MOTORS

Technical Information

HP 30

WHITE

together in motion

White is a leading global provider of motor and steering solutions that power the evolution of mobile and industrial applications around the world.

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344 cm³/r [21 in³/r] 10

400 cm³/r [24.4 in³/r] 11

434 cm³/r [26.5 in³/r] 11

480 cm³/r [29.3 in³/r] 12

677 cm³/r [41.3 in³/r] 12

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Chapter 1
General Information

Topics:

- *Features*
- *Benefits*
- *Standard motor*
- *Wheel motor*
- *Balance plate*
- *Extreme duty seal guard*
- *Applications for HP30 motors*

Features

HP 30 hydraulic motors provide design flexibility.

All motors are available with various configurations consisting of:

- Displacement (Geroler size)
- Output shaft
- Port configuration
- Mounting flange

Benefits

- Lowest pressure drop motor in the industry
- The most experienced manufacturer of LSHT hydraulic motors
- High starting torque
- 2 speed capable
- Series circuit capable

Standard motor

The standard motor mounting flange is located as close to the output shaft as possible. This type of mounting supports the motor close to the shaft load. This mounting flange is also compatible with many standard gear boxes.

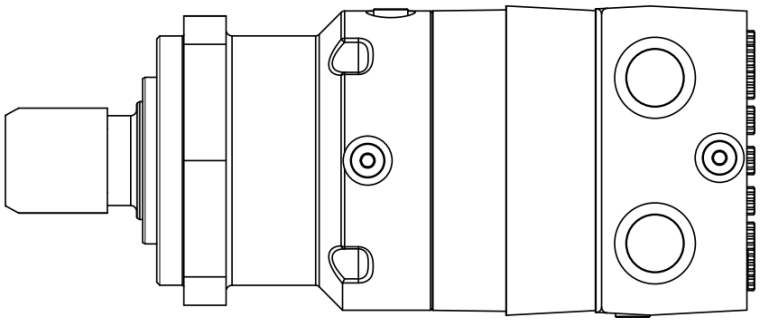

Figure 1 Standard motor

Wheel motor

The wheel motor mounting flange is located near the center of the motor which permits part or all of the motor to be located inside the wheel or roller hub. In traction drive applications, loads can be positioned over the motor bearings for optimal bearing life. This wheel motor mounting flange provides design flexibility in many applications.

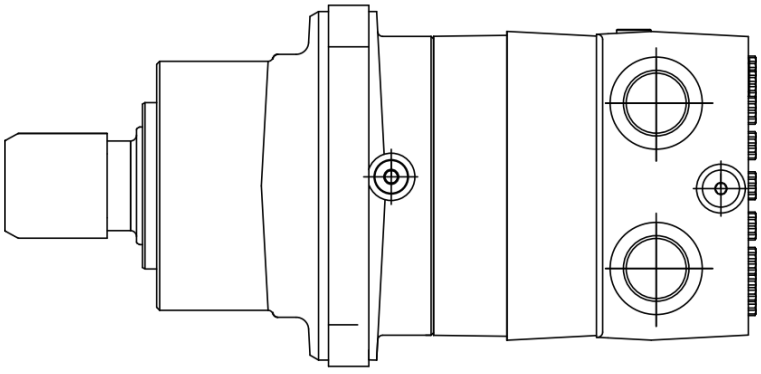

Figure 2 Wheel motor

Balance plate

The HP30 uses a balance plate to reduce the leakage over the face of the rotating Geroler. This device also protects the motor from high temperature differences between the fluid from the pump and the fluid communicated to the motor.

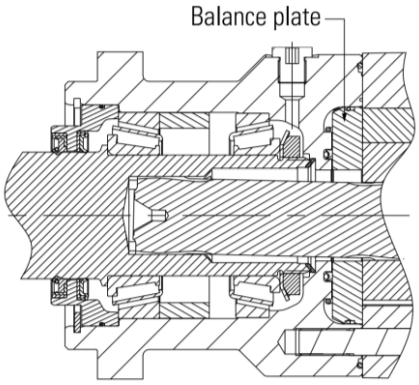

Figure 3 Balance plate

Extreme duty seal guard

Extreme duty seals are engineered to equipment working in harsh conditions, such as cement augers, dredgers, fertilizer and salt spreaders, tillers and other machines that require power wash-downs.

The two piece seal features two channels, one stationary and one that rotates with the motor shaft. In between the channels is a greased cavity used to reduce friction and keep dirt out. Compared to the current industry standard slinger seal guard, the Extreme Duty Seal Guard adds three additional barriers to protect the motor from contamination.

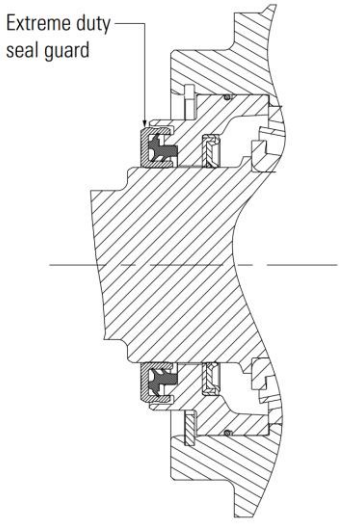

Figure 4 Extreme duty seal guard

Applications for HP30 motors

- Harvesters
- Augers
- Forestry Equipment
- Grinders and Mixers
- Horizontal/Vertical Drilling
- Material Handling
- Metal Forming
- Sprayers
- Skid Steer Loaders

Chapter 2
Single Speed

Topics:

- *Technical Information*
- *Performance data*
- *Dimensions*
- *Install Instructions*
- *Shaft side load capacity*
- *Case pressure and case port*
- *Model code*

Technical Information

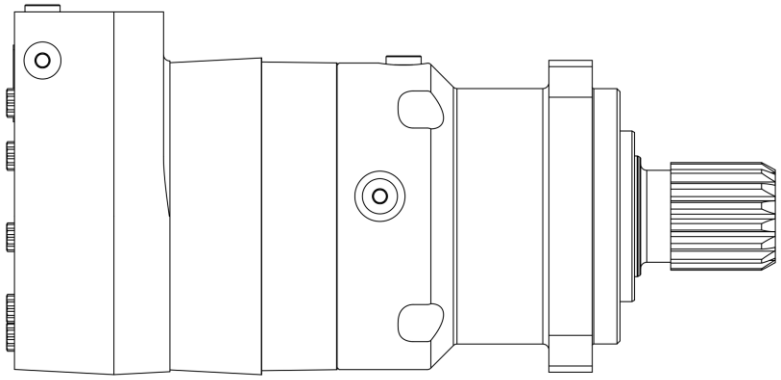

Figure 5 Single speed

Type			HP30				
Geometric displacement	cm^3		344	400	434	480	677
	$[in^3]$		*[21.0]*	*[24.4]*	*[26.5]*	*[29.3]*	*[41.3]*
Maximum speed	min^{-1}	cont.	495	426	392	355	252
	[rpm]	int.[1)]	770	663	610	552	392
Maximum torque	N•m [lbf•in]	cont.	1.164	1.876	2.037	2.252	2.469
			[14.288]	*[16.601]*	*[18.030]*	*[19.935]*	*[21.852]*
		int. [1)]	1.764	2.084	2.263	2.503	2.893
			[15.876]	*[18.446]*	*[20.034]*	*[22.150]*	*[25.605]*
Maximum oil flow	l/min [US gal/ min]	cont.	170				
			[45]				
		int.[1)]	265				
			[70]				
Pressure Δ	Bar [psi]	cont.	310	310	310	310	241
			[4.500]	*[4.500]*	*[4.500]*	*[4.500]*	*[3.500]*
		int.[1)]	345	345	345	345	283
			[5.000]	*[5.000]*	*[5.000]*	*[5.000]*	*[4.100]*
		peak	379	379	379	379	310
			[5.500]	*[5.500]*	*[5.500]*	*[5.500]*	*[4.500]*
Min starting torque	kg [lb]	Standard mount	36.9	37.6	38.0	38.4	40.4
			[81.4]	*[82.8]*	*[83.7]*	*[84.7]*	*[89.0]*
		Wheel mount	39.7	40.4	40.7	41.2	43.2
			[87.6]	*[89.0]*	*[89.8]*	*[90.9]*	*[95.1]*

Table 1 Single speed technical information

Note:

To assure best motor life, run motor in low speed high torque mode at approximately 30% of continuous pressure and 50% of continuous flow for 30 minutes in each direction before application of full load. Ensure that motor is filled with fluid prior to operation.

Thermal Shock Warning: Do not operate the motor with fluid that is 70F or more above the motor temperature.

Minimum Delta Pressure: *WARNING:*

Motors must not run with equal inlet and outlet pressure. 50 PSID minimum delta pressure between motor ports is required at all times (except when switching direction of rotation).

Maximum inlet pressure: 405 bar [5850 psi]
Do not exceed Δ pressure rating (see chart above).

Maximum return pressure: 405 bar [5850 psi] with case drain installed.
Do not exceed Δ pressure rating (see chart above).

Δ bar [Δ psi]: The true pressure difference between inlet port and outlet port.

Continuous rating: Motor may be run continuously at these ratings.

Intermittent operation: 10% of every minute.

Peak operation: 1% of every minute.

Recommended fluids: Premium quality, anti-wear type hydraulic oil with a viscosity of not less than cSt [70 SUS] at operating temperature.

Recommended maximum system operating temp.: 82°C [180°F]

Recommended filtration: Per ISO Cleanliness code, 4406: 20/18/13.

Performance data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area. Performance data is typical at 25.5 cSt [120 SUS]. Actual data may vary slightly from unit to unit in production.

344 cm³/r [21 in³/r]

Flow LPM [gpm]

	[500] **34**	[1000] **69**	[1500] **103**	[2000] **138**	[2500] **172**	[3000] **207**	[3500] **241**	[4000] **276**	[4500] **310**	[5000] **345**	[5500] **379**
19 [5]	[1472] *166* **50**	[3021] *341* **48**	[4579] *517* **46**	[5078] *574* **44**	[7624] *861* **43**	[9108] *1029* **40**	[10720] *1211* **39**	[12211] *1380* **38**	[13768] *1556* **38**	[15245] *1722* **36**	[16676] *1884* **33**
30 [8]	[1491] *169* **81**	[3068] *347* **76**	[4604] *520* **74**	[6170] *697* **74**	[7762] *877* **74**	[9319] *1053* **72**	[10876] *1229* **70**	[12445] *1406* **68**	[13984] *1580* **66**	[15485] *1750* **64**	[16891] *1908* **61**
45 [12]	[1462] *165* **124**	[3067] *346* **118**	[4613] *521* **114**	[6217] *702* **113**	[7779] *879* **113**	(9346) *1056* **112**	[10948] *1237* **110**	[12477] *1410* **108**	[14015] *1583* **106**	[15547] *1757* **103**	[16951] *1915* **100**
61 [16]	[1436] *162* **167**	[3037] *343* **159**	[4608] *521* **154**	[6178] *698* **152**	[7753] *876* **151**	(9340) *1055* **151**	[10914] *1233* **150**	[12490] *1411* **148**	[14040] *1586* **145**	[15429] *1743* **143**	[16866] *1906* **140**
76 [20]	[1408] *159* **211**	[3004] *339* **201**	[4576] *517* **195**	[6156] *696* **191**	[7744] *875* **190**	(9313) *1052* **189**	[10902] *1232* **188**	[12452] *1407* **187**	[13830] *1563* **185**	[15317] *1731* **183**	[16809] *1899* **179**
91 [24]	[1351] *153* **255**	[2969] *335* **243**	[4556] *515* **237**	[6125] *692* **232**	[7724] *873* **229**	(9301) *1051* **227**	[10897] *1231* **226**	[12470] *1409* **226**	[13972] *1579* **223**	[15407] *1741* **220**	[16679] *1885* **218**
106 [28]	[1340] *151* **296**	[2930] *331* **285**	[4501] *509* **278**	[6087] *688* **273**	[7665] *866* **269**	(9255) *1046* **266**	[10835] *1224* **265**	[12392] *1400* **264**	[13792] *1558* **253**	[15233] *1721* **250**	[16704] *1887* **245**
121 [32]	[1303] *147* **341**	[2856] *323* **328**	[4443] *502* **319**	[6011] *679* **312**	[7604] *859* **308**	(9196) *1039* **305**	[10779] *1218* **303**	[12331] *1393* **302**	[13679] *1546* **301**	[15084] *1704* **298**	[16600] *1875* **294**
136 [36]	[1287] *145* **384**	[2794] *316* **371**	[4378] *495* **361**	[5958] *673* **354**	[7522] *850* **349**	(9110) *1029* **345**	[10688] *1208* **341**	[12252] *1384* **338**	[13568] *1533* **334**	[15007] *1696* **331**	[16569] *1872* **328**
151 [40]	[1253] *142* **427**	[2698] *305* **414**	[4317] *488* **403**	[5879] *664* **395**	[7443] *841* **390**	(9019) *1019* **385**	[10586] *1196* **381**	[12107] *1368* **379**	[13451] *1520* **377**	[14944] *1688* **374**	[16505] *1865* **370**
170 [45]	[1237] *140* **485**	[2674] *302* **465**	[4203] *475* **455**	[5785] *654* **446**	[7331] *828* **440**	(8891) *1005* **434**	[10472] *1183* **430**	[11919] *1347* **426**	[13429] *1517* **423**	[14905] *1684* **421**	[16474] *1861* **418**
227 [60]	[1100] *124* **645**	[2351] *266* **622**	[3669] *415* **609**	[5550] *627* **599**	[6724] *760* **587**	[8574] *969* **580**	[10040] *1134* **542**	[11407] *1289* **572**	[12771] *1443* **567**	[14384] *1625* **564**	[16124] *1822* **593**
265 [70]		[2215] *250* **727**	[3487] *394* **712**	[5385] *608* **701**	[6537] *739* **686**	[8438] *953* **678**	[9883] *1117* **633**	[11218] *1267* **669**	[12548] *1418* **664**	[14184] *1603* **660**	[15988] *1806* **696**

Continuous
Intermittent
Peak
No operation

[5385] *608* **701** } Torque [lb-in] *Nm* **Speed RPM**

Figure 6 Performance data 344 cm³/r

400 cm³/r [24.4 in³/r]

Flow LPM [gpm]	[500] 34	[1000] 69	[1500] 103	[2000] 138	[2500] 172	[3000] 207	[3500] 241	[4000] 276	[4500] 310	[5000] 345	[5500] 379
15 [4]	[1696] *192* **35**	[3461] *391* **33**	[5232] *591* **32**	[7051] *797* **29**	[8788] *993* **27**	[10516] *1188* **24**	[12132] *1371* **22**	[13884] *1569* **19**	[15098] *1706* **18**	[16504] *1865* **17**	[18112] *2046* **16**
30 [8]	[1734] *196* **73**	[3556] *402* **70**	[5378] *608* **67**	[7198] *813* **66**	[9016] *1019* **63**	[10801] *1220* **61**	[12635] *1428* **58**	[14376] *1624* **55**	[16092] *1818* **52**	[17786] *201* **48**	[19750] *2231* **46**
45 [12]	[1709] *193* **111**	[3560] *4002* **107**	[5382] *608* **102**	[7225] *816* **99**	[9032] *1020* **97**	[10837] *1224* **96**	[12652] *1429* **93**	[14448] *1632* **90**	[16178] *1828* **88**	[17912] *2024* **84**	[19752] *2232* **83**
61 [16]	[1667] *188* **148**	[3514] *397* **143**	[5354] *605* **139**	[7194] *813* **134**	[9012] *1018* **132**	[10840] *1225* **130**	[12644] *1429* **128**	[14421] *1629* **125**	[16192] *1829* **121**	[17953] *2028* **118**	[19755] *2232* **116**
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132 [35]	[1553] *175* **325**	[3154] *356* **317**	[4986] *563* **310**	[6858] *775* **303**	[8658] *978* **298**	[10439] *1179* **293**	[12268] *1386* **288**	[14032] *1585* **284**	[15792] *1784* **279**	[17454] *1972* **274**	[19350] *2186* **271**
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227 [60]	[1402] *158* **557**	[2782] *314* **546**	[4420] *499* **529**	[6147] *694* **526**	[7951] *898* **514**	[9737] *1100* **507**	[11541] *1304* **498**	[13403] *1514* **485**	[15134] *1710* **474**	[16680] *1885* **468**	[18438] *2083* **464**
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Continuous
Intermittent
Peak
No operation

Figure 7 Performance data 400 cm³/r

434 cm³/r [26.5 in³/r]

Flow LPM [gpm]	[500] 34	[1000] 69	[1500] 103	[2000] 138	[2500] 172	[3000] 207	[3500] 241	[4000] 276	[4500] 310	[5000] 345	[5500] 379
19 [5]	[1859] *210* **40**	[3828] *433* **38**	[5846] *660* **37**	[7798] *881* **35**	[9707] *1097* **33**	[11679] *1320* **32**	[13580] *1534* **30**	[15532] *1755* **28**	[17715] *2002* **29**	[19497] *2203* **26**	[21425] *2421* **27**
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45 [12]	[1883] *213* **100**	[3885] *439* **97**	[5878] *664* **94**	[7881] *890* **92**	[9858] *1114* **89**	[11839] *1338* **87**	[13859] *1566* **84**	[15853] *1791* **82**	[17818] *2013* **80**	[19785] *2235* **78**	[21706] *2452* **76**
61 [16]	[1838] *208* **135**	[3852] *435* **130**	[5847] *661* **127**	[7872] *889* **125**	[9853] *1113* **122**	[11838] *1338* **119**	[13862] *1566* **116**	[15893] *1796* **113**	[17850] *2017* **111**	[19839] *2241* **109**	[21761] *2459* **106**
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106 [28]	[1688] *191* **238**	[3715] *420* **231**	[5742] *649* **226**	[7733] *874* **222**	[9738] *1100* **218**	[11768] *1330* **215**	[13789] *1558* **212**	[15806] *1786* **209**	[17794] *2010* **206**	[19751] *2232* **203**	[21696] *2451* **200**
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265 [70]		[2845] *321* **585**	[4842] *547* **573**	[6614] *747* **565**	[8922] *1008* **556**	[10801] *1220* **549**	[12756] *1441* **544**	[14741] *1666* **533**	[16904] *1910* **531**	[18743] *2118* **525**	[20780] *2348* **518**

Continuous
Intermittent
Peak
No operation

Figure 8 Performance data 434 cm³/r

[6614] *747* **565** } Torque [lb-in] *Nm* **Speed RPM**

480 cm³/r [29.3 in³/r]

Flow LPM [gpm]	[500]	[1000]	[1500]	[2000]	[2500]	[3000]	[3500]	[4000]	[4500]	[5000]	[5500]
	34	**69**	**103**	**138**	**172**	**207**	**241**	**276**	**310**	**345**	**379**
19	[2030]	[4156]	[6239]	[8401]	[10381]	[12499]	[14668]	[16741]	[19004]	[21234]	[23044]
	229	*470*	*705*	*949*	*1173*	*1412*	*1657*	*1892*	*2147*	*2399*	*2604*
[5]	**36**	**34**	**32**	**31**	**30**	**29**	**28**	**27**	**26**	**26**	**25**
30	[2059]	[4245]	[6393]	[8526]	[10726]	[12911]	[15052]	[17096]	[19250]	[21386]	[23509]
	233	*48*	*722*	*863*	*1212*	*1459*	*1701*	*1932*	*2175*	*2416*	*2656*
[8]	**59**	**56**	**54**	**53**	**52**	**51**	**50**	**49**	**47**	**45**	**44**
45	[2043]	[4261]	[6424]	[8633]	[10768]	[12918]	[15167]	[17274]	[19448]	[21527]	[23674]
	231	*481*	*726*	*975*	*1217*	*1460*	*1714*	*1952*	*2197*	*2432*	*2675*
[12]	**90**	**86**	**84**	**83**	**80**	**79**	**77**	**73**	**75**	**73**	**75**
61	[2014]	[4232]	[6417]	[8604]	[10800]	[12956]	[15181]	[17330]	[19482]	[21545]	[23605]
	228	*478*	*725*	*972*	*1220*	*1464*	*1715*	*1958*	*2201*	*2434*	*2667*
[16]	**121**	**116**	**113**	**111**	**109**	**108**	**106**	**104**	**103**	**102**	**101**
76	[1971]	[4184]	[6377]	[8586]	[10764]	[12916]	[15137]	[17295]	[19378]	[21434]	[23390]
	223	*473*	*720*	*970*	*1216*	*1459*	*1710*	*1954*	*2189*	*2422*	*2643*
[20]	**152**	**146**	**142**	**139**	**137**	**135**	**133**	**132**	**131**	**130**	**128**
91	[1918]	[4137]	[6325]	[8538]	[10715]	[12889]	[15073]	[17201]	[19396]	[21426]	[23357]
	217	*467*	*715*	*965*	*1210*	*1456*	*1703*	*1944*	*2191*	*2421*	*2639*
[24]	**183**	**176**	**172**	**169**	**166**	**164**	**163**	**161**	**159**	**159**	**158**
106	[1844]	[4088]	[6270]	[8474]	[10648]	[12859]	[14966]	[17131]	[19218]	[21166]	[23211]
	208	*462*	*708*	*957*	*1203*	*1453*	*1691*	*1936*	*2171*	*2391*	*2622*
[28]	**214**	**207**	**202**	**198**	**195**	**193**	**192**	**190**	**188**	**188**	**183**
121	[1785]	[3990]	[6204]	[8397]	[10600]	[12798]	[15029]	[17032]	[19073]	[21209]	[2328]
	202	*451*	*701*	*949*	*1198*	*1446*	*1698*	*1924*	*2155*	*2396*	*2630*
[32]	**246**	**237**	**232**	**228**	**224**	**221**	**220**	**218**	**215**	**212**	**205**
136	[1682]	[3906]	[6107]	[8318]	[10479]	[12680]	[14802]	[16928]	[19033]	[21022]	[23073]
	190	*441*	*690*	*940*	*1184*	*1433*	*1672*	*1913*	*2150*	*2375*	*2607*
[36]	**277**	**268**	**261**	**257**	**253**	**250**	**247**	**246**	**244**	**243**	**242**
151	[1623]	[3812]	[6014]	[8227]	[10423]	[12599]	[14712]	[16821]	[18978]	[20968]	[23004]
	183	*431*	*680*	*930*	*1178*	*1424*	*1662*	*1900*	*2144*	*2369*	*2599*
[40]	**308**	**298**	**291**	**286**	**282**	**279**	**277**	**276**	**273**	**272**	**269**
170	[1593]	[3733]	[5901]	[8107]	[10256]	[12453]	[14601]	[16702]	[18803]	[20837]	[23039]
	180	*422*	*667*	*916*	*1159*	*1407*	*1650*	*1887*	*2125*	*2354*	*2603*
[45]	**346**	**336**	**328**	**322**	**317**	**314**	**311**	**309**	**307**	**306**	**304**
227	[1273]	[3369]	[5528]	[7547]	[9826]	[11901]	[14131]	[15883]	[18224]	[20258]	[22393]
	144	*381*	*625*	*853*	*1110*	*1345*	*1597*	*1795*	*2059*	*2289*	*2530*
[60]	**463**	**449**	**439**	**432**	**425**	**423**	**418**	**417**	**413**	**412**	**408**
265		[3202]	[5365]	[7342]	[9666]	[11731]	[13928]	[15659]	[17991]	[20012]	[22199]
		362	*606*	*829*	*1092*	*1325*	*1574*	*1769*	*2033*	*2261*	*2508*
[70]		**525**	**513**	**505**	**497**	**495**	**489**	**488**	**484**	**482**	**478**

Continuous
Intermittent
Peak
No operation

Figure 9 Performance data 480 cm³/r

677 cm³/r [41.3 in³/r]

Flow LPM [gpm]	[500]	[1000]	[1500]	[2000]	[2500]	[3000]	[3500]	[4000]	[4500]
	34	**69**	**103**	**138**	**172**	**207**	**241**	**276**	**310**
19	[2891]	[5874]	[8849]	[11879]	[14733]	[18029]	[21058]	[24108]	[26345]
	327	*664*	*1000*	*1342*	*1665*	*2037*	*2379*	*2724*	*2977*
[5]	**25**	**23**	**22**	**20**	**19**	**19**	**18**	**18**	**17**
30	[2946]	[5976]	[9040]	[12173]	[15193]	[18209]	[21319]	[24331]	[27149]
	333	*675*	*1021*	*1375*	*1717*	*2057*	*2409*	*2749*	*3067*
[8]	**42**	**39**	**37**	**36**	**34**	**33**	**32**	**31**	**30**
45	[2949]	[6045]	[9153]	[12250]	[15322]	[18427]	[21576]	[24476]	[27610]
	333	*683*	*1034*	*1384*	*1731*	*2082*	*2438*	*2765*	*3119*
[12]	**65**	**59**	**56**	**55**	**56**	**54**	**53**	**52**	**50**
61	[2894]	[6012]	[9092]	[12148]	[15242]	[18400]	[21479]	[24558]	[27562]
	327	*679*	*1027*	*1373*	*1722*	*2079*	*2427*	*1958*	*3114*
[16]	**87**	**82**	**77**	**74**	**73**	**73**	**72**	**70**	**69**
76	[2819]	[5936]	[9011]	[12090]	[15221]	[18322]	[21481]	[24547]	[27517]
	318	*671*	*1018*	*1366*	*1720*	*2070*	*2427*	*2773*	*3109*
[20]	**110**	**104**	**99**	**95**	**94**	**94**	**93**	**91**	**90**
91	[2740]	[5846]	[8918]	[11991]	[15079]	[18242]	[21380]	[24421]	[27386]
	310	*661*	*1008*	*1355*	*1704*	*2061*	*2416*	*2759*	*3094*
[24]	**132**	**125**	**120**	**116**	**113**	**113**	**113**	**112**	**111**
106	[2640]	[5757]	[8843]	[11896]	[14926]	[18030]	[21241]	[24273]	[27183]
	298	*650*	*999*	*1344*	*1686*	*2037*	*2400*	*2742*	*3071*
[28]	**150**	**147**	**141**	**135**	**133**	**131**	**130**	**130**	**130**
121	[2511]	[5621]	[8715]	[11761]	[14858]	[18015]	[21090]	[24209]	[27101]
	284	*635*	*985*	*1329*	*1679*	*2035*	*2383*	*2735*	*3062*
[32]	**176**	**169**	**162**	**157**	**153**	**151**	**153**	**154**	**152**
136	[2364]	[5508]	[8581]	[11666]	[14749]	[17898]	[20993]	[24048]	[26990]
	267	*622*	*969*	*1318*	*1666*	*2022*	*2372*	*2717*	*3050*
[36]	**199**	**190**	**184**	**178**	**176**	**174**	**175**	**175**	**173**
151	[2257]	[5398]	[8498]	[11591]	[14680]	[17844]	[20981]	[24035]	[26911]
	255	*610*	*960*	*1310*	*1659*	*2016*	*2371*	*2716*	*3041*
[40]	**222**	**212**	**205**	**199**	**195**	**193**	**193**	**195**	**195**
170	[2134]	[5193]	[8294]	[11413]	[14489]	[17596]	[20716]	[23818]	[26687]
	241	*587*	*667*	*1290*	*1637*	*1988*	*2341*	*2691*	*3015*
[45]	**249**	**240**	**233**	**226**	**222**	**219**	**214**	**212**	**211**
227	[1608]	[4641]	[7692]	[10865]	[13773]	[16854]	[20139]	[22970]	[25908]
	182	*524*	*869*	*1228*	*1556*	*1904*	*2275*	*2595*	*2927*
[60]	**333**	**321**	**312**	**304**	**296**	**293**	**291**	**293**	**292**
265		[4381]	[7434]	[10596]	[13519]	[16589]	[19870]	[22709]	[25603]
		495	*840*	*1197*	*1527*	*1874*	*2245*	*2566*	*2893*
[70]		**375**	**366**	**357**	**347**	**344**	**341**	**343**	**342**

Continuous
Intermittent
Peak
No operation

[10596] Torque [lb-in]
1197 *Nm*
357 **Speed RPM**

Figure 10 Performance data 677 cm³/r

Dimensions

Standard mount

Main ports

1-1/16-12 UN-2B SAE O-ring ports (2) 9/16-18 UNF-2B SAE O-ring case drain port (1)	or	G1 (BSP) O-ring ports (2) G1/4 (BSP) O-ring case drain port (1)

Standard rotation viewed from shaft end

Port A pressurized – CW (clockwise)

Port B pressurized – CCW (counter- clockwise)

Manifold interface

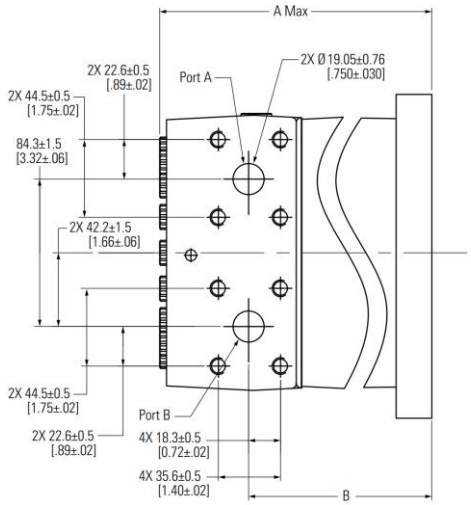


Figure 11 Standard mount Manifold Interface

Closed loop

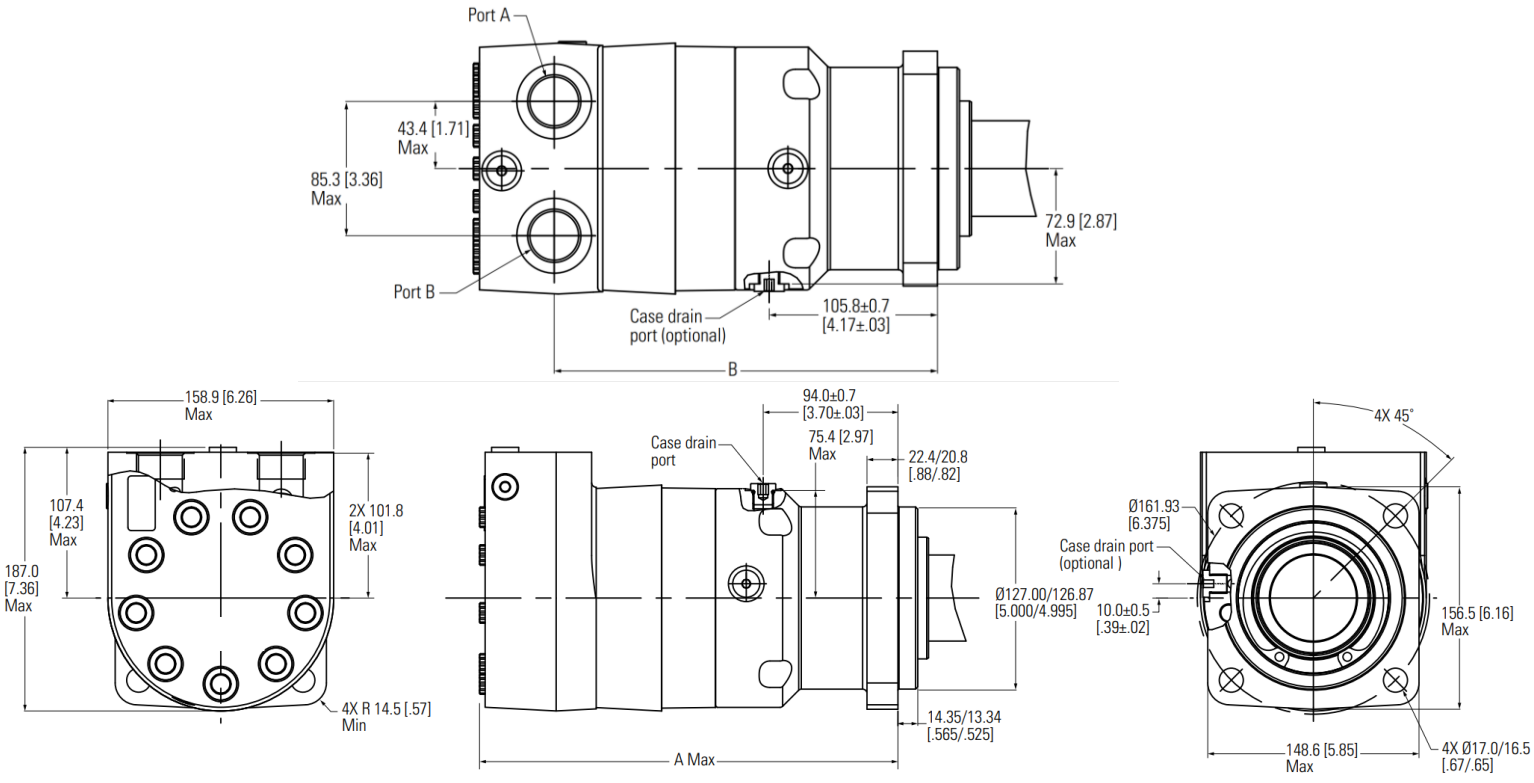


Figure 12 Closed loop

Open loop

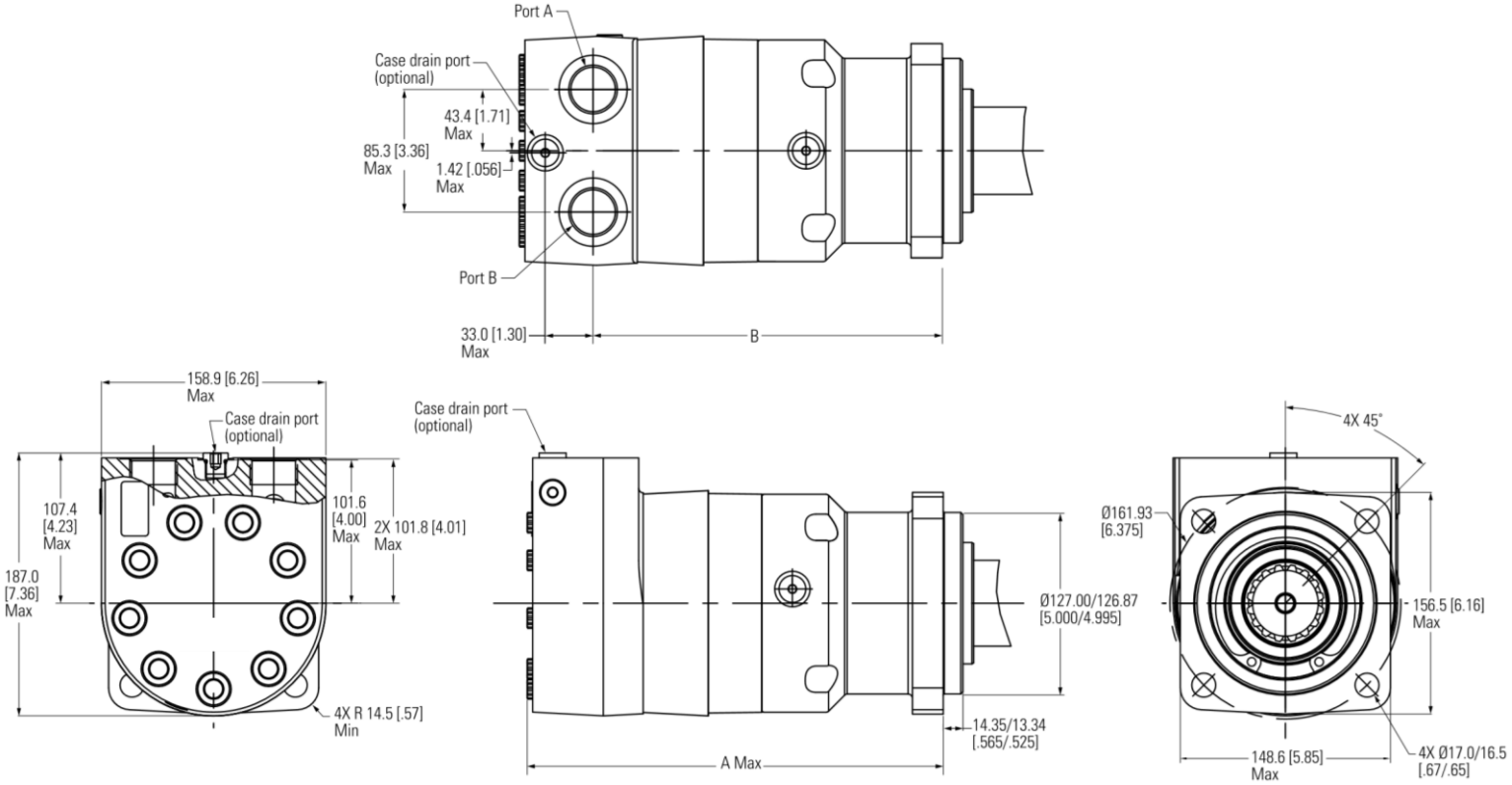


Figure 13 open loop

Motor dimensions – Standard mount

Displacement *cm³/r [in³/r]*	**A Max** *mm [in]*	**B** *mm [in]*
344 *[21.0]*	288.0 *[11.34]*	235.6 *[9.28]*
400 *[24.4]*	293.2 *[11.55]*	240.9 *[9.49]*
434 *[26.5]*	296.5 *[11.67]*	244.2 *[9.61]*
480 *[29.3]*	300.6 *[11.84]*	248.3 *[9.78]*
677 *[41.3]*	319.1 *[12.56]*	266.8 *[10.50]*

Table 2 Motor dimension - standard mount

Wheel Mount

Main ports

1-1/16-12 UN-2B SAE O-ring ports (2) 9/16-18 UNF-2B SAE O-ring case drain port (1)	or	G1 (BSP) O-ring ports (2) G1/4 (BSP) O-ring case drain port (1)

Standard rotation viewed from shaft end

Port A pressurized – CW (clockwise)
Port B pressurized – CCW (counter- clockwise)

Manifold interface

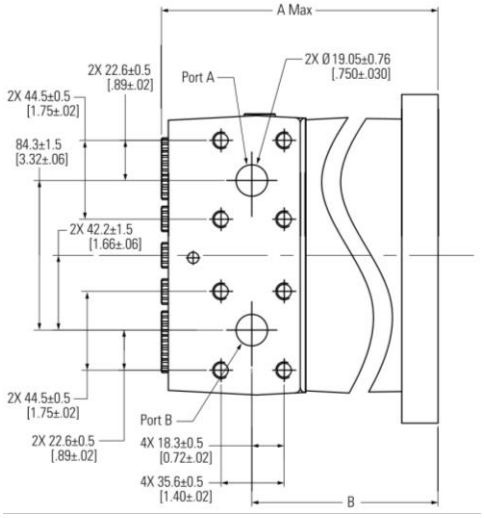


Figure 14 Wheel Mount manifold interface

Closed loop

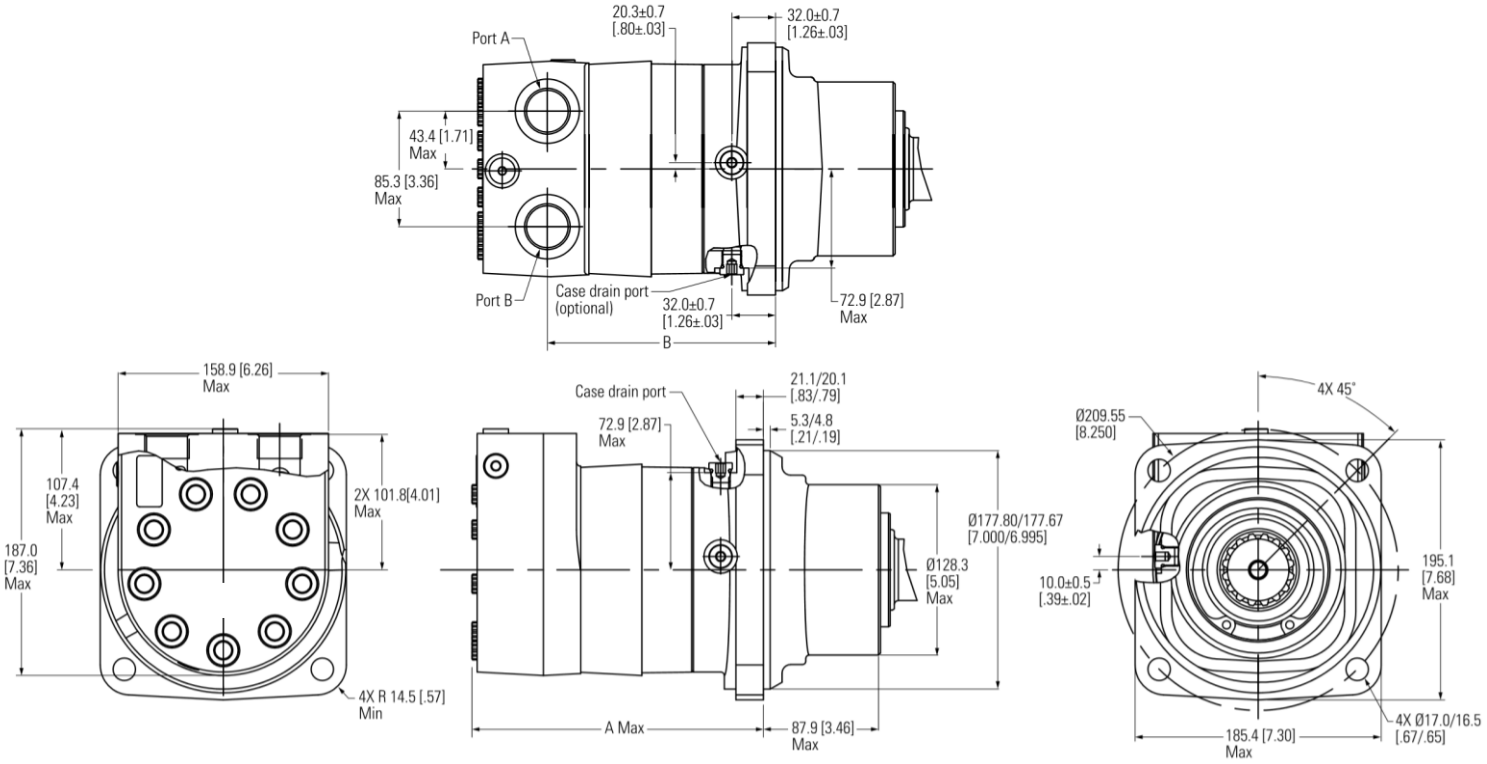


Figure 15 Wheel mount closed loop

Open loop

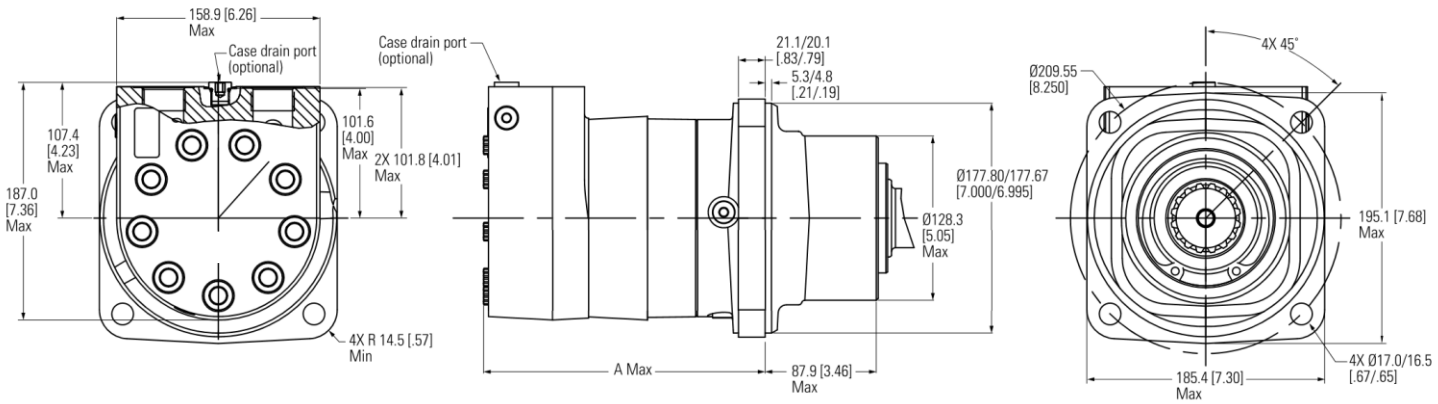


Figure 16 Wheel Mount Open loop

Motor dimensions – Wheel mount

Displacement *cm³/r [in³/r]*	A Max *mm [in]*	B *mm [in]*
344 *[21.0]*	214.2 [8.43]	161.8 [6.37]
400 *[24.4]*	219.5 [8.64]	16 7.1 [6.58]
434 *[26.5]*	222.7 [8.77]	170.4 [6.71]
480 *[29.3]*	226.8 [8.93]	174.5 [6.87]
677 *[41.3]*	245.3 [9.66]	193.0 [7.60]

Table 3 Motor dimension – wheel mount

Bearingless mount

Main ports

1-1/16-12 UN-2B SAE O-ring ports (2)

9/16-18 UNF-2B SAE O-ring case drain port (1)

or

G1 (BSP) O-ring ports (2)
G1/4 (BSP) O-ring case drain port (1)

Standard rotation viewed from shaft end

Port A pressurized – CW (clockwise)

Port B pressurized – CCW (counter- clockwise)

Closed loop configuration

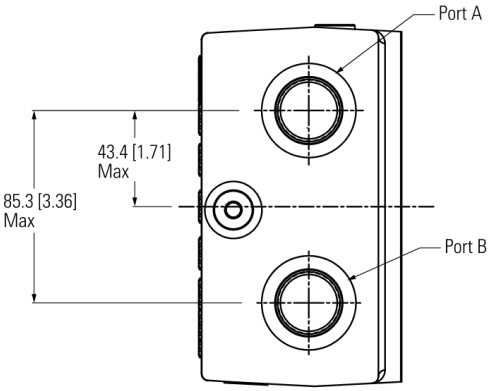


Figure 17 Bearingless mount closed loop configuration

Open loop configuration

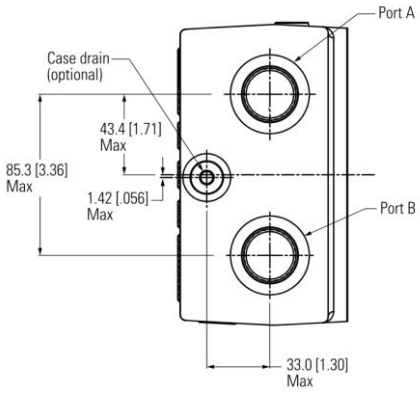


Figure 18 Bearingless mount open loop configuration

Closed loop

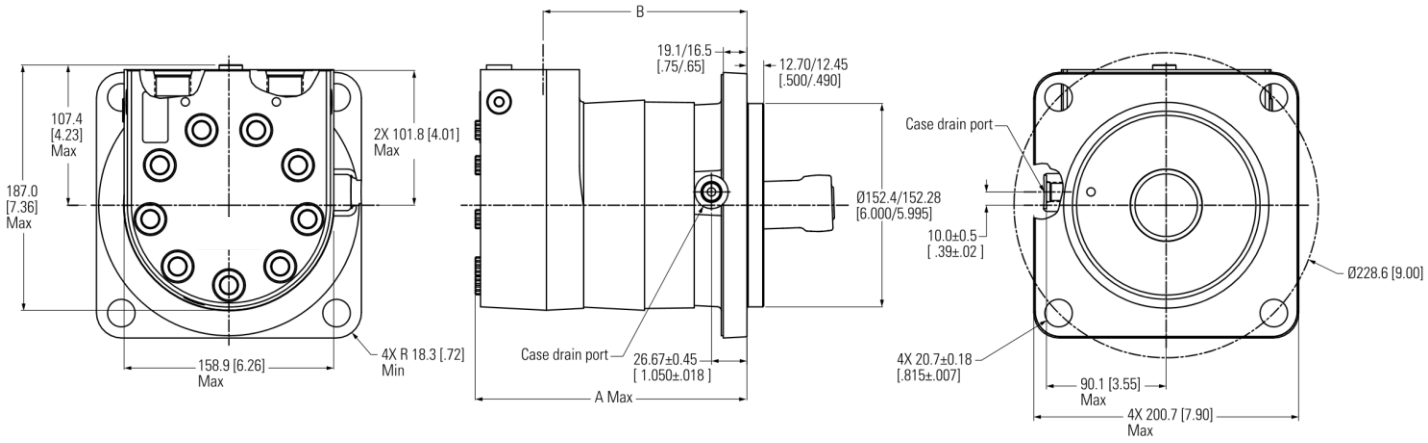


Figure 19 Bearingless mount closed loop

Open loop

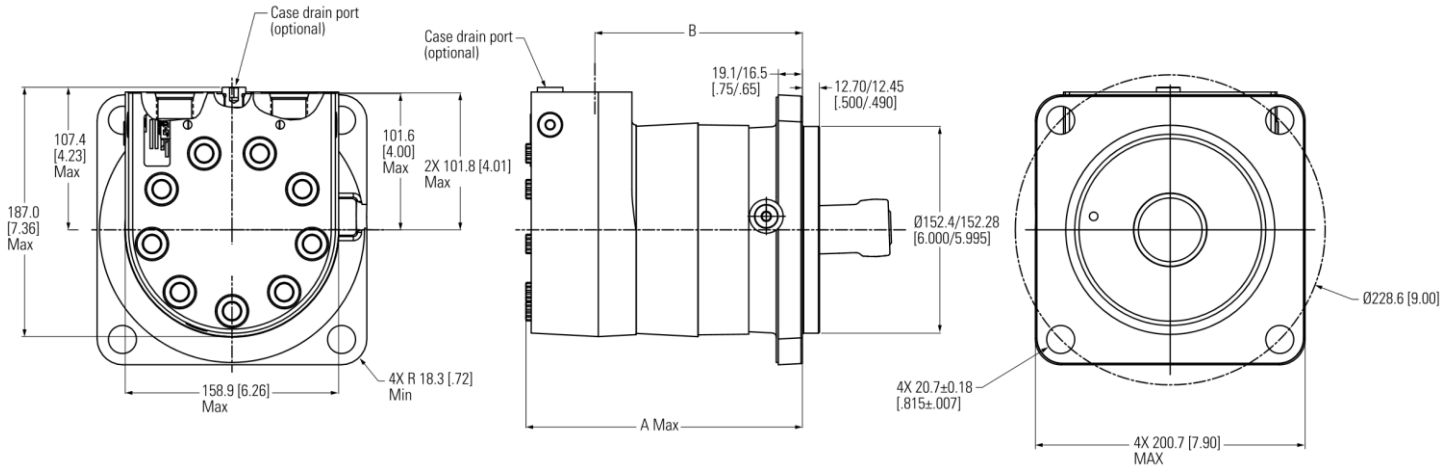


Figure 20 Bearingless mount open loop

Motor dimensions – Wheel mount

Displacement *cm^3/r [in^3/r]*	**A Max** *mm [in]*	**B** *mm [in]*
344 *[21.0]*	199.6 *[7.86]*	147.8 *[5.82]*
400 *[24.4]*	204.9 *[8.07]*	153.1 *[6.03]*
434 *[26.5]*	208.1 *[8.19]*	156.4 *[6.16]*
480 *[29.3]*	212.2 *[8.36]*	160.5 *[6.32]*
677 *[41.3]*	230.8 *[9.09]*	179.0 *[7.05]*

Table 4 Motor dimension – wheel mount

Note:

Use of a case drain is optional in an open loop circuit if motor case pressure does not exceed 300 psi.

Install Instructions

Bearingless mount

1. 1 Internal spline in mating part to be per spline data. Specification material to be ASTM A304, 8620H carburize to a hardness of 60-64 HRc with case depth (to 50HRc) of 0,076 -1,27 [.030 -.050]. Dimensions apply after heat treat.
2. Mating part to have critical dimensions as shown. Oil holes must be provided and open for proper oil circulation.
3. Seal to be furnished with motor for proper oil circulation thru splines.

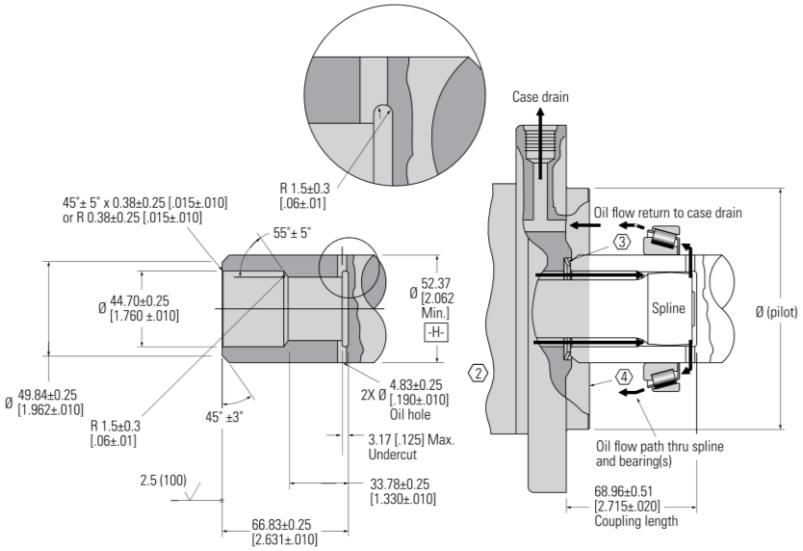
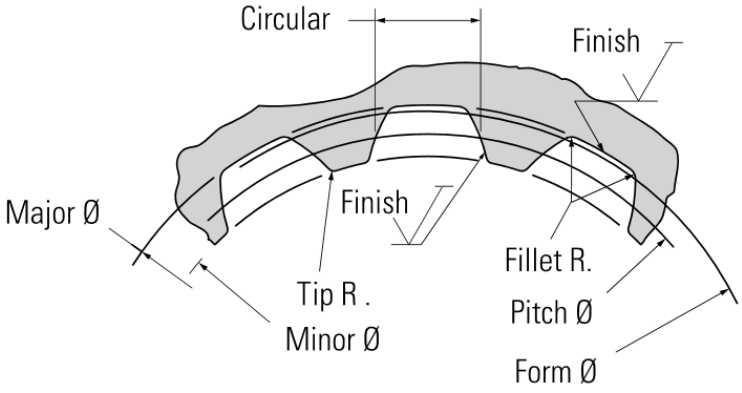


Figure 21 Install instruction bearingless mount

Spline pitch 10/20
Pressure angle ..... 30°
Number of teeth 16
Class of fit..... Ref. 5
Type of fit ..... SIDE
Pitch diameter .....Ref. 40.640000 [1.6000000] ⌀0,20 [.008] H
Base diameter ..... Ref. 35.195272 [1.3856406]
Major diameter.....43.56 [1.715] MAX 43.18 [1.700] MIN
Minor diameter.....36.83-37.08 [1.450-1.460]
Form diameter, min. .....42.47 [1.672]
Fillet radius.....0.64-0.76 [.025-.030]
Tip radius .....0.25-0.51 [.010-.020]
Finish .....1.6 [63]
Involute profile variation.....+0.000 -0.025 [+.0000 -.0010]
Total index variation .....0.040 [.0016]
Lead variation .....0.013 [.0005]
Circular space width:
- Maximum actual .....4.105 [.1616]
- Minimum effective .....3.995 [.1573]
- Maximum effective ..... Ref. 4.081 [.1582]
- Minimum actual ..... Ref. 4.081 [.1582]

Dimension between two pins .... Ref. 34.272-34.450 [1.3493-1.3563]
Pin diameter.....4.389 [.1728]



Note:
Close loop shown - flow path reverses for open loop configuration.

Shaft installation

2 1/8 Inch 16 tooth splined

2712 [24000] Max. Torque Nm [lb-in]

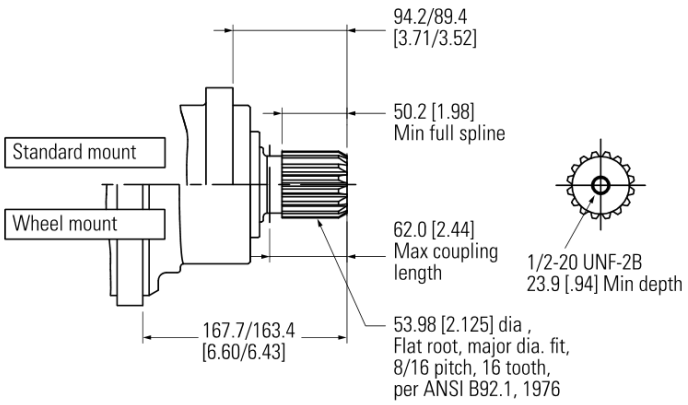


Figure 22 2 1/8 inch 16 tooth splined shaft

2 ¼ Inch straight

2712 [24000] Max. Torque Nm [lb-in]

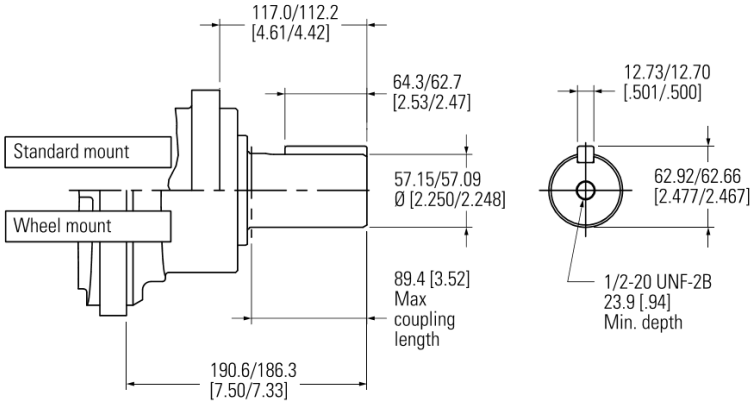


Figure 23 2 1/4 inch straight shaft

2 ¼ inch tapered

2712 [24000] Max. Torque Nm [lb-in]

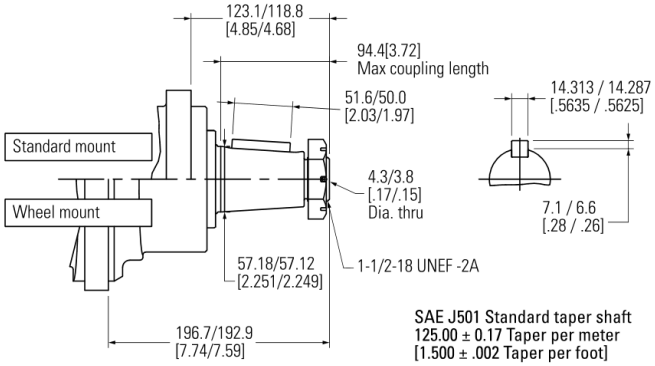


Figure 24 2 1/4 inch tapered shaft

Tapered shaft hub data

Recommended torque:
(1150 Nm [850 lb-ft] dry)
(880 Nm [650 lb-ft] lub)
Plus torque required to align the slotted nut with the shaft crosshole.

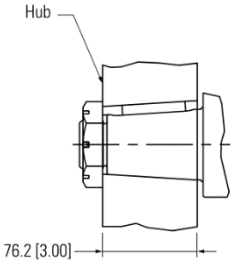


Figure 25 Tapered shaft hub data

Slotted hexagon nut

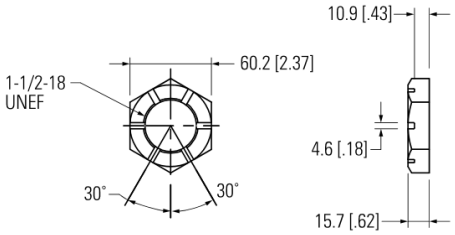
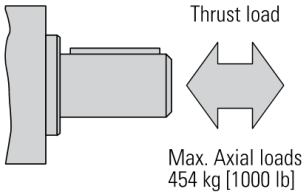


Figure 26 Slotted hexagon nut

Shaft side load capacity

These curves indicate the radial load capacity on the motor shaft at various locations with an external thrust load of 454 kg [1,000 lb].



Note:

Case pressure will increase the allowable inward thrust load and decrease the allowable outward thrust load. Case pressure will push outward on the shaft at 199 kg/7 Bar [438 lb/100 psi].

Each curve is based on B 10 bearing life [2000 hours or 12,000,000 shaft revolutions at 100 rpm] at rated output torque. To determine radial load at speeds other than 100 rpm, multiply the load values given on the bearing curve by the factors in the chart below.

Standard mount curve

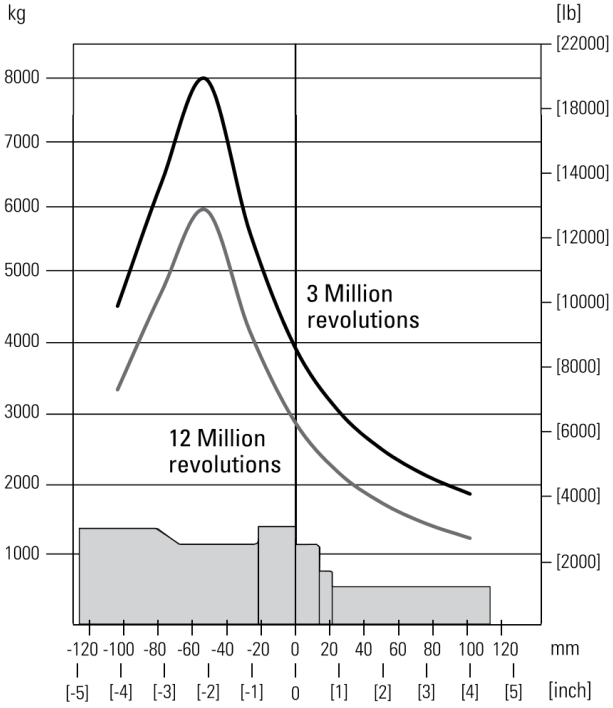


Figure 27 Standard mount curve

Wheel mount curve

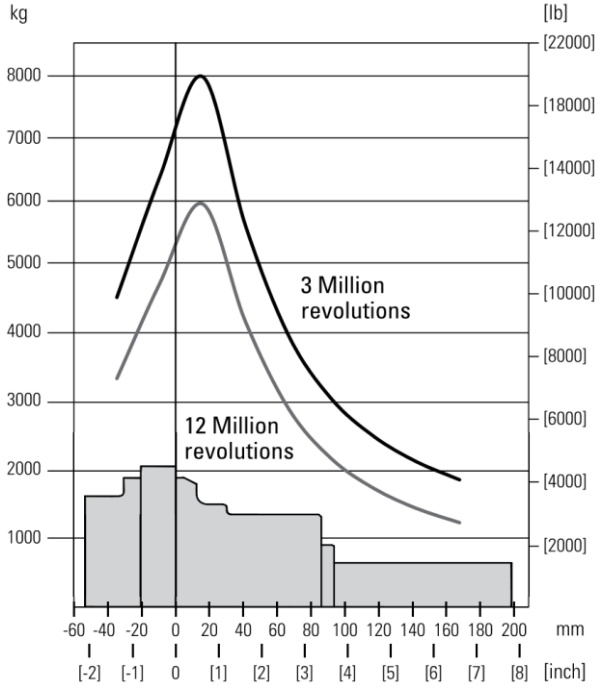


Figure 28 Wheel mount curve

rpm	Multiplication factor
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.54

For 3,000,000 shaft revolutions or 500 hours – Increase these shaft loads 52%.

Case pressure and case port

HP30 series motors are durable and have long life as long as the recommended case pressure is not exceeded. Allowable case pressure is highest at low shaft speeds.
Consequently, motor life will be shortened if case pressure exceeds these ratings (acceptability may vary with application). Determine if an external case drain is required from the case pressure seal limitation chart.

Case porting advantage

Contamination control — flushing the motor case.

Cooler motor — exiting oil draws motor heat away.

Extend motor seal life — maintain low case pressure with a preset restriction in the case drain line.

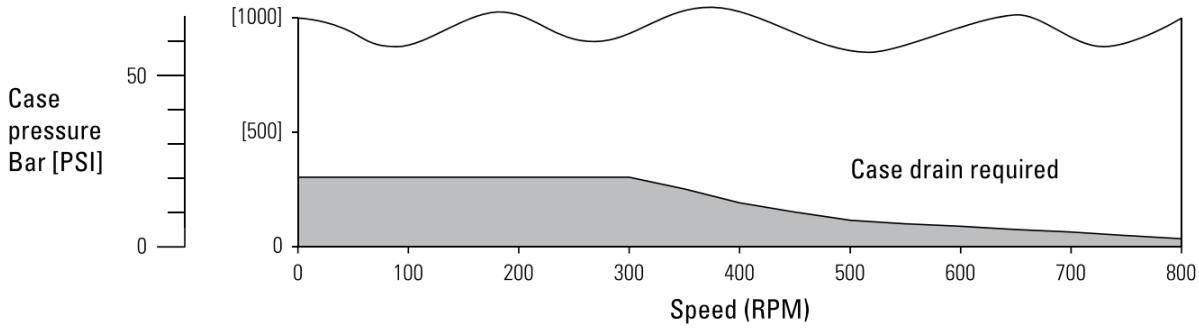


Figure 29 Case pressure

***Note**: Use of a case drain is optional in an open loop circuit if motor case pressure does not exceed 300 psi.*

HP30 motors applied in closed loop circuit applications must have a case drain line to tank. Without this drain line the internal drive spline will not have adequate lubrication.

Model code

The following 30-digit coding system has been developed to identify all of the configuration options for the HP30 series motor. Use this model code to specify a motor with the desired features. All 30-digits of the code must be present when ordering. You may want to photocopy the matrix below to ensure that each number is entered in the correct box.

M	HP3	1A	21	AA	00	AA	01	0	0	0	0	0	00	00	00	00	C
1	2,3,4	5, 6	7, 8	9, 10	11, 12	13, 14	15, 16	17	18	19	20	21	22, 23	24, 25	26, 27	28, 29	30

1 Product

M – Motor

2,3,4 Product series

HP3 – HP30 series

5,6 Configuration

1A – Single-speed

1B – Single-speed w/spring applied hydraulic release wet brake

2A – Two-speed

2B – Two-speed w/spring applied hydraulic release wet brake

7,8 Displacement

21 – 343.8 cm³/r [20.98 in³/r]

24 – 400.0 cm³/r [24.40 in³/5]

26 – 434.2 cm³/r [26.50 in³/5]

29 – 479.5 cm³/r [29.26 in³/5]

41 – 677.3 cm³/r [41.33 in³/5]

9,10 Mounting type

AA – Brake, 4 bolts 169.75 [6.683] pilot dia. With 4.3 [.17] pilot length and M16 x 2-6h threaded holes on 224.00 [8.819] dia. bolt circle

BB – Bearingless, 4 bolt: 152.4[6.00] pilot dia. 20.70 [.815] dia. Holes on 228.6 [9.00] dia. bolt circle

SA – Standard, 4 bolt: 127.00 [5.000] pilot dia. 17.02 [.670] dia. holes on 161.92 [6.375] dia. bolt circle

SB – Standard, 4 bolt: 127.00 [5.000] pilot dia. 17.70 [.697] dia. holes on 162.3 [6.390] dia. bolt circle

SF – Standard, 4 bolt: 160.00 [6.299] pilot dia. 18.0 [.71] dia. holes on 200.0 [7.87] dia. bolt circle

SE – Standard, 4 bolt: 125.00 [4.921] pilot dia. 14.00 [.551] dia. holes on 160.00 [6.299] dia. bolt circle

WA – Wheel, 4 bolt: 177.80 [7.000] pilot dia. 17.02 [.670] dia. holes on 209.55 [8.250] dia. bolt circle

11,12 Output shaft

00 – None (bearingless)

01 – Splined 2⅛", 16t 8/16 dp with ½-20 threaded hole

02 – Straight keyed, 2¼" dia. with ½-20 threaded hole

03 – Tapered, 2¼" SAE J501 with 1½-18 thread and slotted nut

04 – Straight keyed, 50mm dia. with M12 metric threaded hole

07 – Straight keyed, 40mm dia. with M12 metric threaded hole

08 – Splined 1½", 17t 12/24 dp with M12 Metric threaded hole

10 – Tapered, 60mm ISO R775 with M42 thread and slotted nut

13,14 Port type

AA – #12 SAE O-ring ports

AC – #16 SAE O-ring ports

AE – G 1 BSP straight thread ports

AF – 17.78 [.700] dia. Manifold ports with 8x.375-16 UNC-2B port block mounting holes

15,16 Case flow option

01 – Shuttle valve with .5625-18 UNF-2B SAE O-ring case drain port in line with main ports, optional .5625-18 UNF-2B case drain port in mounting flange (closed loop circuits)

02 – Shuttle valve with .5625-18 UNF-2B SAE O-ring case drain port in mounting flange (for bearingless and brake) (closed loop circuits)

03 – Shuttle valve with G 1/4 BSP straight thread case drain port in mounting flange (for bearingless and brake) (closed loop circuits)

04 – Check valve with orifice plug, G 1/4 BSP straight thread case drain port in valve housing (open loop circuits)

05 – Shuttle valve with G ¼ BSP straight thread case drain port in line with main ports, optional G 1/4 BSP straight thread case drain port in mounting flange (closed loop circuits)

06 – Check valve with orifice plug, .5625-18 UNF-2B SAE O-ring case drain port in valve housing (open loop circuits)

09 – Check valve with orifice plug, dia. 250 manifold case drain port in valve housing (open loop circuits)

17 Low pressure relief

0 – None

A – Set @ 4.5 bar (65 psi)

B – Set @ 11.0 bar (160 psi)

C – Set @ 15.2 bar (220 psi)

D – Set @ 20.7 bar (300 psi)

18 Pressure/flow option

0 – None

18 Geroler option

0 – None

20 Seal option

0 – None

1 – Viton seals

2 – Outer grease seal (for brake only)

3 – Extreme duty seal guard

21 Accessories

0 – None

1 – M 12 threaded connector, digital speed pickup (30 pulse) (Pin 1 = power supply, Pin 3 = common, Pin 4 = output signal)

22,23 Special features (hardware)

00 – None

24,25 Special features (assembly)

00 – None

01 – Reverse rotation

26,27 Paint option

00 – No paint

AA – Painted low gloss black

AE – Painted charcoal gray

28,29 Customer identification

00 – None

30 Design code

C – Three

Chapter 3
Two speed

Topics:

- *Description*
- *Performance data*
- *Specifications*
- *Dimensions*
- *Typical hydraulic circuit*

Description

HP30 series motors are available with an integral two-speed feature that allows the operator to shift the motor between low speed high torque (LSHT) mode and high speed low torque (HSLT) mode. In the LSHT mode, output torque and rotation speed values are equal to those of the conventional HP30 motor. In the HSLT mode motor displacement is reduced by one third, resulting in a fifty percent increase in rotation speed and a torque output reduction of one third.

The HP30 two-speed motor is bidirectional. It will function with equal shaft output in either rotation direction (CW or CCW) in both LSHT or HSLT modes. Shift on the fly technology allows full-power operation throughout the full duration of the shift.
Changing between modes is accomplished by changing the displacement in a ratio of 1 to 1.5. An external two-position three-way control valve is required for shifting pressure to the pilot port between low pressure (LSHT mode) and pilot signal pressure (HSLT mode).

An integral selector valve shift the motor from LSHT mode to HSLT mode. Initially, low pressure is supplied to the pilot port. The selector valve is biased to LSHT mode by a return spring. When pilot signal pressure is supplied to the pilot port and 10.3 Δbar [150 psi] over case pressure is reached, the selector valve overcomes return spring force and the shifts the spool to select HSLT mode.

Oil on the opposite side of the spool is drained internally to case. The pressure difference between the pilot port and drain port must be maintained to keep the motor in the high speed mode. When pilot pressure is removed from the pilot port, the pressure in the pilot end of the spool valve is relieved and drained back through the control valve and the return spring forces the spool valve to LSHT position.

Pilot pressure may come from any source that will provide uninterrupted pressure during the high-speed mode operation. Allowable pilot pressure must be at least 3.5 Δbar [50 psi] and may be as high as full operating pressure of the motor.

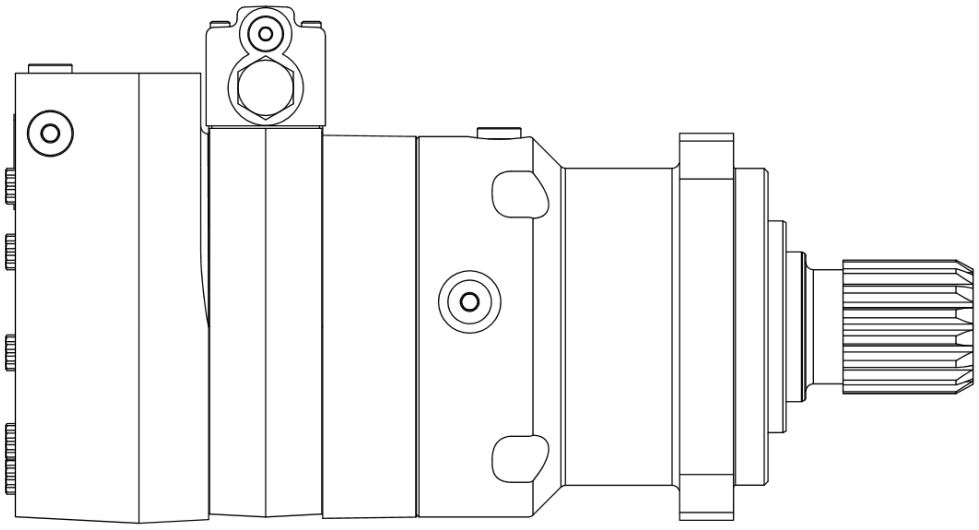
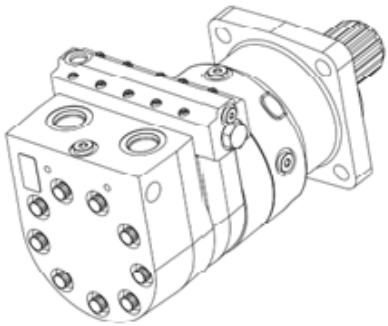
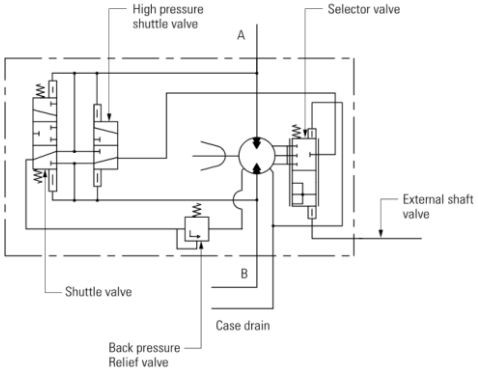


Figure 30 Two speed

Performance data

In the LSHT mode, torque and speed values are equal to those of the conventional HP30 motor (refer to single- speed motor performance data). In the HSLT mode, rotation speed is increased by fifty percent and torque output is reduced by one third. The HP30 two-speed motor will function with equal shaft output in either rotation direction (CW or CCW) in both LSHT and HSLT modes.





***Note**:*

The schematic diagram applies to HP30 series two-speed motors.

Specifications

Type				HP 30				
Geometric displacement	cm^3 [in^3]	*High speed mode*		**229**	**267**	**289**	**320**	**477**
				[14.0]	*[16.3]*	*[17.7]*	*[19.5]*	*[27.5]*
		Low speed mode		**344**	**400**	**434**	**480**	**677**
				[21.0]	*[24.4]*	*[26.5]*	*[29.3]*	*[41.3]*
Maximum speed	min^{-1} [rpm]	cont.		743	639	588	532	378
		int.[1)]		[495]	[426]	[392]	[355]	[252]
Maximum torque	N•m [lbf•in]	High speed mode	cont.	1.076	1.251	1.358	1.501	1.646
				[9.525]	*[11.067]*	*[12.020]*	*[13.290]*	*[14.571]*
			int. [1)]	1.196	1.389	1.509	1.669	1.929
				[10.584]	*[12.297]*	*[13.356]*	*[14.767]*	*[17.068]*
		Low speed mode	cont.	1.614	1.876	2.037	2.252	2.469
				[14.288]	*[16.600]*	*[18.030]*	*[19.935]*	*[21.856]*
			int. [1)]	1.794	2.084	2.263	2.503	2.893
				[15.876]	*[18.446]*	*[20.034]*	*[22.150]*	*[25.602]*
Maximum oil flow	l/min [US gal/ min]	cont.		170				
				[45]				
Pressure Δ	Bar [psi]	cont.		310	310	310	310	241
				[4.5]	*[4.5]*	*[4.5]*	*[4.5]*	*[3.5]*
		int.[1)]		345	345	345	345	283
				[5.0]	*[5.0]*	*[5.0]*	*[5.0]*	*[4.1]*
		peak		379	379	379	379	310
				[5.5]	*[5.5]*	*[5.5]*	*[5.5]*	*[4.5]*
Min starting torque	kg [lb]	Standard mount		36.9	37.6	38.0	38.4	40.4
				[81.4]	*[82.8]*	*[83.7]*	*[84.7]*	*[89.0]*
		Wheel mount		39.7	40.4	40.7	41.2	43.2
				[87.6]	*[89.0]*	*[89.8]*	*[90.9]*	*[95.1]*

Table 5 Two speed technical information

***Note**: To assure best motor life, run motor in low speed high torque mode at approximately 30% of continuous pressure and 50% of continuous flow for 30 minutes in each direction before application of full load. Ensure that the motor is filled with fluid prior to operation.*

Thermal Shock Warning:	Do not operate the motor with fluid that is 70F or more above the motor temperature.
Minimum Delta Pressure:	*WARNING:* *Motors must not run with equal inlet and outlet pressure. 50 PSID minimum delta pressure between motor ports is required at all times (except when switching direction of rotation).*
Maximum inlet pressure:	405 bar [5850 psi] Do not exceed Δ pressure rating (see chart above).
Maximum return pressure:	405 bar [5850 psi] with case drain installed. Do not exceed Δ pressure rating (see chart above).
Maximum case pressure:	20 bar [300 psi]
Δ bar [Δ psi]:	The true pressure difference between inlet port and outlet port.
Continuous rating:	Motor may be run continuously at these ratings.
Intermittent operation:	10% of every minute.
Peak operation:	1% of every minute.
Recommended fluids:	Premium quality, anti-wear type hydraulic oil with a viscosity of not less than 13 cSt [70 SUS] at operating temperature.
Recommended maximum system operating temp.:	82°C [180°F]
Recommended filtration:	Per ISO Cleanliness code, 4406: 20/18/13.

Dimensions

Two-speed standard motor

Main ports

1-1/16-12 UN-2B SAE O-ring ports (2)	or	G1 (BSP) O-ring ports (2)
9/16-18 UNF-2B SAE O-ring case drain port (1)		G1/4 (BSP) O-ring case drain port (1)

Standard rotation viewed from shaft end

Port A pressurized – CW (clockwise)

Port B pressurized – CCW (counter- clockwise)

Manifold interface

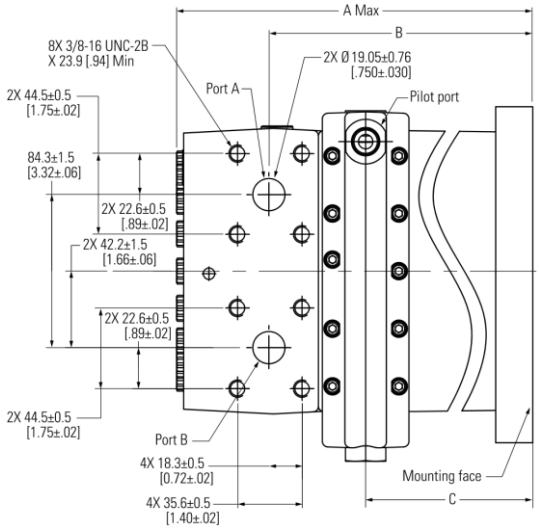


Figure 31 Two-speed standard motor manifold interface

Closed loop

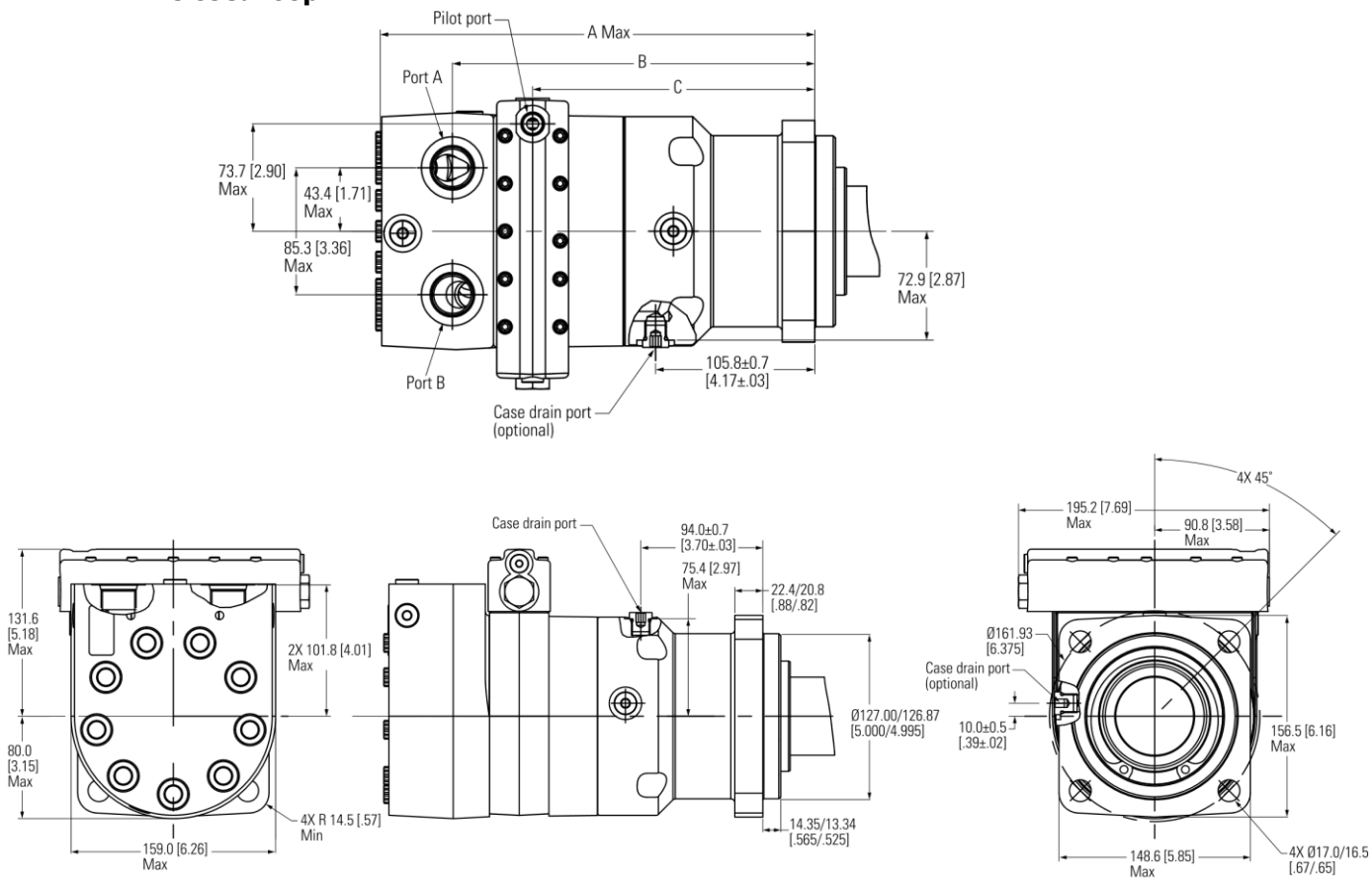


Figure 32 Figure 33 Two speed standard closed loop

Open loop

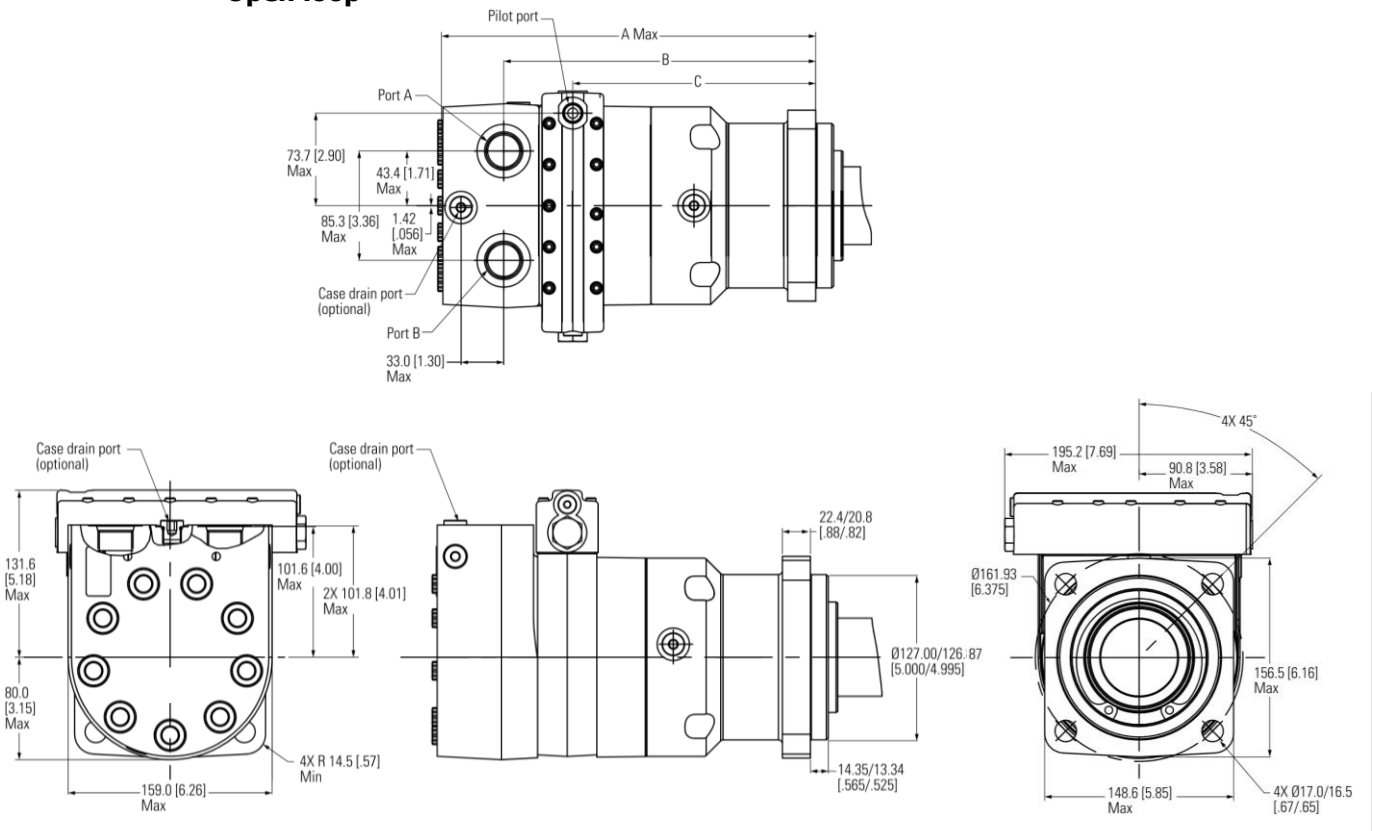


Figure 34 Two speed standard open loop

Motor dimensions – Standard mount

Displacement *cm³/r [in³/r]*	A Max *mm [in]*	B *mm [in]*	C *mm [in]*
344 *[21.0]*	288.0 *[11.34]*	235.6 *[9.28]*	182.3 *[7.18]*
400 *[24.4]*	293.2 *[11.55]*	240.9 *[9.49]*	187.6 *[7.39]*
434 *[26.5]*	296.5 *[11.67]*	244.2 *[9.61]*	190.8 *[7.51]*
480 *[29.3]*	300.6 *[11.84]*	248.3 *[9.78]*	194.9 *[7.68]*
677 *[41.3]*	319.1 *[12.56]*	266.8 *[10.50]*	213.5 *[8.40]*

Table 6 Two speed motor dimension – Standard mount

***Note**:*

Use of a case drain is optional in an open loop circuit if motor case pressure does not exceed 300 psi.

Two-speed wheel mount

Main ports

1-1/16-12 UN-2B SAE O-ring ports (2)

9/16-18 UNF-2B SAE O-ring case drain port (1)

or

G1 (BSP) O-ring ports (2)
G1/4 (BSP) O-ring case drain port (1)

Standard rotation viewed from shaft end

Port A pressurized – CW (clockwise)

Port B pressurized – CCW (counter- clockwise)

Manifold interface

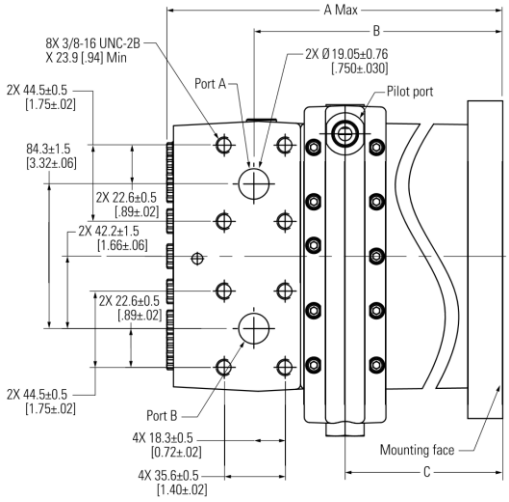


Figure 35 Two speed wheel mount manifold interface

Closed loop

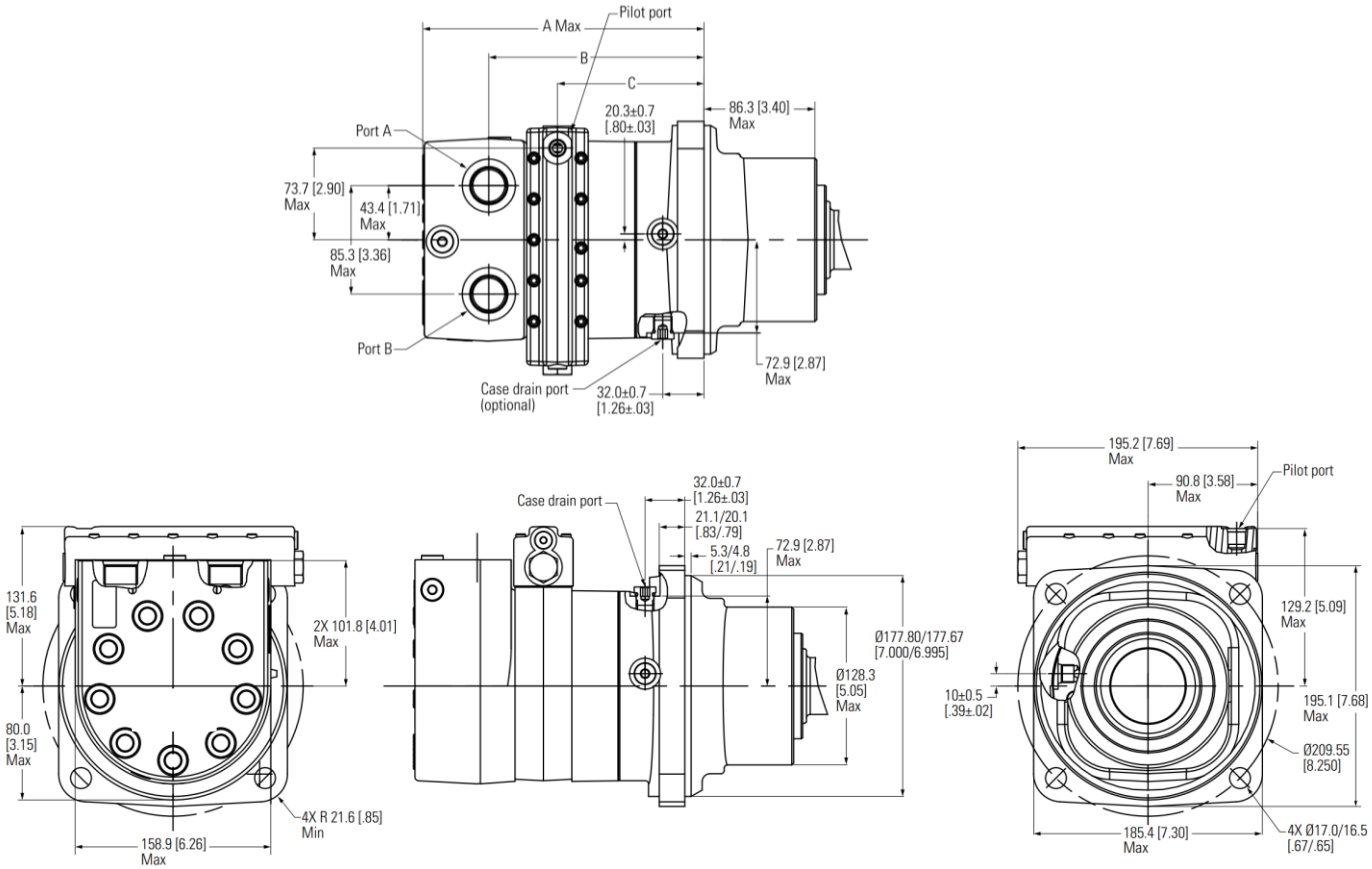


Figure 36 Two speed motor wheel mount closed loop

Open loop

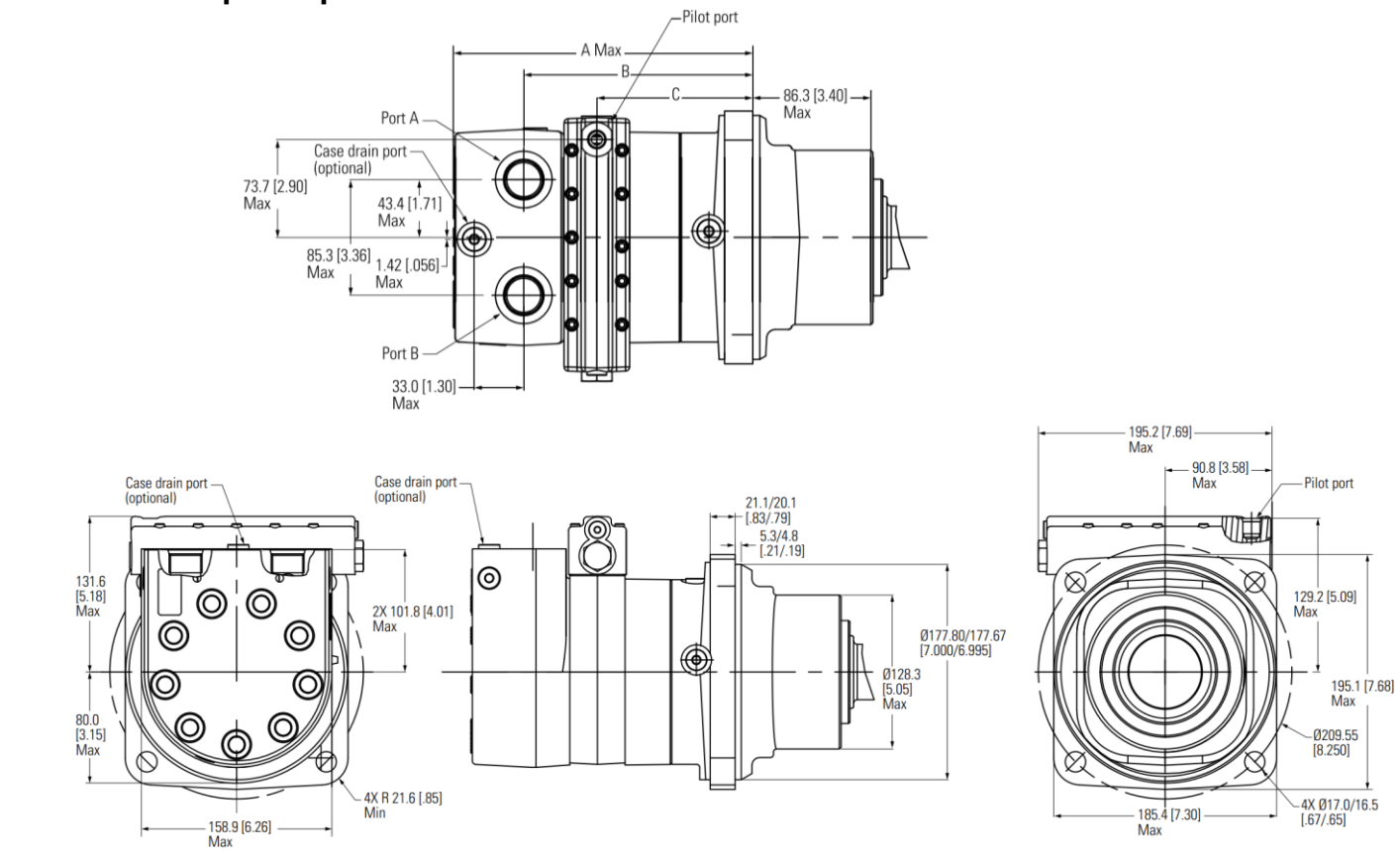


Figure 37 Two speed wheel mount open loop

***Note**: Use of a case drain is optional in an open loop circuit if motor case pressure does not exceed 300 psi.*

Motor dimensions – Wheel mount

Displacement *cm³/r [in³/r]*	A Max *mm [in]*	B *mm [in]*	C *mm [in]*
344 *[21.0]*	214.2 *[8.43]*	161.8 *[6.37]*	108.6 *[4.28]*
400 *[24.4]*	219.5 *[8.64]*	167.1 *[6.58]*	113.9 *[4.49]*
434 *[26.5]*	222.7 *[8.77]*	170.4 *[6.71]*	117.0 *[4.61]*
480 *[29.3]*	226.8 *[8.93]*	174.5 *[6.87]*	121.3 *[4.78]*
677 *[41.3]*	245.3 *[9.66]*	193.0 *[7.60]*	139.6 *[5.50]*

Table 7 Two speed motor dimension – Wheel mount

Two-speed bearingless

Main ports

1-1/16-12 UN-2B SAE O-ring ports (2)

9/16-18 UNF-2B SAE O-ring case drain port (1)

or

G1 (BSP) O-ring ports (2)
G1/4 (BSP) O-ring case drain port (1)

Standard rotation viewed from shaft end

Port A pressurized – CW (clockwise)
Port B pressurized – CCW (counter- clockwise)

Closed loop

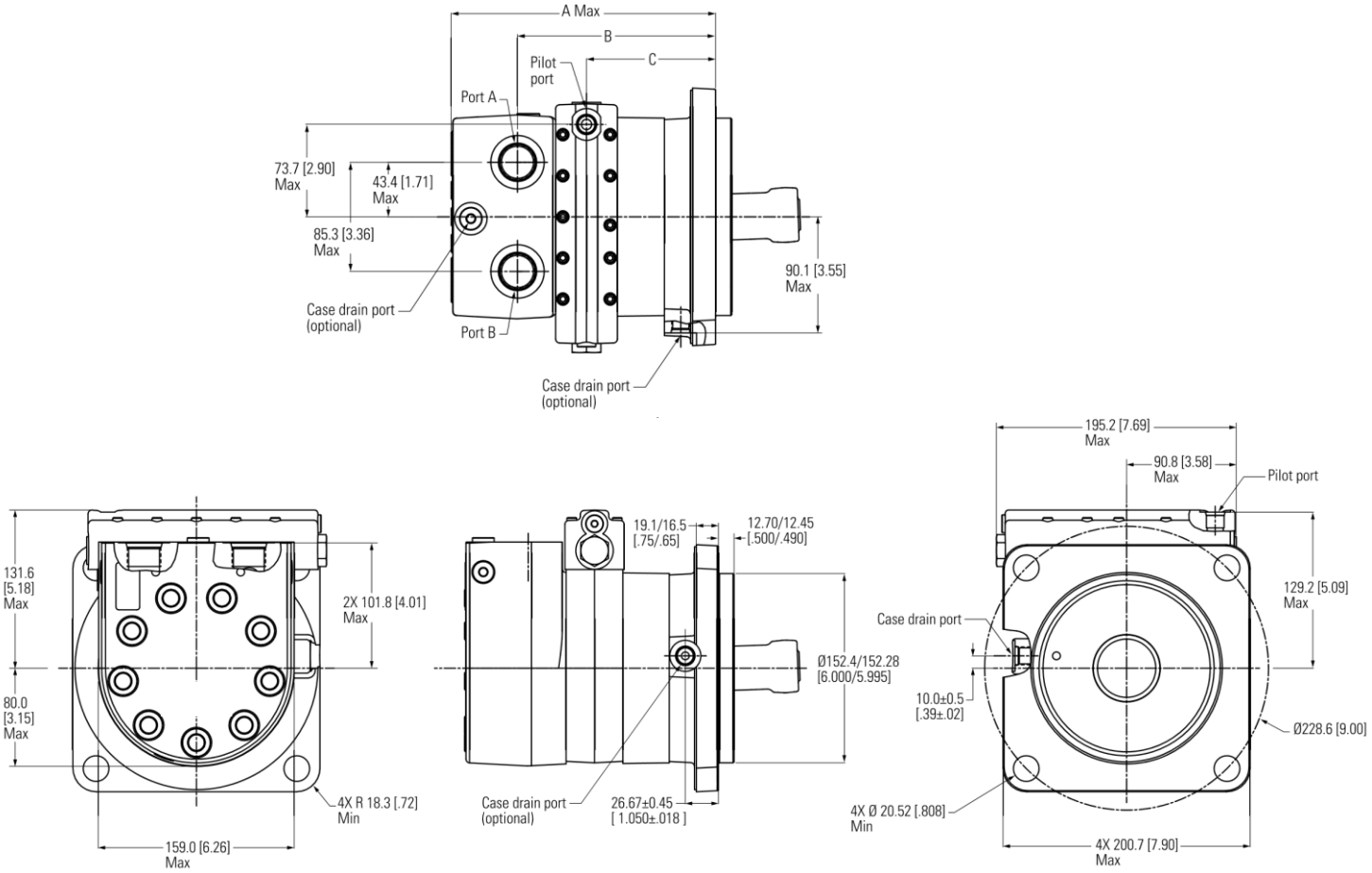


Figure 38 Two speed bearingless closed loop

Open loop

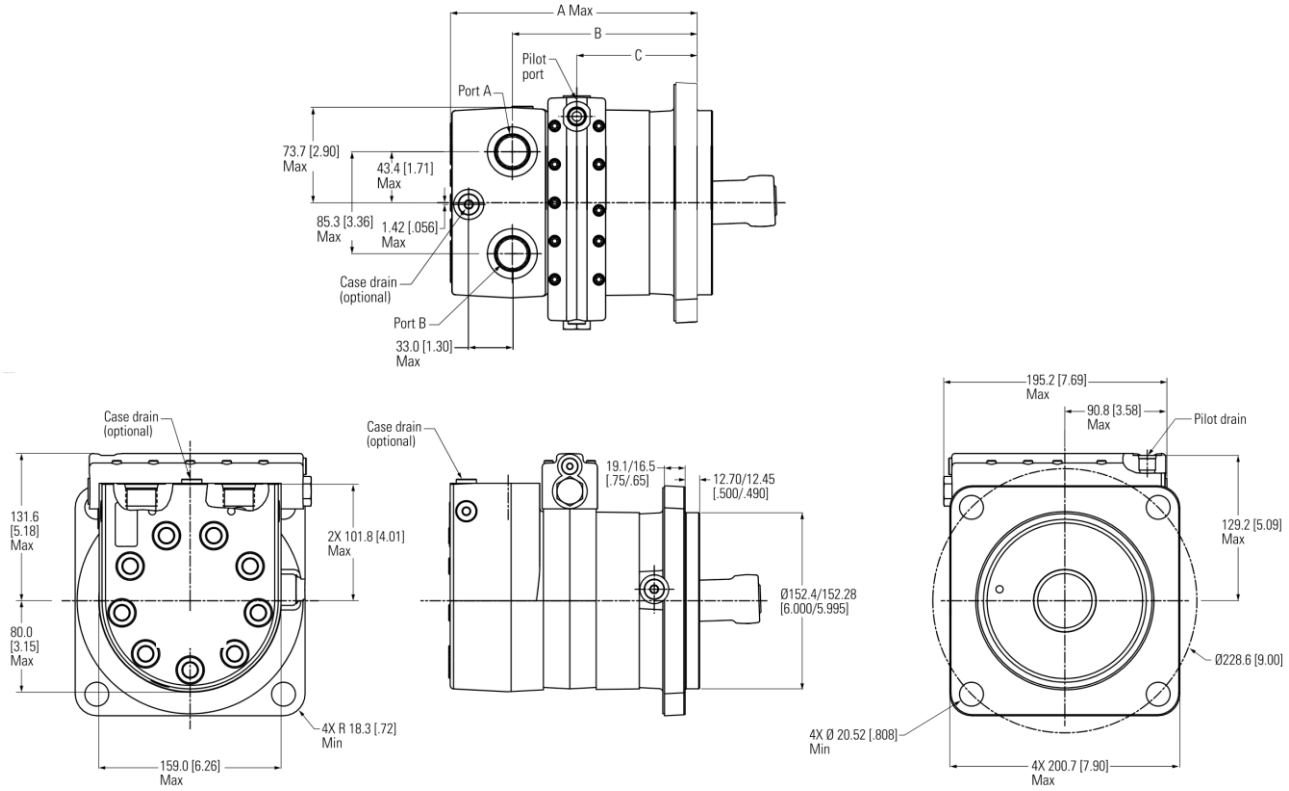


Figure 39 Two speed wheel mount open loop

Motor dimensions – Bearingless mount

Displacement *cm^3/r [in^3/r]*	**A Max** *mm [in]*	**B** *mm [in]*	**C** *mm [in]*
344 *[21.0]*	199.6 *[7.86]*	147.8 *[5.82]*	94.5 *[3.72]*
400 *[24.4]*	204.9 *[8.07]*	153.1 *[6.03]*	99.8 *[3.93]*
434 *[26.5]*	208.1 *[8.19]*	156.4 *[6.16]*	103.1 *[4.06]*
480 *[29.3]*	212.2 *[8.36]*	160.5 *[6.32]*	107.2 *[4.22]*
677 *[41.3]*	230.8 *[9.09]*	179.0 *[7.05]*	125.7 *[4.95]*

Table 8 Two speed motor dimension – bearingless mount

***Note**: Use of a case drain is optional in an open loop circuit if motor case pressure does not exceed 300 psi.*

Typical hydraulic circuit

Shuttle valve, two way (closed center)

Schematic diagrams

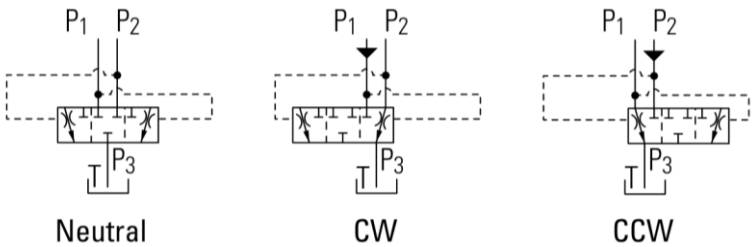


Figure 40 Shuttle valve

Closed loop circuit

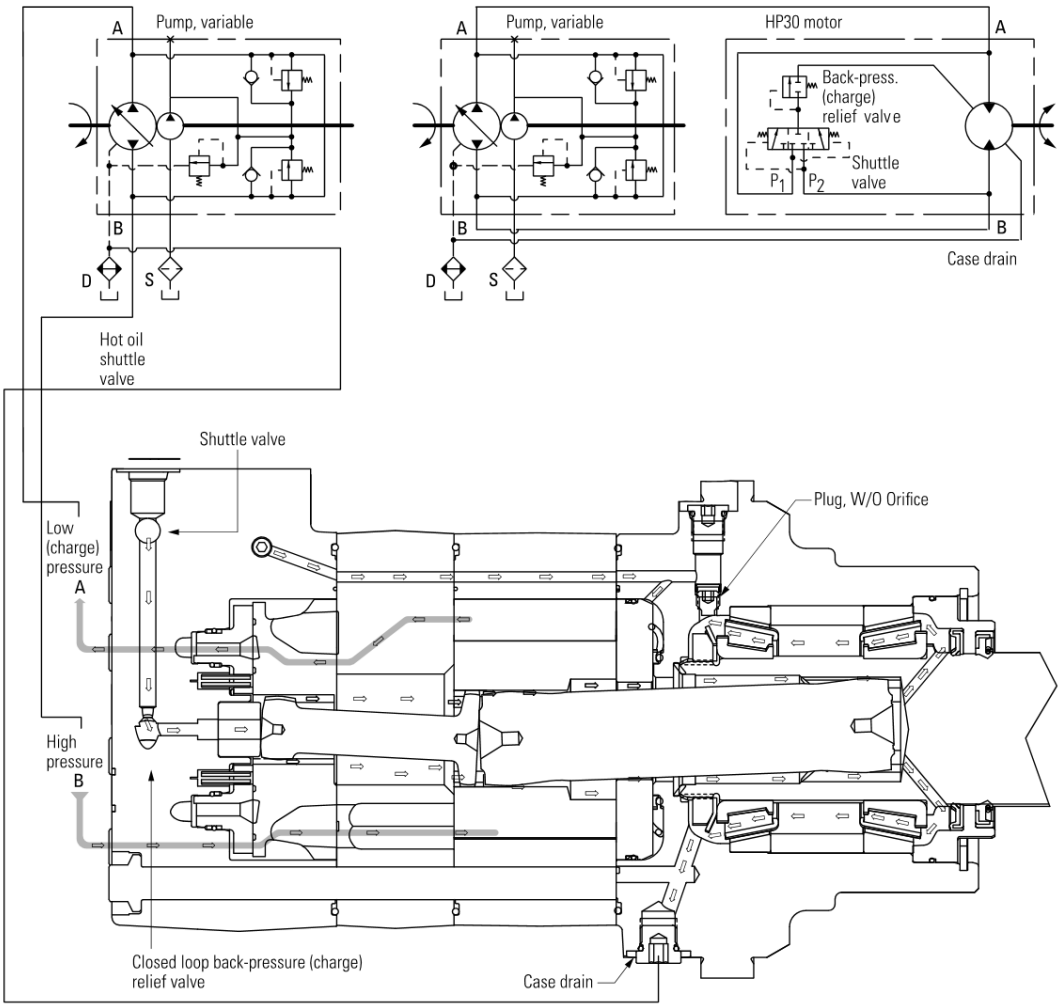


Figure 41 Closed loop circuit

Note:

Conversion Kit Number 9901136-000 can be used to convert a -003 design code open loop motor into a -003 closed loop motor.

See HP30 parts and repair manual for more information.

Shuttle flow charts

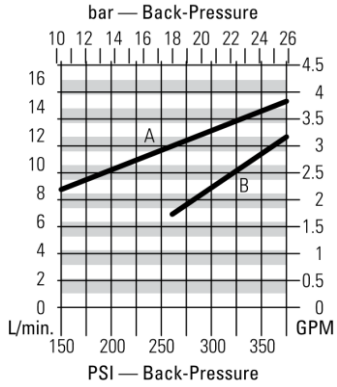


Figure 42Shuttle flow chart

A

4,5 bar [65 PSI] @ 60° C [140° F]
Δ Between Back-Pressure and Case Pressure (Typical Data)

B

15,2 bar [220 PSI] @ 60° C [140° F]
Δ Between Back-Pressure and Case Pressure (Typical Data)
Due to Machining Tolerances, Flow May be More or Less

Note:

Closed loop circuits must have a shuttle valve configuration. See model code position 15, 16 "Case Flow Option."

HP30 motors applied in closed loop circuit applications must have a case drain line to tank. Without this drain line the internal drive spline will not have adequate lubrication.

Open loop circuit

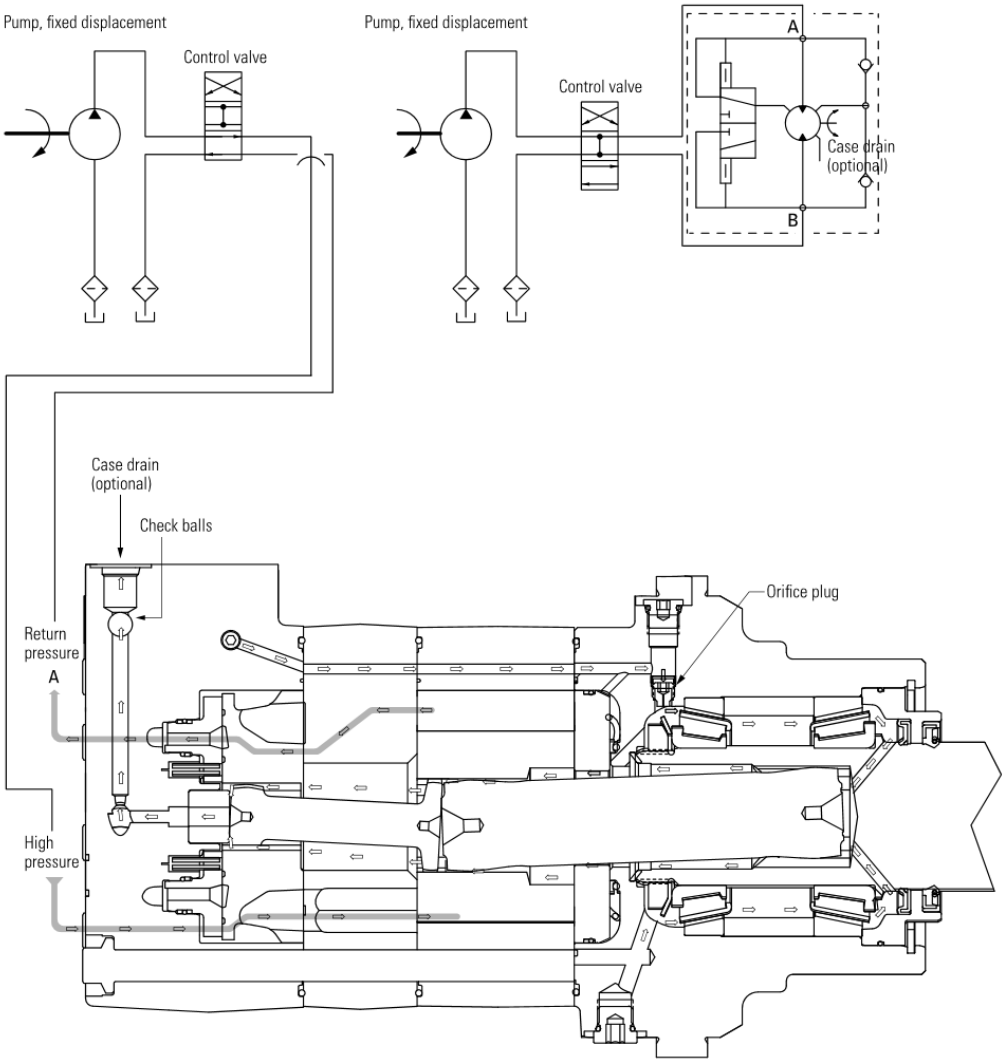
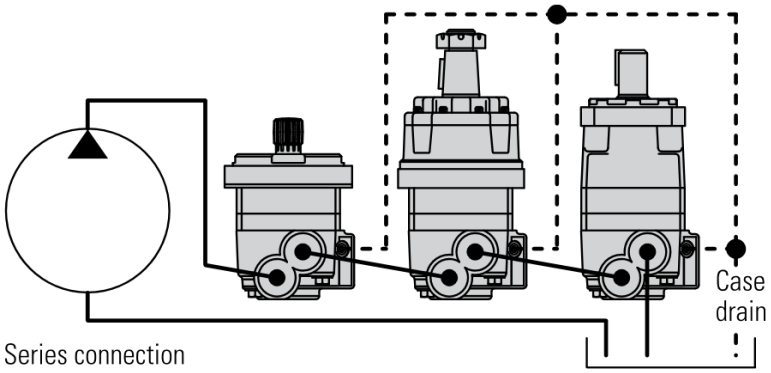


Figure 43 Open loop circuit

***Note**: Conversion Kit Number 9901135-000 can be used to convert a -003 design code closed loop motor into a -003 open loop motor. See HP30 parts and repair manual for more information.*

HP30 motor is series circuit capable.



Note:

Open loop circuits must have a check valve with orifice plug configuration. See model code position 15, 16 "Case flow option."

Use of a case drain is optional in an open loop circuit if motor case pressure does not exceed 300 psi.

Two-speed circuit

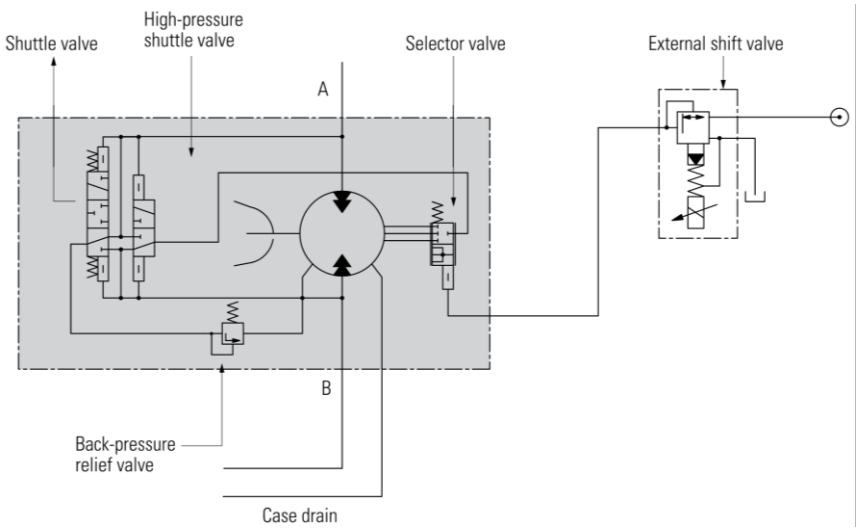


Figure 44 Two-speed circuit

Two-speed brake motor circuit

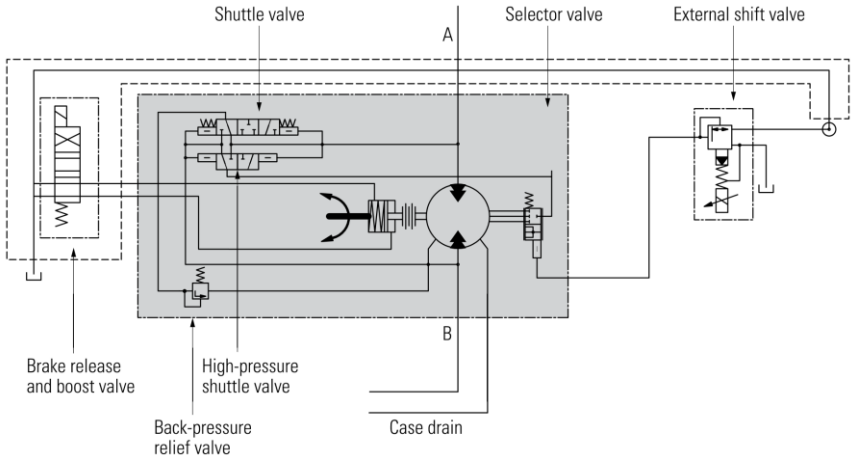


Figure 45 Two speed brake motor circuit

Chapter 4
Brake motor

Topics:

- *Description*
- *Dimensions*
- *Brake shaft side load capacity*

Description

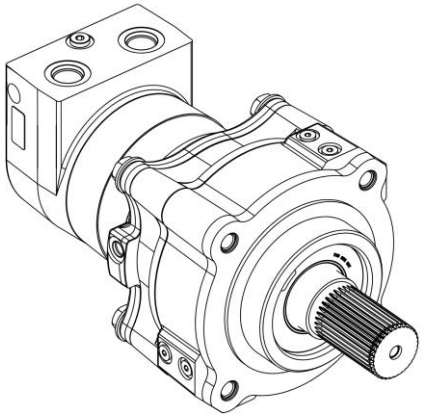


Figure 46 Brake motor

Features

- Spring-applied/hydraulically released multi-disc brake
- Spring automatically applies brake when hydrostatic pressure is absent
- Environmentally protected
- Integral design – motor and brake as a single package to minimize length and cost
- Infinite braking – eliminates machine creep associated with park pawl mechanisms
- Boost feature – increases holding capacity to match full motor output torque
- No adjustments needed
- Two sets of release and boost ports – allows for multiple plumbing options and facilitates bleeding
- Seal option: "with outer grease seal" & "without outer grease seal" both configurations are available in brake motors

Applications

- Skid steer loaders
- Trenchers
- Road rollers
- Anywhere load-holding is needed on a low-speed high-torque drive system

Specifications

- **Static holding**
  780 N-m [6900 lb-in] minimum torque (spring only - no boost) 2621 N-mm [23200 lb-in] minimum (@ 10.3 bar [150 psi boost] 3570 N-m [31600 lb-in] minimum (@ 15.2 bar [220 psi] boost)
- **Release pressure**
  10.3 bar [150 psi] minimum for full release 68.9 bar [1000 psi] maximum allowed at release port
- **Case pressure**
  1.4 bar [20 psi] continuous
  3.5 bar [50 psi] maximum
- **Boost pressure**
  15.2 bar [220 psi] continuous
  34.5 bar [500 psi] maximum
- **Speed**
  360 rpm maximum
- **Emergency**
  After 3 consecutive stops, brake to still meet parking requirement

Dimensions

Brake motor single speed

Main ports

1-1/16-12 UN-2B SAE O-ring ports (2) 9/16-18 UNF-2B SAE O-ring case drain port (1)	or	G1 (BSP) O-ring ports (2) G1/4 (BSP) O-ring case drain port (1)

Standard rotation viewed from shaft end

Port A pressurized – CW (clockwise)

Port B pressurized – CCW (counter- clockwise)

Closed loop

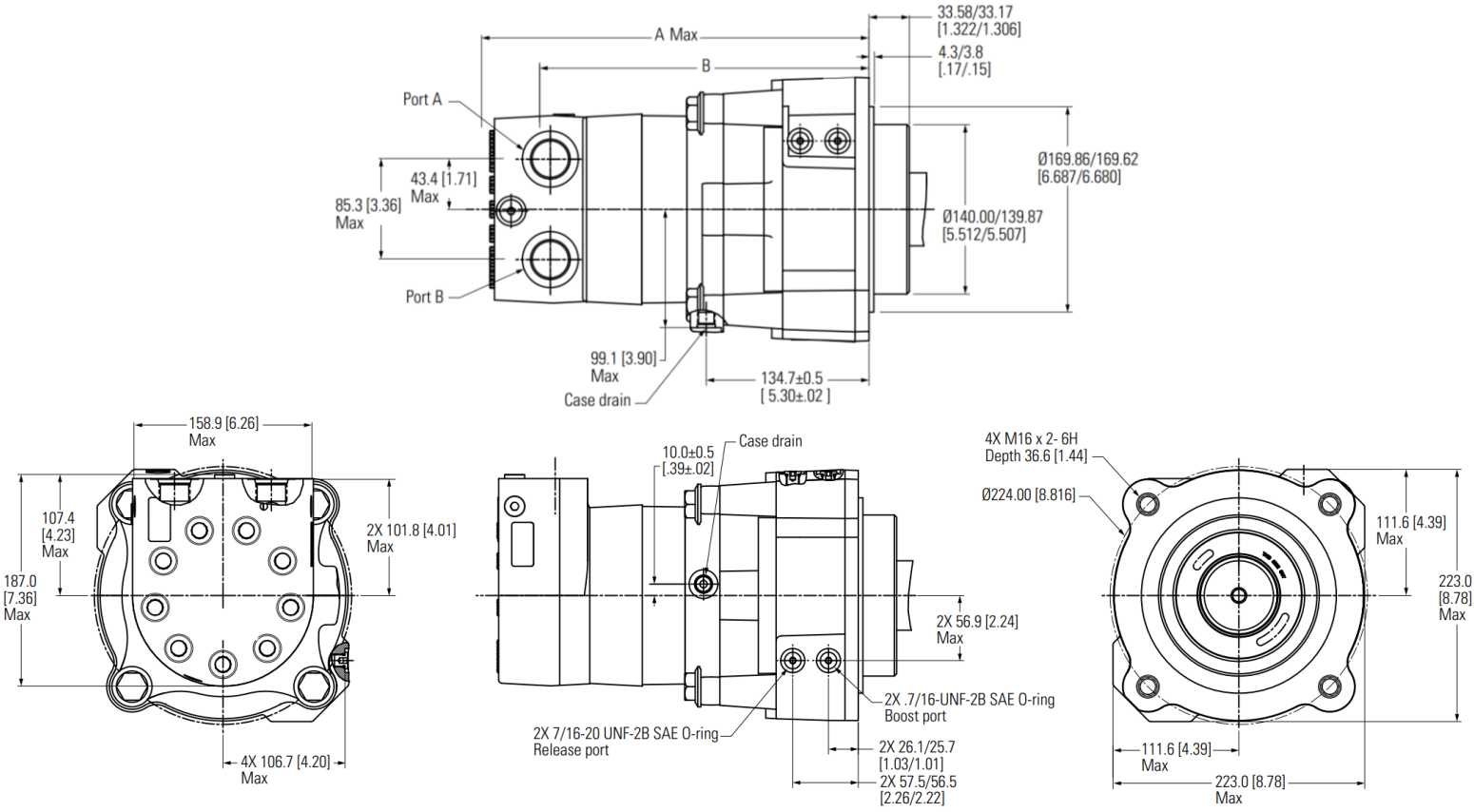


Figure 47 Brake motor single speed closed loop

Brake Motor dimensions – Single speed

Displacement *cm^3/r [in^3/r]*	**A Max** *mm [in]*	**B** *mm [in]*
344 *[21.0]*	311.0 *[12.25]*	259.0 *[10.20]*
400 *[24.4]*	316.3 *[12.45]*	264.3 *[10.40]*
434 *[26.5]*	319.6 *[12.58]*	267.5 *[10.53]*
480 *[29.3]*	323.7 *[12.74]*	271.6 *[10.69]*
677 *[41.3]*	342.2 *[13.47]*	290.1 *[11.42]*

Table 9 Brake motor dimension – single speed

Brake motor two speed

Main ports

1-1/16-12 UN-2B SAE O-ring ports (2) 9/16-18 UNF-2B SAE O-ring case drain port (1)	or	G1 (BSP) O-ring ports (2) G1/4 (BSP) O-ring case drain port (1)

Standard rotation viewed from shaft end

Port A pressurized – CW (clockwise)

Port B pressurized – CCW (counter- clockwise)

Closed loop

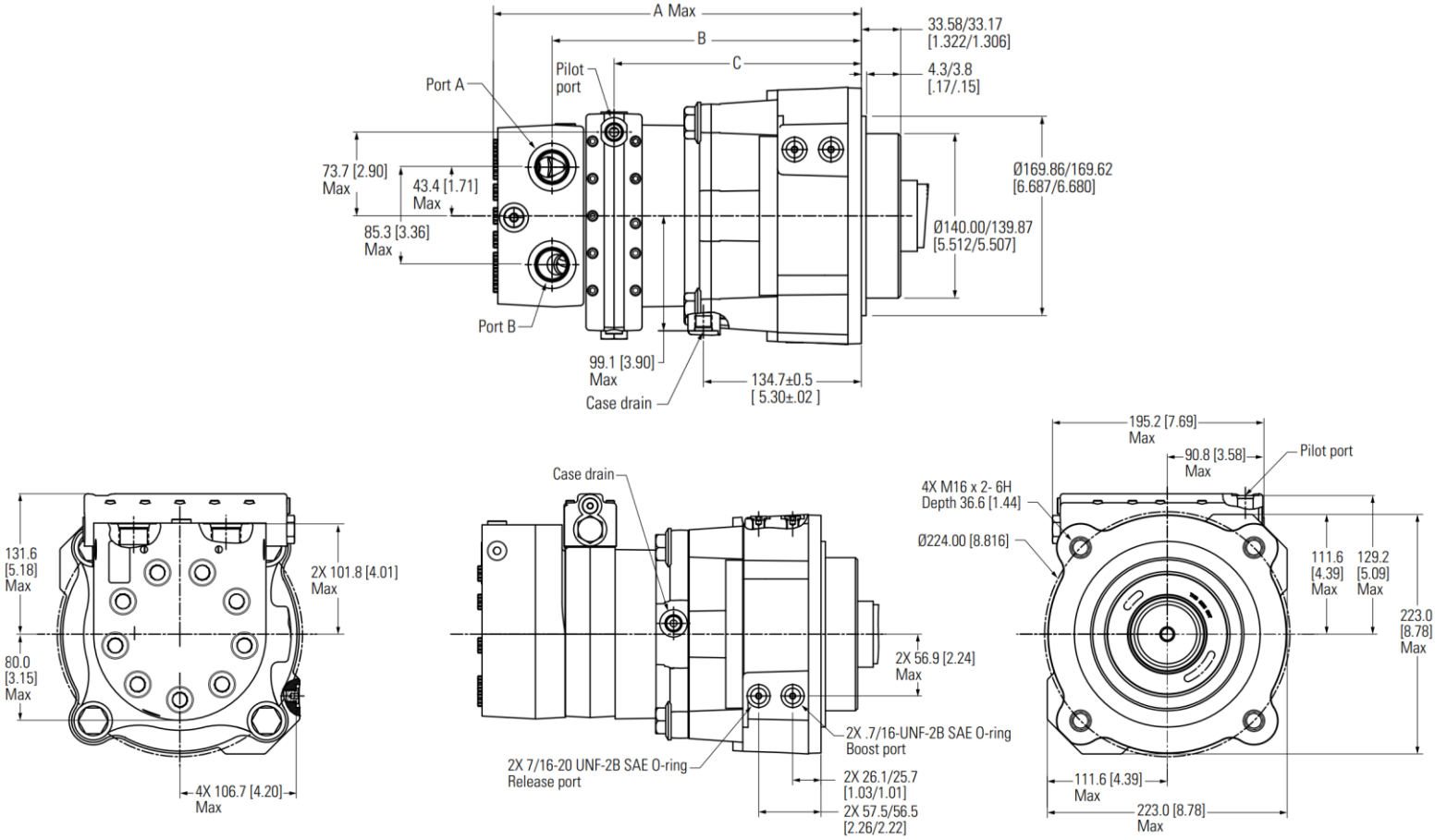


Figure 48 Brake motor two speed closed loop

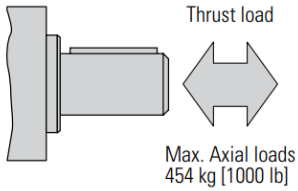
Brake Motor dimensions – Two speed

Displacement *cm^3/r [in^3/r]*	A Max *mm [in]*	B *mm [in]*	C *mm [in]*
344 *[21.0]*	311.0 *[12.25]*	259.0 *[10.20]*	205.6 *[8.10]*
400 *[24.4]*	316.3 *[12.45]*	264.3 *[10.40]*	210.9 *[8.30]*
434 *[26.5]*	319.6 *[12.58]*	267.5 *[10.53]*	214.2 *[8.43]*
480 *[29.3]*	323.7 *[12.74]*	271.6 *[10.69]*	218.3 *[8.59]*
677 *[41.3]*	342.2 *[13.47]*	290.1 *[11.42]*	236.8 *[9.32]*

Table 10 Two speed motor dimension – brake motor

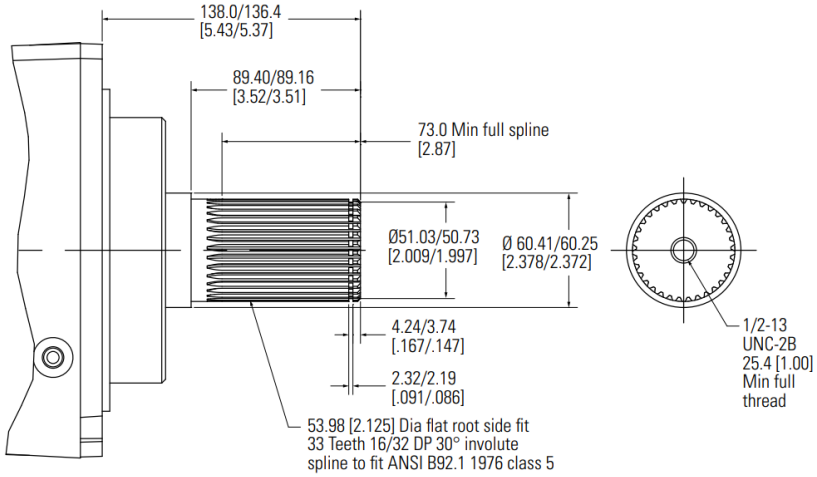
Brake shaft side load capacity

These curves indicate the radial load capacity on the motor shaft at various locations with an allowable external thrust load of 454 kg [1,000 lb].



Note:

Case pressure will increase the allowable inward thrust load and decrease the allowable outward thrust load. Case pressure will push outward on the shaft at 100 kg/3.5 bar [222 lb/50 psi].



Each curve is based on B 10 bearing life [2000 hours or 12,000,000 shaft revolutions at 100 rpm] at rated output torque. To determine radial load at speeds other than 100 rpm, multiply the load values given on the bearing curve by the factors in the chart below.

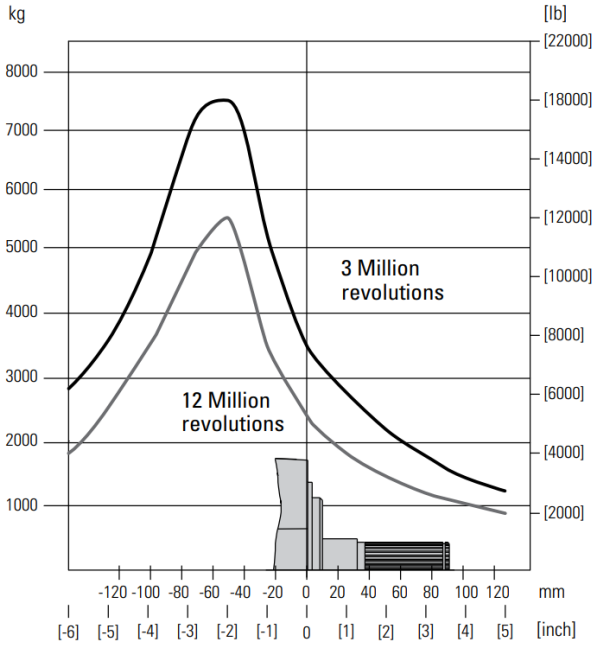


Figure 49 HP 30 Brake curve

rpm	Multiplication factor
50	1.23
100	1.00
200	0.81
300	0.72
360	0.69

For 3,000,000 shaft revolutions or 500 hours – Increase these shaft loads 52%.

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