Installation Instructions

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Unions and True Union Ball Valves

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PIPING SYSTEMS

Please read all instructions before attempting to install unions or valves.

Introduction

Because unions and ball valves have similar, threaded nut connectors, these instructions have been written with both of these components in mind. GF unions and ball valves are designed to provide many years of service when installed properly.

As with any piping system component, unions and valves have particular considerations that must be kept in mind during installation in order to ensure best performance. Even experienced installers will benefit from reviewing these instructions before each installation.

Valve Support

Ball valves must be well-supported. Refer to the GF Engineering Handbook for detailed instructions on support installation. (http://www.gfpiping.com)

An unsupported or insufficiently-supported valve body will twist when opened and closed, subjecting the union connection to torque stress that may cause cracking or distortion and subsequent leakage.

System Alignment

The major contributor to union nut failures is misalignment. Uneven compression of the o-ring will cause leaks to occur. Union nuts can be damaged by the stress of holding a misaligned system together.

Sealing Mechanism

GF union connections use an o-ring as the sealing mechanism which is highly effective under relatively low tightening force.

Dirt and Debris

An often overlooked issue is the presence of dirt and debris on the o-ring or sealing surfac e. This will prevent proper o-ring sealing; if it is present on the nut or body threads, it will clog the threads and prevent proper tightening.

Installation

Understand and carefully follow these installation steps in order to ensure a seal that is sufficient to guard against leaks while avoiding excessive forces that can damage the union nut.

End Connectors

Always remove the union nut and end connectors from the ball valve for installation.

Make sure that you slide the union nut onto the pipe, with the threads facing the proper direction, BEFORE installing the end connector.

Solvent Cementing

Solvent cementing of pipe into the union or ball valve sockets should be done before the union nut connections are engaged. Be careful not to get any cement on the sealing surfaces, which can disrupt the seal and cause leaks. For best results, allow the cemented joint to properly cure prior to assembling the union nut connection, in order to avoid damaging the uncured joint.

O-Ring Placement

Once the cement has cured, ensure that the o-ring is securely seated in its groove. The o-ring should rest securely in place without adhesive or other aids.

Never use any foreign substance or object to hold the o-ring in place.

Union Connection

There should be no gap between the mating components, so that the threaded nut serves only to compress the o-ring thus creating the seal. However, a small gap (less than 1/8") between the mating components is acceptable.

Never use the union nuts to draw together any gaps between the mating faces of the components or to correct any system misalignment.

Hand-Tightening (All Sizes) (see Table 1)

The next step is to hand-tighten the union nut. With the o-ring in place, engage the nut with its mating threads and turn clockwise with one hand. Continue turning with moderate force until the nut no longer turns.

Be careful to use reasonable force when tightening the nut. Your grip should be firm but not aggressive. The nut should turn easily until it bottoms out and brings the mating faces into direct contact.

It is recommended that you place an indexing mark, with a permanent marker, on the union nut and body to identify the hand tight position.

Do not use any form of lubricant on the threads of the union nut.

Union and ball valve sizes 3/8" through 1½" should be sufficiently sealed after hand-tightening, for the hydrostatic pressure test of the system.

Optional Further Tightening (Sizes 2" to 4") (see Table 1)

Based on experience, or system requirements, the installer may choose to turn the nut an additional 1/8 turn (approximately 45°) in order to ensure a better seal before hydrostatically pressure testing the system.

To do this, use a strap wrench to turn the nut 1/8 turn past the index mark applied after assembly.

Do not exceed 1/8 turn past the index mark.

Do not use any metallic tools. Tool marks on the union nut will void manufacturer's warranty.

At this point, the system should be hydrostatically pressure tested before turning the union nut any farther.

Table 1
Tightening Guide for Union and Ball Valve Nuts

Size (in)	Initial	Additional, Pre-Test	Additional, Post-Test
3/8	Hand- Tight	None	1/8 Turn Max
1/2	Hand-Tight	None	1/8 Turn Max
3/4	Hand-Tight	None	1/8 Turn Max
1	Hand-Tight	None	1/8 Turn Max
1¼	Hand-Tight	None	1/8 Turn Max
1½	Hand-Tight	None	1/8 Turn Max
2	Hand-Tight	1/8 Turn Max	Consult Factory
2½	Hand-Tight	1/8 Turn Max	Consult Factory
3	Hand-Tight	1/8 Turn Max	Consult Factory
4	Hand-Tight	1/8 Turn Max	Consult Factory

Post-Test Tightening (Sizes 3/8" to 1½" only)

(see Table 1)

It is highly unlikely that any union nut connection, when tightened as instructed above, will leak under normal operating conditions.

In the unlikely event that a leak occurs, the union nut at the leaking joint may be tightened an additional 1/8 turn, as described above. The system should then be re-tested.

If the joint still leaks after post-test tightening, do not continue to tighten the nut at the leaking joint. Disassemble the leaking joint, re-check system alignment, and check for obstructions in the sealing area.

If the cause of a leak can not be determined, or if you suspect that the union or valve is defective, contact your GF representative at (800) 854-4090 for further instructions.

Quality Check After Assembly

To check if the union connections are installed in a stress-free manner, GF recommends that a random check of alignment be done by removing the nut on selected union connection one at a time. A properly installed system will not have any movement of the piping as the nut is loosened. If any springing action is noticed, steps should be taken to remove the stress prior to re-installing the union nut.

Documentation

Keep Instructions Available

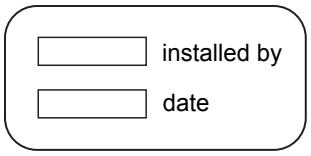
Provide a copy of these instructions to every installer on the job site prior to beginning installation.

Installation Tags

Best practices include tagging each union with:

- installer's initials
- installation date

This information can be recorded on pre-printed stickers, as shown below, and placed on each union nut immediately after installation.



Experience has shown that installation tags speed up the process of resolving system leaks and product failures, improve communication between the contractor and distributor or manufacturer, highlight training opportunities, and promote worker diligence.

See the GF vinyl technical manual for information on guides, support spacing, and allowance for thermal expansion.

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