

**State of California
AIR RESOURCES BOARD**

**Executive Order VR-101-B
Phil-Tite Phase I Vapor Recovery System
With Ball Float Overfill Prevention**

WHEREAS, the California Air Resources Board (CARB) has established, pursuant to California Health and Safety Code sections 39600, 39601 and 41954, certification procedures for systems designed for the control of gasoline vapor emissions during the filling of underground gasoline storage tanks, in its **CP-201 Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities (Certification Procedure)** as last amended July 25, 2001 incorporated by reference in Title 17, California Code of Regulations, Section 94011;

WHEREAS, CARB has established, pursuant to California Health and Safety Code sections 39600, 39601 and 41954, test procedures for determining the compliance of Phase I vapor recovery systems with emission standards;

WHEREAS, the Certification Procedure provides that the CARB Executive Officer shall issue an order of certification if he or she determines that the vapor recovery system conforms to all of the applicable requirements set forth in the Certification Procedure; and

WHEREAS, Phil-Tite Enterprises has developed a plan for training installation and maintenance contractors to meet the certification requirements specified in CP-201;

WHEREAS, G-01-032 delegates to the Chief of the Monitoring and Laboratory Division the authority to certify or approve modifications to certified Phase I and Phase II vapor recovery systems for gasoline dispensing facilities;

WHEREAS, I William V. Loscutoff, Chief of the Monitoring and Laboratory Division, find that the Phil-Tite Phase I Vapor Recovery System (Phil-Tite System) conforms with all of the requirements set forth in the Certification Procedure, and results in a vapor recovery system which is at least 98.0 percent efficient as tested pursuant to the test procedure for **TP-201.1 Volumetric Efficiency of Phase I Systems**;

NOW THEREFORE, IT IS HEREBY ORDERED that the Phil-Tite System is certified to be at least 98.0 percent efficient. Exhibit 1 contains a list of the certified components by manufacturer and model number. Exhibit 2 contains the performance standards and specifications, maintenance intervals and the certified installation and maintenance instructions for the Phil-Tite System. Exhibit 3 contains the manufacturing specifications. Exhibit 4 outlines the test procedure **Static Torque of Rotatable Phase I Adaptors**. Exhibit 5 outlines the test procedure **Pressure Integrity of Drop Tube/Drain Valve Assembly**.

IT IS FURTHER ORDERED that compliance with the applicable certification requirements, rules and regulations of the Division of Measurement Standards of the Department of Food and Agriculture, the Office of the State Fire Marshal and the Division of Occupational Safety and Health of the Department of Industrial Relations is made a condition of this certification.

IT IS FURTHER ORDERED that the certified Phil-Tite system and/or components contained herein shall be warranted, in writing, for at least one year from the date of installation, to the ultimate purchaser and each subsequent purchaser within the warranty period. The warranty

shall specify that the vapor recovery system is designed, built and equipped so as to conform at the time of original sale and installation with the applicable performance standards and performance specifications and is free from defects in materials and workmanship which could cause the vapor recovery system to fail. Copies of the manufacturer's warranty for the system and/or components shall be made available to the GDF owner/operator and a warranty tag shall be affixed as required in the Certification Procedure.

IT IS FURTHER ORDERED that the system, as installed, shall comply with the procedures and performance standards with which the test installation was required to meet during certification testing. If, in the judgment of the Executive Officer, a significant fraction of installations fail to meet the specifications of this certification, the certification may be subject to modification or revocation.

IT IS FURTHER ORDERED that each Pressure/Vacuum Vent Valve (P/V Valve), Spill Container Drain Valve and Rotatable Adaptor shall be 100 percent performance tested at the factory, and shall comply with the requirements specified in Exhibit 3.

IT IS FURTHER ORDERED that each Phil-Tite System component listed in Exhibit 1, Figure 1A shall be clearly identified by a permanent identification showing the manufacturer's name and model number.

IT IS FURTHER ORDERED that Phil-Tite Enterprises shall make available upon request the program developed to train contractors in the correct installation and maintenance of the Phil-Tite system.

IT IS FURTHER ORDERED that the certified Phil-Tite system shall be installed and maintained in accordance with the manufacturer's recommended installation and maintenance instructions contained in this Executive Order. A copy of this Executive Order shall be maintained at each GDF where a certified Phil-Tite system is installed.

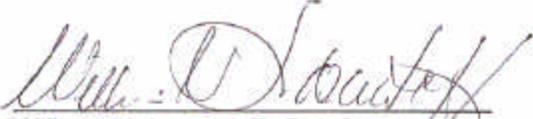
IT IS FURTHER ORDERED that any alteration in the equipment parts, design, installation or operation of the system certified hereby is prohibited and deemed inconsistent with this certification unless the alteration has been submitted in writing and approved by the undersigned.

IT IS FURTHER ORDERED that the following requirements are made a condition of certification. The owner or operator of the Phil-Tite System shall conduct, and pass, the following tests no later than 60 days after startup and at least once every 3 years after startup testing; shorter time periods may be specified in accordance with local district rules and regulations: **TP-201.3 Determination of 2 Inch H₂O Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities, Exhibit 4 Pressure Integrity of Drop Tube/Drain Valve Assembly, and Exhibit 5 Static Torque of Rotatable Phase I Adaptors.** The test results shall be made available upon request within 15 days after the tests are conducted, or within 15 days of the request. If applicable, the results shall be submitted in a district-approved format. Alternative test procedures may be used if determined by the Executive Officer, in writing, to yield comparable results.

IT IS FURTHER ORDERED that the certification of the Phil-Tite Phase I vapor recovery system is valid through June 30, 2005.

IT IS FURTHER ORDERED that Executive Order VR-101-A, issued on June 19, 2001, is hereby superceded by this Executive Order.

Executed at Sacramento, California, this 12th day of July 2002.


William V. Loscutoff, Chief
Monitoring and Laboratory Division

Attachments:

- Exhibit 1 Phil-Tite Phase I Vapor Recovery System Equipment List
- Exhibit 2 Installation, Maintenance and Compliance Specifications
- Exhibit 3 Manufacturers Performance Standards and Specifications
- Exhibit 4 Static Torque of Rotatable Phase I Adaptors
- Exhibit 5 Pressure Integrity of Drop Tube/Drain Valve Assembly

Executive Order VR-101-B

Exhibit 1

Figure 1A

Phil-Tite Phase I Vapor Recovery System Equipment List

Component Name	Manufacturer	Model Number
Spill Container	Phil-Tite	85000 Series
Debris Bucket	Phil-Tite	PP 1005 TB (product) (required)
	Phil-Tite	PP 1005 TBP (vapor) (optional)
Gasoline Hand Pump	Phil-Tite	EP-400-VB (optional)
Rotatable Phase I Adaptors	Phil-Tite	SWF-100-B (product)
	Phil-Tite	SWV-101-B (vapor)
Phase I Vapor Riser Offset	Phil-Tite	M-6050 (optional)
Riser Adaptor	Phil-Tite	M/F4X4
Spill Container Cast Lid	Phil-Tite	85011
Drop Tube	OPW	61-T (various lengths)
Dust Caps	Morrison Brothers	305C (product)
	Morrison Brothers	323C (vapor)
Pressure/Vacuum Vent Valve	Husky	Model 4885, 2-Inch Threaded
Extractor Fitting	Universal	V421 Series
	OPW	233 Series
Ball Float Vent Valve	Universal	Model 37 Series
	OPW	Model 53 VM Series
Tool Kit for Rotatable Adaptors and Spill Containers	Phil-Tite	T-7043
Tank Gauge Port Components *	Ever-Tite	4097AGBR (Threaded Adaptor) 4097MBR (Double Handle Cap)

** Tank gauge port components, other than those listed above shall not be installed after September 1, 2002. Tank gauge port components installed prior to September 1, 2002, shall be allowed to remain in use for the remainder of their useful life.*

Figure 1B

The following components may not be installed as new or replacement parts after September 1, 2002. These components, if installed prior to September 1, 2002, may remain in use for remainder of their useful life.

Component Name	Manufacturer	Model Number
Drop Tube	EBW	782-204 (various lengths)
	Emco Wheaton	A0020 (various lengths)
Extractor Fitting	EBW	3XX Series
	Emco Wheaton	A0079 Series

Executive Order VR-101-B

Exhibit 2

Installation, Maintenance and Compliance Specifications

This exhibit contains the specifications used for the proper installation and maintenance of the system by which compliance of the Gasoline Dispensing Facility (GDF) is to be determined.

General Specifications

1. The Phil-Tite System shall be installed and maintained according to the manufacturer's specifications and demonstrate compliance with the Certification and Test Procedures **Determination of 2 Inch H₂O Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities (TP-201.3)**, **Static Torque of Rotatable Phase I Adaptors (Exhibit 4)** and **Pressure Integrity of Drop Tube/Drain Valve Assembly (Exhibit 5)**. Testing shall be successfully conducted within 60 days of installation and at least once every three years thereafter unless otherwise specified by the local district.
2. During all Phase I deliveries there shall be at least one vapor recovery connection between the cargo tank vapor recovery connection and the underground storage tank associated with each delivery.

Pressure/Vacuum Vent Valves For Storage Tank Vent Pipes

1. Vent pipes may be manifolded to produce a single vent outlet on which a single Pressure/Vacuum (P/V) Vent Valve is installed.
2. A maximum of 3 Pressure/Vacuum Vent Valves, not exceeding an additive leakrate of ≤ 0.17 CFH at 2.00 inches H₂O, shall be used on any single GDF.
3. Vent pipe manifolds shall be constructed of steel pipe or an equivalent material that has been listed for use with gasoline. If a material other than steel is used the GDF operator shall provide a manufacturers listing demonstrating that the material is compatible for use with gasoline. An example of a vent pipe manifold is shown in Figure 2U. This example reflects only one allowable configuration (i.e., tee may be located at either left, center or right side, and more or fewer vent pipes may be manifold together).
4. The vent pipe manifold shall be installed at a height not less than 12 feet above the grade used for gasoline cargo tank delivery operations and shall conform to all applicable fire regulations.
5. Each P/V Valve shall have permanently affixed to it a yellow or gold label with black lettering stating the positive and negative pressure settings specified below:

Positive pressure setting: 3.0 ± 0.5 inches H₂O

Negative pressure setting: 8.0 ± 2.0 inches H₂O

Rotatable Product and Vapor Recovery Adaptors

1. Rotatable product and vapor recovery adaptors shall maintain a minimum 360-degree rotation and average static torque not to exceed 108 pound-inch (9 pound-foot) when tested as specified in Exhibit 4.
2. The vapor adaptor poppet shall not leak when closed. The absence of vapor leaks may be verified with the use of commercial liquid leak detection solution, or by bagging, when the vapor containment space of the underground storage tank is subjected to a non-zero gauge pressure. (Note: leak detection solution will detect leaks only when positive gauge pressure exists).

Vapor Recovery and Product Adaptor Dust Caps

1. Dust caps shall be installed on all Phase I tank adaptors.

Drop Tube and Drain Valve

1. The Drop Tube and Drain Valve (Drop Tube/Drain Valve Assembly) is designed to drain liquid directly into the drop tube and is therefore isolated from the underground storage tank ullage. The leak rate of the Drop Tube/Drain Valve Assembly shall be determined by using the test method specified in Exhibit 5.

Double Fill Configuration

1. A Phil-Tite Double Fill Configuration shall be allowed for installation provided that no more than two fill points are installed on any single underground storage tank and that no offset of the vapor recovery riser pipe is installed. An example of a Phil-Tite Double Fill configuration is shown in Figure 2S.
2. Two vapor return hoses shall be connected to the double fill configuration with at least one connection to each cargo tank(s) used to simultaneously deliver gasoline through two product hoses into a single tank.

Vapor Recovery Riser Offset

1. A vapor recovery tank riser may be offset from the tank connection to the vapor recovery Spill Container provided that the maximum horizontal distance (offset distance) does not exceed twenty (20) inches.
2. A vapor recovery riser may be offset up to the maximum allowable horizontal distance with use of commercially available, four (4) inch steel pipe fittings, a Phil-Tite Model M-6050 Vapor Riser Offset, or a combination of the two products. The Phil-Tite Model M-6050 Vapor Riser Offset shall not exceed eight (8) inches in offset distance. An example of a Phil-Tite Model M-6050 configuration is shown in Figure 2R.

Threaded Riser Adaptor

1. A threaded Riser Adaptor, used to produce a true sealing surface at the top of a field threaded riser pipe, shall be used on each 4-inch riser pipe where a threaded connection that uses a gasket seal exists. Threaded connections that require use of a Riser Adaptor include the following:

- a. Product Spill Container
 - b. Vapor Recovery Spill Container
 - c. Tank Gauging Components (i.e., threaded adaptor)
2. The Riser Adaptor shall provide a machined flat, square, sealing surface in which the component gasket can seal to.

Figure 2A

Facility Compliance Specifications

Component	Test Method	Standard or Specification
Rotatable Phase I Adaptors	Exhibit 4	Minimum, 360-degree rotation Maximum, 108 pound-inch average static torque
Drop Tube/Drain Valve Assembly	Exhibit 5	≤0.17 CFH at 2.00 inches H ₂ O
UST, P/V Valve, Fittings, Adaptors, and Connections	TP-201.3	2.00 inches H ₂ O - 5 minutes
Pressure/Vacuum Vent Valve	TP-201.2B Appendix 1	Positive Pressure: 3.0 ±0.5 inches H ₂ O Negative Pressure: 8.0 ±2.0 inches H ₂ O Leakrate: ≤0.05 CFH at +2.0 inches H ₂ O ≤0.21 CFH at -4.0 inches H ₂ O

Figure 2B

Maintenance Intervals for Phil-Tite System Components

Component	Maintenance Interval
Spill Container (SC-85100 Only)	Annually, See Figure 2E and 2F.
Rotatable Phase I Adaptors	Not field serviceable. See Figure 2I and 2J.
Pressure/Vacuum Vent Valve	Annually, See Figure 2O.
OPW 53 VM Series Ball Float	Every three years, See Figure 2Q.
Universal Model 37 Series Ball Float	Annually, See Figure 2P.

Each gasoline dispensing facility operator/owner shall keep a maintenance log on-site.

Figure 2C

Product Side Installation Using Phil-Tite System

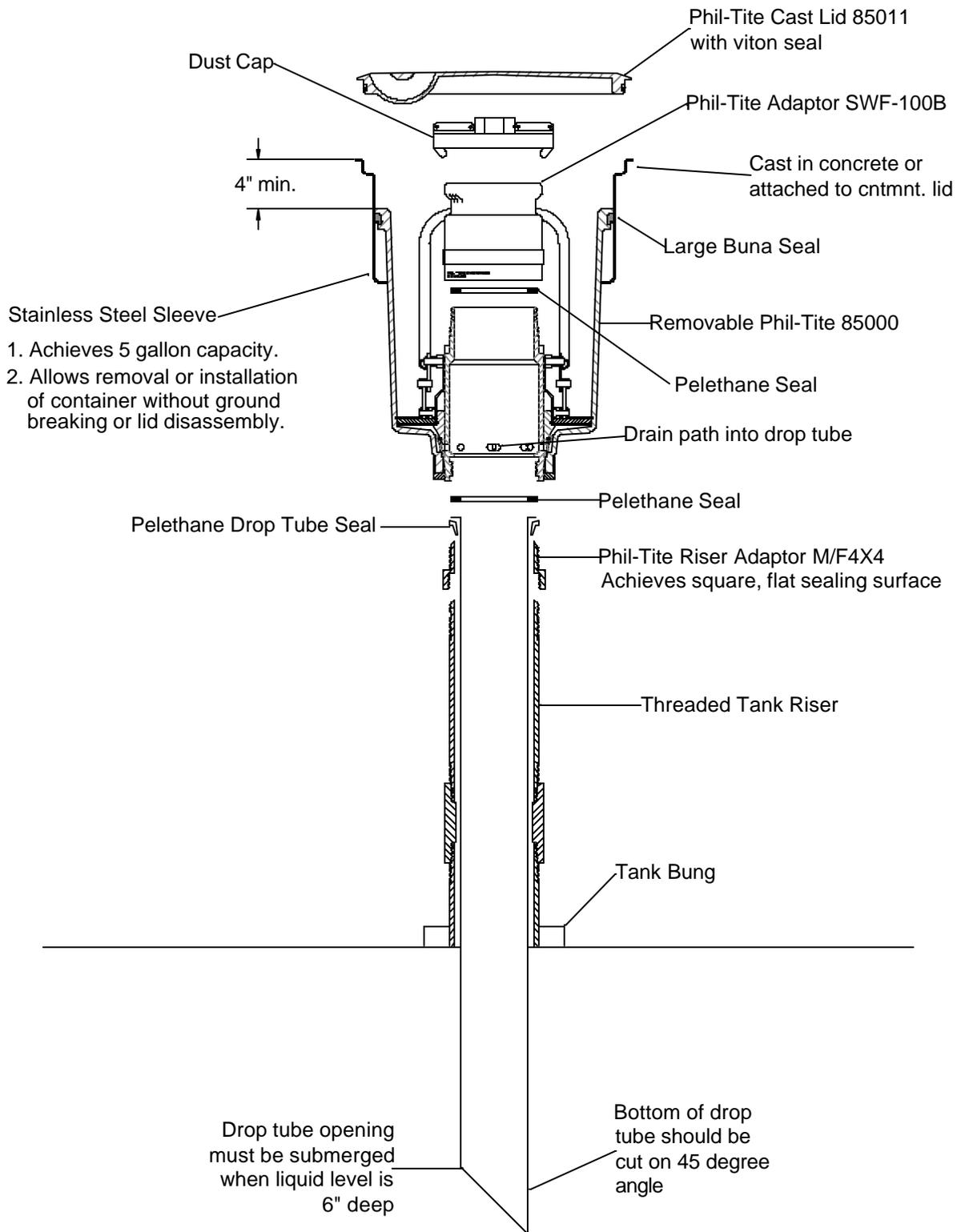


Figure 2D

Vapor Recovery Installation Using Phil-Tite System

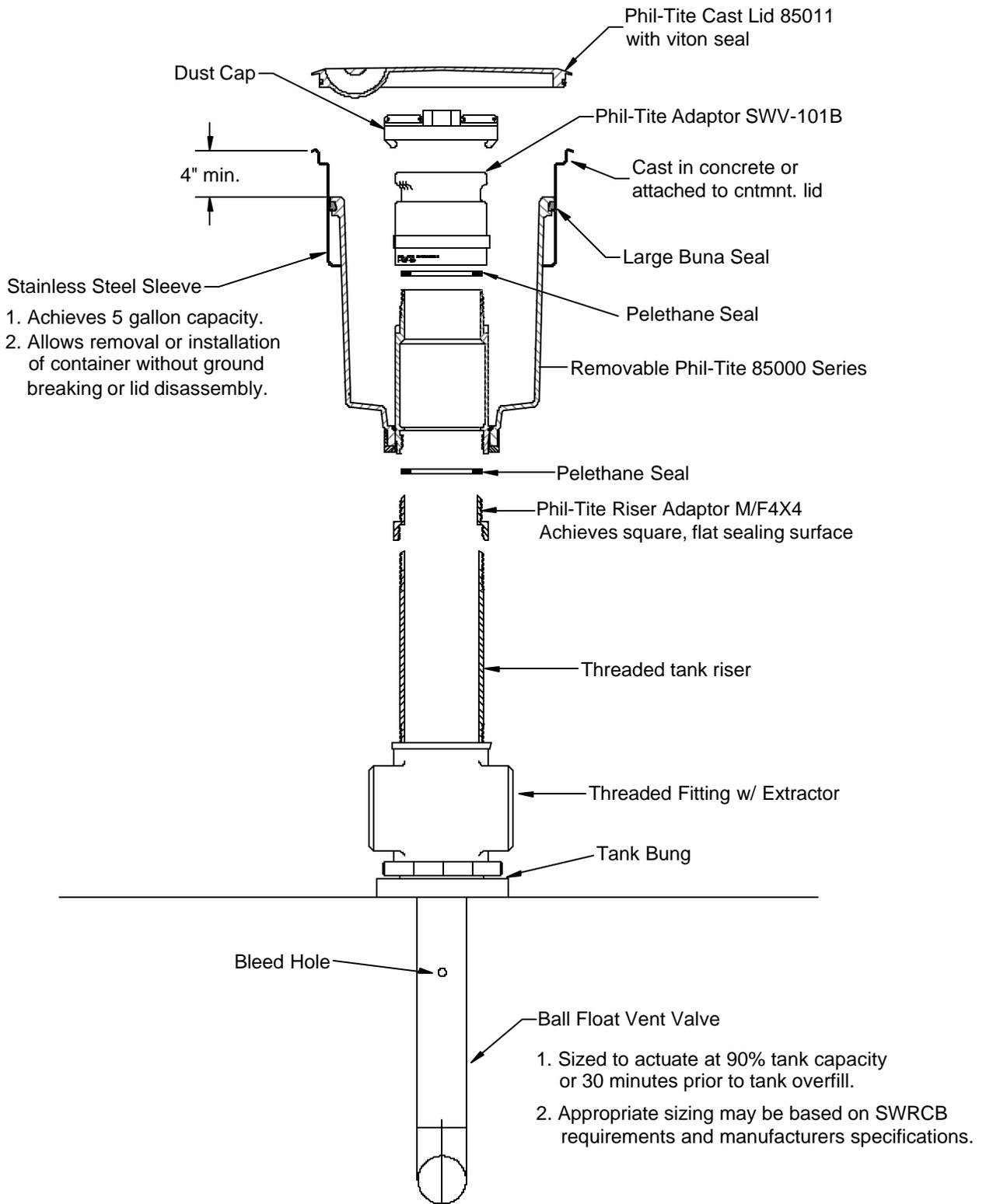
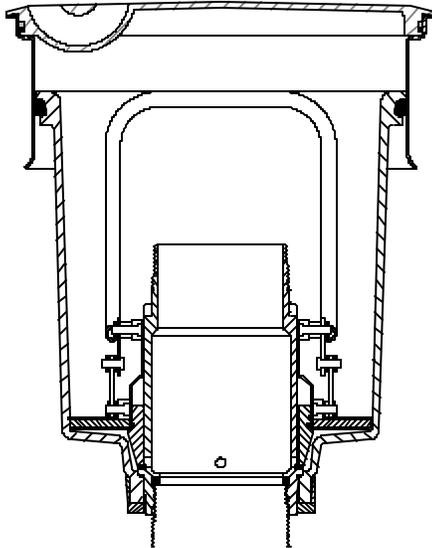


Figure 2E

Phil-Tite 85000 Product Spill Container and Drain Valve Assembly



Please detach here, fill out completely, and promptly mail back to manufacturer.

<p>Phil-Tite Enterprises, Inc. 3732 Electro Way Redding, CA 96002 Phone - 530-223-7400 Fax - 530-223-7418</p> <p align="center">WARRANTY CARD</p> <p>This product is warranted by Phil-Tite Enterprises, Inc. against defective material and workmanship for (1) (one) year from installation date. We will repair/replace, as we deem necessary, product that has been verified defective by a representative of our company. Any damage caused by either freight or wrongful installation are not covered under this warranty. This warranty does not cover normal wear, or force majeure - caused by fire, flood, earthquake, explosion, war, or acts of God. Seals and O-rings are not a warranty item. Warranty is null and void if: a) item is disassembled, b) item is installed improperly, or c) warranty label has been tampered with or is removed from product.</p> <p>Expiration Date: _____ Serial Number: _____ Model Number: _____ Mfg. Number: _____</p> <p><small>This card must be returned to manufacturer for warranty to be honored.</small></p>	<p align="center">TO BE FILLED OUT BY INSTALLER/MAINTENANCE PERSON</p> <p>Name of Maintenance/Service Company: _____</p> <p>Address: _____ _____ _____</p> <p>Date of Install: _____</p> <p>Name and Location of Install: _____ _____ _____</p>
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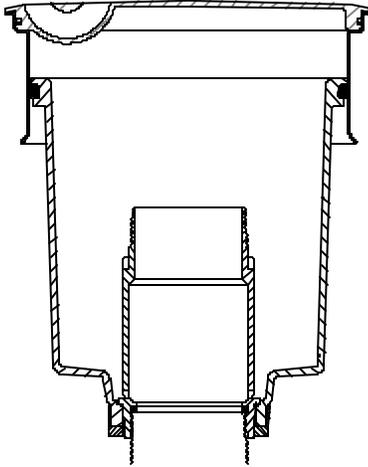
PHIL-TITE 85000 SERIES SPILL CONTAINERS

Phil-Tite Spill Containers are designed to provide easy installation or removal of the container without the need for timely excavation or disassembly of secondary containment covers. Phil-Tite drain valves provide fast and complete removal of excess liquid spilled during a gasoline delivery operation while maintaining a vapor tight, reliable seal that eliminates leaks into the environment.

<p>INSTALLATION:</p> <ol style="list-style-type: none"> (1) Ensure there is adequate clearance to provide at least 4 inches between the top of the Spill Container and the top of the stainless steel sleeve once final installation is complete. Use a tape measure to verify. (2) Inspect the container ensuring that the flat lower seal is in place and properly oriented for sealing with the Riser Adaptor and top of drop tube. (3) SC-85100 Only. Inspect the inner foam filter located inside the container. The filter should be resting on the bottom, secured by the snap ring. (4) SC-85100 Only. Move the ball handle back and forth making sure that the lower assembly rises when moved to the open position and compresses when closed. The ball handle should move freely with no binding and snap into place when moved to the closed position. (5) NOTE! DO NOT USE ANY TYPE OF THREAD SEALING COMPOUND FOR SPILL CONTAINER INSTALLATION! Apply an even coat of Silicon based spray to the large, outer seal of the container and the inside of the stainless steel sleeve to ease insertion. By hand, thread the container onto the Riser Adaptor taking care not to cross thread. Phil-Tite Spill Containers create an optimum, leak free seal when properly tightened to the tank riser as described in item #6. (6) Using an approved installation tool (Phil-Tite T-7043-1 Tool Kit) and torque wrench, tighten the Spill Container onto the Riser Adaptor to a torque value between 75 and 100 FT. LBS. (7) The container is ready for installation of a rotatable adaptor and dust cap. (8) SC-85100 Only. Upon final installation, ensure there is at least 4 inches between the top of the container and top of the stainless steel sleeve. Test the drain valve as described in CARB procedure TP-201.1D. <p>THE USE OF UNAPPROVED TOOLS, OR IMPROPER TORQUING OF THE SPILL CONTAINER WILL VOID ANY AND ALL APPLIED WARRANTIES.</p>	<p>MAINTENANCE:</p> <ol style="list-style-type: none"> (1) Apply an even coat of Silicon based spray to the inside of the stainless steel sleeve to ease removal. Remove the Spill Container using an approved installation tool (Phil-Tite T-7043-1). (2) Inspect the flat lower seal (container to riser seal) for cuts or damage, replace if necessary. (3) Remove the snap-ring and foam filter from the inside of container. Inspect the foam filter, ensure it is not torn or damaged, replace if necessary. (4) With the snap ring and foam filter removed, loosen the allen screw in the top clamp and remove the valve assembly by pulling up on the valve handle. (5) Remove the O-Ring from the bottom of the container and inspect for cuts or damage, replace if necessary. (6) Inspect the boot-screen assembly and ensure there are no cracks or cuts. If the boot-screen assembly requires replacement, loosen the allen screw on the bottom clamp and separate clamp-handle assembly from boot-screen assembly. (7) Inspect the O-Ring on the shut off collar for cuts or damage, replace if necessary. (8) Reassemble container in reverse order. Ensure that the valve assembly is properly adjusted so that when the handle is moved back and forth, the valve assembly moves up and down freely without binding. NOTE: The ball handle must snap into place when moved to the closed position! (9) Reinstall the container using the installation instructions provided and test the drain valve pressure integrity as described in CARB procedure TP-201.1D. <p>PLEASE CONTACT PHIL-TITE ENTERPRISES FOR A SCHEDULE OF "HOW-TO" CLASSES OFFERED FOR THE INSTALLATION OR REPAIR OF ALL PHIL-TITE PRODUCTS.</p>
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Figure 2F

Phil-Tite 85001-NV Vapor Recovery Spill Container and Inner Assembly



Please detach here, fill out completely, and promptly mail back to manufacturer.

<p>Phil-Tite Enterprises, Inc. 5752 Electro Way Redding, CA 96002 Phone - 530-223-7400 Fax - 530-223-7418</p>	<p>TO BE FILLED OUT BY INSTALLER/MAINTENANCE PERSON</p>
<p>WARRANTY CARD</p>	<p>Name of Maintenance/Service Company: _____</p>
<p>This product is warranted by Phil-Tite Enterprises, Inc. against defective material and workmanship for (1) (one) year from installation date. We will repair/replace, as we deem necessary, product that has been verified defective by a representative of our company. Any damage caused by either freight or wrongful installation are not covered under this warranty. This warranty does not cover normal wear, or force majeure - caused by fire, flood, earthquake, explosion, war, or acts of God. Seals and O-rings are not a warranty item. Warranty is null and void if a) item is disassembled, b) item is installed improperly, or c) warranty label has been tampered with or is removed from product.</p>	<p>Address: _____</p>
<p>Expiration Date: _____</p>	<p>Date of Install: _____</p>
<p>Serial Number: _____</p>	<p>Name and Location of Install: _____</p>
<p>Model Number: _____ Mfg. Number: _____</p>	<p>_____</p>
<p><small>This card must be returned to manufacturer for warranty to be honored</small></p>	

PHIL-TITE 85000 SERIES SPILL CONTAINERS

Phil-Tite Spill Containers are designed to provide easy installation or removal of the container without the need for timely excavation or disassembly of secondary containment covers. Phil-Tite drain valves provide fast and complete removal of excess liquid spilled during a gasoline delivery operation while maintaining a vapor tight, reliable seal that eliminates leaks into the environment.

<p>INSTALLATION:</p> <ol style="list-style-type: none"> (1) Ensure there is adequate clearance to provide at least 4 inches between the top of the Spill Container and the top of the stainless steel sleeve once final installation is complete. Use a tape measure to verify. (2) Inspect the container ensuring that the flat lower seal is in place and properly oriented for sealing with the Riser Adaptor and top of drop tube. (3) SC-85100 Only. Inspect the inner foam filter located inside the container. The filter should be resting on the bottom, secured by the snap ring. (4) SC-85100 Only. Move the bail handle back and forth making sure that the lower assembly rises when moved to the open position and compresses when closed. The bail handle should move freely with no binding and snap into place when moved to the closed position. (5) NOTE! DO NOT USE ANY TYPE OF THREAD SEALING COMPOUND FOR SPILL CONTAINER INSTALLATION! Apply an even coat of Silicon based spray to the large, outer seal of the container and the inside of the stainless steel sleeve to ease insertion. By hand, thread the container onto the Riser Adaptor taking care not to cross thread. Phil-Tite Spill Containers create an optimum, leak free seal when properly tightened to the tank riser as described in item #5. (6) Using an approved installation tool (Phil-Tite T-7043-1 Tool Kit) and torque wrench, tighten the Spill Container onto the Riser Adaptor to a torque value between 75 and 100 FT. LBS. (7) The container is ready for installation of a rotatable adaptor and dust cap. (8) SC-85100 Only. Upon final installation, ensure there is at least 4 inches between the top of the container and top of the stainless steel sleeve. Test the drain valve as described in CARB procedure TP-201.1D. <p>THE USE OF UNAPPROVED TOOLS, OR IMPROPER TORQUING OF THE SPILL CONTAINER WILL VOID ANY AND ALL APPLIED WARRANTIES.</p>	<p>MAINTENANCE:</p> <ol style="list-style-type: none"> (1) Apply an even coat of Silicon based spray to the inside of the stainless steel sleeve to ease removal. Remove the Spill Container using an approved installation tool (Phil-Tite T-7043-1). (2) Inspect the flat lower seal (container to riser seal) for cuts or damage, replace if necessary. (3) Remove the snap-ring and foam filter from the inside of container. Inspect the foam filter, ensure it is not torn or damaged, replace if necessary. (4) With the snap ring and foam filter removed, loosen the allen screw in the top clamp and remove the valve assembly by pulling up on the valve handle. (5) Remove the O-Ring from the bottom of the container and inspect for cuts or damage, replace if necessary. (6) Inspect the boot-screen assembly and ensure there are no cracks or cuts. If the boot-screen assembly requires replacement, loosen the allen screw on the bottom clamp and separate clamp-handle assembly from boot-screen assembly. (7) Inspect the O-Ring on the shut off collar for cuts or damage, replace if necessary. (8) Reassemble container in reverse order. Ensure that the valve assembly is properly adjusted so that when the handle is moved back and forth, the valve assembly moves up and down freely without binding. NOTE: The bail handle must snap into place when moved to the closed position! (9) Reinstall the container using the installation instructions provided and test the drain valve pressure integrity as described in CARB procedure TP-201.1D. <p>PLEASE CONTACT PHIL-TITE ENTERPRISES FOR A SCHEDULE OF "HOW-TO" CLASSES OFFERED FOR THE INSTALLATION OR REPAIR OF ALL PHIL-TITE PRODUCTS.</p>
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Figure 2G

Phil-Tite 85011 Spill Container Lid

14" CAST LID (ONE OPENING)

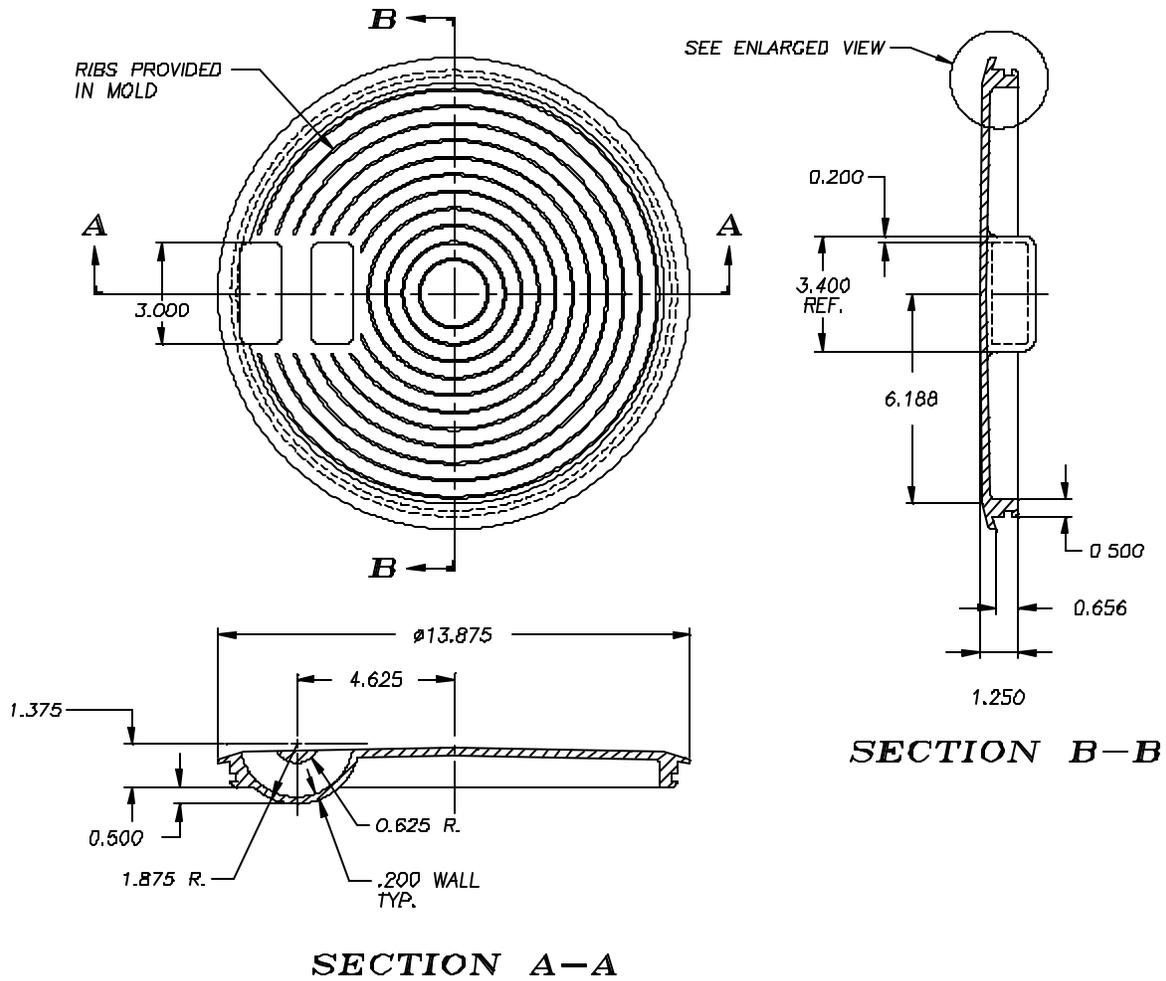
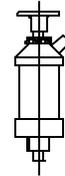
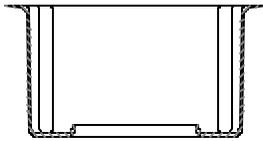
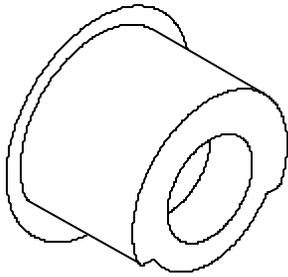


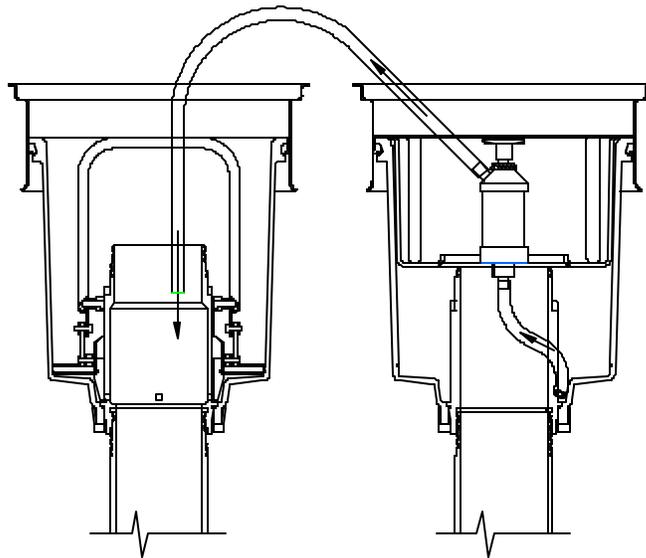
Figure 2H

Phil-Tite Debris Bucket
Part Number PP 1005 TB (Product) (required)
Part Number PP 1005 TBP (Vapor) (optional)
Phil-Tite Hand Pump EP-400-VB (optional)



Debris Bucket

Hand Pump
(installd in vapor
debris bucket only)



PRODUCT

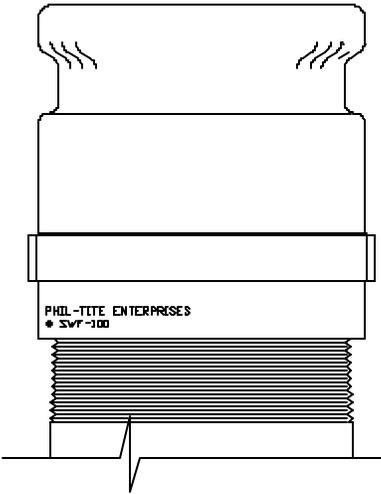
VAPOR REC

Hand Pump Operation

Figure 21

Phil-Tite SWF-100-B Rotatable Product Adaptor

Please detach here, fill out completely, and promptly mail back to manufacturer.



<p>Phil-Tite Enterprises, Inc. 3732 Electro Way Redding, CA 96002 Phone - 530-223-7400 Fax - 530-223-7418</p>	<p>TO BE FILLED OUT BY INSTALLER/MAINTENANCE PERSON</p>
<p>WARRANTY CARD</p>	<p>Name of Maintenance/Service Company: _____</p>
<p>This product is warranted by Phil-Tite Enterprises, Inc. against defective material and workmanship for 1 (one) year from installation date. We will repair/replace, as we deem necessary, product that has been verified defective by a representative of our company. Any damage caused by either freight or wrongful installation are not covered under this warranty. This warranty does not cover normal wear, or force majeure - caused by fire, flood, earthquake, explosion, war, or acts of God. Seals and O-rings are not a warranty item. Warranty is null and void if a) item is disassembled, b) item is installed improperly, or c) warranty label has been tampered with or is removed from product.</p>	<p>Address: _____</p>
<p>Expiration Date: _____</p>	<p>Date of Install: _____</p>
<p>Serial Number: _____</p>	<p>Name and Location of Install: _____</p>
<p>Model Number: _____ Mfg. Number: _____</p>	<p>_____</p>
<p><i>This card must be returned to manufacturer for warranty to be honored</i></p>	

SWF-100-B & SWV-101-B ROTATABLE ADAPTORS

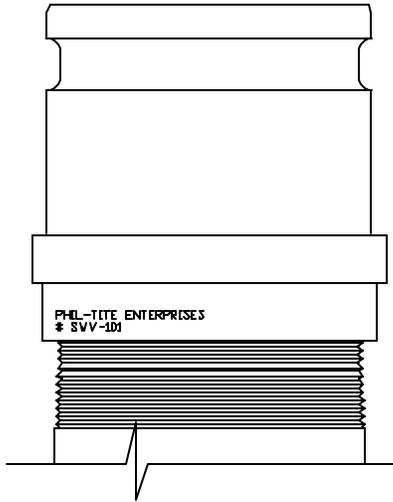
The PHIL-TITE SWF-100-B & SWV-101-B rotatable adaptors are designed to produce a free turning, 360 degree rotation of a fuel delivery elbow which prevents the adaptors from overlightening or loosening on the spill container riser.

<p>INSTALLATION:</p> <ol style="list-style-type: none"> (1) Remove the adaptor from the box and inspect for shipping damage. Ensure that the riser seal is in place and free from damage or defects. (SWV-101-B ONLY) Ensure that the vapor poppet opens and closes freely by actuating the poppet by hand. (2) NOTE! DO NOT USE ANY TYPE OF THREAD SEALANT FOR INSTALLATION. Phil-Tite adaptors are designed to create an optimum, leak free seal when properly tightened as described in item #4. (3) By hand, thread the adaptor onto the spill container riser taking care not to cross thread. (4) Using a torque wrench and an adaptor installation tool (PHIL-TITE TOOL KIT # T-7043-1), tighten to a torque value between the range of 50 AND 75 FT. LBS. (5) Once properly tightened, install a compatible dust cap. The adaptors are ready for operation. <p>WARNING! THE USE OF UNAPPROVED TOOLS OR IMPROPER INSTALLATION WILL VOID ANY AND ALL APPLIED WARRANTIES.</p>	<p>MAINTENANCE:</p> <p>The Phil-Tite rotatable adaptors are not field serviceable with the exception of the vapor poppet and vapor poppet seal found on the SWV-101-B. To replace either of the components:</p> <ol style="list-style-type: none"> (1) Remove the SWV-101-B adaptor from the spill container riser using an installation tool (PHIL-TITE TOOL KIT # T-7043-1). (2) Using a compatible pair of snap ring pliers, remove the snap ring from the inside of the rotatable adaptor. (3) After removing the snap ring, remove the brass spider, spring and vapor poppet through the bottom of the adaptor. (4) With the vapor poppet removed, inspect the poppet and poppet seal for cuts, tears or damage. Replace if necessary. (5) Reassemble the vapor poppet, spring and brass spider in the reverse order from which they were removed. (6) Replace the snap ring and actuate the poppet by hand, making sure the assembly is secure and actuates properly. (7) Reinstall and properly torque the SWV-101-B on the spill container riser as described under "INSTALLATION".
--	---

Figure 2J

Phil-Tite SWV-101B Rotatable Vapor Adaptor

Please detach here, fill out completely, and promptly mail back to manufacturer.



<p>Phil-Tite Enterprises, Inc. 3732 Electro Way Redding, CA 96002 Phone - 530-223-7400 Fax - 530-223-7418</p>	<p>TO BE FILLED OUT BY INSTALLER/MAINTENANCE PERSON</p>
<p>WARRANTY CARD</p>	<p>Name of Maintenance/Service Company: _____</p>
<p>This product is warranted by Phil-Tite Enterprises, Inc. against defective material and workmanship for 1 (one) year from installation date. We will repair/replace, as we deem necessary, product that has been verified defective by a representative of our company. Any damage caused by either freight or wrongful installation are not covered under this warranty. This warranty does not cover normal wear, or force majeure - caused by fire, flood, earthquake, explosion, war, or acts of God. Seals and O-rings are not a warranty item. Warranty is null and void if a) item is disassembled, b) item is installed improperly, or c) warranty label has been tampered with or is removed from product.</p>	<p>Address: _____ _____ _____</p>
<p>Expiration Date: _____</p>	<p>Date of Install: _____</p>
<p>Serial Number: _____</p>	<p>Name and Location of Install: _____</p>
<p>Model Number: _____ Mfg. Number: _____</p>	<p>_____ _____ _____</p>
<p><i>This card must be returned to manufacturer for warranty to be honored</i></p>	

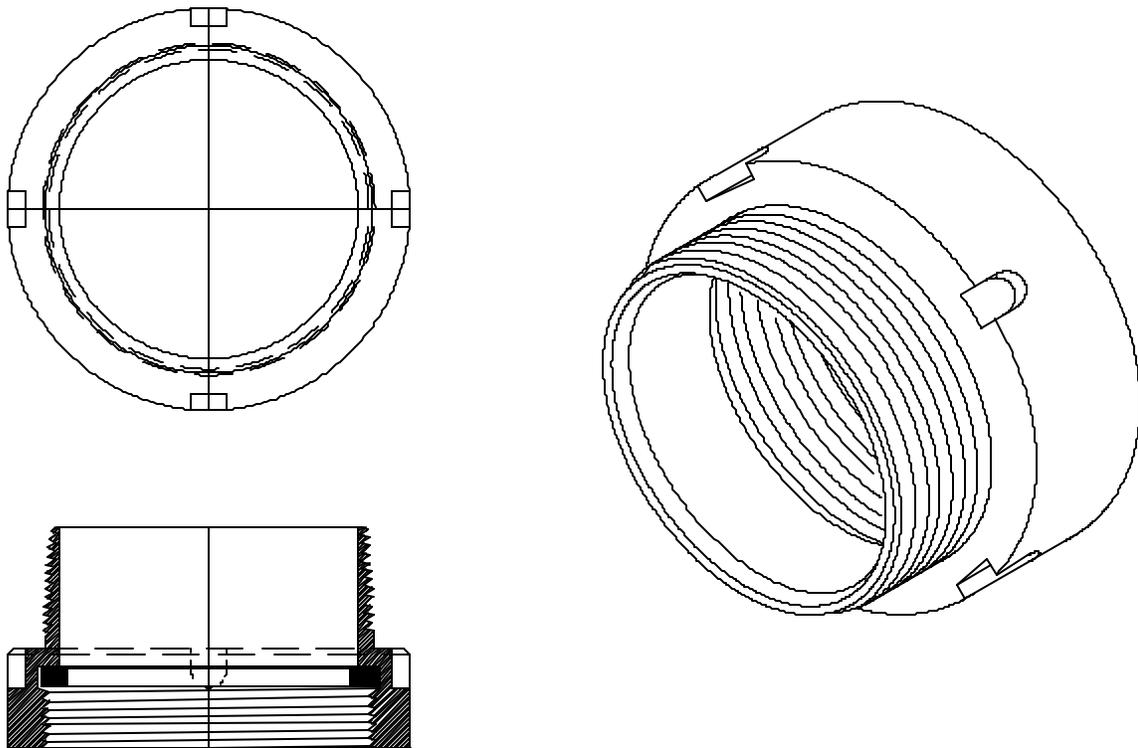
SWF-100-B & SWV-101-B ROTATABLE ADAPTORS

The PHIL-TITE SWF-100-B & SWV-101-B rotatable adaptors are designed to produce a free turning, 360 degree rotation of a fuel delivery elbow which prevents the adaptors from overlightening or loosening on the spill container riser.

<p>INSTALLATION:</p> <ol style="list-style-type: none"> (1) Remove the adaptor from the box and inspect for shipping damage. Ensure that the riser seal is in place and free from damage or defects. (SWV-101-B ONLY) Ensure that the vapor poppet opens and closes freely by actuating the poppet by hand. (2) NOTE! DO NOT USE ANY TYPE OF THREAD SEALANT FOR INSTALLATION. Phil-Tite adaptors are designed to create an optimum, leak free seal when properly tightened as described in item #4. (3) By hand, thread the adaptor onto the spill container riser taking care not to cross thread. (4) Using a torque wrench and an adaptor installation tool (PHIL-TITE TOOL KIT # T-7043-1), tighten to a torque value between the range of 50 AND 75 FT. LBS. (5) Once properly tightened, install a compatible dust cap. The adaptors are ready for operation. <p>WARNING! THE USE OF UNAPPROVED TOOLS OR IMPROPER INSTALLATION WILL VOID ANY AND ALL APPLIED WARRANTIES.</p>	<p>MAINTENANCE:</p> <p>The Phil-Tite rotatable adaptors are not field serviceable with the exception of the vapor poppet and vapor poppet seal found on the SWV-101-B. To replace either of the components:</p> <ol style="list-style-type: none"> (1) Remove the SWV-101-B adaptor from the spill container riser using an installation tool (PHIL-TITE TOOL KIT # T-7043-1). (2) Using a compatible pair of snap ring pliers, remove the snap ring from the inside of the rotatable adaptor. (3) After removing the snap ring, remove the brass spider, spring and vapor poppet through the bottom of the adaptor. (4) With the vapor poppet removed, inspect the poppet and poppet seal for cuts, tears or damage. Replace if necessary. (5) Reassemble the vapor poppet, spring and brass spider in the reverse order from which they were removed. (6) Replace the snap ring and actuate the poppet by hand, making sure the assembly is secure and actuates properly. (7) Reinstall and properly torque the SWV-101-B on the spill container riser as described under "INSTALLATION".
--	---

Figure 2K

Phil-Tite Model M/F4X4 Riser Adaptor



PHIL-TITE M/F4X4 RISER ADAPTOR

The Phil-Tite M/F4X4 Riser Adaptor is designed to provide a flat, true sealing surface for the installation of a gasket sealed, threaded component such as a Spill Container, Threaded Adaptor or storage tank gauging device.

INSTALLATION:

1. If installing a Spill Container on the M/F4X4, determine the final riser height required to meet finished grade and then subtract 1-3/4" to include the M/F4X4 Riser Adaptor. For all other components, determine the desired final riser height including the M/F4X4. Cut and thread the riser pipe to the appropriate height.
2. Apply a gasoline resistant, non-hardening thread sealant to the threads of the riser pipe **only**. By hand, thread the M/F4X4 onto the riser pipe.
3. Using an approved Installation Tool (Phil-Tite T-7043-1 Tool Kit), tighten the M/F4X4 onto the riser to a torque value between **150 and 175 Foot-Pounds**.
4. If installing a drop tube at the product fill riser, install the provided drop tube gasket under the drop tube flange and insert the tube into the tank.
5. Install a Spill Container, threaded adaptor or tank gauging equipment onto the Riser Adaptor ensuring that it is installed in conjunction with the **Manufacturers Recommended Installation Instructions**.

WARNING! THE USE OF UNAPPROVED TOOLS OR IMPROPER INSTALLATION WILL VOID ANY AND ALL APPLIED WARRANTIES.

Figure 2L

Phil-Tite Removal and Installation Kit for Rotatable Adaptors and Spill Containers

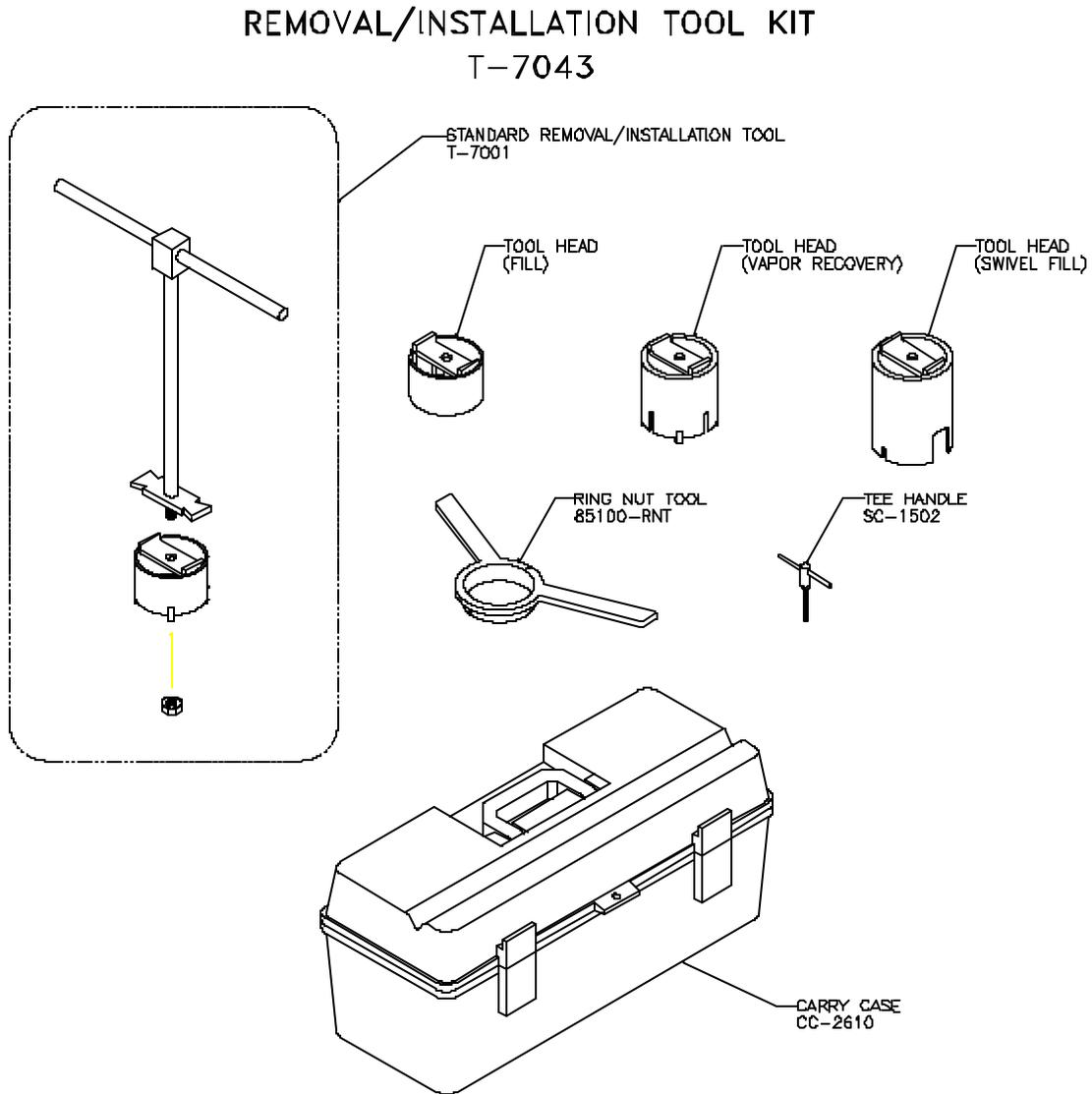
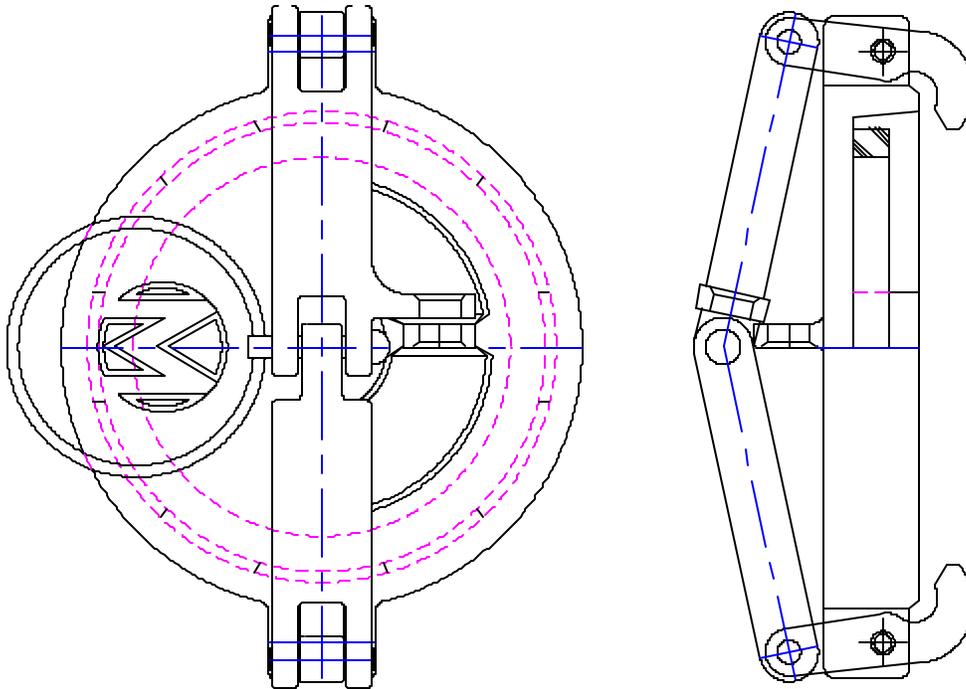


Figure 2M

Morrison Brothers 323C Vapor Recovery Adaptor Cap



WARRANTY—All Morrison products are thoroughly tested before shipment and only material found to be defective in manufacture will be replaced. Claims must be made within one year from the date of invoice. Morrison Bros. Co. will not allow claims for labor or consequential damage resulting from purchase, installation, or misapplication of the product.

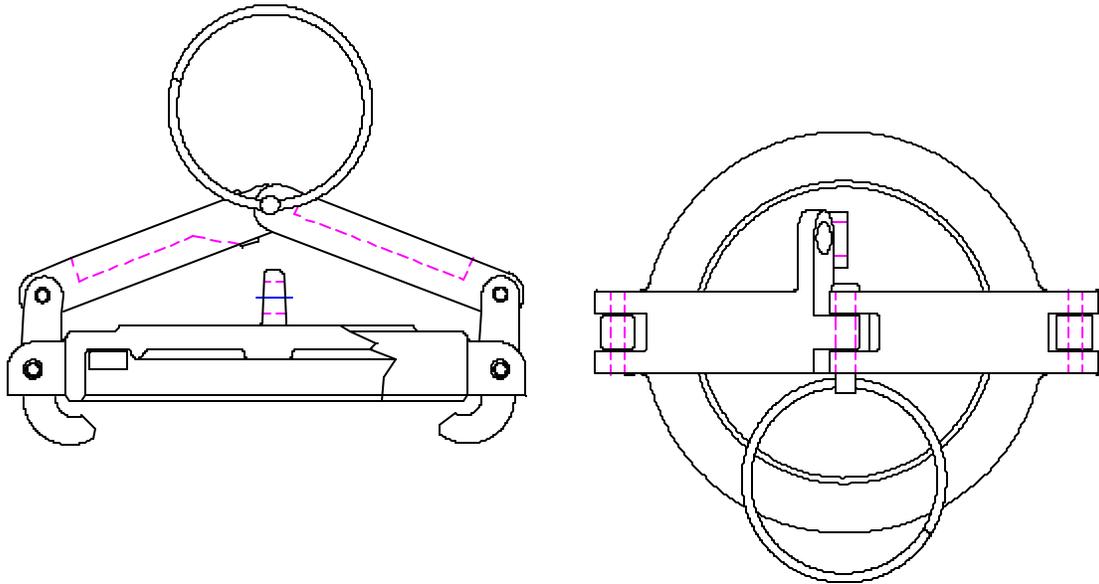


MORRISON BROS. CO.

24th and Elm Street
P.O. Box 238
Dubuque, IA 52001

Figure 2N

Morrison Brothers 305C Product Adaptor Cap



WARRANTY—All Morrison products are thoroughly tested before shipment and only material found to be defective in manufacture will be replaced. Claims must be made within one year from the date of invoice. Morrison Bros. Co. will not allow claims for labor or consequential damage resulting from purchase, installation, or misapplication of the product.

 **MORRISON BROS. CO.**
24th and Elm Street
P.O. Box 238
Dubuque, IA 52001

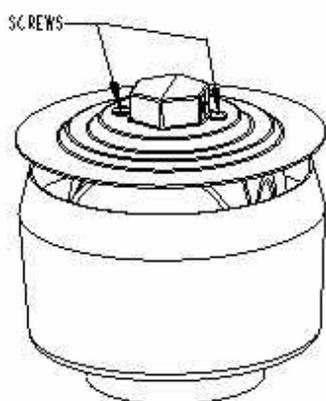
Figure 20

Husky Model 4885 2-Inch Threaded Pressure/Vacuum Vent Valve

PRESSURE/VACUUM VENT MODEL 4885 INSTALLATION AND MAINTENANCE INSTRUCTIONS

INSTALLATION

The P/V Vent is designed to fit on top of a 2" vent pipe. Remove the P/V Vent from the carton and visually inspect for any shipping damage.



Model 4885 Thread-On P/V Vent

Apply fuel resistant pipe sealant to the threads on the 2" vent stack. Screw the P/V Vent onto the vent stack and tighten to a range of 20 to 50 ft-lbs with a suitable wrench. DO NOT OVER-TIGHTEN. Periodic maintenance is recommended (see below).

MAINTENANCE

Annually inspect the P/V Vent valve for foreign objects without removing the P/V Vent valve from the vent pipe by using the following procedure:

1. Remove the screws that hold the top cover on.
2. Remove any debris that might be sitting inside the lower cover.
3. Check the drain holes in the lower cover for blockage.
4. The two (2) screens should not be removed.
5. Reinstall the top cover and retaining screws.
6. Tighten the screws firmly.

NOTE: DO NOT ALTER OR COVER THE P/V VENT



HUSKY CORPORATION • 2325 HUSKY WAY • PACIFIC, MO 63069

www.husky.com PHONE: 800-325-3558 009041 – 5 6/5/02
(REVERSE SIDE IS 009063) 009041 – 4 12/10/01

PRESSURE VACUUM VENT WARRANTY INFORMATION

Husky Corporation will, at its option, repair, replace, or credit the purchase price of any Husky manufactured Pressure Vacuum Vent which proves upon examination by Husky, to be defective in material and/or workmanship within EIGHTEEN (18) MONTHS from the date of shipment for any Husky Pressure Vacuum Vent, except as otherwise provided herein. For all other Husky manufactured product, see Husky Form No. PS2002-Term (4/15/02) at www.husky.com.

The warranty period on repaired or replacement product is only for the remainder of the warranty period. Buyer must return the products to Husky, transportation charges prepaid. This Warranty does not apply to equipment or parts which have been installed improperly, damaged by misuse, improper operation or maintenance, or which are altered or repaired in any way other than by Husky.

The Warranty provisions contained herein apply ONLY to original purchasers and subsequent commercial purchasers within the warranty period who use the equipment for commercial or industrial purposes. THERE ARE NO OTHER WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE, AND ANY OTHER SUCH WARRANTIES ARE HEREBY SPECIFICALLY DISCLAIMED.

Husky assumes NO LIABILITY for labor charges or other costs incurred by Buyer incidental to the service, adjustment, repair, return, removal or replacement of products. HUSKY ASSUMES NO LIABILITY FOR ANY INCIDENTAL, CONSEQUENTIAL, OR OTHER DAMAGES UNDER ANY WARRANTY, EXPRESS OR IMPLIED, AND ALL SUCH LIABILITY IS HEREBY EXPRESSLY EXCLUDED.

Husky reserves the right to change or improve the design of any Husky fuel dispensing equipment without assuming any obligations to modify any fuel dispensing equipment previously manufactured.



HUSKY CORPORATION • 2325 HUSKY WAY
• PACIFIC, MO 63069
www.husky.com PHONE: 800-325-3558

009063– 0 6/5/02

Figure 2P

**Universal Model Number 37 Series Ball Float Vent Valve
And Model V421 Series Extractor Fitting**

**Installation Instruction for Model 37 Series
Float Vent Valve and Model V421 Extractor Fitting**



1. Apply a non-hardening, gasoline resistant, pipe compound to the threads of Model 37 before installing the unit into the cage assembly of the Universal Model V421 Extractor Fitting. Tighten the Model 37 into the cage assembly to a torque of approximately 45 ft.-lbs.
2. Apply a non-hardening, gasoline resistant, pipe compound to the threads of the cage assembly to facilitate removal at a later date. Install the cage assembly into the Model V421 to a torque of approximately 45 ft.-lbs. Use caution when installing the cage assembly into the Model V421. Do not over tighten. Make sure the ball moves freely.
3. Apply a non-hardening, gasoline resistant, pipe compound to the threads of the Extractor Fitting and hand tighten the assembly into the tank bung. Tighten the Extractor Assembly into the tank to a torque of approximately 150 ft.-lbs.

Maintenance

Annually, inspect the Model 37 to ensure proper operation. Check to ensure that the ball moves freely within the cage and that the bleed hole allows free airflow.

WARNING! This product is only to be used on gravity drop systems. **DO NOT** use this product if the tank is being filled by means of a pump.

Universal Valve Co., Inc.
478 Schiller Street
Elizabeth, NJ 07206
Phone: (800) 223 -0742
Fax: (908) 351-0369



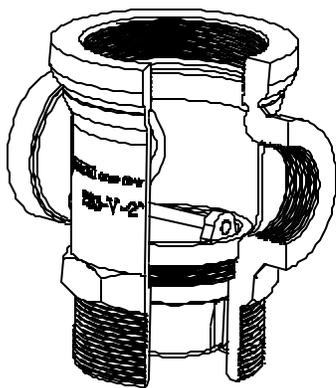
© Copyright 2002 Universal Valve Co., Inc.

Figure 2Q

OPW Model 53 VM Series Ball Float Vent Valve And 233 Series Extractor

OPW Installation and Maintenance Instructions

53VM AND 233 SERIES BALL FLOAT / EXTRACTOR ASSEMBLIES



IMPORTANT: Please read these warnings and use the assembly instructions completely and carefully before starting. Failure to do so may cause product failure, or result in environmental contamination due to liquid leakage into the soil, creating hazardous spill conditions.

IMPORTANT: Check to make sure the unit is intact and undamaged and all parts have been supplied. Never substitute parts for those supplied. Doing so may cause product failure and void warranty.

WARNING-DANGER: Using electrically operated equipment near gasoline or gasoline vapors may result in a fire or explosion, causing personal injury and property damage. Be sure that the working area is free from such hazards, and always use proper precautions.

NOTE: At all times when product is in the storage tank keep the riser pipe capped, so the vapors cannot escape into the environment.

Notice: OPW products must be used in compliance with applicable federal, state, and local laws and regulations. Product selection should be based on physical specifications and limitations and compatibility with the environment and material to be handled. OPW makes no warranty of fitness for a particular use. All illustrations and specifications in this literature are based on the latest production information available at the time of publication. Prices, materials, and specification are subject to change at any time, and models may be discontinued at any time, in either case, without notice or obligation.

WARNING: OPW Overfill Warning Systems should only be used on submerged pumping systems, and not with suction pump systems. OPW Overfill Warning Systems should only be used on gravity drop systems. DO NOT use where Pump Off Unloading is used.

IMPORTANT: Installing the incorrect length OPW 53V Ball Float Vent Valve for your specific application may result in delivery flow restriction at tank levels exceeding requirements established by the U.S. EPA. Always consult the appropriate tank charts and determine the specifics of your tank installation to determine the appropriate length OPW 53V to be installed. The illustration and instructions on the back of this sheet are intended to serve as a guide in this determination.

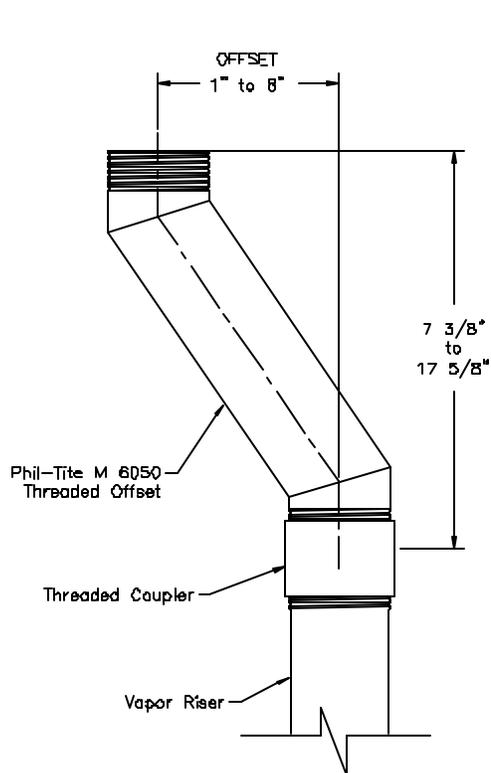
Field Installation Instructions

1. **Apply a non-hardening, gasoline resistant pipe compound on the ball float nipple threads. Install the extractor cage-assembly onto the ball float nipple. (Recommend torques, 3"NPT thread, 125 ft-lbs min. to 200 ft-lbs max, 2"NPT thread, 100 ft-lbs min. to 150 ft-lbs max.) DO NOT USE TEFLON TAPE**
2. Thread the 233 Series OPW Extractor Fitting into the tank bung fitting. (Recommend torque, 4"NPT thread, 125" ft-lbs min. to 250 ft-lbs max.) Thread the Ball Float and cage assembly into the 233 extractor fitting using the OPW 89 Extractor Wrench. (Recommend torque, 3 3/4-8 thread, 75 ft-lbs min. to 150 ft-lbs max.)
3. Make sure Ball Float moves freely, full stroke, without binding.
4. **Preventative Maintenance** - Every three years, remove and inspect the valve for damage, contamination, corrosion, freedom of movement of the ball float, and check the bleeder orifice for proper airflow. Replace if damaged or corroded.

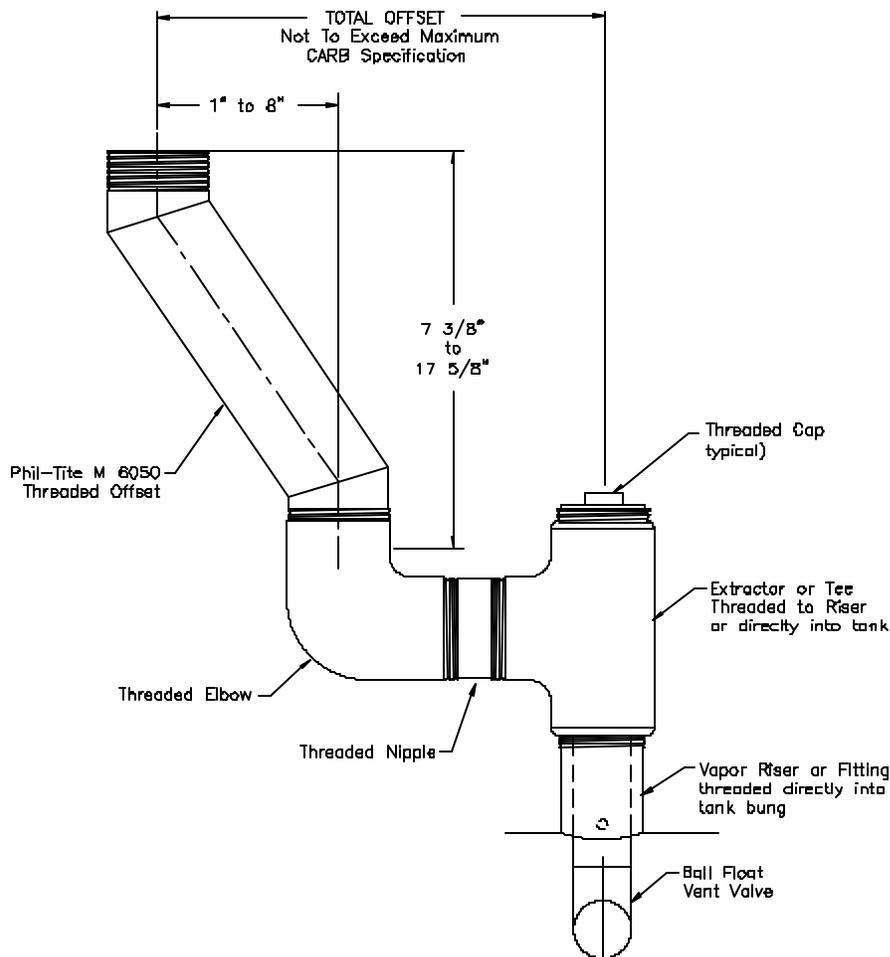
Figure 2R

Phil-Tite Model M-6050 Vapor Recovery Riser Offset

Offset Using Straight Riser



Offset Using Ball Float



Phil-Tite M-6050 Vapor Riser Offset

INSTALLATION:

- (1) On the underground storage tank, measure the tank bungs from center to center and then subtract 16 inches from that measurement. The result will match the size of the M-6050 Vapor Riser Offset required which also includes additional space for connections or fittings.

Example: If the tank bungs measure out to 22 inches center to center and you subtract 16 inches, you will have a maximum size, 6-inch M-6050 Vapor Riser Offset for your application.

- (2) Apply a gasoline resistant, non-hardening thread sealant to the TANK END ONLY of the M-6050 using the sealant manufacturers recommended instructions. The use of sealant on the spill container end varies by manufacturer.
- (3) By hand, thread the M-6050 into the pipe coupler or threaded fitting depending on your configuration (see figures). By hand, thread the entire assembly onto the underground storage tank.

Note: If a Ball Float Vent Valve is to be installed, you must use a threaded connection to allow the installation and removal of the Ball Float Vent Valve.

- (4) Tighten the M-6050 and threaded fittings to a torque value between the range of **150 and 200 Ft-lbs**.

Figure 2S

Typical Phil-Tite Double Fill Configuration

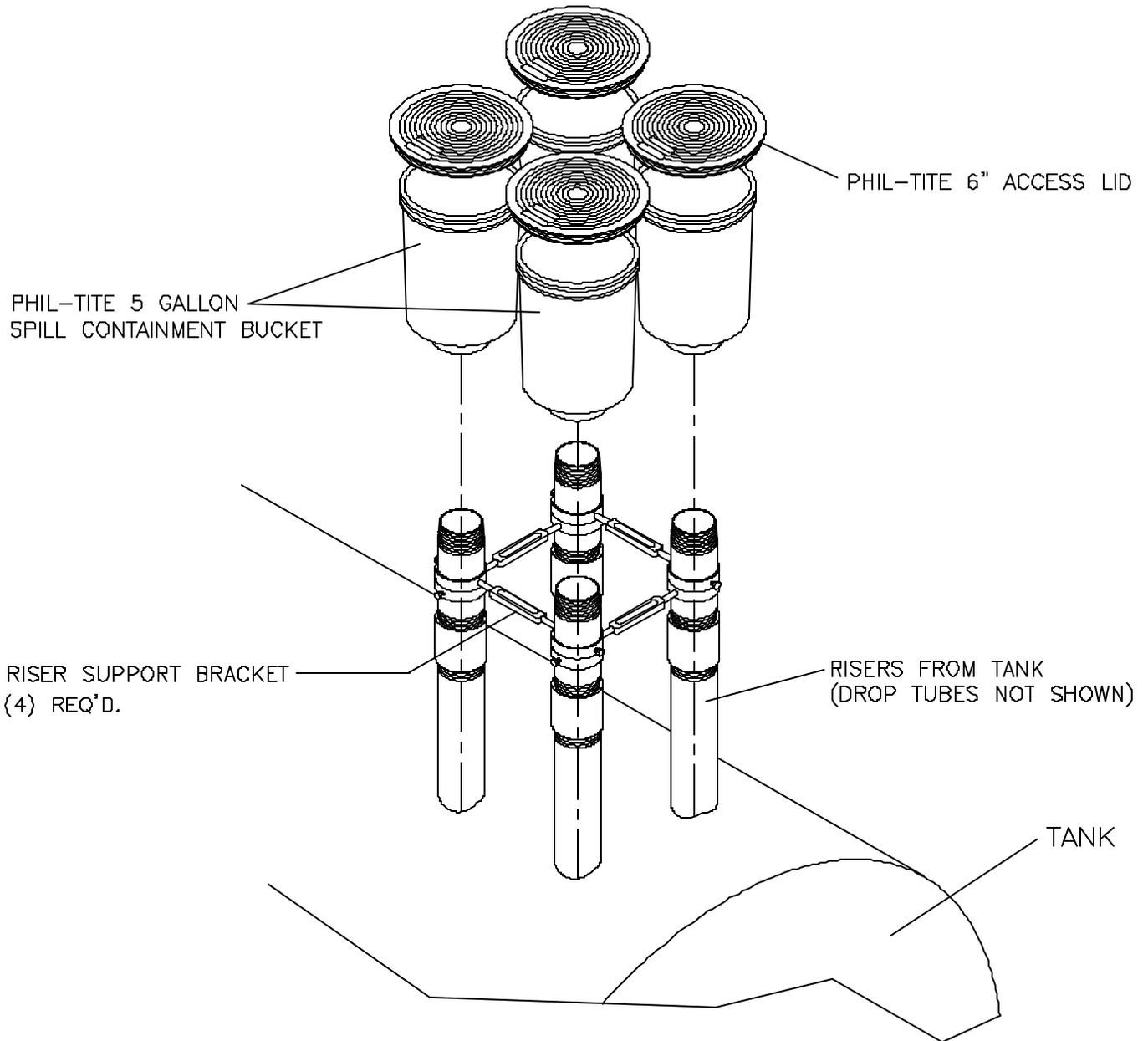


Figure 2T

Ever-Tite Tank Part # 4097AGBR Fill Pipe Adaptor for Tank Gauge Probe
And Part #4097MBR Fill Pipe Adaptor Cap

Ever-Tite Coupling Products

Fill Pipe Adaptor, Part #4097AGBR



Ever-Tite Coupling Products

Fill Pipe Adaptor Cap, Part #4097MBR



Installation Instructions

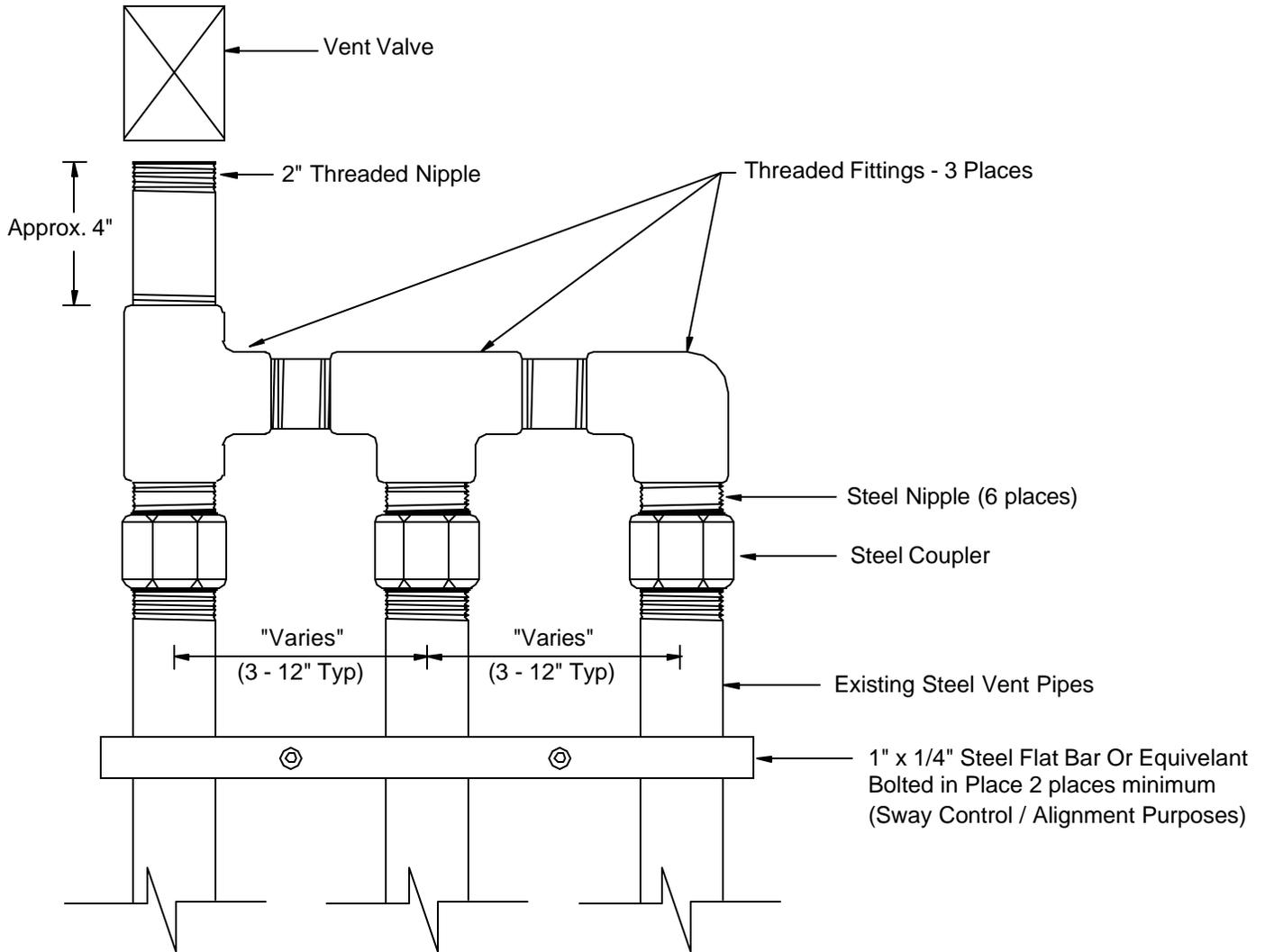
1. Thread by hand to avoid cross threading.
2. Tighten adaptor to 75 to 100 foot-pounds torque.

Warranty

The Company warrants its goods to be free from defects in material and workmanship as represented in our catalogs or applicable drawings and specifications agreed to by us at the time of acceptance of the order by Ever-Tite Coupling Products. Our obligation under this warranty shall be limited to repairing or replenishing any parts which shall, within one (1) year after shipment to the original purchaser, be demonstrated to be defective. This warranty is expressly in lieu of all other warranties, express or implied, including the warranties of merchantability and fitness. No person, firm or corporation is authorized to assume for us any other liability in connection with the sale of these goods.

Figure 2U

Typical Vent Pipe Manifold



Note: This figure represents one instance where three vent pipes have been manifolded into one single outlet. However, a maximum of three Husky Model 4885 Threaded Pressure/Vacuum Vent Valves may be used on a single Gasoline Dispensing Facility.

Executive Order VR-101-B

Exhibit 3

Manufacturers Performance Standards and Specifications

The performance standards and specifications contained in this Exhibit shall establish the minimum requirements by which vapor recovery components shall be manufactured, warranted, and offered for sale. These specifications shall verify the minimum parameters by which CARB shall determine compliance with certification.

Pressure/Vacuum Vent Valves for Storage Tank Vent Pipes

1. Each Pressure/Vacuum Vent Valve (P/V Valve) shall be 100 percent performance tested at the factory. Each P/V Valve shall be shipped with a card or label stating the performance specifications listed below, and a statement that the valve was tested to, and met, these specifications.
 - a. The pressure settings for the P/V Valve
 - Positive pressure setting of 3.0 ± 0.5 inches H₂O.
 - Negative pressure setting of 8.0 ± 2.0 inches H₂O.
 - b. The leak rate for each P/V Valve, including connections, shall not exceed:
 - 0.05 CFH at 2.0 inches H₂O.
 - 0.21 CFH at -4.0 inches H₂O.
3. Each P/V Valve shall have permanently affixed to it a yellow or gold label with black lettering listing the positive and negative pressure settings specified above.

Spill Container and Drain Valves

1. Spill Containers and all internal components contained within a Spill Container shall be compatible with any and all fuel blends in common use in California, including seasonal changes, and approved for use as specified in Title 13, CCR, section 2260, et seq.
2. Each Spill Container Drain Valve shall be 100 percent performance tested at the factory. Each Spill Container shall have affixed to it a card or label stating the performance specifications listed below, and a statement that the valve was tested to, and met, the following specification.
 - a. The leak rate for the Spill Container Drain Valve meets or exceeds the following specification: ≤ 0.17 CFH at 2.00 inches H₂O

Rotatable Product and Vapor Recovery Adaptors

1. The rotatable product and vapor recovery adaptors shall not leak.
2. Rotatable product and vapor recovery adaptors shall be capable of rotating at least 360 degrees when used in conjunction with any product or vapor recovery elbow used to connect to cargo tanks.

3. The vapor recovery adaptor cam and groove shall be manufactured in accordance with the standard described in Commercial Item Description, CID A-A-59326.
4. The rotatable product adaptor cam and groove shall be manufactured in accordance with the cam and groove standard specified by CARB as shown in Figure 3B.
5. Each rotatable product and vapor recovery adaptor shall be 100 percent performance tested at the factory. Each adaptor shall have affixed to it a card or label stating the performance specification listed below, and a statement that the adaptor was tested to, and met, the following specification.
 - a. The average static torque for the rotatable adaptor meets or exceeds the following specification: maximum 108 pound-inch average static torque.

Product and Vapor Recovery Adaptor Dust Caps

1. Dust caps shall not leak when installed on vapor recovery or product adaptors. Dust caps shall be factory tested to ensure compatibility with the cam and groove standards for rotatable adaptors as specified in Section 3 of CP-201.

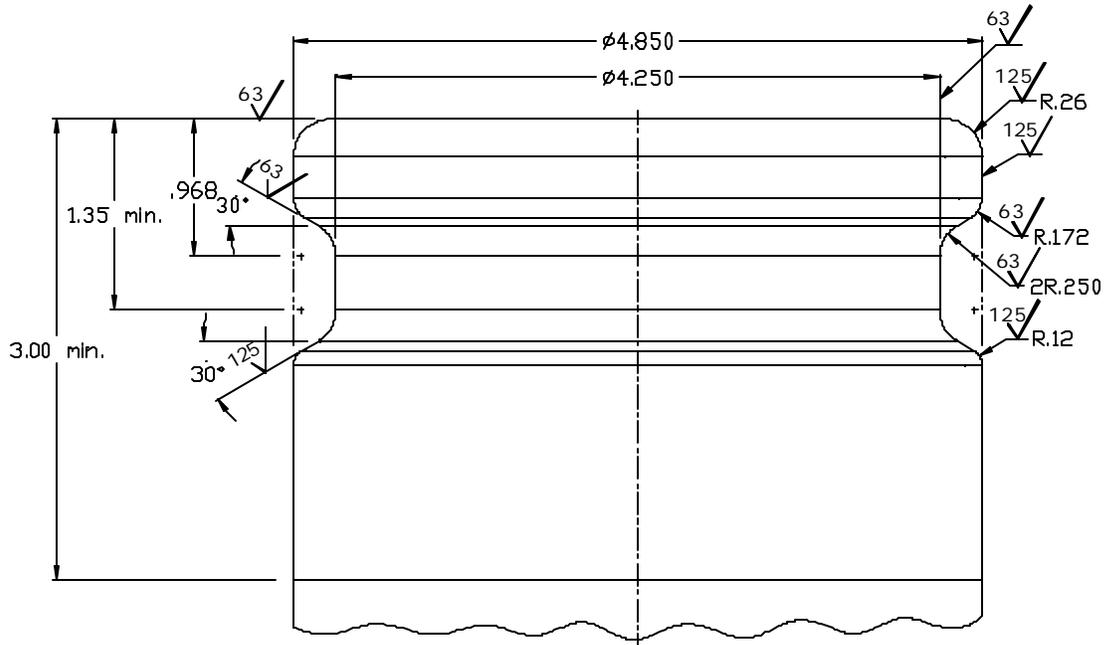
Figure 3A

Manufacturers Component Standards or Specifications

Component	Test Method	Standard or Specification
Rotatable Phase I Adaptors	Exhibit 4	Minimum, 360-degree rotation Maximum, 108 pound-inch average static torque
Drop Tube/Drain Valve Assembly	Exhibit 5	≤0.17 CFH at 2.00 inches H ₂ O
Drain Valve Assembly Only	Exhibit 5 or equivalent	≤0.17 CFH at 2.00 inches H ₂ O
Rotatable Vapor Recovery Adaptor	Micrometer	Cam and Groove Standard CID A-A-59326
Rotatable Product Adaptor	Micrometer	Cam and Groove Standard CARB Standard (Figure 3B)
UST, Fittings and Connections	TP-201.3	2.00 inches H ₂ O - 5 minutes
Pressure/Vacuum Vent Valve	TP-201.2B Appendix 1	Positive Pressure: 3.0 ±0.5 inches H ₂ O Negative Pressure: 8.0 ±2.0 inches H ₂ O Leakrate: ≤ 0.05 CFH at +2.0 inches H ₂ O ≤ 0.21 CFH at -4.0 inches H ₂ O

Figure 3B

CARB Product Adaptor Cam and Groove Standard



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ± 0.5°

Executive Order VR-101-B

Exhibit 4

Static Torque of Rotatable Phase I Adaptors

Definitions common to all certification and test procedures are in:

D-200 Definitions for Vapor Recovery Procedures

For the purpose of this procedure, the term "CARB" refers to the California Air Resources Board, and the term "Executive Officer" refers to the CARB Executive Officer, or his or her authorized representative or designate.

1. PURPOSE AND APPLICABILITY

- 1.1 The purpose of this procedure is to quantify the amount of static torque required to start the rotation of a rotatable Phase I adaptor. This procedure determines compliance with the performance specification required by CARB.

2. PRINCIPLE AND SUMMARY OF TEST PROCEDURE

- 2.1 A compatible dust cap is installed on a rotatable Phase I adaptor. A Torque Test Tool is then installed on the dust cap and three static torque measurements are taken. If the resulting, average static torque is less than, or equal to, the maximum allowable static torque value specified in Certification Procedure CP-201, the adaptor is verified to be in compliance.

3. BIASES AND INTERFERENCES

- 3.1 Missing or defective gaskets in the dust cap may bias the results towards compliance as a dust cap may slip on the rotatable adaptor prior to the adaptor rotating. This bias is eliminated by ensuring that the dust cap seal is securely in place and does not show signs of excessive wear or damage.
- 3.2 Gasoline or other lubricants on the sealing surface of the rotatable adaptor or the dust cap seal can cause the dust cap to slip and may bias the results towards compliance. This bias is eliminated by ensuring that the sealing surface of the rotatable adaptor and dust cap is clean, dry and free of lubricants.

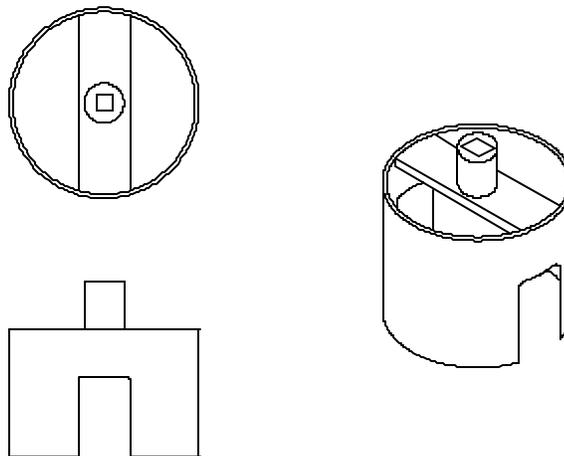
4. SENSITIVITY, RANGE, AND PRECISION

- 4.1 The measurable static torque is dependent upon the range of the Torque Wrench used for the test. The recommended Torque Wrench range specified in Section 5.1 provides sufficient precision at the maximum allowable static torque.

5. EQUIPMENT

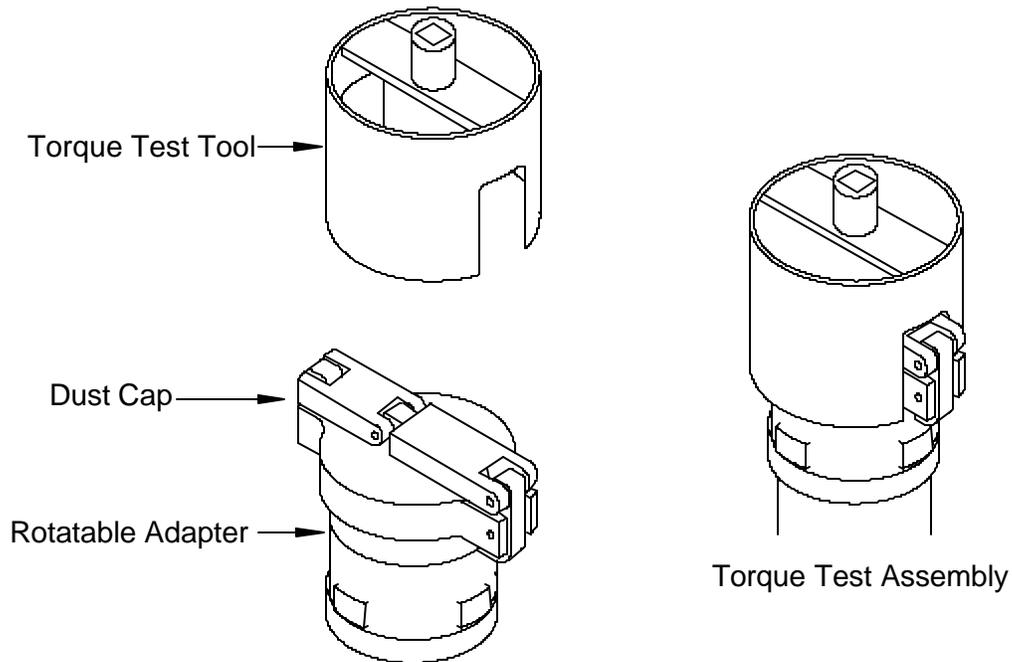
- 5.1** Torque Wrench. Use a Snap-On TER12FUA Torque Wrench, or equivalent to measure the static torque of the rotatable adaptor. The torque wrench used to conduct static torque testing shall be capable of the following.
- 5.1.1** The maximum full-scale range of the Torque Wrench shall be 144 pounds-inches (12 pound-feet) with minimum accuracy of 3.0 percent.
 - 5.1.2** The minimum readability of the Torque Wrench shall be 5.00 pound-inch increments to ensure accurate readings.
 - 5.1.3** The torque wrench shall incorporate a mechanism, such as a tell-tale needle, that identifies the maximum applied torque during each measurement.
- 5.2** Static Torque Test Assembly. Use a compatible dust cap and rotatable adaptor Torque Test Tool, Phil-Tite® Part Number 6004 or equivalent. A depiction of the Phil-Tite® Torque Test Tool is shown in Figure 1. An example of a complete Static Torque Test Assembly is shown in Figure 2.
- 5.3** Socket wrench and socket extension. Use a 3/8 inch or 1/2 inch socket wrench, adaptors and socket extension (if needed) to verify 360-degree rotation or to conduct static torque testing. The socket extension shall not exceed 12 inches in length.

Figure 1
Phil-Tite® Torque Test Tool



- 5.4** Traffic Cones. Use traffic cones to encircle the Phase I area while the test is being conducted.

Figure 2
Static Torque Test Assembly



6. PRE-TEST PROCEDURES

- 6.1 Place the traffic cones around the perimeter of the Phase I spill containers, allowing sufficient space to safely conduct the test.
- 6.2 Remove the lids of the Phase I spill containers. Visually determine that the adaptors are of the rotatable design.
- 6.3 Inspect the dust caps to ensure that the caps and that the gaskets are intact and do not show signs of excessive wear or damage.
- 6.4 Inspect the rotatable adaptors. If the adaptors are wet or covered with a lubricant, wipe the adaptors clean to ensure maximum friction between the dust cap and the adaptor seal surface.

7. TEST PROCEDURE

- 7.1** Install the dust cap on the Phase I rotatable adaptor.
- 7.2** Install the Torque Test Tool on the dust cap as shown in Figure 2.
- 7.3** Verification of rotation, conducted prior to the static torque test. Place a socket wrench with socket extension (if required) into the Torque Test Tool, or equivalent. Rotate the adaptor a minimum of 360 degrees. Note: do not continue with static torque measurements if the adaptor does not rotate 360 degrees.
- 7.4** Install the Torque Wrench into the Torque Test Tool. If the spill container is too deep to allow connection of the Torque Wrench, use a compatible socket extension to reach into the bucket to the Torque Test Tool. The socket extension shall not exceed 12 inches in length.
- 7.5** Place one hand on top of the Torque Wrench, directly above the center of the Torque Test Tool to keep the wrench level when applying pressure. Gently apply an even, steady pressure just until the adaptor begins to rotate. Record the maximum static torque value as shown on the torque wrench and proceed to 7.6 and 7.7.
- 7.6** After the first static torque measurement is taken, slowly rotate the adaptor one third of full rotation (120 degrees) from the point of the first measurement location. Using the same technique as specified in 7.5, measure and record a second static torque.
- 7.7** Following the first and second measurements, slowly rotate the adaptor a second, one third of full rotation (120 degrees) from the second measurement location. Using the same technique as specified in 7.5, measure and record a third static torque. Rotating the adaptor in one-third increments ensures that the average static torque is representative of the entire adaptor rotation.

8. POST-TEST PROCEDURES

- 8.1** Remove the Torque Test Assembly and replace the appropriate lids on each of the spill containers.
- 8.2** Remove the traffic cones from the Phase I area.

9. CALCULATING RESULTS

- 9.1** Calculate the arithmetic average of the three tests for each adapter tested and record on a data sheet.

10. REPORTING RESULTS

- 10.1** Report the results of the quantification of the leakrate through the Drop Tube/Drain Valve Assembly as shown on Form 1. Districts may require the use of alternate Drop Tube/Drain Valve Assembly data sheets provided they include the same parameters identified on Form 1.

11. ALTERNATE PROCEDURES

- 11.1** This procedure shall be conducted as specified. Modifications to this test procedure shall not be used to determine compliance unless prior written approval has been obtained from the CARB Executive Officer, pursuant to Section 14 of Certification Procedure CP-201.

Form 1
Static Torque of Rotatable Phase I Adaptors

Test Company:	Conducted By:
Test Date:	Facility Name:
Facility Address:	City:

Measurement Units: pound-inches

Vapor Adaptor 1			Vapor Adaptor 2			Vapor Adaptor 3			Vapor Adaptor 4		
360° Test	PASS	FAIL									
Brand:			Brand:			Brand:			Brand:		
Model:			Model:			Model:			Model:		
Grade:			Grade:			Grade:			Grade:		
Torque 1:			Torque 1:			Torque 1:			Torque 1:		
Torque 2:			Torque 2:			Torque 2:			Torque 2:		
Torque 3:			Torque 3:			Torque 3:			Torque 3:		
Average:			Average:			Average:			Average:		

Product Adaptor 1			Product Adaptor 2			Product Adaptor 3			Product Adaptor 4		
360° Test	PASS	FAIL									
Brand:			Brand:			Brand:			Brand:		
Model:			Model:			Model:			Model:		
Grade:			Grade:			Grade:			Grade:		
Torque 1:			Torque 1:			Torque 1:			Torque 1:		
Torque 2:			Torque 2:			Torque 2:			Torque 2:		
Torque 3:			Torque 3:			Torque 3:			Torque 3:		
Average:			Average:			Average:			Average:		

Comments: _____

Executive Order VR-101-B

Exhibit 5

Pressure Integrity of Drop Tube/Drain Valve Assembly

Definitions common to all certification and test procedures are in:

D-200 Definitions for Vapor Recovery Procedures

For the purpose of this procedure, the term "CARB" refers to the California Air Resources Board, and the term "Executive Officer" refers to the CARB Executive Officer, or his or her authorized representative or designate.

1. PURPOSE AND APPLICABILITY

- 1.1** The purpose of this procedure is to quantify the pressure integrity of a Drop Tube and Drain Valve seal when a drop tube is installed below a Spill Container drain path as shown in Figure 1. This procedure determines compliance with the performance standard(s) for the maximum allowable leakrate for the Spill Container Drain Valve as defined in CP-201 and verifies the zero leak decay limit for a drop tube seal (Drop Tube/Drain Valve Assembly).
- 1.2** This procedure is not applicable to installations that have drop tube overfill protection devices installed.

2. PRINCIPLE AND SUMMARY OF TEST PROCEDURE

- 2.1** A compatible product cap is modified to allow the introduction of nitrogen into a Phase I drop tube. A pressure-measuring device is connected to the modified cap. If the resulting measured nitrogen flowrate necessary to maintain a steady-state pressure of 2.00 inches H₂O is less than, or equal to, the maximum allowable leakrate for the Spill Containment Drain Valve, the assembly is verified to be in compliance.
- 2.2** If the introduction of nitrogen, at a flowrate equal to the maximum allowable leakrate does not result in a steady state pressure that meets, or exceeds, the limits specified in CP-201, the Phase I product adaptor shall be inspected and tested. Any leaks attributable to the Phase I product adaptor shall be corrected and the test repeated to ensure the measured pressure versus flowrate is attributable only to the Drop Tube/Drain Valve Assembly.
- 2.3** If the introduction of nitrogen, at a flowrate equal to the maximum allowable leakrate does not result in a steady state pressure that meets, or exceeds, the limits specified in CP-201 following verification of the Phase I adaptor integrity, the drop tube sealing mechanism shall be inspected and verified for proper seating. Any leaks attributable to the drop tube sealing mechanism shall be corrected and the test repeated to ensure the measured pressure versus flowrate is attributable only to the Spill Container Drain Valve.

3. BIASES AND INTERFERENCES

- 3.1** Missing or defective gaskets on the Phase I product adaptor, or a loose adaptor, may bias the results towards noncompliance. This bias is eliminated by testing the Phase I product adaptor for leaks prior to final determination of the compliance status of the Drop Tube/Drain Valve Assembly.
- 3.2** Product levels less than four (4) inches above the highest opening at the bottom of the submerged drop tube may bias the test toward noncompliance.
- 3.3** Leaks in the test equipment will bias the results toward noncompliance. Prior to conducting the test, this bias is eliminated by conducting a leak check of the test equipment. During the test, this bias is eliminated by using leak detection solution to verify the absence of leaks in the test equipment.

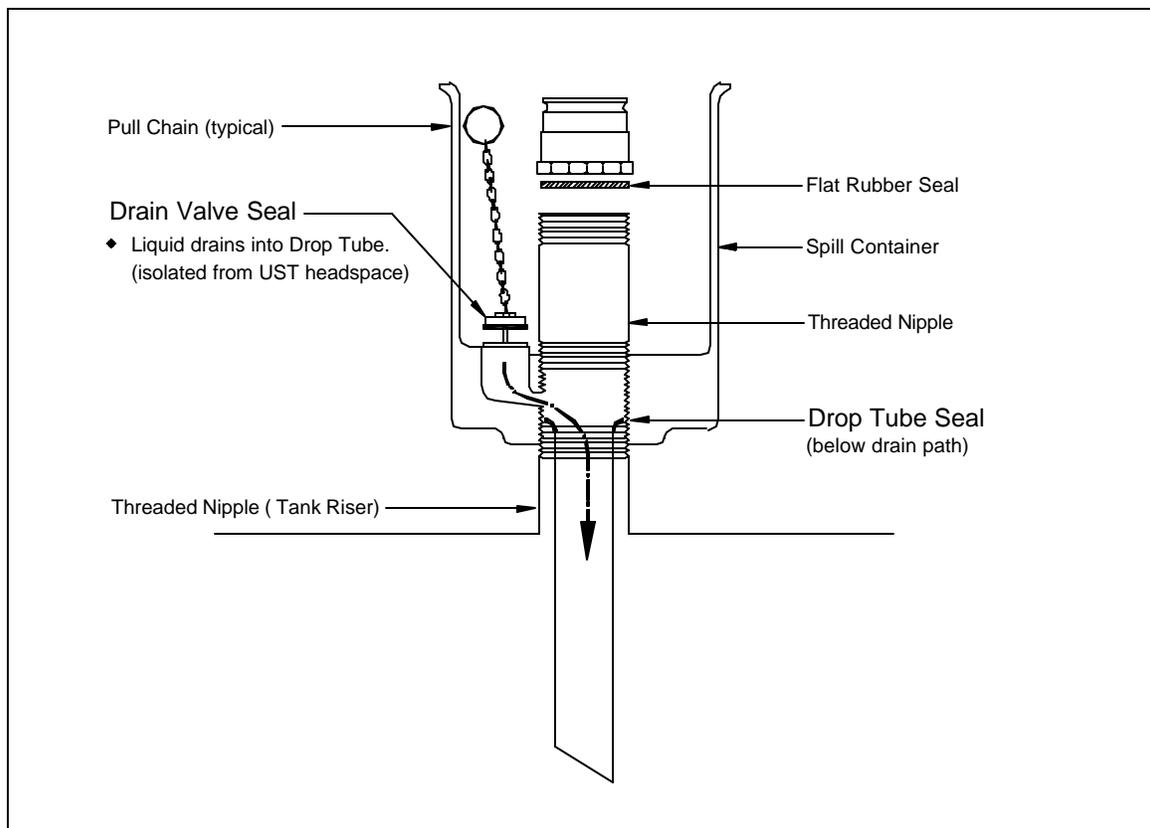
4. SENSITIVITY, RANGE, AND PRECISION

- 4.1** The measurable leakrate is dependent upon the range of the flowmeter used for the test. The recommended flowmeter range specified in Section 5.1 provides sufficient precision at the maximum allowable leakrate defined in CP-201.
- 4.2** The sensitivity of the pressure measuring device is 0.01 inches H₂O for electronic pressure measuring devices and 0.05 inches H₂O for mechanical pressure gauges.

5. EQUIPMENT

- 5.1** Pressure Introduction Assembly. Use a product cap compatible with the Phase I product adaptor. The cap shall be equipped with a pressure tap and flowmeter capable of measuring flowrates equal to the maximum allowable leakrate. The maximum allowable full-scale range for the flowmeter shall be 1.00 CFH. The flowmeter shall be calibrated for use with nitrogen. As a safety precaution, the hose used to feed nitrogen into the assembly shall be steel braided, or a separate grounding strap may be used. An example of a complete Pressure Introduction Assembly is shown in Figure 2. An example of a Product Cap Test Assembly is shown in Figure 3.
- 5.2** Pressure Measuring Device. Use a pressure-measuring device to monitor the pressure in the drop tube.
 - 5.2.1** If an electronic pressure-measuring device is used, the maximum fullscale range of the device shall be 10 inches H₂O. The minimum accuracy shall be 0.5 percent and the pressure measuring device shall be readable to the nearest 0.01 inches H₂O.
 - 5.2.2** If a mechanical pressure-measuring device is used, the maximum fullscale range shall be 5 inches H₂O. The minimum accuracy shall be 1.0 percent and the minimum graduations shall be 0.05 inches H₂O. The minimum diameter of the pressure gauge face shall be 4 inches.

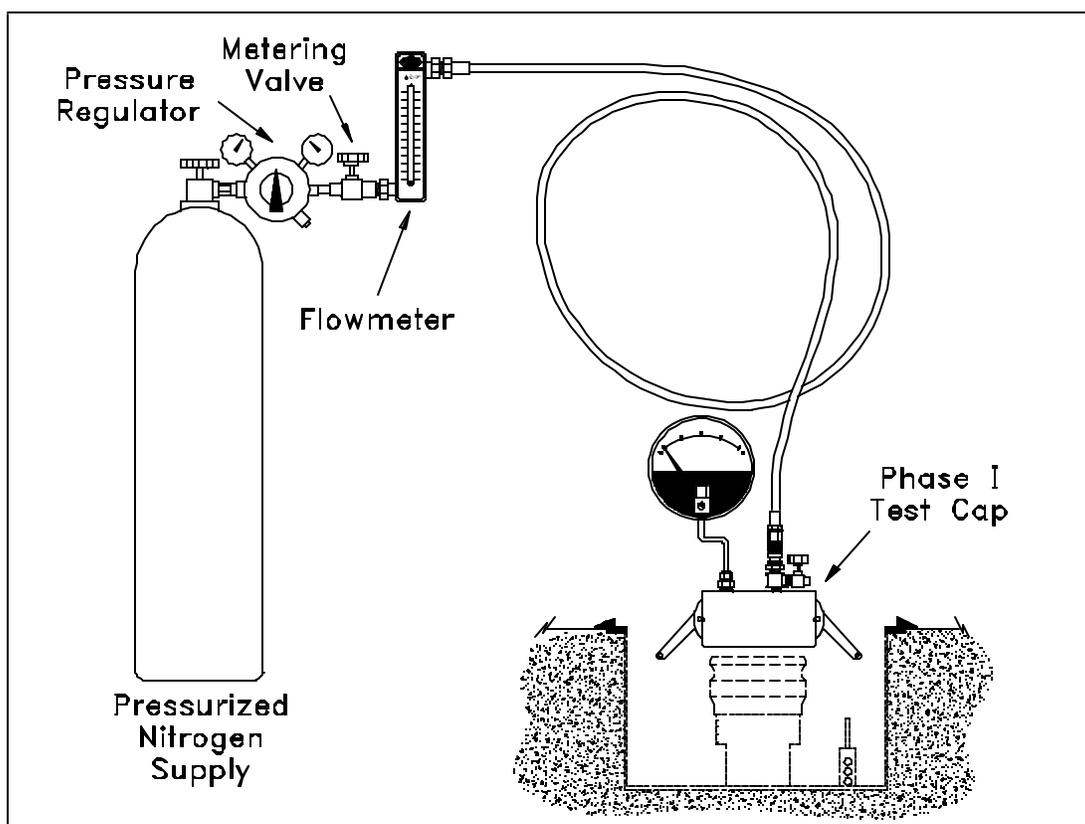
Figure 1
Drop Tube/Drain Valve Assembly



- 5.3** Nitrogen. Use commercial grade gaseous nitrogen in a high-pressure cylinder, equipped with a two-stage pressure regulator and a one psig pressure relief valve.
- 5.4** Stopwatch. Use a stopwatch accurate to within 0.2 seconds to time the duration of the test.
- 5.5** Leak Detection Solution. Any commercial liquid solution designed to detect vapor leaks may be used to verify the pressure integrity of the Phase I product adaptor during this test.
- 5.6** Vapor Poppet Pressure Relief Assembly. Use an assembly to open the Phase I vapor poppet during testing. This will ensure that the underground storage tank (UST) ullage and liquid surface is at zero gauge pressure. An example of a Vapor Poppet Pressure Relief Assembly is shown in Figure 3.

- 5.7 Traffic Cones. Use traffic cones to encircle the area containing the Phase I spill containers while the test is being conducted.
- 5.8 Tank Gauging Stick. Use a tank gauging stick of sufficient length to verify that the UST liquid level is at least four (4) inches above the highest opening at the bottom of the submerged drop tube. The tank gauging stick shall be equipped with a non-sparking "L" bracket at the end.

Figure 2
Pressure Introduction Assembly



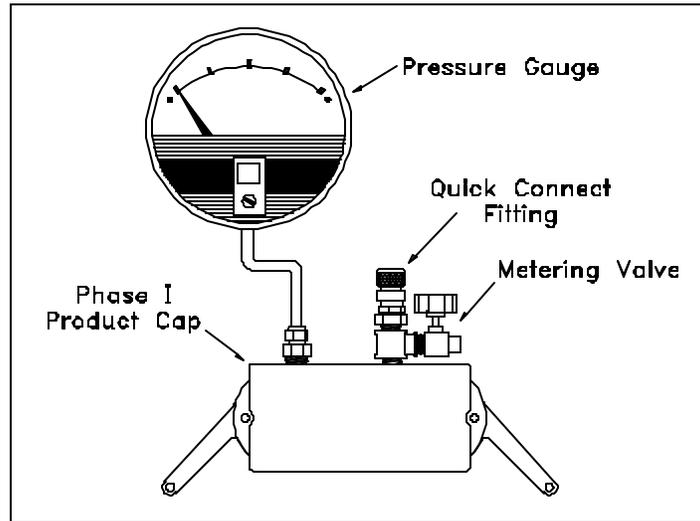
4. PRE-TEST PROCEDURES

The flowmeter and pressure-measuring device shall be calibrated within the 180 days prior to conducting the test. The flowmeter(s) shall be calibrated for use with nitrogen. Calibrations shall be conducted in accordance with EPA or CARB protocols. **CARB calibration methodology for flow meters are contained in Appendix D of Air Monitoring Quality Assurance, Volume VI, Standard Operating Procedures for Stationary Source Emission Monitoring and Testing, January 1979.**

- 6.2 Place the traffic cones around the perimeter of the Phase I Spill Containers, allowing sufficient space to safely conduct the test.

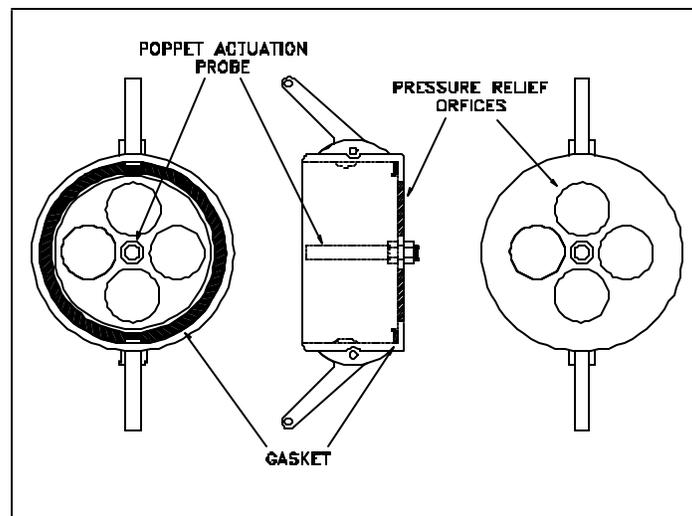
- 6.3 Remove the lids of the Phase I Spill Containers. Visually determine that the drop tube is installed below the Spill Container and that the drain path allows liquid to drain directly into the drop tube.

Figure 3
Product Cap Test Assembly



- 6.4 Inspect the Phase I product adaptor to ensure that the gasket is intact and that the adaptor is securely attached to the Phase I product stem.
- 6.5 Verify that the liquid level in the storage tank is at least four (4) inches above the highest opening at the bottom of the submerged drop tube. This may be accomplished by using a tank gauging stick equipped with a non-sparking "L" bracket on the end.

Figure 4
Vapor Poppet Pressure Relief Assembly



7. TEST PROCEDURE

- 7.1 Connect the Pressure Introduction Assembly to the Phase I product adaptor as shown in Figure 1. Connect the nitrogen supply line to the inlet of the flowmeter.
- 7.2 Connect the Vapor Poppet Pressure Relief Assembly to the Phase I vapor poppet to bring the UST headspace to atmospheric pressure.
- 7.3 With no vehicle refueling occurring, open the nitrogen supply and adjust the nitrogen flowrate to at least three times the maximum allowable leakrate specified in CP-201, and start the stopwatch.
- 7.4 Wait until the pressure measuring device records a pressure between 2.00 and 2.20 inches H₂O.
 - 7.4.1 If the pressure does not reach at least 2.00 inches H₂O within 180 seconds, the Drop Tube/Drain Valve Assembly does not comply with the maximum allowable leakrate.
 - 7.4.2 If the pressure reaches at least 2.00 inches H₂O, reduce the introduction of nitrogen to the allowable leakrate specified in CP-201. Wait until the pressure reaches steady state conditions for at least ten (10) seconds and record both the nitrogen flowrate and the steady state pressure. If the steady state pressure is less than 2.00 inches H₂O, the Drop Tube/Drain Valve Assembly does not comply with the maximum allowable leakrate.
 - 7.4.2.1.1 In the case of a Drop Tube/Drain Valve Assembly not reaching the minimum specified pressure, use a soap solution on the rotatable adaptor to ensure that the rotation mechanism or the adaptor seal is not leaking.
 - 7.4.2.1.2 In the case of a Drop Tube/Drain Valve Assembly not reaching the minimum specified pressure following verification of the rotatable adaptor mechanism, ensure that the drop tube seal is properly tightened according to the manufacturers recommended installation instructions.

8. POST-TEST PROCEDURES

- 8.1 Remove the Pressure Introduction Assembly and the Vapor Poppet Pressure Relief Assembly from the Phase I connections. Replace the caps on the appropriate Phase I adaptors, and the lids on the appropriate Spill Containers.
- 8.2 Remove the traffic cones from the Phase I area.
- 8.3 If the steady-state pressure, at a nitrogen flowrate rate equal to the allowable leakrate, was not equal to or greater than 2.00 inches H₂O, Equation 9-1 may be used to determine the leakrate at 2.00 inches H₂O.

9. CALCULATING RESULTS

9.1 If the flowrate of Nitrogen was at the upper limit of the flowmeter and the measured pressure never reached 2.00 inches H₂O, but was greater than 0.0 inches H₂O, the actual leakrate at a pressure of 2.00 inches H₂O shall be calculated as follows:

$$Q_{2.00} = (2.00)^{1/2} \left[\frac{Q_{actual}}{(P_{actual})^{1/2}} \right] \quad \text{Equation 9-1}$$

Where:

- $Q_{2.00}$ = The leakrate of the drop tube assembly at 2.00 inches H₂O, cubic feet per hour
- Q_{actual} = The actual introduction rate of nitrogen, cubic feet per hour
- P_{actual} = The actual measured steady-state pressure at Q_{actual} , inches H₂O
- 2.00 = Pressure, inches H₂O

10. REPORTING RESULTS

10.1 Report the results of the quantification of the leakrate through the Drop Tube/Drain Valve Assembly as shown on Form 1. Districts may require the use of alternate Drop Tube/Drain Valve Assembly data sheets provided they include the same parameters identified on Form 1.

11. ALTERNATE PROCEDURES

11.1 This procedure shall be conducted as specified. Modifications to this test procedure shall not be used to determine compliance unless prior written approval has been obtained from the CARB Executive Officer, pursuant to Section 14 of Certification Procedure CP-201.

Form 1

Field Data Sheet

Pressure Integrity Of Drop Tube/Drain Valve Assembly

Facility:	Test Date:	Tester(s):
Address:	City:	Zip Code:
Phase I System Type:	Phase II System Type:	
Date of Last Flowmeter Calibration:	Date of Last Pressure Device Calibration:	

Test Results

Product Grade	Nitrogen Flowrate (CFH)	Pressure (inches H ₂ O)	Make/Model Spill Container	Make/Model Rotatable Product Adaptor	Make/Model Rotatable Vapor Adaptor

<i>Comments:</i>