engine crankshaft and end play.
4. 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.

5. 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 38 to 42 pounds feet of torque [51,6 - 56,9 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.

6. 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.

Measure engine crankshaft end play after assembly of torque converter. This value must be within one thousandth (.001) of an inch [0,0254 mm] of end play recorded (line 3) before assembly of torque converter.

802646 – 1.5 INCH [38,1] 16 SCREW RING GEAR KIT

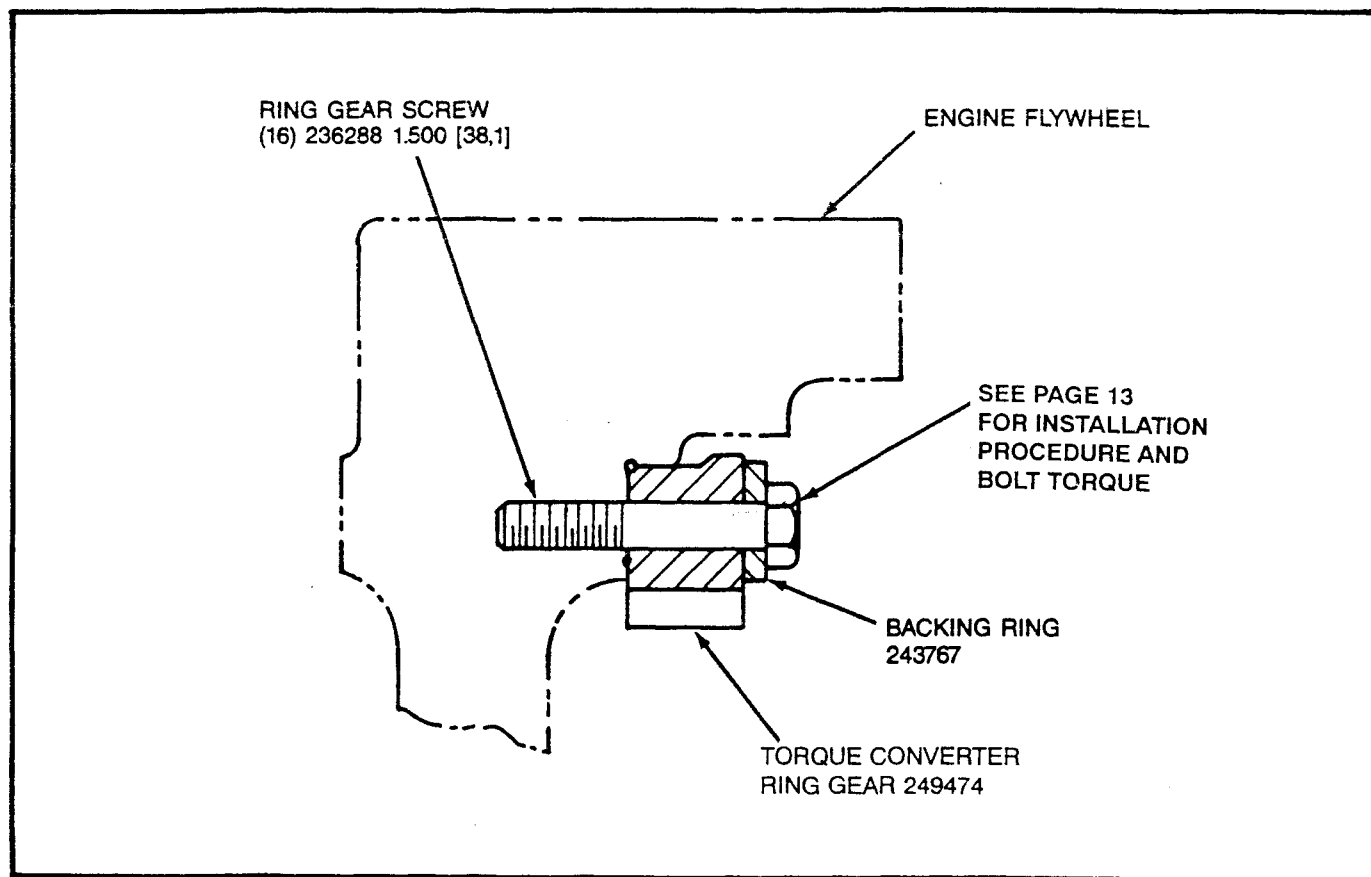
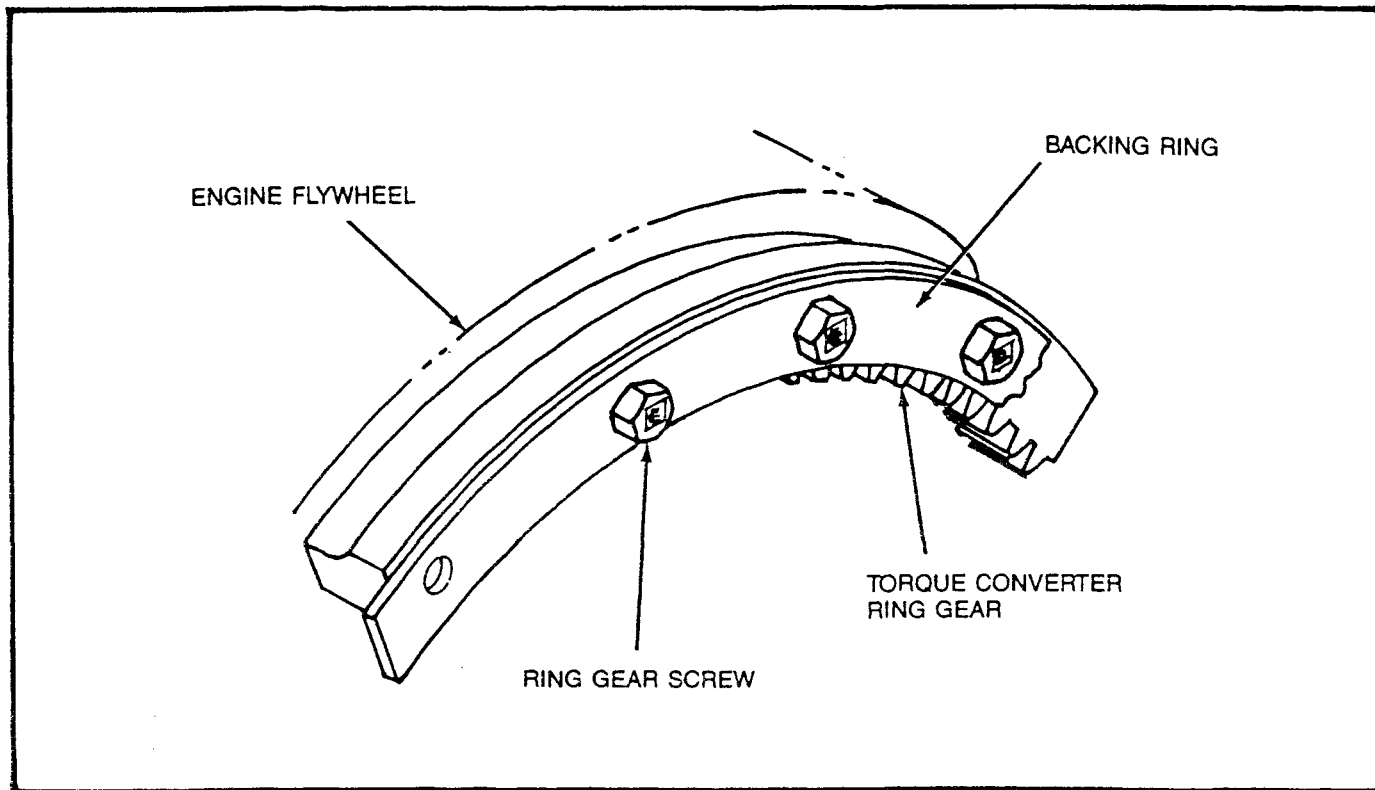
1	249474	SDC Torque Converter Ring Gear
16	236288	Ring Gear Screw 1.5 Inch [38,1]
1	802648	Installation Instruction Sheet

802647 – 1.5 INCH [38,1] 16 SCREW RING GEAR KIT

1	249474	SDC Torque Converter Ring Gear
16	236288	Ring Gear Screw 1.5 Inch [38.1]
1	243767	Backing Ring
1	802648	Installation Instruction Sheet

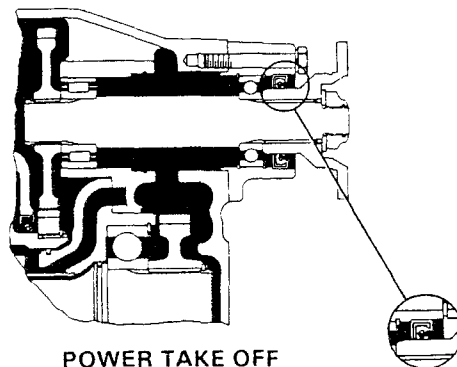
243767 Backing Ring not included in 802646 Ring Gear Kit. Must be Ordered Separately.

SEE PAGE 24 FOR 32 SCREW RING GEAR INSTALLATION PROCEDURE

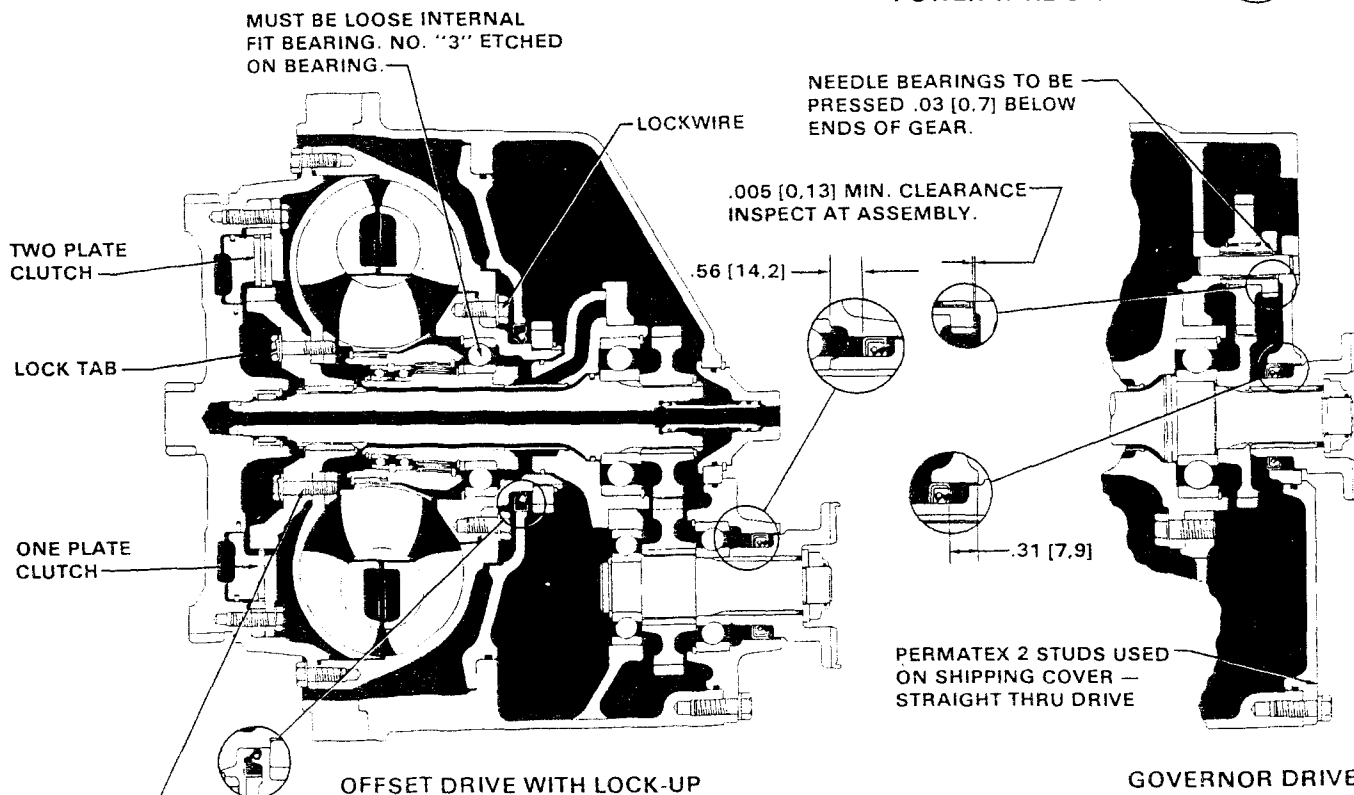


1. TORQUE OUTPUT SHAFT NUT TO 200-250 lb-ft [271,2-338,9 N·m.]
2. ALL LEAD-IN CHAMFERS FOR OIL SEALS, PISTON RINGS & "O" RINGS MUST BE SMOOTH & FREE FROM BURRS. INSPECT AT ASSEMBLY.
3. LUBRICATE ALL PISTON RINGS & "O" RINGS AT ASSEMBLY.
4. APPLY THIN COATING OF GREASE BETWEEN SEAL LIPS ON LIP TYPE SEALS PRIOR TO ASSEMBLY.
5. USE PERMATEx & CRANE SEALER ONLY WHERE SPECIFIED.
6. APPLY VERY LIGHT COAT OF PERMATEx NO. 2 TO O.D. OF ALL OIL SEALS BEFORE ASSEMBLY.

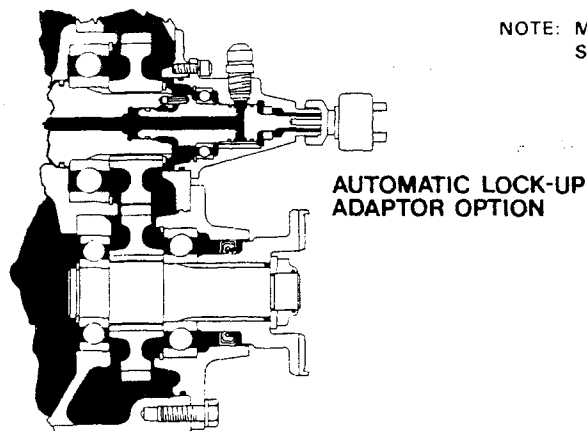
7. AFTER ASSEMBLY OF PARTS USING PERMATEx OR CRANE SEALER THERE MUST BE NO FREE OR EXCESS MATERIAL THAT COULD ENTER THE OIL CIRCUIT.
8. HEAT NOSE BUSHING TO 200° F. [93° C] BEFORE ASSEMBLY OF BUSHING TO COVER.
9. GOVERNOR DRIVE NEEDLE BEARINGS TO BE PRESSED 0.031 [0.79] BELOW ENDS OF GEAR.
10. LUBE HOLES TO BE CHECKED PRIOR TO ASSEMBLY. HOLES MUST BE FREE OF DIRT & BURRS.



POWER TAKE OFF

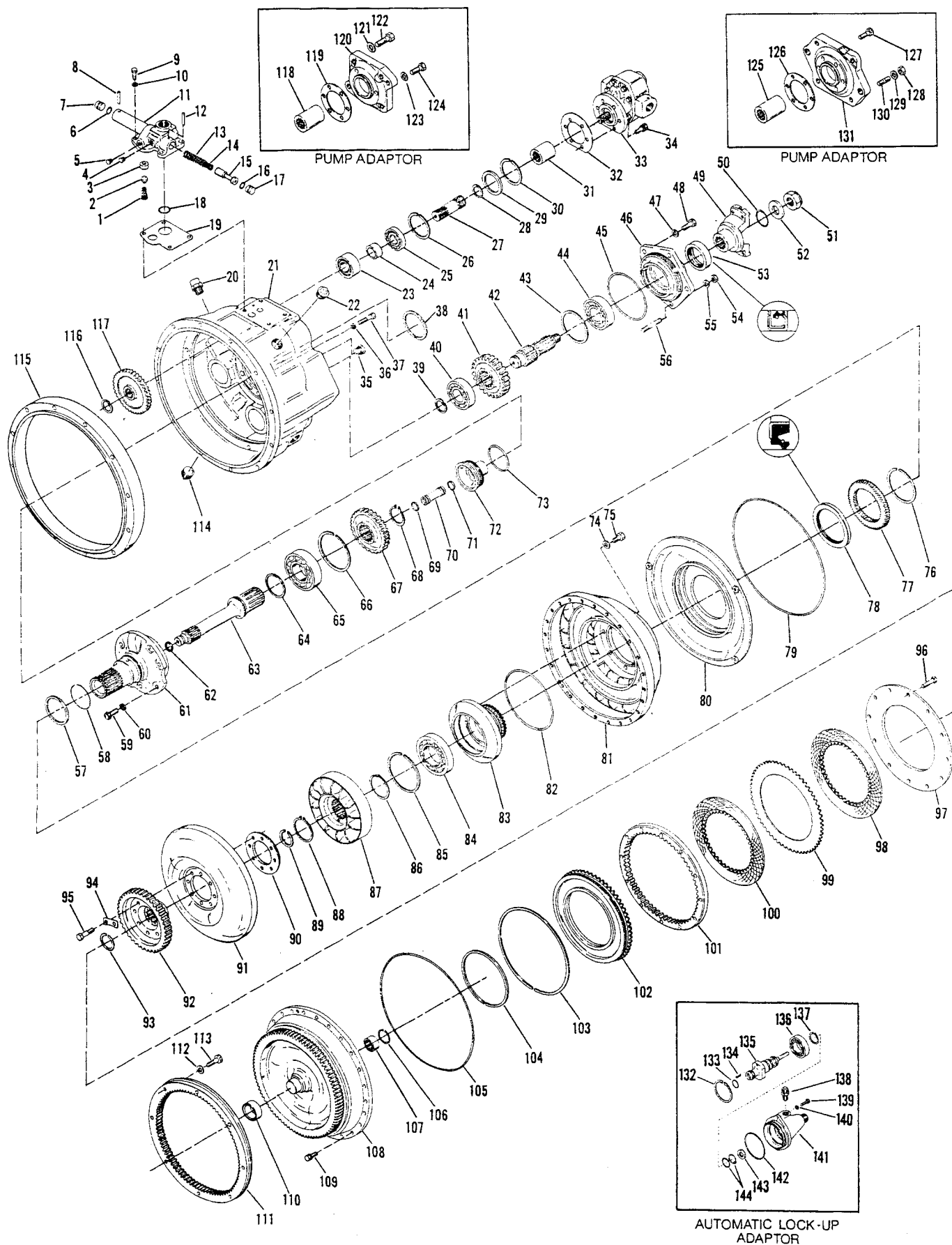


NOTE: METRIC DIMENSIONS SHOWN IN BRACKETS []



AUTOMATIC LOCK-UP ADAPTOR OPTION

ASSEMBLY INSTRUCTIONS FOR C-270 CONVERTER WITH LOCK-UP AND OTHER OPTIONS



CL-270 CONVERTER WITH LOCK-UP

ITEM	DESCRIPTION	QTY.	ITEM	DESCRIPTION	QTY.
1	Safety Valve Spring	1	73	Lock-up Tube Adaptor "O" Ring	1
2	Safety Valve Plunger	1	74	Hub to Impeller Screw Washer	8
3	Safety Valve Seat	1	75	Hub to Impeller Screw	8
4	Valve Housing Pipe Plug	1	76	Impeller Hub Gear Snap Ring	1
5	Valve Housing Pipe Plug	1	77	Impeller Hub Gear	1
6	Valve Stop "O" Ring	1	78	Oil Baffle Oil Seal	1
7	Valve Stop	1	79	Oil Baffle "O" Ring	1
8	Valve Stop Roll Pin	1	80	Oil Baffle	1
9	Valve to Housing Screw and Lockwasher	4	81	Impeller	1
10	Part of Item 9	1	82	Impeller Hub "O" Ring	1
11	Regulating Valve Assembly	1	83	Impeller Hub	1
12	Valve Stop Roll Pin	1	84	Impeller Hub Bearing	1
13	Valve Spring — Outer	1	85	Bearing Snap Ring	1
14	Valve Spring — Inner	1	86	Reaction Member Spacer	1
15	Valve Piston	1	87	Reaction Member	1
16	Valve Stop "O" Ring	1	88	Reaction Member Snap Ring	1
17	Valve Stop	1	89	Turbine Retaining Ring	1
18	Valve to Housing "O" Ring	1	90	Turbine Ring	1
19	Valve to Housing Gasket	1	91	Turbine	1
20	Check Valve Breather Assembly	1	92	Turbine Clutch Disc Hub	1
21	Converter Housing	1	93	Turbine Retaining Ring	1
22	Pipe Plug	2	94	Turbine and Clutch Disc Hub Screw Lockplate	4
23	Adaptor Pump Shaft Bearing	3	95	Turbine and Clutch Disc Hub Screw	8
24	Pump Shaft Spacer	3	96	End Plate to Disc Screw	12
25	Pump Shaft Bearing	3	97	End Plate	1
26	Pump Bearing Snap Ring	3	98	Clutch Inner Disc	1
27	Pump Drive Shaft	3	99	Clutch Outer Disc	1
28	Pump Snap Ring	3	100	Clutch Inner Disc	1
29	Pump Shaft Washer	3	101	Outer Drive Disc	1
30	Pump Snap Ring	3	102	Lock-Up Piston	1
31	Charging Pump Sleeve	1	103	Outer Piston Ring	1
32	Charging Pump Gasket	1	104	Inner Piston Ring	1
33	Charging Pump	1	105	Impeller to Cover Sealing Ring	1
34	Pump Mounting Screw and Lockwasher	3	106	Bearing Snap Ring	1
35	Pipe Plug	1	107	Impeller Cover Bearing	1
36	Oil Baffle Screw Lockwasher	3	108	Impeller Cover	1
37	Oil Baffle Screw	3	109	Impeller to Cover Screw and Lockwasher	24
38	Lock-up Tube Adaptor Snap Ring	1	110	Impeller Cover Sleeve	1
39	Bearing Snap Ring	1	111	Flywheel Ring Gear	1
40	Output Shaft Front Bearing	1	112	Ring Gear Plain Washer	16
41	Output Shaft Gear	1	113	Ring Gear Screw	16
42	Output Shaft	1	114	Pipe Plug	2
43	Bearing Snap Ring	1	115	Converter Housing Adaptor Ring	1
44	Output Shaft Rear Bearing	1	116	Pump Drive Gear Snap Ring	3
45	Bearing Retainer "O" Ring	1	117	Pump Drive Gear	3
46	Bearing Retainer	1	118	Pump Drive Sleeve	1
47	Retainer Screw Lockwasher	3	119	Pump Adaptor Gasket	1
48	Retainer Screw	3	120	Pump Adaptor	1
49	Output Flange	1	121	Pump Adaptor Screw Lockwasher	3
50	Flange "O" Ring	1	122	Pump Adaptor Screw	3
51	Output Shaft Nut	1	123	Optional Adaptor Screw Lockwasher	3
52	Output Shaft Washer	1	124	Optional Adaptor Screw	3
53	Oil Seal	1	125	Pump Drive Sleeve	1
54	Bearing Retainer Stud Nut	2	126	Pump Adaptor Gasket	1
55	Bearing Retainer Stud Lockwasher	2	127	Pump Adaptor Screw	3
56	Bearing Retainer Stud	2	128	Pump Adaptor Stud Nut	3
57	Piston Ring	1	129	Pump Adaptor Stud Nut Washer	6
58	Piston Ring Expander Spring	1	130	Pump Adaptor Stud	3
59	Stator Support Screw	6	131	Pump Adaptor	1
60	Support Screw Lockwasher	6	132	Bearing Snap Ring	1
61	Stator Support and Sleeve Assembly	1	133	Drive Shaft "O" Ring	1
62	Turbine Shaft Piston Ring	1	134	Drive Shaft Roll Pin	1
63	Turbine Shaft	1	135	Tachometer Drive Shaft	1
64	Piston Ring	1	136	Tachometer Drive Shaft Bearing	1
65	Turbine Shaft Bearing	1	137	Drive Shaft Bearing Snap Ring	1
66	Snap Ring	1	138	Hydraulic Line Fitting	1
67	Turbine Shaft Gear	1	139	Adaptor Housing Bolt	2
68	Gear Snap Ring	1	140	Adaptor Housing Bolt Lockwasher	2
69	Lock-up Tube "O" Ring	1	141	Tachometer Adaptor Housing	1
70	Lock-up Tube	1	142	Adaptor Housing "O" Ring	1
71	Lock-up Tube "O" Ring	1	143	Drive Shaft Oil Seal	1
72	Lock-up Tube Adaptor	1	144	Drive Shaft "O" Ring	2

DISASSEMBLY OF THE LOCK-UP PORTION OF THE CL-270 SERIES CONVERTER

After the Converter has been removed from the vehicle and the exterior thoroughly cleaned to prevent dirt and foreign matter from entering the mechanism.

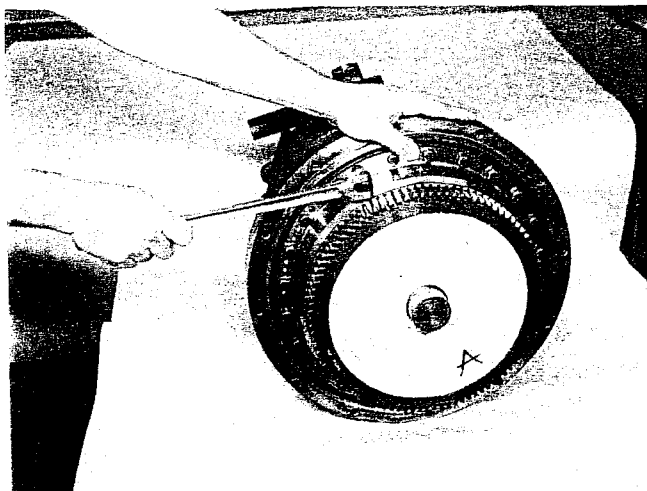


Figure 1

Remove impeller cover to impeller bolts and washers.

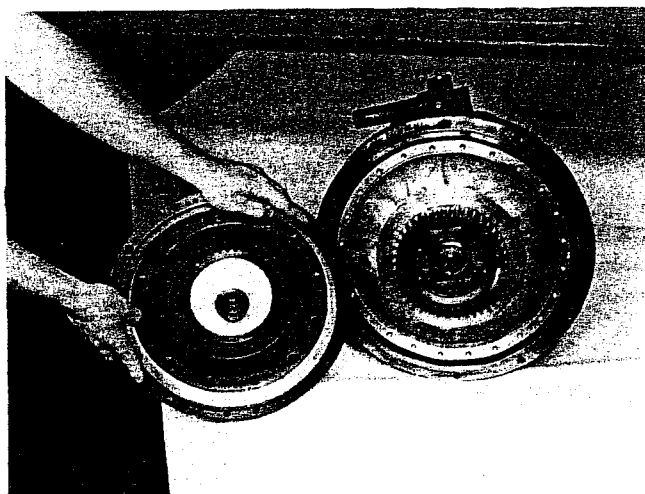


Figure 2

Remove impeller cover. **Note:** Lock-up clutch disc parts will come off with impeller cover.

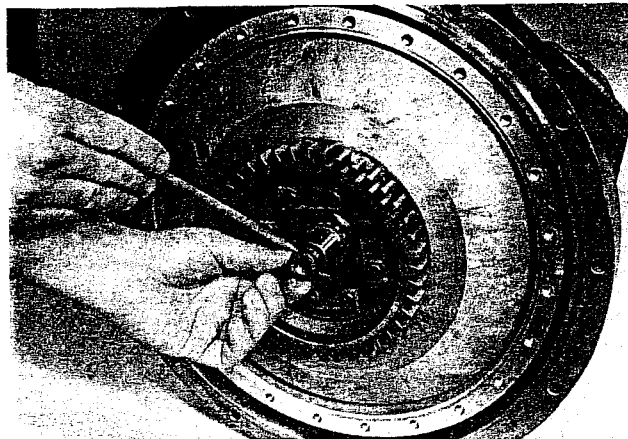


Figure 3

Remove turbine shaft lock-up oil sealing piston ring.

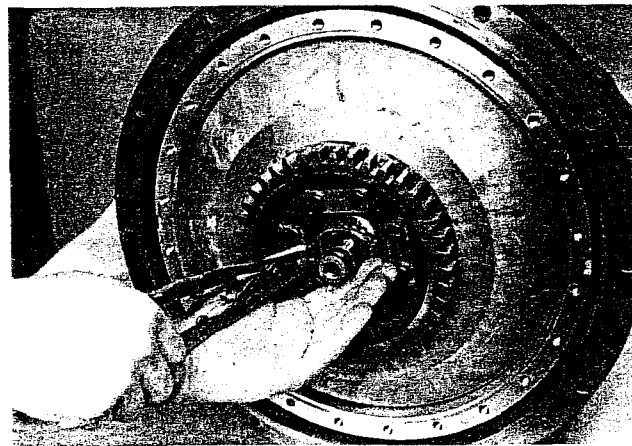


Figure 4

Remove turbine retaining ring.

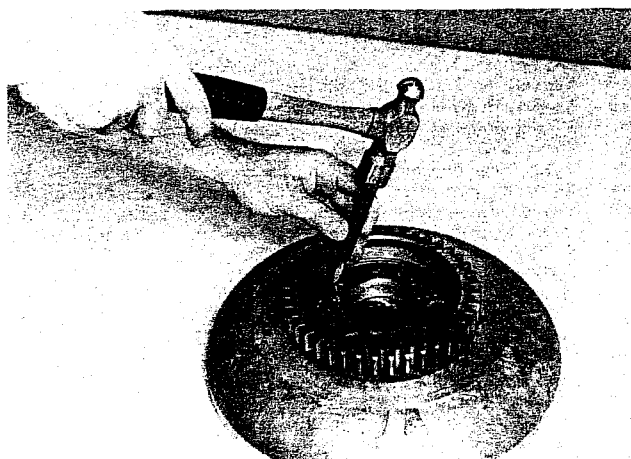


Figure 5

If turbine hub is to be removed, straighten lock tabs from bolt heads and remove bolts, disc hub and turbine ring.

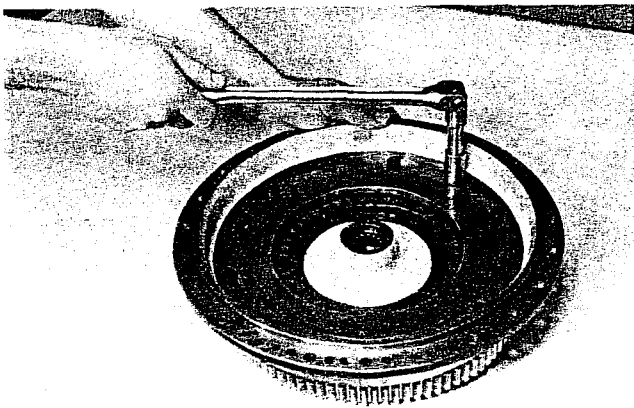


Figure 6
Remove lock-up end plate bolts.

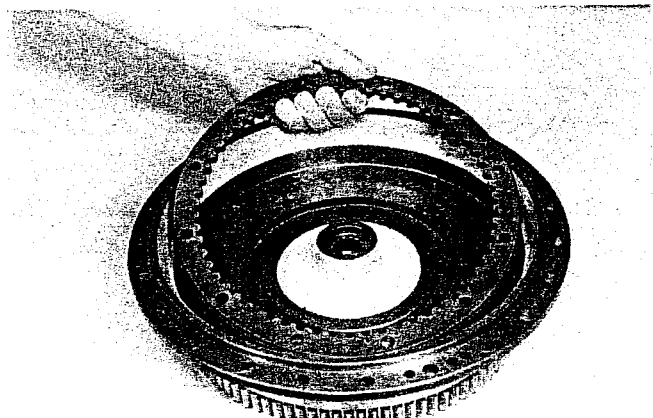


Figure 9
Remove outer drive disc.

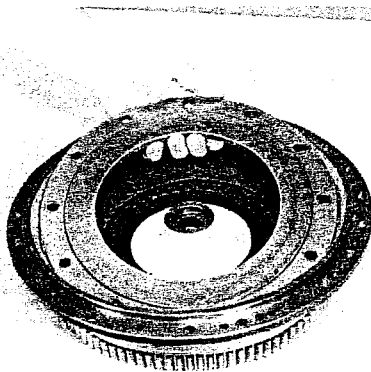


Figure 7
Remove end plate.

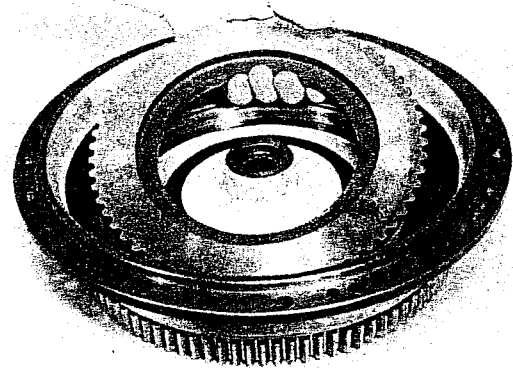


Figure 10
Remove lock-up piston. **NOTE:** This may require turning impeller cover over and tapping on a wooden bench to remove piston.

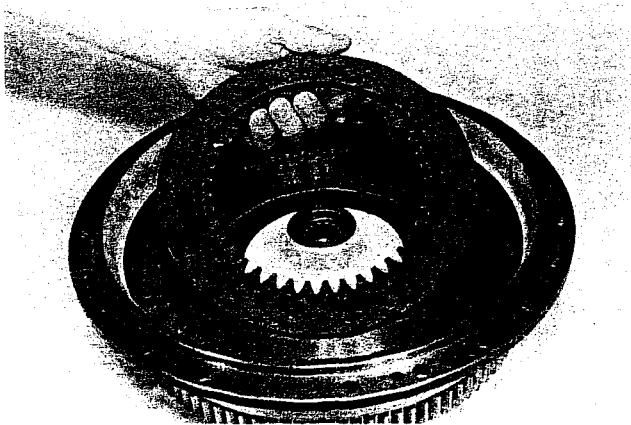


Figure 8
NOTE: Some units will have a two friction plate and one steel plate clutch and some units will have a single friction plate clutch. The one shown is a single friction type. Remove friction disc.

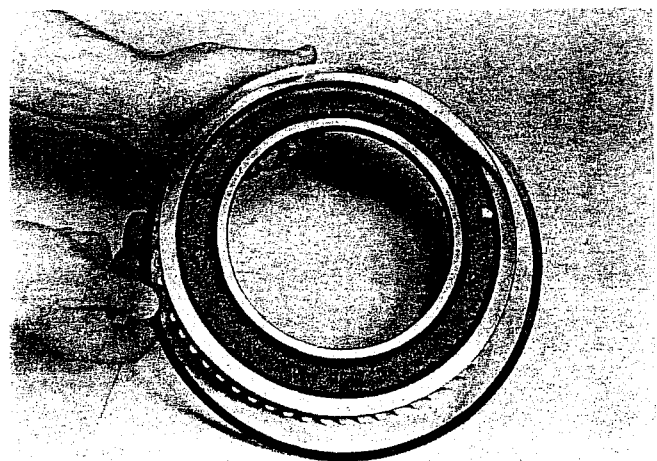


Figure 11
Remove outer piston oil sealing ring.

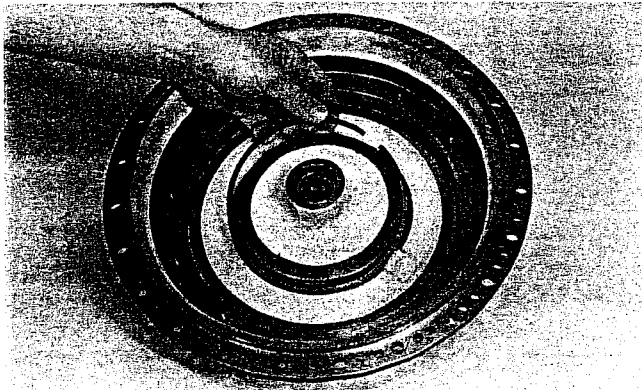


Figure 12

Remove piston inner sealing ring.
See **CLEANING AND INSPECTION** section.
REASSEMBLY OF LOCK-UP COVER.

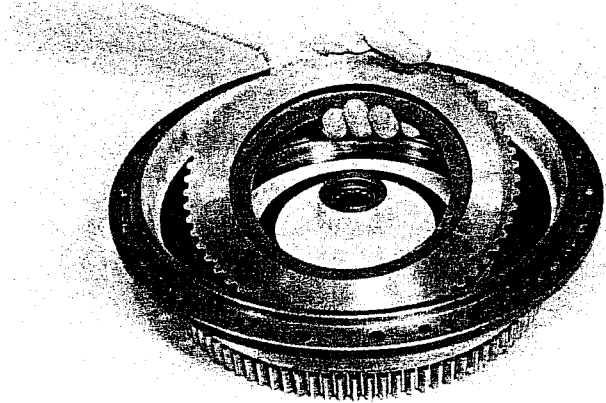


Figure 15

Install piston in impeller cover as shown.

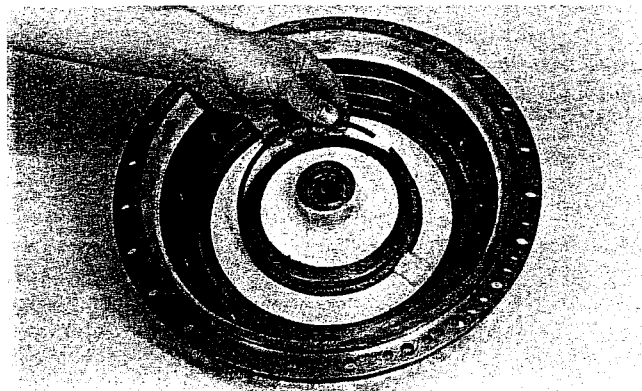


Figure 13

Install a new inner piston oil sealing ring.

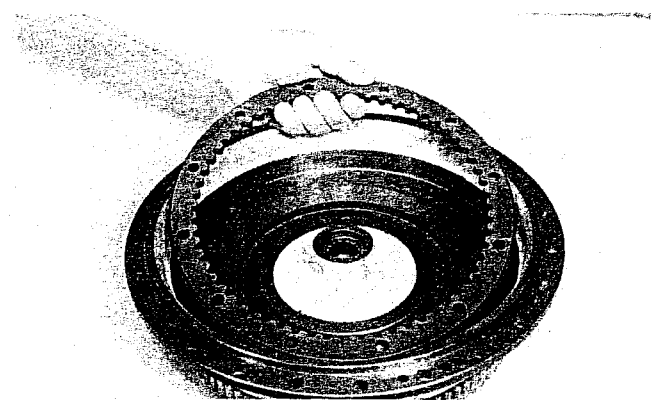


Figure 16

Align holes in outer drive disc with holes in impeller cover and install drive disc.

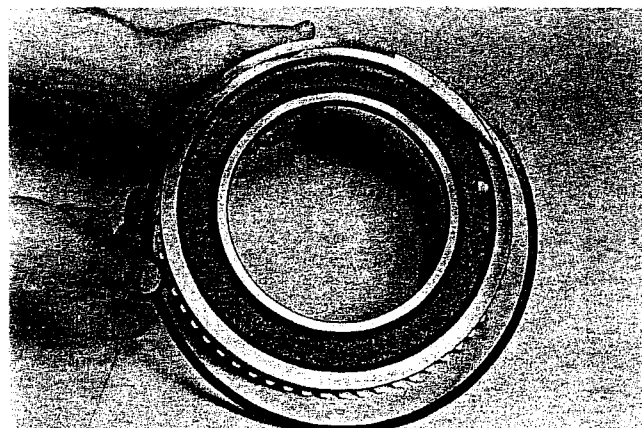


Figure 14

Install outer piston oil sealing ring.

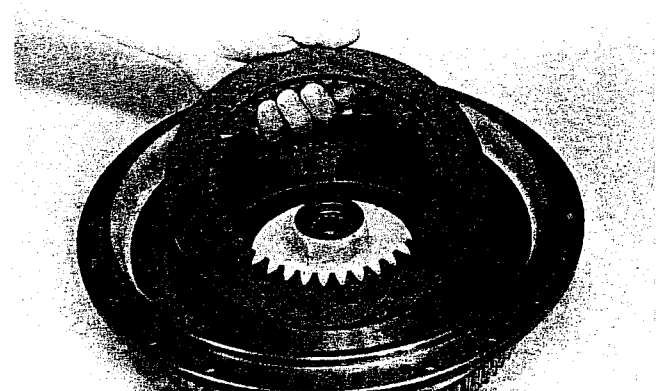


Figure 17

Some units will have a two friction plate clutch and some units will have a single friction plate clutch. On a Two plate clutch install one friction plate (teeth on the inner diameter) as shown. Install one steel plate with teeth on the outer diameter. Install second friction plate (teeth on the inner diameter). On a single friction plate install plate as shown.

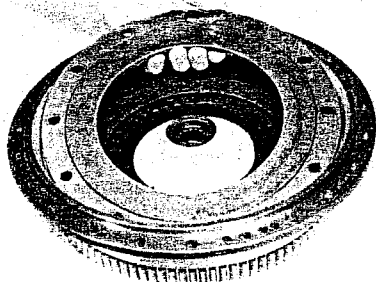


Figure 18
Install end plate as shown.

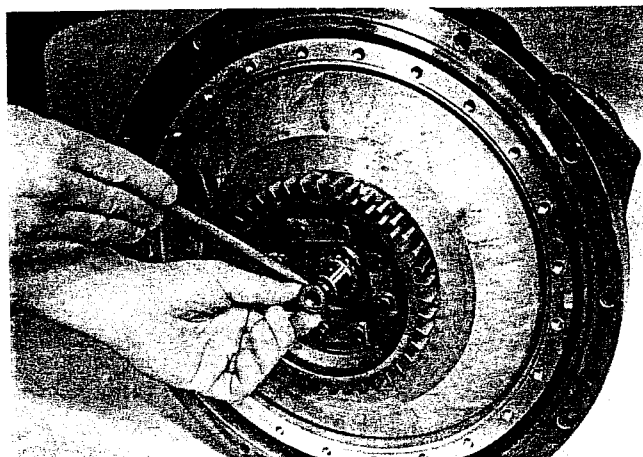


Figure 21
Install turbine shaft lock-up oil sealing ring on turbine shaft.

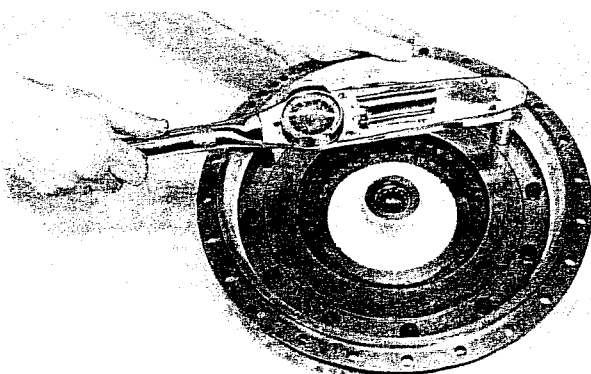


Figure 19
Install end plate bolts and tighten 23 to 25 Ft. Lbs. Torque [31,2 - 33,8 N.m.].

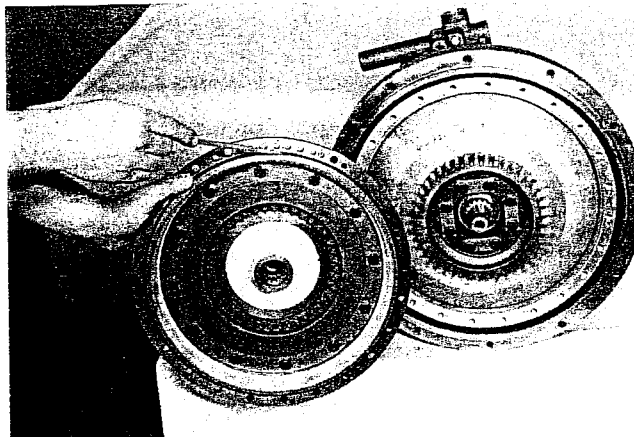


Figure 22
Position new impeller to impeller cover oil sealing ring on impeller cover assembly.

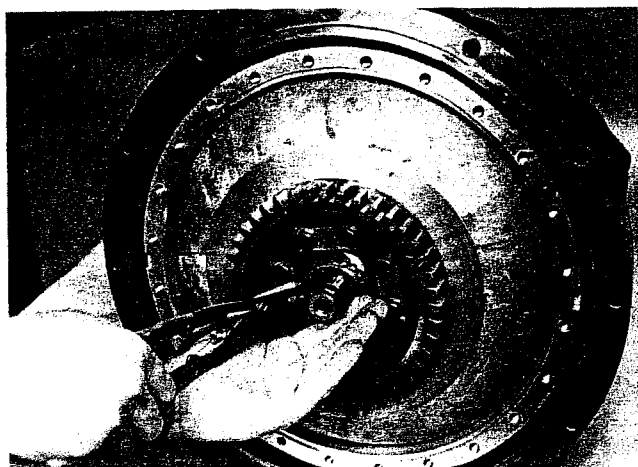


Figure 20
Position turbine on turbine shaft and install retaining ring.

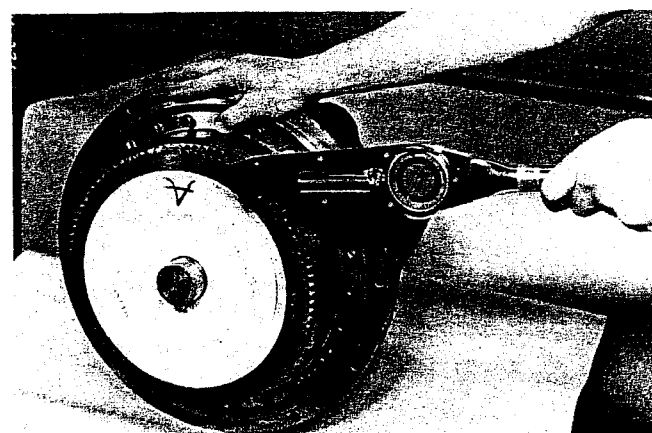


Figure 23
Install impeller to impeller cover bolts and tighten 23 to 25 Ft. Lbs. Torque [31,2 - 33,8 N.m.].

AUTOMATIC LOCK-UP & TURBINE SHAFT TACHOMETER DRIVE DISASSEMBLY & REASSEMBLY

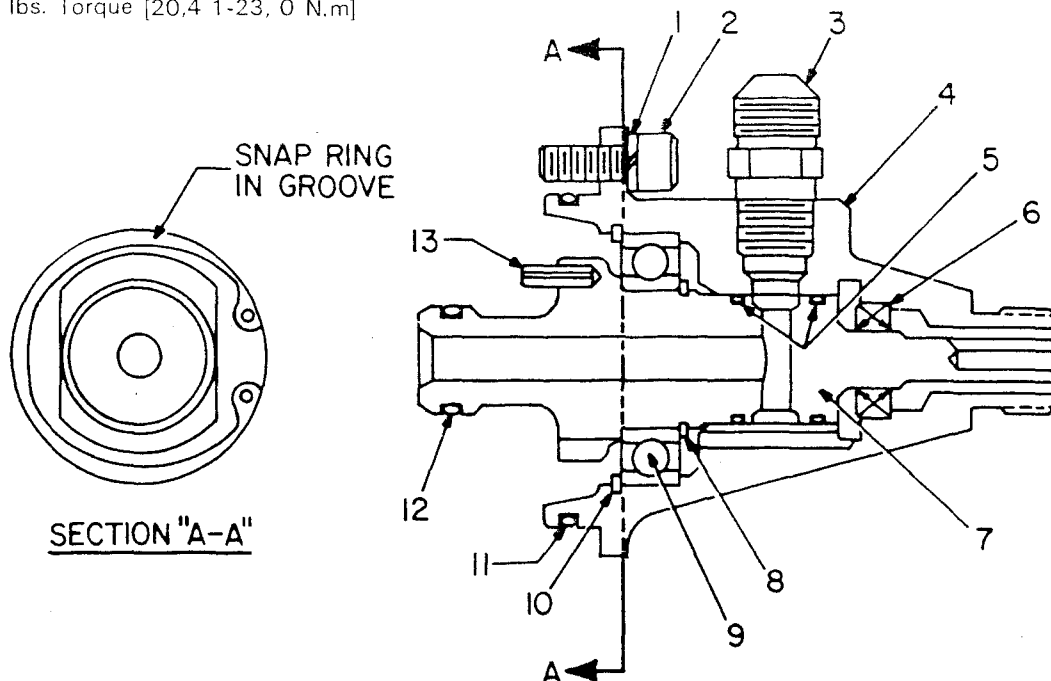
Remove Speed Sensor & Hydraulic Line From Tachometer & Drive Adaptor

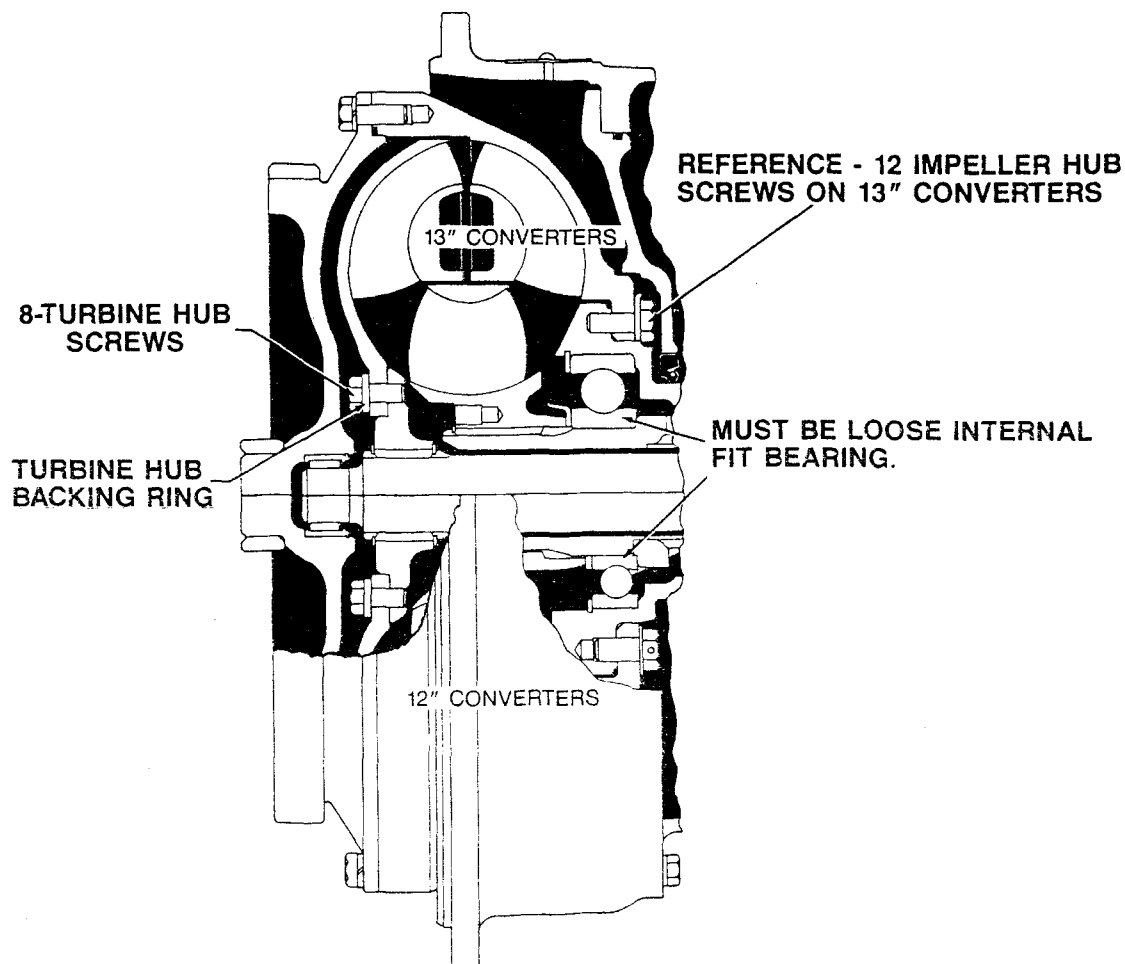
DISASSEMBLY

1. Remove Tachometer Adaptor Housing Bolts - Item 2 and Washers - Item 1.
2. Remove Tachometer Housing - Item 4 from Converter Housing.
Note: Tach Drive Shaft and Bearings will come off with the Tach Housing as an assembly. Remove Drive Shaft "O" Ring - Item 12 from Shaft.
3. See Section "AA". Remove Bearing Snap Ring - Item 10 from Tach Housing.
4. Using a small punch in the end of the Tach Drive Shaft - Item 7 on the end where the Speed Sensor is attached, tap Shaft from housing - Item 4. Remove Tach Housing "O" Ring - Item 11 from Housing.
5. Remove the two Tach Drive Shaft Piston Rings - Item 5 from Drive Shaft.
6. Remove Drive Shaft Bearing Snap Ring - Item 8 from Shaft.
7. Press Tach Drive Shaft Bearing - Item 9 from Shaft.
8. If Oil Seal - Item 6 is to be replaced tap Seal from Housing - Item 4 from Speed Sensor End of Housing.

REASSEMBLY

9. Install a new Oil Seal - Item 6 in Housing with lip of Seal toward the large end of Housing.
10. Press Bearing - Item 9 on Tach Drive Shaft - Item 7.
11. Install Bearing Snap Ring - Item 8 on Tach Drive Shaft being certain Ring is in full position in Snap Ring Groove.
12. Install two new Drive Shaft Piston Rings - Item 5 on Tach Drive Shaft.
13. Install Tach Drive Shaft - Item 7 and Bearing Assembly into Tach Drive Housing - Item 4. Use caution as not to damage Oil Seal - Item 6 or Piston Rings - Item 5 when installing Shaft in Housing.
14. See Section "AA" and install Bearing Snap Ring - Item 10 in Housing being certain Ring is in full position in Snap Ring Groove.
15. If Roll Pin - Item 13 was removed, reinstall Roll Pin in Drive Shaft.
16. Install new "O" Ring - Item 11 on Drive Shaft Housing - Item 4.
17. Install new "O" Ring - Item 12 on Drive Shaft - Item 7.
18. Install Tach Drive Assembly on Converter Housing aligning Roll Pin - Item 13 with hole in Turbine Shaft. Use caution as not to damage Housing or Drive Shaft "O" Rings.
19. Apply a $\frac{3}{8}$ " [9,52 mm] band of Loctite Dri-lock Adhesive No. 202 (green) about $\frac{1}{8}$ " [3,17 mm] from the threaded end of the Bolt - Item 2. Install all Bolts - Item 2 and Washers - Item 1 in Tach Drive Housing into Converter Housing. Tighten Bolts 15 to 17 ft. lbs. Torque [20,4 1-23, 0 N.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 C-270 CONVERTER WITH SPECIAL APPLICATION IMPELLER HUB BEARING.

32 SCREW STABLE DRIVE CONNECTION NON-ASBESTOS CONVERTER DRIVE RING GEAR INSTALLATION PROCEDURE

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].
5. To obtain maximum effectiveness of the special screw's locking featured, 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 is **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.

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 [0,0254 mm] of end play recorded (in Paragraph #2) before assembly of torque converter.

802649 - 1.5 INCH [38,1] 32 SCREW RING GEAR KIT

1	249473	SDC Torque Converter Ring Gear
32	243970	Ring Gear Screw 1.5 Inch [38,1]
1	802655	Installation Instruction Sheet

802652 - 2.5 INCH [63,5] 32 SCREW RING GEAR KIT

1	249473	SDC Torque Converter Ring Gear
32	237153	Ring Gear Screw 2.5 Inch [63,5]
1	802655	Installation Instruction Sheet

802650 - 1.75 INCH [44,4] 32 SCREW RING GEAR KIT

1	249473	SDC Torque Converter Ring Gear
32	244903	Ring Gear Screw 1.75 Inch [44,4]
1	802655	Installation Instruction Sheet

802653 - 3.0 INCH [76,2] 32 SCREW RING GEAR KIT

1	249473	SDC Torque Converter Ring Gear
32	236938	Ring Gear Screw 3.0 Inch [76,2]
1	802655	Installation Instruction Sheet

802651 - 2.0 INCH [50,8] 32 SCREW RING GEAR KIT

1	249473	SDC Torque Converter Ring Gear
32	240318	Ring Gear Screw 2.0 Inch [50,8]
1	802655	Installation Instruction Sheet

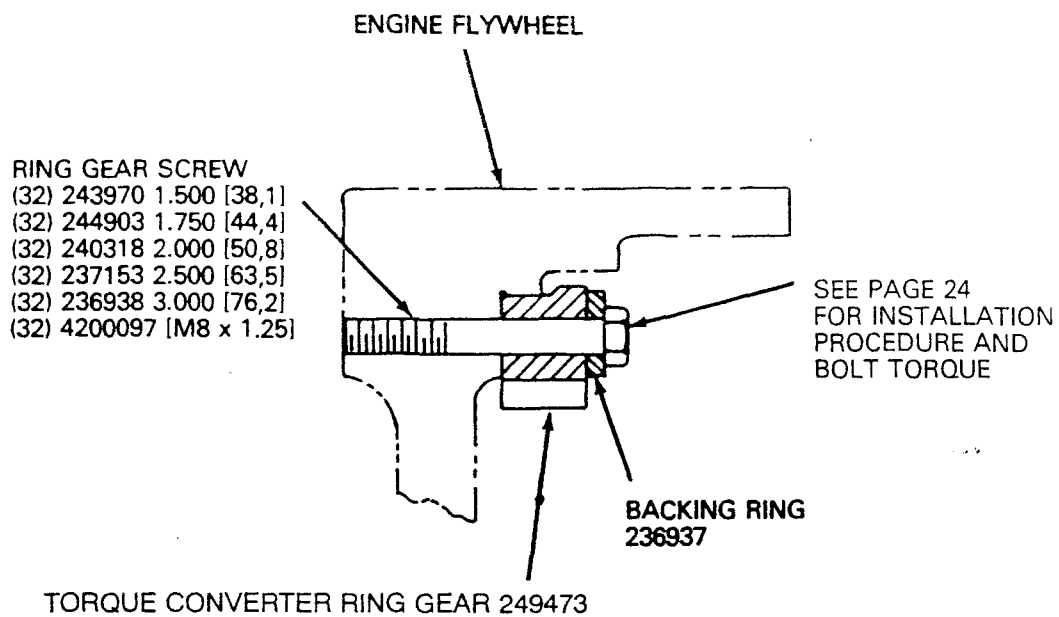
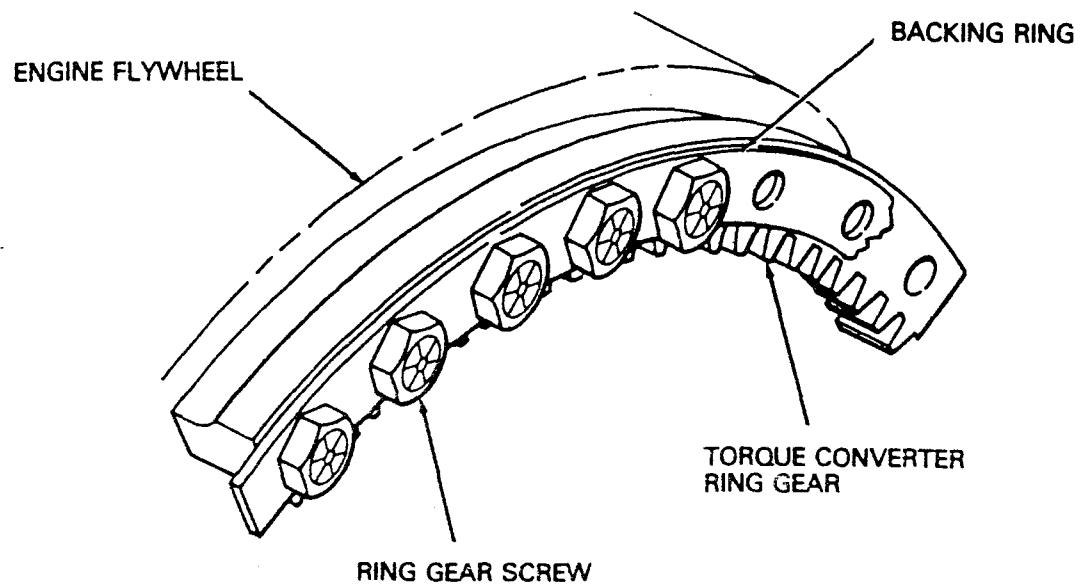
802654 - M8-32 SCREW RING GEAR KIT

1	249473	SDC Torque Converter Ring Gear
32	4200097	Ring Gear Screw [M8 x 1,25]
1	802655	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 25 FOR INSTALLATION ILLUSTRATIONS



SPEED SENSOR INSTALLATION

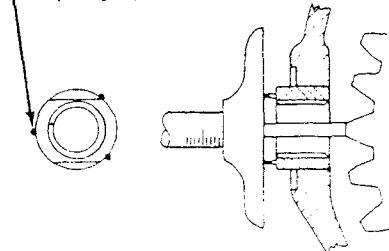
VIEW "T" (Pump Drive Gear Sensor)

Inspect at assembly.

Dim. "U" from gear tooth.

REAR VIEW OF CONVERTER

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.

VIEW "S" (Output Drive Gear Sensor)

Inspect at assembly.

Dim. "W" from gear tooth.

Assemble Speed Sensor Bushing in housing to specified
dimension "U" or "W" with Loctite 262 and stake (3) three
places. See Pump Drive and Output Gear Charts for dimensions.

PUMP DRIVE RATIO

RATIO	DRIVE GEAR NO. OF TEETH	DRIVEN GEAR NO. OF TEETH	SPEED SENSOR BUSHING DEPTH "U" PER VIEW "T"
1.135	37	42	1.060 ± .007 [26.9 ± .17]
.951	41	39	1.060 ± .007 [26.9 ± .17]

OUTPUT GEAR RATIO (6 PITCH)

RATIO	TURBINE SHAFT & GEAR ASS'Y NO. OF TEETH	OUTPUT GEAR NO. OF TEETH	SPEED SENSOR BUSHING DEPTH "W" PER VIEW "S"
1.292	24	31	1.060 ± .007 [26.9 ± .17]
1.115	26	29	1.060 ± .007 [26.9 ± .17]
1.037	27	28	1.390 ± .007 [35.3 ± .17]
.964	28	27	1.390 ± .007 [35.3 ± .17]
* .897	29	26	1.390 ± .007 [35.3 ± .17]

* Requires straight thru housing plus bore plug

OUTPUT GEAR RATIO (5.35 PITCH)

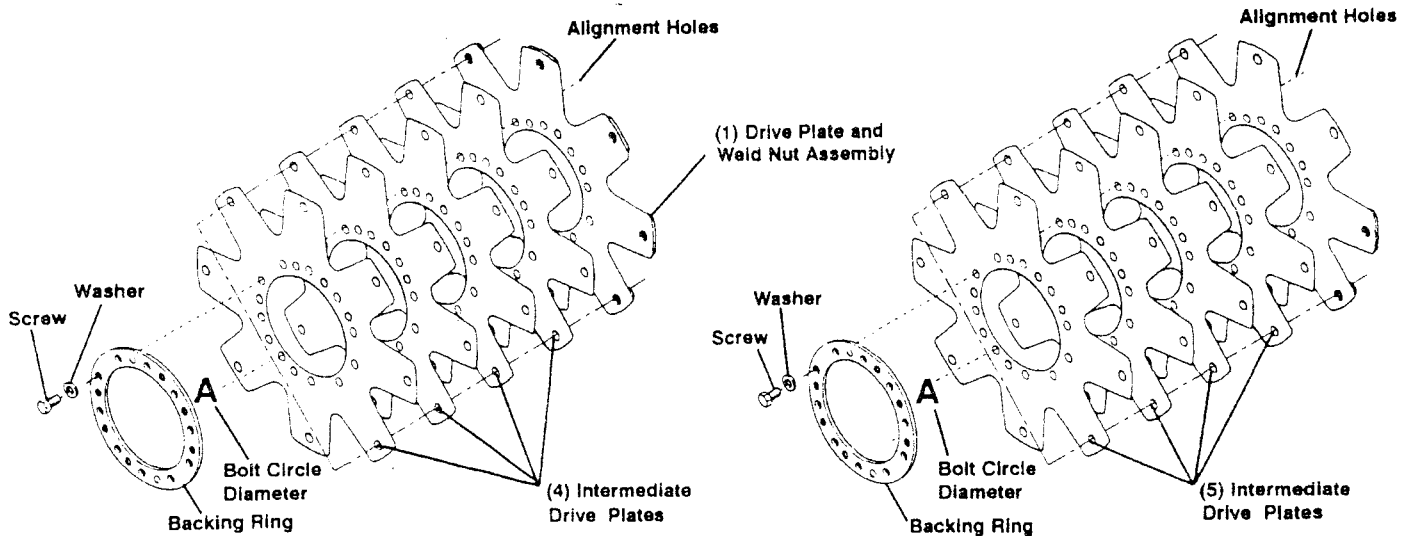
RATIO	TURBINE SHAFT & GEAR ASS'Y NO. OF TEETH	OUTPUT GEAR NO. OF TEETH	SPEED SENSOR BUSHING DEPTH "W" PER VIEW "S"
1.333	21	28	1.060 ± .007 [26.9 ± .17]
1.130	23	26	1.060 ± .007 [26.9 ± .17]
1.042	24	25	1.390 ± .007 [35.3 ± .17]
.960	25	24	1.390 ± .007 [35.3 ± .17]
.885	26	23	1.390 ± .007 [35.3 ± .17]

28000/32000 SERIES TRANSMISSION AND C-270/C-320 CONVERTER DRIVE PLATE

INSTALLATION INSTRUCTIONS

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. 802517

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

NOTE: Assembly of flexplates must be completed within a 15 minute period from start of screw installation. If the screw is removed for any reason it must be replaced. The adhesive left in the tapped hole must be removed with the proper tap and cleaned with solvent. Dry the hole thoroughly and use a new screw for reinstallation.

"A" Dimension (Bolt Circle Diameter)
13.125" [333,375 mm] Diameter
Kit No. 802521

13.50" [342,900 mm] Diameter
Kit No. 802568

17.00" [431,800 mm] Diameter
Kit No. 802566

Each kit will include the following parts:

- 4 Intermediate Drive Plates
- 1 Drive Plate and Weld Nut Assembly
- 1 Backing Ring
- 10 Drive Plate Mounting Screws
- 10 Drive Plate Washer
- 1 Instruction Sheet

Each kit will include the following parts:

- 5 Intermediate Drive Plates
- 1 Backing Ring
- 10 Drive Plate Mounting Screws
- 10 Drive Plate Washer
- 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 degrees apart in backing ring must be out (toward engine fly-wheel). Install capscrews and washers. Tighten 33 to 36 ft. lbs. torque [45-49 N.m]

Over 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.

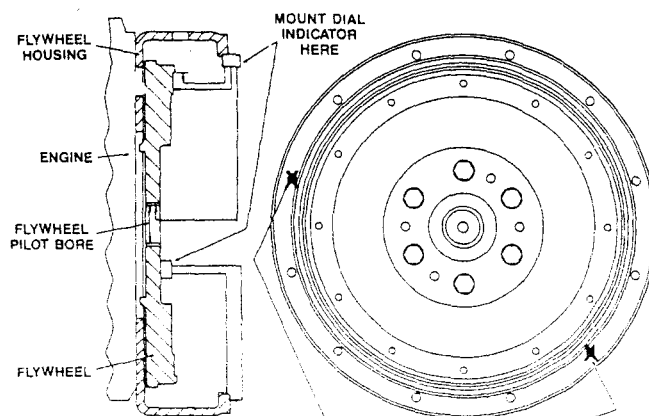


FIG 1

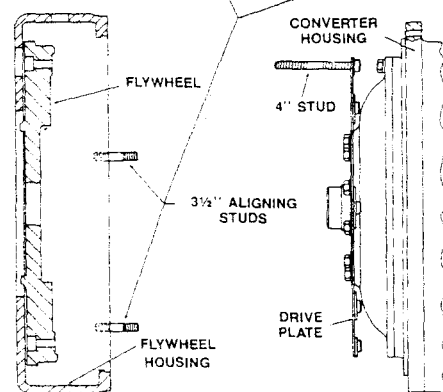


FIG 2

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

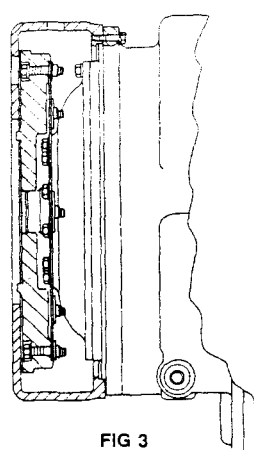


FIG 3

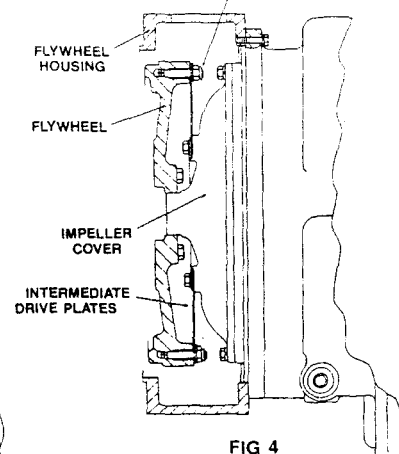


FIG 4

Arco, Italy

Brugge, Belgium

Statesville, North Carolina

CLARK-HURTH
COMPONENTS

Price on request