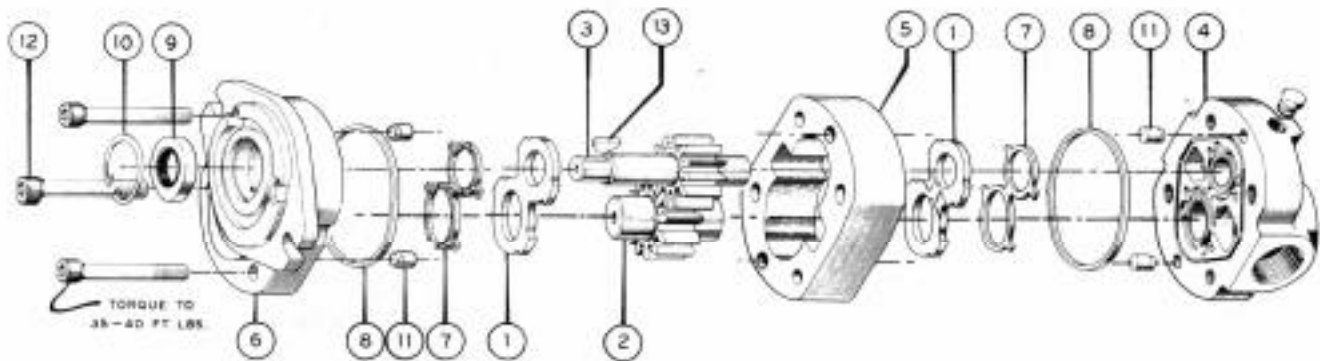
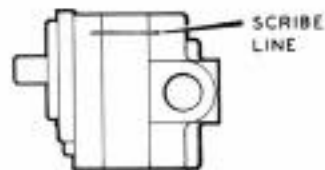


40 Series SEAL REPLACEMENT INSTRUCTIONS



A. DISASSEMBLY:

1. Remove unit and thoroughly clean. Remove shaft key (13) and any nicks or burrs on shaft.
2. Scribe line on outside of unit across front cover, body and rear cover to assure proper reassembly.
3. Lightly clamp rear cover (4) in vise, shaft up. **EXCESSIVE CLAMPING PRESSURE CAN CAUSE DISTORTION.**
4. Remove cap screws (12) from front cover (6).
5. Tap upwards, underneath front cover flange and remove front cover. As unit separates, the body may remain with either the front or rear cover. Remove loose parts (rings, plates, etc.)
- *6. To separate body from front cover, clamp body in vise and again tap upwards on front cover flange. To separate body from rear cover, clamp body in vise and tap downward on shaft. Remove static seals (8) and loading seals (7) from grooves. **DO NOT DAMAGE GROOVE OR COVER SURFACE.**
7. Remove snap ring (10) from shaft seal cavity in front cover using internal snap ring pliers.
8. Clamp front cover in vise, seal down, and drive shaft seal out of cavity using screwdriver held at about a 45° angle. **USE CAUTION NOT TO DAMAGE CAVITY.**
- * Step 6 can be by-passed if only the shaft seal is being replaced.



B. PARTS INSPECTION:

1. Thoroughly clean all parts in solvent and dry with compressed air.
2. Inspect all parts for damage and unusual or excessive wear. If gears, bushings or body are damaged or badly worn, replace unit (Only plates and seals are replaceable).

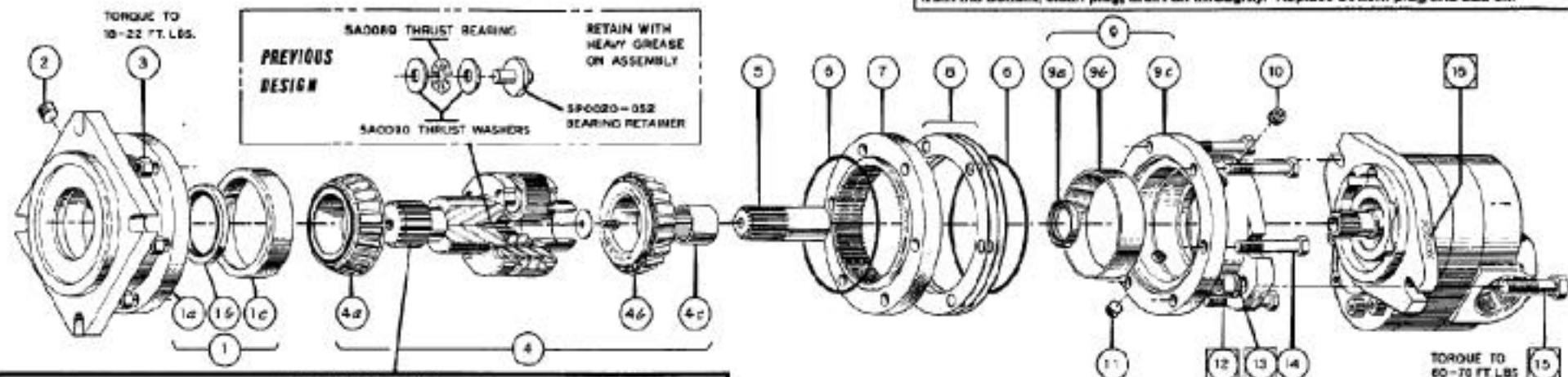
C. REASSEMBLY:

1. Install new shaft seal (9) in front cover (6). Be sure bearing drain hole is not blocked.
2. Install snap ring (10) and new seals (7, 8) in covers (if needed).
3. Assemble body (5) and rear cover (4) aligning dowel pins (11) and scribed line.
4. Insert thrust plate (1) into body (5) flat side toward seal (7). Lubricate gears and insert.
5. Insert thrust plate (1) over shaft, flat side toward seal (7).
6. Lubricate shaft and slide front cover (6) over shaft and dowel pins (11). Tap if needed.
7. Insert cap screws (12) and tighten evenly as follows:
Series 40: 35/40 ft. lbs. Series 50: 35/40 ft. lbs.
8. Rotate shaft, the maximum torque is:
Series 40: 15 ft. lbs. Series 50: 20 ft. lbs.
If greater torque is required, disassemble unit, re-clean and re-assemble.

It is the policy of Cross Manufacturing, Inc. to improve its products whenever possible and practical to do so. We reserve the right to make changes, improvements and modifications at any time without incurring the obligation to make such changes, improvements and modifications on any equipment sold previously.

50G PLANETARY GEAR MOTOR & PLANETARY GEAR REDUCER

The 50G planetary gear reducer uses 90 wt. gear lubricant (approx. 5 1/2 oz.) Check level by removing pipe plug at the side of the front cover. To change oil, remove the pipe plug from the bottom, clean plug, drain oil thoroughly. Replace bottom plug and add oil.



PLANETARY OPTIONS				
CARRIER SHAFT				
	11 TOOTH	14 TOOTH	KEYED	KEYED
SHAFT DIA. x L.	SPO020-066	SPO020-069	SPO020-071	SPO020-073
CARRIER DIA.	SPO020-091	SPO020-092	SPO020-093	SPO020-094

PARTS LIST

QTY	PART NUMBER	DESCRIPTION	STY
1	SPO020-089	FRONT HOUSING ASSEMBLY	1
1a	SPO020-062	FRONT HOUSING	1
1b	SAG032	SHAFT SEAL	1
1c	SAG056	BEARING CUP	1
2	2AG349-4	PIPE PLUG (1/2 NPTF) OIL CHECK	1
3	SAG110	NUT (3/16-18) SELF LOCKING	6
4	SEC ABOVE CHART	PLANETARY CARRIER ASSEMBLY	1
4a	SAG054	BEARING CONE	1
4b	SAG053	BEARING CONE	1
4c	SAG066	NEEDLE BEARING	1

PARTS LIST

QTY	PART NUMBER	DESCRIPTION	STY
5	SPO020-065	SUN GEAR	1
6	2AG083-7048	O-RING	2
7	SPO020-060	RING GEAR	1
8	SPO020-067	SHIM SET	1
9	SPO020-090	REAR HOUSING ASSEMBLY	1
9a	SAG088	SHAFT SEAL	1
9b	SAG058	BEARING CUP	1
9c	SPO020-064	REAR HOUSING	1
10	2AG349-6	PIPE PLUG (3/8 NPTF) FILLER	1
11	SAG100	MAGNETIC PIPE PLUG (1/2 NPTF) DRAIN	1
12	2AG235-8	NUT (1/2-13)	2
13	2AG736-10B	LOCKWASHER	2
14	2AG077-624	CAPSCREW (5/16-18 X 2.50)	6
15	2AG077-620	CAPSCREW (1/2-13 X 2.00)	2
16	AS STAMPED	HYDRAULIC MOTOR	1
-	EP 90 WT	GEAR LUB OIL (150-180 CC)	-
-	SPO017-004	SEAL KIT (MOTOR)	0
-	SPO017-013	SEAL KIT (PLANETARY)	0

SERVICE INFORMATION MANUAL

Important Safety Notice

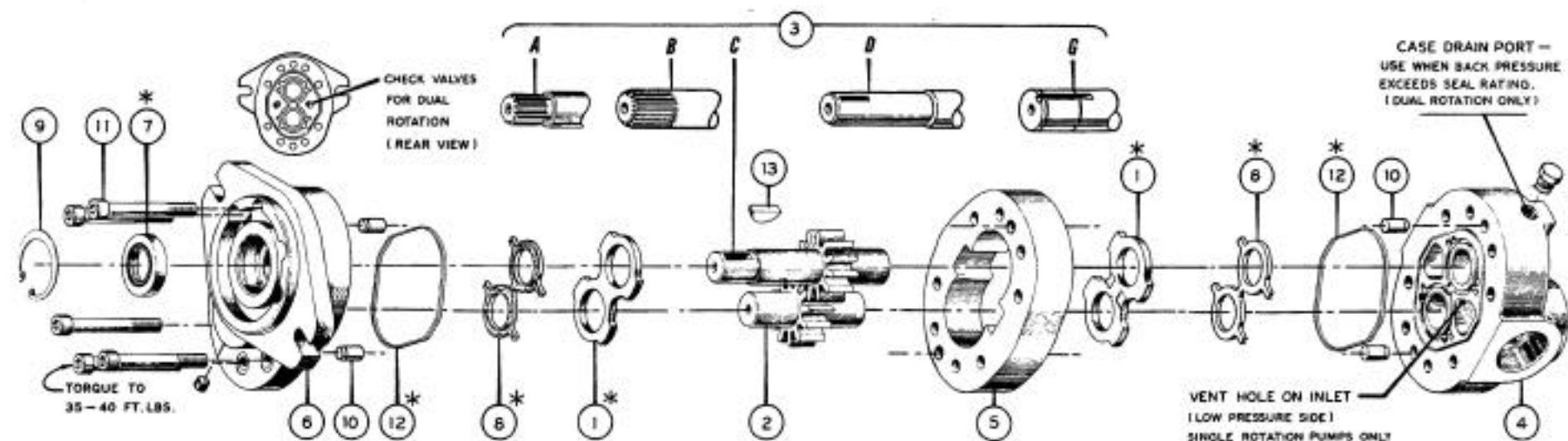
Proper service and repair is important to the safe reliable operation of all hydraulic components. The service procedures recommended by Cross Manufacturing and described in this service manual are effective methods for performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that some warnings against the use of specific service methods that can damage the hydraulic component or render it unsafe are stated in this service manual. It is also important to understand these warnings are not exhaustive. Cross Manufacturing could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Cross Manufacturing has not undertaken any such broad evaluation. Accordingly, anyone who uses a service procedure or tool which is not recommended by Cross Manufacturing must first satisfy himself thoroughly that neither his safety nor component function will be jeopardized by the service method he selects.

All information, illustrations, and specifications contained in this literature are based on the latest product information available at the time of publication approval. The right is reserved to make changes at any time without notice.

SERIES 50 GEAR PUMP and MOTOR

Parts Exploded



PARTS LIST

PARTS LIST

○	PART DESCRIPTION	DETAIL PART NO.	SOP015 SOM015	SOP019 SOM019	SOP023 SOM023	SOP027 SOM027	SOP033 SOM033	SOP038 SOM038	SOP052 SOM052	QTY
1*	THRUST PLATE	SP0013	001							2
2	DRIVEN GEAR	SP0012	001	002	003	004	005	006	018P	1
3	DRIVE GEAR	SP0011	SEE SHAFT							1
4	REAR COVER ASSY	SP0007	SEE PORTING							1
5	BODY	SP0004	001	002	003	004	005	006	010	1
6	FRONT COVER ASSY	SP0003	003 DUAL ROTATION							1
	FRONT COVER ASSY	SP0003	001 SINGLE ROTATION							
7*	SHAFT SEAL	5A0009	HIGH PRESSURE (250 PSI) / SINGLE ROTATION (20 PSI)							1
	SHAFT SEAL	5A0008								
8*	LOADING SEAL	5A0011	175							2
9	RETAINING RING	2A0466	710							1
10	DOWEL PIN	2A0310	630							4
11	CAPSCREW	2A0079	630	632	632	634	636	640	646	8
	LENGTH		3	3 1/4	3 1/4	3 1/2	3 3/4	4	4 3/4	—
12*	STATIC SEAL	1A1288	AS REQD.							AS REQD.
13	WOODRUFF KEY	5A0005	AS REQD.							AS REQD.
	SEAL KIT	SP0017	009	PTO DUAL BODY						0
	SEAL KIT	SP0017	008	DUAL BODY (DUAL ROTATION)						0
	SEAL KIT	SP0017	007	DUAL BODY (SINGLE ROTATION)						0
	SEAL KIT	SP0017	006	PTO PUMP						0
	SEAL KIT	SP0017	004	PUMP OR MOTOR, DUAL ROTATION						0
	SEAL KIT	SP0017	002	PUMP OR MOTOR						0
	SHIPPING PLUG	2A0353	30	1 7/8 - 12 O-RING PORT (SAE #24)						AS REQD.
	SHIPPING PLUG	2A0353	28	1 5/8 - 12 O-RING PORT (SAE #20)						
	SHIPPING PLUG	2A0353	21	1 3/8 - 12 O-RING PORT (SAE #18)						

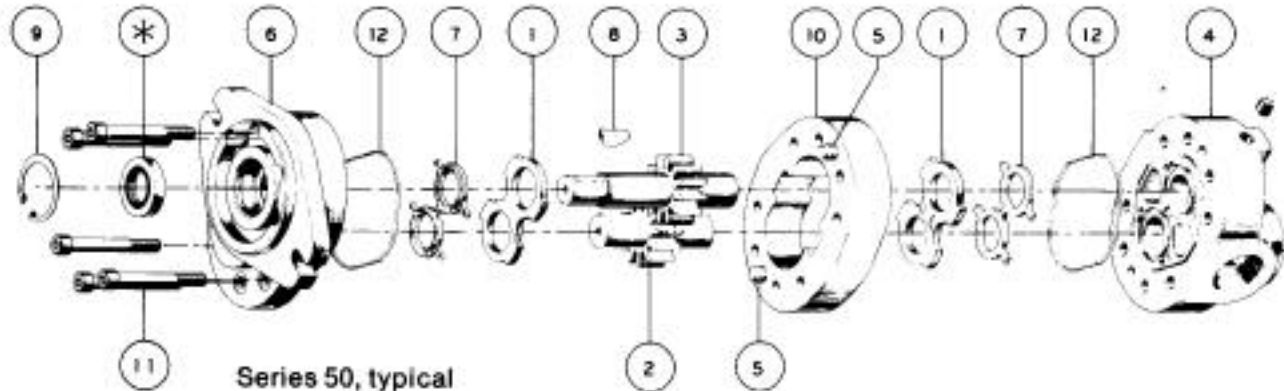
* INCLUDED IN SEAL KIT

SPEC	PART DESCRIPTION & SIZE		SOP015	SOP019	SOP023	SOP027	SOP033	SOP038	SOP052
	SHAFT FOR DRIVE GEAR, SPO011	③	SOM015	SOM019	SOM023	SOM027	SOM033	SOM038	SOM052
	A. 18 TOOTH SPLINE		007	008	009	010	011	012	142
	B. 15 TOOTH SPLINE		019	020	021	022	023	024	025
	C. 7/8" DIA. KEYED, STANDARD		001	002	003	004	005	006	148P
	D. 7/8" DIA. LONG KEYED		055	056	057	058	059	060	151
	E. PTO		084	085	086	087	088	089	090
	MINIMUM AT 1800 RPM	GPM	10.7	13.7	16.3	19.2	23.1	26.6	38.5
	80 % VOL.	LPM	40.0	51.8	61.9	72.7	87.6	100.9	138.0
	DISPLACEMENT	CU. IN./REV.	1.52	1.95	2.32	2.74	3.30	3.80	5.20
		ML/REV.	24.9	32.0	38.0	44.9	54.7	62.3	85.2
	MAXIMUM PUMP RPM IN INLET PORTS	1 5/16	3000	3000	3000	1700	1400	1200	1000
		1 5/8	3000	3000	3000	2600	2100	1800	1600
		1 7/8	3000	3000	3000	3000	3000	2700	2200

MAXIMUM MOTOR SPEED IS 3000 RPM.

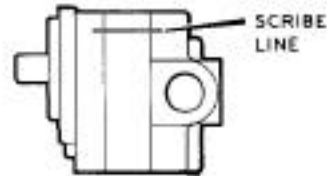
PART DESCRIPTION		PORT SIZES			DASH NO. FOR ASSEMBLY
SPO007 ④		INLET		OUTLET	
SAE O-RING REAR PORTS	SINGLE	RD	1 1/8 - 12 (#24)	1 5/16 - 12 (#18)	003
		RE	1 5/8 - 12 (#20)	1 5/16 - 12 (#18)	004
	DUAL	RD	1 7/8 - 12 (#24)	1 5/16 - 12 (#18)	019
		RE	1 5/8 - 12 (#20)	1 5/16 - 12 (#18)	016
SAE O-RING SIDE PORTS	SINGLE	SA	1 7/8 - 12 (#24)	1 5/16 - 12 (#18)	001
		SB	1 5/8 - 12 (#20)	1 5/16 - 12 (#18)	002
	DUAL	SA	1 7/8 - 12 (#24)	1 5/16 - 12 (#18)	005
		SB	1 5/8 - 12 (#20)	1 5/16 - 12 (#18)	015
	DUAL	SA	1 7/8 - 12 (#24)	1 5/16 - 12 (#18)	012
		SB	1 5/8 - 12 (#20)	1 5/16 - 12 (#18)	007

SEAL REPLACEMENT INSTRUCTIONS



A. DISASSEMBLY:

1. Remove unit and thoroughly clean. Remove shaft key (8) and any nicks or burrs on shaft.
2. Scribe line on outside of unit across front cover, body and rear cover to assure proper reassembly.
3. Lightly clamp rear cover (4) in vise, shaft up. **EXCESSIVE CLAMPING PRESSURE CAN CAUSE DISTORTION.**
4. Remove cap screws (11) from front cover (6). (Nuts on series 60).
5. Tap upwards, underneath front cover flange and remove front cover. As unit separates, the body may remain with either the front or rear cover. Remove loose parts (rings, plates, etc.)
- *6. To separate body from front cover, clamp body in vise and again tap upwards on front cover flange. To separate body from rear cover, clamp body in vise and tap downward on shaft. Remove static seals (12) and loading seals (7) from grooves. **DO NOT DAMAGE GROOVE OR COVER SURFACE.**
7. Remove snap ring (9) from shaft seal cavity in front cover using internal snap ring pliers.
8. Clamp front cover in vise, seal down, and drive shaft seal out of cavity using screwdriver held at about a 45° angle. **USE CAUTION NOT TO DAMAGE CAVITY.**
- * Step 6 can be by-passed if only the shaft seal is being replaced.



B. PARTS INSPECTION:

1. Thoroughly clean all parts in solvent and dry with compressed air.
2. Inspect all parts for damage and unusual or excessive wear. If gears, bushings or body are damaged or badly worn, replace unit (Only plates and seals are replaceable).

C. REASSEMBLY:

1. Install new shaft seal (*) in front cover (6). Be sure bearing drain hole is not blocked.
2. Install snap ring (9) and new seals (7, 12) in covers (if needed).
3. Assemble body (10) and rear cover (4) aligning dowel pins (5) and scribed line.
4. Insert thrust plate (1) into body (10) flat side toward seal 7. Lubricate gears and insert.
5. Insert thrust plate (1) over shaft, flat side toward seal 7.
6. Lubricate shaft and slide front cover (6) over shaft and dowel pins (5). Tap if needed.
7. Insert cap screws (11) (or nuts) and tighten evenly as follows:

Series 40: 35/40 ft. lbs.	Series 50: 35/40 ft. lbs.	Series 60: 65/80 ft. lbs.
---------------------------	---------------------------	---------------------------
8. Rotate shaft, the maximum torque is:

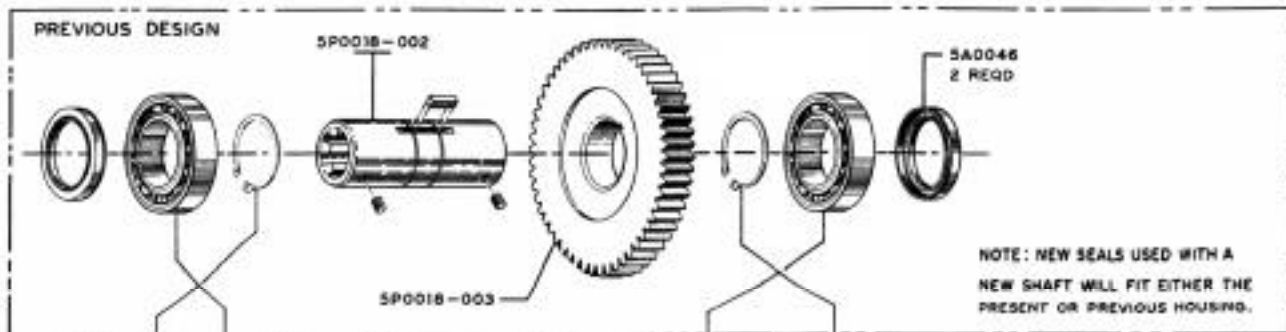
Series 40: 15 ft. lbs.	Series 50: 20 ft. lbs.	Series 60: 25 ft. lbs.
------------------------	------------------------	------------------------

 If greater torque is required, disassemble unit, re-clean and re-assemble.

It is the policy of Cross Manufacturing, Inc. to improve its products whenever possible and practical to do so. We reserve the right to make changes, improvements and modifications at any time without incurring the obligation to make such changes, improvements and modifications on any equipment sold previously.

INCREASER 3 : 1

Parts Exploded

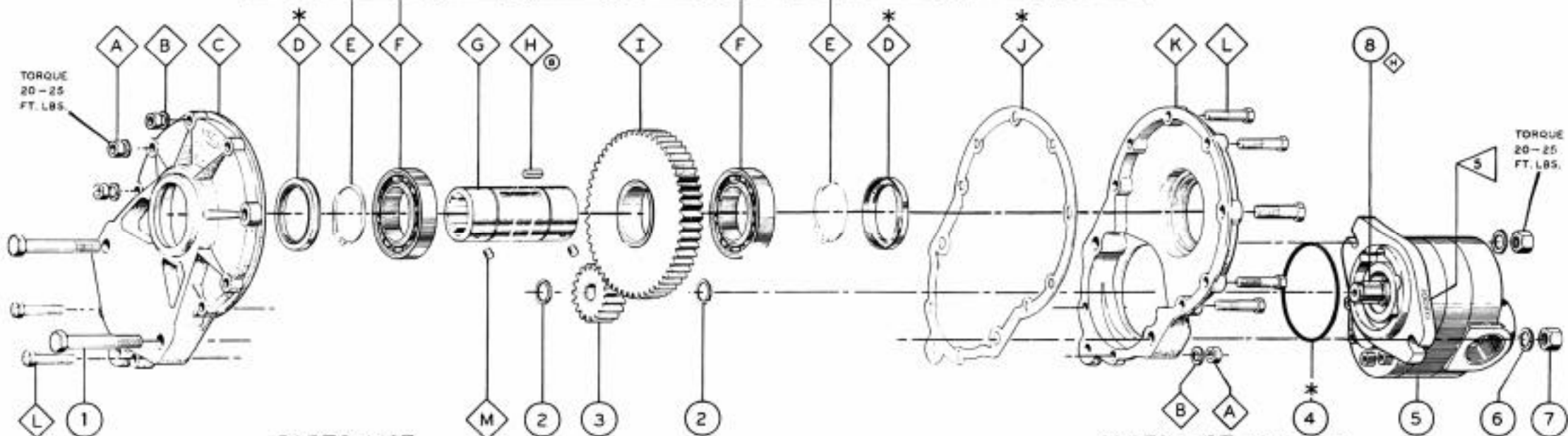


1000 RPM — 21 Tooth
PTO Spline

5P0018-023

5P0018-023 PTO Increaser Shaft

5P0018-024 Gear Box Assy. -1000 rpm



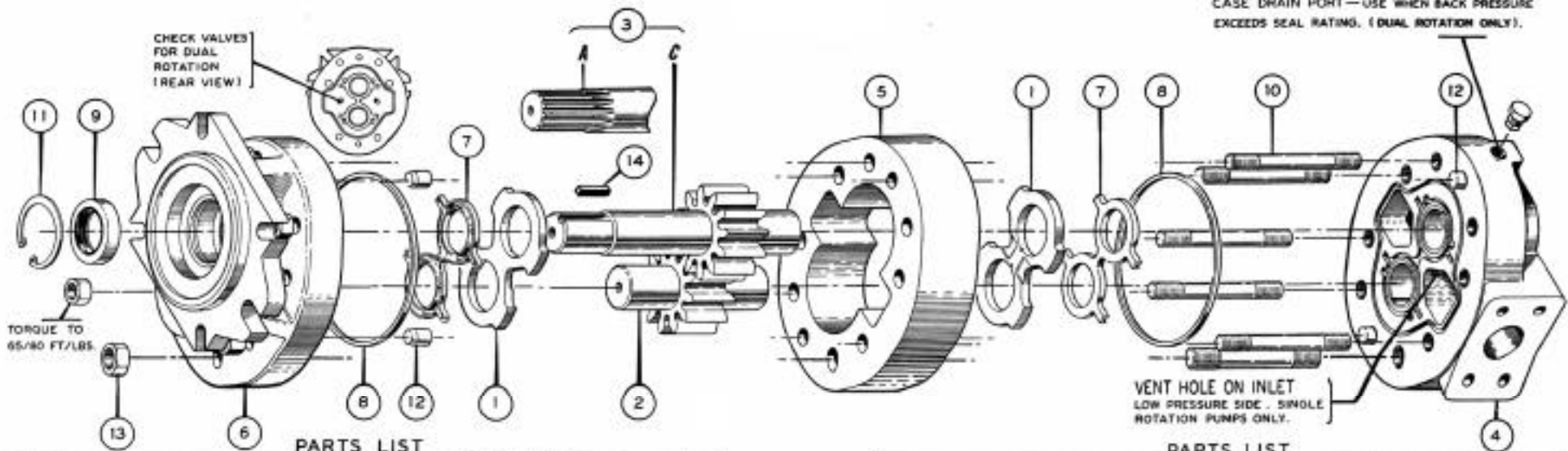
PARTS LIST

PARTS LIST CONTINUED

○	PART NO.	DESCRIPTION	QTY
1	2A0077-840	CAPSCREW 1/2 X 4"	2
2	5A0069	RETAINING RING - EXTERNAL	2
3	5P0018-004	INCREASER GEAR	1
4	2A0283-7045	O-RING	1
5	300XXX <5	PUMP (SEE PART NO. ON INDIVIDUAL UNIT)	1
6	2A0736-108	LOCKWASHER	2
7	2A0235-8	NUT 1/2" -13	2
8	5A0068	STRAIGHT KEY	1
5P0018-019 PTO GEAR BOX ASSEMBLY CONSISTS OF THE FOLLOWING PARTS:			
△	2A0235-6	NUT	9
B	2A0736-106	LOCKWASHER	9
C	5P0018-011	INCREASER HOUSING MACHINING - FRONT	1

◇	PART NO.	DESCRIPTION	QTY
D	5A0104	SHAFT SEAL	2
E	2A0467-196	RETAINING RING-EXTERNAL (SAME AS 5A0085)	2
F	5A0039	BALL BEARING	2
G	5P0018-021	PTO INCREASER SHAFT	1
H	5A0068	STRAIGHT KEY	1
I	5P0018-022	PTO INCREASER GEAR	1
J	5A0076	INCREASER HOUSING GASKET	1
K	5P0018-010	INCREASER HOUSING MACHINING-REAR	1
L	2A0077-622	CAPSCREW	9
M	2A0506-505	SET SCREW	2
5P0017-006 SEAL KIT - PUMP			0
5P0017-016 SEAL KIT - GEAR BOX (ITEMS INCLUDED*)			0

SERIES 60 Gear Pump and Motor *Parts Exploded*



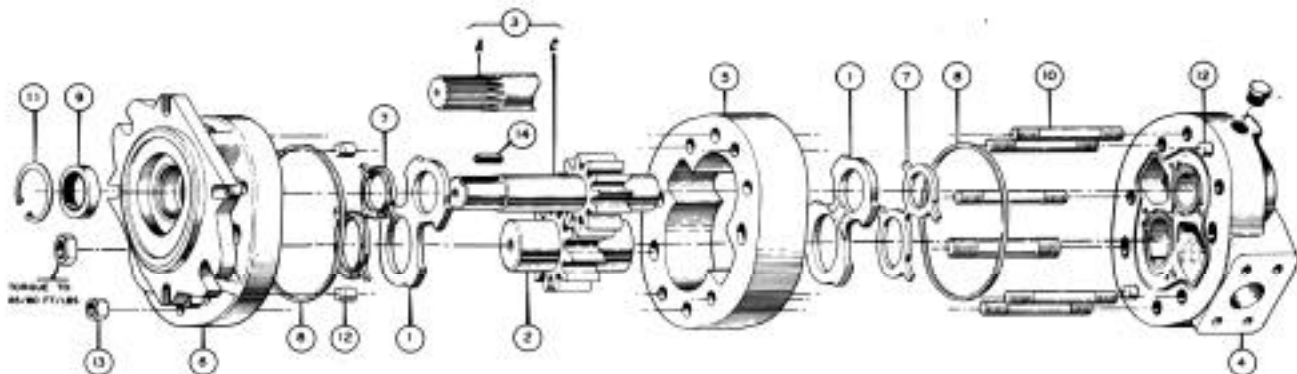
PARTS LIST

QTY	PART DESCRIPTION	DETAIL PART NUMBER	ASSEMBLY NUMBER						QTY
			60P040 60M040	60P051 60M051	60P061 60M061	60P071 60M071	60P081 60M081	60P092 60M092	
2	THRUST PLATE	6P0013	001						2
1	DRIVEN GEAR	6P0012	001	002	003	004	005	006	1
1	DRIVE GEAR	6P0011	SEE SHAFT						1
1	REAR COVER ASSEMBLY	6P0007	SEE PORTING						1
1	BODY	6P0004	001	002	003	004	005	006	1
1	FRONT COVER ASSEMBLY	6P0003	002 DUAL ROTATION						1
1	FRONT COVER ASSEMBLY	6P0003	001 SINGLE ROTATION						1
2	LOADING SEAL	5A0079							2
2	STATIC SEAL	5A0041							2
1	SHAFT SEAL	5A0080	DUAL ROTATION						1
1	SHAFT SEAL	5A0040	SINGLE ROTATION						1
8	TIE BOLT	2A0580	431	456	481	506	531	562	8
	LENGTH		4 3/8	4 9/16	4 13/16	5 1/8	5 5/8	5 3/4	
1	RETAINING RING	2A0466	212						1
4	DOWEL PIN	2A0310	810						4
8	HEX NUT 1/2-13 THD	2A0235	8						8
1	STRAIGHT KEY	5A0082							1
0	SEAL KIT	6P0017	001	SINGLE ROTATION (100 PSI)					0
0	SEAL KIT	6P0017	002	DUAL ROTATION (250 PSI)					0
	SHIPPING PLUG	2A0353	30	1 7/8-12 O-RING PORT (SAE #24)					AS REQD
	SHIPPING PLUG	2A0353	26	1 5/8-12 O-RING PORT (SAE #20)					
	SHIPPING PLUG	2A0356	24	1 1/2" SPLIT FLANGE					
	SHIPPING PLUG	2A0356	20	1 1/4" SPLIT FLANGE					
	SHIPPING PLUG	2A0356	32	2.0 SPLIT FLANGE					

PARTS LIST

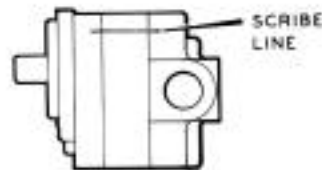
PART DESCRIPTION & SIZE		ASSEMBLY NUMBER					
SHAFT FOR DRIVE GEAR. 6P0011 (3)		60P040 60M040	60P051 60M051	60P061 60M061	60P071 60M071	60P081 60M081	60P092 60M092
A	14 TOOTH SPLINE	007	008	009	010	011	012
C	1 1/2" STRAIGHT KEY	001	002	003	004	005	006
SPECIFICATIONS	MINIMUM AT 1800 RPM	OPM 107.5	36.1	43.1	50.1	57.2	64.9
	DISPLACEMENT	CU IN. / REV. LPM	4.05 107.5	5.15 136.7	6.15 162.3	7.15 189.8	8.15 216.4
	MAXIMUM PUMP RPM IN INLET PORTS	1 5/8-12 / 1 1/4" S.F. 1 7/8-12 / 1 1/2" S.F. 2" SPLIT FLANGE	2000 3000 3000	1750 2500 3000	1400 2200 3000	1900 2600	1600 2500
MAXIMUM MOTOR SPEED IS 3000 RPM.							
PART DESCRIPTION OF 6P0007 (4)		PORT SIZES				DASH NO. ALL ASSY'S	
SAE O-RING REAR PORTS	ROTATION	INLET		OUTLET			
		SINGLE	RJ	1 5/8-12 (#20)	1 5/8-12 (#20)	006	007
		DUAL	RK	1 7/8-12 (#24)	1 7/8-12 (#24)	011	012
		SINGLE	SA	1 7/8-12 (#24)	1 5/8-12 (#20)	014	
		DUAL	SE	1 5/8-12 (#20)	1 5/8-12 (#20)	013	
		SINGLE	SF	1 7/8-12 (#24)	1 7/8-12 (#24)	015	
		DUAL	SA	1 7/8-12 (#24)	1 5/8-12 (#20)	017	
		DUAL	SE	1 5/8-12 (#20)	1 5/8-12 (#20)	016	
		DUAL	SF	1 7/8-12 (#24)	1 7/8-12 (#24)	018	
		SINGLE	SB	1 1/2"	1 1/4"	002	
		DUAL	SC	2"	1 1/4"	001	
		SINGLE	SH	1 1/2"	1 1/2"	004	
		DUAL	SG	1 1/4"	1 1/4"	008	
		DUAL	SH	1 1/2"	1 1/2"	009	

60 Series SEAL REPLACEMENT INSTRUCTIONS



A. DISASSEMBLY:

1. Remove unit and thoroughly clean. Remove shaft key (14) and any nicks or burrs on shaft.
 2. Scribe line on outside of unit across front cover, body and rear cover to assure proper reassembly.
 3. Lightly clamp rear cover (4) in vise, shaft up. **EXCESSIVE CLAMPING PRESSURE CAN CAUSE DISTORTION.**
 4. Remove nuts (13) from front cover (6).
 5. Tap upwards, underneath front cover flange and remove front cover. As unit separates, the body may remain with either the front or rear cover. Remove loose parts (rings, plates, etc.)
 - *6. To separate body from front cover, clamp body in vise and again tap upwards on front cover flange. To separate body from rear cover, clamp body in vise and tap downward on shaft. Remove static seals (8) and loading seals (7) from grooves. **DO NOT DAMAGE GROOVE OR COVER SURFACE.**
 7. Remove snap ring (11) from shaft seal cavity in front cover using internal snap ring pliers.
 8. Clamp front cover in vise, seal down, and drive shaft seal out of cavity using screwdriver held at about a 45° angle. **USE CAUTION NOT TO DAMAGE CAVITY.**
- * Step 6 can be by-passed if only the shaft seal is being replaced.



B. PARTS INSPECTION:

1. Thoroughly clean all parts in solvent and dry with compressed air.
2. Inspect all parts for damage and unusual or excessive wear. If gears, bushings or body are damaged or badly worn, replace unit (Only plates and seals are replaceable).

C. REASSEMBLY:

1. Install new shaft seal (9) in front cover (6). Be sure bearing drain hole is not blocked.
2. Install snap ring (11) and new seals (7, 8) in covers (if needed)
3. Assemble body (5) and rear cover (4) aligning dowel pins (12) and scribed line.
4. Insert thrust plate (1) into body (5) flat side toward seal 7. Lubricate gears and insert.
5. Insert thrust plate (1) over shaft, flat side toward seal 7.
6. Lubricate shaft and slide front cover (6) over shaft and dowel pins (12). Tap if needed.
7. Add nuts and tighten evenly 65/80 ft. lbs.
8. Rotate shaft, the maximum torque is 25 ft. lbs.
If greater torque is required, disassemble unit, re-clean and re-assemble.

It is the policy of Cross Manufacturing, Inc. to improve its products whenever possible and practical to do so. We reserve the right to make changes, improvements and modifications at any time without incurring the obligation to make such changes, improvements and modifications on any equipment sold previously.