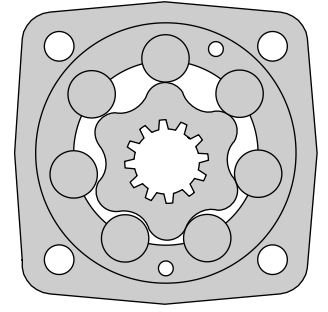


HYDRAULIC MOTORS MLHSY



APPLICATION

- » Conveyors
- » Metal working machines
- » Machines for agriculture
- » Road building machines
- » Mining machinery
- » Food industries
- » Special vehicles etc.



CONTENTS

Specification data	26
Performance data	27÷29
Dimensions and mounting - Side ports	13
Wheel motor	14
Shaft extensions	16
Permissible shaft loads	17
Permissible shaft seal pressure	18
Dimensions and mounting- MLHSYS, V.....	19÷20
Dimensions and mounting - Rear ports	21
Dimensions of the attached component	30
Internal Spline data	31
Order code	31

OPTIONS

- » Model- Disc valve, roll-gerotor
- » Flange and wheel mount
- » Short motor
- » Speed sensing
- » Side and rear ports
- » Shafts- straight, splined and tapered
- » SAE, Metric and BSPP ports
- » Other special features

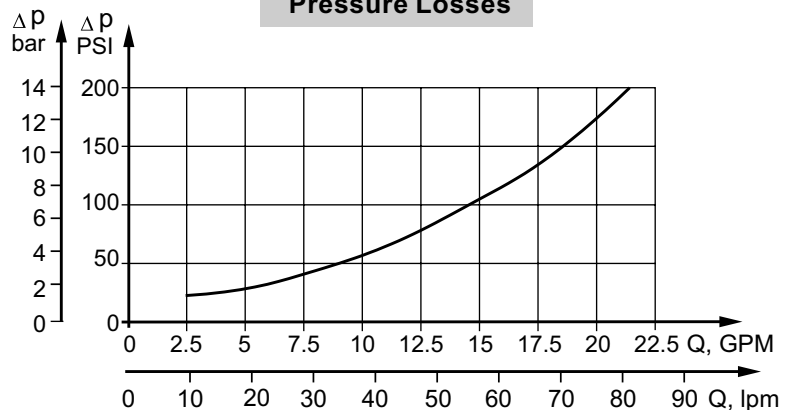
GENERAL

Displacement,	in ³ /rev [cm ³ /rev.]	12.2÷24.2 [200÷397]
Max. Speed,	[RPM]	185÷375
Max. Torque,	in-lb [daNm]	5010÷7965 [56,6÷90]
Max. Output,	HP [kW]	14.7÷24.3 [11÷18,1]
Max. Pressure Drop,	PSI [bar]	2320÷2900 [160÷200]
Max. Oil Flow,	GPM [lpm]	20 [75]
Min. Speed,	[RPM]	5÷6
Permissible Shaft Loads	lbs [daN]	P _a =1125 [500]
Pressure fluid		Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature range,	°F [°C]	-22÷194 [-30÷90]
Optimal Viscosity range, SUS [mm²/s]		98÷347 [20÷75]
Filtration		ISO code 20/16 (Min. recommended fluid filtration of 25 micron)

Oil flow in drain line

Pressure drop PSI [bar]	Viscosity SUS [mm ² /s]	Oil flow in drain line GPM [lpm]
2030 [140]	98 [20]	.396 [1,5]
	164 [35]	.264 [1]
3045 [210]	98 [20]	.793 [3]
	164 [35]	.528 [2]

Pressure Losses



SPECIFICATION DATA

Type		MLHSY 200	MLHSY 250	MLHSY 315	MLHSY 400	MLHSY 475
Displacement, in.³/rev. [cm.³/rev.]		12.2 [200]	15.3 [250]	19.2 [314,9]	24.2 [397]	28.96 [474,6]
Max. Speed, [RPM]	cont.	375	300	240	185	155
	Int.*	450	360	285	225	185
Max. Torque in- lb [daNm]	cont.	5010 [56,6]	6270 [70,8]	7965 [90,0]	7965 [90,0]	8055 [91,0]
	Int.*	5710 [64,5]	7135 [80,6]	8500 [96,0]	8585 [97,0]	8500 [96,0]
	peak**	5755 [65]	7135 [80,6]	9560 [108]	9735 [110]	8850 [100]
Max. Output HP [kW]	cont.	24.3 [18,1]	24.1 [18,0]	22.8 [17]	14.7 [11,0]	12.1 [9]
	int.*	32.2 [24,0]	31.9 [23,8]	27.1 [20,2]	16.1 [12]	14.7 [11,0]
Max. Pressure Drop PSI [bar]	cont.	2900 [200]	2900 [200]	2900 [200]	2320 [160]	2230 [140]
	Int.*	3270 [225]	3270 [225]	3270 [225]	2540 [175]	2175 [150]
	peak**	3270 [225]	3270 [225]	3270 [225]	2900 [200]	2540 [175]
Max. Oil Flow GPM [lpm]	cont.	20 [75]	20 [75]	20[75]	20[75]	20[75]
	Int.*	24 [90]	24 [90]	24 [90]	24 [90]	24 [90]
Max. Inlet Pressure PSI [bar]	cont.	3045 [210]	3045 [210]	3045 [210]	3045 [210]	3045 [210]
	Int.*	3625 [250]	3625 [250]	3625 [250]	3625 [250]	3625 [250]
	peak**	4350 [300]	4350 [300]	4350 [300]	4350 [300]	4350 [300]
Max. Return Pressure with Drain Line PSI [bar]	cont.	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]
	Int.*	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]
	peak**	3045 [210]	3045 [210]	3045 [210]	3045 [210]	3045 [210]
Max. Starting Pressure with Unloaded Shaft, PSI [bar]		115 [8]	115 [8]	115 [8]	115 [8]	115 [8]
Min. Starting Torque in- lb [daNm]	at max. press. drop cont.	4090 [46,2]	5135 [58,0]	6530 [73,8]	6370 [72,0]	4160 [47]
	at max. press. drop Int.*	4490 [50,7]	5630 [63,6]	7010 [79,2]	6965 [78,7]	4870 [55]
Min. Speed***, [RPM]		6	6	5	5	5
Weight, lb [kg] For Rear Ports + .88[0,40]	MLHSY (F,A)	24.7 [11,2]	25.8 [11,7]	27.3 [12,4]	29.3 [13,3]	31.8 [14,4]
	MLHSYW(E)	25.6 [11,6]	26.7 [12,1]	28.2 [12,8]	30.2 [13,7]	32.6 [14,8]
	MLHSYS	24.9 [11,3]	26.0 [11,8]	27.6 [12,5]	29.5 [13,4]	32.0 [14,5]
	MLHSYV	15.9 [7,2]	17.0 [7,7]	18.5 [8,4]	20.5 [9,3]	22.9 [10,4]

* Intermittent operation: the permissible values may occur for max. 10% of every minute.

** Peak load: the permissible values may occur for max. 1% of every minute.

*** For speeds of 5 RPM lower than given, consult factory or your regional manager.

1. Intermittent speed and intermittent pressure must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using synthetic fluids consult the factory for alternative seal materials.
4. Recommended minimum oil viscosity 70 SUS[13mm²/s] at 122°F [50°C].
5. Recommended maximum system operating temperature is 180°F [82°C].
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.



Performance Data MLHSY 200

	Pressure (Δ PSI)									Max. Cont.	Max. Int.	Speed (theor.)
	500	750	1000	1250	1500	1750	2050	2540	2900	3260		
Flow [GPM]	1	787 19	1260 18	1705 17	2100 16	2515 15	2990 13	3462 12	4266 9	4768 7.5	- -	19
	2	817 38	1293 37	1728 36	2136 35	2557 34	3048 33	3540 32	4374 27.5	4844 25	5482 23	38
	4	817 75	1296 73	1769 72	2207 70	2651 69	3137 67	3610 66	4462 61	4948 56	5573 47	76
	6	817 113	1300 112	1776 111	2196 110	2657 109	3148 107	3645 105	4528 101	5018 89.5	5669 80.5	114
	8	799 150	1296 149	1769 148	2196 147	2657 146	3143 144	3622 142	4522 137	5044 124	5710 113	151
	10	769 187	1245 186	1728 185	2178 183	2604 181	3095 179	3600 177	4486 172	5022 164	5732 152	182
	12	722 226	1190 225	1705 223	2118 221	2551 219	3075 217	3552 215	4456 210	4972 201	5661 190	227
	14	698 264	1170 262	1651 260	2083 258	2515 256	3055 254	3522 252	4410 246	4905 239	5596 228	265
	17	609 320	1095 317	1585 314	2012 311	2438 309	2948 306	3432 303	4321 296	4796 294	5516 281	322
	Max. Cont.	20	515 377	1006 375	1479 373	1923 371	2355 369	2840 366	3344 363	4232 356	4734 343	5410 333
Max. Int.	24	385 452	888 450	1355 448	1787 446	2207 444	2682 442	3196 440	3997 428	4568 418	5268 402	454
Torque (theor.) in-lb. [daNm]		971 [10,97]	1457 [16,46]	1938 [21,9]	2428 [27,43]	2912 [32,9]	3399 [38,4]	3982 [44,99]	4934 [55,75]	5632 [63,63]	6333 [71,55]	

12.2 in³./rev. [200 cm³./rev.]

Torque [in-lb] 5268
Speed [RPM] 402

Performance Data MLHSY 250

	Pressure (Δ PSI)							Max. Cont.	Max. Int.	Speed (theor.)
	500	750	1000	1400	1800	2200	2900	3260		
Flow [GPM]	1	1196 15	1735 14	2330 13	3014 12	3990 10	4870 8	6062 6	- -	15
	2	1202 30	1816 29	2332 28	3090 27	4030 25	4952 23	6173 16	6878 4	30
	4	1185 60	1740 58	2336 57	3154 55	4088 53	5052 45	6280 40	7008 26.5	61
	6	1156 90	1722 88	2312 86	3190 84	4070 82	5086 76	6285 58	7055 39.5	91
	8	1140 120	1716 118	2290 116	3154 114	4052 112	5080 104	6294 84	7099 58.5	121
	10	1074 150	1652 148	2242 146	3125 144	4012 140	5046 132	6294 110	7110 84	151
	12	1005 180	1582 178	2185 176	3050 174	3970 168	4994 158	625 140	7099 113	182
	14	958 210	1542 208	2138 206	2985 204	3900 198	4952 188	6173 168	7055 148	212
	17	846 256	1436 254	2050 252	2862 249	3790 243	4848 233	6088 217	6945 200	257
	Max. Cont.	20	742 300	1325 298	1932 296	2740 293	3668 287	4742 276	5988 256	6834 240
Max. Int.	24	584 360	1168 358	1792 356	2546 354	3504 347	4520 330	5842 312	6724 300	363
Torque (theor.) in-lb. [daNm]		1214 [13,72]	1821 [20,57]	2425 [27,4]	3399 [38,4]	4372 [49,4]	5346 [60,4]	7036 [79,5]	7913 [89,4]	

15.25 in³./rev. [250 cm³./rev.]

Torque [in-lb] 6724
Speed [RPM] 300

The Performance data was collected at back pressure 72.5÷145 PSI [5÷10 bar] and oil with viscosity of 150 SUS [32 mm²/s] at 122°F [50° C].



Performance Data MLHSY 315

	Flow [GPM]	Pressure (Δ PSI)								Max. Cont.	Max. Int.	Speed (theor.)
		500	750	1000	1200	1400	1700	2000	2540	2900	3190	
Flow	1	1406 11.5	2040 11.5	2708 11	3270 10.5	3850 10	4888 9	5550 7.5	-	-	-	12
	2	1448 23	2092 22.5	2778 22	3330 21.5	3945 21	4924 20	5638 17	6992 7	-	-	24
	4	1460 46	2145 45.5	2838 45	3434 44.5	4056 43.5	4965 41	5750 37.5	7213 28	7744 18	8320 10	48
	6	1454 70	2145 69	2838 68	3418 67	4045 66	4982 64	5798 61	7301 46.5	7966 36	8497 25	72
	8	1448 95	2105 94	2790 93	3388 62	4010 90	4970 86	5798 80	7275 64	8010 52	8541 42	96
	10	1390 119	2040 118	2730 117	3364 116	3974 114	4924 110	5762 105	7293 88	8030 75	8585 64	120
	12	1342 143	1992 142	2678 141	3318 140	3934 138	4865 134	5702 128	7275 111	7992 95	8630 81	144
	14	1272 167	1934 166	2620 165	3235 163	3868 160	4782 156	5632 150	7169 134	7921 120	8620 106	168
	17	1155 203	1800 202	2498 201	3135 200	3750 198	4665 195	5498 191	6903 189	7788 162	8496 146	204
Max. Cont.	20	996 240	1682 237	2368 234	2990 231	3658 228	4572 223	5370 217	6859 199	7700 185	8408 169	240
Max. Int.	24	808 288	1488 286	2210 284	2838 282	3470 279	4366 273	5133 264	6638 243	7434 232	8231 218	289
Torque (theor.) in-lb. [daNm]		1531 [17,3]	2292 [25,9]	3062 [34,6]	3824 [43,2]	4284 [48,4]	5195 [58,7]	6116 [69,1]	7771 [87,8]	8868 [100,2]	9754 [110,2]	

19.2 in³./rev. [314,9 cm³./rev.]

Torque [in-lb] 8231
Speed [RPM] 218

Performance Data MLHSY 400

	Flow [GPM]	Pressure (Δ PSI)							Max. Cont.	Max. Int.	Speed (theor.)
		250	500	750	1000	1400	1700	2000	2300	2540	
Flow	2	865 18.5	1725 18	2592 17.5	3450 17	4702 16.5	5400 15.5	6255 11	-	-	19
	4	902 37	1800 36.5	2620 36	3475 35.5	4820 34.5	5595 33	6461 26	7434 17	7966 8	38
	6	918 56	1825 55	2700 54	3540 53	5035 52	5820 50	6611 40	7700 33	8231 25	57
	8	890 75	1775 74	2720 73	3530 72	4932 71	5755 69	6680 61	7789 47	8408 36.5	76
	10	865 95	1725 94	2675 93	3490 92	4892 90	5715 88	6727 81	7905 66	8541 54.5	95
	12	740 113	1675 113	2605 112	3415 111	4855 109	5690 107	6682 99	7921 84	8585 71	114
	14	650 133	1612 132	2525 131	3322 130	4735 127	5560 123	6638 118	7877 102	8580 90	133
	16	580 152	1520 151	2465 150	3230 149	4632 147	5485 144	6550 136	7744 121	8497 108	153
	18	508 171	1450 170	2375 169	3040 168	4540 165	5315 162	6372 159	7567 145	8364 131	172
Max. Cont.	20	424 190	1240 189	2125 188	2955 185	4465 181	5230 176	6195 172	7390 164	8187 150	191
Max. Int.	24	250 228	992 227	1885 226	2730 225	4260 221	5210 215	5930 210	7036 203	8568 196	229
Torque (theor.) in-lb. [daNm]		964 [10,89]	1929 [21,8]	2894 [32,7]	3859 [43,6]	5398 [60,99]	6554 [74,05]	7712 [87,13]	8869 [100,2]	9798 [110,7]	

24.21 in³./rev. [397 cm³./rev.]

Metric Conversions
Flow 1 lpm = .2642 GPM
Pressure 1 bar = 14.51 PSI
Torque 1 Nm = 8.85 in-lb

Torque [in-lb] 8568
Speed [RPM] 196

The Performance data was collected at back pressure 72.5÷145 PSI [5÷10 bar] and oil with viscosity of 150 SUS [32 mm²/s] at 122°F [50° C].



Performance Data MLHSY 475

		Pressure, Δ PSI (bar)								Max. Cont.	Max. Int.	Speed (theor.)
		250 [17,5]	500 [35]	750 [52,5]	1000 [70]	1200 [85]	1450 [100]	1670 [115]	1885 [130]	2030 [140]		
Flow, GPM [l/min]	1.32 [5]	970 9.5	1940 9	2920 8.5	3980 8	4910 7.5	5570 7	6200 6.5	7600 6	8300 5.5	10	
	2.64 [10]	1010 20	2010 19.5	3010 18.5	4070 18	4960 17.5	5750 17	6550 16.8	7900 16.5	8400 16	21	
	4 [15]	1030 30.5	2080 28	3060 27.5	4080 27.5	5050 27	5930 26.5	6800 25	7950 24.5	8500 24	31	
	5.28 [20]	1050 40	2090 39.5	3100 38	4150 36.5	5070 35.5	5970 34.5	6900 34	8010 32	8600 31	41	
	8 [30]	1020 61	2120 60	3180 57.5	4140 55	5100 54.5	6030 54	7100 53	8020 52	8700 50	62	
	10.56 [40]	970 81.5	2000 81	3130 79	4070 77	5060 75	5930 74	6950 72	7950 70	8600 68	83	
	13.2 [50]	890 102.5	1910 101.5	2980 99.5	3950 97	4970 95	5800 93	6850 92	7800 90	8550 88	103	
	16 [60]	750 123.5	1820 122	2850 120	3760 117	4790 115	5660 113	6700 112	7700 110	8400 108	124	
	Max. Cont.	20 [75]	530 152	1520 151	2600 148	3500 146	4540 143	5490 140	6500 138	7400 136	8200 132	155
	Max. Int.	24 [90]	350 183	1280 180	2390 176	3280 173	4420 168	5310 164	6300 162	7200 157	8100 154	186
Torque (theor.) in-lb. [daNm]		1170 [13,2]	2345 [26,5]	3520 [39,7]	4690 [53]	5680 [64,2]	6730 [76]	7700 [87]	8675 [98]	9380 [106]		

28.96 in³./rev. [474,6 cm³./rev.]

Torque [in-lb] 8100
Speed [RPM] 154

Metric Conversions

Flow 1 lpm = .2642 GPM

Pressure 1 bar = 14.51 PSI

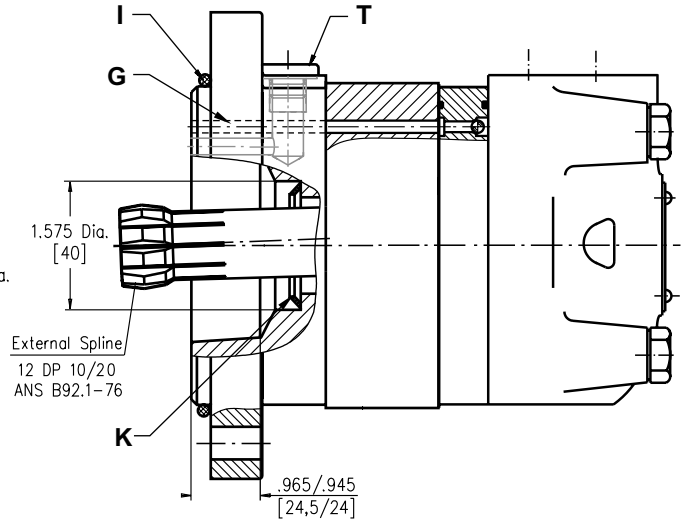
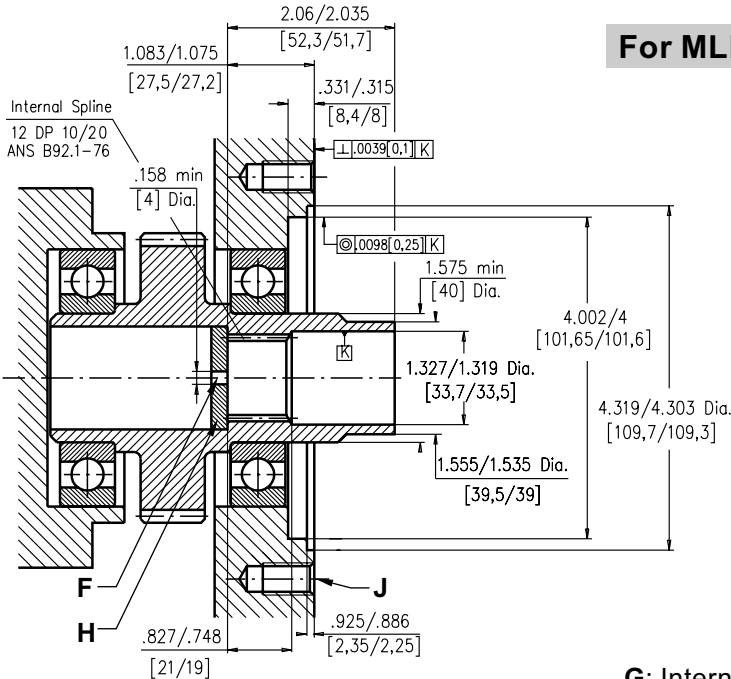
Torque 1 Nm = 8.85 in-lb

The Performance data was collected at back pressure 72.5÷145 PSI [5÷10 bar] and oil with viscosity of 150 SUS [32 mm²/s] at 122°F [50° C].

The dimensions, mounting data, shaft extensions and permissible shaft loads are the same as at hydraulic motors type MLHS... except following below.

DIMENSIONS OF THE ATTACHED COMPONENT

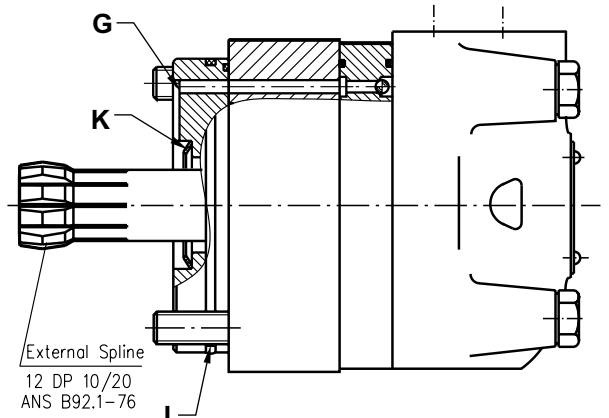
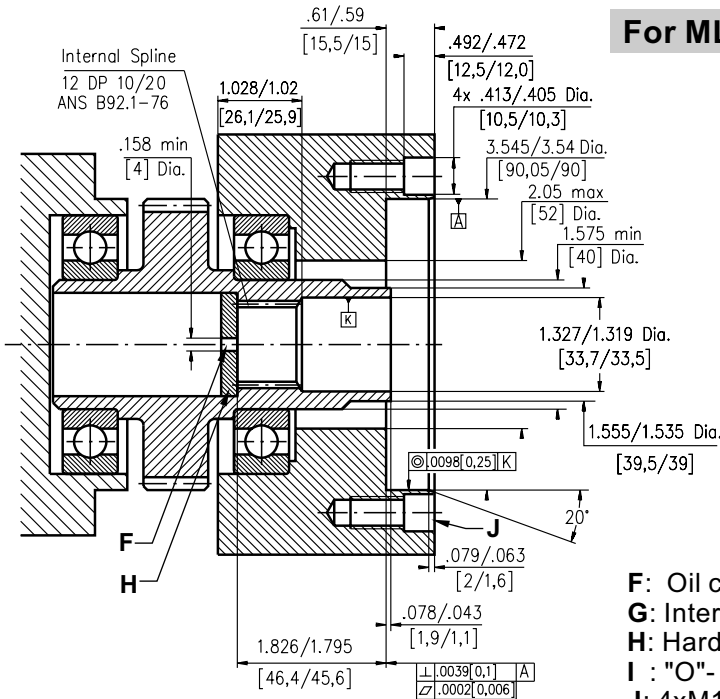
For MLHSYS



- F:** Oil circulation hole
- H:** Hardened stop plate
- K:** Conical seal ring

- G:** Internal drain channel
- I:** "O"- Ring 4.016x .118 [102x3]
- J:** 4x½ UN- min .61 [15] Deep, 90°, 5.00[127] Dia. B.C.
- T:** Drain connection G1/4 or ¼"-20UNF

For MLHSYV



- F:** Oil circulation hole
- G:** Internal drain channel
- H:** Hardened stop plate
- I:** "O"- Ring 3.346x .079 [85x2]
- J:** 4xM10- min 1.299 [33] Deep, 90°, 4.095[104] Dia. B.C.
- K:** Conical seal ring

DRAIN CONNECTION

A drain line ought to be used when pressure in the return line can exceed the permissible pressure. It can be connected:

- For MLHSYS at the drain port of the motor;
- For MLHSYV at the drain connection of the attached component. The maximum pressure in the drain line is limited by the attached component and its shaft seal.

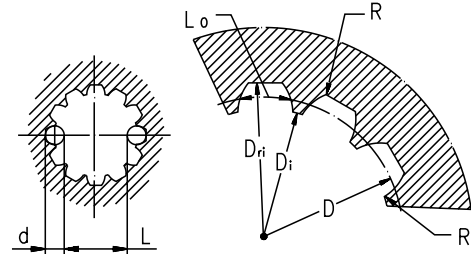
The drain line must be possible for oil to flow freely between motor and attached component and must be led to the tank. The maximum pressure in the drain line is limited by the attached component and its seal.

INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

Standard 12 DP 10/20 ANS B92.1-1976, class 5
 $[m=2.54; \text{corrected } x.m=+0,4]$

Fillet Root Side Fit	inch	mm
Number of Teeth	z	12
Diametral Pitch	DP	10/20
Pressure Angle		30°
Pitch Dia.	D	1.2
Major Dia.	D _{ri}	1.315 ÷ 1.307
Minor Dia.	D _i	1.098 ÷ 1.094
Space Width [Circular]	L _o	.178 ÷ .176
Fillet Radius	R	.008
Max. Measurement between Pins	L	.928 ÷ .923
Pin Dia.	d	.19039 ÷ .19031

Above are when hardened



Hardening Specification:
 HV=750±50 on the surface.
 HV=560 at .035±.019 [0,7±0,2] case depth
 Material: 20 MoCr4 DIN 17210 or SAE8620.

ORDER CODE

1	2	3	4	5	6	7	8
MLHSY							

Pos. 1 - Mounting Flange

- omit - SAE A-4, four holes
- A** - SAE A-2, two holes
- B** - SAE B, two holes
- E** - Wheel mount, 4.25 Pilot Dia.
- F** - Magneto, four holes
- S** - Short
- V** - Very short
- W** - Wheel mount, 5.00 Pilot Dia.
- BD** - With drum brake

Pos. 2 - Displacement code

- 200** - 12.20 [200,0] in.³/rev. [cm.³/rev.]
- 250** - 15.30 [250,0] in.³/rev. [cm.³/rev.]
- 315** - 19.20 [314,9] in.³/rev. [cm.³/rev.]
- 400** - 24.20 [397,0] in.³/rev. [cm.³/rev.]
- 475** - 28.96 [474,6] in.³/rev. [cm.³/rev.]

Pos. 3 - Shaft Extensions* [see page 16]

- omit - for **BD**, **S** and **V** mounting flange
- C** - 1¼" [31,75] straight, Parallel key
- G** - 1¼" [31,75] 14T DP 12/24 Splined
- M** - 32 mm straight, Parallel key
- P** - 34,85 mm Splined, p.t.o. DIN 9611 Form 1
- T** - 1¼" [31,75] J501 Tapered

Pos. 4 - Actuating Direction [for MLHSYBD only]

- /R** - right
- /L** - left

Pos. 5 - Port Size/Type [standard manifold to each]

- 2** - side ports, 2xG1/2, G1/4, BSP thread, ISO 228
- 4** - side ports, 2x7/8-14 UNF, O-ring, 7/16-20 UNF
- 6** - rear ports, 2xG1/2; G1/4; BSP thread, ISO 228
- 7** - rear ports, 2x7/8-14 UNF, O-ring, 7/16-20 UNF

Pos. 6 - Shaft Seal Version [see page 18]

- omit - Low pressure seal
- U** - High pressure seal

Pos. 7 - Special Features [see page 65]

Pos. 8 - Design Series

- omit - Factory specified

Notes : * 1. The permissible output torque for shafts must not be exceeded!
 2. The following combinations are not allowed - **E** flange with **G** and **P** shafts.

The hydraulic motors are mangano-phosphatized as standard.