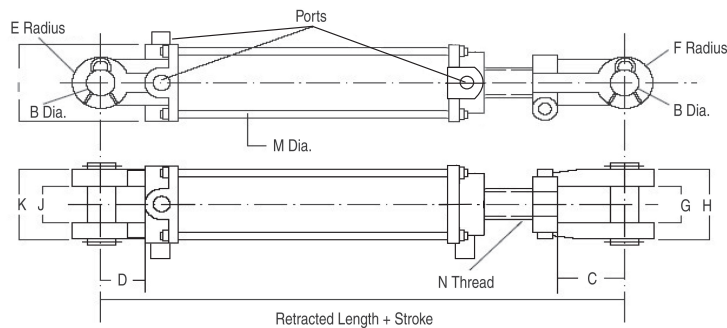


HTR TIE-ROD CYLINDERS

Cylinders

THE HTR LINE

2500 PSI DOUBLE 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.
- 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.

| 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. |
|-------------|-------------|--------|----------------|-------|-------|-------|-----|-------------|---------|-------------|--------------------|---------|
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-2048 | 2.0 | 48 | 1-1/4 | 2.520 | 2.835 | 2.520 | M10 | 1-1/8-12UNF | 2.375 | 3/8 NPT | 58.25 | 35.00 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |

HTR TIE-ROD CYLINDERS

Cylinders

THE HTR LINE

2500 PSI DOUBLE ACTING CYLINDERS

CYLINDERS

| PART NUMBER | BORE (INCH) | STROKE | ROD DIA (INCH) | H | I | K | M | N | TUBE OD | PORTS (NPTF) | PIN CTR RETRACT-ED | WT LBS. |
|-------------|-------------|--------|----------------|-------|-------|-------|-----|-------------|---------|--------------|--------------------|---------|
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-3016 | 3.0 | 16 | 1-1/4 | 2.600 | 3.740 | 2.520 | M12 | 1-1/4-12UNF | 3.375 | 1/2 NPT | 28.25 | 34.76 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-3048 | 3.5 | 48 | 1-1/2 | 2.600 | 4.130 | 2.520 | M12 | 1-1/4-12UNF | 3.875 | 1/2 NPT | 58.25 | 74.69 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-3516 | 3.5 | 16 | 1-1/4 | 2.600 | 4.134 | 2.520 | M12 | 1-1/4-12UNF | 3.875 | 1/2 NPT | 28.25 | 37.18 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-4016A | 4.0 | 16 | 1-3/4 | 2.600 | 4.724 | 2.600 | M12 | 1-1/4-12UNF | 4.375 | 1/2NPT | 31.50 | 57.20 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-4026 | 4.0 | 26 | 1-3/4 | 2.600 | 4.724 | 2.600 | M12 | 1-1/4-12UNF | 4.375 | 1/2 NPT | 36.25 | 72.00 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-4048 | 4.0 | 48 | 1-3/4 | 2.600 | 4.724 | 2.600 | M12 | 1-1/4-12UNF | 4.375 | 1/2 NPT | 48.25 | 98.00 |
| HTR-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 |
| HTR-5006 | 5.0 | 6 | 1-1/2 | 2.677 | 6.000 | 3.500 | M16 | 1-1/4-12UNF | 5.453 | 1/2 NPT | 18.25 | 56.76 |

HTR TIE-ROD CYLINDERS

Cylinders

THE HTR LINE

2500 PSI DOUBLE ACTING CYLINDERS

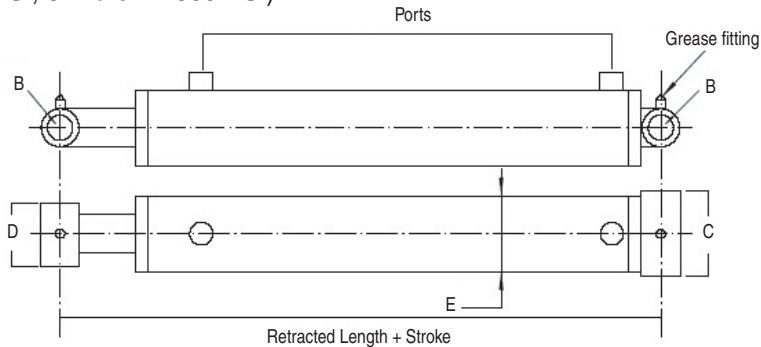
| PART NUMBER | BORE (INCH) | STROKE | ROD DIA (INCH) | H | I | K | M | N | TUBE OD | PORTS (NPTF) | PIN CTR RETRACT-ED | WT LBS. |
|-------------|-------------|--------|----------------|-------|-------|-------|-----|-------------|---------|--------------|--------------------|---------|
| HTR-5008 | 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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |

HMW MECHANICAL WELDED CYLINDERS

Cylinders

THE HMW 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

| Bore | B | C | D | E | Ports(NPT) |
|------|------|------|------|-----|------------|
| 1.50 | 0.77 | 2.25 | 2.00 | 2.0 | 1/4 NPT |
| 2.00 | 1.02 | 2.75 | 2.25 | 2.5 | 3/8 NPT |
| 2.50 | 1.02 | 3.25 | 2.25 | 3.0 | 1/2 NPT |
| 3.00 | 1.02 | 3.75 | 2.25 | 3.5 | 1/2 NPT |
| 3.50 | 1.27 | 4.25 | 2.25 | 4.0 | 1/2 NPT |
| 4.00 | 1.52 | 4.75 | 2.50 | 4.5 | 1/2 NPT |
| 5.00 | 1.77 | 5.75 | 3.25 | 5.5 | 1/2 NPT |

| PART NUMBER | BORE | STROKE (INCH) | ROD DIA (INCH) | PIN CENTERS RETRACTED (INCH) | PIN CENTERS EXTENDED (INCH) | WEIGHT LBS |
|-------------|------|---------------|----------------|------------------------------|-----------------------------|------------|
| HMW-1504 | 1.50 | 4 | 1" | 12.00 | 16.00 | 9.04 |
| HMW-1506 | 1.50 | 6 | 1" | 14.00 | 20.00 | 10.14 |
| HMW-1508 | 1.50 | 8 | 1" | 16.00 | 24.00 | 11.47 |
| HMW-1510 | 1.50 | 10 | 1" | 18.00 | 28.00 | 12.79 |
| HMW-2008 | 2.00 | 8 | 1-1/4" | 16.00 | 24.00 | 13.45 |
| HMW-2010 | 2.00 | 10 | 1-1/4" | 18.00 | 28.00 | 15.21 |
| HMW-2012 | 2.00 | 12 | 1-1/4" | 20.00 | 32.00 | 16.98 |
| HMW-2014 | 2.00 | 14 | 1-1/4" | 22.00 | 36.00 | 18.74 |
| HMW-2016 | 2.00 | 16 | 1-1/4" | 24.00 | 40.00 | 20.51 |
| HMW-2018 | 2.00 | 18 | 1-1/4" | 26.00 | 44.00 | 22.27 |
| HMW-2020 | 2.00 | 20 | 1-1/4" | 28.00 | 48.00 | 24.03 |
| HMW-2024 | 2.00 | 24 | 1-1/4" | 32.00 | 56.00 | 27.56 |
| HMW-2028 | 2.00 | 28 | 1-1/4" | 36.00 | 64.00 | 31.09 |
| HMW-2030 | 2.00 | 30 | 1-1/4" | 38.00 | 68.00 | 32.85 |
| HMW-2032 | 2.00 | 32 | 1-1/4" | 40.00 | 72.00 | 34.84 |
| HMW-2036 | 2.00 | 36 | 1-1/4" | 44.00 | 80.00 | 38.37 |
| HMW-2040 | 2.00 | 40 | 1-1/4" | 48.00 | 88.00 | 41.90 |
| HMW-2048 | 2.00 | 48 | 1-1/4" | 56.00 | 104.00 | 48.95 |
| HMW-2508 | 2.50 | 8 | 1-1/2" | 16.00 | 24.00 | 19.85 |
| HMW-2510 | 2.50 | 10 | 1-1/2" | 18.00 | 28.00 | 21.83 |
| HMW-2512 | 2.50 | 12 | 1-1/2" | 20.00 | 32.00 | 24.03 |
| HMW-2514 | 2.50 | 14 | 1-1/2" | 22.00 | 36.00 | 26.24 |
| HMW-2516 | 2.50 | 16 | 1-1/2" | 24.00 | 40.00 | 28.44 |

HMW MECHANICAL WELDED CYLINDERS

Cylinders

THE HMW 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 |
|-------------|------|---------------|----------------|------------------------------|-----------------------------|------------|
| HMW-2518 | 2.50 | 18 | 1-1/2" | 26.00 | 44.00 | 30.65 |
| HMW-2520 | 2.50 | 20 | 1-1/2" | 28.00 | 48.00 | 32.85 |
| HMW-2524 | 2.50 | 24 | 1-1/2" | 32.00 | 56.00 | 37.26 |
| HMW-2528 | 2.50 | 28 | 1-1/2" | 36.00 | 64.00 | 41.45 |
| HMW-2530 | 2.50 | 30 | 1-1/2" | 38.00 | 68.00 | 43.66 |
| HMW-2532 | 2.50 | 32 | 1-1/2" | 40.00 | 72.00 | 45.86 |
| HMW-2536 | 2.50 | 36 | 1-1/2" | 44.00 | 80.00 | 50.27 |
| HMW-2540 | 2.50 | 40 | 1-1/2" | 48.00 | 88.00 | 54.68 |
| HMW-2548 | 2.50 | 48 | 1-1/2" | 56.00 | 104.00 | 63.28 |
| HMW-3008 | 3.00 | 8 | 1-1/2" | 16.00 | 24.00 | 24.70 |
| HMW-3010 | 3.00 | 10 | 1-1/2" | 18.00 | 28.00 | 27.12 |
| HMW-3012 | 3.00 | 12 | 1-1/2" | 20.00 | 32.00 | 29.55 |
| HMW-3014 | 3.00 | 14 | 1-1/2" | 22.00 | 36.00 | 31.97 |
| HMW-3016 | 3.00 | 16 | 1-1/2" | 24.00 | 40.00 | 34.40 |
| HMW-3018 | 3.00 | 18 | 1-1/2" | 26.00 | 44.00 | 36.82 |
| HMW-3020 | 3.00 | 20 | 1-1/2" | 28.00 | 48.00 | 39.25 |
| HMW-3024 | 3.00 | 24 | 1-1/2" | 32.00 | 56.00 | 44.10 |
| HMW-3028 | 3.00 | 28 | 1-1/2" | 36.00 | 64.00 | 48.95 |
| HMW-3030 | 3.00 | 30 | 1-1/2" | 38.00 | 68.00 | 51.38 |
| HMW-3032 | 3.00 | 32 | 1-1/2" | 40.00 | 72.00 | 53.58 |
| HMW-3036 | 3.00 | 36 | 1-1/2" | 44.00 | 80.00 | 58.43 |
| HMW-3040 | 3.00 | 40 | 1-1/2" | 48.00 | 88.00 | 63.28 |
| HMW-3048 | 3.00 | 48 | 1-1/2" | 56.00 | 104.00 | 72.99 |
| HMW-3508 | 3.50 | 8 | 1-3/4" | 18.00 | 26.00 | 32.63 |
| HMW-3510 | 3.50 | 10 | 1-3/4" | 20.00 | 30.00 | 35.72 |
| HMW-3512 | 3.50 | 12 | 1-3/4" | 22.00 | 34.00 | 38.81 |
| HMW-3514 | 3.50 | 14 | 1-3/4" | 24.00 | 38.00 | 41.67 |
| HMW-3516 | 3.50 | 16 | 1-3/4" | 26.00 | 42.00 | 44.76 |
| HMW-3518 | 3.50 | 18 | 1-3/4" | 28.00 | 46.00 | 47.63 |
| HMW-3520 | 3.50 | 20 | 1-3/4" | 30.00 | 50.00 | 50.72 |
| HMW-3524 | 3.50 | 24 | 1-3/4" | 34.00 | 58.00 | 56.67 |
| HMW-3528 | 3.50 | 28 | 1-3/4" | 38.00 | 66.00 | 62.62 |
| HMW-3530 | 3.50 | 30 | 1-3/4" | 40.00 | 70.00 | 65.71 |
| HMW-3532 | 3.50 | 32 | 1-3/4" | 42.00 | 74.00 | 68.80 |
| HMW-3536 | 3.50 | 36 | 1-3/4" | 46.00 | 82.00 | 74.75 |
| HMW-3540 | 3.50 | 40 | 1-3/4" | 50.00 | 90.00 | 80.70 |
| HMW-3548 | 3.50 | 48 | 1-3/4" | 58.00 | 106.00 | 92.61 |
| HMW-4008 | 4.00 | 8 | 2" | 18.00 | 26.00 | 40.79 |
| HMW-4010 | 4.00 | 10 | 2" | 20.00 | 30.00 | 44.54 |
| HMW-4012 | 4.00 | 12 | 2" | 22.00 | 34.00 | 48.29 |
| HMW-4014 | 4.00 | 14 | 2" | 24.00 | 38.00 | 51.82 |
| HMW-4016 | 4.00 | 16 | 2" | 26.00 | 42.00 | 55.57 |
| HMW-4018 | 4.00 | 18 | 2" | 28.00 | 46.00 | 59.09 |
| HMW-4020 | 4.00 | 20 | 2" | 30.00 | 50.00 | 62.84 |
| HMW-4024 | 4.00 | 24 | 2" | 34.00 | 58.00 | 70.12 |
| HMW-4028 | 4.00 | 28 | 2" | 38.00 | 66.00 | 77.40 |
| HMW-4030 | 4.00 | 30 | 2" | 40.00 | 70.00 | 81.14 |

HMW MECHANICAL WELDED CYLINDERS

Cylinders

THE HMW LINE

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

CYLINDERS

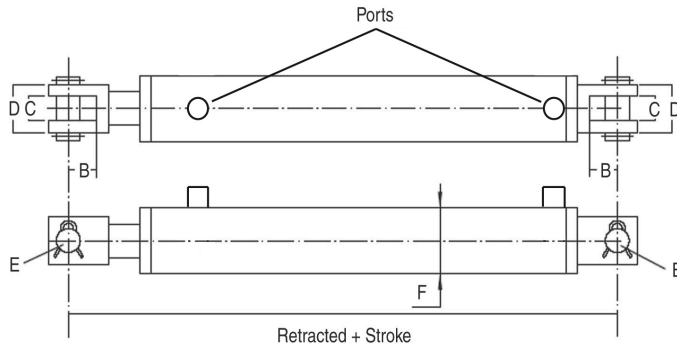
| PART NUMBER | BORE | STROKE (INCH) | ROD DIA (INCH) | PIN CENTERS RETRACTED (INCH) | PIN CENTERS EXTENDED (INCH) | WEIGHT LBS |
|-------------|------|---------------|----------------|------------------------------------|-----------------------------------|------------|
| HMW-4032 | 4.00 | 32 | 2" | 42.00 | 74.00 | 84.67 |
| HMW-4036 | 4.00 | 36 | 2" | 46.00 | 82.00 | 91.95 |
| HMW-4040 | 4.00 | 40 | 2" | 50.00 | 90.00 | 99.23 |
| HMW-4048 | 4.00 | 48 | 2" | 58.00 | 106.00 | 114.00 |
| HMW-5008 | 5.00 | 8 | 2-1/2" | 20.00 | 28.00 | 71.88 |
| HMW-5010 | 5.00 | 10 | 2-1/2" | 22.00 | 32.00 | 76.07 |
| HMW-5012 | 5.00 | 12 | 2-1/2" | 24.00 | 36.00 | 80.48 |
| HMW-5014 | 5.00 | 14 | 2-1/2" | 26.00 | 40.00 | 84.67 |
| HMW-5016 | 5.00 | 16 | 2-1/2" | 28.00 | 44.00 | 89.08 |
| HMW-5018 | 5.00 | 18 | 2-1/2" | 30.00 | 48.00 | 93.49 |
| HMW-5020 | 5.00 | 20 | 2-1/2" | 32.00 | 52.00 | 97.68 |
| HMW-5024 | 5.00 | 24 | 2-1/2" | 36.00 | 60.00 | 106.28 |
| HMW-5028 | 5.00 | 28 | 2-1/2" | 40.00 | 68.00 | 115.10 |
| HMW-5030 | 5.00 | 30 | 2-1/2" | 42.00 | 72.00 | 119.29 |
| HMW-5032 | 5.00 | 32 | 2-1/2" | 44.00 | 76.00 | 123.70 |
| HMW-5036 | 5.00 | 36 | 2-1/2" | 48.00 | 84.00 | 132.30 |
| HMW-5040 | 5.00 | 40 | 2-1/2" | 52.00 | 92.00 | 140.90 |
| HMW-5048 | 5.00 | 48 | 2-1/2" | 60.00 | 108.00 | 158.10 |

CLEVIS WELDED CYLINDERS

Cylinders

THE HCW 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

| 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 EXTENDED (INCH) | WEIGHT LBS |
|-------------|------|---------------|----------------|-------------------------------|-----------------------------|------------|
| HCW-2004 | 2.00 | 4 | 1-1/4" | 14.25 | 18.25 | 12.79 |
| HCW-2006 | 2.00 | 6 | 1-1/4" | 16.25 | 22.25 | 14.55 |
| HCW-2008 | 2.00 | 8 | 1-1/4" | 18.25 | 28.25 | 16.32 |
| HCW-2010 | 2.00 | 10 | 1-1/4" | 20.25 | 30.25 | 17.86 |
| HCW-2012 | 2.00 | 12 | 1-1/4" | 22.25 | 34.25 | 19.40 |
| HCW-2014 | 2.00 | 14 | 1-1/4" | 24.25 | 38.25 | 21.17 |
| HCW-2016 | 2.00 | 16 | 1-1/4" | 26.25 | 42.25 | 22.93 |
| HCW-2018 | 2.00 | 18 | 1-1/4" | 28.25 | 46.25 | 24.48 |
| HCW-2020 | 2.00 | 20 | 1-1/4" | 30.25 | 50.25 | 26.24 |
| HCW-2024 | 2.00 | 24 | 1-1/4" | 34.25 | 58.25 | 29.55 |
| HCW-2028 | 2.00 | 28 | 1-1/4" | 38.25 | 66.25 | 32.85 |
| HCW-2030 | 2.00 | 30 | 1-1/4" | 40.25 | 70.25 | 34.62 |
| HCW-2032 | 2.00 | 32 | 1-1/4" | 42.25 | 74.25 | 36.16 |
| HCW-2034 | 2.00 | 34 | 1-1/4" | 44.25 | 78.25 | 37.93 |
| HCW-2036 | 2.00 | 36 | 1-1/4" | 46.25 | 82.25 | 39.69 |
| HCW-2504 | 2.50 | 4 | 1-1/2" | 14.25 | 18.25 | 16.98 |
| HCW-2506 | 2.50 | 6 | 1-1/2" | 16.25 | 22.25 | 19.18 |
| HCW-2508 | 2.50 | 8 | 1-1/2" | 20.25 | 28.25 | 21.39 |
| HCW-2510 | 2.50 | 10 | 1-1/2" | 20.25 | 30.25 | 23.37 |
| HCW-2512 | 2.50 | 12 | 1-1/2" | 22.25 | 34.25 | 25.58 |
| HCW-2514 | 2.50 | 14 | 1-1/2" | 24.25 | 38.25 | 27.78 |
| HCW-2516 | 2.50 | 16 | 1-1/2" | 26.25 | 42.25 | 29.77 |
| HCW-2518 | 2.50 | 18 | 1-1/2" | 28.25 | 46.25 | 31.97 |
| HCW-2520 | 2.50 | 20 | 1-1/2" | 30.25 | 50.25 | 34.18 |
| HCW-2524 | 2.50 | 24 | 1-1/2" | 34.25 | 58.25 | 38.37 |
| HCW-2528 | 2.50 | 28 | 1-1/2" | 38.25 | 66.25 | 42.56 |

CLEVIS WELDED CYLINDERS

Cylinders

THE HCW 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 |
|-------------|------|---------------|----------------|-------------------------------|-----------------------------|------------|
| HCW-2530 | 2.50 | 30 | 1-1/2" | 40.25 | 70.25 | 44.76 |
| HCW-2532 | 2.50 | 32 | 1-1/2" | 42.25 | 74.25 | 46.97 |
| HCW-2534 | 2.50 | 34 | 1-1/2" | 44.25 | 78.25 | 48.95 |
| HCW-2536 | 2.50 | 36 | 1-1/2" | 46.25 | 82.25 | 51.16 |
| HCW-3004 | 3.00 | 4 | 1-1/2" | 14.25 | 18.25 | 21.83 |
| HCW-3006 | 3.00 | 6 | 1-1/2" | 16.25 | 22.25 | 24.26 |
| HCW-3008 | 3.00 | 8 | 1-1/2" | 18.25 | 28.25 | 26.90 |
| HCW-3010 | 3.00 | 10 | 1-1/2" | 20.25 | 30.25 | 29.11 |
| HCW-3012 | 3.00 | 12 | 1-1/2" | 22.25 | 34.25 | 31.53 |
| HCW-3014 | 3.00 | 14 | 1-1/2" | 24.25 | 38.25 | 33.96 |
| HCW-3016 | 3.00 | 16 | 1-1/2" | 26.25 | 42.25 | 36.60 |
| HCW-3018 | 3.00 | 18 | 1-1/2" | 28.25 | 46.25 | 39.03 |
| HCW-3020 | 3.00 | 20 | 1-1/2" | 30.25 | 50.25 | 41.45 |
| HCW-3024 | 3.00 | 24 | 1-1/2" | 34.25 | 58.25 | 46.31 |
| HCW-3028 | 3.00 | 28 | 1-1/2" | 38.25 | 66.25 | 51.16 |
| HCW-3030 | 3.00 | 30 | 1-1/2" | 40.25 | 70.25 | 53.58 |
| HCW-3032 | 3.00 | 32 | 1-1/2" | 42.25 | 74.25 | 56.23 |
| HCW-3034 | 3.00 | 34 | 1-1/2" | 44.25 | 78.25 | 58.65 |
| HCW-3036 | 3.00 | 36 | 1-1/2" | 46.25 | 82.25 | 61.08 |
| HCW-3504 | 3.50 | 4 | 1-3/4" | 14.25 | 18.25 | 26.24 |
| HCW-3506 | 3.50 | 6 | 1-3/4" | 16.25 | 22.25 | 29.33 |
| HCW-3508 | 3.50 | 8 | 1-3/4" | 18.25 | 28.25 | 32.41 |
| HCW-3510 | 3.50 | 10 | 1-3/4" | 20.25 | 30.25 | 35.50 |
| HCW-3512 | 3.50 | 12 | 1-3/4" | 22.25 | 34.25 | 38.59 |
| HCW-3514 | 3.50 | 14 | 1-3/4" | 24.25 | 38.25 | 41.67 |
| HCW-3516 | 3.50 | 16 | 1-3/4" | 26.25 | 42.25 | 44.76 |
| HCW-3518 | 3.50 | 18 | 1-3/4" | 28.25 | 46.25 | 48.07 |
| HCW-3520 | 3.50 | 20 | 1-3/4" | 30.25 | 50.25 | 51.16 |
| HCW-3524 | 3.50 | 24 | 1-3/4" | 34.25 | 58.25 | 57.33 |
| HCW-3528 | 3.50 | 28 | 1-3/4" | 38.25 | 66.25 | 63.50 |
| HCW-3530 | 3.50 | 30 | 1-3/4" | 40.25 | 70.25 | 66.59 |
| HCW-3532 | 3.50 | 32 | 1-3/4" | 42.25 | 74.25 | 69.90 |
| HCW-3534 | 3.50 | 34 | 1-3/4" | 44.25 | 78.25 | 72.99 |
| HCW-3536 | 3.50 | 36 | 1-3/4" | 46.25 | 82.25 | 76.07 |
| HCW-4004 | 4.00 | 4 | 2" | 14.25 | 18.25 | 30.65 |
| HCW-4006 | 4.00 | 6 | 2" | 16.25 | 22.25 | 34.40 |
| HCW-4008 | 4.00 | 8 | 2" | 18.25 | 28.25 | 39.25 |
| HCW-4010 | 4.00 | 10 | 2" | 20.25 | 30.25 | 42.12 |
| HCW-4012 | 4.00 | 12 | 2" | 22.25 | 34.25 | 46.08 |
| HCW-4014 | 4.00 | 14 | 2" | 24.25 | 38.25 | 50.05 |
| HCW-4016 | 4.00 | 16 | 2" | 26.25 | 42.25 | 53.80 |
| HCW-4018 | 4.00 | 18 | 2" | 28.25 | 46.25 | 57.77 |
| HCW-4020 | 4.00 | 20 | 2" | 30.25 | 50.25 | 61.52 |
| HCW-4024 | 4.00 | 24 | 2" | 34.25 | 58.25 | 69.46 |
| HCW-4028 | 4.00 | 28 | 2" | 38.25 | 66.25 | 77.18 |
| HCW-4030 | 4.00 | 30 | 2" | 40.25 | 70.25 | 81.14 |
| HCW-4032 | 4.00 | 32 | 2" | 42.25 | 74.25 | 84.89 |

CLEVIS WELDED CYLINDERS

Cylinders

THE HCW LINE

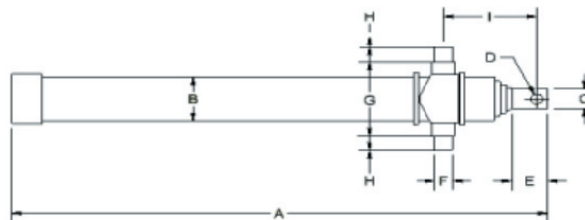
2500 and 3000 PSI DOUBLE ACTING CYLINDERS (4" Bore = 3000 PSI, 5" Bore = 2500 PSI)

| PART NUMBER | BORE | STROKE (INCH) | ROD DIA (INCH) | PIN CENTERS RE-TRACTED (INCH) | PIN CENTERS EXTENDED (INCH) | WEIGHT LBS |
|-------------|------|---------------|----------------|-------------------------------|-----------------------------|------------|
| HCW-4034 | 4.00 | 34 | 2" | 44.25 | 78.25 | 88.86 |
| HCW-4036 | 4.00 | 36 | 2" | 46.25 | 82.25 | 92.61 |
| HCW-5004 | 5.00 | 4 | 2-1/2" | 16.25 | 20.25 | 63.95 |
| HCW-5006 | 5.00 | 6 | 2-1/2" | 18.25 | 24.25 | 68.36 |
| HCW-5008 | 5.00 | 8 | 2-1/2" | 18.25 | 28.25 | 72.77 |
| HCW-5010 | 5.00 | 10 | 2-1/2" | 22.25 | 32.25 | 77.18 |
| HCW-5012 | 5.00 | 12 | 2-1/2" | 24.25 | 36.25 | 81.59 |
| HCW-5014 | 5.00 | 14 | 2-1/2" | 26.25 | 40.25 | 86.00 |
| HCW-5016 | 5.00 | 16 | 2-1/2" | 28.25 | 44.25 | 90.41 |
| HCW-5018 | 5.00 | 18 | 2-1/2" | 30.25 | 48.25 | 94.82 |
| HCW-5020 | 5.00 | 20 | 2-1/2" | 32.25 | 52.25 | 99.23 |
| HCW-5024 | 5.00 | 24 | 2-1/2" | 36.25 | 60.25 | 108.05 |
| HCW-5028 | 5.00 | 28 | 2-1/2" | 40.25 | 68.25 | 116.87 |
| HCW-5030 | 5.00 | 30 | 2-1/2" | 42.25 | 72.25 | 121.28 |
| HCW-5032 | 5.00 | 32 | 2-1/2" | 44.25 | 76.25 | 125.69 |
| HCW-5034 | 5.00 | 34 | 2-1/2" | 46.25 | 80.25 | 130.10 |
| HCW-5036 | 5.00 | 36 | 2-1/2" | 48.25 | 84.25 | 134.51 |

THE HTC LINE

3000 PSI SINGLE ACTING CYLINDERS

7 Tons and 12 Tons Inverse

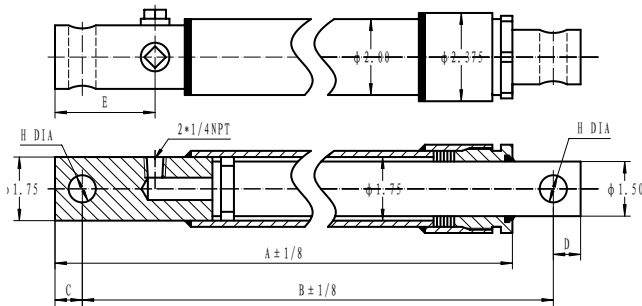


| PART NUMBER | CAPACITY | STROKE | CLOSED (A) | B | C | D | E | F | G | H | I | PORT | WEIGHT LBS. |
|-------------|----------|--------|------------|---|---|--------|------|------|-----|------|---|----------|-------------|
| HTC-3378 | 7 TONS | 78" | 35.5" | 4 | 2 | 1.0625 | 2.25 | 1.25 | 6.5 | 1.25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

SNOW PLOW CYLINDERS

Snow Plow Cylinders

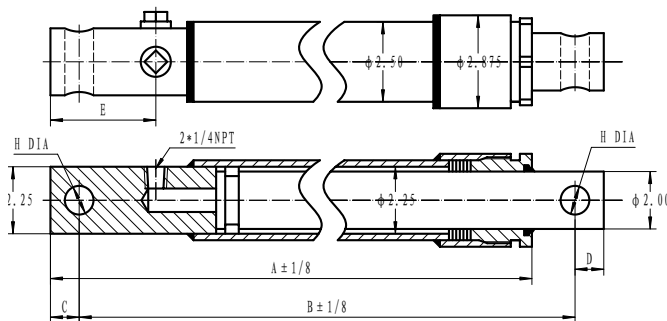
SNOW PLOW



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.

| PART NUMBER | DESCRIPTION | A | B | C & D | E | H | WT LBS. |
|----------------|-----------------------------|---------|--------|-------|---------|------|---------|
| HSPM-1506-0625 | MYER 1.5" X 6" | 11-7/8 | 12.00 | 11/16 | 2.00 | 5/8 | 12 |
| HSPM-1510-0625 | MYER 1.5" X 10" | 15-7/8 | 16-1/4 | 11/16 | 2.00 | 5/8 | 14 |
| HSPM-1512-0625 | MYER 1.5" X 12" | 17-7/8 | 18.00 | 11/16 | 2.00 | 5/8 | 15 |
| HSPW-1506-0750 | WESTREN 1.5" X 6" | 12-5/8 | 13.00 | 11/16 | 2-3/4 | 3/4 | 12 |
| HSPW-1508-0750 | WESTREN 1.5" X 8" | 14-5/8 | 15-1/4 | 11/16 | 2-3/4 | 3/4 | 13 |
| HSPW-1510-0750 | WESTREN 1.5" X 10" X 1" | 16-5/8 | 17-1/4 | 11/16 | 2-3/4 | 3/4 | 14 |
| HSPW-1510-1000 | WESTREN 1.5" X 10" X 1" | 16-5/8 | 17-1/2 | 11/16 | 2-3/4 | 1.00 | 14 |
| HSPA-1510-0750 | ARTIC 1.5" X 10" | 16-5/8 | 17.00 | 3/4 | 2-3/4 | 3/4 | 14 |
| HSPA-1512-0750 | ARTIC 1.5" X 12" | 16-5/8 | 19.00 | 3/4 | 2-3/4 | 3/4 | 15 |
| HSPA-1512-1000 | FISHER 1.5" X 12" | 18-7/16 | 19-3/8 | 3/4 | 2-5/8 | 1.00 | 15 |
| HSPA-1510-1000 | FISHER & DIAMOND 1.5" X 10" | 16-3/8 | 17-1/4 | 3/4 | 2-11/16 | 1.00 | 14 |

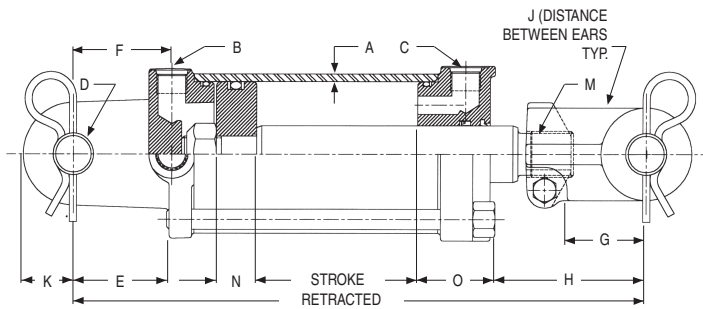


| PART NUMBER | DESCRIPTION | A | B | C & D | E | H | WT LBS. |
|----------------|------------------------------|--------|---------|-------|--------|-------|---------|
| HSPM-2012-0625 | MYER 2.0" X 12" | 17-1/4 | 18.00 | 3/4 | 2-3/16 | 5/8 | 18 |
| HSPW-2016-1000 | WESTREN & DIAMOND 2.0" X 16" | 22-5/8 | 23-5/8 | 11/16 | 2-3/4 | 1.00 | 21 |
| HSPW-2006-0750 | WESTREN 2.0" X 6" | 12-5/8 | 13-3/16 | 3/4 | 2-3/4 | 3/4 | 13 |
| HSPW-2010-1000 | WESTREN 2.0" X 10" | 16-5/8 | 17-1/4 | 11/16 | 2-3/4 | 1.00 | 16 |
| HSPF-2016-125 | FISHER 2.0" X 16" | 22-1/2 | 23-1/4 | 7/8 | 2-3/4 | 1-1/4 | 20 |

TIE-ROD CYLINDERS



THE ROYAL PLATE LINE 3000 PSI DOUBLE ACTING TIE ROD CYLINDERS



FEATURES:

- Honed tubing (SAE-9000 & SAE 9100 series have cylinder finish tubing)
- Heavy duty, high strength tie rods
- Chromed, ground & polished piston rod will operate at full pressure through 16" stroke
- Cast iron piston, ductile iron butt, gland & clevis
- Carboxylated nitrile u-cup & urethane wiper in gland
- Pins & clips included
- Standard color is red
- Stroke control may be installed on 8" strokes
- Side ports available on request at no additional cost

CYLINDERS

| PTR | 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. |
|-----------|----------|-------|--------|----------|------------------|------|---------------|-------|--------|--------|---------|--------|------|-------|----------|-----|---------|----------|
| PTR-2004 | 8404 | 2 | 4 | 1 | 14 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1-14 | 7/8 | 2 1/4 | 18 |
| PTR-2006 | 8406 | 2 | 6 | 1 | 16 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1-14 | 7/8 | 2 1/4 | 19 |
| PTR-2008 | 8408 | 2 | 8 | 1 | 20 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1-14 | 7/8 | 2 1/4 | 20 |
| PTR-2010 | 8410 | 2 | 10 | 1 | 20 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1-14 | 7/8 | 2 1/4 | 21 |
| PTR-2012 | 9012 | 2 | 12 | 1 1/8 | 22 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1 1/8-12 | 7/8 | 2 3/8 | 25 |
| PTR-2014 | 9014 | 2 | 14 | 1 1/8 | 24 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1 1/8-12 | 7/8 | 2 3/8 | 26 |
| PTR-2016A | 9016 | 2 | 16 | 1 1/8 | 31 1/2 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 8 1/2 | 1.06 | 15/16 | 1 1/8-12 | 7/8 | 2 3/8 | 28 |
| PTR-2018 | 9018 | 2 | 18 | 1 1/8 | 28 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1 1/8-12 | 7/8 | 2 3/8 | 29 |
| PTR-2020 | 9020 | 2 | 20 | 1 1/8 | 30 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1 1/8-12 | 7/8 | 2 3/8 | 31 |
| PTR-2024 | 9024 | 2 | 24 | 1 1/8 | 34 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1 1/8-12 | 7/8 | 2 3/8 | 35 |
| PTR-2030 | 9030 | 2 | 30 | 1 1/8 | 40 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1 1/8-12 | 7/8 | 2 3/8 | 39 |
| PTR-2506 | 7006 | 2 1/2 | 6 | 1 1/8 | 16 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 2 3/8 | 22 |
| PTR-2508 | 9108 | 2 1/2 | 8 | 1 1/4 | 20 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 5 1/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 2 3/8 | 25 |
| PTR-2510 | 9110 | 2 1/2 | 10 | 1 1/4 | 20 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 2 3/8 | 26 |
| PTR-2512 | 9112 | 2 1/2 | 12 | 1 1/4 | 22 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 2 3/8 | 27 |
| PTR-2514 | 9114 | 2 1/2 | 14 | 1 1/4 | 24 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 2 3/8 | 29 |
| PTR-2516 | 9116 | 2 1/2 | 16 | 1 1/4 | 31 1/2 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 8 1/2 | 1.06 | 15/16 | 1 1/8-12 | 1 | 2 3/8 | 33 |
| PTR-2518 | 9118 | 2 1/2 | 18 | 1 1/4 | 28 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 2 3/8 | 34 |
| PTR-2520 | 9120 | 2 1/2 | 20 | 1 1/4 | 30 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 2 3/8 | 36 |
| PTR-2524 | 9124 | 2 1/2 | 24 | 1 1/4 | 34 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 2 3/8 | 39 |
| PTR-2530 | 9130 | 2 1/2 | 30 | 1 1/4 | 40 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 3/8 | 1 13/16 | 3 1/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 2 3/8 | 44 |
| PTR-3006 | 7106 | 3 | 6 | 1 1/8 | 16 1/4 | 1/8 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 1 15/16 | 24 |
| PTR-3008 | 9208 | 3 | 8 | 1 3/8 | 20 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 7/16 | 1 13/16 | 5 3/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 1 15/16 | 32 |
| PTR-3010 | 9210 | 3 | 10 | 1 3/8 | 20 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 1 15/16 | 33 |
| PTR-3012 | 9212 | 3 | 12 | 1 3/8 | 22 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 1 15/16 | 33 |
| PTR-3014 | 9214 | 3 | 14 | 1 3/8 | 24 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 7/16 | 1 13/16 | 3 3/16 | 1.06 | 15/16 | 1 1/8-12 | 1 | 1 15/16 | 35 |
| PTR-3016 | 10616 | 3 | 16 | 1 3/8 | 26 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 1 1/4 | 1 1/8-12 | 1 | 1 15/16 | 29 |
| PTR-3016A | 9216 | 3 | 16 | 1 3/8 | 31 1/2 | 3/16 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 7/16 | 1 13/16 | 9 | 1.06 | 15/16 | 1 1/8-12 | 1 | 1 15/16 | 39 |
| PTR-3018 | 9218 | 3 | 18 | 1 3/8 | 28 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 1 15/16 | 42 |
| PTR-3020 | 9220 | 3 | 20 | 1 3/8 | 30 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 1 15/16 | 45 |
| PTR-3024 | 9224 | 3 | 24 | 1 3/8 | 34 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 1 15/16 | 47 |
| PTR-3030 | 9230 | 3 | 30 | 1 3/8 | 40 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 1 15/16 | 53 |
| PTR-3036 | 9236 | 3 | 36 | 1 3/8 | 46 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 1 15/16 | 61 |
| PTR-3048 | 9248 | 3 | 48 | 1 3/8 | 58 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 7/16 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 15/16 | 1 1/8-12 | 1 | 1 15/16 | 66 |
| PTR-3508A | 9308A | 3 1/2 | 8 | 1 3/8 | 20 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 3/8 | 2 7/16 | 1 13/16 | 5 3/4 | 1.06 | 1 1/4 | 1 1/8-12 | 1 | 1 13/16 | 35 |

TIE-ROD CYLINDERS



THE ROYAL PLATE LINE

3000 PSI DOUBLE ACTING TIE ROD CYLINDERS

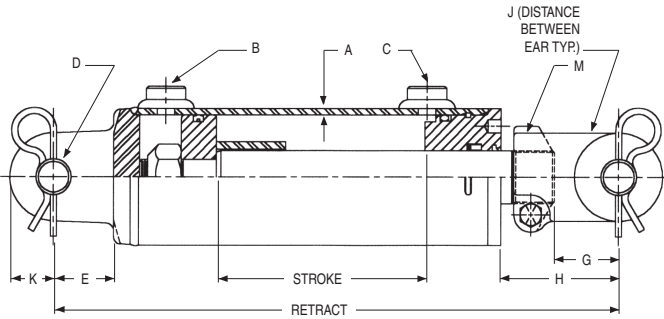
CYLINDERS

| PTR | 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. |
|---------------|----------|-------|--------|----------|------------------|------|---------------|-------|--------|--------|---------|-------|------|-------|----------|---|---------|----------|
| PTR-3510 | 9310A | 3 1/2 | 10 | 1 3/8 | 20 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 3/8 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 1 1/4 | 1 1/8-12 | 1 | 1 13/16 | 36 |
| PTR-3512 | 9312A | 3 1/2 | 12 | 1 3/8 | 22 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 3/8 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 1 1/4 | 1 1/8-12 | 1 | 1 13/16 | 38 |
| PTR-3514 | 9314A | 3 1/2 | 14 | 1 3/8 | 24 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 3/8 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 1 1/4 | 1 1/8-12 | 1 | 1 13/16 | 41 |
| PTR-3516A | 9316A | 3 1/2 | 16 | 1 3/8 | 31 1/2 | 3/16 | 3/4-16 SAE | 1.015 | 2 3/8 | 2 7/16 | 1 13/16 | 9 | 1.06 | 1 1/4 | 1 1/8-12 | 1 | 1 13/16 | 46 |
| PTR-3518 | 9318A | 3 1/2 | 18 | 1 3/8 | 28 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 3/8 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 1 1/4 | 1 1/8-12 | 1 | 1 13/16 | 47 |
| PTR-3520 | 9320A | 3 1/2 | 20 | 1 3/8 | 30 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 3/8 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 1 1/4 | 1 1/8-12 | 1 | 1 13/16 | 49 |
| PTR-3524 | 9324A | 3 1/2 | 24 | 1 3/8 | 34 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 3/8 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 1 1/4 | 1 1/8-12 | 1 | 1 13/16 | 54 |
| PTR-3530 | 9330A | 3 1/2 | 30 | 1 3/8 | 40 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 3/8 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 1 1/4 | 1 1/8-12 | 1 | 1 13/16 | 64 |
| PTR-3536 | 9336A | 3 1/2 | 36 | 1 3/8 | 46 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 3/8 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 1 1/4 | 1 1/8-12 | 1 | 1 13/16 | 66 |
| PTR-3548 | 9348A | 3 1/2 | 48 | 1 3/8 | 58 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 3/8 | 2 7/16 | 1 13/16 | 3 3/4 | 1.06 | 1 1/4 | 1 1/8-12 | 1 | 1 13/16 | 73 |
| PTR-4008 | 9408 | 4 | 8 | 1 3/4 | 20 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 7/8 | 5 1/4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 1 13/16 | 45 |
| PTR-4008-1.5R | 8608 | 4 | 8 | 1 1/2 | 20 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 7/8 | 5 1/4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 1 13/16 | 42 |
| PTR-4010 | 9410 | 4 | 10 | 1 3/4 | 20 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 7/8 | 3 1/4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 1 13/16 | 48 |
| PTR-4012 | 9412 | 4 | 12 | 1 3/4 | 22 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 7/8 | 3 1/4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 1 13/16 | 49 |
| PTR-4014 | 9414 | 4 | 14 | 1 3/4 | 24 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 7/8 | 3 1/4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 1 13/16 | 51 |
| PTR-4016 | 108816 | 4 | 16 | 1 3/4 | 26 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 7/8 | 3 1/4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 1 13/16 | 48 |
| PTR-4016A | 9416 | 4 | 16 | 1 3/4 | 31 1/2 | 3/16 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 7/8 | 8 1/2 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 1 13/16 | 61 |
| PTR-4018 | 9418 | 4 | 18 | 1 3/4 | 28 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 7/8 | 3 1/4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 1 13/16 | 62 |
| PTR-4020 | 9420 | 4 | 20 | 1 3/4 | 30 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 7/8 | 3 1/4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 1 13/16 | 72 |
| PTR-4024 | 9424 | 4 | 24 | 1 3/4 | 34 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 7/8 | 3 1/4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 1 13/16 | 74 |
| PTR-4030 | 9430 | 4 | 30 | 1 3/4 | 40 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 7/8 | 3 1/4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 1 13/16 | 77 |
| PTR-4036 | 9436 | 4 | 36 | 1 3/4 | 46 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 7/8 | 3 1/4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 1 13/16 | 83 |
| PTR-4048 | 9448 | 4 | 48 | 1 3/4 | 58 1/4 | 3/16 | 3/4-16 SAE | 1.015 | 2 5/16 | 2 7/16 | 1 7/8 | 3 1/4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 1 13/16 | 109 |
| PTR-5008 | 9508 | 5 | 8 | 2 | 20 1/4 | 1/4 | 7/8-16 SAE | 1.265 | 2 3/4 | 2 5/8 | 2 | 4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 2 1/2 | 67 |
| PTR-5012 | 9512 | 5 | 12 | 2 | 24 1/4 | 1/4 | 7/8-16 SAE | 1.265 | 2 3/4 | 2 5/8 | 2 | 4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 2 1/2 | 75 |
| PTR-5014 | 9514 | 5 | 14 | 2 | 26 1/4 | 1/4 | 7/8-16 SAE | 1.265 | 2 3/4 | 2 5/8 | 2 | 4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 2 1/2 | 80 |
| PTR-5016A | 9516 | 5 | 16 | 2 | 31 1/2 | 1/4 | 7/8-16 SAE | 1.265 | 2 3/4 | 2 5/8 | 2 | 7 1/4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 2 1/2 | 84 |
| PTR-5018 | 9518 | 5 | 18 | 2 | 28 1/4 | 1/4 | 7/8-16 SAE | 1.265 | 2 3/4 | 2 5/8 | 2 | 4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 2 12 | 90 |
| PTR-5020 | 9520 | 5 | 20 | 2 | 32 1/4 | 1/4 | 7/8-16 SAE | 1.265 | 2 3/4 | 2 5/8 | 2 | 4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 2 1/2 | 95 |
| PTR-5024 | 9524 | 5 | 24 | 2 | 36 1/4 | 1/4 | 7/8-16 SAE | 1.265 | 2 3/4 | 2 5/8 | 2 | 4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 2 1/2 | 100 |
| PTR-5030 | 9530 | 5 | 30 | 2 | 42 1/4 | 1/4 | 7/8-16 SAE | 1.265 | 2 3/4 | 2 5/8 | 2 | 4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 2 1/2 | 108 |
| PTR-5036 | 9536 | 5 | 36 | 2 | 48 1/4 | 1/4 | 7/8-16 SAE | 1.265 | 2 3/4 | 2 5/8 | 2 | 4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 2 1/2 | 118 |
| PTR-5048 | 9548 | 5 | 48 | 2 | 60 1/4 | 1/4 | 7/8-16 SAE | 1.265 | 2 3/4 | 2 5/8 | 2 | 4 | 1.06 | 1 1/4 | 1 1/2-12 | 1 | 2 1/2 | 161 |

WELDED CYLINDERS



THE SWORD LINE 3000 PSI DOUBLE ACTING CYLINDERS



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
- Carboxylated nitrile u-cup & urethane wiper in gland, crown seal on piston
- Square ring gland retainer provides positive lock
- Pins & clips included
- Standard color is white
- Stroke control may be installed on 8" strokes

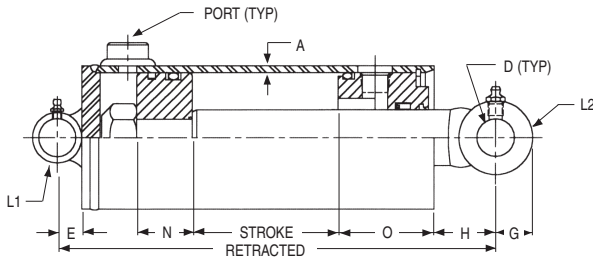
CYLINDERS

| PCW | MFGR. NO. | BORE | STROKE | ROD DIA. | RE-TRACT. DIMEN. | A | B/C PORT SIZE | D | E | G | H | J | K | M | SHIP WT. |
|-----------|-----------|-------|--------|----------|------------------|------|---------------|-------|-------|---------|---------|--------|-------|----------|----------|
| PCW-2008 | 42008 | 2 | 8 | 1 1/8 | 20 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 5 9/16 | 1 1/16 | 1 | 1 1/8 12 | 10 |
| PCW-2010 | 42010 | 2 | 10 | 1 1/8 | 20 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 9/16 | 1 1/16 | 1 | 1 1/8 12 | 20 |
| PCW-2012 | 42012 | 2 | 12 | 1 1/8 | 22 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 9/16 | 1 1/16 | 1 | 1 1/8 12 | 22 |
| PCW-2016A | 42016 | 2 | 16 | 1 1/8 | 31 1/2 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 8 13/16 | 1 1/16 | 1 | 1 1/8 12 | 25 |
| PCW-2020 | 42020 | 2 | 20 | 1 1/8 | 30 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 9/16 | 1 1/16 | 1 | 1 1/8 12 | 28 |
| PCW-2024 | 42024 | 2 | 24 | 1 1/8 | 34 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 9/16 | 1 1/16 | 1 | 1 1/8 12 | 31 |
| PCW-2508 | 42508 | 2 1/2 | 8 | 1 1/4 | 20 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 5 9/16 | 1 1/16 | 1 | 1 1/8 12 | 21 |
| PCW-2510 | 42510 | 2 1/2 | 10 | 1 1/4 | 20 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 9/16 | 1 1/16 | 1 | 1 1/8 12 | 22 |
| PCW-2512 | 42512 | 2 1/2 | 12 | 1 1/4 | 22 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 9/16 | 1 1/16 | 1 | 1 1/8 12 | 23 |
| PCW-2516 | 42516 | 2 1/2 | 16 | 1 1/4 | 31 1/2 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 8 13/16 | 1 1/16 | 1 | 1 1/8 12 | 27 |
| PCW-2520 | 42520 | 2 1/2 | 20 | 1 1/4 | 30 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 9/16 | 1 1/16 | 1 | 1 1/8 12 | 31 |
| PCW-2524 | 42524 | 2 1/2 | 24 | 1 1/4 | 34 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 9/16 | 1 1/16 | 1 | 1 1/8 12 | 35 |
| PCW-3008 | 43008 | 3 | 8 | 1 3/8 | 20 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 5 9/16 | 1 1/16 | 1 1/8 | 1 1/8 12 | 23 |
| PCW-3010 | 43010 | 3 | 10 | 1 3/8 | 20 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 9/16 | 1 1/16 | 1 1/8 | 1 1/8 12 | 26 |
| PCW-3012 | 43012 | 3 | 12 | 1 3/8 | 22 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 9/16 | 1 1/16 | 1 1/8 | 1 1/8 12 | 28 |
| PCW-3016A | 43016 | 3 | 16 | 1 3/8 | 31 1/2 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 8 13/16 | 1 1/16 | 1 1/8 | 1 1/8 12 | 33 |
| PCW-3020 | 43020 | 3 | 20 | 1 3/8 | 30 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 9/16 | 1 1/16 | 1 1/8 | 1 1/8 12 | 39 |
| PCW-3024 | 43024 | 3 | 24 | 1 3/8 | 34 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 9/16 | 1 1/16 | 1 1/8 | 1 1/8 12 | 43 |
| PCW-3508 | 43508 | 3 1/2 | 8 | 1 1/2 | 20 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 5 3/8 | 1 1/16 | 1 1/4 | 1 1/2 12 | 29 |
| PCW-3510 | 43510 | 3 1/2 | 10 | 1 1/2 | 20 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 3/8 | 1 1/16 | 1 1/4 | 1 1/2 12 | 31 |
| PCW-3512 | 43512 | 3 1/2 | 12 | 1 1/2 | 22 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 3/8 | 1 1/16 | 1 1/4 | 1 1/2 12 | 33 |
| PCW-3516A | 43516 | 3 1/2 | 16 | 1 1/2 | 31 1/2 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 8 3/8 | 1 1/16 | 1 1/4 | 1 1/2 12 | 38 |
| PCW-3520 | 43520 | 3 1/2 | 20 | 1 1/2 | 30 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 3/8 | 1 1/16 | 1 1/4 | 1 1/2 12 | 43 |
| PCW-3524 | 43524 | 3 1/2 | 24 | 1 1/2 | 34 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 3/8 | 1 1/16 | 1 1/4 | 1 1/2 12 | 48 |
| PCW-4008 | 44008 | 4 | 8 | 1 3/4 | 20 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 5 3/8 | 1 1/8 | 1 1/4 | 1 1/2 12 | 40 |
| PCW-4010 | 44010 | 4 | 10 | 1 3/4 | 20 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 3/8 | 1 1/8 | 1 1/4 | 1 1/2 12 | 43 |
| PCW-4012 | 44012 | 4 | 12 | 1 3/4 | 22 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 3/8 | 1 1/8 | 1 1/4 | 1 1/2 12 | 45 |
| PCW-4016A | 44016 | 4 | 16 | 1 3/4 | 31 1/2 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 8 3/8 | 1 1/8 | 1 1/4 | 1 1/2 12 | 54 |
| PCW-4020 | 44020 | 4 | 20 | 1 3/4 | 30 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 3/8 | 1 1/8 | 1 1/4 | 1 1/2 12 | 58 |
| PCW-4024 | 44024 | 4 | 24 | 1 3/4 | 34 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 3/8 | 1 1/8 | 1 1/4 | 1 1/2 12 | 60 |
| PCW-4030 | 44030 | 4 | 30 | 1 3/4 | 40 1/4 | 3/16 | 1/2 NPTF | 1.015 | 1 3/4 | 1 13/16 | 3 3/8 | 1 1/8 | 1 1/4 | 1 1/2 12 | 65 |

WELDED CYLINDERS



THE ROYAL LINE 2500 PSI DOUBLE ACTING CYLINDERS



FEATURES:

- Honed tubing
- Heavy duty welded construction
- Chromed, ground & polished piston rod
- Cast iron piston & gland
- Pin eye mounting on both ends
- Quad ring/backup washer & urethane wiper in gland
- O-ring/backup washers & cast iron ring for piston seals
- Truarc type gland retainer
- Standard color is red

CYLINDERS

| PMW | MFGR. NO. | BORE | STROKE | ROD DIA. | RE-TRACT. DIMEN. | PORT SIZE | A | D | E | G | H | L1 | L2 | N | O | SHIP WT. |
|----------|-----------|-------|--------|----------|------------------|-----------|------|-------|-------|-------|---------|-------|-------|--------|-------|----------|
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |

WELDED CYLINDERS



THE ROYAL LINE 2500 PSI DOUBLE ACTING CYLINDERS

| PMW | MFGR. NO. | BORE | STROKE | ROD DIA. | RE-TRACT. DIMEN. | PORT SIZE | A | D | E | G | H | L1 | L2 | N | O | SHIP WT. |
|----------|-----------|------|--------|----------|------------------|-----------|------|-------|-------|-------|---|-------|----|--------|-------|----------|
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |
| PMW-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 |

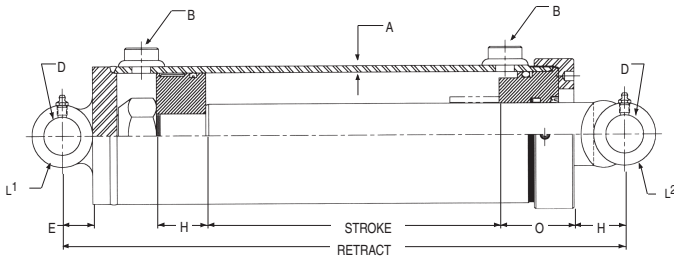
CYLINDERS

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
- 3/4 NPTF full-flow ports
- Standard color is highway yellow
- High grade gray iron piston & 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

CYLINDERS

| PMW2 | MFGR. NO. | BORE | STROKE | ROD DIA. | RE-TRACT. DIMEN. | A | B PORT SIZE | D | E | H | L1 | O | L2 | SHIP WT. |
|----------|-----------|------|--------|----------|------------------|-----|-------------|-------|-------|-------|-------|---------|----|----------|
| PMW-5008 | 21008 | 5 | 8 | 2 1/2 | 19 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 1 7/8 | 5 3/4 | 2 15/16 | 4 | 75 |
| PMW-5012 | 21012 | 5 | 12 | 2 1/2 | 23 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 1 7/8 | 5 3/4 | 2 15/16 | 4 | 85 |
| PMW-5016 | 21016 | 5 | 16 | 2 1/2 | 27 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 1 7/8 | 5 3/4 | 2 15/16 | 4 | 90 |
| PMW-5020 | 21020 | 5 | 20 | 2 1/2 | 31 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 1 7/8 | 5 3/4 | 2 15/16 | 4 | 105 |
| PMW-5024 | 21024 | 5 | 24 | 2 1/2 | 35 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 1 7/8 | 5 3/4 | 2 15/16 | 4 | 115 |
| PMW-5030 | 21030 | 5 | 30 | 2 1/2 | 41 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 1 7/8 | 5 3/4 | 2 15/16 | 4 | 130 |
| PMW-5036 | 21036 | 5 | 36 | 2 1/2 | 47 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 1 7/8 | 5 3/4 | 2 15/16 | 4 | 145 |
| PMW-5048 | 21048 | 5 | 48 | 2 1/2 | 61 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 1 7/8 | 5 3/4 | 2 15/16 | 4 | 180 |
| PMW-5054 | 21054 | 5 | 54 | 2 1/2 | 68 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 1 7/8 | 5 3/4 | 2 15/16 | 4 | 195 |
| PMW-5060 | 21060 | 5 | 60 | 2 1/2 | 75 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 1 7/8 | 5 3/4 | 2 15/16 | 4 | 215 |
| PMW-6008 | 22008 | 6 | 8 | 3 | 19 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 2 | 6 3/4 | 3 1/8 | 4 | 100 |
| PMW-6012 | 22012 | 6 | 12 | 3 | 23 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 2 | 6 3/4 | 3 1/8 | 4 | 110 |
| PMW-6016 | 22016 | 6 | 16 | 3 | 27 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 2 | 6 3/4 | 3 1/8 | 4 | 125 |
| PMW-6024 | 22024 | 6 | 24 | 3 | 35 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 2 | 6 3/4 | 3 1/8 | 4 | 150 |
| PMW-6030 | 22030 | 6 | 30 | 3 | 41 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 2 | 6 3/4 | 3 1/8 | 4 | 170 |
| PMW-6036 | 22036 | 6 | 36 | 3 | 47 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 2 | 6 3/4 | 3 1/8 | 4 | 190 |
| PMW-6048 | 22048 | 6 | 48 | 3 | 61 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 2 | 6 3/4 | 3 1/8 | 4 | 240 |
| PMW-6054 | 22054 | 6 | 54 | 3 | 68 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 2 | 6 3/4 | 3 1/8 | 4 | 265 |
| PMW-6060 | 22060 | 6 | 60 | 3 | 75 | 1/4 | 3/4 NPTF | 1.515 | 1 1/4 | 2 | 6 3/4 | 3 1/8 | 4 | 290 |

SINGLE ACTING TELESCOPIC CYLINDERS



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



Features

- Plunger diameters: 2" thru 9-3/4"
- Strokes up to 400"
- One thru six moving stages available
- Maximum pressure to 2,500 PSI
- High-quality V-packing to seal high and low pressures
- Externally threaded head nuts for extra strength, easy seal adjustment
- Special plunger stops assure full shoulder stop
- Easy-access bleeder screw, manual or automatic
- High quality glass-filled nylon or optional bronze bearing rings
- Dual lip wiper to prevent contamination
- Wide range of cylinder mountings, including trunions
- Maximum overlap for stability
- Chromed plungers available

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

85 - 2 - 250



CYLINDERS

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.

MANUFACTURERS SERVICE MANUALS ARE AVAILABLE. CALL FOR DETAILS.

DOUBLE ACTING CYLINDERS:

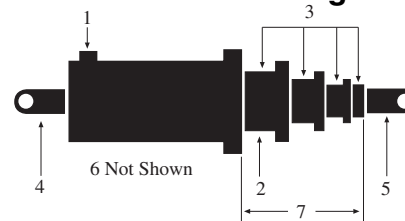
- Operating pressure up to 2000 psi.
- Main cylinder outside diameter from 3-3/4" to 10-13/16".
- Lifting capacity to 153,180 lbs.
- Chrome-plated sleeves are available on special order.
- Pin-eye and trunion mountings are standard. If other types are required, dimensions must be specified.

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
2. 8 = 7-7/8" nominal diameter of largest sleeve
3. 4 = 4 stages or sleeves
4. D = Type of mounting on base end
5. C = Type of mounting on rod end
6. -40 = Modification or design variation
7. 161 = Length of stroke (161")

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, Hycot 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
 $.597 \times 200 = 29.8$ 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.

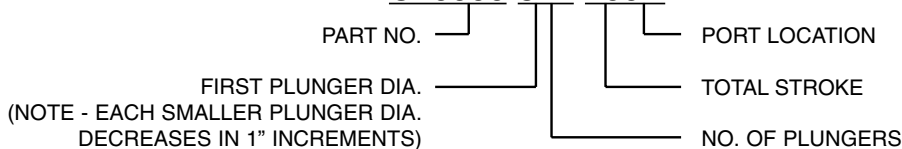
GUIDE RINGS & RETAINING RINGS
 Hycotel® features replaceable plunger guide rings, designed and balanced to be well lubricated and made of specially compounded material for long wearing performance. The retainer rings work in conjunction with the piston design to be positively locked into stop position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

"DUAL-LIP" WIPER
 This dual lip design wiper of Hytrel is a more efficient "dirt wiper." The dual lip provides an improved means of keeping dirt out.

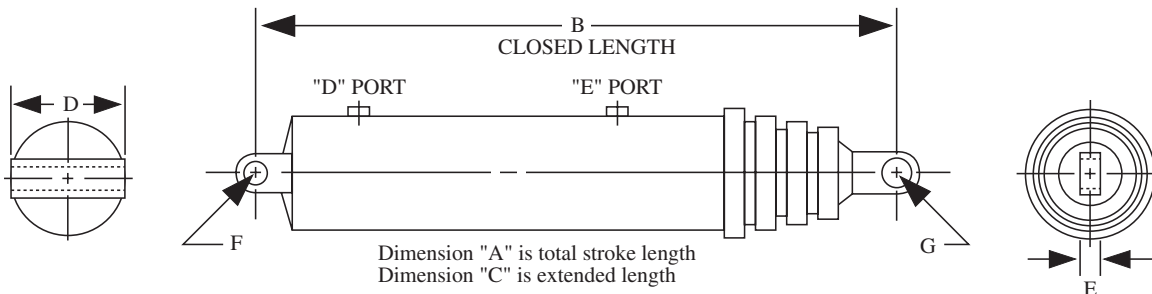
CYLINDERS

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

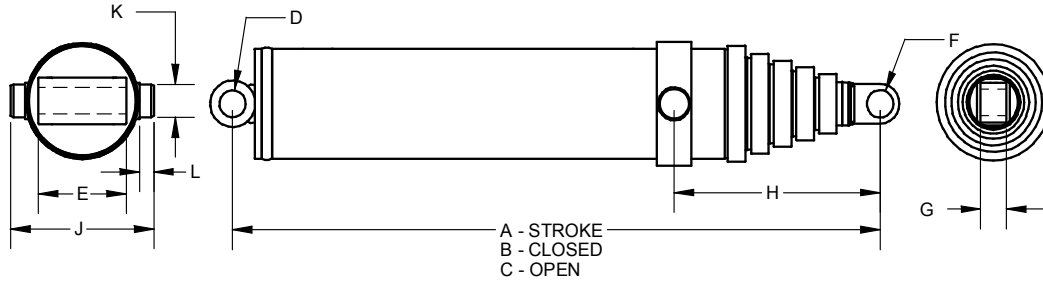
SOUTHERN HYDRAULIC CYLINDER, INC.

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

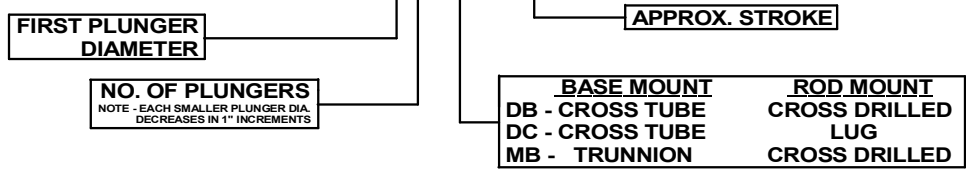
STANDARD SINGLE ACTING TELESCOPIC CYLINDER SPECIFICATIONS

| 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) |
|--------------|------------|------------|----------|-----------|------------|---|---|------|------|------|------|------|------|------|------|---------------|---------------|---------------|
| SHC-M32DB-43 | 40.38 | 29.69 | 70.07 | 4.00 | 3 | 2 | - | 1.50 | 4.00 | 1.25 | 1.88 | - | - | - | - | .58 | 1.46 | 60 |
| SHC-M32DB-50 | 46.67 | 32.84 | 79.51 | 4.00 | 3 | 2 | - | 1.50 | 4.00 | 1.25 | 1.88 | - | - | - | - | .66 | 1.68 | 66 |
| SHC-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 |
| SHC-M42DB-50 | 47.25 | 33.69 | 80.94 | 5.00 | 4 | 3 | - | 1.50 | 5.00 | 1.50 | 2.75 | - | - | - | - | 1.23 | 3.23 | 95 |
| SHC-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 | |
| SHC-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 |
| SHC-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 | |
| SHC-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 |
| SHC-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 |
| SHC-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 |
| SHC-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 |
| SHC-M43MB-98 | 96.42 | 42.19 | 138.61 | 5.00 | 4 | 3 | 2 | - | - | 1.25 | 2.00 | 8.69 | 8.81 | 1.75 | .88 | 1.37 | 4.50 | 128 |
| SHC-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 |
| SHC-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 |
| SHC-M53DB-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 |
| SHC-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 |
| SHC-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 |
| SHC-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 (SHC-M53DC-72, SHC-M53DC-84, & SHC-M53DC-84A USE 3/4"-14 NPT)
 OTHER SIZES AND OPTIONS ARE AVAILABLE.



CYLINDER IDENTIFICATION SHC - M 53 DB - 75



SINGLE ACTING EXTEND LOAD CAPACITY

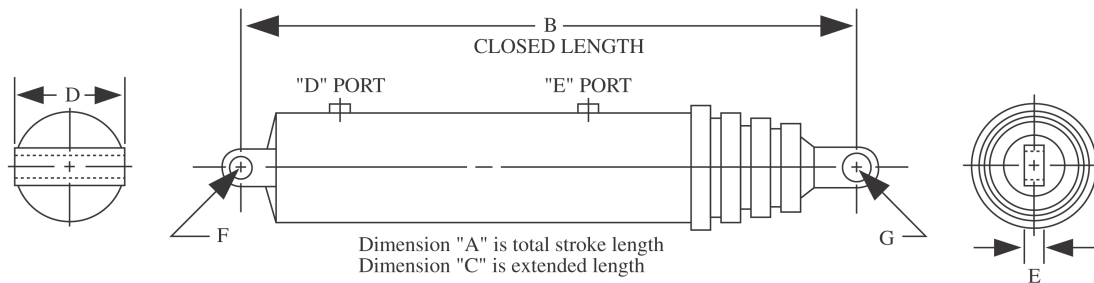
LOAD CAPACITY : LBS @ PSI

*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. See page 17-20 for specifications.

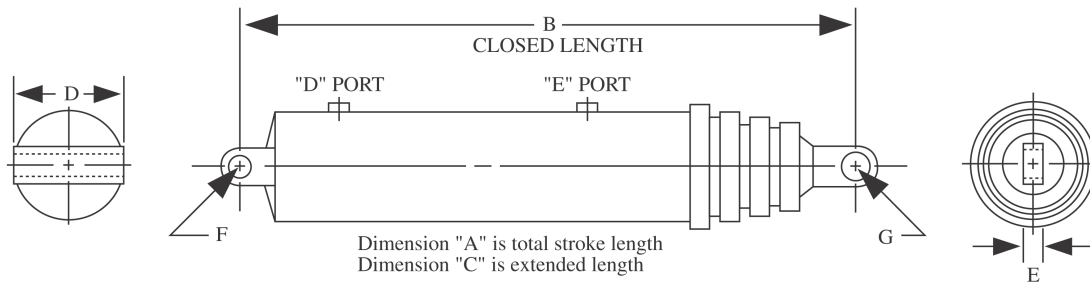


Stroke lengths for Hyco 70,000 series cylinders may be slightly different than those shown in chart. Please call our component group for exact 70,000 series stroke lengths.

| CYLINDER NO. | A | B | C | D | E | F | G |
|--------------|--------|--------|---------|----------------|------|------|------|
| 5372-SA | 72.00 | 37.12 | 109.12 | 8.13 | 1.50 | 2.00 | 1.68 |
| 5384-SA | 84.00 | 41.12 | 125.12 | 8.12 | 1.50 | 2.06 | 1.56 |
| 53104-SA | 104.00 | 47.75 | 151.75 | 8.13 | 1.50 | 2.00 | 1.68 |
| 6384-SA | 84.00 | 41.00 | 125.00 | 7.62 | 2.00 | 2.12 | 2.06 |
| 63104-SA | 103.87 | 47.62 | 151.50 | 7.62 | 2.00 | 2.12 | 2.06 |
| 63108-SA | 108.00 | 49.00 | 157.00 | 7.625 | 2.00 | 2.12 | 2.06 |
| 63111-SA | 111.00 | 50.00 | 161.00 | 7.00 | 2.00 | 2.00 | 2.00 |
| 63120-SA | 120.00 | 53.00 | 173.00 | 7.625 | 2.00 | 2.12 | 2.06 |
| 63120-TSA | 120.00 | 53.375 | 173.375 | TRIUNION MOUNT | 4.00 | N/A | 1.56 |
| 63126-SA | 126.00 | 55.00 | 181.00 | 7.62 | 2.00 | 2.12 | 2.06 |
| D63128-SA | 126.50 | 54.63 | 181.13 | 6.75 | 2.00 | 2.00 | 1.63 |
| 63140-TSA | 139.87 | 60.00 | 199.97 | TRIUNION MOUNT | 4.00 | N/A | 1.56 |
| 64135-SA | 134.88 | 47.13 | 182.00 | 8.00 | 2.69 | 1.75 | 1.50 |
| 64156-SA | 155.87 | 52.37 | 208.12 | 8.00 | 2.68 | 1.87 | 1.56 |
| 73110-SA | 110.63 | 50.06 | 160.69 | 8.25 | 2.00 | 2.00 | 2.00 |
| 73120-SA | 120.00 | 53.12 | 173.12 | 8.625 | 1.50 | 2.12 | 2.06 |
| D73126 | 125.25 | 55.12 | 180.37 | 6.75 | 2.00 | 2.00 | 1.63 |
| 73130-SA | 130.12 | 56.50 | 186.62 | 8.625 | 1.50 | 2.12 | 2.06 |
| 73140-SA | 140.00 | 60.00 | 200.00 | 8.25 | 2.00 | 2.00 | 2.00 |
| D73142-SA | 142.13 | 60.75 | 202.88 | 6.75 | 2.00 | 2.00 | 1.63 |
| 74120-SA | 120.00 | 44.75 | 164.75 | 8.625 | 2.00 | 2.12 | 2.06 |
| 74135-SA | 135.00 | 48.25 | 183.25 | 8.625 | 2.00 | 2.12 | 2.06 |
| 74140-SA | 140.25 | 49.25 | 189.75 | 8.625 | 2.00 | 2.12 | 2.06 |
| 74156-SA | 156.00 | 53.37 | 209.37 | 8.625 | 2.00 | 2.12 | 2.06 |
| 74161-SA | 161.00 | 54.62 | 215.62 | 8.62 | 2.00 | 2.12 | 2.06 |
| 74167-SA | 167.25 | 56.25 | 223.50 | 8.62 | 2.00 | 2.12 | 2.06 |
| 84148-SA | 147.75 | 51.50 | 199.25 | 9.50 | 2.00 | 2.12 | 2.06 |
| 84156-SA | 155.75 | 53.50 | 209.25 | 9.50 | 2.00 | 2.12 | 2.06 |
| 84170-SA | 169.75 | 57.00 | 226.75 | 9.50 | 2.00 | 2.12 | 2.06 |
| 84180-SA | 179.75 | 59.50 | 239.25 | 9.50 | 2.00 | 2.12 | 2.06 |
| 85170-SA | 170.00 | 49.87 | 219.87 | 9.50 | 2.00 | 2.12 | 2.06 |
| 85190-SA | 190.00 | 54.00 | 244.00 | 9.50 | 2.00 | 2.12 | 2.06 |
| 85197-SA | 196.13 | 55.25 | 251.38 | 9.50 | 2.00 | 2.00 | 2.00 |
| 85220-SA | 220.00 | 60.00 | 280.00 | 9.50 | 2.00 | 2.12 | 2.06 |
| 85220-TSA | 218.25 | 60.38 | 278.63 | TR | 2.00 | TR | 2.00 |
| 85235-SA | 235.00 | 65.00 | 300.00 | 9.50 | 2.00 | 2.12 | 2.06 |
| 85235-TSA | 233.25 | 63.38 | 296.33 | TR | 2.00 | TR | 2.00 |
| 85250-SA | 250.00 | 68.00 | 318.00 | 9.50 | 2.00 | 2.12 | 2.06 |
| 85250-TSA | 248.25 | 68.38 | 316.63 | TR | 2.00 | TR | 2.00 |
| 85265-SA | 265.00 | 71.00 | 336.00 | 9.50 | 2.00 | 2.12 | 2.06 |
| 85265-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. See page 17-20 for specifications.

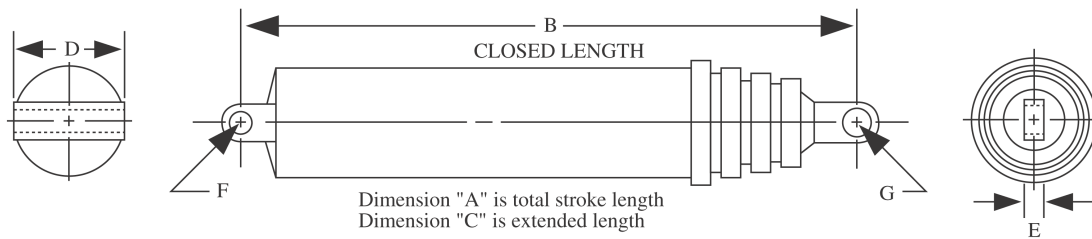


Stroke lengths for Hyco 70,000 series cylinders may be slightly different than those shown in chart. Please call our component group for exact 70,000 series stroke lengths.

| CYLINDER NO. | A | B | C | D | E | F | G |
|--------------|--------|-------|--------|-------|------|------|------|
| 825190-SA | 190.00 | 54.00 | 244.00 | 10.25 | 2.00 | 2.12 | 2.06 |
| 825220-SA | 220.00 | 60.00 | 280.00 | 10.25 | 2.00 | 2.12 | 2.06 |
| 825235-SA | 235.00 | 65.00 | 300.00 | 10.25 | 2.00 | 2.12 | 2.06 |
| 825250-SA | 250.00 | 68.00 | 318.00 | 10.25 | 2.00 | 2.12 | 2.06 |
| 825265-SA | 264.62 | 74.50 | 339.12 | 10.25 | 2.00 | 2.12 | 2.06 |
| 825280-SA | 279.62 | 77.62 | 357.25 | 10.25 | 2.00 | 2.12 | 2.06 |
| 95220-SA | 219.75 | 60.12 | 279.87 | 10.75 | 2.00 | 2.12 | 2.06 |
| 95235-SA | 234.75 | 65.00 | 299.75 | 10.75 | 2.00 | 2.12 | 2.06 |
| 95250-SA | 249.75 | 72.62 | 322.37 | 10.75 | 2.00 | 2.12 | 2.06 |
| 95265-SA | 264.75 | 75.62 | 340.37 | 10.75 | 2.00 | 2.12 | 2.06 |
| 975220-SA | 219.75 | 60.00 | 280.00 | 12.00 | 2.00 | 2.12 | 2.06 |
| 975235-SA | 234.75 | 65.25 | 300.00 | 12.00 | 2.00 | 2.12 | 2.06 |
| 975250-SA | 249.75 | 72.62 | 322.37 | 12.00 | 2.00 | 2.12 | 2.06 |
| HPT53100 | 99.12 | 46.25 | 145.37 | 7.75 | 1.50 | 2.06 | 1.78 |
| HPT53110 | 105.12 | 47.87 | 153.00 | 7.75 | 1.50 | 2.06 | 1.78 |
| HPT53120 | 122.37 | 54.00 | 176.37 | 7.75 | 1.50 | 2.06 | 1.78 |
| HPT53130 | 127.62 | 54.50 | 182.12 | 7.75 | 1.50 | 2.06 | 1.78 |
| HPT63120 | 120.75 | 54.00 | 174.75 | 8.00 | 2.00 | 2.50 | 2.25 |
| HPT63130 | 125.25 | 55.50 | 180.75 | 8.00 | 2.00 | 2.50 | 2.25 |
| HPT63140 | 138.75 | 60.00 | 198.75 | 8.00 | 2.00 | 2.50 | 2.25 |
| HPT63160 | 160.12 | 69.12 | 229.25 | 8.00 | 2.00 | 2.50 | 2.25 |
| 475 | 43.12 | 31.68 | 74.81 | 1.50 | 2.50 | 3.37 | 1.81 |
| 495 | 64.75 | 31.75 | 96.50 | 1.50 | 2.50 | 3.37 | 1.81 |
| 498 | 89.50 | 41.87 | 131.37 | 1.50 | 2.50 | 3.37 | 1.81 |
| SHC-M32DB-43 | 40.13 | 29.69 | 69.82 | 4.00 | 2.00 | 1.50 | 1.25 |
| SHC-M32DB-50 | 47.94 | 33.47 | 81.41 | 4.00 | 2.00 | 1.50 | 1.25 |
| SHC-M42DB-43 | 39.50 | 30.19 | 69.90 | 5.00 | 3.00 | 1.50 | 1.50 |
| SHC-M42DB-50 | 51.25 | 36.13 | 87.38 | 5.00 | 3.00 | 1.50 | 1.50 |
| SHC-M42MB-50 | 51.25 | 35.07 | 86.32 | TR | 3.00 | TR | 1.50 |
| SHC-M42DB-60 | 60.00 | 40.63 | 100.63 | 5.00 | 3.00 | 1.50 | 1.50 |
| SHC-M42MB-65 | 65.00 | 42.07 | 107.07 | TR | 3.00 | TR | 1.50 |
| SHC-M43DB-75 | 68.62 | 33.69 | 102.31 | 5.00 | 2.00 | 1.50 | 1.25 |
| SHC-M43MB-75 | 68.25 | 32.50 | 100.75 | TR | 2.00 | TR | 1.25 |
| SHC-M53DB-60 | 57.75 | 30.00 | 87.75 | 6.00 | 3.00 | 1.50 | 1.50 |
| SHC-M53DB-74 | 74.00 | 35.44 | 109.44 | 6.00 | 3.00 | 1.50 | 1.50 |
| SHC-M53MB-74 | 74.00 | 34.38 | 108.38 | TR | 3.00 | TR | 1.50 |
| SHC-M53MB-90 | 86.06 | 38.63 | 124.69 | TR | 3.00 | TR | 1.50 |

DOUBLE ACTING TELESCOPIC CYLINDERS

These cylinders are available from Custom Hoists, Commercial, and Hyco. Request the manufacturer you want. See page 18, 23 & 24 for specifications.



| CYLINDER NO. | A | B | C | D | E | F | G |
|--------------|---------|--------|---------|----------------|------|----------------|------|
| 52112-DA | 111.75 | 75.50 | 187.25 | 2.00 | 2.00 | 2.01 | 2.01 |
| 53110-DA | 109.62 | 56.75 | 166.37 | 2.00 | 2.00 | 3.03 | 1.56 |
| 53155-DA | 155.75 | 75.50 | 231.25 | 2.00 | 2.00 | 2.00 | 1.50 |
| 53182-DA | 182.00 | 81.00 | 263.00 | 3.87 | 6.50 | 2.00 | 2.00 |
| 6282-DA | 82.00 | 56.50 | 138.50 | 2.25 | 2.25 | 3.03 | 3.03 |
| 6397-DA | 97.12 | 52.37 | 149.50 | 1.50 | 1.50 | 1.28 | 1.28 |
| 63108-DA | 107.62 | 50.75 | 158.37 | 7.12 | 3.87 | 1.78 | 1.78 |
| 63118-DA | 118.00 | 58.50 | 176.50 | 3.00 | 4.00 | 2.50 | 2.50 |
| 63124-DA | 124.50 | 76.87 | 201.48 | 2.00 | 2.00 | 2.031 | 2.06 |
| 63132-DA | 131.62 | 62.37 | 194.00 | 7.12 | 3.87 | 1.78 | 1.78 |
| 63167-DA | 167.00 | 85.25 | 252.25 | 4.00 | 3.69 | 2.00 | 2.00 |
| 64118-DA | 118.13 | 49.38 | 167.50 | 2.25 | 2.25 | 1.50 | 1.50 |
| 64136-DA | 135.62 | 49.37 | 185.00 | 2.00 | 2.25 | 1.56 | 1.56 |
| 64150-DA | 150.00 | 56.56 | 206.56 | 2.25 | 2.25 | 1.50 | 1.50 |
| 72156-DA | 156.12 | 96.00 | 252.12 | N/A | 2.00 | N/A | 2.06 |
| 74131-DA | 131.50 | 53.37 | 184.87 | 1.50 | 1.50 | 1.28 | 1.28 |
| 74171-DA | 171.12 | 62.37 | 233.50 | 7.00 | 4.00 | 1.78 | 1.78 |
| 83126-DA | 126.00 | 72.00 | 198.00 | 3.00 | 3.00 | 2.51 | 2.51 |
| 84176-TD2 | 176.25 | 69.00 | 245.25 | TRIUNION MOUNT | 2.00 | TRIUNION MOUNT | 1.75 |
| 84176-TD3 | 176.25 | 69.00 | 245.25 | TRIUNION MOUNT | 2.00 | N/A | 1.76 |
| 84178-DA | 178.25 | 69.00 | 247.25 | 2.00 | 2.00 | 1.78 | 1.78 |
| 85125-DA | 125.00 | 49.75 | 174.75 | 2.50 | 2.50 | 2.00 | 2.00 |
| 85156-DA | 155.625 | 55.50 | 211.125 | 2.00 | 2.00 | 2.00 | 2.00 |
| 85195-DA | 195.00 | 69.37 | 264.87 | 2.00 | 2.00 | 2.03 | 2.03 |
| 85220-TD2 | 220.00 | 69.25 | 289.25 | TRIUNION MOUNT | 2.00 | N/A | 1.76 |
| 85220-TD3 | 220.25 | 69.25 | 289.50 | TRIUNION MOUNT | 2.00 | N/A | 1.76 |
| 85300-DA | 300.25 | 87.37 | 387.62 | 1.75 | 2.00 | 2.00 | 2.18 |
| 85348-DA | 347.87 | 100.00 | 447.87 | 2.00 | 2.00 | 2.06 | 2.18 |
| 85378-DA | 378.00 | 104.75 | 482.75 | 2.00 | 2.00 | 2.12 | 2.06 |
| 86177-DA | 176.75 | 53.37 | 230.12 | 1.50 | 1.50 | 1.28 | 1.28 |
| 915125-DA | 125.00 | 49.75 | 174.75 | 2.50 | 2.50 | 2.00 | 2.00 |
| 95160-DA | 159.75 | 61.00 | 220.75 | 2.00 | 2.00 | 2.02 | 2.02 |
| 96170-DA | 169.75 | 50.625 | 220.37 | 2.50 | 2.50 | 2.00 | 2.00 |
| 96199-DA | 199.12 | 57.87 | 257.00 | 2.00 | 2.00 | 2.03 | 2.03 |
| 96412-DA | 412.25 | 99.62 | 511.87 | TRIUNION MOUNT | 2.00 | TRIUNION MOUNT | 2.06 |
| 96456-DA | 456.50 | 107.00 | 563.50 | TRIUNION MOUNT | 2.00 | TRIUNION MOUNT | 2.06 |
| 974176-DA | 176.12 | 69.12 | 245.25 | 3.00 | 3.00 | 2.52 | 2.52 |
| 974190-DA | 189.62 | 71.00 | 260.62 | 2.25 | 2.00 | 2.25 | 2.02 |
| 976199-DA | 199.12 | 57.87 | 257.00 | 2.00 | 2.00 | 2.03 | 2.03 |

DOUBLE ACTING TELESCOPIC CYLINDERS

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: HPU12VCHEFVDO2-RC 1 - 9 Pcs: \$386.10 Net Each 10+ Pcs: \$343.20 Net Each 12 VDC 2.5 GPM Pump 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 1 - 9 Pcs: \$386.10 Net Each 10+ Pcs: \$343.20 Net Each 12 VDC 1.6 GPM Pump 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 (Page 9) or equivalent size cylinder



| | |
|---|--|
| Part Number: HPU12VCHCFWD02-RC 1 - 9 Pcs: \$386.10 Net Each 10+ Pcs: \$343.20 Net Each 12 VDC 1.6 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: HPU12VCHEFWD02-RC 1 - 9 Pcs: \$383.09 Net Each 10+ Pcs: \$340.52 Net Each 12 VDC 2.5 GPM Pump 5 Gallon Steel Tank Two Button Control 3 Meter Cable Power Up, Gravity Down Adjustable relief valve pre set at 2900 psi |
|---|--|

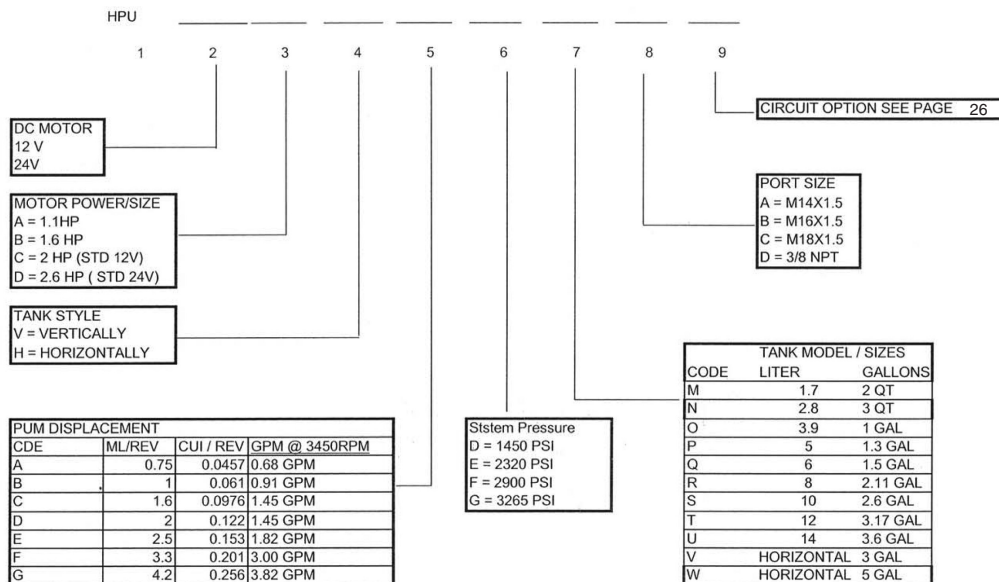
Reservoir size accommodates HTC 12-Ton Cylinders (Page 9) or equivalent size cylinder

| | |
|--|---|
| Part Number: HPU12VCHCFSD02-RC 1 - 9 Pcs: \$328.82 Net Each 10+ Pcs: \$292.28 Net Each 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 1.45 gpm @ 3450 rpm Adjustable relief valve pre set at 2900 psi | Part Number: HPU12VCHCFSD12-RC 1 - 9 Pcs: \$400.33 Net Each 10+ Pcs: \$355.85 Net Each 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 1.45 gpm @3450 rpm Adjustable relief valve pre set at 2900 psi |
|--|---|

| | |
|--|---|
| Part Number: MTE-D202T-4850-16-25 1 - 9 Pcs: \$341.64 Each 10+ Pcs: \$303.68 Each Specifications are relief valve set at 2000 psi. 1.6 gpm @ 1500 psi 1.8 gallon reservoir Runs on 12 volt DC power Includes 15 ft corded remote control cable Excellent use for truck tailgate, boat lifts, and tow behind dump trailers | Part Number: MTE-D202T-4851-16-25 1 - 9 Pcs: \$410.87 Each 10+ Pcs: \$365.22 Each Specifications are relief valve set at 2000 psi. 1.6 gpm @ 1500 psi 1.8 gallon reservoir Runs on 12 volt DC power Includes 15 ft corded remote control cable Solenoid operation allow for lift, hold, and reverse double acting circuit Motor is reversible, eliminating the use of a troublesome cartridge valve |
|--|---|

POWER UNITS

HOW TO CREATE A POWER UNIT PART

















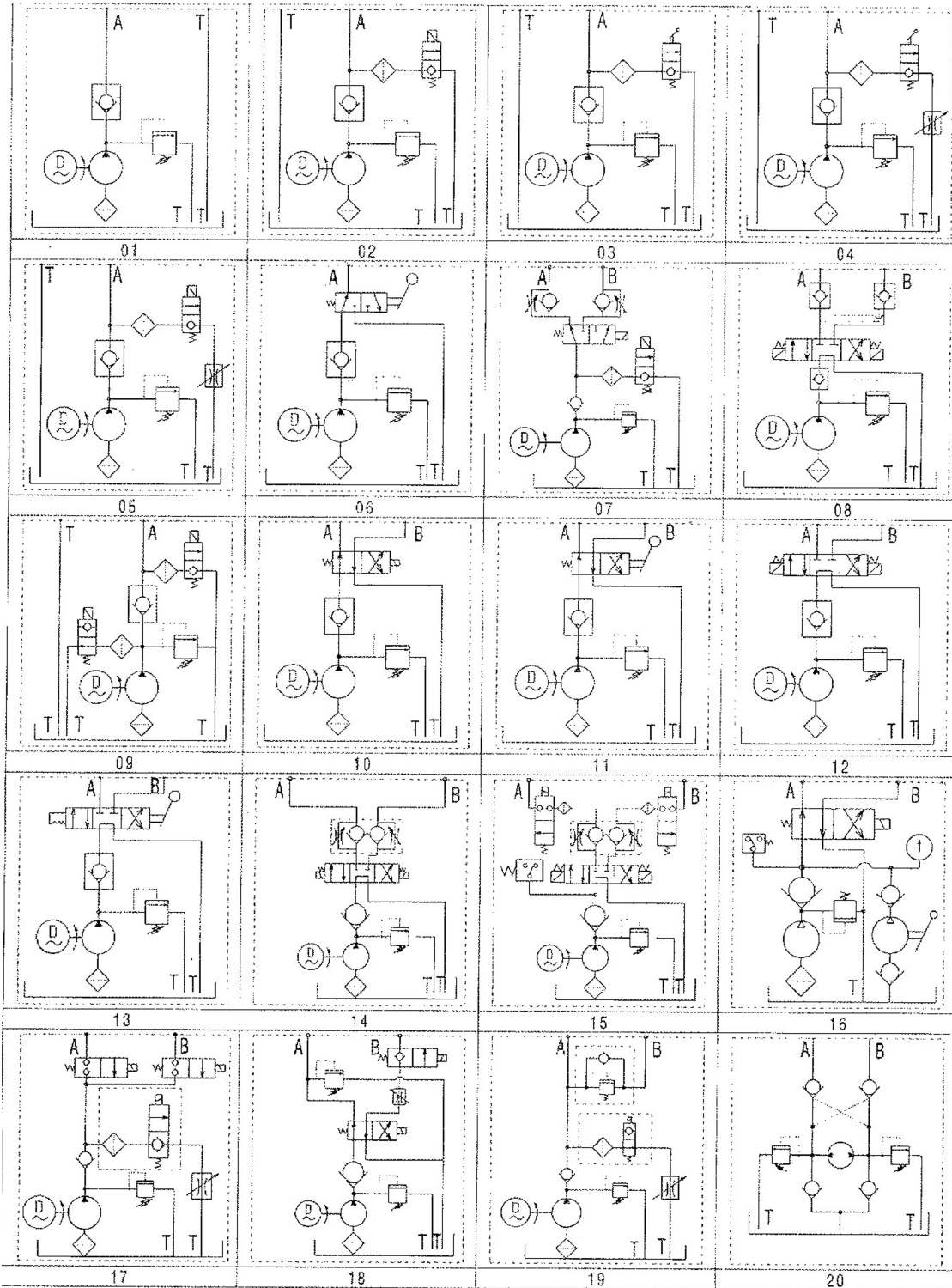
POWER UNITS

Drawing of Circuits - Power Unit Hydraulic Schematic Diagram

POWER UNITS

Key

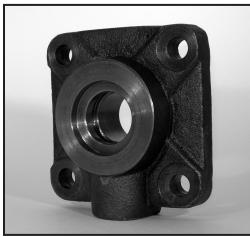
-  Two Position Manual Valve Spring Centered
-  Check Valve
-  Flow Control Adjustable
-  Two Position Solenoid Valve
-  Pilot Operated Check Valve
-  4 Way 3 Position Solenoid Spring Centered Valve
-  Relief Valve
-  Hydraulic Pump
-  Filter
-  12 VDC Electric Motor
-  Two Position 3 Way Spring Centered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



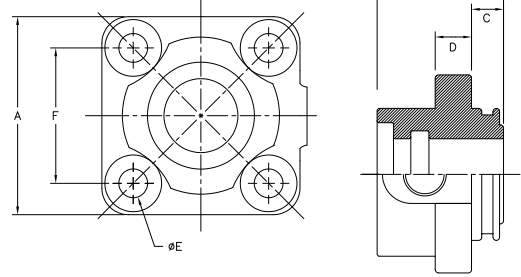
CYLINDER GLANDS AND CAPS

Component Parts

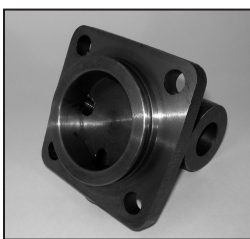
THE HTR LINE



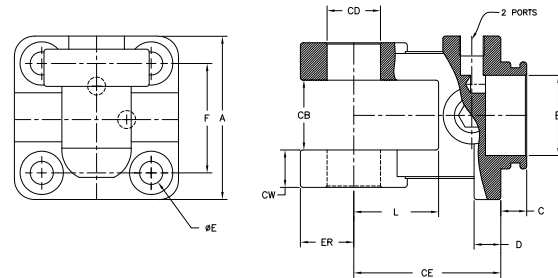
HTR GLANDS



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



HTR CAPS

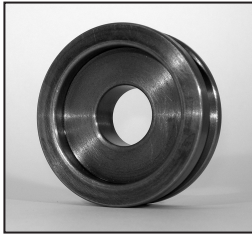


| Part Number | Bore | A | B | C | D | E | F | Ports | CB | CD | CE | CW | L | ER |
|-------------|------|------|------|------|------|------|------|----------|------|------|------|------|------|------|
| HTR-2.0 CAP | 2.0 | 3.07 | 1.50 | 0.50 | 0.50 | 0.43 | 2.05 | 3/8" NPT | 1.14 | 1.01 | 2.84 | 0.69 | 1.63 | 1.00 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |
| HTR-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 |

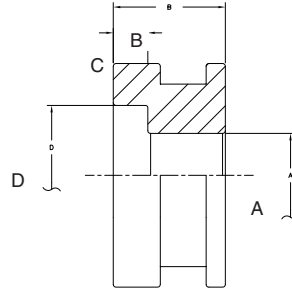
CYLINDER PISTONS/CLEVIS/STROKE ADJUSTERS

Component Parts

THE HTR LINE



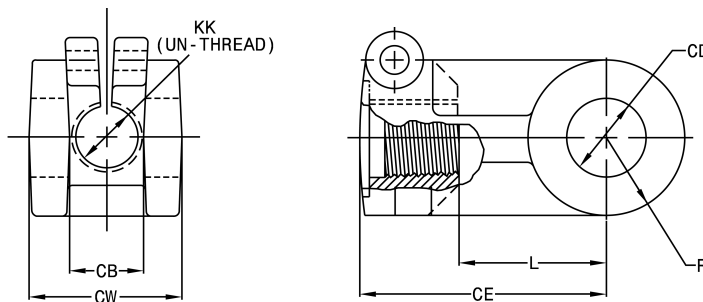
HTR PISTON



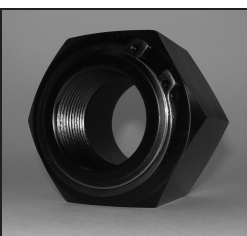
| Part Number | Bore | A | B | C | D |
|----------------|------|------|------|------|------|
| HTR-2.0 PISTON | 2.0 | 0.75 | 1.00 | 0.32 | 1.38 |
| HTR-2.5 PISTON | 2.5 | 0.75 | 1.00 | 0.32 | 1.50 |
| HTR-3.0 PISTON | 3.0 | 1.00 | 1.00 | 0.32 | 2.25 |
| HTR-3.5 PISTON | 3.5 | 1.00 | 1.00 | 0.32 | 2.76 |
| HTR-4.0 PISTON | 4.0 | 1.00 | 1.00 | 0.32 | 2.76 |
| HTR-5.0 PISTON | 5.0 | 1.25 | 1.89 | 0.63 | 3.54 |



HTR MOBILE SPLIT CLEVIS



| Part Number | Bore | CB | CD | CE | CW | KK | L | R |
|----------------|------|------|------|------|------|-----------|------|------|
| HTR-2.0-CLEVIS | 2.0 | 1.12 | 1.00 | 3.25 | 2.62 | 1-1/8"-12 | 2.12 | 1.00 |
| HTR-2.5-CLEVIS | 2.5 | 1.12 | 1.00 | 3.25 | 2.62 | 1-1/8"-12 | 2.12 | 1.00 |
| HTR-3.0-CLEVIS | 3.0 | 1.12 | 1.00 | 3.25 | 2.62 | 1-1/4"-12 | 2.12 | 1.00 |
| HTR-3.5-CLEVIS | 3.5 | 1.12 | 1.00 | 3.25 | 2.62 | 1-1/4"-12 | 2.12 | 1.00 |
| HTR-4.0-CLEVIS | 4.0 | 1.12 | 1.00 | 3.25 | 2.62 | 1-1/4"-12 | 2.12 | 1.00 |
| HTR-5.0-CLEVIS | 5.0 | 1.12 | 1.89 | 3.25 | 2.62 | 1-1/4"-12 | 2.12 | 1.25 |



Stroke Adjusters

| PART NUMBER | DESCRIPTION |
|-------------|------------------------|
| HB-SA-1125 | 1-1/8" STROKE ADJUSTER |
| HB-SA-1250 | 1-1/4" STROKE ADJUSTER |
| HB-SA-1500 | 1-1/2" STROKE ADJUSTER |

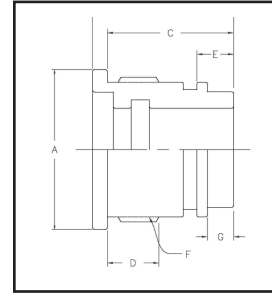
HMW & HCW GLANDS AND PISTONS

Component Parts

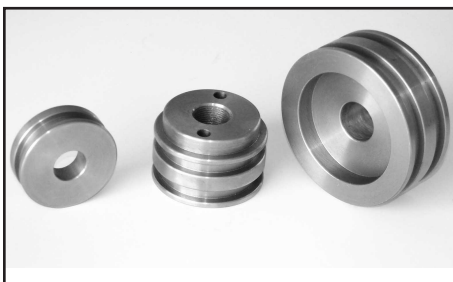
THE HMW & HCW LINE



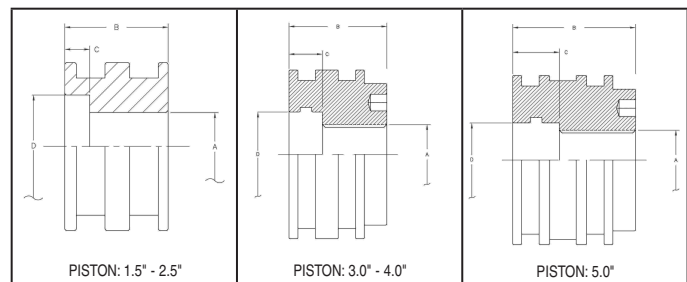
HMW & HCW
FOR GLANDS



| Part Number | Rod | Bore | A | B | C | D | E | F | G |
|---------------|-------|------|------|------|------|------|------|--------|------|
| HMW-1.5-GLAND | 1 | 1.5 | 1.97 | 2.40 | 1.93 | 0.79 | 0.54 | M43-2 | 0.40 |
| HMW-2.0-GLAND | 1-1/4 | 2.0 | 2.44 | 2.17 | 1.93 | 0.79 | 0.54 | M55-2 | 0.40 |
| HMW-2.5-GLAND | 1-1/2 | 2.5 | 2.95 | 2.17 | 1.93 | 0.79 | 0.54 | M68-2 | 0.40 |
| HMW-3.0-GLAND | 1-1/2 | 3.0 | 3.45 | 2.40 | 1.93 | 0.83 | 0.54 | M81-2 | 0.40 |
| HMW-3.5-GLAND | 1-3/4 | 3.5 | 3.94 | 2.17 | 1.93 | 0.83 | 0.54 | M94-2 | 0.40 |
| HMW-4.0-GLAND | 2 | 4.0 | 4.45 | 2.44 | 2.20 | 1.10 | 0.54 | M106-2 | 0.40 |
| HMW-5.0-GLAND | 2-1/2 | 5.0 | 5.45 | 2.68 | 2.20 | 1.10 | 0.54 | M132-2 | 0.40 |



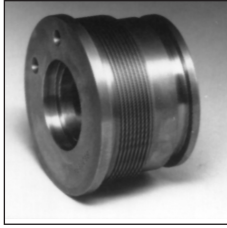
HMW & HCW
FOR PISTONS



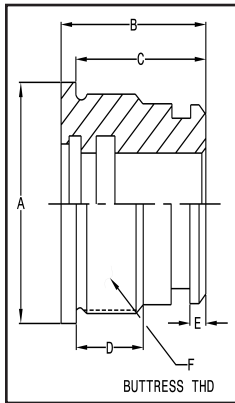
| Part Number | Bore | A | B | C | D |
|----------------|------|-------|------|------|-------|
| HMW-1.5-PISTON | 1.5 | 0.634 | 1.22 | 0.16 | 0.906 |
| HMW-2.0-PISTON | 2.0 | 0.807 | 1.22 | 0.30 | 1.220 |
| HMW-2.5-PISTON | 2.5 | 0.948 | 1.38 | 0.38 | 1.375 |
| HMW-3.0-PISTON | 3.0 | M24-2 | 2.09 | 0.71 | 1.504 |
| HMW-3.5-PISTON | 3.5 | M30-2 | 2.28 | 0.79 | 1.755 |
| HMW-4.0 PISTON | 4.0 | M36-2 | 2.28 | 0.79 | 2.005 |
| HMW-5.0 PISTON | 5.0 | M48-2 | 2.88 | 0.98 | 2.505 |

These replacement parts are for HMW & HCW cylinders found on page 3 - 8

MOBILE CYLINDER HEADS



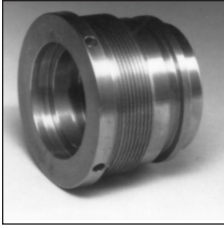
Material: 65-45-12
Ductile Iron



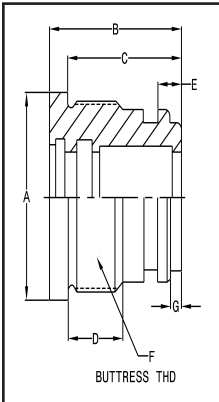
IT Head

| PART NUMBER | BORE +.003" -.003" | ROD +.003" -.003" | A | B | C | D | E | F (BUT- TRESS) | SEAL KIT NUMBER |
|-------------|--------------------------|-------------------------|------|------|------|------|------|-------------------|--------------------|
| CM-H107277 | 1.500 | 1.000 | 2.00 | 2.00 | 1.50 | 0.75 | 0.28 | 1-3/4"-12 | SK-H107277 |
| CM-H107597 | 2.000 | 1.000 | 2.50 | 2.12 | 1.94 | 1.00 | 0.12 | 2-1/4"-12 | SK-H107597 |
| CM-H107598 | 2.000 | 1.125 | 2.50 | 2.00 | 1.75 | 0.75 | 0.19 | 2-1/4"-12 | SK-H107598 |
| CM-H107595 | 2.000 | 1.250 | 2.50 | 2.25 | 2.00 | 1.00 | 0.19 | 2-1/4"-12 | SK-H107595 |
| CM-H107193 | 2.500 | 1.125 | 3.00 | 2.00 | 1.75 | 0.75 | 0.19 | 2-3/4"-12 | SK-H107193 |
| CM-H107194 | 2.500 | 1.250 | 3.00 | 2.00 | 1.75 | 0.75 | 0.19 | 2-3/4"-12 | SK-H107194 |
| CM-H107463 | 2.500 | 1.500 | 3.00 | 2.38 | 2.00 | 1.00 | 0.19 | 2-3/4"-12 | SK-H107463 |
| CM-H107673 | 2.500 | 1.750 | 3.00 | 2.25 | 1.88 | 0.88 | 0.28 | 2-3/4"-12 | SK-H107673 |
| CM-H107157 | 3.000 | 1.000 | 3.50 | 2.25 | 2.00 | 1.00 | 0.19 | 3-1/4"-12 | SK-H107157 |
| CM-H107196 | 3.000 | 1.250 | 3.50 | 2.25 | 2.00 | 1.00 | 0.19 | 3-1/4"-12 | SK-H107196 |
| CM-H107131 | 3.000 | 1.500 | 3.50 | 2.25 | 2.00 | 1.00 | 0.19 | 3-1/4"-12 | SK-H107131 |
| CM-H107189 | 3.000 | 1.750 | 3.50 | 2.25 | 2.00 | 1.00 | 0.19 | 3-1/4"-12 | SK-H107189 |
| CM-H107359 | 3.000 | 2.000 | 3.50 | 2.50 | 2.00 | 1.00 | 0.19 | 3-1/4"-12 | SK-H107359 |
| CM-H107591 | 3.250 | 1.500 | 3.75 | 2.25 | 2.00 | 1.00 | 0.19 | 3-1/2"-12 | SK-H107591 |
| CM-H107592 | 3.250 | 1.750 | 3.75 | 2.25 | 2.00 | 1.00 | 0.19 | 3-1/2"-12 | SK-H107592 |
| CM-H107197 | 3.500 | 1.250 | 4.00 | 2.25 | 2.00 | 1.00 | 0.19 | 3-3/4"-12 | SK-H107197 |
| CM-H107198 | 3.500 | 1.500 | 4.00 | 2.25 | 2.00 | 1.00 | 0.19 | 3-3/4"-12 | SK-H107198 |
| CM-H107108 | 3.500 | 1.750 | 4.00 | 2.25 | 2.00 | 1.00 | 0.19 | 3-3/4"-12 | SK-H107108 |
| CM-H107112 | 3.500 | 2.000 | 4.00 | 2.25 | 2.00 | 1.00 | 0.19 | 3-3/4"-12 | SK-H107112 |
| CM-H107462 | 3.500 | 2.500 | 4.00 | 2.50 | 2.12 | 1.00 | 0.25 | 3-3/4"-12 | SK-H107462 |
| CM-H107130 | 4.000 | 1.500 | 4.50 | 2.25 | 2.00 | 1.00 | 0.19 | 4-1/4"-12 | SK-H107130 |
| CM-H107124 | 4.000 | 1.750 | 4.50 | 2.25 | 2.00 | 1.00 | 0.19 | 4-1/4"-12 | SK-H107124 |
| CM-H107311 | 4.000 | 2.000 | 4.50 | 2.25 | 2.00 | 1.00 | 0.19 | 4-1/4"-12 | SK-H107311 |
| CM-H107331 | 4.000 | 2.250 | 4.50 | 2.25 | 2.00 | 1.00 | 0.19 | 4-1/4"-12 | SK-H107331 |
| CM-H107386 | 4.000 | 2.500 | 4.50 | 2.50 | 2.12 | 1.12 | 0.19 | 4-1/4"-12 | SK-H107386 |
| CM-H107525 | 4.000 | 3.000 | 4.50 | 2.50 | 2.12 | 1.00 | 0.25 | 4-1/4"-12 | SK-H107525 |
| CM-H107199 | 4.500 | 1.750 | 5.00 | 2.25 | 2.00 | 1.00 | 0.19 | 4-3/4"-12 | SK-H107199 |
| CM-H107200 | 4.500 | 2.000 | 5.00 | 2.25 | 2.00 | 1.00 | 0.19 | 4-3/4"-12 | SK-H107200 |
| CM-H107201 | 4.500 | 2.250 | 5.00 | 2.25 | 2.00 | 1.00 | 0.19 | 4-3/4"-12 | SK-H107201 |
| CM-H107528 | 4.500 | 3.500 | 5.00 | 2.38 | 2.00 | 1.00 | 0.19 | 4-3/4"-12 | SK-H107528 |
| CM-H107234 | 5.000 | 1.750 | 5.50 | 2.25 | 2.00 | 1.00 | 0.19 | 5-1/4"-12 | SK-H107234 |
| CM-H107212 | 5.000 | 2.000 | 5.50 | 2.25 | 2.00 | 1.00 | 0.19 | 5-1/4"-12 | SK-H107212 |
| CM-H107204 | 5.000 | 2.500 | 5.50 | 2.50 | 2.12 | 1.12 | 0.19 | 5-1/4"-12 | SK-H107204 |
| CM-H107205 | 5.000 | 3.000 | 5.50 | 2.50 | 2.12 | 1.12 | 0.19 | 5-1/4"-12 | SK-H107205 |
| CM-H107345 | 6.000 | 2.000 | 6.50 | 2.50 | 2.12 | 1.12 | 0.19 | 6-1/4"-12 | SK-H107345 |
| CM-H107206 | 6.000 | 2.500 | 6.50 | 2.50 | 2.12 | 1.12 | 0.19 | 6-1/4"-12 | SK-H107206 |
| CM-H107207 | 6.000 | 3.000 | 6.50 | 2.50 | 2.12 | 1.12 | 0.19 | 6-1/4"-12 | SK-H107207 |
| CM-H107178 | 6.000 | 3.500 | 6.50 | 2.50 | 2.12 | 1.12 | 0.19 | 6-1/4"-12 | SK-H107178 |
| CM-H107328 | 7.000 | 3.000 | 7.50 | 2.88 | 2.50 | 1.12 | 0.59 | 7-1/4"-10 | SK-H107328 |
| CM-H107493 | 7.000 | 3.500 | 7.50 | 2.88 | 2.50 | 1.12 | 0.59 | 7-1/4"-10 | SK-H107493 |
| CM-H107467 | 7.000 | 4.000 | 7.50 | 2.88 | 2.50 | 1.12 | 0.59 | 7-1/4"-10 | SK-H107467 |
| CM-H107466 | 8.000 | 4.000 | 9.00 | 3.75 | 3.25 | 1.50 | 0.88 | 8-1/4"-10 | SK-H107466 |
| CM-H107494 | 8.000 | 4.500 | 9.00 | 3.75 | 3.25 | 1.50 | 0.88 | 8-1/4"-10 | SK-H107494 |
| CM-H107475 | 8.000 | 5.000 | 9.00 | 3.75 | 3.25 | 1.50 | 0.88 | 8-1/4"-10 | SK-H107475 |

MOBILE CYLINDER HEADS



Material: 65-45-12
Ductile Iron



ITW Head

| PART NUMBER | BORE +.003" -.003" | ROD +.003" -.003" | A | B | C | D | E | F (BUT- TRESS) | G | SEAL KIT NUMBER |
|-------------|--------------------------|-------------------------|-------|------|------|------|------|-------------------|-------|--------------------|
| CM-H107729 | 3.000 | 1.750 | 3.50 | 2.62 | 2.25 | 1.00 | 0.56 | 3-1/4"-12 | 0.38 | SK-H107729 |
| CM-H107548 | 3.000 | 2.000 | 3.50 | 2.62 | 2.25 | 1.00 | 0.56 | 3-1/4"-12 | 0.38 | SK-H107548 |
| CM-H107791 | 3.500 | 1.750 | 4.00 | 2.62 | 2.25 | 1.00 | 0.56 | 3-3/4"-12 | 0.38 | SK-H107791 |
| CM-H107549 | 3.500 | 2.000 | 4.00 | 2.62 | 2.25 | 1.00 | 0.56 | 3-3/4"-12 | 0.38 | SK-H107549 |
| CM-H107550 | 4.000 | 2.000 | 4.50 | 3.25 | 2.75 | 1.25 | 0.56 | 4-1/4"-12 | 0.38 | SK-H107550 |
| CM-H107551 | 4.000 | 2.500 | 4.50 | 3.25 | 2.75 | 1.25 | 0.56 | 4-1/4"-12 | 0.38 | SK-H107551 |
| CM-H107640 | 4.000 | 3.000 | 4.50 | 3.62 | 3.12 | 1.38 | 0.19 | 4-1/4"-12 | N/A | SK-H107640 |
| CM-H107716 | 4.500 | 2.000 | 5.00 | 3.25 | 2.75 | 1.25 | 0.56 | 4-3/4"-12 | 0.38 | SK-H107716 |
| CM-H107552 | 4.500 | 2.500 | 5.00 | 3.25 | 2.75 | 1.25 | 0.56 | 4-3/4"-12 | 0.38 | SK-H107552 |
| CM-H107553 | 4.500 | 3.000 | 5.00 | 3.25 | 2.75 | 1.25 | 0.56 | 4-3/4"-12 | 0.38 | SK-H107553 |
| CM-H107630 | 4.500 | 3.500 | 5.00 | 3.62 | 3.12 | 1.38 | 0.19 | 4-3/4"-12 | N/A | SK-H107630 |
| CM-H107679 | 5.000 | 2.000 | 5.50 | 3.00 | 2.50 | 1.12 | 0.56 | 5-1/4"-12 | 0.38 | SK-H107679 |
| CM-H107554 | 5.000 | 2.500 | 5.50 | 3.62 | 3.12 | 1.38 | 0.81 | 5-1/4"-12 | 0.56 | SK-H107554 |
| CM-H107555 | 5.000 | 3.000 | 5.50 | 3.62 | 3.12 | 1.38 | 0.81 | 5-1/4"-12 | 0.56 | SK-H107555 |
| CM-H107651 | 5.000 | 3.500 | 5.50 | 3.62 | 3.12 | 1.38 | 0.81 | 5-1/4"-12 | 0.56 | SK-H107651 |
| CM-H107606 | 5.000 | 4.000 | 5.50 | 3.62 | 3.12 | 1.38 | 0.19 | 5-1/4"-12 | N/A | SK-H107606 |
| CM-H107611 | 5.500 | 2.500 | 6.00 | 3.62 | 3.12 | 1.38 | 0.81 | 5-3/4"-12 | 0.56 | SK-H107611 |
| CM-H107612 | 5.500 | 3.000 | 6.00 | 3.62 | 3.12 | 1.38 | 0.81 | 5-3/4"-12 | 0.56 | SK-H107612 |
| CM-H107706 | 5.500 | 3.500 | 6.00 | 3.62 | 3.12 | 1.38 | 0.81 | 5-3/4"-12 | 0.56 | SK-H107706 |
| CM-H107583 | 5.500 | 4.000 | 6.00 | 3.62 | 3.12 | 1.38 | 0.81 | 5-3/4"-12 | 0.56 | SK-H107583 |
| CM-H107608 | 5.500 | 4.500 | 6.12 | 3.62 | 3.12 | 1.38 | 0.19 | 5-3/4"-12 | N/A | SK-H107608 |
| CM-H107556 | 6.000 | 2.500 | 6.50 | 3.62 | 3.12 | 1.38 | 0.81 | 6-1/4"-12 | 0.56 | SK-H107556 |
| CM-H107557 | 6.000 | 3.000 | 6.50 | 3.62 | 3.12 | 1.38 | 0.81 | 6-1/4"-12 | 0.56 | SK-H107557 |
| CM-H107558 | 6.000 | 3.500 | 6.50 | 3.62 | 3.12 | 1.38 | 0.81 | 6-1/4"-12 | 0.56 | SK-H107558 |
| CM-H107570 | 6.000 | 4.000 | 6.50 | 3.62 | 3.12 | 1.38 | 0.81 | 6-1/4"-12 | 0.56 | SK-H107570 |
| CM-H107584 | 6.000 | 4.500 | 6.50 | 3.38 | 2.88 | 1.25 | 0.81 | 6-1/4"-12 | 0.62 | SK-H107584 |
| CM-H107721 | 7.000 | 2.500 | 7.50 | 4.25 | 3.75 | 1.50 | 1.03 | 7-1/4"-10 | 0.75 | SK-H107721 |
| CM-H107559 | 7.000 | 3.000 | 7.50 | 4.25 | 3.75 | 1.50 | 1.03 | 7-1/4"-10 | 0.75 | SK-H107559 |
| CM-H107560 | 7.000 | 3.500 | 7.50 | 4.25 | 3.75 | 1.50 | 1.03 | 7-1/4"-10 | 0.75 | SK-H107560 |
| CM-H107561 | 7.000 | 4.000 | 7.50 | 4.25 | 3.75 | 1.50 | 1.03 | 7-1/4"-10 | 0.75 | SK-H107561 |
| CM-H107607 | 8.000 | 3.500 | 8.50 | 4.50 | 3.75 | 1.50 | 1.03 | 8-1/4"-10 | 0.75 | SK-H107607 |
| CM-H107562 | 8.000 | 4.000 | 8.50 | 4.50 | 3.75 | 1.50 | 1.03 | 8-1/4"-10 | 0.75 | SK-H107562 |
| CM-H107563 | 8.000 | 4.500 | 8.50 | 4.50 | 3.75 | 1.50 | 1.03 | 8-1/4"-10 | 0.75 | SK-H107563 |
| CM-H107722 | 8.000 | 5.000 | 8.50 | 4.50 | 3.75 | 1.50 | 1.03 | 8-1/4"-10 | 0.075 | SK-H107722 |
| CM-H107605 | 10.000 | 4.000 | 10.50 | 5.00 | 4.25 | 1.50 | 1.25 | 10-1/4"-10 | 1.00 | SK-H107605 |
| CM-H107604 | 10.000 | 5.000 | 10.50 | 5.00 | 4.25 | 1.50 | 1.25 | 10-1/4"-10 | 1.00 | SK-H107604 |

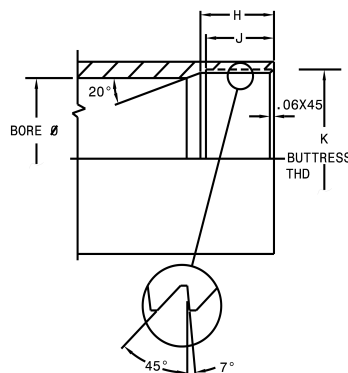
IT & ITW Technical Information

Basic information for Internal Buttress Threads (52 degrees)

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

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

"K" = Buttress Thread as determined by Head

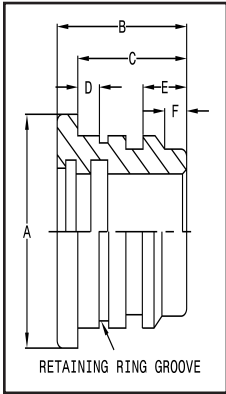


| Basic Thread Size | Min. Major Diameter | Pitch Diameter | Minor Diameter |
|-------------------|---------------------|-----------------|-----------------|
| 2-1/4"-12 | 2.2604 | 2.2000/2.2075 | 2.1500/2.1575 |
| 2-3/4"-12 | 2.7604 | 2.7000/2.7080 | 2.6500/2.6580 |
| 3-1/4"-12 | 3.2604 | 3.2000/3.2080 | 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 HEADS

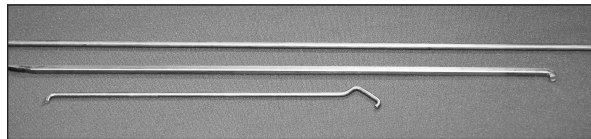


Material: Ductile Iron



TK Head

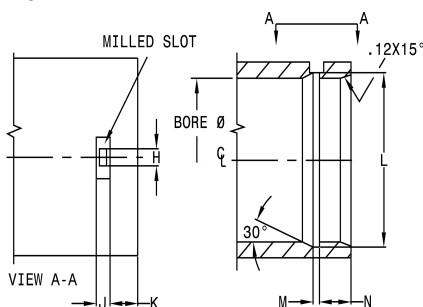
| TK HEAD | BORE +.003" -.003" | ROD +.003" -.003" | A | B | C | D | E | F | SEAL KIT NUMBER | LOCK WIRE NUMBER |
|-----------|--------------------------|-------------------------|------|------|------|------|------|------|--------------------|---------------------|
| CM-H70181 | 1.500 | 0.750 | 1.88 | 2.00 | 1.63 | 0.38 | 0.63 | 0.38 | SK-H70181 | RR20030 |
| CM-H70184 | 1.500 | 1.000 | 1.88 | 2.00 | 1.12 | 0.31 | 0.19 | N/A | SK-H70184 | RR20030 |
| CM-H70093 | 2.000 | 1.000 | 2.38 | 2.25 | 1.88 | 0.44 | 0.75 | 0.50 | SK-H70093 | RR20029 |
| CM-H70159 | 2.000 | 1.125 | 2.38 | 2.50 | 1.88 | 0.44 | 0.75 | 0.44 | SK-H70159 | RR20029 |
| CM-H70160 | 2.000 | 1.250 | 2.38 | 2.50 | 1.88 | 0.44 | 0.75 | 0.44 | SK-H70160 | RR20029 |
| CM-H70161 | 2.500 | 1.125 | 2.88 | 2.25 | 1.88 | 0.44 | 0.75 | 0.44 | SK-H70161 | RR20031 |
| CM-H70162 | 2.500 | 1.250 | 2.88 | 2.25 | 1.88 | 0.44 | 0.75 | 0.38 | SK-H70162 | RR20031 |
| CM-H70163 | 2.500 | 1.500 | 2.88 | 2.25 | 1.88 | 0.44 | 0.75 | 0.62 | SK-H70163 | RR20031 |
| CM-H70861 | 2.500 | 1.750 | 2.88 | 2.50 | 1.88 | 0.44 | 0.75 | 0.38 | SK-H70861 | RR20031 |
| CM-H70164 | 3.000 | 1.250 | 3.38 | 2.75 | 2.25 | 0.51 | 0.88 | 0.50 | SK-H70164 | RR20027 |
| CM-H70130 | 3.000 | 1.500 | 3.38 | 2.75 | 2.25 | 0.51 | 0.88 | 0.50 | SK-H70130 | RR20027 |
| CM-H70560 | 3.000 | 1.750 | 3.38 | 2.75 | 2.25 | 0.51 | 0.88 | 0.44 | SK-H70560 | RR20027 |
| CM-H70165 | 3.000 | 2.000 | 3.38 | 2.75 | 2.25 | 0.51 | 0.88 | 0.44 | SK-H70165 | RR20027 |
| CM-H70166 | 3.500 | 1.250 | 3.88 | 2.75 | 2.25 | 0.51 | 0.88 | 0.50 | SK-H70166 | RR20032 |
| CM-H70089 | 3.500 | 1.500 | 3.88 | 2.75 | 2.25 | 0.51 | 0.88 | 0.50 | SK-H70089 | RR20032 |
| CM-H70862 | 3.500 | 1.750 | 3.88 | 2.75 | 2.25 | 0.51 | 0.88 | 0.50 | SK-H70862 | RR20032 |
| CM-H70167 | 3.500 | 2.000 | 3.88 | 2.75 | 2.25 | 0.51 | 0.88 | 0.50 | SK-H70167 | RR20032 |
| CM-H70115 | 4.000 | 1.500 | 4.50 | 2.75 | 2.25 | 0.44 | 0.88 | 0.44 | SK-H70115 | RR20033 |
| CM-H70576 | 4.000 | 1.750 | 4.50 | 2.75 | 2.25 | 0.44 | 0.88 | 0.44 | SK-H70576 | RR20033 |
| CM-H70116 | 4.000 | 2.000 | 4.50 | 2.75 | 2.25 | 0.44 | 0.88 | 0.44 | SK-H70116 | RR20033 |
| CM-H70168 | 4.000 | 2.500 | 4.50 | 2.75 | 2.25 | 0.44 | 0.88 | 0.44 | SK-H70168 | RR20033 |
| CM-H70367 | 4.500 | 2.000 | 5.00 | 2.75 | 2.25 | 0.44 | 0.88 | 0.44 | SK-H70367 | RR20087 |
| CM-H70378 | 4.500 | 2.500 | 5.00 | 2.75 | 2.25 | 0.44 | 0.88 | 0.44 | SK-H70378 | RR20087 |
| CM-H70379 | 4.500 | 3.000 | 5.00 | 2.75 | 2.25 | 0.44 | 0.88 | 0.44 | SK-H70379 | RR20087 |
| CM-H70114 | 5.000 | 2.000 | 5.50 | 3.00 | 2.50 | 0.56 | 0.94 | 0.50 | SK-H70114 | RR20039 |
| CM-H70113 | 5.000 | 2.500 | 5.50 | 3.00 | 2.50 | 0.56 | 0.94 | 0.50 | SK-H70113 | RR20039 |
| CM-H70107 | 5.000 | 3.000 | 5.50 | 3.00 | 2.50 | 0.56 | 0.94 | 0.50 | SK-H70107 | RR20039 |
| CM-H70389 | 5.500 | 2.000 | 6.00 | 3.00 | 2.50 | 0.56 | 0.94 | 0.50 | SK-H70389 | RR20089 |
| CM-H70390 | 5.500 | 2.500 | 6.00 | 3.00 | 2.50 | 0.56 | 0.94 | 0.50 | SK-H70390 | RR20089 |
| CM-H70391 | 5.500 | 3.000 | 6.00 | 3.00 | 2.50 | 0.56 | 0.94 | 0.50 | SK-H70391 | RR20089 |
| CM-H70112 | 6.000 | 2.000 | 6.50 | 3.00 | 2.50 | 0.56 | 0.94 | 0.50 | SK-H70112 | RR20040 |
| CM-H70111 | 6.000 | 2.500 | 6.50 | 3.00 | 2.50 | 0.56 | 0.94 | 0.50 | SK-H70111 | RR20040 |
| CM-H70108 | 6.000 | 3.000 | 6.50 | 3.00 | 2.50 | 0.56 | 0.94 | 0.50 | SK-H70108 | RR20040 |



LOCK WIRES

TK Technical Information

Retaining Groove Information



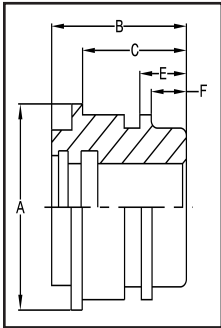
| BORE +.003" -.003" | H | J | K | L +.010" -.000" | M +.005" -.000" | N +.000" -.005" |
|--------------------------|------|------|------|-----------------------|-----------------------|-----------------------|
| 1.500 | 0.25 | 0.25 | 0.28 | 1.625 | 0.125 | 0.375 |
| 2.000 | 0.25 | 0.25 | 0.34 | 2.125 | 0.125 | 0.438 |
| 2.500 | 0.25 | 0.25 | 0.34 | 2.625 | 0.125 | 0.438 |
| 3.000 | 0.25 | 0.25 | 0.41 | 3.125 | 0.125 | 0.500 |
| 3.500 | 0.25 | 0.25 | 0.41 | 3.625 | 0.125 | 0.500 |
| 4.000 | 0.38 | 0.25 | 0.41 | 4.188 | 0.188 | 0.438 |
| 4.500 | 0.38 | 0.25 | 0.41 | 4.688 | 0.188 | 0.438 |
| 5.000 | 0.38 | 0.25 | 0.53 | 5.188 | 0.188 | 0.562 |
| 5.500 | 0.38 | 0.25 | 0.53 | 5.688 | 0.188 | 0.562 |
| 6.000 | 0.38 | 0.25 | 0.53 | 6.188 | 0.188 | 0.562 |

*0.312 For 1" Rod

MOBILE CYLINDER HEADS



Material: Ductile Iron

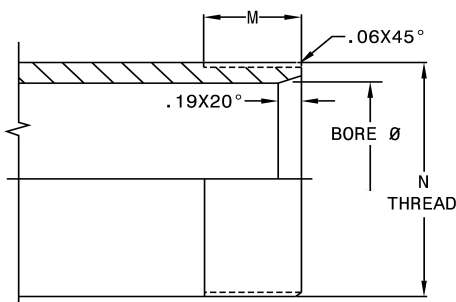


TH Head

| PART NUMBER | BORE +.003"-.003" | ROD +.003"-.003" | A | B | C | E | F | SEAL KIT NUMBER |
|-------------|----------------------|---------------------|------|------|------|------|------|--------------------|
| CM-H70154 | 2.000 | 1.000 | 2.25 | 2.38 | 1.94 | 0.81 | 0.62 | SK-H70154 |
| CM-H70155 | 2.000 | 1.125 | 2.25 | 2.38 | 1.94 | 0.81 | 0.62 | SK-H70155 |
| CM-H70156 | 2.000 | 1.250 | 2.25 | 2.38 | 1.94 | 0.81 | 0.62 | SK-H70156 |
| CM-H70157 | 2.500 | 1.125 | 2.75 | 2.38 | 1.94 | 0.81 | 0.62 | SK-H70157 |
| CM-H70076 | 2.500 | 1.250 | 2.75 | 2.38 | 1.94 | 0.81 | 0.62 | SK-H70076 |
| CM-H70158 | 2.500 | 1.500 | 2.75 | 2.38 | 1.94 | 0.81 | 0.62 | SK-H70158 |
| CM-H70462 | 2.500 | 1.750 | 2.75 | 2.38 | 2.19 | 0.81 | 0.62 | SK-H70462 |
| CM-H70029 | 3.000 | 1.250 | 3.25 | 2.75 | 2.19 | 0.94 | 0.75 | SK-H70029 |
| CM-H70011 | 3.000 | 1.500 | 3.25 | 2.75 | 2.19 | 0.94 | 0.75 | SK-H70011 |
| CM-H70814 | 3.000 | 1.750 | 3.25 | 2.75 | 2.19 | 0.94 | 0.75 | SK-H70814 |
| CM-H70012 | 3.000 | 2.000 | 3.25 | 2.75 | 2.56 | 0.94 | 0.69 | SK-H70012 |
| CM-H70013 | 3.500 | 1.500 | 3.75 | 2.75 | 2.19 | 0.94 | 0.75 | SK-H70013 |
| CM-H70504 | 3.500 | 1.750 | 3.75 | 2.75 | 2.19 | 0.94 | 0.75 | SK-H70504 |
| CM-H70030 | 3.500 | 2.000 | 3.75 | 2.75 | 2.19 | 0.94 | 0.75 | SK-H70030 |
| CM-H70031 | 3.500 | 2.500 | 3.75 | 2.75 | 2.56 | 0.94 | 0.75 | SK-H70031 |
| CM-H70014 | 4.000 | 1.500 | 4.25 | 2.75 | 2.19 | 0.94 | 0.75 | SK-H70014 |
| CM-H70488 | 4.000 | 1.750 | 4.25 | 2.75 | 2.19 | 0.94 | 0.75 | SK-H70488 |
| CM-H70015 | 4.000 | 2.000 | 4.25 | 2.75 | 2.19 | 0.94 | 0.75 | SK-H70015 |
| CM-H70032 | 4.000 | 2.500 | 4.25 | 2.75 | 2.19 | 0.94 | 0.75 | SK-H70032 |
| CM-H70033 | 4.000 | 3.000 | 4.25 | 2.75 | 2.56 | 0.94 | 0.75 | SK-H70033 |
| CM-H70276 | 4.500 | 2.000 | 4.75 | 2.75 | 2.19 | 0.94 | 0.75 | SK-H70276 |
| CM-H70310 | 4.500 | 2.500 | 4.75 | 2.75 | 2.19 | 0.94 | 0.75 | SK-H70310 |
| CM-H70377 | 4.500 | 3.000 | 4.75 | 2.75 | 2.19 | 0.94 | 0.69 | SK-H70377 |
| CM-H70037 | 5.000 | 2.000 | 5.38 | 3.00 | 2.44 | 1.13 | 0.88 | SK-H70037 |
| CM-H70038 | 5.000 | 2.500 | 5.38 | 3.00 | 2.44 | 1.13 | 0.88 | SK-H70038 |
| CM-H70039 | 5.000 | 3.000 | 5.38 | 3.00 | 2.44 | 1.13 | 0.88 | SK-H70039 |
| CM-H70153 | 5.500 | 2.000 | 5.88 | 3.00 | 2.44 | 1.13 | 0.88 | SK-H70153 |
| CM-H70142 | 5.500 | 2.500 | 5.88 | 3.00 | 2.44 | 1.13 | 0.88 | SK-H70142 |
| CM-H70143 | 5.500 | 3.000 | 5.88 | 3.00 | 2.44 | 1.13 | 0.88 | SK-H70143 |
| CM-H70041 | 6.000 | 2.000 | 6.38 | 3.00 | 2.44 | 1.13 | 0.88 | SK-H70041 |
| CM-H70042 | 6.000 | 2.500 | 6.38 | 3.00 | 2.44 | 1.13 | 0.88 | SK-H70042 |
| CM-H70043 | 6.000 | 3.000 | 6.38 | 3.00 | 2.44 | 1.13 | 0.88 | SK-H70043 |
| CM-H70180 | 7.000 | 2.500 | 7.50 | 4.00 | 3.13 | 1.75 | 1.50 | SK-H70180 |
| CM-H70176 | 7.000 | 3.000 | 7.50 | 4.00 | 3.13 | 1.75 | 1.50 | SK-H70176 |
| CM-H70186 | 7.000 | 3.500 | 7.50 | 4.00 | 3.13 | 1.75 | 1.50 | SK-H70186 |
| CM-H70133 | 8.000 | 3.000 | 8.50 | 4.00 | 3.13 | 1.75 | 1.50 | SK-H70133 |
| CM-H70195 | 8.000 | 3.500 | 8.50 | 4.00 | 3.13 | 1.75 | 1.50 | SK-H70195 |
| CM-H70217 | 8.000 | 4.000 | 8.50 | 4.00 | 3.13 | 1.75 | 1.50 | SK-H70217 |

MOBILE CYLINDER HEADS

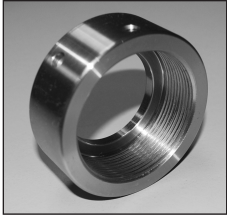
TH Head Technical Information



| Bores +.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 |

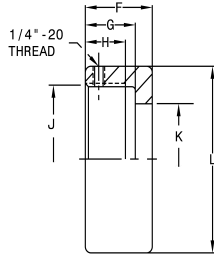
LOCK WIRE - PAGE REFERENCE TO 30

MOBILE CYLINDER CAPS

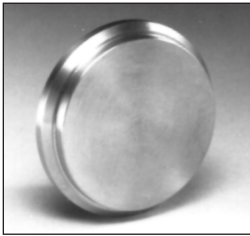


Material: 1026 CDS Tubing

TH Cap



| PART NUMBER | BORE +.003"-.003" | F | G | H | J | K | L |
|-------------|----------------------|------|------|------|-----------------|------|-------|
| CM-HC70074 | 2.000 | 1.13 | 0.88 | 0.69 | 2-3/8"-12 UN-2B | 1.81 | 3.00 |
| CM-HC70075 | 2.500 | 1.13 | 0.88 | 0.69 | 2-7/8"-12 UN-2B | 2.31 | 3.50 |
| CM-HC70008 | 3.000 | 1.38 | 1.00 | 0.75 | 3-1/2"-12 UN-2B | 2.63 | 4.00 |
| CM-HC70009 | 3.500 | 1.38 | 1.00 | 0.75 | 4"-12 UN-2B | 3.13 | 4.50 |
| CM-HC70034 | 4.000 | 1.38 | 1.00 | 0.75 | 4-1/2"-12 UN-2B | 3.63 | 5.00 |
| CM-HC70277 | 4.500 | 1.38 | 1.00 | 0.75 | 5"-12 UN-2B | 4.13 | 5.50 |
| CM-HC70040 | 5.000 | 1.38 | 1.00 | 0.75 | 5-1/2"-12 UN-2B | 4.63 | 6.25 |
| CM-HC70140 | 5.500 | 1.38 | 1.00 | 0.75 | 6"-12 UN-2B | 5.13 | 6.75 |
| CM-HC70044 | 6.000 | 1.38 | 1.00 | 0.75 | 6-5/8"-12 UN-2B | 5.63 | 7.50 |
| CM-HC70174 | 7.000 | 2.00 | 1.38 | 1.13 | 7-7/8"-12 UN-2B | 6.13 | 9.00 |
| CM-HC70132 | 8.000 | 2.00 | 1.38 | 1.13 | 8-7/8"-12 UN-2B | 7.13 | 10.00 |

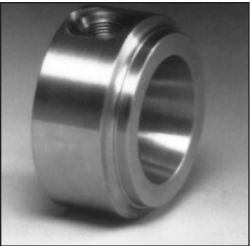


Material: A-36 Plate

Base Plate (medium duty)

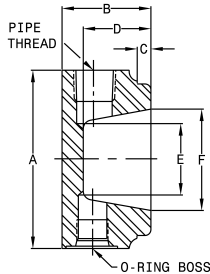


| PART NUMBER | BORE +.003"-.003" | A | B | C |
|-------------|----------------------|------|------|------|
| CM-BP60056 | 1.500 | 1.88 | 0.50 | 0.25 |
| CM-BP60010 | 2.000 | 2.38 | 0.50 | 0.25 |
| CM-BP60011 | 2.500 | 2.88 | 0.50 | 0.25 |
| CM-BP60012 | 3.000 | 3.38 | 0.59 | 0.25 |
| CM-BP60013 | 3.500 | 3.88 | 0.69 | 0.38 |
| CM-BP60014 | 4.000 | 4.50 | 0.75 | 0.38 |
| CM-BP60437 | 4.500 | 5.00 | 0.88 | 0.38 |
| CM-BP60015 | 5.000 | 5.56 | 0.88 | 0.38 |
| CM-BP60124 | 5.500 | 6.00 | 0.88 | 0.38 |
| CM-BP60016 | 6.000 | 6.75 | 1.00 | 0.38 |
| CM-BP60157 | 7.000 | 8.00 | 1.00 | 0.38 |
| CM-BP60107 | 8.000 | 9.00 | 1.00 | 0.38 |



Material: A-36 Plate

Base End (ported)

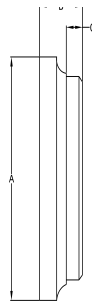


| PART NUMBER | BORE +.003"-.003" | NPT | SAE | A | B | C | D | E | F |
|--------------|----------------------|------|-----|------|------|------|------|------|------|
| CM-BEP112380 | 2.000 | 3/8" | #6 | 2.50 | 1.56 | 0.25 | 1.00 | 1.25 | 1.45 |
| CM-BEP112381 | 2.500 | 3/8" | #6 | 3.00 | 1.56 | 0.25 | 1.00 | 1.25 | 1.75 |
| CM-BEP112382 | 3.000 | 1/2" | #8 | 3.50 | 1.69 | 0.25 | 1.12 | 1.75 | 2.19 |
| CM-BEP112383 | 3.500 | 1/2" | #8 | 4.00 | 1.69 | 0.25 | 1.12 | 2.00 | 2.19 |
| CM-BEP112384 | 4.000 | 1/2" | #8 | 4.50 | 1.81 | 0.25 | 1.35 | 2.12 | 2.62 |
| CM-BEP112385 | 4.500 | 1/2" | #8 | 5.12 | 1.81 | 0.25 | 1.35 | 2.12 | 2.62 |
| CM-BEP112386 | 5.000 | 3/4" | #12 | 5.62 | 1.94 | 0.25 | 1.35 | 2.38 | 3.03 |
| CM-BEP112398 | 5.500 | 3/4" | #12 | 6.25 | 2.19 | 0.25 | 1.50 | 3.29 | 4.06 |
| CM-BEP112387 | 6.000 | 3/4" | #12 | 6.75 | 2.19 | 0.25 | 1.50 | 3.29 | 4.06 |



Material: A-36 Plate

Base Plate (heavy duty)



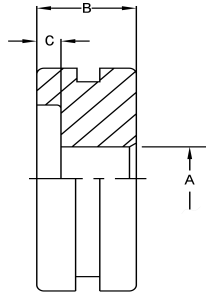
| PART NUMBER | BORE +.003"-.003" | A | B | C |
|-------------|----------------------|--------|------|------|
| CM-BP112527 | 1.500 | 2.000 | 0.50 | 0.19 |
| CM-BP112292 | 2.000 | 2.500 | 0.50 | 0.12 |
| CM-BP112209 | 2.500 | 3.000 | 0.62 | 0.25 |
| CM-BP112210 | 3.000 | 3.500 | 0.75 | 0.25 |
| CM-BP112461 | 3.250 | 3.750 | 0.88 | 0.25 |
| CM-BP112211 | 3.500 | 4.000 | 0.88 | 0.25 |
| CM-BP112212 | 4.000 | 4.500 | 1.00 | 0.25 |
| CM-BP112414 | 4.000 | 4.620 | 1.00 | 0.25 |
| CM-BP112213 | 4.500 | 5.000 | 1.12 | 0.25 |
| CM-BP112234 | 5.000 | 5.500 | 1.25 | 0.25 |
| CM-BP112459 | 5.000 | 5.620 | 1.25 | 0.25 |
| CM-BP112214 | 5.000 | 5.750 | 1.25 | 0.25 |
| CM-BP112426 | 5.500 | 6.120 | 1.31 | 0.25 |
| CM-BP112236 | 6.000 | 6.500 | 1.38 | 0.25 |
| CM-BP112512 | 6.000 | 6.620 | 1.38 | 0.25 |
| CM-BP112215 | 6.000 | 6.750 | 1.38 | 0.25 |
| CM-BP112569 | 6.500 | 7.250 | 1.25 | 0.25 |
| CM-BP112364 | 7.000 | 8.000 | 1.44 | 0.25 |
| CM-BP112373 | 8.000 | 9.000 | 1.50 | 0.25 |
| CM-BP112496 | 9.000 | 10.000 | 1.50 | 0.38 |
| CM-BP112467 | 10.000 | 11.000 | 1.50 | 0.38 |

MOBILE PISTONS



Material: Ductile Iron

TM Piston

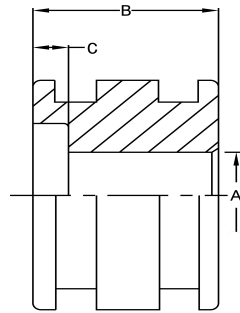


| PART NUMBER | BORE +.003" -.003" | A +.002" -.000" | B | C | SEAL KIT NUMBER |
|-------------|--------------------------|--------------------|------|------|--------------------|
| CM-P70079 | 1.50 | 0.626 | 0.88 | N/A | SK-P70079 |
| CM-P70055 | 2.00 | 0.751 | 1.00 | N/A | SK-P70055 |
| CM-P70065 | 2.50 | 0.751 | 1.00 | N/A | SK-P70065 |
| CM-P70841 | 3.00 | 0.751 | 1.00 | 0.25 | SK-P70841 |
| CM-P70872 | 3.50 | 1.001 | 1.00 | 0.38 | SK-P70872 |
| CM-P70067 | 4.00 | 1.001 | 1.00 | N/A | SK-P70067 |
| CM-P70384 | 4.50 | 1.251 | 1.50 | N/A | SK-P70384 |
| CM-P70090 | 5.00 | 1.251 | 1.50 | N/A | SK-P70090 |
| CM-P70385 | 5.50 | 1.501 | 1.50 | N/A | SK-P70385 |
| CM-P70139 | 6.00 | 1.501 | 1.50 | N/A | SK-P70139 |



Material: Ductile Iron

TH Piston

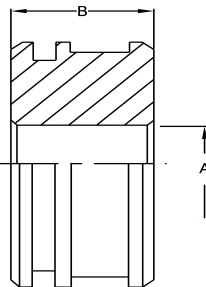


| PART NUMBER | BORE +.003" -.003" | A +.002" -.000" | B | C | SEAL KIT NUMBER |
|-------------|--------------------------|--------------------|------|------|--------------------|
| CM-P70020 | 1.50 | 0.626 | 1.13 | N/A | SK-P70020 |
| CM-P70005 | 2.00 | 0.751 | 1.50 | N/A | SK-P70005 |
| CM-P70017 | 2.50 | 0.751 | 1.50 | N/A | SK-P70017 |
| CM-P70006 | 3.00 | 1.001 | 1.75 | N/A | SK-P70006 |
| CM-P70007 | 3.50 | 1.126 | 1.75 | N/A | SK-P70007 |
| CM-P70010 | 4.00 | 1.251 | 1.75 | N/A | SK-P70010 |
| CM-P70275 | 4.50 | 1.251 | 1.75 | N/A | SK-P70275 |
| CM-P70018 | 5.00 | 1.251 | 2.00 | N/A | SK-P70018 |
| CM-P70141 | 5.50 | 1.501 | 2.00 | N/A | SK-P70141 |
| CM-P70019 | 6.00 | 1.501 | 2.00 | N/A | SK-P70019 |
| CM-P70175 | 7.00 | 1.751 | 3.00 | 0.75 | SK-P70175 |
| CM-P70134 | 8.00 | 2.001 | 3.00 | 0.75 | SK-P70134 |



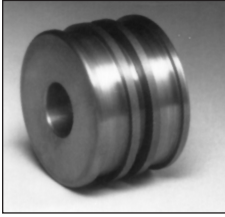
Material: 65-45-12
Ductile Iron

IT (narrow) Piston

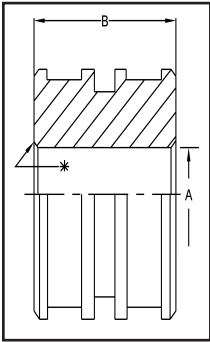


| PART NUMBER | BORE +.003" -.003" | A +.002" -.000" | B | SEAL KIT NUMBER |
|-------------|--------------------------|--------------------|------|--------------------|
| CM-P110629 | 1.500 | 0.626 | 1.12 | SK-P110629 |
| CM-P110238 | 2.000 | 0.751 | 1.25 | SK-P110238 |
| CM-P110239 | 2.500 | 0.751 | 1.25 | SK-P110239 |
| CM-P110240 | 3.000 | 0.876 | 1.25 | SK-P110240 |
| CM-P110608 | 3.250 | 1.001 | 1.25 | SK-P110608 |
| CM-P110241 | 3.500 | 1.001 | 1.25 | SK-P110241 |
| CM-P110242 | 4.000 | 1.001 | 1.25 | SK-P110242 |
| CM-P110384 | 4.500 | 1.126 | 1.50 | SK-P110384 |
| CM-P110212 | 5.000 | 1.126 | 1.50 | SK-P110212 |

MOBILE PISTONS



Material: 65-45-12
Ductile Iron

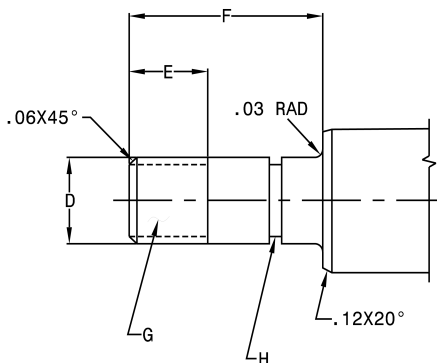


IT (wide) Piston

| IT (WIDE) PISTON | BORE $+.003''-.003''$ | A $+.002''-.000''$ | B | SEAL KIT NUMBER |
|------------------|-----------------------|--------------------|------|-----------------|
| CM-P110548 | 2.000 | 1.001 | 2.00 | SK-P110548 |
| CM-P110596 | 2.500 | 0.751 | 1.88 | SK-P110596 |
| CM-P110121 | 3.000 | 1.001 | 2.00 | SK-P110121 |
| CM-P110288 | 3.500 | 1.126 | 2.00 | SK-P110288 |
| CM-P110287 | 4.000 | 1.126 | 2.00 | SK-P110287 |
| CM-P110537 | 4.500 | 1.251 | 2.00 | SK-P110537 |
| CM-P110248 | 5.000 | 1.251 | 2.00 | SK-P110248 |
| CM-P110511 | 5.500 | 1.251 | 2.12 | SK-P110511 |
| CM-P110249 | 6.000 | 1.251 | 2.12 | SK-P110249 |
| CM-P110607 | 6.000 | 1.501 | 2.12 | SK-P110607 |
| CM-P110312 | 7.000 | 1.751 | 2.12 | SK-P110312 |
| CM-P110479 | 8.000 | 2.001 | 3.12 | SK-P110479 |
| CM-P110683 | 9.000 | 2.501 | 4.38 | SK-P110683 |
| CM-P110634 | 10.000 | 2.500 | 4.38 | SK-P110634 |

*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"

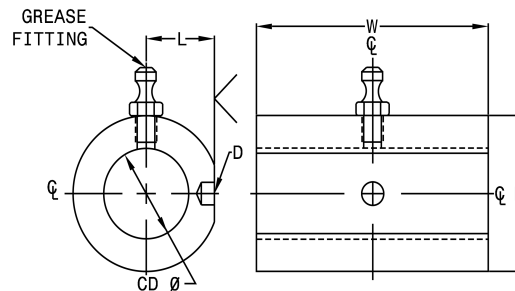
"G" = Thread Size to be determined by nut used

"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.

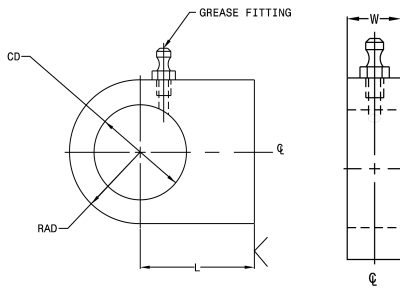
MOBILE MOUNTS

Cross Tube Mount



| PART NUMBER | CD | W | B | L | D |
|-------------|------|------|------|------|------------|
| CM-CT251015 | 1.00 | 2.50 | 1.50 | 0.69 | .250 x .09 |
| CM-CT301015 | 1.00 | 3.00 | 1.50 | 0.69 | .250 x .09 |
| CM-CT351015 | 1.00 | 3.50 | 1.50 | 0.69 | .250 x .09 |
| CM-CT401015 | 1.00 | 4.00 | 1.50 | 0.69 | .250 x .09 |
| CM-CT451015 | 1.00 | 4.50 | 1.50 | 0.69 | .250 x .09 |
| CM-CT271017 | 1.00 | 2.75 | 1.75 | 0.81 | .250 x .15 |
| CM-CT321017 | 1.00 | 3.25 | 1.75 | 0.81 | .250 x .15 |
| CM-CT371017 | 1.00 | 3.75 | 1.75 | 0.81 | .250 x .15 |
| CM-CT421017 | 1.00 | 4.25 | 1.75 | 0.81 | .250 x .15 |
| CM-CT471017 | 1.00 | 4.75 | 1.75 | 0.81 | .250 x .15 |
| CM-CT521017 | 1.00 | 5.25 | 1.75 | 0.81 | .250 x .15 |
| CM-CT271220 | 1.25 | 2.75 | 2.00 | 0.88 | .250 x .15 |
| CM-CT321220 | 1.25 | 3.25 | 2.00 | 0.88 | .250 x .15 |
| CM-CT371220 | 1.25 | 3.75 | 2.00 | 0.88 | .250 x .15 |
| CM-CT421220 | 1.25 | 4.25 | 2.00 | 0.88 | .250 x .15 |
| CM-CT471220 | 1.25 | 4.75 | 2.00 | 0.88 | .250 x .15 |
| CM-CT521220 | 1.25 | 5.25 | 2.00 | 0.88 | .250 x .15 |
| CM-CT601220 | 1.25 | 6.00 | 2.00 | 0.88 | .250 x .15 |
| CM-CT701220 | 1.25 | 7.00 | 2.00 | 0.88 | .250 x .15 |
| CM-CT301525 | 1.50 | 3.00 | 2.50 | 1.13 | .250 x .19 |
| CM-CT421525 | 1.50 | 4.25 | 2.50 | 1.13 | .250 x .19 |
| CM-CT471525 | 1.50 | 4.75 | 2.50 | 1.13 | .250 x .19 |
| CM-CT551525 | 1.50 | 5.50 | 2.50 | 1.13 | .250 x .19 |
| CM-CT601525 | 1.50 | 6.00 | 2.50 | 1.13 | .250 x .19 |
| CM-CT701525 | 1.50 | 7.00 | 2.50 | 1.13 | .250 x .19 |
| CM-CT321727 | 1.75 | 3.25 | 2.75 | 1.25 | .250 x .19 |
| CM-CT471727 | 1.75 | 4.75 | 2.75 | 1.25 | .250 x .19 |
| CM-CT551727 | 1.75 | 5.50 | 2.75 | 1.25 | .250 x .19 |
| CM-CT601727 | 1.75 | 6.00 | 2.75 | 1.25 | .250 x .19 |
| CM-CT701727 | 1.75 | 7.00 | 2.75 | 1.25 | .250 x .19 |
| CM-CT352030 | 2.00 | 3.50 | 3.00 | 1.38 | .250 x .19 |
| CM-CT472030 | 2.00 | 4.75 | 3.00 | 1.38 | .250 x .19 |
| CM-CT552030 | 2.00 | 5.50 | 3.00 | 1.38 | .250 x .19 |
| CM-CT602030 | 2.00 | 6.00 | 3.00 | 1.38 | .250 x .19 |
| CM-CT702030 | 2.00 | 7.00 | 3.00 | 1.38 | .250 x .19 |

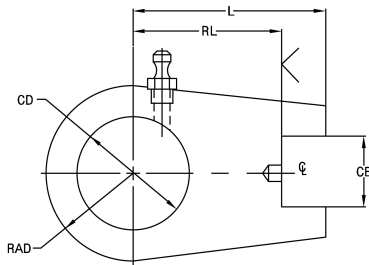
MOBILE WELDED MOUNTS



Material: 50K Min. Yield Plate

Welded Base End Spherical Mount

| PART NUMBER | CD | L | RAD | W | PIN DIAMETER | DESIGNED SPHERICAL # | MAX PULL AT YEILD |
|-------------|-------|------|------|------|--------------|----------------------|-------------------|
| CM-WBES-10 | 1.625 | 2.00 | 1.25 | 0.75 | 1.00 | SB99100 | 15,000# |
| CM-WBES-12 | 2.000 | 2.00 | 1.50 | 0.94 | 1.25 | SB99125 | 20,000# |
| CM-WBES-15 | 2.437 | 2.50 | 1.88 | 1.12 | 1.50 | SB99150 | 35,000# |
| CM-WBES-17 | 2.812 | 2.50 | 2.00 | 1.31 | 1.75 | SB99175 | 35,000# |
| CM-WBES-20 | 3.187 | 2.75 | 2.38 | 1.50 | 2.00 | SB99200 | 55,000# |
| CM-WBES-25 | 3.937 | 3.25 | 3.00 | 1.88 | 2.50 | SB99250 | 95,000# |

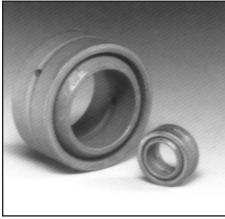


Material: 50K Min. Yield Plate

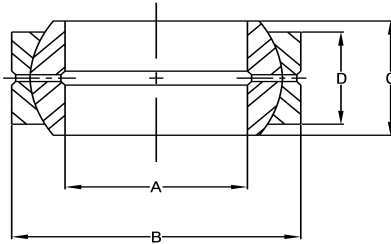
Welded Rod End Spherical Mount

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

MOBILE SPHERICAL BEARINGS



Spherical Bearing

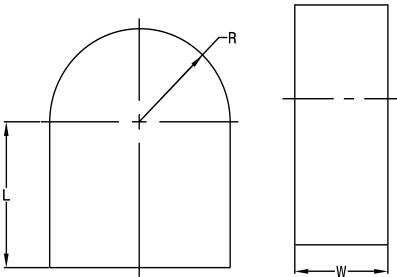


| PART NUMBER | A | B | C | D | HOUSING DIAMETER |
|-------------|---------------|---------------|-------------|-------------|------------------|
| CM-SB99062 | 0.6245/0.6250 | 1.0625/1.0620 | 0.547/0.542 | 0.469/0.464 | 1.0614/1.0622 |
| CM-SB99075 | 0.7495/0.7500 | 1.2495/1.2500 | 0.656/0.651 | 0.562/0.557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

MOBILE WELDED MOUNTS



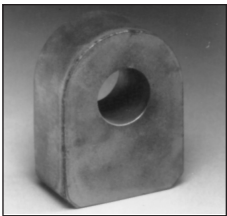
Material: A-36 Plate



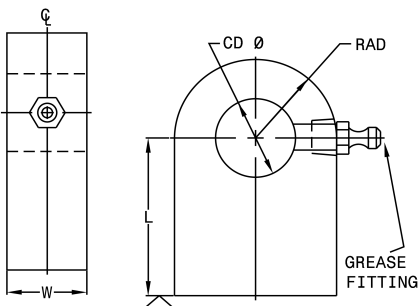
Mounting Lug

| PART NUMBER | L | R | W |
|-------------|------|------|------|
| CM-ML296 | 1.50 | 1.00 | 0.50 |
| CM-ML297 | 1.50 | 1.00 | 0.62 |
| CM-ML298 | 1.50 | 1.00 | 0.75 |
| CM-ML299 | 1.75 | 1.25 | 1.00 |
| CM-ML301 | 2.00 | 1.50 | 1.00 |
| CM-ML302 | 2.50 | 2.00 | 1.00 |
| CM-ML303 | 1.50 | 1.00 | 1.25 |
| CM-ML304 | 1.50 | 1.12 | 1.50 |
| CM-ML305 | 2.00 | 1.25 | 1.50 |
| CM-ML306 | 1.75 | 1.50 | 1.50 |
| CM-ML307 | 2.75 | 1.50 | 1.50 |
| CM-ML308 | 1.75 | 1.25 | 2.00 |
| CM-ML309 | 2.00 | 1.50 | 2.00 |
| CM-ML310 | 2.12 | 1.50 | 2.00 |
| CM-ML311 | 2.25 | 1.50 | 2.00 |
| CM-ML312 | 3.00 | 1.50 | 2.00 |
| CM-ML313 | 1.75 | 1.75 | 2.00 |
| CM-ML314 | 1.88 | 1.75 | 2.00 |
| CM-ML315 | 2.12 | 1.75 | 2.00 |
| CM-ML316 | 2.50 | 1.75 | 2.00 |
| CM-ML317 | 2.75 | 1.75 | 2.00 |
| CM-ML318 | 3.00 | 2.00 | 2.00 |
| CM-ML319 | 3.00 | 2.12 | 2.00 |
| CM-ML320 | 3.12 | 2.50 | 2.00 |
| CM-ML321 | 2.00 | 1.12 | 2.25 |
| CM-ML322 | 2.25 | 1.75 | 2.25 |
| CM-ML323 | 3.00 | 2.50 | 2.25 |
| CM-ML324 | 3.00 | 2.50 | 2.50 |
| CM-ML325 | 3.00 | 2.25 | 3.00 |
| CM-ML326 | 3.00 | 2.00 | 3.25 |

MOBILE WELDED MOUNTS



Material: A-36 Plate



Mounting Lug

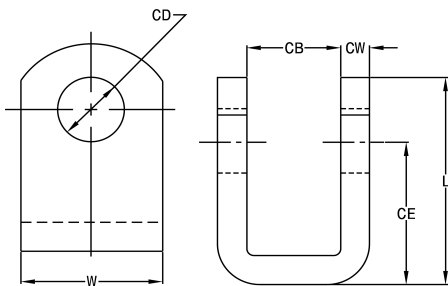
| PART NUMBER | CD | L | RAD | W | GREASE FITTING |
|-------------|------|------|------|------|----------------|
| CM-ML050100 | 1.00 | 2.00 | 1.00 | 0.50 | N/A |
| CM-ML062100 | 1.00 | 2.00 | 1.00 | 0.62 | N/A |
| CM-ML060333 | 1.00 | 2.12 | 1.00 | 0.75 | N/A |
| CM-ML100100 | 1.00 | 2.00 | 1.00 | 1.00 | N/A |
| CM-ML125100 | 1.00 | 2.00 | 1.00 | 1.25 | 1/8" NPT |
| CM-ML062125 | 1.25 | 2.50 | 1.25 | 0.62 | N/A |
| CM-ML075125 | 1.25 | 2.50 | 1.25 | 0.75 | N/A |
| CM-ML100125 | 1.25 | 2.50 | 1.25 | 1.00 | N/A |
| CM-ML150125 | 1.25 | 2.50 | 1.25 | 1.50 | 1/8" NPT |
| CM-ML200125 | 1.25 | 2.50 | 1.25 | 2.00 | 1/8" NPT |
| CM-ML062150 | 1.50 | 2.50 | 1.50 | 0.62 | N/A |
| CM-ML075150 | 1.50 | 2.50 | 1.50 | 0.75 | N/A |
| CM-ML150150 | 1.50 | 2.50 | 1.50 | 1.50 | 1/8" NPT |
| CM-ML200150 | 1.50 | 2.50 | 1.50 | 2.00 | 1/8" NPT |
| CM-ML250150 | 1.50 | 2.50 | 1.50 | 2.50 | 1/8" NPT |
| CM-ML200200 | 2.00 | 3.00 | 2.00 | 2.00 | 1/8" NPT |
| CM-ML250200 | 2.00 | 3.00 | 2.00 | 2.50 | 1/8" NPT |

MOBILE WELDED MOUNTS



Formed Clevis

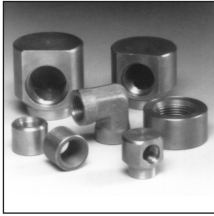
Material: 1040 HF Bar



| PART NUMBER | CB | CD | CE | CW | L | W |
|-------------|------|------|------|------|------|------|
| CM-CL3011 | 0.75 | 0.50 | 1.50 | 0.38 | 2.25 | 1.25 |
| CM-CL7337 | 1.06 | 0.75 | 2.00 | 0.38 | 3.12 | 1.75 |
| CM-CL6547 | 1.25 | 1.00 | 2.50 | 0.50 | 3.62 | 2.00 |
| CM-CL8278 | 0.88 | 1.00 | 2.93 | 0.50 | 4.06 | 2.00 |
| CM-CL323 | 1.25 | 1.00 | 5.06 | 0.38 | 6.06 | 1.75 |
| CM-B120753 | 1.50 | 1.12 | 2.12 | 0.50 | 3.25 | 2.25 |
| CM-B120625 | 1.62 | 1.25 | 2.75 | 0.75 | 4.00 | 2.50 |
| CM-80003 | 0.50 | N/A | N/A | 0.38 | 2.38 | 1.00 |
| CM-80010 | 1.12 | N/A | N/A | 0.38 | 3.50 | 2.00 |
| CM-B120829 | 1.50 | N/A | N/A | 0.50 | 3.25 | 2.50 |
| CM-80001 | 1.12 | N/A | N/A | 0.50 | 4.00 | 2.00 |
| CM-B120672 | 1.50 | N/A | N/A | 0.50 | 4.00 | 3.00 |
| CM-B120760 | 1.12 | 1.00 | 2.12 | 0.62 | 3.38 | 2.50 |
| CM-B120756 | 1.12 | N/A | N/A | 0.62 | 4.25 | 3.00 |
| CM-80015 | 1.25 | N/A | N/A | 0.62 | 4.62 | 2.50 |
| CM-B120613 | 1.62 | N/A | N/A | 0.75 | 4.00 | 2.50 |
| CM-B120614 | 2.12 | N/A | N/A | 1.00 | 5.00 | 3.00 |

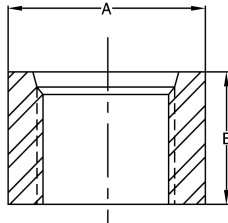
MOBILE WELDED MOUNTS

PORTS/LOCK NUTS



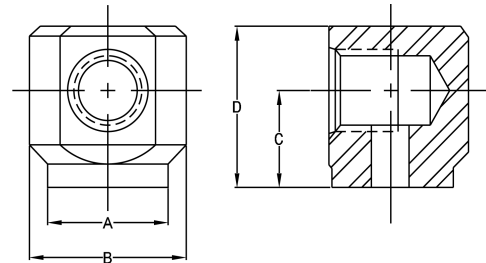
Ports

O-ring Boss Half Coupling Port



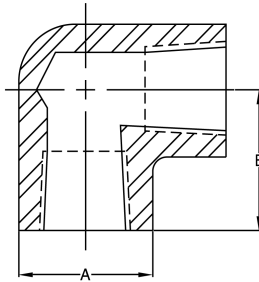
| PART NUMBER | PORT SIZE | A | B |
|-------------|-----------|------|------|
| CM-PO65304 | #4 SAE | 0.88 | 1.00 |
| CM-PO65305 | #5 SAE | 0.88 | 0.75 |
| CM-PO65306 | #6 SAE | 1.00 | 1.00 |
| CM-PO65308 | #8 SAE | 1.25 | 1.06 |
| CM-PO65310 | #10 SAE | 1.38 | 1.06 |
| CM-PO65312 | #12 SAE | 1.50 | 1.28 |
| CM-PO65314 | #14 SAE | 1.63 | 1.25 |
| CM-PO65316 | #16 SAE | 1.75 | 1.28 |
| CM-PO65320 | #20 SAE | 2.25 | 1.28 |
| CM-PO65324 | #24 SAE | 2.50 | 1.00 |

90 Degree O-ring Boss Port



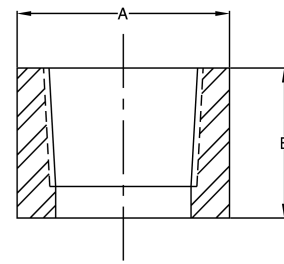
| PART NUMBER | BAR SIZE | A | B | C | D |
|-------------|----------|------|------|------|------|
| CM-PO65604 | #4 SAE | 0.75 | 1.12 | 0.75 | 1.12 |
| CM-PO65606 | #6 SAE | 0.87 | 1.25 | 0.81 | 1.25 |
| CM-PO65608 | #8 SAE | 1.25 | 1.62 | 1.00 | 1.62 |
| CM-PO65610 | #10 SAE | 1.25 | 1.75 | 1.12 | 1.88 |
| CM-PO65612 | #12 SAE | 1.50 | 2.12 | 1.19 | 2.00 |
| CM-PO65616 | #16 SAE | 1.50 | 2.25 | 1.25 | 2.38 |

90 Degree Pipe Thread Port



| PART NUMBER | PORT SIZE | A | B |
|-------------|-----------|------|------|
| CM-PO65225 | 1/4" NPT | 0.75 | 1.00 |
| CM-PO65237 | 3/8" NPT | 0.88 | 1.00 |
| CM-PO65250 | 1/2" NPT | 1.12 | 1.25 |
| CM-PO65275 | 3/4" NPT | 1.38 | 1.38 |
| CM-PO652751 | 1" NPT | 1.75 | 1.62 |

Pipe Thread Half Coupling



| PART NUMBER | PORT SIZE | A | B |
|-------------|------------|------|------|
| CM-PO65025 | 1/4" NPT | 0.88 | 1.06 |
| CM-PO65037 | 3/8" NPT | 1.00 | 1.00 |
| CM-PO65050 | 1/2" NPT | 1.25 | 1.06 |
| CM-PO65075 | 3/4" NPT | 1.50 | 1.28 |
| CM-PO65100 | 1" NPT | 1.75 | 1.28 |
| CM-PO65125 | 1-1/4" NPT | 2.25 | 1.28 |
| CM-PO65150 | 1-1/2" NPT | 2.75 | 1.28 |

MOBILE MOUNTS

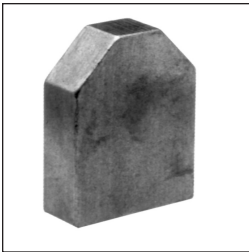
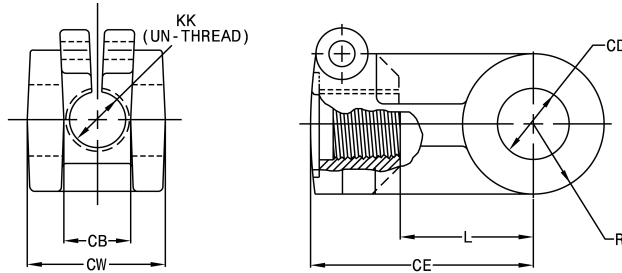


Mobile Split Clevis

| PART NUMBER | CB | CD | CE | CW | KK | L | R |
|-------------|------|------|------|------|------------|------|------|
| CM-RC10033 | 1.12 | 1.00 | 3.25 | 2.62 | 1-1/16"-12 | 2.12 | 1.00 |
| CM-RC10034 | 1.12 | 1.00 | 3.25 | 2.62 | 1-1/8"-12 | 2.12 | 1.00 |
| CM-RC10035 | 1.12 | 1.00 | 3.25 | 2.62 | 1-1/4"-12 | 2.12 | 1.00 |
| CM-RC11312 | 1.25 | 1.25 | 3.25 | 2.75 | 1-1/4"-12 | 2.12 | 1.25 |
| CM-RC11412 | 1.25 | 1.25 | 4.00 | 2.75 | 1-1/4"-12 | 2.75 | 1.25 |

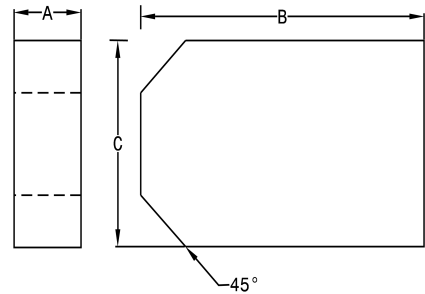
Material: Ductile Iron

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



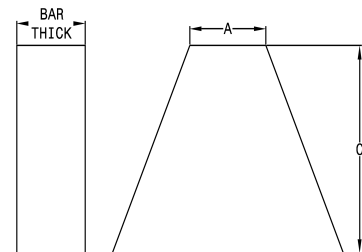
Mounting Ear

| PART NUMBER | BAR SIZE | A | B | C |
|-------------|-------------|-------|-------|-------|
| CM-ME-100 | 1/2 x 1-1/4 | 1/2 | 1-1/4 | 1 |
| CM-ME-200 | 5/8 x 2 | 5/8 | 2 | 1-1/2 |
| CM-ME-300 | 3/4 x 2-1/2 | 3/4 | 2-1/2 | 2 |
| CM-ME-400 | 1 x 3-1/2 | 1 | 3-1/2 | 2-3/4 |
| CM-ME-500 | 1-1/4 x 4 | 1-1/4 | 4 | 3-1/2 |
| CM-ME-600 | 1-1/4 x 4 | 1-1/4 | 4-1/2 | 4 |



Mounting Ear

| PART NUMBER | BAR SIZE | A | B | C |
|-------------|-------------|-------|-------|-------|
| CM-MEA-100 | 1/2 x 1-1/4 | 9/16 | 1-3/4 | 1-1/4 |
| CM-MEA-200 | 5/8 x 2 | 7/8 | 2-3/4 | 2 |
| CM-MEA-300 | 3/4 x 2-1/2 | 1-3/8 | 3-3/4 | 2-1/2 |
| CM-MEA-400 | 1 x 3-1/2 | 1-3/4 | 5 | 3-1/2 |
| CM-MEA-500 | 1-1/4 x 4 | 1-1/4 | 4 | 3-1/2 |
| CM-MEA-600 | 1-1/4 x 4 | 1-1/4 | 6-3/4 | 4-1/2 |



MOBILE MOUNTS

INDUSTRIAL MOUNTS

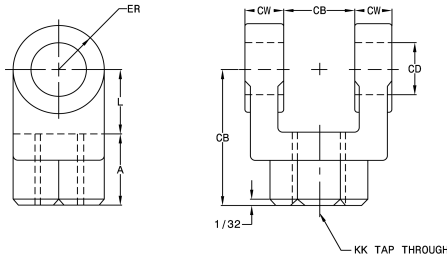
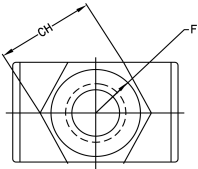


Material: 05, 07, 10
Forging 13 & Up Ductile
Iron Casting

Rod Clevis

| PART NUMBER | CB | CD | CE | CH | CW | F | L | A | KK | ER |
|-------------|-------|-------|-------|---------|-------|---------|-------|-------|-----------|-------|
| CM-RC0500 | 0.765 | 1/2 | 1-1/2 | 1 | 1/2 | 1 | 3/4 | 3/4 | 7/16"-20 | 1/2 |
| CM-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 |
| CM-RC1000 | 1.515 | 1 | 3-1/8 | 1-1/2 | 3/4 | 1-1/2 | 1-1/2 | 1-5/8 | 1"-14 | 1 |
| CM-RC1375 | 2.032 | 1-3/8 | 4-1/8 | 2 | 1 | 2 | 2-1/8 | 2 | 1-1/4"-12 | 1-3/8 |
| CM-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 |
| CM-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 |
| CM-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 |
| CM-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 |
| CM-RC3500 | 4.032 | 3-1/2 | 8-1/2 | 5 | 2 | 5 | 4 | 4-1/2 | 3-1/4"-12 | 3-1/2 |
| CM-RC4000 | 4.532 | 4 | 10 | 6-1/8 | 2-1/4 | 6-1/8 | 4-1/2 | 5-1/2 | 4"-12 | 4 |

* = Other Thread Sizes Available



INDUSTRIAL MOUNTS

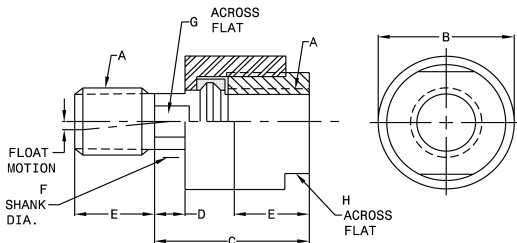


1/16 Radial Float 2°
Spherical Motion

Alignment Coupler

| ALIGNMENT COUPLER | A | B | C | D | E | F | G | H | MAX PULL YIELD |
|-------------------|-----------|-------|---------|-------|-------|-------|--------|-------|----------------|
| CM-BD-437 | 7/16"-20 | 1-1/4 | 2 | 1/2 | 3/4 | 5/8 | 1/2 | 1 | 10,000 |
| CM-BD-500 | 1/2"-20 | 1-1/4 | 2 | 1/2 | 3/4 | 5/8 | 1/2 | 1 | 14,000 |
| CM-BD-625 | 5/8"-18 | 1-1/4 | 2 | 1/2 | 3/4 | 5/8 | 1/2 | 1 | 19,000 |
| CM-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 |
| CM-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 |
| CM-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 |
| CM-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 |
| CM-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 |
| CM-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 |
| CM-BD-1875 | 1-7/8"-12 | 3-3/4 | 5-7/16 | 7/8 | 3 | 2 | 1-7/8 | 3-1/2 | 240,000 |

NOTE: Metric Thread Sizes Also Available



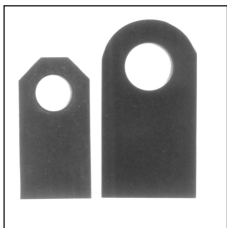
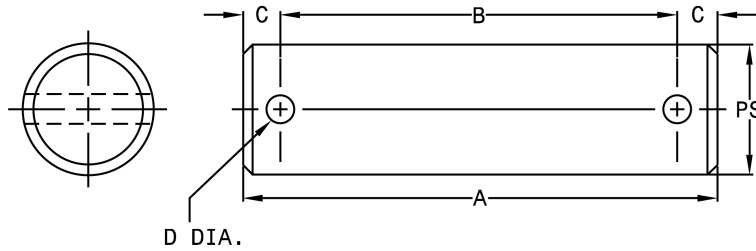
INDUSTRIAL MOUNTS



Material: 1144 Steel Nitrotec Treated Surface

Pivot Pin

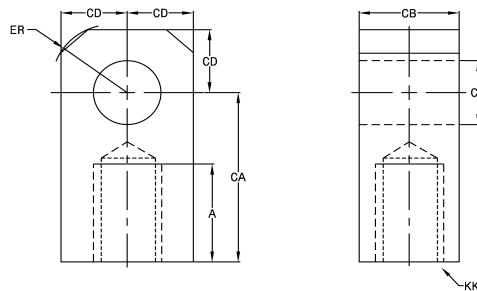
| PART NUMBER | PIN SIZE | A | B | C | D |
|-------------|----------|-------|-------|-------|-------|
| CM-PP0500 | 0.500 | 2.281 | 1.938 | 0.172 | 0.106 |
| CM-PP0750 | 0.750 | 3.094 | 2.719 | 0.188 | 0.140 |
| CM-PP1000 | 1.000 | 3.594 | 3.219 | 0.188 | 0.140 |
| CM-PP1375 | 1.375 | 4.656 | 4.250 | 0.203 | 0.173 |
| CM-PP1750 | 1.750 | 5.656 | 5.250 | 0.203 | 0.173 |
| CM-PP2000 | 2.000 | 5.719 | 5.281 | 0.219 | 0.204 |
| CM-PP2500 | 2.500 | 6.781 | 6.313 | 0.234 | 0.219 |



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

Rod Eyes

| PART NUMBER | A | CA | CB | CD | ER | KK |
|-------------|-------|---------|-------|-------|---------|-----------|
| CM-RE0500 | 3/4 | 1-1/2 | 3/4 | 1/2 | 5/8 | 7/16"-20 |
| CM-RE0750 | 1-1/8 | 2-1/16 | 1-1/4 | 3/4 | 7/8 | 3/4"-16 |
| CM-RE1000 | 1-5/8 | 2-13/16 | 1-1/2 | 1 | 1-3/16 | 1"-14 |
| CM-RE1375 | 2 | 3-7/16 | 2 | 1-3/8 | 1-9/16 | 1-1/4"-12 |
| CM-RE1750 | 2-1/4 | 4 | 2-1/2 | 1-3/4 | 2 | 1-1/2"-12 |
| CM-RE2000 | 3 | 5 | 2-1/2 | 2 | 2-1/2 | 1-7/8"-12 |
| CM-RE2500 | 3-1/2 | 5-13/16 | 3 | 2-1/2 | 2-13/16 | 2-1/4"-12 |



INDUSTRIAL MOUNTS

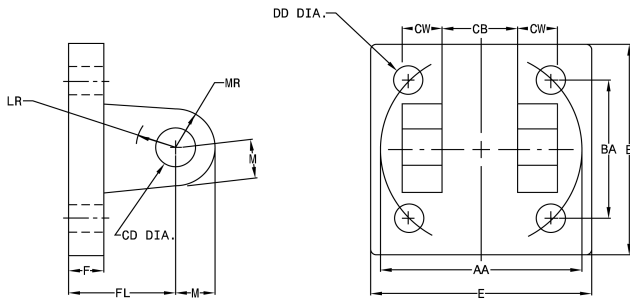
INDUSTRIAL MOUNTS



Clevis Bracket

| PART NUMBER | AA | BA | CB | CD | CW | DD | E | F | FL | LR | M | MR |
|-------------|-----|---------|-------|-------|-------|---------|-------|-----|-------|--------|-------|--------|
| CM-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 |
| CM-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 |
| CM-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 |
| CM-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 |

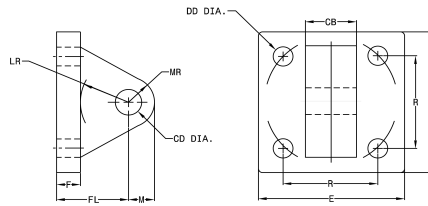
Material: Forging, Weldment, or Ductile Iron



INDUSTRIAL MOUNTS



Eye Bracket



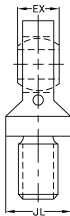
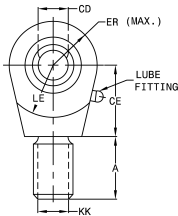
Material: Forging, Weldment, or Ductile Iron

| PART NUMBER | CB | CD | DD | E | F | FL | LR | M | MR | R |
|-------------|-------|-------|---------|--------|---------|---------|-------|-------|--------|-------|
| CM-BDEB-05 | 3/4 | 1/2 | 13/32 | 2-1/2 | 3/8 | 1-1/8 | 3/4 | 1/2 | 9/16 | 1.63 |
| CM-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 |
| CM-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 |
| CM-BDEB-13 | 2 | 1-3/8 | 21/32 | 5 | 7/8 | 3 | 2-1/8 | 1-3/8 | 1-5/8 | 3.81 |
| CM-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 |
| CM-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 |
| CM-BDEB-25 | 3 | 2-1/2 | 1-3/16 | 8-1/2 | 1 | 4 | 3 | 2-1/2 | 3 | 6.59 |
| CM-BDEB-30 | 3 | 3 | 1-5/16 | 9-1/2 | 1 | 4-1/4 | 3-1/4 | 3 | 3-1/4 | 7.50 |
| CM-BDEB-35 | 4 | 3-1/2 | 1-13/16 | 12-5/8 | 1-11/16 | 5-11/16 | 4 | 3-1/2 | 4-1/8 | 9.62 |
| CM-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 |

INDUSTRIAL MOUNTS



Spherical Rod Eye

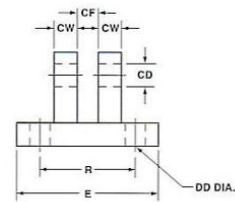
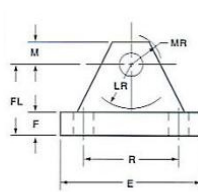


Material: Forging, Weldment, or Ductile Iron

| PART NUMBER | CD | A | CE | EX | ER | LE | KK | JL REF | LOAD CAP | SPACER WIDTH |
|-------------|-------|-------|-------|---------|---------|--------|-----------|--------|----------|--------------|
| CM-RES-05 | 0.500 | 11/16 | 7/8 | 7/16 | 7/8 | 3/4 | 7/16"-20 | 7/8 | 2,600 | 0.150 |
| CM-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 |
| CM-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 |
| CM-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 |
| CM-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 |
| CM-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 |



Spherical Clevis Brackets



Material: Steel Weldment

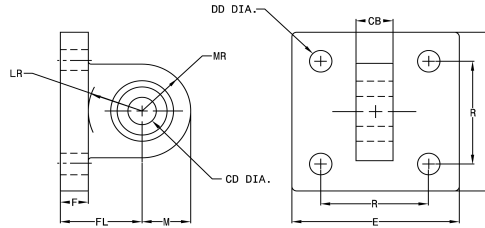
| PART NUMBER | E | F | M | R | CD | CF | CW | DD | FL | LR | MR |
|-------------|-------|------|------|------|-------|------|------|-----|------|------|------|
| CM-CBS-0500 | 3.00 | .50 | .50 | 2.05 | .500 | .44 | .50 | .41 | 1.50 | .94 | .62 |
| CM-CBS-0750 | 3.75 | .62 | .88 | 2.76 | .750 | .66 | .62 | .53 | 2.00 | 1.38 | 1.00 |
| CM-CBS-1000 | 5.50 | .75 | 1.00 | 4.10 | 1.000 | .88 | .75 | .53 | 2.50 | 1.69 | 1.19 |
| CM-CBS-1375 | 6.50 | .88 | 1.38 | 4.95 | 1.375 | 1.19 | 1.00 | .66 | 3.50 | 2.44 | 1.62 |
| CM-CBS-1750 | 8.50 | 1.25 | 1.75 | 6.58 | 1.750 | 1.53 | 1.25 | .91 | 4.50 | 2.88 | 2.06 |
| CM-CBS-2000 | 10.62 | 1.50 | 2.00 | 7.92 | 2.000 | 1.75 | 1.50 | .91 | 5.00 | 3.31 | 2.38 |

INDUSTRIAL MOUNTS



Material: Forging,
Weldment, or Ductile Iron

Spherical Eye Bracket

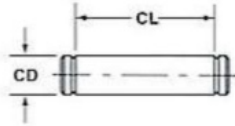


| PART NUMBER | CB | CD | DD | E | F | FL | LR | M | MR | R |
|-------------|-------|-------|-------|-------|-----|-------|-------|--------|--------|------|
| CM-BDS-07 | 3/4 | 3/4 | 17/32 | 3-1/2 | 5/8 | 1-7/8 | 1-1/4 | 1-3/16 | 1-3/16 | 2.56 |
| CM-BDS-10 | 1 | 1 | 21/32 | 4-1/2 | 3/4 | 2-1/4 | 1-1/2 | 1-3/8 | 1-3/8 | 3.25 |
| CM-BDS-13 | 1-3/8 | 1-3/8 | 21/32 | 5 | 7/8 | 3 | 2-1/8 | 2 | 2 | 3.81 |



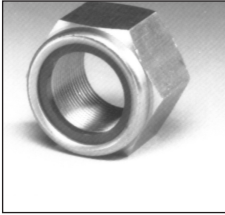
Material: CD1144

Pivot Pins for Spherical Clevis Brackets

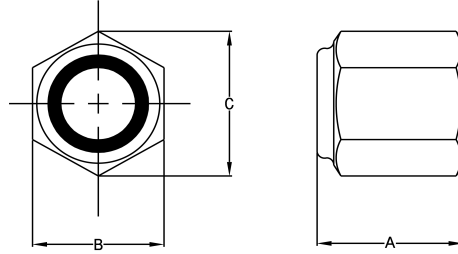


| PART NUMBER | CD | CL |
|-------------|--------------|---------|
| CM-PPS0500 | .4997-.0004 | 1 9/16 |
| CM-PPS0750 | .7497-.0005 | 2.1/32 |
| CM-PPS1000 | .9997-.0005 | 2 1/2 |
| CM-PPS1375 | 1.3746-.0006 | 3 5/16 |
| CM-PPS1750 | 1.7496-.0006 | 4 7/32 |
| CM-PPS2000 | 1.9996-.0007 | 4 15/16 |

INDUSTRIAL COUPLINGS AND NUTS



Nylon Insert Lock Nut

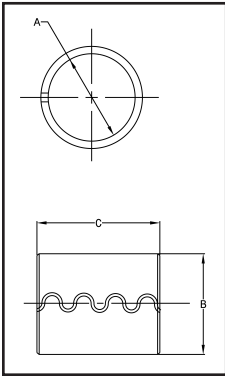


| PART NUMBER | BAR SIZE | A | B | C |
|-------------|-----------|------|------|------|
| CM-LN45050 | 1/2"-20 | 0.60 | 0.75 | 0.84 |
| CM-LN45062 | 5/8"-18 | 0.75 | 0.94 | 1.06 |
| CM-LN45075 | 3/4"-16 | 0.88 | 1.06 | 1.19 |
| CM-LN45087 | 7/8"-14 | 1.00 | 1.25 | 1.40 |
| CM-LN45100 | 1"-14 | 1.06 | 1.44 | 1.62 |
| CM-LN45101 | 1"-14 | 0.88 | 1.62 | 1.83 |
| CM-LN45112 | 1-1/8"-12 | 1.19 | 1.62 | 1.83 |
| CM-LN45126 | 1-1/4"-12 | 1.38 | 1.81 | 2.06 |
| CM-LN45151 | 1-1/2"-12 | 1.62 | 2.19 | 2.44 |
| CM-LN45152 | 1-1/2"-12 | 0.81 | 2.19 | 2.44 |
| CM-LN45175 | 1-3/4"-12 | 1.50 | 2.75 | 3.06 |
| CM-LN45200 | 2"-12 | 1.62 | 3.12 | 3.50 |
| CM-LN45225 | 2-1/4"-12 | 1.94 | 3.50 | 3.94 |
| CM-LN45226 | 2-1/4"-12 | 2.81 | 3.50 | 3.94 |
| CM-LN45250 | 2-1/2"-12 | 2.25 | 4.00 | 4.60 |

SPLIT TENSION BUSHINGS/PLUGS/VENTS



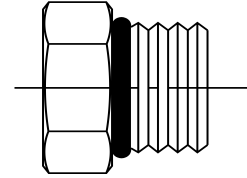
Material: Hardened Spring Steel



Split Tension Bushing

| PART NUMBER | A | B | C | HOUSING DIAMETER |
|-------------|------|------|------|------------------|
| CM-99507 | 0.75 | 1.00 | 2.00 | 1.002/1.006 |
| CM-99508 | 0.88 | 1.00 | 2.00 | 1.002/1.006 |
| CM-99510 | 1.00 | 1.25 | 0.75 | 1.252/1.256 |
| CM-99514 | 1.00 | 1.25 | 0.88 | 1.252/1.256 |
| CM-99511 | 1.00 | 1.25 | 1.00 | 1.252/1.256 |
| CM-99513 | 1.00 | 1.25 | 1.25 | 1.252/1.256 |
| CM-99512 | 1.00 | 1.25 | 1.50 | 1.252/1.256 |
| CM-99519 | 1.25 | 1.50 | 1.25 | 1.502/1.506 |
| CM-99522 | 1.25 | 1.50 | 1.50 | 1.502/1.506 |
| CM-99521 | 1.25 | 1.50 | 2.00 | 1.502/1.506 |
| CM-99531 | 1.50 | 1.75 | 1.50 | 1.752/1.756 |
| CM-99533 | 1.50 | 1.75 | 2.00 | 1.752/1.756 |
| CM-99535 | 1.50 | 1.75 | 3.00 | 1.752/1.756 |
| CM-99534 | 1.50 | 1.88 | 2.00 | 1.877/1.881 |
| CM-995335 | 1.50 | 1.75 | 2.50 | 1.752/1.756 |
| CM-99537 | 1.50 | 2.00 | 1.25 | 2.002/2.006 |
| CM-995371 | 1.50 | 2.00 | 2.00 | 2.002/2.006 |
| CM-99540 | 1.75 | 2.00 | 1.25 | 2.002/2.006 |
| CM-995375 | 1.75 | 2.00 | 1.50 | 2.002/2.006 |
| CM-99538 | 1.75 | 2.00 | 2.00 | 2.002/2.006 |
| CM-99539 | 1.75 | 2.00 | 2.25 | 2.002/2.006 |
| CM-995410 | 1.75 | 2.00 | 3.00 | 2.002/2.006 |
| CM-99541 | 1.75 | 2.25 | 2.00 | 2.252/2.256 |
| CM-99546 | 2.00 | 2.38 | 3.00 | 2.377/2.381 |
| CM-99549 | 2.00 | 2.25 | 1.50 | 2.252/2.256 |
| CM-99550 | 2.00 | 2.25 | 2.50 | 2.252/2.256 |
| CM-99547 | 2.00 | 2.50 | 2.00 | 2.502/2.506 |
| CM-99545 | 2.00 | 2.50 | 2.50 | 2.502/2.506 |
| CM-99556 | 2.50 | 3.00 | 2.00 | 3.002/3.006 |
| CM-99557 | 2.50 | 3.00 | 3.00 | 3.002/3.006 |
| CM-99565 | 3.00 | 3.50 | 2.50 | 3.502/3.506 |

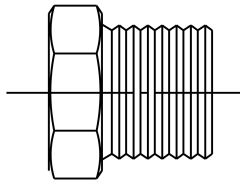
Steel Plug (O-Ring Boss)



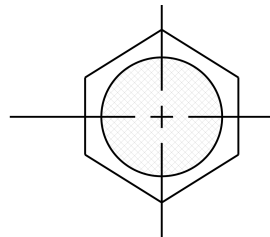
| PART NUMBER | PORT SIZE |
|-------------|-----------|
| CM-74004 | #4 SAE |
| CM-74005 | #5 SAE |
| CM-74006 | #6 SAE |
| CM-74008 | #8 SAE |
| CM-74010 | #10 SAE |
| CM-74012 | #12 SAE |
| CM-74014 | #14 SAE |
| CM-74016 | #16 SAE |
| CM-74020 | #20 SAE |

SPLIT TENSION BUSHING/PLUGS/VENTS

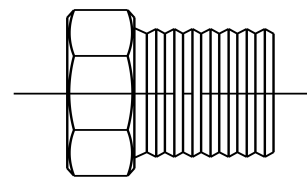
NPT Air Vent



| PART NUMBER | PORT SIZE |
|-------------|-----------|
| CM-77002 | 1/8" NPT |
| CM-77004 | 1/4" NPT |
| CM-77006 | 3/8" NPT |
| CM-77008 | 1/2" NPT |
| CM-77010 | 3/4" NPT |



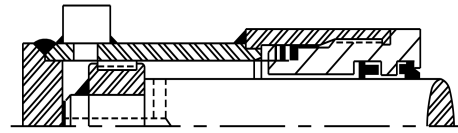
NPT Steel Plug



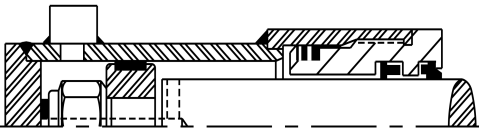
| PART NUMBER | PORT SIZE |
|-------------|------------|
| CM-74112 | 1/8" NPT |
| CM-74125 | 1/4" NPT |
| CM-74137 | 3/8" NPT |
| CM-74150 | 1/2" NPT |
| CM-74175 | 3/4" NPT |
| CM-74199 | 1" NPT |
| CM-74200 | 1-1/4" NPT |

DISPLACEMENT CYLINDER COMPONENTS

Displacement Cylinder Components



WELDED STYLE PISTON

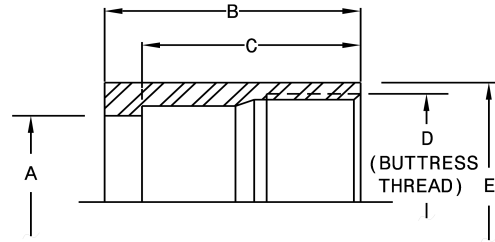


LOCK NUT STYLE PISTON

| 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 HEADS PAGE

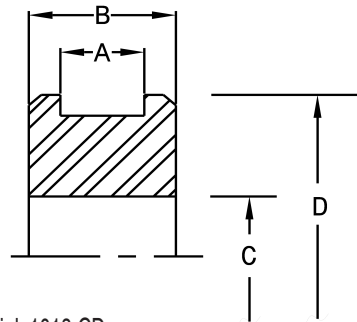
Collar



Material: 1026 DOM

| PART NUMBER | A | B | C | D | E |
|-------------|-------|------|------|-----------|------|
| CM-C132392 | 2.311 | 2.44 | 2.06 | 2-3/4"-12 | 3.00 |
| CM-C132463 | 2.940 | 2.38 | 2.12 | 3-1/4"-12 | 3.50 |
| CM-C132464 | 3.436 | 2.50 | 2.25 | 3-3/4"-12 | 4.00 |
| CM-C132454 | 3.940 | 2.50 | 2.25 | 4-1/4"-12 | 4.50 |

Piston

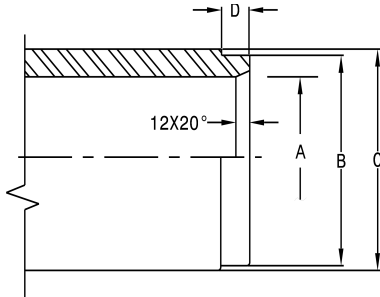


Material: 1018 CD

| PART NUMBER | A | B | C | D | E |
|-------------|------|------|-------|------|------------|
| CM-P110539 | 0.50 | 0.75 | 0.876 | 1.95 | SK-P110539 |
| CM-P110540 | 0.50 | 0.75 | 1.126 | 2.45 | SK-P110540 |
| CM-P110541 | 0.75 | 1.12 | 1.501 | 2.95 | SK-P110541 |
| CM-P110542 | 0.75 | 1.12 | 1.751 | 3.45 | SK-P110542 |
| CM-P110543 | 0.75 | 1.12 | 2.501 | 3.95 | SK-P110543 |

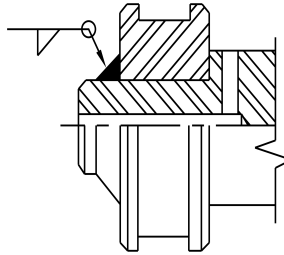
DISPLACEMENT CYLINDER TECHNICAL INFORMATION

Barrel Machining



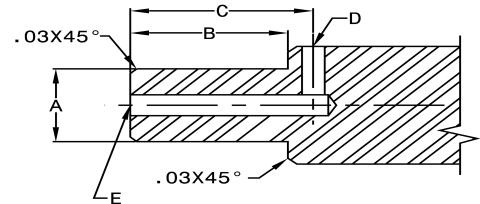
| COLLAR NUMBER | A +.003" -.003 | B +.001" -.001 | C | D |
|---------------|----------------------|----------------------|------|------|
| C132392 | 2.000 | 2.308 | 2.50 | 0.38 |
| C132463 | 2.500 | 2.937 | 3.00 | 0.25 |
| C132464 | 3.000 | 3.433 | 3.50 | 0.25 |
| C132454 | 3.500 | 3.937 | 4.00 | 0.25 |
| C132465 | 4.000 | 4.433 | 4.50 | 0.25 |

Piston Welding



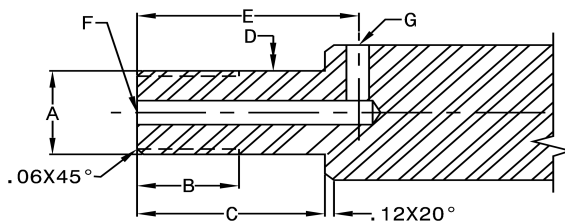
| PISTON NUMBER | WELD SIZE |
|---------------|-----------|
| P110539 | 1/4" |
| P110540 | 1/4" |
| C110541 | 5/16" |
| C110542 | 3/8" |
| C110543 | 3/8" |

Stub (Welded Style)



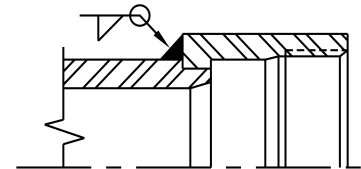
| PISTON NUMBER | A +.001" -.001 | B | C | D Dia. Drill x Depth | E Dia. Drill x Depth |
|---------------|----------------------|------|------|----------------------------|----------------------------|
| P110539 | 0.874 | 1.12 | 1.31 | 0.25 x 0.75 | 0.25 x 1.44 |
| P110540 | 1.124 | 1.12 | 1.38 | 0.31 x 1.00 | 0.31 x 1.50 |
| C110541 | 1.499 | 1.56 | 1.81 | 0.31 x 1.25 | 0.31 x 2.00 |
| C110542 | 1.749 | 1.62 | 1.88 | 0.38 x 1.50 | 0.38 x 2.00 |
| 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 |
|---------------|-------------|------|------|---------------------|------|----------------------------|----------------------------|-----------------|
| P110539 | 7/8"-14 | 1.25 | 1.88 | 0.874 | 2.12 | 0.25 x 2.25 | 0.25 x 0.75 | LN45087 |
| P110540 | 1-1/8"-12 | 1.44 | 2.06 | 1.124 | 2.38 | 0.31 x 2.56 | 0.31 x 1.00 | LN45112 |
| C110541 | 1-1/2"-12 | 1.88 | 2.88 | 1.499 | 3.19 | 0.31 x 3.38 | 0.31 x 1.25 | LN45151 |
| C110542 | 1-3/4"-12 | 1.75 | 2.75 | 1.749 | 3.06 | 0.38 x 3.31 | 0.31 x 1.50 | LN45175 |

Collar Welding

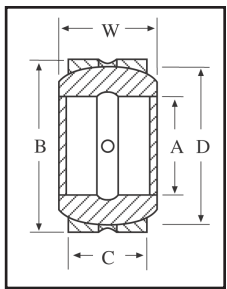


| COLLAR NUMBER | WELD SIZE |
|---------------|-----------|
| C132392 | 1/4" |
| C132463 | 1/4" |
| C132464 | 1/4" |
| C132454 | 1/4" |
| C132465 | 5/16" |

ACCESSORIES

Self Aligning Bearings

Inch



| PART NUMBER | A | B | W | C | D |
|-------------|-------|-------|-------|-------|-------|
| HH008ES | 1/2 | .875 | .437 | .375 | .709 |
| HH010ES | 5/8 | 1.062 | .547 | .469 | .899 |
| HH012ES | 3/4 | 1.250 | .656 | .562 | 1.803 |
| HH014ES | 7/8 | 1.438 | .765 | .656 | 1.260 |
| HH100ES | 1 | 1.625 | .875 | .750 | 1.417 |
| HH104ES | 1-1/4 | 2.000 | 1.093 | .937 | 1.772 |
| HH106ES | 1-3/8 | 2.187 | 1.187 | 1.031 | 1.929 |
| HH108ES | 1-1/2 | 2.438 | 1.312 | 1.125 | 2.165 |
| HH108ES2RS | 1-1/2 | 2.438 | 1.312 | 1.125 | 2.165 |
| HH112ES | 1-3/4 | 2.812 | 1.531 | 1.312 | 2.520 |
| HH112ES2RS | 1-3/4 | 2.812 | 1.531 | 1.312 | 2.520 |
| HH200ES | 2 | 3.187 | 1.750 | 1.500 | 2.874 |
| HH200ES2RS | 2 | 3.187 | 1.750 | 1.500 | 2.874 |
| HH204ES | 2-1/4 | 3.562 | 1.969 | 1.687 | 3.228 |
| HH204ES2RS | 2-1/4 | 3.562 | 1.969 | 1.687 | 3.228 |
| HH208ES | 2-1/2 | 3.937 | 2.187 | 1.875 | 3.583 |
| HH208ES2RS | 2-1/2 | 3.937 | 2.187 | 1.875 | 3.583 |
| HH212ES | 2-3/4 | 4.375 | 2.406 | 2.062 | 3.937 |
| HH212ES2RS | 2-3/4 | 4.375 | 2.406 | 2.062 | 3.937 |
| HH300ES | 3 | 4.750 | 2.625 | 2.250 | 4.331 |
| HH300ES2RS | 3 | 4.750 | 2.625 | 2.250 | 4.331 |
| HH304ES | 3-1/4 | 5.125 | 2.844 | 2.437 | 4.685 |
| HH308ES | 3-1/2 | 5.500 | 3.062 | 2.625 | 5.039 |
| HH308ES2RS | 3-1/2 | 5.500 | 3.062 | 2.625 | 5.039 |
| HH312ES | 3-3/4 | 5.875 | 3.281 | 2.812 | 5.394 |
| HH400ES | 4 | 6.250 | 3.500 | 3.000 | 5.748 |
| HH400ES2RS | 4 | 6.250 | 3.500 | 3.000 | 5.748 |
| HH408ES | 4-1/2 | 7.000 | 3.937 | 3.375 | 6.457 |
| HH500ES | 5 | 7.750 | 4.375 | 3.750 | 7.205 |
| HH600ES | 6 | 8.750 | 4.750 | 4.125 | 8.150 |

Metric

| Part Number | A | B | W | C | D |
|-------------|----|-----|----|----|------|
| MHH20ES | 20 | 35 | 16 | 12 | 29 |
| MHH20ES2RS | 20 | 35 | 16 | 12 | 29 |
| MHH25ES | 25 | 42 | 20 | 16 | 35.5 |
| MHH25ES2RS | 25 | 42 | 20 | 16 | 35.5 |
| MHH30ES | 30 | 47 | 22 | 18 | 40.7 |
| MHH30ES2RS | 30 | 47 | 22 | 18 | 40.7 |
| MHH35ES | 35 | 55 | 25 | 20 | 47 |
| MHH35ES2RS | 35 | 55 | 25 | 20 | 47 |
| MHH40ES | 40 | 62 | 28 | 22 | 53 |
| MHH40ES2RS | 40 | 62 | 28 | 22 | 53 |
| MHH45ES2RS | 45 | 68 | 32 | 25 | 60 |
| MHH50ES | 50 | 75 | 35 | 28 | 66 |
| MHH50ES2RS | 50 | 75 | 35 | 28 | 66 |
| MHH60ES | 60 | 90 | 44 | 36 | 80 |
| MHH70ES | 70 | 105 | 49 | 40 | 92 |
| MHH70ES2RS | 70 | 105 | 49 | 30 | 92 |
| MHH80ES | 80 | 120 | 55 | 45 | 105 |

ACCESSORIES

ACCESSORIES



SPECIFICATIONS:

- Black epox 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 70⁷/lb (7.9Nm)

Fluid Level Gauges



| PART NUMBER | DESCRIPTION |
|------------------|---|
| STF-SNA076BS0-10 | FLUID LEVEL GAUGE 3" long without thermometer |
| STF-SNA076BST-10 | FLUID LEVEL GAUGE 3" long with thermometer |
| STF-SNA127BST-12 | FLUID LEVEL GAUGE 5" long with thermometer |
| STF-SNA127BN012 | FLUID LEVEL GAUGE 5" long without thermometer |

SPECIFICATIONS:

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

Filler Breather



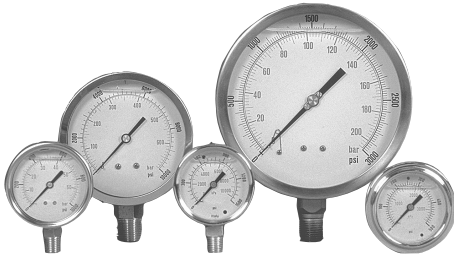
| PART NUMBER | DESCRIPTION | |
|-------------------|-----------------|--|
| STF-SES6-P-40-N06 | FILLER BREATHER | WEATHER PROOFED MINI 40 MICRON 3/8" NPT |
| STF-SES3-P-40-S80 | FILLER BREATHER | WEATHER PROOFED 40 MICRON 80MM LONG BASKET |
| STF-SES3-40-S80 | FILLER BREATHER | 40 MICRON 80MM LONG BASKET |
| STF-SES3L-40-S80 | FILLER BREATHER | LOCKING TAB 40 MICRON 80MM LONG BASKET |
| STF-SES3-40-S150 | FILLER BREATHER | 40 MICRON 150MM LONG BASKET |
| STF-SES6-40-N04 | FILLER BREATHER | MINI 40 MICRON 1/4" NPT |
| STF-SES6-40-N06 | FILLER BREATHER | MINI 40 MICRON 3/8" NPT |
| STF-SES5-40-N12 | FILLER BREATHER | 40 MICRON 3/4" NPT |

NOTE*(ABOVE FILLER BREATHERS ARE CHROME PLATED THAT ARE NOT WEATHER PROOFED)

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 |
|--------------------|--|
| STF-SPG-63-3030S | PRESSURE GAUGE 2.5" 30" HG - 30 PSI BOTTOM MOUNT |
| STF-SPG-63-100S | PRESSURE GAUGE 2.5" 100 PSI BOTTOM MOUNT |
| STF-SPG-63-160S | PRESSURE GAUGE 2.5" 160 PSI BOTTOM MOUNT |
| STF-SPG-63-500S | PRESSURE GAUGE 2.5" 500 PSI BOTTOM MOUNT |
| STF-SPG-63-600S | PRESSURE GAUGE 2.5" 600 PSI BOTTOM MOUNT |
| STF-SPG-63-1000S | PRESSURE GAUGE 2.5" 1,000 PSI BOTTOM MOUNT |
| STF-SPG-63-1500S | PRESSURE GAUGE 2.5" 1,500 PSI BOTTOM MOUNT |
| STF-SPG-63-2000S | PRESSURE GAUGE 2.5" 2,000 PSI BOTTOM MOUNT |
| STF-SPG-63-3000S | PRESSURE GAUGE 2.5" 3,000 PSI BOTTOM MOUNT |
| STF-SPG-63-5000S | PRESSURE GAUGE 2.5" 5,000 PSI BOTTOM MOUNT |
| STF-SPG-63-6000S | PRESSURE GAUGE 2.5" 6,000 PSI BOTTOM MOUNT |
| STF-SPG-63-10000S | PRESSURE GAUGE 2.5" 10,000 PSI BOTTOM MOUNT |
| STF-SPG-63-3000P-U | PRESSURE GAUGE 2.5" 3,000 PSI PANEL MOUNT |
| STF-SPG-63-300S | PRESSURE GAUGE 2.5" 300 PSI BOTTOM MOUNT |
| STF-SPG-63-5000P-U | PRESSURE GAUGE 2.5" 5,000 PSI PANEL MOUNT |
| STF-SPG-100-300P-U | PRESSURE GAUGE 4" 300 PSI PANEL MOUNT |
| STF-SPG-100-10000S | PRESSURE GAUGE 4" 10,000 PSI BOTTOM MOUNT |

* 1/4" NPT

O-RING KITS

O-RING KIT

Part Number: 568 Kit-A

| PART NUMBER | QTY | PART NUMBER | QTY |
|-------------|-----|-------------|-----|
| 006-012 | 20 | 210-222 | 10 |
| 110-116 | 13 | 325-327 | 7 |

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



O-RING METRIC KIT

Part Number: Metric O Kit-J-A

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

The Metric O-Kit J-A contains a total of 389 O-Rings in 30 different sizes, another extremely low cost per size value.



O-RING KITS

U.S. INDUSTRIAL O-RING KIT

Part Number: 568 Kit

| PART NUMBER | QTY | PART NUMBER | QTY |
|-------------|-----|-------------|-----|
| 005-011 | 25 | 111-116 | 10 |
| 012 | 15 | 117-121 | 7 |
| 013-018 | 10 | 210-211 | 10 |
| 110 | 15 | 212-219 | 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 WAREHOUSE KIT

Part Number: Quad-Ring WH Kit

| PART NUMBER | QTY | PART NUMBER | QTY |
|-------------|-----|-------------|-----|
| QR-4004-012 | 10 | QR-4125-135 | 3 |
| QR-4013-030 | 5 | QR-4136-154 | 2 |
| QR-4031-038 | 3 | QR-4204-216 | 5 |
| QR-4039-048 | 2 | QR-4217-229 | 3 |
| QR-4108-116 | 10 | QR-4230-338 | 2 |
| QR-4117-124 | 5 | | |

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.



ASSORTMENT KITS AND TOOLS

O-RING KITS

O-RING WAREHOUSE KIT

Part Number: 568 WH Kit

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

Our 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. 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: 568 WH Kit-90D

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



O-RING KITS

90 DUROMETER O-RING KIT

Part Number: 568 90D Kit

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

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



SAE 900 O-RING BOSS KIT

Part Number: 900 Boss Kit

| PART NUMBER | QTY | SAE PORT SIZE | PART NUMBER | QTY | SAE PORT SIZE |
|-------------|-----|---------------|-------------|-----|---------------|
| 568-904 | 35 | -4 | 568-910 | 20 | -10 |
| 568-905 | 30 | -5 | 568-911 | 15 | -11 |
| 568-906 | 30 | -6 | 568-912 | 15 | -12 |
| 568-907 | 20 | -7 | 568-913 | 15 | -13 |
| 568-908 | 20 | -8 | 568-914 | 15 | -14 |
| 568-909 | 20 | -9 | 568-916 | 15 | -16 |

This 250 piece assortment contains the most popular size 90 Durometer Boss O-rings in 12 different fitting sizes, individually separated, which will supply your shop, service truck, or parts counter with the sizes you need!

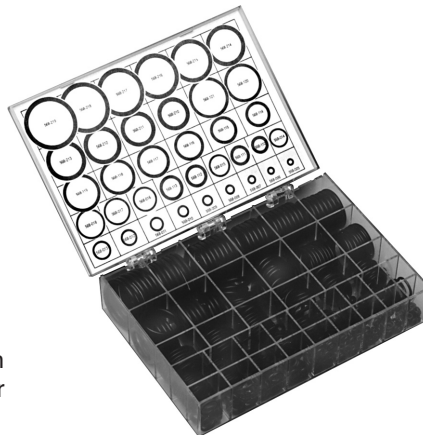


FLUOROCARBON O-RING KIT

Part Number: 568 FC Kit

| PART NUMBER | QTY | PART NUMBER | QTY |
|-------------|-----|-------------|-----|
| 005-011V | 25 | 111-116V | 10 |
| 012V | 15 | 117-121V | 7 |
| 013-018V | 10 | 210-211V | 10 |
| 110V | 15 | 212-219V | 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.



ASSORTMENT KITS AND TOOLS

O-RING KITS

MAX O-RING KIT

Part Number:
MAX 1381 Kit

Part Number:
MAX 1381 Kit-90D

These sturdy kits, packaged in a heavy duty box, contains 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

| FLANGE NUMBER | QTY | FLANGE NUMBER | QTY |
|---------------|-----|---------------|-----|
| 8 | 10 | 20 | 5 |
| 12 | 10 | 24 | 5 |
| 16 | 10 | 32 | 5 |

Boss O-Rings

| BOSS NUMBER | QTY | BOSS NUMBER | QTY |
|-------------|-----|-------------|-----|
| 903 | 15 | 907 | 25 |
| 904 | 25 | 910 | 25 |
| 906 | 15 | 912 | 15 |
| 908 | 25 | 916 | 10 |

1/16" C/S O-Rings

| O-RING NUMBER | QTY | O-RING NUMBER | QTY |
|---------------|-----|---------------|-----|
| 006 - 118 | 25 | 028 | 15 |
| 019 - 021 | 20 | 029 | 10 |
| 022 - 026 | 15 | 030 | 10 |



3/32" C/S O-Rings

| O-RING NUMBER | QTY | O-RING NUMBER | QTY |
|---------------|-----|---------------|-----|
| 109 - 118 | 25 | 129 | 10 |
| 119 - 120 | 20 | 131 | 10 |
| 121 - 127 | 15 | 133 | 10 |
| 128 | 10 | 135 | 5 |

1/8" C/S O-Rings

| O-RING NUMBER | QTY | O-RING NUMBER | QTY |
|---------------|-----|---------------|-----|
| 210 - 214 | 20 | 228 | 10 |
| 215 - 222 | 15 | 232 | 10 |
| 223 - 224 | 10 | 236 | 10 |
| 226 | 10 | | |

O-RING KITS

SAE 900 O-RING BOSS FLUOROCARBON KIT

Part Number: 900 Boss FC

| PART NUMBER | QTY | SAE PORT SIZE | PART NUMBER | QTY | SAE PORT SIZE |
|-------------|-----|---------------|-------------|-----|---------------|
| 568-904V | 35 | -4 | 568-910V | 20 | -10 |
| 568-905V | 30 | -5 | 568-911V | 15 | -11 |
| 568-906V | 30 | -6 | 568-912V | 15 | -12 |
| 568-907V | 20 | -7 | 568-913V | 15 | -13 |
| 568-908V | 20 | -8 | 568-914V | 15 | -14 |
| 568-909V | 20 | -9 | 568-916V | 15 | -16 |



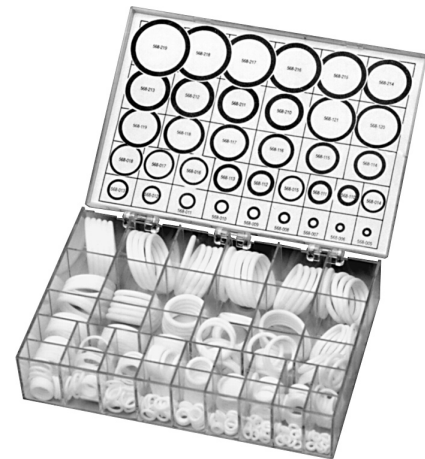
This 250 piece assortment contains the most popular size 90 Durometer Viton™ Boss O-rings in 12 different fitting sizes, individually separated, which will supply your shop, service truck, or parts counter with the sizes you need!

PTFE O-RING KIT

Part Number: 568 PTFE Kit

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.

| PART NUMBER | QTY |
|-------------|-----|
| 005-012T | 15 |
| 013-018T | 10 |
| 110-116T | 10 |
| 117-121T | 5 |
| 210-219T | 5 |



QUAD RING KIT

Part Number: Quad-Ring Kit

| PART NUMBER | QTY | PART NUMBER | QTY |
|-------------|-----|-------------|-----|
| 4005-4012 | 10 | 4110-4116 | 6 |
| 4013-4016 | 6 | 4117-4121 | 4 |
| 4017-4018 | 5 | 4210-4219 | 5 |

This kit contains a total of 226 Quad Seals in 36 different sizes, providing an extremely low cost per size value.



O-RING KITS

O-RING FACE KIT

Part Number: 568 Face Kit

| PART NUMBER | QTY | PART NUMBER | QTY |
|-------------|-----|-------------|-----|
| 011-90D | 25 | 018-90D | 20 |
| 012-90D | 25 | 021-90D | 15 |
| 014-90D | 25 | 025-90D | 10 |
| 016-90D | 25 | 029-90D | 10 |

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



O-RING FLANGE KIT

Part Number: 568 Flange Kit

| PART NUMBER | QTY | PART NUMBER | QTY |
|-------------|-----|-------------|-----|
| 210-90D | 10 | 225-90D | 10 |
| 214-90D | 10 | 228-90D | 10 |
| 219-90D | 10 | 232-90D | 10 |
| 222-90D | 10 | | |

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



SPLIT FLANGE SEAL KIT

Part Number: SFS Kit

| PART NUMBER | QTY | PART NUMBER | QTY |
|-------------|-----|-------------|-----|
| SFS-8 | 5 | SFS-24 | 5 |
| SFS-12 | 5 | SFS-32 | 5 |
| SFS-16 | 5 | SFS-40 | 5 |
| SFS-20 | 5 | | |

This kit contains 35 Split Flange Seals in 7 popular sizes.

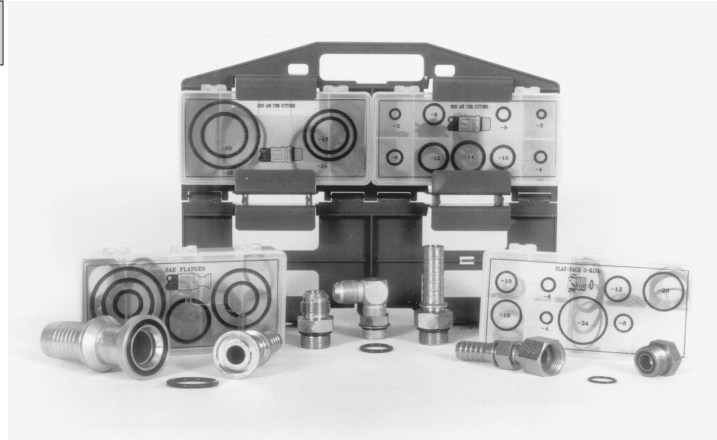


O-RING KITS

HOSE END & ADAPTER KIT

Part Number: O-R Fitting Kit

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.



HOSE END & ADAPTER KIT PARTS

SAE FLANGE SEALS

Part Number: SAE Flange Seals

| SAE PORT SIZE | 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 |

FLAT FACE SEALS

Part Number: Flat Face O-Rings

| PORT SIZE | 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 |

SAE O-RING BOSS & TUBE SEALS

Part Number: Boss & Tube Fittings-1

Part Number: Boss & Tube Fittings-2

| SAE PORT SIZE | PART NUMBER | QTY | SAE PORT SIZE | PART NUMBER | QTY |
|---------------|-------------|-----|---------------|-------------|-----|
| -2 | 568-902 | 8 | -12 | 568-912 | 8 |
| -3 | 568-903 | 8 | -14 | 568-914 | 8 |
| -4 | 568-904 | 8 | -16 | 568-916 | 8 |
| -5 | 568-905 | 8 | -20 | 568-920 | 8 |
| -6 | 568-906 | 8 | -24 | 568-924 | 8 |
| -8 | 568-908 | 8 | -32 | 568-932 | 8 |
| -10 | 568-910 | 8 | | | |

O-RING KITS

COMMON JAPANESE SIZES O-RINGS IN 70 DUROMETER

Part Number: **Metric O Kit-J**



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

| 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 |

COMMON JAPANESE SIZES O-RINGS IN 90 DUROMETER

Part Number: **Metric O Kit-J-90D**



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

| 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 |

O-RING KITS

COMMON EUROPEAN SIZES O-RINGS IN 70 DUROMETER

Part Number: Metric O Kit-E

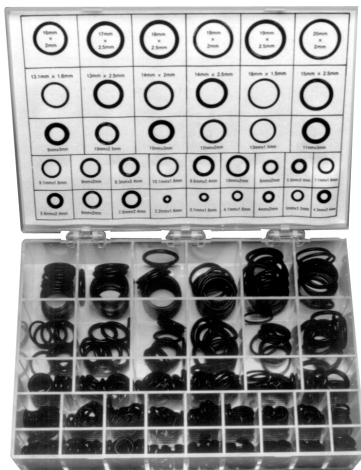


This 500 piece kit contains the most popular European metric O-ring sizes.

| 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 |

COMMON EUROPEAN SIZES O-RINGS IN 90 DUROMETER

Part Number: Metric O Kit-E-90D



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

| 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 |

O-RING SPLICE KITS

O-RING SPLICE KIT INCH SIZES

Part Number: 568 Splice Kit

Kit Contains:

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

Replacement Parts

Parts:

#568 Splice Tool
#568 Adhesive
70 Duro. Cord



O-RING SPLICE KIT INCH & METRIC SIZES

Part Number: Met/Inch Splice Kit

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)

1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 5.7, 8.4



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: 568 FC Splice Kit

Kit Contains:

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

Replacement Parts

Parts:

#568 Splice Tool
#568 Adhesive
75 Duro. Fluorocarbon Cord



BACK-UP RING KITS

574 BACK-UP RING KIT

Part Number: 574 Kit

| 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: 575 Kit

| 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.

BACK-UP RING KITS

PTFE BACK-UP RING KIT

Part Number: 575 PTFE Kit S

| 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.

STYLE 870 KIT

Part Number: 870 TRI-Kit

The 870 Tri-Kit is packaged in three sturdy cases that contain 180 U-Cups. The U-Cups conform to AN-6226 size standards in 36 popular sizes ranging from 1/8" to 1-1/8" inside diameter. All of the seals are molded from 70A Durometer Buna-N rubber.



RETAINER RING KITS

Each kit has an assortment of retainer rings (Tru-arc, Eaton, or spiral wound style) packed in a reusable plastic box. All rings are made in the USA from carbon spring steel.

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

TRU-ARC

Part Number: 300-310 Kit

| PART NUMBER | QTY. | PART NUMBER | QTY. |
|-------------|------|-------------|------|
| 300-050 | 12 | 310-050 | 12 |
| 300-062 | 12 | 310-062 | 12 |
| 300-075 | 12 | 310-075 | 12 |
| 300-087 | 12 | 310-087 | 12 |
| 300-100 | 12 | 310-100 | 12 |
| 300-112 | 12 | 310-112 | 12 |
| 300-125 | 12 | 310-125 | 12 |
| 300-137 | 12 | 310-137 | 12 |
| 300-150 | 12 | 310-150 | 12 |



SPIRAL WOUND

Part Number: SRR Kit

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



EATON

Part Number: ERR Kit

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



RETAINER RING KITS



ROTOR PACK KIT

Part Number: RPK 4 Kit

Packaged in four plastic cases with a handy carrying case, our rotor pack kit contains approximately 50 each of 20 common internal/external retaining ring sizes. The internal rings fit housings or bores from 3/8" internal diameter to 1-1/8". External rings accommodate shaft sizes from 1/4" internal diameter to 1-1/8". Two retainer ring installation pliers are also included.

EXTERNAL RETAINER RINGS

Part Number: 310 Kit

| 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, 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: 300 Kit

| 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

CAP PLUG KIT

Part Number: **Cap Plug Kit**



This sturdy kit, packaged in an unbreakable box, contains 553 cap plugs in the most popular sizes.

| Cap Plug Number | QTY | Cap Plug Number | QTY | Cap Plug Number | QTY |
|-----------------|-----|-----------------|-----|-----------------|-----|
| CAP-2-X | 50 | CAP-PD-100 | 15 | CAP-G-22 | 10 |
| CAP-4 | 50 | CAP-PD-120 | 10 | CAP-G-25 | 12 |
| CAP-6-X | 50 | CAP-PD-140 | 5 | CAP-G-27 | 16 |
| CAP-9 | 40 | CAP-PD-160 | 10 | CAP-P-28 | 25 |
| CAP-12-X | 25 | CAP-G-2 | 20 | CAP-P-38 | 25 |
| CAP-14 | 20 | CAP-G-8 | 20 | CAP-P-48 | 25 |
| CAP-PD-60 | 25 | CAP-G-14 | 20 | CAP-P-68-H | 25 |
| CAP-PD-80 | 25 | CAP-G-18 | 20 | CAP-P-88-H | 10 |

CAT® SILICONE O-RING KIT

Part Number: **CTC-4C8253**

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



CAT® O-RING KIT

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

Part Number: **CTC-4C4784**



CAT® NITRILE O-RING KIT

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

Part Number: **CTC-4C4782**




ASSORTMENT KITS

COTTER PIN KIT

Part Number: Cotter Pin Kit




| | | |
|--|--------------------------|----------------------------|
|  | 1/16" X 1" 150 pcs. | 3/32" X 1" 150 pcs. |
| | 1/8" X 1 1/4" 75 pcs. | 3/32" X 1 1/2" 100 pcs. |
| | 1/8" X 2" 50 pcs. | 5/32" X 2 1/2" 30 pcs. |
| 555 Pieces | | |

WOODRUFF KEY KIT

Part Number: Woodruff Keys Kit




| | | |
|--|----------------------------------|----------------------------------|
|  | 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: Grease Fitting Kit



| | | |
|---|---|--|
|  | 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 | | |

TESTING TOOLS

FasTest® WEH 17 SERIES



Your Ergonomic Solution to Eliminate Wrenches and Bottle-Necks

FasTest® WEH 17 connectors provide leak tight connections for filling, charging, evacuation and pressure testing. The WEH 17 automatically seals when pressurized. Available in lever or pneumatically activated versions to grip and seal to female threads. Test pressures to 3500 psi.

How to Operate

To Connect: Collapse split collets in accordance with the operating method you have selected. Insert collets into female thread of the component to be tested. Expand collet to grip and seal. Activate test media through connector side port.

To Disconnect: Deactivate test pressure. Collapse split collets in accordance with the operating method you have selected. Remove connector from test piece.

Caution: WEH Series 17 connectors are not internally valved. Disconnecting while pressurized will cause leakage of test media.

Technical Data

Seals: Nitrile

Materials: Stainless steel

Temperature: -40° to +250°F

Pressure Ranges: 0 to 5000 psi. (static)

Pneumatic Operation: Requires a minimum air supply of 75 psi.

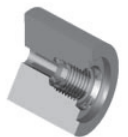
Rated Pressure: Based on test results using threaded ports manufactured to the referenced specifications and steel material. Other materials or deviations from those specifications may reduce the safe working pressure and should be verified by test. For dynamic pressure cycles or heavy side-load applications please see **FasMate®** Series.

NPTF Pipe Thread



| PART NUMBER | CONNECTS TO FEMALE THREAD | RATED PRESSURE | MAIN SEAL SET 5/PKG |
|----------------------|---------------------------|----------------|---------------------|
| HH17H-40204041-1BB1 | 1/4" NPTF | 5000 | S17-041B |
| HH17H-40206061-1BB1* | 3/8" NPTF | 5000 | S17-061B |
| HH17H-40208081-1BB1 | 1/2" NPTF | 5000 | S17-081B |
| HH17H-40212121-1BB1 | 3/4" NPTF | 3500 | S17-121B |

SAE O-Ring



| PART NUMBER | CONNECTS TO FEMALE THREAD | RATED PRESSURE | MAIN SEAL SET 5/PKG |
|--------------------|---------------------------|----------------|---------------------|
| HH17H-044021-1BB1 | -4 (7/16-20) | 5000 | S17-042B |
| HH17H-064041-1BB1 | -6 (9/16-18) | 5000 | S17-062B |
| HH17H-084061-1BB1* | -8 (3/4-16) | 5000 | S17-082B |
| HH17H-104081-1BB1 | -10 (7/8-14) | 5000 | S17-102B |
| HH17H-124121-1BB1 | -12 (1 1/16-12) | 3500 | S17-122B |

* In-stock. Additional sizes available for order.

TESTING TOOLS

TwistMate® MIT SERIES

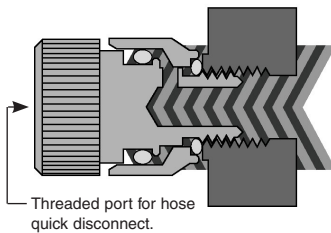


No Wrenches Needed • Hand Tighten Your Port Adapters • Shortens Testing Time

Twistmate® MIT mechanical internal thread connectors and plugs provide fast leak tight threaded connections for testing, filling, flushing, plugging, calibrating or venting applications. The patented pressure assisted sealing eliminates wrench tightening and thread sealants for safe secure connections up to 10,000 psi. With sizes up to 4" NPTF, and high flow design, the MIT is ideal for large unit run testing. Fast and reliable sealing reduces test time and production losses from scrap, rework and re-testing. Full flow design for shortest filling and test times.

Spin Twistmate® finger-tight onto thread until face seal contacts test piece. They seal automatically when the system is pressurized. Air, gas or hydraulic pressure in the system provides a sealing force that presses the urethane main seal against the face of the threads. This automatic internal piston action maintains the seal with minimum pressure.

Piston Action



Operation

- Step 1. Spin **Twistmate®** into the threaded port until the seal makes contact.
- Step 2. Introduce the media and pressure. The external sleeve automatically moves toward the test port enhancing the seal squeeze. Vacuum applications will require finger-tightening.

Technical Data

Seals: Urethane and Nitrile
 Materials: Steel with QPQ or Stainless Steel
 Temperature: -40° to +200°F
 Pressure: Vacuum to 10,000 psi
 Rated Pressure: Based on test results using threaded ports manufactured to the referenced specifications and steel material. Other materials or deviations from those specifications may reduce the safe working pressure and should be verified by test.

NPTF Pipe Thread



| PART NUMBER | CONNECTS TO FEMALE THREAD | RATED PRESSURE | CONNECTOR TYPE | MAIN SEAL SET 5/PKG |
|---------------|---------------------------|----------------|----------------|---------------------|
| HHMIT-022021 | 1/8" NPTF | 5000 | SWIVEL | S1109-U70 |
| HHMIT-042041 | 1/4" NPTF | 5000 | SWIVEL | S1111-U70 |
| HHMIT-062061 | 3/8" NPTF | 5000 | SWIVEL | S1113-U70 |
| HHMIT-082081 | 1/2" NPTF | 5000 | SWIVEL | S1209-U70 |
| HHMIT-122121X | 3/4" NPTF | 5000 | CONNECTOR | S1213-U70 |
| HHMIT-162161X | 1" NPTF | 5000 | CONNECTOR | S1216-U70 |
| HHMIT-202201X | 1-1/2" NPTF | 5000 | CONNECTOR | S1222-U70 |
| HHMIT-242241X | 2" NPTF | 5000 | CONNECTOR | S1327-U70 |

SAE O-Ring



| PART NUMBER | CONNECTS TO FEMALE THREAD | RATED PRESSURE | CONNECTOR TYPE | MAIN SEAL SET 5/PKG |
|---------------|---------------------------|----------------|----------------|---------------------|
| HHMIT-044021X | -04 (7/16-20) | 5000 | CONNECTOR | S1109-U70 |
| HHMIT-064041X | -06 (9/16-18) | 5000 | CONNECTOR | S1111-U70 |
| HHMIT-084081X | -08 (3/4-16) | 4000 | CONNECTOR | S1209-U70 |
| HHMIT-104081X | -10 (7/8-14) | 4000 | CONNECTOR | S1209-U70 |
| HHMIT-124121X | -12 (1 1/16-12) | 4000 | CONNECTOR | S1213-U70 |
| HHMIT-164161X | -16 (1 5/16-12) | 4000 | CONNECTOR | S1217-U70 |
| HHMIT-204201X | -20 (1 5/8-12) | 4000 | CONNECTOR | S1222-U70 |

INSTALLATION TOOLS

ROD U-SEAL INSTALLATION TOOLS

| Part Number | Seal ID Range |
|-------------|------------------|
| IT 100 | 3/4" to 1-1/4" |
| IT 150 | 1-3/8" to 1-7/8" |
| IT 200 | 2" to 3" |
| IT 100-NN | 3/4" to 1-1/4" |
| IT 150-NN | 1-3/8" to 1-7/8" |
| IT 200-NN | 2" to 3" |



These tools aid U-seal installation, eliminating the risk of damaging the seal lip.

REMOVAL TOOLS

**We have the packing removal tools to fit your needs.
Try out these high quality tools in your shop.**

Proper tools make the job of servicing cylinders easier and faster and reduce the possibility of damaging the finely machined surfaces. The handy tools listed on this page aid in the repair of telescopic cylinders and make it easier to do a quality job.

O-RING PICK SET 1

Part Number: O-Ring Pick

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: ORP-B
Part Number: ORP-SS**

Available in brass (ORP-B) or stainless steel (ORP-SS), these tools have been specifically engineered to enhance o-ring removal and replacement. Coated handles increase the tools performance in less than perfect environments.



O-RING PICK SET 3

Part Number: O Pick Set

Packaged in a clear vinyl pouch, 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.



O-RING PICK SET 4

Part Number: Maxi Pick Set

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.



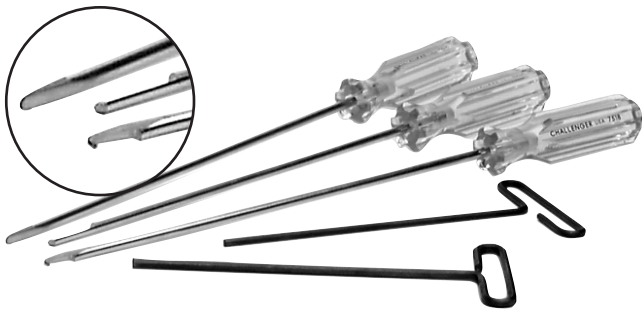
REMOVAL TOOLS

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5 PIECE TOOL KIT SET

Part Number: CH-TK-1



CHEVRON ASSEMBLY TOOL

Part Number: CM-376-9067-001



FLEXIBLE PACKING HOOKS

| Part Number | Packing Space | Length |
|-------------|---------------|---------|
| FPH-187 | 3/16"-up | 6-1/2" |
| FPH-312R | 5/16"-up | 7-1/2" |
| FPH-437R | 7/16"-up | 10-1/2" |
| FPH-500R | 1/2"-up | 14-1/2" |

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°).



REMOVAL TOOLS

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REPLACEABLE WOODSCREW TIPS

| Part Number | Packing Space |
|-------------|---------------|
| FPH-RTW312 | 5/16"-up |
| FPH-RTW437 | 7/16"-up |



REPLACEABLE CORKSCREW TIPS

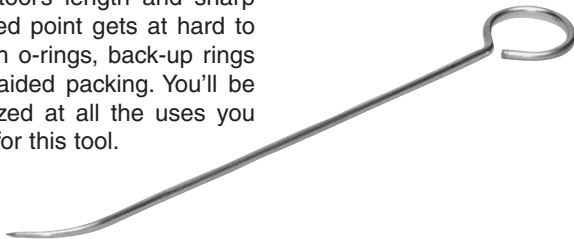
| Part Number | Packing Space |
|-------------|---------------|
| FPH-RTC312 | 5/16"-up |
| FPH-RTC437 | 7/16"-up |
| FPH-RTC500 | 1/2"-up |



SOLID SHAFT PICKS

| Part Number | Packing Space | Length |
|-------------|---------------|--------|
| SSP-125 | | 9-1/2" |
| SSP-312 | 5/16"-up | 10" |

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.



REMOVAL TOOLS

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Try out these high quality tools in your shop.**

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11 PIECE PACKING TOOL KIT

Part Number: Pack Tool Set-11

| PART NUMBER | QTY | PART NUMBER | QTY |
|-------------|-----|-------------|-----|
| FPH-312R | 2 | FPH-RTC312 | 1 |
| FPH-437R | 2 | FPH-RTC437 | 1 |
| SSP-125 | 1 | WRENCH | 1 |
| SSP-187 | 1 | BOX | 1 |
| SSP-312 | 1 | | |



17 PIECE PACKING TOOL KIT

Part Number: Pack Tool Set-17

| PART NUMBER | QTY | PART NUMBER | QTY |
|-------------|-----|-------------|-----|
| FPH-312R | 2 | FPH-RTC437 | 1 |
| FPH-437R | 2 | FPH-RTC500 | 1 |
| FPH-500R | 2 | FPH-RTW312 | 1 |
| SSP-125 | 1 | FPH-RTW437 | 1 |
| SSP-187 | 1 | FPH-RTW500 | 1 |
| SSP-312 | 1 | WRENCH | 1 |
| FPH-RTC312 | 1 | BOX | 1 |



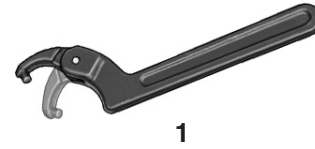
ASSORTMENT KITS AND TOOLS

DISMANTLING TOOLS

SPANNER WRENCHES

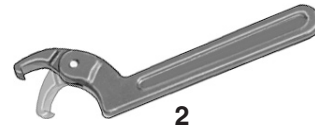
(1) ADJUSTABLE HEAD — PIN STYLE

| PART NUMBER | PART OD RANGE | PIN DIA. | PIN LGTH. |
|----------------|-----------------------------------|----------|-----------|
| SPAP-2.00X0.13 | 3/4" to 2" (19mm to 50mm) | 1/8" | 1/8" |
| SPAP-2.00X0.19 | 3/4" to 2" (19mm to 50mm) | 3/16" | 5/32" |
| SPAP-3.00X0.19 | 1-1/4" to 3" (32mm to 76mm) | 3/16" | 3/16" |
| SPAP-3.00X0.25 | 1-1/4" to 3" (32mm to 76mm) | 1/4" | 7/32" |
| SPAP-4.75X0.25 | 2" to 4-3/4" (51mm to 120mm) | 1/4" | 1/4" |
| SPAP-6.25X0.38 | 4-1/2" to 6-1/4" (115mm to 159mm) | 3/8" | 1/4" |



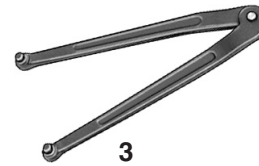
(2) ADJUSTABLE HEAD — HOOK STYLE

| PART NUMBER | PART OD RANGE | HOOK WD. | HOOK DP. |
|-------------|-----------------------------------|----------|----------|
| SPAH-2.00 | 3/4" to 2" (19mm to 50mm) | 11/32" | 1/8" |
| SPAH-3.00 | 1-1/4" to 3" (32mm to 76mm) | 13/32" | 5/32" |
| SPAH-4.75 | 2" to 4-3/4" (51mm to 120mm) | 15/32" | 3/16" |
| SPAH-6.25 | 4-1/2" to 6-1/4" (115mm to 159mm) | 15/32" | 1/4" |
| SPAH-8.75 | 6-1/8" to 8-3/4" (155mm to 222mm) | 15/32" | 5/16" |

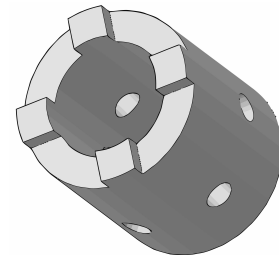
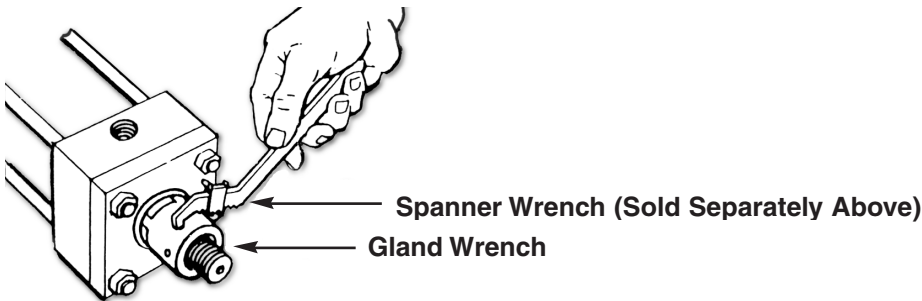


(3) ADJUSTABLE FACE — PIN STYLE

| PART NUMBER | DIA. RANGE (CENTER TO CENTER) | PIN DIA. | PIN LGTH. |
|-----------------|-------------------------------|----------|-----------|
| SPAPF-2.00X0.19 | 5/8" to 2" (16mm to 50mm) | 3/16" | 1/8" |
| SPAPF-3.00X0.25 | 5/8" to 3" (16mm to 76mm) | 1/4" | 3/16" |
| SPAPF-4.00X0.31 | 5/8" to 4" (16mm to 101mm) | 5/16" | 1/4" |



PARKER GLAND WRENCHES



| Rod Dia. | Kit # | ID X OD X HT | Spanner (Sold Separately Above) |
|-------------------------|------------|----------------------------|---------------------------------|
| 1/2", 5/8", 12mm & 14mm | PKH-069590 | 11/16" X 1-1/8" X 1-3/8" | SPAP-2.00X0.19 |
| 18mm | PKH-084765 | 13/16" X 1-1/4" X 1-7/16" | SPAP-2.00X0.19 or SWP-3.00X0.19 |
| 1" & 22mm | PKH-069591 | 1-1/16" X 1-5/8" X 1-1/2" | SPAP-2.00X0.19 or SWP-3.00X0.19 |
| 28mm | PKH-084766 | 1-1/4" X 1-11/16" X 9/16" | SPAP-2.00X0.19 or SWP-3.00X0.19 |
| 1-3/8" & 36mm | PKH-069592 | 1-7/16" X 1-7/8" X 1-5/8" | SPAP-2.00X0.19 or SWP-3.00X0.19 |
| 1-3/4" & 45mm | PKH-069593 | 1-13/16" X 2-1/4" X 1-5/8" | SPAP-3.00X0.25 or SWP-4.75X0.25 |
| 2" | PKH-069594 | 2-1/16" X 2-1/2" X 2" | SPAP-3.00X0.25 or SWP-4.75X0.25 |
| 2-1/2" & 56mm | PKH-069595 | 2-9/16" X 3" X 2-1/8" | SPAP-3.00X0.25 or SWP-4.75X0.25 |
| 70mm | PKH-069596 | 2-15/16" X 3-1/2" X 2-3/8" | SPAP-4.75X0.25 |

MEASURING TOOLS

O-RING MEASURING CONE

Part Number: O-Ring Cone-Inch

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.



PI TAPES

Part Number **Size**

PI-212 2" - 12"

This handy tool allows for quick accurate measuring of the outside diameters (OD) of vee packing, large U-Seals, Piston Rings, and metal parts such as cylinder stages, rams and rods. This tape comes with certificate of calibration. Accurate to .001".



DIGITAL CALIPERS

Part Number

HH-Caliper-6-P
HH-Caliper-12-P

A high quality instrument, able to measure up to 150mm or 6". A push of a button changes from inches to metric. A clear LCD display shows a reading with a resolution of 0.0005" (0.01mm) that is accurate to $\pm 0.03\text{mm}$. These calipers come in a sturdy, padded plastic case with instructions and a spare battery.



O-RING GAUGE

Part Number: OR- GAUGE

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



MEASURING TOOLS

POWER PUNCH MAXI SET

Part Number: Maxi Punch Set

| PART NUMBER | PUNCH RANGE |
|-------------|---|
| Punch Set | 1/4, 5/16, 3/8, 7/16, 1/2, 16,5/8, 1/16, 3/4, 3/16, 7/8, 5/16, 1 |

This extremely high quality punch set includes 13 punches, power punch, centering pin, punch pad and carrying case. Durable cutting heads cut washers and bolt holes effortlessly. Guaranteed 100% satisfaction.



O-RING CHART

Part Number: O-Ring Chart NN

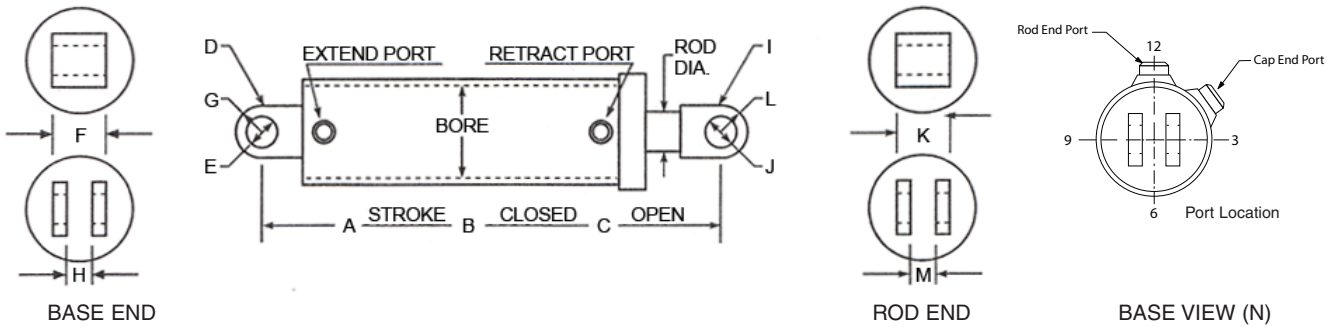
Durable, Accurate, and Fast, these charts allow for easy Standard O-ring size identification. No shop should be without one!



Technical Information

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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 _____

A : Total stroke _____

B : Closed length _____

C : Open length _____

D : Base mount type or code _____

E : Base pin diameter _____

F : Base mount width _____

G : Base mount radius _____

H : Base Clevis Gap (if applicable) _____

I : Rod mount type or code _____

J : Rod pin diameter _____

K : Rod mount width _____

L : Rod mount radius _____

M : Rod clevis gap (if applicable) _____

N : Base End Port Location _____

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 _____

Requested by: Firm _____ Current Quan. _____

Address _____ Future Quan. _____

City _____ State _____ Zip _____

Phone _____ Fax _____

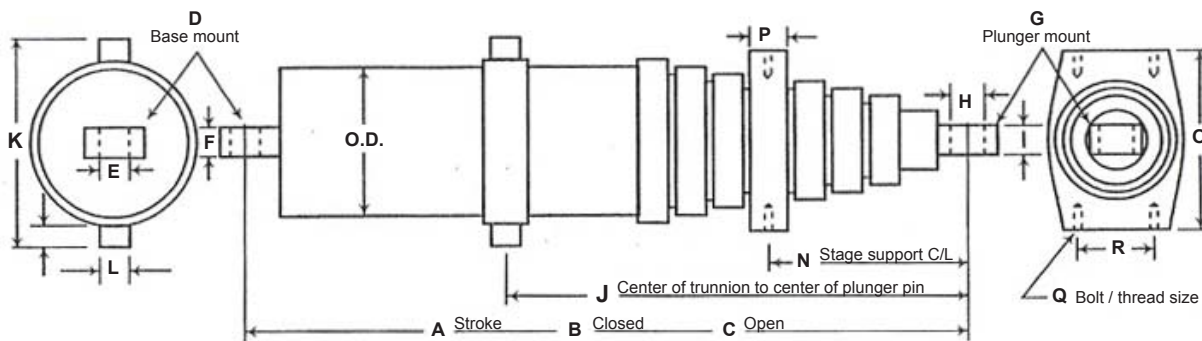
Contact _____

Phone (800) 777-5617 Fax (800) 759-6391



Hercules Sealing Products
 1016 N. Belcher Rd
 Clearwater, FL 33765

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 (800) 777-5617 Fax (800) 759-6391



Hercules Sealing Products
 1016 N. Belcher Rd
 Clearwater, FL 33765

TECHNICAL INFORMATION

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 | | |
| 3-1/2 | 2 | 58 | 116 | 176 | 294 | 588 | 705 | 882 | 1175 | 1470 | | |
| | — | 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 | |
| 4 | 2 | 35 | 70 | 107 | 178 | 356 | 428 | 534 | 712 | 890 | 1780 | |
| | — | 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 | |
| 5 | 2-1/2 | 30 | 60 | 90 | 150 | 300 | 362 | 450 | 600 | 750 | 1500 | |
| | — | 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 |
| 6 | 3-1/2 | 22 | 44 | 66 | 111 | 222 | 266 | 333 | 444 | 555 | 1110 | 1665 |
| | — | 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 |
| 8 | 3-1/2 | 12 | 24 | 37 | 62 | 124 | 148 | 185 | 245 | 310 | 620 | 930 |
| | 4 | 15 | 30 | 44 | 73 | 146 | 176 | 220 | 295 | 365 | 730 | 1095 |
| | — | 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 |
| 10 | 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 |
| | — | 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 |
| 10 | 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

| GPM | PUMP PRESSURE PSI | | | | | | | | | | |
|-------|-------------------|------|------|------|------|------|------|------|------|-------|-------|
| | 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) = $\frac{\text{FLOW RATE (GPM)} \times \sqrt{\text{SPECIFIC GRAVITY}}}{\text{PRESSURE DROP (PSI)}}$ | $CV = \frac{Q \sqrt{SG}}{P \Delta}$ |
| 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 = $\frac{\text{OUTPUT HORSEPOWER}}{\text{INPUT HORSEPOWER}} \times 100$ | $Eff_{fOV} = \frac{HP_{OUT}}{HP_{IN}} \times 100$ |
| | OVERALL EFFICIENCY = $\text{VOLUMETRIC Eff.} \times \text{MECHANICAL Eff.}$ | $Eff_{fOV} = Eff_{VOL.} \times Eff_{MECH.}$ |
| PUMP EFFICIENCY Overall in Percent | VOLUMETRIC EFFICIENCY = $\frac{\text{ACTUAL FLOW RATE OUTPUT (GPM)}}{\text{THEORETICAL FLOW RATE OUTPUT (GPM)}} \times 100$ | $Eff_{fVOL} = \frac{O_{ACT}}{O_{THEO.}} \times 100$ |
| PUMP EFFICIENCY Mechanical in Percent | MECHANICAL EFFICIENCY = $\frac{\text{THEORETICAL TORQUE TO DRIVE}}{\text{ACTUAL TORQUE TO DRIVE}} \times 100$ | $Eff_{MEC} = \frac{T_{THEO.}}{T_{ACT.}} \times 100$ |
| PUMP LIFE B ₁₀ BEARING LIFE | B ₁₀ HOURS OF BEARING LIFE = $\text{RATED LIFE HOURS} \times \frac{\text{RATED SPEED (RPM)}}{\text{NEW SPEED (RPM)}} \times \left(\frac{\text{RATED PRESSURE (PSI)}}{\text{NEW PRESSURE (PSI)}} \right)^3$ | $B_{10} = \text{RATED HRS.} \times \frac{\text{RPM}_R}{\text{RPM}_N} \times \left(\frac{P}{PN} \right)^3$ |

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 | | |
| RESERVOIR COOLING CAPACITY Based on Adequate Air Circulation | HEAT (BTU/HR) = $2 \times \text{TEMPERATURE DIFFERENCE BETWEEN RESERVOIR WALLS AND AIR (°F)} \times \text{AREA OF RESERVOIR (Sq. Ft.)}$ | BTU/HR = $2.0 \times T \times A \times \Delta$ |
| 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 = $Q \times 210 \times T \times \Delta$ |
| HEAT IN FRESH WATER (approx.) | HEAT (BTU/HR) = FLOW RATE (GPM) X 500 X TEMPERATURE DIFFERENCE (°F) | BTU/HR = $Q \times 500 \times T$ |
| 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 |

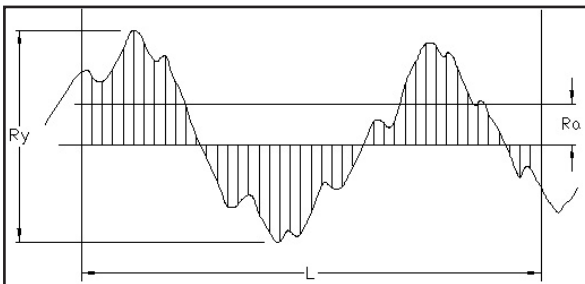
TECH TIP - SURFACE FINISH

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 $0.4 \mu\text{m}$ Ra is equivalent to $16 \mu\text{in}$ 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 $12 \mu\text{in}$ [0.1 to $0.3 \mu\text{m}$]
Rz $50 \mu\text{in}$ [$1.3 \mu\text{m}$]
Rsk = -1.0 to -4.0

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

Ra = 4 to $20 \mu\text{in}$ [0.1 to $0.5 \mu\text{m}$]
Rz $80 \mu\text{in}$ [$2.0 \mu\text{m}$]
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 $1 \mu\text{in}$ to $140 \mu\text{in}$ [$0.02 \mu\text{m}$ to $3.5 \mu\text{m}$] 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] |

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

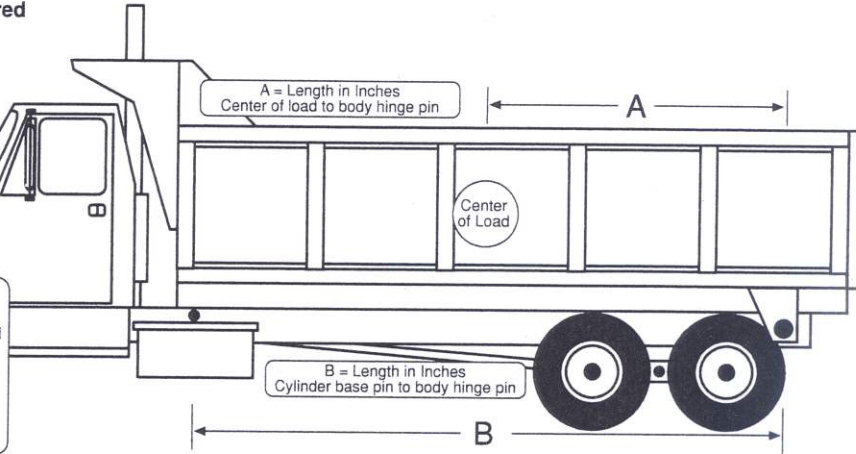
$$\frac{\text{Load (lbs)} \times \text{"A"}}{\text{"B"}} = \text{Initial required cylinder force}$$

Example

$$\frac{50,000\# \times 85\text{"}}{166\text{"}} = 25,603\# \text{ of force to start the lift}$$

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

| Stage O.D. in inches | System operating pressure | | | |
|----------------------|---------------------------|----------|----------|----------|
| | 800 psi | 1000 psi | 1500 psi | 2000 psi |
| 2.75" | 4752 | 5940 | 8909 | 11879 |
| 3.75" | 8836 | 11045 | 16567 | 22089 |
| 4.75" | 14176 | 17721 | 26581 | 35441 |
| 5.75" | 20774 | 25967 | 38951 | 51935 |
| 6.75" | 28628 | 35785 | 53677 | 71570 |
| 7.90" | 39213 | 49017 | 73525 | 98034 |
| 9.37" | 55165 | 68956 | 103434 | 137911 |



Formula for Calculating the Required Cylinder Stroke for a Dump Angle

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

Example

$$166\text{"} (\text{B}) \times .845 (\text{D}) = 140\text{"} \text{ Stroke}$$

| "D" | Dump Angle |
|------|------------|
| .715 | 42 deg |
| .733 | 43 deg |
| .750 | 44 deg |
| .765 | 45 deg |
| .780 | 46 deg |
| .797 | 47 deg |
| .813 | 48 deg |
| .830 | 49 deg |
| .845 | 50 deg |
| .861 | 51 deg |
| .877 | 52 deg |
| .892 | 53 deg |
| .903 | 54 deg |
| .923 | 55 deg |
| .939 | 56 deg |
| .954 | 57 deg |

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

