

18000 powershift transmission

maintenance & service manual

6 speed supplement

**to be used in conjunction with
R or HR 3 speed long drop
18000 maintenance & service manual.**

CLARK **Axle and
Transmission
Divisions**

Service Publications

1300 Falahee Road

Jackson, Michigan 49204

TABLE OF CONTENTS

SIX-SPEED CLUTCH AND GEAR GROUP	FIG. A
TYPICAL SIX-SPEED LOW POWER FLOW	FIG. B
TYPICAL SIX-SPEED HI POWER FLOW	FIG. C
TYPICAL 18,000 SIX-SPEED ASSEMBLY INSTRUCTION SHEET .	FIG. D
DISASSEMBLY	1
18,000 SERIES SIX-SPEED CLUTCH AND GEAR ARRANGEMENT . .	10

CLARK

CLARK

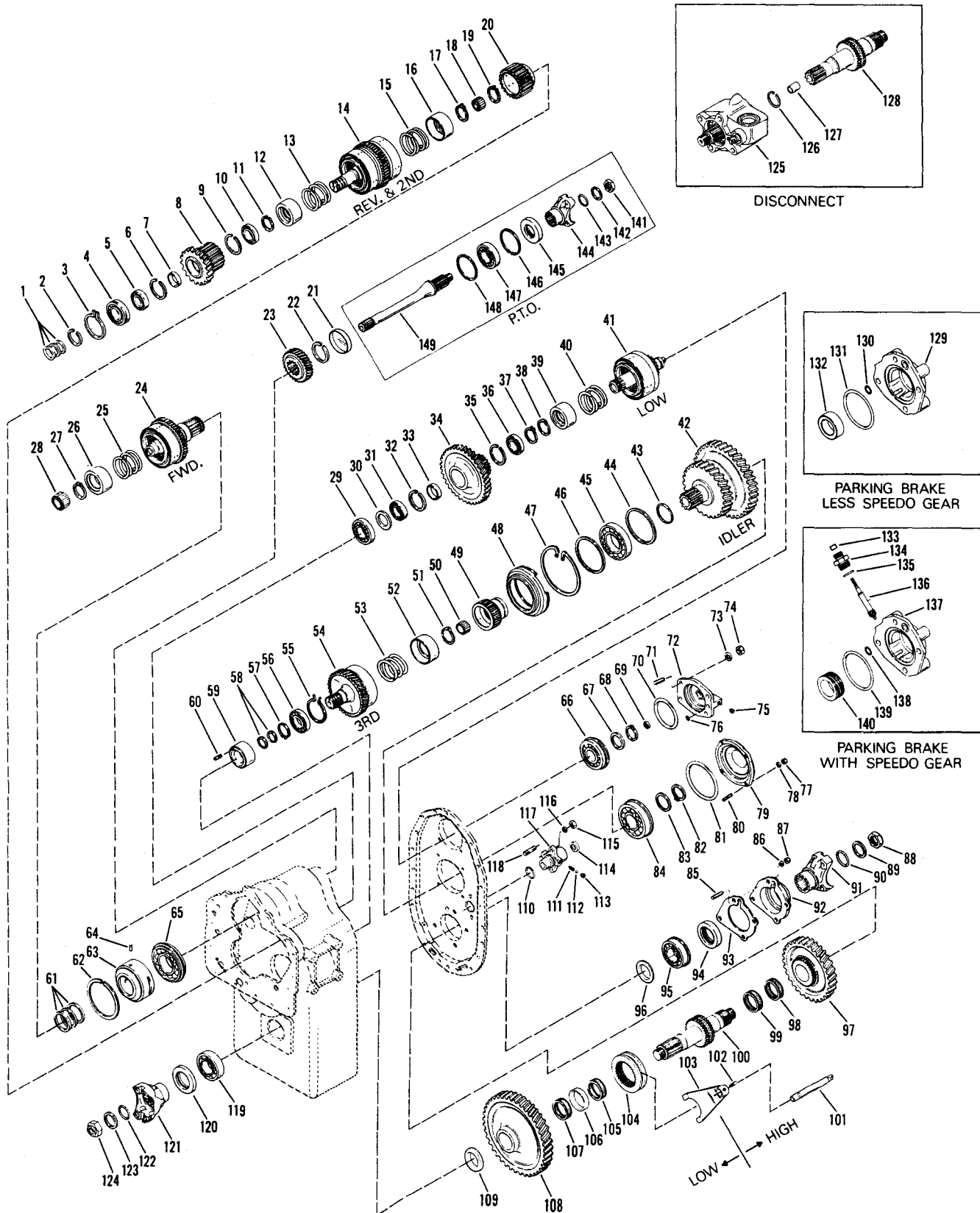


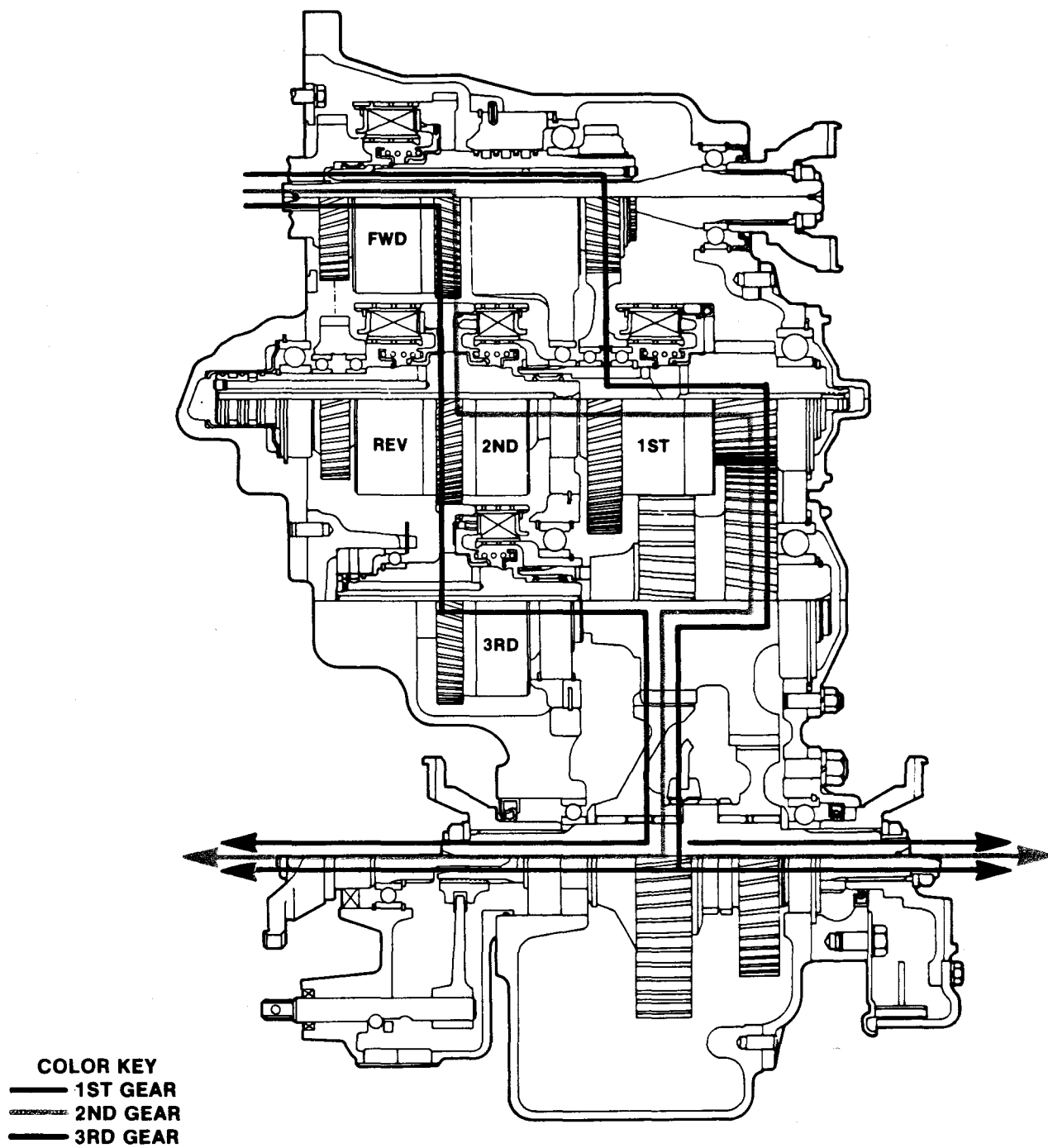
Figure A

6 SPEED CLUTCH AND GEAR GROUP

ITEM	DESCRIPTION	QTY.	ITEM	DESCRIPTION	QTY.
1	Reverse and 2nd Shaft Piston Ring	3	64	Sleeve Roll Pin	1
2	Front Bearing Retaining Ring	1	65	Forward Shaft Rear Bearing	1
3	Front Bearing Snap Ring	1	66	Low Speed Shaft Rear Bearing	1
4	Reverse and 2nd Shaft Front Bearing	1	67	Rear Bearing Support Washer	1
5	Clutch Driven Gear Bearing	1	68	Rear Bearing Retaining Ring	1
6	Bearing Retaining Ring	1	69	Low Shaft Piston Ring	1
7	Clutch Driven Gear Bearing Spacer	1	70	Rear Bearing Cap "O" Ring	1
8	Reverse Clutch Gear and Hub Assembly	1	71	Bearing Cap Stud	4
9	Bearing Retaining Ring	1	72	Low Shaft Rear Bearing Cap	1
10	Clutch Driven Gear Bearing	1	73	Bearing Cap Stud Lockwasher	4
11	Spring Retainer Snap Ring	1	74	Bearing Cap Stud Nut	4
12	Spring Retainer	1	75	Bearing Cap Plug	1
13	Piston Return Spring	1	76	Bearing Cap "O" Ring	1
14	Reverse and 2nd Shaft, and Clutch Drum Assembly	1	77	Rear Bearing Cap Stud Nut	4
15	Piston Return Spring	1	78	Rear Bearing Cap Stud Lockwasher	4
16	Spring Retainer	1	79	Idle Shaft Rear Bearing Cap	1
17	Spring Retainer Snap Ring	1	80	Rear Bearing Cap Stud	4
18	Reverse and 2nd Shaft Rear Bearing	1	81	Rear Bearing Cap "O" Ring	1
19	2nd Clutch Disc Hub Snap Ring	1	82	Idle Shaft Rear Bearing Retainer Ring	1
20	2nd Clutch Disc Hub	1	83	Rear Bearing Support Washer	1
21	Bore Plug	1	84	Idle Shaft Rear Bearing	1
22	Gear Retaining Ring	1	85	Bearing Cap Stud	4
23	Forward Shaft Gear	1	86	Bearing Cap Stud Lockwasher	4
24	Forward Shaft, and Clutch Drum Assembly	1	87	Bearing Cap Stud Nut	4
25	Piston Return Spring	1	88	Flange Nut	1
26	Spring Retainer	1	89	Flange Washer	1
27	Spring Retainer Snap Ring	1	90	Flange "O" Ring	1
28	Forward Shaft Pilot Bearing	1	91	Output Flange	1
29	Low Speed Clutch Shaft Front Bearing	1	92	Rear Bearing Cap	1
30	Front Bearing Spacer	1	93	Bearing Cap Gasket	1
31	Low Speed Gear Bearing	1	94	Rear Bearing Cap Oil Seal	1
32	Low Speed Gear Bearing Locating Ring	1	95	Output Shaft Rear Bearing	1
33	Low Speed Gear Spacer	1	96	Gear Thrust Washer	1
34	Low Shaft Gear and Hub Assembly	1	97	High Range Gear	1
35	Low Speed Gear Bearing Locating Ring	1	98	High Gear Bearing	1
36	Low Speed Gear Bearing	1	99	High Gear Bearing	1
37	Low Gear Bearing Retaining Ring	1	100	Output Shaft	1
38	Spring Retainer Snap Ring	1	101	Hi & Low Shift Rail	1
39	Spring Retainer	1	102	High and Low Shift Rail Lockscrew	1
40	Piston Return Spring	1	103	High and Low Shift Fork	1
41	Low Clutch Shaft Drum Assembly	1	104	Range Shift Hub	1
42	Idle Shaft	1	105	Low Gear Bearing	1
43	Bearing Retaining Ring	1	106	Bearing Spacer	1
44	Bearing Locating Ring	1	107	Low Gear Bearing	1
45	3rd Clutch Disc Hub Bearing	1	108	Low Range Gear	1
46	Bearing Locating Ring	1	109	Gear Thrust Washer	1
47	Bearing Carrier Locating Ring	1	110	Range Shift Rail Housing "O" Ring	1
48	Bearing Carrier	1	111	Mesh Lock Spring	1
49	3rd Clutch Disc Hub	1	112	Mesh Lock Ball	1
50	3rd Clutch Shaft Pilot Bearing	1	113	Housing Detent Plug	1
51	Spring Retainer Snap Ring	1	114	Shift Rail Oil Seal	1
52	Spring Retainer	1	115	Housing Stud Nut	2
53	Piston Return Spring	1	116	Housing Stud Nut Lockwasher	2
54	3rd Clutch Shaft, and Drum Assembly	1	117	Hi & Low Shift Rail Support	1
55	3rd Clutch Shaft Front Bearing Locating Ring	1	118	Range Shift Rail Housing Stud	2
56	3rd Clutch Shaft Front Bearing	1	119	Output Shaft Front Bearing	1
57	3rd Clutch Shaft Front Bearing Retaining Ring	1	120	Output Oil Seal	1
58	3rd Clutch Shaft Piston Ring	2	121	Output Flange	1
59	Piston Ring Outer Race	1	122	Flange "O" Ring	1
60	Outer Race Roll Pin	1	123	Flange Washer	1
61	Forward Shaft Piston Ring	3	124	Flange Nut	1
62	Piston Ring Sleeve Retaining Ring	1	125	Disconnect Assembly	1
63	Piston Ring Sleeve	1	126	Output Shaft Front Bearing Retainer Ring	1
			127	Output Shaft Bushing	1
			128	Output Shaft	1
				(Used with Disconnect only)	

CLARK

CLARK

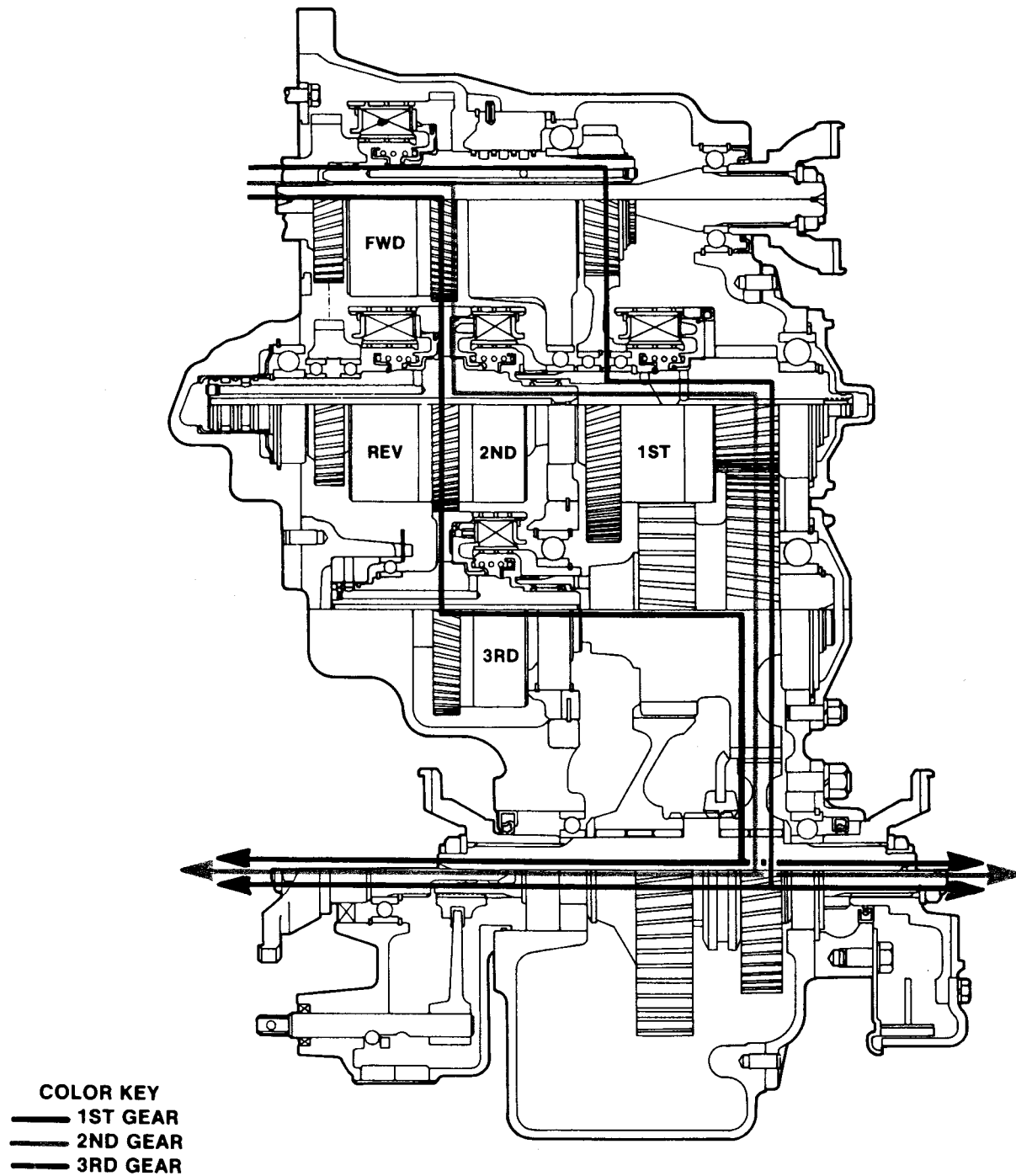


**6 SPEED 18000 TRANSMISSION POWER FLOW
LOW RANGE**

Figure B

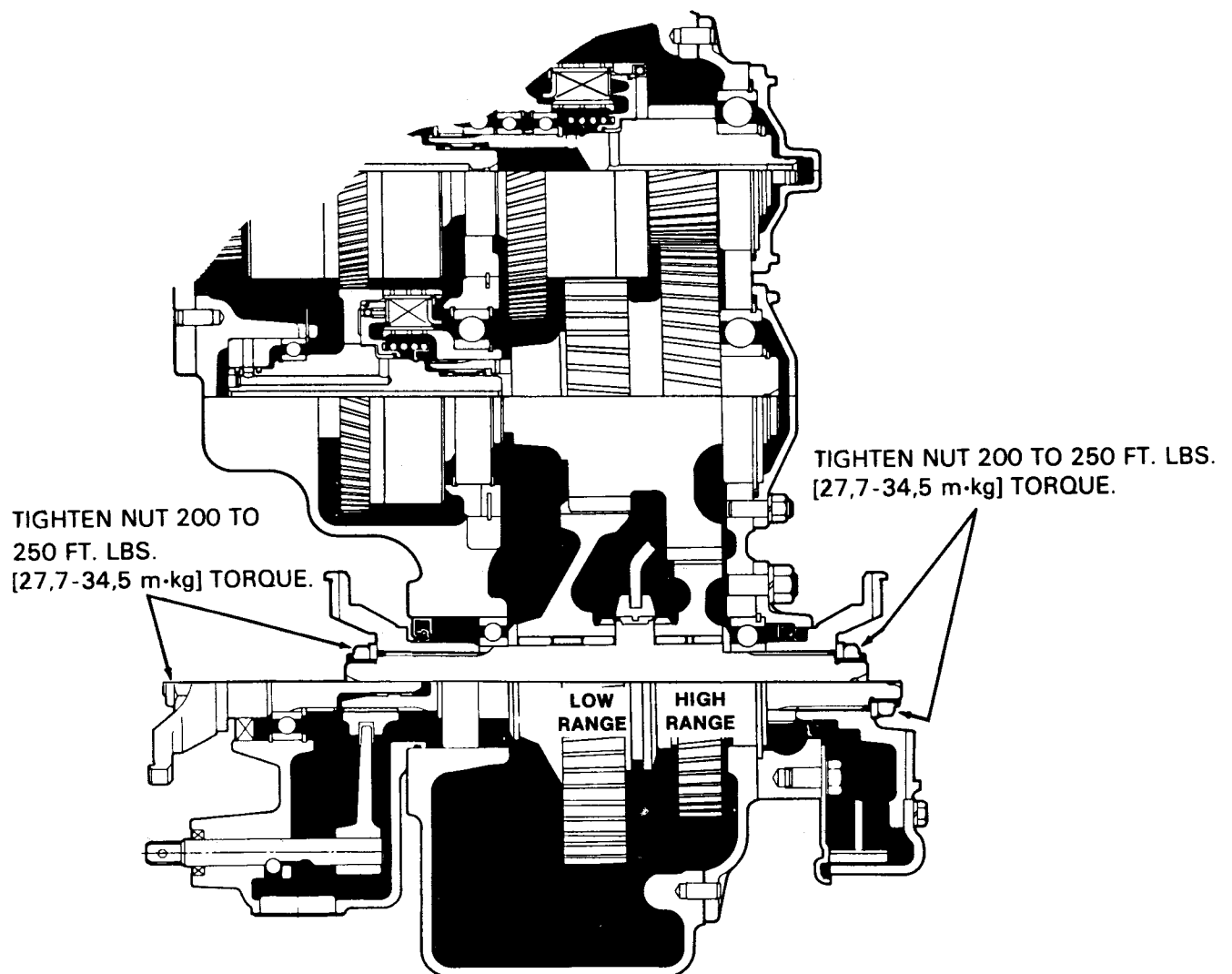
CLARK

CLARK



**6 SPEED 18000 TRANSMISSION POWER FLOW
HIGH RANGE**

Figure C



REFER TO R OR HR 3 SPEED
MAINTENANCE AND SERVICE MANUAL FOR
OTHER ASSEMBLY INSTRUCTIONS

Figure D

18000 SERIES 6 SPEED

To be used in conjunction with the 18000 3 Speed R or HR Long Drop Output Maintenance and Service Manual

The 6-speed transmission has 3 working range shifts and 3 travel range shifts.

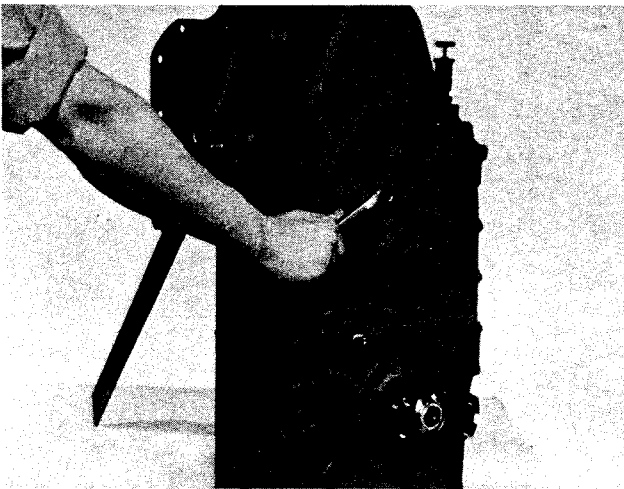
Gear ratio determines working and travel ranges. They are as follows:

1st — 2nd and 4th working ratio. 3rd — 5th and 6th travel ratio.

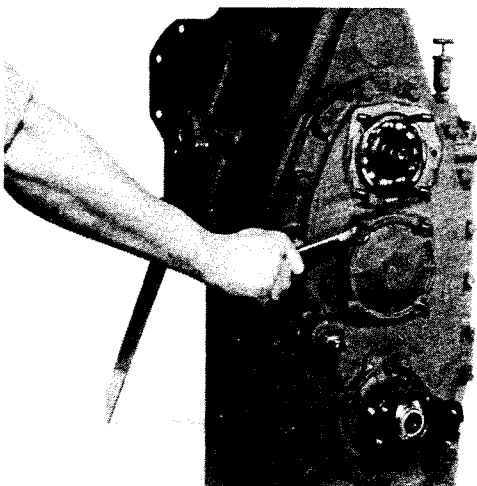
NOTE: Range shift from low to high must be made with machine stopped.

DISASSEMBLY

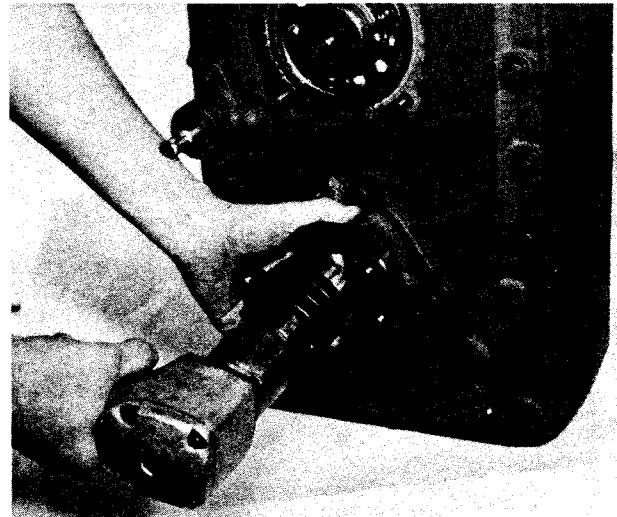
Use the information in the 3-speed Long Drop Maintenance and Service Manual up to removing the low clutch rear bearing cap.

**Figure 1**

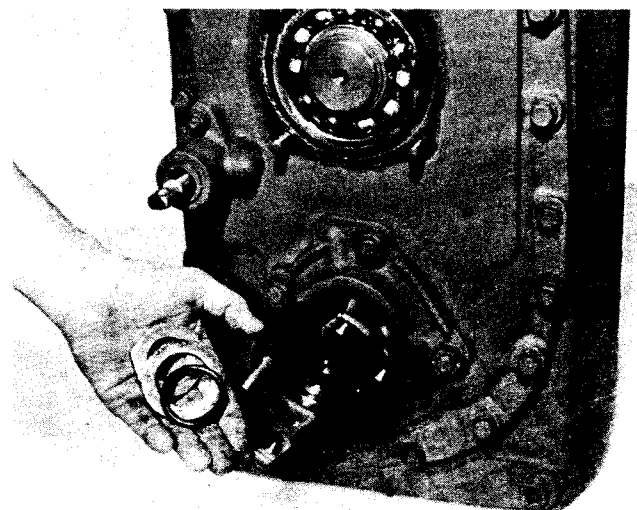
Remove low clutch rear bearing cap stud nuts and washers. Remove cap.

**Figure 2**

Remove idler shaft bearing cap stud nuts and washers.

**Figure 3**

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 4**

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.

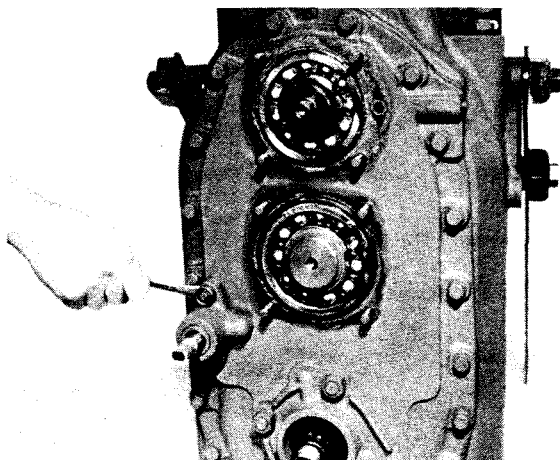


Figure 5

Remove range shift rail support stud nuts and washers.

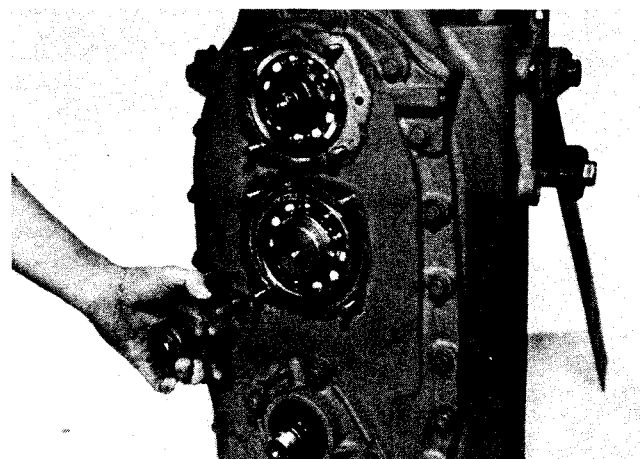


Figure 6

Slide rail support from rail. Use caution as not to lose shift rail detent ball.

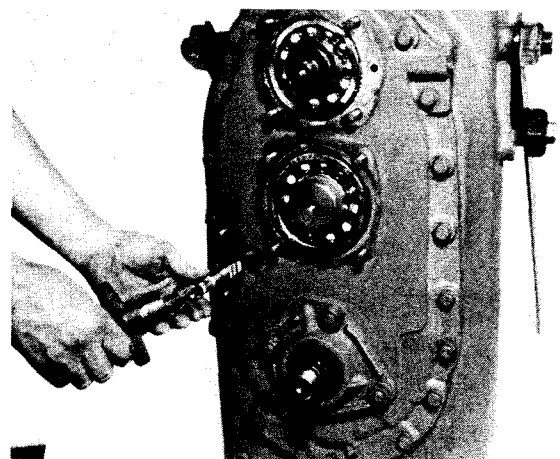


Figure 7

Support and detent ball removed.

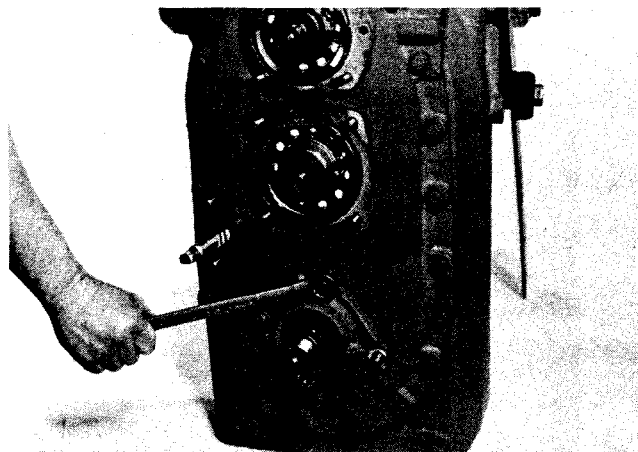


Figure 8

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

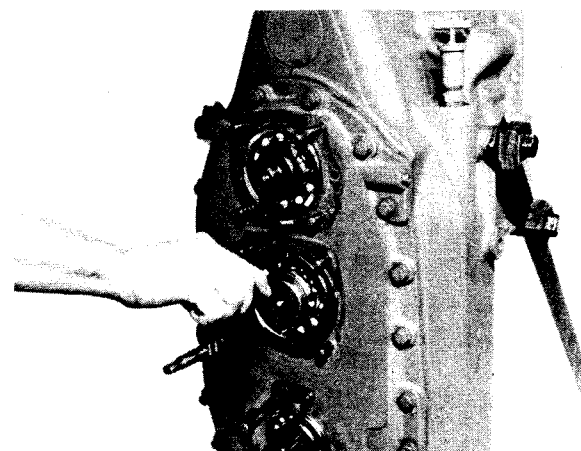


Figure 9

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

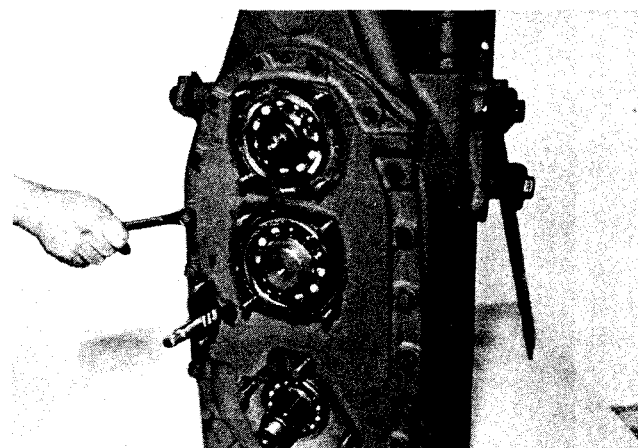


Figure 10

Remove rear cover bolts and washers.

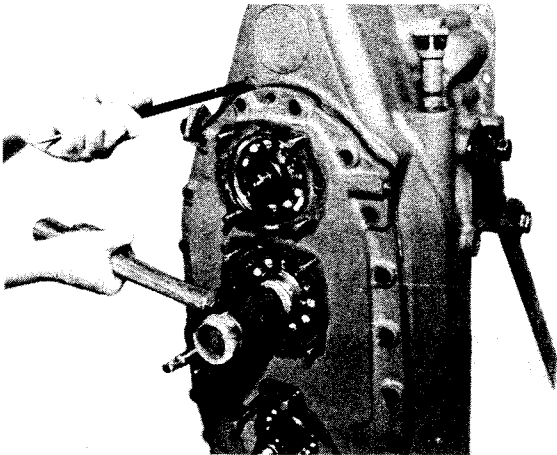


Figure 11

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.

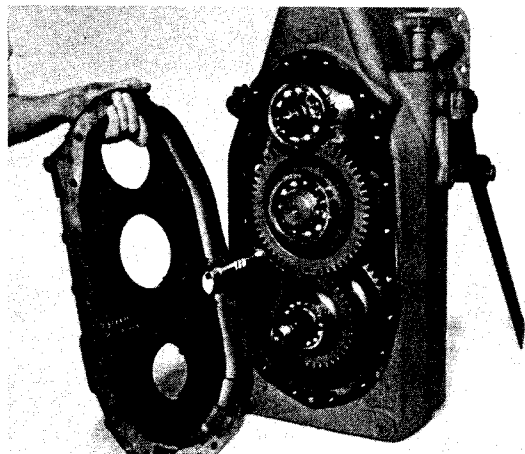


Figure 12

Rear cover removed.

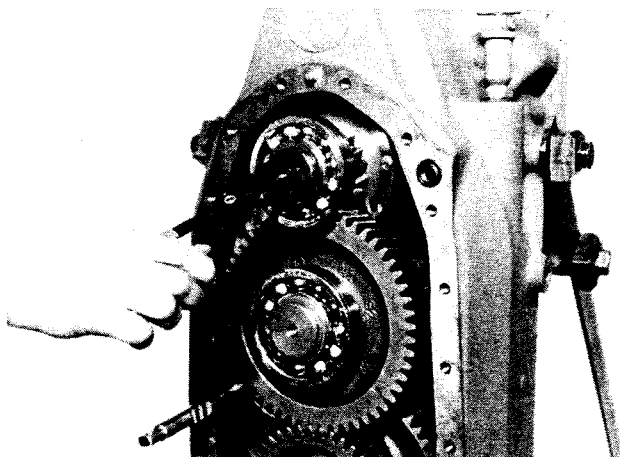


Figure 13

Remove low clutch rear bearing retainer ring.

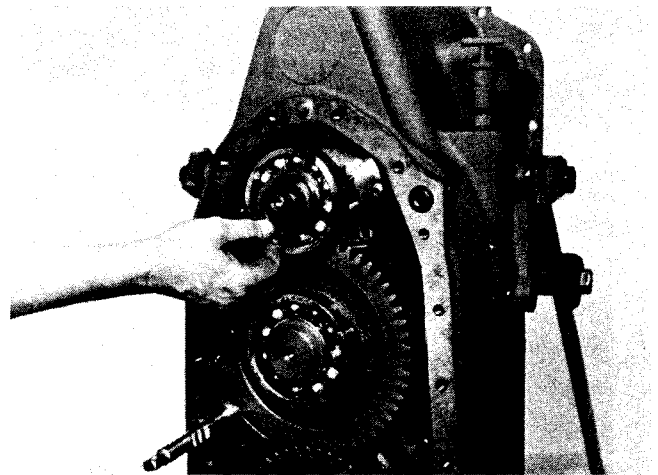


Figure 14

Remove bearing spacer.

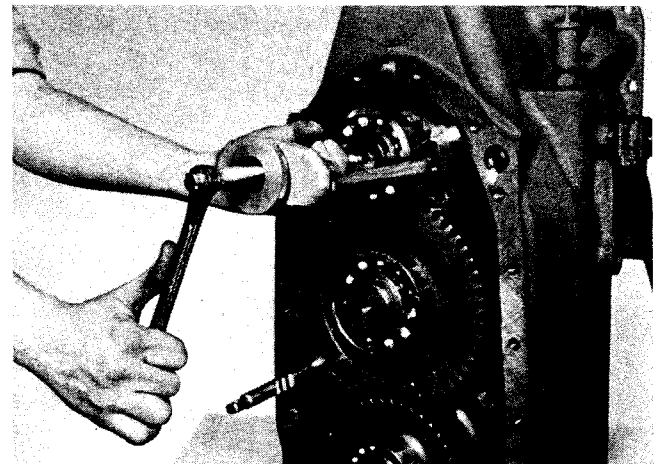


Figure 15

Remove low clutch rear bearing.

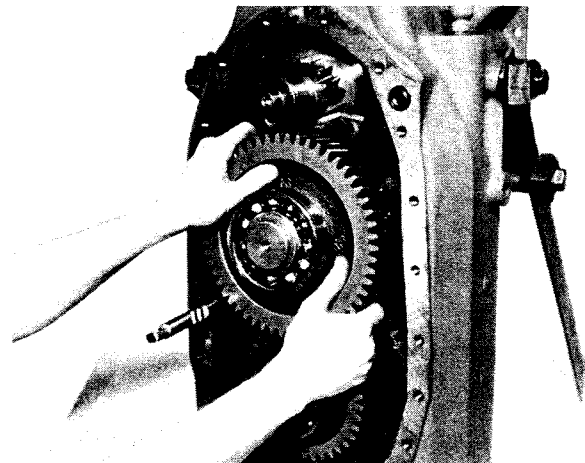


Figure 16

Remove idler shaft and gear assembly.

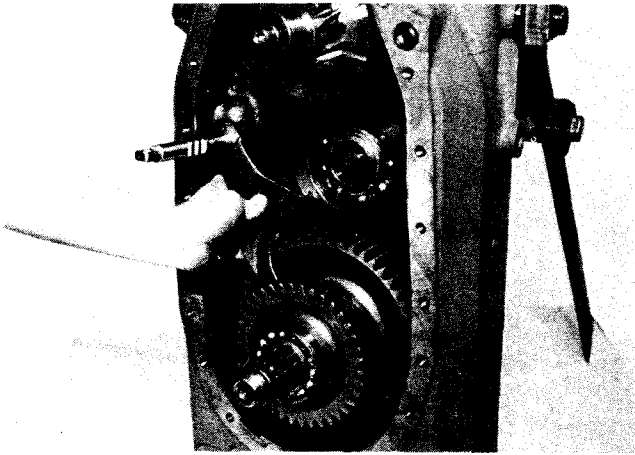


Figure 17

Remove range shift fork and rail from housing.

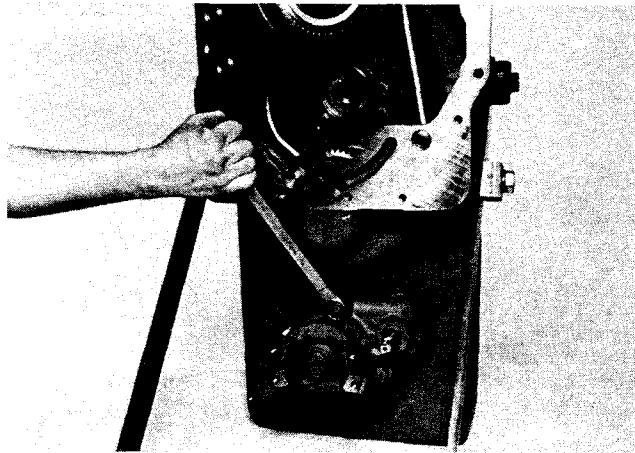


Figure 18

Remove axle disconnect stud nuts and washers.
NOTE: If disconnect is not used, remove output shaft front flange nut, washer, "O" ring and flange.

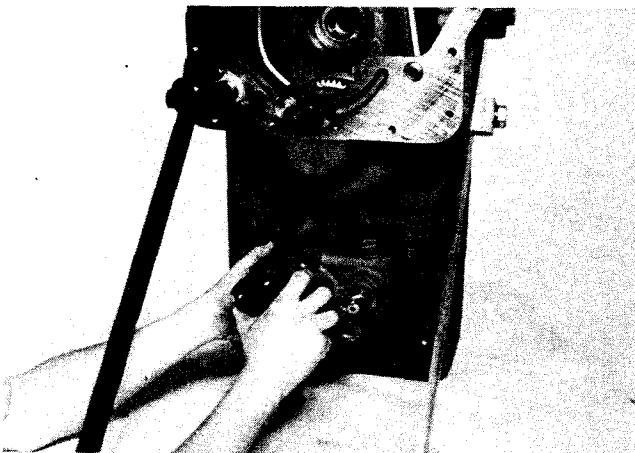


Figure 19

Remove disconnect assembly from studs.

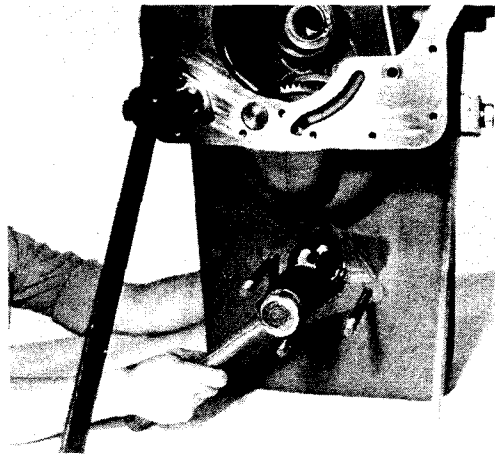


Figure 20

Tap output shaft to remove output shaft front bearing from bearing bore.

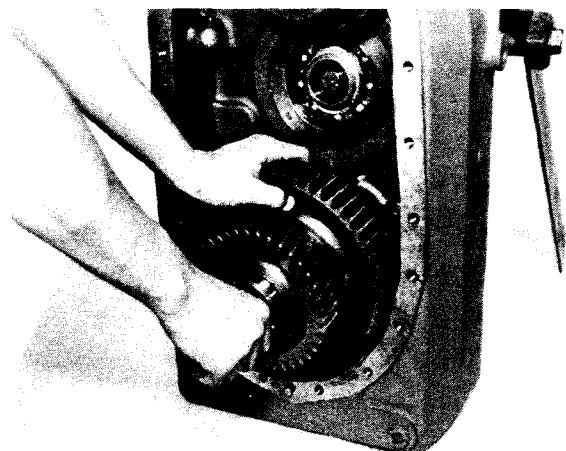


Figure 21

Remove output shaft assembly from housing.

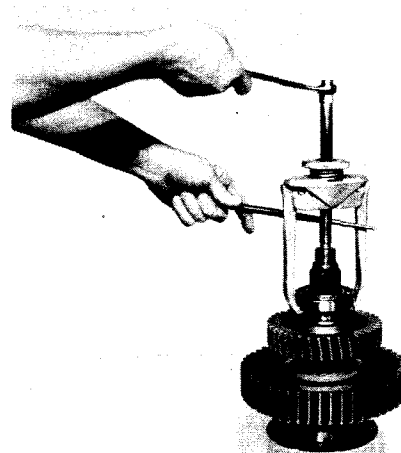
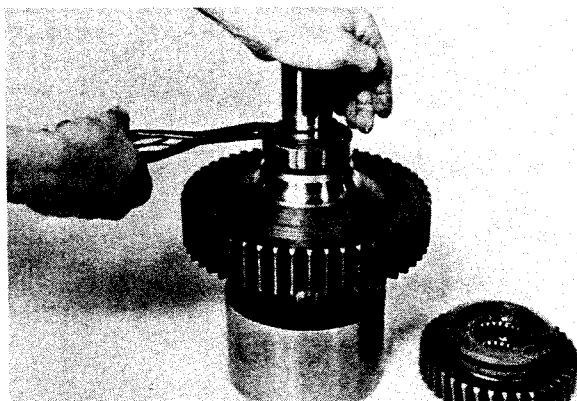
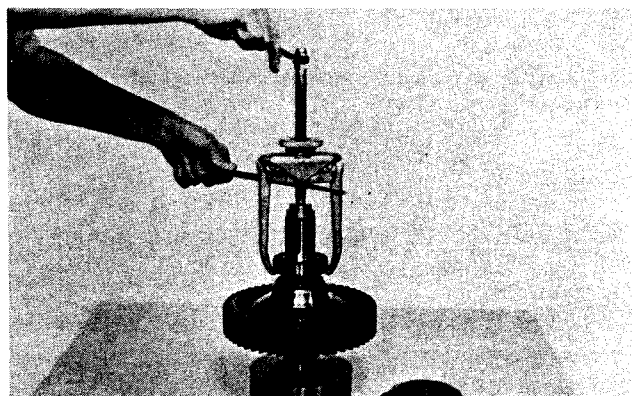


Figure 22

Remove output shaft rear bearing. Remove high range gear, bearings and shaft hub from shaft.

**Figure 23**

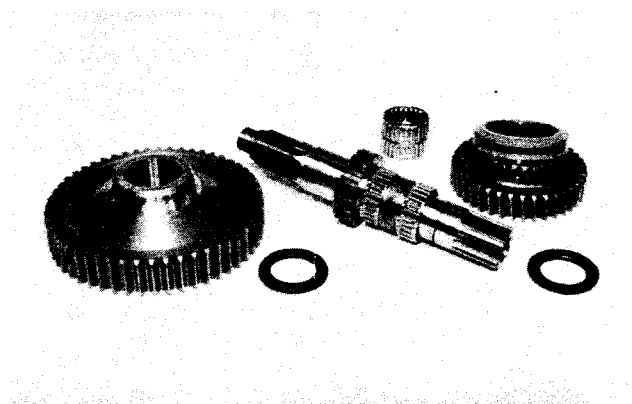
If unit has a disconnect, remove front bearing retainer ring.

**Figure 24**

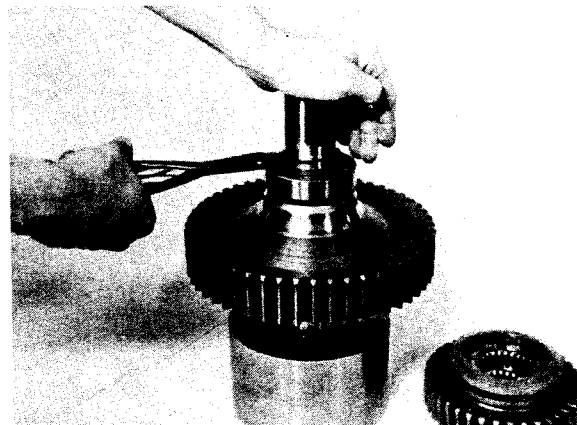
Remove front bearing.

Refer to 3 speed long drop maintenance and service manual for cleaning and inspection of parts before reassembly.

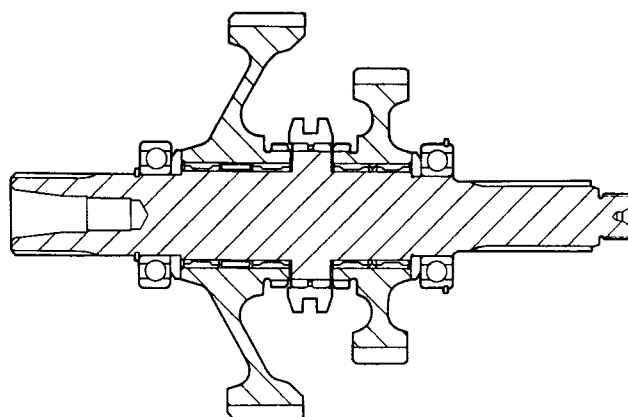
REASSEMBLY

**Figure 25**

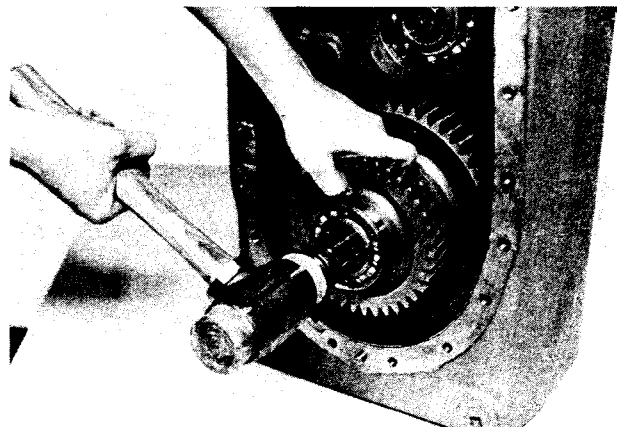
A bearing spacer is used in the output shaft low gear. Install inner needle bearing assembly, bearing spacer and outer bearing assembly.

**Figure 26**

Position low gear on bearings and spacer. Use caution as not to damage bearings. **NOTE:** Long hub of gear up. Position thrust washer on shaft with bevel on washer up. Press front bearing on shaft. If disconnect is used install front bearing retainer ring.

**Figure 27**

Cross section of output shaft showing stack up of parts.

**Figure 28**

Install output shaft assembly in housing. Tap assembly into position.

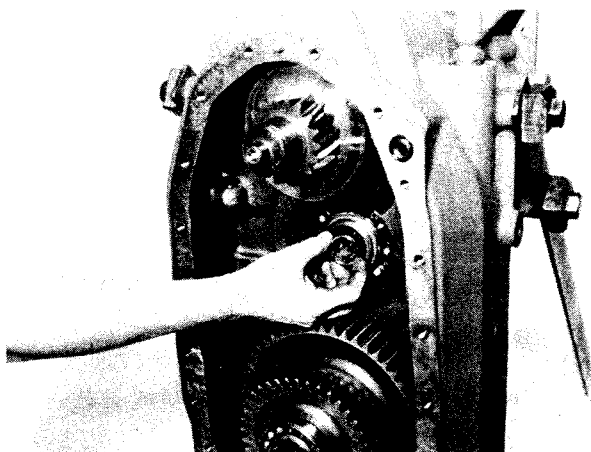


Figure 29

Insert idler shaft pilot bearing in 3rd speed clutch disc hub.

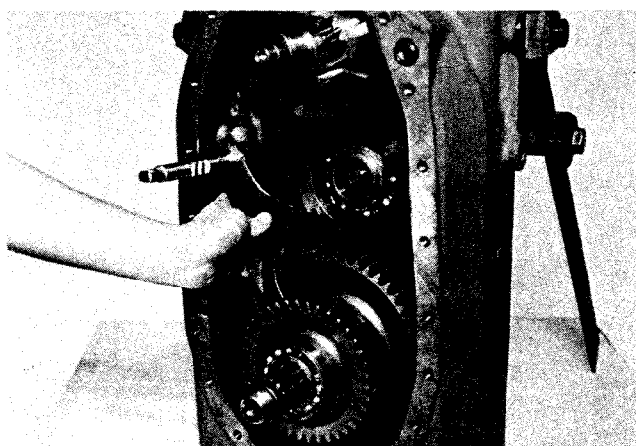


Figure 30

Position range shift fork and rail in range shift hub.

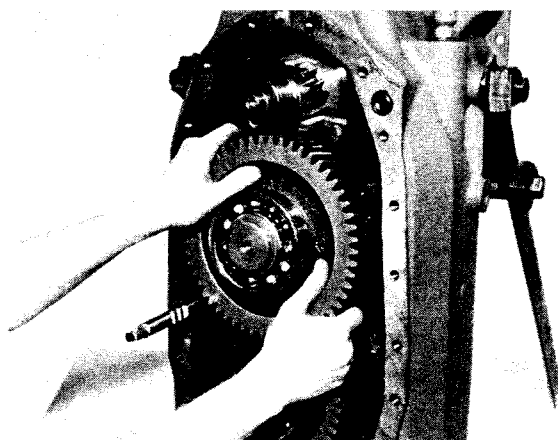


Figure 31

Install idler shaft and gear assembly in 3rd speed clutch disc hub by aligning splines on idler shaft with splines in clutch disc hub.

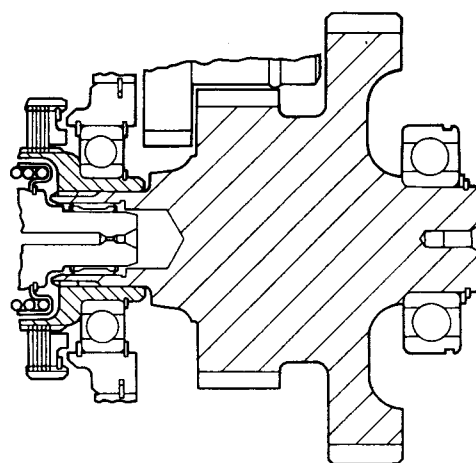


Figure 32

Cross section of idler shaft installed in 3rd speed clutch disc hub.

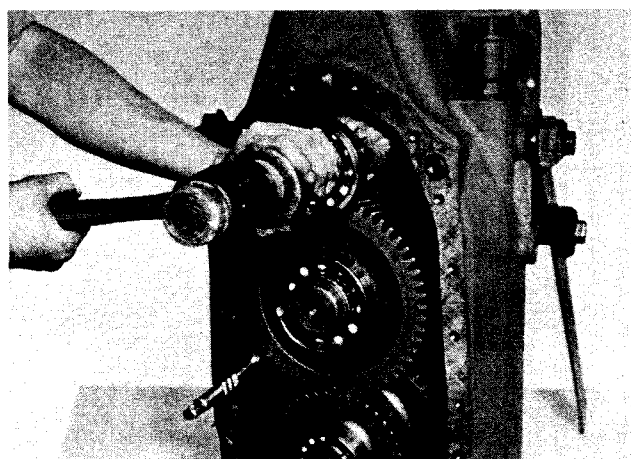


Figure 33

Install low clutch rear bearing.

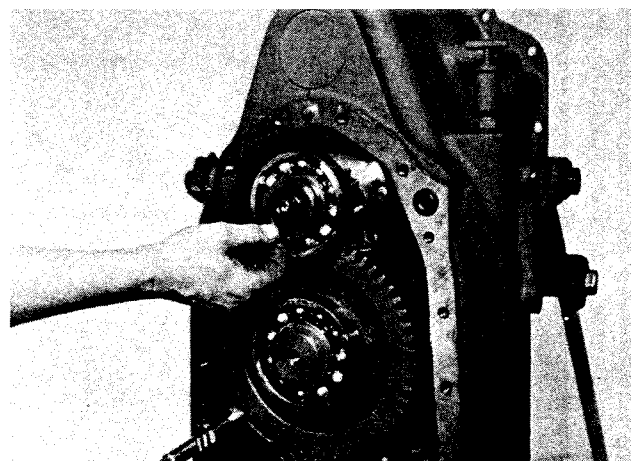


Figure 34

Install bearing spacer.

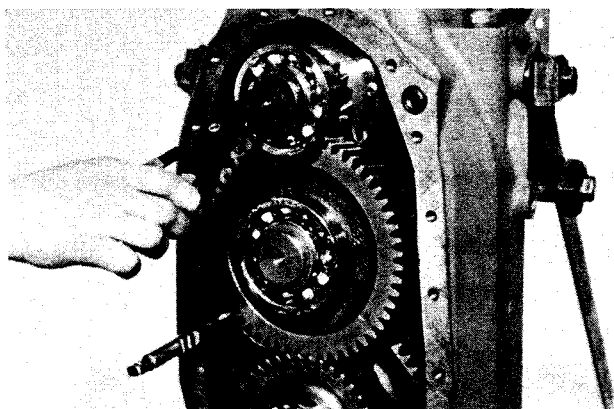


Figure 35
Install bearing retainer ring.

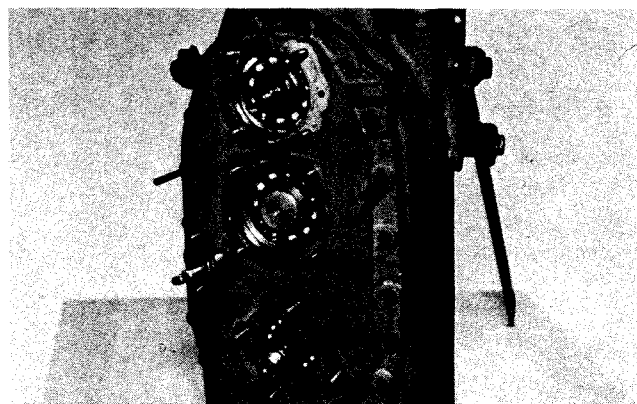


Figure 36
Position new gasket and "O" ring on rear of transmission housing. A thin coat of chassis grease will hold the gasket and "O" ring in place.
Install rear cover. Note two aligning studs to facilitate cover to housing assembly. Tap cover in place aligning shaft bearings with bearing bores. Remove studs and install cover bolts and lockwashers.

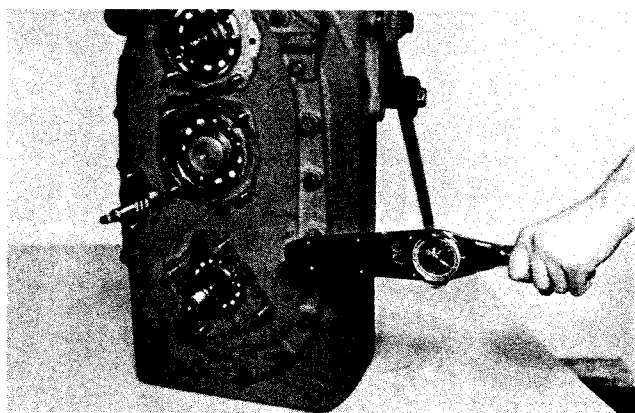


Figure 37
Tighten rear cover bolts 37 to 41 ft. lbs. torque [5,1 - 5,6 m.kg].

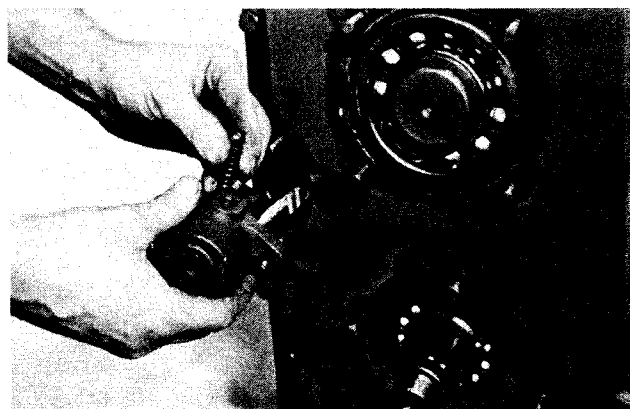


Figure 38
Position range shift rail support detent spring and ball in rail support.

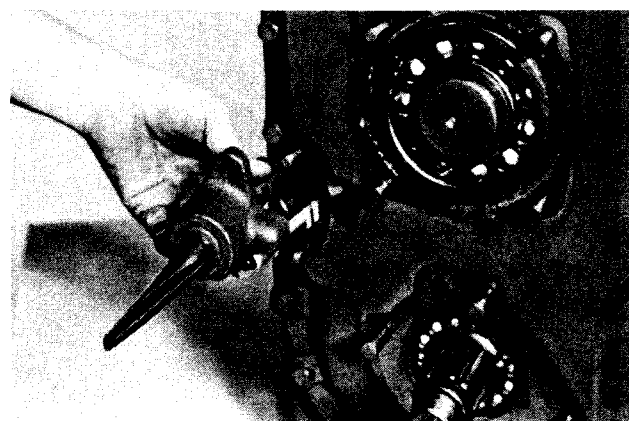


Figure 39
Detent ball and spring can be depressed with a blunt tool to hold in spring pocket until rail is in position. To facilitate assembly a taper rod was used to hold the detent spring and ball in position while installing support on shift rail.

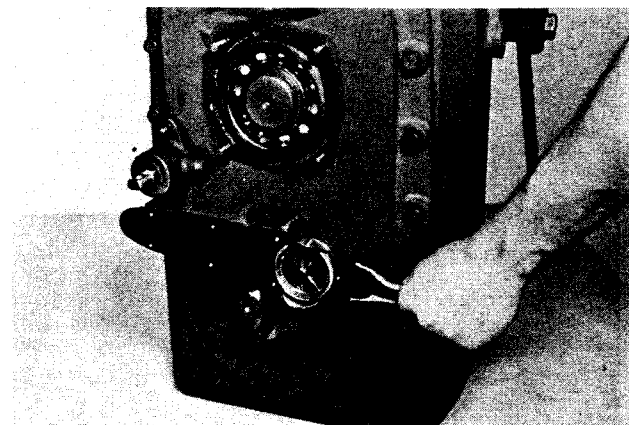


Figure 40
Install support washers and stud nuts. Tighten nuts 26 to 29 ft. lbs. torque [3,6 - 4,0 m.kg].

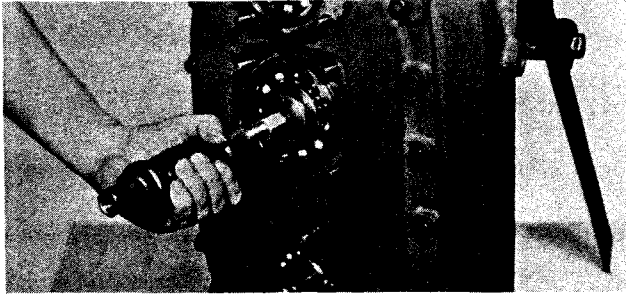


Figure 41

From the front of the transmission tap the low clutch and the output shaft to the rear far enough to install the rear bearing locating ring. On the idler shaft a hammer puller was made from a 3/8 - 24 threaded plug to pull the rear bearing to the rear far enough to install the locating ring.

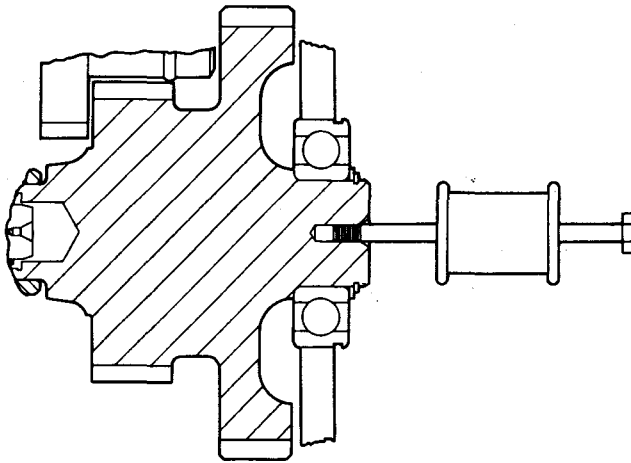


Figure 42

Cross section of hammer puller and idler shaft. Install low clutch, idler shaft and rear output shaft bearing locating rings.

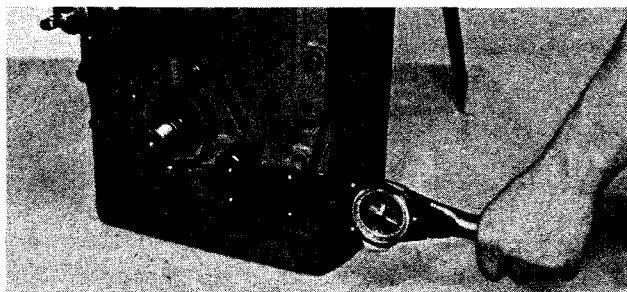


Figure 43

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.

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

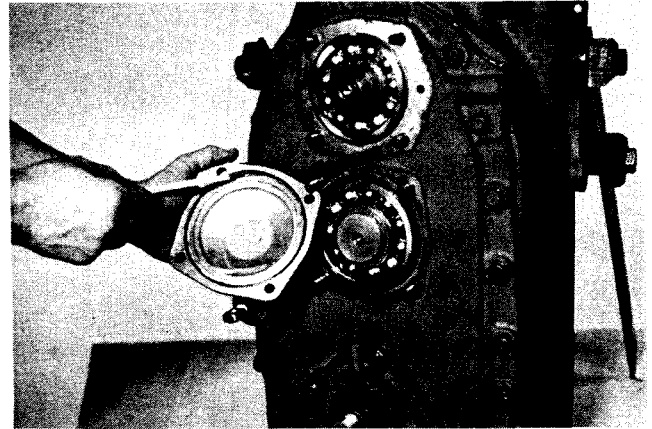


Figure 44

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

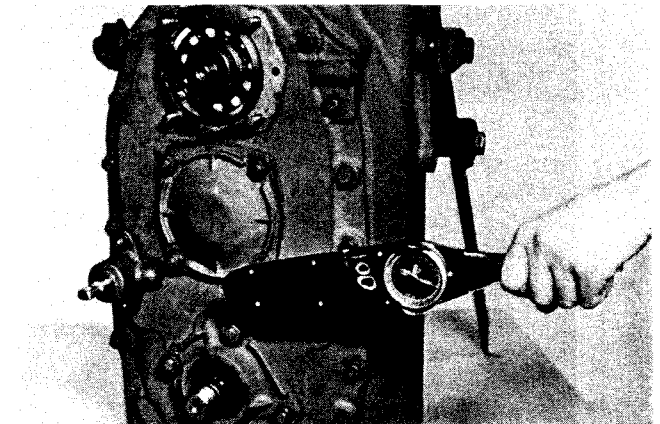


Figure 45

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

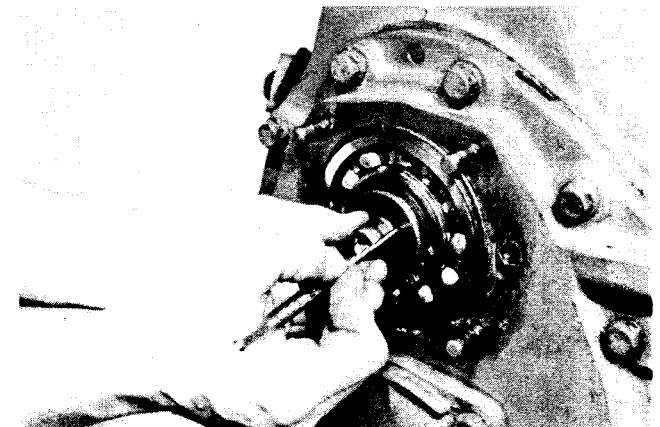
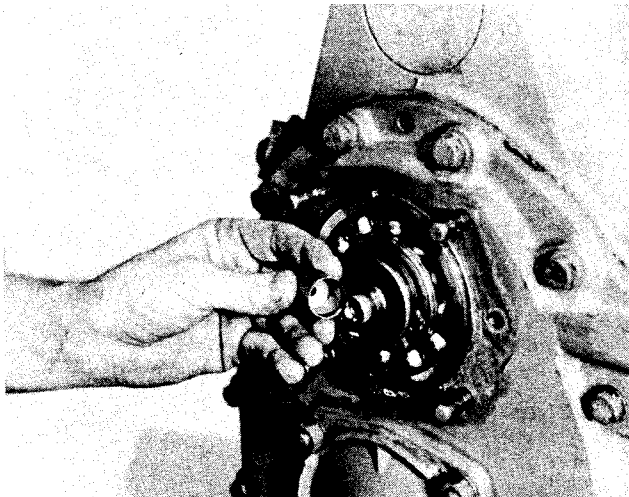
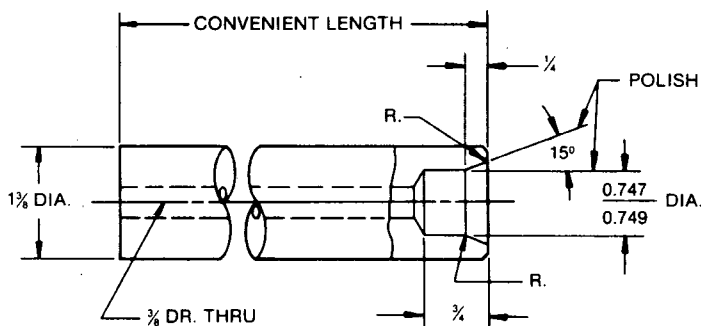


Figure 46

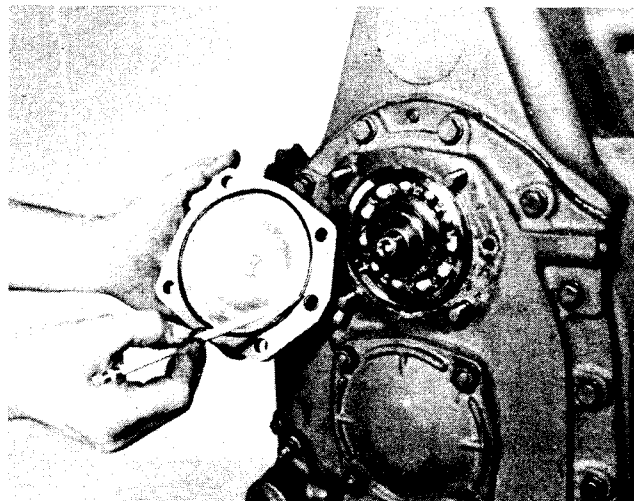
Install new low clutch oil sealing ring. **NOTE:** Sealing ring must be sized before installing bearing cap. Sizing can be done by using a round rod as shown and forcing ring into groove and back to original size.

**Figure 47**

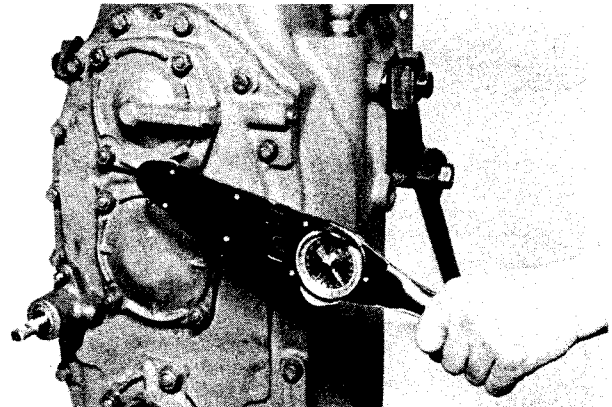
To facilitate bearing cap assembly a sizing tool can be made for ease of sizing oil sealing ring. See Figure 48.

**Figure 48**

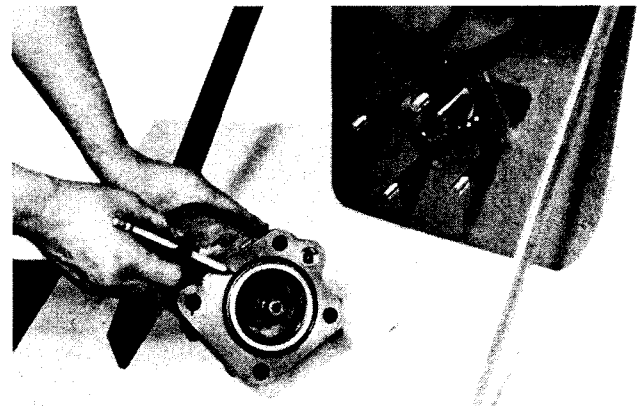
Low shaft oil sealing ring sizing tool.

**Figure 49**

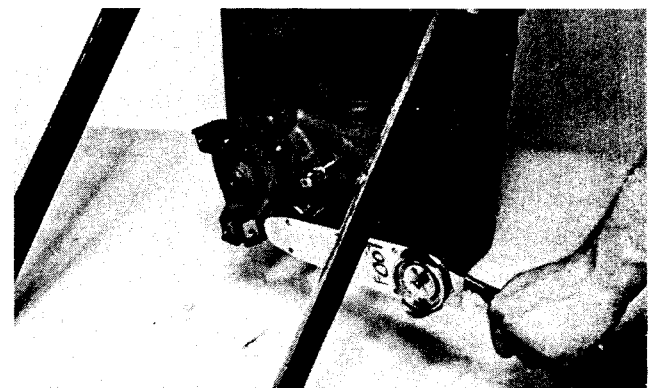
Install new bearing cap and low clutch pressure port "O" rings on low shaft bearing cap. Position bearing cap on low shaft. Install washers and stud nuts.

**Figure 50**

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

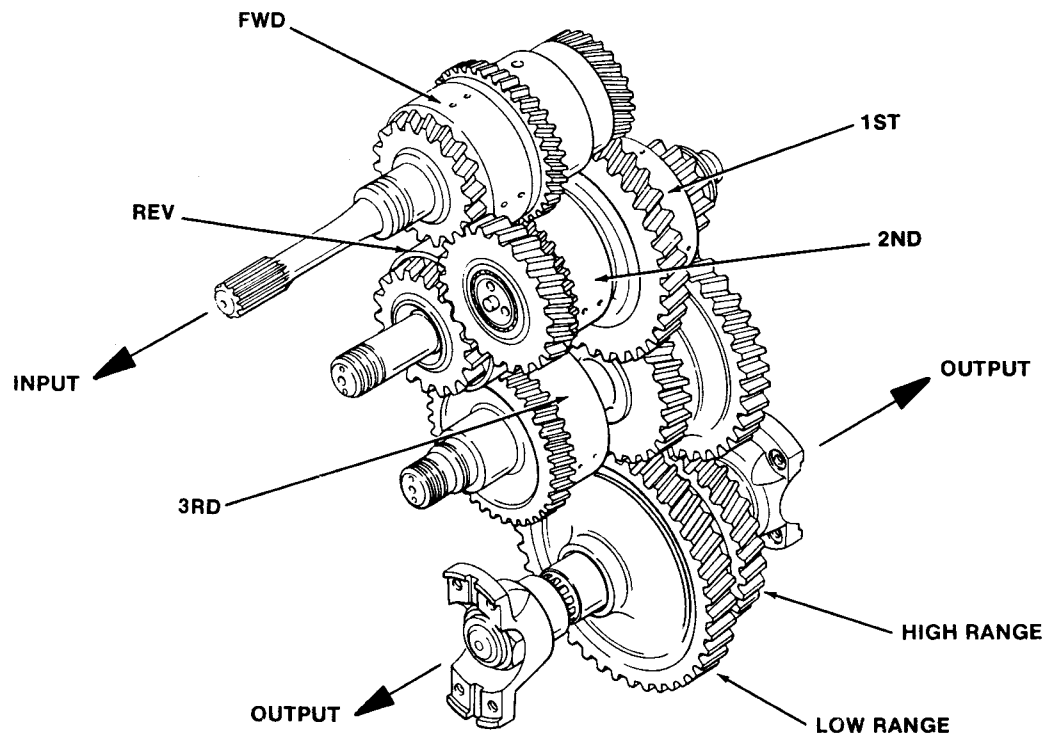
**Figure 51**

Position new "O" ring on disconnect housing. Install disconnect assembly on studs.

**Figure 52**

Install washers and stud nuts. Tighten 64 to 70 ft. lbs. torque [8,9 - 9,7 m.kg]. Install rear 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.kg].

Refer to 3 Speed Long Drop 18000 Maintenance and Service Manual for further reassembly.



**18000 SERIES 6 SPEED LONG DROP
CLUTCH AND GEAR ARRANGEMENT**