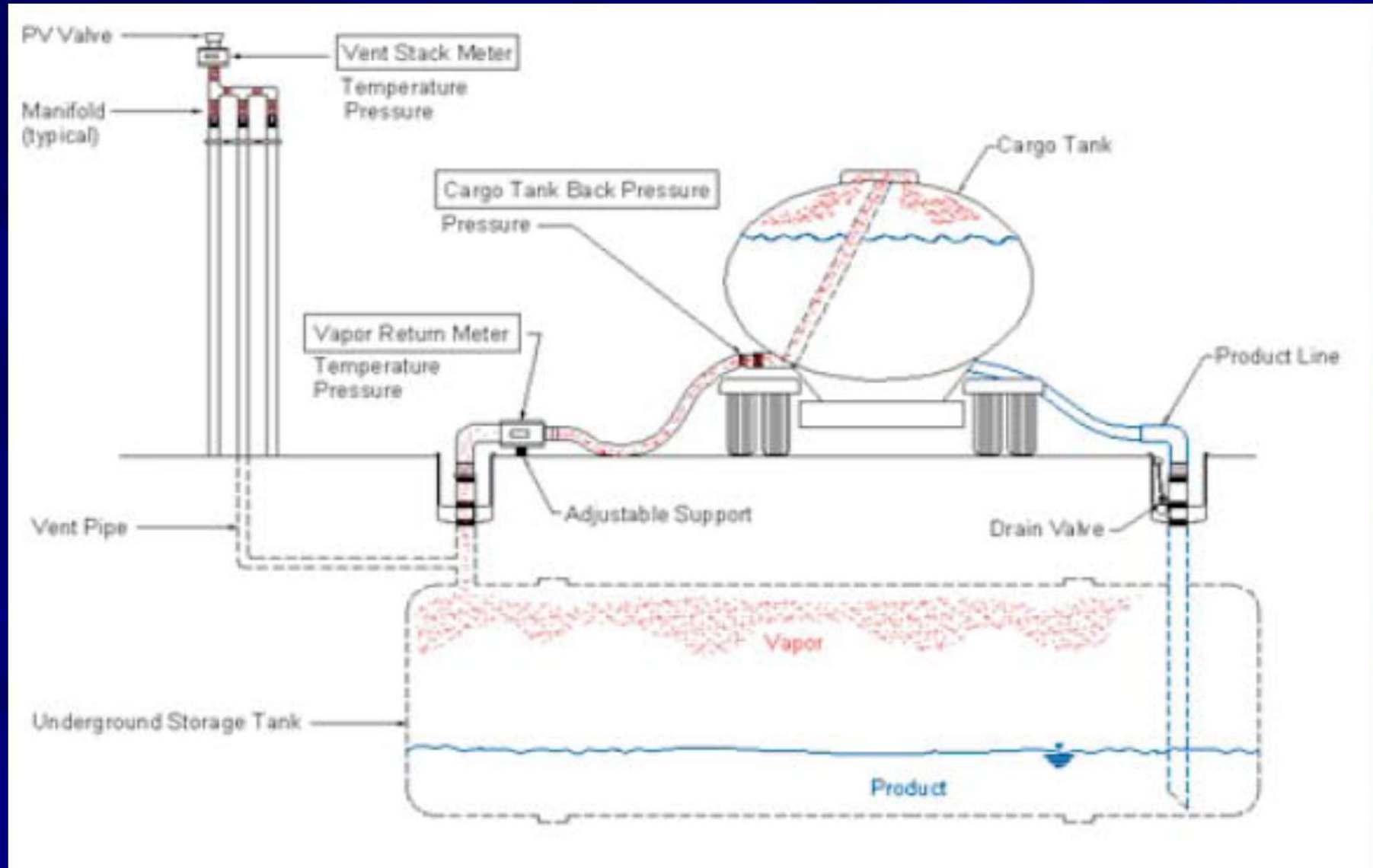




Underground Storage Tank Inspections

Bureau of UST Compliance and
Enforcement

Phase I Vapor Recovery



Phase I Vapor Recovery

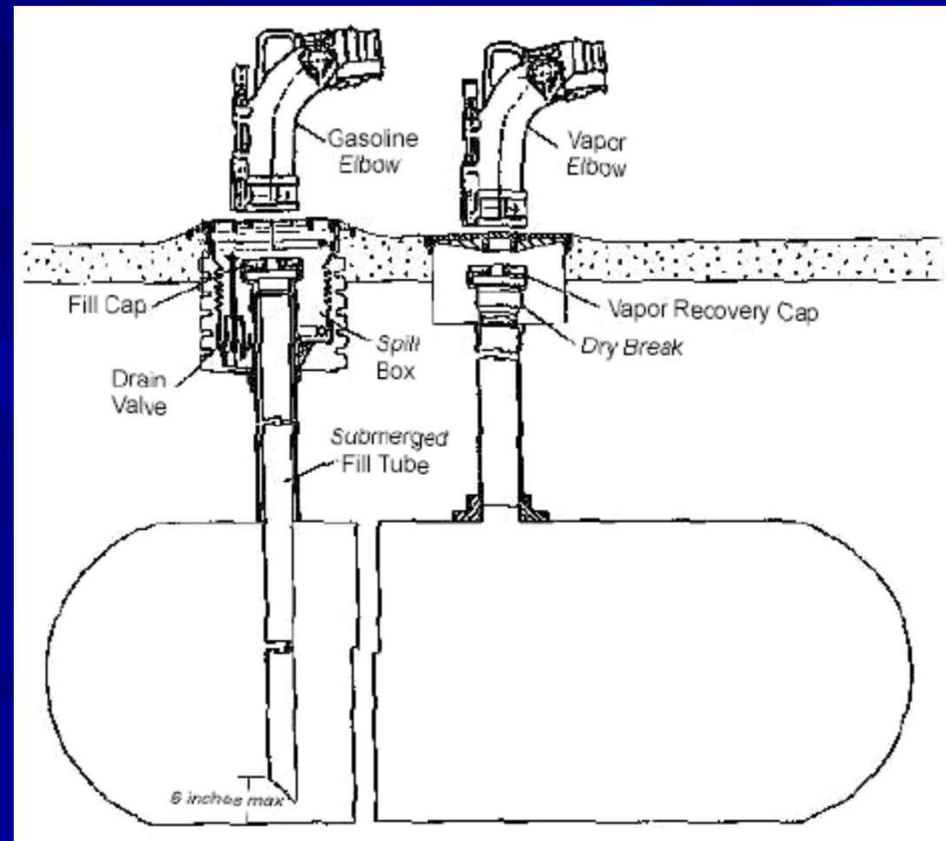
NJAC 7:27-16.3(c)&(d)

- Required for gasoline tanks 2,000 gallons or greater in capacity
- Delivery **MUST** be made through a submerged fill pipe (within 6" of the tank bottom)
- Storage Tank **MUST** be equipped with one of the following emission controls:
 - A Pressure/Vacuum relief valve must be installed on the vent *and*
 - System must reduce the total VOC emissions into the outdoor atmosphere by no less than 98%
OR
 - A floating roof

Two-Point Delivery



This is your typical delivery at a facility that has dry breaks. If you witness a delivery, make sure the hose has a tight seal with the dry break to prevent a vapor discharge.



Some GDFs have manifolded vapor recovery, or ONE dry break for multiple tanks. That is the only case where one vapor connection is acceptable for multiple tanks!

Dry Break

aka "Poppet Valve"



Here is a typical dry break. Make sure this valve is in the closed position. Also, try to depress the valve, as it should spring back up when you release it. If this is frozen in the open OR closed position, it's a violation and the tank should not take deliveries until it is repaired/replaced according to 7:27-16.3(d)

Dry Break Problem?



Before



After

Both are violations, the one on the right is just comical.

More Dry Break Issues...

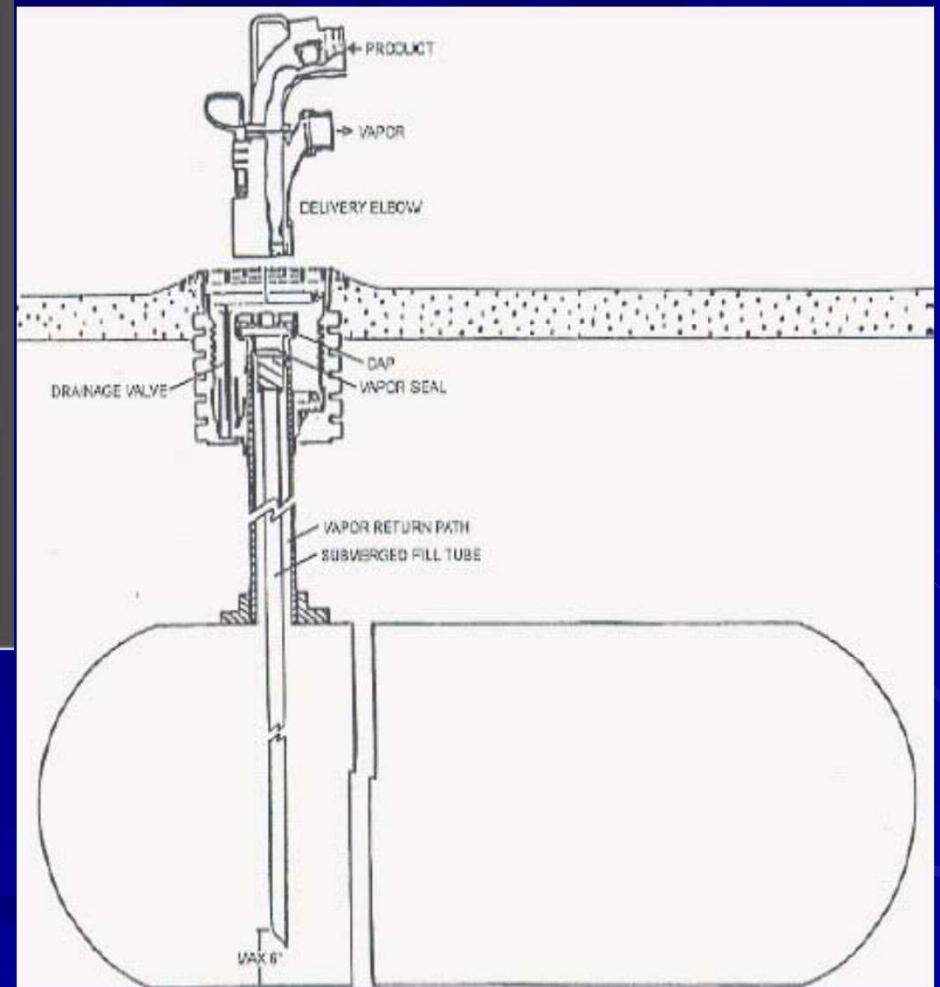


This is a very common and illegal practice. In order to make their delivery faster, some tanker operators do not hook up their Phase I hose to the dry break, and instead prop it open with something, usually a screwdriver, pebble, or even the dust cap. If you come across this in the field, stop the delivery until the operator hooks up his hose to the dry break.

One-Point (Coaxial) Deliveries



One Point Coaxial



Delivery is made with a double-hose through one connection. Product is on top then through the middle of the connection, vapor is on bottom then around the outside of the connection.

Poppeted Coaxial



Pressure/Vacuum Valves

Old PVV

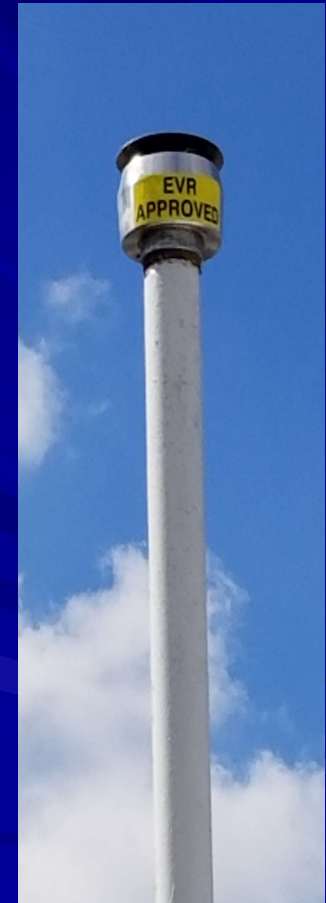
- Should have been replaced by 12/23/18



New EVR PVV



- OPW (723v model)
- Husky (5885 model)
- Franklin (PV-zero model)



Pressure/Vacuum Valves

Three vent lines manifolded into one.



Three unmanifolded vent lines with three P/V Valves.

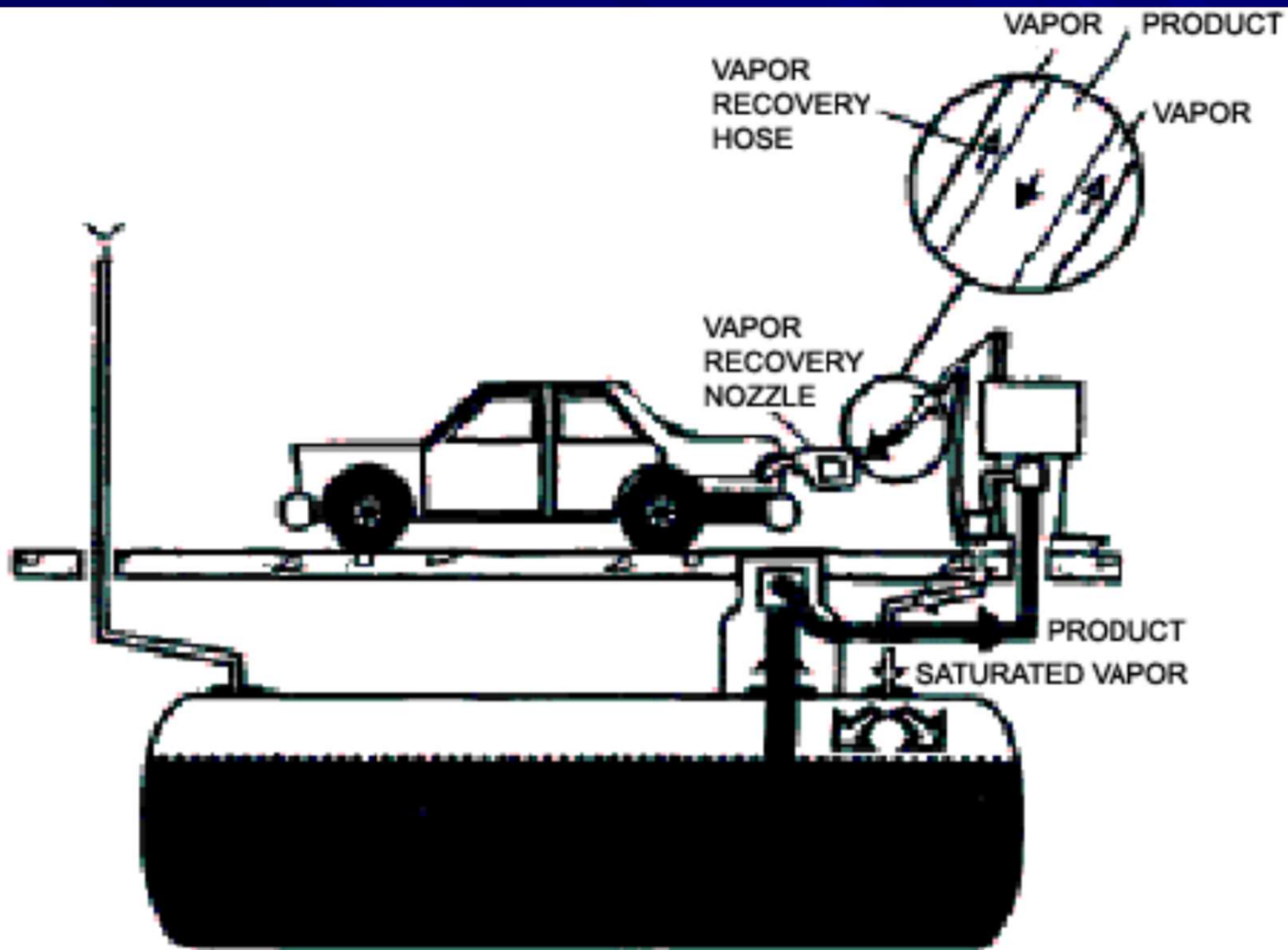


These valves are installed on top of the vents to prevent vapors from being released into the atmosphere. Current regulations require a CARB EVR approved P/V valve to crack at 2.5-6" water column positive and 6-10" negative

Swivel Adapters

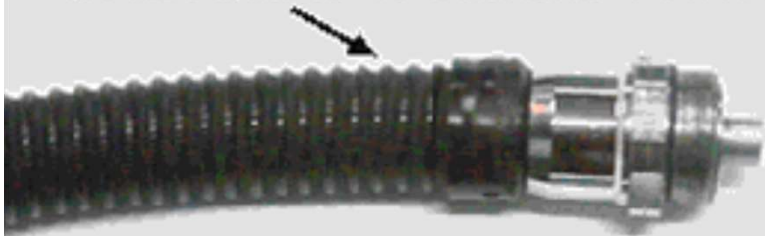


Phase II Vapor Recovery



Balance vs. Vac Assist

Standard Coaxial Hose

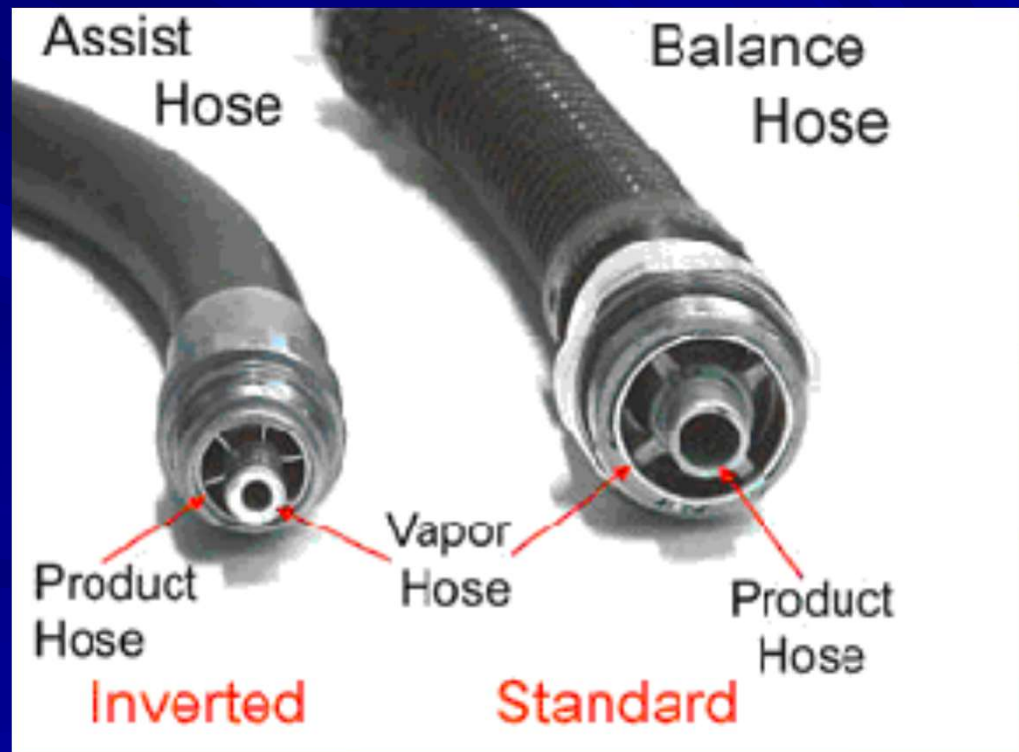


Inverted Coaxial Hose

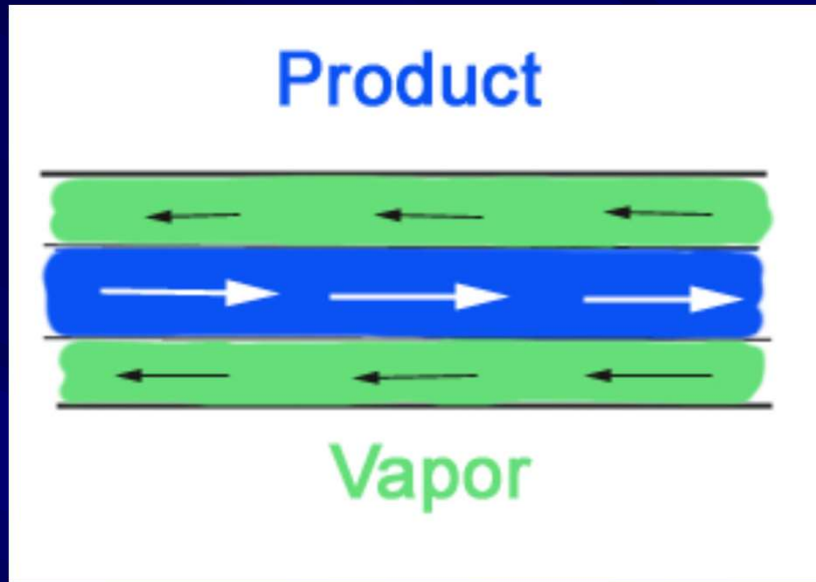


The difference between the two types of system hoses is apparent. The balance hose is thicker and ribbed, while the vac assist hose is smooth and thinner.

The inner workings of the two hoses are inverted. A balance hose has the vapor path on the outside, while the assist hose has the product path on the outside.



Balance System

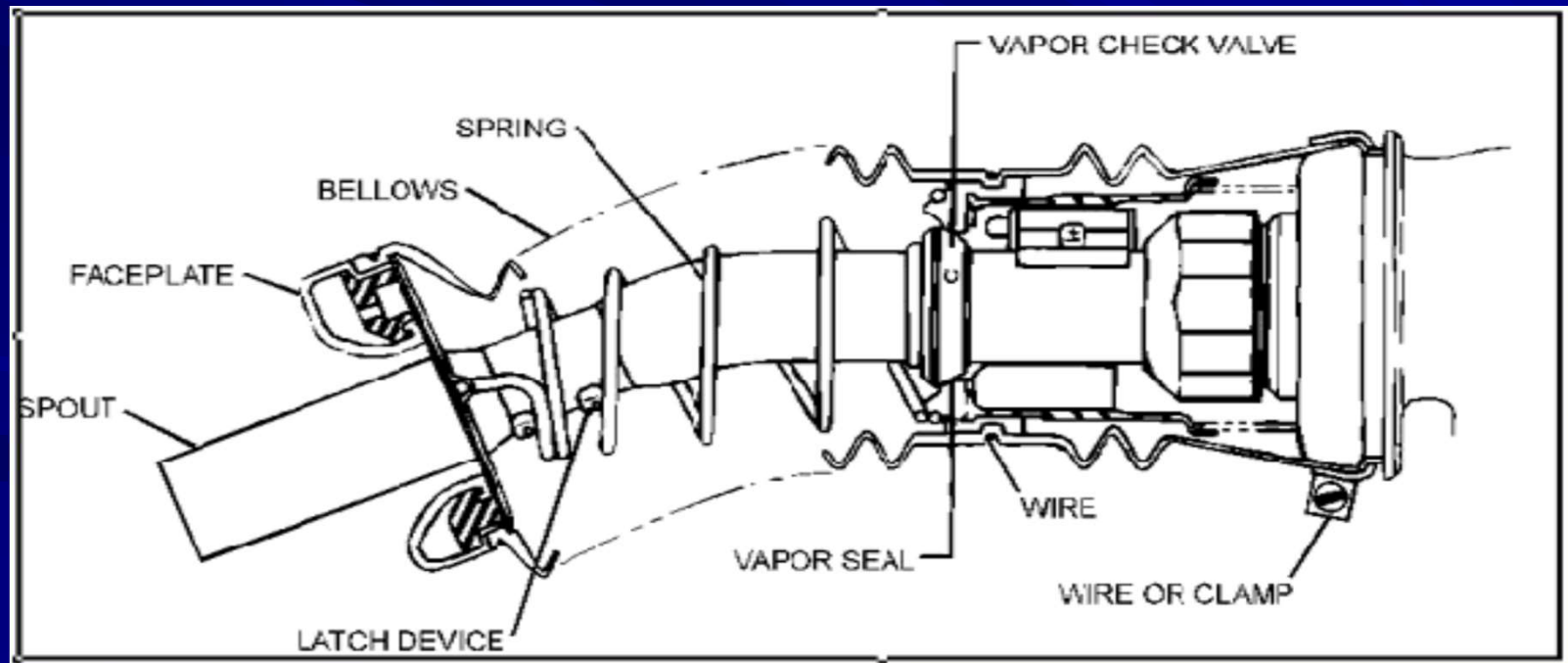


A balance system has the product flowing through the middle in one direction, and the vapor along the outside in the opposite direction. This is a passive system that relies on the slight pressurization of the vehicle gas tank gaining product, along with the vacuum created by the UST (or AST) losing product. This system is compatible with any Phase I system and ORVR.



Balance Nozzle

Check for tears or holes in the bellows and faceplate. Also test the check valve to make sure it is opening/closing. To test for a liquid blockage, simply hold the nozzle out downward with the hose over your shoulder, point the nozzle into a bucket, and pull open the bellows to open the check valve. If gasoline pours out of the bellows, it's likely the station is topping off.



Balance Nozzle

Emco w/ an external check valve

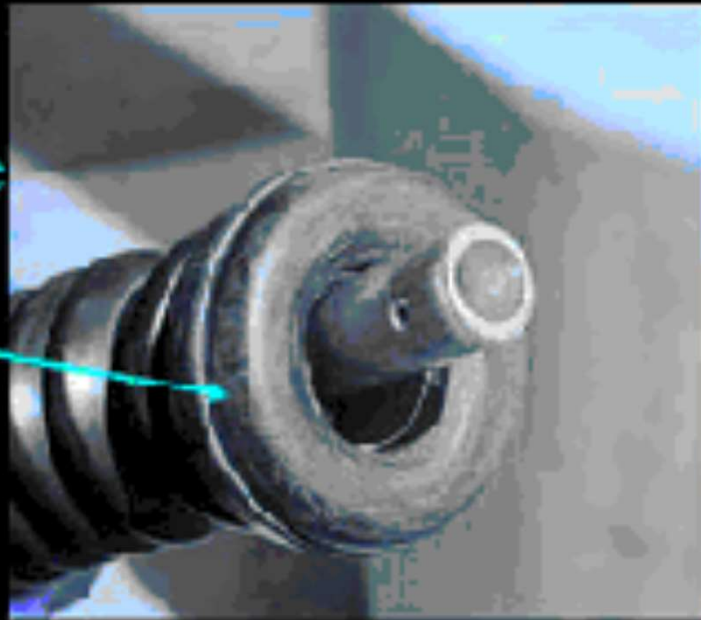


This is a common Emco balance nozzle. The check valve opens/closes the vapor path to the rest of the Phase II system. It is opened when the bellows are engaged/pulled back (see picture to the right). Check to make sure that this valve opens and closes properly. Some nozzles have internal check valves instead, which can't be inspected.

Balance Nozzle

Perhaps the most common part of the balance system to find holes/tears is in the face-plate. This occurs due to normal wear and tear from being constantly shoved against vehicle gas tanks. Any failures of this part of the device could result in there not being a tight seal during the fill and a vapor release.

Balance Nozzle
Note-
Face Plate
for positive
seal



Balance Nozzle

Speaking of torn face-plates.....

Also notice the hole on the underneath part of the spout in this picture. This is the automatic shut-off for the nozzle. Once fuel reaches this hole, the nozzle will click off, preventing a vehicle overfill. Check to see if this is clogged or damaged.



Balance Violations

OOPS!!



Weathering, dry-rot, or severe neglect can render the system inoperable. It is the facility's responsibility to maintain their equipment and replace any defective or damaged parts.

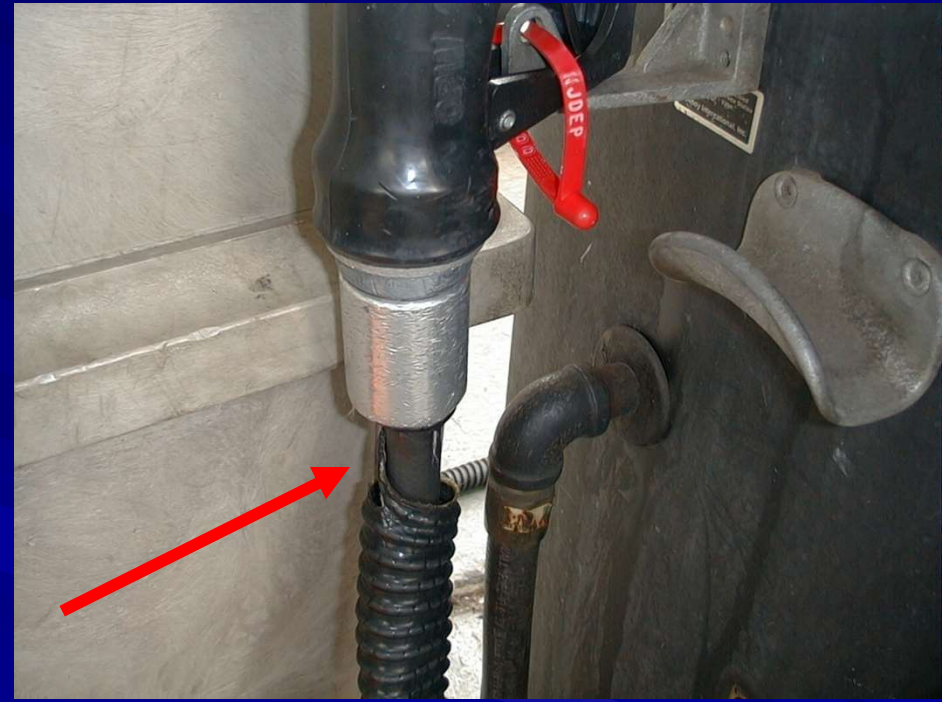
Balance Violations

Nice Hose!!



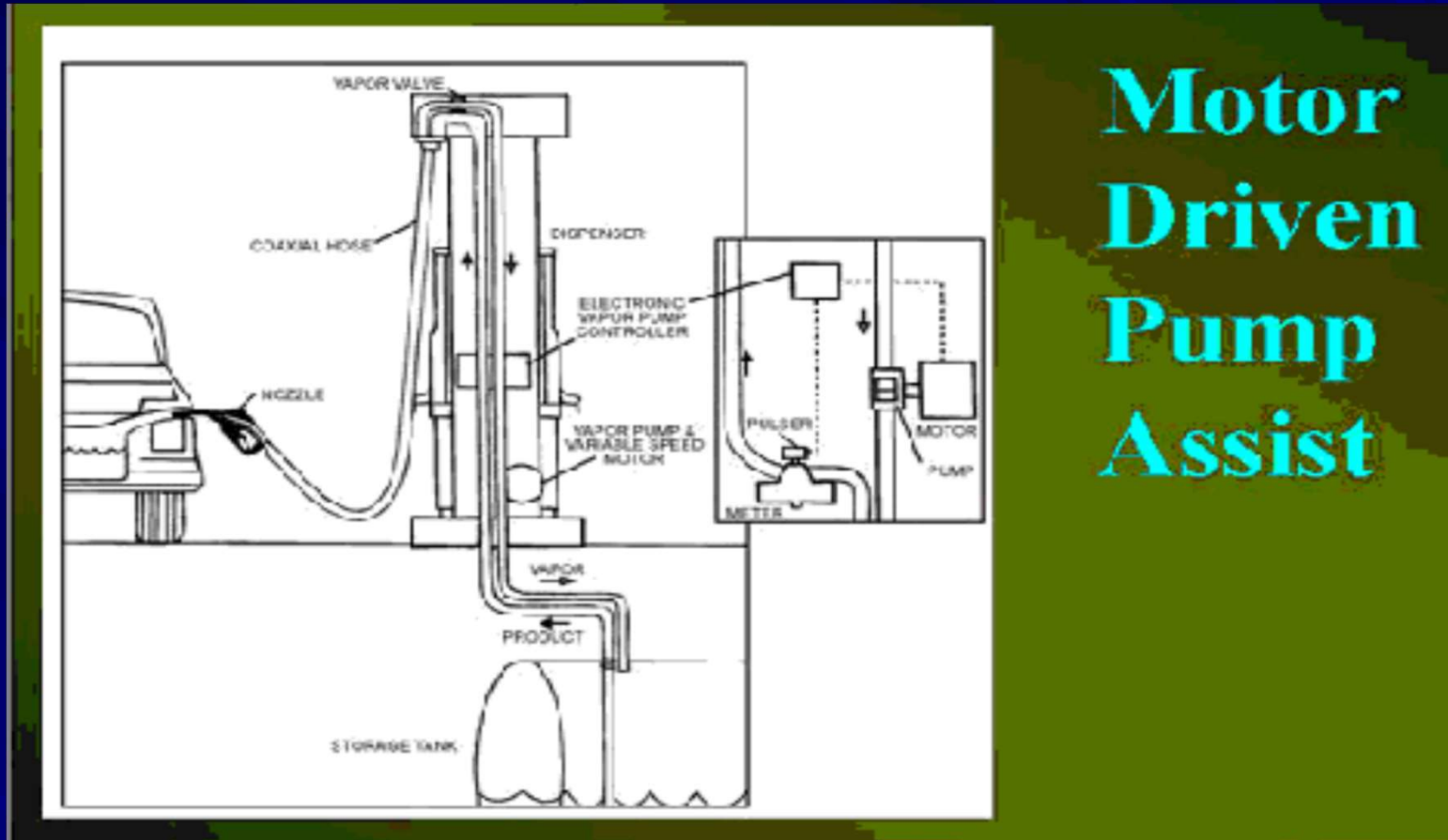
These cracks are likely the cause of weathering and an irresponsible O/O. Get them replaced. Phase II equipment must be 95% effective, so any equipment failures will result in that number being diminished.

Balance Violations



Amazingly, this equipment is not functioning. GDFs with General Permits are required to visually inspect their equipment and keep a log **DAILY!** There are no excuses.

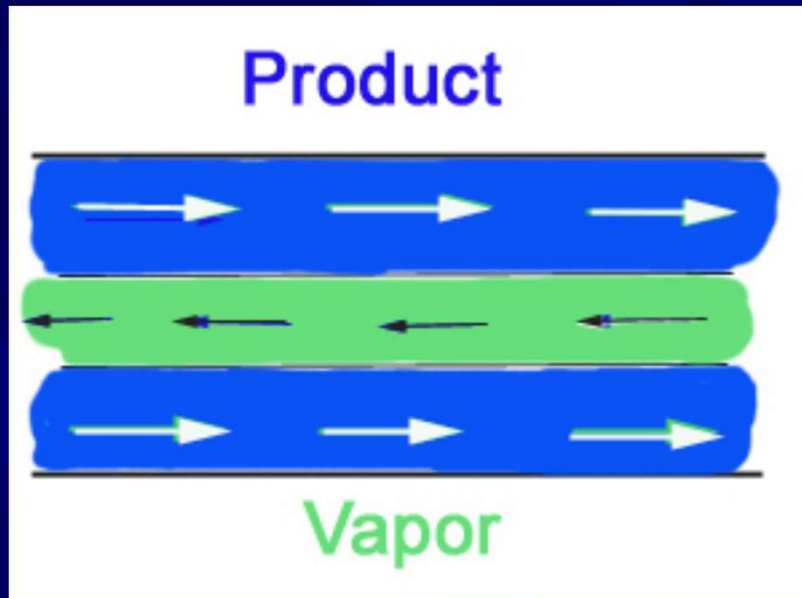
Vacuum Assist System



Motor Driven Pump Assist

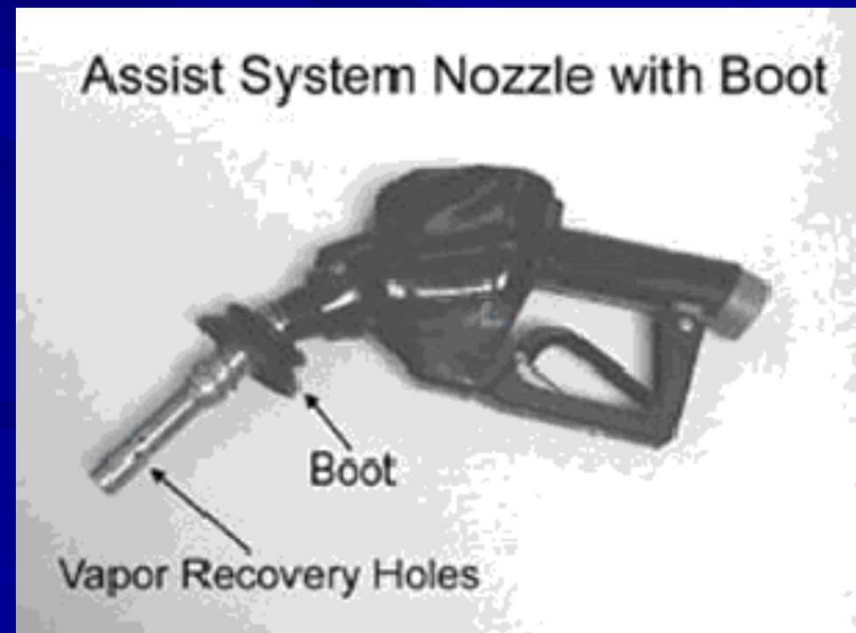
The diagram above shows a vacuum assist recovery system. The system pulls the vapors from the vehicle's fuel tank into the UST using a pump. The vapor pump may be fluid driven, motor driven, or electronically driven. The pump, or pumps, are usually located within the dispenser.

Vacuum Assist



Vacuum Assist equipment differs from balance substantially. The product and vapor flow is inverse from balance in the hose, so any kind of hose failure is even more dangerous. Vacuum Assist is only compatible with two-point Phase I systems, although some facilities in NJ still try to use it with coaxial Phase I.

Vacuum Assist nozzles also appear and operate very differently from a balance system. Gone are the faceplate and bellows, as this system can NOT have a tight seal with the vehicle tank. This active system pulls vapor from the vehicle tank through the holes near the end of the spout.



Vacuum Assist

Here is a better view of a typical Vacuum Assist nozzle. Notice the larger holes which pull in the vapor. Also notice the metal flap about half-way down the spout, this is the latching device that holds the nozzle in place while it is in-use.



Notice this nozzle has a splash-guard. The sole function of this is to prevent spillage during a delivery, it has no vapor recovery function. However, this is required in NJ. Other nozzles do exist without splash-guards, but they are not permitted to be used in NJ.

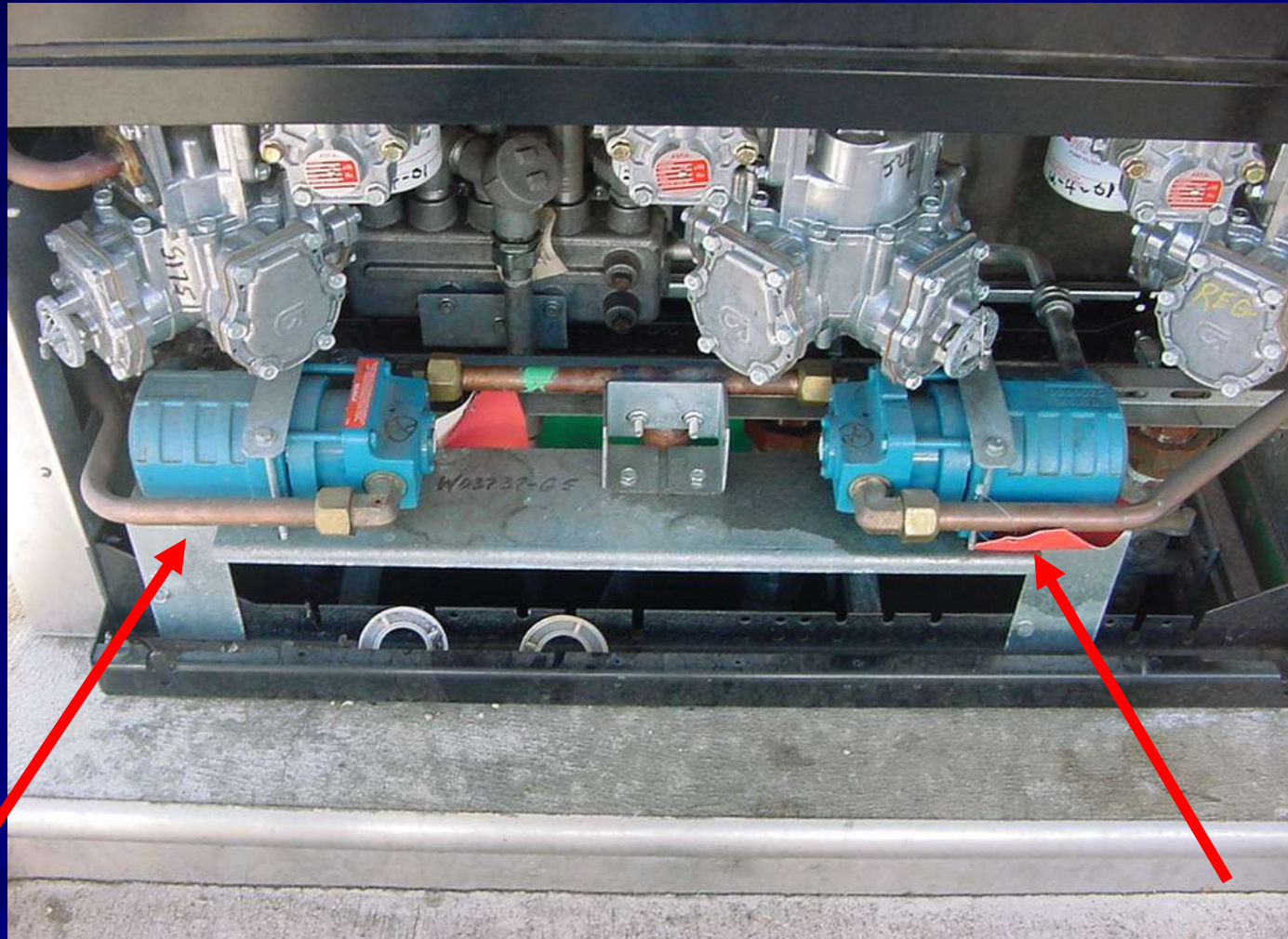


Vacuum Assist



The arrow on the hose pointing out flow direction is not restricted to only Vac Assist systems. Just make sure it's pointing the correct way! Believe it or not, some people can't follow that simple instruction. Note the difference in appearance between the Vac Assist hose and the balance hose shown earlier.

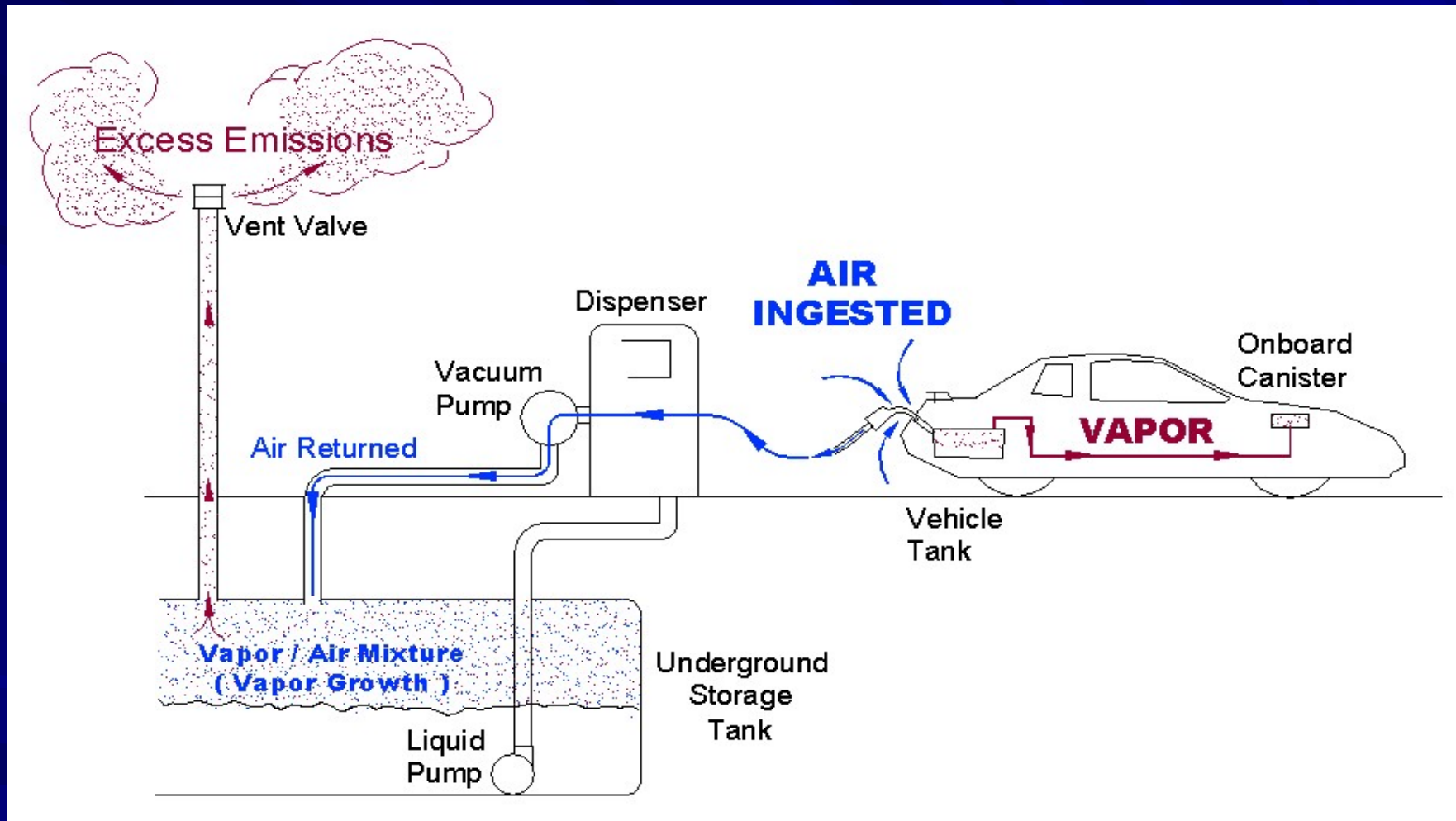
Vacuum Assist



The red arrows are pointing to two Healy Vac-Pumps located in the dispenser at a Vac-Assist station. It is much more common nowadays for these to be in each dispenser rather than the tank field.

The ORVR Problem

(That's Onboard Refueling Vapor Recovery for you sports fans)



Sites that are incompatible with ORVR must decommission Phase 2 by 12/23/20

ORVR Nozzles



If a vacuum assist site has ORVR compatible nozzles, they are NOT required to decommission

Pressure Regulation



If a vacuum assist site is using a device like this, they are NOT required to decommission

Phase 2 Decommissioning

- System not compatible with ORVR (Vac-Assist without permeator or compatible nozzles) – MUST have been decommissioned by 12/23/20.
- Balanced systems or Vac-Assist with permeator must either:
 - Maintain current systems or decommission

Where to cap the vent line?



14 Day Notification

- Annual vapor recovery testing
- Phase 2 Decommissioning – before and after
- Within 72 hours of vapor test fail

14 Day Notification

What goes in it?

14dayUSTnotice@dep.nj.gov

- ▶ Site P.I. number
- ▶ Site name and address
- ▶ Site contact name and phone number
- ▶ Contractor hired name and phone number
- ▶ Scope of work to be done
- ▶ Start date of work

14 Days After Decommissioning What goes in the notification

- Site name and address, PI#, name and contact information for the owner and operator
- the name and contact information of the certified individual and business who conducted the decommissioning
- the date on which the decommissioning was conducted and a decommissioning checklist in accordance with PEI/RP300, or a checklist that may be amended by the Department as applicable.

Post Decommissioning

- New hoses must be CARB certified low permeation hoses
- New nozzles must be “Enhanced Conventional” aka ECO nozzles once equipment has CARB approval
- Tank tie test – one time test after decommissioning
- Pressure Decay, PV Valve annually.
- Dynamic Backpressure and Air to Liquid testing is NOT required.

Post Decommissioning

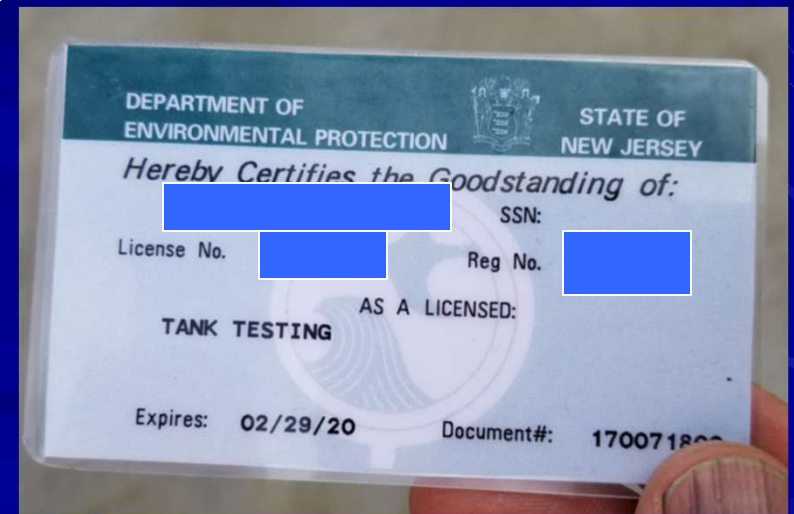


Decommissioning Contractors

- Work completed by a NJ UST contractor certified in installation-entire or closure
- Must be performed according to PEI RP300 – including testing procedures
- 14 day notification to NJDEP prior to and **after completion** (include Pressure Decay, PV Valve, Tie Tank test results and RP300 checklist)

Certified Work

- ▶ The Owner or Operator shall ensure that decommission work is performed by a NJ certified individual and firm in either Installation-Entire or Closure
- ▶ Work must be complete either by the certified individual or under the onsite supervision of a certified individual
- ▶ Ask to see the individual's license
- ▶ Name
- ▶ Effective dates
- ▶ Categories of certification



Phase 1 EVR

- EVR P/V valve now required at installed for new construction and for existing sites by 12/23/18.
- Full EVR system (mix and match) now required at install for new construction and for existing sites by 12/23/24.
- Torque test (annual for facilities with swivel adapters).
- Single point systems are exempt from the torque test.

EVR P/V Valves



Husky Model 5885



OPW Model 723V

Adapters



Fill adapter



Poppet adapter

Some AST sites will have EVR approved non-rotatable adapters. Consult CARB's website at <https://ww2.arb.ca.gov/resources/documents/vapor-recovery-phase-i-evr-ast-executive-orders> for current allowable equipment listings for ASTs.

Phase 1 only Sites

- Phase 1 testing is now required on previously exempt Phase 1 only sites
- Annual testing – PV Valve and Static Pressure Performance
 - Torque test (annual): if swivel adapters are installed; EVR adapters are required for new installs, and existing sites by 12/23/24

Vapor Testing

- Phase 1 (annual test)
 - Pressure Decay
 - PVV
 - Torque test (installations after 12/23/17 or by 12/23/24 for existing)
- Phase 2 (3 year test)
 - Dynamic Backpressure
 - Air/Liquid Ratio (vac. assist only)
- Post Decommissioning Tests
 - Pressure Decay
 - PVV
 - Tie-Tank

Out of Service USTs

- Register as Out of Service within 7 days
- Empty and disconnect/cap piping within 3 months
- Decide if you're keeping or closing system by 11th month
- If tanks and piping are double wall, system is eligible for an extension
- By the end of the 12th month, system must either have an approved extension or be closed
- Penalties for violations are a **\$15k base penalty**



7-day Investigations

- Any time a situation occurs that indicates a possible discharge from the system, an investigation **MUST** be conducted within 7 days
- Fuel alarms, test failures, visual indications of liquid in containment, etc
- Failure to perform a required 7 day investigation is a **\$15k base penalty**



Compatibility



Fuel needs to be kept dry. If water gets into your tank, microbes can multiply and create an acidic environment that corrodes any metal components

Compatibility rules

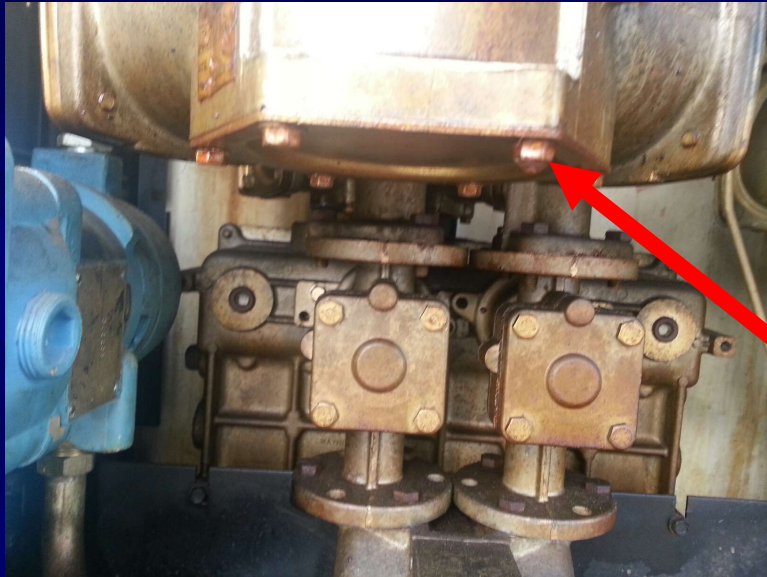
- Owners and operators shall notify the Department in accordance with N.J.A.C. 7:14B-2.1, at least **30 days** prior to introducing into the UST system any regulated substance that contains **greater than 10 percent ethanol** or **greater than 20 percent biodiesel**, or any other regulated substance identified by the Department. Owners and operators must demonstrate compatibility of all UST system equipment and components with these regulated substances using one or more of the following methods:
 - 1. A certification or listing of UST system equipment or components by a nationally recognized, independent testing laboratory for use with the regulated substance stored;
 - 2. The written statement of compatibility from the equipment or component manufacturer, indicating the range of biofuel blends with which the equipment or component is compatible; or
 - 3. Another method that the owner and operator demonstrates is no less protective of human health and the environment than the methods listed in (b)1 or 2 above.

Symptoms of a Problem



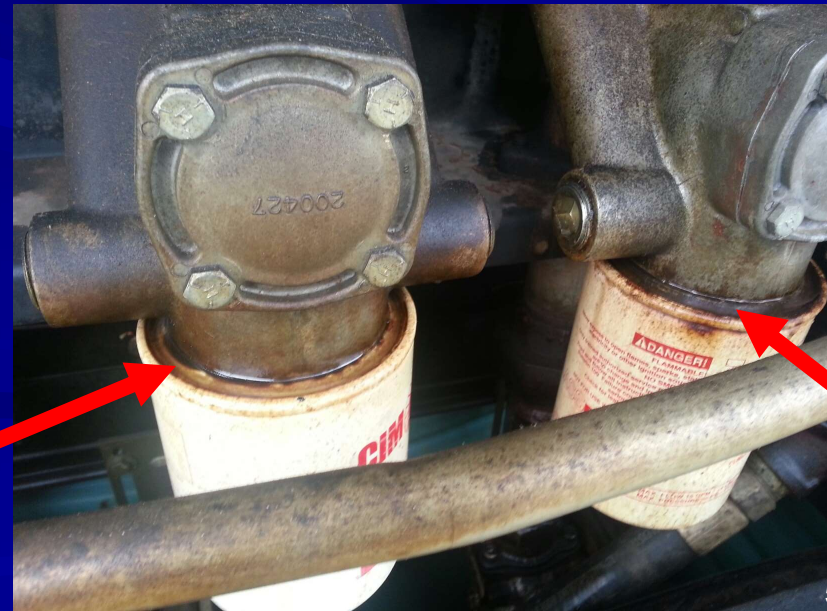
Obviously, equipment can fail over time. But some failures should raise an alarm, especially if more than one of these things is happening at your facility!

More Symptoms



Dispenser meters and filters can get clogged if fuel is contaminated, resulting in the equipment leaking.

One sign of fuel problems is slow-flow at the dispenser. If you get to that point, you likely have many other symptoms of compatibility/fuel quality issues.



MICHAEL HOLLIS

BUREAU OF UST COMPLIANCE AND ENFORCEMENT

609-477-0945

MICHAEL.HOLLIS@DEP.NJ.GOV



ACE Academy Training

May 2021