



OTCO Water Distribution Workshop Webinar

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FORD METER BOX

Service Line Materials & Fittings

COUPLINGS FOR PIPE AND TUBING





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Types of Pipe and Tubing

TYPES OF SERVICE MATERIALS

IRON
PIPE



LEAD
PIPE



PVC
PIPE



COPPER
TUBE



POLYETHYLENE
(P.E.) TUBE / PIPE



Types of Pipe and Tubing

IRON PIPE



- OUTSIDE DIAMETER (O.D.) CONTROL
- EASILY CORRODED
- CONDUCTS ELECTRICAL CURRENT
- PRIOR TO COMPRESSIONS, HAD TO BE THREADED

Types of Pipe and Tubing

LEAD PIPE



- INSIDE DIAMETER (I.D.) CONTROL - O.D. VARIES PER STRENGTH
- THREE STRENGTHS – STRONG (S), EXTRA STRONG (XS) & DBL EXTRA STRONG (XXS)
- CONDUCTS ELECTRICAL CURRENT
- PRIOR TO COMPRESSIONS, HAS TO BE WIPED OR FLANGED

Types of Pipe and Tubing

COPPER TUBE



- OUTSIDE DIAMETER (O.D.) CONTROL; INDUSTRY STANDARD KNOWN AS “COPPER TUBE SIZE” (CTS)
- RESISTS CORROSION
- CONDUCTS ELECTRICAL CURRENT
- PRIOR TO COMPRESSIONS, HAD TO BE FLARED OR SOLDERED



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Types of Pipe and Tubing

POLYETHYLENE TUBE



- FLEXIBLE PLASTIC TUBE; PET - POLYETHYLENE TUBE
- OUTSIDE DIAMETER (O.D.) CONTROL REFERRED TO AS “COPPER TUBE SIZE” (CTS)
- RESISTS CORROSION
- DOES NOT CONDUCT ELECTRICAL CURRENT
- PRIOR TO COMPRESSIONS, COULD BE FLARED

Types of Pipe and Tubing

POLYETHYLENE PIPE

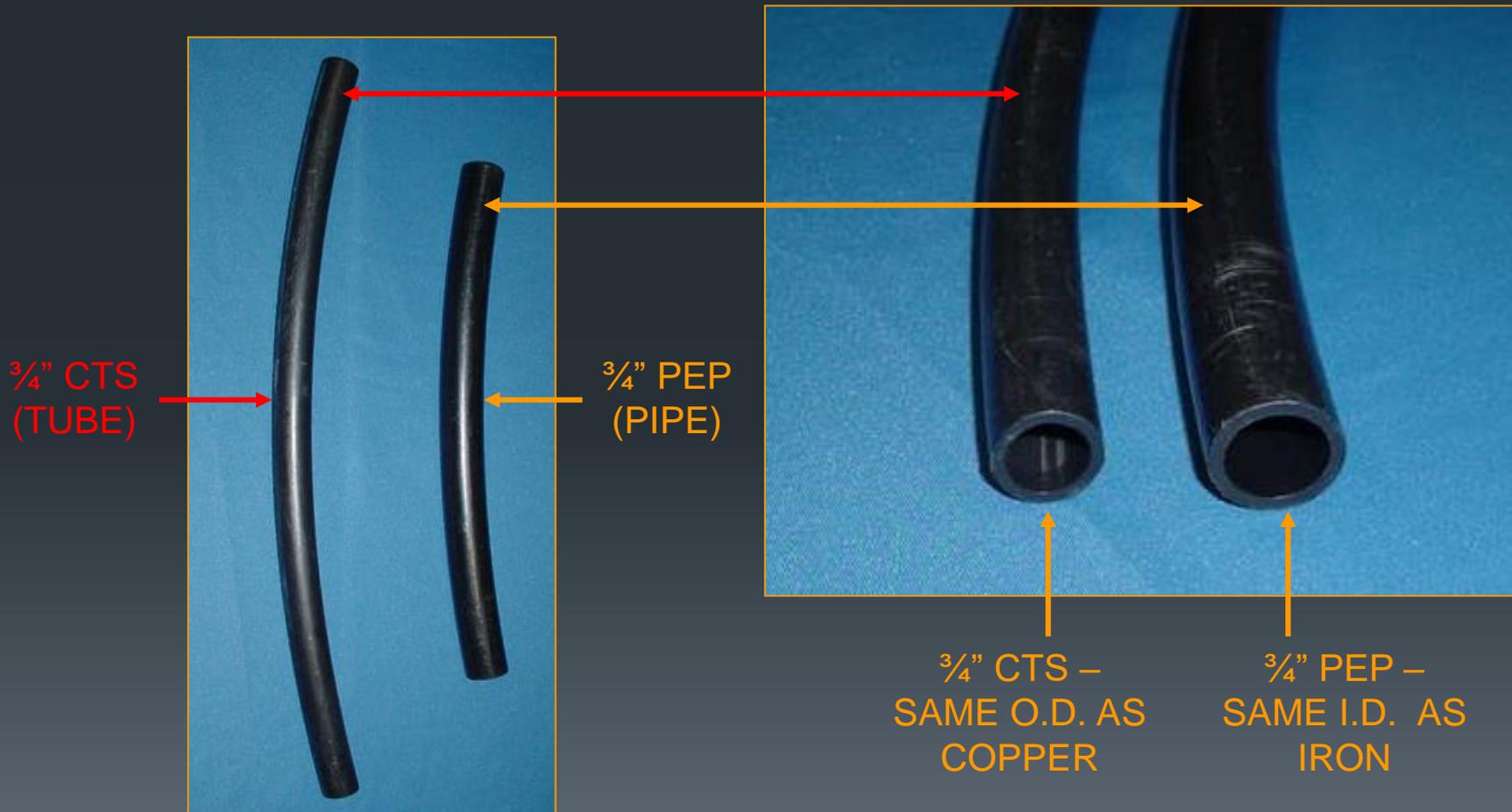


- FLEXIBLE PLASTIC PIPE; PEP - POLYETHYLENE PIPE
- INSIDE DIAMETER (I.D.) CONTROL HAVING SAME I.D. AS IRON PIPE
- RESISTS CORROSION
- DOES NOT CONDUCT ELECTRICAL CURRENT
- PRIOR TO COMPRESSIONS, COULD BE FLARED



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Types of Pipe and Tubing



Types of Pipe and Tubing

POLYVINYL CHLORIDE PIPE



- RIGID PLASTIC PIPE; PVC – POLYVINYL CHLORIDE PIPE
- OUTSIDE DIA (O.D.) CONTROL HAVING SAME O.D. AS IRON PIPE
- RESISTS CORROSION
- DOES NOT CONDUCT ELECTRICAL CURRENT
- PRIOR TO COMPRESSIONS, HAD TO BE GLUED/SOLVENT WELDED
- FORD P.J. FOR PVC ARE RECOMMENDED ONLY FOR SCH 40 & SCH 80



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Types of Pipe and Tubing

CODES FOR COMPRESSION COUPLING NUTS

CTS = Copper & P.E. Tube

PEP = P.E. Pipe

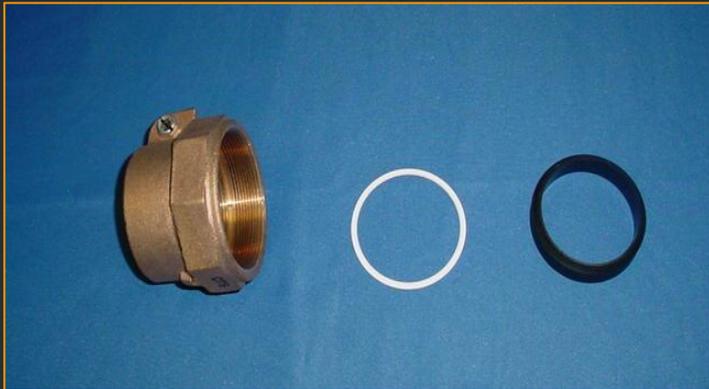
PVC = PVC Pipe

S = Strong Lead

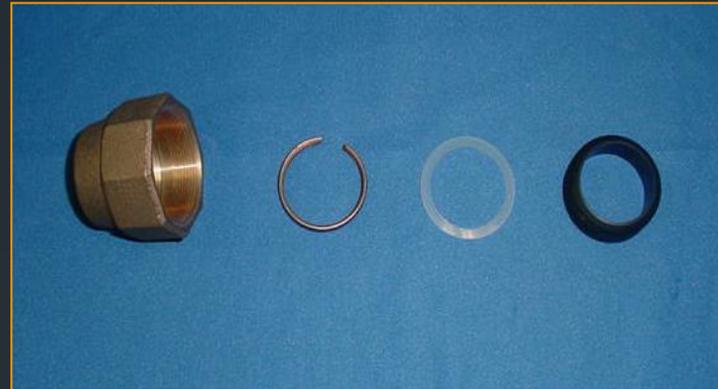
XS = Extra Strong Lead

XXS = Dbl Extra Strong

Types of Fittings



PACK JOINT



GRIP JOINT



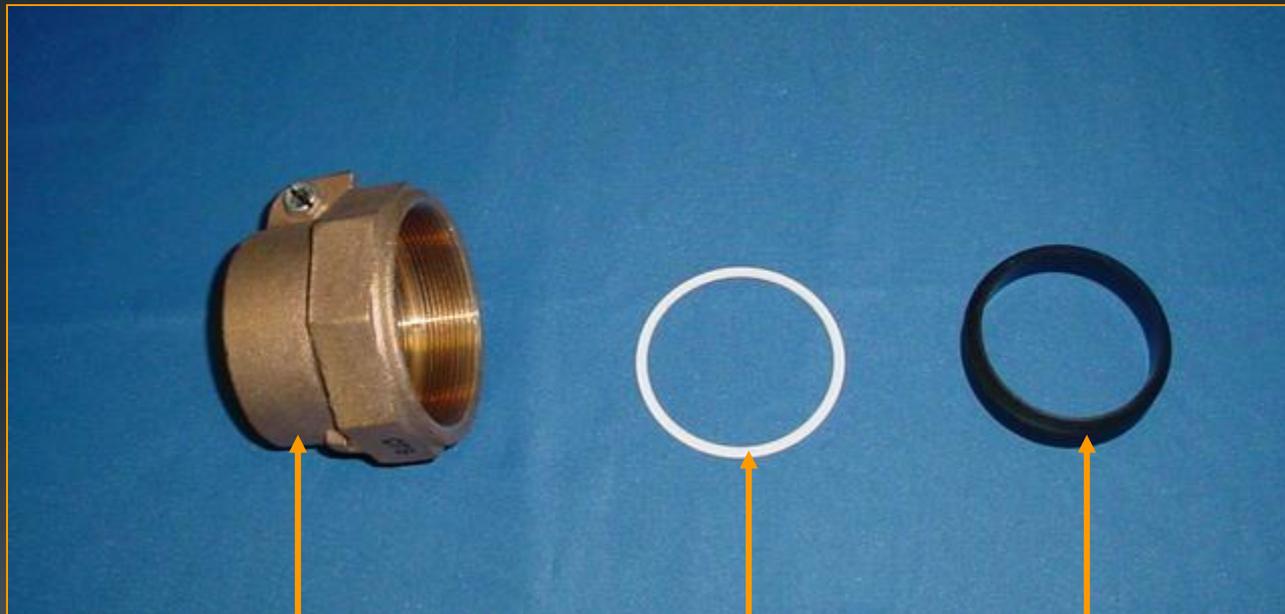
QUICK JOINT



FLARE

Types of Fittings

PACK JOINT



P.J. NUT WITH
CLAMPING DEVICE

ANTI-FRICTION
RING

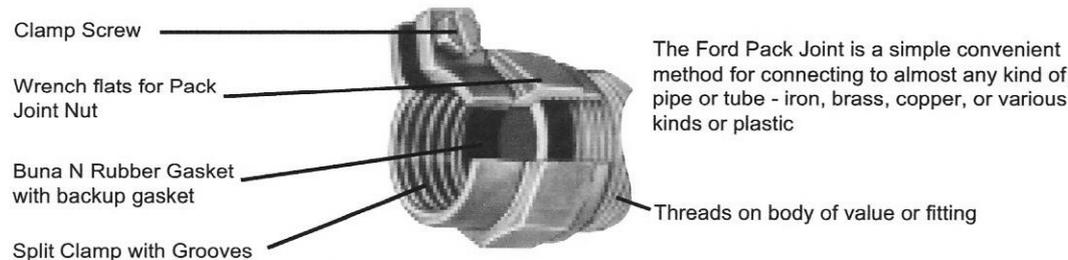
BEVELED
RUBBER
GASKET



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Pack Joint Installation Instructions

IMPORTANT NOTICE - READ CAREFULLY INSTRUCTIONS FOR PACK JOINT CONNECTIONS



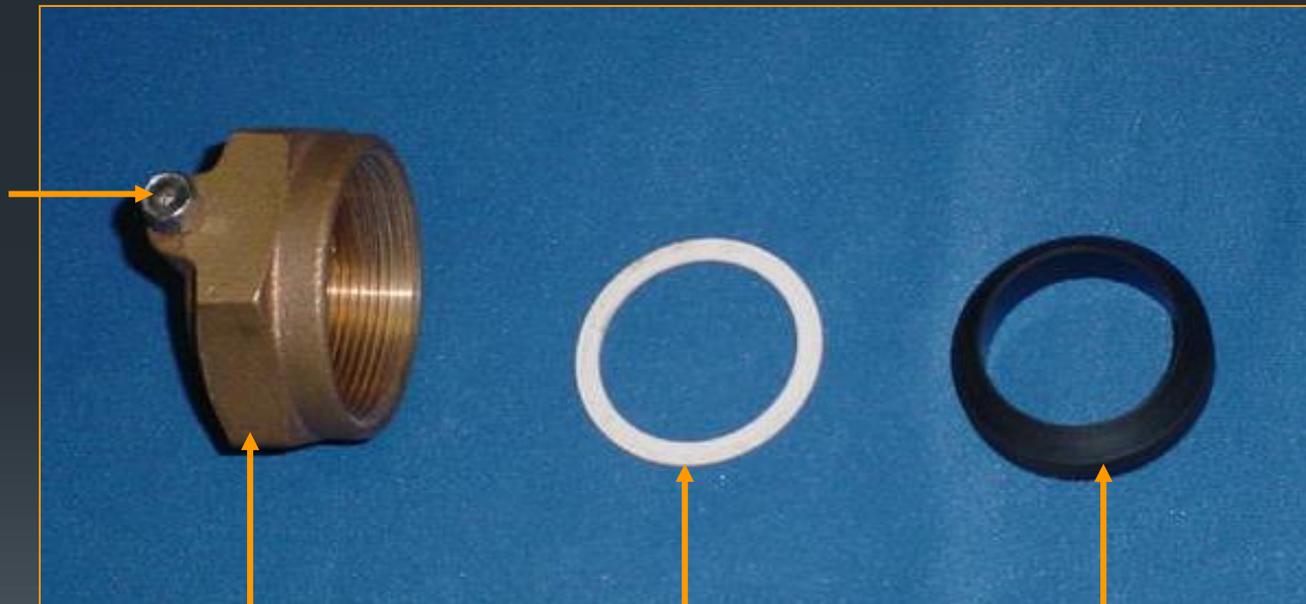
Steps for Installation

- (1) Make sure pipe is round, not flattened. On copper tubing use a rounding tool, if necessary. Clean or scrape off any dirt or corrosion so that surface is smooth.
- (2) Insert pipe through Pack Joint nut and into the socket of the fitting. If the nut or socket appears too large for pipe, a check should be made to be sure you are using the correct fitting or that pipe is of proper diameter.
- (3) Tighten Pack Joint nut 1 to 1 1/2 turns after gasket starts to compress. If clamp screw is not accessible, reposition by further tightening Pack Joint nut.
- (4) To ensure against blowout of pipe, tighten the clamp screw very securely. A socket or box end wrench is preferable to a screwdriver.
- (5) **ALWAYS PRESSURE TEST FOR LEAKS BEFORE BACKFILLING.**
- (6) **DO NOT USE THIS FITTING ON A GAS LINE.**
- (7) **DO NOT USE THIS FITTING WITH CLASS 160 POLYBUTYLENE PIPE OR TUBING.**

Types of Fittings

PACK JOINT (IRON PIPE)

S. S. SET
SCREW
CLAMPING
DEVICE



BRASS P. J. NUT

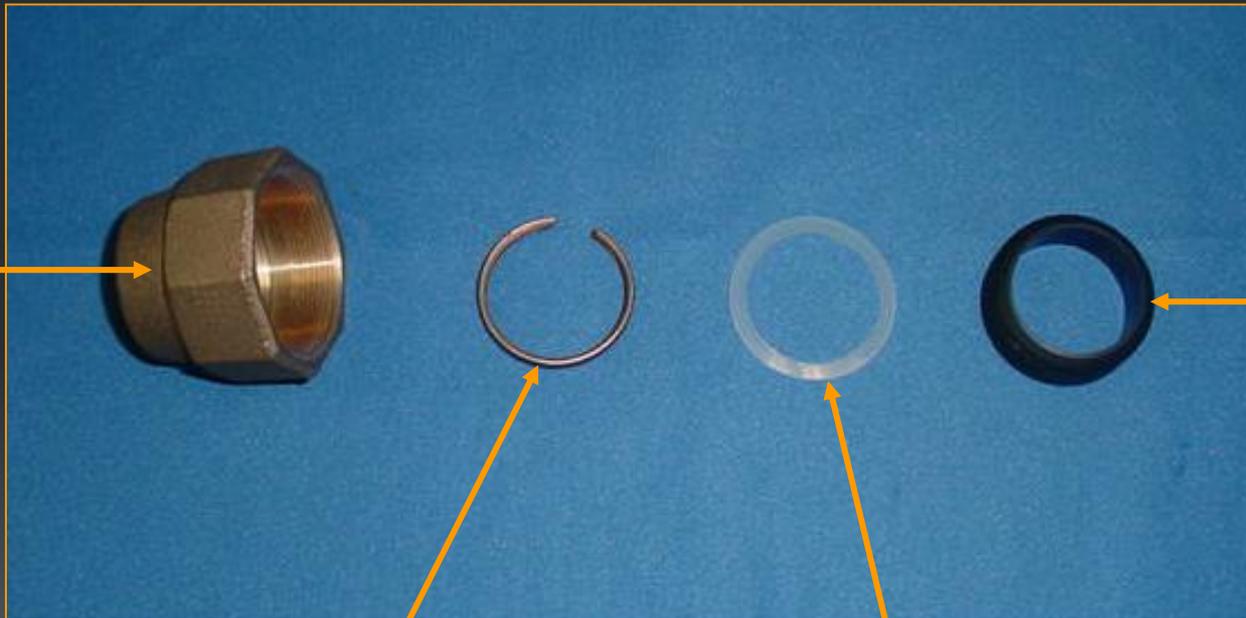
ANTI-FRICTION
RING

BEVELED
RUBBER
GASKET

Types of Fittings

GRIP JOINT

BRASS
G.J. NUT



GRIPPER
RING

ANTI-FRICTION
RING

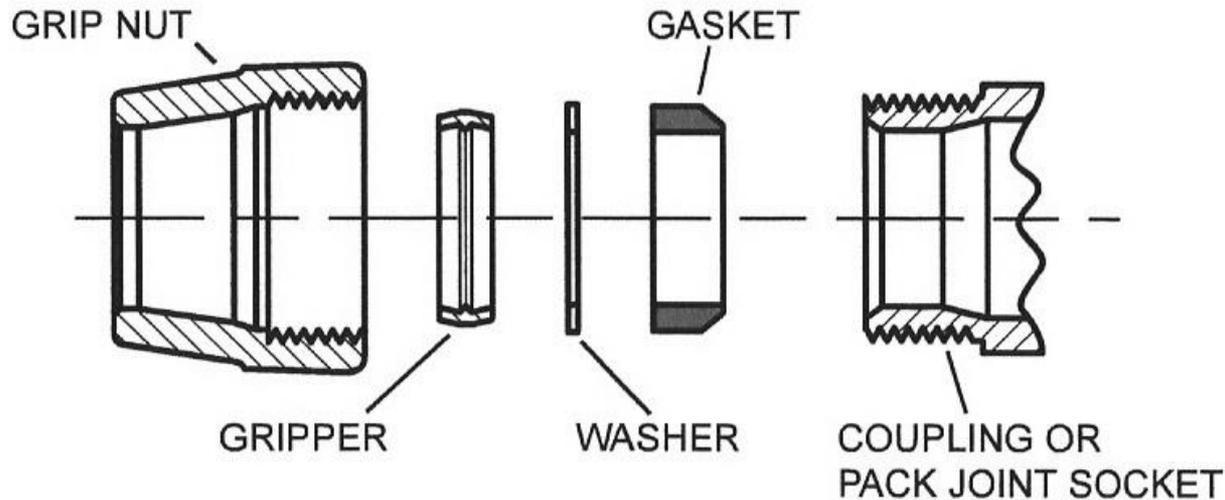
BEVELED
RUBBER
GASKET



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Grip Joint Installation Instructions

GRIP JOINT Installation Instructions



1. Prepare service tubing for connection by cleaning, deburring and rounding if necessary.
2. When using plastic pipe or tubing, install proper size solid, flared insert stiffener in the pipe / tubing.



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Grip Joint Installation Instructions

3. After selecting the proper size **GRIP JOINT** fitting, loosen the grip nut and insert tubing into the nut through the grip ring and gasket. The tubing should be inserted into the fitting so that the end of tubing is well past the rubber seal gasket. (The grip nut can also be disassembled from the fitting as long as the internal parts are kept in the order shown in the diagram above.) Remove burrs from pipe / tubing for easier insertion.
4. Hold the body of the **GRIP JOINT** fitting stationary while installing the nut. Tighten the nut 1-1/2 to 2 turns past hand tight.
5. Always pressure test for leaks before backfilling. Failure to observe these instructions will void the manufacturers warranty.

Types of Fittings

QUICK JOINT



BRASS Q. J. NUT CASTING

RUBBER GASKET WITH S.S.
RETAINER RING

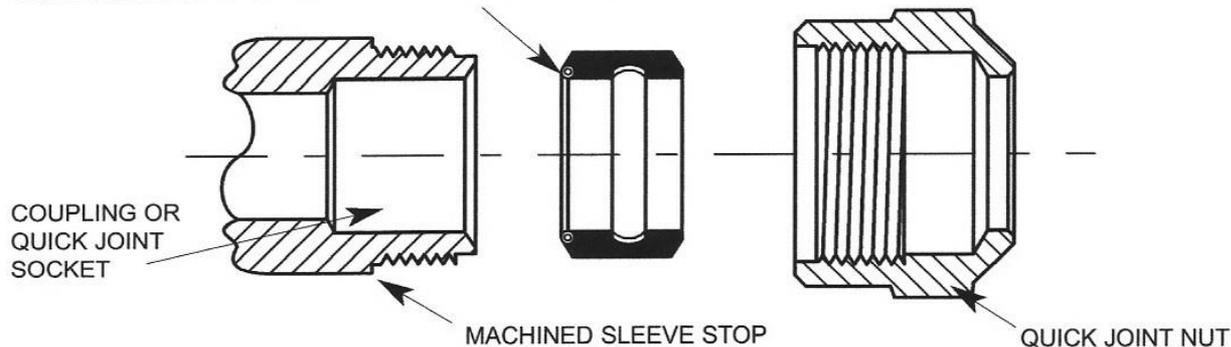


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Quick Joint Installation Instructions

IMPORTANT NOTICE - READ CAREFULLY INSTRUCTIONS FOR QUICK JOINT CONNECTIONS

METAL GASKET TIP CONTACTS SLEEVE AND COPPER TUBING FOR ELECTRICAL CONDUCTIVITY.
CONDUCTIVE SPRING MUST FACE COUPLING BODY



Steps for Installation

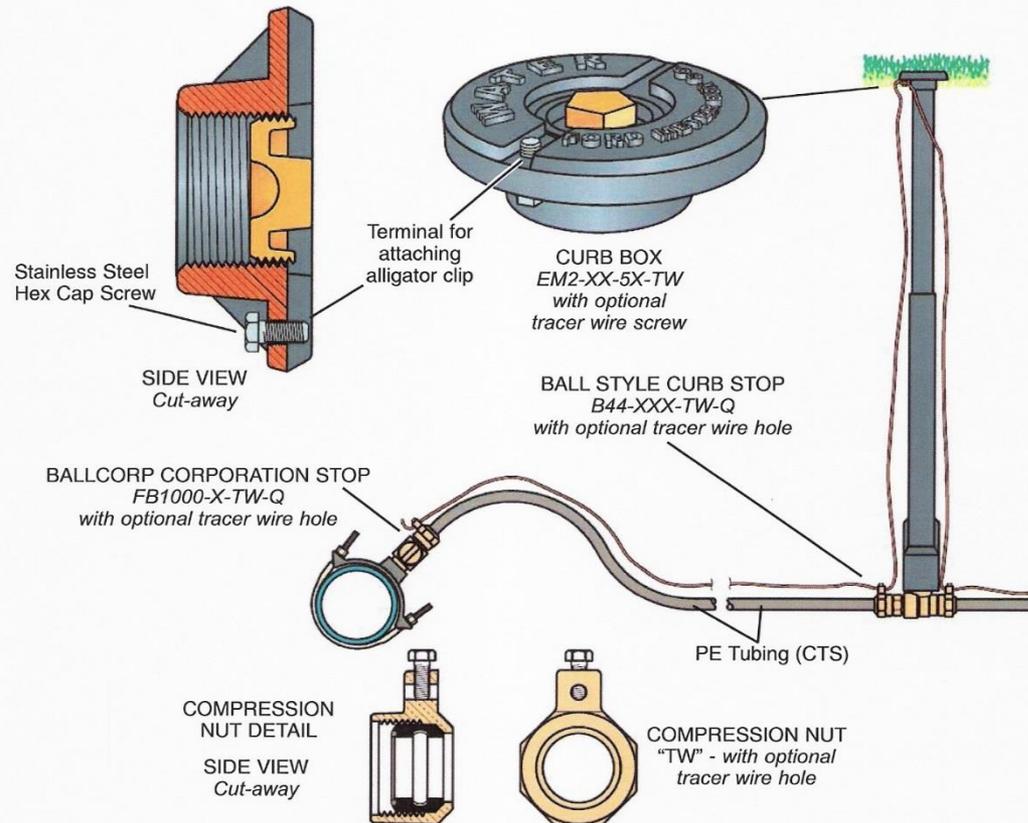
- (1) Make sure pipe is round, not flattened. On copper tubing use a rounding tool if necessary. Clean or scrape off any dirt or corrosion so that surface is smooth.
- (2) Use Ford Insert Stiffeners with any plastic pipe that is likely to distort or cold flow under pressure of the Quick Joint rubber or gripper.
- (3) Insert pipe through Quick Joint nut and into the fitting socket. If the nut or socket appears too large for pipe, make sure you are using the correct fitting and the pipe is the proper diameter.
- (4) Tighten Quick Joint nut until it contacts the machined sleeve stop.
- (5) **ALWAYS PRESSURE TEST FOR LEAKS BEFORE BACKFILLING.**
- (6) **DO NOT USE THIS FITTING ON A GAS LINE.**
- (7) **DO NOT USE THIS FITTING WITH CLASS 160 POLYBUTYLENE PIPE OR TUBING.**



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Tracer Wire

Tracer Wire Services

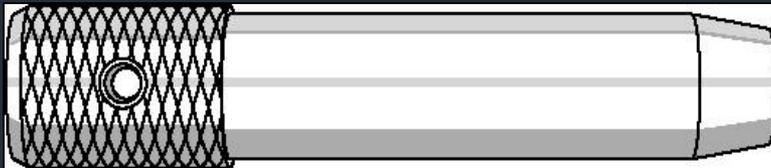




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Leaking Compression Fitting

Out-of-round copper tubing can cause a poor gasket seal. View 1 of 2



Copper Rounding Tool

3/4" - CRT-3

1" - CRT-4

1-1/4" - CRT-5

1-1/2" - CRT-6

2" - CRT-7





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Leaking Compression Fitting

Out-of-round copper tube compared to a round fitting. View 2 of 2





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Leaks After Installed for Weeks or Months

Deflected copper can cause a poor gasket seal.
View 1 of 3





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Service Line Brass / Saddles

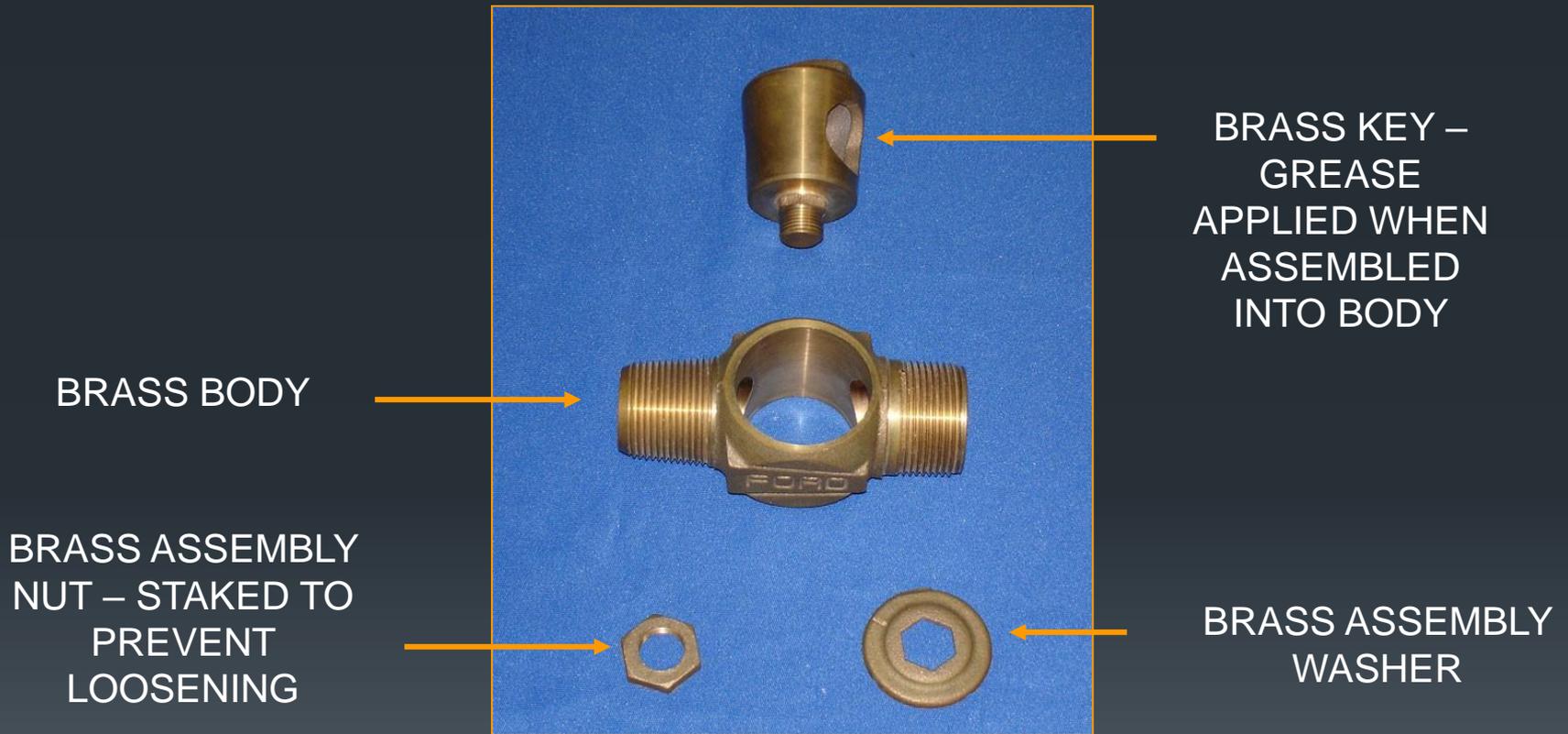
BALLCORPS & CORP STOPS





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Key Corp Components



PLUG DESIGN CORP STOP



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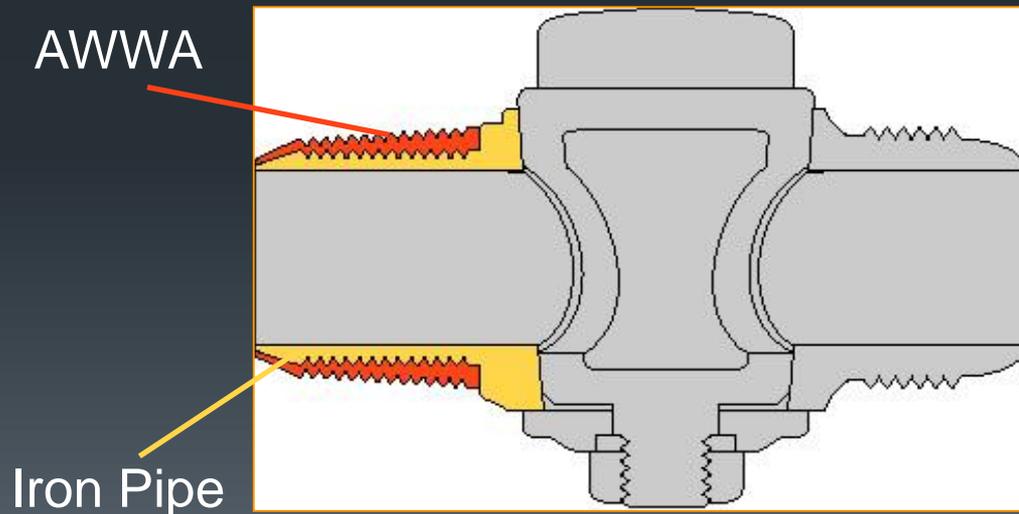
Ballcorp Components



BALL DESIGN CORP STOP

Ballcorps & Corp Stops

- A. AWWA (INLET THREADS – Compatible with tap or saddle threads, CC, CS, Mueller)
- B. Iron Pipe



AWWA

I.P.



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Ballcorps & Corp Stops

OUTLET CONNECTIONS

- A. Flare
- B. Compression
- C. Pipe Threads
- D. Special outlets - Increased I.P.; Wiped Lead

A.



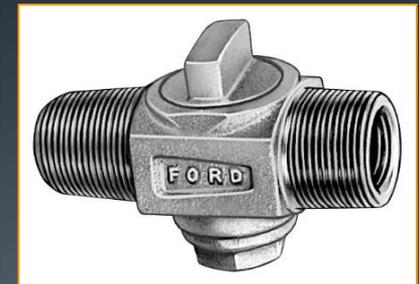
B.



C.



D.





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Numbering System

Ford Corporation Stop Numbering System

TYPE OF CORPORATION STOP

- F** = Key/Plug Corporation Stop
- FB** = Ford Ballcorp Corporation Stop
- FBRW** = Ford Ballcorp Corporation Stop embossed with "Reclaimed Water"

NOTE: 1-1/4", 1-1/2" and 2" sizes are available only as Ford Ballcorp Corporations.

CORPORATION STOP SIZE

- 1** = 1/2"
- 2** = 5/8"
- 3** = 3/4"
- 4** = 1"
- 5** = 1-1/4"
- 6** = 1-1/2"
- 7** = 2"

CORPORATION STOP SIZE BY INCREASED OUTLET CONNECTION SIZE

- 23** = 5/8"x3/4"
- 34** = 3/4"x1"
- 45** = 1"x1-1/4"
- 56** = 1-1/4"x1-1/2"
- 67** = 1-1/2"x2"
- 78** = 2"x2-1/2"

NO-LEAD
-NL = No-Lead Alloy ▲

F 1000 - 3 - G - NL

INLET AND OUTLET CONNECTION TYPE

Inlet		Outlet
AWWA	MIP	
200	300	Male Coupling Thread with Inside Driving Thread
400	500	Male Iron Pipe
600	700	Flare Copper
800	900	Increased MIP with Inside Driving Thread
1000	1100	Pack Joint for Copper or Plastic Tubing (CTS)
1001	1101	Pack Joint for PE Pipe
1002	1102	Pack Joint for PVC Pipe
1600	1700	Female Iron Pipe

Note: See item listings in catalog section to assure that desired sizes and options are available.

** Ultra-Tite couplings assembled to corporation stop hand tight.

OPTIONS

- G** = Grip Joint (3/4"-2" CTS and 3/4" and 1" PEP)
- IDR7** = Pack Joint for 1-1/2" and 2" PEP requires dimension ratio designation
- Q** = Quick Joint (for indicated items)
- TA** = Tee-Head Adapter for Ballcorps
- TW-Q** = CTS Quick Joint Nut with Tracer Wire Terminal
- **U-ANWT** = Ultra-Tite Coupling (requires a drilling/tapping machine adapter for MIP threads)
- **U2-ANWT** = Ultra-Tite Coupling (requires a drilling/tapping machine adapter for flare copper threads)
- U-AWT** = Consists of components assembled watertight to coupling or ell

▲ Ford Meter Box no-lead brass products manufactured from UNS/CDA No. 89833 alloy shall contain no more than 0.25% total lead content by weight. United States federal and state laws allow the use of products manufactured from UNS C83600 85-5-5-5 brass alloy for only non-potable water systems within the United States. The same UNS C83600 85-5-5-5 brass alloy, also referenced as gunmetal or LG2, is specified and used in potable water systems in most other countries.

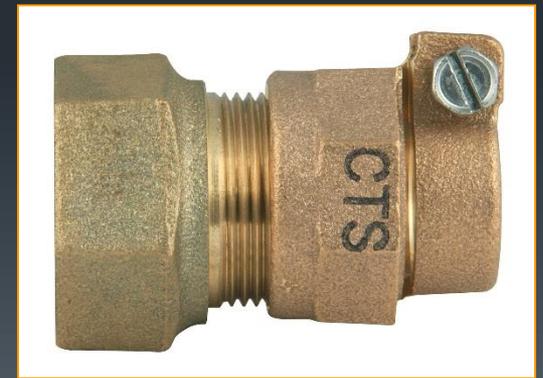
Remove "-NL" from catalog number to have products manufactured from UNS C83600 85-5-5-5 brass alloy.

Parties responsible for monitoring and maintaining proper water system design must exercise full responsibility in understanding and upholding the full intent and scope of applicable lead laws.

Ballcorps & Corp Stops

ACCESSORIES & MISCELLANEOUS

ELLS, BENDS & COUPLINGS





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Ballcorps & Corp Stops

COMPRESSION CONVERTED TO FLARE



RA42-44-NL



F1000-4-NL COMP
CORP WITH RA42-44-NL



CONVERTED TO
F600-4-NL –
READY TO
ACCEPT ELL



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Ballcorps & Corp Stops

LEAD CORP CONNECTIONS



WIPED OR "GOOSENECK"



FLANGED



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Ballcorps & Corp Stops

ACCESSORIES & MISCELLANEOUS

ADAPTERS & BUSHINGS



TEE HEAD
ADAPTER



WASHER FOR
SCREW PLUG
ADAPTER



INLET
BUSHINGS



CORP STOP
PLUG



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Ballcorps & Corp Stops

ACCESSORIES & MISCELLANEOUS
SERVICE INSULATORS



DIELECTRIC
BUSHING

COUPLING

COUPLING



SI-4-NL SERVICE INSULATOR

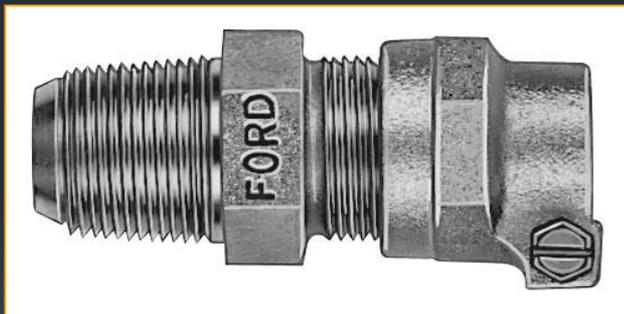


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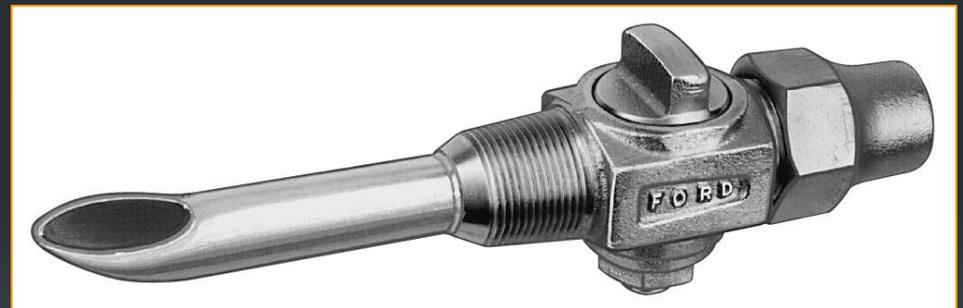
Ballcorps & Corp Stops

ACCESSORIES & MISCELLANEOUS

SPECIALS



REPLACEMENT PIECE



PITORIFICE CORP STOP



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Ballcorps & Corp Stops

INSTALLATION / HANDLING

Use Correct Wrench



USE SMOOTH JAW WRENCH



DO NOT USE PIPE WRENCH

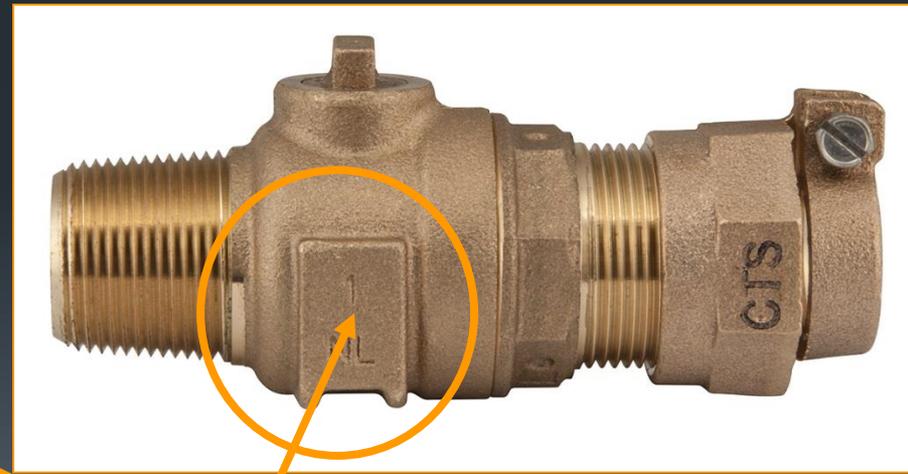


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Ballcorps & Corp Stops

INSTALLATION / HANDLING

Wrench Location: Correct

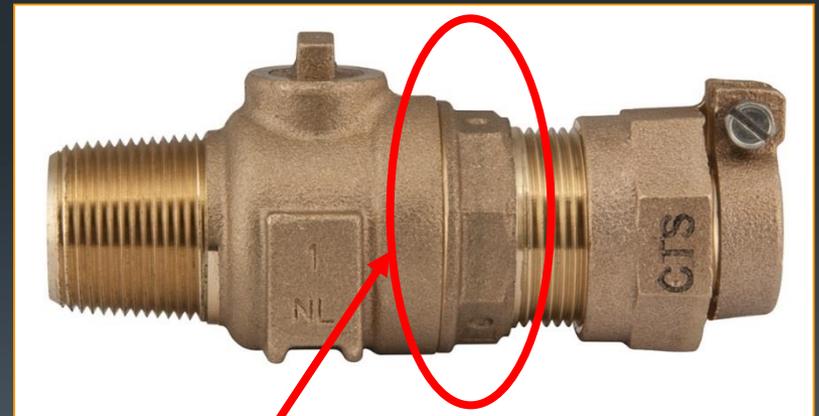
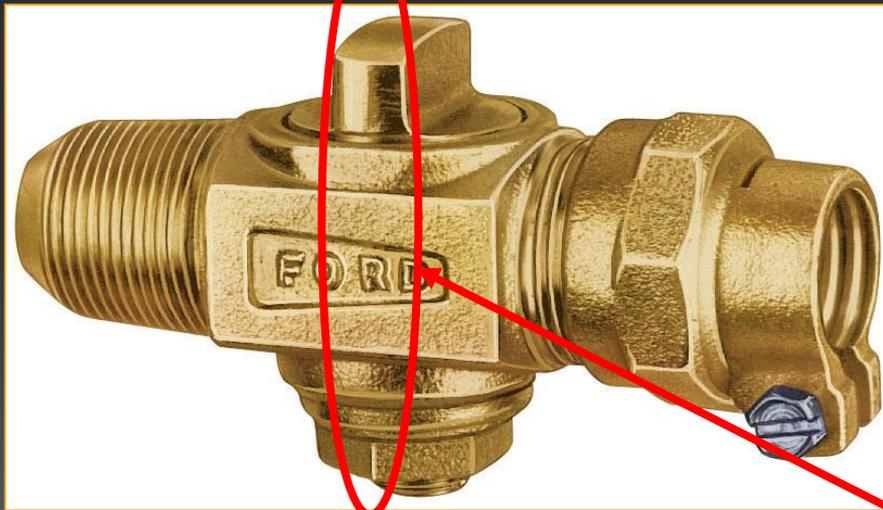


PLACE WRENCH AT "SQUARE" OR "FLATS"

Ballcorps & Corp Stops

INSTALLATION / HANDLING

Wrench Location: Incorrect



DO NOT PLACE WRENCH HERE



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Ball Valve Curb Stops

*- The Industry Standard -
The Ford Ball Valve*

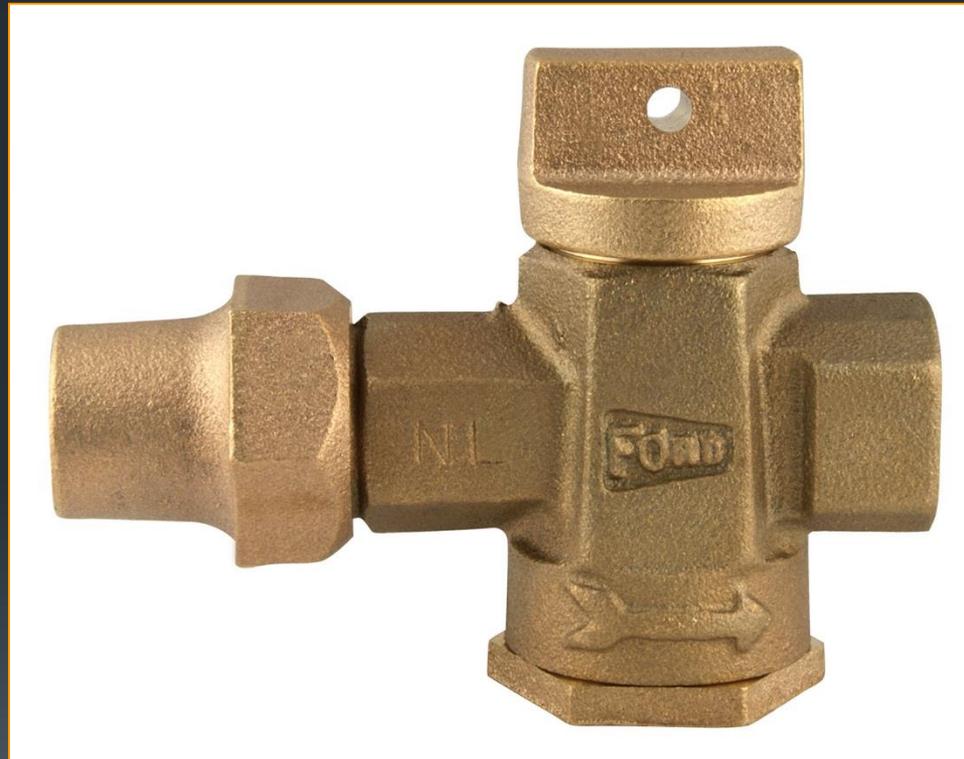
- Superb design, quality, and precise manufacturing are the features that make the Ford Ball Valve the best in the industry.
- **Ford ball valves feature a solid one piece tee-head and stem.** A fluorocarbon-coated brass ball provides maximum flow capacity and ease of turning now, and in the future. Ford Ball Valves are designed to withstand **WORKING PRESSURES** up to 300 PSI.





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Inverted Key Curb Stops





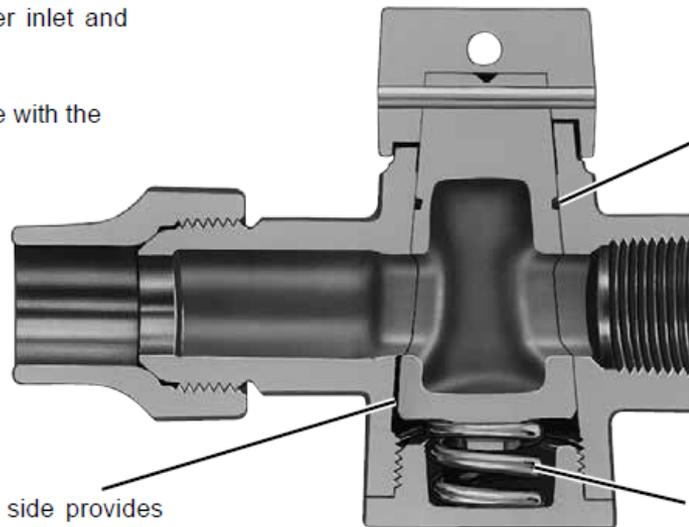
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Inverted Key Valve Curb Stop

Features of the Ford Inverted Key Valve

The photo at right shows a Z21-333-NL inverted key valve with flare copper inlet and female iron pipe outlet.

Inverted key curb stops are available with the stop-and-waste feature.



A Buna-N rubber O-ring near the top of the inverted key offers extra protection against leaks.

A water passage on the inlet side provides upward pressure on the key, helping to hold it in the proper position.

A bronze coil spring exerts a constant upward force on the bottom of the key. If the tee-head requires tapping to free a stuck key, the spring automatically reseats the key in a watertight position.

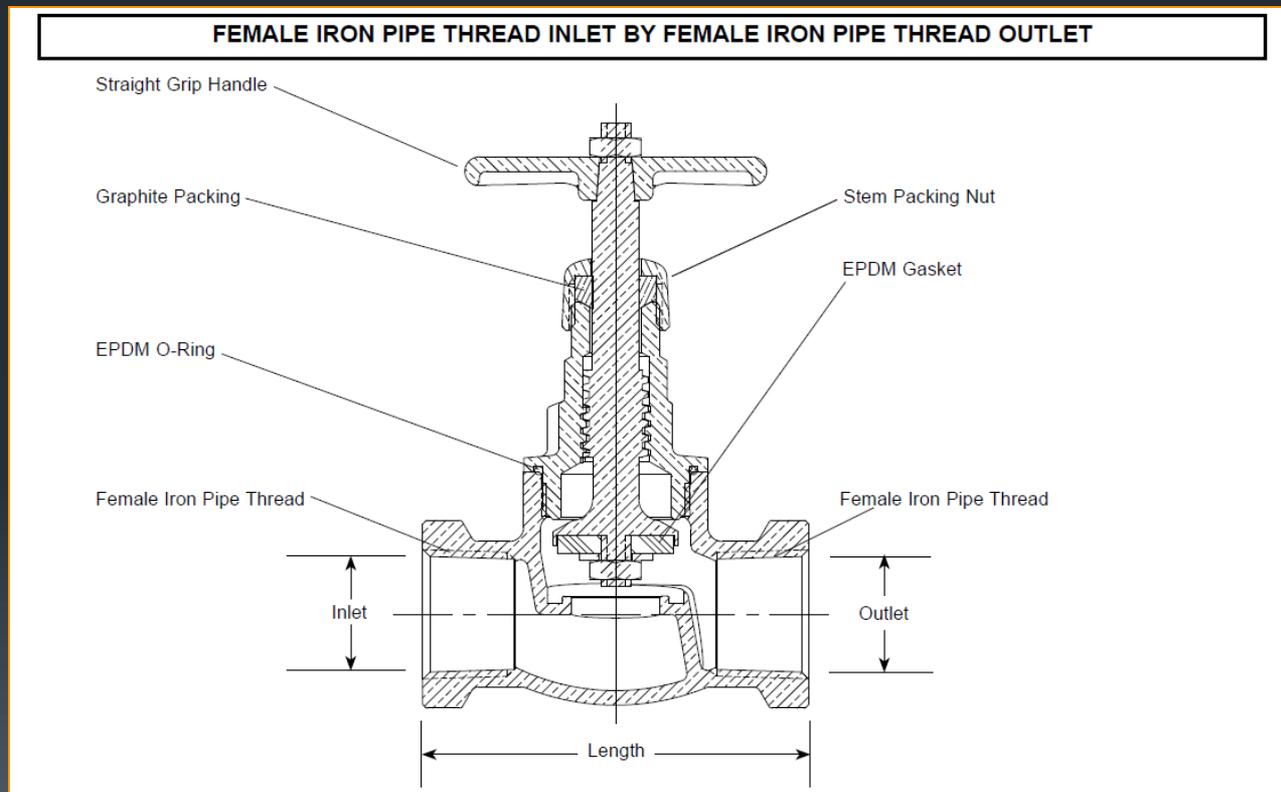


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Compression Valves



Compression Valves



Tapping Saddles

- Allows you to make a tap without shutting down system water main.
- Install 3/4" thru 2" service line on a variety of pipe styles and class.
- Make taps with a Drilling machine rather than costly and heavy direct tapping machines.



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S70 & S90 Style Service Saddles

- AWWA 85-5-5-5 Water Works Brass alloy
- Hinge Pin: Body and strap are joined with a silicone bronze pin
- EPDM rubber O-ring
- Allows for easy assembly
- Thread may be FIP, AWWA, or BSP





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S70 & S90 Saddles for Standard PVC Pipe

- Their ample width and preformed radius provides greater distribution of clamping pressure to avoid crushing the pipe.
- S70 series, for iron pipe size PVC.
- S90 series, for Ductile iron size C900 PVC.





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Numbering System

Ford All Brass Saddle for PVC Pipe Numbering System

TYPE OF SADDLE

S = Brass saddle

S

TYPE OUTLET THREAD

0 = Tapped AWWA

1 = Tapped Iron Pipe

0

TYPE OF MAIN TO BE TAPPED

7 = PVC Main - Steel O.D.

9 = PVC Main - Cast Iron O.D.

7

-

20

SIZE PVC MAIN

20 = 2"

25 = 2-1/2"

30 = 3"

40 = 4"

50 = 5"

60 = 6"

80 = 8"

100 = 10"

120 = 12"

3

**SIZE
OUTLET
THREAD**

1 = 1/2"

3 = 3/4"

4 = 1"

5 = 1-1/4"

6 = 1-1/2"

7 = 2"

Note: S902 and S912 styles are 4", 6" and 8" two-piece bolted saddles. These saddles follow the same numbering system except the "2" distinguishes these saddles from the hinged saddles of the same size.

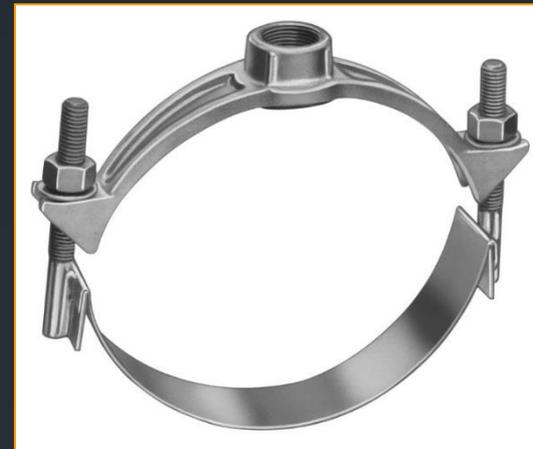
101B & 202B Service Saddles

- The single strap 101B and the double strap 202B brass saddles are designed with built in flexibility to cover asbestos cement and/ or cast iron size pipe.
- Castings are made of 85-5-5-5 water works brass.
- Straps are high quality silicon bronze flattened to provide a wide surface against the pipe.



101BS & 202BS Saddles

- This style of saddle incorporates a Stainless Steel band in place of the Silicon bronze straps.
- The stainless easily conforms to the surface of PVC and the brass provides the required strength to support the service line.





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Fabricated Steel Saddles Styles FS202 & F202

- FOR 3" AND 4" TAPS
- DESIGNED FOR IRON PIPE SERVICE TAPS.
- AVAILABLE WITH ZINC PLATED STEEL STRAPS OR A STAINLESS STEEL BAND.
- 150 PSI WORKING PRESSURE RATING.
- RECOMMENDED FOR AIR RELEASE OR VACUUM VALVE APPLICATIONS.





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Stainless Steel Saddles Style FS313

- STYLE FS313 FOR STANDARD OR C900 PVC PIPE
- Stainless Steel Band
- Stainless Taps are TIG Welded to the Shell
- Stainless Steel Nuts & Bolts
- Nuts are Fluorocarbon coated to Prevent Galling
- Buna-N rubber Gasket
- Rating 250 PSI





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Repair Saddle Style FRS202

- Body – 7-1/2” wide with Double Band
- All Stainless Steel fully Passivated to restore Stainless Characteristics.
- Taps Available in 3/4” through 2” FIP, AWWA or BSP threads

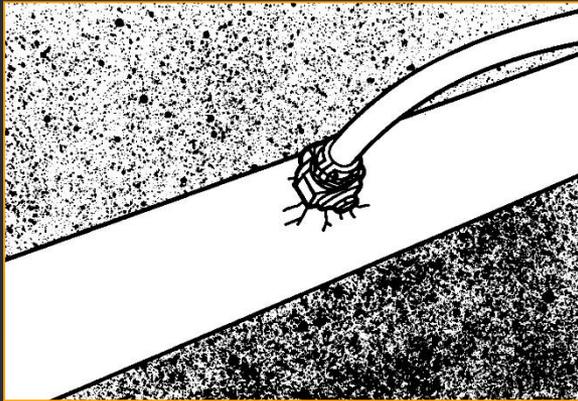




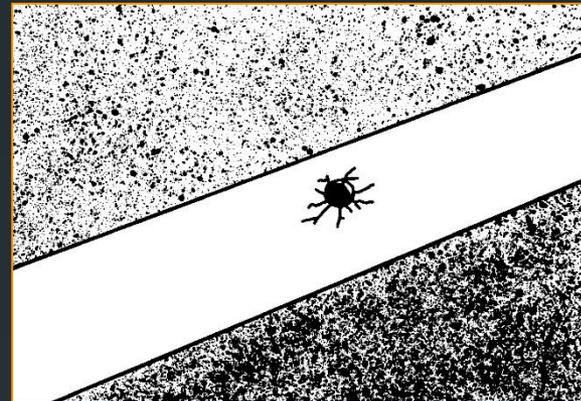
FORD METER BOX

Repair Saddle Style FRS202

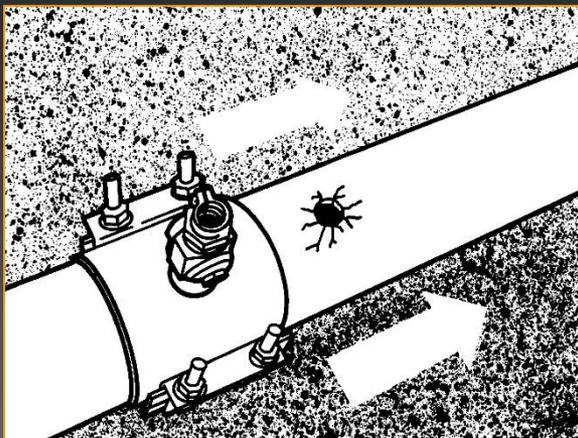
1-Confirm the leak location by cleaning and examining the pipe.



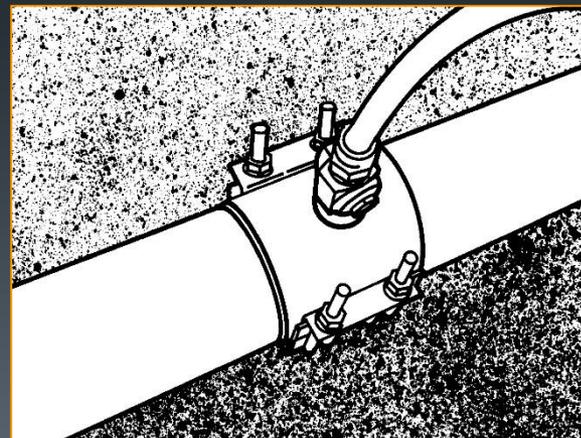
2-Shut off the water supply and remove the Corporation Stop from the pipe.



3-Install The Corporation stop into the Saddle, and position it loosely on the pipe next to the hole.



4-Center the Saddle over the damaged pipe hole and tighten the saddle onto the pipe.

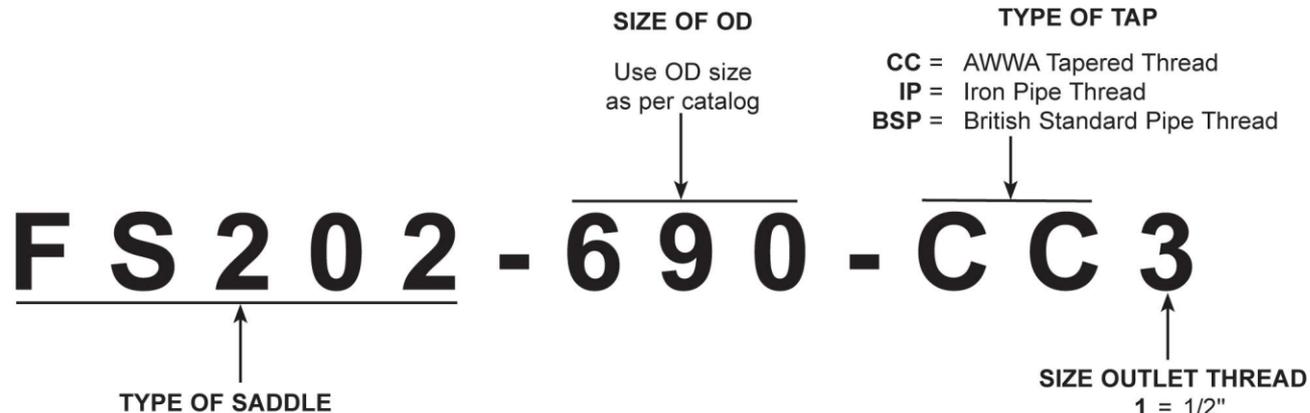




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Numbering System

Ford Brass Saddle and Iron Service Saddle Numbering System



- TYPE OF SADDLE**
- 101B** = Brass saddle with a single silicon bronze strap
 - 101BS** = Brass saddle with a single stainless steel band
 - 202B** = Brass saddle with two silicon bronze straps
 - 202BS** = Brass saddle with a double wide stainless steel band
 - F101** = Iron saddle with a single strap
 - FS101** = Iron saddle with a single stainless steel band
 - FC101** = Iron saddle with a single stainless steel band & epoxy coating
 - F202** = Iron saddle with two steel straps (*for 3" & 4" taps, saddle body is fabricated steel*)
 - FS202** = Iron saddle with a double wide stainless steel band (*for 3" & 4" taps, saddle body is fabricated steel*)
 - FC202** = Iron saddle with a double wide stainless steel band & epoxy coating
 - FRS202** = All stainless steel repair saddle with two stainless steel bands
 - FS303** = All stainless steel saddle for PVC pipe

- SIZE OUTLET THREAD**
- 1 = 1/2"
 - 3 = 3/4"
 - 4 = 1"
 - 6 = 1-1/2"
 - 7 = 2"
 - 8 = 2-1/2"
 - 9 = 3"
 - 11 = 4"



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- Questions and answers