

Low Speed High Torque TGK Series Torqmotor™

Catalog No. HY13-1505-001/US,EU

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



ENGINEERING YOUR SUCCESS.



WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the "Offer of Sale".

© 2014, Parker Hannifin Corporation, All Rights Reserved

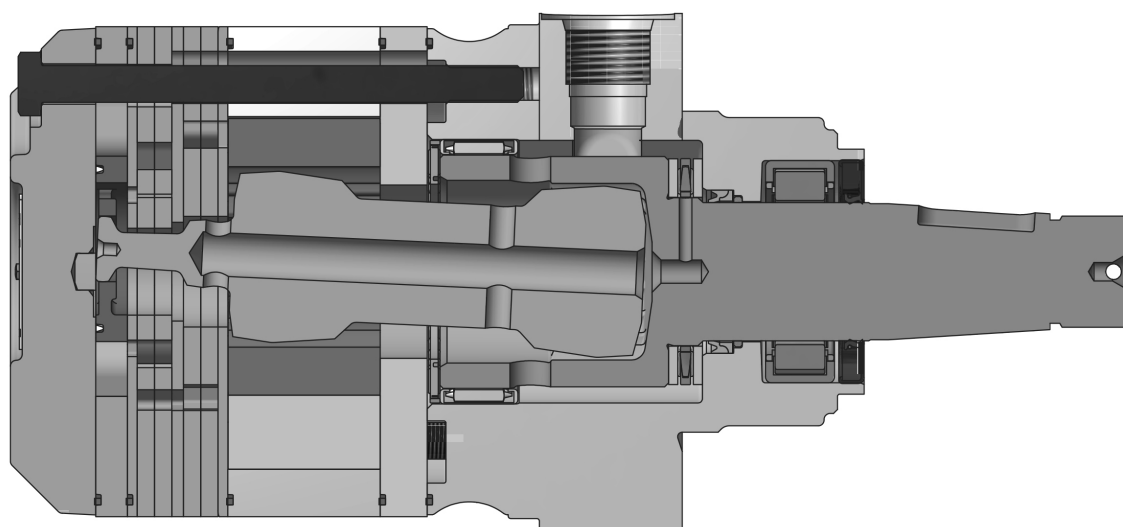
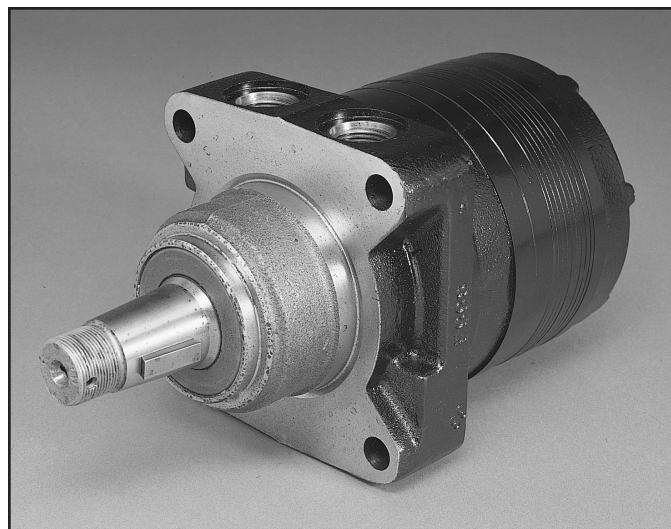


Parker Hannifin Corporation
Hydraulic Pump/Motor Division
Greeneville, Tennessee, USA

15 Displacements	(6.9 to 58.5 in ³ /rev)	
15 Schluckvolumen	110 . . . 959 cm³/rev	
15 Cylindrée		
15 Desplazamientos		
	Cont.	Int.
Maximum Pressure	(3500 psid)	(4000 psid)
Eingangsdruck	. . . 241 bar	. . . 276 bar
Pression entrée		
Presion Maxima		
Maximum Oil Flow	(30 gpm)	
Schluckstrom	. . . 114 lpm	
Débit d'huile		
Caudal Maximo de Aceite		
Maximum Speed	(660 rpm)	
Drehzahl	660 rpm	
Vitesse de rotation		
Velocidad Maxima		
	Cont.	Int.
Maximum Torque	(14,624 lb in)	(17,948 lb in)
MaxDrehmoment	1652 Nm	2028 Nm
Couple		
Torque Maximo		
Maximum Side Load at Key	(3597 lb)	
Seitenlast	. . . 16000 N	
Charges latérales		
Carga Maxima Lateral		

High Power Density in a Compact Design

The TGK motor is a compact motor with the performance of much larger motors. Up to 45 HP in less than 6 inches of length. This high power density allows for higher HP applications in a small space, reducing machine weight as well. Its unique drive train design is based on proven Torqmotor™ technology, assuring unmatched durability.



TGK

Series










XXXX

Displacement
Schluckvolumen
Cylindrée
Desplazamiento

Code	cm³/tr cm³/giro cm³/U in³/rev
0110	110 / 6.9
0140	141 / 8.6
0170	169 / 10.3
0195	195 / 11.9
0240	238 / 14.5
0280	280 / 17.1
0310	310 / 18.9
0335	337 / 20.6
0360	360 / 22.2
0405	405 / 24.7
0475	477 / 29.1
0530	528 / 32.3
0625	623 / 38.0
0785	786 / 48.0
0960	959 / 58.5

X


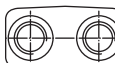
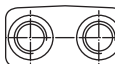




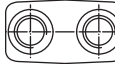

Mounting
Gehäuse
Carter
Montaje

Code	Mounting
A	SAE "A" 2 Bolt 
B	SAE "B" 2 Bolt 
L	Wheel, Front Brake 
M	Magneto 
E	Modified SAE "A" (6 Hole) with Long Pilot 
U	Wheel, Standard 
W*	Wheel, Optional 
D*	Large Wheel Mount 
V*	SAE "A" 4 Bolt 

*Requires rear porting

X

Ports
Anschluß
Plan de raccordement
Lumbreras


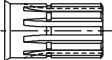










Code	Ports
A	7/8-14 SAE O-Ring; Rear Axial 
B	7/8-14 SAE O-Ring; Rear Radial 
X	G 1/2 BSPP, Rear Radial 
E	Manifold; Rear Radial 
H	ISO 6149 M22 x 1.5 
M*	5/16-18 UNC Manifold 
K*	Manifold M6, Front 
S	7/8-14 SAE 
T	1/2 BSPF Front 

*Not available on L, U or W mounting.



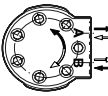
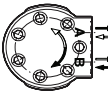
* Requires rear porting.
Nur Endanschluss möglich
Exige des orifices en arriere
Necesita lumbrera posterior

* AbtriebswelleØ 25mm Max. Moment cont./int.
Coupling shaftØ 1 inch Max. x. torque cont./int.
ArbreØ SAE Couple maxi cont./int.
Eje de acople Coppia max cont./int.

} 450/550 Nm

XX	
Shaft Welle Arbre Eje	
Code	Shaft
03	1 1/4" Keyed 
04	10B Spline 
05	1 1/4" 14 Tooth Spline 
08	1 1/4" Tapered 
19	1 3/8" J501 Taper 
20	1 3/8" Keyed 
31	1 1/2" Taper 1.25-18 Thread 
32	1 1/2" Straight Key 3/8 Tap 
36	1 1/2" 17 Tooth Spline 12/24 Pitch 
46	32 mm Keyed 
62*	1 1/4" 14 Tooth Spline SAE 
64	40 mm Keyed 

* Conforms to SAE recommended length

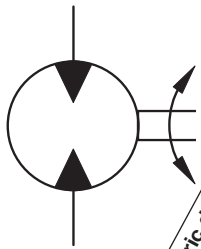
0	
Rotation Drehrichtung Direction de rotation Rotacion	
Code	Rotation
0	Standard B ↓ ↑ A 
1	Reverse Timed Manifold B ↑ ↓ A 
Code	Rear Rotation
0	Standard 
1	Reverse Timed Manifold 

Rotation viewed
from shaft end.

XXXX	
Options Opciones	
Code	Options
AAAA	Black Paint
AAAF***	Castle Nut, Black Paint
AABP***	Castle Nut, No Paint
AAAG	Fluorocarbon Seals, Black Paint
AAAH	Fluorocarbon Seals, No Paint
AAAJ	High Temperature Commutator Seal, Black Paint
AAFG	High Temperature Commutator Seal, No Paint
AAFW	High Temperature Commutator Seal, Fluorocarbon ¹ Seals, Painted
AAFA	High Temperature Commutator Seal, Fluorocarbon ¹ Seals, No Paint
AANG	High Temperature Commutator Seal, Fluorocarbon ¹ Seals, Castle Nut, Painted

- * Not available with A, B or E porting
- ** Shuttle port position as viewed from shaft end of motor
- *** Available only with shaft codes 08 & 19
- **** Not available on 0625, 0785 or 0960 displacement codes

¹ Fluorocarbon is available under various registered trademarks, including Viton.



Geometric displacement
Geom. Schluckvolumen
Cylindrée
Cilindrata
Max. speed @ Max. intermittent flow
Max. Drehzahl Intermittierender Betrieb:
Vitesse de rotation maxi
Velocidad maxima a caudal intermitente maximo
Max. oil flow
Max. Schluckstrom
Portata max
Max. differential pressure
Max. Druckgefälle
Chute de pression maxi
Presion diferencial maxima
Max. supply pressure
Max. Eingangsdruck
Presion maxi entrée
Presion maxima de alimentacion
Max. torque
Max. Drehmoment
Couple maxi
Torque Maximo
Max. performance
Max. Leistungabgabe
Potenza de sortie maxi
Min. starting torque
Min. Anlaufmoment
Couple min. fourni au démarrage
Torque minimo de arranque

Motor Series TGK	cm³/rev in³/rev	rev/min	cont		int		max bar psid	cont		int		max KW HP	cont		int	
			l/min g/min	bar psid	Nm lb-in	Nm lb-in		Nm lb-in	Nm lb-in							
0110	110 6.9	672	76	95	241	276	300	373	426	24	279	318	279	318		
			20	25	3500	4000		3299	3767		2464	2814				
0140	141 8.6	660	76	95	241	276	300	474	530	30	354	418	3137	3706		
			20	25	3500	4000		4199	4794		3137	3706				
0170	169 10.3	554	76	95	241	276	300	578	646	32	432	505	3820	4392		
			20	25	3500	4000		5114	5838		3820	4392				
0195	195 11.9	477	76	95	241	276	300	671	753	31	501	562	4434	5062		
			20	25	3500	4000		5936	6776		4434	5062				
0240	238 14.5	393	76	95	241	276	300	794	913	30	593	678	5250	6000		
			20	25	3500	4000		4350	7027		8031	5250		6000		
0280	280 17.1	334	76	95	241	276	300	936	1073	29	699	799	6191	7075		
			20	25	3500	4000		4350	8286		9470	6191		7075		
0310	310 18.9	303	76	95	241	276	300	1037	1229	29	773	883	6841	7819		
			20	25	3500	4000		4350	9175		10465	6841		7819		
0335	337 20.3	277	76	95	241	276	300	1128	1297	28	843	963	7457	8522		
			20	25	3500	4000		4350	9981		11834	7457		8522		
0360	360 22.2	263	76	95	241	276	300	1205	1377	28	900	1029	7968	9107		
			20	25	3500	4000		4350	10665		12189	7968		9107		
0405	405 24.7	232	76	95	241	276	300	1353	1546	29	1011	1155	8944	10222		
			20	25	3500	4000		4350	11971		13681	8944		10222		
0475	477 29.1	237	76	114	241	276	300	1593	1821	37	1190	1360	10535	12040		
			20	30	3500	4000		4350	14101		16115	10535		12040		
0530	528 32.3	231	76	114	224	259	300	1643	1895	32	1227	1416	10861	12532		
			20	30	3250	3750		4350	14537		16774	10861		12532		
0625	623 38.0	182	76	114	190	224	300	1635	1932	28	1221	1443	10810	12776		
			20	30	2750	3250		4350	14469		17100	10810		12776		
0785	786 48.0	143	76	114	152	186	300	1652	2028	22	1234	1515	10926	13409		
			20	30	2200	2700		4350	14624		17948	10926		13409		
0960	959 58.5	118	76	114	124	159	300	1647	2105	19	1231	1504	10893	13314		
			20	30	1800	2300		4350	14580		18630	10893		13314		

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

* Intermittent operation rating applies to 10% of every minute.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

TGK 0110

110 cm³ / rev (6.9 in³ / rev)

PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
.5	408 11	834 5						
1	424 28	856 22	1285 14	1713 8				
2	447 62	908 55	1359 46	1796 38	2221 29	2646 24	3063 15	3494 15
3	444 95	911 88	1370 79	1824 70	2278 60	2732 51	3181 42	3621 37
4	443 130	919 120	1389 111	1853 102	2312 92	2763 81	3207 73	3649 66
5	437 163	919 153	1395 143	1866 134	2332 123	2794 113	3249 103	3694 97
7	424 232	911 219	1398 209	1878 197	2352 186	2822 176	3285 165	3742 157
9	405 299	898 286	1389 274	1874 262	2354 249	2829 238	3299 228	3767 218
12	370 401	861 386	1358 372	1851 358	2337 345	2818 332	3294 321	3767 309
15	328 503	819 485	1314 468	1813 454	2304 440	2788 428	3270 414	3749 400
20	380 672	731 636	1230 633	1727 616	2220 601	2715 584	3204 569	3687 554

Flow (GPM)

TORQUE (LB IN) 2715
 SPEED (RPM) 584

TGK 0140

141 cm³ / rev (8.6 in³ / rev)

PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
.5	519 9	1060 4						
1	540 22	1090 17	1635 11	2180 6				
2	569 49	1156 43	1730 36	2286 30	2827 23	3368 19	3899 12	4447 12
3	565 75	1159 69	1744 62	2321 55	2899 47	3477 40	4048 33	4608 29
4	564 102	1170 94	1768 87	2358 80	2943 72	3517 64	4082 57	4644 52
5	556 128	1170 120	1776 112	2375 105	2968 97	3556 89	4135 81	4701 76
7	540 182	1160 172	1779 164	2390 155	2994 146	3592 138	4181 130	4763 123
9	515 235	1143 225	1768 215	2385 206	2996 196	3601 187	4199 179	4794 171
12	471 315	1096 303	1729 292	2356 281	2974 271	3587 261	4193 252	4794 243
15	418 395	1042 381	1673 368	2307 357	2933 346	3549 336	4163 325	4771 314
20	299 528	931 512	1565 497	2198 484	2825 472	3455 459	4078 447	4692 435
25	173 660	794 643	1426 626	2059 612	2695 598	3332 583	3961 569	4579 555

Flow (GPM)

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TGK 0170

169 cm³ / rev (10.3 in³ / rev)

	PRESSURE (PSID)							
	500	1000	1500	2000	2500	3000	3500	4000
.5	620 9	1284 7	1945 5	2613 4	3293 3	3983 2		
1	652 20	1337 18	2006 16	2683 14	3375 12	4063 11	4744 8	5402 8
2	678 42	1390 40	2105 37	2822 35	3535 32	4226 30	4909 27	5587 25
3	678 64	1397 61	2117 58	2836 56	3554 53	4263 50	4963 46	5652 44
4	679 86	1409 83	2142 80	2872 77	3596 74	4310 71	5021 67	5716 64
5	675 108	1413 104	2150 101	2885 98	3616 94	4339 91	5057 87	5761 83
7	661 153	1405 148	2152 143	2900 140	3642 136	4374 132	5101 127	5818 123
9	632 197	1385 191	2140 186	2891 181	3638 177	4380 173	5114 168	5838 163
12	583 263	1334 256	2096 250	2860 244	3617 239	4362 234	5101 228	5823 223
15	524 330	1275 322	2035 314	2804 308	3572 302	4327 296	5070 289	5801 283
20	382 442	1143 432	1908 422	2683 413	3455 406	4216 399	4972 391	5714 383
25	239 554	983 543	1747 531	2523 520	3299 511	4071 501	4839 492	5591 483

Flow (GPM)

TORQUE (LB IN) 4839
 SPEED (RPM) 492

TGK 0195

195 cm³ / rev (11.9 in³ / rev)

	PRESSURE (PSID)							
	500	1000	1500	2000	2500	3000	3500	4000
.5	733 7	1503 3						
1	761 16	1546 13	2326 8	3104 3				
2	799 35	1638 32	2465 27	3270 21	4046 16	4813 11	5589 7	6375 6
3	794 55	1639 50	2476 45	3303 39	4132 34	4970 28	5792 23	6595 19
4	794 74	1654 69	2509 64	3356 58	4196 52	5023 46	5830 40	6635 35
5	783 93	1653 88	2517 83	3375 76	4224 70	5065 64	5895 58	6710 52
7	762 131	1637 126	2514 120	3384 113	4245 106	5098 99	5940 92	6772 86
9	731 170	1616 164	2499 157	3373 150	4239 142	5093 135	5936 127	6774 120
12	677 228	1562 221	2455 213	3343 205	4217 196	5081 188	5934 179	6776 172
15	613 285	1498 278	2389 269	3283 260	4169 251	5040 242	5907 232	6765 233
20	448 381	1350 373	2245 363	3141 353	4031 342	4919 331	5798 321	6663 310
25	334 477	1158 468	2044 457	2941 445	3837 433	4729 421	5612 409	6500 397

Flow (GPM)

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TGK 0240

238 cm³ / rev (14.5 in³ / rev)

	500	1000	1500	2000	2500	3000	3500	4000
	932 6	1907 4	2894 2					
.5								
1	960 14	1954 12	2950 9	3943 6	4939 3	5930 2		
2	988 30	2031 27	3065 24	4090 20	5107 17	6100 14	7068 11	8037 9
3	983 45	2029 42	3071 39	4101 35	5128 31	6161 27	7182 23	8184 20
4	978 61	2037 58	3090 54	4136 49	5176 45	6207 42	7230 37	8234 33
5	962 77	2030 73	3092 69	4144 64	5190 60	6231 56	7259 51	8271 47
7	933 108	2005 104	3078 99	4141 94	5194 89	6239 84	7275 78	8298 73
9	890 140	1972 135	3048 129	4112 123	5169 117	6213 112	7245 106	8271 100
12	832 187	1912 181	2996 175	4071 167	5125 161	6163 154	7195 147	8224 140
15	753 235	1832 228	2921 220	4009 212	5081 204	6137 196	7182 188	8212 180
20	559 314	1654 306	2744 297	3834 287	4917 278	5991 268	7045 258	8081 248
25	524 393	1427 384	2507 373	3595 363	4690 352	5780 340	6853 328	7913 317

Flow (GPM)

TORQUE (LB IN) 5780
 SPEED (RPM) 340

TGK 0280

280 cm³ / rev (17.1 in³ / rev)

	500	1000	1500	2000	2500	3000	3500	4000
	1056 5	2177 4	3323 2	4512 1				
.5								
1	1087 12	2223 10	3378 8	4552 6	5734 5	6930 3	8135 3	9350 2
2	1124 25	2313 23	3513 21	4700 18	5880 16	7060 14	8239 12	9400 11
3	1124 39	2323 36	3532 34	4740 31	5940 28	7143 25	8346 22	9536 19
4	1126 52	2346 49	3568 47	4786 43	6004 40	7214 37	8415 33	9596 30
5	1115 65	2350 62	3582 59	4816 56	6044 52	7256 49	8457 45	9641 41
7	1091 92	2338 88	3586 85	4832 80	6072 76	7301 72	8515 67	9706 63
9	1046 118	2309 114	3564 110	4811 105	6051 101	7280 96	8499 90	9707 85
12	981 159	2242 154	3506 148	4757 143	5992 137	7221 132	8444 125	9652 118
15	898 199	2164 193	3437 186	4702 180	5951 174	7187 168	8416 160	9625 152
20	691 266	1976 258	3255 250	4529 243	5795 235	7044 227	8275 218	9499 209
25	703 334	1726 324	2987 314	4260 305	5540 296	6815 286	8071 276	9311 267

Flow (GPM)

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

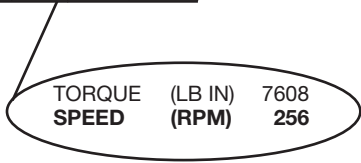
Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TGK 0310

310 cm³ / rev (18.9 in³ / rev)

	PRESSURE (PSID)							
	500	1000	1500	2000	2500	3000	3500	4000
.5	1188 4	2464 3	3766 2	5102 1				
1	1220 11	2508 9	3812 7	5145 5	6477 4	7822 2	9181 2	10530 1
2	1259 23	2598 21	3950 19	5298 17	6642 14	7972 13	9282 10	10574 9
3	1257 35	2606 33	3889 30	5332 28	6688 25	8044 22	9392 19	10693 16
4	1259 47	2628 44	4003 42	5377 39	6749 36	8114 33	9461 29	10780 26
5	1247 59	2629 56	4252 52	5401 50	6782 47	8149 42	9499 39	10823 35
7	1218 84	2614 80	4013 76	5413 72	6806 68	8184 64	9543 60	10874 56
9	1167 107	2574 103	3983 99	5386 94	6780 90	8162 85	9529 80	10877 75
12	1089 143	2493 139	3904 133	5308 128	6696 122	8075 117	9443 110	10793 102
15	995 180	2400 173	3817 167	5225 160	6621 154	8003 148	9371 140	10718 131
20	769 241	2194 234	3618 225	5043 218	6462 210	7863 203	9238 194	10588 183
25	626 303	1955 294	3359 284	4771 274	6251 265	7608 256	8998 246	10360 236

Flow (GPM)



TGK 0335

337 cm³ / rev (20.6 in³ / rev)

	PRESSURE (PSID)							
	500	1000	1500	2000	2500	3000	3500	4000
.5	1297 4	2699 3	4128 1	5584 1				
1	1329 10	2741 8	4176 7	5630 5	7084 4	8551 2	10036 2	11496 1
2	1369 21	2832 19	4308 17	5787 15	7265 13	8718 11	10136 9	11534 8
3	1366 32	2838 30	4326 27	5817 25	7301 22	8781 20	10248 17	11685 14
4	1368 43	2858 40	4358 38	5861 35	7358 32	8850 29	10317 25	11748 22
5	1355 54	2858 51	4368 48	5880 45	7386 42	8880 38	10352 34	11791 30
7	1323 76	2840 73	4363 69	5888 65	7407 61	8908 57	10384 53	11829 47
9	1266 98	2791 94	4326 90	5856 85	7376 81	8884 76	10372 71	11834 64
12	1177 131	2698 127	4230 121	5759 116	7273 110	8773 105	10261 98	11726 90
15	1075 165	2594 159	4127 153	5654 146	7170 140	8670 134	10153 126	11613 116
20	833 221	2372 214	3915 205	5463 197	7008 189	8533 182	10026 173	11479 161
25	678 277	2142 269	3663 259	5189 248	6726 239	8257 230	9757 219	11219 209

Flow (GPM)

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

TGK 0360

360 cm³ / rev (22.2 in³ / rev)

PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
.5	1386 4	2883 3	4410 1	5965 1				
1	1420 9	2928 7	4461 7	6014 5	7567 4	9135 2	10721 2	12281 1
2	1462 20	3025 18	4602 16	6182 14	7761 12	9313 10	10828 8	12321 7
3	1459 30	3031 28	4621 25	6214 23	7799 21	9380 19	10947 16	12482 13
4	1461 40	3053 37	4655 36	6261 33	7884 30	9454 27	11021 23	12550 21
5	1447 51	3053 48	4666 45	6281 42	7890 39	9486 36	11059 32	12596 28
7	1413 71	3034 68	4661 65	6290 61	7913 57	9516 53	11093 50	12636 44
9	1352 92	2981 88	4621 84	6256 80	7879 76	9490 71	11080 66	12642 60
12	1257 123	2882 119	4519 113	6152 109	7769 103	9372 98	10961 92	12526 84
15	1148 154	2771 149	4409 143	6040 137	7659 131	9262 125	10846 118	12406 109
20	890 207	2534 200	4182 192	5836 184	7486 177	9115 170	10710 162	12262 151
25	724 259	2288 252	3913 242	5543 232	7185 224	8821 215	10423 205	11985 196

Flow (GPM)

TORQUE (LB IN) 8821
 SPEED (RPM) 215

TGK 0405

405 cm³ / rev (24.7 in³ / rev)

PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
.5	1544 4	3178 3	4840 2	6515 1	8185 1			
1	1593 8	3256 7	4928 6	6607 6	8303 5	9987 4	11652 3	
2	1636 17	3351 16	5084 15	6817 14	8550 13	10272 12	11978 11	13575 10
3	1637 27	3365 25	5106 23	6847 22	8588 21	10314 19	12031 18	13674 16
4	1645 36	3394 34	5159 32	6920 30	8668 29	10402 27	12130 26	13858 24
5	1640 45	3408 43	5201 41	6983 39	8733 37	10466 35	12194 33	13989 31
7	1606 64	3396 61	5211 59	7003 56	8772 54	10527 51	12271 49	14306 46
9	1551 82	3350 80	5176 77	6981 73	8763 70	10519 67	12269 64	14077 61
12	1428 110	3238 107	5075 103	6888 99	8670 95	10424 91	12172 88	14015 84
15	1310 138	3112 135	4948 130	6759 125	8545 120	10306 115	12060 111	13910 106
20	1136 185	2862 181	4692 175	6518 168	8336 162	10122 156	11877 151	13717 145
25			4492 219	6303 212	8084 204	9848 197	11585 190	13408 184

Flow (GPM)

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TGK 0475

477 cm³ / rev (29.1 in³ / rev)

	PRESSURE (PSID)								
	500	1000	1500	2000	2500	3000	3500	4000	
.5	1768 3	3732 3	5733 2	7744 1	9762 1				
1	1868 7	3878 7	5879 6	7851 5	9838 4	11830 3			
2	1964 15	4055 14	6180 14	8237 12	10241 10	12136 8	14283 5	16325 2	
3	1972 23	4074 22	6208 21	8321 19	10379 17	12355 13	14513 9	16597 4	
4	2005 31	4135 30	6287 29	8382 27	10463 24	12496 20	14648 15	16749 9	
5	2004 39	4129 38	6304 37	8428 34	10514 31	12544 26	14719 20	16832 13	
7	1990 55	4133 54	6308 52	8445 50	10555 45	12602 40	14795 32	16913 23	
9	1924 70	4104 69	6285 68	8430 65	10528 60	12608 54	14797 45	16935 35	
12	1775 94	3974 93	6157 91	8328 87	10446 82	12528 75	14736 65	16890 54	
15	1619 118	3784 116	5990 114	8188 110	10311 104	12372 96	14598 85	16757 72	
20	1314 157	3373 156	5629 153	7853 149	10038 141	12145 132	14363 119	16545 102	
25	1141 197	3029 196	5220 193	7427 189	9629 182	11757 174	13876 163	16021 151	
30	606 237	2505 236	4649 233	6766 230	8878 224	10989 219	13047 212	15138 204	

Flow (GPM)

TORQUE (LB IN) 6766
 SPEED (RPM) 230

TGK 0530

528 cm³ / rev (32.2 in³ / rev)

	PRESSURE (PSID)								
	500	1000	1500	2000	2500	3000	3250	3750	
.5	2080 3	4256 3	6479 2	8726 2	11012 1				
1	2158 7	4372 6	6592 6	8779 5	10994 4				
2	2246 14	4567 13	6869 12	9126 11	11376 9				
3	2242 21	4578 20	6916 19	9237 17	11500 14	13847 12	15006 10	17323 7	
4	2253 28	4625 27	6977 25	9296 23	11586 20	13949 17	15115 15	17449 11	
5	2235 35	4629 34	7002 32	9333 29	11626 26	14011 22	15185 20	17534 15	
7	2182 49	4599 48	7006 46	9362 42	11659 38	14077 33	15263 30	17634 23	
9	2095 63	4535 62	6960 59	9330 55	11650 50	14086 43	15281 39	17671 30	
12	1943 85	4390 83	6825 80	9217 75	11549 69	13997 62	15198 57	17602 46	
15	1753 106	4199 104	6638 100	9052 95	11408 87	13859 79	15067 74	17483 63	
20	1327 141	3783 139	6262 135	8701 129	11086 120	13563 110	14784 104	17228 90	
25	1011 177	3300 175	5751 171	8210 165	10639 158	13032 149	14240 144	16656 132	
30	269 213	2698 211	5083 208	7415 203	9814 197	12198 188	13388 183	15769 173	

Flow (GPM)

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

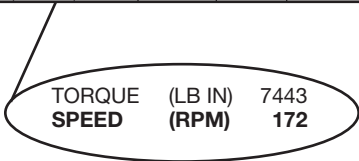
Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TGK 0625

623 cm³ / rev (38.0 in³ / rev)

	PRESSURE (PSID)							
	500	1000	1500	1750	2000	2500	2750	3250
.5	1939 2	4593 1						
1	2087 5	4665 3	7283 2	8680 2				
2	2338 11	4991 9	7590 8	8853 7				
3	2386 17	5101 15	7753 13	9055 12	10383 11	13039 7	14367 5	17022 1
4	2457 23	5202 21	7872 19	9174 17	10487 15	13147 11	14477 9	17137 4
5	2479 29	5246 27	7943 25	9242 23	10551 21	13221 15	14557 12	17227 5
7	2464 41	5273 39	7995 36	9306 34	10605 31	13292 24	14636 20	17324 11
9	2401 53	5223 51	7993 48	9337 45	10653 42	13382 36	14747 33	17476 26
12	2254 71	5092 69	7886 65	9239 62	10585 58	13345 49	14725 44	17484 33
15	2052 89	4901 87	7721 83	9086 80	10439 75	13219 64	14608 57	17387 42
20	1600 120	4490 117	7334 112	8725 109	10088 104	12900 92	14305 86	17117 72
25	1063 151	3933 148	6818 144	8235 140	9634 136	12484 125	13909 118	16758 103
30	359 182	3250 180	6074 176	7443 172	8830 168	11636 162	13039 158	15845 151

Flow (GPM)



TGK 0785

786 cm³ / rev (48.0 in³ / rev)

	PRESSURE (PSID)					
	500	1000	1500	2000	2200	2700
.5	2910 2	6153 2	9607 1	12950 1		
1	3011 4	6296 4	9670 3	12919 3		
2	3217 9	6536 8	9935 7	13060 6		
3	3220 14	6613 13	9977 11	13079 9	14481 8	17775 5
4	3265 19	6679 17	10021 15	13078 13	14489 12	17767 9
5	3263 23	6703 22	10047 19	13103 16	14523 15	17810 12
7	3218 33	6722 31	10068 28	13062 24	14514 22	17802 17
9	3107 43	6664 41	10108 36	13185 31	14665 28	18033 21
12	2892 57	6489 55	9959 49	13082 42	14573 38	17977 29
15	2643 71	6238 69	9733 62	12938 54	14420 50	17858 41
20	2044 95	5673 92	9239 85	12636 75	14113 70	17647 58
25	2313 119	4976 117	8571 110	12073 101	13490 97	17021 86
30	496 143	4104 141	7582 137	11024 130	12463 127	15969 120

Flow (GPM)

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

TGK 0960

959 cm³ / rev (58.5 in³ / rev)

	PRESSURE (PSID)				
	500	1000	1500	1800	2300
.5	3692 2	7712 1	11750 1		
1	3788 3	7858 3	11895 3		
2	3900 7	8045 7	12058 6		
3	3905 11	8078 11	12135 10	14623 9	18738 7
4	3939 15	8155 14	12210 13	14718 12	18854 10
5	3923 19	8173 18	12238 17	14763 16	18921 14
7	3860 27	8160 26	12262 24	14816 22	19017 19
9	3733 35	8074 34	12224 31	14803 28	19049 23
12	3475 47	7848 45	12062 42	14665 39	18958 33
15	3149 58	7545 57	11823 53	14445 50	18782 45
20	2437 78	6843 76	11227 72	13854 68	18234 62
25	2969 98	5990 96	10360 92	12921 88	17226 80
30	603 118	4919 117	9170 113	11751 109	16034 102

Flow (GPM)

TORQUE (LB IN) 9170
 SPEED (RPM) 113

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

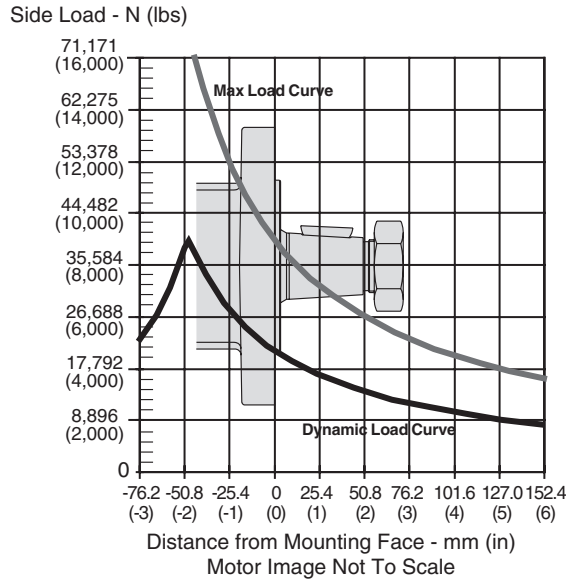
Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

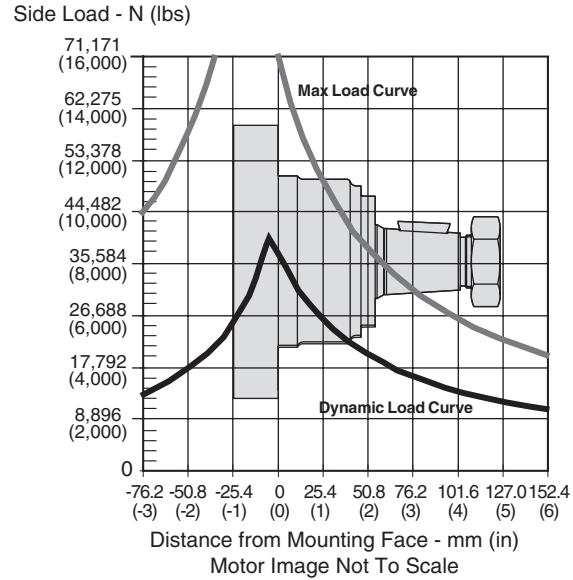
Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

Flange Mount / Standardgehäuse
Monture à bride(s) / Montaje de brida



The dynamic side load curve is based on uni-directional steady state loads for L_{10} bearing life at 3×10^6 revolutions. Die zulässige auslegbare radiale Wellenbelastungskurve ist unter ruhenden, einseitig statisch gerichteten Lastverhältnissen auf eine L_{10} Lebensdauer mit 3×10^6 Umdrehungen kalkuliert. La courbe de charge latérale permise se base sur des charges unidirectionnelles en régime permanent pour le roulement L_{10} à 3×10^6 révolutions. La curva de valores admisibles de carga lateral está basada en cargas constantes para cojinetes L_{10} a 3×10^6 revoluciones.

Wheel Mount / Radnabengehäuse
Monture à roue/ Montaje de rueda



The maximum load curve is defined by bearing static load capacity. This curve should not be exceeded at any time including shock loads. Die maximale radiale Wellenbelastungskurve ist definiert als maximale statische Last ohne Drehzahl. Sie gilt als Grenze und sollte keinesfalls überschritten werden. La courbe de charge maximale est définie par la capacité de charge statique portante. Cette courbe ne devrait être dépassée en aucun moment y compris pour les charges par à-coups. La curva de carga máxima queda definida por la capacidad de carga estática del cojinete. No se deben superar los valores de esta curva, ni siquiera con cargas provisorias de impacto.

Equation to Calculate the Expected Radial Bearing Life
Gleichung zur Ermittlung der Lagerlebensdauer

Equation to calculate the dynamic bearing life for a given load:
 Bestimmung der erlaubten radialen Wellenbelastung mit vorgegebener Last

Use F_a , F_b and S in equation to determine hours of L_{10} bearing life.
 Die Lebensdauer in Stunden ergibt sich durch einsetzen von F_a , F_b , und S in die nachstehende Formel.

$$L = \frac{3 \times 10^6}{60 \times S} \left\{ \frac{F_a}{F_b} \right\}^{3.33}$$

Where / Mit:

S = Shaft Speed RPM / Abtriebswellendrehzahl in min^{-1}

L = Life In Hours / Lebensdauer in Stunden

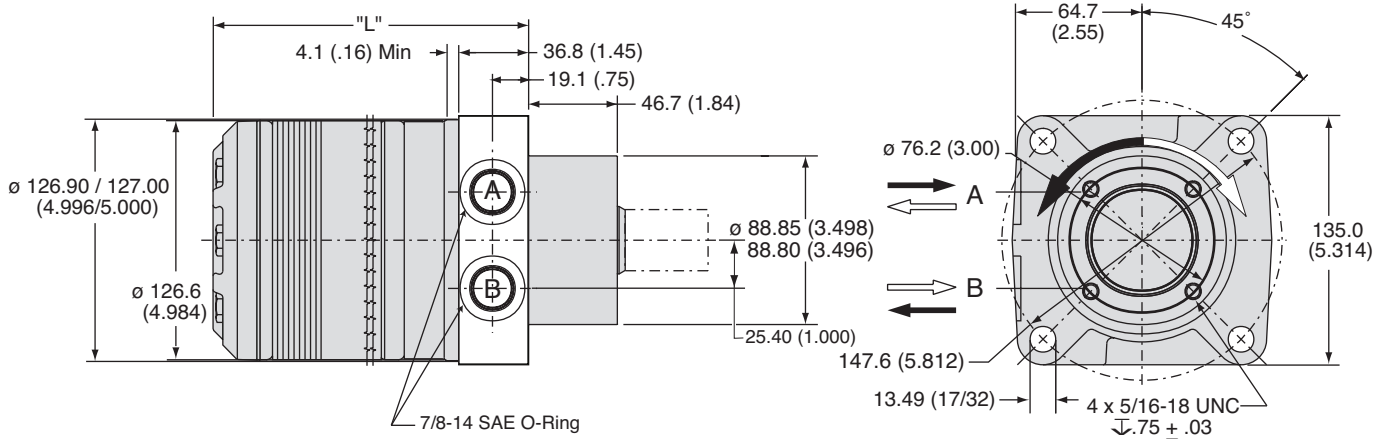
F_a = Dynamic side load defined by above curve at a distance from mounting flange. / Erlaubte radiale Wellenbelastung als Function der Laenge

F_b = Application side load. / Anwendungsseitige Wellenbelastung

Note: Calculations are based on L_{10} bearing life per ISO 281.
 Auslegung basiert auf einer L_{10} Lebensdauer nach ISO 281.

Code: LS

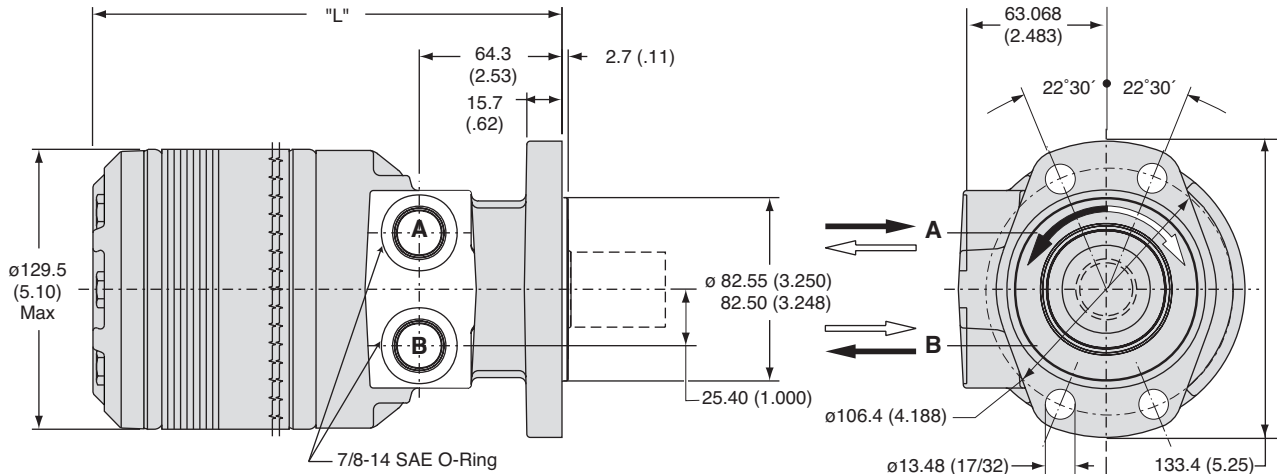
Wheel, Front Brake Nose, 7/8-14 SAE



Code LS	disp	0110	0140	0170	0195	0240	0280	0310	0335	0360	0405	0475	0530	0625	0785	0960
Weight/Gewicht kg		14.0	14.4	14.6	14.9	15.2	15.6	15.7	15.8	16.1	16.4	16.5	17.6	18.3	19.7	21.1
Poids/Peso (lb)		30.9	31.8	32.2	32.8	33.5	34.3	34.7	34.9	35.4	36.2	36.4	38.9	40.3	43.4	46.6
Length "L" mm		145	148	151	153	157	162	165	167	170	173	181	186	195	211	227
Length "L" (in)		5.71	5.83	5.93	6.04	6.19	6.36	6.48	6.58	6.71	6.83	7.11	7.31	7.66	8.30	8.95

Code: MS

Magneto, 7/8-14 SAE

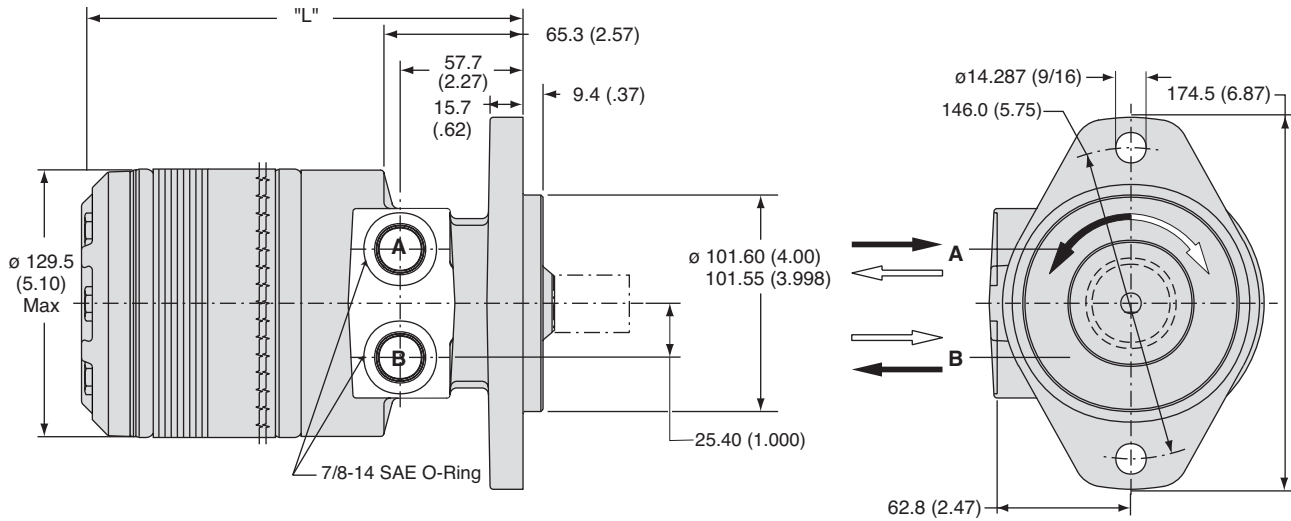


Code MS	disp	0110	0140	0170	0195	0240	0280	0310	0335	0360	0405	0475	0530	0625	0785	0960
Weight/Gewicht kg		13.7	14.1	14.3	14.5	14.8	15.2	15.4	15.5	15.8	16.1	16.6	17.3	18.0	19.8	20.8
Poids/Peso (lb)		30.1	31.0	31.5	32.0	32.7	33.5	33.9	34.2	34.8	35.4	36.7	38.1	39.6	43.6	45.9
Length "L" mm		190	193	196	199	202	207	210	212	216	219	226	231	240	256	273
Length "L" (in)		7.49	7.61	7.72	7.82	7.97	8.14	8.26	8.36	8.49	8.61	8.89	9.09	9.44	10.08	10.73

English equivalents for metric specifications are shown in ().

Code: BS

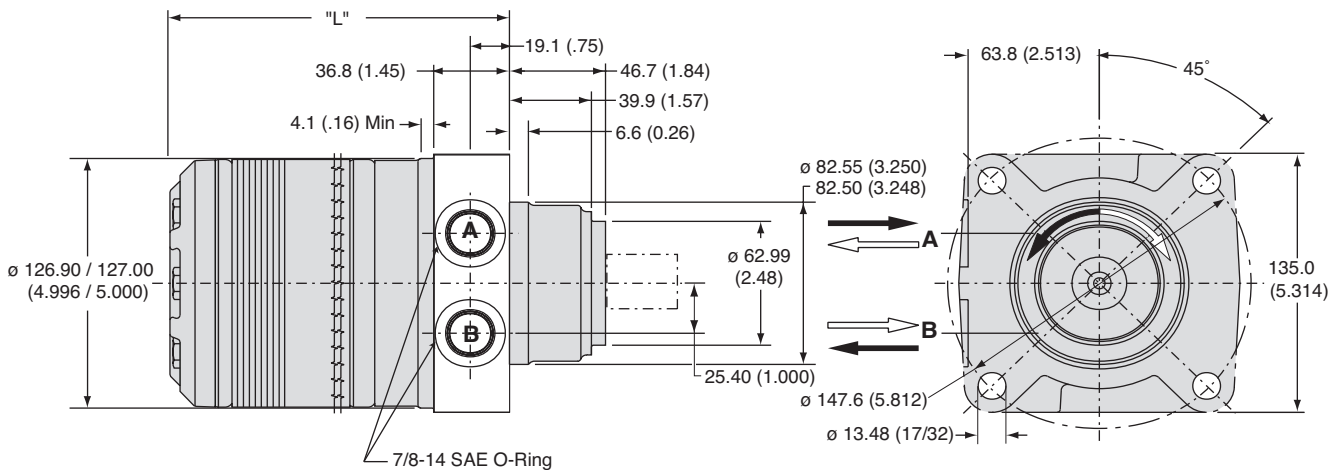
SAE B 2-Bolt, 7/8-14 SAE O-Ring



Code BS	disp	0110	0140	0170	0195	0240	0280	0310	0335	0360	0405	0475	0530	0625	0785	0960
Weight/Gewicht kg		14.3	14.7	14.9	15.1	15.5	15.8	16.0	16.1	16.4	16.7	17.3	17.9	18.6	20.0	21.5
Poids/Peso (lb)		31.5	32.4	32.9	33.4	34.1	34.9	35.3	35.6	36.2	36.8	38.1	39.5	41.0	44.0	47.3
Length "L" mm		190	193	196	199	202	207	210	212	216	219	226	231	240	256	273
Length "L" (in)		7.49	7.61	7.72	7.82	7.97	8.14	8.26	8.36	8.49	8.61	8.89	9.09	9.44	10.08	10.73

Code: US

Wheel, Standard, 7/8-14 SAE

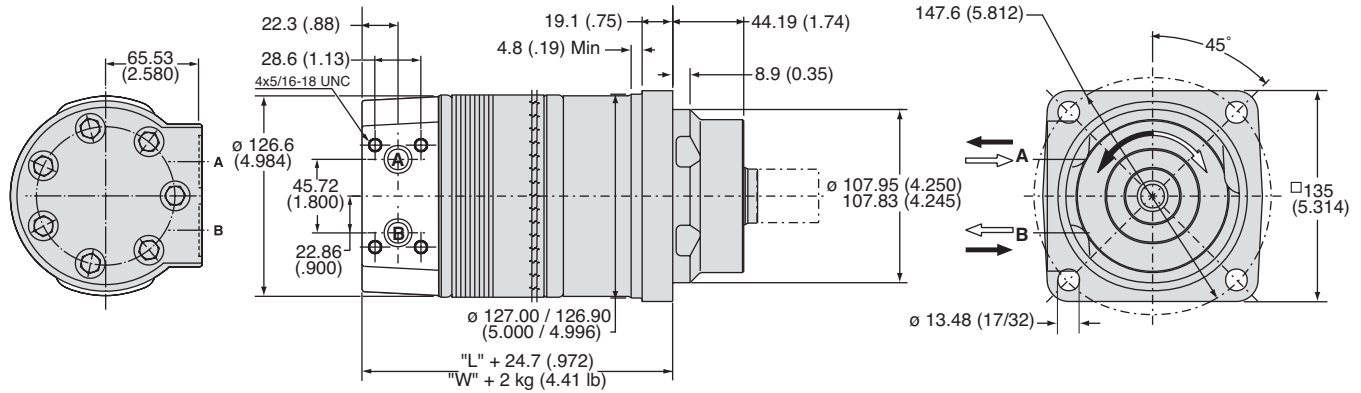


Code US	disp	0110	0140	0170	0195	0240	0280	0310	0335	0360	0405	0475	0530	0625	0785	0960
Weight/Gewicht kg		14.0	14.4	14.6	14.9	15.2	15.6	15.7	15.8	16.1	16.4	16.5	17.6	18.3	19.7	21.1
Poids/Peso (lb)		30.9	31.8	32.2	32.8	33.5	34.3	34.7	34.9	35.4	36.2	36.4	38.9	40.3	43.4	46.6
Length "L" mm		145	148	151	153	157	162	165	167	170	173	181	186	195	211	227
Length "L" (in)		5.71	5.83	5.93	6.04	6.19	6.36	6.48	6.58	6.71	6.83	7.11	7.31	7.66	8.30	8.95

English equivalents for metric specifications are shown in ().

Code: WE

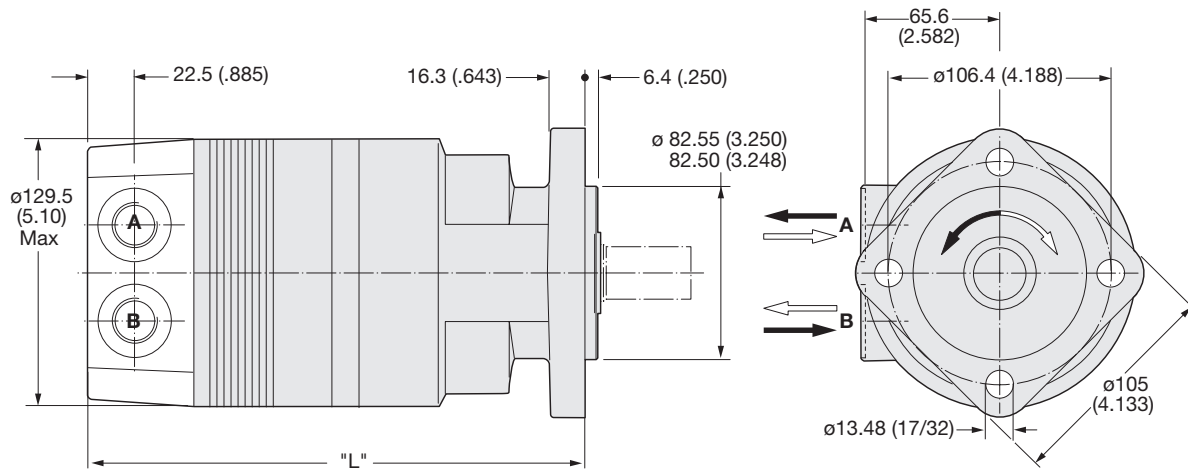
Wheel, Optional, Manifold Rear Port



Code WE	disp	0110	0140	0170	0195	0240	0280	0310	0335	0360	0405	0475	0530	0625	0785	0960
Weight/Gewicht	kg	17.0	17.4	17.6	17.8	18.1	18.5	18.7	18.8	19.1	19.4	19.6	20.6	21.3	22.6	24.1
Poids/Peso	(lb)	37.4	38.3	38.8	39.3	40.0	40.8	41.2	41.5	42.1	42.7	44.0	45.4	46.9	49.9	53.2
Length "L"	mm	172	175	178	182	186	190	193	196	199	202	209	214	223	240	256
Length "L"	(in)	6.78	6.90	7.00	7.16	7.32	7.49	7.61	7.71	7.84	7.96	8.23	8.43	8.79	9.43	10.08

Code: VB

SAE A 4-Bolt, 7/8-14 SAE Rear Port

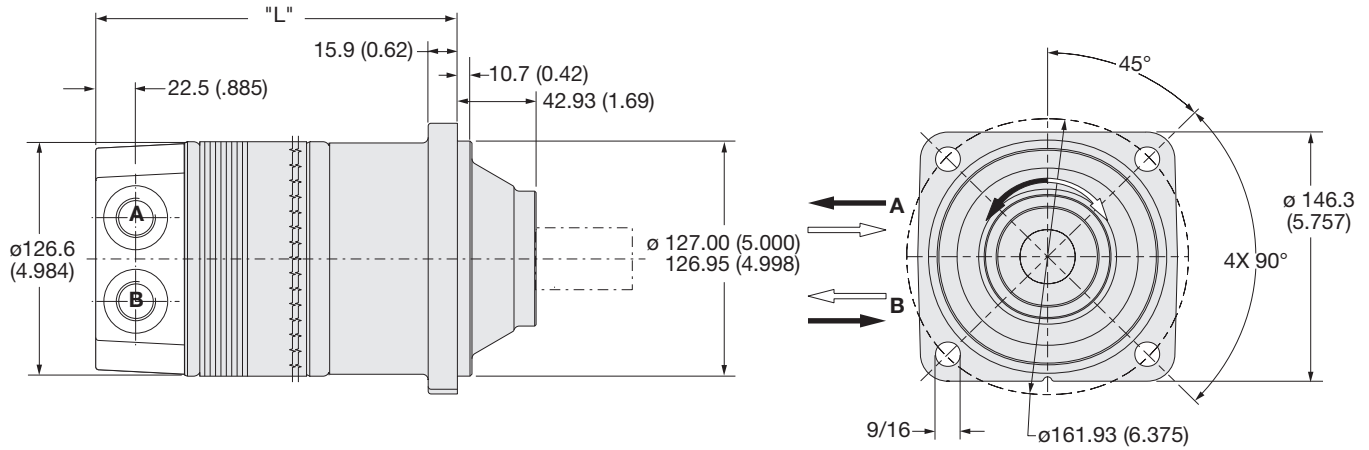


Code VB	disp	0110	0140	0170	0195	0240	0280	0310	0335	0360	0405	0475	0530	0625	0785	0960
Weight/Gewicht	kg	15.5	15.9	16.1	16.4	16.7	17.1	17.2	17.4	17.8	18.1	18.5	19.2	19.4	21.1	22.6
Poids/Peso	(lb)	34.2	35.1	35.4	36.1	36.8	37.7	38.0	38.3	39.2	40.0	40.7	42.3	43.7	46.6	49.8
Length "L"	mm	211	214	214	220	224	228	231	233	237	240	247	252	261	277	294
Length "L"	(in)	8.32	8.44	8.42	8.65	8.81	8.97	9.09	9.19	9.32	9.44	9.72	9.92	10.28	10.92	11.57

English equivalents for metric specifications are shown in ().

Code: DB

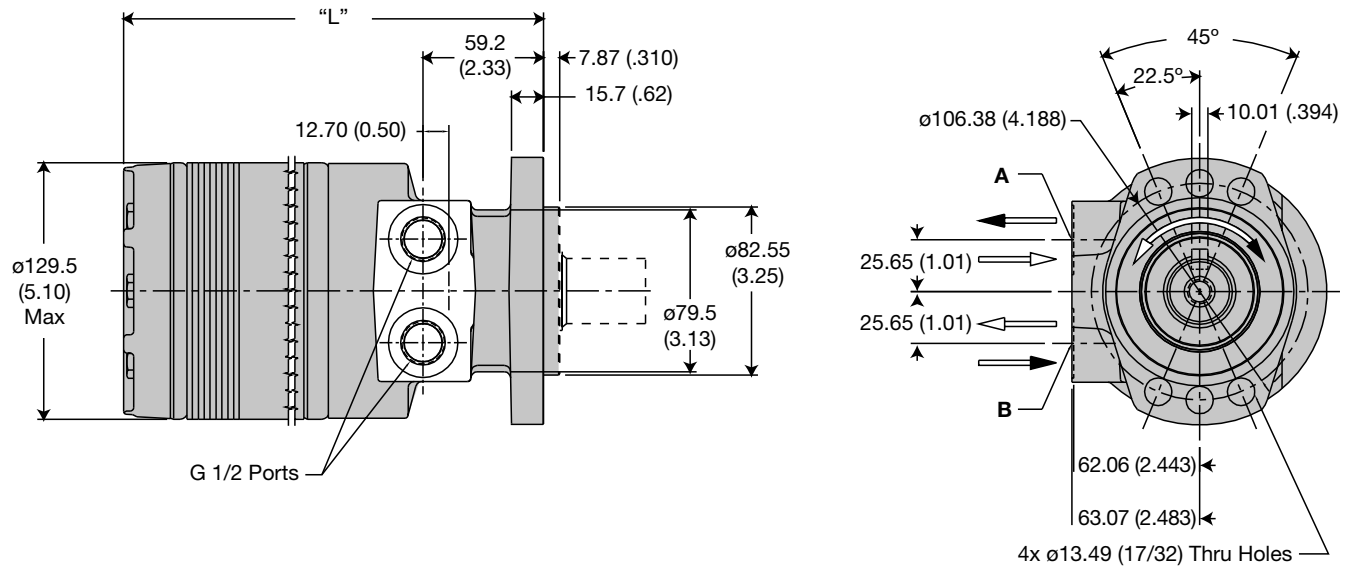
Large Wheel Mount, 7/8-14 SAE Rear Port



Code DB	disp	0110	0140	0170	0195	0240	0280	0310	0335	0360	0405	0475	0530	0625	0785	0960
Weight/Gewicht kg		17.0	17.4	17.6	17.8	18.1	18.5	18.7	18.8	19.1	19.4	19.6	20.6	21.3	22.6	24.1
Poids/Peso (lb)		37.4	38.3	38.8	39.3	40.0	40.8	41.2	41.5	42.1	42.7	44.0	45.4	46.9	49.9	53.2
Length "L" mm		172	175	178	182	186	190	193	196	199	202	209	214	223	240	256
Length "L" (in)		6.78	6.90	7.00	7.16	7.32	7.49	7.61	7.71	7.84	7.96	8.23	8.43	8.79	9.43	10.08

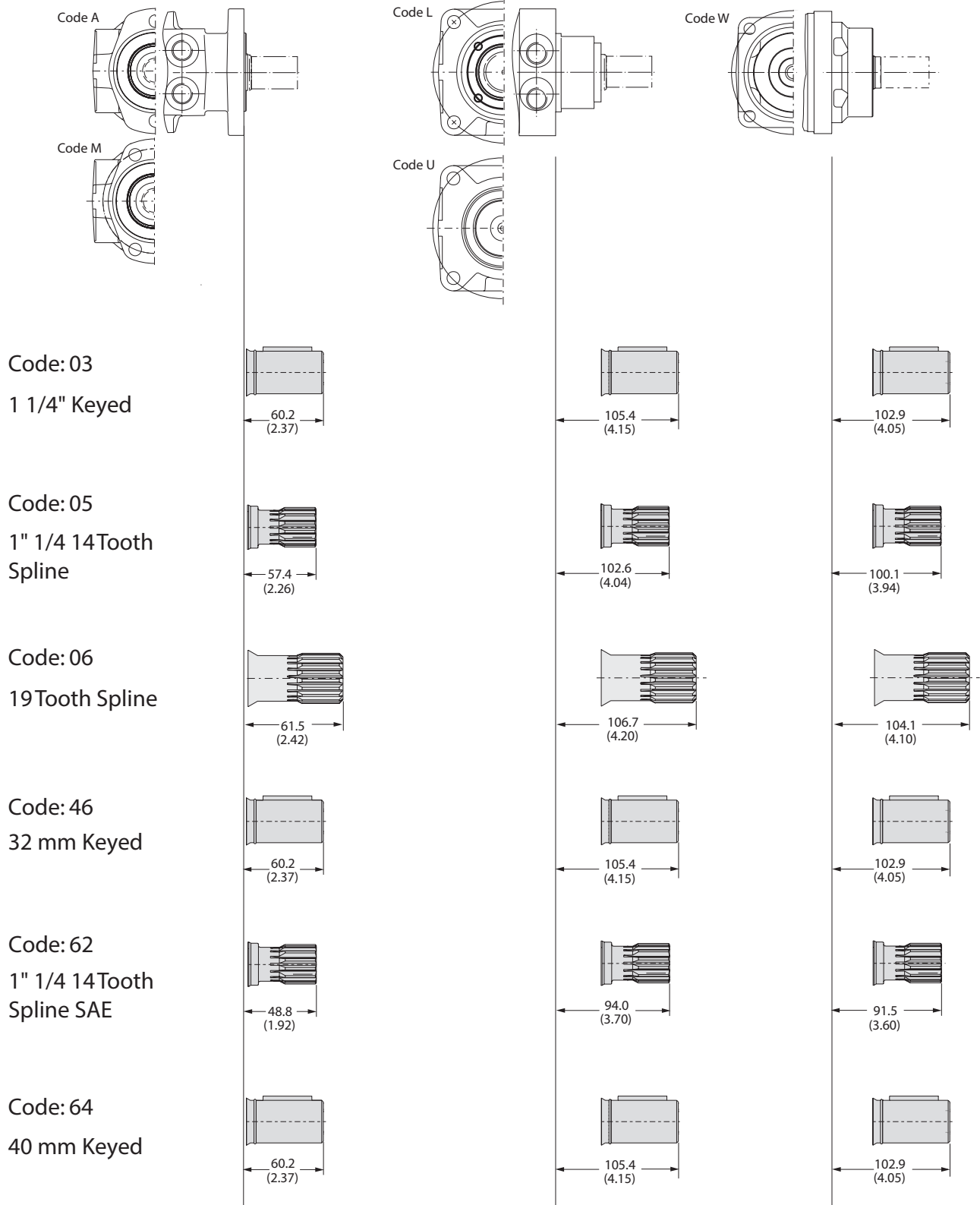
Code: EW

Modified SAE A 6-Bolg, G1/2 BSPP



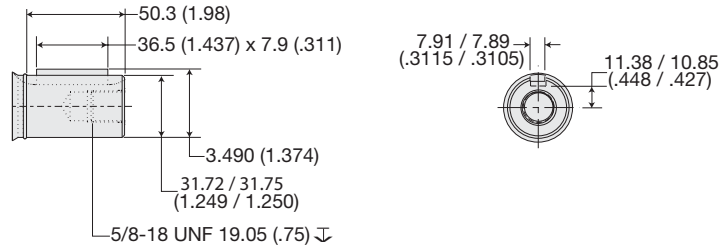
Code DB	disp	0110	0140	0170	0195	0240	0280	0310	0335	0360	0405	0475	0530	0625	0785	0960
Weight/Gewicht kg		13.7	14.1	14.3	14.5	14.8	15.2	15.4	15.5	15.8	16.1	16.6	17.3	18.0	19.8	20.8
Poids/Peso (lb)		30.1	31.0	31.5	32.0	32.7	33.5	33.9	34.2	34.8	35.4	36.7	38.1	39.6	43.6	45.9
Length "L" mm		190	193	196	199	202	207	210	212	216	219	226	231	240	256	273
Length "L" (in)		7.49	7.61	7.72	7.82	7.97	8.14	8.26	8.36	8.49	8.61	8.89	9.09	9.44	10.08	10.73

English equivalents for metric specifications are shown in ().

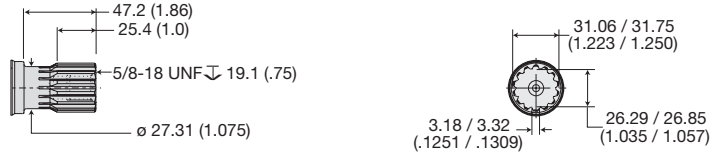


English equivalents for metric specifications are shown in ().

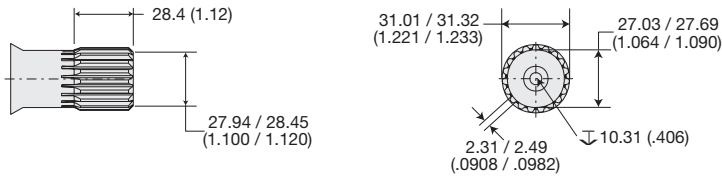
Code: 03
1 1/4" Keyed



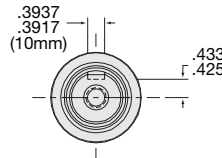
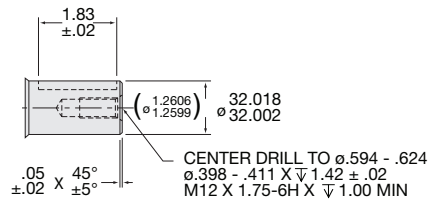
Code: 05
1" 1/4 14 Tooth Spline



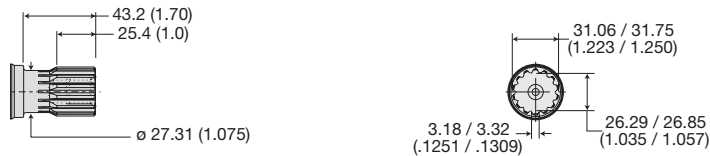
Code: 06
19 Tooth Spline



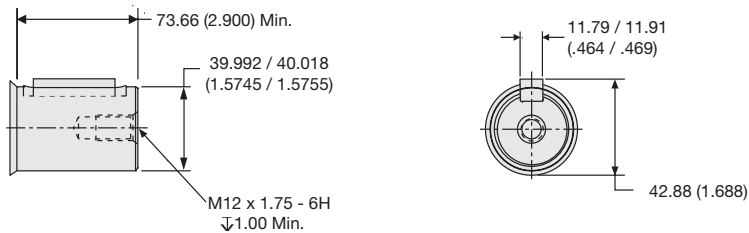
Code: 46
32 mm Keyed



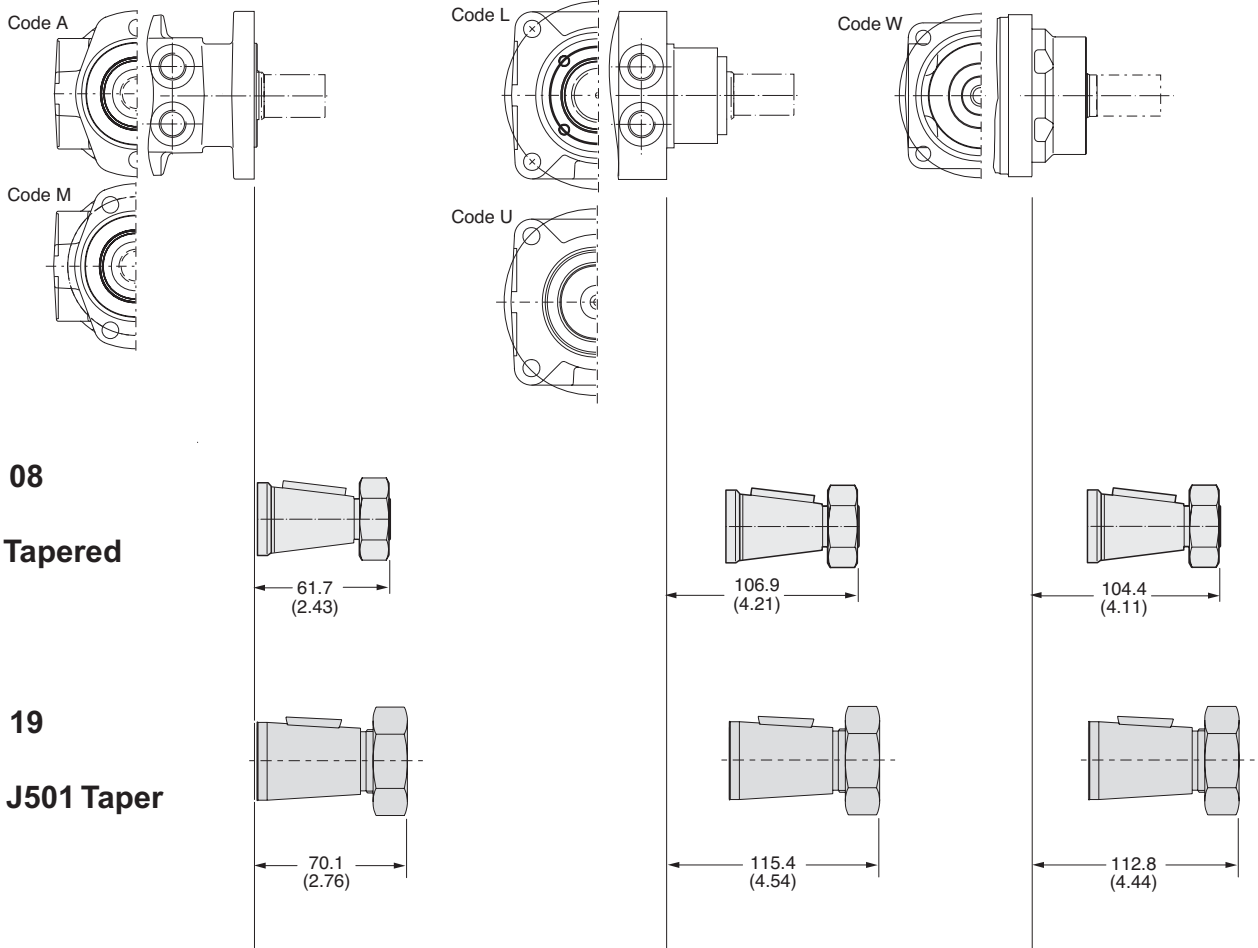
Code: 62
1" 1/4 14 Tooth Spline SAE



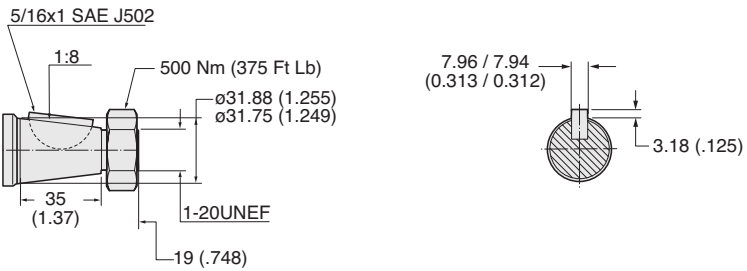
Code: 64
40 mm Keyed



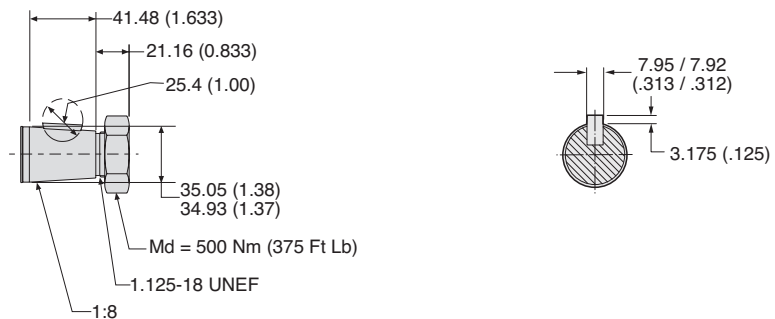
English equivalents for metric specifications are shown in ().



Code: 08
1 1/4" Tapered



Code: 19
1 3/8" J501 Taper



English equivalents for metric specifications are shown in ().

Offer of Sale

The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, Hydraulics Group, and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

1. Terms and Conditions. Seller's willingness to offer Products, or accept an order for Products, to or from Buyer is expressly conditioned on Buyer's assent to these Terms and Conditions and to the terms and conditions found on-line at www.parker.com/saleterms/. Seller objects to any contrary or additional term or condition of Buyer's order or any other document issued by Buyer.

2. Price Adjustments; Payments. Prices stated on the reverse side or preceding pages of this document are valid for 30 days. After 30 days, Seller may change prices to reflect any increase in its costs resulting from state, federal or local legislation, price increases from its suppliers, or any change in the rate, charge, or classification of any carrier. The prices stated on the reverse or preceding pages of this document do not include any sales, use, or other taxes unless so stated specifically. Unless otherwise specified by Seller, all prices are F.O.B. Seller's facility, and payment is due 30 days from the date of invoice. After 30 days, Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.

3. Delivery Dates; Title and Risk; Shipment. All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon tender to the carrier at Seller's facility (i.e., when it's on the truck, it's yours). Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's changes in shipping, product specifications or in accordance with Section 13, herein.

4. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of eighteen (18) months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

5. Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 60 days after delivery or, in the case of an alleged breach of warranty, within 30 days after the date within the warranty period on which the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for any amount due to Seller from Buyer) must be commenced within thirteen months from the date of tender of delivery by Seller or, for a cause of action based upon an alleged breach of warranty, within thirteen months from the date within the warranty period on which the defect is or should have been discovered by Buyer.

6. LIMITATION OF LIABILITY. UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.

7. Contingencies. Seller shall not be liable for any default or delay in performance if caused by circumstances beyond the reasonable control of Seller.

8. User Responsibility. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

9. Loss to Buyer's Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

10. Special Tooling. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

11. Buyer's Obligation; Rights of Seller. To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.

12. Improper use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

13. Cancellations and Changes. Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.

14. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

15. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

16. Waiver and Severability. Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

17. Termination. This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (c) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (d) an assignment for the benefit of creditors, or (e) the dissolution or liquidation of the Buyer.

18. Governing Law. This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.

19. Indemnity for Infringement of Intellectual Property Rights. Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

20. Taxes. Unless otherwise indicated, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of Products.

21. Equal Opportunity Clause. For the performance of government contracts and where dollar value of the Products exceed \$10,000, the equal employment opportunity clauses in Executive Order 11246, EVVRAA, and 41 C.F.R. §§ 60-1.4(a), 60-741.5(a), and 60-250.4, are hereby incorporated.

Parker Hydraulics International Sales Offices

North America

Hydraulics Group Headquarters
6035 Parkland Boulevard
Cleveland, OH 44124-4141 USA
Tel: 216-896-3000
Fax: 216-896-4031

Parker Hannifin Canada Division
160 Chisholm Drive Milton
Ontario, Canada L9T 3G9
Tel: 905-693-3000
Fax: 905-876-1958

Mexico

Parker Hannifin de México
Industrial Hydraulic Sales
Eje Uno Norte No. 100
Parque Industrial Toluca 2000
Toluca, Edo. de Mexico CP 50100
Tel: 52 72 2275 4200
Fax: 52 72 2279 9308

Parker Hannifin de México
Mobile Hydraulic Sales
Via de FFCC a Matamoros 730
Apodaca, NL CP de Mexico 66600
Tel: 52 81 8156 6000
Fax: 52 81 8156 6068

Europe

Hydraulics Group Headquarters
La Tuillière 6
1163 Etoy - Switzerland
Tel: 41 21 821 8500
Fax: 41 21 821 8580

South Africa

Parker Hannifin Africa Pty Ltd
P.O. Box 1153
ZA-Kempton Park 1620,
Republic of South Africa
Tel: 27 11 961 0700
Fax: 27 11 392 7213

Mobile Sales

**Mobile Sales Organization
and Global Sales**
850 Arthur Avenue
Elk Grove Village, IL 60007 USA
Tel: 847-258-6200
Fax: 847-258-6299

Industrial Sales

Central Region
1042 Maple Avenue
Unit 331
Lisle, IL 60532 USA
Tel: 630-964-0796

Great Lakes Region
6035 Parkland Boulevard
Cleveland, OH 44124-4141 USA
Tel: 216-896-2740
Fax: 866-498-7507

Gulf Region
20002 Standing Cypress Drive
Spring, TX 77379 USA
Tel: 817-473-4431
Fax: 888-227-9454

Southwest Region
700 S. 4th Avenue
Mansfield, TX 76063 USA
Tel: 817-473-4431
Fax: 888-227-9454

**Mid Atlantic & Southeast
Regions**
1225 Old Alpharetta Rd
Suite 290
Alpharetta, GA 30005 USA
Tel: 770-619-9767
Fax: 770-619-9806

Midwest Region
8145 Lewis Road
Minneapolis, MN 55427 USA
Tel: 763-513-3535
Fax: 763-544-3418

Northeast Region
P.O. Box 396
Pine Brook, NJ 07058 USA
Tel: 973-227-2565
Fax: 973-227-2467

Northwest Region
6458 North Basin Avenue
Portland, OR 97217 USA
Tel: 503-283-1020
Fax: 866-611-7308

Pacific Region
8460 Kass Drive
Buena Park, CA 90621 USA
Tel: 714-228-2509
Fax: 714-228-2511

Asia Pacific

Parker Hannifin Shanghai Ltd.
280 Yunqiao Road,
Jin Qiao Export Processing Zone
Shanghai 201206, China
Tel: 86 21 2899 5000
Fax: 86 21 6445 9717

Parker Hannifin Hong Kong Ltd.
8/F, Kin Yip Plaza
9 Cheung Yee Street
Cheung Sha Wan, Hong Kong
Tel: 852 2428 8008
Fax: 852 2480 4256

Parker Hannifin Korea Ltd.
9F KAMCO Yangjae Tower
949-3 Dogok1-dong, Gangnam-gu
Seoul, 135-860, Korea
Tel: 82 2 559 0400
Fax: 82 2 556 8187

Parker Hannifin India Pvt Ltd.
Plot No. EL-26, MIDC,
TTC Industrial Area
Mahape, Navi Mumbai, 400 709, India
Tel: 91 22 6513 7081
Fax: 91 22 2768 6841

Parker Hannifin Australia
Parker Hannifin Pty Ltd.
9 Carrington Road
Castle Hill, NSW 2154, Australia
Tel: 612 9634 7777
Fax: 612 9842 5111

Latin America

**Parker Hannifin Ind. e Com. Ltda
Hydraulics Division**
Av. Frederico Ritter, 1100
94930-000 Cachoeirinha RS, Brazil
Tel: 55 51 3470 6090
Fax: 55 51 3470 9281

Parker Hannifin Argentina S.A.I.C.
Stephenson 2711
1667-Tortuguitas-Malvinas Argentinas
Pcia. de Buenos Aires, Argentina
Tel: 54 3327 44 4129
Fax: 54 3327 44 4199

Pan American Division
7400 NW 19th Street, Suite A
Miami, FL 33126 USA
Tel: 305-470-8800
Fax: 305-470-8808

HY13-1505/US 5/2014



Parker Hannifin Corporation
Hydraulic Pump Motor Division
2745 Snapps Ferry Road
Greeneville, TN 37745
phone 423 639 8151
fax 423 787 2418
www.parker.com