DAVID BROWN HYDRAULICS

1PN SERIES

HYDRAULIC GEAR PUMPS

4 to 28.1 cm^3/rev (0.244 to 1.715 in^3/rev)
280 bar (4060 psi) peak pressure

1PN SERIES TECHNICAL DATA

OPERATING PARAMETERS

1PN Series pumps are designed to provide high performance levels and long life when operated within the parameters shown. For operation outside these parameters please consult your David Brown Hydraulics representative.

Maximum port pressures	see below.	
Speed Range	All models	see table below
Temperature	Minimum at start-up	-40°C (-40°F)
	Maximum continuous	+80°C (+176°F)
	Maximum intermittent	+100°C (+212°F)
Viscosity	Maximum at start-up	2000 mm^2/sec
	Maximum continuous	250 mm^2/sec
	Minimum continuous	10 mm^2/sec
	Optimum	15-25 mm^2/sec
Fluid Cleanliness	To ISO4406 solid contaminant	
	Start-up period	21/17
	Maximum in service	19/15
	Optimum	16/11
	Maximum water	0.1%
Fluid Velocity	Maximum in INLET line	2.5 m/sec (8 ft/sec)
	Recommended in INLET line	1.5 m/sec (5 ft/sec)
Fluids	All data is quoted for mineral oils HM and HV.	
	For fire resistant and environmentally aware fluids please contact your David Brown representative.	
Rotation	Clockwise or Anti-clockwise viewed from shaft end (not reversible).	

MODEL	DISPLACEMENT	OUTLET PRESSURE		SPEED	
	cm^3/rev (in^3/rev)	Rated - bar (psi)	Peak - bar (psi)	Minimum	Maximum
1PN 040	4.0 (0.244)	250 (3625)	280 (4060)	600	3000
1PN 061	6.1 (0.372)	250 (3625)	280 (4060)	600	3000
1PN 082	8.2 (0.500)	250 (3625)	280 (4060)	600	3000
1PN 095	9.5 (0.579)	250 (3625)	280 (4060)	600	3000
1PN 119	11.9 (0.726)	250 (3625)	280 (4060)	600	3000
1PN 135	13.5 (0.823)	250 (3625)	280 (4060)	600	3000
1PN 140	14.0 (0.854)	250 (3625)	280 (4060)	600	3000
1PN 146	14.6 (0.890)	250 (3625)	280 (4060)	600	3000
1PN 168	16.8 (1.025)	250 (3625)	280 (4060)	600	3000
1PN 192	19.2 (1.171)	250 (3625)	280 (4060)	600	3000
1PN 229	22.9 (1.397)	210 (3045)	250 (3625)	600	2500
1PN 281	28.1 (1.714)	175 (2540)	210 (3045)	600	2500

INLET CONDITIONS

It is essential that pumps are installed so that the pump can draw sufficient oil under all operating conditions. 1PN Series pump inlet porting is designed to facilitate full volume fill but the following machine design recommendations should be followed.

- **Never run pumps dry - particular care should be taken to open any shut-off valves.**
- **Use large diameter pipes and fittings and avoid sharp bends and long lengths.**
  Fluid velocity should not exceed 2.5 m/sec (8.0 ft/sec) calculated by:

$V = \frac{21.22Q}{D^2}$ m/sec where V = velocity (m/sec), Q = flow rate (l/min), D = bore diameter (mm)

$V = \frac{0.408Q}{D^2}$ ft/sec where V = velocity (ft/sec), Q = flow rate (US gal/min), D = bore diameter (inches)

- **If possible mount the pump below the lowest level of fluid in the tank. If necessary prime the pump on start-up.**
- **Ensure that inlet lines are airtight.**
- **Particular care should be taken where high speeds and/or high fluid viscosities are involved.**

As a general rule pressure at the pump inlet should not be less than 0.25 bar absolute (2" Hg) at normal viscosity of 23 mm^2/sec (110 SSU).

David Brown Hydraulics' Engineers will be pleased to advise on any installation

1PN SERIES INTRODUCTION

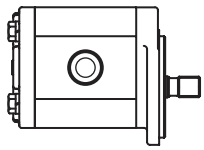
A RANGE OF SINGLE AND MULTIPLE PUMPS

Pump elements are available with displacements from 4.0 to 22.9 cm^3/rev (0.244 to 1.397 in^3/rev) for maximum continuous operating pressures of up to 250 bar and peak operating pressures of up to 280 bar. Maximum inlet pressure is 2 bar.

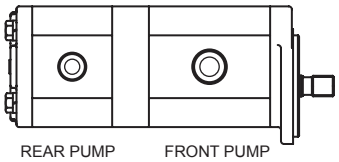
Pumps can be supplied as single, or as multiple units. Pumps can also be used as add-on units to other pumps types in a wide variety of combinations.

Please contact your David Brown Hydraulics representative to discuss your specific requirement or for more information on possible combinations of triple and quadruple pumps.

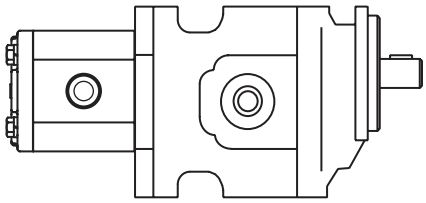
SINGLE PUMPS



DOUBLE PUMPS



ADD ON TO OTHER PUMPS



Triple, quad and other combinations are also available, please consult your DB Hydraulics representative for details

1PN SERIES MODEL NUMBERS

1 P N 1 4 0 A G T 5 D C S S

Series

repeat for each pumping section

Displacements

SINGLE PUMPS

Code	DISPLACEMENT	
	cm^3/rev	in^3/rev
040	4.0	0.244
061	6.1	0.372
082	8.2	0.500
095	9.5	0.579
119	11.9	0.726
135	13.5	0.823
140	14.0	0.854
146	14.6	0.890
168	16.8	1.025
192	19.2	1.171
229	22.9	1.397
281	28.1	1.714

Rotation

Code	Rotation
A	Anti-clockwise
C	Clockwise

viewed from shaft end

Mounting Flange type

Refer to page 4 for details

Drive Shaft type

Refer to page 5 for details

repeat for each pumping section

repeat for each pumping section

Outrigger bearing

Code	Description
O	Required
S	Not required

Refer to page 6 for details

Rear cover

Code	Description
S	Standard
R	Ports in rear cover
L	With load sensing valve
V	With relief valve
Y	With priority flow valve
Z	With flow control valve

Refer to your local David Brown Hydraulics representative for details of availability of codes L, Y & Z

Outlet port type

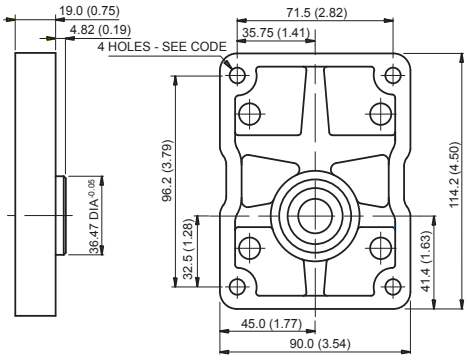
Refer to page 6 for options

Inlet port type

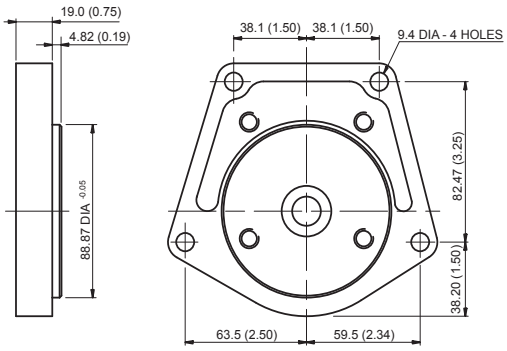
Refer to page 6 for options
(Use code 00 for No Port - applies to sections of multiple pumps only)

MOUNTING FLANGES

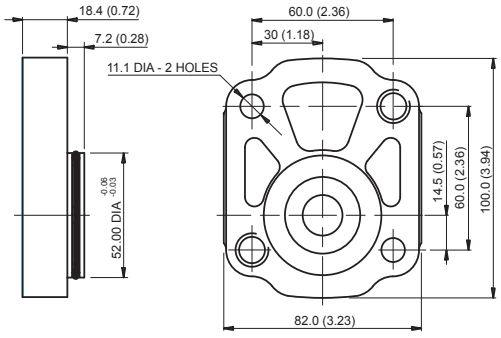
Code B 4 HOLES 7.1 DIA (0.28)
Code R 4 HOLES 9.0 DIA (0.35)



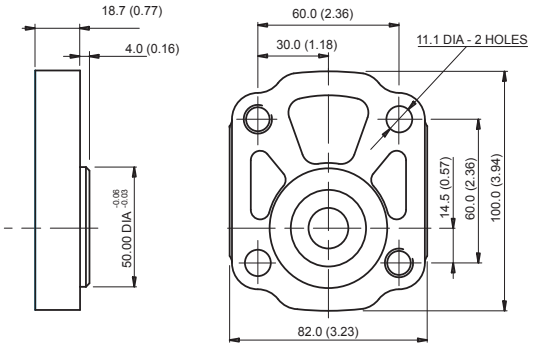
Code C



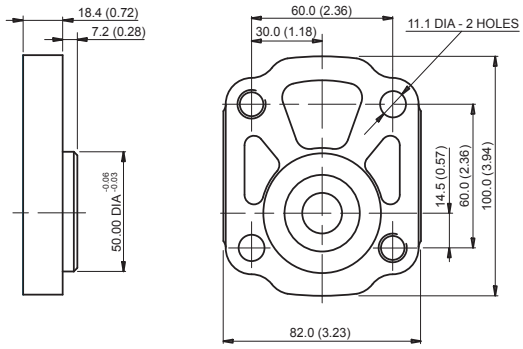
Code D
E52C



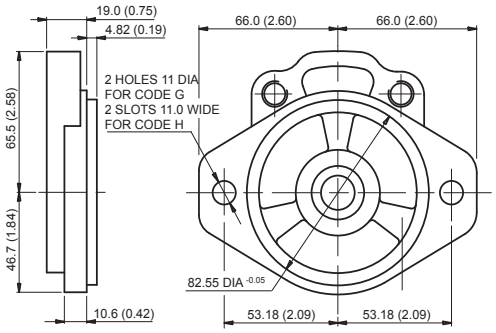
Code E



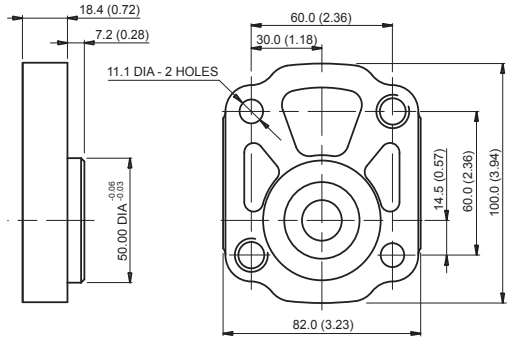
Code F
B50C



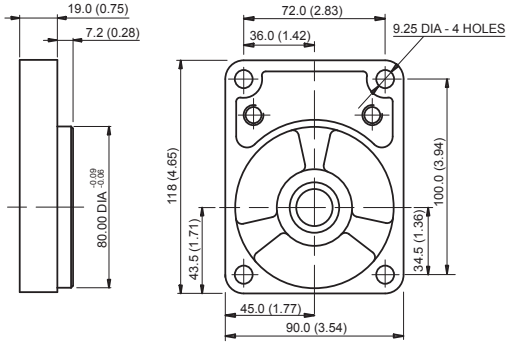
Code G with mounting holes
Code H with mounting slots
SAE 82 - 2 (A - 2 Bolt)



Code J



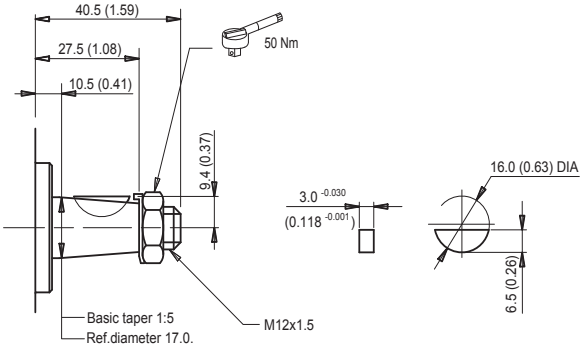
Code S
B80C



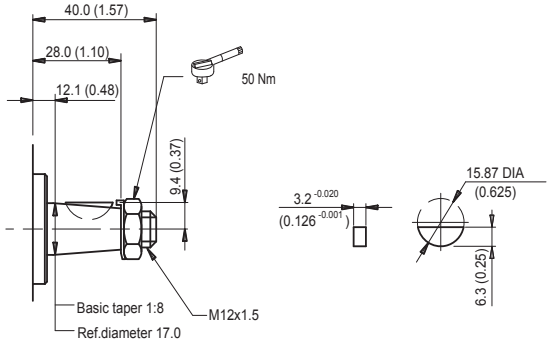
Please note: Other flanges may be available which are not displayed here. Please contact your local representative.

DRIVE SHAFTS

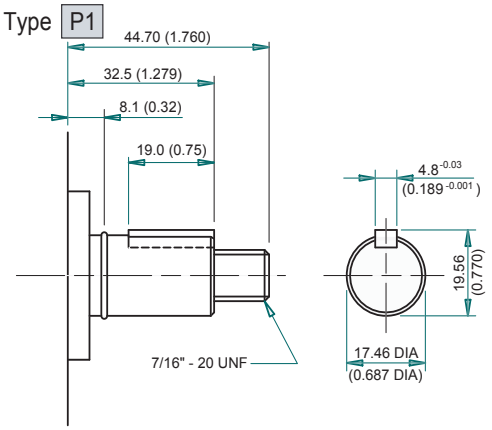
Shaft Type T5



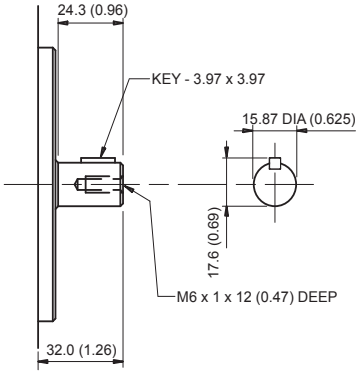
Shaft Type T8



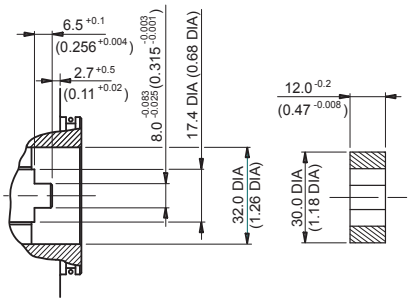
Shaft Type P1



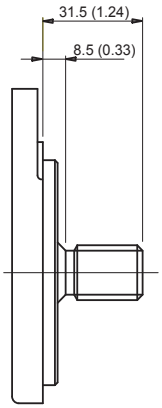
Shaft Type P2



Shaft Type R1

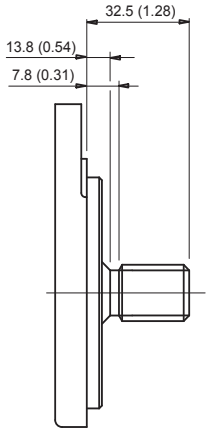


Shaft Type S1



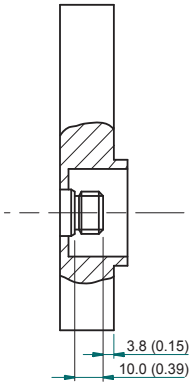
Involute Spline
9 Teeth
16/32 DP
16-4/SAE 'A'
(SAE J744)

Shaft Type S2



SAE Spline
Flat Root Side Fit
11 Teeth
16/32 DP
19-4 (SAE J744)

Shaft Type S3



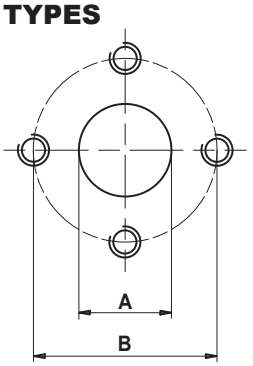
8 Teeth
DIN 5482 Spline
B15X12

Please note: Other shafts may be available which are not displayed here. Please contact your local representative.

1PN SERIES TECHNICAL DETAILS

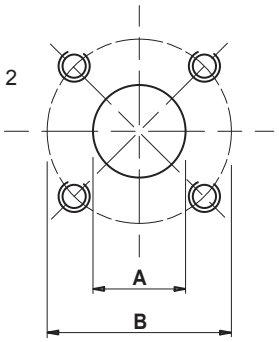
PORT TYPES

TYPE 1



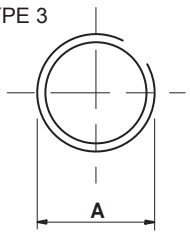
TYPE	'A' Dia	'B' Dia	Thread
A	15.0	35.0	M6x1x13
B	20.0	40.0	M8x1.25x13
C	13.5	30.2	M6x1x13

TYPE 2



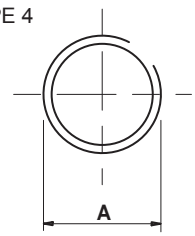
TYPE	'A' Dia	'B' Dia	Thread
D	15.0	35.0	M6x1x13
F	20.0	40.0	M6x1x13

TYPE 3



TYPE	'A' Thread
H	1/2" BSP
J	3/4" BSP

TYPE 4

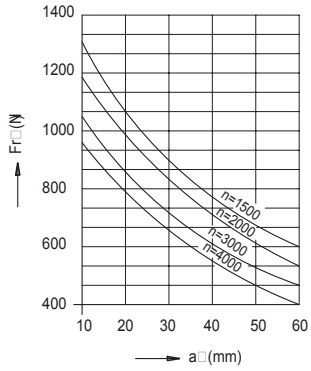


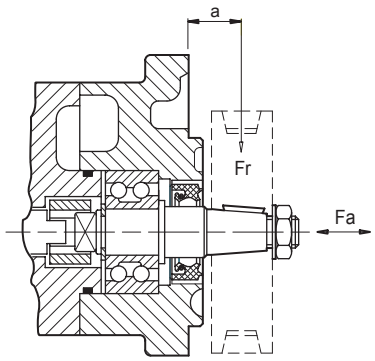
TYPE	'A' Thread
M	7/8"-14 UNF
N	1-1/16"-12 UNF

		Flange Ports - Type 1			Flange Ports - Type 2			Threaded Ports - Type 3			Threaded Ports - Type 4		
PORT TYPE		INLET	INLET	OUTLET	INLET	INLET	OUTLET	INLET	INLET	OUTLET	INLET	INLET	OUTLET
		A	B	C	D	F	D	H	J	H	M	N	M
MODEL TYPE	060	■		■	■		■	■		■	■		■
	082	■		■	■		■	■		■	■		■
	095	■		■	■		■	■		■	■		■
	119		■	■		■	■		■	■		■	■
	140		■	■		■	■		■	■		■	■
	168		■	■		■	■		■	■		■	■
	190		■	■		■	■		■	■		■	■
	229		■	■		■	■		■	■		■	■

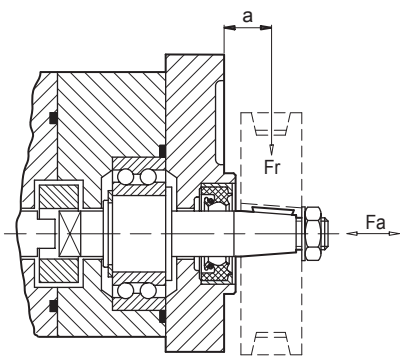
■ = Preferred option. Other port types may be available - consult your David Brown Hydraulics representative for further information

OUTRIGGER BEARINGS



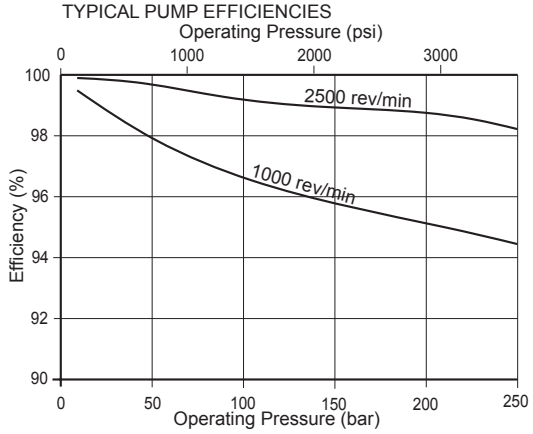


Type 1: Mounting Flange Type 'Y'
(hole centres as Code 'S')



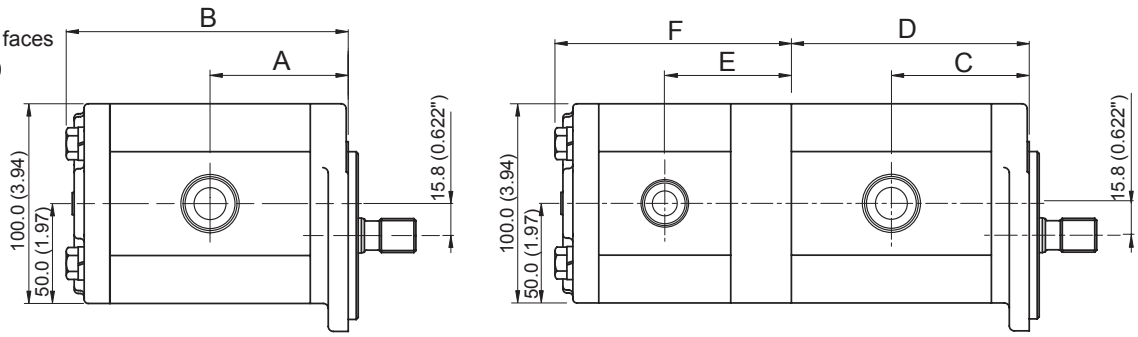
Type 2: Mounting Flange Type 'B', 'G' or 'S'

PUMP EFFICIENCY



1PN SERIES INSTALLATION DATA

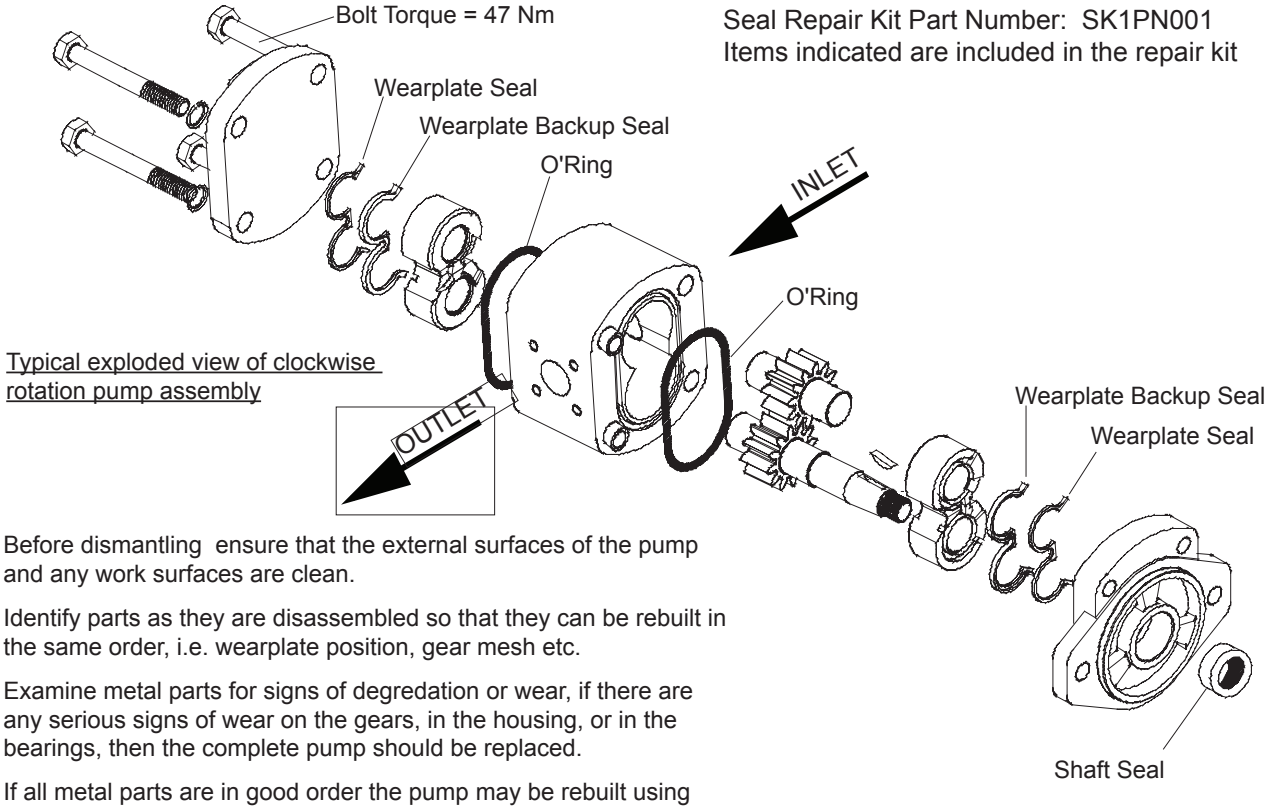
Note:
With across port faces
= 84 mm (3.31")



	SINGLE PUMPS		DOUBLE PUMPS			
PUMP MODEL	A	B	C	D	E	F
040	42.2	88.0	42.2	65.4	53.2	99.0
061	43.8	91.4	43.8	68.7	54.8	102.4
082	45.5	94.6	45.5	71.9	56.5	105.6
095	46.5	96.6	46.5	73.9	57.5	107.6
119	48.4	100.5	48.4	77.7	59.4	111.5
135	49.6	102.9	49.6	80.2	60.6	113.9
140	50.0	102.6	50.0	79.0	61.0	114.7
146	50.5	104.6	50.5	81.9	61.5	115.6
168	52.0	107.1	52.2	85.4	63.2	119.1
192	60.0	123.9	60.0	101.2	71.0	134.9
229	63.0	129.6	63.0	106.9	74.0	140.6
281	67.0	137.8	67.0	115.1	78.0	148.8

Please note: The lengths in this table are true for flange types B, C, G, H, & S. For flange types D, E, F, & J.
Please refer to page 4 of this catalogue for flange length variation.

1PN SERIES SERVICING DATA



Seal Repair Kit Part Number: SK1PN001
Items indicated are included in the repair kit

Typical exploded view of clockwise rotation pump assembly

Before dismantling ensure that the external surfaces of the pump and any work surfaces are clean.

Identify parts as they are disassembled so that they can be rebuilt in the same order, i.e. wearplate position, gear mesh etc.

Examine metal parts for signs of degredation or wear, if there are any serious signs of wear on the gears, in the housing, or in the bearings, then the complete pump should be replaced.

If all metal parts are in good order the pump may be rebuilt using new seals throughout.

Global Hydraulics combines the businesses of David Brown Hydraulics, Hydreco, and Powauto and supports worldwide customers with application expertise and famously reliable products.
The Global Hydraulics range includes pumps, motors, valves, pilot valves and power take offs to provide transport and mobile hydraulic solutions to customers seeking reliability combined with advanced performance.
For assistance see contact information below.

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