

DYNAPOWER

Generation 2



Reliability. Service. Consistency. These are just a few of the key features built into every pump, motor and integrated system that **DYNAPOWER** manufactures. A unit of the Fortune 500 Company GENERAL SIGNAL, **DYNAPOWER** has led the industry for over half a century—developing products that power the world's most sophisticated technology.

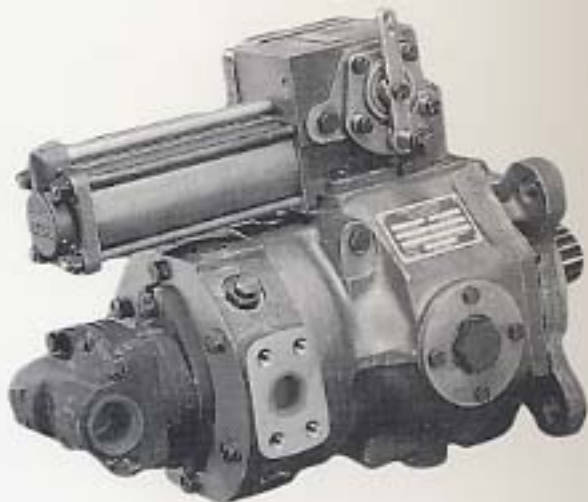
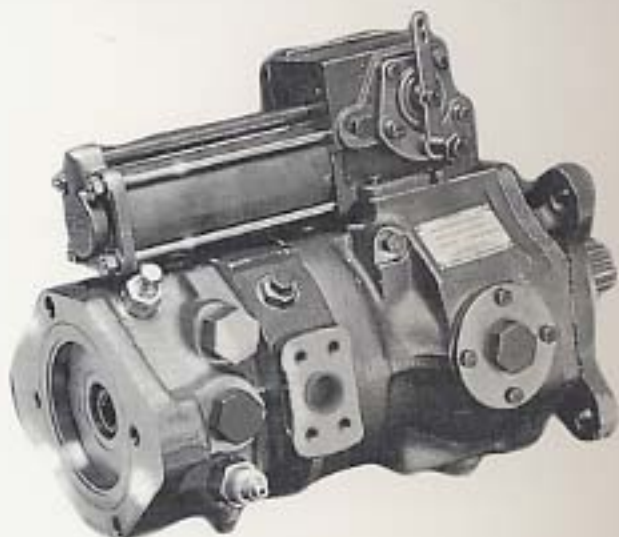
Withstanding the harshest environments around the globe, **DYNAPOWER** products continue to earn the respect of a client base that demands nothing less than the highest standards. Offering the longest

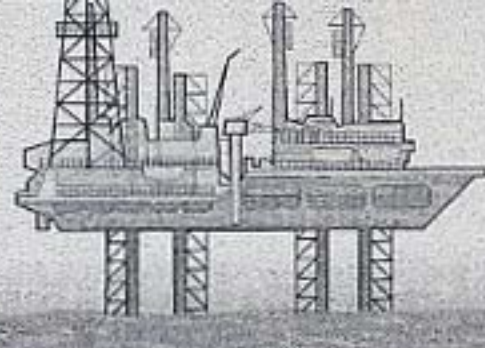
THE POWER SOURCE OF RELIABILITY

warranty in the business simply adds to the beauty of this dependable technology. And should you ever need service, **DYNAPOWER** will provide highly experienced personnel at your site—anywhere in the world—*within 48 hours of your call!*

For complete system integration, custom engineering, and team-managed quality control, **DYNAPOWER** is your source for a diversity of products serving the widest possible variety of requirements. From commercial and industrial—to aerospace and defense markets—demand **DYNAPOWER!**

And discover power that just won't quit!

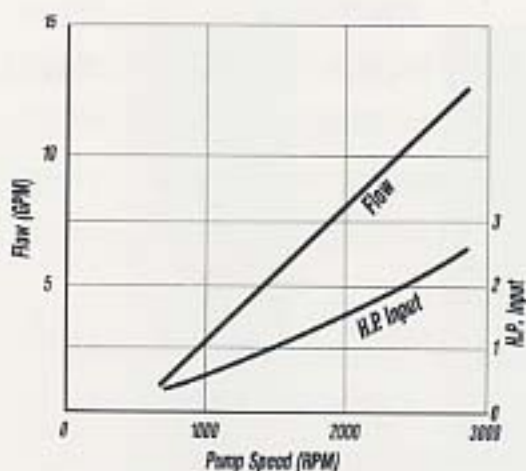




STANDARD PUMPS AND MOTORS

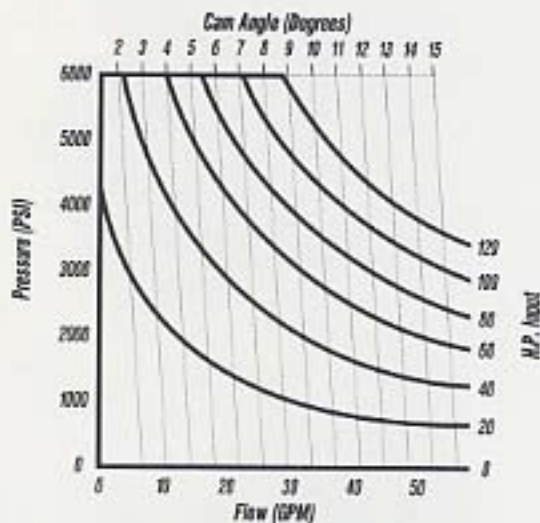
MODEL NUMBER ►	35	48	60	90	120	210
Displacement (cu. in./rev.)	3.5	4.8	6.0	9.0	12.0	21.0
Std. Charge Pump Displacement (cu. in./rev.)	1.2	1.2	1.2	1.8	2.8	4.9
Continuous Max. Speed Pump (RPM) Motor	3200	3200	3000	2800	2500	2100
Continuous Horsepower Input (HP)	126	175	204	286	338	501
Peak Horsepower Input (HP)	169	263	309	409	505	763
Max. System Pressure (PSI)	6000	6000	6000	6000	6000	6000
Max. Fluid Temperature (°F)	200	200	200	200	200	200
Actual Output Torque (ft lbs. / 1000 Δp)		60	74	111	148	260
Weight Pump (with charge pump) (lbs.)	121	121	121	260	275	550
Weight Motor (with relief valve) (lbs.)		107	107	163	209	455

PERFORMANCE CURVES

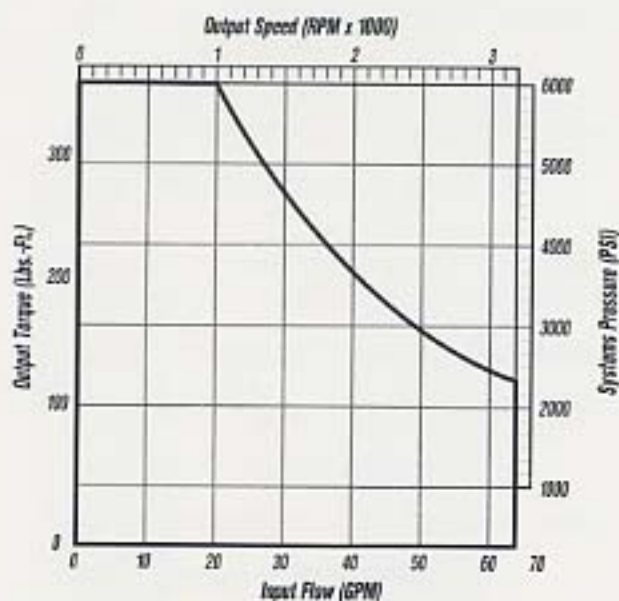


Standard Charge Pump Performance

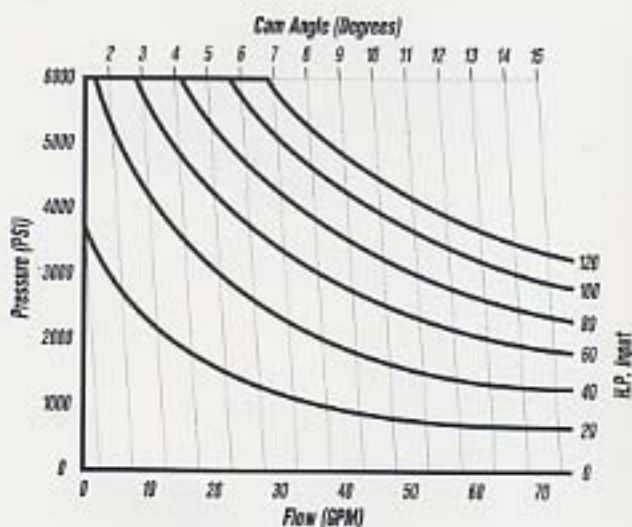
Displacement - 1.2 CUB Discharge Pressure - 200 PSI
Section 70 In. Hg.



Pump Speed 2200 RPM



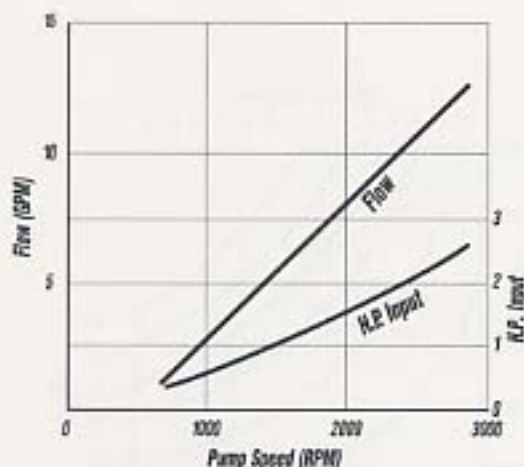
Cam Angle 15° (Maximum Displacement)



Pump Speed 2800 RPM

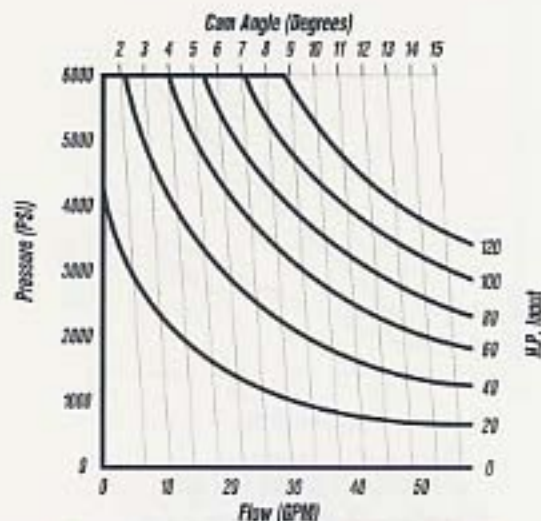
MODEL 48

PERFORMANCE CURVES

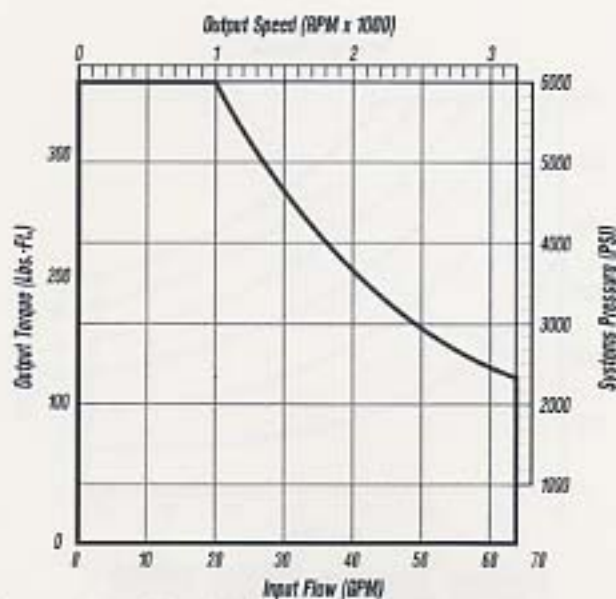


Standard Charge Pump Performance

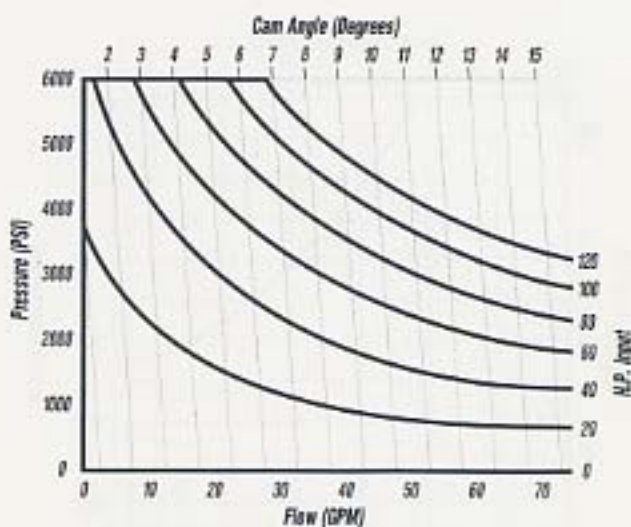
Displacement - 1.2 GPR Discharge Pressure - 200 PSI
Section 10 in. NPS



Pump Speed 2200 RPM

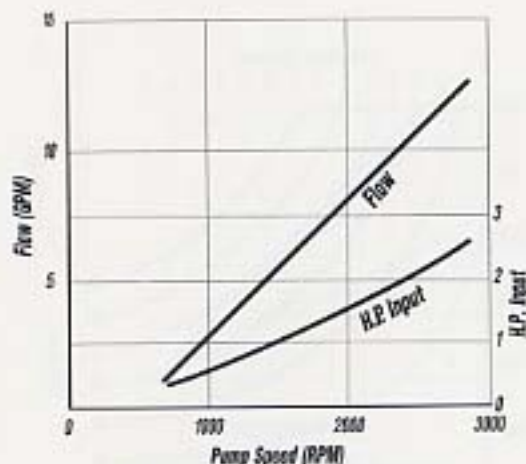


Cam Angle 15° (Maximum Displacement)



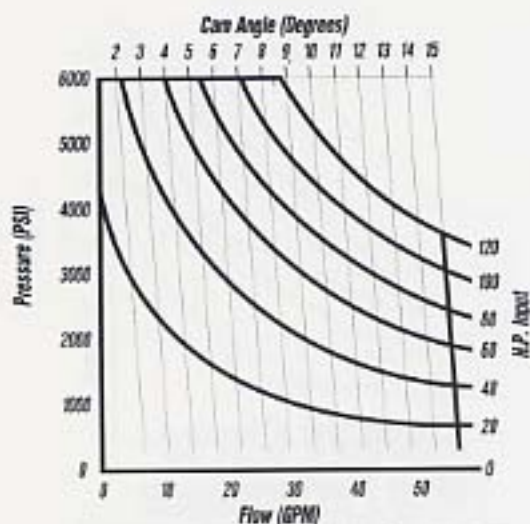
Pump Speed 2800 RPM

PERFORMANCE CURVES

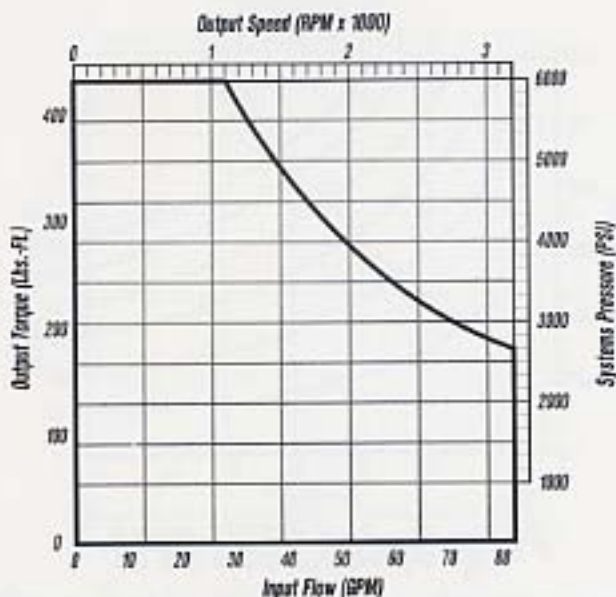


Standard Charge Pump Performance

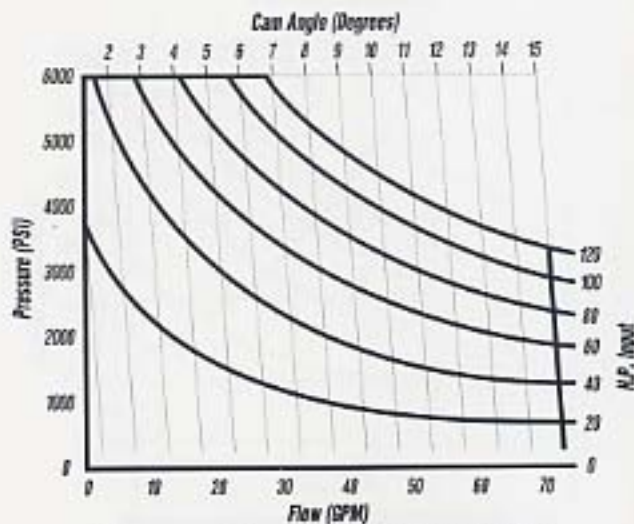
Displacement - 1.2 CUB. IN. Discharge Pressure - 200 PSI
Section 10 In. NG.



Pump Speed 2200 RPM



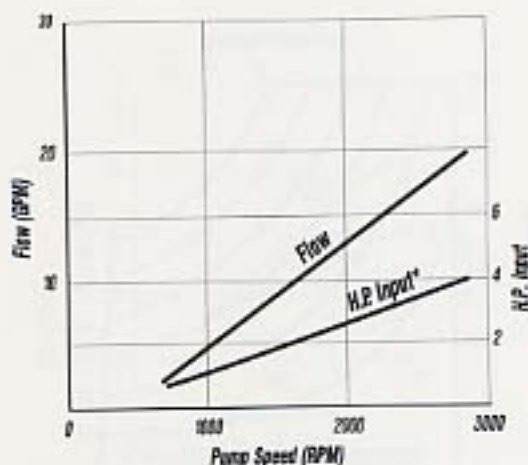
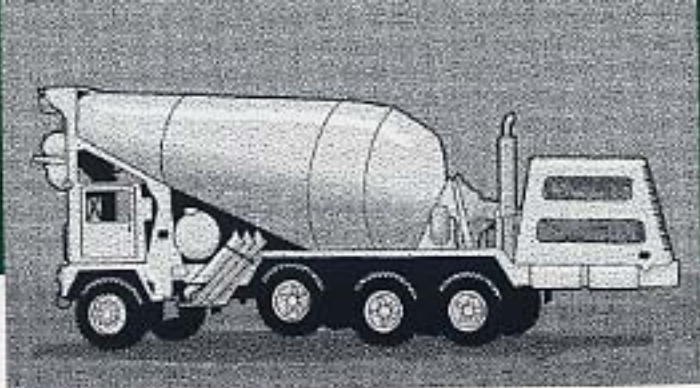
Cam Angle 15° (Maximum Displacement)



Pump Speed 2800 RPM

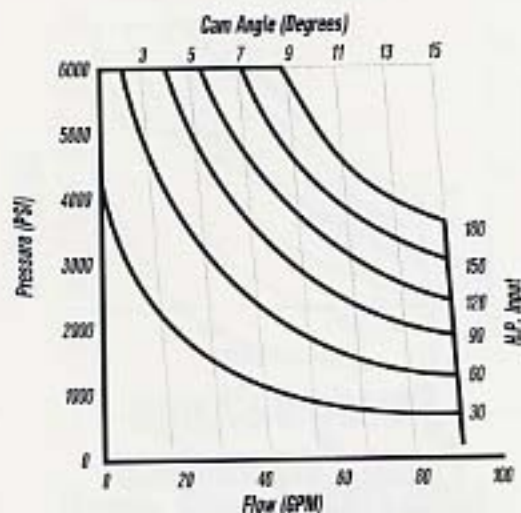
MODEL 90

PERFORMANCE CURVES

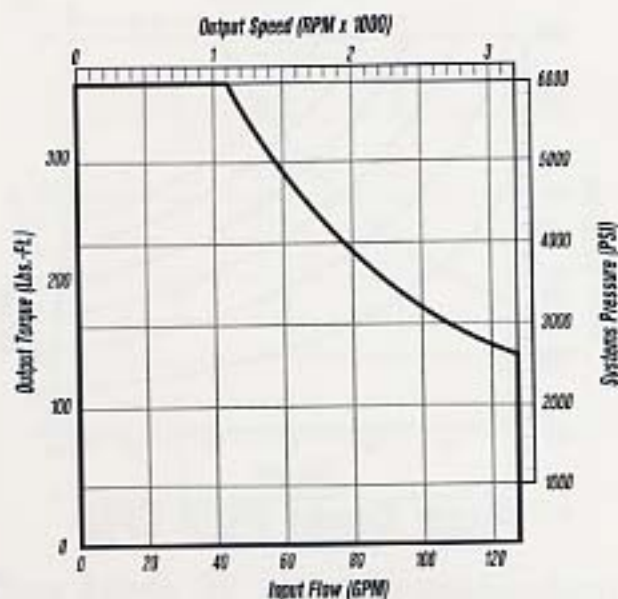


Standard Charge Pump Performance

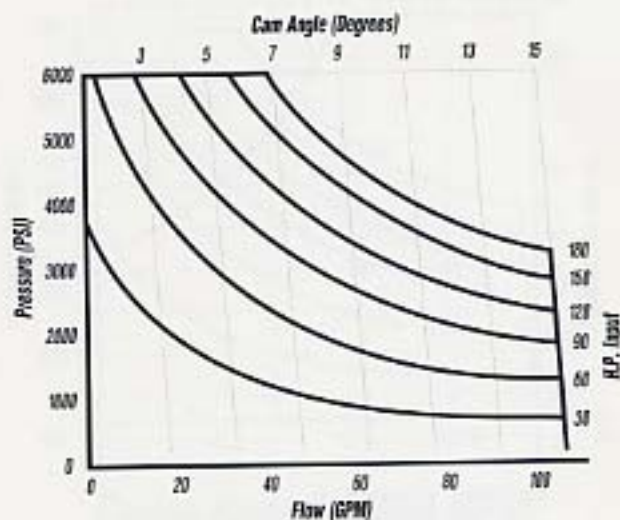
Displacement - 1.8 CR Discharge Pressure - 200 PSI
Section 10 ft. AG.



Pump Speed 2200 RPM

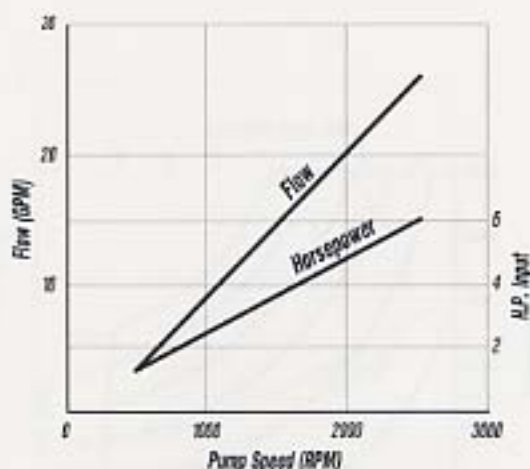


Cam Angle 15° (Maximum Displacement)



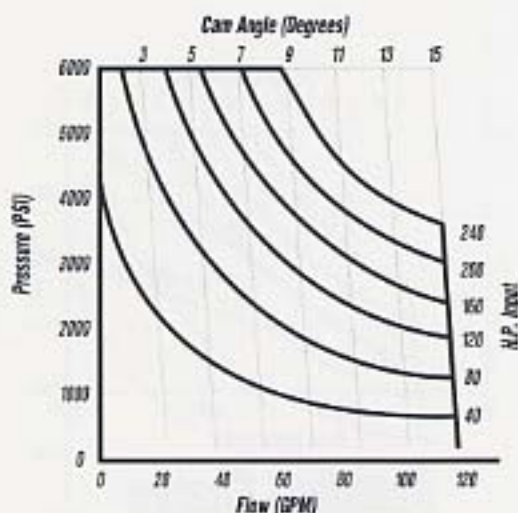
Pump Speed 2800 RPM

PERFORMANCE CURVES

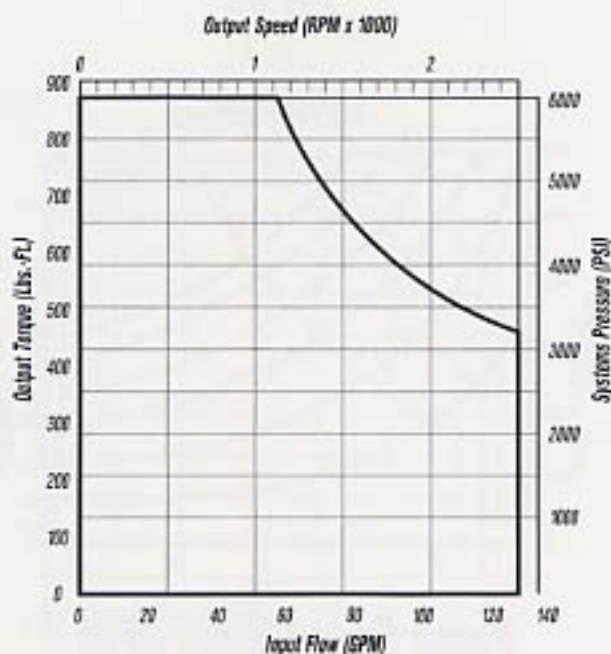


Standard Charge Pump Performance

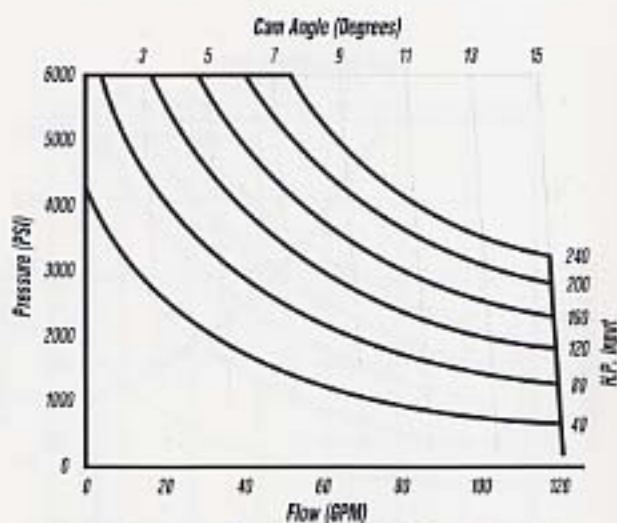
Displacement - 2.2 C/R Discharge Pressure - 200 PSI
Section 13 in. AG



Pump Speed 2200 RPM



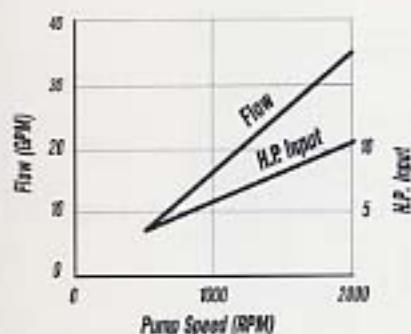
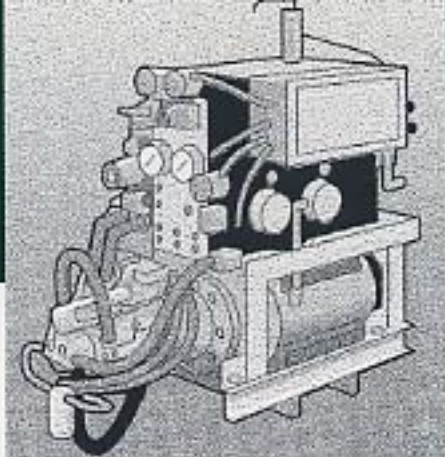
Cam Angle 15° (Maximum Displacement)



Pump Speed 2500 RPM

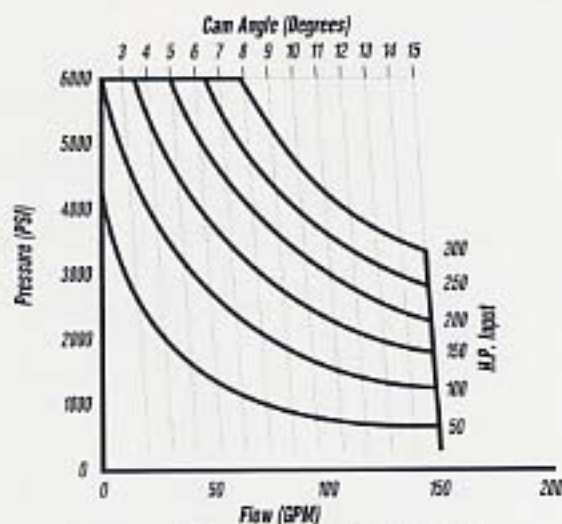
MODEL 210

PERFORMANCE CURVES

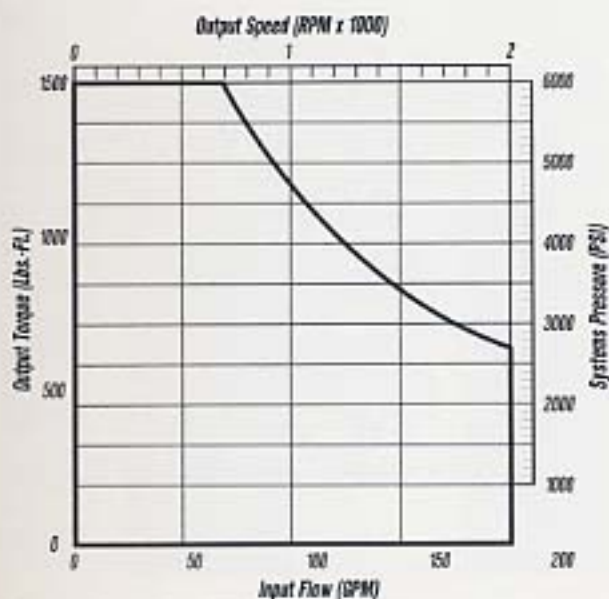


Standard Charge Pump Performance

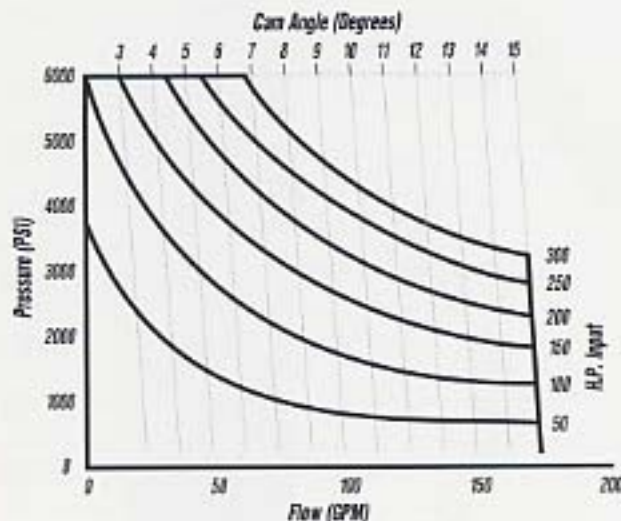
Displacement - 4.9 CID Discharge Pressure - 200 PSI
Suction 10 in. HG.



Pump Speed 1750 RPM



Cam Angle 15° (Maximum Displacement)



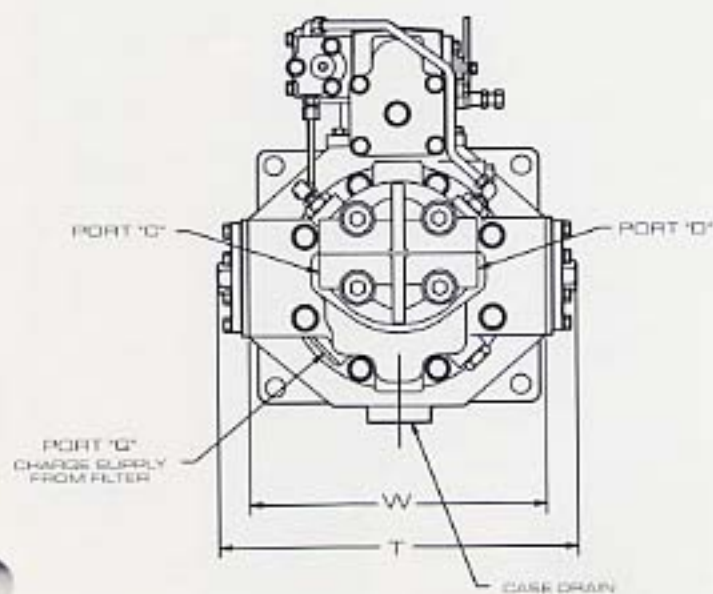
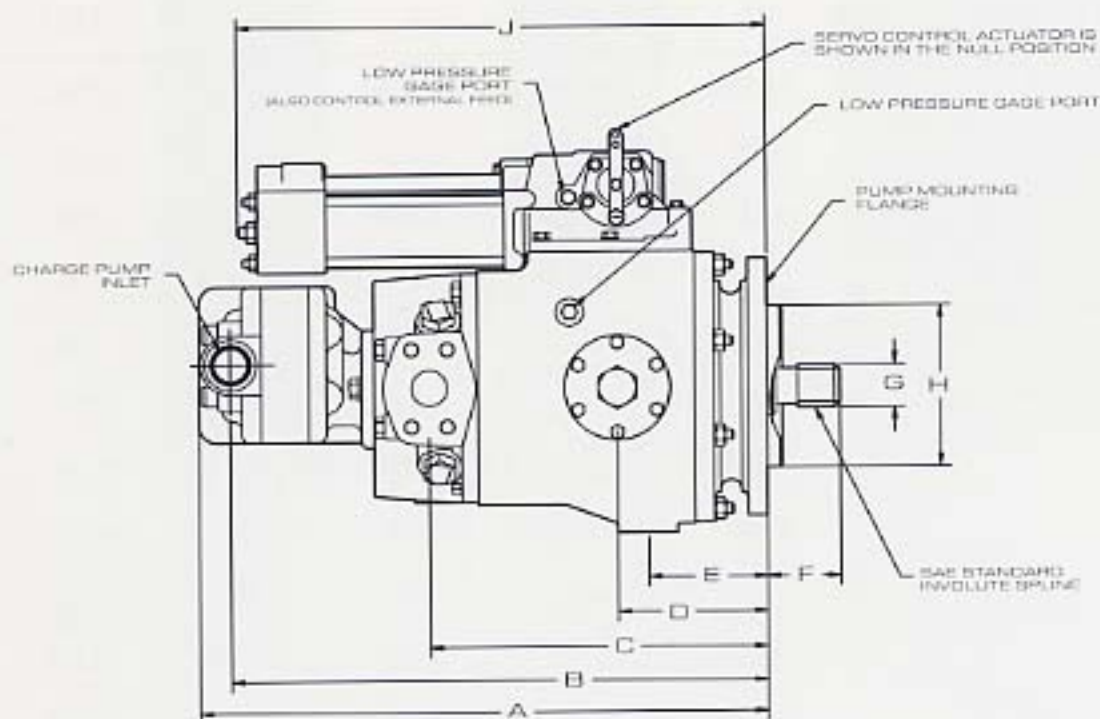
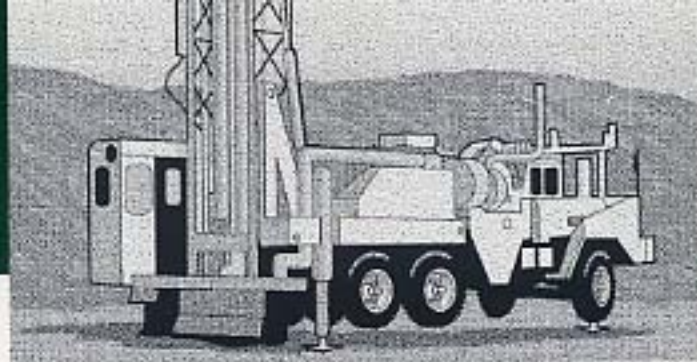
Pump Speed 2000 RPM

INSTALLATION DATA

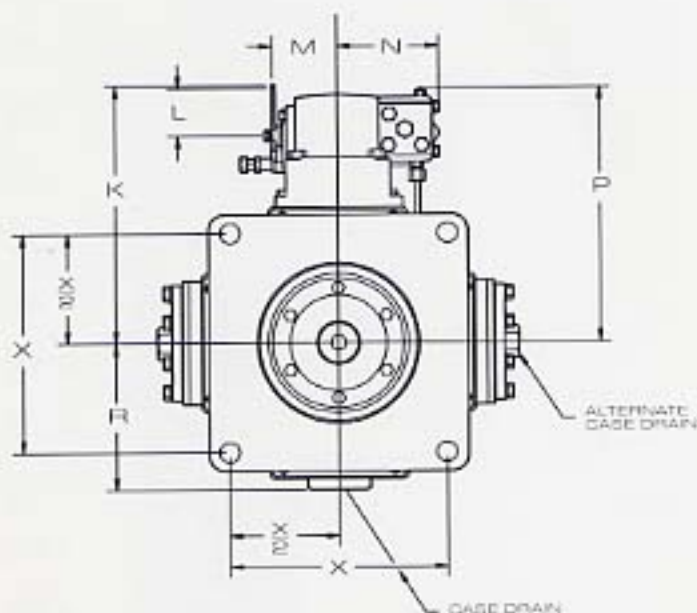
MODEL NUMBER	35	48	60	90	120	210
A	14.781	14.781	14.781	21.688	22.750	25.297
B	13.813	13.813	13.813	20.438	21.500	22.547
C	9.625	9.625	9.625	13.016	13.531	16.422
D	4.188	4.188	4.188	6.469	5.984	7.250
E	3.313	3.313	3.313	5.250	4.766	6.063
F	2.933	2.938	2.938	2.656	2.938	3.438
G	1.750	1.750	1.750	1.750	1.750	2.000
H	6.000	6.000	6.000	6.000	6.500	7.000
J	14.000	14.000	14.000	21.578	21.078	22.344
K	9.109	9.109	9.109	10.219	10.219	11.219
L	1.625	1.625	1.625	2.000	2.000	2.000
M	2.313	2.313	2.313	2.313	2.313	2.313
N	3.906	3.906	3.906	3.906	3.906	3.906
P	8.031	8.031	8.031	9.625	10.000	11.125
R	4.313	4.313	4.313	5.875	5.875	6.750
T	10.406	10.406	10.406	13.344	13.344	15.844
W	7.750	7.750	7.750	10.000	11.125	14.563
X	6.359	6.359	6.359	6.359	8.844	9.750
Thread Size	1 1/8	1 1/2	1 3/4	1 5/8	1 3/4	1 3/4

PUMP

DIMENSIONS *



LEFT



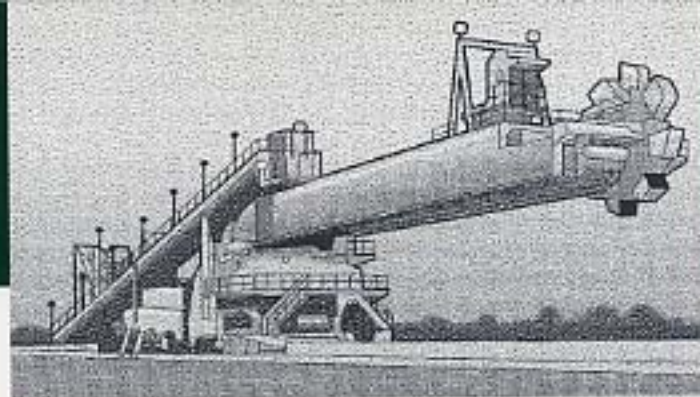
RIGHT

*all measurements in inches

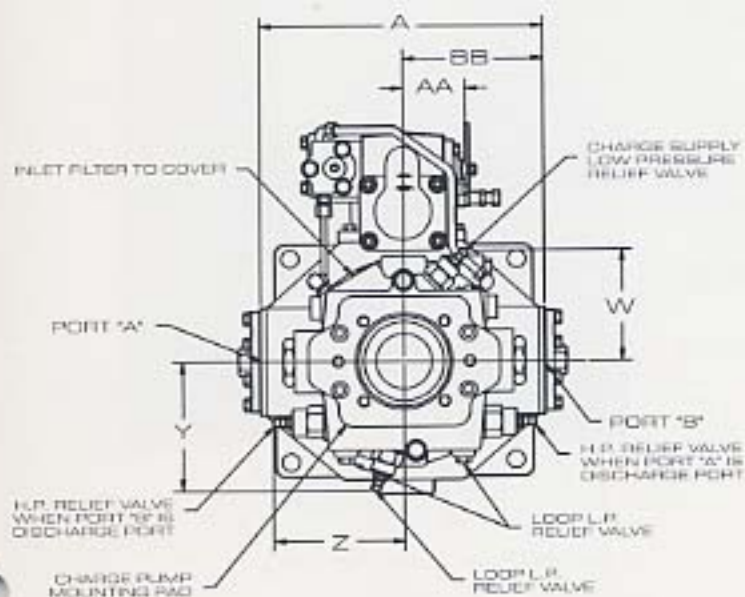
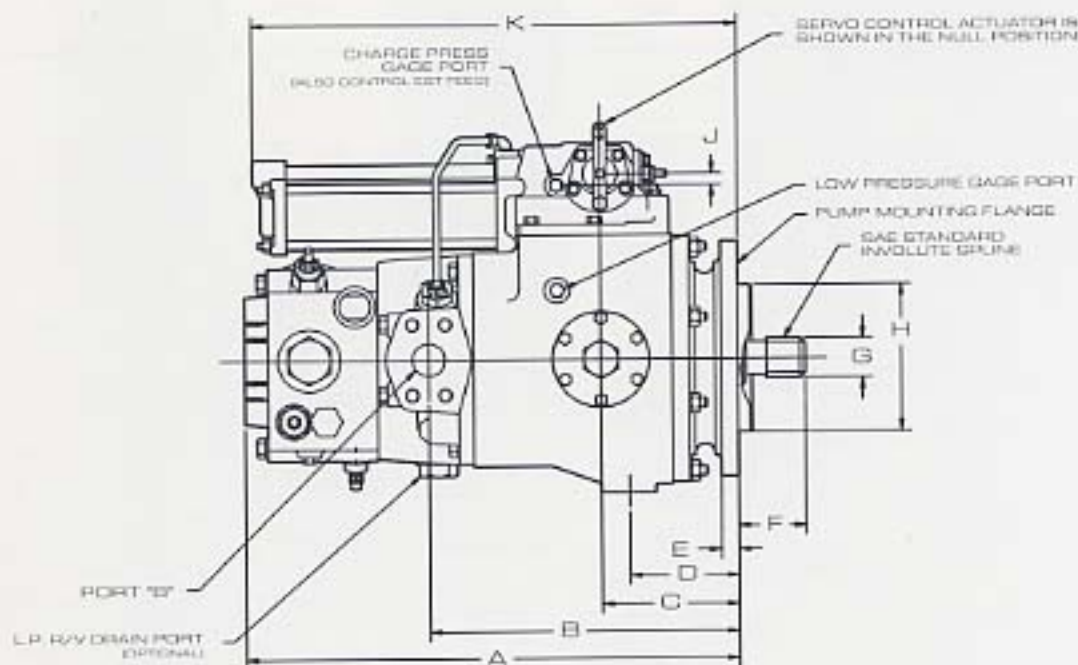
INSTALLATION DATA

MODEL NUMBER	35	48	60	90	120	210
A	14.656	14.656	14.656	18.563	21.313	24.313
B	9.625	9.625	9.625	13.016	13.531	16.438
C	4.188	4.188	4.188	6.469	5.984	7.250
D	3.313	3.313	3.313	5.250	4.766	6.063
E	.688	.688	.688	.750	.750	1.250
F	.500	.500	.500	.500	.625	.625
G	1.750	1.750	1.750	1.750	1.750	2.000
H	6.000	6.000	6.000	6.000	6.500	7.000
J	.500	.500	.500	.500	.500	.500
K	14.000	14.000	14.000	21.578	21.078	22.344
M	8.000	8.000	8.000	8.500	10.375	11.719
N	8.031	8.031	8.031	10.000	10.000	11.125
P	3.875	3.875	3.875	3.875	3.875	3.875
R	3.906	3.906	3.906	3.906	3.906	3.906
T	1.625	1.625	1.625	2.000	2.000	2.000
W	3.000	3.000	3.000	3.000	4.062	4.062
X	7.750	7.750	7.750	10.000	11.125	14.563
Y	4.969	4.969	4.969	5.875	5.313	5.313
Z	4.313	4.313	4.313	4.313	5.531	5.531
AA	2.313	2.313	2.313	2.313	2.313	2.313
BB	3.875	3.875	3.875	5.000	5.563	7.281
CC	6.359	6.359	6.359	6.359	8.844	9.750
Thread Size	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8

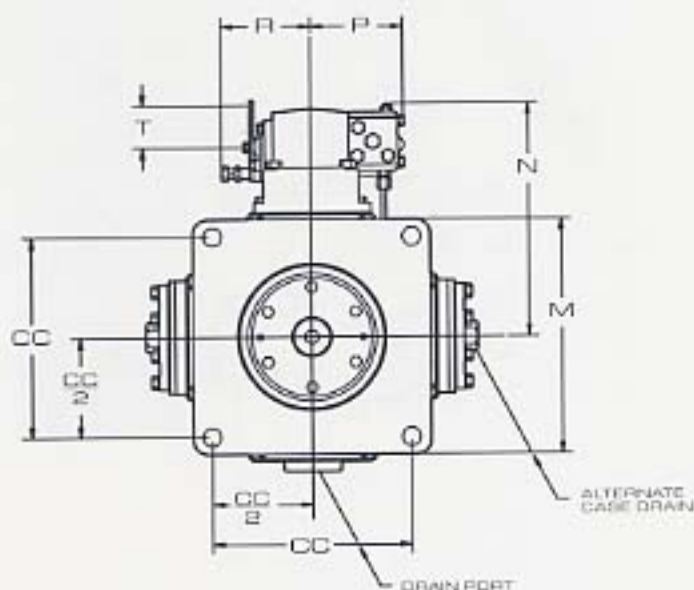
PUMPVAL



DIMENSIONS *



LEFT



RIGHT

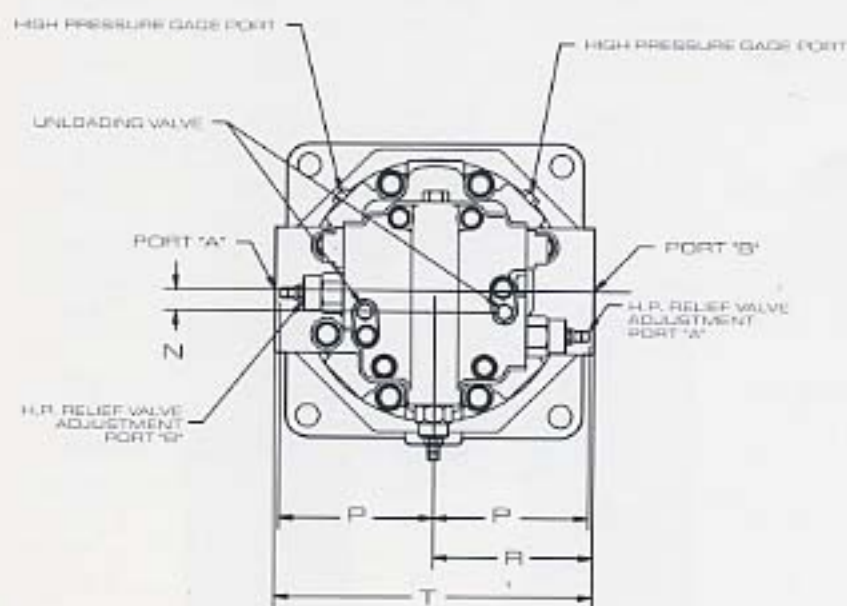
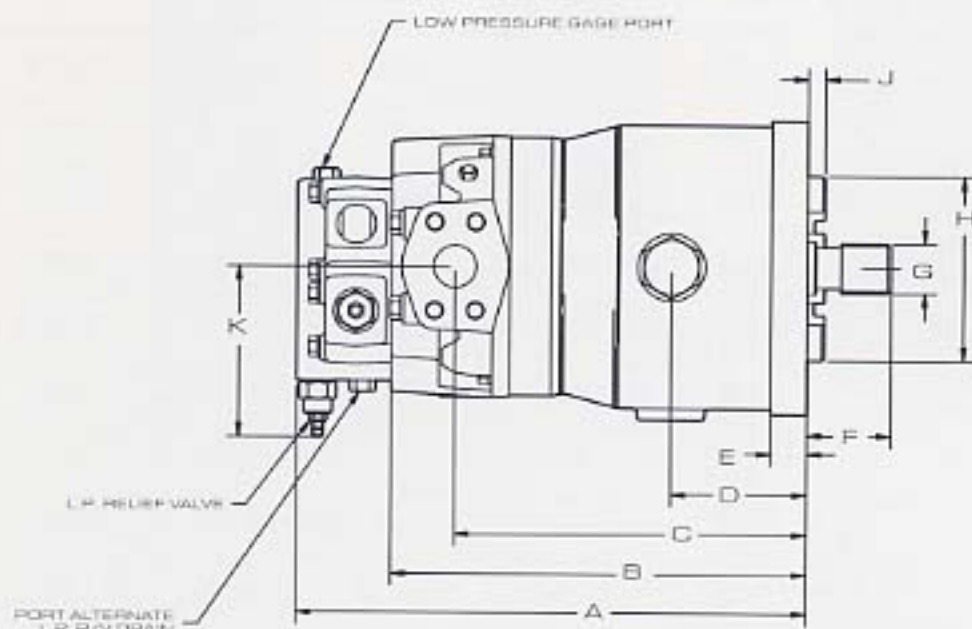
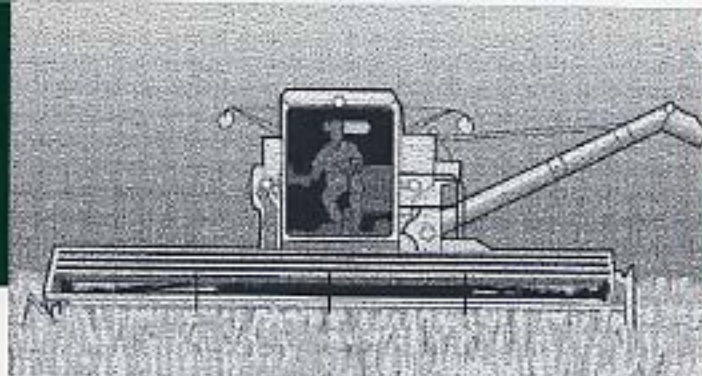
*all measurements in inches

INSTALLATION DATA

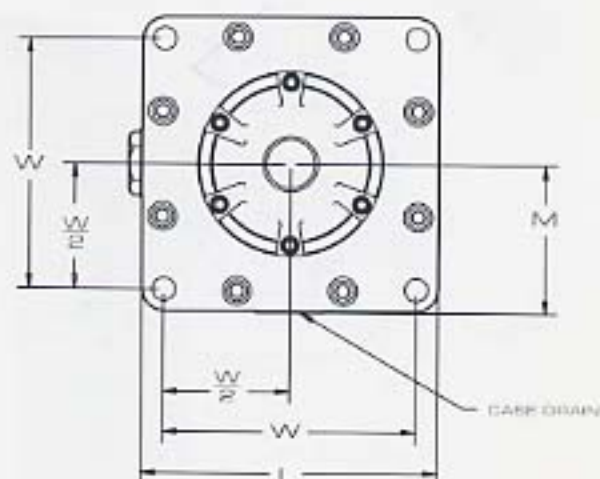
MODEL NUMBER ▶	48	60	90	120	210
A	13.688	13.688	15.656	17.938	21.094
B	10.469	10.469	13.688	17.062	20.219
C	9.062	9.062	11.656	12.344	15.656
D	3.344	3.344	4.438	4.750	6.062
E	.688	.688	.750	1.250	1.250
F	.313	.313	.891	.875	1.125
G	1.750	1.750	1.750	1.750	2.000
H	6.000	6.000	6.000	6.500	7.000
J	.500	.500	.500	.625	.625
K	4.188	4.188	4.938	5.391	
L	8.000	8.000	8.875	10.375	
M	4.000	4.000	4.438	5.188	
N	.469	.469	.969	.750	
P	4.531	4.531	4.750	5.406	
R	3.875	3.875	5.000	5.563	
T	7.750	7.750	10.000	11.125	
W	6.359	6.359	6.359	8.844	9.750
Thread Size	1 1/8	1 1/8	1 1/8	1 1/8	1 1/2

FIXED MOTOR

DIMENSIONS *



LEFT



RIGHT

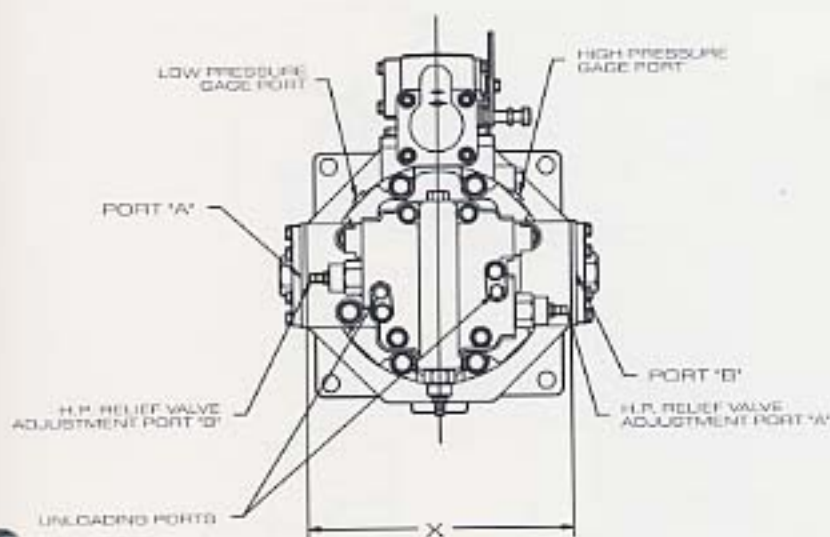
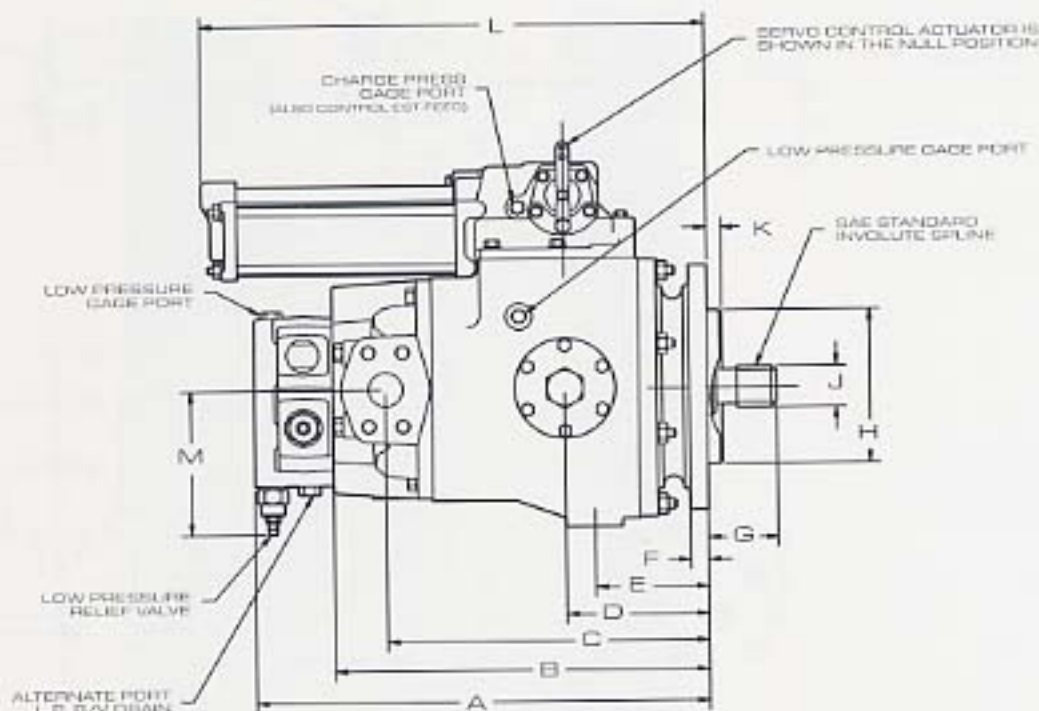
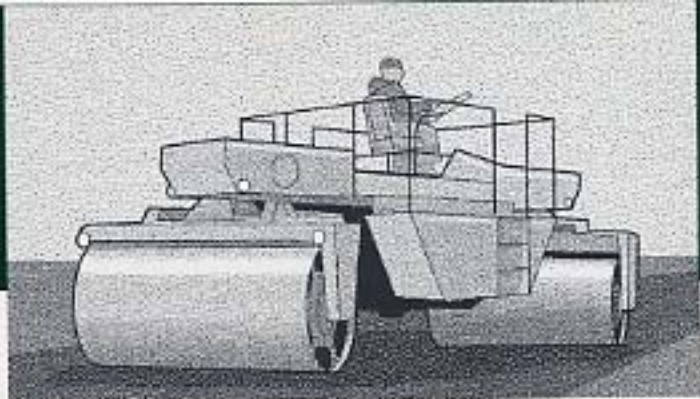
*all measurements in inches

INSTALLATION DATA

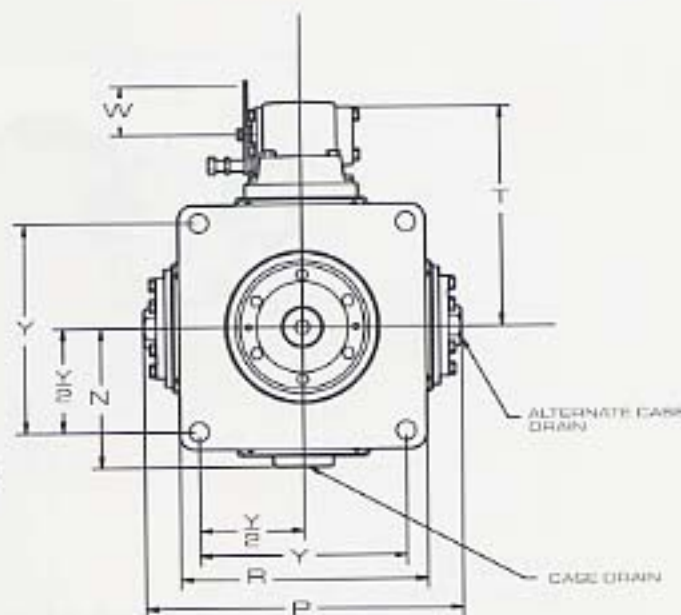
MODEL NUMBER	35	48	60	90	120	210
A	14.250	14.250	14.250	17.000	19.125	21.703
B	11.844	11.844	11.844	16.219	16.281	19.016
C	9.625	9.625	9.625	13.016	13.531	16.422
D	4.188	4.188	4.188	6.484	5.984	7.250
E	3.313	3.313	3.313	5.250	4.766	6.063
F	.688	.688	.688	.750	.750	1.000
G	.875	.875	.875	.875	.875	1.125
H	6.000	6.000	6.000	6.000	6.500	7.000
J	1.750	1.750	1.750	1.750	1.750	2.000
K	.500	.500	.500	.500	.625	.625
L	14.000	14.000	14.000	21.578	21.078	22.344
M	4.188	4.188	4.188	4.813	6.000	5.391
N	4.313	4.313	4.313	5.875	5.875	6.750
P	10.406	10.406	10.406	13.281	13.344	15.844
R	8.000	8.000	8.000	9.500	10.375	11.719
T	8.031	8.031	8.031	9.609	9.625	10.625
W	1.625	1.625	1.625	2.000	2.000	2.000
X	7.750	7.750	7.750	10.000	10.813	14.563
Y	6.359	6.359	6.359	6.359	8.844	9.750
Thread Size	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8

VARIABLE MOTOR

DIMENSIONS *



LEFT

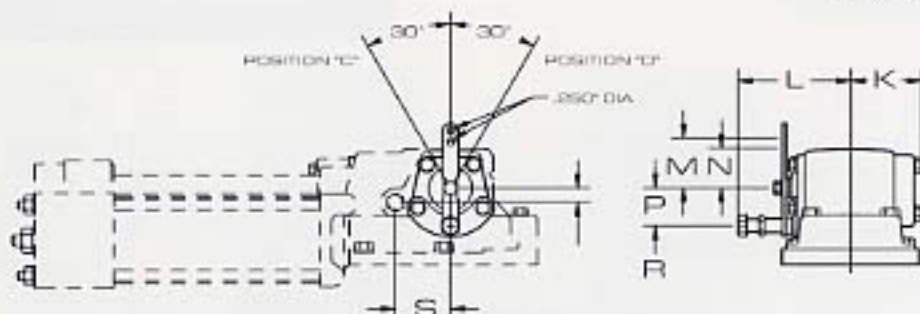


RIGHT

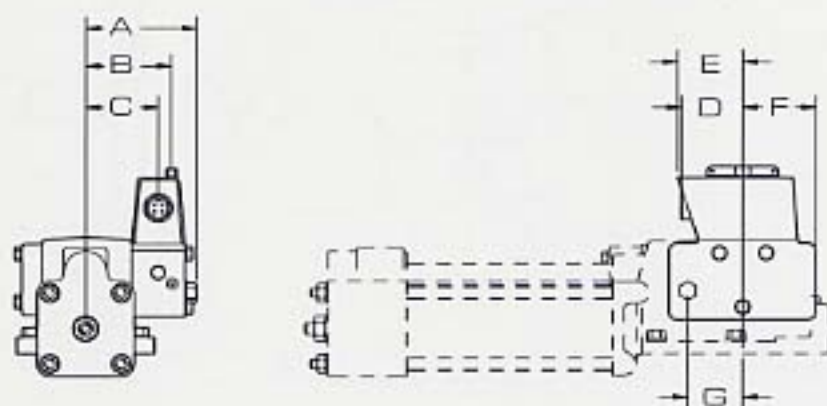
*all measurements in inches

DIMENSIONS

ADJUSTABLE
NEUTRAL
DETENT



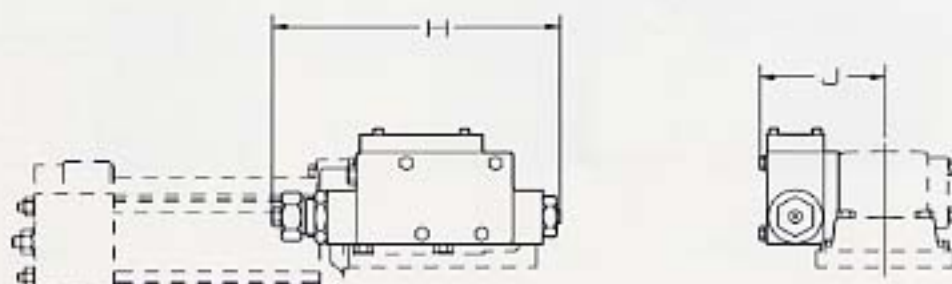
ELECTRO-
HYDRAULIC
ACTUATOR



SCISSORS
SPRING
DETENT



HYDRAULIC
ACTUATOR



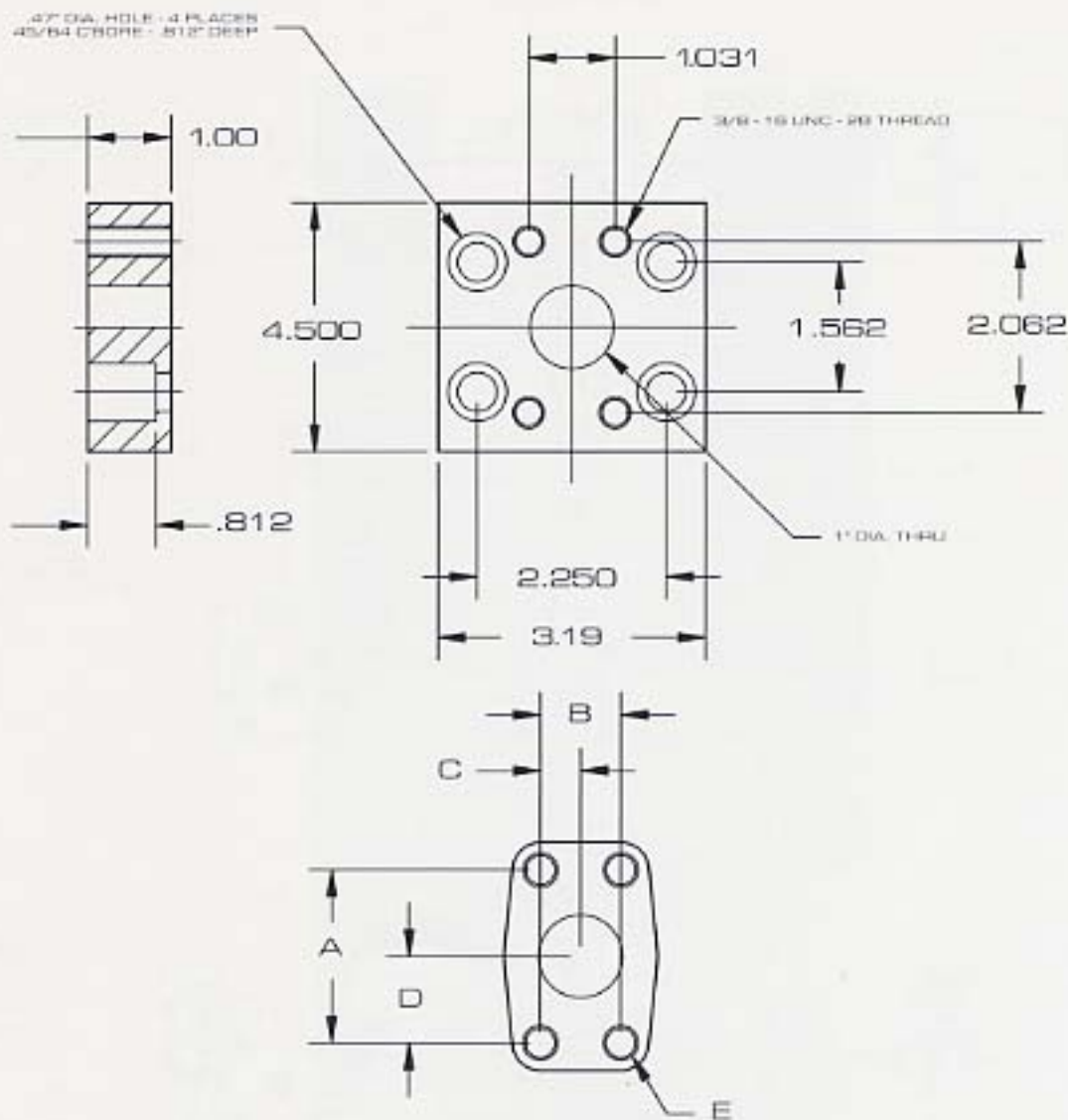
CONTROLS

INSTALLATION DATA

	ALL SIZES	
A	3.828	
B	2.969	
C	2.516	
D	2.141	
E	2.266	
F	2.531	
G	1.906	
H	7.516	
J	3.797	
K	2.453	
L	3.906	
M	2.000	
N	1.625	
P	1.313	
R	.500	
S	1.906	
T	.500	
W	1.906	
X	3.906	
Y	3.875	

*all measurements in inches

DIMENSIONS & INSTALLATION DATA *



	35	48	60	90	120	210
A	2.250	2.250	2.250	3.125	3.125	3.812
B	1.093	1.093	1.093	1.440	1.440	1.750
C	.550	.550	.550	.720	.720	.875
D	1.125	1.125	1.125	1.560	1.560	1.906
E	1/8 - 14	1/8 - 14	1/8 - 14	3/8 - 11	3/8 - 11	1/2 - 10

DYNAPOWER TERMINOLOGY

MODEL NUMBER

Cubic Inch per Revolution

Pump is standard variable pump with charge pump relief in cover which dumps into case.

Pumpval - comes standard with SAE "B" 2 bolt flange and splined coupling for charge pump (not included). Available in sizes 35, 48, 60, 90, & 120 and SAE "C" for 210. This cover option includes high pressure cross port relief valves, charge pump relief valve and hot oil shuttle with low pressure relief valve.

PRESSURE PORTS

Code 62 - Standard 6000 PSI ports.

Code 61 - Optional 3000 PSI ports.

Code 62 to Code 61 adapters let you change from our standard Code 62 to Code 61 at a fraction of the price for an optional Code 61 cover.

SHAFT

All pumps and pumpvals come in standard SAE configuration.

MOUNTING PAD

All pumps and pumpvals come in standard SAE 4 bolt configuration.

CAM STOP

Overcenter operation requires no cam stop. Cam stops are designed to work at center or above to limit the lowest amount of displacement to a pre-determined value. (Full Flow is 15°)

CONTROL

Adjustable Detent - Our standard, has an adjustable friction lever with a neutral catch.

Scissor Spring - Returns to neutral if not held in stroke.

Electro-Hydraulic Actuator - Provides linear flow rates proportional to input signal of + 0 to 100 MADC.

Hydraulic Actuator - Provides flow rates proportional to input signal of 50-150 PSI.

Solenoid - 3 position flow setting with a complete range of both AC and DC current.

Proportional Solenoid - Provides linear flow rates proportional to current pulse width.

CONTROL ORIFICE

Used to control the speed of reaction to a command. The smaller the orifice, the slower the reaction. Also available with internal feed plugged to allow control of volume, pressure and filtration to control.

PRESSURE REGULATION

Low Pressure servo (our standard) so called because it utilizes charge pressure to change control swash plate position.

Pressure Compensator, lets pump return toward neutral when pressure hits a pre-set level.

Horsepower Limiter - Senses a combination swash plate angle and pressure so pump does not exceed a pre-set input torque value. This is available in 16 torque limit ranges for each frame size.

TORQUE LIMITS

If Horsepower Limiter control is desired, calculate which range your application needs as follows: $HP \times RPM \div 5252 = \text{Torque Limit } \#ft$

PRESSURE SETTINGS

If a pressure compensator or Horse Power Limiter is selected, a pressure setting is available on the pumpval crossport relief valves, motor relief valves and also on the control.

The control setting will be the desired working pressure, and relief valves should be set 500 PSI above this pressure to eliminate unwanted heat generation.

SPECIAL HARDWARE

Please consult with factory Application Engineering to determine the availability of any specific needs not fulfilled with our catalog choices.

Displacement (cu. in./rev)

3.5, 4.8, 6.0, 9.0, 12.0, 21.0

Cover

A - Pump
B - Pumpval

Pressure Ports (SAE)

1 - Code 62 - Standard
2 - Code 61 - Optional
3 - Code 62 with Code 61 Adapters - Optional

Shaft	3.5	4.8	6.0	9.0	12.0	21.0
1 - SAE C Splined	Opt.	Opt.	Opt.			
2 - SAE D Splined	Std.	Std.	Std.	Std.		
3 - SAE E Splined					Std.	
4 - SAE F Splined						Std.
5 - Straight Keyed	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
6 - Tapered	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.

Mounting Pad	3.5	4.8	6.0	9.0	12.0	21.0
1 - SAE C	Opt.	Opt.	Opt.			
2 - SAE D	Std.	Std.	Std.	Std.		
3 - SAE E					Std.	
4 - SAE F						Std.

Cam Stop

A - None (Std.)
B - 0 Degree
C - 5 Degree
D - 7 Degree
E - 10 Degree

Control

1 - Adjustable Detent (Std.)
2 - Scissor Spring
3 - Hydraulic Actuator
4 - Electro Hydraulic (Actuator)
5 - Solenoid
6 - Proportional Solenoid

PUMP/PUMPVAL

ORDER SHEET

Pressure Setting (in P.S.I.)

Pumpval
Control

Torque Limits (Ft. Lbs.)

OPTIONAL

Per Unit Size

3.5	4.8	6.0	9.0	12.0	21.0
CIR	CIR	CIR	CIR	CIR	CIR
33	45	56	84	112	196
35	45	60	90	120	210
38	52	65	97	129	226
44	60	75	113	150	263
49	67	84	126	168	293
53	72	90	135	180	314
57	78	97	145	194	339
66	90	113	169	225	394
82	112	140	210	280	490
88	120	150	225	300	525
94	129	161	242	323	565
110	150	188	281	375	656
123	168	210	315	420	735
131	180	225	338	450	788
141	194	242	363	484	847
164	225	281	422	563	985

Pressure Regulation

- 1 - Low Pressure Servo (Std.)
- 2 - Pressure Compensator
- 3 - Horsepower Limiter

Control Orifice

- A - No Orifice (Std.) Internal Feed
- B - .062 Internal Feed
- C - .052 Internal Feed
- D - .042 Internal Feed
- E - No Orifice External Feed
- F - .062 External Feed
- G - .052 External Feed
- H - .042 External Feed

Displacement

4.8, 6.0, 9.0, 12.0, 21.0

Type

MF - Fixed Displacement

MV - Variable Displacement

Pressure Ports (SAE)

1 - Code 62 - Standard

2 - Code 61 - Optional

Shaft

	4.8	6.0	9.0	12.0	21.0
1 - SAE C Splined	Opt.	Opt.			
2 - SAE D Splined	Std.	Std.	Std.		
3 - SAE E Splined				Std.	
4 - SAE F Splined					Std.
5 - Tapered	Opt.	Opt.	Opt.	Opt.	Opt.
6 - 23 Tooth 16/32 Pitch	Opt.	Opt.			

Mounting Pad

	4.8	6.0	9.0	12.0	21.0
1 - SAE C	Opt.	Opt.			
2 - SAE D	Std.	Std.	Std.		
3 - SAE E				Std.	
4 - SAE F					Std.

FIXED & VARIABLE MOTOR ORDER SHEET

--	--	--	--	--

Control

- A - Adjustable Detent - Std.
- B - Two Speed
- C - Pressure Compensated

Orifice

- 1 - None - Internal Feed - Std.
- 2 - .062 - Internal Feed
- 3 - .052 - Internal Feed
- 4 - .042 - Internal Feed
- 5 - None - External Feed
- 6 - .062 - External Feed
- 7 - .052 - External Feed
- 8 - .042 - External Feed

Pressure Setting

Relief Valve _____
Control _____

Minimum Stop

- 1 - None or Fixed Motor
- 2 - 0 Degree
- 3 - 5 Degree
- 4 - 7 Degree
- 5 - 10 Degree

Cover

- 1 - High pressure relief with
spring centered shuttle - Std.
- 2 - Plain Cover - Opt.

Special Hardware _____

DYNAPOWER START-PAC

From the cold starts in Siberian power plants—
to the extreme heat of Saudi's pipelines,

DYNAPOWER'S START-PAC "powers up" over
5,000 turbines worldwide. More effective than air or
electric starting systems, **START-PAC** delivers
starting power for a wide range of high torque, high
speed applications. And because the hydraulic motor

STARTING WITHOUT END

bolts onto the turbine, one supplier is all you need for
both the pump and motor. It's also smaller, lighter and
simple to install. So not only is shipping more
economical, but **START-PAC** is an added advantage
where floor space is a consideration. **START-PAC**
systems have been starting turbines since they
began. In fact, many original **START-PAC** systems
are still giving their turbines a fresh start—
even after 30 years.



DYNAPOWER

DYNAPOWER has built its reputation on products that perform in the most demanding conditions. Behind it all is the perfect combination of an experienced workforce, engineering savvy, superior custom capabilities and worldwide product support you can count on for just about any unique specification you require.

DYNAPOWER's commitment to product, customer satisfaction, price and service, gives you a top-rated supplier relied upon by the most respected manufacturers in the world.

POWER BEYOND RELIABILITY

When it comes to supplying product ... providing solutions ... exceeding the needs of a demanding, high tech world, **DYNAPOWER** has what it takes to give you the power to succeed.