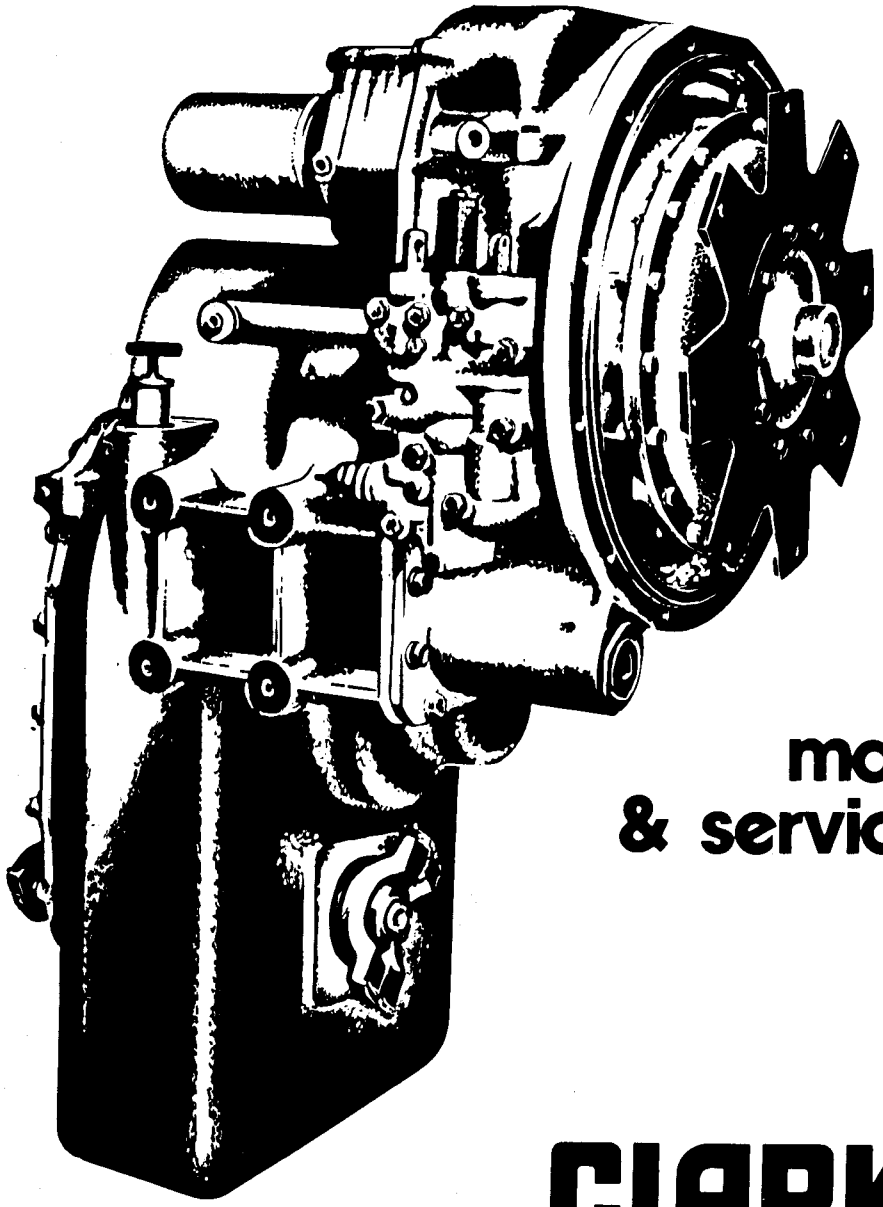
25

18000 powershift transmission

3 speed long drop output



maintenance & service manual

CLARK Axle and Transmission Divisions

SM HR 183LD (Rev. 10-78)

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** Power Shift Transmission.

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 transmission, its principle 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-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. The Clark Equipment Company does not warrant repair or replacement parts, nor failures resulting from the use thereof, which are not supplied by or approved by the Clark Equipment Company. IMPORTANT: **Always furnish the Distributor with the transmission serial and model number when ordering parts.**

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NOTE: Metric Dimensions Shown in Brackets [ ].

CLARK

HOW THE UNITS OPERATE

The transmission and hydraulic torque portion of the power train enacts an important role in transmitting engine power to the driving wheels. In order to properly maintain and service these units it is important to first understand their function and how they operate.

The transmission and torque converter function together and operate through a common hydraulic system. It is necessary to consider both units in the study of their function and operation.

To supplement the text below, and for reference use therewith, the following illustrations are provided:

The HR Model consists of a torque converter and powershifted transmission in one package mounted directly to the engine.

The shift control valve assembly is mounted directly on the side of the converter housing. The function of the control valve assembly is to direct oil under pressure to the desired directional and speed clutch. A provision is made on certain models to neutralize the transmission when the brakes are applied. This is accomplished through use of a brake actuated shutoff valve. The speed and direction clutch assemblies are mounted inside the transmission case and are connected to the output shaft of the converter by direct gearing. The purpose of the speed or directional clutches is to direct the power flow through the gear train to provide the desired speed range and direction.

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With the engine running, the converter charging pump draws oil from the transmission sump through the removable oil suction screen and directs it through the pressure regulating valve and oil filter.

The pressure regulating valve maintains pressure to the transmission control cover for actuating the direction and speed clutches. This requires a small portion of the total volume of oil used in the system. The remaining volume of oil is directed through the torque converter circuit to the oil cooler and returns to the transmission for positive lubrication. This regulator valve consists of a hardened valve spool operating in a closely fitted bore. The valve spool is spring loaded to hold the valve in a closed position. When a specific pressure is achieved, the valve spool works against the spring until a port is exposed along the side of the bore. This sequence of events provides the proper system pressure.

After entering the converter housing the oil is directed through the stator support to the converter blade cavity and exits in the passage between the turbine shaft and converter support. The oil then flows out of the converter to the oil cooler. After leaving the cooler, the oil is directed to a lubricating fitting on the transmission and through a series of tubes and passages lubricates the transmission bearings and clutches. The oil then gravity drains to the transmission sump.

The hydraulic torque converter consists basically of three elements and their related parts to multiply engine torque. The engine power is transmitted from the engine flywheel to the impeller element through the impeller cover. This element is the pump portion of the hydraulic torque converter and is the primary component which starts the oil flowing to the other components which results in torque multiplication. This element can be compared to a centrifugal pump in that it picks up fluid at its center and discharges at its outer diameter.

The torque converter turbine is mounted opposite the impeller and is connected to the output shaft of the torque converter. This element receives fluid at its outer diameter and discharges at its center. Fluid directed by the impeller out into the particular design of blading in the turbine and reaction member is the means by which the hydraulic torque converter multiplies torque.

The reaction member of the torque converter is located between and at the center or inner diameters of the impeller and turbine elements. Its function is to take the fluid which is exhausting from the inner portion of the turbine and change its direction to allow correct entry for recirculation into the impeller element.

The torque converter will multiply engine torque to its designed maximum multiplication ratio when the output shaft is at zero RPM. Therefore, we can say that as the output shaft is decreasing in speed the torque multiplication is increasing.

The shift control valve assembly consists of a valve body with selector valve spools. A detent ball and spring in the selector spool provides one position for each speed range. A detent ball and spring in the direction spool provides three positions, one each for forward, neutral and reverse.

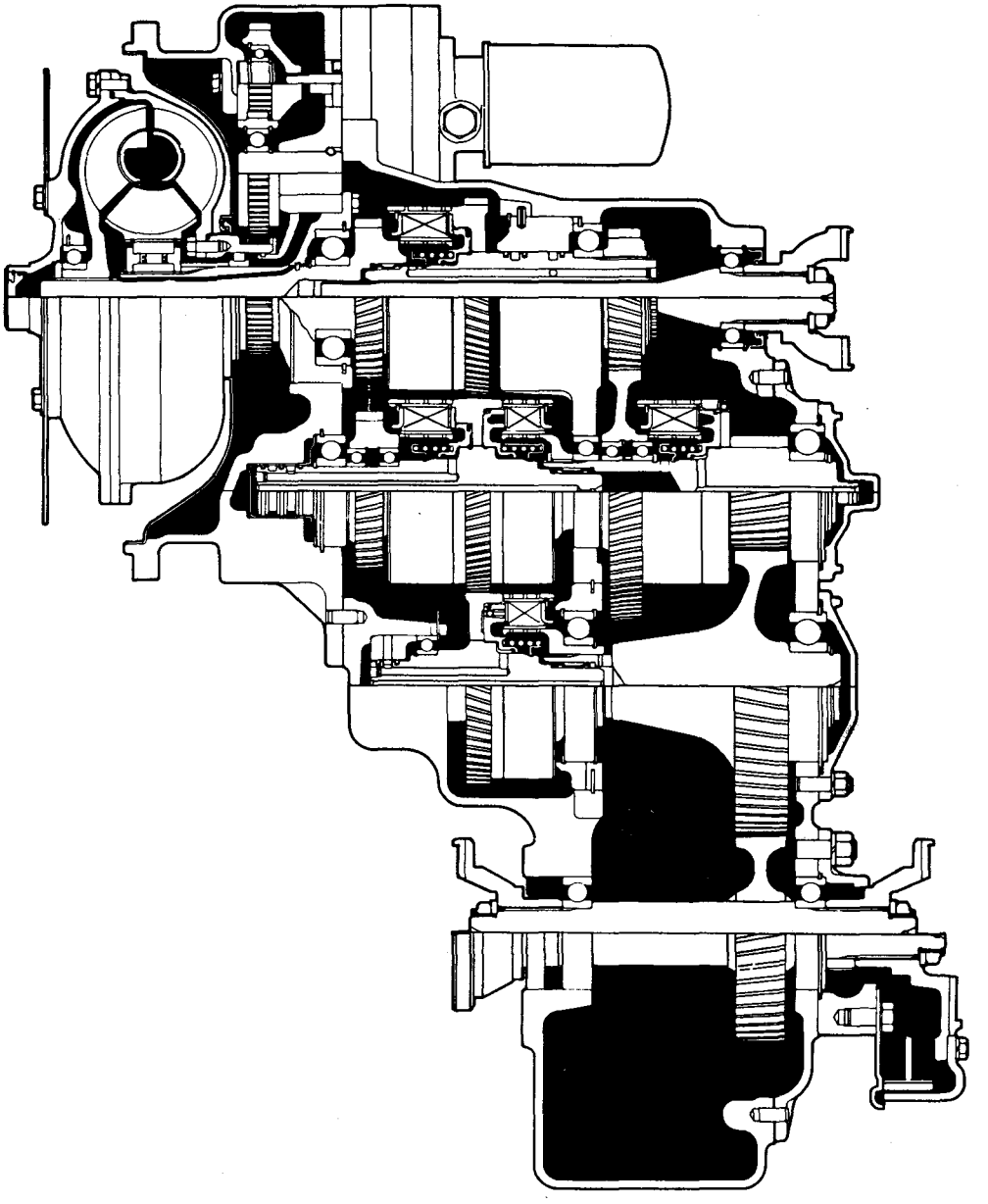
With the engine running and the directional control lever in neutral position, oil pressure from the regulating valve is blocked at the control valve, and the transmission is in neutral. Movement of the forward and reverse spool will direct oil, under pressure to either the forward or reverse direction clutch as desired. When either directional clutch is selected the opposite clutch is relieved of pressure and vents back through the direction selector spool. The same procedure is used in the speed selector.

The direction or speed clutch assembly consists of a drum with internal splines and a bore to receive a hydraulically actuated piston. The piston is "oil tight" by the use of sealing rings. A steel disc with external splines is inserted into the drum and rests against the piston. Next, a friction disc with splines at the inner diameter is inserted. Discs are alternated until the required total is achieved. A heavy back-up plate is then inserted and secured with a snap ring. A Hub with O.D. splines is inserted into the splines of discs with teeth on the inner diameter. The discs and hub are free to increase in speed or rotate in the opposite direction as long as no pressure is present in that specific clutch.

CLARK

To engage the clutch, as previously stated, the control valve is placed in the desired position. This allows oil under pressure to flow from the control valve, through a passageway, to a chosen clutch shaft. This shaft has a drilled passageway for oil under pressure to enter the shaft. Oil pressure sealing rings are located on the clutch shaft. These rings direct oil under pressure to a desired clutch. Pressure of the oil forces the piston and discs against the heavy back-up plate. The discs, with teeth on the outer diameter, clamping against discs with teeth on the inner diameter, enables the hub and clutch shaft to be locked together and allows them to drive as a unit.

There are bleed balls or bleed orifices, depending upon the model, in the clutch piston which allow quick escape for oil when the pressure to the piston is released.



BASIC DESIGN

Figure A

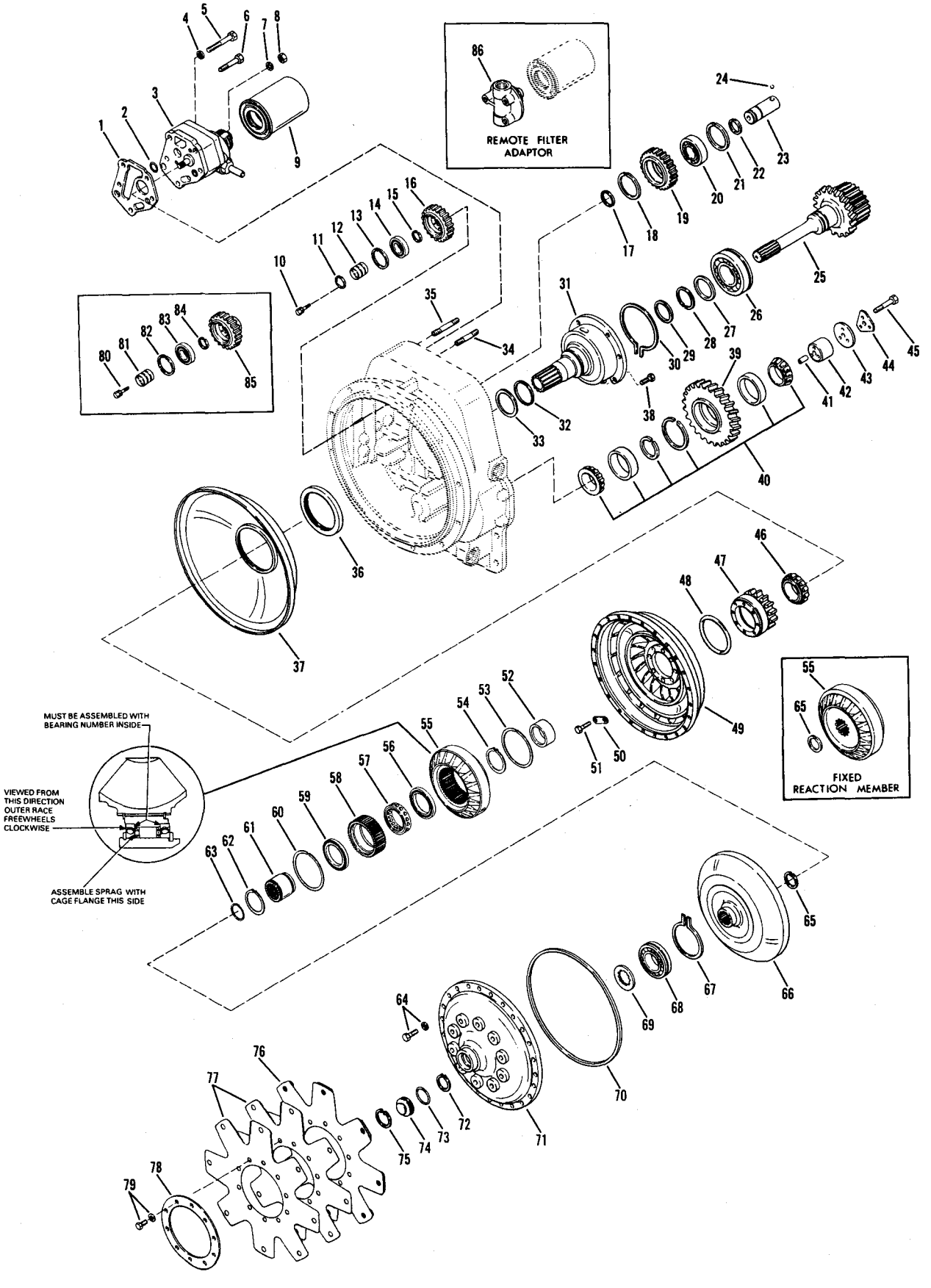

REMOTE FILTER ADAPTOR
FIXED REACTION MEMBER
MUST BE ASSEMBLED WITH BEARING NUMBER INSIDE
VIEWED FROM THIS DIRECTION OUTER RACE FREEWHEELS CLOCKWISE
ASSEMBLE SPRAG WITH CAGE FLANGE THIS SIDE

Figure B

CLARK

HR18000 CONVERTER GROUP

ITEM	DESCRIPTION	QTY.
1	Pump to Housing Gasket	1
2	"O" Ring	1
3	Charging Pump Assembly	1
4	Pump Mounting Screw Lockwasher	3
5	Pump Mounting Screw	1
6	Pump Mounting Screw	2
7	Pump Mounting Stud Lockwasher	2
8	Pump Mounting Stud Nut	2
9	Filter Assembly	1
10	Bearing Support Screw and Lockwasher	2
11	Bearing Locating Ring	1
12	Pump Drive Bearing Support	1
13	Bearing Retaining Ring	1
14	Pump Drive Gear Bearing	1
15	Bearing Locating Ring	1
16	Pump Drive Gear	1
17	Idler Gear Bearing Locating Ring	1
18	Idler Gear Bearing Retaining Ring	1
19	Pump Drive Idler Gear	1
20	Idler Stub Shaft Bearing	1
21	Bearing Retaining Ring	1
22	Bearing Locating Ring	1
23	Idler Gear Stub Shaft	1
24	Stub Shaft Lockball	1
25	Turbine Shaft and Disc Hub Assembly	1
26	Turbine Shaft Bearing	1
27	Bearing Locating Washer	1
28	Bearing Retaining Ring	1
29	Piston Ring	1
30	Bearing Snap Ring	1
31	Reaction Member Support	1
32	Piston Ring Expander Ring	1
33	Piston Ring	1
34	Pump Mounting Stud	1
35	Pump Mounting Stud	1
36	Oil Seal	1
37	Oil Baffle Assembly	1
38	Reaction Member Support Screw	1
39	Reverse Idler Gear	1
40	Reverse Idler Gear Bearing Assembly	1
41	Reverse Idler Shaft Pin	1
42	Reverse Idler Shaft	1
43	Bearing Retaining Plate	1
44	Lock Plate	1
45	Retaining Plate Screw	3
46	Impeller Hub Gear Bearing	1
47	Impeller Hub Gear	1
48	Impeller Hub "O" Ring	1
49	Impeller	1
50	Impeller to Hub Screw Lock Tab	4
51	Impeller to Hub Screw	8
52	Reaction Member Spacer	1
53	Freewheel Outer Race Locating Ring	1
54	Freewheel Inner Race Retaining Ring	1
55	Reaction Member	1
56	Freewheel Bearing	1
57	Freewheel Sprag Assembly	1
58	Freewheel Outer Race	1
59	Freewheel Bearing	1
60	Freewheel Outer Race Retaining Ring	1
61	Freewheel Inner Race	1
62	Freewheel Inner Race Locating Ring	1
63	Reaction Member to Support Retaining Ring	1
64	Impeller to Cover Screw and Lockwasher	24
65	Turbine Locating Ring	1
66	Turbine	1
67	Turbine Hub Bearing Locating Ring	1
68	Turbine Hub Bearing	1
69	Bearing Retaining Washer	1
70	Impeller to Cover "O" Ring	1
71	Impeller Cover	1
72	Turbine Retaining Ring	1
73	Impeller Cover Bore Plug "O" Ring	1
74	Bore Plug	1
75	Bore Plug Retaining Ring	1
76	Drive Plate Assembly	1
77	Drive Plate	2
78	Drive Plate Backing Ring	1
79	Drive Plate Mounting Screw and Lockwasher	10
80	Bearing Support Screw and Lockwasher	2
81	Auxiliary Pump Drive Bearing Support	1
82	Bearing Retaining Ring	1
83	Pump Drive Gear Bearing	1
84	Bearing Locating Ring	1
85	Auxiliary Pump Drive Gear	1
86	Optional Remote Filter Adaptor	1

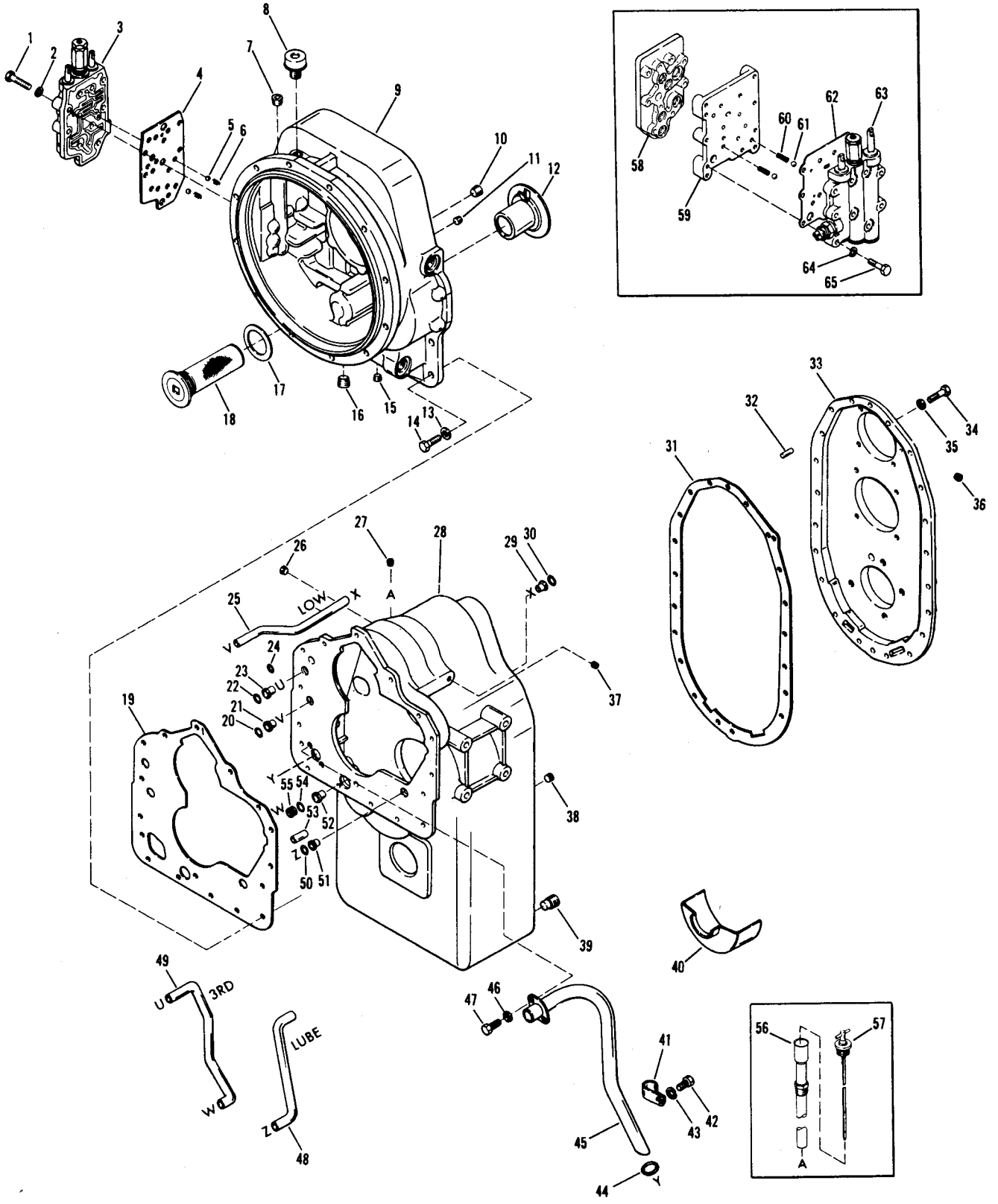

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Figure C

CLARK

HR 18000 LONG DROP CONVERTER AND TRANSMISSION CASE GROUP

ITEM	DESCRIPTION	QTY.
1	Valve to Converter Housing Screw	9
2	Valve to Converter Housing Screw Lockwasher	9
3	Control Valve Assembly	1
4	Control Valve Gasket	1
5	Detent Ball	2
6	Detent Spring	2
7	Pipe Plug	1
8	Air Breather	1
9	Converter Housing	1
0	Pipe Plug	1
1	Pipe Plug	1
2	Converter Housing Sleeve	1
3	Converter Housing to Transmission Case Screw Lockwasher	16
4	Converter Housing to Transmission Case Screw	16
5	Pipe Plug	1
6	Pipe Plug	1
7	Screen Assembly Gasket	1
8	Screen Assembly	1
9	Housing to Case Gasket	1
0	Pressure Tube "O" Ring	1
1	Tube Sleeve	1
2	Pressure Tube "O" Ring	1
3	Tube Sleeve	1
4	Clutch Pressure "O" Ring	1
5	Low Speed Clutch Pressure Tube	1
6	Pipe Plug	1
7	Pipe Plug	1
8	Transmission Case Assembly	1
9	Tube Sleeve	1
0	Pressure Tube "O" Ring	1
1	Rear Cover to Case Gasket	1
2	Rear Cover to Case Dowel Pin	2
3	Rear Cover	1
4	Rear Cover to Case Screw	20
35	Rear Cover to Case Screw Lockwasher	20
36	Pipe Plug	1
37	Pipe Plug	1
38	Pipe Plug	1
39	Magnetic Drain Plug	1
40	Oil Baffle	1
41	Suction Tube Clip	1
42	Clip Retaining Screw	1
43	Clip Lockwasher	1
44	Suction Line "O" Ring	1
45	Suction Tube Assembly	1
46	Suction Tube Retaining Screw Lockwasher	2
47	Suction Tube Retaining Screw	2
48	Clutch Lube Tube	1
49	3rd Speed Tube	1
50	Pressure Tube "O" Ring	1
51	Tube Sleeve	1
52	Tube Sleeve	1
53	Dowel Pin	1
54	3rd Speed Pressure Plug "O" Ring	1
55	3rd Speed Pressure Plug	1
56	Dipstick Tube Assembly	1
57	Dipstick	1

Optional Remote Mounted Control Valve Parts

58	Remote Control Valve Adaptor Plate	1
59	Remote Control Valve Mounting Plate	1
60	Detent Spring	2
61	Detent Ball	2
62	Control Valve to Mounting Plate Gasket	1
63	Control Valve Assembly	1
64	Valve to Mounting Plate Screw Lockwasher	9
65	Valve to Mounting Plate Screw	9

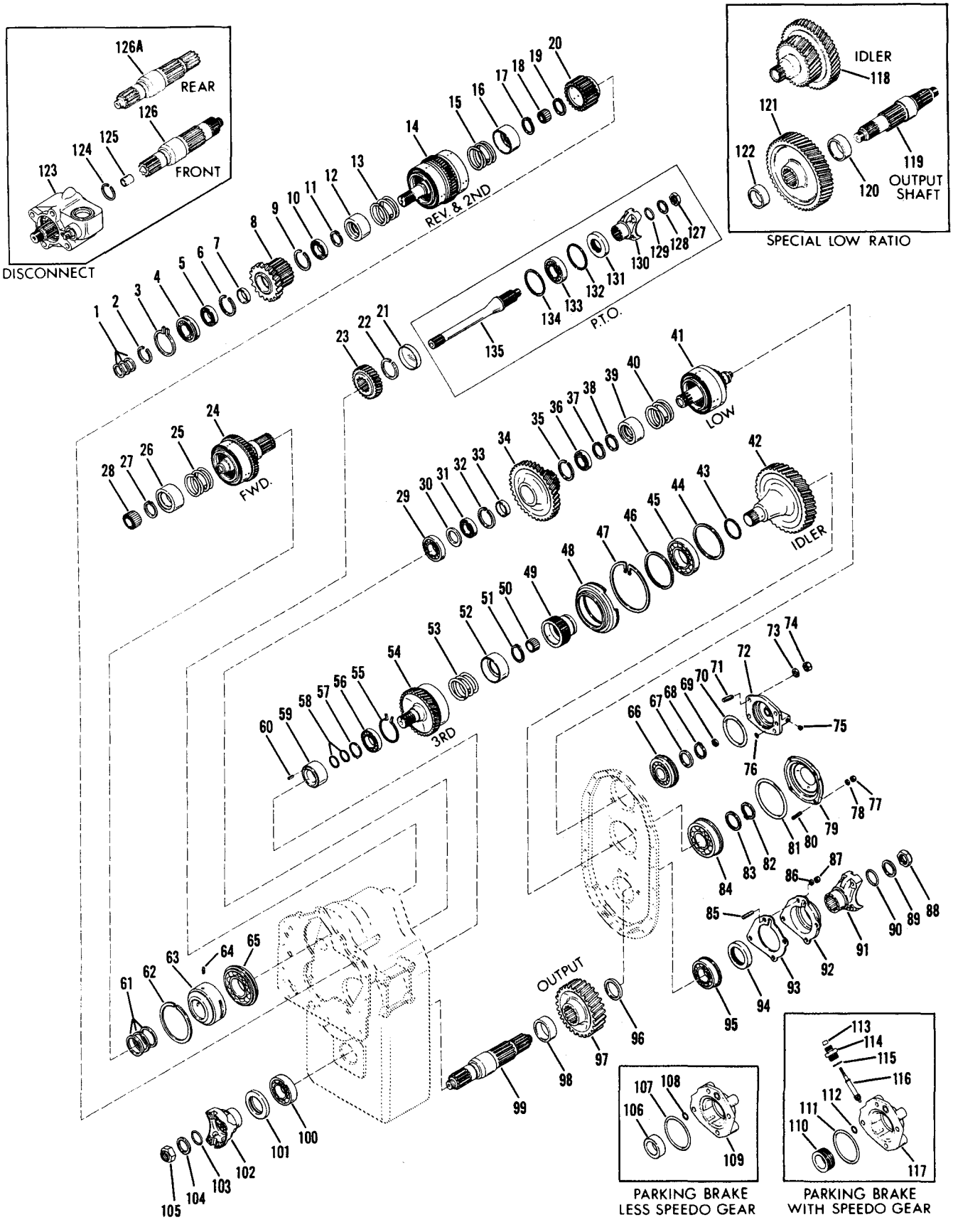
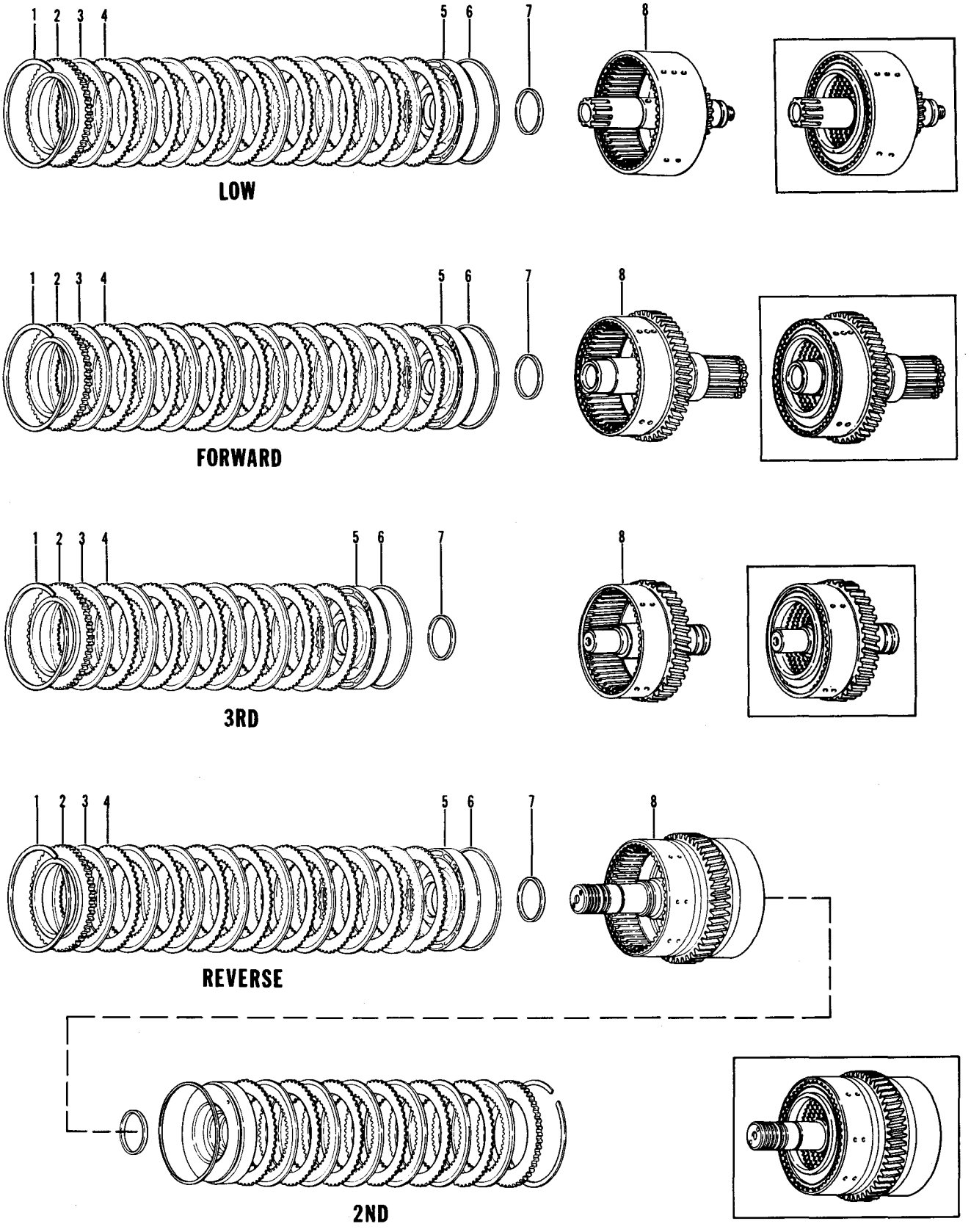

DISCONNECT
REAR
FRONT
REV. & 2ND
SPECIAL LOW RATIO
IDLER
OUTPUT SHAFT
P.T.O.
LOW
FWD.
IDLER
3RD
OUTPUT
PARKING BRAKE LESS SPEEDO GEAR
PARKING BRAKE WITH SPEEDO GEAR

Figure D

18000 THREE SPEED LONG DROP GEAR AND CLUTCH GROUP

ITEM	DESCRIPTION	QTY.
1	Reverse and 2nd Shaft Piston Ring	3
2	Front Bearing Retaining Ring	1
3	Front Bearing Snap Ring	1
4	Reverse and 2nd Shaft Front Bearing	1
5	Clutch Driven Gear Bearing	1
6	Bearing Retaining Ring	1
7	Clutch Driven Gear Bearing Spacer	1
8	Reverse Clutch Gear and Hub Assembly	1
9	Bearing Retaining Ring	1
0	Clutch Driven Gear Bearing	1
1	Spring Retainer Snap Ring	1
2	Spring Retainer	1
3	Piston Return Spring	1
4	Reverse and 2nd Clutch	1
5	Piston Return Spring	1
6	Spring Retainer	1
7	Spring Retainer Snap Ring	1
8	Reverse and 2nd Clutch Shaft Rear Bearing	1
9	2nd Clutch Disc Hub Snap Ring	1
0	2nd Clutch Disc Hub	1
1	Bore Plug	1
2	Gear Retainer Snap Ring	1
3	Forward Shaft Gear	1
4	Forward Clutch	1
5	Piston Return Spring	1
6	Spring Retainer	1
7	Spring Retainer Snap Ring	1
8	Forward Clutch Shaft Pilot Bearing	1
9	Low Speed Clutch Shaft Front Bearing	1
0	Front Bearing Spacer	1
1	Low Speed Gear Bearing	1
2	Low Speed Gear Bearing Locating Ring.	1
3	Low Speed Gear Spacer	1
4	Low Speed Gear and Hub Assembly	1
5	Low Speed Gear Bearing Locating Ring	1
6	Low Speed Gear Bearing	1
7	Low Speed Gear Bearing Retaining Ring	1
8	Spring Retainer Snap Ring	1
9	Spring Retainer	1
0	Piston Return Spring	1
1	Low Speed Clutch	1
2	Idler Shaft and Gear	1
3	Bearing Retaining Ring	1
4	Bearing Locating Ring	1
5	3rd Clutch Disc Hub Bearing	1
6	Bearing Locating Ring	1
7	Bearing Carrier Locating Ring	1
3	Bearing Carrier	1
9	3rd Speed Clutch Disc Hub	1
0	3rd Speed Clutch Shaft Pilot Bearing	1
1	Spring Retainer Snap Ring	1
2	Spring Retainer	1
3	Piston Return Spring	1
4	3rd Speed Clutch	1

ITEM	DESCRIPTION	QTY.
55	3rd Speed Clutch Shaft Front Bearing Locating Ring	1
56	3rd Speed Clutch Shaft Front Bearing	1
57	3rd Speed Clutch Shaft Front Bearing Retaining Ring	1
58	3rd Speed Clutch Shaft Piston Ring	2
59	Piston Ring Outer Race	1
60	Outer Race Roll Pin	1
61	Forward Shaft Piston Ring	1
62	Piston Ring Sleeve Retainer Ring	1
63	Piston Ring Sleeve	1
64	Sleeve Roll Pin	1
65	Forward Clutch Shaft Rear Bearing	1
66	Low Speed Clutch Shaft Rear Bearing	1
67	Rear Bearing Support Washer	1
68	Rear Bearing Retaining Ring	1
69	Low Speed Clutch Shaft Piston Ring	1
70	Rear Bearing Cap "O" Ring	1
71	Bearing Cap Stud	4
72	Low Speed Clutch Shaft Rear Bearing Cap	1
73	Bearing Cap Stud Lockwasher	4
74	Bearing Cap Stud Nut	4
75	Bearing Cap Plug	1
76	Bearing Cap "O" Ring	1
77	Rear Bearing Cap Stud Nut	4
78	Rear Bearing Cap Stud Lockwasher	4
79	Idler Shaft Rear Bearing Cap	1
80	Rear Bearing Cap Stud	4
81	Rear Bearing Cap "O" Ring	1
82	Idler Shaft Rear Bearing Retainer Ring	1
83	Rear Bearing Support Washer	1
84	Idler Shaft Rear Bearing	1
85	Bearing Cap Stud	4
86	Bearing Cap Stud Lockwasher	4
87	Bearing Cap Stud Nut	4
88	Flange Nut	1
89	Flange Washer	1
90	Flange "O" Ring	1
91	Output Flange	1
92	Output Shaft Rear Bearing Cap	1
93	Bearing Cap Gasket	1
94	Rear Bearing Cap Oil Seal	1
95	Output Shaft Rear Bearing	1
96	Output Shaft Rear Bearing Spacer	1
97	Output Gear	1
98	Output Gear Spacer	1
99	Output Shaft	1
100	Output Shaft Front Bearing	1
101	Front Oil Seal	1
102	Output Flange	1
103	Flange "O" Ring	1
104	Flange Washer	1
105	Flange Nut	1
106 thru 135	Various Options	



18000 SERIES 3 SPEED LONG DROP CLUTCH ASSEMBLY WITHOUT INCHING

Figure E

CLARK

LOW CLUTCH GROUP

ITEM	DESCRIPTION	QTY.	ITEM	DESCRIPTION	QTY.
1	Backing Plate Snap Ring	1	5	Clutch Piston	1
2	Clutch Disc Backing Plate	1	6	Outer Clutch Piston Ring	1
3	Clutch Inner Disc	8	7	Inner Clutch Piston Seal	1
4	Clutch Outer Disc	8	8	Low Speed Clutch Shaft and Drum Assembly..	1

FORWARD CLUTCH GROUP

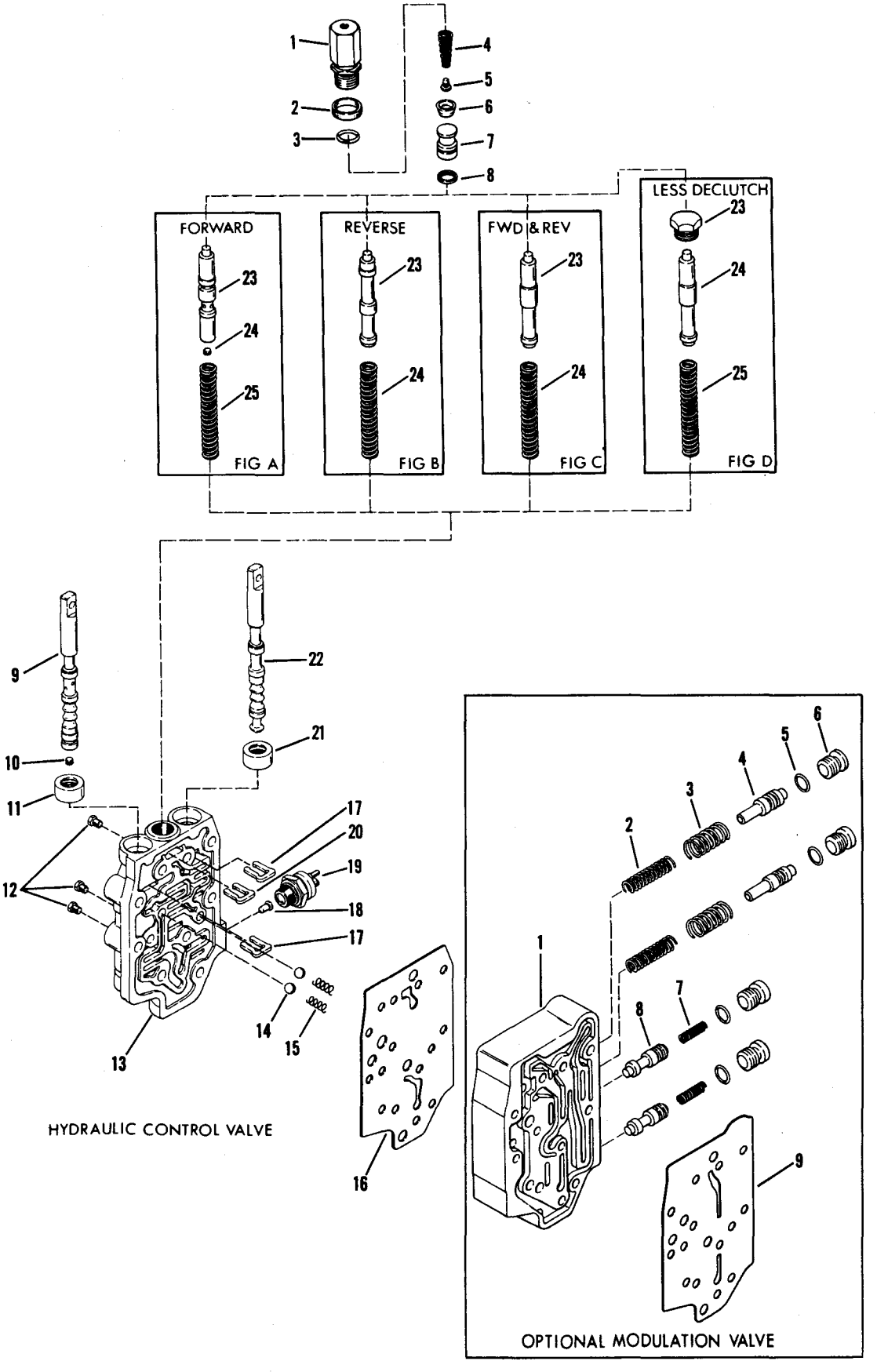
ITEM	DESCRIPTION	QTY.	ITEM	DESCRIPTION	QTY.
1	Backing Plate Snap Ring	1	5	Clutch Piston	1
2	Clutch Disc Backing Plate	1	6	Outer Clutch Piston Ring	1
3	Clutch Inner Disc	8	7	Inner Clutch Piston Seal	1
4	Clutch Outer Disc	8	8	Forward Clutch Shaft and Drum Assembly.....	1

3RD CLUTCH GROUP

ITEM	DESCRIPTION	QTY.	ITEM	DESCRIPTION	QTY.
1	Backing Plate Snap Ring	1	5	Clutch Piston Assembly	1
2	Clutch Disc Backing Plate	1	6	Outer Clutch Piston Seal	1
3	Clutch Inner Disc	6	7	Inner Clutch Piston Seal	1
4	Clutch Outer Disc	6	8	3rd Speed Clutch Shaft and Drum Assembly..	1

REVERSE AND 2ND CLUTCH GROUP

ITEM	DESCRIPTION	QTY.	ITEM	DESCRIPTION	QTY.
1	Backing Plate Snap Ring	2	5	Clutch Piston	2
2	Clutch Disc Backing Plate	2	6	Outer Clutch Piston Seal	2
3	Clutch Inner Disc	14	7	Inner Clutch Piston Seal	2
4	Clutch Outer Disc	14	8	Reverse and 2nd Speed Clutch Shaft and Drum Assembly	1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FORWARD
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LESS DECLUTCH
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FIG A
FIG B
FIG C
FIG D
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22
HYDRAULIC CONTROL VALVE
OPTIONAL MODULATION VALVE

Figure F

CLARK

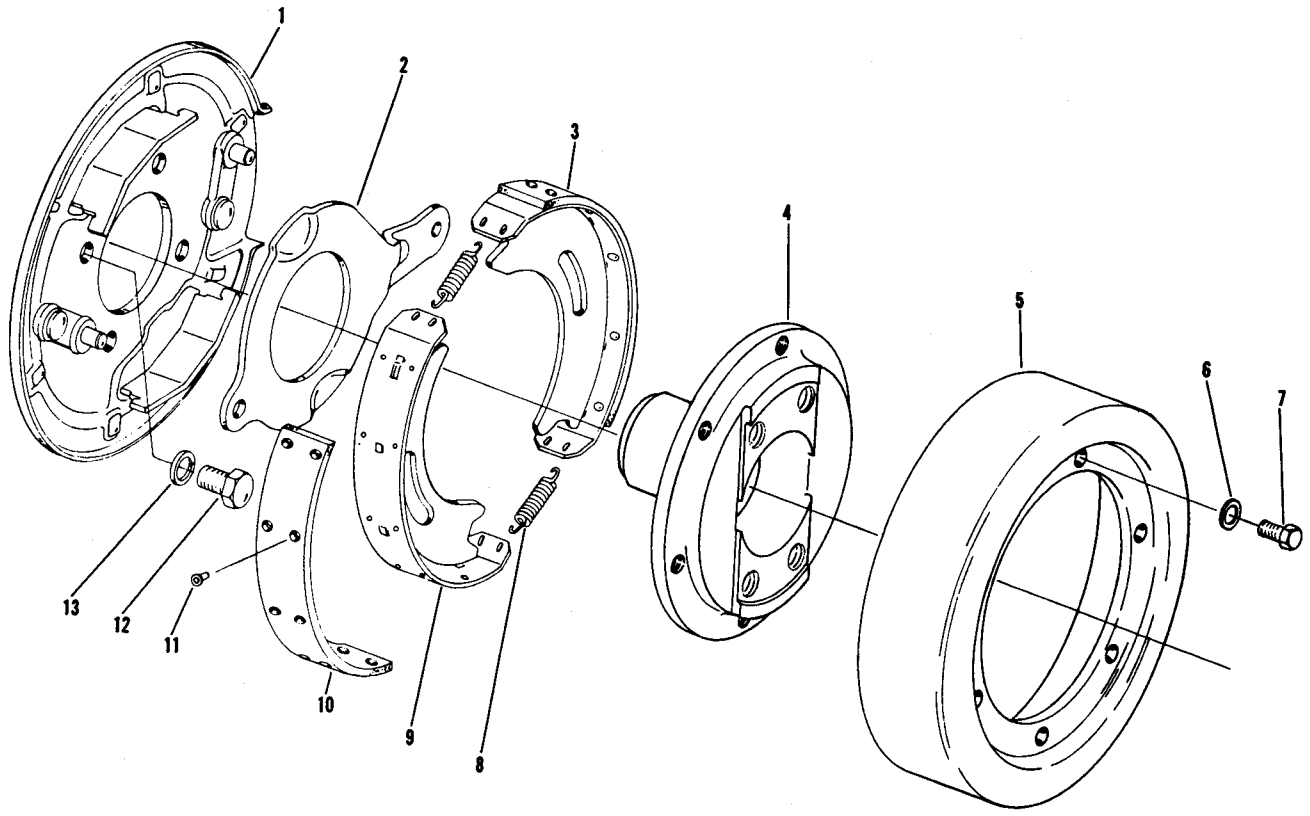
CONTROL VALVE ASSEMBLY

ITEM	DESCRIPTION	QTY.
1	Hydarulic Actuator Assembly	1
2	Band Seal	1
3	Piston Housing "O" Ring	1
4	Piston Balance Spring	1
5	Spring Retainer Pin	1
6	Piston Seal	1
7	Piston	1
8	Glyd Ring	1
9	Speed Selector Spool	1
10	Spool Plug	1
11	Oil Seal	1
12	Pipe Plug	3
13	Control Valve Housing	1
14	Detent Ball	2
15	Detent Spring	2
16	Control Valve Gasket	1
17	Valve Spool Stop	2
18	Neutral Switch Actuating Pin	1
19	Neutral Switch	1
20	Declutch Spool Stop	1
21	Oil Seal	1
22	Forward and Reverse Valve Spool	1

NOTE: Items 23 thru 25 are various declutch options.

MODULATOR VALVE ASSEMBLY
(Optional)

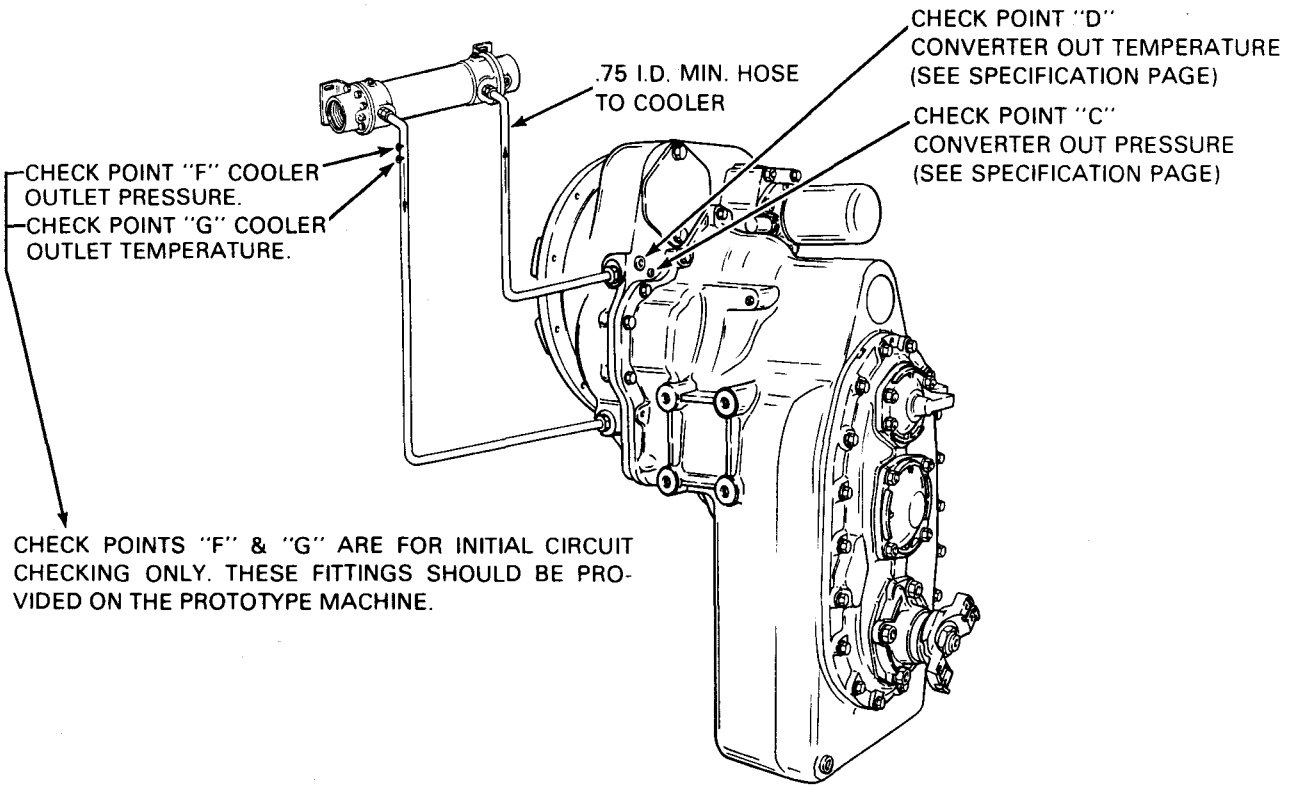
ITEM	DESCRIPTION	QTY.
1	Modulator Valve Housing	1
2	Accumulator Spring (Inner) Not Used on All Models	2
3	Accumulator Spring (Outer)	2
4	Accumulator Valve	2
5	Spool Stop Plug "O" Ring	4
6	Spool Stop Plug	4
7	Regulator Spring	2
8	Regulator Spool	2
9	Modulator Valve to Converter Housing Gasket	1



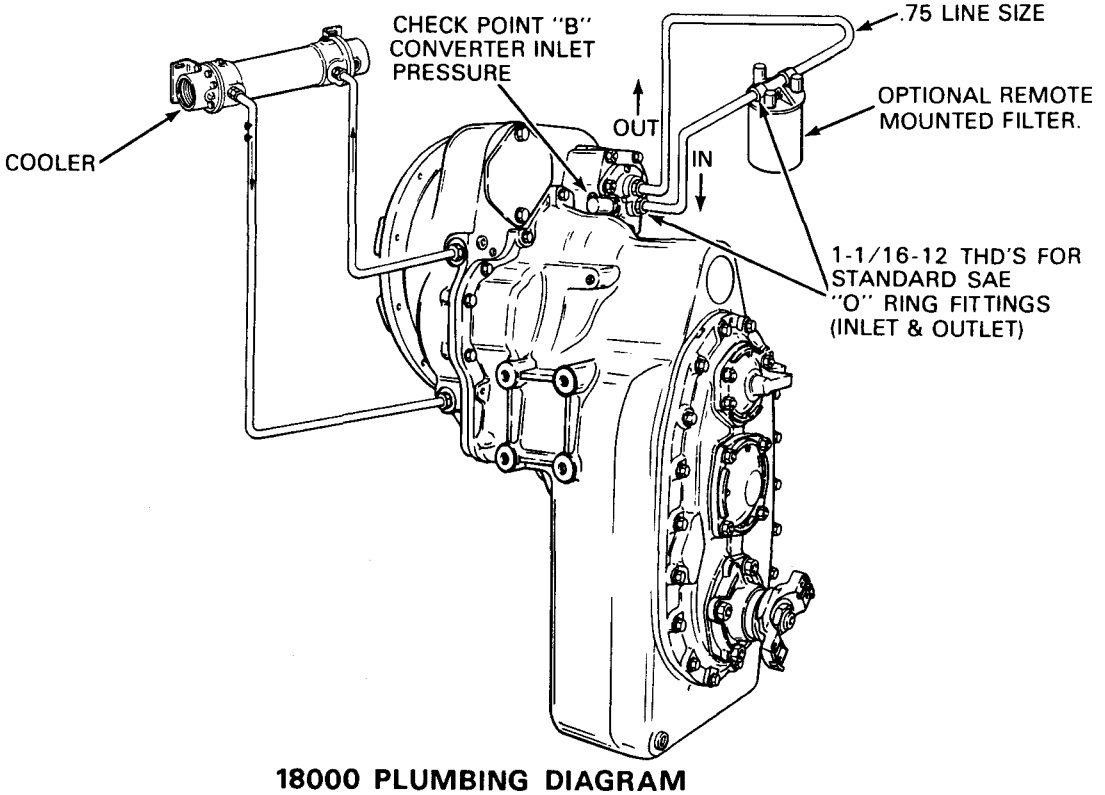
PARKING BRAKE GROUP

ITEM	DESCRIPTION	QTY.
1	Backing Plate Assembly	1
2	Actuating Lever	1
3	Brake Shoe and Lining	2
4	Brake Flange	1
5	Brake Drum	1
6	Brake Drum to Flange Screw Lockwasher	6
7	Brake Drum to Flange Screw	6
8	Return Spring	2
9	Brake Shoe, See Item 3	
10	Brake Lining	2
11	Brake Lining Rivet	20
12	Backing Plate Screw	4
13	Backing Plate Screw Lockwasher	4

Figure G



18000 PLUMBING DIAGRAM
3 SPEED LONG DROP



18000 PLUMBING DIAGRAM
3 SPEED LONG DROP
(WITH REMOTE FILTER)

Figure H

CLARK

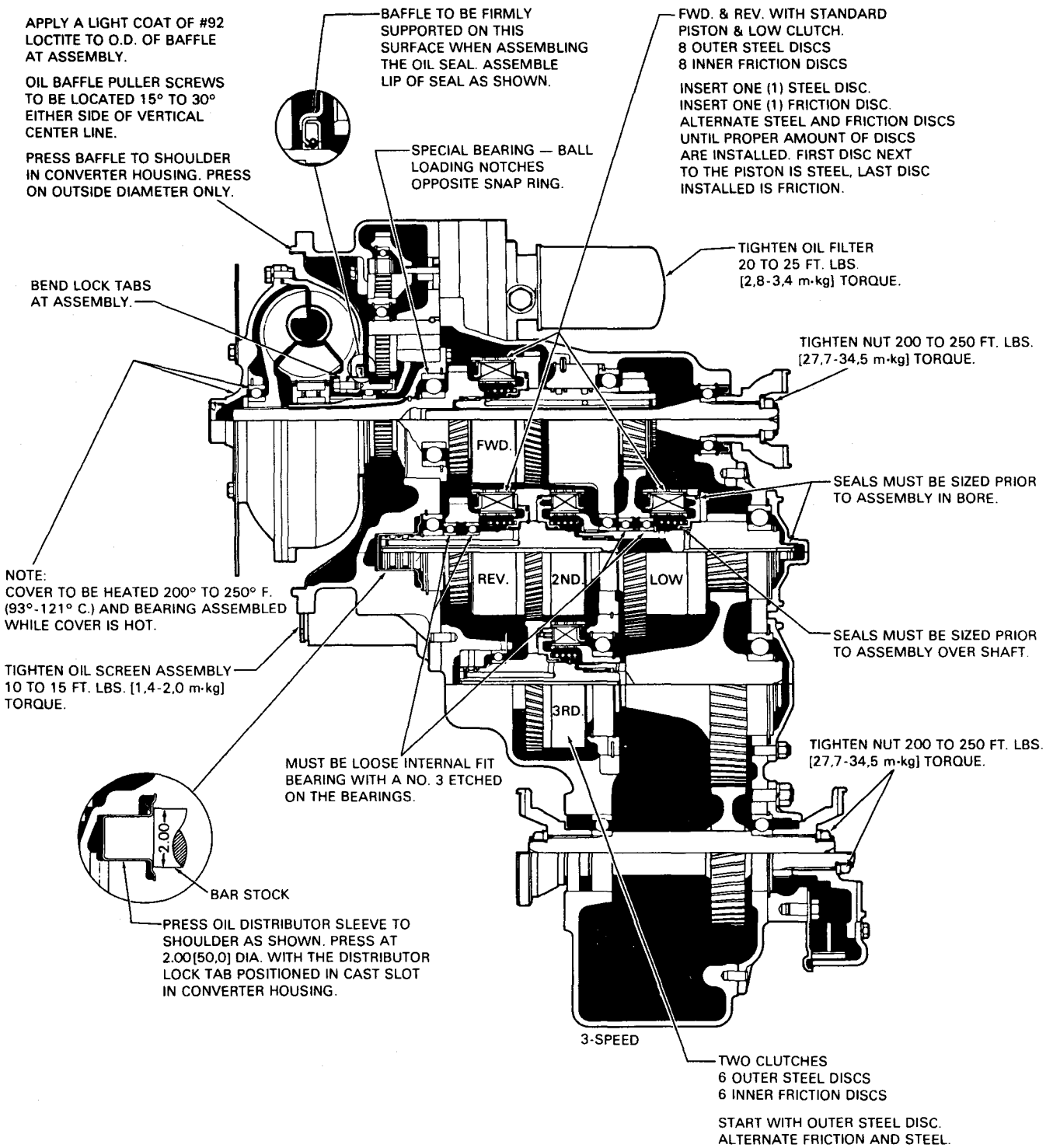
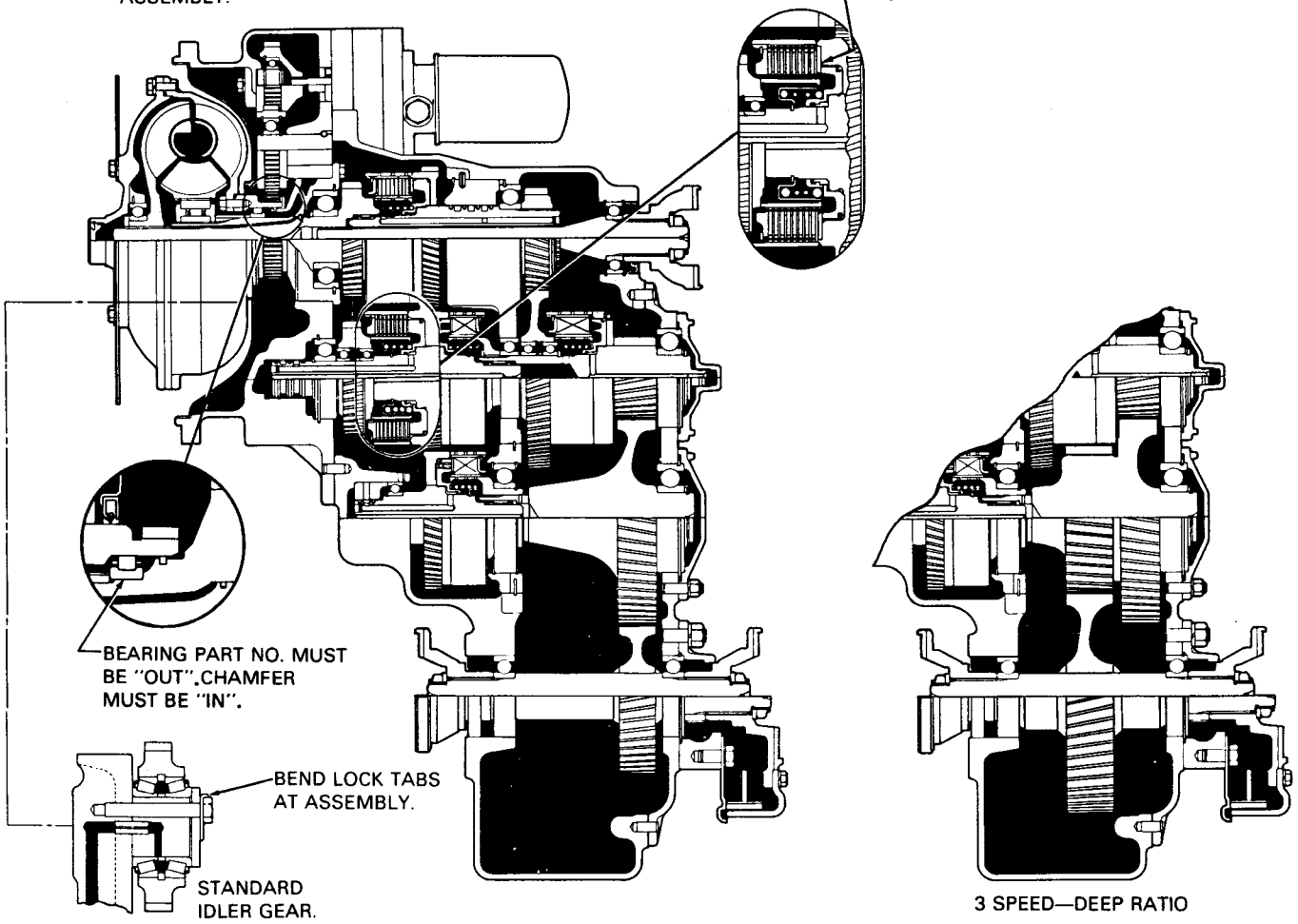


Figure 1

1. ALL LEAD IN CHAMFERS FOR OIL SEALS, PISTON RINGS, & "O" RINGS MUST BE SMOOTH AND FREE FROM BURRS. INSPECT AT ASSEMBLY.
2. LUBRICATE ALL PISTON RING GROOVES & "O" RINGS WITH OIL BEFORE ASSEMBLY.
3. APPLY VERY LIGHT COAT OF PERMATEX NO. 2 TO O.D. OF ALL OIL SEALS BEFORE ASSEMBLY.
4. AFTER ASSEMBLY OF PARTS USING LOCTITE OR PERMATEX THERE MUST NOT BE ANY FREE OR EXCESS MATERIAL THAT COULD ENTER THE OIL CIRCUIT.
5. APPLY A LIGHT COAT OF #92 LOCTITE TO ALL PIPE PLUGS.
6. APPLY A THIN COATING OF GREASE BETWEEN SEAL LIPS ON LIP TYPE SEALS PRIOR TO ASSEMBLY.

SPECIAL STEEL BACKING PLATE TO BE USED WITH REDUCED SIZE PISTONS.

FORWARD AND REVERSE CLUTCHES WITH REDUCED SIZE PISTONS.
1 OUTER STEEL BACKING PLATE AND DISC ASSEMBLY.
7 OUTER STEEL DISCS.
8 INNER FRICTION DISCS.
START WITH OUTER STEEL BACKING PLATE NEXT TO PISTON, THEN (1) INNER FRICTION DISC, THEN (1) OUTER STEEL DISC. ALTERNATE STEEL AND FRICTION DISCS UNTIL PROPER AMOUNT OF DISCS ARE INSTALLED.



NOMINAL SIZE		GRADE 5 FINE THREAD TORQUE FT. LBS.	GRADE 5 COARSE THREAD TORQUE FT. LBS.
1/4	.2500	9-11 [1,2-1,5 m·kg]	8-10 [1,1-1,4 m·kg]
5/16	.3125	16-20 [2,2-2,8 m·kg]	12-16 [1,7-2,2 m·kg]
3/8	.3750	26-29 [3,6-4,0 m·kg]	23-25 [3,2-3,4 m·kg]
7/16	.4375	41-45 [5,7-6,2 m·kg]	37-41 [5,1-5,6 m·kg]
1/2	.5000	64-70 [8,9-9,7 m·kg]	57-63 [7,9-8,7 m·kg]
9/16	.5625	91-100 [12,6-13,8 m·kg]	82-90 [11,3-12,4 m·kg]

Figure 1

CLARK

TYPICAL 18000 CROSS SECTION

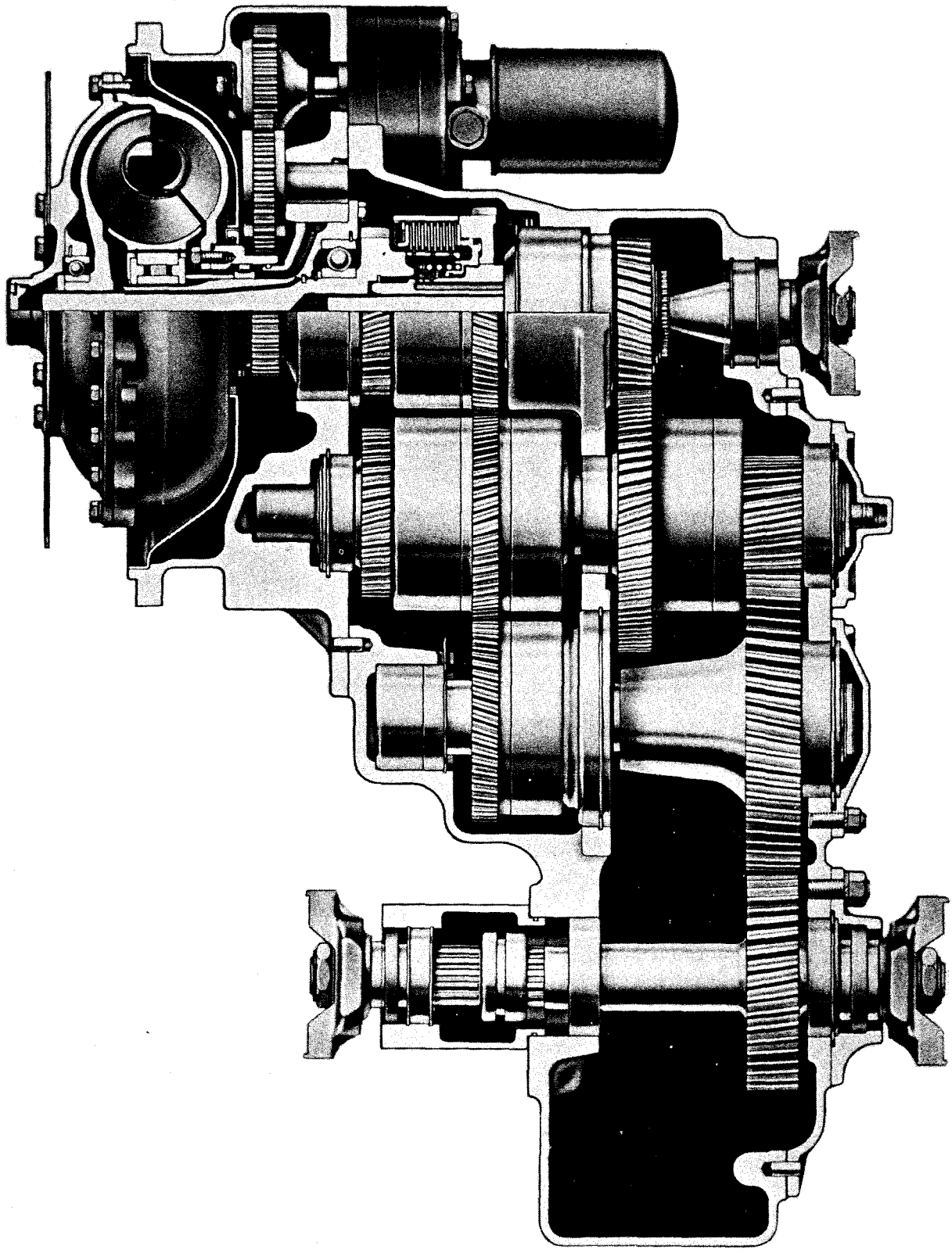


Figure J

CLARK

MAINTENANCE AND SERVICE

The instructions contained herein cover the disassembly and reassembly of the transmission in a sequence that would normally be followed after the unit has been removed from the machine and is to be completely overhauled. It must also be understood that this is a basic 18000 transmission with many options. All 18000 transmissions are very similar to trouble shoot, disassemble, repair, and reassemble.

CAUTION: Cleanliness is of extreme importance and an absolute must in the repair and overhaul of this unit. 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

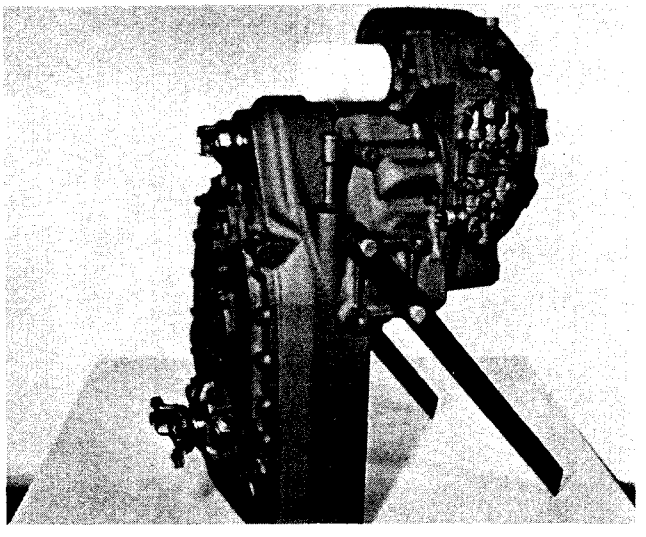


Figure 1
Side view of the 18000 series long drop transmission. The transmission being disassembled is a 3 speed.

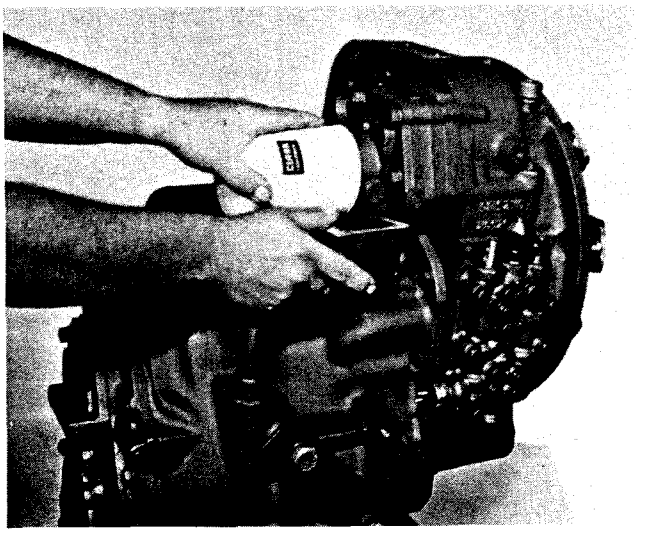


Figure 3
It is recommended a small pan be used to catch the oil left in the filter element. Remove filter element.

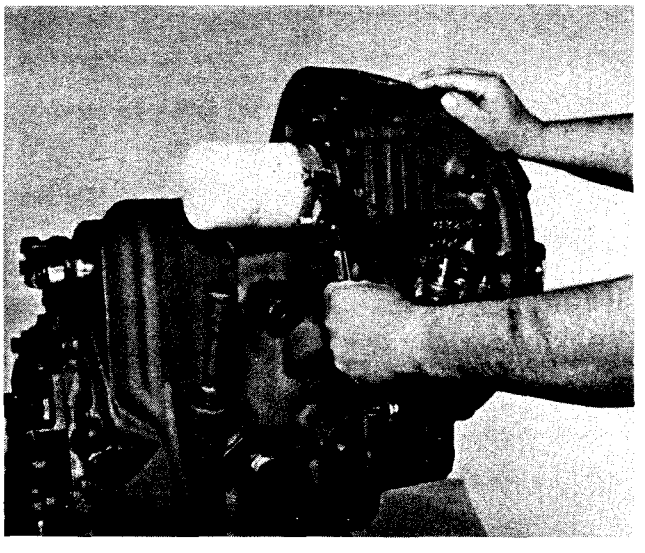


Figure 2
Loosen filter assembly.

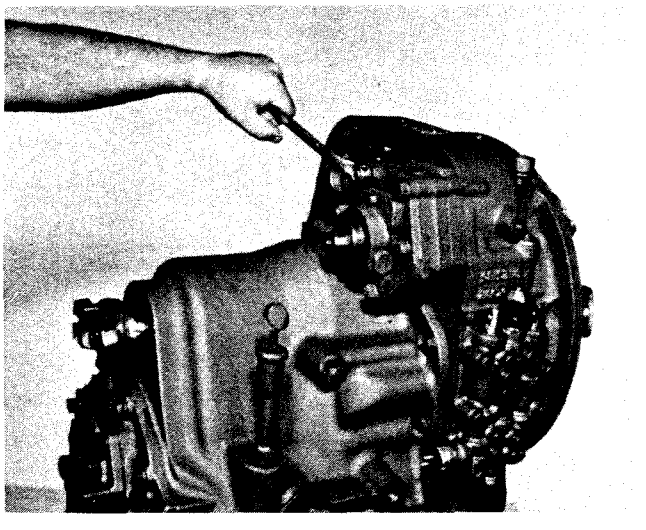


Figure 4
Remove pressure regulating valve and charging pump bolts and stud nuts.

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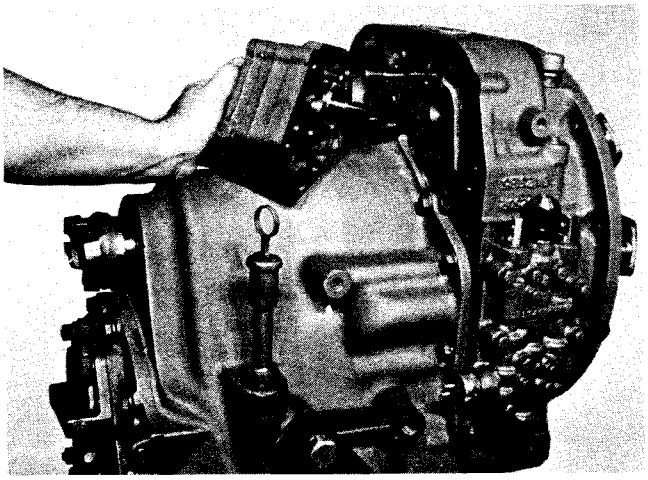

Figure 5
Remove valve and pump assembly.

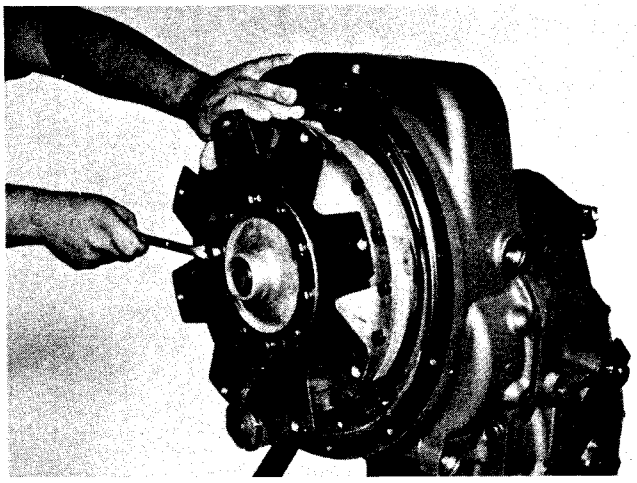

Figure 6
Remove drive plate mounting screws and washers.

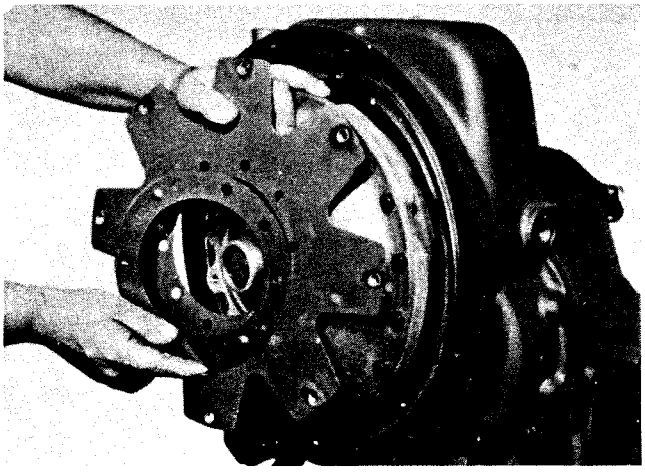

Figure 7
Remove Drive plate and backing ring.

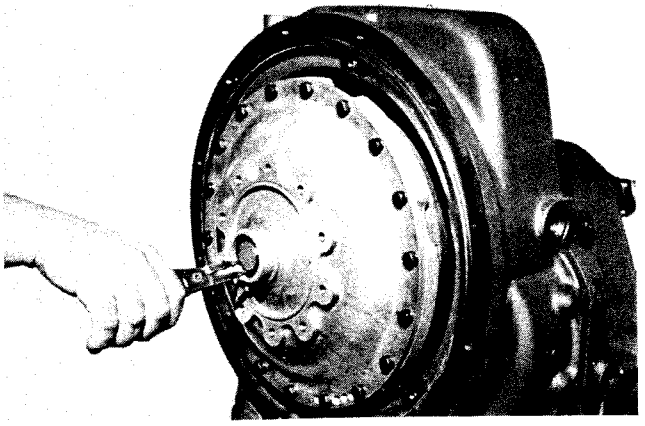

Figure 8
Remove impeller cover bore plug retainer ring.

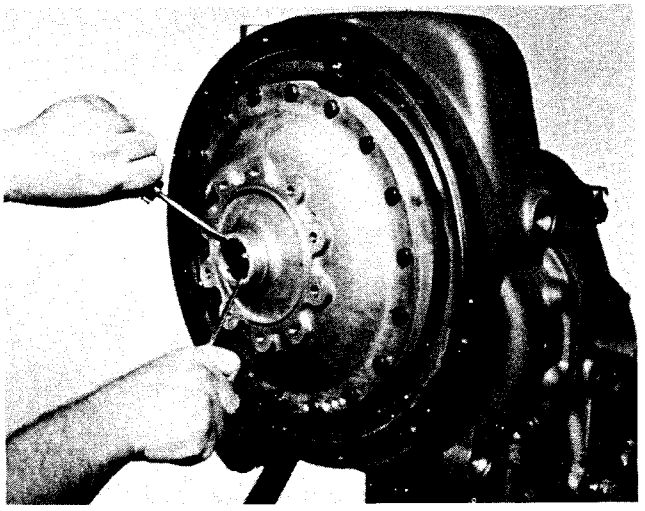

Figure 9
Using two small screw drivers as shown, remove bore plug.

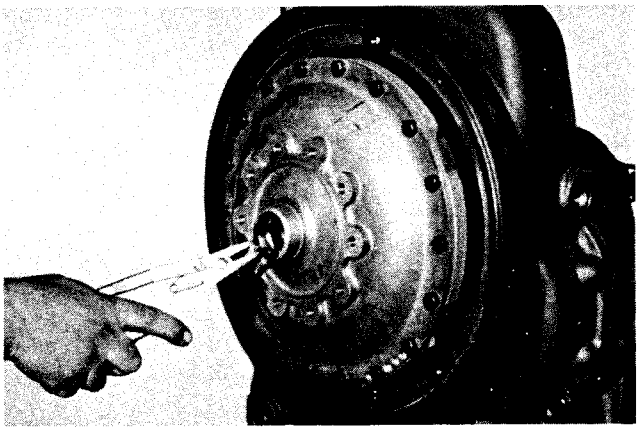

Figure 10
Through bore plug hole, remove turbine retaining ring. See Figure 10-A.

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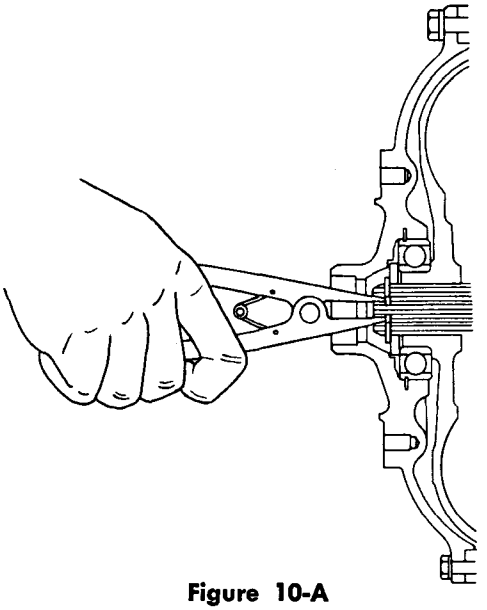

Figure 10-A

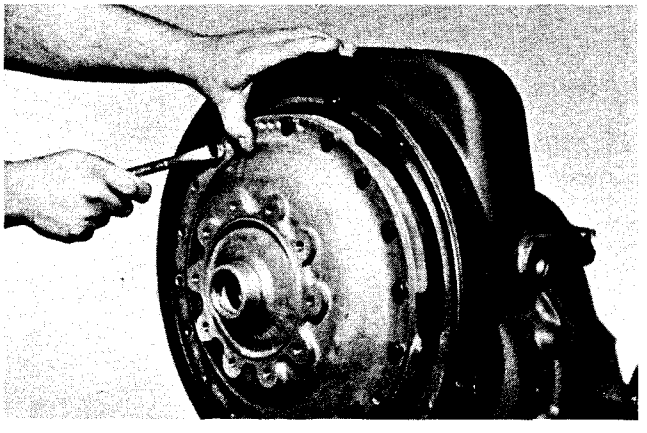

Figure 11
Remove impeller cover to impeller bolts.

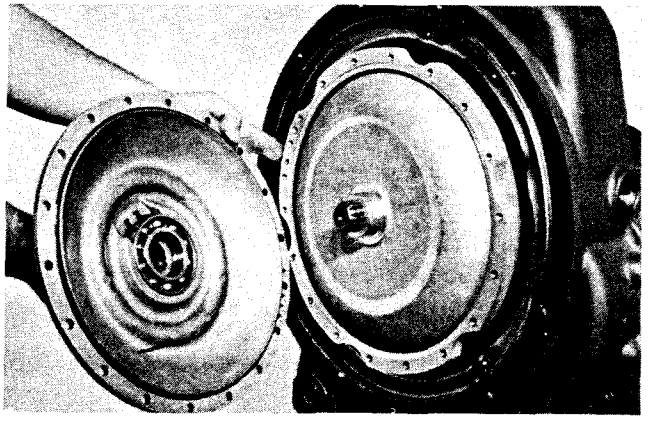

Figure 12
Remove impeller cover. **NOTE:** Turbine may remain in impeller cover bearing and will come off with impeller cover as shown in Figure 13.

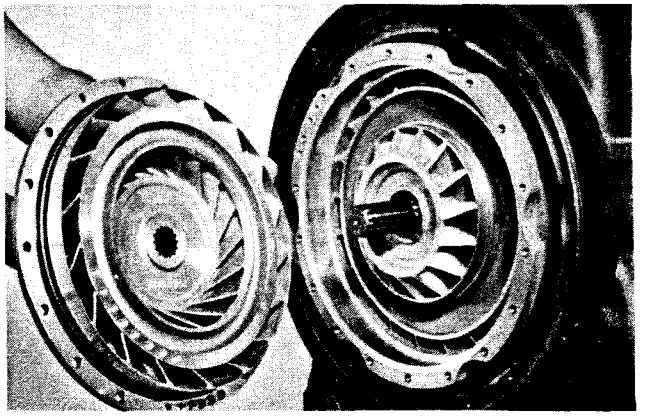

Figure 13
Impeller cover and turbine being removed as an assembly.

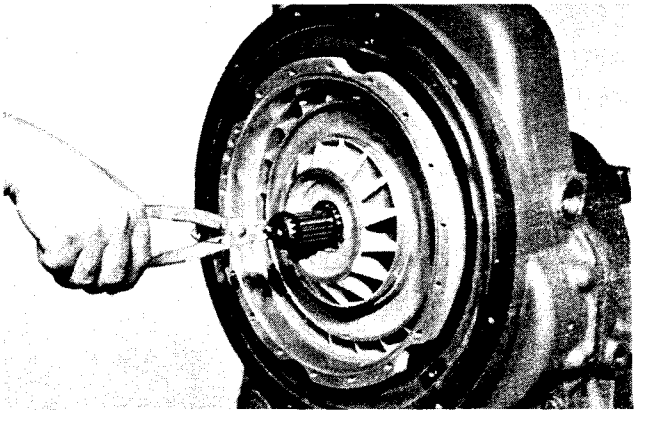

Figure 14
Remove turbine locating ring.

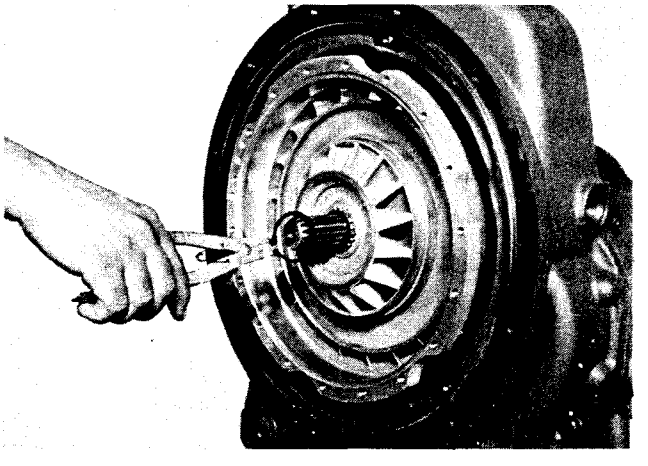

Figure 15
Remove reaction member retainer ring.

NOTE: Some units will have a fixed reaction member and some units will have a freewheeling reaction member. The fixed is a one piece and the freewheeling is an assembly. Remove as an assembly.

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FREEWHEEL DISASSEMBLY

Figure 16
Remove rear inner race retainer ring.

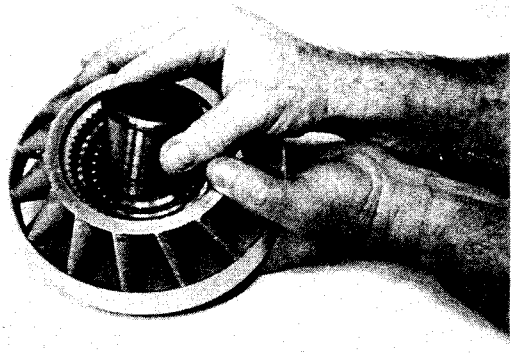

Figure 17
Remove inner race.

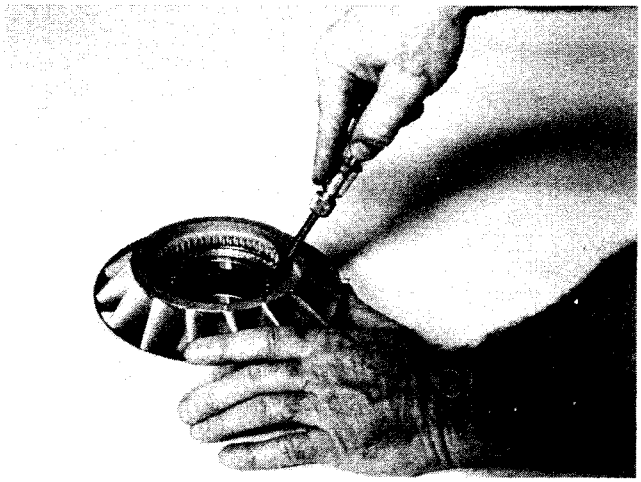

Figure 18
Remove front outer race to reaction member retainer ring.

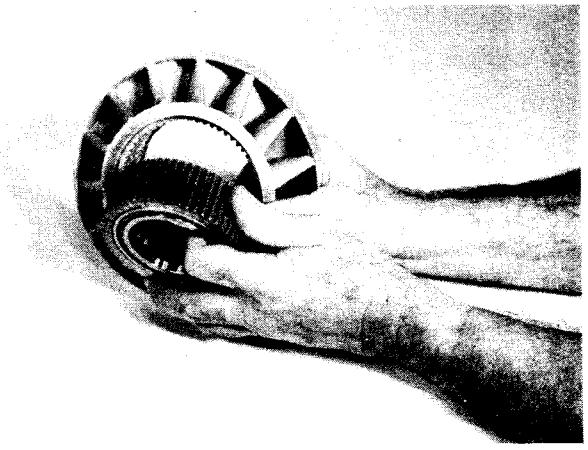

Figure 19
Remove outer race.

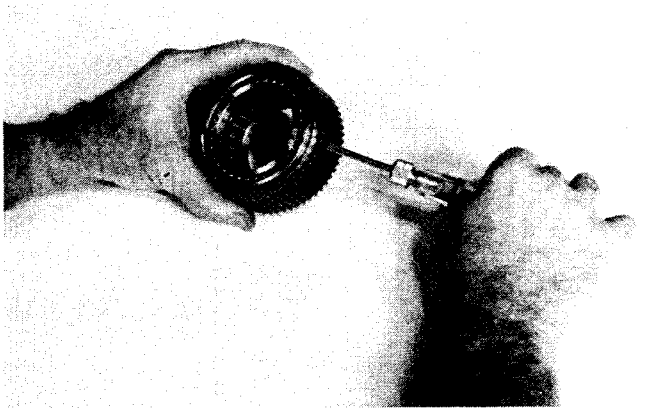

Figure 20
Using a screw driver as shown in two access holes 180° apart, pry front bearing from outer race.

Figure 21
Slide sprang assembly from outer race. Tapping on rear bearing outer race only remove bearing from freewheel outer race.

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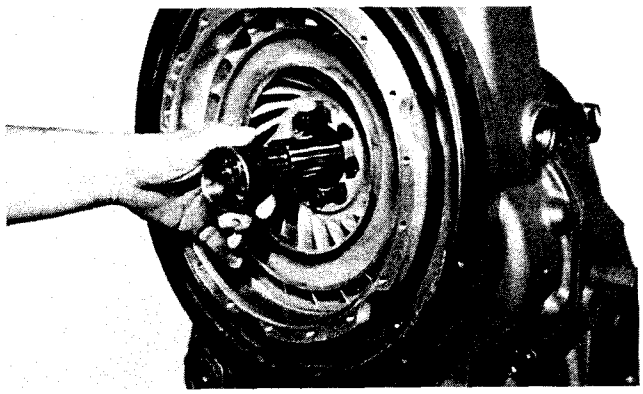

Figure 22
Remove reaction member spacer. Remove impeller and hub assembly.

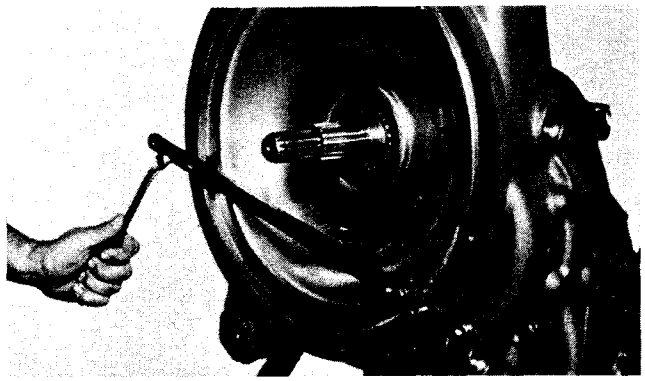

Figure 23
Using oil baffle puller holes provided, remove oil baffle. **NOTE:** Puller tool like shown can be fabricated from diagram shown in Figure 23-A.

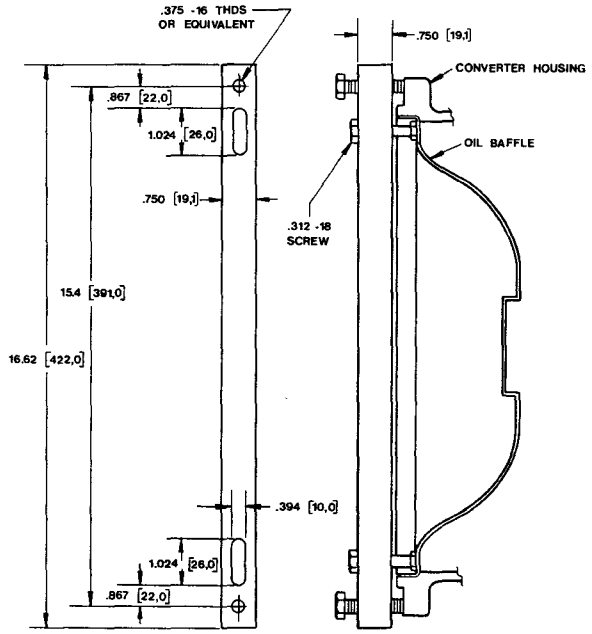

Figure 23-A

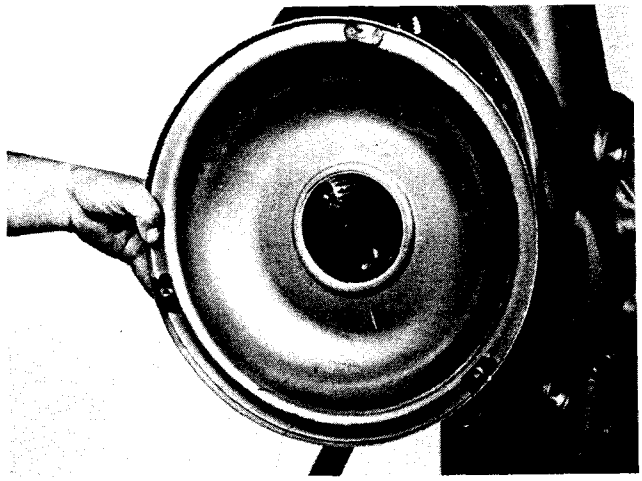

Figure 24
Oil baffle removed.

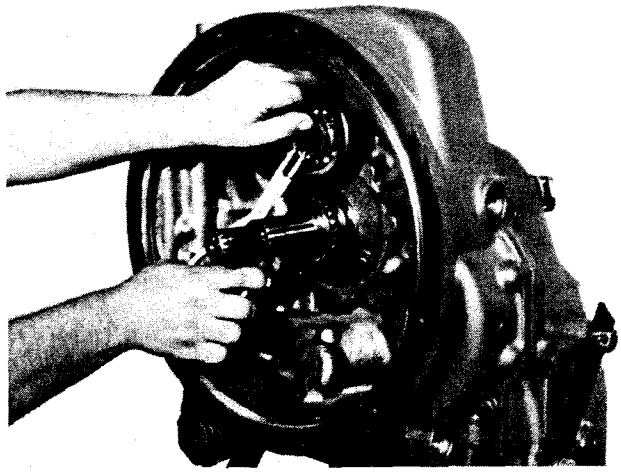

Figure 25
Remove pump drive idler gear retaining ring.

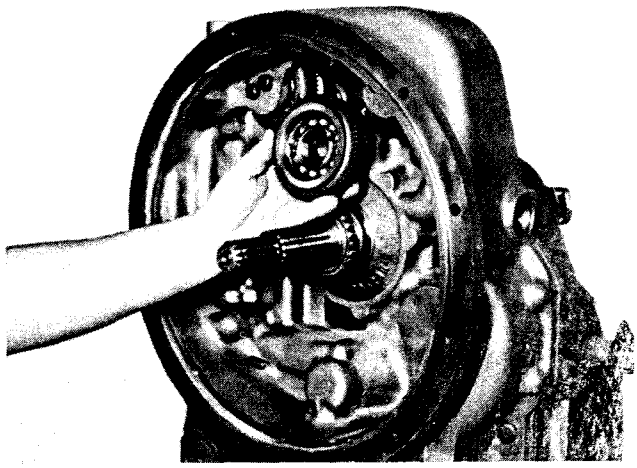

Figure 26
Remove idler gear and bearing assembly.

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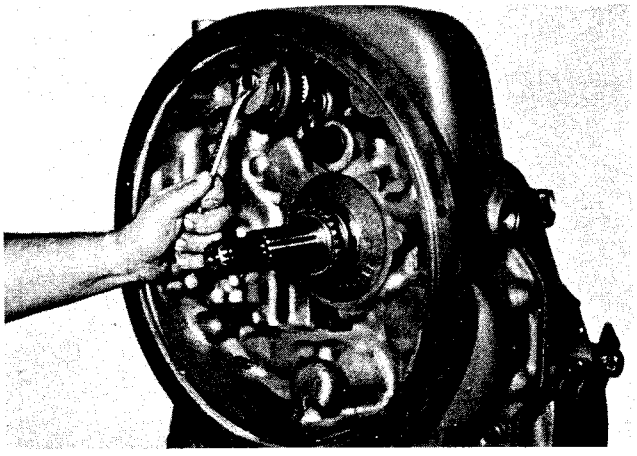

Figure 27
Remove pump drive bearing support screw and lockwasher.

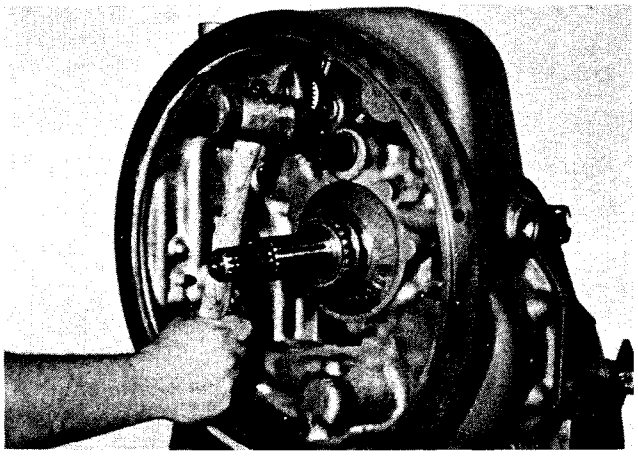

Figure 28
Using a soft hammer, tap pump drive gear and bearing support from housing.

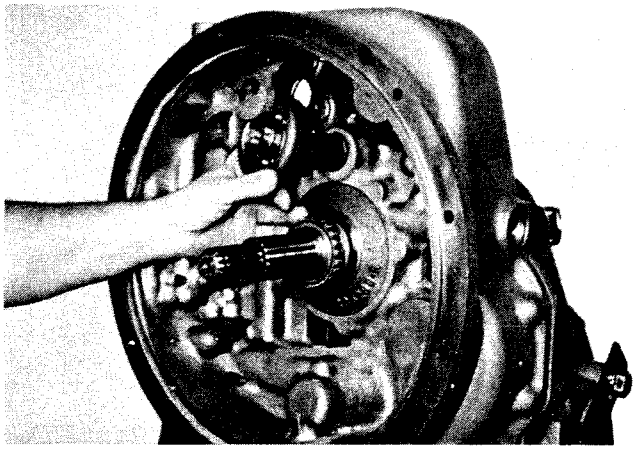

Figure 29
Remove gear and bearing assembly from housing.

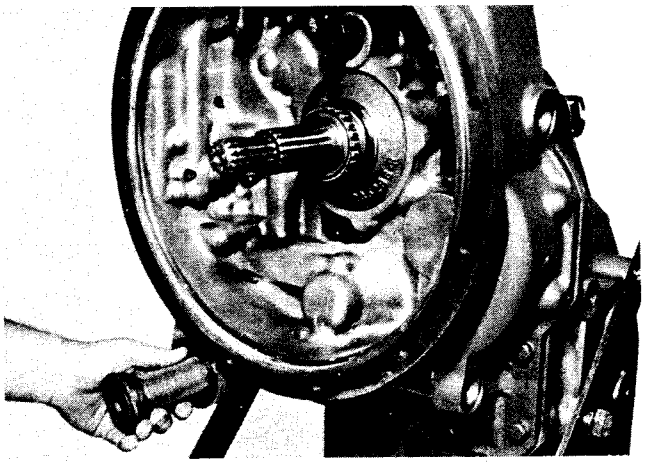

Figure 30
Remove sump screen assembly.

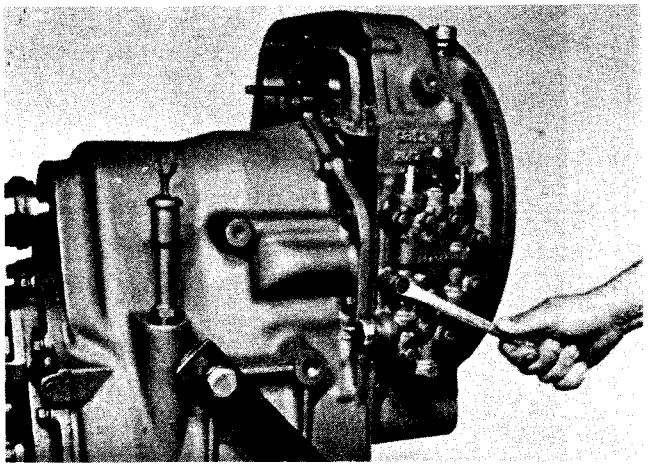

Figure 31
Remove control valve bolts and lockwashers.

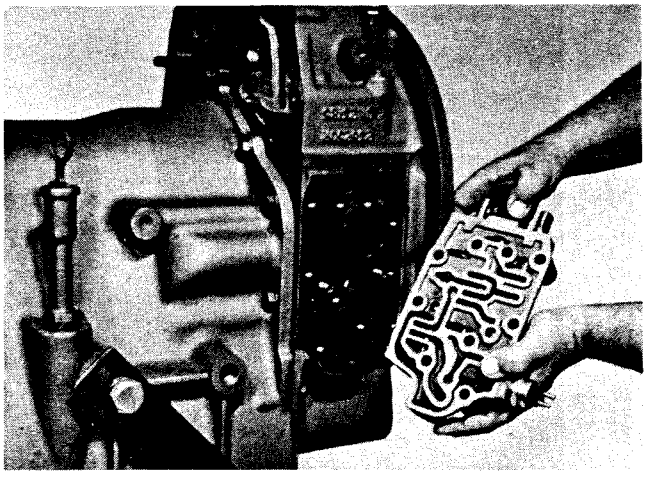

Figure 32
Remove control valve assembly. Use caution as not to lose detent springs and balls.

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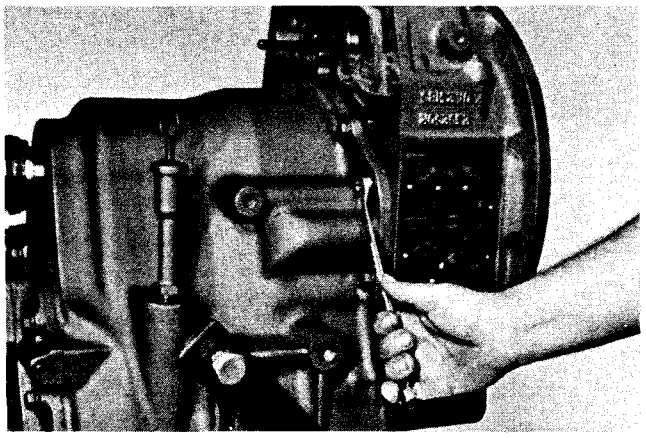

Figure 33
Remove all bolts but one securing transmission to converter housing.

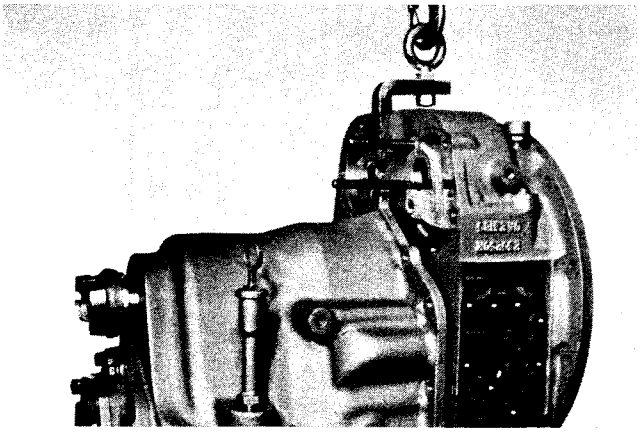

Figure 34
Support converter housing with a chain hoist. Remove remaining bolt.

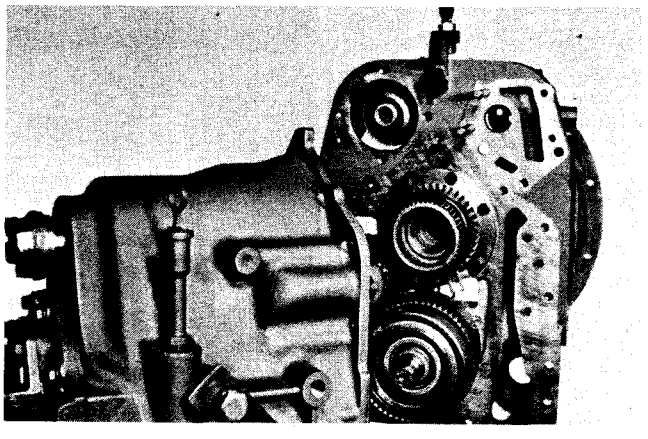

Figure 35
Separate converter housing from transmission case assembly. **NOTE:** Reverse and 2nd clutch will remain in converter housing.

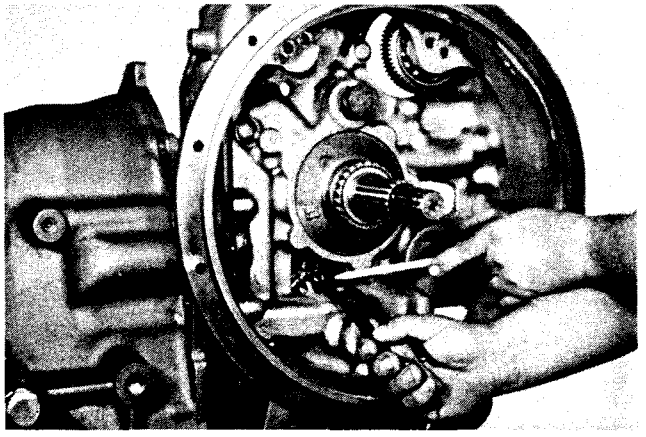

Figure 36
Using spreading type snap ring pliers, spread ears on the reverse clutch front bearing retaining ring.

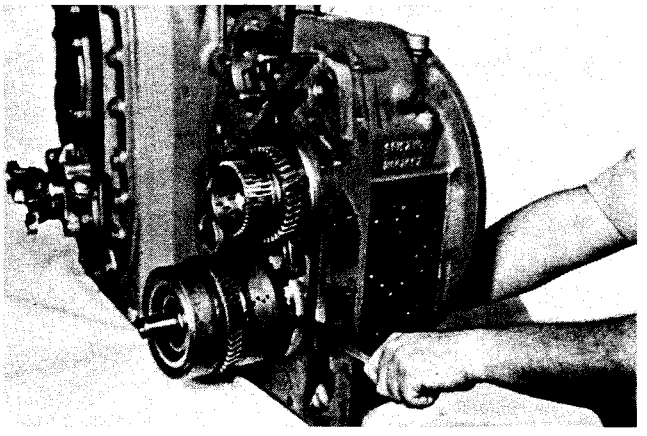

Figure 37
Holding snap ring open pry reverse and 2nd clutch assembly from converter housing.

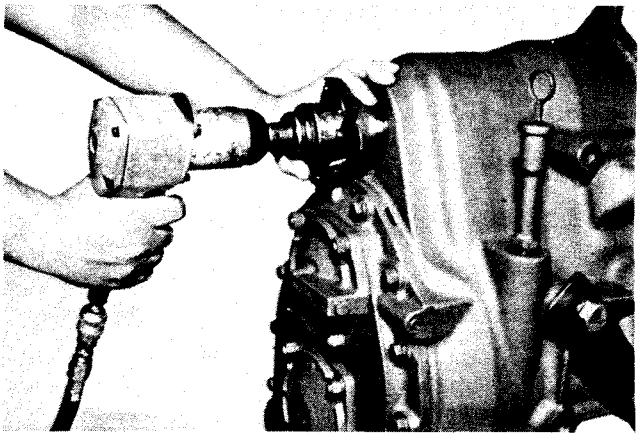

Figure 38
NOTE: P.T.O. is optional, if not used proceed to Figure 43. Using an impact wrench (if available), if not a flange retainer bar must be used to hold the companion flange from turning, loosen P.T.O. flange nut.

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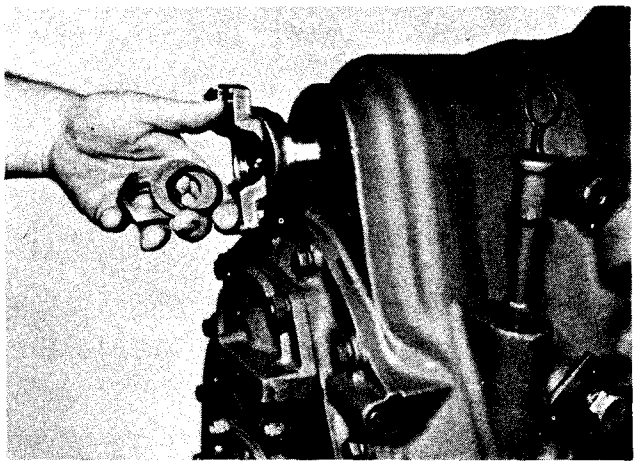

Figure 39
Remove flange nut, washer, "O" ring and flange.

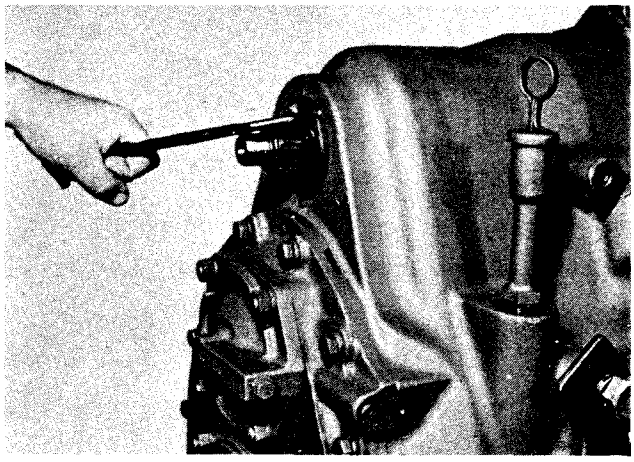

Figure 40
Using a pointed bar or screwdriver, pry oil seal from housing. Use caution as not to damage housing bore.

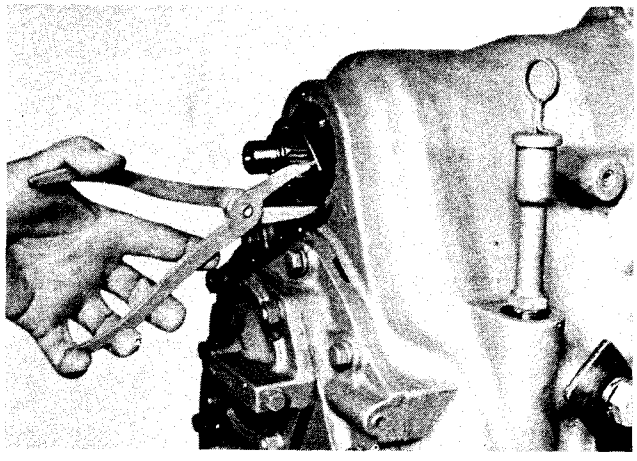

Figure 41
Remove P.T.O. bearing outer snap ring.

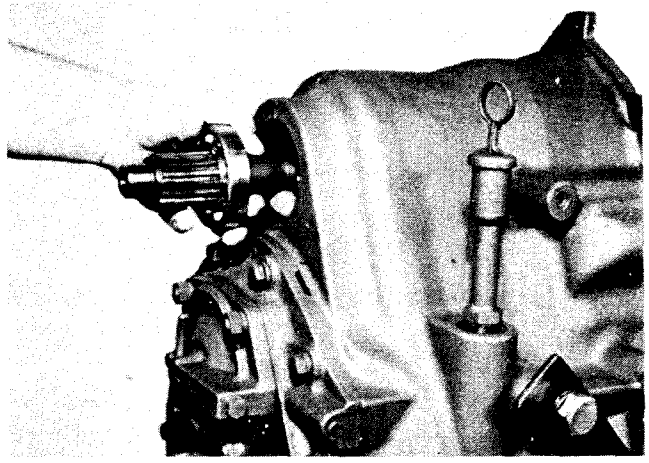

Figure 42
Remove P.T.O. shaft and bearing from housing.

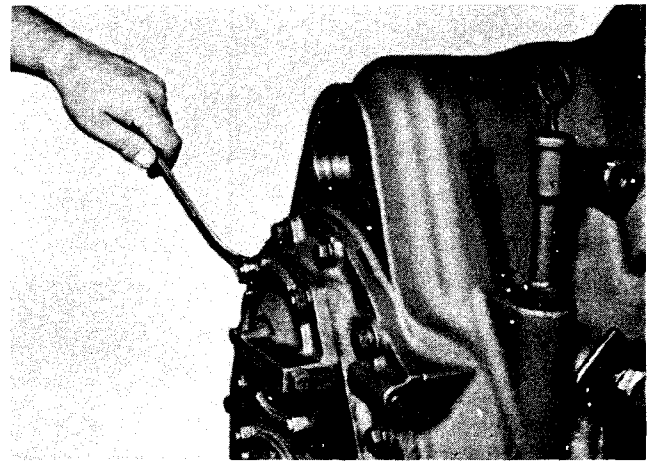

Figure 43
Remove low clutch rear bearing cap stud nuts and washers. Remove cap.

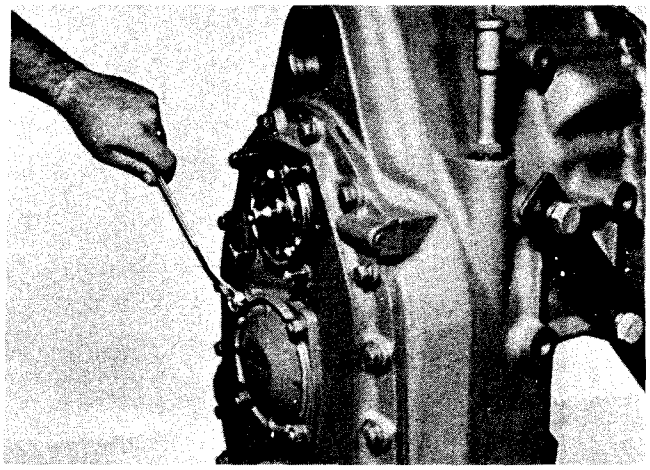

Figure 44
Remove idler shaft bearing cap stud nuts and washers.

CLARK

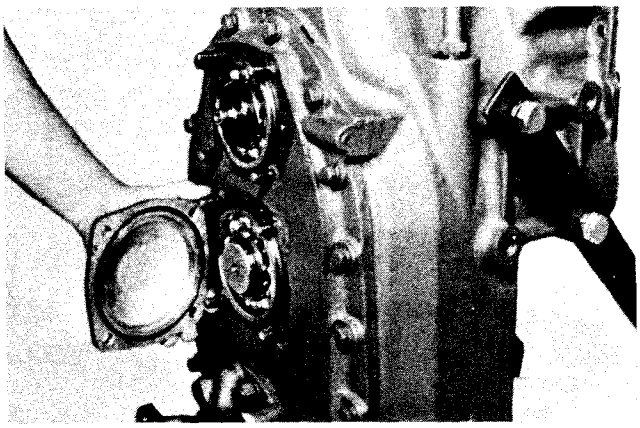

Figure 45
Remove bearing cap.

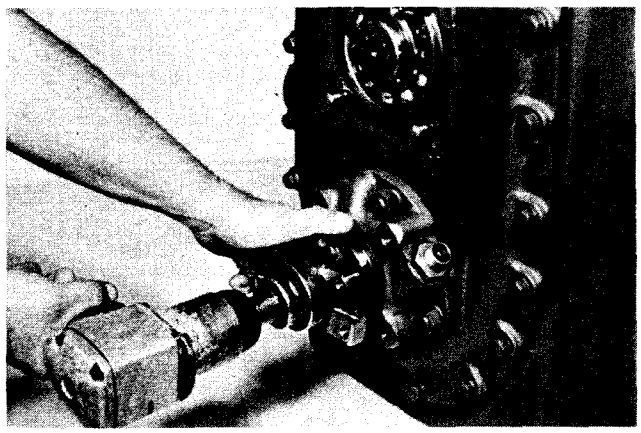

Figure 46
Using an impact wrench (if available), if not a flange retainer bar must be used to hold the companion flange from turning, loosen output flange nut.

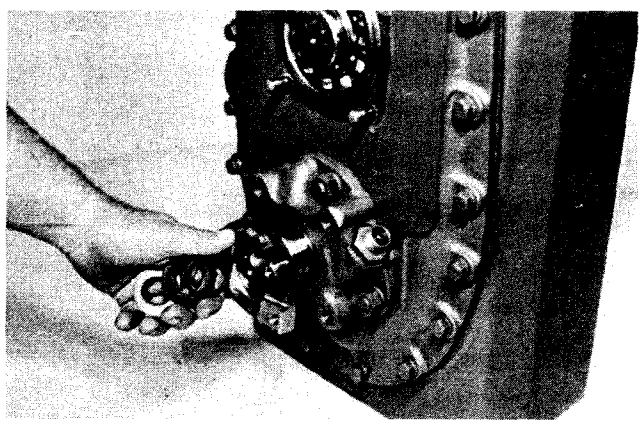

Figure 47
Remove flange nut, washer, "O" ring and flange. If a parking brake is used remove brake drum. Remove brake backing plate bolts and washers. Remove backing plate assembly.

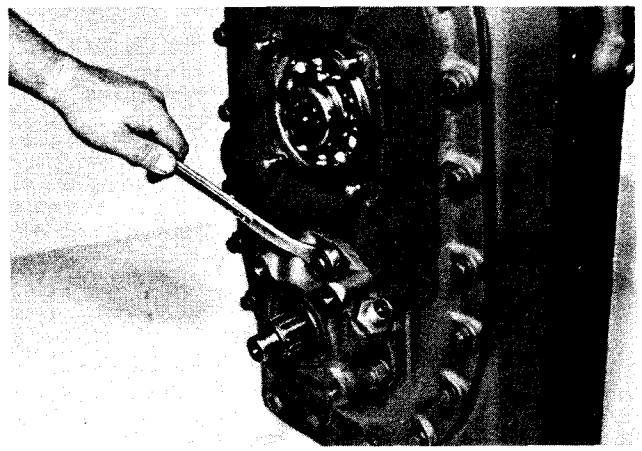

Figure 48
Remove output shaft bearing cap stud nuts and washers.

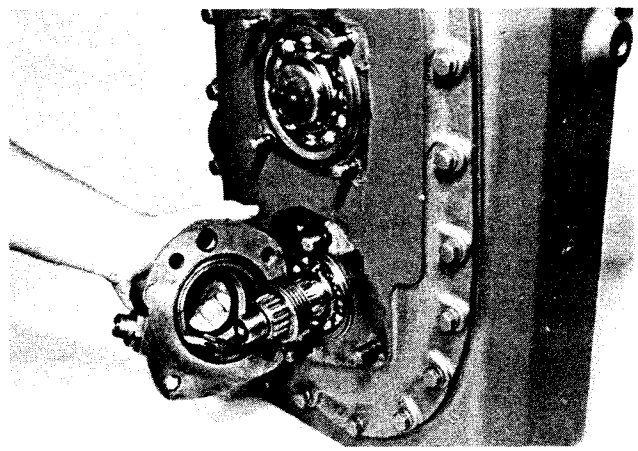

Figure 49
Remove output shaft bearing cap. Cap shown has optional speedometer gear. Remove speedometer drive gear from output shaft.

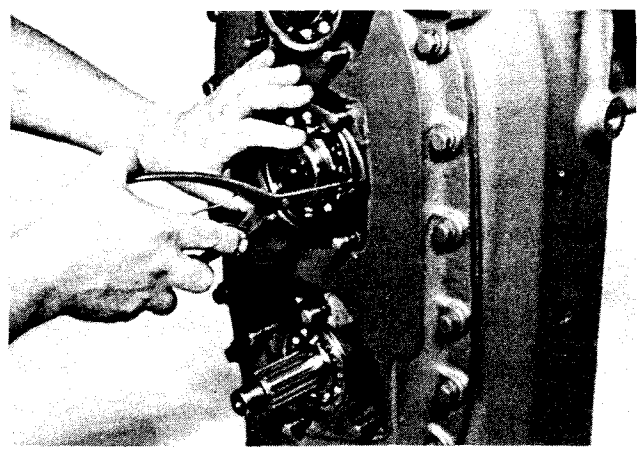

Figure 50
Remove low clutch, idler shaft and output shaft rear bearing locating rings.

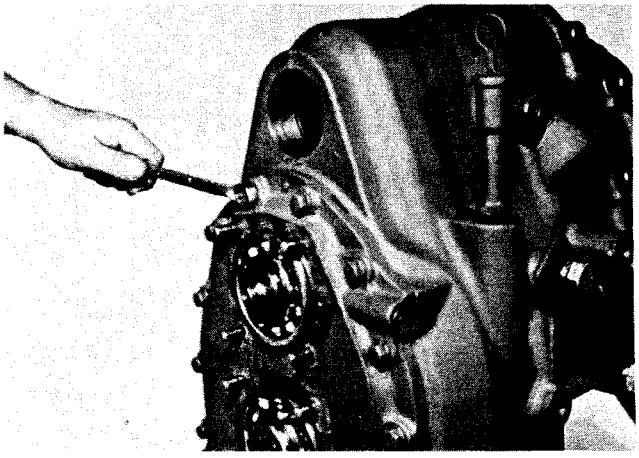

Figure 51
Remove rear cover bolts and washers.

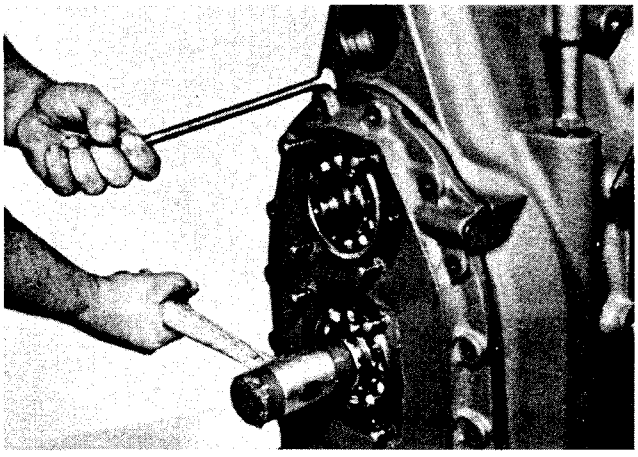

Figure 52
Using pry slots provided, pry cover from transmission housing. Using a soft hammer tap on low clutch, idler and output shafts to prevent cover from binding.

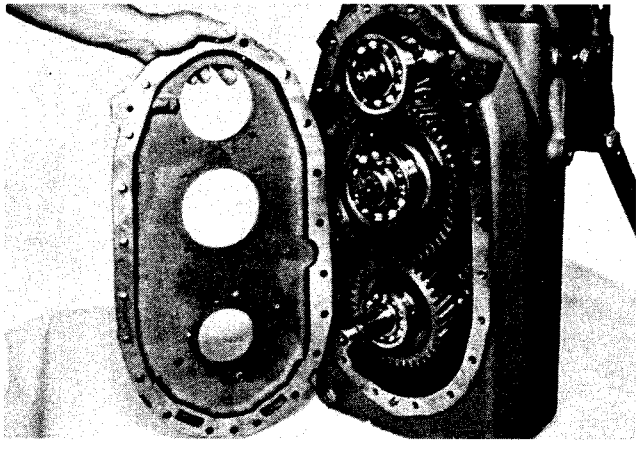

Figure 53
Rear cover removed

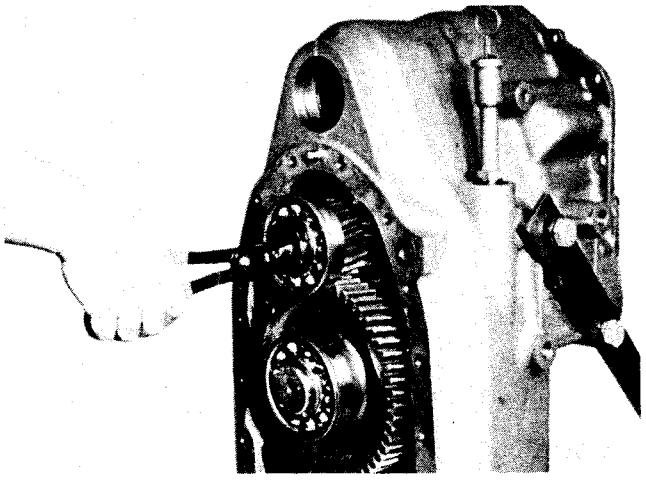

Figure 54
Remove low clutch rear bearing retainer ring.

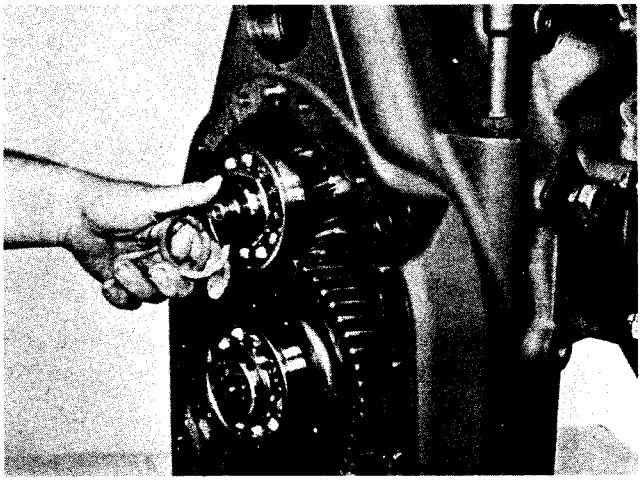

Figure 55
Low clutch rear bearing spacer and retainer ring.

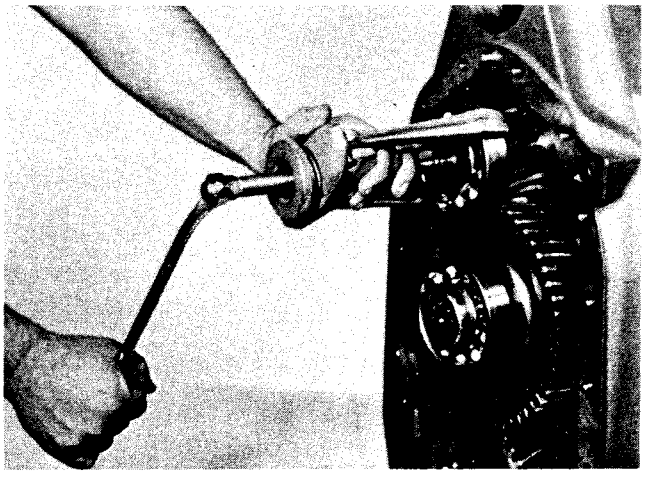

Figure 56
Remove low clutch rear bearing.

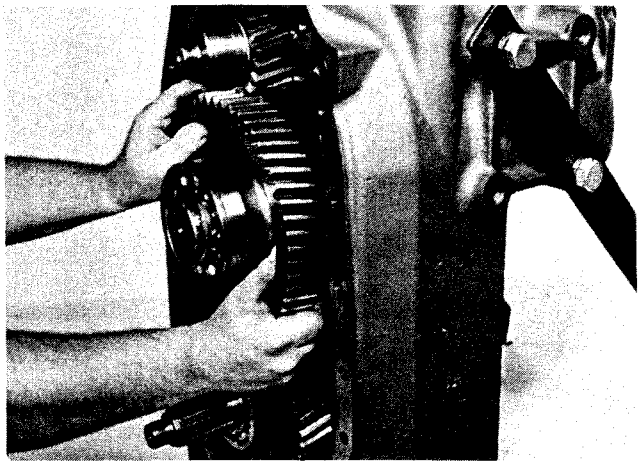

Figure 57
Remove idler gear and rear bearing as an assembly.

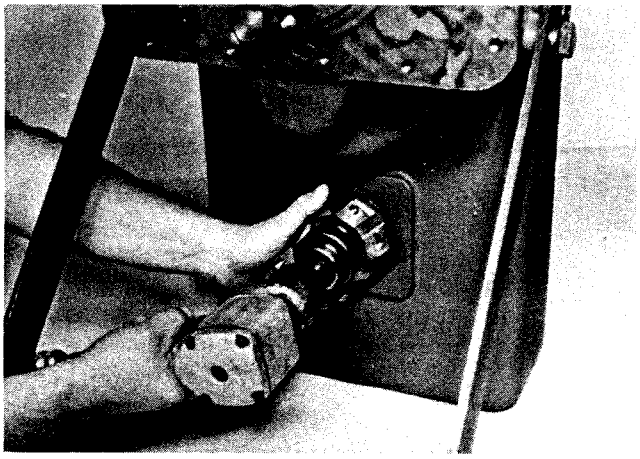

Figure 58
Remove output shaft front flange nut, washer, "O" ring and flange.

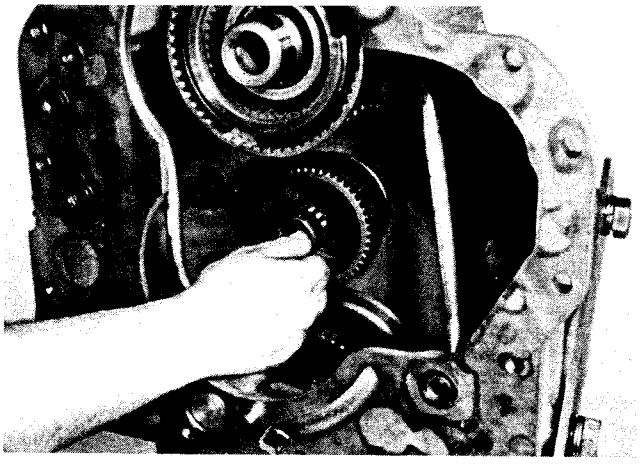

Figure 59
Remove reverse and 2nd clutch pilot bearing.

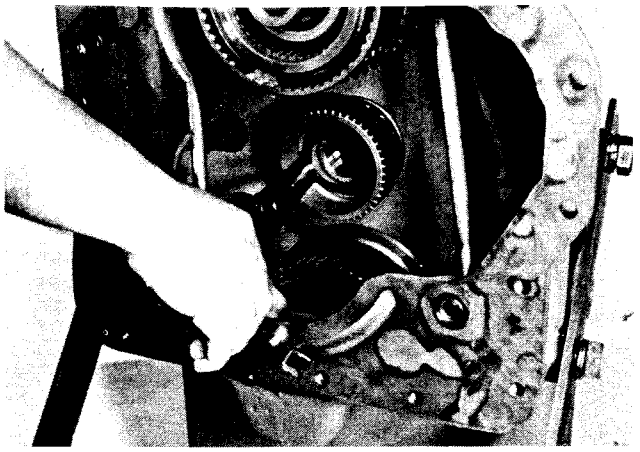

Figure 60
Remove 2nd clutch disc hub retainer ring.

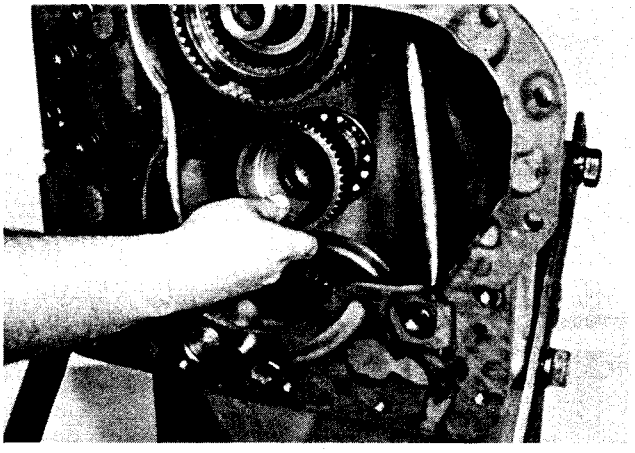

Figure 61
Remove disc hub.

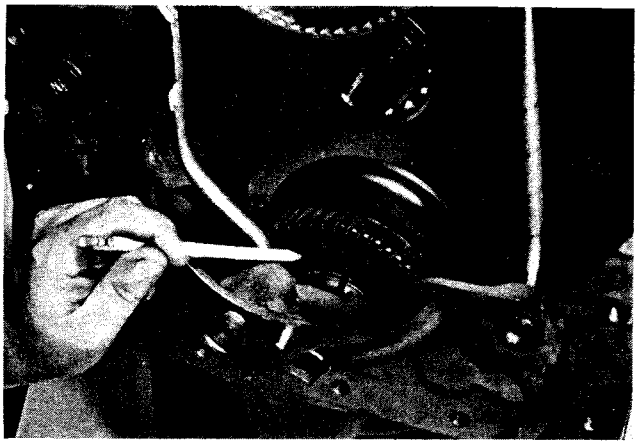

Figure 62
Compress ears on 3rd clutch front bearing locating ring. Remove ring from ring groove. It is not necessary to remove ring from clutch, it will come out when clutch is removed. See Figure 62-A.

CLARK

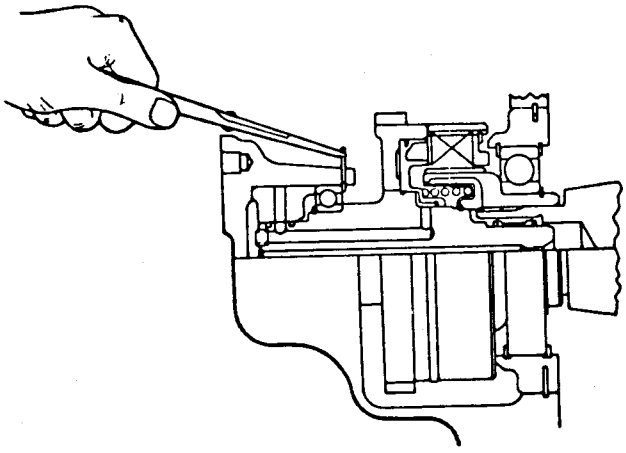

Figure 62-A

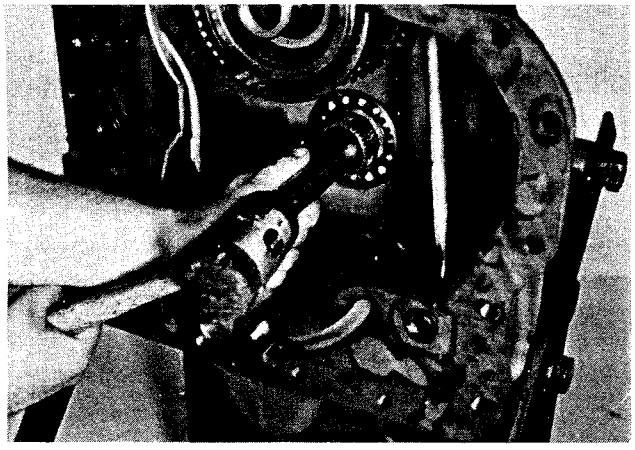

Figure 63

Tap low clutch assembly from housing. If possible it is recommended someone help in this operation to prevent the low clutch from dropping out of the case.

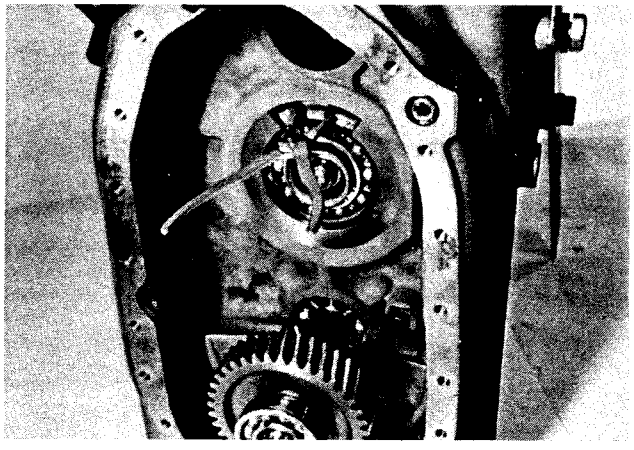

Figure 64

Using contracting type snap ring pliers as shown, contract 3rd clutch bearing carrier locating ring. Lock pliers to hold ring contracted.

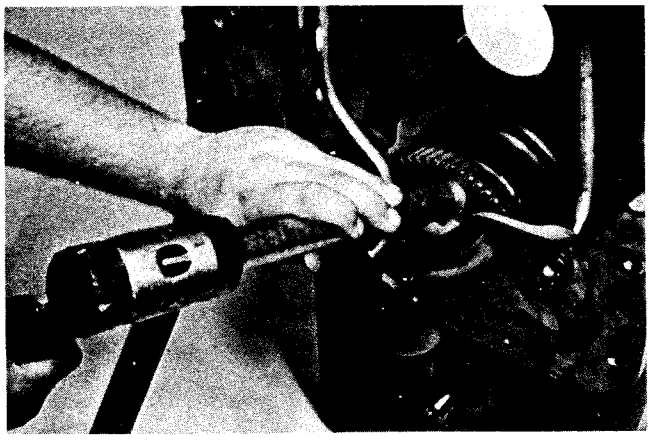

Figure 65

From front of transmission and using a soft bar tap 3rd speed clutch assembly from housing. If clutch seems difficult to remove recheck front and rear snap rings being sure they are clear of the ring groove.

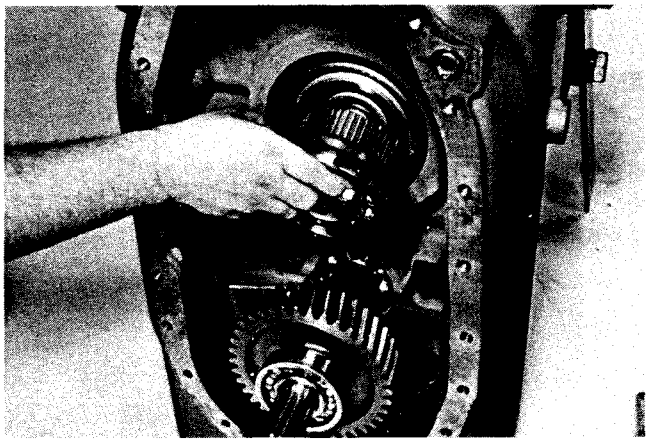

Figure 66

Remove bearing carrier, bearing and 3rd speed clutch disc hub.

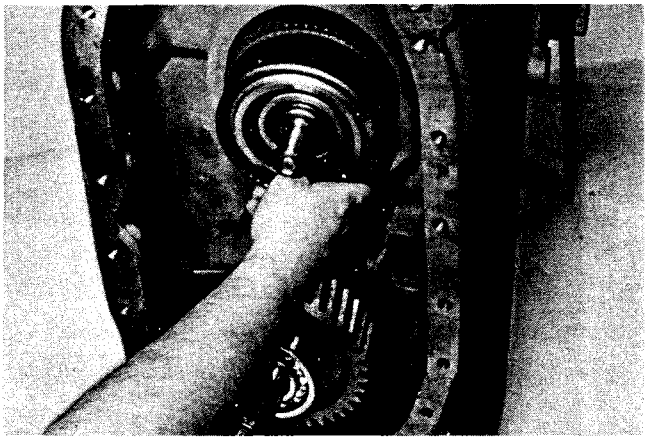

Figure 67

Remove 3rd speed clutch assembly.

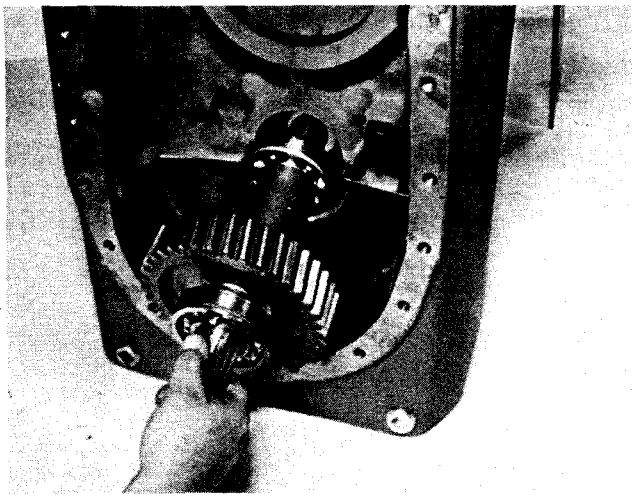

Figure 68
Remove output shaft and bearings as an assembly.

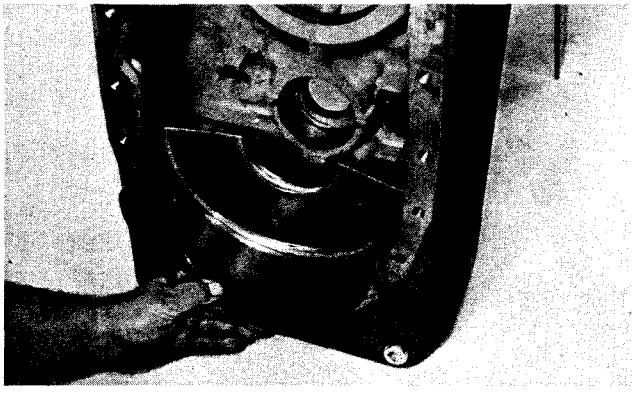

Figure 69
Remove oil sump oil baffle.

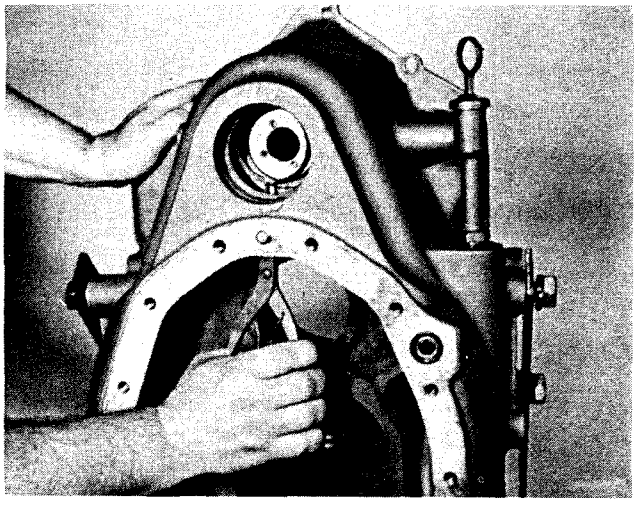

Figure 70
Remove forward clutch shaft drive gear retainer ring. See Figure 70-A.

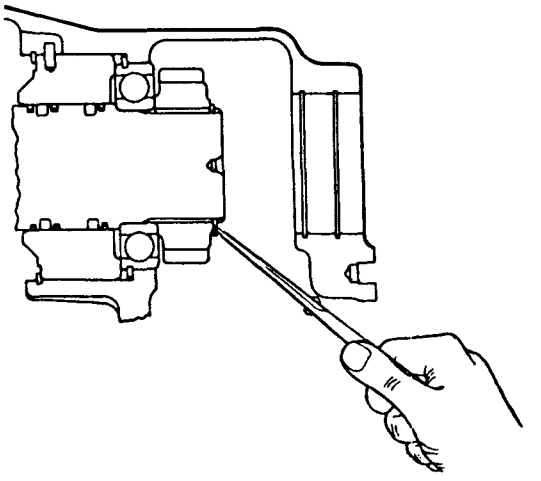

Figure 70-A

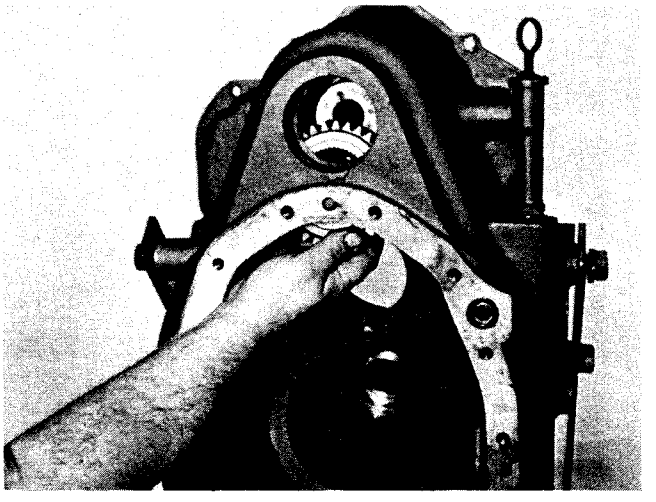

Figure 71
Remove forward clutch shaft drive gear.

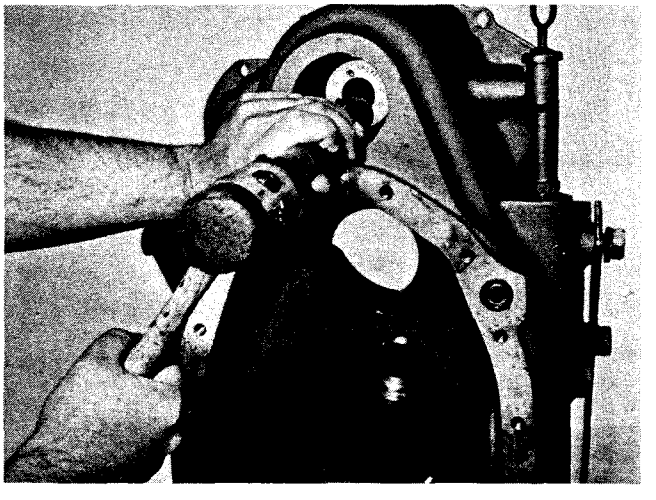

Figure 72
Tap forward clutch from rear bearing.

CLARK

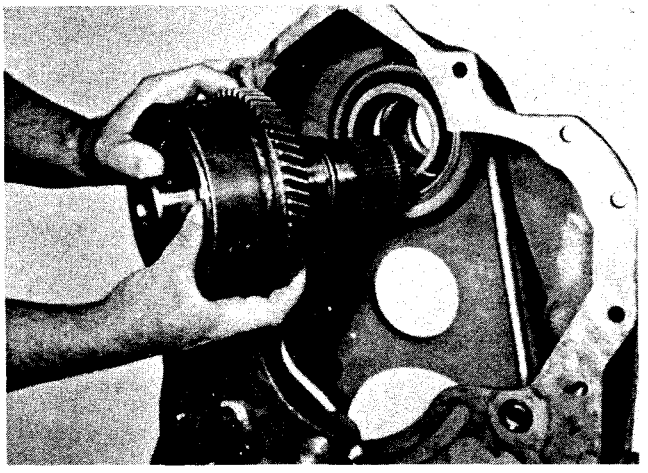

Figure 73
Remove forward clutch assembly.

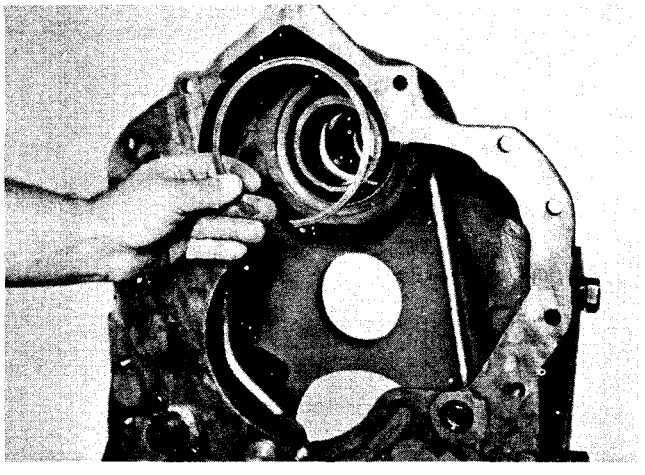

Figure 74
Remove forward clutch piston ring sleeve retainer ring.

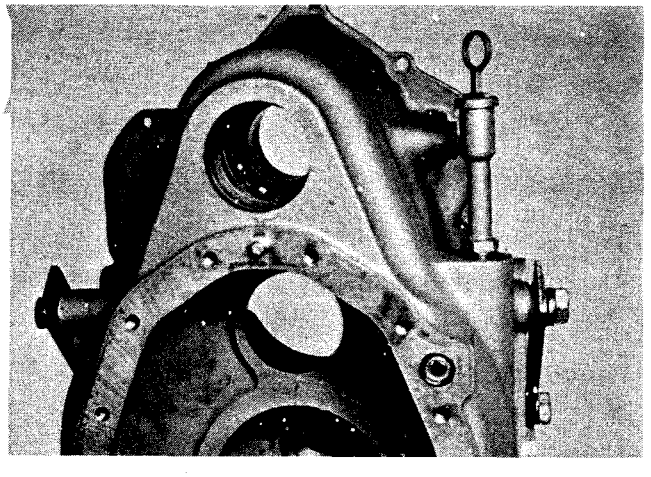

Figure 75
If piston ring sleeve or forward clutch rear bearing is to be replaced, tap bearing from rear of housing.

CLUTCH DISASSEMBLY
Low Clutch

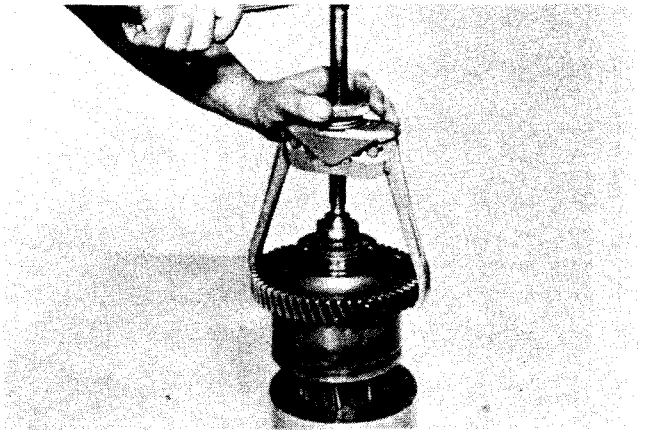

Figure 76
Remove low gear and hub, bearing spacer and low clutch front bearing.

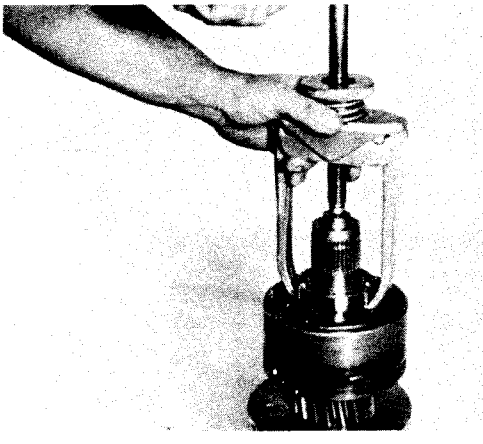

Figure 77
Remove low speed gear bearing.

Figure 78
Remove low gear bearing locating ring.

CLARK

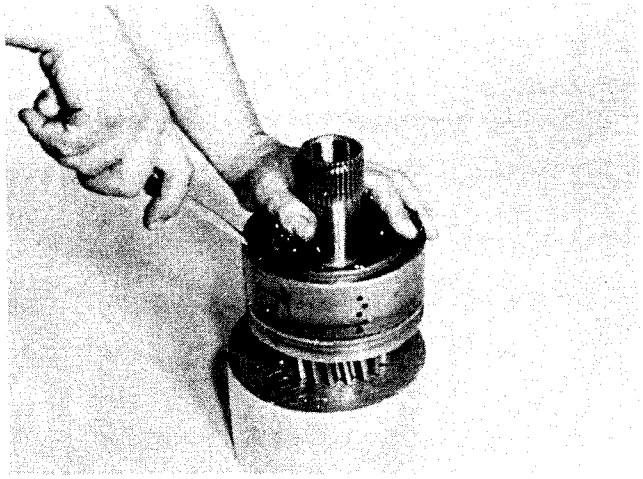

Figure 79
Remove end plate retainer ring.

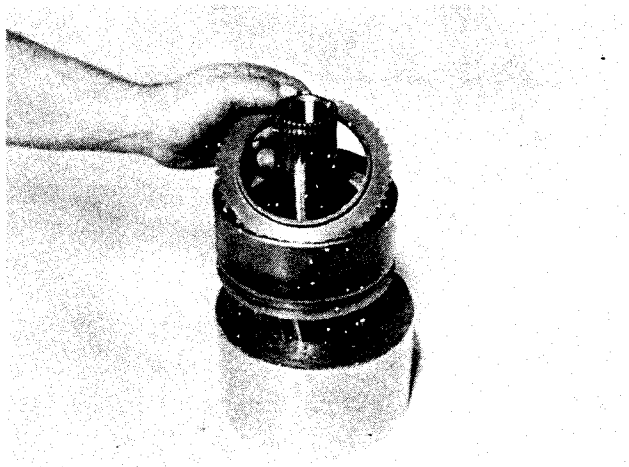

Figure 80
Remove end plate.

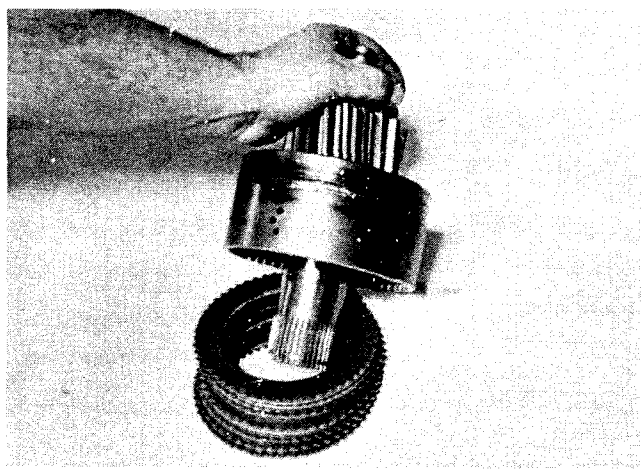

Figure 81
Turn clutch over. Remove inner and outer clutch discs.

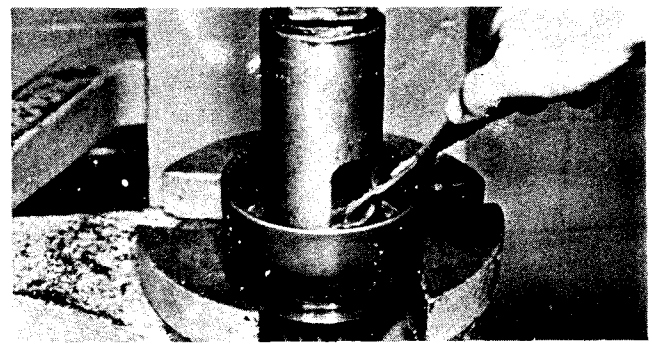

Figure 82
Remove clutch piston return spring. A sleeve with a portion removed is recommended for removing the clutch piston return spring, washer, and retainer ring. Sleeve shown is a common pipe, with a 1-1/2 x 1 [39,0x26,0mm] opening. The pipe is 6 x 3-1/4 x 2-3/4 [155,0x85,0x78,0mm]. Compress spring retainer washer. Through opening remove spring retainer snap ring. Release tension on spring retainer.

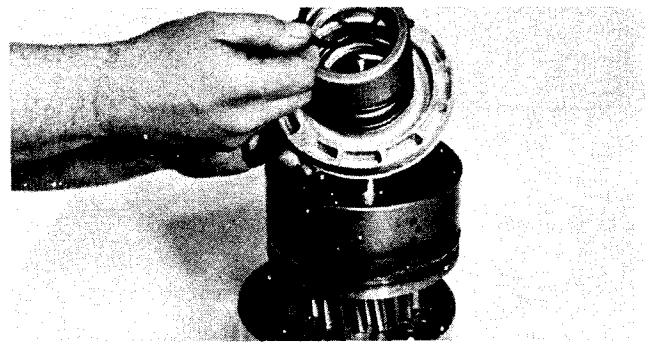

Figure 83
Remove spring retainer and spring. Turn clutch over and tap clutch shaft on a block of wood to remove clutch piston.

LOW CLUTCH REASSEMBLY

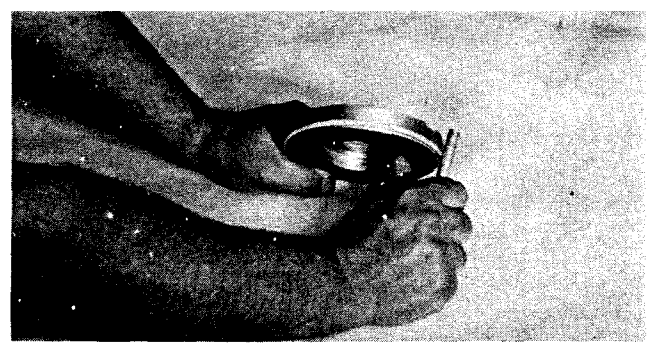

Figure 84
Install clutch piston outer seal ring. **NOTE:** Ring must be sized before installing in clutch drum. Sizing is best accomplished by rotating piston while holding a round object against the new seal ring as shown. Rotate piston until seal ring is flush with outer diameter of piston.

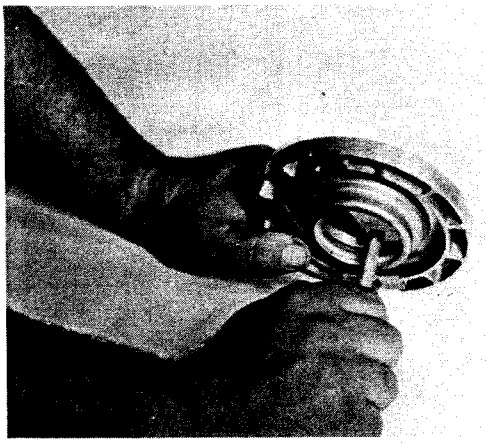

Figure 85
Install clutch piston inner seal ring and size as described in Figure 84.

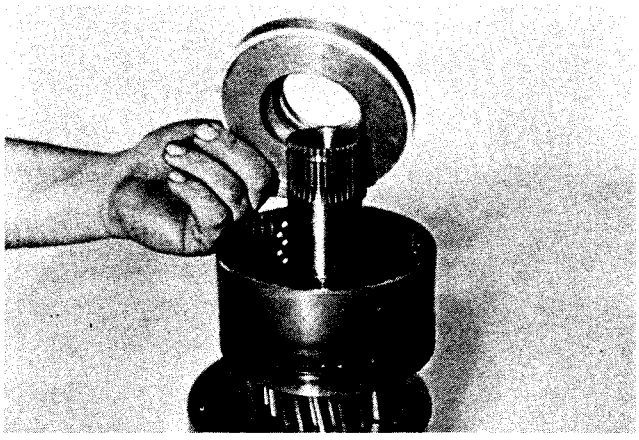

Figure 86
Position piston in low clutch drum as shown. Use caution as not to damage inner and outer piston sealing rings.

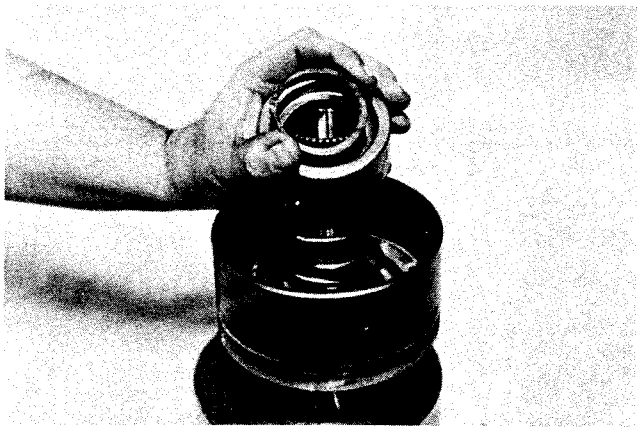

Figure 87
Position piston return spring, spring retainer, and snap ring in clutch drum.

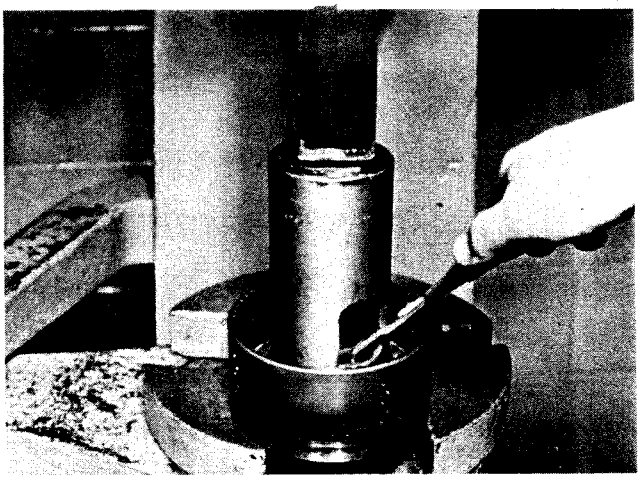

Figure 88
Compress spring and retainer. Install retainer snap ring.

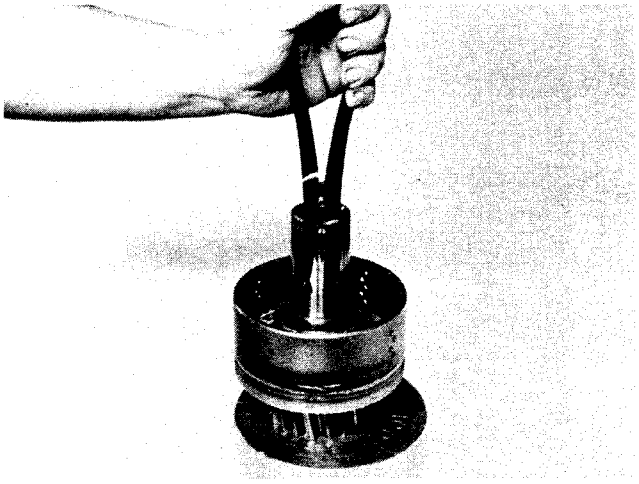

Figure 89
Install clutch inner bearing locating ring.

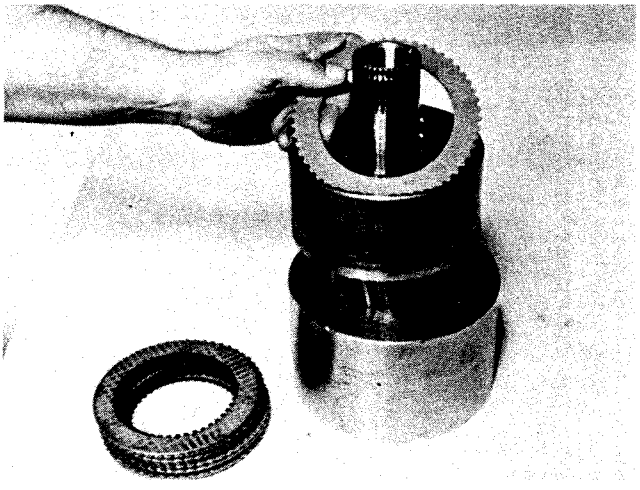

Figure 90
Install one steel disc.

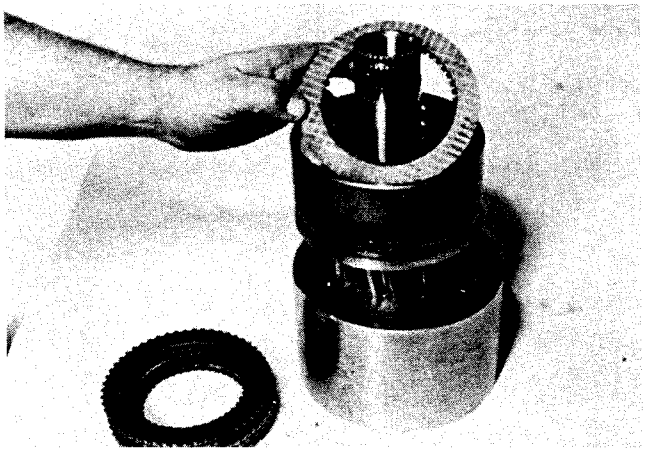

Figure 91
Install one friction disc. Alternate steel and friction discs until the proper amount of discs are installed. First disc next to the piston is steel, last disc installed is friction.

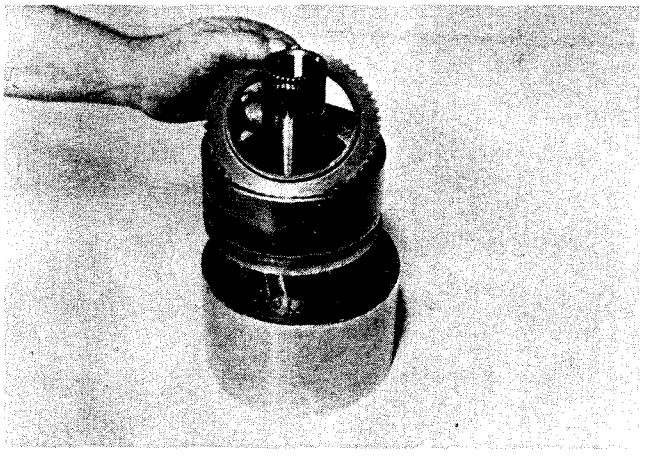

Figure 92
Install clutch disc end plate.

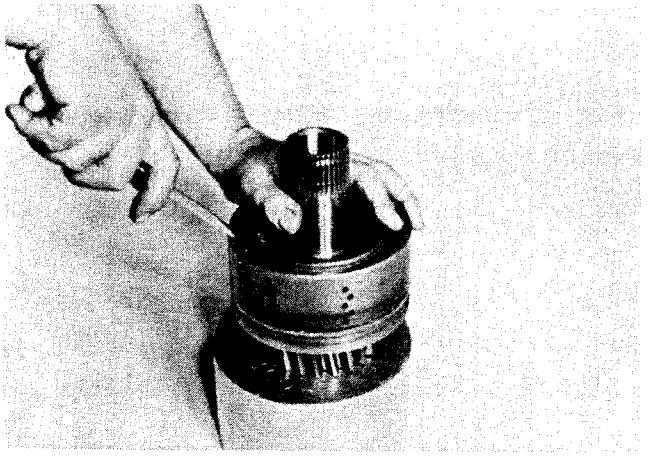

Figure 93
Install end plate retainer ring.

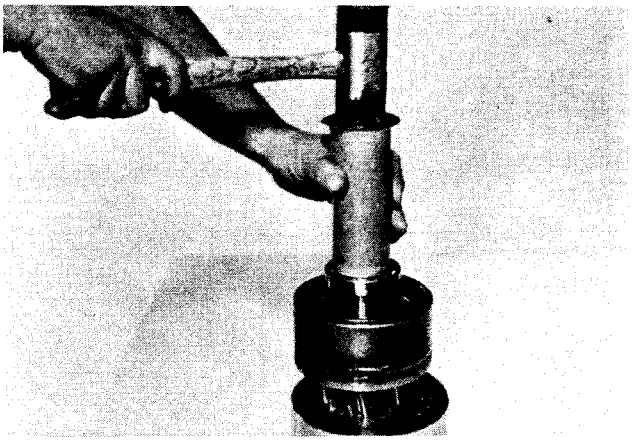

Figure 94
Install low speed gear inner bearing.

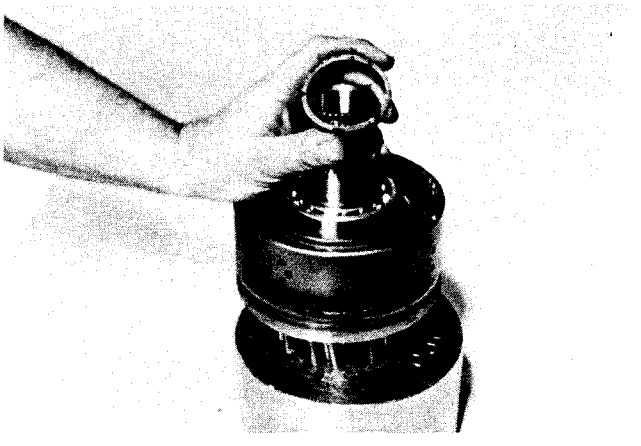

Figure 95
Install low speed gear bearing spacer.

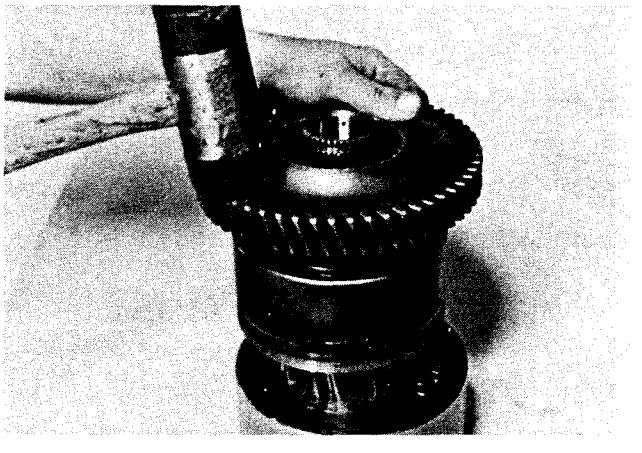

Figure 96
Install low clutch driven gear and hub into clutch drum. Align splines on clutch hub with internal teeth of friction discs. Tap gear into position. Do not force this operation. Gear splines must be in full position with internal teeth of all friction discs.

CLARK

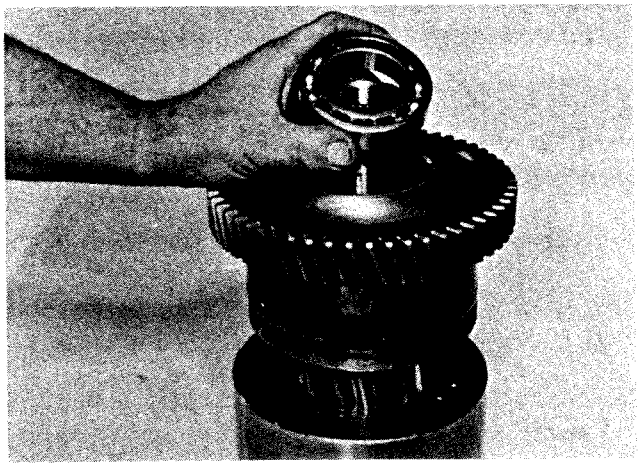

Figure 97
Install low speed gear outer bearing.

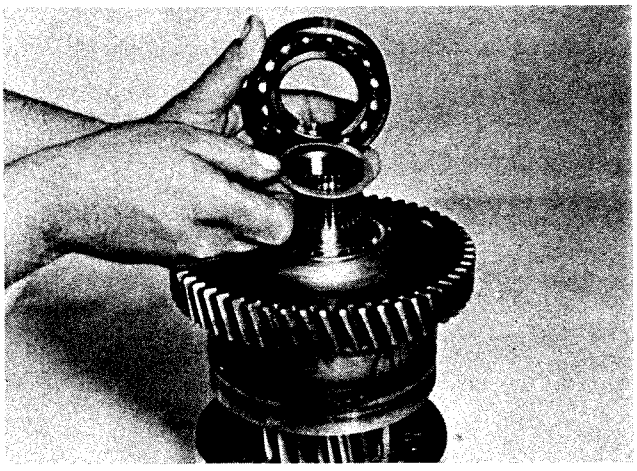

Figure 98
Position low gear front bearing spacer and bearing on clutch shaft.

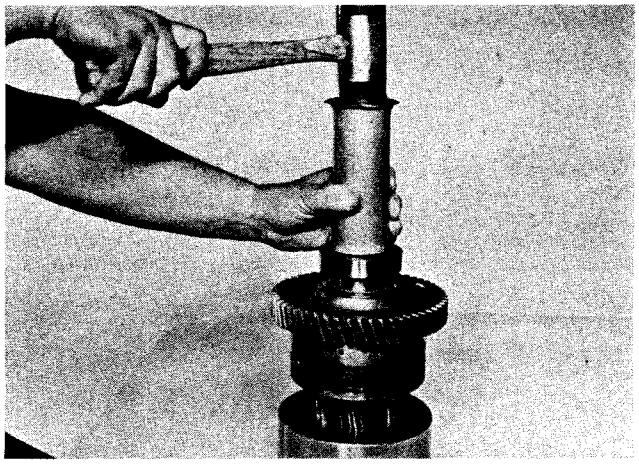

Figure 99
Tap bearing into position.

REVERSE AND 2nd CLUTCH DISASSEMBLY
(Reverse being disassembled)

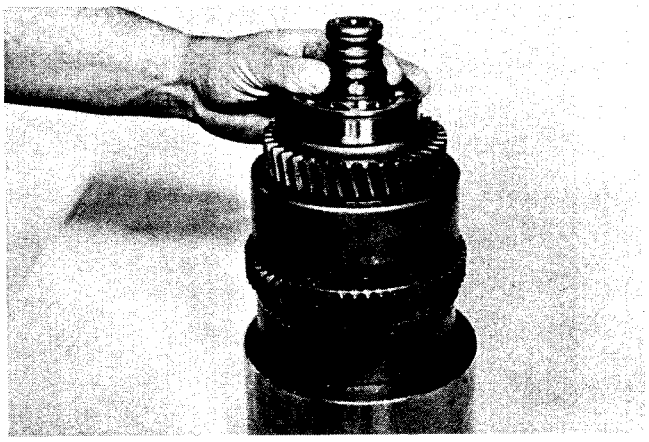

Figure 100
Remove clutch shaft piston rings.

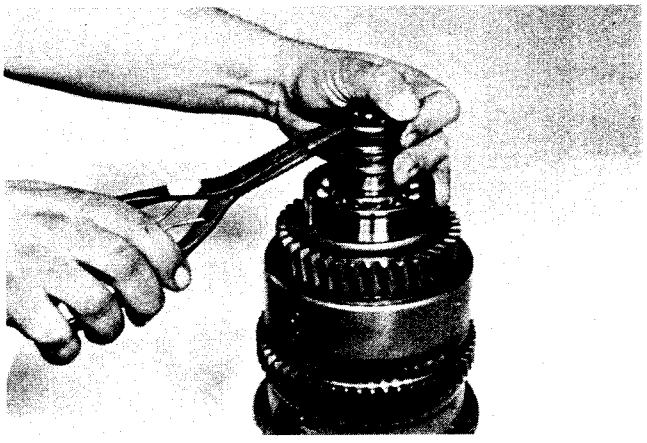

Figure 101
Remove front bearing retainer ring.

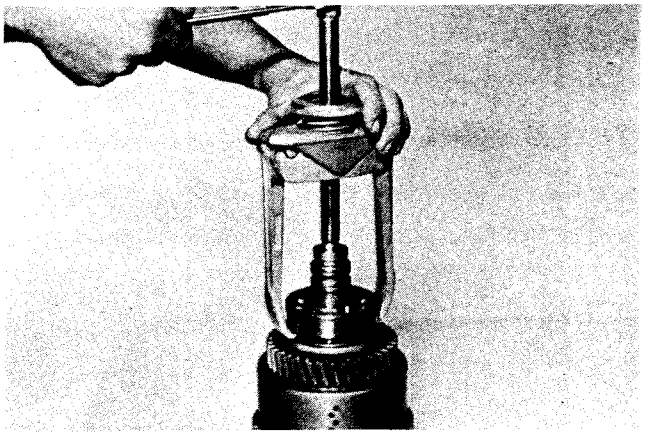

Figure 102
Remove front bearing.

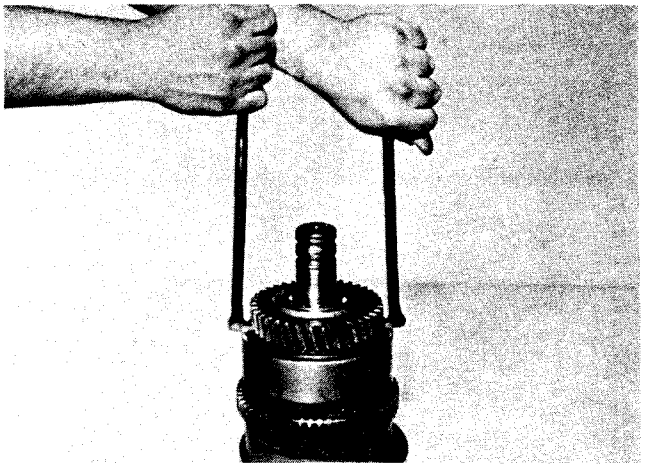

Figure 103
Pry reverse gear from clutch assembly far enough to use a gear puller.

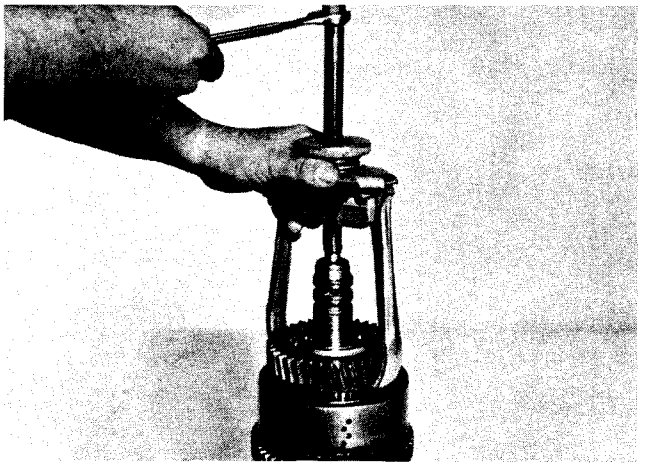

Figure 104
Remove gear as shown.

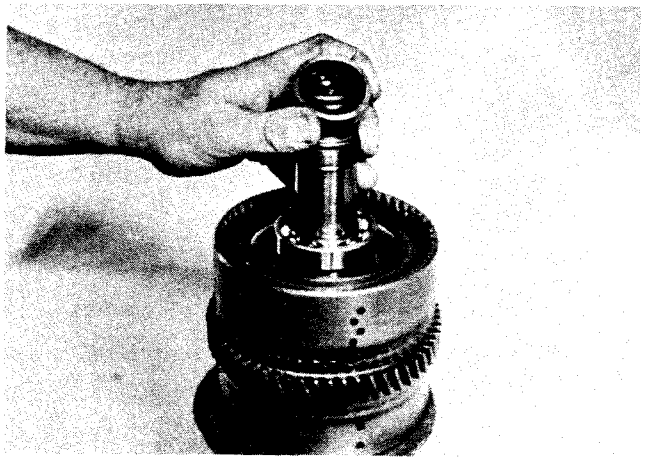

Figure 105
Remove bearing spacer.

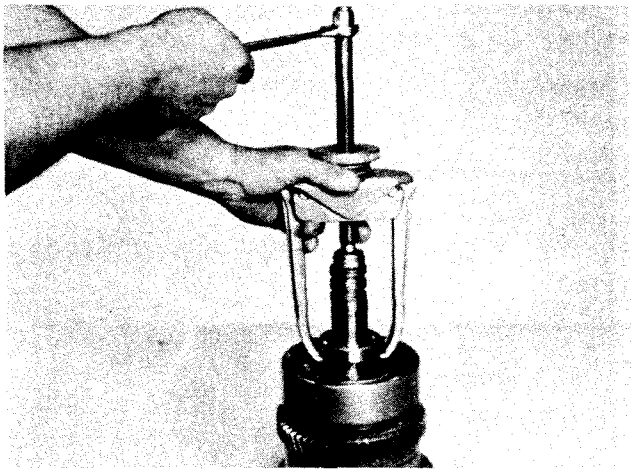

Figure 106
Remove inner bearing.

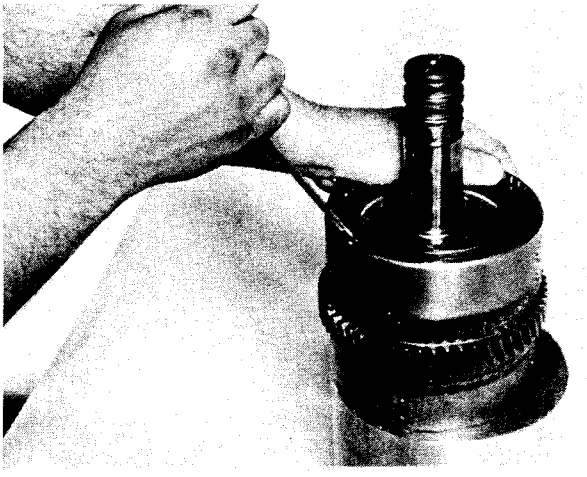

Figure 107
Remove end plate retainer ring.

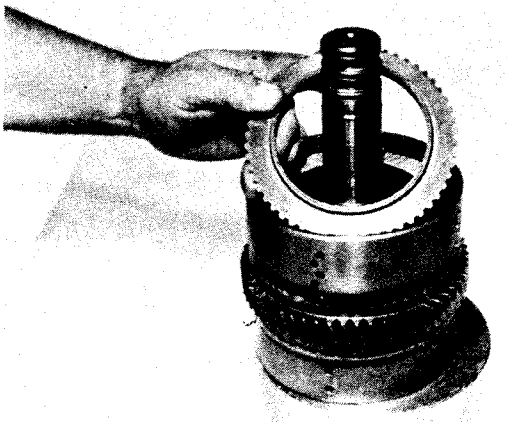

Figure 108
Remove end plate.

CLARK

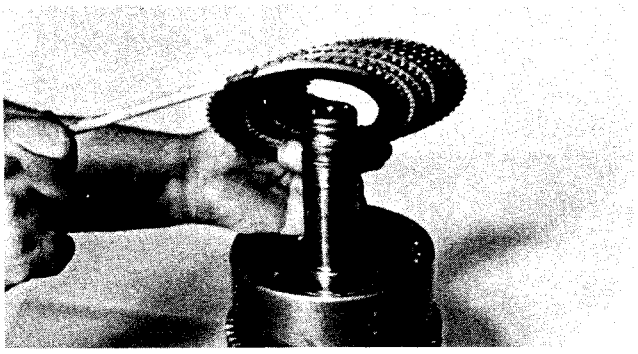

Figure 109

Remove clutch discs. **NOTE:** In units equipped with modulation the forward and reverse clutches will have a reduced size clutch piston. The steel clutch plate next to the piston will have a backing ring on it as shown.

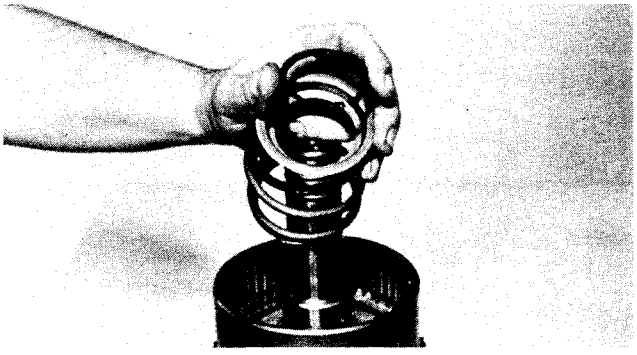

Figure 110

Refer to procedure shown in Figure 82 for removing return spring retainer ring. Remove ring, spring retainer and return spring. Turn clutch over and tap shaft on a block of wood to remove clutch piston. Repeat procedure for 2nd clutch disassembly.

REVERSE AND 2ND CLUTCH REASSEMBLY

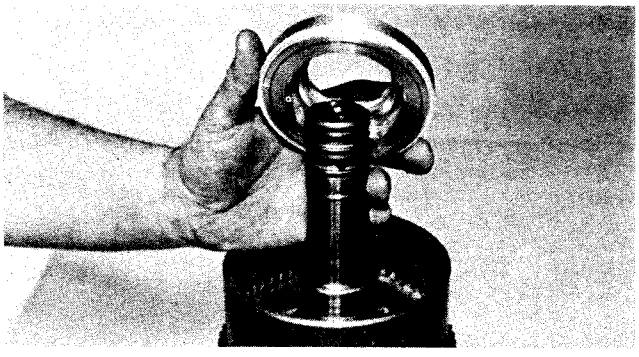

Figure 111

Install inner and outer clutch piston seal rings. Size rings as explained in Figure 84. Position piston in clutch drum. **NOTE:** Low clutch, 2nd clutch or 3rd clutch will not have reduced size pistons. This is for modulation in forward and reverse only.

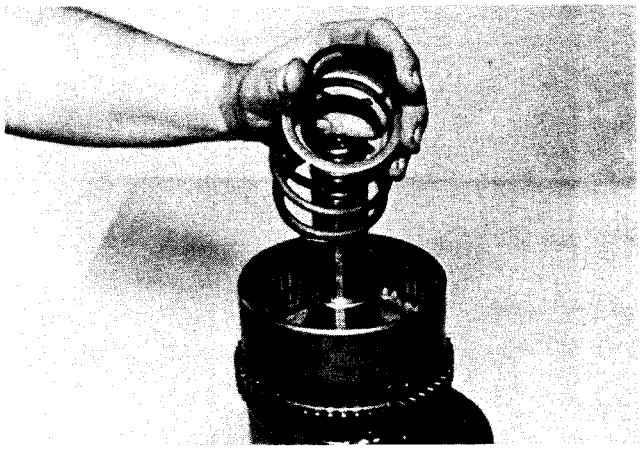

Figure 112

Install return spring, spring retainer and retainer ring.

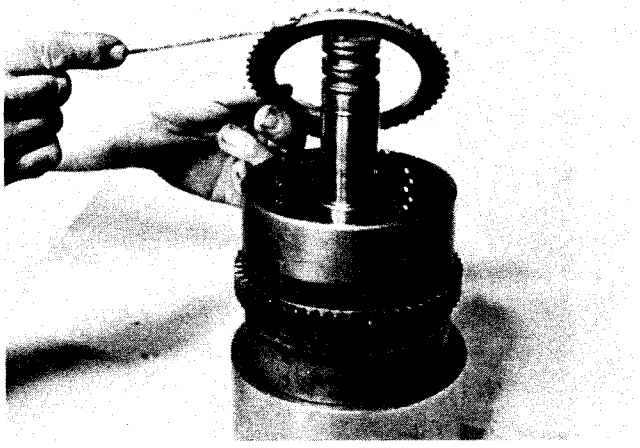

Figure 113

Install 1st steel disc with backing ring next to piston. **NOTE:** This disc is used only in forward and reverse modulated clutches.

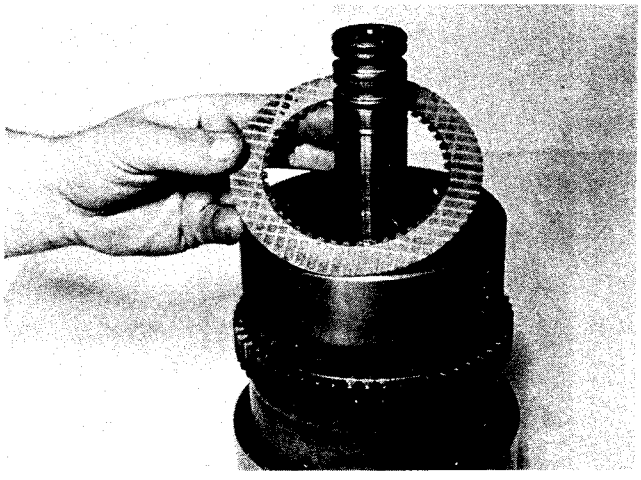

Figure 114

Install one friction disc.

CLARK

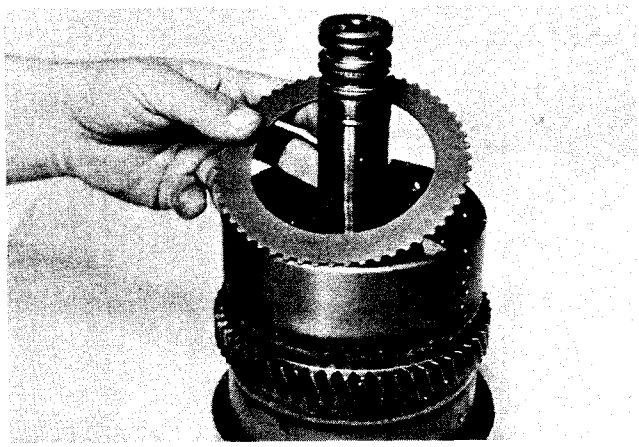

Figure 115
Install one steel disc. Alternate friction and steel discs until the proper amount of discs are installed. First disc next to the piston is steel, last disc installed is friction. **NOTE:** On forward and reverse modulated clutches the first steel disc will have a backing ring on it.

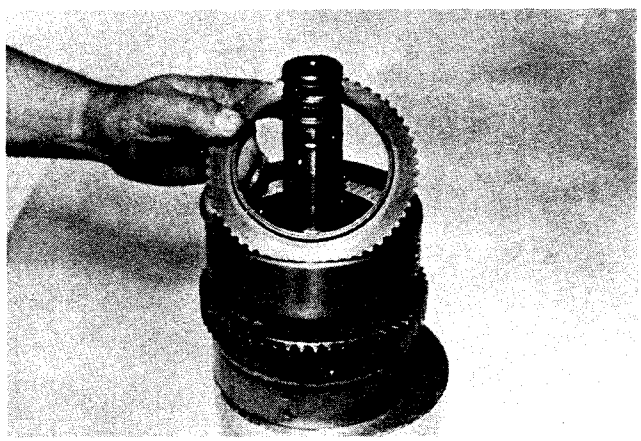

Figure 116
Install end plate.

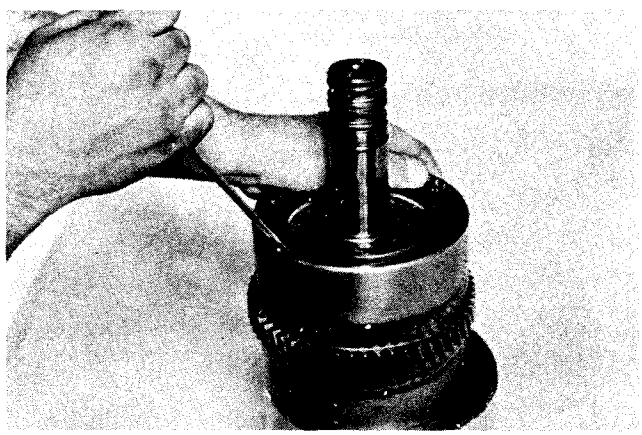

Figure 117
Install end plate retainer ring.

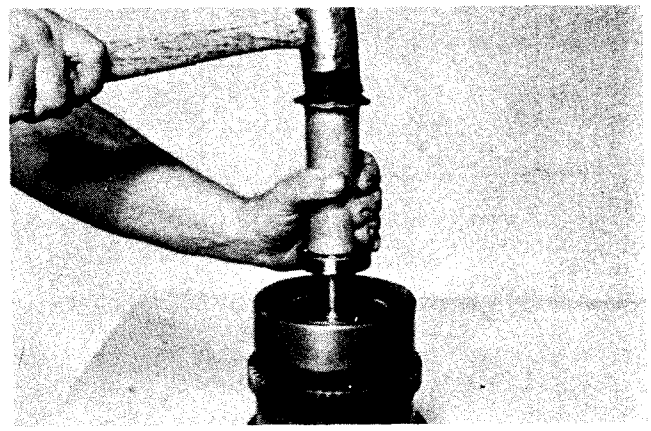

Figure 118
Install inner clutch driven gear bearing.

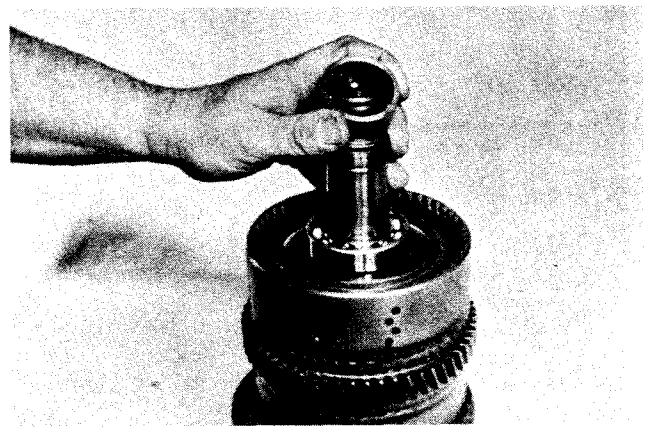

Figure 119
Install bearing spacer.

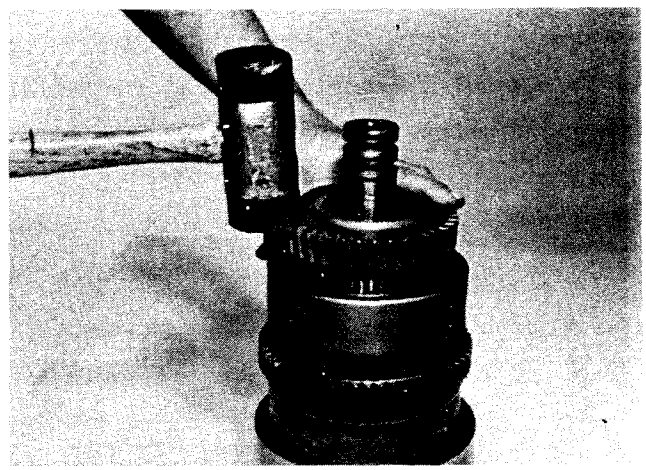

Figure 120
Install clutch driven gear into clutch drum. Align splines on clutch gear with internal teeth of friction discs. Tap gear into position. Do not force this operation. Gear splines must be in full position with internal teeth of all friction discs.

CLARK

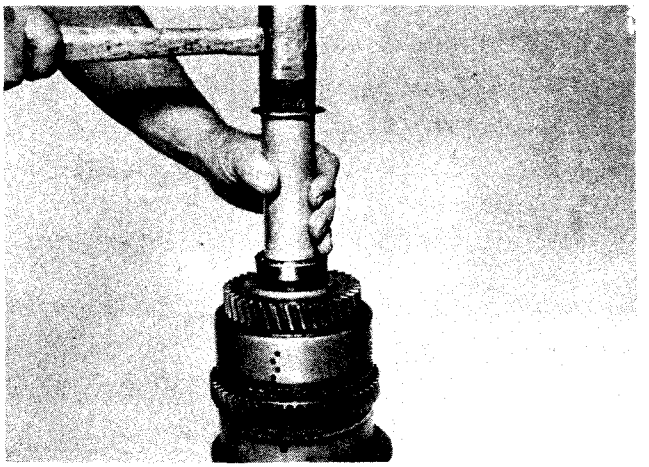

Figure 121
Install outer bearing.

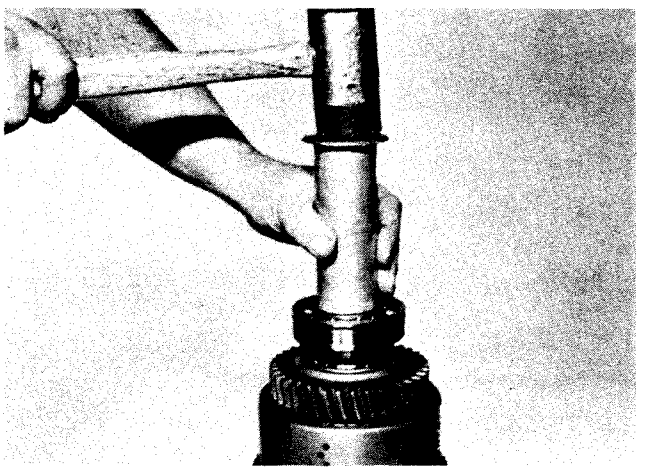

Figure 122
Install front bearing. **NOTE:** Snap ring groove in front bearing must be up.

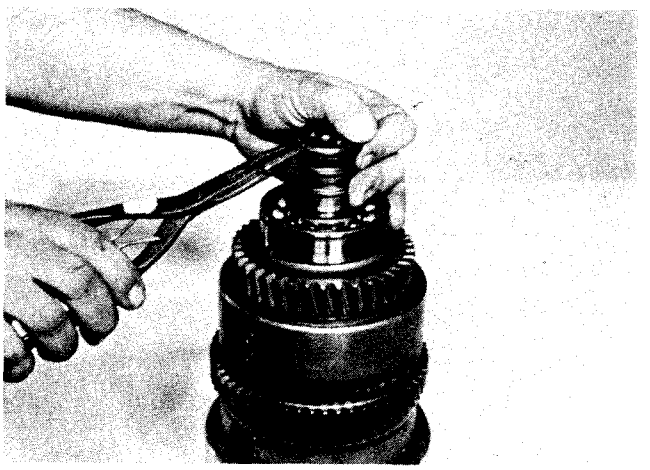

Figure 123
Install front bearing retainer ring.

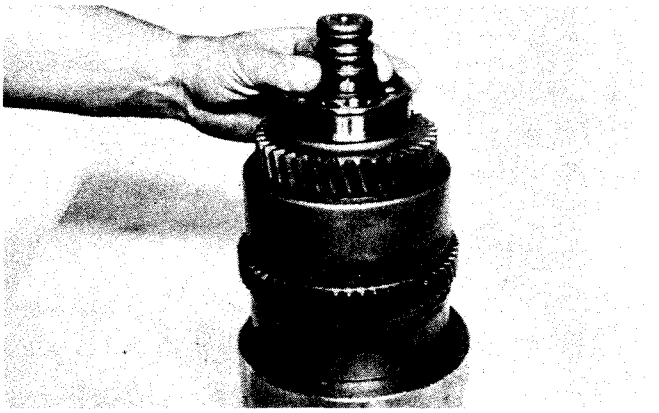

Figure 124
Install new clutch shaft piston rings. Grease rings to center on shaft to facilitate reassembly into transmission housing.

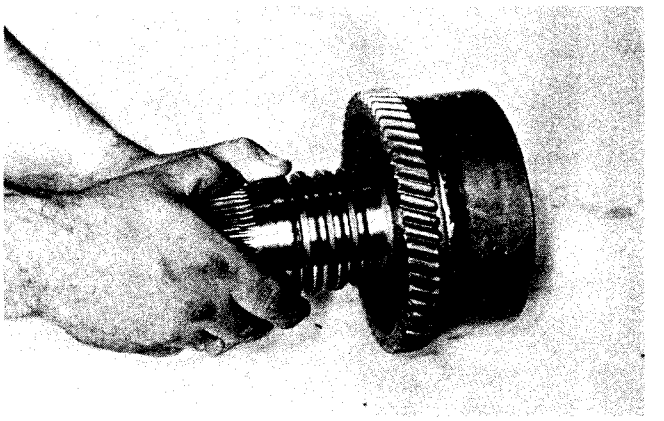

Figure 125
Forward clutch will disassemble and reassemble the same as the reverse clutch. Install new clutch shaft piston rings. Grease rings to facilitate reassembly.

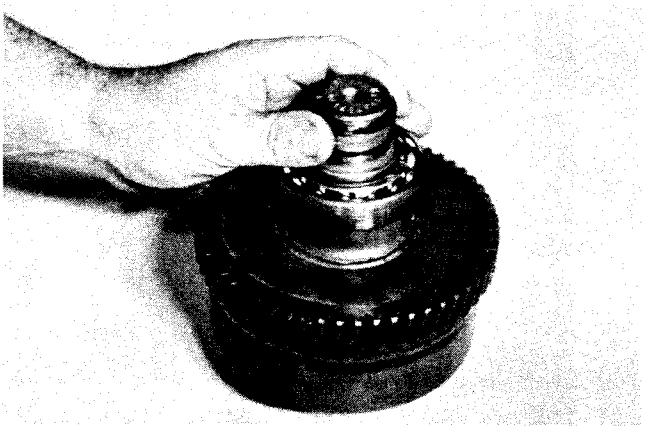

Figure 126
The 3rd speed clutch will disassemble and reassemble the same as the forward. Install new clutch shaft piston rings.

CONVERTER HOUSING DISASSEMBLY

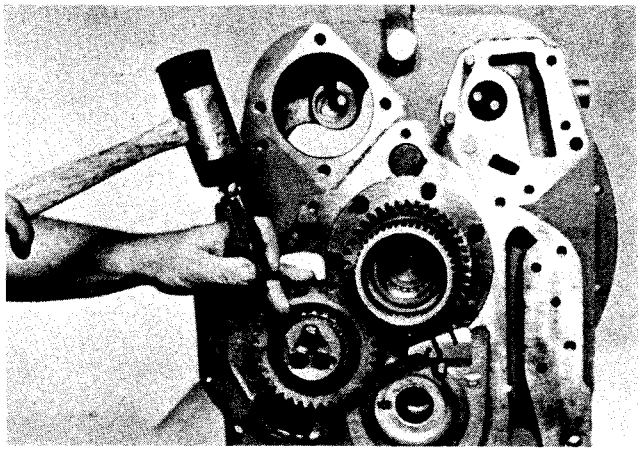

Figure 127
Straighten lockplate tabs from reverse idler capscrews.

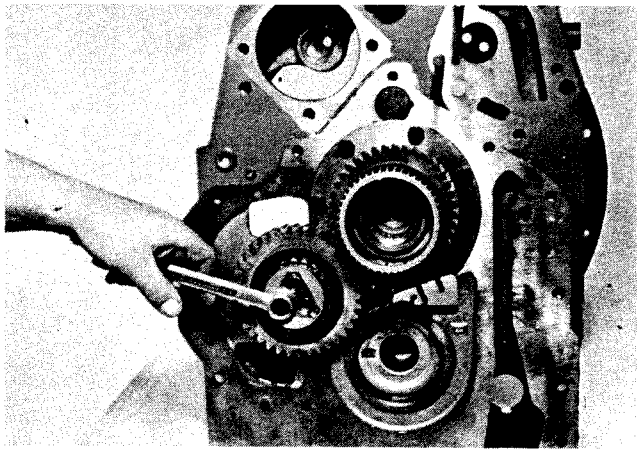

Figure 128
Remove reverse idler capscrews.

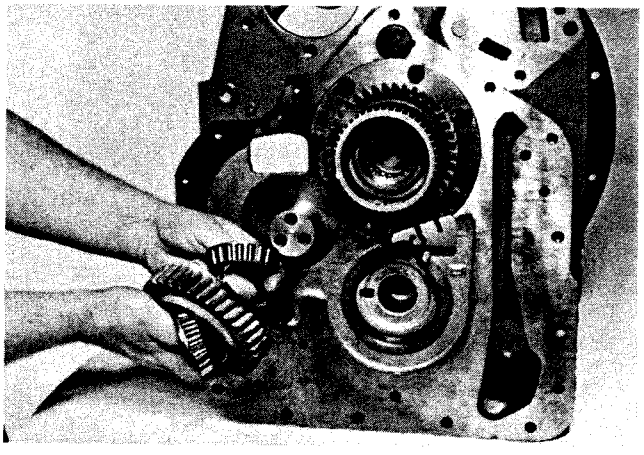

Figure 129
Remove reverse idler gear and bearing assembly.

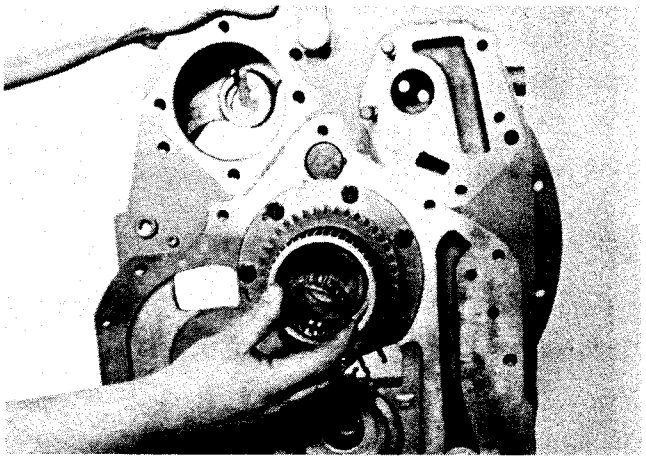

Figure 130
Remove forward shaft pilot bearing.

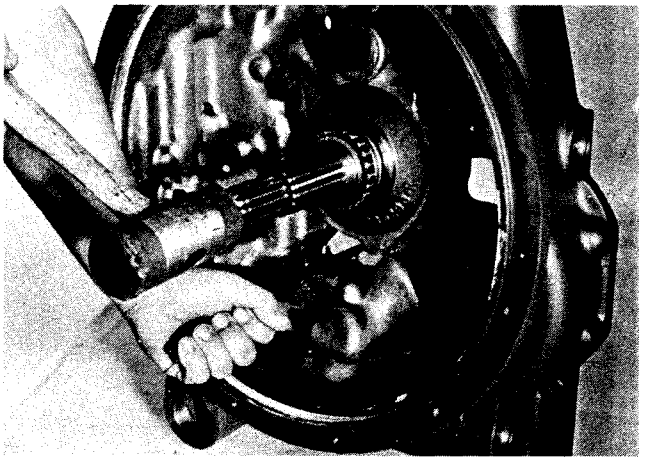

Figure 131
Using spreader type snap ring pliers spread ears on the turbine shaft bearing snap ring. Tap turbine shaft from converter housing.

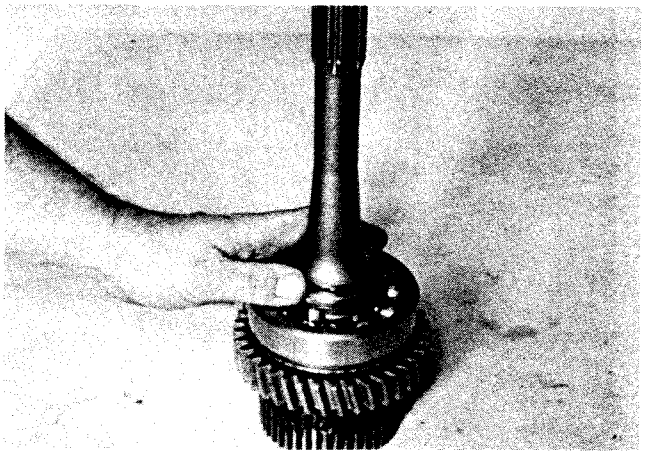

Figure 132
Remove turbine shaft piston ring.

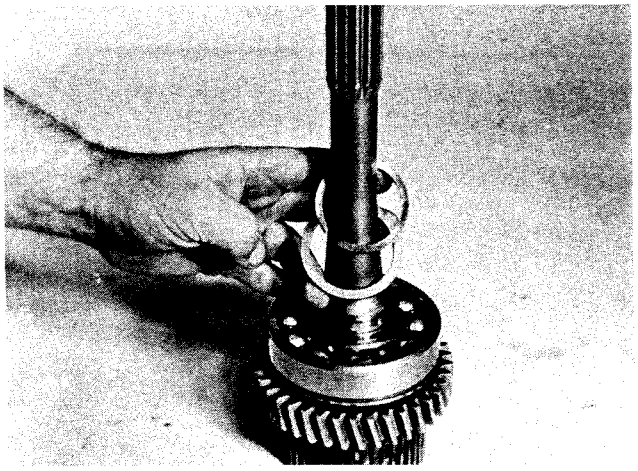

Figure 133
Remove turbine shaft bearing retainer ring and washer.

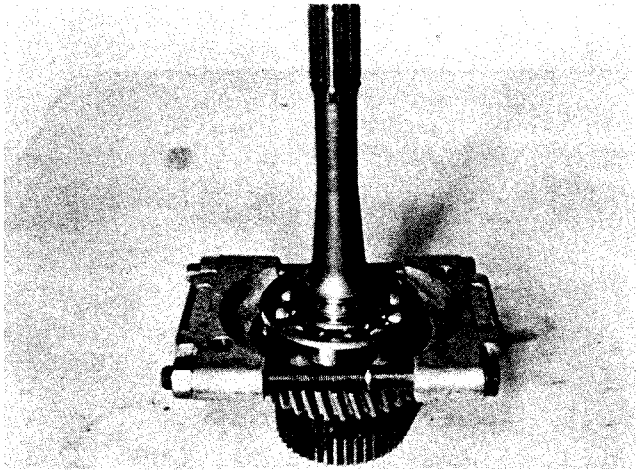

Figure 134
Recommended procedure for removing bearing.

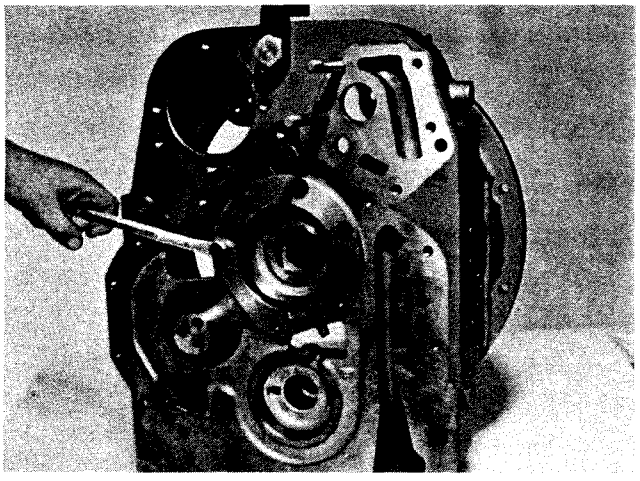

Figure 135
Remove reaction member support capscrews.

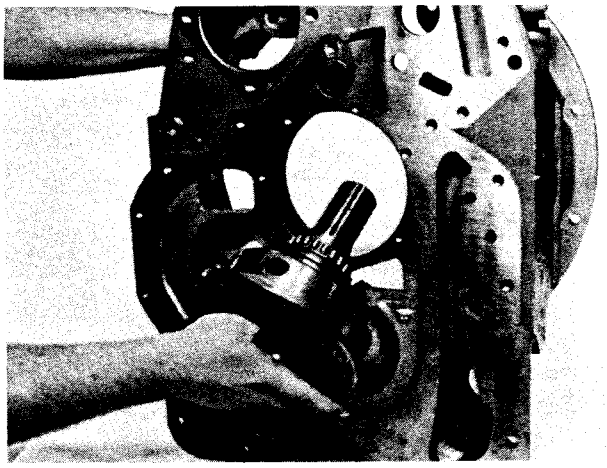

Figure 136
Tap reaction member support from housing.

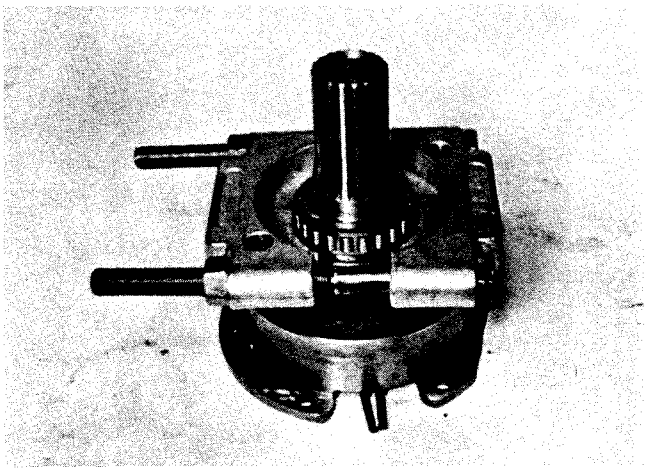

Figure 137
Remove bearing from support. Remove support oil sealing ring and sealing ring expander spring.

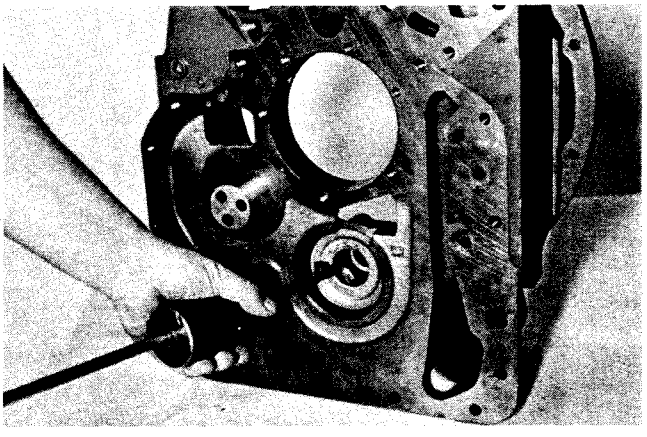

Figure 138
If reverse clutch piston ring sleeve is to be replaced, remove as shown.

CLARK

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 larger side of cone 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 skin rashes and inhalation of vapors 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.

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 clean light oil and wrap in clean lintless cloth or paper to protect them until installed.

Oil Seals, Gaskets and Retaining Rings

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

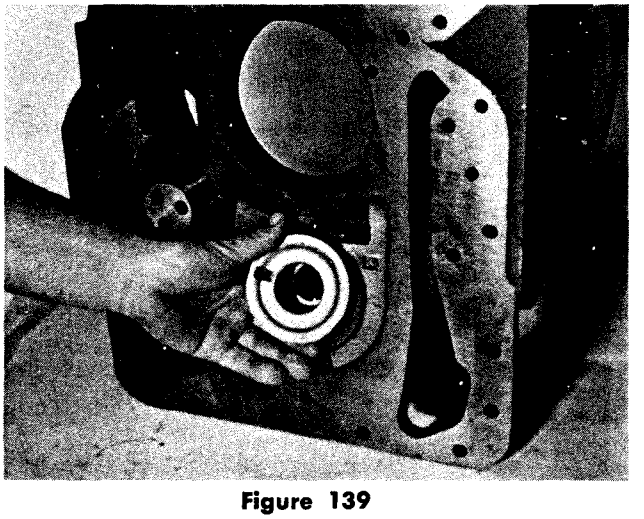

Figure 139
Install reverse clutch piston ring sleeve in housing.

CLARK

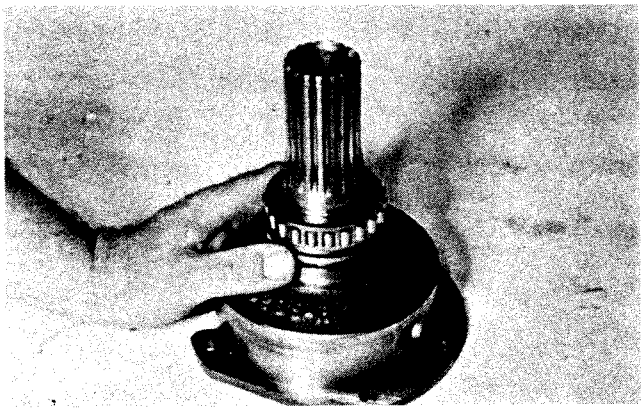

Figure 140

Install new sealing ring expander spring and oil sealing ring on support. Expander spring gap to be 180° from sealing ring hook joint. Press support bearing into position. **NOTE:** Bearing part number must be up.

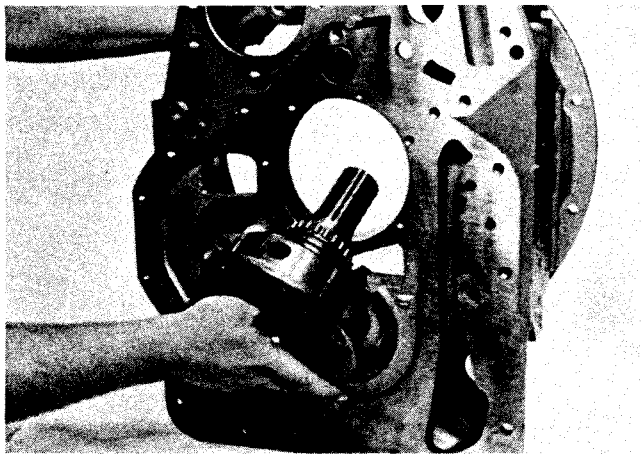

Figure 141

Position support in converter housing aligning holes of support with housing.

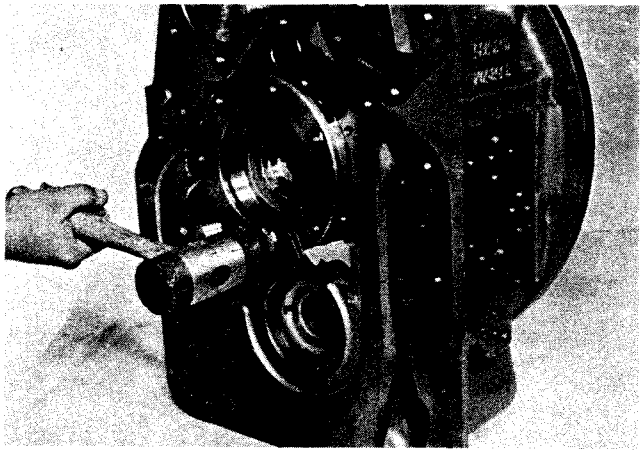

Figure 142

Tap support into position.

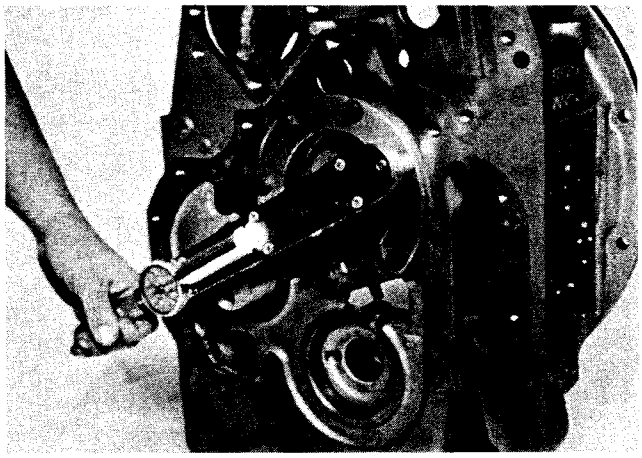

Figure 143

Tighten support bolts 23 to 25 ft. lbs. torque [3,2-3,4 m.kg].

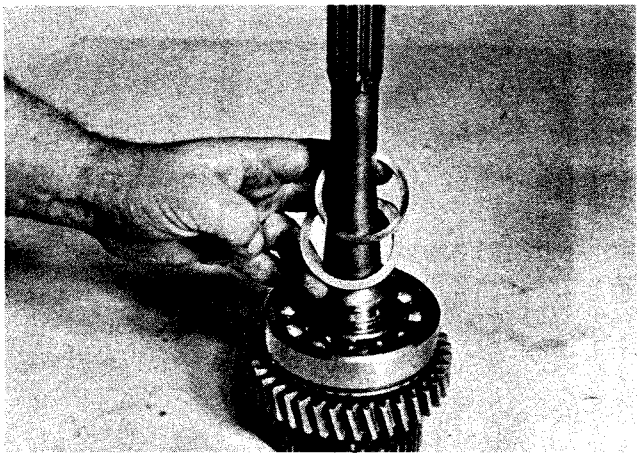

Figure 144

Press turbine shaft bearing into position. Install bearing washer and retainer ring.

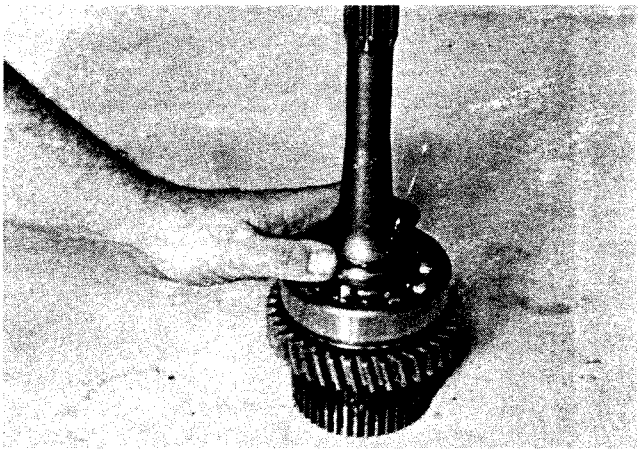

Figure 145

Install new turbine shaft piston ring.

CLARK

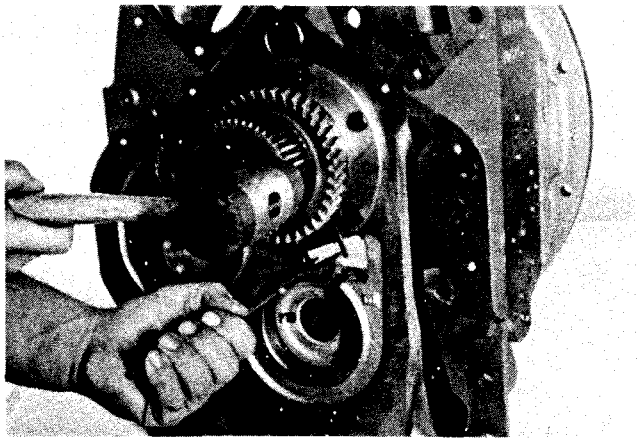

Figure 146
Spread ears on turbine shaft bearing retainer ring located in reaction member support. Tap turbine shaft into position.

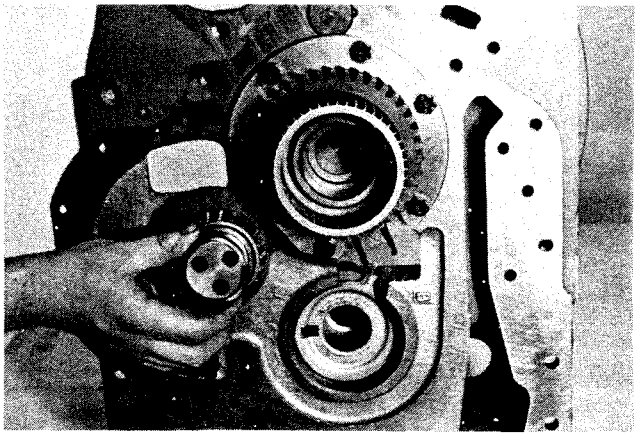

Figure 147
Position reverse idler inner bearing and bearing spacer on shaft.

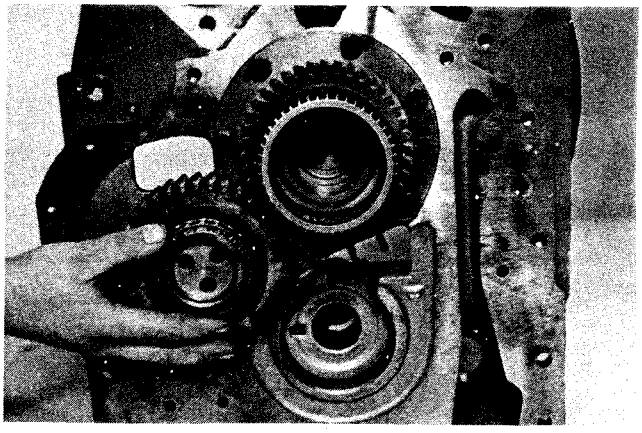

Figure 148
Position idler gear on shaft and bearing. **NOTE:** Long hub of gear out. Install outer taper bearing in gear.

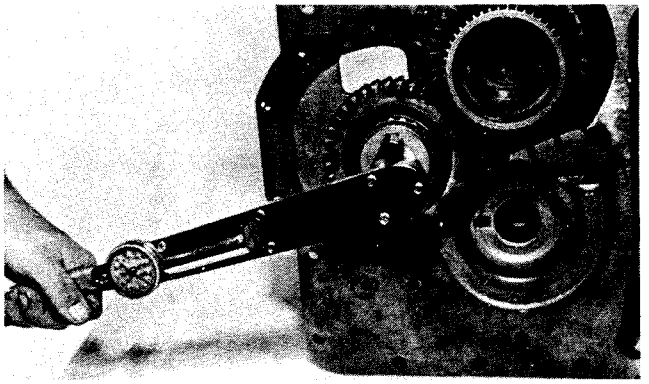

Figure 149
Install bearing retainer plate, lock plate and idler gear capscrews. Tighten capscrews 37 to 41 ft. lbs. torque [5,1 - 5,6 m.kg]. Bend lockplate tabs over capscrew heads to prevent loosening.

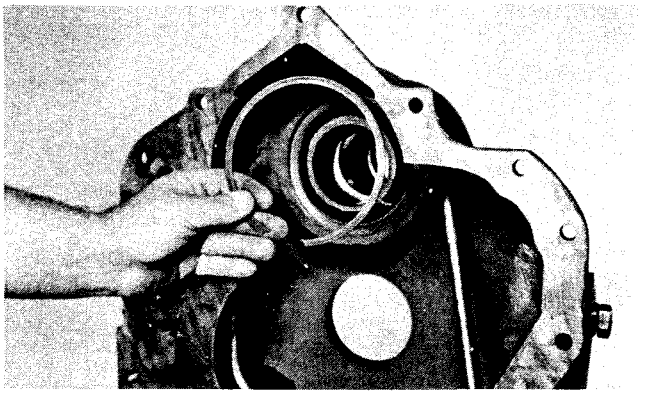

Figure 150
Tap forward clutch shaft rear bearing into bearing bore with bearing snap ring toward front of housing. Align roll pin in forward clutch shaft piston ring sleeve with groove in housing. Tap sleeve into position and secure with sleeve retainer ring.

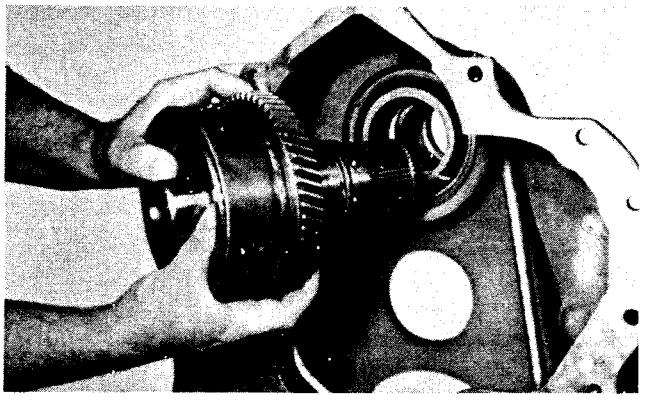

Figure 151
Position forward clutch assembly into transmission housing. Use caution as not to damage forward shaft piston rings.

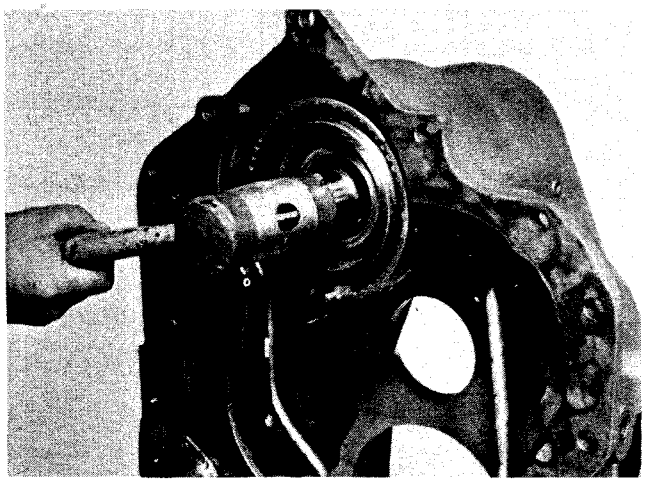

Figure 152
Tap clutch assembly into position.

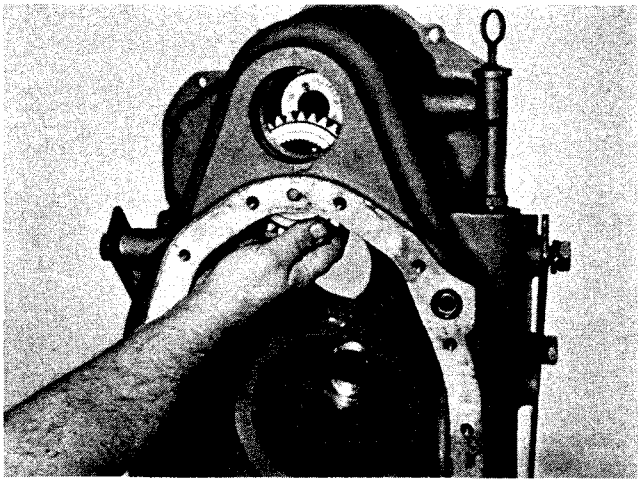

Figure 153
Position forward shaft gear on shaft.

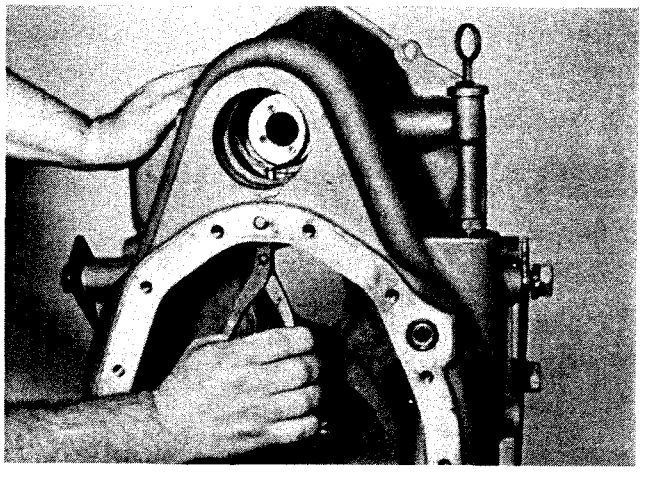

Figure 154
Install gear retainer ring. See Figure 154-A.

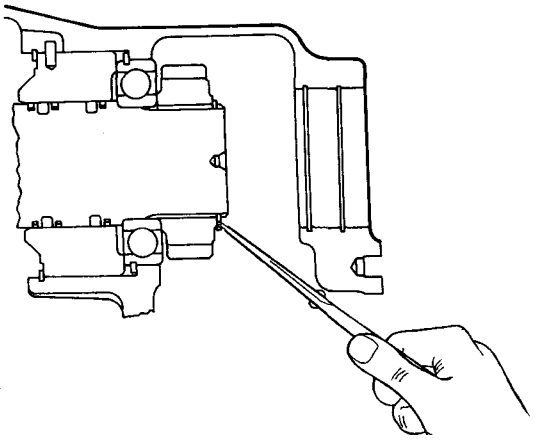

Figure 154-A

Figure 155
If 3rd speed clutch rear bearing carrier was disassembled press bearing into carrier against locating ring. Secure bearing with retainer ring. Press 3rd speed clutch disc hub into bearing and secure with retainer ring. Position disc hub and bearing carrier on 3rd speed clutch.

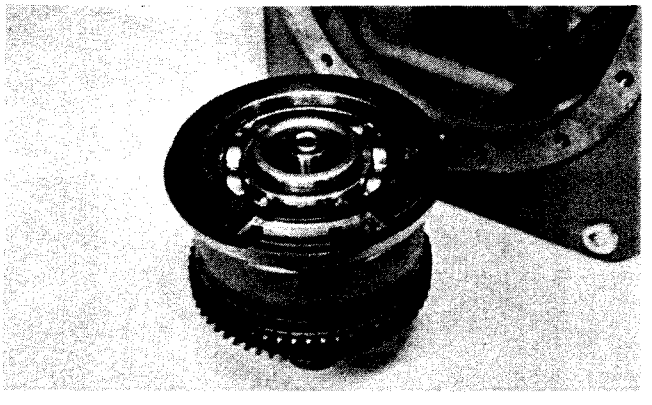

Figure 156
Align splines on disc hub with internal teeth of friction discs in clutch. Do not force this operation. Disc hub splines must be in full position with internal teeth of all friction discs.

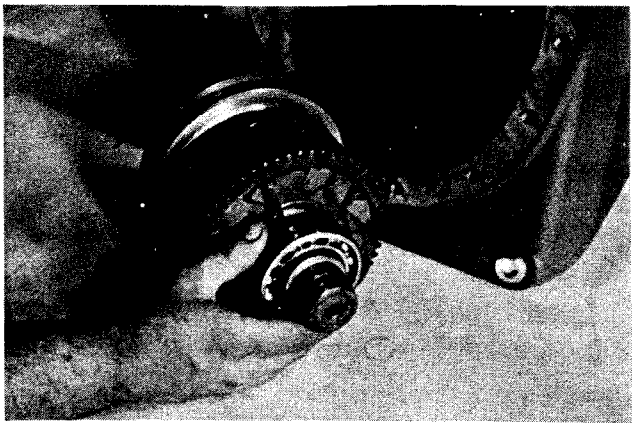

Figure 157
Position the 3rd clutch front bearing locating ring on clutch assembly. Ring will be installed in housing ring groove later in the text.

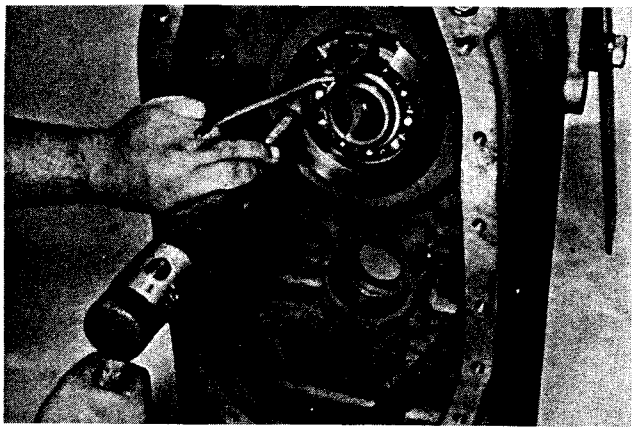

Figure 158
Using contracting type snap ring pliers as shown, lock pliers to hold ring contracted. Tap 3rd speed clutch assembly and bearing carrier into housing until snap ring groove in housing is aligned with snap ring. Remove pliers being sure snap ring is in full position in snap ring groove.

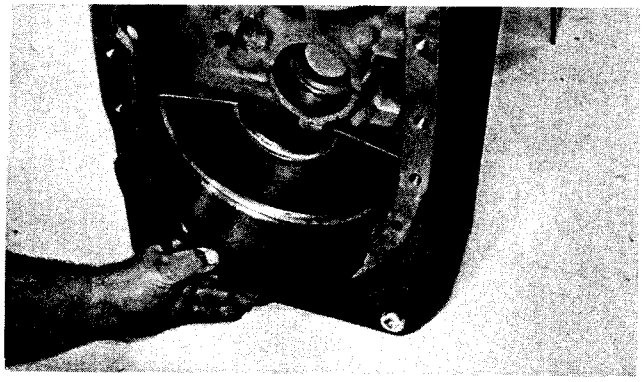

Figure 159
Position sump oil baffle in housing.

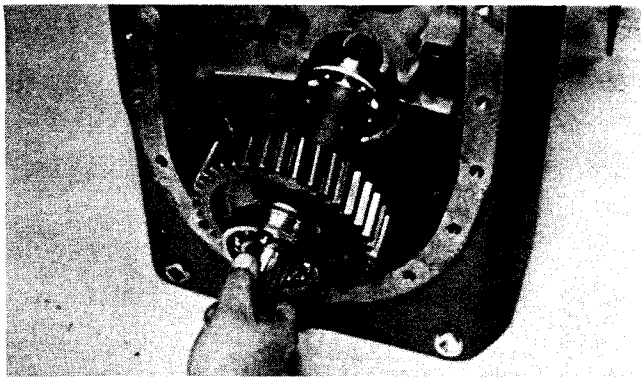

Figure 160
Install output shaft and bearing assembly in housing.

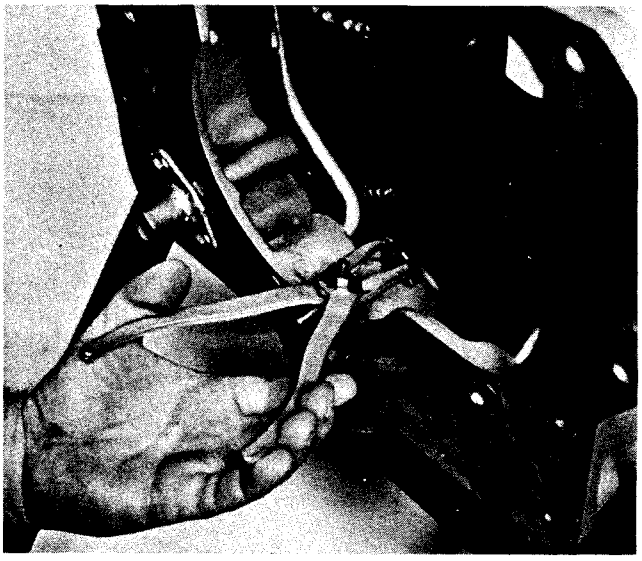

Figure 161
From front of housing install 3rd speed clutch front bearing retainer ring. **NOTE:** Be certain ring is in full position in ring groove.

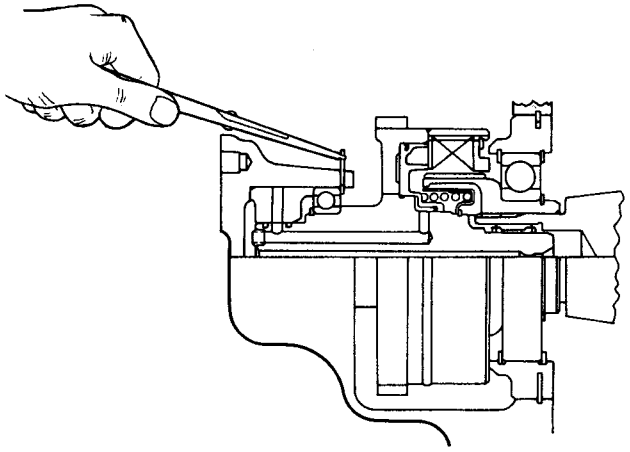

Figure 161-A

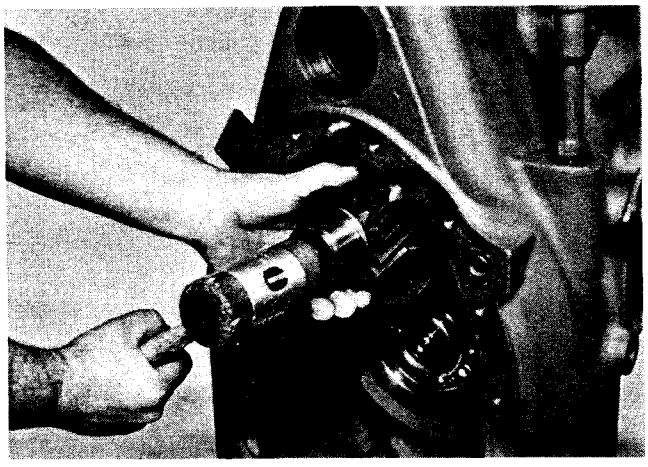

Figure 162
From rear of housing position low speed clutch in bearing bore. Tap clutch in place.

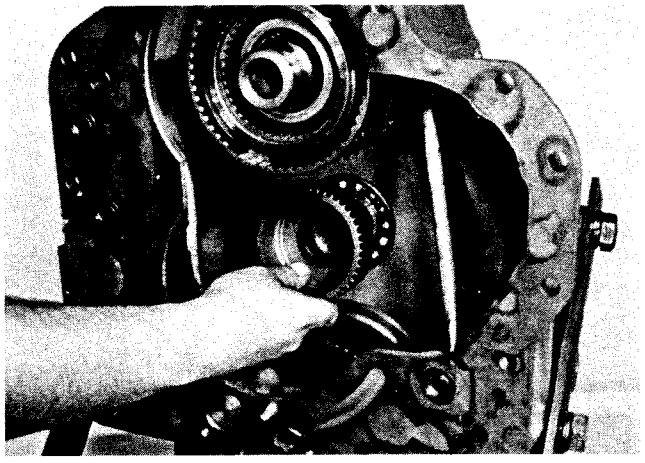

Figure 163
From front of housing install 2nd speed clutch disc hub on low clutch shaft.

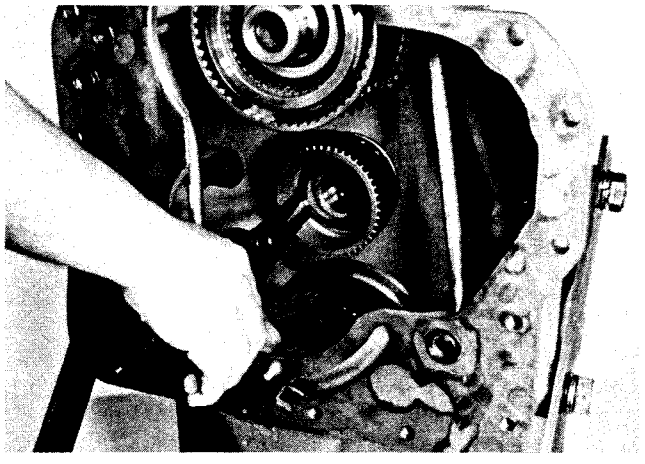

Figure 164
Install disc hub retainer ring.

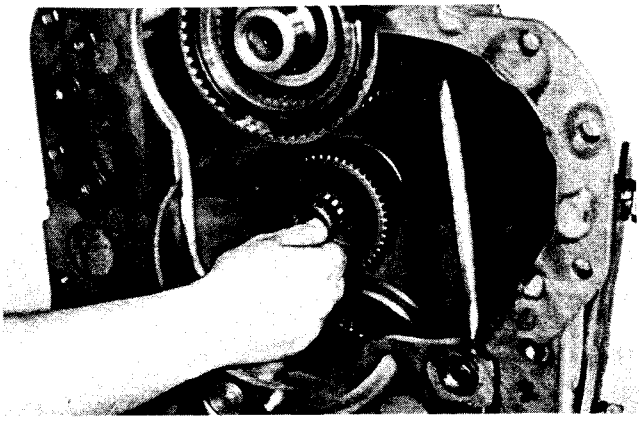

Figure 165
Position 2nd speed clutch shaft pilot bearing in low clutch shaft.

Figure 166
Install front output flange, new "O" ring, washer and nut. Tighten 200 to 250 ft. lbs. torque [27,7 - 34,5 m.kg].

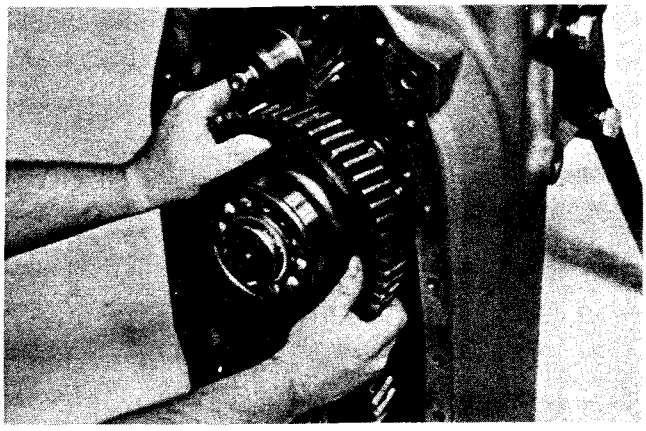

Figure 167
Position idler shaft and bearing assembly in end of 3rd speed clutch. **NOTE:** If special low ratio is incorporated, the idler shaft will have two gears on it. (Unit shown is a standard ratio.)

CLARK

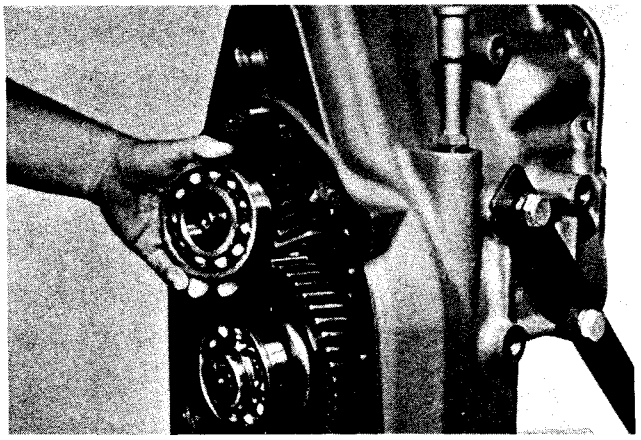

Figure 168
Position low clutch rear bearing on shaft, with snap ring groove out.

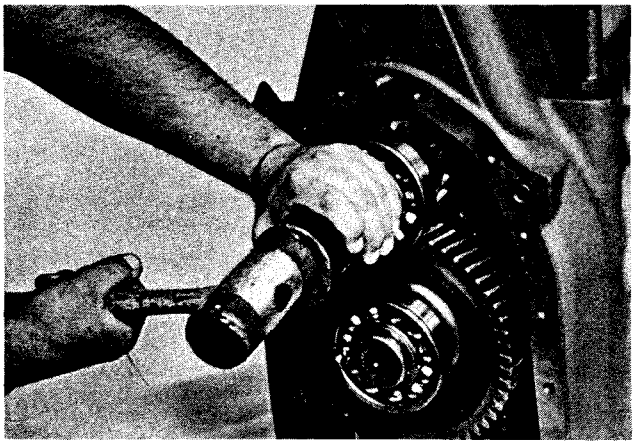

Figure 169
Tap bearing into position.

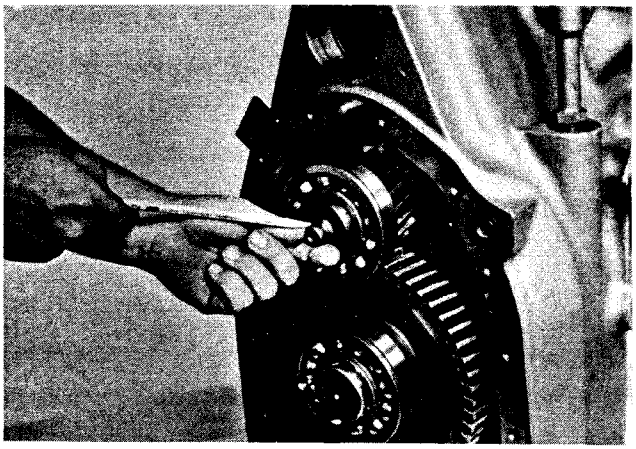

Figure 170
Install new oil sealing ring on low clutch shaft.

NOTE: New ring must be sized before installing low shaft bearing cap.

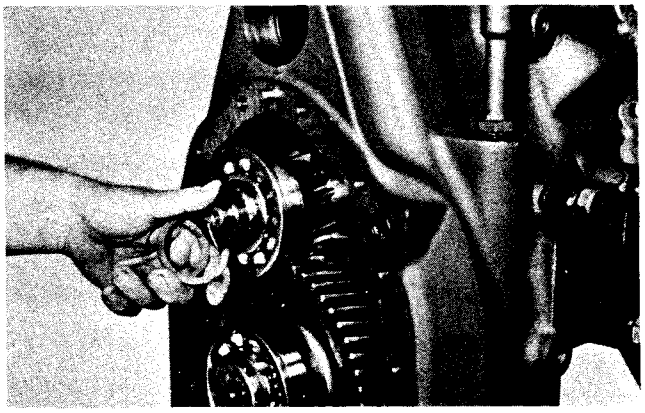

Figure 171
Install low shaft rear bearing spacer.

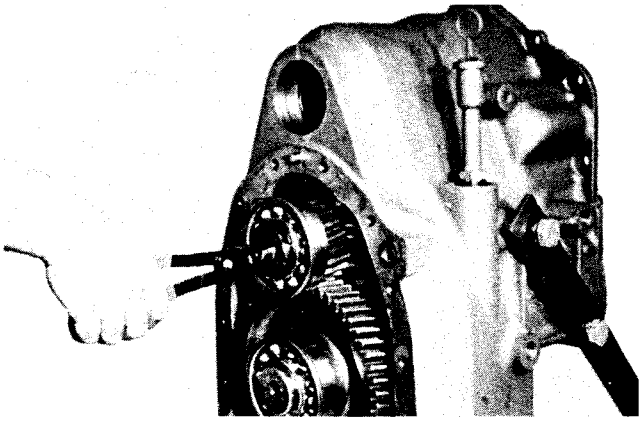

Figure 172
Install bearing retainer ring.

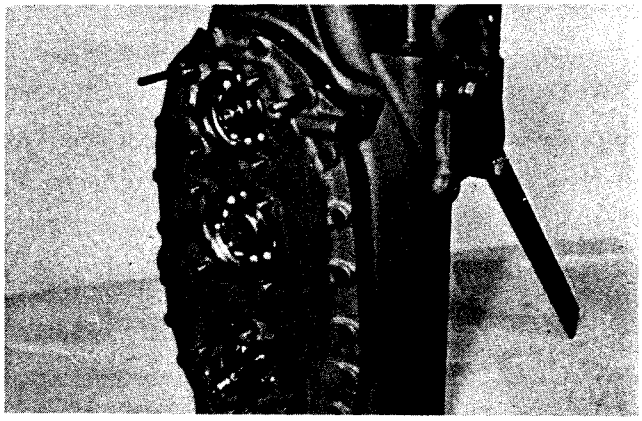

Figure 173
Position new gasket and "O" ring on rear of transmission housing. A thin coat of chassis grease will hold the gasket and "O" ring in place.

Install rear cover. Note two aligning studs to facilitate cover to housing assembly. Tap cover in place aligning shaft bearings with bearing bores. Remove studs and install cover bolts and lockwashers.

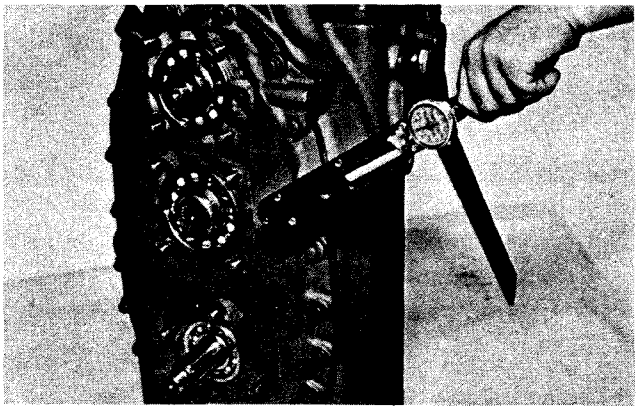

Figure 174

Tighten rear cover bolts 37 to 41 ft. lbs. torque [5,1-5,6 m.kg].

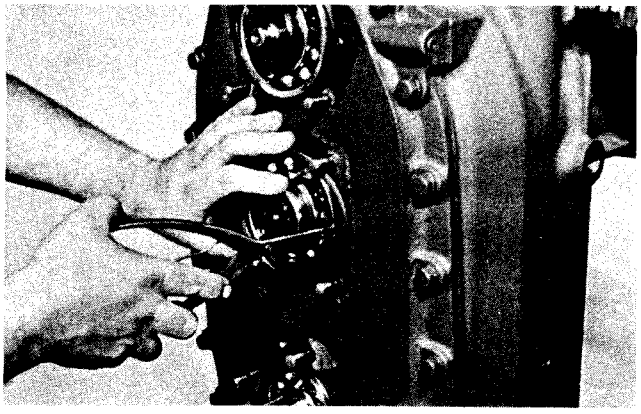

Figure 175

Install low, idler and output shaft rear bearing locating rings.

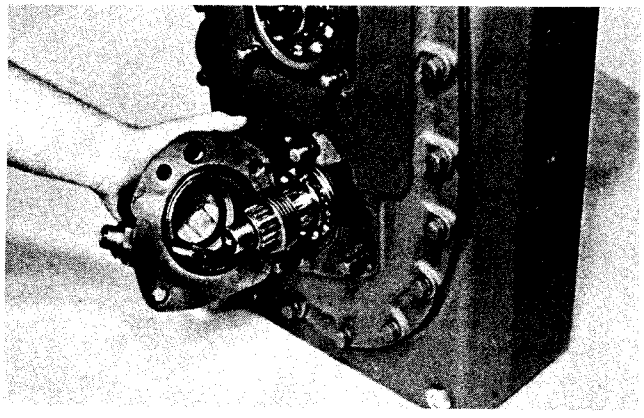

Figure 176

Apply a light coat of Permatex No. 2 to the outer diameter of the output oil seal. Press seal in bearing cap with lip of seal toward bearing side of bearing cap. Position new "O" rings on bearing cap. **NOTE:** Some units will have a gasket only between the cap and cover.

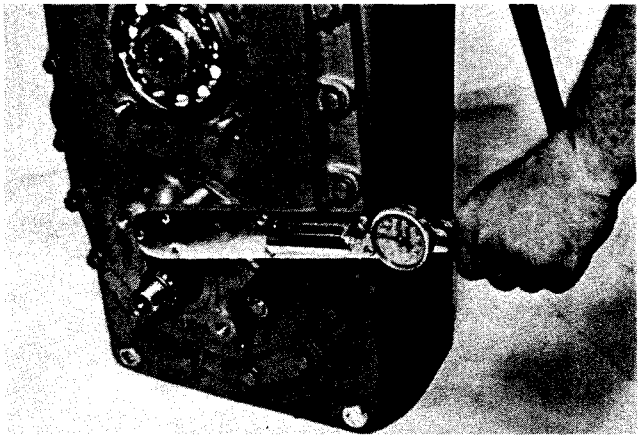

Figure 177

Install lockwashers and stud nuts. Tighten 91 to 100 ft. lbs. torque [12,6 - 13,8 m.kg].

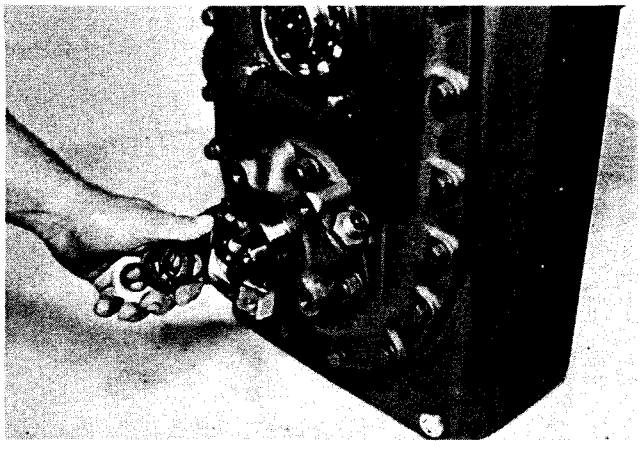

Figure 178

Install output flange, "O" ring, washer and flange nut. Block flange to prevent turning. Tighten flange nut 200 to 250 ft. lbs. torque [27,7 - 34,5 m.k.g].

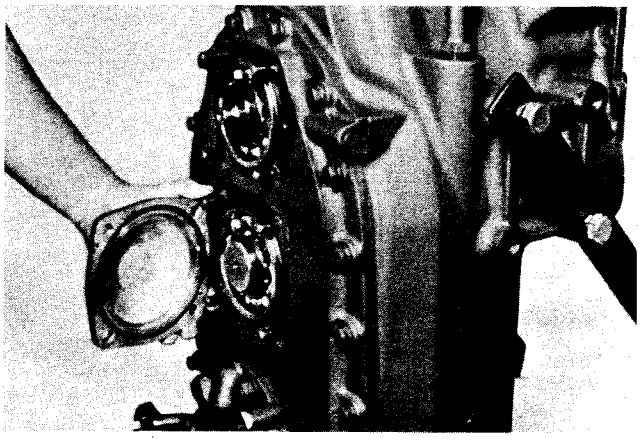

Figure 179

Position new "O" ring on idler shaft bearing cap. Install cap on studs and secure with lockwashers and nuts.

CLARK

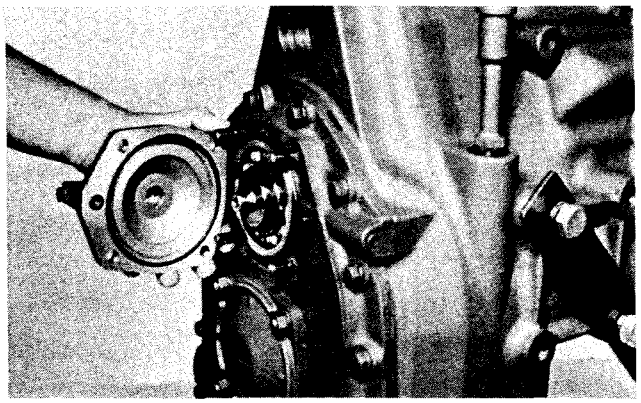

Figure 180

Install new bearing cap and low clutch pressure port "O" rings on low shaft bearing cap. Position bearing cap on low shaft. Install washers and stud nuts.

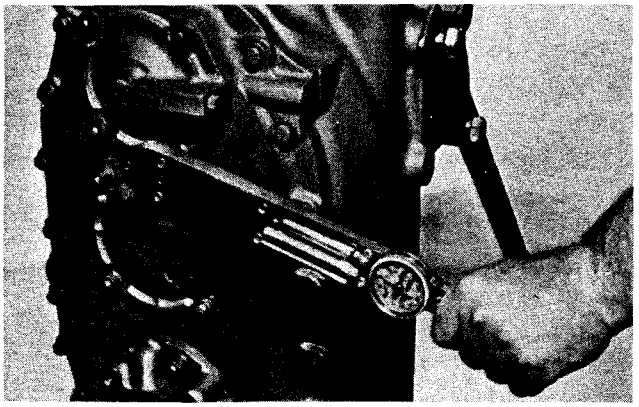

Figure 181

Tighten low shaft and idler shaft stud nuts 41 to 45 ft. lbs. torque [5,7 - 6,2 m.kg].

NOTE: P.T.O. is optional. If P.T.O. is not used, coat outer diameter of bore plug with Parmatex No. 2. Tap bore plug in housing and proceed with Figure 186.

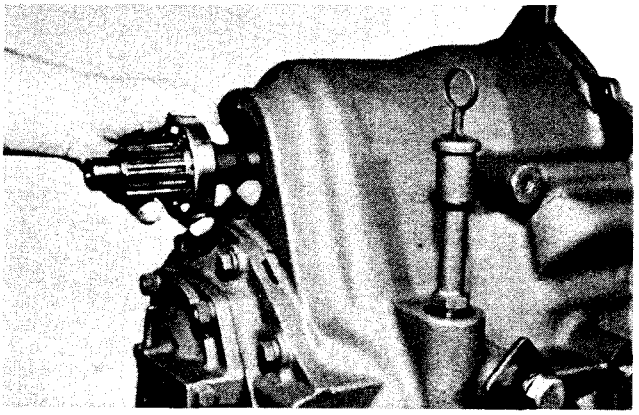

Figure 182

Position P.T.O. shaft and bearing in housing. Tap in place.

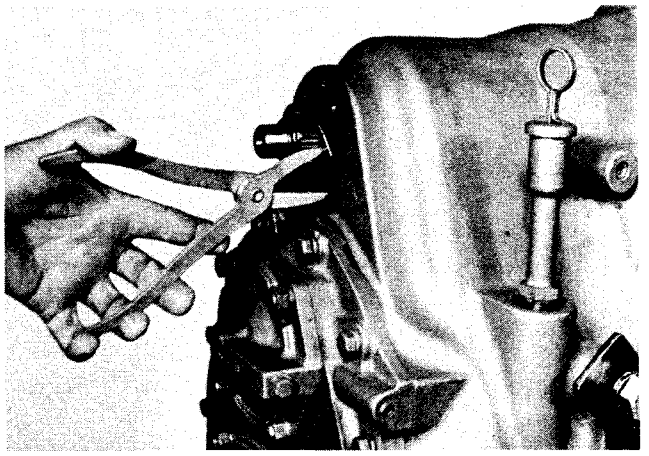

Figure 183

Install P.T.O. bearing retainer ring.

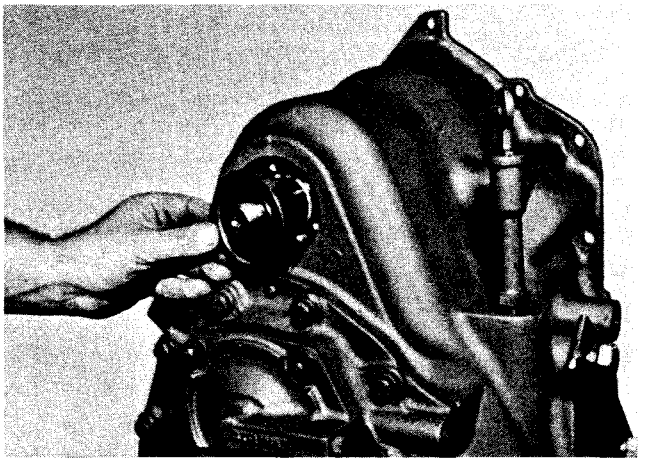

Figure 184

Coat outer diameter of P.T.O. seal with Permatex No.2. Install seal in housing with lip of seal toward the inside.

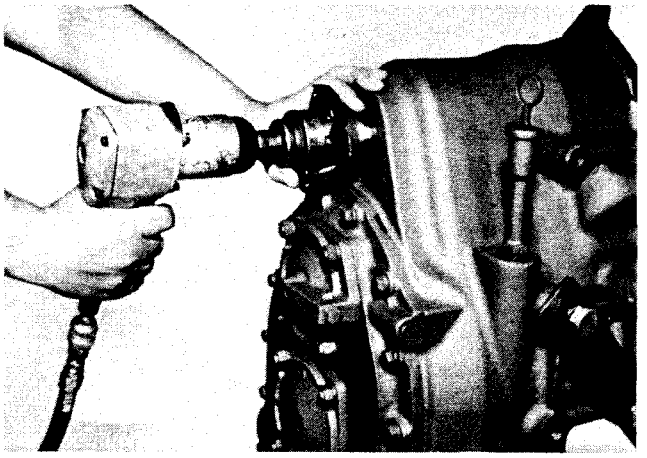

Figure 185

Install P.T.O. flange, new "O" ring, washer and nut. Tighten 200 to 250 ft. lbs. torque [27,7 - 34,5 m.kg].

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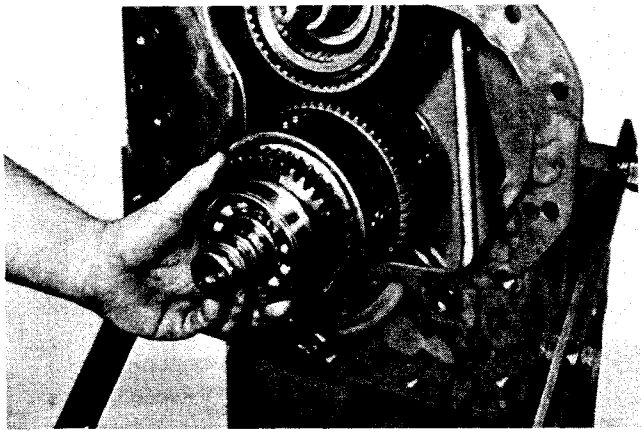

Figure 186

Position reverse and 2nd speed clutch on disc hub aligning splines of disc hub with internal teeth of 2nd speed clutch friction discs. Disc hub must be in full position with friction discs. Do not force this operation.

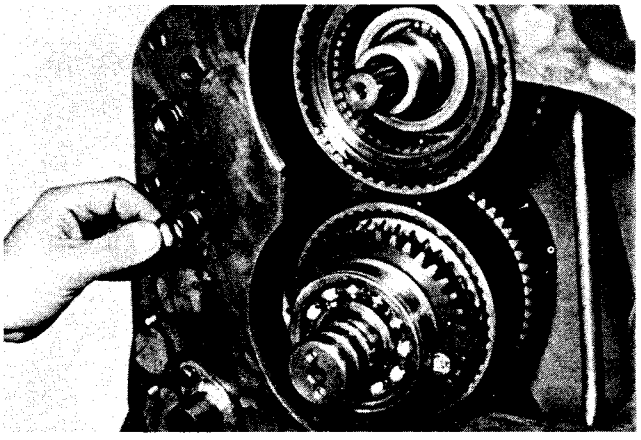

Figure 187

Install new "O" rings on front of transmission housing. A thin coat of chassis grease will hold "O" rings in place.

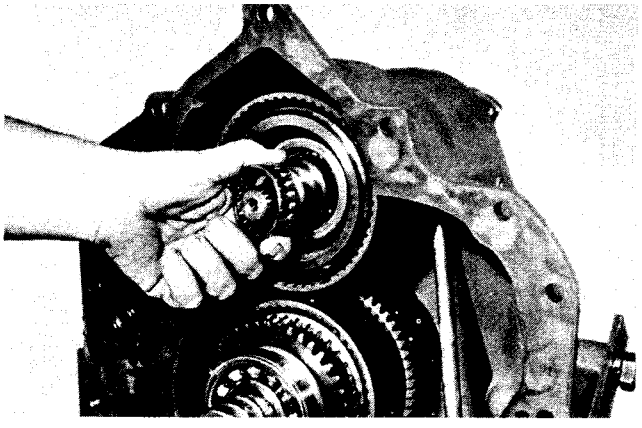

Figure 188

Install forward clutch pilot bearing.

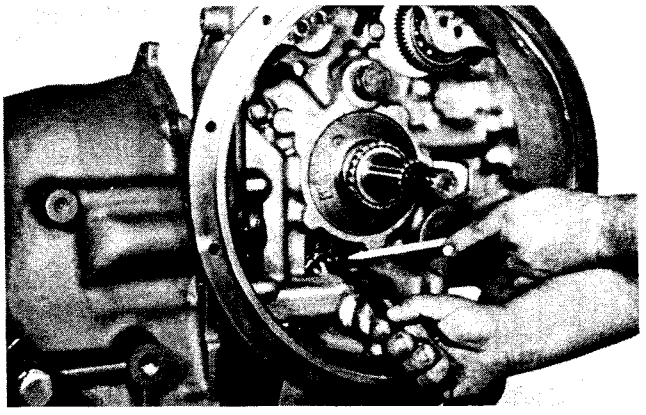

Figure 189

Position new gasket on front of transmission housing. A thin coat of chassis grease will hold gasket in place. Spread ears on the reverse clutch front bearing. Lock pliers open to hold snap ring open.

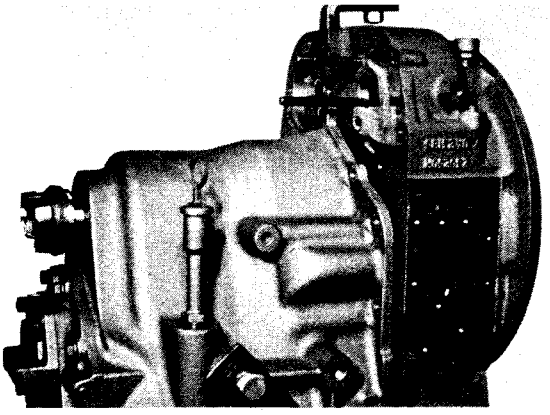

Figure 190

Position converter housing assembly on transmission case. Use caution as not to disturb housing "O" rings or gasket.

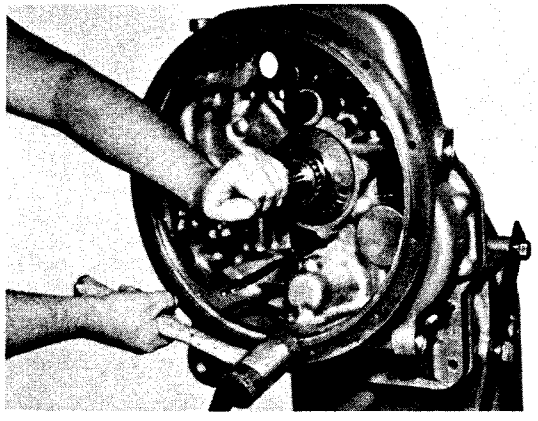

Figure 191

Tap converter housing in place. Use caution as not to damage reverse clutch front piston ring. Note aligning stud.

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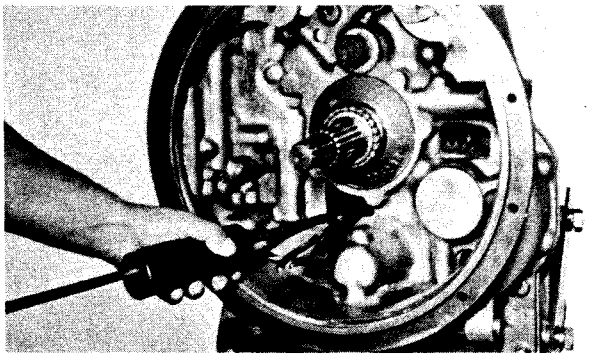


Figure 192

Install a cap screw in the front and one in the rear of the converter housing and snug up but do not tighten. This will hold the converter housing to the transmission housing. Using a hook type hammer puller as shown, pull the reverse clutch gear toward the front of the converter housing. This will move the reverse and 2nd clutch assembly forward to align the snap ring groove in the bearing with the snap ring in the housing. Being certain bearing snap ring is in full position in snap ring groove, remove pliers.

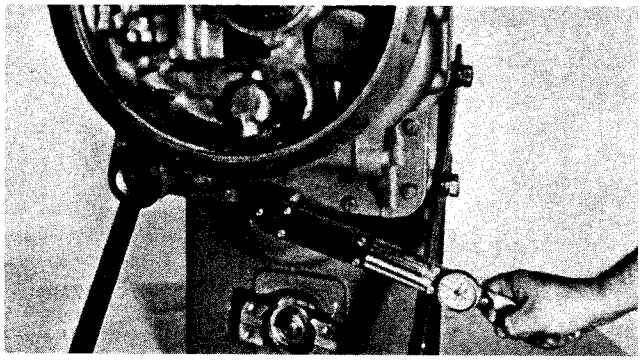


Figure 193

Remove converter housing aligning stud. Install converter housing and transmission housing capscrews. Tighten 37 to 41 ft. lbs. torque [5,1 - 5,6 m.kg].

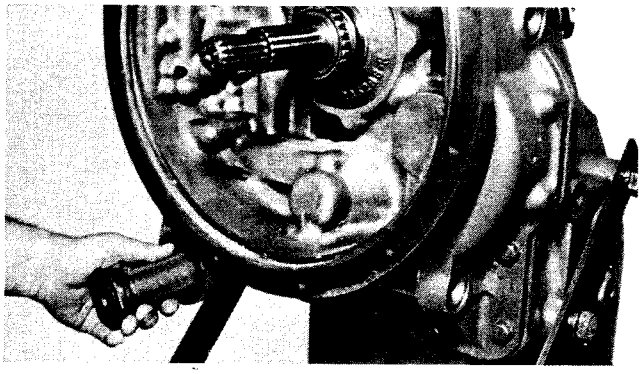


Figure 194

Position new gasket on sump screen, install screen assembly and tighten 10 to 15 ft. lbs. torque [1,4-2,0 m.kg].

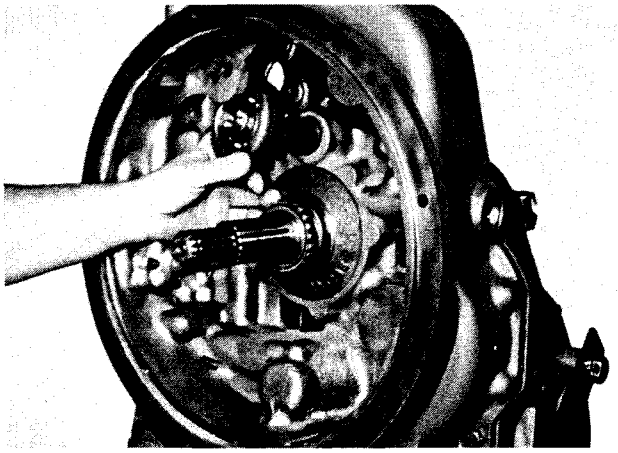


Figure 195

Install auxiliary and charging pump drive gear. Snug capscrews to hold gears in place.

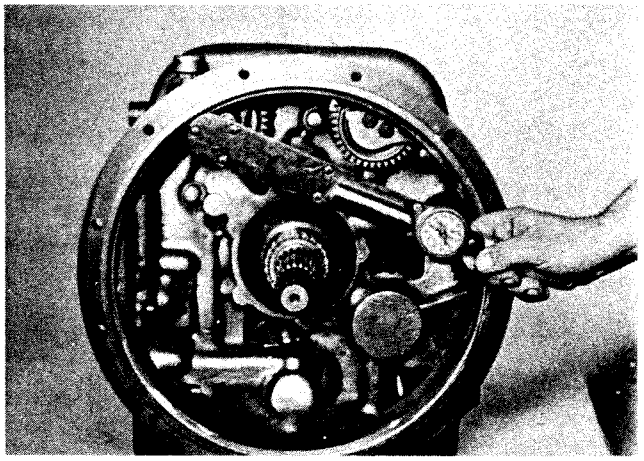


Figure 196

Tighten pump drive gear capscrews 23 to 25 ft. lbs. torque [3,2 - 3,4 m.kg].

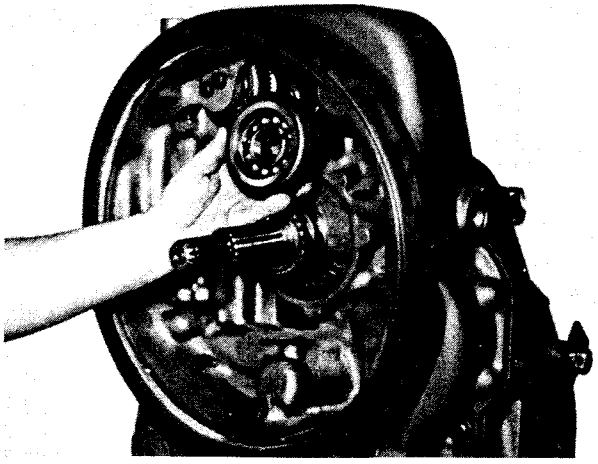


Figure 197

Position pump idler gear and bearing on stub shaft.

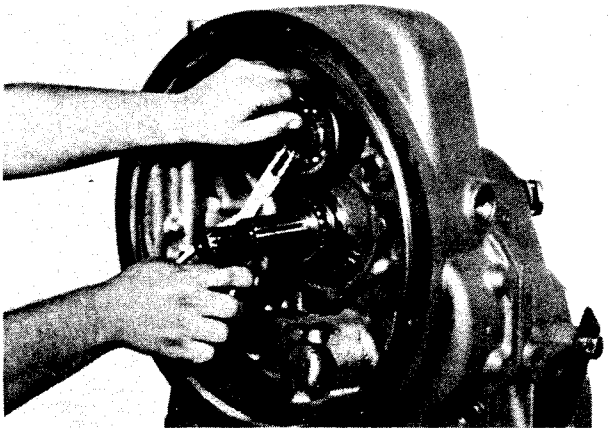


Figure 198
Install idler gear bearing locating ring.

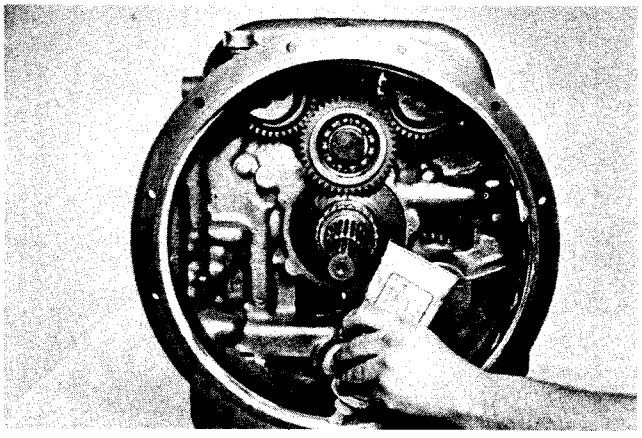


Figure 199
Apply a light coat of #92 Loctite to O.D. of oil baffle or counter bore in converter housing. Remove immediately any excess sealant that could enter the oil circuit.

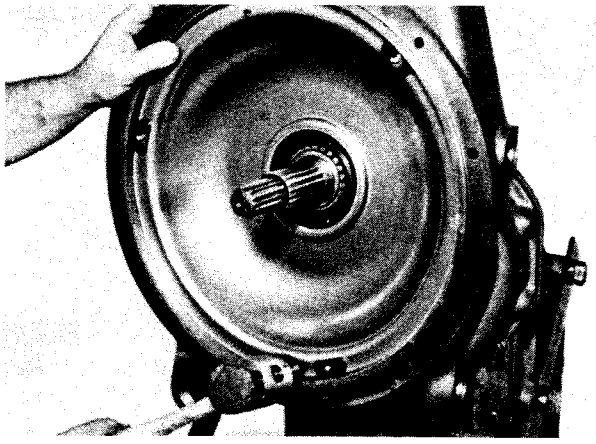


Figure 200
Assemble new oil baffle oil seal in baffle. Position oil baffle puller screw holes 15° to 30° either side of vertical center line. Tap baffle into position until baffle shoulders in converter housing.

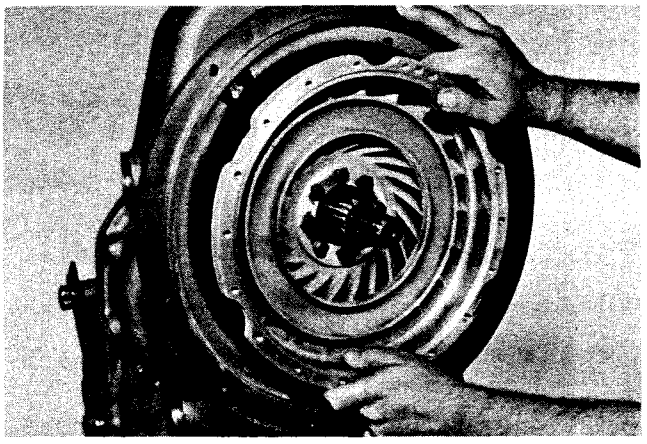


Figure 201
Install impeller and hub assembly using caution as not to damage the oil baffle oil seal. **NOTE:** Use extreme caution as not to cut, break or unhook the oil sealing ring on the support.

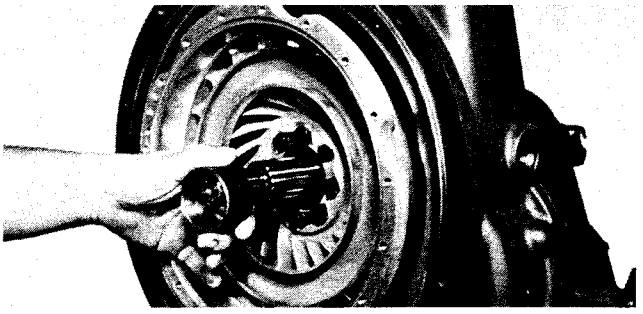


Figure 202
Position reaction member to impeller hub gear spacer on reaction member support. **NOTE:** If a fixed reaction member is used, install reaction member and retaining ring. Proceed to Figure 214.

FREEWHEEL REASSEMBLY

Figure 203
Outer race showing lead in champher. This champher must be up when installing sprag assembly.

CLARK

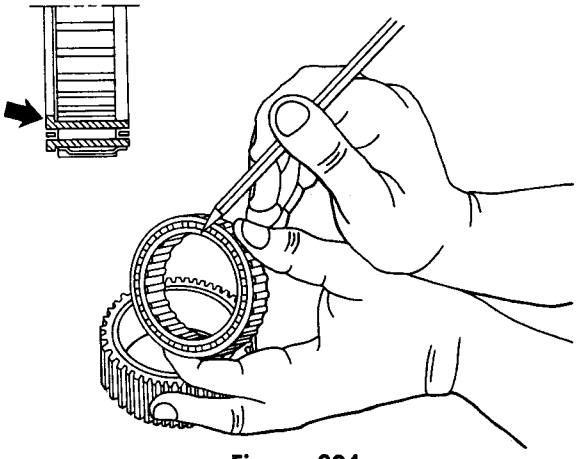


Figure 204

Install sprag assembly into champhered side of outer race with sprag cage flange down.

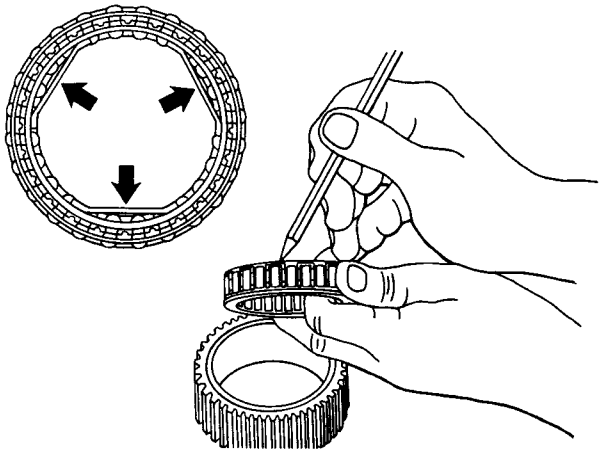


Figure 205

Note brass cross bar clips are up when sprag cage flange is down. Note drag strips (shown by arrows) are also up when installing sprag assembly in outer race.

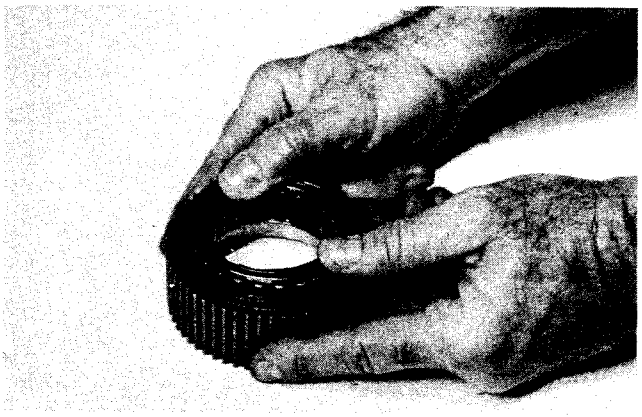


Figure 206

Slide sprag assembly into outer race. Use care when positioning sprag assembly in outer race. **DO NOT FORCE THIS OPERATION.**

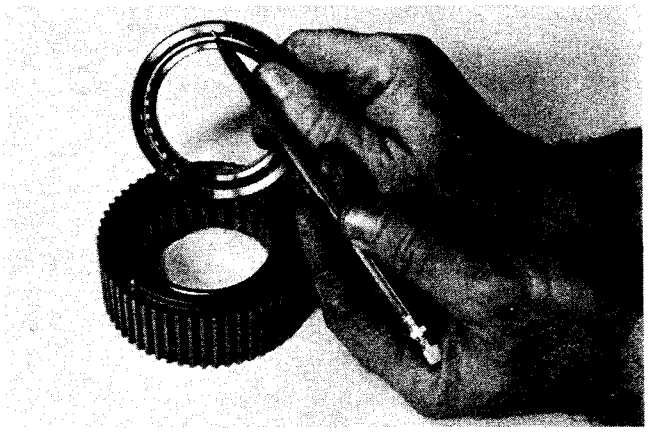


Figure 207

Tap rear bearing into outer race. **NOTE: Bearing part number must be in.**

Figure 208

Tap front bearing into outer race. **NOTE: Bearing part number must be in.**

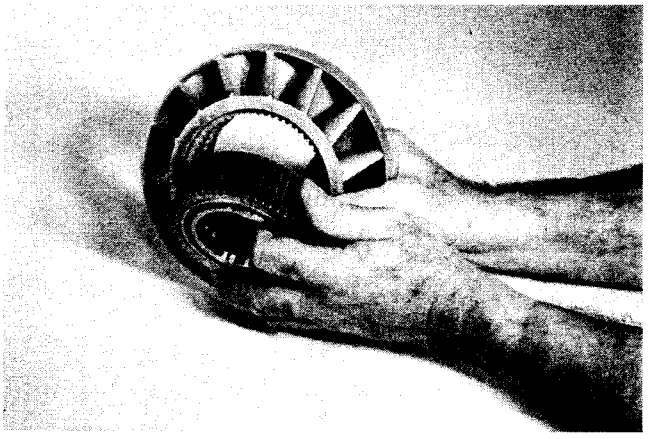


Figure 209

Install outer race and sprag assembly in reaction member. **NOTE:** Undercut shoulder of race must go toward the rear of the reaction member.

CLARK

Figure 210
Install outer race to reaction member retaining ring.

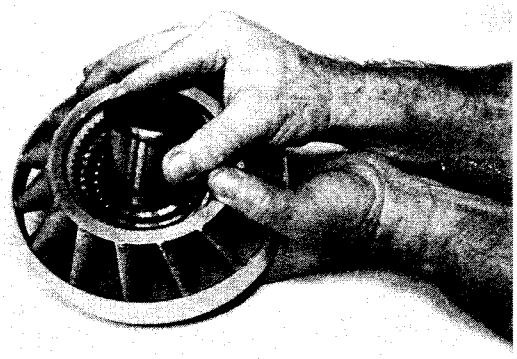


Figure 211
From the front of the reaction member install the freewheel inner race. Install inner race rear retainer ring.

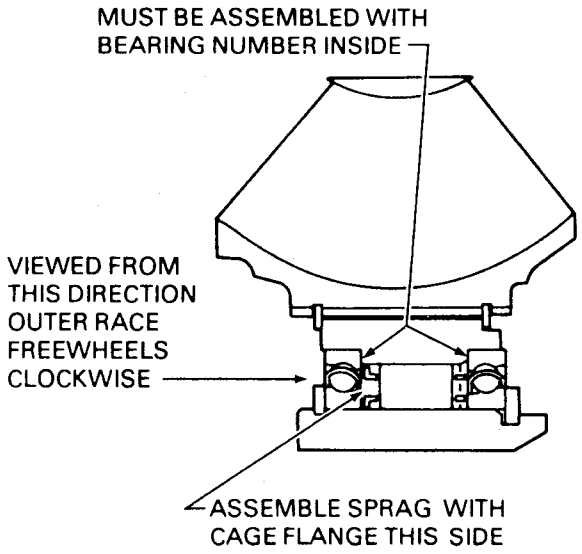


Figure 212

MUST FREEWHEEL IN
CLOCKWISE ENGINE ROTATION

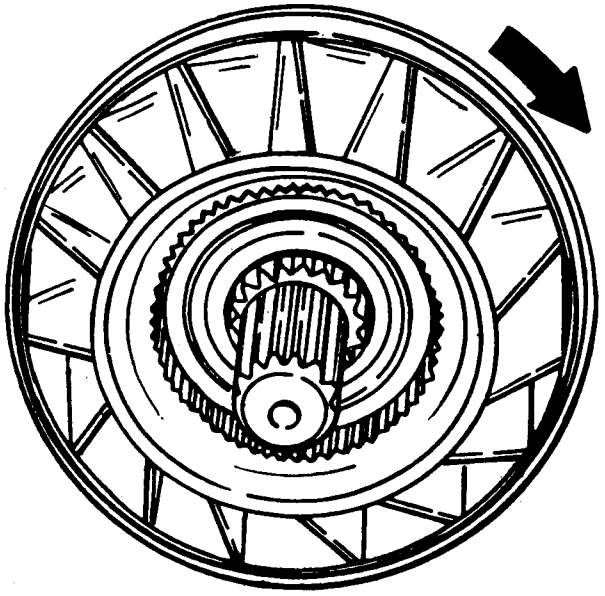


Figure 213
Install reaction member on support. Check rotation of freewheeling reaction member to be sure of proper freewheel assembly. Install reaction member retaining ring.

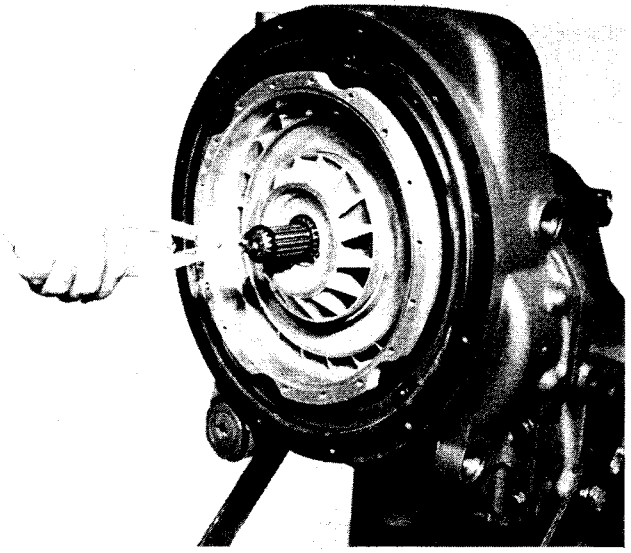


Figure 214
Position inner turbine locating ring on turbine shaft. Install turbine on shaft.

CLARK

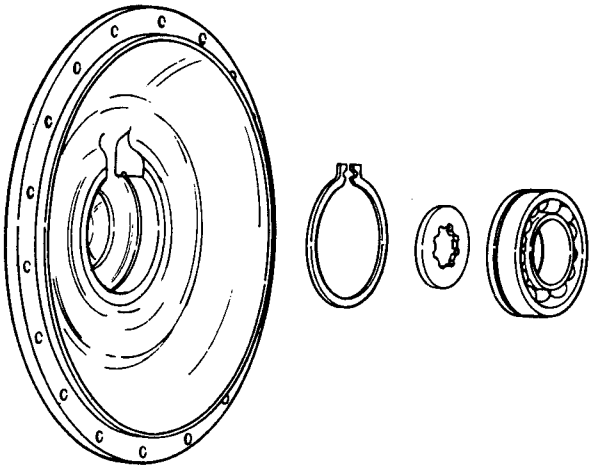


Figure 215

If the impeller cover bearing retaining washer or bearing was replaced, use the following procedure for reassembly. Heat cover 200° to 250° F [93°-121° C]. Position snap ring in groove. Place bearing retainer washer in cover. While cover is hot press bearing into position spreading ears on snap ring at the same time. Align snap ring groove in bearing with snap ring. Release snap ring. Check ring to be certain it is in full position in groove.

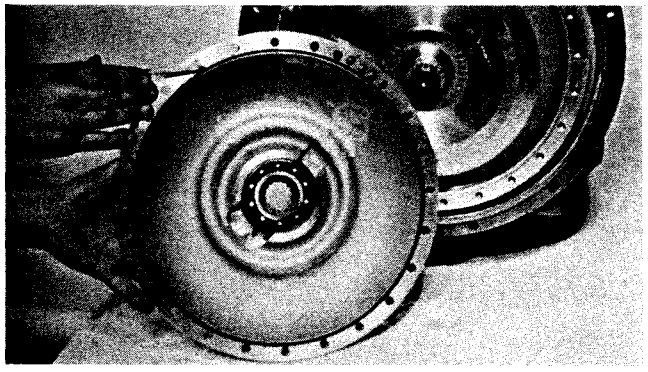


Figure 216

Position new "O" ring on impeller cover.

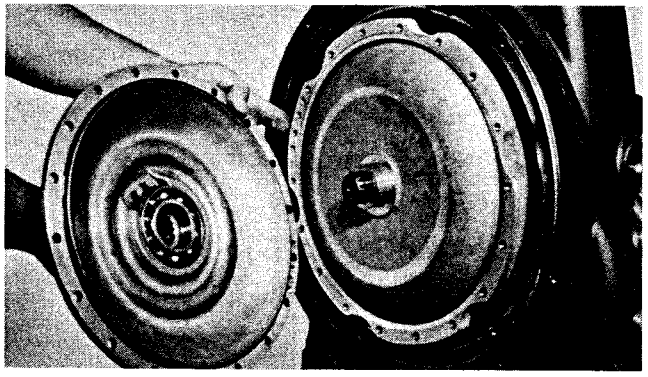


Figure 217

Install impeller cover assembly on impeller. Use caution as not to damage "O" ring. Bearing retainer plate must be aligned with the turbine shaft.

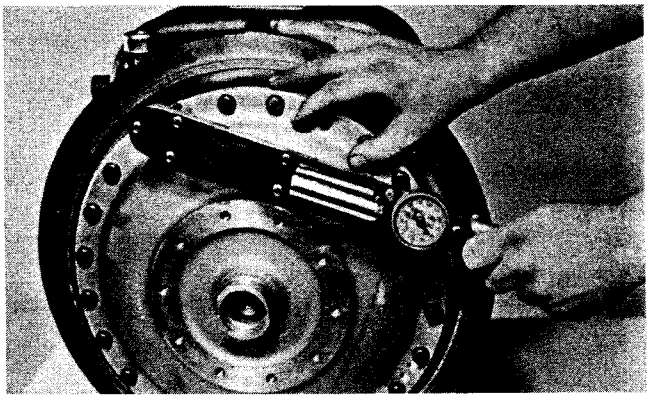


Figure 218

Install impeller cover to impeller capscrews and washers.

Tighten 11" impeller cover capscrews 12 to 16 ft. lbs. torque [1,6 - 2,2 m.kg].

Tighten 12" impeller cover capscrews 23 to 25 ft. lbs. torque [3,2 - 3,4 m.kg].

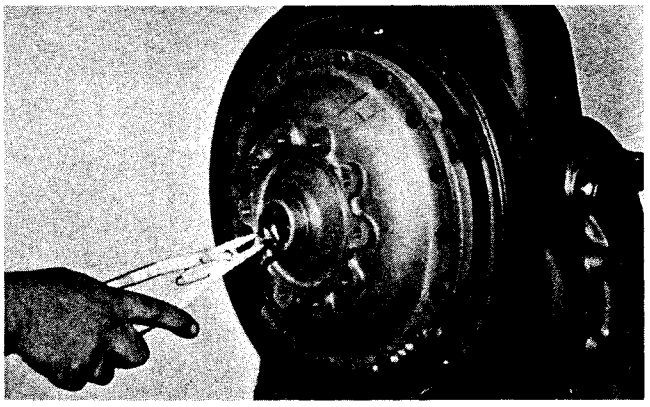


Figure 219

Install turbine retainer ring. See Figure 220.

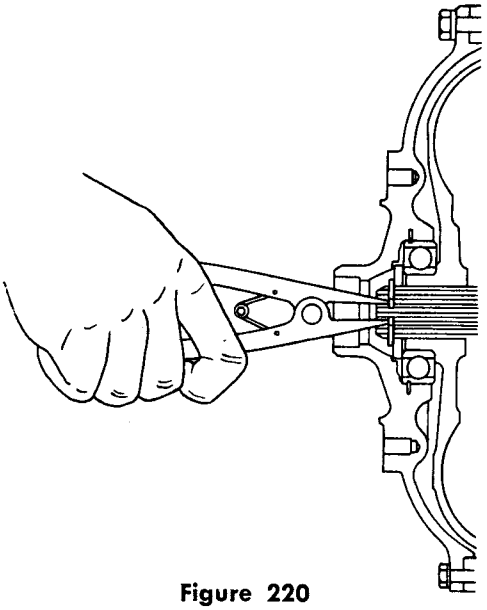


Figure 220

CLARK

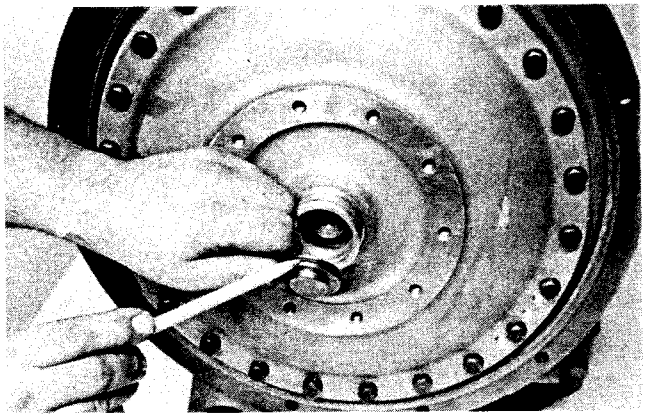


Figure 221

Position new "O" ring on impeller cover bore plug, lubricate ring to facilitate reassembly. Install plug in cover.

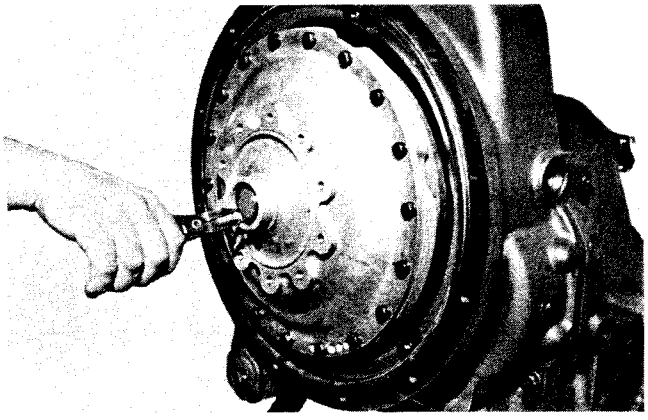


Figure 222

Install bore plug retainer ring.

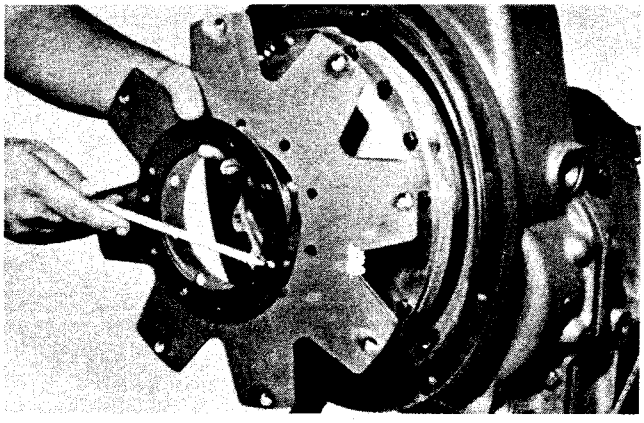


Figure 223

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.

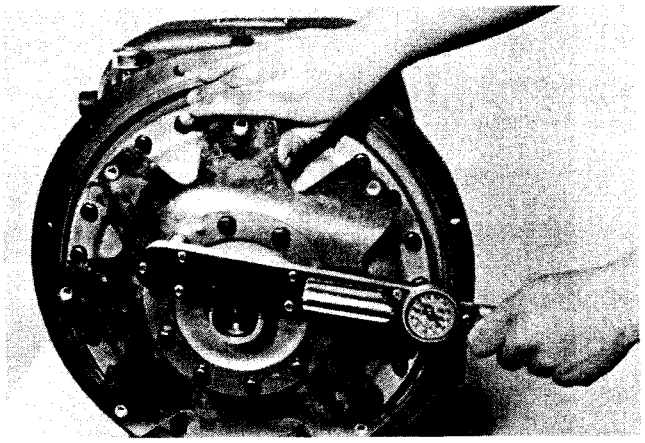


Figure 224

Tighten drive plate capscrews 23 to 25 ft. lbs. torque [3,2 - 3,4 m.kg].

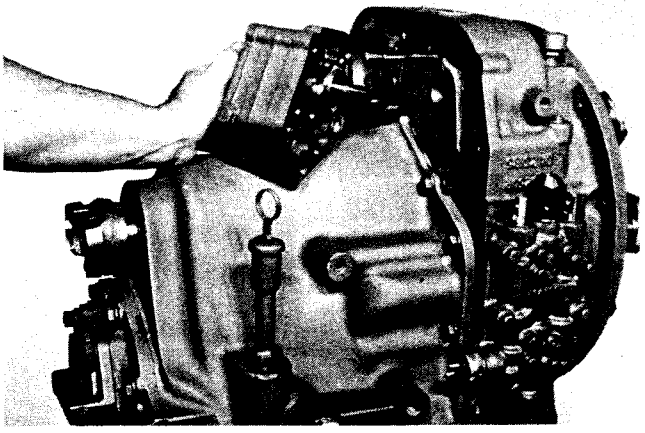


Figure 225

Using a new gasket and "O" ring, position charging pump assembly on studs. Install washers, nuts and capscrews.

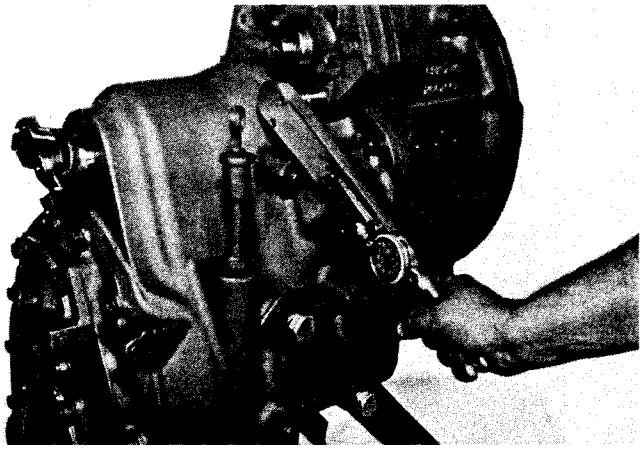


Figure 226

Tighten capscrews 37 to 41 ft. lbs. torque [5,1 - 5,6 m.kg]. Tighten stud nuts 41-45 ft. lbs. torque [5,7-6,2 m.kg].

CLARK

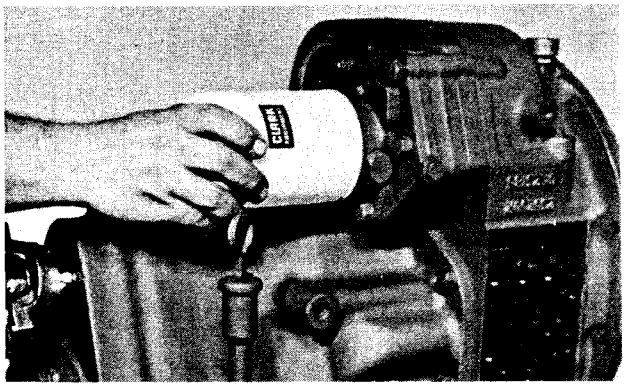


Figure 227

ıstall new oil filter. Tighten 20 to 25 ft. lbs. torque 2,8 - 3,4 m.kg].

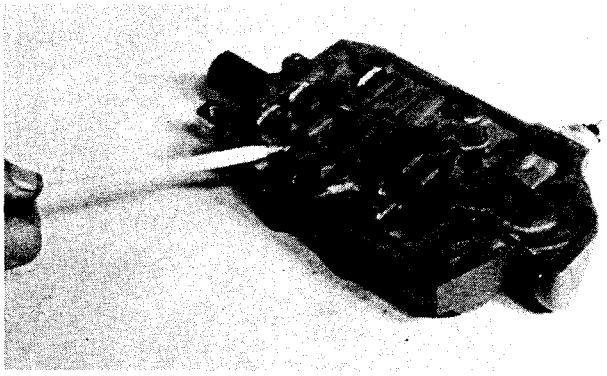


Figure 228

the control cover valve spools are to be inspected or ıe spool oil seals changed, remove the valve spool ops as shown and pull spools out of oil seals. Always eplace oil seals if valve spools are removed for inspec- on. Sharp edges on valve spool will cut lip of oil seal. /hen replacing oil seal, pick old seal out of housing sing caution as not to damage oil seal bore.

ıstall new seal in control valve. **NOTE:** When instal- ng speed and direction selector spools through oil seal se extreme caution as not to cut lip of oil seal.

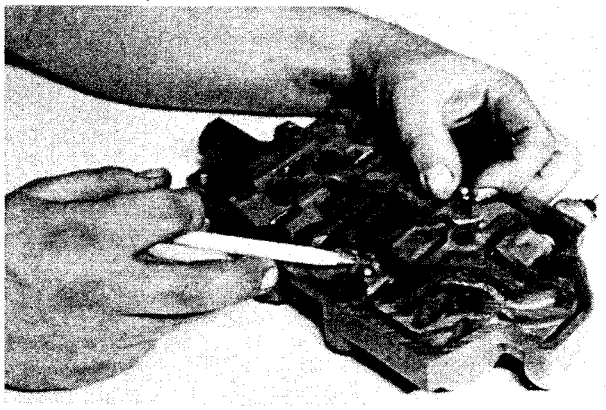


Figure 229

Position detent balls in housing.

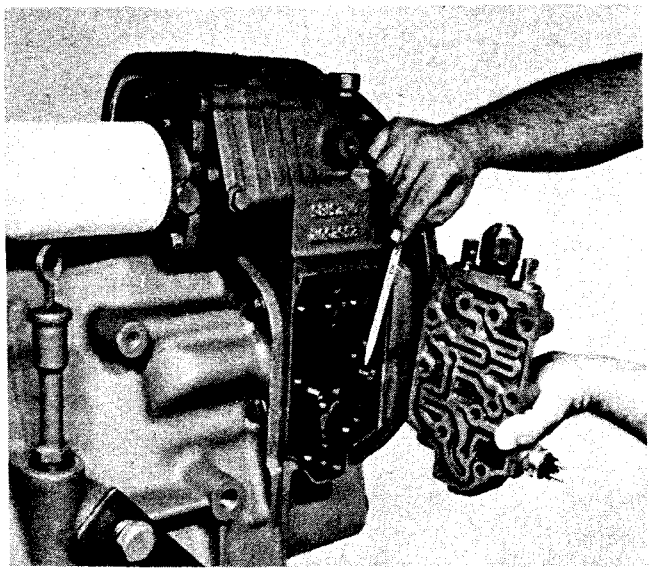


Figure 230

Position new gasket and detent springs on converter housing. Install control valve and valve to housing capscrews and washers.

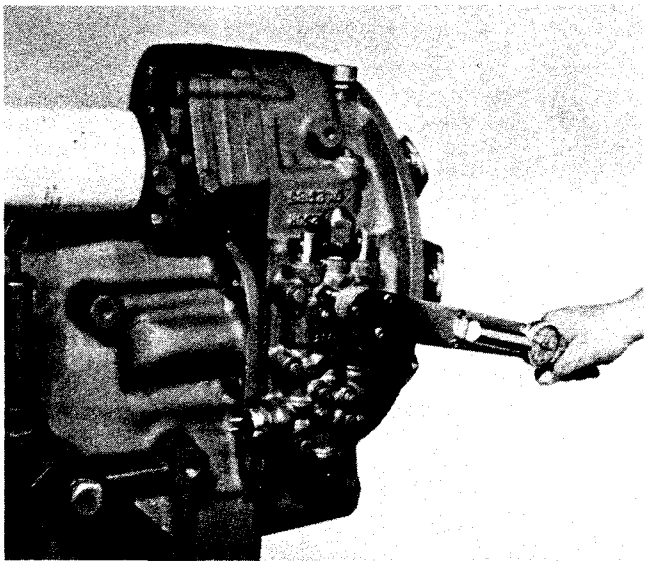


Figure 231

Tighten capscrews 23 to 25 ft. lbs. torque [3,2 - 3,4 m.kg].

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 engine 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.

   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. Recheck with hot oil (180-200° F.) [82, 2-93, 3° C].

   Bring oil level to **FULL** mark on dipstick.

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

TOWING OR PUSH STARTING

Before towing the vehicle, be sure to lift the rear wheels off the ground or disconnect the driveline to avoid damage to the transmission during towing.

NOTE: If the transmission has 4 wheel drive, disconnect both front and rear drivelines. Because of the design of the hydraulic system, the engine **cannot** be started by pushing or towing.

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. [1,76 Kg/cm²] minimum pressure at 2000 R.P.M. engine speed **AND** a maximum of 70 P.S.I. [4,92 Kg/cm²] 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	180-220 p.s.i. [12,7-15,4 kg/cm²] — 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. [0,4 kg/cm²]. If clutch pressure varies in any one clutch more than 5 psi. [0,4 kg/cm²] repair clutch.**

NOTE: Never use service brakes while making clutch pressure checks. Units having brake actuated declutching in forward and/or reverse will not give a true reading.

ALWAYS USE PARKING BRAKE WHEN MAKING CLUTCH PRESSURE CHECKS.

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.

DRAIN PERIOD Every 250 hours, change oil filter element. Every 500 hours, drain and refill system as follows: Drain with oil at 150 to 200° F. [65, 6 - 93, 3° C].

(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.

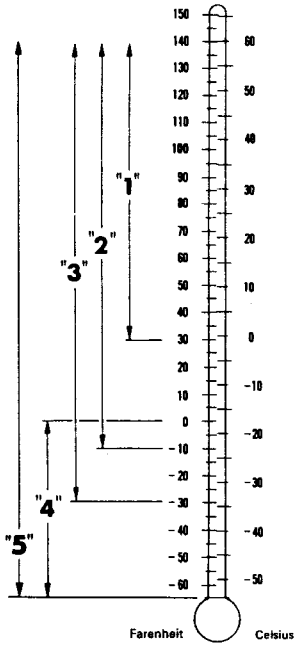
(c) Refill transmission to LOW mark.

(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 POWER SHIFTED TRANSMISSION AND TORQUE CONVERTERS

Prevailing Ambient Temperature



"1" C-3 Grade 30 ENGINE OIL Grade 30 API-SE or CD

"2" (1) MIL-L-2104C Grade 10
(2) C-2 or C-3 Grade 10-W
(3) ENGINE OIL Grade 10 API-SE or CD

"3" (1) DEXRON*
(2) DEXRON II* — See Caution below

"4" MIL-L-46167

"5" CONOCO Polor Start DN — 600 Fluid

NOTE:

Oil groups 2 & 3 may be used to lower ambient temperatures when sump preheaters are used.

Oil group 4 should be used only up to ambient temperature shown.

Contact Clark Transmission Division for lubrication to be used as initial fill in new modulated shift transmissions.

CAUTION: Dexron II* is not compatible with graphitic clutch plate friction material. Dexron II* can not be used in the 3000, 4000, 5000, 8000 or 16000 series power shift transmissions, or the HR28000 series having converter lock-up, or the C270 series converter having lock-up.

*Dexron is a registered trademark of General Motors Corporation.

TROUBLE SHOOTING GUIDE
For The
HR Model, 18000 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, transmisison, and allied hydraulic system for pressures and rate of oil flow, it is essential that the following preliminary checks be made.

1. 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. Defective oil pump.	3. Replace pump.

OVERHEATING

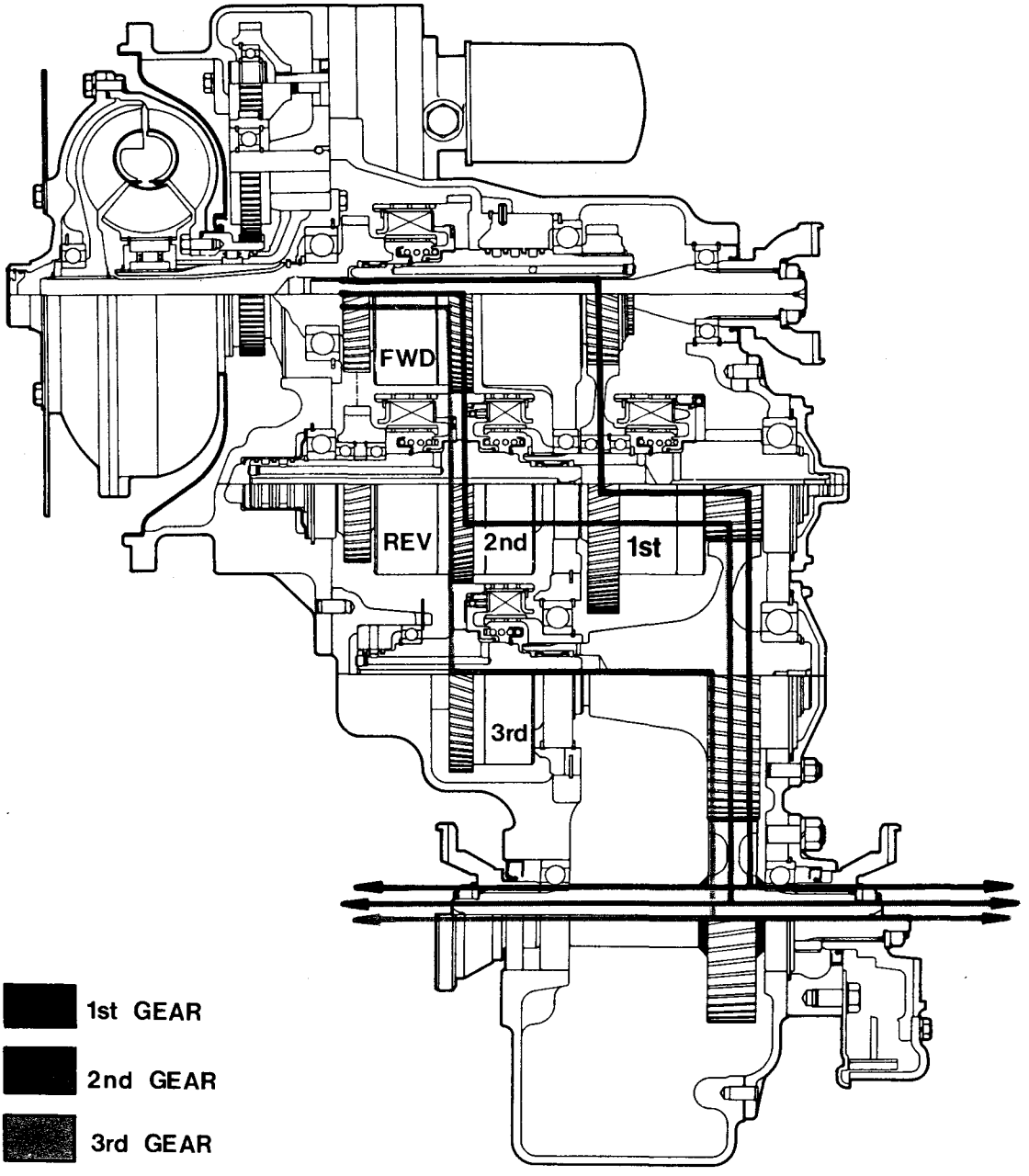
1. Worn oil sealing rings.	1. Remove, disassemble, and rebuild converter assembly.
2. Worn oil pump.	2. Replace.
3. Low oil level.	3. Fill to proper level.

NOISY CONVERTER

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

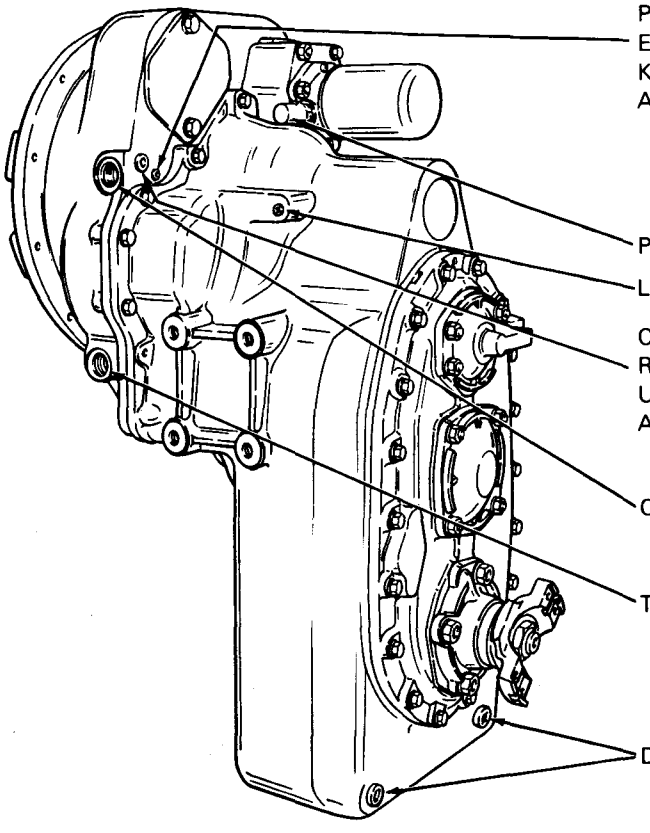
LACK OF POWER

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 "Over-Heating."



18000 3 SPEED TRANSMISSION LONG DROP
POWER FLOW

PRESSURE CHECK POINTS



CHECK POINT "C" CONVERTER OUTLET PRESSURE 25 P.S.I. [1,76 Kg/cm²] MINIMUM PRESSURE AT 2000 R.P.M. ENGINE SPEED AND A MAXIMUM OF 70 P.S.I. [4,92 Kg/cm²] OUTLET PRESSURE WITH ENGINE OPERATING AT NO LOAD GOVERNED SPEED.

PRESSURE REGULATOR VALVE

LUBE (CONSTRUCTION HOLE ONLY)

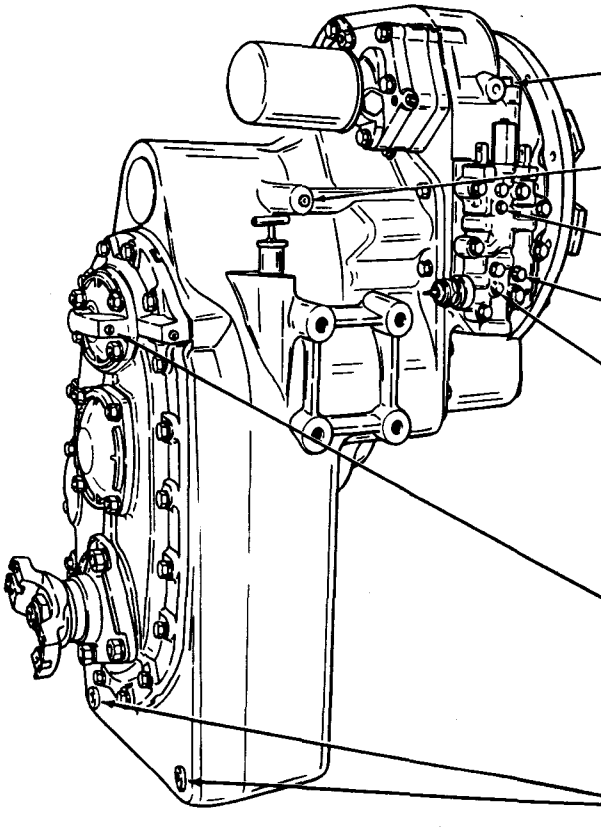
CHECK POINT "D" CONVERTER OUTLET TEMPERATURE RED LINE 250° F. [121° C] ½ N.P.T.F. PORT SIZE — MAY USE CLARK NO. 234033 (REF.) OR SAE NO. 2 TEMPERATURE PICKUP.

CONVERTER OUT

TO LUBE FROM COOLER

DRAIN

CHECK POINTS A & D SHOULD BE MONITORED BY GAUGES LOCATED IN OPERATOR'S COMPARTMENT.



CHECK POINT "A" CLUTCH PRESSURE ¼ N.P.T.F. CLUTCH PRESSURE 180 TO 220 P.S.I. [12,65-15,46 Kg/cm²].

FWD. (CONSTRUCTION HOLE ONLY)

TRANSMISSION FWD. CLUTCH PRESSURE PORT (⅛ N.P.T.F.)

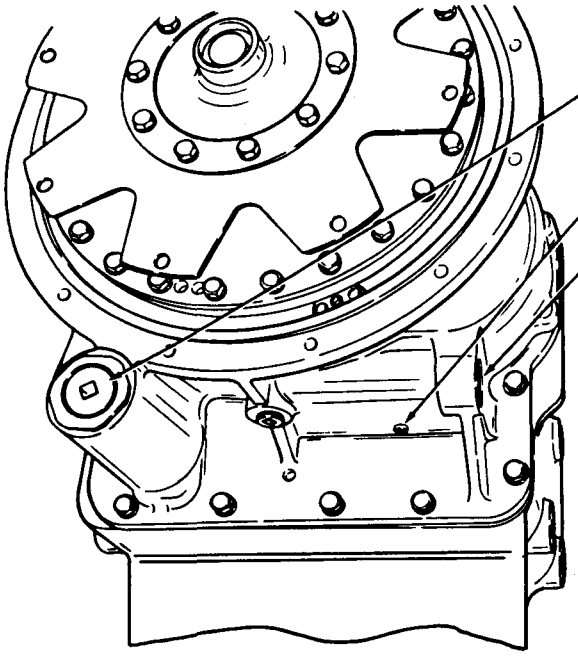
2ND

TRANSMISSION REV. CLUTCH PRESSURE PORT (⅛ N.P.T.F.)

THESE PORTS ARE PROVIDED FOR INSTALLATION OF BACK-UP WARNING LIGHT PRESSURE SWITCH OR HORN.

1ST (LOW)

DRAIN



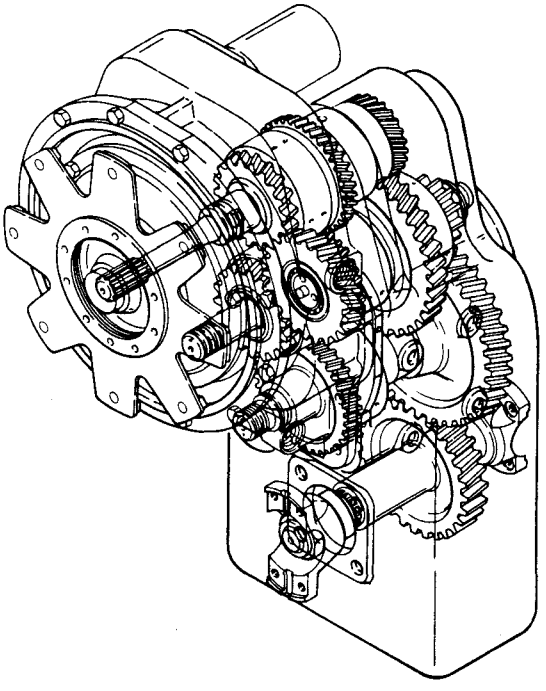
SUMP SCREEN

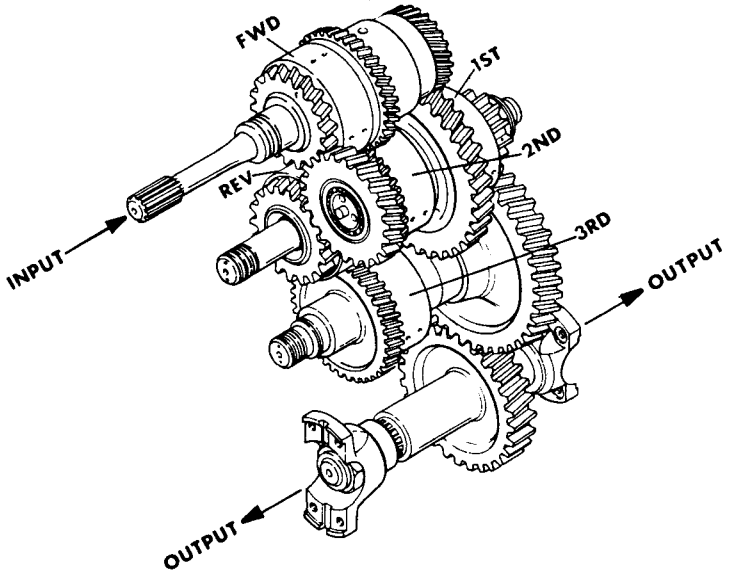
CHECK POINT "H" LUBE PRESSURE ⅛ N.P.T.F. 15-25 P.S.I. [1,1-1,7 Kg/cm²] @ 2000 RPM & 180°-200° F [82,2-93,3° C] AT CONVERTER OUTLET.

TO LUBE FROM COOLER

HOSE LINE OPERATING REQUIREMENTS:

1. PRESSURE LINES:
   AMBIENT TO 250° F [121° C] FOR CONTINUOUS OPERATION. MUST WITHSTAND 300 P.S.I. [21,09 Kg/cm²] CONTINUOUS OPERATION WITH 600 P.S.I. [42,19 Kg/cm²] SURGE PRESSURE. REF. SAE 100RI HYDRAULIC HOSE.
2. OIL SPECIFICATIONS:
   SEE CLARK DWG. NO. 236647 FOR CLARK RECOMMENDATIONS FOR USE IN TORQUE CONVERTERS & POWER SHIFT TRANSMISSIONS.
3. ALL HOSE LINES USED MUST CONFORM TO SAE SPEC. NO. SAE J1019 TESTS & PROCEDURES FOR HIGH-TEMPERATURE TRANSMISSION OIL HOSE, LUBRICATING OIL HOSE & HOSE ASSEMBLIES.





18000 SERIES-3 SPEED LONG DROP CLUTCH AND GEAR ARRANGEMENT

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. No. 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 2.50 [63,50mm] 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 front access hole.

4. Install a 4.00 [101,60mm] long drive plate locating stud .3750-24 fine thread in a drive plate nut.

5. Rotate the transmission torque converter to align the locating stud in the drive plate with the flywheel drive plate mounting screw hole positioned in step No. 3. Locate transmission on flywheel housing aligning drive plate to flywheel and transmission to flywheel housing guide studs. 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. Install drive plate attaching screw and washer. Snug screw but **do not tighten. NOTE:** 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 [3,46-4,14 m.kg]. This will require torquing each screw and rotating the engine flywheel until the full amount of eight (8) screws have been tightened.

7. Measure engine crankshaft end play after transmission has been completely installed on engine flywheel. This value must be within .001 [0,025mm] of the end play recorded in step No. 2.