

California Environmental Protection Agency

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**ARB Approved**

**Installation, Operation and Maintenance Manual**

For

Executive Order

VR-302-F

(Standing Loss Control Vapor Recovery System for  
New Installations of Aboveground Storage Tanks)

**May 14, 2014**

## NOTICE:

The **ARB Approved Installation, Operation and Maintenance Manual for the Standing Loss Control Vapor Recovery System for New Installations of Aboveground Storage Tanks (AST)** describes the tools and methods required to install the Standing Loss Control Enhanced Vapor Reduction (EVR) System.

The AST manufacturers written instructions, procedures and guidelines will be adhered to when installing, operating and maintaining ASTs or the warranty will be void. It is the owner's (of the AST) responsibility to ensure that the Standing Loss Control EVR System is properly and safely installed, operated and maintained on their ASTs. The owner may also choose to hire any qualified contractor or technician to install, operate and maintain the Standing Loss Control EVR System on their ASTs. All the current requirements of state, federal and local codes for installation and repair of gasoline dispensing equipment must be adhered to. Installation, operation and maintenance of the Standing Loss Control EVR System must also meet all the necessary safety precautions and site safety requirements to assure a safe and trouble free installation.

A list of recommended qualified technicians/contractors can be located by contacting the manufacturer of the Standing Loss Control EVR System. The following is a list of manufacturers and their contact information:

### Pressure/Vacuum Vent Valves Manufacturers

**Husky Corporation**  
2325 Husky Way  
Pacific, Missouri 63069  
Phone: (800) 325-3558  
<http://www.husky.com/husky/>

**Franklin Fueling Systems**  
3760 Marsh Road  
Madison, Wisconsin 53718  
Phone: (800) 285-9787  
<http://www.franklinfueling.com>

### Aboveground Storage Tank (AST) Manufacturers

**Modern Custom Fabrication  
SuperVault AST**  
2421 E. California Avenue  
Fresno, California 93721  
Phone: (800) 800-8268  
<http://www.supervault.com>

**ConVault Incorporated  
ConVault AST**  
4109 Zeering Road  
Denair, California 95316  
Phone: (800) 222-7099  
<http://www.convault.com>

**Steel Tank Institute  
Fireguard AST**  
944 Donata Court  
Lake Zurich, Illinois 60047  
Phone: (847) 438-8265  
Phone: (936) 756-7731  
<http://www.steeltank.com>

**Containment Solutions, Inc.  
Hoover Vault AST**  
5150 Jefferson Chemical Rd  
Conroe, Texas 77301-6834  
Phone: (877) 274-8265  
<http://www.containmentsolutions.com>

**Above Ground Tank Vault**  
**Above Ground Tank Vault AST**  
P.O. Box 1487  
Arroyo Grande, California 93420  
Phone: (800) 743-6745

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## EQUIPMENT CHECKLIST

From the list below, check the box for each component you used:

### Pressure/Vacuum Vent Valve

- Husky  
5885
- Franklin Fueling Systems,  
PV-Zero

### Protected Aboveground Storage Tanks

- SuperVault MH Series AST
- Steel Tank Institute  
Fireguard AST
- ConVault Incorporated  
ConVault AST
- Containment Solutions, Inc.  
Hoover Vault AST
- Above Ground Tank Vault  
Above Ground Tank Vault AST

# INSTALLATION CHECK LIST

Site Location:  
(name) \_\_\_\_\_

Address: \_\_\_\_\_

City/State: \_\_\_\_\_ Contact/Phone: \_\_\_\_\_

Installing Contractor:  
(name) \_\_\_\_\_

Address: \_\_\_\_\_

City/State: \_\_\_\_\_ Contact/Phone: \_\_\_\_\_

Tank Number: \_\_\_\_\_ Product: \_\_\_\_\_ Capacity: \_\_\_\_\_

Tank Number: \_\_\_\_\_ Product: \_\_\_\_\_ Capacity: \_\_\_\_\_

Tank Number: \_\_\_\_\_ Product: \_\_\_\_\_ Capacity: \_\_\_\_\_

Installing Technician:  
(name): \_\_\_\_\_

Technician Certification  
Number: \_\_\_\_\_

Signature: \_\_\_\_\_

Yes/No	Initials

1. Is all of the installed equipment for Standing Loss Control EVR listed in ARB Executive Order (E.O.) VR-302?

**NOTE: All Standing Loss Control Vapor Recovery installed equipment must be listed in E.O. VR-302. See attached Exhibit 1 Checklist, and check each item installed.**

Yes/No	Initials

2. Pressure/Vacuum Vent Valve  
Is there a P/V valve installed on the top of each (gasoline) vent pipe (a maximum of three EVR P/V valves per GDF) or manifold?

a. P/V vent valve(s) torqued to \_\_\_\_\_ ft. lbs.

Yes/No	Initials

3. SuperVault MH Series  
Has the SuperVault AST been installed with the proper pressure/vacuum vent valve?

a. Describe any issues: \_\_\_\_\_  
\_\_\_\_\_

Yes/No	Initials

4. Steel Tank Institute Fireguard AST

Has the Fireguard AST been installed with the proper pressure/vacuum vent valve?

a. Describe any issues: \_\_\_\_\_  
\_\_\_\_\_

Yes/No	Initials

5. ConVault AST

Has the ConVault AST been installed with the proper pressure/vacuum vent valve?

a. Describe any issues: \_\_\_\_\_  
\_\_\_\_\_

Yes/No	Initials

6. Containment Solutions, Inc. Hoover Vault AST

Has the Hoover Vault AST been installed with the proper pressure/vacuum vent valve?

a. Describe any issues: \_\_\_\_\_  
\_\_\_\_\_

Yes/No	Initials

7. Above Ground Tank Vault – AGT Vault AST

Has the AGT Vault been installed with the proper pressure/vacuum vent valve?

a. Describe any issues: \_\_\_\_\_  
\_\_\_\_\_

**Summary of Maintenance<sup>1</sup>**  
**Required of the Standing Loss Control Vapor Recovery System**

Component	Interval	Maintenance To Be Performed
<b>Pressure/Vacuum Vent Valve</b> Husky 5885	Annual	1. Remove screws that hold on the top cover. Do not remove the screens. 2. Remove any debris from inside the lower cover 3. Check the drain holes in the lower cover. 4. Reinstall the top cover 5. Tighten the screws firmly
Franklin Fueling Systems PV-Zero	Annual	1. Visually inspect the housing, pipe, fittings, and rain cap for obvious signs of damage, missing parts, or fluid leaks. 2. Visually inspect the rain cap, from ground level, for signs of bird nests or insect activity. 3. Drain and inspect the fill fluid per the Fluid Inspection Procedure in IOM.
<b>Protected Aboveground Storage Tank (AST)</b> All tanks listed in Exhibit 1	Annual	1. Inspect the tank exterior to ensure the integrity of the coating for chips or corrosion. 2. Check for small cracks and any signs of Leakage. 3. Check readability of signs and decals

**(End of maintenance table.)**

<sup>1</sup> These maintenance requirements shall not circumvent use of the manufacturer's installation and maintenance instructions. Maintenance contractors or owner/operators shall refer to the manufacturers complete installation and maintenance instructions found herein to ensure that all maintenance requirements are met. Maintenance must be conducted within the interval specified from the date of installation and at least within the specified interval thereafter

**IOM 2  
Husky  
Model 5885**

	MODEL #5885 Recommended Installation, Maintenance and Inspection Instructions	5885
	<b>EVR Pressure Vacuum Vent</b>	

WARNING Designed for use at motor fuel dispensing facilities only.

**INSTALLATION INSTRUCTIONS**

NOTE: Always adhere to installation / usage instructions and warnings. Improper use may result in injury, damage or hazardous spill.

1. Remove the vent from the carton and visually inspect for any shipping damage.
2. Apply fuel resistant pipe sealant to the threads on the 2" vent stack.
3. Screw the Pressure Vacuum (P/V) vent onto the vent stack and tighten to a range of 20 to 50 ft-lbs with a suitable wrench.
4. **DO NOT OVERTIGHTEN**

**TESTING / MAINTENANCE / INSPECTION**

Testing Criteria Per TP201.1E and Exhibit 3 of applicable Phase 1 E.O.

Leak rate: Pressure = .05 CFH @ 2" wc, Vacuum = .21 CFH @ -4" wc.  
Cracking Pressure = 2 1/2" to 6" wc, Vacuum = -6" to -10" wc.



*Annually Inspect the P/V vent valve for foreign objects:*

1. Remove the screws that hold on the top cover. Do not remove the screens.
2. Remove any debris from inside the lower cover.
3. Check the drain holes in the lower cover.
4. Reinstall the top cover.
5. Tighten the screws firmly.

- All drive aways, maintenance and inspection activities must be logged using the serial number of the individual product.
- Apply city, state, or federal testing regulations as appropriate.

**ANY TEST / INSPECTION FAILURE REQUIRES IMMEDIATE EQUIPMENT REPLACEMENT OR REMOVAL FROM SERVICE.  
MADE IN THE USA**



**ALWAYS ADHERE TO INSTALLATION / USAGE INSTRUCTIONS AND WARNINGS.**



Improper use may result in injury, damage, or hazardous spill.

**GENERAL WARNINGS / INSTRUCTIONS**

- Use of equipment is at individuals' own risk.
- Always abide and adhere to city, state, and federal regulations regarding use and installation of dispensing equipment.
- Always follow the dispenser manufacturer's instructions.
- Always turn off all power to dispenser during maintenance and inspection activities.
- Always close the shear valves during maintenance and inspection activities.
- Always relieve pressure from system prior to performing maintenance activities.
- Always check continuity after installation using a megohmmeter (Refer to PEI RP 400 for details).
- Always replace or remove from service damaged or leaking dispensing equipment immediately.
- Always report leaks / spills / accidents to appropriate authorities.
- Always wear appropriate safety equipment during maintenance activities.
- Always have appropriate fire extinguishing equipment within 5 feet of dispensers.
- Always use pipe sealant approved for gasoline service.
- Always place containers on the ground before filling.
- Always discharge static electricity before using or servicing equipment by touching a metal part of the dispenser before and after fueling vehicle.
- Never smoke within 20 feet of dispensers.
- Never keep in service past recommended life.
- Never leave the nozzle unattended while dispensing fuel.
- Never use sparking or flaming devices within 20 feet of dispensers.
- Never use power tools near dispensers or to aid in the installation process.
- Never use cell phone within 20 feet of dispensers.
- Never reenter car when fueling vehicle.
- Never allow gasoline to touch eyes or skin.
- Never use at flow rates in excess of regulatory guidelines.
- Never use at flow rates less than 5 gallons per minute.
- Never dispense flammable material into unapproved containers.
- Never dispense fuel without a valid driver's license.

**CAUTION: DO NOT ALTER OR COVER THE P/V VENT**

## TROUBLESHOOTING GUIDE

- |                                |  |
|--------------------------------|--|
| Pressure Decay Test Failure... | 1. Test vent to CARB TP201.1E.<br>2. Replace vent. |
|--------------------------------|--|
- 

### For stations with ISD monitoring

- |               |  |
|---------------|--|
| Vapor leak... | 1. Verify other equipment is not the cause.<br>2. Test vent to CARB TP201.1E<br>3. Replace vent. |
|---------------|--|
- 
- |   |                 |
|---|-----------------|
| Exceeds allowable system cracking pressure... | 1. Replace vent |
|---|-----------------|
- 

## GENERAL TECHNICAL DATA

Fuel Type	Test and warranty for gasoline and diesel fuel
Body	Sand cast aluminum
Screens	Stainless Steel 40 mesh
Seal	Nitrile Foam
Covers	Aluminum
Weight	1.2 lbs
Threads	2" NPT
Case Quantity	20
Listings	CARB 
Patents	5,957,157

## ACCESSORIES

### **Part #5041 3" to 2" Threaded Adaptor**

#### Installation Procedure:

1. Visually inspect the o-ring and threads for chips, dirt & debris.
  2. Apply fuel resistant pipe sealant to the 3" NPT threads of the vent pipe.
  3. Screw the P/V vent adaptor onto the vent stack by hand.
  4. Apply fuel resistant pipe sealant to the 2" NPT threads of the P/V vent adaptor.
  5. Screw the P/V vent onto the adaptor and tighten to a range of 20 to 50 ft-lbs. with a suitable wrench. Do not overtighten.
- 

### **Part #5426 Test Adaptor**

NOTE: This adaptor is designed to fit on the inlet of the P/V Vent to allow for field and lab tests.

#### Installation Procedure:

1. Screw P/V Vent adaptor into the P/V Vent valve until hand tight. Make sure the seal is compressed.
  2. Place the P/V Vent valve and adaptor on a flat surface.
  3. Attach a 3/16" hose (Tygon fuel tubing) from test apparatus to hose barb on the side of the adaptor.
  4. After testing, remove hose from barb and remove adaptor from vent.
-

**IOM 2  
Franklin Fueling System (FFS)  
PV-Zero**



***PV-ZERO***<sup>™</sup>  
**Liquid-Filled Pressure/Vacuum Vent Valve**  
*FFS P/N 407215901*

**Installation, Testing  
and Maintenance Manual**

Franklin Fueling Systems • 3760 Marsh Rd. • Madison, WI 53718 USA  
Tel: +1 608 838 8786 • 800 225 9787 • Fax: +1 608 838 6433 • [www.franklinfueling.com](http://www.franklinfueling.com)

**Warning**  This symbol identifies a warning. A warning sign will appear in the text of this document when a potentially hazardous situation may arise if the instructions that follow are not adhered to closely. A potentially hazardous situation may involve the possibility of severe bodily harm or even death.

**Caution**  This is a caution symbol. A caution sign will appear in the text of this document when a potentially hazardous environmental situation may arise if the instructions that follow are not adhered to closely. A potentially hazardous environmental situation may involve the leakage of fuel from equipment that could severely harm the environment.

**Danger**  This symbol identifies an electrical danger. An electrical danger sign will appear in the text of this document when a potentially hazardous situation involving large amounts of electricity may arise if the instructions that follow are not adhered to closely. A potentially hazardous situation may involve the possibility of electrocution, severe bodily harm, or even death.

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**Warning**  Follow all federal, state and local laws governing the installation of this product and its associated systems. When no other regulations apply, follow NFPA codes 30, 30A and 70 from the National Fire Protection Association. Failure to follow these codes could result in severe injury, death, serious property damage and/or environmental contamination.

**Warning**  Always secure the work area from moving vehicles. To help eliminate unsafe conditions, secure the area by using a service truck to block access to the work environment, or by using any other reasonable means available to ensure the safety of service personnel.

**Warning**  The PV-ZERO is used with tanks containing gasoline or other flammable substances, you may create an explosion hazard if you do not follow the requirements in this manual carefully.

### Description of the FFS PV-ZERO Liquid Filled P/V Vent Valve

The PV-ZERO operates using a similar concept to a common P-Trap used in plumbing drain applications to create a liquid air seal. The liquid seals the UST ullage vapors from the atmosphere while still maintaining the proper differential pressure set-points. After the differential pressure has been exceeded, air or vapor bubbles through the liquid media until the pressure returns to the operational pressure settings. Figures 1-3 illustrate the operation of the PV-ZERO.

The PV-ZERO has no moving parts and the only maintenance required is periodic inspection of the liquid.

Because the PV-ZERO does not use seals or gaskets to seal off the UST ullage from atmosphere, the unit will not allow vapor or air to pass through at pressure less than the cracking set-point. As long as the valve is filled with 1.6 liters (54 ozs) of PV-ZERO fluid, the stainless steel valve housing is not damaged, and the pipe fittings are correctly installed, the unit should be leak free.

The liquid used for the PV-ZERO unit is silicone-based and has a very low vapor pressure and low toxicity.

The PV-ZERO can be mounted either at the top of the vent rack or in-line (mid-mount at working level). To avoid the risk of climbing a ladder and to maximize the simplicity of inspection and service, the preferred installation of the PV-ZERO is to be mounted in-line. It can be mounted on a single riser pipe or many riser pipes manifolded to a single line. The PV-ZERO is designed to mount on 3" riser piping, but can also be installed on 2" riser piping.

See drawings on pages 9-11 for mounting options.

\*\*\* Refer to CARB EVR documents regarding equipment rules for manifold systems.\*\*\*

A support frame should be used for mounting all vent riser piping and must be used to stabilize the piping above the PV-ZERO if it is to be mounted in-line.

If the PV-ZERO is to be top mounted, the support frame must stabilize the piping below the unit (and the unit itself). Check local agencies for support frame requirements and consult a licensed structural engineer if in doubt of the structural integrity of the vent rack support system.

**Note:** Do not mount the PV-ZERO unit on a free standing vent piping system without a support frame!

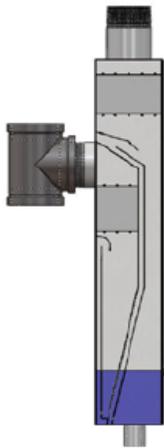


Figure 1: No Differential

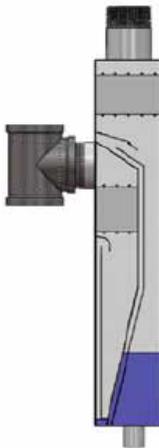


Figure 2: Positive Cracking

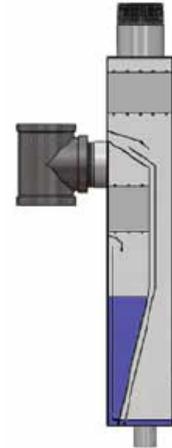


Figure 3: Negative Cracking

## Installation

**Note:** Use a thread sealant that is approved for gasoline and gasoline-ethanol blends such as Gasoila Soft Set or Jomar Heavy Weight for all threaded pipe fittings and plugs. The 3" side tee and 1" bottom drain plug are factory installed. Tighten all fittings per recognized industry installation standards.

1. Thread the bottom of the 3" side tee onto the vent riser piping. The PV-ZERO may be mounted mid-line or top mounted on a single riser or a manifolded system (see drawings, pages 9 & 10). For 2" riser piping systems, use a 3x2" NPT reducing coupling with a 3" pipe nipple at least 6" long (see drawing, page 11).
2. Make sure the PV-ZERO unit is plumb within  $\pm 3^\circ$  and not set at an angle. Failure to set in the vertical position may cause improper operation.
3. For mid-line mounting installations, install and secure the rest of the 3" discharge piping on the vent rack (refer to NFPA 30 for specific fuel system vent piping requirements). **Be sure to use a pipe wrench to counteract the tightening force to the valve!**
4. Fill the PV-ZERO unit through the side port with 1.6 liters (54 oz.) of PV-ZERO fluid (FFS p/n 407220001) provided with the unit. It may also be filled through the discharge outlet fitting (top). **Do not pour into the 3" side tee fitting!**

**Note:** To fill the fluid in the PV-ZERO, the UST (Underground Storage Tank) must be open to the atmosphere OR the inflatable test plug needs to be installed to reach the correct level. If the tank is under pressure or vacuum, the correct fill level cannot be obtained.

5. Install the side plug.
6. Perform the **Field Testing Procedure**.
7. Install the 3" pipe plug on top of the tee.
8. Attach the 3" upward-venting rain cap provided. Attach to the top of the vent pipe (mid-mount installation) or directly to the top of the PV-ZERO (top mount) **Keep the rain cap installed to minimize water intrusion, and to ensure proper operation.**

The PV-ZERO may be painted, however, do not paint over or cover the nameplate placards decals.

## Field Testing

**Note:** Compliance testing of the PV-ZERO, if required by the local air quality district, shall be conducted in accordance with California Air Resources Board (CARB) test procedure TP-201.1E and Exhibit 2 of the Executive Order. This test shall be conducted using the PV-ZERO test cap assembly (FFS p/n 407225901) with the valve in its installed condition. The PV-ZERO can be tested without removing the unit from the vent rack.

There are (3) ports on the PV-ZERO test cap assembly (see page 8):

- 1 – Schrader valve connection for the inflatable plug
- 1 – 1/4" hose barb (for pressure/vacuum supply)
- 1 – 1/8" hose barb (for manometer)

1. Remove 3" pipe plug from top of tee (if necessary).
2. Install the test cap assembly through the top of the 3" tee, allowing the inflatable plug to extend into the vent riser pipe - tighten fully.
3. Inflate the inflatable plug to 35 PSI.
4. Test per CARB TP-201.1E
5. Deflate the inflatable plug.
6. Remove test cap assembly from 3" tee.

### Recommended Maintenance Intervals

- **Every year:** Visually inspect the housing, pipe, fittings, and rain cap for obvious signs of damage, missing parts, or fluid leaks.
- **Every year:** Visually inspect the rain cap, from ground level, for signs of bird nests or insect activity.
- **Every year:** Drain and inspect the fill fluid per the *Fluid Inspection Procedure*.

### Fluid Handling

The PV-ZERO is filled with a silicone based fluid, p/n 407220001 (contact FFS for MSDS sheet). The PV-ZERO fill fluid is resistant to UV exposure, does not support bioactivity and is resistant to oxidation.

Since the PV-ZERO is exposed to tank ullage vapors, used PV-ZERO fill fluid may contain trace amounts of ethanol and gasoline. The maintenance technician servicing the PV-ZERO should wear appropriate eye protection and nitrile gloves when inspecting or servicing the fill fluid. Check with local and state regulations regarding handling, transportation, recycling and disposal of silicone based fluids.

### Fluid Inspection Procedure

1. Remove the 3" NPT plug from the top of the side tee.
2. Remove the 3/8" NPT side plug.
3. Remove the 1" NPT bottom plug and drain the fluid into a clean, transparent container.
4. Visually inspect the fill fluid for debris or water contamination. Since the specific gravity of the fluid is slightly less than water, any water in the fluid will settle to the bottom. The fluid can be reused indefinitely as long as it is free of sediment and water.

Note: Clean fluid can be refilled into the valve and topped off with new fluid, or it can be completely replaced with new fluid.

5. Reinstall the 1" NPT bottom plug.
6. Refill the PV-ZERO valve with fluid through the side-port until it spills out of the port. This is the correct fill level of 1.6 liters (54 oz.).
7. Reinstall the 3/8" NPT side plug.
8. Perform the *Field Testing Procedure*
9. Reinstall the 3" NPT plug in the top of the side tee.

Only use the approved PV-ZERO fluid (P/N 407220001). Substitution of other fluids voids the warranty and can cause vapor leaks!

### PV-ZERO Specifications

Height:	33.5"
Width:	5.0"
Length:	12.3"
Dry weight:	20#
Inlet piping connection	3" NPT
Discharge piping connection	3" NPT
Fill port	3/8" NPT
Drain port	1" NPT
Construction material	304 stainless steel
Fuel Compatibility	Gas & E85
Pressure leak rate	<< 0.05CFH at +2.0 W.C.
Vacuum leak rate	<< 0.21 CFH at -4.0 W.C.
Pressure drop at 60 cfm flow rate with tank positive pressure	14" W.C.
Pressure drop at 90 cfm flow rate with tank positive pressure	28" W.C.
Minimum operating temperature	-40°F (-40°C)
Maximum operating temperature	130°F (54°C)
Maximum test pressure	5 PSI
Maximum mounting angle deviation from vertical	3°

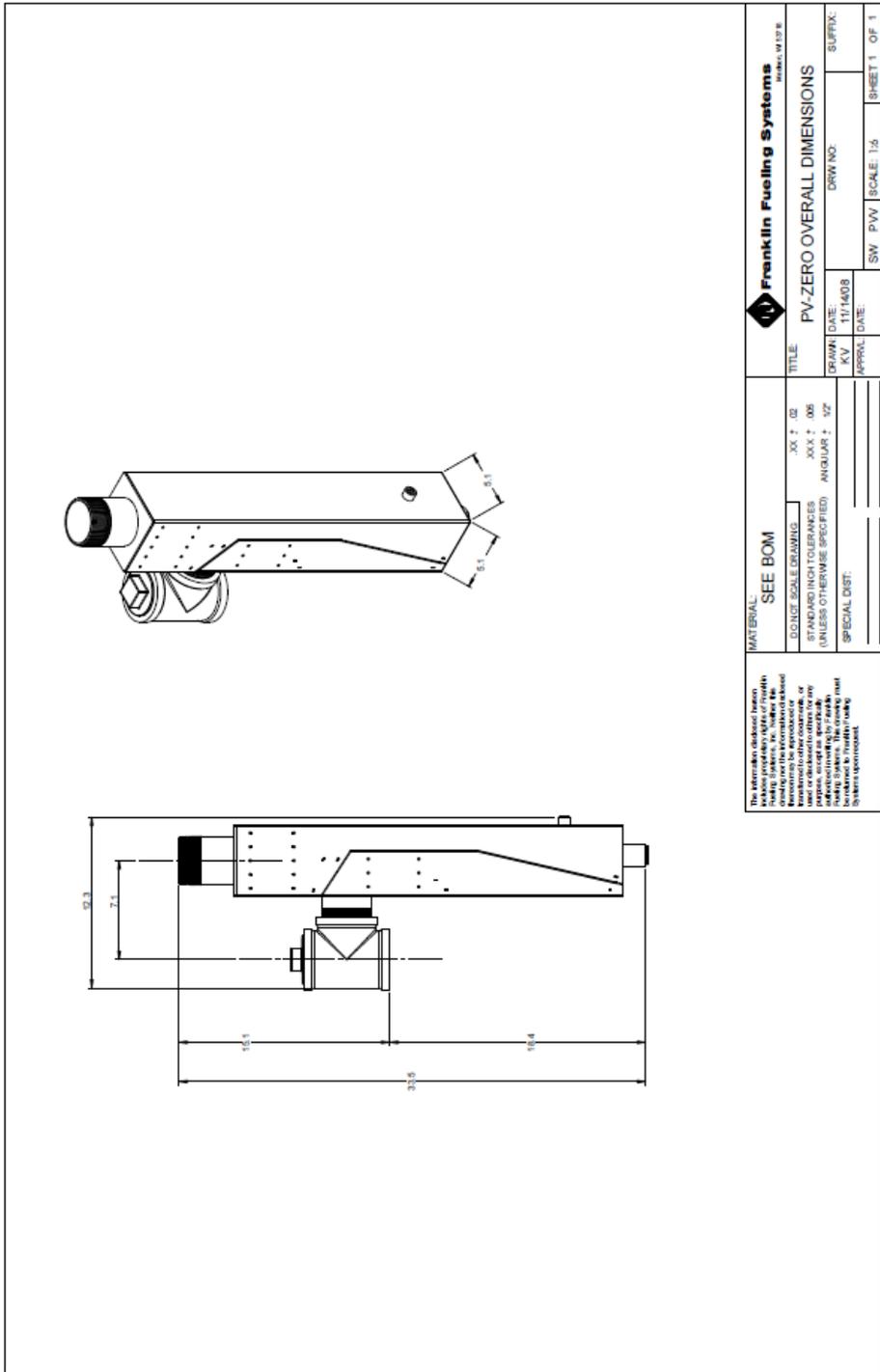
### Drawing List:

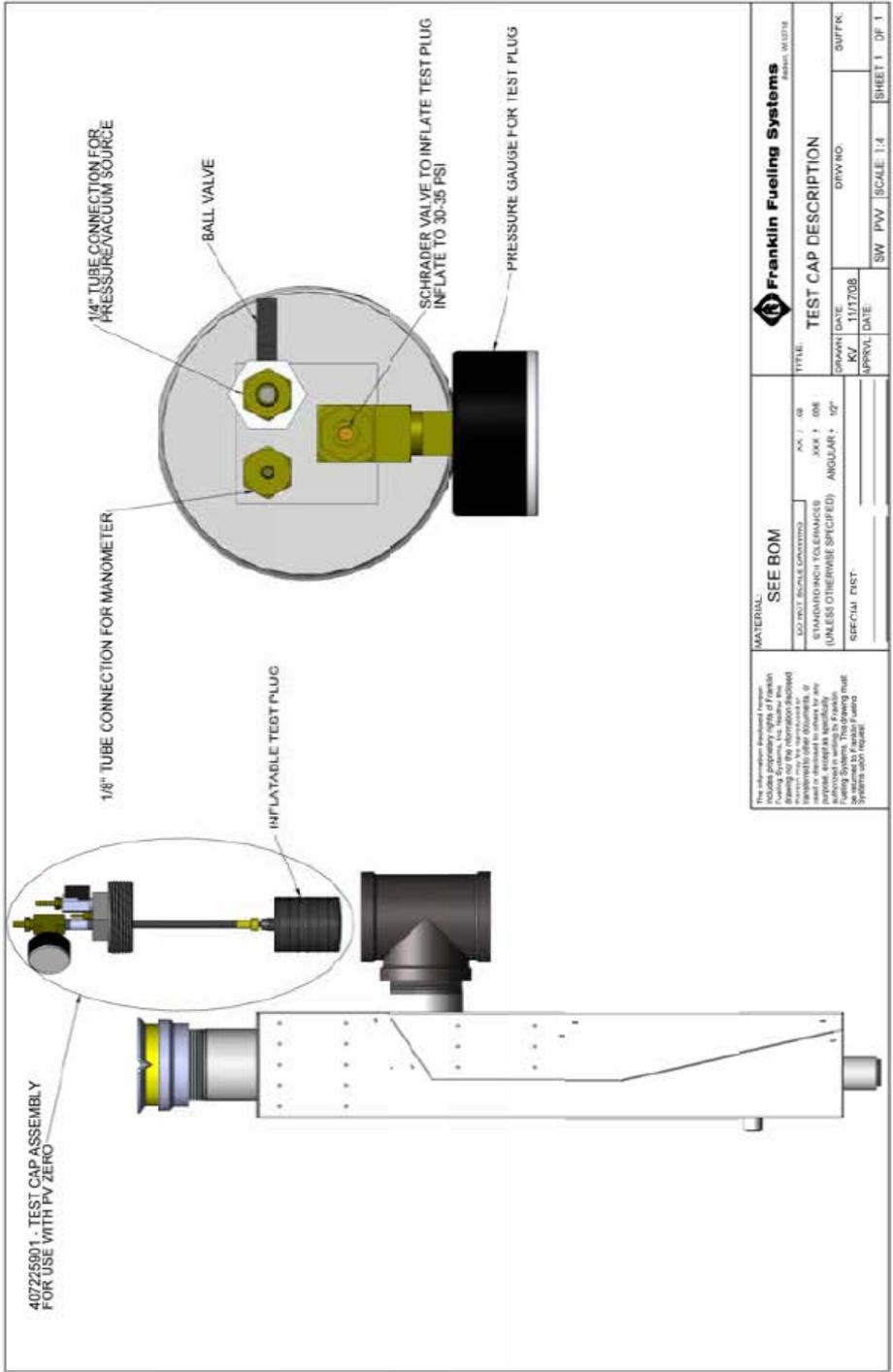
Page	Drawing Description
6	PV-ZERO Operating Assembly
7	PV-ZERO Overall Dimensions
8	Test Cap Description
9	3" Manifolder Mid Mount
10	3" Mounting Assembly
11	2" Mounting Assembly

The drawings are on the following pages.

6

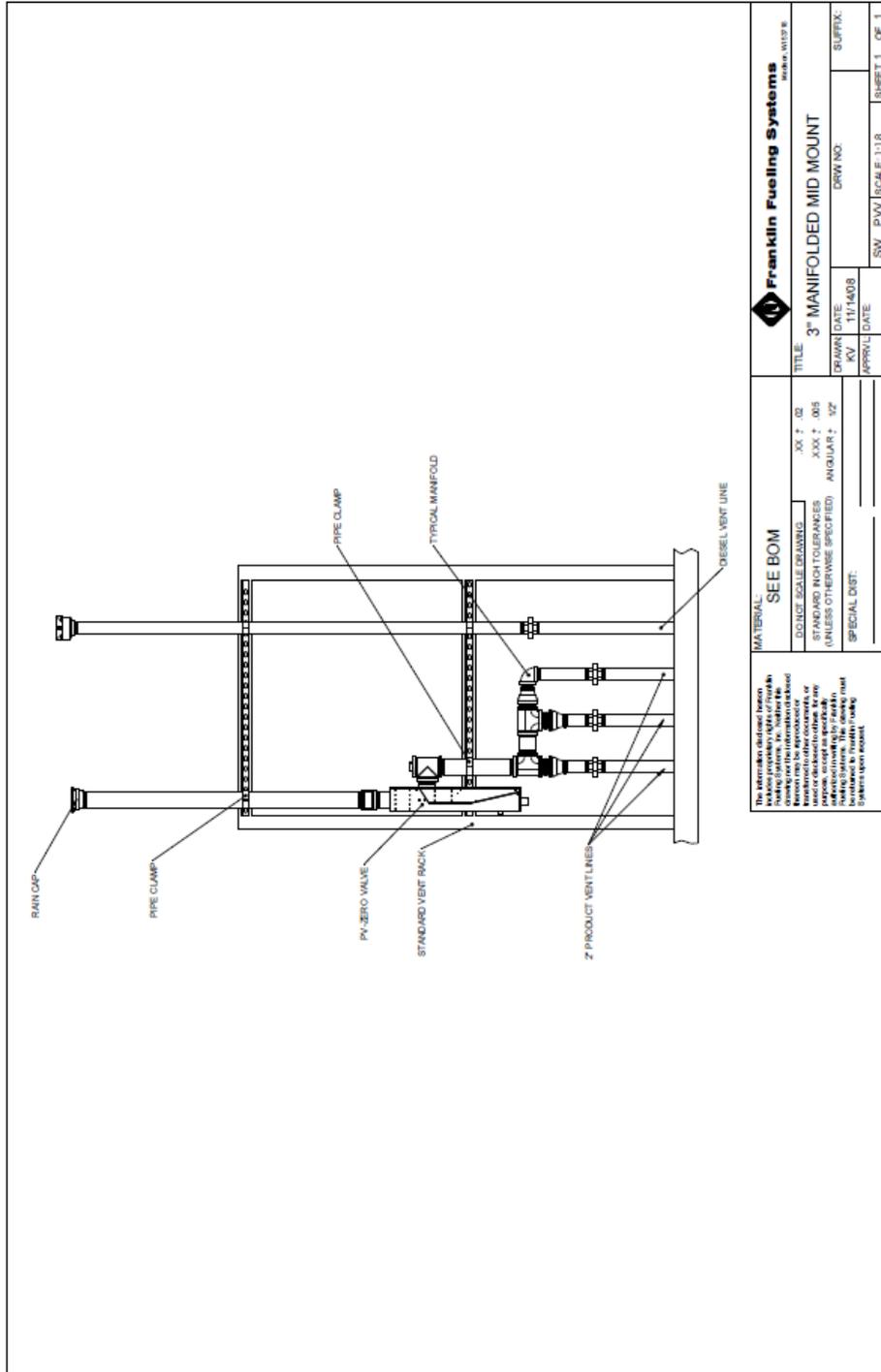
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">8</td><td style="width: 10%;">NOT PROVIDED</td><td style="width: 70%;">** 3/2 NPT READING COUPLING</td><td style="width: 10%; text-align: center;">1</td></tr> <tr><td>7</td><td>NOT PROVIDED</td><td>** 3/4 NPT NIPPLE (MIN OF #1)</td><td style="text-align: center;">1</td></tr> <tr><td>6</td><td>4072001</td><td>3/4 NPT SQUARE HEAD PIPE PLUG</td><td style="text-align: center;">1</td></tr> <tr><td>5</td><td>4072001</td><td>3/4 NPT TEE</td><td style="text-align: center;">1</td></tr> <tr><td>4</td><td>4072001</td><td>PLUG BRASS 1/2 NPT</td><td style="text-align: center;">1</td></tr> <tr><td>3</td><td>4075401</td><td>PLUG BRASS 3/4 NPT</td><td style="text-align: center;">1</td></tr> <tr><td>2</td><td>8052001</td><td>TANK VENT ASSY. 3"</td><td style="text-align: center;">1</td></tr> <tr><td>1</td><td>4072001</td><td>PV-ZERO BODY ASSEMBLY</td><td style="text-align: center;">1</td></tr> <tr><td>ITEM</td><td>PART NUMBER</td><td>DESCRIPTION</td><td>QTY</td></tr> </table>	8	NOT PROVIDED	** 3/2 NPT READING COUPLING	1	7	NOT PROVIDED	** 3/4 NPT NIPPLE (MIN OF #1)	1	6	4072001	3/4 NPT SQUARE HEAD PIPE PLUG	1	5	4072001	3/4 NPT TEE	1	4	4072001	PLUG BRASS 1/2 NPT	1	3	4075401	PLUG BRASS 3/4 NPT	1	2	8052001	TANK VENT ASSY. 3"	1	1	4072001	PV-ZERO BODY ASSEMBLY	1	ITEM	PART NUMBER	DESCRIPTION	QTY	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>3" VENT RISER</p> </div> <div style="text-align: center;"> <p>2" VENT RISER</p> </div> </div> <div style="text-align: center; margin-top: 20px;"> <p>6" MIN LENGTH</p> </div>	<p style="text-align: right;">DRAW NO: 407215901</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>REV</td><td>DESCRIPTION</td><td>ECN INC</td><td>BY</td><td>DATE</td></tr> <tr><td>1</td><td>ENGINEERING RELEASE</td><td>402055</td><td>KVJ/PH</td><td>11/14/08</td></tr> </table> <p style="text-align: center;"><b>Franklin Fueling Systems</b></p> <p>TITLE: PV-ZERO OPERATING ASSEMBLY</p> <p>SCALE: XX, 7.02 STANDARD INCH TOLERANCES: .004, ±.005 (UNLESS OTHERWISE SPECIFIED) ANGULAR: ±.12"</p> <p>DRAWN DATE: 11/14/08 BY: JJK CHECK DATE: 11/14/08 BY: JJK</p> <p>DRWNO: 407215 SCALE: 1:1 SHEET 1 OF 1</p>	REV	DESCRIPTION	ECN INC	BY	DATE	1	ENGINEERING RELEASE	402055	KVJ/PH	11/14/08
8	NOT PROVIDED	** 3/2 NPT READING COUPLING	1																																													
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5	4072001	3/4 NPT TEE	1																																													
4	4072001	PLUG BRASS 1/2 NPT	1																																													
3	4075401	PLUG BRASS 3/4 NPT	1																																													
2	8052001	TANK VENT ASSY. 3"	1																																													
1	4072001	PV-ZERO BODY ASSEMBLY	1																																													
ITEM	PART NUMBER	DESCRIPTION	QTY																																													
REV	DESCRIPTION	ECN INC	BY	DATE																																												
1	ENGINEERING RELEASE	402055	KVJ/PH	11/14/08																																												
<p style="text-align: center;">MATERIAL: SEE BOM</p> <p>DO NOT SCALE DRAWING STANDARD INCH TOLERANCES (UNLESS OTHERWISE SPECIFIED)</p> <p>SPECIAL DET:</p>		<p><small>This information is the property of Franklin Fueling Systems, Inc. Neither the whole nor any part of this information may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without the prior written permission of Franklin Fueling Systems, Inc.</small></p>																																														



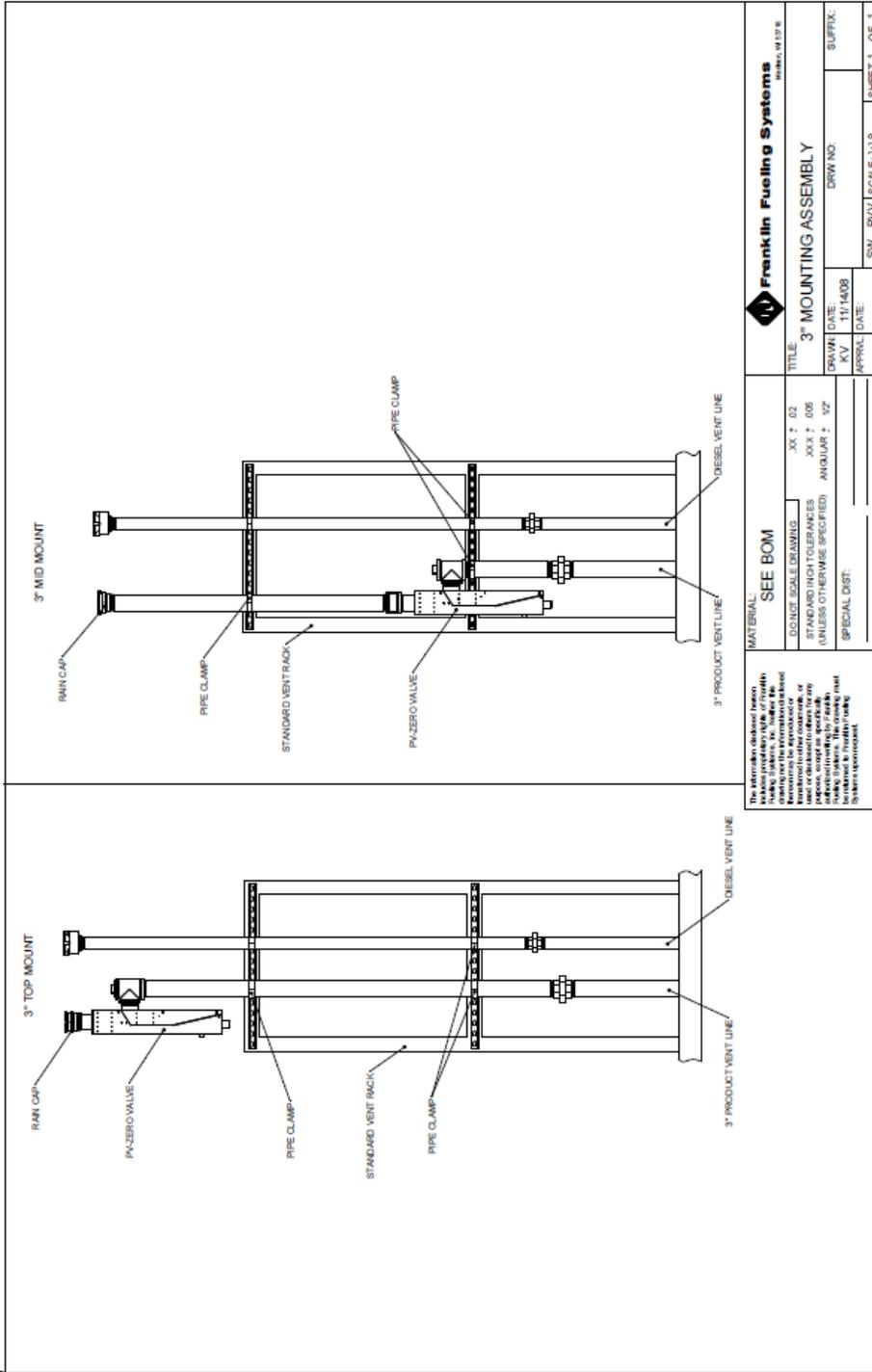


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MATERIAL: SEE BOM		REV. NO. 08		DATE: 11/17/08	
SPEC. NO. 304-1-008		DRAWN BY: KJ		APPROVED BY: DUFFK	
TITLE: TEST CAP DESCRIPTION		DRAWN DATE: 11/17/08		SCALE: 1:4	
SHEET 1		OF 1		SHEET 1	



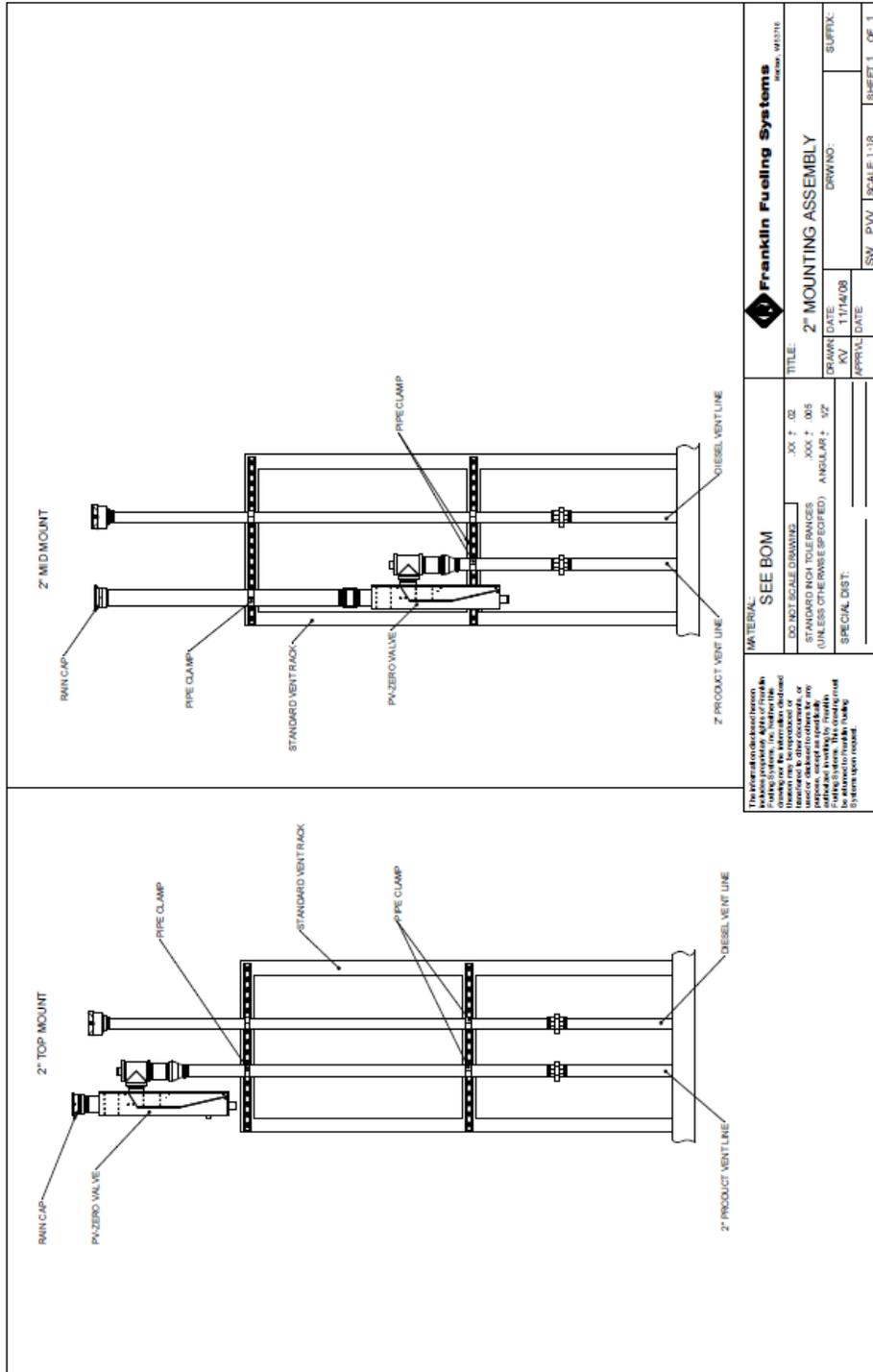
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<p><b>MATERIAL:</b>  <b>SEE BOM</b></p>		<p><b>TITLE:</b>          3" MANIFOLDED MID MOUNT</p>
<p>DO NOT SCALE DRAWING</p>	<p>XX ? 02</p>	<p>DRAWN DATE:          KV 11/14/08</p>
<p>STANDARD TIGHT TOLERANCES          (UNLESS OTHERWISE SPECIFIED)</p>	<p>XXX ? 005          ANGLEULAR ? 1/2"</p>	<p>APPROVAL DATE:          SW P/W SCALE 1:18</p>
<p>SPECIAL DIST:</p>		<p>SHEET 1 OF 1</p>



<b>Franklin Fueling Systems</b> <small>Model: M 107 B</small>	
TITLE <b>3" MOUNTING ASSEMBLY</b>	DRAWN BY P/V
DATE 11/14/08	DRW NO. SW - PVV
APPROVAL DATE:	SCALE: 1:18
SPECIAL DIST:	SHEET 1 OF 1

MATERIAL: SEE BOM  
 DIMENSIONS: SEE DRAWING  
 STANDARD TOLERANCES: UNLESS OTHERWISE SPECIFIED  
 ANGULAR: ± 1°  
 SURFACE FINISH: UNLESS OTHERWISE SPECIFIED

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<b>2" MOUNTING ASSEMBLY</b>	
TITLE: 2" MOUNTING ASSEMBLY	DRAWN: GROWNO
DRAWN DATE: 1/11/08	SUPPL:
APPROVAL DATE:	SW P/V SCALE 1:18 SHEET 1 OF 1
MATERIAL: SEE BOM	
DO NOT SCALE DRAWING	XX 1 02
STANDARD HIGH TOLERANCES (UNLESS OTHERWISE SPECIFIED)	.0005 ANGULAR ± .02
SPECIAL DIST:	

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## **Franklin Fueling Systems**

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IOM 3  
SuperVault MH Series AST

***SUPERVAULT MH***  
**Multi-Hazard Rated**

INSULATED AND PROTECTED  
ABOVEGROUND FUEL STORAGE TANKS

Cylindrical and Rectangular Styles

***Owners Manual***

***SUPERVAULT MH***

•Smart •Safe •Secure •Reusable  
Fire after Fire, Bullet after Bullet, Impact after Impact

# ***SUPERVAULT MH***

## ***LISTINGS***

**SuperVault MH**  
**Multi-Hazard Rated Insulated and Protected Aboveground Fuel Storage Tanks**  
**Cylindrical and Rectangular Styles**  
**TESTING RESULTS**  
**Tests Performed by Southwest Research Institute, San Antonio, Texas**  
**NATIONAL STANDARDS REQUIRE DEMONSTRATED**  
**RESISTANCE TO HIGH INTENSITY LIQUID POOL FIRE EXPOSURE**

	Actual Results		Pass/Fail Criteria					
	Initial Test	Retest	SwRI 95-03		UFC Std A-II-F-1		UL2085 Protected	
Starting Temperature	80	61	Initial Test	Retest	Initial Test	Retest	Initial Test	Retest
2 Hour Results								
o Average Temp Rise (°F)	134	139	260	260	260	*	800	*
o Max. Absolute Temp. (°F)	275	212	400	400	400	*	1080	*
4 Hour Results								
o Average Temp Rise (°F)	165	n/a	260	*	*	*	*	*
o Max. Absolute Temp. (°F)	323	n/a	400	*	*	*	*	*

A sample tank was placed in a 2000 °f blast furnace. Thermometers located throughout the tank measure the temperature rise.  
 \* No requirements

**HOSE STREAM RESISTANCE**

SwRI STANDARDS 95-03 AND 93-01 AND UFC STANDARDS A-II-F-1 REQUIRE DEMONSTRATION RESISTANCE TO HOSE STREAM IMPINGEMENT ON THE TEST TANK IMMEDIATELY AFTER CONCLUSION OF THE RATED FIRE EXPOSURE PERIOD.

For a 4 Hour Fire Rating the hose stream test is 5 minutes of a 45 PSI stream administered through a 1-1/8" fire nozzle. The pass/fail criteria is that the primary tank must remain leak tight after application of the hose stream to test tank.

Not only did the primary tank of the SuperVault MH remain leak tight but there was NO PENETRATION of the outer steel tank and NO LOSS of insulation.

**PROJECTILE RESISTANCE**

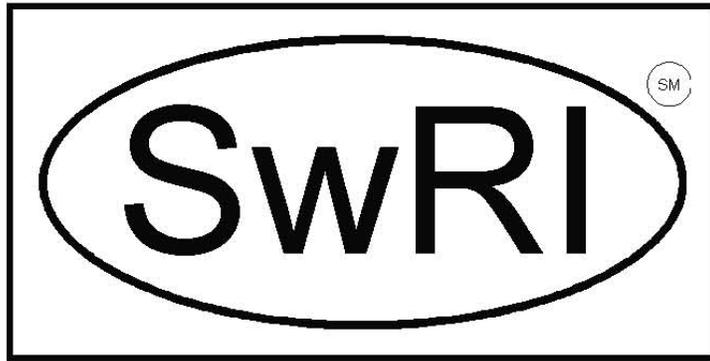
SwRI STANDARD 95-03 AND 93-01 AND UFC STANDARDS A-II-F-1 AND UL 2085 PROTECTED REQUIRE DEMONSTRATION RESISTANCE TO PROJECTILE PENETRATION OF THE PRIMARY TANK.

After conclusion of the hose stream test the SuperVault MH was subjected to 5 rounds of 150-grain, M-2 ammunition discharged from a 0.30 caliber rifle at a distance of 100 feet. The minimum muzzle velocity of the rounds was 2700 ft/sec. bullet resistance is the basis for Projectile Penetration Resistance rating. The SuperVault MH withstood all 5 rounds without penetration of the primary tank.

**IMPACT RESISTANCE**

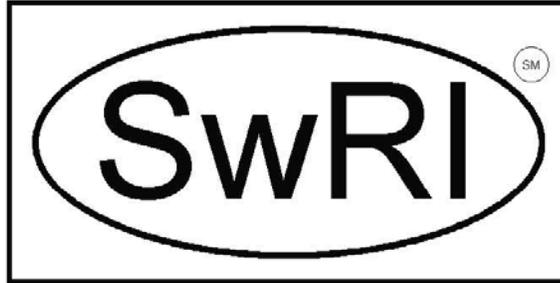
SwRI STANDARD 95-03 AND 93-01 AND UFC STANDARD AII-F-1 AND UL 2085 PROTECTED REQUIRE DEMONSTRATION RESISTANCE TO HEAVY VEHICLE IMPACT WITHOUT PENETRATION OF THE PRIMARY TANK.

After anchoring in accordance with the manufacture's instructions the tank will be subject to an impact of 12,000 pounds traveling at 10 mph applied at 18" above the ground surface. The SuperVault MH withstood the impact without penetration of the primary tank.



This mark on the product signifies that the product is listed by Southwest Research Institute.

The SuperVault MH is listed for compliance with SwRI Standards 95-03 and 03-01, Uniform Fire Code standard A-II-F-1 (formerly known as UFC 79-7) and UL 2085 Protected. The label on the tank bears the SwRI logo as evidence of listing and indicates compliance with the national standards listed above.



	<b>SuperVault MH</b>
	Manufactured by Modern Custom Fabrication, Inc. Fresno, CA
	SwRI ID NO. 02098-01-02
	<b>Multi-Hazard Rated Protected Secondary Containment Aboveground Tank for Flammable and Combustible Liquids</b>
<b>LISTED BY:</b>	This product has been evaluated for re-use after exposure to fire, puncture, or heavy-vehicle impact. Should any of these occur, contact the manufacturer.
Southwest Research Institutes ® San Antonio, Texas	This product has been listed after passing a 4-hour Fire Exposure Test, a Hose Stream Resistance Test, a Projectile Penetration Test, a Heavy Vehicle Impact Test, an environmental exposure evaluation, and an additional 2-hour Fire Exposure Test using the same, fully-assembled test tank for all tests.
Serial No. <input type="text"/>	This tank complies with the requirements of SwRI Test Procedure 95-03, SwRI Test Procedure 93-01, UL 2085 and Section 20.9 of UL 1746 (1993) (Interstitial Communication Test), and is recognized listed product by Southwest Research Institute, San Antonio, Texas.
	Manufactured under one or more of the following patents: United States patent Nos. 5,038,456; 5,082,138; 5,092,024; and 5,103,996. Manufactured under license from Super Technologies, LLC.

SuperVault MH tank Label for Fresno

# ***SUPERVAULT MH***

# ***INSTALLATION***

## ***Installation Instructions***

These instructions are for the stationary installation of the **SuperVault MH** aboveground tank used for the storage of petroleum products at atmospheric pressure.

No amount of written instruction, provided by manufacturers or regulatory agencies, will serve to convert an incompetent or under supervised mechanic into a competent craftsman. Installation of storage systems for flammable and combustible liquids is a unique field. The ability to recognize and react to unexpected, abnormal conditions that may occur during a tank installation requires experience as well as skill.

In addition to proper system design and operation, use of tank installers who possess both the experience and integrity to insist on doing the job right constitutes the greatest protection against ultimate tank system failure and liability exposure.

Your **SuperVault MH** must be installed in accordance with all applicable federal, state and local environmental regulations and safety codes.

### ***Location***

Tank must meet local requirements. The enclosed "Clearance Requirements" diagram is based on the 2003 International Fire Code and is for reference only. Always check with your local authorities for their particular requirements before starting work.

### ***Foundation***

Tank foundation must comply with local Building Code regulations. Ask your local Fire Department or Building Department for recommendations. Modern Custom Fabrication Inc. recommends that at a minimum the concrete footing should be sufficiently above grade to prevent

accumulation of debris, dirt and water around the tank supports.

The **SuperVault MH** tank supports and base plates meet the requirements of 2007 California Building Code. Expansion joint material that will not absorb water (asphalt impregnated fiberboard) should be placed between the tank supports and the concrete foundation.

### ***Handling***

Do not handle or install tank without having knowledge and experience in procedures involved with safe aboveground tank installation.

Before any attempt is made to move a tank, it should be established that hoisting equipment has sufficient capacity and reach to safely lift and lower the tank without dragging or dropping.

Lifting with nylon straps is preferred to prevent damage of the tank coating. The straps must be clean to avoid scratching the tank coating.

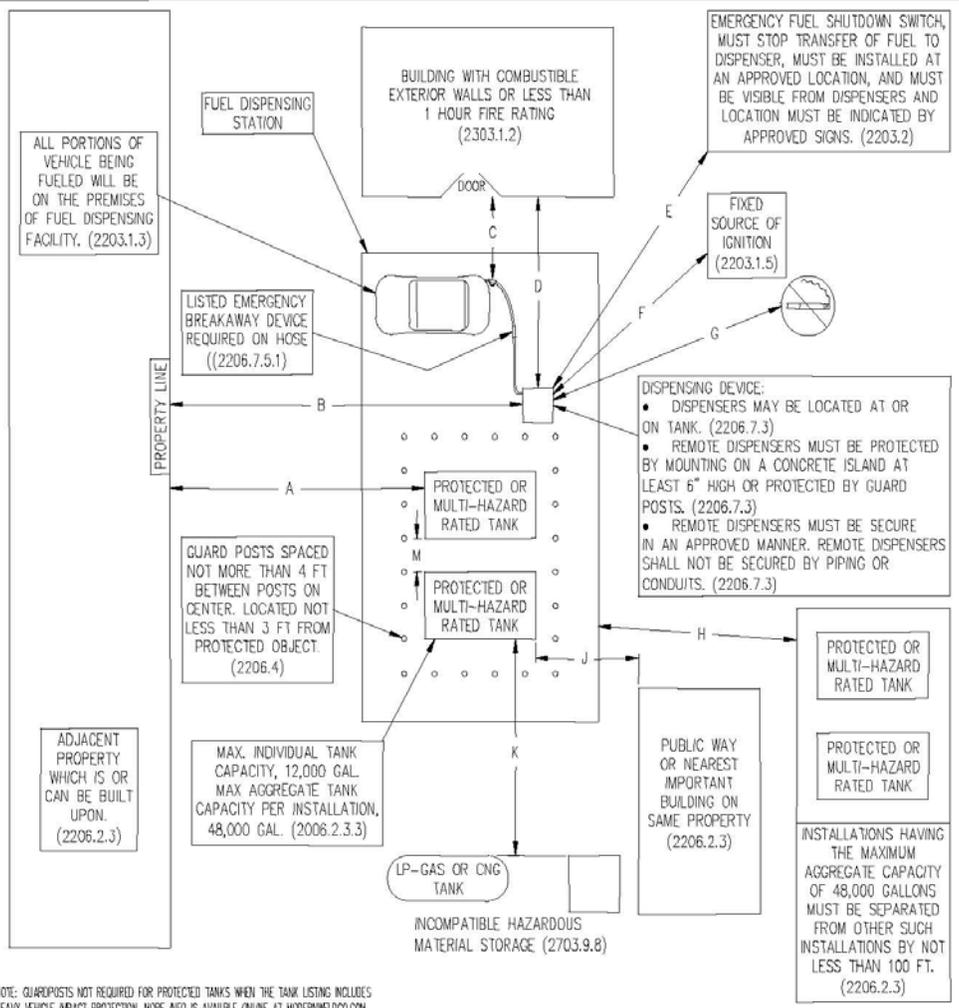
**Do not push, drag or drop the SuperVault MH.**

**Do not handle or move the SuperVault MH unless it is empty.**

### ***Venting***

All aboveground fuel storage tanks are required to have emergency vents to prevent the buildup of pressure. The emergency venting requirement for **SuperVault MH** tank must be provided by the use of emergency vent valve attached to a properly sized primary tank fitting. The tank manufacturer provides emergency venting for secondary tank by means of relief caps over the pour ports.

## CLEARANCE REQUIREMENTS FOR ABOVEGROUND FUEL STORAGE TANKS USED FOR MOTOR VEHICLE FUEL DISPENSING STATIONS



ALL PORTIONS OF VEHICLE BEING FUELED WILL BE ON THE PREMISES OF FUEL DISPENSING FACILITY. (2203.1.3)

FUEL DISPENSING STATION

BUILDING WITH COMBUSTIBLE EXTERIOR WALLS OR LESS THAN 1 HOUR FIRE RATING (2303.1.2)

EMERGENCY FUEL SHUTDOWN SWITCH, MUST STOP TRANSFER OF FUEL TO DISPENSER, MUST BE INSTALLED AT AN APPROVED LOCATION, AND MUST BE VISIBLE FROM DISPENSERS AND LOCATION MUST BE INDICATED BY APPROVED SIGNS. (2203.2)

LISTED EMERGENCY BREAKAWAY DEVICE REQUIRED ON HOSE ((2206.7.5.1)

FIXED SOURCE OF IGNITION (2203.1.5)

PROPERTY LINE

DISPENSING DEVICE:  
 • DISPENSERS MAY BE LOCATED AT OR ON TANK. (2206.7.3)  
 • REMOTE DISPENSERS MUST BE PROTECTED BY MOUNTING ON A CONCRETE ISLAND AT LEAST 6" HIGH OR PROTECTED BY GUARD POSTS. (2206.7.3)  
 • REMOTE DISPENSERS MUST BE SECURE IN AN APPROVED MANNER. REMOTE DISPENSERS SHALL NOT BE SECURED BY PIPING OR CONDUITS. (2206.7.3)

GUARD POSTS SPACED NOT MORE THAN 4 FT BETWEEN POSTS ON CENTER. LOCATED NOT LESS THAN 3 FT FROM PROTECTED OBJECT. (2206.4)

PROTECTED OR MULTI-HAZARD RATED TANK

ADJACENT PROPERTY WHICH IS OR CAN BE BUILT UPON. (2206.2.3)

MAX. INDIVIDUAL TANK CAPACITY, 12,000 GAL  
 MAX AGGREGATE TANK CAPACITY PER INSTALLATION, 48,000 GAL. (2006.2.3.3)

PUBLIC WAY OR NEAREST IMPORTANT BUILDING ON SAME PROPERTY (2206.2.3)

LP-GAS OR CNG TANK

INCOMPATIBLE HAZARDOUS MATERIAL STORAGE (2703.9.8)

INSTALLATIONS HAVING THE MAXIMUM AGGREGATE CAPACITY OF 48,000 GALLONS MUST BE SEPARATED FROM OTHER SUCH INSTALLATIONS BY NOT LESS THAN 100 FT. (2206.2.3)

NOTE: GUARDPOSTS NOT REQUIRED FOR PROTECTED TANKS WHEN THE TANK LISTING INCLUDES HEAVY VEHICLE IMPACT PROTECTION. MORE INFO IS AVAILABLE ONLINE AT MODERNMELDOD.COM

TANK CAPACITY (GALLONS)	A	B	C	D	E	F	C	H	J	K	M
8000 OR LESS	15 FT	10 FT	5 FT	10 FT	20 FT - 100 FT	20 FT	25 FT	100 FT	5 FT	20 FT	3 FT
OVER 8000	25 FT	10 FT	5 FT	10 FT	20 FT - 100 FT	20 FT	25 FT	100 FT	15 FT	20 FT	3 FT

# ***SUPERVAULT MH***

## ***TESTING***

## ***TESTING***

Each SuperVault MH is leak tested during the fabrication process by using 5 PSI of positive pressure internally and externally applying a leak detecting solution to all seams and joints. This is performed on both the primary and secondary tanks. Should the owner require additional field testing, the following procedure is offered to meet this requirement.

### Warnings:

1. Do not air test a tank which has previously contained flammable or combustible liquids.
2. Air pressure used for this test must not exceed 5 PSI.

**SUPERVAULT MH ABOVEGROUND PROTECTED FUEL STORAGE TANK**  
**PRIMARY TANK FIELD TESTING**

These tanks are thoroughly tested at the factory and certified to be leak free. Should the owner require additional field testing, the following procedure is offered to meet this requirement.

Modern Custom Fabrication Inc. is not responsible for any cost incurred relating to field testing.

**PROCEDURE**

1. Cap openings and install test equipment in the order listed below starting at compressor or air supply.
  - a. Pressure reducing valve (5 PSI on outlet side)
  - b. 0 to 5 PSI pressure gage
  - c. 5 PSI pressure relief valve
  - d. Shut-off valve
  - e. 0 to 5 PSI pressure gage at tank
2. Slowly raise tank pressure to 4 PSI. CAUTION: Do not exceed 4 PSI.
3. Close shut-off valve when test pressure of 4 PSI is reached.
4. Leak test all pipe caps and test manifold with leak-detecting fluid to insure no loss of air pressure at these points.
5. Record time and pressure gage reading on a Test Log every 5 minutes. After 30 minutes have elapsed, record final pressure test and time.
6. No more than a 1% loss in test pressure over test period is allowed for tank to satisfactorily pass pressure test.

**CERTIFICATION**

The undersigned hereby certify that the pressure test was performed in strict conformance with this procedure for the SuperVault listed below.

Performed By: _____ Company Name	_____ Company Representative Signature
_____ Date of Test	_____ Company Representative Name (Please Print)
Witnessed By: _____ Regulating Authority	_____ Regulator/Inspector Signature
_____ Regulator/Inspector Name (Please Print)	_____ Time
Tank Owner: _____	Customer P.O. No. _____
Installation Address: _____	Delivery Date _____
_____	Installation Date _____
_____	Tank Serial No. _____

**SuperVault MH Test Log**

Date of Test \_\_\_\_\_

Tank Serial No. \_\_\_\_\_

Test Start Time \_\_\_\_\_

**Record Pressure**

4 PSI Reached (Time) \_\_\_\_\_ (PSI) \_\_\_\_\_

1. 5 minute lapse (Time) \_\_\_\_\_ (PSI) \_\_\_\_\_

2. 5 minute lapse (Time) \_\_\_\_\_ (PSI) \_\_\_\_\_

3. 5 minute lapse (Time) \_\_\_\_\_ (PSI) \_\_\_\_\_

4. 5 minute lapse (Time) \_\_\_\_\_ (PSI) \_\_\_\_\_

5. 5 minute lapse (Time) \_\_\_\_\_ (PSI) \_\_\_\_\_

6. 5 minute lapse (Time) \_\_\_\_\_ (PSI) \_\_\_\_\_

No more than a 1% loss in test pressure over test period is allowed for tank to satisfactorily pass pressure test.

# ***SUPERVAULT MH***

# ***MAINTENANCE***

## Maintenance

These maintenance procedures cover the tank only. Different applications and sizes of tanks create a variety of equipment configurations that would be impossible to cover in this section. Follow the equipment manufacturer's recommendation for maintenance schedules.

The following tank components should be inspected at least once a week:

### **Emergency and Normal Vents**

Check the operation of the vents for free movement and no obstructions.

### **Spill Pan**

Spill pan should be clean and free of obstructions. Drain valve must have free movement and be normally closed during operation of the tank.

### **Monitor Tube**

Ensure the monitor tube is dry. This can be accomplished by sticking the tube with the gauge stick that is supplied with the tank. If the tank is equipped with a mechanical or electronic monitoring device, test it for proper operation.

### **Finish**

Inspect surface of the tank for chips or corrosion. If found sand, clean and paint in accordance with the paint manufacturer recommendation.

### **Fuel**

Impurities and moisture in fuel can damage the tank and equipment. Check with your fuel supplier for assistance with a clean fuel program and check for procedures to eliminate containments, including water from your fuel.

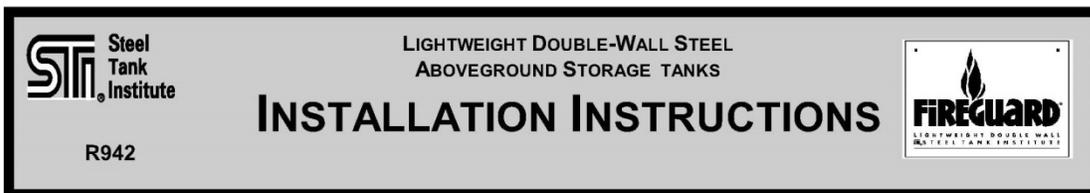
## FUEL STORAGE TANK MONITORING LOG RECORD

DATE	GASOLINE	DIESEL	OPERATOR	COMMENTS
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
Additional notes for this period:				

**DIRECTIONS: WEEKLY**

- 1) Tank operator to write in the date the tank leak monitor or indicator is checked.
- 2) Operator write in condition observed for each tank, i.e. dry or fuel present.
- 3) Operator to initial and comment on condition of each tank.
- 4) Report any liquid present in the monitor tube or alarm condition to your supervisor.
- 5) Tanks fitted with float actuated LEAK GAUGE have viewing indicator window.  
CLEAR indicates NO LEAKS, RED indicates LEAK. Check gauge periodically for proper operation.

**IOM 3-B**  
**Steel Tank Institute**  
**Fireguard AST**



FEBRUARY 2007

- 1.0 TANK SITE EVALUATION AND PREPARATION PRIOR TO INSTALLATION**
- 1.1** The foundation must be designed to support the tank plus 100% of its contents when full. The foundation design shall also take into account the type of support that is being used and the point load associated with that support. The foundation may be constructed using concrete, asphalt, gravel or other stable material and must include provisions in its design to prevent tank movement. The foundation should include any provisions necessary for seismic design. The foundation design must also include provision for draining surface water away from the tank.
- 1.2** For tank installations without cathodic corrosion protection, the tank should be grounded in accordance with applicable electrical and fire code standards.
- 1.3** Where the steel tank body is in contact with the earth, use a zinc grounding rod. Do not use a copper grounding rod.
- 1.4** Where the steel tank body is in contact with the earth or foundation, it should be protected from external corrosion. For external corrosion protection using cathodic corrosion protection, consult applicable standards (i.e., National Association of Corrosion Engineers) to provide the tank with appropriate protection from lightning without interference with the corrosion protection. Steel tanks in contact with the earth should not use copper grounding. Refer to STI R893-89, "Recommended Practice for External Corrosion Protection of Shop Fabricated Aboveground Storage Tank Floors."
- 1.5** Tanks located in areas subject to flooding must be protected against floatation.
- 1.6** Aboveground tanks should not be located above underground utilities or directly beneath overhead power lines.
- 1.7** The tank shall be protected from vandalism and accidental damage in accordance with all applicable codes, i.e., NFPA 30, NFPA 30A, UFC, etc. as well as local environmental regulations and safety codes. Consult local authorities before installing this tank.
- 2.0 TANK HANDLING**
- 2.1** Do not handle or install the tank without having knowledge and experience in procedures involved with proper and safe installation of an aboveground tank used for storage of stable, flammable and combustible liquids.
- 2.2** Equipment for handling the tank shall be of adequate size to lift and position the tank. **DO NOT DROP OR DRAG THE TANK.**
- 2.3** Tanks shall be carefully handled using cables or chains of adequate length (with spreader bars, if necessary) and size. Attach to the tank using the lifting lugs provided. Care should be taken that the angle between the two cables, at the lift point, shall be no greater than 60 degrees.
- 2.4** **DO NOT HANDLE OR MOVE THE TANK UNLESS IT IS EMPTY.**
- 2.5** This is a stationary tank. Do not use this tank for transport of any product.
- 3.0 TESTING**
- 3.1 General Requirements**
- 3.1.1** An on-site air test of the tank may be required by local authorities to ensure no damage has occurred in shipping and handling. All testing shall be done as described below.
- 3.1.2** Vacuum monitored double wall tanks are shipped from the manufacturer with a vacuum drawn on the space between the walls. Read and record the vacuum pressure. If the vacuum gauge reading is less than 12 inches

3.1.3 In lieu of the air pressure test described below, a vacuum may be applied to the interstice of a double-wall tank or to the interstice of a double-bottom tank. DO NOT APPLY A VACUUM TO THE PRIMARY TANK OF A DOUBLE-WALL TANK OR TO A SINGLE-WALL TANK. A vacuum of 7" to 10" Hg is to be applied to the interstice and held for at least 24 hours with no more than a 2" Hg vacuum loss allowed. If this vacuum cannot be held for 24 hours, then perform the air test procedure described below.

3.1.3.1 Caution must be taken in applying a vacuum to the interstice of a tank and the testing must be stopped if any deformation appears on the tank.

### 3.2 Air Pressure Test Procedure for Tanks

3.2.1 Remove emergency vents and cap openings to hold tank pressure as required.  
NOTE: Use only calibrated air pressure gauges with a 0-15 psig (0-103 kPa) dial span. The relief valve must have a flow rate at the set pressure that is greater than the flow rate of the air supply line. The regulated air supply test pressure used for this test should be as follows:

- a. **Horizontal cylindrical tanks** - Not less than 3 psig (20.7 kPa) nor more than 5 psig (34.5 kPa) . Set the pressure relief valve in the test air supply line at 5.5 psi (38 kPa).
- b. **Vertical tanks**-Not less than 1½ psig (10.4 kPa) nor more than 3 psig (20.7 kPa). Set pressure relief valve in test air supply line at 3 psig (20.7 kPa).
- c. **Rectangular tanks**-Not more than 3 psig (20.7 kPa). Set pressure relief valve in test air supply line at 3 psig (20.7 kPa).  
CAUTION: Do not leave pressurized tank unattended while the pressure line/air line is connected. Do not stand in front of tank heads or fittings when pressurizing tank. Pressurizing of large tanks may result in the slight deformation of the top and bottom of vertical tanks, of the sides of rectangular tanks, and of the heads and ends of cylindrical tanks. Should

deformation appear severe, immediately relieve the pressure.

### 3.2.2 Tank Pressurizing Procedure

3.2.2.1 The following air pressure testing does not apply to double-wall tanks equipped with interstitial vacuum monitoring systems. (In lieu of the air pressure test, the tank may be shipped from the factory with a vacuum in the tank interstice. Read and record the vacuum pressure. If the vacuum pressure gauge reading is less than 12 inches Hg (40.5 kPa), contact the tank manufacturer).

3.2.2.2 Install test piping as shown in Figure 2. Close valves A and B. Open valve C. Temporarily plug, cap or seal off remaining tank openings to hold pressure.

3.2.2.3 Connect the regulated test air supply line to test piping as shown in Figure 2.

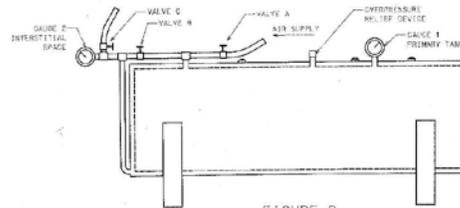


FIGURE 2  
DOUBLE WALL TANK

3.2.2.4 Close valves B and C. Slowly open valve A to pressurize the primary tank. Pressure gauge 1 should indicate test air pressure given in Section 3.2.1 above.

3.2.2.5 Close valve A. Disconnect the regulated test air supply line from the test piping.

3.2.2.6 Monitor test pressure in the primary tank for 1 hour minimum. A steady drop in pressure reading for gauge 1 indicates there may be a leak in the primary tank. Check the fittings, the gauge, and then retest. If the problem persists, contact the tank manufacturer.

3.2.2.7 If no leaks are found, close valve C and slowly open valve B to pressurize the interstitial space between the double walls of the tank.

**WARNING:** Do not apply air pressure to the interstitial space between the walls of a double wall tank without air pressure in the primary tank. Do not apply air pressure to the interstitial space that is higher than the air pressure in the primary tank. Damage to the tank may result.

Pressure gauge 1 will indicate a slight drop in test pressure when valve B is opened, but should hold steady at the lower pressure. If the test pressure drops below the minimum requirements, close valve B, reconnect the air supply line and slowly open valve A to increase the pressure in the primary tank. When the required pressure is indicated on gauge 1 close valve A, disconnect the test air supply line. Open valve B to equalize pressure in the primary tank and the interstitial space. Gauge 1 and gauge 2 should have the same pressure reading.

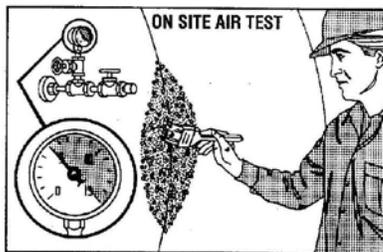
**3.2.2.8** Close valve B. Hold the test pressure in the interstitial space for 1 hour minimum. A steady drop in pressure gauge 2 indicates there may be a leak in the interstitial space. Check the fittings, the gauges, and then retest. If the problem persists, contact the tank manufacturer.

**3.2.2.9** Proceed to Section 3.2.3, "Detection of Leaks" below.

### **3.2.3 Detection of Leaks**

**3.2.3.1** Immediately apply the leak test solution to the tank exterior surfaces, welds, fittings, etc. Check for leaks. No leaks are allowed. If leaks are found, notify the tank manufacturer. If no leaks are found, testing of the tank is complete.

**3.2.3.2** Open valve C, then slowly open valve B to release the test air pressure.



**3.2.3.3** With the tank depressurized, remove the test piping, temporary plugs, caps and seals. Reinstall the emergency relief vents, etc. which were removed in Section 3.2.1 above. Emergency vents are required on both the primary tank and the secondary tank.

**WARNING:** Emergency relief vents must be operable to prevent causing tank failure by over-pressurization.

## **4.0 TANK PIPING AND ACCESSORIES**

**4.1** Install all permanent piping and fittings using compatible, non-hardening thread sealant material.

**4.2** All unused tank openings must be properly sealed and tested to be liquid and vapor tight prior to putting the tank into service.

**4.3** **DO NOT WELD ON THE TANK, MODIFY OR PENETRATE THE TANK STRUCTURE IN ANY WAY WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE TANK MANUFACTURER.**

**4.4** All tank accessories shall be installed as required per local codes. Anti-siphon devices, overfill shut-offs and alarms, vents gauges, emergency vents, etc. are common requirements for tanks storing motor fuels for the purpose of being dispensed into motor vehicles.

## **5.0 LABELING**

**5.1** Tanks shall be labeled in accordance with all applicable codes.

## **6.0 MAINTENANCE**

**6.1** The tank operator should perform periodic walk-around inspections to identify and repair areas of damage to the vessel or the coating itself and check for proper drainage around the tank area.

**6.2** It is imperative that the tank exterior be inspected periodically to ensure that the integrity of the coating is maintained. The frequency of periodic repainting will be based upon environmental factors in the geographic area where the tank is located. Special consideration should be given to the selection of the paint, surface preparation and coating application. The coating selected should be suitable for use with the current coating, or the existing coating should be removed. The coating

- selected should be of industrial quality.
- 6.3** Proper site preparation and maintenance are vital to ensure drainage of surface water. Should ground conditions change or settlement occur, take the appropriate steps to maintain proper drainage and prevent standing water near or under the tank area.
- 6.4** The primary tank shall be inspected monthly for the presence of water at the lowest possible points inside the primary tank. Remove any water found. Water and sediment in fuel can cause plugging of filters. Also, bacterial growth, originating from the fuel can cause corrosion of tanks and lines. For procedures on how to check for the presence of water and removal of water, refer to API Recommended Practice 1621, Appendix D and API Standard 2610. Another source of information is a report by the US Department of Energy Brookhaven National Laboratory, BNL 48406, which provides information on methods to test for and remove water, test for bacterial presence in fuel, tank cleaning and fuel additives.
- 6.5** This tank must be removed from service if damaged by fire exposure, other physical means or misuse.
- 6.6** Failure to adhere with these maintenance instructions may void your warranty.
- 6.7** Tank relocation requirements - often aboveground storage tanks are relocated. The following instructions are to be followed when this occurs: All steps are to be documented and the documentation is to be kept for the life of the tank.
- 6.7.1** The hazards associated with the cleaning, entry, inspection, testing, maintenance or other aspects of ASTs are significant. Safety considerations and controls should be established prior to undertaking physical activities associated with ASTs. Cleaning of tanks must be per state and local jurisdiction requirements.
- 6.7.2** Refer to the STI Standard SP001, "Standard for the Inspection of Aboveground Storage Tanks" for requirements concerning tank inspections. This SP001 Standard details requirements for inspections based on the tank installation and age. A tank must undergo

the appropriate inspection prior to relocation.

- 6.7.3** In addition, the tank must be subjected to a pressure (or vacuum) test as detailed paragraph 3.2 above except an inert gas, such as nitrogen, should be used for tanks that have previously held fuel.

#### **Disclaimer**

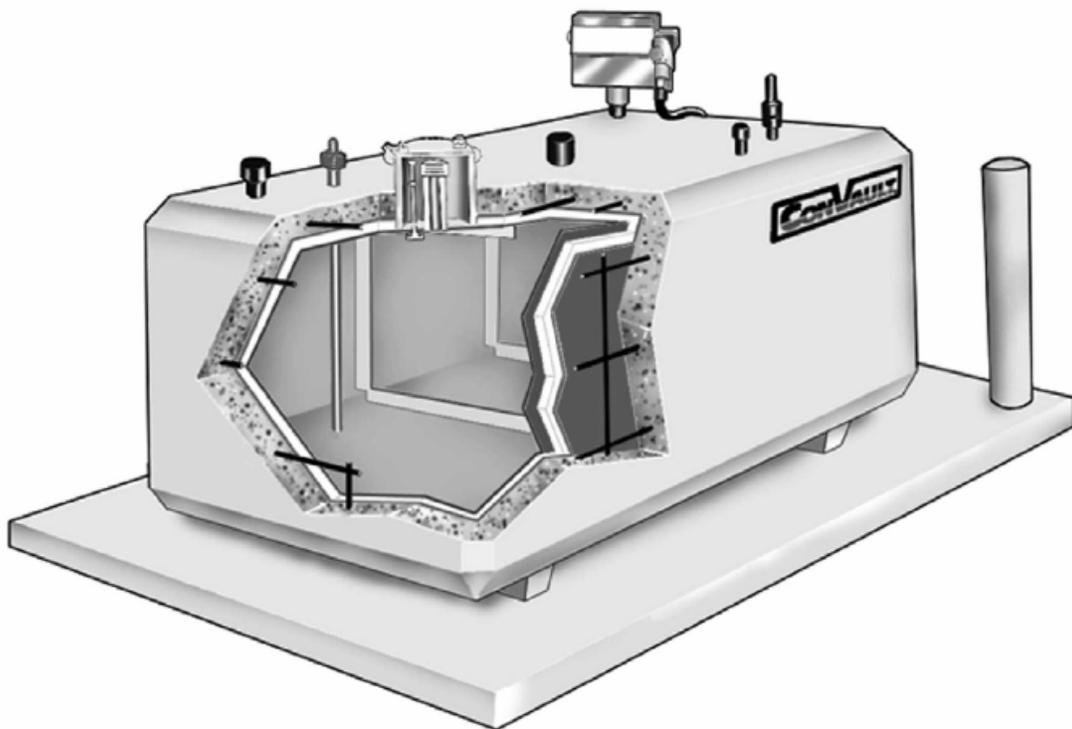
These instructions are intended only as an aid to tank installers who are knowledgeable and experienced in aboveground tank installation. Compliance herewith does not necessarily meet the requirements of applicable federal, state and local laws, regulations and ordinances concerning tank installation. STI makes no warranties, express or implied, including but not limited to, any implied warranties of merchantability or fitness for a particular purpose, as a result of these installation instructions.

IOM 3  
ConVault  
ConVault AST



*The Industry Leader In Aboveground Fuel Storage Systems*

# ***INSTALLATION INSTRUCTIONS***





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## A. SCOPE

1. These instructions apply to stationary, shop fabricated, aboveground, concrete encased steel tanks for the storage of stable, flammable and combustible liquids at normal atmospheric pressure. Because the tank installation is a specialized skill, it is assumed that those using these instructions will have knowledge of, and possess the skills and equipment necessary to install this type of aboveground storage tank properly and safely.
- **NOTE:** Consult the Authorities Having Jurisdiction to insure compliance with local codes and regulations prior to carrying out any instructions given herein.

## B. PERMITS AND APPROVALS

1. Because of the combustible and flammable nature of the hydrocarbon liquids stored in the Aboveground Storage Tanks (AST), they are subject to various codes, and regulations. The codes and regulations govern the fabrication, testing, shipment, installation, operation, and maintenance of the tanks. The codes and regulations may originate from local fire authorities (e.g. Fire Marshals), local building jurisdictions (e.g. city or county building officials), state laws and regulations (e.g. Air Resource Board), Federal agencies (e.g. Environmental Protection Agency) and regional and national codes (e.g. National Fire Protection Association (NFPA), Uniform Fire Code (UFC), or International Fire Code (IFC)).
2. Installation, operation and maintenance of the tanks must be carried out in accordance with the applicable codes and regulations. These aboveground storage tanks are intended for installation in accordance with NFPA 30, NFPA 30A, UFC (including article 79 Appendix A-II-F), and IFC.
3. System installation starts with obtaining the required state and local permits.
4. Typical approval process and documents needed are shown in the **List 1, Page 17, Product Description**. Specific local or jurisdictional requirements may slightly differ from location to locations but the list is a good reference and a guide for your permit requirements.
5. State and local permit applications must be made with the current and up-to-date forms.
6. Zoning permits may also be required.



### C. TANK SITE

- **NOTE:** The location of each ConVault® tank is stored in ConVault, Inc.'s central data bank. If the tank is to be relocated to a different location, ConVault, Inc. must be properly notified to update the data bank. The product limited warranty could be voided if ConVault® is not informed of tank relocation or if tank is not reinstalled in accordance with these installation instructions. It should be noted that ConVault® Warranty is conditional on installation of tanks in accordance with ConVault® Installation Instructions. Your attention is specifically drawn to the tank site selection and foundations requirements.

**⚠WARNING** Follow the instructions enumerated below. Failure to follow these instructions may result in death or serious injury.

1. Tank location and foundation to comply with the current edition of the Uniform Building Code (UBC) and all applicable local codes and ordinances. For sites subject to ground frost, the foundation slab design should be reviewed to take into consideration frost line requirements.
2. The tanks should be located a minimum of 1/3 the height of the vault away from down slopes - greater than 3:1, and 1/2 the height of the vault away from up slopes smaller than 3:1.
3. Tanks located in areas subject to flooding must be protected against floatation. Flood resistant tie-down brackets are available for all tank sizes to resist floatation during complete submergence.
4. Aboveground storage tanks should not be located over underground utilities or directly beneath overhead power and telephone lines.
5. The tank should be protected from vandalism and accidental damage in accordance with all the applicable codes.
6. Fire department vehicle access should be provided within 150 feet of any tank.
7. The venting of a tank to a remote location must include the use of a steel pipe equal to or greater in size than the vent outlet, and the methods of supporting such piping against displacement must comply with local codes. Provide the vent piping with a slope to ensure that all condensed vapors drain back to the tank.

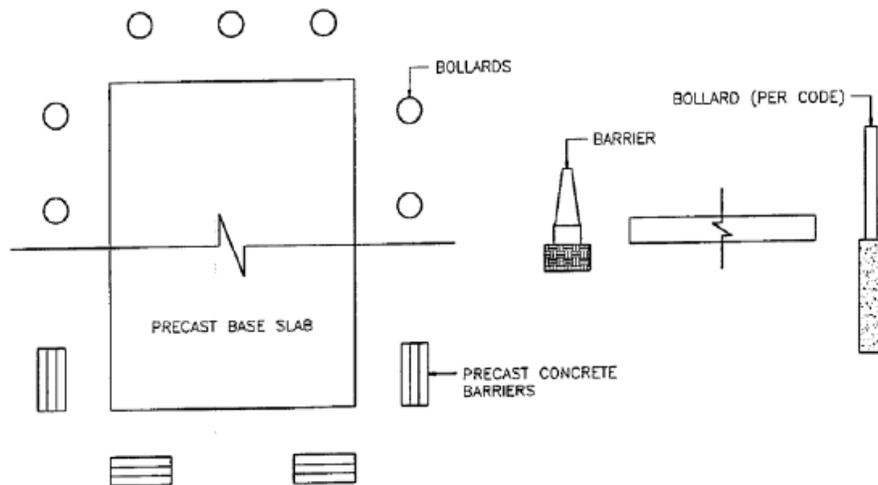
#### D. BOLLARD INSTALLATION

Collision protection is recommended on sides of the tank exposed to traffic. This is generally accomplished with pipe bollards. Always check state and local codes. Sample installations are shown below:

Spacing from the tank should conform to the applicable code requirements.

As an alternative to steel pipes, you may use precast concrete barriers. You can obtain the precast barriers from your Convault® representative.

**Figure No. 6**  
**Sample Bollard Installation**





## E. FOUNDATIONS

**CAUTION** Failure to provide proper foundation may result in damage to the tank and equipment affixed to it and may void the tank warranty.

1. Tank location and foundation must comply with requirements of the current edition of the relevant building code and all the applicable local codes and ordinances.
2. The tank slab may be poured in place using the Convault standard slab drawing, which may be obtained by contacting Convault or your local representative. An alternative to pouring the slab in the field is to purchase a precast slab from the manufacturer.
3. The foundation for the tank must be designed to support the tank plus the weight of the maximum amount of product the tank will be storing. The foundation design must also include provision for draining surface water away from the tank to minimize the risk of fuel accumulation under the tank from an overflow or spills.
4. Tanks located in areas subject to earthquake must be protected against seismic forces. Optional earthquake restraints are available. The restraints can be retrofitted to the slab should local requirements change. The restraints are mounted on the slab and are secured with anchor bolts directly into the slab. The tank feet rest in the restraints and do not require bolting directly to the tank. Insure that the slab is large enough to accommodate earthquake restraints or hold-downs.
5. Tanks located in areas subject to hurricanes may be required by your local Authority Having Jurisdiction (AHJ) to be fitted with hurricane hold down restraints.
6. The tank foundation is to sit on undisturbed earth or compacted fill, free of organic material.
7. The following minimum soil characteristics may be used if the Convault® tank is installed on a continuous solid slab which will uniformly distribute the weight of the tank and its contents to the soil:
  - a. Bearing Capacity: minimum 1,000 but preferably 2,000 lb. per sq. ft.
  - b. Total settlement: 1 inch maximum.
  - c. Differential settlement: 1/2 inch maximum.



- d. Provide a minimum six-inch (6") thick granular sub-grade, compacted and graded to a level uniform subsurface prior to the cast slab placement or pouring of the cast-in-place slab.
- e. A geological engineer should evaluate the effect of the water table and frost lines if such unusual conditions exist at the site.
- f. Soil surface and granular sub grade under foundation should be flat within 1/16" per foot. Soil around foundation should be sloped away 1/8" per foot minimum for 5 feet.
- **NOTE:** If Bearing pads are used under the tank legs instead of grouting, the tank foundation and slab should be designed to withstand concentrated loads under the bearing pads. For grouting instructions see paragraph J on Page 31.
- **NOTE:** The above soil characteristics, foundation and slab design requirements may be revised by a qualified design engineer who would design the foundation and the slab on a site-specific basis.
- **NOTE:** Some Authorities Having Jurisdiction require up-lift restraints for areas subject to flooding and hurricanes.

## F. TANK HANDLING

**▲WARNING** Failure to obey the following tank handling instructions may result in death or serious injury.

- **NOTE:** Do not handle or install tank without having knowledge and experience in procedures involved with proper and safe installation of an aboveground tank used for storage of flammable and combustible liquids. Reliance on skilled and professional installers is an important factor in avoiding damage to tank and system failure.
1. Equipment required in the shipping and off-loading of Convault® aboveground storage tanks include lifting straps, nylon tie-down straps, crane, forklift, and carpet remnants strategically placed on the bevels to prevent the tie-down straps from scraping the paint loose while the tank is en-route. See also **Equipment Required and Procedures Page 29.**
  2. Do not drop or drag the tank. Dropping or dragging a tank may result in damaging the tank beyond repair and voiding the Convault® Limited warranty.



3. Do not handle or move the Convault®, unless it is empty. Under no circumstances should a tank containing petroleum product be moved.
4. If petroleum product has been introduced in the tank, first empty and cleanse the tank, then relocate using the Department of Transportation Guidelines for transporting fuel containers.

## G. TRANSPORTATION

It is important that Convault® tanks are properly lifted and loaded on trailers and flat beds. The tank should be supported on solid lumber under the far two legs. The tank should be properly secured to prevent sliding and undue vibration from the road.

**CAUTION** Convault® 8,000 through 12,000-gallon tanks are provided with three legs. The middle leg is approximately ¾" shorter than the other two. The middle leg is made shorter to prevent the tank from damage caused by vibration while being transported. Therefore, the middle leg should not be supported on the trailer or on the flatbed. Supporting the third leg during transportation may result in property damage.

## H. UNLOADING AND SETTING

**WARNING** Failure to provide adequate equipment and proper procedures for unloading and setting the tank may result in death or serious injury.

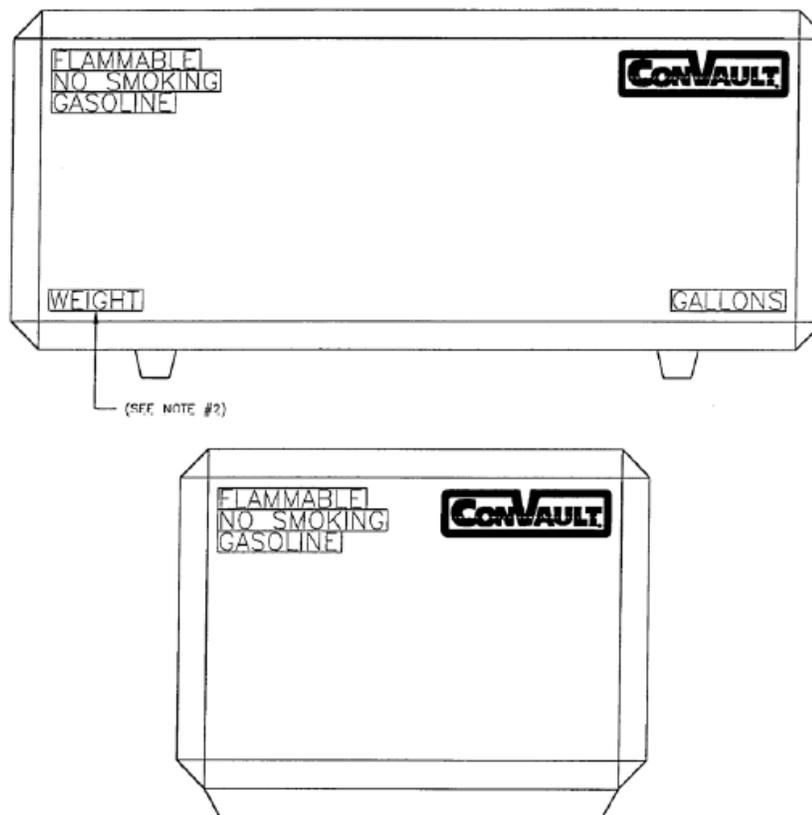
1. The unloading equipment and procedures are critical to setting the tank safely and without harming the people or damaging the tank.
  - **NOTE:** The most important aspect of a job procedure is SAFETY. Please ensure that every step of this procedure is carried out with safety first in mind.
2. Tanks Weight and Dimensions.

Please refer to Figures No. 2, 3, 4 and 5 in Product Description, pages 13 through 16. For actual tank weights and dimensions, please contact your Convault® distributor.



## I. EQUIPMENT REQUIRED & PROCEDURES

1. Following is a list of equipment that may be required to handle a Convault® tank:
  - a. A crane or a forklift of sufficient capacity to safely lift and place the unit.
  - b. Slings minimum 20 feet long each and rated for the tank weight. The angles between the slings should be at least 50 degrees.
  - c. 4-way spreader.
  - d. Miscellaneous shackles, tag lines, and rigging tools.
2. Note the following guidelines to handle and install a Convault® tank.
  - a. Plan the required crane and rigging capacity to safely unload the tank.
  - b. Inspect the tank on the delivery truck prior to unloading. Report any damage in transit to the truck driver and note on the shipping ticket.
  - c. Allow sufficient crane time for installing the load block and organizing the rigging.
  - d. During unloading and setting, allow one person in-charge to signal the crane operator. Keep people clear of the load and avoid being trapped between the load and building walls and equipment.
  - e. Make sure there is no overhead wiring to interfere with crane or boom operation. Provide sufficient room for cranes and boom trucks to off load.
  - f. Department of Transportation prohibits transportation of tanks with product and warning labels. Product and warning labels should be installed on site. If installed at the plant, they should be masked prior to shipment. Labels and decals must be placed on the tank in accordance with **Figure No. 7** page 30.

**Figure No. 7****NOTES:**

1. For best results, attach decals or signs at 60° – 70° F.
2. Empty weight.
3. ConVault logo to be located in upper right corners.
4. NO SMOKING, FLAMMABLE or COMBUSTIBLE and "product" signs to be located in upper left corners.
5. Capacity signs to be located in lower right corner of long sides.
6. Weight signs to be located in lower left corner of long sides.
7. FILL, VENT, EMERGENCY VENT, LEAK DETECTOR TUBE, Do Not Drill..., Caution: This Tank..., signs to be located along upper bevel near corresponding nipples.
8. Warning: Death May Occur... sign to be located on top of tank near manway, if applicable.



## **J. GROUTING OF LEGS**

1. All tanks larger than 2000 gallon must be grouted with non-shrink grout to the concrete slab or supported with alternative engineered pad interface.
2. We recommend grouting the legs of all tank sizes, which will provide a uniform load distribution on legs and foundations.
3. Neoprene pads may be used instead of grouting in accordance with the manufacturer's recommendations. Pads should be neoprene with 50 durometer Type A hardness. The physical properties of neoprene pads should meet or exceed AASHTO specifications M251, Sections 18, 25. For specifications and installation instructions of neoprene pads contact your ConVault® representative.
4. Also, see Notes on page 27 under FOUNDATIONS.



## K. ELECTRICAL

1. Electrical service and fuel piping to the pump units should be installed in accordance with the requirements of National Electric Code (NEC)- NFPA 70 and local requirements.
2. All electrical devices used with or located within twenty (20) feet of the Convault® tank should conform to NEC Hazardous Locations. All electric conduits and wiring connected to the tank should be explosion proof and in strict accordance with NEC Class-1, Division 1 or other local standards whichever is stricter.
3. An emergency shut-off switch is required to be mounted in a location visible from the dispenser. The switch is normally mounted on a building wall or a post. The switch must be marked as an emergency shut-off switch, in accordance with NEC.
4. Pumps and all other equipment used in the hazardous area should be rated by UL or Factory Mutual (FM).
5. Electrical grounding is required for flammable liquid fuel tanks. Convault® Tanks are provided with two grounding bolts welded to the steel tank or lugs welded to the nipples on tank top. Installation of grounding shall be in accordance with the NFPA 780 code. See Appendix B of this manual for a summary of **Lightning Protection Installation Instructions**.

## L. PIPING

1. Piping on Convault® tanks will mainly depend on dispensing method considered for your facilities. Several methods are suggested below. You should note that dispensing methods suggested here are schematic only and they are not detailed installation drawings. You should engage an engineer/designer to design the piping arrangement and make sure they are in accordance with the applicable codes, rules and regulations. Please also make sure you check with your Authorities Having Jurisdiction and find out which codes and regulations are applicable to your area.

**CAUTION** Do not connect any fuel return or vapor recovery pipe to leak detector tube or communication nipple. Failure to comply will result in filling the interstice with fuel and consequently voiding your warranty. The leak detector tube and the communication nipple are powder coated red for easy identification.



## **M. GENERAL APPLICATION REQUIREMENTS**

1. The following requirements apply to **all applications**:
  - a) Fuel tank shall be located with set backs from buildings, property lines and public highways in accordance with state and local codes.
  - b) Emergency venting device shall be installed on the emergency vent pipe nipple prior to use. See also paragraph H.2 on page 48 for operation.
  - c) Pressure vacuum vent (PV) caps shall be installed on normal vent.
  - d) Phase I vapor recovery system shall be installed, if required by the Authorities Having Jurisdiction.
  - e) Net positive suction head (NPSH) problems and cavitation may occur in extremely high altitudes or as a result of long suction piping. In these cases, use of submersible pump should be considered.
  - f) Fire extinguishers shall be provided as required by the applicable fire codes.
  - g) A cleanup kit shall be provided at the site.
  - h) Always consult Authorities Having Jurisdiction.
  
2. The following requirements apply to **Dispensing Applications** shown in **Figures 8 through 11**:
  - a) Dispensing shall be by a UL/ULC listed pump equipped with:
    - i. Vacuum breaker
    - ii. Filter and adapter
    - iii. UL listed fuel hose
    - iv. Safety breakaway valve
    - v. Auto shutoff nozzle
  - b) Phase II vapor recovery system shall be installed, if required by the Authorities Having Jurisdiction.
  - c) Any pump described as "remote" must be approved by the Authorities Having Jurisdiction in advance of the installation of the pump.
  
3. The following requirements apply to **Generator Fuel Supply** shown in **Figures 12, 13 and 14** and recommended piping shall include:
  - a) Angle check valve with pressure relief or foot valve, strainer and pressure relief valve.
  - b) Shut-off valve with fusible link on supply piping
  - c) Anti siphon valve if the level of the suction piping falls below the high level of fuel in the tank.

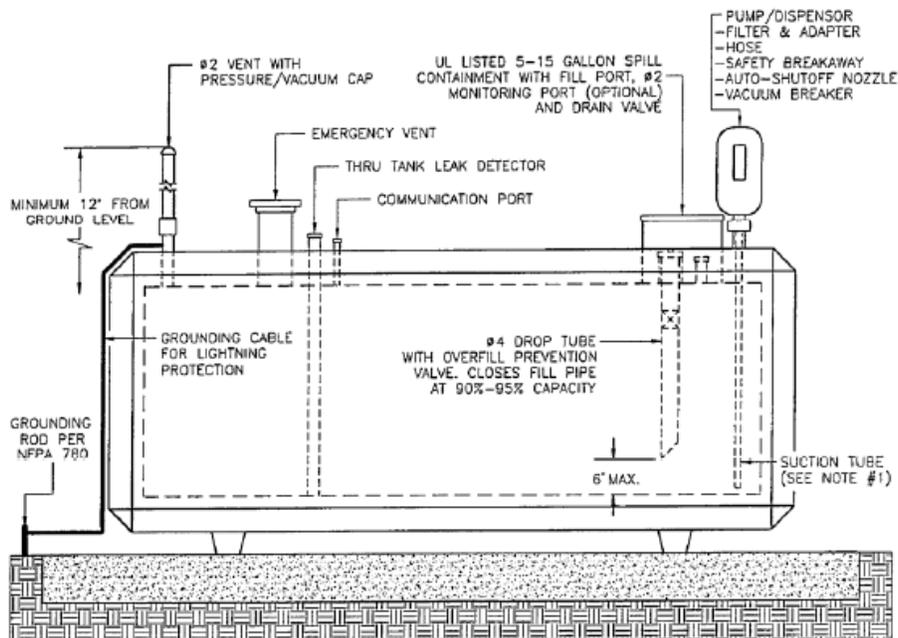


## N. DISPENSING APPLICATIONS

### 1. On-Tank Suction Type Dispensing Application

Dispensing from the Convault® tank system is most simply accommodated by a top of tank pump. This arrangement eliminates leaking valves and fittings. Our recommended dispensing configuration is shown in Figure 8. Diagram provided is recommended for sites with tanks 2000 gallon and less that serve the end-user's internal fleet/vehicles. See the **General Applications Requirements in M.1 and M.2 on page 33.**

**Figure No. 8**



Notes:

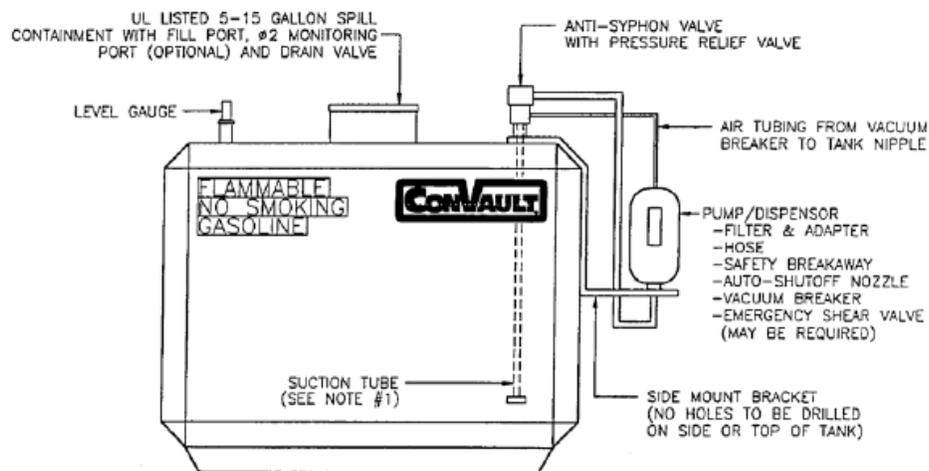
1. Bottom of foot valve/strainer to be 1" from bottom of steel tank
2. Stairway assembly to fill port (optional)

## 2. Side-Mount Suction Type Dispensing Application

The diagram provided in **Figure 9** is recommended for the sites to dispense fuel to private user or for fleet vehicles. In addition to the **General Applications Requirements in M.1 and M.2 on page 33**, the system should be equipped with:

- a) Anti siphon valve with pressure relief or solenoid valve,
- b) Emergency shear valve, if required by Authority Having Jurisdiction.

**Figure No. 9**



Notes:

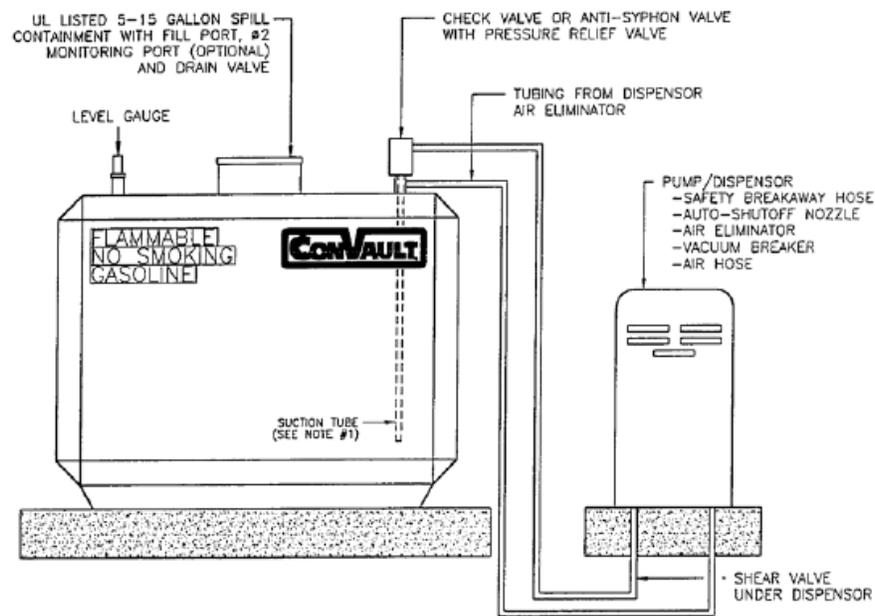
1. Bottom of foot valve/strainer to be 1" from bottom of steel tank
2. Stairway assembly to fill port (optional)

### 3. Off-Tank Suction Type Dispensing Application

The diagram in **Figure 10** provided is recommended for those sites authorized to either dispense to motor vehicles for public use or fleet vehicles with high-speed dispensing accessories. In addition to the **General Applications Requirements in M.1 and M.2 on page 33**, the system should be equipped with:

- a) Angle check valve or anti siphon valve with pressure relief,
- b) Under pump emergency shear valve, if required by Authority Having Jurisdiction.

**Figure No. 10**



**Notes:**

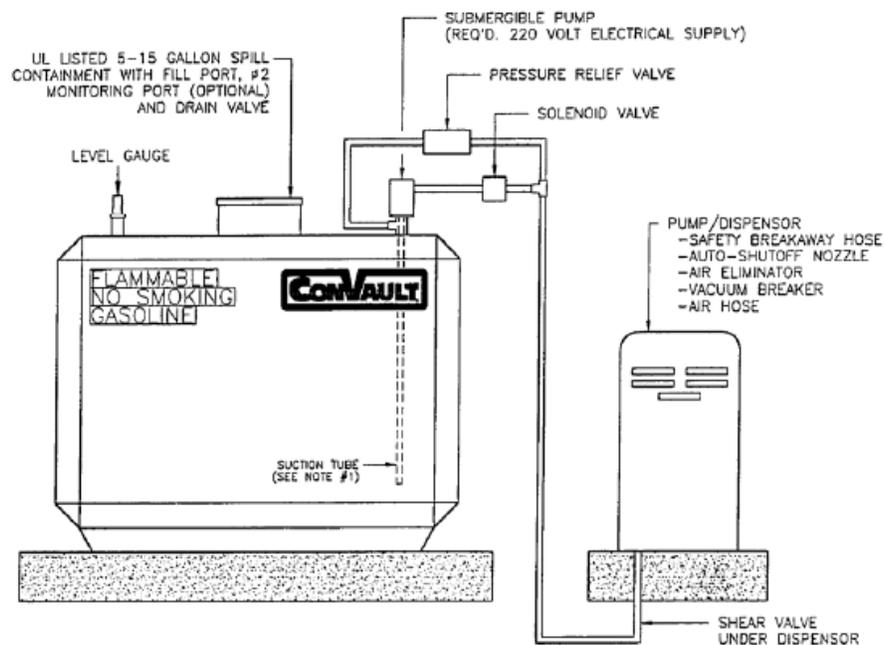
1. Bottom of foot valve/strainer to be 1" from bottom of steel tank
2. Stairway assembly to fill port (optional)

#### 4. Submersible Pump Dispensing Application

The diagram shown in Figure No. 11 is recommended for those sites authorized to either dispense to motor vehicles for public use or fleet vehicles with high-speed dispensing accessories. In addition to the **General Applications Requirements in M.1 and M.2 on page 33**, the system should be equipped with:

- a) Solenoid valve with pressure relief,
- b) Emergency shear valve, if required by Authority Having Jurisdiction,
- c) Submersible pump, which will require 220-volt electric supply.

**Figure No. 11**



Notes:

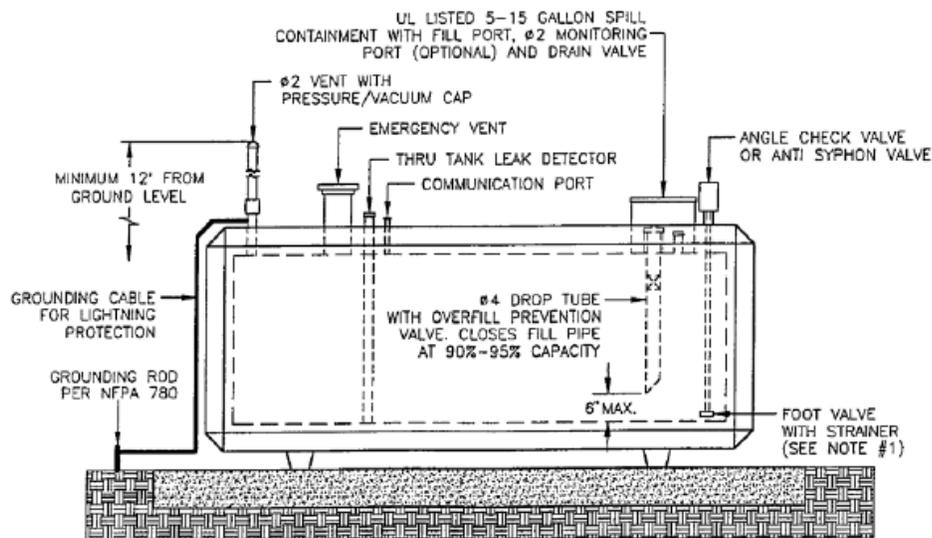
1. Bottom of foot valve/strainer to be 1" from bottom of steel tank
2. Stairway assembly to fill port (optional)

## O. GENERATOR FUEL SUPPLY APPLICATION

The diagrams shown in Figure No. 12, 13 and 14 are recommended for those sites utilizing a Convault® AST to supply a generator, whether it is primary or standby in function. See also the General Applications Requirements in M.1 and M.3 page 33.

For directions and side view, see Figure 12; for end view, see Figure 13; for option of using one connection for both suction and return lines see Figure 14.

**Figure No. 12**  
Side View



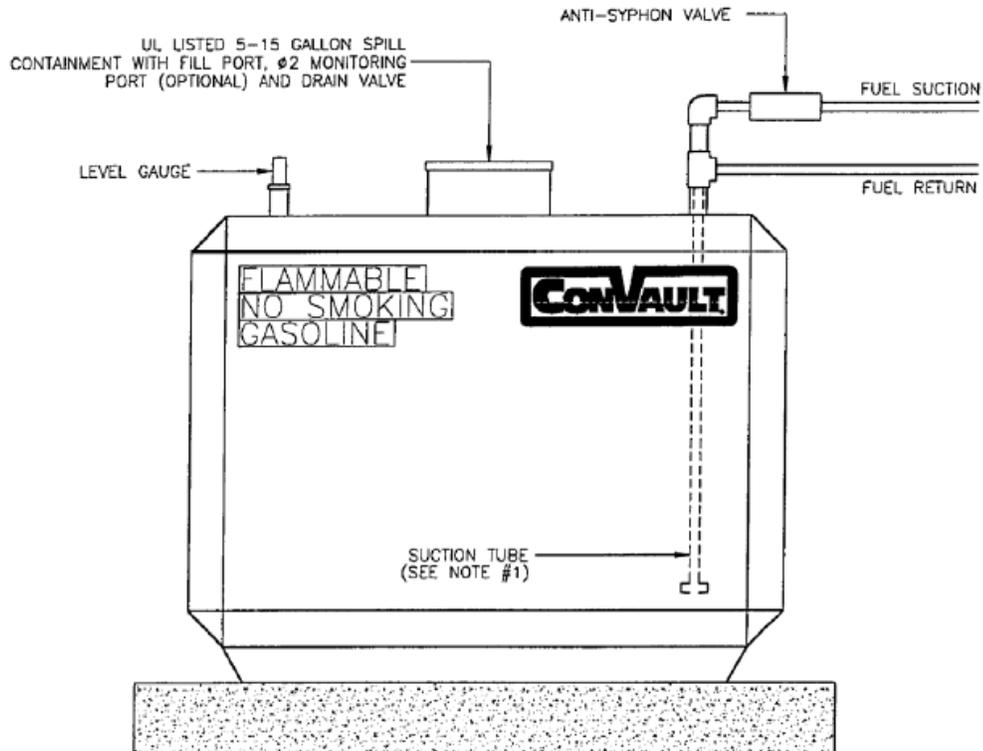
Notes:

1. Bottom of foot valve/strainer to be 1" from bottom of steel tank
2. Stairway assembly to fill port (optional)



See the General Applications Requirements in M.1 and M.3 page 33.

**Figure No. 13**  
**Generator Fuel Supply**  
**End View**

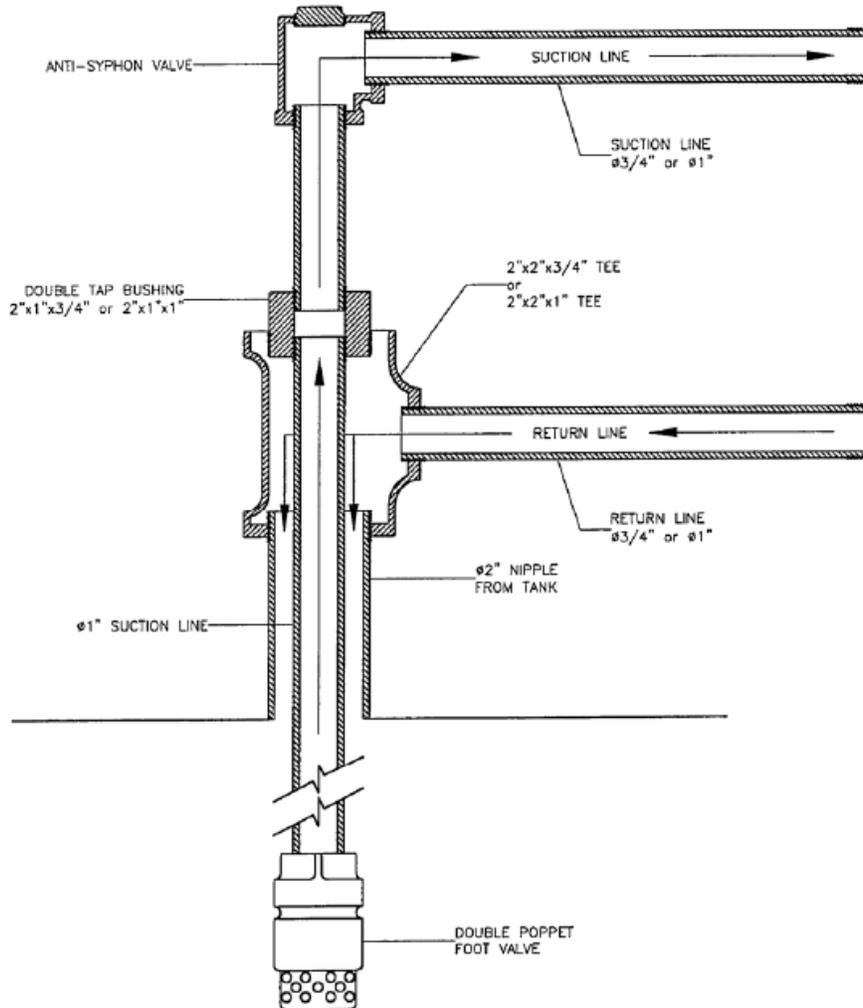


NOTES:

1. Bottom of foot valve/strainer to be 1" from bottom of steel tank
2. Stairway assembly to fill port (optional)

**CAUTION** Do not connect any fuel return or vapor recovery pipe to leak detector tube or communication nipple. Failure to comply will result in filling the interstice with fuel and consequently voiding your warranty. The leak detector tube and the communication nipple are powder coated red for easy identification.

**Figure No. 14**  
**Generator Fuel Supply**  
**Optional use of one connection for both suction and fuel return line.**



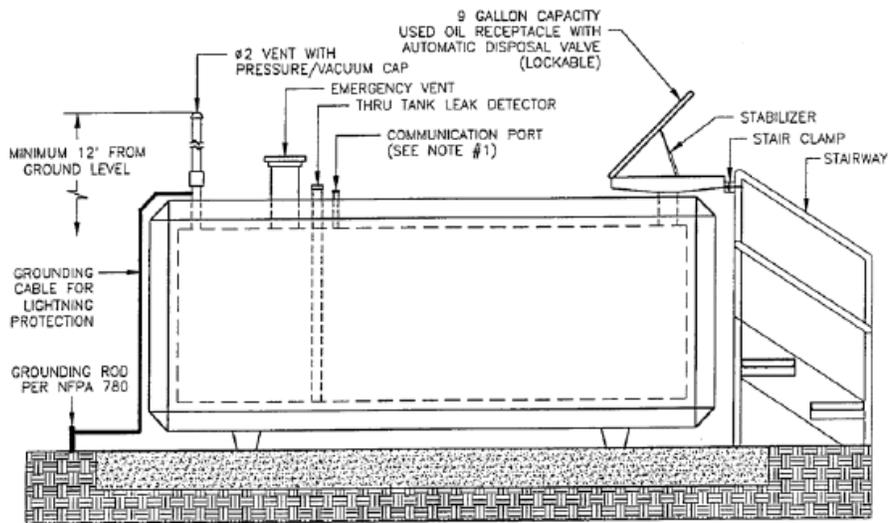


## P. USED OIL APPLICATION

The diagram provided in **Figure No. 15** is recommended for use with used oil storage and is not a requirement. Confirm with the local Authorities Having Jurisdiction and ensure that all pertinent operational requirements have been met in advance of installation. See also the **General Applications Requirements in M.1 page 33**.

ConVault® recommends the use of a used-oil receptacle, stair clamps, and a step-platform for manual pouring sites. Where the tank is filled by a remote pump, an overfill prevention system should be utilized. ConVault® recommends the use of an audible alarm in conjunction with existing level indicator devices, as well as a solenoid valve in the fill pipe or shut-off switch to control the pump. Fire extinguisher and spill cleanup kit should be provided at the site.

**Figure No. 15**

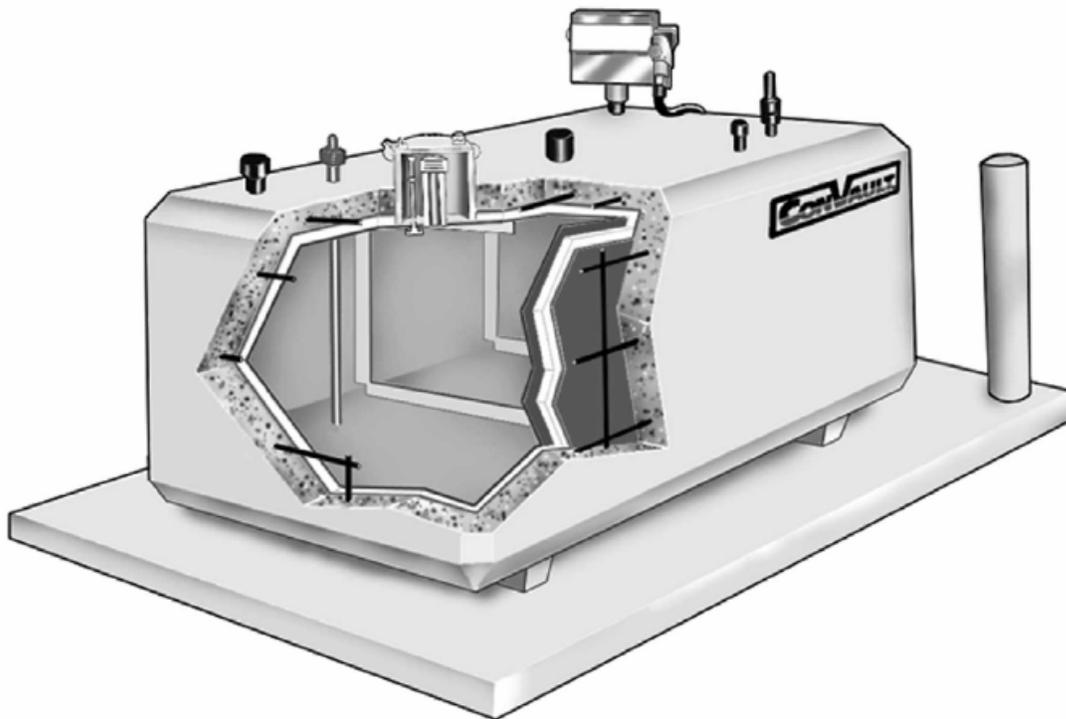


1. STAIRWAY ASSEMBLY TO FILL PORT (OPTIONAL)



*The Industry Leader In Aboveground Fuel Storage Systems*

# ***OPERATING MANUAL***



*April 2007*

*Operating Manual*

*Pg. 42*



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## A. GENERAL

Convault® tank is a steel storage tank insulated with Styrofoam and wrapped in a secondary containment consisting of 30 mil high density polyethylene membrane encased in a 6 inch thick reinforced concrete vault.

Since the tank contains flammable or combustible liquids, it is therefore prudent that general common sense is exercised in operating the fuel storage system. Dispensing of fuel from the Convault® storage tank to other equipment, automobiles, generators, etc., requires connection of accessories to the tank. Therefore it is important to establish practices and procedures to ensure that accessories and their piping connections are free from any leaks or other hazardous conditions.

- **NOTE:** it is very important that you familiarize yourself with the fuel dispensing equipment and accessories and follow their manufacturer's operating instructions to their full extent. Equipment manufacturer's operating instructions, guidelines, and recommendations take precedence to the instructions contained in the Convault® operating manual. Use the following list as your order of priority:
  1. Local jurisdiction codes, rules and regulations.
  2. Applicable state codes, rules and regulations.
  3. Applicable regional and national codes, rules and requirements.
  4. Manufacturer's recommended installation, and operating procedures.
  5. Convault® operating manual.

## B. FILLING THE TANK

- **NOTE:** Filling of tanks should be carried out under continuous and close supervision.

Tank filling nipple is a threaded 4 or 6-inch pipe located inside the spill containment compartment. The filling nipple is located lower than the containment top to catch any potential spills.



**CAUTION** **DO NOT** ever use the 2" Leak Detector Tube or the 1" communication nipple for filling the tank. These nipples are not connected to the primary tank. They are powder coated red to distinguish them from all other primary tank nipples, which are coated black or white. If the leak detector tube or the communication nipple are used as filling ports, or connected to any other filling or vapor recovery system, the secondary containment will be filled with fuel or petroleum product vapors. This will invalidate your ConVault® Limited Warranty. It is essential that all operating personnel and fuel delivery truck drivers are trained and are made familiar with the proper filling operations.

- **NOTE:** Multi-Compartment tanks must be carefully labeled to prevent cross-filling the individual tanks; for example, a double 500 gallon tank should be labeled as diesel and gasoline to insure the operator or the fill truck driver can easily identify each compartment.

### C. GENERAL FIRE PROTECTION

Smoking is prohibited within fifty feet (50') of all storage and dispensing devices. Signs prohibiting smoking must be conspicuously posted.

Portable fire extinguishers must be provided for the suppression of fires in accordance with NFPA 10 and UFC for high hazard area. Additional fire control equipment might be required, if in the opinion of the fire official, an unusual fire exposure hazard exists.

### D. LEAK DETECTOR

All ConVault® aboveground storage tanks are equipped with one or two Leak Detector Tubes to enable you to check and monitor any leaks from your primary steel tank into the secondary containment. The secondary containment consists of a 30-mil high-density polyethylene membrane encased in 6-inch thick concrete to provide 2-hour fire resistant vault for protection of primary and secondary containments.

The primary steel storage tank is shop-tested at 5 psig for 24 hours and is checked for leaks and any other damage before it is wrapped in the secondary containment. Under normal circumstances, the primary steel tank is not expected to leak.

Notwithstanding the above, the tanks should be visually inspected, on a weekly basis for any signs of leaks from the primary tank, pipes, fittings, and auxiliary equipment attached or connected to the tank.

The 2-inch leak detector tube is located on top of the tank and is powder coated in red to make it easy to identify. Except for a 1-inch communication nipple and the 2-inch leak



detector tube, all other connections on the tank are powder coated black or white. If the leak detector tube is not equipped with mechanical or electronic leak monitoring devices, to perform your weekly operating inspection, remove the cap and insert a clean dry wooden gauge stick into the leak detector tube until the wooden stick touches the bottom. Remove the gauge stick and visually inspect the gauge stick for any sign of fuel. If the gauge stick is wet or smells like hydrocarbon fuel, call your ConVault® distributor or the corporate office at 209-632-7571 or toll free 800-222-7099. Be prepared to provide the following information:

1. Location of the tank
2. Tank size
3. UL or UL Canada serial number.

#### **E. COMMUNICATION NIPPLE**

ConVault® tanks are equipped with a one inch (1") communication nipple powder coated red. Under normal operating conditions, the communication nipple should be kept capped. The communication port is provided to disperse air from the secondary containment during certain performance tests. Such tests, if deemed necessary by the ConVault® representative, should be performed under direct supervision of ConVault® or its authorized representative.

- **NOTE:** If your ConVault® is fitted with a double walled steel tank, the 1" communication nipple is not required and therefore it will not be supplied.

**CAUTION** **DO NOT** ever use the 2" Leak Detector Tube or the 1" communication nipple for filling the tank. These nipples are not connected to the primary tank. They are powder coated red to distinguish them from all other primary tank nipples, which are coated black or white. If the leak detector tube or the communication nipple are used as filling ports, or connected to any other filling or vapor recovery system, the secondary containment will be filled with fuel or petroleum product vapors. This will invalidate your ConVault® Limited Warranty. It is essential that all operating personnel and fuel delivery truck drivers are trained and are made familiar with the proper filling operations.



## F. FUEL DISPENSING

- Important Note: Any pump described as “remote” must be approved by the Authorities Having Jurisdiction in advance of the installation of the pump. Specific operating instructions must be obtained from the manufacturer of such pump, and followed implicitly and exclusive of any Convault® directives.
- NOTE: The majority of Convault® tanks are equipped with either a Fill-Rite pump or GasBoy pump. However, your tank may have been supplied with a different pump make. Familiarize yourself with the make of the pump supplied with your tank. Make sure you get the manufacturer’s operating manual. Learn how to operate the pump, and make sure your operating personnel know how to operate it as well.
- NOTE: Do not overfill or top off fuel port.
- NOTE: The minimum 1/4” Styrofoam insulation and the six-inch (6”) concrete vault give thermal protection that minimizes temperature change for liquid fuels stored in excessively hot or cold environments. However, the liquid fuel will have some temperature variation at different times of the day. The liquid will expand or contract due to temperature changes and may slightly affect your level gauge indications. You may experience a slight variation in volume measurements for the same amount of liquid in the tank. On average, gasoline and diesel fuel will have about 0.6% and 0.4%, respectively, variation in volume for every 10-degree-F temperature difference. For example for a 6,000-gallon gasoline tank (full), a 10-degree-F temperature change will be equivalent to a 1/2” (or a 36 gallon) difference in liquid level in your tank.

## G. OVERFILL PROTECTION

The U.S. EPA requires that the tank have overfill protection measures that include an overfill alarm and an automatic flow restrictor or flow shut-off. Additionally, all product transfers must be constantly monitored.

We recommend a level gauge or level indicator be installed on the tank to meet the fire code requirements. This gauge must be accessible to the delivery operator.

State or local fire or environmental regulations may contain additional requirements. Check with you local Authorities Having Jurisdiction.



**NOTE:** Check your tank and make sure which type of overfill protection you have received on your tank and familiarize yourself and your operating personnel with the accessories provided and their operation.

## H. VENTING

### 1. Atmospheric Vent:

Convault® tanks must be provided with 2 inch vent line for venting into atmosphere in case of a pressure build-up inside the tank. Make sure vent cap is not obstructed to allow free flow of vapors from the vent. Obstruction of 2-inch vent line cap may lead to pressure build-up inside the tank and cause the emergency vent system to open.

### 2. Primary Tank Emergency Vent:

Convault® tanks must be provided with emergency pressure relief devices to automatically relieve the pressure of the primary tank before it reaches a maximum of 2.5 psig. Tank sizes from 125 gallon to 12,000 gallon are provided with 2 inch to 8-inch emergency pressure relief nipples and pressure relief devices. See WARNING under testing on page 60. Tanks with over 5,000 gallons capacity may have been provided with a manway cover that has long bolts instead of an emergency vent device. Before the pressure inside the tanks rises to 2.5 psig, the pressure relief device or the long bolt manhole cover rises, allowing the vapor inside the tank to escape and thus relieve the pressure inside the tank. At 2.5 psig pressure, the emergency venting device will be fully open.

### 3. Secondary Containment Emergency Vent:

The Convault® Non-Metallic secondary containment tanks have UL listing for emergency venting by "Form of Construction". Therefore, installation of an emergency vent on the secondary containment will not be required. If the Authorities Having Jurisdiction require the tank to be provided with an emergency vent, then the secondary containment may be provided with an emergency venting device as an optional item. Depending on the size of the tank the venting device size will be 4 inch to 8 inch. The emergency venting device will open before the secondary containment internal pressure reaches 2.5 psig. At 2.5 psig pressure, the emergency venting device will be fully open.

- **NOTE:** Familiarize yourself and your operating personnel with the emergency pressure relief systems provided and their operation on your tank. The Uniform Fire Code (UFC) requires the system to be fully operational at all times.



## I. SPILL CONTAINMENT

ConVault® tanks are provided with 5 to 15-Gallon spill containment mounted on top of the tank, surrounding the tank fill-pipe with spill containment except for the remote fill. The containment will catch occasional spills. A hand-activated valve is provided inside the containment to drain the spill back into the primary tank.

## J. BACTERIA MONITORING AND CONTROL

Bacterial infestation of fuel tanks and lines, originating from the fuel, chemically alter fuel to produce water, sludge and acids. Water and acids are corrosive and can cause severe corrosion in the tank, especially in the diesel fuel storage, at the bottom part of the tank in the interface between water and fuel. Also, microbial growth can cause fuel filter plugging, injection failing, system deposits, and corrosion of tanks and lines. You should arrange to have your fuel analyzed for microbial growth and to eradicate the infestation, if any. This program will prevent corrosion of your tank and piping and fuel filter plugging. Contact your fuel supplier for the locations and service of research labs that can test the fuel system and help you control bacterial infection. Also, ask your fuel supplier for the frequency of such tests needed to control bacterial infection. Bacteria cannot grow if there is no water in the fuel. Monitoring and controlling of water accumulation in the tank will also prevent bacterial growth. See paragraph K on water monitoring and control.

## K. WATER MONITORING AND CONTROL

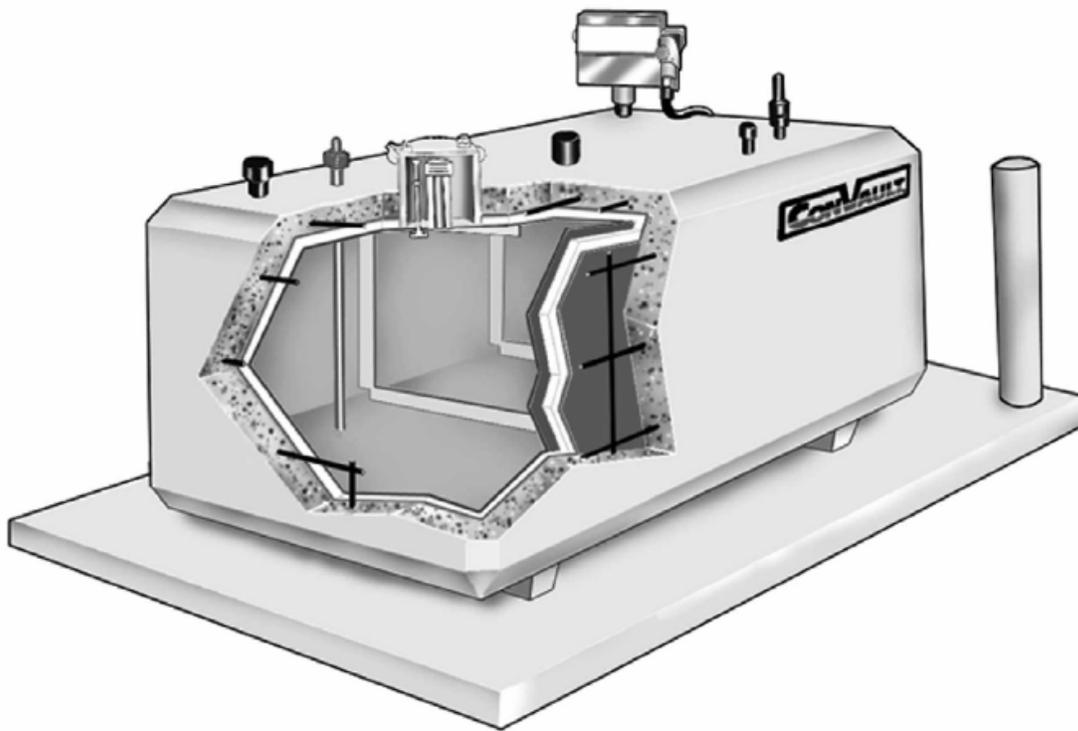
You may get water in the fuel through condensation of water vapor from the air. Water is heavier than fuel and therefore it settles at the bottom of the tank and causes corrosion. One way of minimizing condensation of water vapor inside the tank is by installing a pressure/vacuum vent (PVV) cap on your tank. The PVV cap normally keeps the vent line closed unless the internal tank pressure or vacuum opens it. The advantage of the PVV cap is that under normal operating conditions it keeps the outside air from entering the tank through the vent. Water may also enter the tank with the fuel delivered to you. You should regularly monitor the tank and make sure that there is no water accumulated at the tank bottom. If there is water at the tank bottom, you should pump it out with a small hand held pump called a "Thief Pump". If you do not monitor and pump out the water from the tank bottom, the useful life of your tank may be reduced dramatically.

**CAUTION** Water and bacteria monitoring and control are essential to preventing internal corrosion of steel tanks. Lack of such control measures by the owner and operator may invalidate the ConVault® Limited Warranty.



*The Industry Leader In Aboveground Fuel Storage Systems*

# ***MAINTENANCE MANUAL***



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*April 2007*

*Maintenance Manual*

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## A. FUEL TANK-CONVAULT® (ALL SIZES)

**▲WARNING** Never enter a tank without proper equipment. Provide proper equipment and proper procedures for operation and maintenance personnel for entering a confined space. Entering a tank without proper equipment may result in injury or death.

The owner/operator is required to inspect the tank visually on a regular basis, at least once a week. Visual inspection is the primary form of maintenance required. The inspection and maintenance should include the following:

1. Check for small cracks, and any signs of leakage. Fill and repair the small cracks. The touch-up paint provided at the time of delivery, for paint coated tanks, can be used for repair of the chipped paint.
2. Inspect all decals and signs and replace if not readable. Extra decals can be purchased through your local distributor. All decals must be on the tank before filling it.
- **NOTE:** Multi-Compartment tanks must be carefully labeled to prevent cross-filling the individual tanks; e.g., a D500 should be respectively labeled as diesel and gasoline to insure that each compartment can be easily identify by fuel truck driver or by the system operator.
3. Inspect the leak-detector tube for any signs of leakage from the primary steel tank into the secondary containment. See specific instruction for leak detection under paragraph D, page 45 and paragraph G, page 55.
4. Inspect nipples; spill containment and manholes for any sign of powder coating deterioration and corrosion. Remove the deteriorated and chipped off coating. Then sand, clean, and paint in accordance with the paint manufacturer's recommendation.
5. Confirm with your local fuel supplier the need to utilize additives for seasonal variances or to reduce corrosion of the inner steel tank due to local fuel impurities / intermittent moisture. Your local fuel supplier should be able to provide this guidance.
6. For Tank Maintenance Checklist, see Appendix A



## B. FUEL PUMPS

- **IMPORTANT NOTE:** Any pump described as “remote” must be authorized by the Authorities Having Jurisdiction in advance of its installation. Pump manufacturer’s operating and maintenance instructions must be followed. The Convault® distributor can advise you how to contact the manufacturers for more details on fuel dispensing equipment and their maintenance procedures.

**⚠ DANGER** To avoid fire, electric shock, and injury or death, turn off power at circuit breaker or fuse. Test that power is off before servicing electrical wiring.

1. Follow pump manufacturer’s recommendation for the procedure and frequency of maintenance.
2. Disconnect electrical equipment from the main electric power to eliminate electrical shocks.
3. Check the motor for any sign of over-heating or excessive wear.
4. Check the meter and reset.
5. Have your electrical wiring connections checked by a qualified person.

## C. NOZZLES

1. Visually inspect the nozzle for wear and tear.
2. Inspect the trigger mechanism for any sign of metal fatigue and mechanical failure.
3. Check for leaks around connection to hose.

## D. FILTER

1. Replace the filter every six (6) months or as needed. Mark the date changed on the filter.
2. Check all fittings for leaks. Tighten or adjust the fittings as needed.



## E. MISCELLANEOUS VENTS, HOSES, AND GAUGES

1. Visually inspect all vents, vent caps, hoses, level indicators and gauges at least once a week. Check hoses for leaks at least once a week.
  2. Check, all hoses and fittings for excessive wear--replace, if needed.
  3. Check fuel gauge for proper operation. Level indicator should indicate approximate amount of fuel in the tank. If gauge is not reading the proper amount of fuel, test fuel level manually with wooden stick gauge and compare it with automatic gauge. If gauge is not indicating the correct amount of fuel, remove and inspect the float assembly. If damaged, replace defective parts.
- **NOTE:** The minimum 1/4" Styrofoam insulation and the six (6") concrete vault give thermal protection that minimize temperature change for liquid fuels stored in excessively hot or cold environments. However, the liquid fuel will have some temperature variation at different times of the day. The liquid will expand or contract due to temperature changes and may slightly affect your level gauge indications. You may experience a slight variation in volume measurements for the same amount of liquid in the tank. On average, gasoline and diesel fuel will have about 0.6% and 0.4% respectively, variation in volume for every 10-degree-F temperature difference. For example for a 6,000-gallon gasoline tank (full), a 10-degree-F temperature change will be equivalent to a 1/2" (or a 36 gallon) difference in liquid level in your tank.

## F. EMERGENCY RELIEF VENT

1. Check the operation of emergency relief vent of the primary tank (and the secondary containment venting device if provided) at least once a year by lifting top cap and releasing it. Emergency relief vent cap should operate free from any restrictions and reseal upon release. Emergency relief vent caps should not be propped open, as this action will facilitate loss of fuel through vaporization.
  2. Check atmospheric vent cap for proper operation and ensure that it is not obstructed or prevented from venting into atmosphere.
- **NOTE:** Familiarize yourself with the emergency pressure relief system provided on your tank. The Uniform Fire Code (UFC) requires the system to be fully operational at all times. See paragraph H.2 on page 48 and WARNING on Page 60.



## G. LEAK DETECTOR PADLOCK

Inspect the lock on the leak detector tube cap for corrosion. Oil the lock in key slot with lightweight lube oil, when required. The lock should always be attached to the cap to prevent accidental filling of leak detector with fuel.

- **NOTICE:** See CAUTION under paragraph B, FILLING THE TANK, of OPERATING MANUAL, page 44 and paragraph D, LEAK DETECTOR, page 45.

## H. BACTERIA MONITORING AND CONTROL

Bacterial infection on fuel tanks and lines, originating from the fuel, chemically alter fuel to produce water, sludge and acids. Water and acids are corrosive and can cause severe corrosion in the tank, especially in the diesel fuel storage and at the bottom part of the tank. Also, microbial growth can cause fuel filter plugging, injection failing, system deposits, and corrosion of tanks and lines. You should arrange to have your fuel analyzed for microbial growth and to eradicate the infestation, if any. This program will prevent corrosion of your tank and piping and fuel filter plugging. Contact your fuel supplier for the locations and service of research labs that can test the fuel system and help you control bacterial infection. Also, ask your fuel supplier for the frequency of such tests needed to control bacterial infection. Bacteria cannot grow if there is no water in the fuel. Monitoring and controlling of water accumulation in the tank will also prevent bacterial growth. See paragraph I on Water Monitoring and Control.

## I. WATER MONITORING AND CONTROL

You may get water in the fuel through condensation of water vapor from the air. Water is heavier than fuel and therefore it settles at the bottom of the tank and causes corrosion. One way of minimizing condensation of water vapor inside the tank is by installing a pressure/vacuum vent (PVV) cap on your tank. The advantage of the PVV cap is that it normally keeps the vent line closed unless the internal tank pressure or vacuum opens it, thus reducing the amount of moist air entering the tank through the vent. You should regularly monitor the tank and make sure that there is no water accumulated at the tank bottom. If there is water at the tank bottom, you should pump it out with a small hand held pump called a "Thief Pump". If you do not monitor and pump out the water from the tank bottom, the useful life of your tank may be reduced dramatically.

**CAUTION** Water and bacteria monitoring and control are essential to preventing internal corrosion of steel tanks. Lack of such control measures by the owner and operator may invalidate the ConVault® Limited Warranty.



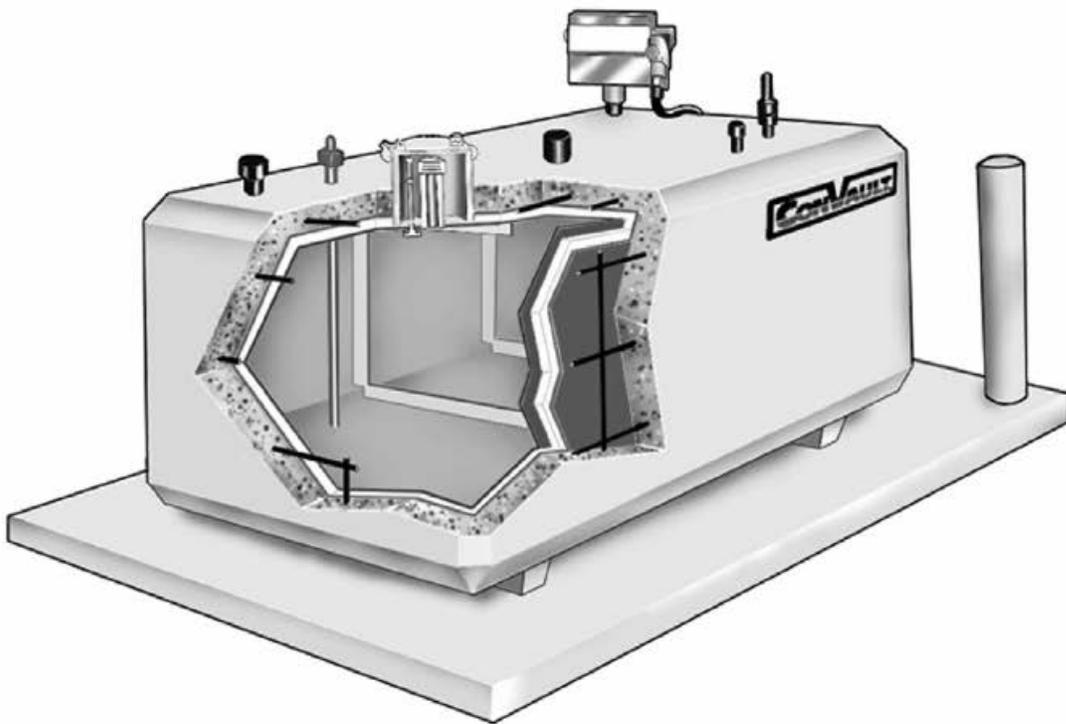
## **J. PREVENTIVE MAINTENANCE**

1. Preventive maintenance can be less expensive compared to the cost of system shutdown and repairs. In the long run, preventive maintenance will save you money.
  2. See Appendix A for suggested Maintenance Checklist and Maintenance Procedures.
  3. Always be looking at how you can implement a preventive maintenance program.
- 
- **FINAL NOTE:** Should you require any assistance in the aforementioned maintenance instructions on ConVault® aboveground fuel storage tanks, please call (800) 222-7099 for details or email us at [info@convault.com](mailto:info@convault.com).



*The Industry Leader In Aboveground Fuel Storage Systems*

# ***TESTING MANUAL***



*April 2007*

*Testing Manual*

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## A. GENERAL

Convault® tanks are shipped pre-assembled and shop-tested. Generally, this eliminates the need for site testing of the tanks. However, some fire and local authorities may require the tanks to be pressure tested on site. It may be required to test the primary steel tank or both the primary steel tank and the secondary containment. If such tests are required on site, proceed with the following instructions. Make sure every step of the test procedure is carried out according to the instructions and pay careful attention to the **Cautions** and **Warnings** in the procedure.

**▲ WARNING** Using air, never pressure test a tank that contains flammable and combustible material. If the tank contains flammable or combustible material, it should be tested using inert gases such as Carbon Dioxide or Nitrogen. Improperly testing a tank containing flammable and combustible materials may cause an explosion in the tank resulting in death or serious injury.

**CAUTION** The secondary containment should not be tested unless the test is coordinated with and supervised by Convault® or its authorized representative. Inexperienced testing personnel can cause severe structural damage to an otherwise functional AST. Several methods are available to conduct the test of annular space. The tests should always be performed under the direct supervision of a Convault® representative. Failure to observe this measure could void the warranty.

## B. AIR PRESSURE TEST PROCEDURE FOR PRIMARY STEEL TANK

Install test piping as shown in **Figure No. 16, page 61** and proceed as follows:

1. Temporarily plug, cap, or seal off remaining primary tank openings to hold the pressure.
2. If tank is equipped with a long-bolt manway for emergency venting, replace manway long-bolts with short-bolts and tighten them securely.
3. If the tank is equipped with standard emergency vent, remove the emergency vent and cap the opening to hold pressure as required.
4. If the tank is equipped with 1-inch communication nipple, remove the cap from the communication nipple for the secondary containment.
5. If the tank is not equipped with a communication nipple, remove or open the cap on the leak detector tube.
6. If leak detector tube is equipped with mechanical or electronic level detection equipment, remove the equipment to allow the air to freely escape from the annular space.



**CAUTION** The test air supply should not be more than 3 psig. Use only calibrated diaphragm type air pressure gauges with a zero to 10-psig dial span. Set pressure relief valve in test air supply line at 3 psig. Over pressurization of a tank may burst the tank and cause injury.

7. Close valve A.
8. Connect regulated test air supply line to test piping as shown in Figure No. 16 for single compartment tank. If the tank contains more than one primary compartment tank, use the same piping arrangement for each compartment and pressure test them all. The vault may contain up to 4 primary tank compartments.

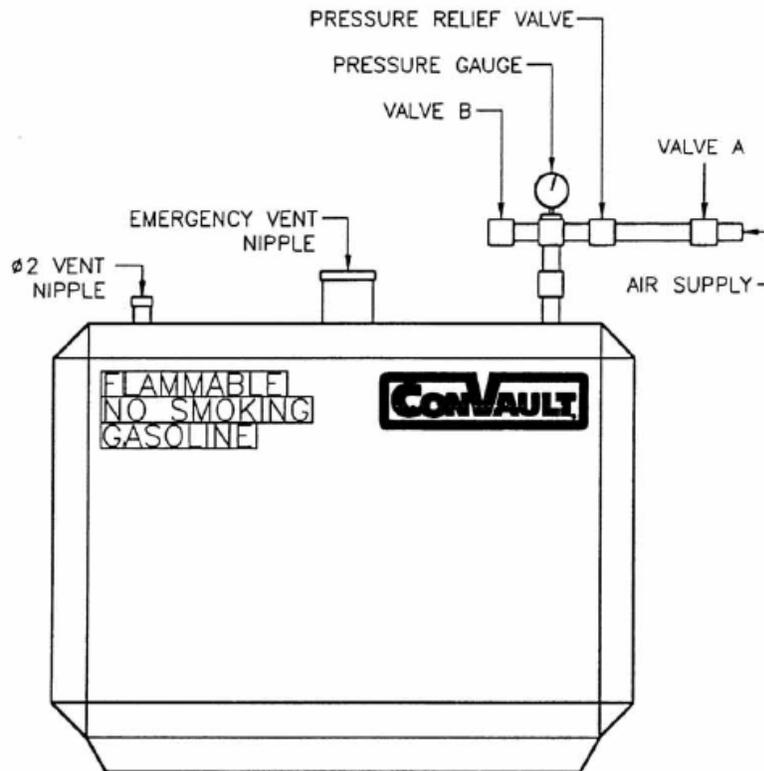
**CAUTION** Verify that the test air supply line pressure regulator is properly set at 3 psig before proceeding.

9. Slowly open valve A to pressurize the primary tank. Close valve B. Pressure gauge should indicate a pressure of 3 psig.

**CAUTION** Never leave a pressurized tank unattended. The air inside the tank may heat up and gently cause the pressure inside the tank to rise above 3-psig maximum pressure. If pressure in the tank rises, the pressure should be reduced to 3 psig by opening the valve B. Failure to constantly monitor the tank internal pressure may damage the tank.

10. Close valve A. Disconnect test air supply line from test piping.
11. Hold test pressure in primary tank for 1-hour minimum. A steady drop in pressure gauge reading indicates that there may be a leak in the plumbing or in the primary tank. Make sure that plumbing is airtight.
12. If no leaks are found and the tank passes the test, then open valve A and B and let the air out of the primary tank.
13. With tank de-pressurized, remove test piping, temporary plugs, caps and seals. Reinstall the cap on the communication nipple or the level indication equipment on the leak detector tube. Reinstall emergency relief vents. If tank is equipped with an emergency vent long-bolt manway, reassemble manway cover with bolts supplied by tank manufacturer.

**WARNING** Reassemble manway cover with proper size and type of long-bolt, with a minimum unthreaded length of 2 inches, so that when cover is fully raised, there is a 1-1/2 inch minimum space between manway cover and frame. Failure to properly assemble cover of a long-bolt manway used for emergency venting may make vent inoperable causing bodily injury or damage to the tank.

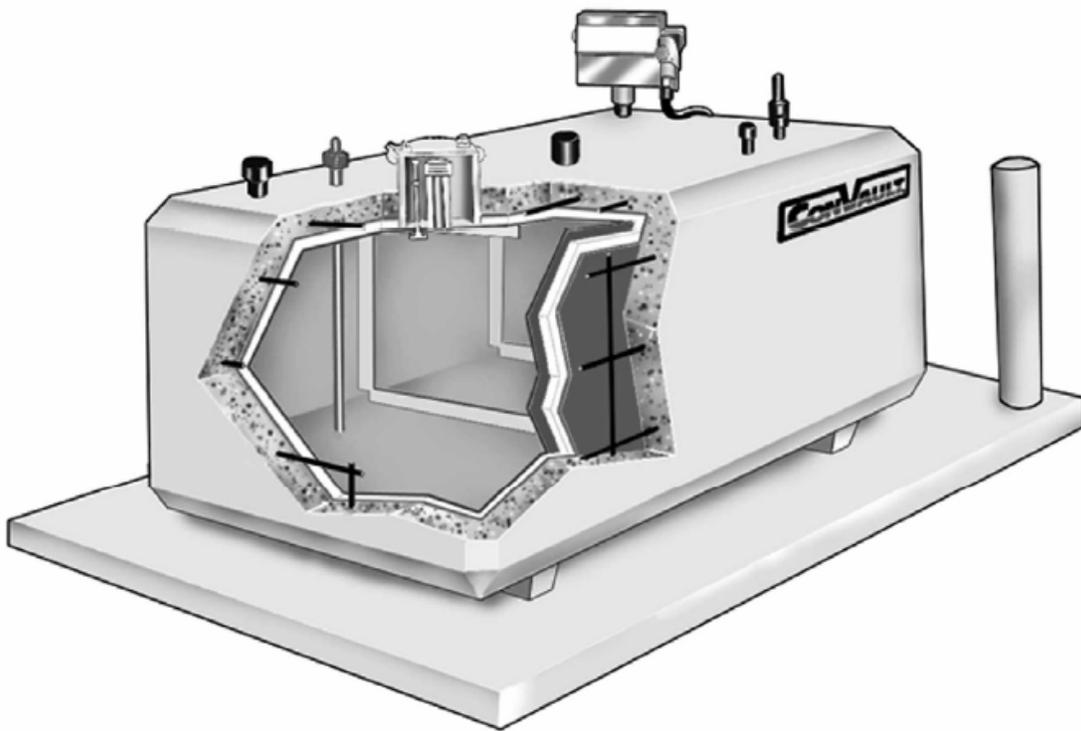
**C. Test Piping Diagram****Figure No. 16****NOTE:**

PLUG, CAP OR SEAL OFF ALL PRIMARY TANK OPENINGS.



*The Industry Leader In Aboveground Fuel Storage Systems*

# ***APPENDIX A***



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*April 2007*

*Appendix A*



## Maintenance Checklist

Inspection Date \_\_\_\_\_

Inspector \_\_\_\_\_

Note: This checklist is designed for general use. Some items may not apply. All equipment inspections and maintenance should be documented. You are encouraged to make copies of this checklist. See the corresponding maintenance procedures and your owner's manual for corrective actions and more details.

### Weekly Maintenance:

- 1. Check leak detector for indication of fluid in interstice. (This is required by warranty.) If checked with a stick gauge, ensure the stick is clean and dry before insertion.
- 2. Check for leaks on the pumps, filters, hoses, nozzles, joints and fittings.
- 3. Check nipples, spill containment and manholes for paint or powder coating decay (required by warranty). Check piping and fittings for rust.
- 4. Check pump meter and reset button.
- 5. Check fuel gauge for proper operation. If you have a Kruger At-A-Glance Gauge, check the clear cap for weathering or cracks.
- 6. Check spill containment for debris.
- 7. Check for small cracks in concrete.
- 8. Check readability of signs and decals.

### Monthly Maintenance:

- 9. Check for water in the primary tank bottom under the fuel (required by warranty).
- 10. Visually check the tank, including under the tank for any signs of leakage as required by the Environmental Protection Agency 40 CFR 112.
- 11. Check leak detector tube cap for corrosion and proper operation. If a Kruger manual leak indicator is installed, remove the red ring and clear cap and check to see that the red indicator moves up and down about 1 inch freely. Also, check for weathering or cracks in the clear cap. If electronic leak detection is installed, check it by using the test button.
- 12. Check all nozzles, hoses and fittings for wear and tear.
- 13. Check trigger mechanism on nozzle for metal fatigue or mechanical failure.
- 14. Check pump motor for signs of over-heating or excessive wear.
- 15. Check body of tank for cleanliness, need of paint, or rusting where applicable. Check signs and decals for need of replacement. Check slab and supports of unit for structural soundness.
- 16. Visually check grounding wires to see that they are properly attached to the tank terminals and grounding rod.

### Other Periodic Maintenance:

- 17. Replace the dispenser filter at least every six (6) months or as needed (mark the date replaced on the filter).
- 18. Check fuel for bacterial infestation or microbial growth.
- 19. Have a qualified person periodically check all electrical wiring.
- 20. Check the emergency relief vent at least once a year by lifting the top cap and releasing it to ensure freedom of movement.
- 21. At least once a year, remove the leak detection device and check for proper operation.
- 22. At least once a year, check the calibration of the fuel gauge.
- 23. Follow the pump manufacturer's recommendation for frequency and procedures of maintenance.
- 24. Document significant storage events per 40 CFR 112 and your state regulations.



## Maintenance Procedures

Please note that item numbers on this sheet correspond to the item numbers on the Maintenance Checklist. Most of the maintenance requirements and procedures are also covered in the Convault® owner's manual.

### Weekly Checks:

1. If leak detector indicates fluid in the interstice, remove any devices and determine what the fluid is. Call your Convault® representative.
2. If fuel leaks are detected, contact the appropriate authorities as necessary. Tighten, repair as necessary, replace components, or contact your installer or service company.
3. If paint or powder coating deterioration occurs on nipples, spill containment or manholes, clean to bare metal, prime with a good quality zinc based primer, and repaint. If corrosion is severe, contact your Convault® representative as soon as practical.
4. If dispenser meter is not working or will not reset, call your service company or installer.
5. If the fuel gauge fails to operate properly, repair/replace it, or call your service company before the next delivery. (It is the owner/operator's responsibility to prevent the overfilling of the tanks. The gauge is part of the required system to prevent overfilling.) If the Kruger gauge cap has deteriorated, it could be allowing rainwater into the primary tank and should be replaced.
6. Keep spill containment clear of debris at all times. A contaminated spill containment will cause the fuel to be contaminated when any spill is released through the drain into the primary tank. Materials such as rags or paper products used to clean the spill containment must be disposed of properly, as they will usually contain fuel from the spill containment.
7. If there are small cracks in the concrete, fill and repair them. If you have questions, call your local Convault® representative.
8. If signs or decals lose visibility, order replacements from your local Convault® representative before the next time the tank is filled.

### Monthly:

9. If there is water in the tank it will collect at the bottom, under the fuel. Water in the tank will cause increased corrosion. If you discover water in the primary tank it must be removed. One method is to pump it out with a "Thief Pump", a small pump that pulls the water from the bottom 1/8" of the tank. Check tank openings for possible water entry points. If you find that you are pumping out more than one half gallon of water for every 1000 gallons of product stored, see your fuel dealer, or call your Convault® representative. Also consult paragraph I in the maintenance section of the owner's manual.
10. If you detect leakage, determine what the liquid is, if possible. If it is fuel, call your Convault® representative and appropriate authorities as necessary. If it is water, seal the top using the Convault® repaint guidelines.
11. If there are problems with the leak detector tube or lock, clean and lubricate them as necessary. See paragraph G in the maintenance section of the owner's manual. If the Kruger leak indicator does not function properly, remove it and repair or replace it. Due to ultraviolet radiation, the clear cap on the Kruger leak indicator will deteriorate over time. If it has deteriorated, it could be allowing rainwater into the interstitial area and should be replaced. New caps and rings or entire units can be purchased from Kruger, your service company, or your Convault® representative. Kruger now offers a guard, which will prolong the life of the cap. If electronic leak detection test fails, call your service company.



12. If nozzles, hoses or fittings exhibit signs of wear and tear, repair/replace as necessary or call your service company.
13. If trigger mechanism on nozzle exhibits signs of metal fatigue or mechanical failure, replace nozzle or call your service company.
14. If pump motor shows signs of overheating such as housing discoloration or excessive wear such as bearing noise, repair as necessary or contact your service company.
15. Clean, paint, and repair problem areas as necessary. Order replacements signs or decals from your local Convault® representative. If the slab is cracking or settling, contact your local Convault® representative and your slab installer. If you have questions, call your local Convault® representative.
16. Make a visual inspection of grounding wires. If they are not attached properly, make appropriate changes or call your installer or your service company.

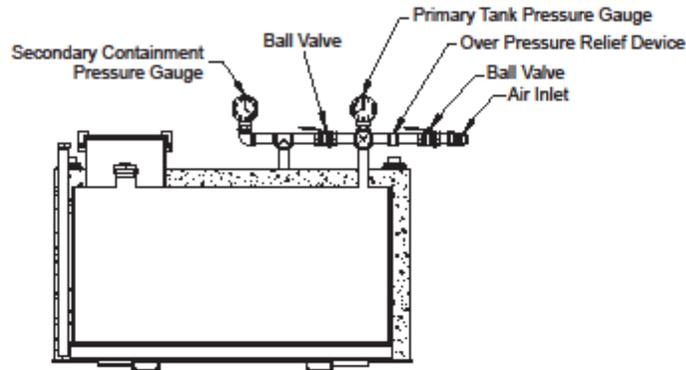
**Other Periodic Maintenance:**

17. Filters can be purchased from your Convault® representative or local service company. The date can be scratched on with a sharp object, or written with a permanent marker.
18. If bacterial infestation is detected, consult paragraph H in the maintenance section of the owner's manual.
19. Repair as necessary. Wiring (other than intrinsically safe items) in a class 1 area requires special sealing to prevent explosions.
20. If the emergency relief vent exhibits signs of motion restriction, promptly call your installer, your service company, or your Convault® representative. Proper operation of this device is critical as most injuries and fatalities that happen in conjunction with fuel fires are due to improper, non-functional emergency relief vents or emergency relief vents replaced with normal pipe caps.
21. Most leak detection devices use a float. By removing the device from the leak detector tube and turning it upside down (simulating a floating situation) you can easily check for movement of the float and proper mechanical or electronic indication. If the leak detection device fails to operate properly, call your installer or your service company.
22. The fuel gauge can be checked by "sticking" the tank and comparing it to the gauge reading. Some gauges are more accurate than the stick. If the gauge reading varies substantially from the stick reading, contact the gauge manufacturer or service company. If your stick reads in inches only and you need a calibration/conversion chart, contact your Convault® representative or download a copy from the Convault® website.
23. Pump maintenance requirements vary by manufacturer. If you have questions, contact your installer, local service company, or the manufacturer of the equipment.
24. If you have a warranty or environmental problem down the road, documentation will be very helpful. We recommend that you keep a copy of the "Maintenance Checklist" with items marked for every maintenance inspection. Notes about problems and corrections can be written on the back of the sheet and used for future reference. Many sites are now required to have a SPCC plan for emergencies on file. If you need a recommendation for companies that do this, please call your Convault® representative. **The name, phone number and location of your local representative can be obtained from the ConVault® web site by clicking on "Local Distributor" and your state or country at <http://www.convault.com>.**

**IOM 3**  
**Containment Solutions, Inc.**  
**Hoover Vault AST**



**HOOVER VAULT TANK™**  
**INSTALLATION INSTRUCTIONS**



Containment Solutions, Inc. (CSI), in accordance with all state, national and provincial codes requires testing at the jobsite by the installing contractor. This test should be accomplished after the tank has been placed at the location where it will be operating, and BEFORE any product is introduced into the tank. CSI strongly recommends that this work be performed by a trained and licensed AST installer. At a minimum, tanks should be tested to the written procedures presented below as well as applicable instructions outlined in the Petroleum Equipment Institute recommended practice RP200. The below presented guidelines do not alleviate the installer from insuring that all tanks are installed in strict accordance with NFPA 30, NFPA 30A and/or NFPA 31 codes at a minimum, in addition to all applicable state or local codes that may be more stringent.

**1.0 Tank Site**

- 1.1 The foundation for the tank must be designed to support the total tank weight plus 100% of the weight of the maximum amount of product the tank will be storing. The foundation may be comprised of concrete, asphalt, gravel or other stable material and must include provisions in its design to prevent tank movement. The foundation design must also include provisions for draining surface water away from the tank to minimize corrosion.
- 1.2 This tank must be installed in accordance with all applicable federal, state and local environmental regulations and safety codes.
- 1.3 Tank must be grounded per local codes.
- 1.4 Tanks located in areas subject to flooding must be protected against flotation.
- 1.5 The tank shall be protected and secured from vandalism. The tank shall also be protected from accidental damage, such as from vehicular impacts, in accordance with all applicable codes.

**2.0 Tank Handling**

- 2.1 Equipment for handling the tank shall be of adequate size to lift and set the tank. For some tank sizes, a fork-lift may be used for tank movement. Do not drop or drag the tank.
- 2.2 Tanks shall be carefully handled to prevent damage to the tank coating. The use of nylon straps is preferred to prevent damage to the tank coating. When using cables or chains, they shall be padded, and of adequate length and size.
- 2.3 It is the responsibility of the buyer to touch-up and repair any damage to the coating that occurs during transportation, installation or piping installation.
- 2.4 The inner tank must be empty before the tank is moved.

### 3.0 Testing

The following air pressure testing shall be performed at installation.

- 3.1 Install test piping as shown in Figure 1. Temporarily plug, cap or seal off remaining tank openings to hold pressure. If tank is equipped with standard emergency vents, remove emergency vents and cap openings to hold tank pressure as required.
- 3.2 The air pressure used for this test must not exceed 3 psig (21 kpa). Use a gauge with a 0 to 15 psig dial span. Set pressure relief valve in test air supply line at 3 psig.

Do not leave pressurized tank unattended.

Do not stand in front of tank heads or fittings when pressurizing tank.

- 3.3 The inner tank shall be pressurized to a maximum 3 psig air pressure.
  - 3.3.1 While maintaining this air pressure, the outer tank shall be tested to a maximum 3 psig in the interstitial space. Pressurize the interstice with air from the primary tank to avoid overpressurization of the interstice.

NOTE: The inner tank will drop in pressure when the interstitial space is pressurized, but should hold steady at the lower pressure. If test pressure drops below 3 psig, close off the air supply to the annular space. Then reconnect the air supply line to the primary tank and increase the pressure to 3 psig maximum. Then continue testing the annular space per these instructions.
  - 3.3.2 All visible seams and welds are to be covered with a leak testing solution or equivalent material for the detection of leaks. Hold test pressure in interstitial space for one hour minimum. A steady drop in gauge pressure, or a stream of bubbles, indicates there may be a leak in the interstitial space.
  - 3.3.3 If any leaks are detected, notify the tank manufacturer. If no leaks are found, testing of the tank is complete.

**WARNING:** To avoid damage to the tank, do not apply air pressure to the interstitial space between the walls of a double wall tank without air pressure in the primary tank. Do not apply air pressure to the interstitial space that is higher than the air pressure in the primary tank.

- 3.4 With tank depressurized, remove test piping, temporary plugs, caps and seals.
- 3.5 Reinstall emergency relief vents, etc. If tank is equipped with an emergency vent long bolt manway, reassemble manway cover with long bolts supplied by tank manufacturer as noted below. An emergency vent is required on both the primary tank and the interstice.

**WARNING:** Remove temporary manway cover short bolts and reassemble manway cover with proper size and type of long bolt with a minimum unthreaded length of 2 inches, so that when cover is fully raised, there is a 1-1/2 inch minimum space between manway cover and frame. Failure to properly assemble cover of a long bolt manway used for emergency venting may make vent inoperable, causing tank failure by over-pressurization.
- 3.6 Installation of pumps, dispensers and electrical wiring shall follow the applicable requirements of codes and zoning ordinances.

### 4.0 Tanks

- 4.1 Install all permanent piping and fittings using suitable thread sealant material.
- 4.2 All unused tank openings must be properly sealed using threaded pipe plugs, flanges or caps using suitable thread sealant material.
- 4.3 Do not weld on the tank, modify, or penetrate the tank structure in any way without the express written permission of the tank manufacturer.

### 5.0 Labeling

- 5.1 Tanks shall be labeled in accordance with all applicable codes.

## 6.0 Tank Accessories

- 6.1 All tank accessories shall be installed as required per local codes. Anti-siphon devices, overflow shut-off and alarms, vents, gauges, emergency vents, etc. are common requirements for tanks storing motor fuels for the purpose of being dispensed into motor vehicles.
- 6.2 Manual liquid level gauges may require adjustment before initial start-up and before each refueling of the tank.
- 6.3 Adjustment of liquid level gauge:
  - 1) Visually inspect the moving parts of the gauge through tank top to ensure free full movement. If operation is obstructed, than gauge removal is needed.
  - 2) Remove gauge from fitting, realign the swing arm and reinstall in fitting in the correct direction allowing for proper operation of the gauge.

## 7.0 Factory Installed Equipment And Accessories

- 7.1 Factory installed equipment and accessories are susceptible to loosening during transit due to vibration. This could result in minor leaks at threaded connections.
- 7.2 At time of site installation and start-up, the installer or end user will be responsible for a visual inspection and repair of loose or leaking connections.

NOTE: Do not attempt to retighten all fittings before a fluid start-up test. Breaking the seal of the sealant during tightening could result in leaks.
- 7.3 To repair a loose or leaking threaded connection, disassemble the connection, clean threads and reinstall fittings using the proper pipe sealant. (Ref. Gasola, Blue Block or Loctite {2 part-pipe sealant and primer})

## 8.0 Maintenance

- 8.1 Aboveground tanks are subject to basic maintenance requirements during the service life. The tank vessel is subject to accidental damage, vandalism, and atmospheric degradation of the coating.
- 8.2 The tank operator should perform periodic visual inspections to identify areas of damage to the vessel or the coating itself. Such damage should be repaired.
- 8.3 Periodic repainting of the surface will be required. The frequency of this maintenance procedure will be based upon the environmental factors in the geographic area where the tank is located. The operator is responsible for the selection of the paint, surface preparation and coating application. Local codes may require that the tank be relabeled.
- 8.4 Proper site preparation is vital to ensure proper draining of surface water (see paragraph 1.0 Tank Site). Over time, settlement may occur which alters the effectiveness of the initial surface water drainage provisions. Visual inspection of the vessel and surrounding foundation should identify any change in the drainage pattern. Should stagnant surface water be discovered against the surface of the vessel, the tank operator should consult the installation contractor.

### Requirements:

- 1) The Authority Having Jurisdiction shall be contacted prior to installing this tank.
- 2) This tank is intended to be installed in accordance with NFPA 30, NFPA 30A, Uniform Fire Code or International Fire Code.
- 3) This tank shall be investigated to determine acceptability for use after fire exposure damage, other physical damage, or misuse.
- 4) Flame arresters shall be installed in the normal vent lines when required by the Authority Having Jurisdiction.
- 5) The monitoring port on the secondary containment should be checked monthly for accumulation of liquid. If liquid is detected, test for the presence of hydrocarbons.
- 6) The primary tank should be checked monthly for the accumulation of water. All water shall be removed from the primary tank if detected.

IOM 3  
Above Ground Tank Vault  
AGT Vault AST

1

# **AGT Vault Owner Manual**

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## **GENERAL:**

It is understood that no oral promises, agreements, or other understandings exist except as herein specified. Above Ground Tank Vaults of America is hereinafter referred to as "AGT Vault" and the buyer, owner or purchaser is hereinafter referred to a "Purchaser". AGT Vault shall have no obligation to maintain any proposal after thirty (30) days. It shall become a binding contract on both parties only if the same or a purchase order covering the same is signed by Purchaser and accepted and acknowledged by an executive of AGT Vault. Circumstances may arise where, because of a default on AGT Vault 's part or other liability (including negligence and misrepresentation), the buyer is entitled to recover damages from AGT Vault. In each such instance, regardless of the basis on which the buyer is entitled to claim damages, AGT Vault liability is limited to accepting the return of the equipment that is the subject of the claim (FOB plant of manufacture), refunding any amounts paid thereof by the buyer [less depreciation at the rate of fifteen percent (15%) per year] and canceling any balance still owing on the equipment. Under no circumstances is AGT Vault liable for third-party claims against the buyer for losses or damages, economic consequential damages (including lost profits or savings) or incidental damages, even if AGT Vault may be at fault. It shall be the obligation and financial responsibility of the purchaser to comply with ongoing compliance with all applicable performance standards and specifications.

## **STATEMENT OF LIMITED WARRANTY:**

AGT Vault warrants that equipment that it manufactures or has manufactured for it under contract (and in accordance to its specifications) to be free from defects in materials and workmanship for a period one year from the date of installation thereof to the original and subsequent purchasers. During the warranty period, AGT Vault will, at its option, repair or replace equipment found to be defective under normal use and service. AGT Vault does not warrant uninterrupted or error-free operation of equipment. Misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by the buyer or failure caused by a product for which AGT Vault is not responsible may void the warranty. This warranty is limited to tank only and does not include paint, decals, pump and/or pump components, or air vents. The tank must be painted by the owner every two years to insure no corrosion and if this is not maintained as directed it will void the warranty. Other warranty terms may be provided upon request outside of normal warranty but must be in writing and signed by parties.

## **F.O.B. FACTORY:**

Shall be interpreted to include loading on cars or trucks at AGT Vault 's plant, but not include blocking and anchoring. This warranty gives the buyer specific legal rights and the buyer may also have other rights which vary from state to state. This warranty shall extend to the original purchaser and to any receiver within the warranty period of the equipment covered.

**THESE WARRANTIES REPLACE ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. HOWEVER, SOME LAWS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES. IF THESE LAWS APPLY, THEN ALL EXPRESS AND IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY.**

**This warranty shall include ongoing compliance with all applicable performance standards and specifications.**

Any equipment or parts thereof covered by this agreement, which is not manufactured by AGT Vault will be covered only by the warranty, if any, of its manufacturer. The buyer is responsible for any pick-up and delivery charges associated with warranty service. The buyer is responsible for loss of, or damage to, equipment in transit when the buyer is responsible for transportation charges.

**TO OBTAIN WARRANTY SERVICE, CONTACT AGT Vault at (800) 743-6745 No corrective action under warranty will be commenced on any equipment without prior written approval from AGT Vault.**

### **ACCEPTANCE:**

If this proposal meets with your approval, please indicate on your purchase order that the order is an acceptance of this quotation, and refer to our quotation number and date of same.

### **DELIVERY DATES:**

Shipping promise shown is based on present conditions of supply and scheduling. If, however, it is imperative that shipment be made earlier than indicated, please advise and AGT Vault will make an immediate investigation with a view to improve delivery to meet your requirements. Shipping and completion dates expressed or implied are based on prompt receipt of order and /or approved drawings. Shipping promise will be calculated from time of receipt of order, approved drawings or release for fabrication, whichever is later. AGT Vault shall not be responsible for delays in shipment or completion due to conditions beyond its control, including, but not limited to, accidents, strike, actions of mobs, default of delivery promise by suppliers, operation of the law and acts of God.

### **SPECIFICATIONS:**

Items quoted are intended to conform to plans, specifications and/or descriptions available, but conformity is not guaranteed by AGT Vault and should be verified by Purchaser.

### **DELAYS BY PURCHASER:**

Quotations assume, unless otherwise stated, that Purchaser's order will permit AGT Vault to obtain, or set aside, necessary material and schedule productions immediately upon receipt of order, deposits and / or approved drawings. If the conditions of Purchaser's order or delay of over 30 days in returning approved drawings do not permit obtaining, or setting aside material or scheduling production, AGT Vault reserves the right to review and re quote to adjust and increase in costs experienced by AGT Vault from the date of order to date of release for fabrication by Purchaser. If completion of fabricated material is made to coincide with the scheduled delivery, and Purchaser delays shipment, such material will be subject to invoicing

upon storage in our yard. Such storage to be at Purchaser's risk and any expense involved in storing or moving shall be for Purchaser's Account. AGT Vault shall not be obligated to change completion schedule after fabrication has begun. Expense caused by such delays during fabrication or installation, caused by Purchaser, shall be borne by Purchaser.

**HAULING:**

If hauling or shipping charges are included or quoted, such quotation is F.O.B. cars or trucks. Unless otherwise specified, Purchaser is to receive and unload any material on trucks, which cannot be unloaded at site by Driver. If changes in shipping rate are made before shipment, contract price will be adjusted accordingly.

**TITLE:**

Title to and ownership of said property shall remain vested in AGT Vault until the entire purchase price herein provided for shall have been paid in full in cash; in case of failure or refusal to make payments when due, then and in any such event, the whole of the unpaid portion of the purchase price shall, at AGT Vault's option become immediately due and payable.

**TAXES:**

Contract price is subject to increase by amount of any Sales, Use, or Excise Tax or other similar tax, however designated, levied or charged, either by Federal, State, City or other governmental agency, unless such tax is specifically included in quotation.

**PRICE ADJUSTMENTS:**

Price or prices quoted herein are based on present material, shop and freight costs. In the event of a change, before completion, in aforementioned factors AGT Vault reserves the right to adjust the selling price to directly reflect such changes.

**UNCOLLECTED FUNDS:**

Monies not received per the terms of the contract shall accrue interest charges prorated daily at a rate of 1.50% per month plus collection costs and reasonable attorney's fees.

**UNASSEMBLED MATERIAL:**

Material or equipment on which AGT Vault is not to perform the work of assembly or installation with existing material or material furnished by others, is sold subject to inspection

and acceptance by Purchaser before material leaves AGT Vault 's plant. Claims incidental to assemble by others cannot be honored.

**WORKMANSHIP AND INSPECTION:**

Unless otherwise specified herein, all material shall be furnished subject to the common manufacturing tolerances and variations of AGT Vault. Material furnished shall be subject to AGT Vault 's standard inspection, at place of manufacture. If inspection by the

Purchaser is required and provided for, such inspection with consequent approval or rejection shall be made before shipment.

## **OWNERS INSTALLATION & CARE OF THE AGT VAULT**

Below are the U.L. testing results, label, and drawings for your perusal. Many AGT Vault tanks are designed as drawn below. The equipment are accessories to the tank that can be provided by AGT Vault.

These tanks are made of steel so the paint coatings on the tank are very important. The tank shall be painted every 18 months and in high corrosive locations every 12 months. This will insure a long life for the tank even beyond the 25 year expected life.

All AGT Vault tanks are atmospheric and any closing of the vents and introducing pressure by any means is prohibited except for low pressure testing as required by local agencies, under no circumstance may the testing pressure exceed 5 psi.

If installation is quoted, it is assumed, unless otherwise specified, that normal conditions will be encountered, and that any delays, obstructions, etc., caused by the Purchaser or his agents, or by unusual and unanticipated conditions at the site, such extra expense thereby caused shall be for Purchaser's account. If any excavation, water, quicksand, rock, extremely rough fill, etc., is encountered, price shall be adjusted accordingly to cover extra expense necessary to complete installation. AGT Vault shall not be held liable for breaking, destroying, or otherwise mutilating underground installations such as sewers, water or steam lines, electric or telephone cables, etc., unless such obstructions have been accurately located and marked and the locations given to AGT Vault by the Purchaser. Purchaser shall indemnify and hold AGT Vault harmless from all liability for any damage to underground installations or obstructions caused by AGT Vault or its agents or contractors whether due in whole or in part to negligence of AGT Vault, where the same have not been located and marked for AGT Vault.

All Federal, State and local codes should be adhered to, to insure the safety of storing and dispensing of flammable materials. Your local jurisdiction will regulate the installation requirements. AGT Vault will always try to satisfy any requirement that may be required. Naturally any special needs beyond our agreement will be an addition in cost.

All labeling on the tank at time of sale must be maintained by the new owner.



1650 Bloor Boulevard  
Santa Clara, CA 95050-4169  
United States Country Code (1  
(408) 966-2400  
FAX No. (408) 298-3256  
<http://www.ul.com>

AGT Vault  
1718 N. Shirk Road  
Visalia, CA 93291

November 4, 1998



Attention: Mark Crisp

Fax No. 800-487-7764

Reference: Our conversation on November 3, 1998

Subject: Tests performed on AGT Tanks

Dear Mark:

Per your request, here is a list of the tests that have been performed on AGT Protected Aboveground Flammable Liquid Tanks.

- Full Scale Fire Test
- Strength of Pipe Fittings Test - Bending Moment and Torque
- Impact Test
- Load Test
- Leakage Test
- Strength of Lift Fittings Test
- Projectile Impact Test
- Vehicle Impact Test
- Fire Test of Interstitial Insulation

The tanks that were tested passed all of the above tests satisfactorily, hence they are Listed. In addition to these tests, the Vehicle Impact Test was also performed on a tank filled to capacity with water, again with satisfactory results.

Please contact us if you require any further information about the testing of your products.

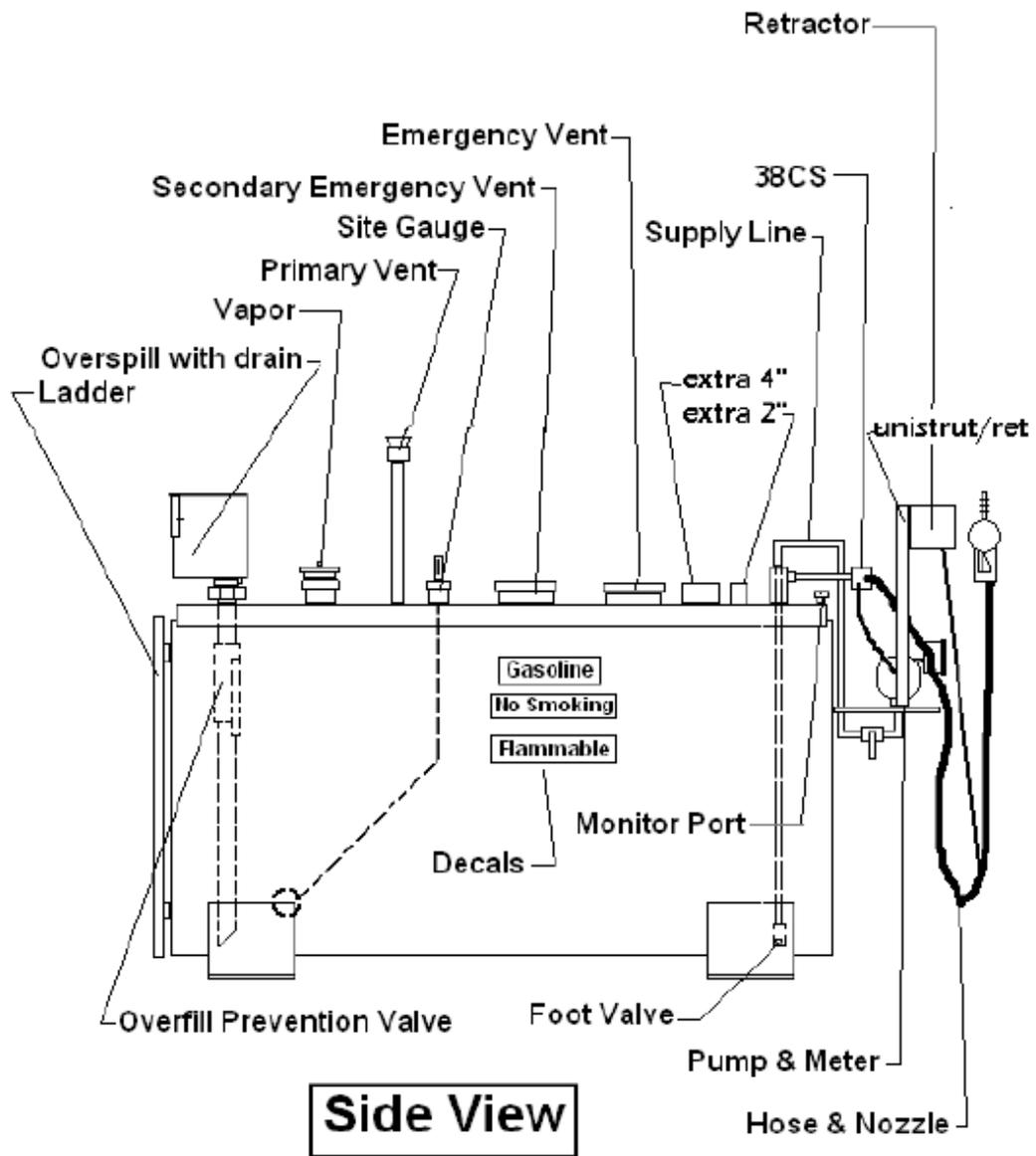
Regards,

Bryan Fox (Ext. 32552)  
Associate Project Engineer  
Engineering Services  
Section 315W

A not-for-profit organization  
dedicated to public safety as  
committed to quality service

	<b>Underwriters Laboratories Inc. ®</b> <b>LISTED</b>	MH17603
<b>PROTECTED, SECONDARY CONTAINMENT ABOVEGROUND TANK FOR FLAMMABLE LIQUIDS NO. _____</b>		
Manufactured by: _____ Factory Code: _____		
Model: _____		
Date of Manufacture: _____		
Primary tank capacity _____ Gallons		
Note: This tank requires emergency relief venting capacity not less than _____ C.F.H. (Primary Tank) and _____ C.F.H. (Annular Space).		
<b>ABOVE GROUND TANK VAULT 800/234-AGTV</b>		
<p>Pressurize Primary Tank When Pressure Testing Annular (Interstitial) space. This tank is for stationary installation only. VEHICLE IMPACT AND PROJECTILE RESISTANT. This aboveground tank manufactured in accordance with: UL 142, Standard UL 2085, and UFC 79-7. This aboveground tank is intended for installation in accordance with UFC Appendix II-F, NFPA30, NFPA30A and NFPA31. Install approved overspill containment and overfill prevention before filling - SEE OWNER'S MANUAL. TANKS TO BE INSTALLED PER INSTALLATION INSTRUCTIONS. Slope installation with monitoring access end of tank at lowest point This tank shall be investigated to determine acceptability for continued use after fire exposure, physical abuse or misuse.</p>		

# UL Label



# Warranty Card

Model #: \_\_\_\_\_

U.L. Label #: \_\_\_\_\_

Date of Manufacture: \_\_\_\_\_

Date of Installation: \_\_\_\_\_

Installer Contractors License Number: \_\_\_\_\_

State Certified ICC Number: \_\_\_\_\_

Date of Delivery: \_\_\_\_\_

Owners Name: \_\_\_\_\_

Location of Tank: \_\_\_\_\_

Limited Warranty period of 1 year from Date of Installation as described in Owner's Manual.

Warranty Card stating date of installation may be submitted to (optional):

AGT Vault  
P.O. 2116  
Nipomo, Ca 93444

This tank component was factory tested and met all applicable performance standards and specifications of the Underwriters Laboratory standard of 2085, and to which it was certified by the California Air Resources Board: Executive Orders VR-301 and VR-302.