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# GRINNELL Figure 640 Pivot-Bolt Rigid Coupling for Joining Grooved Copper Tubing Systems

## General Description

The GRINNELL Figure 640 Pivot-Bolt Rigid Coupling joins roll grooved, hard-drawn copper tubing systems (CTS). It provides a rigid joint by firmly gripping the entire circumference of the copper tube groove. Figure 640 Pivot-Bolt Rigid Couplings are a proven, dependable, and more efficient method of joining copper tube when compared to traditional methods such as soldering (sweating) joints.

GRINNELL Pivot-Bolt Couplings have been tested and proven to install in less than half the time of other standard grooved couplings. Simply push the gasket onto the pipe, swing the coupling body over the gasket, and tighten only one bolt. In comparison with other installation-ready couplings, the GRINNELL Pivot-Bolt Coupling allows clear visual confirmation that the gasket is properly seated on the gasket sealing surfaces.

The Figure 640 Pivot-Bolt Rigid Coupling is capable of pressures up to 300 psi (20,7 bar).

The Figure 640 Pivot-Bolt Rigid Coupling saves installation time in two ways:

- Only one bolt on the coupling requires tightening.
- The Grade "EHT" EPDM Gasket is specially designed for an easy push-on installation.

This coupling is also quicker to prepare to install. The nuts do not require un-torquing to remove the gasket as do the nuts used in standard rigid couplings.

Bolt ends in the Figure 640 Pivot-Bolt Rigid Coupling are staked to prevent inadvertent misplacement or loss of nuts during installation.

**NOTICE**

*Never remove any piping component nor correct or modify any piping deficiencies without first de-pressurizing and draining the system. Failure to do so may result in serious personal injury, property damage, and/or impaired device performance.*

*It is the designer's responsibility to select products suitable for the intended service and to ensure that pressure ratings and performance data are not exceeded. Material and gasket selection should be verified to be compatible for the specific application. Always read and understand the installation instructions.*

*The GRINNELL Figure 640 Pivot-Bolt Rigid Coupling described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the Approval agency, in addition to the standards of any other authorities having jurisdiction. Failure to do so may result in serious personal injury or impair the performance of these devices.*

*The owner is responsible for maintaining their mechanical system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.*

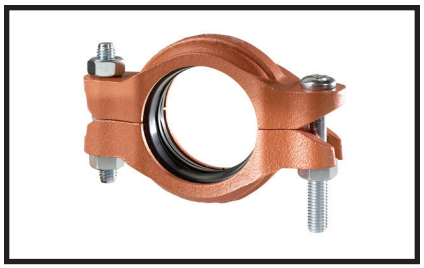
## Technical Data

**Approvals**
UL and ULC Listed
IAPMO UPC Certified
Certified to all requirements of NSF/ANSI 61

**Sizes**
2 Inch to 8 Inch

**Housing**
Ductile iron conforming to ASTM A 536, Grade 65-45-12

**Finish**
Copper Acrylic Enamel



For fire protection pressure rating, listing and approval information, contact your Grinnell representative.

10 YEAR LIMITED WARRANTY

For warranty terms and conditions, visit www.grinnell.com

**Bolts/Nuts**
Bolts and nuts are zinc-electroplated conforming to ASTM B 633.

- Carbon Steel oval neck track head bolts are heat-treated and conform to the physical properties of ASTM A 183 Grade 2 and SAE J429 Grade 5 with a minimum tensile strength of 110,000 psi.
- Carbon Steel heavy hex nuts conform to the physical properties of ASTM A 183 Grade 2 and SAE J995 Grade 5.
- Carbon Steel pivot bolts are heat-treated with a minimum tensile strength of 130,000 psi.

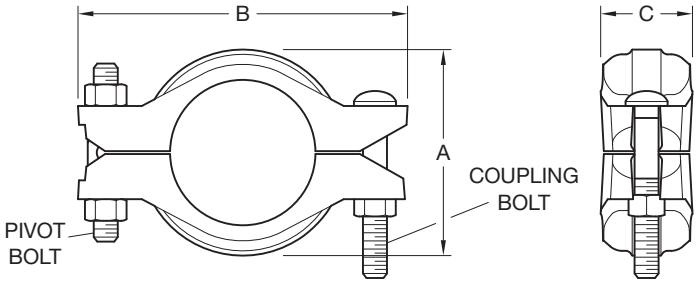
**Gasket**
Grade "EHT" EPDM, Center-Stop, Push-On Style, NSF-61 certified for copper tubing systems, Red and Copper Striped color code

- For closed-loop heating systems, -30°F to 250°F (-34°C to 120°C)
- For potable water systems, up to 180°F (up to 82°C)

Recommended for use in low temperature and vacuum systems.

| Nominal ANSI Inches | Type "K" ASTM B-88 | | | Type "L" ASTM B-88 | | | Type "M" ASTM B-88 | | | DWV ASTM B-306 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Wall Thick. Inches *mm* | Max. Working Press. psi *bar* | Max. End Load Lbs. *kN* | Wall Thick. Inches *mm* | Max. Working Press. psi *bar* | Max. End Load Lbs. *kN* | Wall Thick. Inches *mm* | Max. Working Press. psi *bar* | Max. End Load Lbs. *kN* | Wall Thick. Inches *mm* | Max. Working Press. psi *bar* | Max. End Load Lbs. *kN* |
| 2 | 0.083 *2,1* | 300 *20,7* | 1,065 *4,74* | 0.070 *1,8* | 300 *20,7* | 1,065 *4,74* | 0.058 *1,5* | 250 *17,2* | 890 *3,96* | — | — | — |
| 2-1/2 | 0.095 *2,4* | 300 *20,7* | 1,625 *7,23* | 0.080 *2,0* | 300 *20,7* | 1,625 *7,23* | 0.065 *1,7* | 250 *17,2* | 1,350 *6,01* | — | — | — |
| 3 | 0.109 *2,8* | 300 *20,7* | 2,300 *10,23* | 0.090 *2,3* | 300 *20,7* | 2,300 *10,23* | 0.072 *1,8* | 250 *17,2* | 1,415 *6,30* | 0.045 *1,1* | 100 *6,9* | 765 *3,40* |
| 4 | 0.134 *3,4* | 300 *20,7* | 4,005 *17,82* | 0.110 *2,8* | 300 *20,7* | 4,005 *17,82* | 0.095 *2,4* | 250 *17,2* | 3,340 *14,86* | 0.058 *1,5* | 100 *6,9* | 1,335 *5,94* |
| 5 | 0.160 *4,1* | 300 *20,7* | 6,190 *27,55* | 0.125 *3,2* | 300 *20,7* | 6,190 *27,55* | 0.109 *2,8* | 200 *13,8* | 4,125 *18,36* | 0.072 *1,8* | 100 *6,9* | 2,060 *9,17* |
| 6 | 0.192 *4,9* | 300 *20,7* | 8,840 *39,34* | 0.140 *3,6* | 300 *20,7*) | 8,840 *39,34* | 0.122 *3,1* | 200 *13,8* | 5,890 *26,21* | 0.083 *2,1* | 100 *6,9* | 2,945 *13,10* |
| 8 | 0.271 *6,9* | 300 *20,7* | 15,550 *69,2* | 0.200 *5,1* | 300 *20,7* | 15,550 *69,2* | 0.170 *4,3* | 200 *13,8* | 10,370 *46,10* | 0.109 *2,8* | 100 *6,9* | 5,180 *23,0* |

***TABLE A***
***FIGURE 640 RIGID GROOVED COUPLING***
***PRESSURE RATINGS***




| Copper Tube Size | | Dimensions | | | Pivot Bolt Size Dia. x Lg. | Coupling Bolt Size Dia. x Lg. | Net Weight Lbs. *kg* |
|---|---|---|---|---|---|---|---|
| Nominal ANSI Inches | O.D. Inches *mm* | A Inches *mm* | B Inches *mm* | C Inches *mm* | | | |
| 2 | 2.125 *54,0* | 3.34 *84,9* | 5.86 *148,8* | 1.90 *48,3* | 1/2 x 3-3/4 | 1/2 x 3-5/8 | 3.1 *1,4* |
| 2-1/2 | 2.625 *66,7* | 3.85 *97,8* | 6.36 *161,5* | 1.90 *48,3* | 1/2 x 3-3/4 | 1/2 x 3-5/8 | 3.2 *1,5* |
| 3 | 3.125 *79,4* | 4.35 *110,5* | 6.86 *174,2* | 1.91 *48,5* | 1/2 x 3-3/4 | 1/2 x 3-5/8 | 3.6 *1,6* |
| 4 | 4.125 *104,8* | 5.48 *139,2* | 7.99 *202,9* | 1.93 *49,0* | 1/2 x 3-3/4 | 1/2 x 3-5/8 | 4.2 *1,9* |
| 5 | 5.125 *130,2* | 6.57 *166,9* | 9.73 *247,1* | 2.00 *50,8* | 5/8 x 4-1/2 | 5/8 x 4-1/2 | 6.9 *3,1* |
| 6 | 6.125 *155,6* | 7.57 *192,3* | 10.73 *272,5* | 2.02 *51,3* | 5/8 x 4-1/2 | 5/8 x 4-1/2 | 7.5 *3,4* |
| 8 | 8.125 *206,4* | 9.57 *243,1* | 12.73 *323,3* | 2.04 *51,8* | 5/8 x 4-1/2 | 5/8 x 4-1/2 | 8.8 *4,0* |

***FIGURE 1***
***FIGURE 640 RIGID GROOVED COUPLING***
***FOR JOINING COPPER TUBING***

| Bolt Size ANSI Inches | Bolt Torque Range Ft. - Lbs. |
|---|---|
| 3/8 | 30-40 |
| 1/2 | 90-110 |
| 5/8 | 100-130 |
| 3/4 | 150-200 |
| 7/8 | 180-220 |
| 1 | 200-250 |
| 1-1/8 | 225-275 |

***TABLE B***
***BOLT TORQUE***
***SPECIFICATIONS***

# Installation

The following instructions apply to Figure 640 Pivot-Bolt Rigid Couplings described in Technical Data Sheet G512. The installation is based on tube grooved in accordance with Roll Groove for Copper Tubing Specifications described in Technical Data Sheet G720.

**⚠WARNING**

*Never remove any piping component nor correct or modify any piping deficiencies without first de-pressurizing and draining the system. Failure to do so may result in serious personal injury, property damage, and/or impaired device performance.*

*It is the designer's responsibility to select products suitable for the intended service and to ensure that pressure ratings and performance data are not exceeded. Material and gasket selection should be verified for compatibility with the specific application. Always read and understand the installation instructions.*

*The GRINNELL Figure 640 Pivot-Bolt Rigid Couplings described herein must be installed and maintained in compliance with this document, in addition to the standards of any other authorities having jurisdiction. Failure to do so may result in serious personal injury or impair the performance of these devices.*

*The owner is responsible for maintaining their mechanical system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.*

**Step 1.**
Inspect exterior groove and ends of the tube to verify all burrs, loose debris, dirt, chips, paint and any other foreign material such as grease is removed. Ensure pipe end sealing surfaces are free of sharp edges, projections, indentations, and/or other defects.

Disassemble coupling by loosing the nut on the coupling bolt only. Loosen nut to end of the bolt and swing out of slotted hole. Remove the gasket.

**NOTICE**

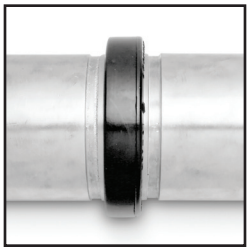
*Do not loosen or adjust the nuts on the Pivot Bolt. The Pivot Bolt assembly is factory-preset for optimal performance. In the unlikely event that the nuts have become loosened, tighten the nuts on the Pivot Bolt to a minimum torque of 10 lbs.-ft.*

**Step 2.**
Verify that the coupling and gasket grade are correct for the application intended. Refer to Technical Data Sheet G610 for additional gasket information.

Apply a fine layer of petroleum-free silicone lubricant to the gasket. Be sure to include the sealing edges as well as in inner and outer surfaces. To prevent deterioration of the gasket material, a petroleum lubricant should never be used on Grade "EN" EPDM, Grade "EHT" EPDM, or Grade "L" Silicone gaskets. For assembly below 40°F (4°C), a petroleum-free silicone lubricant must be used to prevent freezing of the lubricant.

**NSF Requirement**
To retain the NSF 61 Certification, an NSF 61 Certified lubricant, such as Dow Corning No. 7 offered through GRINNELL Products, must be used for the intended service.

**Step 3.**
Install the gasket by pushing it over the tube until the center stop of the gasket is in contact with the end of the pipe.



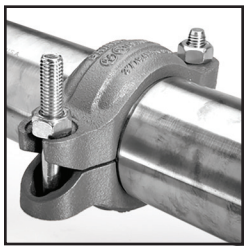
Slide the other tube end into the gasket ensuring it has also made contact with the center leg of the gasket. Both tube ends should be aligned vertically and horizontally.

The gasket should now appear evenly spaced between the two grooves and the outside of the gasket should be parallel with the tube.

**Step 4.**
Swing the coupling housing over the gasket. Verify that the housings are over the gasket and that the housing keys are fully engaged into the grooves.

**Step 5.**
Slide the Coupling Bolt and nut into the housing and rotate the nut until finger tight. Verify that the bolt head is fully recessed in the housing and the nut is recessed into the counterbore around the slot.

**Step 6.**
Tighten the nut on the Coupling Bolt until properly torqued. There is no need to tighten the nut on the Pivot Bolt.



**NOTICE**

*Figure 640 Pivot-Bolt Rigid Couplings have an intended gap of up to 1/16 of an inch at each pad to allow for positive rigid gripping onto the tube. The patented tongue and groove design provides protection to the back of the gasket during installation. For proper bolt torques refer to Table B.*

*Bolt-torque information is supplied as a guideline and may be used when setting the torque on power impact wrenches. Refer to the manufacturer's instructions for settings.*

# *Ordering Procedure*

Grinnell Mechanical Products, are available through a network of distribution centers. For the nearest distributor, visit www.grinnell.com.

Specify GRINNELL Figure 640 Pivot-Bolt Rigid Coupling, quantity, pipe size (Nominal ANSI or O.D.), finish (Copper Acrylic Enamel) and Grade “EHT” EPDM gasket.





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