

California Environmental Protection Agency



**ARB Approved
Installation, Operation and Maintenance Manual**

For

Executive Order

VR-501-D

**Balance Phase II Enhanced Vapor Recovery (EVR)
System for Protected Aboveground Storage
Tanks (AST)**

NOTICE:

The **ARB Approved Installation, Operation and Maintenance Manual (IOM) for VR-501** describe the tools, methods, and skill levels required to install the **Balance Phase II EVR Systems**.

Unless specified otherwise, only skilled technicians that are trained, certified, and licensed by Hirt Combustion Engineers, Inc. (HCE or Hirt) are able to perform installation, maintenance, or repairs of components manufactured by HCE or the warranty will be void. Unless specified otherwise, only skilled technicians that are trained, certified and licensed by EMCO Wheaton Retail (i.e. EMCO Certified Technicians) are able to perform installation, maintenance or repairs of components manufactured by EMCO or hoses manufactured by Veyance Technologies or warranty will be void. Unless specified in this IOM, only skilled technicians that are trained, certified, and licensed by VST, Inc. (i.e. VST Authorized Service Contractors) are able to perform installation, maintenance, or repairs of components manufactured by VST Inc. or the warranty will be void.

NOTE: GDF Owner / Operator can remove and install hanging hardware (nozzle, curb hose, breakaway, and whip hose). Additional certifications may be required in accordance with local district requirements.

It is the responsibility of each Hirt Technician, EMCO Certified Technician and VST Authorized Service Contractor (ASC), to be familiar with the current requirements of state, federal, and local codes for installation and repair of gasoline dispensing equipment.

It is also the responsibility of the Hirt Technician, EMCO Certified Technician and VST Authorized Service Contractor (ASC) to be aware of all the manuals, necessary safety precautions, and site safety requirements to assure a safe and trouble-free installation.

To confirm Hirt training, a person should contact Hirt below with the Name (and company) of the technician.

Contact Information:

Customer Service Department
Hirt Combustion Engineers, Inc.
Phone: (562) 692-6970
email: HirtVCS@aol.com

To confirm the status of an EMCO Certified Technician, please visit the EMCO Wheaton Retail's website at www.emcoretail.com or contact:

Jose E. Rodriguez
Manager of Technical Services & Support
EMCO Wheaton Retail
Phone: 619-421-1743
Email: JERodriguezSD@aol.com

EMCO Wheaton Retail
2300 Industrial Park Drive
Wilson, North Carolina 27893
Phone: 252-243-4394
Fax: 252-243-4759
Email: ewrc@emcoretail.com

To participate in a VST training class, a candidate will need to complete an enrollment form, which can be downloaded from the VST website at www.vsthose.com or requested by phone at 937-704-9333. Once the enrollment form is approved by VST, the candidate can enroll in a VST training class.

To confirm a VST Authorized Service Contractor status, a person can go to the VST website at www.vsthose.com. This list is updated periodically.

Vapor Systems Technologies, Inc.
650 Pleasant Valley Drive
Springboro, Ohio 45066

PH: 937-704-9333
FX: 937-704-9443
www.vsthose.com

Balance Phase II EVR System for
Protected Aboveground Storage Tanks (AST)

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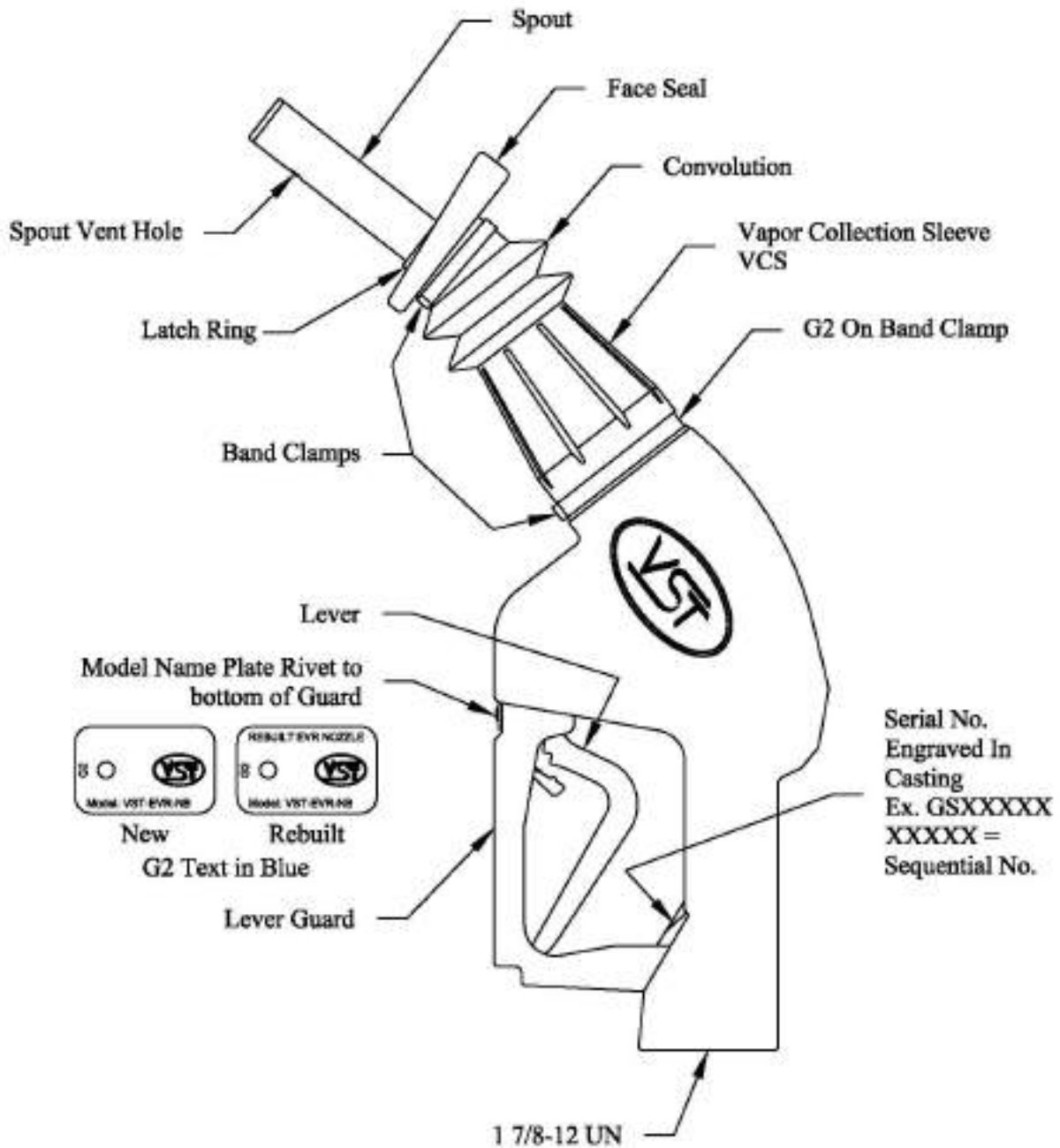
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Weekly Inspections –Hanging Hardware

| HANGING HARDWARE SYSTEM | | | | | |
|--------------------------------|---|---|---|--------------------------|---|
| Component | Procedure | Fail Criteria | Corrective Action | Reference Manuals | Authorized Personnel |
| Nozzle Hose Breakaway | Inspect each hose, breakaway, and nozzle for loose connections or leaks | Presence of a leak | Tighten connections or replace with new product | IOM-6 | Nozzle, hose, or breakaway replacement: GDF owner/operator or VST ASC Levels A, B, C, or D or EMCO Level A Component repair: VST ASC Levels A, B, or C or EMCO Level A |
| | | Presence of residue from a leak | Tighten connections or replace with new product | IOM-8 | |
| | | Visible o-ring between any component connection | Tighten connections or replace with new product | IOM-9 | |
| CO-AXIAL HOSES | | | | | |
| Component | Procedure | Fail Criteria | Corrective Action | Reference Manuals | Authorized Personnel |
| Coaxial Hose | Inspect hoses for wear, severe kinks, cracks, splitting, and functional swivels | Kinks, cracks, splitting, non-functional swivels, or any visible openings | Replace with new hose | IOM-8 | Hose replacement: GDF owner/operator or VST ASC Levels A, B, C, or D or EMCO Level A |
| BREAKAWAY | | | | | |
| Component | Procedure | Fail Criteria | Corrective Action | Reference Manuals | Authorized Personnel |
| Breakaway | Inspect breakaway for leaks around the scuff | Presence of a leak around the scuff | Replace with new breakaway | IOM-9 | Replace breakaway: GDF Owner/Operator or VST ASC Levels A, B, C, or D or EMCO Level A |

| VST NOZZLE | | | | | |
|--|---|--|---|------------------------------|---|
| Nozzle Component | Procedure | Fail Criteria | Corrective Action | Reference Manuals | Authorized Personnel |
| Nozzle lever, lever guard, lever lock | Inspect for imperfections, cuts, or damage to the: Nozzle Lever Lever Guard Lever Lock Spout Spout Vent Hole Face Seal Interlock Rod Vapor Collection Sleeve. | Damaged or missing | Replace with new VST nozzle | IOM-6 | Nozzle Replacement: GDF Owner/Operator or VST ASC Levels A, B, C, or D |
| Nozzle Spout | | Sheared or bent | Replace nozzle spout assembly with new VST Front-End Kit or Replace with new VST nozzle | IOM-7 IOM-6 | Front-End Repair: VST ASC Levels A, B, C, or D Nozzle Replacement: GDF Owner/Operator or VST ASC Levels A, B, C, or D |
| Nozzle Vent Hole | | Vent hole blocked | Clear blockage | IOM-6 | Blockage Repair: GDF Owner/Operator or VST ASC Levels A, B, C, or D |
| Nozzle Collection Sleeve | | If greater than 18 inches total length of cuts (if greater than 0.4 sq. inches of material missing) | Replace vapor collection kit | IOM-7 | Front-End Repair: VST ASC Levels A, B, C, or D |
| | | | Replace nozzle with new VST nozzle | IOM-6 | Nozzle Replacement: GDF Owner/Operator or VST ASC Levels A, B, C, or D |
| Nozzle Face Seal | | Greater than 30% of the material is missing (if greater than 2.5 inches of the accumulated faceplate circumference is missing) | Replace vapor collection kit | IOM-7 | Front-End Repair: VST ASC Levels A, B, C, or D |
| | | | Replace nozzle with new VST nozzle | IOM-6 | Nozzle Replacement: GDF Owner/Operator or VST ASC Levels A, B, C, or D |
| Nozzle Front-End Kit (Collection sleeve and face seal) | | Alignment lines are misaligned and/or the assembly is askew | Replace vapor collection kit | IOM-7 | Front-End Repair: VST ASC Levels A, B, C, or D |
| | | | Replace nozzle with new VST nozzle | IOM-6 | Nozzle Replacement: GDF Owner/Operator or VST ASC Levels A, B, C, or D |
| Nozzle Interlock Rod | | Nozzle Inspection | Interlock rod sticks during engagement or disengagement | Replace vapor collection kit | IOM-7 |
| | Replace nozzle with new VST nozzle | | | IOM-6 | Nozzle Replacement: GDF Owner/Operator or VST ASC Levels A, B, C, or D |

VST G2 Nozzle



| EMCO NOZZLE | | | | | |
|-------------------------------------|---|---|---|--------------------------|--|
| Nozzle Component | Procedure | Fail Criteria | Corrective Action | Reference Manuals | Authorized Personnel |
| Lever, Hold Open Latch, Lever Guard | Inspect for defects, cuts or damage to the: Lever Hold Open Latch Lever Guard Spout | Damaged or missing | Replace with new EMCO latch kit or nozzle | IOM – 6 | Latch Kit Repair: EMCO Certified Technician Level A Nozzle Replacement: GDF Owner/Operator or EMCO Certified Technician Level A |
| Spout | | Sheared or bent | Replace with new EMCO Spout Kit or nozzle | IOM – 6 IOM - 7 | Spout Kit Repair: EMCO Certified Technician Level A Nozzle Replacement: GDF Owner/ Operator or EMCO Certified Technician Level A |
| Spout Vent Hole | Inspect for defects, cuts or damage to the: Spout Vent Hole Boot Face Bellows | Vent hole blocked | Clear blockage | IOM – 6 | Blockage Repair: GDF Owner/Operator or EMCO Certified Technician Level A |
| Boot Face | | > than 0.4 sq. inches of boot face material is missing (e.g. A triangular or similar shape in which greater than 7/16 inches of the boot face circumference is missing [accumulated]) | Replace with new EMCO boot face kit or nozzle | IOM – 6 IOM - 7 | Boot Face Kit Repair: EMCO Certified Technician Level A Nozzle Replacement: GDF Owner/Operator or EMCO Certified Technician Level A |
| Bellows | | A cut across 7 consecutive bellows convolutions | Replace with new EMCO bellows kit or nozzle | IOM – 6 IOM - 7 | Bellows Kit Repair: EMCO Certified Technician Level A Nozzle Replacement: GDF Owner/Operator or EMCO Certified Technician Level A |

| EMCO NOZZLE | | | | | |
|------------------------------|---|---|--|--------------------|---|
| Insertion Interlock Rod | Inspect for defects, cuts or damage to the: Insertion Interlock Rod Band Clamps Serial Plate Security Rivet | Insertion interlock rod sticks during engagement or disengagement | Replace with new EMCO Spout Kit or nozzle | IOM – 6 IOM - 7 | Spout Kit Repair: EMCO Certified Technician Level A Nozzle Replacement: GDF Owner/Operator or EMCO Certified Technician Level A |
| Band Clamps | | Damaged or missing | Replace with new EMCO band clamp kit or nozzle | IOM – 6 IOM - 7 | Band Clamp Kit Repair: EMCO Certified Technician Level A Nozzle Replacement: GDF Owner/Operator or EMCO Certified Technician Level A |
| Serial Plate, Security Rivet | | Damaged or missing | Replace with new EMCO nozzle | IOM – 6 | Nozzle Replacement: GDF Owner/Operator or EMCO Certified Technician Level A |



Models A4005EVR & RA4005EVR Balance Vapor Recovery Nozzles Weekly Insertion Interlock Test Procedure



Objective: The purpose of this test procedure is to verify proper field operation of the Model A4005EVR nozzle insertion interlock during engagement or disengagement.

Service Tools Required:

- Gasoline Approved Container
- Protective Gloves

CAUTION:

1. Always barricade work area to keep pedestrians and vehicles from accessing the dispenser during testing of the nozzle.
2. Always use a gasoline approved container when performing any type of testing or preventive maintenance on hanging hardware components. (nozzle, hose swivel, breakaway and hoses)
3. Always point the end of the spout downwards into a gasoline approved container when performing the Weekly Insertion Interlock Test Procedure. Failure may result in a hazardous gasoline spill or personal injury and/ or death.
4. Always make sure the dispenser is de-activated (off) while performing the Weekly Insertion Interlock Test Procedure. Failure may result in a hazardous gasoline spill or personal injury and/ or death.

Lever Verification:



1. Remove the nozzle from the dispenser cradle without touching the lever. If the hold-open latch is engaged, the nozzle fails. The nozzle shall not be used and must be immediately taken out of service.



2. Point the end of the spout downwards into a gasoline approval container. Engage (squeeze) the lever without compressing the bellows. Perform this step a minimum of three times to assure the lever has free motion and no tension (dead lever).

IMPORTANT: If at any time while performing step 2 the lever exhibits tension (live lever), the nozzle fails. The nozzle shall not be used and must be immediately taken out of service.

3. If the lever exhibits no tension (dead lever) while performing step 2, the nozzle has successfully passed. Record the results on the Lever Verification Form and proceed to step 4.



Models A4005EVR & RA4005EVR Balance Vapor Recovery Nozzles Weekly Insertion Interlock Test Procedure

Insertion Interlock Verification:



4. While pointing the end of the spout downwards into a gasoline approved container compress the bellows from its "free" extended position, and engage (squeeze) the lever. If the lever exhibits no tension (dead lever), the nozzle fails. The nozzle shall not be used and must be immediately taken out of service.

IMPORTANT: When compressing the bellows, the lever will exhibit tension (live lever) allowing both the fuel and vapor valves inside the nozzle to open to atmosphere.

7. If the lever exhibits no tension (dead lever) while performing step 6, the nozzle has successfully passed. Place the nozzle back on the dispenser cradle and record the results on the Insertion Interlock Verification Form.



5. While keeping the lever engaged, slowly allow the bellows to extend to its "free" position in a controlled manner that simulates removing the nozzle from a vehicle fill pipe. Make sure that the boot face is not caught on the spout latch ring.

IMPORTANT: The fuel and vapor valves will close once the bellows reaches its extended position. A "click" will indicate both valves are closed and the insertion interlock is disengaged.



6. While pointing the end of the spout downwards into a gasoline approved container, engage (squeeze) the lever without compressing the bellows. Perform this step a minimum of three times to assure the lever has free motion and no tension (dead lever).

IMPORTANT: If at any time while performing step 6 the lever exhibits tension (live lever), the nozzle fails. The nozzle shall not be used and must be immediately taken out of service.

Emco Wheaton Retail Corp.

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619-421-1743 (Technical Services, California)

p/n 570196
Rev. A, 11/12



**Models A4005EVR & RA4005EVR Balance Vapor Recovery Nozzles
Weekly Insertion Interlock Test Procedure**

Facility: _____ Facility Address: _____

Lever Verification Form

| | | | | | | | | | | | | | | | | | | | | |
|-----------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Fueling Point # | | | | | | | | | | | | | | | | | | | | |
| Pass | | | | | | | | | | | | | | | | | | | | |
| Fail | | | | | | | | | | | | | | | | | | | | |

Lever Verification Form

| | | | | | | | | | | | | | | | | | | | | |
|-----------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Fueling Point # | | | | | | | | | | | | | | | | | | | | |
| Pass | | | | | | | | | | | | | | | | | | | | |
| Fail | | | | | | | | | | | | | | | | | | | | |

Insertion Interlock Verification Form

| | | | | | | | | | | | | | | | | | | | | |
|-----------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Fueling Point # | | | | | | | | | | | | | | | | | | | | |
| Pass | | | | | | | | | | | | | | | | | | | | |
| Fail | | | | | | | | | | | | | | | | | | | | |

Insertion Interlock Verification Form

| | | | | | | | | | | | | | | | | | | | | |
|-----------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Fueling Point # | | | | | | | | | | | | | | | | | | | | |
| Pass | | | | | | | | | | | | | | | | | | | | |
| Fail | | | | | | | | | | | | | | | | | | | | |

Date: _____ Performed by: _____

Date: _____ Performed by: _____

Lever Verification Form

| | | | | | | | | | | | | | | | | | | | | |
|-----------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Fueling Point # | | | | | | | | | | | | | | | | | | | | |
| Pass | | | | | | | | | | | | | | | | | | | | |
| Fail | | | | | | | | | | | | | | | | | | | | |

Lever Verification Form

| | | | | | | | | | | | | | | | | | | | | |
|-----------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Fueling Point # | | | | | | | | | | | | | | | | | | | | |
| Pass | | | | | | | | | | | | | | | | | | | | |
| Fail | | | | | | | | | | | | | | | | | | | | |

Insertion Interlock Verification Form

| | | | | | | | | | | | | | | | | | | | | |
|-----------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Fueling Point # | | | | | | | | | | | | | | | | | | | | |
| Pass | | | | | | | | | | | | | | | | | | | | |
| Fail | | | | | | | | | | | | | | | | | | | | |

Insertion Interlock Verification Form

| | | | | | | | | | | | | | | | | | | | | |
|-----------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Fueling Point # | | | | | | | | | | | | | | | | | | | | |
| Pass | | | | | | | | | | | | | | | | | | | | |
| Fail | | | | | | | | | | | | | | | | | | | | |

Date: _____ Performed by: _____

Date: _____ Performed by: _____

Weekly Inspection and Testing Checklist

| Checklist results may be used to assist with filling out GDF maintenance log. | | | Date: | Page: _____ of _____ |
|---|---------------------------------------|-----------------------------------|---------------------------------|---------------------------|
| Dispenser Number | Unihose or Fuel Grade (circle one) | Nozzle Inspection (circle one) | Hose Inspection (circle one) | Breakaway (circle one) |
| | Unihose 87 89 91 other _____ | Pass Fail | Pass Fail | Pass Fail |
| | Unihose 87 89 91 other _____ | Pass Fail | Pass Fail | Pass Fail |
| | Unihose 87 89 91 other _____ | Pass Fail | Pass Fail | Pass Fail |
| | Unihose 87 89 91 other _____ | Pass Fail | Pass Fail | Pass Fail |
| | Unihose 87 89 91 other _____ | Pass Fail | Pass Fail | Pass Fail |
| | Unihose 87 89 91 other _____ | Pass Fail | Pass Fail | Pass Fail |
| | Unihose 87 89 91 other _____ | Pass Fail | Pass Fail | Pass Fail |
| | Unihose 87 89 91 other _____ | Pass Fail | Pass Fail | Pass Fail |
| | Unihose 87 89 91 other _____ | Pass Fail | Pass Fail | Pass Fail |
| | Unihose 87 89 91 other _____ | Pass Fail | Pass Fail | Pass Fail |
| | Unihose 87 89 91 other _____ | Pass Fail | Pass Fail | Pass Fail |
| | Unihose 87 89 91 other _____ | Pass Fail | Pass Fail | Pass Fail |
| | Unihose 87 89 91 other _____ | Pass Fail | Pass Fail | Pass Fail |
| | Unihose 87 89 91 other _____ | Pass Fail | Pass Fail | Pass Fail |

Balance Phase II EVR System for
Protected Aboveground Storage Tanks (AST)

Alarm Troubleshooting Summary For Hirt VCS 100-2 VaporTek® Processor

| VCS 100 Indicator Panel | Description | Light Indicator | Recommended Troubleshooting |
|-------------------------|---|-----------------|--|
| MALFUNCTION LIGHT | <p>AST ullage pressure is positive for at least 1 continuous hour.</p> <p>Power is turned off to the processor or disconnected.</p> | Red | <p>GDF Owner/Operator Responsibilities:</p> <ul style="list-style-type: none"> • “Weekly Inspections” of Hanging Hardware as specified in section 2 of Installation, Operation, and Maintenance Manual. • “Drive-Offs and Other Customer Abuse” as specified in section 5 of Installation, Operation, and Maintenance Manual. • Exhibit 7 of Executive Order VR-501 • Record findings in GDF Owner/Operator Maintenance Log. <p>Certified Contractor Responsibilities:</p> <ul style="list-style-type: none"> • Follow HIRT VCS 100-2 VaporTek® Troubleshooting Guide (Contact Hirt by either Phone: (562) 692-6970 or by email: HirtVCS@aol.com to get Guide) • TP-206.3 and Exhibit 4 of Executive Order VR-501 • Exhibit 7 of Executive Order VR-501 • Exhibit 8 of Executive Order VR-501 • Record findings in GDF Owner/Operator Maintenance Log. |

Drive-Offs and Other Customer Abuse

If the hanging hardware components are involved in a drive-off or if they incur some customer abuse, and they are not replaced as new, each individual component of the hanging hardware **must be visually inspected and functionally tested** before the components can return to dispensing fuel.

- ▶ A visual assessment and functional tests are outlined in the following pages.

ANY COMPONENT THAT DOES NOT PASS A VISUAL INSPECTION OR FUNCTIONAL TEST MUST BE REPLACED.

IF THE VST BREAKAWAY WITH THE GRAY RETENTION BAND (AND UL LABEL THAT STATES REATTACHABLE) IS INVOLVED IN A DRIVEOFF, IT MAY BE RECONNECTED. THESE BREAKAWAYS ARE RECONNECTABLE.



Before beginning work, barricade the work area to block customer use.

1 Drive Offs & Other Customer Abuse: Perform a Visual Assessment

Visually inspect the hanging hardware system as follows to determine the extent of the damage:

| Action | Test Procedure | Corrective Action | Reference Material | Authorized Personnel |
|---|--|--|--------------------|---|
| Perform a thorough visual examination of the exterior of the whip hose and the curb hose for any obvious imperfections. | Obvious imperfections include, but are not limited to: Damage to the swivels Damage to the couplings Kinks / flat spots Tears to the outer hose | Replace with new hose(s). | IOM-8 | Hose replacement: GDF Owner/Operator or VST ASC Levels A, B, C, or D or EMCO Level A for Veyance Hose |
| | If there are no imperfections to the whip and curb hose, those hoses may be reused. | Reassemble hose(s). | IOM-8 | GDF Owner/Operator or VST ASC Levels A, B, C, or D or EMCO Level A for Veyance Hose |
| Perform a thorough visual inspection of the nozzle for any obvious imperfections. | Obvious imperfections include, but are not limited to: | Replace damaged components where applicable. | IOM-7 | Nozzle repair: VST ASC Levels A, B, C, or D or EMCO Level A |
| | <u>VST Nozzle:</u> Damaged spout (broken, bent); Damage to the face seal, collection sleeve / interlock rod assembly; Broken face seal; Torn collection sleeve; Bent interlock rod; Nozzle alignment marks; Damage to the lever and lever guard. <u>EMCO Nozzle:</u> Damage spout, broken or bent; Damage to the insertion interlock rod; Torn boot face or bellows; Damage to the lever, hold open latch and lever guard; Missing band clamp, serial plate and security rivet. | Replace with new nozzle. | IOM-6 | Nozzle replacement: GDF Owner/Operator or VST ASC Levels A, B, C, or D or EMCO Level A |

| | | | | |
|--|---|-----------------------------|-------|--|
| Perform a thorough visual inspection of the breakaway for any obvious imperfections. | <u>EMCO Breakaway</u> Non-re-connectable. Breakaway separated. | Replace with new breakaway | IOM-9 | Breakaway replacement: GDF Owner/Operator or EMCO Level A |
| | <u>VST (Reattachable)</u> Re-connectable. Breakaway separated, | Replace or repair breakaway | IOM-9 | Breakaway replacement / repair: GDF Owner/Operator or VST ASC Levels A, B, C, or D |
| If no imperfection or damage is visibly evident, proceed to functional testing. | | | | |

Function Testing Description

Perform the following functional tests prior to re-using a hose, breakaway or a nozzle following a drive-off:

| Test | Test Procedure | Corrective Action | Authorized Personnel |
|--|--|---|--|
| Leak Check | <p>Verify that there are no liquid leaks in all components.</p> <p>Dispense fuel and check each connection between the components.</p> <p>A visual inspection of the nozzle can determine any obvious liquid leaks.</p> | <p>Any component that does not pass the functional test must be replaced.</p> <p>Go to IOM 6, 8, and 9</p> | <p>GDF Owner/Operator or VST ASC Levels A, B, C, or D or EMCO Level A</p> |
| Meter Creep | <p>Checking for meter creep will verify the integrity of the connections.</p> <p>Dispense 1/10 to 2/10 of a gallon of fuel into an approved container then release lever and move components around and/or gently shake the hose and verify if the displace amount on the dispenser changes.</p> | <p>Any component that does not pass the functional test must be replaced.</p> <p>Go to IOMs 6, 8, and 9</p> | <p>GDF Owner/Operator or VST ASC Levels A, B, C, or D or EMCO Level A</p> |
| Automatic Shut-Off and Insertion Interlock | <p>The insertion interlock mechanism shall not allow dispensing when the bellows is uncompressed as determined by direct observation or GDF-09 (See Vapor Recovery Defects list).</p> | <p>Repair or replace the nozzle</p> <p>Go to IOM-6 or IOM-7</p> | <p>Nozzle replacement GDF Owner/Operator or VST ASC Levels A, B, C, or D or EMCO Level A</p> <p>Nozzle repair VST ASC Levels A, B, C, or D or EMCO Level A</p> |
| Resistance | IOM-6 | <p>Any component that does not pass the functional test must be replaced.</p> <p>Go to IOM 6, 8, and 9</p> | <p>GDF Owner/Operator or VST ASC Levels A, B, C, or D or EMCO Level A</p> |

VST Installation Procedure for Phase II Coaxial EVR Balance Dripless Nozzles

Part Number Series: VST-EVR-NBcc, VST-EVR-NBccR
cc = Scuff Guard Color Code and R = rebuilt



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www.vsthose.com

For VST Model #'s:

VST-EVR-NB (G2), and VST-EVR-NB (G2 Rebuilt)

GENERAL INFORMATION

If hanging hardware components are involved in a drive-off or incur other customer abuse, each individual component must be functionally tested prior to customer dispensing activities.

INSTALLATION PREPARATION

This procedure must be followed to insure leak-proof installation and operation of these nozzles.

1. Turn off and tag the power to the dispenser. Dispenser must be de-energized prior to service to avoid personal injury.
2. Barricade work area to block vehicle access to the dispenser.
3. Close the dispenser shear valve prior to removing hanging hardware (hoses, safety breakaways, and nozzles).
4. Drain liquid product from the hanging hardware set into an approved container prior to replacing any hanging hardware components.
5. Remove hanging hardware from the dispenser prior to making replacement component assembly connections. VST recommends connecting the whip hose to the dispenser as the last connection during the hanging hardware assembly.

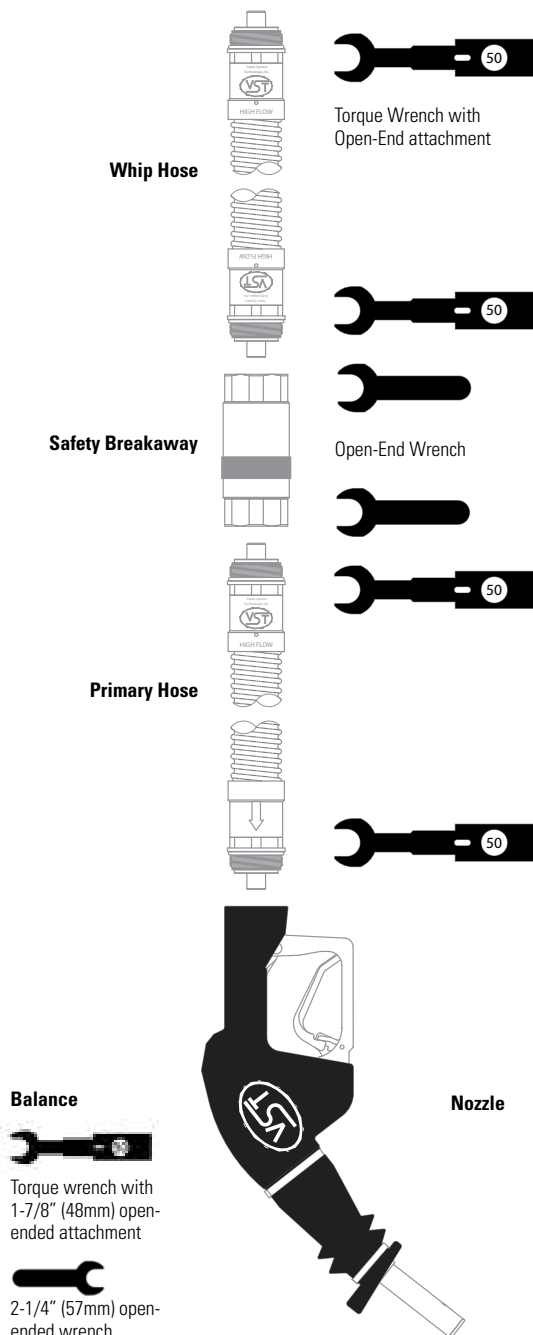
INSTALLATION AND FUNCTION TESTS

STOP! If this is a new facility installation, the fueling point must be flushed into an approved container before installing the nozzle. Using this nozzle to flush the system could result in foreign material becoming lodged in the nozzle's valve and cause it not to shut off.

1. Initial inspection and function tests:
 - a. Carefully unpack nozzle from shipping carton.
 - b. Inspect nozzle exterior for any damage.
 - c. Inspect threads, lever, lever lock, spout, collection sleeve, band clamps, and face seal to determine that they are present and undamaged.
 - d. Verify interlock rod alignment. Check interlock for engagement and release. Proper function of interlock rod requires the nozzle collection sleeve to be compressed $\frac{1}{4}$ " to $\frac{1}{2}$ " and the lever to be engaged into the dispensing position. Nozzle will not function without interlock rod properly engaged.
 - e. Inspect spout vent hole. It should be clear of debris.

Figure 1.

EVR Hanging Hardware Assembly



VST Installation Procedure for Phase II Coaxial EVR Balance Dripless Nozzles

Part Number Series: VST-EVR-NBcc, VST-EVR-NBccR

cc = Scuff Guard Color Code and R = rebuilt

2. Lightly lubricate ALL O-Rings on mating connections with petroleum jelly or other suitable lubricant. DO NOT USE pipe dope or thread sealant.
3. Attach nozzle onto mating hose connection and tighten by hand.
4. Tighten the nozzle connection to 50 ft-lbs of torque. DO NOT OVER TIGHTEN. Use a torque wrench with an open-end attachment to fit the hose couplings and an open-end wrench to properly tighten coupling connections. DO NOT USE channellocks or pliers to tighten hose joints. Proper ft./lb. torque may not be achieved with these tools.
5. Purge air from the system by pumping one-tenth (1/10) to two-tenths (2/10) of a gallon of fuel into an approved container. Inspect the nozzle connection for liquid leaks and make proper adjustments at hose connection if necessary.
6. Check the nozzle shut-off action by dispensing fuel into an approved container at least three times to assure the proper automatic operation of the interlock rod. The fuel flow-rate must be greater than 3 gpm for the automatic shut-off mechanism to operate.

To test, operate the nozzle and submerge the spout tip in fuel until the fuel level covers the vent hole. The main valve of the nozzle automatically shuts off when the liquid covers the vent hole at the end of the spout. The nozzle is not designed to operate on gravity flow. The hold-open latch will disengage automatically when liquid covers the vent hole in the spout. Verify that the fuel flow stops when the nozzle collection sleeve is decompressed (e.g. interlock rod is disengaged). To test that the fuel flow stops, dispense some fuel into an approved container. Slowly remove the nozzle from the container while dispensing fuel. Fuel flow should stop when the nozzle collection sleeve is fully decompressed.

7. Measure the resistance between the dispenser outlet casting and the tip of the nozzle spout. Use an electronic multimeter set on the high range of the ohmmeter function. Resistance should not indicate more than 70,000 ohms per foot of hose. Example: The measured resistance for a 12-foot hose must not exceed 840,000 ohms (840 kilohms).

MAINTENANCE

Inspect nozzles daily for damaged component parts: vapor collection sleeve, face seal, interlock rod, spout, lever, lever lock, etc. Damaged components must be replaced. Vent hole at the end of

the spout should be clear of debris. The nozzle will not operate properly if vent hole becomes clogged. The nozzle will not function properly without the interlock rod properly engaged. Keep the hose connections tight.

Should there be a drive-off or incidence of customer abuse, follow the initial inspection instructions found in the INSTALLATION section. The nozzle should be replaced when damaged. The nozzle is designed and constructed to give lasting service if properly handled and maintained. If for any reason it should need attention, contact your VST distributor for proper disposition.

NOTE

Due to abuse, misuse, changing gasoline formulas, variation in maintenance practices, environmental conditions, and/or conditions beyond the manufacturer's control, dispensing equipment may need replacement before five (5) years. Inspections and proper maintenance procedures should be followed by the station manager to determine if replacement is required before five (5) years.

WARNING

Unauthorized rebuilding or modifying of nozzles voids ALL approvals and warranties.

VST products must be used in compliance with applicable federal, state, and local laws and regulations.

If local regulatory codes prohibit use of the nozzle's hold-open clip, it must be removed prior to nozzle installation. Remove the nozzle to a safe work area.

Place the nozzle on a flat surface.

Locate the alloy rivet securing the hold-open clip and spring in the nozzle's handle. Use a drill with a 3/16" (5mm) drill bit, drill out the rivet securing the hold-open clip, and discard the clip, spring, and all other rivet debris.



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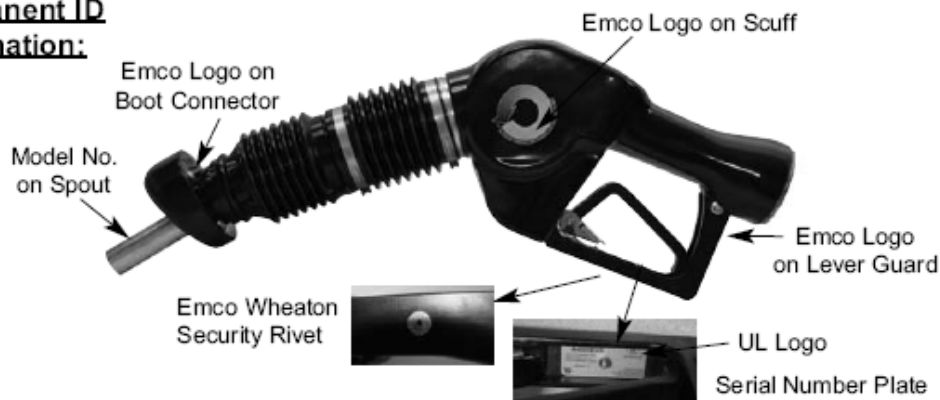
www.vsthose.com

EMCO®
WHEATON RETAIL

A4005EVR
Balance Vapor Recovery Nozzle
RA4005EVR = Rebuilt
XXX = Scuff Guard Color

For use with the Vapor
Systems Technologies VST
Coaxial Curb and Whip Hoses

**Permanent ID
Information:**



INSTALLATION INSTRUCTIONS

Service Tools Required:

- 1 7/8" Crows Foot
- Torque Wrench w/ 50 ft-lbs Setting
- Pipe Wrench w/ Flat Jaws
- Gasoline Approved Container
- Petroleum Jelly or Other Suitable Lubricant

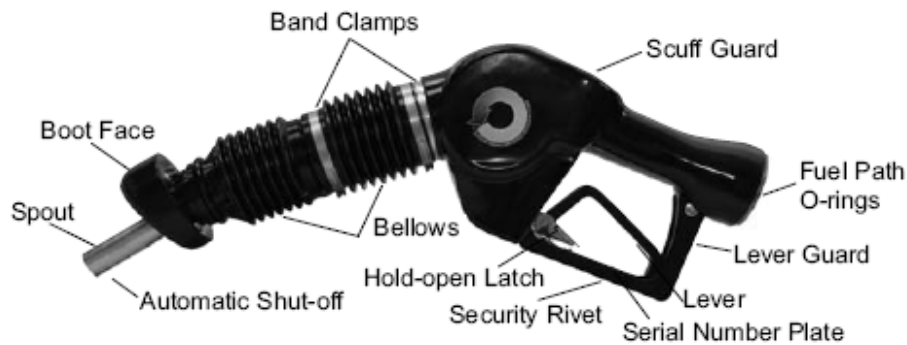
CAUTION:

1. Always barricade work area to keep pedestrians and vehicles from accessing the dispenser.
2. Always use a gasoline approved container or test can when performing any type of preventive maintenance.
3. Before attempting to install, remove or service the A4005EVR nozzle, turn off and tag out power to the corresponding dispenser.
4. Before attempting to install, remove or service the A4005EVR nozzle, close the emergency impact valves located inside the base of the dispenser. Relieve the line pressure and standing fuel through the nozzle spout into a gasoline approved container by compressing the bellows and squeezing the lever.

IMPORTANT: Failure to perform cautions 3 and 4 may result in a hazardous gasoline spill, damage to equipment, personal injury and/or death.

1

Pre-Inspection:



1. Carefully unpack and remove the A4005EVR nozzle from the shipping container. Evaluate the following components for damage: scuff guard, lever guard, lever, hold open latch, serial number plate, security rivet, bellows, band clamps, boot face and spout.
2. Verify the automatic shutoff located at the end of the spout. The vent hole must be free and clear of all debris.
3. Verify the fuel path o-rings located at the hose end of the A4005EVR nozzle. Both o-rings must be properly secured inside the factory machined grooves.

Pre-Functional Test:



4. Functional test the insertion interlock of the A4005EVR nozzle by compressing the bellows and then squeezing the lever. The A4005EVR nozzle will not function unless the insertion interlock is properly engaged.

Pre-Installation:



5. Lightly lubricate both fuel path o-rings using petroleum jelly or other suitable lubricant.



6. Before attempting to install the A4005EVR nozzle onto the curb hose, verify the vapor path o-ring is properly secured onto the connector, and in good working condition. Lightly lubricate the o-ring using petroleum jelly or other suitable lubricant.

IMPORTANT: Do not use pipe thread sealant compound or Teflon tape when installing the A4005EVR nozzle. Failure to comply will void warranty.

Installation:

IMPORTANT: If this is a new facility installation, the fueling point must be flushed into a gasoline approved container before installing the A4005EVR nozzle. Failure to perform this procedure could result in foreign material becoming lodged inside the nozzle's fuel path causing it not to shut off or a reduction in fuel flow.



7. Attach the A4005EVR nozzle onto the curb hose connector. Tighten by hand to avoid cross threading. Take caution to avoid pinching the vapor path o-ring.



8. Using a 1 7/8" crows foot and torque wrench tighten the curb hose connector to 50 ft-lbs of torque.

Post Functional Tests:

9. Carefully purge the trapped air from the fueling point. Begin dispensing by compressing the bellows and then squeezing the lever. Dispense one gallon of fuel into a gasoline approved container.
10. Functional test the automatic shutoff of the A4005EVR nozzle. Begin dispensing by compressing the bellows and then squeezing the lever. Place the hold-open latch in "high" clip position to secure the lever. Dispense one gallon of fuel into a gasoline approved container. At the same time, lower the spout tip into the standing fuel until the vent hole is completely submersed. The main valve of the A4005EVR nozzle will automatically close causing fuel flow to stop.

IMPORTANT: Perform step 10 a minimum of three times to assure the insertion interlock, hold open latch and the automatic shutoff of the A4005EVR nozzle are operating properly.

According to UL requirement 842, the fuel flow rate must be greater than 3 gallons per minute for the automatic shutoff to operate properly. A common cause of low flow rates are dirty or clogged dispenser filters.

Post Inspection:

11. Before placing the A4005EVR nozzle onto the dispenser cradle, inspect all hanging hardware connections for potential fuel leaks. Make proper adjustments if necessary.

PREVENTIVE MAINTENANCE

1. Weekly inspect the A4005EVR nozzle, evaluate the following components for damage: scuff guard, lever guard, lever, hold open latch, serial number plate, security rivet, bellows, band clamps, boot face and spout. Damage components must be replaced with factory authorized service kits.

| <u>Part Number</u> | <u>Description</u> |
|--------------------|-------------------------|
| 492775EVR | Bellows & Boot Face Kit |
| 492776EVR | Boot Face Kit |
| 492834EVR | Spout Kit |
| 494150EVR | Latch Kit |
| 494748EVR | Fuel Path O-ring Kit |
| 494750EVR | Bellows Band Clamps Kit |
| A0557EVR-XXX | Scuff Guard Kit |

IMPORTANT: Do not remove the serial number plate and security rivet from the A4005EVR nozzle. Failure to comply will void warranty.

2. Weekly inspect the automatic shutoff located at the end of the spout. The vent hole must be free and clear of all debris.
3. Weekly inspect all hanging hardware connections for potential fuel leaks.

IMPORTANT: Should a drive-off or incidence of customer abuse occur, follow the initial inspection and function instructions found in the installation section.

PERFORMANCE STANDARDS & SPECIFICATIONS

This component was factory tested to, and met the following specifications:

1. Meets ARB Material Compatibility with Fuel Blends as per Section 3.8 of CP-201.
2. Meets ARB Capable of Refueling Any Vehicle Standards as per Section 4.7.1 of CP-201.
3. Meets ARB Spout Dimension Standards as per Section 4.7.3 of CP-201.
4. Meets ARB Nozzle and Dispenser Compatibility Standards as per Section 4.9 of CP-201.
5. Meets ARB Balance Nozzle Criteria Standards as per Section 5.1 of CP-201.
6. TP-201.2B – Complies with the maximum allowable leak rate of 0.07 CFH @ 2.00 inches of water column pressure.
7. TP-201.2C – Complies with the maximum allowable spillage factor of 0.24 pounds/ 1,000 gallons.
8. TP-201.2D – Complies with the maximum allowable average of 3 post fuel drips.
9. TP-201.2E – Complies with the maximum allowable average of 100mL liquid retention and 1mL liquid spit-back.
10. TP-201.2J – Complies with the maximum allowable component pressure drop of 0.08 inches of water column @ 60 CFH.

IMPORTANT: Leave these installation instructions with the station owner and/or operator.

VST Installation Procedure for Phase II Coaxial EVR Balance Nozzle Repair Kits

Part Number Series: VST-FEK-300 (Front End Kit Included VCK and NSA)

VST-VCK-300 (Vapor Collection Kit)

VST-NSA-300 (Nozzle Spout Assembly)



Vapor Systems Technologies, Inc.

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www.vsthose.com

Use ONLY on VST Nozzles:

Model #: VST-EVR-NB (G2) and VST-EVR-NB (G2 Rebuilt)

TOOLS

- Torque Wrench
- VST-SRT-200 Torque Wrench Attachment
- Approved Fuel Container
- VST-BPT-100 Nozzle Band Clamp Pincers
- Wide Mouth Funnel
- Petroleum Jelly (or suitable lubricant)

GENERAL INFORMATION

If hanging hardware components are involved in a drive-off or incur other customer abuse, each individual component must be functionally tested prior to customer dispensing activities.

INSTALLATION PREPARATION

This procedure must be followed to ensure leak-proof installation and operation of these nozzles.

1. Turn off and tag the power to the dispenser. Dispenser must be de-energized prior to service to avoid personal injury.
2. Barricade work area to block vehicle access to the dispenser.
3. Close the dispenser shear valve prior to removing hanging hardware (hoses, safety breakaways, and nozzles).
4. Visually inspect and assess the extent of the damage to all hanging hardware components. If the spout is loose at all, replace the entire nozzle spout assembly with VST-NSA-300.
5. Drain liquid product from the hanging hardware set into an approved container prior to replacing any hanging hardware assembly.
6. Remove hanging hardware from the dispenser prior to making replacement component assembly connections. VST recommends connecting the whip hose to the dispenser as the last connection during the hanging hardware assembly.
7. To drain nozzle, engage nozzle interlock:
 - a. Push in face seal on nozzle boot assembly
 - b. Hold the backend of the nozzle over an approved container
 - c. Pull nozzle lever to fully drain the nozzle

VAPOR COLLECTION KIT (VST-VCK-300) REMOVAL

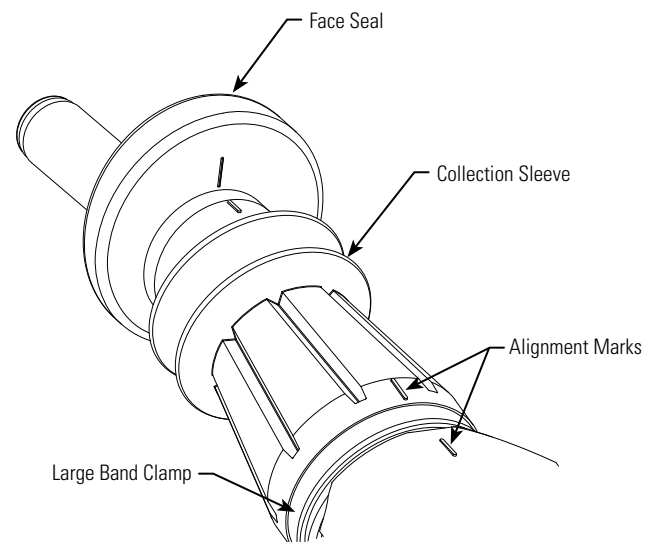
(See Figure 1)

1. Remove large band clamp from the Vapor Collection Assembly with nozzle band clamp pincers (VST-BPT-100).
2. Pull the Vapor Collection Assembly (boot) off of the clamping groove of the nozzle body.

3. Pull Vapor Collection Assembly off of the spout by slightly twisting to go over the spout latch ring.
4. Properly discard the removed components.

Figure 1

Vapor Collection Assembly



VAPOR COLLECTION KIT (VST-VCK-300) REPLACEMENT

1. Place the large band clamp on the collection sleeve. (See Figure 1)
2. Verify the interlock rod is properly inserted into the hole of the interlock sleeve located around the spout prior to pushing the VCK into place. The rod should be visible through the side hole of the sleeve. (See Figure 2)
3. Slide the VST-VCK-300 over the spout.
4. Align and center all alignment marks on top of the vapor collection kit and nozzle scuff. (See Figure 1)
5. Engage interlock a few times to check for correct alignment and functionality. (See Functional Test 3)
6. Tighten collection band clamp until collection sleeve will not rotate. (See Figure 1)

VST Installation Procedure for Phase II Coaxial EVR Balance Nozzle Repair Kits

Part Number Series: VST-FEK-300 (Front End Kit Included VCK and NSA)

VST-VCK-300 (Vapor Collection Kit)

VST-NSA-300 (Nozzle Spout Assembly)

Figure 2

Nozzle Spout Assembly

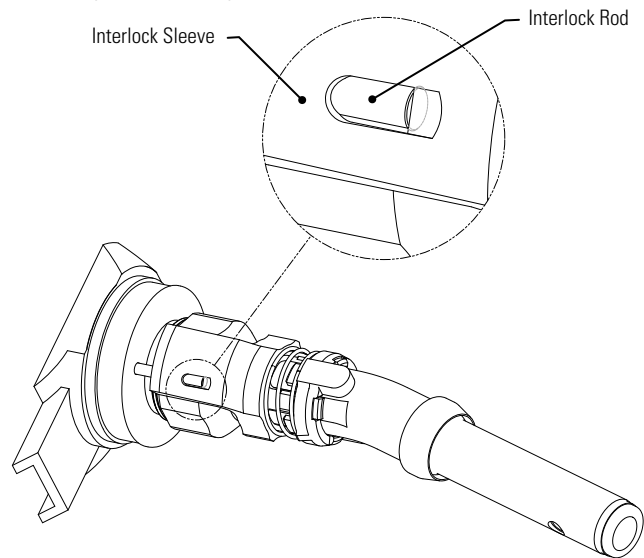
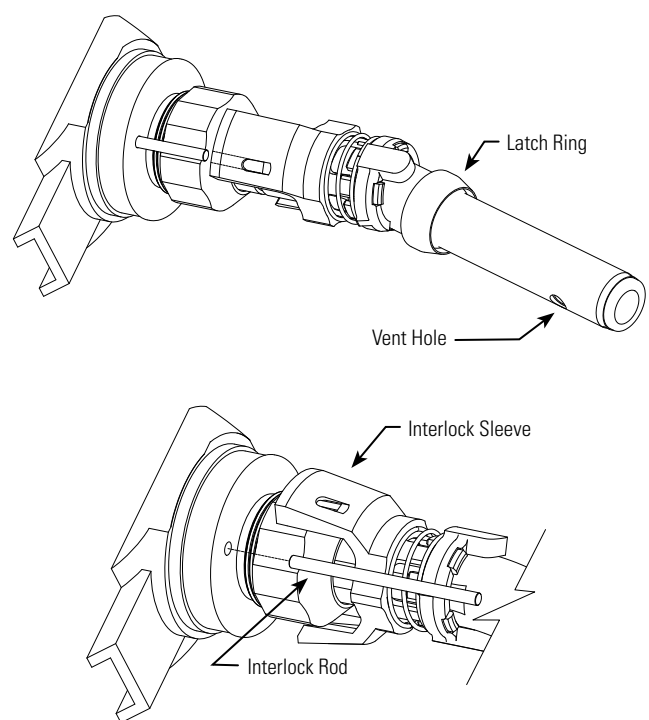


Figure 3

Interlock Rod Removal



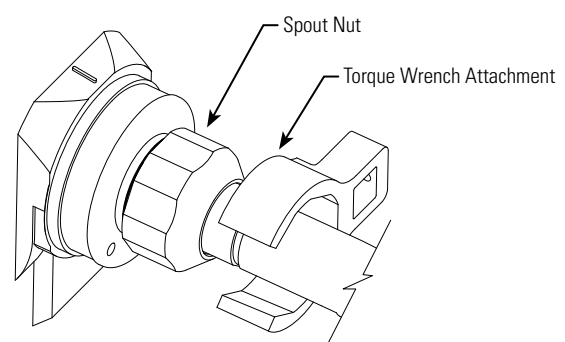
NOZZLE SPOUT ASSEMBLY (VST-NSA-300) REMOVAL

(See Figures 3-4)

1. Remove Vapor Collection Assembly.
2. Hold the interlock rod in place to allow the rod to be disengaged from the hole of the sleeve that is located around the spout nut. (See Figure 3)
3. Slide and rotate the sleeve away from the spout nut and remove the interlock rod. (See Figure 3)
4. Loosen spout nut with the VST-SRT-200 Spout Nut Torque Wrench Attachment. (See Figure 4) **NOTE:** Do not use pipe wrench or locking-type pliers.
5. Once threads are completely disengaged, pull the spout straight out.
6. Properly discard the removed components.

Figure 4

Torque Wrench Attachment



NOZZLE SPOUT ASSEMBLY (VST-NSA-300) REPLACEMENT

(See Figures 5-6)

1. Fuel chamber should remain in the nozzle casting with the vacuum sensing tube hole oriented at the top.
2. If the fuel chamber is pulled out of the nozzle casting:
 - a. Check O-ring for damage.
 - b. Replace O-ring if damaged (check for cuts, nicks, etc.).
 - c. Lubricate O-ring prior to re-assembly.
3. Insert fuel chamber into nozzle casting:
 - a. Poppet stem with spring goes through poppet hole in the fuel chamber (center hole).
 - b. Push fuel chamber until it is flush with casting.
 - c. Vacuum sensing tube in the fuel chamber should be oriented at the top.

VST Installation Procedure for Phase II Coaxial EVR Balance Nozzle Repair Kits

Part Number Series: VST-FEK-300 (Front End Kit Included VCK and NSA)

VST-VCK-300 (Vapor Collection Kit)

VST-NSA-300 (Nozzle Spout Assembly)

4. Lightly lubricate ALL O-rings on the spout assembly. **NOTE:** Do not block vacuum sensing-tube hole with lubricant.
5. Align vacuum sensing tube with mating hole in the fuel chamber. (See Figure 5)
6. Align the anti-rotation bump on the spout with the casting notch. Be careful not to damage the spout O-ring. (See Figure 5)
7. Firmly insert spout assembly into the nozzle casting.
8. Apply a dab of Loctite® 271 to the male thread of the nozzle casting. Be careful not to apply the Loctite® so that it would enter into the casting notch. (See Figure 6)
9. Thread spout nut onto the nozzle casting and tighten firmly. Torque to 34 foot-pounds. Use VST-SRT-200 Spout Nut Torque Wrench Attachment in order to apply the appropriate torque. Spout should be tight and not able to rotate. Do not over-tighten the spout nut.
10. After tightening the spout nut, place the interlock rod into the hole of the nozzle casting. Move the sleeve in place so the interlock rod is inserted into the recessed hole on the end of the sleeve. The interlock rod may be compressed into the nozzle to ease the insertion. The interlock rod should be visible through the side hole of the sleeve. (See Figure 2)
11. Re-install the Vapor Collection Kit Assembly per the Vapor Collection Kit Replacement instructions.

FUNCTIONAL TESTS

1. Follow the VST Installation Procedure for each hanging hardware component. (Executive Order Procedures: Section 6, 8 and 9).
2. Purge air from the system by pumping one-tenth (1/10) to two-tenths (2/10) of a gallon of fuel into an approved container. Inspect the nozzle connection for liquid leaks and make proper adjustments at the hose connection if necessary.
3. Check the nozzle shut-off action by dispensing fuel into an approved container at least three times to assure the proper automatic operation of the interlock rod. The fuel flow-rate must be greater than 3 gpm for the automatic shut-off mechanism to operate.

To test, operate the nozzle and submerge the spout tip in fuel until the fuel level covers the vent hole. The main valve of the nozzle automatically shuts off when the liquid covers the

Figure 5
Spout Assembly

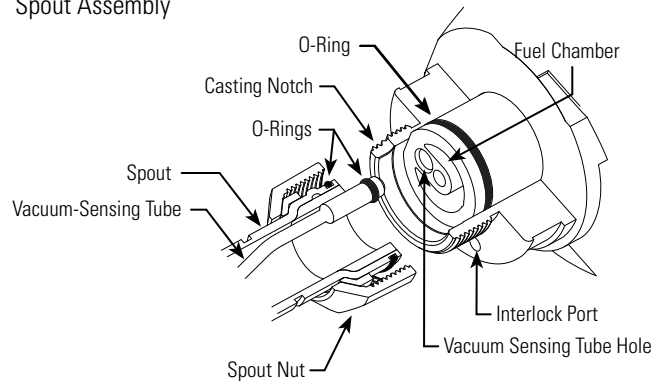
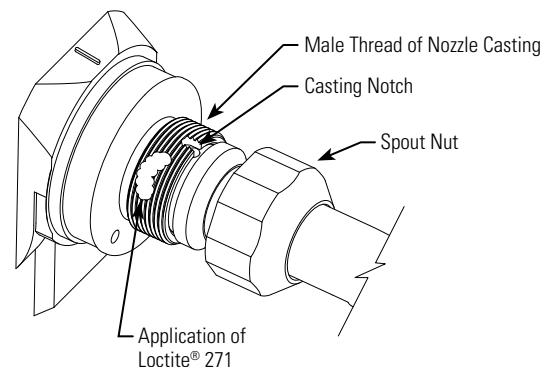


Figure 6
Application of Loctite® 271



vent hole at the end of the spout. The nozzle is not designed to operate on gravity flow. The hold-open latch will disengage automatically when liquid covers the vent hole in the spout. Verify that the fuel flow stops when the nozzle collection sleeve is decompressed (eg. Interlock rod is disengaged). To test that the fuel flow stops, dispense some fuel into an approved container. Slowly remove the nozzle from the container while dispensing fuel. Fuel flow should stop when the nozzle collection sleeve is fully decompressed.

4. Measure the resistance between the dispenser outlet casting and the tip of the nozzle spout. Use an electronic multimeter set on the high range of the ohmmeter function. Resistance should not indicate more than 70,000 ohms per foot of the hose. **Example:** The measured resistance of a 12 foot hose must not exceed 840,000 ohms (840 kilohms).

VST Installation Procedure for Phase II Coaxial EVR Balance Nozzle Repair Kits

Part Number Series: VST-FEK-300 (Front End Kit Included VCK and NSA)

VST-VCK-300 (Vapor Collection Kit)

VST-NSA-300 (Nozzle Spout Assembly)

MAINTENANCE

Inspect nozzles daily for damaged components parts: vapor collection sleeve, face seal, interlock rod, spout, lever, lever lock, etc. Damaged components must be replaced. Vent hole at the end of the spout should be clear of debris. The nozzle will not operate properly if vent hole becomes clogged. The nozzle will not function properly without the interlock rod properly engaged. Keep the hose connections tight.

Should there be a drive-off or incidence of customer abuse, follow the initial inspection instructions found in the VST Installation Procedure Section 6. The nozzle should be replaced when damaged. The nozzle is designed and constructed to give lasting service if properly handled and maintained. If for any reason it should need attention, contact your VST distributor for proper disposition.

NOTE

Due to the abuse, misuse, changing gasoline formulas, variation in maintenance practices, environmental conditions, and/or conditions beyond the manufacturer's control, dispensing equipment may need replacement before five (5) years. Inspections and proper maintenance procedures should be followed by the station manager to determine if replacement is required before five (5) years.

WARNING

Unauthorized rebuilding or modifying of nozzles voids ALL approvals and warranties. VST products must be used in compliance with applicable federal, state, and local laws and regulations. If local regulatory codes prohibit use of the nozzle's hold open clip, it must be removed prior to nozzle installation. Remove the nozzle to a safe work area.

Place the nozzle on a flat surface. Locate the alloy rivet securing the hold-open clip, and spring in the nozzle's handle. Use a drill with a 3/16" (5 mm) drill bit, drill out the rivet securing the hold-open clip, and discard the clip, spring, and all other rivet debris.

Packing List:

- (1) Bellows & Boot Face
- (1) Bellows O-ring
- (2) Bellows Band Clamps



**A4005EVR Balance
Vapor Recovery Nozzle**



INSTALLATION INSTRUCTIONS

Service Tools Required:

- Flat Head Screw Driver w/ Fine Tip
- Bench Vise w/ 5" Jaw Width
- Bellows Retainer Plate Tool p/n 494712EVR
- Bellows Band Clamp Crimp Tool p/n 494652EVR
- Scribe Tool w/ 90 degree tip
- Gasoline Approved Container

CAUTION:

1. Always barricade work area to keep pedestrians and vehicles from accessing the dispenser.
2. Always use a gasoline approved container or test can when performing any type of preventive maintenance.
3. Before attempting to install, remove or service the A4005EVR nozzle, turn off and tag out power to the corresponding dispenser.
4. Before attempting to install, remove or service the A4005EVR nozzle, close the emergency impact valves located inside the base of the dispenser. Relieve the line pressure and standing fuel through the nozzle spout into a gasoline approved container by compressing the bellows and squeezing the lever.

IMPORTANT: Failure to perform cautions 3 and 4 may result in a hazardous gasoline spill, damage to equipment, personal injury and/or death.

Pre-Inspection:

1. Carefully unpack and remove all kitted parts from the shipping container and evaluate for any kind of damage. Verify that no parts are missing from the packing list before proceeding with the installation.

Pre-Installation:

2. Empty all standing fuel within the spout and bellows into a gasoline approved container before attempting to service the bellows and boot face.



3. It is unnecessary to remove the A4005EVR nozzle from the fueling point during the removal and installation of the bellows and boot face. Use the bench vise to properly secure the A4005EVR nozzle during service.

Installation:

Removing the Existing Bellows & Boot Face



4. Locate the top bellows band clamp. Use the flat head screw driver to dislodge the locking mechanism and remove the band clamp from the bellows.



5. Locate the bottom bellows band clamp. Use the flat head screw driver to dislodge the locking mechanism and remove the band clamp from the bellows.



6. Remove the bellows and boot face from the A4005EVR nozzle. Grab the bellows and pull away from the nozzle body.



7. Use the scribe tool to remove the bellows o-ring.

IMPORTANT: Properly discard all removed components.

Installing the New Bellows & Boot Face



8. Before attempting to install the new bellows and boot face verify that the top of the interlock push rod is properly aligned with the bottom edge of the interlock guide.



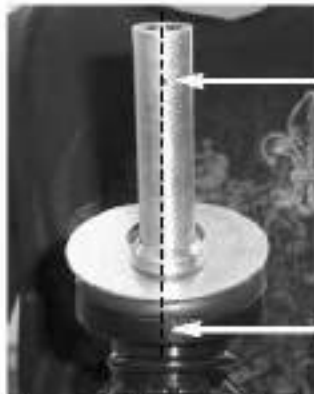
9. Install the new bellows o-ring. Verify that the o-ring seats properly into the machined groove.



10. Slide the new bellows over the spout until the end reaches the nozzle body. Push down over the bellows o-ring until properly seated.



11. Use the bellows retainer plate tool p/n 494712EVR to secure and lock the bellows and boot face in place.



12. Slowly rotate the bellows until the parting line of the boot connector is aligned with the spout and automatic shut-off.



13. Install the new top bellows band clamp into the groove of the bellows. Lock and align the crimp portion with the parting line of the bellows.



14. Use the bellows band clamp crimp tool p/n 494652EVR to crimp and secure into place.



15. Install the new bottom bellows band clamp into the groove of the bellows. Lock and align the crimp portion with the parting line of the bellows.



16. Use the bellows band clamp crimp tool p/n 494652EVR to crimp and secure into place.



17. Remove the bellows retainer plate tool p/n 494712EVR from bellows and spout.
18. Remove the A4005EVR nozzle from the bench vise.

Post-Functional Test:



19. Functional test the insertion interlock of the A4005EVR nozzle by compressing the bellows and then squeezing the lever. The A4005EVR nozzle will not function unless the insertion interlock is properly engaged.

Post-Installation:

20. Place the A4005EVR nozzle back onto the dispenser cradle.

PREVENTIVE MAINTENANCE

1. Weekly inspect the bellows & boot face for tears, cuts and slits. Replace with factory authorized service kits.

| <u>Part Number</u> | <u>Description</u> |
|--------------------|-------------------------|
| 492775EVR | Bellows & Boot Face Kit |

PERFORMANCE STANDARDS & SPECIFICATIONS

This component was factory tested to, and met the following specifications:

1. Meets ARB Material Compatibility with Fuel Blends as per Section 3.8 of CP-201.
2. Meets ARB Capable of Refueling Any Vehicle Standards as per Section 4.7.1 of CP-201.

IMPORTANT: Leave these installation instructions with the station owner and/ or operator.

Packing List:

- (1) Boot Face
- (4) Mounting Screws



A4005EVR
Balance Vapor Recovery Nozzle



INSTALLATION INSTRUCTIONS

Service Tools Required:

- Philips Head Screw Driver w/ Fine Tip
- Bench Vise w/ 5" Jaw Width
- Gasoline Approved Container

CAUTION:

1. Always barricade work area to keep pedestrians and vehicles from accessing the dispenser.
2. Always use a gasoline approved container or test can when performing any type of preventive maintenance.
3. Before attempting to install, remove or service the A4005EVR nozzle, turn off and tag out power to the corresponding dispenser.
4. Before attempting to install, remove or service the A4005EVR nozzle, close the emergency impact valves located inside the base of the dispenser. Relieve the line pressure and standing fuel through the nozzle spout into a gasoline approved container by compressing the bellows and squeezing the lever.

IMPORTANT: Failure to perform cautions 3 and 4 may result in a hazardous gasoline spill, damage to equipment, personal injury and/or death.

Pre-Inspection:

1. Carefully unpack and remove all kitted parts from the shipping container and evaluate for any kind of damage. Verify that no parts are missing from the packing list before proceeding with the installation.

Pre-Installation:

2. Empty all standing fuel within the spout and bellows into a gasoline approved container before attempting to service the boot face.



3. It is unnecessary to remove the A4005EVR nozzle from the fueling point during the removal and installation of the boot face. Use the bench vise to properly secure the A4005EVR nozzle during service.

Installation:

Removing the Existing Boot Face



4. Use the philips screw driver to remove the four mounting screws located on the back of the boot connector.



5. Remove the existing boot face by pulling out of the boot connector.

2 **IMPORTANT: Properly discard all removed components.**

Installing the New Boot Face



6. Install the new boot face into the boot connector by pressing evenly. Align the four mounting holes of the boot face with those of the boot connector.



7. Use the philips screw driver to install and tighten the four new mounting screws.
8. Remove the A4005EVR nozzle from the bench vise.

Post-Installation:

9. Place the A4005EVR nozzle back onto the dispenser cradle.

PREVENTIVE MAINTENANCE

1. Weekly inspect the boot face for tears, cuts and slits. Replace with factory authorized service kits.

| <u>Part Number</u> | <u>Description</u> |
|--------------------|--------------------|
| 492776EVR | Boot Face Kit |

PERFORMANCE STANDARDS & SPECIFICATIONS

This component was factory tested to, and met the following specifications:

1. Meets ARB Material Compatibility with Fuel Blends as per Section 3.8 of CP-201.
2. Meets ARB Capable of Refueling Any Vehicle Standards as per Section 4.7.1 of CP-201.

Packing List:

- | | |
|-------------------------|------------------------|
| (1) Spout | (1) Interlock Guide |
| (1) Bellows O-ring | (1) Interlock Push Rod |
| (2) Bellows Band Clamps | |



**A4005EVR Balance
Vapor Recovery Nozzle**



INSTALLATION INSTRUCTIONS

Service Tools Required:

- | | |
|---|--------------------------------|
| • Flat Head Screw Driver w/ Fine Tip | • Scribe Tool w/ 90 Degree Tip |
| • 15" Crescent Wrench | • Needle Nose Pliers |
| • Torque Wrench w/ 45-55 ft-lbs. Setting | • 40mm Crows Foot |
| • Bench Vise w/ 5" Jaw Width | • Snap Ring Pliers w/ Fine Tip |
| • Bellows Retainer Plate Tool p/n 494712EVR | |
| • Bellows Band Clamp Crimp Tool p/n 494652EVR | |
| • Gasoline Approved Container | |

CAUTION:

1. Always barricade work area to keep pedestrians and vehicles from accessing the dispenser.
2. Always use a gasoline approved container or test can when performing any type of preventive maintenance.
3. Before attempting to install, remove or service the A4005EVR nozzle, turn off and tag out power to the corresponding dispenser.
4. Before attempting to install, remove or service the A4005EVR nozzle, close the emergency impact valves located inside the base of the dispenser. Relieve the line pressure and standing fuel through the nozzle spout into a gasoline approved container by compressing the bellows and squeezing the lever.

IMPORTANT: Failure to perform cautions 3 and 4 may result in a hazardous gasoline spill, damage to equipment, personal injury and/or death.

Pre-Inspection:

1. Carefully unpack and remove all kitted parts from the shipping container and evaluate for any kind of damage. Verify that no parts are missing from the packing list before proceeding with the installation.

Pre-Installation:

2. Empty all standing fuel within the spout and bellows into a gasoline approved container before attempting to service the spout.



3. It is unnecessary to remove the A4005EVR nozzle from the fueling point during the removal and installation of the spout. Use the bench vise to properly secure the A4005EVR nozzle during service.

Installation:

Removing the Existing Bellows & Boot Face



4. Locate the top bellows band clamp. Use the flat head screw driver to dislodge the locking mechanism and remove the band clamp from the bellows.



5. Locate the bottom bellows band clamp. Use the flat head screw driver to dislodge the locking mechanism and remove the band clamp from the bellows.



6. Remove the bellows and boot face from the A4005EVR nozzle. Grab the bellows and pull away from the nozzle body.



7. Use the scribe tool to remove the bellows o-ring.

IMPORTANT: Properly discard bellows band clamps and bellows o-ring.

Removing the Existing Spout



8. Locate the snap ring on the spout. Use the snap ring and needle nose pliers to remove the snap ring from the machined groove. Slide the snap ring upward.



9. Disassemble the interlock guide. Remove the top piece by pulling upward and sliding over the spout. Remove the bottom piece by sliding over the spout.



10. Use the 15" crescent wrench to loosen the spout nut. Unfasten the spout nut by hand to avoid cross threading.



11. Remove the spout by slowly pulling upward.



12. Use the needle nose pliers to remove the interlock push rod.

IMPORTANT: Properly discard all removed components.

Installing the New Spout



13. Use the needle nose pliers to install the new interlock push rod.



14. Install the new spout by inserting the vent tube connector into the nozzle vent port. Slowly push downward on the spout and align the dimple on the spout with the notch on the nozzle body.



15. Fasten the new spout nut by hand onto the nozzle threads to avoid cross threading. Use the 40mm crows foot and torque wrench to tighten the spout nut between 45 to 55 ft-lbs of torque.



16. Install the new interlock guide by sliding the top and bottom pieces over the spout. Press the top piece into the bottom piece.



17. Use the snap ring and needle nose pliers to install the new snap ring into the machined groove located on the spout. Slide the snap ring downward until seated properly.

Installing the Existing Bellows & Boot Face



18. Before attempting to install the existing bellows & boot face verify that the top of the interlock push rod is properly aligned with the bottom edge of the interlock guide.



19. Install the new bellows o-ring. Verify that the o-ring seats properly into the machined groove.

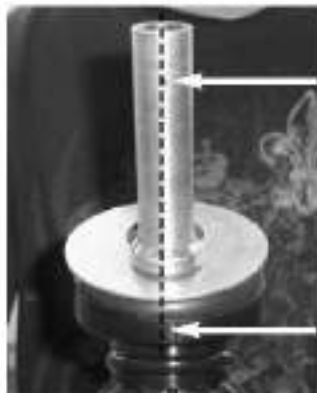


20. Slide the bellows over the spout until the end reaches the nozzle body. Push down over the bellows o-ring until properly seated.

6



21. Use the bellows retainer plate tool p/n 494712EVR to secure and lock the bellows and boot face in place.



22. Slowly rotate the bellows until the parting line of the boot connector is aligned with the spout and automatic shut-off.



23. Install the new top bellows band clamp into the groove of the bellows. Lock and align the crimp portion with the parting line of the bellows.



24. Use the bellows band clamp crimp tool p/n 494652EVR to crimp and secure into place.

7



25. Install the new bottom bellows band clamp into the groove of the bellows. Lock and align the crimp portion with the parting line of the bellows.



26. Use the bellows band clamp crimp tool p/n 494652EVR to crimp and secure into place.



27. Remove the bellows retainer plate tool p/n 494712EVR from bellows and spout.
28. Remove the A4005EVR nozzle from the bench vise.

Post-Functional Test



29. Functional test the insertion interlock of the A4005EVR nozzle by compressing the bellows and then squeezing the lever. The A4005EVR nozzle will not function unless the insertion interlock is properly engaged.
30. Functional test the automatic shutoff of the A4005EVR nozzle. Begin dispensing by compressing the bellows and then squeezing the lever. Place the hold-open latch in "high" clip position to secure the lever. Dispense one gallon of fuel into a gasoline approved container. At the same time, lower the spout tip into the standing fuel until the automatic shut is completely submersed. The main valve of the A4005EVR nozzle will automatically close causing fuel flow to stop.

IMPORTANT: Perform step 30 a minimum of three times to assure the insertion interlock , hold open latch and the automatic shutoff of the A4005EVR nozzle are operating properly.

According to UL requirement 842, the fuel flow rate must be greater than 3 gallons per minute for the automatic shutoff to operate properly. A common cause of low flow rates are dirty or clogged dispenser filters.

Post-Installation:

31. Place the A4005EVR nozzle back onto the dispenser cradle.

PREVENTIVE MAINTENANCE

1. Weekly inspect the spout for sheared, bent or blocked vent hole. Replace with factory authorized service kits.

| <u>Part Number</u> | <u>Description</u> |
|--------------------|--------------------|
| 492834EVR | Spout Kit |

PERFORMANCE STANDARDS & SPECIFICATIONS

This component was factory tested to, and met the following specifications:

1. Meets ARB Material Compatibility with Fuel Blends as per Section 3.8 of CP-201.
2. Meets ARB Capable of Refueling Any Vehicle Standards as per Section 4.7.1 of CP-201.
3. Meets ARB Spout Dimension Standards as per Section 4.7.3 of CP-201.

For use with Vapor Systems
Technologies VST California Air
Resources Board Executive
Orders VR-203 and VR-204



Packing List:

(2) Fuel Path O-rings

**A4005EVR Balance
Vapor Recovery Nozzle**



**A4119EVR Coaxial
Safe Break Valve**



INSTALLATION INSTRUCTIONS

Service Tools Required:

- Pipe Wrench w/ Flat Jaws
- Bench Vise w/ 5" Jaw Width
- Petroleum Jelly or Other Suitable Lubricant
- Scribe Tool w/ 90 Degree Tip
- Gasoline Approved Container

CAUTION:

1. Always barricade work area to keep pedestrians and vehicles from accessing the dispenser.
2. Always use a gasoline approved container or test can when performing any type of preventive maintenance.
3. Before attempting to install, remove or service the A4005EVR nozzle and A4119EVR safe break valve, turn off and tag out power to the corresponding dispenser.
4. Before attempting to install, remove or service the A4005EVR nozzle and A4119EVR safe break valve, close the emergency impact valves located inside the base of the dispenser. Relieve the line pressure and standing fuel through the nozzle spout into a gasoline approved container by compressing the bellows and squeezing the lever.

IMPORTANT: Failure to perform cautions 3 and 4 may result in a hazardous gasoline spill, damage to equipment, personal injury and/or death.

Pre-Inspection:

1. Carefully unpack and remove all kitted parts from the shipping container and evaluate for any kind of damage. Verify that no parts are missing from the packing list before proceeding with the installation.

Pre-Installation:

2. Empty all standing fuel within the spout and bellows into a gasoline approved container before attempting to service the fuel path o-rings.



3. It is necessary to remove the A4005EVR nozzle and A4119EVR safe break valve from the curb hose during the removal and installation of the fuel path o-rings. Use the pipe wrench with flat jaws to loosen the curb hose connector. Unfasten the curb hose connector by hand from the A4005EVR nozzle to avoid cross threading.

IMPORTANT: Drain the fuel from the hanging hardware into a gasoline approved container when removing the A4005EVR nozzle from the curb hose.



A4005EVR Nozzle



**A4119EVR
Safe Break Valve**

4. Use the bench vise to properly secure the A4005EVR nozzle or A4119EVR safe break valve during service.

Installation:

Removing the Existing Fuel Path O-rings



A4005EVR Nozzle



**A4119EVR
Safe Break Valve**

5. Use the scribe tool to remove the existing fuel path o-rings.
6. Clean and remove all existing grease, fuel residue, debris, etc. from within the machined grooves.

IMPORTANT: Properly discard all removed components.

Installing the New Fuel Path O-rings



A4005EVR Nozzle



**A4119EVR
Safe Break Valve**

7. Use the scribe tool to install the new fuel path o-rings. Verify that both o-rings seat properly into the machined grooves.



A4005EVR Nozzle



**A4119EVR
Safe Break Valve**

8. Lightly lubricate the fuel path o-rings using petroleum jelly or other suitable lubricant.

Post-Installation:

9. Before attempting to reinstall the A4005EVR nozzle or A4119EVR safe break valve, please refer to the following installation instructions below.

- A4005EVR Balance Vapor Recovery Nozzle p/n 570435
- A4119EVR Coaxial Safe Break Valve p/n 569043

PREVENTIVE MAINTENANCE

1. Weekly inspect the A4005EVR nozzle and A4119EVR safe break valve connections for leaks or fuel residue. Replace with factory authorized service kits.

| <u>Part Number</u> | <u>Description</u> |
|--------------------|----------------------|
| 494748EVR | Fuel Path O-ring Kit |

PERFORMANCE STANDARDS & SPECIFICATIONS

This component was factory tested to, and met the following specifications:

1. Meets ARB Material Compatibility with Fuel Blends as per Section 3.8 of CP-201.

IMPORTANT: Leave these installation instructions with the station owner and/ or operator.

Packing List:

(6) Bellows Band Clamps



**A4005EVR Balance
Vapor Recovery Nozzle**



INSTALLATION INSTRUCTIONS

Service Tools Required:

- Flat Head Screw Driver w/ Fine Tip
- Bench Vise w/ 5" Jaw Width
- Bellows Retainer Plate Tool p/n 494712EVR
- Bellows Band Clamp Crimp Tool p/n 494652EVR
- Gasoline Approved Container

CAUTION:

1. Always barricade work area to keep pedestrians and vehicles from accessing the dispenser.
2. Always use a gasoline approved container or test can when performing any type of preventive maintenance.
3. Before attempting to install, remove or service the A4005EVR nozzle, turn off and tag out power to the corresponding dispenser.
4. Before attempting to install, remove or service the A4005EVR nozzle, close the emergency impact valves located inside the base of the dispenser. Relieve the line pressure and standing fuel through the nozzle spout into a gasoline approved container by compressing the bellows and squeezing the lever.

IMPORTANT: Failure to perform cautions 3 and 4 may result in a hazardous gasoline spill, damage to equipment, personal injury and/or death.

Pre-Inspection:

1. Carefully unpack and remove all kitted parts from the shipping container and evaluate for any kind of damage. Verify that no parts are missing from the packing list before proceeding with the installation.

Pre-Installation:

2. Empty all standing fuel within the spout and bellows into a gasoline approved container before attempting to service the bellows band clamps.



3. It is unnecessary to remove the A4005EVR nozzle from the fueling point during the removal and installation of the bellows band clamps. Use the bench vise to properly secure the A4005EVR nozzle during service.

Installation:

Removing the Existing Bellows Band Clamps



4. Locate the top bellows band clamp. Use the flat head screw driver to dislodge the locking mechanism and remove the band clamp from the bellows.



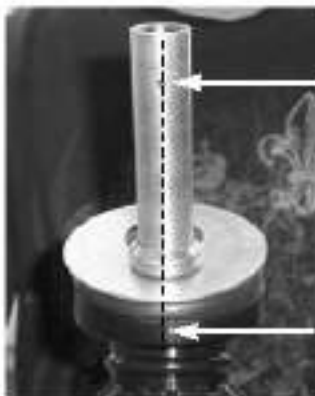
5. Locate the bottom bellows band clamp. Use the flat head screw driver to dislodge the locking mechanism and remove the band clamp from the bellows.

IMPORTANT: Properly discard all removed components.

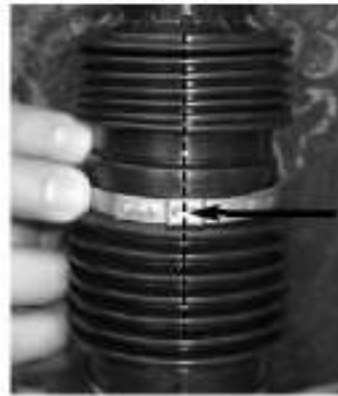
Installing the New Bellows Band Clamps



6. Use the bellows retainer plate tool p/n 494712EVR to secure and lock the bellows and boot face in place.



7. Slowly rotate the bellows until the parting line of the boot connector is aligned with the spout and automatic shut-off.



8. Install the new top bellows band clamp into the groove of the bellows. Lock and align the crimp portion with the parting line of the bellows.



9. Use the bellows band clamp crimp tool p/n 494652EVR to crimp and secure into place.



10. Install the new bottom bellows band clamp into the groove of the bellows. Lock and align the crimp portion with the parting line of the bellows.



11. Use the bellows band clamp crimp tool p/n 494652EVR to crimp and secure into place.



12. Remove the bellows retainer plate tool p/n 494712EVR from bellows and spout.
13. Remove the A4005EVR nozzle from the bench vise.

Post-Functional Test:



14. Functional test the insertion interlock of the A4005EVR nozzle by compressing the bellows and then squeezing the lever. The A4005EVR nozzle will not function unless the insertion interlock is properly engaged.

Post-Installation:

15. Place the A4005EVR nozzle back onto the dispenser cradle.

PREVENTIVE MAINTENANCE

1. Weekly inspect the bellows band clamps for damage or if missing. Replace with factory authorized service kits.

| <u>Part Number</u> | <u>Description</u> |
|--------------------|------------------------|
| 494750EVR | Bellows Band Clamp Kit |

PERFORMANCE STANDARDS & SPECIFICATIONS

This component was factory tested to, and met the following specifications:

1. Meets ARB Material Compatibility with Fuel Blends as per Section 3.8 of CP-201.
2. Meets ARB Capable of Refueling Any Vehicle Standards as per Section 4.7.1 of CP-201.

IMPORTANT: Leave these installation instructions with the station owner and/ or operator.

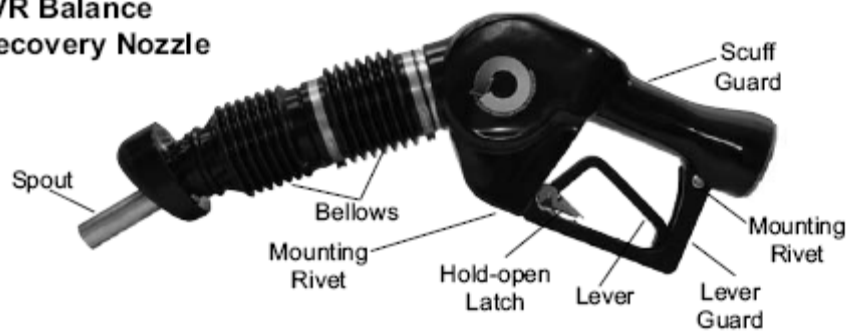
For use with Vapor Systems
Technologies VST California Air
Resources Board Executive
Orders VR-203 and VR-204

Packing List:

- (1) Latch Assembly
- (2) Mounting Rivets
- (1) Dust Plug



**A4005EVR Balance
Vapor Recovery Nozzle**



INSTALLATION INSTRUCTIONS

Service Tools Required:

- Pipe Wrench w/ Flat Jaws
- Flat Head Screw Driver w/ Wide Tip
- 1/8" Diameter Punch
- Bench Vise w/ 5" Jaw Width
- Lever Guard Rivet Installation Tool p/n 494653EVR
- Needle Nose Pliers
- Awl w/ 1/4" Tip
- Hammer
- 5/8" Diameter Punch
- Gasoline Approved Container

CAUTION:

1. Always barricade work area to keep pedestrians and vehicles from accessing the dispenser.
2. Always use a gasoline approved container or test can when performing any type of preventive maintenance.
3. Before attempting to install, remove or service the A4005EVR nozzle, turn off and tag out power to the corresponding dispenser.
4. Before attempting to install, remove or service the A4005EVR nozzle, close the emergency impact valves located inside the base of the dispenser. Relieve the line pressure and standing fuel through the nozzle spout into a gasoline approved container by compressing the bellows and squeezing the lever.

1

IMPORTANT: Failure to perform cautions 3 and 4 may result in a hazardous gasoline spill, damage to equipment, personal injury and/or death.

Pre-Inspection:

1. Carefully unpack and remove all kitted parts from the shipping container and evaluate for any kind of damage. Verify that no parts are missing from the packing list before proceeding with the installation.

Pre-Installation:

2. Empty all standing fuel within the spout and bellows into a gasoline approved container before attempting to service the latch.



3. It is necessary to remove the A4005EVR nozzle from the curb hose during the removal and installation of the latch. Use the pipe wrench with flat jaws to loosen the curb hose connector. Unfasten the curb hose connector by hand from the A4005EVR nozzle to avoid cross threading.

IMPORTANT: Drain the fuel from the hanging hardware into a gasoline approved container when removing the A4005EVR nozzle from the curb hose.

Installation:

Removing the Existing Latch



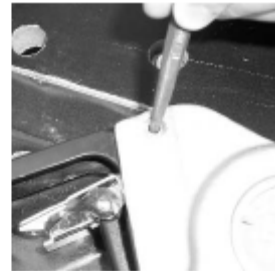
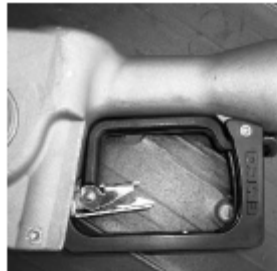
4. Pull the rear end of the scuff guard over the nozzle body until the dust plug is visible. Use the bench vise to properly secure the A4005EVR nozzle during service.
- 2



5. Use the awl and hammer to lightly tap and remove the dust plug.



6. Use the flat head screw driver to loosen the brass screw. Use the needle nose pliers to remove the brass screw and spring from the nozzle body.



7. Remove the A4005EVR nozzle from the bench vise and place on a flat surface. Use the 1/8" diameter punch and hammer to lightly tap and remove both mounting rivets located on the lever guard.



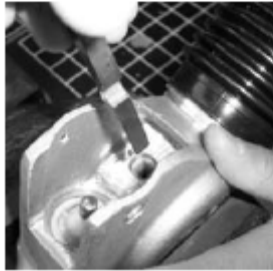
8. Remove the lever guard from the nozzle body.



9. Remove the existing latch by slowly pulling upward until the square stem clears the nozzle body.

IMPORTANT: Properly discard the dust plug and mounting rivets and latch.

Installing the New Latch



10. Locate the notch on the square stem and align to the right of the nozzle body. Install the new latch by pressing downward on the square stem.



11. Remove the A4005EVR nozzle from the bench vise and turn top side up. Install the existing spring around the square stem. Fasten the existing brass screw by hand onto the top of the square stem to avoid cross threading. Use the flat head screw driver to tighten.



12. Install the new dust plug. Use the 5/8 punch and hammer to light tap into place.



13. Remove the A4005EVR nozzle from the bench vise and place on flat surface. Install the existing lever guard onto the nozzle body using the new mounting rivets. Use the lever guard rivet installation tool p/n 494653EVR and hammer to properly flare the ends of the mounting rivets.



14. Install the existing scuff guard by pulling over the nozzle body.

Post-Installation:

15. Before attempting to reinstall the A4005EVR nozzle, please refer to the A4005EVR Balance Vapor Recovery Nozzle Installation Instructions p/n 570435.

PREVENTIVE MAINTENANCE

1. Weekly inspect the latch for damage or if missing. Replace with factory authorized service kits.

| <u>Part Number</u> | <u>Description</u> |
|--------------------|--------------------|
| 494150EVR | Latch Kit |

PERFORMANCE STANDARDS & SPECIFICATIONS

This component was factory tested to, and met the following specifications:

1. Meets ARB Material Compatibility with Fuel Blends as per Section 3.8 of CP-201.

IMPORTANT: Leave these installation instructions with the station owner and/ or operator.

For use with Vapor Systems
Technologies VST California Air
Resources Board Executive
Orders VR-203 and VR-204



Packing List:

(1) Scuff Guard

A4005EVR
Balance Vapor Recovery Nozzle



INSTALLATION INSTRUCTIONS

Service Tools Required:

- Pipe Wrench w/ Flat Jaws
- Gasoline Approved Container
- Utility Knife

CAUTION:

1. Always barricade work area to keep pedestrians and vehicles from accessing the dispenser.
2. Always use a gasoline approved container or test can when performing any type of preventive maintenance.
3. Before attempting to install, remove or service the A4005EVR nozzle, turn off and tag out power to the corresponding dispenser.
4. Before attempting to install, remove or service the A4005EVR nozzle, close the emergency impact valves located inside the base of the dispenser. Relieve the line pressure and standing fuel through the nozzle spout into a gasoline approved container by compressing the bellows and squeezing the lever.

IMPORTANT: Failure to perform cautions 3 and 4 may result in a hazardous gasoline spill, damage to equipment, personal injury and/or death.

Pre-Inspection:

1. Carefully unpack and remove all kitted parts from the shipping container and evaluate for any kind of damage. Verify that no parts are missing from the packing list before proceeding with the installation.

Pre-Installation:

2. Empty all standing fuel within the spout and bellows into a gasoline approved container before attempting to service the scuff guard.



3. It is necessary to remove the A4005EVR nozzle from the curb hose during the removal and installation of the scuff guard. Use the pipe wrench with flat jaws to loosen the curb hose connector. Unfasten the curb hose connector by hand from the A4005EVR nozzle to avoid cross threading.

IMPORTANT: Drain the fuel from the hanging hardware into a gasoline approved container when removing the A4005EVR nozzle from the curb hose.

Installation:

Removing the Existing Scuff Guard



4. Place the A4005EVR nozzle on a flat surface. Use the utility knife to make the first cut along the front side of the scuff guard.



5. Use the utility knife to make the second cut along the rear side of the scuff guard.



6. Remove the scuff guard from the nozzle body.

IMPORTANT: Properly discard all removed components.

Installing the New Scuff Guard

7. Before attempting to install the new scuff guard. Soften the scuff guard by soaking in hot water and soap.



8. Install the new scuff guard by sliding over the spout and bellows. Pull the scuff guard completely over the nozzle body.

Post-Installation:

9. Before attempting to reinstall the A4005EVR nozzle, please refer to the A4005EVR Balance Vapor Recovery Nozzle Installation Instructions p/n 570435.

PREVENTIVE MAINTENANCE

1. Weekly inspect the scuff guard for the Emco Wheaton Retail manufacturer's logo. Replace with factory authorized service kits.

| <u>Part Number</u> | <u>Description</u> |
|--------------------|--------------------|
| A0557EVR | Scuff Guard Kit |

PERFORMANCE STANDARDS & SPECIFICATIONS

This component was factory tested to, and met the following specifications:

1. Meets ARB Material Compatibility with Fuel Blends as per Section 3.8 of CP-201.

IMPORTANT: Leave these installation instructions with the station owner and/ or operator.

VST Installation Procedure for Phase II Coaxial EVR Balance Fuel Hoses

Part Number Series: VSTA-EVR and VDV-EVR



Vapor Systems Technologies, Inc.

650 Pleasant Valley Drive
Springboro, Ohio 45066 (USA)

Toll Free: 1-888-878-4673

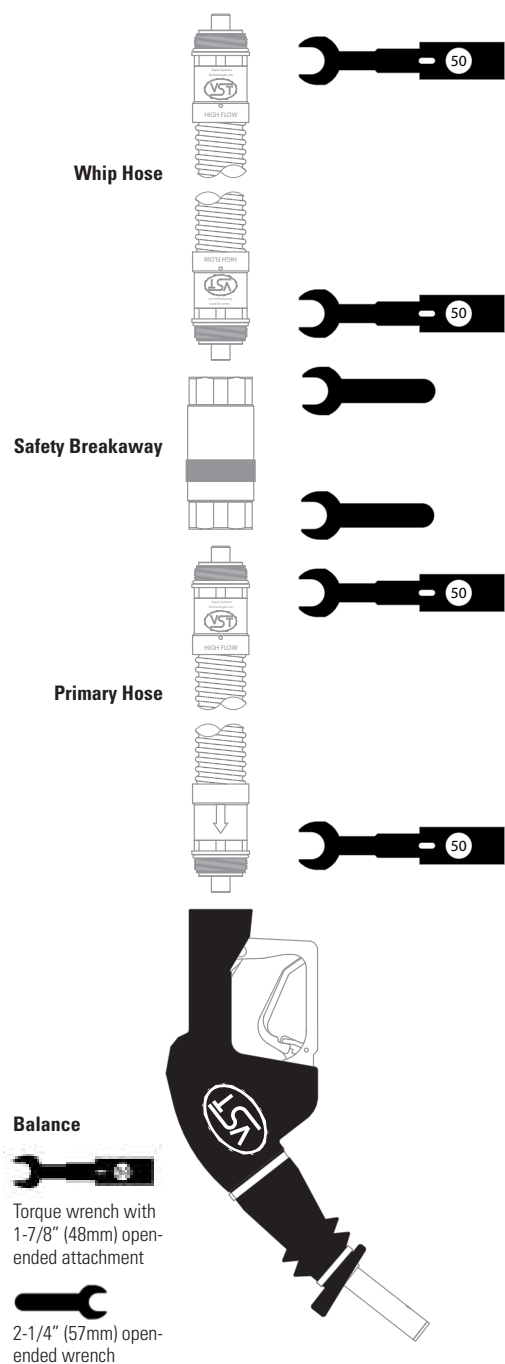
Phone: 937-704-9333

Fax: 937-704-9443

www.vsthose.com

Figure 1.

EVR Balance Hanging Hardware Assembly



GENERAL INFORMATION

If hanging hardware components are involved in a drive-off or incur other customer abuse, each individual component must be functionally tested prior to customer dispensing activities.

INSTALLATION PREPARATION

This procedure must be followed to insure leak-proof installation and operation of these hose products.

1. Turn off and tag the power to the dispenser. Dispenser must be de-energized prior to service to avoid personal injury.
2. Barricade work area to block vehicle access to the dispenser.
3. Close the dispenser shear valve prior to removing hanging hardware (hoses, safety breakaways, and nozzles).
4. Drain liquid product from the hanging hardware set into an approved container prior to replacing any hanging hardware components.
5. Remove hanging hardware from the dispenser prior to making replacement component assembly connections. VST recommends connecting the whip hose to the dispenser as the last connection during the hanging hardware assembly.

INSTALLATION AND FUNCTION TESTS

1. Initial inspection:
 - a. Carefully unpack hose from shipping carton.
 - b. Inspect ALL O-Rings on each end of the hose to determine that they are present and undamaged.
 - c. Inspect hose exterior for any damage.
 - d. Inspect coupling threads for any damage.
2. Lightly lubricate ALL O-Rings on mating connections with petroleum jelly or other suitable lubricant. DO NOT USE pipe dope or thread sealant.
3. Insert the hose coupling into the mating connection and hand-tighten.

NOTE Flow direction arrows on whip and primary hoses, where applicable, are indicated on hose coupling cuffs.
4. Tighten all the hose-joint connections to 50 foot-pounds of torque. DO NOT OVER TIGHTEN. Use a torque wrench with an open-end attachment to fit the hose couplings and an open-end wrench to properly tighten coupling connections. DO NOT USE channel-locks or pliers to tighten hose joints. Proper ft./lb. torque may not be achieved with these tools.
5. Purge air from the system by pumping one-tenth (1/10) to two-tenths (2/10) of a gallon of fuel into an approved container. Inspect each hose-joint connection for liquid leaks and make proper adjustments if necessary.

6. Check the nozzle shut-off action by dispensing fuel into an approved container at least three times to assure the proper automatic operation of the interlock rod. The fuel flow-rate must be greater than 3 gpm for the automatic shut-off mechanism to operate.

To test, operate the nozzle and submerge the spout tip in fuel until the fuel level covers the vent hole. The main valve of the nozzle automatically shuts off when the liquid covers the vent hole at the end of the spout. The nozzle is not designed to operate on gravity flow. The hold-open latch will disengage automatically when liquid covers the vent hole in the spout. Verify that the fuel flow stops when the nozzle collection sleeve is decompressed (e.g. interlock rod is disengaged). To test that the fuel flow stops, dispense some fuel into an approved container. Slowly remove the nozzle from the container while dispensing fuel. Fuel flow should stop when the nozzle collection sleeve is fully decompressed.

7. Measure the resistance between the dispenser outlet casting and the tip of the nozzle spout. Use an electronic multimeter set on the high range of the ohmmeter function. Resistance should not indicate more than 70,000 ohms per foot of hose. Example: The measured resistance for a 12-foot hose must not exceed 840,000 ohms (840 kilohms)

PROCEDURE FOR POSITIONING THE LIQUID REMOVAL DEVICE

This procedure must be followed to insure proper positioning for the liquid-removal device in Part Number Series: VDV-EVR (See Figure 2).

1. After installing the VST hanging hardware, hold the nozzle straight out from the dispenser so that the compressed bellows is 48 inches away from the front face of the dispenser (simulate when the bellows is compressed in the filler neck of a vehicle) and the spout tip of the nozzle is 30 inches above the pavement. The nozzle spout is to be at a 30-degree angle above the horizontal plane.

2. When the hose and nozzle are held in position as shown in Figure 2, the factory installed liquid-removal device indicator-mark (striped line) on the vapor hose must be located:
 - In the bottom of the loop section within the tolerance range.
 - The allowable tolerance range is 3 inches left or right of the 6:00 o'clock position (lowest point of the loop) as measured along the center line of the hose

- In the bottom of the loop section within the tolerance range.
- The allowable tolerance range is 3 inches left or right of the 6:00 o'clock position (lowest point of the loop) as measured along the center line of the hose

If the liquid-removal device indicator-mark is not located within the tolerance range, the installer must choose one of the following options:

Adjust the hose retractor (if installed)

Use a different length whip hose

Use a different length primary hose

IMPORTANT

It is the installing technician's responsibility to insure that the properly sized and marked hanging hardware is installed at the dispenser. Failure to

properly install and locate the liquid removal device may reduce the effectiveness of the product in application resulting in outer hose liquid blockage and failure of the liquid removal test procedure.

MAINTENANCE

Inspect hoses daily for damage, loose connection, or leaks. Replace as necessary. Subject to customer abuse, hose should be replaced when damaged.

The hose is designed and constructed to give lasting service if properly handled and maintained. If for any reason it should need attention, contact your VST distributor for proper disposition.

NOTE Due to abuse, misuse, changing gasoline formulas, variation in maintenance practices, environmental conditions, and/or conditions beyond the manufacturer's control, dispensing equipment may need replacement before five (5) years. Inspections and proper maintenance procedures should be followed by the station manager to determine if replacement is required before five (5) years.

WARNING Unauthorized rebuilding or modifying of hoses voids **ALL** approvals and warranties. VST products must be used in compliance with applicable federal, state and local laws and regulations.

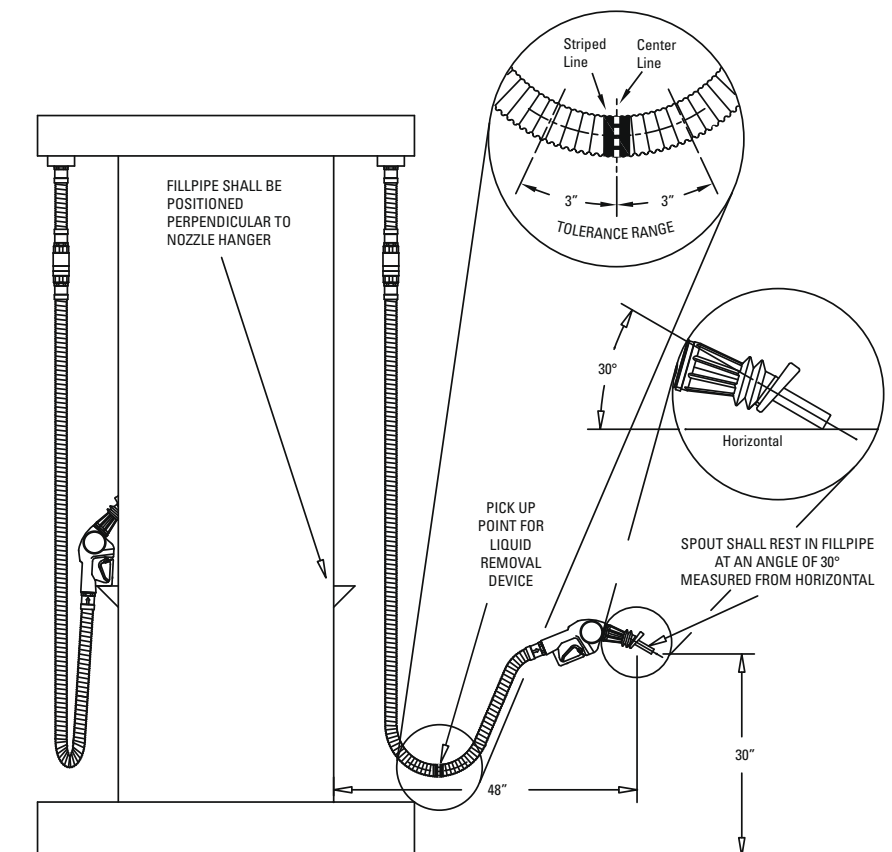


Figure 2. Procedure For Positioning the Liquid Removal Device

Maxxim Premier Installation Instructions

- 1 Install the correct hose length and other hanging hardware on the dispenser. This will include whip hose, breakaway, long hose, and nozzle.
 - a) When installing Maxxim Premier Plus, the end of the hose stamped “NOZZLE END” must be attached to the nozzle.
 - b) If a hose retractor is required, use retractor clamp; part # 532-365-105-000-00.
 - c) Do not use high retractor tension. High tension is difficult for customers to handle and it reduces the life of the hose. Retractor tension above 12 pounds will void the warranty.
 - d) Do not mix Maxxim Premier Plus outer or inner hose with components from other manufacturer’s stage II hoses. The mixed assembly may not be grounded and could cause a serious fire hazard.
 - e) Make sure that the long hose does not touch the pavement or the top of the island when the nozzle hangs on the dispenser hook.
- 2 Tighten the swivel nut to 50 ft. lbs. torque using an open end torque wrench. Do not use a pipe wrench because the teeth on the wrench will damage the fitting. This connection is sealed by an o-ring. Do not apply thread sealant.
 - Alternate method: If a torque wrench is not available, turn the swivel nut by hand until snug and the o-ring is seated. Then use a wrench to tighten the swivel nut ¼ turn past snug. This connection has straight threads and must be cinched tight to prevent the threads from unscrewing in service.

One source for an open end torque wrench is Belknap Tools, both part #'s are needed:

- VB-0608005 open end wrench head
- VB-100ST-I wrench handle preset at the factory to 50 ft lbs

After extended service, the swivel nut o-ring can be lubricated with front end bearing grease or Parker O-Lube

- 3 Function Test - Measure the resistance between the dispenser outlet casting and the tip of the nozzle spout. Use an electronic multimeter set on the high range of the ohmmeter function. Resistance should not indicate more than 70,000 ohms per foot of hose. Example: The measured resistance for a 12-foot hose must not exceed 840,000 ohms (840 kilohms)

Maxxim Premier Plus Venturi Pick-up Length Instructions

It is the responsibility of the installer to determine the optimum venturi pick-up length and verify that hoses installed on a dispenser have the optimum pick-up location. Failure to properly size the pick-up location will reduce the effectiveness of the venturi in removing liquid blockage from the outer vapor hose and may result in failure of the liquid removal test.

When the Maxxim Premier Plus hose is assembled in the factory, a mark is placed on the outer hose to locate the venturi pick-up location. This mark will help the installer determine whether the hose has the optimum pick-up location for the installation.

- 4 Hold the nozzle straight out from the dispenser so that the end of the compressed bellows (simulate when the bellows is compressed in the filler neck of a car) is 48 inches away from the front face of the dispenser (see Figure 1). Hold the nozzle so that the tip of the spout is 30 inches above the pavement and the spout is at a 30° angle above the horizontal plane (see Figure 1). When the nozzle and hose are held in the position shown in Figure 1, the mark on the outer vapor hose should be within 3 inches of the bottom of the loop (see Figure 1).

- 5 If the mark on the hose is not within the tolerance shown in Figure 1, the installer may:
- Adjust the hose retractor (if installed);
 - Install a different length whip hose; or
 - Install a different long hose with the optimum venturi pick-up location. To determine the optimum venturi pick-up location (e.g., venturi pick-up tube length), conduct the following:
 - a) Hold the nozzle and hose in the position shown in Figure 1;
 - b) Measure the length from the back end of the nozzle (where the hose screws into the nozzle) to the bottom of the loop in the hose. This length is the optimum “pick-up” length for the Maxim Premier Plus balance venturi hose.
 - c) Contact your local distributor to obtain a Maxim Premier Plus hose with the optimum venturi pick-up tube length.

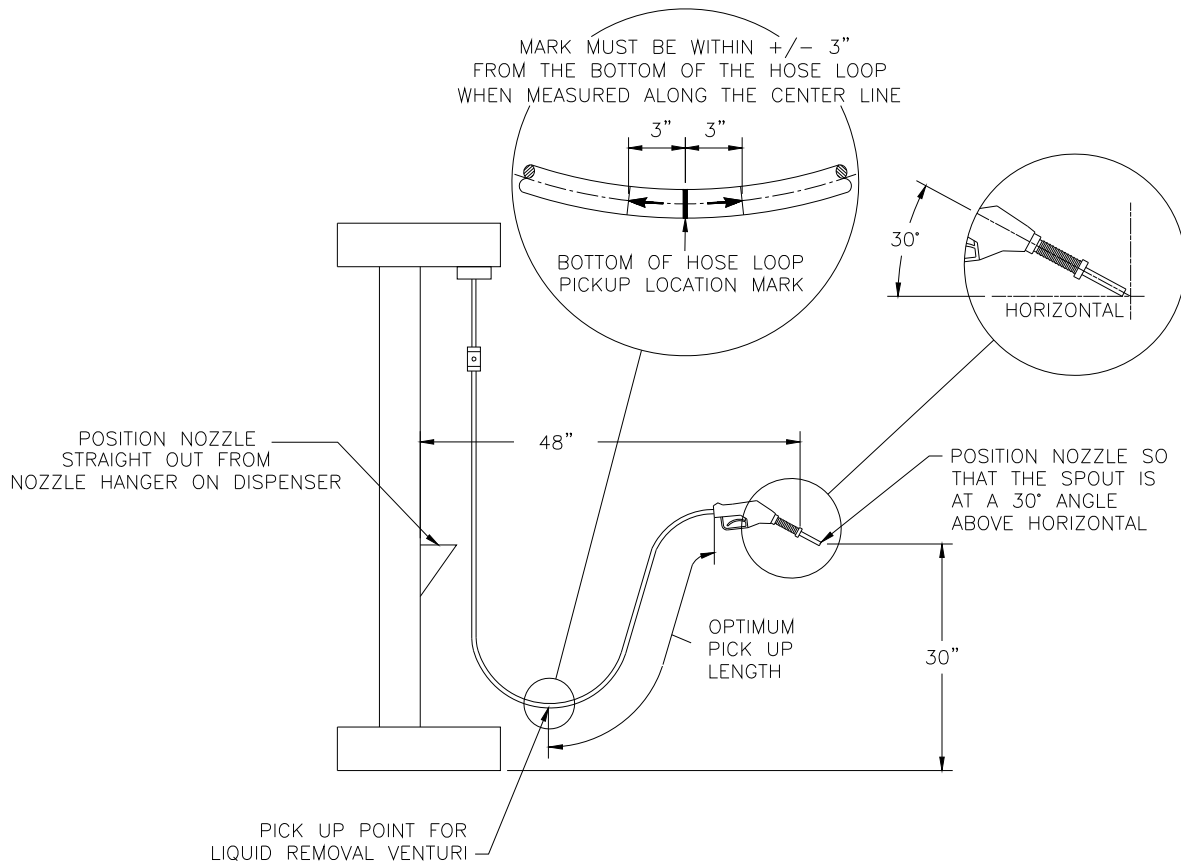


FIGURE 1

Questions on installation should be directed to your local distributor or Contitech Customer Service.

ContiTech USA, Inc.
 703 S. Cleveland Massillon Rd.
 Fairlawn, OH 44333 USA
 Telephone: 1-800-235-4632

VST Installation Procedure for Phase II Coaxial EVR Balance Safety Breakaway Devices

Reattachable Breakaway Part Number Series: VSTA-EVR-SBKA



Vapor Systems Technologies, Inc.

650 Pleasant Valley Drive
Springboro, Ohio 45066 (USA)

Toll Free: 1-888-878-4673

Phone: 937-704-9333

Fax: 937-704-9443

www.vsthose.com

APPLICATION

These VST Safety Breakaway devices are intended to prevent damage to the dispenser and hose in the event of a vehicle drive off. These devices separate at pull forces up to 350 lbs. Determine that 350 lbs. pull force will not damage the dispenser. After verifying that the dispenser is securely bolted to the island, it can be tested by using a spring scale and a length of rope. The rope must be connected at the dispenser outlet casting, which may require a threaded bushing with a hole for attaching the rope. Attach the scale to the rope and pull to 350 lbs. in several directions. Be sure to avoid damaging the dispenser.

NOTE:

- The whip hose **ALWAYS** attaches to the dispenser. If a retractor is being used, the retractor clamp **MUST** be between the breakaway and dispenser.
- VST hoses are made to withstand 350 pounds tensile pull without damage. If another brand of hose is present at the dispenser, VST recommends that you contact the hose manufacturer regarding the compatibility with this breakaway device.

General Information

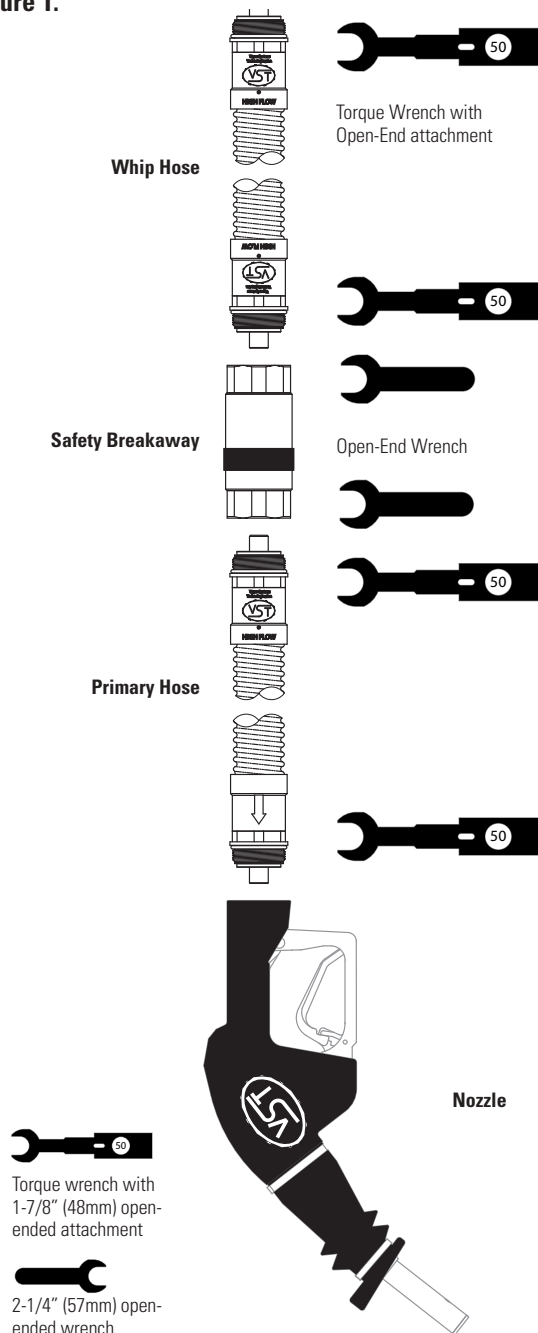
If hanging hardware components are involved in a drive-off or incur other customer abuse, each individual component must be functionally tested prior to customer dispensing activities.

Installation Preparation

These procedures must be followed to ensure leak-proof installation and operation of these safety breakaway products.

- Turn off and tag the power to the dispenser. Dispenser must be de-energized prior to service to avoid personal injury.
- Barricade work area to block vehicle access to the dispenser.
- Close dispenser shear valve prior to performing any service work with the hanging hardware (hoses, safety breakaways, and nozzles).
- Drain liquid product from the hanging hardware set into an approved container prior to replacing any hanging hardware component.

Figure 1.



VST Installation Procedure for Phase II Coaxial EVR Balance Safety Breakaway Devices

Reattachable Breakaway Part Number Series: VSTA-EVR-SBKA

5. For the installation of a new breakaway, remove hanging hardware from the dispenser prior to making replacement component assembly connections. VST recommends connecting the whip hose to dispenser as the last connection during hanging hardware assembly.

Installation and Function Tests

1. Initial inspection:
 - a. Carefully unpack safety breakaway from shipping carton.
 - b. Inspect safety breakaway for any damage to threads, O-rings, exterior, etc.
2. Lightly lubricate **ALL** O-rings on mating connections with petroleum jelly or other suitable lubricant. **DO NOT USE** pipe dope or thread sealant.
3. Attach breakaway on mating connection and tighten by hand. **NOTE FLOW DIRECTION ARROW** (where applicable). Use the hex on the breakaway body closest to the connection to tighten. **DO NOT USE** the breakaway body to tighten the unit.
4. Tighten breakaway connection to 50 foot-pounds of torque. **DO NOT OVER TIGHTEN.** Use the hex on the breakaway body closest to the connection to tighten. Use a torque wrench with an open-end attachment to fit the hose couplings and an open-end wrench to properly tighten breakaway connections. **DO NOT USE** channel-locks or pliers to tighten connections. Proper ft./lb. torque may not be achieved with these tools.
5. Purge air from the system by pumping one-tenth (1/10) to two-tenths (2/10) of a gallon of fuel into an approved container. Inspect each hose joint connection for liquid leaks and make proper adjustments if necessary. Checking for meter creep will verify the integrity of the connections. After dispensing the fuel, release the lever and move components around and/or gently shake the hose and verify if the displayed amount on the dispenser changes. If meter creep is experienced, check all components and replace as necessary.
6. Check the nozzle shut-off action by dispensing fuel into an approved container at least three times to assure proper automatic operation of the interlock rod. The fuel flow-rate must be greater than 3 gpm for the automatic shut-off mechanism to operate.

To test, operate the nozzle and submerge the spout tip in fuel until the fuel level covers the vent hole. The main valve of the



Figure 2: Check each half for damage

nozzle automatically shuts off when liquid covers the vent hole at the end of the spout. The nozzle is not designed to operate on gravity flow. The hold-open latch will disengage automatically when liquid covers the vent hole in the spout. Verify that the fuel flow stops when the nozzle collection sleeve is decompressed (e.g. interlock rod is disengaged). Slowly remove the nozzle from the container while dispensing fuel. Fuel flow should stop when the nozzle collection sleeve is fully decompressed.

7. Measure the resistance between the dispenser outlet casting and the tip of the nozzle spout. Use an electronic multimeter set on the high range of the ohmmeter function. Resistance should not indicate more than 70,000 ohms per foot of hose. Example: The measured resistance for a 12-foot hose must not exceed 840,000 ohms (840 kilohms).

BREAKAWAY REATTACHMENT PROCEDURE

The VSTA-EVR-SBKA Safety Breakaway may be reconnected with the use of the VST Breakaway Assembly Tool (VST-BAT-100).

BREAKAWAY REATTACHMENT PROCEDURE

1. Follow **INSTALLATION PREPARATION** steps 1-4.
2. Inspect both safety breakaway halves for damage that may have occurred during separation. Include looking for external damage to the product and missing alignment pin, etc. See **Figures 2 and 3. If damage or missing parts are detected, replace with new product.** Ensure that the retaining sleeve is placed on the breakaway half connected to the whip hose before reassembly.

VST Installation Procedure for Phase II Coaxial EVR Balance Safety Breakaway Devices

Reattachable Breakaway Part Number Series: VSTA-EVR-SBKA

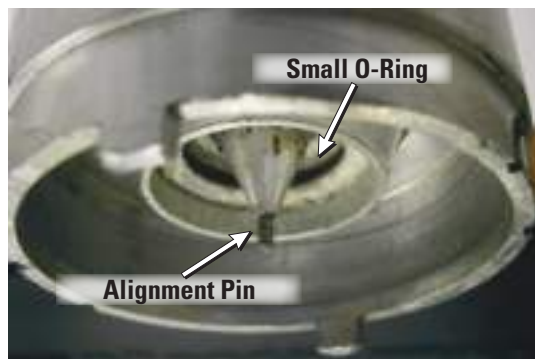


Figure 3: Check for Alignment Pin

3. Prior to reassembling, be sure the mating parts are undamaged and clean.
4. Replace all O-rings with those provided in the repair kit (VST-BRK-100).
 - a. Lightly lubricate the O-rings on mating connections with petroleum jelly or other suitable lubricant. **DO NOT USE** pipe dope or thread sealant.
 - b. Use the large O-ring provided in the repair kit to replace the outer O-ring on the curb hose side of the breakaway. See **Figure 5**.
 - c. Use the small O-ring provided in the repair kit to replace the inner O-ring on the whip side of the breakaway. Use a plastic pick provided in the kit to remove the old O-ring. See **Figure 3**.
5. Apply a liberal amount of lithium grease provided in the repair kit (VST-BRK-100) completely around the mating diameter surface of the curb hose side of the breakaway. The grease will need to cover the entire surface that will slide into the mating end of the breakaway. See **Figure 5**. **DO NOT USE** pipe dope or thread sealant.
6. Utilize the VST Breakaway Assembly Tool (VST-BAT-100) with the appropriate reassembly plates to reassemble the breakaway. The tool is used to provide appropriate leverage for the ease of reassembly of the breakaway and to secure the breakaway during replacement of the shear washers. This can be done without disassembling the hoses from the breakaway halves.
7. Press the button on the Breakaway Assembly Tool to spread the end clamps apart to allow the two separated breakaway halves

to fit between the top and bottom clamps. Slide the top clamp of the VST Breakaway Assembly Tool behind the hex on the breakaway half connected to the whip hose. See **Figure 4**.

8. Slide the separated bottom half of the breakaway (with curb hose and nozzle attached) onto the bottom clamp of the VST Breakaway Assembly Tool. Align the shear ring grooves away from the reassembly tool for ease of insertion of the shear washers. See **Figure 4**.
9. Slowly squeeze the VST Breakaway Assembly Tool trigger to bring the breakaway halves together.
10. Carefully align the two breakaway halves. Place the alignment pin from the breakaway upper half into the hole of the inner poppet on the lower half of the breakaway



Figure 4: Attach Reassembly Tool

CAUTION: Reconnection can cause a small amount of gasoline to leak out of the breakaway. A towel wrapped loosely around the breakaway can help to minimize spills.

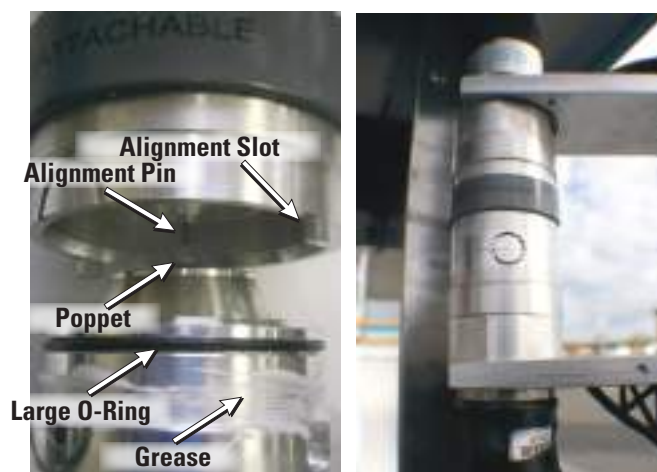


Figure 5: Align Poppet Pin from upper to lower half of breakaway and finish alignment

VST Installation Procedure for Phase II Coaxial EVR Balance Safety Breakaway Devices

Reattachable Breakaway Part Number Series: VSTA-EVR-SBKA



Vapor Systems Technologies, Inc.

650 Pleasant Valley Drive
Springboro, Ohio 45066 (USA)

Toll Free: 1-888-878-4673

Phone: 937-704-9333

Fax: 937-704-9443

www.vsthose.com



Figure 6: Add Shear Washer



Figure 7: Remove Grease



**Figure 8: Reposition
Retaining Sleeve**



**Figure 9: Verify
Connection Integrity**

that is connected to the nozzle end. Continue squeezing the trigger of the VST Breakaway Assembly Tool while guiding the alignment slots together to finish reassembly. See **Figure 5**.

NOTE: Once the two breakaway halves come together close enough for placement of the shear washers, do not squeeze the tool trigger any further. Unnecessary pressure on the tool could damage or break the tool.

11. Once the two aligned halves are together place one shear washer into each of the shear washer grooves (2 total) from the repair kit (VST-BRK-100). See **Figure 6**. Ensure that the shear washer is completely seated into the groove before moving the retaining sleeve into place. See **Figure 7**. Wipe off excess grease after installation of the shear rings.
12. After the two breakaway halves are reattached, remove the Breakaway Assembly Tool (press the button on the tool to allow the plates to release). Reposition the retaining sleeve to the groove between the two halves of the breakaway. See **Figure 8**. Give the reassembled breakaway a strong pull to verify that it is properly connected. See **Figure 9**.
13. If successful, follow the **Installation and Functional Tests** steps 5 – 7 in this document.

MAINTENANCE

Inspect safety breakaways regularly for damage, loose connections or leaks. Replace as necessary. Subject to customer abuse, safety breakaway should be replaced when damaged.

The safety breakaway is designed and constructed to give lasting service if properly handled and maintained. If for any reason it should need attention, contact your VST distributor for proper disposition.

NOTE: Due to abuse, misuse, changing gasoline formulas, variation in maintenance practices, environmental conditions and/or conditions beyond the manufacturer's control, dispensing equipment may need replacement before five (5) years. Inspections and proper maintenance procedures should be followed by the station manager to determine if replacement is required before five (5) years.

WARNING

Unauthorized rebuilding or modifying of safety breakaways voids ALL approvals and warranties.

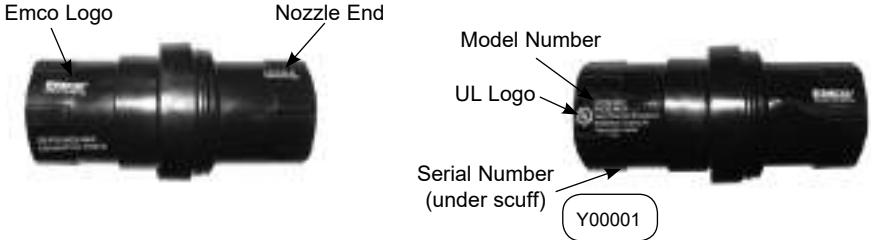
VST products must be used in compliance with applicable federal, state and local laws and regulations.



A4119EVR

Coaxial SafeBreak® Valve

Permanent ID:



INSTALLATION INSTRUCTIONS

Service Tools Required:

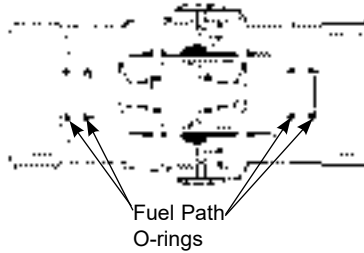
- 1 7/8" Crows Foot
- Gasoline Approved Container
- Petroleum Jelly or Other Suitable Lubricant
- Torque Wrench w/ 50ft-lbs Setting
- Pipe Wrench w/ Flat Jaws

CAUTION:

1. Always barricade work area to keep pedestrians and vehicles from accessing the dispenser.
2. Always use a gasoline approved container or test can when performing any type of preventive maintenance.
3. Before attempting to install, remove or service the A4119EVR SafeBreak® valve, turn off and tag out power to the corresponding dispenser.
4. Before attempting to install, remove or service the A4119EVR SafeBreak® valve, close the emergency impact valves located inside the base of the dispenser. Relieve the line pressure and standing fuel through the nozzle spout into a gasoline approved container by compressing the bellows and squeezing the lever.
5. If a hose retractor is used, the A4119EVR SafeBreak® valve must be attached on the nozzle end of the retractor clamp.

IMPORTANT: Failure to perform cautions 3 and 4 may result in a hazardous gasoline spill, damage to equipment, personal injury and/ or death.

Pre-Inspection:

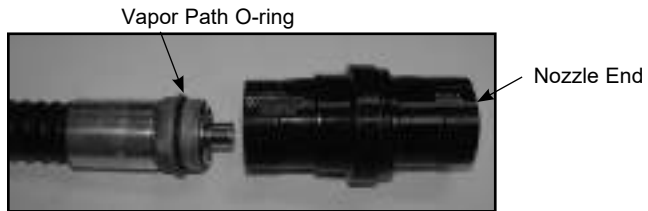


1. Carefully unpack and remove the A4119EVR SafeBreak® valve from the shipping container and evaluate for any kind of damage.
2. Verify the fuel path o-rings located on both ends of the A4119EVR SafeBreak® valve. All o-rings must be properly secured inside the factory machined grooves.

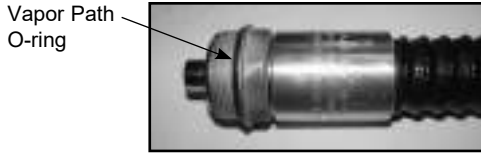
Pre-Installation:



3. Lightly lubricate the fuel path o-rings using petroleum jelly or other suitable lubricant.



4. Before attempting to install the A4119EVR SafeBreak® valve onto the whip hose, verify the word “NOZZLE”, which is printed on the scuff guard of the SafeBreak® valve, is on the opposite end. Verify the vapor path o-ring is properly secured onto the connector, and in good working condition. Lightly lubricate the o-ring using petroleum jelly or other suitable lubricant.



5. Before attempting to install the A4119EVR SafeBreak® valve onto the curb hose, verify the vapor path o-ring is properly secured onto the connector, and in good working condition. Lightly lubricate the o-ring using petroleum jelly or other suitable lubricant.

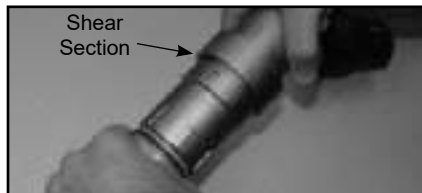
IMPORTANT: Do not use pipe thread sealant compound or Teflon tape when installing the A4119EVR SafeBreak® valve. Failure to comply will void warranty.

Installation:

IMPORTANT: If this is a new facility installation, the fueling point must be flushed into a gasoline approved container before installing the A4119EVR SafeBreak® valve. Failure to perform this procedure could result in foreign material becoming lodged inside the SafeBreak® valve's fuel path causing a reduction in fuel flow.



6. Remove the scuff guard by sliding on to the whip hose. Attach the A4119EVR SafeBreak® valve onto the whip hose connector. Tighten by hand to avoid cross threading. Take caution to avoid pinching the vapor path o-ring.



IMPORTANT: Never tighten across the shear section of the A4119EVR SafeBreak® valve. Failure to comply will result in damage to the SafeBreak® valve and void warranty.



- Using a 1 7/8" crows foot and torque wrench, tighten the whip hose connector to 50 ft-lbs of torque.



- Remove the scuff guard by sliding on to the curb hose. Attach the A4119EVR SafeBreak® valve onto the curb hose connector. Tighten by hand to avoid cross threading. Take caution to avoid pinching the vapor path o-ring.



- Using a 1 7/8" crows foot and torque wrench, tighten the curb hose connector to 50 ft-lbs of torque.

Post Functional Tests:

- Carefully purge the trapped air from the fueling point. Begin dispensing by compressing the bellows and then squeezing the lever. Dispense one gallon of fuel into a gasoline approved container.
- Functional test the automatic shutoff of the A4005EVR nozzle. Begin dispensing by compressing the bellows and then squeezing the lever. Place the hold open latch in "high" clip position to secure the lever. Dispense one gallon of fuel into a gasoline approved container. At the same time, lower the spout tip into the standing fuel until the vent hole is completely submersed. The main valve of the A4005EVR nozzle will automatically close causing fuel flow to stop.

IMPORTANT: Perform step 11 a minimum of three times to assure the insertion interlock, hold open latch and the automatic shutoff of the A4005EVR nozzle are operating properly.

According to UL requirement 842, the fuel flow rate must be greater than 3 gallons per minute for the automatic shutoff to operate properly. A common problem cause of low flow rates are dirty or clogged dispenser filters.

Post Inspection:

12. Before placing the A4005EVR nozzle onto the dispenser cradle, inspect all hanging hardware connections for potential fuel leaks. Make proper adjustments if necessary.

PREVENTIVE MAINTENANCE

1. Weekly inspect the A4119EVR SafeBreak® valve, evaluate for any kind of damage. Damaged components must be replaced with factory authorized service kits.

| <u>Part Number</u> | <u>Description</u> |
|--------------------|----------------------|
| 494748EVR | Fuel Path O-ring Kit |

2. Weekly inspect all hanging hardware connections for potential fuel leaks.

IMPORTANT: Should a drive-off or incidence of customer abuse occur, follow the initial inspection and function instructions found in the installation section.

PERFORMANCE STANDARDS & SPECIFICATIONS

This component was factory tested to, and met the following specifications:

1. Meets ARB Material Compatibility with Fuel Blends as per Section 3.8 of CP-201.
2. TP-201.2J – Complies with the maximum allowable component pressure drop of 0.04 inches of water column @ 60 CFH.

IMPORTANT: Leave these installation instructions, product warranty registration card and the warranty tag with the station owner and/or operator.

Emco Wheaton Retail Corp.
2300 Industrial Park Dr. • Wilson, NC 27893
252-243-0150 • 252-243-4759 (fax)

p/n 569043
Rev. H, 04/19

For use with Vapor Systems
Technologies VST California Air
Resources Board Executive
Orders VR-203 and VR-204



Packing List:

(2) Fuel Path O-rings

**A4005EVR Balance
Vapor Recovery Nozzle**



**A4119EVR Coaxial
Safe Break Valve**



INSTALLATION INSTRUCTIONS

Service Tools Required:

- Pipe Wrench w/ Flat Jaws
- Bench Vise w/ 5" Jaw Width
- Petroleum Jelly or Other Suitable Lubricant
- Scribe Tool w/ 90 Degree Tip
- Gasoline Approved Container

CAUTION:

1. Always barricade work area to keep pedestrians and vehicles from accessing the dispenser.
2. Always use a gasoline approved container or test can when performing any type of preventive maintenance.
3. Before attempting to install, remove or service the A4005EVR nozzle and A4119EVR safe break valve, turn off and tag out power to the corresponding dispenser.
4. Before attempting to install, remove or service the A4005EVR nozzle and A4119EVR safe break valve, close the emergency impact valves located inside the base of the dispenser. Relieve the line pressure and standing fuel through the nozzle spout into a gasoline approved container by compressing the bellows and squeezing the lever.

IMPORTANT: Failure to perform cautions 3 and 4 may result in a hazardous gasoline spill, damage to equipment, personal injury and/or death.

1

Pre-Inspection:

1. Carefully unpack and remove all kitted parts from the shipping container and evaluate for any kind of damage. Verify that no parts are missing from the packing list before proceeding with the installation.

Pre-Installation:

2. Empty all standing fuel within the spout and bellows into a gasoline approved container before attempting to service the fuel path o-rings.



3. It is necessary to remove the A4005EVR nozzle and A4119EVR safe break valve from the curb hose during the removal and installation of the fuel path o-rings. Use the pipe wrench with flat jaws to loosen the curb hose connector. Unfasten the curb hose connector by hand from the A4005EVR nozzle to avoid cross threading.

IMPORTANT: Drain the fuel from the hanging hardware into a gasoline approved container when removing the A4005EVR nozzle from the curb hose.



A4005EVR Nozzle



**A4119EVR
Safe Break Valve**

4. Use the bench vise to properly secure the A4005EVR nozzle or A4119EVR safe break valve during service.

Installation:

Removing the Existing Fuel Path O-rings



A4005EVR Nozzle



**A4119EVR
Safe Break Valve**

5. Use the scribe tool to remove the existing fuel path o-rings.
6. Clean and remove all existing grease, fuel residue, debris, etc. from within the machined grooves.

IMPORTANT: Properly discard all removed components.

Installing the New Fuel Path O-rings



A4005EVR Nozzle



**A4119EVR
Safe Break Valve**

7. Use the scribe tool to install the new fuel path o-rings. Verify that both o-rings seat properly into the machined grooves.



A4005EVR Nozzle



**A4119EVR
Safe Break Valve**

8. Lightly lubricate the fuel path o-rings using petroleum jelly or other suitable lubricant.

Post-Installation:

9. Before attempting to reinstall the A4005EVR nozzle or A4119EVR safe break valve, please refer to the following installation instructions below.

- A4005EVR Balance Vapor Recovery Nozzle p/n 570435
- A4119EVR Coaxial Safe Break Valve p/n 569043

PREVENTIVE MAINTENANCE

1. Weekly inspect the A4005EVR nozzle and A4119EVR safe break valve connections for leaks or fuel residue. Replace with factory authorized service kits.

| <u>Part Number</u> | <u>Description</u> |
|--------------------|----------------------|
| 494748EVR | Fuel Path O-ring Kit |

PERFORMANCE STANDARDS & SPECIFICATIONS

This component was factory tested to, and met the following specifications:

1. Meets ARB Material Compatibility with Fuel Blends as per Section 3.8 of CP-201.

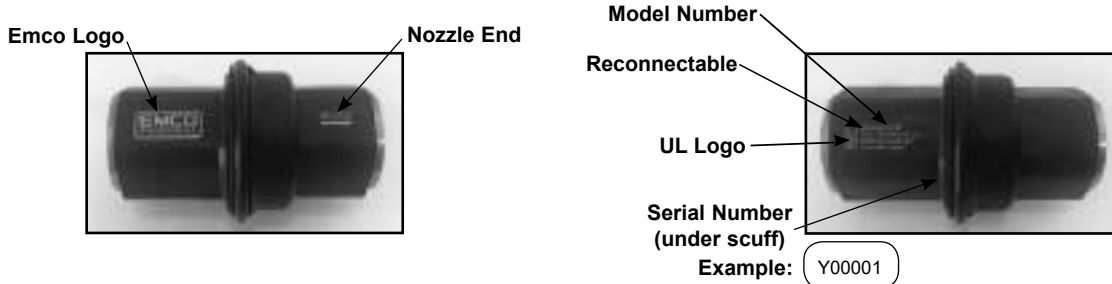
IMPORTANT: Leave these installation instructions with the station owner and/ or operator.



A4119EVR

Reconnectable Coaxial
SafeBreak® Valve

Permanent ID:



INSTALLATION INSTRUCTIONS

Service Tools Required:

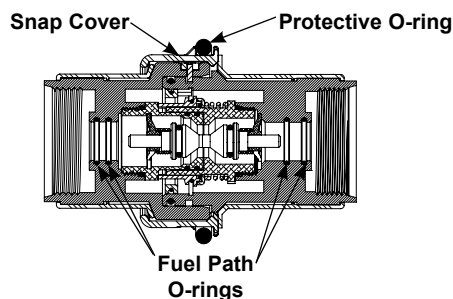
- 1 7/8" Crows Foot
- Gasoline Approved Container
- Petroleum Jelly or other Suitable Lubricant
- Torque Wrench w/ 50ft-lbs Setting
- Adjustable Wrench w/ Flat Jaws 1 7/8" to 2 1/4"

CAUTION:

1. Always barricade work area to keep pedestrians and vehicles from accessing the dispenser.
2. Always use a gasoline approved container or test can when performing any type of preventive maintenance.
3. Before attempting to install, remove or service the A4119EVR SafeBreak® valve, turn off and tag out power to the corresponding dispenser.
4. Before attempting to install, remove or service the A4119EVR SafeBreak® valve, close the emergency impact valves located inside the base of the dispenser. Relieve the line pressure and standing fuel through the nozzle spout into a gasoline approved container by compressing the bellows and squeezing the lever.
5. If a hose retractor is used, the A4119EVR SafeBreak® valve must be attached on the nozzle end of the retractor clamp.

IMPORTANT: Failure to perform cautions 3 and 4 may result in a hazardous gasoline spill, damage to equipment, personal injury and/ or death.

Pre-Inspection:



1. Carefully unpack and remove the A4119EVR SafeBreak® valve from the shipping container and evaluate for any kind of damage.
2. Verify the fuel path o-rings located on both ends of the A4119EVR SafeBreak® valve. All o-rings must be properly secured inside the factory machined grooves.
3. Verify the snap cover and protective o-ring are properly secured.



A4119EVR

Reconnectable Coaxial
SafeBreak® Valve

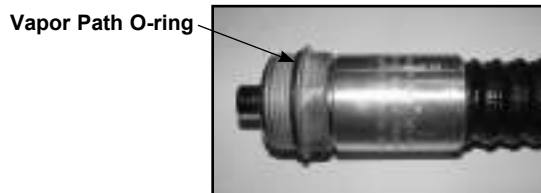
Pre-Installation:



4. Lightly lubricate the fuel path o-rings using petroleum jelly or other suitable lubricant.



5. Before attempting to install the A4119EVR SafeBreak® valve onto the whip hose, verify the word “NOZZLE”, which is printed on the scuff guard of the SafeBreak® valve, is on the opposite end. Verify the vapor path o-ring is properly secured onto the connector, and in good working condition. Lightly lubricate the o-ring using petroleum jelly or other suitable lubricant.



6. Before attempting to install the A4119EVR SafeBreak® valve onto the curb hose, verify the vapor path o-ring is properly secured onto the connector, and in good working condition. Lightly lubricate the o-ring using petroleum jelly or other suitable lubricant.

IMPORTANT: Do not use pipe thread sealant compound or Teflon tape when installing the A4119EVR SafeBreak® valve. Failure to comply will void warranty.

Installation:

IMPORTANT: If this is a new facility installation, the fueling point must be flushed into a gasoline approved container before installing the A4119EVR SafeBreak® valve. Failure to perform this procedure could result in foreign material becoming lodged inside the SafeBreak® valve’s fuel path causing a reduction in fuel flow.

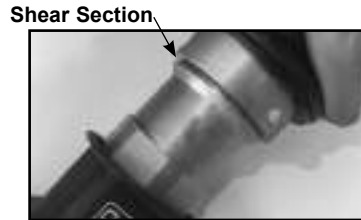


7. Remove the scuff guard by sliding the whip hose. Attach the A4119EVR SafeBreak® valve onto the whip hose connector. Tighten by hand to avoid cross threading. Take caution to avoid pinching the vapor path o-ring.

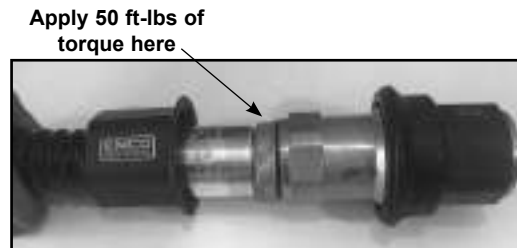


A4119EVR

Reconnectable Coaxial
SafeBreak® Valve



IMPORTANT: Never tighten across the shear section of the A4119EVR SafeBreak® valve. Failure to comply will result in damage to the SafeBreak® valve and void warranty.



- Using a 1 7/8" crows foot with a torque wrench and a 2 1/4" wrench (with flat jaws) secure the A4119EVR SafeBreak® valve and tighten the whip hose connector to 50 ft-lbs of torque.



- Remove the snap cover by pushing down on opposite tabs, then slide both the snap cover and scuff guard onto the curb hose. Attach the A4119EVR SafeBreak® valve onto the curb hose connector. Tighten by hand to avoid cross threading. Take caution to avoid pinching the vapor path o-ring.



- Using a 1 7/8" crows foot with a torque wrench and a 2 1/4" wrench (with flat jaws) secure the A4119EVR SafeBreak® valve and tighten the curb hose connector to 50 ft-lbs of torque.

Post Functional Tests:

- Carefully purge the trapped air from the fueling point. Begin dispensing by compressing the bellows and then squeezing the lever. Dispense one gallon of fuel into a gasoline approved container.
- Functional test the automatic shutoff of the A4005EVR nozzle. Begin dispensing by compressing the bellows and then squeezing the lever. Place the hold open latch in "high" clip position to secure the lever. Dispense one gallon of fuel into a gasoline approved container. At the same time, lower the spout tip into the standing fuel until the vent hole is completely submersed. The main valve of the A4005EVR nozzle will automatically close causing fuel flow to stop.



A4119EVR

Reconnectable Coaxial
SafeBreak® Valve

IMPORTANT: Perform step 12 a minimum of three times to assure the insertion interlock, hold open latch and the automatic shutoff of the A4005EVR nozzle are operating properly.

According to UL requirement 842, the fuel flow rate must be greater than 3 gallons per minute for the automatic shutoff to operate properly. A common problem cause of low flow rates are dirty or clogged dispenser filters.

Post Inspection:

13. Before placing the A4005EVR nozzle onto the dispenser cradle, inspect all hanging hardware connections for potential fuel leaks. Make proper adjustments if necessary.

PREVENTIVE MAINTENANCE

1. Weekly inspect the A4119EVR SafeBreak® valve, evaluate for any kind of damage. Damaged components must be replaced with factory authorized service kits.

| <u>Part Number</u> | <u>Description</u> |
|--------------------|----------------------|
| 494748EVR | Fuel Path O-ring Kit |
| 495920 | Shear Pin Kit |
| 495843 | Snap Cover Kit |
| 495866 | Scuff Guard Kit |

2. Weekly inspect all hanging hardware connections for potential fuel leaks.

IMPORTANT: Should a drive-off or incidence of customer abuse occur, follow the initial inspection and function instructions found in the installation section.

PERFORMANCE STANDARDS & SPECIFICATIONS

This component was factory tested to, and met the following specifications:

1. Meets ARB Material Compatibility with Fuel Blends as per Section 3.8 of CP-201.
2. TP-201.2J – Complies with the maximum allowable component pressure drop of 0.04 inches of water column @ 60 CFH.

IMPORTANT: Leave these installation instructions, product warranty registration card and the warranty tag with the station owner and/or operator.



A4119EVR

Reconnectable Coaxial
SafeBreak® Valve

RECONNECTING PROCEDURES

Repair & Replacement Kits:



Shear Pin Kit P/N 495820
3 Shear Pins
1 Vapor Path O-ring



Snap Cover Kit P/N 495843
1 Snap Cover
1 Protective O-ring



Scuff Guard Kit P/N 495866
1 Male Scuff Guard
1 Female Scuff Guard

Service Tools Required:

- EMCO Clamp Tool p/n 572909
- Petroleum Jelly or other Suitable Lubricant
- Scribe Tool w/ 90 Degree Tip
- Towel Wipes

IMPORTANT: Refer to page 1, caution steps 1 through 5, before attempting to reconnect the A4119EVR SafeBreak® valve. Failure to perform the required steps may result in a hazardous gasoline spill, damage to equipment, personal injury and/ or death.

Pre-Inspection:



Figure 1: Male Half (dispenser end)

Vapor Path O-ring



Figure 2: Female Half (nozzle end)

1. Keep the nozzle of the ground by placing onto the dispenser cradle.
2. Carefully inspect both male and female halves for external and internal damage that may have occurred during separation. If signs of damage refer to page 1, pre-inspection, step 1 and replace with a new A4119EVR SafeBreak® valve.
3. Carefully inspect the snap cover, protective o-ring and scuff guards for damage or wear. Replace if necessary.

CAUTION: If damage or missing parts are found do not attempt to reconnect the existing A4119EVR SafeBreak® valve. Failure to comply may result in a hazardous gasoline spill, damage to the equipment or personal injury and/ or death.

Pre-Installation:

4. Using a scribe tool with a 90 degree tip replace the vapor path o-ring located on the male half and lightly lubricate with petroleum jelly or other suitable lubricant. **Refer to Figure 1.**
5. Using a towel wipe clean the inside area of the female half and lightly lubricate with petroleum jelly or other suitable lubricant. **Refer to Figure 2.**

IMPORTANT: Do not use pipe thread sealant compound as a lubricant.

Installation:

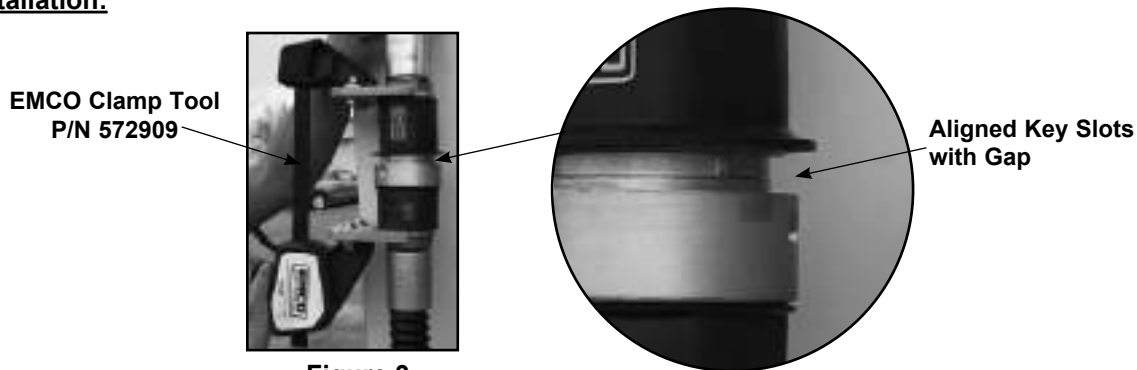


Figure 3

6. Place and secure the EMCO Clamp Tool P/N 572909 on both ends of the A4119EVR SafeBreak® valve. Align the top and bottom key slots before attempting to reconnect the male and female halves. **Refer to Figure 3.**

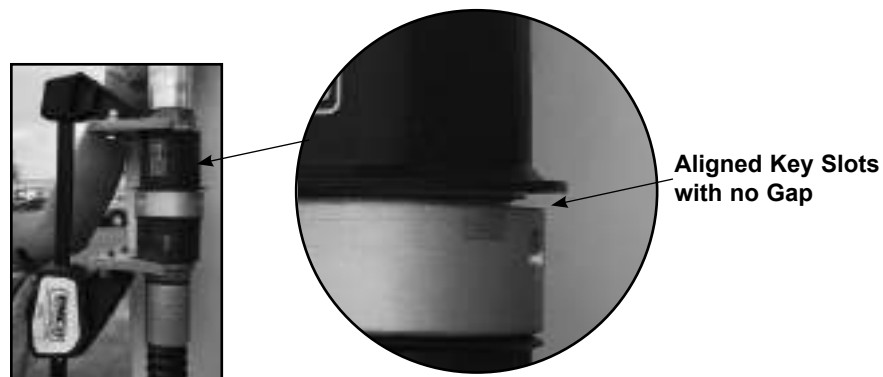


Figure 4

7. Slowly squeeze the lever of the EMCO Clamp Tool P/N 572909 until both the male and female halves come together. **Refer to Figure 4.**

CAUTION: Reconnection can cause a small amount of gasoline to leak out of the SafeBreak®. A towel wrapped loosely around the SafeBreak® can help to minimum spills.



Figure 5



Figure 6

8. Install each of the three shear pins into the openings of the female half. Be sure the yellow button sits flush with the outside surface. Once all three shear pins are secured in place remove the EMCO Clamp Tool P/N 572909 by squeezing the lever and relief lever at the same time. **Refer to Figures 5 and 6.**



Figure 7



Figure 8

Protective O-ring
Secured

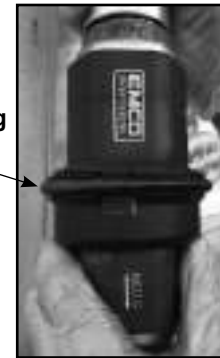


Figure 9

9. Slide the snap cover upward over the shear pins until locked and secured into position. Verify by pulling downward. Be sure the protective o-ring is secured onto the snap cover groove. **Refer to Figures 7, 8 and 9.**

Post Function Tests:

10. Refer to page 3, post functional tests, steps 11 and 12.
11. Perform a meter creep test by keeping the fueling point activated without dispensing fuel for approximately 60 seconds. The meter reading on the dispenser display in gallons should not increment; this indicates the fuel path of the hanging hardware is leak free. If the meter reading increments, this indicates a possible faulty component that suffered damage during the drive-off occurrence; this includes the nozzle, curb or whip hoses.

Post Inspection:

12. Refer to page 4, post inspection, step 13.

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Website: www.HirtInc.com

HIRT VCS 100-2 VaporTek®
VAPOR PROCESSOR AND INDICATOR PANEL
FOR USE WITH ASTs

MANUAL OF
INSTALLATION, OPERATION, AND MAINTENANCE

REV. 13:5/2014

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1. INTRODUCTION

This manual contains the operation, installation, interconnection, start-up, and maintenance instructions for the VCS 100-2 VAPORTEK® processor and Indicator Panel. Note, these instructions are written to give the best installation in a sequence easiest for the installer. If there are any instructions in this manual which seem impossible, impractical, or questionable for your installation, call the Hirt Customer Service Department at (562) 692-6970 and ask for information regarding your local Hirt representative. There are some allowable alternatives, but call to be sure, don't guess. Note, this manual should be retained for future reference.

2. SAFETY/WARNINGS

WARNING: Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury, or death. Read instructions thoroughly before installing or servicing this equipment.

WARNING: When gasoline vapor abatement system (i.e. processor) is in operation, temperature inside can exceed 2,000°F. To prevent burn hazard, do not contact any part of the gasoline vapor abatement system except controls. Do not remove protective covers while gasoline vapor abatement system is in operation.

3. CONTRACTOR REQUIREMENTS

To prevent from voiding the product warranty, all contractors who install, startup, and/or repair the VCS 100-2 VAPORTEK® system must be a Hirt VCS 100-2 certified technician. To attend a VCS 100-2 VAPORTEK® training session, call Hirt Customer Service at (562) 692-6970 or send an email request to HirtVCS@aol.com. Once Hirt training is successfully completed, the technician will receive a wallet size proof of certification card. Technicians should carry the card while on the jobsite. Hirt maintains a list of active certified installers and companies for verification. Contractors should always verify the training and certification requirements with the local Air Quality Management District before beginning installation of CARB EVR systems.

4. HIRT VCS 100-2 VAPORTEK® SYSTEM OVERVIEW

4.1 THEORY OF OPERATION

The processor continuously measures the pressure of the vapor in the ullage of the storage tanks. When that pressure is zero or negative the processor remains de-energized and completely inactive. At any time when the pressure in the storage tank vapor becomes positive, the processor energizes its turbine, which extracts vapor from the storage tanks and sends that vapor into its thermal oxidizer where that vapor is destroyed. The processor continues to extract vapor until the pressure of the vapor is returned to negative, whereupon the processor turns itself off. It remains off unless or until the pressure again becomes positive.

4.2 PROCESSOR MECHANIZATION - HOW THE PROCESSOR OPERATES

The processor is connected to the storage tanks via the tank vapor vents, or another vapor pipe. The processor contains a vacuum sensor/switch, turbine, spark igniter, pilot, flame safeguard, vapor valve, and a thermal oxidizer.

When the vacuum sensor/switch measures that the pressure in the storage tank is negative or zero, it remains open, thus not energizing the processor. In this condition the processor is inert and has zero effect on the remainder of the dispensing facility or its Stage I/II vapor recovery systems.

When the vacuum sensor/switch measures that the pressure of the vapor in the storage tanks is positive, the switch closes energizing the turbine and activating the flame safeguard. The flame safeguard generates a spark at the pilot tip (i.e. spark igniter). The vapor is forced by the turbine from the storage tanks into the pilot and hence into the spark igniter. Only ignition of the pilot can cause the flame safeguard's relay to close*. Only when pilot ignition is present and the flame safeguard relay is closed does the vapor valve open admitting vapor to the thermal oxidizer. Note that if the pilot does not ignite, the main vapor valve does not open, thus unprocessed vapor from the thermal oxidizer cannot be vented to the atmosphere. In the thermal oxidizer the vapor is converted into CO₂ and H₂O and then vented to the atmosphere.

*This electrical interlock, built into the flame safeguard, is required by the California State Fire Marshal, ETL, American Gas Association specification 1-97, and ANSI Z21.20

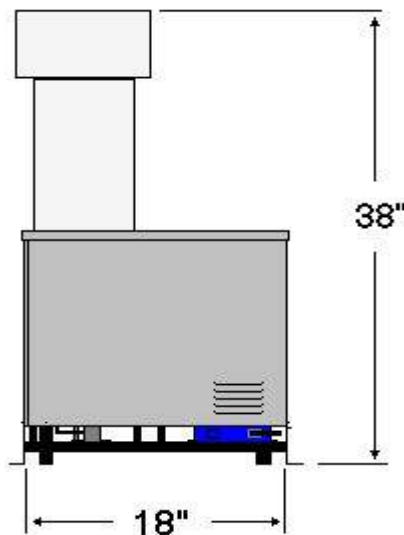
4.3 INDICATOR PANEL FUNCTION

For both the ISD equipped and non-ISD versions, the processors' electrical power source comes thru an Indicator Panel. The panel allows the station operator to determine whether or not the processor is operating properly. The panel includes a POWER switch with an integral POWER (green) lamp, a PROCESSING (green) lamp, and a MALFUNCTION (red) lamp. See Indicator Panel Face sketch at the bottom of page 7.

During normal operation the POWER switch is on, the POWER lamp is on, the PROCESSING lamp is lit intermittently, and the MALFUNCTION lamp is extinguished. The PROCESSING lamp is wired so it will light when thermal oxidation is occurring.

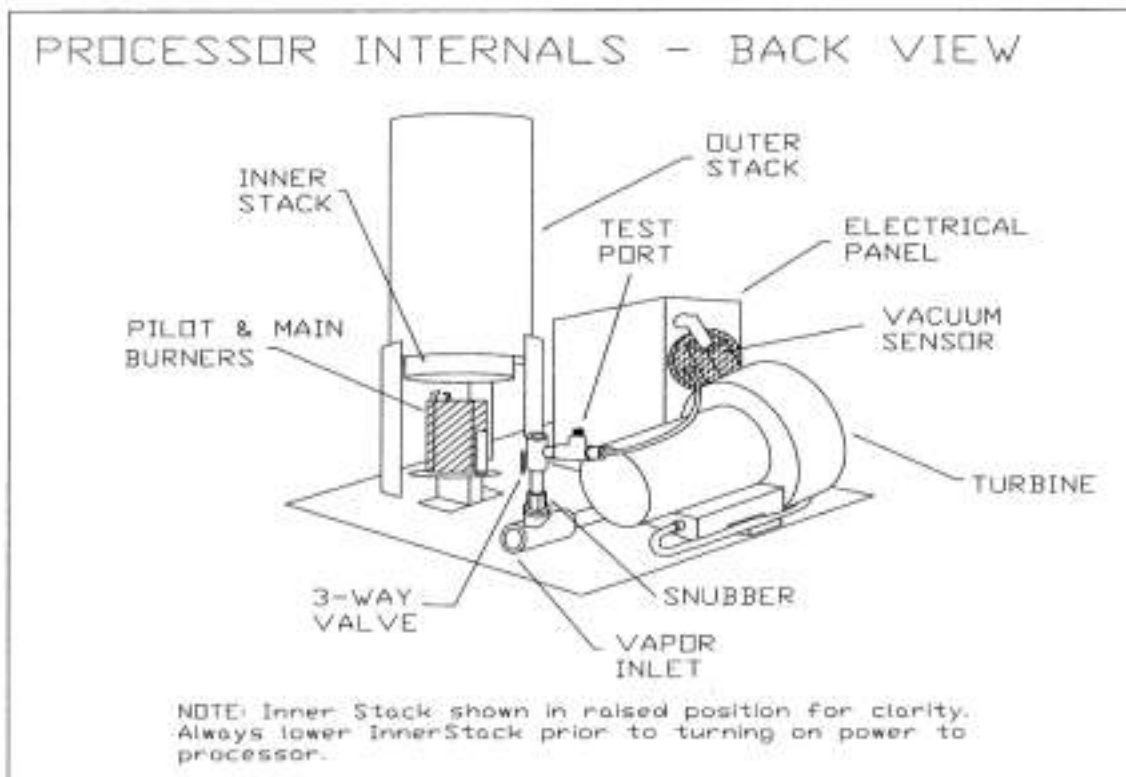
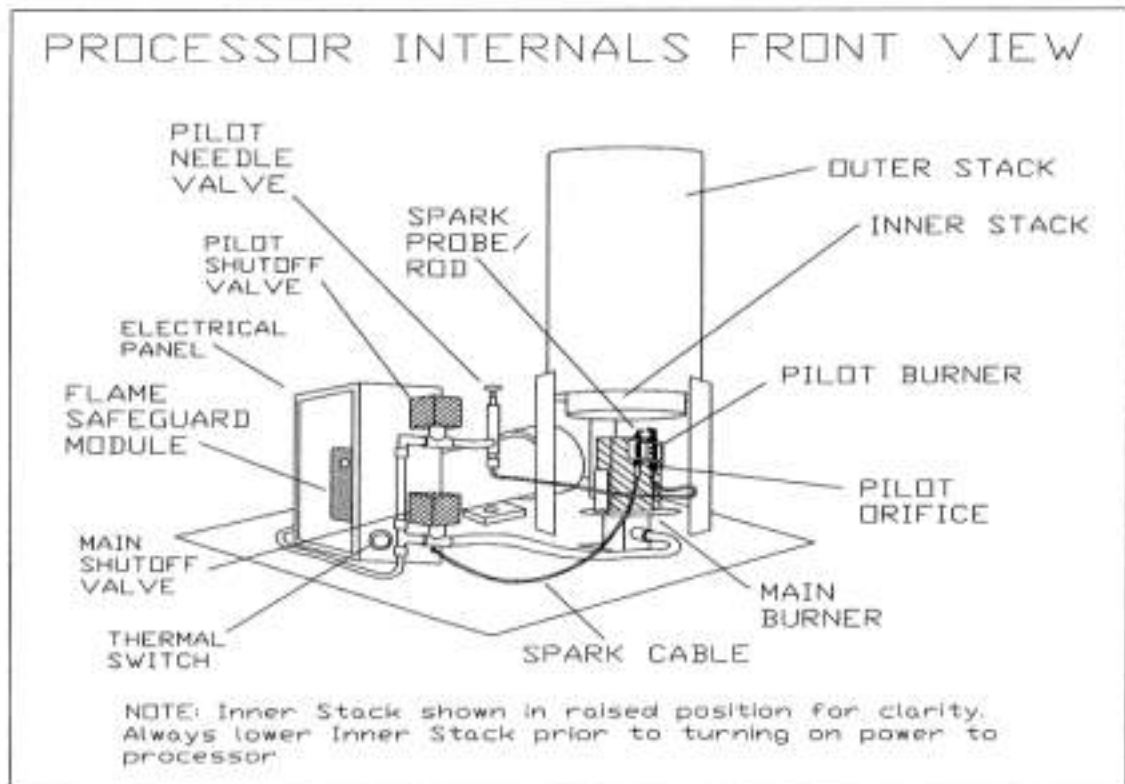
When a malfunction occurs the MALFUNCTION lamp will be lit. At this point the PROCESSING lamp may be off, lit intermittently, or lit continuously. The MALFUNCTION lamp is wired to the vacuum sensor/switch and a timing module. If the AST pressure is positive for at least 1 hour, then the vacuum sensor/switch will be closed and the timing module will light the MALFUNCTION lamp. The MALFUNCTION lamp will extinguish after the malfunction is corrected, and the processor has restored the UST ullage to a nominal -0.25" w.c.

4.4 PROCESSOR: Dimensions, Weight, and Specifications



MODEL: VCS 100-2 VAPORTEK®
SERVICE: Outdoor, non hazardous area
ELECTRICAL: 120 VAC, 3 Ampere, intermittent
VAPOR PIPE CONNECTION: 3/4" NPT
WEIGHT: 80 lbs.
OVERALL DIMENSIONS: 18" wide X 18" deep x 38" high (without legs)

4.5. Processor Components



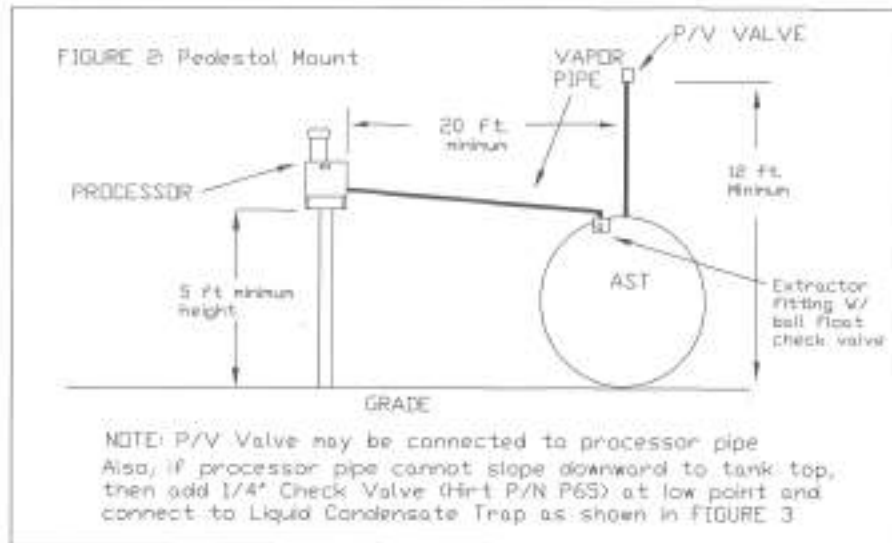
5. INSTALLATION OF PROCESSOR

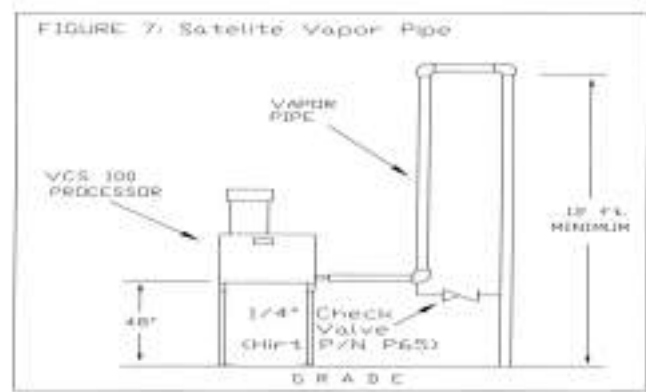
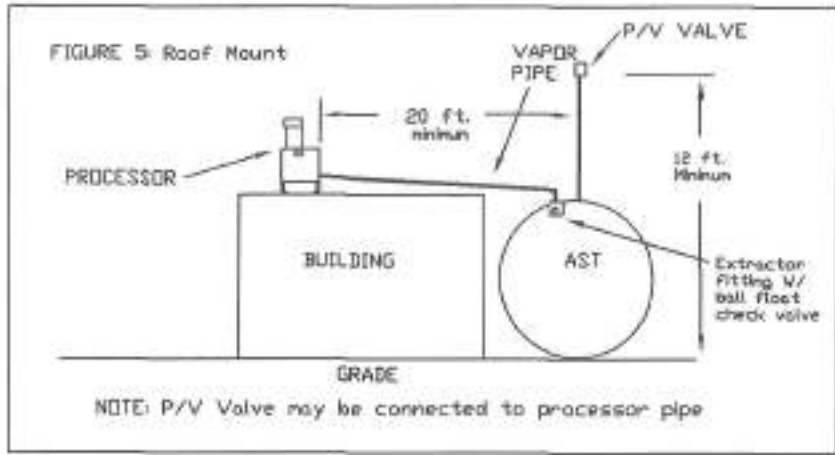
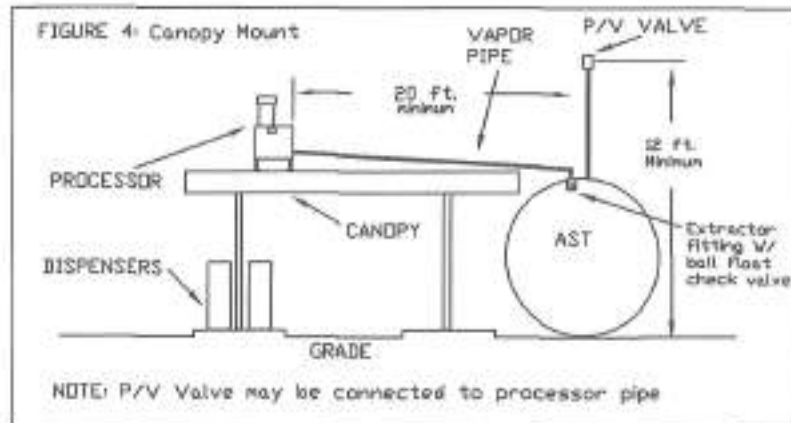
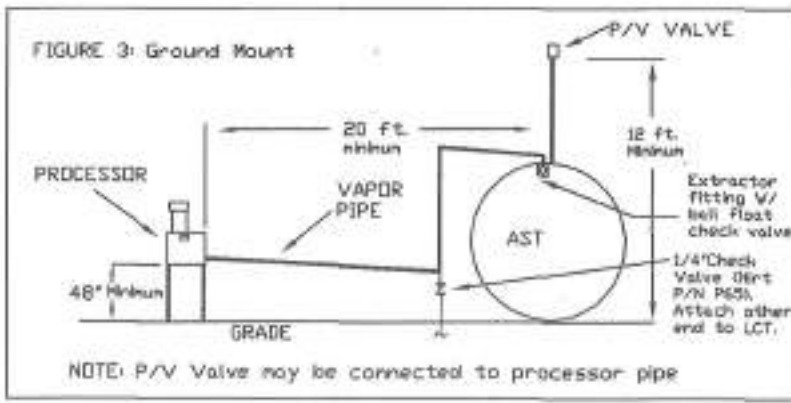
5.1 PRE-INSTALLATION SITE REQUIREMENTS

Selection of processor location should be based on the following requirements and considerations:

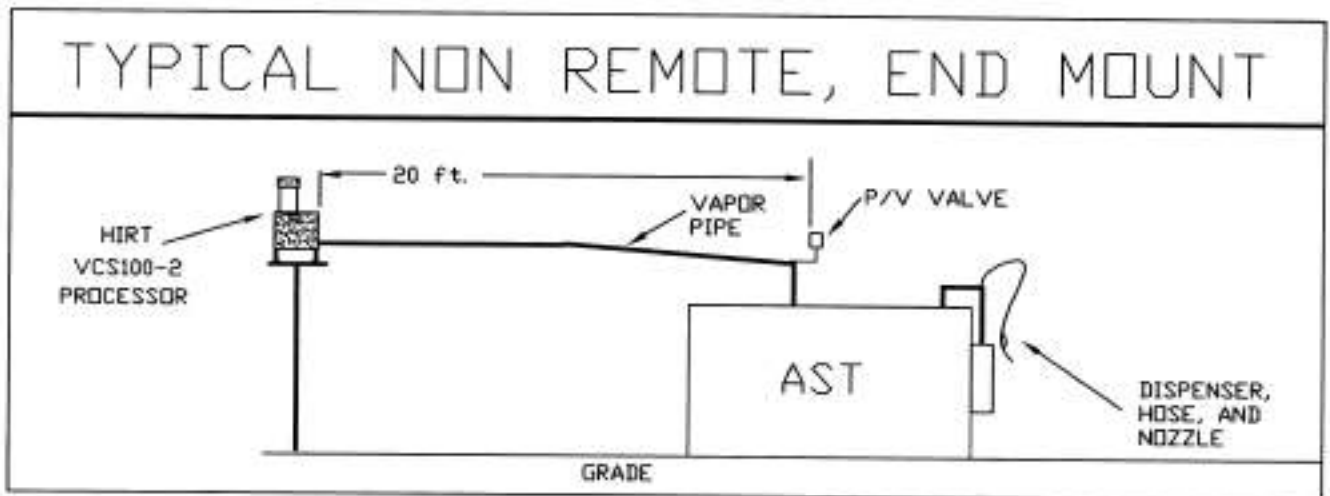
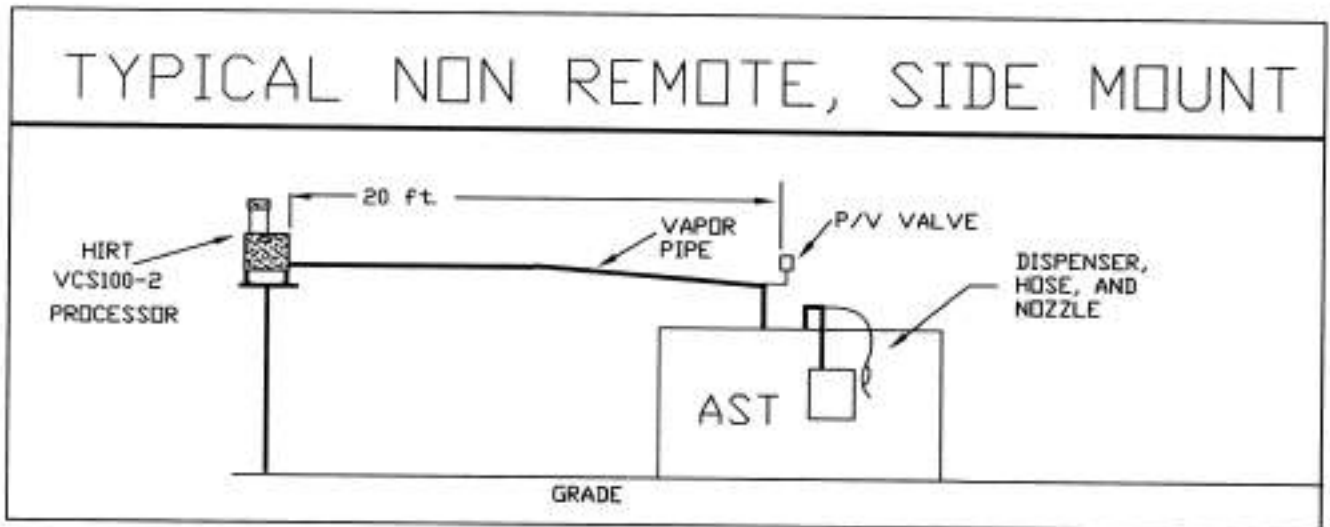
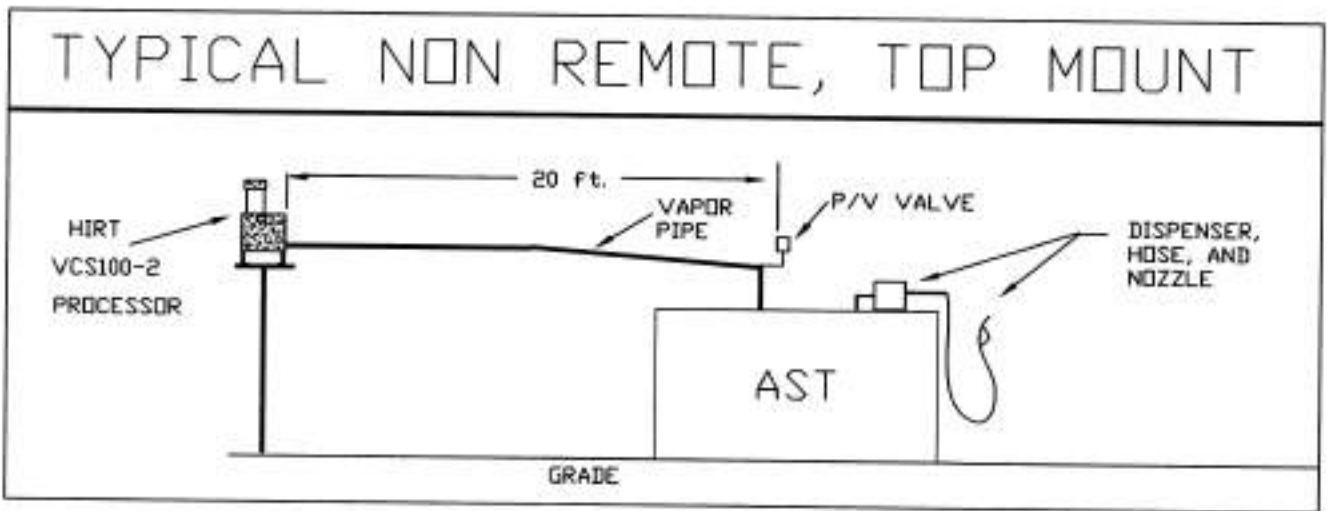
- 5.1.1 Non-Hazardous area. See National Fire Protection Association 30 & 30A or California Code of Regulation section 1918.64
- 5.1.2 A minimum horizontal distance of 20 ft. from any fuel transfer point, with processor at 4ft. height minimum. (i.e. dispensers, nozzles or storage tank drop tubes).
- 5.1.3 A minimum horizontal distance of 20 ft. from pressure/vacuum valve.
- 5.1.4 Processor must be located so there is a 2 ft. clearance on all sides for maintenance.
- 5.1.5 Remote from wheel traffic, foot traffic, and valuable ground level space.
- 5.1.6 Ease of pipe run to processor from aboveground storage tanks(s). Typically the processor connects to the storage tank vent pipes. However, the processor can be connected to any tank fitting except for the dispenser's vapor return pipe. See section 7.2.2 and FIGURE 12 & 10)
- 5.1.7 Ease of conduit run to Indicator Panel.
- 5.1.8 Do not locate processor on property easement. Consult local authority, such as City Hall, to determine width of set back from property line.

The preferred location for the processor is on the roof of the building to which the vent pipes attach. Many other locations are also practical such as pedestal mount, ground mount, canopy mount, and roof mount on a remote building, and Satellite Mount as noted in FIGURES 2, 3, 4, 5, and 7:



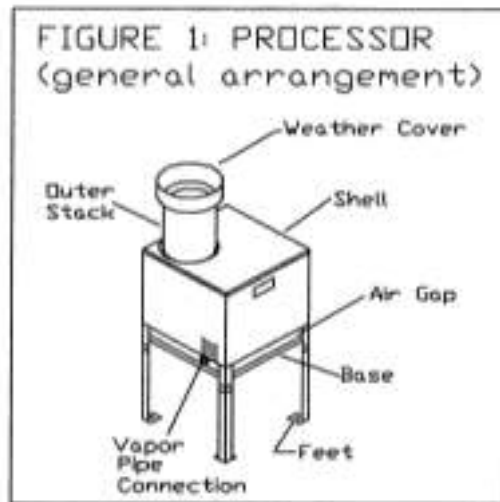


Here are some examples of the Non Remote dispenser configuration:



5.2 ASSEMBLY OF LEGS TO PROCESSOR

Please refer to FIGURE 1, the processor general arrangement drawing, for the following instructions.



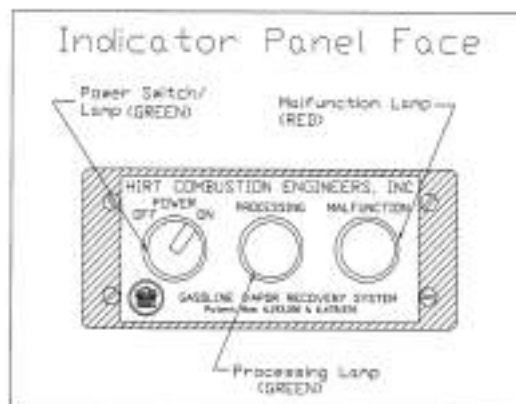
Ground level mount requires the use of the 48" Legs or pedestal, and canopy or roof mount may require either 48" or 5" Legs. If Legs not already purchased, see your local distributor.

5.2.1 Bolt appropriate Legs to Base of processor. Be sure to use the bolts, lock washers, and nuts provided with the Legs. Note that Legs attach behind corner angle brackets of Base, See FIGURE 8 Step 8.9 for details.

5.2.2 Bolt feet to concrete, deck plate, and/or solid non-flammable structure. Note, concrete mount will require the use of (4) 1/4" DIA. X 3" RED HEAD wedge anchors (i.e. 2.5" embedment).

WARNING: Do not block 1.5" air gap between processor Shell and Base. This gap allows combustion air to reach thermal oxidizer. Also, keep the processor area free and clear from combustibles, keep a minimum clearance of 2 ft. all the way around processor.

6. INSTALLATION OF INDICATOR PANEL



Install the Indicator Panel at a location chosen for the following considerations:

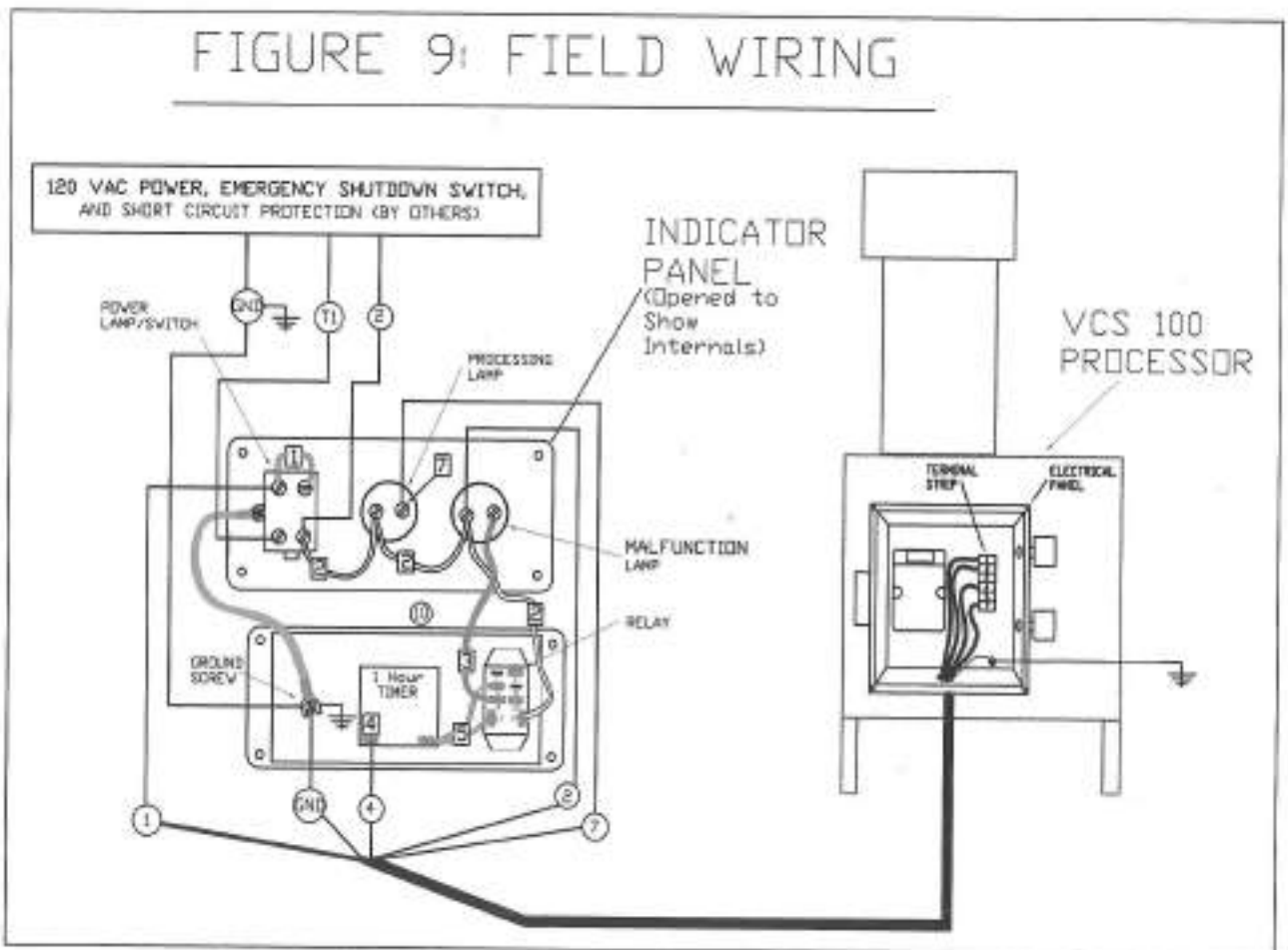
- 6.1 Indoors (If Outdoors, must be in weather resistant enclosure, by other panels.)
- 6.2 Access by attendant.
- 6.3 In view of attendant.
- 6.4 Ease of conduit run to station's main electrical panel.
- 6.5 Ease of conduit run to processor location.

7. CONNECTION OF ELECTRICAL AND VAPOR PIPE

Remove Processor's Weather Cover, Shell, and electrical panel lid prior to performing the following steps.

7.1 ELECTRICAL POWER SUPPLY

- 7.1.1 Note that the power to the Indicator Panel and processor comes through the station master switch and the emergency pump shutdown switch. See FIGURE 9.

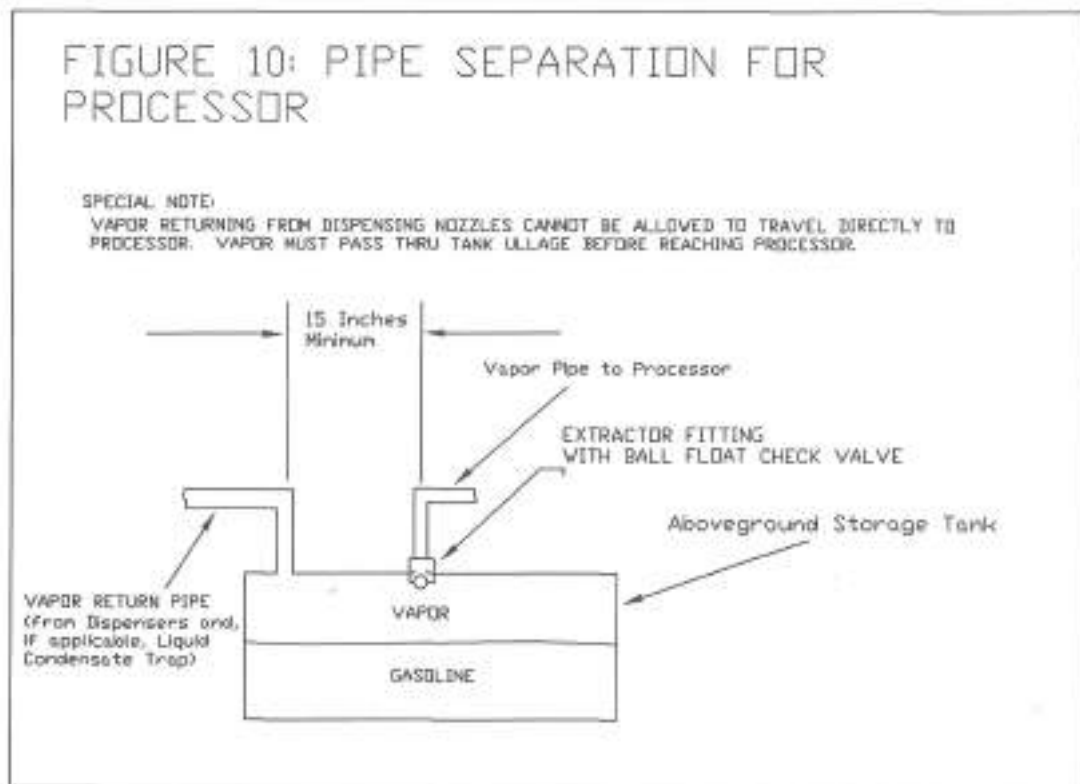


7.1.2 Wire size should be per local electrical code for an (8) ampere, 120 VAC load. Be sure to include circuit protection per local code. Also, system must be electrically grounded in accordance with local codes, or in the absence of local codes, with the current edition of the National Electrical Code, ANSI/NFPA70.

7.1.3 Conduit access to the processor is through the bottom of the processor's electrical panel. Be sure to use a sealed cable fitting approved for use in Class 1, Groups C and D, Division 2 areas where the conduit enters the panel.

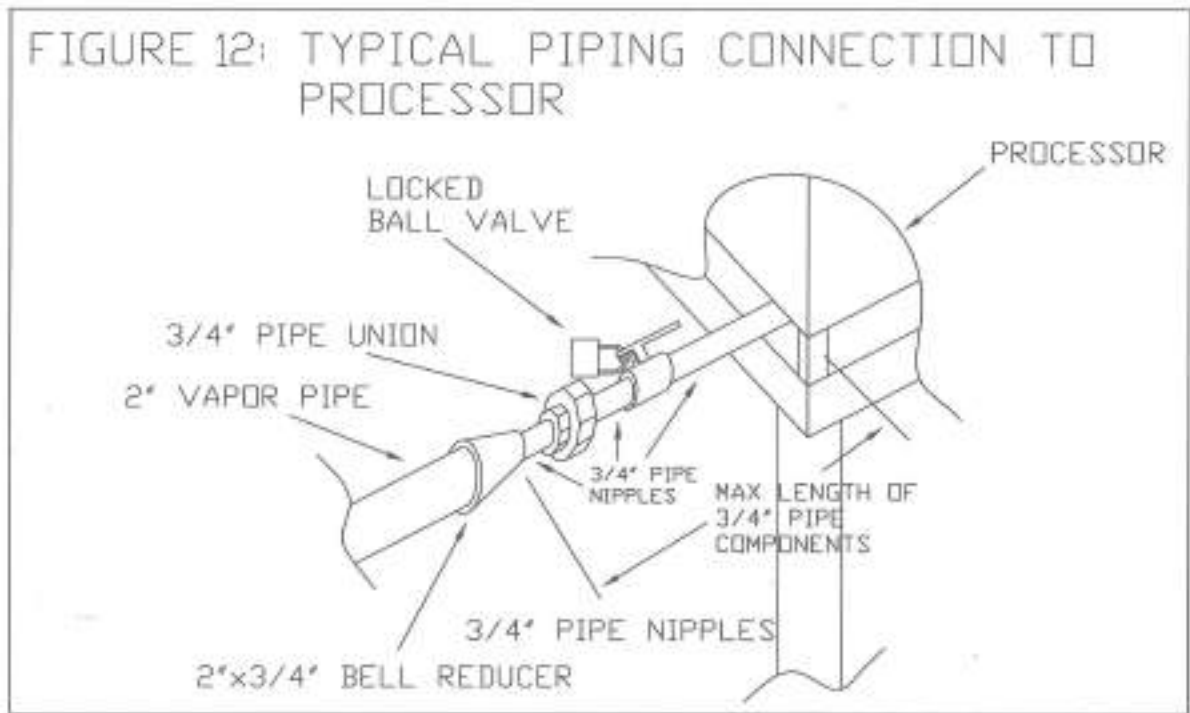
7.2 GASOLINE VAPOR SUPPLY

7.2.1 A vapor pipe is needed to connect the processor to the ullage of all the gasoline storage tanks. Use 2" NPT galvanized pipe for runs up to 300 ft. Usually the vapor pipe connects to the vent pipes, however, any connection to the ullage of the storage tanks, other than direct connection to the dispenser's vapor return pipe, is acceptable. Processor vapor pipe needs to slope downward 1/8" per foot towards AST top or to where 1/4" Check Valve (Hirt P/N P65) connects. See FIGURES 2,3,4,5, and 10.



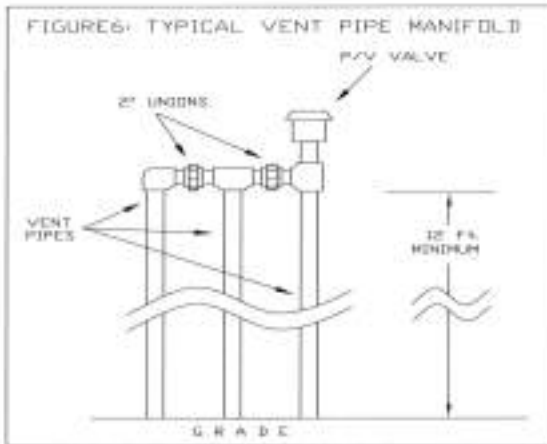
7.2.2 Vapor pipe to processor must connect to tank top at a fitting at least 15" remote from Vapor Return piping. Be sure to put a pipe support close to the processor to prevent placing undue stress on the Turbine. Vapor Return Pipe from dispensers must slope at least 1/8" per foot, but a slope of 1/4" per foot is recommended.

- 7.2.3 Vapor pipe configuration must prevent liquid gasoline from reaching processor. Vapor pipe to processor must have ball float valve inside extractor fitting to prevent liquid product from reaching processor. See Figure 10.
- 7.2.4 Vapor pipe connection at the processor is with (3) 3/4" NPT nipples, (1) 3/4" NPT lockable ball valve, (1) 3/4" NPT union, and (1) 3/4" NPT to 2" NPT bell reducer. The ball valve is installed in the vapor pipe to the processor for maintenance and repair. The ball valve is to be left in the locked open position (open to AST ullage) during normal operation. Failure to leave the valve in an open position may result in a processor malfunction. Note, use no more than a 12" length of 3/4" piping components. See FIGURE 12 for details.



CAUTION: Hold processor internal pipe train with backing wrench to prevent twisting pipe train while connecting vapor piping.

- 7.2.5 If the ullage of the tanks is not already interconnected, then manifold the vent pipes together with 2" galvanized pipe at a minimum of 12 ft. above grade. See FIGURE 6 on next page. Note that at least (1) P/V Valve must remain connected to the manifold.



8. START-UP

If all instructions thus far have been followed, the VCS 100-2 VAPORTEK® system should start itself and run automatically. Proceed with the following steps:

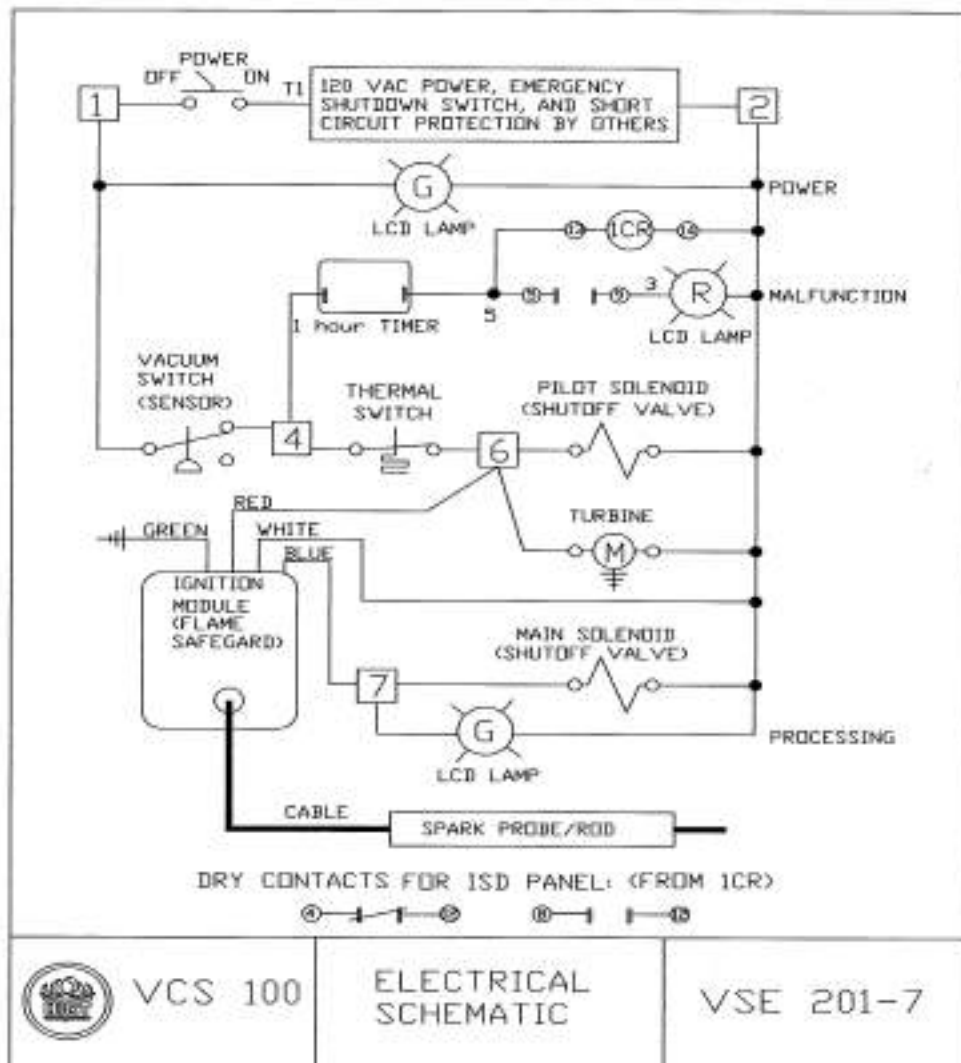
- 8.1 Check to see that nozzles are on their hangers and vapor hoses are connected. Check also to see that gasoline storage tank fittings (fill caps, dry breaks, drop tubes, drain valves, etc.) are seated and sealing.
- 8.2 At the Indicator Panel, turn the POWER switch ON. The green lamp on the switch should light, and the processor should have electrical power now. The green PROCESSING lamp will be lit intermittently (only when the processor is energized), and the red MALFUNCTION lamp should remain extinguished.

WARNING: The processor (pilot and main burner) is automatic. It will cycle its thermal oxidizer ON if vacuum diminishes in the vapor spaces and OFF if there is sufficient vacuum. Therefore use caution when working close to the thermal oxidizer. It may come ON without notice. A mirror is recommended for looking down the stack.

- 8.3 Check the pressure in storage tanks.
 - 8.3.1 If AST ullage pressure is negative (vacuum), then proceed with step 8.6.
 - 8.3.2 If the storage tank pressure is positive, check to see that turbine is running and either there is a flame at pilot burner tip or a spark. If not, reset thermal switch inside processor's electrical panel, by depressing (red) pushbutton, see Section 4.5 Processor Components FRONT VIEW. Turbine and spark should come on.

8.4 Within 1 hour, the processor pilot and main burner stages should ignite. Once a vacuum of at least a nominal -0.25" w.c. is generated, the processor should shutoff. This indicates that the processor is completely functional and controlling itself automatically. If so, go to step 8.8. If the stages don't ignite within 1 hour, or if your work schedule is such that waiting 1 hour is inconvenient, then continue with the following step 8.5.

8.5 The turbine in the processor should be running and the igniter/sensor probe sparking but the pilot will not be ignited. Failure of the pilot to ignite is probably because the station's vapor piping is full of air. To purge this air and replace it with vapor, use 2 short pieces of wire and jump the circuit from terminal [1] to [6] and [6] to [7] at the terminal strip inside the electrical panel inside the processor.



Note on the ELECTRICAL SCHEMATIC that a [1] to [6] jumper energizes the turbine, ignition module, and pilot solenoid. A [6] to [7] jumper energizes the main solenoid.

As soon as the air is purged from the vapor piping, the pilot and main stages will both ignite. As soon as pilot and main ignite, the 2 jumpers must be removed. If so, go to step 8.8.

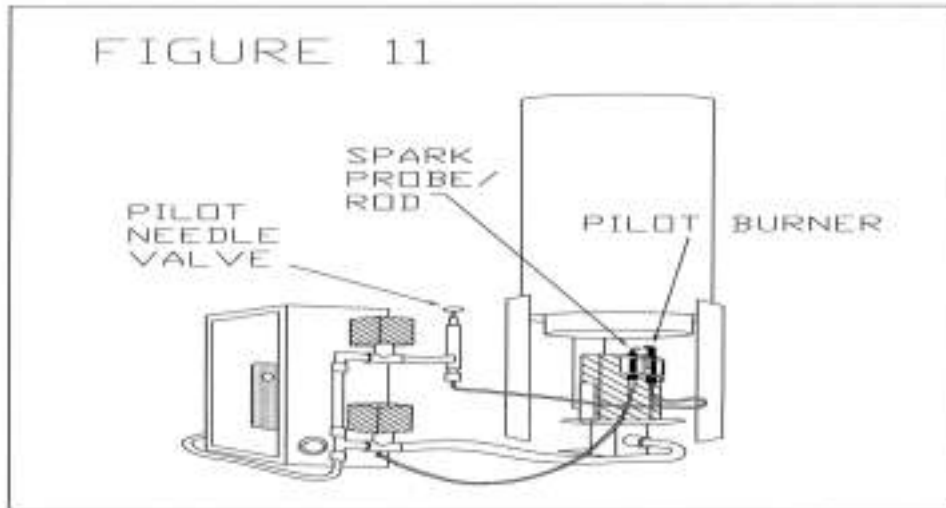
If the stages do not ignite after 15 minutes, go to step 8.7.

8.6 The processor will not turn on if the vacuum sensor/switch is satisfied. Therefore, any air in the vapor piping will need to be purged so the processor stages can ignite when storage tank vacuum decays. To purge this air and replace it with vapor, use 2 short pieces of wire and jump the circuit from Terminal [1] to [6] and [6] to [7] at the terminal strip inside the electrical panel inside the processor. Note on the ELECTRICAL SCHEMATIC that a [1] to [6] jumper energizes the turbine, igniter, and pilot solenoid. A [6] to [7] jumper energizes the main solenoid. As soon as the air is purged from the vapor piping, the pilot and main stages will both ignite. As soon as pilot and main ignite, the 2 jumpers must be removed. If so, go to step 8.8. If the stages do not ignite after 15 minutes go to step 8.7.

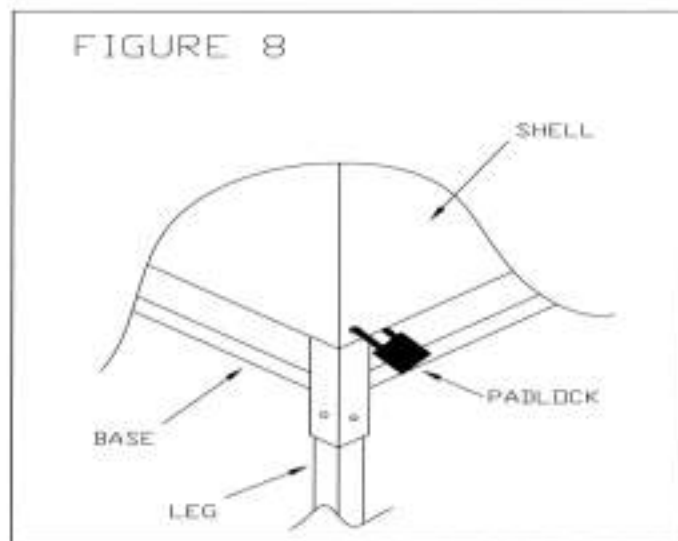
8.7 If the pilot and main do not ignite after the jumpers have been connected for 15 minutes, it is probably because there is an air leak in the vapor piping and air is entering as fast as it is being purged.

First remove the jumper wires. To find leak(s), conduct ARB test procedure TP-206.3 and review Exhibit 4 (Items to consider when conducting TP-206.3). Check the pipe fittings, vent riser manifold, P/V valve, storage tank fill tube caps, dry break gaskets and cover cap gaskets, hoses, nozzles, and vapor valves - any place where air could be entering the vapor. Correct leaks and then go back to step 8.3.

8.8 Check setting of Pilot Needle Valve adjustment. The valve is used to adjust the length of the (2) tongues of flame at the pilot burner. The ideal pilot flames are approximately 1" long, blue in color, with yellow tips. One flame tongue licks the Spark Probe/Rod. The factory setting for the Pilot Needle Valve is 2 1/4 turns open. A small adjustment may be necessary to achieve the ideal flame length. If required, adjust the black knob on the Needle Valve more open or closed until ideal flame setting is achieved. See FIGURE 11.



8.9 Start-up is now complete. Turn off power to processor. Replace lid on electrical panels, Shell, and Weather Cover. If desired, the station owner can add padlocks to prevent tampering, see FIGURE 8 below. Ensure that the 3/4" ball valve at the processor inlet is in the locked open position (opened to AST ullage). Turn on power to processor. The processor is now in normal, automatic mode. To complete the installation the Hirt certified technician needs to complete the Product Warranty Card and give to station owner or operator.



9. MAINTENANCE INSTRUCTIONS

The VCS 100-2 VAPORTEK® vapor processor has only one major moving part, the Turbine. The Turbine and other internal components in the processor need no adjustments after installation and start up. The vapor processor must be inspected and tested annually. The Hirt VCS 100-2 Vaportek® annual inspection checklist (reference Section 3 of VR-501 IOM) and leave at site with the maintenance records.

10. REPLACEMENT OF COMPONENTS

The Hirt VCS 100-2 VAPORTEK® system components which have failed cannot be repaired. Failed components must be replaced. In order to maintain the product warranty, use only genuine Hirt replacement parts. Each component comes with its own written instructions covering replacement and testing to insure proper installation.

11. PRODUCT WARRANTY

- . This product has a 12 month warranty, which becomes effective at time of installation. This warranty applies to the initial purchaser and any subsequent purchasers, during the warranty period.
- . This product is warranted to meet all the applicable performance standards and specifications, for the duration of the warranty period.
- . Liability under any implied or expressed warranty is limited to replacement of the product.
- . HCE is not responsible for improperly installed or misuse of the product.
- . HCE cannot be held responsible for damage to the product or its equipment due to acts of nature, vandalism, or neglect.
- . HCE products are warranted to be free of defects in material and workmanship.
- . In the event of a warranty claim, the purchaser must obtain a Return Authorization Number prior to returning product. All shipping costs are the responsibility of the customer.
- . HCE shall repair or replace, at its option, any HCE component which proves to be defective.
- . The cost of labor for any field repair, removal, replacement, or diagnosis is not covered by this warranty.
- . The liability of HCE is limited solely and specifically to this warranty.
- . HCE shall not be liable for any special, collateral, or consequential damages arising from this warranty, the use of this equipment or from any order accepted pursuant thereto.
- . The use of parts not authorized by HCE voids the warranty.
- . Installation, start-up, service, or repairs of this product by personnel not certified HCE voids the above described warranty.