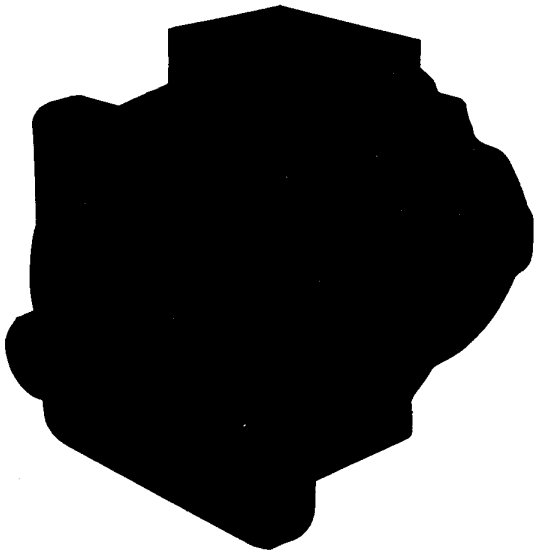
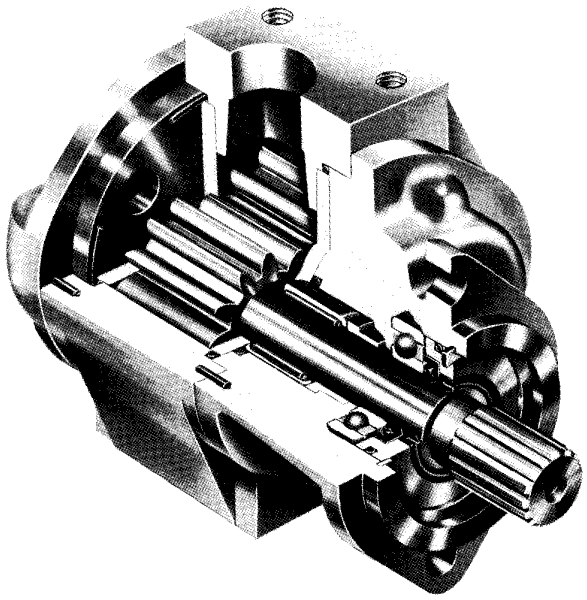
Gear Pumps and Motors



0100

HYDRECO
HAMWORTHY



OPERATION NOTES

All components are designed to operate within the limits of performance of an Average Production Unit as stated herein.

For operations outside the Standard Specification it is essential that prior approval be obtained from HYDRECO HAMWORTHY

The Company's Terms of Warranty are specified on our written quotations, and are also available separately on request.

DIRT, METAL PARTICLES AND OTHER CONTAMINANTS ARE HARMFUL TO ALL PRECISION BUILT HYDRAULIC COMPONENTS.

ALWAYS ENSURE THAT THE SYSTEM IS INITIALLY CLEAN INTERNALLY AND THAT SUITABLY RATED 10μ FILTERS ARE CORRECTLY INSTALLED.

Before pressurising the Pump, Motor or Control Valve, confirm that :

1. ALL PIPES and FITTINGS are PROPERLY INSTALLED and CONNECTED.
2. The SYSTEM is FILLED WITH FLUID of the CORRECT SPECIFICATION.

Servicing Instructions and Spare Parts Sheets for all Hydreco Hamworthy units are available from our Service Department

General Data 2100

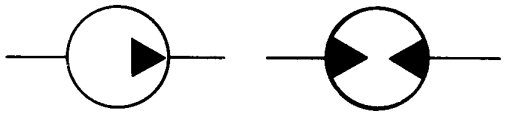
INTRODUCTION

The information contained in this leaflet covers all 2100 series Gear Pumps and Motors, forming part of the wide range of Hydraulic Pumps, Motors, Control and Auxiliary Valves produced by Hydreco Hamworthy.

Our extensive coverage is specifically designed to provide manufacturers of construction equipment and mechanical handling plant with the best possible combination of pumps, motors and control equipment at competitive prices.

The high rate of technical innovation demanded by equipment manufacturers constantly adds new features to our products, usually as the result of intensive practical development undertaken to improve the operation or economics of a specific type of machine. Such features cannot always be covered in a publication of this nature but our application engineers are always ready to help in finding a practical solution.

Hydraulically, your business is our business and we believe our company to be uniquely qualified to assist you to get the best out of your machines. This professional technical service is freely at your disposal.



Our fully equipped plant, backed by our own first-class foundry, provides us with the most up-to-date production facilities in Europe.

Manufacturing plants in the U.S.A., Australia and Japan, supported by qualified distributors or subsidiary companies in the most important industrial markets ensure that parts and service are available internationally.

GENERAL DATA

Drive Shafts	See Page 5
Shaft Seal Designs	See Page 5
Mounting Flanges	See Page 6
Port Connections	See Page 7
Rotation – Pumps	Either direction (not reversible)
Rotation – Motors	Either direction (reversible)
Speed Range – Pumps	500 – 2700 u/min
Speed Range – Motors	500 – 3000 u/min
Dimensions	See Page 5
Weight	See Page 5
Mounting Position	No attitude limitation
Ambient Temperature Range	$-20^{o}C$ to $+60^{o}C$.
Hydraulic Fluid Temperature Range	$-20^{o}C$ to $+80^{o}C$.
Maximum viscosity for cold start	850 cSt
For normal working conditions	250 cSt
Minimal permissible viscosity	10 cSt

For optimum 'life' and efficiency, fluid viscosity should be in the range of 15 to 25 cSt during normal working conditions.

Performance Data Overall Efficiencies Pressure/Speed Limitations	See Pages 9 to 14

OPERATING PRESSURE – PUMPS

Inlet Pressure Range	Pe min. = see data sheet 4 Pe max. = 1 bar (0.1 MPa)
Outlet Pressure Maximum –	
Units 2107, 2110, 2113	Pd = 170 bar (17 MPa)
Units 2116, 2120	Pd = 160 bar (16 MPa)
Units 2125, 2227	Pd = 140 bar (14 MPa)

OPERATING PRESSURE – MOTORS

Operating Pressure Maximum –	
Units 2107, 2110, 2113	Pd = 170 bar (17 MPa)
Units 2116, 2120	Pd = 160 bar (16 MPa)
Units 2125, 2227	Pd = 140 bar (14 MPa)
Drain Line Pressure	2 bar (0.2 MPa)

THEORETICAL DISPLACEMENT

UNIT	cm^3/Rev.
2107	31.6
2110	44
2113	57.4
2116	70.5
2120	88.2
2125	110.6
2227	132.4

Units 2107 and 2227 are of limited application. For details refer to Hydreco Hamworthy.

ALL DATA IS OBTAINED FROM AVERAGE PERFORMANCE OF REGULAR PRODUCTION UNITS USING GOOD QUALITY S.A.E.10 MINERAL HYDRAULIC OIL AT 49 DEG. C. GENERALLY CORRESPONDING TO A VISCOSITY OF 21 CENTISTOKES.

Critical Dimensions of all Shafts, Flanges and Ports conform to S.A.E. Standards where these are specified.

General Data

2100

MODEL NUMBER COMPOSITION

P 2 A 21 10 B 3 B2 C*

P – Pump
M – Motor

Design Level

Shaft Sealing
Types

Unit Series

Gear Width
Sizes 07, 10, 13, 16, 20, 25, 27

Shaft Extension
Types B, C SAE Splined
G Parallel with key
L Tapered

Mounting Flanges
Types 2, 3, 4, 5 and 8

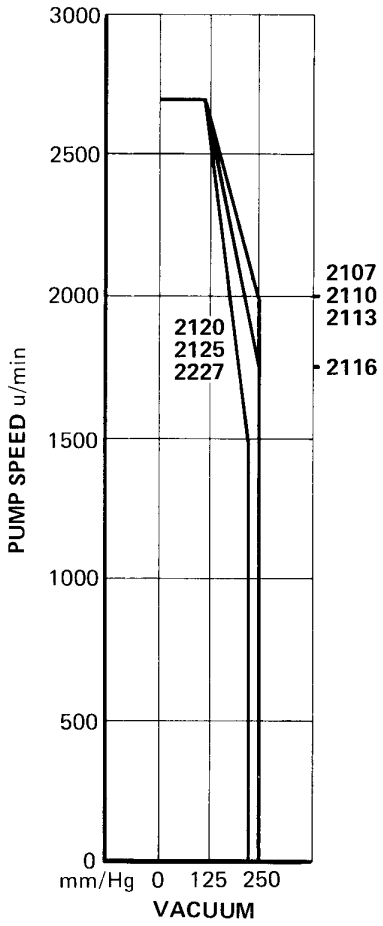
Ports
Types B2, B26 (Pumps)
B1, B3, B25, B29 (Motors)

Rotation (viewed on Shaft End)
Pumps: C (clockwise), or A (anticlockwise). Not reversible
Motors: D (dual). Reversible

* Additional code letters or numbers may be added to the model number for special NON-STANDARD designs.

FOR COMPLETE DETAILS REFER TO INDIVIDUAL DATA SHEETS

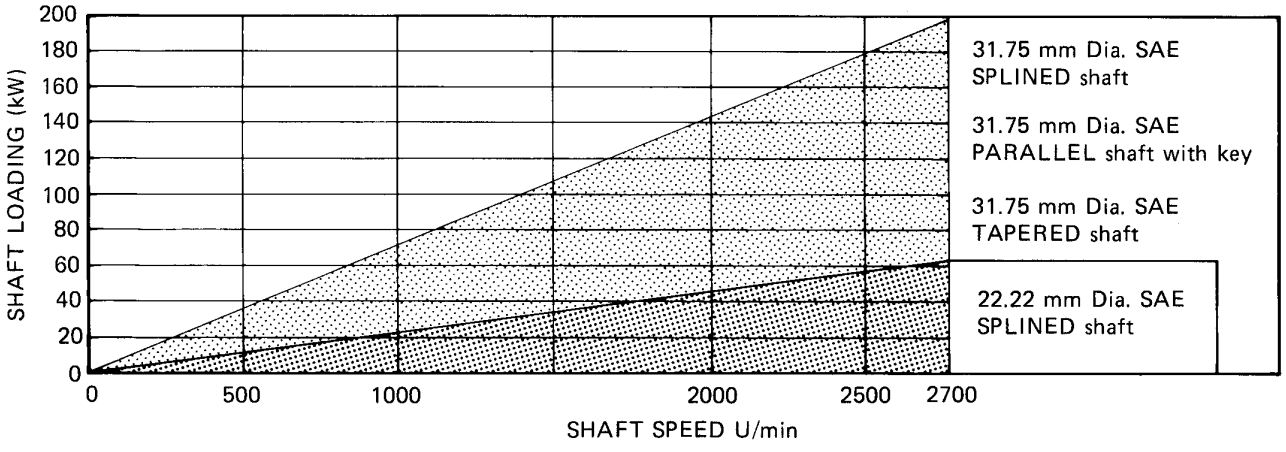
PERMISSIBLE INLET CONDITIONS



Pumps with Standard Size ports will operate without detriment when the inlet conditions are within the areas shown on the chart. For operation outside these areas, consult Hydreco Hamworthy.

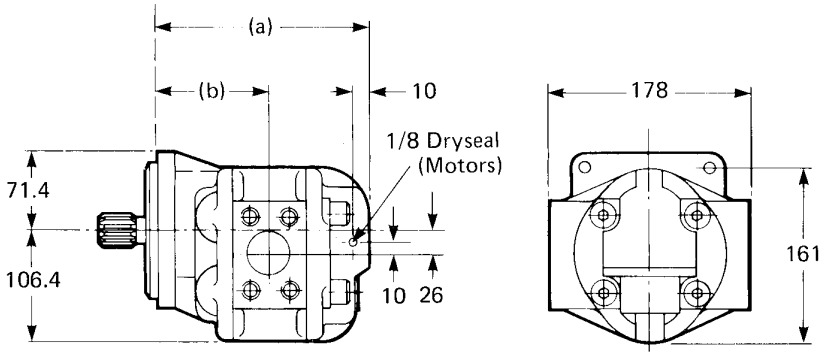
DRIVE SHAFT POWER LIMITATIONS

The shafts listed below are recommended for use where the horsepower to be transmitted at any given speed lies within the shaded areas of the accompanying graph, – for requirements outside these limitations refer to Hydreco Hamworthy.



Installation Data 2100

GENERAL DIMENSIONS (mm)



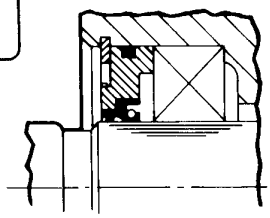
DIMENSIONS (a) & (b) CHANGE WITH ADAPTOR & HOUSING

Unit size	(a)		(b)		Weight kg
	A/B/C	E Design	A/B/C	E Design	
2107	184	247	98	162	17.2
2110					18.2
2113	191	254	102	165	19
2116	200	263	107	170	20.5
2120	210	255	111	174	21.5
2125	222	280	112	181	24
2227	227	290	120	178	25.9

C of G position approximately 50% of Dim. A

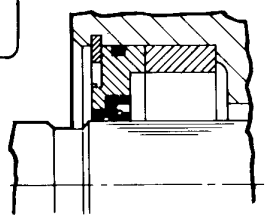
SHAFT SEAL DESIGNS

A



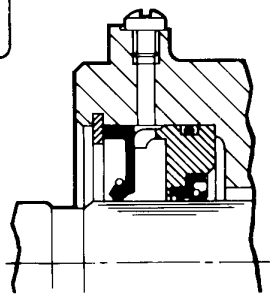
Suitable for drives with limited axial and radial load.

B



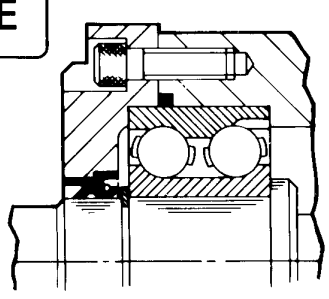
STANDARD
Suitable for drives with no radial or axial load.

C



Suitable for drives with no radial or axial load where tell-tale external bleed is necessary.

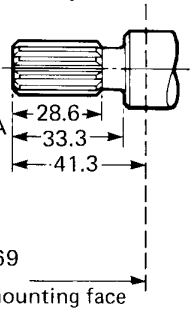
E



Suitable for drives imposing heavy axial load and some radial load onto drive shaft.

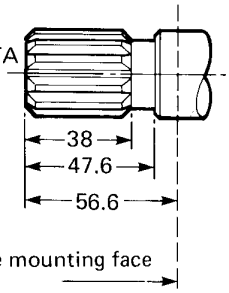
DRIVE SHAFTS

B **22.22 Dia. SAE 13 Tooth Involute Spline**



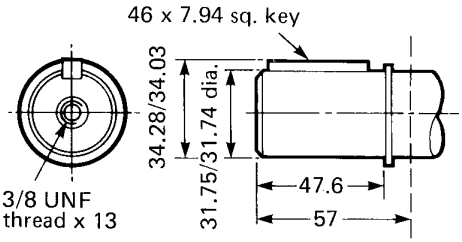
For Designs A & C only
INVOLUTE SPLINE DATA
Side Fit – Flat Root
Diametral Pitch 16/32
Pressure Angle 30°
Number of Teeth 13
Major Diameter 21.79/21.69
Standard flange mounting face

C **31.75 Dia. SAE 14 Tooth Involute Spline**



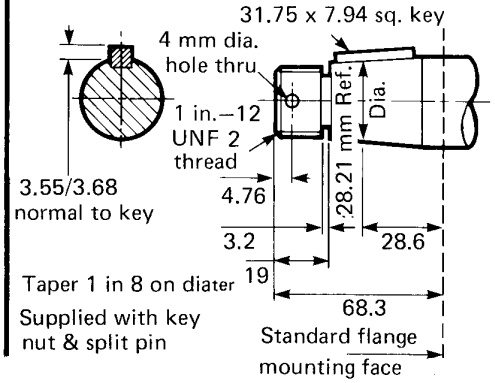
INVOLUTE SPLINE DATA
Side Fit – Flat Root
Diametral Pitch 12/24
Pressure Angle 30°
Number of Teeth 14
Major Diameter 31.2/31.12
Standard flange mounting face

G **31.75 Dia. SAE Parallel Shaft with Key**



Supplied with key
Standard flange mounting face

L **31.75 Dia. Taper Shaft with Key, Nut & Split Pin**



Taper 1 in 8 on diater
Supplied with key nut & split pin
Standard flange mounting face

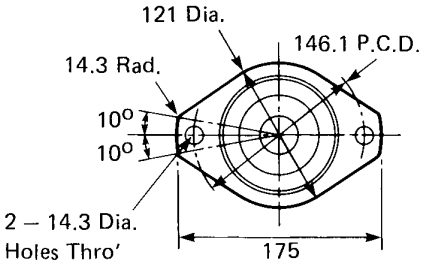
Installation Data 2100

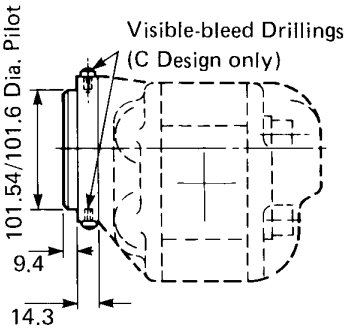
FLANGES

Dimensions in millimetres

2

SAE B
2 Hole
Available for
Designs A, B & C

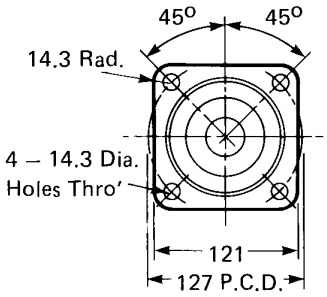


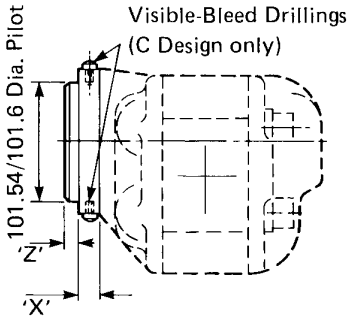


3

SAE B
4 Hole
Available for
Designs A, B, C & E

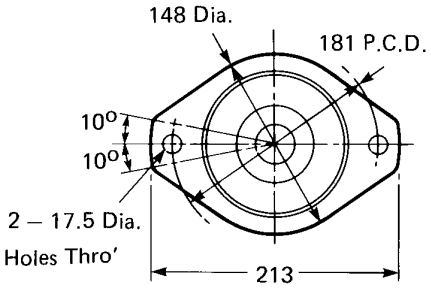
DESIGNS	A/B/C	E
DIM 'X'	14.3	17.5
DIM 'Z'	9.4	6.4

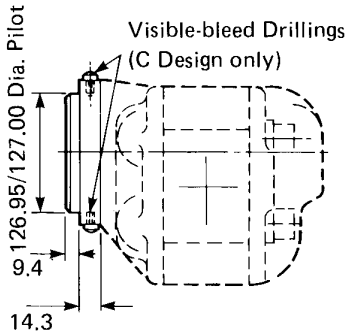




4

SAE C
2 Hole
Available for
Designs A, B & C

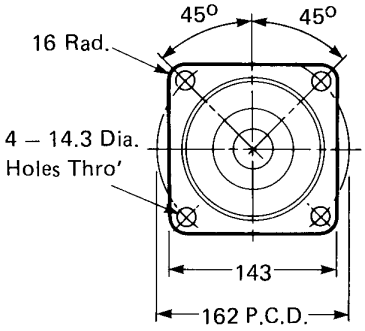


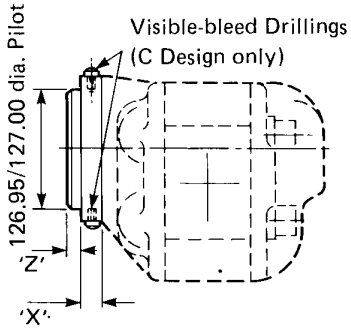


5

SAE C
4 Hole
Available for
Designs A, B, C & E

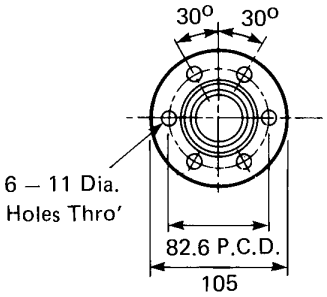
DESIGNS	A/B/C	E
DIM 'X'	14.3	17.5
DIM 'Z'	9.4	6.35

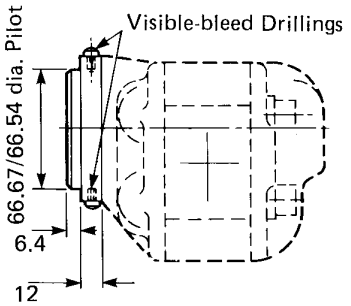




8

6 Hole
Round Flange
6.35 Pilot
Available for C Design only





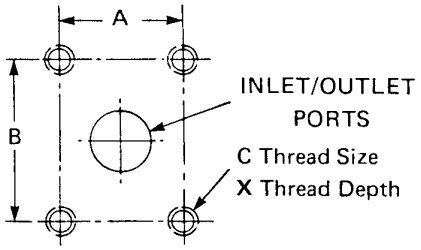
Visible-bleed Drillings (C Design only)
Adaptors for C design pumps will have a plug fitted in BOTH bleed drillings when initially assembled.
The UPPERMOST plug should be removed when a C design pump is installed.

PORTS (PUMPS)

Dimensions in millimetres

B2 Unequal SAE Flanged Ports (UNC Tapping)

B26 Unequal SAE Flanged Ports (METRIC Tapping)



PUMP SIZE	INLET					OUTLET				
	DIA.	A	B	C (B2)	C (B26)	DIA.	A	B	C (B2)	C (B26)
2107 2110 2113	31.75	30.2	58.7	7/16 – 14 UNC x 19	M10 x 1.75 x 16	25.4	26.2	52.3	3/8 – 16 UNC x 16	M10 x 1.75 x 16
2116 2120	38.1	35.7	69.8	1/2 – 13 UNC x 22.3	M12 x 1.75 x 17.7	31.75	30.1	58.7	7/16 – 14 UNC x 19	
2125	50.8	42.8	77.8			38.0	35.7	69.9	1/2 – 13 UNC x 22.3	M12 x 1.75 x 17.7
2227	63.5	50.8	88.9							

PORTS (MOTORS)

B1 Equal SAE Flanged Ports

B25 As B1 with METRIC Fixings

B3 Equal Enlarged SAE Flanged Ports

B29 As B3 with METRIC Fixings

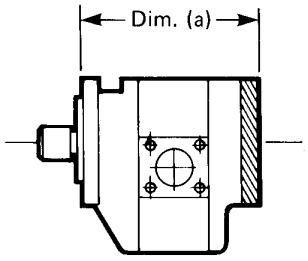
MOTOR SIZE	DIA.		A		B		C			
	B1/B25	B3/B29	B1/B25	B3/B29	B1/B25	B3/B29	B1	B25	B3	B29
2107	25.4	25.4	26.2	26.2	52.4	52.4	3/8 – 16 UNC x 16	M10 x 1.5 x 16	3/8 – 16 UNC x 16	M10 x 1.5 x 16
2110										
2113		31.7		30.2		58.7			7/16 – 14 UNC x 19	
2116	31.75	38.1	30.2	35.7	58.7	69.8	7/16 – 14 UNC x 19		1/2 – 13 UNC x 22	M12 x 1.75 x 27
2120										
2125	38.1	50.8	35.7	42.9	69.8	77.8	1/2 – 13 UNC x 22	M12 x 1.75 x 27		
2227										

Installation Data 2100

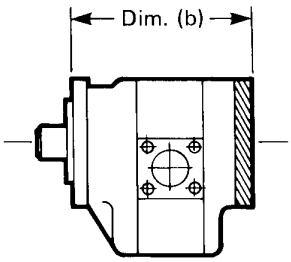
INSTALLATION DIMENSIONS – MULTIPLE UNITS

Dimensions in millimetres

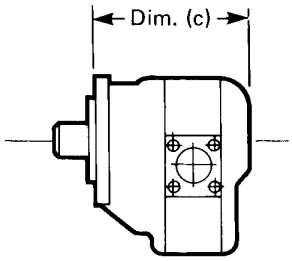
FRONT UNIT



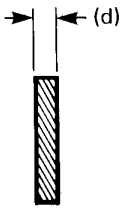
INTERMEDIATE UNIT



REAR UNIT



ADAPTOR PLATE



(for Separating Seals)

SEAL DESIGNS 'A', 'B' or 'C'												'E' DESIGN Front Units Only			
3100				2100				1600							
UNIT SIZE	FRONT (a)	INTER (b)	REAR (c)	UNIT SIZE	FRONT (a)	INTER (b)	REAR (c)	UNIT SIZE	FRONT (a)	INTER (b)	REAR (c)	UNIT SIZE	(a)	SIZE	(a)
3115	221	221	210	**2107**	185	185	184	**1604**	145	145	145	**3115**	255	2107	249
3117	227	227	216	**2110**				**1606**				**3117**	261	2110	
3120	234	234	222	**2113**	192	192	191	**1608**	149	149	149	**3120**		2113	255
3125	246	246	235	**2116**	202	202	200	**1610**	154	154	154	**3125**	280	2116	265
3130	259	259	248	**2120**	211	211	210	**1613**	162	162	162	**3130**	293	2120	274
3135	272	272	260	**2125**	224	224	222	**1617**	172	172	172	**3135**	306	2125	287
–	–	–	–	**2227**	229	229	227	**1623**	187	187	187	–	–	–	–
–	–	–	–	–	–	–	–	**For END PORTED Units add 11mm to dim^{n} (C)**				–	–	–	–

For FRONT or INTERMEDIATE units, dimension (d) is included in dimensions (a) and (b) in the table.

Where a 3100 SERIES unit has a 1900 or 2200 series unit in tandem, dimensions (a) or (b) in the table for 3100 series should be reduced by 4mm.

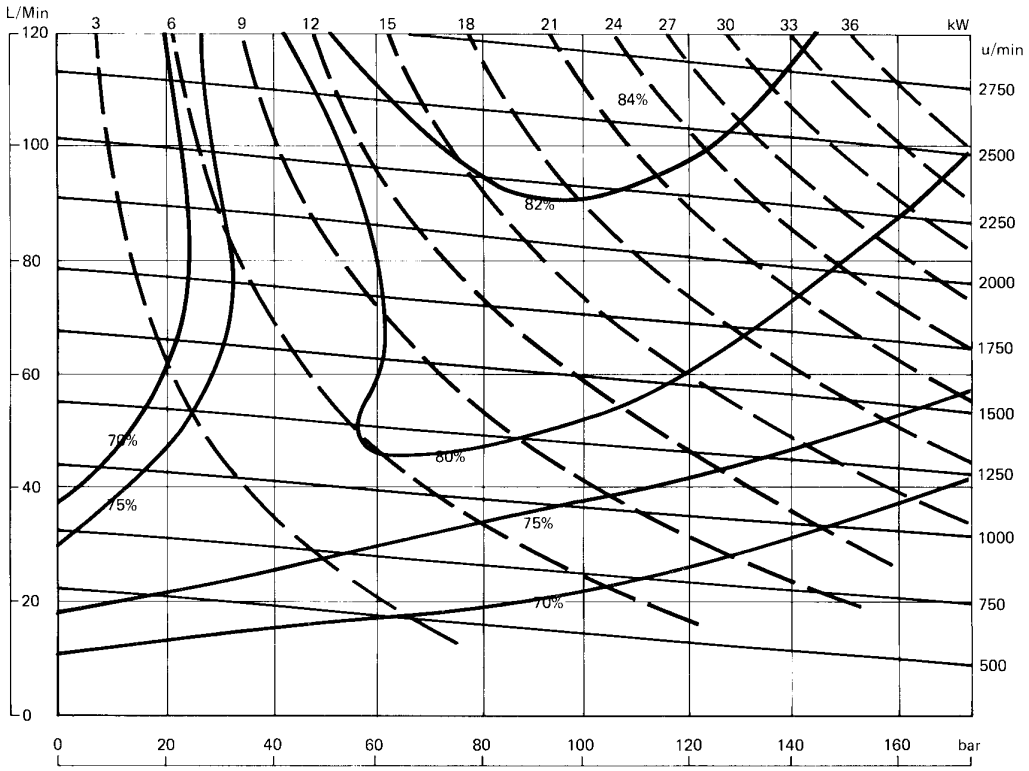
For 1600 Series units fitted in Tandem to 1900 or 2200 Series, dimension (c) in the table for 1600 Series should be reduced by 14mm.

For 2100 Series units fitted in Tandem to 2200 Series, dimension (c) in the table for 2100 Series should be reduced by 3mm.

Ensure that the correct (a) dimension is used with each Seal Design.
For dimensions not shown refer to the separate units section.
Total H.P. / SPEED requirements must be within the limits given in the SHAFT LOADING CHARTS (see page 4).
Smallest capacity pump units are normally mounted in REAR position only.
In multiple MOTOR assemblies each unit is normally of the same size and capacity.
For Variations of Design, Performance and Specification see the relevant Selection Data Sheets for each unit.

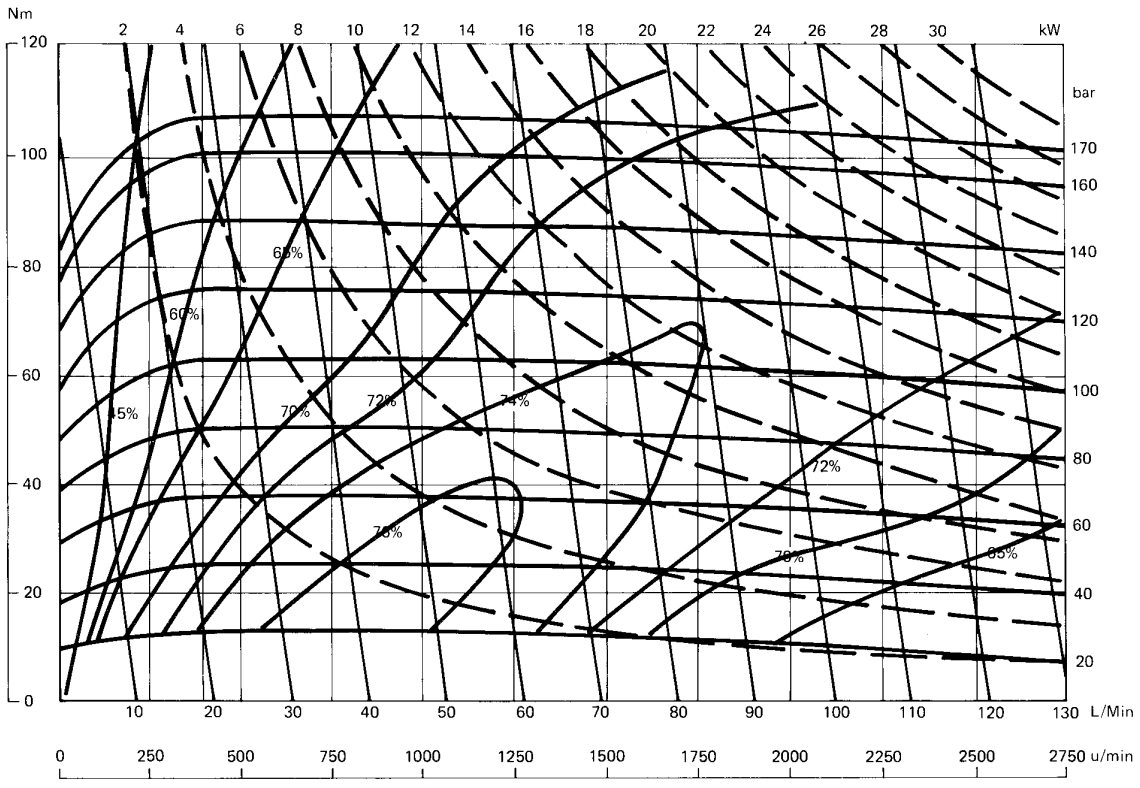
Performance Data 2100

2110 PUMP



Key : Flow ——— Power Absorption — — Overall Efficiency ———

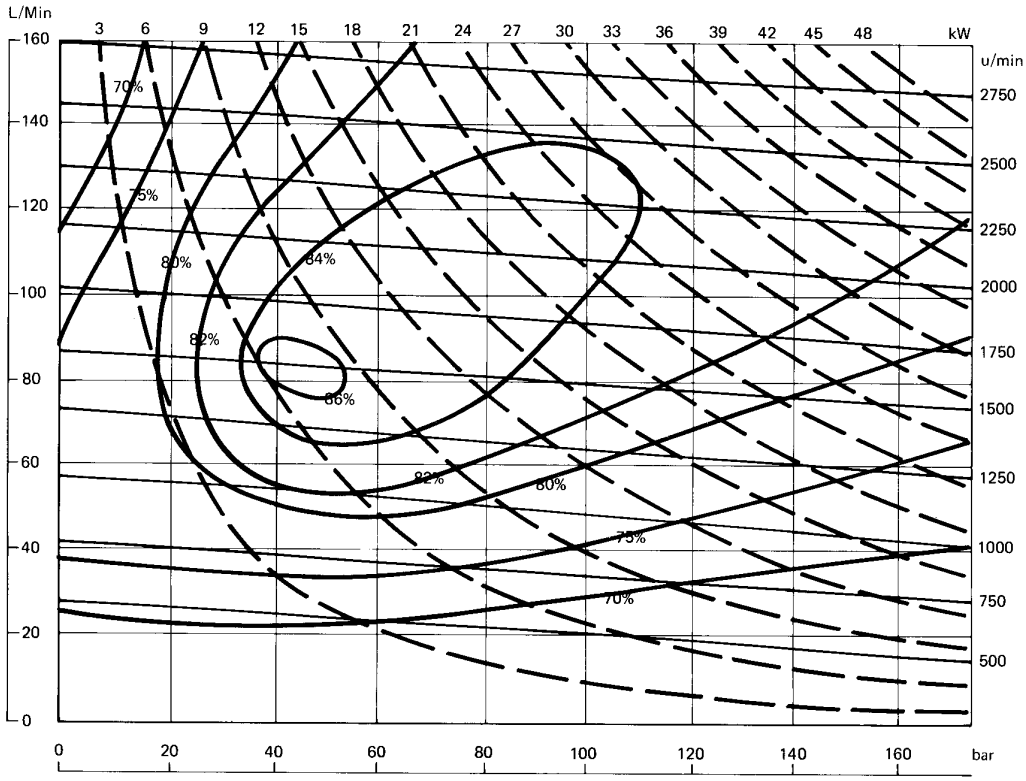
2110 MOTOR



Key : Pressure ——— Power — — Flow ——— Overall Efficiency ———

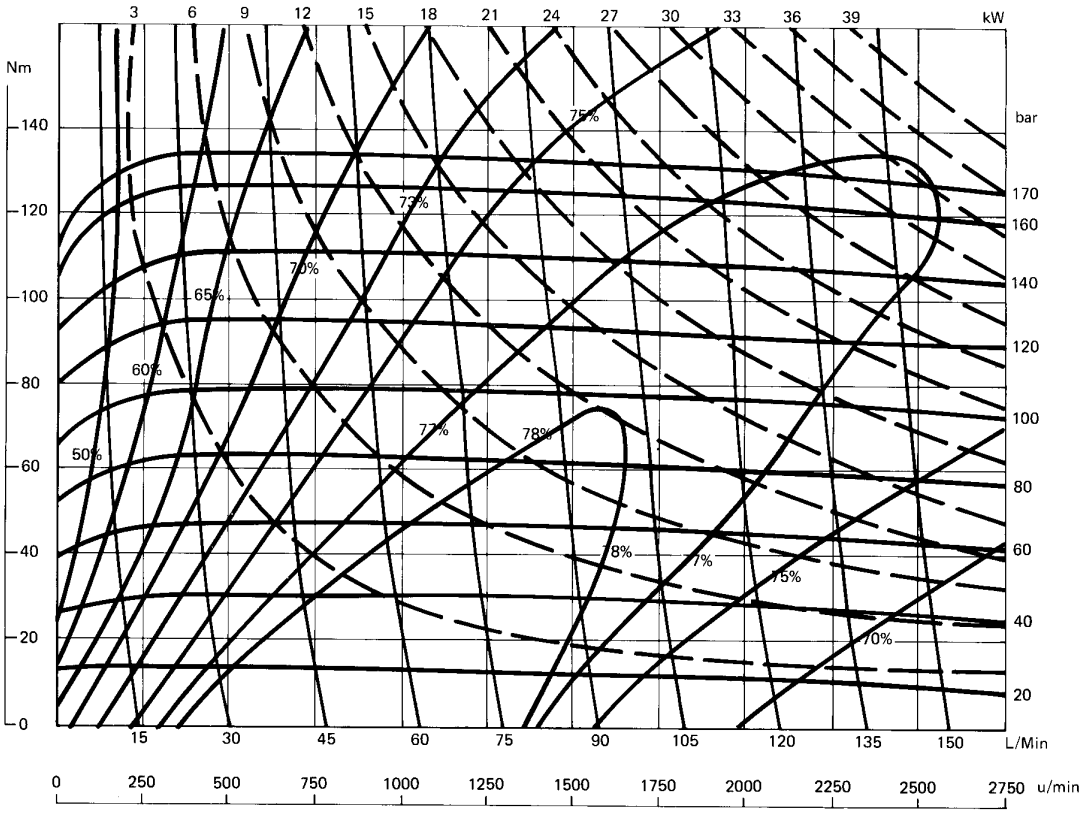
Performance Data 2100

2113 PUMP



Key : Flow ——— Power Absorption — — Overall Efficiency ———

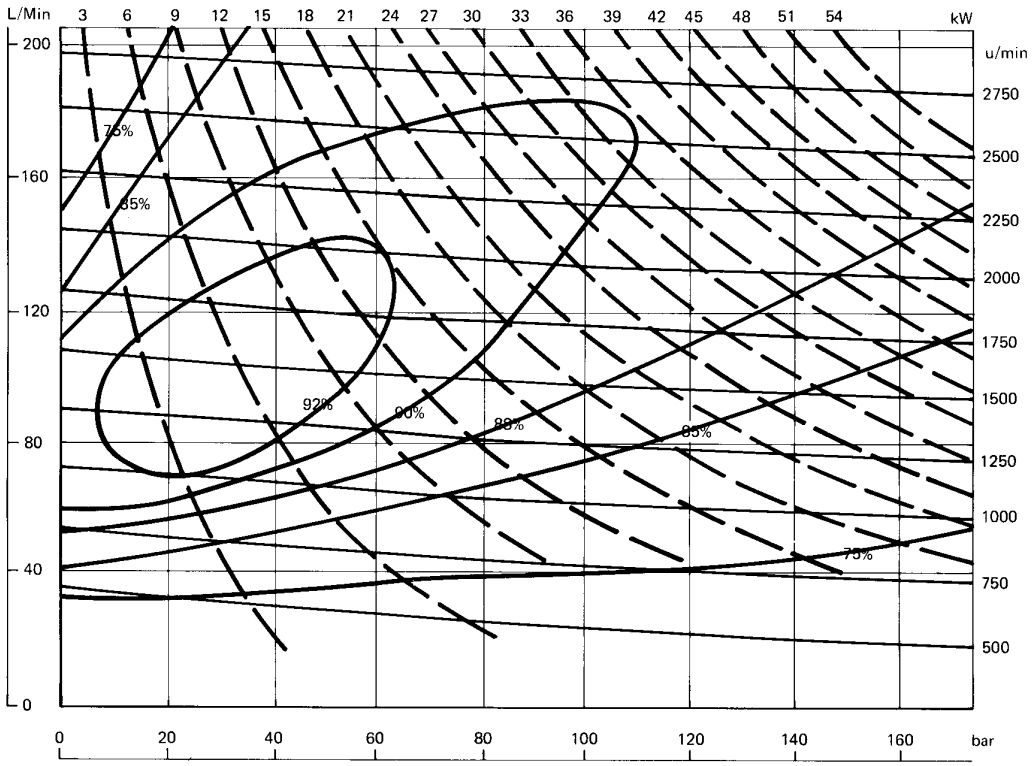
2113 MOTOR



Key : Pressure ——— Power — — Flow ——— Overall Efficiency ———

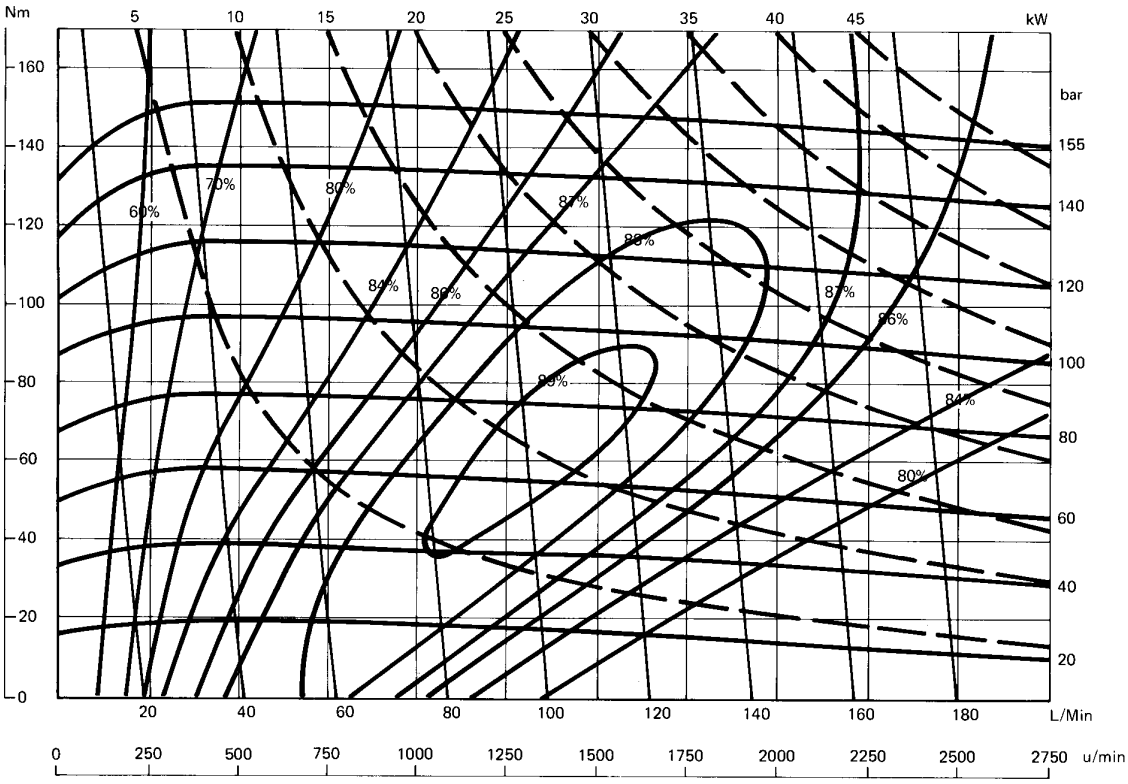
Performance Data 2100

2116 PUMP



Key : Flow ——— Power Absorption — — Overall Efficiency ———

2116 MOTOR

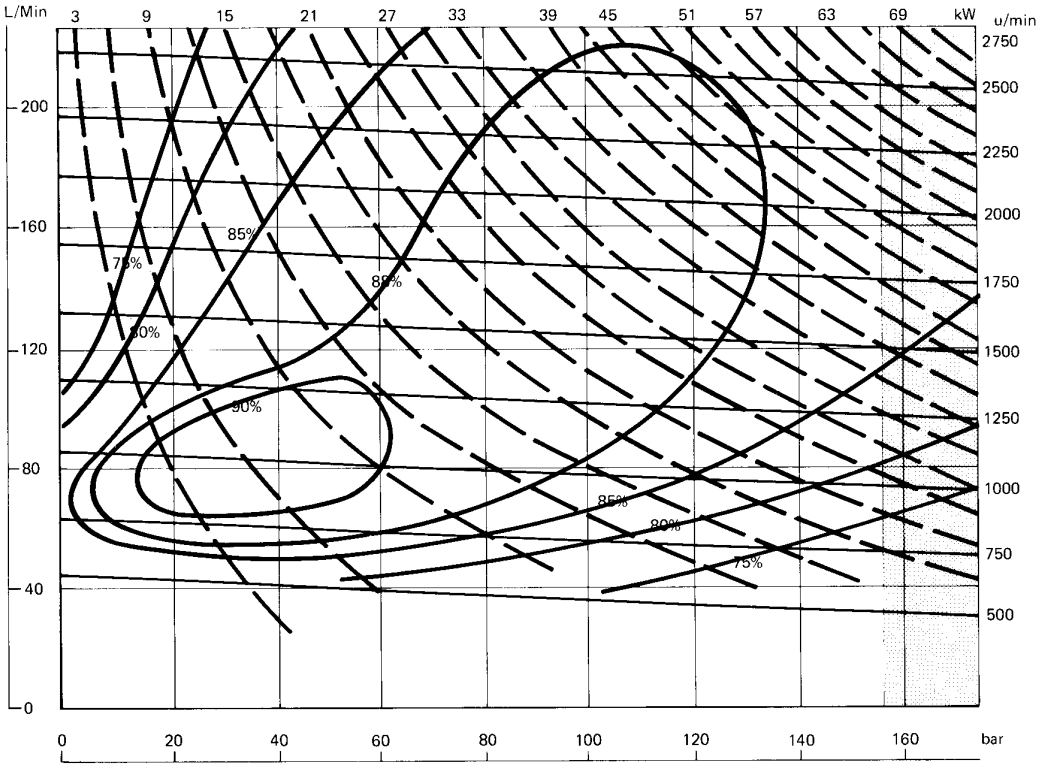


Key : Pressure ——— Power — — Flow ——— Overall Efficiency ———

Performance Data 2100

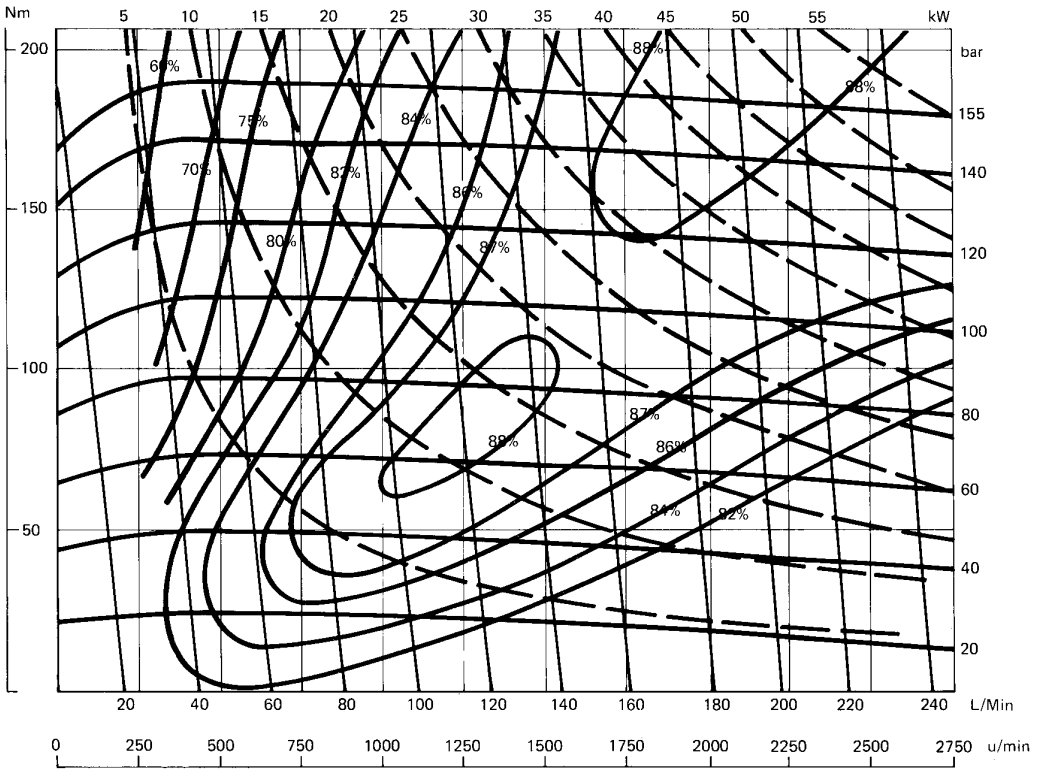
2120 PUMP

For operation within the shaded area refer to Hydreco Hamworthy



Key : Flow ——— Power Absorption — — Overall Efficiency ———

2120 MOTOR

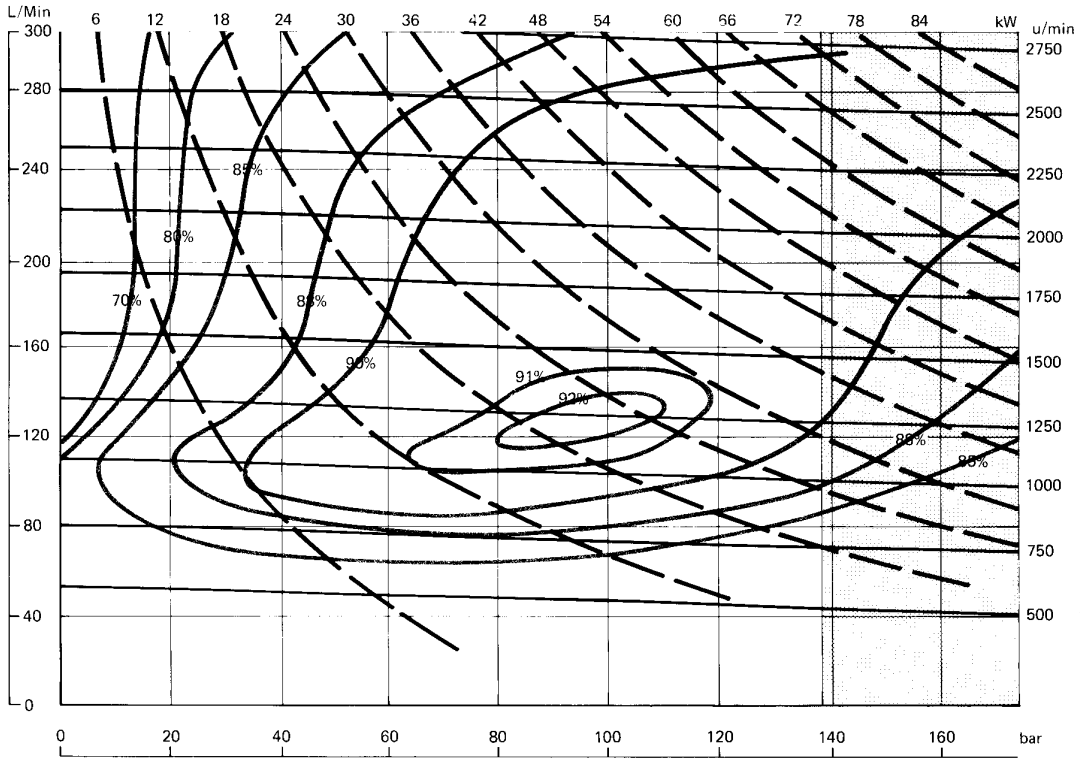


Key : Pressure ——— Power — — Flow ——— Overall Efficiency ———

Performance Data 2100

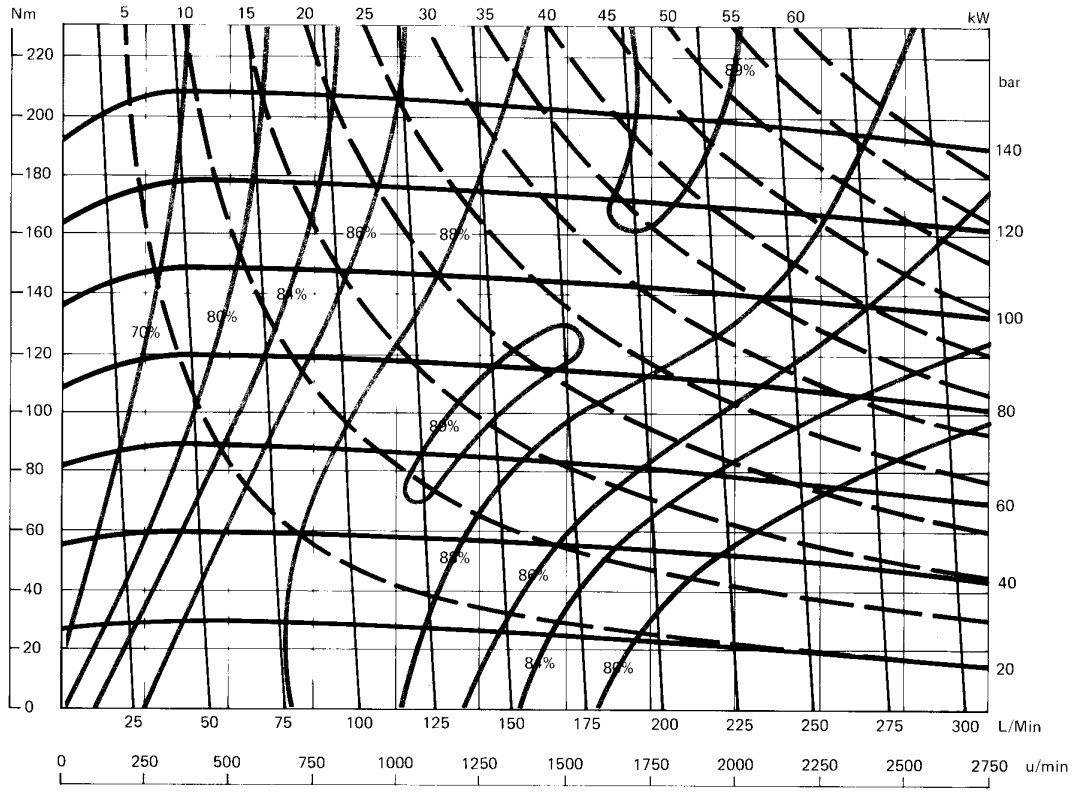
2125 PUMP

For operation within the shaded area refer to Hydreco Hamworthy



Key : Flow ——— Power Absorption — — Overall Efficiency ———

2125 MOTOR

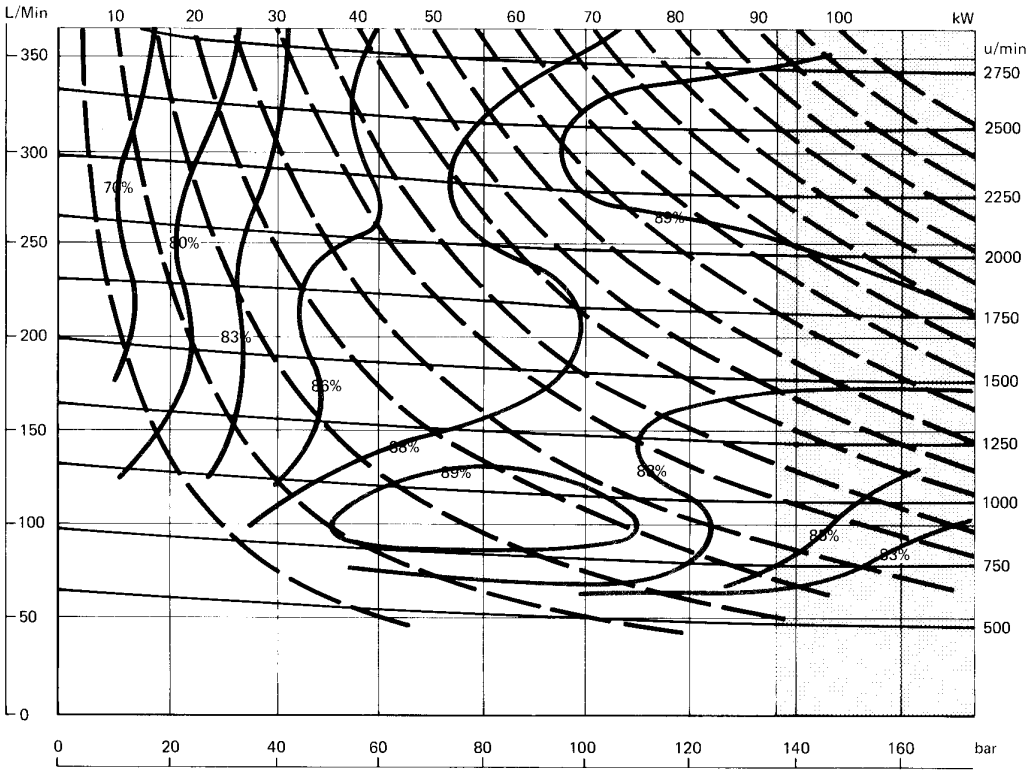


Key : Pressure ——— Power — — Flow ——— Overall Efficiency ———

Performance Data 2100

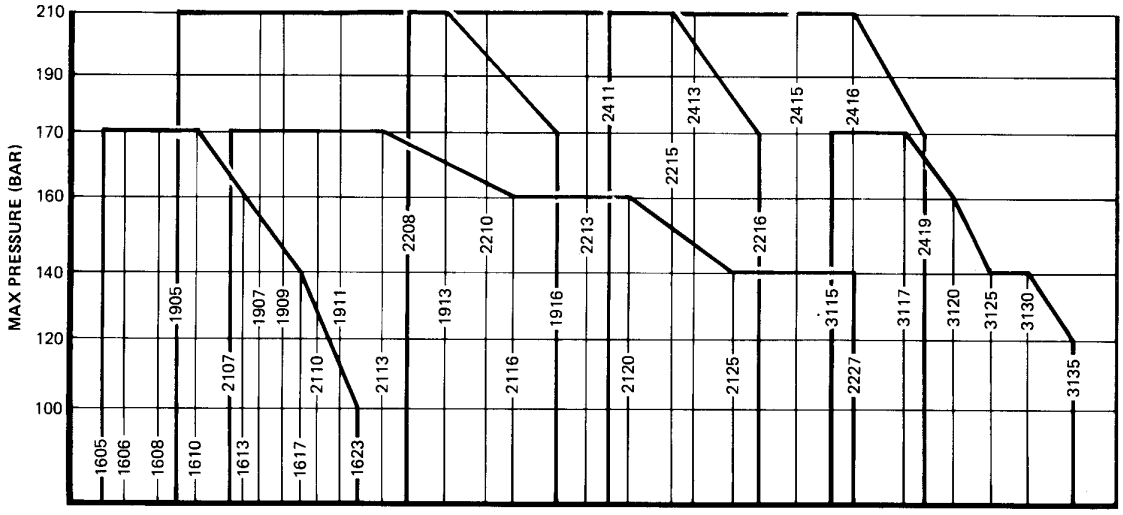
2227 PUMP

For operation within the shaded area refer to Hydreco Hamworthy



Key : Flow ——— Power Absorption — — Overall Efficiency ———

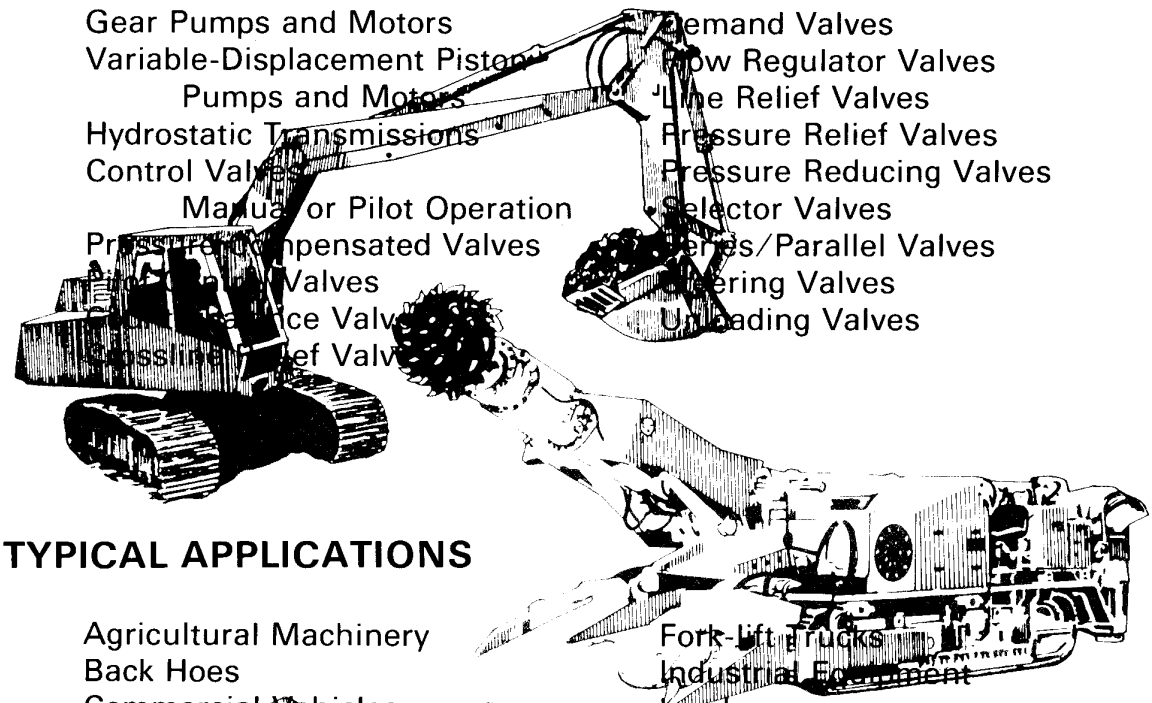
THE CHART BELOW SHOWS THE DISPLACEMENT AND OPERATING PRESSURES AVAILABLE FROM THE FULL RANGE OF HYDRECO HAMWORTHY GEAR PUMPS AND MOTORS.



1600 12.4 15.6 20 25 32.5 42.3 55.8
2100 32 44.25 57.5 70.8 88.5 110.6 132.7
3100 131.5 153.5 175.4 219 263.1 306.9
1900 22 33.5 41.5 51.8 62.2 74.3
2200 58.9 70.4 86.1 101.5 111.3
2400 87.3 103.6 119.8 132.8 155.4

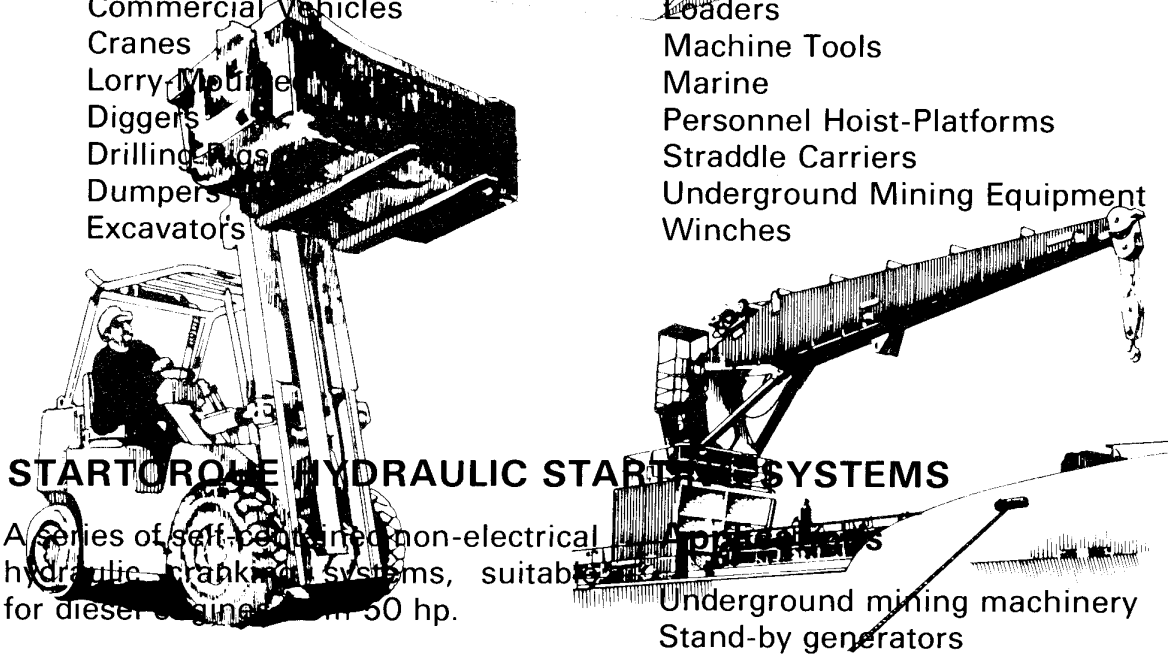
DISPLACEMENT CM^3/REV

Gear Pumps and Motors
Variable-Displacement Piston Pumps and Motors
Hydrostatic Transmissions
Control Valves
Manual or Pilot Operation
Pressure Compensated Valves
Valves
Valves
Relief Valves
Demand Valves
Flow Regulator Valves
Line Relief Valves
Pressure Relief Valves
Pressure Reducing Valves
Selector Valves
Series/Parallel Valves
Steering Valves
Unloading Valves



TYPICAL APPLICATIONS

Agricultural Machinery
Back Hoes
Commercial Vehicles
Cranes
Lorry-Mounted
Diggers
Drilling Rigs
Dumpers
Excavators
Fork-lift Trucks
Industrial Equipment
Loaders
Machine Tools
Marine
Personnel Hoist-Platforms
Straddle Carriers
Underground Mining Equipment
Winches



STARTORQUE HYDRAULIC STARTER SYSTEMS

A series of self-contained non-electrical hydraulic cranking systems, suitable for diesel engines from 50 hp.

Applications
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Stand-by generators
Marine engines
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Compressors