

MISO
INDUSTRIES

4710 Steffani Lane
Houston, TX 77041
TEL: (713) 468-7500
<https://msoindustries.com>
info@msoindustries.com



TABLE OF CONTENTS

INTRODUCTION

Typical Sealing Components	iii
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CYLINDERS

Index.....	1
Bobcat Cylinders	2
Skyjack Cylinders.....	3
MSO Brand Cylinders - Tie Rod and Welded	4 - 15
Snow Plow Cylinders.....	16
Prince Cylinders	17 - 22
Telescopic	23 - 30
Power Units.....	31 - 32

MSO BRAND REPAIR PARTS

Index.....	33
MSO Brand Repair Parts	34 - 40

MOBILE REPAIR PARTS

Index.....	41
Mobile Repair Parts.....	42 - 67
Ports/Lock Nuts	68
Displacement Cylinder Components and Technical Information.....	69 - 70

INDUSTRIAL REPAIR PARTS

Index.....	71
Industrial Repair Parts.....	72 - 76

REPAIR ACCESSORIES

Index.....	77
Repair Accessories.....	78 - 106

ASSORTMENT KITS AND TOOLS

Index.....	107
O-Ring Kits	108 - 117
Assortment Kits	120 - 125
Tools.....	127 - 141

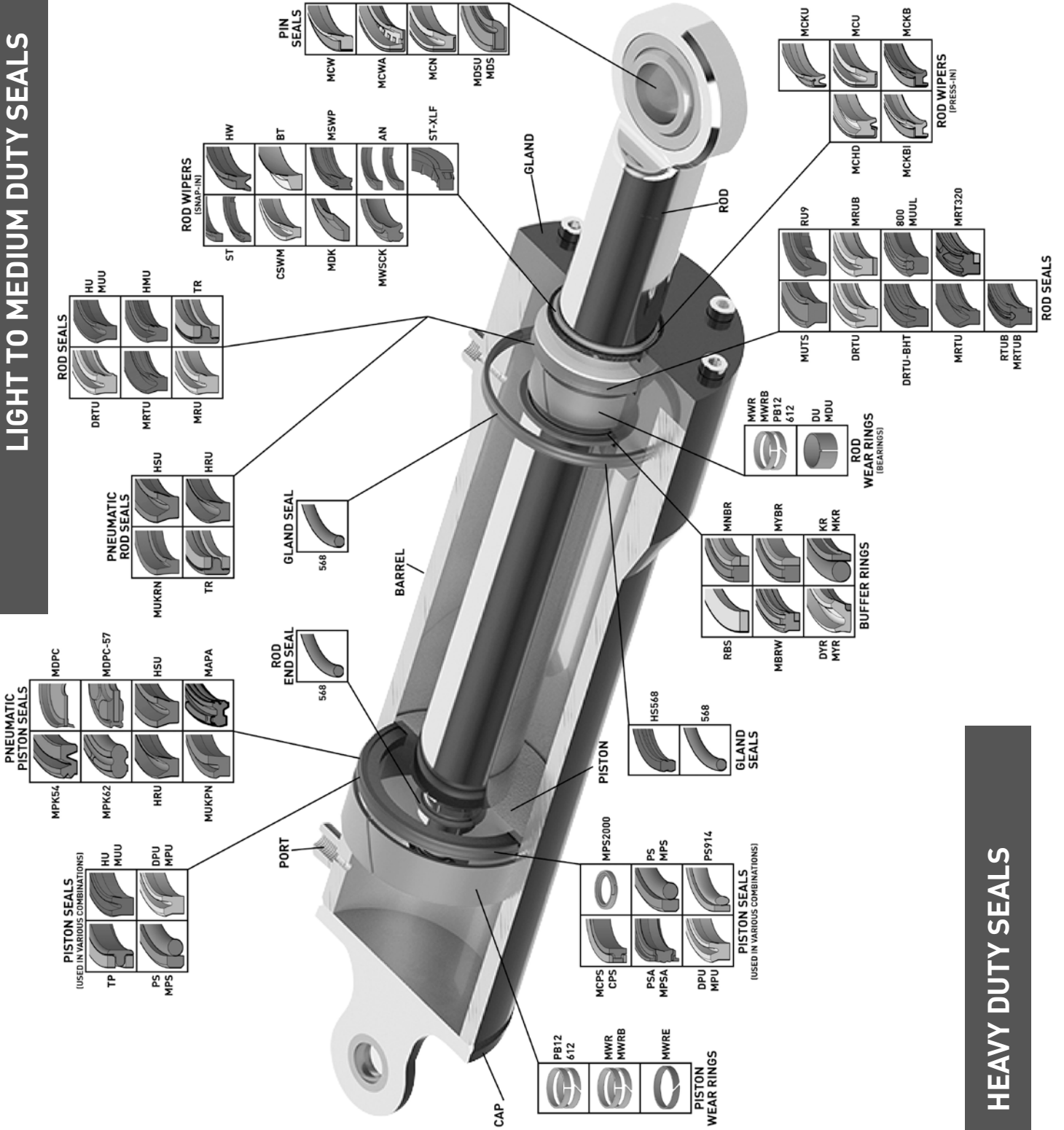
TECHNICAL INFORMATION

Index.....	143
Technical Information.....	144 - 165

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TYPICAL SEALING COMPONENTS

LIGHT TO MEDIUM DUTY SEALS



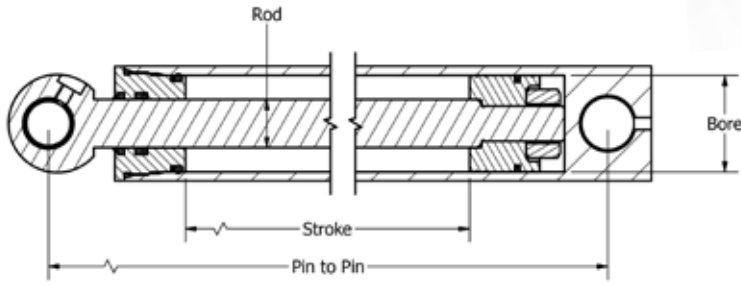
HEAVY DUTY SEALS

Cylinders

Contents	Page
Bobcat Cylinders	2
Skyjack Cylinders	3
HTR - MSO Brand Tie-Rod Cylinders - 2500 psi	4 - 6
HSTR (Olympus) - MSO Brand Tie-Rod Cylinders - 3000 psi	7 - 8
HMW - MSO Brand Welded Cylinders - Cross Tube Mount	9 - 11
HCW - MSO Brand Welded Cylinders - Clevis Mount	12 - 14
HTC - MSO Brand Telescopic Cylinders	15
MSO Brand Snow Plow Cylinders	16
Prince Royal Plate Line (Tie-Rod)	17 - 18
Prince Sword Line	19
Prince Royal Line (Welded)	20 - 21
Prince Gladiator Line	22
Single Acting Telescopic Cylinders	23 - 28
Double Acting Telescopic Cylinders	29
Telescopic Cylinders Weights	30
Power Units	31 - 32

MSBOBCAT CYLINDERS

MSBOBCAT CYLINDERS



FEATURES:

- Hard chrome plated rod
- Cast iron piston
- Cast iron gland with buttress threads
- Pressure rated 3000 - 3500 psi
- SAE and JIC flared ports
- Grease ports on both pin eyes
- Standard color is charcoal gray

PART NUMBER	APPLICATION	MODELS	ROD	BORE	STROKE	PIN TO PIN	LIST PRICE
MSBCK-7117174	Bucket Tilt	773, S150, S160, S175, S185, S205, T180, T190	1-3/8	2-3/4	13-1/8	21-1/4	\$721.18
MSBCK-7208419	Bucket Tilt	S220, S250, S300, S330, T250, T300, T320	1-1/2	3	15	24	716.90
MSBCK-7191555	Boom	E32, E32i, E35, E35i	1-3/4	3	26-3/8	37-5/8	916.99
MSBCK-7117667	Lift	773, S175, S185, S205, T190	1-1/2	2-1/2	23-13/16	33-3/8	861.35
MSBCK-7106456 (6817310)	Lift	S250, S300, T300, A300	1-5/8	3	25-1/2	38-3/8	943.74
MSBCK-7175388 (6810611)	Attachment	S100, S130, S150, S160, S175, S185, S205, 220, S250, S300, S330, T110, T140, T180, T190, T200, T250, T300, T320, 773	1	1-3/4	6-3/4	26-3/8	497.55
MSBCK-7235736	Bucket Tilt - Right	S630, S650, S750, S770, T630, T650, T750, T770	1-1/2	3	13-5/8	23-1/2	807.85
MSBCK-7235738	Bucket Tilt - Left	S630, S650, S750, S770, T630, T650, T750, T770	1-1/2	3	13-5/8	23-1/2	807.85
MSBCK-7338638 (7151185)	Bucket Tilt	S160, S530, S570, S590, T590	1-1/2	2-3/4	12-7/8	13-3/4	684.00

MSO now offers Bobcat replacement cylinders.

Benefits include:

- MSO list price - Up to 50% Off OEM price!
- MSO warranty* 18 months versus OEM 12 month warranty
- Made in the USA
- In-stock, same day shipment
- Reduce customer downtime by replacing versus repairing cylinders
- High performance Freudenberg-NOK AU30000 Seal rated for 250 degrees F and up to 7250 psi; resulting in extended seal life.
- Cast iron steel gland with buttress threads versus aluminum OEM gland means less galled or damage threads
- Hardened chrome rod which is less susceptible to bending
- In-stock MSO Bobcat seal kits available

CYLINDER #	SEAL KIT #	ROD	BORE	LIST PRICE
MSBCK-7117174	MSBCK-6806330	1-3/8	2-3/4	\$33.49
MSBCK-7208419	MSBCK-7135547	1-1/2	3	36.72
MSBCK-7191555	MSBCK-7197632	1-3/4	3	50.76
MSBCK-7117667	MSBCK-7135559	1-1/2	2-1/2	36.73
MSBCK-7106456 (6817310)	MSBCK-7137939	1-5/8	3	36.62
MSBCK-7175388 (6810611)	MSBCK-7138014	1	1-3/4	20.45
MSBCK-7235736	MSBCK-7225491	1-1/2	3	31.84
MSBCK-7235738	MSBCK-7225491	1-1/2	3	31.84
MSBCK-7338638	MSBCK-7199903	1-1/2	2-3/4	24.68

MSSKYJACK CYLINDERS

MSSKYJACK CYLINDERS



MSSKY-121087BA



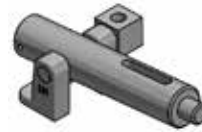
MSSKY-162715AB



MSSKY-127900-NP



MSSKY-128186



MSSKY-128187

PART NUMBER	APPLICATION	MODELS	ROD	BORE	STROKE	PIN TO PIN	LIST PRICE
MSSKY-127900	BRAKE	SJIII3215 & SJIII3219	3/4	1-1/2	2-3/8	9-3/4	\$395.00
MSSKY-127900-NP	BRAKE	SJIII3215 & SJIII3219	3/4	1-1/2	2-3/8	9-3/4	225.00
MSSKY-128186	PIN ASSEMBLY, BRAKE, RH	SJIII3215 & SJIII3219	-	-	-	-	60.00
MSSKY-128187	PIN ASSEMBLY, BRAKE, LH	SJIII3215 & SJIII3219	-	-	-	-	60.00
MSSKY-121087BA	STEERING (DOUBLE ROD)	SJIII3015, SJIII3215 & SJIII3219	1-1/8	2	4	17-1/2	289.00
MSSKY-162715BA	STEERING	SJIII3220, SJIII3226, SJIII4620, SJIII4626, SJIII4632, SJIII4830, SJIII4832, SJIII6826 & SJIII6832	3/4	1-1/2	4.81	12.44	285.00

CYLINDER #	SEAL KIT #	ROD	BORE	LIST PRICE
MSSKY-127900	MSSKY-127153	3/4	1-1/2	\$395.00
MSSKY-127900-NP	MSSKY-127153	3/4	1-1/2	225.00
MSSKY-121087BA	MSSKY-121090	1-1/8	2	289.00
MSSKY-162715BA	MSSKY-105816	3/4	1-1/2	285.00

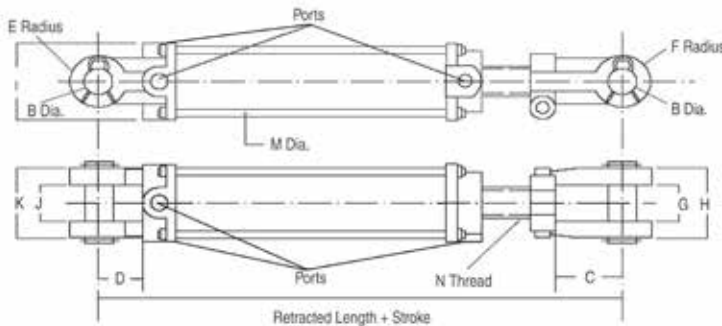
MSHTR TIE-ROD CYLINDERS

MSO Brand Cylinders

THE MSHTR LINE

Pressure Ratings: 2" - 4" Bore = 2500 PSI, 5"

Bore = 2000 PSI



FEATURES:

- Ductile iron piston.
- Ductile iron gland, drilled oil passages.
- Honed steel tube, precision finished for extended seal life.
- High tensile, hard chrome plated rod.
- Ductile iron end mounts, female clevises with pins and clips included.
- Tube Seal: O-ring
- Rod Seal: Deep polypak with B lip design; metal canned wiper.
- 2-Piece 93A urethane piston seal, with a 70A nitrile energizer.
- All Seals: Manufactured to US specifications.
- NPT ports.

For quantities above 50 pieces, call MSO for special pricing.

Seal kits for these cylinders are shown at the end of the section.

"A" = Agricultural application w/ rod extension

BORE (INCH)	B	C	D	E	F	G = J
2.0	1.015	2.125	1.625	1.000	1.000	1.142
2.5	1.015	2.125	1.625	1.000	1.000	1.142
3.0	1.015	2.125	1.625	1.125	1.000	1.142
3.5	1.015	2.125	1.625	1.125	1.125	1.142
4.0	1.015	2.125	1.625	1.125	1.125	1.142
5.0	1.015	2.125	2.250	1.250	1.500	1.260

PART NUMBER	BORE (INCH)	STROKE	ROD DIA (INCH)	H	I	K	M	N	TUBE OD	PORTS (NPT)	PIN CTR RETRACT-ED	WT LBS.	LIST PRICE
MSHTR-2004	2.0	4	1-1/8	2.520	2.835	2.520	M10	1-1/8-12UNF	2.375	3/8 NPT	14.25	14.30	\$104.20
MSHTR-2006	2.0	6	1-1/8	2.520	2.835	2.520	M10	1-1/8-12UNF	2.375	3/8 NPT	16.25	15.84	104.20
MSHTR-2008	2.0	8	1-1/8	2.520	2.835	2.520	M10	1-1/8-12UNF	2.375	3/8 NPT	18.25	17.60	104.65
MSHTR-2008A	2.0	8	1-1/8	2.520	2.835	2.520	M10	1-1/8-12UNF	2.375	3/8 NPT	20.25	17.60	104.65
MSHTR-2010	2.0	10	1-1/8	2.520	2.835	2.520	M10	1-1/8-12UNF	2.375	3/8 NPT	20.25	18.70	114.71
MSHTR-2012	2.0	12	1-1/8	2.520	2.835	2.520	M10	1-1/8-12UNF	2.375	3/8 NPT	22.25	20.24	120.09
MSHTR-2014	2.0	14	1-1/8	2.520	2.835	2.520	M10	1-1/8-12UNF	2.375	3/8 NPT	24.25	22.00	125.52
MSHTR-2016	2.0	16	1-1/8	2.520	2.835	2.520	M10	1-1/8-12UNF	2.375	3/8 NPT	26.25	23.54	130.04
MSHTR-2016A	2.0	16	1-1/8	2.520	2.835	2.520	M10	1-1/8-12UNF	2.375	3/8 NPT	31.50	37.20	139.49
MSHTR-2018	2.0	18	1-1/8	2.520	2.835	2.520	M10	1-1/8-12UNF	2.375	3/8 NPT	28.25	25.08	137.02
MSHTR-2020	2.0	20	1-1/8	2.520	2.835	2.520	M10	1-1/8-12UNF	2.375	3/8 NPT	30.25	26.62	141.84
MSHTR-2024	2.0	24	1-1/8	2.520	2.835	2.520	M10	1-1/8-12UNF	2.375	3/8 NPT	34.25	29.70	153.02
MSHTR-2048	2.0	48	1-1/8	2.520	2.835	2.520	M10	1-1/8-12UNF	2.375	3/8 NPT	58.25	35.00	251.99
MSHTR-2504	2.5	4	1-1/8	2.520	3.150	2.520	M10	1-1/8-12UNF	2.875	3/8 NPT	14.25	16.28	108.20
MSHTR-2506	2.5	6	1-1/8	2.520	3.150	2.520	M10	1-1/8-12UNF	2.875	3/8 NPT	16.25	18.04	108.20
MSHTR-2508	2.5	8	1-1/8	2.520	3.150	2.520	M10	1-1/8-12UNF	2.875	3/8 NPT	18.25	20.24	112.89
MSHTR-2508A	2.5	8	1-1/4	2.520	3.150	2.520	M10	1-1/8-12UNF	2.875	3/8 NPT	20.25	22.00	117.31
MSHTR-2510	2.5	10	1-1/8	2.520	3.150	2.520	M10	1-1/8-12UNF	2.875	3/8 NPT	20.25	21.34	124.31
MSHTR-2512	2.5	12	1-1/8	2.520	3.150	2.520	M10	1-1/8-12UNF	2.875	3/8 NPT	22.25	23.10	137.87
MSHTR-2514	2.5	14	1-1/8	2.520	3.150	2.520	M10	1-1/8-12UNF	2.875	3/8 NPT	24.25	24.86	144.38
MSHTR-2516	2.5	16	1-1/8	2.520	3.150	2.520	M10	1-1/8-12UNF	2.875	3/8 NPT	26.25	26.62	149.74
MSHTR-2518	2.5	18	1-1/8	2.520	3.150	2.520	M10	1-1/8-12UNF	2.875	3/8 NPT	28.25	28.38	155.44
MSHTR-2520	2.5	20	1-1/8	2.520	3.150	2.520	M10	1-1/8-12UNF	2.875	3/8 NPT	30.25	30.14	161.66
MSHTR-2524	2.5	24	1-1/8	2.520	3.150	2.520	M10	1-1/8-12UNF	2.875	3/8 NPT	34.25	33.66	173.64
MSHTR-2536	2.5	36	1-1/4	2.520	3.150	2.520	M10	1-1/4-12UNF	2.875	3/8 NPT	46.25	38.25	233.69

MSHTR TIE-ROD CYLINDERS

THE MSHTR LINE

Pressure Ratings: 2" - 4" Bore = 2500 PSI, 5" Bore = 2000 PSI

PART NUMBER	BORE (INCH)	STROKE	ROD DIA (INCH)	H	I	K	M	N	TUBE OD	PORTS (NPT)	PIN CTR RETRACT-ED	WT LBS.	LIST PRICE
MSHTR-3004	3.0	4	1-1/4	2.600	3.740	2.520	M12	1-1/4-12UNF	3.375	1/2 NPT	14.25	21.56	\$122.80
MSHTR-3006	3.0	6	1-1/4	2.600	3.740	2.520	M12	1-1/4-12UNF	3.375	1/2 NPT	16.25	23.76	122.80
MSHTR-3008	3.0	8	1-1/4	2.600	3.740	2.520	M12	1-1/4-12UNF	3.375	1/2 NPT	18.25	26.62	125.11
MSHTR-3008A	3.0	8	1-3/8	2.600	3.740	2.520	M12	1-1/4-12UNF	3.375	1/2 NPT	20.25	27.50	135.43
MSHTR-3010	3.0	10	1-1/4	2.600	3.740	2.520	M12	1-1/4-12UNF	3.375	1/2 NPT	20.25	28.16	139.27
MSHTR-3012	3.0	12	1-1/4	2.600	3.740	2.520	M12	1-1/4-12UNF	3.375	1/2 NPT	22.25	30.36	150.27
MSHTR-3014	3.0	14	1-1/4	2.600	3.740	2.520	M12	1-1/4-12UNF	3.375	1/2 NPT	24.25	32.56	156.23
MSHTR-3016	3.0	16	1-1/4	2.600	3.740	2.520	M12	1-1/4-12UNF	3.375	1/2 NPT	26.25	34.76	162.16
MSHTR-3016A	3.0	16	1-3/8	2.600	3.740	2.520	M12	1-1/4-12UNF	3.375	1/2 NPT	31.50	42.90	187.86
MSHTR-3018	3.0	18	1-1/4	2.600	3.740	2.520	M12	1-1/4-12UNF	3.375	1/2 NPT	28.25	36.96	168.00
MSHTR-3020	3.0	20	1-1/4	2.600	3.740	2.520	M12	1-1/4-12UNF	3.375	1/2 NPT	30.25	39.16	186.72
MSHTR-3024	3.0	24	1-1/4	2.600	3.740	2.520	M12	1-1/4-12UNF	3.375	1/2 NPT	34.25	43.34	201.17
MSHTR-3030	3.0	30	1-1/4	2.600	3.740	2.520	M12	1-1/4-12UNF	3.375	1/2 NPT	40.25	48.00	241.16
MSHTR-3036	3.0	36	1-1/2	2.600	3.740	2.520	M12	1-1/4-12UNF	3.375	1/2 NPT	46.25	54.55	268.35
MSHTR-3504	3.5	4	1-1/4	2.600	4.134	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	14.25	23.32	137.53
MSHTR-3506	3.5	6	1-1/4	2.600	4.134	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	16.25	25.52	144.00
MSHTR-3508	3.5	8	1-1/4	2.600	4.134	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	18.25	28.82	145.24
MSHTR-3508A	3.5	8	1-3/8	2.600	4.134	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	20.25	29.70	155.34
MSHTR-3510	3.5	10	1-1/4	2.600	4.134	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	20.25	29.92	157.17
MSHTR-3512	3.5	12	1-1/4	2.600	4.134	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	22.25	32.34	165.46
MSHTR-3514	3.5	14	1-1/4	2.600	4.134	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	24.25	34.76	176.87
MSHTR-3516	3.5	16	1-1/4	2.600	4.134	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	26.25	37.18	185.69
MSHTR-3516A	3.5	16	1-3/8	2.600	4.134	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	31.50	50.60	211.18
MSHTR-3518	3.5	18	1-1/4	2.600	4.134	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	28.25	39.60	195.01
MSHTR-3520	3.5	20	1-1/4	2.600	4.134	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	30.25	42.02	204.28
MSHTR-3524	3.5	24	1-1/2	2.600	4.134	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	34.25	51.70	234.07
MSHTR-3530	3.5	30	1-1/2	2.600	4.130	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	40.25	55.00	271.12
MSHTR-3532	3.5	32	1-1/2	2.600	4.130	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	42.25	58.00	299.53
MSHTR-3536	3.5	36	1-1/2	2.600	4.130	2.520	M12	1-1/4-12UNF	3.875	1/2 NPT	46.25	62.00	294.77
MSHTR-3548	3.5	48	1-1/2	2.600	4.130	2.600	M12	1-1/4-12UNF	3.875	1/2 NPT	58.25	74.69	357.75
MSHTR-4004	4.0	4	1-1/4	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	14.25	29.48	183.62
MSHTR-4006	4.0	6	1-1/4	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	16.25	33.60	187.79
MSHTR-4008	4.0	8	1-1/4	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	18.25	35.86	184.83
MSHTR-4008A	4.0	8	1-3/4	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2NPT	20.25	37.40	206.16
MSHTR-4010	4.0	10	1-1/4	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	20.25	37.84	210.68
MSHTR-4012	4.0	12	1-1/4	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	22.25	40.70	222.48
MSHTR-4014	4.0	14	1-1/4	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	24.25	43.56	238.71
MSHTR-4016	4.0	16	1-1/4	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	26.25	46.42	246.70
MSHTR-4016A	4.0	16	1-3/4	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	31.50	57.20	290.86
MSHTR-4018	4.0	18	1-1/2	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	28.25	50.60	255.91
MSHTR-4020	4.0	20	1-1/2	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	30.25	53.46	266.18
MSHTR-4024	4.0	24	1-1/2	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	32.25	59.18	281.85
MSHTR-4024-2	4.0	24	2	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	34.25	68.00	307.21
MSHTR-4030	4.0	30	1-3/4	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	40.25	75.00	345.36
MSHTR-4030-2	4.0	30	2	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	40.25	78.00	356.56
MSHTR-4036	4.0	36	1-3/4	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	46.25	82.00	396.37
MSHTR-4048	4.0	48	2	2.600	4.724	2.600	M12	1-1/4-12UNF	4.375	1/2 NPT	58.25	98.00	457.33
MSHTR-5004	5.0	4	1-1/2	2.677	6.000	3.500	M16	1-1/4-12UNF	5.453	1/2 NPT	16.25	53.46	273.00
MSHTR-5008	5.0	8	1-1/2	2.677	6.000	3.500	M16	1-1/4-12UNF	5.453	1/2 NPT	20.25	61.16	290.53
MSHTR-5010	5.0	10	1-1/2	2.677	6.000	3.500	M16	1-1/4-12UNF	5.453	1/2 NPT	22.25	63.36	316.31
MSHTR-5012	5.0	12	2	2.677	6.000	3.500	M16	1-1/4-12UNF	5.453	1/2 NPT	24.25	73.04	342.16
MSHTR-5014	5.0	14	2	2.677	6.000	3.500	M16	1-1/4-12UNF	5.453	1/2 NPT	26.25	77.00	368.26
MSHTR-5016	5.0	16	2	2.677	6.000	3.500	M16	1-1/4-12UNF	5.453	1/2 NPT	28.25	81.18	\$387.89

CYLINDERS

MSHTR TIE-ROD CYLINDERS

THE MSHTR LINE

Pressure Ratings: 2" - 4" Bore = 2500 PSI, 5" Bore = 2000 PSI

PART NUMBER	BORE (INCH)	STROKE	ROD DIA (INCH)	H	I	K	M	N	TUBE OD	PORTS (NPT)	PIN CTR RETRACT-ED	WT LBS.	LIST PRICE
MSHTR-5018	5.0	18	2	2.677	6.000	3.500	M16	1-1/4-12UNF	5.453	1/2 NPT	30.25	85.14	407.33
MSHTR-5020	5.0	20	2	2.677	6.000	3.500	M16	1-1/4-12UNF	5.453	1/2 NPT	32.25	89.10	426.84
MSHTR-5024	5.0	24	2	2.677	6.000	3.500	M16	1-1/4-12UNF	5.453	1/2 NPT	36.25	97.24	472.96
MSHTR-5030	5.0	30	2	2.677	6.000	3.500	M16	1-1/4-12UNF	5.453	1/2 NPT	42.25	109.56	541.40

SEAL KIT NUMBER	Rod x Bore	LIST PRICE
MSHTR-2.0X1.12K	SK-P-U-10-1.125x2.000	\$13.50
MSHTR-2.5X1.12K	SK-P-U-10-1.125x2.500	13.85
MSHTR-2.5X1.25K-A	SK-P-U-10-1.250x2.500	10.81
MSHTR-3.0X1.25K	SK-P-U-10-1.250x3.000	14.49
MSHTR-3.0X1.37K-A	SK-P-U-10-1.375x3.000	11.11
MSHTR-3.0X1.50K	SK-P-U-10-1.500x3.000	22.78
MSHTR-3.5X1.25K	SK-P-U-10-1.250x3.500	15.35
MSHTR-3.5X1.37K-A	SK-I-U-10-1.375x3.500	11.48
MSHTR-3.5X1.50K	SK-P-U-10-1.500x3.500	16.34
MSHTR-4.0X1.25K	SK-P-U-10-1.250x4.000	27.42
MSHTR-4.0X1.50K	SK-P-U-10-1.500x4.000	28.40
MSHTR-4.0X1.75K	SK-P-U-10-1.750x4.000	29.71
MSHTR-4.0X2.00K	SK-P-U-10-2.000x4.000	36.94
MSHTR-5.0X1.50K	SK-P-UB-10-1.500x5.000	49.49
MSHTR-5.0X2.00K	SK-P-UB-10-2.000x5.000	61.38

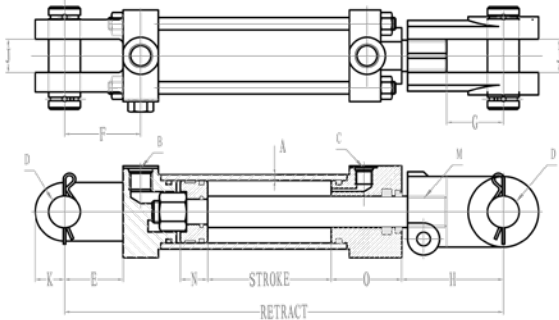
CYLINDERS

MSHSTR (OLYMPUS) TIE ROD CYLINDERS

MSO Brand Cylinders

THE MSHSTR (Olympus) LINE

3000 PSI DOUBLE ACTING TIE ROD CYLINDERS



FEATURES:

- Honed Steel tube, precision finished for extended seal life
- Heavy duty, high strength tie rods
- Chromed, ground and polished piston rod
- Pin and clevis included
- Rod seal: Twin lip heavy duty polyurethane seal
- Rod Wiper: Heavy duty metal canned wiper
- 2-piece 93A urethane piston seal with 70A buna energizer
- All pistons designed to include high strength nylon wear bands
- Painted Black
- SAE O-Ring Ports

BORE (INCH)	A	D	E	F	G	J	K
2.0	0.188	1.015	1.812	2.375	1.813	1.063	0.938
2.5	0.188	1.015	1.844	2.375	1.813	1.063	0.938
3.0	0.188	1.015	2.125	2.438	1.813	1.063	1.063
3.5	0.188	1.015	2.125	2.438	1.813	1.063	1.250
4.0	0.188	1.015	2.125	2.438	1.875	1.063	1.250
5.0	0.250	1.265	2.500	2.625	2.000	1.063	1.407

For quantities above 50 pieces, call MSO for special pricing.

Seal kits for these cylinders are shown at the end of the section.

PART NUMBER	BORE	STK	ROD DIA.	RETRAC. DIMEN.	SHIP WT	PORTS (SAE)	H	M	N	O	LIST PRICE
MSHSTR-2004	2	4	1.125	14.25	18	#8 3/4-16	3.250	1.125-12UNF	0.875	2.375	\$142.80
MSHSTR-2006	2	6	1.125	16.25	19	#8 3/4-16	3.250	1.125-12UNF	0.875	2.375	149.10
MSHSTR-2008	2	8	1.125	18.25	22	#8 3/4-16	3.25	1.125-12UNF	0.875	2.250	144.99
MSHSTR-2008A	2	8	1.125	20.25	20	#8 3/4-16	3.250	1.125-12UNF	0.875	2.375	158.32
MSHSTR-2010	2	10	1.125	20.25	21	#8 3/4-16	3.250	1.125-12UNF	0.875	2.375	162.06
MSHSTR-2012	2	12	1.125	22.25	25	#8 3/4-16	3.250	1.125-12UNF	0.875	2.375	172.24
MSHSTR-2014	2	14	1.125	24.25	26	#8 3/4-16	3.250	1.125-12UNF	0.875	2.375	180.24
MSHSTR-2016A	2	16	1.125	31.50	28	#8 3/4-16	8.500	1.125-12UNF	0.875	2.375	188.53
MSHSTR-2018	2	18	1.125	28.25	29	#8 3/4-16	3.250	1.125-12UNF	0.875	2.375	186.07
MSHSTR-2020	2	20	1.125	30.25	31	#8 3/4-16	3.250	1.125-12UNF	0.875	2.375	193.32
MSHSTR-2024	2	24	1.125	34.25	31	#8 3/4-16	3.250	1.125-12UNF	0.875	2.375	209.27
MSHSTR-2030	2	30	1.125	40.25	39	#8 3/4-16	3.250	1.125-12UNF	0.875	2.375	233.21
MSHSTR-2506	2.5	6	1.125	16.25	22	#8 3/4-16	3.250	1.125-12UNF	1.000	2.375	161.25
MSHSTR-2508	2.5	8	1.125	18.25	25	#8 3/4-16	3.25	1.125-12UNF	1.000	2.375	169.80
MSHSTR-2508A	2.5	8	1.250	20.25	25	#8 3/4-16	3.250	1.125-12UNF	1.000	2.375	176.14
MSHSTR-2510	2.5	10	1.250	20.25	26	#8 3/4-16	3.250	1.125-12UNF	1.000	2.375	184.62
MSHSTR-2512	2.5	12	1.250	22.25	27	#8 3/4-16	3.250	1.125-12UNF	1.000	2.375	193.70
MSHSTR-2514	2.5	14	1.250	24.25	29	#8 3/4-16	3.250	1.125-12UNF	1.000	2.375	199.34
MSHSTR-2516A	2.5	16	1.250	31.50	33	#8 3/4-16	8.500	1.125-12UNF	1.000	2.375	223.17
MSHSTR-2518	2.5	18	1.250	28.20	34	#8 3/4-16	3.250	1.125-12UNF	1.000	2.375	217.24
MSHSTR-2520	2.5	20	1.250	30.25	36	#8 3/4-16	3.250	1.125-12UNF	1.000	2.375	225.87
MSHSTR-2524	2.5	24	1.250	34.25	39	#8 3/4-16	3.250	1.125-12UNF	1.000	2.375	247.11
MSHSTR-2530	2.5	30	1.250	40.25	44	#8 3/4-16	3.250	1.125-12UNF	1.000	2.375	277.49
MSHSTR-3006	3	6	1.125	16.25	24	#8 3/4-16	3.750	1.125-12UNF	1.000	1.938	179.72
MSHSTR-3008	3	8	1.375	18.25	30	#8 3/4-16	3.25	1.125-12UNF	1.000	1.938	192.76
MSHSTR-3008A	3	8	1.375	20.25	32	#8 3/4-16	5.750	1.125-12UNF	1.000	1.938	199.99
MSHSTR-3010	3	10	1.375	20.25	33	#8 3/4-16	3.750	1.125-12UNF	1.000	1.938	205.83

MSHSTR (OLYMPUS) TIE ROD CYLINDERS

THE MSHSTR (Olympus) LINE

3000 PSI DOUBLE ACTING TIE ROD CYLINDERS

CYLINDERS

PART NUMBER	BORE	STK	ROD DIA.	RETRAC. DIMEN.	SHIP WT	PORTS (SAE)	H	M	N	O	LIST PRICE
MSHSTR-3012	3	12	1.375	22.25	33	#8 3/4-16	3.750	1.125-12UNF	1.000	1.938	\$216.19
MSHSTR-3014	3	14	1.375	24.25	35	#8 3/4-16	3.750	1.125-12UNF	1.000	1.938	226.35
MSHSTR-3016	3	16	1.375	26.25	38	#8 3/4-16	3.750	1.125-12UNF	1.000	1.938	236.84
MSHSTR-3016A	3	16	1.375	31.50	39	#8 3/4-16	9.000	1.125-12UNF	1.000	1.938	251.62
MSHSTR-3018	3	18	1.375	28.25	42	#8 3/4-16	3.750	1.125-12UNF	1.000	1.938	248.31
MSHSTR-3020	3	20	1.375	30.25	45	#8 3/4-16	3.750	1.125-12UNF	1.000	1.938	258.66
MSHSTR-3024	3	24	1.375	34.25	41	#8 3/4-16	3.750	1.125-12UNF	1.000	1.938	282.33
MSHSTR-3030	3	30	1.375	40.25	53	#8 3/4-16	3.750	1.125-12UNF	1.000	1.938	316.53
MSHSTR-3036	3	36	1.375	46.25	61	#8 3/4-16	3.750	1.125-12UNF	1.000	1.938	355.00
MSHSTR-3048	3	48	1.375	58.25	66	#8 3/4-16	3.750	1.125-12UNF	1.000	1.938	411.86
MSHSTR-3508	3.5	8	1.375	18.25	36	#8 3/4-16	3.25	1.125-12UNF	1.000	2.000	232.44
MSHSTR-3508A	3.5	8	1.375	20.25	35	#8 3/4-16	5.750	1.250-12UNF	1.000	2.000	224.53
MSHSTR-3510	3.5	10	1.375	20.25	36	#8 3/4-16	3.750	1.250-12UNF	1.000	2.000	231.65
MSHSTR-3512	3.5	12	1.375	22.25	38	#8 3/4-16	3.750	1.250-12UNF	1.000	2.000	243.34
MSHSTR-3514	3.5	14	1.375	24.25	41	#8 3/4-16	3.750	1.250-12UNF	1.000	2.000	254.77
MSHSTR-3516A	3.5	16	1.375	31.50	46	#8 3/4-16	9.000	1.250-12UNF	1.000	2.000	281.59
MSHSTR-3518	3.5	18	1.375	28.25	47	#8 3/4-16	3.750	1.250-12UNF	1.000	2.000	278.08
MSHSTR-3520	3.5	20	1.375	30.25	49	#8 3/4-16	3.750	1.250-12UNF	1.000	2.000	289.70
MSHSTR-3524	3.5	24	1.375	34.25	54	#8 3/4-16	3.750	1.250-12UNF	1.000	2.000	317.89
MSHSTR-3530	3.5	30	1.375	40.25	64	#8 3/4-16	3.750	1.250-12UNF	1.000	2.000	356.57
MSHSTR-3536	3.5	36	1.375	46.25	66	#8 3/4-16	3.750	1.250-12UNF	1.000	2.000	392.41
MSHSTR-3548	3.5	48	1.375	58.25	73	#8 3/4-16	3.750	1.250-12UNF	1.000	2.000	463.62
MSHSTR-4008	4	8	1.750	18.25	48	#8 3/4-16	3.25	1.125-12UNF	1.250	1.813	277.02
MSHSTR-4008A	4	8	1.750	20.25	45	#8 3/4-16	5.250	1.500-12UNF	1.250	1.813	287.43
MSHSTR-4010	4	10	1.750	20.25	48	#8 3/4-16	3.250	1.500-12UNF	1.250	1.813	295.16
MSHSTR-4012	4	12	1.750	22.25	49	#8 3/4-16	3.250	1.500-12UNF	1.250	1.813	310.18
MSHSTR-4014	4	14	1.750	24.25	51	#8 3/4-16	3.250	1.500-12UNF	1.250	1.813	325.00
MSHSTR-4016	4	16	1.750	26.25	58	#8 3/4-16	3.250	1.500-12UNF	1.250	1.813	341.01
MSHSTR-4016A	4	16	1.750	31.50	61	#8 3/4-16	8.500	1.500-12UNF	1.250	1.813	361.56
MSHSTR-4018	4	18	1.750	28.25	62	#8 3/4-16	3.250	1.500-12UNF	1.250	1.813	355.95
MSHSTR-4020	4	20	1.750	30.25	72	#8 3/4-16	3.250	1.500-12UNF	1.250	1.813	370.97
MSHSTR-4024	4	24	1.750	34.25	74	#8 3/4-16	3.250	1.500-12UNF	1.250	1.813	405.33
MSHSTR-4030	4	30	1.750	40.25	77	#8 3/4-16	3.250	1.500-12UNF	1.250	1.813	455.44
MSHSTR-4036	4	36	1.750	46.25	83	#8 3/4-16	3.250	1.500-12UNF	1.250	1.813	502.97
MSHSTR-4048	4	48	1.750	58.25	109	#8 3/4-16	3.250	1.500-12UNF	1.250	1.813	595.58
MSHSTR-5008A	5	8	2.000	20.25	67	#10 7/8-14	4.000	1.500-12UNF	1.437	2.500	434.36
MSHSTR-5012	5	12	2.000	24.25	75	#10 7/8-14	4.000	1.500-12UNF	1.437	2.500	477.84
MSHSTR-5014	5	14	2.000	26.25	80	#10 7/8-14	4.000	1.500-12UNF	1.437	2.500	282.88
MSHSTR-5016A	5	16	2.000	31.50	84	#10 7/8-14	4.000	1.500-12UNF	1.437	2.500	537.03
MSHSTR-5018	5	18	2.000	30.25	90	#10 7/8-14	4.000	1.500-12UNF	1.437	2.500	541.81
MSHSTR-5020	5	20	2.000	32.25	95	#10 7/8-14	4.000	1.500-12UNF	1.437	2.500	564.54
MSHSTR-5024	5	24	2.000	36.25	100	#10 7/8-14	4.000	1.500-12UNF	1.437	2.500	613.11
MSHSTR-5030	5	30	2.000	42.25	108	#10 7/8-14	4.000	1.500-12UNF	1.437	2.500	684.29
MSHSTR-5036	5	36	2.000	48.25	118	#10 7/8-14	4.000	1.500-12UNF	1.437	2.500	751.02
MSHSTR-5048	5	48	2.000	60.25	161	#10 7/8-14	4.000	1.500-12UNF	1.437	2.500	883.15

SEAL KIT NUMBER	Rod x Bore	LIST PRICE
MSHSTR-2.0X1.12K	SK-P-U-10-1.125x2.000	\$23.02
MSHSTR-2.5X1.25K	SK-P-U-10-1.250x2.500	23.86
MSHSTR-3.0X1.37K	SK-P-U-10-1.375x3.000	27.27
MSHSTR-3.0X1.12K	SK-P-U-10-1.125x3.000	23.65

SEAL KIT NUMBER	Rod x Bore	LIST PRICE
MSHSTR-3.5X1.37K	SK-P-U-10-1.375x3.500	\$29.52
MSHSTR-4.0X1.5K	SK-P-U-10-4.000x1.500	35.94
MSHSTR-4.0X1.75K	SK-P-U-10-1.750x4.000	41.09
MSHSTR-5.0X2.0K	SK-P-U-10-2.000x5.000	54.13

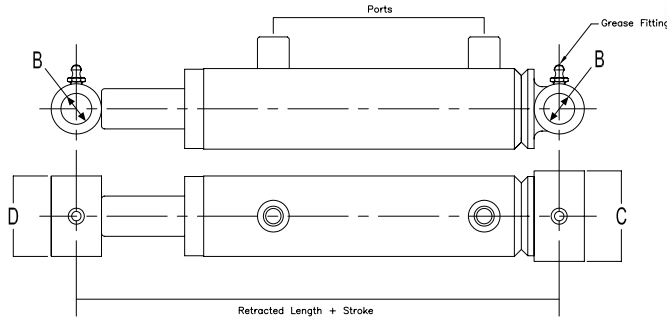
MSHMW MECHANICAL WELDED CYLINDERS

MSO Brand Cylinders

THE MSHMW LINE

2500 and 3000 PSI DOUBLE ACTING CYLINDERS

(4" Bore = 3000 PSI, 5" Bore = 2500 PSI)



FEATURES:

- Honed tubing
- Heavy duty welded construction
- Chromed, ground & polished piston rod
- Cast iron piston & gland
- Pin eye mounting on both ends
- Loaded u-seal & urethane wiper in gland
- O-ring/backup washers & u-seals for piston seals
- Threaded gland retainer
- Standard color is black

For quantities above 50 pieces, call MSO for special pricing.

Seal kits for these cylinders are shown at the end of the section.

Bore	B	C	D	Ports(NPT)
1.50	0.77	2.25	2.00	1/4 NPT
2.00	1.02	2.75	2.25	3/8 NPT
2.50	1.02	3.25	2.25	1/2 NPT
3.00	1.02	3.75	2.25	1/2 NPT
3.50	1.27	4.25	2.25	1/2 NPT
4.00	1.52	4.75	2.50	1/2 NPT
5.00	1.77	5.75	3.25	1/2 NPT

PART NUMBER	BORE	STROKE (INCH)	ROD DIA (INCH)	PIN CENTERS RETRACTED (INCH)	PIN CENTERS EXTENDED (INCH)	WEIGHT LBS	LIST PRICE
MSHMW-1504	1.50	4	1"	12.00	16.00	9.04	\$127.65
MSHMW-1506	1.50	6	1"	14.00	20.00	10.14	138.43
MSHMW-1508	1.50	8	1"	16.00	24.00	11.47	148.14
MSHMW-1510	1.50	10	1"	18.00	28.00	12.79	156.34
MSHMW-2008	2.00	8	1-1/4"	16.00	24.00	13.45	141.21
MSHMW-2010	2.00	10	1-1/4"	18.00	28.00	15.21	149.22
MSHMW-2012	2.00	12	1-1/4"	20.00	32.00	16.98	155.21
MSHMW-2014	2.00	14	1-1/4"	22.00	36.00	18.74	162.88
MSHMW-2016	2.00	16	1-1/4"	24.00	40.00	20.51	173.78
MSHMW-2018	2.00	18	1-1/4"	26.00	44.00	22.27	183.23
MSHMW-2020	2.00	20	1-1/4"	28.00	48.00	24.03	189.03
MSHMW-2024	2.00	24	1-1/4"	32.00	56.00	27.56	204.62
MSHMW-2028	2.00	28	1-1/4"	36.00	64.00	31.09	214.03
MSHMW-2030	2.00	30	1-1/4"	38.00	68.00	32.85	254.78
MSHMW-2032	2.00	32	1-1/4"	40.00	72.00	34.84	270.59
MSHMW-2036	2.00	36	1-1/4"	44.00	80.00	38.37	281.55
MSHMW-2040	2.00	40	1-1/4"	48.00	88.00	41.90	310.02
MSHMW-2048	2.00	48	1-1/4"	56.00	104.00	48.95	367.07
MSHMW-2508	2.50	8	1-1/2"	16.00	24.00	19.85	154.03
MSHMW-2510	2.50	10	1-1/2"	18.00	28.00	21.83	163.57
MSHMW-2512	2.50	12	1-1/2"	20.00	32.00	24.03	168.46
MSHMW-2514	2.50	14	1-1/2"	22.00	36.00	26.24	179.46
MSHMW-2516	2.50	16	1-1/2"	24.00	40.00	28.44	185.27

MSHMW MECHANICAL WELDED CYLINDERS

THE MSHMW LINE

2500 and 3000 PSI DOUBLE ACTING CYLINDERS (4" Bore = 3000 PSI, 5" Bore = 2500 PSI)

PART NUMBER	BORE	STROKE (INCH)	ROD DIA (INCH)	PIN CENTERS RETRACTED (INCH)	PIN CENTERS EXTENDED (INCH)	WEIGHT LBS	LIST PRICE
MSHMW-2518	2.50	18	1-1/2"	26.00	44.00	30.65	\$193.16
MSHMW-2520	2.50	20	1-1/2"	28.00	48.00	32.85	206.86
MSHMW-2524	2.50	24	1-1/2"	32.00	56.00	37.26	220.82
MSHMW-2528	2.50	28	1-1/2"	36.00	64.00	41.45	243.65
MSHMW-2530	2.50	30	1-1/2"	38.00	68.00	43.66	270.17
MSHMW-2532	2.50	32	1-1/2"	40.00	72.00	45.86	288.94
MSHMW-2536	2.50	36	1-1/2"	44.00	80.00	50.27	298.46
MSHMW-2540	2.50	40	1-1/2"	48.00	88.00	54.68	339.53
MSHMW-2548	2.50	48	1-1/2"	56.00	104.00	63.28	422.61
MSHMW-3008	3.00	8	1-1/2"	16.00	24.00	24.70	173.01
MSHMW-3010	3.00	10	1-1/2"	18.00	28.00	27.12	183.51
MSHMW-3012	3.00	12	1-1/2"	20.00	32.00	29.55	197.73
MSHMW-3014	3.00	14	1-1/2"	22.00	36.00	31.97	205.44
MSHMW-3016	3.00	16	1-1/2"	24.00	40.00	34.40	213.30
MSHMW-3018	3.00	18	1-1/2"	26.00	44.00	36.82	220.79
MSHMW-3020	3.00	20	1-1/2"	28.00	48.00	39.25	231.86
MSHMW-3024	3.00	24	1-1/2"	32.00	56.00	44.10	256.75
MSHMW-3028	3.00	28	1-1/2"	36.00	64.00	48.95	284.66
MSHMW-3030	3.00	30	1-1/2"	38.00	68.00	51.38	295.73
MSHMW-3032	3.00	32	1-1/2"	40.00	72.00	53.58	310.47
MSHMW-3036	3.00	36	1-1/2"	44.00	80.00	58.43	331.90
MSHMW-3040	3.00	40	1-1/2"	48.00	88.00	63.28	390.92
MSHMW-3048	3.00	48	1-1/2"	56.00	104.00	72.99	431.74
MSHMW-3508	3.50	8	1-3/4"	18.00	26.00	32.63	202.10
MSHMW-3510	3.50	10	1-3/4"	20.00	30.00	35.72	209.63
MSHMW-3512	3.50	12	1-3/4"	22.00	34.00	38.81	220.07
MSHMW-3514	3.50	14	1-3/4"	24.00	38.00	41.67	228.77
MSHMW-3516	3.50	16	1-3/4"	26.00	42.00	44.76	251.31
MSHMW-3518	3.50	18	1-3/4"	28.00	46.00	47.63	264.80
MSHMW-3520	3.50	20	1-3/4"	30.00	50.00	50.72	277.56
MSHMW-3524	3.50	24	1-3/4"	34.00	58.00	56.67	297.29
MSHMW-3528	3.50	28	1-3/4"	38.00	66.00	62.62	345.57
MSHMW-3530	3.50	30	1-3/4"	40.00	70.00	65.71	374.34
MSHMW-3532	3.50	32	1-3/4"	42.00	74.00	68.80	385.22
MSHMW-3536	3.50	36	1-3/4"	46.00	82.00	74.75	416.75
MSHMW-3540	3.50	40	1-3/4"	50.00	90.00	80.70	436.21
MSHMW-3548	3.50	48	1-3/4"	58.00	106.00	92.61	491.11
MSHMW-4008	4.00	8	2"	18.00	26.00	40.79	237.51
MSHMW-4010	4.00	10	2"	20.00	30.00	44.54	260.71
MSHMW-4012	4.00	12	2"	22.00	34.00	48.29	275.48
MSHMW-4014	4.00	14	2"	24.00	38.00	51.82	295.94
MSHMW-4016	4.00	16	2"	26.00	42.00	55.57	306.20
MSHMW-4018	4.00	18	2"	28.00	46.00	59.09	317.03
MSHMW-4020	4.00	20	2"	30.00	50.00	62.84	329.85
MSHMW-4024	4.00	24	2"	34.00	58.00	70.12	345.57
MSHMW-4028	4.00	28	2"	38.00	66.00	77.40	391.17
MSHMW-4030	4.00	30	2"	40.00	70.00	81.14	417.49
MSHMW-4032	4.00	32	2"	42.00	74.00	84.67	437.70
MSHMW-4036	4.00	36	2"	46.00	82.00	91.95	465.33
MSHMW-4040	4.00	40	2"	50.00	90.00	99.23	495.96
MSHMW-4048	4.00	48	2"	58.00	106.00	114.00	575.09
MSHMW-5008	5.00	8	2-1/2"	20.00	28.00	71.88	392.20
MSHMW-5010	5.00	10	2-1/2"	22.00	32.00	76.07	408.37

CYLINDERS

MSHMW MECHANICAL WELDED CYLINDERS

THE MSHMW LINE

2500 and 3000 PSI DOUBLE ACTING CYLINDERS (4" Bore = 3000 PSI, 5" Bore = 2500 PSI)

PART NUMBER	BORE	STROKE (INCH)	ROD DIA (INCH)	PIN CENTERS RETRACTED (INCH)	PIN CENTERS EXTENDED (INCH)	WEIGHT LBS	LIST PRICE
MSHMW-5012	5.00	12	2-1/2"	24.00	36.00	80.48	\$454.38
MSHMW-5014	5.00	14	2-1/2"	26.00	40.00	84.67	488.37
MSHMW-5016	5.00	16	2-1/2"	28.00	44.00	89.08	515.27
MSHMW-5018	5.00	18	2-1/2"	30.00	48.00	93.49	542.28
MSHMW-5020	5.00	20	2-1/2"	32.00	52.00	97.68	566.32
MSHMW-5024	5.00	24	2-1/2"	36.00	60.00	106.28	585.18
MSHMW-5028	5.00	28	2-1/2"	40.00	68.00	115.10	610.02
MSHMW-5030	5.00	30	2-1/2"	42.00	72.00	119.29	633.29
MSHMW-5032	5.00	32	2-1/2"	44.00	76.00	123.70	682.00
MSHMW-5036	5.00	36	2-1/2"	48.00	84.00	132.30	716.41
MSHMW-5040	5.00	40	2-1/2"	52.00	92.00	140.90	792.59
MSHMW-5048	5.00	48	2-1/2"	60.00	108.00	158.10	870.90

SEAL KIT NUMBER	Rod x Bore	LIST PRICE
MSHMW-1.5X1.00K	SK-P-U-5-1.000x1.500	\$24.95
MSHMW-2.0X1.25K	SK-P-U-5-1.250x2.000	39.32
MSHMW-2.5X1.50K	SK-P-U-5-1.500x2.500	52.10
MSHMW-3.0X1.50K	SK-P-U-5-1.500x3.000	58.15
MSHMW-3.5X1.75K	SK-P-U-5-1.750x3.500	69.46
MSHMW-4.0X2.00K	SK-P-U-5-2.000x4.000	67.38
MSHMW-5.0X2.50K	SK-P-U-5-2.500x5.000	108.13

These seal kits are replacements for both the HMW and HCW cylinders.

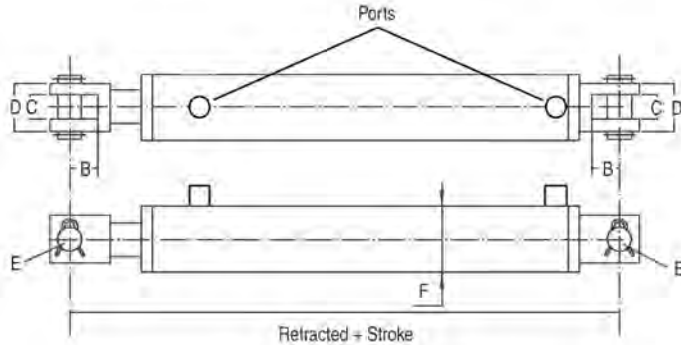
CLEVIS WELDED CYLINDERS

MSO Brand Cylinders

THE MSHCW LINE

2500 and 3000 PSI DOUBLE ACTING CYLINDERS

(4" Bore = 3000 PSI, 5" Bore = 2500 PSI)



FEATURES:

- Skived, honed tubing
- Heavy duty welded construction
- Chromed, ground & polished piston rod will operate at full pressure through 16" stroke
- Cast iron piston, cast steel butt, gland & clevis
- Loaded u-seal & urethane wiper in gland, u-seal on piston
- Threaded gland
- Pins & clips included
- Standard color is black
- Stroke control may be installed on 8" strokes

For quantities above 50 pieces, call MSO for special pricing.

Seal kits for these cylinders are shown at the end of the section.

Bore	B	C	D	E	F	Ports(NPT)
2.00	2.125	1.125	2.07	1.00	2.5	3/8 NPT
2.50	2.125	1.125	2.07	1.00	3.0	1/2 NPT
3.00	2.125	1.125	2.07	1.00	3.5	1/2 NPT
3.50	2.125	1.125	2.07	1.00	4.0	1/2 NPT
4.00	2.000	1.125	2.07	1.00	4.5	1/2 NPT
5.00	2.000	1.500	2.44	1.00	5.5	1/2 NPT

PART NUMBER	BORE	STROKE (INCH)	ROD DIA (INCH)	PIN CENTERS RE-TRACTED (INCH)	PIN CENTERS EX-TENDED (INCH)	WEIGHT LBS	LIST PRICE
MSHCW-2004	2.00	4	1-1/4"	14.25	18.25	12.79	\$134.16
MSHCW-2006	2.00	6	1-1/4"	16.25	22.25	14.55	134.16
MSHCW-2008	2.00	8	1-1/4"	20.25	28.25	16.32	141.32
MSHCW-2010	2.00	10	1-1/4"	20.25	30.25	17.86	150.63
MSHCW-2012	2.00	12	1-1/4"	22.25	34.25	19.40	155.40
MSHCW-2014	2.00	14	1-1/4"	24.25	38.25	21.17	162.88
MSHCW-2016	2.00	16	1-1/4"	26.25	42.25	22.93	173.94
MSHCW-2018	2.00	18	1-1/4"	28.25	46.25	24.48	184.66
MSHCW-2020	2.00	20	1-1/4"	30.25	50.25	26.24	189.20
MSHCW-2024	2.00	24	1-1/4"	34.25	58.25	29.55	204.74
MSHCW-2028	2.00	28	1-1/4"	38.25	66.25	32.85	214.24
MSHCW-2030	2.00	30	1-1/4"	40.25	70.25	34.62	254.78
MSHCW-2032	2.00	32	1-1/4"	42.25	74.25	36.16	270.72
MSHCW-2034	2.00	34	1-1/4"	44.25	78.25	37.93	276.55
MSHCW-2036	2.00	36	1-1/4"	46.25	82.25	39.69	281.55
MSHCW-2504	2.50	4	1-1/2"	14.25	18.25	16.98	146.09
MSHCW-2506	2.50	6	1-1/2"	16.25	22.25	19.18	146.09
MSHCW-2508	2.50	8	1-1/2"	20.25	28.25	21.39	154.21
MSHCW-2510	2.50	10	1-1/2"	20.25	30.25	23.37	163.57
MSHCW-2512	2.50	12	1-1/2"	22.25	34.25	25.58	168.64
MSHCW-2514	2.50	14	1-1/2"	24.25	38.25	27.78	179.46
MSHCW-2516	2.50	16	1-1/2"	26.25	42.25	29.77	185.43
MSHCW-2518	2.50	18	1-1/2"	28.25	46.25	31.97	193.16
MSHCW-2520	2.50	20	1-1/2"	30.25	50.25	34.18	207.02
MSHCW-2524	2.50	24	1-1/2"	34.25	58.25	38.37	220.96
MSHCW-2528	2.50	28	1-1/2"	38.25	66.25	42.56	243.89

CLEVIS WELDED CYLINDERS

THE MSHCW LINE

2500 and 3000 PSI DOUBLE ACTING CYLINDERS (4" Bore = 3000 PSI, 5" Bore = 2500 PSI)

PART NUMBER	BORE	STROKE (INCH)	ROD DIA (INCH)	PIN CENTERS RE-TRACTED (INCH)	PIN CENTERS EXTENDED (INCH)	WEIGHT LBS	LIST PRICE
MSHCW-2530	2.50	30	1-1/2"	40.25	70.25	44.76	\$270.17
MSHCW-2532	2.50	32	1-1/2"	42.25	74.25	46.97	289.04
MSHCW-2534	2.50	34	1-1/2"	44.25	78.25	48.95	293.92
MSHCW-2536	2.50	36	1-1/2"	46.25	82.25	51.16	298.46
MSHCW-3004	3.00	4	1-1/2"	14.25	18.25	21.83	162.08
MSHCW-3006	3.00	6	1-1/2"	16.25	22.25	24.26	162.08
MSHCW-3008	3.00	8	1-1/2"	20.25	28.25	26.90	171.44
MSHCW-3010	3.00	10	1-1/2"	20.25	30.25	29.11	183.51
MSHCW-3012	3.00	12	1-1/2"	22.25	34.25	31.53	197.87
MSHCW-3014	3.00	14	1-1/2"	24.25	38.25	33.96	205.44
MSHCW-3016	3.00	16	1-1/2"	26.25	42.25	36.60	213.51
MSHCW-3018	3.00	18	1-1/2"	28.25	46.25	39.03	220.79
MSHCW-3020	3.00	20	1-1/2"	30.25	50.25	41.45	231.99
MSHCW-3024	3.00	24	1-1/2"	34.25	58.25	46.31	256.96
MSHCW-3028	3.00	28	1-1/2"	38.25	66.25	51.16	285.02
MSHCW-3030	3.00	30	1-1/2"	40.25	70.25	53.58	296.46
MSHCW-3032	3.00	32	1-1/2"	42.25	74.25	56.23	310.57
MSHCW-3034	3.00	34	1-1/2"	44.25	78.25	58.65	321.43
MSHCW-3036	3.00	36	1-1/2"	46.25	82.25	61.08	331.90
MSHCW-3504	3.50	4	1-3/4"	14.25	18.25	26.24	191.73
MSHCW-3506	3.50	6	1-3/4"	16.25	22.25	29.33	191.73
MSHCW-3508	3.50	8	1-3/4"	20.25	28.25	32.41	203.32
MSHCW-3510	3.50	10	1-3/4"	20.25	30.25	35.50	209.63
MSHCW-3512	3.50	12	1-3/4"	22.25	34.25	38.59	221.32
MSHCW-3514	3.50	14	1-3/4"	24.25	38.25	41.67	228.77
MSHCW-3516	3.50	16	1-3/4"	26.25	42.25	44.76	251.31
MSHCW-3518	3.50	18	1-3/4"	28.25	46.25	48.07	264.80
MSHCW-3520	3.50	20	1-3/4"	30.25	50.25	51.16	278.81
MSHCW-3524	3.50	24	1-3/4"	34.25	58.25	57.33	297.29
MSHCW-3528	3.50	28	1-3/4"	38.25	66.25	63.50	344.35
MSHCW-3530	3.50	30	1-3/4"	40.25	70.25	66.59	375.56
MSHCW-3532	3.50	32	1-3/4"	42.25	74.25	69.90	385.22
MSHCW-3534	3.50	34	1-3/4"	44.25	78.25	72.99	401.18
MSHCW-3536	3.50	36	1-3/4"	46.25	82.25	76.07	418.01
MSHCW-4004	4.00	4	2"	14.25	18.25	30.65	230.22
MSHCW-4006	4.00	6	2"	16.25	22.25	34.40	230.22
MSHCW-4008	4.00	8	2"	20.25	28.25	39.25	243.34
MSHCW-4010	4.00	10	2"	20.25	30.25	42.12	260.71
MSHCW-4012	4.00	12	2"	22.25	34.25	46.08	275.48
MSHCW-4014	4.00	14	2"	24.25	38.25	50.05	295.94
MSHCW-4016	4.00	16	2"	26.25	42.25	53.80	306.20
MSHCW-4018	4.00	18	2"	28.25	46.25	57.77	317.03
MSHCW-4020	4.00	20	2"	30.25	50.25	61.52	329.85
MSHCW-4024	4.00	24	2"	34.25	58.25	69.46	345.57
MSHCW-4028	4.00	28	2"	38.25	66.25	77.18	391.17
MSHCW-4030	4.00	30	2"	40.25	70.25	81.14	423.28
MSHCW-4032	4.00	32	2"	42.25	74.25	84.89	437.70
MSHCW-4034	4.00	34	2"	44.25	78.25	88.86	451.67
MSHCW-4036	4.00	36	2"	46.25	82.25	92.61	471.14
MSHCW-5006	5.00	6	2-1/2"	18.25	24.25	68.36	379.02
MSHCW-5008	5.00	8	2-1/2"	20.25	28.25	72.77	392.49
MSHCW-5010	5.00	10	2-1/2"	22.25	32.25	77.18	408.37
MSHCW-5012	5.00	12	2-1/2"	24.25	36.25	81.59	454.38

CLEVIS WELDED CYLINDERS

THE MSHCW LINE

2500 and 3000 PSI DOUBLE ACTING CYLINDERS (4" Bore = 3000 PSI, 5" Bore = 2500 PSI)

PART NUMBER	BORE	STROKE (INCH)	ROD DIA (INCH)	PIN CENTERS RE-TRACTED (INCH)	PIN CENTERS EXTENDED (INCH)	WEIGHT LBS	LIST PRICE
MSHCW-5014	5.00	14	2-1/2"	26.25	40.25	86.00	\$488.37
MSHCW-5016	5.00	16	2-1/2"	28.25	44.25	90.41	515.27
MSHCW-5018	5.00	18	2-1/2"	30.25	48.25	94.82	542.28
MSHCW-5020	5.00	20	2-1/2"	32.25	52.25	99.23	566.32
MSHCW-5024	5.00	24	2-1/2"	36.25	60.25	108.05	585.18
MSHCW-5028	5.00	28	2-1/2"	40.25	68.25	116.87	610.02
MSHCW-5030	5.00	30	2-1/2"	42.25	72.25	121.28	633.29
MSHCW-5032	5.00	32	2-1/2"	44.25	76.25	125.69	682.29
MSHCW-5034	5.00	34	2-1/2"	46.25	80.25	130.10	257.14
MSHCW-5036	5.00	36	2-1/2"	48.25	84.25	134.51	716.41

SEAL KIT NUMBER	Rod x Bore	LIST PRICE
MSHMW-1.5X1.00K	SK-P-U-5-1.000x1.500	\$24.95
MSHMW-2.0X1.25K	SK-P-U-5-1.250x2.000	39.32
MSHMW-2.5X1.50K	SK-P-U-5-1.500x2.500	52.10
MSHMW-3.0X1.50K	SK-P-U-5-1.500x3.000	58.15
MSHMW-3.5X1.75K	SK-P-U-5-1.750x3.500	69.46
MSHMW-4.0X2.00K	SK-P-U-5-2.000x4.000	67.38
MSHMW-5.0X2.50K	SK-P-U-5-2.500x5.000	108.13

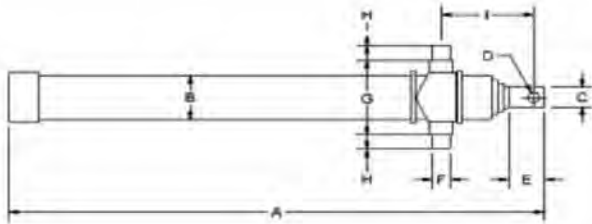
These seal kits are replacements for both the HMW and HCW cylinders.

CLEVIS WELDED CYLINDERS

THE MSHTC LINE

3000 PSI SINGLE ACTING CYLINDERS

7 Tons and 12 Tons Inverse



PART NUMBER	CAPACITY	STROKE	CLOSED (A)	B	C	D	E	F	G	H	I	PORT	WEIGHT LBS.	LIST PRICE
MSHTC-3378	7 TONS	78"	35.5"	4	2	1.0625	2.25	1.25	6.5	1.25	7	1/2" NPT	108 LBS	\$707.55
MSHTC-3390	7 TONS	90"	39.5"	4	2	1.0625	2.5	1.25	6.5	1.25	7	1/2" NPT	100 LBS	749.42
MSHTC-33108	7 TONS	108"	45"	4	2	1.0625	2.5	1.25	6.5	1.25	7	1/2" NPT	120 LBS	807.03
MSHTC-4378	12 TONS	78"	34.75"	5	2	1.0625	2.25	1.5	7.5	1.5	7	1/2" NPT	129 LBS	893.45
MSHTC-4390	12 TONS	90"	38.75"	5	2	1.0625	2.25	1.5	7.5	1.5	7	1/2" NPT	129 LBS	943.47
MSHTC-43108	12 TONS	108"	44.75"	5	2	1.0625	2.25	1.5	7.5	1.5	7	1/2" NPT	156 LBS	1,012.40
MSHTC-43120	12 TONS	120"	48.75"	5	2	1.0625	2.25	1.5	7.5	1.5	7	1/2" NPT	167 LBS	1,091.51

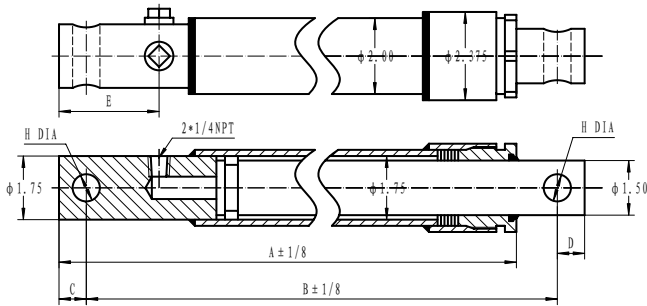
SEAL KIT NUMBER	SERIES	LIST PRICE
MSHTC-756045K	MSHTC 33 Series	\$82.06
MSHTC-927560K	MSHTC 43 Series	119.32

SNOW PLOW CYLINDERS

MSO Snow Plow Cylinders

SNOW PLOW

2500 PSI SINGLE ACTING CYLINDERS

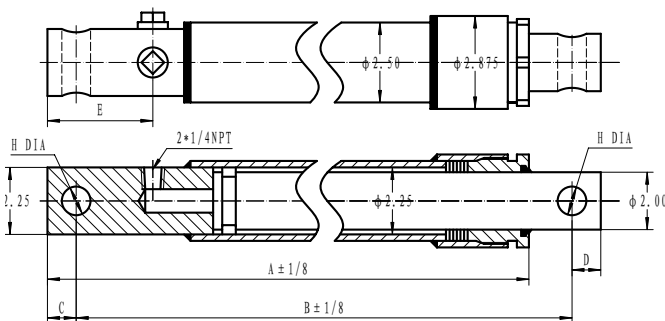


FEATURES:

- Ductile iron piston.
- Ductile iron gland, drilled oil passages.
- Honed steel tube, precision finished for extended seal life.
- High tensile, hard chrome plated rod.
- Tube Seal: O-ring
- All Seals: Manufactured to US specifications.

PART NUMBER	DESCRIPTION	A	B	C & D	E	H	WT LBS.	LIST PRICE
MSHSPM-1506-0625	MYER 1.5" X 6"	11-7/8	12.00	11/16	2.00	5/8	12	\$95.58
MSHSPM-1510-0625	MYER 1.5" X 10"	15-7/8	16-1/4	11/16	2.00	5/8	14	108.78
MSHSPM-1512-0625	MYER 1.5" X 12"	17-7/8	18.00	11/16	2.00	5/8	15	115.02
MSHSPW-1506-0750	WESTERN 1.5" X 6"	12-5/8	13.00	11/16	2-3/4	3/4	12	95.58
MSHSPW-1508-0750	WESTERN 1.5" X 8"	14-5/8	15-1/4	11/16	2-3/4	3/4	13	102.64
MSHSPW-1510-0750	WESTERN 1.5" X 10" X 3/4"	16-5/8	17-1/4	11/16	2-3/4	3/4	14	108.78
MSHSPW-1510-1000	WESTERN 1.5" X 10" X 1"	16-5/8	17-1/2	11/16	2-3/4	1.00	14	108.78
MSHSPA-1510-0750	ARCTIC 1.5" X 10"	16-5/8	17.00	3/4	2-3/4	3/4	14	108.78
MSHSPA-1512-0750	ARCTIC 1.5" X 12"	18-5/8	19.00	3/4	2-3/4	3/4	15	45.84
MSHSPF-1512-1000	FISHER 1.5" X 12"	18-7/16	19-3/8	3/4	2-5/8	1.00	15	115.02
MSHSPF-1510-1000	FISHER & DIAMOND 1.5" X 10"	16-3/8	17-1/4	3/4	2-11/16	1.00	14	108.78

SEAL KIT NUMBER	DESCRIPTION	LIST PRICE
MSHSP-SP150K	1-1/2" ROD CYLINDER	\$13.08
MSHSP-SP200K	2" ROD CYLINDER	14.34



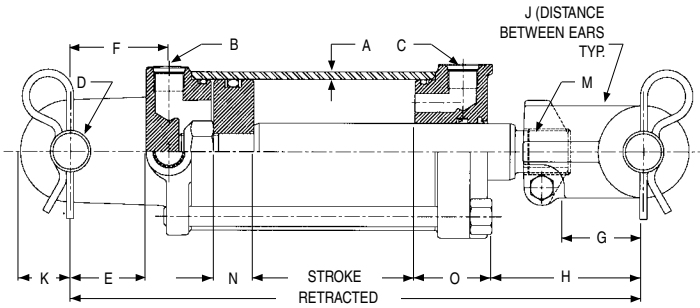
PART NUMBER	DESCRIPTION	A	B	C & D	E	H	WT LBS.	LIST PRICE
MSHSPM-2012-0625	MYER 2.0" X 12"	17-1/4	18.00	3/4	2-3/16	5/8	18	\$145.85
MSHSPW-2016-1000	WESTERN & DIAMOND 2.0" X 16"	22-5/8	23-5/8	11/16	2-3/4	1.00	21	169.08
MSHSPW-2006-0750	WESTERN 2.0" X 6"	12-5/8	13-3/16	3/4	2-3/4	3/4	13	124.01
MSHSPW-2010-1000	WESTERN 2.0" X 10"	16-5/8	17-1/4	11/16	2-3/4	1.00	16	141.64
MSHSPF-2016-125	FISHER 2.0" X 16"	22-1/2	23-1/4	7/8	2-3/4	1-1/4	20	169.08

CYLINDERS

TIE-ROD CYLINDERS



THE ROYAL PLATE LINE 3000 PSI DOUBLE ACTING TIE ROD CYLINDERS



FEATURES:

- Honed tubing (Royal Plate series have cylinder finish tubing)
- Heavy duty, high strength tie rods
- Chromed, ground and polished piston rod will operate at full pressure through 16" stroke
- Ductile iron piston, butt, gland & clevis
- Urethane u-cup and metal encased urethane wiper in gland
- Pins and clips included
- Standard color is black
- Stroke control may be installed on 8" strokes
- Side ports available on request at no additional cost

* For quantities above 50 pieces, call MSO for special pricing.

Seal kits for these cylinders are shown at the end of the section.
"A" = Agricultural application w/ rod extension.

PART NUMBER	MFGR NO.	BORE	STROKE	ROD DIA.	RE-TRACT. DIMEN.	A	B/C PORT SIZE	D	E	F	G	H	J	K	M	N	O	SHIP WT.	LIST PRICE
MSPTR-2004	8404	2	4	1 1/8	14 1/4	3/16	3/4-16 SAE	1.015	1 13/16	2 3/8	1 13/16	3 1/2	1.06	15/16	1 1/8-12	7/8	2 3/16	18	\$252.70
MSPTR-2006	8406	2	6	1 1/8	16 1/4	3/16	3/4-16 SAE	1.015	1 13/16	2 3/8	1 13/16	3 1/2	1.06	15/16	1 1/8-12	7/8	2 3/16	19	254.60
MSPTR-2008	8408	2	8	1 1/8	20 1/4	3/16	3/4-16 SAE	1.015	1 13/16	2 3/8	1 13/16	5 1/2	1.06	15/16	1 1/8-12	7/8	2 3/16	20	258.50
MSPTR-2010	8410	2	10	1 1/8	20 1/4	3/16	3/4-16 SAE	1.015	1 13/16	2 3/8	1 13/16	3 1/2	1.06	15/16	1 1/8-12	7/8	2 3/16	21	266.90
MSPTR-2012	9012	2	12	1 1/8	22 1/4	3/16	3/4-16 SAE	1.015	1 13/16	2 3/8	1 13/16	3 1/2	1.06	15/16	1 1/8-12	7/8	2 3/16	25	270.20
MSPTR-2014	9014	2	14	1 1/8	24 1/4	3/16	3/4-16 SAE	1.015	1 13/16	2 3/8	1 13/16	3 1/2	1.06	15/16	1 1/8-12	7/8	2 3/16	26	275.70
MSPTR-2016A	9016	2	16	1 1/8	31 1/2	3/16	3/4-16 SAE	1.015	1 13/16	2 3/8	1 13/16	8 3/4	1.06	15/16	1 1/8-12	7/8	2 3/16	28	288.00
MSPTR-2018	9018	2	18	1 1/8	28 1/4	3/16	3/4-16 SAE	1.015	1 13/16	2 3/8	1 13/16	3 1/2	1.06	15/16	1 1/8-12	7/8	2 3/16	29	295.20
MSPTR-2020	9020	2	20	1 1/8	30 1/4	3/16	3/4-16 SAE	1.015	1 13/16	2 3/8	1 13/16	3 1/2	1.06	15/16	1 1/8-12	7/8	2 3/16	31	305.20
MSPTR-2024	9024	2	24	1 1/8	34 1/4	3/16	3/4-16 SAE	1.015	1 13/16	2 3/8	1 13/16	3 1/2	1.06	15/16	1 1/8-12	7/8	2 3/16	35	324.70
MSPTR-2030	9030	2	30	1 1/8	40 1/4	3/16	3/4-16 SAE	1.015	1 13/16	2 3/8	1 13/16	3 1/2	1.06	15/16	1 1/8-12	7/8	2 3/16	39	354.20
MSPTR-2506	7006	2 1/2	6	1 1/4	16 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 13/16	1 13/16	3 5/16	1.06	15/16	1 1/8-12	1	2 3/8	22	275.80
MSPTR-2508	9108	2 1/2	8	1 1/4	20 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 13/16	1 13/16	5 5/16	1.06	15/16	1 1/8-12	1	2 3/8	25	281.50
MSPTR-2510	9110	2 1/2	10	1 1/4	20 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 13/16	1 13/16	3 5/16	1.06	15/16	1 1/8-12	1	2 3/8	26	292.50
MSPTR-2512	9112	2 1/2	12	1 1/4	22 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 13/16	1 13/16	3 5/16	1.06	15/16	1 1/8-12	1	2 3/8	27	305.20
MSPTR-2514	9114	2 1/2	14	1 1/4	24 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 13/16	1 13/16	3 5/16	1.06	15/16	1 1/8-12	1	2 3/8	29	318.30
MSPTR-2516	9116	2 1/2	16	1 1/4	31 1/2	3/16	3/4-16 SAE	1.015	1 7/8	2 13/16	1 13/16	8 9/16	1.06	15/16	1 1/8-12	1	2 3/8	33	333.30
MSPTR-2518	9118	2 1/2	18	1 1/4	28 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 13/16	1 13/16	3 5/16	1.06	15/16	1 1/8-12	1	2 3/8	34	344.10
MSPTR-2520	9120	2 1/2	20	1 1/4	30 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 13/16	1 13/16	3 5/16	1.06	15/16	1 1/8-12	1	2 3/8	36	357.10
MSPTR-2524	9124	2 1/2	24	1 1/4	34 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 13/16	1 13/16	3 5/16	1.06	15/16	1 1/8-12	1	2 3/8	39	383.10
MSPTR-2530	9130	2 1/2	30	1 1/4	40 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 13/16	1 13/16	3 5/16	1.06	15/16	1 1/8-12	1	2 3/8	44	421.60
MSPTR-3006	7106	3	6	1 3/8	16 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 1/4	1.06	1 1/16	1 1/8-12	1	1 15/16	24	281.30
MSPTR-3008	9208	3	8	1 3/8	20 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	5 3/4	1.06	1 1/16	1 1/8-12	1	1 15/16	32	295.90
MSPTR-3010	9210	3	10	1 3/8	20 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/16	1 1/8-12	1	1 15/16	33	308.90
MSPTR-3012	9212	3	12	1 3/8	22 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/16	1 1/8-12	1	1 15/16	33	323.90
MSPTR-3014	9214	3	14	1 3/8	24 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/16	1.06	1 1/16	1 1/8-12	1	1 15/16	35	338.40
MSPTR-3016	10616	3	16	1 3/8	26 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/16	1 1/8-12	1	1 15/16	29	355.60
MSPTR-3016A	9216	3	16	1 3/8	31 1/2	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	9	1.06	1 1/16	1 1/8-12	1	1 15/16	39	355.60
MSPTR-3018	9218	3	18	1 3/8	28 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/16	1 1/8-12	1	1 15/16	42	368.20
MSPTR-3020	9220	3	20	1 3/8	30 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/16	1 1/8-12	1	1 15/16	45	383.20

TIE-ROD CYLINDERS



THE ROYAL PLATE LINE

3000 PSI DOUBLE ACTING TIE ROD CYLINDERS

CYLINDERS

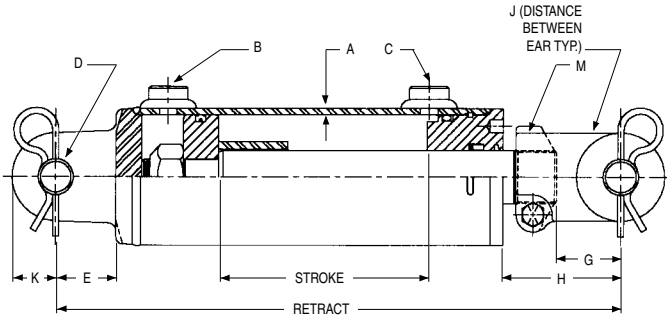
PART NUMBER	MFGR NO.	BORE	STROKE	ROD DIA.	RE-TRACT. DIMEN.	A	B/C PORT SIZE	D	E	F	G	H	J	K	M	N	O	SHIP WT.	LIST PRICE
MSPTR-3024	9224	3	24	1 3/8	34 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/16	1 1/8-12	1	1 15/16	47	\$419.90
MSPTR-3030	9230	3	30	1 3/8	40 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/16	1 1/8-12	1	1 15/16	53	477.90
MSPTR-3036	9236	3	36	1 3/8	46 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/16	1 1/8-12	1	1 15/16	61	536.10
MSPTR-3048	9248	3	48	1 3/8	58 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 7/8	1.06	1 1/16	1 1/8-12	1	1 15/16	66	660.00
MSPTR-3508A	9308A	3 1/2	8	1 3/8	20 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	5 3/4	1.06	1 1/4	1 5/16-12	1	1 15/16	35	321.00
MSPTR-3510	9310A	3 1/2	10	1 3/8	20 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/4	1 5/16-12	1	1 15/16	36	336.50
MSPTR-3512	9312A	3 1/2	12	1 3/8	22 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/4	1 5/16-12	1	1 15/16	38	355.70
MSPTR-3514	9314A	3 1/2	14	1 3/8	24 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/4	1 5/16-12	1	1 15/16	41	374.50
MSPTR-3516A	9316A	3 1/2	16	1 3/8	31 1/2	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	9	1.06	1 1/4	1 5/16-12	1	1 15/16	46	396.70
MSPTR-3518	9318A	3 1/2	18	1 3/8	28 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/4	1 5/16-12	1	1 15/16	47	412.20
MSPTR-3520	9320A	3 1/2	20	1 3/8	30 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/4	1 5/16-12	1	1 15/16	49	431.00
MSPTR-3524	9324A	3 1/2	24	1 3/8	34 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/4	1 5/16-12	1	1 15/16	54	468.80
MSPTR-3530	9330A	3 1/2	30	1 3/8	40 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/4	1 5/16-12	1	1 15/16	64	538.80
MSPTR-3536	9336A	3 1/2	36	1 3/8	46 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/4	1 5/16-12	1	1 15/16	66	608.60
MSPTR-3548	9348A	3 1/2	48	1 3/8	58 1/4	3/16	3/4-16 SAE	1.015	1 7/8	2 7/16	1 13/16	3 3/4	1.06	1 1/4	1 5/16-12	1	1 15/16	73	748.80
MSPTR-4008	9408	4	8	1 3/4	20 1/4	3/16	3/4-16 SAE	1.015	1 3/4	2 7/16	1 7/8	5 1/4	1.06	1 1/4	1 1/2-12	1 1/4	1 13/16	45	424.20
MSPTR-4010	9410	4	10	1 3/4	20 1/4	3/16	3/4-16 SAE	1.015	1 3/4	2 7/16	1 7/8	3 1/4	1.06	1 1/4	1 1/2-12	1 1/4	1 13/16	48	442.50
MSPTR-4012	9412	4	12	1 3/4	22 1/4	3/16	3/4-16 SAE	1.015	1 3/4	2 7/16	1 7/8	3 1/4	1.06	1 1/4	1 1/2-12	1 1/4	1 13/16	49	465.30
MSPTR-4014	9414	4	14	1 3/4	24 1/4	3/16	3/4-16 SAE	1.015	1 3/4	2 7/16	1 7/8	3 1/4	1.06	1 1/4	1 1/2-12	1 1/4	1 13/16	51	487.90
MSPTR-4016	108816	4	16	1 3/4	26 1/4	3/16	3/4-16 SAE	1.015	1 3/4	2 7/16	1 7/8	3 1/4	1.06	1 1/4	1 1/2-12	1 1/4	1 13/16	48	514.70
MSPTR-4016A	9416	4	16	1 3/4	31 1/2	3/16	3/4-16 SAE	1.015	1 3/4	2 7/16	1 7/8	8 1/2	1.06	1 1/4	1 1/2-12	1 1/4	1 13/16	61	514.70
MSPTR-4018	9418	4	18	1 3/4	28 1/4	3/16	3/4-16 SAE	1.015	1 3/4	2 7/16	1 7/8	3 1/4	1.06	1 1/4	1 1/2-12	1 1/4	1 13/16	62	533.40
MSPTR-4020	9420	4	20	1 3/4	30 1/2	3/16	3/4-16 SAE	1.015	1 3/4	2 7/16	1 7/8	3 1/4	1.06	1 1/4	1 1/2-12	1 1/4	1 13/16	72	556.20
MSPTR-4024	9424	4	24	1 3/4	34 1/4	3/16	3/4-16 SAE	1.015	1 3/4	2 7/16	1 7/8	3 1/4	1.06	1 1/4	1 1/2-12	1 1/4	1 13/16	74	588.00
MSPTR-4030	9430	4	30	1 3/4	40 1/4	3/16	3/4-16 SAE	1.015	1 3/4	2 7/16	1 7/8	3 1/4	1.06	1 1/4	1 1/2-12	1 1/4	1 13/16	77	655.80
MSPTR-4036	9436	4	36	1 3/4	46 1/4	3/16	3/4-16 SAE	1.015	1 3/4	2 7/16	1 7/8	3 1/4	1.06	1 1/4	1 1/2-12	1 1/4	1 13/16	83	724.00
MSPTR-4048	9448	4	48	1 3/4	58 1/4	3/16	3/4-16 SAE	1.015	1 3/4	2 7/16	1 7/8	3 1/4	1.06	1 1/4	1 1/2-12	1 1/4	1 13/16	109	860.00
MSPTR-5008	9508	5	8	2	20 1/4	1/4	7/8-14 SAE	1.265	1 3/4	2 5/8	2	4	1.13	1 3/8	1 1/2-12	1 7/16	2 1/2	67	587.50
MSPTR-5012	9512	5	12	2	24 1/4	1/4	7/8-14 SAE	1.265	1 3/4	2 5/8	2	4	1.13	1 3/8	1 1/2-12	1 7/16	2 1/2	75	638.80
MSPTR-5014	9514	5	14	2	26 1/4	1/4	7/8-14 SAE	1.265	1 3/4	2 5/8	2	4	1.13	1 3/8	1 1/2-12	1 7/16	2 1/2	80	664.50
MSPTR-5016A	9516	5	16	2	31 1/2	1/4	7/8-14 SAE	1.265	1 3/4	2 5/8	2	7 1/4	1.13	1 3/8	1 1/2-12	1 7/16	2 1/2	84	698.50
MSPTR-5018	9518	5	18	2	30 1/4	1/4	7/8-14 SAE	1.265	1 3/4	2 5/8	2	4	1.13	1 3/8	1 1/2-12	1 7/16	2 12	90	715.60
MSPTR-5020	9520	5	20	2	32 1/4	1/4	7/8-14 SAE	1.265	1 3/4	2 5/8	2	4	1.13	1 3/8	1 1/2-12	1 7/16	2 1/2	95	741.20
MSPTR-5024	9524	5	24	2	36 1/4	1/4	7/8-14 SAE	1.265	1 3/4	2 5/8	2	4	1.13	1 3/8	1 1/2-12	1 7/16	2 1/2	100	776.30
MSPTR-5030	9530	5	30	2	42 1/4	1/4	7/8-14 SAE	1.265	1 3/4	2 5/8	2	4	1.13	1 3/8	1 1/2-12	1 7/16	2 1/2	108	856.80
MSPTR-5036	9536	5	36	2	48 1/4	1/4	7/8-14 SAE	1.265	1 3/4	2 5/8	2	4	1.13	1 3/8	1 1/2-12	1 7/16	2 1/2	118	942.50
MSPTR-5048	9548	5	48	2	60 1/4	1/4	7/8-14 SAE	1.265	1 3/4	2 5/8	2	4	1.13	1 3/8	1 1/2-12	1 7/16	2 1/2	161	1,133.80

SEAL KIT NUMBER	Rod x Bore	LIST PRICE
MSPMCK-B200000	SK-I-U-10-1-1/8X2 (tie rod kit)	\$35.11
MSPMCK-B250000	SK-P-U-10-1-1/4X2-1/2	51.09
MSPMCK-B300000	SK-P-U-10-1-3/8X3	42.05
MSPMCK-B350000	SEAL KIT	49.98
MSPMCK-B400000	SK-P-U-10-1-3/4X4	69.12
MSPMCK-B450000	SK-P-U-10-2X4-1/2	72.22
MSPMCK-B500000	SK-P-U-10-2.000x5.000	69.10

WELDED CYLINDERS



THE SWORD LINE 3000 PSI DOUBLE ACTING CYLINDERS



FEATURES:

- Skived, honed tubing
- Heavy duty welded construction
- Chromed, ground and polished piston rod will operate at full pressure through 16" stroke
- Ductile iron piston, gland and clevis, cast steel butt
- Urethane u-cup and urethane wiper in gland, crown seal on piston
- Square ring gland retainer provides positive lock
- Pins and clips included
- Standard color is black
- Stroke control may be installed on 8" strokes

PART NUMBER	MFGR. NO.	BORE	STROKE	ROD DIA.	RE-TRACT. DIMEN.	A	B/C PORT SIZE SAE	D	E	G	H	J	K	M	SHIP WT.	LIST PRICE
MSPCWS-1508	19408	1 1/2	8	3/4	20 1/4	3/16	9/16 - 18	.765	2 5/8	2 5/8	5 1/4	5/8	3/4	-	13	\$315.60
MSPCWS-1510	19410	1 1/2	10	3/4	20 1/4	3/16	9/16 - 18	.765	2 5/8	2 5/8	5 1/4	5/8	3/4	-	14	319.37
MSPCWS-2008	42008	2	8	1 1/8	20 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1	1 1/8 12	10	320.70
MSPCWS-2010	42010	2	10	1 1/8	20 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1	1 1/8 12	20	330.00
MSPCWS-2012	42012	2	12	1 1/8	22 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1	1 1/8 12	22	338.90
MSPCWS-2016A	42016	2	16	1 1/8	31 1/2	3/16	3/4 - 16	1.015	1 3/4	1 13/16	8 13/16	1 1/16	1	1 1/8 12	25	367.40
MSPCWS-2020	42020	2	20	1 1/8	30 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1	1 1/8 12	28	383.90
MSPCWS-2024	42024	2	24	1 1/8	34 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1	1 1/8 12	31	402.60
MSPCWS-2508	42508	2 1/2	8	1 1/4	20 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1	1 1/8 12	21	337.50
MSPCWS-2510	42510	2 1/2	10	1 1/4	20 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1	1 1/8 12	22	346.50
MSPCWS-2512	42512	2 1/2	12	1 1/4	22 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1	1 1/8 12	23	357.10
MSPCWS-2516	42516	2 1/2	16	1 1/4	31 1/2	3/16	3/4 - 16	1.015	1 3/4	1 13/16	8 13/16	1 1/16	1	1 1/8 12	27	386.90
MSPCWS-2520	42520	2 1/2	20	1 1/4	30 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1	1 1/8 12	31	406.80
MSPCWS-2524	42524	2 1/2	24	1 1/4	34 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1	1 1/8 12	35	427.90
MSPCWS-3008	43008	3	8	1 3/8	20 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1 1/8	1 1/8 12	23	372.90
MSPCWS-3010	43010	3	10	1 3/8	20 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1 1/8	1 1/8 12	26	392.70
MSPCWS-3012	43012	3	12	1 3/8	22 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1 1/8	1 1/8 12	28	404.60
MSPCWS-3016A	43016	3	16	1 3/8	31 1/2	3/16	3/4 - 16	1.015	1 3/4	1 13/16	8 13/16	1 1/16	1 1/8	1 1/8 12	33	427.20
MSPCWS-3020	43020	3	20	1 3/8	30 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1 1/8	1 1/8 12	39	454.90
MSPCWS-3024	43024	3	24	1 3/8	34 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 9/16	1 1/16	1 1/8	1 1/8 12	43	506.40
MSPCWS-3508	43508	3 1/2	8	1 1/2	20 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 3/8	1 1/16	1 1/4	1 1/2 12	29	491.80
MSPCWS-3510	43510	3 1/2	10	1 1/2	20 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 3/8	1 1/16	1 1/4	1 1/2 12	31	513.00
MSPCWS-3512	43512	3 1/2	12	1 1/2	22 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 3/8	1 1/16	1 1/4	1 1/2 12	33	534.10
MSPCWS-3516A	43516	3 1/2	16	1 1/2	31 1/2	3/16	3/4 - 16	1.015	1 3/4	1 13/16	8 3/8	1 1/16	1 1/4	1 1/2 12	38	592.70
MSPCWS-3520	43520	3 1/2	20	1 1/2	30 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 3/8	1 1/16	1 1/4	1 1/2 12	43	634.10
MSPCWS-3524	43524	3 1/2	24	1 1/2	34 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 3/8	1 1/16	1 1/4	1 1/2 12	48	648.20
MSPCWS-4008	44008	4	8	1 3/4	20 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 3/8	1 1/8	1 1/4	1 1/2 12	40	520.60
MSPCWS-4010	44010	4	10	1 3/4	20 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 3/8	1 1/8	1 1/4	1 1/2 12	43	542.80
MSPCWS-4012	44012	4	12	1 3/4	22 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 3/8	1 1/8	1 1/4	1 1/2 12	45	564.70
MSPCWS-4016A	44016	4	16	1 3/4	31 1/2	3/16	3/4 - 16	1.015	1 3/4	1 13/16	8 3/8	1 1/8	1 1/4	1 1/2 12	54	625.70
MSPCWS-4020	44020	4	20	1 3/4	30 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 3/8	1 1/8	1 1/4	1 1/2 12	58	670.70
MSPCWS-4024	44024	4	24	1 3/4	34 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 3/8	1 1/8	1 1/4	1 1/2 12	60	715.90
MSPCWS-4030	44030	4	30	1 3/4	40 1/4	3/16	3/4 - 16	1.015	1 3/4	1 13/16	5 3/8	1 1/8	1 1/4	1 1/2 12	65	783.80

SEAL KIT NUMBER	Rod x Bore	LIST PRICE
MSPMCK-19400	3/4 X 1-1/2	\$49.20
MSPMCK-42000	1-1/8 X 2	97.40
MSPMCK-42500	SEAL KIT	22.94
MSPMCK-43000	1-3/8 X 3	59.00
MSPMCK-43500	1-1/2 X 3-1/2	72.80
MSPMCK-44000	1-3/4 X 4	82.30

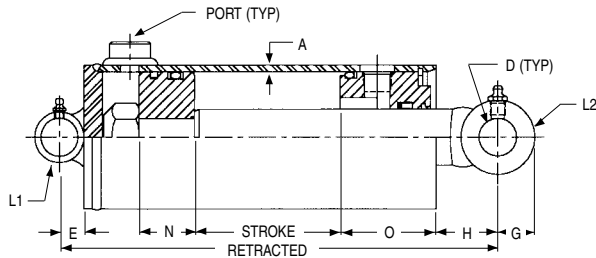
* For quantities above 50 pieces, call MSO for special pricing.

"A" = Agricultural application w/ rod extension.

WELDED CYLINDERS



THE ROYAL LINE 2500 PSI DOUBLE ACTING CYLINDERS



FEATURES:

- Honed tubing
- Heavy duty welded construction
- Chromed, ground and polished piston rod
- Ductile iron piston and gland
- Pin eye mounting on both ends
- Urethane u-cup and urethane wiper in gland
- O-ring/backup washers and cast iron ring for piston seals
- Truarc type gland retainer
- Standard color is black

* For quantities above 50 pieces, call MSO for special pricing.

Seal kits for these cylinders are shown at the end of the section.

PART NUMBER	MFGR. NO.	BORE	STROKE	ROD DIA.	RE-TRACT. DIMEN.	PORT SIZE	A	D	E	G	H	L1	L2	N	O	SHIP WT.	LIST PRICE
MSPMW-2508	5408	2 1/2	8	1 3/8	16	3/8 NPTF	3/16	.760	9/16	3/4	2 9/16	3	1 3/8	1 1/4	2 1/2	17	\$330.60
MSPMW-2512	5412	2 1/2	12	1 3/8	20	3/8 NPTF	3/16	.760	9/16	3/4	2 9/16	3	1 3/8	1 1/4	2 1/2	20	342.10
MSPMW-2516	5416	2 1/2	16	1 3/8	24	3/8 NPTF	3/16	.760	9/16	3/4	2 9/16	3	1 3/8	1 1/4	2 1/2	23	357.80
MSPMW-2520	5420	2 1/2	20	1 3/8	28	3/8 NPTF	3/16	.760	9/16	3/4	2 9/16	3	1 3/8	1 1/4	2 1/2	27	365.70
MSPMW-2524	5424	2 1/2	24	1 3/8	32	3/8 NPTF	3/16	.760	9/16	3/4	2 9/16	3	1 3/8	1 1/4	2 1/2	30	383.90
MSPMW-2530	5430	2 1/2	30	1 3/8	38	3/8 NPTF	3/16	.760	9/16	3/4	2 9/16	3	1 3/8	1 1/4	2 1/2	35	419.50
MSPMW-2532	5432	2 1/2	32	1 3/8	40	3/8 NPTF	3/16	.760	9/16	3/4	2 9/16	3	1 3/8	1 1/4	2 1/2	41	425.80
MSPMW-2536	5436	2 1/2	36	1 3/8	44	3/8 NPTF	3/16	.760	9/16	3/4	2 9/16	3	1 3/8	1 1/4	2 1/2	44	433.80
MSPMW-2542	5442	2 1/2	42	1 3/8	50	3/8 NPTF	3/16	.760	9/16	3/4	2 9/16	3	1 3/8	1 1/4	2 1/2	47	461.50
MSPMW-3008	8308	3	8	1 1/2	16	1/2 NPTF	3/16	1.015	11/16	1	2 5/16	3 1/2	1 1/2	1 1/4	2 5/8	22	392.20
MSPMW-3012	8312	3	12	1 1/2	20	1/2 NPTF	3/16	1.015	11/16	1	2 5/16	3 1/2	1 1/2	1 1/4	2 5/8	26	409.60
MSPMW-3016	8316	3	16	1 1/2	24	1/2 NPTF	3/16	1.015	11/16	1	2 5/16	3 1/2	1 1/2	1 1/4	2 5/8	31	416.70
MSPMW-3020	8320	3	20	1 1/2	28	1/2 NPTF	3/16	1.015	11/16	1	2 5/16	3 1/2	1 1/2	1 1/4	2 5/8	35	428.50
MSPMW-3024	8324	3	24	1 1/2	32	1/2 NPTF	3/16	1.015	11/16	1	2 5/16	3 1/2	1 1/2	1 1/4	2 5/8	41	444.70
MSPMW-3030	8330	3	30	1 1/2	38	1/2 NPTF	3/16	1.015	11/16	1	2 5/16	3 1/2	1 1/2	1 1/4	2 5/8	46	477.20
MSPMW-3032	8332	3	32	1 1/2	40	1/2 NPTF	3/16	1.015	11/16	1	2 5/16	3 1/2	1 1/2	1 1/4	2 5/8	48	487.10
MSPMW-3036	8336	3	36	1 1/2	44	1/2 NPTF	3/16	1.015	11/16	1	2 5/16	3 1/2	1 1/2	1 1/4	2 5/8	52	513.60
MSPMW-3040	8340	3	40	1 1/2	48	1/2 NPTF	3/16	1.015	11/16	1	2 5/16	3 1/2	1 1/2	1 1/4	2 5/8	56	526.90
MSPMW-3042	8342	3	42	1 1/2	50	1/2 NPTF	3/16	1.015	11/16	1	2 5/16	3 1/2	1 1/2	1 1/4	2 5/8	59	539.90
MSPMW-3048	8348	3	48	1 1/2	56	1/2 NPTF	3/16	1.015	11/16	1	2 5/16	3 1/2	1 1/2	1 1/4	2 5/8	65	601.10
MSPMW-3508	5508	3 1/2	8	1 1/2	16	1/2 NPTF	3/16	1.015	11/16	1	1 11/16	4	1 1/2	1 1/2	2 5/8	26	442.80
MSPMW-3512	5512	3 1/2	12	1 1/2	20	1/2 NPTF	3/16	1.015	11/16	1	1 11/16	4	1 1/2	1 1/2	2 5/8	29	442.20
MSPMW-3516	5516	3 1/2	16	1 1/2	24	1/2 NPTF	3/16	1.015	11/16	1	1 11/16	4	1 1/2	1 1/2	2 5/8	34	468.10
MSPMW-3520	5520	3 1/2	20	1 1/2	28	1/2 NPTF	3/16	1.015	11/16	1	1 11/16	4	1 1/2	1 1/2	2 5/8	38	488.80
MSPMW-3524	5524	3 1/2	24	1 1/2	32	1/2 NPTF	3/16	1.015	11/16	1	1 11/16	4	1 1/2	1 1/2	2 5/8	44	500.70
MSPMW-3530	5530	3 1/2	30	1 1/2	38	1/2 NPTF	3/16	1.015	11/16	1	1 11/16	4	1 1/2	1 1/2	2 5/8	48	543.00
MSPMW-3532	5532	3 1/2	32	1 1/2	40	1/2 NPTF	3/16	1.015	11/16	1	1 11/16	4	1 1/2	1 1/2	2 5/8	52	556.90
MSPMW-3536	5536	3 1/2	36	1 1/2	44	1/2 NPTF	3/16	1.015	11/16	1	1 11/16	4	1 1/2	1 1/2	2 5/8	56	584.80
MSPMW-3540	5540	3 1/2	40	1 1/2	48	1/2 NPTF	3/16	1.015	11/16	1	1 11/16	4	1 1/2	1 1/2	2 5/8	60	612.80
MSPMW-3542	5542	3 1/2	42	1 1/2	50	1/2 NPTF	3/16	1.015	11/16	1	1 11/16	4	1 1/2	1 1/2	2 5/8	64	642.80
MSPMW-3548	5548	3 1/2	48	1 1/2	56	1/2 NPTF	3/16	1.015	11/16	1	1 11/16	4	1 1/2	1 1/2	2 5/8	70	758.90
MSPMW-4008	5608	4	8	2	17	1/2 NPTF	3/16	1.265	15/16	1 1/4	2	4 1/2	2	1 5/16	2 7/8	35	560.70
MSPMW-4012	5612	4	12	2	21	1/2 NPTF	3/16	1.265	15/16	1 1/4	2	4 1/2	2	1 5/16	2 7/8	41	581.90
MSPMW-4016	5616	4	16	2	25	1/2 NPTF	3/16	1.265	15/16	1 1/4	2	4 1/2	2	1 5/16	2 7/8	48	606.10
MSPMW-4020	5620	4	20	2	29	1/2 NPTF	3/16	1.265	15/16	1 1/4	2	4 1/2	2	1 5/16	2 7/8	56	628.00

CYLINDERS

WELDED CYLINDERS



THE ROYAL LINE

2500 PSI DOUBLE ACTING CYLINDERS

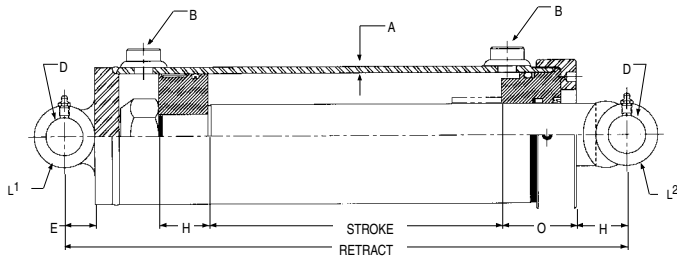
PART NUMBER	MFGR. NO.	BORE	STROKE	ROD DIA.	RE-TRACT. DIMEN.	PORT SIZE	A	D	E	G	H	L1	L2	N	O	SHIP WT.	LIST PRICE
MSPMW-4024	5624	4	24	2	33	1/2 NPTF	3/16	1.265	15/16	1 1/4	2	4 1/2	2	1 5/16	2 7/8	62	\$664.40
MSPMW-4030	5630	4	30	2	39	1/2 NPTF	3/16	1.265	15/16	1 1/4	2	4 1/2	2	1 5/16	2 7/8	72	677.50
MSPMW-4032	5632	4	32	2	41	1/2 NPTF	3/16	1.265	15/16	1 1/4	2	4 1/2	2	1 5/16	2 7/8	74	698.20
MSPMW-4036	5636	4	36	2	45	1/2 NPTF	3/16	1.265	15/16	1 1/4	2	4 1/2	2	1 5/16	2 7/8	80	745.20
MSPMW-4040	5640	4	40	2	49	1/2 NPTF	3/16	1.265	15/16	1 1/4	2	4 1/2	2	1 5/16	2 7/8	85	770.90
MSPMW-4042	5642	4	42	2	51	1/2 NPTF	3/16	1.265	15/16	1 1/4	2	4 1/2	2	1 5/16	2 7/8	92	784.40
MSPMW-4048	5648	4	48	2	57	1/2 NPTF	3/16	1.265	15/16	1 1/4	2	4 1/2	2	1 5/16	2 7/8	100	857.50
MSPMW-4060	5660	4	60	2	69	1/2 NPTF	3/16	1.265	15/16	1 1/4	2	4 1/2	2	1 5/16	2 7/8	120	960.00

SEAL KIT NUMBER	Rod x Bore	LIST PRICE
MSPMCK-5400	1-3/8 X 2-1/2	\$55.83
MSPMCK-5500	1-1/2 X 3-1/2	69.12
MSPMCK-5600	2 X 4	74.36
MSPMCK-8300	1-1/2 X 3	59.24
MSPMCK-5500	1-1/2 X 3-1/2	69.12
MSPMCK-5600	2 X 4	74.36

WELDED CYLINDERS



THE GLADIATOR LINE 3000 PSI DOUBLE ACTING CYLINDERS



FEATURES:

- Heavy duty welded construction
- 3000 PSI (2:1 safety factor for buckling on 36" stroke and less. Longer stroke consult factory)
- Steel gland cap retainer with lock screw
- Standard color is black
- High grade Ductile iron piston and gland
- Precision skived tube for long seal life
- All steel spacer tube for bearing length on 48" or more of stroke
- Ground and polished chrome C-1045 steel piston rod for maximum life
- Heavy duty torqued locknut for piston retainer
- Polyurethane "U" cup and heavy duty wiper in gland. Crown seal with bearing rings on piston

* For quantities above 50 pieces, call MSO for special pricing.

PART NUMBER	MFGR. NO.	BORE	STROKE	ROD DIA.	RE-TRACT. DIMEN.	A	B PORT SIZE	D	E	H	L1	O	L2	SHIP WT.	LIST PRICE
MSPMWS-5008	21008	5	8	2 1/2	19	1/4	1 1/16-12 SAE	1.515	1 1/4	1 7/8	5 3/4	2 15/16	4	75	\$860.40
MSPMWS-5012	21012	5	12	2 1/2	23	1/4	1 1/16-12 SAE	1.515	1 1/4	1 7/8	5 3/4	2 15/16	4	85	931.50
MSPMWS-5016	21016	5	16	2 1/2	27	1/4	1 1/16-12 SAE	1.515	1 1/4	1 7/8	5 3/4	2 15/16	4	90	974.60
MSPMWS-5020	21020	5	20	2 1/2	31	1/4	1 1/16-12 SAE	1.515	1 1/4	1 7/8	5 3/4	2 15/16	4	105	1,040.70
MSPMWS-5024	21024	5	24	2 1/2	35	1/4	1 1/16-12 SAE	1.515	1 1/4	1 7/8	5 3/4	2 15/16	4	115	1,117.40
MSPMWS-5036	21036	5	36	2 1/2	47	1/4	1 1/16-12 SAE	1.515	1 1/4	1 7/8	5 3/4	2 15/16	4	145	1,307.10
MSPMWS-5048	21048	5	48	2 1/2	61	1/4	1 1/16-12 SAE	1.515	1 1/4	1 7/8	5 3/4	2 15/16	4	180	1,619.60
MSPMWS-5054	21054	5	54	2 1/2	68	1/4	1 1/16-12 SAE	1.515	1 1/4	1 7/8	5 3/4	2 15/16	4	195	1,722.10
MSPMWS-5060	21060	5	60	2 1/2	75	1/4	1 1/16-12 SAE	1.515	1 1/4	1 7/8	5 3/4	2 15/16	4	215	1,840.10
MSPMWS-6008	22008	6	8	3	19	1/4	1 1/16-12 SAE	1.515	1 1/4	2	6 3/4	3 1/8	4	100	1,071.90
MSPMWS-6012	22012	6	12	3	23	1/4	1 1/16-12 SAE	1.515	1 1/4	2	6 3/4	3 1/8	4	110	1,171.00
MSPMWS-6016	22016	6	16	3	27	1/4	1 1/16-12 SAE	1.515	1 1/4	2	6 3/4	3 1/8	4	125	1,211.90
MSPMWS-6024	22024	6	24	3	35	1/4	1 1/16-12 SAE	1.515	1 1/4	2	6 3/4	3 1/8	4	150	1,403.10
MSPMWS-6030	22030	6	30	3	41	1/4	1 1/16-12 SAE	1.515	1 1/4	2	6 3/4	3 1/8	4	170	1,553.30
MSPMWS-6036	22036	6	36	3	47	1/4	1 1/16-12 SAE	1.515	1 1/4	2	6 3/4	3 1/8	4	190	1,703.50
MSPMWS-6048	22048	6	48	3	61	1/4	1 1/16-12 SAE	1.515	1 1/4	2	6 3/4	3 1/8	4	240	2,185.10
MSPMWS-6054	22054	6	54	3	68	1/4	1 1/16-12 SAE	1.515	1 1/4	2	6 3/4	3 1/8	4	265	2,371.20
MSPMWS-6060	22060	6	60	3	75	1/4	1 1/16-12 SAE	1.515	1 1/4	2	6 3/4	3 1/8	4	290	2,448.60

SEAL KIT NUMBER	Rod x Bore	LIST PRICE
MSPMCK-21000	2-1/2 X 5	\$115.50
MSPMCK-22000	3 X 6	131.54

SINGLE ACTING TELESCOPIC CYLINDERS



These cylinders are available from Custom Hoists, Commercial®, Hyco and SHC. Request the manufacturer you want.

4,000 Series Single Acting Telescopic Cylinders



FEATURES

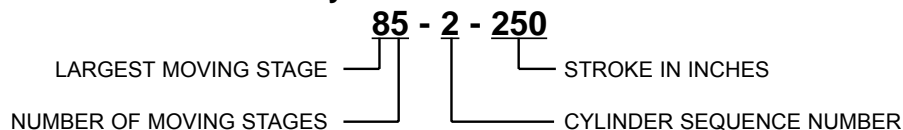
- Self-Bleeding design
- Pre-loaded v-packing with a self-adjusting wave spring energizer to maintain a continuous force on the packing.
- Threaded headnuts for added strength and field seal adjustment.
- Longer Bearing Length (overlap) for stability.
- Stock Models inventoried at 5 warehouse locations throughout the U.S. to meet your immediate requirements.
- For Front Mount Dump Body Cylinder Force and Stroke Calculations link

MANUFACTURERS SERVICE MANUALS ARE AVAILABLE.
CALL FOR DETAILS.

Individual Plunger Lifting Capacities for Single-Acting Telescopic Cylinders

Plunger Dia. (In.)	Cross Section Area (Sq. In.)	Specific Operating Pressures			
		1500 PSI (LBS)	1800 PSI (LBS)	2000 PSI (LBS)	2500PSI (LBS)
2	3.14	4,710	5,672	6,280	7,850
3	7.06	10,590	12,708	14,120	17,650
4	12.56	18,840	22,608	25,120	31,400
5	19.63	29,445	35,334	39,260	49,075
6	28.27	42,405	50,886	56,540	70,675
7	38.48	57,720	69,264	76,960	96,200
8	50.26	75,390	90,468	100,520	125,650
8-1/4	53.50	80,250	96,300	107,000	133,750
9-1/8	65.40	98,100	117,720	130,800	163,500
9-3/4	74.50	111,750	134,100	149,000	186,250

Cylinder Identification



SINGLE ACTING TELESCOPIC CYLINDERS



These cylinders are available from Custom Hoists, Commercial®, Hyco and SHC. Request the manufacturer you want.

COMMERCIAL FEATURES

- Longer sleeve overlap for improved stability and higher column loading.
- Heavy walled tubing in the first stage offers up to 27% more cross-sectional area providing up to 76% greater tube burst strength than our competition.
- Beveled mating surfaces of the overlap collar and stop ring for greater impact resistance during dumping operations.
- Snap-on, glass-filled bearings that absorb contaminants without damaging the cylinder walls.
- Threaded stop rings for easier servicing and more reliable stopping action.
- External packing nuts to give added support to the tube and make servicing easier.
- Wave springs and chevron packing for positive, self-compensating seals.
- Hytrel rod wipers resist high temperatures without extruding.
- Cast steel pin-eye and rod-end mountings give dependable strength.

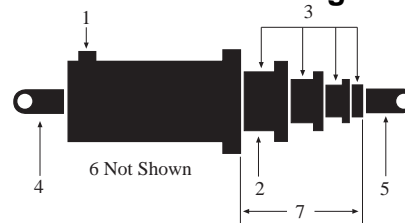
SINGLE ACTING CYLINDERS:

- Operating pressure up to 2000 psi.
- Main cylinder outside diameter from 3-3/4" to 11-1/8".
- All cylinders have NPT ports, unless otherwise specified.
- Lifting capacity to 138,060 lbs.
- Chrome-plated sleeves and plungers are available on special order.
- Pin-eye and trunion mountings are standard. If other types are required, dimensions must be specified.

S.A. Cylinder Information

Sleeve O.D. in inches	Effective Area in sq. inches	Load Capacity lbs. at 2000 p.s.i.	Displacement per in. of stroke in gallons
2.75	5.94	11,880	.026
3.75	11.04	22,080	.048
4.75	17.72	35,440	.077
5.75	25.96	51,920	.112
6.75	35.78	71,560	.155
7.905	48.70	97,400	.210
9.375	69.03	138,060	.299

Model Number Coding



Model Number S84DC-40-161

1. S = Single-acting Type Cylinder
- SD = Double-acting telescopic type
- 8 = 7-7/8" nominal diameter of largest sleeve
- 4 = 4 stages or sleeves
- D = Type of mounting on base end
- C = Type of mounting on rod end
- 40 = Modification or design variation
- 161 = Length of stroke (161")

MANUFACTURERS SERVICE MANUALS ARE AVAILABLE. CALL FOR DETAILS.

DOUBLE ACTING CYLINDERS:

- Operating pressure up to 2000 psi.
- 3-3/4" to 10-13/16".
- Lifting capacity to 153,180 lbs.
- Chrome-plated sleeves are available on special order.
- Pin-eye and trunion mountings are standard. If other types are required, dimensions must be specified.

D.A. Cylinder Information

Sleeve or plunger O.D. (inches)	Bore of Main or Sleeve (inches)	Effective Area extended (sq. inches)	Effective Area retracted (sq. inches)	Load Capacity at 2000 p.s.i. extended (pounds)	Load Capacity at 2000 p.s.i. retracted (pounds)	Displacement per in. of stroke extended (gallons)	Displacement per in. of stroke retracted (gallons)
2.75	3.25	8.295	2.355	16,590	4,710	.036	.010
3.75	4.25	14.186	3.142	28,372	6,284	.061	.014
4.75	5.25	21.648	3.927	43,296	7,854	.094	.017
5.75	6.25	30.680	4.713	61,360	9,426	.133	.020
6.75	7.25	41.282	5.497	82,564	10,994	.179	.024
7.905	8.437	55.680	6.973	111,360	13,946	.242	.030
9.375	9.143	76.590	7.560	153,180	15,120	.331	.038

SINGLE ACTING TELESCOPIC CYLINDERS



These cylinders are available from Custom Hoists, Commercial[®], Hyco and SHC. Request the manufacturer you want.



Fluid Capacity: Volume To Fully Extend			
Plunger Dia. (Inches)	Effective Area (Sq. Inches)	Load Capacity (Lbs. @ 2000 PSI)	Displacement (Gal./In. of Stroke)
3	7.07	14,140	.031
4	12.56	25,120	.054
5	19.63	9,260	.085
6	28.27	56,540	.122
7	38.48	76,960	.166
8.12	51.78	103,560	.224
8.25	53.46	106,920	.231
9.38	69.10	138,200	.299

Follow example to determine displacement of the complete cylinder **Example:** Model 824-200

8.12 in. plunger .224
 7 in. plunger .166
 6 in. plunger .122
 5 in. plunger .085
 .597

.597 x 200 = 29.8 Gallons to fully extend
 4

Features

GENERAL DATA

Operating pressures to 2000 psi. Plunger diameters range from 2" to 9.375". Lifting capacities to 138,200 lbs. Pin-eye mountings standard—trunion type available. Chrome-plated plungers available.

AUTOMATIC AIR BLEEDERS

Every standard Hycotel single-acting telescopic cylinder comes equipped with an automatic air bleeder. This completely eliminates time-consuming and potentially hazardous manual air bleeding operation.

GUIDE RINGS & RETAINING RINGS

Hycotel[®] features replaceable plunger guide rings, designed and balanced to be well lubricated and made of specially compounded material for long wearing performance. The retainer rings work in conjunction with the piston design to be positively locked into stop position grooves when the cylinder is fully extended.

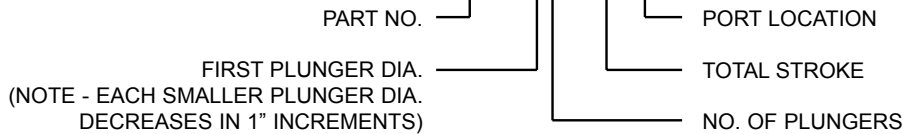
"DUAL-LIP" WIPER

This dual lip design wiper of Hytel is a more efficient "dirt wiper." The dual lip provides an improved means of keeping dirt out.

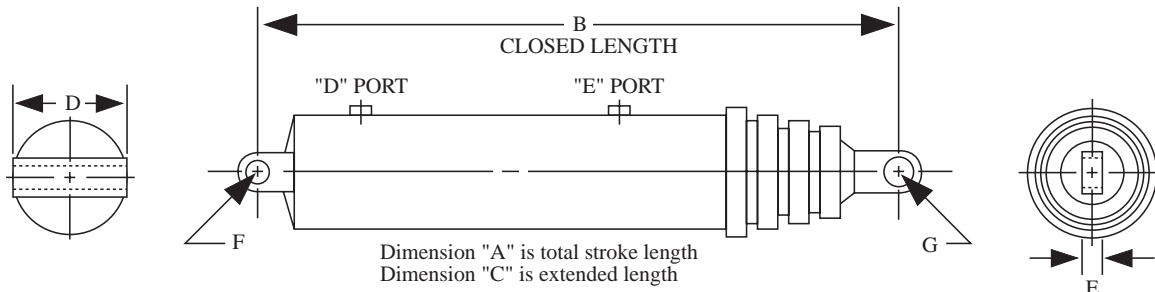
MANUFACTURERS SERVICE MANUALS ARE AVAILABLE. CALL FOR DETAILS.

Cylinder Identification

C70000-814-200D



NOTE: "D" and "E" suffix in Part No. represents a specific port location.
 For dimensional data, consult our sales staff.
 A "T" suffix in Part No. represents Trunion Mount.



SINGLE ACTING TELESCOPIC CYLINDERS

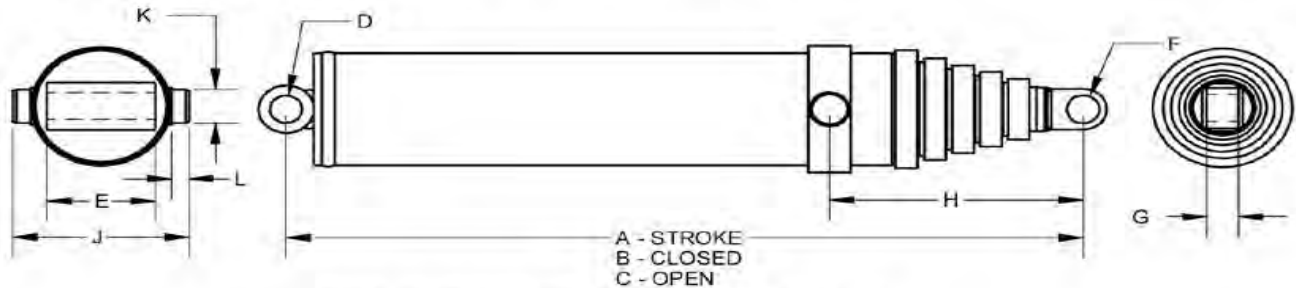
SOUTHERN HYDRAULIC CYLINDER, INC.

These cylinders are available from Custom Hoists, Commercial®, Hyco and SHC. Request the manufacturer you want.

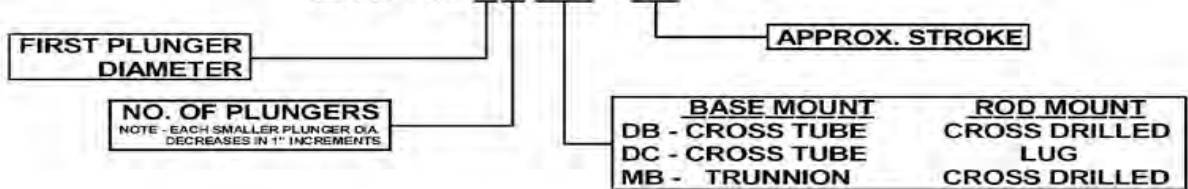
STANDARD SINGLE ACTING TELESCOPIC CYLINDER SPECIFICATIONS

Model Number	Stroke (A)	Closed (B)	Open (C)	Dia. Body	Stage Dia.			(D)	(E)	(F)	(G)	(H)	(J)	(K)	(L)	Ret Vol (Gal)	Ext Vol (Gal)	Dry Wt. (Lbs)
					3	2	-											
MSSHC-M32DB-43	40.38	29.69	70.07	4.00	3	2	-	1.50	4.00	1.25	1.88	-	-	-	-	.58	1.46	60
MSSHC-M32DB-50	46.87	32.84	79.51	4.00	3	2	-	1.50	4.00	1.25	1.88	-	-	-	-	.68	1.88	66
MSSHC-M42DB-43	39.50	30.19	69.69	5.00	4	3	-	1.50	5.00	1.50	2.75	-	-	-	-	1.06	2.72	86
MSSHC-M42DB-50	47.25	33.69	80.94	5.00	4	3	-	1.50	5.00	1.50	2.75	-	-	-	-	1.23	3.23	85
MSSHC-M42MB-50	51.25	35.07	86.32	5.00	4	3	-	-	-	1.50	2.75	8.50	8.81	1.75	.88	1.33	3.50	97
MSSHC-M42DB-60	57.88	39.07	96.95	5.00	4	3	-	1.50	5.00	1.50	2.75	-	-	-	-	1.48	3.93	109
MSSHC-M42MB-65	65.00	42.07	107.07	5.00	4	3	-	-	-	1.50	2.75	8.50	8.81	1.75	.88	1.66	4.41	115
MSSHC-M43MB-74	73.88	34.63	108.51	5.00	4	3	2	-	-	1.25	1.88	8.50	8.81	1.75	.88	1.07	3.45	106
MSSHC-M43DB-75	67.34	33.62	100.96	5.00	4	3	2	1.50	5.00	1.25	1.88	-	-	-	-	.98	3.15	105
MSSHC-M43MB-75	68.25	32.75	101.00	5.00	4	3	2	-	-	1.25	1.88	8.50	8.81	1.75	.88	.99	3.19	100
MSSHC-M43DB-98	89.83	41.13	130.96	5.00	4	3	2	1.50	5.00	1.25	1.88	-	-	-	-	1.29	4.19	124
MSSHC-M43MB-98	96.42	42.19	138.81	5.00	4	3	2	-	-	1.25	2.00	8.89	8.81	1.75	.88	1.37	4.50	128
MSSHC-M53DB-60	57.11	29.81	86.92	6.00	5	4	3	1.50	6.25	1.50	2.75	-	-	-	-	1.39	4.56	122
MSSHC-M53DC-72	72.00	35.13	107.13	6.00	5	4	3	2.00	7.00	1.69	1.63	-	-	-	-	1.72	5.73	142
MSSHC-M53BD-74	69.14	33.82	102.96	6.00	5	4	3	1.50	6.25	1.50	2.75	-	-	-	-	1.65	5.51	137
MSSHC-M53MB-74	74.00	34.63	108.63	6.00	5	4	3	-	-	1.50	2.75	8.50	8.81	1.75	.88	1.75	5.89	141
MSSHC-M53DC-84	84.20	39.19	123.39	6.00	5	4	3	2.00	7.00	1.69	1.63	-	-	-	-	1.98	6.69	157
MSSHC-M53DC-84A	84.20	39.38	123.58	6.00	5	4	3	2.00	7.00	2.00	1.83	-	-	-	-	1.98	6.69	165
MSSHC-M53DB-90	86.55	39.63	126.18	6.00	5	4	3	1.50	6.25	1.50	2.75	-	-	-	-	2.02	6.87	159
MSSHC-M53MB-90	86.06	38.63	124.69	6.00	5	4	3	-	-	1.50	2.75	8.50	8.81	1.75	.88	2.01	6.83	156

ALL ITEMS LISTED ARE STOCK ITEMS. ALL LISTED ITEMS ARE MARION STYLE CYLINDERS.
 PORTS 1/2"-14 NPT ON SERIES 32, 42, 43, & 53 (MSSHC-M53DC-72, MSSHC-M53DC-84, & MSSHC-M53DC-84A USE 3/4"-14NPT)
 OTHER SIZES AND OPTIONS ARE AVAILABLE.



CYLINDER IDENTIFICATION SHC - M 53 DB - 75



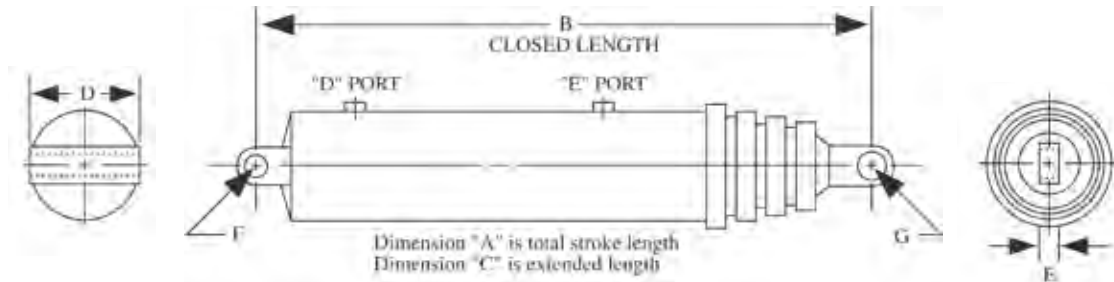
SINGLE ACTING EXTEND LOAD CAPACITY

LOAD CAPACITY : LBS @ PSI
 *ALL DIMENSIONS AND CALCULATIONS NOMINAL

PLUNGER DIA.	1500 PSI	2000 PSI	2500 PSI
2	4,700	6,280	7,850
3	10,600	14,130	17,670
4	18,850	25,130	31,410
5	29,450	39,270	49,080
6	42,410	56,540	70,680
7	57,720	76,960	96,210
8.25	80,180	106,910	133,640

SINGLE ACTING TELESCOPIC CYLINDER STOCK

These cylinders are available from Custom Hoists, Commercial®, Hyco and SHC.
Request the manufacturer you want.

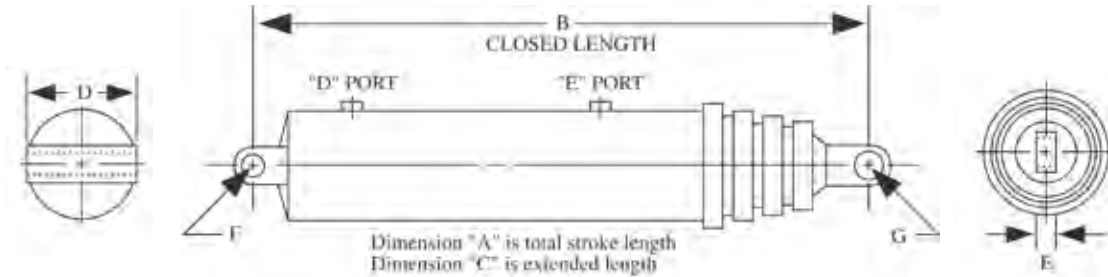


Stroke lengths for Hyco 70,000 series cylinders may be slightly different than those shown in chart. Please call our component group at 1-800-333-5617 for exact 70,000 series stroke lengths.

CYLINDER NO.	A	B	C	D	E	F	G
MS5372-SA	72.00	37.12	109.12	8.13	1.50	2.00	1.68
MS5384-SA	84.00	41.12	125.12	8.12	1.50	2.06	1.56
MS53104-SA	104.00	47.75	151.75	8.13	1.50	2.00	1.68
MS6384-SA	84.00	41.00	125.00	7.62	2.00	2.12	2.06
MS63104-SA	103.87	47.62	151.50	7.62	2.00	2.12	2.06
MS63108-SA	108.00	49.00	157.00	7.625	2.00	2.12	2.06
MS63111-SA	111.00	50.00	161.00	7.00	2.00	2.00	2.00
MS63120-SA	120.00	53.00	173.00	7.625	2.00	2.12	2.06
MS63120-TSA	120.00	53.375	173.375	TRIUNION MOUNT	4.00	N/A	1.56
MS63126-SA	126.00	55.00	181.00	7.00	2.00	2.12	2.06
MSD63128-SA	126.50	54.63	181.13	6.75	2.00	2.00	1.63
MS63140-TSA	139.87	60.00	199.97	TRIUNION MOUNT	4.00	N/A	1.56
MS64135-SA	134.88	47.13	182.00	8.00	2.69	1.75	1.50
MS64156-SA	155.87	52.37	208.12	8.00	2.68	1.87	1.56
MS73110-SA	110.63	50.06	160.69	8.25	2.00	2.00	2.00
MS73120-SA	120.00	53.12	173.12	8.625	1.50	2.12	2.06
MSD73126	125.25	55.12	180.37	6.75	2.00	2.00	1.63
MS73130-SA	130.12	56.50	186.62	8.625	1.50	2.12	2.06
MS73140-SA	140.00	60.00	200.00	8.25	2.00	2.00	2.00
MSD73142-SA	142.13	60.75	202.88	6.75	2.00	2.00	1.63
MS74120-SA	120.00	44.75	164.75	8.625	2.00	2.12	2.06
MS74135-SA	135.00	48.25	183.25	8.625	2.00	2.12	2.06
MS74140-SA	140.25	49.25	189.75	8.625	2.00	2.12	2.06
MS74156-SA	156.00	53.37	209.37	8.625	2.00	2.12	2.06
MS74161-SA	161.00	54.62	215.62	8.62	2.00	2.12	2.06
MS74167-SA	167.25	56.25	223.50	8.62	2.00	2.12	2.06
MS84148-SA	147.75	51.50	199.25	9.50	2.00	2.12	2.06
MS84156-SA	155.75	53.50	209.25	9.50	2.00	2.12	2.06
MS84170-SA	169.75	57.00	226.75	9.50	2.00	2.12	2.06
MS84180-SA	179.75	59.50	239.25	9.50	2.00	2.12	2.06
MS85170-SA	170.00	49.87	219.87	9.50	2.00	2.12	2.06
MS85190-SA	190.00	54.00	244.00	9.50	2.00	2.12	2.06
MS85197-SA	196.13	55.25	251.38	9.50	2.00	2.00	2.00
MS85220-SA	220.00	60.00	280.00	9.50	2.00	2.12	2.06
MS85220-TSA	218.25	60.38	278.63	TR	2.00	TR	2.00
MS85235-SA	235.00	65.00	300.00	9.50	2.00	2.12	2.06
MS85235-TSA	233.25	63.38	296.33	TR	2.00	TR	2.00
MS85250-SA	250.00	68.00	318.00	9.50	2.00	2.12	2.06
MS85250-TSA	248.25	68.38	316.63	TR	2.00	TR	2.00
MS85265-SA	265.00	71.00	336.00	9.50	2.00	2.12	2.06
MS85265-TSA	264.25	74.88	339.13	TR	2.00	TR	2.00

SINGLE ACTING TELESCOPIC CYLINDER STOCK

These cylinders are available from Custom Hoists, Commercial®, Hyco and SHC.
Request the manufacturer you want.

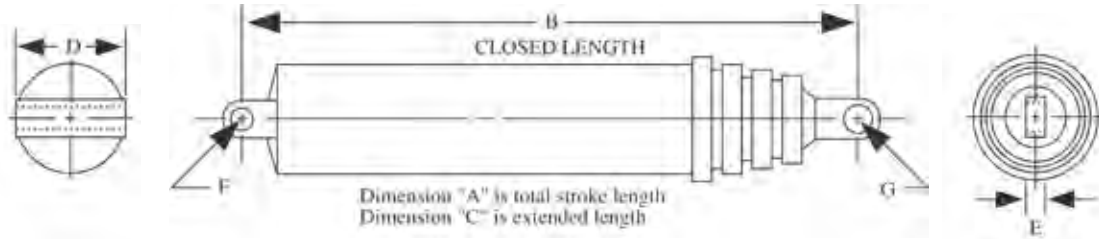


Stroke lengths for Hyco 70,000 series cylinders may be slightly different than those shown in chart. Please call our component group at 1-800-333-5617 for exact 70,000 series stroke lengths.

CYLINDER NO.	A	B	C	D	E	F	G
MS825190-SA	190.00	54.00	244.00	10.25	2.00	2.12	2.06
MS825220-SA	220.00	60.00	280.00	10.25	2.00	2.12	2.06
MS825235-SA	235.00	65.00	300.00	10.25	2.00	2.12	2.06
MS825250-SA	250.00	68.00	318.00	10.25	2.00	2.12	2.06
MS825265-SA	264.62	74.50	339.12	10.25	2.00	2.12	2.06
MS825280-SA	279.62	77.62	357.25	10.25	2.00	2.12	2.06
MS95220-SA	219.75	60.12	279.87	10.75	2.00	2.12	2.06
MS95235-SA	234.75	65.00	299.75	10.75	2.00	2.12	2.06
MS95250-SA	249.75	72.62	322.37	10.75	2.00	2.12	2.06
MS95265-SA	264.75	75.62	340.37	10.75	2.00	2.12	2.06
MS975220-SA	219.75	60.00	280.00	12.00	2.00	2.12	2.06
MS975235-SA	234.75	65.25	300.00	12.00	2.00	2.12	2.06
MS975250-SA	249.75	72.62	322.37	12.00	2.00	2.12	2.06
MSHPT53100	99.12	46.25	145.37	7.75	1.50	2.06	1.78
MSHPT53110	105.12	47.87	153.00	7.75	1.50	2.06	1.78
MSHPT53120	122.37	54.00	176.37	7.75	1.50	2.06	1.78
MSHPT53130	127.62	54.50	182.12	7.75	1.50	2.06	1.78
MSHPT63120	120.75	54.00	174.75	8.00	2.00	2.50	2.25
MSHPT63130	125.25	55.50	180.75	8.00	2.00	2.50	2.25
MSHPT63140	138.75	60.00	198.75	8.00	2.00	2.50	2.25
MSHPT63160	160.12	69.12	229.25	8.00	2.00	2.50	2.25
MS475	43.12	31.68	74.81	1.50	2.50	3.37	1.81
MS495	64.75	31.75	96.50	1.50	2.50	3.37	1.81
MS498	89.50	41.87	131.37	1.50	2.50	3.37	1.81
MSSHC-M32DB-43	40.38	29.69	70.07	1.50	4.00	1.25	1.88
MSSHC-M32DB-50	46.67	32.84	79.51	1.50	4.00	1.25	1.88
MSSHC-M42DB-43	39.50	30.19	69.69	1.50	5.00	1.50	2.75
MSSHC-M42DB-50	47.25	33.69	80.94	1.50	5.00	1.50	2.75
MSSHC-M42MB-50	51.25	35.07	86.32	-	-	1.50	2.75
MSSHC-M42DB-60	57.88	39.07	96.95	1.50	5.00	1.50	2.75
MSSHC-M42MB-65	65.00	42.07	107.07	-	-	1.50	2.75
MSSHC-M43MB-74	73.88	34.63	108.51	-	-	1.25	1.88
MSSHC-M43DB-75	67.34	33.62	100.96	1.50	5.00	1.25	1.88
MSSHC-M43MB-75	68.25	32.75	101.00	-	-	1.25	1.88
MSSHC-M43DB-98	89.83	41.13	130.96	1.50	5.00	1.25	1.88
MSSHC-M43MB-98	96.42	42.19	138.61	-	-	1.25	2.00
MSSHC-M53DB-60	57.11	29.81	86.92	1.50	6.25	1.50	2.75
MSSHC-M53DC-72	72.00	35.13	107.13	2.00	7.00	1.69	1.63
MSSHC-M53DB-74	69.14	33.82	102.96	1.50	6.25	1.50	2.75
MSSHC-M53MB-74	74.00	34.63	108.63	-	-	1.50	2.75
MSSHC-M53DB-90	86.55	39.63	126.18	1.50	6.25	1.50	2.75
MSSHC-M53MB-90	86.06	38.63	124.69	-	-	1.50	2.75

DOUBLE ACTING TELESCOPIC CYLINDERS

These cylinders are available from Custom Hoists, Commercial®, and Hyco.
Request the manufacturer you want.



CYLINDER NO.	A	B	C	D	E	F	G
MS52112-DA	111.75	75.50	187.25	2.00	2.00	2.01	2.01
MS53110-DA	109.62	56.75	166.37	2.00	2.00	3.03	1.56
MS53155-DA	155.75	75.50	231.25	2.00	2.00	2.00	1.50
MS53182-DA	182.00	81.00	263.00	3.87	6.50	2.00	2.00
MS6282-DA	82.00	56.50	138.50	2.25	2.25	3.03	3.03
MS6397-DA	97.12	52.37	149.50	1.50	1.50	1.28	1.28
MS63108-DA	107.62	50.75	158.37	7.12	3.87	1.78	1.78
MS63118-DA	118.00	58.50	176.50	3.00	4.00	2.50	2.50
MS63124-DA	124.50	76.87	201.48	2.00	2.00	2.031	2.06
MS63132-DA	131.62	62.37	194.00	7.12	3.87	1.78	1.78
MS63167-DA	167.00	85.25	252.25	4.00	3.69	2.00	2.00
MS64118-DA	118.13	49.38	167.50	2.25	2.25	1.50	1.50
MS64136-DA	135.62	49.37	185.00	2.00	2.25	1.56	1.56
MS64150-DA	150.00	56.56	206.56	2.25	2.25	1.50	1.50
MS72156-DA	156.12	96.00	252.12	N/A	2.00	N/A	2.06
MS74131-DA	131.50	53.37	184.87	1.50	1.50	1.28	1.28
MS74171-DA	171.12	62.37	233.50	7.00	4.00	1.78	1.78
MS83126-DA	126.00	72.00	198.00	3.00	3.00	2.51	2.51
MS84176-TD2	176.25	69.00	245.25	TRIUNION MOUNT	2.00	TRIUNION MOUNT	1.75
MS84176-TD3	176.25	69.00	245.25	TRIUNION MOUNT	2.00	N/A	1.76
MS84178-DA	178.25	69.00	247.25	2.00	2.00	1.78	1.78
MS85125-DA	125.00	49.75	174.75	2.50	2.50	2.00	2.00
MS85156-DA	155.625	55.50	211.125	2.00	2.00	2.00	2.00
MS85195-DA	195.00	69.37	264.87	2.00	2.00	2.03	2.03
MS85220-TD2	220.00	69.25	289.25	TRIUNION MOUNT	2.00	N/A	1.76
MS85220-TD3	220.25	69.25	289.50	TRIUNION MOUNT	2.00	N/A	1.76
MS85300-DA	300.25	87.37	387.62	1.75	2.00	2.00	2.18
MS85348-DA	347.87	100.00	447.87	2.00	2.00	2.06	2.18
MS85378-DA	378.00	104.75	482.75	2.00	2.00	2.12	2.06
MS86177-DA	176.75	53.37	230.12	1.50	1.50	1.28	1.28
MS915125-DA	125.00	49.75	174.75	2.50	2.50	2.00	2.00
MS915160-DA	159.75	61.00	220.75	2.00	2.00	2.02	2.02
MS916170-DA	169.75	50.625	220.37	2.50	2.50	2.00	2.00
MS916199-DA	199.12	57.87	257.00	2.00	2.00	2.03	2.03
MS96412-DA	412.25	99.62	511.87	TRIUNION MOUNT	2.00	TRIUNION MOUNT	2.06
MS96456-DA	456.50	107.00	563.50	TRIUNION MOUNT	2.00	TRIUNION MOUNT	2.06
MS974176-DA	176.12	69.12	245.25	3.00	3.00	2.52	2.52
MS974190-DA	189.62	71.00	260.62	2.25	2.00	2.25	2.02
MS976199-DA	199.12	57.87	257.00	2.00	2.00	2.03	2.03

TELESCOPIC CYLINDER WEIGHTS

These cylinders weights are average weights for Custom Hoists and Hyco manufactured cylinders. Cylinders manufactured by Commercial® Intertech are usually 50-70 pounds heavier than weights listed.

CYLINDER #	WT. (LBS.)	CYLINDER #	WT. (LBS.)	CYLINDER #	WT. (LBS.)	CYLINDER #	WT. (LBS.)
5360-SA	134	825235-SA	725	85220-TD3	764	HL-1-4106	67
5372-SA	160	825250-SA	765	85300-DA	848	HL-1-4108	90
5384-SA	175	825265-SA	795	85348-DA	875	HL-1-4110	105
53104-SA	200	825280-SA	835	85378-DA	952	HL-1-4272	68
6384-SA	215	95220-SA	780	86177-DA	485	HL-1-4305	50
63104-SA	249	95235-SA	825	915125-DA	528	HL-1-4328	185
63108-SA	256	95250-SA	868	95160-DA	740	HL-1-4330	192
63111-SA	260	95265-SA	890	96170-DA	568	HL-1-4339	104
63120-SA	279	975220-SA	858	96199-DA	795	HL-1-4340	175
63120-TSA	279	975235-SA	967	96412-DA	1350	HL-1-4341	85
63126-SA	286	975250-SA	1076	96456-DA	1408	HL-1-4348	170
D63128-SA	278	HPT53100	190	974176-DA	978	HL-1-4884	150
63140-TSA	330	HPT53110	193	974190-DA	995	HL-1-4887	121
64135-SA	260	HPT53120	230	976199-DA	864	LCH-15527	97
64156-SA	310	HPT53130	214	475	102	LCH-2R1006A	168
73110-SA	350	HPT63120	267	495	102	LCH-PO-1166	190
73120-SA	336	HPT63130	270	498	132	LCH-PO-265	102
D73126	355	HPT63140	288	D3021GDA	55	MX-401222	260
73130-SA	358	HPT63160	328	D3526GDA	70	MX-401282	105
73140-SA	404	52112-DA	318	D4021EDA	96	MX-401826	51
D73142-SA	383	53110-DA	246	D4028EDA	105	MX-404614	176
74120-SA	311	53155-DA	307	D4030FDA	96	PG-3128C	67
74135-SA	335	53182-DA	357	D4035HDA	125	PG-6042BDA	239
74140-SA	347	6282-DA	253	D4128EDA	91	PG-7078DA	442
74156-SA	370	6397-DA	275	D4522JDA	84	PKM-1341-LM	61
74161-SA	390	63108-DA	283	D4522EDA	100	PKM-1351-LM	214
74167-SA	390	63118-DA	317	D4526BDA	104	PKM-2162-LM	24
84148-SA	451	63124-DA	383	D4548BDA	165	SHC-M32DB-43	57
84156-SA	455	63132-DA	332	D5532EDA	135	SHC-M32DB-50	63
84170-SA	494	63167-DA	320	DD-BB8133-1	188	SHC-M42DB-43	81
84180-SA	524	64118-DA	280	DD-BB8134-1	150	SHC-M42DB-50	91
85170-SA	450	64136-DA	271	DD-BB8281-1	114	SHC-M42MB-50	100
85190-SA	506	64150-DA	305	DD-BB8374-1	174	SHC-M42DB-60	115
85197-SA	525	72156-DA	630	DD-BB8379-1	110	SHC-M42MB-65	116
85220-SA	567	74131-DA	334	DD-BB8748-1	85	SHC-M43DB-75	98
85220-TSA	585	74171-DA	575	DD-AB19461	368	SHC-M43MB-75	107
85235-SA	619	83126-DA	555	DD-AB19774	110	SHC-M53DB-60	115
85235-TSA	637	84176-TD2	700	DD-AB19775	175	SHC-M53DB-74	137
85250-SA	654	84176-TD3	550	HL-1-4070	83	SHC-M53MB-74	140
85250-TSA	672	84178-DA	560	HL-1-4093	150	SHC-M53MB-90	154
85265-SA	674	85125-DA	510	HL-1-4094	125		
85265-TSA	692	85156-DA	495	HL-1-4100	73		
825190-SA	595	85195-DA	620	HL-1-4101	100		
825220-SA	667	85220-TD2	764	HL-1-4103	119		

POWER UNITS

POWER UNITS

Part Number: HPU12VCHCFVD02-RC
Net Price: \$417.79
 12 VDC
 1.75 GPM
 3 Gallon Steel Tank
 Two Button Remote Control
 3 Meter Cable
 Power Up, Gravity Down
 Adjustable relief valve pre set at 2900 psi

Part Number: HPU12VCHCFVD02-RC
Net Price: \$417.79
 12 VDC
 1.12 GPM
 3 Gallon Steel Tank
 Two Button Control
 3 Meter Cable
 Power Up, Gravity Down
 Adjustable relief valve pre set at 2900 psi



Reservoir size accommodates HTC 7-Ton Cylinders or equivalent size cylinder

Part Number: HPU12VCHCFWD02-RC
Net Price: \$417.79
 12 VDC
 1.12 GPM Pump
 5 Gallon Steel Tank
 Two Button Remote Control
 3 Meter Cable
 Power Up, Gravity Down
 Adjustable relief valve pre set at 2900 psi

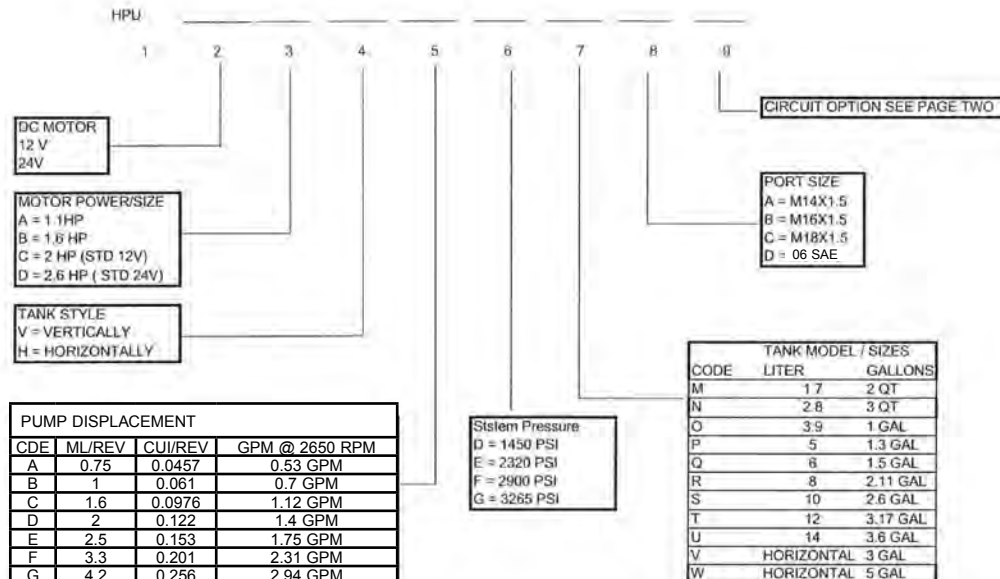
Part Number: HPU12VCHCFWD02-RC
Net Price: \$414.54
 12 VDC
 1.75 GPM
 5 Gallon Steel Tank
 Two Button Control
 3 Meter Cable
 Power Up, Gravity Down
 Adjustable relief valve pre set at 2900 psi

Reservoir size accommodates HTC 12-Ton Cylinders or equivalent size cylinder

Part Number: HPU12VCHCFSD02-RC
Net Price: \$355.82
 Circuit 3 way power up gravity down
 12 vdc power source required
 Steel tank 2.6 gallon capacity
 Two button remote control
 Flow rate is 1.12 gpm @ 2650 rpm
 Adjustable relief valve pre set at 2900 psi

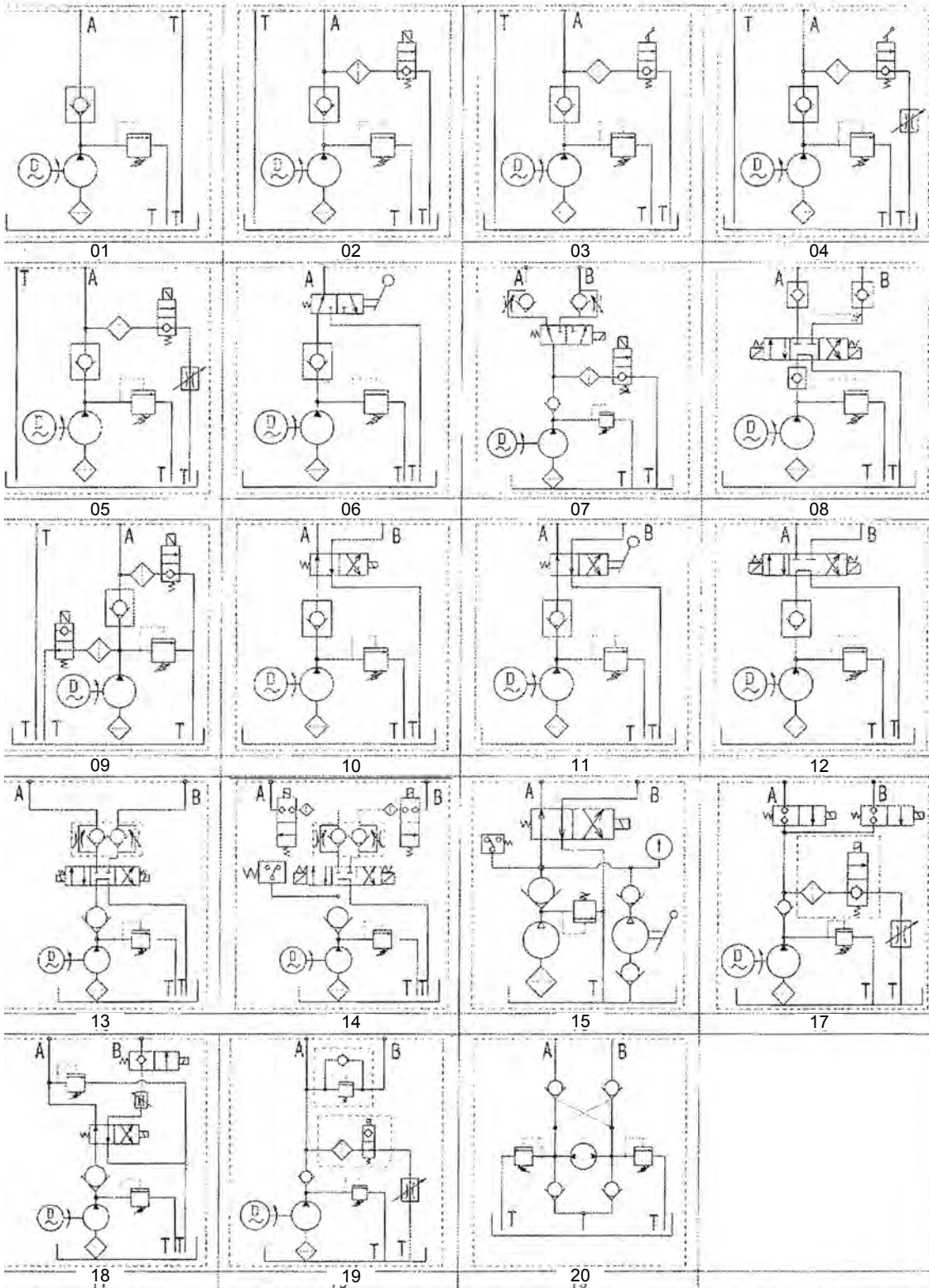
Part Number: HPU12VCHCFSD12-RC
Net Price: \$433.19
 Circuit 4way three position valve power out & power in
 12vdc power source required
 Steel tank 2.6 gallon capacity
 Two button remote control
 Flow rate is 1.12 gpm @ 2650 rpm
 Adjustable relief valve pre set at 2900 psi

HOW TO CREATE A POWER UNIT PART











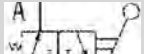
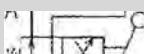




POWER UNITS

Drawing of Circuits - Power Unit Hydraulic Schematic Diagram



Key

-  Two Position Manual Valve Spring Centered
-  Check Valve
-  Flow Control Adjustable
-  Two Position Solenoid Valve
-  Pilot Operated Check Valve
-  4 Way 3 Position Solenoid Spring Centered Valve
-  Relief Valve
-  Hydraulic Pump
-  Filter
-  12 VDC Electric Motor
-  Two Position 3 Way Spring Centered Manual Valve
-  Two Position 4 Way Spring Centered Manual Valve
-  Two Position 4 Way Spring Centered Solenoid Valve
-  Pressure Switch

MSO Brand Repair Parts

Contents	Page
MSHTR Cylinder Glands	34
MSHTR Cylinder Caps	34
MSHTR Pistons	35
MSHTR Mobile Split Clevis	35
MSHSTR Cylinder Glands	36
MSHSTR Cylinder Caps	36
MSHSTR Pistons	37
MSHSTR Mobile Split Clevis	37
MSHMW Glands	38
MSHMW Pistons	38
MSHCW Glands	39
MSHCW Pistons	39
MSO Brand Stroke Adjusters	40

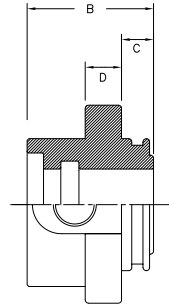
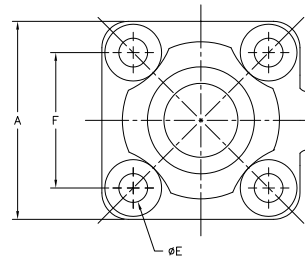
CYLINDER REPAIR PARTS

MSO Brand Repair Parts

THE MSHTR LINE



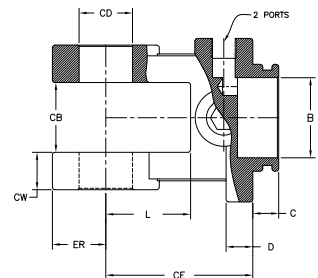
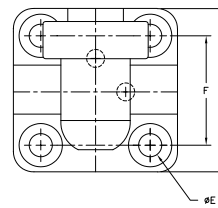
GLANDS



Part Number	Rod	Bore	A	B	C	D	E	F	Port	List Price
MSHTR-2.0X1.125-GLAND	1.125	2.0	3.07	1.92	0.50	0.52	0.43	2.05	3/8" NPT	\$17.56
MSHTR-2.5X1.125-GLAND	1.125	2.5	3.35	1.92	0.50	0.62	0.43	2.36	3/8" NPT	21.55
MSHTR-3.0X1.250-GLAND	1.250	3.0	4.05	1.96	0.50	0.73	0.51	2.87	1/2" NPT	26.90
MSHTR-3.5X1.250-GLAND	1.250	3.5	4.33	1.95	0.50	0.74	0.51	3.19	1/2" NPT	30.66
MSHTR-3.5X1.500-GLAND	1.500	3.5	4.33	1.95	0.50	0.74	0.51	3.19	1/2" NPT	30.66
MSHTR-4.0X1.250-GLAND	1.250	4.0	4.72	1.89	0.51	0.98	0.51	3.62	1/2" NPT	41.34
MSHTR-4.0X1.500-GLAND	1.500	4.0	4.72	1.89	0.51	0.98	0.51	3.62	1/2" NPT	41.42
MSHTR-4.0X1.750-GLAND	1.750	4.0	4.72	1.89	0.51	0.98	0.51	3.62	1/2" NPT	41.42
MSHTR-5.0X1.500-GLAND	1.500	5.0	6.30	2.24	0.68	1.18	0.67	4.45	1/2" NPT	66.69
MSHTR-5.0X2.000-GLAND	2.000	5.0	6.30	2.24	0.68	1.18	0.67	4.45	1/2" NPT	66.69



CAPS



Part Number	Bore	A	B	C	D	E	F	Ports	CB	CD	CE	CW	L	ER	List Price
MSHTR-2.0 CAP	2.0	3.07	1.50	0.50	0.50	0.43	2.05	3/8" NPT	1.14	1.01	2.84	0.69	1.63	1.00	\$21.60
MSHTR-2.5 CAP	2.5	3.35	1.77	0.50	0.50	0.43	2.36	3/8" NPT	1.14	1.01	2.84	0.69	1.63	1.00	24.90
MSHTR-3.0 CAP	3.0	4.05	2.28	0.50	0.50	0.51	2.87	1/2" NPT	1.14	1.01	2.84	0.69	1.63	1.00	27.81
MSHTR-3.5 CAP	3.5	4.33	2.56	0.50	0.69	0.51	3.19	1/2" NPT	1.14	1.01	2.84	0.69	1.63	1.00	34.75
MSHTR-4.0 CAP	4.0	4.72	3.00	0.51	0.75	0.51	3.62	1/2" NPT	1.14	1.01	2.88	0.73	1.63	1.13	40.70
MSHTR-5.0 CAP	5.0	6.30	3.94	0.69	0.75	0.67	4.45	1/2" NPT	1.26	1.01	3.95	1.12	2.25	1.50	84.28

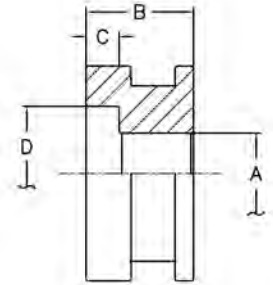
MSO REPAIR PARTS

CYLINDER REPAIR PARTS

MSO Brand Repair Parts THE MSHTR LINE



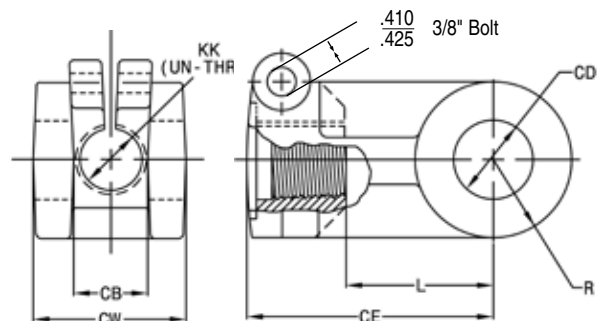
PISTON



Part Number	Bore	A	B	C	D	List Price
MSHTR-2.0 PISTON	2.0	0.75	1.00	0.32	1.38	\$8.36
MSHTR-2.5 PISTON	2.5	0.75	1.00	0.32	1.50	10.00
MSHTR-3.0 PISTON	3.0	1.00	1.00	0.32	2.25	11.31
MSHTR-3.5 PISTON	3.5	1.00	1.00	0.32	2.76	13.19
MSHTR-4.0 PISTON	4.0	1.00	1.00	0.32	2.76	15.72
MSHTR-5.0 PISTON	5.0	1.25	1.89	0.63	3.54	32.83



SPLIT CLEVIS



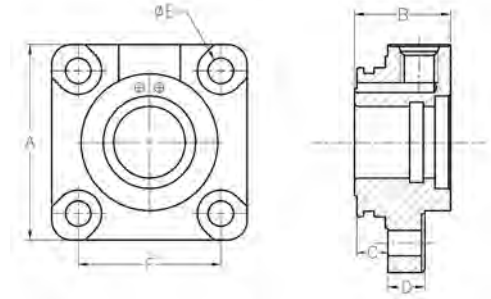
Part Number	Bore	CB	CD	CE	CW	KK	L	R	List Price
MSHTR-2.0 CLEVIS	2.0	1.12	1.00	3.25	2.62	1-1/8"-12	2.12	1.00	\$34.41
MSHTR-2.5 CLEVIS	2.5	1.12	1.00	3.25	2.62	1-1/8"-12	2.12	1.00	34.41
MSHTR-3.0 CLEVIS	3.0	1.12	1.00	3.25	2.62	1-1/4"-12	2.12	1.00	34.41
MSHTR-3.5 CLEVIS	3.5	1.12	1.00	3.25	2.62	1-1/4"-12	2.12	1.00	34.41
MSHTR-4.0 CLEVIS	4.0	1.12	1.00	3.25	2.62	1-1/4"-12	2.12	1.00	34.41
MSHTR-5.0 CLEVIS	5.0	1.25	1.00	3.25	2.62	1-1/4"-12	2.12	1.25	28.34

CYLINDER REPAIR PARTS

MSO Brand Repair Parts THE MSHSTR LINE



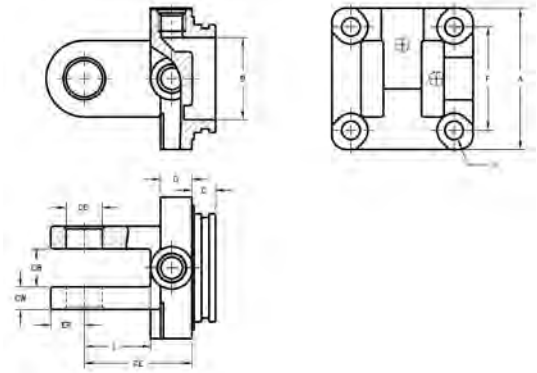
GLANDS



Part Number	Rod	Bore	A	B	C	D	E	F	Port	List Price
MSHSTR-2.0-GLAND	1.125	2.00	3.23	2.25	0.67	0.99	0.43	2.36	SAE8	\$36.57
MSHSTR-2.5-GLAND	1.250	2.50	3.47	2.38	0.67	0.75	0.51	2.48	SAE8	41.33
MSHSTR-3.0-GLAND	1.375	3.00	4.02	1.94	0.63	0.75	0.51	2.91	SAE8	47.14
MSHSTR-3.5-GLAND	1.375	3.50	4.33	2.00	0.63	0.75	0.51	3.19	SAE8	51.27
MSHSTR-4.0-1.50-GLAND	1.500	4.00	5.12	1.81	0.71	1.06	0.67	3.70	SAE8	65.63
MSHSTR-4.0-1.75-GLAND	1.750	4.00	5.12	1.81	0.71	1.06	0.67	3.70	SAE8	65.63
MSHSTR-5.0-GLAND	2.000	5.00	6.61	2.50	0.71	1.13	0.83	4.96	SAE10	114.64



CAPS



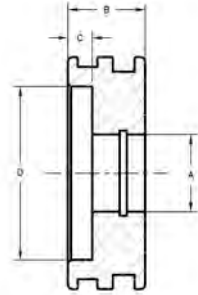
Part Number	Bore	A	B	C	D	E	F	Ports	CB	CD	CE	CW	L	ER	List Price
MSHSTR-2.0-ENDCAP	2.0	3.23	1.42	0.67	1.17	0.39	2.36	SAE8	1.06	1.01	2.98	0.63	1.81	0.93	\$42.98
MSHSTR-2.5-ENDCAP	2.5	3.47	1.77	0.59	1.10	0.39	2.48	SAE8	1.06	1.01	2.95	0.63	1.84	0.90	44.42
MSHSTR-3.0-ENDCAP	3.0	4.02	2.28	0.63	0.91	0.51	2.91	SAE8	1.06	1.01	3.04	0.63	2.13	0.94	52.38
MSHSTR-3.5-ENDCAP	3.5	4.33	2.56	0.63	0.91	0.51	3.19	SAE8	1.06	1.01	3.04	0.81	2.13	0.94	62.87
MSHSTR-4.0-ENDCAP	4.0	5.12	2.95	0.67	1.04	0.67	3.70	SAE8	1.06	1.01	3.17	0.81	2.13	0.98	78.90
MSHSTR-5.0-ENDCAP	5.0	6.61	3.94	0.67	1.04	0.83	4.96	SAE10	1.06	1.26	3.54	0.94	2.50	1.40	120.16

CYLINDER REPAIR PARTS

MSO Brand Repair Parts THE MSHSTR LINE



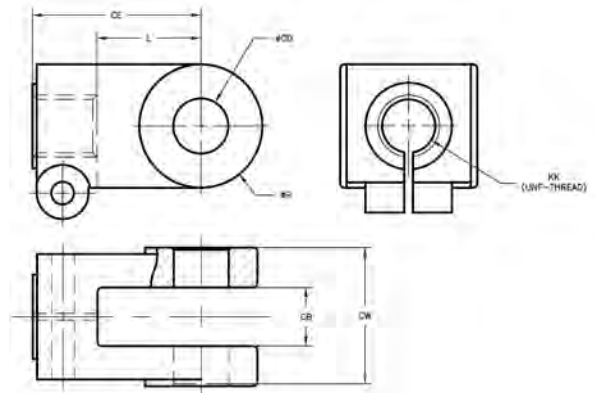
PISTON



Part Number	Bore	A	B	C	D	List Price
MSHSTR-2.0-PISTON	2.0	0.75	1.0	0.2	1.5	\$23.15
MSHSTR-2.5-PISTON	2.5	0.75	1.0	0.2	1.5	25.64
MSHSTR-3.0-PISTON	3.0	1.00	1.0	0.3	2.3	29.72
MSHSTR-3.5-PISTON	3.5	1.00	1.0	0.3	2.3	33.05
MSHSTR-4.0-PISTON	4.0	1.25	1.3	0.3	2.3	42.43
MSHSTR-5.0-PISTON	5.0	1.50	1.5	0.3	2.3	60.65



SPLIT CLEVIS



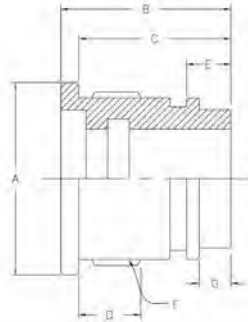
Part Number	Bore	CB	CD	CE	CW	KK	L	R	List Price
MSHSTR-2.0-2.5-CLEVIS	2.0/2.5	1.06	1.01	3.06	2.50	1-1/8"-12	1.81	2.25	\$35.80
MSHSTR-3.0-CLEVIS	3.0	1.06	1.01	2.98	2.50	1-1/8"-12	1.81	2.55	40.22
MSHSTR-3.5-CLEVIS	3.5	1.06	1.01	2.98	2.87	1-1/4"-12	1.81	2.55	44.15
MSHSTR-4.0-CLEVIS	4.0	1.06	1.01	2.98	2.87	1-1/2"-12	1.81	2.55	44.15
MSHSTR-5.0-CLEVIS	5.0	1.06	1.26	3.19	2.87	1-1/2"-12	2.00	2.55	49.46

CYLINDER REPAIR PARTS

MSO Brand Repair Parts THE MSHMW LINE



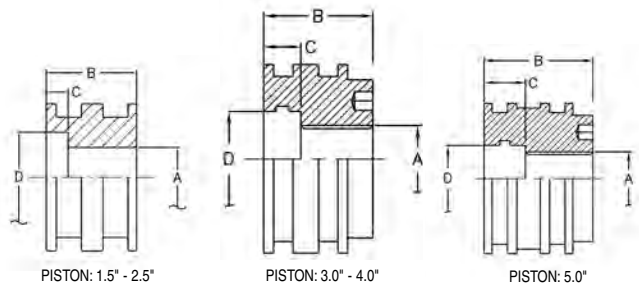
GLANDS



Part Number	Rod	Bore	A	B	C	D	E	F	G	List Price
MSHMW-1.5-GLAND	1	1.5	1.87	2.40	1.93	0.86	0.54	M43 x 2	0.40	10.08
MSHMW-2.0-GLAND	1-1/4	2.0	2.375	2.17	1.93	0.90	0.54	M55 x 2	0.40	12.27
MSHMW-2.5-GLAND	1-1/2	2.5	2.875	2.17	1.93	0.90	0.54	M68 x 2	0.40	14.61
MSHMW-3.0-GLAND	1-1/2	3.0	3.46	2.40	1.93	0.90	0.54	M81 x 2	0.40	21.49
MSHMW-3.5-GLAND	1-3/4	3.5	3.976	2.17	1.93	0.90	0.54	M94 x 2	0.40	23.31
MSHMW-4.0-GLAND	2	4.0	4.488	2.44	2.20	1.18	0.54	M106 x 2	0.40	33.39
MSHMW-5.0-GLAND	2-1/2	5.0	5.472	2.68	2.20	1.18	0.54	M132 x 2	0.40	52.74



PISTONS



Part Number	Bore	A	B	C	D	List Price
MSHMW-1.5-PISTON	1.5	0.688	1.22	0.15	1.10	\$7.40
MSHMW-2.0-PISTON	2.0	0.805	1.22	0.29	1.26	9.37
MSHMW-2.5-PISTON	2.5	0.947	1.37	0.37	1.49	12.25
MSHMW-3.0-PISTON	3.0	M24 x 2	2.09	0.71	1.502	18.39
MSHMW-3.5-PISTON	3.5	M30 x 2	2.16	0.67	1.752	24.57
MSHMW-4.0 PISTON	4.0	M36 x 2	2.16	0.67	2.002	29.01
MSHMW-5.0 PISTON	5.0	M48 x 2	2.87	0.98	2.502	52.97

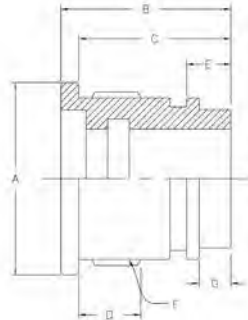
**These replacement parts are for
HMW cylinders found on page 8 - 10**

CYLINDER REPAIR PARTS

MSO Brand Repair Parts THE MSHCW LINE



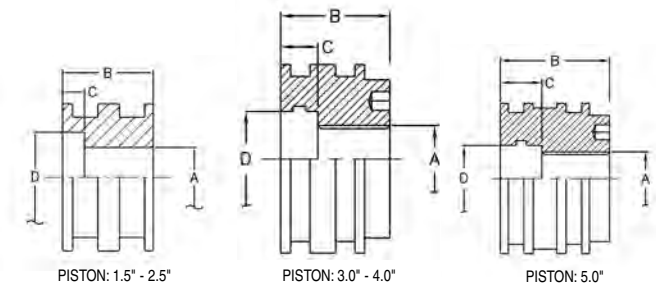
GLANDS



Part Number	Rod	Bore	A	B	C	D	E	F	G	List Price
MSHCW-1.5-GLAND	1	1.5	1.97	2.40	1.93	0.79	0.54	M43-2	0.40	\$10.08
MSHCW-2.0-GLAND	1-1/4	2.0	2.44	2.17	1.93	0.79	0.54	M55-2	0.40	12.27
MSHCW-2.5-GLAND	1-1/2	2.5	2.95	2.17	1.93	0.79	0.54	M68-2	0.40	14.61
MSHCW-3.0-GLAND	1-1/2	3.0	3.45	2.40	1.93	0.83	0.54	M81-2	0.40	21.49
MSHCW-3.5-GLAND	1-3/4	3.5	3.94	2.17	1.93	0.83	0.54	M94-2	0.40	23.31
MSHCW-4.0-GLAND	2	4.0	4.45	2.44	2.20	1.10	0.54	M106-2	0.40	33.39
MSHCW-5.0-GLAND	2-1/2	5.0	5.45	2.68	2.20	1.10	0.54	M132-2	0.40	52.74



PISTONS



Part Number	Bore	A	B	C	D	List Price
MSHCW-1.5-PISTON	1.5	0.634	1.22	0.16	0.906	\$7.40
MSHCW-2.0-PISTON	2.0	0.807	1.22	0.30	1.220	9.37
MSHCW-2.5-PISTON	2.5	0.948	1.38	0.38	1.375	12.25
MSHCW-3.0-PISTON	3.0	M24-2	2.09	0.71	1.504	18.39
MSHCW-3.5-PISTON	3.5	M30-2	2.28	0.79	1.755	24.57
MSHCW-4.0 PISTON	4.0	M36-2	2.28	0.79	2.005	29.01
MSHCW-5.0 PISTON	5.0	M48-2	2.88	0.98	2.505	39.11

**These replacement parts are for
HCW cylinders found on page 12 - 13**

STROKE ADJUSTERS

MSO Brand Stroke Adjusters



PART NUMBER	DESCRIPTION	LIST PRICE
MSHB-SA-1250	1-1/4 -12" STROKE ADJUSTER	\$34.07

Mobile Repair Parts

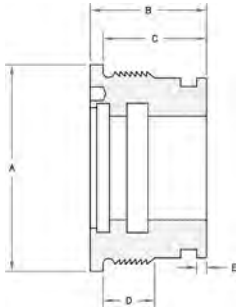
Contents	Page
Mobile Cylinder Glands	42 - 51
Mobile Cylinder Caps	52
Mobile Cylinder Pistons	53 - 56
Mobile All-In-One Pistons	57
Mobile Mounts	58 - 59
Mobile Welded Mounts	60 - 62
Mobile Spherical Bearings	63
Mobile Ball Ends	63 - 64
Mobile Weldable Trunnions	65
Steel Bushings	66
Mobile Welded Pivot Pins and Clips	67
Ports / Lock Nuts	68
Displacement Cylinder Components	69
Displacement Cylinder Technical Information	70

MOBILE CYLINDER GLANDS



IT Gland

Material: 65-45-12
Ductile Iron



PART NUMBER	BORE +.003" -.003"	ROD +.000" -.003"	A	B	C	D	E	F (BUT- TRESS)	LIST PRICE
MSCM-H107277	1.500	1.000	2.00	2.00	1.50	0.75	0.28	1-3/4"-12	\$20.16
MSCM-H107597	2.000	1.000	2.50	2.12	1.94	1.00	0.12	2-1/4"-12	19.01
MSCM-H107598	2.000	1.125	2.50	2.00	1.75	0.75	0.19	2-1/4"-12	18.54
MSCM-H107595	2.000	1.250	2.50	2.25	2.00	1.00	0.19	2-1/4"-12	19.55
MSCM-H107193	2.500	1.125	3.00	2.00	1.75	0.75	0.19	2-3/4"-12	25.77
MSCM-H107194	2.500	1.250	3.00	2.00	1.75	0.75	0.19	2-3/4"-12	25.77
MSCM-H107463	2.500	1.500	3.00	2.38	2.00	1.00	0.19	2-3/4"-12	28.25
MSCM-H107673	2.500	1.750	3.00	2.25	1.88	0.88	0.28	2-3/4"-12	27.38
MSCM-H107157	3.000	1.000	3.50	2.25	2.00	1.00	0.19	3-1/4"-12	33.73
MSCM-H107196	3.000	1.250	3.50	2.25	2.00	1.00	0.19	3-1/4"-12	33.73
MSCM-H107131	3.000	1.500	3.50	2.25	2.00	1.00	0.19	3-1/4"-12	33.73
MSCM-H107189	3.000	1.750	3.50	2.25	2.00	1.00	0.19	3-1/4"-12	33.73
MSCM-H107359	3.000	2.000	3.50	2.50	2.00	1.00	0.19	3-1/4"-12	33.73
MSCM-H107591	3.250	1.500	3.75	2.25	2.00	1.00	0.19	3-1/2"-12	40.04
MSCM-H107592	3.250	1.750	3.75	2.25	2.00	1.00	0.19	3-1/2"-12	40.04
MSCM-H107197	3.500	1.250	4.00	2.25	2.00	1.00	0.19	3-3/4"-12	43.71
MSCM-H107198	3.500	1.500	4.00	2.25	2.00	1.00	0.19	3-3/4"-12	43.71
MSCM-H107108	3.500	1.750	4.00	2.25	2.00	1.00	0.19	3-3/4"-12	43.71
MSCM-H107112	3.500	2.000	4.00	2.25	2.00	1.00	0.19	3-3/4"-12	43.71
MSCM-H107462	3.500	2.500	4.00	2.50	2.12	1.00	0.25	3-3/4"-12	47.16
MSCM-H107130	4.000	1.500	4.50	2.25	2.00	1.00	0.19	4-1/4"-12	54.95
MSCM-H107124	4.000	1.750	4.50	2.25	2.00	1.00	0.19	4-1/4"-12	54.95
MSCM-H107311	4.000	2.000	4.50	2.25	2.00	1.00	0.19	4-1/4"-12	54.95
MSCM-H107331	4.000	2.250	4.50	2.25	2.00	1.00	0.19	4-1/4"-12	54.95
MSCM-H107386	4.000	2.500	4.50	2.50	2.12	1.12	0.19	4-1/4"-12	60.14
MSCM-H107525	4.000	3.000	4.50	2.50	2.12	1.00	0.25	4-1/4"-12	60.14
MSCM-H107199	4.500	1.750	5.00	2.25	2.00	1.00	0.19	4-3/4"-12	67.41
MSCM-H107200	4.500	2.000	5.00	2.25	2.00	1.00	0.19	4-3/4"-12	67.41
MSCM-H107201	4.500	2.250	5.00	2.25	2.00	1.00	0.19	4-3/4"-12	67.41
MSCM-H107528	4.500	3.500	5.00	2.38	2.00	1.00	0.19	4-3/4"-12	70.31
MSCM-H107234	5.000	1.750	5.50	2.25	2.00	1.00	0.19	5-1/4"-12	86.23
MSCM-H107212	5.000	2.000	5.50	2.25	2.00	1.00	0.19	5-1/4"-12	86.23
MSCM-H107204	5.000	2.500	5.50	2.50	2.12	1.12	0.19	5-1/4"-12	91.38
MSCM-H107205	5.000	3.000	5.50	2.50	2.12	1.12	0.19	5-1/4"-12	91.38
MSCM-H107345	6.000	2.000	6.50	2.50	2.12	1.12	0.19	6-1/4"-12	130.83
MSCM-H107206	6.000	2.500	6.50	2.50	2.12	1.12	0.19	6-1/4"-12	130.83
MSCM-H107207	6.000	3.000	6.50	2.50	2.12	1.12	0.19	6-1/4"-12	130.83
MSCM-H107178	6.000	3.500	6.50	2.50	2.12	1.12	0.19	6-1/4"-12	130.83
MSCM-H107328	7.000	3.000	7.50	2.88	2.50	1.12	0.59	7-1/4"-10	191.92
MSCM-H107467	7.000	4.000	7.50	2.88	2.50	1.12	0.59	7-1/4"-10	191.92
MSCM-H107466	8.000	4.000	9.00	3.75	3.25	1.50	0.88	8-1/4"-10	284.96
MSCM-H107475	8.000	5.000	9.00	3.75	3.25	1.50	0.88	8-1/4"-10	284.96

SEAL KIT NUMBER	LIST PRICE
MSCM-SK-H107277	\$47.27
MSCM-SK-H107597	21.98
MSCM-SK-H107598	21.98
MSCM-SK-H107595	21.98
MSCM-SK-H107193	21.53
MSCM-SK-H107194	21.53
MSCM-SK-H107463	29.91
MSCM-SK-H107673	29.91
MSCM-SK-H107157	22.21
MSCM-SK-H107196	21.53
MSCM-SK-H107131	21.61
MSCM-SK-H107189	23.01
MSCM-SK-H107359	23.64
MSCM-SK-H107591	27.86
MSCM-SK-H107592	29.26
MSCM-SK-H107197	22.23
MSCM-SK-H107198	23.01
MSCM-SK-H107108	24.41
MSCM-SK-H107112	27.05
MSCM-SK-H107462	28.17
MSCM-SK-H107130	24.01
MSCM-SK-H107124	25.58
MSCM-SK-H107311	21.84
MSCM-SK-H107331	31.93
MSCM-SK-H107386	33.08
MSCM-SK-H107525	32.28
MSCM-SK-H107199	28.25
MSCM-SK-H107200	30.08
MSCM-SK-H107201	33.97
MSCM-SK-H107528	53.66
MSCM-SK-H107234	28.82
MSCM-SK-H107212	30.57
MSCM-SK-H107204	35.58
MSCM-SK-H107205	39.61
MSCM-SK-H107345	32.21
MSCM-SK-H107206	37.20
MSCM-SK-H107207	41.24
MSCM-SK-H107178	47.65
MSCM-SK-H107328	44.64
MSCM-SK-H107467	59.94
MSCM-SK-H107466	61.79
MSCM-SK-H107475	83.26

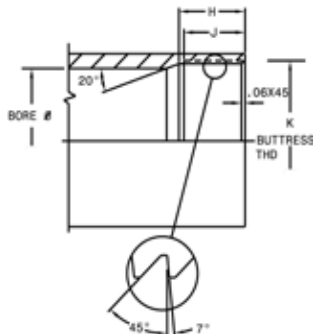
IT & ITW Technical Information

Basic information for Internal Buttress Threads (52 degrees)

"H" = Length of Thread on Gland plus 1/8"

"J" = Length of Thread on Gland plus 1/16"

"K" = Buttress Thread as determined by Gland

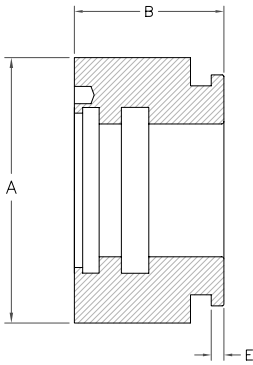


Basic Thread Size	Min. Major Diameter	Pitch Diameter	Minor Diameter
2-1/4"-12	2.2604	2.2000/2.2075	2.1500/2.1575
2-3/4"-12	2.7604	2.7000/2.7080	2.6500/2.6580
3-1/4"-12	3.2604	3.2000/3.2080	3.1500/3.1580
3-1/2"-12	3.5104	3.4500/3.4580	3.4000/3.4080
3-3/4"-12	3.7604	3.7000/3.7080	3.6500/3.6580
4-1/4"-12	4.2604	4.2000/4.2084	4.1500/4.1584
4-3/4"-12	4.7604	4.7000/4.7084	4.6500/4.6584
5-1/4"-12	5.2604	5.2000/5.2084	5.1500/5.1584
5-3/4"-12	5.7604	5.7000/5.7084	5.6500/5.6584
6-1/4"-12	6.2604	6.2000/6.2084	6.1500/6.1584
7-1/4"-10	7.2626	7.1900/7.1995	7.1300/7.1395
8-1/4"-10	8.2626	8.1900/8.1995	8.1300/8.1395
10-1/4"-10	10.2626	10.1900/10.1995	10.1300/10.1395

MOBILE CYLINDER GLANDS



Material: 65-45-12
Ductile Iron



These glands are threadless to allow for a repair or machine shop to customize the threads on the gland as required.

IT Gland - Threadless

PART NUMBER	BORE +.003" -.003"	ROD +.000" -.003"	A	B	E	LIST PRICE
MSCM-H107597-NTHD	2.000	1.000	2.50	2.12	0.12	\$18.01
MSCM-H107598-NTHD	2.000	1.125	2.50	2.00	0.19	17.57
MSCM-H107595-NTHD	2.000	1.250	2.50	2.25	0.19	19.05
MSCM-H107193-NTHD	2.500	1.125	3.00	2.00	0.19	25.18
MSCM-H107194-NTHD	2.500	1.250	3.00	2.00	0.19	25.18
MSCM-H107463-NTHD	2.500	1.500	3.00	2.38	0.19	27.49
MSCM-H107673-NTHD	2.500	1.750	3.00	2.25	0.28	26.06
MSCM-H107157-NTHD	3.000	1.000	3.50	2.25	0.19	32.25
MSCM-H107196-NTHD	3.000	1.250	3.50	2.25	0.19	32.25
MSCM-H107131-NTHD	3.000	1.500	3.50	2.25	0.19	32.25
MSCM-H107189-NTHD	3.000	1.750	3.50	2.25	0.19	32.25
MSCM-H107359-NTHD	3.000	2.000	3.50	2.50	0.19	32.25
MSCM-H107591-NTHD	3.250	1.500	3.75	2.25	0.19	37.77
MSCM-H107592-NTHD	3.250	1.750	3.75	2.25	0.19	37.77
MSCM-H107197-NTHD	3.500	1.250	4.00	2.25	0.19	41.79
MSCM-H107198-NTHD	3.500	1.500	4.00	2.25	0.19	41.79
MSCM-H107108-NTHD	3.500	1.750	4.00	2.25	0.19	41.79
MSCM-H107112-NTHD	3.500	2.000	4.00	2.25	0.19	41.79
MSCM-H107462-NTHD	3.500	2.500	4.00	2.50	0.25	41.79
MSCM-H107130-NTHD	4.000	1.500	4.50	2.25	0.19	53.42
MSCM-H107124-NTHD	4.000	1.750	4.50	2.25	0.19	53.42
MSCM-H107311-NTHD	4.000	2.000	4.50	2.25	0.19	53.42
MSCM-H107331-NTHD	4.000	2.250	4.50	2.25	0.19	53.42
MSCM-H107386-NTHD	4.000	2.500	4.50	2.50	0.19	53.42
MSCM-H107199-NTHD	4.500	1.750	5.00	2.25	0.19	66.38
MSCM-H107200-NTHD	4.500	2.000	5.00	2.25	0.19	66.38
MSCM-H107201-NTHD	4.500	2.250	5.00	2.25	0.19	66.38
MSCM-H107528-NTHD	4.500	3.500	5.00	2.38	0.19	66.38
MSCM-H107234-NTHD	5.000	1.750	5.50	2.25	0.19	75.33
MSCM-H107212-NTHD	5.000	2.000	5.50	2.25	0.19	75.33
MSCM-H107204-NTHD	5.000	2.500	5.50	2.50	0.19	75.33
MSCM-H107345-NTHD	6.000	2.000	6.50	2.50	0.19	116.54
MSCM-H107206-NTHD	6.000	2.500	6.50	2.50	0.19	116.54
MSCM-H107178-NTHD	6.000	3.500	6.50	2.50	0.19	116.54
MSCM-H107328-NTHD	7.000	3.000	7.50	2.88	0.59	170.21
MSCM-H107467-NTHD	7.000	4.000	7.50	2.88	0.59	170.21

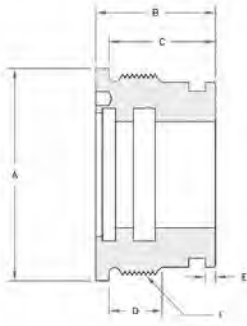
SEAL KIT NUMBER	LIST PRICE
MSCM-SK-H107597	\$21.98
MSCM-SK-H107598	21.98
MSCM-SK-H107595	21.98
MSCM-SK-H107193	21.53
MSCM-SK-H107194	21.53
MSCM-SK-H107463	29.91
MSCM-SK-H107673	29.91
MSCM-SK-H107157	22.21
MSCM-SK-H107196	21.53
MSCM-SK-H107131	21.61
MSCM-SK-H107189	23.01
MSCM-SK-H107359	23.64
MSCM-SK-H107591	27.86
MSCM-SK-H107592	29.26
MSCM-SK-H107197	22.23
MSCM-SK-H107198	23.01
MSCM-SK-H107108	24.41
MSCM-SK-H107112	27.05
MSCM-SK-H107462	28.17
MSCM-SK-H107130	24.01
MSCM-SK-H107124	25.58
MSCM-SK-H107311	21.84
MSCM-SK-H107331	31.93
MSCM-SK-H107386	33.08
MSCM-SK-H107199	28.25
MSCM-SK-H107200	30.08
MSCM-SK-H107201	33.97
MSCM-SK-H107528	53.66
MSCM-SK-H107234	28.82
MSCM-SK-H107212	30.57
MSCM-SK-H107204	35.58
MSCM-SK-H107345	32.21
MSCM-SK-H107206	37.20
MSCM-SK-H107178	47.65
MSCM-SK-H107328	44.64
MSCM-SK-H107467	59.94

MOBILE CYLINDER GLANDS



IT Gland - Unified Thread

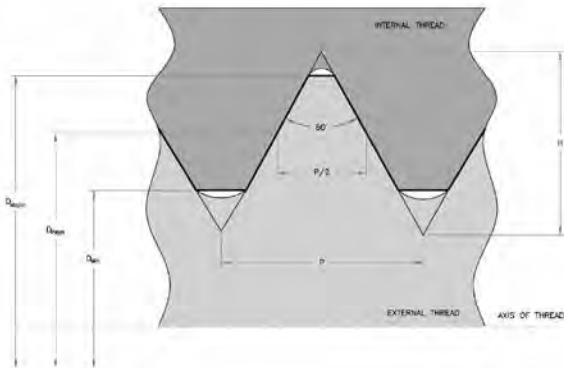
Material: 65-45-12
Ductile Iron



PART NUMBER	BORE +.003" -.003"	ROD +.000" -.003"	A	B	C	D	E	F (UNIFIED)	LIST PRICE
MSCM-H107277-UTS	1.500	1.000	2.00	2.00	1.50	0.75	0.28	1-3/4"-12	\$12.70
MSCM-H107597-UTS	2.000	1.000	2.50	2.12	1.94	1.00	0.12	2-1/4"-12	19.15
MSCM-H107595-UTS	2.000	1.250	2.50	2.25	2.00	1.00	0.19	2-1/4"-12	19.55
MSCM-H107194-UTS	2.500	1.250	3.00	2.00	1.75	0.75	0.19	2-3/4"-12	25.96
MSCM-H107196-UTS	3.000	1.250	3.50	2.25	2.00	1.00	0.19	3-1/4"-12	35.58
MSCM-H107463-UTS	2.500	1.500	3.00	2.38	2.00	1.00	0.19	2-3/4"-12	28.53
MSCM-H107131-UTS	3.000	1.500	3.50	2.25	2.00	1.00	0.19	3-1/4"-12	35.48
MSCM-H107198-UTS	3.500	1.500	4.00	2.25	2.00	1.00	0.19	3-3/4"-12	43.52
MSCM-H107189-UTS	3.000	1.750	3.50	2.25	2.00	1.00	0.19	3-1/4"-12	35.38
MSCM-H107108-UTS	3.500	1.750	4.00	2.25	2.00	1.00	0.19	3-3/4"-12	43.44
MSCM-H107124-UTS	4.000	1.750	4.50	2.25	2.00	1.00	0.19	4-1/4"-12	54.29
MSCM-H107311-UTS	4.000	2.000	4.50	2.25	2.00	1.00	0.19	4-1/4"-12	54.15
MSCM-H107462-UTS	3.500	2.500	4.00	2.50	2.12	1.00	0.25	3-3/4"-12	46.61
MSCM-H107386-UTS	4.000	2.500	4.50	2.50	2.12	1.12	0.19	4-1/4"-12	59.31
MSCM-H107206-UTS	6.000	2.500	6.50	2.50	2.12	1.12	0.19	6-1/4"-12	130.67

SEAL KIT NUMBER	LIST PRICE
MSCM-SK-H107277	\$47.27
MSCM-SK-H107597	21.98
MSCM-SK-H107595	21.98
MSCM-SK-H107194	21.53
MSCM-SK-H107196	21.53
MSCM-SK-H107463	29.91
MSCM-SK-H107131	21.61
MSCM-SK-H107198	23.01
MSCM-SK-H107189	23.01
MSCM-SK-H107108	24.41
MSCM-SK-H107124	25.58
MSCM-SK-H107311	21.84
MSCM-SK-H107462	28.17
MSCM-SK-H107386	33.08
MSCM-SK-H107206	37.20

IT & ITW Glands with Unified Thread Technical Information



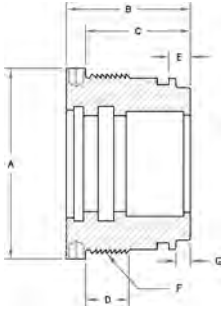
Major Diameter	Threads per Inch	Pitch P	Minor Diameter	Pitch Diameter	Height H
1.75	12	0.0833	1.6598	1.6959	0.0722
2.25	12	0.0833	2.1598	2.1959	0.0722
2.75	12	0.0833	2.6598	2.6959	0.0722
3.25	12	0.0833	3.1598	3.1959	0.0722
3.75	12	0.0833	3.6598	3.6959	0.0722
4.25	12	0.0833	4.1598	4.1959	0.0722
4.75	12	0.0833	4.6598	4.6959	0.0722
5.25	12	0.0833	5.1598	5.1959	0.0722
5.75	12	0.0833	5.6598	5.6959	0.0722
6.25	12	0.0833	6.1598	6.1959	0.0722

MOBILE CYLINDER GLANDS



ITW Gland

Material: 65-45-12
Ductile Iron



PART NUMBER	BORE +.003" -.003"	ROD +.000" -.003"	A	B	C	D	E	F (BUT- TRESS)	G	LIST PRICE
MSCM-H107729	3.000	1.750	3.50	2.62	2.25	1.00	0.56	3-1/4"-12	0.38	\$40.08
MSCM-H107548	3.000	2.000	3.50	2.62	2.25	1.00	0.56	3-1/4"-12	0.38	40.08
MSCM-H107791	3.500	1.750	4.00	2.62	2.25	1.00	0.56	3-3/4"-12	0.38	48.08
MSCM-H107549	3.500	2.000	4.00	2.62	2.25	1.00	0.56	3-3/4"-12	0.38	48.08
MSCM-H107550	4.000	2.000	4.50	3.25	2.75	1.25	0.56	4-1/4"-12	0.38	70.86
MSCM-H107551	4.000	2.500	4.50	3.25	2.75	1.25	0.56	4-1/4"-12	0.38	70.86
MSCM-H107640	4.000	3.000	4.50	3.62	3.12	1.38	0.19	4-1/4"-12	N/A	77.25
MSCM-H107716	4.500	2.000	5.00	3.25	2.75	1.25	0.56	4-3/4"-12	0.38	86.05
MSCM-H107552	4.500	2.500	5.00	3.25	2.75	1.25	0.56	4-3/4"-12	0.38	86.05
MSCM-H107553	4.500	3.000	5.00	3.25	2.75	1.25	0.56	4-3/4"-12	0.38	86.05
MSCM-H107630	4.500	3.500	5.00	3.62	3.12	1.38	0.19	4-3/4"-12	N/A	93.55
MSCM-H107679	5.000	2.000	5.50	3.00	2.50	1.12	0.56	5-1/4"-12	0.38	102.42
MSCM-H107554	5.000	2.500	5.50	3.62	3.12	1.38	0.81	5-1/4"-12	0.56	117.42
MSCM-H107555	5.000	3.000	5.50	3.62	3.12	1.38	0.81	5-1/4"-12	0.56	117.42
MSCM-H107651	5.000	3.500	5.50	3.62	3.12	1.38	0.81	5-1/4"-12	0.56	117.42
MSCM-H107606	5.000	4.000	5.50	3.62	3.12	1.38	0.19	5-1/4"-12	N/A	117.42
MSCM-H107611	5.500	2.500	6.00	3.62	3.12	1.38	0.81	5-3/4"-12	0.56	138.41
MSCM-H107612	5.500	3.000	6.00	3.62	3.12	1.38	0.81	5-3/4"-12	0.56	138.41
MSCM-H107706	5.500	3.500	6.00	3.62	3.12	1.38	0.81	5-3/4"-12	0.56	138.41
MSCM-H107556	6.000	2.500	6.50	3.62	3.12	1.38	0.81	6-1/4"-12	0.56	167.94
MSCM-H107557	6.000	3.000	6.50	3.62	3.12	1.38	0.81	6-1/4"-12	0.56	167.94
MSCM-H107558	6.000	3.500	6.50	3.62	3.12	1.38	0.81	6-1/4"-12	0.56	167.94
MSCM-H107570	6.000	4.000	6.50	3.62	3.12	1.38	0.81	6-1/4"-12	0.56	167.94
MSCM-H107584	6.000	4.500	6.50	3.38	2.88	1.25	0.81	6-1/4"-12	0.62	44.73
MSCM-H107721	7.000	2.500	7.50	4.25	3.75	1.50	1.03	7-1/4"-10	0.75	241.94
MSCM-H107559	7.000	3.000	7.50	4.25	3.75	1.50	1.03	7-1/4"-10	0.75	241.94
MSCM-H107560	7.000	3.500	7.50	4.25	3.75	1.50	1.03	7-1/4"-10	0.75	241.94
MSCM-H107561	7.000	4.000	7.50	4.25	3.75	1.50	1.03	7-1/4"-10	0.75	241.94
MSCM-H107607	8.000	3.500	8.50	4.50	3.75	1.50	1.03	8-1/4"-10	0.75	325.59
MSCM-H107562	8.000	4.000	8.50	4.50	3.75	1.50	1.03	8-1/4"-10	0.75	325.59
MSCM-H107563	8.000	4.500	8.50	4.50	3.75	1.50	1.03	8-1/4"-10	0.75	91.58
MSCM-H107722	8.000	5.000	8.50	4.50	3.75	1.50	1.03	8-1/4"-10	0.075	91.58
MSCM-H107605	10.000	4.000	10.50	5.00	4.25	1.50	1.25	10-1/4"-10	1.00	561.92
MSCM-H107604	10.000	5.000	10.50	5.00	4.25	1.50	1.25	10-1/4"-10	1.00	168.58

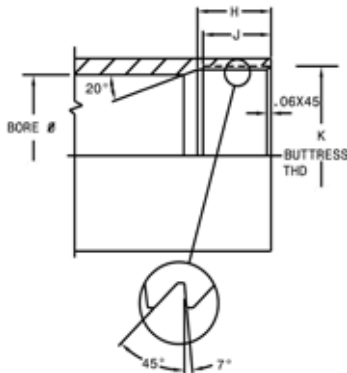
SEAL KIT NUMBER	LIST PRICE
MSCM-SK-H107729	\$38.47
MSCM-SK-H107548	43.68
MSCM-SK-H107791	38.72
MSCM-SK-H107549	45.10
MSCM-SK-H107550	49.85
MSCM-SK-H107551	57.65
MSCM-SK-H107640	81.27
MSCM-SK-H107716	62.83
MSCM-SK-H107552	51.86
MSCM-SK-H107553	63.54
MSCM-SK-H107630	66.91
MSCM-SK-H107679	34.00
MSCM-SK-H107554	68.00
MSCM-SK-H107555	96.40
MSCM-SK-H107651	74.84
MSCM-SK-H107606	88.04
MSCM-SK-H107611	70.29
MSCM-SK-H107612	98.68
MSCM-SK-H107706	117.34
MSCM-SK-H107556	69.68
MSCM-SK-H107557	98.05
MSCM-SK-H107558	69.00
MSCM-SK-H107570	108.48
MSCM-SK-H107584	101.59
MSCM-SK-H107721	117.44
MSCM-SK-H107559	117.67
MSCM-SK-H107560	76.08
MSCM-SK-H107561	122.84
MSCM-SK-H107607	78.04
MSCM-SK-H107562	124.72
MSCM-SK-H107563	149.12
MSCM-SK-H107722	149.63
MSCM-SK-H107605	139.96
MSCM-SK-H107604	160.75

MOBILE REPAIR PARTS

IT & ITW Technical Information

Basic information for Internal Buttress
Threads (52 degrees)

"H" = Length of Thread on Gland plus 1/8"
"J" = Length of Thread on Gland plus 1/16"
"K" = Buttress Thread as determined by Gland



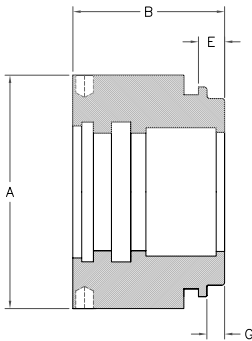
Basic Thread Size	Min. Major Diameter	Pitch Diameter	Minor Diameter
2-1/4"-12	2.2604	2.2000/2.2075	2.1500/2.1575
2-3/4"-12	2.7604	2.7000/2.7080	2.6500/2.6580
3-1/4"-12	3.2604	3.2000/3.2080	3.1500/3.1580
3-1/2"-12	3.5104	3.4500/3.4580	3.4000/3.4080
3-3/4"-12	3.7604	3.7000/3.7080	3.6500/3.6580
4-1/4"-12	4.2604	4.2000/4.2084	4.1500/4.1584
4-3/4"-12	4.7604	4.7000/4.7084	4.6500/4.6584
5-1/4"-12	5.2604	5.2000/5.2084	5.1500/5.1584
5-3/4"-12	5.7604	5.7000/5.7084	5.6500/5.6584
6-1/4"-12	6.2604	6.2000/6.2084	6.1500/6.1584
7-1/4"-10	7.2626	7.1900/7.1995	7.1300/7.1395
8-1/4"-10	8.2626	8.1900/8.1995	8.1300/8.1395
10-1/4"-10	10.2626	10.1900/10.1995	10.1300/10.1395

MOBILE CYLINDER GLANDS

ITW Gland - Threadless



Material: 65-45-12
Ductile Iron



These glands are threadless to allow for a repair or machine shop to customize the threads on the gland as required.

PART NUMBER	BORE +.003" -.003"	ROD +.000" -.003"	A	B	E	G	LIST PRICE
MSCM-H107729-NTHD	3.000	1.750	3.50	2.62	0.56	0.38	\$31.76
MSCM-H107548-NTHD	3.000	2.000	3.50	2.62	0.56	0.38	31.76
MSCM-H107791-NTHD	3.500	1.750	4.00	2.62	0.56	0.38	33.96
MSCM-H107549-NTHD	3.500	2.000	4.00	2.62	0.56	0.38	33.96
MSCM-H107550-NTHD	4.000	2.000	4.50	3.25	0.56	0.38	56.65
MSCM-H107551-NTHD	4.000	2.500	4.50	3.25	0.56	0.38	56.65
MSCM-H107716-NTHD	4.500	2.000	5.00	3.25	0.56	0.38	69.41
MSCM-H107552-NTHD	4.500	2.500	5.00	3.25	0.56	0.38	69.41
MSCM-H107679-NTHD	5.000	2.000	5.50	3.00	0.56	0.38	80.17
MSCM-H107554-NTHD	5.000	2.500	5.50	3.62	0.81	0.56	86.88
MSCM-H107555-NTHD	5.000	3.000	5.50	3.62	0.81	0.56	80.17
MSCM-H107651-NTHD	5.000	3.500	5.50	3.62	0.81	0.56	80.17
MSCM-H107606-NTHD	5.000	4.000	5.50	3.62	0.19	N/A	80.17
MSCM-H107611-NTHD	5.500	2.500	6.00	3.62	0.81	0.56	102.87
MSCM-H107612-NTHD	5.500	3.000	6.00	3.62	0.81	0.56	102.87
MSCM-H107706-NTHD	5.500	3.500	6.00	3.62	0.81	0.56	102.87
MSCM-H107556-NTHD	6.000	2.500	6.50	3.62	0.81	0.56	122.99
MSCM-H107557-NTHD	6.000	3.000	6.50	3.62	0.81	0.56	122.99
MSCM-H107558-NTHD	6.000	3.500	6.50	3.62	0.81	0.56	122.99
MSCM-H107584-NTHD	6.000	4.500	6.50	3.38	0.81	0.62	122.99
MSCM-H107559-NTHD	7.000	3.000	7.50	4.25	1.03	0.75	53.02
MSCM-H107560-NTHD	7.000	3.500	7.50	4.25	1.03	0.75	60.24
MSCM-H107607-NTHD	8.000	3.500	8.50	4.50	1.03	0.75	244.75
MSCM-H107562-NTHD	8.000	4.000	8.50	4.50	1.03	0.75	244.75
MSCM-H107563-NTHD	8.000	4.500	8.50	4.50	1.03	0.75	244.75
MSCM-H107722-NTHD	8.000	5.000	8.50	4.50	1.03	0.75	244.75
MSCM-H107605-NTHD	10.000	4.000	10.50	5.00	1.25	1.00	415.36

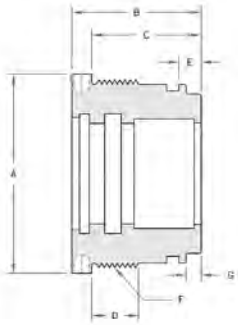
SEAL KIT NUMBER	LIST PRICE
MSCM-SK-H107729	\$38.47
MSCM-SK-H107548	43.68
MSCM-SK-H107791	38.72
MSCM-SK-H107549	45.10
MSCM-SK-H107550	49.85
MSCM-SK-H107551	57.65
MSCM-SK-H107716	62.83
MSCM-SK-H107552	51.86
MSCM-SK-H107679	34.00
MSCM-SK-H107554	68.00
MSCM-SK-H107555	96.40
MSCM-SK-H107651	74.84
MSCM-SK-H107606	88.04
MSCM-SK-H107611	70.29
MSCM-SK-H107612	98.68
MSCM-SK-H107706	117.34
MSCM-SK-H107556	69.68
MSCM-SK-H107557	98.05
MSCM-SK-H107558	69.00
MSCM-SK-H107584	101.59
MSCM-SK-H107559	117.67
MSCM-SK-H107560	76.08
MSCM-SK-H107607	78.04
MSCM-SK-H107562	124.72
MSCM-SK-H107563	149.12
MSCM-SK-H107722	149.63
MSCM-SK-H107605	139.96

MOBILE CYLINDER GLANDS

ITW Gland - Unified Thread



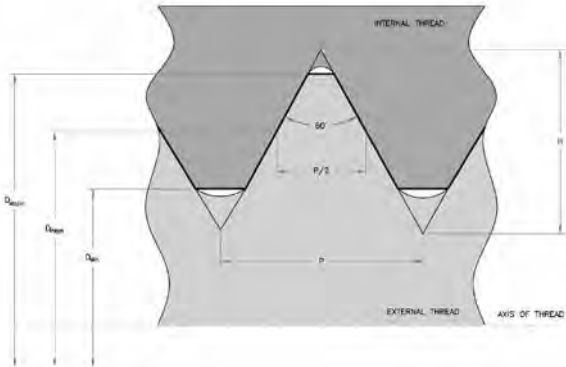
Material: 65-45-12
Ductile Iron



PART NUMBER	BORE +.003" -.003"	ROD +.000" -.003"	A	B	C	D	E	F	G	LIST PRICE
MSCM-H107729-UTS	3.000	1.750	3.50	2.62	2.25	1.00	0.56	3-1/4"-12	0.38	\$39.53
MSCM-H107791-UTS	3.500	1.750	4.00	2.62	2.25	1.00	0.56	3-3/4"-12	0.38	47.53
MSCM-H107548-UTS	3.000	2.000	3.50	2.62	2.25	1.00	0.56	3-1/4"-12	0.38	39.38
MSCM-H107549-UTS	3.500	2.000	4.00	2.62	2.25	1.00	0.56	3-3/4"-12	0.38	47.40
MSCM-H107550-UTS	4.000	2.000	4.50	3.25	2.75	1.25	0.56	4-1/4"-12	0.38	69.94
MSCM-H107716-UTS	4.500	2.000	5.00	3.25	2.75	1.25	0.56	4-3/4"-12	0.38	85.17
MSCM-H107679-UTS	5.000	2.000	5.50	3.00	2.50	1.12	0.56	5-1/4"-12	0.38	102.19
MSCM-H107554-UTS	5.000	2.500	5.50	3.62	3.12	1.38	0.81	5-1/4"-12	0.56	116.14
MSCM-H107611-UTS	5.500	2.500	6.00	3.62	3.12	1.38	0.81	5-3/4"-12	0.56	137.62
MSCM-H107555-UTS	5.000	3.000	5.50	3.62	3.12	1.38	0.81	5-1/4"-12	0.56	115.64
MSCM-H107612-UTS	5.500	3.000	6.00	3.62	3.12	1.38	0.81	5-3/4"-12	0.56	137.12
MSCM-H107557-UTS	6.000	3.000	6.50	3.62	3.12	1.38	0.81	6-1/4"-12	0.56	167.30
MSCM-H107558-UTS	6.000	3.500	6.50	3.62	3.12	1.38	0.81	6-1/4"-12	0.56	166.71
MSCM-H107570-UTS	6.000	4.000	6.50	3.62	3.12	1.38	0.81	6-1/4"-12	0.56	165.92

SEAL KIT NUMBER	LIST PRICE
MSCM-SK-H107729	\$38.47
MSCM-SK-H107791	38.72
MSCM-SK-H107548	43.68
MSCM-SK-H107549	45.10
MSCM-SK-H107550	49.85
MSCM-SK-H107716	62.83
MSCM-SK-H107679	34.00
MSCM-SK-H107554	68.00
MSCM-SK-H107611	70.29
MSCM-SK-H107555	96.40
MSCM-SK-H107612	98.68
MSCM-SK-H107557	98.05
MSCM-SK-H107558	69.00
MSCM-SK-H107570	108.48

IT & ITW Glands with Unified Thread Technical Information



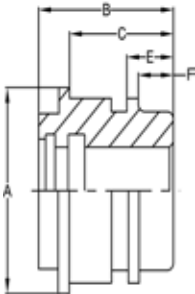
Major Diameter	Threads per Inch	Pitch P	Minor Diameter	Pitch Diameter	Height H
1.75	12	0.0833	1.6598	1.6959	0.0722
2.25	12	0.0833	2.1598	2.1959	0.0722
2.75	12	0.0833	2.6598	2.6959	0.0722
3.25	12	0.0833	3.1598	3.1959	0.0722
3.75	12	0.0833	3.6598	3.6959	0.0722
4.25	12	0.0833	4.1598	4.1959	0.0722
4.75	12	0.0833	4.6598	4.6959	0.0722
5.25	12	0.0833	5.1598	5.1959	0.0722
5.75	12	0.0833	5.6598	5.6959	0.0722
6.25	12	0.0833	6.1598	6.1959	0.0722

MOBILE CYLINDER GLANDS



TH Gland

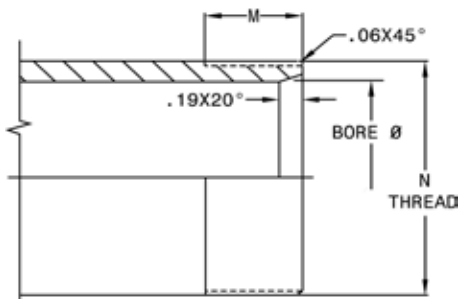
Material: Ductile Iron



PART NUMBER	BORE +.003" -.003"	ROD +.000" -.003"	A	B	C	E	F	LIST PRICE
MSCM-H70154	2.000	1.000	2.25	2.38	1.94	0.81	0.62	\$25.46
MSCM-H70155	2.000	1.125	2.25	2.38	1.94	0.81	0.62	25.46
MSCM-H70156	2.000	1.250	2.25	2.38	1.94	0.81	0.62	26.20
MSCM-H70157	2.500	1.125	2.75	2.38	1.94	0.81	0.62	33.59
MSCM-H70076	2.500	1.250	2.75	2.38	1.94	0.81	0.62	33.59
MSCM-H70158	2.500	1.500	2.75	2.38	1.94	0.81	0.62	33.59
MSCM-H70462	2.500	1.750	2.75	2.38	2.19	0.81	0.62	33.59
MSCM-H70029	3.000	1.250	3.25	2.75	2.19	0.94	0.75	43.43
MSCM-H70011	3.000	1.500	3.25	2.75	2.19	0.94	0.75	43.43
MSCM-H70814	3.000	1.750	3.25	2.75	2.19	0.94	0.75	43.43
MSCM-H70012	3.000	2.000	3.25	2.75	2.56	0.94	0.69	43.43
MSCM-H70013	3.500	1.500	3.75	2.75	2.19	0.94	0.75	52.83
MSCM-H70504	3.500	1.750	3.75	2.75	2.19	0.94	0.75	52.83
MSCM-H70030	3.500	2.000	3.75	2.75	2.19	0.94	0.75	53.13
MSCM-H70031	3.500	2.500	3.75	2.75	2.56	0.94	0.75	53.13
MSCM-H70014	4.000	1.500	4.25	2.75	2.19	0.94	0.75	65.45
MSCM-H70488	4.000	1.750	4.25	2.75	2.19	0.94	0.75	65.45
MSCM-H70015	4.000	2.000	4.25	2.75	2.19	0.94	0.75	65.45
MSCM-H70032	4.000	2.500	4.25	2.75	2.19	0.94	0.75	65.45
MSCM-H70033	4.000	3.000	4.25	2.75	2.56	0.94	0.75	65.45
MSCM-H70276	4.500	2.000	4.75	2.75	2.19	0.94	0.75	75.60
MSCM-H70310	4.500	2.500	4.75	2.75	2.19	0.94	0.75	75.60
MSCM-H70377	4.500	3.000	4.75	2.75	2.19	0.94	0.69	75.60
MSCM-H70037	5.000	2.000	5.38	3.00	2.44	1.13	0.88	100.18
MSCM-H70038	5.000	2.500	5.38	3.00	2.44	1.13	0.88	100.60
MSCM-H70039	5.000	3.000	5.38	3.00	2.44	1.13	0.88	100.60
MSCM-H70153	5.500	2.000	5.88	3.00	2.44	1.13	0.88	120.71
MSCM-H70142	5.500	2.500	5.88	3.00	2.44	1.13	0.88	120.71
MSCM-H70143	5.500	3.000	5.88	3.00	2.44	1.13	0.88	120.71
MSCM-H70041	6.000	2.000	6.38	3.00	2.44	1.13	0.88	140.65
MSCM-H70042	6.000	2.500	6.38	3.00	2.44	1.13	0.88	140.65
MSCM-H70043	6.000	3.000	6.38	3.00	2.44	1.13	0.88	140.65
MSCM-H70180	7.000	2.500	7.50	4.00	3.13	1.75	1.50	237.66
MSCM-H70176	7.000	3.000	7.50	4.00	3.13	1.75	1.50	237.66
MSCM-H70186	7.000	3.500	7.50	4.00	3.13	1.75	1.50	237.66
MSCM-H70133	8.000	3.000	8.50	4.00	3.13	1.75	1.50	295.29
MSCM-H70195	8.000	3.500	8.50	4.00	3.13	1.75	1.50	295.29
MSCM-H70217	8.000	4.000	8.50	4.00	3.13	1.75	1.50	295.29

SEAL KIT NUMBER	LIST PRICE
MSCM-SK-H70154	\$21.98
MSCM-SK-H70155	21.98
MSCM-SK-H70156	21.98
MSCM-SK-H70157	21.98
MSCM-SK-H70076	21.98
MSCM-SK-H70158	21.98
MSCM-SK-H70462	22.68
MSCM-SK-H70029	21.98
MSCM-SK-H70011	21.98
MSCM-SK-H70814	23.06
MSCM-SK-H70012	25.73
MSCM-SK-H70013	21.98
MSCM-SK-H70504	22.83
MSCM-SK-H70030	25.58
MSCM-SK-H70031	31.05
MSCM-SK-H70014	24.48
MSCM-SK-H70488	25.93
MSCM-SK-H70015	28.62
MSCM-SK-H70032	33.73
MSCM-SK-H70033	37.85
MSCM-SK-H70276	30.68
MSCM-SK-H70310	35.77
MSCM-SK-H70377	39.89
MSCM-SK-H70037	32.44
MSCM-SK-H70038	37.55
MSCM-SK-H70039	41.66
MSCM-SK-H70153	33.22
MSCM-SK-H70142	38.32
MSCM-SK-H70143	42.47
MSCM-SK-H70041	34.71
MSCM-SK-H70042	39.83
MSCM-SK-H70043	43.96
MSCM-SK-H70180	41.27
MSCM-SK-H70176	45.53
MSCM-SK-H70186	50.73
MSCM-SK-H70133	50.46
MSCM-SK-H70195	52.60
MSCM-SK-H70217	56.61

TH Gland Technical Information



Bore +.003" -.003"	M	N	Thread Major Diameter	Thread Pitch Diameter
2.000	0.81	2-3/8"-12 UN-2A	2.3731/2.3617	2.3191/2.3128
2.500	0.81	2-7/8"-12 UN-2A	2.8731/2.8617	2.8191/2.8127
3.000	1.00	3-1/2"-12 UN-2A	3.4981/3.4867	3.4440/3.4376
3.500	1.00	4"-12 UN-2A	3.9980/3.9866	3.9439/3.9374
4.000	1.00	4-1/2"-12 UN-2A	4.4980/4.4866	4.4439/4.4374
4.500	1.00	5"-12 UN-2A	4.9980/4.9866	4.9439/4.9372
5.000	1.00	5-1/2"-12 UN-2A	5.4980/5.4866	5.4439/5.4372
5.500	1.00	6"-12 UN-2A	5.9979/5.9865	5.9438/5.9369
6.000	1.00	6-5/8"-12 UN-2A	6.6229/6.6115	6.5688/6.5619
7.000	1.25	7-7/8"-12 UN-2A	7.8729/7.8615	7.8188/7.8119
8.000	1.25	8-7/8"-12 UN-2A	8.8729/8.8615	8.8188/8.8119

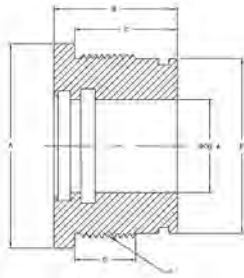
MOBILE CYLINDER GLANDS



Mobile Metric Gland

Material: Cast Iron
Grade G25 Equivalent
to ASTM A48-35

Thread Configuration Call Out
90 X 2
Maj. Diameter Pitch



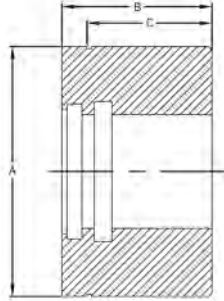
PART NUMBER	BORE	ROD	A	B	C	D	E	F (ISO THREAD)	LIST PRICE	SEAL KIT NUMBER	LIST PRICE
MSHCC-SG322027	32.00	20.00	42	33	27	15	32.5	36X1.5	\$14.63	MSHCC-GK20-32	\$6.12
MSHCC-SG352032	35.00	20.00	45	40	32	18	35.6	39X1.5	15.81	MSHCC-GK20-35	5.07
MSHCC-SG352232	35.00	22.00	45	40	32	19	35.6	39X1.5	20.76	MSHCC-GK22-35	6.28
MSHCC-SG402032	40.00	20.00	50	40	32	19	40.6	44X1.5	13.73	MSHCC-GK20-40	5.15
MSHCC-SG402232	40.00	22.00	50	40	32	19	40.6	44X1.5	15.53	MSHCC-GK22-40	6.37
MSHCC-SG402532	40.00	25.00	50	40	32	19	40.6	44X1.5	17.07	MSHCC-GK25-40	5.05
MSHCC-SG402832	40.00	28.00	50	40	32	19	40.6	44X1.5	18.40	MSHCC-GK28-40	6.92
MSHCC-SG452232	45.00	22.00	55	40	32	19	45.6	49X1.5	19.02	MSHCC-GK22-45	6.33
MSHCC-SG452532	45.00	25.00	55	40	32	19	45.6	49X1.5	20.69	MSHCC-GK25-45	5.06
MSHCC-SG502035	50.00	20.00	60	43	35	22	50.6	54X1.5	17.83	MSHCC-GK20-50	5.29
MSHCC-SG503535	50.00	35.00	60	43	35	22	50.6	54X1.5	19.16	MSHCC-GK35-50	5.07
MSHCC-SG553535	55.00	35.00	65	43	35	20	55.6	60X1.5	22.22	MSHCC-GK35-55	6.63
MSHCC-SG603540	60.00	35.00	70	50	40	26	60.6	64X1.5	33.24	MSHCC-GK35-60	6.86
MSHCC-SG604040	60.00	40.00	70	50	40	26	60.6	64X1.5	26.62	MSHCC-GK40-60	11.21
MSHCC-SG633540	63.00	35.00	73	50	40	26	63.6	68X1.5	27.52	MSHCC-GK35-63	6.56
MSHCC-SG653540	65.00	35.00	75	50	40	25	65.6	69X1.5	27.94	MSHCC-GK35-65	6.82
MSHCC-SG654040	65.00	40.00	75	50	40	25	65.6	69X1.5	28.42	MSHCC-GK40-65	11.15
MSHCC-SG703540	70.00	35.00	80	50	40	26	70.6	74X1.5	30.31	MSHCC-GK35-70	6.62
MSHCC-SG704040	70.00	40.00	80	50	40	26	70.6	74X1.5	28.42	MSHCC-GK40-70	7.07
MSHCC-SG704540	70.00	45.00	80	50	40	26	70.6	74X1.5	31.98	MSHCC-GK45-70	11.48
MSHCC-SG753550	75.00	35.00	90	60	50	33	75.6	80X2	37.97	MSHCC-GK35-75	7.04
MSHCC-SG754050	75.00	40.00	90	60	50	33	75.6	80X2	36.23	MSHCC-GK40-75	7.47
MSHCC-SG754550	75.00	45.00	90	60	50	33	75.6	80X2	39.09	MSHCC-GK45-75	11.88
MSHCC-SG803550	80.00	35.00	95	60	50	32	80.6	85X2	46.05	MSHCC-GK35-80	6.87
MSHCC-SG804050	80.00	40.00	95	60	50	32	80.6	85X2	48.28	MSHCC-GK40-80	7.18
MSHCC-SG806050	80.00	60.00	95	60	50	32	80.6	85X2	42.00	MSHCC-GK60-80	10.31
MSHCC-SG853550	85.00	35.00	100	60	50	30	85.6	90X2	49.74	MSHCC-GK35-85	7.18
MSHCC-SG854050	85.00	40.00	100	60	50	30	85.6	90X2	49.60	MSHCC-GK40-85	7.61
MSHCC-SG854550	85.00	45.00	100	60	50	30	85.6	90X2	52.25	MSHCC-GK45-85	12.01
MSHCC-SG904050	90.00	40.00	105	60	50	32	90.6	95X2	62.63	MSHCC-GK40-90	13.16
MSHCC-SG904550	90.00	45.00	105	60	50	32	90.6	95X2	51.76	MSHCC-GK45-90	13.11
MSHCC-SG906050	90.00	60.00	105	60	50	32	90.6	95X2	51.28	MSHCC-GK60-90	11.84
MSHCC-SG1006050	100.00	60.00	115	60	50	32	100.6	105X2	69.81	MSHCC-GK60-100	12.29
MSHCC-SG1004070XL	100.00	40.00	115	82	70	51	100.6	105X2	81.85	MSHCC-GK40-100XL	12.58
MSHCC-SG1004570XL	100.00	45.00	115	82	70	51	100.6	105X2	75.17	MSHCC-GK45-100XL	13.10
MSHCC-SG1006070XL	100.00	60.00	115	82	70	51	100.6	105X2	75.45	MSHCC-GK60-100XL	11.83
MSHCC-SG1007070XL	100.00	70.00	115	82	70	51	100.6	105X2	81.09	MSHCC-GK70-100XL	14.04
MSHCC-SG1106070	110.00	60.00	125	82	70	51	110.6	115X2	88.55	MSHCC-GK60-110	11.09
MSHCC-SG1107070	110.00	70.00	125	82	70	51	110.6	115X2	88.55	MSHCC-GK70-110	13.28
MSHCC-SG1206070	120.00	60.00	140	82	70	49	120.6	125X2	153.06	MSHCC-GK60-120	13.51
MSHCC-SG1207070	120.00	70.00	140	82	70	49	120.6	125X2	112.45	MSHCC-GK70-120	16.12
MSHCC-SG1208070	120.00	80.00	140	82	70	49	120.6	125X2	108.34	MSHCC-GK80-120	16.70
MSHCC-SG1256080	125.00	60.00	145	92	80	59	125.6	130X2	139.95	MSHCC-GK60-125	11.29
MSHCC-SG1257080	125.00	70.00	145	92	80	59	125.6	130X2	139.34	MSHCC-GK70-125	13.90
MSHCC-SG1258080	125.00	80.00	145	92	80	59	125.6	130X2	124.36	MSHCC-GK80-125	16.41
MSHCC-SG1407080	140.00	70.00	160	92	80	59	140.6	145X2	144.70	MSHCC-GK70-140	14.32
MSHCC-SG1408080	140.00	80.00	160	92	80	59	140.6	145X2	155.36	MSHCC-GK80-140	17.03
MSHCC-SG1507090	150.00	70.00	170	102	90	69	150.6	155X2	177.59	MSHCC-GK70-150	14.21
MSHCC-SG1508090	150.00	80.00	170	102	90	69	150.6	155X2	173.54	MSHCC-GK80-150	17.11
MSHCC-SG1608090	160.00	80.00	180	102	90	69	160.6	165X2	200.29	MSHCC-GK80-160	18.54

All dimensions shown in millimeters.

MOBILE CYLINDER GLANDS



Mobile Metric Gland - Unfinished



PART NUMBER	BORE *	ROD	A	B	C	D	E	F (ISO THREAD)	LIST PRICE
MSHCC-SG542057UF	45.00	20.00	54	65	57	N/A	N/A	N/A	\$23.06
MSHCC-SG542257UF	45.00	22.00	54	65	57	N/A	N/A	N/A	22.16
MSHCC-SG542557UF	45.00	25.00	54	65	57	N/A	N/A	N/A	20.97
MSHCC-SG742565UF	65.00	25.00	74	75	65	N/A	N/A	N/A	43.06
MSHCC-SG743565UF	65.00	35.00	74	75	65	N/A	N/A	N/A	38.03
MSHCC-SG744065UF	65.00	40.00	74	75	65	N/A	N/A	N/A	32.26
MSHCC-SG943575UF	80.00	35.00	94	85	75	N/A	N/A	N/A	52.67
MSHCC-SG944075UF	80.00	40.00	94	85	75	N/A	N/A	N/A	53.15
MSHCC-SG944575UF	80.00	45.00	94	85	75	N/A	N/A	N/A	53.30
MSHCC-SG1144095UF	100.00	40.00	114	107	95	N/A	N/A	N/A	67.71
MSHCC-SG1144595UF	100.00	45.00	114	107	95	N/A	N/A	N/A	86.52
MSHCC-SF1146095UF	100.00	60.00	114	107	95	N/A	N/A	N/A	86.04

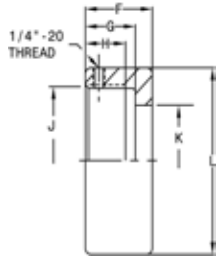
*Denotes Recommended Bore Size.

Unfinished HCC Style Hydraulic Glands Include a Nylon Rod Bearing, Rod Seal and Rod Wiper. All dimensions shown in millimeters.

MOBILE CYLINDER CAPS



TH Cap



Material: 1026 CDS Tubing
SAE Threads

PART NUMBER	BORE $\pm .003$ -.003"	F	G	H	J	K	L	LIST PRICE
MSCM-HC70074	2.000	1.13	0.88	0.69	2-3/8"-12 UN-2B	1.81	3.00	\$23.00
MSCM-HC70075	2.500	1.13	0.88	0.69	2-7/8"-12 UN-2B	2.31	3.50	25.91
MSCM-HC70008	3.000	1.38	1.00	0.75	3-1/2"-12 UN-2B	2.63	4.00	31.38
MSCM-HC70009	3.500	1.38	1.00	0.75	4"-12 UN-2B	3.13	4.50	35.89
MSCM-HC70034	4.000	1.38	1.00	0.75	4-1/2"-12 UN-2B	3.63	5.00	41.32
MSCM-HC70277	4.500	1.38	1.00	0.75	5"-12 UN-2B	4.13	5.50	45.78
MSCM-HC70040	5.000	1.38	1.00	0.75	5-1/2"-12 UN-2B	4.63	6.25	54.99
MSCM-HC70140	5.500	1.38	1.00	0.75	6"-12 UN-2B	5.13	6.75	60.87
MSCM-HC70044	6.000	1.38	1.00	0.75	6-5/8"-12 UN-2B	5.63	7.50	73.85
MSCM-HC70174	7.000	2.00	1.38	1.13	7-7/8"-12 UN-2B	6.13	9.00	123.45
MSCM-HC70132	8.000	2.00	1.38	1.13	8-7/8"-12 UN-2B	7.13	10.00	145.86



Base Plate (medium duty)

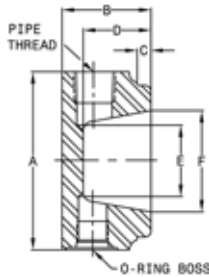


Material: A-36 Plate

PART NUMBER	BORE $\pm .003$ -.003"	A	B	C	LIST PRICE
MSCM-BP60056	1.500	1.88	0.50	0.25	\$13.80
MSCM-BP60010	2.000	2.38	0.50	0.25	15.56
MSCM-BP60011	2.500	2.88	0.50	0.25	18.77
MSCM-BP60012	3.000	3.38	0.59	0.25	24.53
MSCM-BP60013	3.500	3.88	0.69	0.38	29.54
MSCM-BP60014	4.000	4.50	0.75	0.38	37.50
MSCM-BP60437	4.500	5.00	0.88	0.38	48.68
MSCM-BP60015	5.000	5.56	0.88	0.38	57.19
MSCM-BP60124	5.500	6.00	0.88	0.38	66.81
MSCM-BP60016	6.000	6.75	1.00	0.38	85.72
MSCM-BP60157	7.000	8.00	1.00	0.38	112.51
MSCM-BP60107	8.000	9.00	1.00	0.38	137.81



Base End (ported)



Material: A-36 Plate

PART NUMBER	BORE $\pm .003$ -.003"	NPT	SAE	A	B	C	D	E	F	LIST PRICE
MSCM-BEP112380	2.000	3/8"	#6	2.50	1.56	0.25	1.00	1.25	1.45	\$33.51
MSCM-BEP112381	2.500	3/8"	#6	3.00	1.56	0.25	1.00	1.25	1.75	41.41
MSCM-BEP112382	3.000	1/2"	#8	3.50	1.69	0.25	1.12	1.75	2.19	54.21
MSCM-BEP112383	3.500	1/2"	#8	4.00	1.69	0.25	1.12	2.00	2.19	63.55
MSCM-BEP112384	4.000	1/2"	#8	4.50	1.81	0.25	1.35	2.12	2.62	81.62
MSCM-BEP112385	4.500	1/2"	#8	5.12	1.81	0.25	1.35	2.12	2.62	99.26
MSCM-BEP112386	5.000	3/4"	#12	5.62	1.94	0.25	1.35	2.38	3.03	121.85
MSCM-BEP112398	5.500	3/4"	#12	6.25	2.19	0.25	1.50	3.29	4.06	158.98
MSCM-BEP112387	6.000	3/4"	#12	6.75	2.19	0.25	1.50	3.29	4.06	181.29



Base Plate (heavy duty)



Material: A-36 Plate

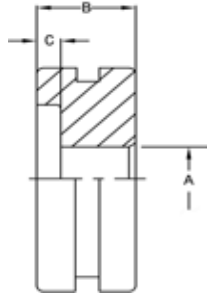
PART NUMBER	BORE $\pm .003$ -.003"	A	B	C	LIST PRICE
MSCM-BP112527	1.500	2.000	0.50	0.19	\$15.32
MSCM-BP112292	2.000	2.500	0.50	0.12	17.07
MSCM-BP112209	2.500	3.000	0.62	0.25	21.12
MSCM-BP112210	3.000	3.500	0.75	0.25	27.65
MSCM-BP112461	3.250	3.750	0.88	0.25	31.84
MSCM-BP112211	3.500	4.000	0.88	0.25	35.02
MSCM-BP112212	4.000	4.500	1.00	0.25	44.59
MSCM-BP112414	4.000	4.620	1.00	0.25	46.10
MSCM-BP112213	4.500	5.000	1.12	0.25	55.68
MSCM-BP112234	5.000	5.500	1.25	0.25	68.93
MSCM-BP112459	5.000	5.620	1.25	0.25	70.44
MSCM-BP112214	5.000	5.750	1.25	0.25	72.85
MSCM-BP112426	5.500	6.120	1.31	0.25	85.54
MSCM-BP112236	6.000	6.500	1.38	0.25	98.24
MSCM-BP112512	6.000	6.620	1.38	0.25	99.77
MSCM-BP112215	6.000	6.750	1.38	0.25	102.93
MSCM-BP112569	6.500	7.250	1.25	0.25	112.51
MSCM-BP112364	7.000	8.000	1.44	0.25	140.67
MSCM-BP112373	8.000	9.000	1.50	0.25	176.87
MSCM-BP112496	9.000	10.000	1.50	0.38	211.71
MSCM-BP112467	10.000	11.000	1.50	0.38	250.41

MOBILE CYLINDER PISTONS



TM Piston

Material: Ductile Iron



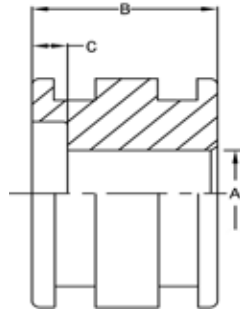
PART NUMBER	BORE +.003" -.003"	A +.002" -.000"	B	C	LIST PRICE
MSCM-P70079	1.50	0.626	0.88	N/A	\$13.43
MSCM-P70055	2.00	0.751	1.00	N/A	15.65
MSCM-P70065	2.50	0.751	1.00	N/A	19.42
MSCM-P70841	3.00	0.751	1.00	0.25	23.93
MSCM-P70872	3.50	1.001	1.00	0.38	27.98
MSCM-P70067	4.00	1.001	1.00	N/A	34.33
MSCM-P70384	4.50	1.251	1.50	N/A	49.56
MSCM-P70090	5.00	1.251	1.50	N/A	58.89
MSCM-P70385	5.50	1.501	1.50	N/A	69.12
MSCM-P70139	6.00	1.501	1.50	N/A	81.30

SEAL KIT NUMBER	LIST PRICE
MSCM-SK-P70079	\$21.53
MSCM-SK-P70055	21.53
MSCM-SK-P70065	21.53
MSCM-SK-P70841	21.53
MSCM-SK-P70872	21.53
MSCM-SK-P70067	21.53
MSCM-SK-P70384	22.23
MSCM-SK-P70090	21.53
CMSM-SK-P70385	22.23
MSCM-SK-P70139	22.23



TH Piston

Material: Ductile Iron



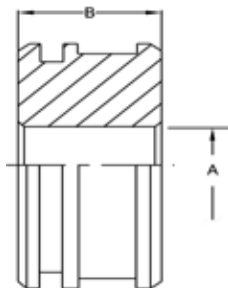
PART NUMBER	BORE +.003" -.003"	A +.002" -.000"	B	C	LIST PRICE
MSCM-P70020	1.50	0.626	1.13	N/A	\$14.95
MSCM-P70005	2.00	0.751	1.50	N/A	18.68
MSCM-P70017	2.50	0.751	1.50	N/A	23.93
MSCM-P70006	3.00	1.001	1.75	N/A	32.17
MSCM-P70007	3.50	1.126	1.75	N/A	38.42
MSCM-P70010	4.00	1.251	1.75	N/A	47.02
MSCM-P70275	4.50	1.251	1.75	N/A	56.32
MSCM-P70018	5.00	1.251	2.00	N/A	71.60
MSCM-P70141	5.50	1.501	2.00	N/A	85.54
MSCM-P70019	6.00	1.501	2.00	N/A	99.99
MSCM-P70175	7.00	1.751	3.00	0.75	170.48
MSCM-P70134	8.00	2.001	3.00	0.75	216.13

SEAL KIT NUMBER	LIST PRICE
MSCM-SK-P70020	\$21.53
MSCM-SK-P70005	21.98
MSCM-SK-P70017	24.01
MSCM-SK-P70006	30.15
MSCM-SK-P70007	36.04
MSCM-SK-P70010	40.87
MSCM-SK-P70275	44.90
MSCM-SK-P70018	77.07
MSCM-SK-P70141	116.90
MSCM-SK-P70019	79.76
MSCM-SK-P70175	163.34
MSCM-SK-P70134	188.59



IT (narrow) Piston

Material: 65-45-12
Ductile Iron



PART NUMBER	BORE +.003" -.003"	A +.002" -.000"	B	LIST PRICE
MSCM-P110629	1.500	0.626	1.12	\$14.95
MSCM-P110238	2.000	0.751	1.25	17.94
MSCM-P110239	2.500	0.751	1.25	22.46
MSCM-P110240	3.000	0.876	1.25	27.70
MSCM-P110608	3.250	1.001	1.25	30.23
MSCM-P110241	3.500	1.001	1.25	32.49
MSCM-P110242	4.000	1.001	1.25	39.57
MSCM-P110384	4.500	1.126	1.50	51.86
MSCM-P110212	5.000	1.126	1.50	60.47

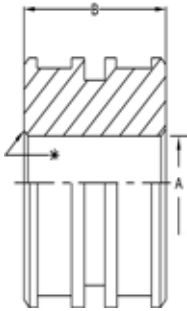
SEAL KIT NUMBER	LIST PRICE
MSCM-SK-P110629	\$21.53
MSCM-SK-P110238	21.98
MSCM-SK-P110239	21.53
MSCM-SK-P110240	22.23
MSCM-SK-P110608	21.53
MSCM-SK-P110241	21.53
MSCM-SK-P110242	21.53
MSCM-SK-P110384	26.09
MSCM-SK-P110212	34.65

MOBILE CYLINDER PISTONS



IT (wide) Piston

Material: 65-45-12
Ductile Iron

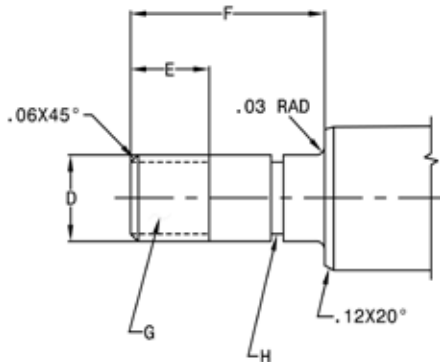


IT (WIDE) PISTON	BORE +.003" -.003"	A +.002" -.000"	B	LIST PRICE
MSCM-P110548	2.000	1.001	2.00	\$21.66
MSCM-P110596	2.500	0.751	1.88	27.70
MSCM-P110121	3.000	1.001	2.00	35.89
MSCM-P110288	3.500	1.126	2.00	43.71
MSCM-P110287	4.000	1.126	2.00	53.79
MSCM-P110537	4.500	1.251	2.00	65.39
MSCM-P110248	5.000	1.251	2.00	76.19
MSCM-P110511	5.500	1.251	2.12	94.65
MSCM-P110249	6.000	1.251	2.12	112.92
MSCM-P110607	6.000	1.501	2.12	112.92
MSCM-P110312	7.000	1.751	2.12	160.26
MSCM-P110479	8.000	2.001	3.12	240.47
MSCM-P110683	9.000	2.501	4.38	315.32
MSCM-P110634	10.000	2.500	4.38	386.07

SEAL KIT NUMBER	LIST PRICE
MSCM-SK-P110548	\$28.88
MSCM-SK-P110596	5.23
MSCM-SK-P110121	31.03
MSCM-SK-P110288	29.69
MSCM-SK-P110287	33.62
MSCM-SK-P110537	54.02
MSCM-SK-P110248	43.43
MSCM-SK-P110511	50.85
MSCM-SK-P110249	62.15
MSCM-SK-P110607	64.16
MSCM-SK-P110312	69.72
MSCM-SK-P110479	119.40
MSCM-SK-P110683	425.76
MSCM-SK-P110634	321.56

*NOTE: P110479 is counter bored for a (-.226) Stub O-ring.
P110634 is counter bored for a (-.230) Stub O-ring.
P110683 is counter bored for a (-.230) Stub O-ring.

Piston Stub Technical Information



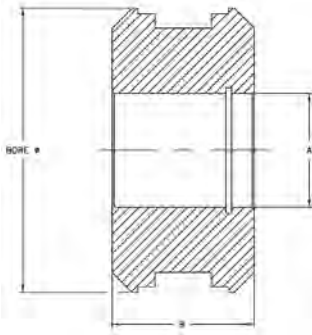
- "D" = "A" Diameter of Piston, minus 0.001"/0.003"
- "E" = Nut Length + 0.25"
- "F" = Piston Width "B" minus Counterbore Depth "C" + Nut Length + 0.12"
- "G" = Thread Size to be determined by nut used
- "H" = Located under middle of Piston, 0.098"/0.093" Wide X 0.050"/0.052" Deep for 1/16 cross section O-ring (000 Series)

Note: Good rule of thumb is to size the stub diameter at least one half the diameter of the rod.

MOBILE CYLINDER PISTONS



Material: 11SMn30-080M46
Equivalent To SAE 1045
And SAE 1215



Mobile Metric Piston

PART NUMBER	BORE	ROD	A	B	LIST PRICE
MSHCC-MP351540	35.00	20,25	15	40	\$12.05
MSHCC-MP401540	40.00	20,25	15	40	9.82
MSHCC-MP451540	45.00	20,25	15	40	12.68
MSHCC-MP501540	50.00	20,25	15	40	12.89
MSHCC-MP502050	50.00	30,35	20	50	13.65
MSHCC-MP552040	55.00	30,35	20	40	13.99
MSHCC-MP602045	60.00	30,35	20	45	18.46
MSHCC-MP602445	60.00	40	24	45	19.09
MSHCC-MP602750	60.00	35,40	27	50	20.27
MSHCC-MP632050	63.00	30,35	20	50	22.30
MSHCC-MP632445	63.00	40	24	45	21.88
MSHCC-MP632750	63.00	35,40	27	50	19.09
MSHCC-MP633050	63.00	40	30	50	21.68
MSHCC-MP652050	65.00	30,35	20	50	19.02
MSHCC-MP652445	65.00	40	24	45	20.00
MSHCC-MP702050	70.00	30,35	20	50	24.80
MSHCC-MP702445	70.00	40	24	45	24.60
MSHCC-MP702750	70.00	35,40,45,50	27	50	24.25
MSHCC-MP752445	75.00	40	24	45	29.40
MSHCC-MP752750	75.00	35,40,45,50	27	50	25.65
MSHCC-MP802445	80.00	40	24	45	30.79
MSHCC-MP802750	80.00	35,40,45,50	27	50	32.88
MSHCC-MP803050	80.00	40,50	30	50	29.82
MSHCC-MP852445	85.00	40	24	45	34.41
MSHCC-MP852750	85.00	35,40,45,50	27	50	36.01
MSHCC-MP902750	90.00	35,40,45,50	27	50	35.88
MSHCC-MP903050	90.00	40,50	30	50	33.24
MSHCC-MP903350	90.00	50,60	33	50	38.60
MSHCC-MP1002750	100.00	35,40,45,50	27	50	43.26
MSHCC-MP1003350	100.00	50,60	33	50	47.72
MSHCC-MP1004050	100.00	70	40	50	40.05
MSHCC-MP1103350	110.00	50,60	33	50	54.41
MSHCC-MP1104050	110.00	70	40	50	53.56
MSHCC-MP1204050	120.00	70	40	50	73.43
MSHCC-MP1253350	125.00	50,60	33	50	69.46
MSHCC-MP1254050	125.00	70	40	50	81.16
MSHCC-MP1404058	140.00	70	40	58	108.82
MSHCC-MP1504058	150.00	70	40	58	111.68
MSHCC-MP1605158	160.00	—	51	58	126.65

SEAL KIT NUMBER	LIST PRICE
MSHCC-PK35	\$9.02
MSHCC-PK40	8.98
MSHCC-PK45	9.87
MSHCC-PK50	10.26
MSHCC-PK50	10.26
MSHCC-PK55	14.12
MSHCC-PK60	11.45
MSHCC-PK60	11.45
MSHCC-PK60	11.45
MSHCC-PK63	10.44
MSHCC-PK63	10.44
MSHCC-PK63	10.44
MSHCC-PK65	12.96
MSHCC-PK65	12.96
MSHCC-PK70	13.08
MSHCC-PK70	13.08
MSHCC-PK70	13.08
MSHCC-PK75	12.26
MSHCC-PK75	12.26
MSHCC-PK80	14.17
MSHCC-PK80	14.17
MSHCC-PK80	14.17
MSHCC-PK85	18.93
MSHCC-PK85	18.93
MSHCC-PK90	19.38
MSHCC-PK90	19.38
MSHCC-PK90	19.38
MSHCC-PK100	21.31
MSHCC-PK100	21.31
MSHCC-PK100	21.31
MSHCC-PK110	22.43
MSHCC-PK110	22.43
MSHCC-PK120	25.78
MSHCC-PK125	27.63
MSHCC-PK125	27.63
MSHCC-PK140	42.32
MSHCC-PK150	34.76
MSHCC-PK160	36.08

All dimensions shown in millimeters.

MOBILE CYLINDER PISTONS

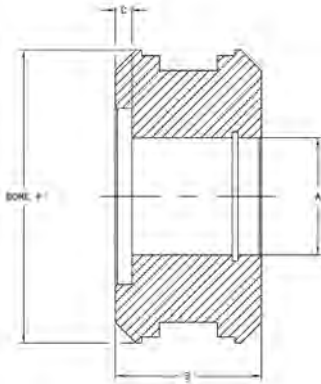


Material: 11SMn30-080M46
 Equivalent To SAE 1045
 And SAE 1215

Mobile Metric Piston - Narrow

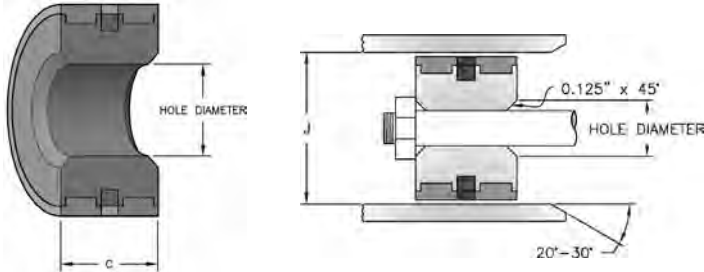
PART NUMBER	BORE	ROD	A	B	C	LIST PRICE
MSHCC-MP401527SP	40.00	N/A	15	27	5	\$15.94
MSHCC-MP502025SP	50.00	N/A	20	25	N/A	19.22
MSHCC-MP502130SP	50.00	N/A	21	30	5	19.02
MSHCC-MP602535SP	60.00	N/A	25	35	5	27.66
MSHCC-MP632535SP	63.00	N/A	25	35	5	29.89
MSHCC-MP652535SP	65.00	N/A	25	35	5	39.36
MSHCC-MP702535SP	70.00	N/A	25	35	5	32.05
MSHCC-MP802840SP	80.00	N/A	28	40	6	40.55
MSHCC-MP903540SP	90.00	N/A	35	40	6	47.58
MSHCC-MP1003540SP	100.00	N/A	35	40	6	52.81

HCC Style Narrow Pistons Include a 5-Piece Piston Seal Assembly, Piston Rod Seal - O-ring, and Threaded Seal - O-ring. All dimensions shown in millimeters.



MOBILE ALL-IN-ONE PISTONS

The John Deere and New Holland All-In-One Pistons are designed to handle a broad range of application parameters. The piston body is machined to exact dimensions and is constructed using four components: a high strength steel body, a non-metallic bearing, a rubber loading ring, and a filled PTFE seal ring. The non-metallic bearing is molded to the piston using a special proprietary process.



SEAL INFORMATION

MATERIAL	STEEL, NYLON, NBR, PTFE
TEMPERATURE RANGE	-40° TO +230° F
PRESSURE RANGE	0 TO 5,000 PSI
SPEED	3 FT/SEC

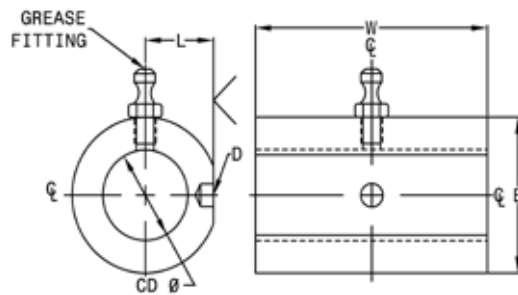
Part Number	C Width	I Piston Diameter	J Bore Diameter	Hole Diameter	Counterbore Diameter (mm)	Counterbore Depth (mm)	List Price
MSJD-AH138200	31.24	49.96	50.00	16.56	25.01 ±0.051	10.01 ±0.25	\$117.11
MSJD-AH174930	31.24	49.96	50.00	20.55	32.02 ±0.051	10.01 ±0.25	154.71
MSJD-AH233516	31.24	49.96	50.00	16.56	32.02 ±0.051	10.01 ±0.25	162.89
MSJD-AH135785	31.24	55.88	56.00	16.59	25.01 ±0.051	10.01 ±0.25	154.10
MSJD-AH137177	31.24	62.97	63.00	22.58	40.01 ±0.051	10.01 ±0.25	148.66
MSJD-AH142159	31.24	62.97	63.00	20.57	32.02 ±0.051	10.01 ±0.25	118.72
MSJD-AH160647	31.24	62.97	63.00	22.58	45.02 ±0.051	10.01 ±0.25	148.66
MSJD-AH166138	31.24	62.97	63.00	22.58	36.00 ±0.051	10.01 ±0.25	144.53
MSJD-AH228448	31.24	62.97	63.00	24.56	36.00 ±0.051	10.01 ±0.25	88.03
MSJD-RE29383	31.24	62.97	63.00	22.20	N/A	N/A	149.99
MSJD-AH158623	36.25	69.85	70.00	24.56	40.01 ±0.051	14.99 ±0.25	119.17
MSJD-AH165962	36.25	69.85	70.00	27.58	45.01 ±0.051	14.99 ±0.25	215.75
MSJD-AH172352	36.25	69.85	70.00	22.58	36.00 ±0.051	14.99 ±0.25	152.04
MSJD-AH227867	36.25	69.85	70.00	27.58	40.01 ±0.051	14.02 ±0.13	119.17
MSJD-RE34084	36.25	69.85	70.00	24.56	45.01 ±0.051	14.99 ±0.25	215.75
MSJD-AH139078	29.08	79.86	80.00	24.56	40.01 ±0.051	9.50 ±0.25	191.70
MSNH-83962807	29.08	79.86	80.00	24.26	40.11 ±0.051	10.01 ±0.25	132.04
MSNH-87432513	29.08	79.86	80.00	24.26	50.09 ±0.051	14.99 ±0.25	132.04
MSJD-AH165826	40.74	79.86	80.00	27.58	50.00 ±0.051	14.99 ±0.25	141.82
MSJD-AH173410	40.74	79.86	80.00	30.58	50.00 ±0.051	14.99 ±0.25	178.75
MSJD-RE33968	40.74	79.86	80.00	27.58	45.01 ±0.051	19.51 ±0.25	182.03
MSJD-RE34085	40.74	79.86	80.00	27.58	40.01 ±0.051	19.51 ±0.25	141.82
MSNH-85800981	29.08	89.87	90.00	24.26	50.09 ±0.051	14.99 ±0.25	146.71
MSJD-AHC11073	40.13	89.97	90.00	30.58	50.01 ±0.025	14.50 ±0.25	225.96
MSJD-AH136453	45.75	89.87	90.00	27.58	45.02 ±0.051	19.99 ±0.25	246.57
MSJD-AH141183	45.75	89.87	90.00	30.58	50.01 ±0.025	19.99 +0.25 - 0.23	219.15
MSJD-AH169436	45.75	89.87	90.00	30.58	45.02 ±0.051	19.99 ±0.25	318.46
MSJD-AH169827	45.75	89.87	90.00	26.09	56.02 ±0.051	19.99 ±0.25	236.30
MSJD-AH205060	45.75	89.87	90.00	30.58	50.01 ±0.025	19.99 +0.25 - 0.23	219.15
MSJD-AHC10806	40.13	99.97	100.00	30.58	50.01 ±0.025	14.50 ±0.25	285.38
MSNH-85800982	41.28	99.87	100.00	30.78	56.10 ±0.051	13.97 ±0.25	146.11
MSJD-AH159034	45.75	99.97	100.00	30.58	50.00 ±0.051	19.99 ±0.25	364.47
MSJD-AH164620	45.75	99.97	100.00	33.83	50.00 ±0.051	19.99 ±0.25	287.65
MSJD-AH166637	45.75	99.97	100.00	33.63	56.02 ±0.051	19.99 ±0.25	390.39
MSJD-AH169826	45.75	99.97	100.00	26.09	50.00 ±0.051	19.99 ±0.25	380.11
MSJD-AH205062	45.75	99.97	100.00	30.58	50.00 ±0.051	19.99 ±0.25	364.47
MSNH-81875232	45.09	109.88	110.00	30.25	50.09 ±0.051	9.91 ±0.25	160.25
MSJD-AHC10777	40.13	114.99	115.00	30.58	50.01 ±0.025	14.50 ±0.25	342.45
MSNH-85800983	40.31	114.86	115.00	33.76	63.09 ±0.051	10.01 ±0.25	191.54
MSNH-87611074	40.31	114.86	115.00	33.76	63.09 ±0.051	10.01 ±0.25	191.54
MSJD-AH168884	45.75	114.96	115.00	36.63	56.02 ±0.051	19.99 ±0.25	318.46
MSJD-AH167446	55.25	124.97	125.00	36.63	63.00 ±0.051	19.99 ±0.25	462.29
MSJD-AH173851	63.53	152.32	152.00	42.52	70.00 +0.050 - 0.025	38.00 ±0.25	632.02

MOBILE MOUNTS



Cross Tube Mount

PART NUMBER	CD	W	B	L	D	LIST PRICE
MSCM-CT251015	1.00	2.50	1.50	0.69	.250 x .09	\$13.72
MSCM-CT301015	1.00	3.00	1.50	0.69	.250 x .09	14.40
MSCM-CT351015	1.00	3.50	1.50	0.69	.250 x .09	18.00
MSCM-CT401015	1.00	4.00	1.50	0.69	.250 x .09	18.26
MSCM-CT451015	1.00	4.50	1.50	0.69	.250 x .09	21.26
MSCM-CT271017	1.00	2.75	1.75	0.81	.250 x .15	19.29
MSCM-CT321017	1.00	3.25	1.75	0.81	.250 x .15	20.23
MSCM-CT371017	1.00	3.75	1.75	0.81	.250 x .15	21.26
MSCM-CT421017	1.00	4.25	1.75	0.81	.250 x .15	22.46
MSCM-CT471017	1.00	4.75	1.75	0.81	.250 x .15	25.98
MSCM-CT521017	1.00	5.25	1.75	0.81	.250 x .15	27.08
MSCM-CT271220	1.25	2.75	2.00	0.88	.250 x .15	20.41
MSCM-CT321220	1.25	3.25	2.00	0.88	.250 x .15	21.86
MSCM-CT371220	1.25	3.75	2.00	0.88	.250 x .15	25.63
MSCM-CT421220	1.25	4.25	2.00	0.88	.250 x .15	26.92
MSCM-CT471220	1.25	4.75	2.00	0.88	.250 x .15	28.46
MSCM-CT521220	1.25	5.25	2.00	0.88	.250 x .15	29.82
MSCM-CT601220	1.25	6.00	2.00	0.88	.250 x .15	35.40
MSCM-CT701220	1.25	7.00	2.00	0.88	.250 x .15	38.40
MSCM-CT301525	1.50	3.00	2.50	1.13	.250 x .19	24.60
MSCM-CT421525	1.50	4.25	2.50	1.13	.250 x .19	31.97
MSCM-CT471525	1.50	4.75	2.50	1.13	.250 x .19	33.95
MSCM-CT551525	1.50	5.50	2.50	1.13	.250 x .19	40.38
MSCM-CT601525	1.50	6.00	2.50	1.13	.250 x .19	44.67
MSCM-CT701525	1.50	7.00	2.50	1.13	.250 x .19	47.33
MSCM-CT321727	1.75	3.25	2.75	1.25	.250 x .19	32.83
MSCM-CT471727	1.75	4.75	2.75	1.25	.250 x .19	44.15
MSCM-CT551727	1.75	5.50	2.75	1.25	.250 x .19	48.01
MSCM-CT601727	1.75	6.00	2.75	1.25	.250 x .19	54.17
MSCM-CT701727	1.75	7.00	2.75	1.25	.250 x .19	59.40
MSCM-CT352030	2.00	3.50	3.00	1.38	.250 x .19	37.04
MSCM-CT472030	2.00	4.75	3.00	1.38	.250 x .19	49.55
MSCM-CT552030	2.00	5.50	3.00	1.38	.250 x .19	51.17
MSCM-CT602030	2.00	6.00	3.00	1.38	.250 x .19	62.07
MSCM-CT702030	2.00	7.00	3.00	1.38	.250 x .19	68.66



MOBILE MOUNTS

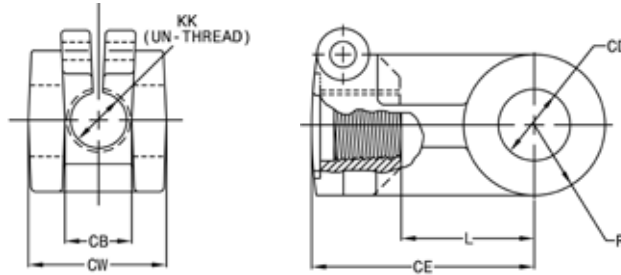


Mobile Split Clevis

PART NUMBER	CB	CD	CE	CW	KK	L	R	LIST PRICE
MSCM-RC10033	1.12	1.00	3.25	2.62	1-1/16"-12	2.12	1.00	\$31.28
MSCM-RC10034	1.12	1.00	3.25	2.62	1-1/8"-12	2.12	1.00	34.41
MSCM-RC10035	1.12	1.00	3.25	2.62	1-1/4"-12	2.12	1.00	34.41
MSCM-RC11312	1.25	1.25	3.25	2.75	1-1/4"-12	2.12	1.25	39.25
MSCM-RC11412	1.25	1.25	4.00	2.75	1-1/4"-12	2.75	1.25	111.29

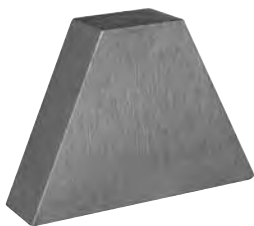
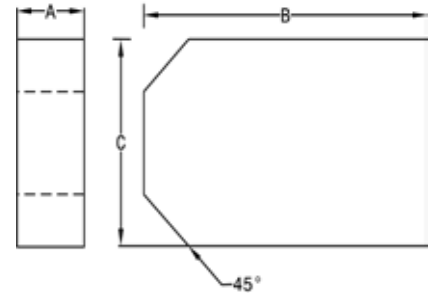
Material: Ductile Iron

Can be used on HTR Cylinders (page 11) or equivalent size cylinders.



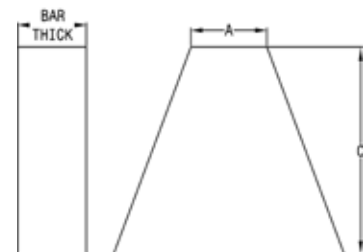
Mounting Ear

PART NUMBER	BAR SIZE	A	B	C	LIST PRICE
MSCM-ME-100	1/2 x 1-1/4	1/2	1-1/4	1	6.60
MSCM-ME-200	5/8 x 2	5/8	2	1-1/2	8.80
MSCM-ME-300	3/4 x 2-1/2	3/4	2-1/2	2	11.96
MSCM-ME-400	1 x 3-1/2	1	3-1/2	2-3/4	21.89
MSCM-ME-500	1-1/4 x 4	1-1/4	4	3-1/2	53.27
MSCM-ME-600	1-1/4 x 4	1-1/4	4-1/2	4	77.37



Mounting Ear

PART NUMBER	BAR SIZE	A	B	C	LIST PRICE
MSCM-MEA-100	1/2 x 1-1/4	9/16	1-3/4	1-1/4	\$5.26
MSCM-MEA-200	5/8 x 2	7/8	2-3/4	2	9.52
MSCM-MEA-300	3/4 x 2-1/2	1-3/8	3-3/4	2-1/2	23.42
MSCM-MEA-400	1 x 3-1/2	1-3/4	5	3-1/2	33.87
MSCM-MEA-500	1-1/4 x 4	1-1/4	4	3-1/2	81.14
MSCM-MEA-600	1-1/4 x 4	1-1/4	6-3/4	4-1/2	95.77



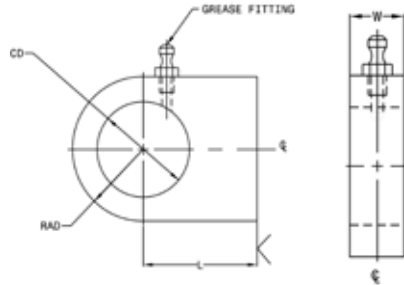
MOBILE WELDED MOUNTS



Welded Base End Spherical Mount

PART NUMBER	CD	L	RAD	W	PIN DIAMETER	DESIGNED SPHERICAL #	MAX PULL AT YIELD	LIST PRICE
MSCM-WBES-10	1.625	2.00	1.25	0.75	1.00	SB99100	15,000#	\$175.95
MSCM-WBES-12	2.000	2.00	1.50	0.94	1.25	SB99125	20,000#	188.61
MSCM-WBES-15	2.437	2.50	1.88	1.12	1.50	SB99150	35,000#	247.40
MSCM-WBES-17	2.812	2.50	2.00	1.31	1.75	SB99175	35,000#	279.52
MSCM-WBES-20	3.187	2.75	2.38	1.50	2.00	SB99200	55,000#	261.90
MSCM-WBES-25	3.937	3.25	3.00	1.88	2.50	SB99250	95,000#	349.17

Material: 50K Min. Yield Plate

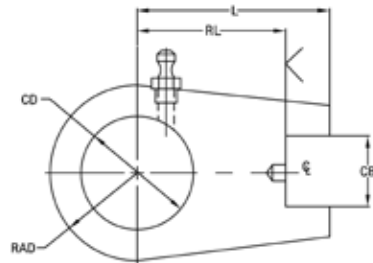


Welded Rod End Spherical Mount



PART NUMBER	CD	L	RAD	W	D	CB	RL	PIN DIAMETER	DESIGNED SPHERICAL #	LIST PRICE
MSCM-WRES-10	1.625	2.750	1.25	0.75	.250 X .19	1.015	2.12	1.00	SB99100	\$163.29
MSCM-WRES-12	2.000	3.000	1.50	0.94	.250 X .19	1.265	2.25	1.25	SB99125	238.80
MSCM-WRES-15	2.437	3.250	1.88	1.12	.250 X .19	1.515	2.50	1.50	SB99150	261.90
MSCM-WRES-17	2.812	3.750	2.00	1.31	.250 X .19	1.515	2.75	1.75	SB99175	267.32
MSCM-WRES-20	3.187	4.000	2.38	1.50	.250 X .19	2.015	3.00	2.00	SB99200	269.12
MSCM-WRES-25	3.937	4.750	3.00	1.88	.250 X .19	2.515	3.50	2.50	SB99250	320.68

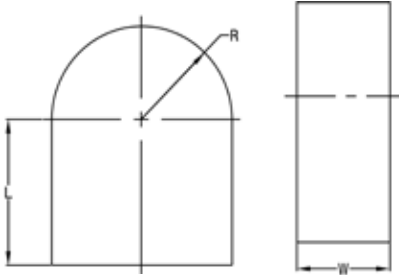
Material: 50K Min. Yield Plate



MOBILE WELDED MOUNTS



Material: A-36 Plate

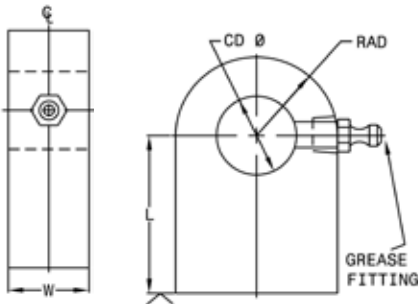


Mounting Lug

PART NUMBER	L	R	W	LIST PRICE
MSCM-ML296	1.50	1.00	0.50	\$9.76
MSCM-ML297	1.50	1.00	0.62	9.44
MSCM-ML298	1.50	1.00	0.75	10.34
MSCM-ML299	1.75	1.25	1.00	13.70
MSCM-ML301	2.00	1.50	1.00	16.29
MSCM-ML302	2.50	2.00	1.00	22.02
MSCM-ML303	1.50	1.00	1.25	14.91
MSCM-ML304	1.50	1.12	1.50	16.37
MSCM-ML305	2.00	1.25	1.50	19.11
MSCM-ML306	1.75	1.50	1.50	20.03
MSCM-ML307	2.75	1.50	1.50	22.04
MSCM-ML308	1.75	1.25	2.00	21.15
MSCM-ML309	2.00	1.50	2.00	25.49
MSCM-ML310	2.12	1.50	2.00	26.01
MSCM-ML311	2.25	1.50	2.00	26.69
MSCM-ML312	3.00	1.50	2.00	31.64
MSCM-ML313	1.75	1.75	2.00	34.96
MSCM-ML314	1.88	1.75	2.00	37.86
MSCM-ML315	2.12	1.75	2.00	36.39
MSCM-ML316	2.50	1.75	2.00	42.43
MSCM-ML317	2.75	1.75	2.00	44.81
MSCM-ML318	3.00	2.00	2.00	53.63
MSCM-ML319	3.00	2.12	2.00	55.08
MSCM-ML320	3.12	2.50	2.00	66.26
MSCM-ML321	2.00	1.12	2.25	26.63
MSCM-ML322	2.25	1.75	2.25	42.57
MSCM-ML323	3.00	2.50	2.25	70.65
MSCM-ML324	3.00	2.50	2.50	74.30
MSCM-ML325	3.00	2.25	3.00	80.13
MSCM-ML326	3.00	2.00	3.25	80.13



Material: A-36 Plate



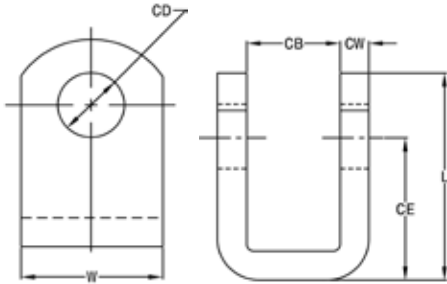
Mounting Lug

PART NUMBER	CD	L	RAD	W	GREASE FITTING	LIST PRICE
MSCM-ML050100	1.00	2.00	1.00	0.50	N/A	\$15.32
MSCM-ML062100	1.00	2.00	1.00	0.62	N/A	16.43
MSCM-ML060333	1.00	2.12	1.00	0.75	N/A	17.48
MSCM-ML100100	1.00	2.00	1.00	1.00	N/A	20.61
MSCM-ML125100	1.00	2.00	1.00	1.25	1/8" NPT	22.68
MSCM-ML062125	1.25	2.50	1.25	0.62	N/A	20.61
MSCM-ML075125	1.25	2.50	1.25	0.75	N/A	24.02
MSCM-ML100125	1.25	2.50	1.25	1.00	N/A	27.38
MSCM-ML150125	1.25	2.50	1.25	1.50	1/8" NPT	33.73
MSCM-ML200125	1.25	2.50	1.25	2.00	1/8" NPT	38.74
MSCM-ML062150	1.50	2.50	1.50	0.62	N/A	24.02
MSCM-ML075150	1.50	2.50	1.50	0.75	N/A	27.93
MSCM-ML150150	1.50	2.50	1.50	1.50	1/8" NPT	41.32
MSCM-ML200150	1.50	2.50	1.50	2.00	1/8" NPT	48.91
MSCM-ML250150	1.50	2.50	1.50	2.50	1/8" NPT	58.89
MSCM-ML200200	2.00	3.00	2.00	2.00	1/8" NPT	71.87
MSCM-ML250200	2.00	3.00	2.00	2.50	1/8" NPT	82.13

MOBILE WELDED MOUNTS



Material: 1040 HF Bar



Formed Clevis

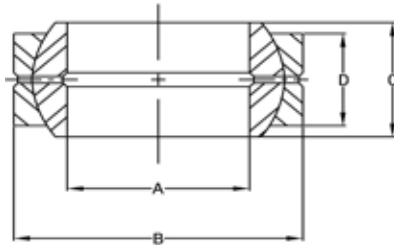
PART NUMBER	CB	CD	CE	CW	L	W	LIST PRICE
MSCM-CL3011	0.75	0.50	1.50	0.38	2.25	1.25	\$29.30
MSCM-CL7337	1.06	0.75	2.00	0.38	3.12	1.75	32.12
MSCM-CL6547	1.25	1.00	2.50	0.50	3.62	2.00	44.77
MSCM-CL8278	0.88	1.00	2.93	0.50	4.06	2.00	45.46
MSCM-CL323	1.25	1.00	5.06	0.38	6.06	1.75	39.38
MSCM-B120753	1.50	1.12	2.12	0.50	3.25	2.25	47.90
MSCM-B120625	1.62	1.25	2.75	0.75	4.00	2.50	58.49
MSCM-80003	0.50	N/A	N/A	0.38	2.38	1.00	29.30
MSCM-80010	1.12	N/A	N/A	0.38	3.50	2.00	34.24
MSCM-B120829	1.50	N/A	N/A	0.50	3.25	2.50	50.01
MSCM-80001	1.12	N/A	N/A	0.50	4.00	2.00	48.58
MSCM-B120672	1.50	N/A	N/A	0.50	4.00	3.00	59.35
MSCM-B120760	1.12	1.00	2.12	0.62	3.38	2.50	50.01
MSCM-B120756	1.12	N/A	N/A	0.62	4.25	3.00	60.05
MSCM-80015	1.25	N/A	N/A	0.62	4.62	2.50	40.63
MSCM-B120613	1.62	N/A	N/A	0.75	4.00	2.50	62.43
MSCM-B120614	2.12	N/A	N/A	1.00	5.00	3.00	108.18

MOBILE SPHERICAL BEARINGS



Spherical Bearing

PART NUMBER	A	B	C	D	HOUSING DIAMETER	LIST PRICE
MSCM-SB99062	0.6245/0.6250	1.0625/1.0620	0.547/0.542	0.469/0.464	1.0614/1.0622	\$27.05
MSCM-SB99075	0.7495/0.7500	1.2495/1.2500	0.656/0.651	0.562/0.557	1.2487/1.2497	25.44
MSCM-SB99100	0.9995/1.0000	1.6250/1.6245	0.875/0.870	0.750/0.745	1.6237/1.6247	22.14
MSCM-SB99125	1.2495/1.2500	2.0000/1.9995	1.093/1.087	0.937/0.932	1.9985/1.9997	31.96
MSCM-SB99137	1.3745/1.3750	2.1875/2.1869	1.187/1.182	1.031/1.026	2.1860/2.1872	48.38
MSCM-SB99150	1.4995/1.5000	2.4375/2.4369	1.312/1.307	1.125/1.120	2.4360/2.4372	41.82
MSCM-SB99175	1.7495/1.7500	2.8125/2.8119	1.531/1.526	1.312/1.307	2.8110/2.8122	57.40
MSCM-SB99200	1.9995/2.0000	3.1875/3.1869	1.750/1.745	1.500/1.495	3.1858/3.1871	77.90
MSCM-SB99225	2.2495/2.2500	3.5625/3.5617	1.969/1.964	1.687/1.682	3.5607/3.5621	106.60
MSCM-SB99250	2.4994/2.5000	3.9375/3.9367	2.187/2.182	1.875/1.870	3.9357/3.9371	144.33



MOBILE TOP LINK BALL ENDS

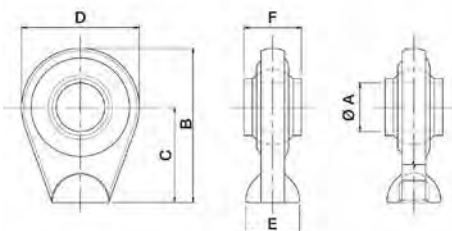


MATERIAL : ST52.3

PLEASE NOTE THAT SIZES ARE EITHER METRIC OR IMPERIAL

PART NUMBER	CATEGORY	A	B	C	D	E	F	LIST PRICE
MSHCC-TL19-5030	1	19	77	50	53	25	30	\$22.09
MSHCC-TL19-5044	1	19	75	50	53	25	44	21.27
MSHCC-TL19-3444*	1	19	67	34	58	30 X 14	44	28.60
MSHCC-TL19-5551	1	19	82	55	75	35	51	48.31
MSHCC-TL19-6044	1	19	91	60	62	34	44	23.95
MSHCC-TL20-5844		20	91	58	62	34	44	31.90
MSHCC-TL20-6044		20	91	60	62	34	44	16.61
MSHCC-TL22-5035	1	22	80	50	62	26	35	30.56
MSHCC-TL22-6551	1	22	103	65	75	38	51	32.93
MSHCC-TL25-6551-75	2	25.4	103	65	75	38	51	34.38
MSHCC-TL25-6551-83	2	25.4	107	65	83	50	51	43.96
MSHCC-TL25-7051	2	25.4	104	70	85	50	51	26.33
MSHCC-TL35-6535		35	107	65	83	50	35	45.93
MSHCC-TL40-8575		40	139	85	108	60	75	90.42

* THIS ITEM HAS A RECTANGLE BASE



MSO PART NUMBERS

HCC-TL 19 - 50 - 30

Top Link Pin Diameter Center Height Total Width

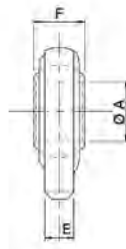
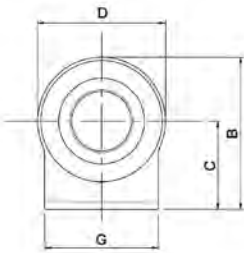
MOBILE LOWER LINK BALL ENDS

Style A

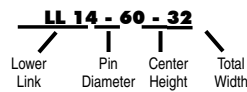


MATERIAL : ST52.3

PART NUMBER	CATEGORY	A	B	C	D	E	F	G	LIST PRICE
MSHCC-LL14-6032		14.2	83	60	46	11	32	30	\$18.89
MSHCC-LL16-6020		16.2	83	60	46	11	20	30	18.79
MSHCC-LL19-4535	1	19.2	73	45	65	15	35	50	44.28
MSHCC-LL22-4535	1	22.1	73	45	65	15	35	50	35.61
MSHCC-LL25-5035	2	25.4	88	50	76	18	35	70	31.06
MSHCC-LL28-5535	2	28.2	97	55	83	18	35	70	39.85



MSO PART NUMBERS HCC-

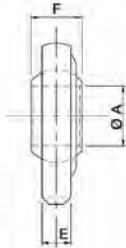
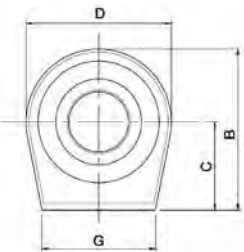


Style B

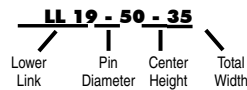


MATERIAL : ST52.3

PART NUMBER	CATEGORY	A	B	C	D	E	F	G	LIST PRICE
MSHCC-LL19-5035	1	19	84	50	67	18	35	56	\$24.46
MSHCC-LL22-5035	2	22	84	50	67	18	35	56	27.88
MSHCC-LL22-7535	1	22	109	75	67	18	35	56	28.39
MSHCC-LL28-8045	2	28.4	120	80	85	18	45	70	62.04
MSHCC-LL28-8035	2	28.4	120	80	85	18	35	70	39.75



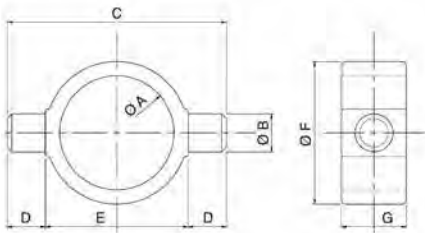
MSO PART NUMBERS HCC-



WELDABLE TRUNNIONS

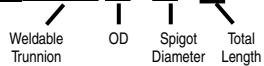


MATERIAL : STEEL- FE 501C / FE 510 - UNI 6659



MSO PART NUMBERS

MSHCC-WT 45 - 20 - 90

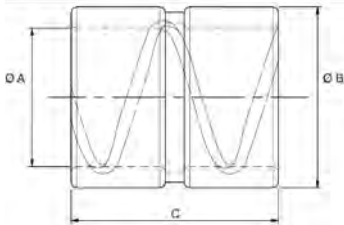


PART NUMBER	A	B	C	D	E	F	G	LIST PRICE
MSHCC-WT452090	45	20	90	15	60	60	24	\$61.94
MSHCC-WT5020110	50	20	110	20	70	65	30	88.05
MSHCC-WT502595	50	25	95	15	65	65	29	73.59
MSHCC-WT5525100	55	25	100	15	70	70	29	69.36
MSHCC-WT6025130	60	25	130	25	80	75	35	102.60
MSHCC-WT6030115	60	30	115	20	75	75	34	78.86
MSHCC-WT6530120	65	30	120	20	80	80	34	84.13
MSHCC-WT7030130	70	30	130	20	90	90	34	143.89
MSHCC-WT7030160	70	30	160	30	100	90	45	148.33
MSHCC-WT7335145	73	35	145	25	95	95	44	162.78
MSHCC-WT7535150	75	35	150	25	100	100	44	132.85
MSHCC-WT8035150	80	35	150	25	100	100	44	125.93
MSHCC-WT8035180	80	35	180	35	110	100	50	176.50
MSHCC-WT8040165	80	40	165	30	105	105	54	147.19
MSHCC-WT8540165	85	40	165	30	105	105	54	169.80
MSHCC-WT9045190	90	45	190	35	120	120	58	215.73
MSHCC-WT9545190	95	45	190	35	120	120	58	211.92
MSHCC-WT10045200	100	45	200	35	130	130	58	303.16
MSHCC-WT10545200	105	45	200	35	130	130	58	303.16
MSHCC-WT11550225	115	50	225	40	145	145	68	243.61
MSHCC-WT12050225	120	50	225	40	145	145	68	339.91
MSHCC-WT12550235	125	50	235	40	155	155	68	409.89
MSHCC-WT13050235	130	50	235	40	155	155	68	409.89

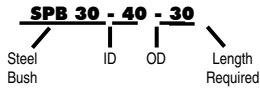
STEEL BUSHINGS



MATERIAL : E410 (EN 10305-1)
HARDNESS: HRC 58-62, 0.8-1 MM DEPTH



MSO **PART NUMBERS** **MSHCC-**



PART NUMBER	Ø A	Ø B	C	LIST PRICE
MSHCC-SPB30-40-30	30	40	30	\$35.71
MSHCC-SPB30-40-35	30	40	35	35.20
MSHCC-SPB30-40-40	30	40	40	39.23
MSHCC-SPB30-40-50	30	40	50	40.56
MSHCC-SPB35-45-30	35	45	30	36.33
MSHCC-SPB35-45-35	35	45	35	48.10
MSHCC-SPB35-45-40	35	45	40	36.14
MSHCC-SPB35-45-60	35	45	60	45.11
MSHCC-SPB40-50-30	40	50	30	39.64
MSHCC-SPB40-50-35	40	50	35	38.81
MSHCC-SPB40-50-40	40	50	40	41.50
MSHCC-SPB40-50-50	40	50	50	45.83
MSHCC-SPB40-50-60	40	50	60	43.25
MSHCC-SPB45-55-30	45	55	30	36.24
MSHCC-SPB45-55-50	45	55	50	43.56
MSHCC-SPB50-60-40	50	60	40	52.13
MSHCC-SPB50-60-50	50	60	50	47.08
MSHCC-SPB50-60-80	50	60	80	65.34
MSHCC-SPB60-70-50	60	70	50	53.78
MSHCC-SPB60-70-60	60	70	60	65.55
MSHCC-SPB60-75-40	60	75	40	111.27
MSHCC-SPB60-75-50	60	75	50	73.70
MSHCC-SPB60-75-60	60	75	60	101.47
MSHCC-SPB60-75-70	60	75	70	107.35
MSHCC-SPB60-75-80	60	75	80	115.71
MSHCC-SPB65-80-70	65	80	70	112.41
MSHCC-SPB70-85-70	70	85	70	120.14
MSHCC-SPB70-85-80	70	85	80	122.32
MSHCC-SPB75-90-80	75	90	80	155.55
MSHCC-SPB75-90-100	75	90	100	171.87

MOBILE WELDED PIVOT PINS AND CLIPS



Material: Steel, Plated Surface
Includes 2 External Hair Pin Clips

Mobile Pivot Pin and Hair Pin Clips

PART NUMBER	DESCRIPTION	CD	CL	LIST PRICE
MSHCW-1.0X2.83 PIN ASSY	HCW PIN-CLIP ASSEMBLY	1	2.33	\$9.87
MSHCW-1.0X3.23 PIN ASSY	HCW PIN-CLIP ASSEMBLY	1	2.33	9.87
MSHTR-1.0X3.50 PIN ASSY	HTR PIN-CLIP ASSEMBLY	1	2.86	10.18
MSHTR-1.0X4.41 PIN ASSY	HTR PIN-CLIP ASSEMBLY	1	3.77	10.54



Material: Steel, Plated Surface
Includes 2 R-Clips

Mobile Pivot Pin and R-Clips

PART NUMBER	DESCRIPTION	CD	CL	LIST PRICE
MSHSTR-1.0X2.83 PIN ASSY	HSTR PIN-CLIP ASSEMBLY	1	2.83	\$13.27
MSHSTR-1.0X3.25 PIN ASSY	HSTR PIN-CLIP ASSEMBLY	1	3.25	13.27
MSHSTR-1.25X3.31 PIN ASSY	HSTR PIN-CLIP ASSEMBLY	1.25	3.31	17.44



Does not include Hair Pin Clips

Mobile Pivot Pins

PART NUMBER	DESCRIPTION	CD	CL	LIST PRICE
MSHCW-1.0X2.83PIN	1.0 X 2.83	1	2.33	\$6.91
MSHCW-1.0X3.23PIN	1.0 X 3.23	1	2.73	6.91
MSHTR-1.0X3.50PIN	1.0 X 3.50	1	2.86	7.20
MSHTR-1.0X4.41PIN	1.0 X 4.41	1	3.77	7.57



Does not include R Clips

Mobile Pivot Pins

PART NUMBER	DESCRIPTION	CD	CL	LIST PRICE
MSHSTR-1.0X2.83 PIN	1.0 X 2.83	1	2.83	\$10.30
MSHSTR-1.0X3.25 PIN	1.0 X 3.25	1	3.25	10.30
MSHSTR-1.25X3.31 PIN	1.25 X 3.31	1	3.31	14.46
MSPMC-190400001	1.0 X 2.125 (PRINCE)	1	2.12	18.57
MSPMC-190400035	1.0 X 3.25 (PRINCE)	1	3.25	41.52



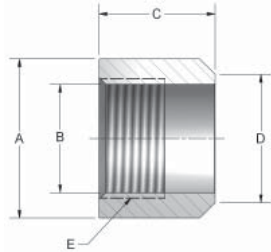
Mobile Clips

PART NUMBER	DESCRIPTION	LIST PRICE
MSHCW-CLIP	HCW-HTR HAIR PIN CLIP	\$1.49
MSHTR-CLIP	HCW-HTR HAIR PIN CLIP	1.46
MSHSTR-CLIP	HSTR R-CLIP	1.49
MSPMC-190600003	PMC R-CLIP (PRINCE)	1.46

PORTS/LOCK NUTS



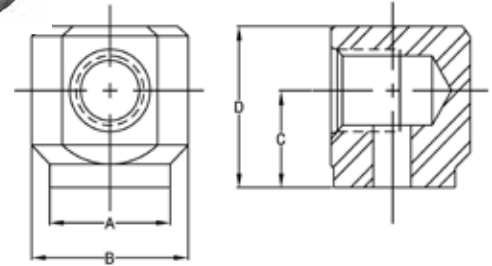
O-ring Boss Half Coupling Port



PART NUMBER	PORT SIZE	A	B	C	D	E	LIST PRICE
MSCM-PO65304	#4 SAE	0.88	0.389	1.00	0.570	7/16-20	\$11.11
MSCM-PO65305	#5 SAE	0.88	0.453	0.75	0.880	1/2-20	12.88
MSCM-PO65306	#6 SAE	1.00	0.508	1.00	0.690	9/16-18	11.53
MSCM-PO65308	#8 SAE	1.25	0.689	1.06	0.870	3/4-16	11.96
MSCM-PO65310	#10 SAE	1.38	0.806	1.06	0.990	7/8-14	11.82
MSCM-PO65312	#12 SAE	1.50	0.981	1.28	1.160	1 1/16-12	16.65
MSCM-PO65314	#14 SAE	1.63	1.106	1.25	1.290	1 3/16-12	19.52
MSCM-PO65316	#16 SAE	1.75	1.231	1.28	1.410	1 5/16-12	24.00
MSCM-PO65320	#20 SAE	2.25	1.544	1.28	1.720	1 5/8-12	31.56
MSCM-PO65324	#24 SAE	2.75	1.794	1.28	1.980	1 7/8-12	49.41

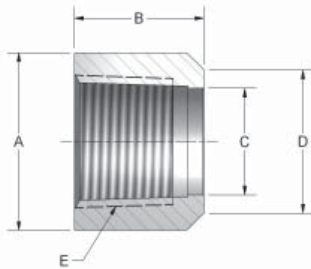


O-ring Boss 90 Degree Port



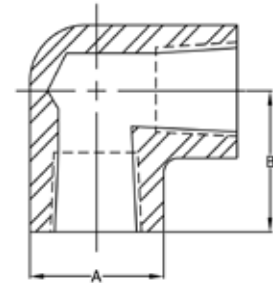
PART NUMBER	BAR SIZE	A	B	C	D	LIST PRICE
MSCM-PO65604	#4 SAE	0.75	1.12	0.75	1.12	\$25.48
MSCM-PO65606	#6 SAE	0.87	1.25	0.81	1.25	27.62
MSCM-PO65608	#8 SAE	1.25	1.62	1.00	1.62	30.22
MSCM-PO65610	#10 SAE	1.25	1.75	1.12	1.88	34.91
MSCM-PO65612	#12 SAE	1.50	2.12	1.19	2.00	50.45
MSCM-PO65616	#16 SAE	1.50	2.25	1.25	2.38	67.12

Pipe Thread Half Coupling



PART NUMBER	PORT SIZE	A	B	C	D	E	LIST PRICE
MACM-PO65025	1/4" NPT	0.88	1.06	.391	.570	1/4-18	\$3.77
MSCM-PO65037	3/8" NPT	1.00	1.00	.520	.690	3/8-18	3.87
MSCM-PO65050	1/2" NPT	1.25	1.06	.650	.870	1/2-14	5.21
MSCM-PO65075	3/4" NPT	1.50	1.28	.850	1.160	3/4-14	5.76
MSCM-PO65100	1" NPT	1.75	1.28	1.050	1.410	1-11.5	11.53
MSCM-PO65125	1-1/4" NPT	2.25	1.28	1.420	1.720	1 1/4-11.5	20.60
MSCM-PO65150	1-1/2" NPT	2.75	1.28	1.560	1.980	1 1/2-11.5	24.72

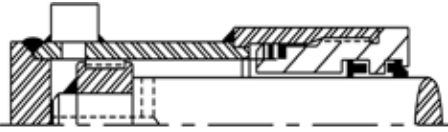
Pipe Thread 90 Degree Port



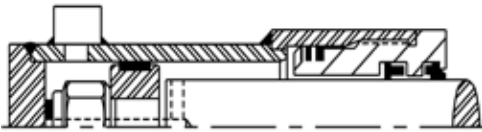
PART NUMBER	PORT SIZE	A	B	LIST PRICE
MSCM-PO65225	1/4" NPT	0.75	1.00	\$15.68
MSCM-PO65237	3/8" NPT	0.88	1.00	23.37
MSCM-PO65250	1/2" NPT	1.12	1.25	34.89
MSCM-PO65275	3/4" NPT	1.38	1.38	39.80
MSCM-PO652751	1" NPT	1.75	1.62	43.51

DISPLACEMENT CYLINDER COMPONENTS

Displacement Cylinder Components



WELDED STYLE PISTON



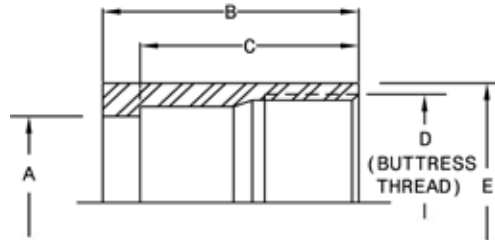
LOCK NUT STYLE PISTON

PISTON DIA.	ROD DIA.	HEAD NUMBER	COLLAR NUMBER	PISTON NUMBER
2.0	1.5	H107463	C132392	P110539
2.5	2.0	H107359	C132463	P110540
3.0	2.5	H107462	C132464	P110541
3.5	3.0	H107525	C132454	P110542
4.0	3.5	H107528	C132465	P110543

NOTE:

SEE IT MOBILE GLANDS, PAGE 40 - 42

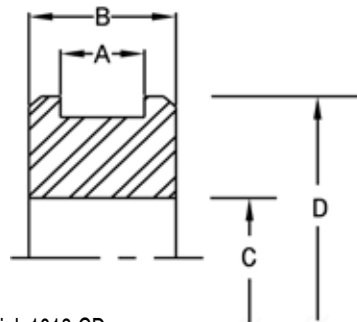
Collar



Material: 1026 DOM

PART NUMBER	A	B	C	D	E	LIST PRICE
MSCM-C132392	2.311	2.44	2.06	2-3/4"-12	3.00	\$288.18
MSCM-C132463	2.940	2.38	2.12	3-1/4"-12	3.50	243.80
MSCM-C132464	3.436	2.50	2.25	3-3/4"-12	4.00	181.22

Piston



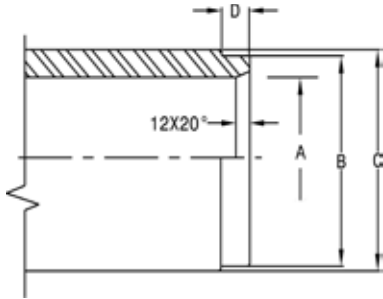
Material: 1018 CD

PART NUMBER	A	B	C	D	E	LIST PRICE
MSCM-P110539	0.50	0.75	0.876	1.95	SK-P110539	\$69.28
MSCM-P110540	0.50	0.75	1.126	2.45	SK-P110540	64.74
MSCM-P110541	0.75	1.12	1.501	2.95	SK-P110541	103.28
MSCM-P110542	0.75	1.12	1.751	3.45	SK-P110542	*

* Reference Only

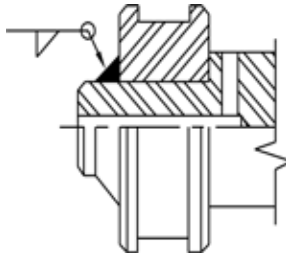
DISPLACEMENT CYLINDER TECHNICAL INFORMATION

Barrel Machining



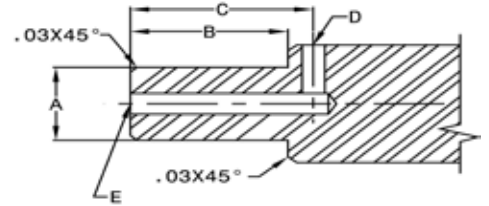
COLLAR NUMBER	A +.003" -.003	B +.001" -.001	C	D	LIST PRICE
MSCM-C132392	2.000	2.308	2.50	0.38	\$288.18
MSCM-C132463	2.500	2.937	3.00	0.25	243.80
MSCM-C132464	3.000	3.433	3.50	0.25	181.22

Piston Welding



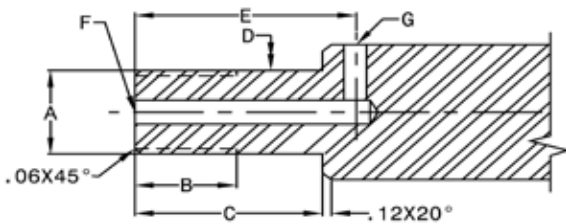
PISTON NUMBER	WELD SIZE	LIST PRICE
MSCM-P110539	1/4"	\$69.28
MSCM-P110540	1/4"	64.74
MSCM-P110541	5/16"	103.28
MSCM-P110542	3/8"	*

Stub (Welded Style)



PISTON NUMBER	A +.001" -.001	B	C	D Dia. Drill x Depth	E Dia. Drill x Depth	LIST PRICE
MSCM-P110539	0.874	1.12	1.31	0.25 x 0.75	0.25 x 1.44	\$69.28
MSCM-P110540	1.124	1.12	1.38	0.31 x 1.00	0.31 x 1.50	64.74
MSCM-C110541	1.499	1.56	1.81	0.31 x 1.25	0.31 x 2.00	*
MSCM-C110542	1.749	1.62	1.88	0.38 x 1.50	0.38 x 2.00	*
MSCM-C110543	2.499	1.62	1.88	0.38 x 1.75	0.38 x 2.00	*

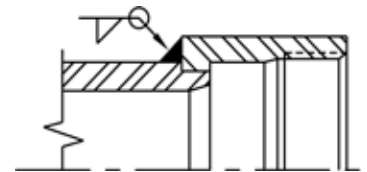
Stub (Lock Nut Style)



PISTON NUMBER	A UN-THD	B	C	D +.001 -.001	E	F Dia. Drill x Depth	G Dia. Drill x Depth	LOCK NUT NUMBER
MSCM-P110539	7/8"-14	1.25	1.88	0.874	2.12	0.25 x 2.25	0.25 x 0.75	LN45087
MSCM-P110540	1-1/8"-12	1.44	2.06	1.124	2.38	0.31 x 2.56	0.31 x 1.00	LN45112
MSCM-P110541	1-1/2"-12	1.88	2.88	1.499	3.19	0.31 x 3.38	0.31 x 1.25	LN45151
MSCM-P110542	1-3/4"-12	1.75	2.75	1.749	3.06	0.38 x 3.31	0.31 x 1.50	LN45175

* Reference Only

Collar Welding



COLLAR NUMBER	WELD SIZE	LIST PRICE
MSCM-C132392	1/4"	\$288.18
MSCM-C132463	1/4"	243.80
MSCM-C132464	1/4"	181.22

Industrial Repair Parts

Contents	Page
Industrial Mounts	72 - 76
Industrial Pins	76

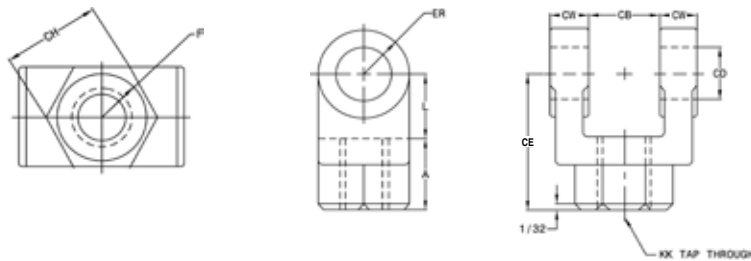
INDUSTRIAL MOUNTS



Rod Clevis

Material: 05, 07, 10
Forging 13 & Up Ductile
Iron Casting

PART NUMBER	CB	CD	CE	CH	CW	F	L	A	KK	ER	LIST PRICE
MSCM-RC0500	0.765	1/2	1-1/2	1	1/2	1	3/4	3/4	7/16"-20	1/2	\$20.89
MSCM-RC0750	1.265	3/4	2-3/8	1-1/4	5/8	1-1/4	1-1/4	1-1/8	3/4"-16	3/4	44.47
MSCM-RC1000	1.515	1	3-1/8	1-1/2	3/4	1-1/2	1-1/2	1-5/8	1"-14	1	72.27
MSCM-RC1375	2.032	1-3/8	4-1/8	2	1	2	2-1/8	2	1-1/4"-12	1-3/8	146.11
MSCM-RC1750	2.531	1-3/4	4-1/2	2-3/8	1-1/4	2-3/8	2-1/4	2-1/4	1-1/2"-12	1-3/4	179.18
MSCM-RC2000	2.531	2	5-1/2	2-15/16	1-1/4	2-15/16	2-1/2	3	1-7/8"-12	2	294.36
MSCM-RC2500	3.032	2-1/2	6-1/2	3-1/2	1-1/2	3-1/2	3	3-1/2	2-1/4"-12	2-1/2	396.80
MSCM-RC3000	3.032	3	6-3/4	3-7/8	1-1/2	3-7/8	3-1/4	3-1/2	2-1/2"-12	2-3/4	669.43
MSCM-RC3500	4.032	3-1/2	8-1/2	5	2	5	4	4-1/2	3-1/4"-12	3-1/2	919.63
MSCM-RC4000	4.532	4	10	6-1/8	2-1/4	6-1/8	4-1/2	5-1/2	4"-12	4	1,535.52



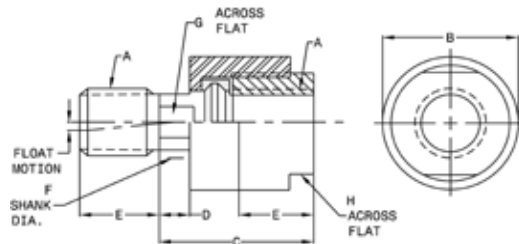
Alignment Coupler



1/16 Radial Float 2°
Spherical Motion

ALIGNMENT COUPLER	A	B	C	D	E	F	G	H	MAX PULL YIELD	LIST PRICE
MSCM-BD-437	7/16"-20	1-1/4	2	1/2	3/4	5/8	1/2	1	10,000	\$90.38
MSCM-BD-500	1/2"-20	1-1/4	2	1/2	3/4	5/8	1/2	1	14,000	90.38
MSCM-BD-625	5/8"-18	1-1/4	2	1/2	3/4	5/8	1/2	1	19,000	107.16
MSCM-BD-750	3/4"-16	1-3/4	2-5/16	1/2	1-1/8	31/32	13/16	1-1/2	34,000	81.52
MSCM-BD-875	7/8"-14	1-3/4	2-5/16	1/2	1-1/8	31/32	13/16	1-1/2	39,000	123.99
MSCM-BD-1000	1"-14	2-1/2	2-15/16	1/2	1-5/8	1-3/8	1-5/32	2-1/4	64,000	186.59
MSCM-BD-1250	1-1/4"-12	2-1/2	2-15/16	1/2	1-5/8	1-3/8	1-5/32	2-1/4	78,000	250.05
MSCM-BD-1500	1-1/2"-12	3-1/4	4-3/8	13/16	2-1/4	1-3/4	1-1/2	3	134,000	436.46
MSCM-BD-1750	1-3/4"-12	3-1/4	4-3/8	13/16	2-1/4	1-3/4	1-1/2	3	134,000	436.15
MSCM-BD-1875	1-7/8"-12	3-3/4	5-7/16	7/8	3	2	1-7/8	3-1/2	240,000	592.25

NOTE: Metric Thread Sizes Also Available



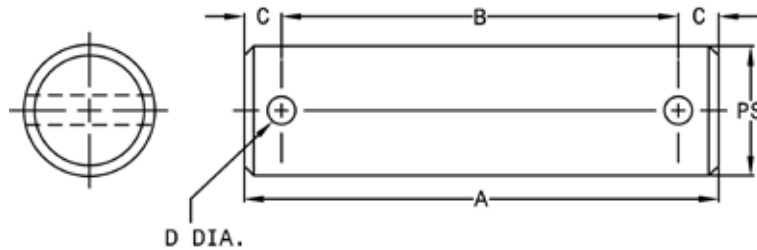
INDUSTRIAL MOUNTS

Pivot Pin



Material: 1144 Steel Nitrotec
Treated Surface

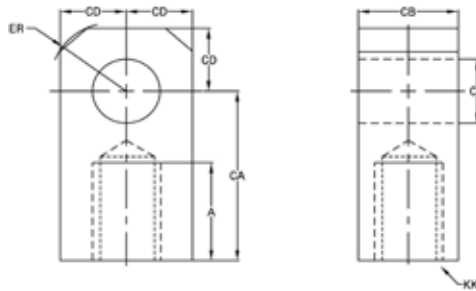
PART NUMBER	PIN SIZE	A	B	C	D	LIST PRICE
MSCM-PP0500	0.500	2.281	1.938	0.172	0.106	\$6.40
MSCM-PP0750	0.750	3.094	2.719	0.188	0.140	8.21
MSCM-PP1000	1.000	3.594	3.219	0.188	0.140	17.52
MSCM-PP1375	1.375	4.656	4.250	0.203	0.173	28.00
MSCM-PP1750	1.750	5.656	5.250	0.203	0.173	44.43
MSCM-PP2000	2.000	5.719	5.281	0.219	0.204	53.90
MSCM-PP2500	2.500	6.781	6.313	0.234	0.219	125.68



Material: 05 thru
13, C.F. Bar
Material: 17 thru
40, Steel Plate

Rod Eyes

PART NUMBER	A	CA	CB	CD	ER	KK	LIST PRICE
MSCM-RE0500	3/4	1-1/2	3/4	1/2	5/8	7/16"-20	\$18.63
MSCM-RE0750	1-1/8	2-1/16	1-1/4	3/4	7/8	3/4"-16	35.09
MSCM-RE1000	1-5/8	2-13/16	1-1/2	1	1-3/16	1"-14	57.45
MSCM-RE1375	2	3-7/16	2	1-3/8	1-9/16	1-1/4"-12	108.26
MSCM-RE1750	2-1/4	4	2-1/2	1-3/4	2	1-1/2"-12	151.70
MSCM-RE2000	3	5	2-1/2	2	2-1/2	1-7/8"-12	325.16
MSCM-RE2500	3-1/2	5-13/16	3	2-1/2	2-13/16	2-1/4"-12	475.23



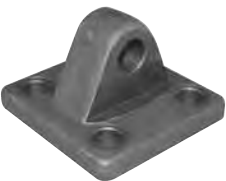
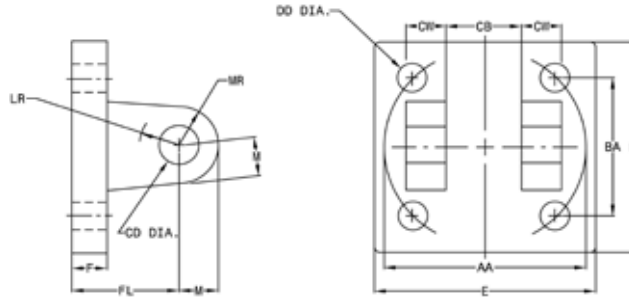
INDUSTRIAL MOUNTS



Clevis Bracket

PART NUMBER	AA	BA	CB	CD	CW	DD	E	F	FL	LR	M	MR	LIST PRICE
MSCM-BDCB-07	3.6	2-9/16	1.265	3/4	5/8	1/2"-20	3-1/2	5/8	1-7/8	1-1/16	3/4	1-1/16	\$125.25
MSCM-BDCB-10	4.6	3-1/4	1.515	1	3/4	5/8"-18	4-1/2	3/4	2-1/4	1-1/4	1	1-1/8	210.11
MSCM-BDCB-13	5.4	3-13/16	2.032	1-3/8	1	5/8"-18	5	7/8	3	7/8	1-3/8	1-3/4	239.13
MSCM-BDCB-20	8.2	5-3/4	2.531	2	1-1/4	1"-14	7-1/2	1	3-12	2-1/8	2	2-1/8	699.82

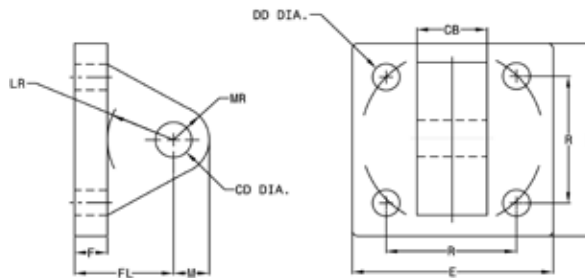
Material: Forging, Weldment, or Ductile Iron



Eye Bracket

PART NUMBER	CB	CD	DD	E	F	FL	LR	M	MR	R	LIST PRICE
MSCM-BDEB-05	3/4	1/2	13/32	2-1/2	3/8	1-1/8	3/4	1/2	9/16	1.63	\$31.78
MSCM-BDEB-07	1-1/4	3/4	17/32	3-1/2	5/8	1-7/8	1-1/4	3/4	7/8	2.56	58.74
MSCM-BDEB-10	1-1/2	1	21/33	4-1/2	3/4	2-1/4	1-1/2	1	1-1/4	3.25	95.89
MSCM-BDEB-13	2	1-3/8	21/32	5	7/8	3	2-1/8	1-3/8	1-5/8	3.81	164.80
MSCM-BDEB-17	2-1/2	1-3/4	29/32	6-1/2	7/8	3-1/8	2-1/4	1-3/4	2-1/8	4.95	324.96
MSCM-BDEB-20	2-1/2	2	1-1/16	7-1/2	1	3-1/2	2-1/2	2	2-7/16	5.75	568.17
MSCM-BDEB-25	3	2-1/2	1-3/16	8-1/2	1	4	3	2-1/2	3	6.59	733.19
MSCM-BDEB-30	3	3	1-5/16	9-1/2	1	4-1/4	3-1/4	3	3-1/4	7.50	890.81
MSCM-BDEB-40	4-1/2	4	2-1/16	14-7/8	1-15/16	6-7/16	4-1/2	4	5-1/4	11.50	3,885.26

Material: Forging, Weldment, Ductile Iron, or Carbon Steel



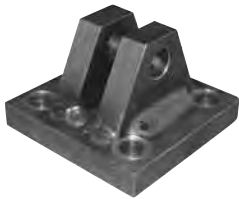
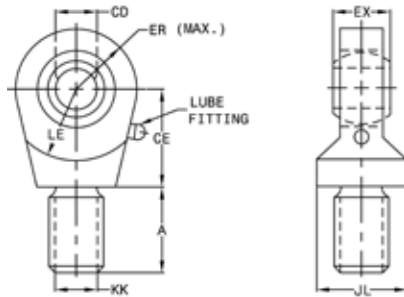
INDUSTRIAL MOUNTS



Spherical Rod Eye

PART NUMBER	CD	A	CE	EX	ER	LE	KK	JL REF	LOAD CAP	SPACER WIDTH	LIST PRICE
MSCM-RES-05	0.500	11/16	7/8	7/16	7/8	3/4	7/16"-20	7/8	2,600	0.150	\$114.85
MSCM-RES-07	0.750	1	1-1/4	21/32	1-1/4	1-1/16	3/4"-16	1-5/16	9,400	0.250	143.78
MSCM-RES-10	1.000	1-1/2	1-7/8	7/8	1-3/8	1-7/16	1"-14	1-1/2	16,800	0.250	154.13
MSCM-RES-13	1.375	2	2-1/8	1-3/16	1-13/16	1-7/8	1-1/4"-12	2	28,600	0.375	218.27
MSCM-RES-17	1.750	2-1/8	2-1/2	1-17/32	2-3/16	2-1/8	1-1/2"-12	2-1/4	43,000	0.416	505.31
MSCM-RES-20	2.000	2-7/8	2-3/4	1-3/4	2-5/8	2-1/2	1-7/8"-12	2-3/4	70,000	0.375	674.85

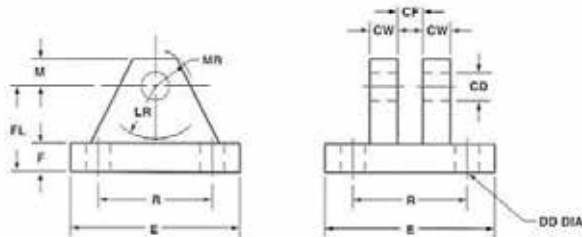
Material: Forging,
Weldment, or Ductile Iron



Spherical Clevis Brackets

PART NUMBER	E	F	M	R	CD	CF	CW	DD	FL	LR	MR	LIST PRICE
MSCM-CBS-0500	3.00	.50	.50	2.05	.500	.44	.50	.41	1.50	.94	.62	\$160.60
MSCM-CBS-0750	3.75	.62	.88	2.76	.750	.66	.62	.53	2.00	1.38	1.00	245.42
MSCM-CBS-1000	5.50	.75	1.00	4.10	1.000	.88	.75	.53	2.50	1.69	1.19	321.06
MSCM-CBS-1375	6.50	.88	1.38	4.95	1.375	1.19	1.00	.66	3.50	2.44	1.62	453.27
MSCM-CBS-1750	8.50	1.25	1.75	6.58	1.750	1.53	1.25	.91	4.50	2.88	2.06	669.94

Material: Steel Weldment



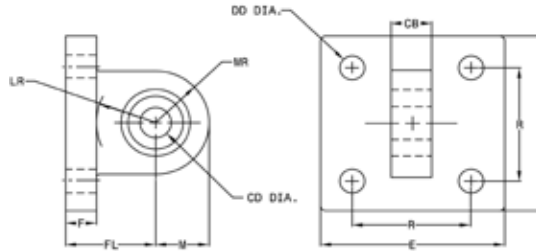
INDUSTRIAL MOUNTS AND PIVOT PINS



Spherical Eye Bracket

PART NUMBER	CB	CD	DD	E	F	FL	LR	M	MR	R	LIST PRICE
MSCM-BDS-07	3/4	3/4	17/32	3-1/2	5/8	1-7/8	1-1/4	1-3/16	1-3/16	2.56	\$450.46
MSCM-BDS-10	1	1	21/32	4-1/2	3/4	2-1/4	1-1/2	1-3/8	1-3/8	3.25	360.54
MSCM-BDS-13	1-3/8	1-3/8	21/32	5	7/8	3	2-1/8	2	2	3.81	585.31

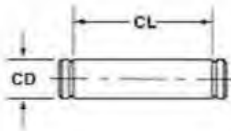
Material: Forging,
Weldment, or Ductile Iron



Pivot Pins for Spherical Clevis Brackets

PART NUMBER	CD	CL	LIST PRICE
MSCM-PPS0500	.4997-.0004	1 9/16	\$11.78
MSCM-PPS0750	.7497-.0005	2.1/32	18.23
MSCM-PPS1000	.9997-.0005	2 1/2	21.59
MSCM-PPS1375	1.3746-.0006	3 5/16	37.09
MSCM-PPS1750	1.7496-.0006	4 7/32	73.12
MSCM-PPS2000	1.9996-.0007	4 15/16	89.35

Material: CD1144
- Close tolerance on pin diameter



Repair Accessories

Contents	Page
Fluid Level Gauges and Filler Breathers	78
Pressure Gauges	79
Support Clamps	80 - 81
Suction Strainers	82
Metal Sight Glasses	83
Return Spin-On Filters	84 - 86
Plastic Cap Plugs	87 - 91
Bolted Split Flange Protectors	91
Face and Thread Seals	92
Connector Rings	93
Wave Springs	94
Carbon Steel Shims	95
Lock Nuts	96 - 97
Self Aligning Bearings	98 - 99
Set Screws and Wind-In Lock Wires	100
Nylon and Filter Vent Plugs	100
Steel Plugs and Vents	101
Port Plugs	102
Split Tension Bushings and Manual Bleeder Valves	103
Threadlocker and Seal Lube	104
PTFE Thread Seal and Silicone Tape	105
Grease Fittings and Caps	105
Cotter Pins	105
Couplings	106



SPECIFICATIONS:

- Black epoxy coated metal shroud with Polyamid sight tube
- Suitable for use with mineral and petroleum based hydraulic fluids, lubricants and gasoline
- Maximum operating temperature 194°F 90°C)
- Thermometer calibration from -20°F to 180°F (-10°C to 80°C)
- SNA 076 has M10 bolts as standard
- SNA 127, SNA 254 has M12 bolts as standard
- Tightening torque 70^l/b (7.9Nm)

Fluid Level Gauges



PART NUMBER	DESCRIPTION	LIST PRICE
MSSTF-SNA076BS0-10	FLUID LEVEL GAUGE 3" long without thermometer	\$18.94
MSSTF-SNA076BST-10	FLUID LEVEL GAUGE 3" long with thermometer	23.94
MSSTF-SNA127BST-12	FLUID LEVEL GAUGE 5" long with thermometer	24.51
MSSTF-SNA127BN012	FLUID LEVEL GAUGE 5" long without thermometer	22.34

SPECIFICATIONS:

- Chrome-Plated Metal Cap
- Cork Gaskets
- Air Flow to 25cfm

Filler Breather



PART NUMBER	DESCRIPTION	LIST PRICE
MSSTF-SES6-P-40-N06	FILLER BREATHER WEATHER PROOFED MINI 40 MICRON 3/8" NPT	\$15.01
MSSTF-SES3-P-40-S80	FILLER BREATHER WEATHER PROOFED 40 MICRON 80MM LONG BASKET	15.35
MSSTF-SES3-40-S80	FILLER BREATHER 40 MICRON 80MM LONG BASKET	14.30
MSSTF-SES3L-40-S80	FILLER BREATHER LOCKING TAB 40 MICRON 80MM LONG BASKET	21.96
MSSTF-SES3-40-S150	FILLER BREATHER 40 MICRON 150MM LONG BASKET	20.06
MSSTF-SES6-40-N04	FILLER BREATHER MINI 40 MICRON 1/4" NPT	10.23
MSSTF-SES6-40-N06	FILLER BREATHER MINI 40 MICRON 3/8" NPT	10.23
MSSTF-SES5-40-N12	FILLER BREATHER 40 MICRON 3/4" NPT	14.07

ACCESSORIES



Pressure Gauges



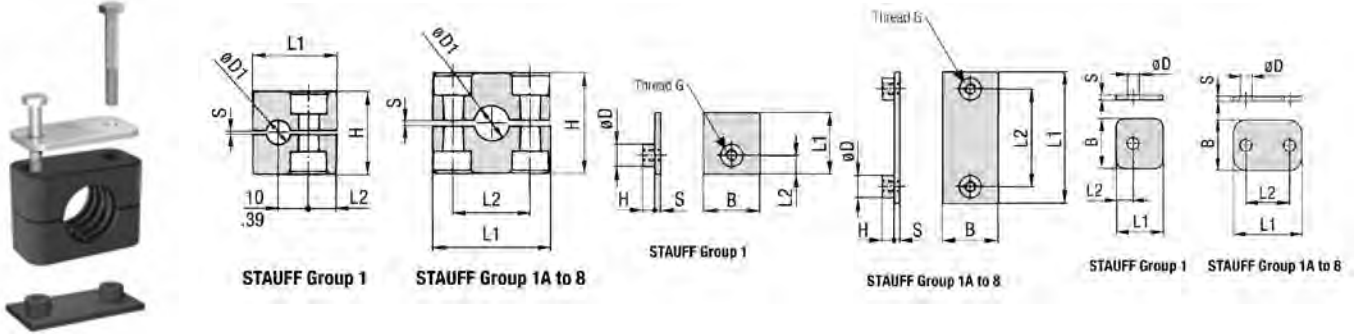
SPECIFICATIONS:

- Copper alloy bourden tube
- Dual scales
- Built in relief valve
- Operating temperatures
Ambient - 4°F to 140°F (-20°C to 60°C)
Media 150°F (+60°C)
- Acrylic lens
- Accuracy = 1.5% of full scale
- Built in snubber

PART NUMBER	DESCRIPTION	LIST PRICE
MSSTF-SPG-63-3030S	PRESSURE GAUGE 2.5" 30" HG - 30 PSI BOTTOM MOUNT	\$24.77
MSSTF-SPG-63-100S	PRESSURE GAUGE 2.5" 100 PSI BOTTOM MOUNT	24.77
MSSTF-SPG-63-160S	PRESSURE GAUGE 2.5" 160 PSI BOTTOM MOUNT	24.77
MSSTF-SPG-63-500S	PRESSURE GAUGE 2.5" 500 PSI BOTTOM MOUNT	24.77
MSSTF-SPG-63-600S	PRESSURE GAUGE 2.5" 600 PSI BOTTOM MOUNT	24.77
MSSTF-SPG-63-1000S	PRESSURE GAUGE 2.5" 1,000 PSI BOTTOM MOUNT	27.66
MSSTF-SPG-63-1500S	PRESSURE GAUGE 2.5" 1,500 PSI BOTTOM MOUNT	24.77
MSSTF-SPG-63-2000S	PRESSURE GAUGE 2.5" 2,000 PSI BOTTOM MOUNT	24.77
MSSTF-SPG-63-3000S	PRESSURE GAUGE 2.5" 3,000 PSI BOTTOM MOUNT	24.77
MSSTF-SPG-63-5000S	PRESSURE GAUGE 2.5" 5,000 PSI BOTTOM MOUNT	24.77
MSSTF-SPG-63-6000S	PRESSURE GAUGE 2.5" 6,000 PSI BOTTOM MOUNT	24.77
MSSTF-SPG-63-10000S	PRESSURE GAUGE 2.5" 10,000 PSI BOTTOM MOUNT	30.74
MSSTF-SPG-63-3000P-U	PRESSURE GAUGE 2.5" 3,000 PSI PANEL MOUNT	29.27
MSSTF-SPG-63-300S	PRESSURE GAUGE 2.5" 300 PSI BOTTOM MOUNT	24.77
MSSTF-SPG-63-5000P-U	PRESSURE GAUGE 2.5" 5,000 PSI PANEL MOUNT	29.28
MSSTF-SPG-100-10000S	PRESSURE GAUGE 4" 10,000 PSI BOTTOM MOUNT	84.94



Support Clamps - Standard Series DIN 3015, Part 1



Sales Part	Group	Clamp Body						Weld Plate						Cover Plate					List Price	
		Tube Size	L1	L2	H	S	Width	Thread G	L1	L2	B	S	H	OD	L1	L2	B	S		OD
MSSTF-SP1064PPDPASUW10K	1	1/4	1.1	0.37	1.06	0.02	1.18	1/4-20 UNC	1.24	0.39	1.18	0.12	0.26	0.47	1.1	0.37	1.18	0.12	0.28	\$3.06
MSSTF-SP1095PPDPASUW10K	1	3/8	1.1	0.37	1.06	0.02	1.18	1/4-20 UNC	1.24	0.39	1.18	0.12	0.26	0.47	1.1	0.37	1.18	0.12	0.28	3.06
MSSTF-SP2127PPDPASUW10K	2	1/2	1.65	1.02	1.3	0.02	1.18	1/4-20 UNC	1.65	1.02	1.18	0.12	0.26	0.47	1.59	1.02	1.18	0.12	0.28	3.82
MSSTF-SP216PPDPASUW10K	2	5/8	1.65	1.02	1.3	0.02	1.18	1/4-20 UNC	1.65	1.02	1.18	0.12	0.26	0.47	1.59	1.02	1.18	0.12	0.28	3.82
MSSTF-SP319PPDPASUW10K	3	3/4	1.97	1.3	1.42	0.02	1.18	1/4-20 UNC	1.97	1.3	1.18	0.12	0.26	0.47	1.89	1.3	1.18	0.12	0.28	4.03
MSSTF-SP3254PPDPASUW10K	3	1	1.97	1.3	1.42	0.02	1.18	1/4-20 UNC	1.97	1.3	1.18	0.12	0.26	0.47	1.89	1.3	1.18	0.12	0.28	4.03
MSSTF-SP532PPDPASUW10K	5	1-1/4	2.8	2.05	2.28	0.03	1.18	1/4-20 UNC	2.8	2.05	1.18	0.12	0.26	0.47	2.76	2.05	1.18	0.12	0.28	5.00
MSSTF-SP538PPDPASUW10K	5	1-1/2	2.8	2.05	2.28	0.03	1.18	1/4-20 UNC	2.8	2.05	1.18	0.12	0.26	0.47	2.76	2.05	1.18	0.12	0.28	5.00

KIT INCLUDES:

- Clamp Body
- Weld Plate
- Cover Plate
- Hexagon Head Bolts

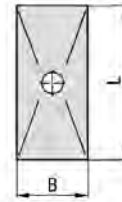
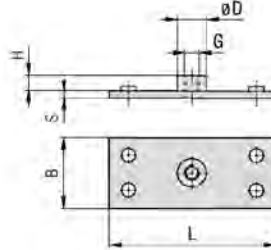
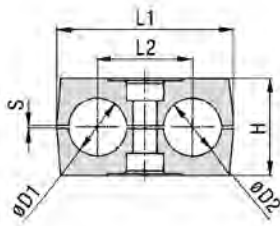
MATERIAL:

- Clamp Body – Polypropylene
- Weld Plate – Carbon Steel, phosphated
- Cover Plate – Carbon Steel, zinc/nickel-plated
- Bolts – Carbon Steel, zinc/nickel-plated

ACCESSORIES



Support Clamps - Twin Series DIN 3015, Part 3



Sales Part	Clamp Body						Weld Plate						Cover Plate					List Price
	Tube Size D1/D2	L1	L2	H	S	Width	L	B	S	H	OD	G Thread	L Length	B Width	H Height	S Thick	OD	
MSSTF-SP2095/095PPGDASUW10K	3/8	2.09	1.14	1.06	0.03	1.18	2.17	1.18	0.2	0.24	0.55	5/16-18 UNC	2.05	1.18	0.28	0.12	0.35	\$4.45
MSSTF-SP2127/127PPGDASUW10K	1/2	2.09	1.14	1.06	0.03	1.18	2.17	1.18	0.2	0.24	0.55	5/16-18 UNC	2.05	1.18	0.28	0.12	0.35	4.45
MSSTF-SP216/16PPGDASUW10K	5/8	2.09	1.14	1.06	0.03	1.18	2.17	1.18	0.2	0.24	0.55	5/16-18 UNC	2.05	1.18	0.28	0.12	0.35	4.49
MSSTF-SP319/19PPGDASUW10K	3/4	2.64	1.42	1.46	0.03	1.18	2.76	1.18	0.2	0.24	0.55	5/16-18 UNC	2.56	1.18	0.28	0.12	0.35	5.40
MSSTF-SP322/22PPGDASUW10K	7/8	2.64	1.42	1.46	0.03	1.18	2.76	1.18	0.2	0.24	0.55	5/16-18 UNC	2.56	1.18	0.28	0.12	0.35	5.40

KIT INCLUDES:

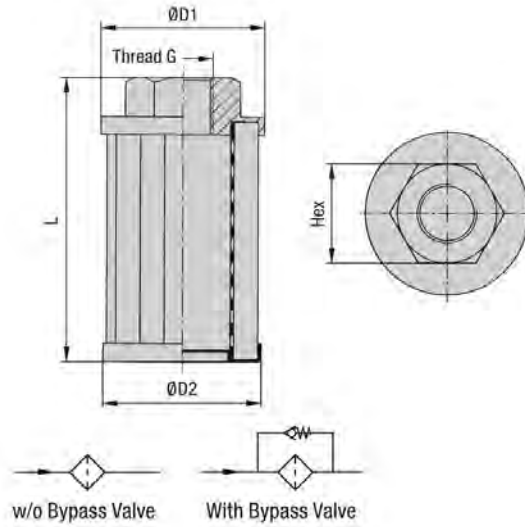
- Clamp Body
- Weld Plate
- Cover Plate
- Hexagon Head Bolts

MATERIAL:

- Clamp Body – Polypropylene
- Weld Plate – Carbon Steel, phosphated
- Cover Plate – Carbon Steel, zinc/nickel-plated
- Bolts – Carbon Steel, zinc/nickel-plated



Suction Strainers



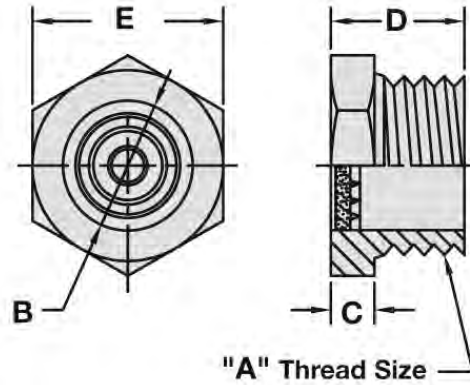
Sales Part No	Description	OD1	OD2	L	Hex	List Price
MSSTF-TFS-100-0	1 NPT, 13 GPM, No Bypass	2.68	2.6	5.51	1.65	\$26.86
MSSTF-TFS-120-0	1.25 NPT, 16.9 GPM, No Bypass	3.46	3.35	7.68	2.36	35.41
MSSTF-TFS-120-3	1.25 NPT, 16.9 GPM, 3 PSI Bypass	3.46	3.35	7.68	2.36	36.41
MSSTF-TFS-150-0	1.5 NPT, 36.4 GPM, No Bypass	3.46	3.35	8.9	2.36	45.18
MSSTF-TFS-200-0	2 NPT, 59.8 GPM, No Bypass	3.46	3.35	10.24	2.76	56.16
MSSTF-TFS-250-0	2.5 NPT, 88.4 GPM, No Bypass	5.91	5.71	8.39	3.54	80.58
MSSTF-TFS-300-0	3 NPT, 104 GPM, No Bypass	5.91	5.71	10.71	3.94	90.34

FEATURES:

- Stainless steel mesh, 125 µm
- Aluminum end caps
- Suitable for mineral and petroleum based hydraulic fluids
- Temperature to 212 °F



Metal Sight Glasses



Sales Part No	Description	OD	L1	L2	Hex	List Price
MSSTF-SLW-06	3/8-18 NPT, 3700 PSI	0.44	0.72	0.32	0.75	\$6.52
MSSTF-SLW-08	1/2-14 NPT, 3500 PSI	0.56	0.78	0.32	0.94	6.78
MSSTF-SLW-12	3/4-14 NPT, 3000 PSI	0.75	0.94	0.32	1.38	7.67
MSSTF-SLW-16	1-11-1/2 NPT, 2500 PSI	0.94	1.25	0.32	1.38	13.40

FEATURES:

- Electroless nickel-plated steel housings
- Hermetically sealed prism glass lenses
- Temperatures to 500 °F

ACCESSORIES

High Pressure Spin-On Filters

MSO high pressure spin-on filters are interchangeable with Donaldson Duramax® HMK04 and HMK05 series.



MSO Part Number	Outside Diameter (in / mm)	Length (in/mm)	Micron Rating $\beta_x \geq 200$	Micron Rating $\beta_x (c) \geq 000$	Max Flow Rate (GPM)	Stauff Part Number	Donaldson Part Number	Parker Part Number	List Price
MSHFP-SF7410MG	3-3/4"/95.3	6"/152.4	-	20	35	SF-7410-MG	P164375	944022Q	\$53.50
MSHFP-SF7520MG	4-3/4"/120.7	11-1/2"/292.1	12	10	50	SF-7520-MG	P165675/ P176567	944038Q	77.93

Material	Micro Glass Media		
Temperature Range	-20° to 250°F (-29° to 121°C)		
	Max Working Pressure	Min Static Burst	Min Element Collapse
MSSF-7400 Series	500 psi	1000 psi	150 psi
MSSF-7500 Series	350 psi	800 psi	200 psi

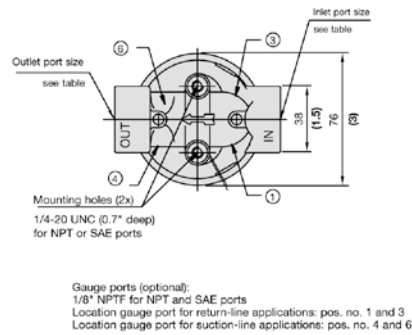
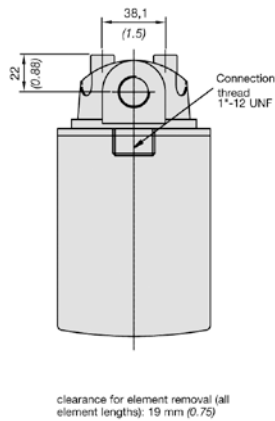
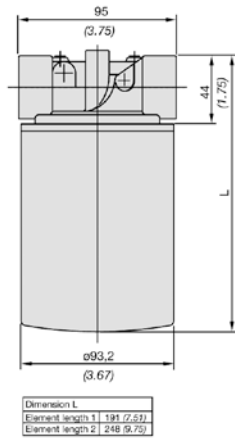
MSO Brand Return Spin-On Filters



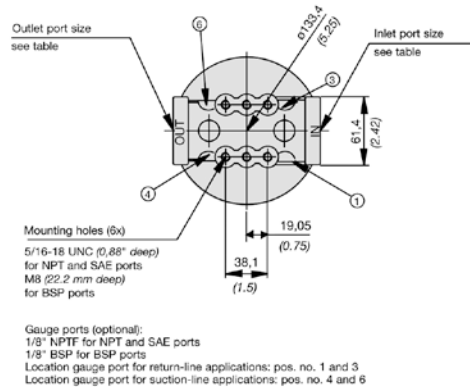
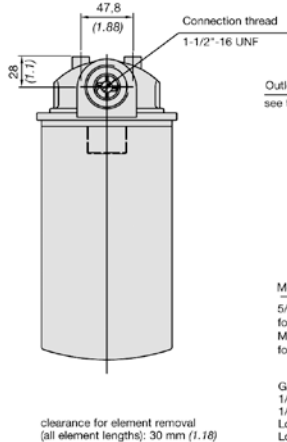
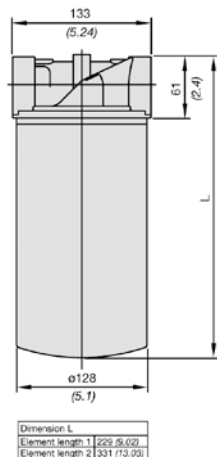
SPECIFICATIONS:

- MSO SF6500 Series spin-on elements are used with the MSO SAF series spin-on filters.
- MSO SF6700 Series spin-on elements are used with the MSO SSF150 spin-on filters.
- Seals: NBR
- Working pressure: Max 14 bar (200 PSI), maximum pressure differential of 5.5 bar (80PSI) for any application with no bypass valve
- Temperature range: -32°C to 100°C (-25°F to 212°F)
- Mineral oils, other fluids on request

SAF07 Spin-On Filter Dimensions



SSF150 Spin-On Filter Dimensions



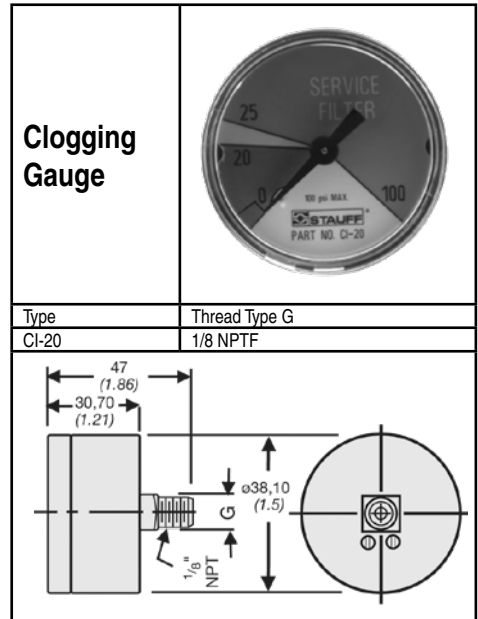
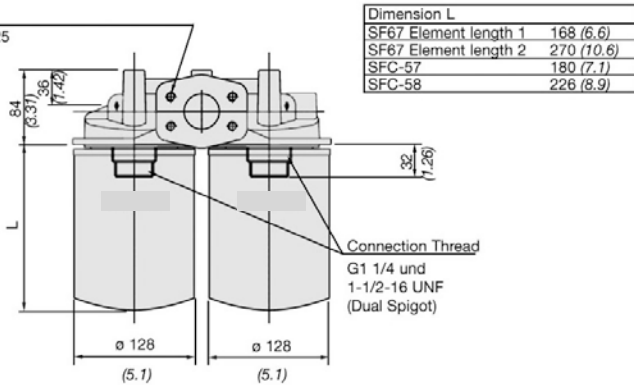
ACCESSORIES

FILTER HEADS			ELEMENTS			CLOGGING GAUGE		
PART NUMBER	DESCRIPTION	LIST PRICE	PART NUMBER	DESCRIPTION	LIST PRICE	PART NUMBER	DESCRIPTION	LIST PRICE
MSHFP-SAF-07-25-1	25 GPM Return Line ¾ NPT Port Connection 25 PSI By-Pass Return Gauge Port Drilled	\$22.58	HFP-SF6520	10 µm filter paper 5.76" long x 3.67" diam	\$13.63	STF-CI-20	Visual Red/Green Gauge 25 PSI By-Pass 1/8" NPTF	\$15.27
			HFP-SF6510	25 µm filter paper 5.76" long x 3.67" diam	13.63			
MSHFP-SSF-150-25-1	80 GPM Return Line 1½ NPT Port Connection 25 PSI By-Pass Return Gauge Port Drilled	\$49.31	HFP-SF6720	10 µm filter paper 6.6" long x 5.1" diam	23.83			
			HFP-SF6710	25 µm filter paper 6.6" long x 5.1" diam	23.83			
MSHFP-SSF-25-25-1	Double Spin-On Filter Head 120 GPM Return Line 1½ NPT and 2 SAE Code 61 Flange Port Connections 25 PSI By-Pass Return Gauge Port Drilled	\$198.39	HFP-SF6720	10 µm filter paper 6.6" long x 5.1" diam	23.83			
			HFP-SF6710	25 µm filter paper 6.6" long x 5.1" diam	23.83			

200 PSI Filter Operating Pressure

SSF25 Spin-On Filter Dimensions

Mounting holes (4x)
1/2-13 UNC for SSF-25
M12 for SSF-25B



PLASTIC CAP PLUGS

CAP PLUG APPLICATION CHART

MSCAP	NPT		INCH THREAD		METRIC THREAD	
	CAPS	PLUGS	CAPS	PLUGS	CAPS	PLUGS
00				10/32	M2,M2.5	M5
0				1/4	M3,M3.5	M6
1				5/16	M5	M8x1
1-X					M6	
2			15/64	3/8	M7	M10x1.25
2-X		1/8				
3				7/16	M8x1	M12
3-X			3/8			M12x1.25
4	1/8	1/4		1/2	M10x1.25	M14
4-X			7/16			M14x1.5
5			1/2	9/16		
5-X					M12x1.25	M16
6	1/4			5/8		
6-X		3/8	9/16			M18
7			5/8		M14x1.5	M18x1.5
7-X						
8				3/4		M20
8-X	3/8				M16x1.5	M20x1.5
9		1/2				M22
9-X			3/4			M22x1.5
10				7/8	M18x1.5	M24
11	1/2					M24x2
11-X			7/8		M20x1.5	
12		3/4				
12-X				1-1/16	M22x1.5	M27x2
13	3/4				M24x2	
13-X			1-1/16			M30x2
14		1			M27x2	M33
17		1-1/4			M36x3	
17-S				1-5/8		
18	1-1/4		1-5/8	1-3/4	M39x3	
19		1-1/2		1-7/8		
20	1-1/2		1-7/8			
20-S						
21						
220						
230			2-1/4			
24-S		2				
240	2					
250			2-1/2			

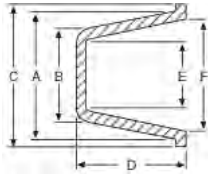


This style cap plug is equipped with a handy fold-down pull ring.

Tapered Caps & Plugs With Pull Ring

Part Number	NPT Port Size	OD Size Tapered	HT	Min Std Pkg	List Price
MSCAP-PR-9	1/8	.337/.375	1/4	50	\$0.13
MSCAP-PR-12	1/4	.436/.475	1/4	50	0.39
MSCAP-PR-17	3/8	.552/.615	3/8	50	0.23
MSCAP-PR-22	1/2	.668/.767	1/2	40	0.25
MSCAP-PR-27X	3/4	.878/.977	1/2	40	0.28
MSCAP-PR-32	1	1.113/1.212	1/2	25	0.31
MSCAP-PR-39	1-1/4	1.505/1.580	1/2	25	0.40
MSCAP-PR-43	1-1/2	1.780/1.860	1/2	20	0.44
MSCAP-PR-50	2	2.226/2.258	1/2	20	0.55

PLASTIC CAP PLUGS



Tapered Caps & Plugs For Misc. Applications

Part Number	A	B	C	D	E	F	List Price
MSCAP-00	.180	.115	5/16	13/32	.051	.118	\$0.28
MSCAP-0	.240	.175	3/8	3/8	.109	.175	0.42
MSCAP-0-X	0.275	0.209	7/16	3/8	0.150	0.209	0.09
MSCAP-1	.302	.240	15/32	3/8	.175	.240	0.30
MSCAP-1-X	.335	.265	15/32	3/8	.240	.275	0.30
MSCAP-2	.365	.300	17/32	3/8	.234	.301	0.30
MSCAP-3	.428	.360	19/32	3/8	.299	.365	0.26
MSCAP-3-X	.460	.390	5/8	3/8	.325	.396	0.30
MSCAP-4-X	.512	.447	5/8	3/8	.385	.448	0.05
MSCAP-5	.547	.490	23/32	1/2	.409	.485	0.05
MSCAP-5-X	.568	.500	3/4	7/16	.435	.503	0.06
MSCAP-6	.620	.531	3/4	1/2	.468	.555	0.05
MSCAP-6A-X	0.576	0.500	0.720	0.470	0.440	0.516	0.10
MSCAP-7	.675	.590	7/8	17/32	.520	.605	0.06
MSCAP-7-X	.695	.610	27/32	1/5	.549	.634	0.09
MSCAP-8	.728	.641	7/8	1/2	.575	.665	0.06
MSCAP-8-X	.754	.675	7/8	5/8	.615	.690	0.06
MSCAP-9-X	.925	.725	1	3/4	.662	.760	0.06
MSCAP-10	.848	.750	1-1/32	5/8	.686	.785	0.06
MSCAP-11	.910	.802	1-3/32	3/4	.740	.846	0.23
MSCAP-11-X	.931	.820	1-1/8	5/8	.754	.868	0.06
MSCAP-12A-X	0.973	0.856	1-1/8	3/4	0.768	0.906	0.17
MSCAP-13	1.091	.966	1-1/4	3/4	.902	1.025	0.23
MSCAP-13-X	1.145	1.002	1-5/16	3/4	.938	1.079	0.09
MSCAP-14-X	1.285	1.180	1-7/16	3/4	1.105	1.215	0.70
MSCAP-16A-X	1.312	1.276	1.380	0.560	1.155	1.190	0.25
MSCAP-17A-X	1.507	1.344	1-3/4	15/16	1.282	1.450	0.27
MSCAP-18	1.680	1.560	1-7/8	3/4	1.497	1.620	0.19
MSCAP-20	1.958	1.806	2.125	1	1.745	1.893	0.76
MSCAP-20-X	2.310	1.940	2.470	0.880	1.875	2.255	0.46
MSCAP-21	2.078	1.902	2-1/4	1	1.839	2.015	0.31
MSCAP-38	1.045	.980	1-1/4	1/2	.916	.984	0.30
MSCAP-220	2.132	1.980	2-1/4	1	1.915	2.068	0.31
MSCAP-230	2.330	2.156	2-5/8	1	2.094	2.264	0.86
MSCAP-240	2.465	2.300	2-5/8	1	2.235	2.400	0.40
MSCAP-250	2.605	2.395	2-5/8	1	2.331	2.541	0.42

Tapered Caps & Plugs For NPT Style Ports

Part Number	NPT Port Size	OD Size Tapered	HT	Min Std Pkg	List Price
MSCAP-2-X	1/8	.330/.396	3/8	50	\$0.09
MSCAP-4	1/4	.419/.485	3/8	50	0.09
MSCAP-6-X	3/8	.550/.631	7/16	50	0.13
MSCAP-9	1/2	.690/.788	9/16	50	0.13
MSCAP-12	3/4	.870/.975	5/8	120	0.06
MSCAP-12-X	3/4	.915/1.040	11/16	25	0.25
MSCAP-14	1	1.094/1.215	3/4	25	0.25
MSCAP-15	1	1.225/1.355	3/4	3	0.43
MSCAP-15-X	1	1.235/1.350	3/4	25	0.28
MSCAP-17	1-1/4	1.450/1.600	3/4	60	0.13
MSCAP-17-S	1-1/4	1.513/1.600	1/2	25	1.04
MSCAP-19	1-1/2	1.735/1.870	3/4	25	0.43
MSCAP-20-S	1-1/2	1.781/1.805	3/8	25	0.28
MSCAP-24-S	2	2.230/2.260	1/2	20	0.34

MCAP Tapered Caps & Plugs For Misc. Applications



Part Number	A mm	B mm	C mm	D mm	E mm	F mm	List Price
MSCAP-M10X1	13.00	11.35	15.88	10.32	9.78	11.38	\$0.05
MSCAP-M12X1	14.43	12.70	19.05	11.11	11.05	12.78	0.06
MSCAP-M12X1.5	14.63	12.70	18.29	11.94	11.18	13.11	0.10
MSCAP-M14X1.5	17.15	14.99	22.23	13.49	13.21	15.37	0.06
MSCAP-M16X1.5	19.15	17.15	22.23	15.88	15.62	17.53	0.06
MSCAP-M18X1.5	21.54	19.05	26.19	15.88	17.42	19.74	0.06
MSCAP-M20X1.5	24.71	21.74	28.58	19.05	19.51	23.01	0.17
MSCAP-M22X1.5	26.42	22.73	29.37	19.05	21.13	24.77	0.25
MSCAP-M25X1.5	29.08	25.45	33.34	19.05	23.83	27.41	0.09
MSCAP-M26X1.5	29.08	25.45	33.34	19.05	23.83	27.41	0.09
MSCAP-M27	31.12	29.19	38.50	19.05	26.37	29.97	0.25
MSCAP-M28X1.5	32.81	29.59	36.10	19.05	27.69	30.61	0.70
MSCAP-M30X2	33.32	32.41	35.05	14.22	29.34	30.23	0.25
MSCAP-M35	38.53	34.14	44.45	23.81	32.56	36.83	0.27
MSCAP-M39	42.49	39.62	47.63	19.05	38.02	41.15	0.19
MSCAP-M4	6.99	5.31	11.11	9.53	3.81	5.31	0.09
MSCAP-M42X2	44.45	40.79	49.21	19.05	39.83	42.80	0.63
MSCAP-M45	49.73	45.87	53.98	25.40	44.32	48.08	0.76
MSCAP-M48	58.67	49.28	62.74	22.35	47.63	57.28	0.46
MSCAP-M5	7.67	6.1	11.91	9.53	4.45	6.1	0.30
MSCAP-M6	8.51	6.73	11.91	9.53	5.18	6.99	0.30
MSCAP-M8X1	10.87	9.14	15.08	9.53	7.59	9.27	0.26

PLASTIC CAP PLUGS



**Female Threaded Cap Plugs
for J.I.C. Fittings**

Part Number	Std Thread Size	O.D. Size Tube	Dash Size	Min Std Pkg	List Price
MSCAP-G-2	7/16-20	1/4	#4	20	\$0.25
MSCAP-G-8	9/16-18	3/8	#6	20	0.25
MSCAP-G-14	3/4-16	1/2	#8	20	0.28
MSCAP-G-18	7/8-14	5/8	#10	20	0.28
MSCAP-G-20	7/8-18	5/8	#10	20	0.61
MSCAP-G-22	1-1/16-12	3/4	#12	20	0.34
MSCAP-G-25	1-3/16-12	7/8	#14	20	0.40
MSCAP-G-27	1-5/16-12	1	#16	20	0.40



Flat Face Fitting Caps

Part Number	Tube Size OD	Thread Size	Min Std Pkg	List Price
MSCAP-PDF-40	1/4	9/16-18	25	\$0.39
MSCAP-PDF-60	3/8	11/16-16	25	0.34
MSCAP-PDF-80	1/2	13/16-16	25	0.39
MSCAP-PDF-100	5/8	1-14	20	0.41
MSCAP-PDF-120	3/4	1-3/16-12	20	0.49
MSCAP-PDF-160	1	1-7/16-12	10	2.25



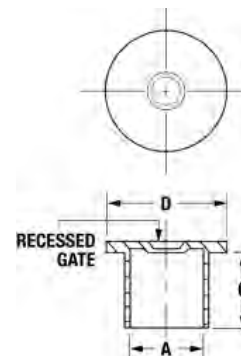
O-Ring Face Fitting Caps

These low density polyethylene caps are designed to fit female o-ring face seals.

Part Number	Thread Size	Min Std Pkg	List Price
MSCAP-OR-4	9/16-18	35	\$0.26
MSCAP-OR-6	11/16-16	25	0.29
MSCAP-OR-8	13/16-16	25	0.32
MSCAP-OR-10	1-14	25	0.40
MSCAP-OR-12	1-3/16-12	25	0.42
MSCAP-OR-16	1-7/16-12	15	0.96
MSCAP-OR-20	1-11/16-12	10	1.60



Unlike tear-tab closures that can only be used once, the CAP-PO series is designed to be reused. Specifically designed to protect straight threads with or without o-rings, this unique design is also ideal for use on a variety of thread forms and non-threaded fittings.



Straight Threaded Cap Plugs

Part Number	Min Std Pkg	To Cap Thread size	A	C	D	List Price
MSCAP-PO-20	25	7/16"	0.428	0.47	0.69	\$0.42
MSCAP-PO-30	25	1/2"	0.49	0.47	0.75	0.58
MSCAP-PO-40	25	9/16"	0.55	0.50	0.81	0.61
MSCAP-PO-50	25	11/16"	0.676	0.50	0.94	0.67
MSCAP-PO-55	25	-	0.721	0.67	1.00	0.70
MSCAP-PO-60	25	3/4"	0.738	0.67	1.00	0.70
MSCAP-PO-70	25	13/16"	0.802	0.56	1.06	0.73
MSCAP-PO-80	25	7/8"	0.864	0.66	1.12	0.75
MSCAP-PO-90	25	1.00"	0.99	0.66	1.25	0.79
MSCAP-PO-100	15	1-1/16"	1.051	0.75	1.31	0.84
MSCAP-PO-110	15	1-3/16"	1.175	0.75	1.44	1.02
MSCAP-PO-120	15	1-5/16"	1.298	0.75	1.56	1.15
MSCAP-PO-130	15	1-7/16"	1.426	0.75	1.69	1.42
MSCAP-PO-140	10	1-5/8"	1.12	0.85	1.88	1.57

**Cap Plug Assortment Kits
Also Available -
See the Kit & Tool Section**

PLASTIC CAP PLUGS



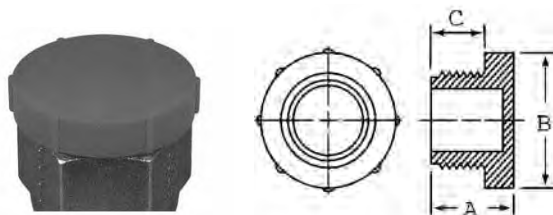
Male Threaded Pipe Plugs (Sq. Top)

Part Number	NPT Port Size	Thread Size	Min Std Pkg	List Price
MSCAP-P-18	1/8	0.364	25	\$0.13
MSCAP-P-28	1/4	0.477	25	0.25
MSCAP-P-38	3/8	0.612	25	0.28
MSCAP-P-48	1/2	0.758	25	0.28
MSCAP-P-68-H	3/4	0.968	25	0.31
MSCAP-P-88-H	1	1.214	20	1.25
MSCAP-TP-13	1-1/4	1.557	5	2.17
MSCAP-TP-15	1-1/2	1.796	5	2.17



Male Threaded Cap Plugs for Flared J.I.C. Fittings

Part Number	Std Thread Size	OD Size Tube	Dash Size	Min Std Pkg	List Price
MSCAP-PD-40	7/16-20	1/4	#4	25	\$0.41
MSCAP-PD-50	1/2-20	5/16	#5	25	0.41
MSCAP-PD-60	9/16-18	3/8	#6	25	0.25
MSCAP-PD-80	3/4-16	1/2	#8	25	0.25
MSCAP-PD-100	7/8-14	5/8	#10	25	0.28
MSCAP-PD-120	1-1/16-12	3/4	#12	25	0.28
MSCAP-PD-140	1-3/16-12	7/8	#14	20	0.42
MSCAP-PD-160	1-5/16-12	1	#16	20	0.42
MSCAP-PD-200	1-5/8-12	1-1/4	#20	15	0.52
MSCAP-PD-220	1-3/4-12	1-3/8	#22	10	1.32
MSCAP-PD-240	1-7/8-12	1-1/2	#24	10	1.19



Miscellaneous - MCAP- TP

Part Number	To Fit Metric Thread Size	A		B		C		Min Std Pkg	List Price
		in	mm	in	mm	in	mm		
MSMCAP-TP-M8X1	M8 x 1	0.562	14.27	0.484	12.29	0.374	9.50	10	\$0.72
MSMCAP-TP-M10X1	M10 x 1	0.574	14.58	0.602	15.29	0.409	10.39	10	1.00
MSMCAP-TP-M12X1	M12 x 1	0.657	16.69	0.728	18.49	0.421	10.69	10	1.07
MSMCAP-TP-M12X1.5	M12 x 1.5	0.641	16.28	0.657	16.69	0.342	8.69	10	1.24
MSMCAP-TP-M14X1.5	M14 x 1.5	0.677	17.20	0.728	18.49	0.374	9.50	10	1.31
MSMCAP-TP-M16X1.5	M16 x 1.5	0.677	17.20	0.866	22.00	0.492	12.50	10	1.28
MSMCAP-TP-M18X1.5	M18 x 1.5	0.720	18.29	0.960	24.38	0.539	13.69	10	1.35
MSMCAP-TP-M20X1.5	M20 x 1.5	0.716	18.19	1.035	26.29	0.551	14.00	10	1.28
MSMCAP-TP-M22X1.5	M22 x 1.5	0.720	18.29	1.110	28.19	0.539	13.69	10	1.28
MSMCAP-TP-M24X1.5	M24 x 1.5	0.728	18.49	1.232	31.29	0.543	13.79	10	1.47
MSMCAP-TP-M25X1.5	M25 x 1.5	0.728	18.49	1.232	31.30	0.551	14.00	5	1.62
MSMCAP-TP-M26X1.5	M26 x 1.5	0.736	18.69	1.287	32.69	0.543	13.79	5	1.65
MSMCAP-TP-M52X1.5	M52 x 1.5	0.846	21.50	2.508	63.70	0.610	15.50	5	5.39

PLASTIC CAP PLUGS



These low density polyethylene caps protect the faces of split flange connectors

Split Flange Coupling Caps - SAE CODE 61

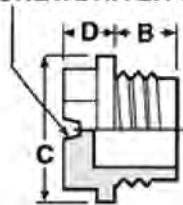
Part Number	Flange Size	Cap Size	Min Std Pkg	List Price
MSCAP-SF-8	1/2	1.19	50	\$0.13
MSCAP-SF-10	5/8	1.35	50	0.19
MSCAP-SF-12	3/4	1.50	50	0.23
MSCAP-SF-16	1	1.75	35	0.25
MSCAP-SF-20	1-1/4	2.00	35	0.26
MSCAP-SF-24	1-1/2	2.38	25	0.40
MSCAP-SF-32	2	2.81	15	0.53
MSCAP-SF-40	2-1/2	3.31	15	0.75

Split Flange Coupling Caps - SAE CODE 62

Part Number	Flange Size	Cap Size	Min Std Pkg	List Price
MSCAP-HPSF-8	1/2	1.25	10	\$1.33
MSCAP-HPSF-12	3/4	1.625	10	1.50
MSCAP-HPSF-16	1	1.87	10	1.54
MSCAP-HPSF-20	1-1/4	2.125	10	1.58
MSCAP-HPSF-24	1-1/2	2.5	10	1.80
MSCAP-HPSF-32	2	3.125	10	1.79



SCREWDRIVER SLOT



Threaded O-Ring Plugs

Part Number	Std Thread Size	B	C	D	Min Std Pkg	List Price
MSCAP-TF-9-OR	9/16-18	0.35	0.81	0.19	10	\$1.61
MSCAP-TF-12-OR	3/4-16	0.44	0.89	0.18	10	1.70

BOLTED SPLIT FLANGE PROTECTORS



3,000 PSI Flanges
SAE Code 61

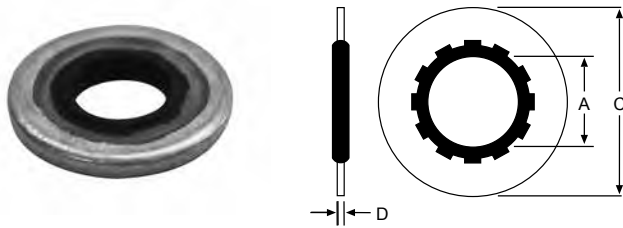
Part Number	Port Size	Min Std Pkg	List Price
MSCAP-8218	1/2	10	\$1.61
MSCAP-8219	3/4	10	1.65
MSCAP-8220	1	10	1.76
MSCAP-8221	1-1/4	10	1.87
MSCAP-8222	1-1/2	10	1.99
MSCAP-8223	2	10	2.20
MSCAP-8224	2-1/2	10	2.20

5,000 PSI Flanges
SAE Code 62

Part Number	Port Size	Min Std Pkg	List Price
MSCAP-XP-075	3/4	10	\$1.65
MSCAP-XP-100	1	10	1.76
MSCAP-XP-125	1-1/4	10	1.87
MSCAP-XP-150	1-1/2	10	1.99
MSCAP-XP-200	2	10	2.20

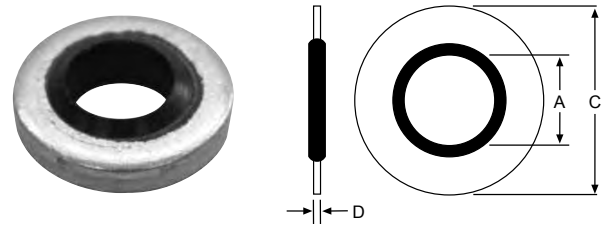
Cap Plug Assortment Kits
Also Available -
See the Kit & Tool Section

STYLE MS110 FACE SEALS



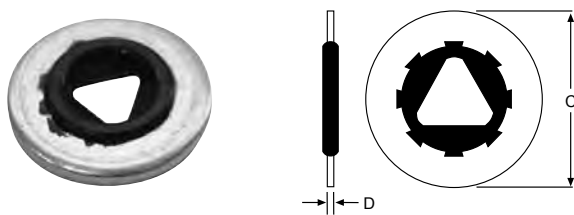
Part Number	Max Screw Size	A Rubber I.D.	B Steel I.D.	C Steel O.D.	D Steel Thick.	List Price
MSDY-110X8	.164	.156	.255	.385	.041	\$1.52
MSDY-110X10	.177	.180	.317	.443	.050	2.11
MSDY-110X3/16	.190	.220	.281	.425	.054	4.13
MSDY-110X7/32	.216	.246	.307	.455	.054	14.59
MSDY-110X1/4	.250	.240	.381	.505	.054	2.45
MSDY-110X5/16	.312	.301	.488	.603	.054	2.50
MSDY-110X3/8	.375	.368	.546	.666	.054	2.54
MSDY-110X7/16	.437	.427	.618	.760	.054	6.24
MSDY-110X1/2	.500	.490	.696	.880	.054	6.93
MSDY-110X9/16	.562	.552	.759	1.067	.054	6.93
MSDY-110X5/8	.625	.615	.818	1.193	.054	8.48

STYLE MSSB FACE SEALS



Part Number	A	C	D	List Price
MSDY-SB-001	.115	.250	.048	\$2.13
MSDY-SB-002	.157	.286	.048	2.13
MSDY-SB-003	.205	.330	.051	1.66
MSDY-SB-004	.270	.520	.051	1.66
MSDY-SB-005	.270	.525	.048	2.35
MSDY-SB-006	.322	.525	.048	2.35
MSDY-SB-007	.340	.560	.051	1.70
MSDY-SB-020A	.408	.625	.083	1.81
MSDY-SB-008	.443	.723	.083	1.81
MSDY-SB-009	.460	.750	.083	1.83
MSDY-SB-225	.531	.866	.059	1.87
MSDY-SB-021B	.541	.810	.083	1.83
MSDY-SB-010	.585	.875	.083	2.00
MSDY-SB-022BB	.625	.875	.083	2.02
MSDY-SB-011	.650	1.000	.083	2.06
MSDY-SB-023C	.680	.937	.083	2.09
MSDY-SB-012	.715	1.000	.097	2.09
MSDY-SB-024CC	.775	1.060	.097	2.29
MSDY-SB-025D	.848	1.125	.097	2.58
MSDY-SB-026E	.925	1.250	.097	2.83
MSDY-SB-013	.955	1.310	.097	4.95
MSDY-SB-027F	1.065	1.375	.097	3.44
MSDY-SB-240	1.083	1.417	.07	3.52
MSDY-SB-028	1.095	1.520	.097	4.47
MSDY-SB-014	1.150	1.440	.092	4.89
MSDY-SB-029G	1.213	1.500	.097	5.20
MSDY-SB-015	1.280	1.630	.128	5.58
MSDY-SB-031	1.329	1.685	.092	6.13
MSDY-SB-030H	1.334	1.685	.133	5.24
MSDY-SB-016	1.410	1.750	.133	12.02
MSDY-SB-032J	1.690	2.062	.103	10.04
MSDY-SB-033K	1.907	2.307	.103	11.63
MSDY-SB-019	2.030	2.500	.128	18.24
MSDY-SB-034	2.161	2.750	.133	19.66
MSDY-SB-036	2.385	2.875	.133	16.43
MSDY-SB-038	2.625	3.130	.133	26.37
MSDY-SB-039	2.995	3.550	.133	29.56

THREAD SEAL

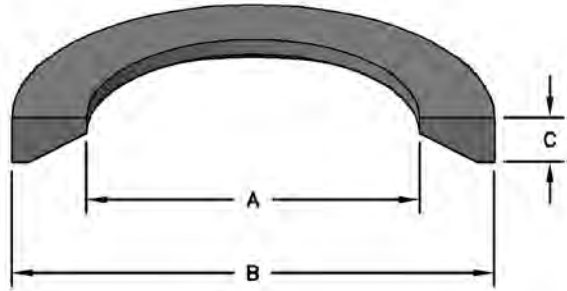


Thread seals provide a positive seal directly against the threads of a bolt. Self-centering and easily installed.

Part Number	C	D	Thread Size	List Price
MSTS7500X10	.469	.051	-10	\$3.18
MSTS7500X1/4	.562	.051	1/4	3.18
MSTS7500X5/16	.687	.064	5/16	3.97
MSTS7500X3/8	.750	.064	3/8	5.56
MSTS7500X7/16	.906	.078	7/16	6.83
MSTS7500X1/2	1.000	.078	1/2	12.78
MSTS7500X7/8	1.562	.109	7/8	20.93

MSDIN 3869 CONNECTOR RINGS

MSDIN 3869 profile rings are axially static soft seals in combination with threaded elements. They are molded from elastomers used for sealing threaded tube connections and fittings. Most common application, construction machinery, hydraulic presses, injection machines, etc. The DIN3869 is offered in two materials, an NBR 85 Shore A (black finish), and FKM 80 Shore A (green finish).

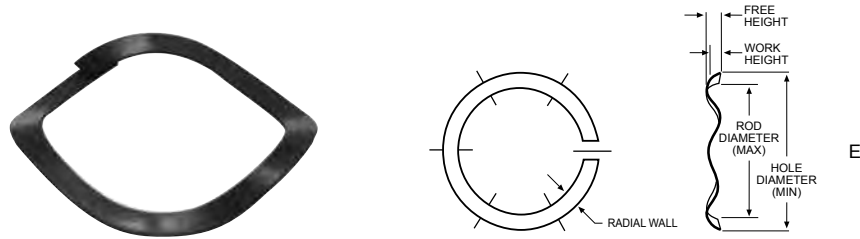


SEAL INFORMATION		
MATERIAL	COLOR	TEMP RANGE
85A NBR	BLACK	-30° TO +100° C -22° TO +212° F
VITON (FKM)	GREEN	-20° TO +200° C -4° TO +392° F

Part Number	Nominal Size	Thread	A Inside Diameter	B Outside Diameter	C Height	Package Quantity	List Price
MSDIN3869-M8X1	8	M8 x 1	6.50	9.90	1.00	5	\$1.55
MSDIN3869-M10X1	10	M10 x 1	8.40	11.90	1.00	5	0.94
MSDIN3869-M12X1.5	12	M12 x 1.5	9.80	14.40	1.50	5	0.94
MSDIN3869-M14X1.5	14	M14 x 1.5	11.60	16.50	1.50	5	1.22
MSDIN3869-M16X1.5	16	M16 x 1.5	13.80	18.90	1.50	5	1.22
MSDIN3869-M17X1.5	17	M17 x 1.5	14.70	18.90	1.50	5	1.22
MSDIN3869-M18X1.5	18	M18 x 1.5	15.70	20.90	1.50	5	1.32
MSDIN3869-M20X1.5	20	M20 x 1.5	17.80	22.90	1.50	5	1.55
MSDIN3869-M21X1.5	21	M21 x 1.5	18.50	23.90	1.50	5	1.82
MSDIN3869-M22X1.5	22	M22 x 1.5	19.60	24.30	1.50	5	1.84
MSDIN3869-M27X2	27	M27 x 2	23.90	29.20	2.00	5	1.76
MSDIN3869-M30X2	30	M30 x 2	27.70	32.70	2.00	2	3.68
MSDIN3869-M33X2	33	M33 x 2	29.70	35.70	2.00	2	1.11
MSDIN3869-M42X2	42	M42 x 2	38.80	45.80	2.00	2	1.83
MSDIN3869-M48X2	48	M48 x 2	44.70	50.70	2.00	2	2.33
MSDIN3869-M8X1-V	8	M8 x 1	6.50	9.90	1.00	5	3.37
MSDIN3869-M10X1-V	10	M10 x 1	8.40	11.90	1.00	5	3.37
MSDIN3869-M12X1.5-V	12	M12 x 1.5	9.80	14.40	1.50	5	5.52
MSDIN3869-M14X1.5-V	14	M14 x 1.5	11.60	16.50	1.50	5	5.52
MSDIN3869-M16X1.5-V	16	M16 x 1.5	13.80	18.90	1.50	2	2.82
MSDIN3869-M18X1.5-V	18	M18 x 1.5	15.70	20.90	1.50	2	3.07
MSDIN3869-M20X1.5-V	20	M20 x 1.5	17.80	22.90	1.50	2	3.93
MSDIN3869-M21X1.5-V	21	M21 x 1.5	18.50	23.90	1.50	2	4.16
MSDIN3869-M22X1.5-V	22	M22 x 1.5	19.60	24.30	1.50	2	4.29
MSDIN3869-M27X2-V	27	M27 x 2	23.90	29.20	2.00	2	4.54
MSDIN3869-M30X2-V	30	M30 x 2	27.70	32.70	2.00	2	7.73

WAVE SPRINGS

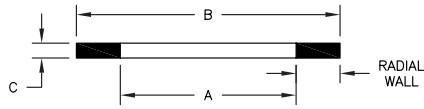
Wave Springs offer a convenient method of exerting a pre-load on vee packing where little or no adjustment is available. Because of a low fatigue factor, the spring should provide a proper pre-load throughout the life of the packing.



Part Number	WORK HEIGHT	FREE HEIGHT	E ROD DIAMETER	HOLE DIAMETER	RADIAL WALL	List Price
MSSSR-0112	.078	.130	.840	1.125	.133	\$ 13.20
MSSSR-0125	.078	.150	.960	1.250	.133	4.99
MSSSR-0150	.078	.170	1.170	1.500	.143	5.30
MSSSR-0175	.078	.140	1.440	1.750	.143	5.30
MSSSR-0187	.078	.150	1.560	1.875	.143	5.30
MSSSR-0200	.093	.140	1.680	2.000	.150	5.77
MSSSR-0225	.093	.170	1.930	2.250	.150	6.10
MSSSR-0237	.093	.160	1.990	2.375	.178	6.29
MSSSR-0250	.093	.170	2.120	2.500	.178	6.62
MSSSR-0262	.093	.190	2.240	2.625	.178	6.62
MSSSR-0275	.109	.170	2.340	2.750	.188	7.28
MSSSR-0300	.109	.190	2.590	3.000	.188	7.79
MSSSR-0312	.109	.210	2.710	3.120	.188	7.73
MSSSR-0325	.109	.200	2.750	3.250	.233	8.37
MSSSR-0350	.109	.230	3.000	3.500	.233	15.60
MSSSR-0362	.109	.240	3.120	3.625	.233	15.90
MSSSR-0375	.109	.260	3.250	3.750	.233	9.82
MSSSR-0400-N	.109	.200	3.570	4.000	.188	28.87
MSSSR-0425	.109	.210	3.740	4.250	.233	30.97
MSSSR-0462	.109	.230	4.125	4.625	.233	12.08
MSSSR-0475	.125	.310	4.240	4.750	.233	37.43
MSSSR-0512	.125	.340	4.610	5.125	.233	43.35

CARBON STEEL SHIMS

These carbon steel shims are commonly used with vee packing sets to fill the empty space in a gland.



Part Number	A Nom. ID	B Nom. OD	C Nom. Ht	RADIAL WALL	List Price
MSSSRS-0150	1.2	1-1/2	.024	.150	\$2.13
MSSSRS-0175	1.45	1-3/4	.024	.150	2.13
MSSSRS-0200	1.7	2	.024	.150	2.97
MSSSRS-0237	2.019	2-3/8	.024	.178	4.43
MSSSRS-0312	2.749	3-1/8	.03	.188	2.83
MSSSRS-0375	3.284	3-3/4	.03	.233	3.35

GRADE C LOCKNUTS

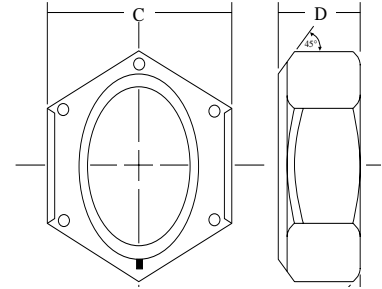
These fine-threaded Grade C locknuts are formed from medium carbon, heat-treated steel and are designed to be used with a Grade 8 bolt. Smaller size locknuts employ an automation style collar while the larger ones use a full collar design. Both locknut types are stocked with cadmium and wax plating.

Automation Style

Part Number	Size	Thread Pitch	C Width Across Flats		D Overall Thickness		List Price
			Max	Min	Max	Min	
MSLN-1/2-13	1/2	13	0.7500	0.736	0.510	0.490	\$1.02
MSLN-1/2-20	1/2	20	0.752	0.741	0.609	0.579	0.61
MSLN-1-14	1	14	1.5020	1.450	0.887	0.831	5.08
MSLN-3/4-16	3/4	16	1.1250	1.088	0.665	0.617	3.06
MSLN-5/8-18	5/8	18	0.9375	0.922	0.645	0.621	1.46
MSLN-7/8-14	7/8	14	1.3145	1.269	0.922	0.724	4.04
MSLN-7/16-20	7/16	20	0.627	0.616	0.468	0.438	2.63



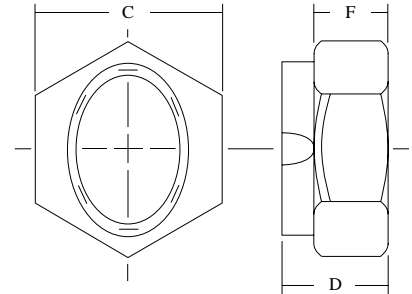
Automation Style



Full Collar Style

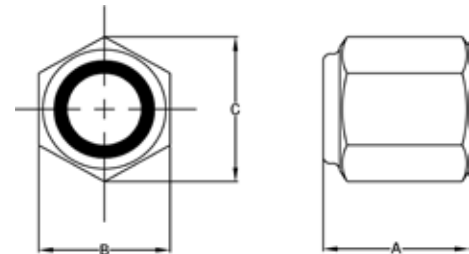
Part Number	Size	Thread Pitch	C Width Across Flats		D Overall Thickness		F Hex Height		List Price
			Max	Min	Max	Min	Max	Min	
MSLN-1-1/2-12	1-1/2	12	2.250	2.175	1.317	1.246	0.885	0.843	\$26.92
MSLN-1-1/4-12	1-1/4	12	1.876	1.812	1.094	1.030	0.719	0.698	19.44
MSLN-1-1/8-12	1-1/8	12	1.687	1.631	0.999	0.939	0.657	0.636	13.15
MSLN-1-3/4-12	1-3/4	12	2.625	2.538	1.540	1.460	1.012	0.989	49.35
MSLN-1-3/8-12	1-3/8	12	2.062	1.994	1.206	1.138	0.795	0.771	24.08
MSLN-2-12	2	12	3.000	2.900	1.763	1.675	1.158	1.134	104.15
MSLN-2-1/2-12	2-1/2	12	3.750	3.625	2.193	2.089	1.930	1.840	137.50

Full Collar Style



Part Number	Bar Size	A	B	C	List Price
MSCM-LN45050	1/2"-20	0.60	0.75	0.84	\$4.80
MSCM-LN45062	5/8"-18	0.75	0.94	1.06	16.67
MSCM-LN45075	3/4"-16	0.88	1.06	1.19	20.89
MSCM-LN45087	7/8"-14	1.00	1.25	1.40	11.50
MSCM-LN45100	1"-14	1.06	1.44	1.62	15.58
MSCM-LN45101	1"-14	0.88	1.62	1.83	18.56
MSCM-LN45112	1-1/8"-12	1.19	1.62	1.83	21.38
MSCM-LN45126	1-1/4"-12	1.38	1.81	2.06	24.87
MSCM-LN45151	1-1/2"-12	1.62	2.19	2.44	32.67
MSCM-LN45152	1-1/2"-12	0.81	2.19	2.44	25.65
MSCM-LN45175	1-3/4"-12	1.50	2.75	3.06	62.87
MSCM-LN45200	2"-12	1.62	3.12	3.50	67.11
MSCM-LN45225	2-1/4"-12	1.94	3.50	3.94	142.90
MSCM-LN45226	2-1/4"-12	2.81	3.50	3.94	195.67
MSCM-LN45250	2-1/2"-12	2.25	4.00	4.50	309.84

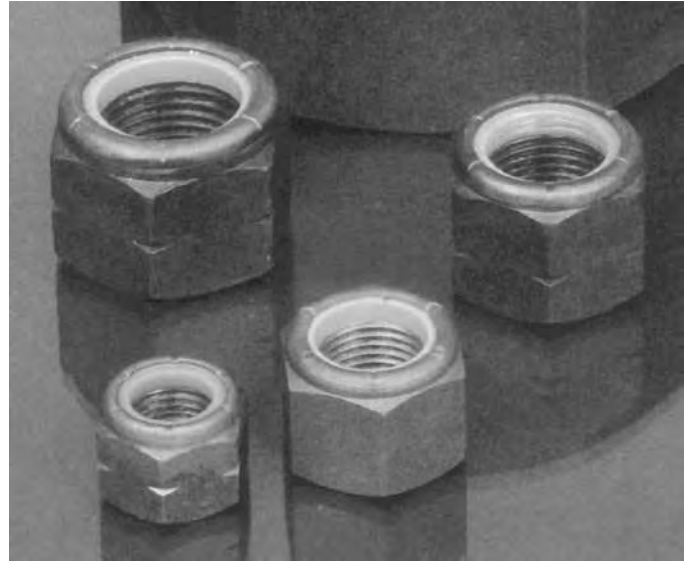
Nylon Insert Lock Nut



"NYLON INSERT" LOCKING NUTS

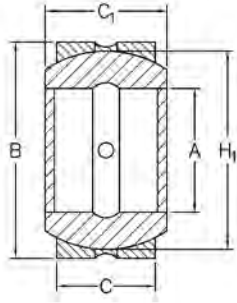
Manufactured from the finest quality steel to offer superior strength, MSO® Seals & Gaskets, Inc. locking nuts with nylon inserts are specifically designed and manufactured to exact dimensions. The high temperature locking inserts are designed to withstand the high temperatures associated with close tolerance performance applications.

Part Number	Thread Size & Pitch	Height	Flats	List Price
MSCTC-2J0564	2 - 12	1-5/8	3-1/8	67.11
MSCTC-2J3247	1-3/4 - 12	1-7/16	2-3/4	62.87
MSCTC-2J3950	1-1/2 - 12	1-5/16	2-3/8	43.22
MSCTC-2J6384	1-1/4 - 12	1-1/8	2	38.51
MSCTC-2J7686	2-1/2 - 12	2-3/16	4	309.84
MSCTC-3J6899	2-1/4 - 12	2-13/16	3-1/2	195.67
MSCTC-3J9449	2-1/2 - 12	2-5/8	4	289.59
MSCTC-3J9545	2 - 12	2-7/16	3-1/8	180.09
MSCTC-4J6888	2-3/4 - 12	2-1/4	4	183.06
MSCTC-4J8734	2-3/4 - 12	3-1/8	4	350.00
MSCTC-5J3488	2-1/4 - 12	1-15/16	3-1/2	142.90
MSCTC-5J5731	1-3/4 - 12	1-7/16	2-1/2	40.31
MSCTC-7J9250	3-1/4 - 12	3-1/8	4-1/2	374.28
MSCTC-9X6018	4 - 12	3.73	5.62	785.60
MSCTC-1438149	M48 × 2	50 mm	75 mm	167.33
MSCTC-1438150	M56 × 2	56 mm	85 mm	175.85
MSCTC-1336686	M56 × 2	57 mm	80 mm	192.28
MSCTC-1475835	M64 × 2	63 mm	95 mm	236.38
MSCTC-7Y4622	M72 × 2	70 mm	105 mm	417.14
MSCTC-7Y4695	M80 × 2	76 mm	115 mm	418.37
MSCTC-1232060	M80 × 2	64 mm	115 mm	296.61
MSCTC-1232112	M90 × 2	76 mm	130 mm	525.00
MSCTC-7Y4956	M90 × 2	84 mm	130 mm	500.99
MSCTC-0875385	M95 × 2	88 mm	135 mm	623.93
MSCTC-1261971	M100 × 2	89 mm	146 mm	858.98
MSCTC-1163513	M105 × 2	97 mm	150 mm	991.42
MSCTC-1163516	M120 × 2	108 mm	170 mm	1,191.66



* Grade N8 (Grade C equivalent) or non-heat treated micro-alloy steel.

STYLE MSHH SELF ALIGNING BEARINGS (INCH)



SEAL INFORMATION

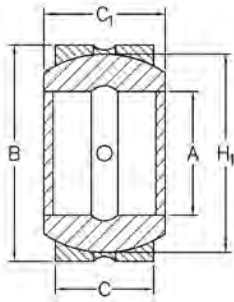
MATERIAL

CARBON
CHROMIUM STEEL

SUFFIX:
2RS = SEALED BEARINGS

Part Number	A Nom. ID	B Nom. OD	C Nom. Ht	C ₁ OVERALL HEIGHT	G HOUSING DIAMETER	H ₁ BEARING GROOVE DIAMETER	Static Radial Load (lbs)	Dynamic Radial Load (lbs)	MATERIAL	List Price
MSHH008ES	1/2	7/8	3/8	.437	.875 ^{+0.000} _{-.0008}	.709	9337	3156	STEEL	\$24.60
MSHH010ES	5/8	1-1/16	15/32	.547	1.0625 ^{+0.000} _{-.0008}	.899	14732	4864	STEEL	27.05
MSHH012ES	3/4	1-1/4	9/16	.656	1.250 ^{+0.000} _{-.001}	1.083	20927	7089	STEEL	25.44
MSHH100ES	1	1-5/8	3/4	.875	1.625 ^{+0.000} _{-.001}	1.417	37359	12605	STEEL	22.14
MSHHW100ES	1	1-5/8	1-1/2	1.500	1.625 ^{+0.000} _{-.001}	1.417	37351	12604	STEEL	27.78
MSHH104ES	1-1/4	2	15/16	1.093	2.000 ^{+0.000} _{-.0012}	1.772	58507	19468	STEEL	31.96
MSHH106ES	1-3/8	2-3/16	1-1/32	1.187	2.1875 ^{+0.000} _{-.0012}	1.929	69756	23404	STEEL	48.38
MSHH108ES	1-1/2	2-7/16	1-1/8	1.312	2.4375 ^{+0.000} _{-.0012}	2.165	84379	28129	STEEL	41.82
MSHH108ES2RS	1-1/2	2-7/16	1-1/8	1.312	2.4375 ^{+0.000} _{-.0012}	2.165	84379	28129	STEEL	55.74
MSHH112ES	1-3/4	2-13/16	1-5/16	1.531	2.8125 ^{+0.000} _{-.0012}	2.520	114752	38255	STEEL	57.40
MSHH112ES2RS	1-3/4	2-13/16	1-5/16	1.531	2.8125 ^{+0.000} _{-.0012}	2.520	114752	38255	STEEL	72.15
MSHH200ES	2	3-3/16	1-1/2	1.750	3.1875 ^{+0.000} _{-.0014}	2.874	150754	50408	STEEL	77.90
MSHH200ES2RS	2	3-3/16	1-1/2	1.750	3.1875 ^{+0.000} _{-.0014}	2.874	150754	50408	STEEL	93.48
MSHHW200ES	2	3-3/16	3	3.000	3.1875 ^{+0.000} _{-.0014}	2.874	150757	50406	STEEL	88.23
MSHH204ES	2-1/4	3-9/16	1-11/16	1.969	3.5625 ^{+0.000} _{-.0014}	3.228	191251	63002	STEEL	106.60
MSHH204ES2RS	2-1/4	3-9/16	1-11/16	1.969	3.5625 ^{+0.000} _{-.0014}	3.228	191251	63002	STEEL	145.48
MSHH208ES	2-1/2	3-15/16	1-7/8	2.187	3.9375 ^{+0.000} _{-.0014}	3.583	234007	77629	STEEL	144.33
MSHH212ES	2-3/4	4-3/8	2-1/16	2.406	4.375 ^{+0.000} _{-.0014}	3.937	285752	95628	STEEL	169.47
MSHH300ES	3	4-3/4	2-1/4	2.625	4.750 ^{+0.000} _{-.0016}	4.331	337506	112505	STEEL	254.19
MSHH300ES2RS	3	4-3/4	2-1/4	2.625	4.750 ^{+0.000} _{-.0016}	4.331	337506	112505	STEEL	302.92
MSHH308ES	3-1/2	5-1/2	2-5/8	3.062	5.500 ^{+0.000} _{-.0016}	5.039	459001	153003	STEEL	451.01
MSHH308ES2RS	3-1/2	5-1/2	2-5/8	3.062	5.500 ^{+0.000} _{-.0016}	5.039	459001	153003	STEEL	500.22
MSHH312ES	3-3/4	5-7/8	2-13/16	3.281	5.875 ^{+0.000} _{-.0016}	5.394	531004	175507	STEEL	487.08
MSHH400ES	4	6-1/4	3	3.500	6.250 ^{+0.000} _{-.0016}	5.748	596256	202508	STEEL	657.64

STYLE MSMHH SELF ALIGNING BEARINGS (METRIC)



SEAL INFORMATION

MATERIAL	CARBON CHROMIUM STEEL
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SUFFIX:
2RS = SEALED BEARINGS

Part Number	A Nom. ID	B Nom. OD	C Nom. Ht	C ₁ OVERALL HEIGHT	G HOUSING DIAMETER	H ₁ BEARING GROOVE DIAMETER	Static Radial Load (lbs)	Dynamic Radial Load (lbs)	List Price
MSMHH20ES	20	35	12	16	35 ^{+0.000} _{-0.025}	29	32857	6759	\$31.02
MSMHH25ES	25	42	16	20	42 ^{+0.000} _{-0.025}	36	54003	10804	38.63
MSMHH25ES2RS	25	42	16	20	42 ^{+0.000} _{-0.025}	36	54003	10804	36.06
MSMHH30ES	30	47	18	22	47 ^{+0.000} _{-0.025}	41	69751	13951	40.89
MSMHH30ES2RS	30	47	18	22	47 ^{+0.000} _{-0.025}	41	69751	13951	51.15
MSMHH35ES	35	55	20	25	55 ^{+0.00} _{-0.03}	47	90008	18009	52.97
MSMHH35ES2RS	35	55	20	25	55 ^{+0.00} _{-0.03}	47	90008	18009	51.15
MSMHH40ES	40	62	22	28	62 ^{+0.00} _{-0.03}	53	112507	22501	58.46
MSMHH40ES2RS	40	62	22	28	62 ^{+0.00} _{-0.03}	53	112507	22501	50.17
MSMHH45ES2RS	45	68	25	32	68 ^{+0.00} _{-0.03}	60	144009	28578	90.27
MSMHH50ES	50	75	28	35	75 ^{+0.00} _{-0.03}	66	175509	35109	85.38
MSMHH50ES2RS	50	75	28	35	75 ^{+0.00} _{-0.03}	66	175509	35109	166.38
MSMHH60ES	60	90	36	44	90 ^{+0.000} _{-0.035}	80	274509	55128	131.85
MSMHH70ES2RS	70	105	30	49	105 ^{+0.000} _{-0.035}	92	351007	70876	166.38
MSMHH70ES	70	105	40	49	105 ^{+0.000} _{-0.035}	92	351007	70876	197.67
MSMHH80ES	80	120	45	55	120 ^{+0.000} _{-0.035}	105	450005	90008	215.76

REPAIR ACCESSORIES

SET SCREWS



These set screws are used on many cylinder headnuts. Use nylon plugs to ensure no damage to the headnut threads. All set screws employ Allen wrench heads.

Part Number	Thread Size	Length	List Price
MSSS-1/4-20X1/2	1/4-20	1/2	\$1.12
MSSS-1/4-20X3/8	1/4-20	3/8	1.31
MSSS-1/4-28X1/4	1/4-28	1/4	1.05
MSSS-1/4-28X3/8	1/4-28	3/8	1.05
MSSS-5/16-18X1/4	5/16-18	1/4	1.05
MSSS-5/16-18X3/8	5/16-18	3/8	1.05
MSSS-5/16-18X3/4	5/16-18	3/4	1.42
MSSS-5/16-24X5/16	5/16-24	5/16	0.45
MSSS-5/16-24X3/8	5/16-24	3/8	1.42
MSSS-3/8-16X3/8	3/8-16	3/8	0.80
MSSS-3/8-16X1/2	3/8-16	1/2	1.12
MSSS-3/8-16X5/8	3/8-16	5/8	1.38
MSSS-3/8-16X7/8	3/8-16	7/8	1.59
MSSS-1/2-13X1/2	1/2-13	1/2	1.86
MSSS-1/2-13X5/8	1/2-13	5/8	2.16
MSSS-#8-32X1/4	#8-32	1/4	2.51
MSSS-#10-24X1/4	#10-24	1/4	1.05

NYLON PLUGS



These nylon plugs are used with headnut set screws to ensure that there is no damage to the headnut threads.

Part Number	Diameter	Length	List Price
MSNYPLUG-125-125	1/8	1/8	\$0.82
MSNYPLUG-125-156	1/8	5/32	0.74
MSNYPLUG-125-875	1/8	7/8	1.38
MSNYPLUG-187-109	3/16	7/64	0.71
MSNYPLUG-187-187	3/16	3/16	0.71
MSNYPLUG-187-250	3/16	1/4	0.72
MSNYPLUG-250-070	1/4	0.070	1.06
MSNYPLUG-250-125	1/4	1/8	0.71
MSNYPLUG-250-187	1/4	3/16	0.71
MSNYPLUG-250-250	1/4	1/4	1.26
MSNYPLUG-312-125	5/16	1/8	0.71
MSNYPLUG-312-250	5/16	1/4	2.17
MSNYPLUG-312-312	5/16	5/16	2.05
MSNYPLUG-375-250	3/8	1/4	0.71
MSNYPLUG-500-875-125H	1/2	7/8	5.33

WIND-IN LOCK WIRES



Part Number	Thickness	Length	List Price
MSLW-093-1262	3/32 sq.	12-5/8	\$30.25
MSMARION-35240	1/8 sq.	10-1/4	13.98
MSMARION-35250	1/8 sq.	13-3/8	13.17
MSMARION-35260	1/8 sq.	16-3/8	13.41
MSMARION-35270	1/8 sq.	19-1/4	15.41
MSMARION-1031	3/16 sq.	21.00	22.41
MS1/8 RD WIRE	1/8 round	11	3.51

FILTER VENT PLUGS



These plugs are used to allow air to pass in and out of the non-pressurized end of a single-acting cylinder.

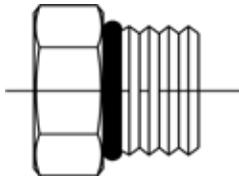
Part Number	NPT Port Size	List Price
MSFV-.125	1/8	\$4.88
MSFV-.250	1/4	6.61
MSFV-.375	3/8	7.98
MSFV-.500	1/2	9.59
MSFV-.750	3/4	14.75
MSFV-1.000	1	17.67

STEEL PLUGS AND VENTS

Steel Plug (O-Ring Boss)



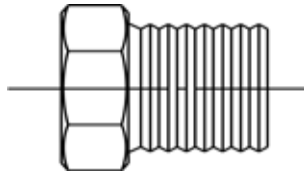
PART NUMBER	PORT SIZE	LIST PRICE
MSCM-74004	#4 SAE	\$2.95
MSCM-74005	#5 SAE	3.27
MSCM-74006	#6 SAE	3.51
MSCM-74008	#8 SAE	6.99
MSCM-74010	#10 SAE	5.90
MSCM-74012	#12 SAE	9.12
MSCM-74014	#14 SAE	21.48
MSCM-74016	#16 SAE	24.31
MSCM-74020	#20 SAE	29.85



NPT Steel Plug



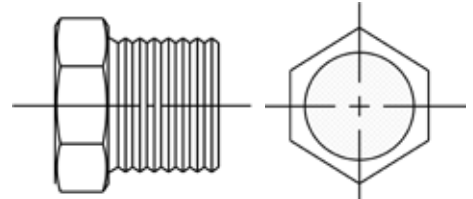
PART NUMBER	PORT SIZE	LIST PRICE
MSCM-74112	1/8" NPT	\$1.15
MSCM-74125	1/4" NPT	1.15
MSCM-74137	3/8" NPT	1.82
MSCM-74150	1/2" NPT	8.37
MSCM-74175	3/4" NPT	3.70
MSCM-74199	1" NPT	5.54
MSCM-74200	1-1/4" NPT	12.68



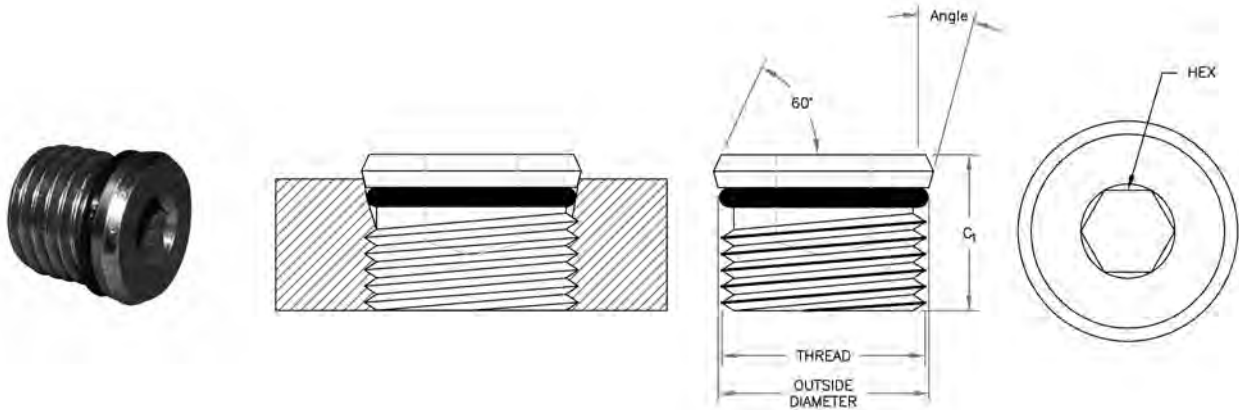
NPT Air Vent



PART NUMBER	PORT SIZE	LIST PRICE
MSCM-77002	1/8" NPT	\$4.88
MSCM-77004	1/4" NPT	6.61
MSCM-77006	3/8" NPT	7.98
MSCM-77008	1/2" NPT	9.59
MSCM-77010	3/4" NPT	14.75



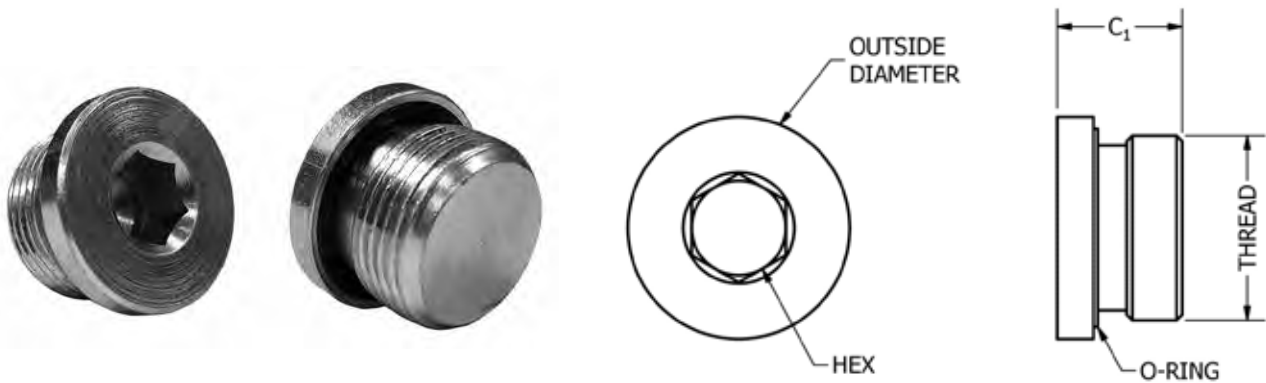
ZERO-LEAK GOLD STANDARD THREAD PORT PLUGS



Part Number	SIZE NUMBER	C ₁ OVERALL HEIGHT	OUTSIDE DIAMETER	HEX	Angle	TESTED TORQUE (ft-lbs)	O-RING	THREAD	List Price
MSSHTPP-S04	4	.450 ±.020	.477 ±.003	.188 ^{+0.005} / _{+0.000}	12 ^{+0.0} / _{-0.5}	7	MOR-8X1.5	7/16-20 UNF	\$2.56
MSSHTPP-S06	6	.480 ±.020	.606 ±.003	.250 ^{+0.005} / _{+0.000}	12 ^{+0.0} / _{-0.5}	11	MOR-12.1X1.6	9/16-18 UNF	3.23
MSSHTPP-S08	8	.560 ±.020	.800 ±.003	.313 ^{+0.005} / _{+0.000}	15 ^{+0.0} / _{-0.5}	28	568-016	3/4-16 UNF	3.81
MSSHTPP-S10	10	.630 ±.020	.930 ±.003	.375 ^{+0.005} / _{+0.000}	15 ^{+0.0} / _{-0.5}	46	MOR-18X2	7/8-14 UNF	5.14
MSSHTPP-S12	12	.750 ±.020	1.130 ±.003	.563 ^{+0.005} / _{+0.000}	15 ^{+0.0} / _{-0.5}	51	MOR-22.3X2.4	1-1/16-12 UN	9.10
MSSHTPP-S16	16	.750 ±.020	1.385 ±.003	.625 ^{+0.005} / _{+0.000}	15 ^{+0.0} / _{-0.5}		MOR-27X2.5	1-5/16-12 UN	17.47

BSPB THREAD PORT PLUGS

BSPB are British Standard Pipe Plugs. Plugs come with DIN3869 NBR 85 shore A axial seals already installed to ensure zero leak.

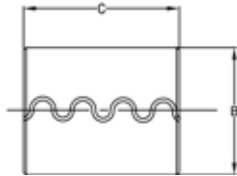


Part Number	Outside Diameter	C ₁ Overall Height	Hex	O-ring	Thread	List Price
MSSHTPP-G-1/4	0.748	0.669	6	DIN3869-M14X1.5	BSPP G 1/4-19	\$3.69
MSSHTPP-G-3/8	0.866	0.669	8	DIN3869-M16X1.5	BSPP G 3/8-19	3.76
MSSHTPP-G-1/2	1.063	0.748	10	DIN3869-M21X1.5	BSPP G 1/2-14	4.54
MSSHTPP-G-3/4	1.26	0.827	12	DIN3869-M27X2	BSPP G 3/4-14	4.90
MSSHTPP-G-1	1.571	0.886	17	DIN3869-M33X2	BSPP G 1-11	11.32

SPLIT TENSION BUSHINGS



Material: Hardened Spring Steel



PART NUMBER	A	B	C	HOUSING DIAMETER	LIST PRICE
MSCM-99507	0.75	1.00	2.00	1.002/1.006	\$13.67
MSCM-99508	0.88	1.00	2.00	1.002/1.006	13.15
MSCM-99510	1.00	1.25	0.75	1.252/1.256	8.60
MSCM-99514	1.00	1.25	0.88	1.252/1.256	10.97
MSCM-99511	1.00	1.25	1.00	1.252/1.256	9.62
MSCM-99513	1.00	1.25	1.25	1.252/1.256	12.73
MSCM-99512	1.00	1.25	1.50	1.252/1.256	11.38
MSCM-99519	1.25	1.50	1.25	1.502/1.506	10.13
MSCM-99522	1.25	1.50	1.50	1.502/1.506	14.40
MSCM-99521	1.25	1.50	2.00	1.502/1.506	15.93
MSCM-99531	1.50	1.75	1.50	1.752/1.756	12.68
MSCM-99533	1.50	1.75	2.00	1.752/1.756	17.19
MSCM-99535	1.50	1.75	3.00	1.752/1.756	25.89
MSCM-99534	1.50	1.88	2.00	1.877/1.881	29.18
MSCM-99535	1.50	1.75	2.50	1.752/1.756	24.30
MSCM-99537	1.50	2.00	1.25	2.002/2.006	23.70

PART NUMBER	A	B	C	HOUSING DIAMETER	LIST PRICE
MSCM-995371	1.50	2.00	2.00	2.002/2.006	\$31.46
MSCM-99540	1.75	2.00	1.25	2.002/2.006	16.40
MSCM-995375	1.75	2.00	1.50	2.002/2.006	20.07
MSCM-99538	1.75	2.00	2.00	2.002/2.006	18.49
MSCM-99539	1.75	2.00	2.25	2.002/2.006	28.15
MSCM-995410	1.75	2.00	3.00	2.002/2.006	34.38
MSCM-99541	1.75	2.25	2.00	2.252/2.256	38.57
MSCM-99546	2.00	2.38	3.00	2.377/2.381	52.23
MSCM-99549	2.00	2.25	1.50	2.252/2.256	17.70
MSCM-99550	2.00	2.25	2.50	2.252/2.256	22.77
MSCM-99547	2.00	2.50	2.00	2.502/2.506	38.98
MSCM-99545	2.00	2.50	2.50	2.502/2.506	50.93
MSCM-99556	2.50	3.00	2.00	3.002/3.006	55.86
MSCM-99557	2.50	3.00	3.00	3.002/3.006	93.86
MSCM-99565	3.00	3.50	2.50	3.502/3.506	93.17

MANUAL BLEEDER VALVES



Part Number	Thread Size	Min Pkg Qty	List Price
MSWH705	1/8 NPT	3	\$5.65

LOCTITE



Threadlocker 242 locks fasteners 1/4" and larger yet allows easy disassembly with hand tools. Prevents rust and corrosion.

Part Number	Application	List Price
MSLOCTITE-24205	Removable Threadlocker 0.5 ml bottle	\$13.06
MSLOCTITE-24221	Removable Threadlocker 10 ml bottle	48.50
MSLOCTITE-24231	Removable Threadlocker 50 ml bottle	143.47
MSLOCTITE-27105	High Strength Threadlocker 0.5 ml bottle	8.93
MSLOCTITE-29031	Penetrating Threadlocker 50 ml bottle	150.63
MSLOCTITE-54531	Hyd/Pneum Thread Sealant 50 ml tube	159.21
MSLOCTITE-82325	Super Lube 3 oz tube	37.93

SEAL LUBE™

O-Ring Lubricant



Part Number: MSSEAL LUBE

List Price: \$24.39

Seal-Lube™ lubricant is a thick, clear, high viscosity silicone oil recommended for use with most seal compounds (except silicone) and a wide variety of hydraulic fluids. Insoluble in water, alcohol, petroleum oil and glycol, Seal-Lube™ can prolong seal life when applied prior to seal installation. Chemically inert and non-toxic, Seal-Lube™ retains its viscosity over a wide temperature range. The handy squeeze 2 ounce bottle dispenses just enough where you want it.

TURBO LOCK



Turbo Lock threadlocker adhesive series is an economical alternative to Loctite.

Part Number	Application	List Price
MSTHREAD LOCKER-11-001	Removable Threadlocker 2 ml bottle	\$5.29
MSTHREAD LOCKER-11-010	Removable Threadlocker 10 ml bottle	36.92
MSTHREAD LOCKER-11-050	Removable Threadlocker 50 ml bottle	64.60
MSTHREAD LOCKER-14-001	High Strength Threadlocker 2 ml bottle	5.29
MSTHREAD LOCKER-14-250	High Strength Threadlocker 250 ml bottle	221.91
MSTHREAD LOCKER-16-010	Penetrating Threadlocker 10 ml bottle	22.87
MSTHREAD LOCKER-16-050	Penetrating Threadlocker 50 ml bottle	59.20

**Set Screw and Nylon Plug
Assortment Kits
Also Available -
See the Kits & Tools Section**

GREASE FITTINGS



Part Number	Description	List Price
MSGF-125NPTS	1/8" NPT STRAIGHT	\$1.46
MSGF-125NPT45	1/8" NPT 45°	2.33
MSGF-125NPT90	1/8" NPT 90°	2.33
MSGF-187DS	3/16" DRIVE STRAIGHT	1.00
MSGF-250-28S	1/4"-28 STRAIGHT	0.76
MSGF-250-28-45	1/4"-28 45°	2.07
MSGF-250-28-90	1/4"-28 90°	2.07
MSGF-312DS	5/16" DRIVE STRAIGHT	1.32

PTFE THREAD SEAL TAPE

Part Number: MSPTFE TAPE
List Price: \$3.26



1/2" Wide by 520" Roll

SILICONE TAPE



Used to create permanent seals for low pressure gas or liquid leaks in hydraulic hoses.
Temperature Range: -62/+500° F

Part Number	Description	List Price
MSSILICONE TAPE	1" X 432" Roll	\$50.22

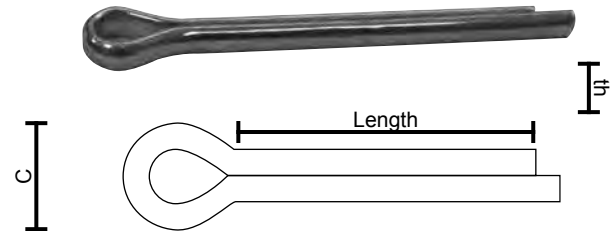
GREASE FITTING CAP



Low density polyethane cap plug for use with standard grease fittings.

Part Number	Description	List Price
MSCAP-GF-10	Cap Plug	\$0.23

COTTER PINS



Part Number	C	Length	th	List Price
MSCP-1X3/32	0.1875	1	0.082	\$0.46
MSCP-1-1/4X1/8	0.25	1.25	0.115	0.34
MSCP-1-1/2X5/32	0.3125	1.5	0.15	0.46
MSCP-1-3/4X3/16	0.39	1.75	0.1875	0.26
MSCP-2X3/16	0.375	2	0.176	0.57
MSCP-2X1/4	0.5	2	0.225	0.46
MSCP-2-1/2X1/8	0.25	2.5	0.115	0.34
MSCP-2-1/2X5/32	0.357	2.5	0.15625	0.56
MSCP-2-1/2X3/16	0.375	2.5	0.176	0.69
MSCP-2-1/2X1/4	0.5	2.5	0.225	0.63
MSCP-3X5/32	0.3125	3	0.15	0.59
MSCP-3X1/4	0.52	3	0.25	1.59
MSCP-3-1/2X1/4	0.5	3.5	0.225	0.88
MSCP-4X1/4	0.5	4	0.225	1.00
MSCP-5X1/4	0.5	5	0.225	3.16
MSCP-6X5/16	0.625	6	0.28	3.77

STYLE MCPL COUPLINGS

MSMCPL power transmission couplings are commonly found on mobile equipment to solve vibration problems in combustion engine driven equipment. The rubber or Hytrel elements effectively absorb shock loads, misalignment forces, and torsional vibrations generated by the connecting equipment at start-up for example. The coupling is axially connected to a PTO or flywheel on the engine side and radially connected to the driven equipment such as hydraulic pumps, generators, compressors, etc.



50H



110H



140H



50A

Part Number	ID X OD Dimensions	Material	Application	List Price
MSMCPL-110H-AL	100 X 222 mm	Hytrel with Aluminum	Hitachi, Kato, etc.	\$555.55
MSMCPL-140H-AL	130 X 250 mm	Hytrel with Aluminum	Komatsu, Kobelco, Kato, etc.	879.11
MSMCPL-50A-AL	107 X 200 mm	Rubber with Aluminum	Kobelco, Mitsubishi, etc.	413.16
MSMCPL-50H-AL	97 X 200 mm	Hytrel with Aluminum	Komatsu, Hitachi, Kobelco, Mitsubishi, Kato, etc.	364.02

**Cotter Pin and Grease Fitting Assortment Kits
Also Available -
See the Kits & Tools Section**

Assortment Kits and Tools

Contents	Page
O-Ring Kits	108 - 116
O-Ring Splice Kits	117
Back-Up Ring Kits	118
Retainer Ring Kits	119
Assortment Kits	120 - 125
Lifting Slings	126
Installation Tools	127
Splice and Cutting Tools	128
Chopping and Removal Tools	129 - 131
Dismantling Tools	132
Remanufacturing Tools	133 - 137
Leak Detection Products	138
Measuring Tools	139 - 141
MSO Merchandise	142

O-RING KITS

O-RING KIT

Part Number: MS568 KIT-A
List Price: \$37.05

DASH NUMBER	QTY
MS006 THRU 012	20
MS110 THRU 116	13
MS210 THRU 222	10
MS325 THRU 327	7



This kit contains a total of 382 O-Rings in 30 different sizes, providing an extremely low cost per size value.

HNBR O-RING KIT

Part Number: MS568 HNBR KIT
List Price: \$58.72

PART NUMBER	QTY
MS568-008H	20
MS568-010H	20
MS568-011H	20
MS568-012H	20
MS568-013H	20
MS568-014H	20
MS568-015H	15
MS568-017H	15
MS568-111H	15
MS568-116H	15
MS568-118H	10
MS568-211H	10



This kit contains a total of 200 70A Durometer HNBR o-rings in 12 different sizes, providing an extremely low cost per size value.

O-RING METRIC KIT

Part Number: MSMETRIC O KIT-J-A
List Price: \$59.61

I.D X C.S. (mm)	QTY	I.D X C.S. (mm)	QTY	I.D X C.S. (mm)	QTY
3 X 2.0	16	14 X 2.5	13	28 X 3.0	12
4 X 2.0	16	16 X 2.5	13	30 X 3.0	12
5 X 2.0	16	17 X 2.5	13	32 X 3.0	12
6 X 2.0	16	19 X 2.5	13	33 X 3.0	12
7 X 2.0	16	19 X 3.0	11	35 X 3.0	12
8 X 2.0	16	20 X 3.0	12	36 X 3.0	12
10 X 2.0	16	22 X 3.0	12	38 X 3.0	12
10 X 2.5	13	24 X 3.0	12	38 X 4.0	9
11 X 2.5	13	25 X 3.0	12	41 X 4.0	9
12 X 2.5	13	27 X 3.0	12	44 X 4.0	9

The Metric O-Kit J-A contains a total of 385 O-Rings in 30 different sizes, another extremely low cost per size value.



MASTER O-RING FITTING KIT

Part Number: MSMASTER OR FITTING KIT
List Price: \$220.86

PORT DASH SIZE	PART NUMBER	QTY	PORT DASH SIZE	PART NUMBER	QTY
SAE BOSS #4	568-904	50	ORS #8	568-014-90D	50
SAE BOSS #5	568-905	50	ORS #10	568-016-90D	50
SAE BOSS #6	568-906	50	ORS #12	568-018-90D	50
SAE BOSS #8	568-908	50	ORS #16	568-021-90D	50
SAE BOSS #10	568-910	50	ORS #20	568-025-90D	50
SAE BOSS #12	568-912	50	ORS #24	568-029-90D	40
SAE BOSS #14	568-914	40	SAE #8	568-210-90D	50
SAE BOSS #16	568-916	40	SAE #12	568-214-90D	50
SAE BOSS #20	568-920	20	SAE #16	568-219-90D	20
SAE BOSS #24	568-924	10	SAE #20	568-222-90D	20
SAE BOSS #32	568-932	10	SAE #24	568-225-90D	20
ORS #4	568-011-90D	50	SAE #32	568-228-90D	20
ORS #6	568-012-90D	50	SAE #40	568-232-90D	10



This 1000 piece assortment contains 1/16" CS, 1/8" CS, and Boss 90A Durometer NBR O-rings in 26 of the most popular fitting sizes, including O-ring face seals and SAE straight thread boss fittings. Individually separated inside of a sturdy steel case.

O-RING KITS

SAE FLANGE SEALS

Part Number: MSSAE FLANGE SEALS
List Price: \$38.62

BOX PART NUMBER	PART NUMBER	QTY
-8	568-210-90D	8
-12	568-214-90D	8
-16	568-219-90D	8
-20	568-222-90D	8
-24	568-225-90D	8
-32	568-228-90D	8



Fits SAE J518 code 61/62 split flanges.

FLAT FACE SEALS

Part Number: MSFLAT FACE O-RINGS
List Price: \$40.90

BOX PART NUMBER	PART NUMBER	QTY
-4	568-011-90D	8
-6	568-012-90D	8
-8	568-014-90D	8
-10	568-016-90D	8
-12	568-018-90D	8
-16	568-021-90D	8
-20	568-025-90D	8
-24	568-029-90D	8



Fits SAE O-ring face seal fittings.

BOSS & TUBE SEALS

Part Number: MSBOSS-TUBE FITTINGS-1
List Price: \$27.66
Part Number: MSBOSS-TUBE FITTINGS-2
List Price: \$40.33

BOX PART NUMBER	PART NUMBER	QTY	KIT NUMBER
-2	568-902	8	FITTINGS-1
-3	568-903	8	FITTINGS-1
-4	568-904	8	FITTINGS-1
-5	568-905	8	FITTINGS-1
-6	568-906	8	FITTINGS-1
-8	568-908	8	FITTINGS-1
-10	568-910	8	FITTINGS-1
-12	568-912	8	FITTINGS-1
-14	568-914	8	FITTINGS-1
-16	568-916	8	FITTINGS-2
-20	568-920	8	FITTINGS-2
-24	568-924	8	FITTINGS-2
-32	568-932	8	FITTINGS-2

Fits SAE Boss straight thread tube fittings.



HOSE END & ADAPTER KIT

Part Number: MSO-R FITTING KIT
List Price: \$157.44

This handy kit contains 27 sizes and 216 pieces of 90A Durometer O-rings for boss, split flange, and flat face hose end fittings and adapters. Each box has a graphic label identifying the type of application and dash number for the seal. A chart on the back of the box lists popular OEM part number matches for each O-ring. Due to popular demand, these kits are now available individually.



Part Number: MSO-R FITTING KIT-V
List Price: \$343.98

This handy kit contains 27 sizes and 216 pieces of 90A Durometer O-rings for boss, split flange, and flat face hose end fittings and adapters. Each box has a graphic label identifying the type of application and dash number for the seal. A chart on the back of the box lists popular OEM part number matches for each O-ring.



O-RING KITS

SAE 900 O-RING BOSS FLUOROCARBON KIT

Part Number: MS900 BOSS
FC List Price: \$204.64

PART NUMBER	QTY	SAE PORT SIZE
568-901V	10	-1
568-902V	10	-2
568-903V	10	-3
568-904V	10	-4
568-905V	12	-5
568-906V	12	-6
568-907V	12	-7
568-908V	12	-8
568-909V	12	-9
568-910V	12	-10
568-911V	10	-11
568-912V	10	-12
568-913V	10	-13
568-914V	10	-14
568-916V	10	-16
568-918V	10	-18
568-920V	10	-20
568-924V	10	-24
568-928V	10	-28
568-932V	10	-32



This 212 piece assortment contains the most popular size 90 Durometer FKM Boss O-rings in 20 different fitting sizes, individually separated, which will supply your shop, service truck, or parts counter with the sizes you need!

SAE J514 O-RING BOSS KIT

Part Number: MS900 BOSS KIT
List Price: \$38.83

PART NUMBER	QTY	SAE PORT SIZE
568-901	10	-1
568-902	10	-2
568-903	10	-3
568-904	10	-4
568-905	12	-5
568-906	12	-6
568-907	12	-7
568-908	12	-8
568-909	12	-9
568-910	12	-10
568-911	10	-11
568-912	10	-12
568-913	10	-13
568-914	10	-14
568-916	10	-16
568-918	10	-18
568-920	10	-20
568-924	10	-24
568-928	10	-28
568-932	10	-32



This 212 piece assortment contains the most popular size 90 Durometer Boss O-rings in 20 different fitting sizes, individually separated, which will supply your shop, service truck, or parts counter with the sizes you need!

O-RING FACE KIT

Part Number: MS568 FACE
KIT List Price: \$34.80

DASH NUMBER	FITTING	QTY
011-90D	#4	25
012-90D	#6	25
014-90D	#8	25
016-90D	#10	25
018-90D	#12	20
021-90D	#16	15
025-90D	#20	10
029-90D	#24	10



This kit contains a total of 155 90 durometer O-Rings in 8 different sizes, providing an extremely low cost per size value.

SAE CODE 61 & 62 O-RING FLANGE KIT

Part Number: MS568 FLANGE
KIT List Price: \$40.94

DASH NUMBER	FITTING	QTY
210-90D	1/2"	10
214-90D	3/4"	10
219-90D	1"	10
222-90D	1-1/4"	10
225-90D	1-1/2"	10
228-90D	2"	10
232-90D	2-1/2"	10



This kit contains a total of 70 90 durometer O-Rings, in 7 different sizes, providing an extremely low cost per size value.

O-RING KITS

SPLIT FLANGE SEAL KIT

Part Number: MSSFS KIT
List Price: \$110.43

PART NUMBER	Flange Size	Replaces O-Ring No.	Outside Diam.	QTY
MSSFS-8	1/2"	-210	1.005	5
MSSFS-12	3/4"	-214	1.255	5
MSSFS-16	1"	-219	1.565	5
MSSFS-20	1-1/4"	-222	1.755	5
MSSFS-24	1-1/2"	-225	2.125	5
MSSFS-32	2"	-228	2.500	5
MSSFS-40	2-1/2"	-232	3.005	5



This kit contains 35 seals in 7 popular sizes for SAE J518 4-Bolt code 61 and code 62 split flanges.

U.S. INDUSTRIAL O-RING KIT

Part Number: MS568 KIT
List Price: \$45.78

DASH NUMBER	QTY
005 THRU 011	25
012	15
013 THRU 018	10
110	15
111 THRU 116	10
117 THRU 121	7
210 THRU 211	10
212 THRU 219	7



This kit contains a total of 436 70 durometer O-Rings in 36 different sizes, providing an extremely low cost per size value.

QUAD RING KIT

Part Number: MSQUAD-RING KIT
List Price: \$112.73

DASH NUMBER	QTY
4005 THRU 4012	10
4013 THRU 4016	6
4017 THRU 4018	5
4110 THRU 4116	6
4117 THRU 4121	4
4210 THRU 4219	5



QUAD WAREHOUSE KIT

Part Number: MSQUAD-RING WH KIT
List Price: \$593.48

DASH NUMBER	QTY
4004 THRU 4012	10
4013 THRU 4030	5
4031 THRU 4038	3
4039 THRU 4048	2
4108 THRU 4116	10
4117 THRU 4124	5
4125 THRU 4135	3
4136 THRU 4154	2
4204 THRU 4216	5
4217 THRU 4229	3
4230 THRU 4338	2



Similar to the O-Ring Warehouse kit, the Quad Seal Warehouse kit contains a total of 583 four-lobed seals in 145 different sizes. This kit is ideal for the small distributor who wishes to have a comprehensive on-hand inventory of Quad seals for counter sales.

O-RING KITS

90 DUROMETER O-RING KIT

Part Number: MS568 90D
KIT List Price: \$65.20

DASH NUMBER	QTY
005 THRU 011-90D	25
012-90D	15
013 THRU 018-90D	10
110-90D	15
111 THRU 116-90D	10
117 THRU 121-90D	7
210 THRU 211-90D	10
212 THRU 219-90D	7



This kit contains a total of 436 90 durometer O-Rings in 36 different sizes, providing an extremely low cost per size value.

FLUOROCARBON O-RING KIT

Part Number: MS568 FC KIT List Price: \$291.04

DASH NUMBER	QTY
005 THRU 011V	25
012V	15
013 THRU 018V	10
110V	15
111 THRU 116V	10
117 THRU 121V	7
210 THRU 211V	10
212 THRU 219V	7



This kit contains a total of 436 75 durometer fluorocarbon O-Rings in 36 different sizes, providing an extremely low cost per size value.

PTFE O-RING KIT

Part Number: MS568 PTFE
KIT List Price: \$634.86

DASH NUMBER	QTY
005 THRU 012T	15
013 THRU 018T	10
110 THRU 116T	10
117 THRU 121T	5
210 THRU 219T	5



This kit contains a total of 325 PTFE O-Rings (55 - 58 Shore D) in 36 different sizes. PTFE O-Rings can withstand temperatures up to 500° F and are impervious to a wide range of chemicals.

FLUOROCARBON O-RING KIT

Part Number: MS568 FC KIT-A List Price: \$128.86

DASH NUMBER	QTY
006 THRU 012	10
110 THRU 114	10
115 THRU 116	5
210 THRU 214	5
216 THRU 222	2
325 THRU 327	2



This kit contains a total of 180 75 Shore A fluorocarbon o-rings in 30 different sizes.

VITON KIT

Part Number: MSMETRIC O KIT-V
List Price: \$113.75

I.D.	C.S	QTY	I.D.	C.S	QTY	I.D.	C.S	QTY
5.00	1.50	20	9.00	2.00	15	19.00	2.00	10
2.20	1.60	20	10.00	2.00	15	20.00	2.00	10
3.10	1.60	20	12.00	2.00	15	10.00	2.50	10
4.10	1.60	20	4.30	2.40	15	13.00	2.50	10
7.10	1.60	20	5.30	2.40	15	14.00	2.50	10
4.00	2.00	20	5.60	2.40	15	15.00	2.50	10
6.00	2.00	20	7.60	2.40	15	17.00	2.50	10
13.00	1.50	15	8.30	2.40	15	18.00	2.50	10
9.10	1.60	15	8.60	2.40	15	19.00	2.50	10
10.10	1.60	15	16.00	1.50	10	9.00	3.00	10
13.10	1.60	15	14.00	2.00	10	10.00	3.00	10
8.00	2.00	15	16.00	2.00	10	11.00	3.00	10

This 500 piece kit contains 75 Shore A fluorocarbon o-rings in 36 metric sizes.



O-RING KITS

O-RING WAREHOUSE KIT

Part Number: MS568 WH KIT
List Price: \$569.45

DASH NUMBER	QTY	DASH NUMBER	QTY	DASH NUMBER	QTY
001 THRU 016	20	125 THRU 142	5	325 THRU 328	5
017 THRU 024	10	143 THRU 146	3	329 THRU 330	4
025 THRU 031	7	147 THRU 151	2	331 THRU 338	2
032 THRU 043	5	210 THRU 216	10	901 THRU 914	5
044 THRU 046	2	217 THRU 229	5	916, 918	5
110 THRU 116	15	230 THRU 232	3	920, 924	5
117 THRU 124	10	233 THRU 237	2	928, 932	5

Our O-ring Warehouse kit is ideally suited for the repair shop that needs a large on-hand selection of O-rings to ensure quick repair of all machine types. 1,110 O-Rings in 150 different sizes are included in this kit. Each size is individually packaged in heavy duty ziploc bags to protect against environmental exposure and contamination. All packages are then stored in a sturdy styrene cabinet with pull-out drawers for easy access to parts. Included card shows size, dimensions, and drawer location for each ring.



90 DUROMETER O-RING WAREHOUSE KIT

Part Number: MS568 WH KIT-90D
List Price: \$533.75

DASH NUMBER	QTY	DASH NUMBER	QTY
001 THRU 016-90D	20	217 THRU 229-90D	5
017 THRU 024-90D	10	230 THRU 232-90D	3
025 THRU 031-90D	7	233 THRU 237-90D	2
032 THRU 043-90D	5	325 THRU 328-90D	5
044 THRU 046-90D	2	329 THRU 330-90D	4
110 THRU 116-90D	15	331 THRU 338-90D	2
117 THRU 124-90D	10	901 THRU 914-90D	5
125 THRU 142-90D	5	916, 918-90D	5
143 THRU 146-90D	3	920, 924-90D	5
147 THRU 151-90D	2	928, 932-90D	5
210 THRU 216-90D	10		

Our 90 Durometer O-ring Warehouse kit is ideally suited for the repair shop that needs a large on-hand selection of O-Rings to insure quick repair of all machine types. 1,110 O-Rings in 150 different sizes are included in this kit.



FLUOROCARBON O-RING WAREHOUSE KIT

Part Number: MS568 WH KIT-FC
List Price: \$768.45

DASH NUMBER	QTY	DASH NUMBER	QTY	DASH NUMBER	QTY
001 THRU 016V	20	125 THRU 142V	5	325 THRU 328V	5
017 THRU 024V	10	143 THRU 146V	3	329 THRU 330V	4
025 THRU 031V	7	147 THRU 151V	2	331 THRU 338V	2
032 THRU 043V	5	210 THRU 216V	10	901 THRU 914V	5
044 THRU 046V	2	217 THRU 229V	5	916V, 918V	5
110 THRU 116V	15	230 THRU 232V	3	920V, 924V	5
117 THRU 124V	10	233 THRU 237V	2	928V, 932V	5

Our 75 Durometer Fluorocarbon O-ring Warehouse kit is ideally suited for the repair shop that needs a large on-hand selection of O-rings to ensure quick repair of all machine types. 1,110 O-Rings in 150 different sizes are included in this kit. Each size is individually packaged in heavy duty ziploc bags to protect against environmental exposure and contamination. All packages are then stored in a sturdy styrene cabinet with pull-out drawers for easy access to parts. Included card shows size, dimensions, and drawer location for each ring.



O-RING KITS

MAX O-RING KIT

Part Number: MSMAX 1381 KIT
List Price: \$389.76

Part Number: MSMAX 1381 KIT-90D
List Price: \$446.18



These sturdy kits, packaged in a heavy duty box, contain 1415 O-Rings in the most popular sizes. Every service truck should have one of these. Five internal boxes contain 1/16" C/S, 3/32" C/S, 1/8" C/S, Boss, and Flange fitting o-rings. Contents and quantities are listed below.

Flange Seals

DASH NUMBER	QTY
8	10
12	10
16	10
20	5
24	5
32	5

Boss O-Rings

DASH NUMBER	QTY
903	15
904	25
905	15
906	25
908	25
910	25
912	15
916	10

1/16" C/S O-Rings

DASH NUMBER	QTY
006 THRU 018	25
019 THRU 021	20
022 THRU 026	15
028	15
029	10
030	10

1/8" C/S O-Rings

DASH NUMBER	QTY
210 THRU 214	20
215 THRU 222	15
223 THRU 224	10
226	10
228	10
232	10
236	10

3/32" C/S O-Rings

DASH NUMBER	QTY
109 THRU 118	25
119 THRU 120	20
121 THRU 127	15
128	10
129	10
131	10
133	10
135	5

O-RING KITS

COMMON JAPANESE SIZE O-RINGS IN 70 DUROMETER

Part Number: MSMETRIC O KIT-J
List Price: \$71.80

I.D.	C.S	QTY	I.D.	C.S	QTY
2.8	1.9	25	20.8	2.4	8
3.8	1.9	20	21.8	2.4	8
4.8	1.9	20	24.4	3.1	6
5.8	1.9	20	29.4	3.1	7
6.8	1.9	15	21.7	3.5	5
7.8	1.9	15	22.1	3.5	5
8.8	1.9	15	23.7	3.5	7
9.8	1.9	15	24.7	3.5	7
9.8	2.4	15	25.2	3.5	7
10.8	2.4	15	25.7	3.5	7
11.0	2.4	15	27.7	3.5	7
11.8	2.4	12	28.7	3.5	6
12.8	2.4	12	29.2	3.5	6
13.8	2.4	12	29.7	3.5	6
14.8	2.4	12	30.7	3.5	6
15.8	2.4	12	31.2	3.5	6
17.8	2.4	8	14.5	4.0	4
19.8	2.4	8	23.5	4.0	6



This 380 piece kit contains the most popular Japanese Industrial metric O-ring sizes.

COMMON EUROPEAN SIZE O-RINGS IN 70 DUROMETER

Part Number: MSMETRIC O KIT-E
List Price: \$54.86

I.D.	C.S	QTY	I.D.	C.S	QTY
5.0	1.5	20	19.0	2.0	10
13.0	1.5	15	20.0	2.0	10
16.0	1.5	10	4.3	2.4	15
2.2	1.6	20	5.3	2.4	15
3.1	1.6	20	5.6	2.4	15
4.1	1.6	20	7.6	2.4	15
7.1	1.6	20	8.3	2.4	15
9.1	1.6	15	8.6	2.4	15
10.1	1.6	15	10.0	2.5	10
13.1	1.6	15	13.0	2.5	10
4.0	2.0	20	14.0	2.5	10
6.0	2.0	20	15.0	2.5	10
8.0	2.0	15	17.0	2.5	10
9.0	2.0	15	18.0	2.5	10
10.0	2.0	15	19.0	2.5	10
12.0	2.0	15	9.0	3.0	10
14.0	2.0	10	10.0	3.0	10
16.0	2.0	10	11.0	3.0	10



This 500 piece kit contains the most popular European metric O-ring sizes.

O-RING KITS

COMMON JAPANESE SIZE O-RINGS IN 90 DUROMETER

Part Number: **MSMETRIC O KIT-J-90D**
List Price: **\$174.72**

I.D.	C.S	QTY	I.D.	C.S	QTY
2.8	1.9	25	20.8	2.4	8
3.8	1.9	20	21.8	2.4	8
4.8	1.9	20	24.4	3.1	6
5.8	1.9	20	29.4	3.1	7
6.8	1.9	15	21.7	3.5	5
7.8	1.9	15	22.1	3.5	5
8.8	1.9	15	23.7	3.5	7
9.8	1.9	15	24.7	3.5	7
9.8	2.4	15	25.2	3.5	7
10.8	2.4	15	25.7	3.5	7
11.0	2.4	15	27.7	3.5	7
11.8	2.4	12	28.7	3.5	6
12.8	2.4	12	29.2	3.5	6
13.8	2.4	12	29.7	3.5	6
14.8	2.4	12	30.7	3.5	6
15.8	2.4	12	31.2	3.5	6
17.8	2.4	8	14.5	4.0	4
19.8	2.4	8	23.5	4.0	6



This 380 piece kit contains the most popular Japanese Industrial metric O-ring sizes in 90 durometer NBR.

COMMON EUROPEAN SIZE O-RINGS IN 90 DUROMETER

Part Number: **MSMETRIC O KIT-E-90D**
List Price: **\$186.71**

I.D.	C.S.	QTY	I.D.	C.S.	QTY
5.0	1.5	20	19.0	2.0	10
13.0	1.5	15	20.0	2.0	10
16.0	1.5	10	4.3	2.4	15
2.2	1.6	20	5.3	2.4	15
3.1	1.6	20	5.6	2.4	15
4.1	1.6	20	7.6	2.4	15
7.1	1.6	20	8.3	2.4	15
9.1	1.6	15	8.6	2.4	15
10.1	1.6	15	10.0	2.5	10
13.1	1.6	15	13.0	2.5	10
4.0	2.0	20	14.0	2.5	10
6.0	2.0	20	15.0	2.5	10
8.0	2.0	15	17.0	2.5	10
9.0	2.0	15	18.0	2.5	10
10.0	2.0	15	19.0	2.5	10
12.0	2.0	15	9.0	3.0	10
14.0	2.0	10	10.0	3.0	10
16.0	2.0	10	11.0	3.0	10



This 500 piece kit contains the most popular European metric O-ring sizes in 90 durometer NBR.

O-RING SPLICE KITS

O-RING SPLICE KIT INCH SIZES

Part Number: MS568 SPLICE KIT
List Price: \$56.72

Kit Contains:

1. Stock of 70 Durometer Buna O-ring Cord*
2. Razor Blade
3. Splicing tool
4. Tube of Adhesive

Replacement Parts

Parts:	List Price
568 SPLICE TOOL	\$10.74 ea
568 ADHESIVE	\$7.70 ea
70 Duro. Cord	



*Cross Sections: 1/16"(.070), 3/32"(.103), 1/8"(.139), 3/16"(.210), 1/4"(.275).
Length: 7 Feet Each

O-RING SPLICE KIT INCH & METRIC SIZES

Part Number: MSMET/INCH SPLICE KIT
List Price: \$100.49

This kit can produce O-Rings of any standard inch size cross-section plus a wide variety of metric sizes. Each kit contains quick drying adhesive, cutting and splicing jig, razor blade, and 14 lengths of 70 Durometer Buna-N cord stock as follows:

Inch cross-sections: (inch)
1/16" (.070), 3/32" (.103), 1/8" (.139),
3/16" (.210), 1/4" (.275)

Metric cross-sections: (mm)
1.6, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 5.7, 8.4
Length: 1 Meter Each



These kits can produce O-Rings of any circumference. The 568 kit contains the most popular inch cross sectional sized O-ring cord. The Metric and Inch Kit has both standard inch size cross sectional cord plus a wide variety of metric sized cord. Both kits contain quick drying adhesive, a cutting and splicing jig, a razor blade and 70 Durometer Buna-N cord.

FLUOROCARBON O-RING SPLICE KIT INCH SIZES

Part Number: MS568 FC SPLICE KIT
List Price: \$206.71

Kit Contains:

1. Stock of 75 Durometer Fluorocarbon Cord*
2. Razor Blade
3. Splicing tool
4. Tube of Adhesive

Replacement Parts

Parts:	List Price
568 SPLICE TOOL	\$10.74 ea
568 ADHESIVE	\$7.70 ea
75 Duro. Fluorocarbon Cord	



*Cross Sections: 1/16" (.070), 3/32"(.103), 1/8"(.139), 3/16"(.210),
1/4"(.275). Length: 7 Feet Each

BACK-UP RING KITS

574 BACK-UP RING KIT

Part Number: MS574 KIT
List Price: \$97.07

PART NUMBER	QTY	PART NUMBER	QTY
574-005	10	574-114	10
574-006	10	574-115	10
574-007	10	574-116	10
574-008	10	574-117	5
574-009	10	574-118	5
574-010	10	574-119	5
574-011	10	574-120	5
574-012	10	574-121	5
574-013	10	574-210	7
574-014	10	574-211	7
574-015	10	574-212	7
574-016	10	574-213	7
574-017	10	574-214	5
574-018	10	574-215	5
574-110	10	574-216	5
574-111	10	574-217	5
574-112	10	574-218	5
574-113	10	574-219	5



This 293 piece kit contains 36 of the most popular size "Parback®" Style Dished Cross Section back-up rings. Molded of 90A Durometer Buna-N Rubber, they stretch for installation and return quickly to their original size. SIZES CORRESPOND TO O-RING NUMBERS. Your shop and service truck should not be without this handy kit.

575 BACK-UP RING KIT

Part Number: MS575 KIT
List Price: \$213.19

PART NUMBER	QTY	PART NUMBER	QTY
575-111	25	575-216	25
575-112	25	575-217	15
575-113	25	575-218	15
575-114	25	575-219	15
575-115	25	575-220	15
575-116	25	575-221	15
575-210	25	575-222	15
575-211	25	575-223	15
575-212	25	575-224	15
575-213	25	575-325	10
575-214	25	575-326	10
575-215	25	575-327	10



This 475 piece kit contains 24 of the most popular size urethane back-up rings. This assortment is essential for parts counters, shop use, and service trucks.

PTFE BACK-UP RING KIT

Part Number: MS575 PTFE KIT
S List Price: \$221.31

PART NUMBER	QTY	PART NUMBER	QTY
575-005ST	15	575-114ST	10
575-006ST	15	575-115ST	10
575-007ST	15	575-116ST	10
575-008ST	15	575-117ST	5
575-009ST	15	575-118ST	5
575-010ST	15	575-119ST	5
575-011ST	15	575-120ST	5
575-012ST	15	575-121ST	5
575-013ST	10	575-210ST	5
575-014ST	10	575-211ST	5
575-015ST	10	575-212ST	5
575-016ST	10	575-213ST	5
575-017ST	10	575-214ST	5
575-018ST	10	575-215ST	5
575-110ST	10	575-216ST	5
575-111ST	10	575-217ST	5
575-112ST	10	575-218ST	5
575-113ST	10	575-219ST	5

This 325 piece kit contains 36 of the most popular size PTFE Back-up Rings. These rings are compatible with all hydraulic fluids, since they are virtually chemically inert, and can be used in applications involving elevated operating temperatures. These rings are scarf cut to facilitate installation.



RETAINER RING KITS

SPIRAL WOUND

Part Number: MSSRR KIT
List Price: \$273.95

PART NUMBER	QTY.	PART NUMBER	QTY.
MSWHM-050	12	WSM-050	12
MSWHM-062	12	WSM-062	12
MSWHM-075	12	WSM-075	12
MSWHM-087	12	WSM-087	12
MSWHM-100	12	WSM-100	12
MSWHM-112	12	WSM-112	12
MSWHM-125	12	WSM-125	12
MSWHM-137	12	WSM-137	12
MSWHM-150	12	WSM-150	12



EATON

Part Number: MSERR KIT
List Price: \$349.99

PART NUMBER	QTY.	PART NUMBER	QTY.
MSNAN-050	12	XAN-050	12
MSNAN-062	12	XAN-062	12
MSNAN-075	12	XAN-075	12
MSNAN-087	12	XAN-087	12
MSNAN-100	12	XAN-100	12
MSNAN-112	12	XAN-112	12
MSNAN-125	12	XAN-125	12
MSNAN-137	12	XAN-137	12
MSNAN-150	12	XAN-150	12



Each kit contains: 18 sizes - 9 internal, 9 external • 216 rings per box • 12 rings per size

Each kit has an assortment of retainer rings (Spiral and Eaton style) packed in a reusable plastic box. All rings are made in the USA from carbon spring steel.

EXTERNAL RETAINER RINGS

Part Number: MS310 KIT
List Price: \$92.73

PART NUMBER	SHAFT SIZE	QTY.	PART NUMBER	SHAFT SIZE	QTY.
310-100	1.000	5	310-200	2.000	5
310-125	1.250	5	310-225	2.250	5
310-137	1.375	5	310-250	2.500	5
310-150	1.500	5	310-275	2.750	3
310-175	1.750	5	310-300	3.000	3



These assortments contain the most popular size retainer rings commonly used in many application such as pumps, motors, and forklift cylinders. Boxed in a handy storage and display case, which will supply your shop, service truck, or parts counter with the sizes you need!

INTERNAL RETAINER RINGS

Part Number: MS300 KIT
List Price: \$198.39

PART NUMBER	BORE SIZE	QTY.	PART NUMBER	BORE SIZE	QTY.
300-075	0.750	10	300-200	2.000	10
300-087	0.875	10	300-225	2.250	5
300-100	1.000	10	300-250	2.500	5
300-112	1.125	10	300-275	2.750	5
300-125	1.250	10	300-300	3.000	5
300-137	1.375	10	300-350	3.500	5
300-150	1.500	10	300-400	4.000	5
300-162	1.625	10	300-450	4.500	2
300-175	1.750	10	300-500	5.000	2



ASSORTMENT KITS

CAT® D-RING KIT

Part Number: MSCTC-4C4784
List Price: \$175.67

PART NUMBER	ID	QTY.
1P3700	19.0	10
1P3702	25.4	10
1P3703	31.9	10
1P3704	38.2	10
1P3705	44.7	10
1P3706	51.1	10
1P3707	54.2	10
1P3708	57.4	5
1P3709	63.9	5



This handy kit, in an unbreakable box, contains the 9 most popular sized D-Rings used on Caterpillar® equipment.

CAT® SILICONE O-RING KIT

Part Number: MSCTC-4C8253
List Price: \$473.23

PART NUMBER	QTY.	PART NUMBER	QTY.
8M4986	10	8M4992	3
8M8157	5	8M4443	3
8M4437	10	9M9647	3
8M4438	5	8M5010	3
8M4389	5	1S0004	5
8M8283	3	9H6067	5
8M5252	3	9M4849	5
8M5661	3	8M4991	3
8M8515	5	2S2251	5
8M4432	5	8M4390	3
8M5248	5	8M4435	5
8M5254	5	8M4445	5
9M7002	3	8M4446	5
8M4436	3	8M4988	5
8M4987	10	8M4990	3
8M5249	5	6L1651	3



This handy kit, in an unbreakable box, contains 149 silicone o-rings in the 32 most popular sizes used on Caterpillar® equipment.

ASSORTMENT KITS

CAT® FLANGE KIT

Part Number: MSCTC-2701545
List Price: \$45.61

PART NUMBER	QTY.
4J0524	10
4J0527	10
4J0522	10
4J5267	10
4J5140	10
4J0520	10



CAT® NITRILE O-RING KIT

Part Number: MSCTC-4C4782
List Price: \$296.83

PART NUMBER	QTY.	PART NUMBER	QTY.
4J0527	10	3D2824	20
4J7533	20	2S4078	20
7J0204	20	4J0524	15
3J7354	20	6V9746	20
1J9671	20	5K9090	20
3J1907	20	6V8400	20
4K1388	20	8T0315	20
4J0526	10	6K6307	20
4J0522	15	4J0523	15
4J0520	15	4J5477	20
4J5267	20	6V8397	20
2M9780	20	6V8398	20
7M8485	20	7J9108	20
4J0525	10	3K0360	20
4J0519	15	304606	20
4J5140	20		



This handy kit, in an unbreakable box, contains 570 nitrile o-rings in the 32 most popular sizes used on Caterpillar® equipment.

ASSORTMENT KITS

JOHN DEERE O-RING KIT

Part Number: MSJD-32X451
List Price: \$67.67

This John Deere O-Ring kit contains a total of 451 components, 70 Shore A and 90 Shore A O-rings. OEM parts numbered for easy reference.

CONTENTS OF KIT

- 160 flat-face fittings
- 291 low pressure fittings



PART NUMBER	QTY.	PART NUMBER	QTY.
MSR26976	20	MST76938*	20
MSR27490	20	MSR495R	10
MSA4365R	20	MSR27149	10
MST77814*	20	MSA4730R*	10
MST77613*	20	MST78612*	20
MST77857*	20	MSA3606R	10
MSF3353R	13	MSR1225R	10
MSP46051	13	MSR29463	10
MSR394R	13	MSU12037	10
MSR459R	13	MST78784*	20
MST77932*	20	MSR30319	10
MSR34404	13	MSU10289	10
MST77858*	20	MST11220	10
MSP47889	13	MSR31378	10
MS32240	13	MSB3690R	10
MSB2762R	10	MSP50631	10

* Used for ORS fittings.

JOHN DEERE O-RING KIT

Part Number: MSJD-AT85197
List Price: \$27.38

This kit contains a total of 80, 90 Durometer o-rings in 8 popular sizes used on John Deere equipment.

PART NUMBER	FITTING.	QTY.
T77814	#4	10
T77613	#6	12
T77857	#8	12
T77932	#10	12
T77858	#12	12
T76938	#16	12
T78612	#20	5
T78784	#24	5



KOMATSU O-RING KIT

Part Number: MSKOM-30-KU-90
List Price: \$332.72

This handy kit, in an unbreakable box, contains 74 21T series o-rings & 165 07000-1 series o-rings in the most popular sizes used on Komatsu equipment.



PART NUMBER	QTY.	PART NUMBER	QTY.	PART NUMBER	QTY.
21T-09-11410	10	07000-12010	10	07000-13025	7
21T-09-11420	8	07000-12011	10	07000-13028	7
21T-09-11430	7	07000-12012	10	07000-13030	7
21T-09-11440	7	07000-12014	10	07000-13032	7
21T-09-11450	7	07000-12015	10	07000-13035	7
21T-09-11460	7	07000-12016	10	07000-13038	5
21T-09-11470	7	07000-12018	10	07000-13040	9
21T-09-11480	7	07000-12020	10	07000-13042	7
21T-09-11490	7	07000-12055	8	07000-13045	7
21T-09-11510	7	07000-13022	7	07000-13048	7

ASSORTMENT KITS

THE ULTIMATE NITRILE O-RING ASSORTMENT

Part Number: MS568 KIT-ULTIMATE

List Price: \$4,149.52



Includes: 12 drawers and 3 slide racks, plus base. Total weight 232 lbs.

214 Items, 1324 Pieces.

Sizes Include:

-001 THRU -010

-012 THRU -050

-106 THRU -163

-204 THRU -262

-314 THRU -355

-425 THRU -429

3 racks - each one is: 20" wide x 15-3/4" deep x 15" high

1 base - 20-3/8" wide x 16" deep x 15-1/8" high

Approximately 61" from top to bottom

THE ULTIMATE FLUOROCARBON O-RING ASSORTMENT

Part Number: MS568 FC KIT-ULTIMATE

List Price: \$8,774.82



Includes: 12 drawers and 3 slide racks, plus base. Total weight 232 lbs.

214 Items, 1324 Pieces.

Sizes Include:

-001 THRU -010

-012 THRU -050

-106 THRU -163

-204 THRU -262

-314 THRU -355

-425 THRU -429

3 racks - each one is: 20" wide x 15-3/4" deep x 15" high


1 base - 20-3/8" wide x 16" deep x 15-1/8" high

Approximately 61" from top to bottom

ASSORTMENT KITS

COTTER PIN KIT

Part Number: MSCOTTER PIN KIT
List Price: \$41.06


	1/8" X 1-1/4" 75 pcs.	3/32" X 1" 150 pcs.
	1/8" X 2" 50 pcs.	3/32" X 1-1/2" 100 pcs.
	1/16" X 1" 150 pcs.	5/32" X 2-1/2" 30 pcs.

555 Pieces



WOODRUFF KEYS KIT

Part Number: MSWOODRUFF KEYS KIT
List Price: \$91.58


	1/8" X 1/2" No. 3 16 pcs.	1/8" X 5/8" No. 5 15 pcs.
	3/32" X 5/8" No. 6 15 pcs.	3/16" X 3/4" No. 9 10 pcs.
	1/4" X 7/8" No. A 5 pcs.	1/4" X 1" No. 15 4 pcs.

65 Pieces



GREASE FITTING KIT

Part Number: MSGREASE FITTING KIT
List Price: \$49.64


	1/8" NPT Straight 6 pcs.	1/4" - 28 Straight 6 pcs.
	3/16" Drive Straight 4 pcs.	1/8" NPT 45 1/8" NPT 90 3 pcs. ea.
	1/4" - 28 45 1/4" - 28 90 3 pc. ea.	5/16" Drive Straight 4 pcs.

32 Pieces



GREASE FITTING KIT-A

Part Number: MSGREASE FITTING KIT-A
List Price: \$45.10


	1/8" PT Straight 25 pcs.	1/8" PT 45° 1/8" PT 90° 1/8" PT 7.5° 5 pcs.
	1/4"-28 PT Straight 50 pcs.	1/4"-28 PT 45° 1/4"-28 PT 90° 5 pcs.

100 Pieces



NYLON PLUG KIT

Part Number: MSNYLON PLUG KIT
List Price: \$142.00

	Nyplug-125-125 1/8" x 1/8" 20 pcs.	Nyplug-187-109 3/16" x 7/64" 20 pcs.	Nyplug-250-125 1/4" x 1/8" 20 pcs.	
	Nyplug-125-156 1/8" x 5/32" 20 pcs.	Nyplug-187-187 3/16" x 3/16" 20 pcs.	Nyplug-250-187 1/4" x 3/16" 20 pcs.	Nyplug-312-125 5/16" x 1/8" 20 pcs.
	Nyplug-125-875 1/8" x 7/8" 20 pcs.	Nyplug-187-250 3/16" x 1/4" 20 pcs.	Nyplug-250-250 1/4" x 1/4" 20 pcs.	Nyplug-375-250 3/8" x 1/4" 20 pcs.

220 Pieces
11 Sizes



SET SCREW KIT

Part Number: MSSSK-INCH
List Price: \$68.43



Use these set screws in confined areas, where there is no room for a protruding head. Nine coarse sizes, three fine sizes.

Hex wrench shown not included. Coarse sizes: 1/8"-40 x 3/16", 5/32"-32 x 3/16", 3/16"-24 x 1/4", 1/4"-20 x 1/4", 1/4"-20 x 3/8", 5/16"-18 x 3/8", 5/16"-18 x 1/2", 3/8"-16 x 3/8", and 3/8"-16 x 1/2".

Fine sizes: 1/4"-28 x 1/4", 5/16"-24 x 3/8", 3/8"-24 x 3/8"

ASSORTMENT KITS

CAP PLUG KIT

Part Number: MSCAP PLUG KIT
List Price: \$239.92



The cap plug kit contains 625 cap plugs in 24 of the most popular sizes.

Cap Plug Number	QTY	Cap Plug Number	QTY	Cap Plug Number	QTY
MSCAP-2-X	50	MSCAP-PD-100	25	CAP-G-22	20
MSCAP-4	50	MSCAP-PD-120	25	CAP-G-25	20
MSCAP-6-X	50	MSCAP-PD-140	20	CAP-G-27	20
MSCAP-9	50	MSCAP-PD-160	20	CAP-P-28	25
MSCAP-12-X	25	MSCAP-G-2	20	CAP-P-38	25
MSCAP-14	20	MSCAP-G-8	20	CAP-P-48	25
MSCAP-PD-60	25	MSCAP-G-14	20	CAP-P-68-H	25
MSCAP-PD-80	25	MSCAP-G-18	20	CAP-P-88-H	20

CAP PLUG CASE

Part Number: MSCAP PLUG CASE
List Price: \$123.11

This rugged case has 24 empty compartments to hold a limited variety of cap plugs from the master kit (shown above).

Case only - cap plugs sold separately.

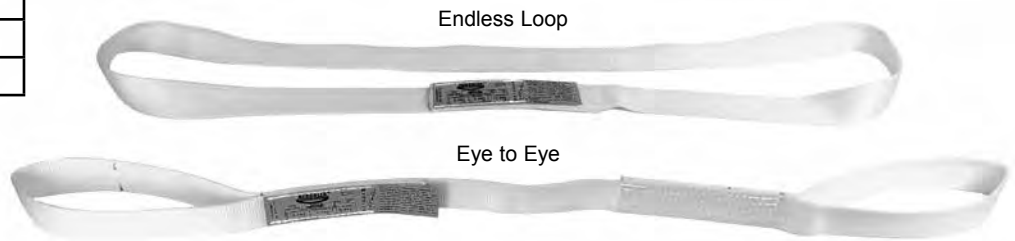


LIFTING SLINGS

MSO now carries new synthetic web lifting slings which are primarily composed of nylon. Our lifting slings are a soft and flexible solution to rigging and are offered in endless and eye to eye styles. All of the synthetic web slings are constructed with 9800 lbs. maximum load rated heavy duty webbing, and are in full compliance with current ASME B30.9 standards, with a 5:1 safety factor.

Nylon web slings with flat eye to eye loops are one of the most popular straps for lifting because of their versatility: they can be used in a choker, basket or vertical hitch. The design also makes it easy to remove from underneath a load.

Material	Nylon
Max Temperature	180°F
UV Degradation	High



Part Number	Width (in)	Length (ft)	Product	Vertical Load Limit (lbs.)	Choker Load Limit (lbs.)	Basket Load Limit (lbs.)	Net Price
MSSLEN1-4	1"	4'	Endless Loop	3200	2500	6400	\$8.52
MSSLEN1-6	1"	6'	Endless Loop	3200	2500	6400	10.85
MSSLEN2-4	2"	4'	Endless Loop	6400	5000	12800	12.85
MSSLEN2-6	2"	6'	Endless Loop	6400	5000	12800	17.09
MSSLEN2-8	2"	8'	Endless Loop	6400	5000	12800	21.33
MSSLEE1-4	1"	4'	Eye to Eye	1600	1200	3200	7.94
MSSLEE1-6	1"	6'	Eye to Eye	1600	1200	3200	9.10
MSSLEE2-4	2"	4'	Eye to Eye	3200	2400	6400	11.78
MSSLEE2-6	2"	6'	Eye to Eye	3200	2400	6400	13.90
MSSLEE2-8	2"	8'	Eye to Eye	3200	2400	6400	16.02

INSTALLATION TOOLS

SEAL TOOL KIT

Part Number: MSSEAL TOOL KIT
Net Price: \$344.49

Kit contains:

- Piston seal compressor
- Pick set
- Pi tape
- Seal installation tool set
- Wear strip cutter
- O-ring adhesive
- Precision cord cutter
- Seal install and remove tool
- O-ring detector



SEAL CLASPER

Part Number: MSSEAL CLASPER
Net Price: \$106.52



The Seal clasper is designed to press a PTFE piston seal back into the groove. The clasper works on seals from 50mm to 360mm OD. It allows a piston seal to be installed into a cylinder safely and rapidly.

The stainless steel belt can be adjusted according to the dimension of seals. The HPU triangle protector prevents seal damage.

How to use:

1. Adjust the length of stainless steel belt to match the seal.
2. Pull the grid to clasp the PTFE piston seal back into groove.

Part Number: SEAL CLASPER XL
Net Price: \$205.27



The Seal clasper is designed to press a PTFE piston seal back into the groove. The Clasper XL works on seals from 350mm to 710mm OD. It allows a piston seal to be installed into a cylinder safely and rapidly.

The stainless steel belt can be adjusted according to the dimension of seals. The HPU triangle protector prevents seal damage.

How to use:

1. Adjust the length of stainless steel belt to match the seal.
2. Pull the grid to clasp the PTFE piston seal back into groove.

INSTALLATION TOOL SET

Part Number: MSIT TOOL SET-A
Net Price: \$46.46

Sizes Included	Max Heel Cross Section
S (22 - 30 mm)	6.6 mm
M (30 - 50 mm)	10.7 mm
L (50 - 70 mm)	19.3 mm
XL (70 - 165 mm)	27.1 mm

This handy tool set has 4 different size installation tools, along with a holder.



QUALITY ROD U-SEAL INSTALLATION TOOLS



Part Number	Seal ID Range	Max Heel Cross Section	Net Price	
MSIT 100	3/4" to 1-1/4"	19 - 31 mm	0.300"	\$22.54
MSIT 150	1-3/8" to 1-7/8"	35 - 47 mm	0.360"	22.54
MSIT 200	2" to 3"	51 - 76 mm	0.600"	22.54
MSIT 100-NN	3/4" to 1-1/4"	19 - 31 mm	0.300"	22.54
MSIT 150-NN	1-3/8" to 1-7/8"	35 - 47 mm	0.360"	22.54
MSIT 200-NN	2" to 3"	51 - 76 mm	0.600"	22.54

These tools aid U-seal installation, eliminating the risk of damaging the seal lip. NN = Without MSO® logo.

Usage Instructions online at www.msindustries.com / Inquiry Forms / Technical Assistance.

VALUE ROD U-SEAL INSTALLATION TOOLS



Part Number	Seal ID Range	Net Price	
MSSEAL TWISTOR M	1-3/16" to 2"	30 - 50 mm	\$12.42
MSASEAL TWISTOR L	2" to 2-3/4"	50 - 70 mm	13.98
MSSEAL TWISTOR XL	2-3/4" to 6-1/2"	70 - 165 mm	15.53

These tools aid Rod U-seal installation, eliminating the risk of damaging the seal lip. Usage Instructions online at: www.msindustries.com / Inquiry Forms / Technical Assistance.

SPLICING / CUTTING TOOLS

O-RING SPLICE TOOL

Part Number: MSOR SPLICER
Net Price: \$32.40

- Splicing tool for o-rings
- For cross section diameter from 2.5 to 20 mm
- Clamping plates for locking
- Aluminium stands for use with glue or heat



ULTRASHARP 4.0

Part Number: MSULTRASHARP 4.0
Net Price: \$51.92



ULTRASHARP 4.0 cutter is designed to cut the strongest resin impregnated fabric bearing tape. It may cut the maximum size 40X4mm (90°). Additional position wheel and blade pad may change the direction of cutting. The design is convenient to both of left hand and right hand users. This specialized cutter for C506 bearing tape (phenolic resins) can easily cut WRT bearing taper (PTFE) as well. The kerfs can be cut with 45°/60°/90° angle by screwing the angle adjusting block.

O-RING SPLICE KIT

Part Number: MSOR SPLICE KIT
Net Price: \$187.69

- Kit contains:
- Splice iron
 - Pi tape
 - Grinding tool
 - O-ring adhesive
 - Precision cord cutter
 - Splice tool



SPLICE IRON

Part Number: MSSEAL HEATER
Net Price: \$43.40



CHOPPING AND REMOVAL TOOLS

O-RING CORD CHOPPER

Part Number: MSORC CHOPPER
Net Price: \$37.88



- Cuts o-ring cord to prepare it for splicing
- Suitable for cross section from 0.103 to 0.551 inches (2.62 to 14 mm)

CHOPPER BLADES

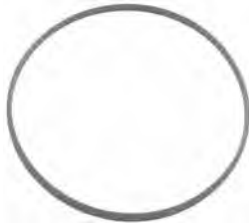
Part Number: MSORC CHOPPER BLADE
Net Price: \$7.53



Quantity of 20 Chopper Blades.

GLAND REMOVAL TOOLS

Part Number	Bore Diameter	List Price
MSJD-6.00X0.40-IT	6"	\$29.06
MSJD-45MM-IT	45 mm	5.32
MSJD-50MM-IT	50 mm	3.55
MSJD-53MM-IT	53 mm	5.72
MSJD-56MM-IT	56 mm	5.93
MSJD-63MM-IT	63 mm	8.92
MSJD-70MM-IT	70 mm	10.05
MSJD-80MM-IT	80 mm	10.74
MSJD-90MM-IT	90 mm	11.82
MSJD-100MM-IT	100 mm	13.62
MSJD-110MM-IT	110 mm	14.86
MSJD-115MM-IT	115 mm	17.77
MSJD-125MM-IT	125 mm	16.58



OIL SEAL REMOVAL & INSTALLATION TOOL

Part Number: MSSR TOOL
Net Price: \$69.72



SSOR PICKER

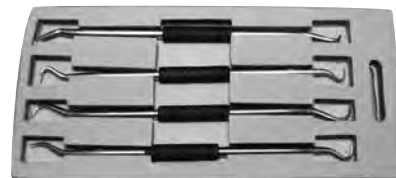
Part Number: MSSSOR PICKER
List Price: \$10.17



The round shape design of SSOR PICKER provide a smooth surface to prevent the risk of damage while rubber O-ring is being taken away from a metal groove. It also protects the surface of metal groove from damage by sharp metal tool like screw driver or metal hook.

O-RING PICK SET

Part Number: MSOR HOOK
List Price: \$7.82



This Value package of O-ring Picks in plastic carrying case, aid in the installation and extraction of O-rings.

REMOVAL TOOLS

O-RING PICK SET 1

Part Number: MSO-RING PICK
Net Price: \$6.73

These bronze O-ring picks, w/ black vinyl case, aid in the installation and extraction of O-rings.



O-RING PICK SET 2

Part Number: MSO PICK SET
Net Price: \$35.77

Designed for heavy duty use and packaged in a clear vinyl pouch, this kit contains a knurled handle and four screw-in picks with different hook configurations. Set includes straight tip, o-ring 90° tip, hook tip, and angle tip. Made in the USA.



SNAP-ON O-RING PICK SET 4

Part Number: MSMAXI PICK SET
Net Price: \$63.35

Designed for heavy duty use and packaged in a plastic pouch, these highly visible picks feature screwdriver-type colored handles. Set includes awl, hook tip, 45° bent tip tool, and 90° bent tip tool. Made in the USA.



CHEVRON ASSEMBLY TOOL

Part Number: MSCM-376-9067-001
Net Price: \$58.51

Vee Packing assembly tool for Telescopic Cylinders.



5 PIECE TOOL KIT SET

Part Number: MSCH-TK-1 Net
Price: \$104.09



Vee Packing tool kit set for Telescopic Cylinders.

8 PIECE O-RING PICK SET

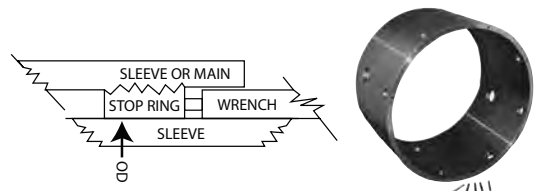
Part Number: MSO PICK SET-A
Net Price: \$21.52



This economical seal pick tool set lowers your chance of surface damage. It contains 8 different hard metal hooks with sturdy plastic handles.

STOP RING WRENCH

Part Number	Sleeve or Plunger O.D.	Pins	Net Price
MSCM-376-6067-047	2-3/4"	5 Pins	\$258.35
MSCM-376-6067-048	3-3/4"	5 Pins	293.13
MSCM-376-6067-049	4-3/4"	5 Pins	315.56
MSCM-376-6067-050	5-3/4"	5 Pins	368.60
MSCM-376-6067-051	6-3/4"	5 Pins	402.77
MSCM-376-6067-052	7-7/8"	5 Pins	435.68
MSCM-376-6067-053	9-3/8"	5 Pins	510.34
MSCM-391-2086-007	Replacement Stop Wrench Pin		3.17



REMOVAL TOOLS

11 PIECE PACKING TOOL KIT

Part Number: MSPACK TOOL
Net Price: SET-11\$148.84



Part Number	QTY	Part Number	QTY
MSFPH-312R	2	FPH-RTC312	1
MSFPH-437R	2	FPH-RTC437	1
MSSSP-125	1	WRENCH	1
MSSSP-187	1	BOX	1
MSSSP-312	1		

REPLACEABLE WOODSCREW TIPS

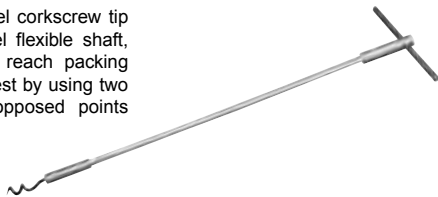
Part Number	Packing Space	Net Price
MSFPH-RTW312	5/16"-up	\$8.46
MSFPH-RTW437	7/16"-up	9.93
MSFPH-RTW500	1/2"-up	10.22



FLEXIBLE PACKING HOOKS

Part Number	Packing Space	Length	Net Price
MSFPH-187	3/16"-up	6-1/2"	\$16.36
MSFPH-312R	5/16"-up	7-1/2"	17.94
MSFPH-437R	7/16"-up	10-1/2"	19.72
MSFPH-500R	1/2"-up	14-1/2"	26.90

With a tempered tool steel corkscrew tip and a woven strand steel flexible shaft, this tool makes hard to reach packing easy to pull out. Works best by using two hooks at diametrically opposed points (180°).



17 PIECE PACKING TOOL KIT

Part Number: MSPACK TOOL
Net Price: SET-17\$245.68



Part Number	QTY	Part Number	QTY
MSFPH-312R	2	FPH-RTC437	1
MSFPH-437R	2	FPH-RTC500	1
MSFPH-500R	2	FPH-RTW312	1
MSSSP-125	1	FPH-RTW437	1
MSSSP-187	1	FPH-RTW500	1
MSSSP-312	1	WRENCH	1
MSFPH-RTC312	1	BOX	1

REPLACEABLE CORKSCREW TIPS

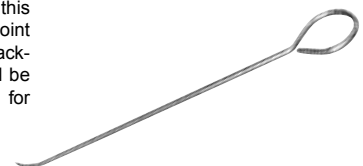
Part Number	Packing Space	Net Price
MSFPH-RTC312	5/16"-up	\$7.18
MSFPH-RTC437	7/16"-up	20.34
MSFPH-RTC500	1/2"-up	10.76



SOLID SHAFT PICKS

Part Number	Packing Space	Length	Net Price
MSSSP-125	1/8 -up	9-1/2"	\$23.40
MSSSP-187	3/16 -up	10"	28.78
MSSSP-312	5/16"-up	10"	46.22

Formed from hardened steel, this tool's length and sharp angled point gets at hard to reach o-rings, back-up rings & braided packing. You'll be amazed at all the uses you find for this tool.



DISMANTLING TOOLS

SPANNER WRENCHES

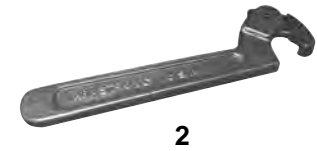
(1) ADJUSTABLE HEAD — PIN STYLE

PART NUMBER	PART OD RANGE	PIN DIA.	PIN LGTH.	NET PRICE
MSSPAP-2.00X0.13	3/4" to 2" (19mm to 50mm)	1/8"	1/8"	\$59.32
MSSPAP-2.00X0.19	3/4" to 2" (19mm to 50mm)	3/16"	5/32"	59.32
MSSPAP-3.00X0.19	1-1/4" to 3" (32mm to 76mm)	3/16"	3/16"	68.03
MSSPAP-3.00X0.25	1-1/4" to 3" (32mm to 76mm)	1/4"	7/32"	68.03
MSSPAP-4.75X0.25	2" to 4-3/4" (51mm to 120mm)	1/4"	1/4"	86.52
MSSPAP-6.25X0.38	4-1/2" to 6-1/4" (115mm to 159mm)	3/8"	1/4"	91.25



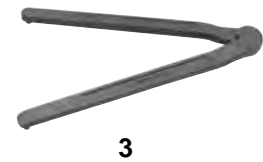
(2) ADJUSTABLE HEAD — HOOK STYLE

PART NUMBER	PART OD RANGE	HOOK WD.	HOOK DP.	NET PRICE
MSSPAH-2.00	3/4" to 2" (19mm to 50mm)	11/32"	1/8"	\$54.02
MSSPAH-3.00	1-1/4" to 3" (32mm to 76mm)	13/32"	5/32"	65.28
MSSPAH-4.75	2" to 4-3/4" (51mm to 120mm)	15/32"	3/16"	82.45
MSSPAH-6.25	4-1/2" to 6-1/4" (115mm to 159mm)	15/32"	1/4"	88.18
MSSPAH-8.75	6-1/8" to 8-3/4" (155mm to 222mm)	15/32"	5/16"	117.10

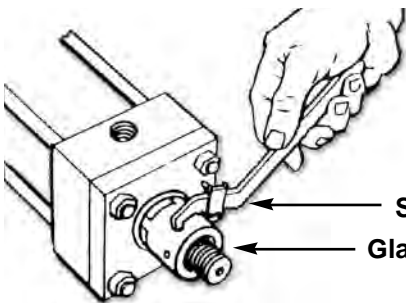


(3) ADJUSTABLE FACE — PIN STYLE

PART NUMBER	DIA. RANGE (CENTER TO CENTER)	PIN DIA.	PIN LGTH.	NET PRICE
MSSPAPF-2.00X0.19	5/8" to 2" (16mm to 50mm)	3/16"	1/8"	\$47.80
MSSPAPF-3.00X0.25	5/8" to 3" (16mm to 76mm)	1/4"	3/16"	69.88
MSSPAPF-4.00X0.31	5/8" to 4" (16mm to 101mm)	5/16"	1/4"	101.23



PARKER GLAND WRENCHES



Rod Dia.	Kit #	ID X OD X HT	Net Price	Spanner (Sold Separately Above)
1/2", 5/8", 12mm & 14mm	PKH-069590	11/16" X 1-1/8" X 1-3/8"	\$36.35	MSSPAP-2.00X0.19
18mm	PKH-084765	13/16" X 1-1/4" X 1-7/16"	32.46	MSSPAP-2.00X0.19 or SPAP-3.00X0.19
1" & 22mm	PKH-069591	1-1/16" X 1-5/8" X 1-1/2"	21.96	MSSPAP-2.00X0.19 or SPAP-3.00X0.19
28mm	PKH-084766	1-1/4" X 1-11/16" X 1-9/16"	31.05	MSSPAP-2.00X0.19 or SPAP-3.00X0.19
1-3/8" & 36mm	PKH-069592	1-7/16" X 1-7/8" X 1-5/8"	42.53	MSSPAP-2.00X0.19 or SPAP-3.00X0.19
1-3/4" & 45mm	PKH-069593	1-13/16" X 2-1/4" X 1-5/8"	40.43	MSSPAP-3.00X0.25 or SPAP-4.75X0.25
2"	PKH-069594	2-1/16" X 2-1/2" X 2"	50.20	MSSPAP-3.00X0.25 or SPAP-4.75X0.25
2-1/2" & 56mm	PKH-069595	2-9/16" X 3" X 2-1/8"	79.29	MSSPAP-3.00X0.25 or SPAP-4.75X0.25
70mm	PKH-069596	2-15/16" X 3-1/2" X 2-3/8"	92.64	MSSPAP-4.75X0.25

REMANUFACTURING TOOLS

SUNNEN PORTABLE HONES - AN-815 AND ANR-275

Part Number: MSH-AN-815
Net Price: \$614.04



Additional sizes and accessories shown below.

Hand Feed - ID Range 64-533 mm (2.500" - 21.000")
 For occasional heavy-duty portable honing

Illustration shows standard AN-815 Portable Hone assembled with single length master holder set and stone set. Requires 16 mm (5/8") chuck capacity for 63.5-127 mm (2.5"-5") diameter. Requires 19mm (3/4") chuck capacity for 127-381 mm (5"-15") diameter. Requires 25.4 mm (1") chuck capacity for larger than 381 mm (15") diameter.

Weight 2.3 kg (5 lbs).

Part Number: MSH-ANR-275
Net Price: \$2,230.00



Additional sizes and accessories shown below.

Remote Feed - ID Range 64-533 mm (2.500" - 21.000")
 For production heavy-duty honing - to be used in a machine or honing rig.

Illustration shows the ANR-275 Portable Hone assembled with Stone Support, Single Length Master Holder Set, Stone Set and 76 mm (3") Drive Shank. (3/4") chuck capacity for 127-381 mm (5"-15") diameter. Requires 16 mm (5/8") chuck capacity for 63.5-127 mm (2.5"-5") diameter. Requires 19 mm (5-15" diameter. Requires 25.4 mm (1") chuck capacity for larger than 381 mm (15") diameter.

Weight 5.2 kg (11.5 lbs).

FOR A COMPLETE PORTABLE HONE ORDER A + B + C + D + E				A - BASIC HONE	B - MASTER HOLDER SETS				C - STONE SUPPORT	D - STONE SET	E - SHAFT EXTENSION		
Diameter Range					Single Length	Double Length	Part Number	Net Price				Part Number	Net Price
General Purpose Stone Sets		Guideless and Keyway Stone Sets											
mm	Inches	mm	Inches	Part Number	Net Price	Part Number	Net Price	Part Number	Net Price				
64-140	2.5-5.5	64-142	2.5-5.6	See Hones H-AN-815 and H-ANR-275 Above	None	-	None	-	None	-			
104-160	4.1-6.3	114-165	4.5-6.5		H-AN-345	\$131.00	None	-	None	-			
119-178	4.7-7.0	130-183	5.1-7.2		H-AN-355	131.00	H-AN-855	\$196.00	None	-			
152-229	6.0-9.0	163-234	6.4-9.2		H-AN-365	131.00	H-AN-865	196.00	H-AN-260	\$92.50			
206-305	8.1-12.0	213-310**	8.4-12.2**		H-AN-375	136.00	H-AN-875	205.00	H-AN-280	109.00			
279-381	11.0-15.0	284-386**	11.2-15.2**		H-AN-385	136.00	H-AN-885	205.00	H-AN-290	119.00			
356-457	14.0-18.0	363-465**	14.3-18.3**	See hones above	H-AN-395	142.00	H-AN-895	212.00	H-AN-340	131.00			
432-533	17.0-21.0	437-538**	17.2-21.2**		H-AN-415	141.00	H-AN-915	212.00	H-AN-450	146.00			

* For light work only in this diameter range.

** Do not use WW (Guideless) Stone Sets in this range due to lack of stability.

Length		Drive Shanks		AN-815 Shaft Extensions		AN-275 Shaft Extensions		Master Holder Sets and Stone Supports		
mm	Inches	Part Number	Net Price	Part Number	Net Price	Part Number	Net Price			
76	3	H-AN-608A**	\$29.40	None	-	None	-	Master Holder Sets, listed in the table above, are used with Type W47, WW51 and WY51 Stone Sets. Double Length Master Holders require two stone sets - use when the bore is more than 457 mm (18") long or when it is necessary to bridge interruptions in the bore. Each Master Holder Set consists of two holders for stones and two holders for guides. Stone Supports are required to give rigidity to the hone assembly when honing bores larger than 178 mm (7") diameter. Stone length is 102 mm (4") or 203 mm (8") when two sets of stones are used with double length master holder set.		
152	6	H-AN-618A*	43.50	H-AN-840	\$54.25	None	-			
235	9.25	None	-	None	-	H-ANR-741	\$397.00			
305	12	None	-	H-AN-841*	60.00	None	-			
483	19	None	-	None	-	H-ANR-742	451.00			
610	24	None	-	H-AN-842	174.00	None	-			
1086	42.75	None	-	None	-	H-ANR-744	570.00			
1220	48	None	-	H-AN-844	266.00	None	-			
1835	72.25	None	-	None	-	H-ANR-746	715.00			

The AN-815 is finished with 152 mm (6") Drive Shank and 305 mm (12") Shaft Extension. The ANR-275 is furnished with 76 mm (3") Drive Shank. Other shanks or extensions may be selected from the table above to make up any practical length (either drive shank can be used with any combination of extensions).

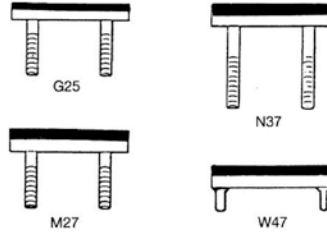
* Supplied with AN-815 hone. ** Supplied with ANR-275 hone.

ASSORTMENT KITS AND TOOLS

REMANUFACTURING TOOLS

SUNNEN HONE STONE SETS FOR MSAN-815 AND MSANR-275

Sunnens Stone Sets for 2.5" to 60" diameter, portable tools (two stones and two guides per set). Stone length is 102 mm (4") or 203 mm (8") when two sets of stones are used with double length master holder set. For Industrial applications. From fast stock removal in deburred, bored, ground, or reamed holes to fine finishing in previously honed holes, these hone stone sets are in stock and ready for next day delivery.



Stone Number	Diameter
G25	2.5 - 2.7
M27	2.7 - 4.1
N37	3.5 - 5.5
W47	4.1 - 60.0*

* Requires Master Holder Set - Limited to 21" with H-AN-815

ALUMINUM OXIDE STONES

MODEL		MSG25		MSM27		MSN37		MSW47	
GRIT SIZE		64 TO 69 mm 2.5" - 2.7"	NET PRICE	69 TO 104 mm 2.7" - 4.1"	NET PRICE	89 TO 140 mm 3.5" - 5.5"	NET PRICE	104 TO 1524 mm 4.1" - 60"***	NET PRICE
80	HARD - SOFT	H-G25-A23	\$22.10	H-M27-A23	\$21.50	H-N37-A23	\$22.10	H-W47-A23	\$22.70
		H-G25-A25	22.10	H-M27-A25	21.50	H-N37-A25	22.10	H-W47-A25	22.70
		H-G25-R25X	22.10	H-M27-R25X	21.50	H-N37-R25X	22.10	H-W47-R25X	22.70
		H-G25-A27	22.10	H-M27-A27	21.50	H-N37-A27	22.10	H-W47-A27	22.70
150	H - S	H-G25-A43	\$22.10	H-M27-A43	\$21.50	H-N37-A43	\$22.10	H-W47-A43	\$22.70
		H-G25-A45	22.10	H-M27-A45	21.50	H-N37-A45	22.10	H-W47-A45	22.70
		H-G25-A47	22.10	H-M27-A47	21.50	H-N37-A47	22.10	H-W47-A47	22.70
		-	-	H-M27-A49	21.50	H-N37-A49	22.10	H-W47-A49	22.70
220	H-S	-	-	-	-	H-N37-A55	\$22.10	H-W47-A55	\$22.70
280	H - S	-	-	-	-	-	-	H-W47-A63	\$22.70
		H-G25-A65	\$22.10	H-M27-A65	\$21.50	H-N37-A65	\$22.10	H-W47-A65	22.70
		-	-	H-M27-A67	21.50	-	-	H-W47-A67	22.70
MODEL		MSGY25		MSMY33		MSNY40		MSWY51	
MAX KEYWAY WIDTH		20.3 mm 0.8"		22.86 mm 0.9"		30.48 mm 1.2"		35.56 mm 1.4"	
GRIT SIZE		64 TO 84 mm 2.5" - 3.3"	NET PRICE	84 TO 107 mm 3.3" - 4.2"	NET PRICE	102 TO 142 mm 4.0" - 5.6"	NET PRICE	114 TO 1524 mm 4.5" - 60"***	NET PRICE
150	M	H-GY25-A47	\$41.90	H-MY33-A47	\$41.90	H-NY40-A47	\$41.90	H-WY51-A47	\$41.90

SILICON CARBIDE STONES

MODEL		MSG25		MSM27		MSN37		MSW47	
GRIT SIZE		64 TO 69 mm 2.5" - 2.7"	NET PRICE	69 TO 104 mm 2.7" - 4.1"	NET PRICE	89 TO 140 mm 3.5" - 5.5"	NET PRICE	104 TO 1524 mm 4.1" - 60"***	NET PRICE
70	HARD - SOFT	-	-	-	-	H-N37-J11	\$22.10	H-W47-J11	\$22.70
		-	-	-	-	H-N37-J13	22.10	H-W47-J13	22.70
		H-G25-J15	\$22.10	-	-	-	-	H-W47-J15	22.70
		H-G25-J17	22.10	H-M27-J17	\$22.10	H-N37-J17	22.10	H-W47-J17	22.70
150	H - S	-	-	-	-	H-N37-J43	\$22.10	H-W47-J43	\$22.70
		H-G25-J45	\$22.10	H-M27-J45	\$22.10	H-N37-J45	22.10	H-W47-J45	22.70
		H-G25-J47	22.10	H-M27-J47	22.10	H-N37-J47	22.10	H-W47-J47	22.70
220	H - S	H-G25-J55	\$22.10	H-M27-J55	\$22.10	H-N37-J55	\$22.10	H-W47-J55	\$22.70
		-	-	H-M27-J57	22.10	H-N37-J57	22.10	-	-
280	H - S	H-G25-J63	\$22.10	H-M27-J63	\$22.10	-	-	H-W47-J63	\$22.70
		H-G25-J65	22.10	H-M27-J65	22.10	H-N37-J65	\$22.10	H-W47-J65	22.70
		H-G25-J67	22.10	H-M27-J67	22.10	H-N37-J67	22.10	H-W47-J67	22.70
400	H - S	H-G25-J85	\$22.10	H-M27-J85	\$22.10	H-N37-J85	\$22.10	H-W47-J85	\$22.70
		H-G25-J87	22.10	H-M27-J87	22.10	H-N37-J87	22.10	H-W47-J87	22.70

* R25X - Red aluminum oxide / sulfur Impregnated

** Requires Master Holder Set - Limited to 21" with H-AN-815 and H-ANR-275

REMANUFACTURING TOOLS

SUNNEN PORTABLE HONES AND STONE SETS FOR H-SNJ-10 AND H-SN-75

Part Number: MSH-SNJ-10
Net Price: \$530.00

Additional sizes and accessories shown below.

Hand Feed - ID Range 31.8-45.0 mm (1.250" - 1.770")
 For occasional portable honing

Illustration shows the SNJ-10 Portable Hone assembled with Stone Set and AN-26A Drive Shank. Will hone bores up to 457 mm (18.0") long as shown; order additional Shaft Extensions for longer bores. Requires 13 mm (1/2") chuck capacity.

Weight .5 kg (1 lb).



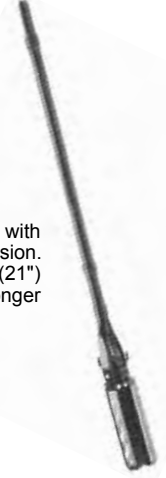
Part Number: MSH-SN-75
Net Price: \$462.00

Additional sizes and accessories shown below.

Hand Feed - ID Range 44-51 mm (1.750" - 2.000")
 For occasional portable honing

Illustration shows the SN-75 Portable Hone assembled with Stone Set, Drive Shank, and 305 mm (12") Shaft Extension. 102 mm (4") stone length. Will hone bores up to 533 mm (21") long as shown; order additional Shaft Extensions for longer bores. Requires 13 mm (1/2") chuck capacity.

Weight 1.4 kg (3 lbs).



To Order: SNJ-10 and SN-75 Basic Hone include 76 mm (3") Drive Shank, 305 mm (12") Extension, and one Universal Joint. Additional Shaft Extensions may be ordered from table above to make up any practical length (Drive Shank can be used with any combination of Extensions). * Supplied with hone	DRIVE SHANKS				SHAFT EXTENSIONS			
	LENGTH				LENGTH			
	MM	INCHES	PART NUMBER	NET PRICE	MM	INCHES	PART NUMBER	NET PRICE
	76	3	MSH-AN-26A*	\$19.55	305	12	MSH-AN-241	\$54.25
					610	24	MSH-AN-242	174.00
					1220	48	MSH-AN-244	245.00

SUNNEN STONE SETS FOR MSH-SNJ-10 PORTABLE HONE							
MATERIAL	GRIT SIZE	31.75 TO 36.50 mm 1.250" - 1.437"	NET PRICE	36.02 TO 40.74 mm 1.418" - 1.604"	NET PRICE	40.13 TO 45.00 mm 1.580" - 1.770"	NET PRICE
Aluminum Oxide	150 (4)	MSH-SNJ1-A45	\$24.80	H-SNJ2-A45	\$24.80	MSH-SNJ3-A45	\$24.80
Silicon Carbide	150 (4)	MSH-SNJ1-J45	\$24.80	-	-	-	-
	280 (6)	MSH-SNJ1-J63	24.80	H-SNJ2-J63	\$24.80	MSH-SNJ3-J63	\$24.80
	400 (8)	MSH-SNJ1-J87	24.80	H-SNJ2-J87	24.80	MSH-SNJ3-J87	24.80

Consists of 3 stones.

SUNNEN STONE SETS FOR MSH-SN-75 PORTABLE HONE				
MATERIAL	GRIT SIZE	SOFT - HARD	44 TO 51 1.75" - 2.00"	NET PRICE
Aluminum Oxide	80 (2)	Hard	MSH-S18-A25	\$21.60
	150 (4)	Medium	MSH-S18-A45	21.60
Silicon Carbide	150 (4)	Medium	MSH-S18-J45	\$21.60
	400 (8)	Medium	MSH-S18-J85	21.60

Consists of 2 stones and 2 guides.

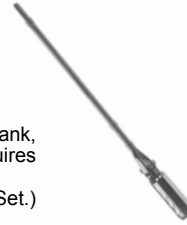
ASSORTMENT KITS AND TOOLS

REMANUFACTURING TOOLS

SUNNEN PORTABLE HONES FOR H-JN-95

Part Number: MSH-JN-95
Net Price: \$462.00

Hand Feed - ID Range 51 - 66 mm (2.000" - 2.600")
 For occasional portable honing
 JN-95 Basic Portable Hone includes 76 mm (3") Drive Shank,
 305 mm (12") Extension, and one Universal Joint. Requires
 13 mm (1/2") chuck capacity.
 (Illustration shows Portable Hone assembled with Stone Set.)



SUNNEN HONE STONE SETS FOR MSH-JN-95 PORTABLE HONE

Stone sets for the H-JN-95 Portable Hone (two stones and two guides per set). The stone sets are for 2" to 2.4" diameters. The listed stone sets are in stock and ready for next day delivery.

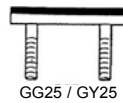
ALUMINUM OXIDE STONES							
MODEL		MST20		MSU22		MSV24	
GRIT SIZE		51 TO 56 mm 2" - 2.2"	NET PRICE	56 TO 61 mm 2.2" - 2.4"	NET PRICE	61 TO 66 mm 2.2" - 2.4"	NET PRICE
80	H-S	MSH-T20-A25	\$21.60	MSH-U22-A25	\$21.60	MSH-V24-A25	\$21.60
150	H-S	MSH-T20-A45	21.60	MSH-U22-A45	21.60	MSH-V24-A45	21.60
280	H-S	MSH-T20-A65	21.60	MSH-U22-A65	21.60	-	-

SILICON CARBIDE STONES							
MODEL		MST20		MSU22		MSV24	
GRIT SIZE		51 TO 56 mm 2" - 2.2"	NET PRICE	56 TO 61 mm 2.2" - 2.4"	NET PRICE	56 TO 61 mm 2.2" - 2.4"	NET PRICE
150	H-S	MSH-T20-J45	\$21.60	-	-	-	-
280	H-S	-	-	-	-	MSH-V24-J65	\$21.60
400	H-S	MSH-T20-J85	21.60	-	-	-	-
		-	-	MSH-U22-J87	\$21.60	MSH-V24-J87	21.60

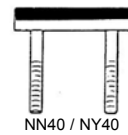
ADDITIONAL SUNNEN HONE STONE SETS AVAILABLE

SUNNEN HONE STONE SETS

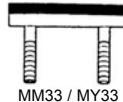
Sunnen Stone Sets for 2.5" to 60" diameter, portable tools (two stones and two guides per set). For Industrial applications. From fast stock removal in deburred, bored, ground, or reamed holes to fine finishing in previously honed holes, these hone stone sets are in stock and ready for next day delivery.



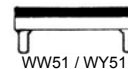
GG25 / GY25



NN40 / NY40



MM33 / MY33



WW51 / WY51

Stone Number	Diameter
Gx25	2.5 - 3.3
Mx33	3.3 - 4.2
Nx40	4.0 - 5.6
Wx51	4.5 - 60*

* Requires the use of Master Holders

PART NUMBER	BORE SIZE	MATERIAL	GRIT SIZE	HARDNESS	NET PRICE
MSH-GY25-J85	2.500 - 3.300	Silicon Carbide	400	Medium	41.90
MSH-H70-A45	2.900 - 11.500	Aluminum Oxide	150	Medium	24.40
MSH-MM33-A45	3.300 - 4.200	Aluminum Oxide	150	Medium	33.30
MSH-MM33-J85	3.300 - 4.200	Silicon Carbide	400	Medium	33.30
MSH-MM33-J87	3.300 - 4.200	Silicon Carbide	400	Hard	33.30
MSH-NN40-A45	4.000 - 5.600	Aluminum Oxide	150	Medium	33.30
MSH-NN40-J85	4.000 - 5.600	Silicon Carbide	400	Medium	33.30
MSH-T20-A45	2.000 - 2.200	Aluminum Oxide	150	Medium	21.60
MSH-U22-A45	2.200 - 2.400	Aluminum Oxide	150	Medium	21.60
MSH-V24-A45	2.400 - 2.600	Aluminum Oxide	150	Medium	21.60
MSH-WY51-A43	4.500 - 60.000	Aluminum Oxide	150	Medium	41.90
MSH-WY51-A45	4.500 - 60.000	Aluminum Oxide	150	Medium	41.90
MSH-WY51-J85	4.500 - 60.000	Silicon Carbide	400	Medium	41.90

REMANUFACTURING TOOLS

HONING OIL - 5 GALLON PAIL

Part Number: MSH-MB-30-5
Net Price: \$125.00

Sunnen Honing Oil is specially compounded for ferrous and non ferrous honing to:

- Dissipate heat from the workpiece
- Lubricate tool contact surfaces (guides)
- Flush bore free of honing swarf
- And maintain clean, free cutting abrasive conditions

Recommended for continuous honing of most materials, including: steel, cast iron, carbide, aluminum, bronze and ceramics. Use with any make honing equipment or tooling.



PORTABLE HONE ACCESSORIES QUICK COUPLER

Part Number: MSH-AN-80
Net Price: \$260.00

Provides instant coupling or uncoupling of hone from drive motor. Install between Drive Shank and Shaft Extension, or between Drive Shank and Hone Head on short bores.

(Can be used with; H-SNJ-10, H-SN-75, & H-JN-95.)



PISTON SEAL REFORMING TOOL

Part Number: MSPS CONSTRICTOR
Net Price: \$14.80



PTFE Piston seal resizing tool.

PISTON SEAL STRETCHER

Part Number: MSSEAL STRETCHER PLUS
Net Price: \$128.04

This Seal Stretcher is heavy duty with a handle for easier use and includes the following:

- 8 stepped segments
- 1 top nut/handle
- 5/16" thick aluminum flat base including 4 mounting bolt holes
- 1 threaded rod with a piston pre-installed
- 1 stop adjustable nut
- Assembly instructions sheet



Usage instructions are online at www.msindustries.com/Technical/Usage and [Installation Instructions/Seal Stretcher Instructions](#).

MINI GRINDER

Part Number:
Net Price:

MSOR GRINDER
\$52.77

The Mini Grinder has a no load speed of 5000-18,000 rpm adjustable, and includes the following:

- Copper collet: 2.4 & 3.2 (mm)
- 2 Diamonds bits
- 2 Grinding Stones
- 1 Nylon Brush
- 1 Connective posts for sanding bands
- 2 sanding bands
- 1 engraving bit
- 1 collet (2.4 mm)



LEAK DETECTION

LEAK DETECTION KIT

Part Number: MSLDU-OPK-341

Net Price: \$373.69

HOW IT WORKS

A small amount of liquid fluorescent dye is added to a circulating fluid system that is being inspected for leaks. The system is then run for a short time to allow the dye to mix and circulate with the host fluid. The dye/fluid mixture escapes with the host fluid wherever there is a leak and glows a bright yellow/green when inspected with a high-intensity ultraviolet or UV/black light lamp. This method is extremely effective in locating even the smallest, most elusive leaks, as well as multiple leaks.



INDIVIDUAL LEAK DETECTION PRODUCTS

Part Number	Description	Net Price
MSLDU-CR-800	CLEANER, 8 OZ SPRAY	\$11.58
MSLDU-OIL-GLO-44-P	DYE, ALL-IN-ONE, 16 OZ	105.26
MSLDU-OPX-3000	LAMP, LED, 115V CHARGER	224.04
MSLDU-UVS-40	SPECTACLES, UV ENHANCING	18.95

MEASURING TOOLS

HIGH QUALITY DIGITAL CALIPER

Part Number: MSHH-CALIPER-6-FR
Net Price: \$44.37

This high quality instrument measures to 6" (150 mm). A push of a button changes from fractions, mm and inches. Functions also include: On/Off function, zero key, data input capabilities, test for low voltage, and "Auto Off" function when unit sits dormant for more than 4 minutes.



DIGITAL CALIPERS

Part Number	Net Price
MSHH-CALIPER-6	\$38.50
MSHH-CALIPER-6-P	38.50
MSHH-CALIPER-12	92.77
MSHH-CALIPER-12-P	92.77

Quality calipers able to measure up to 6" (150mm) or 12" (300mm). A push of a button changes from inches to mm. A clear LCD display shows a reading with a resolution of 0.0005" (0.01mm) that is accurate to ±0.001" (±0.03mm). These calipers come in a sturdy, padded plastic case with instructions and a spare battery.
 P = No MSO logo.



INNER GROOVE CALIPER

Part Number: MSINNER CALIPER
Net Price: \$108.75



Inner Groove Caliper - 200 mm.

INNER DEPTH CALIPER

Part Number: MSMSINNER-DEPTH CALIPER
Net Price: \$135.00



This inner depth caliper is complete with five modes of measurement (OD, ID, General Depth, Groove Width, and Groove Depth). It has a digital display capable of displaying mm, inches, and fractions and can take measurements of up to 8" (205 mm). The four groove depth pins located on the back of the calipers measure 10mm, 20mm, 3/8", and 3/4".

INNER DEPTH CALIPER PINS

Part Number: MSINNER-DEPTH CALIPER DP
Net Price: \$12.50

This Inner-Depth Caliper replacement part includes four groove depth pins measuring 10mm, 20mm, 3/8", and 3/4".



INNER DEPTH CALIPER KNIVES

Part Number: MSINNER-DEPTH CALIPER WK
Net Price: \$12.50

This Inner-Depth Caliper replacement part includes one pair of width knives and four installation screws.



MEASURING TOOLS

O-RING COMPOUND IDENTIFIER

Part Number: MSOR RECOGNISER
Net Price: \$12.30

Identify a variety of o-ring compounds with this handy O-Ring Recognizer kit. Testing for EPDM70, NBR, FFKM (KALREZ®) and FKM o-rings. Three sample seals included.



O-RING MEASURING CONE

Part Number: MSO RING CONE-INCH
Net Price: \$20.50

Handy cone provides o-ring dash numbers instantly. Measures 184 of the most widely used sizes in 5 standard widths, 1/4" ID to 5-5/8" ID. Made of high density polyurethane, the cone stands 17-1/2" high.



BORE TAPE

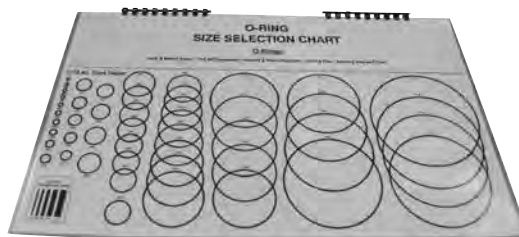
Part Number: MSBORE TAPE 300
Net Price: \$95.07

Measures inside and outside diameters from 50 mm 300 mm (2"-12").



O-RING CHART

Part Number: MSO-RING CHART
Net Price: \$18.68
Part Number: MSO-RING CHART NN
Net Price: \$18.68



Durable, Accurate, and Fast, these charts allow for easy Standard O-ring size identification. No shop should be without one!

NN = Without MSO® logo.

O-RING GAUGE

Part Number: MSOR-GAUGE
Net Price: \$21.53

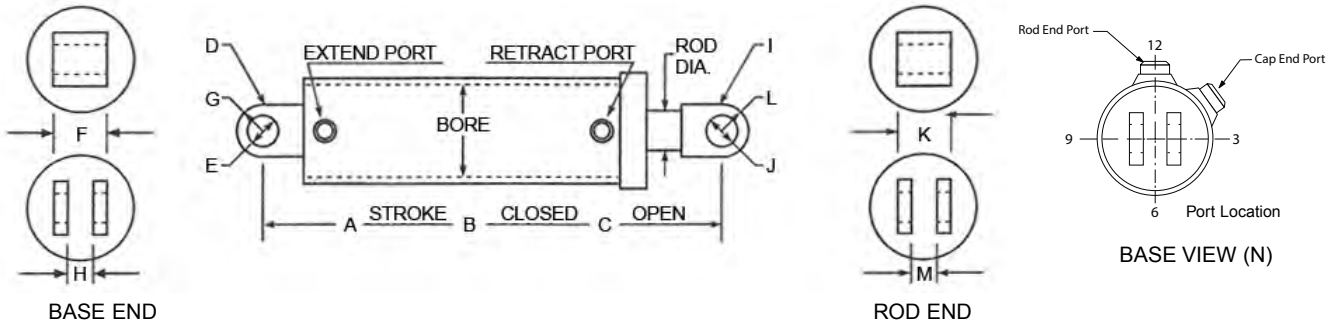
Slide gauge for measuring standard cross-section o-rings with an inside diameter up to 13".



Technical Information

Contents	Page
Cylinder Application Data Form	143
Telescopic Cylinder Application Data Form	144
Cylinder Push and Pull Forces	145
Hydraulic Cylinder Speeds	146
Electric Motor Horsepower	147
Fluid Power Formulas	148 - 149
Tech Tip - Surface Finish	150
Common Telescopic Cylinders	151 - 159
Single Acting Telescopic Cylinders	160
Double Acting Telescopic Cylinders	161
Refuse Bodies	162 - 163
Front Mount Dump Body	164

MSO CUSTOM CYLINDER APPLICATION DATA FORM



Cylinder application _____

Single - or Double-acting _____ System operating pressure Normal _____ Max. _____

Bore _____ Is there a relief valve in system _____ Setting _____

Rod diameter _____ System flow in G.P.M Min. _____ Max. _____

Head & gland design _____ System operating temp. Normal _____ Max. _____

Piston design _____ Fluid type _____

Mounting conditions ___Vert.___Horz.___Incline angle Load holding requirements _____

Any side or eccentric loading possible _____ Environmental condition _____

Average cycles per week _____ Cylinder max force during: Push___ Pull___ Both _____

A : Total stroke _____

B : Closed length _____ I : Rod mount type or code _____

C : Open length _____ J : Rod pin diameter _____

D : Base mount type or code _____ K : Rod mount width _____

E : Base pin diameter _____ L : Rod mount radius _____

F : Base mount width _____ M : Rod clevis gap (if applicable) _____

G : Base mount radius _____ N : Base End Port Location _____

H : Base Clevis Gap (if applicable) _____ Rod End Port Location _____

Special mounting (if applicable) _____

Extend port size and type _____ Extend port location _____

Retract port size and type _____ Retract port location _____

Special features or comments _____
(This includes break-a-way force, shock loads, etc.)

Requested by: Company Name _____ Quantity / Shipment _____

Address _____ Annual Usage _____

City _____ State _____ Zip _____

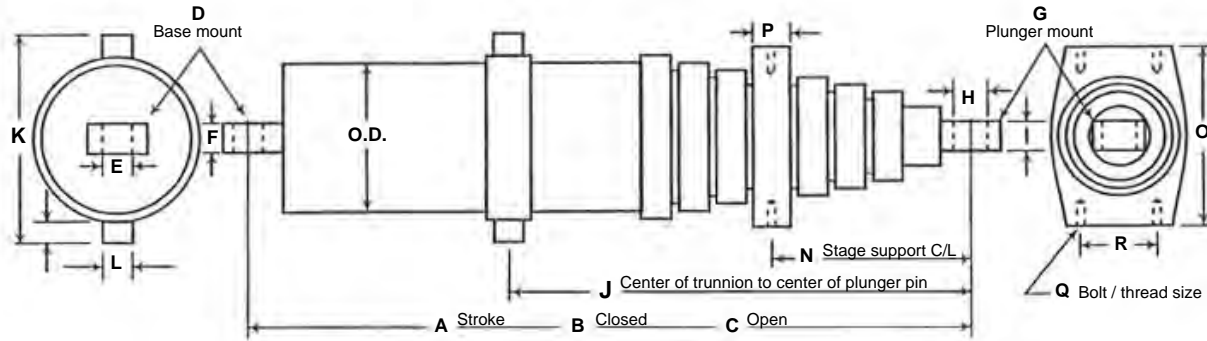
Phone _____ Fax _____

Contact _____

Phone (713) 468-7500

MSO SEALS & GASKETS
4710 Steffani Ln Houston,
TX 77041

TELESCOPIC CYLINDER APPLICATION DATA FORM



Cylinder application _____

Single - or Double-acting _____ System operating pressure Normal _____ Max. _____

O.D. of body _____ Is there a relief valve in system _____ Setting _____

O.D. largest moving stage _____ System flow in G.P.M. Min. _____ Max. _____

Number of moving stages _____ System operating temp. Normal _____ Max. _____

Chrome or non-chrome stages _____ Fluid type _____

Mounting conditions ___Vert. ___Horz. ___Incline angle Load holding requirements _____

Any side or eccentric loading possible _____ Environmental condition _____

A : Total stroke _____ J : Plunger pin to trunnion C/L (if applicable) _____

B : Closed length _____ K : Trunnion overall width _____

C : Open length _____ L : Trunnion lug diameters _____

D : Base mount type or code _____ M : Trunnion lug lengths _____

E : Base pin diameter _____ N : Plunger pin to stage support (if applicable) _____

F : Base mount width _____ O : Stage support width _____

G : Plunger mount type or code _____ P : Stage support thickness _____

H : Plunger pin diameter _____ Q : Stage support bolt & thread size _____

I : Plunger mount width _____ R : Stage support bolt locations & C/L's _____

Special mounting (if applicable) _____

Extend port size and type _____ Extend port location _____

Retract port size and type _____ Retract port location _____

Special features or comments _____

Requested by: Firm _____ Current Quan. _____

Address _____ Future Quan. _____

City _____ State _____ Zip _____

Phone _____ Fax _____

Contact _____

Phone (713) 468-7500

MSO SEALS & GASKETS
4710 Steffani Ln
Houston, TX 77041

CYLINDER PUSH AND PULL FORCES

Square Head "High Pressure" Cylinders

Working Pressure of Hydraulic Fluid P.S.I.

BORE	AREA	ROD	SIZE	50	100	250	500	1000	1500	2000	3000	5000
1-1/2	PUSH	—		88	177	443	885	1,770	2,655	3,540	5,310	8,850
	PULL	STD	5/8	73	146	365	730	1,460	2,190	2,920	4,380	7,300
	PULL	2:1	1	49	98	245	490	980	1,470	1,960	2,940	4,900
2	PUSH	—		157	314	785	1,570	3,140	4,710	6,280	9,420	15,700
	PULL	STD	1	118	236	590	1,180	2,360	3,540	4,720	7,080	11,800
	PULL	2:1	1-3/8	83	166	415	830	1,660	2,490	3,320	4,980	8,300
2-1/2	PUSH	—		246	491	1,228	2,455	4,910	7,265	9,820	14,730	24,550
	PULL	STD	1	206	412	1,030	2,060	4,120	6,180	8,240	12,360	20,600
	PULL	2:1	1-3/4	125	250	625	1,250	2,500	3,750	5,000	7,500	12,500
3-1/2	PUSH	—		415	830	2,075	4,150	8,300	12,450	16,600	24,900	41,500
	PULL	STD	1-3/8	341	681	1,703	3,405	6,810	10,215	13,620	20,430	34,050
	PULL	2:1	2	258	515	1,288	2,575	5,150	7,725	10,300	15,450	25,750
4	PUSH	—		628	1,257	3,143	6,285	12,570	18,855	25,140	37,710	62,850
	PULL	STD	1-3/4	508	1,016	2,540	5,080	10,160	15,240	20,320	30,480	50,800
	PULL	2:1	2-1/2	383	766	1,916	3,830	7,660	11,490	15,320	22,980	38,300
5	PUSH	—		982	1,964	4,910	9,820	19,640	29,460	39,280	58,920	98,200
	PULL	STD	2	825	1,649	4,123	8,245	16,490	24,735	32,980	49,470	82,450
	PULL	2:1	3-1/2	500	1,001	2,503	5,005	10,010	15,015	20,020	30,030	50,050
6	PUSH	—		1,413	2,827	7,068	14,135	28,270	42,405	56,540	84,810	141,350
	PULL	STD	2-1/2	1,168	2,336	5,840	11,680	23,360	35,040	46,720	70,080	116,800
	PULL	2:1	4	786	1,571	3,928	7,855	15,710	23,565	31,420	47,130	78,550
7	PUSH	—		1,924	3,849	9,623	19,245	38,490	57,735	76,980	115,470	192,450
	PULL	STD	3	1,571	3,142	7,855	15,710	31,420	47,130	62,840	94,260	157,100
	PULL	2:1	5	942	1,885	4,713	9,425	18,850	28,275	37,700	56,550	94,250
8	PUSH	—		2,514	5,027	12,568	25,135	50,270	75,405	100,540	150,810	251,350
	PULL	STD	3-1/2	2,032	4,064	10,160	20,320	40,640	60,960	81,280	121,920	203,200
	PULL	2:1	5-1/2	1,326	2,651	6,628	13,255	26,510	39,765	53,020	79,530	132,550
10	PUSH	—		3,927	7,854	19,635	39,270	78,540	117,810	157,080	235,620	392,700
	PULL	STD	4-1/2	3,132	6,264	15,660	31,320	62,640	93,960	125,280	187,920	313,200
	PULL	2:1	7	2,003	4,006	10,015	20,030	40,060	60,090	80,120	120,180	200,300

This table is a ready reference of forces available from either end from various cylinder and rod sizes at a range of pressures. For pressures intermediate between those shown, add force values from two or more pressures whose sum equals the given operating pressure.

HYDRAULIC CYLINDER SPEEDS

Inches / Minute

PISTON DIAMETER	ROD DIAMETER	FLOW - GPM										
		1	2	3	5	10	12	15	20	25	50	75
1	—	298	596	894	1490							
	1/2	392	784	1176	1960							
1-1/2	—	130	260	392	654	1308						
	5/8	158	316	476	792	1584						
	1	235	470	706	1176	2352						
2	—	73	146	221	368	736	883	1120				
	3/4	85	170	257	428	956	1025	1283				
	1	97	184	294	490	980	1175	1465				
	1-3/8	139	278	418	697	1394	1673	2090				
2-1/2	—	47	94	141	235	470	565	675	940	1175		
	1	56	112	168	280	560	672	840	1120	1400		
	1-3/8	67	134	203	339	678	813	1015	1355	1695		
	1-3/4	92	184	277	463	926	1110	1385	1850	2310		
3	—	32	64	98	163	326	392	490	653	817		
	1	36	72	110	184	368	440	551	735	920		
	1-1/2	43	86	131	218	436	523	655	872	1090		
	2	58	116	176	294	588	705	882	1175	1470		
3-1/2	—	24	48	72	120	240	288	360	480	600	1200	
	1-1/4	27	54	82	137	274	330	411	548	685	1370	
	1-3/4	32	64	96	160	320	384	480	640	800	1600	
	2	35	70	107	178	356	428	534	712	890	1780	
4	—	18	36	55	92	184	220	276	368	460	920	
	1-1/4	20	40	61	102	204	244	306	408	510	1020	
	1-3/4	22	44	68	113	226	273	339	452	565	1130	
	2	24	48	73	122	244	294	366	488	610	1220	
	2-1/2	30	60	90	150	300	362	450	600	750	1500	
5	—	12	24	35	58	116	141	174	232	290	580	870
	1-1/2	13	26	39	64	128	155	193	258	320	640	960
	2	14	28	42	70	140	168	210	280	350	700	1050
	2-1/2	16	32	47	78	156	188	235	315	390	780	1170
	3	18	36	55	92	184	220	275	365	460	920	1380
	3-1/2	22	44	66	111	222	266	333	444	555	1110	1665
6	—	8	16	24	41	82	98	123	162	202	404	606
	1-3/4	9	18	27	45	90	107	135	180	225	450	675
	2-1/2	10	20	30	50	100	118	150	200	250	500	750
	3	11	22	33	54	108	130	165	206	270	540	810
	3-1/2	12	24	37	62	124	148	185	245	310	620	930
8	—	4	8	14	23	46	55	69	92	115	230	345
	3-1/2	5-1/2	11	17	28	56	68	85	115	140	280	420
	4	6	12	18	30	60	73	90	122	150	300	450
	5	7-1/2	15	22	38	76	90	114	150	185	375	555
	5-1/2	8-1/2	17	26	43	86	104	129	172	215	430	645
10	—	3	6	9	15	30	35	44	60	73	146	220
	4-1/2	3-1/2	7	11	18	36	44	55	75	92	184	275
	5	4	8	12	20	40	47	60	80	100	200	300
	5-1/2	4-1/2	9	13	21	42	50	63	84	105	210	315
	7	5-1/2	11	17	29	58	69	87	115	145	290	435

This chart is based on the formula

$$V = \frac{231 \times \text{GPM}}{\text{EFF. CYL. AREA (Sq. Inches)}}$$

ELECTRIC MOTOR HORSEPOWER

Required to Drive a Hydraulic Pump

PUMP PRESSURE PSI											
GPM	100	200	250	300	400	500	750	1000	1250	1500	2000
1/2	.04	.07	.09	.10	.14	.17	.26	.34	.43	.52	.69
1	.07	.14	.17	.21	.28	.34	.52	.69	.86	1.03	1.37
1 1/2	.10	.21	.26	.31	.41	.52	.77	1.03	1.29	1.54	2.06
2	.14	.28	.34	.41	.55	.69	1.03	1.37	1.72	2.06	2.75
2 1/2	.17	.34	.43	.52	.69	.86	1.29	1.72	2.15	2.58	3.43
3	.21	.41	.52	.62	.83	1.03	1.54	2.06	2.57	3.09	4.12
3 1/2	.24	.48	.60	.72	.96	1.20	1.80	2.40	3.00	3.60	4.81
4	.28	.55	.69	.82	1.10	1.37	2.06	2.75	3.43	4.12	5.49
5	.34	.69	.86	1.03	1.32	1.72	2.57	3.43	4.29	5.15	6.86
6	.41	.82	1.03	1.24	1.65	2.06	3.09	4.12	5.15	6.18	8.24
7	.48	.96	1.20	1.44	1.92	2.40	3.60	4.81	6.01	7.21	9.61
8	.55	1.10	1.37	1.65	2.20	2.75	4.12	5.49	6.86	8.24	11.0
9	.62	1.24	1.55	1.85	2.47	3.09	4.63	6.18	7.72	9.27	12.4
10	.69	1.37	1.62	2.06	2.75	3.43	5.15	6.86	8.58	10.3	13.8
11	.76	1.51	1.89	2.27	3.02	3.78	5.66	7.55	9.44	11.3	15.1
12	.83	1.65	2.06	2.47	3.30	4.12	6.18	8.24	10.3	12.4	16.5
13	.89	1.79	2.23	2.68	3.57	4.46	6.69	8.92	11.2	13.4	17.8
14	.96	1.92	2.40	2.88	3.84	4.81	7.21	9.61	12.0	14.4	19.2
15	1.03	2.06	2.57	3.09	4.12	5.15	7.72	10.3	12.9	15.4	20.6
16	1.10	2.20	2.75	3.30	4.39	5.49	8.24	11.0	13.7	16.5	22.0
17	1.17	2.33	2.92	3.50	4.68	5.83	8.75	11.7	14.6	17.5	23.3
18	1.24	2.47	3.09	3.71	4.94	6.18	9.27	12.4	15.4	18.5	24.7
19	1.30	2.61	3.26	3.91	5.22	6.52	9.78	13.0	16.3	19.6	26.1
20	1.37	2.75	3.43	4.12	5.49	6.86	10.3	13.7	17.2	21.6	27.5
25	1.72	3.43	4.29	5.15	6.86	8.58	12.9	17.2	21.5	25.8	34.3
30	2.06	4.12	5.15	6.18	8.24	10.3	15.4	20.6	25.7	30.9	41.2
35	2.40	4.81	6.01	7.21	9.61	12.0	18.0	24.0	30.0	36.0	48.0
40	2.75	5.49	6.86	8.24	11.0	13.7	20.6	27.5	34.3	41.2	54.9
45	3.09	6.18	7.72	9.27	12.4	15.4	23.2	31.0	38.6	46.3	61.8
50	3.43	6.86	8.58	10.3	13.7	17.2	25.7	34.3	42.9	51.5	68.6
55	3.78	7.55	9.44	11.3	15.1	18.9	28.3	37.8	47.2	56.6	75.5
60	4.12	8.24	10.3	12.4	16.5	20.6	30.9	41.2	51.5	61.8	83.4
65	4.46	8.92	11.2	13.4	17.8	22.3	33.5	44.6	55.8	66.9	89.2
70	4.81	9.61	12.0	14.4	19.2	24.0	36.0	48.0	60.1	72.1	96.1
75	5.15	10.3	12.9	15.4	20.6	25.7	38.6	51.4	64.3	77.2	103.0
80	5.49	11.0	13.7	16.5	22.0	27.5	41.2	54.9	68.6	82.4	109.8
90	6.18	12.4	15.4	18.5	24.7	30.9	46.3	61.8	77.2	92.7	123.6
100	6.86	13.7	17.2	20.6	27.5	34.4	51.5	68.6	85.8	103.0	137.3

This chart is based on the formula $HP = \frac{GPM \times PSI}{1714 \times \text{EFFICIENCY}}$

For the purposes of this chart, pump efficiency was assumed to be 85%.

As horsepower varies directly with flow or pressure, multiply proportionately to determine values not shown. For instance, at 4000 PSI multiply 2000 PSI values by 2.

FLUID POWER FORMULAS

BASIC FORMULAS		
FORMULA FOR:	WORD FORMULA	LETTER FORMULA
FLUID PRESSURE In Pounds/Square Inch	PRESSURE = $\frac{\text{FORCE (pounds)}}{\text{UNIT AREA (Square Inches)}}$	$P = \frac{F}{A}$ or $\text{psi} = \frac{F}{A}$
FLUID FLOW RATE In Gallons/Minute	FLOW RATE = $\frac{\text{VOLUME (Gallons)}}{\text{UNIT TIME (Minutes)}}$	$Q = \frac{V}{T}$
FLUID POWER In Horsepower	HORSEPOWER = $\frac{\text{PRESSURE (PSI)} \times \text{FLOW (GPM)}}{1714}$	$HP = \frac{PQ}{1714}$
FLUID FORMULAS		
VELOCITY THROUGH PIPING In Feet/Second Velocity	VELOCITY = $\frac{.3208 \times \text{FLOW RATE THROUGH I.D. (GPM)}}{\text{INTERNAL AREA (Square Inches)}}$	$V = \frac{.3208Q}{A}$
COMPRESSIBILITY OF OIL In Additional Required Oil To Reach Pressure	ADDITIONAL VOLUME = $\frac{\text{PRESSURE (PSI)} \times \text{VOLUME OF OIL UNDER PRESSURE}}{250,000 \text{ (Approx.)}}$	$VA = \frac{PV^*}{250,000}$ * Approximately 1/2% per 1000 psi
COMPRESSIBILITY OF A FLUID	COMPRESSIBILITY = $\frac{1}{\text{BULK MODULUS OF THE FLUID}}$	$C(\beta) = \frac{1}{BM}$
SPECIFIC GRAVITY OF A FLUID	SPECIFIC GRAVITY = $\frac{\text{WEIGHT OF ONE CUBIC FOOT OF FLUID}}{\text{WEIGHT OF ONE CUBIC FOOT OF WATER}}$	$SG = \frac{W}{62.4283}$
VALVE (CV) FLOW FACTOR	VALVE FACTOR (CV) = $\frac{\text{FLOW RATE (GPM)} \times \sqrt{\text{SPECIFIC GRAVITY}}}{\text{PRESSURE DROP (PSI)}}$	$CV = \frac{Q \cdot SG}{P \cdot \Delta}$
VISCOSITY IN CENTISTOKES	For Viscosities of 32 to 100 Saybolt Universal Seconds: CENTISTOKES = $.2253 \times \text{SUS} - \frac{194.4}{\text{SUS}}$	$CS = .2253 \text{ SUS} - \frac{194.4}{\text{SUS}}$
VISCOSITY IN CENTISTOKES	For Viscosities of 100 to 240 Saybolt Universal Seconds: CENTISTOKES = $.2193 \times \text{SUS} - \frac{134.6}{\text{SUS}}$	$CS = .2193 \text{ SUS} - \frac{134.6}{\text{SUS}}$
VISCOSITY IN CENTISTOKES	For Viscosities Greater Than 240 Saybolt Universal Seconds: CENTISTOKES = $\frac{\text{SUS}}{4.635}$	$CS = \frac{\text{SUS}}{4.635}$

NOTE: Saybolt Universal Seconds is often abbreviated SSU.

PUMP FORMULAS		
PUMP OUTLET FLOW In Gallons/Minute	FLOW = $\frac{\text{RPM} \times \text{PUMP DISPLACEMENT (Cu. In./Rev.)}}{231}$	$Q = \frac{nd}{231}$
PUMP INPUT POWER In Horsepower Required	HORSEPOWER INPUT = $\frac{\text{FLOW RATE OUTPUT (GPM)} \times \text{PRESSURE (psi)}}{1714 \times \text{EFFICIENCY (Overall)}}$	$HP_{IN} = \frac{QP}{1714 \text{ Eff}}$ or $\frac{\text{GPM} \times \text{psi}}{1714 \text{ Eff}}$
PUMP EFFICIENCY Overall in Percent	OVERALL EFFICIENCY = $\frac{\text{OUTPUT HORSEPOWER}}{\text{INPUT HORSEPOWER}} \times 100$	$E_{f_{OV}} = \frac{HP_{OUT}}{HP_{IN}} \times 100$
	OVERALL EFFICIENCY = VOLUMETRIC Eff. X MECHANICAL Eff.	$E_{f_{OV}} = \text{Eff}_{VOL} \times \text{Eff}_{MECH.}$
PUMP EFFICIENCY Overall in Percent	VOLUMETRIC EFFICIENCY = $\frac{\text{ACTUAL FLOW RATE OUTPUT (GPM)}}{\text{THEORETICAL FLOW RATE OUTPUT (GPM)}} \times 100$	$E_{f_{VOL}} = \frac{O_{ACT.}}{O_{THEO.}} \times 100$
PUMP EFFICIENCY Mechanical in Percent	MECHANICAL EFFICIENCY = $\frac{\text{THEORETICAL TORQUE TO DRIVE}}{\text{ACTUAL TORQUE TO DRIVE}} \times 100$	$E_{f_{MEC}} = \frac{T_{THEO.}}{T_{ACT.}} \times 100$
PUMP LIFE B ₁₀ BEARING LIFE	B ₁₀ HOURS OF BEARING LIFE = $\text{RATED LIFE HOURS} \times \frac{\text{RATED SPEED (RPM)}}{\text{NEW SPEED (RPM)}} \times \left(\frac{\text{RATED PRESSURE (PSI)}}{\text{NEW PRESSURE (PSI)}} \right)^3$	$B_{10} = \text{RATED HRS.} \times \frac{\text{RPM}_R}{\text{RPM}_N} \times \left(\frac{\text{PR}}{\text{PN}} \right)^3$

TECHNICAL INFORMATION

FLUID POWER FORMULAS

ACTUATOR FORMULAS			
FORMULA FOR:	WORD FORMULA	LETTER FORMULA	
CYLINDER AREA In Square Inches	AREA = $\pi \times \text{RADIUS}^2$ (Inches)	A = πr^2	
	= $\frac{\pi \times \text{DIAMETER}^2}{4}$ (Inches)	A = $\frac{\pi D^2}{4}$ or A = $.785D^2$	
CYLINDER FORCE In Pounds, Push or Pull	FORCE = PRESSURE (psi) X NET AREA (Square Inches)	F = psi X A or F = PA	
CYLINDER VELOCITY or SPEED In Feet/Second	VELOCITY = $\frac{231 \times \text{FLOW RATE (GPM)}}{12 \times 60 \times \text{NET AREA (Square Inches)}}$	F = $\frac{231Q}{720A}$ or V = $\frac{.3208Q}{A}$	
CYLINDER VOLUME CAPACITY In Gallons of Fluid	VELOCITY = $\frac{\pi \times \text{RADIUS}^2 \text{ (Inches)} \times \text{STROKE (Inches)}}{231}$	V = $\frac{\pi r^2 l}{231}$	
	= $\frac{\text{NET AREA (Square Inches)} \times \text{STROKE (Inches)}}{231}$	V = $\frac{A l}{231}$ l = Length of Stroke	
CYLINDER FLOW RATE In Gallons Per Minute	FLOW RATE = $\frac{12 \times 60 \times \text{VELOCITY (Feet/Sec.)} \times \text{NET AREA (Sq. Inches)}}{231}$	Q = $\frac{720vA}{231}$ or Q = 3.117vA	
FLUID MOTOR TORQUE In Inch Pounds	TORQUE = $\frac{\text{PRESSURE (psi)} \times \text{F.M. DISPLACEMENT (Cu. In./Rev.)}}{2\pi}$	T = $\frac{\text{psi } d}{2\pi}$ or T = $\frac{Pd}{2\pi}$	
	= $\frac{\text{HORSEPOWER} \times 63025}{\text{RPM}}$	T = $\frac{63025 \text{ HP}}{n}$	
	= $\frac{\text{FLOW RATE (GPM)} \times \text{PRESSURE (psi)} \times 36.77}{\text{RPM}}$	T = $\frac{36.77QP}{n}$ or T = $\frac{36.77Q\text{psi}}{n}$	
FLUID MOTOR TORQUE/100 psi In Inch Pounds	TORQUE/100 psi = $\frac{\text{F.M. DISPLACEMENT (Cu. Inches/Revolution)}}{.0628}$	T _{100psi} = $\frac{d}{.0628}$	
FLUID MOTOR SPEED In Revolutions/Minute	SPEED = $\frac{231 \times \text{FLOW RATE (GPM)}}{\text{F.M. DISPLACEMENT (Cu. Inches/Revolution)}}$	n = $\frac{231Q}{d}$	
FLUID MOTOR POWER In Horsepower Output	HORSEPOWER = $\frac{\text{TORQUE OUTPUT (Inch Pounds)} \times \text{RPM}}{63025}$	HP = $\frac{Tn}{63025}$	
THERMAL FORMULAS Δ			
RESERVOIR COOLING CAPACITY Based on Adequate Air Circulation	HEAT (BTU/HR) = 2 X TEMPERATURE DIFFERENCE BETWEEN RESERVOIR WALLS AND AIR (°F) X AREA OF RESERVOIR (Sq. Ft.)	BTU/HR = 2.0 X T X A	Δ
HEAT IN HYDRAULIC OIL (approx.) Due to System Inefficiency (SG=.89-.92)	HEAT (BTU/HR) = FLOW RATE (GPM) X 210 X TEMPERATURE DIFFERENCE (°F)	BTU/HR = Q X 210 X T	Δ
HEAT IN FRESH WATER (approx.)	HEAT (BTU/HR) = FLOW RATE (GPM) X 500 X TEMPERATURE DIFFERENCE (°F)	BTU/HR = Q X 500 X T	
NOTE: One British Thermal Unit (BTU) is the amount of heat required to raise the temperature of one pound of water one degree. One Horsepower = 2545 BTU/HR.			

VOLUME & CAPACITY EQUIVALENTS								
	Cubic Inches	Cubic Feet	Cubic Yards	Liters	U.S. Gallons	Imperial Gallons	Water at Max. Density 39.2°F 4°C	
							Pounds of Water	Kilograms of Water
Cu Inches	1	.0005787	.00002143	.016384	.004329	.0036065	.0361275	.0163872
Cu Feet	1728	1	.037037	28.317	7.48052	6.23210	62.4283	28.3170
Cu Yards	46,656	27	1	764.56	201.974	168.266	1685.56	764.559
Liters	61.0234	.0353145	.001308	1	.264170	.220083	2.20462	1
U.S. Gallons	231	.133681	.004951	3.78543	1	.833111	8.34545	3.78543
Imp. Gallons	277.274	.160459	.0059429	4.54374	1.20032	1	10.0172	4.54373
Lbs Water	27.6798	.0160184	.0005929	.453592	.119825	.0998281	1	.453593

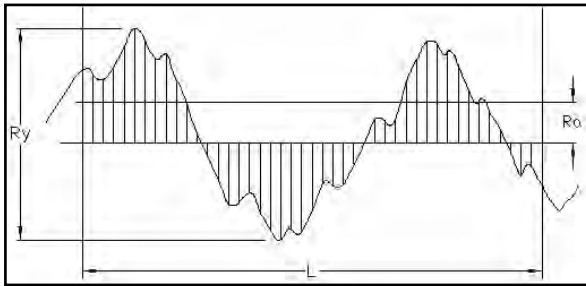
TECH TIP - SURFACE FINISH

The surface finish has a critical influence on excellent sealing performance, low friction and long seal life. A finish that is either too rough or very smooth will cause a negative result. The surface microstructures allow pockets of fluid in very small volumes to pass under the seal with each cycle. This lubricating fluid lowers friction and extends seal life. Seal interface lubrication is reduced with a very fine surface finish and the seal will suffer increased friction and wear. In the case of rod sealing, a rougher finish may result in leakage if the fluid passes under the seal, is removed from the rod and not returned back into the cylinder. The wear rate is a major factor in the life of a dynamic application, and depends on the quality of the rod and the cylinder bore surface finish.

DEFINITIONS

The most frequently specified parameters in the fluid power industry are Ra, Ry, Rt, Rz, Rq, and Rsk which are defined in ISO 4287 and ISO 4288.

Ra is defined as the arithmetical mean deviation of the assessed profile. The inch equivalent parameter is CLA (centre line average). A surface finish of 0.4 μm Ra is equivalent to 16 μin CLA. The "checkmark" symbol used on drawings to specify a surface texture control requirement is an Ra specification.



Ry (also Rmax) is the maximum roughness height in one cutoff length (L) of the profile.

Rt is the maximum roughness height in five cutoff lengths of the roughness profile.

Rz is the average of the five greatest peak-to-valley separations crossing the mean line in a single cutoff length.

Rq is the root mean square deviation of the assessed profile. The equivalent term in inches is RMS (Root Mean Square). The Rq (RMS) of a surface is approximately 10% greater than the Ra (CLA) value.

Rsk is the assessed profile skewness or the measure of symmetry about the mean. A negative Rsk indicates greater valleys than peaks and imparts a better seal mating surface.

RECOMMENDATIONS

A single parameter rating is not sufficient in assessing the surface irregularities. Several parameters should be specified to accurately evaluate the surface depth, shape and orientation and their affect on sealing performance, friction and wear.

Reciprocating Cylinder Rod
Hydraulic and Low Pressure Pneumatic

Ra = 4 to 12 μin [0.1 to 0.3 μm]
Rz \leq 50 μin [1.3 μm]
Rsk = -1.0 to -4.0

Reciprocating Cylinder Bore and Slow Rotary Rod
Hydraulic and Low Pressure Pneumatic

Ra = 4 to 20 μin [0.1 to 0.5 μm]
Rz \leq 80 μin [2.0 μm]
Rsk = -1.0 to -4.0

SURFACE FINISHING

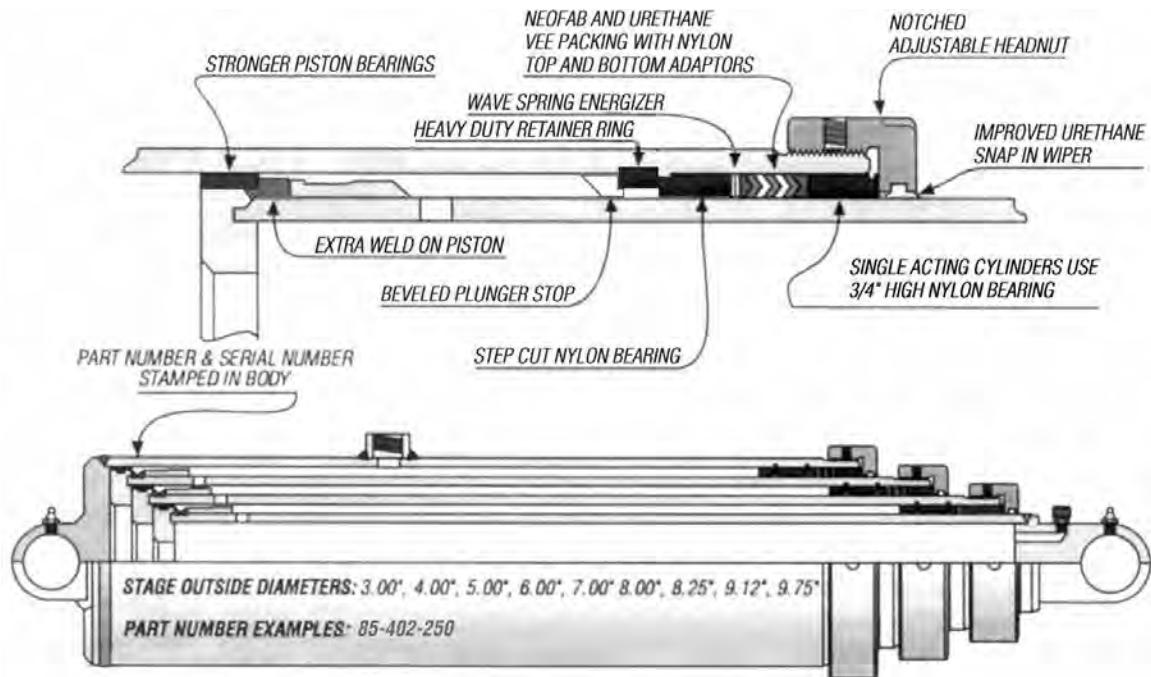
The surface roughness is dependent on the machining process employed. Scores, scratches, voids, concentric or linear machining marks are not permitted. Common production methods result in a metal surface finish of between 1 μin to 140 μin [0.02 μm to 3.5 μm] Ra roughness as shown in the table below.

PROCESS ROUGHNESS Ra (μin [μm])

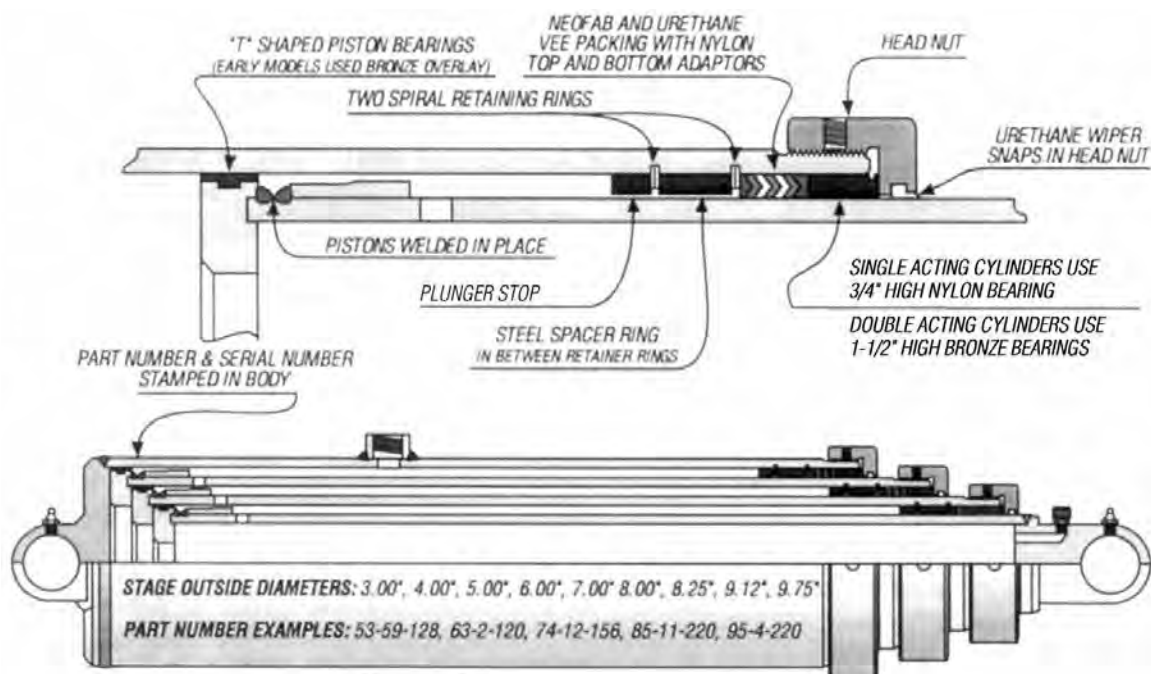
Turning	40 - 140 [1.0 - 3.5]
Boring	24 - 95 [0.6 - 2.4]
Broaching	16 - 63 [0.4 - 1.6]
Precision Rolling	8 - 48 [0.2 - 1.2]
Grinding	8 - 40 [0.2 - 1.0]
Smooth	3 - 12 [0.08 - 0.3]
Super Fine	0.5 - 3 [0.012 - 0.08]
Polished	0.5 - 3 [0.012 - 0.08]

COMMON TELESCOPIC CYLINDERS

CUSTOM HOISTS 400 SERIES

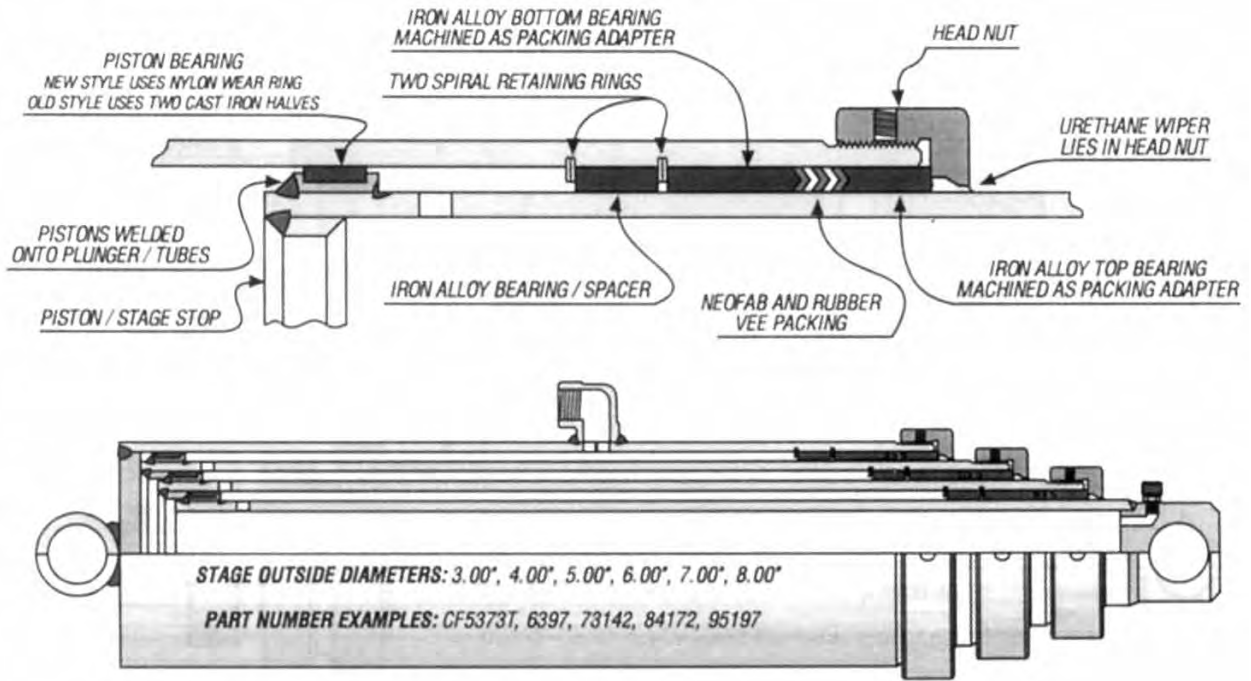


CUSTOM HOISTS OLD SERIES

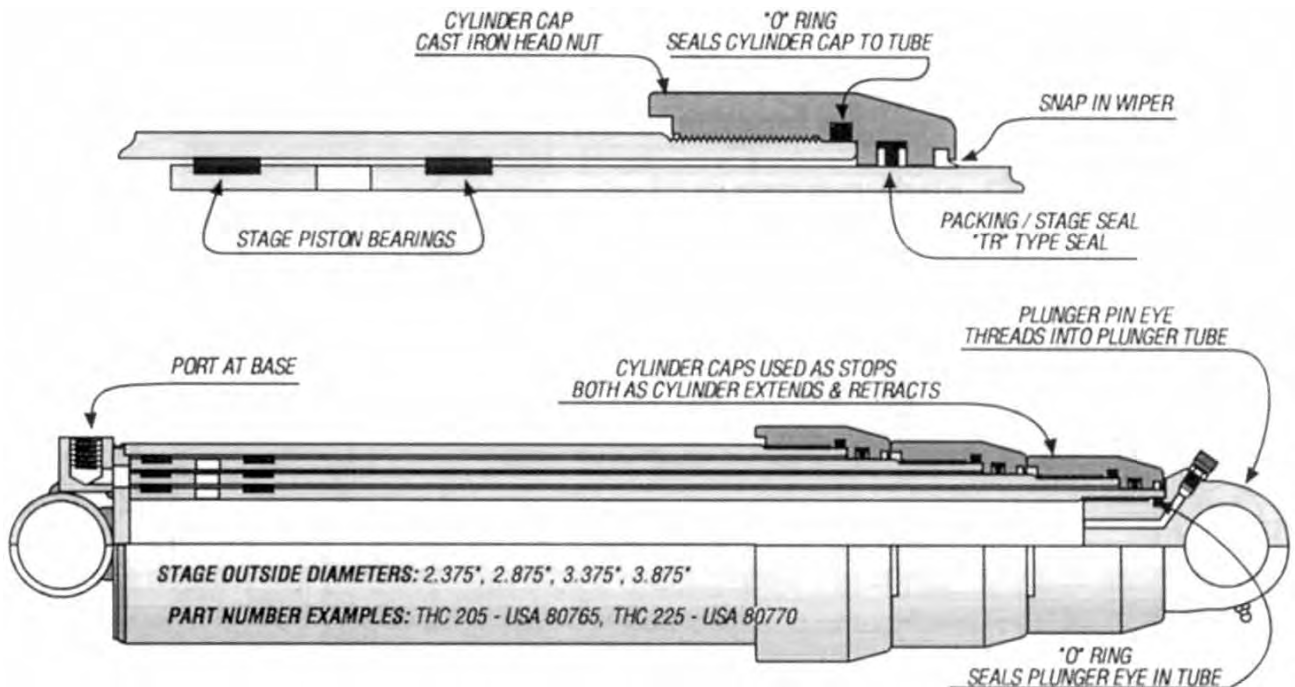


COMMON TELESCOPIC CYLINDERS

FONTAINE

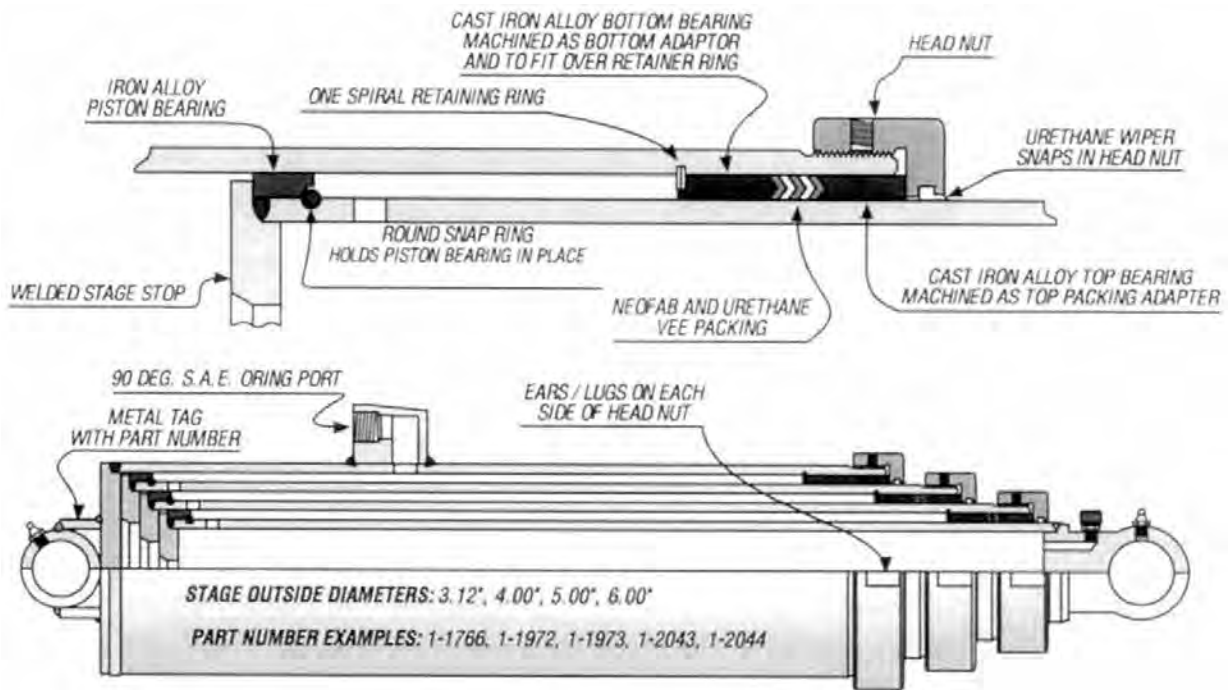


GLENCO / FARMHAND

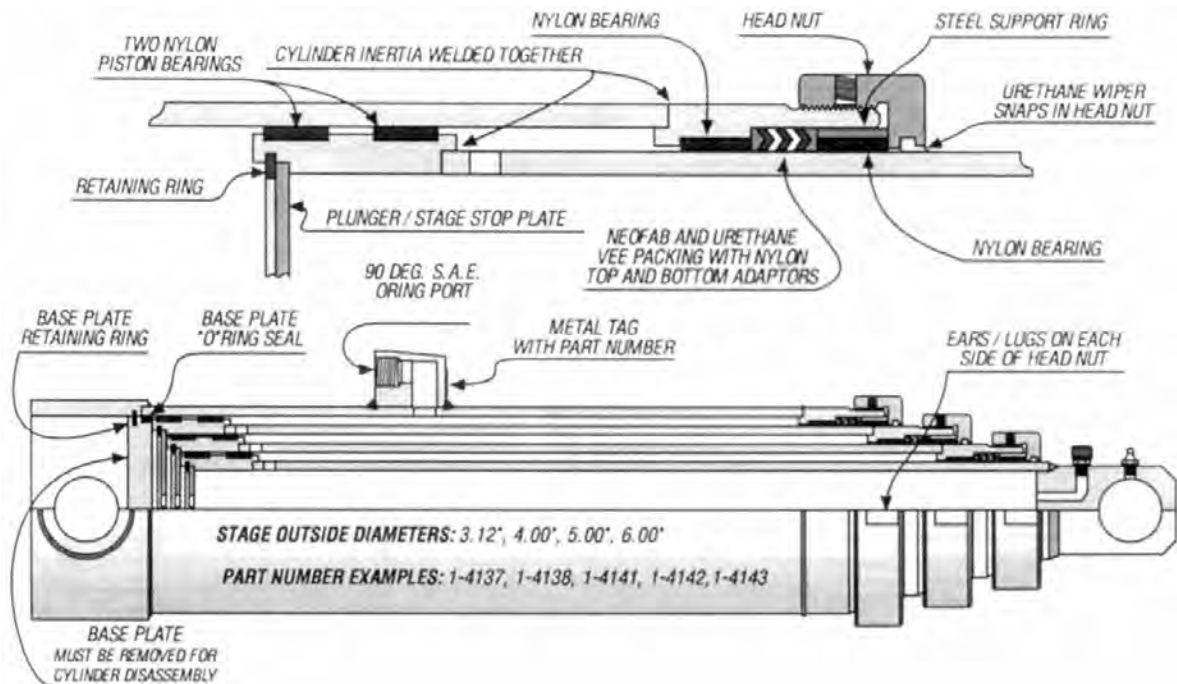


COMMON TELESCOPIC CYLINDERS

HEIL "OLD STYLE" HPT SERIES

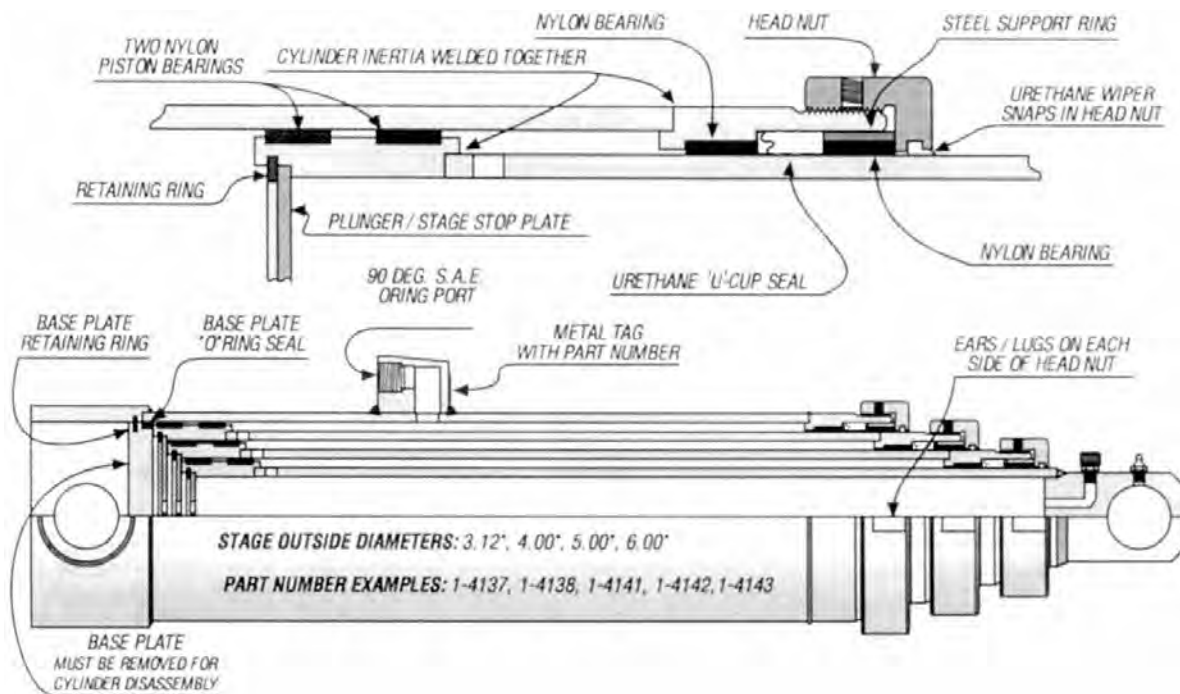


HEIL "NEW STYLE" HPT SERIES

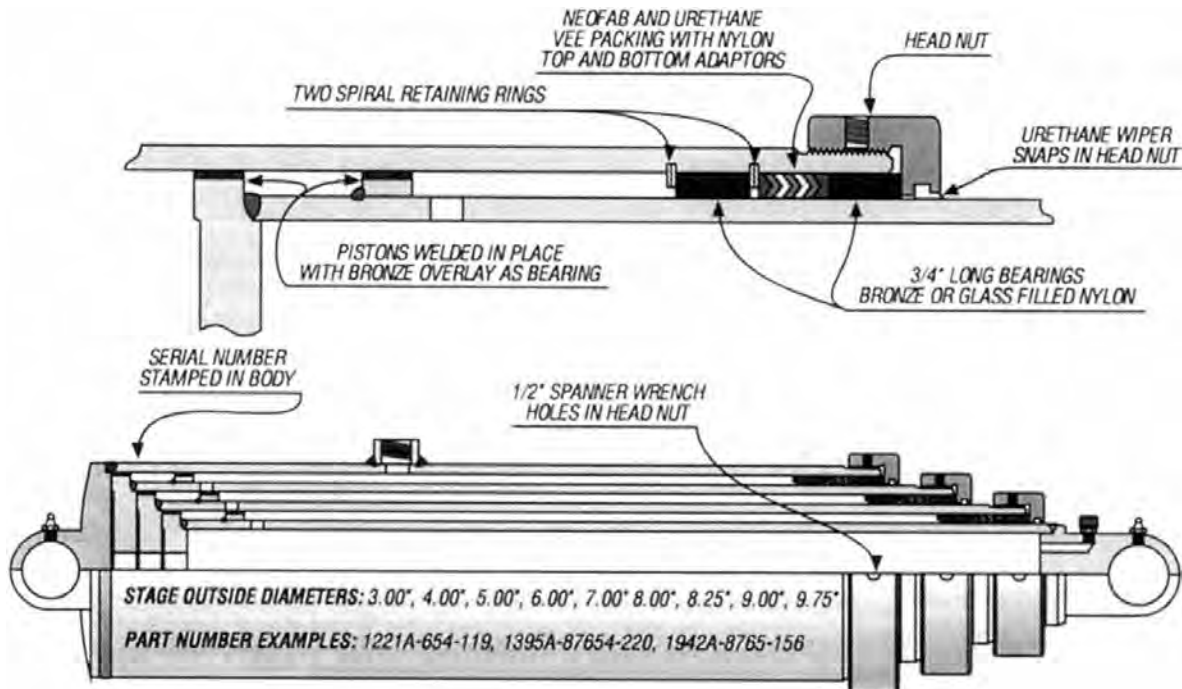


COMMON TELESCOPIC CYLINDERS

HEIL "NEW STYLE" HPT SERIES

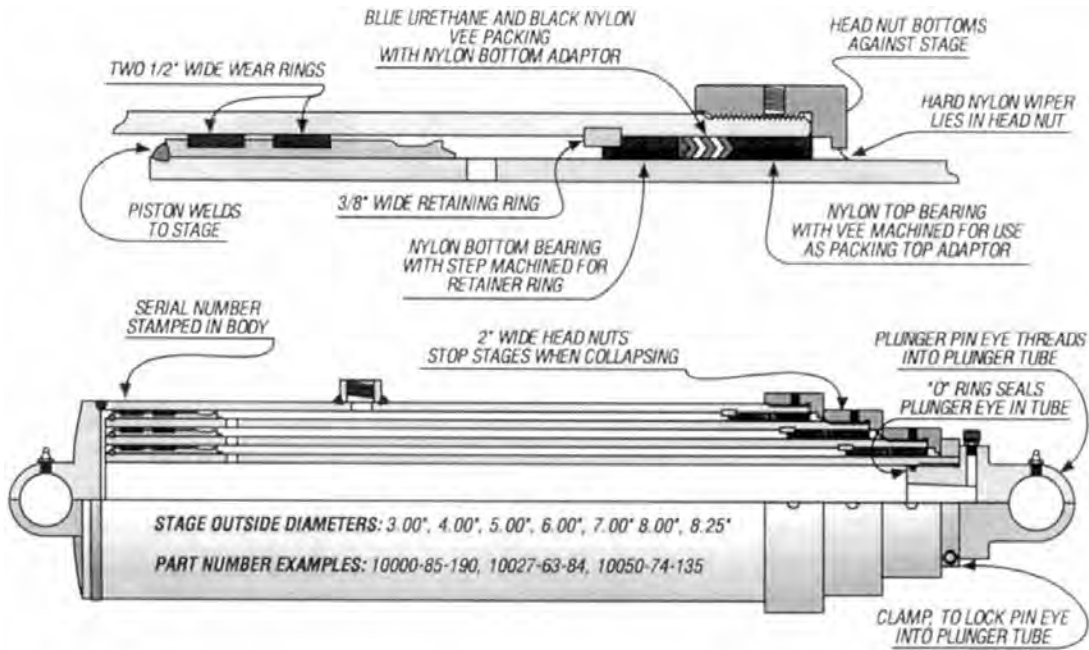


HYCO 900 - 2000 SERIES (MFG. PRIOR TO 6/74)

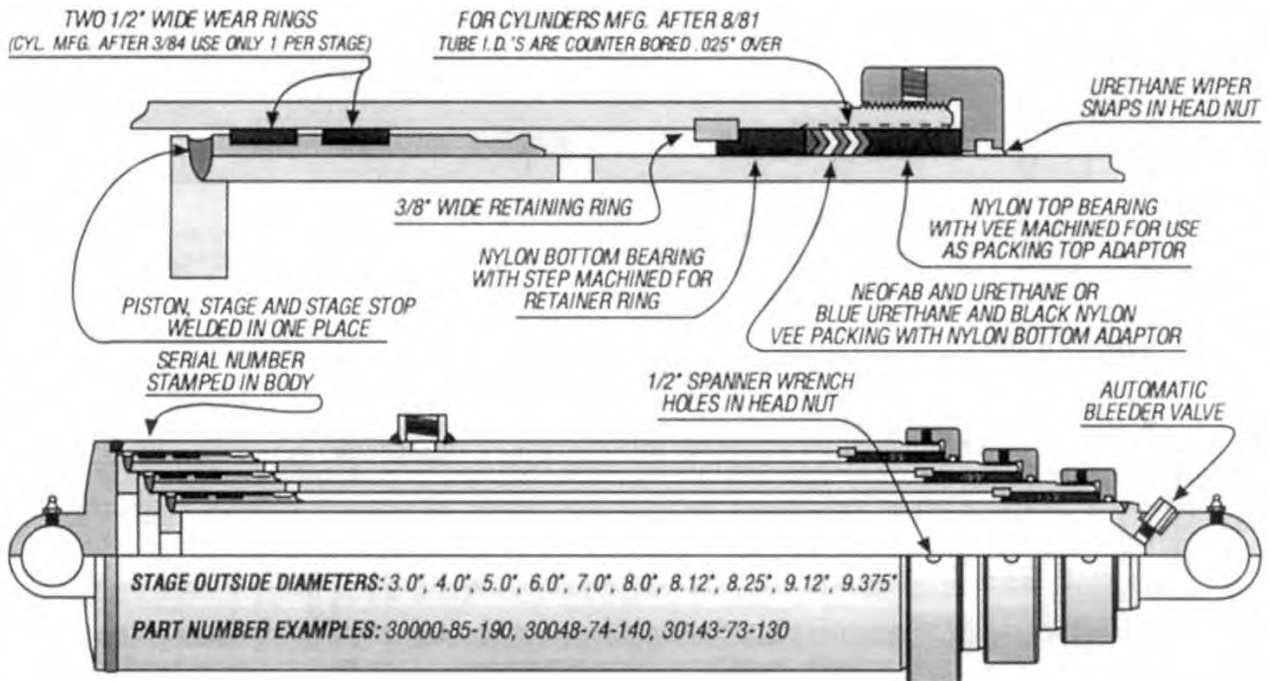


COMMON TELESCOPIC CYLINDERS

HYCO 10,000 SERIES (MFG. PRIOR TO 7/74 TO 8/76)



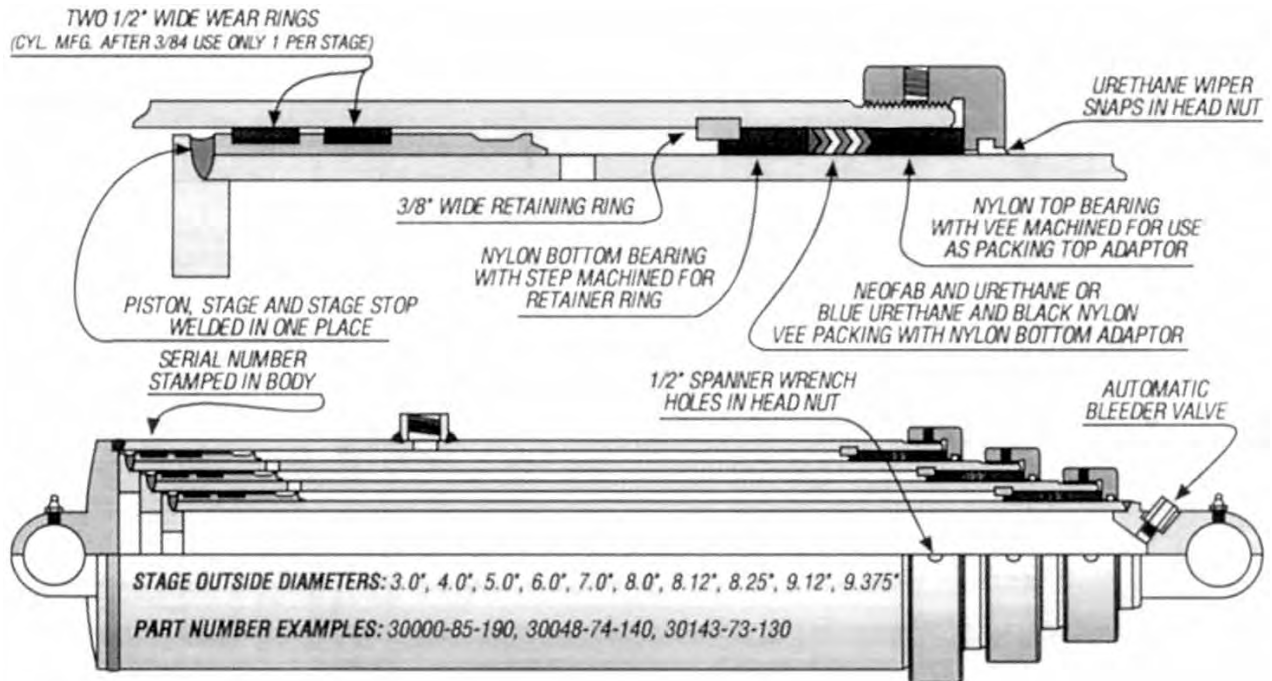
HYCO 30,000 SERIES (OLD STYLE MFG. FROM 8/76 TO 7/81) (NEW STYLE MFG. FROM 8/81 TO PRESENT)



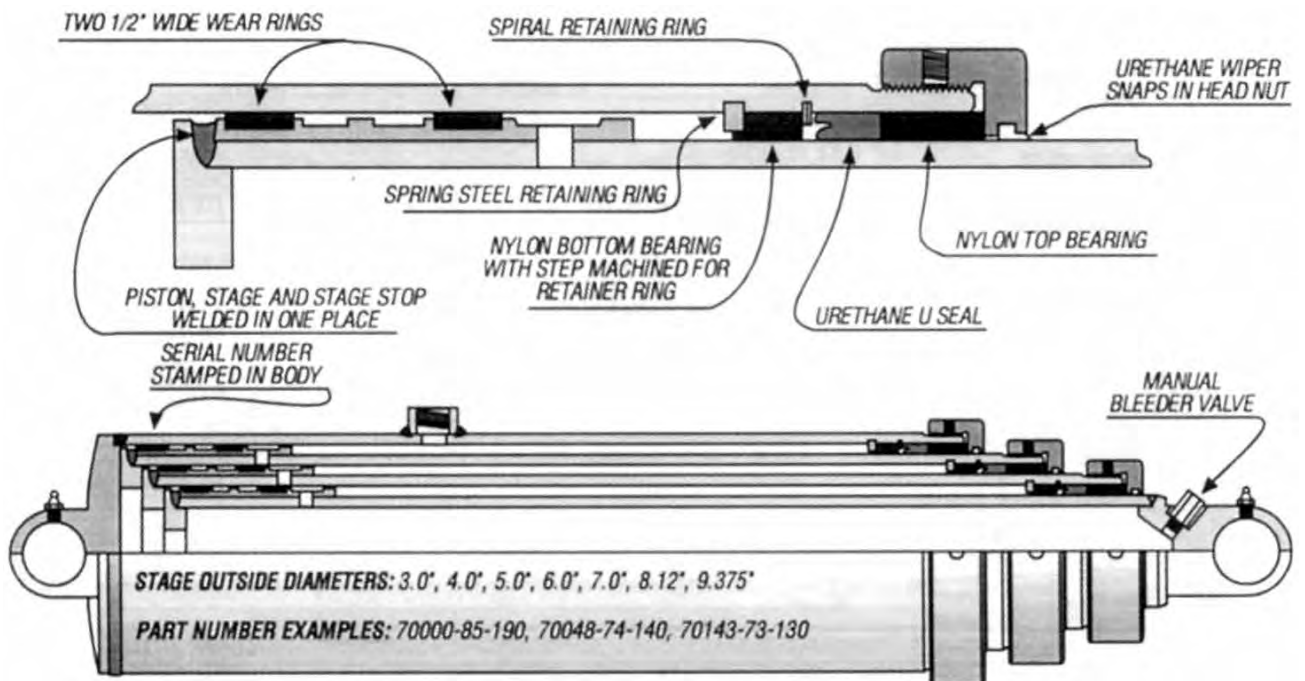
COMMON TELESCOPIC CYLINDERS

HYCO 30,000 SERIES

(NEW STYLE MFG. FROM 8/76 TO 7/81)

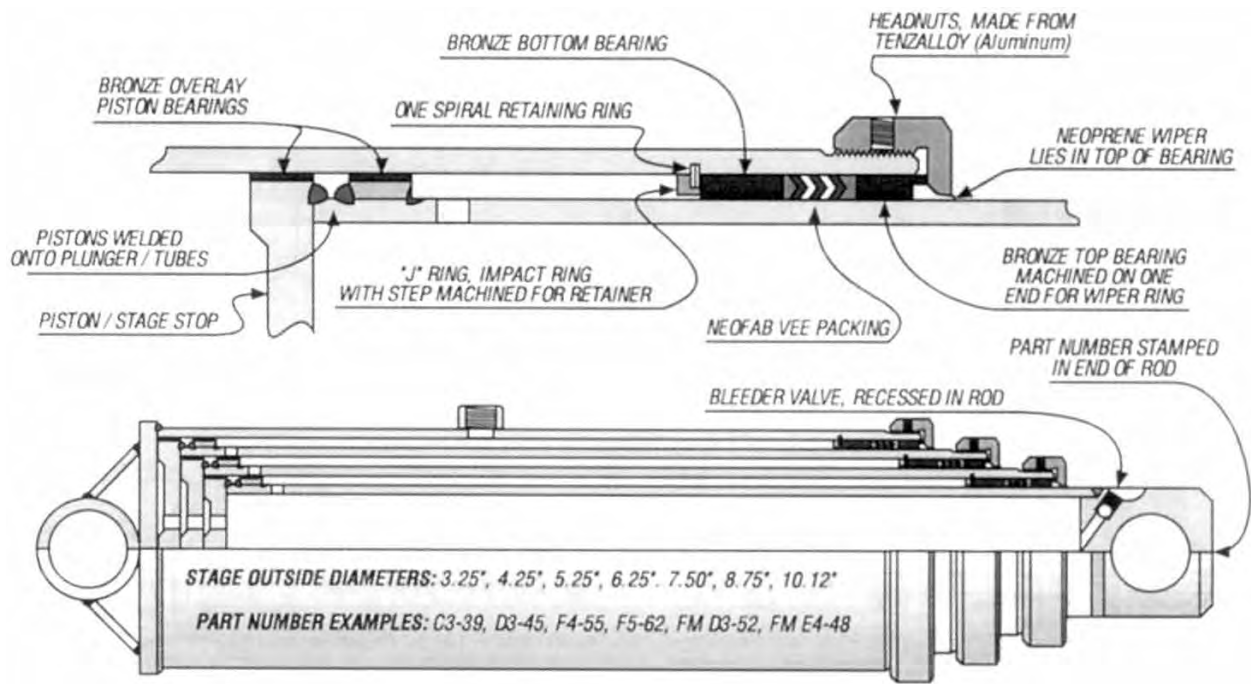


HYCO 70,000 SERIES

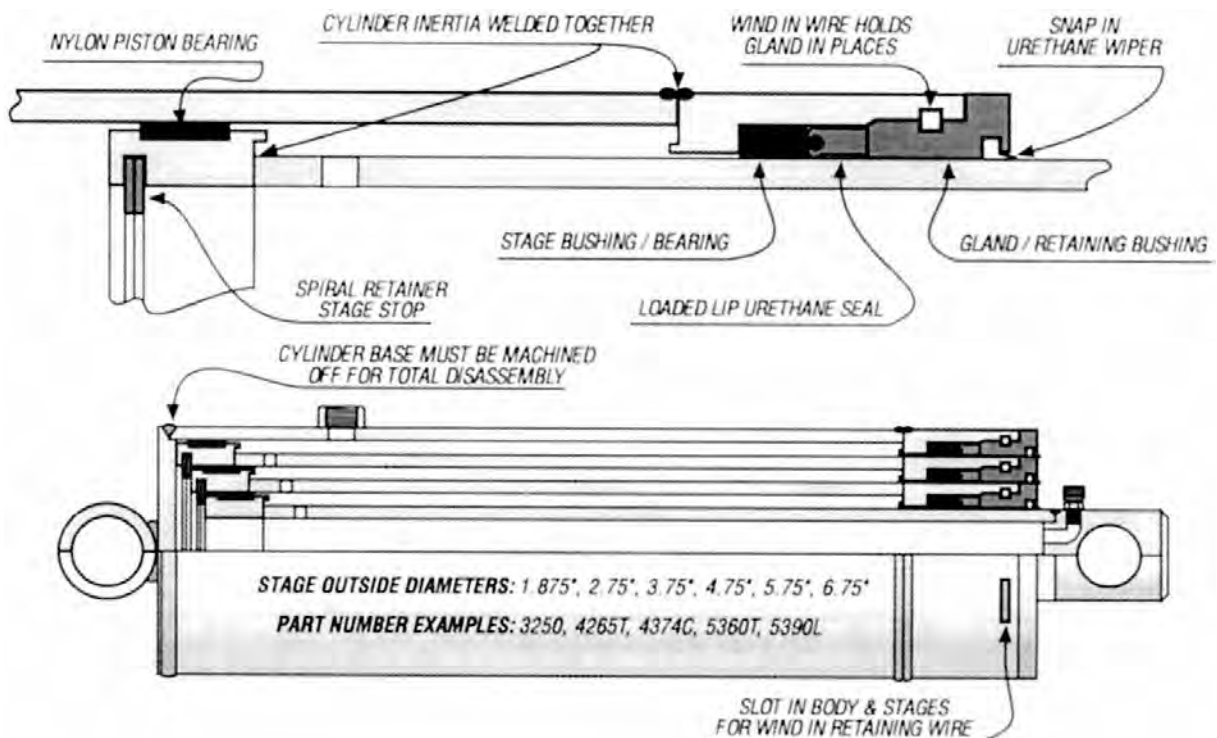


COMMON TELESCOPIC CYLINDERS

JOHNSON

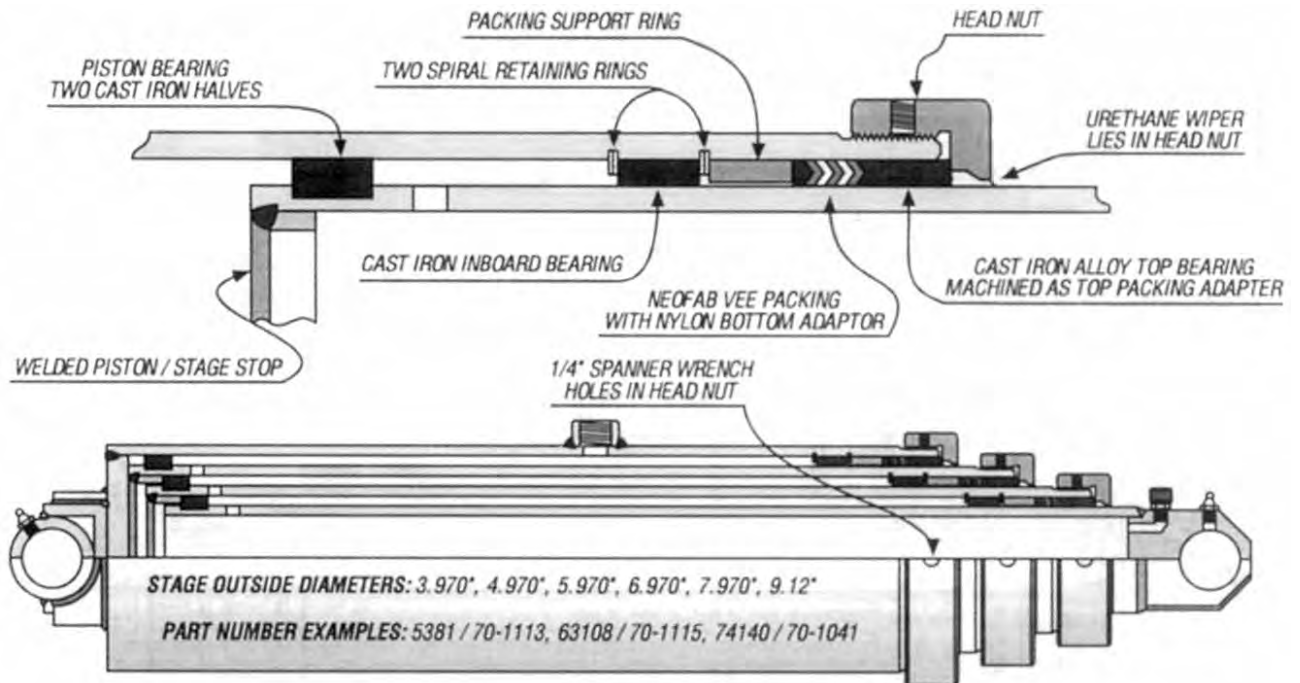


MARION MFG.

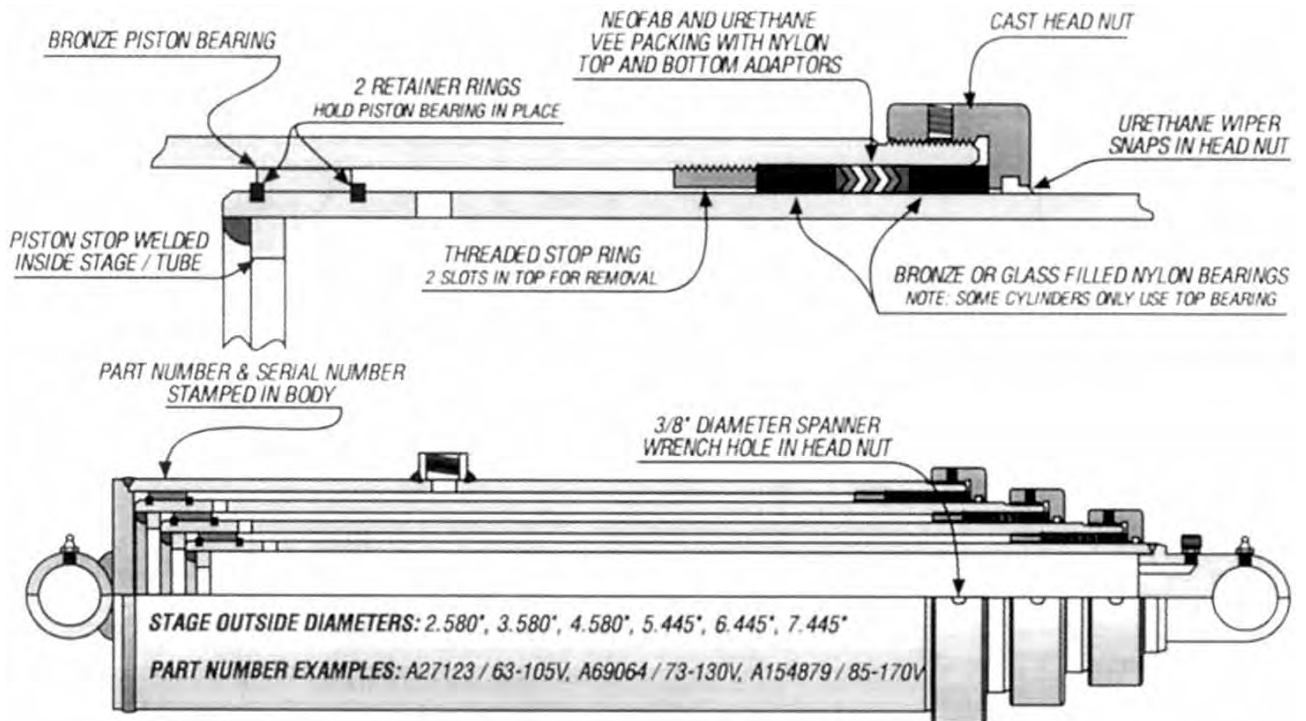


COMMON TELESCOPIC CYLINDERS

PEABODY GALION

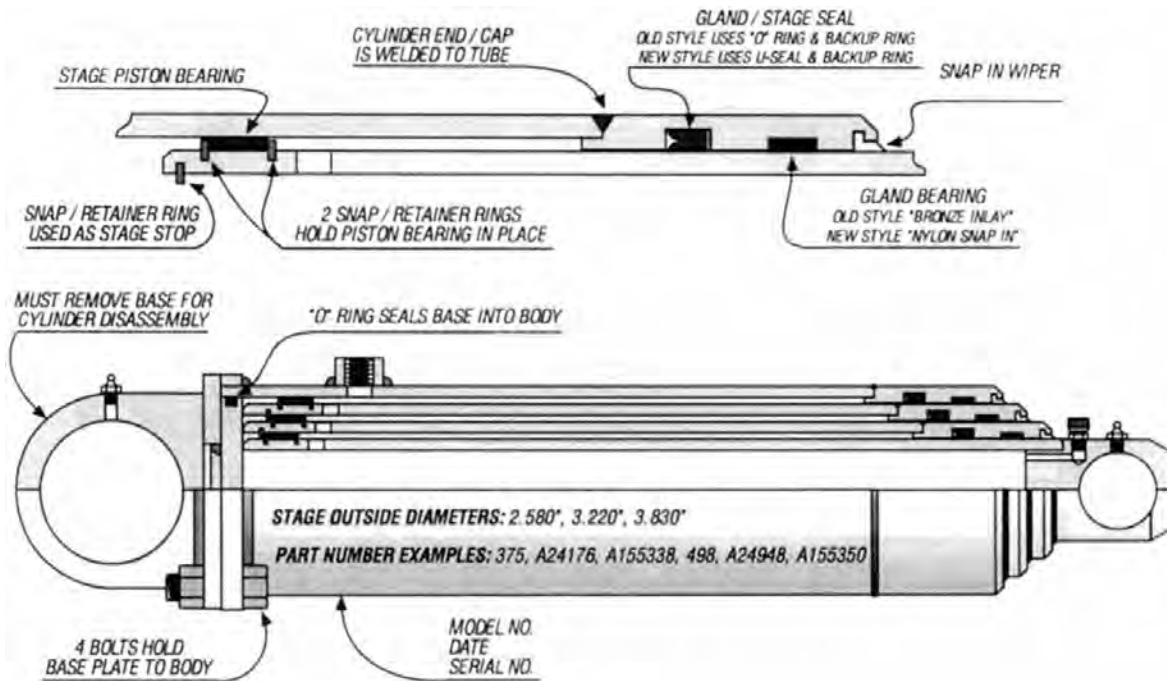


PERFECTION

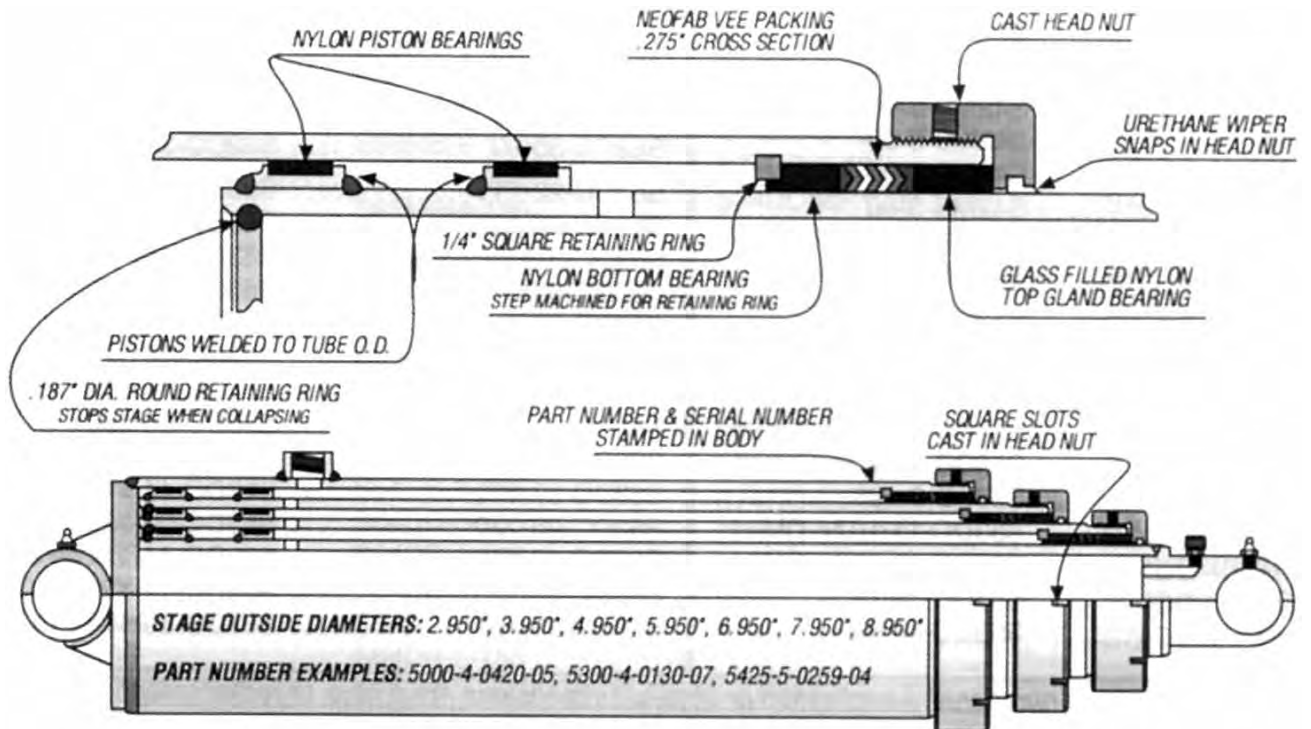


COMMON TELESCOPIC CYLINDERS

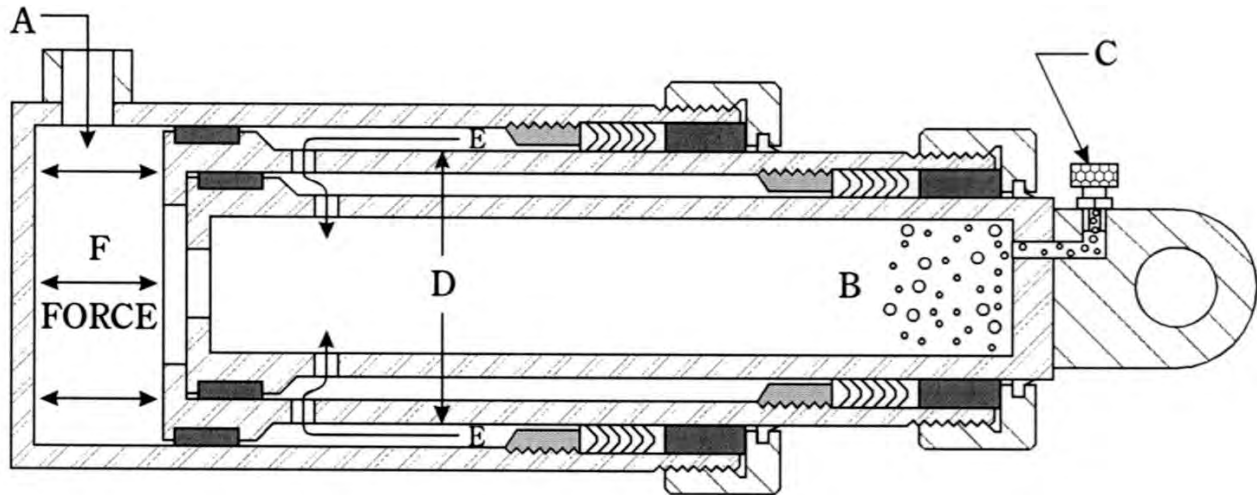
PERFECTION FARM HOISTS



WARD CO.



SINGLE ACTING TELESCOPIC CYLINDERS



To Extend:

High pressure oil from the pump is directed by the control valve through the port (A) to fill the cylinder. Any air in the system is trapped in the end of the cylinder (B) and may be bled off through the bleeder valve (C). Generally, bleeding is only necessary on initial start up or if air has been allowed to enter the system.

Oil pushes on the bottom of the sleeve or plunger forcing (F) it to move out. The outside diameter or sealing area of the sleeve or plunger (D) determines the effective area.

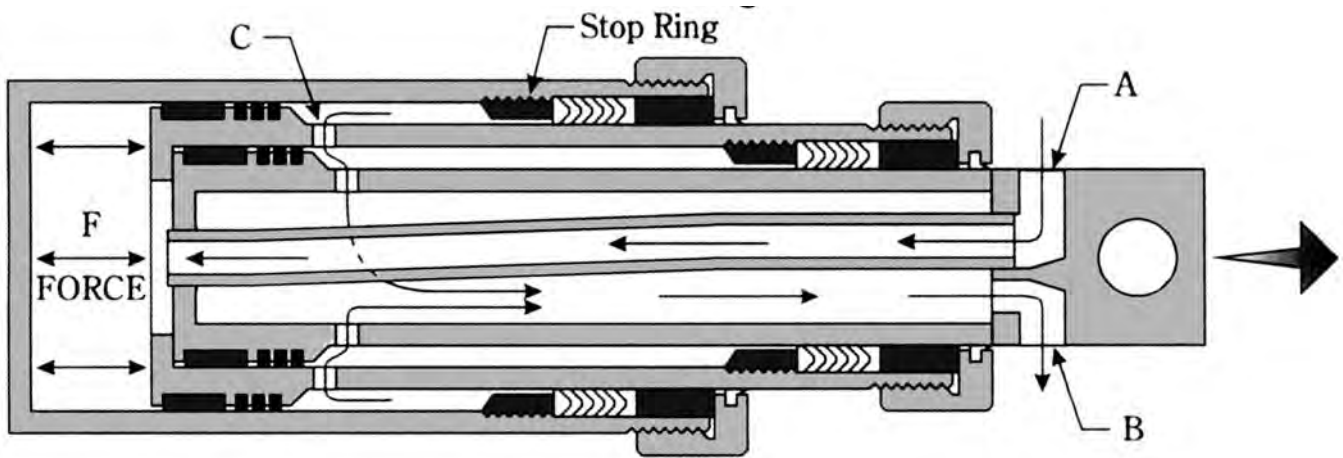
As the sleeve or plunger moves out, the oil trapped between (E) the sleeve or plunger wall is released through holes in the sleeve or plunger.

To Retract:

A single acting cylinder must be retracted by gravity or mechanical means.

DOUBLE ACTING TELESCOPIC CYLINDERS

EXTENDING



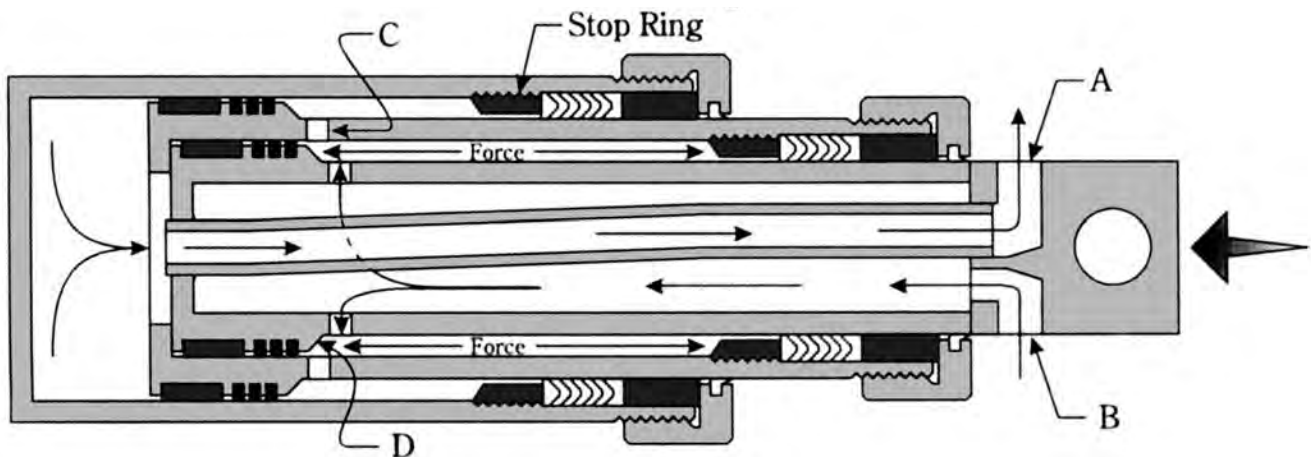
To Extend:

High pressure oil is directed by the control valve into port A. The oil passes through the transfer tube in the rod to the base of the cylinder. The pressure acts on the effective area (area of the largest piston) and extends all stages to the first stop ring.

The next stage then begins to extend. The effective area of each stage is figured from the inside diameter of the next largest stage. Each stage extends in its turn to the stop ring.

Oil trapped between the sleeves escapes through holes (c) in each sleeve and returns to tank through port B.

RETRACTING

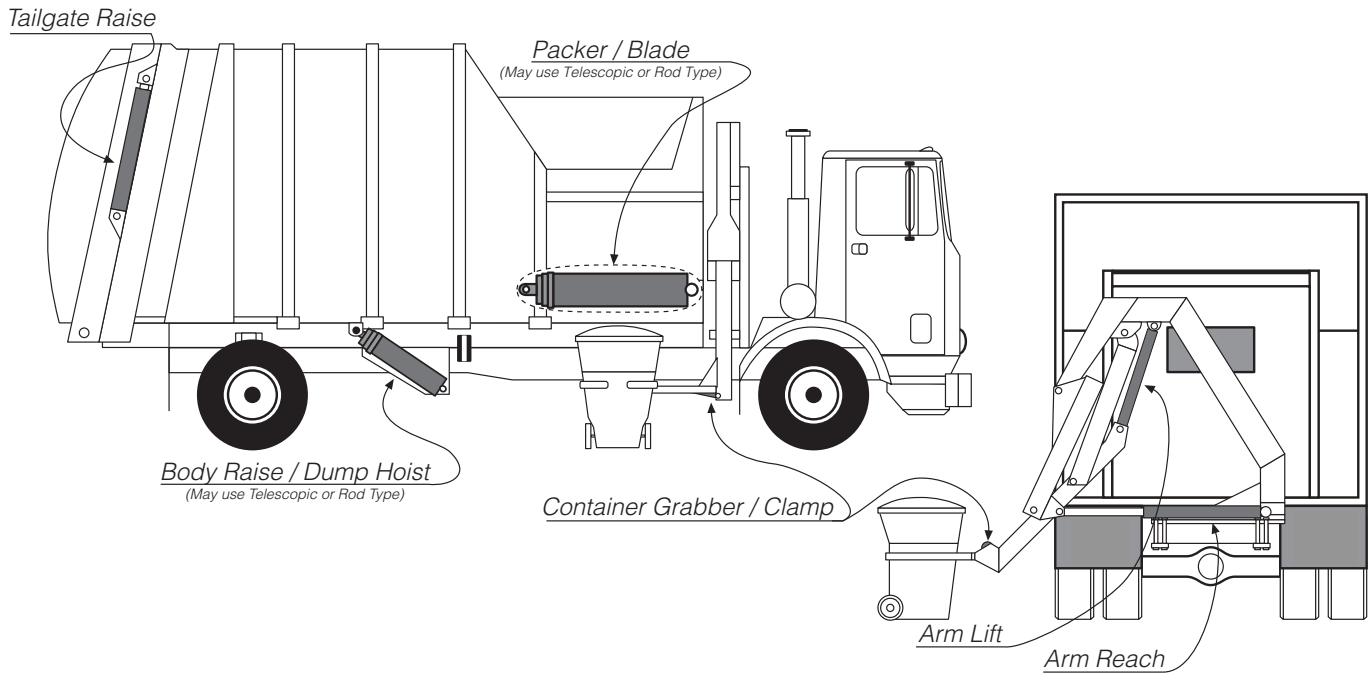


To Retract:

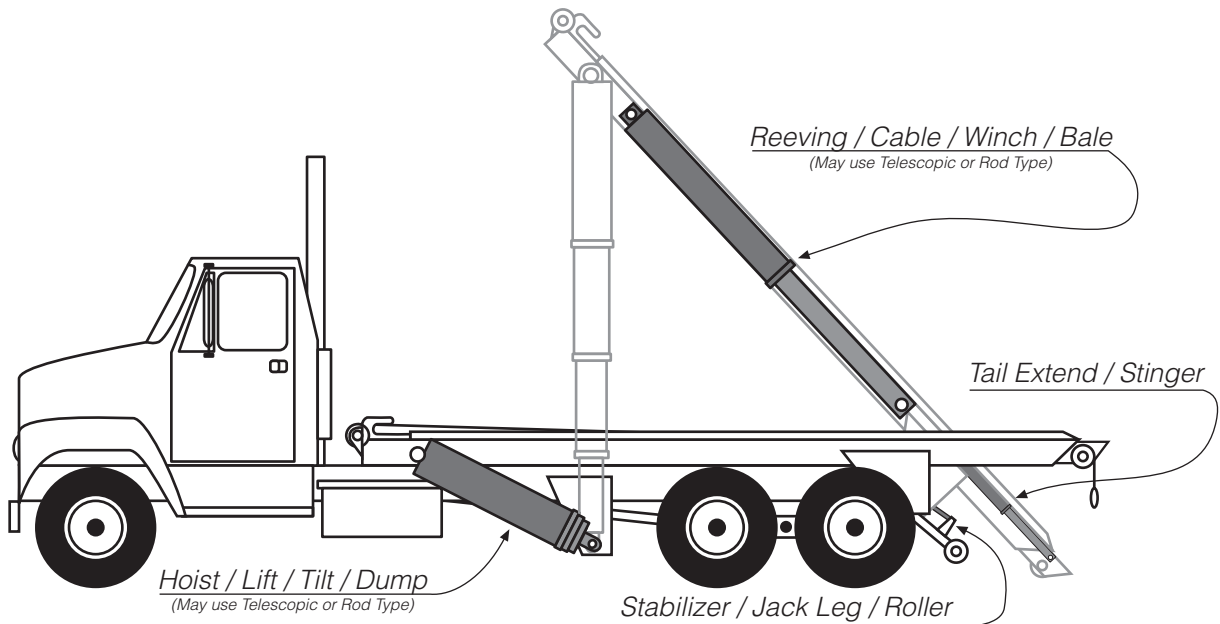
High pressure oil is directed by the control valve in port B. The pressure is applied to the effective area (d) of the plunger which retracts first. Each stage from the smallest to the largest retracts in its turn, however, THE EFFECTIVE AREA FOR RETRACTING EACH STAGE IS THE AREA (D) OF THE PLUNGER.

REFUSE BODIES

Side Loader Refuse Bodies

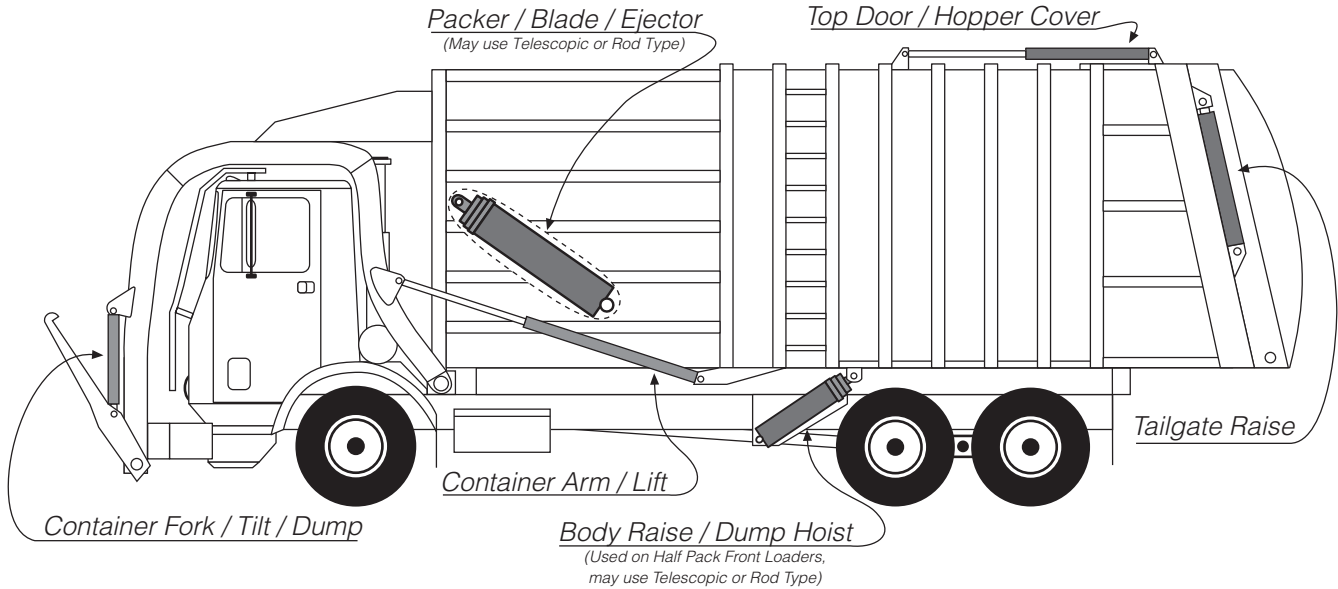


Roll Off & Tilt Frame Hoists

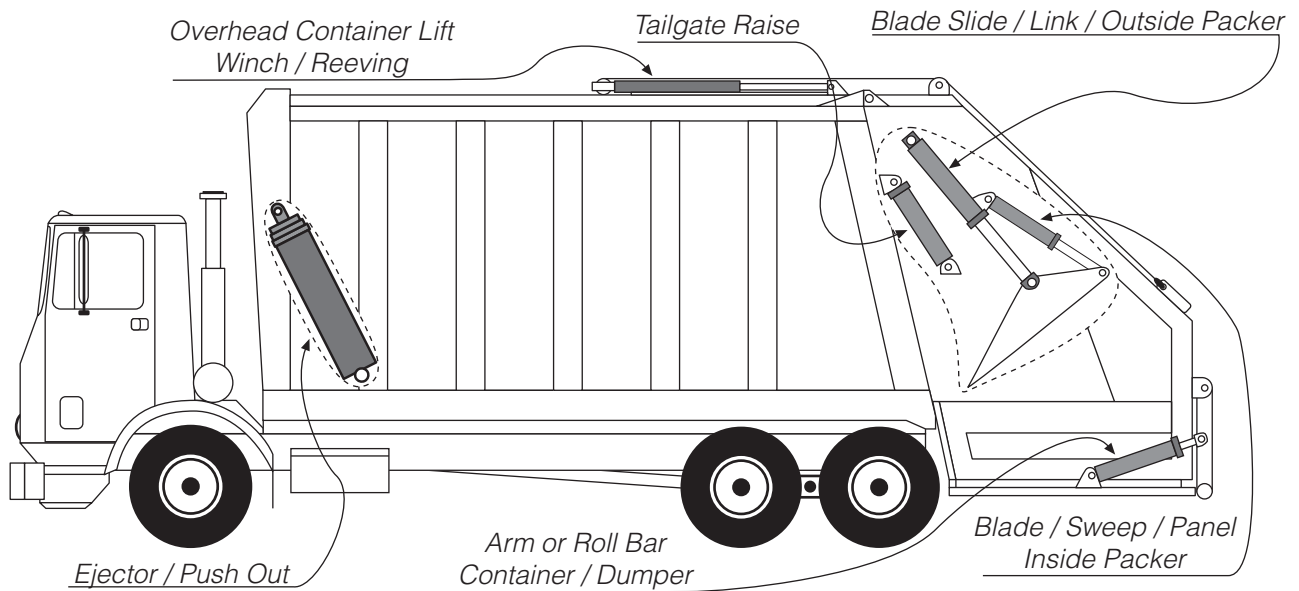


REFUSE BODIES

Front Loader Refuse Bodies



Rear Loader Refuse Bodies



FRONT MOUNT DUMP BODY

Stroke & Lifting Calculations Mounting

NOTE: This guide is for use to determine approximate stroke and lifting requirements for a front mount dump body. Final dimensions should be determined by an engineering drawing.

Formula for Calculating Initial Required Cylinder Force to Lift a Load

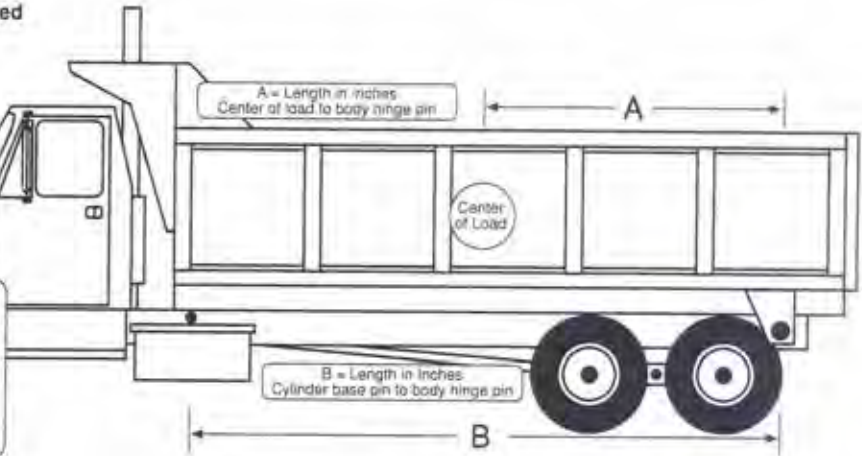
$$\frac{\text{Load (lbs)} \times "A"}{"B"} = \text{Initial required cylinder force}$$

Example

$$\frac{50,000\# \times 95"}{168"} = 25,803\# \text{ of force to start the lift}$$

Note: For a good design, initial pressure should not exceed 800 psi at start of lift

Telescopic Lifting Capabilities				
Stage O.D. in inches	800 psi	1000 psi	1500 psi	2000 psi
2.75"	4752	5940	8909	11879
3.75"	8836	11045	16567	22085
4.75"	14176	17721	26581	35441
5.75"	20774	25967	38951	51935
6.75"	28628	35785	53677	71570
7.50"	36213	45617	73525	98034
9.25"	55145	69205	103434	137911



Formula for Calculating the Required Cylinder Stroke for a Dump Angle

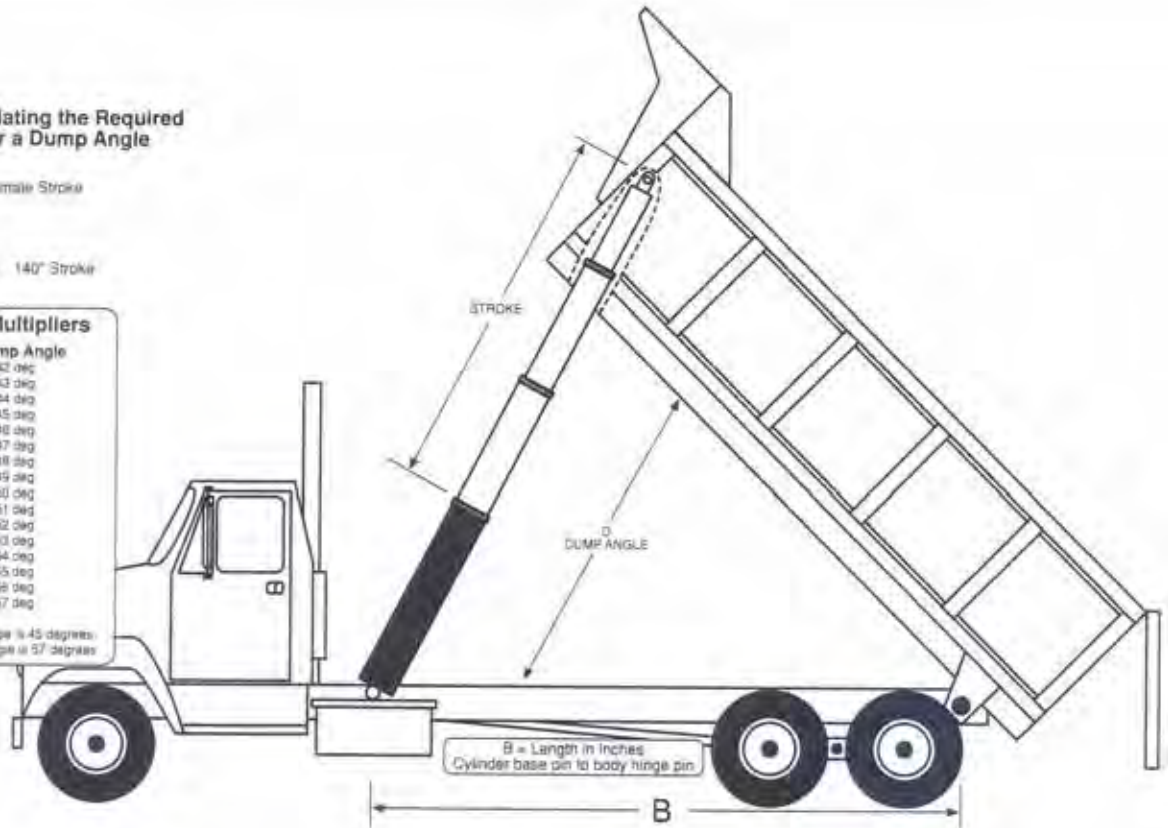
$$"B" \times "D" = \text{Approximate Stroke}$$

Example

$$180" (B) \times .845 (D) = 140" \text{ Stroke}$$

Dump Angle Multipliers	
"D" =	Dump Angle
71.5	42 deg
73	43 deg
75	44 deg
76.5	45 deg
78	46 deg
79.7	47 deg
81	48 deg
83	49 deg
85	50 deg
86.1	51 deg
87	52 deg
89	53 deg
90.3	54 deg
92	55 deg
93.5	56 deg
95.4	57 deg

Normal minimum dump angle is 45 degrees.
Normal maximum dump angle is 57 degrees.



TECHNICAL INFORMATION

