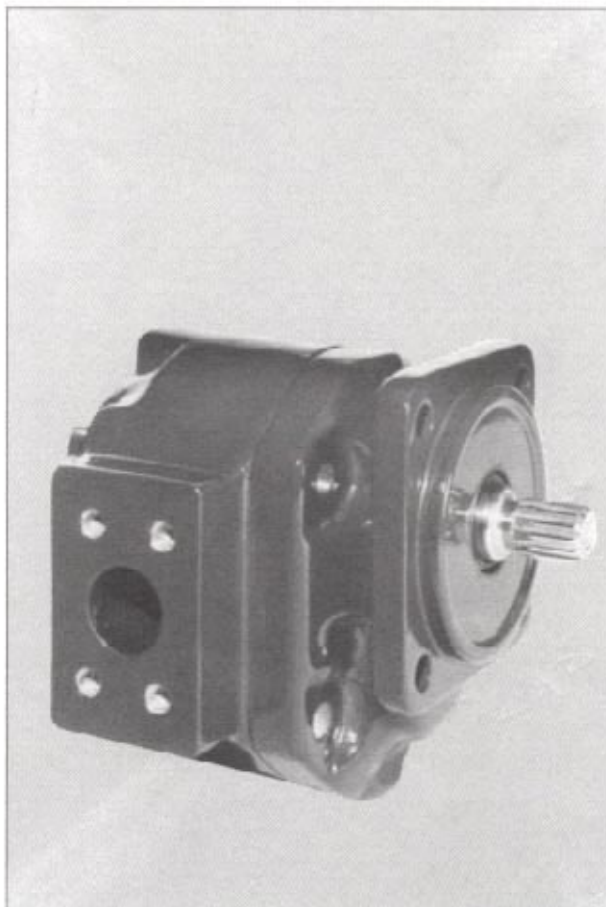


2200

S E R I E S

GEAR PUMPS & MOTORS



58.7 TO 110.8 CM³/REV.
250 BAR. PEAK PRESSURE

2200 GENERAL DATA

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 **David Brown Hydraulics**.

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

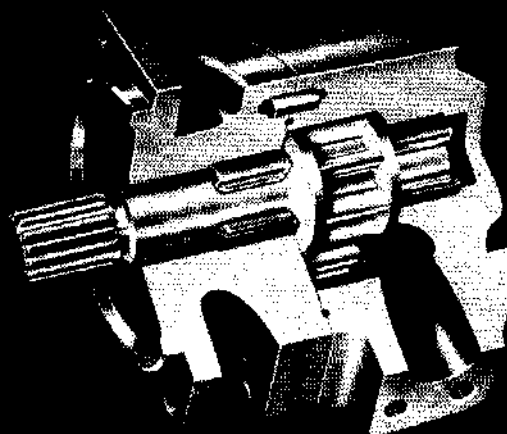
Dirt, metal particles and other contaminants are harmful to all precision built hydraulic components.

Always ensure that the system is initially clean and fluid cleanliness is maintained at ISO.4406 16/11 (optimum), 19/15 (max).

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

- ▶ All pipes and fittings are properly installed and connected
- ▶ The system is filled with fluid of the correct specification.

Servicing Instructions and spare Parts Sheets for all **David Brown Hydraulics** units are available from our Service Department.



Illustrated is a motor with needle roller bearings

Features marked* are preferred standard.

Standard pumps have plain (bush) bearings for maximum economy whilst standard motors have needle roller bearings for maximum torque. See page 4.

INTRODUCTION

The information contained in this leaflet covers all 2200 Series Gear Pumps and Motors forming part of the wide range of Hydraulic Pumps, Motors, Control and Auxiliary Valves produced by **David Brown Hydraulics** (see page14).

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.

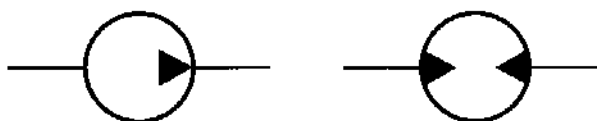
The high rate of technical innovation demanded by equipment manufacturers constantly adds new features to our products, usually as the result of intensive practical development undertaken to improve the operation or economics of a specified type of machine. Such features cannot always be covered in a 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 provides us with the most up-to-date production facilities in Europe.

Qualified distributors or subsidiary companies in the most important industrial markets, ensure that parts and service are available internationally.



THEORETICAL DISPLACEMENT

Units	2208	2210	2213	2215	2216
cm ³ /rev	58.70	70.10	85.70	101.10	110.80

GENERAL DATA

Drive Shafts	See Page 5
Shaft Seal Designs	See Page 5
Mounting Flanges	See Page 6
Port Connections	See Page 6
Rotation - Pumps	Either direction (not reversible)
Rotation - Motors	Either direction (reversible)
Speed Range Pumps	600-2700 rev/min
Speed Range Motors	600-3000 rev/min
Dimensions	See Page 5 & Page 7
Weight	See Page 5
Mounting Position	No attitude limitation
Ambient Temperature Range	-20°C to + 60°C
Hydraulic Fluid Temperature Range	-20°C to + 80°C
Maximum viscosity for Cold Start	850mm ² /sec (cSt)
Maximum for normal working conditions	250mm ² /sec (cSt)
Minimum permissible viscosity	10mm ² /sec (cSt)
For optimum 'life' and efficiency, fluid viscosity should be in the range of 15 to 25mm ² /sec(cSt) during normal working conditions.	
Performance Data	} See Pages 8-12
Overall Efficiencies	
Pressure/ Speed Limitations	

OPERATING PRESSURE - PUMPS

Inlet Pressure Range	Minimum	See Page 4
	Maximum	2 bar
Outlet	2208 to 2213	Nominal 210 bar
		Peak 250 bar
	2215 & 2216	Nominal 170 bar
		Peak 210 bar

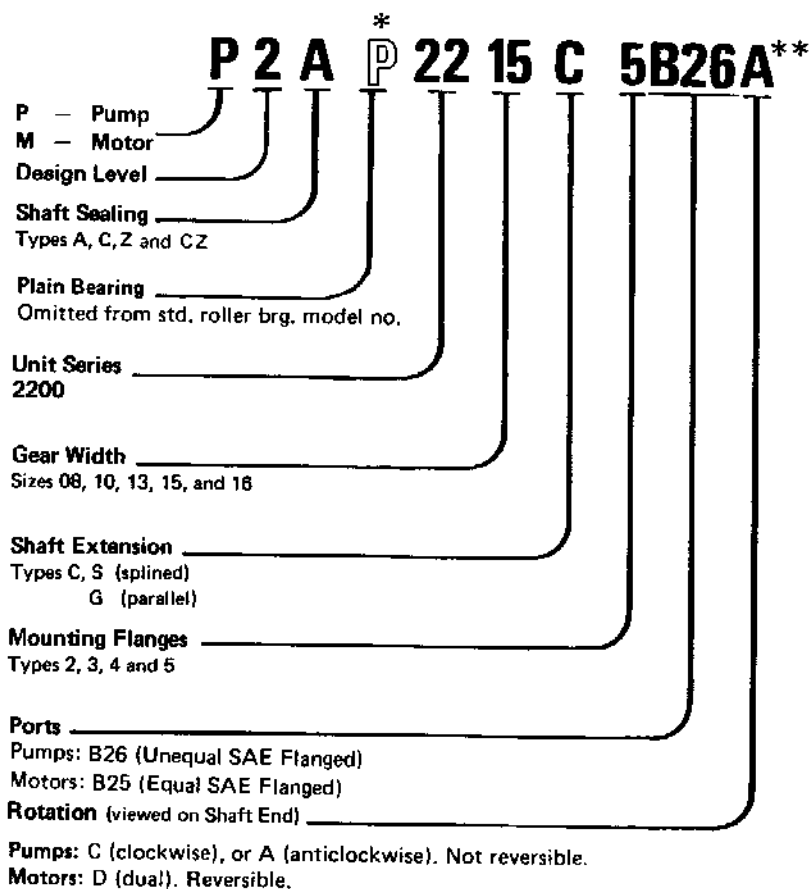
OPERATING PRESSURE - MOTORS

Inlet/Outlet	2208 to 2213	Nominal 210 bar
		Peak 250 bar
	2215 & 2216	Nominal 170 bar
		Peak 210 bar
Drain Line Pressure		Maximum 1 bar

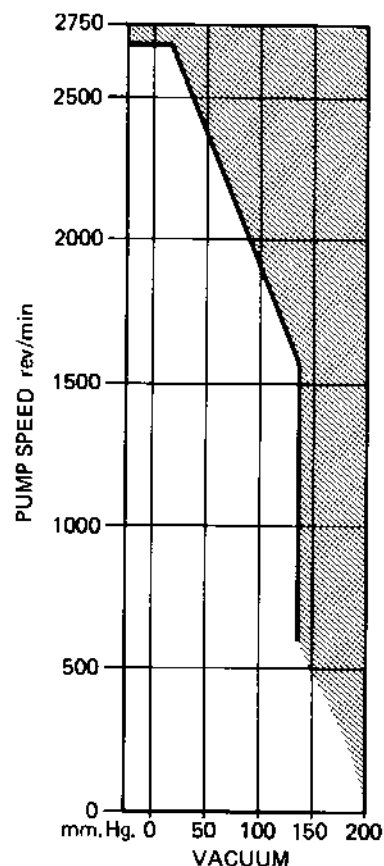
ALL DATA IS OBTAINED FROM AVERAGE PERFORMANCE OF REGULAR PRODUCTION PUMPS USING GOOD QUALITY S.A.E. 10 MINERAL HYDRAULIC OIL AT 50°C. GENERALLY CORRESPONDING TO A VISCOSITY OF 23 mm²/sec (cSt).
Critical Dimensions of all Shafts, Flanges and Ports conform to S.A.E. Standards where these are specified.

2200 GENERAL DATA

MODEL NUMBER COMPOSITION



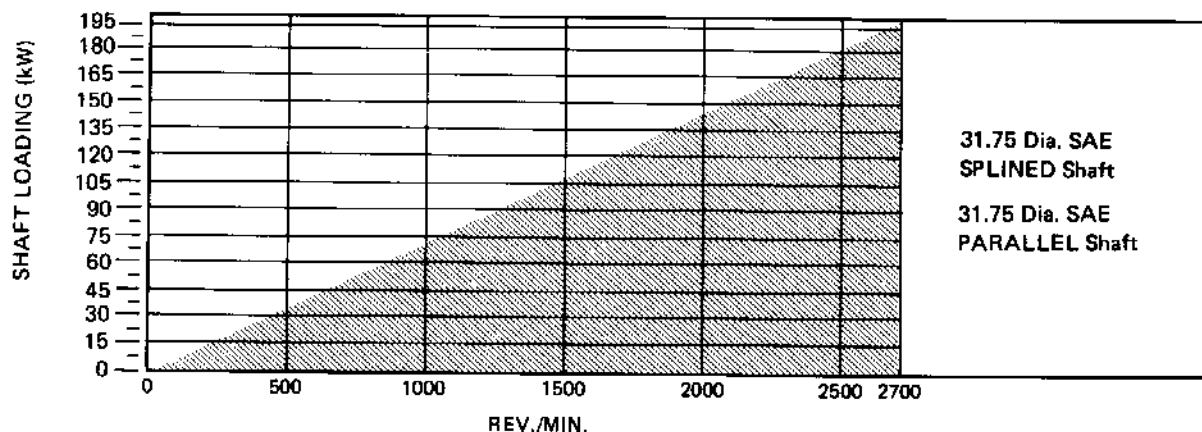
PERMISSIBLE INLET CONDITIONS



Pumps with standard size ports will operate without detriment when inlet conditions are within the outlined area of the chart. For operation within the shaded area, consult **David Brown Hydraulics**.

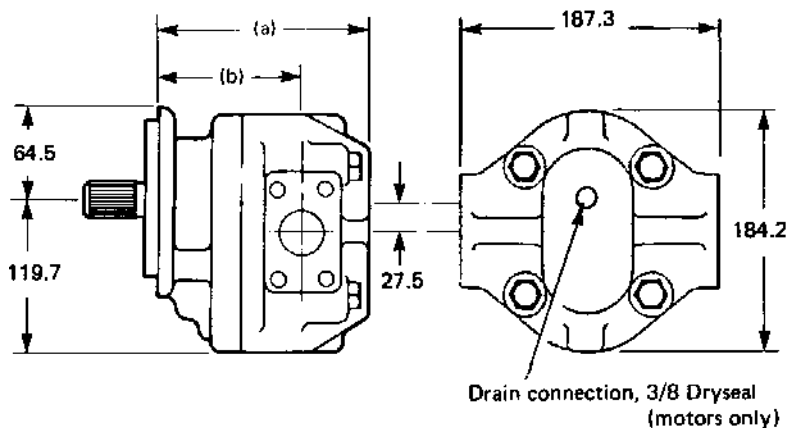
DRIVE SHAFT POWER LIMITATIONS

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 **David Brown Hydraulics**.



2200 INSTALLATION DATA

GENERAL DIMENSIONS (mm)



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

SIZE	(a)	(b)	WEIGHT (kg)
2208	170	109	22.30
2210			22.70
2213	176	116	23.00
2215	186		23.10
2216			23.40

C of G position approx. 50% of Dim. (a)

SHAFT SEAL DESIGNS



* Preferred Feature

Suitable for external shaft or flexible drive couplings.



Visible-bleed drilling in both sides of adaptor. Remove uppermost screw after installation.

Incorporates extra seals and visible bleed facility making it suitable for direct mounting on torque converters and gear boxes.



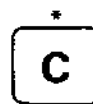
Suitable for most Dual-Rotation Units the HP lip seal will withstand back-pressures of up to 20 bar.



CZ Functions as Z type, but has visible-bleed facility (in top of adaptor only)

DRIVE - SHAFTS

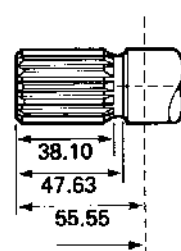
Dimensions in millimetres



31.75 Dia. SAE (1 1/4")
14 Tooth Involute Spline

INVOLUTE SPLINE DATA

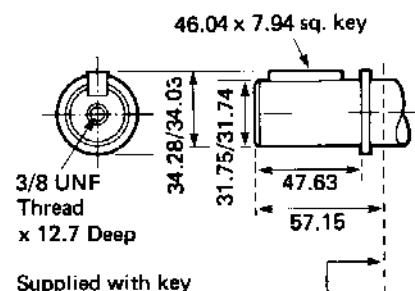
Side Fit – Flat Root
Diametral Pitch 12/24
Pressure Angle 30°
Number of Teeth 14
Major Diameter :-
31.2/31.12



Standard flange mounting face



31.75 Dia. SAE (1 1/4")
Parallel Shaft with Key



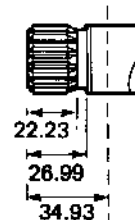
Standard flange mounting face



31.75 Dia. SAE (1 1/4")
14 Tooth Involute Spline
(non-preferred item)

INVOLUTE SPLINE DATA

Side Fit – Flat Root
Diametral Pitch 12/24
Pressure Angle 30°
Number of Teeth 14
Major Diameter
31.2/31.12



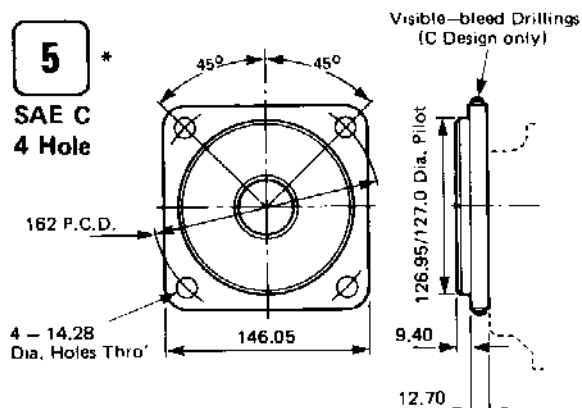
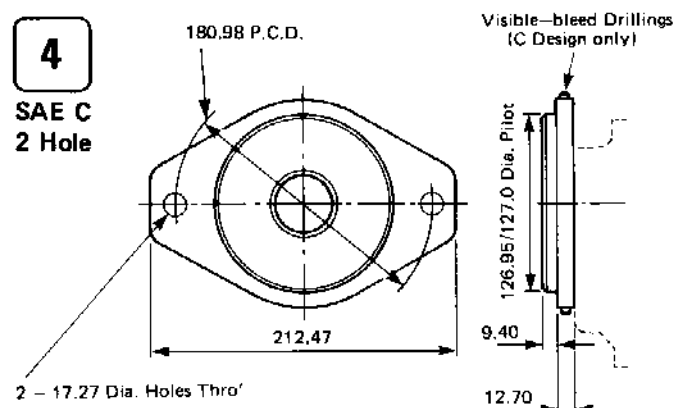
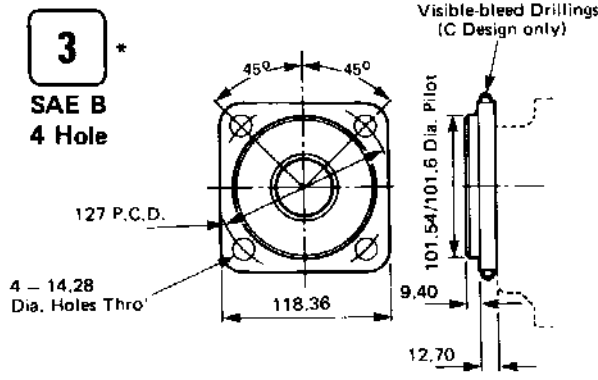
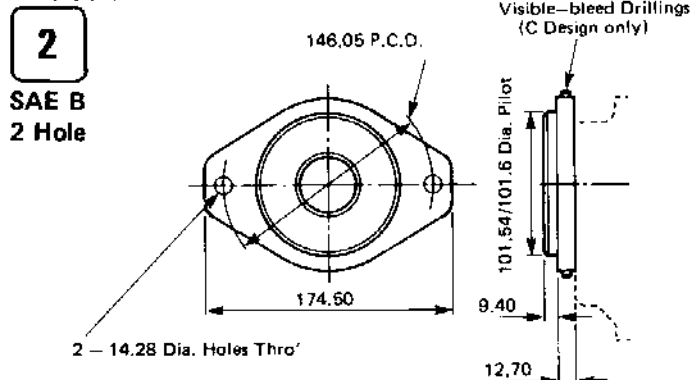
Standard flange mounting face

* Preferred Feature

2200 INSTALLATION DATA

FLANGES

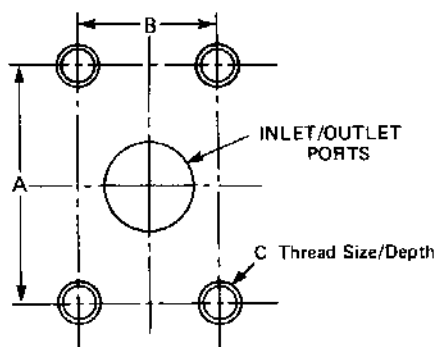
Dimensions in millimetres



PUMP AND MOTOR PORTS

Key to Tables :-

Motors **B25** * Equal S.A.E. Flanges with Metric Tapping



MOTOR SIZE	PORT SIZE	A	B	C
				(B25)
2208	25.40	52.39	26.21	M10 x 1.5 x 28.57
2210	31.75	58.72	30.20	
2213				
2215	38.10	69.85	35.72	M12 — 1.75 x 28.57
2216				

Pumps **B26** * Unequal S.A.E. Flanges with Metric Tapping

PUMP SIZE	INLET			
	SIZE	A	B	C
2208	38.10	69.85	35.72	M12 x 1.75 x 28.57
2210				
2213				
2215	50.80	77.85	42.85	
2216				

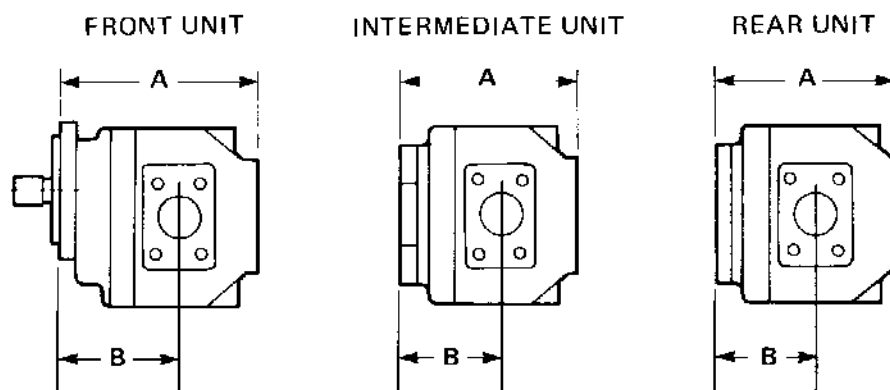
OUTLET			
SIZE	A	B	C
31.75	58.72	30.20	M10 - 1.5 x 28.57

NOTE THAT PORTS CAN BE SUPPLIED WITH UNC PORT TAPPINGS.

* Preferred Feature

INSTALLATION DIMENSIONS – MULTIPLE UNITS

Dimensions in millimetres



ALL SEAL DESIGNS									
2200					1900				
SIZE		FRONT	INTER	REAR	SIZE		FRONT	INTER	REAR
2208	A	178	167	159	1905	A	156	145	132
	B	108	97	97		B	94	83	83
2210	A	178	167	159	1907	A	162	151	132
	B	108	97	97		B	97	86	83
2213	A	184	173	165	1909	A	167	156	148
	B	116	105	105		B	97	86	86
2215	A	194	193	185	1911	A	167	156	148
	B	116	115	115		B	102	90	90
2216	A	194	193	185	1913	A	179	168	160
	B	116	115	115		B	102	90	90
—	—	—	—	—	1916	A	179	168	160
						B	102	90	90

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).

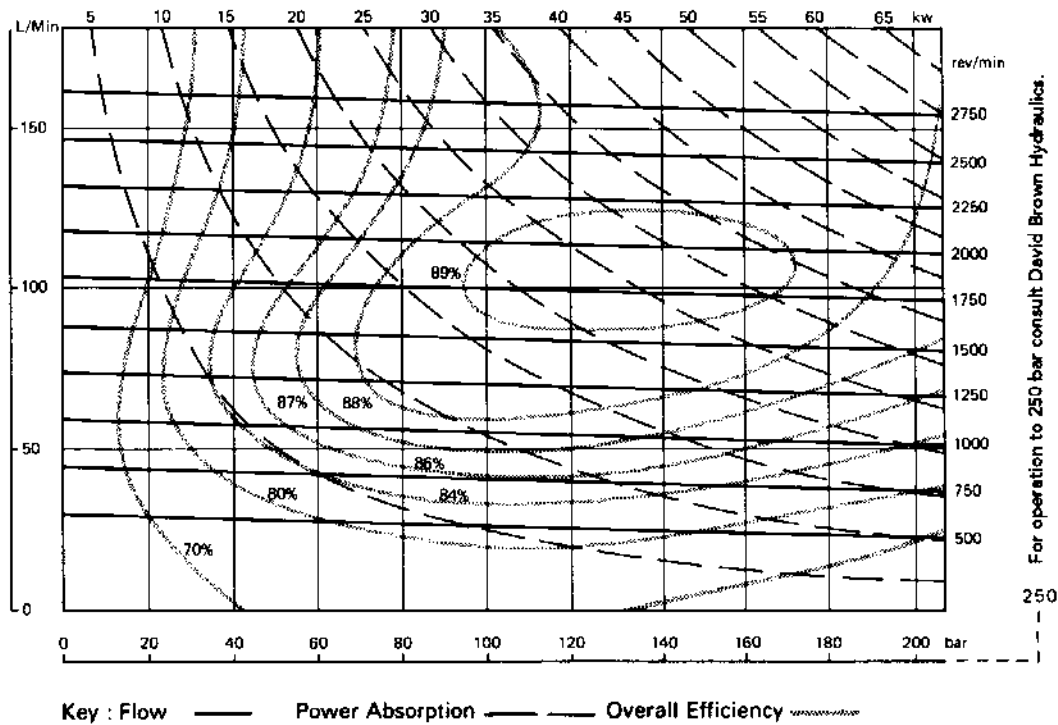
Smallest capacity pump units are normally mounted in REAR position only.

In multiple MOTOR assemblies each unit is normally of the same size and capacity.

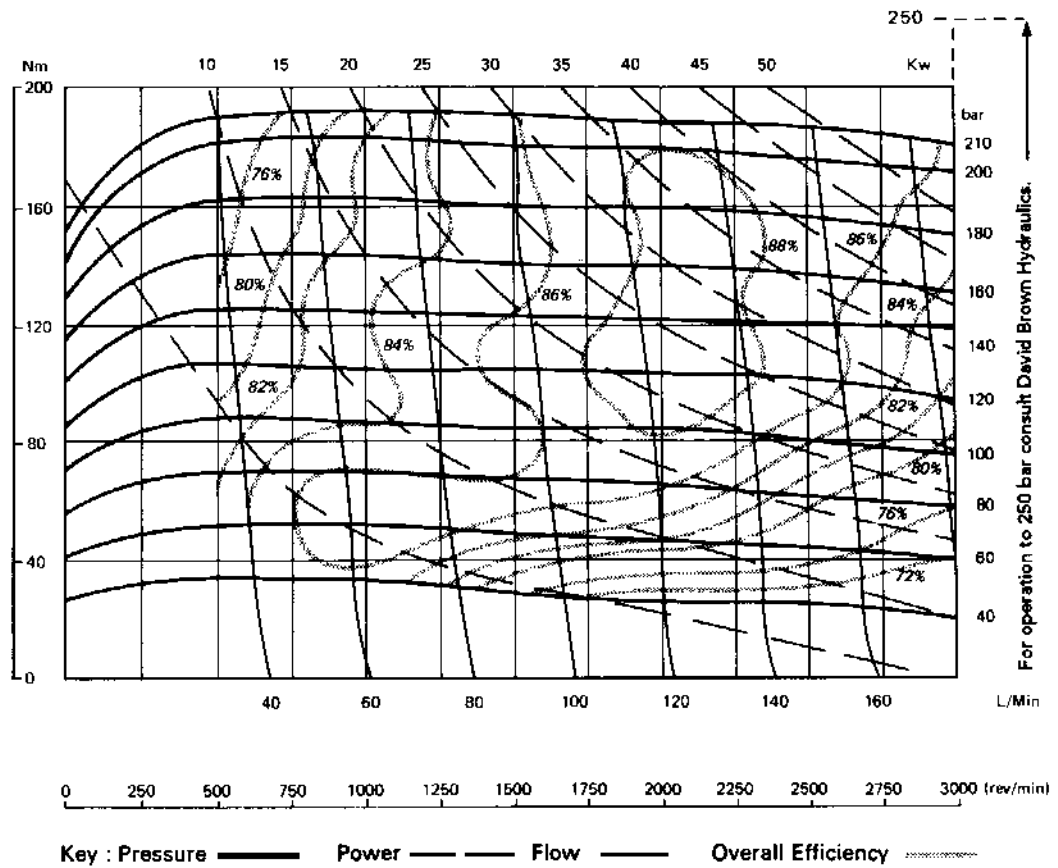
For Variations of Design, Performance and Specification see the relevant Selection Data Sheets for each unit.

2200 PERFORMANCE DATA

2208 PUMP

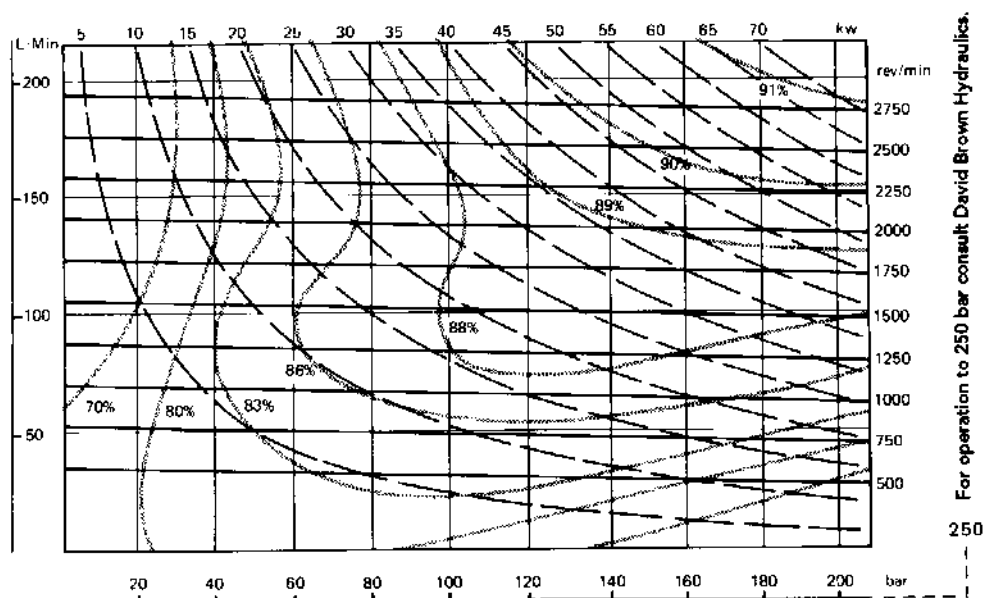


2208 MOTOR



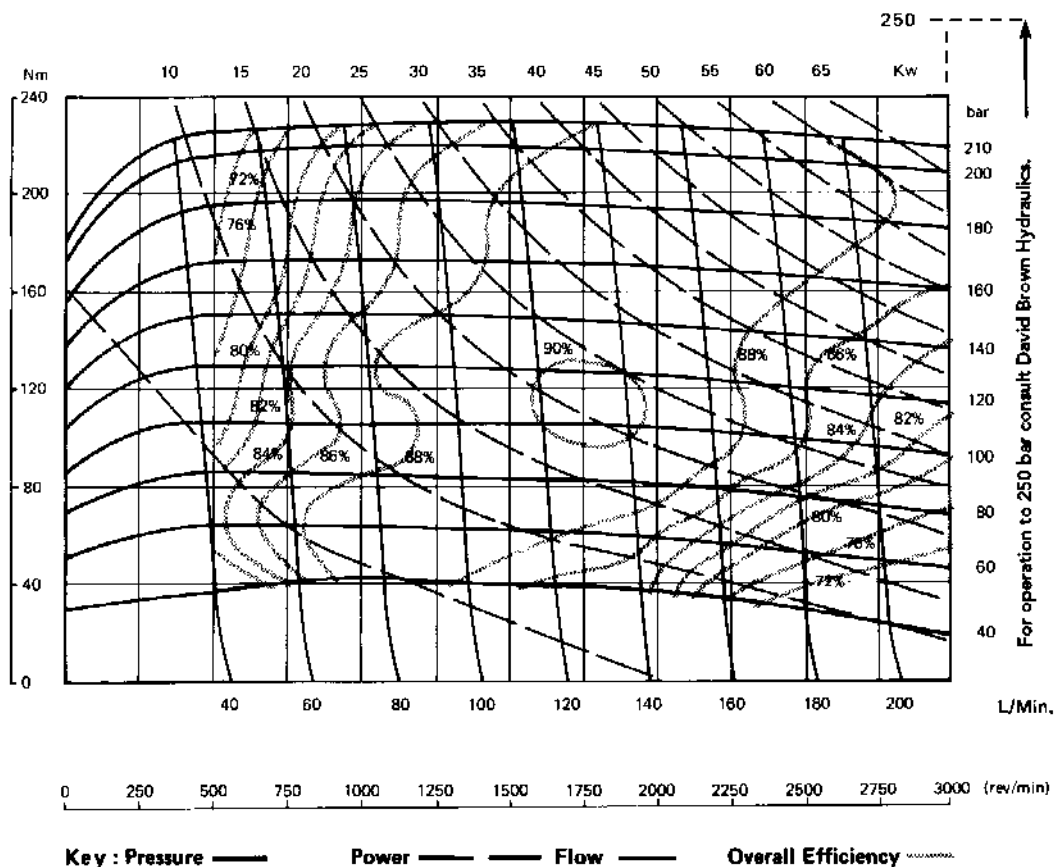
2200 PERFORMANCE DATA

2210 PUMP



Key : Flow — Power Absorption - - - Overall Efficiency

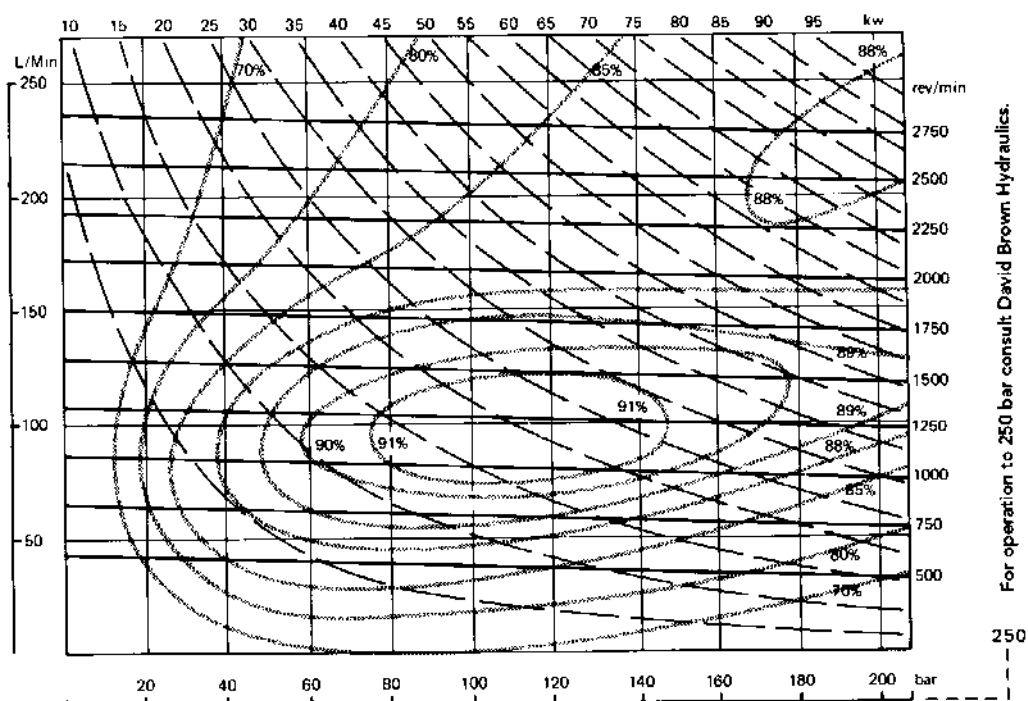
2210 MOTOR



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

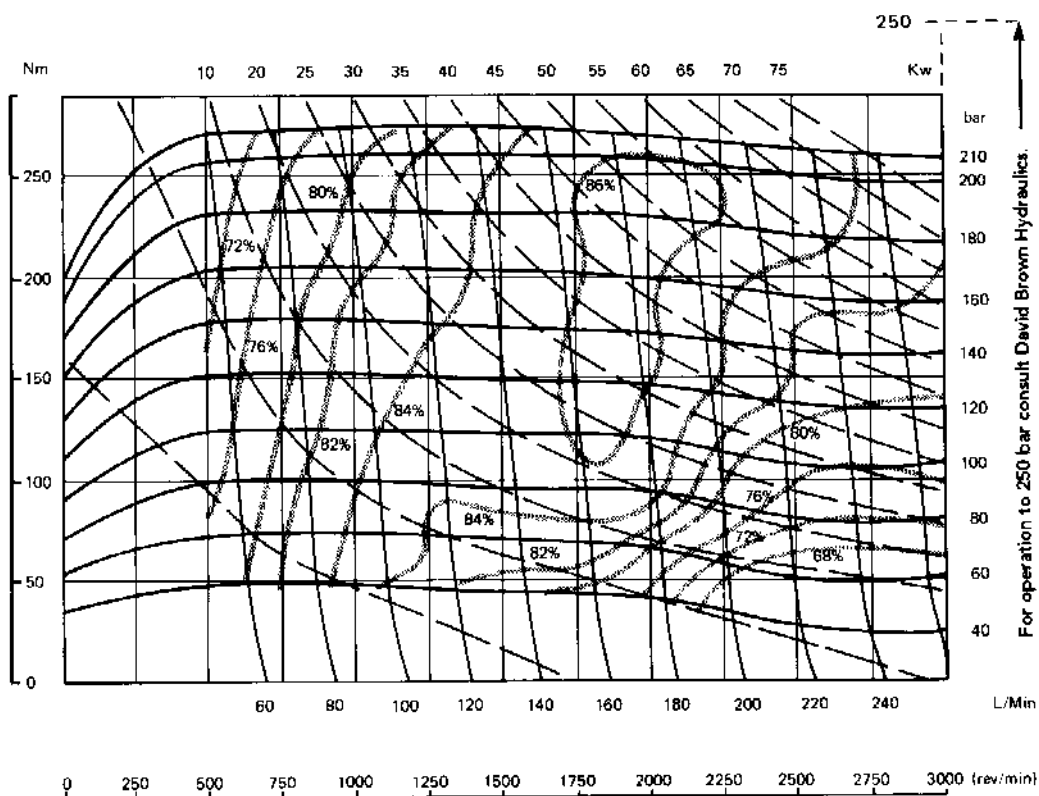
2200 PERFORMANCE DATA

2213 PUMP



Key : Flow — Power Absorption — Overall Efficiency

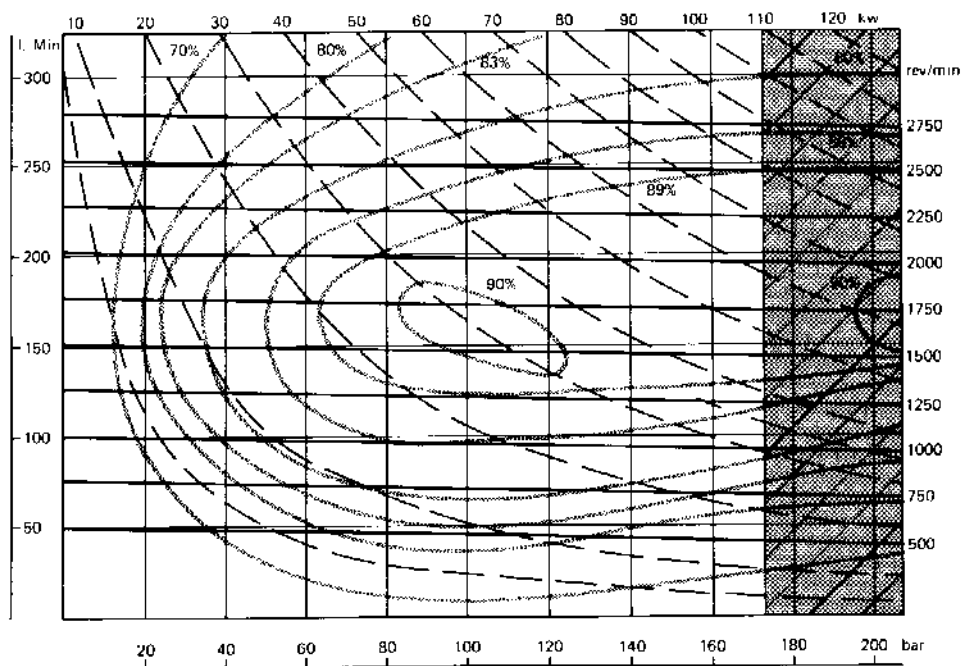
2213 MOTOR



Key : Pressure — Power — Flow — Overall Efficiency

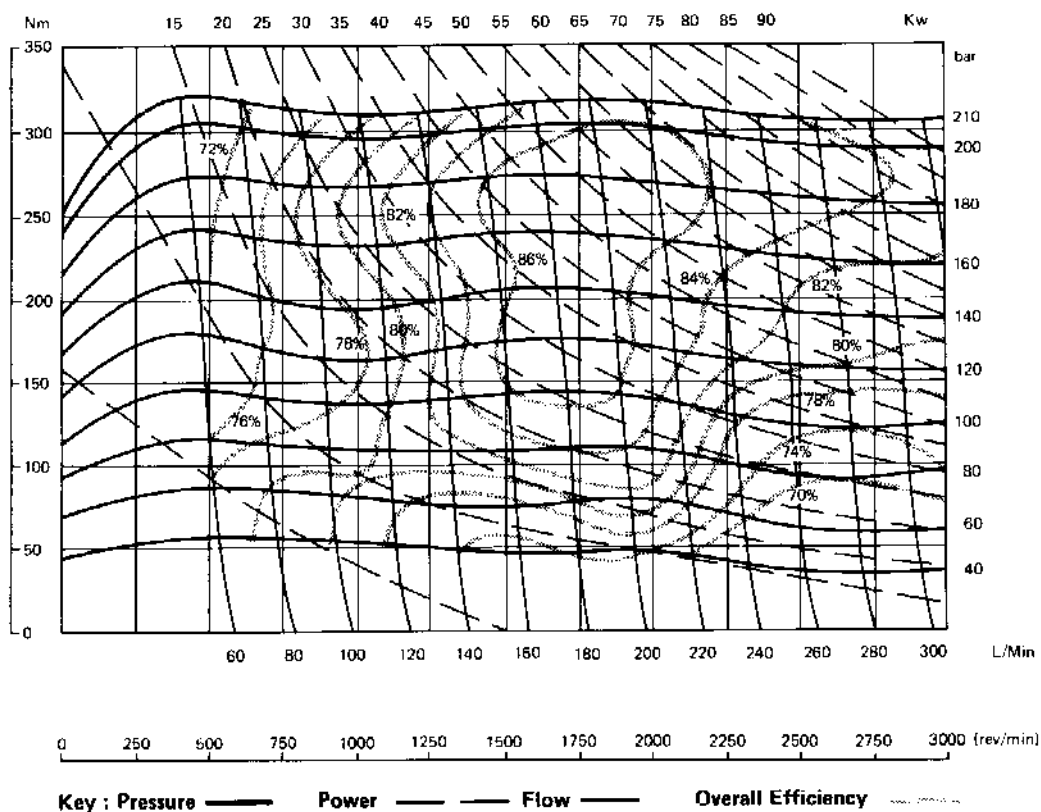
2200 PERFORMANCE DATA

2215 PUMP



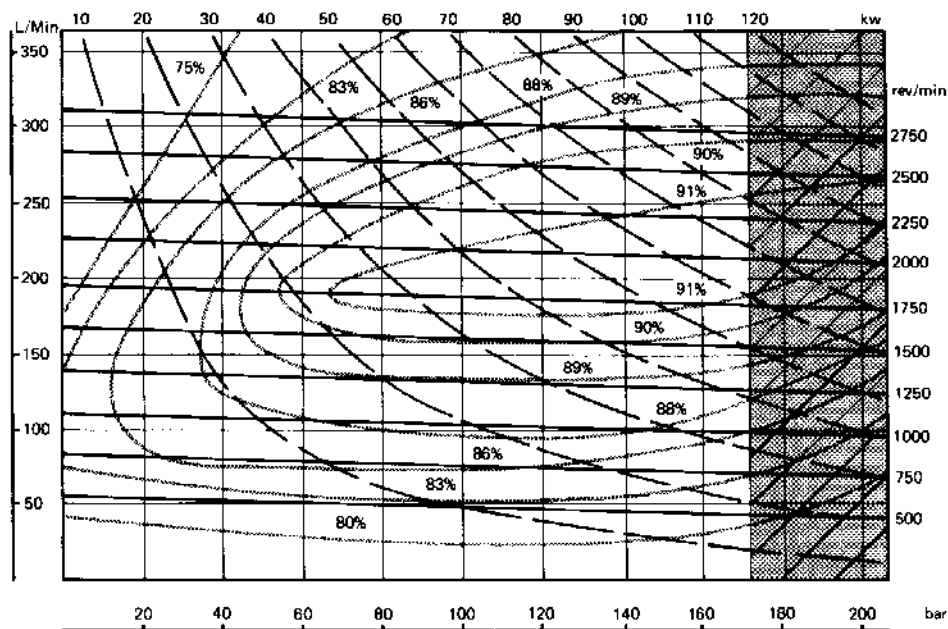
Key : Flow — Power Absorption — Overall Efficiency

2215 MOTOR



2200 PERFORMANCE DATA

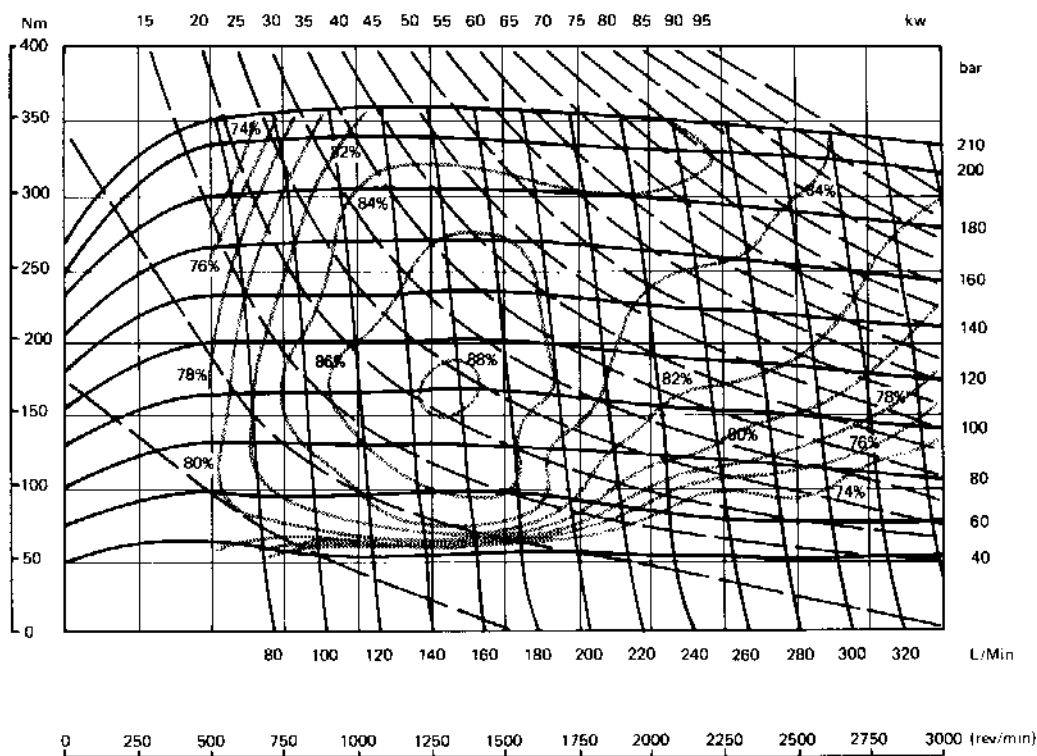
2216 PUMP



For operation within the shaded area refer to David Brown Hydraulics.

Key : Flow — Power Absorption — Overall Efficiency

2216 MOTOR



Key : Pressure — Power — Flow — Overall Efficiency

THE CHART BELOW SHOWS THE DISPLACEMENT AND OPERATING PRESSURES AVAILABLE FROM THE 1600, 1900 AND 2200 RANGE OF GEAR PUMPS AND MOTORS.

