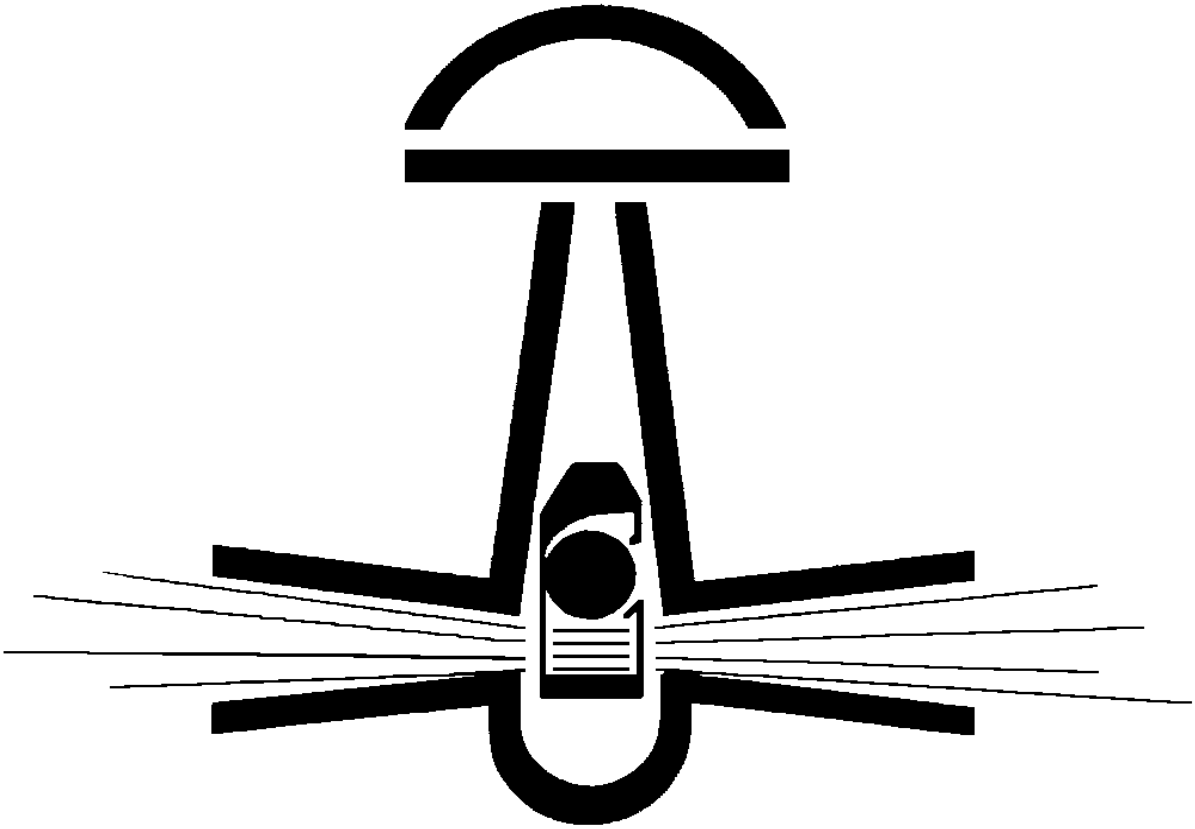
DFT® INC

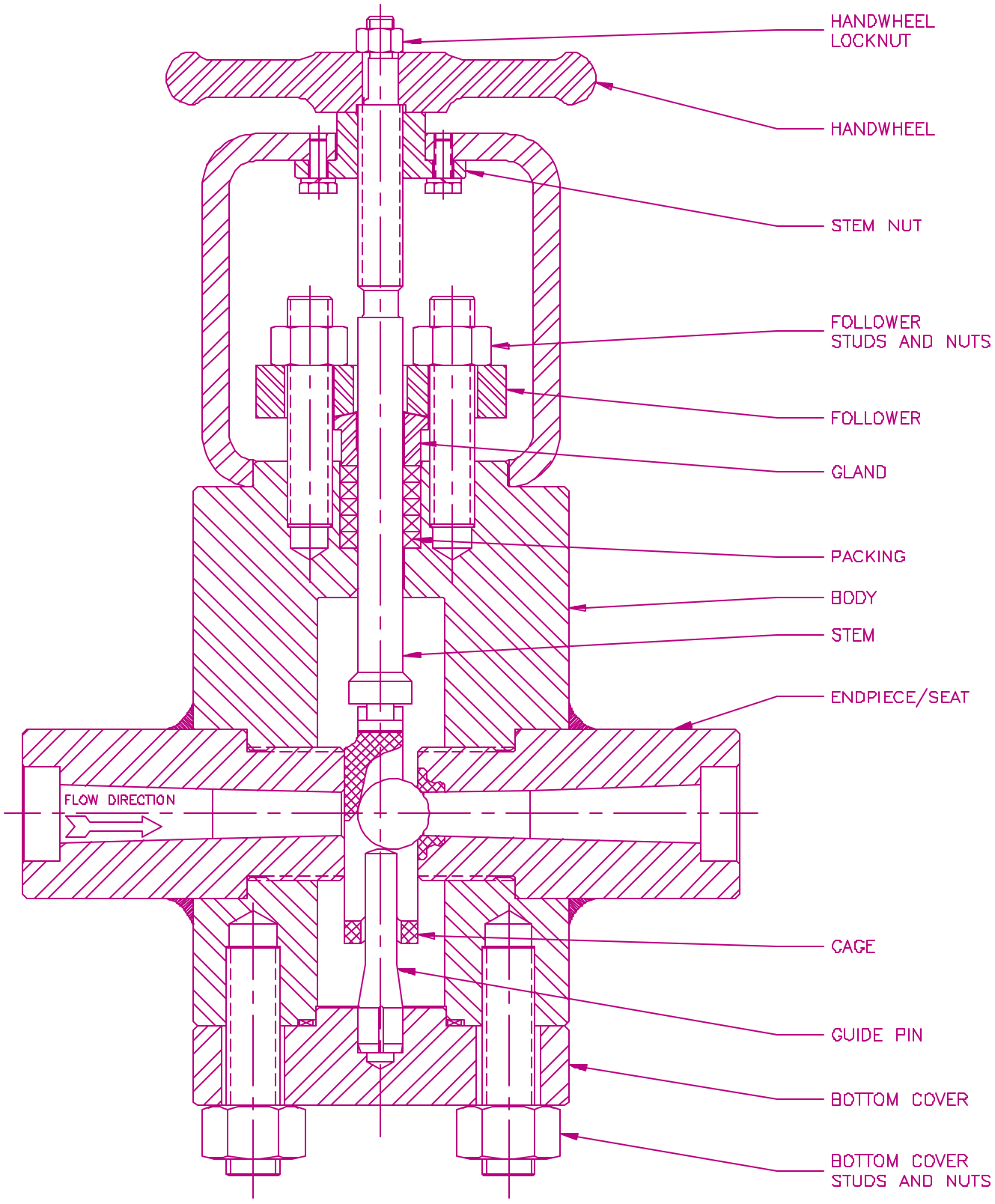
Severe Service Control Valves



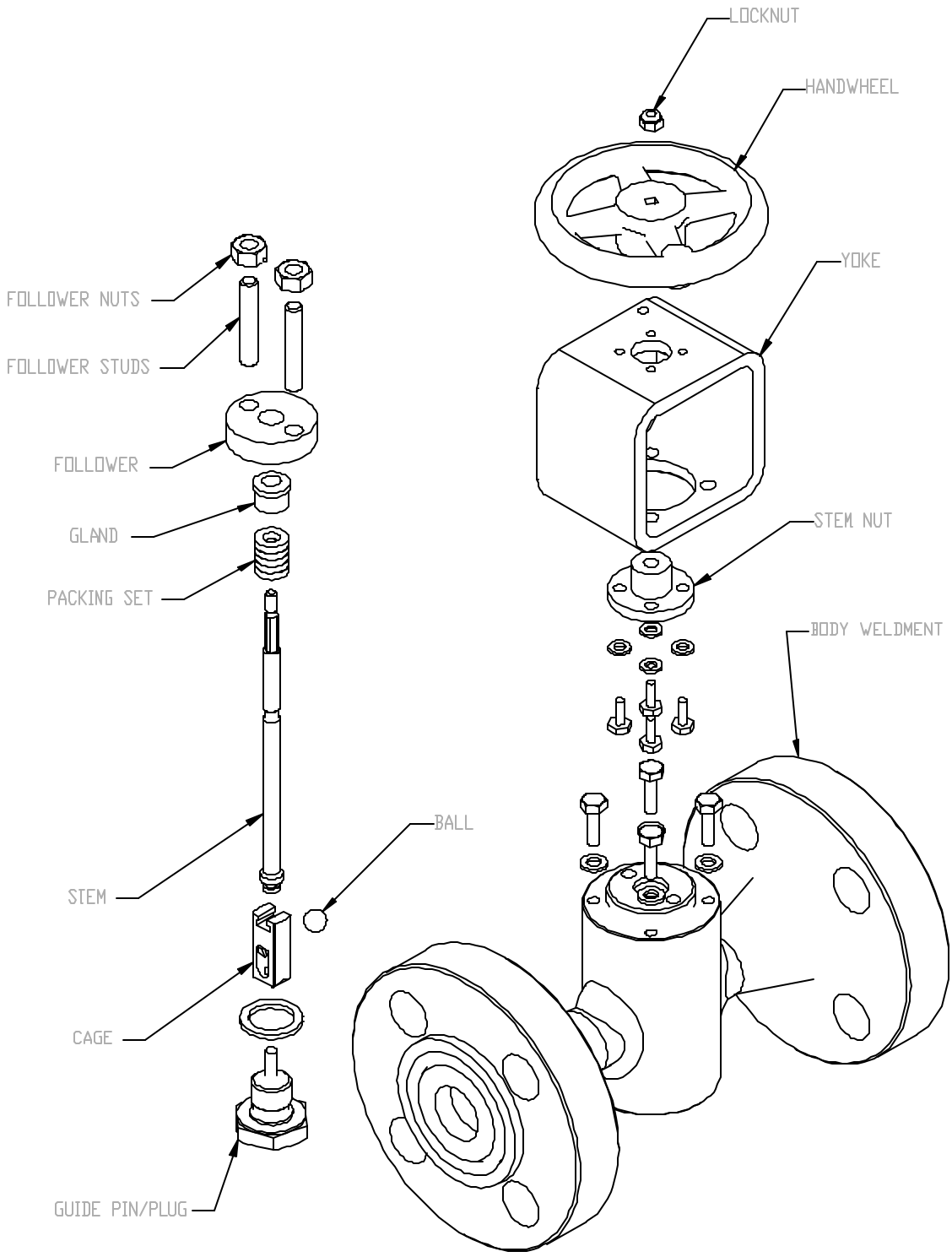
# MAINTENANCE AND INSTRUCTION MANUAL

# UNIFLO Control Valve

**"The Problem Solver™"**




BOTTOM COVER DESIGN




GUIDE PIN/ PLUG DESIGN

**WARNING: USER SHOULD READ AND THOROUGHLY UNDERSTAND THESE INSTRUCTIONS BEFORE INSTALLING THE UNIFLO VALVE. THESE INSTRUCTIONS DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY FACTORS ASSOCIATED WITH THE UNIFLO VALVE'S USE IN SERVICE. IT IS THE RESPONSIBILITY OF THE USER TO ESTABLISH APPROPRIATE SAFETY, HEALTH, AND TRAINING MEASURES FOR THEIR PERSONNEL INSTALLING, SERVICING, OR WORKING IN AN AREA WHERE UNIFLO VALVES ARE IN USE.**

**CUSTOMER AND/OR ITS INSTALLER SHALL BE RESPONSIBLE FOR THE PROPER INSTALLATION OF SELLER'S UNIFLO VALVE INTO A SYSTEM. CUSTOMER AND/OR ITS INSTALLER SHALL BE RESPONSIBLE FOR IMPROPER INSTALLATION AND PHYSICAL DAMAGE RESULTING THEREFROM, INCLUDING, BUT NOT LIMITED TO, DAMAGE RESULTING FROM LEAKAGE, IMPROPER TORQUING, AND FAILURE TO FOLLOW INSTALLATION INSTRUCTIONS.**

## I. INSTALLATION

1. The installation area should be checked for adequate clearance to allow for proper installation and servicing of the valve.
2. Install the valve in the piping so that the flow arrow on the valve body points in the same direction as the flow in the pipe.
3. The valve must be in the fully open position during installation. This will isolate the trim components of the valve away from the intense heat generated by welding the valve in place. Post weld heat treatment, when necessary, should be localized, and every precaution should be taken to keep the intense heat away from the main portion of the valve.
4. Observe normal piping practices when installing the valve in line.

## II. OPERATION

1. To operate the manual valve, rotate the handwheel counter-clockwise to open the valve and clockwise to close the valve.
2. DFT UNIFLO Valves have fixed mechanical stops which limit the valve stroke and protect the internal components from damage as a result of over-stroking. These mechanical stops should not be altered without first consulting DFT Engineering Department.

## III. MAINTENANCE

**NOTE**: In order to prevent external emissions of process fluid, it is recommended that all gaskets and packing be replaced upon valve reassembly.

**WARNING: To prevent personal injury or property damage, ensure that all internal pressure has been removed from the inlet and outlet piping of the valve before performing any maintenance.**

### DISASSEMBLY

1. Set the valve to the full open position. Mark the Body and Bottom Cover with adjacent marks so that their relative positions can be duplicated when the valve is reassembled.
2. Remove the Bottom Cover Nuts and Bottom Cover (or Guide Pin/Plug). Although the Bottom Cover slips out of the Valve Body, it may be necessary to pry the Bottom Cover free. It may make further disassembly easier if the Bottom Cover Studs are removed at this time. Remove and discard the Bottom Cover (or Guide Pin/Plug) Gasket.
3. Loosen the Valve Packing by removing the Follower Nuts from the Follower Studs.
4. Remove the locknut from the top of the Handwheel.
5. Rotate the Handwheel in a clockwise direction (looking down on top of the valve) until the Valve Stem has threaded itself down through the Stem Nut completely. Carefully slide the Valve Stem, Cage, and Ball out of the bottom of the Valve Body. Remove the Ball from the Cage and slide the Cage off the Valve Stem.
6. Remove the Follower and the Gland from the top of the Valve Body. Remove and discard the Packing.

### EXAMINATION

Examine each of the parts carefully; look for signs of wear. All of the parts should be thoroughly cleaned with a suitable solvent. All threaded parts should be cleaned with a suitable solvent and a wire brush and then re-lubricated with an anti-seize compound. All sealing and seating surfaces should be inspected and cleaned. Look for specific signs of wear as indicated below. Contact DFT for replacement parts.

1. Stem - Examine the stem threads for possible damage and clean them thoroughly. Examine the area of the stem which travels through the packing for possible scratches and/or galling. Small scratches (less than .003" deep) can be removed by polishing with emery cloth and a light weight machine oil. This should only be attempted on a lathe, and should be blended into the surrounding surface. Examine the knob at the end of the stem for heavy wear. Examine the stem on a flat surface to determine if it has been bent. Replace any damaged valve stem.
2. Cage - Examine the T-slot corners for evidence of cracking. Also, check the T-slot ears for excessive wear. Replace any damaged cage.
3. Guide Pin - The guide pin should be checked to determine if it is bent. Bent guide pins should be straightened. A slight burnish or dimple may be present at the tip of the guide pin. This is normal and should not be cause for repair. If it is necessary to replace the guide pin, it is extremely important that the new guide pin be checked for correct length before it is installed. The new part will be furnished from the factory with additional length and will require fitting before installation.

**WARNING: Failure to correctly set the guide pin length will restrict the valve closing and damage the guide pin.**

The clearance between the radius on the guide pin and the ball when the ball is in the seat should be as listed in the table below. Use the following method to set the appropriate length of the new guide pin. As shown in Figure 1, push the ball against the seat. Without the Bottom Cover Gasket in place, move the Bottom Cover (or Guide Pin/Plug) up into the Valve Body until the Guide Pin lightly contacts the Ball. There will be a small gap between the Bottom Cover and the bottom of the Valve Body. Carefully measure this gap "D" using a feeler gage or other method. Add the average clearance from the table to the measurement "D" and shorten the Guide Pin by this amount. To shorten the length of the guide pin, use a flat file or an air grinder. The spherical radius on the tip should be maintained.

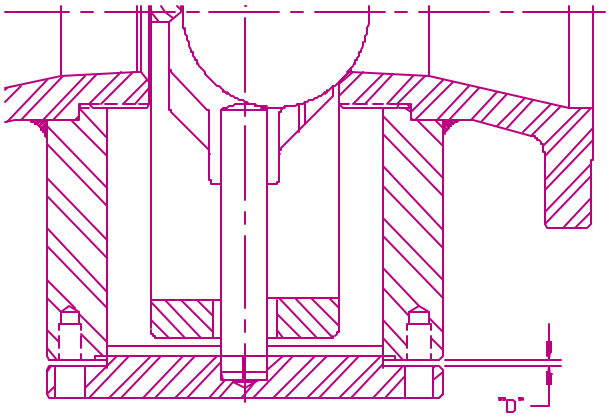



Figure 1

**Guide Pin Clearance Dimensions**

| Valve Size | Required Clearance |
|---|---|
| 1/4" | .010" to .015" |
| 1/2" to 1" | .020" to .030" |
| 1-1/4" to 2" | .025" to .035" |
| 2-1/2" to 6" | .030" to .045" |
| 8" and Larger | .040" to .060" |

**ASSEMBLY**

1. Slide the Cage onto the end of the Valve Stem. The fit between the Cage and the Valve Stem is very critical. If either the Valve Stem or Cage was replaced, it may be necessary to fit the Valve Stem to the Cage. There should be a sliding fit between the knob end of the Valve Stem and the T-Slot of the Cage. The Valve Stem should be free to rotate within the Cage, but excess play should be avoided. If it is necessary to shorten the head of the Valve Stem, it should be done with a flat file or an air grinder while the stem is rotated in a lathe or by other means. The spherical radius on the end must be maintained.
2. Put the Ball into the Cage. Push the Valve Stem up through the bottom of the Valve Body.

**CAUTION**: It is very important that the Ball and Cage be properly oriented in the Valve Body. The open side of the Cage must face downstream so that the Ball can freely move into the downstream seat.

3. Before the Valve Stem engages with the Stem Nut, slide the Packing Gland and the Follower onto the Stem. Making sure that the Valve Stem threads are well lubricated (it is recommended that a dry film molydenum disulfide lubricant be used), thread the Valve Stem through the Stem Nut as far as it will go.
4. Apply a liberal coat of white lithium grease to the Bottom Cover Gasket and insert the Gasket into the bottom of the Valve Body.
5. Apply a coating of anti-seize compound to the Bottom Cover Studs and thread the Studs into the bottom of the Valve Body.
6. Fasten the Bottom Cover (or Guide Pin/Plug) to the Valve Body. Secure it in place with the Bottom Cover Nuts. Torque the Nuts to values listed on the next page.
7. Install new Packing onto the Valve Stem. The braided graphite rings should go on the ends of the compressed graphite rings. The Packing is supplied with split rings. Be sure that the cuts in consecutive packing rings are staggered 120° apart. Push the Packing rings into the gland in the Valve Body.
8. Screw the Follower Nuts onto the Follower Studs to hold the Packing, Gland, and Follower in place. Torque down the valve stem Packing. The torque value is dependent on both the size of the packing and the operating pressure of the valve. Refer to the Production Check Sheet that is found in the documentation package supplied by DFT when the valve was originally shipped.
9. Using the handwheel, stroke the valve closed and then open through several cycles to check the operation of the valve and to consolidate the packing. Recheck the torque setting on the packing.

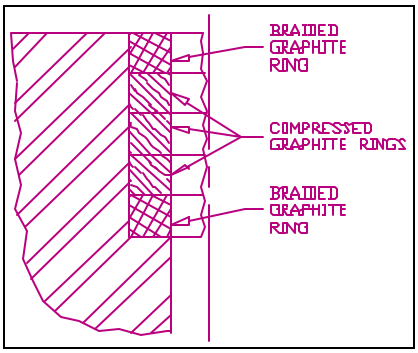



**Figure 2**

**BOLTING TORQUE**

A torque wrench should be used for tightening the pressure vessel bolting used on the DFT Valves.

| FASTENER SIZE (Inches) | THREADS / INCH (UNC) | TORQUE VALUE - (Ft-Lbs) |
|---|---|---|
| 1/2 | 13 | 30 |
| 9/16 | 12 | 45 |
| 5/8 | 11 | 60 |
| 3/4 | 10 | 100 |
| 7/8 | 9 | 160 |
| 1 | 8 | 245 |
| 1-1/8 | 8 | 355 |
| 1-1/4 | 8 | 500 |
| 1-3/8 | 8 | 680 |
| 1-1/2 | 8 | 800 |

These values are based on using a high temperature thread lubricant. The threads as well as the fastener head bearing surface must be lubricated.

Fastener torque values should be applied in incremental steps. Apply a steady, even pull to the torque wrench handle and follow a staggered star pattern when torquing.

**NOTE: To guard against leakage, it is good practice to check and verify the torque for all pressure vessel bolting once the valve is brought up to normal operating pressure and temperature.**

## IV. PREVENTATIVE MAINTENANCE

It is recommended that the valve stem threads be lubricated every 30 days with a dry film molydenum disulfide compound.

## V. CUSTOMER SERVICE

If you wish to discuss a particular application, installation, or maintenance concern, please contact DFT at the address below. When ordering spare parts, please specify the Valve Serial Number stamped on the name plate attached to the valve. Spare parts may be ordered by contacting your local DFT representative or by contacting **DFT** directly.

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