

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER VR-207-A

Emco Wheaton Retail Corporation
Phase II Enhanced Vapor Recovery (EVR) System
with Hirt VCS 100 Thermal Oxidizer
Not Including In-Station Diagnostics (ISD)

WHEREAS, the California Air Resources Board (ARB) has established, pursuant to California Health and Safety Code sections 25290.1.2, 39600, 39601 and 41954, certification procedures for systems designed for the control of gasoline vapor emissions during motor vehicle fueling operations (Phase II EVR vapor recovery systems) in its CP-201, **Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities** (Certification Procedure) as last amended May 25, 2006, incorporated by reference in title 17, California Code of Regulations, section 94011;

WHEREAS, ARB has established, pursuant to California Health and Safety Code sections 39600, 39601, 39607, and 41954, test procedures for determining the compliance of Phase II vapor recovery systems with emission standards;

WHEREAS, Emco Wheaton Retail Corporation (Emco) has applied for certification of the Emco Phase II Enhanced Vapor Recovery System with the Hirt Combustion Engineers, Inc. (Hirt) VCS 100 Thermal Oxidizer Not Including In-Station Diagnostics (Emco Phase II EVR System) pursuant to the Certification Procedure;

WHEREAS, the Certification Procedure provides that the ARB Executive Officer shall issue an Executive Order if he or she determines that the vapor recovery system conforms to all of the applicable requirements set forth in the Certification Procedure;

WHEREAS, I, James N. Goldstene, California Air Resources Board Executive Officer, find that the Emco Phase II EVR System conforms with all requirements set forth in the Certification Procedure, including compatibility when fueling vehicles equipped with onboard refueling vapor recovery systems, and results in a vapor recovery system which is at least 95 percent efficient and shall not exceed 0.38 pounds of hydrocarbons per 1,000 gallons of gasoline transferred when tested pursuant to TP-201.2, **Efficiency and Emission Factor for Phase II Systems** (May 2, 2008);

NOW, THEREFORE, IT IS HEREBY ORDERED that the Emco Phase II EVR System is certified to be at least 95 percent efficient and does not exceed 0.38 pounds of hydrocarbon per 1,000 gallons of gasoline transferred in attended and/or self-service mode when used with an ARB-certified Phase I vapor recovery system and installed, operated, and maintained as specified herein and in the following exhibits. Exhibit 1 contains a list of the equipment certified for use with the Emco Phase II EVR System. Exhibit 2 contains the performance standards, specifications, and typical installation drawings applicable to the Emco Phase II EVR System as installed in a gasoline dispensing facility (GDF).

Exhibit 3 contains the manufacturing performance standards and specifications. Exhibit 4 provides items required in conducting TP-201.3, **Determination of 2 Inch WC Static Pressure of Vapor Recovery Systems of Dispensing Facilities** (March 17, 1999). Exhibit 5 is the **Liquid Removal Test Procedure**. Exhibit 6 provides items required in conducting TP-201.4, **Dynamic Back Pressure** (July 3, 2002). Exhibit 7 is the **Nozzle Bag Test Procedure**. Exhibit 8 is the **Hirt VCS 100 Processor Operability Test Procedure**. Exhibit 9 is the Emco, Hirt, and Goodyear Warranties.

IT IS FURTHER ORDERED that compliance with the applicable certification requirements, rules and regulations of the Division of Measurement Standards of the Department of Food and Agriculture, the Office of the State Fire Marshal of the Department of Forestry and Fire Protection, the Division of Occupational Safety and Health of the Department of Industrial Relations, and the Division of Water Quality of the State Water Resources Control Board are made conditions of this certification.

IT IS FURTHER ORDERED that Emco and Hirt shall provide a warranty for the vapor recovery system and components to the initial purchaser. The warranty shall be passed on to each subsequent purchaser within the warranty period. The manufacturer of components listed in Exhibit 1 not manufactured by Emco or Hirt shall provide a warranty to each of their components certified herein. The warranty shall include the ongoing compliance with all applicable performance standards and specifications and shall comply with all warranty requirements in Section 16.5 of the Certification Procedure. Emco, Hirt, or other manufacturers may specify that the warranty is contingent upon the use of trained installers.

IT IS FURTHER ORDERED that every certified component manufactured by Emco and Hirt shall be performance tested by the manufacturer as provided in Exhibit 3.

IT IS FURTHER ORDERED that the certified Emco Phase II EVR System shall be installed, operated, and maintained in accordance with the **ARB Approved Installation, Operation, and Maintenance Manual**. A copy of this Executive Order and the **ARB Approved Installation, Operation and Maintenance Manual** shall be maintained at each GDF where the certified Emco Phase II EVR System is installed.

IT IS FURTHER ORDERED that equipment listed in Exhibit 1, unless exempted, shall be clearly identified by a permanent identification showing the manufacturer's name, model number, and serial number.

IT IS FURTHER ORDERED that any alteration in the equipment parts, design, installation, or operation of the system certified hereby is prohibited and deemed inconsistent with this certification, unless the alteration has been submitted in writing and approved in writing by the Executive Officer or Executive Officer delegate.

IT IS FURTHER ORDERED that the following requirements are made a condition of certification. The owner or operator of the Emco Phase II EVR System shall conduct and pass the following tests no later than 60 days after startup and at least once in each twelve month period, using the following test procedures:

Emco Phase II EVR System with Hirt Thermal Oxidizer not Including ISD – VR-207-A

- TP-201.3, **Determination of 2 Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities** (March 17, 1999);
- TP-201.4, **Dynamic Back Pressure** (July 3, 2002) in accordance with the condition listed in item 1 of the Vapor Collection section of Exhibit 2;
- Exhibit 4, **Required Items in Conducting TP-201.3**;
- Exhibit 5, **Liquid Removal Test Procedure**;
- Exhibit 6, **Required Items in Conducting TP-201.4**; and
- Exhibit 8, **Hirt VCS 100 Processor with Indicator Panel Operability Test Procedure**;

Local districts at their option may specify the testing frequency and related sequencing of the above tests. Notification of testing, and submittal of test results, shall be done in accordance with local district requirements and pursuant to policies established by that district. Local districts may require the use of alternate test form(s), provided they include the same minimum parameters identified in the datasheet referenced in the test procedure(s). Alternative test procedures, including most recent versions of the test procedures listed above, may be used if determined by the ARB Executive Officer or Executive Officer delegate, in writing, to yield equivalent results.

IT IS FURTHER ORDERED that the following requirements are made a condition of certification. The owner or operator of the Emco Phase II EVR System shall conduct, and pass, the following test no later than 60 days after startup using the following test procedure: Exhibit 7, **Nozzle Bag Test Procedure**. Notification of testing, and submittal of test results, shall be done in accordance with local district requirements and pursuant to the policies established by that district. Alternative test procedures, including most recent versions of the test procedures listed above, may be used if determined by the ARB Executive Officer or Executive Officer delegate, in writing, to yield equivalent results.

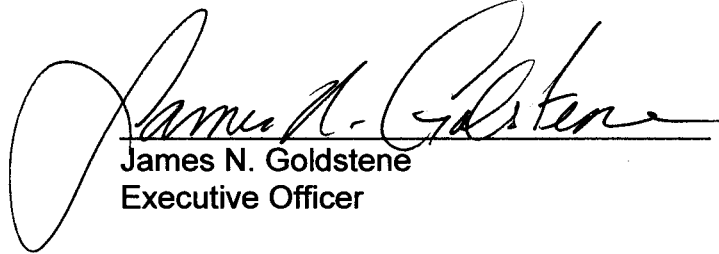
IT IS FURTHER ORDERED that, except as provided above, local districts at their option will specify the testing, related sequencing, and testing frequency of the nozzle vapor valves. If the district requires the nozzle vapor valve be tested, the test shall be conducted in accordance with Exhibit 7, **Nozzle Bag Test Procedure**.

IT IS FURTHER ORDERED that the Emco Phase II EVR System shall be compatible with gasoline in common use in California at the time of certification. The Emco Phase II EVR System is not compatible with gasoline that has a methanol content greater than 5 percent, an ethanol content greater than 10 percent, or a methyl tert butyl ether (MTBE) content greater than 15 percent. Any modifications to comply with future California gasoline requirements shall be approved in writing by the Executive Officer or Executive Officer delegate.

IT IS FURTHER ORDERED that the certification of the Emco Phase II EVR System with Hirt VCS 100 Thermal Oxidizer is valid through September 15, 2013.

IT IS FURTHER ORDERED that this Executive Order shall apply to new installations or major modification of Phase II Systems with a throughput of less than or equal to 600,000 gallons per year. Use of this Executive Order for new installations or major modifications at a GDF with a throughput of more than 600,000 gallons per year is not authorized.

Executed at Sacramento, California, this 23 day of September 2009.



James N. Goldstene
Executive Officer

Attachments:

- Exhibit 1 Equipment List
- Exhibit 2 System Specifications
- Exhibit 3 Performance Standards and Specifications
- Exhibit 4 Required Items in Conducting TP-201.3
- Exhibit 5 Liquid Removal Test Procedure
- Exhibit 6 Required Items in Conducting TP-201.4
- Exhibit 7 Nozzle Bag Test Procedure
- Exhibit 8 Hirt VCS 100 Processor with Indicator Panel Operability Test Procedure
- Exhibit 9 Warranty

**Executive Order VR-207-A
Emco Phase II EVR System with Hirt Thermal Oxidizer**

**Exhibit 1
Equipment List**

<u>Component</u>	<u>Manufacturer/ Model</u>
Nozzle	Emco Model A4005EVR (Figure 1A-1) Emco Model RA4005EVR (Rebuilt)
Coaxial Curb Hose with Liquid Removal Device	Goodyear Model Maxxim Premier Plus (Figure 1A-2)
Coaxial Whip Hose	Goodyear Model Maxxim Premier Plus (Figure 1A-2)
Hose Swivel	EMCO Wheaton Retail Model A4110EVR (Figure 1A-2)
Safe Break Valve	EMCO Wheaton Retail Model A4119EVR (Figure 1A-2)
Hanging Hardware	(Figure 1A-3)
Hirt Thermal Oxidizer With Indicator Panel	Hirt Model VCS 100 (Figure 1A-4) Leg Attachments: 5" – M39 48"- M40
Hirt 1/4" Check Valve	Hirt P65

Figure 1A-1
Emco Model A4005EVR Nozzle

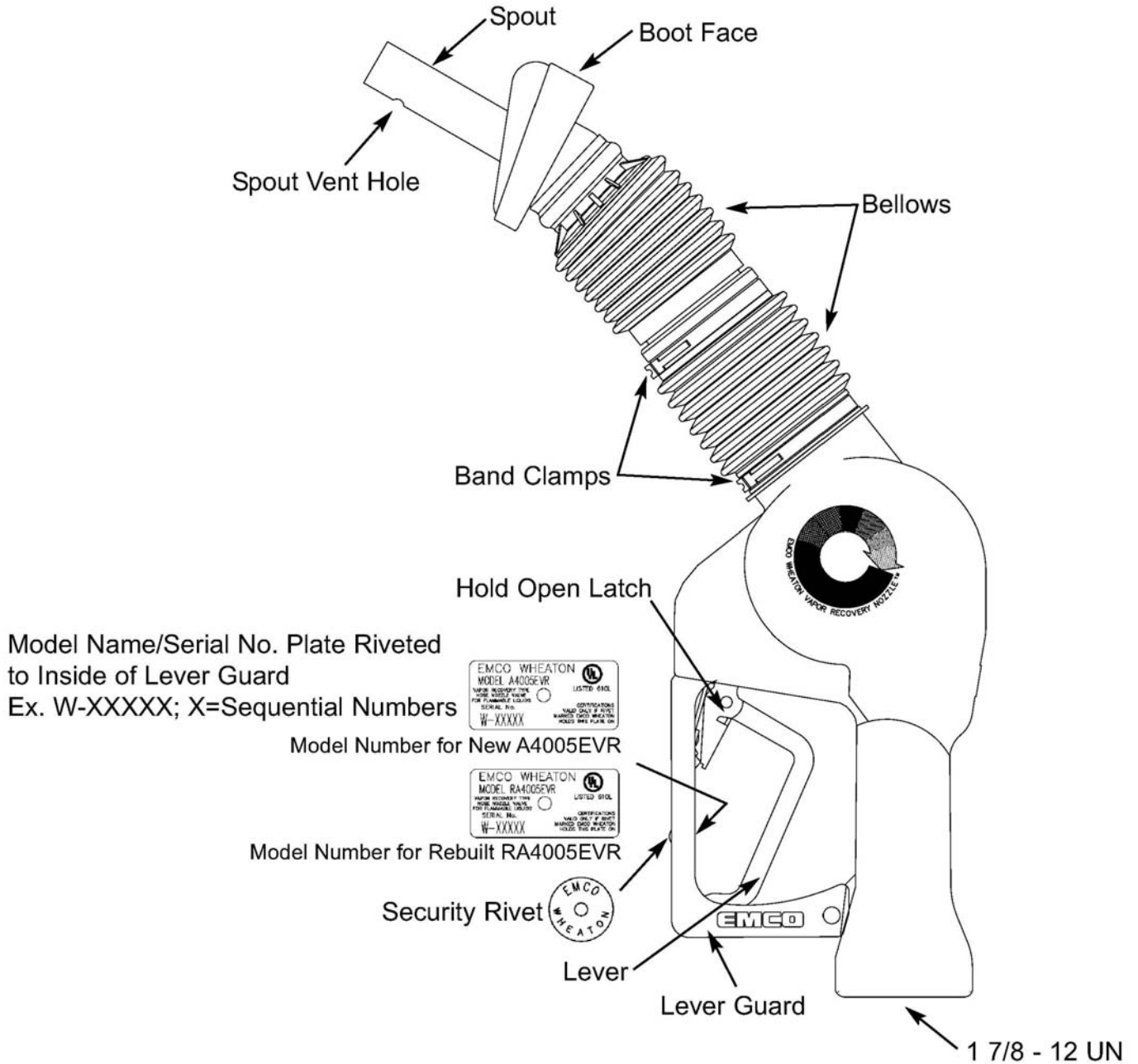


Figure 1A-2
Emco Hanging Hardware
(Nozzle, Hose Swivel, Coaxial Curb Hose, Safe Break, and Coaxial Whip Hose)

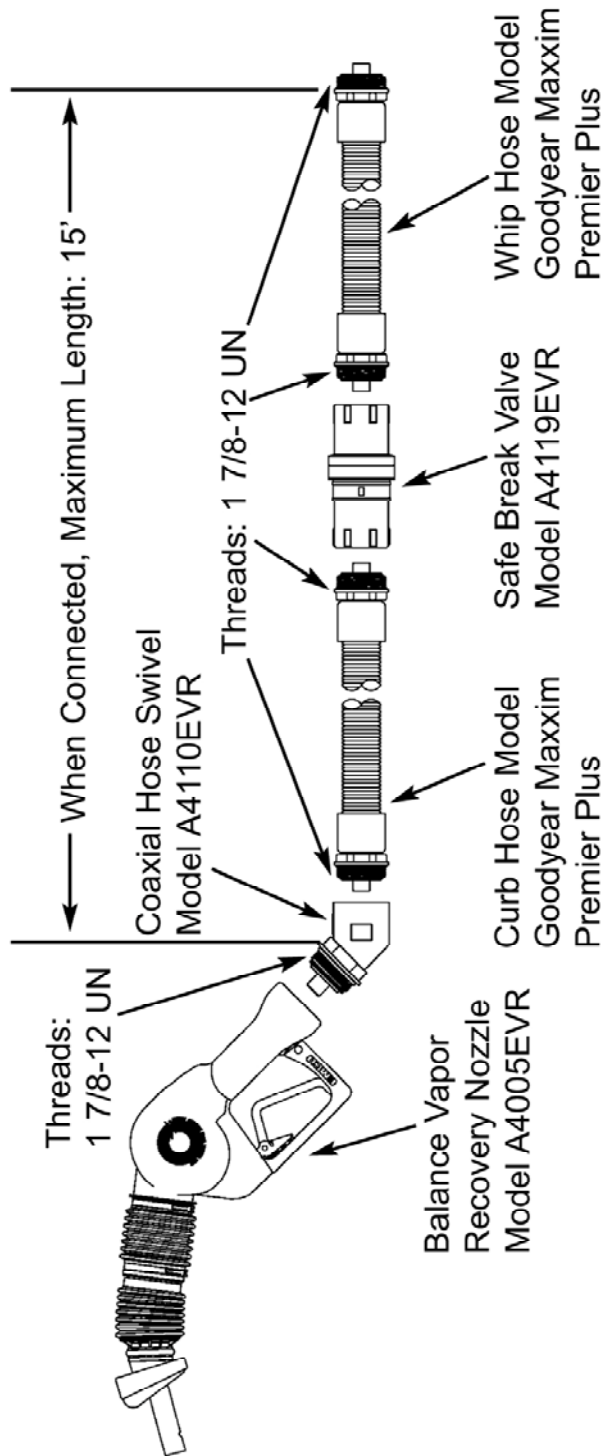


Figure 1A-2 (continued)
Emco Hanging Hardware
(Nozzle, Hose Swivel, Coaxial Curb Hose, Safe Break, and Coaxial Whip Hose)

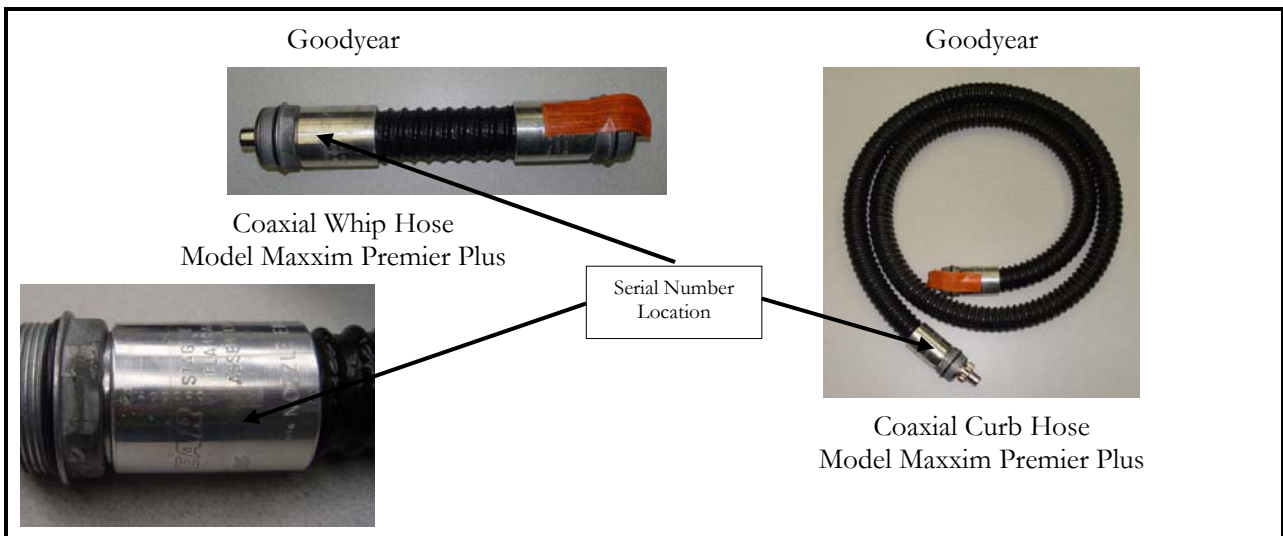
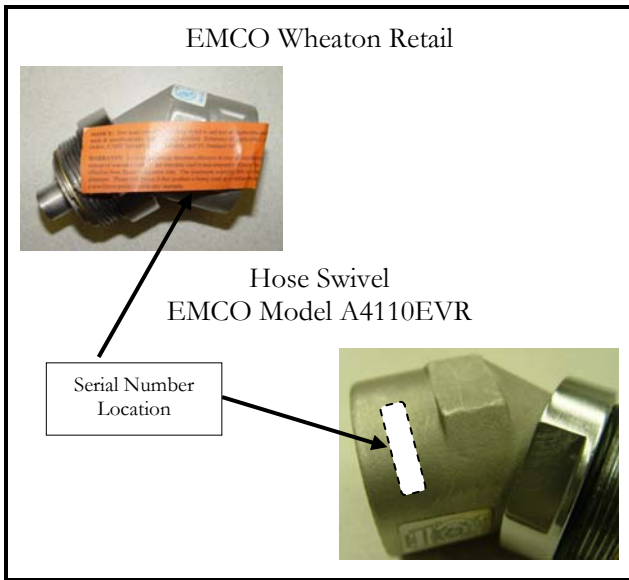


Figure 1A-3
Typical Emco and Goodyear Hanging Hardware with Liquid Removal Device

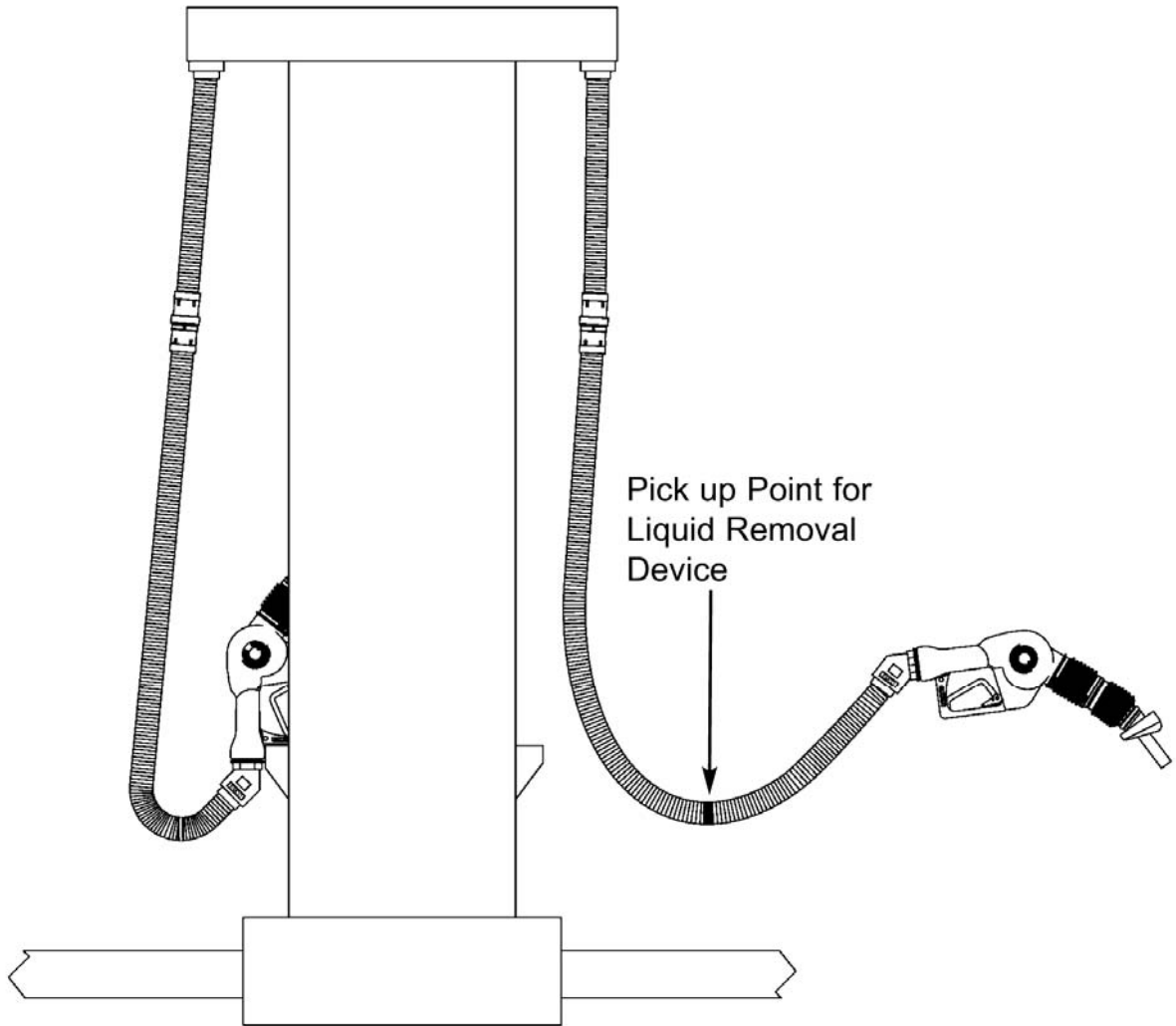
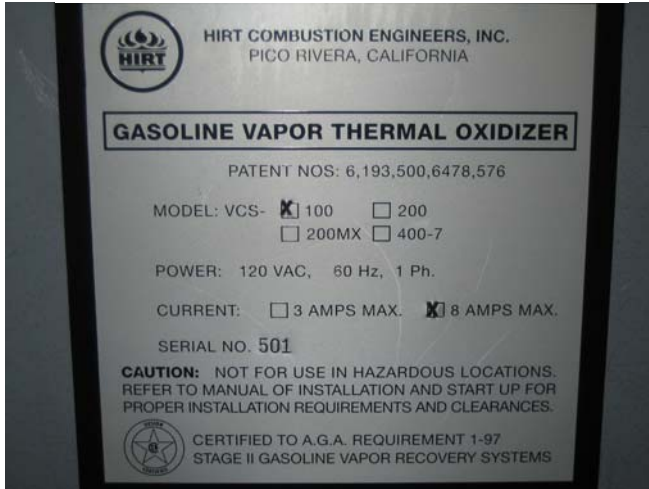
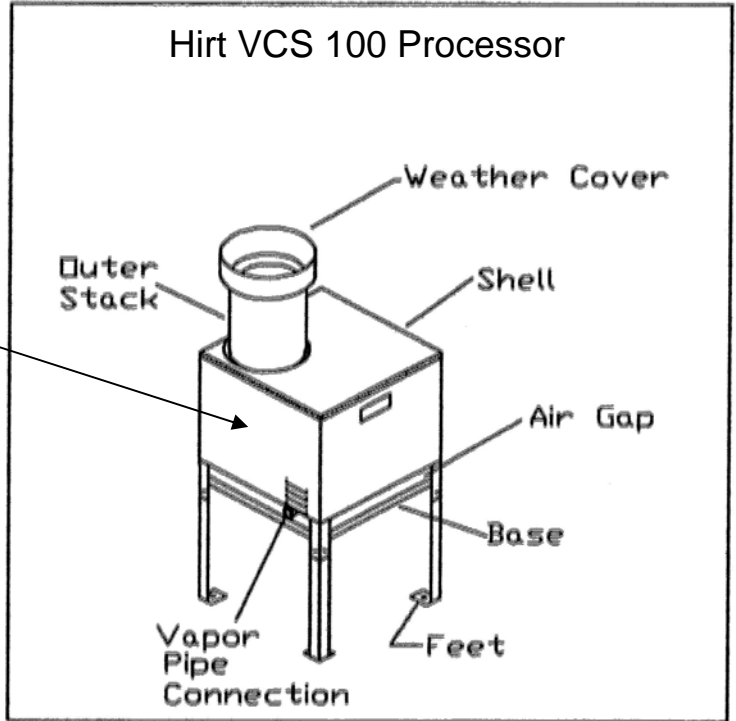


Figure 1A-4
Hirt VCS 100 Thermal Oxidizer and Indicator Panel

VCS 100 Identification Plate



Hirt VCS 100 Processor



Indicator Panel Face

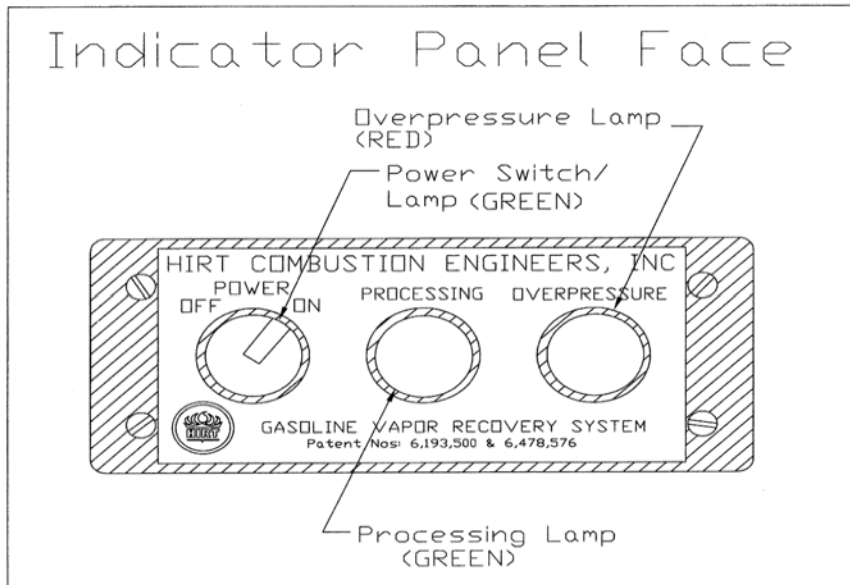
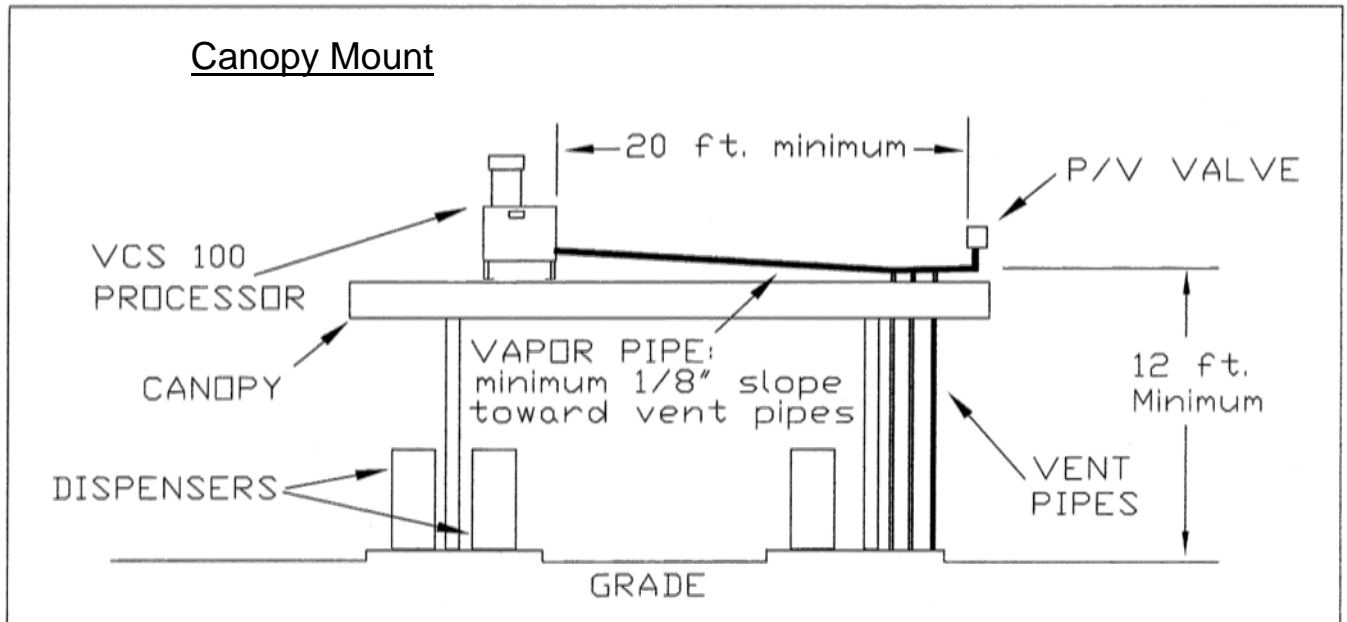
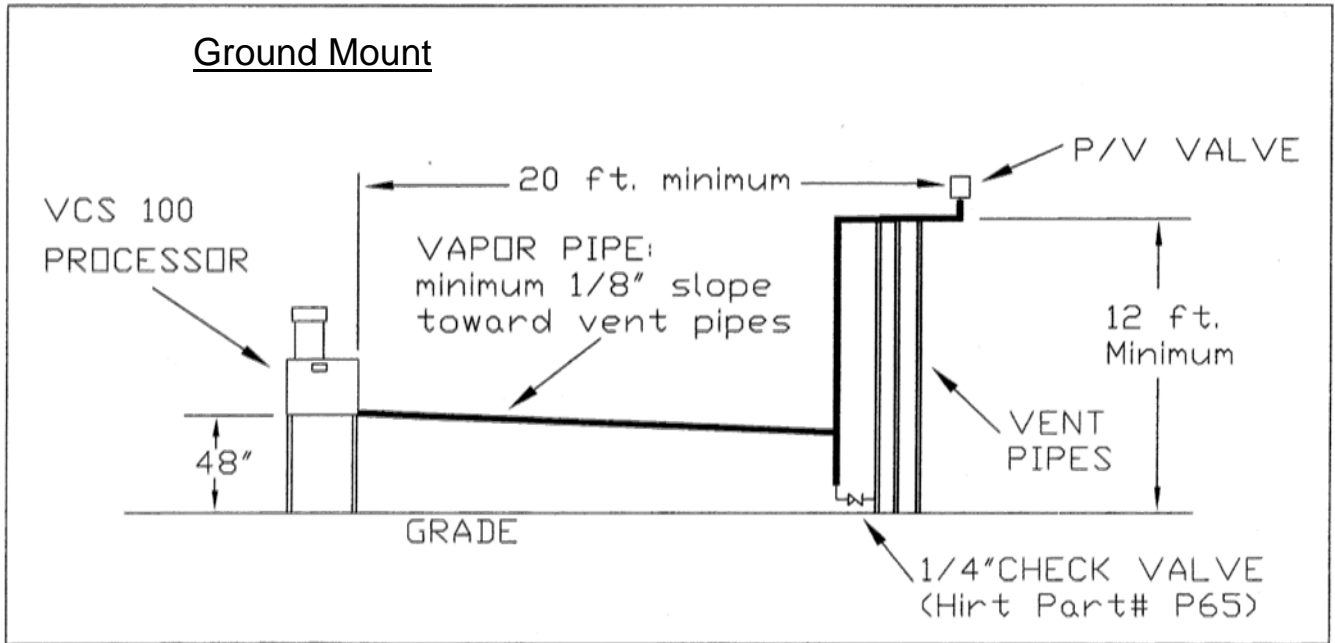


Figure 1A-4 (continued)
Typical Hirt VCS100 Thermal Oxidizer Processor



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Emco Phase II EVR System with Hirt Thermal Oxidizer

Exhibit 2
System Specifications

This exhibit contains the installation, maintenance and compliance standards and specifications that apply to the Emco Phase II EVR System installed at a gasoline dispensing facility (GDF). All components must be installed, maintained, and operated in accordance with the specifications in the **ARB Approved Installation, Operation and Maintenance Manual (IOM)**. Installation, maintenance and repair of system components, including removal and installation of such components in the course of any required tests, shall be performed by technicians certified by the appropriate manufacturer. Additional certifications may be required in accordance with local district requirements. Provided that there are no other local district requirements, a GDF owner/operator can remove and install nozzles, hose swivels, curb hoses, safe brakes, and whip hoses without a manufacturer certification.

Nozzle

1. A vapor bellows shall be installed on the nozzle at the base of the spout, as shown in **Figure 2B-1**.
2. The Emco Model A4005EVR 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. The performance of the nozzle vapor valve can be determined by items 2.1 or 2.2.
 - 2.1. The maximum allowable leak rate for the nozzle vapor path, as determined by TP-201.2B, shall not exceed 0.07 cubic feet per hour (CFH) at a pressure of two inches water column (2.00" WC)
 - 2.2. Verification of the integrity of the vapor valve can be performed on installed nozzles using the nozzle bag test procedure in Exhibit 7.
3. The gasoline flow rate of the nozzle shall be between six (6.0) and ten (10.0) gallons per minute as determined by the applicable provisions of section 6 or 7 of Exhibit 5 or by direct observation for 30 seconds minimum at the maximum hand held position.

Vapor Collection

1. The system pressure drop from the nozzle to the UST, as determined by TP-201.4 (Methodology 1) and Exhibit 6, shall not exceed the following:

0.35 inches WC at a flow rate of 60 CFH of Nitrogen; and
0.62 inches WC at a flow rate of 80 CFH of Nitrogen.

Coaxial Hoses

1. The maximum length of the curb hose, hose swivel, safe break valve, and whip hose combined shall not exceed fifteen feet as measured from the base of the nozzle to the end of dispenser adapter or dispenser, as appropriate (reference Exhibit 1 Figure 1A-2).
2. The liquid removal rate shall not be less than five milliliters per gallon (5 ml/gal) as determined by Exhibit 5 when tested with a gasoline flow rate between six (6.0) and ten (10.0) gallons per minute. Liquid removal requirement is applicable to all grade of gasoline.
3. All hoses shall have a permanent marking indicating the liquid pick-up location.
4. Any hose configuration is allowed when installed in accordance with the IOM section titled "Hoses".

Safe Break Valve

1. The Emco Safe Break Valves are non-reconnecting and shall be replaced following a drive-off.

Flow Limiter

1. No flow limiter is allowed for this system.

Hirt VCS 100 Thermal Oxidizer

1. The processor vapor integrity shall demonstrate compliance with the static pressure decay criteria of TP-201.3 and Exhibit 4.
2. Unless there is maintenance or testing being conducted on the processor, the processor shall be on (power lamp is lit) and in the automatic vapor processor mode. The ball valve on the inlet of the processor shall be locked in the open position shown in **Figure 2B-2** and the 3-Way Valve handle shall be pointing down in the Normal Operating Position (Opened to UST Ullage) shown in Figure 2B-3 during normal processor operation. The handles of the ball valves shall not be removed.
3. Piping to the processor shall be sloped 1/8" per foot minimum toward the vent line(s).
4. The VCS 100 Indicator Panel shall be installed at a location that is most likely to be occupied by the station attendant during normal station operation (i.e., cash register).
5. The processor shall activate when the processor is exposed to an atmospheric pressure input and the Processing lamp at the Indicator Panel shall light within three (3) minutes as determined by Exhibit 8.

6. When the processor is exposed to an atmospheric pressure input, the OVERPRESSURE lamp at the Indicator Panel shall light within sixty two (62) minutes as determined by Exhibit 8.
7. If the OVERPRESSURE lamp lights, the system is not in proper working order. The GDF owner/operator shall immediately take the following actions:
 - a. record the date and time the OVERPRESSURE lamp lit in the station's maintenance and alarm records;
 - b. investigate the cause of the OVERPRESSURE light as provided by section 8 of the Installation, Operations, and Maintenance Manual. Record results of inspections, maintenance, and/or testing conducted in the station's maintenance and alarm records; and if necessary,
 - c. record the date and time when the GDF owner/operator called the maintenance contractor for service.

Pressure/Vacuum Vent Valves for Storage Tank Vents

1. All P/V vent valves shall be an ARB certified P/V valve for a Phase I system.
2. At least one pressure/vacuum (P/V) vent valve shall be installed on each tank vent. The maximum number of P/V vent valves allowed and P/V vent valve performance specifications are listed in the applicable Phase I EVR Executive Order. Vent lines may be manifold to minimize the number of P/V vent valves and potential leak sources, provided the manifold conforms to all applicable fire regulations.

Vapor Recovery Piping Configurations

NOTE: Vapor Return Piping shall meet the requirements specified in section 4.11 of CP-201.

1. Vapor Return and Vent Lines

For facilities installed on or after April 1, 2003, all vapor return and vent lines shall be a minimum nominal internal diameter of 2 inches from the dispensers or the vent stacks to the first manifold. All lines after the first manifold and back to the underground storage tank shall have a minimum nominal internal diameter of 3 inches.

Note: Facilities permitted by a local district prior to April 1, 2003 shall be required to meet the three inch diameter standard only upon facility modification which involves the addition, replacement, or removal of 50 percent or more of the buried vapor piping.

2. All vapor return lines shall have a minimum slope of 1/8 inch per foot from the dispenser riser to the riser of the UST. A slope of 1/4 inch or more per foot is recommended wherever feasible.

3. The dispenser shall be connected to the riser with either flexible or rigid material that 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 inch (1").

Note: The dispenser-to-riser connection is defined as the piping connection between the dispenser piping and the inlet of the dispenser riser. A vapor shear valve may also be part of the riser connection.

4. There is no length restriction for the vapor return piping of the system as long as the system complies with the maximum pressure drop requirement, item 1 of the Vapor Collection section.
5. No product shall be dispensed from any fueling point at a GDF installed with the Emco Phase II EVR System if there is a vapor line that is disconnected and open to the atmosphere.
6. No liquid condensate traps are allowed with this system.

Dispensers

1. The dispenser vapor piping must be sized adequately to meet the maximum pressure drop requirement, item 1 of the Vapor Collection section.
2. Dispenser vapor piping shall be installed so that any liquid in the lines will drain toward the dispenser riser.

Phase I System

1. The Phase I system shall be an ARB-certified system that demonstrates compliance with the static pressure decay test criteria contained in TP-201.3 and Exhibit 4.

Maintenance Records

1. Each GDF operator owner shall keep records of alarms and maintenance performed at the facility. Such records shall be maintained on site in accordance with district requirements or policies. The records shall include alarm date and time, nature of the alarm, troubleshooting, maintenance or repair performed to validate and/or correct alarms, component, or system failures, date when maintenance or repair was conducted, name and Certified Technician Identification Number of individual conducting maintenance or test, affiliation, and telephone number. Additional information may be required in accordance with local district requirements. An example of a GDF maintenance and alarm record is shown in Figure 2B-4.
2. Maintenance shall be conducted in accordance with the Scheduled Maintenance section of the ARB Approved Installation, Operation, and Maintenance Manual.

Vapor Recovery Equipment Defects

The following is deemed a defect for the affected fueling point(s) or system.

1. The fueling point shall be removed from service when more than 0.38 square inches of a nozzle boot face material is missing (e.g., a triangular or similar shape in which greater than 7/16 inches of the boot face circumference is missing (accumulated)).
2. The fueling point shall be removed from service when there is slit across seven (7) consecutive bellows convolutions as determined by direct measurements.
3. The fueling point shall be removed from service when a hose is found to have greater than 150 ml of gasoline in the vapor side as determined by sections 6.1 to 6.5 of Exhibit 5. Note: Prior to draining gasoline from the vapor side of the Goodyear hose, use Emco tool P/N 494635EVR and plug the fuel spout. **Do not activate dispenser when draining gasoline from the vapor side of the Goodyear hose.**
4. The fueling point shall be removed from service when the Emco system pressure drop exceeds the following conditions as determined by Methodology 1 of TP-201.4 and Exhibit 6:

0.95 inches WC at a flow rate of 60 CFH of Nitrogen; and
1.52 inches WC at a flow rate of 80 CFH of Nitrogen.
5. The fueling point shall be removed from service when the dispensing rate is greater than ten (10) gallons per minute (gpm) or less than five (5) gpm as determined by the applicable provisions of section 6 or 7 of Exhibit 5 or by direct observation for 30 seconds minimum at the maximum hand held position.
6. The fueling point shall be removed from service when any hose has a visible opening as determined by direct observation.
7. The fueling point shall be removed from service when the insertion interlock mechanism allows dispensing when the bellows is uncompressed as determined by direct observation or GDF-09 (see Vapor Recovery Defects List).
8. The fueling point shall be removed from service when the nozzle automatic liquid shut-off mechanisms malfunction in any manner as determined by EPO No. 26-F (See Vapor Recovery Defects List) or direct observation.
9. The fueling point shall be removed from service when any nozzle has a defective vapor valve as determined by Exhibit 7 or when the vapor valve has a leak rate that exceeds 0.07 cubic feet per minute at a pressure of two (2) inches WC as determined by TP-201.2B.
10. The fueling point or system shall be removed from service when any component required by this Executive Order is absent, installed improperly or disconnected as determined by direct observation.

Figure 2B-1
Emco Model A4005EVR Nozzle

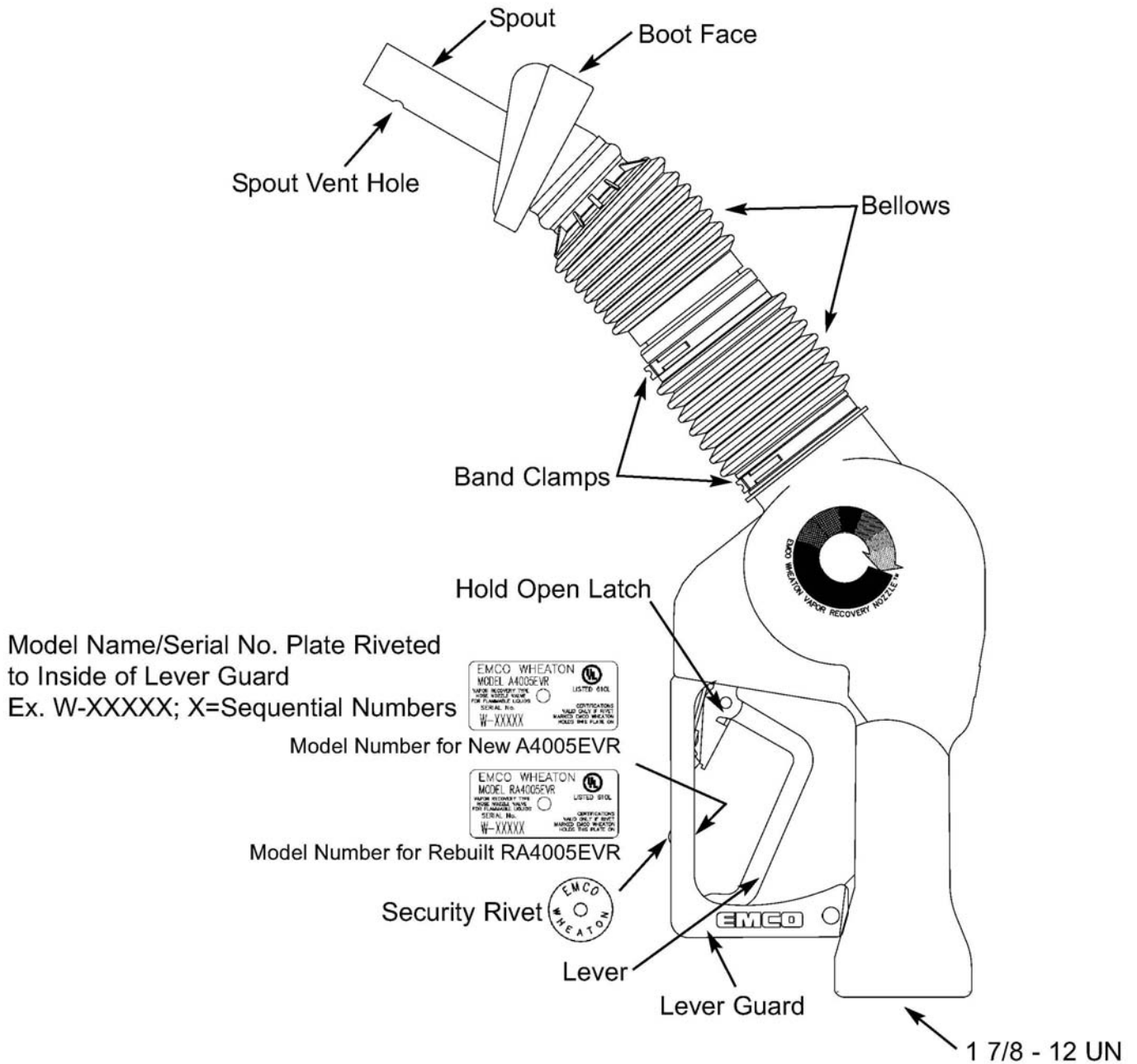


Figure 2B-2
Hirt VCS 100 Thermal Oxidizer
(shown in normal operation)

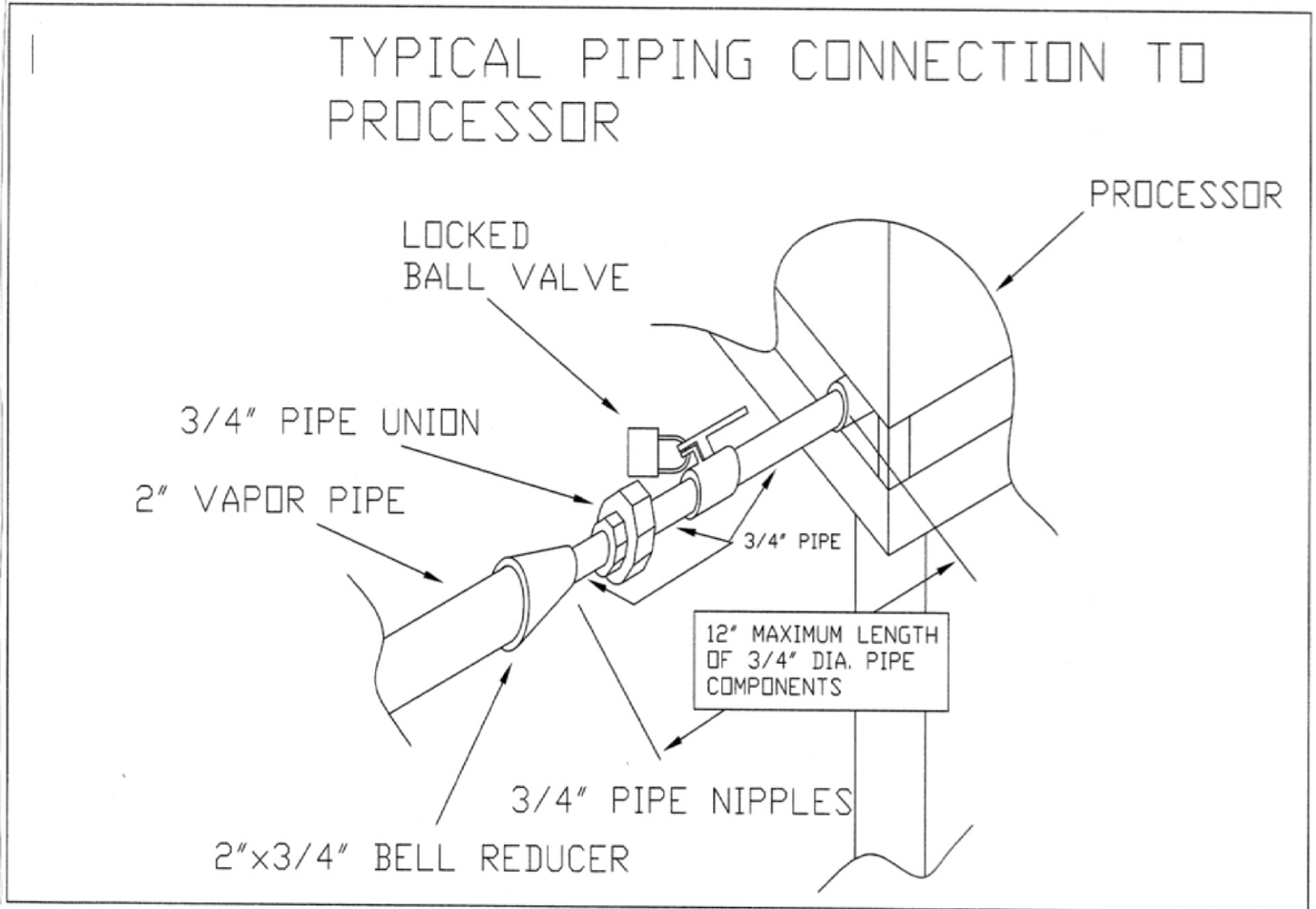


Figure 2B-3
Hirt VCS 100 Thermal Oxidizer
(3-Way Valve shown in normal operation)

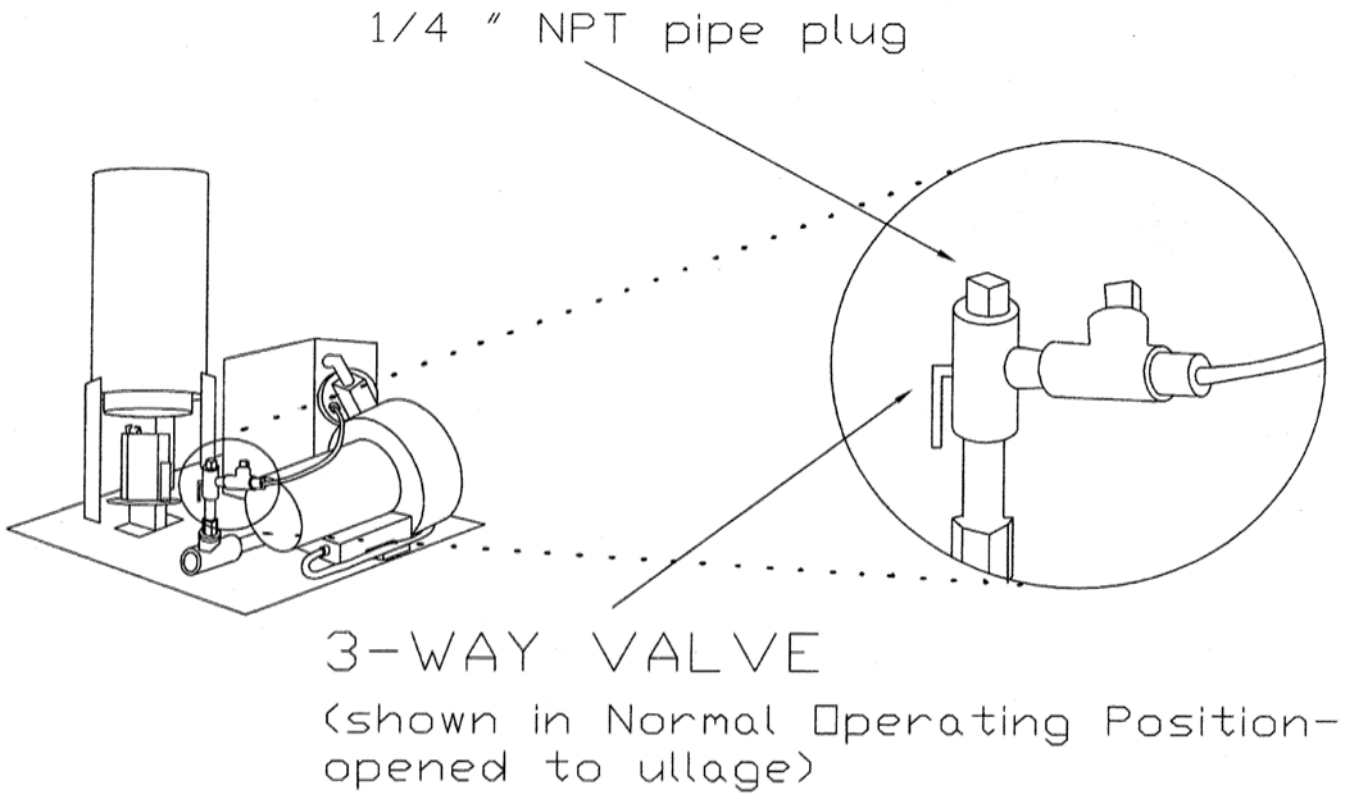


Figure 2B-4
Example of a GDF Maintenance Record and Alarm History Record

Date of Maintenance/ Test/Inspection/Failure/ alarm history (including date and time of maintenance call)	Repair Date To Correct Test Failure	Maintenance/Test/Inspection Performed and Outcome/Action Taken in Response to Alarm	Affiliation	Name and Technician ID Number of Individual Conducting Maintenance or Test	Telephone Number

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Emco Phase II EVR System with Hirt Thermal Oxidizer

Exhibit 3
Performance Standards and Specifications

Part I - Emco Manufacturing Performance Standards and Specifications

The Emco Phase II EVR System and all components shall be manufactured in compliance with the performance standards and specifications in CP-201 (amended May 25, 2006), as well as the requirements specified in this Executive Order. All components (Exhibit 1) shall be manufactured as certified; no change to the equipment, parts, design, materials or manufacturing process shall be made unless approved in writing by the Executive Officer or Executive Officer delegate. Unless specified in Exhibit 2 or in the **ARB Approved Installation, Operation and Maintenance Manual**, the requirements of this section apply to the manufacturing process and are not appropriate for determining the compliance status of a gasoline dispensing facility.

1. NOZZLES

Every nozzle shall be tested at the factory. Every nozzle shall have affixed to it a card or label stating the performance specifications listed below, and a statement that the nozzle was tested to, and met, the following specifications.

- a. The nozzle vapor valve leak rate shall not exceed 0.07 cubic feet per hour (CFH) at a pressure of +2 inches water column (WC) when tested in accordance with the latest version of TP-201.2B.
- b. The nozzle automatic shut off feature is tested at all service clip settings as well as handheld in accordance with Underwriters Laboratories (UL) Standard 842.
- c. The nozzle's primary and secondary shut-off mechanism shall be identical to the design that passed the California Department of Food and Agriculture Division of Measurement Standards Article 2 (DMS 6-6-97).
- d. The nozzle is manufactured to the specifications that passed all tests conducted during the ARB certification for the following:

TP-201.2C	- Spillage from Phase II Systems
TP-201.2D	- Post Fueling Drips from Nozzles
TP-201.2E	- Gasoline Liquid Retention in Nozzles and Hoses
TP-201.2J	- Pressure Drop Bench Testing of Vapor Recovery Components
- e. The nozzle bellows is manufactured such that the force necessary to compress the nozzle bellows 0.883 inches is 5.95 pounds-force.
- f. The terminal end of each nozzle shall be manufactured in accordance with the specifications referenced in Section 4.7.3 of CP-201.

2. COAXIAL HOSES

- a. Every coaxial hose is tested for continuity and pressure tests in accordance with UL Standard 330.
- b. Every coaxial hose is manufactured to the standards and specifications that passed all tests conducted during the ARB certification for the following:
 - Exhibit 5 - Liquid Removal Test Procedure (for curb hoses)
 - TP-201.2J - Pressure Drop Bench Testing of Vapor Recovery Components

3. SAFE BREAK VALVES

- a. Every safe break valve is tested for continuity and pressure tests in accordance with UL Standard 567.
- b. Every safe break valve is manufactured to the standard that passed all tests conducted during the ARB certification for the following:
 - TP-201.2J - Pressure Drop Bench Testing of Vapor Recovery Components

Part II - Hirt Manufacturing Performance Standards and Specifications

The Hirt VCS 100 thermal oxidizer and all components shall be manufactured in compliance with the performance standards and specifications in CP-201 (amended May 25, 2006), as well as the requirements specified in this Executive Order. All components (Exhibit 1) shall be manufactured as certified; no change to the equipment, parts, design, materials or manufacturing process shall be made unless approved in writing by the Executive Officer or Executive Officer delegate. Unless specified in Exhibit 2 or in the ***ARB Approved Installation, Operation and Maintenance Manual***, the requirements of this section apply to the manufacturing process and are not appropriate for determining the compliance status of a gasoline dispensing facility.

1. HIRT VCS 100 THERMAL OXIDIZER

- a. The VCS 100 processor is subjected to an assembly quality check.
- b. The VCS 100 processor is visually inspected to verify identification, caution/warning, electrical, and other Agency labels are in place.
- c. The VCS 100 processor is subjected to vacuum and pressure leak tests.
- d. The VCS 100 processor is subjected to the following functional tests:
 - i. Power test;
 - ii. Verify set point of vacuum sensor switch;
 - iii. Verify operation of main vapor valve;
 - iv. Verify flow rate of pilot and main vapor valves; and
 - v. Dielectric test.

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Exhibit 4
Required Items in Conducting TP-201.3^{1,2}

The instructions below are required when conducting TP-201.3 for the Emco Phase II EVR system with Hirt VCS 100 processor. The tester shall document that each step was followed as indicated below and shall include this page of the Exhibit with the submission of TP-201.3 test results. **See footnote regarding testing of pressure/vacuum vent valve.** Note that districts may require use of an alternate form to meet these requirements, provided the alternate form includes the same minimum parameters.

Hirt VCS 100 Thermal Oxidizer Installed

1. Prior to conducting TP-201.3, the ball valve on the inlet of the Hirt VCS 100 processor shall be Open (Open to UST Ullage), as shown in Figure 1. At the Hirt Indicator Panel, turn the Power Switch to the "Off" position.
2. After conducting TP-201.3, turn the Power Switch to the "On" position.
3. The ball valve on the inlet of the Hirt VCS 100 processor shall remain opened and locked.

Required Steps	Verification (please circle)
1. Inlet ball valve is open and Power Switch is in "Off" position before conducting TP-201.3?	Yes No
2. Power Switch is in "On" position after conducting TP-201.3?	Yes No
3. Inlet ball valve is in the open locked position after conducting TP-201.3?	Yes No

Test Company: _____ Facility Name: _____

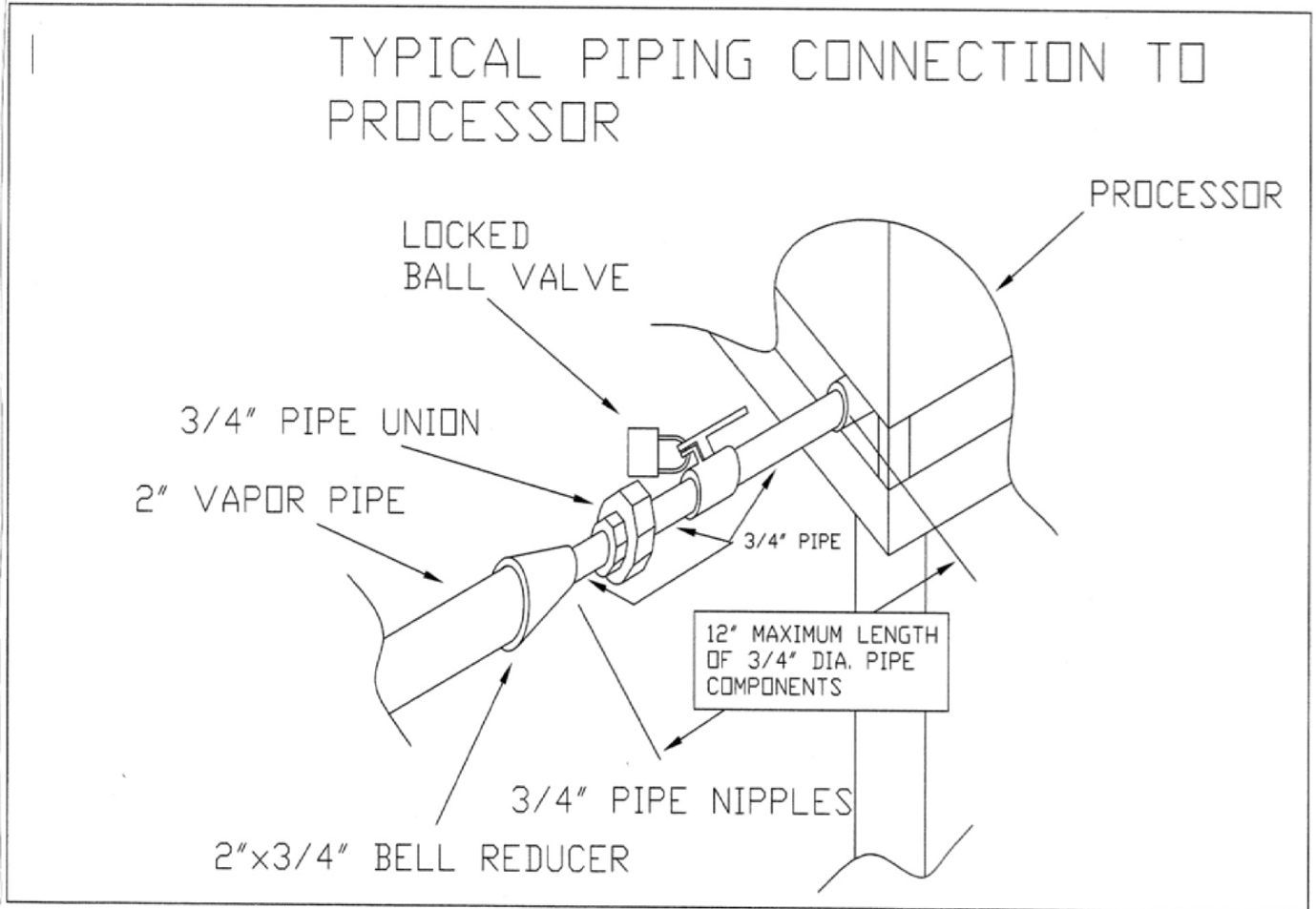
Print Name (Technician)	Signature	Date
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Technician Certification Number and Expiration Date
(ICC or District Training Certification, as applicable)

¹ Note: If the pressure/vacuum (P/V) vent valve is required to be tested by the local District, then the P/V vent valve shall be tested prior to conducting Exhibit 4.

² If Exhibit 8 Testing is to be conducted following completion of this test, at least 24 hours must have elapsed before conducting Exhibit 8.

Figure 1
Configuration of Hirt VCS 100 Thermal Oxidizer to Conduct TP-201.3



**Executive Order VR-207-A
Emco Phase II EVR System with Hirt Thermal Oxidizer**

**Exhibit 5
Liquid Removal Test Procedure**

Definitions common to all certification and test procedures are in:

D-200 Definitions for Vapor Recovery Procedures

For the purpose of this procedure, the term "ARB" refers to the California Air Resources Board, and the term "Executive Officer" refers to the ARB Executive Officer or his or her authorized representative or designate.

1. PURPOSE AND APPLICABILITY

- 1.1 This procedure is used to quantify the removal rate of liquid from the vapor passage of a Phase II balance system hose equipped with a liquid removal device. This procedure provides a method to determine compliance with the liquid removal requirements specified in ARB Executive Orders VR-207 and VR-208 and any subsequent amendments or revisions.

2. PRINCIPLE AND SUMMARY OF TEST PROCEDURE

- 2.1 This test procedure provides two options to determine the compliance of liquid removal devices. Under option 1 (short version), liquid in the vapor path of a coaxial hose is drained and measured. If the volume of liquid drained equals or exceeds 25 ml, a liquid removal test is conducted. For those hoses with less than 25 ml drained, no further testing is required. Under option 2 (long version), all hoses are evaluated regardless of the volume of liquid drained. Option 2 includes a prewetting and wall adhesion step. Both options test the liquid removal device by introducing gasoline into the vapor path of the coaxial hose through the nozzle bellows. After 7.5 gallons of gasoline is dispensed, the amount of gasoline remaining in the hose is measured and the liquid removal rate is determined. The district shall specify which testing option is to be used.

Caution: When draining liquid from the vapor side of the hose, make sure the dispenser is not activated. The nozzle vapor valve is on the same stem as the fuel valve. To drain gasoline from the vapor side of the hose, the fuel lever must be engaged. If the dispenser is activated, gasoline in the fuel hose may be pressurized when engaging the fuel lever.

3. BIASES AND INTERFERENCES

- 3.1. Slits or tears in the hose or nozzle vapor path may bias the results towards compliance.
- 3.2. This test shall not be conducted on any fueling point where the hanging hardware is defective as identified in Exhibit 2.

- 3.3. Any spillage of gasoline invalidates the test for any volumes that are required to be measured or recorded.
- 3.4. A breach of the inner product hose may introduce additional gasoline into the outer vapor path resulting in a larger volume drained than introduced.
- 3.5. Not having the liquid extraction device (indicated by the mark on the outside of the hose) at the bottom of the hose loop during liquid removal testing, as shown in Figure 1, will bias the results towards failure.
- 3.6. The test procedure requires the use of Emco's nozzle spout plug, P/N 494635EVR as shown in Figure 2. This tool is used to plug the spout when draining liquid from the vapor side of the hose. Not plugging the spout may bias the results towards failure. Nicks, cuts, or tears in the plug seal will bias the results towards failure.
- 3.7. Dispensing rates not between 6.0 and 10.0 gallons per minute (GPM) invalidates the test.

4. SENSITIVITY, RANGE, AND PRECISION

- 4.1 The range of measurement of the liquid removal rate is dependent upon the range of the graduated cylinder used for testing.
- 4.2 To ensure precision, graduated cylinder readings shall be measured at the liquid level meniscus.

5. EQUIPMENT

- 5.1. Nozzle Spout Plug: Use Emco's spout plug, P/N 494635EVR (Figure 2).
- 5.2. Stopwatch. Use a stopwatch accurate to within 0.2 seconds.
- 5.3. Funnels. Large and small gasoline compatible, non-breakable, funnels with dimensions similar to those as shown in Figure 3, or equivalent.
- 5.4. Graduated Cylinders. Gasoline compatible, non-breakable 0-25ml, 0-100ml, 0-250 ml, and 0-500 ml graduated cylinders with stable base plates. The 25ml cylinder may be necessary to quantify volumes of liquid less than 20 ml.
- 5.5. Gasoline Test Tank. (Optional) A portable tank, meeting fire safety requirements for use with gasoline, may be used to receive the gasoline dispensed during testing. The tank shall have sufficient volume so that at least 10.0 gallons may be dispensed prior to activating the primary shutoff mechanism of the nozzle. **When using a gasoline test tank, ensure that a ground strap is used and that it is properly connected to an acceptable ground.** To minimize testing-related emissions, vehicle refueling events should be used for this procedure whenever feasible.
- 5.6. Traffic Cones. Use traffic cones to encircle the area where testing is conducted.

- 5.7. Field Data Sheet. Use the appropriate data sheet to record liquid removal test information. Forms 1 and 2 serve as examples; districts may require modified versions.
- 5.8. Gasoline Container. Use a portable fuel container equipped with a tight fitting cap, of at least 1.0 gallon capacity.

NOTE: THIS TEST PROCEDURE PROVIDES TWO OPTIONS TO DETERMINE COMPLIANCE OF LIQUID REMOVAL DEVICES. THE DISTRICT SHALL SPECIFY WHICH TESTING OPTION IS TO BE USED

6. OPTION 1 (SHORT VERSION)

PRE-TEST PROCEDURE

- 6.1 Verify that the 500 ml graduated cylinder is empty. Position the large funnel into the graduated cylinder.
- 6.2 Remove the nozzle from the dispenser. **Do not activate dispenser!** Install Emco's spout plug, P/N 494635EVR in the tip of the spout (Figure 2). Carefully tilt the spout into the funnel/graduated cylinder assembly.
- 6.3 Lower the nozzle and funnel/graduated cylinder assembly as close to the ground as possible. "Walk out" the hose while keeping the nozzle lowered and hose fully extended. The hose shall slope downward from the dispenser toward the nozzle.
- 6.4 **Do not activate dispenser!** Open the nozzle's vapor check valve by compressing the bellows and engaging the fuel lever. Allow 20 seconds for all liquid to drain. Use caution to avoid spillage.
- 6.5 Remove Emco's spout plug and return the nozzle to the dispenser and measure the volume of liquid drained. If the volume drained is less than 200 ml, transfer the liquid into an appropriately sized graduated cylinder. For example, if 40 ml of liquid was drained, use the 100 ml graduated cylinder to take the measurement.
- 6.6 Record the amount of liquid drained on Form 1 ("PRE-TEST").
- 6.7 If the volume drained is greater than or equal to 25 ml, proceed to Section 6.8 of the procedure. Hoses with greater than 25 ml drained are considered to be pre-wetted. If the amount drained is less than 25 ml, proceed to the next nozzle/hose to be evaluated and repeat Section 6.1-6.6

TEST PROCEDURE (FOR HOSES WITH GREATER THAN 25 ML DRAINED)

- 6.8 Pour 150 ml to 175 ml of gasoline into the 250 ml graduated cylinder. Measure and record this volume on Form 1 (VI).
- 6.9 Remove the nozzle from the dispenser and position the nozzle upright so that the

spout is in a vertical position. **Do not activate dispenser!**

- 6.10 Open the nozzle's vapor check valve by compressing the bellows and engaging the fuel lever. Carefully insert the stem of the small funnel between the bellows and nozzle spout.
- 6.11 Pour the measured volume into the vapor path of the hose. Use caution not to spill the gasoline. Remove the small funnel after the gasoline has been introduced.
- 6.12 Insert the nozzle into a vehicle or test tank fill pipe.
- 6.13 Find the mark on the outside of the hose which indicates the location of the liquid pick-up device. Ensure the mark is at the bottom of the hose loop when dispensing as shown in Figure 1. This can be accomplished by lifting up the back of the hose, adjusting nozzle position, or adjusting the test tank position.
- 6.14 Dispense 7.5 (±0.5) gallons at the highest possible flow rate by holding the nozzle lever in the maximum handheld position. Use a stopwatch to measure the time elapsed while dispensing. Record the volume of fuel dispensed (G) and the elapsed time (T) on Form 1. Return nozzle to the dispenser.
- 6.15 Calculate the dispensing rate using the equation below. If the dispensing rate is not between 6.0 and 10.0 gallons per minute (GPM), the test results are invalid.

$$\text{GPM} = 60 \times \left(\frac{\text{G}}{\text{T}} \right)$$

Where:

GPM = dispensing rate (in gallons per minute)
G = gallons of fuel dispensed
T = number of seconds required to dispense

- 6.16 Using the 250 ml graduated cylinder and large funnel, carefully drain the remaining liquid from the vapor path of the hose as described in Section 6.1 through 6.5 (**make sure dispenser is not activated and spout plug is installed before draining liquid!**). Record this quantity on Form 1 (VF).
- 6.17 Use Equation 9.1 to calculate the liquid removal rate for all the applicable hoses tested.
- 6.18 If the liquid removal rate is less than 5.0 ml/gallon, but greater than or equal to 4.5 ml/gallon, repeat the test two additional times and average the three results.

7. OPTION 2 (LONG VERSION)

PRETEST PROCEDURE

- 7.1 Carefully pour 150 ml of gasoline into the 250 ml graduated cylinder.

- 7.2 Remove the nozzle from the dispenser. **Do not activate dispenser!** Install Emco's spout plug, P/N 494635EVR in the tip of the spout as shown in Figure 2. Position the nozzle upright so that the spout is in a vertical position.
- 7.3 Open the nozzle's vapor check valve by compressing the bellows and engaging the fuel lever. Carefully insert the stem of the small funnel between the bellows and nozzle spout.
- 7.4 Pour the gasoline from the 250 ml graduated cylinder into the vapor path of the hose. Use caution not to spill the gasoline. Remove the small funnel after the gasoline has been introduced.
- 7.5 Verify that the 500 ml graduated cylinder is empty. Position the large funnel into the graduated cylinder.
- 7.6 Carefully tilt the spout into the funnel/graduated cylinder assembly. **Make sure Emco's spout plug is installed and the dispenser is deactivated.**
- 7.7 Lower the nozzle and funnel/graduated cylinder assembly as close to the ground as possible. "Walk out" the hose while keeping the nozzle lowered and hose fully extended. The hose shall slope downward from the dispenser toward the nozzle.
- 7.8 Open the nozzle's vapor check valve by compressing the bellows and engaging the fuel lever. Allow 20 seconds for all liquid to drain. Use caution to avoid spillage. If necessary, drain full graduated cylinders into a portable gas can until the hose is empty.
- 7.9 Remove Emco's spout plug and return the nozzle to the dispenser.

TEST PROCEDURE

- 7.10 Pour 150 ml to 175 ml of gasoline into the 250 ml graduated cylinder. Measure and record this volume on Form 2 (VI).
- 7.11 Remove the nozzle from the dispenser. **Do not activate dispenser!** Position the nozzle upright so that the spout is in a vertical position.
- 7.12 Open the nozzle's vapor check valve by compressing the bellows and engaging the fuel lever. Carefully insert the stem of the small funnel between the bellows and nozzle spout.
- 7.13 Pour the measured volume into the vapor path of the hose. Use caution not to spill the gasoline. Remove the small funnel after the gasoline has been introduced.
- 7.14 Insert the nozzle into a vehicle or test tank fill pipe.
- 7.15 Find the mark on the outside of the hose which indicates the location of the liquid pick-up device. Ensure the mark is at the bottom of the hose loop when dispensing

as shown in Figure 1. This can be accomplished by lifting up the back of the hose, adjusting nozzle position, or adjusting the test tank position.

- 7.16** Dispense 7.5 (± 0.5) gallons at the highest possible flow rate by holding the nozzle lever in the maximum handheld position. Use a stopwatch to measure the time elapsed while dispensing. Record the volume of fuel dispensed (G) and the elapsed time (T) on Form 2. Return nozzle to the dispenser.
- 7.17** Calculate the dispensing rate using the equation below. If the dispensing rate is not between 6.0 and 10.0 gallons per minute (GPM), the test results are invalid.

$$\text{GPM} = 60 \times \left(\frac{\text{G}}{\text{T}} \right)$$

Where:

GPM = dispensing rate (in gallons per minute)
G = gallons of fuel dispensed
T = number of seconds required to dispense

- 7.18** Using the 250 ml graduated cylinder and large funnel, carefully drain the remaining liquid from the vapor path of the hose as described in Section 7.5 through 7.8 (**make sure dispenser is deactivated and spout plug is installed before draining liquid!**). Record this quantity on Form 2 (VF).
- 7.19** Open the nozzle's vapor check valve by compressing the bellows and engaging the fuel lever. **Do not activate dispenser!** Carefully insert the stem of the small funnel between the bellows and nozzle spout
- 7.20** Use the 250 ml graduated cylinder and small funnel to pour 150 ml of gasoline into the vapor passage of the hose. Dispense no gasoline.
- 7.21** Using the 250 ml graduated cylinder and large funnel, completely drain the gasoline from the vapor passage back into the graduated cylinder as described in Section 7.5 through 7.9 (**make sure dispenser is deactivated and spout plug is installed before draining liquid!**).
- 7.22** Subtract the volume drained (value from Section 7.21) from the volume added (value from Section 7.20). This value represents the volume of gasoline lost due to wall adhesion. The purpose of the wall adhesion value is to quantify the amount of gasoline lost to evaporation from transfer to and from the graduated cylinders and adhesion of liquid to vapor passage surfaces in previous measurements. Record this quantity on Form 2 (VW).
- 7.23** Use Equation 9.2 to calculate the liquid removal rate for all the applicable hoses tested.
- 7.24** If the liquid removal rate is less than 5.0 ml/gallon, but greater than or equal to 4.5 ml/gallon, repeat the test two additional times and average the three results.

8. POST TEST PROCEDURES

- 8.1. Empty all containers and return any excess gasoline to the underground storage tank.
- 8.2. Remove the traffic cones from the testing area.

9. CALCULATING RESULTS

9.1 If using OPTION 1(short version), the liquid removal rate shall be calculated as follows:

$$VR = \frac{VI - VF}{G}$$

Where:

VR	=	Gasoline removed per gallon dispensed, milliliters/gallon
VI	=	Total initial volume poured into hose vapor passage, milliliters
VF	=	Volume of gasoline remaining in the hose vapor passage after dispensing, milliliters
G	=	Total dispensed, gallons

9.2 If using OPTION 2 (long version), the liquid removal rate shall be calculated as follows:

$$VR = \frac{(VI - VW) - VF}{G}$$

Where:

VR	=	Gasoline removed per gallon dispensed, milliliters/gallon
VI	=	Total initial volume poured into hose vapor passage, milliliters
VW	=	Volume of liquid lost due to wall adhesion, milliliters
VF	=	Volume of gasoline remaining in the hose vapor passage after dispensing, milliliters
G	=	Total dispensed, gallons

10. REPORTING RESULTS

- 10.1. Record all applicable liquid removal rate information on the appropriate form as shown in Form 1 and 2. Districts may require the use of alternate forms provided that the alternate forms include the same parameters as identified in Forms 1 and 2.
- 10.2. If the calculated liquid removal rate is greater than or equal to 5 milliliters/gallon, the liquid removal device has demonstrated compliance.
- 10.3. If the calculated liquid removal rate is less than 5 milliliters/gallon, the liquid removal

device is not in compliance.

11. ALTERNATIVE TEST PROCEDURES

This procedure shall be conducted as specified. Modifications to this test procedure shall not be used to determine compliance unless prior written approval has been obtained from the Executive Officer, pursuant to Section 14 of Certification Procedure CP-201.

FIGURE 1
Position of Liquid Removal Device
When Conducting Liquid Removal Testing

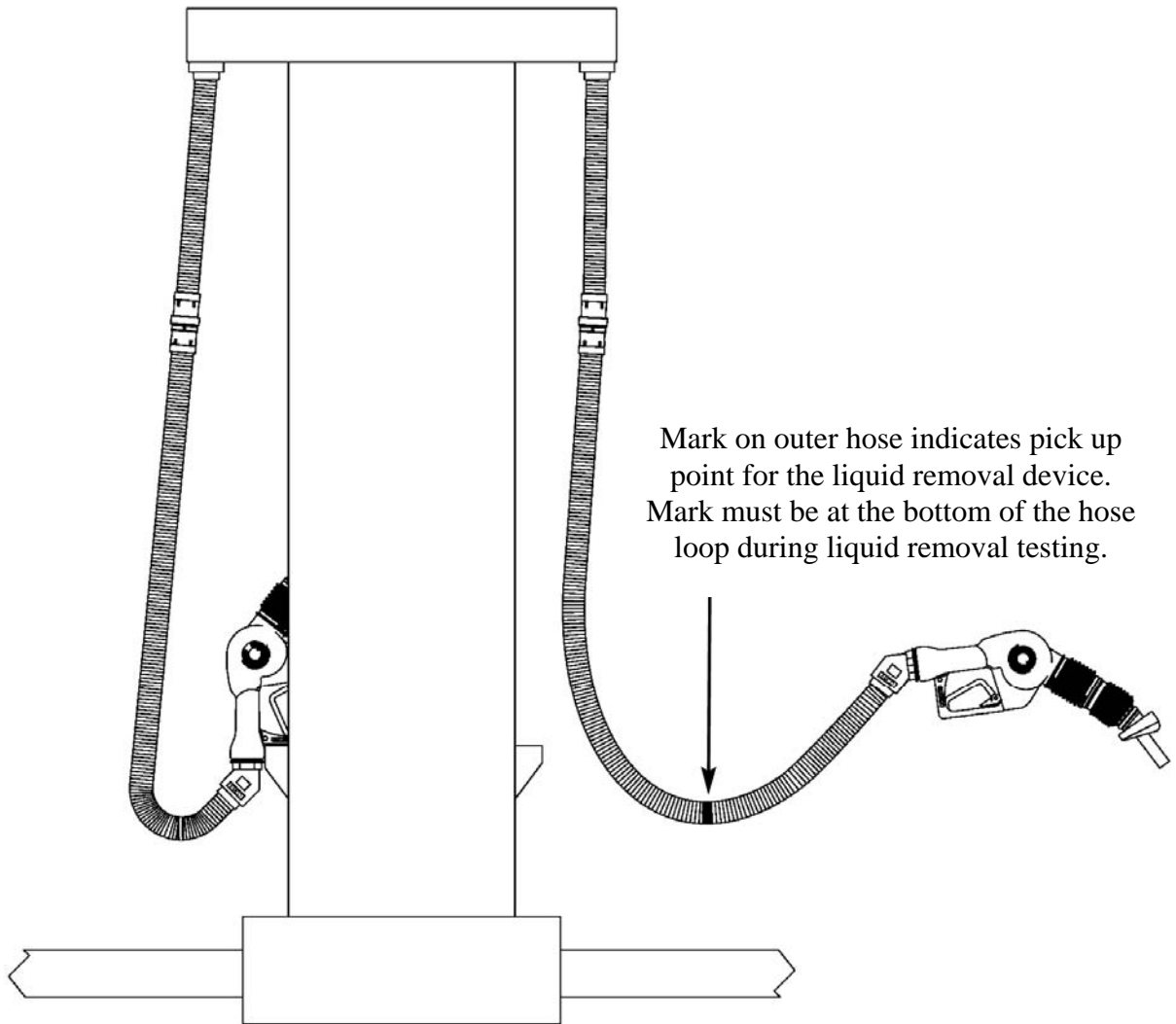


FIGURE 2
Emco Nozzle Spout Plug P/N 494635EVR

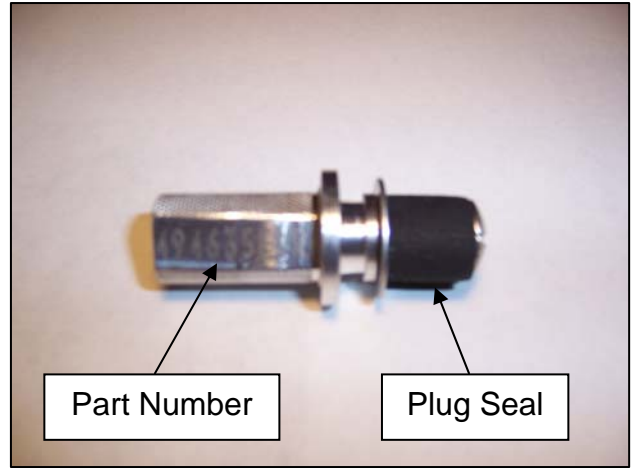
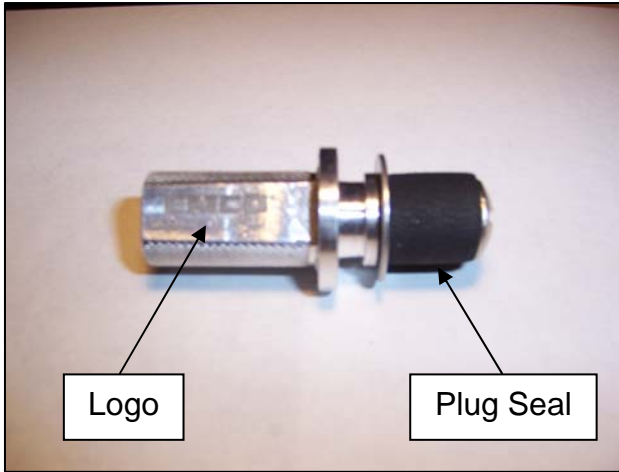
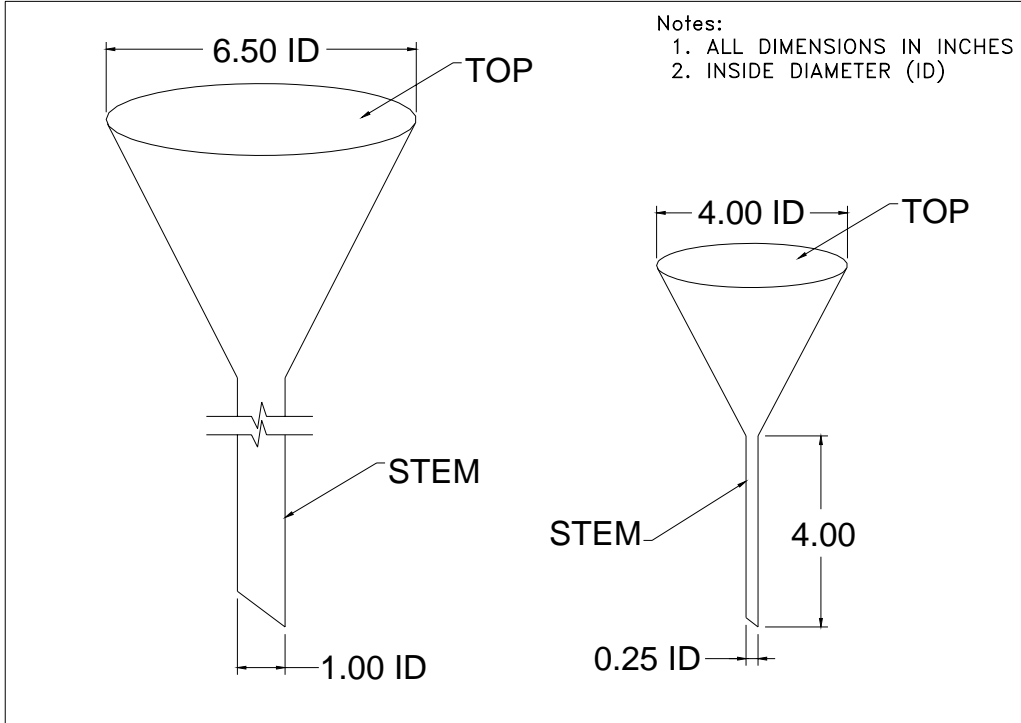


FIGURE 3
Recommended FUNNEL SPECIFICATIONS



FORM 1: LIQUID REMOVAL TEST DATA SHEET (OPTION 1)

Facility Name & Address	Facility Representative & Title	Test Date _____
		A/C or Permit No. _____
		Testing Company _____
		Tester Name _____
		Emco Training Cert # _____
	Phone No. _____	(if applicable)
		Inspector Name _____

GENERAL INFORMATION				PRE-TEST	TEST RUN					VR=(VI-VF)/G
Dispenser Number	Product Grade	Make & Model of Hose	Serial Number of Hose	Volume Drained From Hose in mL	Volume Poured Into Hose in mL (VI)	Gallons Dispensed (G)	Seconds to Dispense (T)	Dispensing Rate (60*(G/T))	Volume Remaining in mL (VF)	Liquid Removal Rate (mL/gal)

FORM 2: LIQUID REMOVAL TEST DATA SHEET (OPTION 2)

Facility Name & Address				Facility Representative & Title				Test Date _____			
								A/C or Permit No. _____			
								Testing Company _____			
								Tester Name _____			
				Phone No. _____				Emco Training Cert # _____			
								(if applicable) _____			
								Inspector Name _____			

GENERAL INFORMATION				PRE-TEST	TEST RUN					VR=((VI-VW)-VF)/G
Dispenser Number	Product Grade	Make & Model of Hose	Serial Number of Hose	Volume Poured into Hose in mL (VI)	Gallons Dispensed (G)	Seconds to Dispense (T)	Dispensing Rate (60*(G/T))	Volume Remaining in mL (VF)	Volume Lost to Wall Adhension in mL (VW)	Liquid Removal Rate (mL/gal)

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Emco Phase II EVR System with Hirt Thermal Oxidizer

Exhibit 6
Required Items in Conducting TP-201.4

The instructions below are required when conducting TP-201.4 for the Emco Phase II EVR System with Hirt Thermal Oxidizer. The tester shall document that each step was followed as indicated below and shall include this page of the Exhibit with the submission of TP-201.4 test results. Note that districts may require use of an alternate form to meet these requirements, provided the alternate form includes the same minimum parameters.

The Emco Model A4005EVR nozzle incorporates a lever-actuated vapor valve. The vapor valve is on the same stem as the fuel valve. When conducting TP-201.4, the nozzle lever must be actuated to open the vapor valve and allow vapor to flow from the nozzle to the underground storage tank. The following steps must be taken when conducting Methodology 1 of TP-201.4:

1. The dispenser shall not be activated. If the dispenser is activated, gasoline in the fuel hose may be pressurized when engaging the fuel lever.
2. The Hirt VCS 100 Thermal Oxidizer shall be turned off. At the Hirt Indicator Panel, turn the Power Switch to the "Off" position.
3. Prior to inserting the Emco EVR nozzle into the fillpipe of the Dynamic Back Pressure Test Unit in step 7.1 of TP-201.4, completely drain any gasoline in the nozzle and vapor path of the hose. The dispenser must be deactivated and the nozzle lever and bellows shall be fully engaged.
4. When flowing nitrogen per step 7.1.2, fully engage the nozzle lever to allow vapor flow from the nozzle to the UST.
5. After conducting TP-201.4, turn the Hirt VCS 100 Power Switch to the "On" position.

Required Steps	Verification (please circle)
1. Were all dispensers deactivated?	Yes No
2. Was VCS 100 Power Switch turned to "Off" position?	Yes No
3. Were all nozzles and hoses completely drained of gasoline prior to inserting nozzle into Dynamic Back Pressure Unit?	Yes No
4. Were all nozzle levers fully engaged when conducting flow test?	Yes No
5. Was VCS 100 Power Switch turned to "On" position after conducting TP-201.4?	Yes No

Test Company: _____ Facility Name: _____

Print Name (Technician)	Signature	Date
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Technician Certification Number and Expiration Date
(ICC or District Training Certification, as applicable)

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Emco Phase II EVR System with Hirt Thermal Oxidizer

Exhibit 7
Nozzle Bag Test Procedure

Verification of the integrity of the Emco nozzle vapor valve shall be performed on installed nozzles by use of the following test.

1. Seal nozzle(s) at the gasoline dispensing facility (GDF) in a plastic bag, using tape or other means to secure the bag around the base of the nozzle (see Figure 1). Any plastic bag large enough to enclose the nozzle and having a thickness of no greater than 2 mils can be used.
2. Observe the bagged nozzle(s) for 30 seconds.
3. Any nozzle where the bag can be seen visually expanding or collapsing has a defective vapor valve and is not in compliance with Exhibit 2.
4. Record the test results on the “Nozzle Bag Test Results” form provided in this Exhibit. Districts may require use of an alternate form, provided that the alternate form includes the same minimum parameters.
5. Remove the bags from all the nozzles and return the nozzles to the dispenser holsters.

Figure 1
Example of Bagged Nozzle



NOZZLE BAG TEST RESULTS

SOURCE INFORMATION		TEST COMPANY INFORMATION	
Facility (DBA)/Site Address:	Facility Representative/Title:	Test Company Name	# of Nozzles: _____ # Nozzles Tested: _____
Print Name	Print Name	Print Name of Tester	# Nozzles Passed: _____ # Nozzles Failed: _____
Street Address	Title ()	Street Address	# Nozzles not Tested: _____
City Zip	Phone No.	City Zip	
District Inspector:	<input type="checkbox"/> P/O <input type="checkbox"/> S/A <input type="checkbox"/> A/C Number:	Date of Test:	Time of Test:

Dispenser	Gas Grade	Nozzle Type	Bag Expanded or Collapsed after 30 Seconds
			<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
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
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			<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

Executive Order VR-207-A
Emco Phase II EVR System with Hirt Thermal Oxidizer

Exhibit 8
Hirt VCS 100 Processor
With Indicator Panel
Operability Test Procedure

Definitions common to all certification and test procedures are in:

D-200 Definitions for Vapor Recovery Procedures

For the purpose of this procedure, the term “ARB” refers to the California Air Resources Board, and the term “ARB Executive Officer” refers to the Executive Officer of the ARB or his or her authorized representative or designate.

1. PURPOSE AND APPLICABILITY

This test procedure verifies the operational status of the Hirt VCS 100 Processor and Indicator Panel.

The station may remain open (normal fuel dispensing) while conducting this procedure.

2. PRINCIPLE AND SUMMARY OF TEST PROCEDURE

The Hirt VCS 100 Processor is designed to activate (e.g. thermally oxidize vapors) when the underground storage tank (UST) ullage pressure exceeds a nominal -0.40 inches water column (“w.c.”). Processor activation will be verified by exposing the processor’s internal vacuum sensor/switch to an atmospheric pressure input. The processor should activate and the Indicator Panel Processing lamp should light.

3. BIASES AND INTERFERENCES

- 3.1 This test is only valid when total ullage is 70% or less than capacity of GDF storage tanks.
- 3.2 At least 24 hours must have elapsed after any tests that introduce air and/or nitrogen into the vapor spaces, such as, but not limited to TP-201.3 (including Exhibit 4), TP-201.4 (including Exhibit 6) and Exhibit 5.
- 3.3 There shall be no Phase I bulk product deliveries into or out of the storage tank(s) within the three (3) hours prior to the test or during performance of this test procedure.
- 3.4 Processor should be inactive (i.e. powered but not processing gasoline vapor).

4. EQUIPMENT

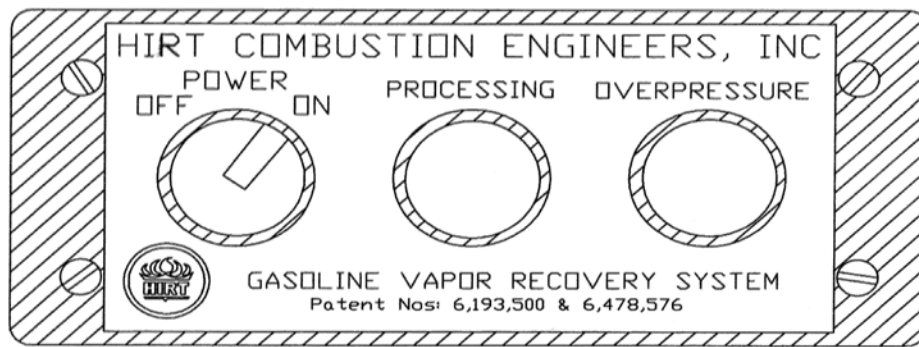
- 4.1 Hand tools: 5/16” nut driver or equivalent, 3/8” open end wrench.
- 4.2 Stopwatch: Use a stopwatch with an accuracy of ± 0.2 seconds.

4.3 Teflon pipe tape.

5. TEST PROCEDURE

- 5.1 System Status Check: Locate Hirt Indicator Panel and verify that the green lamp on the POWER switch is lit, to be sure power is ON. Record on Form 1. If the Power switch is not lit, the processor does not meet the Exhibit 2 Hirt VCS 100 Thermal Oxidizer specifications and no testing shall be conducted.

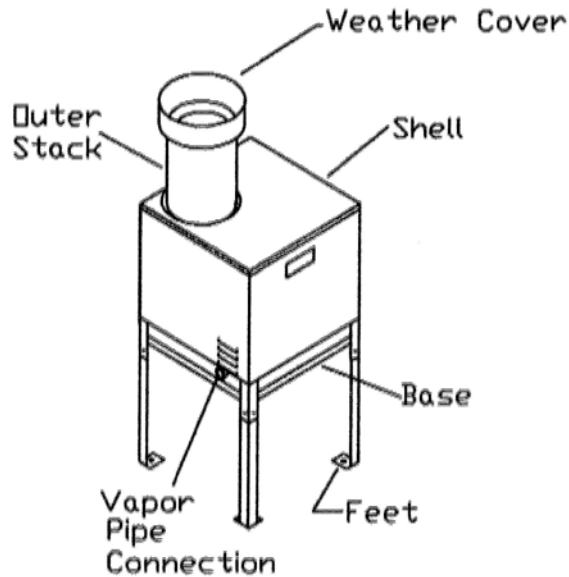
Indicator Panel Face



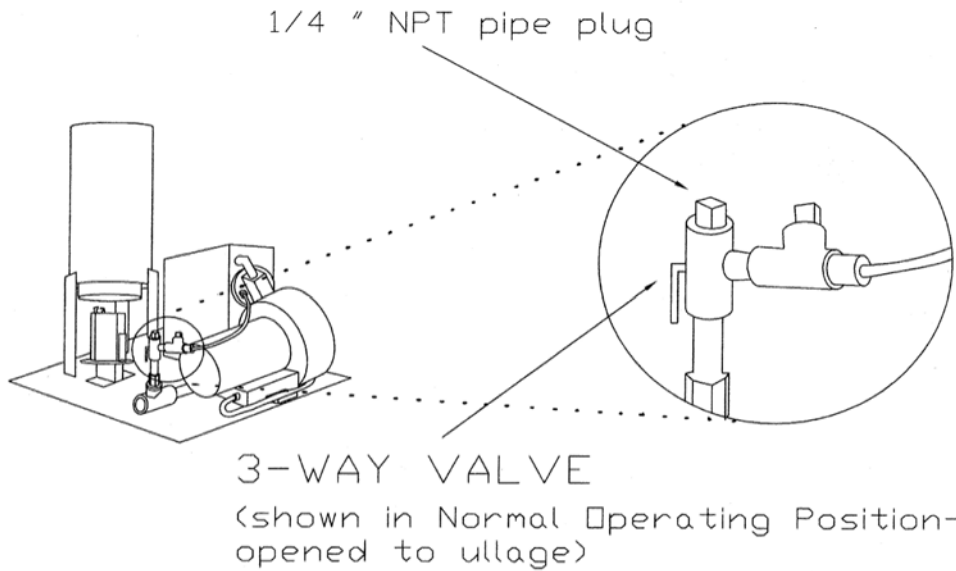
- 5.2 Check green PROCESSING lamp on Indicator Panel. Is the green PROCESSING lamp on? Record on Form 1. If so, then wait until PROCESSING lamp is extinguished before proceeding to step 5.3, to meet BIAS condition 3.4.
- 5.3 Forced Processor Operation: Turn POWER to processor OFF at Indicator Panel.

CAUTION: Processor components, such as Shell, Stack, Burner, and Weather Cover can be Hot! Use care when handling processor or removing its parts.

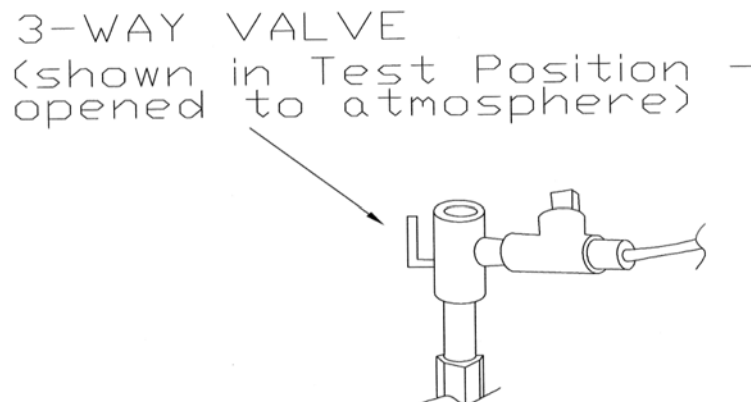
- 5.4. Remove screw from Weather Cover with 5/16" nut driver and remove Weather Cover from Outer Stack.
- 5.5 Remove (4) screws holding Shell to Base with 5/16" nut driver and then remove Shell.



5.6 Locate 3-Way Valve on tubing leading to Vacuum Sensor/Switch. The 3-Way Valve handle should be pointing down, in the Normal Operating Position – Opened to UST Ullage. Remove the 1/4" NPT pipe plug from 3-Way Valve with 3/8" wrench.



5.7 Turn 3-Way Valve handle to the up position.



- 5.8 Turn POWER to processor ON at Indicator Panel, and verify that green lamp on POWER switch is lit. Start the stopwatch.
- 5.9 Verify green PROCESSING lamp on the Indicator Panel lights within 3 minutes. Record on Form 1. If the Processing lamp is on, processor meets the Exhibit 2 Processor specifications. If the Processing lamp is not on within 3 minutes, the processor does not meet the Exhibit 2 Processor specifications and needs technical service.
- 5.10 Verify the OVERPRESSURE lamp on the Indicator Panel lights within sixty two (62) minutes. Record on Form 1. If the OVERPRESSURE lamp is on, processor meets the Exhibit 2 Processor specifications. If the OVERPRESSURE lamp is not on within sixty two (62) minutes, the processor does not meet the Exhibit 2 Processor specifications and needs technical service.
- 5.11 Turn POWER to processor OFF at Indicator Panel.
- 5.12 Turn 3-Way Valve handle back down to Normal Operating Position. Reinstall 1/4" NPT plug (with Teflon pipe tape) and tighten ¼ turn past snug. Reinstall Shell and Weather Cover.
- 5.13 Turn POWER to processor ON at Indicator Panel. Testing is completed.

6. REPORTING

Record all results on Form 1. Districts may require the use of an alternate Form, provided it includes the same minimum parameters as identified in Form 1.

FORM 1:
HIRT VCS 100 PROCESSOR OPERABILITY TEST

DATE OF TEST:

SERVICE COMPANY NAME		SERVICE COMPANY'S TELEPHONE	
SERVICE TECHNICIAN		HIRT TECHNICIAN CERTIFICATION #(as applicable) CC or DISTRICT TRAINING CERTIFICATION (as applicable)	
STATION NAME		DISTRICT PERMIT #	
STATION ADDRESS		CITY	STATE ZIP
Was TP-201.3 (Including Exhibit 4) conducted in the last 24 hours?		Yes ____	No ____
Was TP-201.4 (Including Exhibit 6) conducted in the last 24 hours?		Yes ____	No ____
Was Exhibit 5 conducted in the last 24 hours?		Yes ____	No ____
Was there a fuel delivery within the last 3 hours?		Yes ____	No ____
The % ullage of GDF storage tank(s) is _____ gallons.			
STEP 5.1	Is POWER switch lit?	YES	<input type="checkbox"/>
		NO	<input type="checkbox"/>
STEP 5.2	Is PROCESSING lamp ON?	YES	<input type="checkbox"/>
	If "YES", test cannot be performed until lamp goes off.	NO	<input type="checkbox"/>
STEP 5.9	Time for PROCESSING Lamp to Light? _____ minutes	YES	<input type="checkbox"/>
	Did PROCESSING Lamp light within three (3) minutes?	NO	<input type="checkbox"/>
STEP 5.10	Time for OVERPRESSURE Lamp to Light? _____ minutes	YES	<input type="checkbox"/>
	Did OVERPRESSURE Lamp light within sixty two (62) minutes?	NO	<input type="checkbox"/>

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Emco Phase II EVR System with Hirt Thermal Oxidizer

Exhibit 9
Warranty



WARRANTY POLICY

Emco Wheaton Retail Corporation service station products are warranted to be free from defects in material and workmanship under normal use and service. Vapor recovery nozzles are warranted for a period of twelve (12) months from date of shipment from Emco Wheaton Retail Corporation or from installation date as specified by the returned warranty card, not to exceed fourteen (14) months from the date of shipment from Emco Wheaton Retail Corporation. This warranty excludes the spout and/or front end components of balance vapor recovery nozzles unless damage is obvious when the nozzle is removed from the shipping carton and the defective nozzle is returned to Emco Wheaton Retail Corporation prior to use and within two (2) months from the date of invoice. Other service station products are warranted for a period of twelve (12) months from the date of manufacture.

Emco Wheaton Retail Corporation shall, at its option, repair or replace that part which proves to be defective. Repaired or replacement nozzles are warranted for the balance of the original warranty period. This warranty is void unless the original purchaser and any subsequent purchaser returns the claimed defective item to Emco Wheaton Retail Corporation for inspection to determine whether the claimed defect is covered by this warranty.

The exclusive and sole remedy under this warranty is repair or replacement of the defective part. Emco is not responsible for claims for damage caused by improper installation or maintenance; corrosive fluids; misuse of the product or use the product for other than its intended purpose; or accident, acts of God, or natural phenomena. Emco will not pay for labor or related expenses, nor shall Emco be liable for any incidental, consequential or exemplary damages. This warranty is void if the Emco Wheaton Retail Corporation product has been previously repaired with parts not approved by Emco Wheaton Retail Corporation, or if a nozzle bears the mark or imprint of a company other than Emco Wheaton Retail Corporation, indicating the nozzle has been rebuilt or repaired by a company other than Emco Wheaton Retail Corporation.

EMCO WHEATON RETAIL CORPORATION MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, (WHETHER WRITTEN OR ORAL), INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

In the event a nozzle is returned to Emco Wheaton Retail Corporation within the warranty period described above, and when tested is found to be functional and without defect, Emco Wheaton Retail Corporation reserves the right to return the nozzle to the customer or apply a

Core Credit (see Nozzle Core Return Program), at Emco Wheaton Retail Corporation's discretion.

In the event of failure within the warranty period, call the Customer Service Department at **(800) 234-4394**. Describe the problem and provide the product date stamp information to the customer service representative. In the case of a nozzle, provide the serial number. The customer service representative will provide a product complaint number, if applicable. Ship the defective equipment **PREPAID**, to Emco Wheaton Retail Corporation for repair or replacement.

Emco Wheaton Retail Corporation products should be used in compliance with applicable federal, state and local laws and regulations. Product selection should be based on physical specifications and limitations and compatibility with the environment and material to be handled. All illustrations and specifications are based on the latest product information available at the time of publication. Emco Wheaton Retail Corporation reserves the right to make changes at any time in prices, materials, specifications and models and to discontinue models without notice or obligation.

Emco Wheaton Retail Corporation warrants the workmanship and materials to be free of defects and will comply with the performance standards of California ARB CP-201 for a period of one (1) year from the date of installation or fourteen months from the date of shipment from Emco Wheaton Retail Corporation.

The following warranty card will be shipped with the Emco vapor recovery components:



Emco Wheaton Retail Corp.

252-243-0150 • 252-243-4759 (fax) • www.emcoretail.com

IMPORTANT
Product Warranty
Registration Card

12 month warranty becomes effective at time of installation. If this card is not returned, warranty becomes effective from date of shipment from Emco.

The maximum warranty life is 14 months from date of shipment.

Please call Emco if this product is being used as a replacement. Replacement with a non-Emco product voids any warranty.

Serial Number:
Installation Date:
Installation Site:
City/State/Zip:
Distributor Name:
Product Style: <input type="checkbox"/> A4005EVR Nozzle <input type="checkbox"/> A4110EVR Hose Swivel <input type="checkbox"/> A4119EVR Safe Break Valve

**HIRT COMBUSTION ENGINEERS, INC. (HCE) VCS 100 THERMAL OXIDIZER
WARRANTY POLICY**

- HCE warrants the workmanship and materials to be free from defects and will comply with the performance standards of California ARB CP-201 for a period of one (1) year from the date of installation or from date of shipment from HCE, if registration card is not returned.
- Liability under any implied or expressed warranty is limited to replacement of the product.
- HCE is not responsible for improperly installed or misuse of the product.
- HCE cannot be held responsible for damage to the product or its equipment due to acts of nature, vandalism, or neglect.
- HCE products are warranted to be free of defects in material and workmanship.
- In the event of a warranty claim, the purchaser must obtain a Return Authorization Number prior to returning product. All shipping costs are the responsibility of the customer.
- HCE shall repair or replace, at its option, any HCE component which proves to be defective.
- The cost of labor for any field repair, removal, replacement, or diagnosis is not covered by this warranty.
- The liability of HCE is limited solely and specifically to this warranty.
- HCE shall not be liable for any special, collateral, or consequential damages arising from this warranty, the use of this equipment or from any order accepted pursuant thereto.
- The use of parts not authorized by HCE voids the warranty.
- Installation, start-up, service, or repairs of this product by personnel not certified by HCE voids the above described warranty.

The following warranty card will be shipped with the Hirt VCS 100 Thermal Oxidizer:

<p><u>IMPORTANT</u> PRODUCT WARRANTY REGISTRATION CARD</p> <p>THE 12 MONTH WARRANTY BECOMES EFFECTIVE AT TIME OF INSTALLATION IF THIS CARD IS RETURNED WITHIN 30 DAYS OF START-UP. IF THIS CARD IS NOT RETURNED, WARRANTY BECOMES EFFECTIVE FROM DATE OF SHIPMENT FROM HIRT COMBUSTION ENGINEERS, INC.</p> <p>THE MAXIMUM WARRANTY LIFE IS 18 MONTHS FROM DATE OF SHIPMENT FROM HIRT COMBUSTION ENGINEERS, INC.</p> <p>PROCESSOR WAS FACTORY TESTED TO AND MET APPLICABLE PERFORMANCE STANDARDS & SPECIFICATIONS TO WHICH IT WAS CERTIFIED: REFERENCE ALL APPLICABLE CARB EXECUTIVE ORDERS, CARB TEST PROCEDURES, AND EXHIBITS.</p>	<p>Hirt Combustion Engineers, Inc. Tel: (562) 692-1490 Fax: (562) 692-7413 Email: HirtVCS@aol.com</p>										
	<table border="1"><tr><td>SERIAL NUMBER:</td></tr><tr><td>VSE <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></td></tr><tr><td>TURBINE NUMBER:</td></tr><tr><td>VSE <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></td></tr><tr><td>INSTALLATION DATE:</td></tr><tr><td>SITE ADDRESS:</td></tr><tr><td>CITY / STATE / ZIP CODE:</td></tr><tr><td>DISTRIBUTOR NAME:</td></tr><tr><td>ISD BRAND / MODEL (IF ANY):</td></tr><tr><td>DATE OF MANUFACTURE:</td></tr></table>	SERIAL NUMBER:	VSE <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	TURBINE NUMBER:	VSE <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	INSTALLATION DATE:	SITE ADDRESS:	CITY / STATE / ZIP CODE:	DISTRIBUTOR NAME:	ISD BRAND / MODEL (IF ANY):	DATE OF MANUFACTURE:
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ISD BRAND / MODEL (IF ANY):											
DATE OF MANUFACTURE:											

**Maxxim Premier™ Plus Hose Warranty
California EVR**

Veyance Technologies, Inc., the manufacturer of Goodyear Engineered Products guarantees each assembly of Maxxim Premier™ Plus hose to be free from defects in material and workmanship for a period of the earlier to occur of (i) one (1) year from the date of installation or (ii) a maximum of fourteen months from the date of shipment from Veyance Technologies, Inc. to the initial purchaser. No claims under Veyance’s warranty will be allowed unless they have been first submitted to Veyance for review. When in Veyance’s judgment a defect in material or workmanship has occurred, Veyance’s liability is limited to only replacement of the hose assembly.

This warranty applies to the initial purchaser and any subsequent purchaser only and liability with respect thereto is limited to replacement of the original hose assembly. It does not extend to any Maxxim Premier™ Plus hose which has been subject to misuse, neglect, accident, puncturing, cutting or caused by poorly maintained or malfunctioning retractors, pumps, and nozzles or improper installations.

This warranty is in lieu of all warranties expressed or implied including the warranty of merchantability and fitness for a particular purpose. No representative or person is authorized to assume any other liability in connection with the sales of Maxxim Premier™ Plus hose.

Veyance Technologies, Inc., the manufacturer of Goodyear Engineered Products warrants the workmanship and materials of the Maxxim Premier™ Plus to be free of defects and will comply with the performance standards of California ARB CP-201 for a period of the earlier to occur of (i) one (1) year from the date of installation or (ii) a maximum of fourteen months from the date of shipment from Veyance Technologies, Inc.



Veyance Technologies, Inc.
2701 Omaha Ave. * Norfolk, NE 68701
402.644.2600

IMPORTANT

Product Warranty
Registration Card

Warranty is effective until the earlier to occur: (i) 12 months from date of installation or (ii) 14 months from the date of shipment by Veyance Technologies, Inc.

Please call Veyance Technologies, Inc if this product is being used as a replacement. Replacement with a non-Veyance Technologies, Inc product voids any warranty.

Serial Number:
Installation Date:
Installation Site:
City/State/Zip:
Distributor Name:
Product: Maxxim Premier Plus