



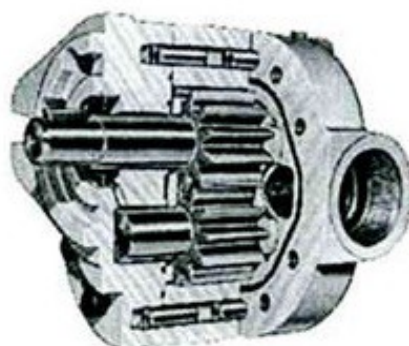
Proven Performers

Gear Pumps and Motors Technical/Service Manual

For CROSS Series 40, 50, 50G, 50T, 53 & 60 Gear Pumps and Motors

HYDRAULIC SAFETY: A relief or bypass in your hydraulic system is necessary to prevent pump from breakage due to overpressurization. Use correct fittings and proper oil as noted in this technical service manual. Change oil as recommended by your implement or tractor manufacturer. If you observe a pinhole leak, discontinue use of the component. If oil has penetrated your skin or contacted your eye, seek medical attention immediately.

Rated working pressure up to 3000 psi
 Maximum shock and surge pressure up to 3500 psi
 Maximum speed, continuous see charts
 Minimum speed recommended 600 rpm



Series	Type	Options	Sizes Cu.In./Rev. X 10				Rotation	Mounting	Shaft	Ports
40	P	O	40	50	60	50G	D	A	See Individual specification Sheets	
50	(pump)	(20 psi pump seal)	5	15	40	81	(dual)	(SAE A, 2-bolt)		
53	M	H	7	19	51	104	L	B		
60	(motor)	(250 psi shaft seal)	10	23	61	124	(left hand)	(SAE B, 2-bolt)		
	G		12	27	71	146	R	C		
	(mtr. w/reducer)		15	33	81	176	(right hand)	(SAE C, 2-bolt, 4- bolt Comb.)		
	T		18	38	92	203				
	(pump/inc.)			52		277				

Note: Pump and motor model numbers are stamped on the front cover of each unit.

Performance Data—Pumps: GPM/RPM						Performance Data—Motors: GPM/RPM						
RPM	1000	1500	2000	2500	3000	GPM	5	10	15	20	30	50
Model	GPM	GPM	GPM	GPM	GPM	Model	RPM	RPM	RPM	RPM	RPM	RPM
40P005	1.7	2.6	3.5	4.3	5.2	40M005	1732					
40P007	2.8	4.1	5.5	6.9	8.3	40M007	1155	2310				
40P010	3.7	5.7	7.4	9.2	11.0	40M010	866	1732	2599			
40P012	4.9	7.3	9.7	12.1	14.6	40M012	693	1386	2079	2772		
40P015	5.8	8.8	11.7	14.6	17.5	40M015	577	1155	1732	2310		
40P018	7.0	10.5	14.0	17.5		40M018	481	962	1443	1925	2887	
50P015	5.9	8.8	11.8	14.6	17.8	50M015	684	1368	2052	2736		
50P019	7.6	11.4	15.2	19.0	22.8	50M019	533	1066	1599	2132		
50P023	9.0	13.6	18.1	22.6	27.1	50M023	448	896	1344	1792	2688	
50P027	10.7	16.0	21.4	26.7	32.0	50M027	379	759	1138	1518	2276	
50P033	12.9	19.3	25.7	32.1	38.6	50M033	315	630	945	1260	1890	
50P038	14.8	22.2	29.6	37.0		50M038	274	547	821	1094	1641	2736
50P052	20.3	30.4	40.6			50M052	199	400	600	800	1199	1999
60P040	15.8	23.7	31.6	39.4	47.3	60M040	257	513	770	1027	1540	2567
60P051	20.1	30.1	40.1	50.2	60.2	60M051	202	404	606	807	1211	2018
60P061	24.0	36.0	47.9	59.9	71.8	60M061	169	338	507	676	1014	1690
60P071	27.9	41.8	55.7	69.6	83.6	60M071		291	436	582	872	1454
60P081	31.8	47.6	63.5	79.4		60M081		255	383	510	765	1275
30P092	36.0	54.1	72.1	90.1		60M092		225	337	450	674	1124

Note: Above performance figures are approximate and are based on 2000 PSI operating pressure. Operation in shaded areas is not recommended.

For Drive Horsepower Required: Multiply flow (gpm) by pressure (psi) and divide by 1714.

$$HP = \frac{GPM \times PSI}{1714}$$

For Maximum Pump Size (for use with gas engine): Multiply rated engine HP by 1028 and divide by pressure (psi). This gives max. flow rate (gpm). Select the nearest pump size from the above chart according to drive speed.

$$GPM = \frac{1028 HP}{PSI}$$

For Motor Drive Torque: Multiply HP by 5252 and divide by RPM.

$$Torque \text{ (ft. lbs.)} = \frac{5252 HP}{RPM}$$

For Hydraulic Motor Size: Multiply torque (ft. lbs.) by 88 and divide by pressure (psi). This gives motor size in cubic inches per revolution (cu.in./rev.) Select the nearest motor size from the above chart. For full load starting, use a 10% larger motor size.

$$DISP = \frac{88T}{PSI}$$

Oil recommendations: Premium quality anti-wear type oil with a viscosity between 100 and 200 SSU at operating temperatures. Automatic transmission fluids are acceptable. Do not use synthetic fluids. No liability or warranty is assumed for applications using fluids not meeting recommended specifications.

Filtration: 25 micron filters are required with 10 micron preferred. If pump inlet filters are used, be certain inlet flow is not restricted. Cavitation will severely reduce pump life.

Pump Speed/Port Size Limitations: If pumps are operated at speeds higher than shown below, cavitation and pump damage can occur.

Series & Size		Pump Inlet Port Size				
		1 1/16-12 3/4"(-12)	1 5/16-12 1"(-16)	1 5/8-12 1 1/4"(-20)	1 7/8-12 1 1/2"(-24)	2" S.F. 2"
40	5	3500	3500			
	7	3400	3500			
	10	2500	3500			
	12	2000	3500			
50	15	1750	3000			
	18	1400	2500			
	15		3000	3000	3000	
	19		2300	3000	3000	
50	23		2000	3000	3000	
	27		1700	2600	3000	
	33		1400	2100	3000	
	38		1200	1800	2700	
60	52		1000	1600	2200	
	40			2000	3000	3000
	51			1750	2500	3000
	61			1400	2200	3000
60	71			1000	1900	3000
	81			800	1600	2600
	92			600	1400	2500

Based on no inlet restriction (6" Hg. Max. Vacuum)

Plumbing Size Recommendations: The following is based on 4 ft./sec. inlet velocity and 15 ft./sec. outlet velocity.

GPM	Pump Inlet			Pump Outlet		
	Pipe	Tube	Hose	Pipe	Tube	Hose
5	3/4"	7/8"	3/4"	1/4"	3/8"	3/8"
10	1"	1"	1"	3/8"	1/2"	1/2"
15	1 1/4"	1 1/4"	1 1/4"	1/2"	5/8"	1/2"
20	1 1/2"	1 1/2"	1 1/2"	3/4"	3/4"	3/4"
25	1 1/2"	1 1/2"	1 1/2"	3/4"	7/8"	3/4"
30	1 3/4"	1 3/4"	1 3/4"	1"	1"	1"
35	2"	2"	2"	1"	1 1/4"	1"
40	2 1/4"	2 1/4"	2 1/4"	1 1/4"	1 1/4"	1 1/4"
50	2 1/2"	2 1/2"	2 1/2"	1 1/4"	1 1/4"	1 1/4"
75	3"	3"	3"	1 1/2"	1 3/4"	1 1/2"

Tube sizes are OD. Hose sizes are ID.

Reduce plumbing size to match pump port size **AT PUMP**