

white drive products

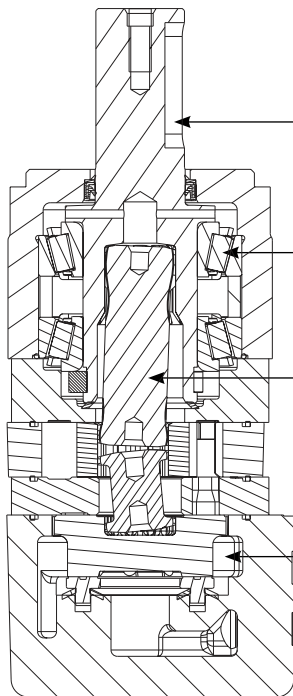


WS

350 SERIES HYDRAULIC MOTORS



The WS product family features flow rates up to 76 LPM [20 GPM], torque up to 824 Nm [7,295 lb-in], and pressures up to 207 bar [3000 PSI] at continuous ratings. The WS targets agricultural equipment, skid steer attachments, and other applications that require greater torque under demanding conditions. A distinguishing feature of the WS in relation to competitive products is its heavy duty drive link with a larger pitch diameter. This enables the WS to better withstand pressure and torque spikes and is reflected in its intermittent and peak performance ratings. Additional product features include a three zone commutator valve, heavy-duty tapered roller bearings, and case drain with integral internal drain*. The WS offers displacements from 80cc [4.8in³] to 496cc [30.3in³]. Nine (9) shaft and seven (7) mounting options are available to meet the most common SAE and European requirements.



KEY FEATURES

- **Nine shaft and seven mounting options** to meet the most common SAE and European requirements.
- **Heavy-duty tapered roller bearings** for extra side load capacity.
- **Heavy-duty drive link with larger pitch diameter** than competitors for greater resistance to pressure and torque spikes.
- **Three zone commutator valve** for high flow capacity.
- **Standard case drain with integral internal drain*** for extended shaft seal life.

*See page 17 for allowable back pressure when utilizing the internal drain.

SPECIFICATIONS

Intermittent Ratings - 10% of Operation Peak Ratings - 1% of Operation

CODE	Displacement cc [in ³ /rev]	Max. Speed rpm		Max. Flow lpm [gpm]		Max. Torque Nm [lb-in]		Max. Pressure bar [psi]		
		cont.	inter.	cont.	inter.	cont.	inter.	cont.	inter.	peak
080	79 [4.78]	870	1060	61 [16]	68 [18]	207 [1832]	286 [2528]	207 [3000]	276 [4000]	276 [4000]
100	100 [6.10]	745	880	76 [20]	95 [25]	280 [2475]	416 [3680]	207 [3000]	310 [4500]	310 [4500]
110	112 [6.85]	675	840	76 [20]	95 [25]	307 [2715]	468 [4145]	207 [3000]	310 [4500]	310 [4500]
130	129 [7.86]	580	730	76 [20]	95 [25]	370 [3275]	550 [4865]	207 [3000]	310 [4500]	310 [4500]
160	162 [9.90]	465	700	76 [20]	114 [30]	462 [4090]	618 [5465]	207 [3000]	276 [4000]	310 [4500]
200	202 [12.31]	375	560	76 [20]	114 [30]	576 [5100]	768 [6795]	207 [3000]	276 [4000]	310 [4500]
230	228 [13.92]	325	490	76 [20]	114 [30]	642 [5685]	806 [7135]	207 [3000]	276 [4000]	310 [4500]
320	325 [19.81]	235	350	76 [20]	114 [30]	789 [6980]	1029 [9105]	190 [2750]	224 [3250]	259 [3750]
400	399 [24.36]	190	280	76 [20]	114 [30]	816 [7225]	1034 [9150]	155 [2250]	190 [2750]	224 [3250]
500	496 [30.29]	155	230	76 [20]	114 [30]	824 [7295]	1041 [9210]	121 [1750]	155 [2250]	172 [2500]



PERFORMANCE

080	Pressure - bars [psi]						Max. Cont.	Max. Inter.
	17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500] 276 [4000]

79 cc [4.8 in³/rev.] **Intermittent Ratings are below and to the right of the BOLD line.** Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	2 [0.5]									Theoretical rpm		
	4 [1]	7 [61] 47	23 [201] 47								25	
	8 [2]	9 [79] 97	28 [244] 95	64 [568] 90	100 [887] 85	135 [1192] 78					49	
	15 [4]	9 [79] 194	27 [242] 192	64 [567] 186	101 [896] 178	137 [1216] 167	174 [1536] 157	207 [1832] 142			97	
	23 [6]	7 [58] 291	25 [224] 289	62 [550] 282	99 [875] 271	136 [1202] 258	172 [1519] 242	207 [1830] 222	242 [2141] 198		194	
	30 [8]	3 [29] 388	22 [196] 388	59 [524] 380	95 [841] 367	131 [1162] 349	167 [1479] 328	203 [1795] 305	240 [2123] 279		281 [2484] 221	291
	38 [10]		19 [171] 484	56 [495] 477	92 [814] 464	128 [1129] 444	164 [1447] 420	200 [1766] 393	236 [2092] 361		279 [2470] 306	388
	45 [12]		14 [127] 581	53 [465] 575	88 [781] 562	125 [1102] 540	159 [1411] 513	195 [1730] 481	233 [2062] 441		278 [2456] 381	484
	53 [14]		9 [80] 678	48 [422] 674	79 [704] 658	119 [1055] 635	155 [1373] 606	191 [1689] 571	229 [2028] 527			581
	61 [16]		2 [14] 775	38 [336] 771	75 [662] 757	111 [985] 736	151 [1337] 704	182 [1611] 664	238 [2109] 608		282 [2499] 540	678
	68 [18]			34 [298] 871	68 [602] 858	101 [896] 833	141 [1244] 806	188 [1661] 750	238 [2104] 680		283 [2507] 605	775

Torque - Nm [lb-in], Speed rpm **Overall Efficiency** - 70 - 100% 40 - 69% 0 - 39%

22 [194]	44 [388]	88 [777]	132 [1165]	176 [1553]	219 [1942]	263 [2330]	307 [2718]	351 [3107]
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Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

100	Pressure - bars [psi]						Max. Cont.	Max. Inter.
	17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500] 276 [4000] 310 [4500]

100 cc [6.10 in³/rev.] **Intermittent Ratings are below and to the right of the BOLD line.** Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	2 [0.5]	14 [120] 11	35 [313] 8	77 [681] 6	116 [1025] 4					Theoretical rpm			
	4 [1]	15 [129] 37	38 [337] 35	80 [710] 10	122 [1079] 7	162 [1436] 5					19		
	8 [2]	16 [138] 75	40 [354] 74	88 [781] 71	136 [1205] 68	181 [1602] 58	227 [2007] 44	267 [2364] 43	315 [2791] 42		352 [3119] 41	383 [3386] 33	38
	15 [4]	16 [138] 151	40 [354] 149	89 [790] 146	138 [1222] 143	187 [1654] 137	235 [2079] 129	282 [2495] 119	324 [2871] 110		370 [3277] 101	411 [3636] 87	76
	23 [6]	14 [127] 226	39 [344] 225	88 [779] 221	137 [1214] 217	186 [1647] 210	234 [2071] 200	282 [2494] 188	324 [2869] 174		371 [3279] 162	415 [3676] 147	152
	30 [8]	12 [109] 302	37 [326] 300	86 [765] 297	136 [1200] 292	184 [1625] 284	232 [2049] 273	280 [2474] 258	323 [2859] 240		369 [3268] 224	416 [3682] 206	228
	38 [10]	10 [88] 378	34 [305] 376	83 [738] 372	133 [1174] 366	181 [1601] 357	229 [2026] 343	276 [2446] 326	318 [2810] 300		366 [3235] 281	415 [3672] 261	303
	45 [12]	7 [65] 453	32 [282] 451	81 [713] 447	129 [1145] 441	178 [1574] 430	226 [2002] 415	274 [2423] 396	316 [2793] 367		364 [3220] 345	413 [3653] 324	379
	53 [14]	4 [39] 528	29 [254] 527	77 [686] 522	126 [1116] 515	175 [1546] 504	222 [1968] 486	266 [2351] 455	315 [2791] 433		362 [3203] 407	411 [3637] 384	455
	61 [16]	2 [15] 604	25 [221] 602	74 [652] 597	122 [1084] 590	171 [1513] 578	219 [1941] 559	264 [2340] 527	312 [2760] 502		360 [3182] 475	409 [3616] 447	531
	68 [18]		21 [186] 678	69 [614] 672	118 [1047] 664	167 [1481] 651	216 [1910] 632	260 [2300] 596	309 [2735] 570		356 [3152] 541	407 [3601] 513	606
	76 [20]		16 [144] 754	65 [573] 747	114 [1009] 739	163 [1441] 725	211 [1872] 704	257 [2278] 677	307 [2712] 652		353 [3121] 624	403 [3568] 668	682
	83 [22]					156 [1379] 801	205 [1814] 782	253 [2239] 758	300 [2653] 730		347 [3075] 698	398 [3526] 668	758
	91 [24]						199 [1762] 850	246 [2179] 826	294 [2604] 799		343 [3037] 768	395 [3495] 733	834
	95 [25]						196 [1737] 883	246 [2176] 863	294 [2605] 835		342 [3028] 800	392 [3472] 770	909

Torque - Nm [lb-in], Speed rpm **Overall Efficiency** - 70 - 100% 40 - 69% 0 - 39%

27 [243]	55 [485]	110 [971]	165 [1456]	219 [1942]	274 [2427]	329 [2913]	384 [3398]	439 [3883]	494 [4369]
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Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]



110

Pressure - bars [psi]	17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500]	276 [4000]	310 [4500]
Max. Cont.										
Max. Inter.										

112 cc [6.85 in³/rev.] Intermittent Ratings are below and to the right of the BOLD line. Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	2 [0.5]	12 [106] 9	38 [334] 8	86 [757] 6	132 [1166] 4							17
	4 [1]	12 [110] 17	38 [334] 10	89 [788] 8	137 [1213] 6	184 [1624] 5						34
Max. Cont.	8 [2]	15 [129] 67	42 [373] 67	98 [863] 65	152 [1341] 62	206 [1823] 58	255 [2257] 45	297 [2629] 40	341 [3015] 36	377 [3334] 22	396 [3502] 9	68
	15 [4]	15 [134] 135	43 [378] 135	97 [863] 133	152 [1350] 130	208 [1838] 125	261 [2314] 118	314 [2776] 107	357 [3158] 88	402 [3558] 71	438 [3879] 49	135
	23 [6]	15 [128] 203	42 [373] 203	97 [856] 200	151 [1337] 196	206 [1826] 190	260 [2302] 182	313 [2770] 170	359 [3179] 143	411 [3633] 124	458 [4054] 103	203
	30 [8]	12 [108] 269	40 [351] 267	94 [833] 265	148 [1313] 262	203 [1798] 258	258 [2281] 248	311 [2753] 234	359 [3177] 201	413 [3656] 178	466 [4122] 155	270
	38 [10]	9 [80] 337	36 [322] 335	91 [803] 333	145 [1280] 331	199 [1761] 325	253 [2236] 313	307 [2715] 296	358 [3165] 255	413 [3652] 232	468 [4144] 206	338
	45 [12]	8 [69] 404	33 [293] 403	87 [770] 401	141 [1247] 399	194 [1716] 391	249 [2205] 378	303 [2684] 360	353 [3124] 313	408 [3613] 289	467 [4133] 259	405
	53 [14]	4 [38] 473	29 [254] 471	82 [728] 470	136 [1202] 465	189 [1676] 457	243 [2152] 442	294 [2605] 403	351 [3108] 376	407 [3601] 347	464 [4109] 316	473
	61 [16]		24 [210] 540	78 [687] 538	131 [1162] 532	185 [1635] 523	239 [2114] 508	290 [2564] 467	346 [3058] 438	402 [3553] 406	462 [4092] 372	540
	68 [18]		18 [163] 608	72 [639] 605	126 [1116] 599	180 [1594] 589	234 [2068] 573	286 [2534] 530	341 [3016] 502	397 [3515] 467	458 [4051] 432	608
	76 [20]		13 [117] 675	68 [598] 673	121 [1068] 667	174 [1541] 656	228 [2017] 639	282 [2494] 594	336 [2977] 565	393 [3481] 528	454 [4017] 492	675
	83 [22]			67 [596] 742	115 [1015] 735	169 [1500] 722	221 [1960] 699	276 [2445] 672	332 [2942] 637	388 [3436] 598	447 [3953] 557	742
	91 [24]			62 [549] 808	109 [967] 801	164 [1452] 787	218 [1926] 767	272 [2403] 702	326 [2885] 702	383 [3385] 659	441 [3906] 620	810
	95 [25]			60 [528] 841	105 [939] 834	161 [1425] 818	215 [1901] 800	270 [2389] 771	323 [2861] 736	380 [3361] 693	439 [3886] 648	844

Torque - Nm [lb-in], Speed rpm Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

31 [273]	62 [545]	123 [1090]	185 [1635]	246 [2180]	308 [2726]	370 [3271]	431 [3816]	493 [4361]	554 [4906]
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Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

130

Pressure - bars [psi]	17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500]	276 [4000]	310 [4500]
Max. Cont.										
Max. Inter.										

129 cc [7.86 in³/rev.] Intermittent Ratings are below and to the right of the BOLD line. Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	2 [0.5]	13 [114] 8	41 [367] 6	94 [830] 3								15
	4 [1]	16 [144] 17	45 [400] 9	101 [890] 6	151 [1334] 4	201 [1780] 3	256 [2264] 3	306 [2706] 2				30
Max. Cont.	8 [2]	19 [172] 58	52 [456] 57	115 [1022] 55	180 [1592] 52	235 [2081] 50	294 [2600] 38	348 [3084] 35	402 [3560] 31	448 [3962] 22	477 [4219] 9	59
	15 [4]	21 [182] 117	53 [469] 116	117 [1037] 114	182 [1609] 111	246 [2175] 107	309 [2735] 101	369 [3265] 92	424 [3749] 80	480 [4249] 68	528 [4671] 53	118
	23 [6]	20 [174] 175	52 [460] 174	116 [1026] 172	180 [1591] 169	244 [2163] 165	308 [2730] 158	371 [3285] 148	427 [3783] 132	489 [4330] 117	547 [4837] 99	177
	30 [8]	17 [150] 234	49 [436] 233	113 [1004] 230	178 [1571] 227	242 [2143] 223	307 [2714] 215	370 [3276] 202	426 [3767] 186	488 [4322] 168	550 [4866] 147	236
	38 [10]	14 [120] 293	46 [403] 291	110 [974] 289	174 [1537] 285	238 [2109] 280	303 [2677] 272	367 [3246] 260	423 [3741] 240	486 [4305] 220	549 [4860] 197	294
	45 [12]	10 [86] 351	42 [367] 350	106 [935] 347	169 [1499] 343	234 [2069] 337	298 [2633] 329	362 [3204] 315	417 [3688] 289	482 [4264] 266	547 [4837] 243	353
	53 [14]	6 [53] 410	37 [329] 408	101 [891] 405	165 [1458] 401	229 [2027] 395	294 [2600] 385	349 [3092] 361	414 [3661] 341	478 [4230] 317	544 [4818] 289	412
	61 [16]		33 [289] 467	96 [853] 464	160 [1415] 460	224 [1979] 453	287 [2543] 442	344 [3048] 415	409 [3620] 392	474 [4195] 367	539 [4773] 338	471
	68 [18]			91 [803] 522	155 [1369] 518	219 [1934] 499	282 [2498] 471	340 [3007] 448	404 [3571] 448	469 [4147] 421	536 [4744] 389	530
	76 [20]			85 [753] 580	148 [1314] 575	212 [1879] 568	277 [2447] 556	335 [2960] 526	399 [3528] 503	464 [4108] 474	533 [4714] 441	588
	83 [22]			77 [681] 641	140 [1242] 637	204 [1805] 627	267 [2362] 613	332 [2938] 592	397 [3510] 567	461 [4076] 536	526 [4651] 504	647
	91 [24]			71 [625] 701	134 [1185] 696	198 [1751] 686	261 [2307] 672	325 [2872] 651	389 [3442] 625	453 [4011] 594	520 [4599] 563	706
	95 [25]			68 [601] 730	131 [1158] 726	195 [1722] 717	258 [2285] 703	322 [2849] 683	384 [3399] 657	450 [3986] 625	519 [4594] 589	735

Torque - Nm [lb-in], Speed rpm Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

35 [313]	71 [625]	141 [1251]	212 [1876]	283 [2502]	353 [3127]	424 [3753]	495 [4378]	565 [5004]	636 [5629]
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Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]



PERFORMANCE

160	Pressure - bars [psi]									Max. Cont.			Max. Inter.		
	17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500]	259 [3750]	276 [4000]					

162 cc [9.90 in³/rev.] **Intermittent Ratings are below and to the right of the BOLD line.** Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	2 [0.5]	20 [173] 11	55 [485] 10	125 [1102] 8	190 [1679] 6	255 [2258] 5										
	4 [1]	22 [199] 23	59 [523] 22	135 [1194] 20	207 [1831] 18	274 [2425] 15	338 [2989] 13	397 [3511] 9								
Max. Cont.	8 [2]	32 [283] 47	63 [554] 45	144 [1273] 43	223 [1974] 41	298 [2635] 37	368 [3255] 34	433 [3830] 29	480 [4251] 21	504 [4459] 16	527 [4664] 10					
	15 [4]	31 [278] 94	69 [609] 94	145 [1287] 91	228 [2014] 88	308 [2728] 84	388 [3416] 79	460 [4071] 71	526 [4654] 59	557 [4931] 53	583 [5163] 45					
	23 [6]	29 [257] 140	69 [615] 138	143 [1265] 136	225 [1990] 135	306 [2711] 130	386 [3412] 124	464 [4108] 116	535 [4737] 100	573 [5074] 93	607 [5370] 83					
	30 [8]	26 [226] 186	66 [583] 185	138 [1225] 184	221 [1958] 182	303 [2678] 177	383 [3387] 170	462 [4088] 160	538 [4761] 144	578 [5116] 135	617 [5463] 125					
	38 [10]	21 [188] 234	62 [547] 233	133 [1180] 232	216 [1914] 230	298 [2633] 224	379 [3353] 217	458 [4055] 206	534 [4730] 189	575 [5085] 180	616 [5451] 168					
	45 [12]	16 [145] 280	57 [509] 278	135 [1192] 276	210 [1861] 274	292 [2581] 270	372 [3289] 261	452 [4000] 250	530 [4688] 234	570 [5046] 224	613 [5423] 212					
	53 [14]	11 [97] 327	51 [455] 326	133 [1178] 325	205 [1817] 323	286 [2530] 316	365 [3231] 307	441 [3905] 293	523 [4627] 274	563 [4986] 264	606 [5363] 251					
	61 [16]	5 [44] 374	45 [402] 372	125 [1110] 371	199 [1761] 370	280 [2474] 363	359 [3173] 353	436 [3857] 338	517 [4572] 319	557 [4934] 308	599 [5301] 295					
	68 [18]		37 [331] 420	118 [1048] 419	192 [1697] 417	272 [2408] 410	351 [3104] 400	427 [3779] 383	508 [4498] 363	548 [4853] 353	592 [5240] 339					
	76 [20]		30 [265] 467	111 [980] 466	183 [1616] 465	264 [2337] 457	343 [3036] 446	419 [3712] 428	500 [4424] 408	540 [4777] 396	584 [5167] 382					
	83 [22]		22 [193] 514	103 [913] 512	176 [1557] 510	256 [2264] 503	335 [2965] 491	413 [3658] 476	492 [4358] 454	533 [4721] 441	575 [5093] 427					
	91 [24]				175 [1553] 558	246 [2180] 550	327 [2890] 522	405 [3587] 500	484 [4286] 484	524 [4639] 484	568 [5027] 473					
	95 [25]				163 [1443] 581	241 [2134] 573	321 [2843] 561	400 [3543] 545	481 [4253] 522	521 [4611] 511	561 [4968] 496					
	Max. Inter.	114 [30]			138 [1222] 699	217 [1917] 691	296 [2618] 679	376 [3324] 661	456 [4034] 645	495 [4383] 625	534 [4729] 609					

12	Theoretical rpm
24	
47	
94	
140	
187	
234	
280	
327	
374	
420	
467	
514	
560	
584	
700	

Torque - Nm [lb-in], Speed rpm Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

45 [394]	89 [788]	178 [1576]	267 [2363]	356 [3151]	445 [3939]	534 [4727]	623 [5515]	668 [5909]	712 [6303]
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Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

200	Pressure - bars [psi]									Max. Cont.			Max. Inter.		
	17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	190 [2750]	207 [3000]	242 [3500]	276 [4000]					

202 cc [12.31 in³/rev.] **Intermittent Ratings are below and to the right of the BOLD line.** Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	2 [0.5]	28 [249] 8	72 [638] 7	157 [1388] 5												
	4 [1]	33 [291] 18	81 [713] 17	170 [1508] 14	254 [2250] 12	335 [2961] 9	411 [3636] 5	454 [4019] 4	508 [4498] 6							
Max. Cont.	8 [2]	39 [343] 37	85 [757] 36	185 [1637] 34	280 [2474] 31	365 [3232] 27	446 [3948] 23	483 [4279] 20	521 [4609] 17	568 [5024] 3						
	15 [4]	40 [354] 75	87 [773] 74	187 [1654] 72	289 [2554] 69	388 [3430] 65	481 [4254] 59	523 [4627] 56	564 [4995] 51	627 [5548] 38	696 [6156] 25					
	23 [6]	38 [334] 112	89 [789] 111	184 [1624] 110	285 [2524] 106	387 [3425] 102	486 [4299] 95	533 [4721] 90	579 [5128] 84	654 [5790] 67	732 [6478] 54					
	30 [8]	34 [298] 150	85 [752] 149	180 [1593] 148	281 [2488] 144	384 [3394] 138	484 [4285] 131	534 [4722] 126	582 [5149] 120	670 [5931] 99	755 [6685] 85					
	38 [10]	29 [255] 188	80 [709] 187	174 [1544] 186	276 [2446] 182	378 [3345] 176	479 [4240] 167	529 [4683] 161	576 [5098] 150	674 [5965] 134	768 [6793] 116					
	45 [12]	22 [197] 226	74 [651] 225	168 [1491] 224	270 [2385] 220	371 [3284] 213	473 [4190] 204	520 [4600] 194	572 [5064] 185	670 [5930] 169	767 [6789] 150					
	53 [14]	16 [139] 263	67 [593] 262	163 [1439] 261	263 [2324] 257	363 [3216] 251	465 [4111] 241	513 [4537] 229	563 [4980] 222	664 [5880] 205	764 [6765] 186					
	61 [16]	8 [70] 301	60 [530] 300	159 [1409] 299	255 [2260] 296	355 [3145] 289	454 [4022] 273	506 [4477] 266	557 [4929] 257	656 [5809] 238	756 [6688] 219					
	68 [18]		50 [446] 338	153 [1358] 336	246 [2181] 334	347 [3067] 327	447 [3955] 310	493 [4363] 302	547 [4838] 294	648 [5731] 274	747 [6612] 253					
	76 [20]		41 [363] 376	144 [1277] 374	237 [2100] 372	336 [2977] 365	437 [3868] 348	487 [4305] 340	537 [4754] 331	637 [5639] 311	740 [6546] 288					
	83 [22]		31 [276] 413	134 [1186] 411	227 [2007] 410	326 [2888] 403	427 [3783] 385	478 [4230] 377	528 [4665] 368	628 [5555] 347	730 [6463] 324					
	91 [24]				216 [1908] 449	315 [2790] 441	417 [3693] 423	467 [4137] 414	518 [4581] 405	618 [5466] 383	723 [6395] 360					
	95 [25]				210 [1856] 468	309 [2737] 461	413 [3656] 440	464 [4107] 432	513 [4543] 422	614 [5436] 401	718 [6353] 378					
	Max. Inter.	114 [30]			181 [1598] 561	281 [2486] 552	382 [3380] 539	433 [3831] 530	482 [4267] 521	580 [5136] 495	689 [6100] 467					

10	Theoretical rpm
19	
38	
76	
113	
151	
188	
226	
263	
301	
338	
376	
413	
451	
470	
563	

Torque - Nm [lb-in], Speed rpm Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

55 [490]	111 [980]	221 [1959]	332 [2939]	443 [3918]	553 [4898]	609 [5388]	664 [5878]	775 [6857]	886 [7837]
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Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]



230	Pressure - bars [psi]							Max. Cont.	Max. Inter.
	17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	190 [2750]	207 [3000]	242 [3500]

228 cc [13.92 in³/rev.] Intermittent Ratings are below and to the right of the BOLD line. Intermittent Ratings - 10% of Operation

2 [0.5]
4 [1]
8 [2]
15 [4]
23 [6]
30 [8]
38 [10]
45 [12]
53 [14]
61 [16]
68 [18]
76 [20]
83 [22]
91 [24]
95 [25]
114 [30]

40 [353] 7	90 [798] 7	189 [1673] 6								
49 [435] 16	97 [856] 15	199 [1764] 14	293 [2592] 12	391 [3457] 10	483 [4272] 7	530 [4692] 5	576 [5094] 4			
43 [378] 32	100 [889] 31	212 [1878] 30	316 [2798] 28	414 [3664] 25	507 [4491] 21	552 [4881] 19	596 [5271] 16			
49 [433] 65	100 [884] 65	217 [1918] 63	333 [2943] 61	442 [3909] 57	542 [4801] 51	589 [5215] 48	642 [5685] 43	724 [6407] 33	806 [7135] 21	
45 [402] 98	97 [861] 98	214 [1897] 97	331 [2929] 93	446 [3950] 89	556 [4925] 81	609 [5393] 76	651 [5762] 68	747 [6610] 56	833 [7371] 43	
41 [360] 131	98 [871] 130	209 [1852] 130	327 [2896] 126	444 [3928] 121	557 [4933] 113	607 [5370] 102	662 [5863] 96	766 [6781] 82	858 [7595] 67	
34 [302] 164	94 [829] 163	204 [1804] 162	321 [2841] 159	439 [3881] 154	550 [4868] 139	608 [5380] 133	665 [5882] 126	775 [6857] 110	875 [7743] 92	
27 [235] 197	86 [763] 196	196 [1734] 195	313 [2772] 192	431 [3815] 186	545 [4819] 171	603 [5334] 164	660 [5837] 157	772 [6829] 140	882 [7803] 119	
19 [167] 229	78 [690] 229	188 [1660] 228	305 [2698] 225	422 [3734] 219	538 [4757] 204	595 [5269] 197	653 [5778] 189	766 [6781] 170	878 [7772] 146	
11 [100] 262	69 [612] 261	178 [1576] 262	295 [2614] 258	413 [3657] 252	528 [4677] 235	586 [5188] 227	644 [5697] 219	700 [6198] 210	815 [7214] 190	
	60 [527] 294	168 [1487] 295	286 [2514] 292	402 [3559] 280	519 [4592] 268	577 [5106] 260	634 [5611] 251	748 [6617] 229	862 [7632] 204	
	49 [430] 327	155 [1375] 328	272 [2408] 325	391 [3457] 314	506 [4482] 302	565 [5001] 294	623 [5514] 285	739 [6537] 262	850 [7525] 235	
	40 [352] 360	149 [1319] 360	262 [2321] 357	379 [3357] 350	495 [4382] 338	553 [4894] 330	611 [5409] 320	724 [6409] 298	839 [7423] 270	
	30 [268] 392	138 [1220] 392	251 [2217] 389	368 [3253] 382	482 [4268] 369	540 [4781] 361	598 [5295] 351	713 [6309] 328	829 [7333] 301	
		131 [1161] 408	245 [2167] 405	362 [3202] 397	478 [4227] 384	537 [4755] 376	592 [5237] 365	708 [6263] 343	823 [7283] 316	
		92 [816] 492	208 [1837] 487	325 [2876] 480	442 [3908] 467	499 [4419] 458	557 [4928] 448	617 [5942] 423	790 [6991] 394	

9
17
34
67
100
133
166
200
233
266
299
332
366
399
415
498

Torque - Nm [lb-in], Speed rpm Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

63 [554]	125 [1108]	250 [2215]	376 [3323]	501 [4431]	626 [5539]	688 [6092]	751 [6646]	876 [7754]	1001 [8862]
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Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

320	Pressure - bars [psi]							Max. Cont.	Max. Inter.
	17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	155 [2250]	172 [2500]	190 [2750]	207 [3000]

325 cc [19.81 in³/rev.] Intermittent Ratings are below and to the right of the BOLD line. Intermittent Ratings - 10% of Operation

2 [0.5]
4 [1]
8 [2]
15 [4]
23 [6]
30 [8]
38 [10]
45 [12]
53 [14]
61 [16]
68 [18]
76 [20]
83 [22]
91 [24]
95 [25]
114 [30]

65 [571] 5	135 [1196] 4	272 [2406] 3	398 [3524] 1							
67 [595] 11	146 [1291] 10	290 [2568] 9	425 [3764] 7	558 [4937] 6	623 [5514] 4	689 [6101] 3	746 [6599] 1			
67 [597] 22	150 [1328] 22	311 [2751] 20	461 [4083] 18	596 [5277] 16	659 [5834] 14	723 [6396] 12	788 [6977] 11	949 [7510] 9		
64 [565] 46	147 [1299] 46	312 [2761] 44	474 [4197] 41	627 [5547] 36	698 [6173] 33	762 [6747] 30	821 [7261] 26	880 [7785] 20	942 [8337] 19	
77 [677] 70	154 [1367] 69	320 [2834] 67	484 [4283] 64	642 [5679] 57	717 [6347] 52	791 [7004] 48	853 [7548] 42	917 [8116] 37	977 [8646] 32	
72 [641] 93	147 [1299] 93	313 [2766] 91	477 [4221] 87	637 [5640] 80	715 [6329] 75	786 [6959] 65	861 [7617] 59	937 [8236] 53	996 [8816] 49	
64 [566] 117	137 [1217] 117	303 [2683] 114	468 [4142] 110	629 [5568] 103	705 [6241] 94	784 [6935] 87	859 [7603] 80	934 [8265] 74	1005 [8895] 68	
53 [473] 140	131 [1155] 139	292 [2587] 138	458 [4049] 134	619 [5479] 125	695 [6151] 116	774 [6850] 109	850 [7523] 103	926 [8197] 96	1001 [8861] 89	
30 [262] 164	122 [1076] 164	281 [2483] 161	446 [3943] 157	606 [5367] 146	687 [6078] 139	764 [6764] 132	840 [7434] 124	915 [8099] 116	990 [8761] 109	
18 [161] 187	112 [994] 186	267 [2359] 185	431 [3818] 181	594 [5253] 169	674 [5966] 163	753 [6660] 155	824 [7290] 149			
18 [160] 209	113 [997] 207	265 [2344] 206	430 [3805] 204	593 [5244] 192	673 [5953] 185	751 [6649] 178	811 [7178] 174			
3 [25] 234	97 [863] 233	248 [2198] 232	415 [3673] 227	578 [5114] 216	658 [5821] 210	736 [6515] 202	797 [7052] 197			
	84 [747] 257	236 [2091] 255	400 [3540] 249	562 [4973] 240	641 [5676] 234	720 [6368] 227	781 [6913] 222			
	75 [667] 280	215 [1900] 279	380 [3365] 273	543 [4804] 264	623 [5510] 258	701 [6202] 251	763 [6756] 246			
	70 [616] 292	207 [1828] 290	370 [3272] 285	533 [4716] 276	613 [5423] 270	698 [6175] 261	758 [6711] 257			
		153 [1353] 350	315 [2789] 344	478 [4230] 335	559 [4943] 329	639 [5653] 322	704 [6233] 318			

6
12
24
47
70
94
117
140
164
187
210
234
257
280
292
350

Torque - Nm [lb-in], Speed rpm Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

89 [788]	178 [1576]	356 [3153]	534 [4729]	713 [6306]	802 [7094]	891 [7882]	980 [8670]	1069 [9459]	1158 [10247]
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Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]



PERFORMANCE

400	Pressure - bars [psi]						Max. Cont.		Max. Inter.	
	17 [250]	35 [500]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]	172 [2500]	190 [2750]

399 cc [24.36 in³/rev.] **Intermittent Ratings are below and to the right of the BOLD line.** Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	2 [0.5]	81 [717] 4	173 [1534] 4	356 [3148] 2								Theoretical rpm
	4 [1]	85 [752] 9	181 [1605] 8	369 [3263] 7	460 [4074] 6	550 [4865] 5	638 [5648] 4	724 [6404] 3	816 [7222] 2			
Max. Cont.	8 [2]	86 [762] 18	187 [1654] 18	387 [3422] 16	483 [4274] 15	575 [5090] 13	662 [5861] 11	747 [6613] 10	826 [7310] 7			10
	15 [4]	82 [724] 38	185 [1635] 37	391 [3460] 35	493 [4361] 34	592 [5240] 31	688 [6086] 27	776 [6871] 23	866 [7667] 17	942 [8337] 12		19
Max. Inter.	23 [6]	75 [663] 57	178 [1573] 56	383 [3393] 54	486 [4301] 52	588 [5201] 50	686 [6074] 46	783 [6926] 40	876 [7750] 33	963 [8524] 27	1056 [9345] 24	38
	30 [8]	66 [585] 76	168 [1490] 75	374 [3306] 73	476 [4216] 72	578 [5119] 69	679 [6007] 65	776 [6868] 57	872 [7716] 50	966 [8545] 43	1055 [9341] 36	57
Max. Cont.	38 [10]		154 [1365] 95	361 [3197] 93	464 [4110] 91	567 [5015] 88	664 [5880] 82	764 [6764] 76	862 [7626] 69	956 [8463] 61	1050 [9289] 52	76
	45 [12]		140 [1237] 114	346 [3066] 112	450 [3978] 110	551 [4880] 107	649 [5744] 101	750 [6638] 95	848 [7503] 88	945 [8361] 80	1039 [9195] 71	95
Max. Inter.	53 [14]		125 [1104] 133	330 [2924] 131	434 [3838] 129	536 [4745] 126	634 [5609] 119	735 [6504] 112	833 [7369] 102	929 [8217] 97	1024 [9058] 88	114
	61 [16]		106 [934] 151	311 [2755] 150	415 [3672] 148	518 [4580] 145	617 [5456] 138	718 [6357] 131	817 [7228] 123	913 [8079] 114	1007 [8913] 104	133
Max. Cont.	68 [18]			291 [2578] 169	395 [3493] 167	498 [4405] 165	597 [5279] 158	699 [6185] 151	798 [7065] 143	896 [7931] 134	991 [8774] 122	152
	76 [20]			269 [2379] 189	371 [3286] 187	475 [4205] 184	575 [5084] 177	678 [5997] 171	777 [6879] 163	876 [7754] 154	972 [8606] 143	171
Max. Inter.	83 [22]			246 [2174] 207	348 [3076] 205	451 [3987] 202	555 [4911] 198	654 [5789] 192	754 [6671] 184	852 [7543] 175	951 [8413] 165	190
	91 [24]			226 [2000] 226	322 [2850] 224	424 [3756] 221	528 [4668] 217	629 [5571] 211	728 [6446] 204	828 [7332] 195	926 [8197] 184	209
Max. Cont.	99 [26]			197 [1739] 246	294 [2600] 244	397 [3515] 241	500 [4421] 236	602 [5323] 231	702 [6214] 224	801 [7093] 215	900 [7963] 205	228
	114 [30]			131 [1162] 284	237 [2100] 282	338 [2991] 279	441 [3901] 275	542 [4798] 269	643 [5687] 263	743 [6574] 254	843 [7458] 245	247

Torque - Nm [lb-in], Speed rpm Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

110 [969]	219 [1939]	438 [3877]	548 [4846]	657 [5816]	767 [6785]	876 [7754]	986 [8723]	1095 [9693]	1205 [10662]
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Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

500	Pressure - bars [psi]						Max. Cont.		Max. Inter.	
	17 [250]	35 [500]	52 [750]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]	

496 cc [30.29 in³/rev.] **Intermittent Ratings are below and to the right of the BOLD line.** Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	2 [0.5]	94 [832] 3	210 [1861] 3	323 [2859] 3	435 [3853] 3							Theoretical rpm
	4 [1]	98 [868] 7	197 [1743] 7	314 [2781] 7	430 [3802] 6	542 [4797] 6	652 [5766] 5	777 [6876] 4				
Max. Cont.	8 [2]	100 [882] 15	205 [1812] 15	328 [2905] 14	447 [3959] 14	565 [5001] 13	677 [5990] 11	780 [6900] 9	879 [7779] 7			8
	15 [4]	95 [843] 31	204 [1803] 30	332 [2938] 30	460 [4070] 29	584 [5170] 28	703 [6225] 25	815 [7212] 21	917 [8118] 16	1012 [8956] 13		16
Max. Inter.	23 [6]	89 [783] 46	196 [1737] 46	324 [2869] 45	453 [4009] 44	580 [5133] 43	705 [6237] 41	824 [7296] 36	930 [8234] 28	1033 [9141] 22		31
	30 [8]	79 [696] 62	185 [1639] 61	314 [2778] 61	443 [3918] 60	570 [5047] 58	696 [6161] 56	814 [7205] 50	930 [8231] 43	1041 [9210] 34		46
Max. Cont.	38 [10]	68 [600] 77	172 [1523] 77	300 [2652] 76	429 [3800] 75	557 [4929] 74	684 [6052] 71	805 [7123] 66	924 [8175] 59	1037 [9175] 50		62
	45 [12]		177 [1568] 92	262 [2318] 92	410 [3624] 91	519 [4593] 89	644 [5696] 86	770 [6811] 82	891 [7885] 75	1008 [8916] 68		77
Max. Inter.	53 [14]		157 [1389] 107	286 [2533] 106	415 [3673] 105	544 [4810] 104	669 [5918] 101	794 [7027] 96	914 [8092] 89	1031 [9122] 80		92
	61 [16]		138 [1219] 123	265 [2347] 122	394 [3486] 121	523 [4630] 120	649 [5740] 116	775 [6861] 111	897 [7936] 104	1013 [8968] 95		107
Max. Cont.	68 [18]		114 [1004] 138	243 [2147] 137	370 [3277] 136	500 [4424] 135	626 [5536] 132	752 [6659] 127	876 [7753] 120	995 [8806] 111		123
	76 [20]		96 [849] 153	217 [1919] 153	344 [3047] 152	473 [4190] 151	600 [5311] 147	728 [6446] 143	852 [7537] 136	972 [8606] 127		138
Max. Inter.	83 [22]		78 [688] 168	154 [1360] 168	276 [2439] 167	406 [3595] 166	534 [4724] 164	660 [5839] 161	784 [6938] 155	907 [8028] 148		153
	91 [24]			160 [1416] 184	268 [2371] 184	397 [3512] 182	524 [4633] 179	650 [5755] 175	776 [6863] 170	898 [7950] 162		168
Max. Cont.	99 [26]			129 [1138] 199	231 [2048] 198	321 [2844] 197	451 [3988] 196	576 [5097] 193	703 [6218] 188	827 [7320] 181		184
	114 [30]				186 [1647] 229	292 [2581] 228	383 [3387] 227	508 [4494] 224	636 [5631] 219	761 [6738] 213		199

Torque - Nm [lb-in], Speed rpm Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

136 [1205]	272 [2410]	409 [3616]	545 [4821]	681 [6026]	817 [7231]	953 [8436]	1090 [9642]	1226 [10847]
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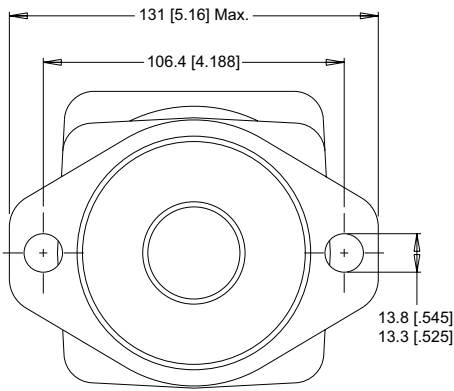
Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]



NOTE: Dimensions shown are without paint. Paint thickness can be up to 0.13 [.005]

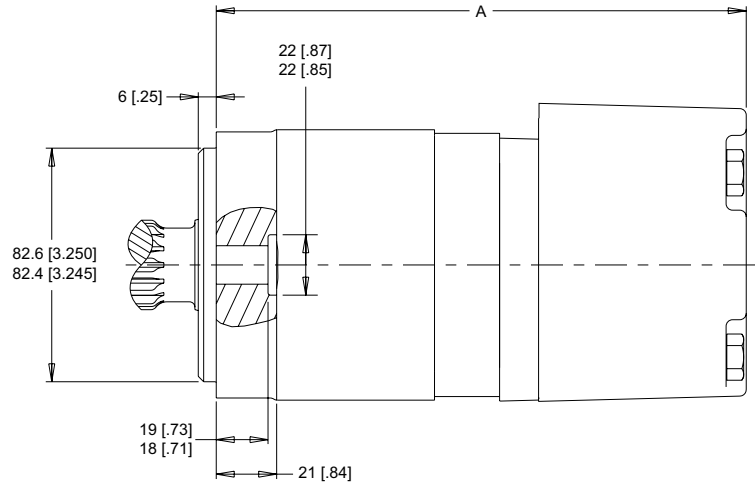
350 & 351 SERIES HOUSINGS (SAE A, MAGNETO MOUNTS)

A0 2-Hole SAE A Mount with End Ports

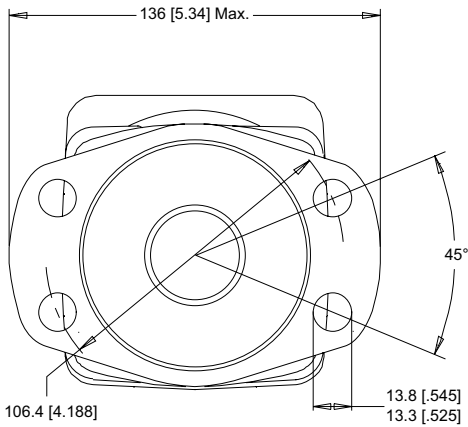


NOTE: Dimension A is found on page 11.

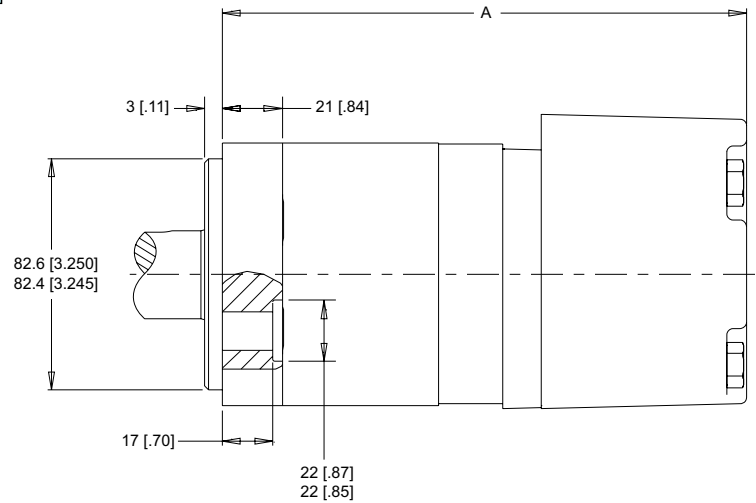
A7 2-Hole SAE A Mount with Side Ports



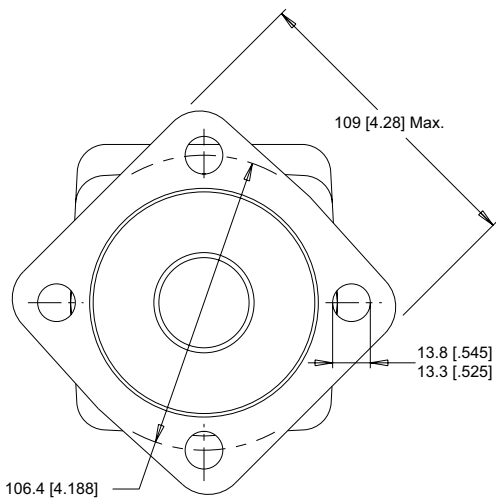
A2 4-Hole Magneto with End Ports



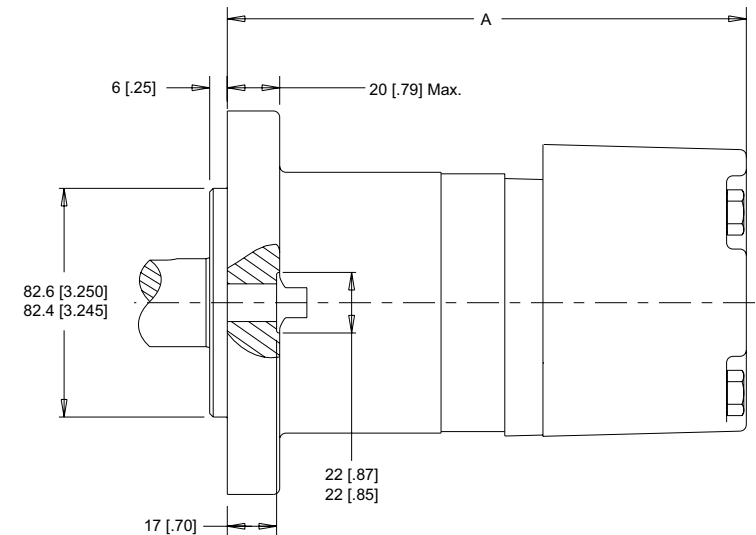
A8 4-Hole Magneto with Side Ports



AG 4-Hole Square SAE A Mount with End Ports



AH 4-Hole Square SAE A Mount with Side Ports

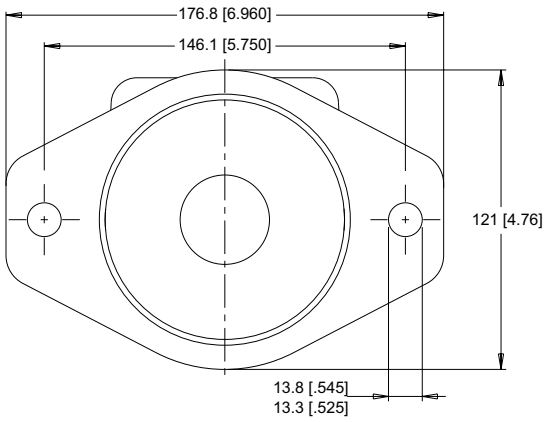




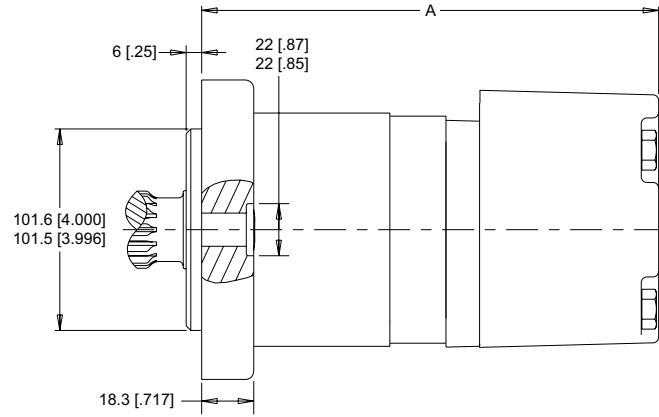
NOTE: Dimensions shown are without paint. Paint thickness can be up to 0.13 [.005]

350 & 351 SERIES HOUSINGS (SAE B, WHEEL MOUNTS)

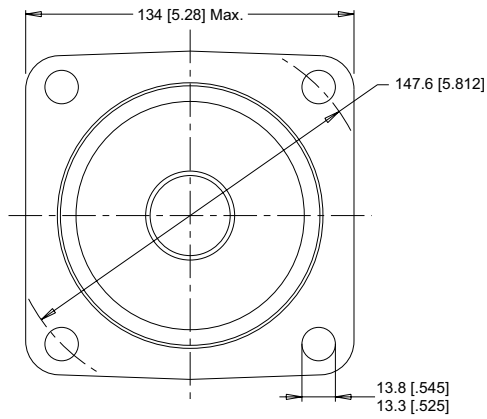
B0 2-Hole SAE B Mount with End Ports



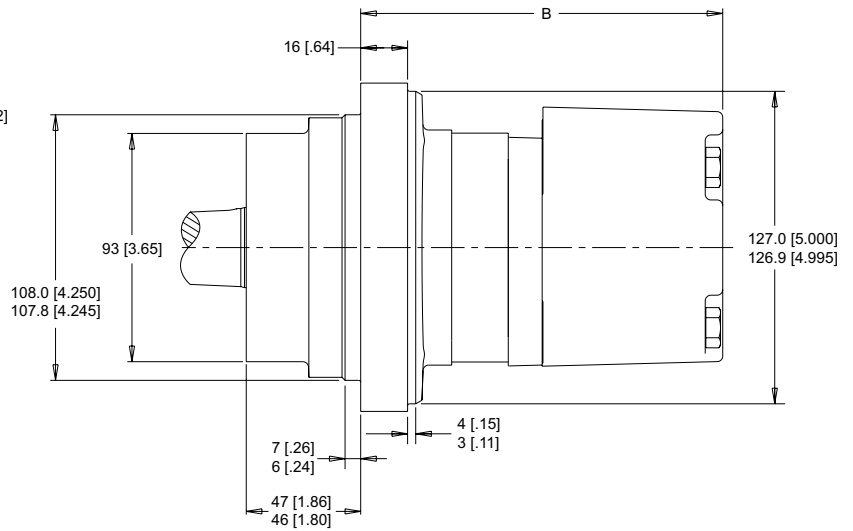
B7 2-Hole SAE B Mount with Side Ports



Y2 4-Hole 4.25" Pilot Wheel Mount with End Ports



Y8 4-Hole 4.25" Wheel Mount with Side Ports



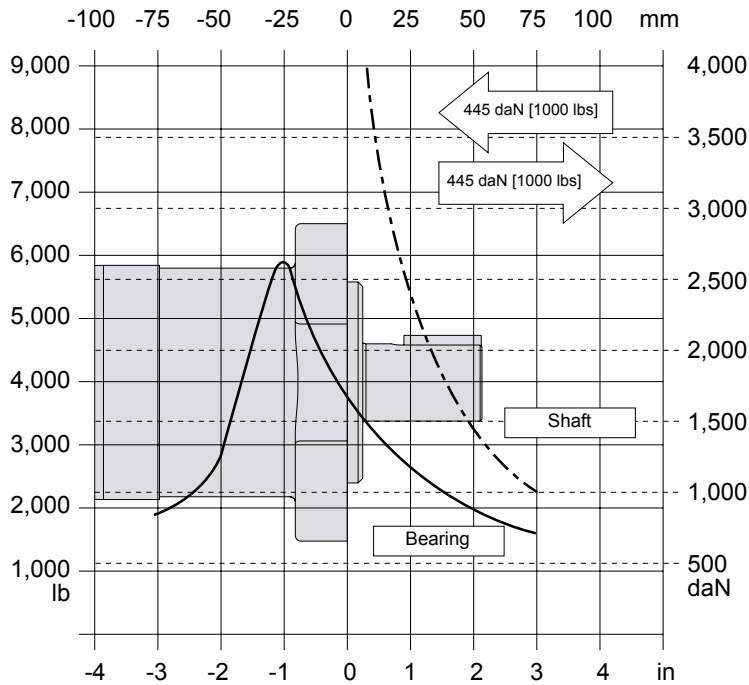
NOTE: Dimension B is found on page 12.



350 & 351 SERIES TECHNICAL INFORMATION

Bearing Curve: The bearing curve represents allowable bearing loads for a B10 life of 2,000 hours at 100 rpm. The curve includes affects of 1,000 lbs inward/outward net thrust* (see note on page 12). Radial loads for speeds other than 100 rpm may be calculated using the multiplication factor table to the right.

SAE A, SAE B, & MAGNETO MOUNT

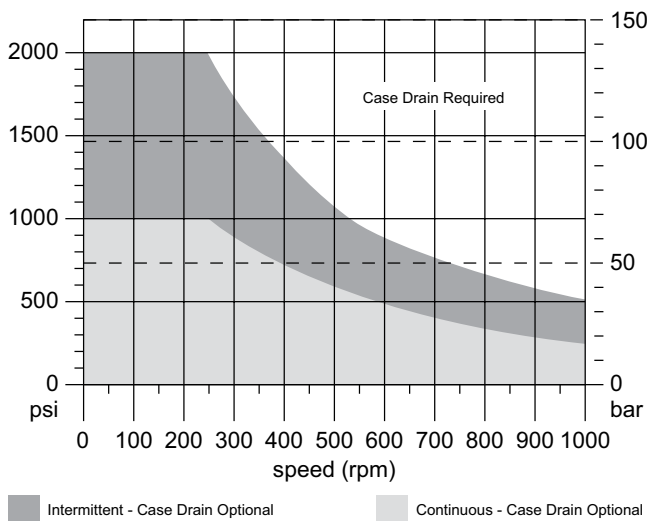


LENGTH / WEIGHT CHART SAE A Mount - Dimension A		
Code	mm [in]	kg [lb]
080	185 [7.27]	11.3 [24.9]
100	185 [7.27]	11.3 [24.9]
110	187 [7.36]	11.4 [25.1]
130	190 [7.49]	11.5 [25.3]
160	197 [7.74]	11.8 [26.0]
200	204 [8.04]	12.2 [26.8]
230	210 [8.28]	12.6 [27.7]
320	228 [8.99]	13.5 [29.7]
400	228 [8.99]	13.5 [29.7]
500	244 [9.60]	14.2 [31.2]

NOTE:
WS motor weights vary ± 0.5 kg [1 lbs] depending upon motor configuration. Add 1.2 kg [2.5 lb] for B mount options. Add 3.8 mm [.15 in] to dimension A for Magneto mount.

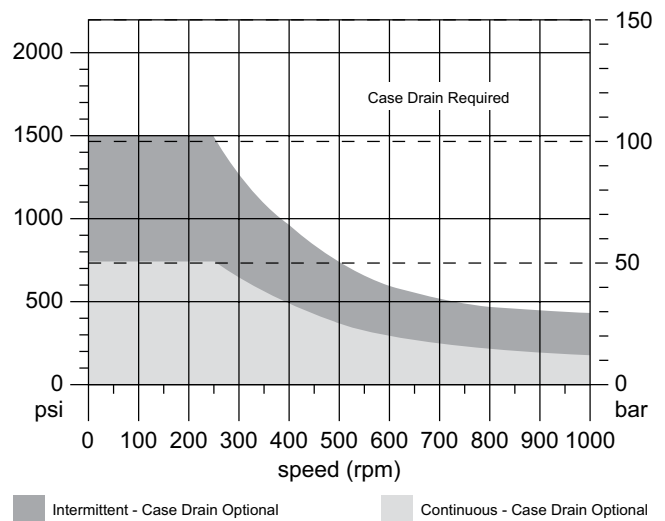
BEARING LOAD MULTIPLICATION FACTOR TABLE	
RPM	FACTOR
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.50

PERMISSIBLE SHAFT SEAL PRESSURE



■ Intermittent - Case Drain Optional ■ Continuous - Case Drain Optional

NOTE: Above chart references shaft options 1-1/4" and smaller.



■ Intermittent - Case Drain Optional ■ Continuous - Case Drain Optional

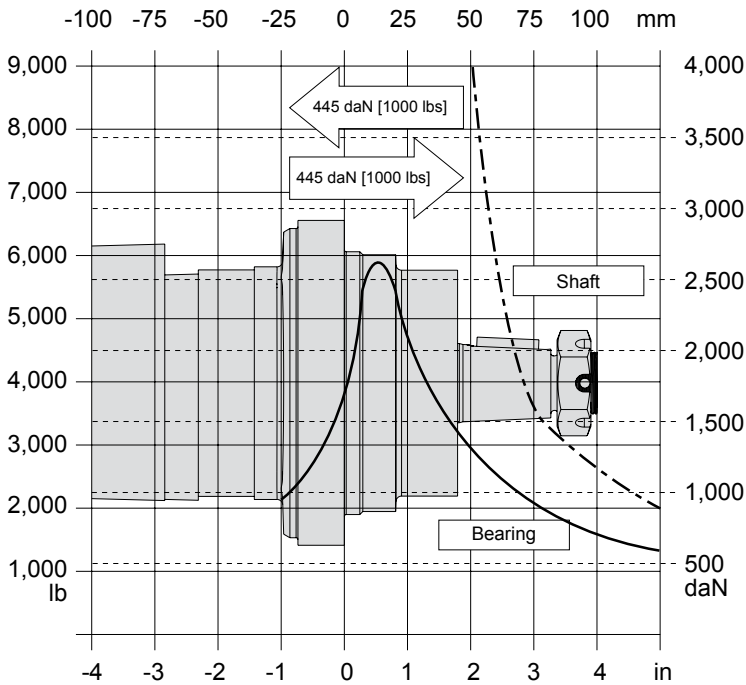
NOTE: Above chart references shaft options larger than 1-1/4".



350 & 351 SERIES TECHNICAL INFORMATION

Bearing Curve: The bearing curve represents allowable bearing loads for a B10 life of 2,000 hours at 100 rpm. The curve includes affects of 1,000 lbs inward/outward net thrust*. Radial loads for speeds other than 100 rpm may be calculated using the multiplication factor table on page 11.

4.25" PILOT WHEEL MOUNTS



* Case pressure will push outward on the shaft. If case drain line is attached and routed directly to tank, case pressure should be negligible. If case drain line is not attached, case pressure will be nearly the same as motor return pressure. When case pressure is acting, the allowable inward axial load can be increased and the allowable outward axial load must be decreased at a rate of 59 kg / 7 bar [130 lb / 100 psi] for shaft codes 02, 10, 12, 20, 21, 22 & 23. The rate for shaft codes 28 & 31 is 78 kg / 7 bar [175 lb / 100 psi].

LENGTH / WEIGHT CHART		
4.25" Wheel Mount - Dimension B		
Code	mm [in]	kg [lb]
080	145 [5.69]	12.5 [27.5]
100	145 [5.69]	12.5 [27.5]
110	147 [5.78]	12.6 [27.7]
130	150 [5.91]	12.7 [27.9]
160	157 [6.16]	13.0 [28.6]
200	164 [6.46]	13.4 [29.5]
230	170 [6.70]	13.8 [30.4]
320	188 [7.41]	14.7 [32.3]
400	188 [7.41]	14.7 [32.3]
500	204 [8.02]	15.4 [33.9]

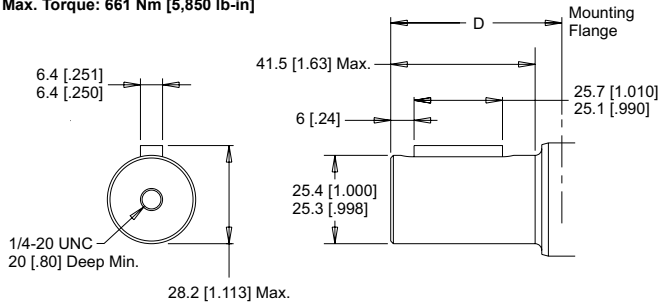
NOTE:
WS motor weights vary ± 0.5 kg [1 lbs] depending upon motor configuration.



350 & 351 SERIES SHAFTS

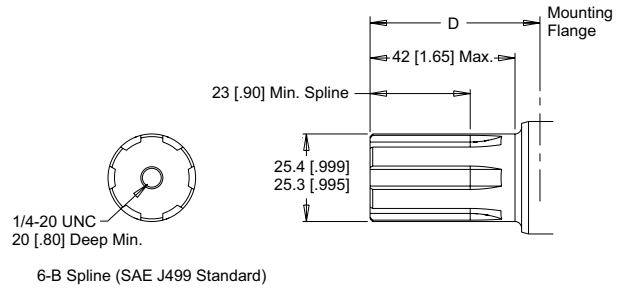
10 1" Straight

Max. Torque: 661 Nm [5,850 lb-in]



02 6-B Spline

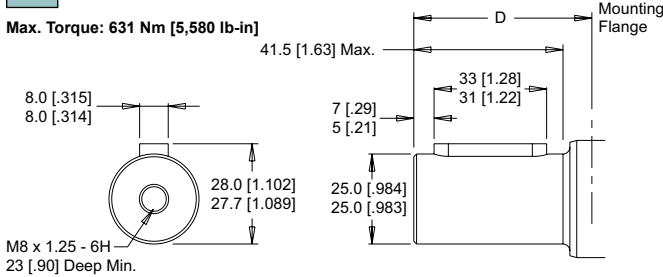
Max. Torque: 429 Nm [3,800 lb-in]



6-B Spline (SAE J499 Standard)

12 25mm Straight

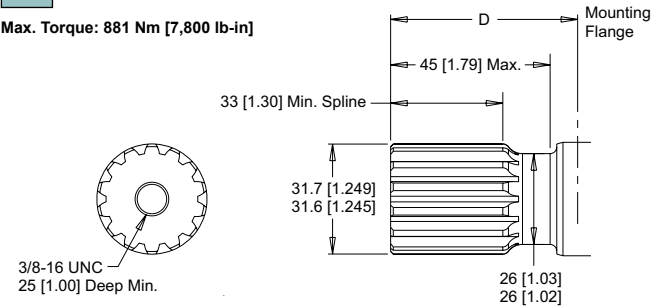
Max. Torque: 631 Nm [5,580 lb-in]



M8 x 1.25 - 6H
23 [.90] Deep Min.

23 14 Tooth Spline

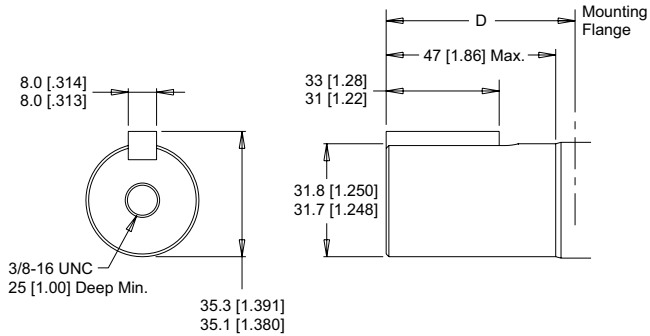
Max. Torque: 881 Nm [7,800 lb-in]



14 Tooth 12/24 pitch Std. (ANSI B92.1-1996 Spline)

20 1-1/4" Straight

Max. Torque: 881 Nm [7,800 lb-in]



3/8-16 UNC
25 [1.00] Deep Min.

MOUNTING FLANGE TO SHAFT END - Dimension D

Code	A0, A7, AG, & AH	A2 & A8	B0 & B7	Y2 & Y8
02	51 [2.00]	47 [1.85]	51 [2.00]	91 [3.58]
10	51 [2.00]	47 [1.85]	51 [2.00]	91 [3.58]
12	51 [2.00]	47 [1.85]	51 [2.00]	91 [3.58]
20	55 [2.18]	52 [2.03]	55 [2.18]	96 [3.76]
21	65 [2.54]	61 [2.39]	65 [2.54]	105 [4.12]
22	64 [2.51]	60 [2.36]	64 [2.51]	104 [4.09]
23	55 [2.17]	52 [2.03]	55 [2.17]	95 [3.75]
28	N/A	N/A	N/A	107 [4.20]
31	N/A	N/A	N/A	123 [4.86]

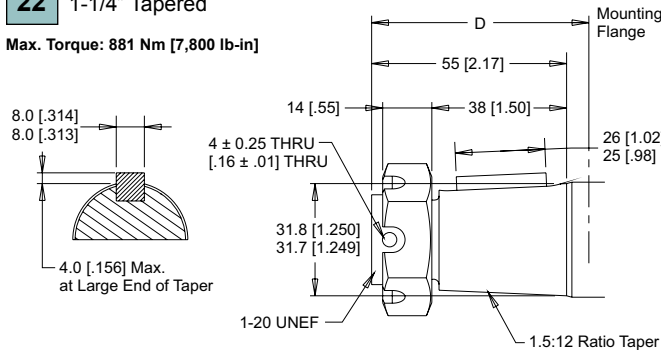
NOTE: Shaft lengths vary ± 0.8 mm [.030 in.]



350 & 351 SERIES SHAFTS

22 1-1/4" Tapered

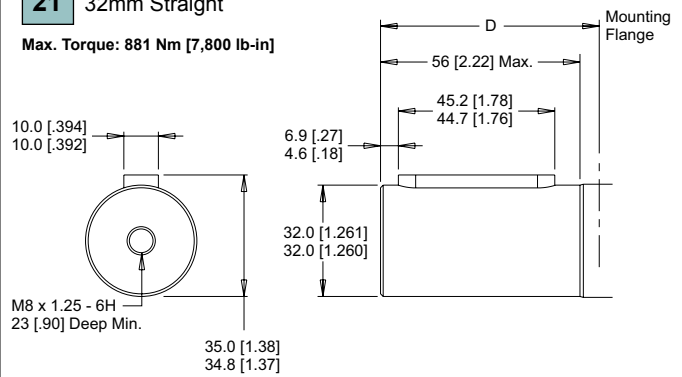
Max. Torque: 881 Nm [7,800 lb-in]



Recommended Nut Torque: 275 lb-ft Dry - 225 lb-ft Lubricated
Plus Torque Required to Align the Slotted Nut with the Shaft Crosshole.

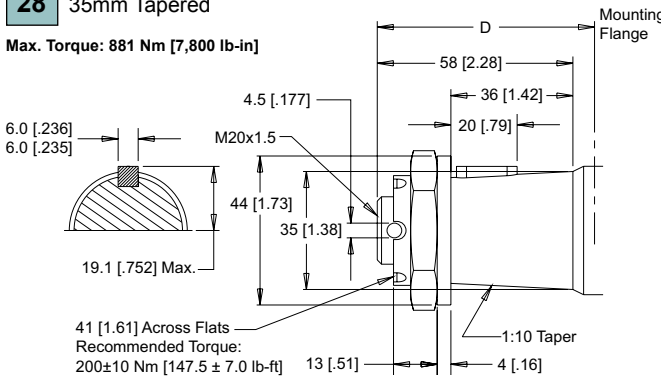
21 32mm Straight

Max. Torque: 881 Nm [7,800 lb-in]



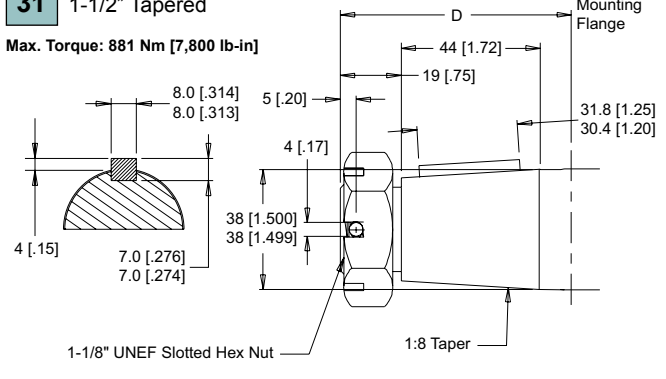
28 35mm Tapered

Max. Torque: 881 Nm [7,800 lb-in]



31 1-1/2" Tapered

Max. Torque: 881 Nm [7,800 lb-in]



NOTE: Dimension D is found on page 13.

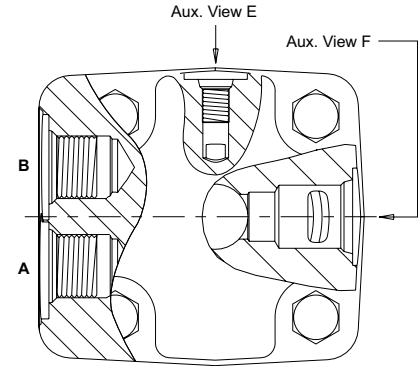
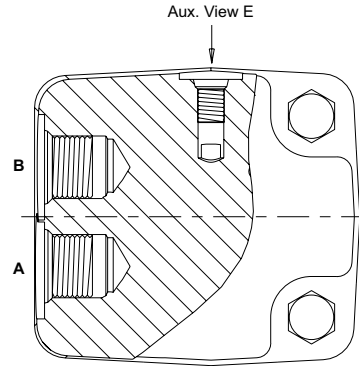
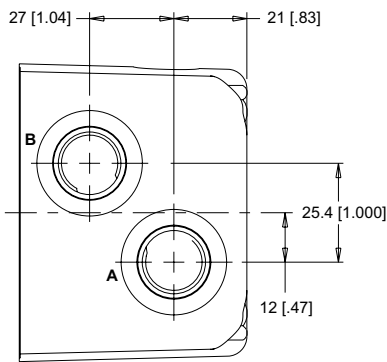


350 & 351 SERIES PORTING OPTIONS

SIDE PORTS

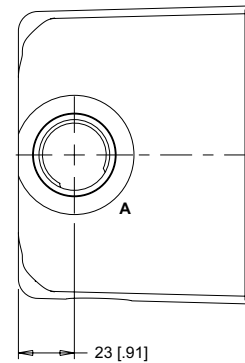
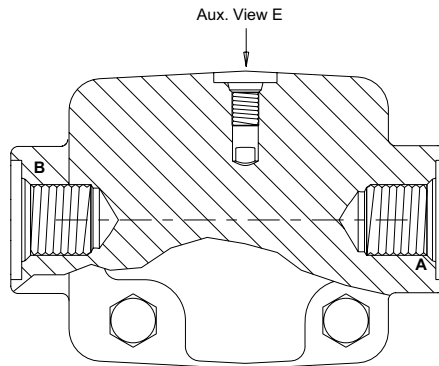
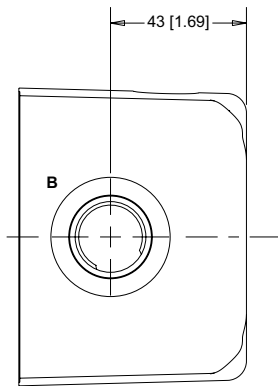
1 7/8" O-Ring with 7/16" Drain Port

2 1/2" BSP.F with 1/4" Drain Port



NOTE: The #1 and #2 WS side ported options can be ordered with a relief valve cavity (10 Series / 2 Way Valve Cavity 7/8" - 14 UNF-2B). See page 16 for Auxillary views E and F.

6 1-1/16" O-Ring with 7/16" Drain Port



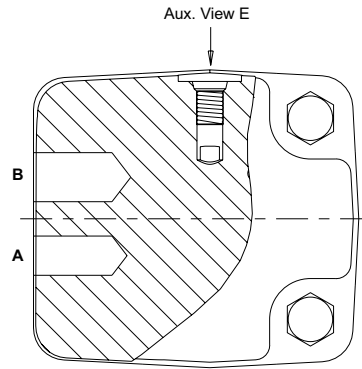
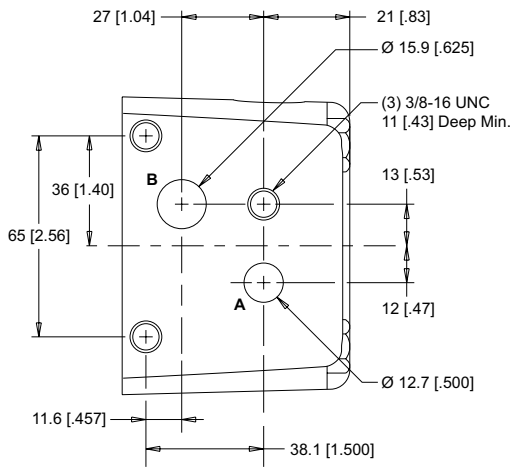
NOTE: See page 16 for Auxillary view E.



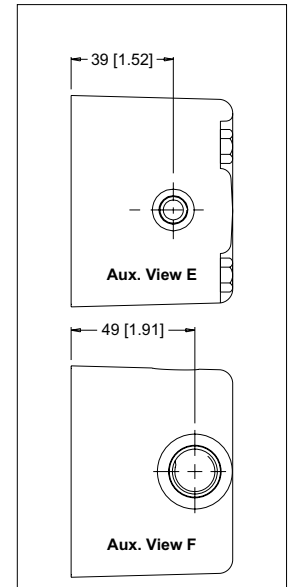
350 & 351 SERIES PORTING OPTIONS

SIDE PORTS

B Offset Manifold with 7/16" Drain Port

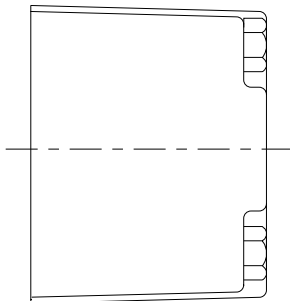


AUXILLARY VIEWS

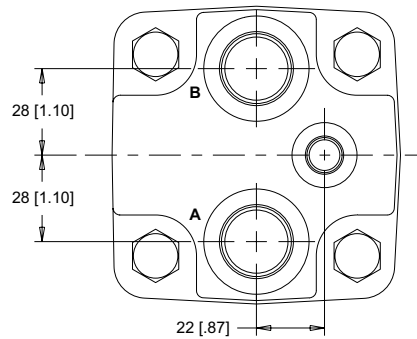


END PORTS

1 7/8" O-Ring with 7/16" Drain Port



2 1/2" BSP.F with 1/4" Drain Port



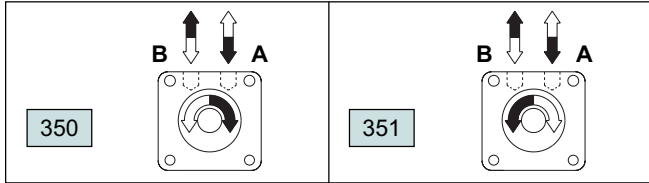


350 & 351 SERIES MODEL CODE BUILDER

SERIES	DISPLACEMENT	HOUSING	SHAFT	PAINT	CAVITY	ADD ON	MISCELLANEOUS
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8

STEP 1 - Select a series

- 350 Clockwise Rotation
- 351 Counterclockwise Rotation



NOTE: The above drawing is for reference only detailing shaft rotation as viewed from shaft end for each series when port "A" is pressurized. Pressurizing port "A" will always give the above results based on the series, however the location of ports "A" and "B" may not be oriented as shown above. Refer to pages 15 and 16 for exact orientation of ports "A" and "B".

STEP 2 - Select a displacement option

080	78 cc	[4.8 in ³ /rev]	200	202 cc	[12.3 in ³ /rev]
100	100 cc	[6.1 in ³ /rev]	230	228 cc	[13.9 in ³ /rev]
110	112 cc	[6.9 in ³ /rev]	320	325 cc	[19.8 in ³ /rev]
130	129 cc	[7.9 in ³ /rev]	400	399 cc	[24.4 in ³ /rev]
160	162 cc	[9.9 in ³ /rev]	500	496 cc	[30.3 in ³ /rev]

STEP 3 - Select a mounting option

NOTE: To complete the three (3) digit WS Series housing code a two (2) digit mounting option must be followed with the single (1) digit porting option found in STEP 3 part II. Side port mounting options need side port porting options and end port mounting options need end port porting options.

- A0 2-Hole SAE A Mount With End Ports
- A2 4-Hole Magneto With End Ports
- A7 2-Hole SAE A Mount With Side Ports
- A8 4-Hole Magneto With Side Ports
- AG 4-Hole Square SAE A Mount With End Ports
- AH 4-Hole Square SAE A Mount With Side Ports
- B0 2-Hole SAE B Mount With End Ports
- B7 2-Hole SAE B Mount With Side Ports
- Y2 4-Hole 4.25" Pilot Wheel Mount With End Ports
- Y8 4-Hole 4.25" Pilot Wheel Mount With Side Ports

STEP 3 (part II) - Select a porting option

END PORTS

- 1 7/8" O-Ring With 7/16" Drain
- 2 1/2" BSP.F With 1/4" Drain

STEP 3 (part II) - Select a porting option

SIDE PORTS

- 1 7/8" O-Ring With 7/16" Drain
- 2 1/2" BSP.F With 1/4" Drain
- 6 1-1/16" O-Ring With 7/16" Drain
- B Offset Manifold With 7/16" Drain

STEP 4 - Select a shaft option

02	6B Spline	22	1-1/4" Tapered
10	1" Straight	23	14 Tooth Spline
12	25mm Straight	28	35mm Tapered
20	1-1/4" Straight	31	1-1/2" Tapered
21	32mm Straight		

NOTE: The 28 and 31 shafts are not available on the SAE A, SAE B, or the Magneto mounts.

STEP 5 - Select a paint option

- A Black
- B Black (unpainted flange face)
- Z No Paint

STEP 6 - Select a valve cavity option and installed valve

A	None	F	121 bar [1750 psi]
B	Relief Valve Cavity	G	138 bar [2000 psi]
C	69 bar [1000 psi]	J	173 bar [2500 psi]
D	86 bar [1250 psi]	L	207 bar [3000 psi]
E	104 bar [1500 psi]		

NOTE: Valve cavity is only available on Side Ports 1 & 2. The B option is the cavity only and will not have a valve cartridge installed.

STEP 7 - Select an add on option

- A Standard
- B Lock Nut
- C Solid Hex Nut

STEP 8 - Select a miscellaneous option

- AA None
- AC Freeturning Rotor
- MA *Mounting Rotated 90°
- MB *Freeturning Rotor and Mounting Rotated 90°

* The MA & MB options are only available on the A0, A2, A7, A8, B0 & B7 mounting options.

WS series motors have been tested per NFPA/T2.6.1-1974 in order to establish ratings for infinite housing life. These ratings are based on pressure cycles with the case drain closed. The ratings for each housing are listed below:

Mounting Option	Rated Fatigue Pressure
4-Hole Square SAE A Mount	34 bar [500 psi]
2-Hole SAE A, B and 4-Hole Magneto Mounts	48 bar [700 psi]
4.25" Wheel Mount	117 bar [1700 psi]

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Before selecting or using a White Drive Products' product, it is important that all information concerning the product warranty, limitation of liability and responsibility of the customer be reviewed. This information is located below. Please direct any questions regarding this information to your White Drive Products representative.

Disclaimer

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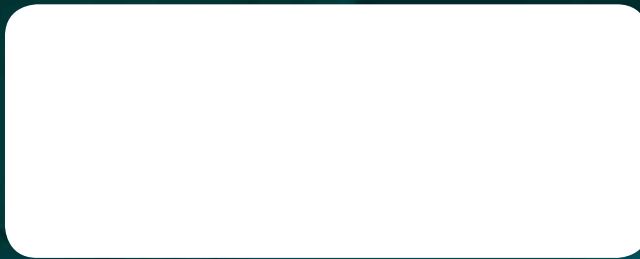
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