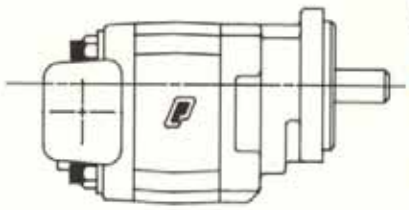
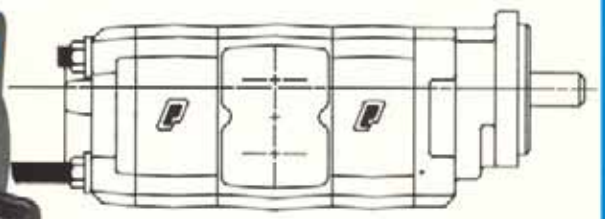
P197/P257 SERIES





PERMCO

TABLE OF CONTENTS

PERMCO'S P197/P257 SERIES JOURNAL BUSHING PUMPS

The P197/P257 series is a series of high performance gear pumps. This completely new design utilizing computer aided engineering has allowed Permco to develop a state of the art external gear pump for heavy duty, high performance mobile applications.

Utilizing specialized sleeve bearing technology, gear journals are supported via a hydra-dynamic film, thus allowing continuous working pressures up to 4500 psi (310 bar) dependent upon the series and the selected gear size. At rated speeds up to 2400 rpm, the series is compatible with all mineral based hydraulic oils and some fire resistant fluids (water glycol and invert emulsions). Employing high strength iron for all pump body components and an all doweled construction, the P197/P257 is well suited for high pressure and high shock load applications.

Internal to the P197/P257 are its patented pressure balanced bronze thrust plates. Being of the floating type, the thrust plates are allowed to move freely, providing a positive seal across the entire face of its mating gear set and ensuring optimum volumetric performance at the highest operating pressures.

The P197/P257 gears are made from a high quality nickel alloy steel that ensures minimal gear flexure at high operating pressures. By using such a steel, the P197/P257 can be operated over a broad range of working pressures without the ensuing gear wipe of the housing at high pressures that can seriously detract from the volumetric output at lower working pressures.

The series is available in both single and multiple gear housing configurations with a variety of drive shaft and porting options. Depending upon the application, the use of Permco's P3000 series continental drive shafts may be applied to the P197 series.

Permco's world headquarters are located in Streetsboro, Ohio with its European operations located near Zurich, Switzerland. We market our products throughout the entire world with distribution and authorized service centers ready to help solve your fluid power problems.

If you require any additional information not contained with this catalog, please feel free to contact your local Permco representative or Permco's Engineering Department.

FLUID TYPE, TEMPERATURE AND INLET CONDITIONS

The P197/P257 series pumps are compatible with mineral base, water glycol and invert emulsion fluids. It is recommended that a premium quality hydraulic fluid with a viscosity range of 150-300 SUS (32-65 cSt.) at 100°F (38° C) be used to assure optimum performance. The normal operating viscosity range is between 55-1000 SUS (9-220 cSt.) with a not to exceed start up viscosity of 2000 SUS (440 cSt.).

Under normal operating conditions, fluid temperatures should not exceed 180° F (82° C) for mineral base fluids and 135° F (57° C) for water glycol and invert emulsions. If temperatures greater than these values are required for a particular application, please consult your Permco representative or call the factory.

Inlet conditions should not exceed 7 in. Hg. for mineral base fluids and 3 in. Hg. for water glycol and invert emulsions. Degassing of the fluid and subsequent cavitation may occur if these values are exceeded. For applications requiring inlet conditions greater than these values, consult your Permco representative or call the factory. Supercharging the inlet is not recommended.

Maximum operating speeds for all fluids and all gear widths is 2400 rpm. Maximum operating pressures are dependent upon gear widths and on the operating fluid. For mineral based oils, maximum operating pressures (dependent upon gear width and series) is 4500 psi (275.8 bar). For water glycol and invert emulsions, consult our Engineering Department.

SHAFT ALIGNMENT

Unit shaft alignment must be within 0.005 inches (.127 mm) total indicator reading (T.I.R.) using a standard motor coupling. Follow coupling manufacturer's installation instructions to prevent end thrust on shaft. Turn pump shaft to assure freedom of rotation. Pump and motor must be mounted on a rigid base.

SIDE LOADS

An outboard bearing is mandatory for radial (side or overhung) loads imposed upon the drive shaft of the pump. The maximum radial load is 1186 lbf. (5276 N) and 3150 lbf. (14011 N) for the 197 and 257, respectively. No axial (thrust) loading is permitted on the shaft.

FILTRATION (MANDATORY)

To assure maximum performance and life, a 10 micrometre nominal return line filter with a Beta 10 rating of 2.2 is required for the system. Attempting to run the pump without proper filtration will degrade the shaft journals and journal bushings, causing premature failure. A 149 micrometre suction strainer is also suggested for added pump protection, however very high viscosities may dictate not using a strainer.

MOUNTING RESTRICTIONS

Mounting position is non-restrictive.

P197/P257 SERIES PERFORMANCE DATA

The information shown on the next pages, represents the average results of a series of laboratory tests and is not necessarily indicative of any one particular unit. Information shown was taken using a mineral base hydraulic fluid at a reservoir temperature of 150° F (65.5° C) and an oil viscosity of 150 SUS at 100° F (32.1 cSt. at 37.8°C).

Consult your Permco Representative or the factory for operation below 600 or above 2400 RPM and temperatures above 180° F.

197 SERIES PERFORMANCE CHART

AVERAGE FLOW — GPM/LPM AT 3000 PSI/206.8 BAR
HORSEPOWER IN — HORSEPOWER/KILOWATTS AT 3000 PSI/206.8 BAR
OIL VISCOSITY — 150 SUS (32.1 cSt.) AT 100° F (37.8° C)
OIL TEMPERATURE — 150° F (65.5° C)

CHART NOMENCLATURE:	GPM/LPM / HP/KW

GEAR WIDTH (in.)

SPEED (RPM)	1	1-1/4	1-1/2	1-3/4	2
600	3.3/12.5	4.2/15.9	5.6/21.2	6.8/25.7	8.2/31.0
	13.7/10.3	16.2/12.1	19.2/14.3	21.2/15.8	24.2/18.0
800	5.1/19.3	6.5/24.6	8.2/30.9	9.79/37.0	11.4/43.1
	17.3/12.9	21.3/15.9	23.9/17.8	26.7/20.0	31.4/23.4
1000	7.0/26.5	9.1/34.4	11.1/42.0	12.9/48.8	14.8/56.0
	19.9/14.8	24.9/18.6	29.2/21.6	34.3/25.5	37.3/27.8
1200	8.7/32.9	11.1/42.2	13.8/52.2	15.8/59.8	18.4/69.6
	22.9/17.1	29.0/21.6	33.2/24.7	38.7/28.8	43.2/32.2
1400	10.5/39.7	13.6/51.4	16.3/61.7	19.1/72.3	21.8/82.5
	25.4/19.0	32.2/24.0	37.7/28.1	44.0/32.8	49.7/37.0
1600	12.2/46.2	15.9/60.0	18.8/71.2	21.9/82.9	25.3/95.8
	28.7/21.5	35.9/26.8	43.2/32.2	49.7/37.0	55.5/41.4
1800	14.1/53.4	17.8/67.5	21.2/80.2	24.9/94.2	28.7/108.6
	32.3/24.1	40.4/30.2	47.9/35.8	57.3/42.7	62.5/46.6
2000	15.8/60.0	19.8/74.9	23.5/89.0	27.7/104.8	31.7/120.0
	36.4/27.2	45.5/33.9	53.9/40.2	63.7/47.5	71.9/53.6
2200	17.4/66.0	21.8/82.5	25.9/98.0	30.5/115.4	34.8/131.7
	41.0/30.6	50.6/37.8	60.0/44.8	70.1/52.3	79.1/59.0
2400	19.0/72.0	23.7/90.0	28.2/106.7	33.3/126.0	38.1/144.2
	46.5/34.7	55.9/41.7	66.3/49.4	77.3/57.6	89.3/66.6

Gear Width	Max. Continuous Operating Pressure (psi/bar)
1 thru 1-1/4	4000/275.8
1-1/2	3750/258.6
1-3/4	3500/241.4
2	3250/224.1

257 SERIES PERFORMANCE CHART

AVERAGE FLOW — GPM/LPM AT PRESSURE SHOWN IN CHART
HORSEPOWER IN — HORSEPOWER/KILOWATTS AT PRESSURE SHOWN IN CHART
OIL VISCOSITY — 150 SUS (32.1 cSt.) AT 100°F (37.8°C)
OIL TEMPERATURE — 150° F (65.5° C)

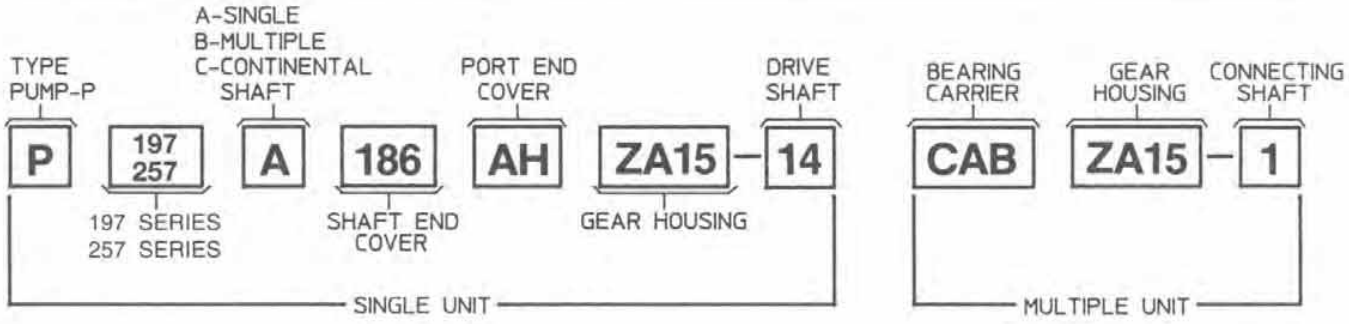
GEAR WIDTH (in.)/PRESSURE

SPEED (RPM)	1 3000 PSI	1-1/4 3000 PSI	1-1/2 3000 PSI	1-3/4 3000 PSI	2 3000 PSI	2-1/4 2750 PSI	2-1/2 2500 PSI
600	4.3/16.3	5.5/20.7	7.3/27.6	8.9/33.5	10.5/39.7	12.4/46.8	14.2/53.7
	17.9/13.4	21.4/15.9	25.0/18.7	27.8/20.7	31.3/23.2	32.0/23.9	31.8/23.7
800	6.6/25.2	8.5/32.1	10.7/40.5	12.7/48.3	14.9/56.2	16.8/63.7	19.1/72.4
	22.6/16.9	28.1/20.9	31.2/23.3	34.7/25.9	39.5/29.5	39.0/29.1	41.0/30.5
1000	9.1/34.6	11.8/44.9	14.5/54.8	16.8/63.7	19.3/73.0	21.9/82.8	24.8/93.9
	27.0/20.1	33.8/25.2	39.6/29.6	44.5/33.2	48.9/36.5	48.7/36.3	50.9/38.0
1200	11.3/42.9	14.5/54.8	18.0/68.1	20.6/78.0	24.0/90.8	27.1/102.6	30.4/115.1
	29.9/22.3	38.4/28.7	43.1/32.2	50.8/37.9	56.8/42.3	57.9/43.2	59.0/44.0
1400	13.7/51.8	17.7/67.1	21.2/80.5	24.9/94.3	28.4/107.6	32.4/122.8	36.2/136.9
	33.3/24.8	41.8/31.2	48.8/36.4	57.3/42.8	64.5/48.1	67.4/49.7	67.6/50.5
1600	15.9/60.2	20.7/78.5	24.5/92.8	28.6/108.1	33.0/124.9	37.3/141.3	41.7/158.2
	37.6/28.0	47.0/35.1	56.4/42.1	65.0/48.5	72.2/53.8	73.7/55.0	74.1/55.3
1800	18.4/69.6	23.2/87.8	27.6/104.6	32.4/122.8	37.2/140.7	42.2/159.8	47.2/178.5
	42.4/31.6	52.7/39.3	62.7/46.8	74.6/55.6	81.4/60.7	80.5/60.0	81.0/60.4
2000	20.6/77.9	25.8/97.8	30.9/117.1	36.1/136.7	41.3/156.5	46.9/177.7	52.5/198.7
	47.4/35.4	59.4/44.3	71.2/53.1	83.1/62.0	93.9/70.0	92.8/69.3	92.2/68.7
2200	22.7/85.9	28.4/107.7	34.1/128.9	39.8/150.6	45.5/172.3	51.6/195.3	57.5/217.9
	53.7/40.0	66.3/49.4	79.6/59.3	91.7/68.3	103.4/77.1	102.2/76.1	103.5/77.1
2400	24.8/93.9	31.0/117.5	37.2/141.0	43.4/164.3	49.7/188.2	56.2/212.8	62.1/235.0
	61.1/45.6	73.3/54.7	88.0/65.6	101.3/75.5	116.0/86.6	114.1/85.0	120.0/89.5

Gear Width	Max. Continuous Operating Pressure (psi/bar)
1/2 thru 1-1/4	4500/310.3
1-1/2	3500/241.4
1-3/4	3250/224.1
2	3000/206.9
2-1/4	2750/189.6
2-1/2	2500/172.4

CHART NOMENCLATURE: GPM/LPM over HP/KW

CODING



197 SERIES DIMENSIONAL DATA

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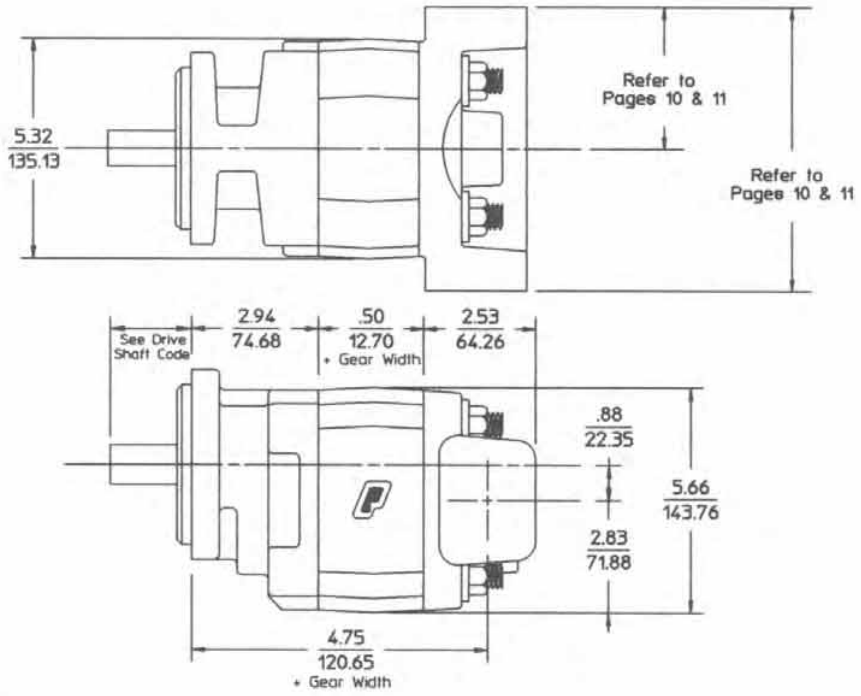

Dimensions: Inches / Millimeters

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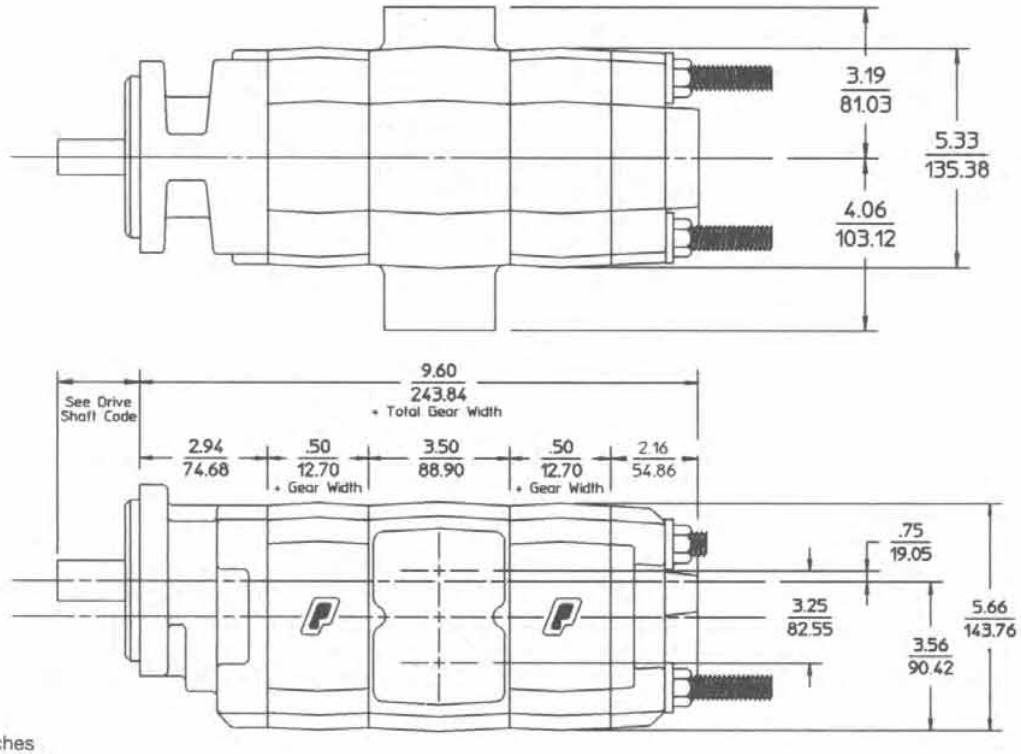

Dimensions: Inches / Millimeters

257 SERIES DIMENSIONAL DATA

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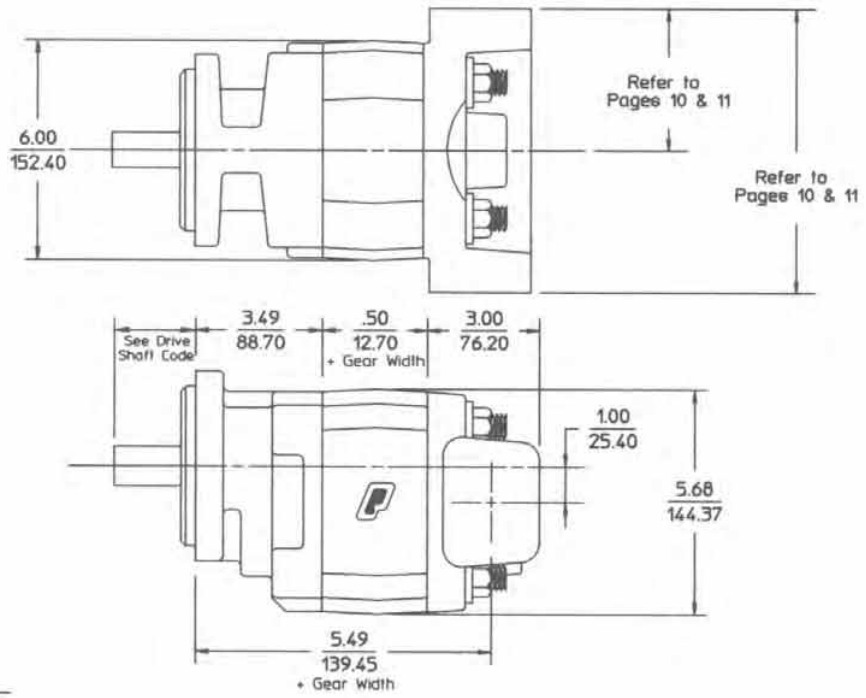

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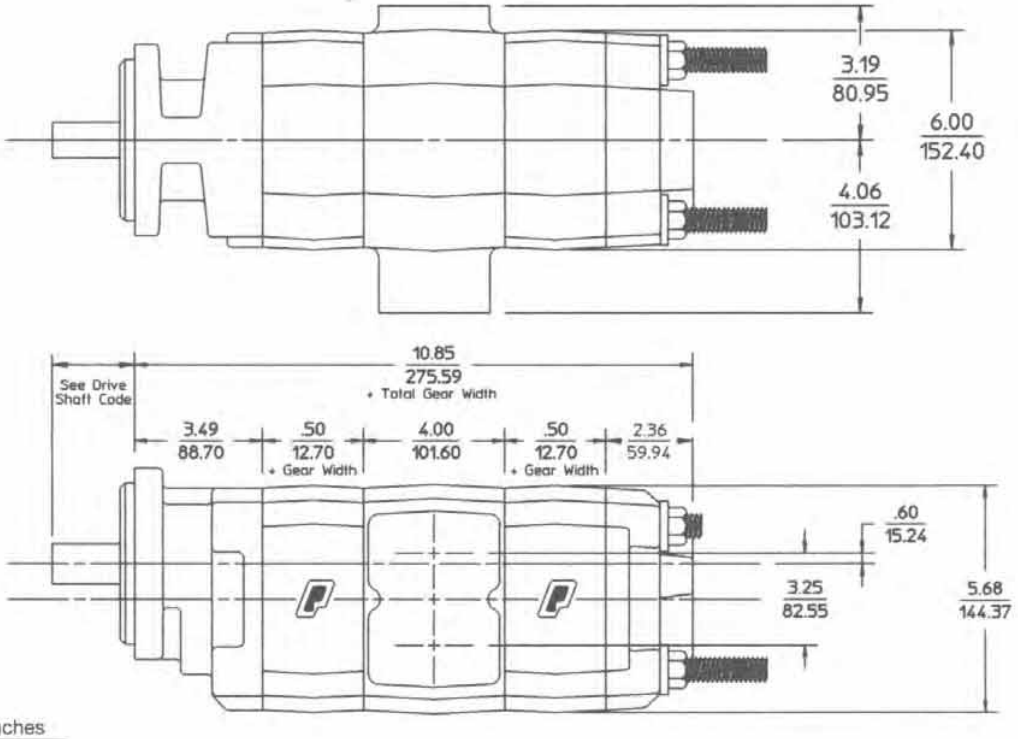
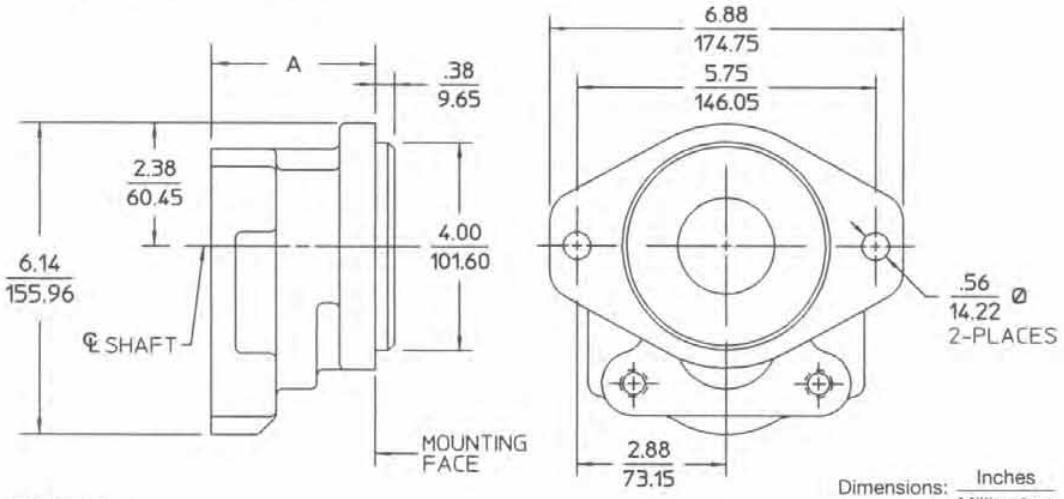


Dimensions: Inches / Millimeters

197/257 SERIES SHAFT END COVERS

2 BOLT MOUNTING FLANGE — SAE B



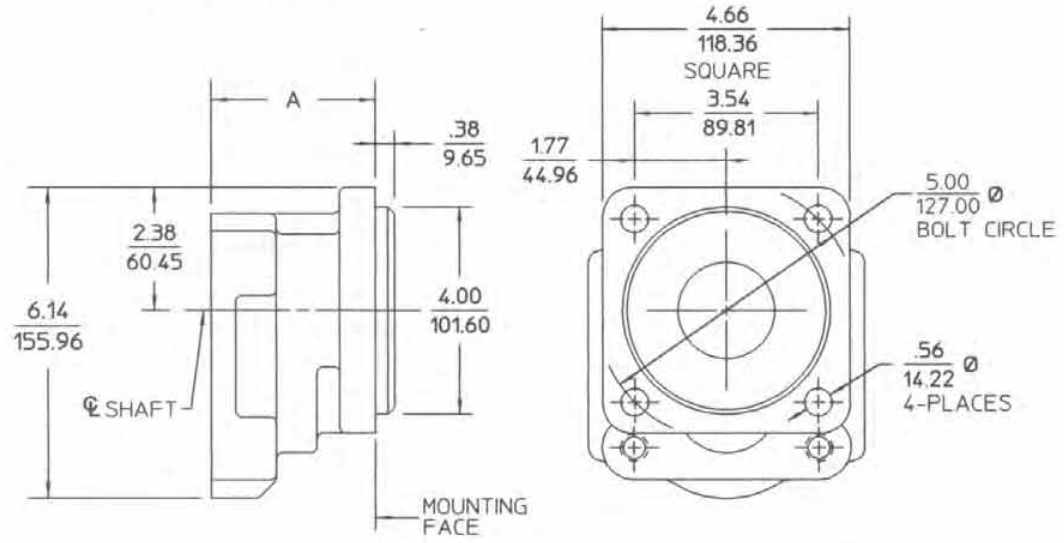
Dimensions: Inches / Millimeters

CODES

ROTATION		SHAFT BEARING	
		WITH	WITHOUT
PUMPS	CW	386	086
	CCW	486	186

DIMENSION	197	257
A	2.94	3.49
	74.68	88.70

4 BOLT MOUNTING FLANGE — SAE B



Dimensions: Inches / Millimeters

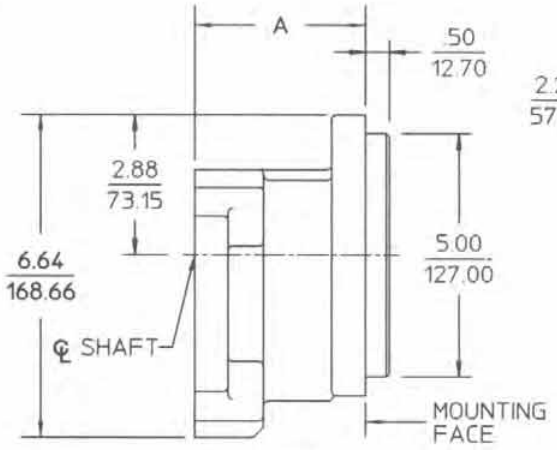
CODES

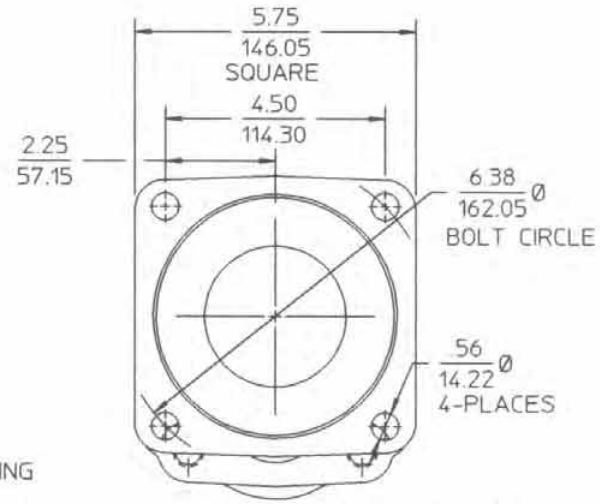
ROTATION		SHAFT BEARING	
		WITH	WITHOUT
PUMPS	CW	331	031
	CCW	431	131

DIMENSION	197	257
A	2.94	3.49
	74.68	88.70

197/257 SERIES SHAFT END COVER

4 BOLT MOUNTING FLANGE — SAE C





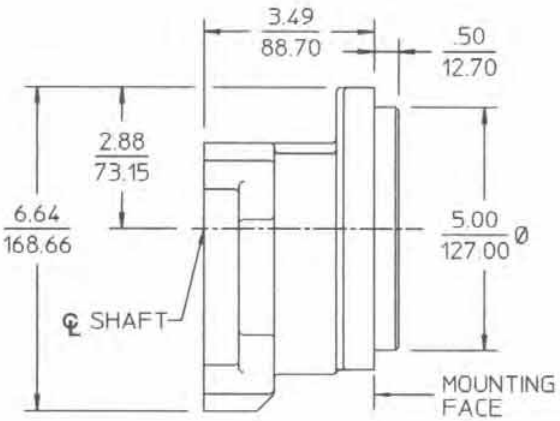
Dimensions: Inches / Millimeters

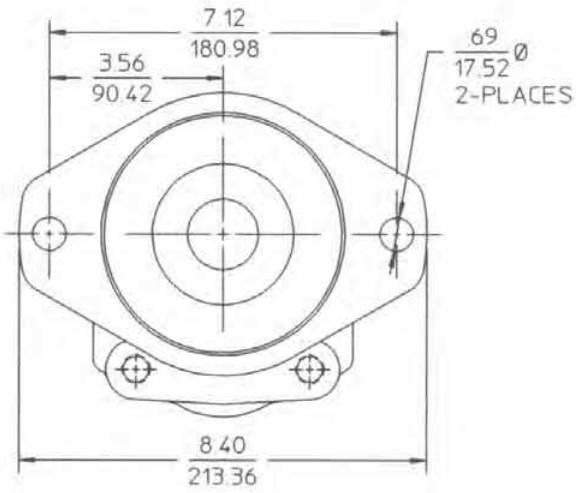
ROTATION		SHAFT BEARING	
		WITH	WITHOUT
PUMPS	CW	367	067
	CCW	467	167

DIMENSION	197	257
A	2.94	3.49
	74.68	88.70

257 SERIES (Only) SHAFT END COVER

2 BOLT MOUNTING FLANGE — SAE C



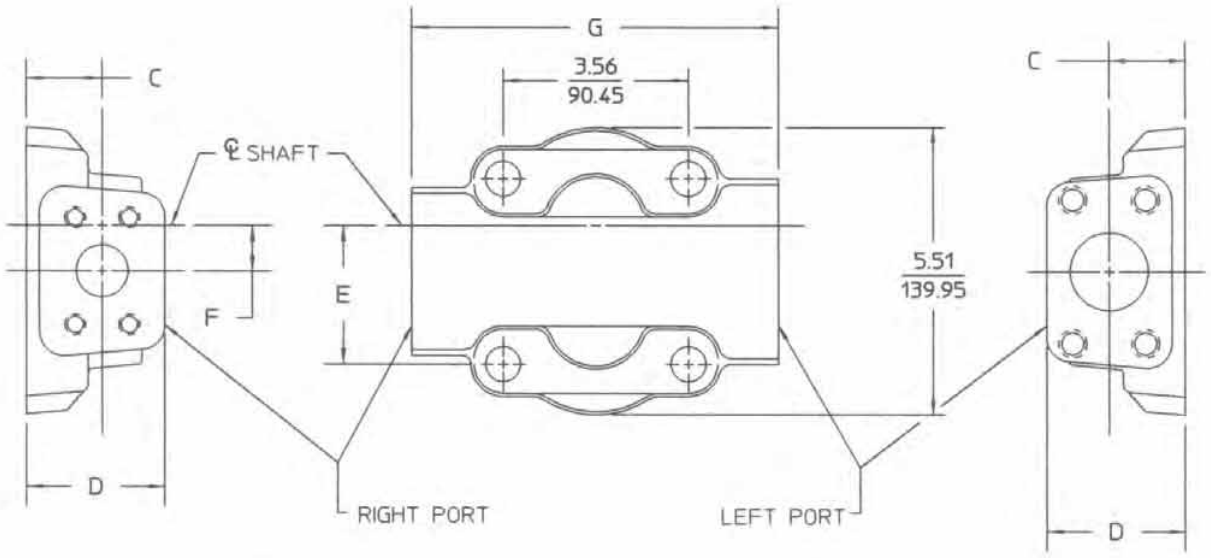


ROTATION		SHAFT BEARING	
		WITH	WITHOUT
PUMPS	CW	387	087
	CCW	487	187

Dimensions: Inches / Millimeters

197/257 SERIES SINGLE PUMP PORT END COVER

SAE 4-BOLT SPLIT FLANGE PORTS



Dimensions: Inches / Millimeters

CODE SELECTION

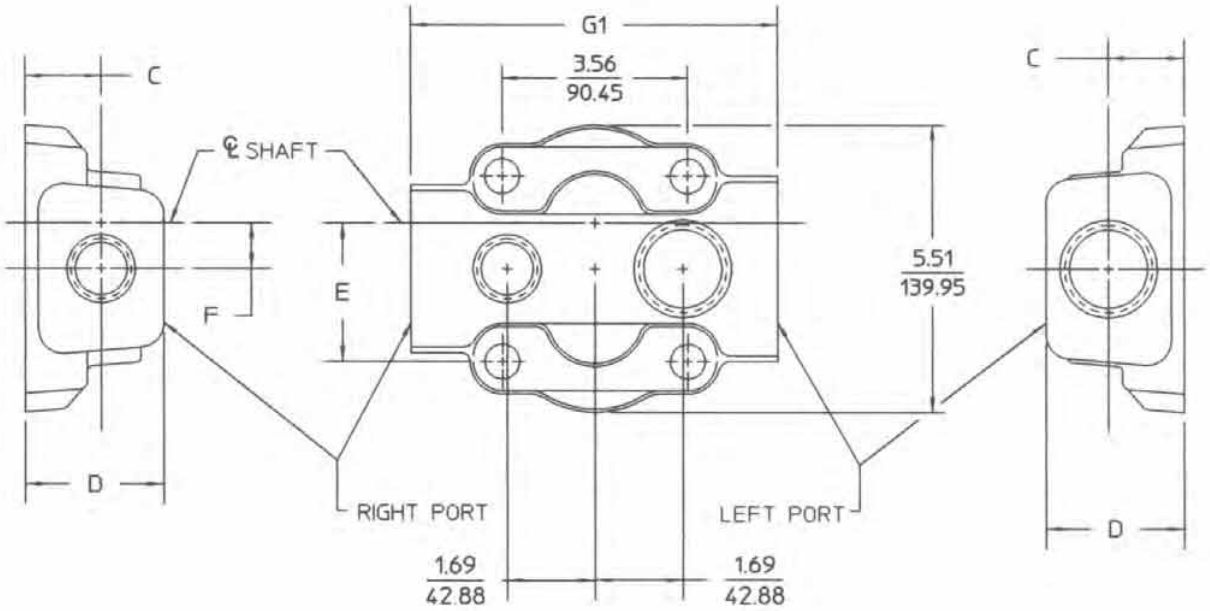
SIDE PORT	ROTATION	LEFT INLET	RIGHT OUTLET	LEFT OUTLET	RIGHT INLET
PA	CW	3/4	1/2	–	–
PB	CW	1	1/2	–	–
PC	CW	1	3/4	–	–
PD	CW	1-1/4	3/4	–	–
PE	CW	1-1/4	1	–	–
PF	CW	1-1/2	1	–	–
PG	CW	1-1/2	1-1/4	–	–
PH	CCW	–	–	1/2	3/4
PJ	CCW	–	–	1/2	1
PK	CCW	–	–	3/4	1
PL	CCW	–	–	3/4	1-1/4
PM	CCW	–	–	1	1-1/4
PN	CCW	–	–	1	1-1/2
PO	CCW	–	–	1-1/4	1-1/2
*PP	CW	2	1-1/4	–	–
*PQ	CW	2	1-1/2	–	–
*PR	CCW	–	–	1-1/4	2
*PS	CCW	–	–	1-1/2	2

*"2" ports available in P257 series only.

NOTE: For extended studs, add an "X" to the above codes

DIMENSION	197	257
C	1.31	1.50
	33.27	38.10
D	2.53	3.00
	64.26	76.20
E	2.66	2.78
	67.56	70.63
F	0.88	1.00
	22.35	25.40
G	7.00	7.13
	177.80	180.98

SAE STRAIGHT THREAD AND BSPP PORTS



Dimensions: Inches / Millimeters

CODE SELECTION (SAE STRAIGHT THREAD)

BOTH SIDE	BOTH REAR	SIDE INLET REAR OUTLET	REAR INLET SIDE OUTLET	ROTATION	LEFT INLET	RIGHT OUTLET	LEFT OUTLET	RIGHT INLET
AA	AB	AC	AD	CW	3/4	1/2	—	—
BA	BB	BC	BD	CW	1	3/4	—	—
CA	CB	CC	CD	CW	1-1/4	1	—	—
DA	—	DC	—	CW	1-1/2	1-1/4	—	—
EA	EB	EC	ED	CCW	—	—	1/2	3/4
FA	FB	FC	FD	CCW	—	—	3/4	1
GA	GB	GC	GD	CCW	—	—	1	1-1/4
HA	—	HC	—	CCW	—	—	1-14	1-1/2

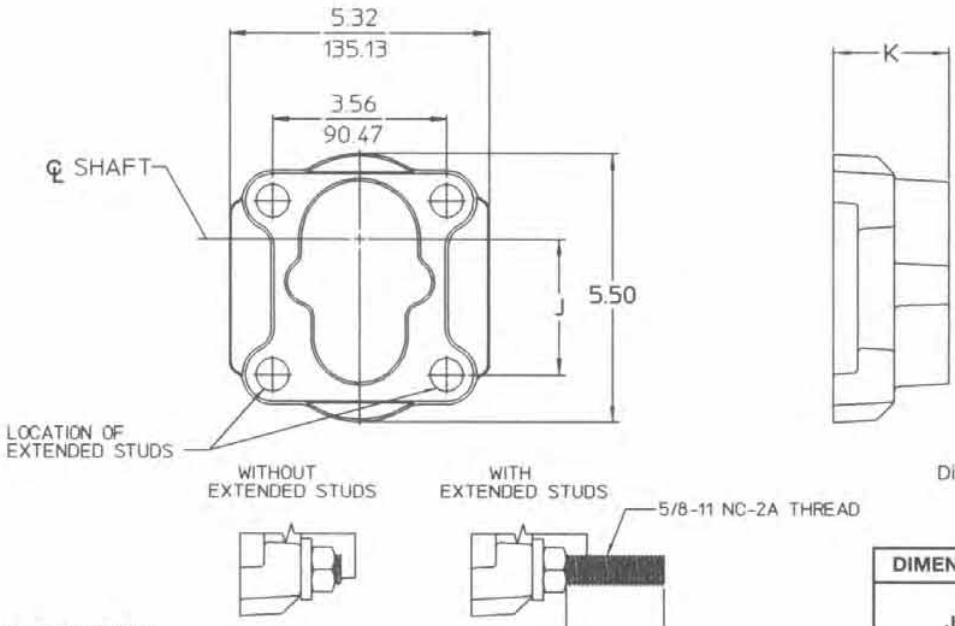
CODE SELECTION (BSPP)

BOTH SIDE	BOTH REAR	SIDE INLET REAR OUTLET	REAR INLET SIDE OUTLET	ROTATION	LEFT INLET	RIGHT OUTLET	LEFT OUTLET	RIGHT INLET
JA	JB	JC	JD	CW	1	3/4	—	—
KA	KB	KC	KD	CW	1-1/4	1	—	—
LA	—	LC	—	CW	1-1/2	1-1/4	—	—
MA	MB	MC	MD	CCW	—	—	3/4	1
NA	NB	NC	ND	CCW	—	—	1	1-1/4
OA	—	OC	—	CCW	—	—	1-1/4	1-1/2

DIMENSION	197	257
C	1.31	1.50
	33.27	38.10
D	2.53	3.00
	64.26	76.20
E	2.66	2.78
	67.56	70.63
F	0.88	1.00
	22.35	25.4
G1	7.25	7.44
	184.15	188.98

NOTE: For extended studs, add an "X" to the above codes

197/257 SERIES TANDEM PUMP PORT END COVER



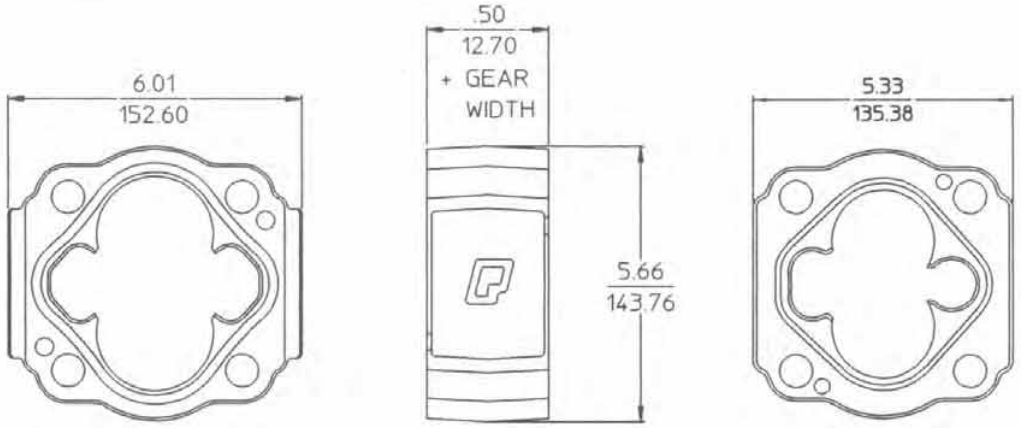
Dimensions: Inches / Millimeters

DIMENSION	197	257
J	2.66	2.78
	67.56	70.61
K	2.16	2.36
	54.86	59.94

CODE SELECTION

STUDS/F	STUDS EXT.
AH	AX

197/257 SERIES GEAR HOUSING



257 SERIES

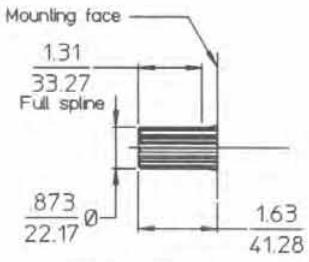
197 SERIES

Dimensions: Inches / Millimeters

CODE SELECTION Gear Width (in.)

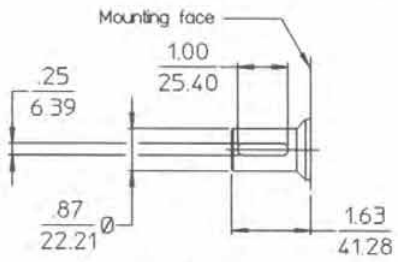
1/2	3/4	1	1-1/4	1-1/2	1-3/4	2	2-1/4	2-1/2
ZA05	ZA07	ZA10	ZA12	ZA15	ZA17	ZA20	ZA22	ZA25
							257 ONLY	

14 SPLINED SAE B (13 TOOTH)



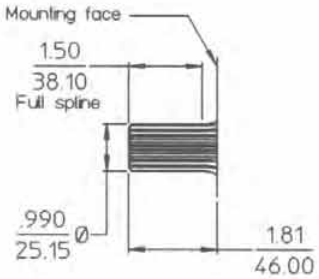
257 PL=6500,6500
197 PL=8000,6000

29 SAE B KEYED



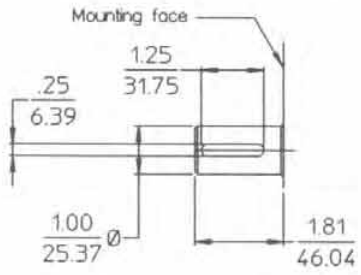
257 PL=N/A,4500
197 PL=N/A,6000

87 SPLINED SAE BB (15 TOOTH)



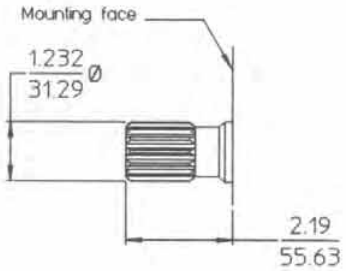
257 PL=10000,8000
197 PL=10000,6000

32 SAE BB KEYED



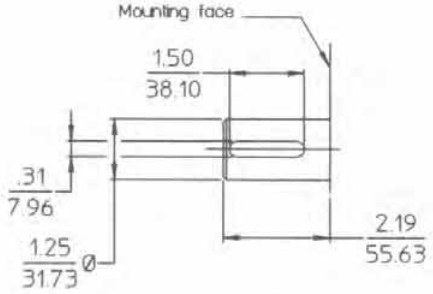
257 PL=6500,CONSULT FACTORY
197 PL=8000,CONSULT FACTORY

6 SPLINED SAE C (14 TOOTH)



257 PL=16000,8000
197 PL=N/A,6000

00 SAE C KEYED



257 PL=14000,8000

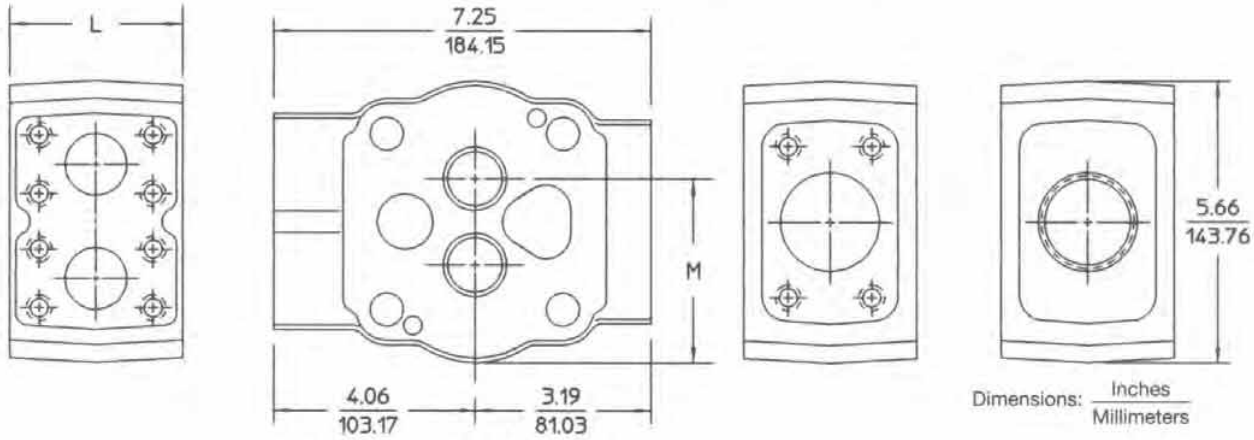
PL = PRESSURE x GEAR WIDTH (For each section and added together)

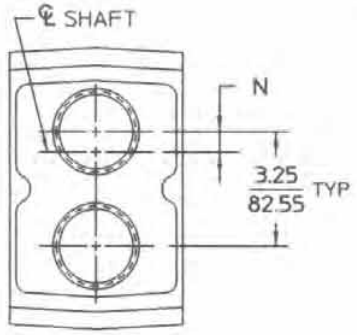
The 257 series has its own continental shafts.
P3000 series continental shafts can be applied in P197 pumps. Consult the Permco code book or the factory for type and availability.

Do not exceed listed PL factor shown for each shaft.

(FORMAT PL = INTEGRAL PL, CONTINENTAL PL)

SAE 4-BOLT SPLIT FLANGE, SAE STRAIGHT THREAD AND BSPP PORTS





DIMENSION	197	257
L	3.50	4.00
	88.90	101.60
M	3.56	3.83
	90.42	97.28
N	0.75	0.60
	19.05	15.24

SPLIT FLANGE PORTING CODES

INLET PORT	ROTATION CW	CCW
1	A	B
1-1/4	C	D
1-1/2	E	F
2	G	H
*2-1/2	Y	Z

*257 ONLY

BOTTOM OUTLET \ TOP OUTLET	3/4	1	1-1/4
3/4	AA	AB	AC
1	BA	BB	BC
1-1/4	CA	CB	CC

BSPP PORTING CODES

INLET PORT	ROTATION CW	CCW
1	I	J
1-1/4	K	L
1-1/2	M	N

BOTTOM OUTLET \ TOP OUTLET	3/4	1	1-1/4
3/4	DA	DB	DC
1	EA	EB	EC
1-1/4	FA	FB	FC

SAE STRAIGHT THREAD PORTING CODES

INLET PORT	ROTATION CW	CCW
1	Q	R
1-1/4	S	T
1-1/2	U	V
*2	W	X

*257 ONLY

BOTTOM OUTLET \ TOP OUTLET	1/2	3/4	1	1-1/4
1/2	HA	HB	HC	HD
3/4	JA	JB	JC	JD
1	KA	KB	KC	KD
1-1/4	LA	LB	LC	LD

Determination of Bearing Carrier Code

1. In the belly down position, determine pump rotation from shaft end. Clockwise rotation will put the inlet on the left side and the top outlet port will be for the front gear section. Counterclockwise rotation will put the inlet on the right side and the top outlet will be for the rear gear section.
2. Select inlet port size.
   Find the appropriate letter that meets the port size and rotation requirements.
3. Select outlet port requirements.
   Top outlet refers to the front gear section for clockwise rotation and rear gear section for counterclockwise rotation. Bottom outlet refers to the rear gear section for clockwise rotation and front gear section for counterclockwise rotation.
4. Combine the inlet port designation with the outlet port designation to arrive at the bearing carrier code.

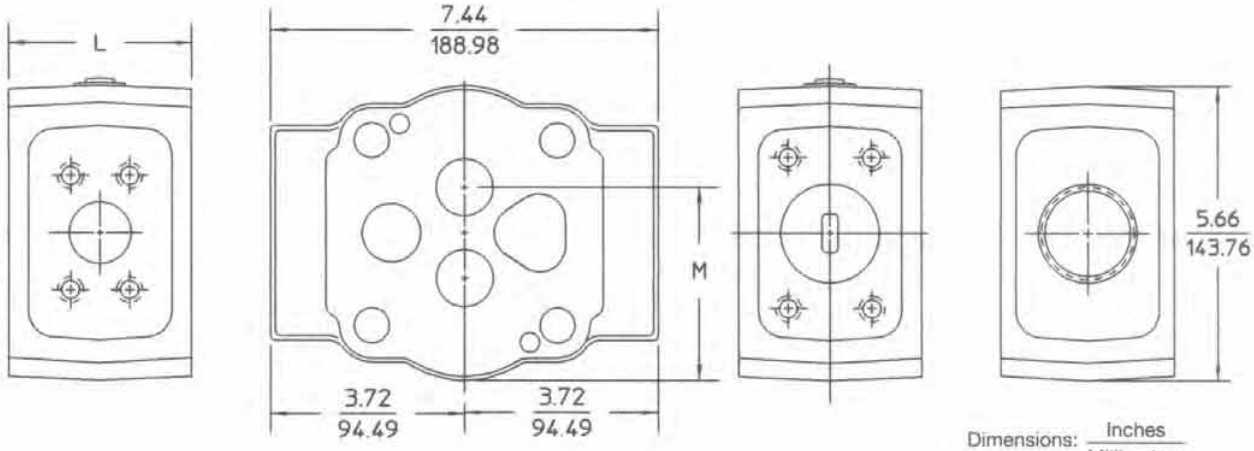
Example: Rotation: Clockwise
Inlet Porting: Split Flange with 1-1/4" Inlet
Designator -C

Outlet Porting: 1" Split Flange top (front section)
3/4" Split Flange bottom (rear section)
Designator -AB

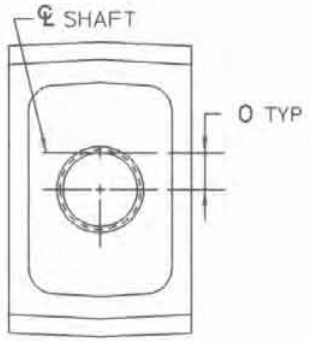
Complete Bearing Carrier Code: CAB

197/257 SERIES BEARING CARRIER — SINGLE INLET / SINGLE OUTLET

SAE 4-BOLT SPLIT FLANGE, SAE STRAIGHT THREAD AND BSPP PORTS



Dimensions: Inches / Millimeters



DIMENSION	197	257
L	3.50	4.00
	88.90	101.60
M	3.56	3.83
	90.42	97.28
O	0.88	1.00
	22.23	25.40

SPLIT FLANGE PORTING CODES

INLET PORT	ROTATION CW	ROTATION CCW
1	A	B
1-1/4	C	D
1-1/2	E	F
2	G	H
*2-1/2	Y	Z

SIZE	PORT TO FRONT	PORT TO REAR	COMMON OUTLET
3/4	AX	XA	MA
1	BX	XB	MB
1-1/4	CX	XC	MC
1-1/2	DX	XD	MD
2	EX	XE	ME
*2-1/2	FX	XF	MF

*257 ONLY

BSPP PORTING CODES

INLET PORT	ROTATION CW	ROTATION CCW
1	I	J
1-1/4	K	L
1-1/2	M	N

SIZE	PORT TO FRONT	PORT TO REAR	COMMON OUTLET
3/4	GX	XG	MG
1	HX	XH	MH
1-1/4	IX	XI	MI
1-1/2	JX	XJ	MJ

SAE STRAIGHT THREAD PORTING CODES

INLET PORT	ROTATION CW	ROTATION CCW
1	Q	R
1-1/4	S	T
1-1/2	U	V
*2	W	X

SIZE	PORT TO FRONT	PORT TO REAR	COMMON OUTLET
1/2	LX	XL	ML
3/4	MX	XM	MM
1	NX	XN	MN
1-1/4	QX	XQ	MQ
1-1/2	RX	XR	MR
*2	SX	XS	MS

*257 ONLY

Determination of Bearing Carrier Code

1. In the belly down position, determine pump rotation from shaft end. Clockwise rotation will put the inlet on the left side and the outlet port will be on the right side. Counterclockwise rotation will put the inlet on the right side and the outlet will be on the left side.

Example: Rotation: Clockwise
Inlet Porting: Split Flange with 1-1/4" Inlet
Designator -C
Outlet Porting: 1" Split Flange (front section)
Designator -BX
Complete Bearing Carrier Code: CBX

WEIGHTS — 197 SERIES

WEIGHT (approximate) SINGLE UNITS

	Gear Width (in.)				
	1	1-1/4	1-1/2	1-3/4	2
Unit Weight (lbs.)	37.0	38.0	39.0	40.5	42.0
Unit Weight (kgs.)	16.8	17.2	17.7	18.4	19.0

WEIGHT (approximate) MULTIPLE UNITS

	Gear Width (in.)					
	1	1-1/4	1-1/2	1-3/4	2	BEARING CARRIER
Unit Weight (lbs.)	12.0	13.0	14.0	15.5	17.0	31.0
Unit Weight (kgs.)	5.4	5.9	6.3	7.0	7.7	14.1

For total multiple unit weight, add the selected gear widths plus the total number of bearing carriers required. To this sum, add 21 lbs. (9.5 kgs.) for the shaft end cover and port end cover combined weight. Please note that this combined weight includes the smaller port end cover designed for multiple units.

WEIGHTS — 257 SERIES

WEIGHT (approximate) SINGLE UNITS

	Gear Width (in.)								
	1/2	3/4	1	1-1/4	1-1/2	1-3/4	2	2-1/4	2-1/2
Unit Weight (lbs.)	43.6	45.0	46.2	47.8	49.1	50.6	51.8	53.3	54.6
Unit Weight (kgs.)	19.8	20.4	20.9	21.7	22.3	22.9	23.5	24.1	24.7

WEIGHT (approximate) MULTIPLE UNITS

	Gear Width (in.)									
	1/2	3/4	1	1-1/4	1-1/2	1-3/4	2	2-1/4	2-1/2	BEARING CARRIER
Unit Weight (lbs.)	7.0	8.3	9.7	11.0	12.3	13.7	15.0	16.4	17.7	28.0
Unit Weight (kgs.)	3.2	3.8	4.4	5.0	5.6	6.2	6.8	7.5	8.0	12.7

For total multiple unit weight, add the selected gear widths plus the total number of bearing carriers required. To this sum, add 27.8 lbs. (12.6 kgs.) for the shaft end cover and port end cover combined weight. Please note that this combined weight includes the smaller port end cover designed for multiple units.

NOTE: Weights are approximate and will vary due to shaft end cover type and porting sizes.

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