

Hydraulic Motors

TYPICAL APPLICATIONS

Hydraulic motors manufactured by Lamina have a main shaft that can be readily adapted by use of chuck or collet to hold tools for rotary machining operations, such as drilling, boring, reaming and the like. The unusual small size of these motors makes them a natural choice for many applications.

- Chicken processing machinery
- Reactor repair
- Plastic Injection molding, thread core remover
- Oil pipeline inspection equipment
- Box sealing equipment
- Tool manipulator, undersea, oil well
- Camera manipulator, undersea
- Camera manipulator, nuclear reactor
- Drill and tap machine tool
- Gang (multiple) drilling, wood
- Electric motor coil winder
- Electrical discharge (E.D.M.) machines
- Plywood machines (brushes)
- Jumbo jet maintenance jacks
- C.N.C., D.N.C., T.C. tool changer drives
- Orange peeling machines
- Sewing machines, automatic XY control
- Diamond wheel dresser
- Milling, sawing applications
- Fan drives
- Agricultural applications
- Conveyor drives
- Automatic clamping
- Drill pointer machines
- Textile washing agitators
- Pipe valve openers
- Dynamite blast hole pump drive
- Index mechanism
- Hose reel retraction

PART NUMBER LEGEND

Motor/Mounting Style
See page 3 for examples

Shaft Style
See page 3 (optional suffix)

Ordering Example:

A25FMO-T-2AV

Gerotor Size
See pages 4-7 for more information

Flange Style
See this page for more information (optional suffix)

Material Options
See page 7 for more information (optional suffix)

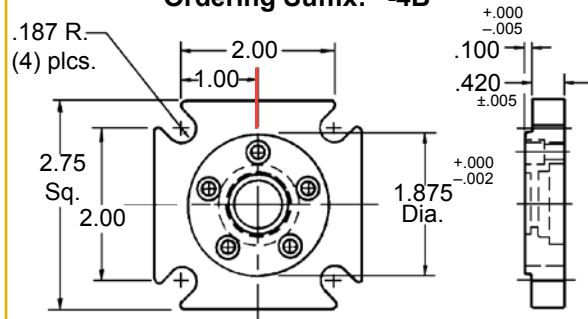
NOTE: FM style motors used with foot mounts are only available with Standard Round Flanges

FLANGE OPTIONS

SQUARE FLANGE

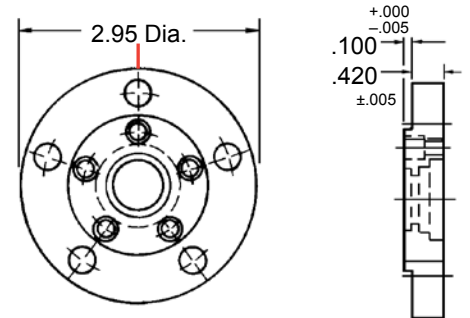
(USA4F17 style)

Ordering Suffix: "-4B"



ROUND FLANGE

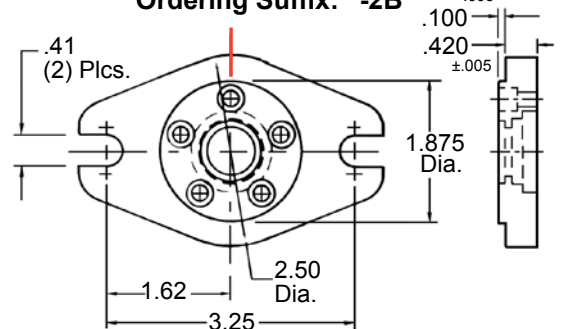
Standard Flange – No ordering suffix



OVAL FLANGE

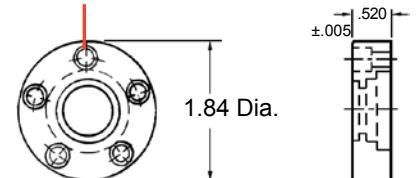
(SAE "AA" style)

Ordering Suffix: "-2B"



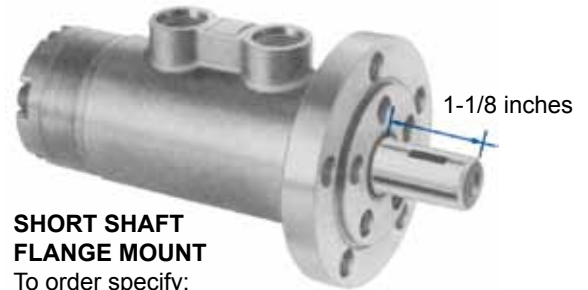
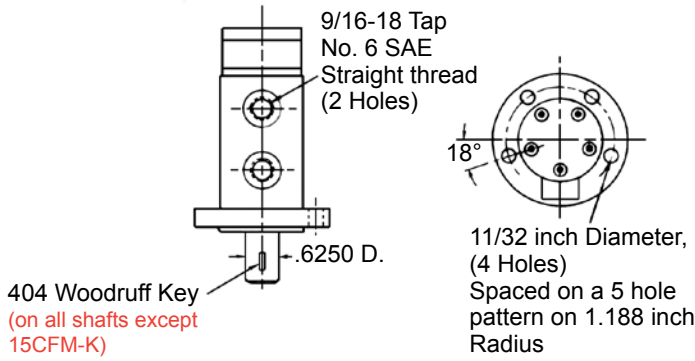
TURNDOWN FLANGE

Ordering Suffix "-T"



All flange styles are available in aluminum.
The port locations are identified by the red lines.

(All dimensions are in inches and are for reference only)

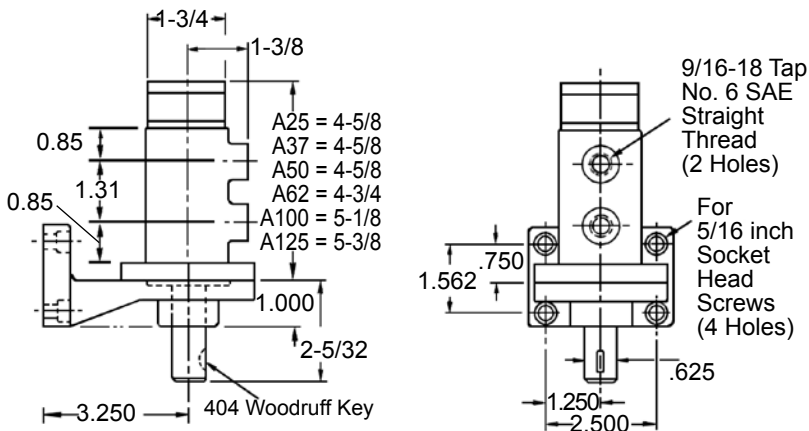
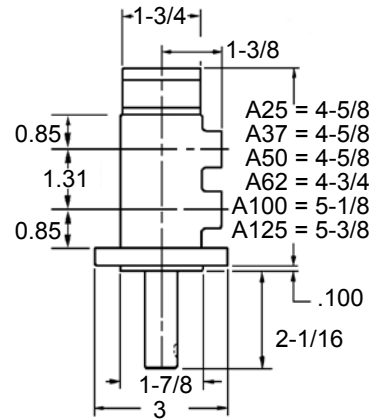


**SHORT SHAFT
FLANGE MOUNT**
To order specify:
A25F, A37F, A50F,
A62F, A100F, A125F



**LONG SHAFT
FLANGE MOUNT**
To order specify:
A25FMO, A37FMO,
A50FMO, A62FMO,
A100FMO, A125FMO

For direct bolt mounting, the motor flange has four thru-holes evenly spaced on a five-hole pattern. The smallest "A" type motor measures only 4-5/8 inches from face of mounting flange to end of motor. Other motors are of similar ultra-compact design.



**PEDESTAL
FOOT MOUNT**
To order specify:
A25FM, A37FM,
A50FM, A62FM,
A100FM, A125FM



All dimensions are shown in inches and are for reference only.

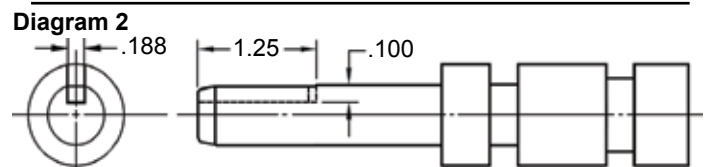
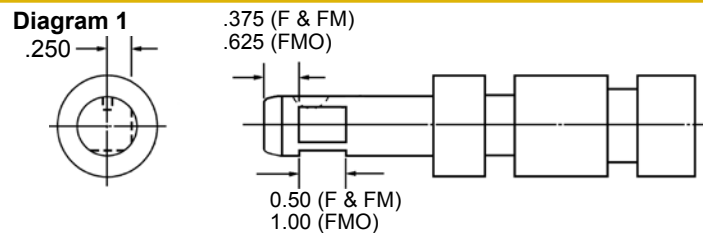
Shaft Options (Standard shaft has no ordering suffix.)

2 Flats on Shaft (Specify Suffix "-2") (Diagram 1)
Hydraulic motors are available with two machined flats.

Tapped Holes on Ends of Shaft (Specify Suffix "-DT")
Hydraulic motors are also available with 1/4-20 tapped holes on the end of the shaft that are 7/8 inches deep. (Drawing not shown.)

Optional Larger Key on Shaft (Specify Suffix "-K") (Diagram 2)
Available for long shaft (FMO) motors only.

Note: The above options are stocked items. Any combination of these options will require lead time.



TORQUE (Inch-pounds)

ORDER MOTOR BY SIZE WITH SUFFIX:

“F” Flange Mount Short Shaft

“FM” Pedestal Foot Mount

“FMO” Flange Mount Long Shaft

Lamina Hydraulic Motors have a “letter-number-letter” designation that indicates the type of motor, size of gerotor, and mounting method required. For example: a motor having a 1/2 inch gerotor, a standard round flange and a short shaft, would be indicated as A50F.

Order motors with optional features according to the following suffixes:

- “-T” Turned down flange
- “-2B” Oval Flange
- “-4B” Square Flange
- “-2” Two flats on shaft
- “-DT” Shaft end tapped
- “-K” Longer Key
- “-A” Aluminum body and flange
- “-V” with Viton seal

Refer to example on bottom of page 2.

When selecting your motor for a specific application, you must remember that the peak motor torque and RPM must be sufficient to meet the most severe demands of the application.

G P M	RPM and TORQUE	A25 MOTOR														
		PSI														
		100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
1	RPM TORQUE	314 6	298 17	282 27	265 37	249 47	233 58	216 68	200 78	184 88	168 98	151 109	135 119	119 129	103 139	86 149
2	RPM TORQUE	596 3	580 14	563 24	547 34	531 44	515 54	498 65	482 75	466 85	450 95	433 106	417 116	401 126	385 136	368 146
3	RPM TORQUE		862 11	845 21	829 31	813 41	797 51	780 62	764 72	748 82	732 92	715 102	699 113	683 123	667 133	650 143
4	RPM TORQUE		1144 8	1127 18	1111 28	1095 38	1079 48	1062 59	1046 69	1030 79	1014 89	997 99	981 110	965 120	948 130	932 140
5	RPM TORQUE		1426 4	1409 15	1393 25	1377 35	1361 45	1344 56	1328 66	1312 76	1295 86	1279 96	1263 107	1247 117	1230 127	1214 137
6	RPM TORQUE			1691 12	1675 22	1659 32	1642 42	1626 52	1610 63	1594 73	1577 83	1561 93	1545 104	1529 114	1512 124	1496 134
7	RPM TORQUE			1973 9	1957 19	1941 29	1924 39	1908 49	1892 60	1876 70	1859 80	1843 90	1827 100	1811 111	1794 121	1778 131
8	RPM TORQUE			2255 5	2239 16	2223 26	2206 36	2190 46	2174 57	2158 67	2141 77	2125 87	2109 97	2093 108	2076 118	2060 128

TORQUE (Inch-pounds)

G P M	RPM and TORQUE	A37 MOTOR														
		PSI														
		100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
1	RPM TORQUE	210 14	201 29	192 44	183 59	173 74	164 88	155 103	146 118	136 133	127 148	118 163	109 178	100 192	90 207	81 222
2	RPM TORQUE	410 9	401 24	392 39	383 53	373 68	364 83	355 98	346 113	337 128	327 143	318 157	309 172	300 187	290 202	281 217
3	RPM TORQUE	610 4	601 18	592 33	583 48	573 63	564 78	555 93	546 108	537 122	527 137	518 152	509 167	500 182	490 197	481 212
4	RPM TORQUE		801 13	792 28	783 43	773 58	764 73	755 87	746 102	737 117	727 132	718 147	709 162	700 177	690 192	681 206
5	RPM TORQUE			992 23	983 38	974 52	964 67	955 82	946 97	937 112	927 127	918 142	909 157	900 171	891 186	881 201
6	RPM TORQUE			1192 18	1183 32	1174 47	1164 62	1155 77	1146 92	1137 107	1127 122	1118 136	1109 151	1100 166	1091 181	1081 196
7	RPM TORQUE			1392 12	1383 27	1374 42	1364 57	1355 72	1346 87	1337 101	1327 116	1318 131	1309 146	1300 161	1291 176	1281 191
8	RPM TORQUE			1592 7	1583 22	1574 37	1564 52	1555 66	1546 81	1537 96	1528 111	1518 126	1509 141	1500 156	1491 170	1481 185

TORQUE (Inch-pounds)

G P M	RPM and TORQUE	A50 MOTOR														
		PSI														
		100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
1	RPM TORQUE	156 18	153 37	150 56	146 75	143 94	140 113	136 132	133 151	129 170	126 189	122 208	118 227	115 246	111 265	107 284
2	RPM TORQUE	306 15	302 34	299 52	296 71	292 90	289 109	285 128	282 147	278 166	275 185	271 205	267 224	264 243	260 262	256 281
3	RPM TORQUE	456 10	453 29	450 48	446 67	443 86	439 105	436 124	432 143	429 162	425 181	421 200	418 220	414 239	410 258	406 277
4	RPM TORQUE	608 5	605 24	601 43	598 62	595 81	591 100	588 119	584 138	580 157	577 177	573 196	569 215	566 234	562 253	558 272
5	RPM TORQUE		752 19	750 38	747 57	745 76	743 95	741 114	737 133	733 152	730 171	726 190	722 209	718 228	714 247	710 267
6	RPM TORQUE		902 12	901 31	900 50	898 69	895 88	892 107	890 127	888 146	884 165	880 184	877 203	873 222	869 242	865 261
7	RPM TORQUE		1057 5	1053 24	1050 43	1048 62	1047 81	1046 100	1044 120	1042 139	1040 158	1036 177	1032 196	1028 215	1024 235	1020 254
8	RPM TORQUE			1206 16	1205 35	1204 54	1203 74	1202 93	1200 112	1198 131	1196 150	1193 169	1189 188	1186 208	1182 227	1178 246

TORQUE (Inch-pounds)

G P M	RPM and TORQUE	A62 MOTOR														
		PSI														
		100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
1	RPM TORQUE	119 26	117 50	114 74	110 98	105 122	100 146	94 171	88 195	81 219	73 243	64 267	54 291	44 315	34 339	22 363
2	RPM TORQUE	236 22	233 46	230 70	227 95	222 119	217 143	211 167	204 191	197 215	188 239	180 263	170 287	160 311	149 335	137 360
3	RPM TORQUE	355 17	352 42	349 66	345 90	341 114	335 138	329 163	322 187	315 211	306 235	297 259	288 283	277 307	266 332	254 356
4	RPM TORQUE	476 12	474 36	471 60	467 84	462 109	456 133	450 157	443 181	435 206	427 230	418 254	408 278	397 302	386 327	374 351
5	RPM TORQUE	600 5	598 30	594 54	590 78	585 102	580 126	573 151	566 175	558 199	550 224	540 248	530 272	519 296	508 321	495 345
6	RPM TORQUE		724 22	721 46	717 70	712 95	706 119	699 143	692 168	684 192	675 216	666 241	655 265	644 290	632 314	620 338
7	RPM TORQUE		854 13	850 37	846 62	841 86	835 110	828 135	821 159	813 184	804 208	794 233	783 257	772 281	760 306	747 330
8	RPM TORQUE			982 27	978 52	973 76	967 101	960 125	952 150	944 174	935 199	925 223	914 248	902 272	890 297	877 321

The operational characteristics of various hydraulic motors are given in the tables to permit easy and quick selection of proper motor for each application. For accurate selection be certain to measure PSI across the motor. This will eliminate any error due to hydraulic system losses.

To order motor with a 2-1/6 inch shaft, order as FMO suffix (foot motor only).

TORQUE (Inch-pounds)

G P M	RPM and TORQUE	A100 MOTOR														
		PSI														
		100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
1	RPM TORQUE	80 38	76 78	71 117	66 156	59 195	52 233	45 272	37 310	28 348	19 386	9 423				
2	RPM TORQUE	151 35	147 74	142 114	136 153	129 192	122 231	115 269	106 308	98 346	88 384	78 422	67 459	56 496	44 534	31 570
3	RPM TORQUE	223 30	219 70	214 109	208 148	201 187	194 226	186 265	178 304	168 342	159 380	148 418	137 456	126 494	113 531	100 568
4	RPM TORQUE	297 23	293 63	287 103	281 142	275 181	267 220	259 259	250 298	241 337	231 375	220 413	209 451	197 489	185 527	171 564
5	RPM TORQUE	373 15	368 55	363 94	357 134	350 173	342 213	334 252	325 291	316 330	305 368	294 407	283 445	270 483	258 521	244 559
6	RPM TORQUE		446 44	440 84	434 124	427 163	419 203	411 242	402 282	392 321	381 360	370 398	358 437	346 476	332 514	319 552
7	RPM TORQUE		522 32	520 72	514 112	507 151	499 191	490 231	480 270	470 310	459 349	448 388	436 427	423 466	409 504	395 543
8	RPM TORQUE		595 17	590 57	582 97	576 137	570 177	564 217	558 257	551 296	540 336	528 375	515 415	502 454	488 493	474 532

From the tables you can determine what is required of the hydraulic system (GPM & PSI) if you know the motor torque and RPM required by the application. Also, if you know the GPM and PSI delivered to the motor by the hydraulic system, you can quickly select the right motor to deliver the torque and RPM required.

CALCULATING HORSEPOWER

$$HP = \frac{\text{Torque} \times \text{RPM}}{63,025}$$

TORQUE (Inch-pounds)

G P M	RPM and TORQUE	A125 MOTOR														
		PSI														
		100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
1	RPM TORQUE	71 32	70 79	67 127	63 173	58 220	52 265	45 311	38 355	29 399	20 443	11 486				
2	RPM TORQUE	130 29	127 77	124 124	119 171	114 218	108 264	102 309	94 355	86 399	76 443	66 487	56 530	44 572	32 614	19 656
3	RPM TORQUE	188 23	186 71	182 119	178 166	172 213	166 259	159 305	152 351	143 396	134 440	123 485	112 528	101 571	88 614	75 656
4	RPM TORQUE	248 14	246 62	242 110	237 157	232 204	226 251	219 297	211 343	202 389	192 434	182 479	170 523	158 567	145 610	132 653
5	RPM TORQUE		307 49	303 97	299 145	293 192	287 239	279 286	271 333	262 379	252 425	242 470	230 515	218 560	204 604	190 647
6	RPM TORQUE		370 32	366 80	362 128	356 176	349 224	342 271	333 318	324 365	314 411	303 457	291 503	278 548	265 593	250 638
7	RPM TORQUE		432 10	428 59	426 107	421 155	414 203	406 251	397 299	388 346	377 394	366 440	354 487	341 533	327 579	312 624
8	RPM TORQUE			495 33	492 81	487 130	480 179	472 227	463 276	453 324	443 372	431 419	418 467	405 514	390 560	375 607

On this table you can find motor torque and RPM for known GPM and PSI – read across from GPM and down from PSI

Example: In a hydraulic system delivering 6 GPM at 800 PSI – an A125 motor will operate at 333 RPM and deliver 318 inch-lbs. of torque.

CALCULATING HORSEPOWER

$$HP = \frac{318 \times 333}{63,025} = 1.68$$

GEROTOR MOTOR			A25	A37	A50	A62	A100	A125
DISPLACEMENT (cubic inches per revolution)			0.82	1.16	1.53	1.88	3.11	3.73
GEROTOR SIZE (Inches)			0.250	0.375	0.500	0.625	1.000	1.250
SPEED (Maximum RPM)			2255	1592	1206	982	595	495
TORQUE (Maximum Inch-pounds)			149	222	284	363	570	656
Sample Motor Weights (pounds)	F	Standard Flange - Short Shaft	3.55	3.55	3.55	3.60	3.80	3.90
	FMO	Standard Flange - Long Shaft	3.65	3.65	3.65	3.70	3.90	4.00
	FM	Foot Mount - Long Shaft	6.15	6.15	6.15	6.20	6.40	6.50
	F-T	Turned Down Flange - Short Shaft	3.10	3.10	3.10	3.15	3.35	3.45
	FMO-T	Turned Down Flange - Long Shaft	3.20	3.20	3.20	3.25	3.45	3.55
	FA	Aluminum Body & Flange - Short Shaft	2.45	2.45	2.45	2.50	2.70	2.80
	FMOA	Aluminum Body & Flange - Long Shaft	2.55	2.55	2.55	2.60	2.80	2.90
	F-TA	Aluminum Body & Turned Down Flange - Short Shaft	2.30	2.30	2.30	2.35	2.55	2.65
	FMO-TA	Aluminum Body & Turned Down Flange - Long Shaft	2.40	2.40	2.40	2.45	2.65	2.75

The rotor gear of these low-weight motors rolls through four complete "CYCLES" for each revolution of the output shaft. Thus, four times greater torque at one-fourth of the conventional speed is obtained without the use of gear reducers. In other words, with Lamina Motors the same amount of torque is assured as you would get from a much larger ordinary motor that is considerably more expensive.

Of considerable importance to application design engineers is the smooth rotation and long life of these unique motors. Because the motors have five fluid chambers, the inherent four-to-one ratio provides twenty fluid power cycles for each revolution of the output shaft. This feature assures a distinct addition, Lamina motors have only three moving parts (motor shaft, spline drive, gerotor star) – this greatly extends the service life.

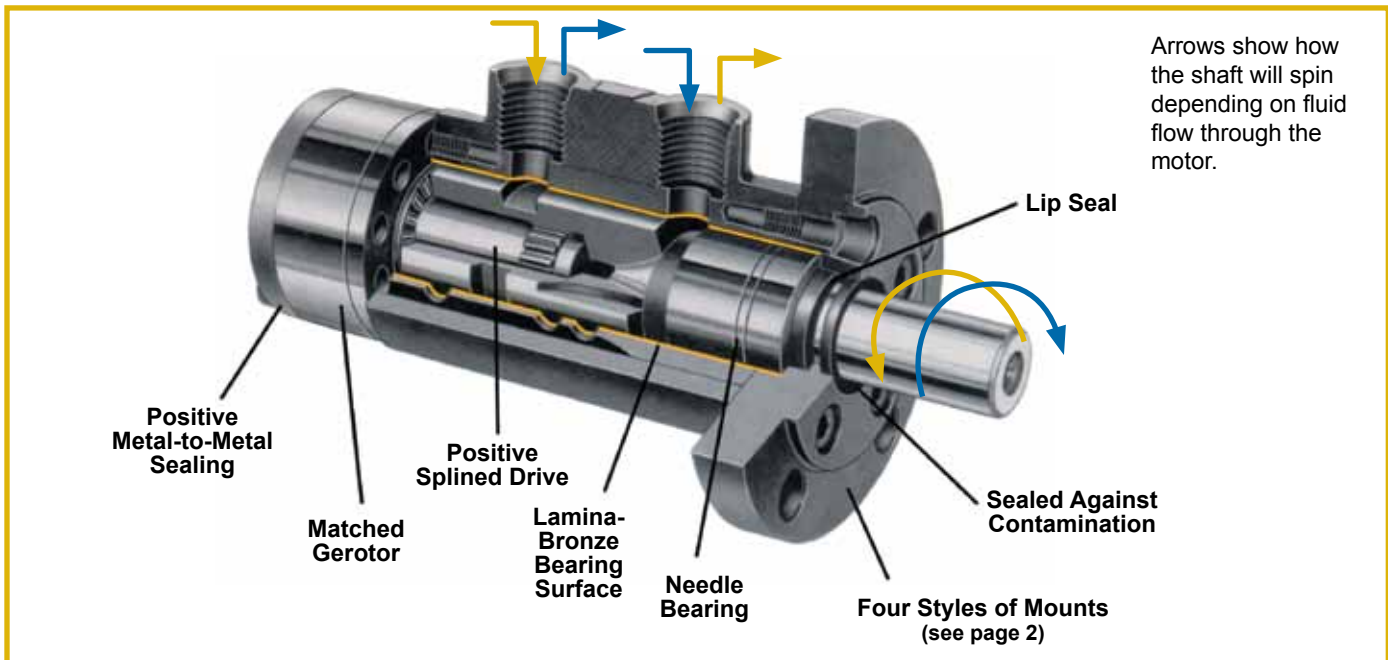
Within the broad range of each gerotor, any torque or speed can be readily secured. Also the various sizes of gerotors available

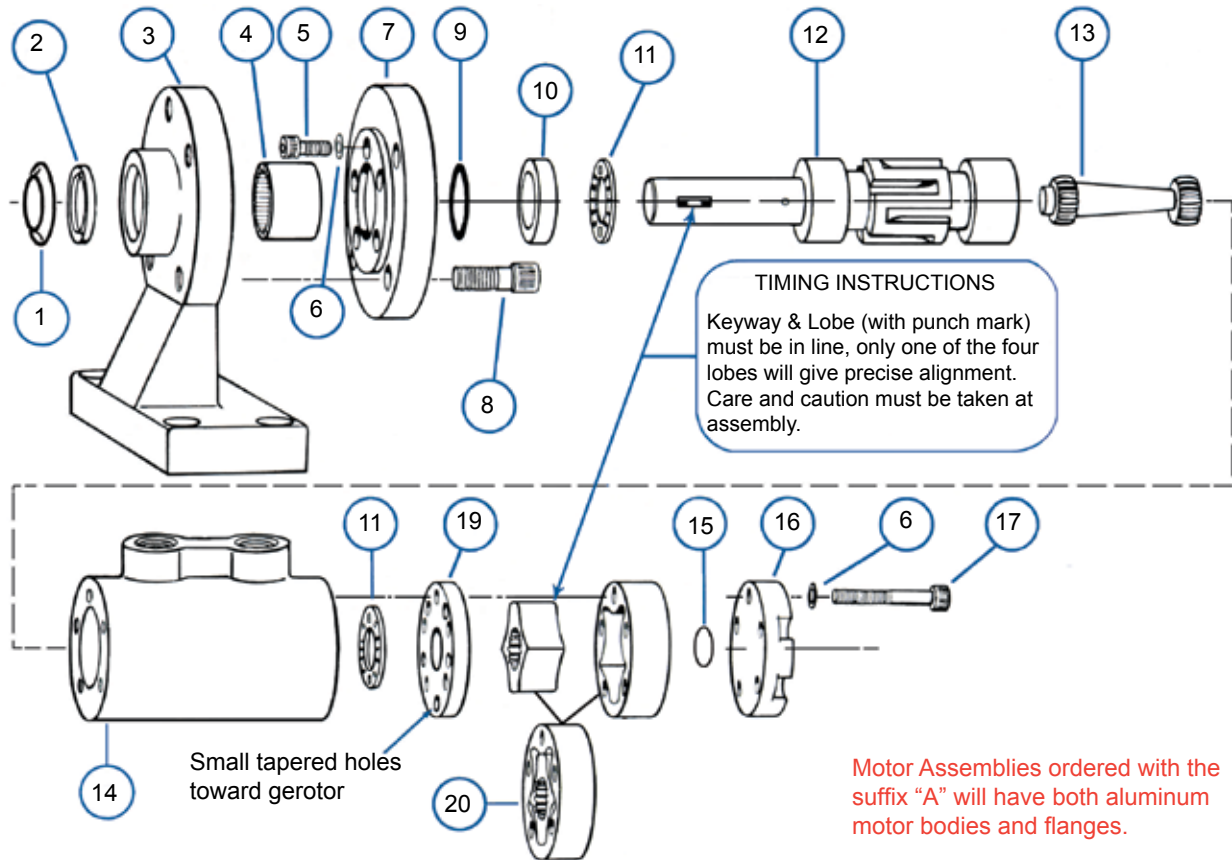
ALL MOTORS	
Minimum Flow Rate	1 GPM
Maximum Flow Rate	8 GPM
Minimum Pressure	100 psi
Maximum Pressure	1500 psi
Maximum Side Load	300 pounds force
Maximum Push Force	500 pounds force
Maximum Pull Force	300 pounds force

provide a torque range from 0 to 656 inch-lbs. and R.P.M. ranging from 0 to 2255. High selectivity to exactly meet requirements is inherent in these motors.

Lamina recommends parallel circuits versus series circuits, because the back pressure generated cannot exceed 300 psi.

Recommended Oil: Mobil[®] DTE 13 (ISO-32 Hydraulic Oil).





Motor Assemblies ordered with the suffix "A" will have both aluminum motor bodies and flanges.

HYDRAULIC MOTOR COMPONENT PARTS

Item No.	PART NUMBER	PART DESCRIPTION	NOTE	Item No.	PART NUMBER	PART DESCRIPTION	NOTE
1	BSS-1	Blood Slinger Shield	Optional Seal - order separately	12	15CFMK	Motor Shaft with Key	FMO only-3/16 x 1-1/4 Key
2	48CF	Dirt Seal	All motors	13	13CA-1/4	Spline Drive	A25 motors only
3	60CFM	Foot Mount	FM style motors only	13	13C	Spline Drive	A37, A50, A62, A100, A125 only
4	52CFM	Shaft Bearing	FM style motors only	14	11CF	Motor Body	All motors except Aluminum
5	SHCS010050F	Screw (10-32x1/2)	All motors - 5 required	14	11CF-ALUM	Motor Body	Aluminum
6	50C	Copper Washer Seal	All motors - 10 required	15	27CA-.125	Gerotor Spacer	A62 motors only
7	10CF	Round Flange	Standard Flange	15	27CD-.500	Gerotor Spacer	A100 motors only
7	10CF-2-BOLT	Oval Flange	Ordering suffix "-2B"	15	27CB-.745	Gerotor Spacer	A125 motors only
7	10CF-4-BOLT	Square Flange	Ordering suffix "-4B"	16	14CF	Gerotor cover	All motors
7	10CF-T	Turned Down Flange	Ordering suffix "-T"	17	39CF	Screw (10-32x1-1/4)	A25, A37, A50 & A62 - 5 req.
7	10CF-ALUM	Round Flange	Aluminum	17	39B-A	Screw (10-32x1-3/4)	A100 motors only - 5 required
7	10CF-2B-ALUM	Oval Flange	Aluminum	17	39CF-A	Screw (10-32x2)	A125 motors only - 5 required
7	10CF-4B-ALUM	Square Flange	Aluminum	19	12C-.406	Separator Plate	A25 motors only
7	10CF-T-ALUM	Turned Down Flange	Aluminum	19	12C-.281	Separator Plate	A37 motors only
8	SHCS031075	Screw (5/16-18x3/4)	FM style motors only	19	12C-.156	Separator Plate	A50, A62, A100, A125 motors only
9	31C	Shaft Seal - Teflon	Standard Seal	20	18C-1/4	Gerotor Assembly	A25 motors only
9	31C-VITON	Shaft Seal - Viton	Optional Seal	20	18C-3/8	Gerotor Assembly	A37 motors only
10	64CF	Thrust Race	All motors	20	18C-1/2	Gerotor Assembly	A50 motors only
11	17CF	Thrust Bearing	All motors - 2 required	20	18C-5/8	Gerotor Assembly	A62 motors only
12	15CF	Motor Shaft - Short	F style motors only	20	18C-1	Gerotor Assembly	A100 motors only
12	15CFM	Motor Shaft - Long	FM & FMO style motors only	20	18C-1-1/4	Gerotor Assembly	A125 motors only
12	15CF-2	Motor Shaft - 2 Flats	F style motors only	SEAL KITS			
12	15CFM-2	Motor Shaft - 2 Flats	FMO style motors only	ASK-1	Seal Kit includes (1) 31C, (1) 48CF, (10) 50C & (2) 17CF		
12	15CFMH-2	Motor Shaft - 2 Flats	FM style motors only				
12	15CFT	Motor Shaft - Tapped	F style motors only	VITON-ASK-1	Seal Kit includes (1) 31C-VITON, (1) 48CF, (10) 50C & (2) 17CF		
12	15CFMT	Motor Shaft - Tapped	FM & FMO style motors only				

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