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OPW Installation & Maintenance Instructions

ASSEMBLY, INSTALLATION, and MAINTENANCE INSTRUCTIONS FOR OPW 71SO VAPOR TIGHT, OVERFILL PREVENTION VALVES.

IMPORTANT: Please read these assembly and installation instructions completely and carefully before starting.



Vapor Tight Overfill Prevention Valves

GENERAL INSTRUCTIONS

The OPW 71SO Overfill Prevention Valve is designed for tight fill, gravity drop applications to help prevent accidental or intentional overfilling of underground storage tanks. It is installed in the UST drop tube in place of a standard drop tube. The main 71SO valve closes when liquid level is at 95% of the top of the tank. A small bypass valve remains open to allow the delivery hose to drain at 3-5 gallons per minute. If the delivery truck valve is not closed after initial shut-off, the bypass valve will close and will restrict all fuel delivery.

The 71SO models of the 71SO are designed to be installed with the following OPW products: Face Seal Adaptor, OPW Spill Container or Multi-port, Jack Screw Kit, Rotatable Product Adaptor, and Product Cap.

IMPORTANT

Read these assembly and installation instructions completely and carefully prior to starting. Check to make sure all parts have been provided. Use only the parts supplied; substitution of parts may cause product failure.

Failure to follow instructions may cause improper product operation or premature failure which may permit storage tank overfill. An overfilled storage tank may create hazardous conditions and/or environmental contamination.

CAUTION

Do not remove elastic band from around float until instructed to do so, as damage to valve may result.

WARNING

Failure to properly connect delivery hose and elbow, and/or disconnecting a liquid filled delivery hose or elbow will result in a hazardous spill, which may result in personal injury, property damage, fire, explosion, and water and soil pollution.

- * Make sure all connections, including the hose and elbow connections, between storage tank and transport are securely coupled.
- * Make sure the lip seal and/or all gaskets in the delivery elbow are properly in place to prevent spills.
- * Do not operate with damaged or missing parts, which prevent tight connections.

Normal Operation: A Hose "Kick" and reduced flow signal that the tank is full. Close transport delivery valve and drain hose into tank before disconnecting any hose fitting.

Overfilled Tank: Failure of the hose to drain after closing the delivery valve signals an overfilled tank. Do Not Disconnect any delivery hose fitting until the liquid level in the tank has been lowered to allow the hose to drain into the tank.

WARNING

In the event you are splashed with fuel remove wet clothing immediately. Skin contact with gasoline can cause chemical burns and may result in inhalation of vapors that may be fatal. Never go inside confined areas after being splashed and never go near ignition sources.

IMPORTANT

Determine if the underground storage tank is equipped with a ball float vent valve, as illustrated in Figure 24. In all systems, the shutoff point of the 71SO must be reached before the ball float reduces flow to ensure proper overfill valve operation.

TOOLS NEEDED FOR INSTALLATION AND ASSEMBLY:

1. 71SO-TOOL or 71SO-TOOLC (includes the following)

- a. Sharp 3/16" drill bit with stop b. Punch
- D-::II
- Drill
 Hammer
- 4. Tape measure
- 5. Hacksaw or cut-off saw, fine tooth; 24 teeth/inch
- 6. Fine half round file
- 7. Screwdriver Phillips blade
- 8. Fine grit sandpaper / steel wool
- 9. Grease, black moly
- 10. Torque Wrench
- 11. Band clamp (3-3/4" diameter minimum)

WARNING

Using electrically operated equipment near gasoline or gasoline vapors may result in fire or explosion, causing personal injury and property damage. Check to assure the working area is free from such hazards, and always use proper precautions.

IMPORTANT: The figures in this installation and maintenance instruction may contain vapor recovery equipment (including model numbers) that is not certified by the California Air Resources Board (CARB) for a specific Phase I Vapor Recovery System. Please refer to Exhibit 1 of the appropriate CARB Phase I Executive Order for a list of certified Phase I Vapor Recovery System Equipment.

71SO Parts Diagram



HOW TO LOCATE THE POSITION OF THE 71SO AT 95% TANK CAPACITY

The length of the upper tube and the placement of the 71SO valve body determine the shut-off point. Following the standard instructions for the OPW 71SO will provide for initial shutoff at 95%. In all cases, the upper tube length must be a minimum of 6-1/2" plus the length of the riser pipe. All length measurements are in inches.

INSTRUCTIONS

- 1.) Find tank capacity (in gallons) from tank calibration chart provided by tank manufacturer.
- 2.) Calculate 95% of capacity.
- 3.) Locate the 95% volume number on the tank calibration chart.
- 4.) Find the dipstick number (X) which corresponds to the 95% tank volume. And, find the dipstick number (Y) which corresponds to the 100%volume.
- 5.) Subtract the dipstick number (X) from the tank diameter (Y) to find the upper tube reference number (Z).
 (Y) (X) = (Z)
- 6.) Subtract 2" from (Z) to find the upper tube depth (C).
 - (Z) 2" = C
- 7.) Is C less than 6-1/2"?
- **NO** Upper tube length is C plus the distance from the top of the Face Seal Adaptor installed on the riser pipe to the inside, top lip of the storage (A).

Upper Tube Length = C + (A)

YES Upper tube length is 6-1/2" plus the riser pipe measurement (A).

Upper Tube Length = 6-1/2" + (A)

NOTE: You must find the actual tank capacity number that correlates to the 6-1/2" + (A) depth for the station records. This number may also be used for the purposes of calibrating an electronic tank level system.



Figure 1

EXAMPLE

- 1.) For an Owens-Corning Model G-3 Fiberglass® Tank Calibration Chart: Tank Capacity - 10,000 gal., nominal 9,403 gal. **NOTE: Use actual capacity only**
- 2.) 95% of actual tank capacity = 0.95 x 9403 gal. = 8933 gal.
- 3.) The closest number which is less than 8933 gal. Is 8910 gal. Choosing the closest number less than 95% of actual capacity ensures that the initial shutoff will occur when the tank is no more than 95% full.
- The calibration chart reading of 8910 gal. corresponds to a dipstick measurement of 82".
- 5.) Dipstick number (X) = 82"Tank diameter (Y) = 92"(Y) - (X) = (Z) (92"-82" = 10")(Z) = 10"
- 7.) (Z) 2" = C (10" 2" = 8") C = 8"
- 7.) Is 8" less than 6-1/2"?
- NO Measure the distance from the top of the FSA-400 Face Seal Adaptor installed on the riser pipe to the inside, top lip of the storage tank and obtain measurement (A).

Upper tube length = C + (A)

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ASSEMBLY INSTRUCTIONS

IMPORTANT: Each of the numbered steps in the installation instructions are designed as a CHECK LIST to ensure proper installation and trouble free operation of the OPW 71SO Overfill Prevention Valve.

Read and follow these steps carefully, checking them off as you proceed.

Figure numbers correspond to step numbers for easy reference.

STEP 1: MEASURE

Install the OPW Face Seal Adaptor and the OPW Thread-on Spill Container on the Fill Riser (Refer to the Installation Instructions Supplied with the Spill Container). Insert the 71SO measuring stick through the riser pipe and hook it under the inside of the tank in the lengthwise direction. Mark the measuring stick at the top of the Face Seal Adaptor threads inside the base of the spill container bucket just below the drain valve outlet window (See Figure 1 &1A). The top flange on the 71SO will rest on the Face Seal Adaptor just below the drain valve outlet, and be locked in place between the Face Seal Adaptor and the 4" nipple that is installed in the spill container with the Jack Screw Kit (See Figure 1A). (For riser pipe configurations other than that shown, consult installation drawings or use other necessary means to measure Dimension "A").

Using a tape measure, measure the distance from the top of the Face Seal Adaptor in the spill container to the bottom of the tank (Dim. "B").

IMPORTANT: Inspect the riser pipe for any foreign material. Over spray from tank relining or any internal burrs inside of pipe must be removed prior to installation. Failure to have an unobstructed riser pipe may prevent proper installation and operation of the valve. The 71SO is designed for installation into schedule 40 riser pipes. The 71SO cannot be installed into schedule 80 riser pipes.

STEP 2: MARK THE TUBE

Use the result from STEP 1 and HOW TO LOCATE THE POSITION OF THE 71SO AT 95% TANK CAPACITY to mark the upper tube. Measure the distance from the seam where the upper tube and valve body meet. For "C" measurements less than or equal to 6-1/2" see Figure 2. For "C" measurements greater than 6-1/2" use a tape measure to mark the calculated upper tube length onto the upper tube.









Figure 2 (For "C" less than or equal to 6-1/2" only)

STEP 3: CUT THE UPPER DROP TUBE

Attach the supplied band clamp to the upper tube just below the mark and ensure that it is assembled square to the tube. The clamp can be used as a guide for making a square cut. If a vise is used, clamp on the valve body casting only to avoid damage to the float and tubes (See Figure 3A). Carefully saw through the tube squarely, at the mark made in Step 2. Use a hacksaw with a new finetooth blade. Rotating the upper tube as the sawing progresses will minimize run out and ensure a square 90-degree cut. Remove the band clamp after tube is cut.

<u>CAUTION</u> -DO NOT use a pipe or tubing cutter to cut the upper drop tube, this may damage the tube, causing it to be out of round thereby prohibiting assembly of the unit.

IMPORTANT: Remove all chips and shavings generated in steps 3 thru 5 out of the cut end of the tube. DO NOT remove chips and shavings by dumping thru valve body.







Figure 3B

STEP 4: FILE THE UPPER DROP TUBE File the upper tube square, and remove any burrs or rough edges. Make sure the cut is flat and square.

IMPORTANT: Carefully file a **good chamfer** on the inside edge of the drop tube to provide a lead-in for the polypak seal and inlet tube installed in step 8.



Figure 4

STEP 5: SAND THE UPPER DROP TUBE Sand the inside of the drop tube with sandpaper and/or steel wool to remove all burrs and sharp edges. After sanding wipe down the inside of the tube with a clean rag from the top to approximately 4 inches down to remove any debris.

Caution: Failure to properly chamfer, sand, and clean the drop tube may cut the seal and result in a failure of a pressure decay leak test.



STEP 6: APPLY GREASE TO DROP TUBE

Apply black moly grease to the inside diameter of the upper drop tube. Make sure coverage is completely around the tube as shown in Figure 6.



STEP 7: APPLY GREASE TO POLYPAK SEAL Ensure that the polypak seal is installed on the inlet tube with the lip up as shown in Figure 7. Apply

black moly grease to the polypak as shown. Make sure coverage is completely around the polypak seal.





STEP 8: INSTALL INLET TUBE

Insert the inlet tube into the upper tube until the upper tube seats against the flange on the inlet tube. Ensure polypak is inserted evenly and stays in inlet tube groove.



Figure 8 SEE PAGE 8 FOR INSTRUCTIONS USING THE 71SO-TOOL.

SEE PAGE 9 FOR INSTRUCTIONS USING THE 71SO-TOOLC.

71SO-TOOL PROCEDURE BELOW, FOR 71SO-TOOLC, SEE PAGE 9

STEP 9A: INSERT 71SO-TOOL OVER INLET TUBE

To install the 71SO-TOOL (sold separately) over the inlet tube, first loosen all three knobs, so the tool can pass freely over the inlet tube flange. Align the slot on the tool with the key on the inlet tube and insert the tool down. See Figure 9A.



STEP 10A: TIGHTEN THE 71SO-TOOL

Use the three view holes to ensure that the tool seats out flat against the top of the inlet tube. To prevent vertical movement of the tool during drilling hand tighten all three knobs evenly the upper drop tube. See Figure 10A.

STEP 11A: PREPARE DRILL AND BIT

Confirm that the stop on the 3/16" drill bit supplied with the 71SO-TOOL is in the correct position before drilling. The stop is factory installed at a distance between 2" to 2-1/16" from the tip with the 71SO-TOOL. If the stop is not at the correct position it must be fixed before drilling. <u>Caution:</u> If the drill stop is not in the proper location failure of a pressure decay leak test may result.



Figure 11A

STEP 12A: DRILL HOLES

With the inlet tube and 71SO-TOOL in place, carefully drill a 3/16" diameter hole in the upper tube using the drill bushing in the knob as a guide. The drill stop is positioned so it will bottom out against the knob after the bit has drilled through the upper drop tube. If the stop is positioned wrong either no hole will be drilled, or a through hole could potentially be drilled through the inlet tube. If no hole is drilled return to step 11 and check the stop dimension. If a hole is drilled through the inlet tube or into the screw hole the assembly is not salvageable. Drill (2) more holes in the two remaining knobs.



Figure 12A

71SO-TOOLC PROCEDURE BELOW, FOR 71SO-TOOL, SEE PAGE 8

STEP 9B: INSERT 71SO-TOOLC OVER INLET TUBE

To install the 71SO-TOOLC (sold separately) over the inlet tube, first loosen the thumb screw, so the tool can pass freely over the inlet tube flange. Align the slot on the tool with the key on the inlet tube and insert the tool down. See Figure 9B.



STEP 10B: TIGHTEN THE 71SO-TOOLC

Ensure that the tool seats flat against the top of the inlet tube. To prevent vertical movement of the tool during drilling, hand tighten the thumb screw against the upper drop tube. See Figure 10B.

STEP 11B: PREPARE DRILL AND BIT

Confirm that the stop on the 3/16" drill bit supplied with the 71SO-TOOLC is in the correct position before drilling. The stop is factory installed at a distance between 1-3/16" to 1-1/4" from the tip with the 71SO-TOOLC. If the stop is not at the correct position it must be fixed before drilling. <u>Caution:</u> If the drill stop is not in the proper location failure of a pressure decay leak test may result.



STEP 12B: DRILL HOLES

With the inlet tube and 71SO-TOOLC in place, carefully drill a 3/16" diameter hole in the upper tube using the hole in the 71SO-TOOLC as a guide. The drill stop is positioned so it will bottom out against the tool after the bit has drilled through the upper drop tube. If the stop is positioned wrong either no hole will be drilled, or a through hole could potentially be drilled through the inlet tube. If no hole is drilled return to step 11 and check the stop dimension. If a hole is drilled through the inlet tube or into the screw hole the assembly is not salvageable. Drill (2) more holes in the two remaining guide holes.



Figure 12B

STEP 13: DIMPLE FIRST HOLE

Remove tool. Remove any chips or burrs from the drilling operation. Place the assembly on a solid surface. Using the punch supplied with the 71SO-TOOL and 71SO-TOOLC, align the tip of the punch with the drilled hole and dimple the upper drop tube by striking the punch with a hammer until the drop tube is formed into countersunk hole in the inlet tube. After punching, remove any chips that may have fallen into the inlet tube screw hole.





STEP 14: ASSEMBLE FIRST SCREW

Ensure that the drop tube was formed into the countersunk screw hole as shown in Figure 14 if not return to step 13. Apply black moly grease to screw and tighten first screw into inlet tube with a screwdriver. Use only the taptite screws that are supplied with the unit. Seating torque is 20 in-lbs min. to 35 in-lbs max. Screw head should be flush with the drop tube. Do not over tighten.





STEP 15: DIMPLE REMAINING HOLES

Remove any chips or burrs from the drilling operation. Dimple the next (2) holes as done in Step 13. Make sure the assembly is on a solid surface when punching. After punching, remove any chips that may have fallen into the inlet tube screw hole.





STEP 16: ASSEMBLE OTHER SCREWS

Apply black moly grease to screws and tighten the other (2) screws into inlet tube with a screwdriver as done in Step 14. Use only the taptite screws that are supplied with the unit. Seating torque is 20 inlbs min. to 35 in-lbs max. Do not over tighten.

STEP 17: APPLY GREASE TO LOWER O-RING AND BODY THREADS

Apply black moly grease to the lower tube o-ring and body threads as shown. Make sure coverage is completely around the o-ring. Install o-ring in groove just above threads.





STEP 18: LOWER TUBE ASSEMBLY

If a vise is used, clamp on the valve body casting only to avoid damage to the float and tubes. Thread the lower tube onto the valve body until the lower tube bottoms out on valve body. Tube can be tightened by hand or with a strap wrench. If a strap wrench is used try to position it on the threaded insert portion of the lower tube to prevent damaging the tube.



Figure 18

Note: Before installing the valve in the tank, a pressure test can be performed on the valve to check for vapor tightness. Seal off both ends of the tube with inflatable plumber's plugs. Apply a maximum 10" W.C. (1/3 PSI) air pressure. If pressure does not hold and a leak can be located with soap solution, do not install the valve. Send the valve back to OPW for warranty evaluation. **Caution:** Do not over-pressurize. Excess pressure can damage the valve.

STEP 19: CUT LOWER TUBE

Measuring from the underside of the inlet tube flange, mark the overall length of the drop tube a distance of (B) minus 6". Determine dimension (B) from the measurements taken in Step 1, Figure 1 (Top of the Face Seal Adapter below the drain valve outlet in the spill container to the bottom of the tank). Saw off the excess tube at a 45-degree angle or per local codes or requirements and file off any sharp burrs (Refer to Figure 24). Optional: Install the OPW Tank Bottom Protector on the lower tube (Refer to Installation instructions supplied with the Tank Bottom Protector).

IMPORTANT: Remove all chips and shavings out of the cut end of the tube. DO NOT remove chips and shavings by dumping thru valve body.

STEP 20: PREPARE FILL RISER FOR VALVE INSERTION

IMPORTANT: Inspect the riser pipe for any foreign material. Over spray from tank relining or any internal burrs inside of pipe must be removed prior to installation. Failure to have an unobstructed riser pipe may prevent proper installation or operation of the valve. Thoroughly clean top of riser pipe.

STEP 21: REMOVE ELASTIC BAND

Remove the elastic band securing the float to the valve body. The float will move into an outward position.

STEP 22: INSERT DROP TUBE

Make sure the upper O-Ring gasket is under the flange of the inlet tube. Hold the float down against the valve body and slowly insert the drop tube overfill valve into the riser pipe. Do not force valve into the riser pipe. If any obstruction or foreign matter interferes with smooth insertion of the valve, the riser pipe must be

cleared.

WARNING Failure to follow the assembly and installation instructions or use of excessive force to insert the OPW 71SO will VOID THE WARRANTY!



Figure 22

Difficulty in removing the existing fill tube (if there is one) means there may be an obstruction in the riser pipe. Look for burrs, deformations, excess tank lining material or other projections that may interfere with easy insertion of the OPW 71SO. The 71SO is designed for insertion into schedule 40 pipe. If schedule 80 pipe has been used for the riser, the 71SO cannot be installed. If seamed pipe has been used, the internal weld bead may interfere with the OPW 71SO and prevent installation. If the OPW 71SO won't slip in easily DON'T FORCE IT! Damage to the valve may result if excess force is used. Examine the riser pipe carefully; determine the nature of the obstruction; take appropriate steps to remove it.

STEP 23: CHECK INSTALLATION

Insert the drop tube all the way into the tank until the flange and gasket seat onto the top of the Face Seal Adaptor. The float will swing out into the operating position as it passes into the tank.



Figure 23

Make sure that the float is aligned along the length of the tank. The length of the tank can easily be determined by locating other manholes or pump boxes that are installed around other tank fittings. Look into the drop tube and align the deflector with the length of the tank.

<u>CAUTION</u>: No obstruction in the tank can be within 14" from the center of the riser pipe or the valve may not operate properly (See Figure 24).

STEP 24: ALIGN VALVE

Install the OPW Jack Screw Kit and a 4" NPT nipple to lock the valve in place. Refer to the Installation Instructions supplied with the Jack Screw Kit. Install the Rotatable Product Adaptor (Refer to Installation Instructions supplied with the Product Adaptor.) Make sure that the valve does not rotate while tightening the adaptor by observing the position of the deflector. **The valve must remain aligned along the length of the tank as in Step 23**. Repeat this step as necessary to assure proper valve alignment.



Figure 24





STEP 25: INSTALL WARNING PLATE

Bend the three warning plate ears down then slide the tie wrap over the warning plate ears and position warning plate against riser pipe approximately 1" below the adaptor. Tighten the tie wrap securely. The valve is now fully installed and in operating position.





Figure 26 – Product Identification

Figure 25

STEP 26: VALVE REMOVAL

The valve can be removed for tank leak testing, inspection, etc., by removing the Rotatable Product Adaptor, the 4" nipple, and the Jack Screw Kit. Reinstall per the above instructions.

STEP 27: ELECTRONIC LIQUID LEVEL MONITORING

If an electronic level monitor is installed, it must be calibrated to match the top of the 71SO valve body, which must correlate with 95% of the actual tank capacity.

PREVENTATIVE MAINTENANCE

Annually, inspect the flapper in the 71SO to see that it is open by looking down the drop tube opening. Test the 71SO drop tube seals with CARB procedure TP-201.1D. If the drop tube seal passes testing, no further maintenance is required. If the drop tube fails testing, replace the drop tube seal with OPW P/N: H11931M for 4" Tubes. Re-test the 71SO drop tube with CARB procedure TP-201.1D. The lower tube o-ring seal OPW P/N: H14840M can also be replaced. If this does not correct the leak the 71SO needs to be replaced.

<u>CAUTION:</u> Do not insert any foreign object into drop tube if flapper is in the closed position. For example a tank level measuring stick. This will damage the valve and void the Warranty. ALWAYS check flapper location before "sticking" the tank. If flapper is in the closed position the tank is either over filled and you need to wait until the liquid level goes down or the 71SO is damaged and needs to be replaced.

71SO Performance Specifications:

This Overfill Prevention Valve has been manufactured and tested to, and met, the following California specifications. Performance Requirement: Leak rate to be less than or equal to 0.17 CFH @ 2.0" W.C.

Torque Specification:

Taptite Screws, #10-24 thread cutting, 20 in-lbs minimum to 35 in-lbs maximum.

Important: Leave these installation instructions and maintenance procedures with the station operator.

Notice: OPW products must be used in compliance with applicable federal, state, and local laws and regulations. Product selection should be based on physical specifications and limitations and compatibility with the environment and material to be handled. All illustrations and specifications in this literature are based on the latest production information available at the time of publication. Prices, materials, and specification are subject to change at any time, and models may be discontinued at any time, in either case, without notice or obligation.

Standard Product Warranty

OPW warrants that products sold by it are free

from defects in materials and workmanship for a period of one year from the date of manufacture by OPW (ECO products two years from date of manufacture.) Proof of purchase may be required. As the exclusive remedy under this limited warranty, OPW, will at its sole discretion, repair, replace, or issue credit for future orders for any product that may prove defective within the one year date of manufacture period (repairs, replacements, or credits may be subject to prorated warranty for remainder of the original warranty period, complete proper warranty claim documentation required.) This warranty shall not apply to any product that has been altered in any way, which has been repaired by any party other than a service representative authorized by OPW, or when failure is due to misuse, or improper installation or maintenance. OPW shall have no liability whatsoever for special, incidental or consequential damages to any party, and shall have no liability for the cost of labor, freight, excavation, clean up, downtime, removal, reinstallation, loss of profit, or any other cost or charges.

For any product certified to California 2001 standards, OPW warrants that product sold by it are free from defects in material and workmanship for a period of one year from date of manufacture or one year from date of registration of installation not to exceed 15 months from date of manufacture by OPW.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND SPECIFICALLY THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.



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