

**GHA SERIES  
 EXTREME DUTY ABRASIVE  
 G, J, N, R & S HYD SIZE  
 ROTARY GEAR PUMP**



The GHA series is designed for applications in the operating ranges noted below. These units are available with head and backhead jackets for temperature control, and packing or carbide mechanical seal options described on the following pages.

This abrasive handling, extreme duty series, provides superior wear resistance. The design also provides superior rotor shaft support and an integral, maintenance-free radial/thrust bearing for reduced deflection and wear. Reduced speeds enable service over extended periods. Information such as percentage, size and hardness of solids present in the liquid are useful to estimate pump life.

**FEATURES**

*HARDENED, WEAR RESISTANT GEARS,  
 HOUSING, HEAD, PIN, AND BUSHING*  
*HARD FACE, WEAR RESISTANT  
 MECHANICAL SEAL*  
*OVERSIZED TAPERED SEAL CAVITY*  
*HEAVY DUTY NEEDLE ROLLER  
 BEARING*  
*ROTOR END CLEARANCE EXTERNALLY  
 ADJUSTABLE*  
*FLEXIBLE SEAL DESIGN ALLOWS FOR  
 A VARIETY OF INDUSTRY  
 STANDARD SEALS OR PACKING*  
*BALL BEARING THRUST CONTROL*

**OPERATING RANGE**

CAPACITY (GPM): (8 TO 325)  
 [LPM] : [25 TO 1020]

PRESSURE (PSI) : [0 TO 200]  
 [BAR] : [0 TO 14]

VISCOSITY (SSU) : (28 TO 250,000)  
 [cSt] : [1 TO 55,000]

TEMPERATURE (F) : (-60° TO 500°)  
 [C] : [-51° TO 260°]

**APPLICATIONS**

USE WITH ANY LIQUID  
 COMPATIBLE WITH  
 CAST IRON

- ★ PAINTS
- ★ INKS
- ★ ADHESIVES
- ★ WASTE LIQUIDS
- ★ EMULSIONS
- ★ FILTERING

EXTER- IOR	ROTOR & IDLER	HSG PORTS	IDLER BUSHING	BACKHD BEARING	IDLER PIN	SHAFT	SHAFT SEALING		ROTA- TION	INTERNAL RELIEF VALVE	
							MECHANICAL SEAL ●	PACKING ■		MATERIAL	SETTING
CAST IRON	HARD IRON	90° TAPPED/ FLNG'D	SILICON CARBIDE	① NEEDLE BEARING	TUNGSTEN CARBIDE	HARD. STEEL	SILICON CARB. SILICON CARB. VITON	ARAMID FIBER W/GRAPHITE	C.W.	DUCTILE IRON	75 PSI [5 BAR]

## Standard Models

**G H A 2 NK 3 - B**  
 | | | | | | | |  
 GEAR DUTY DESIGN PORT SIZE HYDRAULIC SEAL STYLE  
 SIZE SIZE

MODEL NUMBER	NOM. CAPACITY-SPEED		MAXIMUM				SHIPPING DATA		
	MAXIMUM		DIFFERENTIAL PRESSURE - PSI [BAR]			TEMP.	② Weight	Volume	
	GPM [LPM]	RPM 60 Hz [50 HZ]	BELOW 38 SSU [4 cSt]	38 TO 100 SSU [21 cSt]	100 TO 250,000 SSU [55,000 cSt]	°F [°C]			LBS [KG]
GHA 1-1/2 GC 3-B ● GHA 1-1/2 GC 4-B ■	8 [25]	870 [720]						57 [25,9]	2.9
GHA 1-1/2 GF 3-B ● GHA 1-1/2 GF 4-B ■	11 [36]							57 [25,9]	
GHA 1-1/2 GH 3-B ● GHA 1-1/2 GH 4-B ■	15 [49]							57 [25,9]	
GHA 1-1/2 GJ 3-B ● GHA 1-1/2 GJ 4-B ■	19 [60]							57 [25,9]	
GHA 2 JJ 3-B ● GHA 2 JJ 4-B ■	28 [88]		100 [7]	150 [10]	200 [14]	● 250 [119]		144 [65,5]	5.3
GHA 2 JL 3-B ● GHA 2 JL 4-B ■	38 [121]							144 [65,5]	
GHA 2 JP 3-B ● GHA 2 JP 4-B ■	54 [169]							144 [65,5]	
GHA 2 NK 3-B ● GHA 2 NK 4-B ■	60 [188]	580 [480]				■ 500 [260]		180 [81,6]	5.3
GHA 3 NK 3-B ● GHA 3 NK 4-B ■								180 [81,6]	
GHA 2 NM 3-B ● GHA 2 NM 4-B ■	80 [251]							180 [81,6]	
GHA 3 NM 3-B ● GHA 3 NM 4-B ■								180 [81,6]	
GHA 2 NP 3-B ● GHA 2 NP 4-B ■	99 [313]							180 [81,6]	
GHA 3 NP 3-B ● GHA 3 NP 4-B ■								180 [81,6]	10.7

STANDARD MODELS CONT.

① EXCEPT "S" SIZE AND 4-B MODELS (SILICON CARBIDE BUSHING).

② FOR 4-B UNIT WEIGHT, REFER TO GHS SECTION

● MECHANICAL SEAL  
■ PACKING

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GORMAN-RUPP OF CANADA LIMITED • ST. THOMAS, ONTARIO, CANADA

# Standard Models Cont'd

MODEL NUMBER	NOM. CAPACITY-SPEED		MAXIMUM				SHIPPING DATA		
	MAXIMUM		DIFFERENTIAL PRESSURE - PSI [BAR]			TEMP.	Weight	Volume	
	GPM [LPM]	RPM 60 Hz [50 HZ]	BELOW 38 SSU [4 cSt]	38 TO 100 SSU [21 cSt]	100 TO 250,000 SSU [55,000 cSt]	°F [°C]	LBS [KG]	CU. FT.	
GHA 2 RM 3-B ● GHA 2 RM 4-B ■	85 [271]	350 [290]	100 [7]	150 [10]	200 [14]	● 250 [119] ■ 500 [260]	357 [162]	10.7	
GHA 2-1/2 RM 3-B ● GHA 2-1/2 RM 4-B ■							357 [162]		
GHA 3 RM 3-B ● GHA 3 RM 4-B ■							357 [162]		
GHA 3 RP 3-B ● GHA 3 RP 4-B ■							105 [339]		357 [162]
GHA 3 RR 3-B ● GHA 3 RR 4-B ■							125 [402]		357 [162]
GHA 3 RS 3-B ● GHA 3 RS 4-B ■							146 [465]		357 [162]
GHA 4 RS 3-B ● GHA 4 RS 4-B ■							146 [465]		357 [162]
GHA 3 SR 3-B ● GHA 3 SR 4-B ■	210 [660]	350 [290]	100 [7]	150 [10]	200 [14]	● 400 [204] ■ 500 [260]	530 [240]	17.3	
GHA 4 SR 3-B ● GHA 4 SR 4-B ■							530 [240]		
GHA 3 SU 3-B ● GHA 3 SU 4-B ■							325 [1020]		530 [240]
GHA 4 SU 3-B ● GHA 4 SU 4-B ■									530 [240]

PORTS ARE COMPATIBLE WITH 125# ANSI CAST IRON FLANGES. ALL OTHER PORTS ARE TAPPED NPT FOR ANSI PIPE.

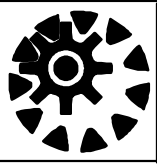
NOTE: PROPER PUMP APPLICATION REQUIRES CONSIDERATION OF ADDITIONAL FACTORS. PLEASE REVIEW APPLICATION GUIDE IN SECTION 500 OR CONSULT THE FACTORY.

# **GHA**

**FOR GHA DRIVE OPTIONS  
AND DIMENSIONS**

**SEE**

**SECTION 545**



# PERFORMANCE CURVES

## SPEED VS. CAPACITY/HORSEPOWER

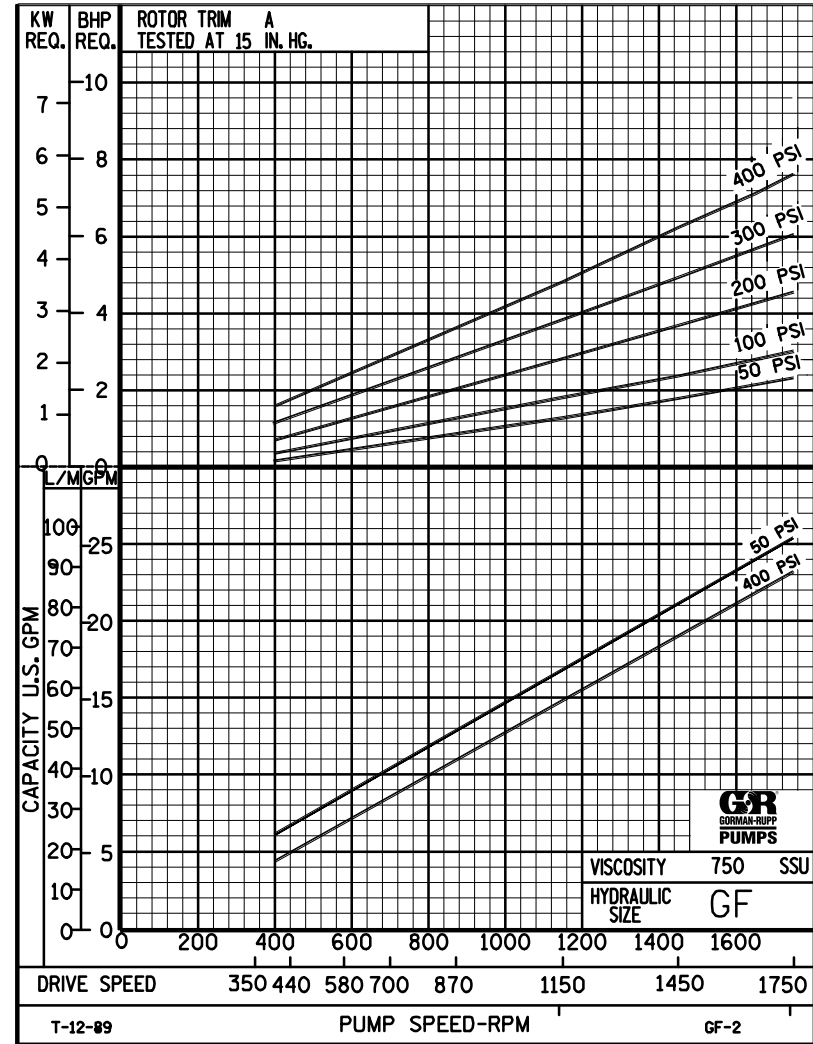
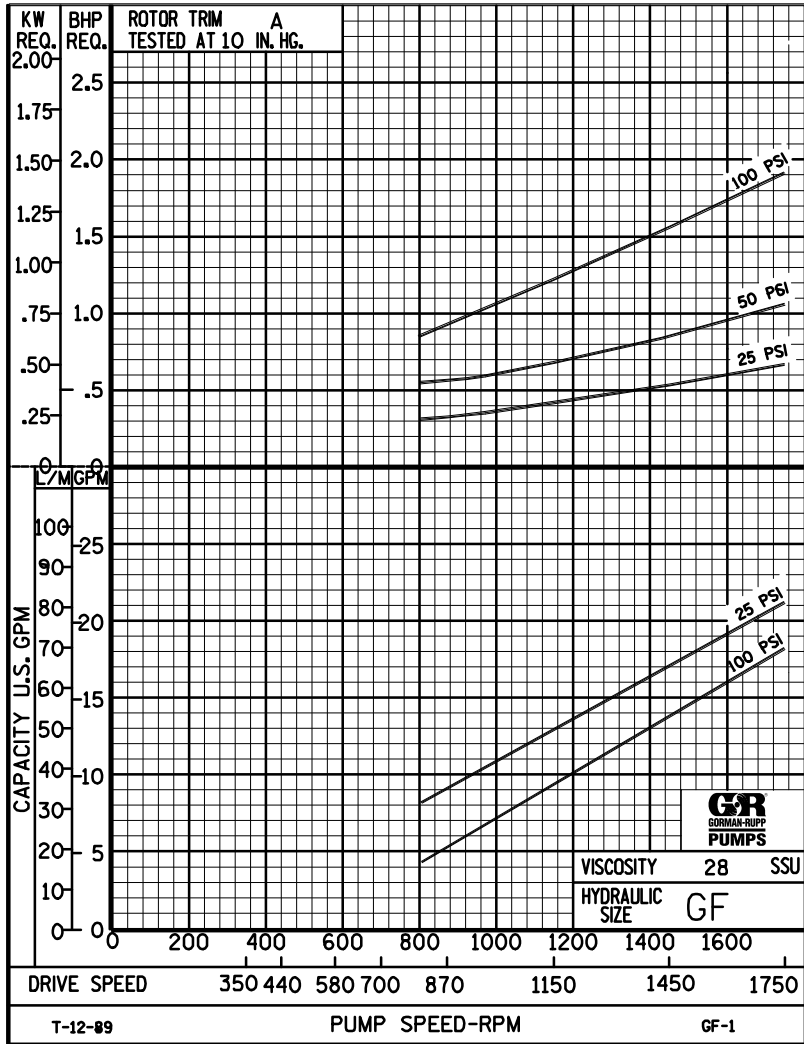
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Hydraulic Size

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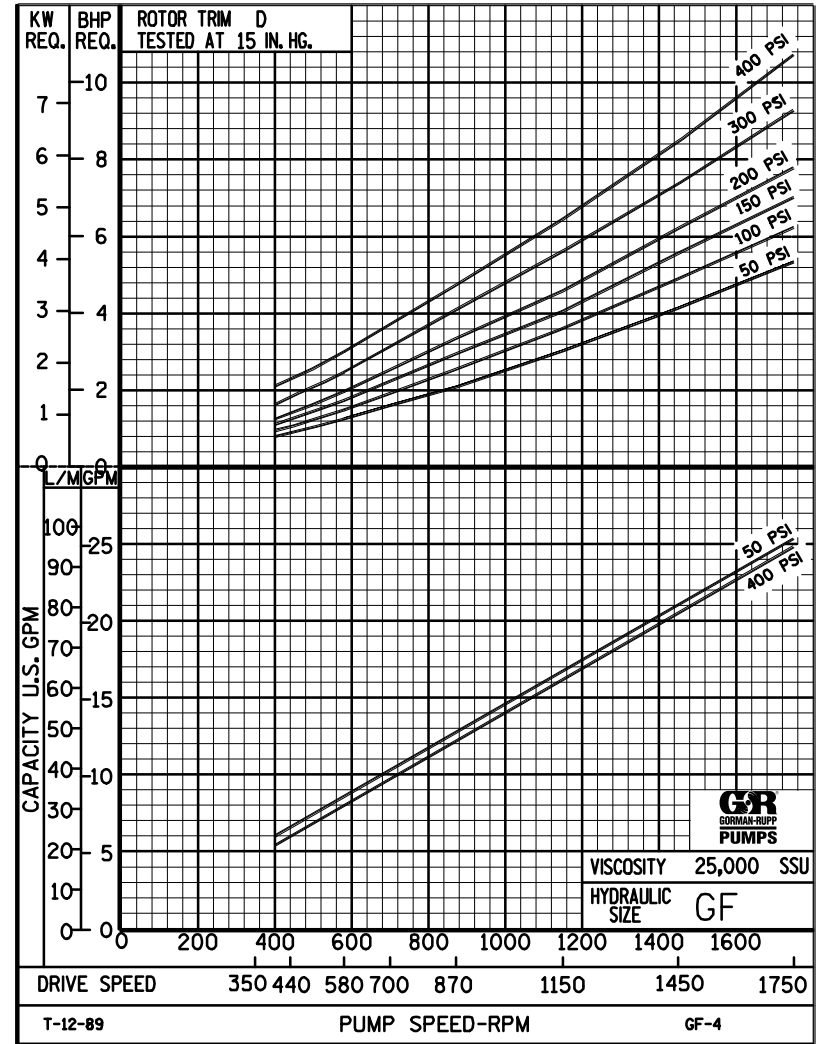
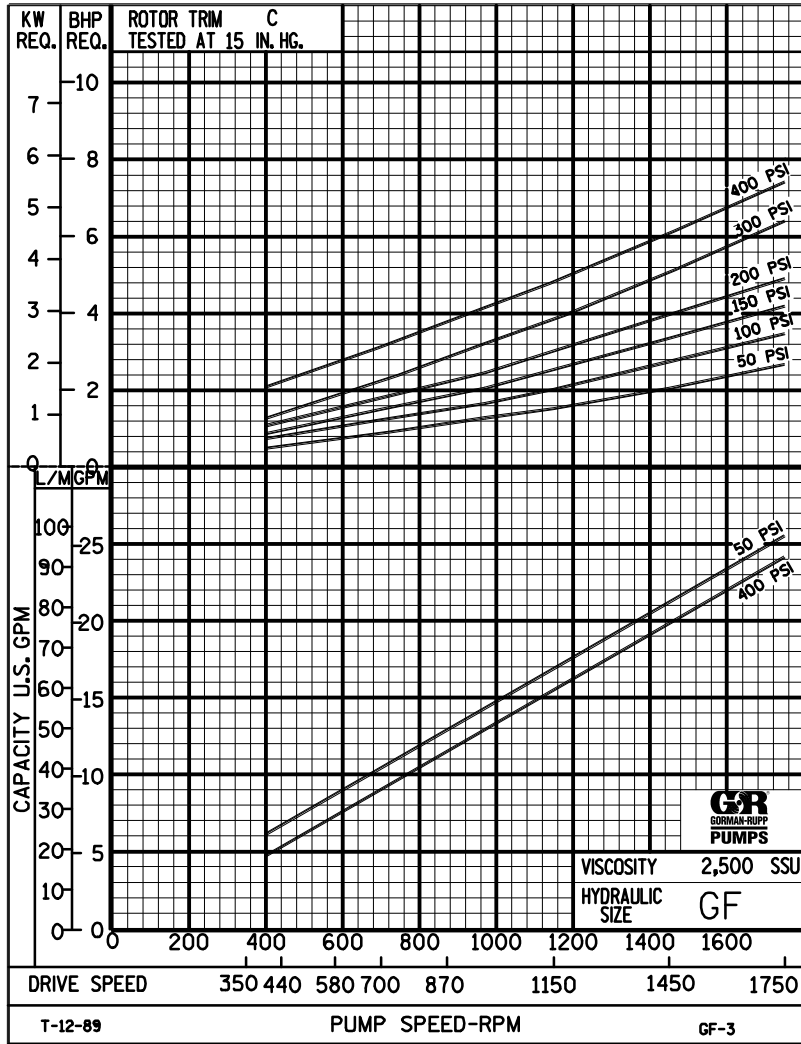
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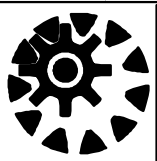
# PERFORMANCE CURVES

## SPEED VS. CAPACITY/HORSEPOWER

**GF** Hydraulic Size



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# GF

## PUMP HYDRAULIC SIZE CHART

SEC. 500

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**23 GPM  
1750 RPM**

NOMINAL		ROTOR TRIM	VISCOSITY (SSU)	N.I.P.R. (PSIA)	FRICTION PIPE LOSS (PSI/FT) <small>(Based on Sch 40 Steel Pipe)</small>					FULL BYPASS RELIEF VALVE PRESSURE (PSI)					CAPACITY (GPM) / H.P. REQUIRED								
CAP. GPM	SPEED RPM				PIPE DIAMETER					CRACKING PRESS. (PSI)					DIFFERENTIAL PRESSURE (PSI)								
					3/4"	1"	1 1/4"	1 1/2"	2"	LOW PRES R/V			HI PRES R/V		MEDIUM DUTY AND HEAVY DUTY				HEAVY DUTY ONLY				
							50	75	100	150	200	25	50	75	100	150	200	300	400				
23	1750	STD	28	3.9	.01	.01	.01	.01	.01	63	89	117				21	20	19	18				
			32		.36	.12	.03	.02	.01							.69	1.1	1.5	1.9				
			38	3.9	.46	.15	.04	.02	.01	63	89	117	167			22	21	21	19	18			
			50		.56	.18	.05	.03	.01							.92	1.1	1.7	2.1	2.9			
			70	3.9	.63	.20	.06	.03	.01	64	90	119	167	230		23	23	22	21	20	20		
			100		.74	.24	.07	.03	.01							1.1	1.4	1.8	2.2	3.1	3.8		
			150	3.9	.83	.27	.08	.04	.01	64	90	119	167	230		24	24	23	22	22	22	21	19
			200		.87	.31	.10	.05	.02							1.4	1.6	2.1	2.4	3.2	3.9	5.3	6.6
			300	3.9	.90	.34	.12	.06	.03	65	91	123	167	230		25	24	24	23	23	23	22	21
			500		1.47	.56	.19	.10	.04							1.6	1.9	2.4	2.7	3.4	4.2	5.6	6.9
		750	3.9	2.20	.84	.28	.15	.06	65	91	123	167	230		25	25	25	24	24	24	24	23	
		1,000		2.94	1.12	.38	.20	.08							1.8	2.2	2.7	3.0	3.7	4.4	5.8	7.1	
		"C"	2,000	5.0	5.87	2.24	.75	.40	.15	69	97	124	168	232		25	25	25	25	25	24	24	24
			3,500		10.3	3.91	1.31	.71	.26							2.4	2.9	3.6	3.7	4.4	4.9	6.4	7.6
			5,000	5.8	14.7	5.59	1.87	1.01	.37	74	100	127	170	233		25	25	25	25	25	25	24	24
			7,500		22.0	8.40	2.80	1.51	.56							3.1	3.4	4.1	4.4	5.1	5.8	7.3	8.3
			10,000	6.5	29.4	11.2	3.73	2.01	.74	79	104	130	172	233		25	25	25	25	25	25	25	24
			15,000		44.0	16.8	5.60	3.02	1.11							3.7	4.1	4.6	5.2	5.9	6.6	8.2	9.3
			20,000	7.1	58.7	22.4	7.46	4.03	1.48	84	109	134	175	234		25	25	25	25	25	25	25	24
			25,000		73.4	28.0	9.32	5.03	1.85							4.2	4.6	5.5	6.2	7.0	7.8	9.3	11
"D"	50,000																						
	75,000																						
	100,000																						
	150,000																						
	200,000																						
250,000																							

(NOTE) For speeds not shown on the pump hydraulic charts, consult factory.



# GF

## PUMP HYDRAULIC SIZE CHART

SEC. 500

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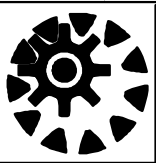
January 2010

**15 GPM  
1150 RPM**

NOMINAL		ROTOR TRIM	VISCOSITY (SSU)	N.I.P.R. (PSIA)	FRICTION PIPE LOSS (PSI/FT) <small>(Based on Sch 40 Steel Pipe)</small>					FULL BYPASS RELIEF VALVE PRESSURE (PSI)					CAPACITY (GPM) / H.P. REQUIRED											
CAP. GPM	SPEED RPM				PIPE DIAMETER					CRACKING PRESS. (PSI)					DIFFERENTIAL PRESSURE (PSI)											
					3/4"	1"	1 1/4"	1 1/2"	2"	LOW PRES R/V			HI PRES R/V		MEDIUM DUTY AND HEAVY DUTY				HEAVY DUTY ONLY							
15	1150	STD	28	2.2	.01	.01	.01	.01	.01	59	86	111				13	11	10	9.5							
			32		.17	.06	.02	.01	.01							.56	.72	.96	1.2							
			38	2.2	.22	.07	.02	.01	.01	59	86	111	161				13	13	11	11	9.5					
			50		.27	.09	.03	.01	.01								.62	.78	1.0	1.3	1.8					
			70	2.2	.30	.10	.03	.01	.01	60	87	113	163	215			14	14	13	12	12	11				
			100		.36	.12	.03	.02	.01								.66	.83	1.1	1.4	1.9	2.4				
			150	2.2	.41	.14	.05	.02	.01	60	87	113	163	217			15	15	14	14	13	13	13	13	12	
			200		.46	.18	.06	.03	.01								.78	.98	1.2	1.5	1.9	2.4	3.5	4.6		
			300	2.2	.58	.22	.08	.04	.02	60	87	115	165	219			16	15	15	15	15	14	14	14	13	
			500		.96	.37	.12	.07	.03								.94	1.2	1.4	1.6	2.1	2.6	3.6	4.7		
		750	2.2	1.44	.55	.18	.10	.04	60	87	115	165	222			16	16	16	16	16	15	15	15	14		
		1,000		1.92	.73	.25	.13	.05								1.1	1.3	1.5	1.7	2.2	2.7	3.7	4.8			
		2,000	2.8	3.83	1.46	.49	.26	.10	62	90	115	165	222			17	17	16	16	16	16	15	15			
		3,500		6.70	2.55	.85	.46	.17								1.4	1.8	2.0	2.1	2.6	3.1	4.1	5.1			
		5,000	3.2	9.57	3.64	1.22	.66	.24	65	92	117	167	224			17	17	16	16	16	16	16	16			
		7,500		14.4	5.46	1.83	.99	.36								1.6	2.0	2.2	2.4	2.9	3.5	4.4	5.4			
		10,000	3.6	19.1	7.29	2.43	1.31	.49	68	94	119	169	224			17	17	16	16	16	16	16	16			
		15,000		28.7	10.9	3.65	1.97	.73								1.9	2.4	2.7	3.0	3.5	4.0	4.8	5.9			
		20,000	3.9	38.3	14.6	4.87	2.63	.97	72	97	122	172	224			17	17	16	16	16	16	16	16			
		25,000		47.8	18.2	6.08	3.28	1.21								2.2	2.8	3.2	3.5	4.0	4.5	5.3	6.5			
50,000	6.1	95.7	36.4	12.2	6.56	2.42	77	102	127	177	229			17	16	16	16	16	16	16	16					
75,000		144	54.6	18.3	9.85	3.63								3.6	4.5	5.1	5.7	6.3	6.8	7.7	8.8					
100,000																										
150,000																										
200,000																										
250,000																										

(NOTE) For speeds not shown on the pump hydraulic charts, consult factory.





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## PUMP HYDRAULIC SIZE CHART

SEC. 500

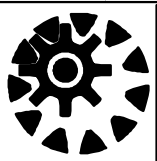
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**11 GPM  
870 RPM**

NOMINAL		ROTOR TRIM	VISCOSITY (SSU)	N.I.P.R. (PSIA)	FRICTION PIPE LOSS (PSI/FT) <small>(Based on Sch 40 Steel Pipe)</small>					FULL BYPASS RELIEF VALVE PRESSURE (PSI)					CAPACITY (GPM) / H.P. REQUIRED												
CAP. GPM	SPEED RPM				PIPE DIAMETER					CRACKING PRESS. (PSI)					DIFFERENTIAL PRESSURE (PSI)												
					3/4"	1"	1 1/4"	1 1/2"	2"	LOW PRES R/V			HI PRES R/V		25	50	75	100	150	200	300	400					
11	870	STD	28	1.5	.01	.01	.01	.01	.01	57	82	107			9	8	7	6									
			32		.10	.03	.01	.01	.01							.32	.53	.71	.91								
			38	1.5	.13	.04	.01	.01	.01	57	82	107	158			10	9	8	7.5	6.5							
			50		.16	.05	.02	.01	.01							.50	.59	.85	1.1	1.4							
			70	1.5	.18	.06	.02	.01	.01	57	82	108	159	210			10	10	9.5	9	8	7					
			100		.21	.06	.02	.01	.01							.54	.63	.88	1.1	1.5	1.8						
			150	1.5	.26	.09	.03	.01	.01	58	83	109	159	212			11	11	10	10	10	9.5	9.5	8			
			200		.33	.12	.05	.02	.01							.61	.71	.94	1.2	1.5	1.8	2.5	3.3				
			300	1.5	.43	.16	.06	.03	.01	58	83	110	160	213			12	12	11	11	11	10	10	9.5			
			500		.70	.27	.09	.05	.02							.69	.81	1.0	1.3	1.6	1.9	2.5	3.5				
			750	1.5	1.05	.40	.14	.07	.03	58	83	112	162	215			12	12	12	12	12	11	11	11			
			1,000		1.41	.54	.18	.10	.04							.79	.93	1.1	1.3	1.7	2.0	2.6	3.6				
		2,000	2.0	2.81	1.07	.36	.19	.07	59	86	113	163	215			13	12	12	12	12	12	11	11				
		3,500		4.91	1.87	.63	.34	.13							.98	1.2	1.3	1.5	1.8	2.2	2.8	3.7					
		5,000	2.4	7.02	2.67	.89	.48	.18	61	86	113	163	215			13	12	12	12	12	12	12	11				
		7,500		10.5	4.00	1.34	.72	.27							1.3	1.5	1.7	1.9	2.2	2.6	3.2	4.1					
		10,000	2.7	14.0	5.34	1.78	.96	.36	64	89	115	167	217			13	12	12	12	12	12	12	12				
		15,000		21.1	8.01	2.68	1.45	.53							1.5	1.8	2.1	2.3	2.6	2.9	3.6	4.4					
		20,000	3.0	28.1	10.7	3.57	1.93	.71	67	92	117	169	219			13	12	12	12	12	12	12	12				
		25,000		35.1	13.4	4.46	2.41	.89							1.9	2.2	2.4	2.5	2.9	3.3	4.1	4.8					
		50,000	4.9	70.2	26.7	8.92	4.81	1.77	70	95	123	173	225			13	12	12	12	12	12	12	12				
		75,000		105	40.1	13.4	7.22	2.66							2.9	3.4	3.6	3.8	4.2	4.6	5.4	6.1					
		100,000	7.1	140	53.4	17.9	9.63	3.55	74	99	127	177	231			12	12	12	12	12	12	12	12				
		150,000		211	80.1	26.8	14.5	5.32							3.6	4.3	4.5	4.7	5.1	5.4	6.2	6.9					
200,000																											
250,000																											

(NOTE) For speeds not shown on the pump hydraulic charts, consult factory.



# GF

## PUMP HYDRAULIC SIZE CHART

SEC. 500

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8 GPM  
580 RPM

NOMINAL		ROTOR TRIM	VISCOSITY (SSU)	N.I.P.R. (PSIA)	FRICTION PIPE LOSS (PSI/FT) (Based on Sch 40 Steel Pipe)					FULL BYPASS RELIEF VALVE PRESSURE (PSI)					CAPACITY (GPM) / H.P. REQUIRED														
CAP. GPM	SPEED RPM				PIPE DIAMETER					CRACKING PRESS. (PSI)					DIFFERENTIAL PRESSURE (PSI)														
					3/4"	1"	1 1/4"	1 1/2"	2"	LOW PRES R/V		HI PRES R/V			MEDIUM DUTY AND HEAVY DUTY				HEAVY DUTY ONLY										
8	580	STD	28	1.1	.01	.01	.01	.01	.01	56	81	106			6	5	4.5	4											
			32		.06	.02	.01	.01	.01						.21	.35	.47	.61											
			38	1.1	.07	.03	.01	.01	.01	56	81	106	157			6.5	6	5.5	4.5	4									
			50		.09	.03	.01	.01	.01							.34	.40	.57	.74	.92									
			70	1.1	.10	.04	.01	.01	.01	56	81	107	158	209			7	6.5	6	6	5.5	4.5							
			100		.10	.04	.01	.01	.01								.36	.42	.59	.76	.98	1.2							
			150	1.1	.15	.05	.02	.01	.01	57	82	108	158	211			7.5	7.5	7	6.5	6.5	6	6	6	5				
			200		.24	.08	.03	.02	.01								.41	.48	.63	.78	1.0	1.2	1.7	2.2					
			300	1.1	.31	.12	.04	.02	.01	57	82	109	159	212			8	8	7.5	7	7	7	6.5	6					
			500		.51	.19	.07	.04	.01								.46	.54	.69	.84	1.1	1.3	1.7	2.3					
			750	1.1	.77	.29	.10	.05	.02	57	82	111	161	214			8.5	8	8	8	8	7	7.5	7					
			1,000		1.02	.39	.14	.07	.03								.53	.62	.76	.89	1.1	1.4	1.7	2.4					
		2,000	1.5	2.04	.78	.26	.14	.05	58	85	112	162	214			8.5	8.5	8	8	8	8	7.5	7.5						
		3,500		3.57	1.36	.46	.25	.09								.66	.77	.88	.99	1.2	1.5	1.9	2.5						
		5,000	1.9	5.01	1.94	.65	.35	.13	60	85	112	162	214			8.5	8.5	8	8	8	8	8	7.5						
		7,500		7.65	2.91	.97	.53	.19								.84	.99	1.1	1.3	1.5	1.7	2.1	2.7						
		10,000	2.2	10.2	3.88	1.30	.70	.26	63	88	114	166	216			8.5	8.5	8	8	8	8	8	7.5						
		15,000		15.3	5.83	1.95	1.05	.39								1.0	1.2	1.3	1.4	1.6	1.9	2.4	2.9						
		20,000	2.5	20.4	7.77	2.59	1.40	.52	66	91	116	168	218			8.5	8.5	8	8	8	8	8	8						
		25,000		25.5	9.71	3.24	1.75	.65								1.0	1.2	1.4	1.5	1.7	2.0	2.5	3.0						
		50,000	4.0	51.1	19.4	6.50	3.50	1.29	68	93	120	170	222			8.5	8.5	8	8	8	8	8	8						
		75,000		76.5	29.1	9.73	5.25	1.93								1.6	1.9	2.1	2.2	2.4	2.7	3.2	3.7						
		100,000	6.0	102	38.9	13.0	7.00	2.58	70	95	122	172	224			8.5	8	8	8	8	8	8	8						
		150,000		153	58.3	19.5	10.5	3.87								2.1	2.5	2.6	2.7	3.0	3.2	3.7	4.2						
200,000	9.4	204	77.7	26.0	14.0	5.15	76	101	130	180	236			8.5	8.5	8.5	8.5	8	8	8	8								
250,000		-	-	-	-	-								2.5	3.0	3.1	3.2	3.4	3.7	4.2	4.7								

(NOTE) For speeds not shown on the pump hydraulic charts, consult factory.