

# Swivels

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## Swivels

# PS Series

## Introduction

The PS Series Swivel is designed to meet today's application needs and performance requirements. Pressure capabilities up to 5000 psi, 3/8" through 1" body sizes, a variety of port options, and Chromium-6 Free plating make the PS Series Swivels ideal for an array of dynamic applications.



### Features:

- Hardened bearing races for extended service life
- Full flow design minimizes pressure drop for optimum system performance
- Sealed bearing design isolates bearing race from media and environment
- Reduced bearing load design minimizes wear in the bearing race and extends service life
- PTFE back-up rings support primary seal for high-pressure applications
- Chromium-6 Free plating for maximum corrosion resistance
- PS Series Swivels eliminate hose twist and torque that may cause premature hose failure

### PS Series Specifications

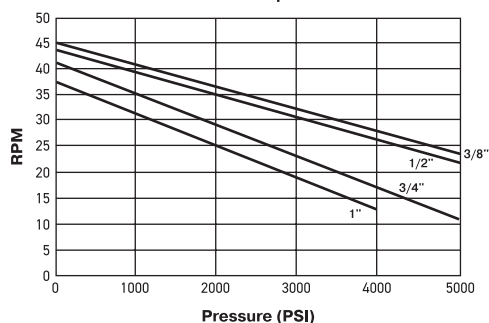
| Body Size (in.)                                     | 3/8          | 1/2  | 3/4  | 1    |
|-----------------------------------------------------|--------------|------|------|------|
| Maximum Rated Pressure (psi)                        | 5000         | 5000 | 5000 | 5000 |
| Except the following port options in the noted size |              |      |      |      |
| 03 (Male JIC 37°)                                   |              |      |      |      |
| 05 (Male SAE O-Ring Boss)                           |              |      |      |      |
| 06 (Female JIC 37°) In-Line Housing Port            |              |      |      |      |
| 07 (Female NPSM)                                    |              | 4600 | 3000 | 2600 |
| Temperature Range                                   | -40° to 250° |      |      |      |

### Seal Options

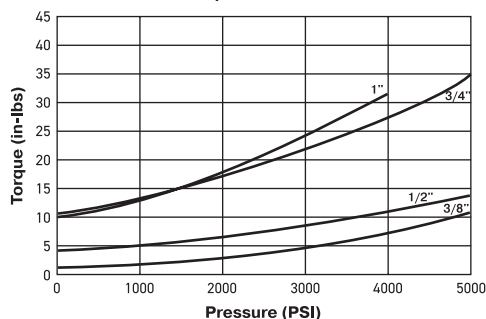
Nitrile

### Performance

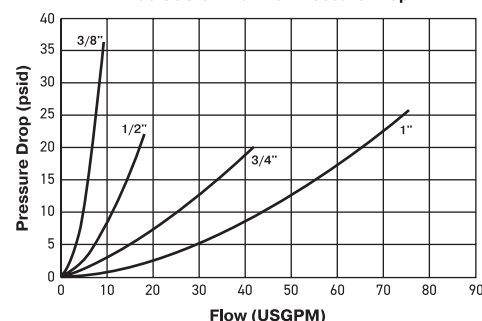
Recommended Max. Speed vs. Pressure



Torque vs. Pressure



90 PS Swivel  
150 SUS Oil Flow vs. Pressure Drop



## Swivels

# PS Series

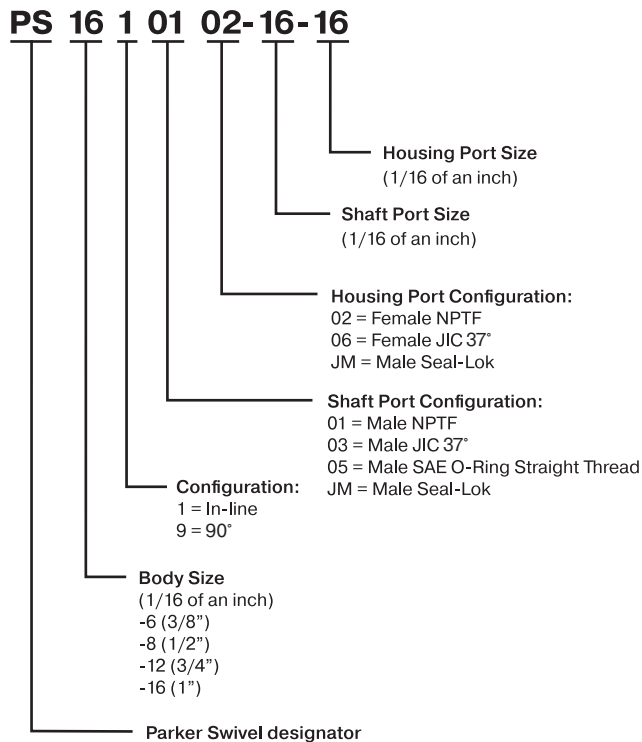
## How To Order

### In-Line Swivels

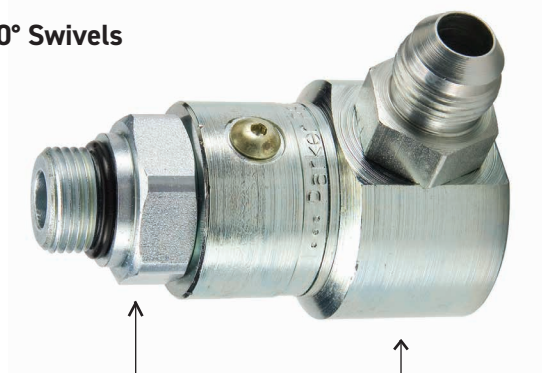


Shaft      Housing

#### PS Part Number

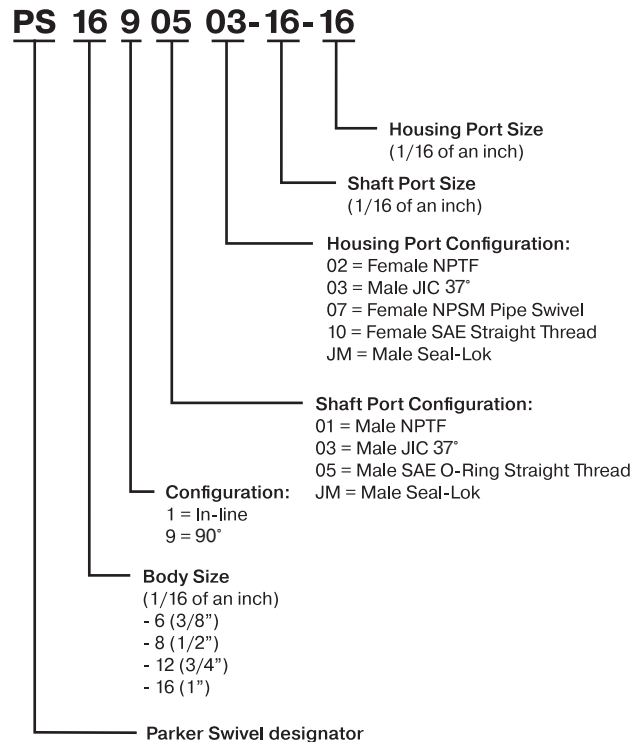


### 90° Swivels



Shaft      Housing

#### PS Part Number



### PS Series Repair Kits (In-line and 90°)

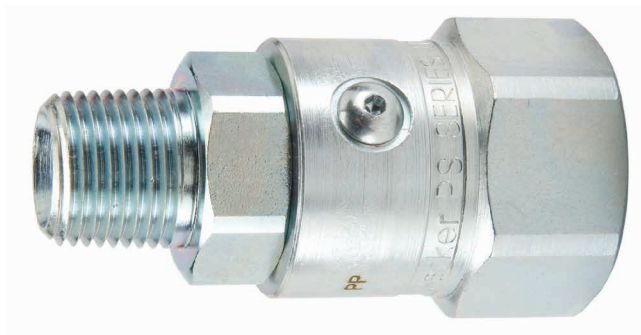
Repair Kits come complete with O-Rings, PTFE Back-Up Ring, Cap Screws, Locking Balls, Retaining Ring and grease fitting. Repair kits are suitable for both current and previous design in-line and 90° PS Series Swivels.

| 3/8" Swivel | 1/2" Swivel | 3/4" Swivel | 1" Swivel |
|-------------|-------------|-------------|-----------|
| PS6-RPR     | PS8-RPR     | PS12-RPR    | PS16-RPR  |
| PS6Y-RPR    | PS8Y-RPR    | PS12Y-RPR   | PS16Y-RPR |
| PS6A-RPR    | PS8A-RPR    | PS12A-RPR   | PS16A-RPR |
| PS6W-RPR    | PS8W-RPR    | PS12W-RPR   | PS16W-RPR |

## Swivels

## PS Series

In-Line



## Materials Of Construction

Housing: .....Carbon Steel

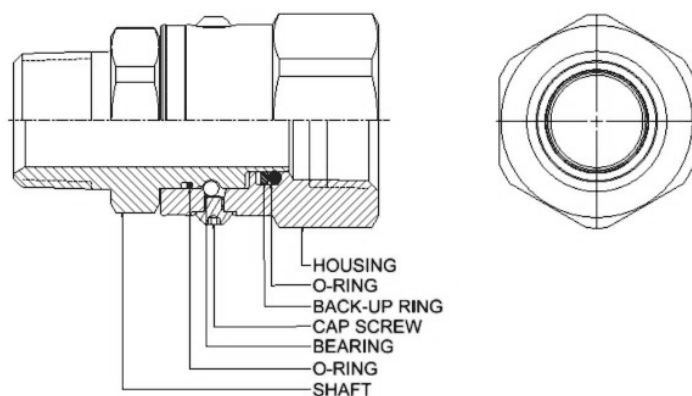
Shaft: .....Carbon Steel

Plating: .....Chromium-6 Free

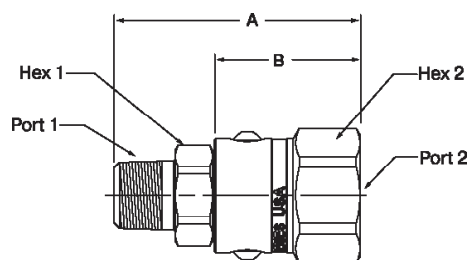
Bearing: .....Chrome

O-Rings: .....Nitrile

Back-Up Ring ..... PTFE



## PS Series Male Pipe - Female Pipe



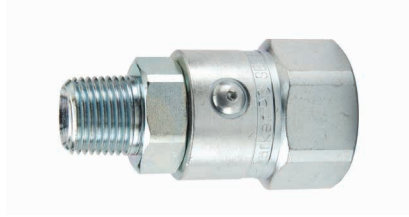
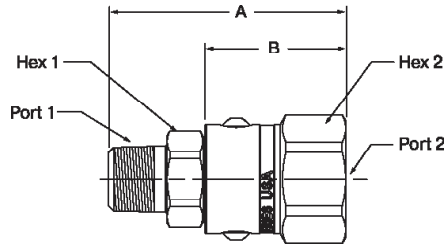
| Part Number Steel | A                | B                | Port 1        | Port 2        | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|------------------|------------------|---------------|---------------|------------------|------------------|
| PS610102-6-6      | 2.66"<br>67.5 mm | 1.64"<br>41.7 mm | 3/8-18 NPTF   | 3/8-18 NPTF   | 0.88"<br>22.2 mm | 1.31"<br>33.3 mm |
| PS810102-8-8      | 3.03"<br>76.8 mm | 1.79"<br>45.5 mm | 1/2-14 NPTF   | 1/2-14 NPTF   | 1.12"<br>28.6 mm | 1.50"<br>36.5 mm |
| PS1210102-12-12   | 3.10"<br>78.8 mm | 1.85"<br>47.0 mm | 3/4-14 NPTF   | 3/4-14 NPTF   | 1.38"<br>35.0 mm | 1.69"<br>42.9 mm |
| PS1610102-16-16   | 3.54"<br>89.8 mm | 2.11"<br>53.5 mm | 1-11 1/2 NPTF | 1-11 1/2 NPTF | 1.62"<br>41.3 mm | 1.88"<br>47.6 mm |

## Swivels

## PS Series

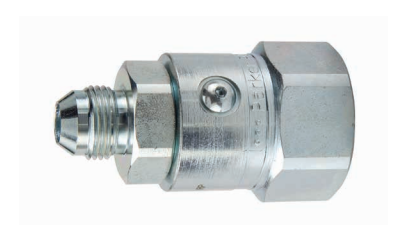
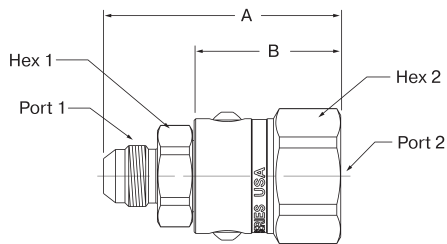
In-Line

## PS Series Male Pipe - Female 37° Flair



| Part Number Steel | A                | B                | Port 1        | Port 2       | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|------------------|------------------|---------------|--------------|------------------|------------------|
| PS610106-6-6      | 2.77"<br>70.3 mm | 1.75"<br>44.5 mm | 3/8-18 NPTF   | 9/16-18 UNF  | 0.88"<br>22.2 mm | 1.31"<br>33.3 mm |
| PS810106-8-8      | 3.05"<br>77.3 mm | 1.81"<br>46.0 mm | 1/2-14 NPTF   | 3/4-16 UNF   | 1.12"<br>28.6 mm | 1.50"<br>36.5 mm |
| PS1210106-12-12   | 3.27"<br>83.2 mm | 2.02"<br>51.3 mm | 3/4-14 NPTF   | 1-1/16-12 UN | 1.38"<br>35.0 mm | 1.69"<br>42.9 mm |
| PS1610106-16-16   | 3.62"<br>92.0 mm | 2.19"<br>55.6 mm | 1-11 1/2 NPTF | 1-5/16-12 UN | 1.62"<br>41.3 mm | 1.88"<br>47.6 mm |

## PS Series Male 37° Flare - Female Pipe



| Part Number Steel | A                | B                | Port 1       | Port 2        | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|------------------|------------------|--------------|---------------|------------------|------------------|
| PS610302-6-6      | 2.66"<br>67.5 mm | 1.64"<br>41.7 mm | 9/16-18 UNF  | 3/8-18 NPTF   | 0.88"<br>22.2 mm | 1.31"<br>33.3 mm |
| PS810302-8-8      | 2.89"<br>73.5 mm | 1.79"<br>45.5 mm | 3/4-16 UNF   | 1/2-14 NPTF   | 1.12"<br>28.6 mm | 1.50"<br>36.5 mm |
| PS1210302-12-12   | 3.21"<br>81.5 mm | 1.85"<br>47.0 mm | 1-1/16-12 UN | 3/4-14 NPTF   | 1.38"<br>35.0 mm | 1.69"<br>42.9 mm |
| PS1610302-16-16   | 3.54"<br>89.8 mm | 2.11"<br>53.5 mm | 1-5/16-12 UN | 1-11 1/2 NPTF | 1.62"<br>41.3 mm | 1.88"<br>47.6 mm |

 **WARNING**

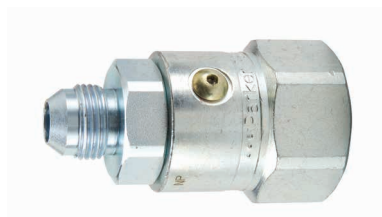
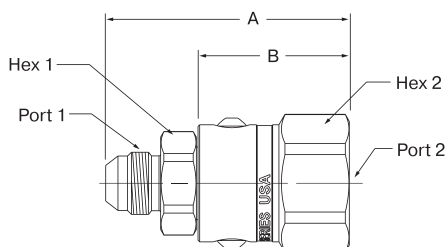
This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

## Swivels

## PS Series

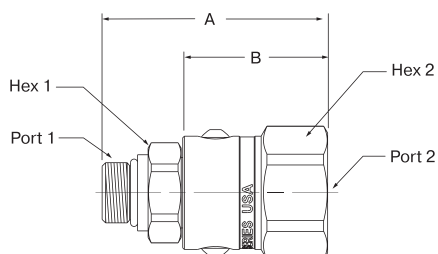
In-Line

## PS Series Male 37° Flare - Female 37° Flare



| Part Number Steel | A                | B                | Port 1       | Port 2       | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|------------------|------------------|--------------|--------------|------------------|------------------|
| PS610306-6-6      | 2.77"<br>70.3 mm | 1.75"<br>44.5 mm | 9/16-18 UNF  | 9/16-18 UNF  | 0.88"<br>22.2 mm | 1.31"<br>33.3 mm |
| PS810306-8-8      | 2.91"<br>74.0 mm | 1.81"<br>46.0 mm | 3/4-16 UNF   | 3/4-16 UNF   | 1.12"<br>28.6 mm | 1.50"<br>36.5 mm |
| PS1210306-12-12   | 3.38"<br>85.8 mm | 2.02"<br>51.3 mm | 1-1/16-12 UN | 1-1/16-12 UN | 1.38"<br>35.0 mm | 1.69"<br>42.9 mm |
| PS1610306-16-16   | 3.62"<br>92.0 mm | 2.19"<br>55.6 mm | 1-5/16-12 UN | 1-5/16-12 UN | 1.62"<br>41.3 mm | 1.88"<br>47.6 mm |

## PS Series Male SAE O-Ring Straight Thread - Female Pipe



| Part Number Steel | A                | B                | Port 1       | Port 2        | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|------------------|------------------|--------------|---------------|------------------|------------------|
| PS610502-6-6      | 2.48"<br>63.0 mm | 1.64"<br>41.7 mm | 9/16-18 UNF  | 3/8-18 NPTF   | 0.88"<br>22.2 mm | 1.31"<br>33.3 mm |
| PS810502-8-8      | 2.79"<br>70.8 mm | 1.79"<br>45.5 mm | 3/4-16 UNF   | 1/2-14 NPTF   | 1.12"<br>28.6 mm | 1.50"<br>36.5 mm |
| PS1210502-12-12   | 3.02"<br>76.7 mm | 1.85"<br>47.0 mm | 1-1/16-12 UN | 3/4-14 NPTF   | 1.38"<br>35.0 mm | 1.69"<br>42.9 mm |
| PS1610502-16-16   | 3.31"<br>84.1 mm | 2.11"<br>53.5 mm | 1-5/16-12 UN | 1-11 1/2 NPTF | 1.62"<br>41.3 mm | 1.88"<br>47.6 mm |

 **WARNING**

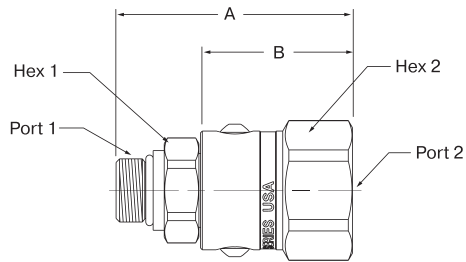
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## Swivels

## PS Series

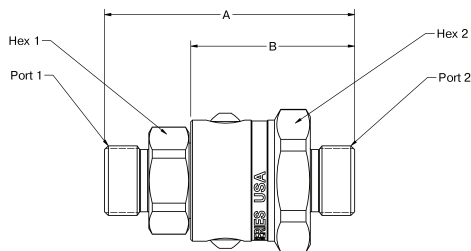
In-Line

## PS Series Male SAE O-Ring Straight Thread - Female 37° Flare



| Part Number Steel | A                | B                | Port 1       | Port 2       | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|------------------|------------------|--------------|--------------|------------------|------------------|
| PS610506-6-6      | 2.59"<br>65.8 mm | 1.75"<br>44.5 mm | 9/16-18 UNF  | 9/16-18 UNF  | 0.88"<br>22.2 mm | 1.31"<br>33.3 mm |
| PS810506-8-8      | 2.81"<br>71.3 mm | 1.81"<br>46.0 mm | 3/4-16 UNF   | 3/4-16 UNF   | 1.12"<br>28.6 mm | 1.50"<br>36.5 mm |
| PS1210506-12-12   | 3.19"<br>81.1 mm | 2.02"<br>51.3 mm | 1-1/16-12 UN | 1-1/16-12 UN | 1.38"<br>35.0 mm | 1.69"<br>42.9 mm |
| PS1610506-16-16   | 3.40"<br>86.3 mm | 2.19"<br>55.6 mm | 1-5/16-12 UN | 1-5/16-12 UN | 1.62"<br>41.3 mm | 1.88"<br>47.6 mm |

## PS Series Male Seal-Lok - Male Seal-Lok



| Part Number Steel | A                | B                | Port 1         | Port 2         | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|------------------|------------------|----------------|----------------|------------------|------------------|
| PS61JMJM-6-6      | 2.67"<br>67.8 mm | 1.83"<br>46.5 mm | 11/16 - 16 UN  | 11/16 - 16 UN  | 0.88"<br>22.2 mm | 1.31"<br>33.3 mm |
| PS81JMJM-8-8      | 2.89"<br>73.4 mm | 1.90"<br>48.3 mm | 13/16 - 16 UN  | 13/16 - 16 UN  | 1.12"<br>28.6 mm | 1.50"<br>38.1 mm |
| PS121JMJM-12-12   | 3.26"<br>82.8 mm | 2.09"<br>53.1 mm | 1-3/16 - 12 UN | 1-3/16 - 12 UN | 1.38"<br>35.0 mm | 1.75"<br>44.4 mm |
| PS161JMJM-16-16   | 3.41"<br>86.6 mm | 2.20"<br>55.9 mm | 1-7/16 - 12 UN | 1-7/16 - 12 UN | 1.62"<br>41.3 mm | 1.88"<br>47.8 mm |

 **WARNING**

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## Swivels

## PS Series

90°



## Materials Of Construction

Housing: .....Carbon Steel

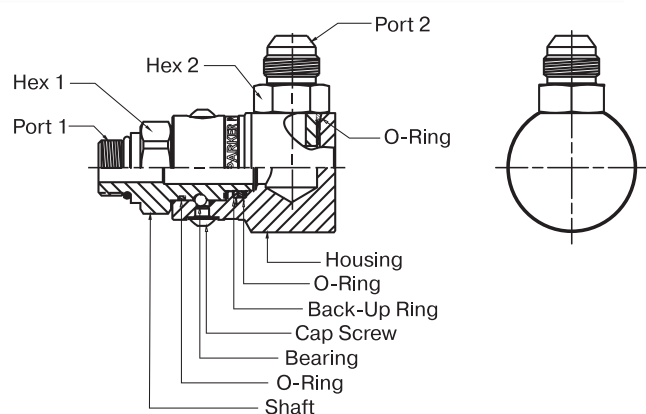
Shaft: .....Carbon Steel

Plating: .....Chromium-6 Free

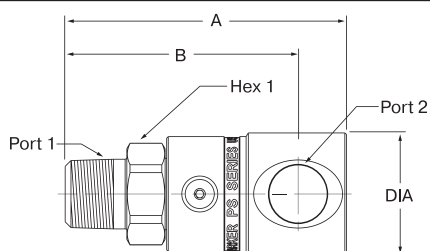
Bearing: .....Chrome

O-Rings: .....Nitrile

Back-Up Ring ..... PTFE



## PS Series Male Pipe - Female Pipe



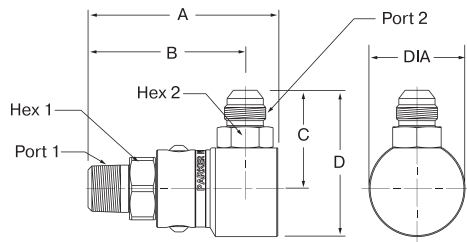
| Part Number Steel | A                 | B                | Diameter         | Port 1        | Port 2        | Wrench Flats 1   |
|-------------------|-------------------|------------------|------------------|---------------|---------------|------------------|
| PS690102-6-6      | 3.05"<br>77.4 mm  | 2.54"<br>64.4 mm | 1.29"<br>32.8 mm | 3/8-18 NPTF   | 3/8-18 NPTF   | 0.88"<br>22.2 mm |
| PS890102-8-8      | 3.43"<br>87.0 mm  | 2.84"<br>72.0 mm | 1.49"<br>37.8 mm | 1/2-14 NPTF   | 1/2-14 NPTF   | 1.12"<br>28.6 mm |
| PS1290102-12-12   | 3.66"<br>93.0 mm  | 3.00"<br>76.1 mm | 1.76"<br>44.6 mm | 3/4-14 NPTF   | 3/4-14 NPTF   | 1.38"<br>35.0 mm |
| PS1690102-16-16   | 4.41"<br>112.0 mm | 3.54"<br>90.0 mm | 2.16"<br>54.9 mm | 1-11 1/2 NPTF | 1-11 1/2 NPTF | 1.62"<br>41.3 mm |

## Swivels

## PS Series

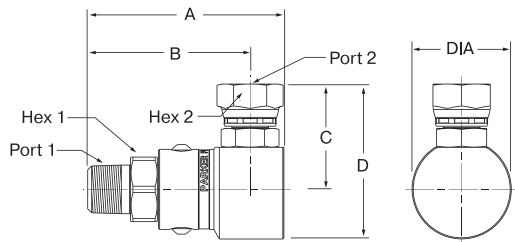
90°

## PS Series Male Pipe - Male 37° Flare



| Part Number Steel | A                 | B                | C                | D                | Diameter         | Port 1        | Port 2       | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|-------------------|------------------|------------------|------------------|------------------|---------------|--------------|------------------|------------------|
| PS690103-6-6      | 3.05"<br>77.4 mm  | 2.54"<br>64.4 mm | 1.44"<br>36.6 mm | 2.09"<br>53.0 mm | 1.29"<br>32.8 mm | 3/8-18 NPTF   | 9/16-18 UNF  | 0.88"<br>22.2 mm | 0.69"<br>17.5 mm |
| PS890103-8-8      | 3.43"<br>87.0 mm  | 2.84"<br>72.0 mm | 1.78"<br>45.1 mm | 2.64"<br>67.1 mm | 1.73"<br>44.0 mm | 1/2-14 NPTF   | 3/4-16 UNF   | 1.12"<br>28.6 mm | 0.88"<br>22.2 mm |
| PS1290103-12-12   | 3.66"<br>93.0 mm  | 3.00"<br>76.1 mm | 2.24"<br>56.9 mm | 3.86"<br>85.3 mm | 2.17"<br>55.2 mm | 3/4-14 NPTF   | 1-1/16-12 UN | 1.38"<br>35.0 mm | 1.25"<br>31.8 mm |
| PS1690103-16-16   | 4.41"<br>112.0 mm | 3.54"<br>90.0 mm | 2.42"<br>61.3 mm | 3.66"<br>92.9 mm | 2.48"<br>63.0 mm | 1-11 1/2 NPTF | 1-5/16-12 UN | 1.62"<br>41.3 mm | 1.50"<br>38.1 mm |

## PS Series Male Pipe - Female NPSM Pipe Swivel



| Part Number Steel | A                 | B                | C                | D                | Diameter         | Port 1        | Port 2        | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|-------------------|------------------|------------------|------------------|------------------|---------------|---------------|------------------|------------------|
| PS690107-6-6      | 3.05"<br>77.4 mm  | 2.54"<br>64.4 mm | 1.51"<br>38.4 mm | 2.16"<br>54.8 mm | 1.29"<br>32.8 mm | 3/8-18 NPTF   | 3/8-18 NPSM   | 0.88"<br>22.2 mm | 0.88"<br>22.2 mm |
| PS890107-8-8      | 3.43"<br>87.0 mm  | 2.84"<br>72.0 mm | 1.86"<br>47.2 mm | 2.72"<br>69.2 mm | 1.73"<br>44.0 mm | 1/2-14 NPTF   | 1/2-14 NPSM   | 1.12"<br>28.6 mm | 1.00"<br>25.4 mm |
| PS1290107-12-12   | 3.66"<br>93.0 mm  | 3.00"<br>76.1 mm | 2.24"<br>56.9 mm | 3.33"<br>84.5 mm | 2.17"<br>55.2 mm | 3/4-14 NPTF   | 3/4-14 NPSM   | 1.38"<br>35.0 mm | 1.25"<br>31.8 mm |
| PS1690107-16-16   | 4.41"<br>112.0 mm | 3.54"<br>90.0 mm | 2.48"<br>63.1 mm | 3.73"<br>94.6 mm | 2.48"<br>63.0 mm | 1-11 1/2 NPTF | 1-11 1/2 NPSM | 1.62"<br>41.3 mm | 1.50"<br>38.1 mm |

 **WARNING**

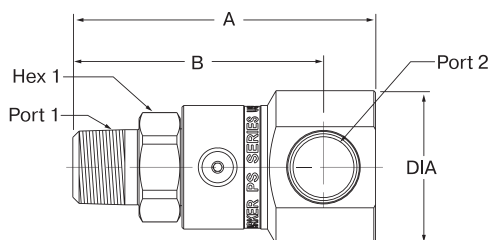
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## Swivels

## PS Series

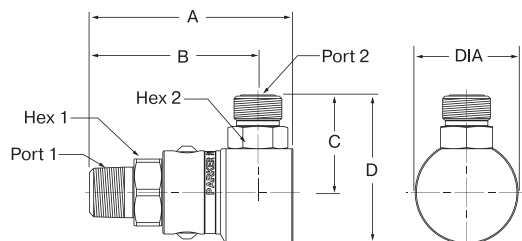
90°

## PS Series Male Pipe - Female SAE Straight Thread



| Part Number Steel | A                 | B                | Diameter         | Port 1        | Port 2       | Wrench Flats 1   |
|-------------------|-------------------|------------------|------------------|---------------|--------------|------------------|
| PS690110-6-6      | 3.05"<br>77.4 mm  | 2.54"<br>64.4 mm | 1.29"<br>32.8 mm | 3/8-18 NPTF   | 9/16-18 UNF  | 0.88"<br>22.2 mm |
| PS890110-8-8      | 3.43"<br>87.0 mm  | 2.84"<br>72.0 mm | 1.73"<br>44.0 mm | 1/2-14 NPTF   | 3/4-16 UNF   | 1.12"<br>28.6 mm |
| PS1290110-12-12   | 3.66"<br>93.0 mm  | 3.00"<br>76.1 mm | 2.17"<br>55.2 mm | 3/4-14 NPTF   | 1-1/16-12 UN | 1.38"<br>35.0 mm |
| PS1690110-16-16   | 4.41"<br>112.0 mm | 3.54"<br>90.0 mm | 2.48"<br>63.0 mm | 1-11 1/2 NPTF | 1-5/16-12 UN | 1.62"<br>41.3 mm |

## PS Series Male Pipe - Male Seal-Lok



| Part Number Steel | A                 | B                | C                | D                | Diameter         | Port 1        | Port 2       | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|-------------------|------------------|------------------|------------------|------------------|---------------|--------------|------------------|------------------|
| PS6901JM-6-6      | 3.05"<br>77.4 mm  | 2.54"<br>64.4 mm | 1.40"<br>35.6 mm | 2.05"<br>52.0 mm | 1.29"<br>32.8 mm | 3/8-18 NPTF   | 11/16-16 UN  | 0.88"<br>22.2 mm | 0.69"<br>17.5 mm |
| PS8901JM-8-8      | 3.43"<br>87.0 mm  | 2.84"<br>72.0 mm | 1.74"<br>44.1 mm | 2.60"<br>66.1 mm | 1.73"<br>44.0 mm | 1/2-14 NPTF   | 13/16-16 UN  | 1.12"<br>28.6 mm | 0.88"<br>22.2 mm |
| PS12901JM-12-12   | 3.66"<br>93.0 mm  | 3.00"<br>76.1 mm | 2.18"<br>55.4 mm | 3.27"<br>83.0 mm | 2.17"<br>55.2 mm | 3/4-14 NPTF   | 1-3/16-12 UN | 1.38"<br>35.0 mm | 1.25"<br>31.8 mm |
| PS16901JM-16-16   | 4.41"<br>112.0 mm | 3.54"<br>90.0 mm | 2.34"<br>59.6 mm | 3.59"<br>91.1 mm | 2.48"<br>63.0 mm | 1-11 1/2 NPTF | 1-7/16-12 UN | 1.62"<br>41.3 mm | 1.50"<br>38.1 mm |

**WARNING**

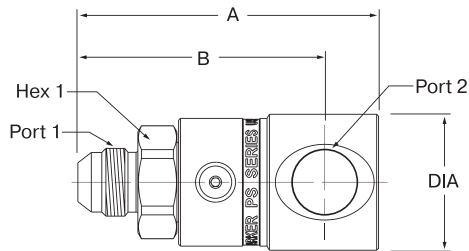
This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

## Swivels

## PS Series

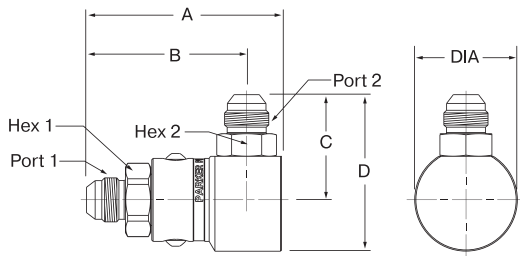
90°

## PS Series Male 37° Flare - Female Pipe



| Part Number Steel | A                 | B                | Port 1       | Port 2        | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|-------------------|------------------|--------------|---------------|------------------|------------------|
| PS690302-6-6      | 3.05"<br>77.4 mm  | 2.54"<br>64.4 mm | 9/16-18 UNF  | 3/8-18 NPTF   | 1.29"<br>32.8 mm | 0.88"<br>22.2 mm |
| PS890302-8-8      | 3.29"<br>83.7 mm  | 2.70"<br>68.7 mm | 3/4-16 UNF   | 1/2-14 NPTF   | 1.49"<br>37.8 mm | 1.12"<br>28.6 mm |
| PS1290302-12-12   | 3.76"<br>95.6 mm  | 3.10"<br>78.8 mm | 1-1/16-12 UN | 3/4-14 NPTF   | 1.76"<br>44.6 mm | 1.38"<br>35.0 mm |
| PS1690302-16-16   | 4.41"<br>112.0 mm | 3.54"<br>90.0 mm | 1-5/16-12 UN | 1-11 1/2 NPTF | 2.16"<br>54.9 mm | 1.62"<br>41.3 mm |

## PS Series Male 37° Flare - Male 37° Flare



| Part Number Steel | A                 | B                | C                | D                | Diameter         | Port 1       | Port 2       | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|-------------------|------------------|------------------|------------------|------------------|--------------|--------------|------------------|------------------|
| PS690303-6-6      | 3.05"<br>77.4 mm  | 2.54"<br>64.4 mm | 1.44"<br>36.6 mm | 2.09"<br>53.0 mm | 1.29"<br>32.8 mm | 9/16-18 UNF  | 9/16-18 UNF  | 0.88"<br>22.2 mm | 0.69"<br>17.5 mm |
| PS890303-8-8      | 3.29"<br>83.7 mm  | 2.70"<br>68.7 mm | 1.78"<br>45.1 mm | 2.64"<br>67.1 mm | 1.73"<br>44.0 mm | 3/4-16 UNF   | 3/4-16 UNF   | 1.12"<br>28.6 mm | 0.88"<br>22.2 mm |
| PS1290303-12-12   | 3.76"<br>95.6 mm  | 3.10"<br>78.8 mm | 2.24"<br>56.9 mm | 3.86"<br>85.3 mm | 2.17"<br>55.2 mm | 1-1/16-12 UN | 1-1/16-12 UN | 1.38"<br>35.0 mm | 1.25"<br>31.8 mm |
| PS1690303-16-16   | 4.41"<br>112.0 mm | 3.54"<br>90.0 mm | 2.42"<br>61.3 mm | 3.66"<br>92.9 mm | 2.48"<br>63.0 mm | 1-5/16-12 UN | 1-5/16-12 UN | 1.62"<br>41.3 mm | 1.50"<br>38.1 mm |

 **WARNING**

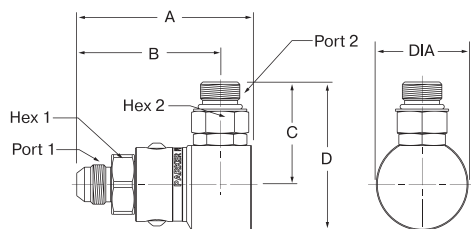
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## Swivels

## PS Series

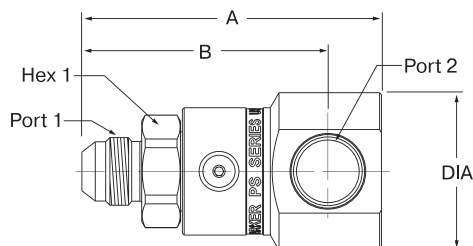
90°

## PS Series Male 37° Flare - Female NPSM Pipe Swivel



| Part Number Steel | A                 | B                | C                | D                | Diameter         | Port 1       | Port 2        | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|-------------------|------------------|------------------|------------------|------------------|--------------|---------------|------------------|------------------|
| PS690307-6-6      | 3.05"<br>77.4 mm  | 2.54"<br>64.4 mm | 1.51"<br>38.4 mm | 2.16"<br>54.8 mm | 1.29"<br>32.8 mm | 9/16-18 UNF  | 3/8-18 NPSM   | 0.88"<br>22.2 mm | 0.88"<br>22.2 mm |
| PS890307-8-8      | 3.29"<br>83.7 mm  | 2.70"<br>68.7 mm | 1.86"<br>47.2 mm | 2.72"<br>69.2 mm | 1.73"<br>44.0 mm | 3/4-16 UNF   | 1/2-14 NPSM   | 1.12"<br>28.6 mm | 1.00"<br>25.4 mm |
| PS1290307-12-12   | 3.76"<br>95.6 mm  | 3.10"<br>78.8 mm | 2.24"<br>56.9 mm | 3.33"<br>84.5 mm | 2.17"<br>55.2 mm | 1-1/16-12 UN | 3/4-14 NPSM   | 1.38"<br>35.0 mm | 1.25"<br>31.8 mm |
| PS1690307-16-16   | 4.41"<br>112.0 mm | 3.54"<br>90.0 mm | 2.48"<br>63.1 mm | 3.73"<br>94.6 mm | 2.48"<br>63.0 mm | 1-5/16-12 UN | 1-11 1/2 NPSM | 1.62"<br>41.3 mm | 1.50"<br>38.1 mm |

## PS Series Male 37° Flare - Female SAE Straight Thread



| Part Number Steel | A                 | B                | Diameter         | Port 1       | Port 2       | Wrench Flats 1   |
|-------------------|-------------------|------------------|------------------|--------------|--------------|------------------|
| PS690310-6-6      | 3.05"<br>77.4 mm  | 2.54"<br>64.4 mm | 1.29"<br>32.8 mm | 9/16-18 UNF  | 9/16-18 UNF  | 0.88"<br>22.2 mm |
| PS890310-8-8      | 3.29"<br>83.7 mm  | 2.70"<br>68.7 mm | 1.73"<br>44.0 mm | 3/4-16 UNF   | 3/4-16 UNF   | 1.12"<br>28.6 mm |
| PS1290310-12-12   | 3.76"<br>95.6 mm  | 3.10"<br>78.8 mm | 2.17"<br>55.2 mm | 1-1/16-12 UN | 1-1/16-12 UN | 1.38"<br>35.0 mm |
| PS1690310-16-16   | 4.41"<br>112.0 mm | 3.54"<br>90.0 mm | 2.48"<br>63.0 mm | 1-1/16-12 UN | 1-1/16-12 UN | 1.62"<br>41.3 mm |

 **WARNING**

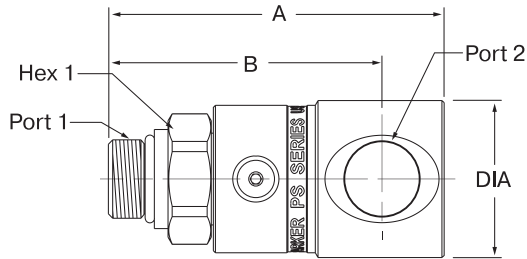
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## Swivels

## PS Series

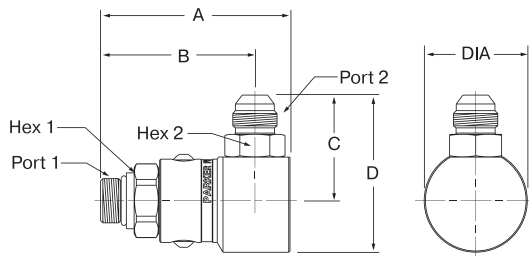
90°

## PS Series Male SAE O-Ring Straight Thread - Female Pipe



| Part Number Steel | A                 | B                | Diameter         | Port 1       | Port 2        | Wrench Flats     |
|-------------------|-------------------|------------------|------------------|--------------|---------------|------------------|
| PS690502-6-6      | 2.87"<br>72.8 mm  | 2.36"<br>59.8 mm | 1.29"<br>32.8 mm | 9/16-18 UNF  | 3/8-18 NPTF   | 0.88"<br>22.2 mm |
| PS890502-8-8      | 3.19"<br>80.9 mm  | 2.60"<br>65.9 mm | 1.49"<br>37.8 mm | 3/4-16 UNF   | 1/2-14 NPTF   | 1.12"<br>28.6 mm |
| PS1290502-12-12   | 3.58"<br>90.9 mm  | 2.92"<br>74.0 mm | 1.76"<br>44.6 mm | 1-1/16-12 UN | 3/4-14 NPTF   | 1.38"<br>35.0 mm |
| PS1690502-16-16   | 4.18"<br>106.3 mm | 3.32"<br>84.3 mm | 2.16"<br>54.9 mm | 1-5/16-12 UN | 1-11 1/2 NPTF | 1.62"<br>41.3 mm |

## PS Series Male SAE O-Ring Straight Thread - Male 37° Flare



| Part Number Steel | A                 | B                | C                | D                | Diameter         | Port 1       | Port 2       | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|-------------------|------------------|------------------|------------------|------------------|--------------|--------------|------------------|------------------|
| PS690503-6-6      | 2.87"<br>72.8 mm  | 2.36"<br>59.8 mm | 1.44"<br>36.6 mm | 2.09"<br>53.0 mm | 1.29"<br>32.8 mm | 9/16-18 UNF  | 9/16-18 UNF  | 0.88"<br>22.2 mm | 0.69"<br>17.5 mm |
| PS890503-8-8      | 3.19"<br>80.9 mm  | 2.60"<br>65.9 mm | 1.78"<br>45.1 mm | 2.64"<br>67.1 mm | 1.73"<br>44.0 mm | 3/4-16 UNF   | 3/4-16 UNF   | 1.12"<br>28.6 mm | 0.88"<br>22.2 mm |
| PS1290503-12-12   | 3.58"<br>90.9 mm  | 2.92"<br>74.0 mm | 2.24"<br>56.9 mm | 3.86"<br>85.3 mm | 2.17"<br>55.2 mm | 1-1/16-12 UN | 1-1/16-12 UN | 1.38"<br>35.0 mm | 1.25"<br>31.8 mm |
| PS1690503-16-16   | 4.18"<br>106.3 mm | 3.32"<br>84.3 mm | 2.42"<br>61.3 mm | 3.66"<br>92.9 mm | 2.48"<br>63.0 mm | 1-5/16-12 UN | 1-5/16-12 UN | 1.62"<br>41.3 mm | 1.50"<br>38.1 mm |

 **WARNING**

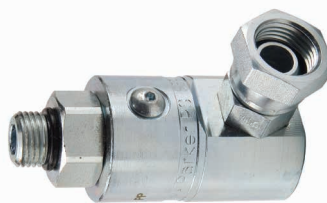
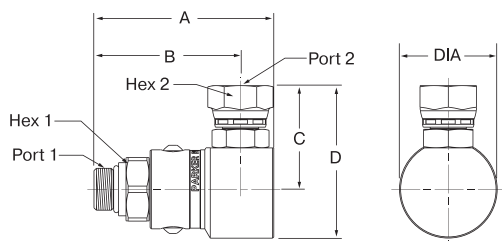
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## Swivels

## PS Series

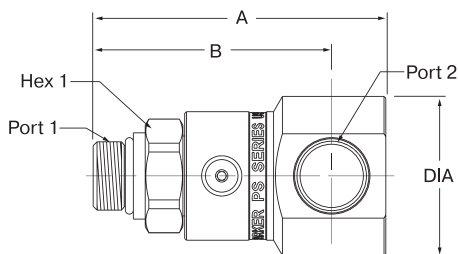
90°

## PS Series Male SAE O-Ring Straight Thread - Female NPSM Pipe Swivel



| Part Number Steel | A                 | B                | C                | D                | Diameter         | Port 1       | Port 2        | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|-------------------|------------------|------------------|------------------|------------------|--------------|---------------|------------------|------------------|
| PS690507-6-6      | 2.87"<br>72.8 mm  | 2.36"<br>59.8 mm | 1.51"<br>38.4 mm | 2.16"<br>54.8 mm | 1.29"<br>32.8 mm | 9/16-18 UNF  | 3/8-18 NPSM   | 0.88"<br>22.2 mm | 0.88"<br>22.2 mm |
| PS890507-8-8      | 3.19"<br>80.9 mm  | 2.60"<br>65.9 mm | 1.86"<br>47.2 mm | 2.72"<br>69.2 mm | 1.73"<br>44.0 mm | 3/4-16 UNF   | 1/2-14 NPSM   | 1.12"<br>28.6 mm | 1.00"<br>25.4 mm |
| PS1290507-12-12   | 3.58"<br>90.9 mm  | 2.92"<br>74.0 mm | 2.24"<br>56.9 mm | 3.33"<br>84.5 mm | 2.17"<br>55.2 mm | 1-1/16-12 UN | 3/4-14 NPSM   | 1.38"<br>35.0 mm | 1.25"<br>31.8 mm |
| PS1690507-16-16   | 4.18"<br>106.3 mm | 3.32"<br>84.3 mm | 2.48"<br>63.1 mm | 3.73"<br>94.6 mm | 2.48"<br>63.0 mm | 1-5/16-12 UN | 1-11 1/2 NPSM | 1.62"<br>41.3 mm | 1.50"<br>38.1 mm |

## PS Series Male SAE O-Ring Straight Thread - Female SAE Straight Thread



| Part Number Steel | A                 | B                | Diameter         | Port 1       | Port 2       | Wrench Flats     |
|-------------------|-------------------|------------------|------------------|--------------|--------------|------------------|
| PS690510-6-6      | 2.87"<br>72.8 mm  | 2.36"<br>59.8 mm | 1.29"<br>32.8 mm | 9/16-18 UNF  | 9/16-18 UNF  | 0.88"<br>22.2 mm |
| PS890510-8-8      | 3.19"<br>80.9 mm  | 2.60"<br>65.9 mm | 1.73"<br>44.0 mm | 3/4-16 UNF   | 3/4-16 UNF   | 1.12"<br>28.6 mm |
| PS1290510-12-12   | 3.58"<br>90.9 mm  | 2.92"<br>74.0 mm | 2.17"<br>55.2 mm | 1-1/16-12 UN | 1-1/16-12 UN | 1.38"<br>35.0 mm |
| PS1690510-16-16   | 4.18"<br>106.3 mm | 3.32"<br>84.3 mm | 2.48"<br>63.0 mm | 1-5/16-12 UN | 1-5/16-12 UN | 1.62"<br>41.3 mm |

**WARNING**

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## Swivels

# S Series

## Introduction

The S Series Swivel product line complements the Quick Coupling Division's PS Series swivel line by offering a pressure balanced, compact forged body design. As a result of the pressure balanced design, the S Series Swivel does not experience a significant increase in torque as pressure rises. The housing body is forged to provide superior performance and durability in tough applications. This product is great for eliminating hose twist, torque and stress caused by the movement of the hydraulic components where side load to the swivel can be minimized.

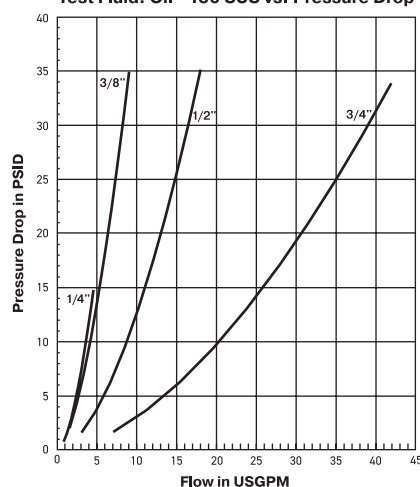


### Features:

- 3000 psi working pressure rating for all sizes
- Nitrile Seals
- Torque value does not significantly increase with pressure
- Dust seals protect the swivel from damaging environmental contaminants
- Field service kits are available for quick and reliable repairs
- 360° swivel eliminates long radius bends, hose twist and stress that can cause premature hose failure
- One piece forged housing eliminates a brazed 90° adapter connection
- Case hardened for enhanced service life
- Compact design to fit into tight areas

### Performance

**S Series Swivel (1/4", 3/8", 1/2", 3/4")**  
Test Fluid: Oil - 150 SUS vs. Pressure Drop



### S Series Swivel Specifications

| Body Size                    | 1/4            | 3/8  | 1/2  | 3/4  |
|------------------------------|----------------|------|------|------|
| Maximum Rated Pressure (psi) | 3000           | 3000 | 3000 | 3000 |
| Temperature Range            | -40° to 250° F |      |      |      |
| Maximum RPM                  | 10             |      |      |      |

### S Series Repair Kits

Repair Kits come complete with primary O-Rings, PTFE back-up rings, external and internal dust seals, retaining ring and instruction sheet.

#### Nitrile Seals

| Size   | Kit Number |
|--------|------------|
| -4/-6  | RK-4/6N    |
| -8/-10 | RK-8N      |
| -12    | RK-12N     |

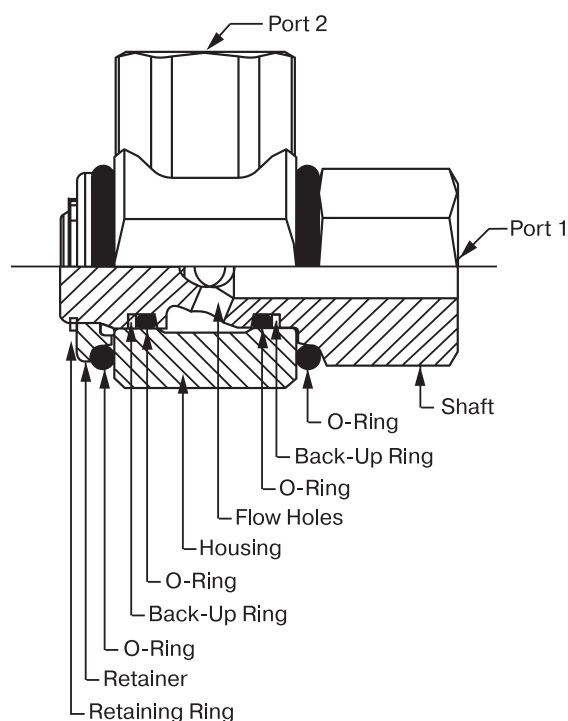
### WARNING

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## Swivels

## S Series

## How To Order



## PS Part Number

**S 21 02 - 8 - 8**

Housing Port Size (1/16 of an inch)

Shaft Port Size (1/16 of an inch)

**Housing Port Configuration:**

02 = Female NPTF  
05 = Male SAE O-Ring Straight Thread  
07 = Female NPSM Pipe Swivel

**Shaft Port Configuration:**

21 = Male NPTF  
22 = Female NPTF  
25 = Male SAE O-Ring Straight Thread

**Parker S Series Swivel designator**

**WARNING**

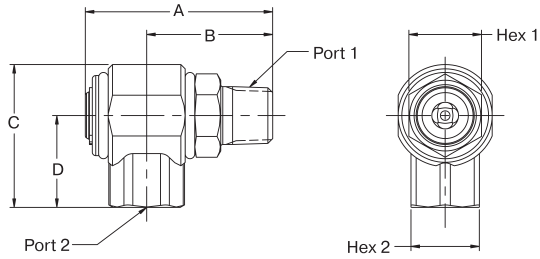
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## Swivels

## S Series

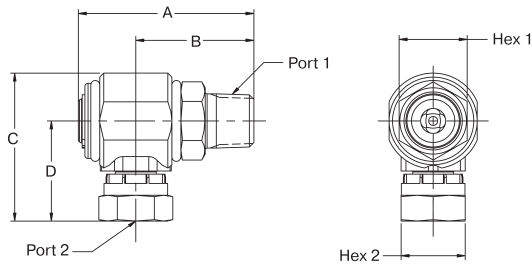
90°

## S Series Male Pipe - Female Pipe



| Part Number Steel | A                | B                | C                | D                | Port 1      | Port 2      | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|------------------|------------------|------------------|------------------|-------------|-------------|------------------|------------------|
| S2102-4-4         | 2.31"<br>58.7 mm | 1.51"<br>38.4 mm | 1.78"<br>45.1 mm | 1.09"<br>27.6 mm | 1/4-18 NPTF | 1/4-18 NPTF | 0.88"<br>22.2 mm | 0.88"<br>22.2 mm |
| S2102-6-6         | 2.31"<br>58.7 mm | 1.51"<br>38.4 mm | 1.78"<br>45.1 mm | 1.09"<br>27.6 mm | 3/8-18 NPTF | 3/8-18 NPTF | 0.88"<br>22.2 mm | 0.88"<br>22.2 mm |
| S2102-8-8         | 2.74"<br>69.6 mm | 1.84"<br>46.8 mm | 2.10"<br>53.3 mm | 1.35"<br>34.3 mm | 1/2-14 NPTF | 1/2-14 NPTF | 1.06"<br>27.0 mm | 1.00"<br>25.4 mm |
| S2102-12-12       | 3.35"<br>85.1 mm | 2.12"<br>53.9 mm | 2.39"<br>60.7 mm | 1.50"<br>38.0 mm | 3/4-14 NPTF | 3/4-14 NPTF | 1.38"<br>34.9 mm | 1.38"<br>34.9 mm |

## S Series Male Pipe - Female NPSM Pipe Swivel



| Part Number Steel | A                | B                | C                | D                | Port 1      | Port 2      | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|------------------|------------------|------------------|------------------|-------------|-------------|------------------|------------------|
| S2107-4-4         | 2.31"<br>58.7 mm | 1.51"<br>38.4 mm | 2.05"<br>52.0 mm | 1.36"<br>34.5 mm | 1/4-18 NPTF | 1/4-18 NPSM | 0.88"<br>22.2 mm | 0.69"<br>17.5 mm |
| S2107-6-6         | 2.31"<br>58.7 mm | 1.51"<br>38.4 mm | 2.07"<br>52.5 mm | 1.38"<br>35.1 mm | 3/8-18 NPTF | 3/8-18 NPSM | 0.88"<br>22.2 mm | 0.88"<br>22.2 mm |
| S2107-8-8         | 2.74"<br>69.6 mm | 1.84"<br>46.8 mm | 2.32"<br>59.0 mm | 1.57"<br>39.9 mm | 1/2-14 NPTF | 1/2-14 NPSM | 1.06"<br>27.0 mm | 1.00"<br>25.4 mm |
| S2107-12-12       | 3.35"<br>85.1 mm | 2.12"<br>53.9 mm | 2.74"<br>69.5 mm | 1.85"<br>46.9 mm | 3/4-14 NPTF | 3/4-14 NPSM | 1.38"<br>34.9 mm | 1.25"<br>31.8 mm |

 **WARNING**

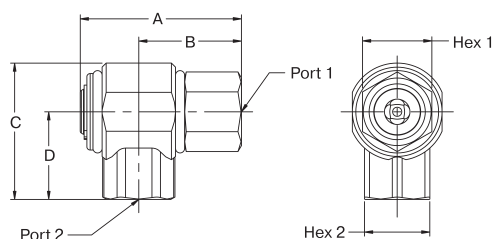
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## Swivels

## S Series

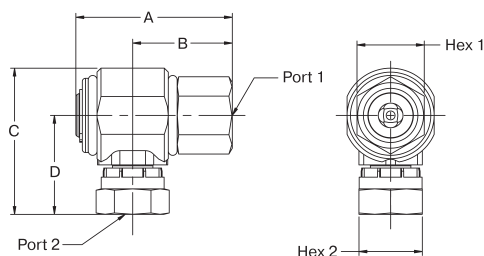
90°

## S Series Female Pipe - Female Pipe



| Part Number Steel | A                | B                | C                | D                | Port 1      | Port 2      | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|------------------|------------------|------------------|------------------|-------------|-------------|------------------|------------------|
| S2202-4-4         | 2.19"<br>55.6 mm | 1.39"<br>35.4 mm | 1.78"<br>45.1 mm | 1.09"<br>27.6 mm | 1/4-18 NPTF | 1/4-18 NPTF | 0.88"<br>22.2 mm | 0.88"<br>22.2 mm |
| S2202-6-6         | 2.19"<br>55.6 mm | 1.39"<br>35.4 mm | 1.78"<br>45.1 mm | 1.09"<br>27.6 mm | 3/8-18 NPTF | 3/8-18 NPTF | 0.88"<br>22.2 mm | 0.88"<br>22.2 mm |
| S2202-8-8         | 2.47"<br>62.7 mm | 1.57"<br>40.0 mm | 2.10"<br>53.3 mm | 1.35"<br>34.3 mm | 1/2-14 NPTF | 1/2-14 NPTF | 1.06"<br>27.0 mm | 1.00"<br>25.4 mm |
| S2202-12-12       | 3.15"<br>80.0 mm | 1.92"<br>48.8 mm | 2.39"<br>60.7 mm | 1.50"<br>38.0 mm | 3/4-14 NPTF | 3/4-14 NPTF | 1.38"<br>34.9 mm | 1.38"<br>34.9 mm |

## S Series Female Pipe - Female NPSM Pipe Swivel



| Part Number Steel | A                | B                | C                | D                | Port 1      | Port 2      | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|------------------|------------------|------------------|------------------|-------------|-------------|------------------|------------------|
| S2207-4-4         | 2.19"<br>55.6 mm | 1.39"<br>35.4 mm | 2.05"<br>52.0 mm | 1.36"<br>34.5 mm | 1/4-18 NPTF | 1/4-18 NPSM | 0.88"<br>22.2 mm | 0.69"<br>17.5 mm |
| S2207-6-6         | 2.19"<br>55.6 mm | 1.39"<br>35.4 mm | 2.07"<br>52.5 mm | 1.38"<br>35.1 mm | 3/8-18 NPTF | 3/8-18 NPSM | 0.88"<br>22.2 mm | 0.88"<br>22.2 mm |
| S2207-8-8         | 2.47"<br>62.7 mm | 1.57"<br>40.0 mm | 2.32"<br>59.0 mm | 1.57"<br>39.9 mm | 1/2-14 NPTF | 1/2-14 NPSM | 1.06"<br>27.0 mm | 1.00"<br>25.4 mm |
| S2207-12-12       | 3.15"<br>80.0 mm | 1.92"<br>48.8 mm | 2.74"<br>69.5 mm | 1.85"<br>46.9 mm | 3/4-14 NPTF | 3/4-14 NPSM | 1.38"<br>34.9 mm | 1.25"<br>31.8 mm |

 **WARNING**

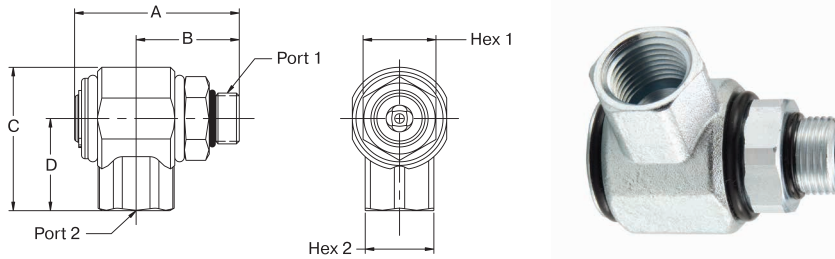
This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

## Swivels

## S Series

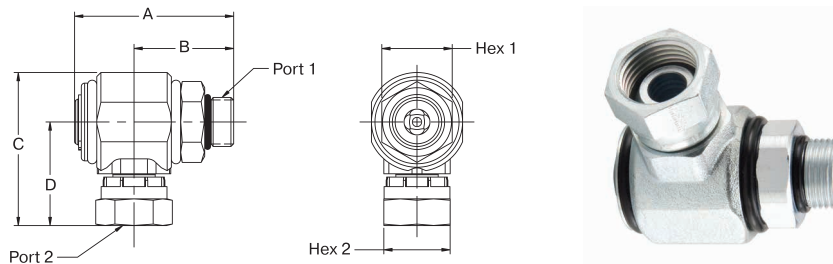
90°

## S Series Male SAE O-Ring Straight Thread - Female Pipe



| Part Number Steel | A                | B                | C                | D                | Port 1       | Port 2      | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|------------------|------------------|------------------|------------------|--------------|-------------|------------------|------------------|
| S2502-6-6         | 2.13"<br>54.1 mm | 1.33"<br>33.8 mm | 1.78"<br>45.1 mm | 1.09"<br>27.6 mm | 9/16-18 UNF  | 3/8-18 NPTF | 0.88"<br>22.2 mm | 0.88"<br>22.2 mm |
| S2502-8-8         | 2.40"<br>61.0 mm | 1.50"<br>38.2 mm | 2.10"<br>53.3 mm | 1.35"<br>34.3 mm | 3/4-16 UNF   | 1/2-14 NPTF | 1.06"<br>27.0 mm | 1.00"<br>25.4 mm |
| S2502-12-12       | 3.40"<br>86.4 mm | 2.17"<br>55.2 mm | 2.39"<br>60.7 mm | 1.50"<br>38.0 mm | 1-1/16-12 UN | 3/4-14 NPTF | 1.38"<br>34.9 mm | 1.38"<br>34.9 mm |

## S Series Male SAE O-Ring Straight Thread - Female NPSM Pipe Swivel



| Part Number Steel | A                | B                | C                | D                | Port 1       | Port 2      | Wrench Flats 1   | Wrench Flats 2   |
|-------------------|------------------|------------------|------------------|------------------|--------------|-------------|------------------|------------------|
| S2507-6-6         | 2.13"<br>54.1 mm | 1.33"<br>33.8 mm | 2.07"<br>52.5 mm | 1.38"<br>35.1 mm | 9/16-18 UNF  | 3/8-18 NPSM | 0.88"<br>22.2 mm | 0.88"<br>22.2 mm |
| S2507-8-8         | 2.40"<br>61.0 mm | 1.50"<br>38.2 mm | 2.32"<br>59.0 mm | 1.57"<br>39.9 mm | 3/4-16 UNF   | 1/2-14 NPSM | 1.06"<br>27.0 mm | 1.00"<br>25.4 mm |
| S2507-12-12       | 3.75"<br>86.4 mm | 2.17"<br>55.2 mm | 2.74"<br>69.5 mm | 1.85"<br>46.9 mm | 1-1/16-12 UN | 3/4-14 NPSM | 1.38"<br>34.9 mm | 1.25"<br>31.8 mm |

 **WARNING**

This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

# Valves

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# VALVES

## Multiple Hydraulic System Applications

Parker Check Valves are unidirectional flow control devices used primarily in hydraulic systems to eliminate potential damage caused by fluid back pressure. Offered in many configurations, Parker can satisfy most hydraulic system applications. Parker's in-line style check valves are available in a variety of sizes, pressure ratings, flow capacities and crack pressures.

H1, HM1 and PV Series Pressure / Vacuum Relief Valves are used to create and maintain a positive pressure in hydraulic tanks and reservoirs. These pressurized reservoir valves provide the following benefits:

- Prevents pump cavitation by assuring a positive supply of oil at the pump inlet
- Minimizes the tank breathing of outside, moist, contaminated air
- Filters all incoming air

## General Ordering Information

When ordering Parker coupler bodies and nipples, please state the part number of each type of coupler body and each type of nipple desired. List coupler bodies and nipples as separate items rather than in combinations. Be sure to double check thread or hose sizes of items required.

Many of Parker's coupling products are available with unique non-standard options well suited to very specific applications. Examples of unusual end use applications might include: high temperatures (above 250° F), extremely caustic/corrosive solutions passing through the coupling, external/environmental corrosion situations, or other high wear and tear situations such as dragging the product along the ground. It is always recommended that the Quick Coupling Division be contacted with any questions concerning specific product application needs.

# Check Valves

## Technical Information

Parker's Check Valves have several unique features that insure years of trouble-free operation.



### Crack Pressure

Crack pressure refers to the amount of fluid pressure in the free flow direction required to move the poppet off the seat. The normal crack pressure setting is 5 PSI; however, other crack pressures are available to allow the check valve to perform special circuit functions, or operate under unique conditions.

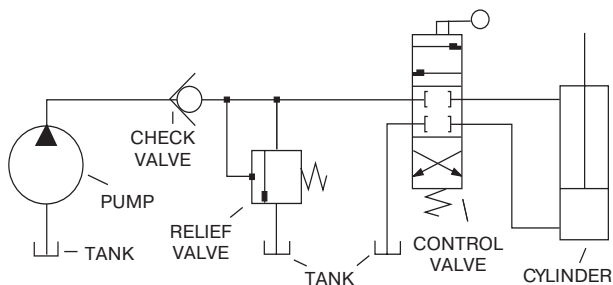
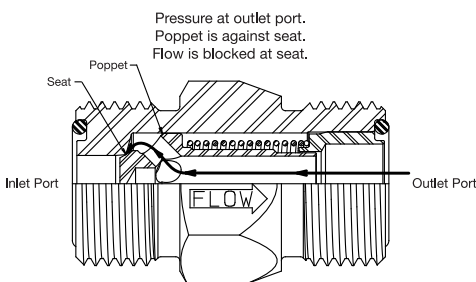
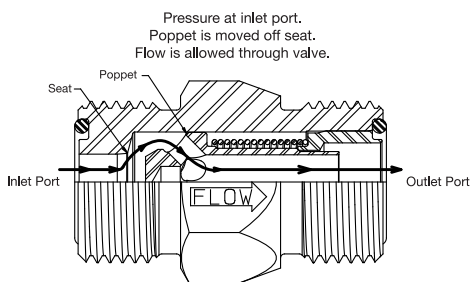
Check valves are not field repairable or adjustable. Crack pressure settings are made at the factory only.

### Applications

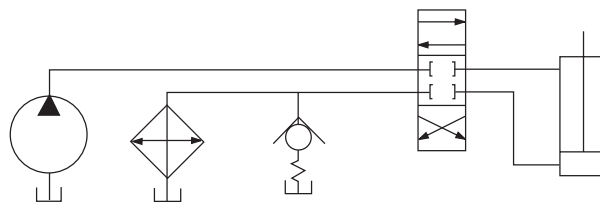
Typical hydraulic circuit, the check valve is used to protect the pump by preventing pressure from returning to the outlet port of the pump.

### Selection Guide

| Series       | Body Size    | Material            | Type                | Rated Pressure (psi) | Crack Pressure Range (psi) |
|--------------|--------------|---------------------|---------------------|----------------------|----------------------------|
| CV Series    | 1/4 - 1"     | Steel               | Metal to Metal Seal | 3000                 | 5-130                      |
| DT Series    | 1/4 - 1 1/4" | Steel               | Metal to Metal Seal | 2500-5000            | 5-200                      |
| DC Series    | 1/4 - 2"     | Steel               | Metal to Metal Seal | 3000                 | 5-100                      |
| CPIFF Series | 1/4 - 1"     | Steel               | Soft Seat           | 5000                 | 5-65                       |
| 3C Series    | 1 1/4 - 2"   | Steel               | Soft Seat           | 3000                 | 5-65                       |
| S6C Series   | 1/4 - 1"     | 316 Stainless Steel | Soft Seat           | 6000                 | 5-65                       |



The graphic symbol for a check-valve is:



Oil cooler bypass circuit. If return line pressure becomes excessive due to resistance through oil cooler (such as startup in cold weather). Check valve opens and allows oil to bypass the cooler and flow to the tank.

## Check Valves

## DT Series Metal Seal

Parker DT Series Check Valves Offer the Features of a Compact Body Size, and up to 5000 PSI Maximum Operating Pressure

The DT Series check valves utilize the dependable, internal design features found in Parker check valves, but with the added benefit and convenience of compact design. Sizes are available from 1/4" to 1-1/4" with six different Fitting Styles. The DT Series expands Parker's high quality product line of versatile and efficient check valves.

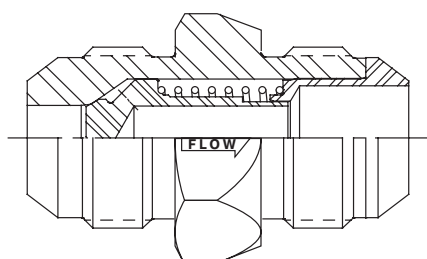


### Features:

- Compact Design - Easy to plumb into tight circuits
- All steel construction - No internal gaskets or seals to wear out
- One-piece body eliminates threads and seals that may be potential leakage points
- Smooth flow stream - Poppet spring is isolated from flow stream
- Variety of end fittings
- Optional crack pressures available from 1 to 200 PSI
- Chromium-6 Free plated exterior finish
- Nitrile O-Ring included on MO and MS fittings
- Captive O-Ring Groove is standard on MS end fittings

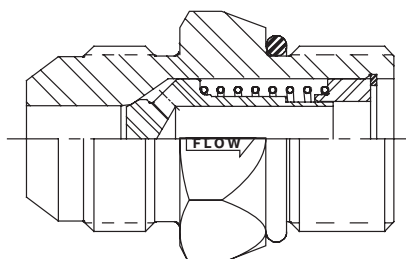
### Specifications

The DT Series check valves have a Maximum Operating Pressure of 2500-5000 PSI. Standard crack pressures are 1, 5, and 65 PSI depending on the port size and configuration. Other crack pressures up to 200 PSI in 5 PSI increments are available upon request.



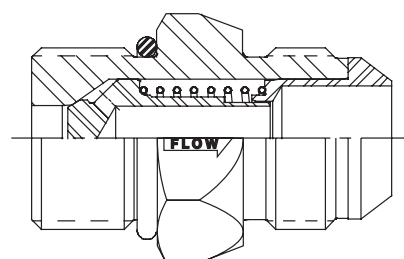
**DT-MFMF**

Male Flare 37° JIC Inlet to Male Flare 37° JIC Outlet



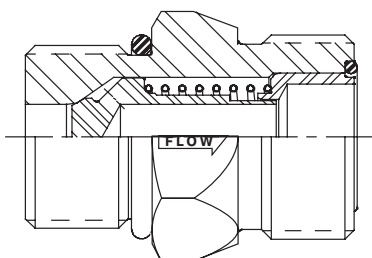
**DT-MFMO**

Male Flare 37° JIC Inlet to Male O-Ring Boss Outlet



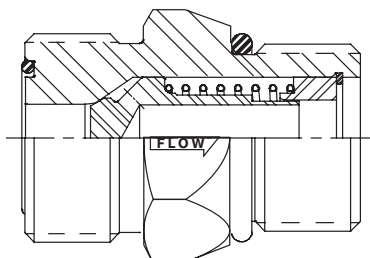
**DT-MOMF**

Male O-Ring Boss Inlet to Male Flare 37° JIC Outlet



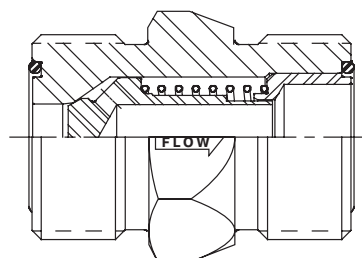
**DT-MOMS**

Male O-Ring Boss Inlet to Male Seal-Lok® Outlet



**DT-MSMO**

Male Seal-Lok® Inlet to Male O-Ring Boss Outlet



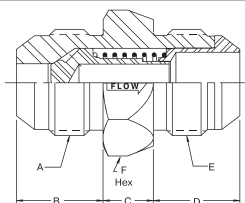
**DT-MSMS**

Male Seal-Lok® Inlet to Male Seal-Lok® Outlet

## Check Valves

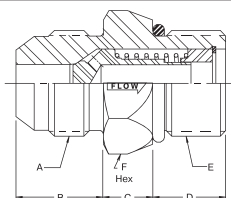
## DT Series Metal Seal

### DT-MFMF Male Flare 37° JIC Inlet to Male Flare 37° JIC Outlet



| Valve Size | Part Number Steel | Inlet Port Thread | Dimensions (in.) |      |      |              | Outlet Port Thread | Wrench Flats | ** Std Crack Pressure (psi) |
|------------|-------------------|-------------------|------------------|------|------|--------------|--------------------|--------------|-----------------------------|
|            |                   | A                 | B                | C    | D    | E            | F                  |              |                             |
| 3/8        | DT-370-MFMF-**    | 9/16-18 UNF       | 0.56             | 0.44 | 0.56 | 9/16-18 UNF  | 0.75               | 1, 5, 65     |                             |
| 1/2        | DT-500-MFMF-**    | 3/4-16 UNF        | 0.66             | 0.50 | 0.66 | 3/4-16 UNF   | 0.88               | 5, 65        |                             |
| 5/8        | DT-620-MFMF-**    | 7/8-14 UNF        | 0.76             | 0.50 | 0.76 | 7/8-14 UNF   | 1.06               | 5            |                             |
| 3/4        | DT-750-MFMF-**    | 1-1/16 - 12 UN    | 0.86             | 0.50 | 0.86 | 1-1/16-12 UN | 1.25               | 1, 5, 65     |                             |
| 1          | DT-1000-MFMF-**   | 1-5/16 - 12 UN    | 0.91             | 0.62 | 0.91 | 1-5/16-12 UN | 1.50               | 5, 65        |                             |
| 1-1/4      | DT-1250-MFMF-**   | 1-5/8 - 12 UN     | 0.96             | 1.06 | 0.96 | 1-5/8-12 UN  | 1.88               | 1, 5         |                             |

### DT-MFMO Male Flare 37° JIC Inlet to Male O-Ring Boss Outlet



| Valve Size | Part Number Steel       | Inlet Port Thread | Dimensions (in.) |      |      |              | Outlet Port Thread | Wrench Flats | ** Std Crack Pressure (psi) |
|------------|-------------------------|-------------------|------------------|------|------|--------------|--------------------|--------------|-----------------------------|
|            |                         | A                 | B                | C    | D    | E            | F                  |              |                             |
| 3/8        | DT-370-MFMO- <b>**</b>  | 9/16-18 UNF       | 0.56             | 0.44 | 0.47 | 9/16-18 UNF  | 0.75               | 1, 5, 65     |                             |
| 1/2        | DT-500-MFMO- <b>**</b>  | 3/4-16 UNF        | 0.66             | 0.50 | 0.55 | 3/4-16 UNF   | 0.88               | 5, 65        |                             |
| 5/8        | DT-620-MFMO- <b>**</b>  | 7/8-14 UNF        | 0.76             | 0.50 | 0.63 | 7/8-14 UNF   | 1.06               | 5            |                             |
| 3/4        | DT-750-MFMO- <b>**</b>  | 1-1/16 - 12 UN    | 0.86             | 0.50 | 0.73 | 1-1/16-12 UN | 1.25               | 1, 5, 65     |                             |
| 1          | DT-1000-MFMO- <b>**</b> | 1-5/16 - 12 UN    | 0.91             | 0.62 | 0.73 | 1-5/16-12 UN | 1.50               | 5, 65        |                             |
| 1-1/4      | DT-1250-MFMO- <b>**</b> | 1-5/8 - 12 UN     | 0.96             | 1.06 | 0.73 | 1-5/8-12 UN  | 1.88               | 1, 5         |                             |

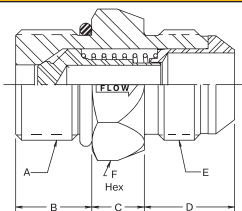
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## Check Valves

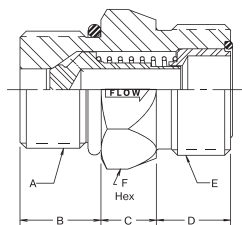
## DT Series Metal Seal

### DT-MOMF Male O-Ring Boss Inlet to Male Flare 37° JIC Outlet



| Valve Size | Part Number Steel | Inlet Port Thread | Dimensions (in.) |      |      |                | Outlet Port Thread | Wrench Flats | ** Std Crack Pressure (psi) |
|------------|-------------------|-------------------|------------------|------|------|----------------|--------------------|--------------|-----------------------------|
|            |                   | A                 | B                | C    | D    | E              | F                  |              |                             |
| 1/4        | DT-250-MOMF-**    | 7/16-20 UNF       | 0.43             | 0.44 | 0.55 | 7/16-20 UNF    | 0.62               | 5            |                             |
| 3/8        | DT-370-MOMF-**    | 9/16-18 UNF       | 0.47             | 0.44 | 0.56 | 9/16-18 UNF    | 0.75               | 1, 5, 65     |                             |
| 1/2        | DT-500-MOMF-**    | 3/4-16 UNF        | 0.55             | 0.50 | 0.66 | 3/4-16 UNF     | 0.88               | 5, 65        |                             |
| 5/8        | DT-620-MOMF-**    | 7/8-14 UNF        | 0.63             | 0.50 | 0.76 | 7/8-14 UNF     | 1.06               | 5            |                             |
| 3/4        | DT-750-MOMF-**    | 1-1/16 - 12 UN    | 0.73             | 0.50 | 0.86 | 1-1/16 - 12 UN | 1.25               | 1, 5, 65     |                             |
| 1          | DT-1000-MOMF-**   | 1-5/16 - 12 UN    | 0.73             | 0.62 | 0.91 | 1-5/16 - 12 UN | 1.50               | 5, 65        |                             |
| 1-1/4      | DT-1250-MOMF-**   | 1-5/8 - 12 UN     | 0.73             | 1.06 | 0.96 | 1-5/8 - 12 UN  | 1.88               | 1, 5         |                             |

### DT-MOMS Male O-Ring Boss Inlet to Male Seal-Lok® Outlet



| Valve Size | Part Number Steel       | Inlet Port Thread | Dimensions (in.) |      |      |                 | Outlet Port Thread | Wrench Flats | ** Std Crack Pressure (psi) |
|------------|-------------------------|-------------------|------------------|------|------|-----------------|--------------------|--------------|-----------------------------|
|            |                         | A                 | B                | C    | D    | E               | F                  |              |                             |
| 1/4        | DT-250-MOMS- <b>**</b>  | 7/16-20 UNF       | 0.43             | 0.45 | 0.39 | 9/16-18 UNF     | 0.62               | 5            |                             |
| 3/8        | DT-370-MOMS- <b>**</b>  | 9/16-18 UNF       | 0.47             | 0.44 | 0.44 | 11/16-16 UN     | 0.75               | 1, 5, 65     |                             |
| 1/2        | DT-500-MOMS- <b>**</b>  | 3/4-16 UNF        | 0.55             | 0.50 | 0.51 | 13/16-16 UN     | 0.88               | 5, 65        |                             |
| 5/8        | DT-620-MOMS- <b>**</b>  | 7/8-14 UNF        | 0.63             | 0.50 | 0.62 | 1-14 UNS        | 1.06               | 5            |                             |
| 3/4        | DT-750-MOMS- <b>**</b>  | 1-1/16 - 12 UN    | 0.73             | 0.50 | 0.68 | 1-3/16 - 12 UN  | 1.25               | 1, 5, 65     |                             |
| 1          | DT-1000-MOMS- <b>**</b> | 1-5/16 - 12 UN    | 0.73             | 0.62 | 0.70 | 1-7/16 - 12 UN  | 1.50               | 5, 65        |                             |
| 1-1/4      | DT-1250-MOMS- <b>**</b> | 1-5/8 - 12 UN     | 0.73             | 1.06 | 0.70 | 1-11/16 - 12 UN | 1.88               | 1, 5         |                             |

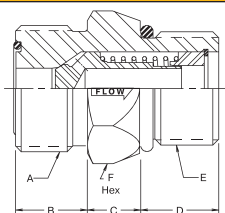
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## Check Valves

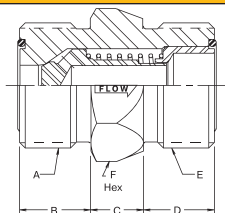
## DT Series Metal Seal

### DT-MSMO Male Seal-Lok® Inlet to Male O-Ring Boss Outlet



| Valve Size | Part Number Steel       | Inlet Port Thread | Dimensions (in.) |      |      |              | Outlet Port Thread | Wrench Flats | ** Std Crack Pressure (psi) |
|------------|-------------------------|-------------------|------------------|------|------|--------------|--------------------|--------------|-----------------------------|
|            |                         | A                 | B                | C    | D    | E            | F                  |              |                             |
| 3/8        | DT-370-MSMO- <b>**</b>  | 11/16-16 UN       | 0.44             | 0.44 | 0.47 | 9/16-18 UNF  | 0.75               | 1, 5, 65     |                             |
| 1/2        | DT-500-MSMO- <b>**</b>  | 13/16-16 UN       | 0.51             | 0.50 | 0.55 | 3/4-16 UNF   | 0.88               | 5, 65        |                             |
| 5/8        | DT-620-MSMO- <b>**</b>  | 1-14 UNS          | 0.62             | 0.49 | 0.63 | 7/8-14 UNF   | 1.06               | 5            |                             |
| 3/4        | DT-750-MSMO- <b>**</b>  | 1-3/16 - 12 UN    | 0.68             | 0.50 | 0.73 | 1-1/16-12 UN | 1.25               | 1, 5, 65     |                             |
| 1          | DT-1000-MSMO- <b>**</b> | 1-7/16 - 12 UN    | 0.70             | 0.62 | 0.73 | 1-5/16-12 UN | 1.50               | 5, 65        |                             |
| 1-1/4      | DT-1250-MSMO- <b>**</b> | 1-11/16 - 12 UN   | 0.70             | 1.06 | 0.73 | 1-5/8-12 UN  | 1.88               | 1, 5         |                             |

### DT-MSMS Male Seal-Lok® Inlet to Male Seal-Lok® Outlet



| Valve Size | Part Number Steel       | Inlet Port Thread | Dimensions (in.) |      |      |                 | Outlet Port Thread | Wrench Flats | ** Std Crack Pressure (psi) |
|------------|-------------------------|-------------------|------------------|------|------|-----------------|--------------------|--------------|-----------------------------|
|            |                         | A                 | B                | C    | D    | E               | F                  |              |                             |
| 3/8        | DT-370-MSMS- <b>**</b>  | 11/16-16 UN       | 0.44             | 0.44 | 0.44 | 11/16-16 UN     | 0.75               | 1, 5, 65     |                             |
| 1/2        | DT-500-MSMS- <b>**</b>  | 13/16-16 UN       | 0.51             | 0.50 | 0.51 | 13/16-16 UN     | 0.88               | 5, 65        |                             |
| 5/8        | DT-620-MSMS- <b>**</b>  | 1-14 UNS          | 0.62             | 0.50 | 0.62 | 1-14 UNS        | 1.06               | 5            |                             |
| 3/4        | DT-750-MSMS- <b>**</b>  | 1-3/16 - 12 UN    | 0.68             | 0.50 | 0.68 | 1-3/16 - 12 UN  | 1.25               | 1, 5, 65     |                             |
| 1          | DT-1000-MSMS- <b>**</b> | 1-7/16 - 12 UN    | 0.70             | 0.62 | 0.70 | 1-7/16 - 12 UN  | 1.50               | 5, 65        |                             |
| 1-1/4      | DT-1250-MSMS- <b>**</b> | 1-11/16 - 12 UN   | 0.70             | 1.06 | 0.70 | 1-11/16 - 12 UN | 1.88               | 1, 5         |                             |

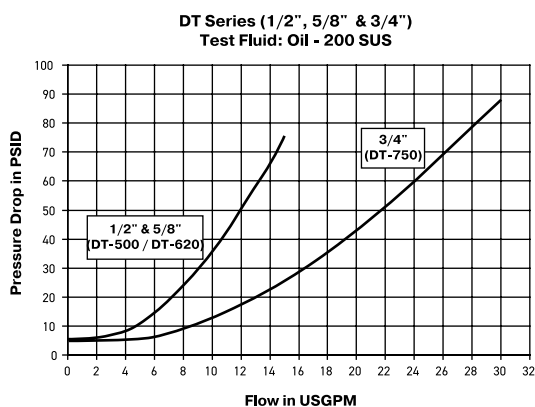
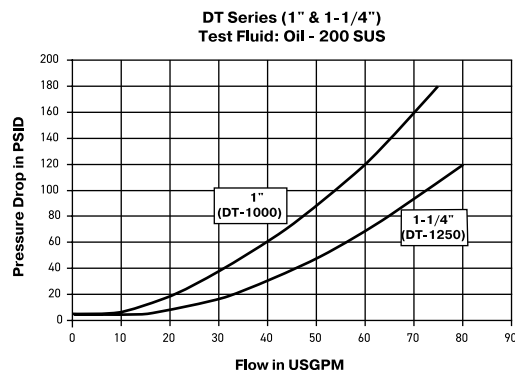
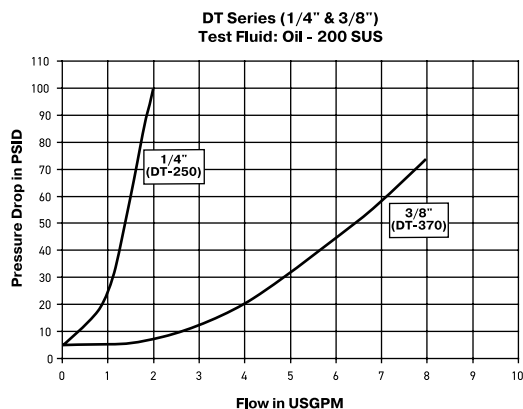
#### WARNING

This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

# Check Valves

# DT Series Metal Seal

## Flow Data



## Ordering Information

**DT - \*\*\* - \*\*\*\* - \*\***

### CRACK PRESSURE

1 = 1 PSI

5 = 5 PSI

65 = 65 PSI

Other Crack Pressures up to 200 PSI in 5 PSI increments are available. Contact the Division for price and delivery on non-standard crack pressures

| SERIES | SIZE   | FITTING STYLE                                          |
|--------|--------|--------------------------------------------------------|
| 250    | 1/4"   | MFMF - Male Flare Inlet to Male Flare Outlet           |
| 370    | 3/8"   | MFMO - Male Flare Inlet to Male O-Ring Boss Outlet     |
| 500    | 1/2"   | MOMF - Male O-Ring Boss Inlet to Male Flare Outlet     |
| 620    | 5/8"   | MOMS - Male O-Ring Boss Inlet to Male Face Seal Outlet |
| 750    | 3/4"   | MSMO - Male Face Seal Inlet to Male O-Ring Boss Outlet |
| 1000   | 1"     | MSMS - Male Face Seal Inlet to Male Face Seal Outlet   |
| 1250   | 1-1/4" |                                                        |

## DT Series Specifications

|                            |             |
|----------------------------|-------------|
| Body Size                  | 1/4 - 1 1/4 |
| Rated Pressure (psi)       | 2500-5000   |
| Material                   | Steel       |
| Crack Pressure Range (psi) | 5-200       |

## DT Series Pressure Table (psi)

| Body Size | Max Rated Pressure | MF (Male JIC 37) | MO (SAE O-Ring Boss) | MS (Male Seal-Lok) |
|-----------|--------------------|------------------|----------------------|--------------------|
| 1/4       | 5000               | 5000             | 5000                 | 5000               |
| 3/8       | 5000               | 5000             | 5000                 | 5000               |
| 1/2       | 5000               | 4500             | 5000                 | 5000               |
| 5/8       | 5000               | 3500             | 5000                 | 5000               |
| 3/4       | 5000               | 3500             | 5000                 | 5000               |
| 1         | 5000               | 3000             | 5000                 | 5000               |
| 1 1/4     | 4000               | 2500             | 4000                 | 4000               |

## DT Series Installation Assembly Torque (ft-lbs)

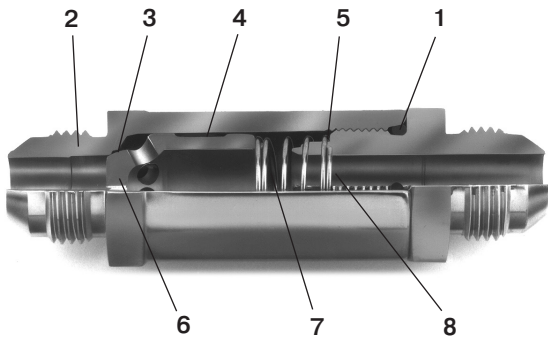
| Body Size | MF (Male JIC 37)                                           | MO (SAE O-Ring Boss) | MS (Male Seal-Lok)                                         |
|-----------|------------------------------------------------------------|----------------------|------------------------------------------------------------|
| 1/4       | Refer to Parker TFD Catalog 4300 for torque recommendation | 13.3 +10% / -0%      | Refer to Parker TFD Catalog 4300 for torque recommendation |
| 3/8       |                                                            | 22.1 +10% / -0%      |                                                            |
| 1/2       |                                                            | 62.6 +10% / -0%      |                                                            |
| 5/8       |                                                            | 84.8 +10% / -0%      |                                                            |
| 3/4       |                                                            | 125.3 +10% / -0%     |                                                            |
| 1         |                                                            | 199 +10% / -0%       |                                                            |
| 1 1/4     |                                                            | 210 +10% / -0%       |                                                            |

## Check Valves

## CV Series Metal Seal

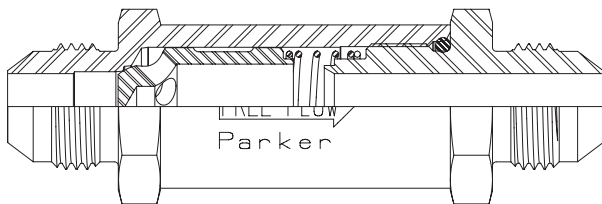
### CV Series Check Valves Offer Low Pressure Drop and High Flow

Parker's CV Series check valves are a rugged built and versatile product designed to protect hydraulic systems from fluid back pressure. The CV Series compliments the DT Series by adding the feature of modular design. The larger body results in less pressure drop and increased performance. The CV Series are in-line unidirectional valves, available in sizes 1/4" to 1", with a pressure rating of up to 3000 PSI, and flow capacities to 100 GPM. Standard spring crack pressures are 5 and 65 PSI. Other crack pressures available upon request.



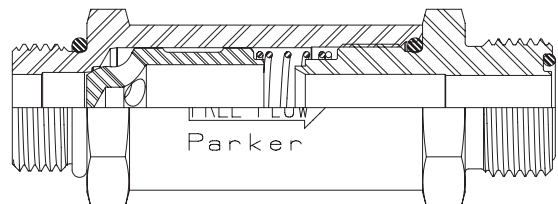
#### Features:

- Nitrile O-ring is standard in the body assembly - Note port O-rings are included on the MO and MS ports
- All-steel construction
- Valve seats resist damage from shocks, surges and contamination
- Poppet has an oil retention groove that lubricates the bore and eliminates galling
- Poppet spring is isolated from the liquid flow stream, minimizing turbulence
- Poppet is heat treated to help prevent damage from shocks, surges and galling
- Close tolerance fit between poppet and poppet retainer creates a cushion that protects valve from surge shock damage
- Optional crack pressures available upon request



**CV-MFMF**

Male Flare 37° JIC Inlet to Male Flare 37° JIC Outlet



**CV-MOMS**

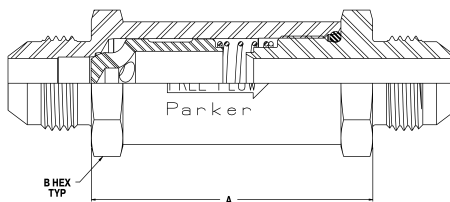
Male O-Ring Boss Inlet to Male Seal-Lok® Outlet

NOTE: Contact QCD for additional port end options.

## Check Valves

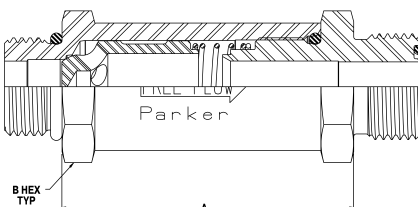
## CV Series Metal Seal

### CV-MFMF Male Flare 37° JIC Inlet to Male Flare 37° JIC Outlet



| Valve Size | Part Number Steel | Inlet Port Thread | Dimensions (in.) |              | Outlet Port Thread | ** Std Crack Pressure (psi) | Max Operating Pressure (psi) |
|------------|-------------------|-------------------|------------------|--------------|--------------------|-----------------------------|------------------------------|
|            |                   |                   | Length           | Wrench Flats |                    |                             |                              |
|            |                   |                   | A                | B            |                    |                             |                              |
| 1/4        | CV-250-MFMF-**    | 7/16-20 UNF       | 1.53             | 0.68         | 7/16-20 UNF        | 5, 65                       | 3000                         |
| 3/8        | CV-370-MFMF-**    | 9/16-18 UNF       | 1.75             | 0.81         | 9/16-18 UNF        | 5, 65                       | 3000                         |
| 1/2        | CV-500-MFMF-**    | 3/4-16 UNF        | 2.22             | 1.00         | 3/4-16 UNF         | 5, 65                       | 3000                         |
| 5/8        | CV-620-MFMF-**    | 7/8-14 UNF        | 2.41             | 1.12         | 7/8-14 UNF         | 5, 65                       | 3000                         |
| 3/4        | CV-750-MFMF-**    | 1-1/16 - 12 UN    | 2.75             | 1.38         | 1-1/16 - 12 UN     | 5, 65                       | 3000                         |
| 1          | CV-1000-MFMF-**   | 1-5/16 - 12 UN    | 3.31             | 1.62         | 1-5/16 - 12 UN     | 5, 65                       | 3000                         |

### CV-MOMS Male O-Ring Boss Inlet to Male Seal-Lok® Outlet



| Valve Size | Part Number Steel | Inlet Port Thread | Dimensions (in.) |              | Outlet Port Thread | ** Std Crack Pressure (psi) | Max Operating Pressure (psi) |
|------------|-------------------|-------------------|------------------|--------------|--------------------|-----------------------------|------------------------------|
|            |                   |                   | Length           | Wrench Flats |                    |                             |                              |
|            |                   |                   | A                | B            |                    |                             |                              |
| 1/4        | CV-250-MOMS-**    | 7/16-20 UNF       | 1.53             | 0.68         | 9/16-18 UNF        | 5, 65                       | 3000                         |
| 3/8        | CV-370-MOMS-**    | 9/16-18 UNF       | 1.75             | 0.81         | 11/16-16 UN        | 5, 65                       | 3000                         |
| 1/2        | CV-500-MOMS-**    | 3/4-16 UNF        | 2.22             | 1.00         | 13/16-16 UN        | 5, 65                       | 3000                         |
| 5/8        | CV-620-MOMS-**    | 7/8-14 UNF        | 2.41             | 1.12         | 1-14 UNS           | 5, 65                       | 3000                         |
| 3/4        | CV-750-MOMS-**    | 1-1/16 - 12 UN    | 2.75             | 1.38         | 1-3/16-12 UN       | 5, 65                       | 3000                         |
| 1          | CV-1000-MOMS-**   | 1-5/16 - 12 UN    | 3.31             | 1.62         | 1-7/16-12 UN       | 5, 65                       | 3000                         |

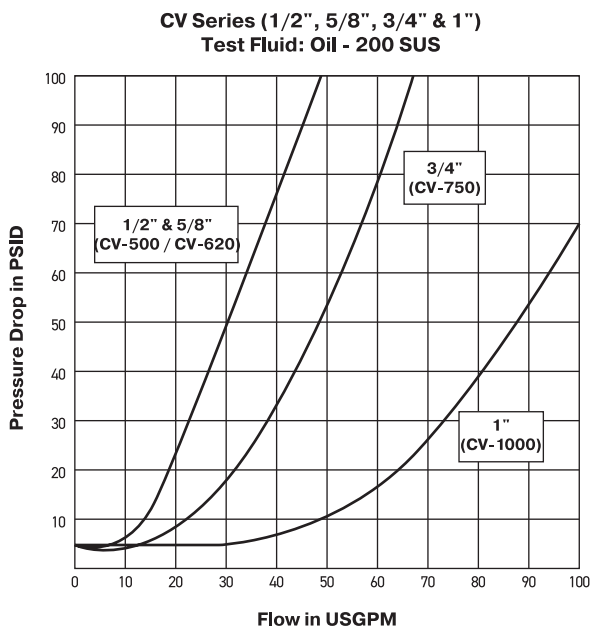
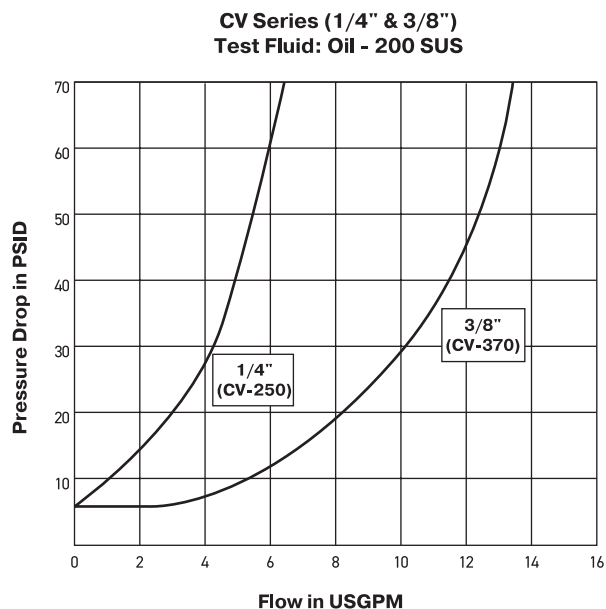
#### WARNING

This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

## Check Valves

## CV Series Metal Seal

### Flow Data



### Ordering Information

**CV - \*\*\* - \*\*\* - \*\***

CRACK PRESSURE

5 - 5 PSI

65 - 65 PSI

Other Crack Pressures up to 200 PSI in 5 PSI increments are available. Contact the Division for price and delivery on non-standard crack pressures

| SERIES | SIZE | FITTING STYLE                                          |
|--------|------|--------------------------------------------------------|
| 250    | 1/4" | MFMF - Male Flare Inlet to Male Flare Outlet           |
| 370    | 3/8" | MOMS - Male O-Ring Boss Inlet to Male Seal-Lok® Outlet |
| 500    | 1/2" |                                                        |
| 620    | 5/8" |                                                        |
| 750    | 3/4" |                                                        |
| 1000   | 1"   |                                                        |

NOTE: Contact QCD for additional port end options.

## Check Valves

## DC Series Metal Seal

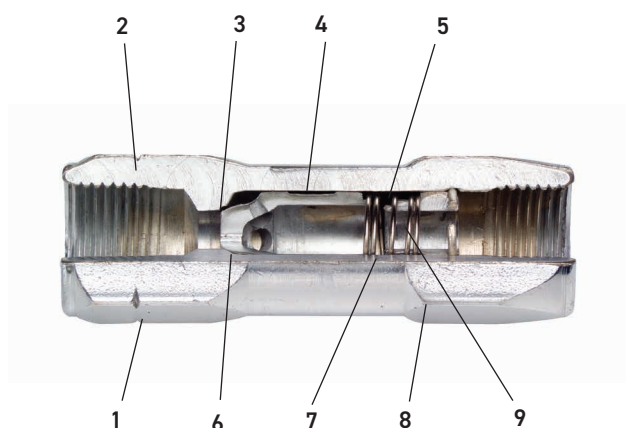
### DC Series Check Valves are Rugged, Cost-competitive

The DC Series offers basic, workhorse check valves – ruggedly built, readily available and reasonably priced. They are in-line valves, available in sizes 1/4" to 2", with a pressure rating range up to 3000 psi, and flow capacities to 300 GPM.



#### Features:

- All-steel construction—no internal seals or gaskets to wear out
- One-piece body eliminates threads and seals that may be potential failure or leakage points
- Valve seats resist damage from shocks, surges and contamination
- Poppet has an oil retention groove that lubricates the bore and eliminates galling
- Poppet spring is isolated from the liquid flow stream, minimizing turbulence
- Poppet is heat treated to help prevent damage from shocks, surges and galling
- Close tolerance fit between poppet and poppet retainer creates a cushion that protects valve from surge shock damage
- Check valve body is shaped like an arrow to indicate flow direction
- Available in a variety of standard and non-standard crack pressures



## Check Valves

DC Series  
Metal Seal

## DC Series Part Numbers

| Valve Size | Part Number Steel | Inlet Port Thread | Dimensions (in.) |              | Outlet Port Thread | ** Std Crack Pressure (psi) | Max Operating Pressure (psi) |
|------------|-------------------|-------------------|------------------|--------------|--------------------|-----------------------------|------------------------------|
|            |                   |                   | Length           | Wrench Flats |                    |                             |                              |
| 1/4        | DC-250-**         | 1/4 - 18 NPSF     | 2.44             | 0.81         | 1/4 - 18 NPSF      | 1, 5, 65                    | 3000                         |
| 1/4        | DC-250-FOFO-**    | .438 - 20 UNF     | 2.44             | 0.81         | .438 - 20 UNF      | 1, 5                        | 3000                         |
| 3/8        | DC-370-**         | 3/8 - 18 NPSF     | 2.75             | 0.88         | 3/8 - 18 NPSF      | 1, 5, 65                    | 3000                         |
| 3/8        | DC-370-FOFO-**    | .562 - 18 UNF     | 2.75             | 0.88         | .562 - 18 UNF      | 5                           | 3000                         |
| 1/2        | DC-500-**         | 1/2 - 14 NPSF     | 3.50             | 1.06         | 1/2 - 14 NPSF      | 1, 5, 65                    | 3000                         |
| 1/2        | DC-500-FOFO-**    | .750 - 16 UNF     | 3.50             | 1.06         | .750 - 16 UNF      | 5, 65                       | 3000                         |
| 3/4        | DC-750-**         | 3/4 - 14 NPSF     | 3.88             | 1.37         | 3/4 - 14 NPSF      | 1, 5, 65                    | 3000                         |
| 3/4        | DC-750-FOFO-**    | 1.062 - 12 UN     | 3.88             | 1.37         | 1.062 - 12 UN      | 5, 65                       | 3000                         |
| 1          | DC-1000-**        | 1 - 11.5 NPSF     | 4.88             | 1.62         | 1 - 11.5 NPSF      | 5, 65                       | 3000                         |
| 1          | DC-1000-FOFO-**   | 1.312 - 12 UN     | 4.88             | 1.62         | 1.312 - 12 UN      | 5, 65                       | 3000                         |
| 1-1/4      | DC-1250-**        | 1-1/4 - 11.5 NPTF | 5.94             | 2.00         | 1-1/4 - 11.5 NPTF  | 5, 65                       | 3000                         |
| 1-1/4      | DC-1250-FOFO-**   | 1.625 - 12 UN     | 5.94             | 2.00         | 1.625 - 12 UN      | 5, 65                       | 3000                         |
| 1-1/2      | DC-1500-**        | 1-1/2 - 11.5 NPTF | 6.37             | 2.38         | 1-1/2 - 11.5 NPTF  | 5, 65                       | 3000                         |
| 1-1/2      | DC-1500-FOFO-**   | 1.875 - 12 UN     | 6.37             | 2.38         | 1.875 - 12 UN      | 5, 65                       | 3000                         |
| 2          | DC-2000-**        | 2 - 11.5 NPTF     | 7.00             | 3.00         | 2 - 11.5 NPTF      | 5, 65                       | 3000                         |
| 2          | DC-2000-FOFO-**   | 2.500 - 12 UN     | 7.00             | 3.00         | 2.500 - 12 UN      | 65                          | 3000                         |

 **WARNING**

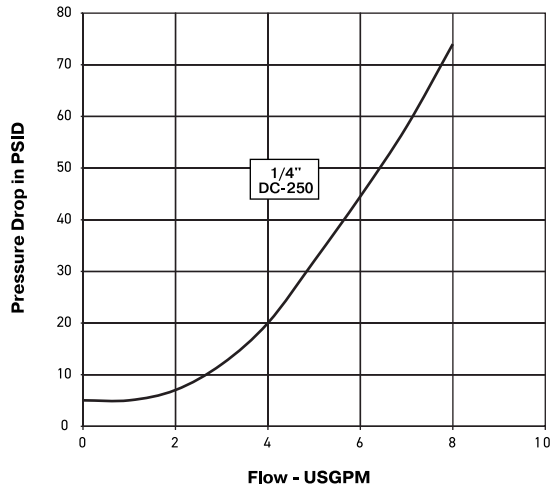
This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

# Check Valves

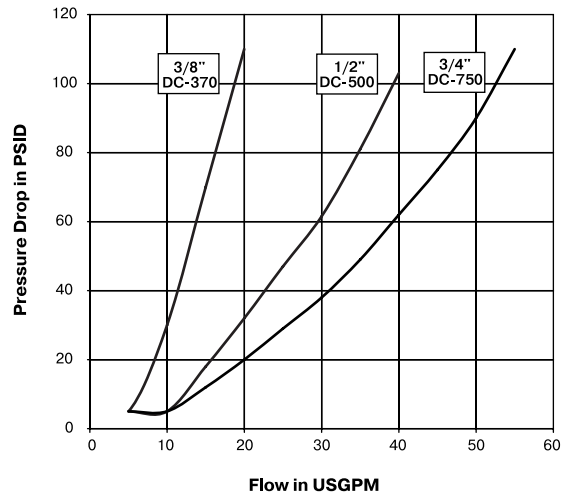
## DC Series Metal Seal

### Flow Data

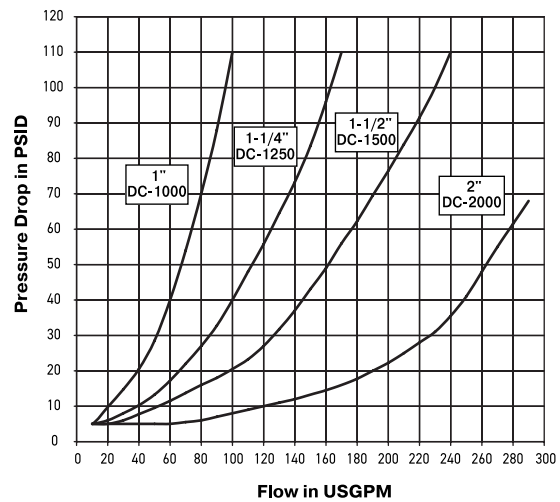
**DC Series (1/4")**  
Test Fluid: Oil - 200 SUS



**DC Series (3/8", 1/2" & 3/4")**  
Test Fluid: Oil - 200 SUS



**DC Series (1", 1-1/4", 1-1/2" & 2")**  
Test Fluid: Oil - 200 SUS



### Ordering Information

**DC - \*\*\* - \*\*\* - \*\***

Series

Size  
250 = 1/4"  
370 = 3/8"  
500 = 1/2"  
750 = 3/4"  
1000 = 1"  
1250 = 1-1/4"  
1500 = 1-1/2"  
2000 = 2"

#### Fitting Style:

**Blank** = Female pipe inlet to Female pipe outlet  
**FOFO** = Female O-ring Boss inlet to Female O-ring Boss outlet

#### Crack Pressure:

1 = 1 PSI  
5 = 5 PSI  
65 = 65 PSI  
Other crack pressures up to 100 PSI (in 5 PSI increments) are available. Contact the Division for price and delivery on non-standard crack pressures.

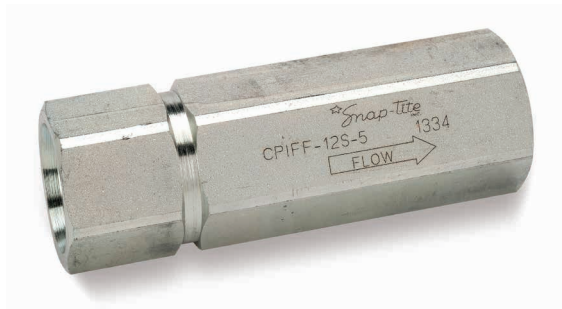
## Check Valves

# CPIFF Series Soft Seat

## CPIFF Series Soft Seat Check Valves Provide a Positive Shut-off to Prevent Reverse Flow

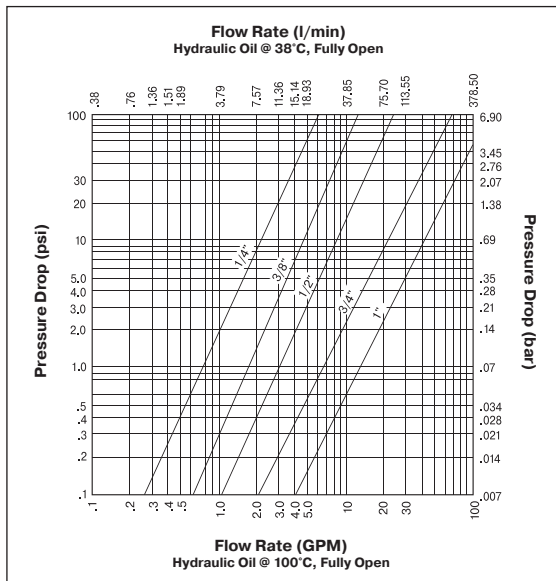
CPIFF Series check valves are designed to protect hydraulic systems from fluid back pressure. The poppet is streamlined with minimum restriction of flow in one direction. Flow is blocked in the reverse direction as the soft seat creates a leak free seal in the closed position.

These in-line unidirectional valves are available in sizes 1/4" to 1" with a pressure rating up to 5000 psi. Standard spring crack pressures are shown in the part number table. Other crack pressures available upon request.



### Features:

- Fluorocarbon poppet seal is standard
- Steel construction
- Optional crack pressures available on request



### CPIFF Series Specifications

| Size (in) | Max Pressure (psi) | MF (Male JIC 37) |
|-----------|--------------------|------------------|
| 1/4       | 5000               | 3                |
| 3/8       | 5000               | 8                |
| 1/2       | 5000               | 12               |
| 3/4       | 5000               | 20               |
| 1         | 5000               | 30               |

### Seal Options (add code to part number)

| Code     | Poppet Seal Material |
|----------|----------------------|
| suffix A | Nitrile              |
| suffix B | Ethylene Propylene   |

# CPIFF Series Soft Seat

## Check Valves

### CPIFF Series Part Numbers



| Valve Size | Part Number Steel | Inlet and Outlet Port Threads (Female) | Dimensions (in.) |              | Standard Seal Material | ** Std Crack Pressure (psi) | Max Operating Pressure (psi) |
|------------|-------------------|----------------------------------------|------------------|--------------|------------------------|-----------------------------|------------------------------|
|            |                   |                                        | Length           | Wrench Flats |                        |                             |                              |
|            |                   |                                        | A                | B            |                        |                             |                              |
| 1/4        | CPIFF-2P-**       | 1/4 - 18 NPSF                          | 1.97             | 3/4          | Fluorocarbon           | 5, 15, 25, 65               | 5000                         |
| 3/8        | CPIFF-3P-**       | 3/8 - 18 NPSF                          | 2.60             | 1            | Fluorocarbon           | 5, 15, 25, 65               | 5000                         |
| 1/2        | CPIFF-4P-**       | 1/2 - 14 NPSF                          | 3.25             | 1-1/4        | Fluorocarbon           | 5, 15, 25, 65               | 5000                         |
| 1/2        | CPIFF-8S-**       | 3/4 - 16 UNF                           | 3.25             | 1-1/4        | Fluorocarbon           | 5, 15, 25, 65               | 5000                         |
| 3/4        | CPIFF-6P-**       | 3/4 - 14 NPSF                          | 4.33             | 1-3/8        | Fluorocarbon           | 5, 15, 25, 65               | 5000                         |
| 3/4        | CPIFF-12S-**      | 1-1/16 - 12 UN                         | 4.33             | 1-3/8        | Fluorocarbon           | 5, 15, 25, 65               | 5000                         |
| 1          | CPIFF-8P-**       | 1 - 11-1/2 NPSF                        | 4.78             | 1-3/4        | Fluorocarbon           | 5, 15, 25, 65               | 5000                         |
| 1          | CPIFF-16S-**      | 1-5/16 - 12 UN                         | 4.78             | 1-3/4        | Fluorocarbon           | 5, 15, 25, 65               | 5000                         |

#### WARNING

This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

## Check Valves

## C Series Soft Seat

S6C and 3C Soft Seat Check Valves span a wide variety of sizes and end configurations

S6C and 3C check valves have a variety of options enabling them to meet the needs of most systems. The soft seated poppet creates a leak free seal to protect hydraulic systems from reverse flow.

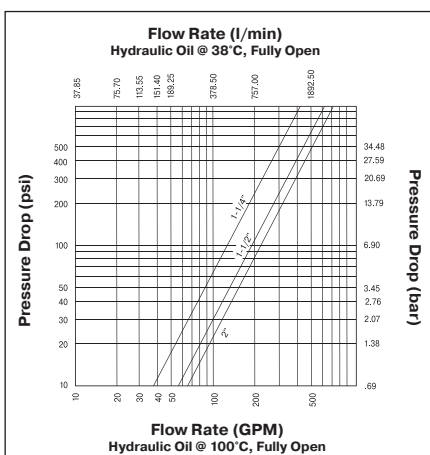
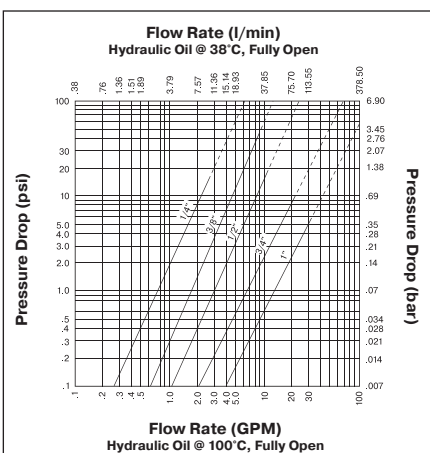
S6C check valves are stainless steel with a rated pressure of 6000 psi (sizes 1/4", 3/8", 1/2", 3/4" & 1"). 3C check valves are steel with a rated pressure of 3000 psi (sizes 1-1/4", 1-1/2" & 2").

These in-line unidirectional valves are available in sizes 1/4" to 2". Standard spring crack pressures are shown in the part number table. Other crack pressures available upon request.



### Features:

- Fluorocarbon poppet seal is standard
- Steel or stainless steel construction
- Optional crack pressures available on request
- Contact QCD for other materials or configurations



### C Series Specifications

| Size (in) | Rated Flow (gpm) |
|-----------|------------------|
| 1/4       | 3                |
| 3/8       | 8                |
| 1/2       | 12               |
| 3/4       | 20               |
| 1         | 30               |
| 1-1/4     | 90               |
| 1-1/2     | 125              |
| 2         | 175              |

### Seal Options (add code to part number)

| Code     | Poppet Seal Material |
|----------|----------------------|
| suffix A | Nitrile              |
| suffix B | Ethylene Propylene   |

## Check Valves

## C Series Soft Seat

### S6C Series Part Numbers



| Valve Size | Part Number Steel* | Part Number Stainless Steel* | Inlet Port Threads       | Dimensions (in.) |              | Outlet Port Threads      | Std Crack Pressure** (psi) | Max Operating Pressure Steel (psi) | Max Operating Pressure Stainless Steel (psi) |
|------------|--------------------|------------------------------|--------------------------|------------------|--------------|--------------------------|----------------------------|------------------------------------|----------------------------------------------|
|            |                    |                              |                          | Length           | Wrench Flats |                          |                            |                                    |                                              |
| 1/4        | 6C4F-F**           | S6C4F-F**                    | 1/4 - 18 NPTF (female)   | 2.82             | 3/4          | 1/4 - 18 NPTF (female)   | 5, 25, 65                  | 6000                               | 6000                                         |
| 1/4        | 6C4F-M**           | S6C4F-M**                    | 1/4 - 18 NPTF (female)   | 2.65             | 3/4          | 1/4 - 18 NPT (male)      | 5, 25, 65                  | 6000                               | 6000                                         |
| 1/4        | 6C4M-M**           | S6C4M-M**                    | 1/4 - 18 NPT (male)      | 2.70             | 3/4          | 1/4 - 18 NPT (male)      | 5, 25, 65                  | 6000                               | 6000                                         |
| 3/8        | 6C6F-F**           | S6C6F-F**                    | 3/8 - 18 NPTF (female)   | 3.38             | 1-1/8        | 3/8 - 18 NPTF (female)   | 5, 25, 65                  | 6000                               | 6000                                         |
| 3/8        | 6C6F-M**           | S6C6F-M**                    | 3/8 - 18 NPTF (female)   | 3.18             | 1-1/8        | 3/8 - 18 NPT (male)      | 5, 25, 65                  | 6000                               | 6000                                         |
| 1/2        | 6C8F-F**           | S6C8F-F**                    | 1/2 - 14 NPTF (female)   | 3.73             | 1-1/4        | 1/2 - 14 NPTF (female)   | 5, 25, 65                  | 6000                               | 6000                                         |
| 1/2        | 6C8M-F**           | S6C8M-F**                    | 1/2 - 14 NPT (male)      | 4.20             | 1-1/4        | 1/2 - 14 NPTF (female)   | 5, 25, 65                  | 6000                               | 6000                                         |
| 1/2        | 6C8M-M**           | S6C8M-M**                    | 1/2 - 14 NPT (male)      | 4.04             | 1-1/4        | 1/2 - 14 NPT (male)      | 5, 25, 65                  | 6000                               | 6000                                         |
| 3/4        | 6C12F-F**          | S6C12F-F**                   | 3/4 - 14 NPTF (female)   | 4.91             | 1-5/8        | 3/4 - 14 NPTF (female)   | 5, 25, 65                  | 6000                               | 5000                                         |
| 1          | 6C16F-F**          | S6C16F-F**                   | 1 - 11-1/2 NPTF (female) | 6.06             | 1-7/8        | 1 - 11-1/2 NPTF (female) | 5, 25, 65                  | 6000                               | 4000                                         |

\* Prop 65 Warning does not apply to stainless steel part numbers

### 3C Series Part Numbers



| Body Size | Part Number Steel* | Part Number Stainless Steel* | Inlet Port Threads             | Dimensions (in.) |              | Outlet Port Threads    | Std Crack Pressure** (psi) | Max Operating Pressure Steel (psi) | Max Operating Pressure Stainless Steel (psi) |
|-----------|--------------------|------------------------------|--------------------------------|------------------|--------------|------------------------|----------------------------|------------------------------------|----------------------------------------------|
|           |                    |                              |                                | Length           | Wrench Flats |                        |                            |                                    |                                              |
| 1-1/4     | 3C20F-F**          | S3C20F-F**                   | 1-1/4 - 11-1/2 NPTF            | 5.76             | 2            | 1/4 - 18 NPTF (female) | 5, 15, 25, 65              | 3000                               | 3000                                         |
| 1-1/4     | 3C20EF-EF**        | S3C20EF-EF**                 | 1-5/8 - 12 UN                  | 5.76             | 2            | 1/4 - 18 NPT (male)    | 5, 15, 25, 65              | 3000                               | 3000                                         |
| 1-1/4     | 3C20EM-EM**        | S3C20EM-EM**                 | 1-5/8 - 12 UN (male 37° flare) | 6.57             | 2            | 1/4 - 18 NPT (male)    | 5, 15, 25, 65              | 3000                               | 3000                                         |
| 1-1/2     | 3C24F-F**          | S3C24F-F**                   | 1-1/2 - 11-1/2 NPTF            | 6.50             | 2-1/2        | 3/8 - 18 NPTF (female) | 5, 15, 25, 65              | 3000                               | 3000                                         |
| 1-1/2     | 3C24EF-EF**        | S3C24EF-EF**                 | 1-7/8 - 12 UN                  | 6.50             | 2-1/2        | 3/8 - 18 NPT (male)    | 5, 15, 25, 65              | 3000                               | 3000                                         |
| 2         | 3C32EF-EF**        | S3C32EF-EF**                 | 2-1/2 - 12 UN                  | 7.28             | 3-1/4        | 1/2 - 14 NPTF (female) | 5, 25, 65                  | 3000                               | 3000                                         |

\* Prop 65 Warning does not apply to stainless steel part numbers



#### WARNING

This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

## Check Valves

# 2600 Series Swing Type

### Low Pressure and Lightweight

Constructed of lightweight aluminum, the 2600 Series Swing Check Valve has a spring-loaded, trapdoor style valve. The valve opens when system pressure approaches 1/2 psi to permit full flow with low pressure drop. As system pressure is relieved, the valve closes, retaining fluids upstream.

Parker's 2600 Series are in-line check valves designed especially for diesel and gasoline engine fuel lines. They are also used for externally mounted oil filters, and coolers, as well as transmission fluid lubrication lines. With a maximum of 1/2 psi cracking pressure, these Swing Check Valves are useful in most low pressure air, liquid, or gas systems.



#### Features:

- Lightweight, corrosion-resistant aluminum construction
- Available with 1/4" or 3/8" NPTF ports
- Standard Nitrile or Fluorocarbon seals
- 1/2 PSI maximum crack pressure
- Trapdoor style valve permits full flow with low pressure drop

#### 2600 Series Specifications

|                   |                                                                                            |
|-------------------|--------------------------------------------------------------------------------------------|
| Rated Pressure    | 250 psi max                                                                                |
| Crack Pressure    | 1/2 psi max                                                                                |
| Weight            | 0.08 lbs                                                                                   |
| Temperature Range | Nitrile: -40° to 200°F (-40° C to 93° C)<br>Fluorocarbon: -40° to 400°F (-40° C to 204° C) |
| Max Leakage       | 5 cc / 24 hours at 28" head                                                                |
| Rated Flow        | 6 gpm (based on 3/8" hose size)                                                            |

#### 2600 Series Part Numbers

| Part Number | Thread        | Seal Material | Dimensions  |                   |
|-------------|---------------|---------------|-------------|-------------------|
|             |               |               | Length (mm) | Wrench Flats (in) |
| 2600        | 1/4 - 18 NPTF | Nitrile       | 2.06 (52)   | 1-1/16            |
| 2676        | 1/4 - 18 NPTF | Fluorocarbon  | 2.06 (52)   | 1-1/16            |
| 2650        | 3/8 - 18 NPTF | Nitrile       | 2.12 (54)   | 1-1/16            |
| 2625        | 3/8 - 18 NPTF | Fluorocarbon  | 2.12 (54)   | 1-1/16            |

## Pressure/Vacuum Relief Valves

## H1 and HM1 Series

H1 Series Pressure/Vacuum Relief Valves are used to maintain positive pressure in hydraulic reservoirs. The compact size, reusable bronze filter and high flow characteristics make this valve a popular choice.

The HM1 Series offers the same features and characteristics as the H1 series with the option of manual over ride. This feature allows the operator to relieve the reservoir pressure before opening the tank for refilling, inspection or servicing.



### Features:

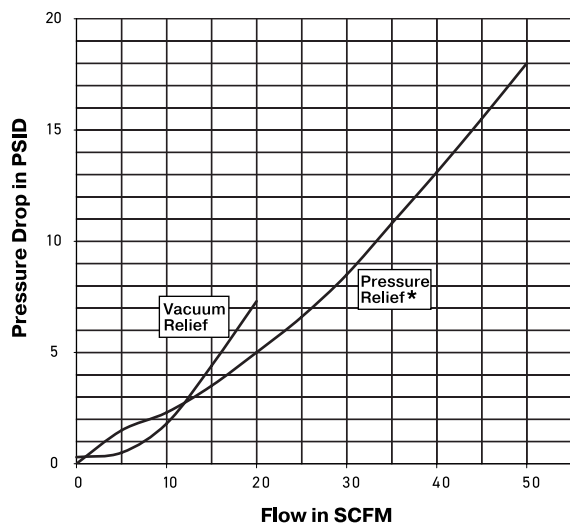
- Easy to remove, cleanable bronze filter
- High flow characteristics
- Compact size
- Available with male pipe or male ORB threads
- Wide variety of pressure relief settings
- HM1 series has a manual pressure relief button

### H1 and HM1 Series Specifications

|                         | H1 Series                                  | HM1 Series |
|-------------------------|--------------------------------------------|------------|
| Pressure Rating         | 60 psi max                                 |            |
| Filter Rating           | 10 micron, nominal                         |            |
| Pressure Relief Setting | 5 psi through 50 psi (in 5 psi increments) |            |
| Vacuum Relief Setting   | 0.3 psi                                    |            |
| Weight                  | 1.0 lbs                                    | 1.1 lbs    |

### Flow Data

H1 and HM1 Pressure-Vacuum Relief Valve



\* Pressure drop is pressure relief valve crack pressure until pressure drop curve increases above pressure relief crack pressure.

### Ordering Information

**H \* - \* \* - \* \* \* \***

#### FITTING STYLE:

**MP** = Male pipe thread

**MO** = Male O-ring Boss, SAE threads

#### FITTING SIZE:

**6** = 3/8"

**8** = 1/2"

**12** = 3/4"

**16** = 1"

#### CRACK PRESSURE (PSI):

**5 to 50**

(in 5 PSI increments)

#### SERIES:

**H1**

**HM1** (with manual pressure relief button)

## Pressure/Vacuum Relief Valves

## PV Series

PV Series is an economical Pressure/Vacuum Relief Valve used to maintain positive pressure in hydraulic reservoirs. The large filter area makes this valve an ideal choice for use in heavily contaminated environments. The optional bayonet type mount allows the valve to be installed in the tank filler port, eliminating the need for an extra port. In this configuration, the valve also serves as a filler cap.



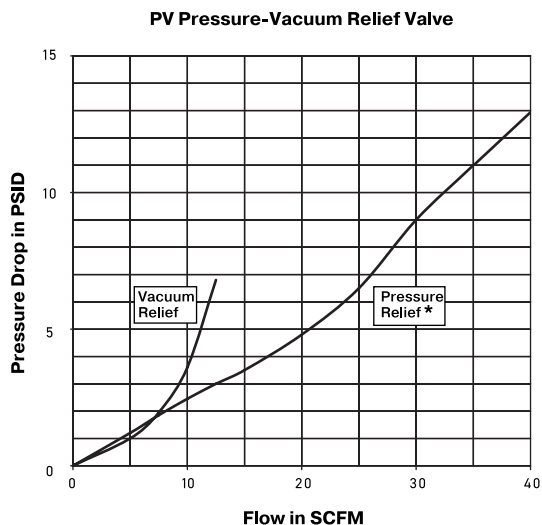
### Features:

- Disposable spin-on automotive type, field replaceable filter (240 sq inches)
- Several pressure relief settings
- Economic design
- Optional bayonet style allows mounting in filler port with valve also functioning as filler cap

### H1 and HM1 Series Specifications

|                                | PV Series                                  | PV Bayonet Style                                                               |
|--------------------------------|--------------------------------------------|--------------------------------------------------------------------------------|
| Filter Rating                  | 10 micron, nominal (240 sq inches)         |                                                                                |
| Pressure Relief Setting        | 5 PSI through 30 PSI (in 5 PSI increments) | 5 and 10 PSI                                                                   |
| Vacuum Relief Setting          | 0.3 psi                                    |                                                                                |
| Weight                         | 1.0 lb.                                    |                                                                                |
| Mounting                       | Male ORB, SAE threads<br>Male pipe threads | Bayonet style with tank receptacle gaskets & screws (optional strainer basket) |
| Replacement Filter Part Number | 7312-009                                   |                                                                                |

### Flow Data



### Ordering Information

**P V - \* \* - \* \* \* \* - \* \***

#### BAYONET OPTION ONLY:

- RO = With receptacle, gaskets and screws
- RB = With receptacle, gaskets, screws and strainer basket

#### FITTING / MOUNTING STYLE:

- BA = Bayonet mount
- MP = Male pipe thread
- MO = Male O-ring Boss, SAE threads

#### FITTING SIZE:

- Blank = Bayonet style
- 8 = 1/2"
- 12 = 3/4"

#### CRACK PRESSURE (PSI):

- 05 (PV, PV-Bayonet)
- 10 (PV, PV-Bayonet)
- 15 (PV)
- 20 (PV)
- 25 (PV)
- 30 (PV)

PV SERIES

## Thermal Bypass Valves

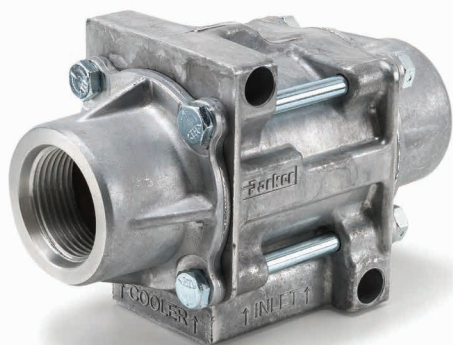
## TH Series

### Maintain Optimum Fluid Temperature

Parker's thermal bypass valve will modulate fluid temperature by shifting return line flow through the cooler, or bypassing it directly to the reservoir.

Additionally, an integral pressure relief function automatically releases excess pressure to the reservoir if the cooler becomes restricted, and the inlet pressure becomes excessive. Relief crack pressure settings range from 5 to 85 PSI.

These lightweight, aluminum valves are ideal for hydrostatic drive circuits requiring fast warm-up, controlled fluid temperatures, and low return line back pressure.

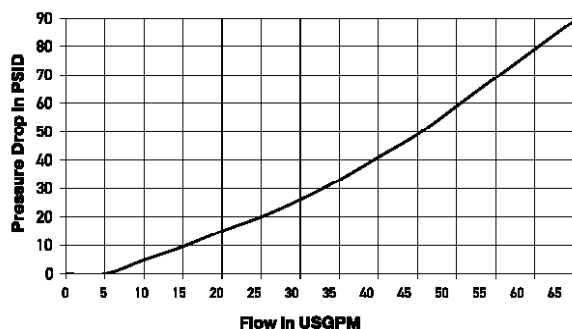


#### Features:

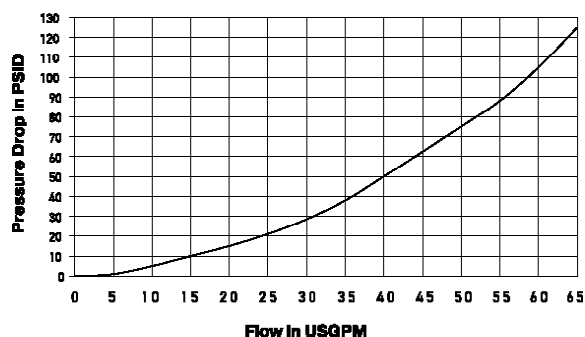
- Lightweight, corrosion-resistant aluminum housing
- Available in five shift temperatures
- Integral relief valve to dump excessive inlet pressures to the reservoir
- 250 PSI maximum operating pressure
- Up to 60 GPM flow rates

#### Flow Data - Pressure Drop (Mobil DTE 26 oil)

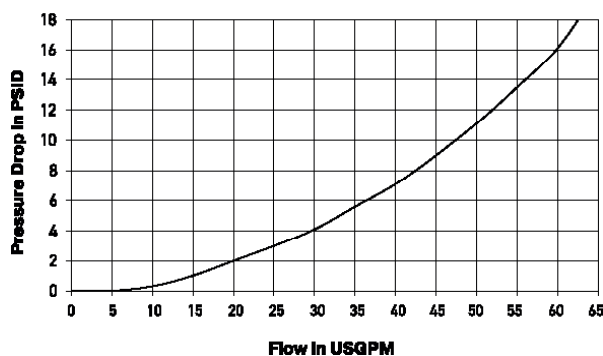
**Inlet Port thru Tank Port  
@ 100°F (300 SUS)**



**Inlet Port over Integral Relief Valve  
@ 170°F (78 SUS Oil)**



**Inlet Port thru Cooler Port  
@ 145°F (110 SUS Oil)**



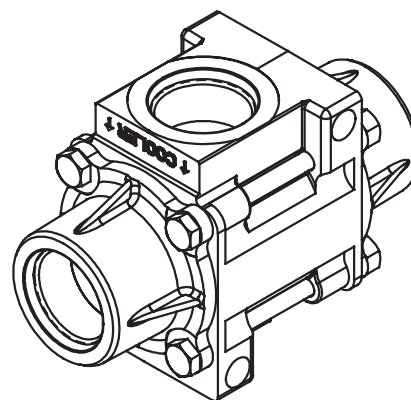
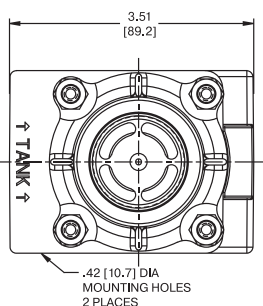
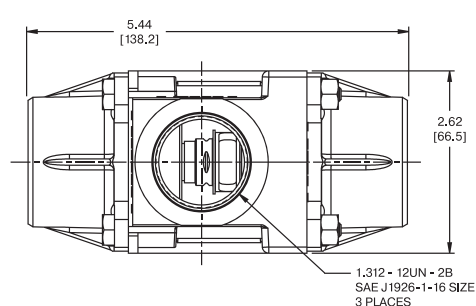
# Thermal Bypass Valves

# TH Series

## TH Series Specifications

|                                           |                                                                                                  |
|-------------------------------------------|--------------------------------------------------------------------------------------------------|
| Size                                      | 1 inch                                                                                           |
| Weight                                    | 2.00 lbs                                                                                         |
| Std Shift Temperatures                    | 100° F, 120° F, 140° F, 160° F, 180° F                                                           |
| Full Shift Temperature (cooler port open) | Shift Temperature plus 25° F                                                                     |
| Proof Pressure                            | 300 PSI (21 bar)                                                                                 |
| Minimum Burst Pressure                    | Up to full shift temperature: 325 PSI (22 bar)<br>Above full shift temperature: 600 PSI (41 bar) |
| Operating Temperature                     | Min: -30° F Max: Shift temperature plus 75° F                                                    |
| Max Flow Rate                             | 60 GPM (227 l/m)                                                                                 |

## Dimensions



## Ordering Information

**TH - 1000 - 16FO - \*\***

VALVE SERIES:  
Thermal Bypass

VALVE SIZE:  
1000 = 1 inch

CRACK PRESSURE/TEMPERATURE CODE:  
(see table)

PORT SIZE & STYLE:  
16FO = 1 inch SAE O-Ring Boss (1.312 - 12UN-2B thread)

## Crack Pressure/Temperature Code

| Shift Temperature | Crack Pressure PSI |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|-------------------|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                   | 5 PSI              | 10 PSI | 15 PSI | 20 PSI | 25 PSI | 30 PSI | 35 PSI | 40 PSI | 45 PSI | 50 PSI | 55 PSI | 60 PSI | 65 PSI | 70 PSI | 75 PSI | 80 PSI | 85 PSI |
| 100° F (38° C)    | 01                 | 02     | 03     | 04     | 05     | 06     | 07     | 08     | 09     | 10     | 11     | 12     | 13     | 14     | 15     | 16     | 17     |
| 120° F (49° C)    | 21                 | 22     | 23     | 24     | 25     | 26     | 27     | 28     | 29     | 30     | 31     | 32     | 33     | 34     | 35     | 36     | 37     |
| 140° F (60° C)    | 41                 | 42     | 43     | 44     | 45     | 46     | 47     | 48     | 49     | 50     | 51     | 52     | 53     | 54     | 55     | 56     | 57     |
| 160° F (71° C)    | 61                 | 62     | 63     | 64     | 65     | 66     | 67     | 68     | 69     | 70     | 71     | 72     | 73     | 74     | 75     | 76     | 77     |
| 180° F (82° C)    | 81                 | 82     | 83     | 84     | 85     | 86     | 87     | 88     | 89     | 90     | 91     | 92     | 93     | 94     | 95     | 96     | 97     |

# APPENDIX

## Codes

The following seal compound and body material compatibility chart is provided as an aid in selecting a specific synthetic rubber compound or body material for a particular application. Operating and environmental conditions must be considered when making the selection of a quick coupling.

Refer to the appropriate section of the catalog for Ordering Information for Seal Codes for specific products.

**To indicate a special material just add the appropriate code letter as a suffix to the catalog number of the coupler.**

It is not necessary to use the code "STD" as the standard Nitrile seal will be used when another code is not used.

## Note

This chart is intended as a guide only and is not to be considered as a recommendation to use Parker quick action couplings in a specific application or with a specific fluid, other factors that must be considered include but are not limited to: fluid and ambient temperature, system pressure, both operating and peak, frequency of connect and disconnect, and applicable standards or regulations.

For recommendations for media not listed below, please contact your Parker representative or the factory.

**CODES: 1 = Satisfactory 2 = Fair 3 = Not Recommended 4 = Insufficient Data Available**

| Media                         | Body Material |       |          |          | Seal Material |      |              |          |
|-------------------------------|---------------|-------|----------|----------|---------------|------|--------------|----------|
|                               | Brass         | Steel | 316 S.S. | 303 S.S. | Nitrile       | E.P. | Fluorocarbon | Neoprene |
| 3M FC-75                      | 4             | 4     | 4        | 4        | 1             | 1    | 2            | 1        |
| ACETAMIDE                     | 4             | 4     | 1        | 2        | 1             | 1    | 3            | 1        |
| ACETIC ACID (5%)              | 3             | 3     | 1        | 1        | 2             | 1    | 1            | 1        |
| ACETONE                       | 1             | 2     | 1        | 1        | 3             | 1    | 3            | 3        |
| ACETOPHENONE                  | 2             | 2     | 2        | 1        | 3             | 1    | 3            | 3        |
| ACETYL ACETONE                | 2             | 2     | 2        | 2        | 3             | 1    | 3            | 3        |
| ACETYL CHLORIDE               | 4             | 2     | 2        | 2        | 3             | 3    | 1            | 3        |
| ACETYLENE                     | 3             | 2     | 1        | 1        | 1             | 1    | 1            | 2        |
| AIR (200 DEGREES F.)          | 1             | 2     | 1        | 1        | 1             | 1    | 1            | 1        |
| AIR (300 DEGREES F.)          | 1             | 2     | 1        | 1        | 2             | 2    | 1            | 2        |
| AIR (400 DEGREES F.)          | 1             | 2     | 1        | 1        | 3             | 3    | 1            | 3        |
| ALUMINUM ACETATE              | 4             | 4     | 4        | 4        | 2             | 1    | 3            | 2        |
| ALUMINUM BROMIDE              | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 1        |
| ALUMINUM CHLORIDE (10%)       | 3             | 3     | 3        | 3        | 1             | 1    | 1            | 1        |
| ALUMINUM CHLORIDE (100%)      | 3             | 2     | 2        | 2        | 1             | 1    | 1            | 1        |
| ALUMINUM FLOURIDE             | 3             | 3     | 3        | 3        | 1             | 1    | 1            | 1        |
| ALUMINUM NITRATE              | 3             | 3     | 2        | 2        | 1             | 1    | 1            | 1        |
| ALUMINUM SALTS                | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 1        |
| ALUMINUM SULPHATE             | 2             | 3     | 2        | 3        | 1             | 1    | 1            | 1        |
| ALUMS (NH <sub>3</sub> ,Cr,K) | 4             | 4     | 4        | 4        | 1             | 1    | 3            | 1        |
| AMMONIA (ANHYDROUS)           | 3             | 2     | 1        | 1        | 2             | 1    | 3            | 1        |
| AMMONIA (COLD, GAS)           | 3             | 2     | 4        | 1        | 1             | 1    | 3            | 1        |
| AMMONIA (HOT, GAS)            | 3             | 2     | 4        | 1        | 3             | 2    | 3            | 2        |
| AMMONIUM CARBONATE            | 3             | 2     | 3        | 3        | 3             | 1    | 1            | 1        |

# Appendix

## Fluid Compatibility Chart

**CODES: 1 = Satisfactory 2 = Fair 3 = Not Recommended 4 = Insufficient Data Available**

| Media                                         | Body Material |       |          |          | Seal Material |      |              |          |
|-----------------------------------------------|---------------|-------|----------|----------|---------------|------|--------------|----------|
|                                               | Brass         | Steel | 316 S.S. | 303 S.S. | Nitrile       | E.P. | Fluorocarbon | Neoprene |
| AMMONIUM CHLORIDE                             | 3             | 3     | 2        | 3        | 1             | 1    | 1            | 1        |
| AMMONIUM HYDROXIDE                            | 3             | 3     | 1        | 2        | 3             | 1    | 3            | 1        |
| AMMONIUM NITRATE                              | 3             | 3     | 1        | 1        | 1             | 1    | 4            | 1        |
| AMMONIUM PERSULFATE SOLUTION                  | 3             | 3     | 1        | 2        | 3             | 1    | 4            | 4        |
| AMMONIUM PHOSPHATE<br>(MONO-, DI-, TRI-BASIC) | 3             | 3     | 3        | 2        | 1             | 1    | 4            | 1        |
| AMMONIUM SALTS                                | 4             | 4     | 4        | 4        | 1             | 1    | 3            | 1        |
| AMMONIUM SULFATE                              | 3             | 3     | 2        | 3        | 1             | 1    | 3            | 1        |
| AMYL BORATE                                   | 4             | 4     | 4        | 4        | 1             | 3    | 1            | 1        |
| AMYL CHLORIDE                                 | 4             | 2     | 1        | 1        | 4             | 3    | 1            | 3        |
| AMYL CHLORONAPHTHALENE                        | 4             | 4     | 4        | 4        | 3             | 3    | 1            | 3        |
| AMYL NAPHTHALENE                              | 4             | 4     | 4        | 4        | 3             | 3    | 1            | 3        |
| ANIMAL OIL (LARD OIL)                         | 2             | 2     | 2        | 2        | 1             | 2    | 1            | 2        |
| AROCOR 1248                                   | 2             | 3     | 3        | 3        | 3             | 2    | 1            | 3        |
| AROCOR 1254                                   | 2             | 3     | 3        | 3        | 3             | 2    | 1            | 3        |
| AROCOR 1260                                   | 2             | 3     | 3        | 3        | 1             | 4    | 1            | 1        |
| AROMATIC FUEL (50%)                           | 4             | 4     | 4        | 4        | 2             | 3    | 1            | 3        |
| ARSENIC ACID                                  | 3             | 3     | 1        | 1        | 1             | 1    | 1            | 1        |
| ASPHALT                                       | 3             | 3     | 1        | 1        | 2             | 3    | 1            | 2        |
| ASTM OIL, NO. 1                               | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 1        |
| ASTM OIL, NO. 2                               | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| ASTM OIL, NO. 3                               | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 3        |
| ASTM OIL, NO. 4                               | 1             | 1     | 1        | 1        | 2             | 3    | 1            | 3        |
| ASTM REFERENCE FUEL A                         | 3             | 2     | 1        | 1        | 1             | 3    | 1            | 2        |
| ASTM REFERENCE FUEL B                         | 3             | 2     | 1        | 1        | 1             | 3    | 1            | 3        |
| ASTM REFERENCE FUEL C                         | 3             | 2     | 1        | 1        | 2             | 3    | 1            | 3        |
| AUTOMOTIVE BRAKE FLUID                        | 4             | 4     | 4        | 4        | 3             | 1    | 3            | 2        |
| BARIUM CHLORIDE                               | 3             | 3     | 2        | 3        | 1             | 1    | 1            | 1        |
| BARIUM HYDROXIDE                              | 3             | 2     | 2        | 3        | 1             | 1    | 1            | 1        |
| BARIUM SALTS                                  | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 1        |
| BARIUM SULFIDE                                | 3             | 2     | 3        | 3        | 1             | 1    | 1            | 1        |
| BEER                                          | 3             | 3     | 1        | 1        | 1             | 1    | 1            | 1        |
| BEET SUGAR LIQUORS                            | 3             | 3     | 1        | 1        | 1             | 1    | 1            | 2        |
| BENZALDEHYDE                                  | 3             | 3     | 2        | 3        | 3             | 1    | 3            | 3        |
| BENZENE                                       | 3             | 2     | 3        | 3        | 3             | 3    | 1            | 3        |
| BENZENESULFONIC ACID (10%)                    | 3             | 3     | 3        | 3        | 3             | 3    | 1            | 2        |
| BENZINE                                       | 4             | 4     | 4        | 4        | 1             | 3    | 1            | 2        |
| BENZOIC ACID                                  | 3             | 3     | 3        | 3        | 3             | 3    | 1            | 3        |
| BENZYL ALCOHOL                                | 4             | 3     | 1        | 2        | 3             | 2    | 1            | 2        |

# Appendix

## Fluid Compatibility Chart

**CODES: 1 = Satisfactory 2 = Fair 3 = Not Recommended 4 = Insufficient Data Available**

| Media                        | Body Material |       |          |          | Seal Material |      |              |          |
|------------------------------|---------------|-------|----------|----------|---------------|------|--------------|----------|
|                              | Brass         | Steel | 316 S.S. | 303 S.S. | Nitrile       | E.P. | Fluorocarbon | Neoprene |
| BENZYL CHLORIDE              | 3             | 3     | 2        | 3        | 3             | 3    | 1            | 3        |
| BLEACH LIQUOR                | 4             | 4     | 4        | 4        | 3             | 1    | 1            | 2        |
| BORAX                        | 3             | 2     | 3        | 3        | 2             | 1    | 1            | 3        |
| BORDEAUX MIXTURE             | 4             | 4     | 4        | 4        | 2             | 1    | 1            | 2        |
| BORIC ACID                   | 3             | 3     | 2        | 3        | 1             | 1    | 1            | 1        |
| BRAKE FLUID (NON-PETROLEUM)  | 4             | 4     | 4        | 4        | 3             | 1    | 3            | 2        |
| BRINE (SODIUM CHLORIDE)      | 3             | 3     | 1        | 1        | 1             | 1    | 1            | 1        |
| BROMINE                      | 4             | 4     | 4        | 4        | 3             | 3    | 1            | 3        |
| BROMINE WATER                | 4             | 4     | 4        | 4        | 3             | 2    | 1            | 3        |
| BUNKER OIL                   | 4             | 4     | 4        | 4        | 1             | 3    | 1            | 3        |
| BUTADIENE (MONOMER)          | 3             | 2     | 1        | 2        | 3             | 3    | 1            | 3        |
| BUTANE                       | 3             | 1     | 1        | 1        | 1             | 3    | 1            | 1        |
| BUTANE (2,2, & 2,3-DIMETHYL) | 4             | 4     | 4        | 4        | 1             | 3    | 1            | 2        |
| BUTANOL (BUTYL ALCOHOL)      | 2             | 1     | 1        | 1        | 1             | 2    | 1            | 1        |
| BUTTER - ANIMAL FAT          | 2             | 3     | 1        | 2        | 1             | 1    | 1            | 2        |
| BUTYL BUTYRATE               | 4             | 4     | 4        | 4        | 3             | 1    | 1            | 3        |
| BUTYL STEARATE               | 4             | 4     | 4        | 4        | 2             | 3    | 1            | 3        |
| CALCINE LIQUORS              | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 4        |
| CALCIUM ACETATE              | 4             | 4     | 4        | 4        | 2             | 1    | 3            | 2        |
| CALCIUM BISULFITE            | 3             | 3     | 2        | 3        | 2             | 1    | 2            | 2        |
| CALCIUM CARBONATE            | 3             | 2     | 3        | 2        | 1             | 1    | 1            | 1        |
| CALCIUM CHLORIDE             | 3             | 3     | 2        | 3        | 1             | 1    | 1            | 1        |
| CALCIUM HYDROXIDE            | 3             | 3     | 2        | 3        | 1             | 1    | 1            | 1        |
| CALCIUM HYPOCHLORITE         | 3             | 3     | 2        | 3        | 2             | 1    | 1            | 2        |
| CALCIUM SALTS                | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 1        |
| CALCIUM SULFIDE              | 3             | 3     | 2        | 2        | 1             | 1    | 1            | 1        |
| CALICHE LIQUORS              | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 1        |
| CANE SUGAR LIQUORS           | 4             | 2     | 1        | 1        | 1             | 1    | 1            | 1        |
| CARBON BISULPHIDE            | 4             | 4     | 4        | 4        | 3             | 3    | 1            | 3        |
| CARBON DIOXIDE               | 1             | 2     | 1        | 1        | 1             | 1    | 1            | 1        |
| CARBON DISULFIDE             | 2             | 2     | 2        | 2        | 3             | 3    | 1            | 3        |
| CARBON MONOXIDE              | 1             | 1     | 1        | 1        | 1             | 1    | 1            | 2        |
| CARBON TETRACHLORIDE         | 2             | 3     | 1        | 3        | 2             | 3    | 1            | 3        |
| CARBONIC ACID                | 3             | 3     | 1        | 2        | 2             | 1    | 1            | 1        |
| CASTOR OIL                   | 1             | 1     | 1        | 1        | 1             | 2    | 1            | 1        |
| CELLUGUARD                   | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 1        |
| CELLULUBE (NOW FYRQUEL)      | 4             | 4     | 4        | 4        | 3             | 1    | 1            | 3        |
| CHINA WOOD OIL (TUNG OIL)    | 2             | 2     | 1        | 1        | 1             | 3    | 1            | 2        |
| CHLORINATED SALT BRINE       | 4             | 4     | 4        | 4        | 3             | 3    | 1            | 3        |

# Appendix

## Fluid Compatibility Chart

**CODES: 1 = Satisfactory 2 = Fair 3 = Not Recommended 4 = Insufficient Data Available**

| Media                      | Body Material |       |          |          | Seal Material |      |              |          |
|----------------------------|---------------|-------|----------|----------|---------------|------|--------------|----------|
|                            | Brass         | Steel | 316 S.S. | 303 S.S. | Nitrile       | E.P. | Fluorocarbon | Neoprene |
| CHLORINATED SOLVENTS       | 4             | 4     | 4        | 4        | 3             | 3    | 1            | 3        |
| CHLOROBENZENE              | 3             | 3     | 2        | 3        | 3             | 3    | 1            | 3        |
| CHLOROBUTADIENE            | 4             | 4     | 4        | 4        | 3             | 3    | 1            | 3        |
| CHLOROFORM                 | 3             | 2     | 2        | 1        | 3             | 3    | 1            | 3        |
| CHLORPHENOL                | 4             | 4     | 4        | 4        | 3             | 3    | 1            | 3        |
| COCONUT OIL                | 4             | 4     | 4        | 4        | 1             | 3    | 1            | 3        |
| COPPER CHLORIDE            | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 2        |
| COPPER SALTS               | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 1        |
| COPPER SULFATE             | 3             | 3     | 2        | 3        | 1             | 1    | 1            | 1        |
| CORN OIL                   | 2             | 1     | 1        | 1        | 1             | 3    | 1            | 3        |
| COTTONSEED OIL             | 3             | 2     | 1        | 2        | 1             | 3    | 1            | 3        |
| CREOSOLS                   | 3             | 2     | 1        | 2        | 3             | 3    | 1            | 3        |
| CREOSOTE                   | 3             | 3     | 2        | 1        | 1             | 3    | 1            | 2        |
| CRESYLIC ACID              | 4             | 2     | 1        | 2        | 3             | 3    | 1            | 3        |
| CRUDE OIL                  | 3             | 2     | 1        | 1        | 2             | 3    | 1            | 3        |
| CUTTING OIL                | 4             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| DECANE                     | 4             | 4     | 4        | 4        | 1             | 3    | 1            | 3        |
| DENATURED ALCOHOL          | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 1        |
| DETERGENT, WATER SOLUTION  | 3             | 3     | 1        | 1        | 1             | 1    | 1            | 2        |
| DIESEL FUEL                | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 3        |
| DIETHYLENE GLYCOL          | 3             | 1     | 1        | 1        | 1             | 1    | 1            | 1        |
| DIMETHYL FORMAMIDE         | 4             | 4     | 1        | 1        | 2             | 1    | 3            | 3        |
| DOW CHEMICAL HD50-4        | 4             | 4     | 4        | 4        | 4             | 1    | 3            | 2        |
| DOW CORNING 200, 510, 550  | 4             | 4     | 4        | 4        | 2             | 1    | 1            | 1        |
| DOWTHERM A,E               | 3             | 1     | 2        | 2        | 3             | 3    | 1            | 3        |
| ETHANOL                    | 1             | 1     | 3        | 3        | 3             | 1    | 3            | 1        |
| ETHYL CHLORIDE             | 3             | 3     | 1        | 3        | 1             | 3    | 1            | 3        |
| ETHYL HEXANOL              | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 1        |
| ETHYLENE DICHLORIDE        | 3             | 3     | 1        | 2        | 3             | 3    | 1            | 3        |
| ETHYLENE GLYCOL            | 2             | 2     | 1        | 2        | 1             | 1    | 1            | 1        |
| FATTY ACIDS                | 3             | 3     | 1        | 2        | 2             | 3    | 1            | 2        |
| FREON 11                   | 1             | 4     | 4        | 4        | 2             | 3    | 2            | 3        |
| FREON 12                   | 1             | 1     | 3        | 1        | 2             | 3    | 1            | 1        |
| FREON 22                   | 1             | 3     | 1        | 1        | 3             | 3    | 3            | 1        |
| FREON 134a                 | 1             | 1     | 1        | 1        | 2             | 1    | 4            | 1        |
| FUEL OIL                   | 3             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| GALLIC ACID                | 3             | 3     | 2        | 2        | 2             | 2    | 1            | 2        |
| GAS, LIQUID, PROPANE (LPG) | 1             | 3     | 1        | 1        | 1             | 3    | 1            | 2        |
| GAS, NATURAL               | 2             | 3     | 1        | 1        | 1             | 3    | 1            | 1        |

# Appendix

## Fluid Compatibility Chart

**CODES: 1 = Satisfactory 2 = Fair 3 = Not Recommended 4 = Insufficient Data Available**

| Media                                        | Body Material |       |          |          | Seal Material |      |              |          |
|----------------------------------------------|---------------|-------|----------|----------|---------------|------|--------------|----------|
|                                              | Brass         | Steel | 316 S.S. | 303 S.S. | Nitrile       | E.P. | Fluorocarbon | Neoprene |
| GASOLINE                                     | 1             | 2     | 1        | 1        | 3             | 3    | 1            | 3        |
| GELATIN                                      | 3             | 3     | 1        | 1        | 1             | 1    | 1            | 1        |
| GLUCOSE                                      | 1             | 1     | 1        | 1        | 1             | 1    | 1            | 1        |
| GLYCERINE (GLYCEROL)                         | 2             | 1     | 1        | 1        | 1             | 1    | 1            | 1        |
| GLYCOLS                                      | 3             | 2     | 2        | 2        | 1             | 1    | 3            | 1        |
| GREEN SULFATE LIQUOR                         | 3             | 3     | 3        | 3        | 2             | 1    | 1            | 2        |
| GULF - FR FLUID (EMULSION)                   | 4             | 4     | 4        | 4        | 1             | 3    | 1            | 2        |
| GULF - FR FLUID G                            | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 1        |
| GULF - FR FLUID P                            | 4             | 4     | 4        | 4        | 3             | 2    | 2            | 3        |
| HELIUM                                       | 1             | 1     | 1        | 1        | 1             | 1    | 1            | 1        |
| HEPTANE                                      | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| HYDRAULIC OIL (PETROLEUM BASE)               | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 1        |
| HYDRAULIC OIL (WATER BASE)                   | 4             | 1     | 1        | 1        | 2             | 1    | 3            | 2        |
| HYDRAZINE                                    | 4             | 3     | 1        | 1        | 2             | 1    | 3            | 2        |
| HYDROGEN GAS                                 | 2             | 2     | 1        | 1        | 1             | 1    | 1            | 1        |
| HYDROLUBE                                    | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 2        |
| ISO OCTANE                                   | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| ISOBUTYL ALCOHOL                             | 4             | 4     | 1        | 1        | 2             | 1    | 1            | 1        |
| ISOPROPYL ALCOHOL                            | 1             | 1     | 2        | 1        | 2             | 1    | 1            | 2        |
| ISOPROPYL ETHER                              | 1             | 1     | 1        | 1        | 2             | 3    | 3            | 3        |
| JP3 AND JP4                                  | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 3        |
| KEROSENE                                     | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| LARD, ANIMAL FAT                             | 1             | 1     | 1        | 1        | 1             | 2    | 1            | 2        |
| LINSEED OIL                                  | 3             | 1     | 1        | 1        | 1             | 3    | 1            | 3        |
| ILUBRICATING OIL SAE<br>(10, 20, 30, 40, 50) | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| MAGNESIUM SALTS                              | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 1        |
| MAGNESIUM SULPHATE                           | 3             | 3     | 2        | 2        | 1             | 1    | 1            | 1        |
| MERCURY                                      | 3             | 3     | 1        | 1        | 1             | 1    | 1            | 1        |
| METHANE                                      | 1             | 3     | 1        | 1        | 1             | 3    | 1            | 2        |
| METHANOL                                     | 1             | 1     | 1        | 1        | 1             | 1    | 3            | 1        |
| METHYL BROMIDE                               | 4             | 1     | 1        | 1        | 2             | 3    | 1            | 3        |
| METHYL CHLORIDE (DRY)                        | 2             | 3     | 1        | 1        | 3             | 3    | 1            | 3        |
| METHYL CHLORIDE (WET)                        | 1             | 3     | 1        | 3        | 3             | 3    | 1            | 3        |
| METHYL ETHER                                 | 4             | 4     | 4        | 4        | 1             | 3    | 1            | 3        |
| METHYL ETHYL KETONE (MEK)                    | 1             | 1     | 1        | 1        | 3             | 1    | 3            | 3        |
| MIL-F-81912 (JP-9)                           | 1             | 1     | 1        | 1        | 3             | 3    | 1            | 3        |

# Appendix

## Fluid Compatibility Chart

**CODES: 1 = Satisfactory 2 = Fair 3 = Not Recommended 4 = Insufficient Data Available**

| Media                                   | Body Material |       |          |          | Seal Material |      |              |          |
|-----------------------------------------|---------------|-------|----------|----------|---------------|------|--------------|----------|
|                                         | Brass         | Steel | 316 S.S. | 303 S.S. | Nitrile       | E.P. | Fluorocarbon | Neoprene |
| MIL-H-5606                              | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| MIL-H-6083                              | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 1        |
| MIL-H-7083                              | 1             | 1     | 1        | 1        | 1             | 1    | 2            | 2        |
| MIL-H-8446 (MLO-8515)                   | 2             | 1     | 1        | 1        | 2             | 3    | 1            | 1        |
| MIL-L-2104 & 2104B                      | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| MIL-L-7808                              | 3             | 2     | 1        | 1        | 2             | 3    | 1            | 3        |
| MILK                                    | 2             | 1     | 1        | 1        | 1             | 1    | 1            | 1        |
| MINERAL OILS                            | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| MLO-7277 AND MLO-7557                   | 2             | 1     | 1        | 1        | 3             | 3    | 1            | 3        |
| MOBILE HF                               | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| MONOMETHYL HYDRAZINE                    | 4             | 4     | 4        | 4        | 2             | 1    | 4            | 2        |
| NAPHTHA (COAL OR PETROLEUM)             | 2             | 1     | 2        | 2        | 2             | 3    | 1            | 3        |
| NAPHTHALENE                             | 2             | 1     | 2        | 2        | 3             | 3    | 1            | 3        |
| NAPHTHENIC ACID                         | 2             | 1     | 2        | 2        | 2             | 3    | 1            | 3        |
| NEATSFOOT OIL                           | 4             | 4     | 4        | 4        | 1             | 2    | 1            | 3        |
| NICKEL, ACETATE                         | 3             | 2     | 1        | 1        | 2             | 1    | 3            | 2        |
| NICKEL CHLORIDE                         | 3             | 3     | 2        | 2        | 1             | 1    | 1            | 2        |
| NICKEL SALTS                            | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 2        |
| NICKEL SULFATE                          | 3             | 3     | 1        | 1        | 1             | 1    | 1            | 1        |
| NITROGEN                                | 1             | 1     | 1        | 1        | 1             | 1    | 1            | 1        |
| NITROUS OXIDE                           | 2             | 2     | 2        | 1        | 1             | 4    | 4            | 4        |
| OCTYL ALCOHOL                           | 1             | 1     | 1        | 1        | 2             | 3    | 1            | 2        |
| OLIVE OIL                               | 2             | 1     | 1        | 1        | 1             | 2    | 1            | 2        |
| ORTHO-DICHLOROBENZENE                   | 2             | 2     | 2        | 2        | 3             | 3    | 1            | 3        |
| OXALIC ACID                             | 3             | 3     | 2        | 1        | 2             | 1    | 1            | 2        |
| OXYGEN (200-400°F)                      | 1             | 1     | 1        | 1        | 3             | 3    | 2            | 3        |
| OXYGEN, COLD                            | 1             | 1     | 1        | 1        | 2             | 1    | 1            | 1        |
| OZONE                                   | 3             | 3     | 1        | 1        | 3             | 1    | 1            | 3        |
| PALMITIC ACID                           | 1             | 2     | 1        | 1        | 1             | 2    | 1            | 2        |
| PARA-DICHLOROBENZENE                    | 2             | 1     | 1        | 2        | 3             | 3    | 1            | 3        |
| PARKER O LUBE                           | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 1        |
| PEANUT OIL                              | 2             | 1     | 1        | 1        | 1             | 3    | 1            | 3        |
| PENTANE<br>(2-3-METHYL, & 2-4 DIMETHYL) | 2             | 2     | 2        | 2        | 1             | 3    | 1            | 2        |
| PERCHLORIC ACID -2N                     | 3             | 3     | 2        | 2        | 3             | 2    | 1            | 2        |
| PERCHLOROETHYLENE                       | 3             | 2     | 2        | 2        | 2             | 3    | 1            | 3        |
| PETROLATUM                              | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |

# Appendix

## Fluid Compatibility Chart

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| Media                                     | Body Material |       |          |          | Seal Material |      |              |          |
|-------------------------------------------|---------------|-------|----------|----------|---------------|------|--------------|----------|
|                                           | Brass         | Steel | 316 S.S. | 303 S.S. | Nitrile       | E.P. | Fluorocarbon | Neoprene |
| PETROLEUM OIL, BELOW 250°F                | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| PHENOL                                    | 1             | 1     | 1        | 1        | 3             | 3    | 1            | 3        |
| PHOSPHORIC ACID (3 MOLAR)                 | 3             | 3     | 2        | 2        | 1             | 1    | 1            | 2        |
| PHOSPHORIC ACID (CONCENTRATED)            | 3             | 3     | 2        | 2        | 3             | 1    | 1            | 3        |
| PHOSPHOROUS TRICHLORIDE                   | 3             | 3     | 1        | 1        | 3             | 1    | 1            | 3        |
| PICRIC ACID, MOLTEN                       | 3             | 3     | 2        | 2        | 2             | 2    | 1            | 2        |
| PICRIC ACID, WATER SOLUTION               | 3             | 3     | 2        | 2        | 1             | 1    | 1            | 1        |
| PINE OIL                                  | 2             | 2     | 1        | 2        | 1             | 3    | 1            | 3        |
| PLATING SOLUTIONS (CHROME)                | 1             | 3     | 1        | 1        | 4             | 1    | 1            | 3        |
| PLATING SOLUTIONS (OTHER)                 | 4             | 1     | 1        | 1        | 1             | 1    | 1            | 3        |
| PNEUMATIC SERVICE                         | 1             | 1     | 1        | 1        | 1             | 1    | 1            | 1        |
| POTASSIUM ACETATE                         | 2             | 1     | 2        | 2        | 2             | 1    | 3            | 2        |
| POTASSIUM CHLORIDE                        | 3             | 3     | 1        | 2        | 1             | 1    | 1            | 1        |
| POTASSIUM CYANIDE                         | 3             | 2     | 2        | 2        | 1             | 1    | 1            | 1        |
| POTASSIUM DICHROMATE                      | 3             | 1     | 2        | 2        | 1             | 1    | 1            | 1        |
| POTASSIUM HYDROXIDE (50%)                 | 3             | 2     | 1        | 2        | 2             | 1    | 3            | 2        |
| POTASSIUM NITRATE                         | 2             | 1     | 1        | 1        | 1             | 1    | 1            | 1        |
| POTASSIUM SALTS                           | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 1        |
| POTASSIUM SULFATE                         | 3             | 2     | 1        | 1        | 1             | 1    | 1            | 1        |
| PRL-HIGH TEMP. HYDR. OIL                  | 4             | 4     | 4        | 4        | 2             | 3    | 1            | 2        |
| PRODUCER GAS                              | 2             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| PROPANE                                   | 1             | 3     | 1        | 1        | 1             | 3    | 1            | 2        |
| PROPYL ACETATE                            | 3             | 1     | 1        | 1        | 3             | 2    | 3            | 3        |
| PROPYL ALCOHOL                            | 1             | 1     | 1        | 1        | 1             | 1    | 1            | 1        |
| PROPYLENE                                 | 1             | 1     | 1        | 1        | 3             | 3    | 1            | 3        |
| PYDRAUL 10E                               | 3             | 1     | 1        | 1        | 3             | 1    | 3            | 3        |
| PYDRAUL A-200, C SERIES                   | 3             | 1     | 1        | 1        | 3             | 3    | 1            | 3        |
| PYDRAUL, 3 SERIES                         | 3             | 1     | 1        | 1        | 3             | 1    | 1            | 3        |
| PYROGARD 42, 43, 53, 55 (PHOSPHATE ESTER) | 4             | 4     | 4        | 4        | 3             | 1    | 1            | 3        |
| PYROGARD D                                | 4             | 4     | 4        | 4        | 1             | 3    | 3            | 2        |
| SEA WATER (SALT WATER)                    | 2             | 3     | 1        | 1        | 1             | 1    | 1            | 2        |
| SHELL IRUS 905                            | 4             | 4     | 4        | 4        | 1             | 3    | 1            | 2        |
| SILICONE GREASES                          | 1             | 1     | 1        | 1        | 1             | 1    | 1            | 1        |
| SILVER NITRATE                            | 3             | 3     | 1        | 2        | 2             | 1    | 1            | 1        |
| SKYDROL 500, TYPE 2                       | 3             | 1     | 1        | 1        | 3             | 1    | 3            | 3        |

# Appendix

## Fluid Compatibility Chart

**CODES: 1 = Satisfactory 2 = Fair 3 = Not Recommended 4 = Insufficient Data Available**

| Media                                   | Body Material |       |          |          | Seal Material |      |              |          |
|-----------------------------------------|---------------|-------|----------|----------|---------------|------|--------------|----------|
|                                         | Brass         | Steel | 316 S.S. | 303 S.S. | Nitrile       | E.P. | Fluorocarbon | Neoprene |
| SKYDROL 7000, TYPE 2                    | 3             | 1     | 1        | 1        | 3             | 1    | 2            | 3        |
| SOAP SOLUTIONS                          | 3             | 3     | 1        | 1        | 1             | 1    | 1            | 2        |
| SODIUM ACETATE                          | 1             | 1     | 1        | 1        | 2             | 1    | 3            | 2        |
| SODIUM BICARBONATE                      | 2             | 2     | 1        | 1        | 1             | 1    | 1            | 1        |
| SODIUM BISULPHATE/<br>BISULPHITE        | 3             | 3     | 2        | 1        | 1             | 1    | 1            | 1        |
| SODIUM BORATE                           | 3             | 2     | 2        | 2        | 1             | 1    | 1            | 1        |
| SODIUM CARBONATE                        | 4             | 1     | 1        | 1        | 1             | 1    | 1            | 1        |
| SODIUM CHLORIDE                         | 3             | 2     | 2        | 2        | 1             | 1    | 1            | 1        |
| SODIUM CYANIDE                          | 3             | 1     | 1        | 1        | 1             | 1    | 4            | 1        |
| SODIUM HYDROXIDE<br>(CAUSTIC SODA, LYE) | 3             | 2     | 1        | 2        | 2             | 1    | 2            | 2        |
| SODIUM HYDROXIDE, 50%                   | 3             | 3     | 1        | 2        | 2             | 1    | 2            | 2        |
| SODIUM METAPHOSPHATE                    | 2             | 1     | 2        | 2        | 1             | 1    | 1            | 2        |
| SODIUM NITRATE                          | 3             | 2     | 1        | 1        | 2             | 1    | 4            | 2        |
| SODIUM PERBORATE                        | 3             | 3     | 1        | 1        | 2             | 1    | 1            | 2        |
| SODIUM PEROXIDE                         | 3             | 1     | 2        | 2        | 2             | 1    | 1            | 2        |
| SODIUM PHOSPHATES                       | 1             | 3     | 2        | 1        | 1             | 1    | 1            | 2        |
| SODIUM SALTS                            | 4             | 4     | 4        | 4        | 1             | 1    | 1            | 2        |
| SODIUM SULFATE                          | 3             | 2     | 1        | 1        | 1             | 1    | 1            | 1        |
| SODIUM SULFIDE / SULFITE                | 3             | 3     | 2        | 3        | 1             | 1    | 1            | 1        |
| SODIUM THIOSULFATE                      | 3             | 3     | 1        | 2        | 2             | 1    | 1            | 1        |
| SOYBEAN OIL                             | 2             | 1     | 1        | 1        | 1             | 3    | 1            | 3        |
| STANNOUS CHLORIDE (15%)                 | 3             | 3     | 2        | 3        | 1             | 1    | 1            | 1        |
| STEAM, BELOW 400°F                      | 1             | 3     | 1        | 1        | 3             | 1*   | 3            | 3        |
| STODDARD SOLVENT                        | 2             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| SUCROSE SOLUTIONS                       | 1             | 1     | 1        | 1        | 1             | 1    | 1            | 2        |
| SULFUR                                  | 2             | 1     | 1        | 1        | 3             | 1    | 1            | 1        |
| SULFUR LIQUORS                          | 1             | 1     | 1        | 1        | 2             | 2    | 1            | 2        |
| SULFUR (MOLTEN)                         | 3             | 3     | 1        | 1        | 3             | 3    | 1            | 3        |
| SULFUR DIOXIDE (DRY)                    | 3             | 1     | 1        | 3        | 3             | 1    | 3            | 3        |
| SULFUR TRIOXIDE (DRY)                   | 2             | 2     | 2        | 3        | 3             | 2    | 1            | 3        |
| SUNSAFE                                 | 3             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| TANNIC ACID (10%)                       | 1             | 3     | 2        | 3        | 1             | 1    | 1            | 2        |
| TAR, BITUMINOUS                         | 2             | 1     | 1        | 1        | 2             | 3    | 1            | 3        |
| TARTARIC ACID                           | 2             | 3     | 3        | 2        | 1             | 2    | 1            | 2        |
| TERPINEOL                               | 4             | 4     | 4        | 4        | 2             | 3    | 1            | 3        |
| TERTIARY BUTYL ALCOHOL                  | 1             | 1     | 1        | 1        | 2             | 2    | 1            | 2        |

# Appendix

## Fluid Compatibility Chart

**CODES: 1 = Satisfactory 2 = Fair 3 = Not Recommended 4 = Insufficient Data Available**

| Media                          | Body Material |       |          |          | Seal Material |      |              |          |
|--------------------------------|---------------|-------|----------|----------|---------------|------|--------------|----------|
|                                | Brass         | Steel | 316 S.S. | 303 S.S. | Nitrile       | E.P. | Fluorocarbon | Neoprene |
| TETRACHLOROETHANE              | 4             | 2     | 1        | 2        | 3             | 3    | 1            | 3        |
| TETRACHLOROETHYLENE            | 3             | 2     | 2        | 4        | 3             | 3    | 1            | 3        |
| TETRAETHYL LEAD                | 1             | 1     | 1        | 1        | 2             | 3    | 1            | 2        |
| TETRAETHYL LEAD (BLEND)        | 1             | 1     | 1        | 1        | 2             | 3    | 1            | 3        |
| TITANIUM TETRACHLORIDE         | 2             | 1     | 2        | 3        | 2             | 3    | 1            | 3        |
| TOLUENE                        | 1             | 1     | 1        | 1        | 3             | 3    | 1            | 3        |
| TRANSFORMER OIL                | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| TRANSMISSION FLUID (TYPE A)    | 1             | 1     | 1        | 1        | 1             | 3    | 1            | 2        |
| TRICHLOROETHANE                | 4             | 2     | 1        | 4        | 3             | 3    | 1            | 3        |
| TRICHLOROETHYLENE              | 3             | 2     | 2        | 2        | 3             | 3    | 1            | 3        |
| TRICRESYL PHOSPHATE            | 4             | 1     | 2        | 2        | 3             | 1    | 2            | 3        |
| TURBINE OIL # 15 (MIL-L-7808A) | 4             | 2     | 1        | 1        | 2             | 3    | 1            | 3        |
| TURPENTINE                     | 3             | 2     | 1        | 1        | 1             | 3    | 1            | 3        |
| VARNISH                        | 1             | 1     | 1        | 1        | 2             | 3    | 1            | 3        |
| WATER                          | 1             | 3     | 1        | 1        | 1             | 1    | 2            | 2        |
| WHISKEY                        | 1             | 3     | 1        | 1        | 1             | 1    | 1            | 1        |
| WINE                           | 1             | 3     | 1        | 1        | 1             | 1    | 1            | 1        |
| WOOD OIL                       | 4             | 2     | 1        | 1        | 1             | 3    | 1            | 2        |
| XYLENE                         | 1             | 2     | 1        | 1        | 3             | 3    | 1            | 3        |
| ZINC SULFATE                   | 3             | 3     | 2        | 2        | 1             | 1    | 1            | 1        |

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## Appendix

### Safety Guide


**WARNING**

### SAFETY GUIDE FOR SELECTING AND USING QUICK COUPLING DIVISION PRODUCTS AND RELATED ACCESSORIES


**WARNING**

**DANGER:** Failure or improper selection or improper use of Quick Coupling Division (QCD) products and related accessories can cause death, personal injury, and property damage. Possible consequences of failure or improper selection or improper use of QCD products or related accessories include but are not limited to:

- Couplings or parts thrown off at high speed.
- High velocity fluid discharge.
- Explosion or burning of the conveyed fluid.
- Contact with suddenly moving or falling objects that are to be held in position or moved by the conveyed fluid.
- Dangerously whipping hose.
- Contact with conveyed fluids that may be hot, cold, toxic, or otherwise injurious.
- Sparking or explosion while paint or flammable liquid spraying.

Before selecting or using any Parker quick action couplings or related accessories, it is important that you read and follow the following instructions.

No product from the Quick Coupling Division is approved for in-flight aerospace applications. For products used in in-flight aerospace applications, please contact Parker Aerospace Group.

**1.1 Scope:** This safety guide provides instructions for selecting and using (including installing, connecting, disconnecting, and maintaining) QCD products and related accessories. This safety guide is a supplement to and is to be used with, the specific Parker publications for the specific QCD products and related accessories being considered for use.

**1.2 Fail-Safe:** QCD products or the hose they are attached to can fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so failure of the QCD product or hose will not endanger persons or property.

**1.3 Distribution:** Provide a copy of this safety guide to each person responsible for selecting or using QCD products. Do not select or use QCD products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.

**1.4 User Responsibility:** Due to the wide variety of operating conditions and uses for QCD products, Parker and its distributors do not represent or warrant any particular QCD

product suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of QCD products.
- Assuring the user's requirements are met and the use presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the QCD products are used.

**1.5 Additional Questions:** Call the appropriate Parker customer service department if you have any questions or require any additional information. For the telephone numbers of the appropriate customer service department, see the Parker publication for the product being considered or used.

## 2.0 QCD Product Selection Instructions

**2.1 Pressure:** QCD product selection must be made so the published rated pressure is equal to or greater than the maximum system pressure. Surge pressures in the system higher than the rated pressure will shorten the QCD products' life. Do not confuse burst pressure or other pressure values with rated pressure and do not use burst pressure or other pressure values for this purpose.

**2.2 Fluid Compatibility:** QCD product selection must assure compatibility of the products' materials of construction with the fluid media being used.

**2.3 Temperature:** Be certain fluid and ambient temperatures, both steady and transient, do not exceed the limitations of the QCD product. Use caution and proper PPE when handling QCD products heated or cooled by the media they are conducting or by their environment.

**2.4 Size:** Transmission of power by means of pressurized liquid varies with pressure and flow. The size of the QCD product and other components of the system must be adequate pressure

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### Safety Guide

losses to a minimum and avoid damage due to heat generation or excessive fluid velocity.

#### 2.5 Pressurized Connect or Disconnect:

If connecting or disconnecting under pressure is a requirement, use only quick couplings designed for that purpose. The rated operating pressure of a quick action coupling may not be the pressure at which it may be safely connected or disconnected.

**2.6 Environment:** Care must be taken to ensure QCD products are either compatible with or protected from the environment (that is, surrounding conditions) to which they are exposed. Environmental conditions including but not limited to ultraviolet radiation, ozone, moisture, water, salt water, chemicals, and air pollutants can cause degradation and premature failure.

**2.7 Locking Means:** Ball locking quick couplings can unintentionally disconnect if they are dragged over obstructions on the end of a hose or if the sleeve is bumped or moved enough to cause disconnect. Sleeves designed with flanges to provide better ripping for oily or gloved hands are especially susceptible to accidental disconnect and should not be used where these conditions exist. Sleeve lock or union (threaded) sleeve designs should be considered where there is a potential for accidental disconnect.

**2.8 Mechanical Loads:** External forces can significantly reduce QCD product life or cause failure. Mechanical loads which must be considered include excessive tensile or side loads, and vibration. Unusual applications may require special testing prior to QCD product selection.

**2.9 Specifications and Standards:** When selecting QCD products, government, industry, and Parker specifications must be reviewed and followed where applicable.

**2.10 Vacuum:** Not all QCD products are suitable or recommended for vacuum service. QCD products used for vacuum applications must be selected to ensure

the product will withstand the vacuum and pressure of the system.

**2.11 Fire Resistant Fluids:** Some fire-resistant fluids require seals other than the standard nitrile used in many QCD products.

**2.12 Radiant Heat:** QCD product can be heated to destruction or loss of sealing integrity without contact by nearby items such as hot manifolds or molten metal. The same heat source may then initiate a fire. This can occur despite the presence of cool air around the QCD product.

**2.13 Welding and Brazing:** Heating of plated parts, including QCD products and port adapters, above 450°F (232°C) such as during welding, brazing, or soldering may emit deadly gases and may cause permanent product damage.

## 3.0 Quick Action Coupling Installation Instructions

**3.1 Pre-Installation Inspection:** Before installing a QCD product, visually inspect it and check for correct style, body material, seal material, and catalog number. Before final installation, coupling halves should be connected and disconnected with a sample of the mating half with which they will be used.

**3.2 Quick Coupling Halves from Other Manufacturers:** If a quick coupling assembly is made up of one Parker half and one half from another manufacturer, the lowest pressure rating of the two halves should not be exceeded.

**3.3 Fitting Installation:** Use a thread sealant, lubricant, or a combination of both when assembling pipe thread joints on QCD products. Be sure the sealant is compatible with the system fluid or gas. To avoid system contamination, use a liquid or paste type sealant rather than a tape style. Use the flats provided to hold QCD product when installing fittings. Do not use pipe wrenches or a vice on other parts of the product to hold it when installing or removing fittings as damage or loosening of threaded assembly joints in the product could result. Do not apply

excessive torque to taper pipe threads because cracking or splitting of the female component can result.

**3.4 Caps and Plugs:** Use dust caps and plugs when quick couplings are not coupled to exclude dirt and contamination and to protect critical surfaces from damage.

**3.5 Quick Coupling Location:** Locate quick couplings where they can be reached for connect or disconnect without exposing the operator to slipping, falling, getting sprayed, or coming in contact with hot or moving parts.

**3.6 Hose Whips:** Use a hose whip (a short length of hose between the tool and the coupling half) instead of rigidly mounting a coupling half on hand tools or other devices. This reduces the potential for coupling damage if the tool is dropped and provides some isolation from mechanical vibration which could cause unintended disconnection.

## 4.0 QCD Product Maintenance Instructions

**4.1** Even with proper selection and installation, QCD product life may be significantly reduced without a maintenance program. Frequency should be determined by the severity of the application and risk potential. A maintenance program must be established and followed by the user and must include the following as a minimum:

#### 4.2 Visual Inspection of QCD

**Product:** Any of the following conditions require immediate shut down and replacement of the QCD product:

- Cracked, damaged, or corroded product.
- Leaks at the fitting, valve or mating seal.
- Broken mounting hardware, especially breakaway clamps.

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### Safety Guide

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**4.3 Visual Inspection Other:** The following items must be tightened, repaired or replaced as required:

- Leaking seals or port connections.
- Excess dirt buildup on the quick coupling locking mechanism or on the interface area of either coupling half
- Clamps, guards, and shields.
- System fluid level, fluid type and any air entrapment.

**4.4 Functional Test:** Operate the system at maximum operating pressure and check for possible malfunctions and leaks. Personnel must avoid potentially hazardous areas while testing and using the system.

**4.5 Replacement Intervals:** Specific replacement intervals must be considered based on previous service life, government, or industry recommendations, or when failures could result in unacceptable downtime, damage, or injury risk. See instruction 1.2 above.

Additional copies of the preceding safety information can be ordered by requesting "Safety Guide for Selecting and Using QCD Product and Related Accessories," Parker Publication DS6013.

Contact Parker's Quick Coupling Division, Minneapolis, MN.

# Appendix

## Offer of Sale

1. Definitions. As used herein, the following terms have the meanings indicated.

Buyer: means any customer receiving a Quote for Products.

Goods: means any tangible part, system or component to be supplied by Seller.

Products: means the Goods, Services and/or Software as described in a Quote.

Quote: means the offer or proposal made by Seller to Buyer for the supply of Products.

Seller: means Parker-Hannifin Corporation, including all divisions and businesses thereof.

Services: means any services to be provided by Seller.

Software: means any software related to the Goods, whether embedded or separately downloaded.

Terms: means the terms and conditions of this Offer of Sale.

2. Terms. All sales of Products by Seller are expressly conditioned upon, and will be governed by the acceptance of, these Terms. These Terms are incorporated into any Quote provided by Seller to Buyer. Buyer's order for any Products whether communicated to Seller verbally, in writing, by electronic data interface or other electronic commerce, shall constitute acceptance of these Terms. Seller objects to any contrary or additional terms or conditions of Buyer. Reference in Seller's order acknowledgement to Buyer's purchase order or purchase order number shall in no way constitute an acceptance of any of Buyer's terms or conditions of purchase. No modification to these Terms will be binding on Seller unless agreed to in writing and signed by an authorized representative of Seller.

3. Price; Payment. The Products set forth in the Quote are offered for sale at the prices indicated in the Quote. Unless otherwise specifically stated in the Quote, prices are valid for thirty (30) days and do not include any sales, use, or other taxes or duties. Seller reserves the right to modify prices at any time to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility (INCOTERMS 2020). All sales are contingent upon credit approval and full payment for all purchases is due thirty (30) days from the date of invoice (or such date as may be specified in the Quote). Unpaid invoices beyond the specified payment date incur interest at the rate of 1.5% per month or the maximum allowable rate under applicable law.

4. Shipment; Delivery; Title and Risk of Loss. All delivery dates are approximate, and Seller is not responsible for damages resulting from any delay. Regardless of the manner of shipment, delivery occurs and title and risk of loss or damage pass to Buyer, upon placement of the Products with the carrier at Seller's facility. Unless otherwise agreed prior to shipment and for domestic delivery locations only, Seller will select and arrange, at Buyer's sole expense, the carrier and means of delivery. When Seller selects and arranges the carrier and means of delivery, freight and insurance costs for shipment to the designated delivery location will be prepaid by Seller and added as a separate line item to the invoice. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions. Buyer shall not return or repack any Products without the prior

written authorization from Seller, and any return shall be at the sole cost and expense of Buyer.

5. Warranty. The warranty for the Products is as follows: (i) Goods are warranted against defects in material or workmanship for a period of twelve (12) months from the date of delivery or 2,000 hours of use, whichever occurs first; (ii) Services shall be performed in accordance with generally accepted practices and using the degree of care and skill that is ordinarily exercised and customary in the field to which the Services pertain and are warranted for a period of six (6) months from the date of completion of the Services; and (iii) Software is only warranted to perform in accordance with applicable specifications provided by Seller to Buyer for ninety (90) days from the date of delivery or, when downloaded by a Buyer or end-user, from the date of the initial download. All prices are based upon the exclusive limited warranty stated above, and upon the following disclaimer: EXEMPTION CLAUSE; DISCLAIMER OF WARRANTY, CONDITIONS, REPRESENTATIONS: THIS WARRANTY IS THE SOLE AND ENTIRE WARRANTY, CONDITION, AND REPRESENTATION, PERTAINING TO PRODUCTS. SELLER DISCLAIMS ALL OTHER WARRANTIES, CONDITIONS, AND REPRESENTATIONS, WHETHER STATUTORY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THOSE RELATING TO DESIGN, NONINFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE. SELLER DOES NOT WARRANT THAT THE SOFTWARE IS ERROR-FREE OR FAULT-TOLERANT, OR THAT BUYER'S USE THEREOF WILL BE SECURE OR UNINTERRUPTED. UNLESS OTHERWISE AUTHORIZED IN WRITING BY SELLER, THE SOFTWARE SHALL NOT BE USED IN CONNECTION WITH HAZARDOUS OR HIGH RISK ACTIVITIES OR ENVIRONMENTS. EXCEPT AS EXPRESSLY STATED HEREIN, ALL PRODUCTS ARE PROVIDED "AS IS".

6. Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon receipt. No claims for shortages will be allowed unless reported to Seller within ten (10) days of delivery. Buyer shall notify Seller of any alleged breach of warranty within thirty (30) days after the date the non-conformance is or should have been discovered by Buyer. Any claim or action against Seller based upon breach of contract or any other theory, including tort, negligence, or otherwise must be commenced within twelve (12) months from the date of the alleged breach or other alleged event, without regard to the date of discovery.

7. LIMITATION OF LIABILITY. IN THE EVENT OF A BREACH OF WARRANTY, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE THE NON-CONFORMING PRODUCT, RE-PERFORM THE SERVICES, OR REFUND THE PURCHASE PRICE PAID WITHIN A REASONABLE PERIOD OF TIME. IN NO EVENT IS SELLER LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING ANY LOSS OF REVENUE OR PROFITS, WHETHER BASED IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE PAID FOR THE PRODUCTS.

8. Confidential Information. Buyer acknowledges and agrees that any technical, commercial, or other confidential information of Seller, including, without limitation, pricing, technical drawings or

prints and/or part lists, which has been or will be disclosed, delivered or made available, whether directly or indirectly, to Buyer ("Confidential Information"), has been and will be received in confidence and will remain the property of Seller. Buyer further agrees that it will not use Seller's Confidential Information for any purpose other than for the benefit of Seller.

9. Loss to Buyer's Property. Any tools, patterns, materials, equipment or information furnished by Buyer or which are or become Buyer's property ("Buyer's Property"), will be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer ordering the Products manufactured using Buyer's Property. Furthermore, Seller shall not be responsible for any loss or damage to Buyer's Property while it is in Seller's possession or control.

10. Special Tooling. "Special Tooling" includes but is not limited to tools, jigs, fixtures and associated manufacturing equipment acquired or necessary to manufacture Goods. Seller may impose a tooling charge for any Special Tooling. Such Special Tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in the Special Tooling, even if such Special Tooling has been specially converted or adapted for manufacture of Goods for Buyer and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller has the right to alter, discard or otherwise dispose of any Special Tooling or other property owned by Seller in its sole discretion at any time.

11. Security Interest. To secure payment of all sums due from Buyer, Seller retains a security interest in all Products delivered to Buyer and, Buyer's acceptance of these Terms is deemed to be a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect Seller's security interest.

12. User Responsibility. Buyer, through its own analysis and testing, is solely responsible for making the final selection of the Products and assuring that all performance, endurance, maintenance, safety and warning requirements of the application of the Products are met. Buyer must analyze all aspects of the application and follow applicable industry standards, specifications, and any technical information provided with the Quote or the Products, such as Seller's instructions, guides and specifications. If Seller provides options of or for Products based upon data or specifications provided by Buyer, Buyer is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products. In the event Buyer is not the end-user of the Products, Buyer will ensure such end-user complies with this paragraph.

13. Use of Products, Indemnity by Buyer. Buyer shall comply with all instructions, guides and specifications provided by Seller with the Quote or the Products. Unauthorized Uses. If Buyer uses or resells the Products in any way prohibited by Seller's instructions, guides or specifications, or Buyer otherwise fails to comply with Seller's instructions, guides and specifications, Buyer acknowledges that any such use, resale, or non-compliance

## Appendix

### Offer of Sale

is at Buyer's sole risk. Further, Buyer shall indemnify, defend, and hold Seller harmless from any losses, claims, liabilities, damages, lawsuits, judgments and costs (including attorney fees and defense costs), whether for personal injury, property damage, intellectual property infringement or any other claim, arising out of or in connection with: (a) improper selection, design, specification, application, or any misuse of Products; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, tools, equipment, plans, drawings, designs, specifications or other information or things furnished by Buyer; (d) damage to the Products from an external cause, repair or attempted repair by anyone other than Seller, failure to follow instructions, guides and specifications provided by Seller, use with goods not provided by Seller, or opening, modifying, deconstructing, tampering with or repackaging the Products; or (e) Buyer's failure to comply with these Terms. Seller shall not indemnify Buyer under any circumstance except as otherwise provided in these Terms.

**14. Cancellations and Changes.** Buyer may not cancel or modify, including but not limited to movement of delivery dates for the Products, any order for any reason except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage and any additional expense. Seller, at any time, may change features, specifications, designs and availability of Products.

**15. Limitation on Assignment.** Buyer may not assign its rights or obligations without the prior written consent of Seller.

**16. Force Majeure.** Seller is not liable for delay or failure to perform any of its obligations by reason of events or circumstances beyond its reasonable control. Such circumstances include without limitation: accidents, labor disputes or stoppages, government acts or orders, acts of nature, pandemics, epidemics, other widespread illness, or public health emergency, delays or failures in delivery from carriers or suppliers, shortages of materials, war (whether declared or not) or the serious threat of same, riots, rebellions, acts of terrorism, fire or any reason whether similar to the foregoing or otherwise. Seller will resume performance as soon as practicable after the event of force majeure has been removed. All delivery dates affected by force majeure shall be tolled for the duration of such force majeure and rescheduled for mutually agreed dates as soon as practicable after the force majeure condition ceases to exist. Force majeure shall not include financial distress, insolvency, bankruptcy, or other similar conditions affecting one of the parties, affiliates and/or sub-contractors.

**17. Waiver and Severability.** Failure to enforce any provision of these Terms will not invalidate that provision; nor will any such failure prejudice either party's right to enforce that provision in the future. Invalidation of any provision of these Terms shall not invalidate any other provision herein and, the remaining provisions will remain in full force and effect.

**18. Termination.** Seller may terminate any agreement governed by or arising from these Terms for any reason and at any time by giving Buyer thirty (30) days prior written notice. Seller may immediately terminate, in writing, if Buyer: (a) breaches any provision of these Terms, (b) becomes

or is deemed insolvent, (c) appoints or has appointed a trustee, receiver or custodian for all or any part of Buyer's property, (d) files a petition for relief in bankruptcy on its own behalf, or one is filed against Buyer by a third party, (e) makes an assignment for the benefit of creditors; or (f) dissolves its business or liquidates all or a majority of its assets.

**19. Ownership of Software.** Seller retains ownership of all Software supplied to Buyer hereunder. In no event shall Buyer obtain any greater right in and to the Software than a right in the nature of a license limited to the use thereof and subject to compliance with any other terms provided with the Software.

**20. Indemnity for Infringement of Intellectual Property Rights.** Seller is not liable for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights ("Intellectual Property Rights") except as provided in this Section. Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on a third party claim that one or more of the Products sold hereunder infringes the Intellectual Property Rights of a third party in the country of delivery of the Products by Seller to Buyer. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of any such claim, and Seller having sole control over the defense of the claim including all negotiations for settlement or compromise. If one or more Products sold hereunder is subject to such a claim, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Products, replace or modify the Products so as to render them non-infringing, or offer to accept return of the Products and refund the purchase price less a reasonable allowance for depreciation. Seller has no obligation or liability for any claim of infringement: (i) arising from information provided by Buyer; or (ii) directed to any Products provided hereunder for which the designs are specified in whole or part by Buyer; or (iii) resulting from the modification, combination or use in a system of any Products provided hereunder. The foregoing provisions of this Section constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for claims of infringement of Intellectual Property Rights.

**21. Governing Law.** These Terms and the sale and delivery of all Products are deemed to have taken place in, and shall be governed and construed in accordance with, the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to the sale and delivery of the Products.

**22. Entire Agreement.** These Terms, along with the terms set forth in the main body of any Quote, forms the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale and purchase. In the event of a conflict between any term set forth in the main body of a Quote and these Terms, the terms set forth in the main body of the Quote shall prevail. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter shall have no effect. These Terms may not be modified unless in writing and signed by an authorized representative of Seller.

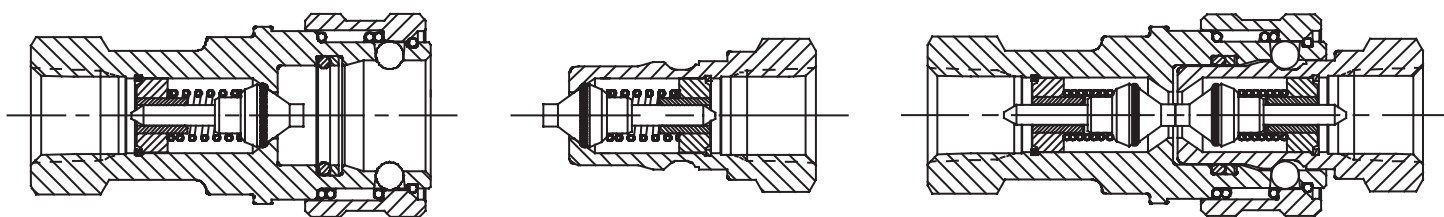
**23. Compliance with Laws.** Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards, including

those of the United States of America, and the country or countries in which Buyer may operate, including without limitation the U.S. Foreign Corrupt Practices Act ("FCPA"), the U.S. Anti-Kickback Act ("Anti-Kickback Act"), U.S. and E.U. export control and sanctions laws ("Export Laws"), the U.S. Food and Drug Administration ("FDA"), and the rules and regulations promulgated by the U.S. Food and Drug Administration ("FDA"), each as currently amended. Buyer agrees to indemnify, defend, and hold harmless Seller from the consequences of any violation of such laws, regulations and standards by Buyer, its employees or agents. Buyer acknowledges that it is familiar with all applicable provisions of the FCPA, the Anti-Kickback Act, Export Laws, the FDCA and the FDA and certifies that Buyer will adhere to the requirements thereof and not take any action that would make Seller violate such requirements. Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly, to any governmental official, foreign political party or official thereof, candidate for foreign political office, or commercial entity or person, for any improper purpose, including the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller. Buyer further represents and agrees that it will not receive, use, service, transfer or ship any Products from Seller in a manner or for a purpose that violates Export Laws or would cause Seller to be in violation of Export Laws. Buyer agrees to promptly and reliably provide Seller all requested information or documents, including end-user statements and other written assurances, concerning Buyer's ongoing compliance with Export Laws.

8/2020

# Appendix

## Glossary of Terms



**Air Inclusion:** The ambient atmosphere forced into the system during the connection of the quick disconnect halves.

**Break-Away:** Automatic disconnection of a coupling when an axial separation force is applied.

**Brinelling:** Dimples or grooves worn into the shoulder of a male half by the locking balls in the female half.

**Burst Pressure:** The pressure at which a device loses the capability to retain pressure.

**Case Hardening:** Hardening the surface of low carbon steel.

**Cold Flow:** Continued deformation under load.

**Connect Under Pressure:** Ability to connect coupling halves with internal line pressure applied to either both sides or one side.

**Coupling, Female Half:** Other nomenclature "coupler", "socket", "body".

**Coupling, Male Half:** Other nomenclature "nipple", "plug", "adapter".

**Coupling, Quick Disconnect:** A component which can quickly join or separate a fluid line without the use of tools or special devices.

**Differential Pressure ( $\Delta P$ ):** The difference in pressure between any two points of a system or a component.

**Double-Acting Sleeve:** Permits push-to-connect and pull-to-disconnect convenience on implement line when female half is clamp mounted and connected with a hose.

**Dust Cap:** Dust or dirt repelling enclosure for both halves.

**Dust Plug:** Dust or dirt repelling enclosure both halves.

**Flow Checking:** Occurs when a nipple valve closes during flow conditions, such as when quickly lowering a heavy implement. (Also called Check Off, Back Checking or Lock-up.)

**Flush Position (Valve):** When the coupler valve is fully open, allowing maximum oil flow.

**Force to Connect:** Axial and/or rotational force required to make a complete connection.

**Force to Disconnect:** The reverse of the above.

**Induction Hardening:** Localized hardening of medium carbon steel.

**Peak Pressure:** Maximum momentary pressure encountered in the operation of a component.

**Pressure Cap:** Cap which incorporates a seal capable of withstanding the rated pressures on the male half.

**Pressure Impulse Test:** Subjecting a component to a specified pressure at a specified rate of increase or decrease for a specified time limit.

**Pressure Operating:** The pressure at which a system is operated.

**Pressure Plug:** Plug which incorporates a seal capable of withstanding the rated pressures on the female half.

**Proof Pressure:** The non-destructive test pressure in excess of the maximum rated operating pressure.

**Push To Connect (Auto Lock):** Locking arrangement which permits one handed connection by pushing the nipple into the coupler.

**Rated Pressure:** The maximum pressure at which a product is designed to operate.

**Single-Acting Sleeve:** Permits pull-to-disconnect convenience on implement line when female body is clamp mounted. Making connection requires manually pulling female body forward, inserting male tip, then allowing body and tip to return to original position in the clamp.

**Sleeve Lock:** Arrangement which provides an additional lock which must be actuated before the locking sleeve can be retracted.

**Spillage:** The fluid removed from the system due to disconnection of a coupling assembly. This is the fluid trapped between the mating seal and the valve seal of the coupling halves.

**Surge Pressure:** The pressure existing from surge conditions.

**Surge Flows:** A rapid increase in fluid flow.

**Thermal Build-Up:** Hydraulic pressure caused by expansion of the fluid due to heat from an external source such as sunlight.

**Trapped Pressure:** Pressurized hydraulic fluid trapped behind closed coupling valve.

**Twist Lock:** A locking arrangement which requires a rotational actuation to unlock the mating halves.

### Types of Quick Disconnect Coupling Valve:

**Straight-Thru (ST):** This provides straight through flow.

**Double Shut-off Valve (DSO):** A valve in the female half and a valve in the male half.

**Single Shut-off Valve (SSO):** Generally, a valve in the female half with no valve in the male half.

**NOTE:** Refer to Parker's Publication No. 3800-B1.0: Safety Guide for Selecting and Using Quick Action Couplings and Related Accessories.