



# **STANDARD ANSI BOLT- ON ASSEMBLY**

**150# ANSI RATING**

## **Installation / Operation / Maintenance Manual**

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## **1.00 Warranty**

L. J. Star warrants its Bolt On Sight Window (BOSW) against defects in material and workmanship for a period of eighteen months from the date of shipment. L. J. Star will, at its option, repair or replace those products that fail to perform as specified with the following exceptions. This warranty does not apply to glass breakage or any other liability other than materials and workmanship.

### **1.10 Exceptions**

Products repaired or modified by persons not authorized by L. J. Star.

Products subject to misuse, negligence or accidents.

Products that are connected, installed or otherwise used in a manner not in accordance with the manufactures instructions.

### **1.20 Provisions**

L. J. Star's responsibility hereunder is limited to repairing or replacing the product at its expense. L. J. Star shall not be liable for loss, damage or expense directly or indirectly related to the installation or use of its products, or from any other cause or for consequential damages. It is expressly understood that L. J. Star is not responsible for damage or injury caused to other products, building, property or persons by reason of the installation or use of its products.

This warranty is in lieu of any other warranty expressed or implied by any party other than L. J. Star. Repairs and/or replacements shall be at the sole discretion of L. J. Star based upon the terms and conditions.

## **2.00 Introduction**

L. J. Star's BOSW is designed to be mounted to a 150# ANSI flange connection on your process vessel. Visible glass sizes range from 1-31/32" to 8-1/16" in diameter.

The sight window is secured in the BOSW by compressing it between a retainer and base flange. The retainer is then attached with cap screws. When properly installed your BOSW can provide a full ANSI B16.5 design rating up to 536° F [gasket material dependent].

### **2.10 Components**

Each BOSW is comprised of six basic components. While various materials of construction are available, each complete unit must have these parts.

#### Base Flange

The sight window mounting surface bolted to the process vessel. It is also the base used to secure the cap screws.

Sealing Gasket

This is placed between the sight window and base flange to seal the unit.

Sight Window

The transparent material allowing visual access to the process vessel.

Cushion Gasket

Placed between the sight window and retainer to prevent damage to the sight window. The material used for the cushion gasket must be constructed from a harder material than the sealing gasket for proper compression.

Retainer

This provides a recessed surface for the cushion gasket and sight window. In conjunction with the cap screws it generates the compressive force on the sight window and gaskets.

Cap Screw

They are utilized to secure the sight window and retainer through mechanically induced compression.

2.20 Pressure / Temperature Specifications

The allowable pressure / temperature limitations for your BOSW are material dependent. The combined effects of the base flange and retainer with the gasket material are displayed below.

**DANGER**

**Do not exceed the listed design ratings. Failure to following these instructions could result in leaks, glass breakage or sudden escape of process fluid or pressure. Should this occur you risk severe personal injury and property damage.**

**Bolt On Sight Window Operating Temperatures**

Base Flange	Gasket Material	Temperature Rating
Carbon Steel	Non-Asbestos	-20° F to 536° F
	PTFE Envelope	-20° F to 450° F
	Viton®	-20° F to 400° F
	Silicone	-20° F to 450° F
	Graphite	-20° F to 536° F
	Gylon®	-20° F to 500° F
316 STS	Non-Asbestos	-40° F to 536° F
	PTFE	-300° F to 450° F
	Viton®	-20° F to 400° F
	Silicone	-75° F to 450° F
	Graphite	-325° F to 536° F
	Gylon®	-325° F to 500° F

The corresponding pressure rating follows ANSI B16.5 guidelines for the base flange material.

Table 1

### 3.00 Installation

#### 3.10 Unpacking

Upon receipt of your BOSW check all components carefully for damage incurred during shipment. If damage is discovered or suspected, do not attempt installation. Notify the carrier immediately and request a damage inspection.

Check each item against the enclosed packing list. Confirm that the attached identification tag lists the proper model and design rating for the intended application.

#### 3.20 Visual Inspection

Insure your BOSW is free of any damage due to mishandling or improper storage before proceeding with installation. Specific areas of concern are the sight window, base flange and retainer.

Examine the sight window for evidence of scratches, chips or cracks. If any are present, do not proceed with installation.

The base flange and retainer must be free of any foreign material. The presence of foreign material could result in point load stress as the sight window is secured. This in turn may lead to sight window failure.

#### 3.30 Positioning the Bolt On Sight Window

Careful thought should be given to the location your BOSW will occupy prior to installing it. Placing your unit in an area where it is subjected to excess mechanical or thermal stress will greatly reduce its serviceable life.

The following criteria should be used to determine the optimum location for your Bolt On Sight Window.

- a) Is it protected from objects that may come in contact with the sight window? This includes environmental contaminants, tools and machinery.
- b) Will the BOSW be protected from rapid temperature changes? You should avoid exposing it to cold air blasts or cold wash down water.

If you cannot provide a positive response to both questions, the location of your BOSW should be reevaluated.

#### 3.40 Preparing the Bolt On Sight Window for Installation

- a) Your BOSW is shipped ready for installation. There is no need to disassembly the unit before mounting it to your vessel. If you do choose to disassemble the unit for installation, be certain to follow the disassembly instructions in Section 6.0 and the assembly procedures listed in Section 3.50 prior to start up.
- b) Install a standard ANSI ring gasket of suitable material for your application on the ANSI flange attached to your vessel.

- c) Set your BOSW on your existing vessel flange. Align the bolt hole pattern in the base flange with the holes in your vessel flange.
- d) Insert the correct size / length studs through the bolt holes and secure finger tight with heavy hex nuts.
- e) Using a torque wrench, follow a standard tightening procedure as shown in Figure 1. The proper torque value will be determined by your gasket material.
- f) Check the torque values of the retainer cap screws. These can loosen during shipment. The proper sequence is shown in Figure 2. The correct torque values for various gasket materials can be found in Table 2.

## DANGER

**Avoid damage to your Bolt On Sight Window during installation. Harming any component could result in the sudden release of pressurized process fluid and cause personal injury and property damage.**

### Torque Sequence – Base Flange

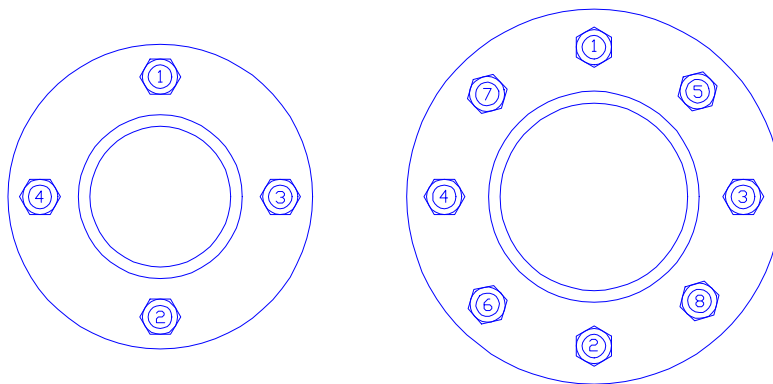


Figure 1

### 3.50 Assembly of Bolt On Sight Window

- a) Check the recessed face of the retainer and base flange for foreign material. If any exists, clean the surface.
- b) Carefully place the sealing gasket in the recessed area of the base flange.
- c) Clean and install the sight window in the recessed area of the base flange.
- d) Place the cushion gasket on the top of the sight window.
- e) Align the holes in the retainer with the tapped holes in the base flange. Carefully lower the retainer on to the cushion gasket. Insure the cushion gasket and sight window are properly seated in the retainer recess.
- f) Place the cap screws through the retainer and tighten with fingers.
- g) Use a torque wrench to complete the tightening procedure. Follow the proper sequence as demonstrated in Figure 2. The correct torque value for the gasket material utilized can be found in Table 2. The cap screws should be tightened in increments of 3 ft-lbs.

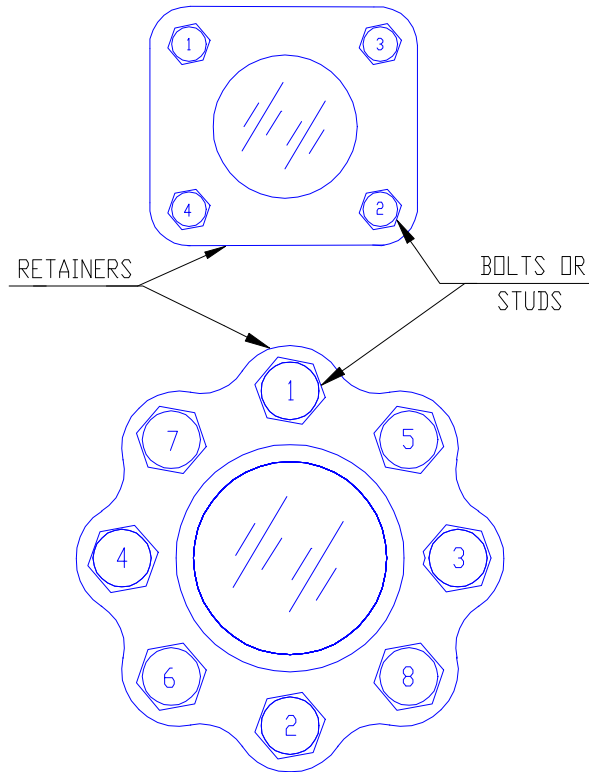


Figure 2

Torque Values in ft-lbs			
Qty of Bolts	ANSI Size	Gasket Type	Torque Value
4	2" 150#	Teflon w/ Non-Asbestos Insert	11
4	3" 150#		18
8	4" 150#		22
8	6" 150#		40
8	8" 150#		45

Table 2

**WARNING**

**Do not torque the nuts of your Bolt On Sight Window while it is under pressure. It will result in incorrect torque values and increase the likelihood of sight window breakage. Before torquing the Bolt On Sight Window it must be free of pressure, allowed to reach ambient temperature and drained of all fluids. Failure to do so could result in personal injury and property damage.**

#### 4.00 Start Up

Prior to placing your BOSW into operation, insure all installation procedures have been completed. Verify the proper torque sequence and values have been applied. Check the sight window for any damage that may have occurred during installation.

Bring the BOSW into service slowly. Rapid pressurization or temperature change will subject the sight window to shock that could significantly shorten its service life or result in failure.

#### 5.00 Maintenance

Periodic maintenance and inspection of your BOSW is recommended to insure the unit is in proper working order. The frequency of maintenance will vary with the application. The end user must determine the appropriate maintenance schedule based upon their experience with the specific application. Realistic maintenance schedules can only be determined with full knowledge of the service and application involved.

### WARNING

**Do not proceed with any maintenance if the Bolt On Sight Window is still at operating pressure or temperature. Relieve the unit of pressure, allow it to reach ambient temperature and purge it of all fluids. Failure to do so could result in personal injury or property damage.**

Any established maintenance procedure should include the following activities.  
Check:

- A) the sight window for signs of damage or wear.
- B) the BOSW for signs of leaks at gaskets.
- C) the BOSW for signs of internal or external corrosion.
- D) bolt torque values.

#### 5.10 Routine Maintenance Activities

### WARNING

**The use of personal safety apparatus when viewing the process fluid or during maintenance is highly recommended. This includes but is not limited to eye and skin protection. Failure to do so could result in personal injury.**

#### 5.11 Sight Window

The sight window should be carefully and regularly inspected. Examine it for evidence of scratches, clouding, etching or any other physical damage. A damaged sight window has been weakened and is susceptible to breaking. Using a concentrated light at a 45° angle to the surface of the sight window will help detect any of these conditions. Damaged areas will glisten more brightly than the surrounding surface.



Clean the surface of your sight window. This can be accomplished by using standard commercial glass cleaner and a soft cloth. Never use an abrasive material, wire brush or scraper.

If damage to the sight window is detected your BOSW should be taken out of service immediately. Do not continue with normal operation until the sight window has been replaced.

#### 5.12 Gaskets

Regularly check your BOSW for evidence of leaks at the gasket surface. If leaks are detected remove the unit from service immediately. Once the gage has reached ambient pressure and temperature verify the torque value on the nuts. If the torque is correct, replace the gaskets.

#### 5.13 Corrosion

Evidence of either internal or external corrosion is an indication that the proper material of construction may not have been chosen for your application. The end user is responsible for determining the material that is compatible with both the process fluid and the surrounding environment. If corrosion is detected the BOSW should be removed from service and the material compatibility investigated by the end user.

### 6.00 Disassembly / Reassembly

#### **DANGER**

**Do not attempt to disassemble your Bolt On Sight Window while it is still in operation. Pressure increases the possibility of the sight window breaking and process fluid escaping. The unit must be relieved of pressure, allowed to reach ambient temperature and purged of all fluids prior to proceeding. Failure to do so could result in personal injury and property damage.**

#### 6.10 Disassembly

The first step in the disassembly of your BOSW is to remove the cap screws. The same pattern used to torque the cap screws should be followed to remove them. Once this is complete, take off the retainer, cushion gasket, sight window and sealing gasket using appropriate safety precautions.

The used sight window and gaskets should be disposed of immediately. They may contain hidden damage and pose a safety risk. Never attempt to reuse these components once they have been in service.

## DANGER

**Never attempt to reuse sight windows or gaskets that have been placed in service. Hidden damage or stress will greatly increase the possibility of the sight window breaking and process fluid escaping. Failure to follow this procedure could result in personal injury and property damage.**

### 6.20 Reassembly

Clean the gasket seating surface of the weld pad and cover flange before proceeding with reassembly. This can be accomplished by using a soft metal scraper. Use extreme care to avoid damaging the seating surface. Failure to properly prepare the surface will result in leaks and sight window breakage.

Check the flatness of both seating surfaces. They must be within 0.005 inches (0.13 mm) T.I.R. If the seating surfaces do not fall within this tolerance and cannot be corrected, the sight port must be replaced.

Follow the procedures outlined in section 3.50

Before finishing your reassembly complete the inspection process outlined in section 3.20. If any signs of damage exist, replace that component before proceeding. The same assembly procedures identified in section 3.50 should be utilized.

## 7.00 Telephone Assistance

For assistance with your L. J. Star Circular Weld Pad Sight Port contact your local representative or the factory. In order to answer your questions quickly and completely please have the following information available.

- Model Number
- Serial Number
- Date the unit was placed in service
- Process media
- Operating pressure
- Operating temperature
- Brief description of problem(s)

**8.00 Exploded Cross Section View**

