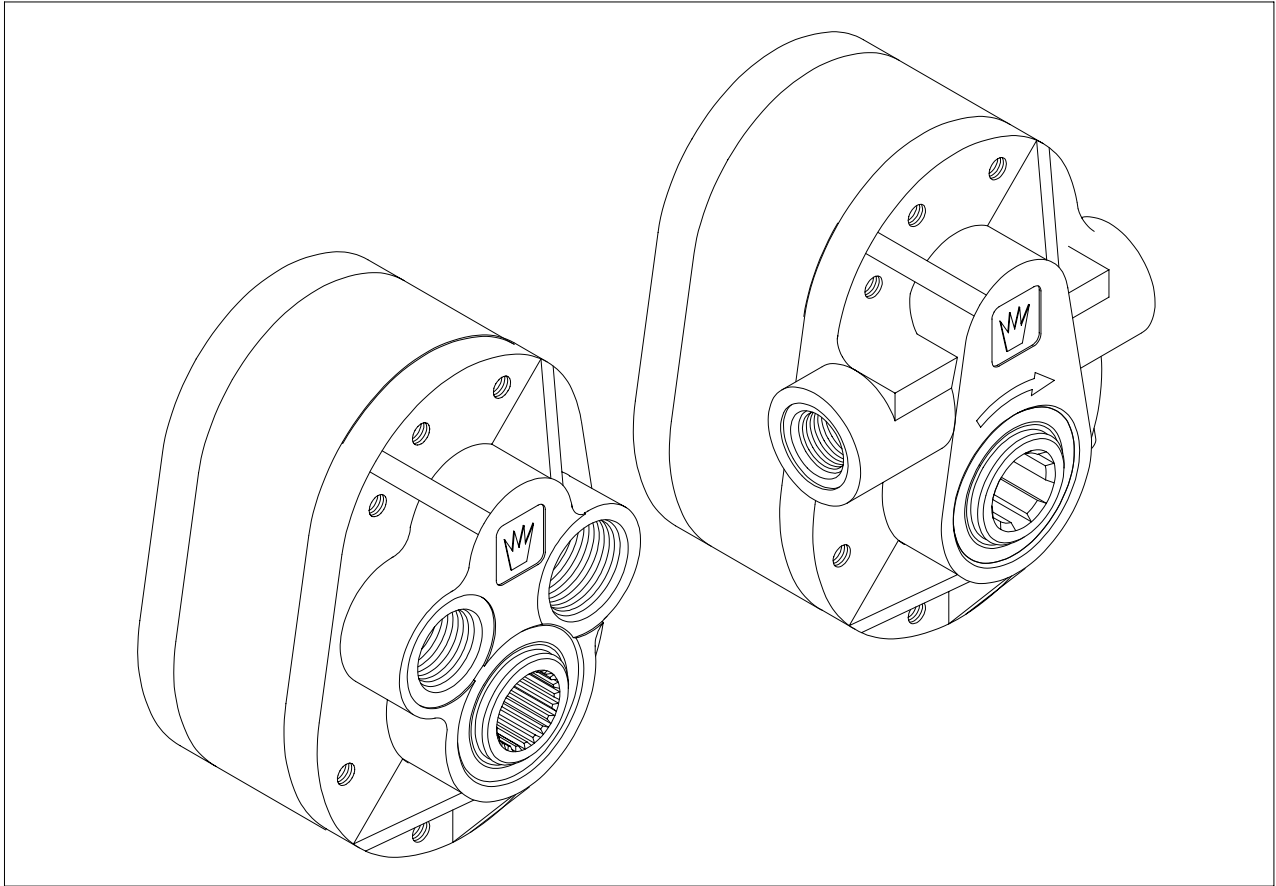
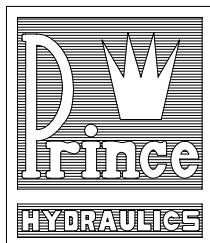


PTO SERIES  
PUMP  
PARTS MANUAL



PRINCE MFG. CORP.



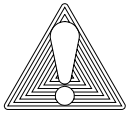
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## GENERAL SAFETY PRECAUTIONS FOR HYDRAULIC PUMPS

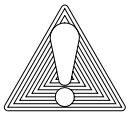
1) ALL HYDRAULIC PUMPS MUST BE PROPERLY INSTALLED INTO THE HYDRAULIC SYSTEM TO PREVENT PERSONAL INJURY AND/OR PROPERTY DAMAGE. FURTHER, THE IMPROPER SERVICING OF A PUMP MAY RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE. PLEASE READ AND UNDERSTAND ALL CATALOG AND SERVICE INFORMATION BEFORE STARTING. AS WITH ALL MECHANICAL WORK THE PROPER TOOLS, KNOWLEDGE, AND SAFETY EQUIPMENT ARE REQUIRED. ALWAYS WEAR SAFETY GLASSES.

2) MAKE SURE ALL PRESSURE HAS BEEN RELIEVED IN THE HYDRAULIC LINES BEFORE INSTALLING OR SERVICING A HYDRAULIC PUMP



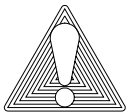
WARNING: ESCAPING HYDRAULIC FLUID UNDER PRESSURE CAN HAVE SUFFICIENT FORCE TO PENETRATE SKIN, CAUSING SERIOUS PERSONAL INJURY. DO NOT USE YOUR HAND TO CHECK FOR HYDRAULIC LEAKS.

3) BEFORE INSTALLING OR SERVICING A HYDRAULIC COMPONENT MAKE SURE ALL WEIGHT HAS BEEN REMOVED FROM THE CYLINDERS OR MOTORS BEFORE DISCONNECTING HYDRAULIC LINES.

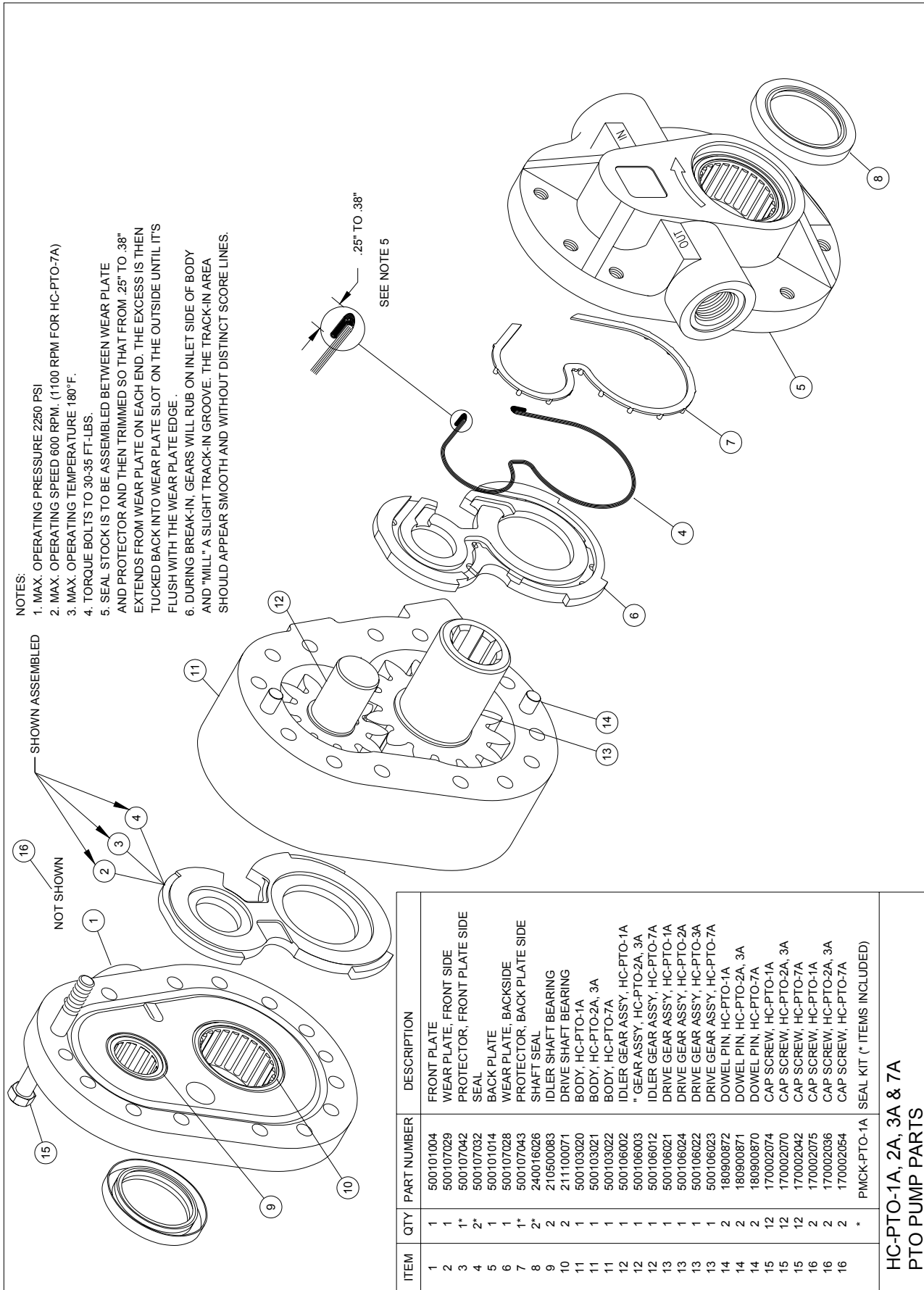


WARNING: DISCONNECTING THE HYDRAULIC LINES WHILE THE CYLINDER OR MOTOR IS UNDER LOAD MAY RESULT IN THE UNEXPECTED RAPID MOVEMENT OF MACHINE RESULTING IN SERIOUS PERSONAL INJURY.

4) DO NOT EXCEED THE OPERATING SPECIFICATIONS FOR PRESSURE, FLOW OR TEMPERATURE. ALL HYDRAULIC SYSTEMS REQUIRE A MEANS TO LIMIT THE MAXIMUM PRESSURE. THIS REQUIRES EITHER A PRESSURE RELIEF VALVE IN THE SYSTEM OR A PUMP THAT HAS PRESSURE COMPENSATION.



WARNING: OVERPRESSURE MAY CAUSE SUDDEN AND UNEXPECTED FAILURE OF A COMPONENT IN THE HYDRAULIC SYSTEM RESULTING IN SERIOUS PERSONAL INJURY. ALWAYS USE A GAUGE WHEN ADJUSTING A RELIEF VALVE.

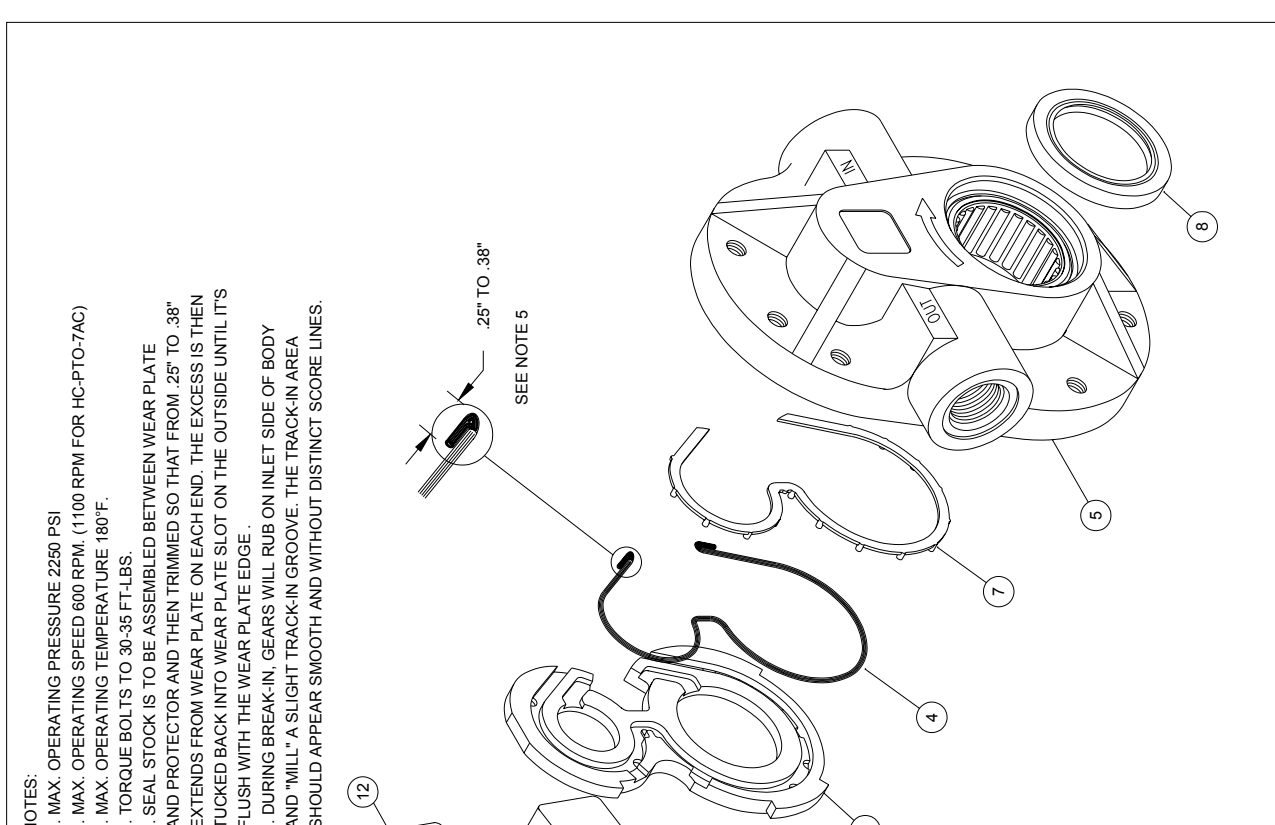


- NOTES:**
1. MAX. OPERATING PRESSURE 2250 PSI
  2. MAX. OPERATING SPEED 600 RPM. (1100 RPM FOR HC-PTO-7A)
  3. MAX. OPERATING TEMPERATURE 180°F.
  4. TORQUE BOLTS TO 30-35 FT-LBS.
  5. SEAL STOCK IS TO BE ASSEMBLED BETWEEN WEAR PLATE AND PROTECTOR AND THEN TRIMMED SO THAT FROM .25" TO .38" EXTENDS FROM WEAR PLATE ON EACH END. THE EXCESS IS THEN TUCKED BACK INTO WEAR PLATE SLOT ON THE OUTSIDE UNTIL IT'S FLUSH WITH THE WEAR PLATE EDGE.
  6. DURING BREAK-IN, GEARS WILL RUB ON INLET SIDE OF BODY AND "MILL" A SLIGHT TRACK-IN GROOVE. THE TRACK-IN AREA SHOULD APPEAR SMOOTH AND WITHOUT DISTINCT SCORE LINES.

SEE NOTE 5

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	500101004	FRONT PLATE
2	1	500107029	WEAR PLATE, FRONT SIDE
3	1*	500107042	PROTECTOR, FRONT PLATE SIDE
4	2*	500107032	SEAL
5	1	500101014	BACK PLATE
6	1	500107028	WEAR PLATE, BACKSIDE
7	1*	500107043	PROTECTOR, BACK PLATE SIDE
8	2	240016026	SHAFT SEAL
9	2	210500083	IDLER SHAFT BEARING
10	2	211100071	DRIVE SHAFT BEARING
11	1	500103020	BODY, HC-PTO-1A
11	1	500103021	BODY, HC-PTO-2A, 3A
11	1	500103022	BODY, HC-PTO-7A
12	1	500106002	IDLER GEAR ASSY, HC-PTO-1A
12	1	500106003	" GEAR ASSY, HC-PTO-2A, 3A
12	1	500106012	IDLER GEAR ASSY, HC-PTO-7A
13	1	500106021	DRIVE GEAR ASSY, HC-PTO-1A
13	1	500106024	DRIVE GEAR ASSY, HC-PTO-2A
13	1	500106022	DRIVE GEAR ASSY, HC-PTO-3A
13	1	500106023	DRIVE GEAR ASSY, HC-PTO-7A
14	2	1809000872	DOWEL PIN, HC-PTO-1A
14	2	1809000871	DOWEL PIN, HC-PTO-2A, 3A
14	2	1809000870	DOWEL PIN, HC-PTO-7A
15	12	17000202074	CAP SCREW, HC-PTO-1A
15	12	17000202070	CAP SCREW, HC-PTO-2A, 3A
15	12	17000202042	CAP SCREW, HC-PTO-7A
16	2	17000202075	CAP SCREW, HC-PTO-1A
16	2	17000202036	CAP SCREW, HC-PTO-2A, 3A
16	2	17000202054	CAP SCREW, HC-PTO-7A
16	*	PMCK-PTO-1A	SEAL KIT (* ITEMS INCLUDED)

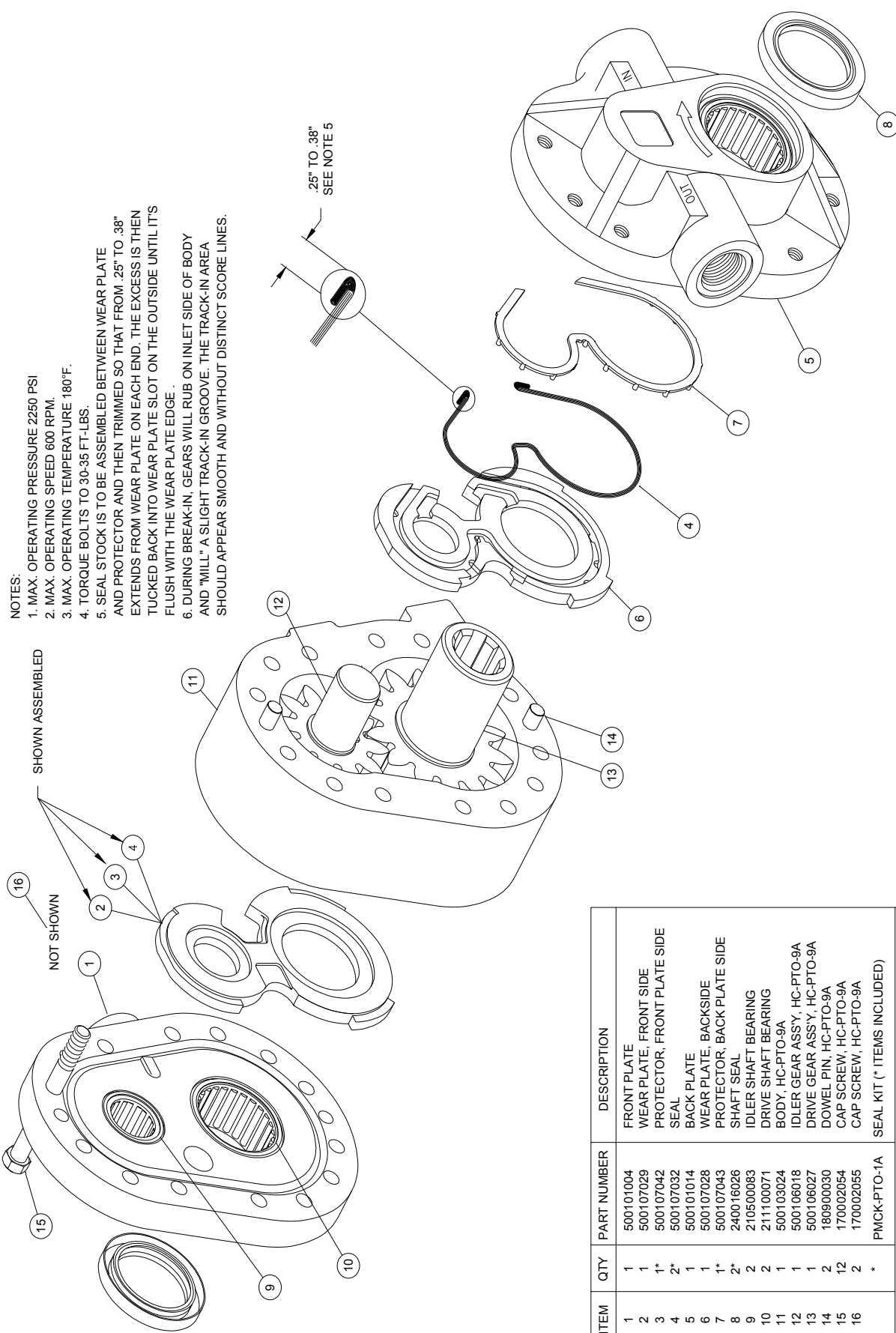
**HC-PTO-1A, 2A, 3A & 7A  
PTO PUMP PARTS**



- NOTES:
1. MAX. OPERATING PRESSURE 2250 PSI
  2. MAX. OPERATING SPEED 600 RPM. (1100 RPM FOR HC-PTO-7AC)
  3. MAX. OPERATING TEMPERATURE 180°F.
  4. TORQUE BOLTS TO 30-35 FT-LBS.
  5. SEAL STOCK IS TO BE ASSEMBLED BETWEEN WEAR PLATE AND PROTECTOR AND THEN TRIMMED SO THAT FROM .25" TO .38" EXTENDS FROM WEAR PLATE ON EACH END. THE EXCESS IS THEN TUCKED BACK INTO WEAR PLATE SLOT ON THE OUTSIDE UNTIL IT'S FLUSH WITH THE WEAR PLATE EDGE.
  6. DURING BREAK-IN, GEARS WILL RUB ON INLET SIDE OF BODY AND "MILL" A SLIGHT TRACK-IN GROOVE. THE TRACK-IN AREA SHOULD APPEAR SMOOTH AND WITHOUT DISTINCT SCORE LINES.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	500101004	FRONT PLATE
2	1	500107029	WEAR PLATE, FRONT SIDE
3	1*	500107042	PROTECTOR, FRONT PLATE SIDE
4	2*	500107032	SEAL
5	1	500101014	BACK PLATE
6	1	500107028	WEAR PLATE, BACKSIDE
7	1*	500107043	PROTECTOR, BACK PLATE SIDE
8	2*	240016026	SHAFT SEAL
9	2	210500083	IDLER SHAFT BEARING
10	2	211100071	DRIVE SHAFT BEARING
11	1	500103033	BODY, HC-PTO-1AC
11	1	500103034	BODY, HC-PTO-2AC, 3AC
11	1	500103035	BODY, HC-PTO-7AC
12	1	500106002	IDLER GEAR ASSY, HC-PTO-1AC
12	1	500106003	* GEAR ASSY, HC-PTO-2AC, 3AC
12	1	500106012	IDLER GEAR ASSY, HC-PTO-7AC
13	1	500106021	DRIVE GEAR ASSY, HC-PTO-1AC
13	1	500106024	DRIVE GEAR ASSY, HC-PTO-2AC
13	1	500106022	DRIVE GEAR ASSY, HC-PTO-3AC
13	1	500106023	DRIVE GEAR ASSY, HC-PTO-7AC
14	2	180900872	DOWEL PIN, HC-PTO-1AC
14	2	180900871	DOWEL PIN, HC-PTO-2AC, 3AC
14	2	180900870	DOWEL PIN, HC-PTO-7AC
15	12	170002074	CAP SCREW, HC-PTO-1AC
15	12	170002070	CAP SCREW, HC-PTO-2AC, 3AC
15	12	170002042	CAP SCREW, HC-PTO-7AC
16	2	170002075	CAP SCREW, HC-PTO-1AC
16	2	170002036	CAP SCREW, HC-PTO-2AC, 3AC
16	2	170002054	CAP SCREW, HC-PTO-7AC
16	*	PMCK-PTO-1A	SEAL KIT (* ITEMS INCLUDED)

**HC-PTO-1AC, 2AC, 3AC & 7AC  
PTO PUMP PARTS**



**NOTES:**

1. MAX. OPERATING PRESSURE 2250 PSI
2. MAX. OPERATING SPEED 600 RPM.
3. MAX. OPERATING TEMPERATURE 180°F.
4. TORQUE BOLTS TO 30-35 FT.-LBS.
5. SEAL STOCK IS TO BE ASSEMBLED BETWEEN WEAR PLATE AND PROTECTOR AND THEN TRIMMED SO THAT FROM .25" TO .38" EXTENDS FROM WEAR PLATE ON EACH END. THE EXCESS IS THEN TUCKED BACK INTO WEAR PLATE SLOT ON THE OUTSIDE UNTIL ITS FLUSH WITH THE WEAR PLATE EDGE.
6. DURING BREAK-IN, GEARS WILL RUB ON INLET SIDE OF BODY AND "MILL" A SLIGHT TRACK-IN GROOVE. THE TRACK-IN AREA SHOULD APPEAR SMOOTH AND WITHOUT DISTINCT SCORE LINES.

.25" TO .38"  
SEE NOTE 5

NOT SHOWN

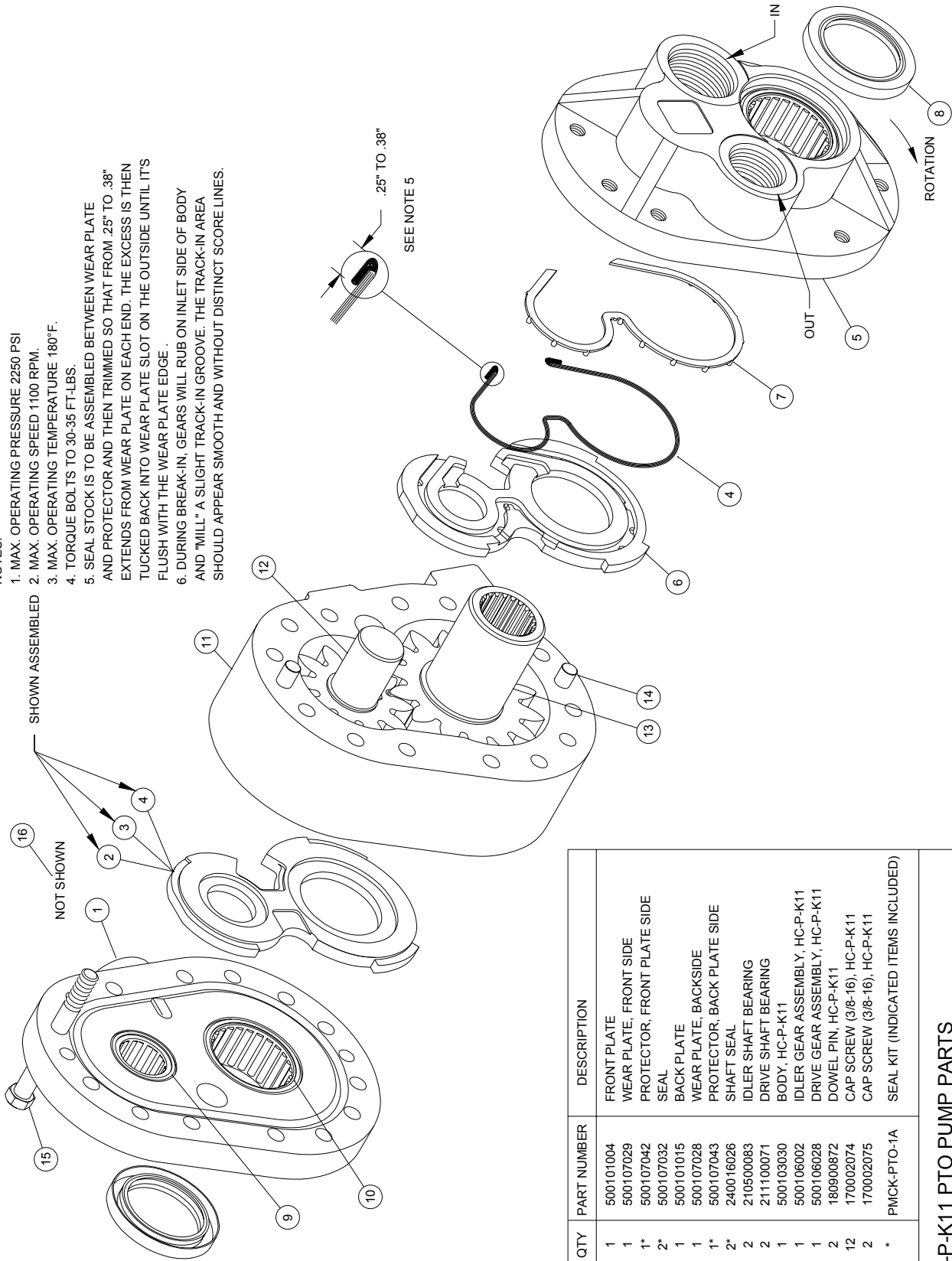
SHOWN ASSEMBLED

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	500101004	FRONT PLATE
2	1	500107029	WEAR PLATE, FRONT SIDE
3	1*	500107042	PROTECTOR, FRONT PLATE SIDE
4	2*	500107032	SEAL
5	1	500101014	BACK PLATE
6	1*	500107028	PROTECTOR, BACK PLATE SIDE
7	2*	500107043	SHAFT SEAL
8	2	240016026	IDLER SHAFT BEARING
9	2	210500083	DRIVE SHAFT BEARING
10	2	211100071	BODY, HC-PTO-9A
11	1	500103024	IDLER GEAR ASSY, HC-PTO-9A
12	1	500106018	DRIVE GEAR ASSY, HC-PTO-9A
13	1	500106027	DOWEL PIN, HC-PTO-9A
14	2	180900030	CAP SCREW, HC-PTO-9A
15	12	170002054	CAP SCREW, HC-PTO-9A
16	2	170002055	SEAL KIT (* ITEMS INCLUDED)
	*	PMCK-PTO-1A	

**HC-PTO-9A  
PTO PUMP PARTS**

NOTES:

1. MAX. OPERATING PRESSURE 2250 PSI
2. MAX. OPERATING SPEED 1100 RPM.
3. MAX. OPERATING TEMPERATURE 180°F.
4. TORQUE BOLTS TO 30-35 FT-LBS.
5. SEAL STOCK IS TO BE ASSEMBLED BETWEEN WEAR PLATE AND PROTECTOR AND THEN TRIMMED SO THAT FROM .25" TO .38" EXTENDS FROM WEAR PLATE ON EACH END. THE EXCESS IS THEN TUCKED BACK INTO WEAR PLATE SLOT ON THE OUTSIDE UNTIL IT'S FLUSH WITH THE WEAR PLATE EDGE.
6. DURING BREAK-IN, GEARS WILL RUB ON INLET SIDE OF BODY AND "MILL" A SLIGHT TRACK-IN GROOVE. THE TRACK-IN AREA SHOULD APPEAR SMOOTH AND WITHOUT DISTINCT SCORE LINES.

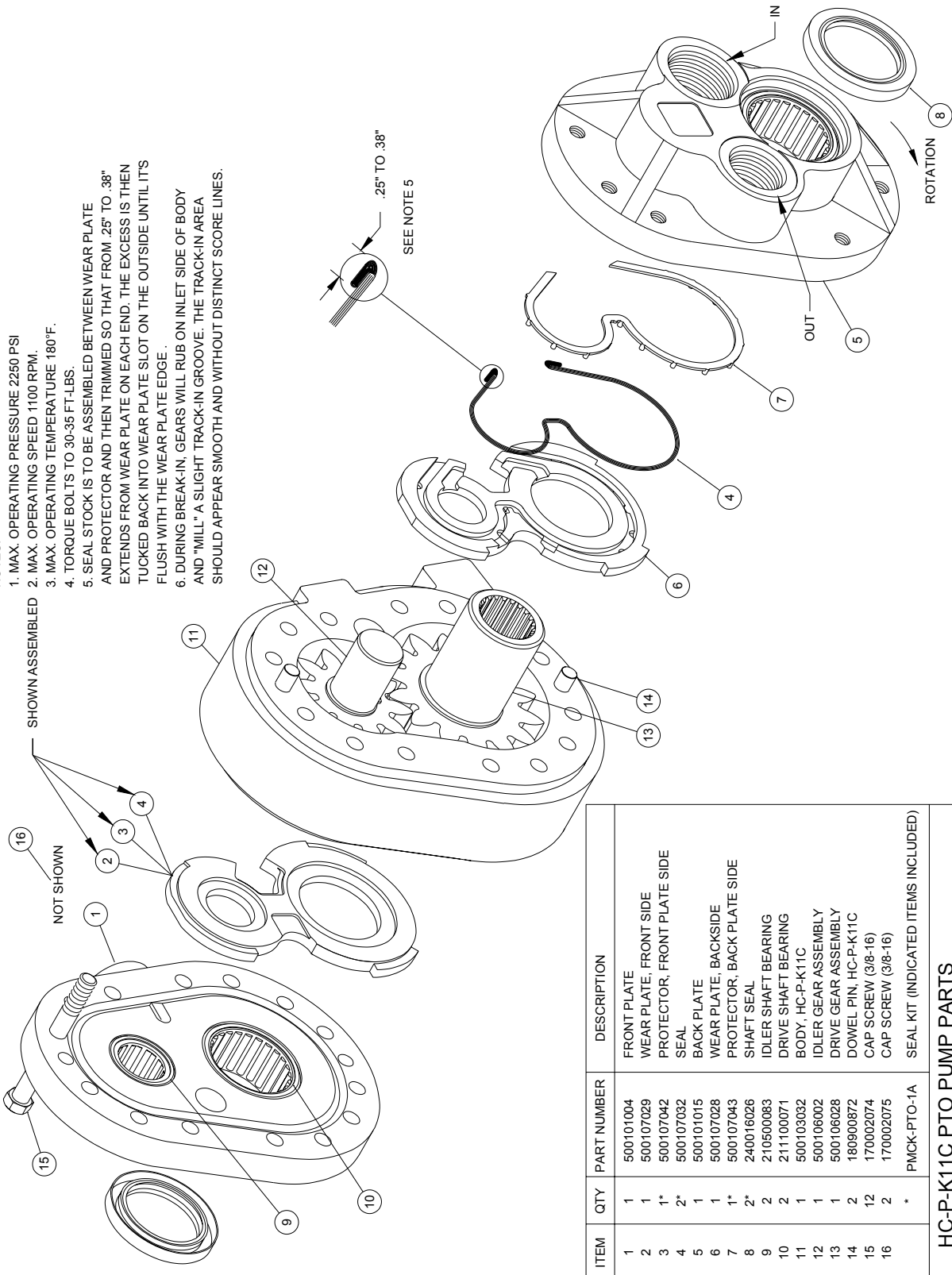


ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	500101004	FRONT PLATE
2	1	500107029	WEAR PLATE, FRONT SIDE
3	1*	500107042	PROTECTOR, FRONT PLATE SIDE
4	2*	500107032	SEAL
5	1	500101015	BACK PLATE
6	1	500107028	WEAR PLATE, BACKSIDE
7	1*	500107043	PROTECTOR, BACK PLATE SIDE
8	2*	240016026	SHAFT SEAL
9	2	210500083	IDLER SHAFT BEARING
10	2	211100071	DRIVE SHAFT BEARING
11	1	500103030	BODY, HC-P-K11
12	1	500106002	IDLER GEAR ASSEMBLY, HC-P-K11
13	1	500106028	DRIVE GEAR ASSEMBLY, HC-P-K11
14	2	180900872	DOWEL PIN, HC-P-K11
15	12	170002074	CAP SCREW (3/8-16), HC-P-K11
16	2	170002075	CAP SCREW (3/8-16), HC-P-K11
	*	PMCK-PTO-1A	SEAL KIT (INDICATED ITEMS INCLUDED)

HC-P-K11 PTO PUMP PARTS

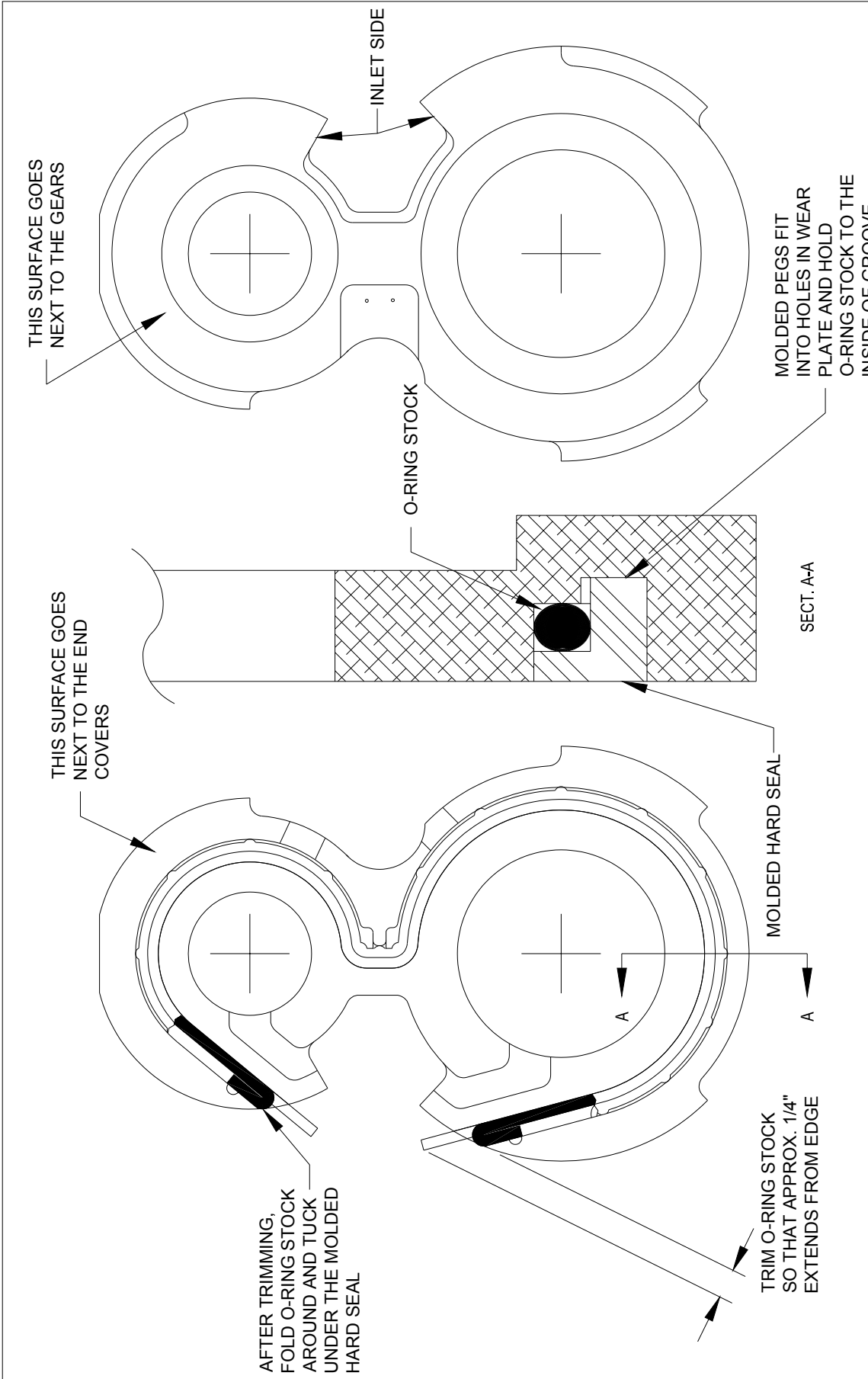
NOTES:

1. MAX. OPERATING PRESSURE 2250 PSI
2. MAX. OPERATING SPEED 1100 RPM.
3. MAX. OPERATING TEMPERATURE 180°F.
4. TORQUE BOLTS TO 30-35 FT-LBS.
5. SEAL STOCK IS TO BE ASSEMBLED BETWEEN WEAR PLATE AND PROTECTOR AND THEN TRIMMED SO THAT FROM .25" TO .38" EXTENDS FROM WEAR PLATE ON EACH END. THE EXCESS IS THEN TUCKED BACK INTO WEAR PLATE SLOT ON THE OUTSIDE UNTIL ITS FLUSH WITH THE WEAR PLATE EDGE.
6. DURING BREAK-IN, GEARS WILL RUB ON INLET SIDE OF BODY AND "MILL" A SLIGHT TRACK-IN GROOVE. THE TRACK-IN AREA SHOULD APPEAR SMOOTH AND WITHOUT DISTINCT SCORE LINES.



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	500101004	FRONT PLATE
2	1	500107029	WEAR PLATE, FRONT SIDE
3	1*	500107042	PROTECTOR, FRONT PLATE SIDE
4	2*	500107032	SEAL
5	1	500101015	BACK PLATE
6	1	500107028	WEAR PLATE, BACKSIDE
7	1*	500107043	PROTECTOR, BACK PLATE SIDE
8	2*	240016026	SHAFT SEAL
9	2	210500083	IDLER SHAFT BEARING
10	2	211100071	DRIVE SHAFT BEARING
11	1	500103032	BODY, HC-P-K11C
12	1	500106002	IDLER GEAR ASSEMBLY
13	1	500106028	DRIVE GEAR ASSEMBLY
14	2	180900872	DOWEL PIN, HC-P-K11C
15	12	170002074	CAP SCREW (3/8-16)
16	2	170002075	CAP SCREW (3/8-16)
	*	PMCK-PTO-1A	SEAL KIT (INDICATED ITEMS INCLUDED)

HC-P-K11C PTO PUMP PARTS

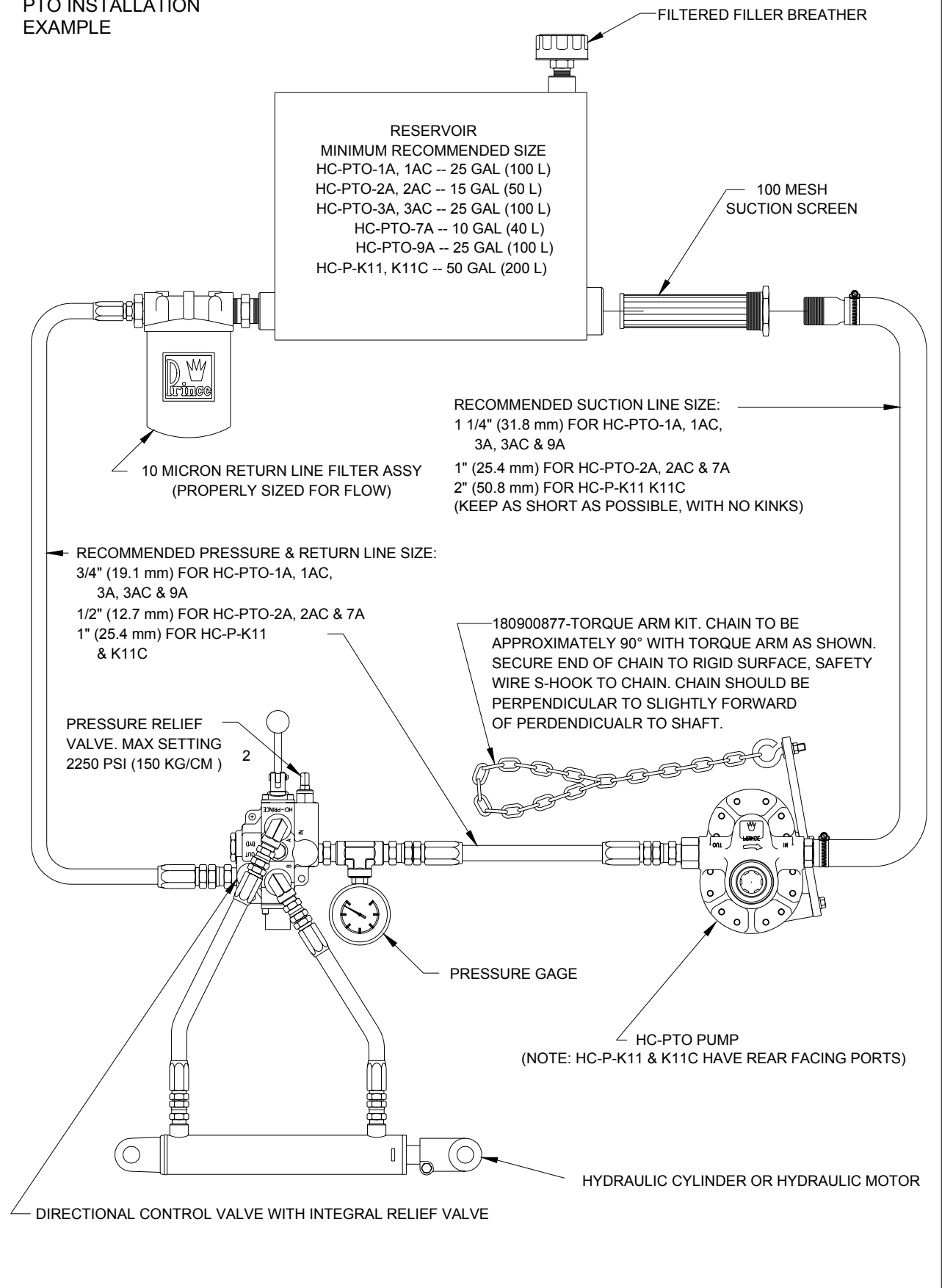


## PTO PUMP INTERNAL SEAL INSTALLATION

The front (closest to the front of the tractor) wear plate and molded seal are illustrated. The rear wear plate and molded seal are mirror images of the front.



**PTO INSTALLATION  
EXAMPLE**



**PUMP INSTALLATION INSTRUCTIONS FOR MODELS:  
 HC-PTO-1A, 1AC, 2A, 2AC, 3A, 3AC, 7A, 9A  
 HC-P-K11 & HC-P-K11C**

Prince PTO series pumps are specifically designed for PTO operation on agricultural tractors. In order to utilize these pumps to their full potential, please read the following and review the illustration on the back of this page before installation.

PUMP MODEL	DESIGN RPM	MAXIMUM RPM	FLOW AT DESIGN RPM*	INPUT POWER AT DESIGN RPM*	REQUIRED SHAFT TYPE
HC-PTO-1A & 1AC	540	600	21.0 gpm (79.5 l/min)	32.1 HP (23.9 kW)	1 3/8" (34.9 mm), 6 TOOTH
HC-PTO-2A & 2AC	540	600	11.4 gpm (43.1 l/min)	18.1 HP (13.5 kW)	1 3/8" (34.9 mm), 6 TOOTH
HC-PTO-3A & 3AC	1000	1100	22.4 gpm (84.8 l/min)	34.3 HP (25.6 kW)	1 3/8" (34.9 mm), 21 TOOTH
HC-PTO-7A	540	600	7.1 gpm (26.9 l/min)	11.9 HP (8.9 kW)	1 3/8" (34.9 mm), 6 TOOTH
HC-PTO-9A	540	600	17.1 gpm (64.7 l/min)	27.4 HP (20.4 kW)	1 3/8" (34.9 mm), 6 TOOTH
HC-P-K11 & K11C	1000	1100	40.0 gpm (151 l/min)	64.8 HP (48.3 kW)	1 3/8" (34.9 mm), 21 TOOTH

\*Numbers based on 2000 psi (140 Kg/cm<sup>2</sup>)

- OPEN CENTER:** Pump flow must return to the reservoir with the valve in the neutral position (valve must be an open center valve).
- PRESSURE:** Before installing, insure that the system has a relief valve set at or below rated pressure of 2250 psi (150 Kg/cm<sup>2</sup>).
- FILTRATION:** A 100 mesh suction strainer and a 10 micron return line filter, both sized properly for flow and both incorporating a "dirty filter" internal bypass filter are recommended. (Note: If the pump is being installed on a system where there has been a component that failed, the system should be cleaned out and new oil should be used.)
- HYDRAULIC FLUID:** Use a good quality mineral base hydraulic fluid with a viscosity of 70-250 sus (13-55 cSt) at system operating conditions. Depending on temperature, commonly used fluids are 10W, 20W, ISO32, ISO46 and ATF.
- TEMPERATURE:** If operating oil temperature exceeds 180°F (82°C), a larger reservoir or heat exchanger is required.
- TORQUE ARM:** Torque arm kit #180900877, with an 11" (280 mm) long torque arm and 800 lb (375 Kg) minimum working strength chain, is recommended. The chain should be approx. 90° to the torque arm and be secured to a rigid surface. The chain should be perpendicular to the PTO shaft to avoid an end thrust on the pump.
- SPLINE LENGTH:** Drive shaft must extend into pump a minimum of 3" (75 mm) for 6 tooth splines, 2 1/2" (60 mm) for 21 tooth splines.
- PORTS:** Ports are as shown. (Note, pumps are provided with a steel plug for the auxiliary outlet port and adapters shown.)

PUMP MODEL	INLET PORT RPM	INLET PORT TO HOSE ADAPTER (PRINCE PART No.)	AUXILIARY OUTLET PORT	REAR OUTLET PORT	OUTLET PORT TO PIPE ADAPTER (PRINCE PART No.)
HC-PTO-1A & 1AC	#16 SAE O-RING	1 1/4" (31.8 mm) HOSE (270011013)	#12 SAE O-RING	#12 SAE O-RING	3/4" (19.1 mm) F. PIPE (500204011)
HC-PTO-2A & 2AC	#16 SAE O-RING	1" (25.4 mm) HOSE (270011017)	#12 SAE O-RING	#12 SAE O-RING	3/4" (19.1 mm) F. PIPE (500204011)
HC-PTO-3A & 3AC	#16 SAE O-RING	1 1/4" (31.8 mm) HOSE (270011013)	#12 SAE O-RING	#12 SAE O-RING	3/4" (19.1 mm) F. PIPE (500204011)
HC-PTO-7A	#16 SAE O-RING	1" (25.4 mm) HOSE (270011017)	#12 SAE O-RING	#12 SAE O-RING	3/4" (19.1 mm) F. PIPE (500204011)
HC-PTO-9A	#16 SAE O-RING	1 1/4" (31.8 mm) HOSE (270011013)	#12 SAE O-RING	#12 SAE O-RING	3/4" (19.1 mm) F. PIPE (500204011)
HC-P-K11 & K11C	#20 SAE O-RING	2" (50.8 mm) HOSE (270011046)	#12 SAE O-RING	#16 SAE O-RING	1" (25.4 mm) F. PIPE (500204012)

PERFORMANCE DATA									
PUMP MODEL	RPM	500 PSI		1000 PSI		1500 PSI		2000 PSI	
		INPUT HP	GPM OUTPUT	INPUT HP	GPM OUTPUT	INPUT HP	GPM OUTPUT	INPUT HP	GPM OUTPUT
HC-PTO-1A & HC-PTO-1AC	540	8.4	21.4	16.1	21.0	23.8	21.0	32.1	21.0
HC-PTO-9A	540	7.1	17.2	13.6	17.0	20.4	16.9	27.4	17.1
HC-PTO-2A & HC-PTO-2AC	540	4.9	12.2	9.3	11.9	13.8	11.6	18.1	11.4
HC-PTO-3A & HC-PTO-3AC	1000	9.3	23.4	17.4	23.0	25.9	22.6	34.3	22.4
HC-PTO-7A	540	2.9	7.6	5.9	7.2	8.8	7.2	11.9	7.1
HC-PTO-K11 & HC-P-K11C	1000	15.5	40.7	29.4	40.1	43.4	40.0	58.8	40.0
	540	8.4	21.4	16.1	21.0	23.8	21.0	32.1	21.0

NOTE: Performance values are average values. Individual pump performance may vary. Performance based on 140 SUS oil at 120° F.



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Fax (402) 494-6941