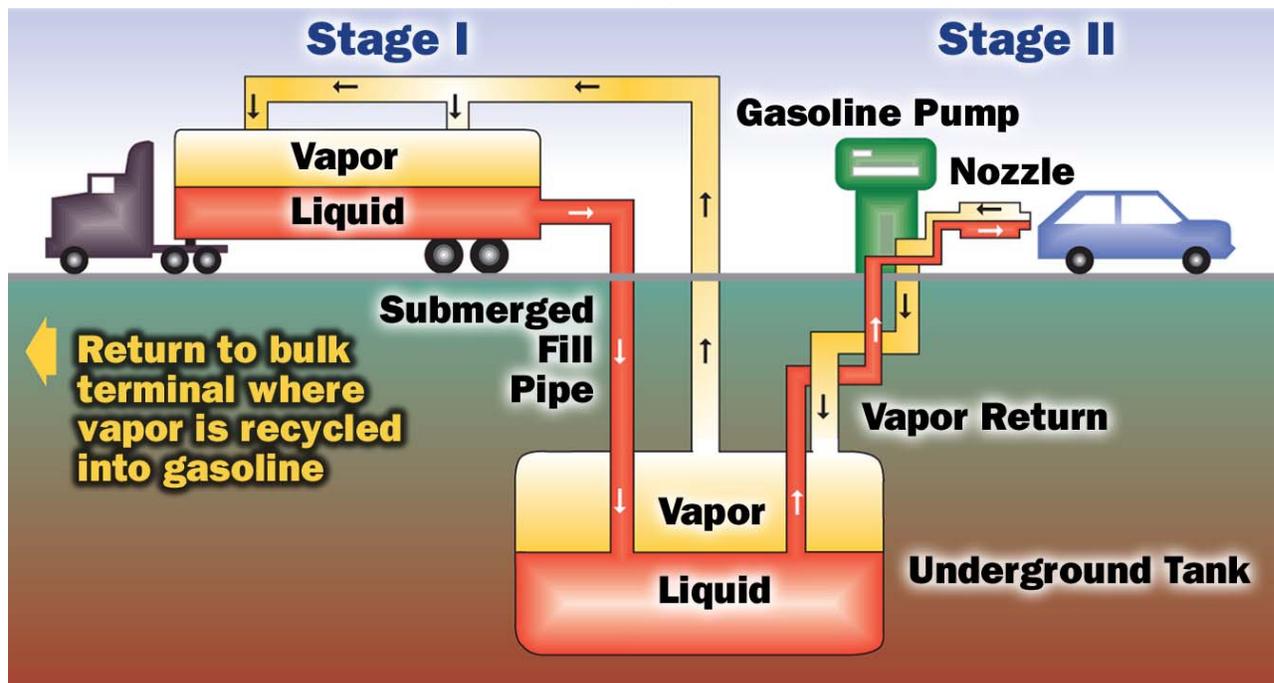


Weekly Inspection Guidance
For Stage II Vapor Recovery
Gasoline Dispensing Facilities
Balance Systems

Balance System, CARB Order G-70-52-AM
Balance System Aboveground Tank CARB Orders

Massachusetts Department of Environmental Protection (MassDEP)
Bureau of Waste Prevention

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Introduction

Under the MassDEP Stage II regulation, only Stage II Vapor Recovery systems approved by the California Air Resources Board (CARB) may be installed in Massachusetts. When CARB certifies a Stage II system a CARB Executive Order is issued. CARB also issues Approval Letters to update existing Executive Orders or to certify new or redesigned Stage II components for use with particular Executive Orders.

Under the MassDEP Stage II regulation, CARB Executive Orders and Approval Letters are enforceable documents and Stage II systems must be installed, operated and maintained in accordance with the terms and conditions of each system's currently applicable CARB Executive Order and Approval Letters.

MassDEP Disclaimer

This document contains guidance information on the MassDEP Stage II regulation and applicable CARB Executive Orders and Approval Letters. This guidance is not a substitute for any requirements contained in the MassDEP Stage II regulation (310 CMR 7.24(6)) or system specific terms and conditions contained in applicable CARB Executive Orders and Approval Letters.

For more detailed program requirements, please see:

- 310 CMR 7.24(6) [Dispensing of Motor Vehicle Fuel](#)
www.mass.gov/MassDEP/air/laws/regulati.htm - apc
- CARB Executive Orders
Stage II systems for underground fuel storage tanks:
<http://www.arb.ca.gov/vapor/eo-PhaseII.htm>
Stage II systems for aboveground fuel storage tanks:
<http://www.arb.ca.gov/vapor/above/above.htm>
- CARB Approval Letters
<http://www.arb.ca.gov/vapor/approval/appr-all.htm>

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1.0 Balance Stage II System Training

How a Balance Stage II System Controls Gasoline Vapors

To prevent gasoline fumes from being emitted to the air during refueling, a "Balance" Stage II system relies on the vacuum created between two tanks in a closed system when liquid is dispensed from one tank to the other i.e., when the gasoline is dispensed from the facility's fuel storage tank to the vehicle's gas tank.

Or, described another way, in a vehicle's empty gas tank, air/gasoline vapors fill the space in the tank not filled by gasoline. As gasoline is dispensed from the facility to the vehicle, the air/gasoline vapors in the vehicle tank are pulled back to the facility's storage tank by the vacuum created by the falling level of gasoline in the facility's storage tank being replaced with the air/gasoline vapors from the vehicle tank.

Training for Correct Balance System Installation, Operation and Maintenance

Stage II System owner/operators and their employees who perform required weekly visual inspections of the Stage II system must be trained in the correct installation, operation, and maintenance of their Stage II system. Required training can be completed by reviewing the terms and conditions of system's CARB Executive Order, Approval Letters, and the system guidance materials presented in this document.

Stage II Training Log – Requirements (see Stage II Training Log on page 28)

Upon completing Stage II System training, a log of all current persons trained to perform weekly Stage II inspections must be maintained on site at the Stage II facility. The log must include the following: the date training completed, the person's printed name and signature.

CARB Executive Orders and Approval Letters

CARB Executive Orders contain the terms and conditions by which a Stage II system is correctly installed, operated, and maintained, as well as specific components (nozzles, hoses, fittings, etc) approved for use with the installed Stage II system. CARB issues Approval Letters to update existing Executive Orders or to certify new or redesigned Stage II components for use with particular Executive Orders.

Please Note: Under the MassDEP Stage II regulation, CARB Executive Orders and Approval Letters are enforceable documents and Stage II systems must be installed, operated and maintained in accordance with the terms and conditions of each system's currently applicable CARB Executive Order and Approval Letters.

Identifying Your Stage II System's CARB Executive Order Number

The CARB Executive Order number for your Stage II system can be obtained from the following sources:

- Your facility's currently applicable Stage II Compliance Certification Form;
- Your Stage II Compliance Testing Company; or
- The MassDEP Stage II Program (617-556-1035)

Obtaining a Copy of Currently Applicable CARB Executive Order and Approval Letters

Copies of your Stage II system's currently applicable CARB Executive Order and Approval Letters can be obtained from the CARB Web Page:

Executive Orders

- Facilities with underground fuel storage tanks should refer to the following Executive Order (G-70-52-AM):

<http://www.arb.ca.gov/vapor/eos/eo-52/eo-52am.htm>

and review the following exhibits:

Exhibit 2 lists the CARB approved equipment.

Exhibits 5-11a show the dispenser configuration requirements.

Please Note: G-70-52-AM was last updated in 1991. Please review applicable Approval Letters for currently applicable components and requirements (see link to Approval Letters below).

- Facilities with aboveground fuel storage tanks use the following web page:

<http://www.arb.ca.gov/vapor/above/above.htm>

- Nozzles Approved for Balance Systems

Executive Order G-70-199-AJ identifies all nozzles certified to meeting the liquid retention (spillage) standard and the specific nozzle(s) approved for use with specific Stage II systems.

Facility owner/operators must refer to Executive Order G-70-199-AJ (<http://www.arb.ca.gov/vapor/eos/eo-199/eo-199.htm>) to identify nozzles approved for use with his or her Stage II system.

Approval Letters

<http://www.arb.ca.gov/vapor/approval/appr-all.htm>

2.0 Balance Stage II System Installation and Maintenance Guidance

All above ground Balance system components (i.e. nozzles, hoses, breakaways, swivels, dispensers, etc.) are approved under CARB Executive Order G-70-52-AM. G-70-52-AM contains diagrams of different types of gasoline dispensers called "exhibits". Each Exhibit includes the equipment requirements applicable to each dispenser type.

Exhibits 5 and 10 are the two most common Balance system dispenser types (see Diagrams 1. and 2. on pages 20 and 21, respectively). If the dispensers at a your facility do not look like Exhibits 5 or 10, please look in Executive Order G-70-52-AM to identify your dispenser type.

Please Note: G-70-52-AM Exhibits 4, 6, and 7 are obsolete and not permitted in Massachusetts.

Balance System Nozzles

Nozzle Boot Length

There are two different lengths for balance nozzle boots: "long" and "short".

- **Short Boot:** The short boot is roughly four inches long and was originally designed to fit in the nozzle holster of Exhibit 5 dispensers.
- **Long Boot:** The long boot is roughly seven inches long and was originally designed to fit in the nozzle holster of blending or multi-product dispensers such as the Exhibit 10 dispenser.
- **Compressed Nozzle Boot Causes Vapor Leaks:** If the nozzle boot becomes compressed when hanging on the dispenser holster, gasoline vapors will escape from the nozzle. To remedy this problem move the nozzle holster down so the boot is not compressed, or install a short boot nozzle.
- **Nozzle Does Not Hang on Dispenser Holster:** To remedy this problem, move the nozzle holster up, or install a long boot nozzle.

Loose, Torn, or Damaged Boots

Nozzle boots create a tight seal around the fuel tank filler neck preventing the ingestion of air into the vapor recovery system. Loose, torn, or damaged nozzle boots must be tightly attached to the nozzle and immediately replaced if torn or damaged or taken out of service and replaced within 14 days.

Nozzle Automatic Shut-off Failure

- **Automatic Shut-Off failure:** A nozzle should shut-off or "click" off as gasoline reaches the top of the fuel tank. Nozzles that fail to click off indicate a broken automatic shut-off valve. Automatic shut-off failures result in over-filling of the tank, causing gasoline spillage.

Any nozzle that fails to shut off shall be immediately replaced or immediately taken out of service and replaced within 14 days.

Please Note: The most common Stage II Complaint that MassDEP receives are complaints regarding nozzles that fail to shut off.

Nozzle Continually Clicks Off During Fuel Dispensing

A nozzle that continually "clicks off" when dispensing fuel to an unfilled tank can indicate one or more of the following:

- Previous operator topped off causing a liquid blockage in hose vapor return line.
- A broken nozzle or improperly installed nozzle component.
- A liquid blockage in the dispenser piping or the underground vapor return line.

Clearing the Hose Vapor Return Line

To clear the hose vapor return line, raise and extend the hose so the gasoline drains back into the dispenser. Or, point the nozzle downward and drain the gasoline into a bucket. Pour the gasoline in the bucket back into the appropriate octane/grade fill pipe of the underground storage tank.

If a nozzle continues to click off after trying to clear the vapor return line, immediately replace the nozzle or immediately take the nozzle out of service and replace it within 14 days. If the problem persists, contact your maintenance contractor or Stage II Testing Company to determine if there is a liquid blockage problem in the underground piping.

Leaking Nozzles

- **Leaking Nozzles:** Nozzles approved for use with Balance systems under CARB Executive Order G-70-199-AL are designed to be "dripless". If, upon stopping the dispensing of gasoline, more than a few drops of gasoline continue to drip from the nozzle, it is an indication of a leaking nozzle.

Any nozzle that leaks gasoline must be immediately replaced or immediately taken out of service and replaced within 14 days.

Exhibit 5 Dispenser: 10-Inch Hose Loop Requirement

Under Executive Order G-70-52-AM, an Exhibit 5 Dispenser cannot have a hose loop exceeding 10 inches as measured from the point where the nozzle meets the metal hose swivel attachment to the lowest point of the hose (see Diagram 1. on page 20).

Hose loops exceeding 10 inches are improperly installed or configured and must be immediately corrected or immediately taken out of service and corrected within 14 days.

Hose loops exceeding 10 inches, may be re-installed or reconfigured by one or more of the following component adjustments:

- **Hose Length:** One or both hose sections may be too long. Hoses can be purchased in half-foot increments, for example, 4.0, 4.5, and 5.0 foot sections. DEP suggests that the hose length be checked first.
- **Retractor Bar Height:** Exhibit 5 allows a retractor bar height from five to seven feet. If the retractor bar is less than seven feet in length it can be moved up but to no more than seven feet in height measured from bottom of dispenser.
- **Nozzle Holster:** The "holster" that the nozzle rests on can be moved up or down.
- **Retractor cable hose attachment:** The retractor cable hose attachment can be moved left or right. Make sure the hose attachment is tightened after moving it. The first three options above should be attempted before adjusting the retractor cable hose attachment.

Balance System Hose Length

Balance system hoses can not touch the island top or pavement when the nozzle is resting in the nozzle holster. A hose that touches the island will eventually wear through allowing vapors to escape.

To shorten a dispenser's hose length, the hose on either side of the Breakaway may be replaced with a shorter length of hose. Such hoses can be purchased in half-foot increments, for example, 4.0, 4.5, and 5.0 foot sections.

Please Note: In the case of a "Dog Bone" shaped island, where the wider island ends protect the hose from damage by vehicle tires, the hose may touch the vertical face of the Dog Bone island, but not the pavement. This exception also applies for Exhibits 8, 9c, & 11.

Exhibit 5 Hose Retractors

When the nozzle is resting in the holster of an Exhibit 5 Dispenser, the retractor cable must pull the hose to the top of the retractor bar.

Hose retractors that do not pull the hose to the top of the retractor bar must be immediately repaired or replaced or immediately taken out of service and repaired or replaced within 14 days.

Hose retractors that do not pull the hose to the top of the retractor may be repaired by one or more of the following component adjustments.

- **Hose Length:** If the hose is too long it will add extra weight preventing the retractor from working properly. If the hose is too short the hose will not be pulled to the top. If the hose is too short, the retractor cable hose attachment will stretch and damage the hose.
- **Retractor Cable:** If the retractor cable breaks, do not retie it. A new retractor cable of the correct length must be installed.
- **Retractor Assembly:** Replace the retractor assembly if the hose is not pulled to the top after adjusting the hose length and retractor cable.

Liquid in Hose Vapor Return Lines

Overfilling or "topping off" a gas tank often results in gasoline being drawn into the vapor return portion of the hose. If a nozzle constantly clicks off during fuel dispensing it is an indication of gasoline likely being trapped in the vapor return portion of the hose.

- **Exhibit 5 Dispensers**
To empty gasoline from Exhibit 5 Dispenser vapor return lines, extend the nozzle downward and drain the gasoline into a bucket. Pour this gasoline back into the appropriate grade fill pipe of the storage tank.
- **Exhibit 10 Dispensers**
Exhibit 10 Dispenser hoses are required to have an internal liquid removal system (also applicable to Dispenser Exhibits 8, 9c, & 11). The liquid removal system is composed of internal siphon tubes that automatically remove gasoline that collects in the vapor return portion of the hose.

Please Note: Correct hose length is critical so that the liquid removal system is in the bottom of the hose loop. If a hose is too long the liquid removal system will not be at the bottom of the hose loop rendering the liquid removal system useless.

Hose Breakaways

Hose breakaways are designed to allow the nozzle and hose assembly to "breakaway"

from the dispenser in case a customer drives off with the nozzle still in the fuel tank filler neck. Failing to install breakaways will result in nozzle, hose, and dispenser damage, and possible personal injury to staff and customers.

Breakaway Installation

- On Exhibit 5 Dispensers, always install the breakaway between the main hose and the retractor cable/bar, **not** between the retractor cable/bar and the dispenser.
- On Exhibit 10 Dispensers, always install the breakaway between the whip hose and the main hose, **not** between the main hose and the nozzle.
- All breakaways have an arrow indicating the direction of gasoline flow. Always install the breakaway with the arrow pointing towards the nozzle.

Breakaway Maintenance

Gasoline residue around a breakaway is an indication of a leaking breakaway. If a breakaway is leaking, immediately replace it or immediately take the breakaway out of service and replace the breakaway within 14 days.

If a customer drives off with a nozzle still in the fuel tank filler neck resulting in the disengagement of the breakaway from the whip hose and dispenser, the breakaway must be replaced. The breakaway can only be reconnected if a CARB approved "reconnectable" breakaway has been installed (<http://www.arb.ca.gov/vapor/approval/cal-07/07-08.pdf>).

3.0 Aboveground Storage Tanks

There are three typical Stage II installations for Aboveground Storage Tank (AST) Systems.

Please Note: Please also refer to Board of Fire Prevention Regulations, 527 CMR 9.00, "Tanks and Containers", for applicable installation requirements for Aboveground Storage Tank Systems.

Small ASTs (500 to 1,000 gallon capacity)

On small ASTs, where it is possible to access the dispenser and nozzle from the top of the AST, top mounted dispensers with a balance Stage II system are typically used (see Diagram 4. on page 23).

All CARB Executive Orders for balance AST systems show a diagram of a small AST.

Large ASTs (1,000 gallons or greater)

On large ASTs that are too tall to access the dispenser and nozzle from the top of the top of the tank, a dispenser is mounted next to the AST, or on a remote fuel-dispensing island.

All balance system dispenser configurations identified in Executive Order G-70-52-AM may be installed on large ASTs. However, all G-70-52-AM dispensers configurations installed on large ASTs must also install a Condensate Trap/Siphon Line.

Condensate Trap/Siphon Line: Since the dispenser vapor return line is lower than the top of the AST, a condensate trap/siphon line must be installed to remove any gasoline condensate that collects in the vapor return line under the dispenser. The condensate trap/siphon line should clear any gasoline condensate

in the vapor return line.

An example diagram of a condensate trap/siphon line installation can be seen in Healy Executive CARB Order G-70-187, Exhibit 2, figures 2A & 2B.

Please Note: ASTs, like all gasoline dispensing systems with Stage II controls, must pass dynamic back pressure and liquid blockage Stage II tests. If a large AST system fails these Stage II tests, the vapor return lines and/or condensate trap must be correctly repaired or reinstalled.

However, on large ASTs, test failures may also be caused by insufficient vacuum to clear the vapor line of condensate. If this is the case, then installation of a Healy 400 ORVR nozzle Vacuum Assist Stage II system (CARB Order G-70-187), may be necessary.

Healy 400 ORVR AST System With A Condensate Trap/Siphon Line (CARB Order # G-70-187)

A Healy 400 ORVR AST system's dispenser must be installed attached to the side of the AST, or on a remote fuel dispensing island.

For more information on Healy Stage II systems, please refer to the MassDEP Healy Inspection Guidance Document and applicable CARB Executive Orders.

4.0 Stage I Vapor Recovery

Stage I Vapor Recovery refers to the gasoline vapor control system between the fuel delivery truck and gasoline storage tanks located at each facility. The way Stage I works is; when gasoline is delivered to a facility, the level of fuel in the storage tanks rise, forcing the vapors in the storage tank back, through the Stage I system, to the fuel delivery truck's tanks. The tank truck then returns to the gasoline terminal where the vapors are collected and condensed back to gasoline.

Stage I Vapor Recovery for Balance Systems

All Balance systems must have a Stage I Vapor Recovery system installed with it. There are two types of Stage I Systems that can be installed on Balance UST Stage II Systems: coaxial or two-point. A Balance system can have either a coaxial or two-point Stage I system, but not both.

- **Coaxial Stage I:** Gasoline tanks with coaxial Stage I have a single product fill/vapor return connection where gasoline is delivered and vapors are extracted (see Diagram 5. on page 24). The coaxial tank drop tube has an inner pipe for gasoline delivery, and an outer pipe that recovers vapors collected in the tank.
- **Two-Point Stage I:** Gasoline tanks with two-point Stage I have a single product fill connection for gasoline delivery and a separate connection for vapor extraction (see Diagram 6 on page 25).

Maintenance of Stage I Components

Properly maintained Stage I components prevent the escape of gasoline vapor from your gasoline storage tanks during delivery of gasoline to your facility. The Stage I System must be inspected and maintained to prevent the loss of vapors.

Two-Point Stage I System Dry Break Valves

The vapor extraction poppet is called a "Dry Break Valve" or "Vapor Adaptor" (see Diagram 7. on page 26). The Dry Break has a spring loaded vapor seal. Press down on the vapor seal and let go (Be cautious of potential excess vapors escaping from the dry-break when pressing down on the vapor seal to test). The vapor seal should snap shut making a tight seal and should not spin freely. Dry breaks that do not close tightly or have leaky vapor seals must be immediately replaced or a new seals installed.

Vapor Caps

All product fills and dry breaks must be equipped with a Vapor Cap. The Vapor Cap keeps the connection clean and prevents vapors from escaping to the air (see Diagram 7. on page 26). Vapor Caps must snap shut making a tight seal and should not spin freely. Vapor Caps that do not snap shut tightly or have leaky vapor seals must be immediately replaced or a new rubber gasket installed.

Rubber Gaskets

A rubber gasket must be installed under each vapor cap.

Please Note: Upon opening a Spill Containment Bucket, the presence of gasoline fumes is an indicator of a leaking vapor cap gasket. Leaking vapor cap gaskets must be immediately replaced.

Spill Containment Buckets

Spill containment buckets are designed to collect excess gasoline if a tank is overfilled (see Diagram 8. on page 27).

- Bucket Lids: Spill buckets must have a tight fitting lid to prevent the introduction of water and debris.
- Clean Buckets: Spill buckets must be free of water, dirt, leaves, or other debris at all times.
- Buckets with Drain Valves: Spill buckets with drain valves must be engaged manually after every fuel delivery to drain gasoline back into the tanks. Gasoline cannot be left in spill buckets since it will evaporate and is a source of air pollution.
- Buckets without Drain Valves: If the spill buckets do not have drain valves, the gasoline must be removed manually with a hand pump, and drained back into the product fill pipe.
- Gasoline/water mixtures in spill buckets should not be drained back into the tank.

PLEASE NOTE: Gasoline/Water mixtures are considered hazardous waste unless managed in accordance with 310 CMR 30.104(3)(e). Gasoline/water mixtures not managed in accordance with 310 CMR 30.104(3)(e) must be collected in sealed drums with proper labeling in accordance with 310 CMR 30.000 (other than 30.104(3)(e)).

Spill containment buckets are designed to collect excess gasoline if a tank is overfilled. An additional potential source of excess gasoline can be gasoline delivery drivers emptying residual gasoline from the delivery hose into the buckets. Consult your gasoline delivery company to ensure excess gasoline

in the delivery hose is drained into the product fill pipe, not the spill bucket.

5.0 Routine Maintenance, Minor and Substantial Modifications: Compliance Testing and Certification Submittal Requirements

Definition of Routine Maintenance, Minor Modification and Substantial Modification

Routine Maintenance means, for the purposes of 310 CMR 7.24(6), the regular re-installation, repair or replacement of one or more Stage II System components including, but not limited to: hoses; nozzles; breakaways; swivels; hose retractors; bucket plow rings; "slip-on" spill or dry break buckets; "O" rings and seals; submersible pumps or suction pipes; fill adaptors; fill tubes; vapor adaptors; fill and vapor caps; drain valves; monitor caps; or riser caps.

Minor Modification means, for the purposes of 310 CMR 7.24(6), the re-installation, repair or replacement of one or more Stage II System components that is not substantial, including, but not limited to: less than 50% of the motor vehicle fuel dispensers (e.g., 1 of 4 dispensers); a central vacuum unit of a Healy 400 ORVR nozzle system or Healy 600 nozzle system; ball float extractor valve housings; dispenser mounted vapor pumps; or "screw-on" spill or dry break buckets. If the re-installation, repair or replacement of Stage II System components occurs at a motor vehicle fuel dispensing facility with two or less dispensers, the re-installation, repair or replacement of only one of the motor vehicle fuel dispensers shall be a Minor Modification.

Substantial Modification means, for the purposes of 310 CMR 7.24(6), the re-installation, repair or replacement of one or more Stage II System components including, but not limited to: 50% or more of the motor vehicle fuel dispensers (e.g., 2 of 4 dispensers); the replacement of one type of Stage II system with another type (e.g., replacement of a balance system with a vacuum assist system, or a Healy 400 ORVR nozzle system or Healy 600 nozzle system with a Healy VP-1000 system); or the re-installation, repair or replacement of Stage II System components requiring excavation below a shear valve or tank pad (e.g., vapor return piping, vent piping, vapor space tie bar, two-point or coaxial Stage I systems; or motor vehicle fuel storage tanks). If the re-installation, repair or replacement of one or more Stage II System components occurs at a motor vehicle fuel dispensing facility with two or fewer dispensers, the re-installation, repair or replacement of all motor vehicle fuel dispensers shall be a Substantial Modification.

Applicable Compliance Testing, Recordkeeping and Certification Requirements

MODIFICATION/REPAIR	TESTING REQUIRED
A. ROUTINE MAINTENANCE	
For routine maintenance and repairs, no submittal to MassDEP or compliance testing is required. Record of repairs is required to be maintained on site in applicable maintenance logs.	
1. Replace hose, nozzle, breakaway, swivel, hose retractor.	No test
2. Replace bucket plow ring	No test
3. Replace "slip-on" spill or dry break bucket. If "screw-on" spill bucket must be replaced. See screw-on spill bucket below.	No test
4. Replace "O" rings and seals	No test
5. Replace/repair submersible pump/suction pipe	No test
6. Replace/repair fill adaptor, fill tube, vapor adaptor, fill and vapor caps, drain valves, monitor caps, riser caps	No test
B. MINOR MODIFICATIONS	
For minor modifications and repairs, compliance testing is required to be performed and passed, but submittal of a Form A to MassDEP is not required. Records of repairs and test results are required to be maintained on site in applicable logs.	
1. Replace dispenser mounted vapor pump (vacuum motor).	Air-to-Liquid Ratio Test (A/L) for that vapor dispenser and applicable nozzles
2. Replace "screw-on" spill or dry break bucket.	Pressure decay
3. Isolate diesel tank or other fuel storage tank not in use from Stage II system.	Pressure decay
4. Replace/repair <50% of total dispensers (e.g., 1 of 4 dispensers).	Pressure decay, dynamic back pressure/liquid blockage, (Air-to-Liquid Ratio for vacuum assist systems)
5. Replace/repair <50% of dispenser piping.	Pressure decay, dynamic back pressure/liquid blockage
6. Replace/repair Healy central vacuum unit for Healy 400 ORVR nozzle system or Healy 600 nozzle System.	Healy vapor return line test, Healy Fillneck Pressure (Healy 400 ORVR), Air-to-Liquid Ratio (Healy 600)
7. Replace/repair ball float extractor valve housing.	Pressure decay
C. SUBSTANTIAL MODIFICATIONS	
For substantial modifications and repairs, all applicable tests are required to be performed and passed ("full system test") and a fully completed Form A must be submitted to MassDEP prior to commencing system operation. Records of repairs and testing are required to be maintained on site in applicable logs.	
1. Excavate below shear valve or tank pad to repair, replace or install vapor return piping, vent piping, vapor space tie bar, two-point or coaxial Stage I systems.	Full system test
2. Excavate below shear valve or tank pad to repair or replace Tank	Full system test
3. Replace/repair $\geq 50\%$ of the vapor recovery system	Full system test
4. Replace/repair $\geq 50\%$ of the dispensers (e.g., 2 or more of 4 dispensers)	Full system test

5. Replace Stage II system with another type (e.g., replace balance system with vacuum assist system, replace Healy 400 ORVR nozzle system or Healy 600 nozzle system with Healy VP-1000 system)	Full system test.
<p>D. Facilities Currently Exempt From Stage II Requirements For gasoline dispensing facilities currently exempt from Stage II installation requirements (i.e., the facility was installed <u>prior to</u> 11/1/1989 and since 11/1/1989 has <u>not</u> been substantially modified <u>or</u> dispensed more than 10,000 gallons of gasoline in any one month) any modification or repair of the gasoline dispensing system identified below or the dispensing of more than 10,000 gallons of gasoline in any one month <u>will trigger the requirement to</u> (a) install a Stage II system, (b) perform and pass all applicable tests and (c) submit a fully completed Form A to MassDEP, prior to commencing system operation.</p>	
1. Excavate below shear valve or tank pad to repair, replace or install vent piping and/or two-point or Coaxial Stage I systems.	
2. Install, repair or replace tank and/or fuel distribution system.	

6.0 Balance System Weekly Visual Inspection Instructions

The MassDEP Stage II regulation requires all Stage II systems to be visually inspected on a weekly basis (once every seven days) to ensure the system is operating correctly and properly maintained.

- Only persons who have been trained can conduct Weekly Stage II Inspections.
- MassDEP recommends that at least two persons be trained for each Stage II facility.
- See Balance System Weekly Visual Inspection Checklist on page 29.

Safety Precautions When Conducting Weekly Stage II Inspections

- Place safety cones around the inspection area. Be aware of moving cars while conducting inspection.
- Wear high visibility safety vest, safety goggles, gloves, and steel toe boots.
- Use a spark resistant crowbar or spark resistant screwdriver for opening Spill Containment buckets and Vapor Connection buckets.

Completing the Balance System Weekly Inspection Checklist

- Enter inspection date to the right of "Week of:"
- Answer all questions, check either "Yes" or "No" for each question.
If you do not understand an inspection question please contact the MassDEP Stage II program at 617-556-1035.
- In the right-hand column of the Inspection Checklist, actions taken in response to incorrectly installed, non-functioning, or broken components at the time of inspection must be noted and the date any repairs completed.

- The Balance System Weekly Inspection Checklist must be fully completed, signed and date by the person performing the inspection.

Please Note:

If your answer to an inspection question has an asterisk (*) next to it, then the component is either incorrectly installed, non-functioning, or broken and therefore in non-compliance with applicable program requirements.

If incorrectly installed, non-functioning, or broken components are identified during a weekly inspection, the following steps must be taken:

- i. immediately repair the incorrectly installed, non-functioning or broken (broken) component(s); or, if the broken component could not be immediately repaired;
- ii. immediately stop dispensing gasoline through the broken component(s), post "Out of Service" signs on it, and repair it within 14 days; or, if the broken component(s) could not be repaired within 14 days;
- iii. immediately isolate¹ the broken component(s) from the remainder of the Stage II system so that the remainder of the Stage II system is correctly operating and post "Out of Service" signs on the broken component(s) until repaired; or, if the broken component(s) can not be isolated from the remainder of the Stage II system so that the remainder of the Stage II system is correctly operating;
- iv. immediately stop ALL dispensing of gasoline at the facility and post "Out of Service" signs on ALL motor vehicle fuel dispensers until the component(s) is repaired.

¹ **Isolate** shall mean, for the purposes of the Stage II regulations, to take out of service of one or more components of a Stage II system so that the remainder of the Stage II system operates as required by the terms and conditions of the system's currently applicable Executive Order.

7.0 Stage II Compliance Testing Requirements

Required Stage II Tests for Balance Systems

TEST NAME	FREQUENCY	DESCRIPTION
Pressure Decay Test	Annually*	Quantifies vapor tightness of the vapor recovery system.
Vapor Space Tie Test	Annually*	Verifies if the underground tanks have been manifolded (connected by vapor piping). Multiple tanks must be manifolded together with vapor piping to distribute the collected vapors evenly to all tanks if there is a "common" Stage II vapor return line. Configurations which include dedicated Stage II vapor return lines to specific tanks do not need to be manifolded but must be verified to return to the proper tank.
Pressure Vacuum Vent Valve Test	Annually*	Determines if the Pressure Vacuum Vent Valves are opening at the correct pressure setting and closing at the correct vacuum setting.
Dynamic Back Pressure Test	Upon installation or substantial modification** <u>and</u> every 3 years	Determines vapor flow resistance through the vapor recovery piping.

*Annually: Tests notated as "Annually", are also required at installation, substantial modification, and every three years.

**Substantial modification: See 4.0 Routine Maintenance, Minor and Substantial Modifications: Compliance Testing and Certification Submittal Requirements.

8.0 Recordkeeping Requirements

Under the MassDEP Stage II regulation, all Stage II facilities must maintain, on-site, the following records for the most recent rolling twelve-month period:

- Stage II Training Log: The training log documents all facility employees currently trained to perform Stage II weekly visual inspections.
- Weekly Inspection Checklists: All weekly inspection checklists for the most recent rolling twelve-month period.
- Stage II Certification Forms: Copies of all applicable Stage II In-Use Compliance Certification forms for the most recent rolling twelve-month period.
- Stage II Test Reports: Copies of all Stage II Compliance Testing Company test reports.

Please Note: MassDEP recommends the above records be maintained in a single 3-ring binder.

9.0 Fuel Dispensing: Topping Off & Spill Prevention

Topping Off Results in Blocked Hoses

Overfilling or "topping off" a gas tank can draw gasoline into the vapor return openings of the nozzle, causing a blockage in the hose vapor return line. This blockage will effect the proper operation of the Stage II vapor recovery system. If a blockage occurs vapors cannot be collected.

- **Clearing the Hose Vapor Return Line:**

Clear the Hose by raising and extending the hose so the gasoline will drain back into the dispenser. If this does not work then point the nozzle downward and drain the gasoline into a bucket. Pour the gasoline back into the appropriate octane/grade fill pipe of the underground storage tank.

Topping Off results in Gasoline Spills

Overfilling or "topping off" a gas tank can result in gasoline spillage. Gasoline contains many toxic compounds that are harmful to public health and the environment.

Cleaning up Gasoline Spills and Disposal of Gasoline Absorbents

An absorbent such as "Speedy Dry" should be used to limit gasoline contamination to the environment. Disposal of gasoline absorbents must be done in accordance with Massachusetts Hazardous Waste regulations (see 310 CMR 30.302: Determination of Whether a Waste is Hazardous). If the gasoline/absorbent is determined to be hazardous, it must be collected in sealed drums with proper labeling in accordance with 310 CMR 30.000.

10.0 Stage II Cost Saving Ideas

Maintain the Stage II System. Your station may be eligible for a Form D1 (no test required) if you are diligent about maintaining your Stage II system. If you pass all certification tests on the first attempt, two years in a row, and postmark your Form C by the due date, you will be eligible for a Form D1.

Install Multi-Product Blending Dispensers to reduce the number of nozzles & hoses that need to be maintained. Blending dispensers have one nozzle/hose assembly on each side of the dispenser.

Shop around for Stage II Testing companies. The prices for Stage II Tests will vary widely so call a number of testing companies to inquire about test prices. MassDEP also recommends that you ask the testing companies for references. MassDEP does not certify Stage II testing companies.

Stage II Equipment Warranty: If purchased nozzles and hoses are under a year warranty have the Stage II system tested within the year. Equipment may fail the test and it will still be covered under the warranty. Hold on to your equipment purchase receipts.

11.0 MassDEP Resources & Other State Agency Resources

MassDEP Stage II Resources:

Stage II Info Line Boston (Answering Machine): (617)-556-1035

MassDEP Stage II email address: aq.stage2@state.ma.us

Marc Bolivar, Database Management & Facility Information Support:
(617) 292-5527

Jeff Gifford, Regulation, Technical, & Enforcement Support:
(617) 556-1144

MassDEP guidance regarding: hazardous wastes, handling used oil filters, etc.

www.mass.gov/MassDEP/recycle/laws/policies.htm

MassDEP Bureau of Waste Site Cleanup (cleanup of oil and hazardous material spills)

www.mass.gov/MassDEP/cleanup/index.htm

24 Hour number – 888-304-1133 - to report releases of oil and hazardous materials to the Emergency Response Program

Leaking Underground Storage Tank Program- general information on leaking UST's
617-292-5887

Department of Fire Services

Ensure proper installation, removal, permitting, and closure of underground storage tanks

www.state.ma.us/dfs, 978-567-3300

Department of Revenue

21J Underground Storage Tank Program for reimbursement for eligible UST facilities

Certificate of Compliance (COC) www.state.ma.us/ust, 617-887-5970

MA Division of Standards

Retail Gasoline & Oil Dealers License. Weights and Measures Enforcement
www.state.ma.us/standards, 617-727-3480

Diagram 1. "Exhibit 5" High-Retractor Balance Dispenser

CARB Required Setup for High-Retractor Balance Dispenser

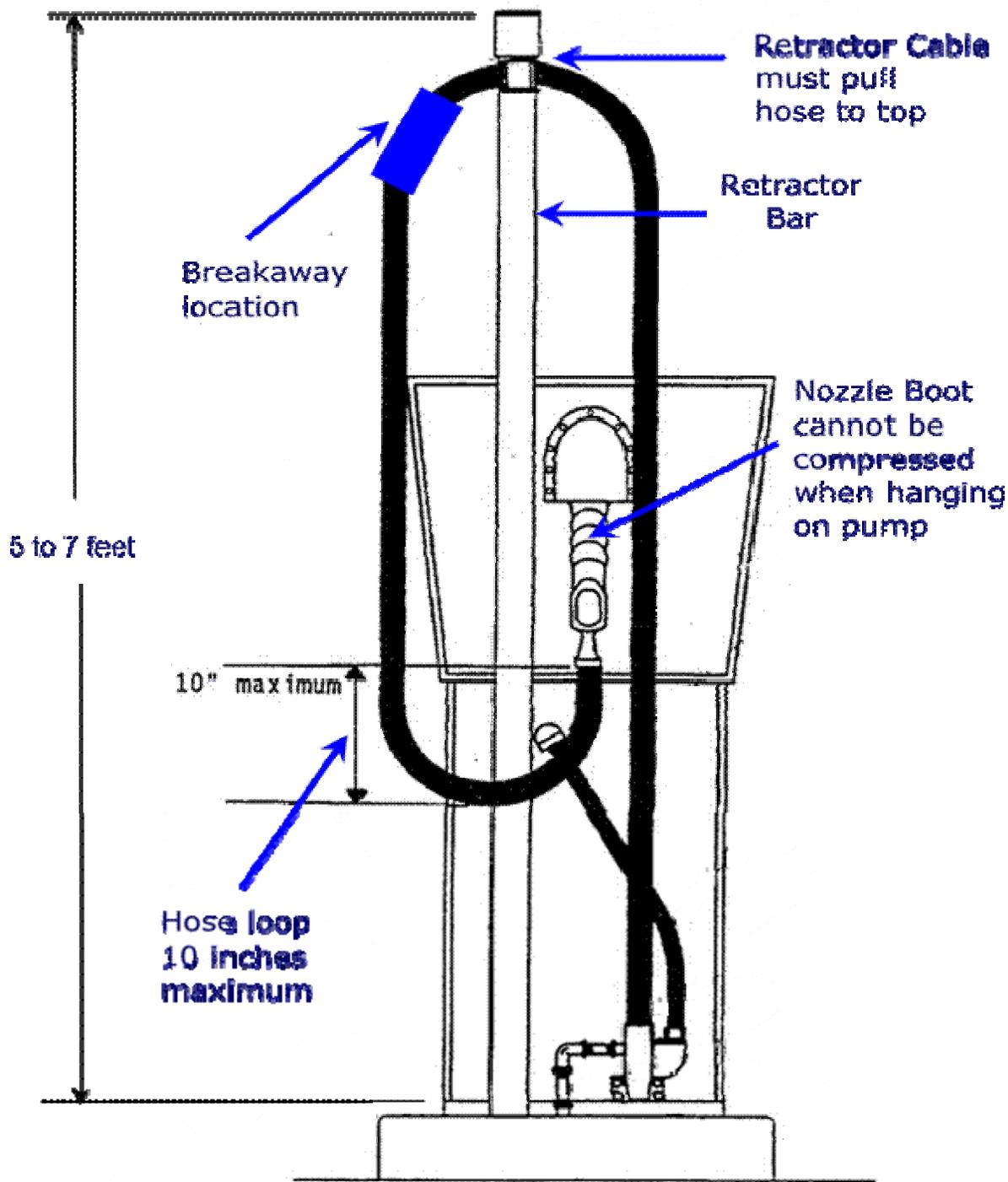
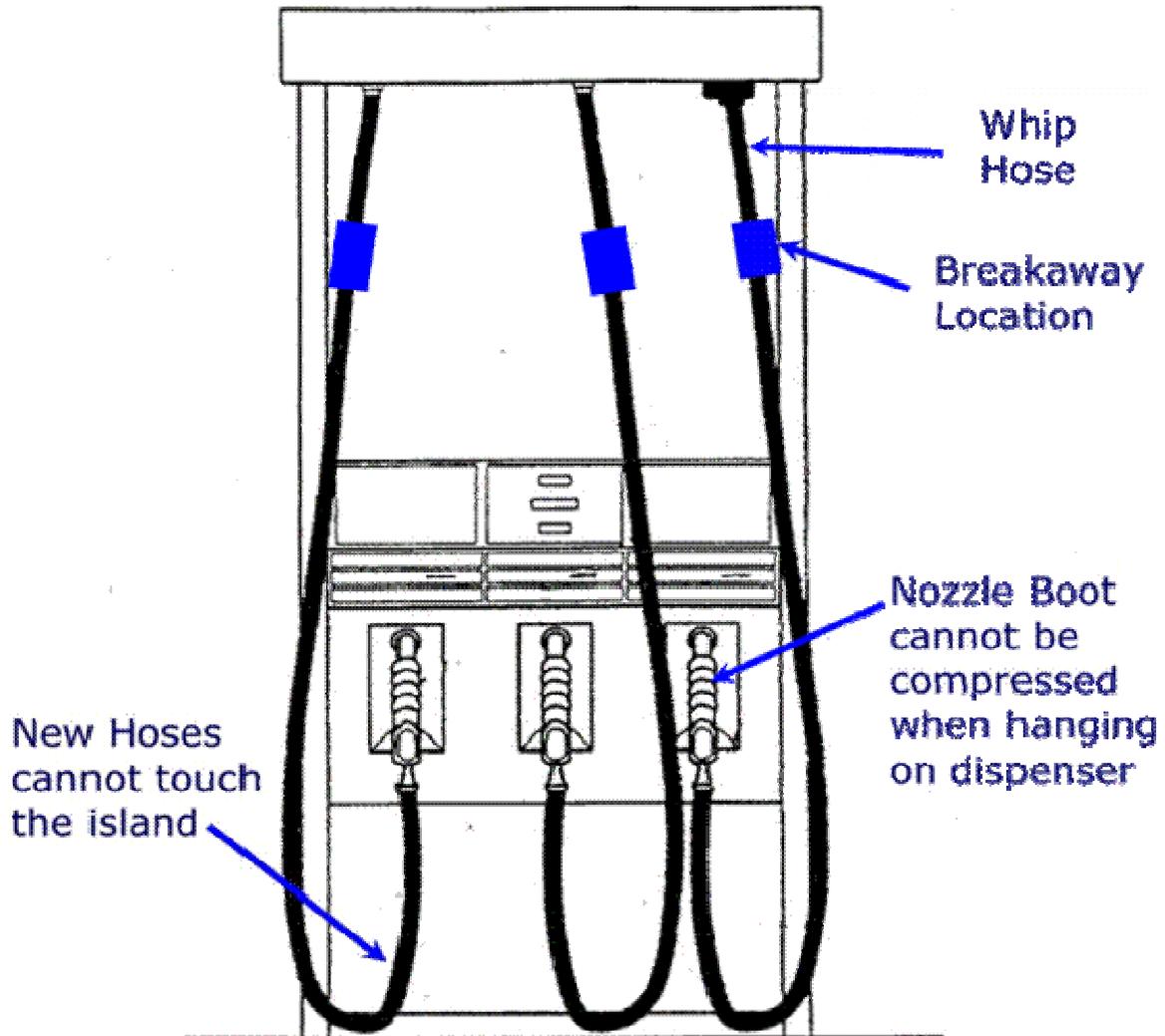


Diagram 2. "Exhibit 10" Multi-Product Balance Dispenser

CARB Required Setup for Multi-Product Dispenser



Exception: In the case of a "Dogbone" island, where the wider island ends protect the hose from damage by vehicle tires, the hose may touch the vertical face of a dogbone island, but not the ground. See CARB order G-70-52-AM, under footnotes for Exhibits 8, 9c, 10 & 11.

Diagram 3. Balance System Nozzle

Balance Nozzle

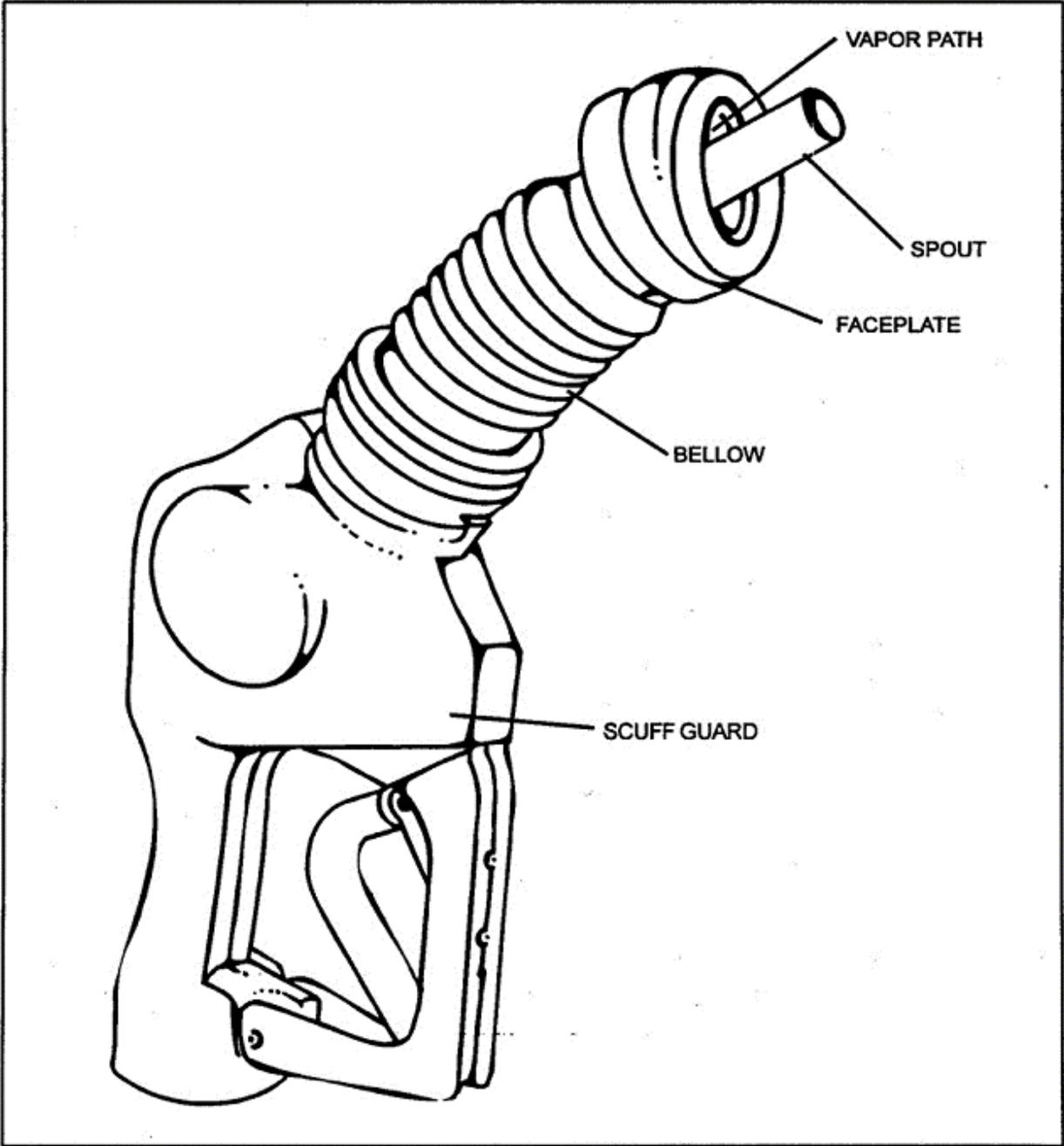


Diagram 4. Aboveground Storage Tank with Balance Components Diagram

Aboveground Storage Tank with Balance Nozzle/hose Components

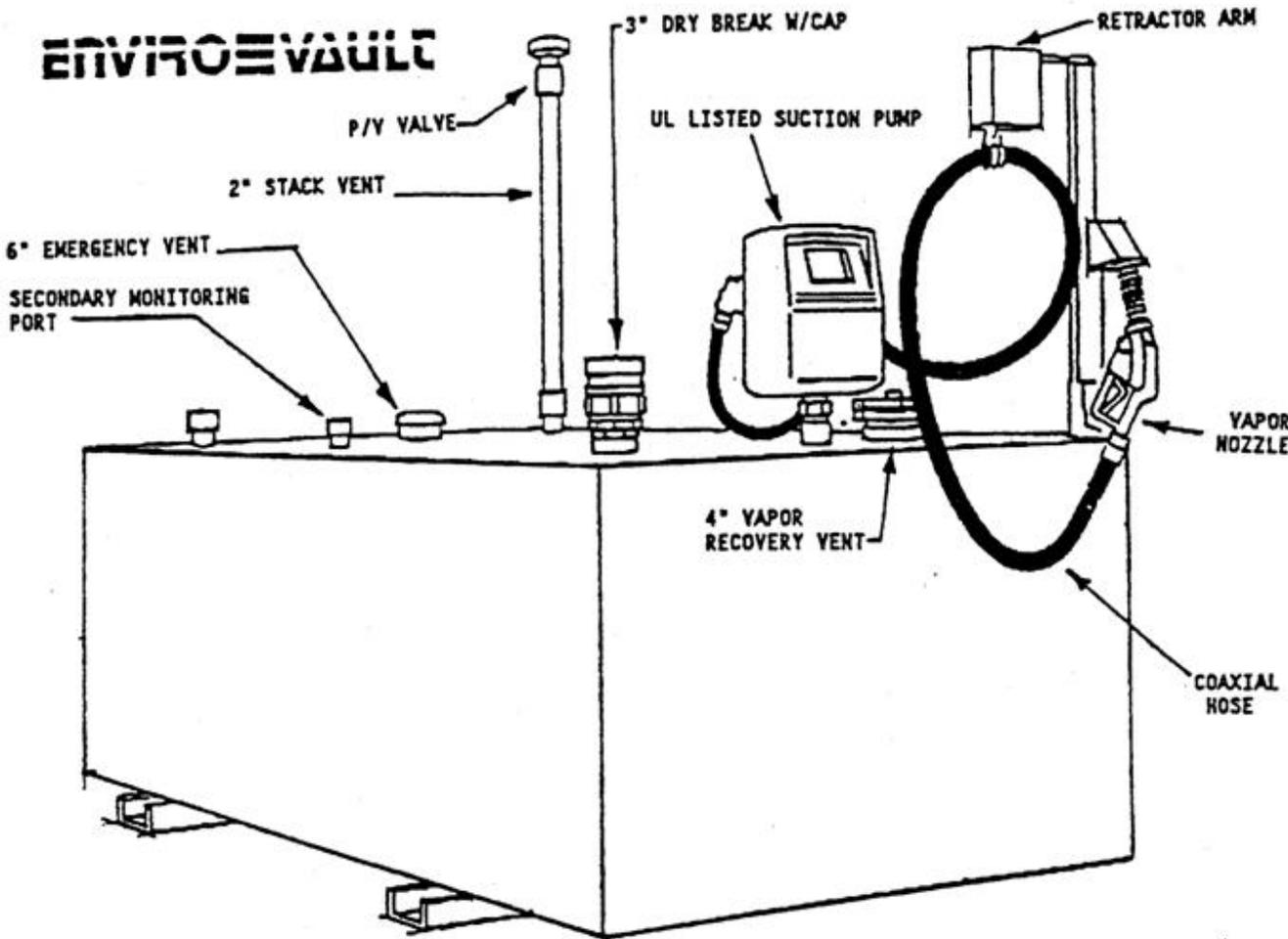


Diagram 5. Coaxial Stage I Vapor Recovery Diagram

Coaxial Stage I Vapor Recovery

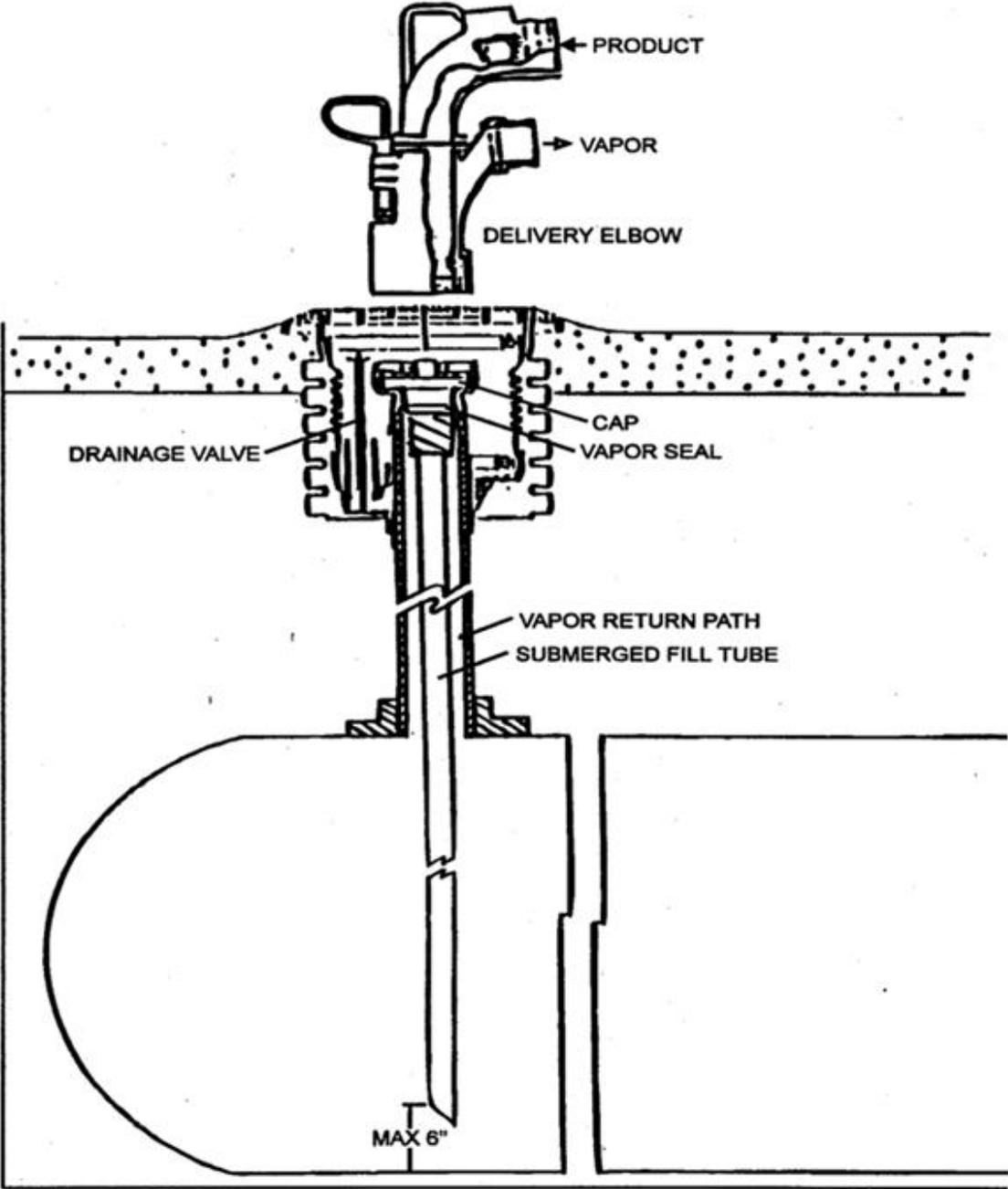
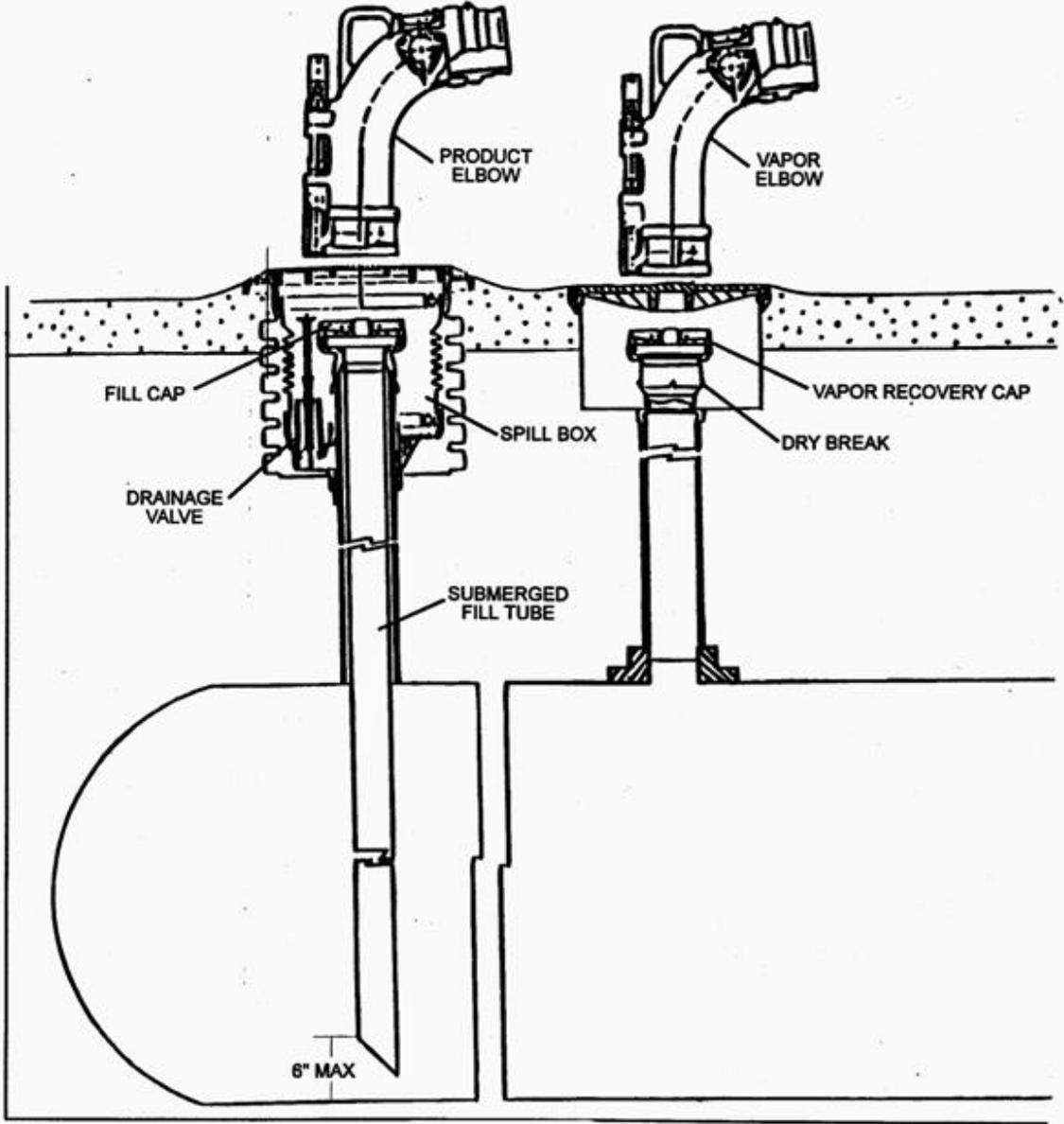


Diagram 6. Two-Point Stage I Vapor Recovery Diagram

Two-Point Stage I Vapor Recovery



**Diagram 7. Dry Break Valve for Two-Point Stage I System
Diagram**

**Dry Break Valve for
Two-Point Stage I System**

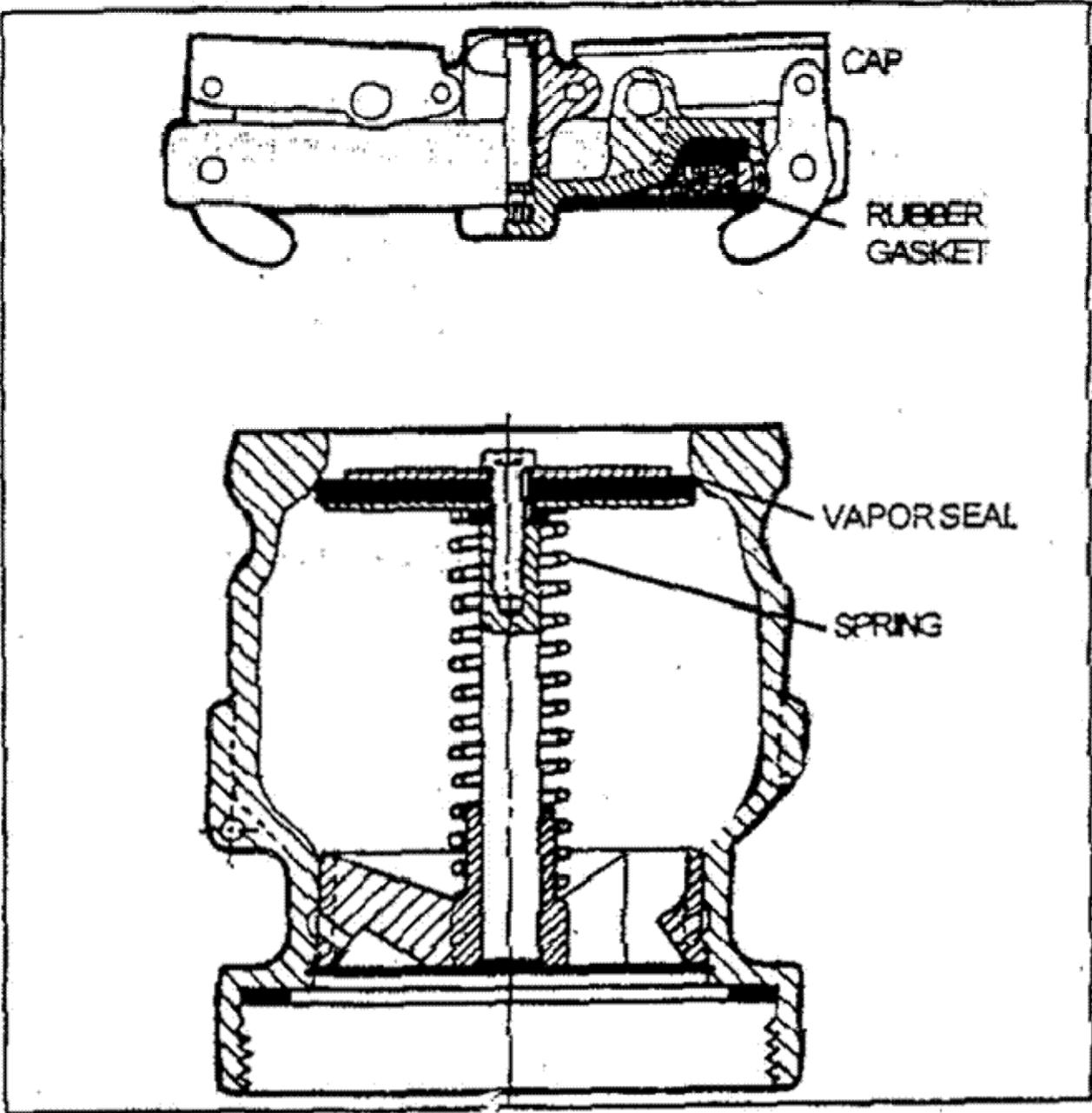
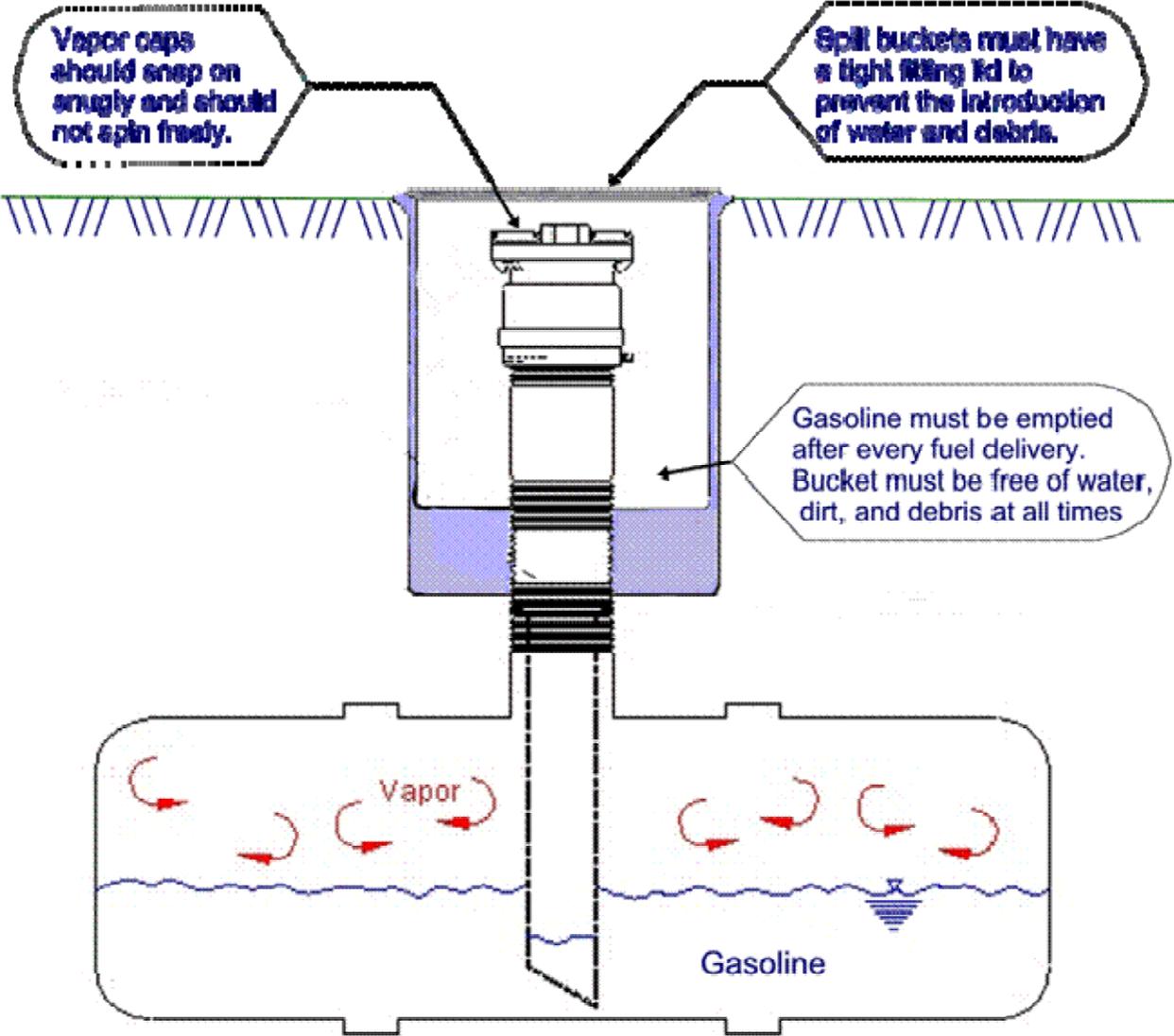


Diagram 8. Spill Containment Bucket for Gas Fill Pipe Diagram

Spill Bucket for Gas Fill Pipe



Week of: _____

Revised MassDEP May 2009

Balance System Weekly Visual Inspection Checklist		If “*”, Date Repaired. Other Repair Notes
<p>A. Nozzles</p> <p>1. Nozzle boots torn, slit, taped or loose? (See Diagram 3, page 22)</p> <p>2. Nozzles failing to shut off or leaking gasoline?</p> <p>3. Nozzle boots compressed when hanging on the dispenser?</p>	<p><input type="checkbox"/> Yes* <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes* <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes* <input type="checkbox"/> No</p>	
<p>B. Hoses, Swivels, Retractors, & Breakaways</p> <p>1. Hoses installed backwards, flattened, kinked, cracked, or taped?</p> <p>2. Hoses lying on dispenser island or ground? (See Diagram 2, page 21)</p> <p>3. Hose loops exceed 10 inches? (See Diagram 1, page 20)</p> <p>4. Hose swivels turn freely minimizing hose damage?</p> <p>5. Retractor cable pulls hose to the top of the retractor bar? (See Diagram 1, page 20)</p> <p>6. Hose Breakaways installed between the nozzle and the retractor bar? (See Diagram 1, page 20)</p> <p>7. Hose Breakaways installed in the proper direction?</p> <p>8. Hose Breakaways leaking gasoline?</p>	<p><input type="checkbox"/> Yes* <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes* <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes* <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No*</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No*</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No*</p> <p><input type="checkbox"/> Yes* <input type="checkbox"/> No</p>	
<p>C. Pressure Vacuum (P/V) Vent Caps</p> <p>P/V Vent Caps installed on all tank vent lines?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No*</p>	

<p>D. Stage I Vapor Recovery</p> <p>Is either Coaxial Stage I or Two-Point Stage I Vapor recovery installed? (See Diagrams 5 & 6, pgs. 24-25)</p>	<input type="checkbox"/> Coaxial <input type="checkbox"/> Two Point	
<p>1. If a Coaxial Stage I Vapor Recovery System is Installed:</p> <ul style="list-style-type: none"> ▪ Coaxial fill/vapor adaptor opening bent or crushed? (Diagram 5, page 24) ▪ Vapor caps installed on all coaxial fill/vapor adaptors? ▪ Vapor caps firmly locked so they don't swivel freely? ▪ Rubber gaskets installed underneath all vapor caps? ▪ Rubber gaskets cracked, torn, or worn out? ▪ Gasoline, water, dirt, or leaves in the spill containment bucket? (See Diagram 8, page 27) 	<input type="checkbox"/> Yes* <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> Yes* <input type="checkbox"/> No <input type="checkbox"/> Yes* <input type="checkbox"/> No	
<p>Stage I Vapor Recovery (Continued)</p>		
<p>2. If a Two-Point Stage I Vapor Recovery System is Installed:</p> <ul style="list-style-type: none"> ▪ Dry Break Vapor Adaptors tight and in good condition? (Diagram 7, page 26) ▪ Vapor caps installed on all Product Fill Adaptors <u>and</u> Dry Break Vapor Adaptors? ▪ Vapor caps firmly locked so they don't swivel freely? ▪ Rubber gaskets installed underneath all vapor caps? ▪ Rubber gaskets cracked, torn, or worn out? ▪ Gasoline fumes escaping from Dry Break Vapor Adaptors with the vapor caps removed? ▪ Gasoline, water, dirt, leaves, or debris in the spill containment buckets? (See Diagram 8, page 27) 	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> Yes* <input type="checkbox"/> No <input type="checkbox"/> Yes* <input type="checkbox"/> No <input type="checkbox"/> Yes* <input type="checkbox"/> No	

E. Vapor Recovery System Repair

As a result of weekly visual inspections, did you find any Stage II and/or Stage I system components incorrectly installed, non-functioning or broken?

Yes* No

If YES, did you:

1. Immediately repair the incorrectly installed, non-functioning or broken (broken) component(s)? or,
2. If the broken component(s) could not be immediately repaired immediately stop dispensing gasoline through the broken component(s), post "Out of Service" signs on it, and repair it within 14 days? or,
3. If the broken component(s) could not be repaired within 14 days; immediately isolate the broken component(s) from the remainder of the Stage II system so that the remainder of the Stage II system is correctly operating and post "Out of Service" signs on the broken component(s) until repaired? or,
4. If the broken component(s) can not be isolated from the remainder of the Stage II system so that the remainder of the Stage II system is correctly operating; immediately stop ALL dispensing of gasoline at the facility and post "Out of Service" signs on ALL motor vehicle fuel dispensers until the component(s) was repaired?

Yes No

Yes No

Yes No

Yes No

Weekly Stage II Inspector's Name (Printed)

Weekly Stage II Inspector's Signature

Date