

## Executive Order G-70-187

### Exhibit 2

#### Specifications for the Healy Model 400 ORVR Vapor Recovery System for Aboveground Storage Tank Systems

##### **1 Nozzle**

- 1.1 The Healy Model 400 ORVR nozzle shall have an operating pressure range at the nozzle boot/fillpipe interface of -1/4" to 0" water column (wc) within an accuracy of +/-1/4" wc (total allowable range is -1/2" to +1/4" wc). Pressure readings shall be taken using a certified test system or non-ORVR equipped vehicles pursuant to Exhibit 5, "Fillneck Vapor Pressure Regulation Fueling Test".
- 1.2 Nozzles shall be 100 percent performance checked at the factory including checks of all shutoff mechanisms and the integrity of the vapor path. The 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
  - 0.005 CFH at a vacuum of eighty-three inches water column (approximately 3 psi).The nozzle shall meet these specifications for the duration of the warranty.
- 1.3 The nozzle boot shall be maintained in good condition and shall be replaced whenever the concatenation of all tears (including rips, slits, cracks and etc.) exceeds 1/2" in length. A nozzle with a boot with tears exceeding 1/2" in length is defined as a equipment defect which substantially impairs the effectiveness of the system in accordance with Health and Safety Code Section 41960.2(c) and is subject to district enforcement action in accordance with Health and Safety Code Section 41960.2(d).

##### **2 Inverted Coaxial Hoses**

- 2.1 The maximum length of any hose shall not exceed 13 feet.
- 2.2 The length of hose which may be in contact with the top or side of the island and/or ground when the nozzle is properly mounted on the dispenser is limited to six inches (6") per refueling point.
- 2.3 A certified swivel shall be installed at the nozzle end of the coaxial hose. A certified swivel may be installed on the dispenser end at the option of the station owner or authorized representative.

##### **3 Inverted Coaxial Hose Adapters**

Inverted coaxial hose adapters shall be 100 percent performance checked at the factory to verify that they are 100% vapor tight. Adapters shall be maintained 100 percent vapor tight.

##### **4 Breakaway Couplings**

Breakaway couplings shall be installed. Only certified breakaways with a valve that closes the vapor path when separated may be used.

## 5 Central Vacuum Unit

- 5.1** The Healy Model 400 ORVR system shall operate with at least one of the central vacuum units (pumps) specified in Exhibit 1 (see Figures 2A-2D and Figure 3). Each central vacuum pump shall be 100 percent performance checked at the factory including verification that the pump, when installed in the system, can be adjusted such that the vapor recovery system performance will operate within the range specified in Exhibit 2 of this executive order. The vapor recovery system vacuum shall be checked and the central vacuum unit adjusted (if necessary) after installation and before commencing operation of the system to insure that the system vacuum operates within a dynamic range from 65" wc to 85" wc.
- 5.2** No dispensing shall be allowed when the central vacuum unit is disabled for maintenance or for any other reason. Dispensing of gasoline when the central vacuum unit is disabled is defined as a equipment defect which substantially impairs the effectiveness of the system in accordance with Health and Safety Code Section 41960.2(c) and is subject to district enforcement action in accordance with Health and Safety Code Section 41960.2(d).
- 5.3** The system shall be equipped with a vacuum gauge (0"- 100" wc) in order to manually monitor the system vacuum. The gauge shall be installed on the inlet side of the central vacuum unit (see Figures 2A, 2C, 3 and 4A) by means of a "tee" and two ball valves with (1) one end of the "tee" connected directly to the gauge, (2) the second end of the "tee" connected to the first ball valve which is connected to the vacuum line and (3) the middle of the "tee" connected to the second ball valve which opens to atmosphere. Both valves shall be closed and the atmospheric port capped except when the gauge is in use. The atmospheric valve may be opened with the vacuum valve closed in order to check the gauge "zero"; a second gauge may also be connected to the atmospheric port with the ball valve to the system vacuum open to check the gauge accuracy.
- 5.4** The system shall operate within a vacuum range from 65" to 85" wc. This vacuum range shall be determined by observing the mechanical gauge as required by Section 5.3.
- 5.5** The maximum number of fueling points that can be supported by each central vacuum unit is listed below in Table 1. This number is based on an in use factor of (50%) and a demonstration of the maximum number of fueling points which can be operated simultaneously while the nozzles maintain vacuum levels within the required operating range. The local district may require a demonstration of nozzle performance with the maximum number of simultaneous fueling points in operation as specified in Exhibit 5, Fillneck Vapor Pressure Regulation Fueling Test.

**Table 1**  
**Central Vacuum Unit – Maximum and Simultaneous Number of Fueling Points**

Central Vacuum Unit	Maximum Number Of Fueling Points	Maximum Number of Simultaneous Fueling Points
Healy 9000 Mini-Jet Pump	8	4
Thomas Industries / Franklin Electric VP500 Vane Pump	10	5
Healy Model 100 Jet Pump	2	1

( 2 each per operating nozzle)		
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To increase the maximum number of fueling points in a gasoline dispensing facility, two or more central vacuum units may be installed in parallel to maintain the necessary vacuum for the system as per CARB approved manufacturer's instructions. The local district may require verification that the system can operate within the specified vacuum range with the maximum number of nozzles which may be used simultaneously as specified in Exhibit 5, Fillneck Vapor Pressure Regulation Fueling Test.

- 5.6** The system shall achieve the minimum operating vacuum of 65" wc within fifteen seconds after the system is energized for a dispensing episode (time required to evacuate the Phase II piping).
- a. A failure to achieve the required initial vacuum for three consecutive dispensing episodes is defined as a equipment defect which substantially impairs the effectiveness of the system in accordance with Health and Safety Code Section 41960.2(c) and is subject to district enforcement action in accordance with Health and Safety Code Section 41960.2(d).
  - b. A failure to achieve the required initial vacuum within a one (1) hour period for any single dispensing episode is defined as a equipment defect which substantially impairs the effectiveness of the system in accordance with Health and Safety Code Section 41960.2(c) and is subject to district enforcement action in accordance with Health and Safety Code Section 41960.2(d).
- 5.7** After the initial minimum vacuum has been reached, the system shall operate within a vacuum range from 65" to 85" wc throughout the dispensing episode. A vacuum level below 60" wc for more than three seconds after the system has reached 65" wc, measured while dispensing is occurring, is defined as a equipment defect which substantially impairs the effectiveness of the system in accordance with Health and Safety Code Section 41960.2(c) and is subject to district enforcement action in accordance with Health and Safety Code Section 41960.2(d). A vacuum level below 65" wc but greater than or equal to 60" wc for more than three seconds after the system has reached 65" wc, measured while dispensing is occurring, indicates that the system is not in good working order, but is not a defect specified pursuant to Health and Safety Code section 41960.2(c), and is subject to district enforcement action including action under Health and Safety Code Section 41960.2(e).
- 5.8** A vacuum level above 90" wc measured while dispensing is occurring is defined as a equipment defect which substantially impairs the effectiveness of the system in accordance with Health and Safety Code Section 41960.2(c) and is subject to district enforcement action in accordance with Health and Safety Code Section 41960.2(d). A vacuum level above 85" wc but less than or equal to 90" wc measured while dispensing is occurring indicates that the system is not in good working order, but is not a defect specified pursuant to Health and Safety Code section 41960.2(c), and is subject to district enforcement action including action under Health and Safety Code Section 41960.2(e).
- 5.9** A non-restrictive ball valve with a nominal size the same as the vapor return line shall be installed in the vapor return line such that the vacuum lines can be isolated from the aboveground storage tanks for the purpose of conducting the "Vacuum Return Line Integrity Test" as specified in Exhibit 4. The valve shall remain open at all times except when the test is being conducted Product dispensing when this valve is closed is defined as a equipment defect which substantially impairs the effectiveness of the system in accordance with Health and Safety Code Section 41960.2(c) and is

subject to district enforcement action in accordance with Health and Safety Code Section 41960.2(d).

**6**     **9466 Check Valve**

The 9466 Check Valve is a required system component and shall not be removed or bypassed during operation or testing of the system.

**7**     **System Monitor**

The Healy Model 400 ORVR system shall have a CARB approved system monitor unless exempted by this executive order.

**8**     **System Monitor Vacuum Sensor**

**8.1**    The monitor shall be powered at all times and have a “power” light indicator. The vacuum monitor portion shall have three system indicator lights. One light shall indicate that the vapor recovery system “motor” ( VP500 vane pump, 100 jet pump(s) or 9000 mini-jet pump) has power. The other two lights shall indicate the system is operating within either “run” or “low” vacuum levels.

**8.2**    The monitor shall flash the “low” vacuum indicator (red LED) whenever the system vacuum level is below sixty-five inches water column (65" wc) as sensed by the System Monitor Pressure Switch during dispensing episodes. The “run” vacuum light (green LED) shall light when the vacuum is 65" wc or higher as sensed by the System Monitor Pressure Switch during dispensing episodes.

**8.3**    The monitor shall sound an alarm and record a system vacuum failure whenever the system fails to achieve the minimum operating vacuum of 65" wc within fifteen seconds after the system is energized for a dispensing episode for three consecutive dispensing episodes.

**8.4**    The monitor shall sound an alarm, continuously flash the “low” vacuum red LED and record a system vacuum failure whenever the vacuum level, as sensed by the System Monitor Pressure Switch during dispensing episodes, is less than 65" wc for more than a total of one (1) hour in any calendar day.

**8.5**    The system monitor shall be located in an area that is audible to station personnel while at their common workplace.

**8.6**    The pressure switch shall be installed at the inlet to the central vacuum unit as shown in Figures 2A, 2C and 3.

**9**     **System Monitor Vent Sensor**

**9.1**    The vent-sensing portion of the system monitor shall have two lights to indicate “venting” and “excess venting”. The “venting” light shall be set to light when venting is occurring. The “excess venting” light will be illuminated and the alarm will sound after a total accumulated time of ten hours of venting has been recorded within any calendar day.

**9.2**    The System Monitor shall, at a minimum, create a permanent record of system date and times of venting and excess venting.

## **10 Log Requirements**

- 10.1** The Monitor shall cause a continuous audible alarm as specified in Sections 8.4, 8.7 and 9.1. The alarm may be silenced for a four hour period with a reset button but shall resound if the condition which caused the alarm is still present. The station owner/operator shall call for maintenance within 24 hours of the initial alarm sounding and shall maintain a "Monitor Maintenance Log Sheet" (see Figure 6) of all alarm events and corresponding maintenance actions. This log shall be kept on site at all times for service station type operations and at a central location for remote or unattended operations.
- 10.2** The owner/operator of service station type systems shall conduct a physical inspection of the equipment on a daily basis and manually monitor the system vacuum levels at the system vacuum gauge on a once per day basis during a dispensing episode to determine proper operation of the system. The inspection results and vacuum observations shall be recorded in a System Log to be kept on site at all times for service station type operations and at a central location for remote or unattended operations.

## **11 Phase II Vapor Recovery System**

- 11.1** Operation of the Phase II system shall not cause venting through the system monitor vent in excess of ten (10) hours in any calendar day. Any venting through the system monitor vent in excess of ten (10) hours in any calendar day which is not attributable to a Phase I fuel delivery is subject to district enforcement action in accordance with Health and Safety Code Section 41960.2(e). Venting through the system monitor vent may be attributed to a Phase I delivery for the duration of the delivery and for a maximum one (1) period following the delivery. The station owner / operator will record events of venting which may be attributed to a Phase I fuel delivery in the System Log. Venting through the 3" pressure setting relief vent is defined as a equipment defect which substantially impairs the effectiveness of the system in accordance with Health and Safety Code Section 41960.2(c) and is subject to district enforcement action in accordance with Health and Safety Code Section 41960.2(d).
- 11.2** The minimum nominal pipe size of the Phase II plumbing shall be 2" up to the riser to the aboveground storage tank where the minimum nominal pipe size shall be 1". This requirement does not apply to self-contained dispenser pump systems as shown in Figure 4A.
- 11.3** The dispenser-to-riser connection shall be installed so that any liquid in the lines will drain toward the Phase II line low point. The internal diameter of the connector, including all fittings, shall not be less than five-eighths inch (5/8") for new factory equipped dispensers. The Healy Model series Z0XXX vapor recovery retrofit kits (which consist of two 0.5" OD copper tube and flare fittings to connect all hose outlet fittings on one side of the dispenser to a 1/2" pipe running vertically from the canopy to the base of the dispenser where 0.5" OD copper tubing and flare fittings connect to the underground vapor return riser) may be used on existing dispensers. This piping configuration is required on each side of the dispenser.
- 11.4** All vapor return lines shall have a slope sufficient to prevent a liquid blockage when used in conjunction with a low point condensate trap or knockout pot.

- 11.5** A condensate trap or knockout pot with an automatic liquid removal system shall be installed at the low point in the vapor return piping (see Figures 2B, 2D and 4D).
- 11.6** All exposed Phase II piping shall be painted white or off-white (with any color base) provided the reflectivity of the paint is 75 percent or better. Reflectivity shall 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). The appropriate color card shall be available at the facility for service station type operations or at a central location for remote or unattended locations.
- 12** **Phase I System**
- 12.1** 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 contained in Exhibit 3.
- 12.2** Spill containment boxes (when present) that have drain valves shall demonstrate compliance with the static pressure decay criteria with the drain valves installed as in normal operation.
- 12.3** The Phase I vapor recovery system shall be operated during product deliveries with no less than one vapor return hose connected for each product being delivered
- 12.4** All Phase I adapters, fittings and connections shall be maintained vapor tight as defined in CARB Source Test Methods Volume 2, Vapor Recovery Definitions, D-200.
- 12.5** The installation of the tank and associated piping and other equipment not specifically listed as certified Phase I equipment in CARB executive orders shall comply with the requirements of local fire officials with jurisdiction where the system is installed.
- 13** **Dispensing Rate**  
The dispensing rate for installations of the Healy Model 400 ORVR System shall not exceed ten (10.0) gallons per minute for any nozzle. The dispensing rate shall be verified as specified in Exhibit 6, “Ten Gallon Per Minute Limitation Compliance Verification Procedure”.