

# SAMPLE STANDARD OPERATING PROCEDURE

---

## SOP-EYE-01

## PROCEDURE FOR THE REPAIR OF H.A. PHILLIPS & CO. “LEVEL EYE®” BULLSEYE-TYPE SIGHT GLASSES

**Objective:**

This procedure is performed for the repair of H.A. Phillips & Co. “Level eye®” bullseye-type sight glasses. This procedure provides general guidance to assure that replacement of parts, tightening due to leak, or other repair of these sight glasses is executed safely with no ammonia release to the atmosphere in close proximity to humans or other sensitive receptors.

**Concerns:**

Careful attention to safety is important to this procedure. Among the incidents we are trying to prevent are:

- Injury to operator(s)
- Exposure and injury of all employees to an ammonia release
- Release of ammonia in an hazardous manner

**Plant Lockout / Tagout program should be followed when taking unit or system out of service, maintaining and returning equipment to service. Refer to plant program for details of Lockout / Tagout.**

---

**Department:**

Refrigeration

**Operator:**

Refrigeration or Maintenance Operator

**Equipment:**

Hand Tools

**Location:**

General ASME Pressure Vessel Control Column

**Related documents**

H.A. Phillips & Co. bulletin: LE91-1100

**Function:**

Allow for the safe replacement of parts, tightening due to leak, or other repair of these bullseye sight glasses with no ammonia release to the atmosphere in close proximity to humans or other sensitive receptors.

## SOP-EYE-01

# PROCEDURE FOR REPAIR OF H.A PHILLIPS & CO. “LEVEL EYE®” BULLSEYE-TYPE SIGHT GLASSES

### EQUIPMENT REQUIRED

#### Personal Protective Equipment (PPE) required:

- hard hat
- chemical splash goggles
- full face shield
- gauntlet type rubber gloves

#### Tools and equipment required:

- water bucket with water
- ammonia proof purge hose attached to a pipe nipple with threads to match the purge valve.
- spanner tool described in next section
- torque wrench
- pipe wrench

#### Apparel and clothing required:

- long sleeved shirt
- long pants (not shorts)
- leather shoes or boots

#### For emergency purposes have at hand ready to use:

- full face gas mask with industrial size ammonia canister for each crew member
- SCBA breathing apparatus for each crew member in an easy to access location
- drench shower/eyewash combo (preferred)

*or*

- garden hose attached to water supply

*or*

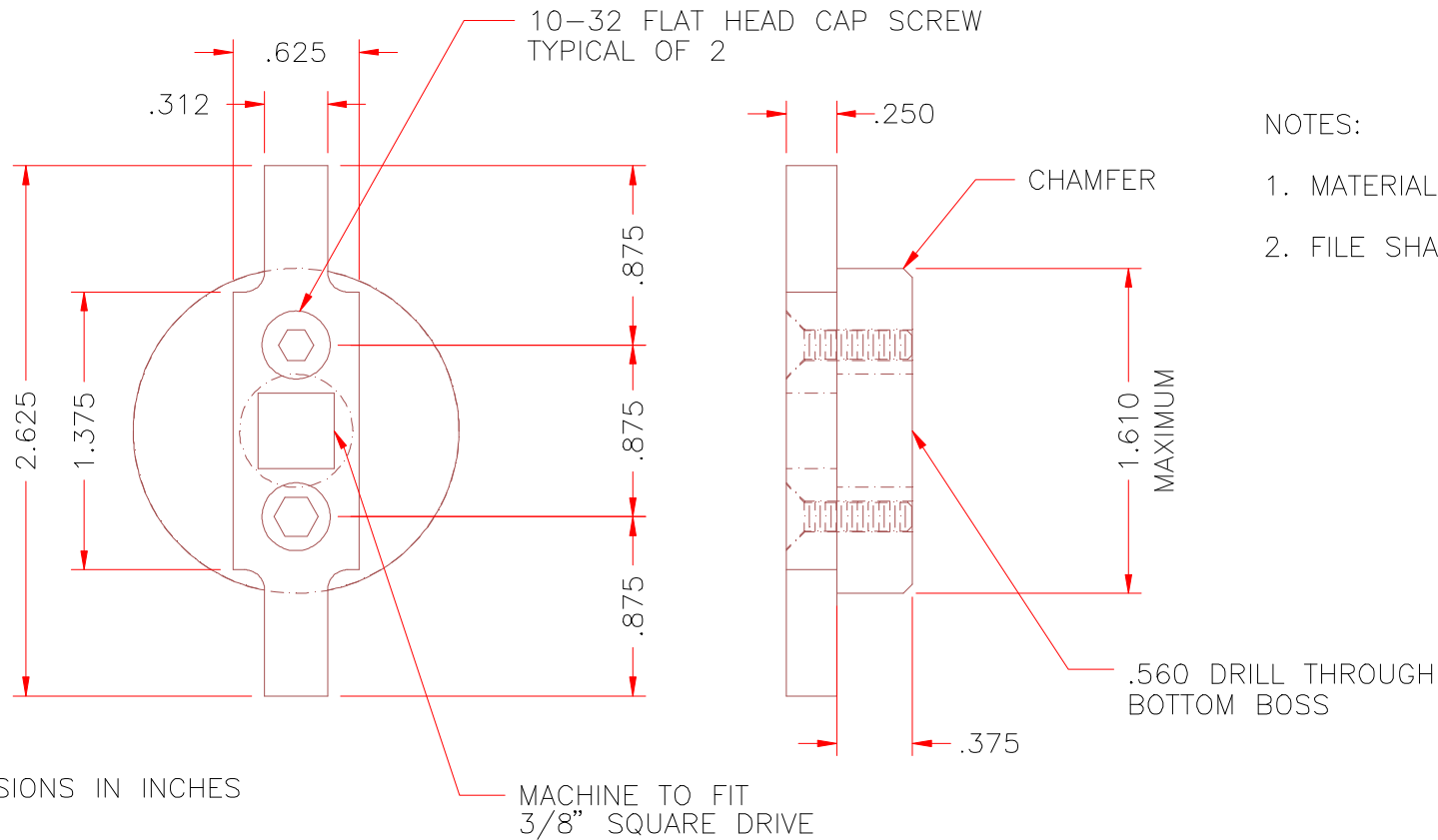
- five (5) gallons fresh water
- portable emergency eye wash
- fire extinguisher (A-B-C rated)

# SOP-EYE-01

# PROCEDURE FOR REPAIR OF H.A PHILLIPS & CO. "LEVEL EYE®" BULLSEYE-TYPE SIGHT GLASSES

## TOOL REQUIRED FOR SERVICING "LEVEL EYE®" SIGHT GLASS

This custom-made tool can be used with a torque wrench.



### NOTES:

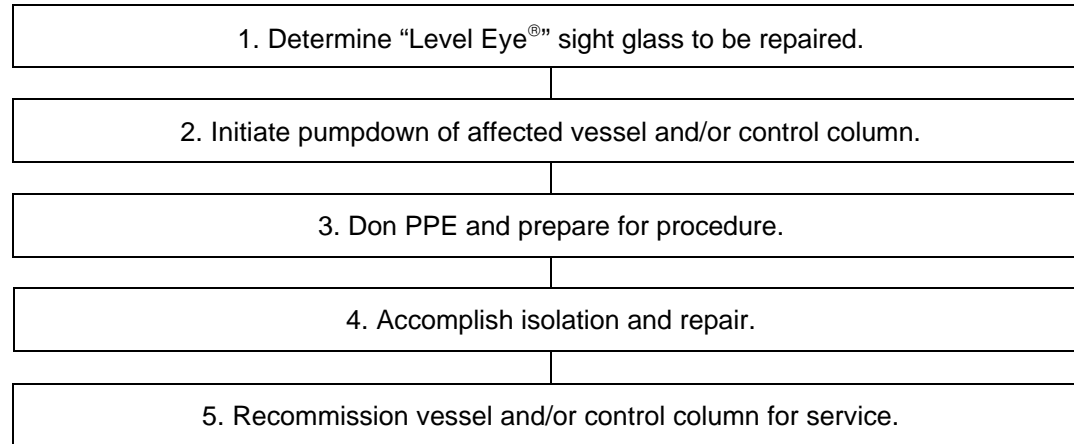
1. MATERIAL: CARBON STEEL
2. FILE SHARP EDGES.

**SOP-EYE-01**

**PROCEDURE FOR REPAIR OF H.A PHILLIPS & CO. “LEVEL EYE®”  
BULLSEYE-TYPE SIGHT GLASSES**

**STANDARD OPERATING PROCEDURE (SOP)**

**TASK FLOW DIAGRAM**



# SOP-EYE-01

# PROCEDURE FOR REPAIR OF H.A PHILLIPS & CO. "LEVEL EYE®" BULLSEYE-TYPE SIGHT GLASSES

TASK	STEP	COMMENTS
1. Determine the "Level Eye®" sight glass to be repaired	1. Determine which "Level Eye®" sight glass is to be repaired.	Use a safe means of determining which "Level Eye®" sight glass is leaking.
2. Initiate pumpdown of affected vessel and/or control column.	1. Lower the vessel liquid level to minimum levels.	<b>NOTE:</b> Do not allow the pump (if the vessel is so equipped) below the minimum liquid level required to prevent pump cavitation..
	2. If the vessel is an accumulator, continue to allow the compressor to run.	This evaporates the remaining liquid in the vessel and/or level column.
	<b>OR</b>	
	2. If the vessel is a high pressure receiver, stop or divert flow from the upstream piping to lower the liquid in the vessel.	This will prevent liquid return to the vessel and/or level column.
	3. When the vessel and/or level column is devoid of liquid, isolate the vessel and/or column from the rest of the system.	If the "Level Eye®" sight glass is on a suction vessel, allow the vessel to pump out until it is in a slight vacuum to reduce the ammonia pressure as low as possible.
3. Don PPE and prepare for procedure.	1. Don required clothing and PPE.	
	2. Prohibit all vehicular and pedestrian traffic in vicinity of operation.	
	3. Close all windows and doors leading into buildings downwind of the sight or other areas of the building.	
	4. Perform visual inspection of "Level Eye®" sight glass and the area.	
	5. Refamiliarize yourself with location of breathing apparatus, escape routes, SCBA location, eyewash and shower station.	

# SOP-EYE-01

# PROCEDURE FOR REPAIR OF H.A PHILLIPS & CO. "LEVEL EYE®" BULLSEYE-TYPE SIGHT GLASSES

TASK	STEP	COMMENTS
3. Don PPE and prepare for procedure. (continued)	6. Determine adequate pumpout.	<b>HAZARD:</b> All liquid must be removed from the system side of the "Level Eye®" and the entire level column and/or vessel before attempting to service, tighten, or repair the sight glass.
	7. Place ladder and tie off to a secure anchor per OSHA requirements, if a ladder is required to access the "Level Eye®". sight glass	
4. Accomplish isolation and repair.	1. Lock-out/Tag-out appropriate isolation valves on the column and/or vessel. Isolate the column and lockout/tagout the valves required so that their position cannot be changed during the procedure.	
	2. Remove the pipe plug (or cap) from the bleed/purge valve.	
	3. Attach pipe nipple with hose attached to the appropriate bleed/purge valve.	The hose should be long enough to be submerged completely to the bottom of a water-filled bucket.
	4. Submerge the hose into the water and fasten the hose to the bucket's bail.	This prevents the hose end from moving out of the water by "jet" action.
	5. Vent high-pressure ammonia gas from the system side of the "Level Eye®" sight glass through the bleed/purge valve into the water.	Water absorbs ammonia vapor. A significant amount of refrigeration oil be present in some control columns.  <b>CAUTION:</b> Do not purge ammonia gas into water if the vessel and/or control column is in a vacuum. This will draw water into the system.  <b>HAZARD:</b> Do not purge liquid ammonia into water. A violent reaction may result.

# SOP-EYE-01

# PROCEDURE FOR REPAIR OF H.A PHILLIPS & CO. “LEVEL EYE®” BULLSEYE-TYPE SIGHT GLASSES

TASK	STEP	COMMENTS
4. Accomplish isolation and repair. (continued)	6. Maintain the bleed/purge valve open to assure that the isolation of the column or vessel is adequate.	Any ice present should be melted before proceeding.
	7. Remove the frost shield, Part Number: 1105, if used.	It should pull straight out.
	8. Slowly unscrew bezel, Part Number: 1102 with the tool described in the “REQUIRED TOOL FOR SERVICING” section.	<b>CAUTION:</b> Check to be sure that there is no pressurized ammonia gas or liquid on the system side of the “Level Eye®” sight glass.  The bezel unscrews counterclockwise.
	9. Remove the sight glass lens, Part Number: 1101 (clear lens) or 1101R (reflex lens), and the gaskets, Part Numbers: 1103 and 1104.	
	10. Clean gasket material and other detritus from the surface of the lens.	<b>CAUTION:</b> Do not use steel wool, polishing cloth, or a scraper to remove gasket material and other detritus from the surface of the lens, as this may damage the lens.  <b>CAUTION:</b> Check the lens to be sure there are no cracks, scratches, or chips present. A slight imperfection may structurally weaken the lens. <u>The lens must be replaced if there is any indication of damage.</u>

# SOP-EYE-01

# PROCEDURE FOR REPAIR OF H.A PHILLIPS & CO. “LEVEL EYE®” BULLSEYE-TYPE SIGHT GLASSES

TASK	STEP	COMMENTS
4. Accomplish isolation and repair. (continued)	11. Replace gaskets, Part Numbers: 1103 and 1104, in the appropriate place along with the undamaged sight glass lens, Part Number: 1101 (clear lens) or 1101R (reflex lens).  <b>NOTE:</b> Always use approved “Like-for-Like” materials in the repair of the refrigeration system components. “Change-in-Kind” procedures per 29 CFR 1910.119, OSHA Process Safety Management, remain in effect for all refrigeration system repairs.	<b>NOTE:</b> The gaskets should receive a light coating of refrigeration oil or suitable antiseize compound.  <b>NOTE:</b> The Neoprene gasket goes on the inside of the lens and acts as the sealer gasket. The fiber gasket prevents damage to the lens when tightened.  <b>NOTE:</b> Always use new gaskets to reassemble the “Level Eye®” bullseye.
	12. Screw the bezel, Part Number: 1102, onto the bullseye housing with the tool described in the “REQUIRED TOOL FOR SERVICING” section.	<b>Do not overtighten. An applied torque of approximately 30 ft-lbs. is required to tighten the bezel.</b>  <b>NOTE:</b> A light coating of the threads of the bezel with a suitable antiseize compound is advisable before installation.
	13. Replace the frost shield, Part Number: 1105, if used.	
5. Recommission vessel and/or control column for service.	<ol style="list-style-type: none"> <li>1. Pressure test the vessel and/or control column before applying system pressure to the the “Level Eye®” assembly. Repair leaks, if necessary.</li> <li>2. Close bleed/purge valve and remove attached ammonia purge hose.</li> <li>3. Pull a vacuum on the vessel and/or control column as appropriate.</li> <li>4. Once the integrity of the “Level Eye®” sight glass seals are established, open the isolation valves to the column or the system.</li> </ol>	

# SOP-EYE-01

## PROCEDURE FOR REPAIR OF H.A PHILLIPS & CO. “LEVEL EYE®” BULLSEYE-TYPE SIGHT GLASSES

TASK	STEP	COMMENTS
	5. Place the equipment into operation.	<b>NOTE:</b> Use the Standard Operating Procedure (SOP) to place the piece of equipment back into operation.
	6. Remove PPE.	
	7. Give “ALL CLEAR” signal to open doors, windows, etc. and allow vehicular and pedestrian traffic	
	8. Secure all tools and equipment utilized.	