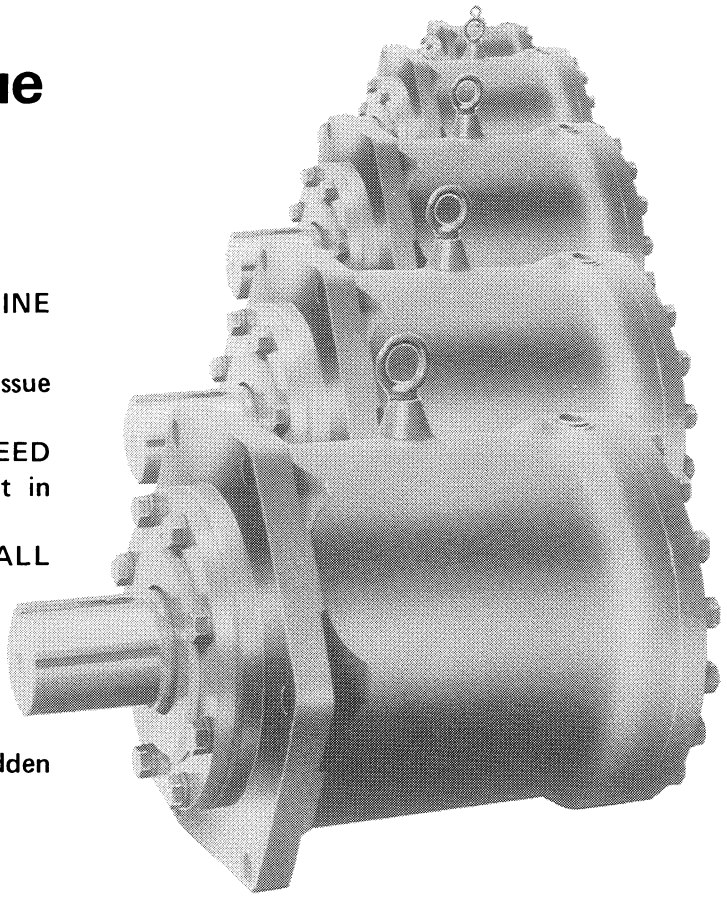
EATON | Hydraulics

ME Series Hydraulic Motors

Eaton®

ME Series
Low Speed High Torque Hydraulic Motor



ADVANTAGES

"PROVEN IN INDUSTRIAL, MOBILE AND MARINE APPLICATIONS"

- HIGH PRESSURE – Continuous Operating Pressue 3600 psi
- SMOOTH OPERATION AT VERY LOW SPEED Multiple pistons and double swash plate result in smooth operation at speeds down to 1 rev/min
- HIGH STARTING TORQUE AND HIGH OVERALL EFFICIENCY
- COMPACT AND EASY TO INSTALL
- FULLY REVERSIBLE
- RUGGED CONSTRUCTION
- QUIET OPERATION
- UNAFFECTED BY THERMAL SHOCK (sudden changes in operating fluid temperature)

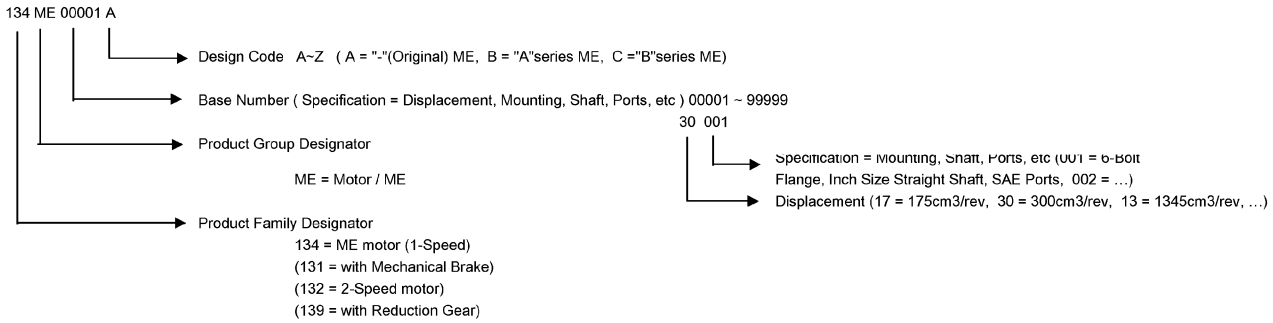
New Performance Data

Model	Displacement	Rated Pressure	Peak Pressure	Rated Torque	Rated Speed	Max Speed	Max Horse Power	Weight
	in^3/rev.	psi	psi	lbf-ft	rpm	rpm	hp	lbs
ME100	6.04	4000	4700	320	1000	1000	61	49
ME150	9.27	4000	4700	492	600	800	56	92
ME175	10.68	4000	4700	566	600	800	65	92
ME300	18.55	4000	4700	984	600	800	112	117
ME350	21.36	4000	4700	1133	600	800	129	117
ME600A	36.74	4000	4700	1948	450	600	167	203
ME750A	45.76	4000	4700	2426	400	520	185	265
ME850	51.68	4000	4700	2740	350	450	183	265
ME1300A	82.06	3600	4700	3916	200	390	186	375
ME1900	113.97	3600	4700	5438	140	260	173	595
ME2600	157.29	3600	4700	7505	110	230	214	772
ME3100	189.42	3600	4700	9039	110	230	251	802
ME4100	249.97	3600	4700	11928	75	200	284	1147

※ Speed in ( ) is a value at 3000 psi.

Limit of hydraulic fluid temperature; –4°F ~ +176°F
Limit of hydraulic fluid viscosity; 77 ~ 2300 SUS
(Normal operating fluid viscosity range; 120 ~ 460 SUS)

Product Numbers (NEW)
ME motors



Example 134ME10001A = ME100-KE (ME motor, 99cm3/rev, Inch size Straight shaft, SAE Ports, Original design)
134ME13006B = ME1300AP (ME motor, 1345cm3/rev, Metric Spline shaft, Metric Ports, A series)
134ME35002C = ME350BHE (ME motor, 350cm3/rev, Inch size Spline shaft, SAE Ports, Third design = B series)

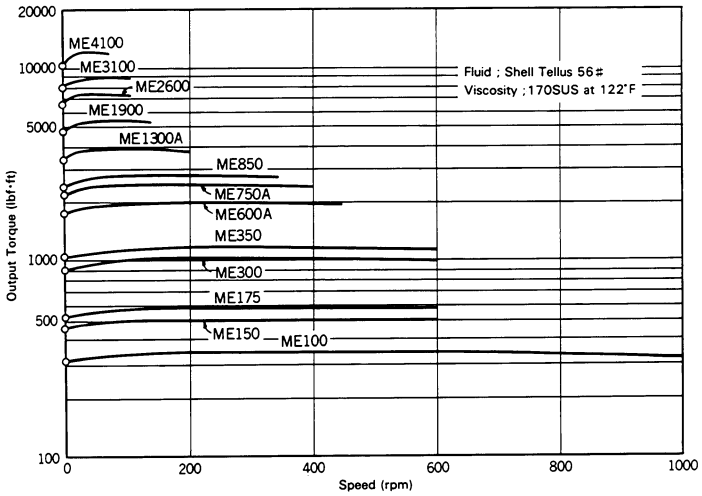
Standard Motor

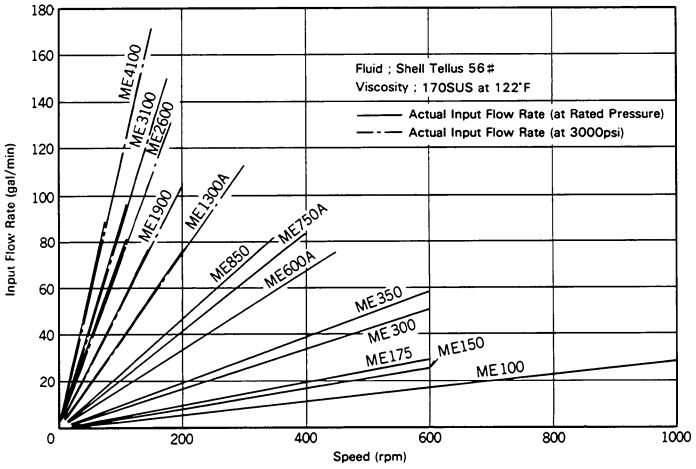
Model			(ME100)	(ME150)	(ME175)	(ME300B)	(ME350B)	(ME600B)
			Displacement cm3/r [in3/r] and Product Number					
			99	152	175	300	350	600
Mounting	Shaft	Ports	[6.0]	[9.3]	[10.7]	[18.3]	[21.4]	[36.6]
6 Bolt Flange (99cm3/r =4 Bolt) (750, 848cm3/r =5 Bolt)	Inch Size Straight (K)	SAE (E)	134ME10001	134ME15001	134ME17001	134ME30001	134ME35001	134ME60001
		Metric						
	Inch Size Spline (H)	SAE (E)	134ME10002	134ME15002	134ME17002	134ME30002	134ME35002	134ME60002
		Metric						
	Metric 1/10 Taper (B)	SAE (E)	134ME10003	134ME15003	134ME17003	134ME30003	134ME35003	134ME60003
		Metric	134ME10021	134ME15021	134ME17021	134ME30021	134ME35021	134ME60021
	Metric Straight (C)	SAE (E)						
		Metric	134ME10022	134ME15022	134ME17022	134ME30022	134ME35022	134ME60022
	Metric Spline (P)	SAE (E)						
		Metric	134ME10023	134ME15023	134ME17023	134ME30023	134ME35023	134ME60023

Standard Motor

Model			(ME750B)	(ME850B)	(ME1300A)	(ME1900)	(ME2600)	(ME3100)	(ME4100)
			750	848	1345	1868	2578	3104	4097
Mounting	Shaft	Ports	[45.8]	[51.8]	[82.1]	[114.0]	[157.3]	[189.4]	[250.0]
6 Bolt Flange (99cm3/r =4 Bolt) (750, 848cm3/r =5 Bolt)	Inch Size Straight (K)	SAE (E)	134ME75001	134ME85001	134ME13001	134ME19001	134ME26001	134ME31001	134ME41001
		Metric							
	Inch Size Spline (H)	SAE (E)	134ME75002	134ME85002	134ME13002	134ME19002	134ME26002	134ME31002	134ME41002
		Metric							
	Metric 1/10 Taper (B)	SAE (E)	134ME75003	134ME85003	134ME13003	134ME19003	134ME26003	134ME31003	134ME41003
		Metric	134ME75021	134ME85021	134ME13021	134ME19021	134ME26021	134ME31021	134ME41021
	Metric Straight (C)	SAE (E)							
		Metric	134ME75022	134ME85022	134ME13022	134ME19022	134ME26022	134ME31022	134ME41022
	Metric Spline (P)	SAE (E)							
		Metric	134ME75023	134ME85023	134ME13023	134ME19023	134ME26023	134ME31023	134ME41023

Motor Selection Charts





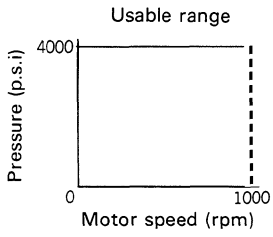
Brake Motors

Model	Product Number	Displacement (in3/rev)	Brake Torque (lbf-ft)	Brake Release Pressure (psi)	Weight (lbf)
ME100-FS-BL70F	131-1001-001	6.04	506	171	185
ME175-FS-BL70F	131-1002-001	10.68	506	171	185
ME300-FS-BA121F	131-1003-001	18.55	875	171	209
ME350-FS-BA121F	131-1004-001	21.36	875	171	209
ME600ANS-BB250F	131-1005-001	36.74	1808	171	410
ME750ANS-BC300F	131-1006-001	45.76	2169	171	478
ME850-NS-BC300F	131-1007-001	51.68	2169	171	478

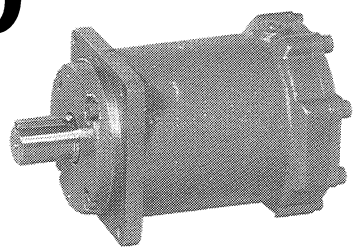
Geared Motors

Model	Product Number	Motor Displacement (in3/rev)	Gear Ratio	Rated Torque at 3000 psi (lbf-ft)	Max. Torque at 3600 psi (lbf-ft)	Rated Speed (rpm)	Allowable Radial Load (lbf)	Weight
ME175-GTE-SPHLF-66S	139-1001-001	10.68	5.053	2,032	2,416	20	14,323	289
ME300-GTE-SPHLF-72S	139-1002-001	18.55	5.053	3,530	4,202	20	18,963	392
ME350-GTE-SPHLF-72D	139-1003-001	21.36	5.053	4,060	4,830	20	23,373	430
ME600AGTE-SPHLF-84D	139-1004-001	36.73	5.053	6,990	8,320	20	29,327	650
ME750AGTE-SPHLF-90D	139-1005-001	45.76	5.053	8,700	10,360	20	35,501	838
ME850-GTE-SPHLF-90D	139-1006-001	51.68	5.053	9,830	11,700	20	35,501	838
M1300-GTE-SPHLE-108D	139-1007-001	82.06	5.053	15,600	18,570	20	52,700	1,290
M1900-GTF-SPHLE-120D	139-1008-001	113.97	5.053	21,670	25,800	20	60,417	1,841
M2600-GTF-SPHLE-132D	139-1009-001	157.29	5.053	29,930	35,620	20	73,427	1,426

Eaton® ME100



Displacement	**: 6.04 in³/rev.**
Rated Pressure	**: 4000 psi**
Peak Pressure	**: 4700 psi**
Rated Torque	**: 320 lbf ft**
Rated Speed	**: 1000 rpm**
Max. Speed	**: 1000 rpm**
Max. Horse Power	**: 61 hp**
Weight	**: 49 lb**



The graphs shown are mean values obtained from production units. FLUID; SHELL TELLUS 56 (VISCOSITY 170 SUS at 122°F)

Fig. 1 Output torque vs speed

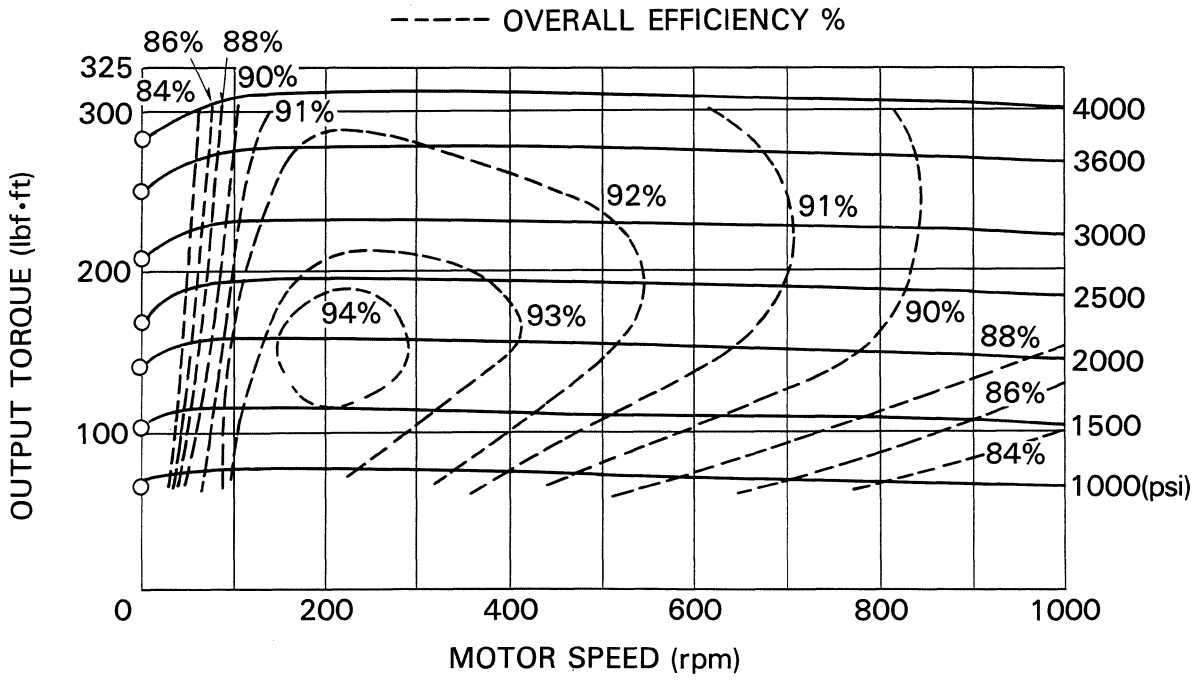
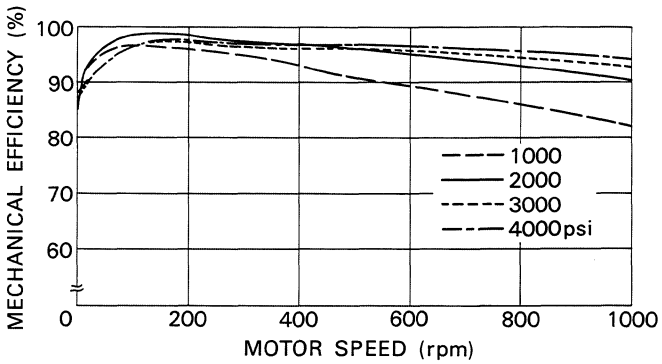
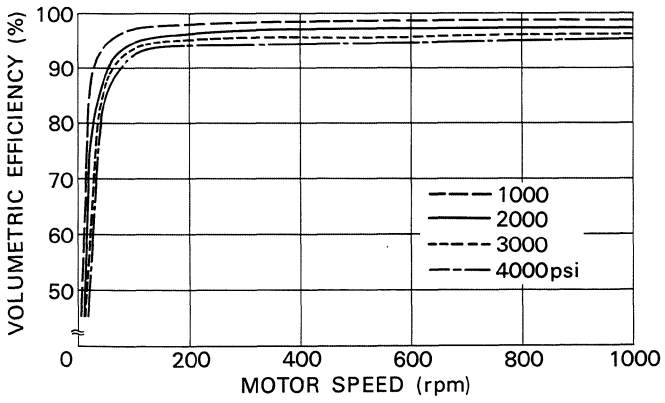


Fig. 2 Mechanical Efficiency



Mechanical efficiency at various speeds is shown for 4 motor pressures.

Fig. 3 Volumetric Efficiency

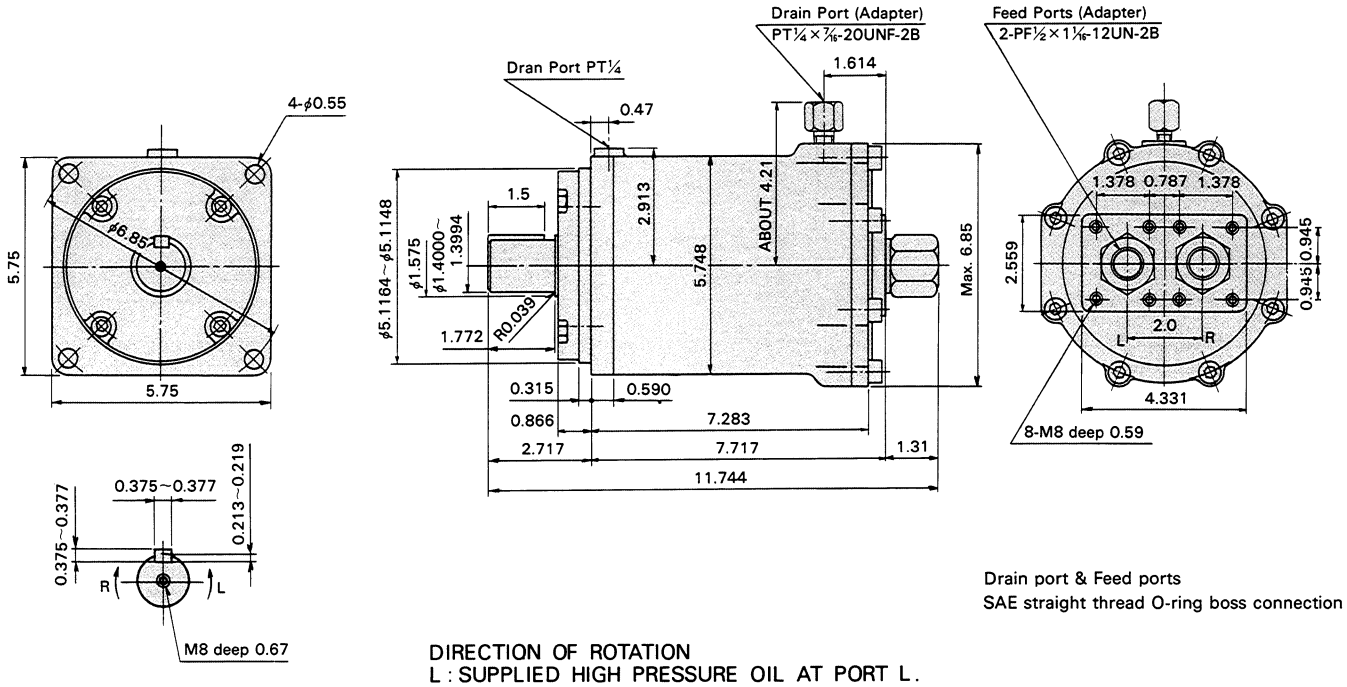


Volumetric efficiency at various speeds is shown for 4 motor pressures.

ME100

Dimensions in inches

Nominal Dimensions

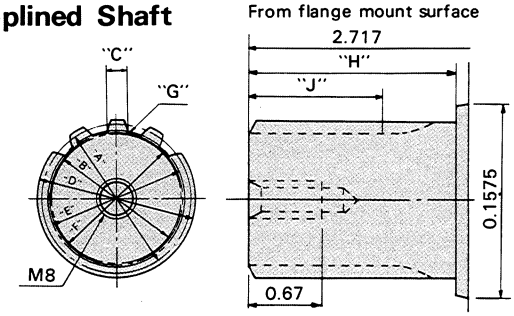


Drain port & Feed ports
SAE straight thread O-ring boss connection

DIRECTION OF ROTATION
L : SUPPLIED HIGH PRESSURE OIL AT PORT L.
R : SUPPLIED HIGH PRESSURE OIL AT PORT R.

Optional Shaft Dimensions

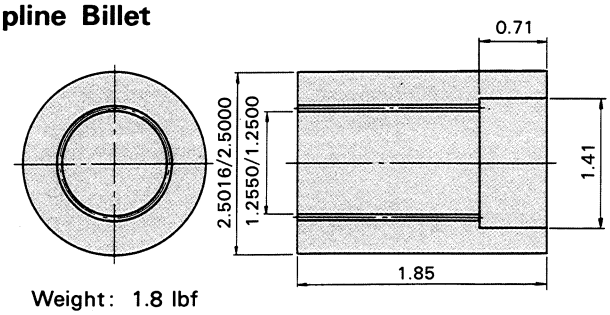
Splined Shaft



Type of Spline : Involute : Flat root side fit : Pressure angle 30° : Pitch 16/32
Class 1 fit : To B.S.3550 or A.S.A.—B5 —15.

No.of teeth	Pitch Dia. "A"	Base Dia. "B"	Tooth Thickness "C"	Major Dia. "D"	Form Dia. "E"	Minor Dia. "F"	Fillet Radius "G"	"H"	"J"
21	1.3125	1.1367	0.0951 0.0939	1.3535 1.3585	1.2460	1.2225 1.2335	0.011	1.772	1.102

Spline Billet



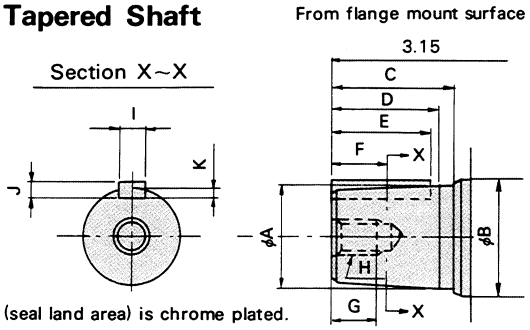
Weight: 1.8 lbf

Involute Spline (Flat root side fit, Class 1 fit)
B.S.3550 or A.S.A-B5-15

Allowable Pressure for Spline Billet : 4000 psi

No.of Teeth:	21
Pitch:	16/32
Pressure Angle:	30°
Pitch Dia:	1.3125
Major Dia:	1.3860/1.3750
Minor Dia:	1.2550/1.2500
Space Width:	0.1010/0.0998

Tapered Shaft



Shaft (seal land area) is chrome plated.

A	B	C	D	E	F	G	H	I	J	K
1.3780 1.3773	0.1575	1.772	1.57	1.50	0.79	0.98	M12	0.3937 0.3923	0.3150 0.3114	0.2047 0.1969

Taper : 1.0/10

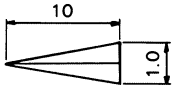


Fig.4 Starting Torque

Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

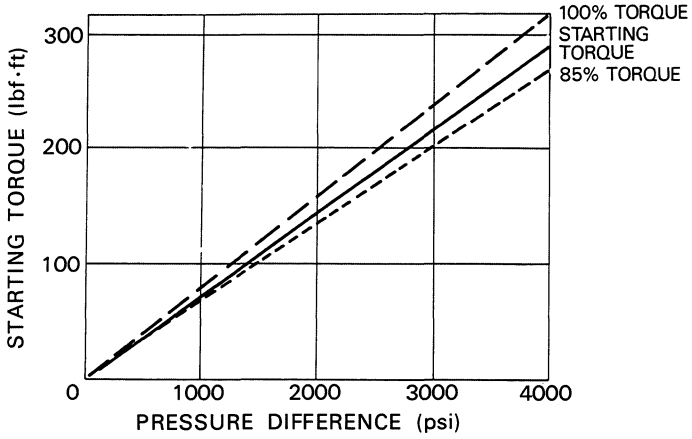


Fig.5 Case Leakage

Case leakage (from motor drain ports) relative to various speeds is shown for 4 motor pressures.

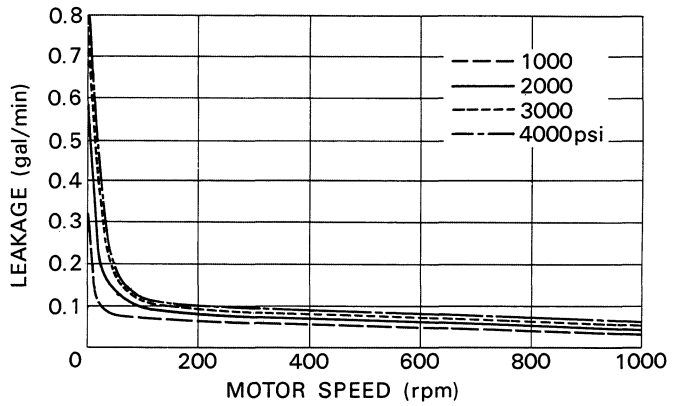


Fig.6 Minimum Boost Pressure

It is important that sufficient inlet pressure is maintained when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

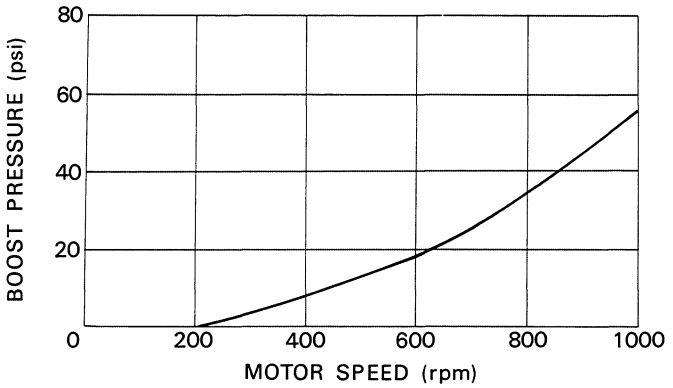


Fig.7 Pressure Drop

Pressure necessary to run motor without load is shown for various speeds.

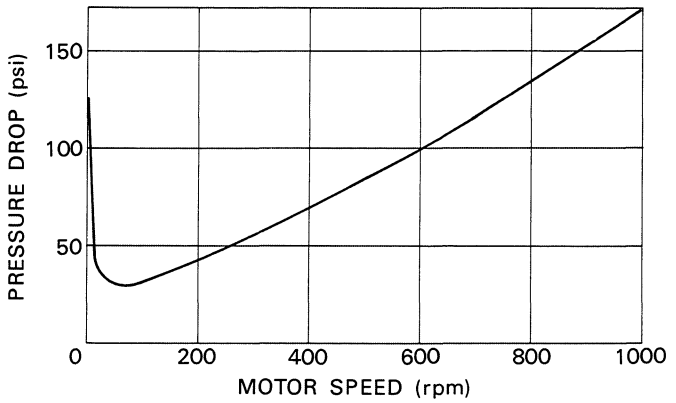
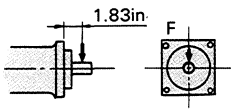


Fig.8 Bearing Life and Motor Shaft Radial Load



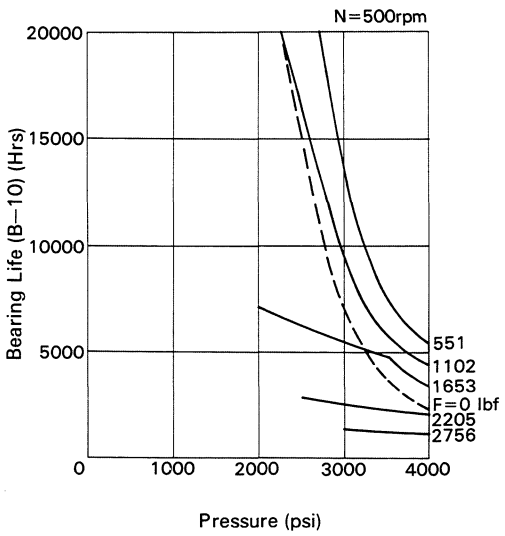
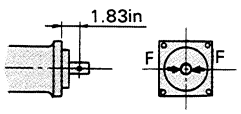


Fig. 8-1



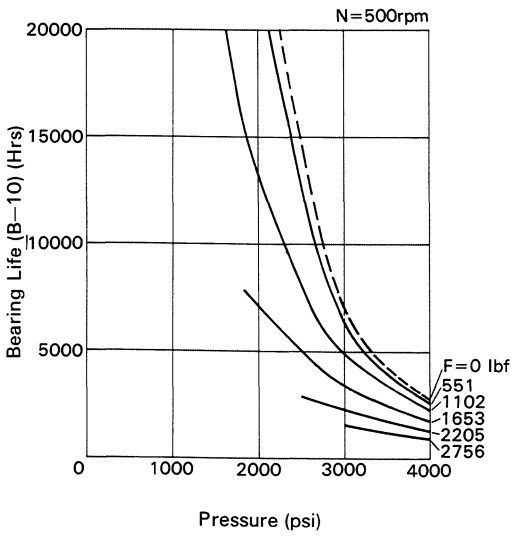


Fig. 8-2

Note

1. If motors are operated on the proper conditions, the operational life is determined by the Bearing Life.
2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 8;
   For a uni-directional application, motor should be installed so that side load acts as shown in figure 8.1.
   For a bi-directional application, involving a radial load for each rotation, then the motor should be installed so that side loads act as shown in figure 8.2.
3. The graphs shown are the bearing life (B-10 Life) at 500 rpm shaft speed for various pressures and radial loads.
   When the shaft speed differs from 500 rpm, the bearing life can be obtained by the formula below:

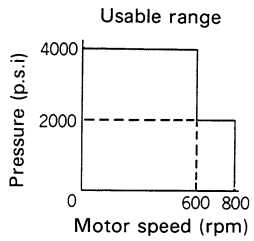
   B-10 Life = (Bearing Life obtainable in the graph at 500 rpm) $\times \frac{500}{\text{Actual Shaft Speed}}$

   In case where the side load acts at a different position to the mid point of the shaft projection please refer to us.
4. Maximum allowable radial load (load applied at the mid-point of shaft projection)

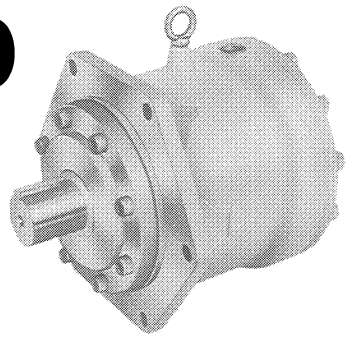
Working Pressure (psi)	2000	3000	4000
Max. Allowable Radial Load (lbf)	3200	3200	3200

5. Applications with axial thrust loads should be referred to us.

Eaton® ME150



Displacement	**: 9.27 in³/rev.**
Rated Pressure	**: 4000 psi**
Peak Pressure	**: 4700 psi**
Rated Torque	**: 492 lbf·ft**
Rated Speed	**: 600 rpm**
Max. Speed	**: 800 rpm**
Max. Horse Power	**: 56 hp**
Weight	**: 92 lb**



The graphs shown are mean values obtained from production units. FLUID; SHELL TELLUS 56 (VISCOSITY 170 SUS at 122°F)

Fig.1 Output torque vs speed

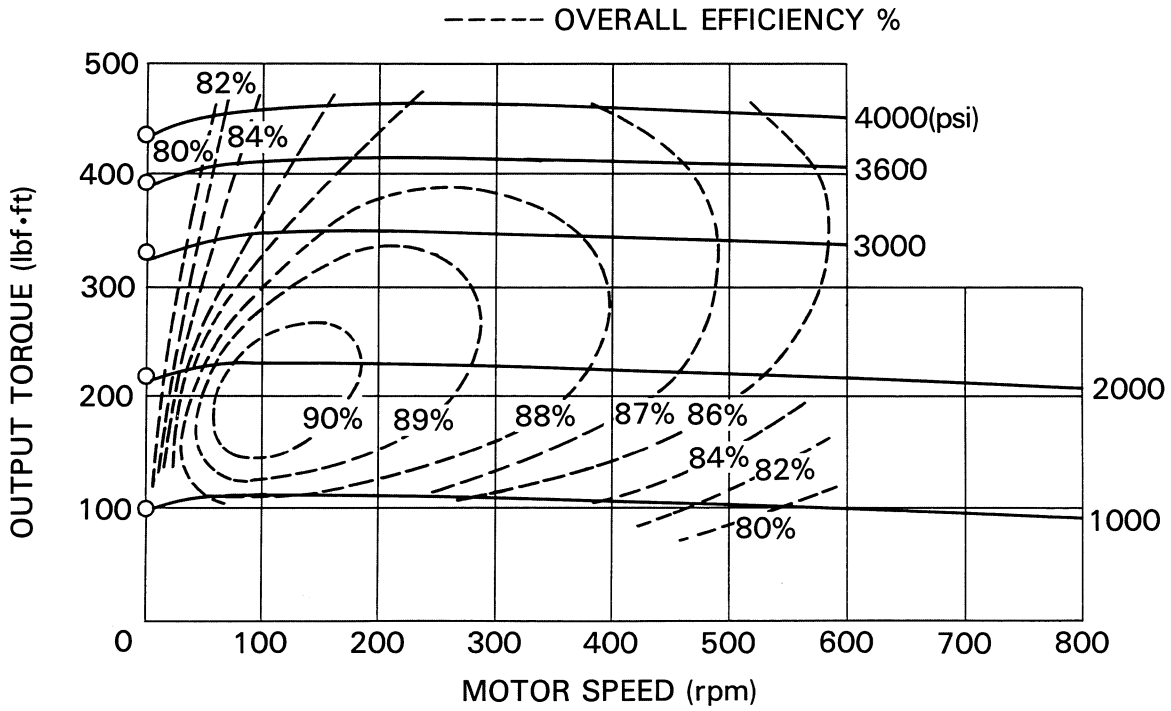
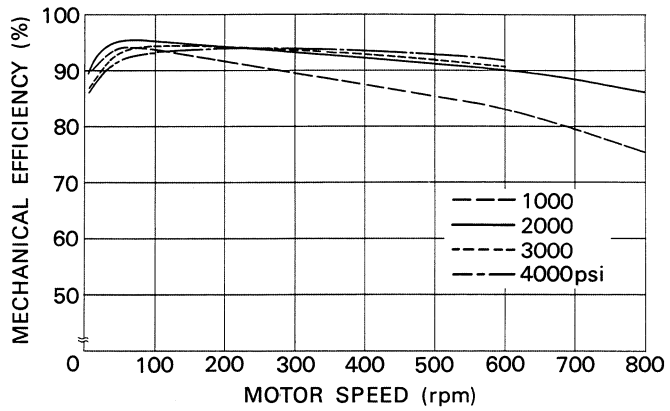
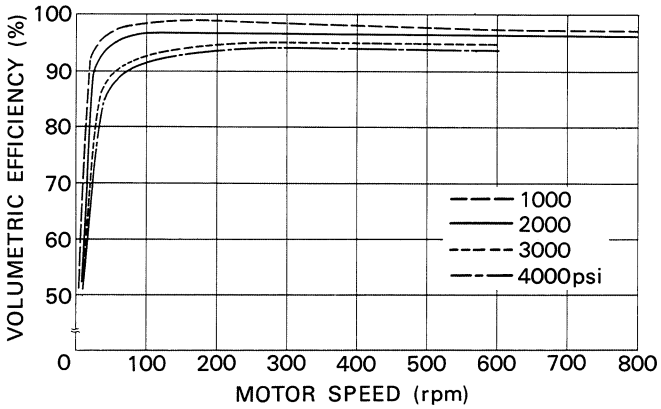


Fig.2 Mechanical Efficiency



Mechanical efficiency at various speeds is shown for 4 motor pressures.

Fig.3 Volumetric Efficiency

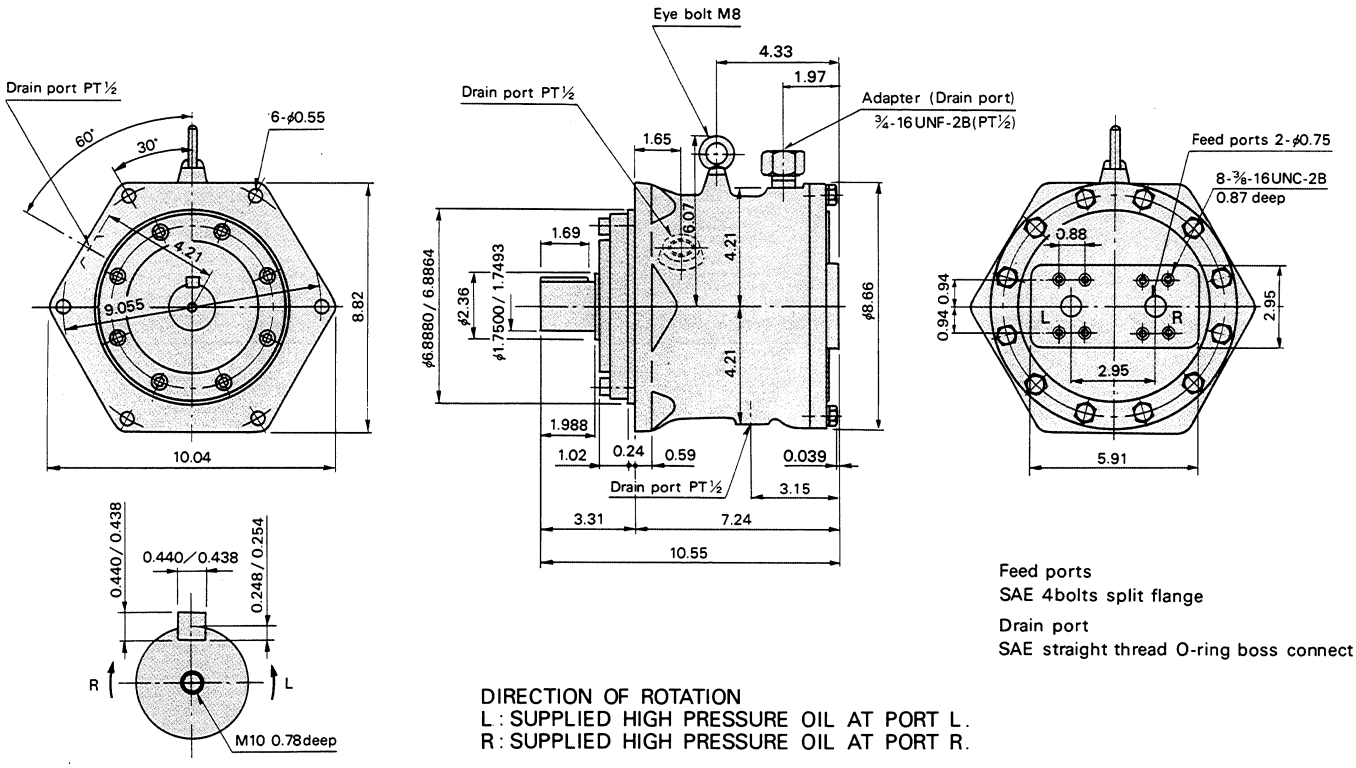


Volumetric efficiency at various speeds is shown for 4 motor pressures.

ME150

Dimensions in inches

Nominal Dimensions



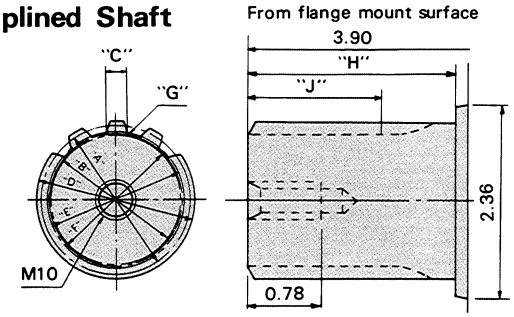
Feed ports
SAE 4bolts split flange

Drain port
SAE straight thread O-ring boss connection

DIRECTION OF ROTATION
L : SUPPLIED HIGH PRESSURE OIL AT PORT L.
R : SUPPLIED HIGH PRESSURE OIL AT PORT R.

Optional Shaft Dimensions

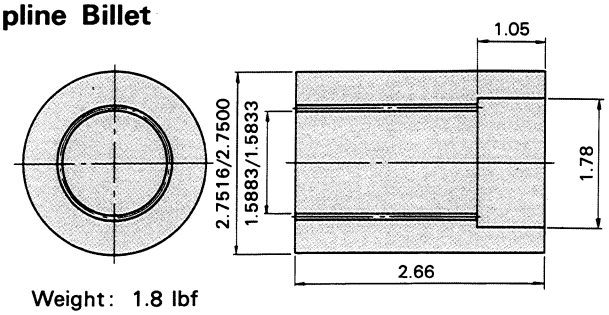
Splined Shaft



Type of Spline : Involute : Flat root side fit : Pressure angle 30° : Pitch 12/24
Class 1 fit : To B.S.3550 or A.S.A.—B5—15.

No.of teeth	Pitch Dia. "A"	Base Dia. "B"	Tooth Thickness "C"	Major Dia. "D"	Form Dia. "E"	Minor Dia. "F"	Fillet Radius "G"	"H"	"J"
20	1.6667	1.4434	0.1294 0.1263	1.7293 1.7243	1.5793	1.5627 1.5497	0.014	2.58	1.57

Spline Billet



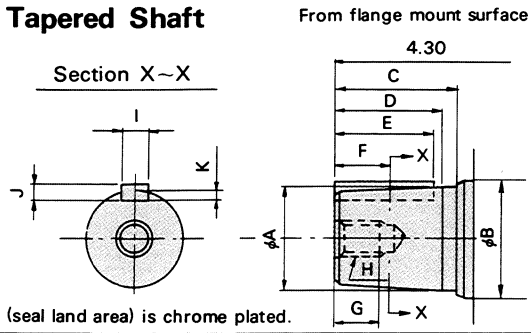
Weight: 1.8 lbf

Involute Spline (Flat root side fit, Class 1 fit)
B.S.3550 or A.S.A-B5-15

Allowable Pressure for Spline Billet : 4000 psi

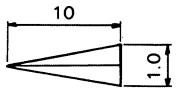
No.of Teeth:	20
Pitch:	12/24
Pressure Angle:	30°
Pitch Dia:	1.6667
Major Dia:	1.7630/1.7500
Minor Dia:	1.5883/1.5833
Space Width:	0.1339/0.1326

Tapered Shaft



Shaft (seal land area) is chrome plated.

A	B	C	D	E	F	G	H	I	J	K
1.7717 1.7710	2.36	2.32	2.13	1.97	1.06	0.98	M16	0.5512 0.5495	0.3543 0.3508	0.2244 0.2165

(Taper : 1.0/10 

)

Fig.4 Starting Torque

Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

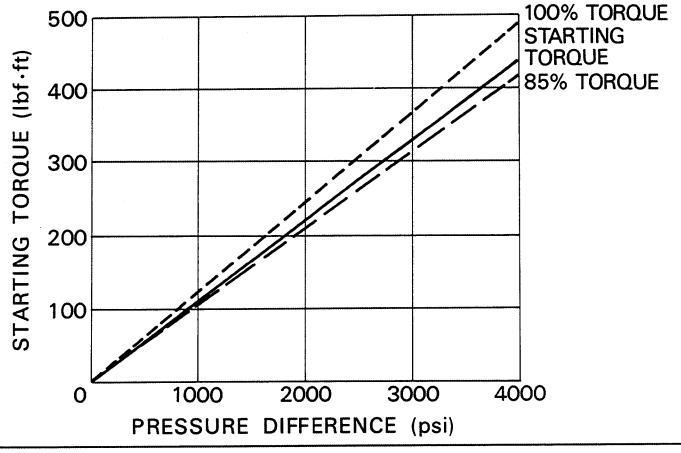


Fig.5 Case Leakage

Case leakage (from motor drain ports) relative to various speeds is shown for 4 motor pressures.

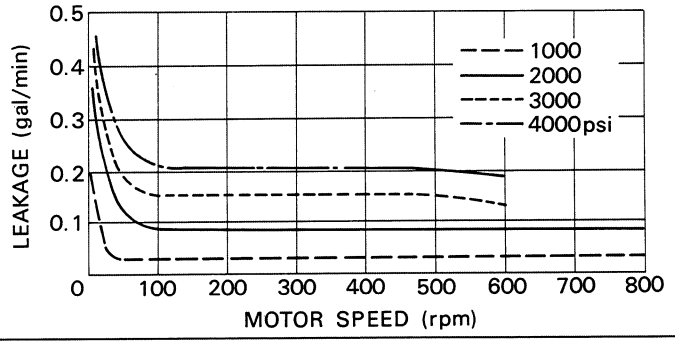


Fig.6 Minimum Boost Pressure

It is important that sufficient inlet pressure is maintained when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

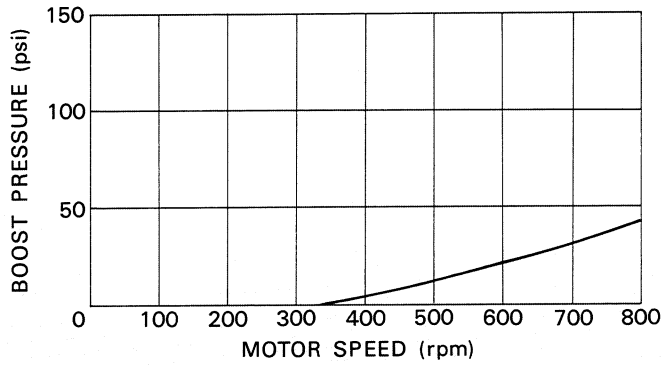


Fig.7 Pressure Drop

Pressure necessary to run motor without load is shown for various speeds.

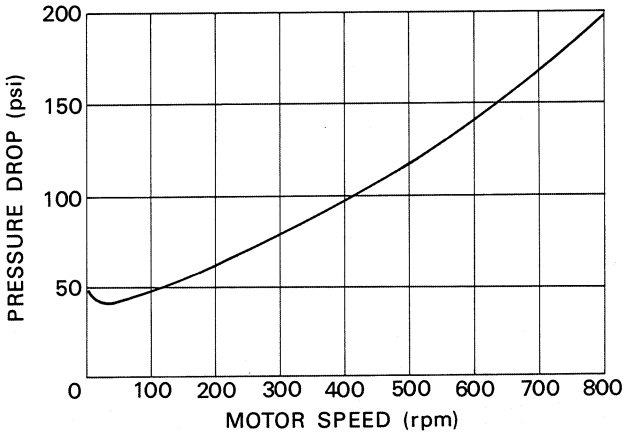
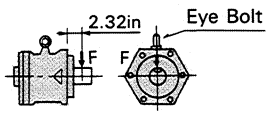


Fig.8 Bearing Life and Motor Shaft Radial Load



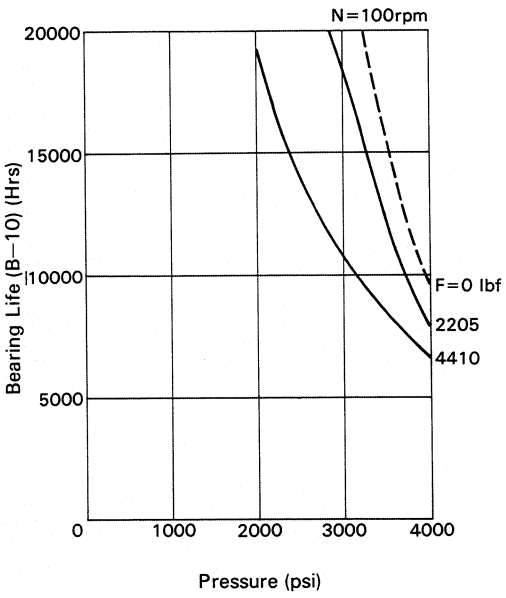
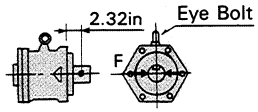


Fig. 8-1



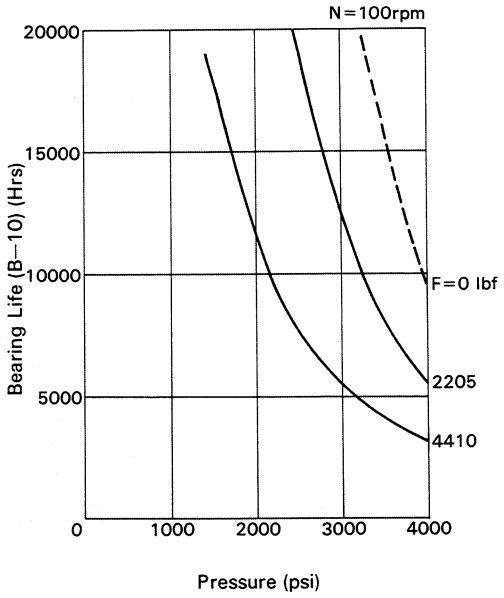


Fig. 8-2

Note

1. If motors are operated on the proper conditions, the operational life is determined by the Bearing Life.

2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 8;
   For a uni-directional application, motor should be installed so that side load acts as shown in figure 8.1.
   For a bi-directional application, involving a radial load for each rotation, then the motor should be installed so that side loads act as shown in figure 8.2.

3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
   When the shaft speed differs from 100 rpm, the bearing life can be obtained by the formula below:

   B-10 Life = (Bearing Life obtainable in the graph at 100 rpm)

   $$\times \frac{100}{\text{Actual Shaft Speed}}$$

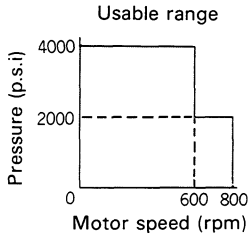
   In case where the side load acts at a different position to the mid point of the shaft projection please refer to us.

4. Maximum allowable radial load (load applied at the mid-point of shaft projection)

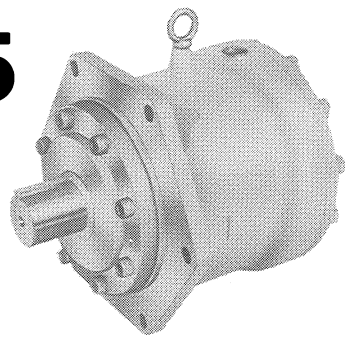
Working Pressure (psi)	2000	3000	4000
Max. Allowable Radial Load (lbf)	6300	6100	6000

5. Applications with axial thrust loads should be referred to us.

Eaton® ME175



Displacement	**: 10.68 in³/rev.**
Rated Pressure	**: 4000 psi**
Peak Pressure	**: 4700 psi**
Rated Torque	**: 566 lbf·ft**
Rated Speed	**: 600 rpm**
Max. Speed	**: 800 rpm**
Max. Horse Power	**: 65 hp**
Weight	**: 92 lb**



The graphs shown are mean values obtained from production units. FLUID; SHELL TELLUS 56 (VISCOSITY 170 SUS at 122°F)

Fig. 1 Output torque vs speed

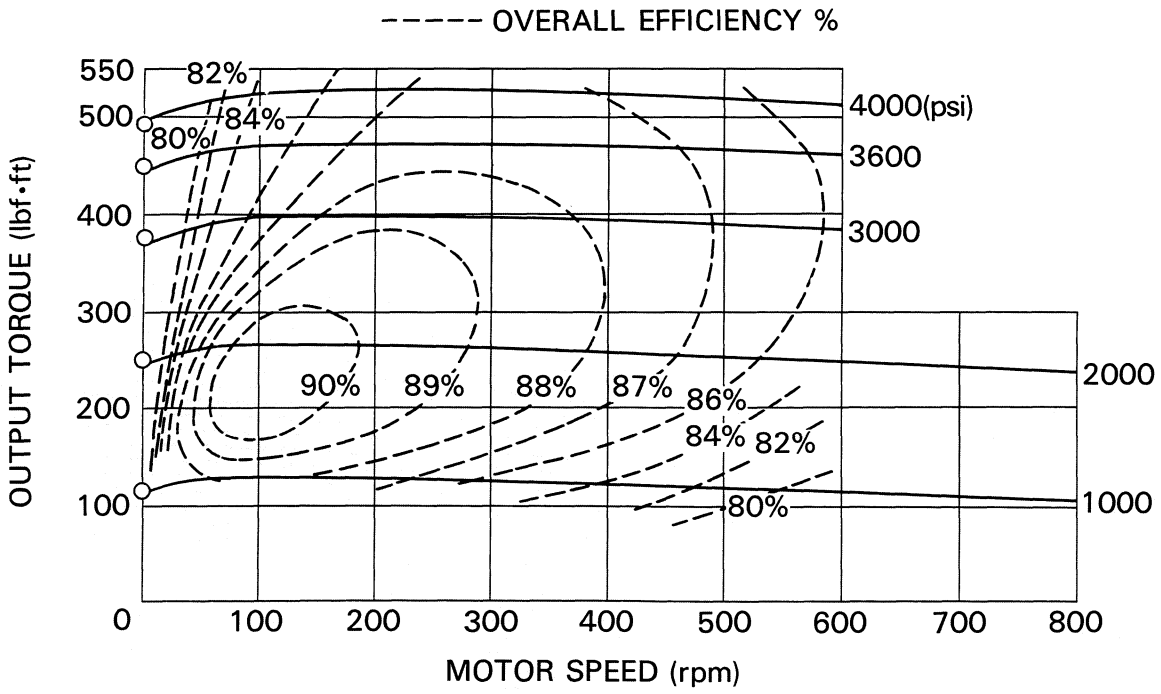
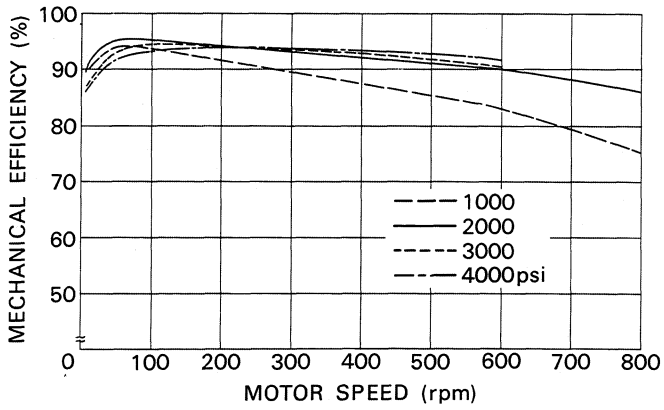
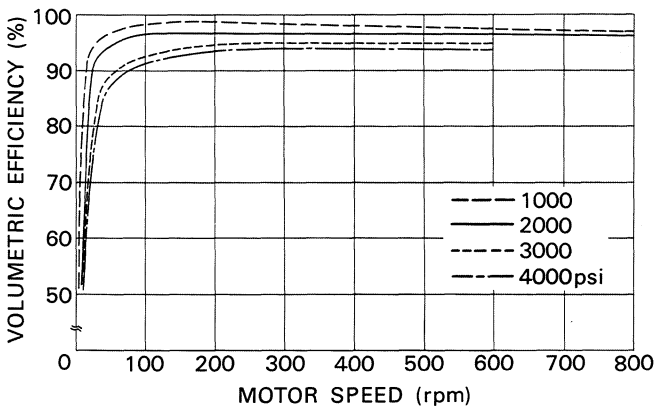


Fig. 2 Mechanical Efficiency



Mechanical efficiency at various speeds is shown for 4 motor pressures.

Fig. 3 Volumetric Efficiency

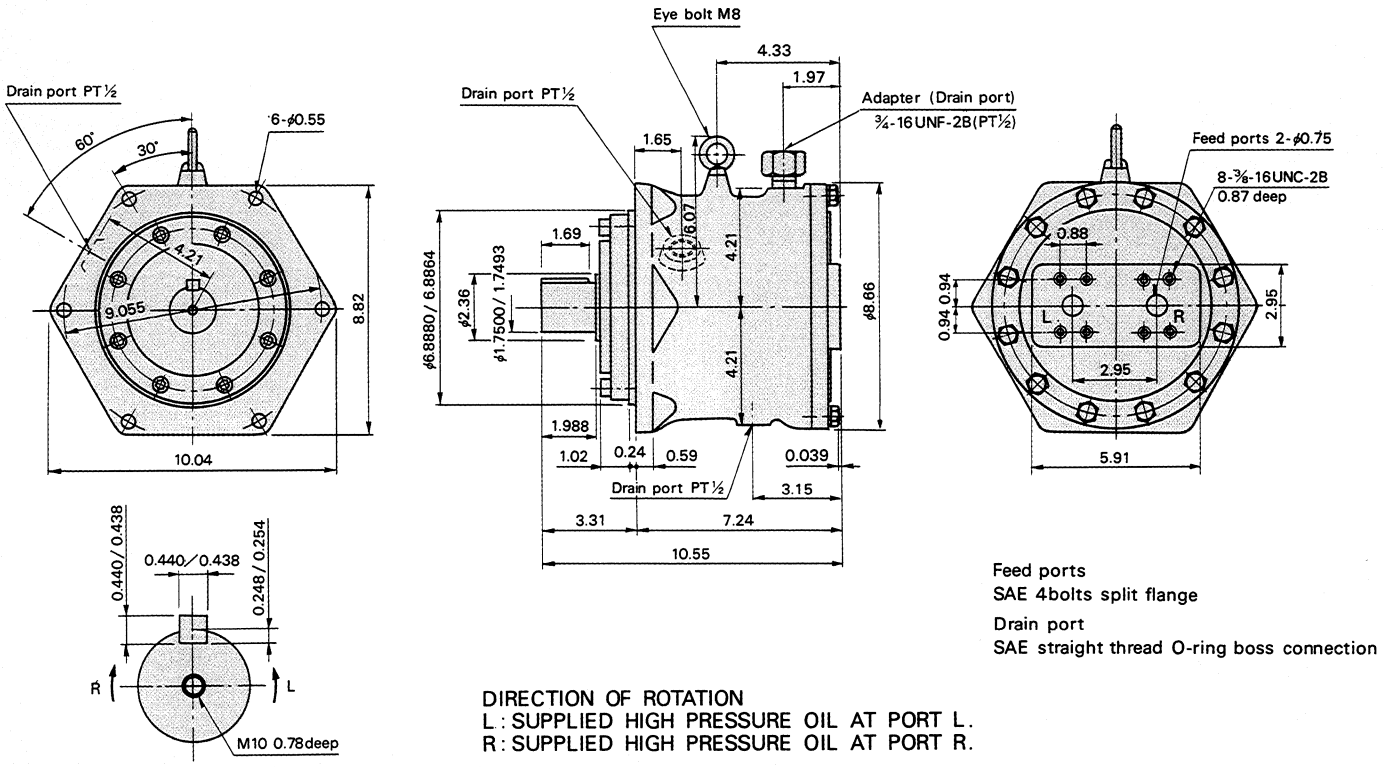


Volumetric efficiency at various speeds is shown for 4 motor pressures.

ME175

Dimensions in inches

Nominal Dimensions



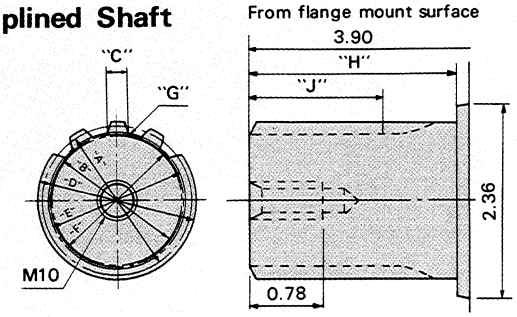
Feed ports
SAE 4bolts split flange

Drain port
SAE straight thread O-ring boss connection

DIRECTION OF ROTATION
L : SUPPLIED HIGH PRESSURE OIL AT PORT L.
R : SUPPLIED HIGH PRESSURE OIL AT PORT R.

Optional Shaft Dimensions

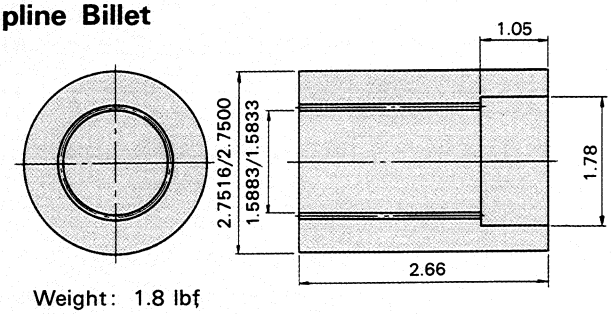
Splined Shaft



Type of Spline : Involute : Flat root side fit : Pressure angle 30° : Pitch 12/24
Class 1 fit : To B.S.3550 or A.S.A.—B5—15.

No.of teeth	Pitch Dia. "A"	Base Dia. "B"	Tooth Thickness "C"	Major Dia. "D"	Form Dia. "E"	Minor Dia. "F"	Fillet Radius "G"	"H"	"J"
20	1.6667	1.4434	0.1294 0.1263	1.7293 1.7243	1.5793	1.5627 1.5497	0.014	2.58	1.57

Spline Billet



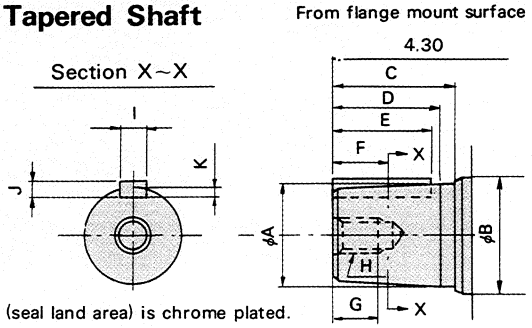
Weight: 1.8 lbf

Involute Spline (Flat root side fit, Class 1 fit)
B.S.3550 or A.S.A-B5-15

Allowable Pressure for Spline Billet : 4000 psi

No.of Teeth:	20
Pitch:	12/24
Pressure Angle:	30°
Pitch Dia:	1.6667
Major Dia:	1.7630/1.7500
Minor Dia:	1.5883/1.5833
Space Width:	0.1339/0.1326

Tapered Shaft



Shaft (seal land area) is chrome plated.

A	B	C	D	E	F	G	H	I	J	K
1.7717 1.7710	2.36	2.32	2.13	1.97	1.06	0.98	M16	0.5512 0.5495	0.3543 0.3508	0.2244 0.2165

Taper : 1.0/10

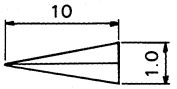


Fig.4 Starting Torque

Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

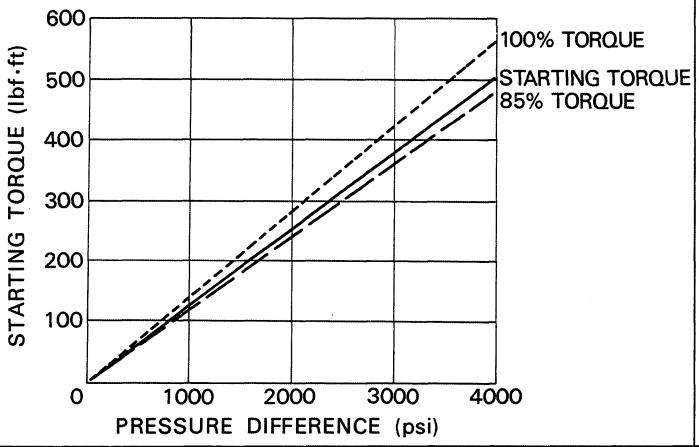


Fig.5 Case Leakage

Case leakage (from motor drain ports) relative to various speeds is shown for 4 motor pressures.

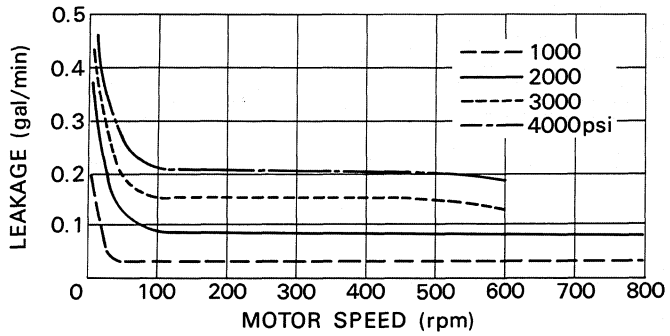


Fig.6 Minimum Boost Pressure

It is important that sufficient inlet pressure is maintained when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

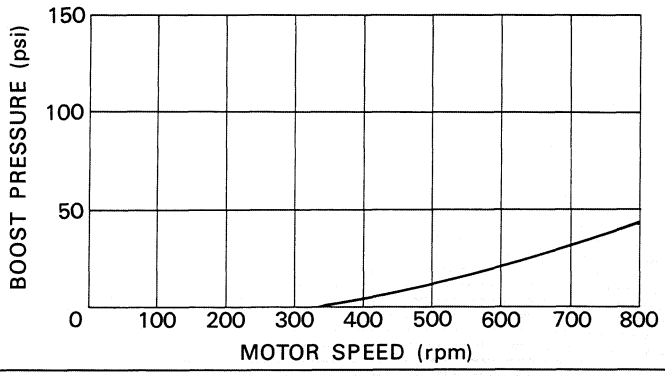


Fig.7 Pressure Drop

Pressure necessary to run motor without load is shown for various speeds.

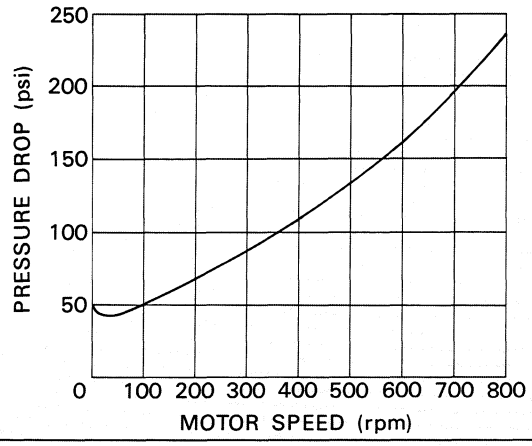
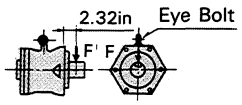


Fig.8 Bearing Life and Motor Shaft Radial Load



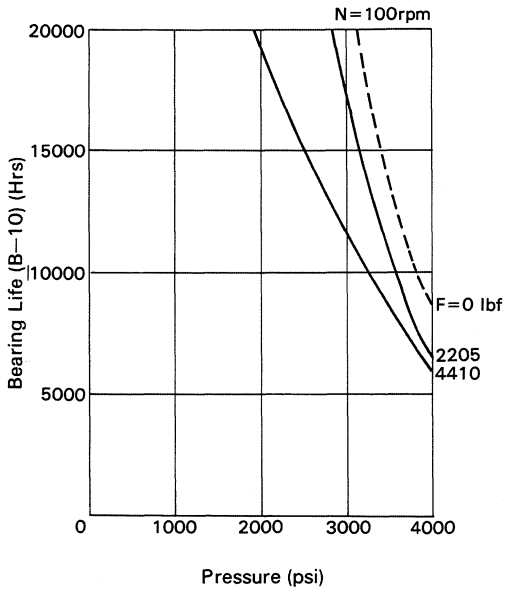
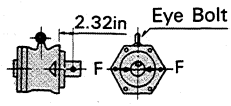


Fig. 8-1



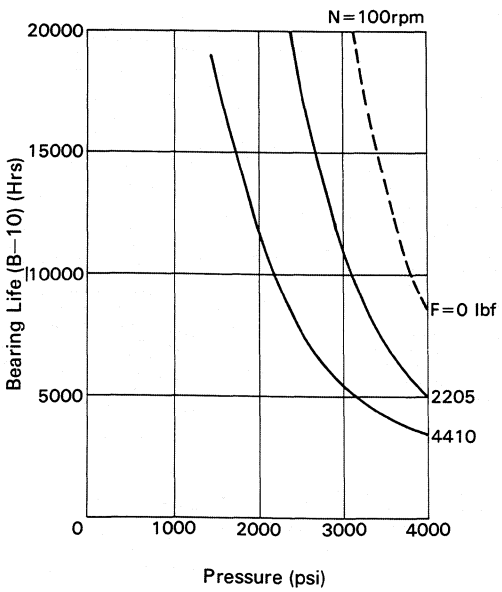


Fig. 8-2

Note

1. If motors are operated on the proper conditions, the operational life is determined by the Bearing Life.

2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 8;
   For a uni-directional application, motor should be installed so that side load acts as shown in figure 8.1.
   For a bi-directional application, involving a radial load for each rotation, then the motor should be installed so that side loads act as shown in figure 8.2.

3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
   When the shaft speed differs from 100 rpm, the bearing life can be obtained by the formula below:

   B-10 Life = (Bearing Life obtainable in the graph at 100 rpm)
   $$\times \frac{100}{\text{Actual Shaft Speed}}$$

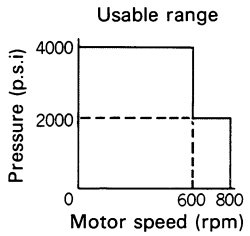
   In case where the side load acts at a different position to the mid point of the shaft projection please refer to us.

4. Maximum allowable radial load (load applied at the mid-point of shaft projection)

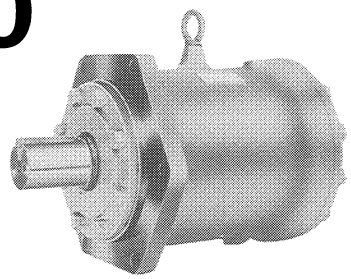
Working Pressure (psi)	2000	3000	4000
Max. Allowable Radial Load (lbf)	6200	6000	5700

5. Applications with axial thrust loads should be referred to us.

Eaton® ME300



Displacement	**: 18.55 in³/rev.**
Rated Pressure	**: 4000 psi**
Peak Pressure	**: 4700 psi**
Rated Torque	**: 984 lbf·ft**
Rated Speed	**: 600 rpm**
Max. Speed	**: 800 rpm**
Max. Horse Power	**: 112 hp**
Weight	**: 117 lb**



The graphs shown are mean values obtained from production units. FLUID; SHELL TELLUS 56 (VISCOSITY 170 SUS at 122°F)

Fig.1 Output torque vs speed

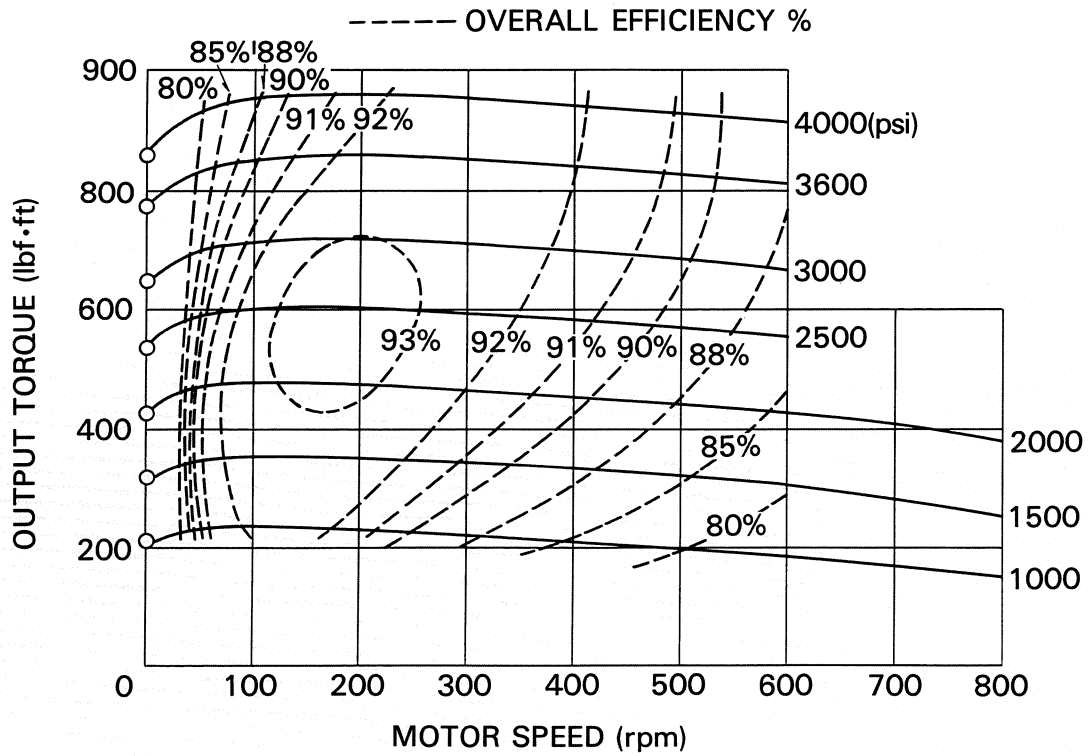
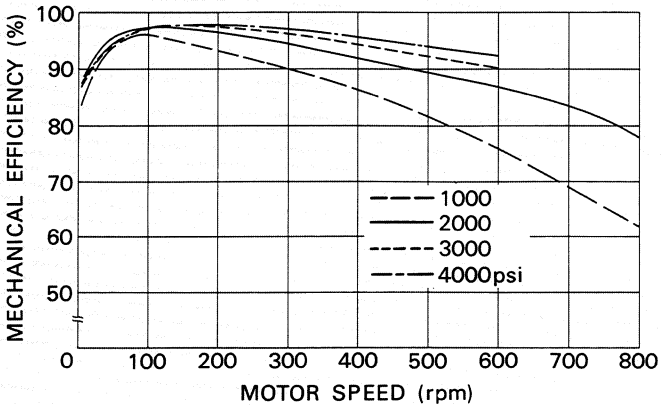
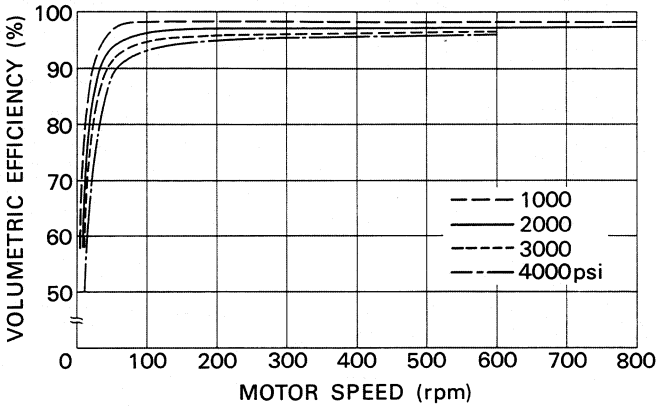


Fig.2 Mechanical Efficiency



Mechanical efficiency at various speeds is shown for 4 motor pressures.

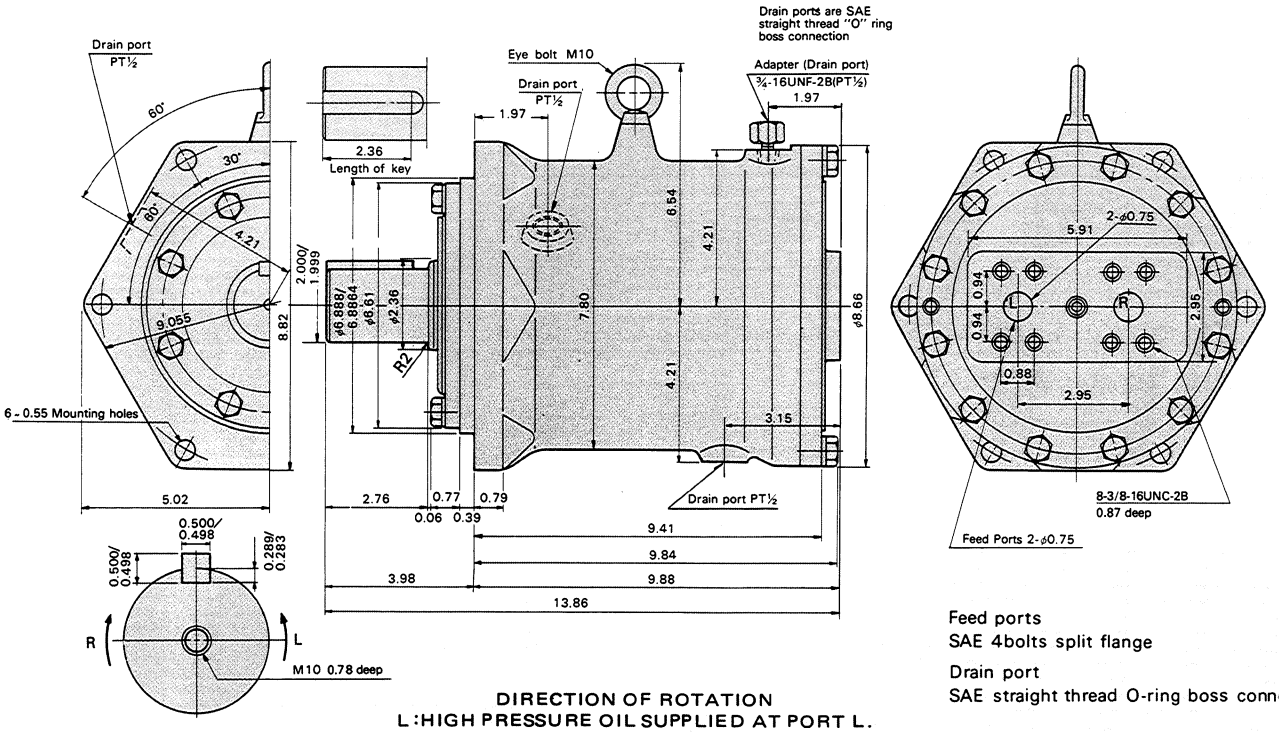
Fig.3 Volumetric Efficiency



Volumetric efficiency at various speeds is shown for 4 motor pressures.

Dimensions in inches

Nominal Dimensions



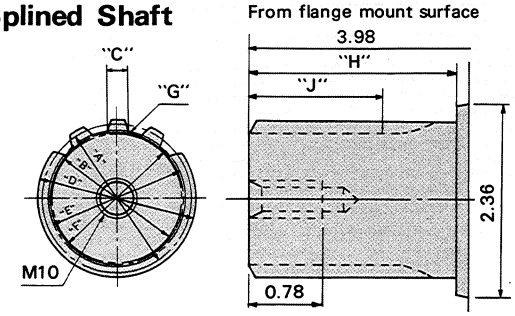
DIRECTION OF ROTATION
L:HIGH PRESSURE OIL SUPPLIED AT PORT L.
R:HIGH PRESSURE OIL SUPPLIED AT PORT R.

Feed ports
SAE 4bolts split flange

Drain port
SAE straight thread O-ring boss connection

Optional Shaft Dimensions

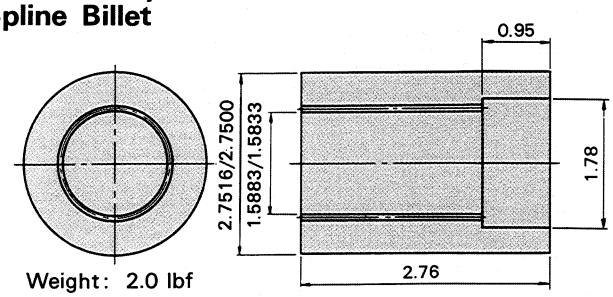
Splined Shaft



Type of Spline: Involute: Flat root side fit: Pressure angle 30°: Pitch 12/24
Class 1 fit: To B.S.3550 or A.S.A.—B5—15.

No.of teeth	Pitch Dia. "A"	Base Dia. "B"	Tooth Thickness "C"	Major Dia. "D"	Form Dia. "E"	Minor Dia. "F"	Fillet Radius "G"	"H"	"J"
20	1.6667	1.4434	0.1294 0.1263	1.7293 1.7243	1.5793	1.5627 1.5497	0.014	2.68	1.77

Spline Billet



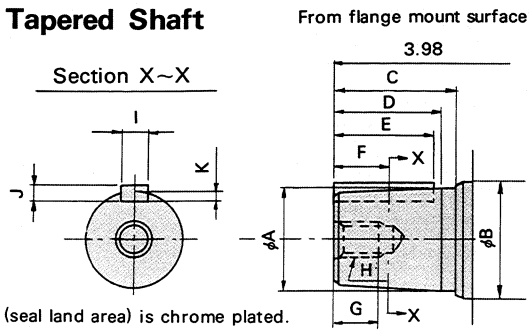
Weight: 2.0 lbf

Involute Spline (Flat root side fit, Class 1 fit)
B.S.3550 or A.S.A-B5-15

Allowable Pressure for Spline Billet: 4000 psi

No.of Teeth:	20
Pitch:	12/24
Pressure Angle:	30°
Pitch Dia:	1.6667
Major Dia:	1.7630/1.7500
Minor Dia:	1.5883/1.5833
Space Width:	0.1339/0.1326

Tapered Shaft



Shaft (seal land area) is chrome plated.

A	B	C	D	E	F	G	H	I	J	K
1.9685 1.9679	2.362	2.323	2.126	1.890	1.063	0.984	M16	0.6299 0.6282	0.3937 0.3902	0.2441 0.2362

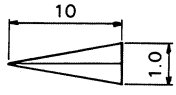
(Taper: 1.0/10 

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Fig.4 Starting Torque

Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

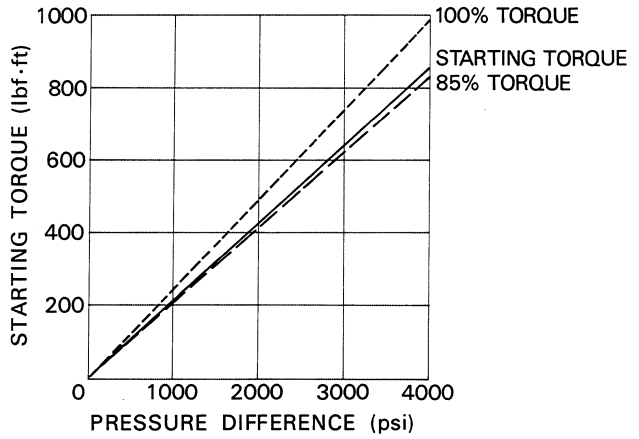


Fig.5 Case Leakage

Case leakage (from motor drain ports) relative to various speeds is shown for 4 motor pressures.

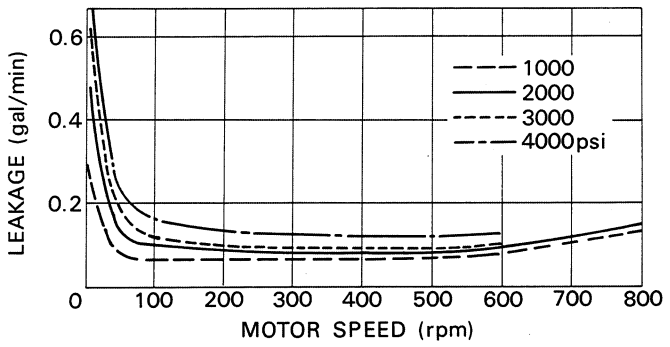


Fig.6 Minimum Boost Pressure

It is important that sufficient inlet pressure is maintained when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

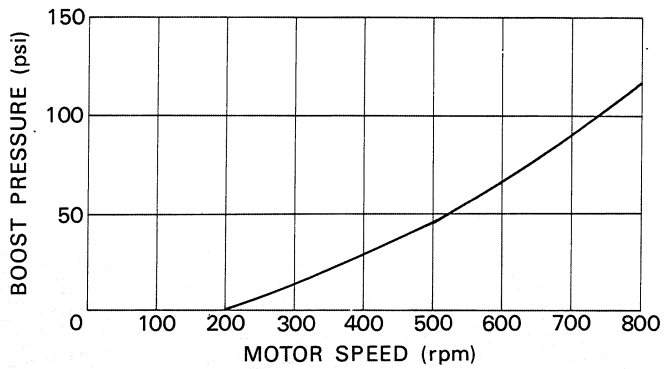


Fig.7 Pressure Drop

Pressure necessary to run motor without load is shown for various speeds.

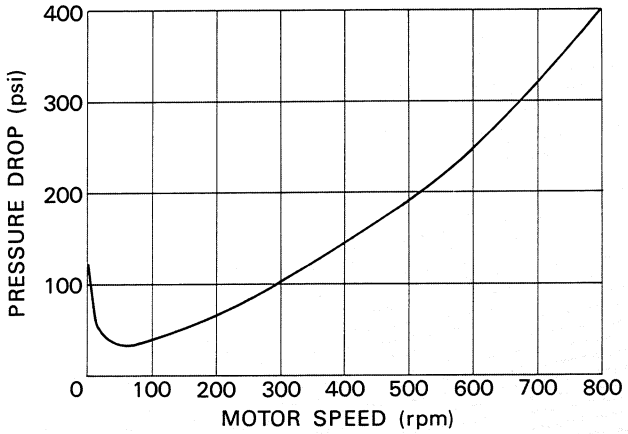
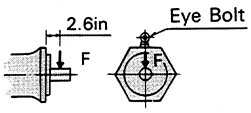


Fig.8 Bearing Life and Motor Shaft Radial Load



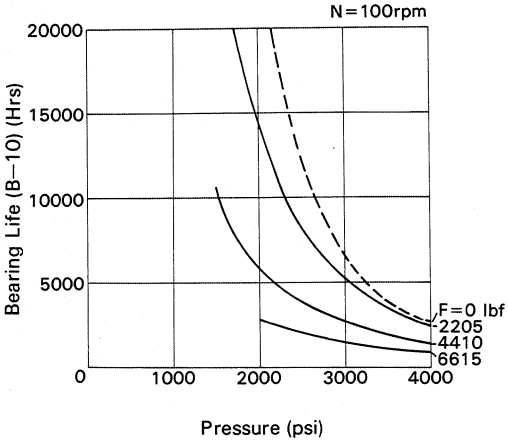
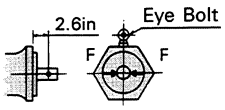


Fig. 8-1



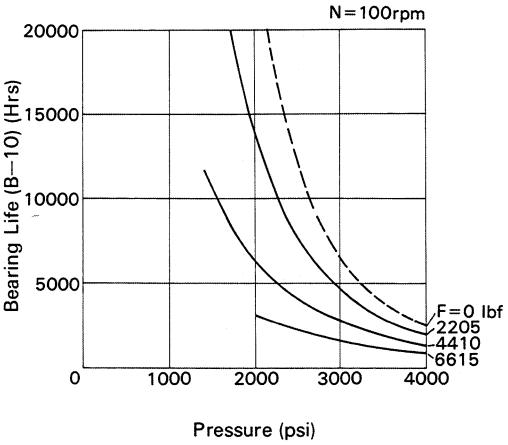


Fig. 8-2

Note

1. If motors are operated on the proper conditions, the operational life is determined by the Bearing Life.
2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 8;
   For a uni-directional application, motor should be installed so that side load acts as shown in figure 8.1.
   For a bi-directional application, involving a radial load for each rotation, then the motor should be installed so that side loads act as shown in figure 8.2.
3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
   When the shaft speed differs from 100 rpm, the bearing life can be obtained by the formula below:

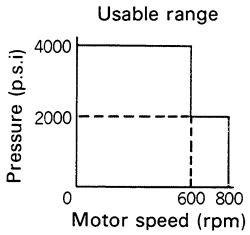
   B-10 Life = (Bearing Life obtainable in the graph at 100 rpm) × 100 / Actual Shaft Speed

   In case where the side load acts at a different position to the mid point of the shaft projection please refer to us.
4. Maximum allowable radial load (load applied at the mid-point of shaft projection)

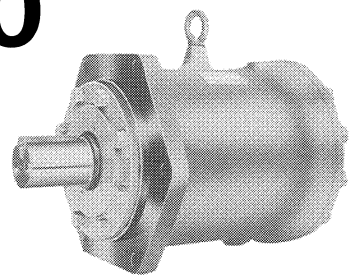
Working Pressure (psi)	2000	3000	4000
Max. Allowable Radial Load (lbf)	6500	6400	6300

5. Applications with axial thrust loads should be referred to us.

Eaton® ME350



Displacement	**: 21.36 in³/rev.**
Rated Pressure	**: 4000 psi**
Peak Pressure	**: 4700 psi**
Rated Torque	**: 1133 lbf·ft**
Rated Speed	**: 600 rpm**
Max. Speed	**: 800 rpm**
Max. Horse Power	**: 129 hp**
Weight	**: 117 lb**



The graphs shown are mean values obtained from production units. FLUID; SHELL TELLUS 56 (VISCOSITY 170 SUS at 122°F)

Fig. 1 Output torque vs speed

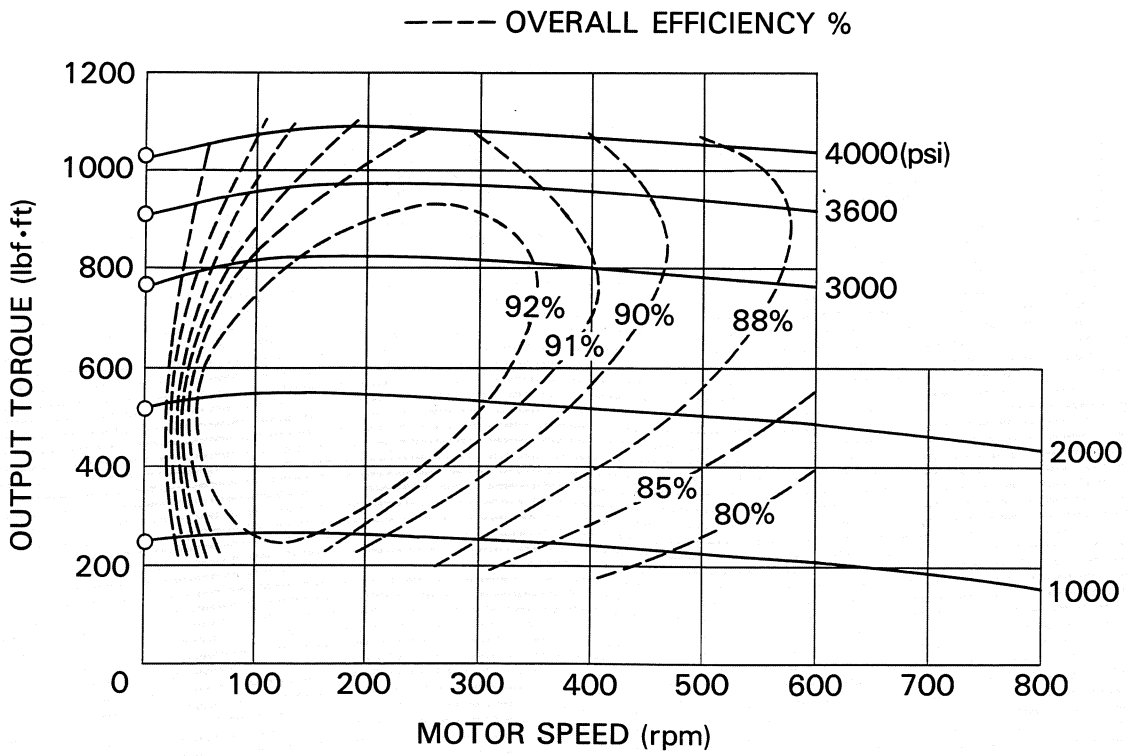
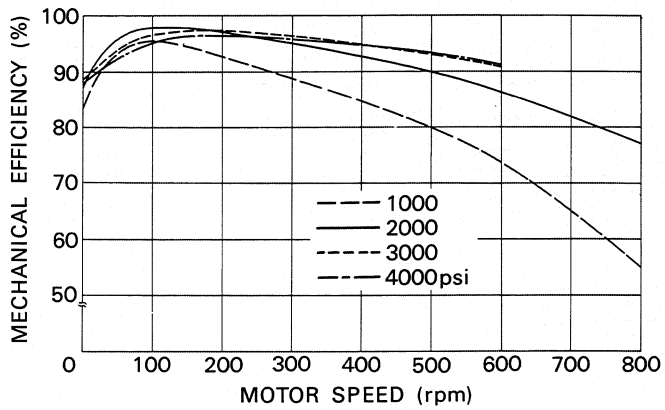
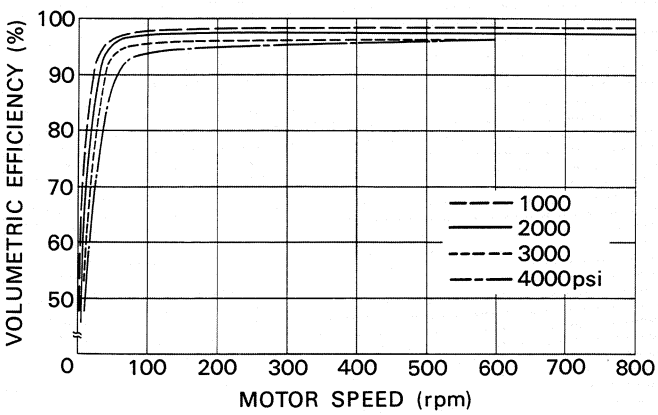


Fig. 2 Mechanical Efficiency



Mechanical efficiency at various speeds is shown for 4 motor pressures.

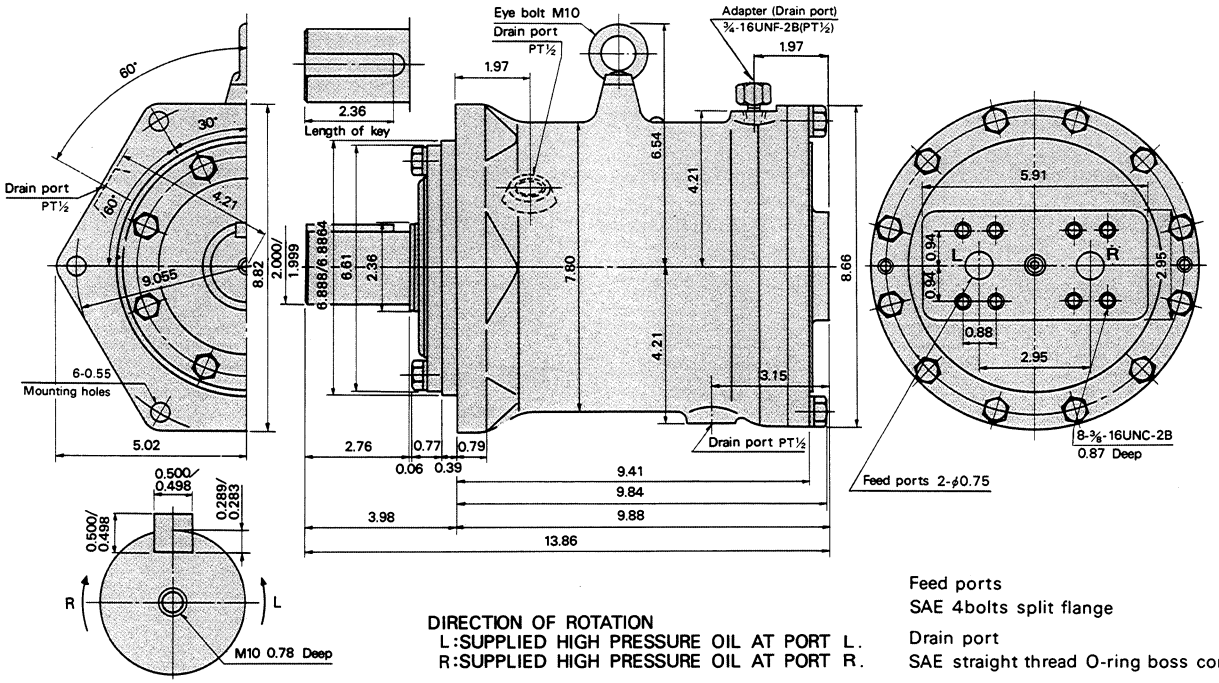
Fig. 3 Volumetric Efficiency



Volumetric efficiency at various speeds is shown for 4 motor pressures.

Dimensions in inches

Nominal Dimensions



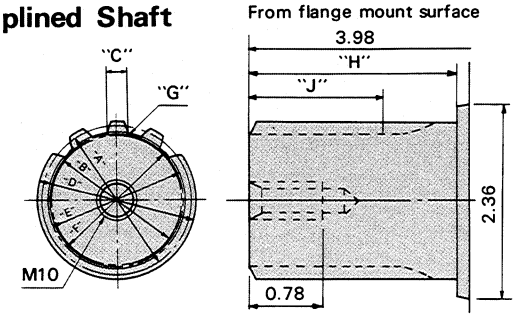
DIRECTION OF ROTATION
L:SUPPLIED HIGH PRESSURE OIL AT PORT L.
R:SUPPLIED HIGH PRESSURE OIL AT PORT R.

Feed ports
SAE 4bolts split flange

Drain port
SAE straight thread O-ring boss connection

Optional Shaft Dimensions

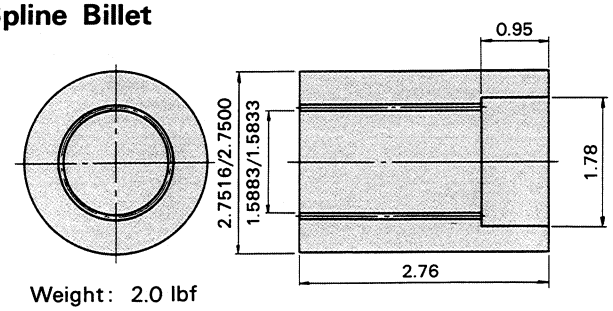
Splined Shaft



Type of Spline: Involute: Flat root side fit: Pressure angle 30°: Pitch 12/24
Class 1 fit: To B.S.3550 or A.S.A.—B5 —15.

No.of teeth	Pitch Dia. "A"	Base Dia. "B"	Tooth Thickness "C"	Major Dia. "D"	Form Dia. "E"	Minor Dia. "F"	Fillet Radius "G"	"H"	"J"
20	1.6667	1.4434	0.1294 0.1263	1.7293 1.7243	1.5793	1.5627 1.5497	0.014	2.68	1.77

Spline Billet



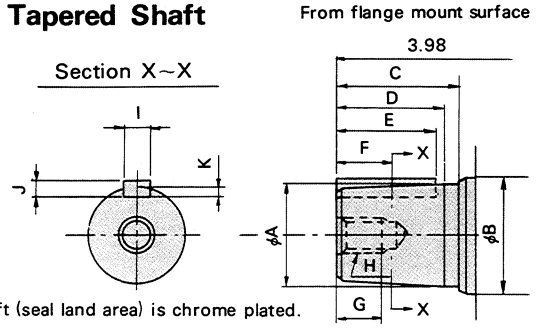
Weight: 2.0 lbf

Involute Spline (Flat root side fit, Class 1 fit)
B.S.3550 or A.S.A-B5-15

Allowable Pressure for Spline Billet: 4000 psi

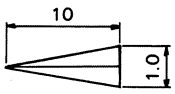
No.of Teeth:	20
Pitch:	12/24
Pressure Angle:	30°
Pitch Dia:	1.6667
Major Dia:	1.7630/1.7500
Minor Dia:	1.5883/1.5833
Space Width:	0.1339/0.1326

Tapered Shaft



Shaft (seal land area) is chrome plated.

A	B	C	D	E	F	G	H	I	J	K
1.9685 1.9679	2.362	2.323	2.126	1.890	1.063	0.984	M16	0.6299 0.6282	0.3937 0.3902	0.2441 0.2362

(Taper : 1.0/10 

)

Fig.4 Starting Torque

Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

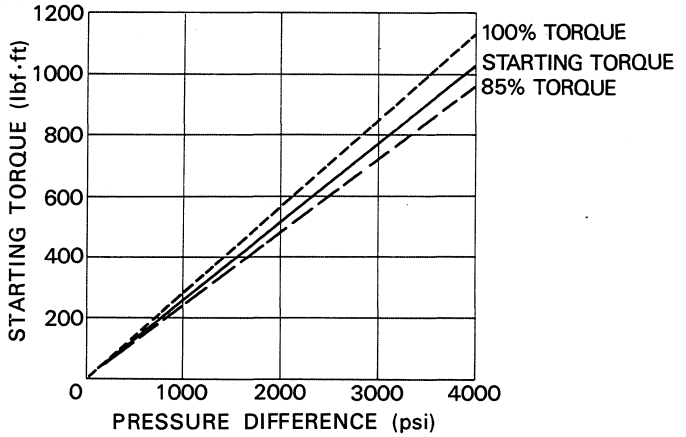


Fig.5 Case Leakage

Case leakage (from motor drain ports) relative to various speeds is shown for 4 motor pressures.

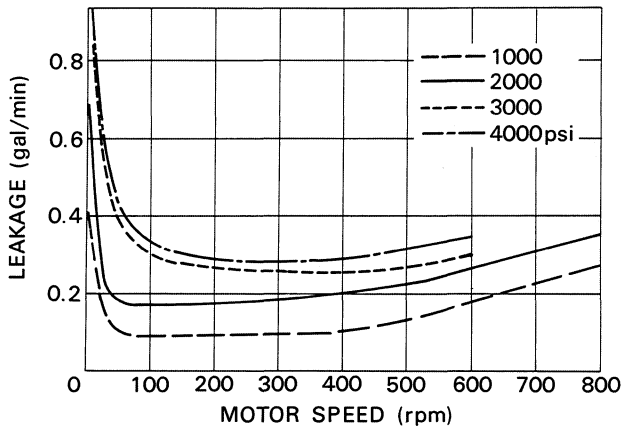


Fig.6 Minimum Boost Pressure

It is important that sufficient inlet pressure is maintained when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

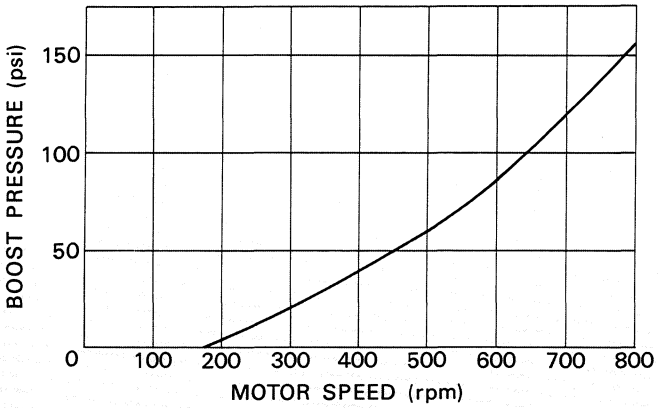


Fig.7 Pressure Drop

Pressure necessary to run motor without load is shown for various speeds.

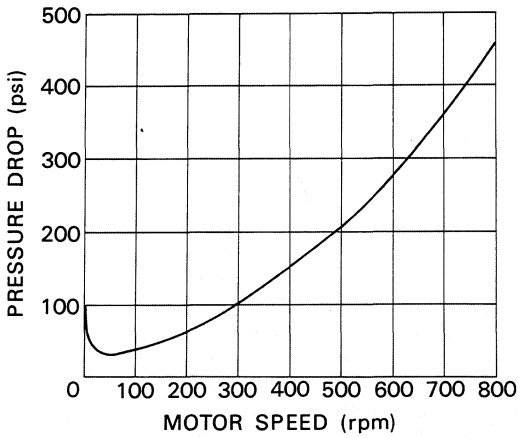


Fig.8 Bearing Life and Motor Shaft Radial Load

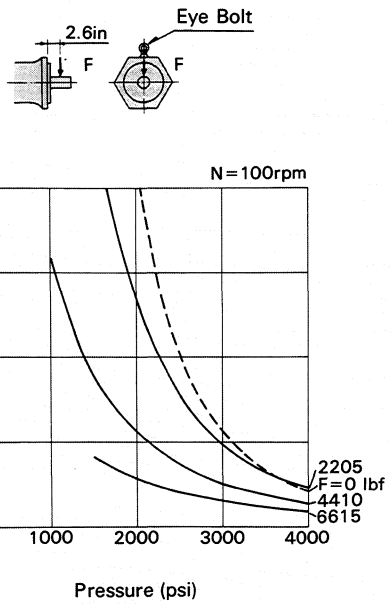


Fig. 8-1

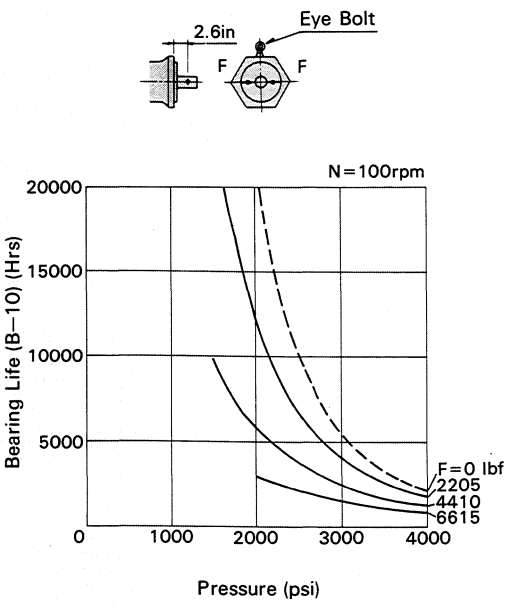


Fig. 8-2

Note

1. If motors are operated on the proper conditions, the operational life is determined by the Bearing Life.

2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 8;
   For a uni-directional application, motor should be installed so that side load acts as shown in figure 8.1.
   For a bi-directional application, involving a radial load for each rotation, then the motor should be installed so that side loads act as shown in figure 8.2.

3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
   When the shaft speed differs from 100 rpm, the bearing life can be obtained by the formula below:

   B-10 Life = (Bearing Life obtainable in the graph at 100 rpm) $\times \frac{100}{\text{Actual Shaft Speed}}$

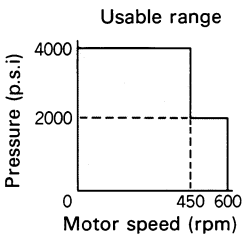
   In case where the side load acts at a different position to the mid point of the shaft projection please refer to us.

4. Maximum allowable radial load (load applied at the mid-point of shaft projection)

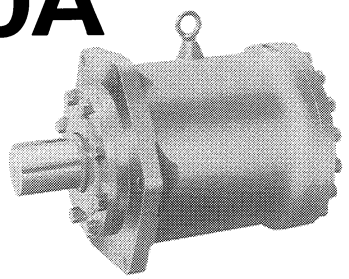
Working Pressure (psi)	2000	3000	4000
Max. Allowable Radial Load (lbf)	6400	6300	6050

5. Applications with axial thrust loads should be referred to us.

Eaton® ME600A



Displacement	: 36.74 in³/rev.
Rated Pressure	: 4000 psi
Peak Pressure	: 4700 psi
Rated Torque	: 1948 lbf·ft
Rated Speed	: 450 rpm
Max. Speed	: 600 rpm
Max. Horse Power	: 167 hp
Weight	: 203 lb



The graphs shown are mean values obtained from production units. FLUID; SHELL TELLUS 56 (VISCOSITY 170 SUS at 122°F)

Fig.1 Output torque vs speed

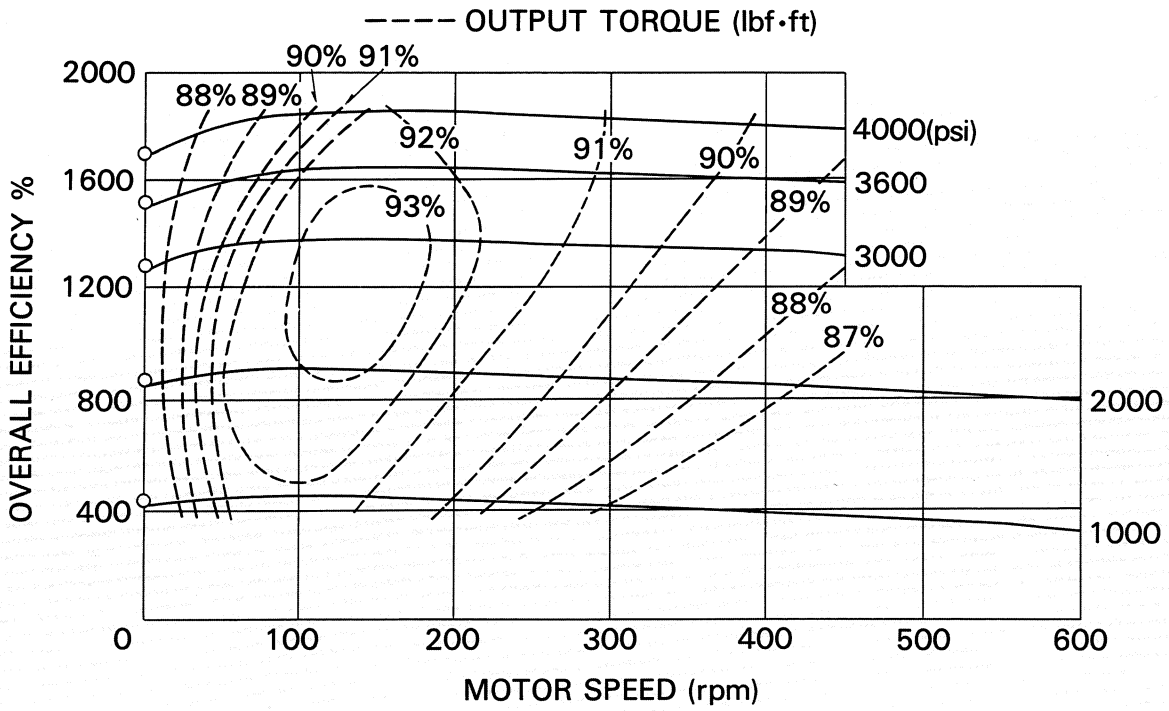
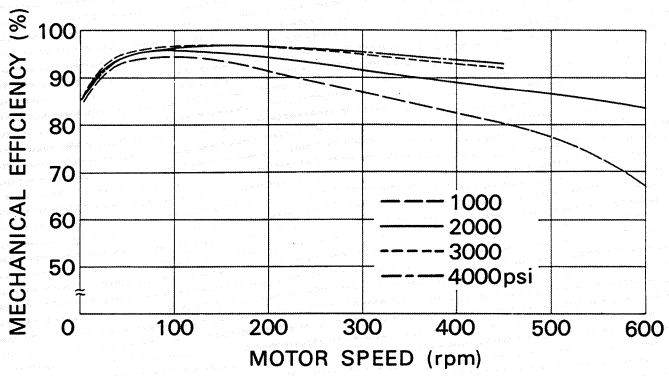
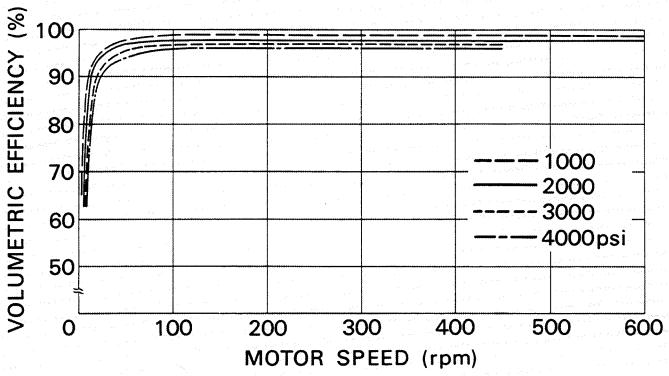


Fig.2 Mechanical Efficiency



Mechanical efficiency at various speeds is shown for 4 motor pressures.

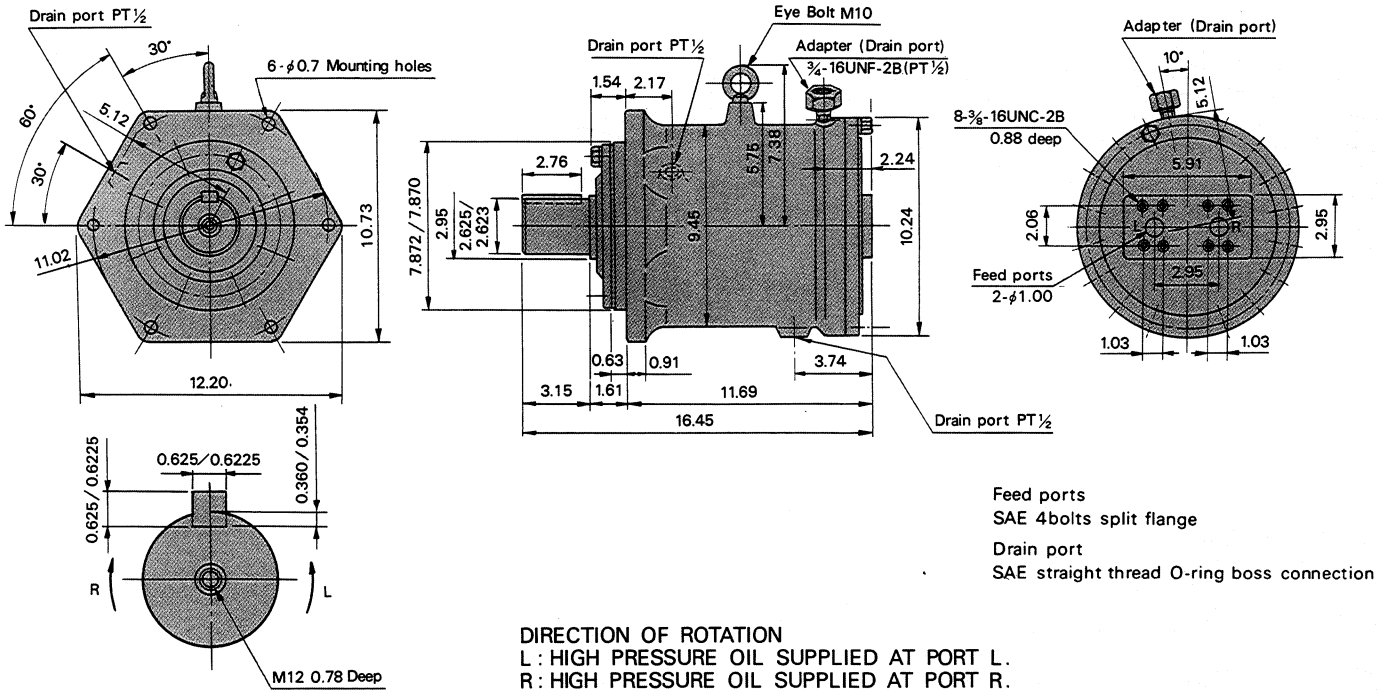
Fig.3 Volumetric Efficiency



Volumetric efficiency at various speeds is shown for 4 motor pressures.

Dimensions in inches

Nominal Dimensions



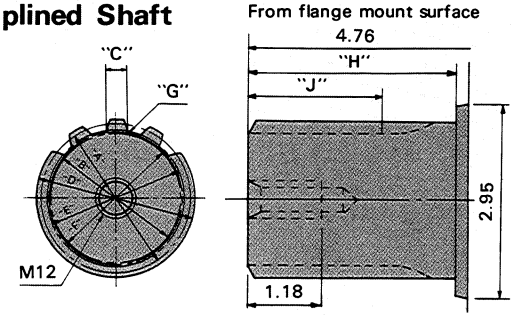
Feed ports
SAE 4bolts split flange

Drain port
SAE straight thread O-ring boss connection

DIRECTION OF ROTATION
L : HIGH PRESSURE OIL SUPPLIED AT PORT L.
R : HIGH PRESSURE OIL SUPPLIED AT PORT R.

Optional Shaft Dimensions

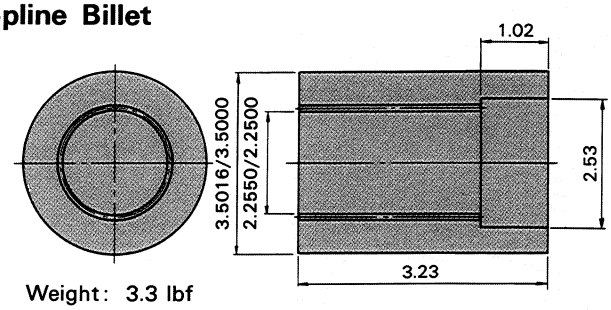
Splined Shaft



Type of Spline : Involute : Flat root side fit : Pressure angle 30° : Pitch 8/16
Class 1 fit : To B.S.3550 or A.S.A.—B5—15.

No.of teeth	Pitch Dia. "A"	Base Dia. "B"	Tooth Thickness "C"	Major Dia. "D"	Form Dia. "E"	Minor Dia. "F"	Fillet Radius "G"	"H"	"J"
19	2.3750	2.0568	0.1928 0.1914	2.4710 2.4660	2.2452	2.2210 2.2030	0.039	3.15	2.17

Spline Billet



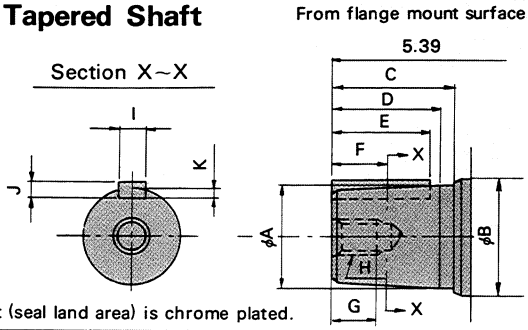
Weight: 3.3 lbf

Involute Spline (Flat root side fit, Class 1 fit)
B.S.3550 or A.S.A-B5-15

Allowable Pressure for Spline Billet : 4000 psi

No.of Teeth:	19
Pitch:	8/16
Pressure Angle:	30°
Pitch Dia:	2.3750
Major Dia:	2.5180/2.5000
Minor Dia:	2.2550/2.2500
Space Width:	0.1996/0.1982

Tapered Shaft



Shaft (seal land area) is chrome plated.

A	B	C	D	E	F	G	H	I	J	K
2.5591 2.5579	2.95	3.35	3.15	2.91	1.57	1.18	M24	0.7087 0.7070	0.4331 0.4287	0.2835 0.2756

Taper : 1.0/10

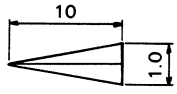


Fig. 4 Starting Torque

Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

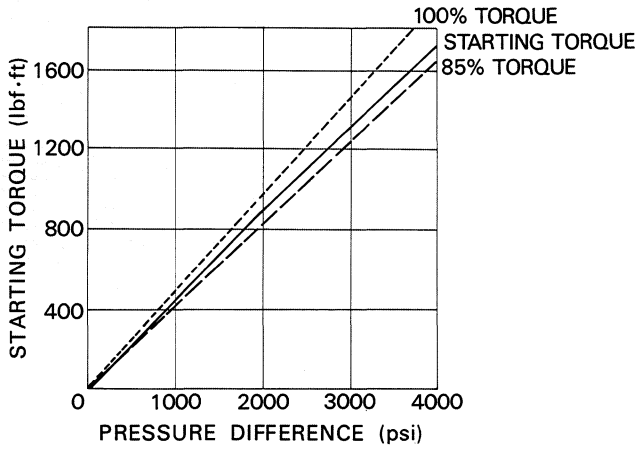


Fig. 5 Case Leakage

Case leakage (from motor drain ports) relative to various speeds is shown for 4 motor pressures.

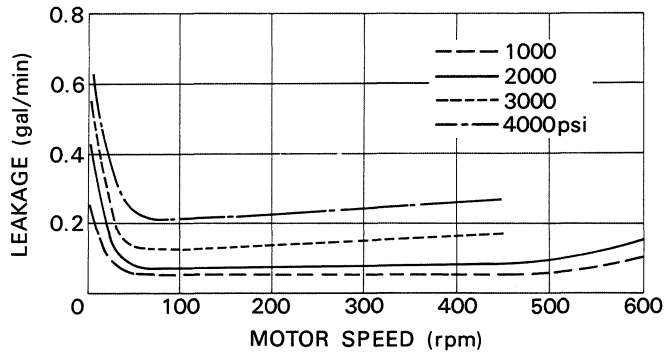


Fig. 6 Minimum Boost Pressure

It is important that sufficient inlet pressure is maintained when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

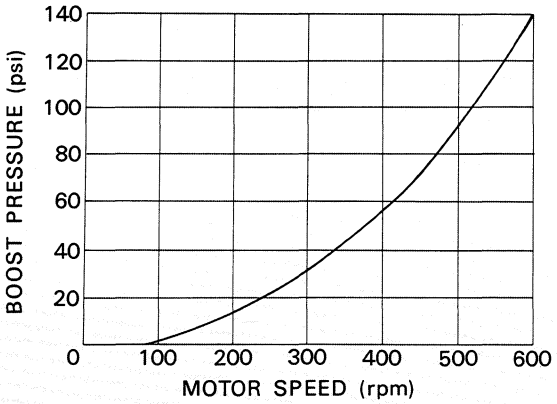


Fig. 7 Pressure Drop

Pressure necessary to run motor without load is shown for various speeds.

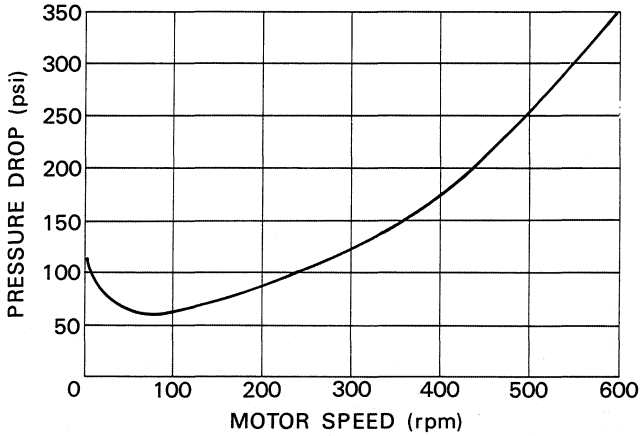
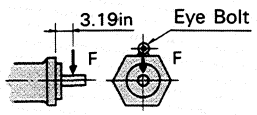


Fig. 8 Bearing Life and Motor Shaft Radial Load



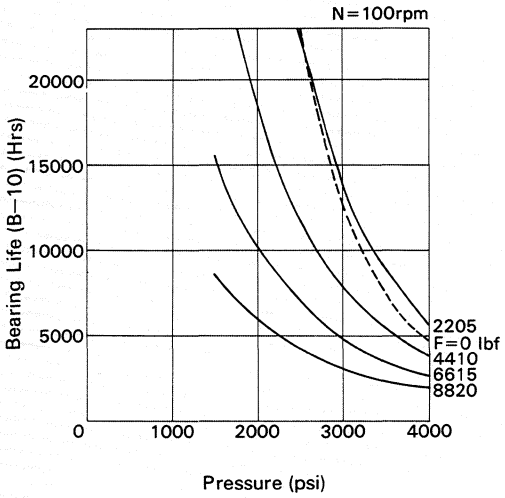
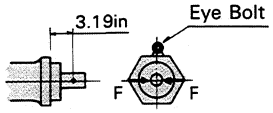


Fig. 8-1



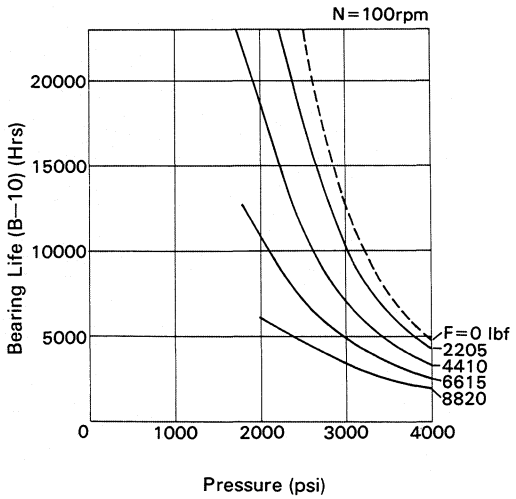


Fig. 8-2

Note

1. If motors are operated on the proper conditions, the operational life is determined by the Bearing Life.

2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 8;
   For a uni-directional application, motor should be installed so that side load acts as shown in figure 8.1.
   For a bi-directional application, involving a radial load for each rotation, then the motor should be installed so that side loads act as shown in figure 8.2.

3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
   When the shaft speed differs from 100 rpm, the bearing life can be obtained by the formula below:

   B-10 Life = (Bearing Life obtainable in the graph at 100 rpm)

   $$\times \frac{100}{\text{Actual Shaft Speed}}$$

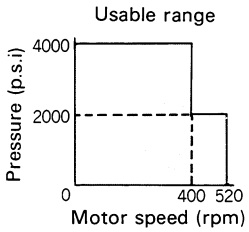
   In case where the side load acts at a different position to the mid point of the shaft projection please refer to us.

4. Maximum allowable radial load (load applied at the mid-point of shaft projection)

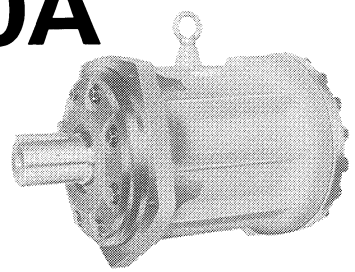
Working Pressure (psi)	2000	3000	4000
Max. Allowable Radial Load (lbf)	10700	10500	10400

5. Applications with axial thrust loads should be referred to us.

Eaton® ME750A



Displacement	: 45.76 in³/rev.
Rated Pressure	: 4000 psi
Peak Pressure	: 4700 psi
Rated Torque	: 2426 lbf·ft
Rated Speed	: 400 rpm
Max. Speed	: 520 rpm
Max. Horse Power	: 185 hp
Weight	: 265 lb



The graphs shown are mean values obtained from production units. FLUID; SHELL TELLUS 56 (VISCOSITY 170 SUS at 122°F)

Fig. 1 Output torque vs speed

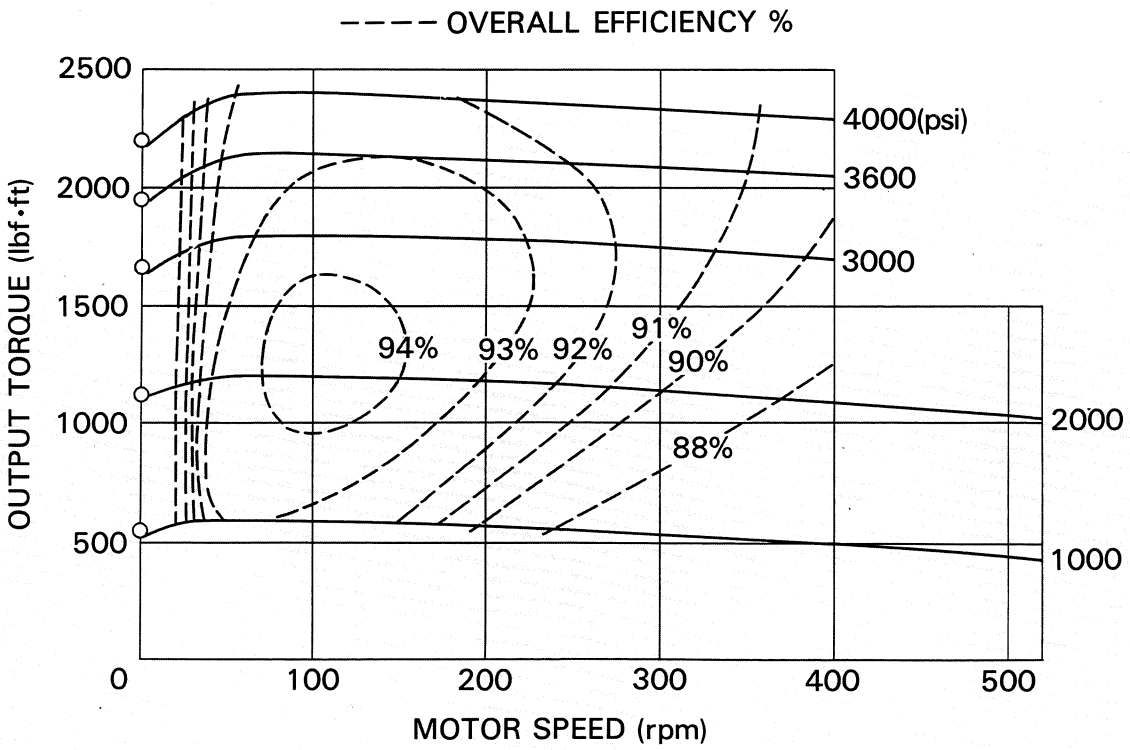
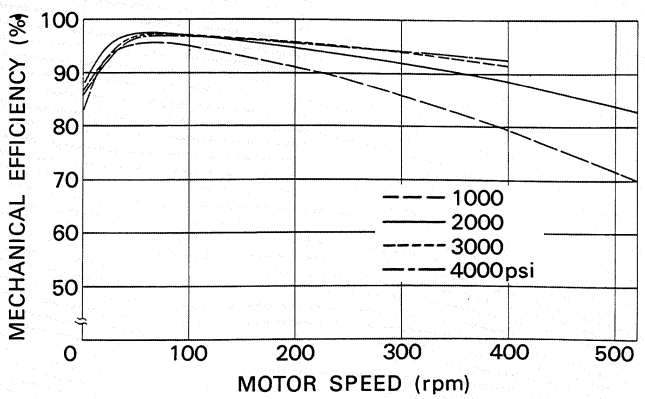
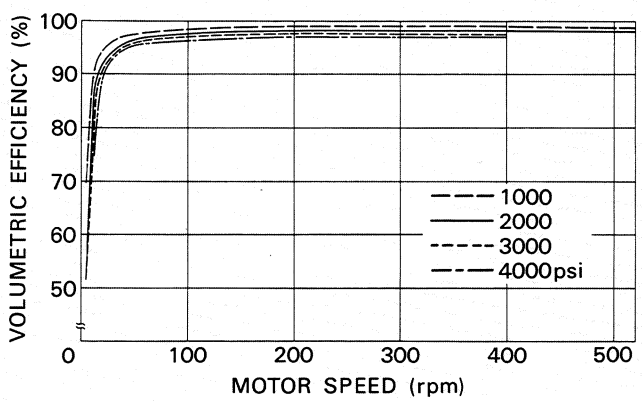


Fig. 2 Mechanical Efficiency



Mechanical efficiency at various speeds is shown for 4 motor pressures.

Fig. 3 Volumetric Efficiency

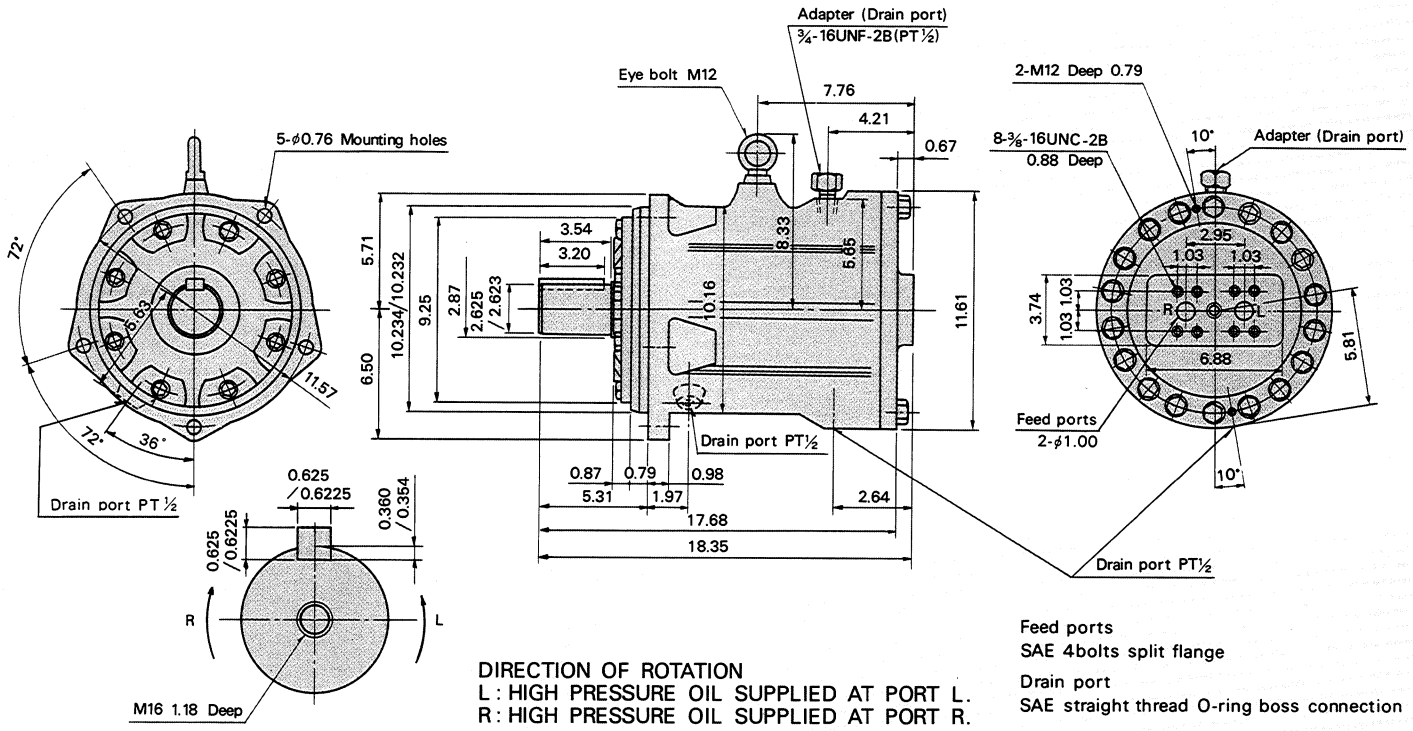


Volumetric efficiency at various speeds is shown for 4 motor pressures.

ME750A

Dimensions in inches

Nominal Dimensions



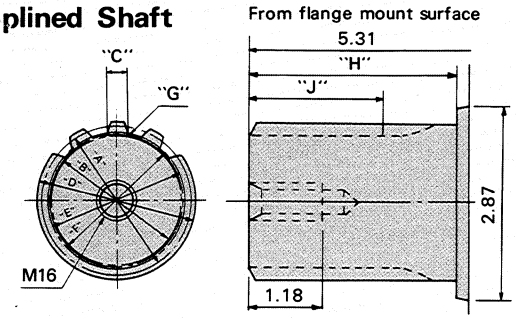
DIRECTION OF ROTATION
L : HIGH PRESSURE OIL SUPPLIED AT PORT L.
R : HIGH PRESSURE OIL SUPPLIED AT PORT R.

Feed ports
SAE 4bolts split flange

Drain port
SAE straight thread O-ring boss connection

Optional Shaft Dimensions

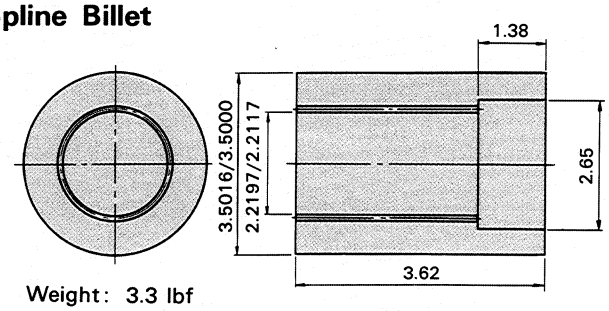
Splined Shaft



Type of Spline : Involute : Flat root side fit : Pressure angle 30° : Pitch 5/10
Class 1 fit : To B.S.3550 or A.S.A.—B5—15.

No.of teeth	Pitch Dia. "A"	Base Dia. "B"	Tooth Thickness "C"	Major Dia. "D"	Form Dia. "E"	Minor Dia. "F"	Fillet Radius "G"	"H"	"J"
12	2.4000	2.0785	0.3124 0.3089	2.5560 2.5480	2.2069	2.1560 2.1310	0.039	3.54	2.20

Spline Billet



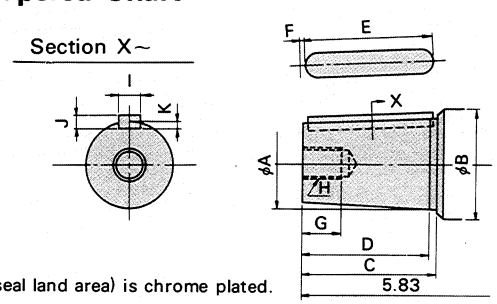
Weight: 3.3 lbf

Involute Spline (Flat root side fit, Class 1 fit)
B.S.3550 or A.S.A-B5-15

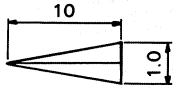
Allowable Pressure for Spline Billet : 4000 psi

No.of Teeth:	12
Pitch:	5/10
Pressure Angle:	30°
Pitch Dia:	2.4000
Major Dia:	2.6250/2.6000
Minor Dia:	2.2197/2.2117
Space Width:	0.3178/0.3163

Tapered Shaft



A	B	C	D	E	F	G	H	I	J	K
2.3819 2.3811	2.953	3.543	3.346	3.346	0.079	1.575	M24	0.6299 0.6282	0.394 0.390	0.244 0.236

(Taper : 1.0/10 

)

Shaft (seal land area) is chrome plated.

Fig.4 Starting Torque

Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

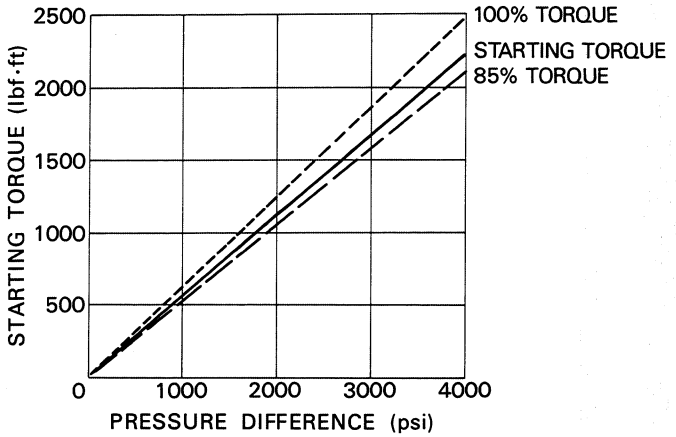


Fig.5 Case Leakage

Case leakage (from motor drain ports) relative to various speeds is shown for 4 motor pressures.

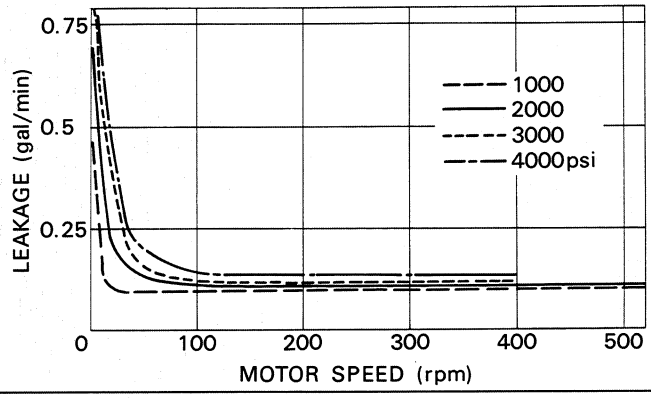


Fig.6 Minimum Boost Pressure

It is important that sufficient inlet pressure is maintained when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

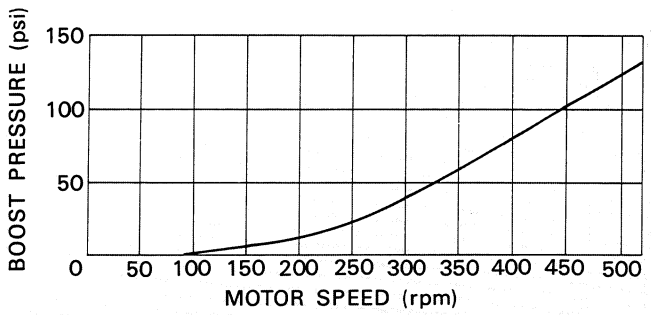


Fig.7 Pressure Drop

Pressure necessary to run motor without load is shown for various speeds.

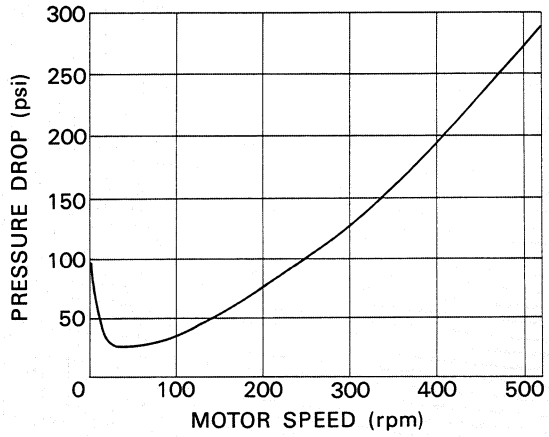


Fig.8 Bearing Life and Motor Shaft Radial Load

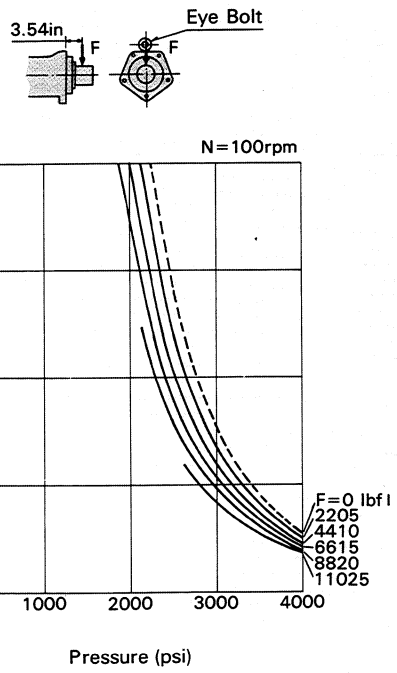


Fig. 8-1

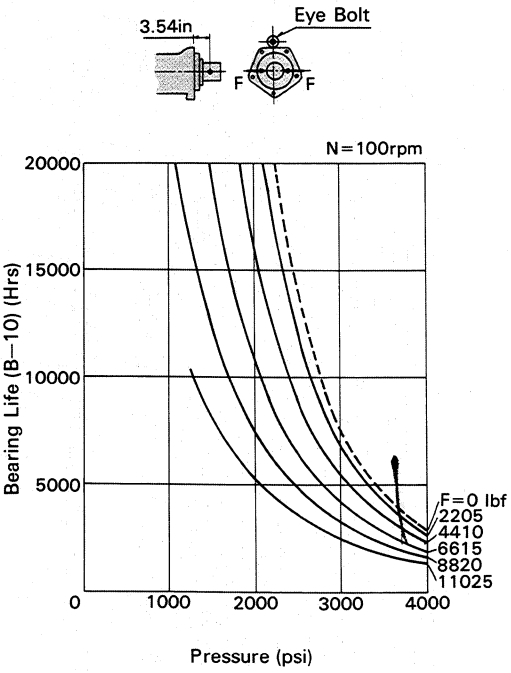


Fig. 8-2

Note

1. If motors are operated on the proper conditions, the operational life is determined by the Bearing Life.

2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 8;
   For a uni-directional application, motor should be installed so that side load acts as shown in figure 8.1.
   For a bi-directional application, involving a radial load for each rotation, then the motor should be installed so that side loads act as shown in figure 8.2.

3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
   When the shaft speed differs from 100 rpm, the bearing life can be obtained by the formula below:

   B-10 Life = (Bearing Life obtainable in the graph at 100 rpm)

   $$\times \frac{100}{\text{Actual Shaft Speed}}$$

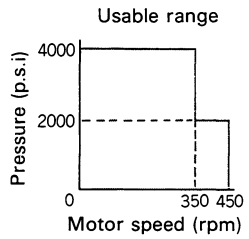
   In case where the side load acts at a different position to the mid point of the shaft projection please refer to us.

4. Maximum allowable radial load (load applied at the mid-point of shaft projection)

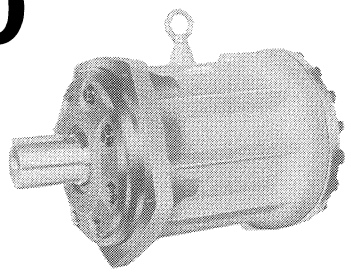
Working Pressure (psi)	2000	3000	4000
Max. Allowable Radial Load (lbf)	11900	11900	11500

5. Applications with axial thrust loads should be referred to us.

Eaton® ME850



Displacement	**: 51.68 in³/rev.**
Rated Pressure	**: 4000 psi**
Peak Pressure	**: 4700 psi**
Rated Torque	**: 2740 lbf·ft**
Rated Speed	**: 350 rpm**
Max. Speed	**: 450 rpm**
Max. Horse Power	**: 183 hp**
Weight	**: 265 lb**



The graphs shown are mean values obtained from production units. FLUID; SHELL TELLUS 56 (VISCOSITY 170 SUS at 122°F)

Fig.1 Output torque vs speed

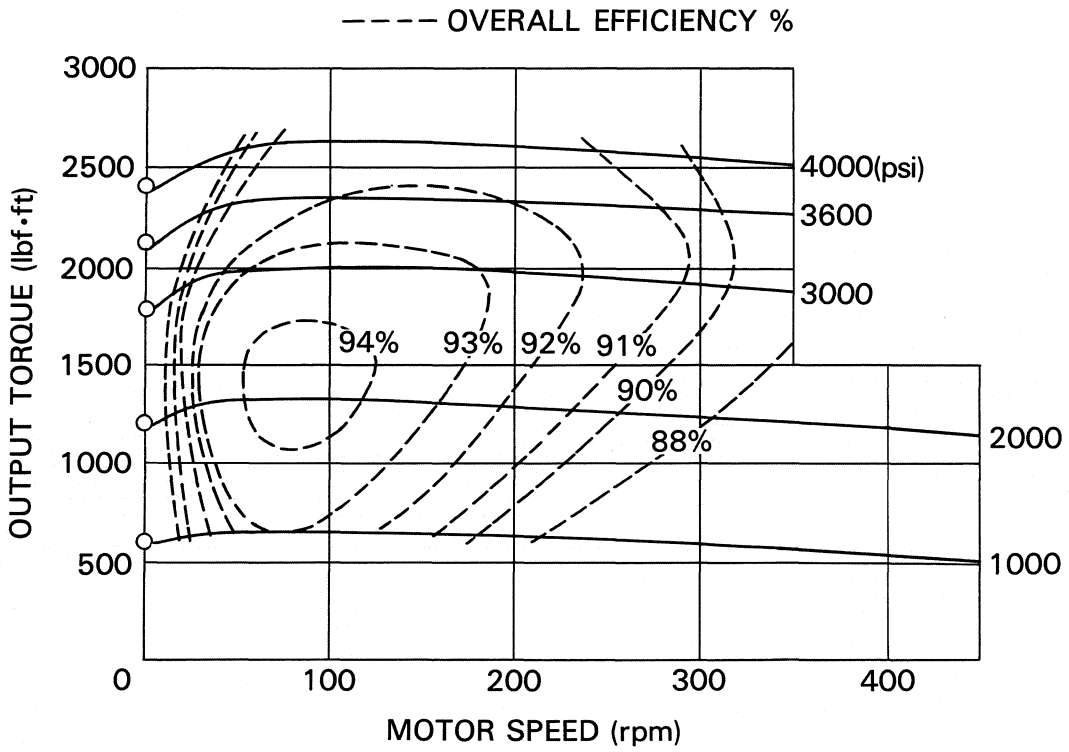
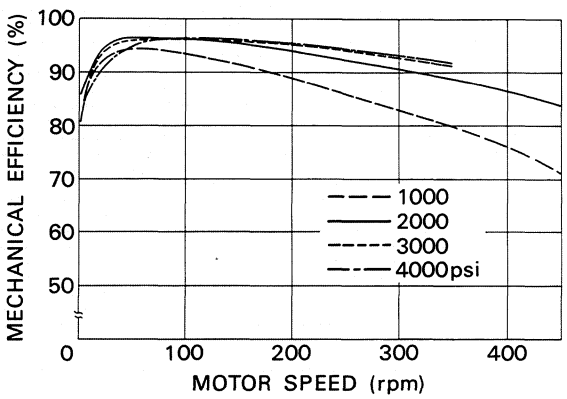
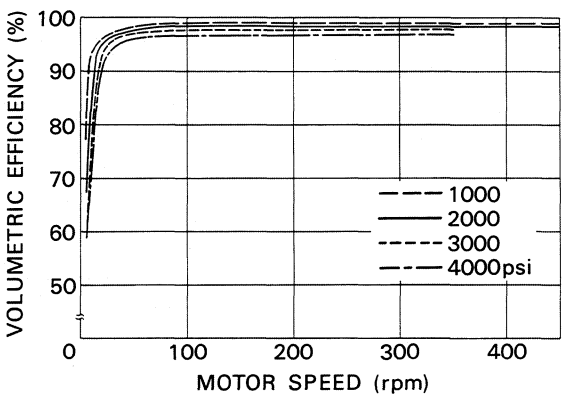


Fig.2 Mechanical Efficiency



Mechanical efficiency at various speeds is shown for 4 motor pressures.

Fig.3 Volumetric Efficiency

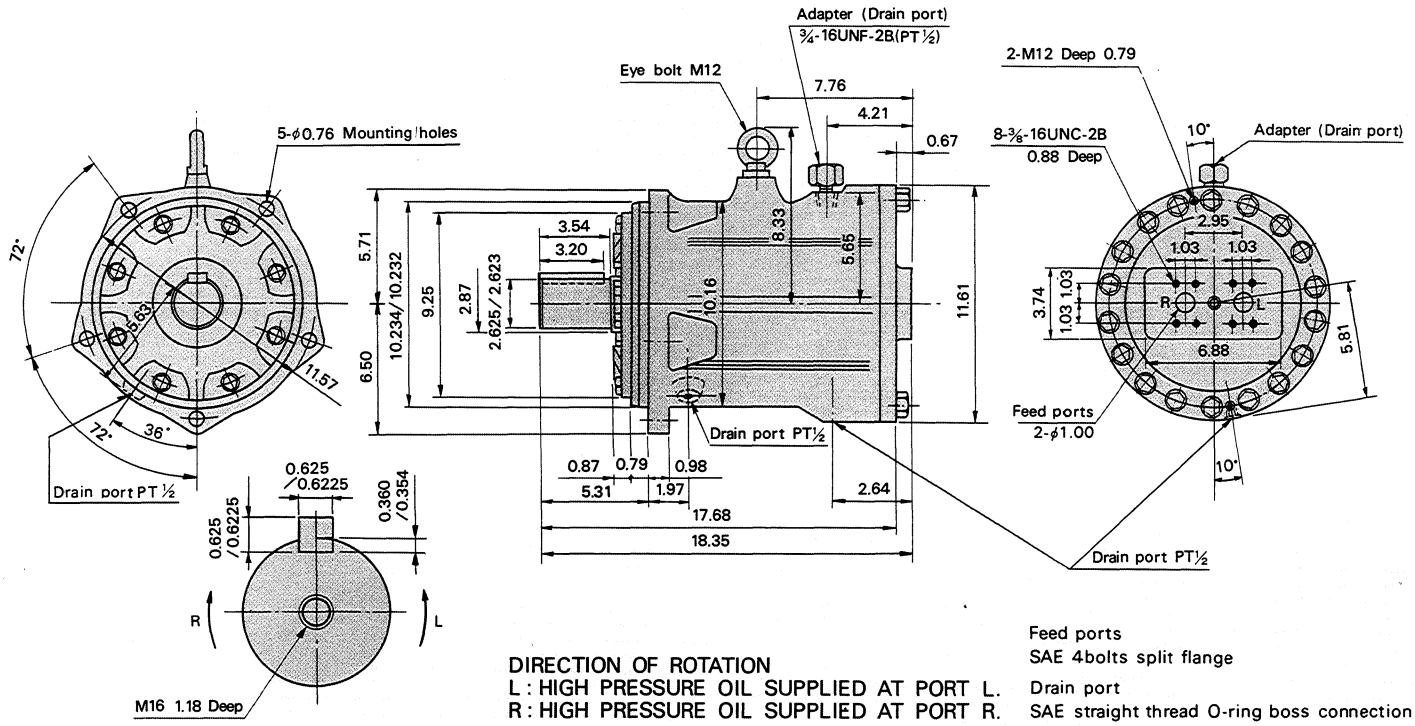


Volumetric efficiency at various speeds is shown for 4 motor pressures.

ME850

Dimensions in inches

Nominal Dimensions

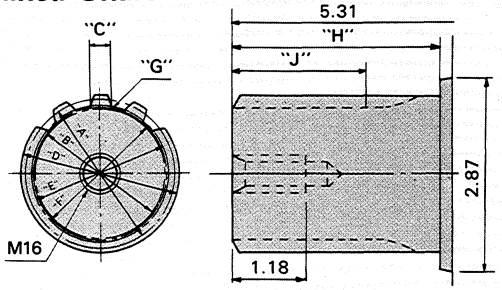


DIRECTION OF ROTATION
L : HIGH PRESSURE OIL SUPPLIED AT PORT L.
R : HIGH PRESSURE OIL SUPPLIED AT PORT R.

Feed ports
SAE 4bolts split flange
Drain port
SAE straight thread O-ring boss connection

Optional Shaft Dimensions

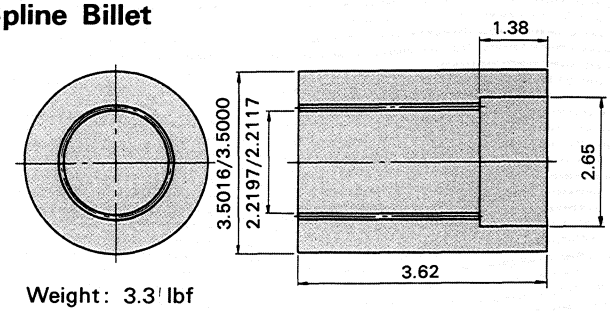
Splined Shaft



Type of Spline : Involute : Flat root side fit : Pressure angle 30° : Pitch 5/10
Class 1 fit : To B.S.3550 or A.S.A.—B5—15.

No.of teeth	Pitch Dia. "A"	Base Dia. "B"	Tooth Thickness "C"	Major Dia. "D"	Form Dia. "E"	Minor Dia. "F"	Fillet Radius "G"	"H"	"J"
12	2.4000	2.0785	0.3124 0.3089	2.5560 2.5480	2.2069	2.1560 2.1310	0.039	3.54	2.20

Spline Billet



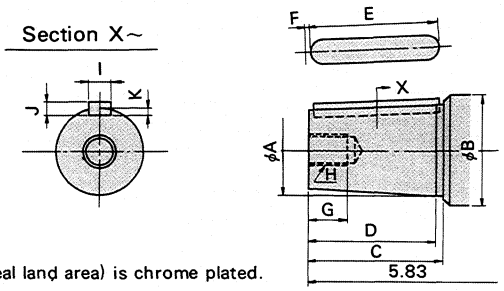
Weight : 3.3 lbf

Involute Spline (Flat root side fit, Class 1 fit)
B.S.3550 or A.S.A-B5-15

Allowable Pressure for Spline Billet : 4000 psi

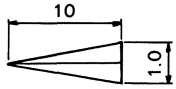
No.of Teeth:	12
Pitch:	5/10
Pressure Angle:	30°
Pitch Dia:	2.4000
Major Dia:	2.6250/2.6000
Minor Dia:	2.2197/2.2117
Space Width:	0.3178/0.3163

Tapered Shaft



Shaft (seal land area) is chrome plated.

A	B	C	D	E	F	G	H	I	J	K
2.3819 2.3811	2.953	3.543	3.346	3.346	0.079	1.575	M24	0.6299 0.6282	0.394 0.390	0.244 0.236

(Taper : 1.0/10 

)

Fig.4 Starting Torque

Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

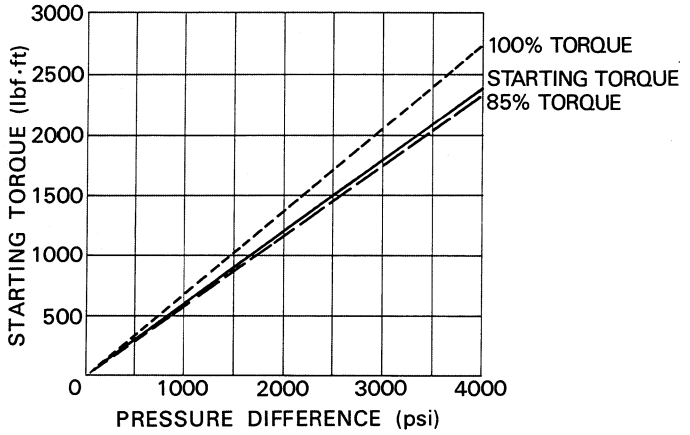


Fig.5 Case Leakage

Case leakage (from motor drain ports) relative to various speeds is shown for 4 motor pressures.

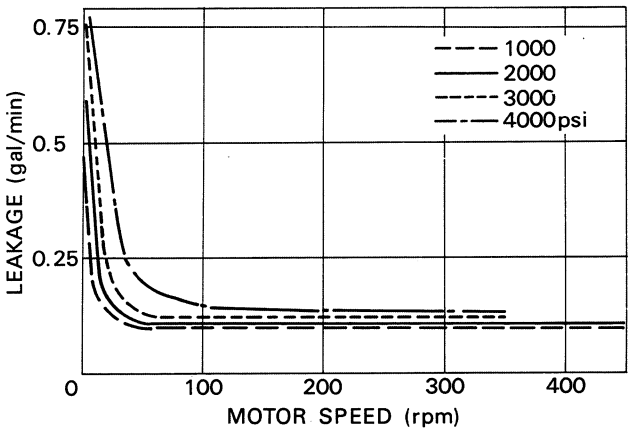


Fig.6 Minimum Boost Pressure

It is important that sufficient inlet pressure is maintained when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

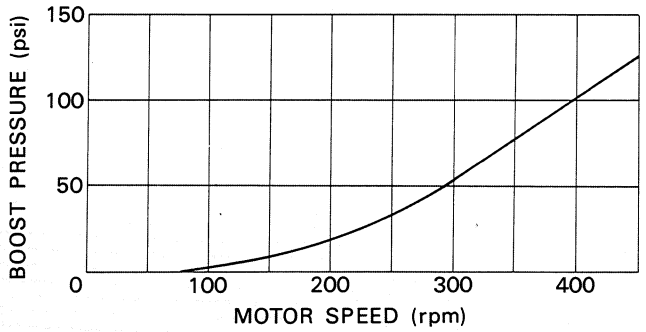


Fig.7 Pressure Drop

Pressure necessary to run motor without load is shown for various speeds.

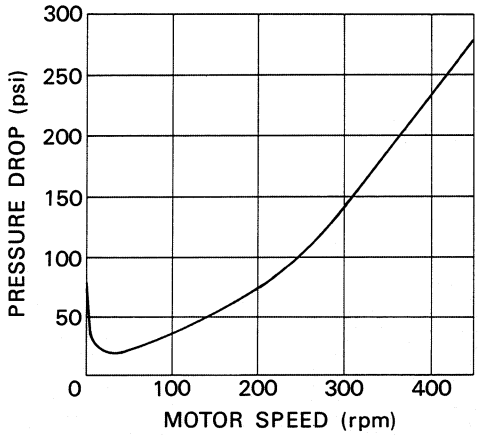
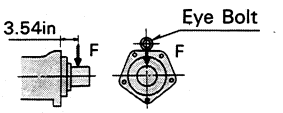


Fig.8 Bearing Life and Motor Shaft Radial Load



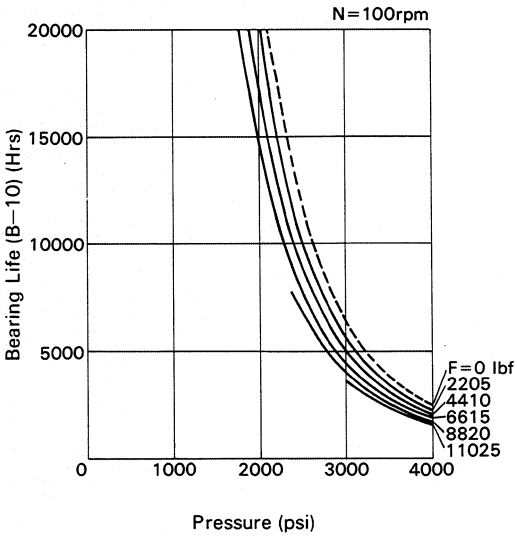
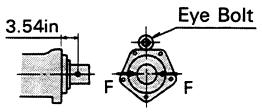


Fig. 8-1



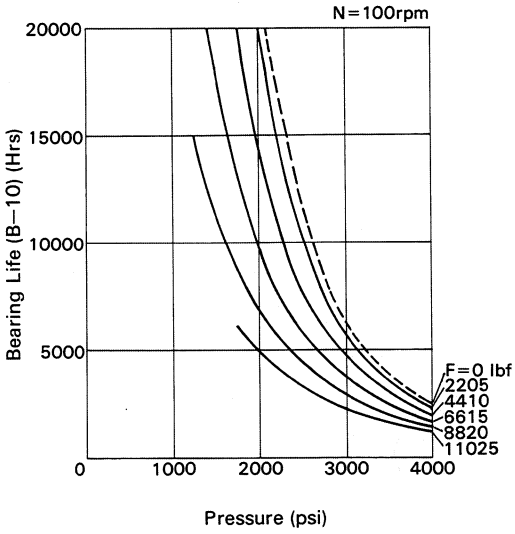


Fig. 8-2

Note

1. If motors are operated on the proper conditions, the operational life is determined by the Bearing Life.

2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 8;
   For a uni-directional application, motor should be installed so that side load acts as shown in figure 8.1.
   For a bi-directional application, involving a radial load for each rotation, then the motor should be installed so that side loads act as shown in figure 8.2.

3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
   When the shaft speed differs from 100 rpm, the bearing life can be obtained by the formula below:

   B-10 Life = (Bearing Life obtainable in the graph at 100 rpm)

   $$\times \frac{100}{\text{Actual Shaft Speed}}$$

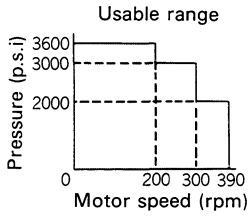
   In case where the side load acts at a different position to the mid point of the shaft projection please refer to us.

4. Maximum allowable radial load (load applied at the mid-point of shaft projection)

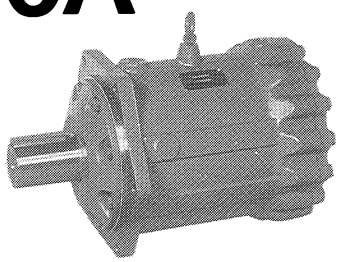
Working Pressure (psi)	2000	3000	4000
Permissible Radial Load (lbf)	11900	11700	10800

5. Applications with axial thrust loads should be referred to us.

Eaton® ME1300A



Displacement	**: 82.06 in³/rev.**
Rated Pressure	**: 3600 psi**
Peak Pressure	**: 4700 psi**
Rated Torque	**: 3916 lbf·ft**
Rated Speed	**: 200 rpm**
Max. Speed	**: 390 rpm**
Max. Horse Power	**: 186 hp**
Weight	**: 375 lb**



The graphs shown are mean values obtained from production units. FLUID; SHELL TELLUS 56 (VISCOSITY 170 SUS at 122°F)

Fig. 1 Output torque vs speed

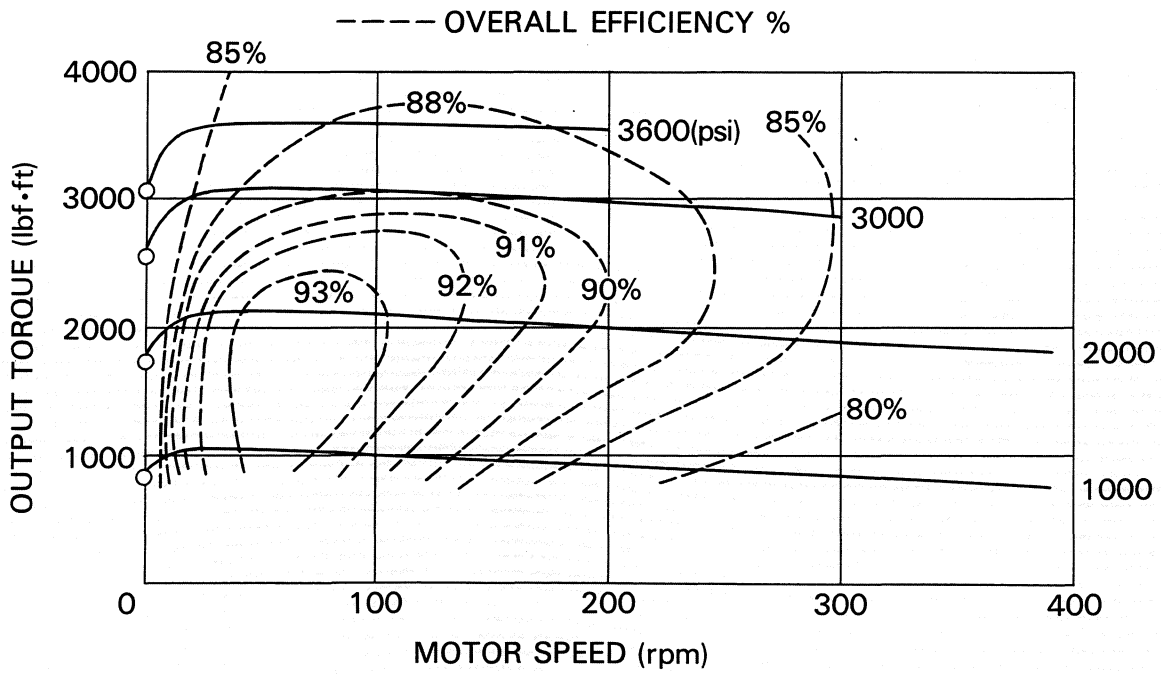
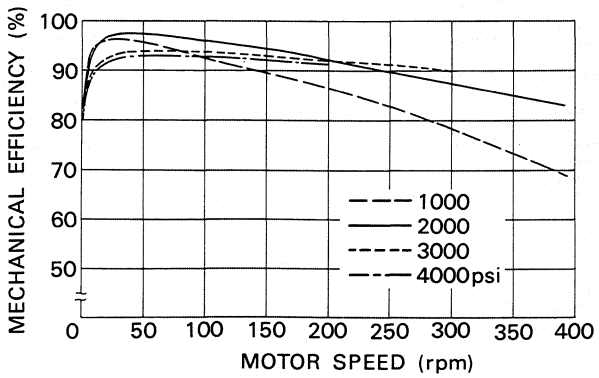
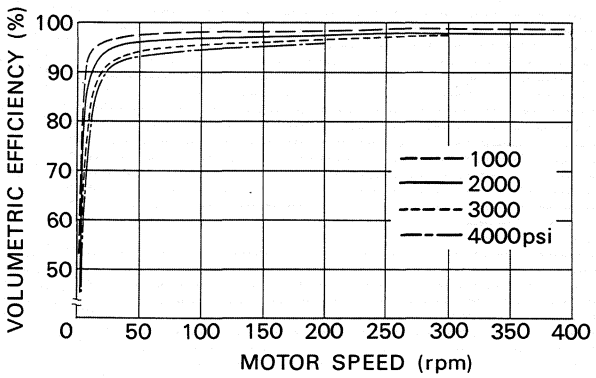


Fig. 2 Mechanical Efficiency



Mechanical efficiency at various speeds is shown for 4 motor pressures.

Fig. 3 Volumetric Efficiency

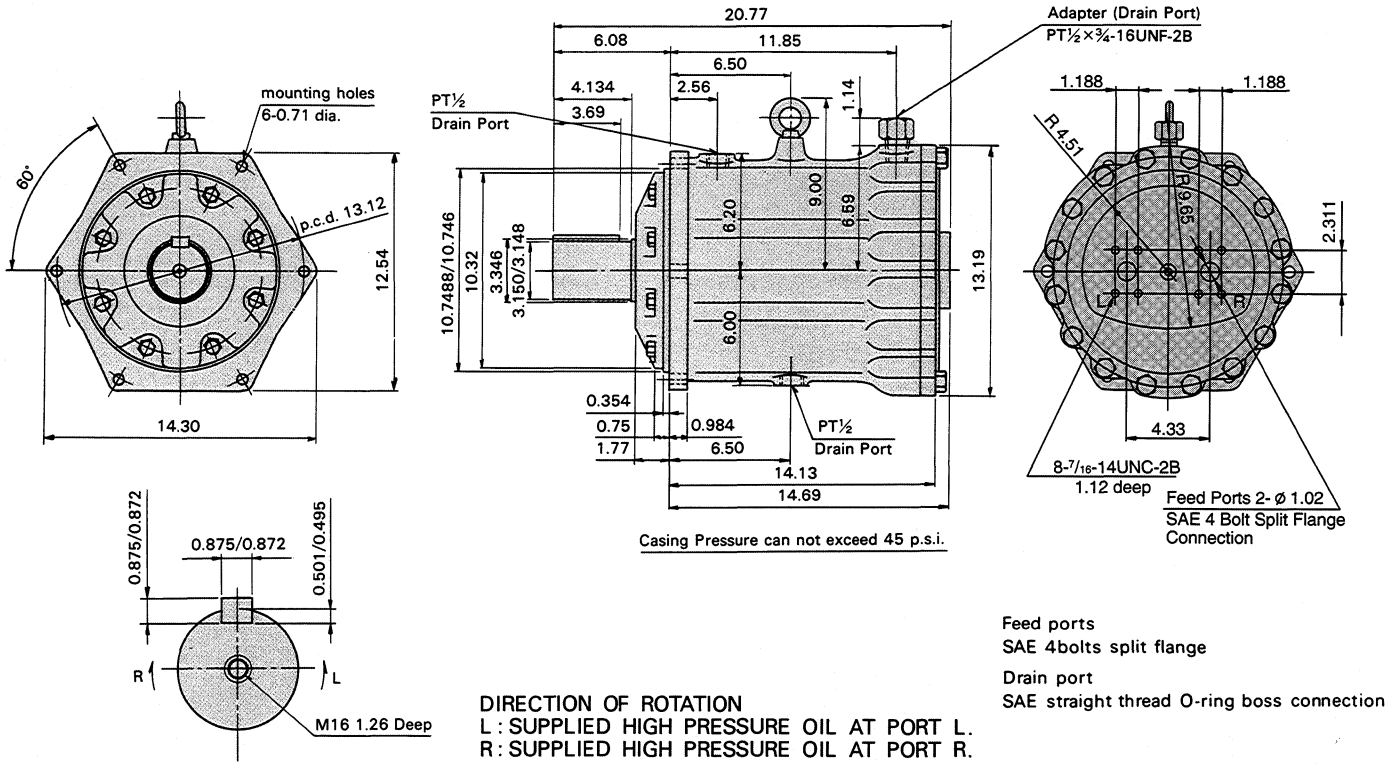


Volumetric efficiency at various speeds is shown for 4 motor pressures.

ME1300A

Dimensions in inches

Nominal Dimensions



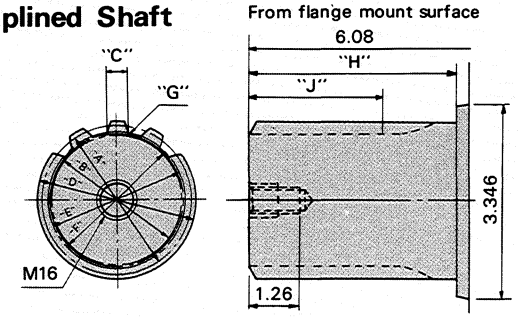
DIRECTION OF ROTATION
L : SUPPLIED HIGH PRESSURE OIL AT PORT L.
R : SUPPLIED HIGH PRESSURE OIL AT PORT R.

Feed ports
SAE 4bolts split flange

Drain port
SAE straight thread O-ring boss connection

Optional Shaft Dimensions

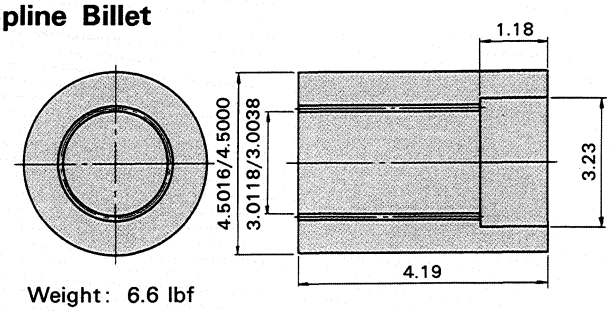
Splined Shaft



Type of Spline : Involute : Flat root side fit : Pressure angle 30° : Pitch 5/10
Class 1 fit : To B.S.3550 or A.S.A.—B5—15.

No.of teeth	Pitch Dia. "A"	Base Dia. "B"	Tooth Thickness "C"	Major Dia. "D"	Form Dia. "E"	Minor Dia. "F"	Fillet Radius "G"	"H"	"J"
15	3.0000	2.5981	0.3120 0.3087	3.1560 3.1480	2.7992	2.7560 2.7310	0.035	4.134	3.01

Spline Billet



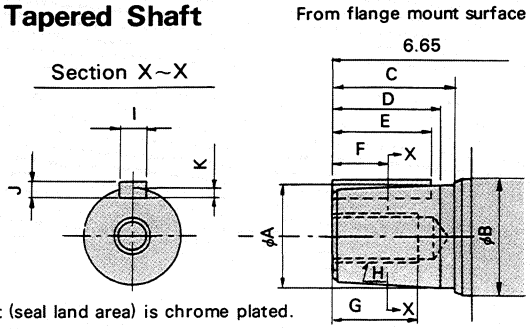
Weight: 6.6 lbf

Involute Spline (Flat root side fit, Class 1 fit)
B.S.3550 or A.S.A-B5-15

Allowable Pressure for Spline Billet : 3600 psi

No.of Teeth:	15
Pitch:	5/10
Pressure Angle:	30°
Pitch Dia:	3.0000
Major Dia:	3.2250/3.2000
Minor Dia:	2.8132/2.8052
Space Width:	0.3179/0.3164

Tapered Shaft



Shaft (seal land area) is chrome plated.

A	B	C	D	E	F	G	H	I	J	K
3.150 3.149	3.346	4.13	3.976	3.54	1.988	2.54	M24	0.8661 0.8641	0.5512 0.5469	0.3622 0.3543

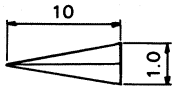
(Taper : 1.0/10 

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Fig.4 Starting Torque

Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

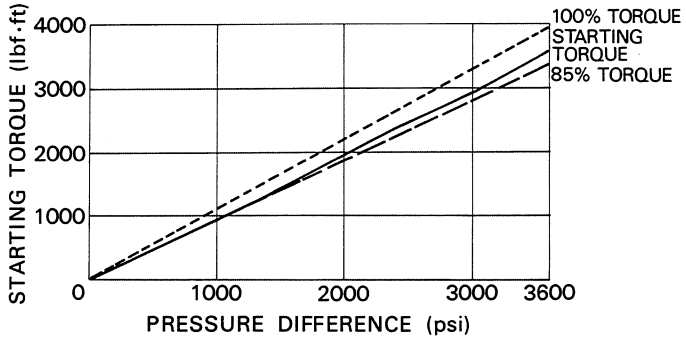


Fig.5 Case Leakage

Case leakage (from motor drain ports) relative to various speeds is shown for 4 motor pressures.

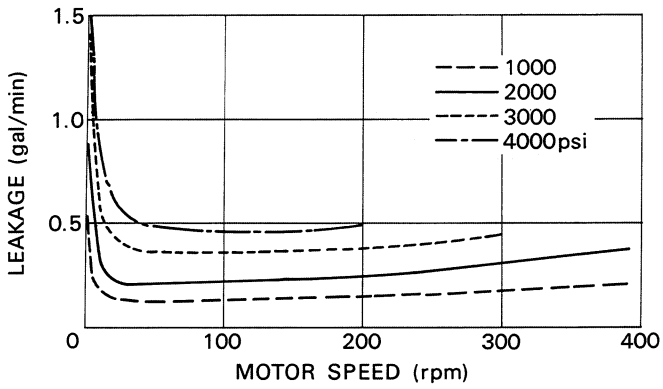


Fig.6 Minimum Boost Pressure

It is important that sufficient inlet pressure is maintained when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

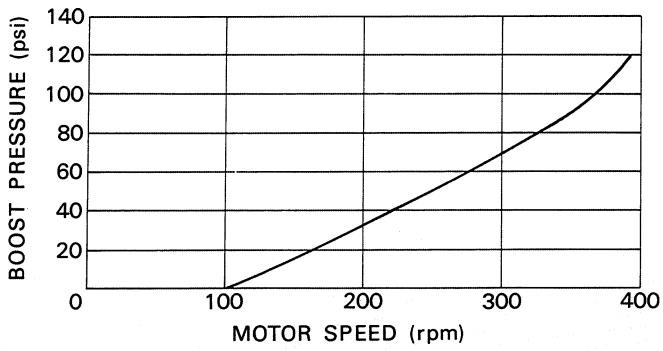


Fig.7 Pressure Drop

Pressure necessary to run motor without load is shown for various speeds.

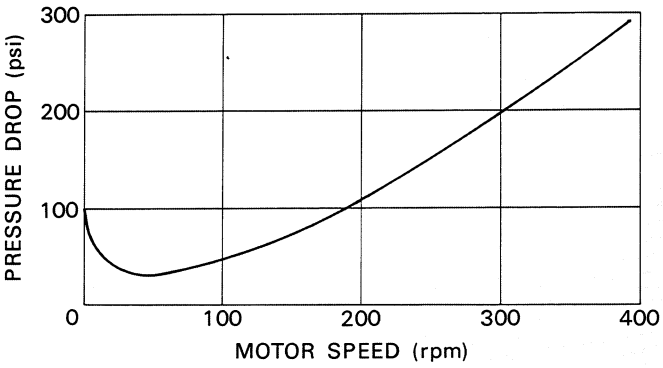
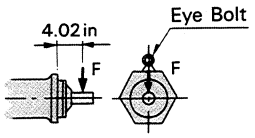


Fig.8 Bearing Life and Motor Shaft Radial Load



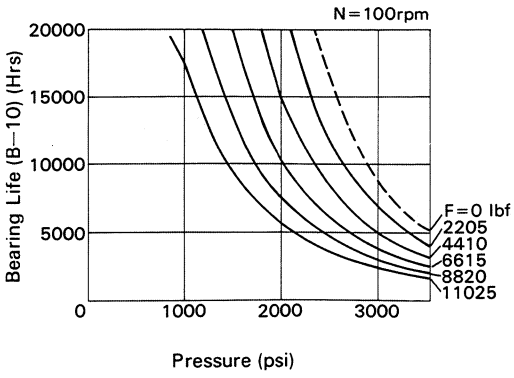
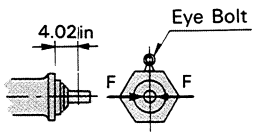


Fig. 8-1



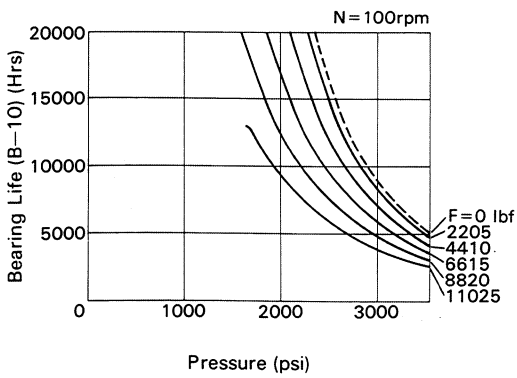


Fig. 8-2

Note

1. If motors are operated on the proper conditions, the operational life is determined by the Bearing Life.

2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 8;
   For a uni-directional application, motor should be installed so that side load acts as shown in figure 8.1.
   For a bi-directional application, involving a radial load for each rotation, then the motor should be installed so that side loads act as shown in figure 8.2.

3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
   When the shaft speed differs from 100 rpm, the bearing life can be obtained by the formula below:

   B-10 Life = (Bearing Life obtainable in the graph at 100 rpm) $\times \frac{\textbf{100}}{\textbf{Actual Shaft Speed}}$

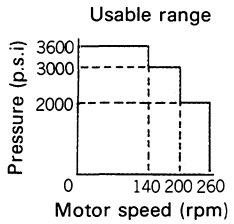
   In case where the side load acts at a different position to the mid point of the shaft projection please refer to us.

4. Maximum allowable radial load (load applied at the mid-point of shaft projection)

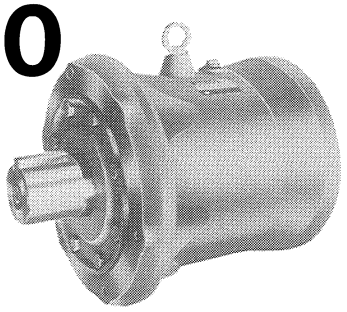
Working Pressure (psi)	2000	3000	3600
Permissible Radial Load (lbf)	9300	8600	7900

5. Applications with axial thrust loads should be referred to us.

Eaton® ME1900



Displacement	**: 113.97 in³/rev.**
Rated Pressure	**: 3600 psi**
Peak Pressure	**: 4700 psi**
Rated Torque	**: 5438 lbf·ft**
Rated Speed	**: 140 rpm**
Max. Speed	**: 260 rpm**
Max. Horse Power	**: 173 hp**
Weight	**: 595 lb**



The graphs shown are mean values obtained from production units. FLUID; SHELL TELLUS 56 (VISCOSITY 170 SUS at 122°F)

Fig. 1 Output torque vs speed

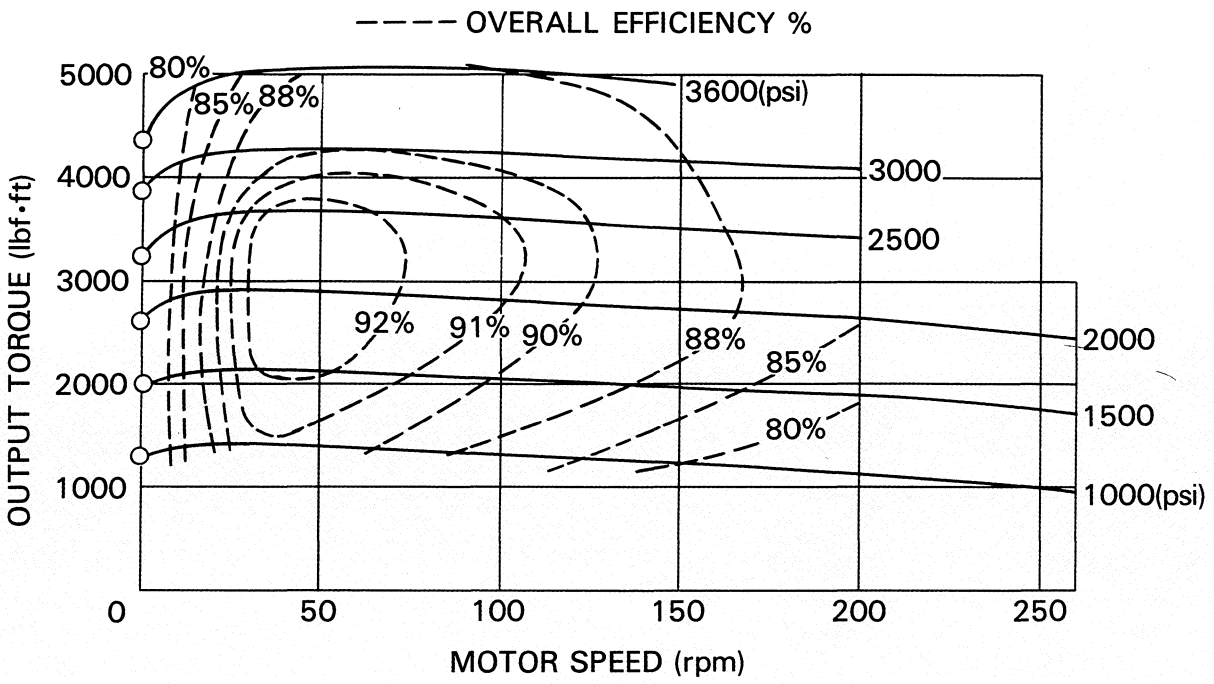
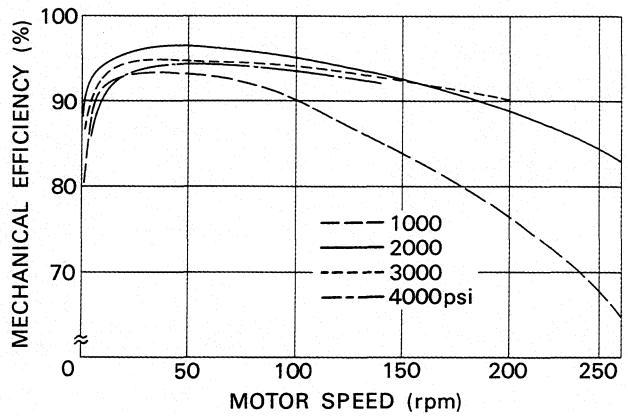
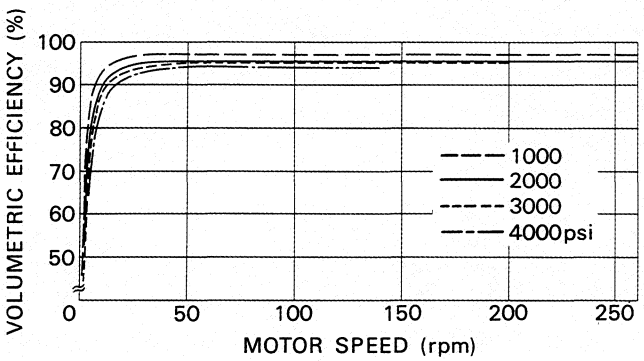


Fig. 2 Mechanical Efficiency



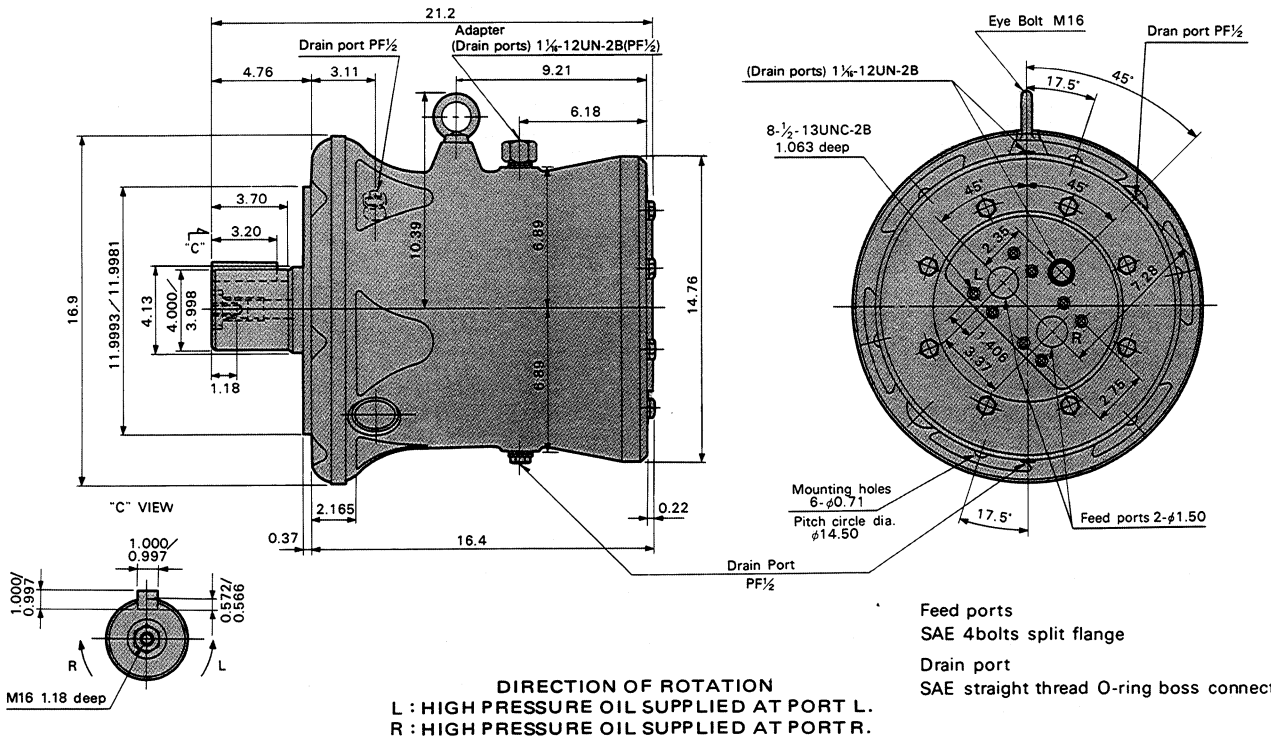
Mechanical efficiency at various speeds is shown for 4 motor pressures.

Fig. 3 Volumetric Efficiency



Volumetric efficiency at various speeds is shown for 4 motor pressures.

Nominal Dimensions



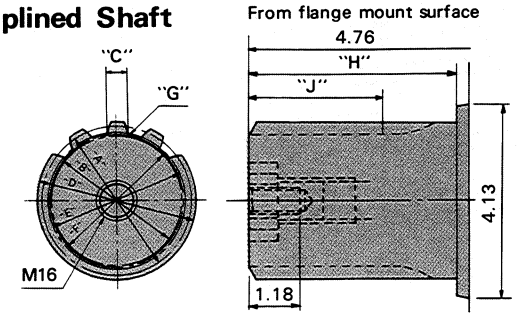
DIRECTION OF ROTATION
L : HIGH PRESSURE OIL SUPPLIED AT PORT L.
R : HIGH PRESSURE OIL SUPPLIED AT PORT R.

Feed ports
SAE 4bolts split flange

Drain port
SAE straight thread O-ring boss connection

Optional Shaft Dimensions

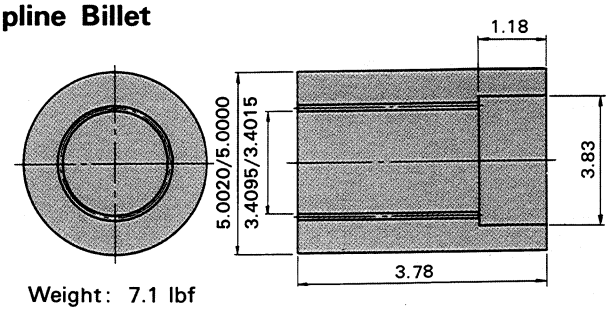
Splined Shaft



Type of Spline : Involute : Flat root side fit : Pressure angle 30° : Pitch 5/10
Class 1 fit : To B.S.3550 or A.S.A.—B5—15.

No.of teeth	Pitch Dia. "A"	Base Dia. "B"	Tooth Thickness "C"	Major Dia. "D"	Form Dia. "E"	Minor Dia. "F"	Fillet Radius "G"	"H"	"J"
18	3.6000	3.1177	0.3123 0.3085	3.7560 3.7480	3.3943	3.3560 3.3310	0.032	3.70	2.55

Spline Billet



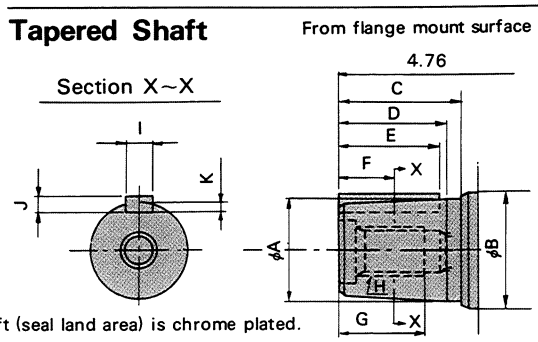
Weight: 7.1 lbf

Involute Spline (Flat root side fit, Class 1 fit)
B.S.3550 or A.S.A-B5-15

Allowable Pressure for Spline Billet : 3600 psi

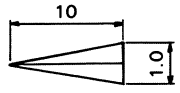
No.of Teeth:	18
Pitch:	5/10
Pressure Angle:	30°
Pitch Dia:	3.6000
Major Dia:	3.8250/3.8000
Minor Dia:	3.4095/3.4015
Space Width:	0.3180/0.3164

Tapered Shaft



Shaft (seal land area) is chrome plated.

A	B	C	D	E	F	G	H	I	J	K
3.9370 3.9361	4.134	3.898	3.701	3.150	1.850	2.500	M36	1.1024 1.1003	0.6299 0.6256	0.4016 0.3937

(Taper : 1.0/10 

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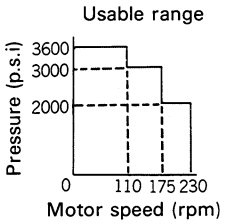
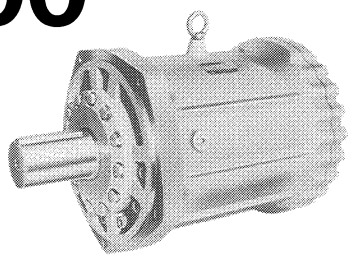
Eaton® ME3100



Displacement	**: 189.42 in³/rev.**
Rated Pressure	**: 3600 psi**
Peak Pressure	**: 4700 psi**
Rated Torque	**: 9039 lbf·ft**
Rated Speed	**: 110 rpm**
Max. Speed	**: 230 rpm**
Max. Horse Power	**: 251 hp**
Weight	**: 802 lb**



The graphs shown are mean values obtained from production units. FLUID; SHELL TELLUS 56 (VISCOSITY 170 SUS at 122°F)

Fig.1 Output torque vs speed

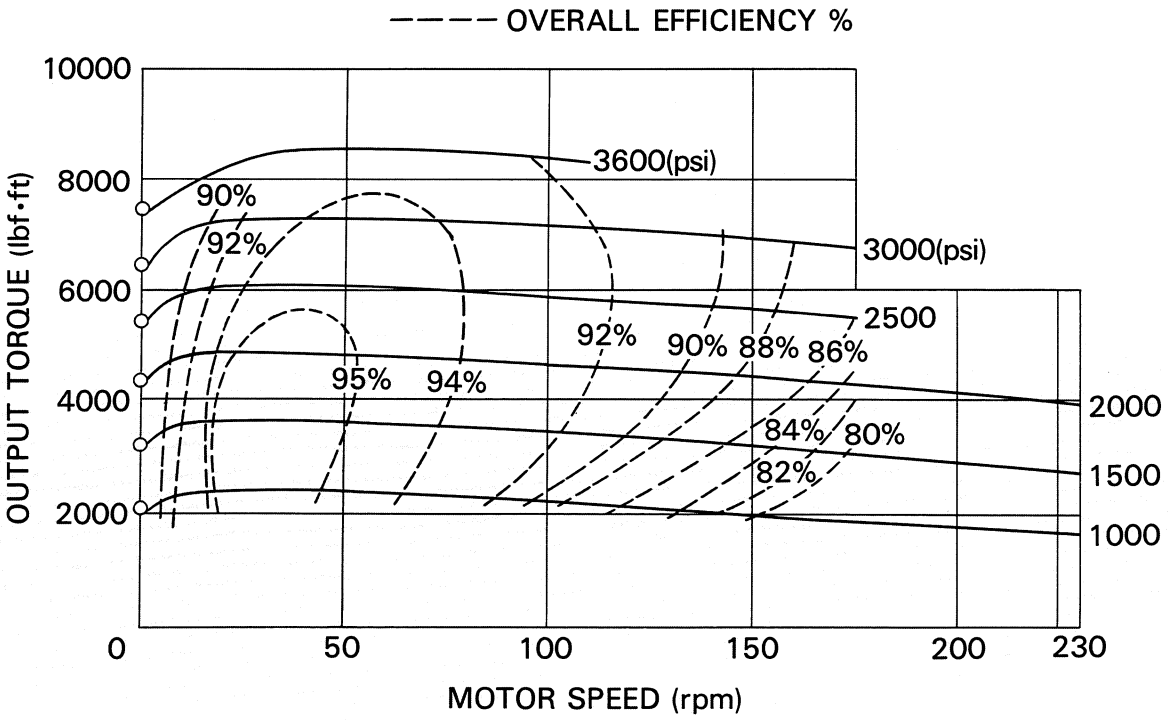
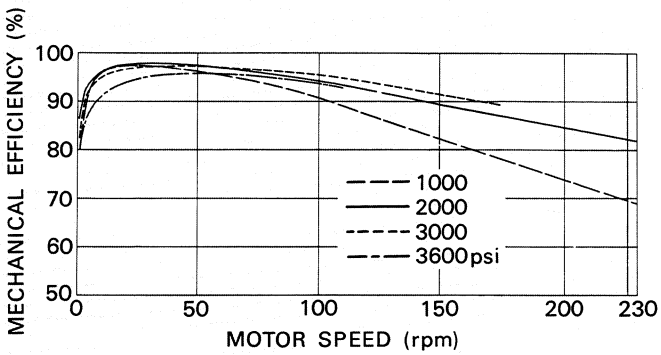
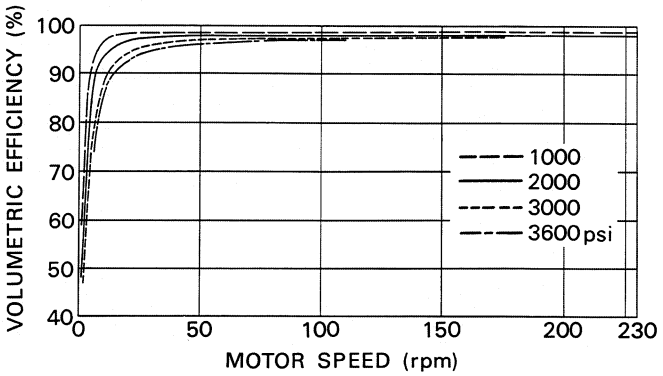


Fig.2 Mechanical Efficiency



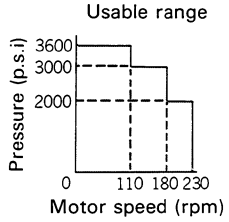
Mechanical efficiency at various speeds is shown for 4 motor pressures.

Fig.3 Volumetric Efficiency

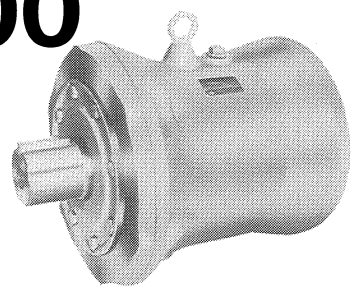


Volumetric efficiency at various speeds is shown for 4 motor pressures.

Eaton® ME2600



Displacement	**: 157.29 in³/rev.**
Rated Pressure	**: 3600 psi**
Peak Pressure	**: 4700 psi**
Rated Torque	**: 7505 lbf·ft**
Rated Speed	**: 110 rpm**
Max. Speed	**: 230 rpm**
Max. Horse Power	**: 214 hp**
Weight	**: 772 lb**



The graphs shown are mean values obtained from production units. FLUID; SHELL TELLUS 56 (VISCOSITY 170 SUS at 122°F)

Fig.1 Output torque vs speed

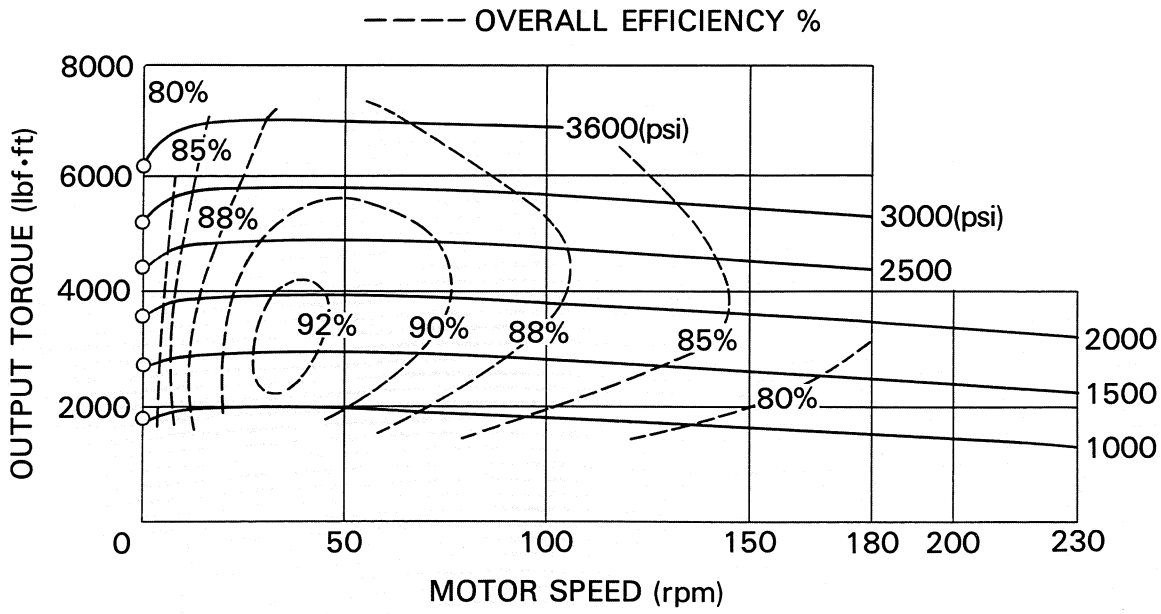
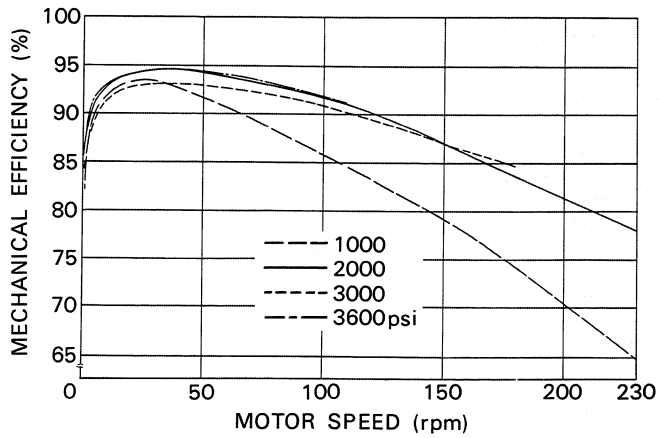
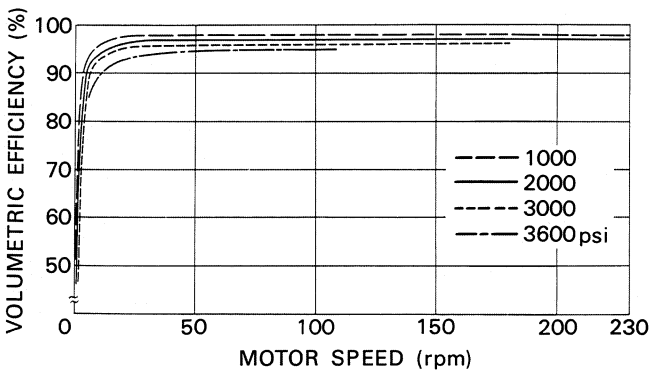


Fig.2 Mechanical Efficiency



Mechanical efficiency at various speeds is shown for 4 motor pressures.

Fig.3 Volumetric Efficiency



Volumetric efficiency at various speeds is shown for 4 motor pressures.

Fig.4 Starting Torque

Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

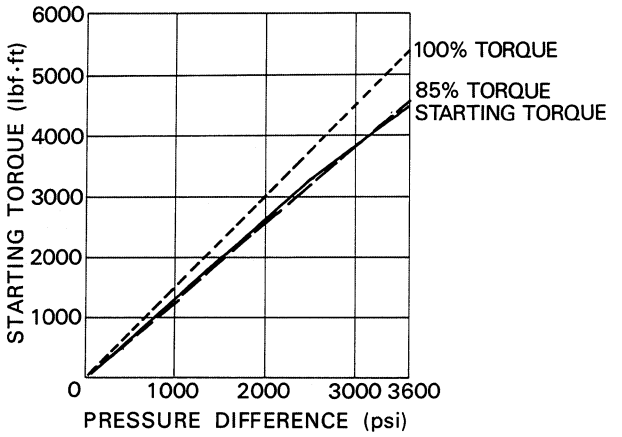


Fig.5 Case Leakage

Case leakage (from motor drain ports) relative to various speeds is shown for 4 motor pressures.

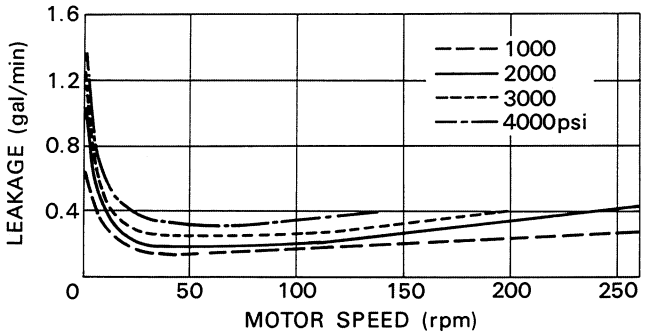


Fig.6 Minimum Boost Pressure

It is important that sufficient inlet pressure is maintained when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

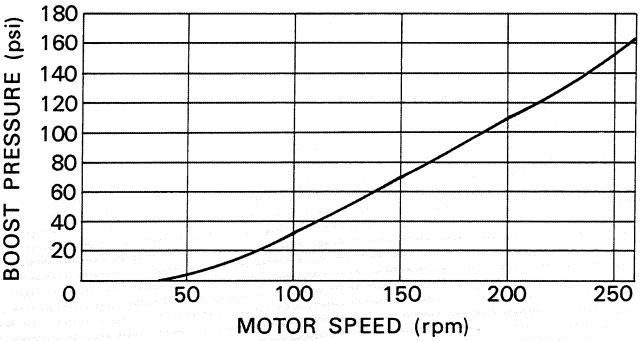


Fig.7 Pressure Drop

Pressure necessary to run motor without load is shown for various speeds.

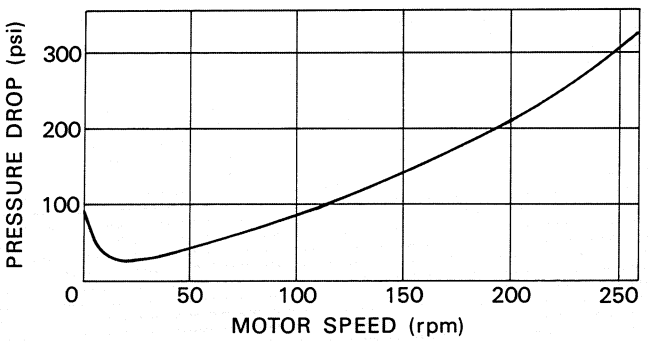
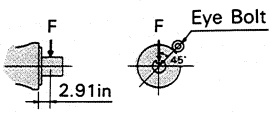


Fig.8 Bearing Life and Motor Shaft Radial Load



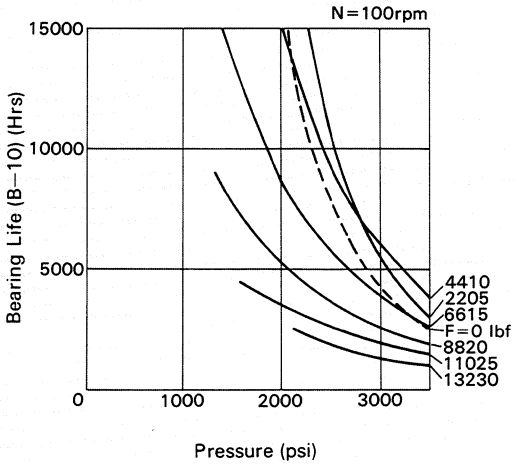
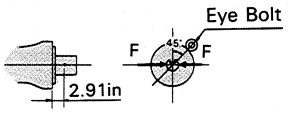


Fig. 8-1



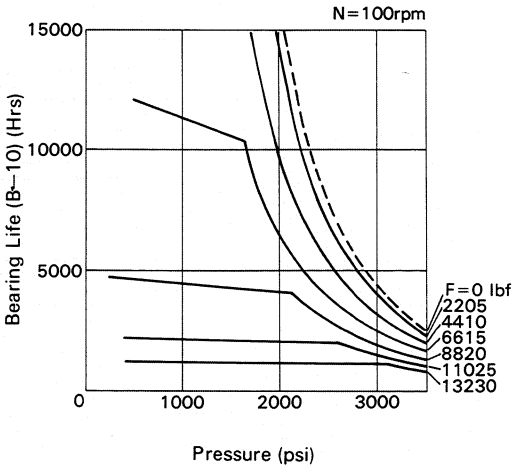


Fig. 8-2

Note

1. If motors are operated on the proper conditions, the operational life is determined by the Bearing Life.

2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 8;
   For a uni-directional application, motor should be installed so that side load acts as shown in figure 8.1.
   For a bi-directional application, involving a radial load for each rotation, then the motor should be installed so that side loads act as shown in figure 8.2.

3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
   When the shaft speed differs from 100 rpm, the bearing life can be obtained by the formula below:

   B-10 Life = (Bearing Life obtainable in the graph at 100 rpm) × 100 / Actual Shaft Speed

   In case where the side load acts at a different position to the mid point of the shaft projection please refer to us.

4. Maximum allowable radial load (load applied at the mid-point of shaft projection)

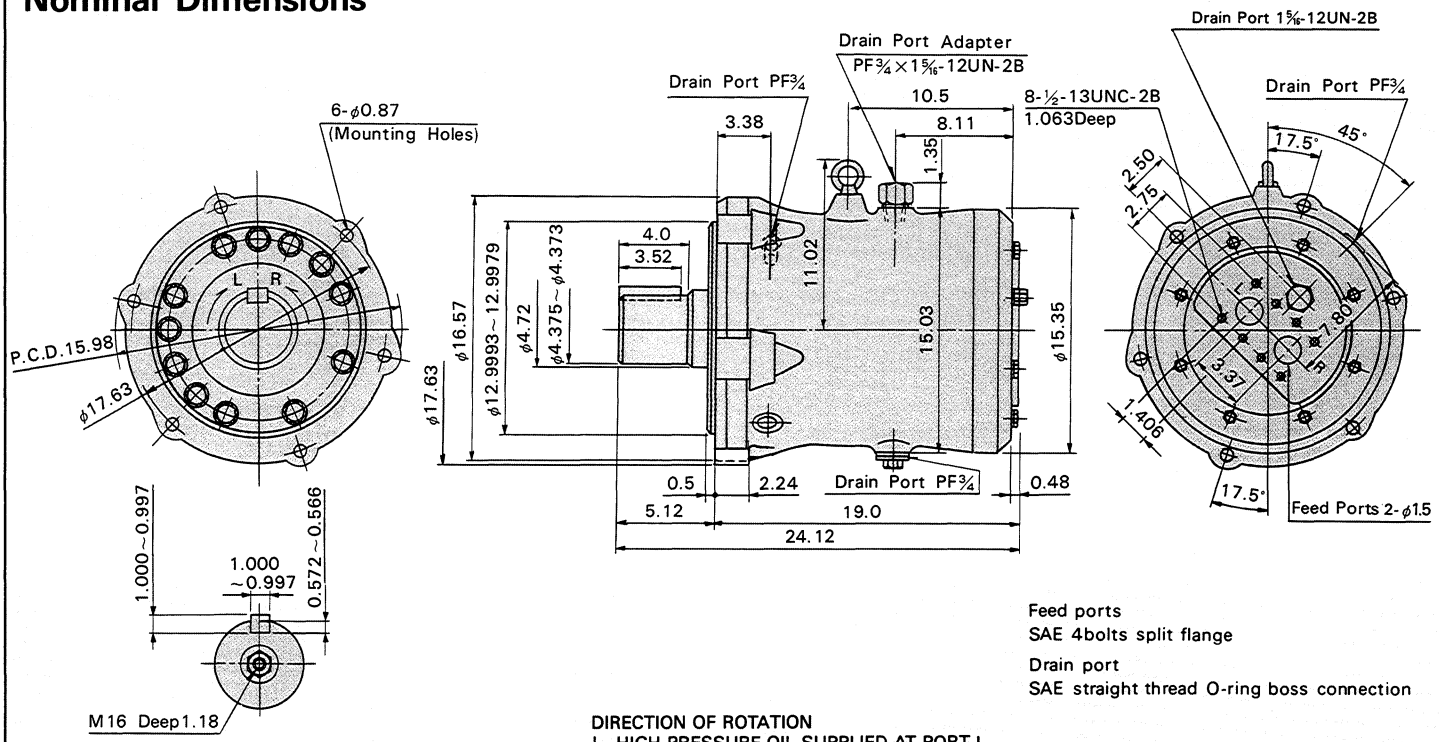
Working Pressure (psi)	2000	3000	3600
Permissible Radial Load (lbf)	13400	11900	10800

5. Applications with axial thrust loads should be referred to us.

ME2600

Dimensions in inches

Nominal Dimensions



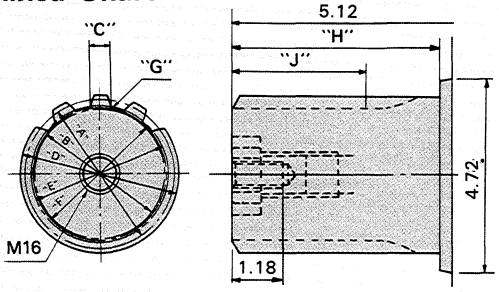
Feed ports
SAE 4bolts split flange

Drain port
SAE straight thread O-ring boss connection

DIRECTION OF ROTATION
L :HIGH PRESSURE OIL SUPPLIED AT PORT L.
R :HIGH PRESSURE OIL SUPPLIED AT PORT R.

Optional Shaft Dimensions

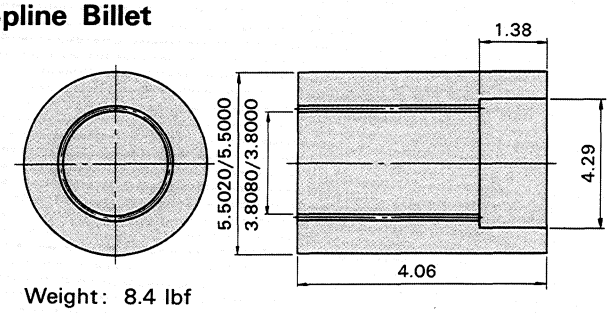
Splined Shaft



Type of Spline : Involute : Flat root side fit : Pressure angle 30° : Pitch 5/10
Class 1 fit : To B.S.3550 or A.S.A.—B5—15.

No.of teeth	Pitch Dia. "A"	Base Dia. "B"	Tooth Thickness "C"	Major Dia. "D"	Form Dia. "E"	Minor Dia. "F"	Fillet Radius "G"	"H"	"J"
20	4.0000	3.4641	0.3123 0.3084	4.1560 4.1480	3.7920	3.7560 3.7310	0.031	4.00	2.70

Spline Billet



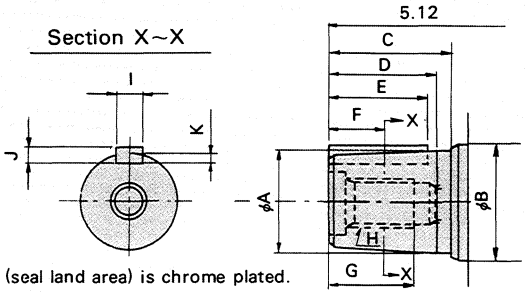
Weight: 8.4 lbf

Involute Spline (Flat root side fit, Class 1 fit)
B.S.3550 or A.S.A-B5-15

Allowable Pressure for Spline Billet : 3600 psi

No.of Teeth:	20
Pitch:	5/10
Pressure Angle:	30°
Pitch Dia:	4.0000
Major Dia:	4.2250/4.2000
Minor Dia:	3.8080/3.8000
Space Width:	0.3181/0.3165

Tapered Shaft



Shaft (seal land area) is chrome plated.

A	B	C	D	E	F	G	H	I	J	K
4.3307 4.3298	4.724	4.197	4.000	3.465	1.969	2.500	M36	1.1024 1.1003	0.6299 0.6256	0.4016 0.3937

Taper : 1.0/10

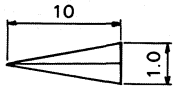


Fig.4 Starting Torque

Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

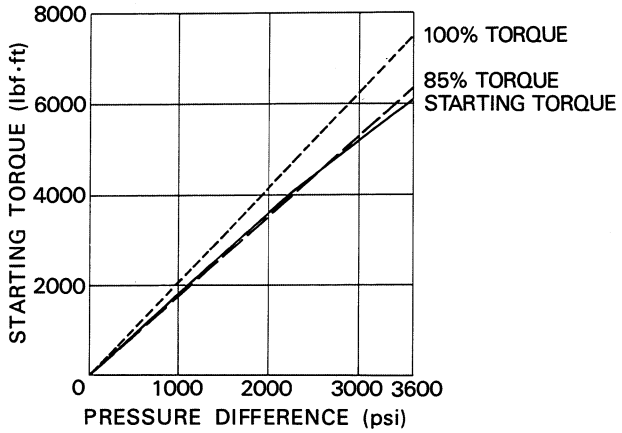


Fig.5 Case Leakage

Case leakage (from motor drain ports) relative to various speeds is shown for 4 motor pressures.

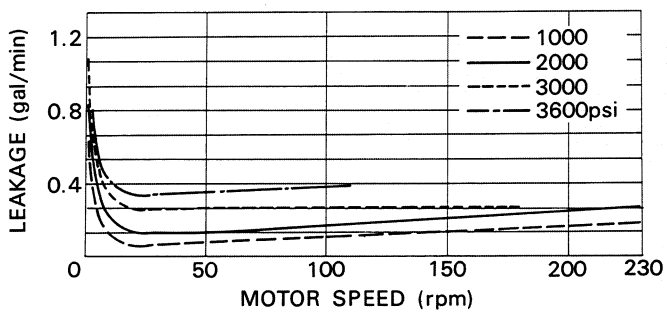


Fig.6 Minimum Boost Pressure

It is important that sufficient inlet pressure is maintained when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

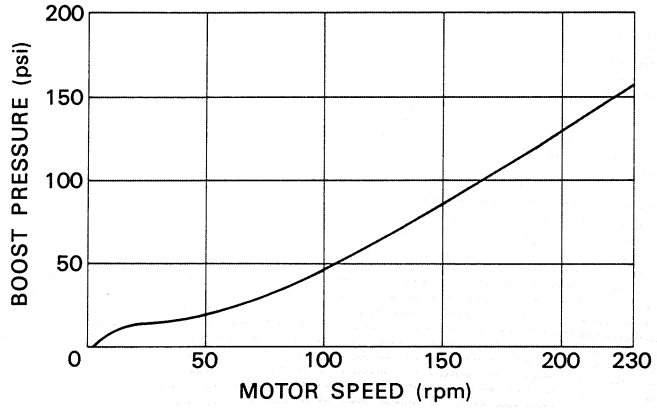


Fig.7 Pressure Drop

Pressure necessary to run motor without load is shown for various speeds.

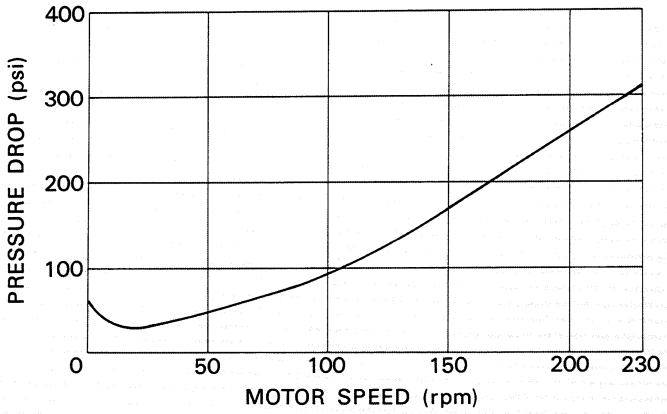
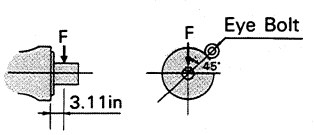


Fig.8 Bearing Life and Motor Shaft Radial Load



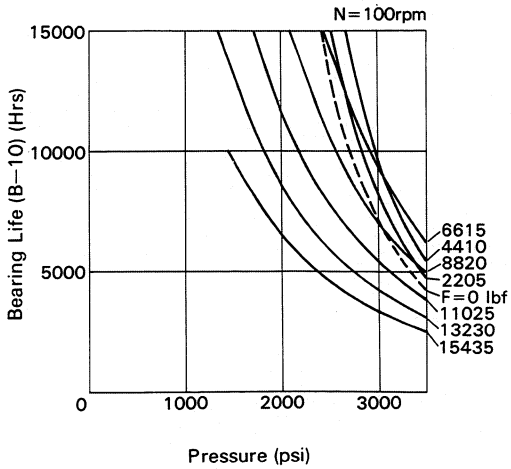
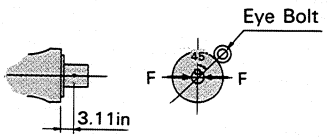


Fig. 8-1



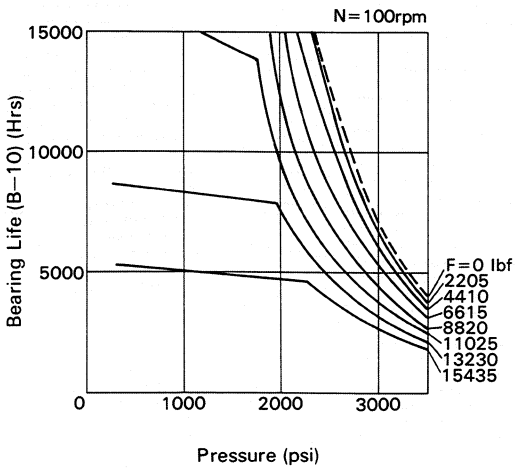


Fig. 8-2

Note

1. If motors are operated on the proper conditions, the operational life is determined by the Bearing Life.
2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 8;
   For a uni-directional application, motor should be installed so that side load acts as shown in figure 8.1.
   For a bi-directional application, involving a radial load for each rotation, then the motor should be installed so that side loads act as shown in figure 8.2.
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   When the shaft speed differs from 100 rpm, the bearing life can be obtained by the formula below:

   B-10 Life = (Bearing Life obtainable in the graph at 100 rpm) × 100 / Actual Shaft Speed

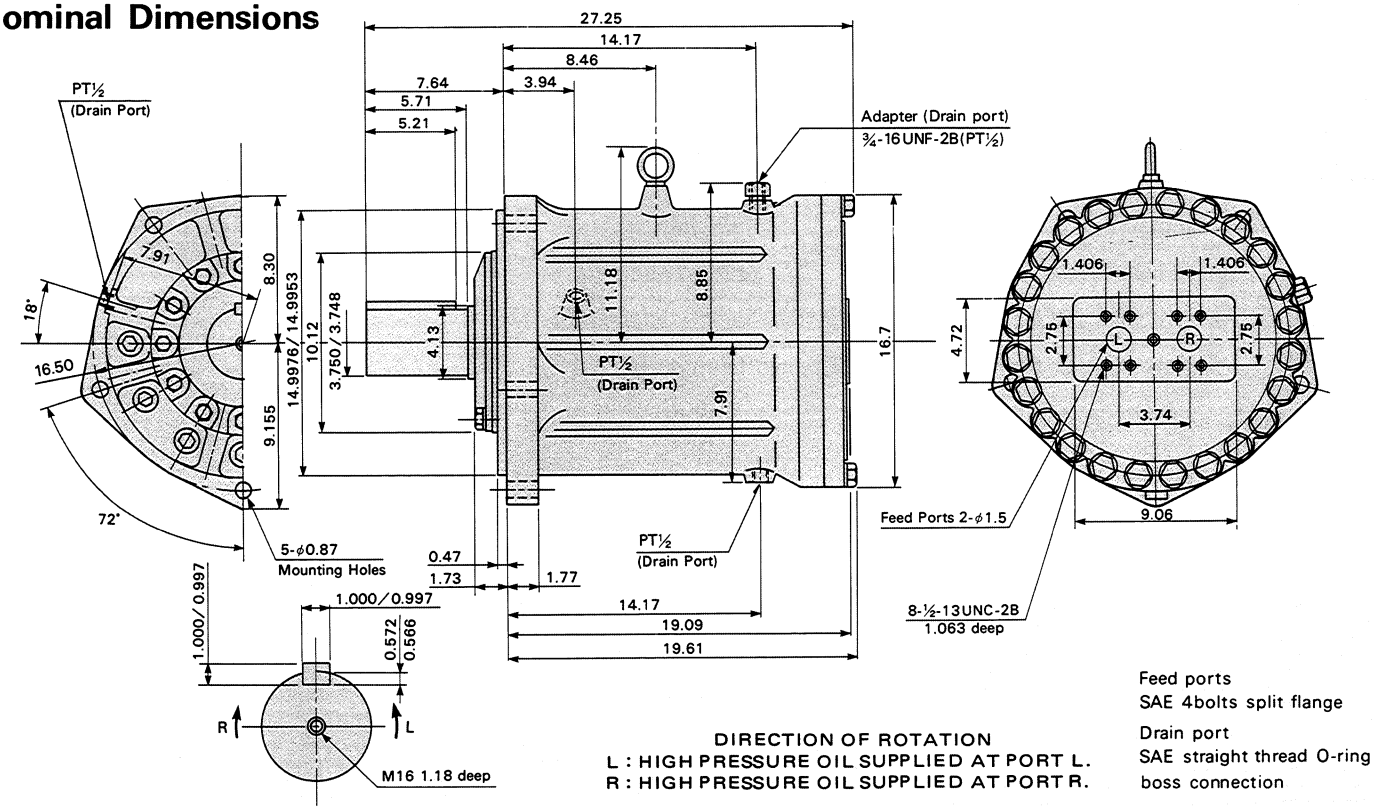
   In case where the side load acts at a different position to the mid point of the shaft projection please refer to us.
4. Maximum allowable radial load (load applied at the mid-point of shaft projection)

Working Pressure (psi)	2000	3000	3600
Permissible Radial Load (lbf)	16300	13900	12600

5. Applications with axial thrust loads should be referred to us.

Dimensions in inches

Nominal Dimensions



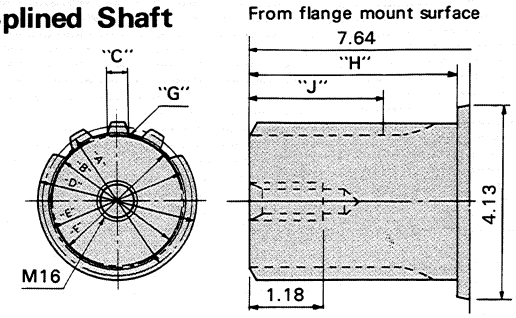
DIRECTION OF ROTATION
L : HIGH PRESSURE OIL SUPPLIED AT PORT L.
R : HIGH PRESSURE OIL SUPPLIED AT PORT R.

Feed ports
SAE 4bolts split flange

Drain port
SAE straight thread O-ring boss connection

Optional Shaft Dimensions

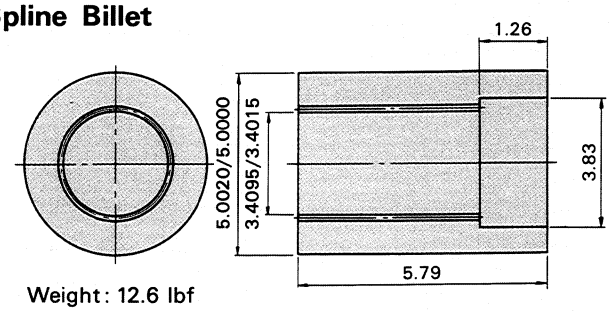
Splined Shaft



Type of Spline : Involute : Flat root side fit : Pressure angle 30° : Pitch 5/10
Class 1 fit : To B.S.3550 or A.S.A.—B5 —15.

No.of teeth	Pitch Dia. "A"	Base Dia. "B"	Tooth Thickness "C"	Major Dia. "D"	Form Dia. "E"	Minor Dia. "F"	Fillet Radius "G"	"H"	"J"
18	3.6000	3.1177	0.3107 0.3085	3.7560 3.7480	3.3943	3.3560 3.3310	0.032	5.71	4.53

Spline Billet



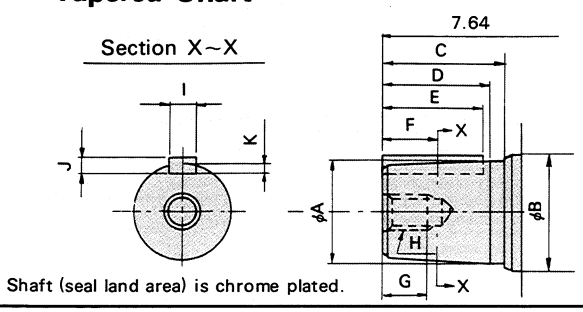
Weight : 12.6 lbf

Involute Spline (Flat root side fit, Class 1 fit)
B.S.3550 or A.S.A-B5-15

Allowable Pressure for Spline Billet : 3600 psi

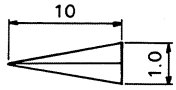
No.of Teeth:	18
Pitch:	5/10
Pressure Angle:	30°
Pitch Dia:	3.6000
Major Dia:	3.8250/3.8000
Minor Dia:	3.4095/3.4015
Space Width:	0.3180/0.3166

Tapered Shaft



Shaft (seal land area) is chrome plated.

A	B	C	D	E	F	G	H	I	J	K
3.7402 3.7393	4.13	5.71	5.51	4.92	2.76	2.56	M36	0.9843 0.9822	0.5512 0.5469	0.3622 0.3543

(Taper : 1.0/10 

)

Fig.4 Starting Torque

Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

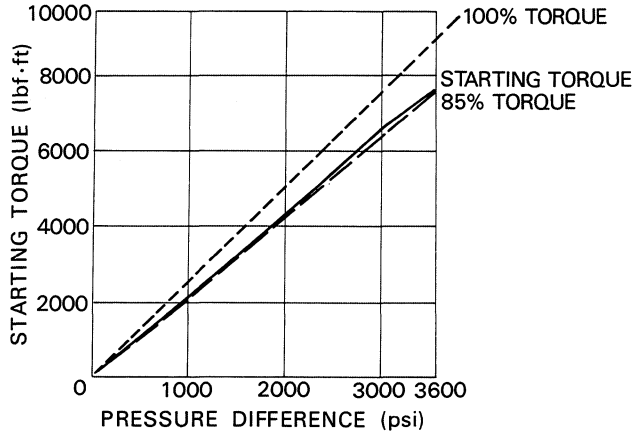


Fig.5 Case Leakage

Case leakage (from motor drain ports) relative to various speeds is shown for 4 motor pressures.

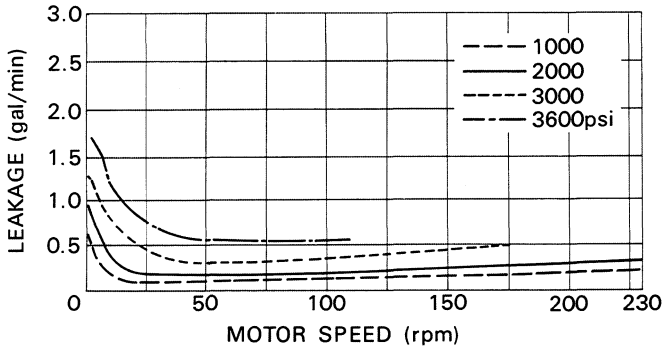


Fig.6 Minimum Boost Pressure

It is important that sufficient inlet pressure is maintained when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

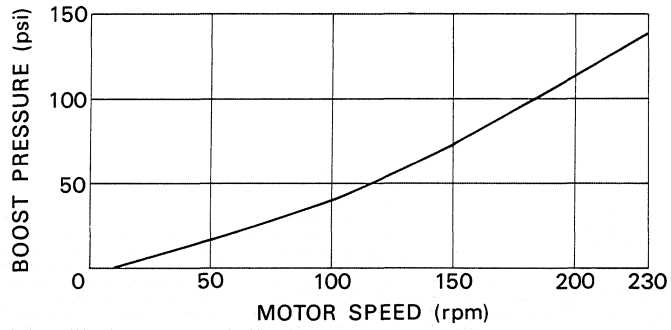


Fig.7 Pressure Drop

Pressure necessary to run motor without load is shown for various speeds.

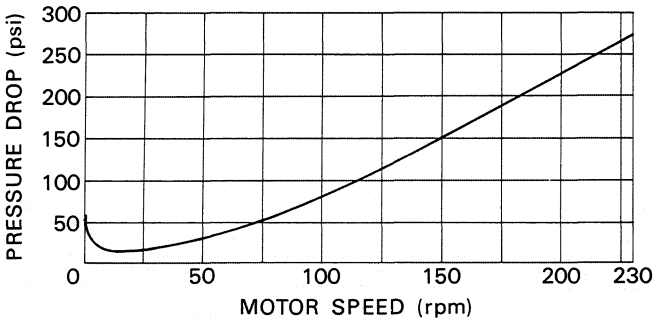
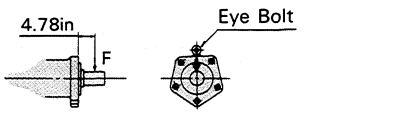


Fig.8 Bearing Life and Motor Shaft Radial Load



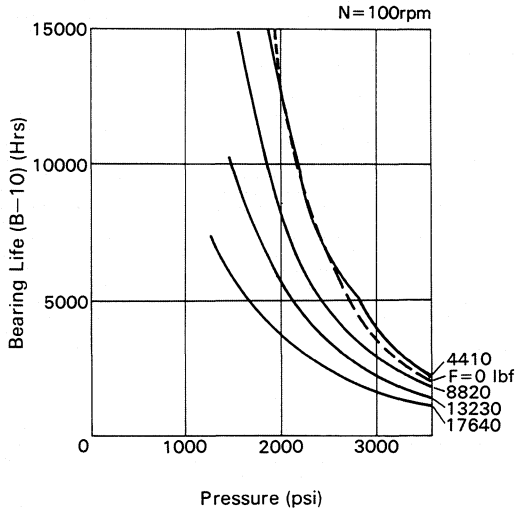
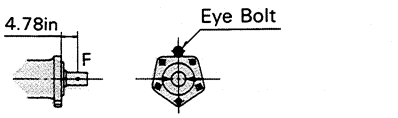


Fig. 8-1



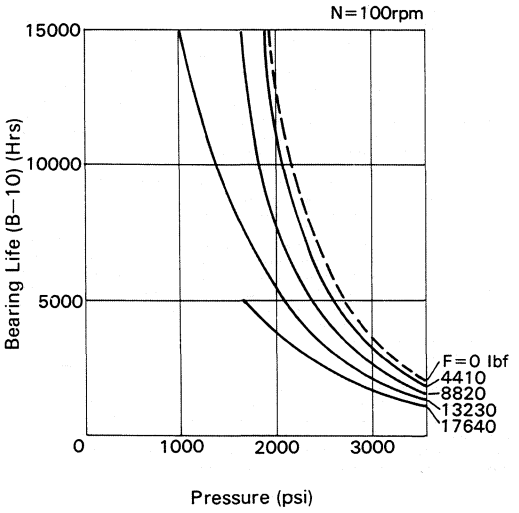


Fig. 8-2

Note

1. If motors are operated on the proper conditions, the operational life is determined by the Bearing Life.

2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 8;
   For a uni-directional application, motor should be installed so that side load acts as shown in figure 8.1.
   For a bi-directional application, involving a radial load for each rotation, then the motor should be installed so that side loads act as shown in figure 8.2.

3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
   When the shaft speed differs from 100 rpm, the bearing life can be obtained by the formula below:

   B-10 Life = (Bearing Life obtainable in the graph at 100 rpm)

   $$\times \frac{100}{\text{Actual Shaft Speed}}$$

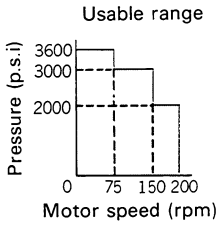
   In case where the side load acts at a different position to the mid point of the shaft projection please refer to us.

4. Maximum allowable radial load (load applied at the mid-point of shaft projection)

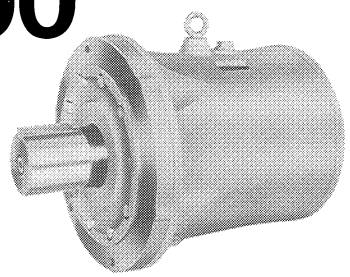
Working Pressure (psi)	2000	3000	3600
Permissible Radial Load (lbf)	16700	15400	14300

5. Applications with axial thrust loads should be referred to us.

Eaton® ME4100



Displacement	: 249.97 in³/rev.
Rated Pressure	: 3600 psi
Peak Pressure	: 4700 psi
Rated Torque	: 11928 lbf·ft
Rated Speed	: 75 rpm
Max. Speed	: 200 rpm
Max. Horse Power	: 284 hp
Weight	: 1147 lb



The graphs shown are mean values obtained from production units. FLUID; SHELL TELLUS 56 (VISCOSITY 170 SUS at 122°F)

Fig. 1 Output torque vs speed

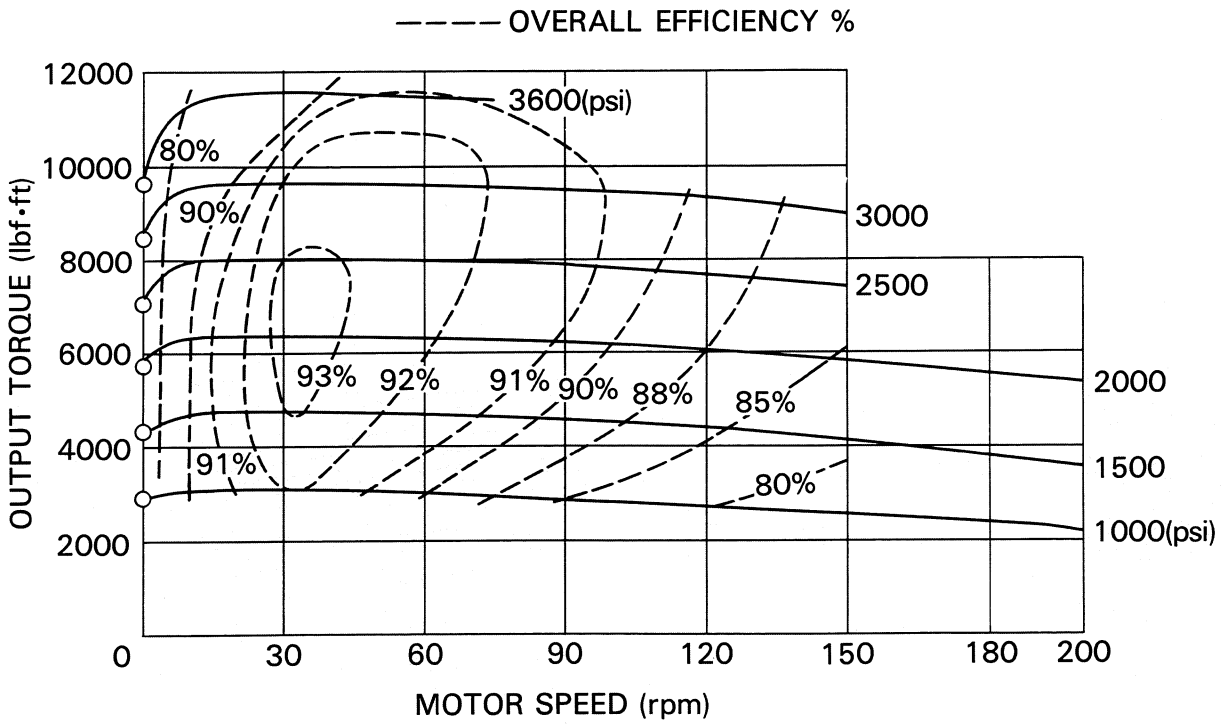
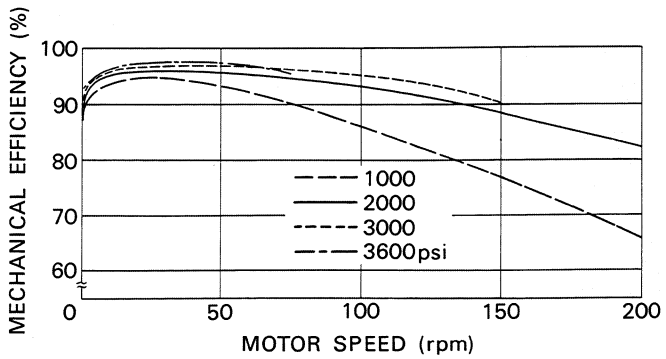
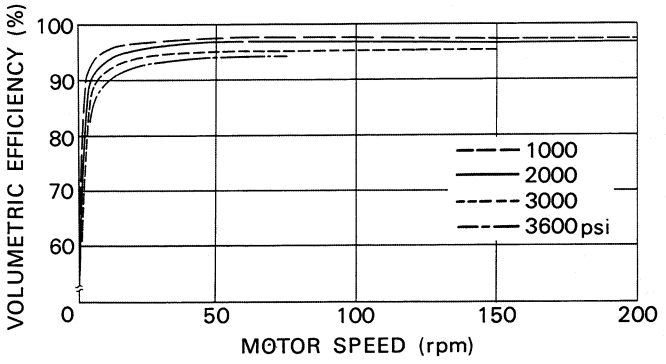


Fig. 2 Mechanical Efficiency



Mechanical efficiency at various speeds is shown for 4 motor pressures.

Fig. 3 Volumetric Efficiency

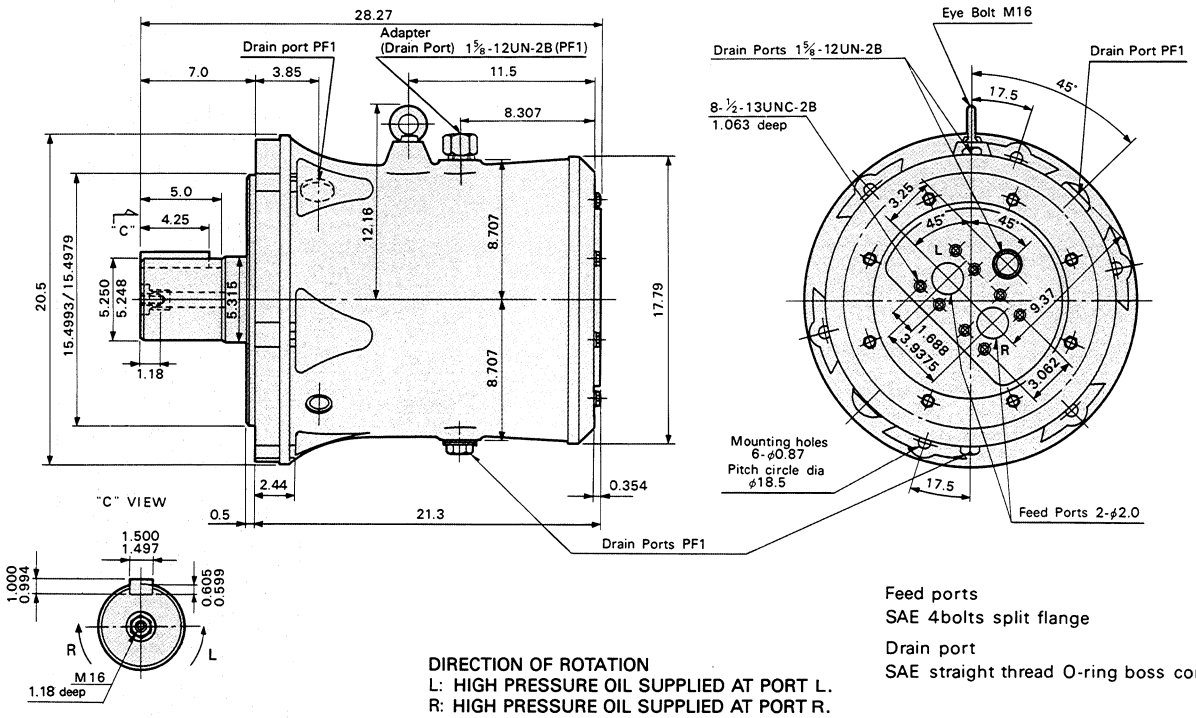


Volumetric efficiency at various speeds is shown for 4 motor pressures.

ME4100

Dimensions in inches

Nominal Dimensions



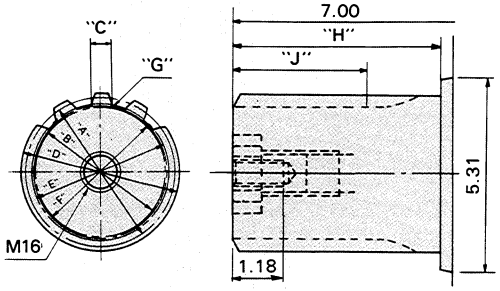
DIRECTION OF ROTATION
L: HIGH PRESSURE OIL SUPPLIED AT PORT L.
R: HIGH PRESSURE OIL SUPPLIED AT PORT R.

Feed ports
SAE 4bolts split flange

Drain port
SAE straight thread O-ring boss connection

Optional Shaft Dimensions

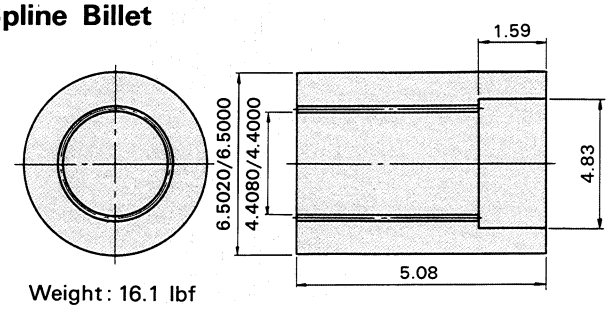
Splined Shaft



Type of Spline: Involute: Flat root side fit: Pressure angle 30°: Pitch 5/10
Class 1 fit: To B.S.3550 or A.S.A.—B5—15.

No.of teeth	Pitch Dia. "A"	Base Dia. "B"	Tooth Thickness "C"	Major Dia. "D"	Form Dia. "E"	Minor Dia. "F"	Fillet Radius "G"	"H"	"J"
23	4.6000	3.9837	0.3123 0.3083	4.7560 4.7480	4.3908	4.3560 4.3310	0.030	5.00	3.45

Spline Billet



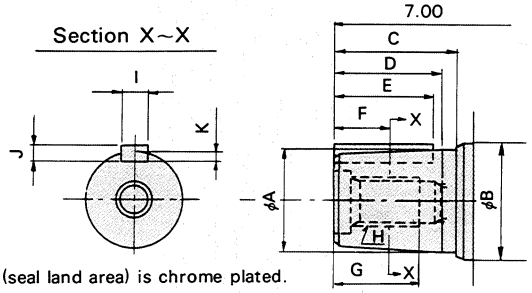
Weight: 16.1 lbf

Involute Spline (Flat root side fit, Class 1 fit)
B.S.3550 or A.S.A-B5-15

Allowable Pressure for Spline Billet: 3600 psi

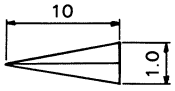
No.of Teeth:	23
Pitch:	5/10
Pressure Angle:	30°
Pitch Dia:	4.6000
Major Dia:	4.8250/4.8000
Minor Dia:	4.4080/4.4000
Space Width:	0.3182/0.3166

Tapered Shaft



Shaft (seal land area) is chrome plated.

A	B	C	D	E	F	G	H	I	J	K
5.1181 5.1171	5.315	5.000	4.331	3.622	2.165	2.500	M36	1.4173 1.4149	0.7874 0.7823	0.4843 0.4724

(Taper : 1.0/10 

)

Fig.4 Starting Torque

Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

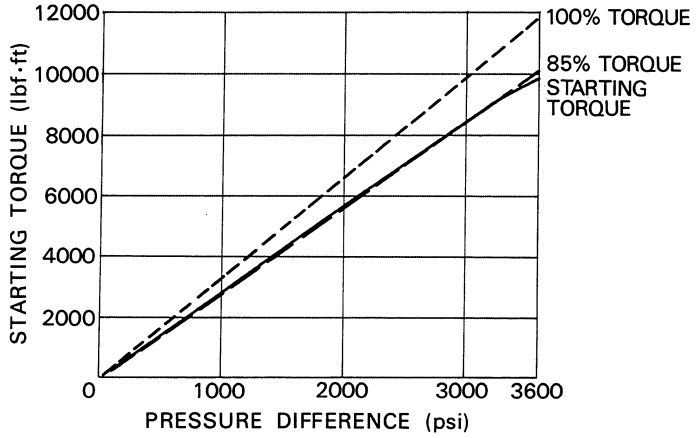


Fig.5 Case Leakage

Case leakage (from motor drain ports) relative to various speeds is shown for 4 motor pressures.

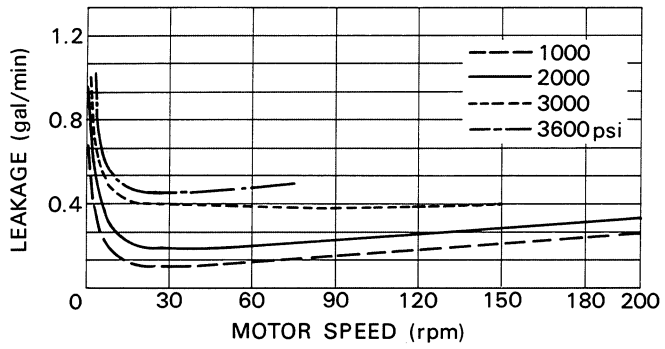


Fig.6 Minimum Boost Pressure

It is important that sufficient inlet pressure is maintained when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

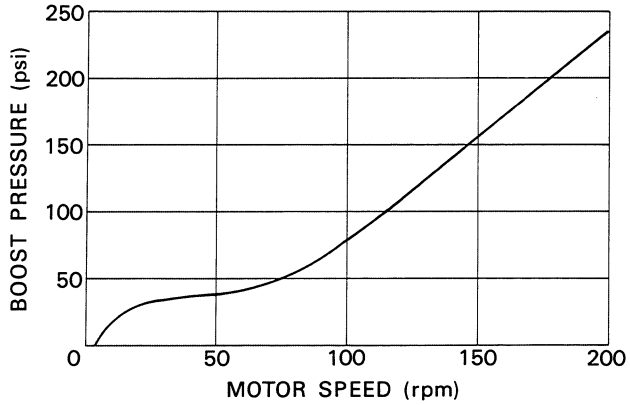


Fig.7 Pressure Drop

Pressure necessary to run motor without load is shown for various speeds.

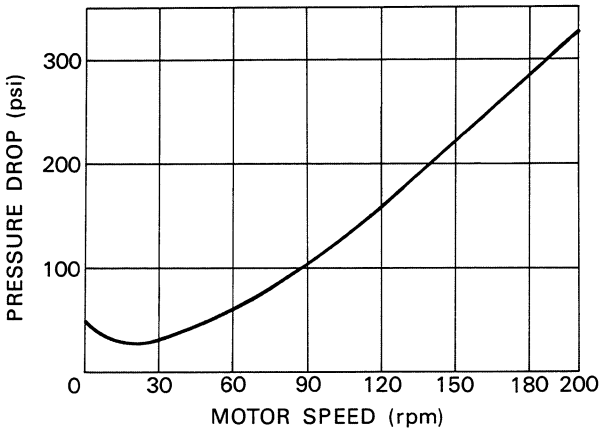
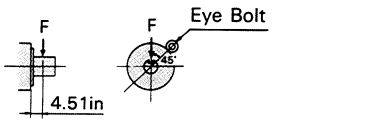


Fig.8 Bearing Life and Motor Shaft Radial Load



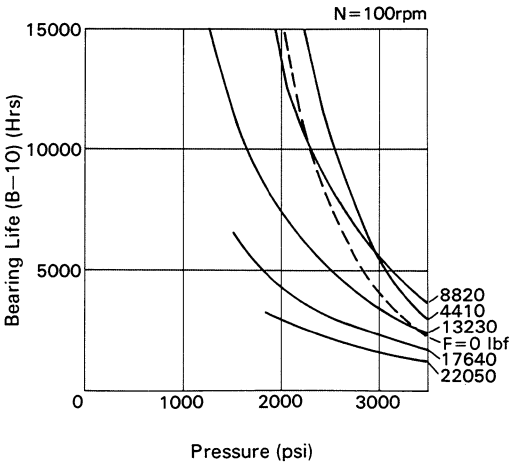
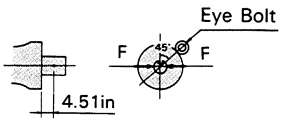


Fig. 8-1



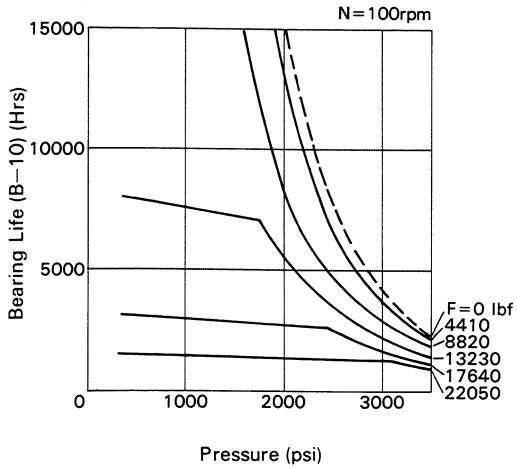


Fig. 8-2

Note

1. If motors are operated on the proper conditions, the operational life is determined by the Bearing Life.
2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 8;
   For a uni-directional application, motor should be installed so that side load acts as shown in figure 8.1.
   For a bi-directional application, involving a radial load for each rotation, then the motor should be installed so that side loads act as shown in figure 8.2.
3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
   When the shaft speed differs from 100 rpm, the bearing life can be obtained by the formula below:

   B-10 Life = (Bearing Life obtainable in the graph at 100 rpm)

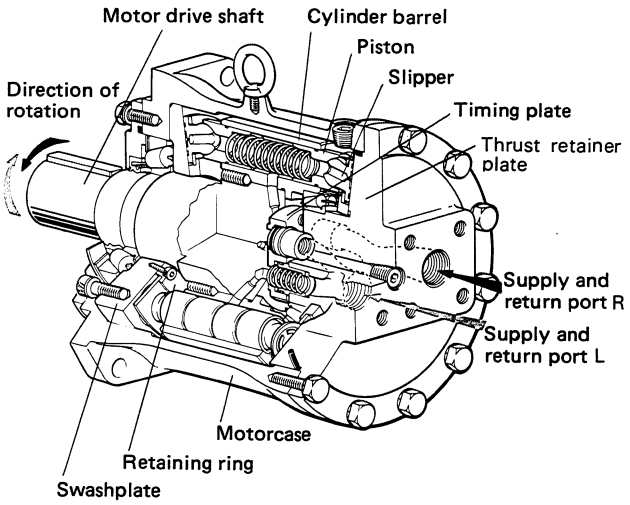
   $$\times \frac{100}{\text{Actual Shaft Speed}}$$

   In case where the side load acts at a different position to the mid point of the shaft projection please refer to us.
4. Maximum allowable radial load (load applied at the mid-point of shaft projection)

Working Pressure (psi)	2000	3000	3600
Permissible Radial Load (lbf)	22000	19800	19200

5. Applications with axial thrust loads should be referred to us.

OPERATION



Fluid entering the supply port is directed via internal passages and timing plate to the center of the cylinder bores. Fluid pressure forces the pistons apart causing the slippers to slide on the angled faces of the swash plates and rotate the barrel and shaft assembly. After work, fluid is exhausted through the timing plate and internal passages to the return port.

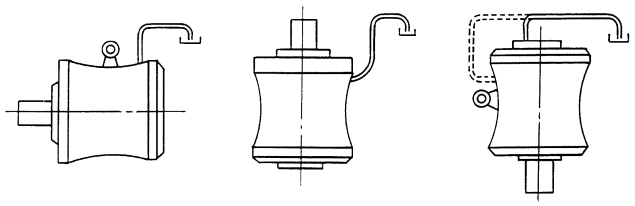
APPLICATION

Motor Casing Drain Pipe

The motor casing drain pipe to the reservoir must be adequately sized so that the casing pressure cannot exceed 45 psi (3 bar), even under cold start conditions. As a guide the pipe diameter must be at least equal to the drain port diameter. Where case pressure exceeds 45 psi (3 bar), or where a long pipe run cannot be avoided, please consult us.

Installation Attitude

ME series motors are flange mounted and can be positioned in any attitude provided that one of the drain connections in the unit case is at the highest point of the unit – THIS IS MOST IMPORTANT.



The dotted line is for ME100, ME150, ME175, ME300, ME350, ME600A, ME750A, ME850, ME1300A and ME3100.

Direct Drives

Whenever possible flexible couplings should be used to relieve the motor shaft of any radial or axial loads.
When splined drives are contemplated it is important that the P.C. dia. of the female spline is concentric to the pilot diameter preferably within 0.002 in T.I.R.

Indirect Drives

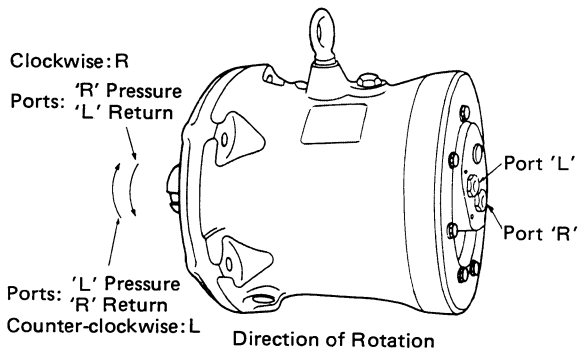
Gear, chain and belt drives may be used provided the motor is mounted as shown in the diagram below and the resultant radial load on the shaft is within the permissible limits shown in the relevant section for each model. Loads are assumed to be applied at the center of the shaft extension. Please consult our representative for conditions outside the above recommendations and in cases where axial loading of the shaft is contemplated.

Shaft rotation view from shaft end	Pulley drive	Gear drive
Reversible	Eye bolt, 45°, Pulley Both positions are acceptable	Eye bolt, 45°, Gear, Gear, Gear Both positions are acceptable
Counter-clockwise	Eye bolt	Eye bolt
Clockwise	Eye bolt	Eye bolt

The dotted circles are the eyebolt locations for ME1900, ME2600 and ME4100.

Direction of Rotation

Motor rotation is reversible by changing over the fluid supply to the motor main ports. The relationship between the direction of rotation and the fluid flow is shown below. The direction of the shaft rotation for ME750A and ME850 is in reverse to the diagram below.



Hydraulic Fluid

(a) Mineral-based fluid

It is important to select a good quality fluid for use in the system. The fluid selected must be suitable for use both under cold-start conditions and at maximum operating temperature. Temperature range −4°F to +158°F. Shell Tellus 56 and equivalent fluids are approved for use with Dowmax motors. These fluids have the following characteristics:

Optimum viscosity range from 98 SUS to 460 SUS at normal working temperatures

Resistance to foaming, oxidation and emulsification

Anti-rust and anti-corrosion properties

(b) Fire-resistant fluid

Phosphate-ester fluids need special seals. Because of low viscosity index a cooler may be needed to ensure constant temperature operation. Speed ratings are affected and advice from our Technical Sales Department should be sought.

Water-glycol fluid has only limited approval and our Technical Sales Department should be consulted whenever its use is considered.

Filtration

A filter of 10 microns standard, preferably with an element condition indicator, must be fitted in the return line from the motor (open circuit), or downstream of the boost pump (closed circuit).

Typical Circuit

Typical open loop and closed loop circuits are shown below.

Fluid Reservoir

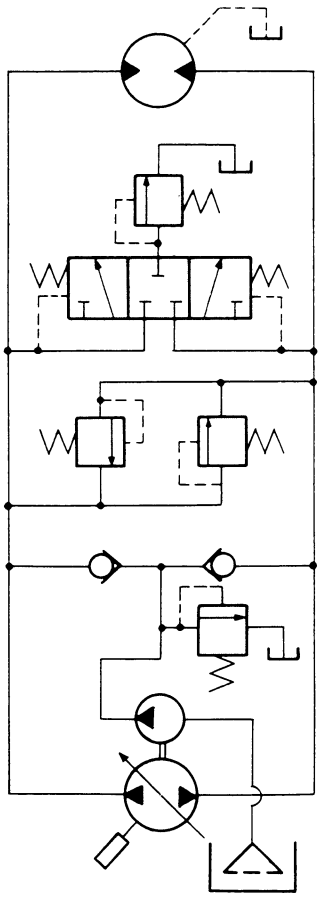
The fluid reservoir must be of adequate size with easy access for cleaning.

A strainer of 100 mesh construction (0.15 mm or 0.006 in. gap) must be fitted to the pump suction line inside the reservoir. It must be of sufficient size to prevent cavitation and to allow for partial obstruction after a period of service. The pump suction line should draw fluid from a point several inches above the tank bottom to avoid sludge deposits, and the return line should be submerged to limit frothing of the fluid.

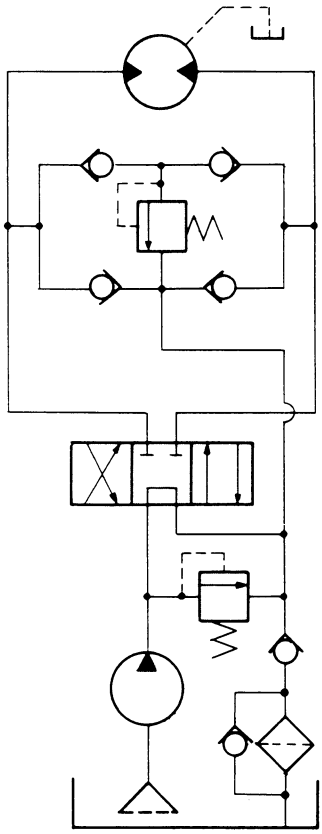
The suction and return connections should be positioned as far apart as possible so that fluid circulation is promoted within the tank to assist convection cooling. A baffle plate fitted between the two connections will help to do this. Displacement volume must be allowed for by providing adequate air space and breathing. For this purpose an oil filler/breather must be fitted to the filling orifice in the top surface of the tank. This should comprise a fine mesh strainer for the filling orifice and an air filter to prevent the entry of dust particles through the breather.

Overrun Protection

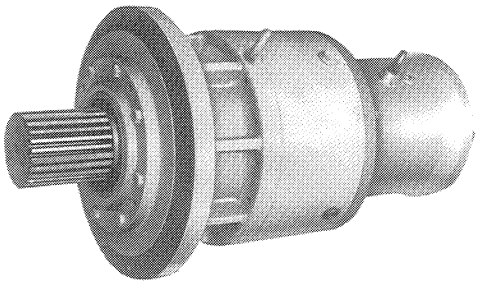
Cavitation can take place if the motor is allowed to rotate under the influence of inertia forces or external loads after the fluid supply has been cut off. On these applications it is recommended that a closed circuit is used. Where this is not possible, motor cavitation can be prevented by using counterbalance or brake valves, anti-cavitation check valves, or by boosting the motor inlet. Boost pressure varies with motor speed and is shown in the Boost Pressure curves.



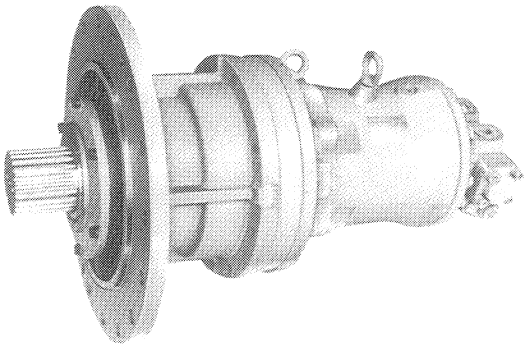
Closed Loop Circuit



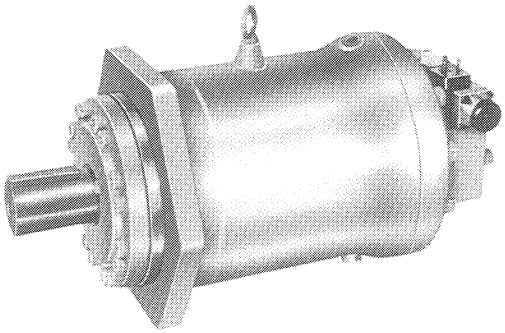
Open Loop Circuit



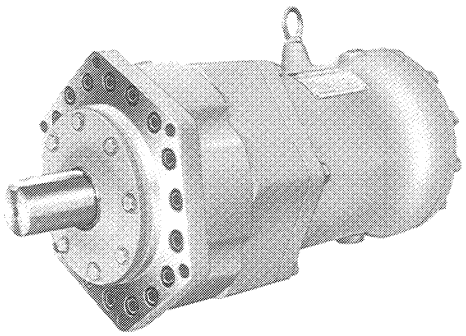
Geared Motor



Counterbalance Valve

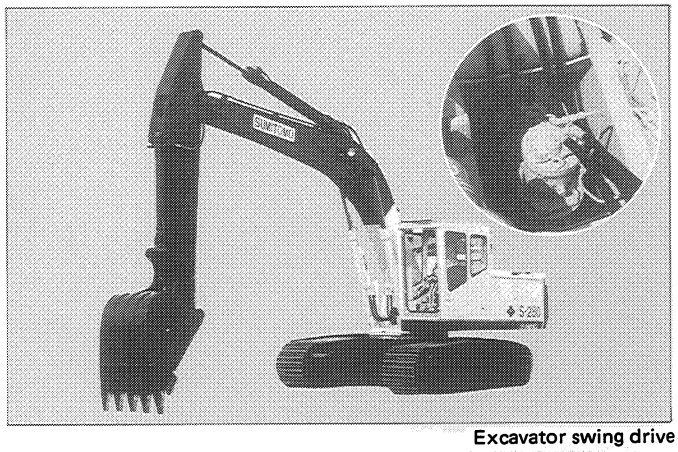


Two Speed Motor

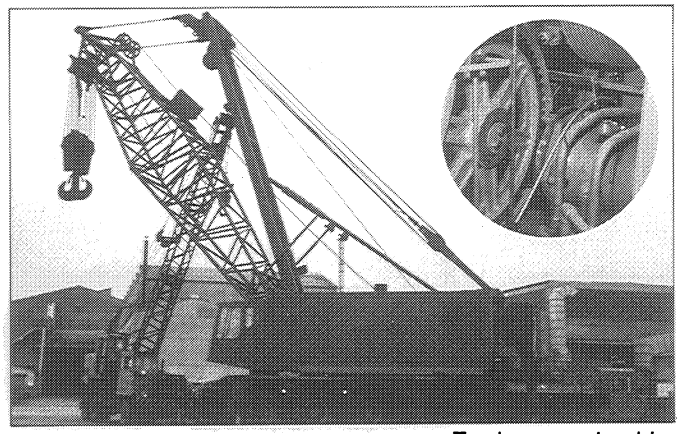


Motor with Brake

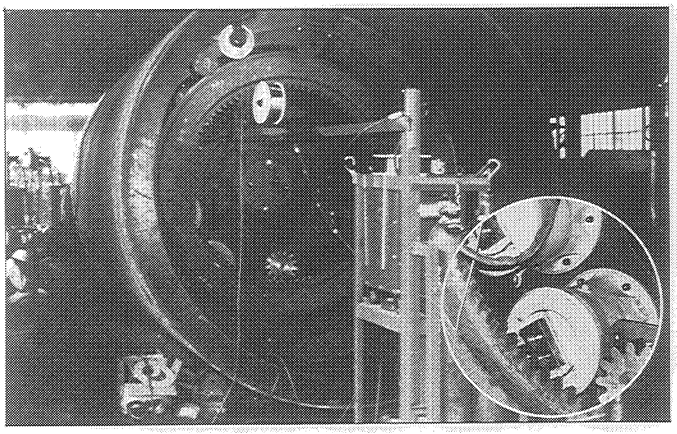
These options are available from
Eaton Hydraulics Division.
Contact your Eaton representative
for more information.



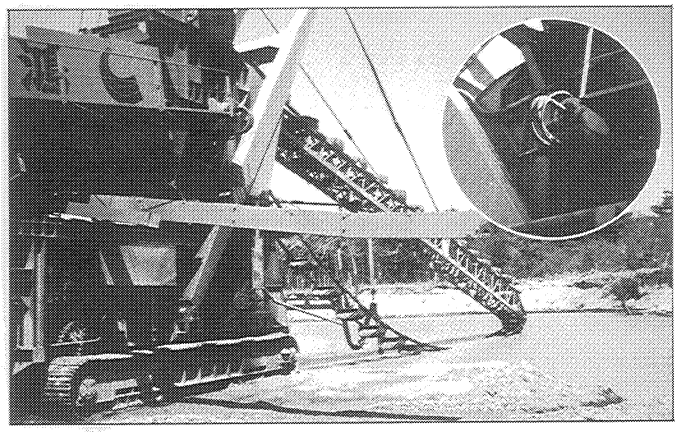
Excavator swing drive



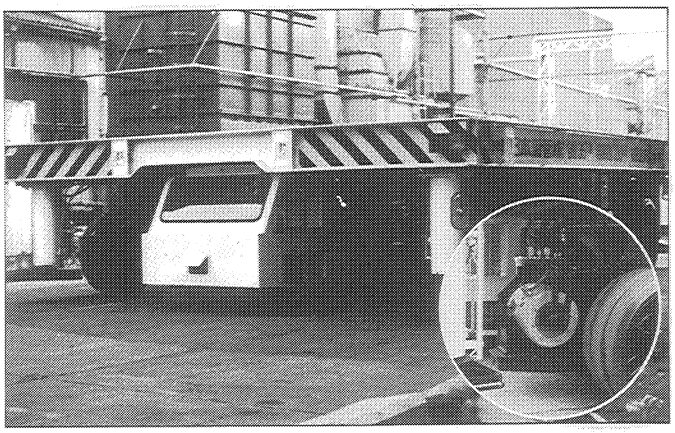
Truck crane swing drive



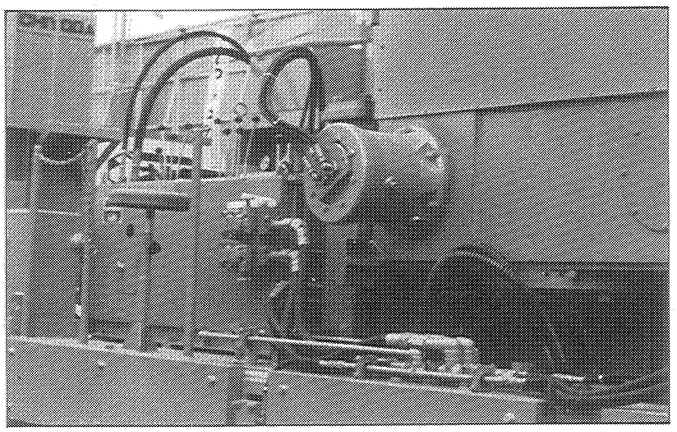
Shielded tunnelling machine



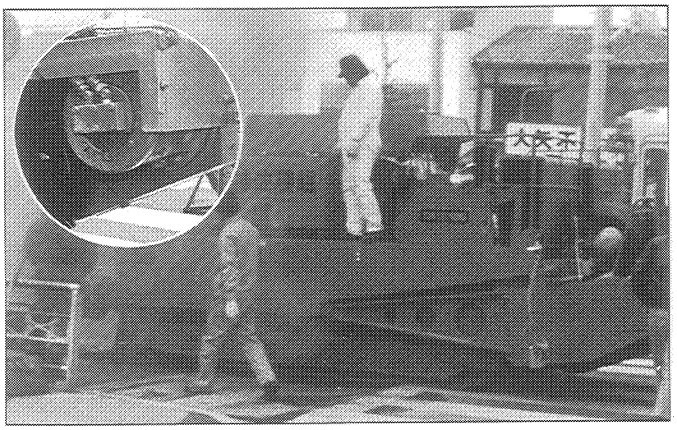
Gravel gathering machine conveyor drive



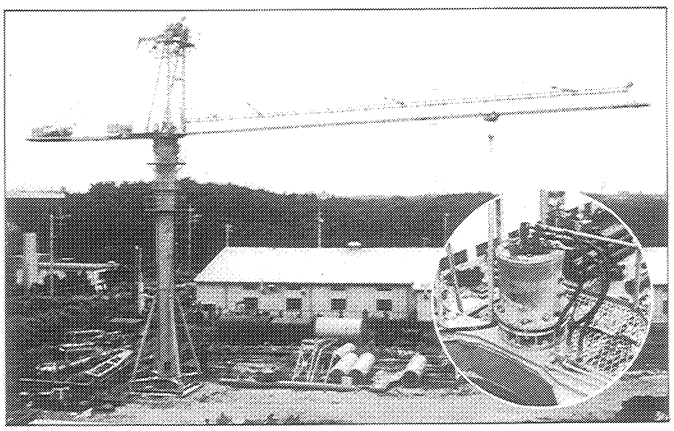
Heavy load carrier



Pile driving machine



Road planer



Tower crane swing drive

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