

State of California

AIR RESOURCES BOARD

EXECUTIVE ORDER G-70-191-AA

**Relating to Language Correction in
Existing Executive Order G-70-191**

Healy Systems, Inc.

WHEREAS, the California Air Resources Board ("the Board" or "CARB") has established, pursuant to California Health and Safety Code sections 39600, 39601 and 41954, certification procedures for systems designed for the control of gasoline vapor emissions during motor vehicle fueling operations (Phase II vapor recovery systems) in its "CP-201 Certification Procedure for Vapor Recovery Systems of Dispensing Facilities" (the "Certification Procedures") as last amended June 1, 2001, incorporated by reference into Title 17, California Code of Regulations, Section 94011;

WHEREAS, the Board has established, pursuant to California Health and Safety Code sections 39600, 39601 and 41954, test procedures for determining the compliance of Phase II vapor recovery systems with emission standards in TP-201.1 through TP-201.6 ("the Test Procedures") last amended February 1, 2001, incorporated by reference into Title 17, California Code of Regulations, Section 94011;

WHEREAS, on August 8, 1999, the Board issued Executive Order G-70-191 for the Healy/Franklin Electric VP-1000 Vapor Pump with the Healy Model 600 Vapor Recovery Nozzle (Healy/Franklin System) Healy Model 600 ORVR/800 Nozzle with the Healy/Franklin Electric VP-1000 Vapor Pump (Healy ORVR Phase II Vapor Recovery System) pursuant to the Certification and Test Procedures;

WHEREAS, Executive Order G-70-191 did not correctly describe the Power Level Controls for the Healy/Franklin Electric VP-1000 vapor pump. The language has been modified to accurately reflect the operational characteristics of the Healy/Franklin Electric VP-1000 vapor pump. A nozzle vapor valve verification test procedure and vapor pump operational verification language has been added. Additional language regarding the use of "low-point" condensate traps in the vapor return lines and the use of above ground manifolding of existing station vapor plumbing, increasing the maximum hose length from 13 to 15 ft has also been added;

WHEREAS, these changes and additions in the language to Healy ORVR Phase II Vapor Recovery System Executive Order have been evaluated pursuant to the Board's Certification Procedure and are clarifying changes;

WHEREAS, Sections 15 and 17 of the Certification Procedures provides that the Executive Officer shall issue an order of certification if he or she determines that the vapor recovery system conforms to all of the requirements set forth in Sections 1 through 13 of the Certification Procedures;

WHEREAS, Section 4.7 of the Certification Procedures provides that Phase II systems must be capable of fueling any motor vehicle that may be fueled at service stations not equipped with vapor recovery systems;

WHEREAS, Sections 15 and 17 of the Certification Procedures provide that the Executive Officer may condition the certification of any system;

WHEREAS, I, Michael P. Kenny, Air Resources Board Executive Officer, find that the Healy ORVR Phase II Vapor Recovery System, conforms with all the requirements set forth in the Certification Procedures, and results in a vapor recovery system which is at least 95 percent effective for attendant and/or self-serve use at gasoline service stations, when used in compliance with this Order and when used in conjunction with a Phase I vapor recovery system, which has been certified by the Board and meets the requirements contained in Exhibit 2 of this Order.

NOW, THEREFORE, IT IS HEREBY ORDERED that the Healy ORVR Phase II Vapor Recovery System is certified to be at least 95 percent effective in attended and/or self-service mode, when used with a CARB-certified Phase I system, as specified in Exhibits 1 and 2 of this Order. **Compatibility of this system with onboard vapor refueling vapor recovery (ORVR) systems was verified, but fugitive emissions, which may occur when the underground storage tanks are under positive pressure have not been quantified and were not included in the calculation of system effectiveness.** Exhibit 1 contains a list of the equipment certified for use with the Healy ORVR Phase II Vapor Recovery System. Exhibit 2 contains installation and performance specifications for the system. Exhibit 3 contains a procedure for verifying the dispensing rate.

IT IS FURTHER ORDERED that the dispensing rate for installations of the Healy ORVR Phase II Vapor Recovery System shall not exceed ten (10.0) gallons per minute under any condition. This is consistent with the flow-rate limitation imposed by United States Environmental Protection Agency as specified in the Federal Register, Volume 58, Number 55, page 16019. The dispensing rate shall be verified as specified in Exhibit 3.

IT IS FURTHER ORDERED that the following requirements are made a condition of certification: The Healy ORVR Phase II Vapor Recovery System shall be installed only in facilities which are capable of demonstrating ongoing compliance with the vapor integrity requirements as specified in the most current version of TP-201.3. The owner or operator of the installation shall conduct, and pass, a Static Pressure Decay test as specified in the most current version of TP-201.3, no later than 60 days after startup

and at least once in each twelve month period. The owner or operator of the installation shall conduct, and pass, an Air-to-Liquid Ratio test as specified in TP-201.5 no later than 60 days after startup and at least once in each twelve month period thereafter. The test results shall be made available to the local air pollution control or air quality management district upon request within fifteen days after the tests are conducted, or within fifteen days of the request. Alternative test procedures may be used if determined by the Executive Officer, in writing, to yield comparable results.

IT IS FURTHER ORDERED that the Healy ORVR Phase II Vapor Recovery System, as installed, shall comply with the procedures and performance standards that the test installation was required to meet during certification testing. If, in the judgment of the Executive Officer, a significant fraction of installations fails to meet the specifications of this certification, or if a significant portion of the vehicle population is found to have configurations which significantly impair the system's collection efficiency, the certification itself may be subject to modification, suspension or revocation.

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

IT IS FURTHER ORDERED that the Healy ORVR Phase II Vapor Recovery System shall, at a minimum, be operated in accordance with the manufacturer's recommended maintenance intervals and shall use the manufacturer's recommended operation, installation, and maintenance procedures.

IT IS FURTHER ORDERED that the Healy Model 600 ORVR/800 nozzles shall be 100 percent performance checked at the factory, including checks of the integrity of the vapor and liquid path, as specified in Exhibit 2 of this Order, and of the proper functioning of all automatic shut-off mechanisms.

IT IS FURTHER ORDERED that each Healy/Franklin Electric VP-1000 Vapor Pump shall be adjusted and 100-percent performance checked at the factory, including verification that the pump performance is within the range specified in Exhibit 2 of this Order.

IT IS FURTHER ORDERED that the Healy ORVR Phase II Vapor Recovery System shall be performance tested during installation for ability to dispense gasoline and collect vapors without difficulty, in the presence of the station manager or other responsible individual. Healy Systems shall provide, to the station owner, operator or designee, CARB-approved copies of the installation and maintenance manuals for the Healy ORVR Phase II Vapor Recovery System. Healy Systems or a factory authorized representative, shall provide to the station manager or other responsible individual, instructions in the proper use of the Healy ORVR Phase II Vapor Recovery System, its

repair and maintenance schedules, and locations where system and/or component replacements can be readily obtained. Copies of this Executive Order and installation and maintenance manuals for the Healy ORVR Phase II Vapor Recovery System shall be stored at the facility. Revisions to the manual are subject to approval by CARB.

IT IS FURTHER ORDERED that the Healy ORVR Phase II Vapor Recovery System, shall be warranted by Healy Systems, in writing, for at least one year, to the ultimate purchaser and each subsequent purchaser, that the vapor recovery system is designed, built and equipped so as to conform, at the time of original installation or sale, with the applicable regulations and is free from defects in materials and workmanship which would cause the vapor recovery system to fail to conform with applicable regulations. Healy Systems shall provide copies of the manufacturer's warranty for the Healy ORVR Phase II Vapor Recovery System, to the station manager, owner or operator. Hoses, nozzles and breakaway couplings shall be warranted to the ultimate purchaser as specified above for at least one year, or for the expected useful life, whichever is longer.

IT IS FURTHER ORDERED that any alteration of the equipment, parts, design, or operation of the systems certified hereby is prohibited, and deemed inconsistent with this certification, unless such alteration has been approved by the Executive Officer or his or her designee.

IT IS FURTHER ORDERED that, upon the adoption of revised standards, an installed Healy ORVR Phase II Vapor Recovery System may continue to be used as provided in Certification Procedure CP-201, pursuant to California Health and Safety Code section 41956.1, which provides that whenever the Board revises performance or certification standards, any system or any system components certified under procedures in effect prior to the adoption of revised standards and installed prior to the effective date of the revised standards may continue to be used in gasoline marketing operations for a period of four years after the effective date of the revised standards, provided that all necessary repair and replacement parts or components shall be certified.

IT IS FURTHER ORDERED that the certification of the Healy ORVR Phase II Vapor Recovery System is valid through July 31, 2005, or as otherwise provided under state law and regulations.

Executed at Sacramento, California, this 30 day of July, 2001.



Michael P. Kenny
Executive Officer

EXECUTIVE ORDER G-70-191-AA

EXHIBIT 1

EQUIPMENT LIST

<u>Component</u>	<u>Manufacturer/Model</u>	<u>State Fire Marshal Identification Number</u>
Nozzles	Model 600 ORVR / 800 (with ORVR modulating valve and vapor valve) (Exhibit 2 Fig. 2B-1)	005:027:025
Vapor Pumps (Collection Unit)	Healy/Franklin Electric Model VP-1000 Vapor Pump (Exhibit 2, Figure 2)	005:027:014
Inverted Coaxial Hoses	Healy Model 75 Series (3/4" I. D.) Healy Model 88 Series (7/8" I. D.)	005:027:003 005:027:004 005:027:005
Hose Adapters	Healy Model CX6-A CX6-VV1A CX6-VV2A CX6-VV3A CX6-TCSVVA CX6-DWVVA CX6-GA CX6-DA CX6-UA	005:027:019

Note: The "A" indicates that no valve is provided in the fitting because the vapor valve is integrated into the nozzle.

Non "A" version hose adapters are also approved for use with this system.

**HEALY SYSTEMS
DISPENSER VAPOR
RETROFIT KITS
(CONVERTS NON-
VAPOR READY
DISPENSERS TO
VAPOR READY)**

Z008 (standard low profile dual hose dispensers)
Z009 (standard low profile single hose dispensers)
Z044 (high profile six hose dispensers)
Z046 (high profile four hose dispensers)
Z047 (high profile uni (two) hose dispensers)

OR

Any dispenser manufacturers vapor kit that converts a non vapor ready dispenser to balance vapor ready.

<u>Component</u>	<u>State Fire Marshal Manufacturer/Model</u>	<u>Identification Number</u>
Breakaway Couplings	Healy Model 8701VV OR Healy Model 8701 which has been upgraded with a Healy Model 715V (vapor valve kit) and labeled as such.	005:027:016
Flow Control Units	Healy Model 1301 or 1302	005:027:020

Pressure/Vacuum Valves
(settings as specified below)

OPW 523LP, 523LPS	005:008:051
Hazlett H-PVB-1 Gold label	005:017:004
Morrison Brothers 749CRB0600 AV	005:041:001
Husky 4620	005:021:015
OPW 523V	005:008:058
EBW 802-308, 802-309	005:034:006
OR	
Any CARB-certified valve with the following pressure and vacuum settings, in inches water column (wc): <u>Pressure</u> : three plus or minus one-half inches (3.0 ± 0.5") water column. <u>Vacuum</u> : eight plus or minus two inches (8 ± 2") water column.	

Phase I Product Adaptors

Bravo B-70 B Swivel
OPW 61SA-1000 Rotatable
OPW 633LC Lock Clamp
CNI Locking Clamp, Part # 613BC

OR

Any CARB-certified device which prevents loosening or overtightening of the Phase I product adaptor.
(Note: Adaptors which can not be prevented from loosening or overtightening may only be used until December 31, 2003.)

Phase I Vapor Adaptors

CNI Locking Clamp, Part # 611DB4AC
Bravo Swivel Vapor Adapter, B-75
OPW 633LC Lock Clamp

Any CARB-certified device which prevents loosening or overtightening of the Phase I vapor adaptor

(Note: Adaptors which can not be prevented from loosening or overtightening may only be used until July 1, 2004.)

EXECUTIVE ORDER G-70-191-AA

EXHIBIT 2

SPECIFICATIONS FOR THE HEALY ORVR PHASE II VAPOR RECOVERY SYSTEM

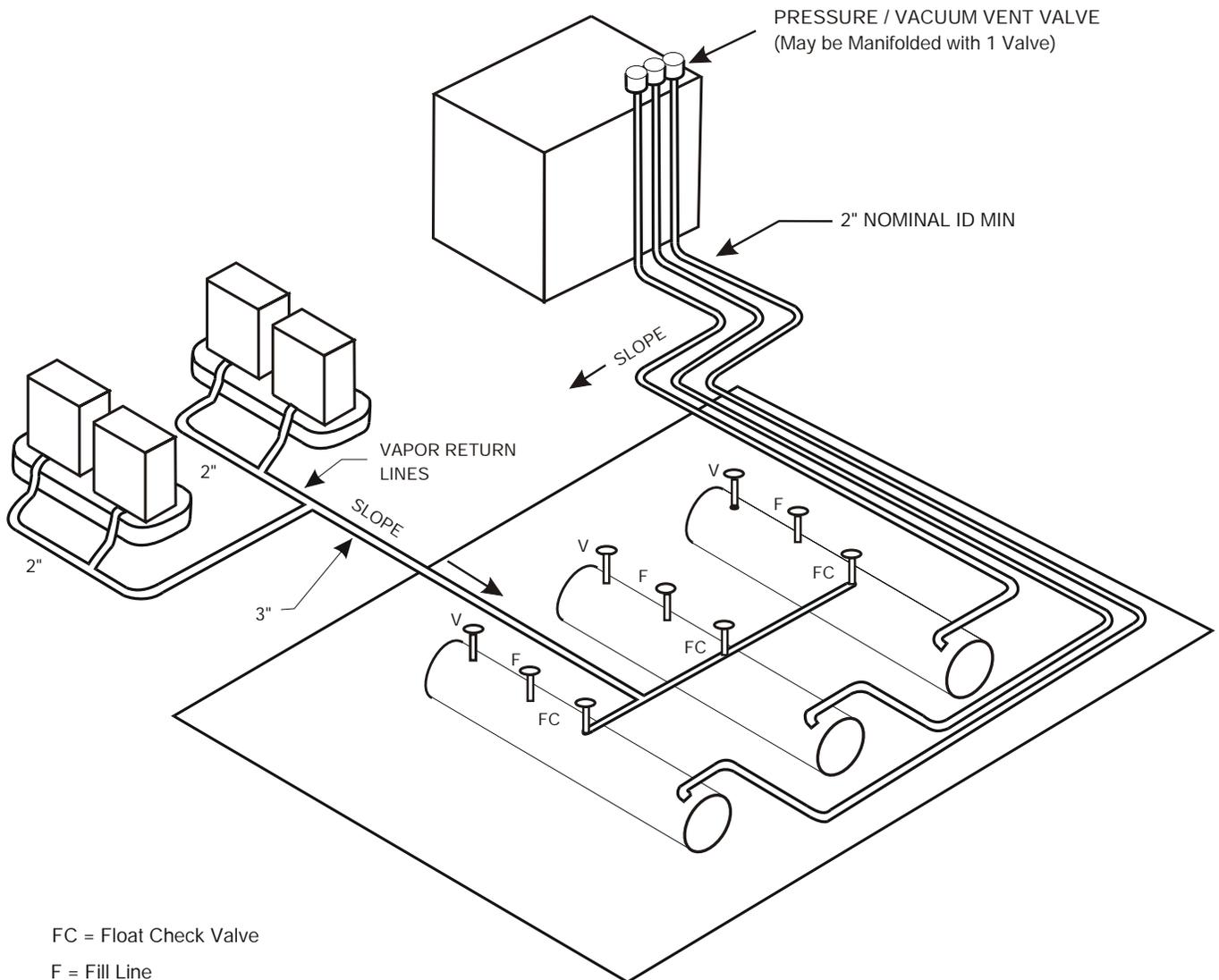
Nozzle

1. A vapor collection boot shall be installed on the nozzle at the base of the spout, as shown in Exhibit 2, Figure 2B-1. Any nozzle with a vapor collection boot which is missing, or which has one half of the mini-boot faceplate or greater missing is defective and shall be immediately removed from service.
2. The Healy Model 600 ORVR / 800 nozzle has an integral vapor valve which prevents the loss of vapor from the underground storage tanks, ensures proper operation of the system and prevents the ingestion of air into the system. Any nozzle with a defective vapor valve shall be immediately removed from service. The integrity of the system shall be restored by replacing the nozzle or otherwise closing the vapor path as soon as practicable.
3. Nozzles shall be 100 percent performance checked at the factory, including checks of all shutoff mechanisms and of the integrity of the vapor path. The maximum allowable leak rate for the nozzle vapor path shall not exceed the following:
 - 0.038 CFH at a pressure of two inches water column (2" WC), and
 - CFH at a vacuum of eighty-three inches water column (approx. 3 psi).
4. Verification of the integrity of the vapor valve can be performed on installed nozzles by use of the following test.
 - a. Seal all nozzles on a dispenser in plastic bags, using tape or other means to secure the bag around the base of the nozzle. Any plastic bag large enough to enclose the nozzles and having a thickness of no greater than 2 mils can be used. 12 " X 20" X 2mil. thick bags are available in California from the California Air Resources Board by calling (800) 952-5588.
 - b. Initialize the dispenser for fueling. **Do not dispense any fuel.** The Healy/Franklin VP-1000 vane pump engages upon dispenser activation and provides approximately 3 psi vacuum to all nozzle points on the dispenser simultaneously.
 - c. With the dispenser initialized, observe all bagged nozzles for approximately 30 seconds. Any nozzle where the bag can be seen visually collapsing has a defective vapor valve and shall be removed from service immediately.
 - d. Disengage the dispenser, remove the bags from all of the nozzles and re-hang the nozzles.

Exhibit 2

Figure 2A-1

Typical Installation of the
Healy ORVR Phase II Vapor Recovery System



FC = Float Check Valve

F = Fill Line

V = Phase I Vapor Recovery

Note: 1. All Vapor/Vent Lines are 3" Nominal ID Minimum
Except as Noted in Exhibit 2 under Vapor Recovery Piping Configurations

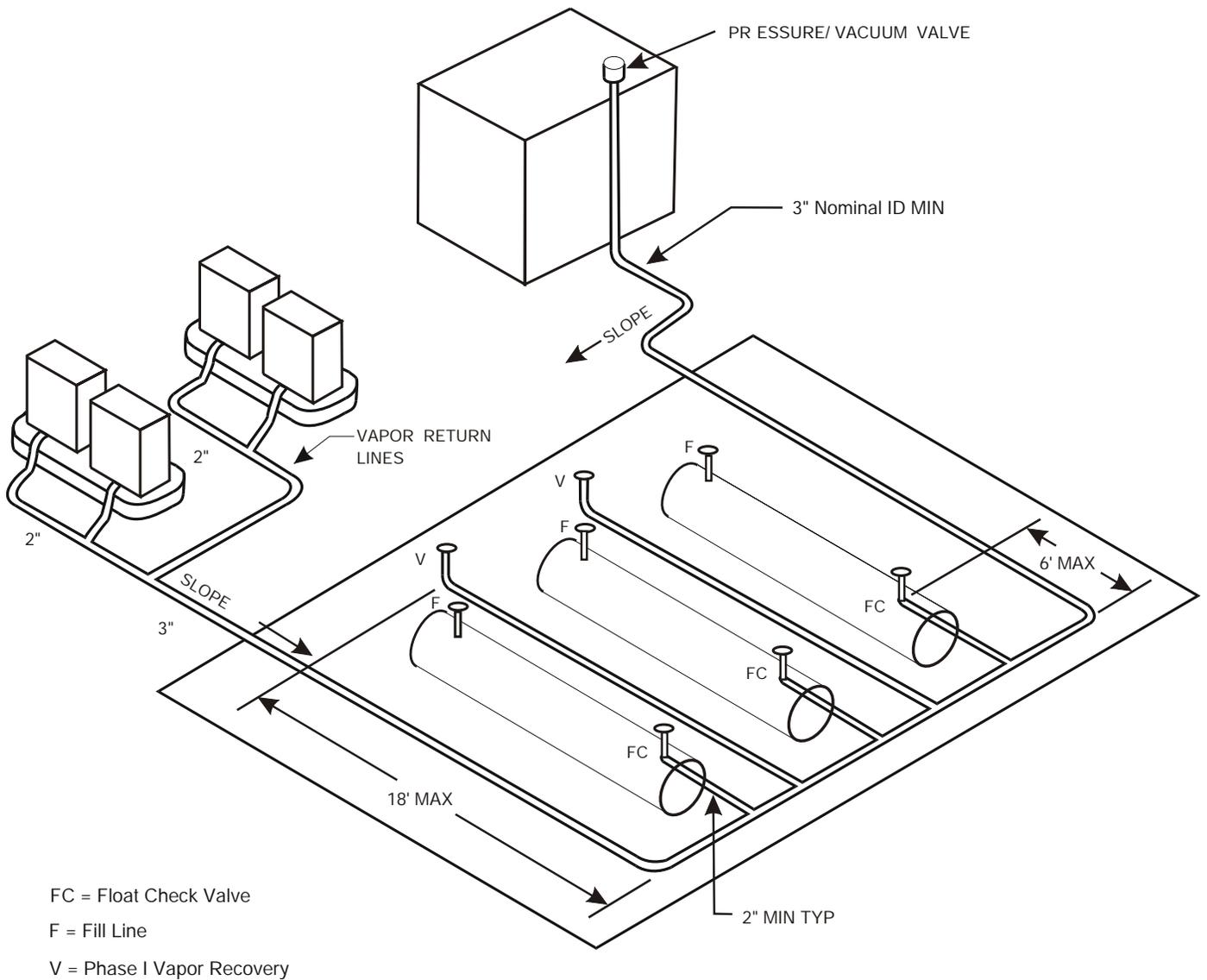
2. Slope: 1/8" per foot Min.

1/4" per Foot Preferred

Exhibit 2

Figure 2A-2

Typical Installation of the
Healy ORVR Phase II Vapor Recovery System



FC = Float Check Valve

F = Fill Line

V = Phase I Vapor Recovery

Note: 1. All Vapor/Vent Lines are 3" Nominal ID Minimum
Except as Noted in Exhibit 2 under Vapor Recovery Piping Configurations

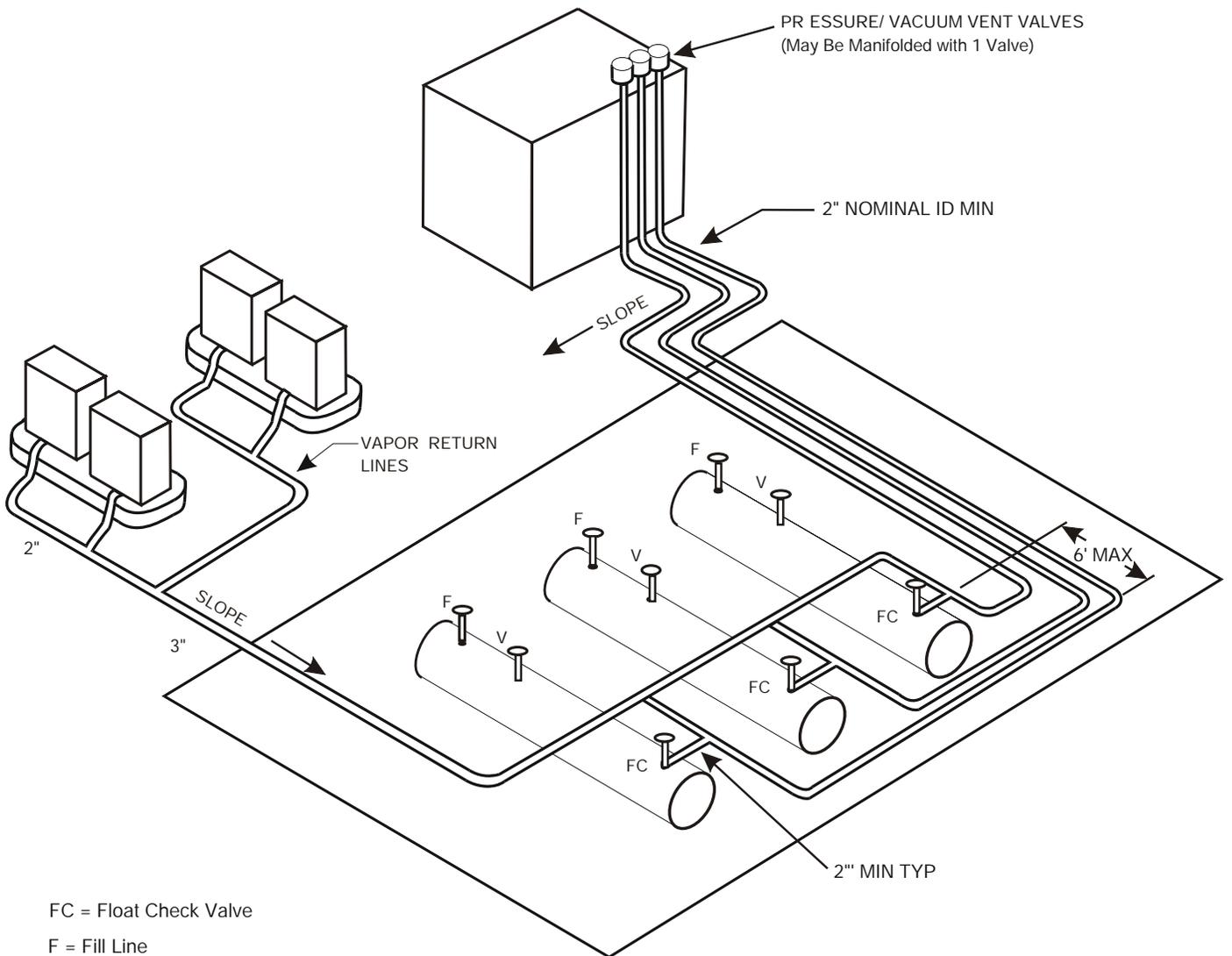
2. Slope: 1/8" per foot Min.

1/4" per Foot Preferred

Exhibit 2

Figure 2A-3

Typical Installation of the
Healy ORVR Phase II Vapor Recovery System



FC = Float Check Valve

F = Fill Line

V = Phase I Vapor Recovery

Note: 1. All Vapor/Vent Lines are 3" Nominal ID Minimum
Except as Noted in Exhibit 2 under Vapor Recovery Piping Configurations

2. Slope: 1/8" per foot Min.

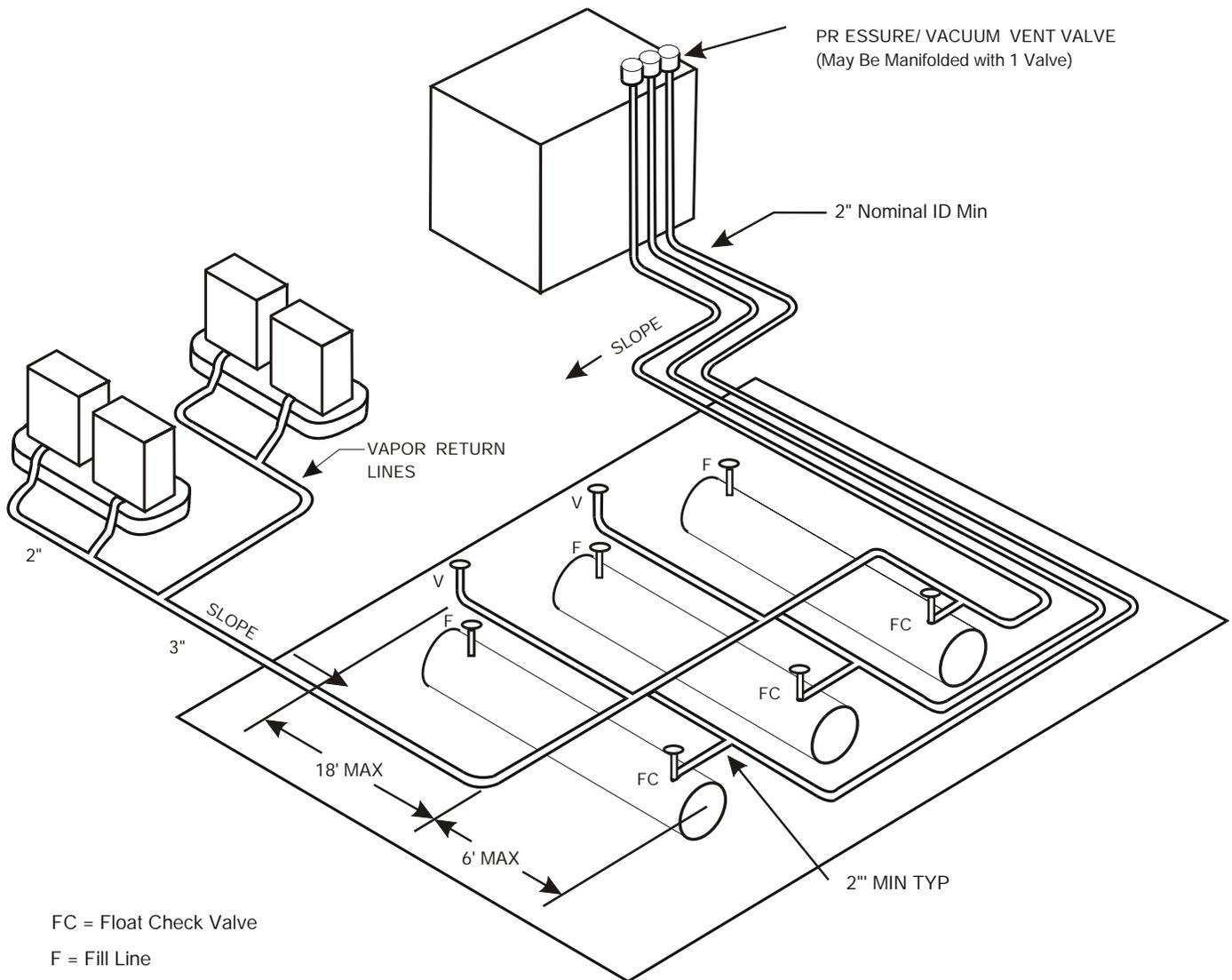
1/4" per Foot Preferred

Executive Order G-70-191-AA

Exhibit 2

Figure 2A-4

Typical Installation of the
Healy ORVR Phase II Vapor Recovery System



FC = Float Check Valve

F = Fill Line

V = Phase I Vapor Recovery

Note: 1. All Vapor/Vent Lines are 3" Nominal ID Minimum
Except as Noted in Exhibit 2 under Vapor Recovery Piping Configurations

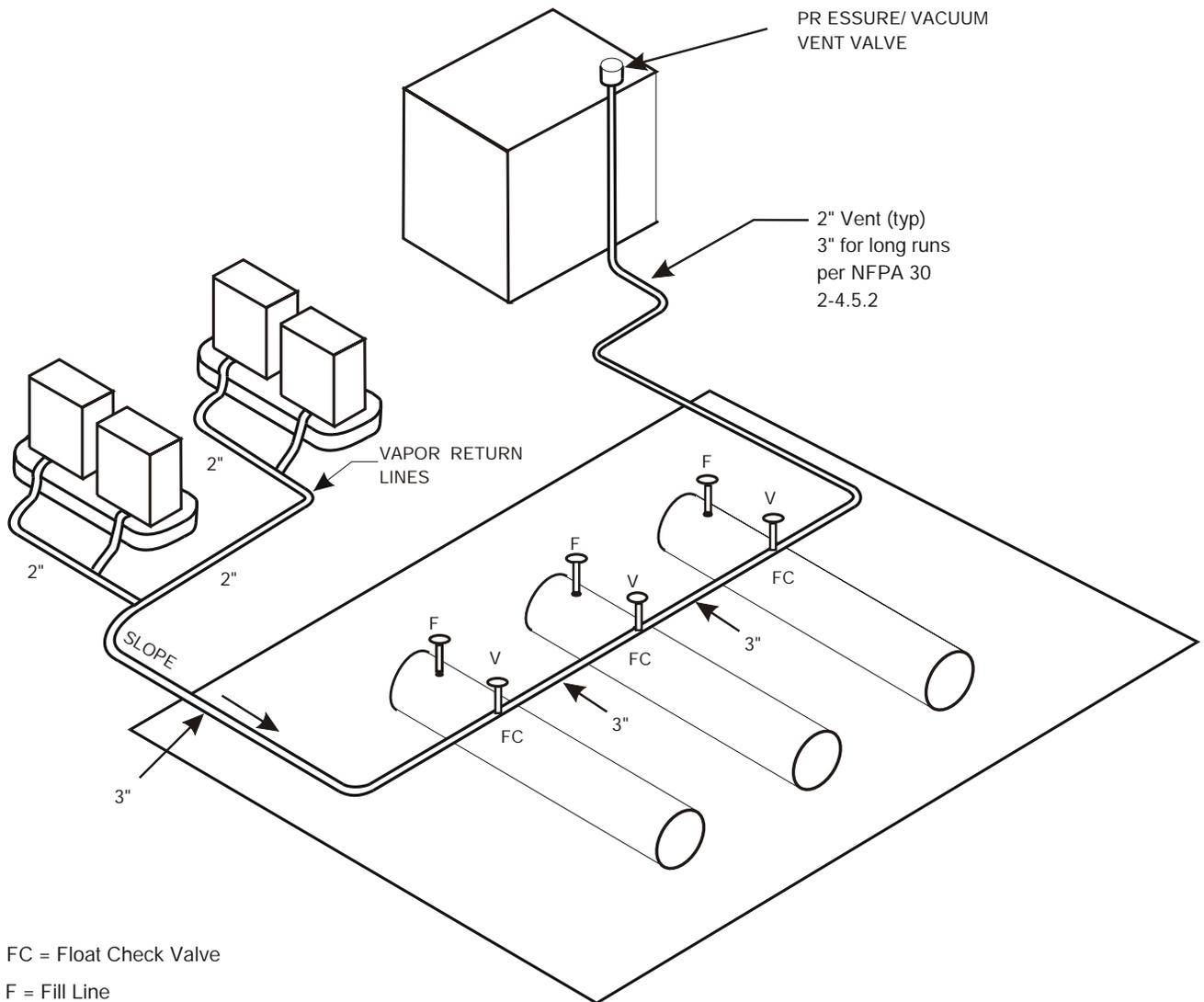
2. Slope: 1/8" per foot Min.

1/4" per Foot Preferred

Exhibit 2

Figure 2A-5

Typical Installation of the
Healy ORVR Phase II Vapor Recovery System



FC = Float Check Valve

F = Fill Line

V = Phase I Vapor Recovery

Note: 1. All Vapor/Vent Lines are 3" Nominal ID Minimum
Except as Noted in Exhibit 2 under Vapor Recovery Piping Configurations

2. Slope: 1/8" per foot Min.

1/4" per Foot Preferred

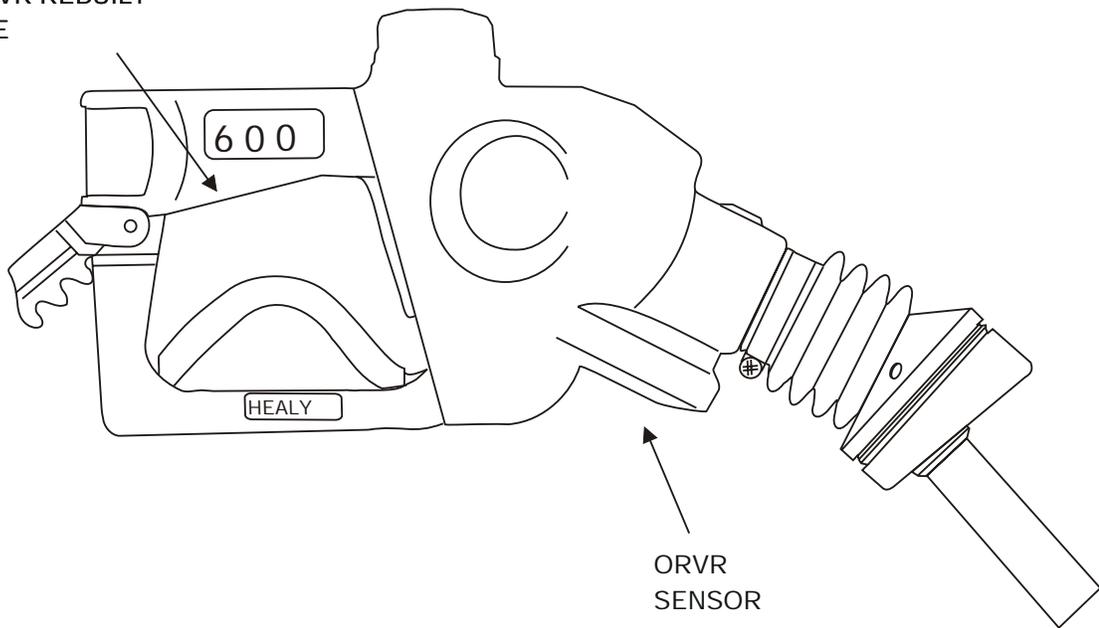
Executive Order G-70-191-AA

Healy ORVR Phase II Vapor Recovery System

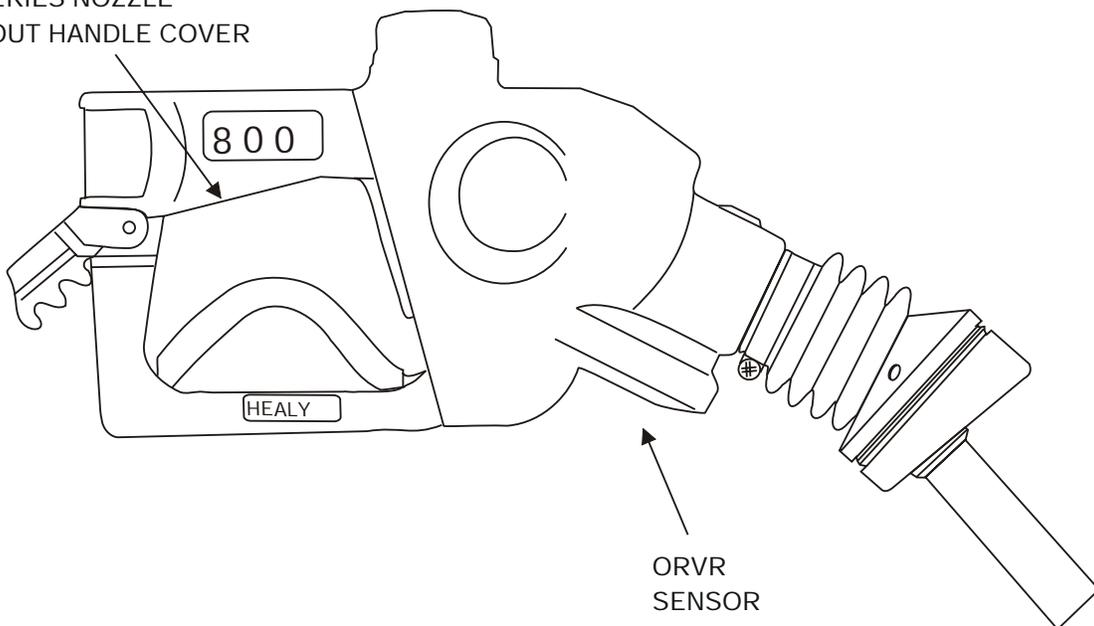
Exhibit 2

Figure 2B-1

600 ORVR REBUILT
NOZZLE



800 SERIES NOZZLE
WITHOUT HANDLE COVER

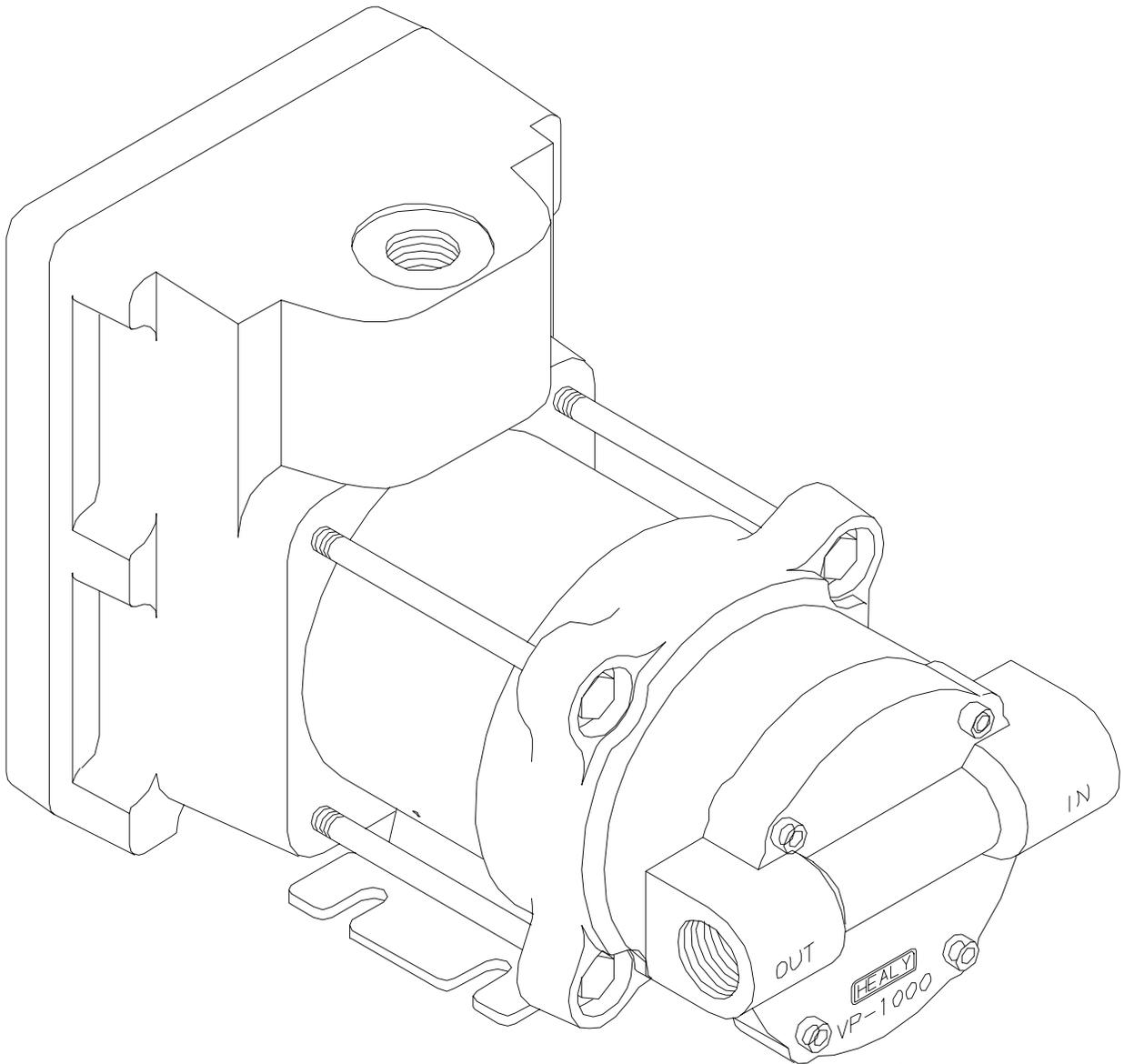


Executive Order G-70-191-AA

Exhibit 2

Figure 2B-2

Healy/Franklin Electric VP1000 Vapor Pump

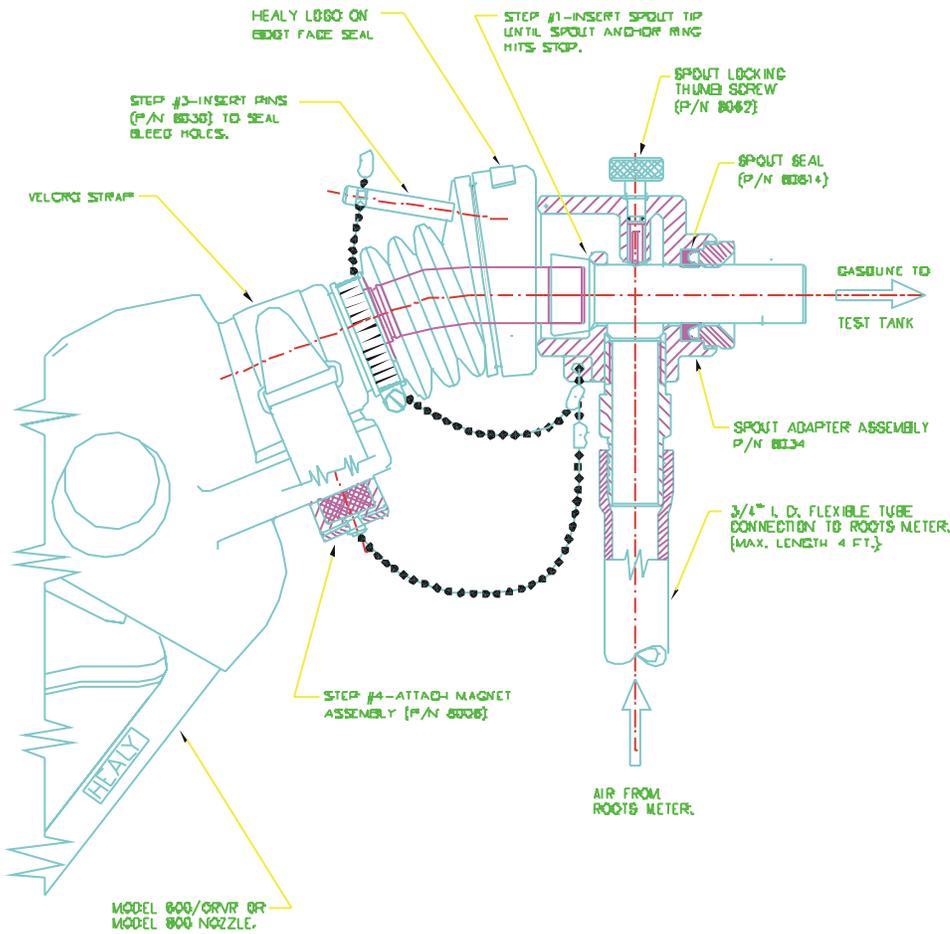


Executive Order G-70-191-AA

Exhibit 2

Figure 2C-1

Healy A/L Adapter For 600 ORVR and 800 Nozzle
Healy Part # 8034



TEST PROCEDURE

- STEP #1 - SLIDE A/L ADAPTER (P/N 8034) OVER SPOUT TIP & COMPRESS BOOT UNTIL SPOUT ANCHOR RING CONTACTS STOP IN A/L ADAPTER.
- STEP #2 - HOLD A/L ADAPTER IN CONTACT WITH SPOUT ANCHOR RING & HAND TIGHTEN THUMB SCREW TO SECURE A/L ADAPTER. (SEE NOTE #1)
- STEP #3 - INSERT PINS TO SEAL 2 BLEED HOLES IN BOOT DIRECTLY BEHIND FACE SEAL ASSEMBLY.
- STEP #4 - HOLD MAGNET ASSEMBLY AGAINST VINYL SCUFF GUARD DIRECTLY BELOW ORVR SENSOR HOUSING & SECURE IN PLACE WITH VELCRO STRAP AS SHOWN. (SEE NOTE #2)
- STEP #5 - PROCEED WITH A/L TEST.
- STEP #6 - REMOVE SEAL PINS & MAGNET ASSEMBLY; LOOSEN THUMB SCREW & REMOVE A/L ADAPTER.

NOTES

- 1 - THE THUMB SCREW & THE HEALY LOGG ON TOP OF THE NOZZLE BOOT FACE SEAL MUST BE IN VERTICAL ALIGNMENT TO IMITATE FUELING AN UNLOADED VEHICLE.
- 2 - A VACUUM LEVEL OF 0.1" H.G. MAY ACTIVATE THE ORVR SENSOR CAUSING A SUBSTANTIAL DECREASE (ERROR) IN THE A/L RATIO. THE MAGNET LOCKS OUT THE ORVR SENSOR TO AVOID FALSE RESULTS IN A/L TESTING OF ORVR NOZZLES.

EXECUTIVE ORDER G-70-191-AA

EXHIBIT 3

**TEN GALLON PER MINUTE LIMITATION
COMPLIANCE VERIFICATION PROCEDURE**

Compliance with the 10 gallon per minute flowrate limitation shall be determined with the following methodology. It is recommended that the maximum dispensing rate through each nozzle/hose assembly be verified. Maximum dispensing rates are achieved with no other dispensing occurring from the same submersible turbine pump (STP). Dispensing rates determined while conducting TP-201.5 are acceptable for verifying compliance with the 10 gallon per minute flowrate limitation.

1) The facility uses identical models of hoses, nozzles, and breakaways:

Dispense gas into a vehicle or approved container. Dispensing shall be conducted in the “hand-held, wide-open” mode. Using a stopwatch accurate to at least 0.2 seconds, begin timing the dispensing rate after at least one gallon has been dispensed. This one gallon buffer is necessary due to the “slow-start” nature of some dispensers. Determine the time required to dispense 2, 3, 4, or 5 gallons of gasoline. The facility shall be deemed in compliance with the 10 gallon per minute limitations if the elapsed time meets, or exceeds, the times shown in Table 1. If the dispensing rate exceeds the allowable limit, a CARB-certified flow limiting device shall be installed.

2) The facility uses different models of hoses, nozzles, or breakaways

Due to potential differences in pressure drops through the various components, each of the nozzle/hose assemblies shall be tested for maximum dispensing rates. Using the same criteria as above, determine the maximum dispensing rate through each nozzle/hose assembly. If the maximum dispensing rate exceeds the 10 gpm limit, a CARB-certified flow limiting device shall be installed.

**Table 1
Verification of 10 gpm**

Product Dispensed, gallons	Minimum Allowable Time, seconds
2.0	11.8
3.0	17.7
4.0	23.6
5.0	29.5

Note: The times have been corrected to allow for the accuracy of the measurement.

Dispensing Rate

The dispensing rate for installations of this system shall not exceed 10.0 gallons per minute at any time. This shall be determined as specified in Exhibit 3 or as specified in TP-201.5 or any alternative test method approved in writing by the Executive Officer.

Inverted Coaxial Hoses

1. The maximum length of the hose assembly shall be 15 feet measured from the dispenser outlet casting to the base of the nozzle.
2. The length of hose, which may be in contact with the island and/or ground when the nozzle is properly mounted on the dispenser, is limited to six inches (6") per loop.

Breakaway Couplings

Breakaway couplings are optional but, if installed, only CARB-certified breakaways with a valve, which closes the vapor path when separated, may be used.

Healy ORVR Phase II Vapor Recovery System

1. The Healy ORVR Phase II Vapor Recovery System shall consist of an integrated vapor recovery unit made up of an electronic (computerized) control unit and a one-eighth (1/8) hp alternating current electric motor that drives a variable speed rotary vane pump. The VP-1000 Vapor Recovery Vane Pump has been sized to satisfy the recovery needs of one dispenser, with two hoses, pumping either individually or simultaneously. Healy Systems supplies a unique regulation valve, built into the faceplate of the pump assembly, to assure that proper levels of vacuum are maintained. The actual vapor recovery rate is determined by a valve in the nozzle which senses product flow.

The A/L ratio of the system shall be 1.10 plus or minus 0.10 (1.00 to 1.20). Any fueling point not capable of demonstrating compliance with this performance standard shall be deemed defective and removed from service. The A/L ratio shall be determined by using the CARB-approved procedure TP-201.5. Note: A CARB certified spout adapter / sleeve unique to the Healy 600 ORVR / 800 nozzle must be used in order to obtain accurate results. See Exhibit 2 Figure 2C-1. Alternative test procedures may be used if they are determined by the Executive Officer, in writing, to yield comparable results.

NOTE: Test Procedure TP-201.5 returns air rather than vapor to the storage tank, and normally causes an increase in storage tank pressure which may result in vent emissions. This is a temporary condition due to the test and should not be considered an indication of malfunction or noncompliance.

2. The Healy ORVR Phase II Vapor Recovery System with the Healy/Franklin Electric VP 1000 Vapor Pump, (Exhibit 2 Figure 2B-2) shall have the following electronic protective features:
 - High Power Level Control. The system shall automatically sense conditions that cause high power levels and shall shut down. Conditions causing high power levels include the following: locked rotor condition of the motor, shorted motor windings, fluid in pump cavity for more time than required to clear a blockage and pump overload conditions. If any of these conditions exist, a signal shall be sent to the VP1000 vane pump interface module located inside the dispenser. The system shall then restart automatically. This “shut down send signal wait-restart” cycle will occur three times. After the third cycle failure, it shall not restart automatically. Instead, an error signal is sent to the interface module, (High Power Level Failure), which will then disable the entire dispenser from dispensing product.
 - Low Power Level Control. The system shall automatically sense conditions that cause low power levels and shall shut down. Conditions causing low power levels include the following: broken rotor, free running motor shaft-no load conditions. If any of these conditions exist, a signal shall be sent to the VP1000 vane pump interface module located inside the dispenser. The system shall then restart automatically. This “shut down send signal wait-restart” cycle will occur three times. After the third cycle failure it shall not restart automatically. Instead, an error signal is sent to the interface module, (Low Power Level Failure), which will then disable the entire dispenser from dispensing product.
 - Verification that the Healy/Franklin VP1000 vane pump is operating correctly can be determined by conducting A/L testing as specified in TP-201.5 or an alternative test method approved in writing by the Executive Officer. Any dispenser where a 0.0 A/L is measured on all fueling points on both sides of the dispenser indicates a failure of the electronic shut-down features of the VP-1000 vane pump. A measured A/L of 0.0 on only one fueling point on one side of a dispenser may be due to hanging hardware problems and may not be indicative of a vane pump problem.

Dispenser Specifications

1. The Healy ORVR Phase II Vapor Recovery System can be installed on any CARB-certified balance vapor ready dispenser. Conversion kits as specified in Exhibit 1 can be used to retrofit non-vapor-ready dispensers. All dispensers must also comply with the following:
 - a) Electronically compatible with the Healy ORVR Phase II Vapor Recovery System with the Healy/Franklin Electric VP 1000 Vapor Pump, which must be capable of displaying the electronic protective features as specified in this Exhibit.

- b) Tested for compliance with air to liquid ratio limits contained in this Exhibit. The test shall be conducted in accordance with TP 201.5, or an alternative test method approved in writing by the Executive Officer.

Pressure/Vacuum Valves for Storage Tank Vents

1. At least one pressure/vacuum (P/V) valve shall be installed on tank vents. Manifolding of vent lines to minimize the number of P/V valves and potential leak sources is recommended, provided the manifold is installed at a height not less than 12 feet above the driveway surface used for Phase I tank truck filling operations. At least one P/V valve shall be installed on manifolded vents. The P/V valve shall be a CARB-certified valve as specified in Exhibit 1. The outlets shall vent upward and be located to eliminate the possibility of vapor accumulating or traveling to a source of ignition or entering adjacent buildings.
2. The P/V valve is designed to open at a pressure of approximately three inches water column (3" WC). Storage tank pressures which exceed 3" WC for more than a short time may indicate a malfunctioning pressure/vacuum vent valve.

Vapor Recovery Piping Configurations, (Figures 2A-1 - 2A-5)

Note: Figures 2A-1-2A-5 show general vapor plumbing piping layouts and are not to be used as specifications.

1. All vapor return and vent lines shall be a minimum 2" diameter from the dispensers to the first main manifold. All lines after the first manifold and back to the underground storage tanks shall be a minimum 3" diameter.

Exception: Smaller vapor lines are not recommended but if pre-existing, may be used providing the pressure drop criteria specified below are met.

2. The maximum allowable pressure drop through the system shall never exceed one-half inch (0.5") water column at 60 SCFH. The pressure drop shall be measured from the dispenser riser to the UST with pressure/vacuum valves installed and with the popped Phase I vapor connection open.
3. All vapor return and vent lines shall slope a minimum of 1/8" per linear foot. A slope of 1/4" per linear foot or more is recommended whenever feasible.

Exception: When it is not possible to achieve the necessary minimum slope from the dispenser risers back to the underground storage tanks due to the topography of a new site or due to upgrading of an existing site, low-point condensate traps or knock-out pots can be utilized as long as the following conditions are met:

- a. The condensate traps must be self-evacuating.
 - b. The entire system must remain vapor tight.
 - c. Access must be provided for inspection purposes. The condensate traps must be maintained in good working order.
 - d. The maximum pressure drop through the system with the condensate traps in place shall not exceed 0.5" WC at 60 SCFH.
4. All vapor return and vent piping shall be installed in accordance with the manufacturer's instructions and all applicable regulations.

5. No product shall be dispensed from any fueling point associated with a vapor line which is disconnected and open to the atmosphere. If vapor lines are manifolded, this includes all fueling points in the facility.
6. All vapor return and vent lines shall be installed in accordance with the manufacturer's instructions and all applicable regulations. The vapor return lines shall be manifolded below grade at the tanks using a minimum 3" diameter line.

Exception: For installations with a vapor return line directly to only one tank, and for which a manifold on the tank vents will be used to provide part of the vapor return path to other tanks, the vent manifold may be used as an alternative to the underground manifold only in existing installations where the vapor piping is already installed, and shall not be used in "new" installations where vapor piping is being installed. For installations with dedicated vapor piping directly to each tank, the vent manifold is approved for both new and existing installations and an additional tank manifold below grade is optional but not required.

7. The dispenser shall be connected to the riser with either flexible or rigid material which is listed for use with gasoline. The dispenser-to-riser connection shall be installed so that any liquid in the lines will drain toward the storage tank. The internal diameter of the connector, including all fittings, shall not be less than one-half inch (1/2").

Inverted Coaxial Hose Adapters

1. Inverted coaxial hose adapters shall be 100 percent performance checked at the factory to verify the integrity of the vapor path.

Underground Storage Tank (UST) Pressure

WARNING: Phase I fill caps should be opened with caution because the storage tank may be under pressure.

Phase I System

1. The Phase I system shall be a CARB-certified system which is in good working order and which demonstrates compliance with the static pressure decay test criteria as specified in the most current version of TP-201.3. Coaxial Phase I systems shall not be used with new installations of the Healy ORVR Phase II Vapor Recovery System. Replacement of storage tanks at existing facilities, or modifications which cause the installation of new or replacement Phase I vapor recovery equipment, are considered new installations with regard to this prohibition. An exception to this prohibition may be made for coaxial Phase I systems CARB-certified after January 1, 1994, as compatible for use with Phase II systems which require pressure/vacuum vent valves.

Where installation of the Healy ORVR Phase II Vapor Recovery System is made by retrofitting previously installed equipment, local districts may elect to allow existing coaxial Phase I systems to remain in use for a specifically identified period of time provided the following conditions are met:

- the existing coaxial Phase I system is a poppeted, CARB-certified system capable of demonstrating compliance with the static pressure decay test as specified above; and
 - installation of the Phase II system requires no modification of the UST(s) and/or connections.
2. Spill containment manholes which have drain valves shall demonstrate compliance with the static pressure decay criteria with the drain valves installed as in normal operation. Manholes with cover-actuated drain valves shall not be used. The local district may require the removal of drain valves provided an alternate method of draining the spill container is specified (i.e., a hand pump maintained at the facility and/or on the product delivery trucks).
 3. Phase I deliveries shall be accomplished so as to ensure that there is at least one vapor connection between the cargo tank compartment headspace and the storage tank associated with the product delivery. There shall be no more than two product hoses used with one vapor hose connected, and no more than three product hoses used with two vapor hoses connected.
 - the Phase I vapor return hose is connected to the delivery tank and to the delivery elbow before the elbow is connected to the facility storage tank;
 - the delivery tank is opened only after all vapor connections have been made, and is closed before connection of any vapor return hoses;
 - the existing coaxial Phase I equipment is in good working order and has demonstrated compliance with static pressure decay test criteria when tested with all fill caps removed; and
 - the vapor return hose is disconnected from the facility storage tank before it is disconnected from the delivery tank.
 4. Storage tank vent pipes, manhole covers and spill containment bucket covers shall be maintained any color which minimizes solar gain and has a reflective effectiveness of 55% or greater. Reflectivity can be determined by visual comparison of the paint with paint color cards obtained from a paint manufacturer who uses the "Master Pallet Notation" to specify the paint color (i.e., 58YY 88/180 where the number in italics is the paint reflectivity). Example colors having a reflective ness of 55% or greater include yellow, light gray, aluminum, tan, red iron oxide, cream or pale blue, light green, glossy gray, light blue, light pink, light cream, white, silver, beige, tin plate or mirrored finish. Spill containment bucket covers that are color coded for product identification are exempted from this requirement.

Exception: Insulated manhole covers such as those manufactured out of a composite material and injected with foam insulation are exempt from the color requirement.

<u>Component</u>	<u>State Fire Marshal Manufacturer/Model</u>	<u>Identification Number</u>
Breakaway Couplings	Healy Model 8701VV OR Healy Model 8701 which has been upgraded with a Healy Model 715V (vapor valve kit) and labeled as such.	005:027:016
Flow Control Units	Healy Model 1301 or 1302	005:027:020

Pressure/Vacuum Valves
(settings as specified below)

OPW 523LP, 523LPS	005:008:051
Hazlett H-PVB-1 Gold label	005:017:004
Morrison Brothers 749CRB0600 AV	005:041:001
Husky 4620	005:021:015
OPW 523V	005:008:058
EBW 802-308, 802-309	005:034:006
OR	
Any CARB-certified valve with the following pressure and vacuum settings, in inches water column (wc): <u>Pressure</u> : three plus or minus one-half inches (3.0 ± 0.5") water column. <u>Vacuum</u> : eight plus or minus two inches (8 ± 2") water column.	

Phase I Product Adaptors

Bravo B-70 B Swivel
OPW 61SA-1000 Rotatable
OPW 633LC Lock Clamp
CNI Locking Clamp, Part # 613BC

OR

Any CARB-certified device which prevents loosening or overtightening of the Phase I product adaptor.
(Note: Adaptors which can not be prevented from loosening or overtightening may only be used until December 31, 2003.)

Phase I Vapor Adaptors

CNI Locking Clamp, Part # 611DB4AC
Bravo Swivel Vapor Adapter, B-75
OPW 633LC Lock Clamp

Any CARB-certified device which prevents loosening or overtightening of the Phase I vapor adaptor

(Note: Adaptors which can not be prevented from loosening or overtightening may only be used until July 1, 2004.)