Mechanical Crimp Connection for Pipe Assemblies
Catalog 4300-MCC  November 2012
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Introduction

General Information

Mechanical Crimp Connection (MCC) technology presents a reliable and leak-free connection for NPS piping systems while aiding in the elimination of time-consuming and costly welding.

MCC is a one piece crimp adapter with a specially designed bite ring and internal elastomeric seals. The bite ring attaches to the pipe during a crimping process and secures the adapter in place. The internal o-rings of MCC ensure that the internal fluid pressure is sealed as well as protect against the ingestion of external contamination.

This robust design makes it a perfect solution for markets, such as offshore, oil & gas, construction, industrial processing and others where reliable leak-free piping systems are a necessity for production uptime and efficiencies.
Introduction

Mechanical Crimp Connection (MCC) Technology Solution

The MCC technology provides a time savings solution to conventional welding. Whether a butt weld or socket weld, MCC reduces the manufacturing costs for a piping system by reducing the assembly time per joint as well as eliminating any pre and post cleaning processes. This allows for valuable equipment or project uptime. The picture below illustrates the time differences between a socket weld and MCC system.

Conventional Welding versus MCC System

<table>
<thead>
<tr>
<th>Mechanical Crimp Connection Assembly Time Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socket Weld System</strong></td>
</tr>
<tr>
<td>½ Hour</td>
</tr>
<tr>
<td>½ Hour</td>
</tr>
<tr>
<td>½ Hour</td>
</tr>
<tr>
<td>½ Hour</td>
</tr>
</tbody>
</table>

**MCC System**

5 Min.

5 Min.

Total fabrication time is reduced from 3 hours to just 20 minutes when using a Mechanical Crimp Connection

5 Min. 5 Min.
Mechanical Crimp Connection for Pipe Assemblies

Introduction

The MCC steel adapters come standard with Parker Tube Fitting’s proprietary Chrome6 Free plating for maximum protection against corrosion reducing any line ruptures from the oxidation of the iron ore in the piping connections. Parker’s superior plating substantially exceeds the SAE requirement of 72 hours with no red rust, out performing all competitors as well.

How It Works:

The MCC adapter is crimped onto the schedule black pipe shown at the right. During the crimping process, the hardened stainless steel bite ring is embedding into the piping. This reduction of the outer diameter also allows the internal pressure seal to close off the internal fluid by compressing between the MCC body and the outer diameter of the pipe. The ingress seal also compresses into place between the MCC body and the outer diameter of the pipe allowing a seal against external elements whether build up or other external fluids.

The internal elastomeric seals come standard as a fluorocarbon compound. While the steel body and hardened stainless steel bite ring allow for higher temperatures, the temperature range of the assembly is -15°F to 400°F. Please consult Parker Tube Fittings Division for applications outside of these temperatures.

Connection Methods:

The Mechanical Crimp Connection (MCC) is incredibly versatile. Both pipe to pipe connections and pipe to hose connections can be accomplished with MCC. The end configurations of Seal-Lok, Triple-Lok, Pipe/Pipe Swivels, and Retaining Ring Flange style code 61/62 can all be utilized with traditional Tube Fittings Division adapters to accomplish 45’s, 90’s, tees, and cross configurations. Also, traditional Tube Fittings Division bending equipment can also be utilized for the formation of custom angled bends with MCC crimp ends.

MCC Pipe to Pipe Utilizing A Fitting Connection

This connection represents the joining of two pipes by utilizing male to female Seal-Lok (ORFS), Triple-Lok (JIC), or Pipe/Pipe Swivel end connections.
Utilizing A Flange Connection
This connection represents the joining of two pipes by utilizing a Retaining Ring Flange crimp and either an ISO 6162-1 (Code 61) or ISO 6162-2 (Code 62) flange clamp kit.

MCC Pipe to Flexible Hose
Utilizing A Fitting Connection
This connection represents the joining of a MCC pipe assembly with a flexible hose assembly.

Utilizing A Flange Connection
This connection represents the joining of a MCC pipe assembly to a flexible hose assembly with either ISO 6162-1 (Code 61) or ISO 6162-2 (Code 62) flange clamps. Simply add an AO adapter (page 14) to connect the bonded seal to the o-ring face of the hose end. Longer bolts will need to be used in this case.
# How to Order:

<table>
<thead>
<tr>
<th>Box 1</th>
<th>Box 2</th>
<th>Box 3</th>
<th>Box 4</th>
<th>Box 5</th>
<th>Box 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitting Style</td>
<td>Crimp Series</td>
<td>Fitting Style Size</td>
<td>Pipe Size</td>
<td>Pipe</td>
<td>Material Designator</td>
</tr>
<tr>
<td>J0 = Male ORFS</td>
<td>MC = Mechanical Crimp Connection</td>
<td>16 = 1&quot;</td>
<td>16 = 1&quot;</td>
<td>P = National Pipe Standard</td>
<td>Blank = Steel</td>
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<tr>
<td>JS = Female ORFS swivel</td>
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<td>20 = 1-1/4&quot;</td>
<td>20 = 1-1/4&quot;</td>
<td></td>
<td></td>
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<tr>
<td>06 = Female JIC swivel</td>
<td></td>
<td>24 = 1-1/2&quot;</td>
<td>24 = 1-1/2&quot;</td>
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<td></td>
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<tr>
<td>03 = Male JIC</td>
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<td>32 = 2&quot;</td>
<td>32 = 2&quot;</td>
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<td></td>
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<tr>
<td>RF = Retaining Flange Code 61/62</td>
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</tbody>
</table>

**Example:** J0MC-16-16P
### Mechanical Crimp Connection for Pipe Assemblies

<table>
<thead>
<tr>
<th>Type</th>
<th>Code</th>
<th>Connection Type</th>
</tr>
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<tbody>
<tr>
<td>Seal-Lok</td>
<td>JSMC</td>
<td>ORFS Swivel / Mechanical Crimp</td>
</tr>
<tr>
<td></td>
<td>J0MC</td>
<td>ORFS / Mechanical Crimp</td>
</tr>
<tr>
<td>Triple-Lok</td>
<td>06MC</td>
<td>37° Swivel / Mechanical Crimp</td>
</tr>
<tr>
<td></td>
<td>03MC</td>
<td>37° Flare / Mechanical Crimp</td>
</tr>
<tr>
<td>Retaining Ring Flange</td>
<td>RFMC</td>
<td>Code 61/62 / Mechanical Crimp</td>
</tr>
<tr>
<td></td>
<td>Code 61</td>
<td>37° Swivel / Mechanical Crimp</td>
</tr>
<tr>
<td></td>
<td>Code 62</td>
<td>37° Flare / Mechanical Crimp</td>
</tr>
</tbody>
</table>

- **Seal-Lok**: Features a mechanical crimp for secure sealing.
- **Retaining Ring Flange**: Includes a retaining ring for additional security.
- **Mechanical Crimp**: Suitable for ORFS connections.
## Seal-Lok

### JSMC
**ORFS Swivel / Mechanical Crimp**

<table>
<thead>
<tr>
<th>TUBE FITTING PART #</th>
<th>END SIZE</th>
<th>H Hex (in.)</th>
<th>L Overall Length (in.)</th>
<th>P Pipe Insertion Depth (in.)</th>
<th>D Pre-Crimped O.D. (in.)</th>
<th>Dynamic Pressure (x 1,000 PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSMC-16-16P</td>
<td>1 7/16 - 12</td>
<td>1</td>
<td>1 1/2</td>
<td>3.81</td>
<td>1.85</td>
<td>1.85</td>
</tr>
<tr>
<td>JSMC-20-20P</td>
<td>1 11/16 - 12</td>
<td>1 1/4</td>
<td>1 7/8</td>
<td>4.30</td>
<td>2.22</td>
<td>2.28</td>
</tr>
<tr>
<td>JSMC-24-24P</td>
<td>2 - 12</td>
<td>1 1/2</td>
<td>2 1/8</td>
<td>4.63</td>
<td>2.45</td>
<td>2.58</td>
</tr>
<tr>
<td>JSMC-32-32P</td>
<td>2 1/2 - 12</td>
<td>2</td>
<td>2 3/4</td>
<td>5.57</td>
<td>2.91</td>
<td>3.25</td>
</tr>
</tbody>
</table>

Note: The pressure rating listed in the product tables is the maximum working pressure of the fitting. If thinner wall thicknesses of scheduled pipe are used, then use the maximum working pressure of the pipe.

### J0MC
**ORFS / Mechanical Crimp**

<table>
<thead>
<tr>
<th>TUBE FITTING PART #</th>
<th>END SIZE</th>
<th>H Hex (in.)</th>
<th>L Overall Length (in.)</th>
<th>P Pipe Insertion Depth (in.)</th>
<th>D Pre-Crimped O.D. (in.)</th>
<th>Dynamic Pressure (x 1,000 PSI)</th>
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</thead>
<tbody>
<tr>
<td>J0MC-16-16P</td>
<td>1 7/16 - 12</td>
<td>1</td>
<td>1 1/2</td>
<td>3.31</td>
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<td>1.85</td>
</tr>
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<td>J0MC-20-20P</td>
<td>1 11/16 - 12</td>
<td>1 1/4</td>
<td>1 7/8</td>
<td>3.75</td>
<td>2.22</td>
<td>2.28</td>
</tr>
<tr>
<td>J0MC-24-24P</td>
<td>2 - 12</td>
<td>1 1/2</td>
<td>2 1/8</td>
<td>4.00</td>
<td>2.45</td>
<td>2.58</td>
</tr>
<tr>
<td>J0MC-32-32P</td>
<td>2 1/2 - 12</td>
<td>2</td>
<td>2 3/4</td>
<td>4.76</td>
<td>2.91</td>
<td>3.25</td>
</tr>
</tbody>
</table>

Note: The pressure rating listed in the product tables is the maximum working pressure of the fitting. If thinner wall thicknesses of scheduled pipe are used, then use the maximum working pressure of the pipe.
**Triple-Lok MCC**

**Mechanical Crimp Connection for Pipe Assemblies**

**Triple-Lok**

**06MC**

37° Swivel / Mechanical Crimp

<table>
<thead>
<tr>
<th>TUBE FITTING PART #</th>
<th>END SIZE</th>
<th>H Hex (in.)</th>
<th>L Overall Length (in.)</th>
<th>P Pipe Insertion Depth (in.)</th>
<th>D Pre-Crimped O.D. (in.)</th>
<th>Thread Engagement TE (in.)</th>
<th>Dynamic Pressure (x 1,000 PSI)</th>
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</thead>
<tbody>
<tr>
<td>06MC-16-16P</td>
<td>1 1/16 - 12</td>
<td>1</td>
<td>1/2</td>
<td>3.75</td>
<td>1.85</td>
<td>1.85</td>
<td>0.59</td>
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<tr>
<td>06MC-20-20P</td>
<td>1 5/8 - 12</td>
<td>1 1/4</td>
<td>1 7/8</td>
<td>4.29</td>
<td>2.22</td>
<td>2.28</td>
<td>0.63</td>
</tr>
<tr>
<td>06MC-24-24P</td>
<td>1 7/8 - 12</td>
<td>1 1/2</td>
<td>2 1/8</td>
<td>4.77</td>
<td>2.45</td>
<td>2.58</td>
<td>0.73</td>
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<tr>
<td>06MC-32-32P</td>
<td>2 1/2 - 12</td>
<td>2</td>
<td>2 3/4</td>
<td>5.56</td>
<td>2.91</td>
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<td>0.94</td>
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</table>

*Note: The pressure rating listed in the product tables is the maximum working pressure of the fitting. If thinner wall thicknesses of scheduled pipe are used, then use the maximum working pressure of the pipe.*

**03MC**

37° Flare / Mechanical Crimp

<table>
<thead>
<tr>
<th>TUBE FITTING PART #</th>
<th>END SIZE</th>
<th>H Hex (in.)</th>
<th>L Overall Length (in.)</th>
<th>P Pipe Insertion Depth (in.)</th>
<th>D Pre-Crimped O.D. (in.)</th>
<th>Dynamic Pressure (x 1,000 PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>03MC-16-16P</td>
<td>1 5/16 - 12</td>
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<td>3.52</td>
<td>1.85</td>
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<td>03MC-20-20P</td>
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<td>1 1/4</td>
<td>1 7/8</td>
<td>4.01</td>
<td>2.22</td>
<td>2.28</td>
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<td>03MC-24-24P</td>
<td>1 7/8 - 12</td>
<td>1 1/2</td>
<td>2 1/8</td>
<td>4.38</td>
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<td>03MC-32-32P</td>
<td>2 1/2 - 12</td>
<td>2</td>
<td>2 3/4</td>
<td>5.22</td>
<td>2.91</td>
<td>3.25</td>
</tr>
</tbody>
</table>

*Note: The pressure rating listed in the product tables is the maximum working pressure of the fitting. If thinner wall thicknesses of scheduled pipe are used, then use the maximum working pressure of the pipe.*
Retaining Ring Flange

**RFMC**
Code 61/62 / Mechanical Crimp

<table>
<thead>
<tr>
<th>TUBE FITTING PART #</th>
<th>END SIZE</th>
<th>L Overall Length (in)</th>
<th>P Pipe Insertion Depth (in)</th>
<th>D Pre-Crimped O.D. (in)</th>
<th>Dynamic Pressure Code 61 (x 1,000 PSI)</th>
<th>Dynamic Pressure Code 62 (x 1,000 PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFMC-16-16P</td>
<td>1 1 1/4</td>
<td>4.58 1.85 1.85 3.00 4.75</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RFMC-20-20P</td>
<td>1 1/4 1 1/4 5.33 2.22 2.28 3.00 4.70</td>
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<td></td>
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</tr>
</tbody>
</table>

**Note:** The pressure rating listed in the product tables is the maximum working pressure of the fitting. If thinner wall thicknesses of scheduled pipe are used, then use the maximum working pressure of the pipe.
# Mechanical Crimp Connection for Pipe Assemblies

## Flange Kits

**Code 61 - ISO 6162-1**

Retaining Ring Flange Kits

<table>
<thead>
<tr>
<th>KIT PART #</th>
<th>Pipe Size</th>
<th>Flange</th>
<th>L (mm)</th>
<th>Qty.</th>
<th>Retaining Ring</th>
<th>Qty</th>
<th>Bonded Seal</th>
<th>Qty</th>
<th>Bolts Tube to Port</th>
<th>Qty</th>
<th>Bolts Tube to Tube</th>
<th>Qty</th>
<th>Nut</th>
<th>Qty</th>
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<tbody>
<tr>
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<td>1”</td>
<td>R-316-CFX</td>
<td>24</td>
<td>1</td>
<td>R16X</td>
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<td>BS16SNX</td>
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<td>-</td>
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<tr>
<td>RF316TTS KIT</td>
<td>1”</td>
<td>R-316-CFX</td>
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<td>R16X</td>
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<td>BS16SNX</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>ZYLS10X70109X</td>
<td>4</td>
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<td>R-320-CFX</td>
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<td>BS20SNX</td>
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<tr>
<td>RF320TTS KIT</td>
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<td>R-320-CFX</td>
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<td>R20X</td>
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<td>R24X</td>
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<tr>
<td>RF324TTS KIT</td>
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<td>R-324-CFX</td>
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**Code 62 - ISO 6162-2**

Retaining Ring Flange Kits

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<tr>
<th>KIT PART #</th>
<th>Pipe Size</th>
<th>Flange</th>
<th>L (mm)</th>
<th>Qty.</th>
<th>Retaining Ring</th>
<th>Qty</th>
<th>Bonded Seal</th>
<th>Qty</th>
<th>Bolts Tube to Port</th>
<th>Qty</th>
<th>Bolts Tube to Tube</th>
<th>Qty</th>
<th>Nut</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF616TPS KIT</td>
<td>1”</td>
<td>R-616-CFX</td>
<td>24</td>
<td>1</td>
<td>R16X</td>
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<td>BS16SNX</td>
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<tr>
<td>RF616TTS KIT</td>
<td>1”</td>
<td>R-616-CFX</td>
<td>24</td>
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<td>R16X</td>
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<td>BS16SNX</td>
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<td>R-620-CFX</td>
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<td>BS20SNX</td>
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<td>R-620-CFX</td>
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<td>-</td>
<td>ZYLS14X90109X</td>
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<td>ISO4032-M14-10X</td>
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<td>1 1/2”</td>
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<td>1</td>
<td>R24X</td>
<td>1</td>
<td>BS24SNX</td>
<td>1</td>
<td>ZYLS16X60109X</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>RF624TTS KIT</td>
<td>1 1/2”</td>
<td>R-624-CFX</td>
<td>35</td>
<td>2</td>
<td>R24X</td>
<td>2</td>
<td>BS24SNX</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>ZYLS16X110109X</td>
<td>4</td>
<td>ISO4032-M16-10X</td>
<td>4</td>
</tr>
<tr>
<td>RF632TPS KIT</td>
<td>2”</td>
<td>R-632-CFX</td>
<td>40</td>
<td>1</td>
<td>R32X</td>
<td>1</td>
<td>BS32SNX</td>
<td>1</td>
<td>ZYLS20X70109X</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>RF632TTS KIT</td>
<td>2”</td>
<td>R-632-CFX</td>
<td>40</td>
<td>2</td>
<td>R32X</td>
<td>2</td>
<td>BS32SNX</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>ZYLS20X110109X</td>
<td>4</td>
<td>ISO4032-M20-10X</td>
<td>4</td>
</tr>
</tbody>
</table>

**Note:** Additional nut and bolt options including material grade and length are available. Consult Parker Tube Fittings Division for additional information.
### Retaining Ring Flange MCC

**Mechanical Crimp Connection for Pipe Assemblies**

**AO - Adapter**

Bonded seal to hose flange o-ring face

ISO 6162-1 (Code 61) and ISO 6162-2 (Code 62)

<table>
<thead>
<tr>
<th>PART #</th>
<th>Size (in.)</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AO16CFX</td>
<td>1&quot;</td>
<td>7</td>
</tr>
<tr>
<td>AO20CFX</td>
<td>1 1/4&quot;</td>
<td>7</td>
</tr>
<tr>
<td>AO24CFX</td>
<td>1 1/2&quot;</td>
<td>7</td>
</tr>
<tr>
<td>AO32CFX</td>
<td>2&quot;</td>
<td>7</td>
</tr>
</tbody>
</table>
MCC Equipment:
The Mechanical Crimp Connection is mechanically attached to piping. In order to accomplish this, a horizontal crimper will need to be used to reduce the adapter down to the specified outer diameter. The Parker MCC CRIMPER is available to provide enough force to complete this outer diameter reduction. The crimping specifications are made available on www.tfdtoolspec.com.

Part Number: MCC Crimper

<table>
<thead>
<tr>
<th>Specifications:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Crimping Force</td>
<td>340 Ton</td>
</tr>
<tr>
<td>Max MCC size</td>
<td>2&quot;</td>
</tr>
<tr>
<td>Master Die ID (Standard)</td>
<td>130 mm</td>
</tr>
<tr>
<td>Max Opening (Die Size plus)</td>
<td>38 mm</td>
</tr>
<tr>
<td>Max die Opening w/o Dies</td>
<td>160 mm</td>
</tr>
<tr>
<td>Length</td>
<td>29&quot;</td>
</tr>
<tr>
<td>Width</td>
<td>20&quot;</td>
</tr>
<tr>
<td>Height</td>
<td>32&quot;</td>
</tr>
<tr>
<td>Weight</td>
<td>579 lb.</td>
</tr>
<tr>
<td>Electrical Requirements</td>
<td>440 volt 3 Phase</td>
</tr>
<tr>
<td>Motor</td>
<td>5 HP</td>
</tr>
<tr>
<td>Reservoir Capacity</td>
<td>8 gallons</td>
</tr>
<tr>
<td>Oil Type</td>
<td>ISO 46 Hyd Oil</td>
</tr>
</tbody>
</table>

**Crimper force needed to crimp MCC**

<table>
<thead>
<tr>
<th>Size</th>
<th>Force (lbf)</th>
<th>Crimping Force (Ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;</td>
<td>286000 lbf</td>
<td>143 Ton</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>331000 lbf</td>
<td>165 Ton</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>375000 lbf</td>
<td>188 Ton</td>
</tr>
<tr>
<td>2&quot;</td>
<td>464000 lbf</td>
<td>232 Ton</td>
</tr>
</tbody>
</table>

**MCC Crimper Dies:**

<table>
<thead>
<tr>
<th>MCC Size</th>
<th>Die Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;</td>
<td>MCC 1 Die 40mm</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>MCC 1 1/4 Die 49mm</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>MCC 1 1/2 Die 57mm</td>
</tr>
<tr>
<td>2&quot;</td>
<td>MCC 2 Die 72mm</td>
</tr>
</tbody>
</table>
Pipe Guidelines:
The Mechanical Crimp Connection can be crimped to carbon steel pipe material ranging in schedule sizes from 40 to 160. ASTM A106 is the suggested carbon steel specification for seamless, fully annealed NPS pipe. Please consult Parker Tube Fittings Division for any material grade or NPS schedule size that is not listed below.

ASTM A106 - Seamless Piping Sizes

<table>
<thead>
<tr>
<th>NPS Pipe Size</th>
<th>Schedule</th>
<th>Outer Diameter (in.)</th>
<th>Wall Thickness (in.)</th>
<th>Inner Diameter (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;</td>
<td>40</td>
<td>1.315</td>
<td>0.133</td>
<td>1.049</td>
</tr>
<tr>
<td>1&quot;</td>
<td>80</td>
<td>1.315</td>
<td>0.179</td>
<td>0.957</td>
</tr>
<tr>
<td>1&quot;</td>
<td>160</td>
<td>1.315</td>
<td>0.250</td>
<td>0.815</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>40</td>
<td>1.660</td>
<td>0.140</td>
<td>1.380</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>80</td>
<td>1.660</td>
<td>0.191</td>
<td>1.278</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>160</td>
<td>1.660</td>
<td>0.250</td>
<td>1.160</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>40</td>
<td>1.900</td>
<td>0.145</td>
<td>1.610</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>80</td>
<td>1.900</td>
<td>0.200</td>
<td>1.500</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>160</td>
<td>1.900</td>
<td>0.281</td>
<td>1.338</td>
</tr>
<tr>
<td>2&quot;</td>
<td>40</td>
<td>2.375</td>
<td>0.154</td>
<td>2.067</td>
</tr>
<tr>
<td>2&quot;</td>
<td>80</td>
<td>2.375</td>
<td>0.218</td>
<td>1.939</td>
</tr>
<tr>
<td>2&quot;</td>
<td>160</td>
<td>2.375</td>
<td>0.344</td>
<td>1.687</td>
</tr>
</tbody>
</table>

*To maximize bite penetration, the condition of the pipe ends must be free of excess lacquer coating.
# Mechanical Crimp Connection for Pipe Assemblies

## Crimp Specifications

![Mechanical Crimp Connection](image)

**ENGINEERING YOUR SUCCESS.**

<table>
<thead>
<tr>
<th>MCC Size</th>
<th>Die Part Number</th>
<th>MCC Crimp OD</th>
<th>Crimp Length</th>
<th>Pipe Insertion Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Min</td>
</tr>
<tr>
<td>1&quot;</td>
<td>MCC 1 DIE 40MM</td>
<td>1.66&quot; (42.2mm)</td>
<td>1.68&quot; (42.7mm)</td>
<td>1.58&quot;</td>
</tr>
<tr>
<td>1-1/4&quot;</td>
<td>MCC 1 1/4 DIE 49MM</td>
<td>2.03&quot; (51.6mm)</td>
<td>2.05&quot; (52.1mm)</td>
<td>1.78&quot;</td>
</tr>
<tr>
<td>1-1/2&quot;</td>
<td>MCC 1 1/2 DIE 57MM</td>
<td>2.30&quot; (58.4mm)</td>
<td>2.33&quot; (58.2mm)</td>
<td>2.04&quot;</td>
</tr>
<tr>
<td>2&quot;</td>
<td>MCC 2 DIE 72MM</td>
<td>2.97&quot; (75.4mm)</td>
<td>2.99&quot; (75.9mm)</td>
<td>2.30&quot;</td>
</tr>
</tbody>
</table>

For the latest specifications, please consult www.tfttoolspec.com

Parker Hannifin Corporation, Tube Fittings Division, 3885 Gateway Blvd., Columbus, OH 43228
MCC Assembly

Ensure the size of the NPS piping used matches the correct size of MCC fitting.

Insert the MCC fitting over the end of the piping.

Once the pipe is bottomed out into the MCC fitting, mark the outside of the pipe at the end of the MCC fitting.

Insert the pipe and MCC fitting into the MCC Crimper while ensuring that the fitting is in contact with the Coupling Stop. There are two rings around the OD of the fitting to indicate where the start of the crimp fingers should be. Adjust the Coupling Stop accordingly.

Cycle the crimper by using the foot pedal. Pushing the pedal to the left will close the dies, pushing the pedal to the right will open the dies.

Inspect the crimp for any visual errors such as a misalignment in the crimper. Also ensure that the line mark completed before is still visible and in contact with the end of the MCC fitting. If there is a gap between the crimp and the mark, cut off and crimp a new adapter on the end.

Check the outside crimper diameter to ensure it is within specification per the crimp decal. Measure the crimp in the middle of the crimped area of the fitting below the flat area. For an accurate reading, measure in-between the raised edges from the die crimp fingers.
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2. Price Adjustments; Payments. Prices stated on Seller's quote or other documentation offered by Seller are valid for 30 days, and do not include any sales, use, or other taxes unless specifically stated. Unless otherwise specified by Seller, all prices are F.O.B. Seller's facility (INCOTERMS 2010). Payment is subject to credit approval and is due 30 days from the date of invoice or such other term as required by Seller's Credit Department, after which Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.

3. Delivery Dates; Title and Risk; Shipment. All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon placement of the products with the shipping carrier at Seller's facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No detriment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that Seller, in its sole discretion, may change product features, specifications, designs and availability without Buyer ordering the items manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

4. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRIS ES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

5. Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 30 days after delivery. Buyer shall notify Seller of any alleged breach of warranty within 30 days after the date the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for an amount due on any invoice) must be commenced within 12 months from the date of the breach without regard to the date breach is discovered.

6. LIMITATION OF LIABILITY. UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLECTIVE, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.

7. User Responsibility. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

8. Loss to Buyer's Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, will be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer ordering the items manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Special Tooling. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. 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 apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

10. Buyer's Obligation; Rights of Seller. To secure payment of all sums due or otherwise, Buyer shall retain a security interest in the goods delivered and this agreement shall be deemed 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 its security interest.

11. Improper use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other use of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

12. Cancellations and Changes. Orders shall not be subject to cancellation or change by Buyer 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. Seller may change product features, specifications, designs and availability with or without notice to Buyer.

13. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

14. Force Majeure. Seller does not assume the risk and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the control of Seller, including but not limited to (a) acts of God, war, strikes, or any other cause beyond Seller's control, (b) events of Force Majeure). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.

15. Waiver and Severability. Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

16. Termination. Buyer may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days written notice of termination. Seller may immediately terminate this agreement, in writing, if Buyer: (a) commits a breach of any provision of this agreement (b) appointments a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or by a third party (d) makes an assignment for the benefit of creditors, or (e) dissolves or liquidates all or a majority of its assets.

17. Governing Law. This agreement and the sale and delivery of all Products hereunder shall be 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 this agreement.
Offer of Sale

18. Indemnity for Infringement of Intellectual Property Rights. Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). 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 an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller’s obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

19. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

20. Compliance with Law, U. K. Bribery Act and U.S. Foreign Corrupt Practices Act. Buyer agrees to comply with all applicable laws and regulations, including both those of the United Kingdom and the United States of America, and of the country or countries of the Territory in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA") and the U.S. Anti-Kickback Act (the "Anti-Kickback Act"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that they are familiar with the provisions of the U. K. Bribery Act, the FCPA and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer shall not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase products or otherwise benefit the business of Seller.
Notes
At Parker, we’re guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 1 800 C-Parker (1 800 272 7537).

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Aerospace

Key Markets

Aftermarket services
Commercial transports
Engines
General & business aviation
Helicopters
Launch vehicles
Military aircraft
Missiles
Power generation
Regional transports
Unmanned aerial vehicles

Key Products

Control systems & actuation products
Engine systems & components
Fluid conveyance systems & components
Fluid metering, delivery & atomization devices
Fuel systems & components
Fuel tank venting systems
Hydraulic systems & components
Thermal management
Wheels & brakes

Automation

Key Markets

Alternative energy
Conveyor & material handling
Factory automation
Food & beverage
Life sciences & medical
Machine tools
Packaging machinery
Paper machinery
Plastics machinery
Primary metals
Safety & security
Semiconductor & electronics
Transportation & automotive

Key Products

AGCC drives & systems
Air preparation
Electric actuators, gantry robots & sliders
Human machine interfaces
Inverters
Markets
Miniature fluids
Pneumatic actuators & jigs
Pneumatic valves & controls
Rotary actuators
Sleever motors, servo motion, drives & controls
Structural exhausts
Vacuum generators, cups & sensors

Climate & Industrial Controls

Key Markets

Agriculture
Air conditioning
Construction Machinery
Food & beverage
Industrial machinery
Life sciences
Oil & gas
Precision cooling
Process
Refrigeration
Transportation

Key Products

Accumulators
Advanced actuators
CO2 controls
Electronic controllers
Filter driers
Hand shut-off valves
Heat exchangers
Hose & fittings
Pressure regulating valves
Refrigerant distributors
Safety relief valves
Smart pumps
Solenoid valves
Thermostatic expansion valves

Filtration

Key Markets

Aerospace
Food & beverage
Industrial plant & equipment
Life sciences
Marine
Mobile equipment
Oil & gas
Power generation & renewable energy
Process
Transportation
Water Purification

Key Products

Analytical gas generators
Compressed air filters & dryers
Engine, air, coolant, fuel & oil filtration systems
Fluid condition monitoring systems
Hydraulic & lubrication filters
Hydrant, nitrogen & zero air generators
Instrumentation filters
Membrane & fiber filters
Microfiltration
Steel air filtration
Water desalination & purification filters & systems

Fluid Connectors

Key Markets

Aerial
Agriculture
Bulk chemical handling
Construction machinery
Food & beverage
Fuel & gas delivery
Industrial machinery
Life sciences
Marine
Mining
Mobile
Oil & gas
Renewable energy
Transportation

Key Products

Check valves
Connections for low pressure fluid conveyance
Deep sea umbilicals
Diagnostic equipment
Hose couplings
Industrial hose
Mooring systems & power cables
PTFE hose & tubing
Quick couplings
Rubber & thermoplastic hose
Tube fittings & adapters
Tubing & plastic fittings

Hydraulics

Key Markets

Aerial
Agriculture
Alternative energy
Construction machinery
Forestry
Industrial machinery
Machine tools
Marine
Material handling
Mining
Oil & gas
Power generation
Refuse vehicles
Renewable energy
Truck hydraulics
Turbo equipment

Key Products

Accumulators
Cartridge valves
Electrohydraulic actuators
Human machine interfaces
Hybrid drives
Hydraulic cylinders
Hydraulic motors & pumps
Hydraulic systems
Hydraulic valves & controls
Hydraulic steering
Integrated hydraulic circuits
Power take-offs
Power units
Rotary actuators
Sensors

Instrumentation

Key Markets

Analytical Instruments
Analytical sample conditioning products & systems
Chemical injection fittings & valves
Fluoropolymer chemical delivery fittings, valves & pumps
High purity gas delivery fittings, valves, regulators & digital flow controllers
Industrial mass flows meters & transmitters
Process control transducers
Process control transmitters, valves, regulators & manifold valves
Permanent no-weld tube fittings
Precision industrial regulators & flow controllers

Seal

Key Markets

Aerospace
Chemical processing
Consumer
Fluid power
General industrial
Information technology
Life sciences
Microelectronics
Military
Oil & gas
Power generation
Renewable energy
Telecommunications
Transportation

Key Products

Dynamic seals
Elastomeric o-rings
Electric & medical instrument design & assembly
EMI shielding
Extruded & precision-cut, fabricated elastomeric seals
High temperature metal seals
Homogenous & inserted elastomeric shapes
Medical device fabrication & assembly
Metal & plastic retained composite seals
Shielded optical windows
Silicone tubing & instructions
Thermal management
Vibration dampening

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Your complete source for quality tube fittings, hose & hose fittings, brass & composite fittings, quick-disconnect couplings, valves and assembly tools, locally available from a worldwide network of authorized distributors.

Fittings:
Available in inch and metric sizes covering SAE, BSP, DIN, GAZ, JIS and ISO thread configurations, manufactured from steel, stainless steel, brass, aluminum, nylon and thermoplastic.

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Available in a wide variety of sizes and materials including rubber, wire-reinforced, thermoplastic, hybrid and custom compounds.

Worldwide Availability:
Parker operates Fluid Connectors manufacturing locations and sales offices throughout North America, South America, Europe and Asia-Pacific.

For information, call toll free...
1-800-C-PARKER (1-800-272-7537)

North American Divisions

Energy Products Division
Stafford, TX
phone 281 566 4500
fax 281 530 5353

Fluid System Connectors Division
Otsego, MI
phone 269 694 9411
fax 269 694 4614

Hose Products Division
Wickliffe, OH
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fax 440 943 3129

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Parflex Division
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fax 763 544 3418

Tube Fittings Division
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phone 614 279 7070
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Distribution Service Centers

Buena Park, CA
phone 714 522 8840
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phone 770 929 0330
fax 770 929 0230

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phone 952 469 5000
fax 952 469 5729

Louisville, KY
phone 502 937 1322
fax 502 937 4180

Portland, OR
phone 503 283 1020
fax 503 283 2201

Toledo, OH
phone 419 878 7000
fax 419 878 7001
fax 419 878 7420
(FCG Kit Operations)

Canada
Grimsby, ONT
phone 905 945 2274
fax 905 945 3945
(Contact Grimsby for other Service Center locations.)

Parker Hannifin Corporation
Tube Fittings Division
3885 Gateway Blvd.
Columbus, OH 43228
phone 614 279 7070
e-mail TFDmailbox@Parker.com
www.parker.com/tfd