Executive Order VR-204-P
Balance Phase II EVR Systems Including ISD Systems

EXHIBIT 17
Veeder-Root ISD Vapor Flow Meter Operability Test Procedure

The following procedures shall be used at field sites to determine the operability of the Veeder-Root ISD system to satisfy the requirements documented in VAPOR RECOVERY CERTIFICATION PROCEDURE, CP-201, CERTIFICATION PROCEDURE FOR VAPOR RECOVERY SYSTEMS AT GASOLINE DISPENSING FACILITIES. Testing the ISD equipment in accordance with this procedure will verify the equipment's operability for Vapor Collection Monitoring.

Veeder-Root's TLS console ISD System Self-Test Monitoring algorithms are designed to verify proper selection, setup and operation of the TLS console modules and sensors and will not complete and report passing test results in the event of a failure of components used in the system. Completed ISD monitoring tests are evidence that:

- The system was properly powered for data collection
- All necessary ISD sensors were setup and connected
- All necessary ISD sensors were operating within specification
- All internal components including TLS console modules were properly setup and operating within specification

Veeder-Root recommends printing a copy of the ISD ALARM STATUS and ISD DAILY report (REF. Section 5, Operation of the ISD Install, Setup & Operation Manual for VST ECS Membrane Processors) periodically to determine that compliance tests are being completed in accordance with local and state regulations.

A step-by-step worksheet for recording data from the following operability tests is provided at the end of this Exhibit.

The term "TLS Console" used throughout this Exhibit includes but is not limited to TLS-350, TLS-350 Plus, TLS-350R, Red Jacket ProMax, Gilbarco EMC consoles which are also referenced in Exhibit 1.

SECTION A. VEEDER-ROOT ISD VAPOR FLOW METER OPERABILITY TEST PROCEDURE

1. PURPOSE AND APPLICABILITY

1.1 This procedure is used to verify the setup and operation of the Vapor Flow Meter (VFM)

2. EQUIPMENT

2.1 **Nitrogen High Pressure Cylinder with Pressure Regulator**. Use a high pressure nitrogen cylinder capable of maintaining a pressure of at least 2000 pounds per square inch gauge (psig) and equipped with a compatible two-stage pressure regulator and a one psig relief valve. A ground strap is recommended during introduction of nitrogen into the system.

2.2 **Flow meter**. Use a flow meter (Rotometer) capable of accurately measuring nitrogen flow rate of 60 cubic feet per hour (cfh).

2.3 **Pressure Measuring Device**. An electronic pressure measuring device with a full range that shall not exceed 0-10 inches of water column (WC) with a minimum accuracy of 0.5 percent of full-scale. A 0-20 inches WC device may be used provided the minimum accuracy is 0.25 percent of full-scale.

2.4 **Squeeze Bulb.** A rubberized or equivalent device used to increase pressure to 5.00” WC.

2.5 **Balance Nozzle Adapter.**

2.5.1 For VST Model VST-EVR-NB nozzle, use Part No. VST-STA-100.
2.5.2 For Emco Wheaton Retail Model A4500EVR nozzle, use Part No. 494761EVR

2.6 **Surrogate Spout.** Use the correct Surrogate Spout Assembly listed below to conduct the pre-test leak check. Figure 1.A shows the VST Surrogate Spout Assembly and Figure 1.B shows the Emco Wheaton Retail Surrogate Spout Assembly.

2.6.1 For VST Model VST-EVR-NB nozzle, use Part No. VST-TSS-100.
2.6.2 For Emco Wheaton Retail Model A45005EVR nozzle, use Part No. 494771EVR

2.7 **Adapter Supply Hose.** The nominal inside diameter of the flexible hose shall be between 0.75 and 1.00 inches, and the length of the tubing shall be between 3 feet and 6 feet.

2.8 **Ball Valve.** The nominal inside diameter of the ball valve shall be 0.25”.

2.9 **Nitrogen Supply Line.** The nominal inside diameter of the flexible tubing shall be between 0.25” and 0.375”.

2.10 **Gas Volume Meter**. Use a Dresser Measurement Roots Meter®, or equivalent (preferably fitted with a digital readout), to measure the volumetric flow rate through the Balance Nozzle Adapter. The gas volume meter shall be calibrated within 180 days prior to conducting this procedure.

2.11 **Stopwatch.** Use a stopwatch accurate to within 0.2 seconds.

2.12 **Lubricant**. Petroleum Jelly.

2.13 **Leak Detection Solution**. Any liquid solution designed to detect gaseous leaks may be used to verify the pressure integrity of test equipment during this test.

2.14 **Notebook personal computer (PC) with ISD PC Setup Tool Version 1.09 or later**. Serial communication cables are required to connect to the ISD system.

Figure 1.A

VST Surrogate Spout Assembly

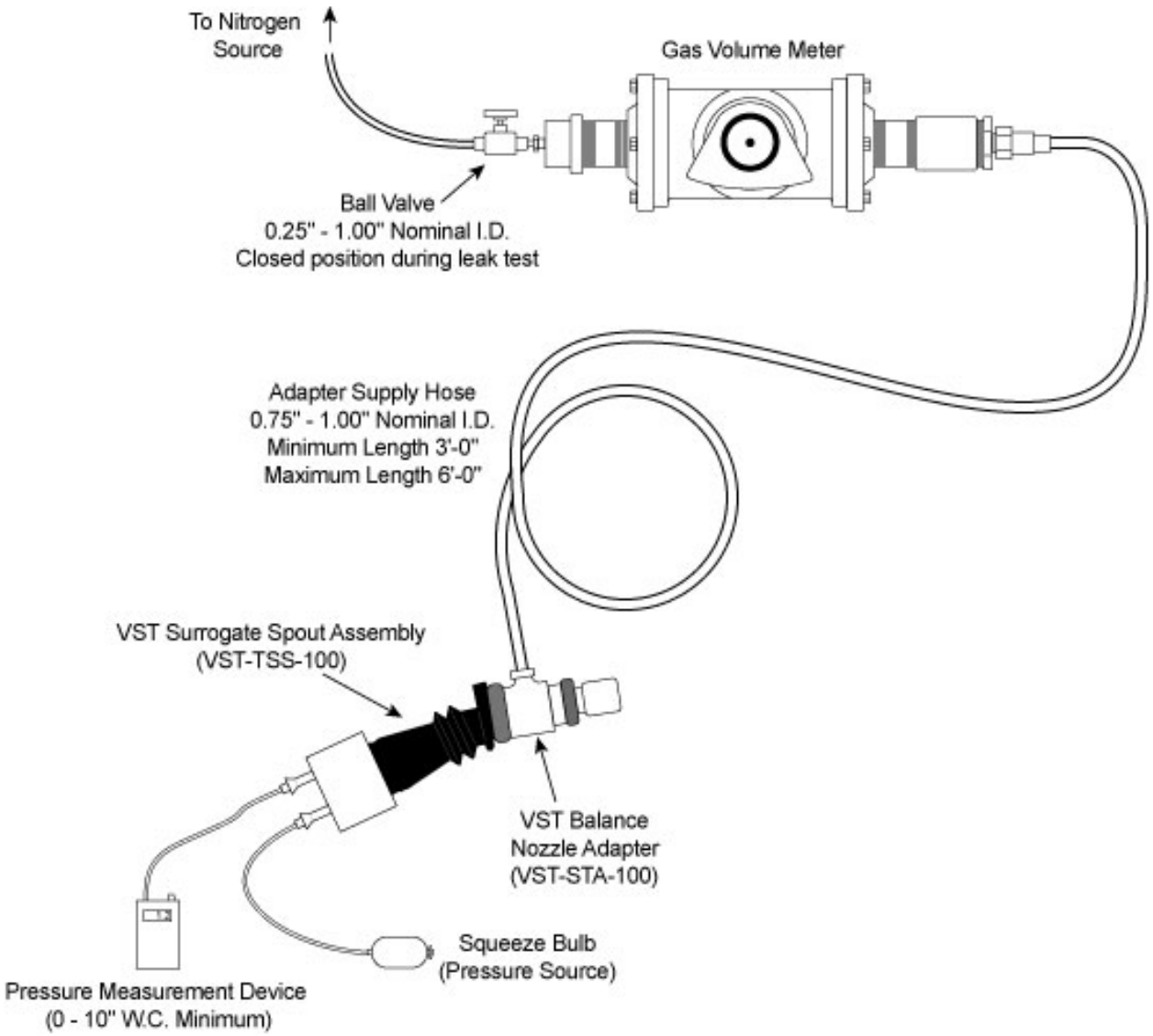


Figure 1.B

EMCO Wheaton Retail Surrogate Spout Assembly

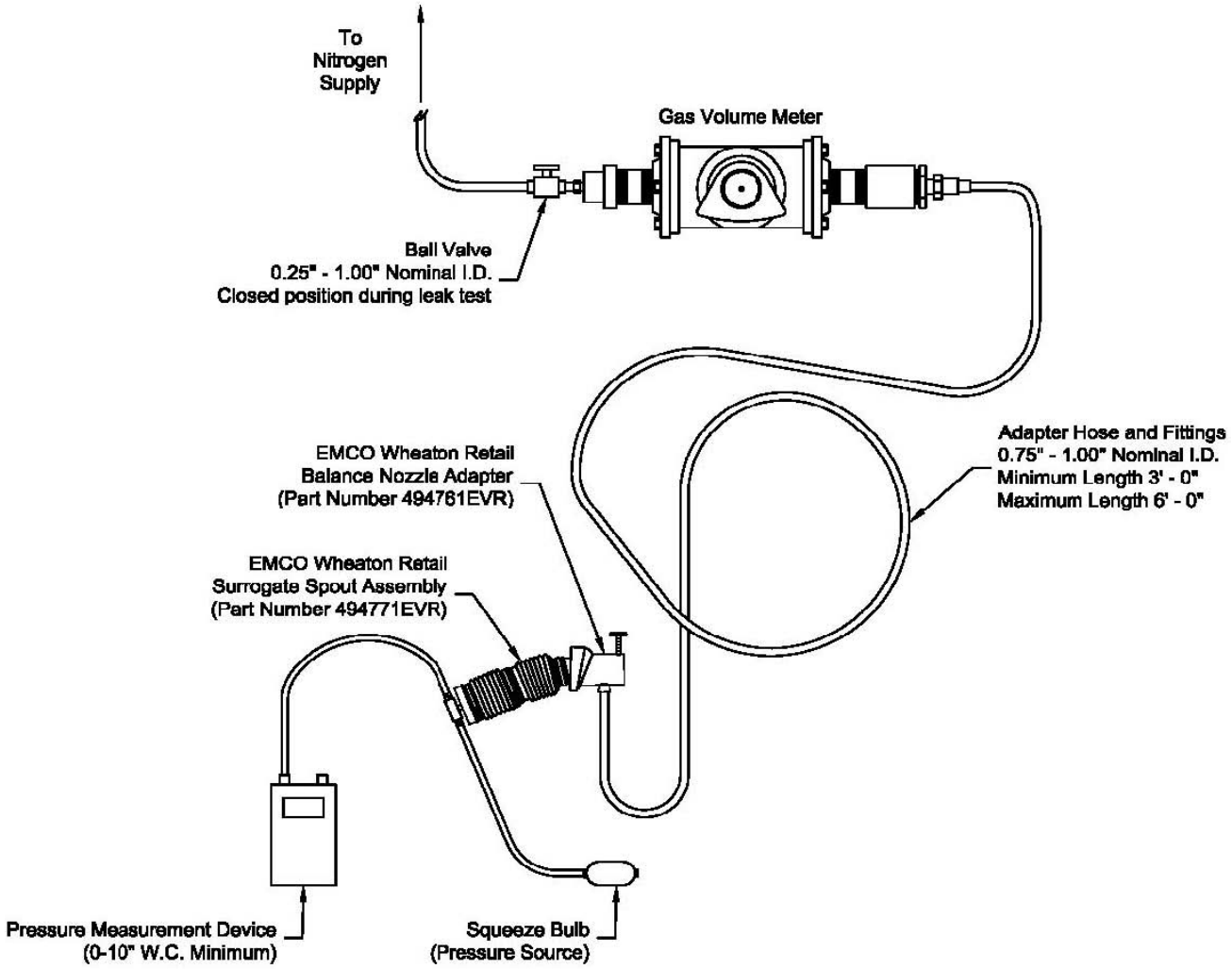


Figure 2.A
VST Vapor Flow Meter Test Assembly

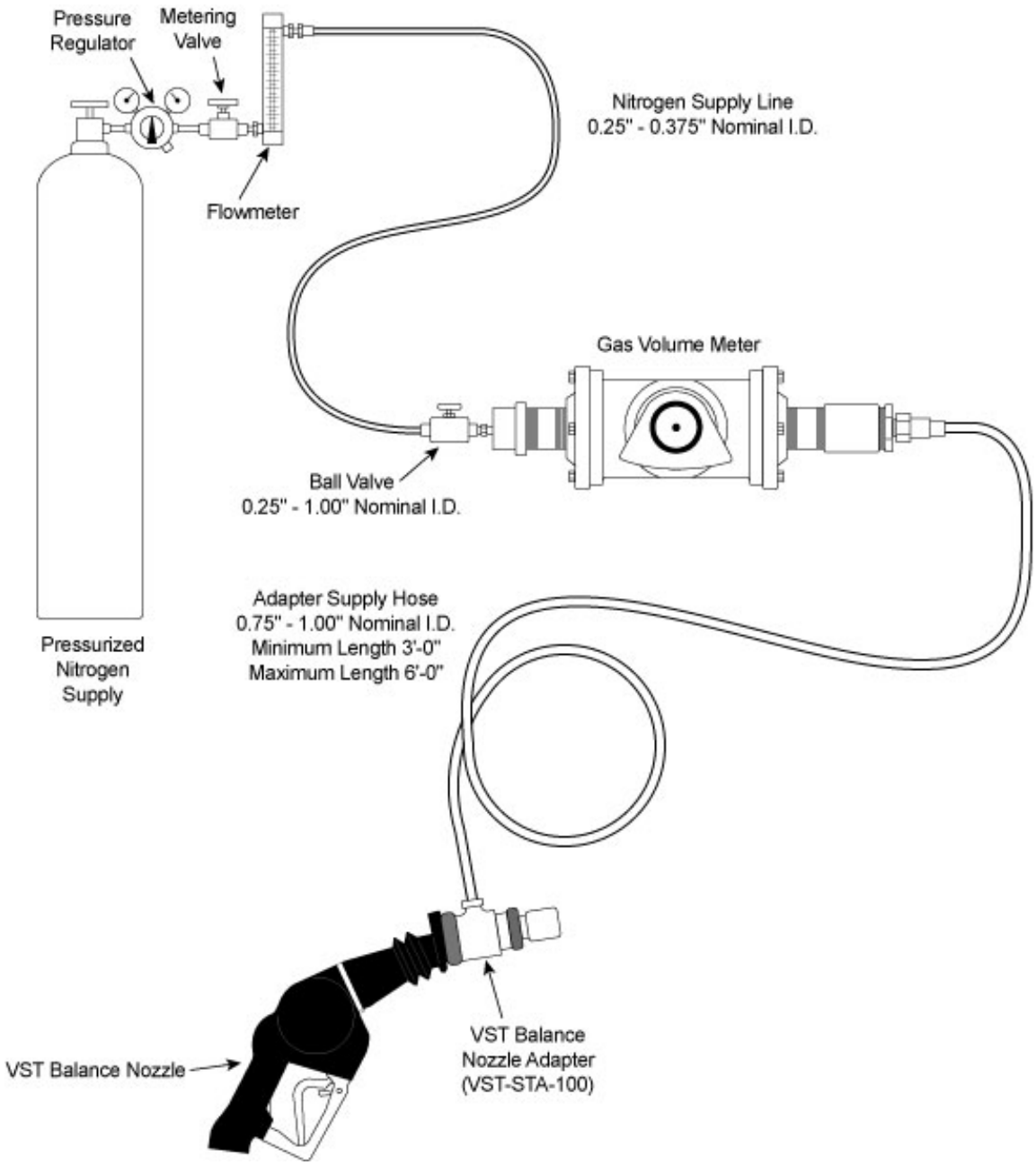
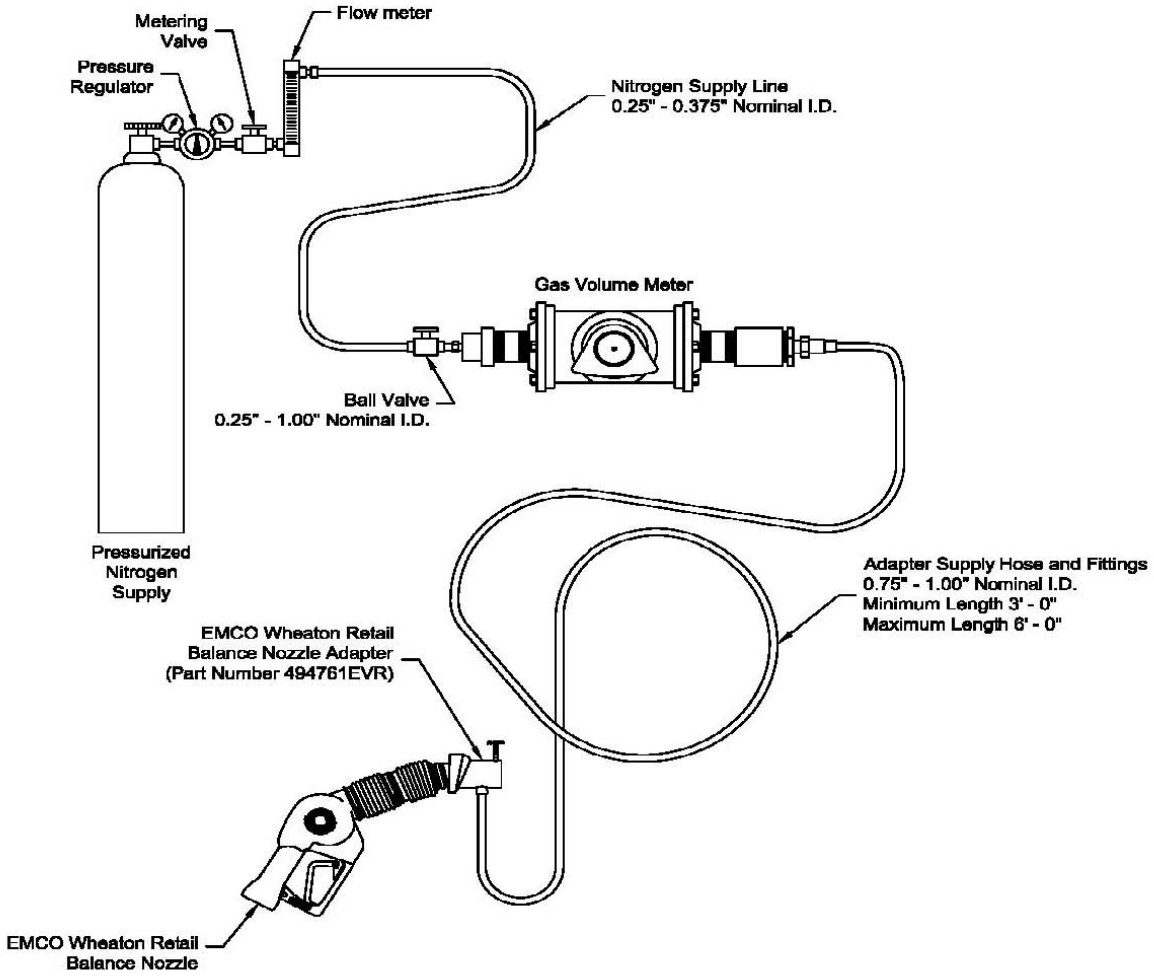


Figure 2.B
Emco Wheaton Retail Vapor Flow Meter Test Assembly



3. PRE-TEST PROCEDURES

3.1 From the TLS Console, ISD Setup Menu print the ISD Setup Report. The ISD Hose Table will identify which VFM (column AA) is being used on each Fueling Position (FL)

```
ISD HOSE TABLE
ID  FP  FL  HL  AA  RR
------------------------
01  01  01  10  01  UU
02  02  02  10  01  UU
03  03  03  10  02  UU
04  04  04  10  02  UU
05  05  05  10  03  UU
06  06  06  10  03  UU
07  07  07  10  04  UU
08  08  08  10  04  UU
09  09  09  10  05  UU
10  10  10  10  05  UU
11  11  11  10  06  UU
12  12  12  10  06  UU

ISD AIRFLOW METER MAP
ID SERIAL NUM LABEL
------------------------
 1 00000111   AFM1 FP1 -
 2 00000112   AFM2 FP3 -
 3 00000113   AFM3 FP5 -
 4 00000114   AFM4 FP7 -
 5 00000115   AFM5 FP9 -
 6 00000116   AFM6 FP11
```

Note: If Veeder-Root's "Maintenance Tracker" is installed and enabled, access to the "diagnostic mode" and "set-up mode" of the TLS Console is prohibited unless a Maintenance Tracker Technician Key or personal computer equipped with Veeder-Root's ISD Setup Tool Software Version 1.09 or higher is made available. Maintenance Tracker is an optional security device designed to prevent unauthorized tampering and clearing of Veeder-Root tank monitoring and ISD alarms. Maintenance Tracker resides within the TLS console and when enabled, a message will appear on the two line display of the TLS console. For additional instructions on how to access the desired parameters to complete this test procedure, see Exhibit 18; "Accessing PMC and ISD Parameters at Gasoline Dispensing Facilities (GDFs) with Veeder-Root "Maintenance Tracker" Security Feature Installed & Enabled".

3.2 Connect the notebook PC running Veeder-Root's "ISD PC Setup Tool" terminal mode, v1.09 or higher, or use Microsoft HyperTerminal to the dedicated TLS Console serial port that is required for ISD reports access. Access the individual airflow meter totals for the airflow meter being tested using the following RS232 command: IV8700.

If this command does not provide results for all vapor flow meters installed at the GDF, the last two digits of the command can be altered to obtain individual flow meter readings. Therefore, it is acceptable to enter the following alternate

command: IV87XX; where XX=any value from 00 to 18 (18 is the maximum number of flow meters that a single TLS Console can accommodate).

Typical IV8700 Report

```
DEC 14, 2007  5:47 AM
AIR FLOW METER TOTALS
DATE-TIME                VOLUME
                    AFM  1    AFM  2    AFM  3    AFM  4
07-12-14 05:46:00 76739.892 63139.977 42860.023 44139.693
```

3.3 Conduct a pre-test leak check of the Balance Nozzle Adapter, the gas volume meter and the adapter supply hose by connecting the Balance Nozzle Adapter to a surrogate spout as shown in Figure 1.A or Figure 1.B. Turn the ball valve in Figure 1.A or Figure 1.B to the closed position. Raise the test pressure to 5.00" ±0.50" WC using a squeeze bulb. There shall not be a pressure drop of more than 1.00" WC from the above starting pressure for 30 seconds from the start of the test. If the leak test passes, proceed with the testing. If the leak test fails, proceed to isolate the source of the leak by pressurizing the test equipment again. Squirt liquid leak detector solution on interfaces and other potential leak sources and watch for the formation of bubbles. Once leak(s) are repaired, repeat the leak test procedure.

Note: Leak checks shall be conducted in a shaded area or away from direct sunlight. Leak checks may be conducted during the testing to ensure leak integrity of test equipment. Apply petroleum jelly, if necessary to the surface area in the Balance Nozzle Adapter. Petroleum jelly can also be applied to the nozzle spout and the face seal (rubber boot) of the surrogate spout assembly and the back of the Balance Nozzle Adapter if necessary.

3.4 Assemble the equipment as shown in Figure 2.A for VST or Figure 2.B for Emco Wheaton Retail nozzle. Leave the Balanced Nozzle Adapter off of the nozzle at this time. Do not enable the dispenser to dispense product. Remove nozzle and utilize any method to keep the nozzle hook in the **off** position.

3.5 Ensure that the ground strap is properly connected to an acceptable ground.

Note: The test requires that the nozzle be squeezed and liquid product must not flow from the dispenser.

3.6 Open the Phase I vapor poppet to atmosphere. Locate the Phase I EVR vapor poppet on the 87 grade tank and remove the dust cap. Open the vapor poppet to atmosphere by using a modified dust cap or equivalent.

4. TEST PROCEDURES

4.1 If the system has a Hirt VCS 100 Processor installed, locate the Hirt Indicator Panel. Turn POWER to processor OFF at Indicator Panel.

Hirt VCS 100 Indicator Panel

4.2 Prevent dispensing from all other fueling positions that use the VFM being tested.

4.3 Record the VFM serial number and fueling position being tested on the worksheet.

4.4 Completely drain any gasoline that may be in the nozzle and hose vapor return path by any acceptable method.

4.5 Continuing from step 3.4, turn the ball valve to the open position and adjust the nitrogen flow using the Rotometer to 60 cfh +/- 5.0 cfh.

4.6 Once the nitrogen flow is set, turn the ball valve to the closed position to stop the flow of nitrogen through the gas volume meter. This will ensure the nitrogen flow rate is set and the nitrogen can instantaneously be activated when the ball valve is turned to the open position.

4.7 Install the Balance Nozzle Adapter on the appropriate nozzle as shown in Figure 2.A or Figure 2.B. Apply petroleum jelly, if necessary to the surface area in the Balance Nozzle Adapter. Petroleum jelly can also be applied to the nozzle spout and the face seal (rubber boot) of the nozzle and the back of the Balance Nozzle Adapter if necessary.

4.8 Wait for two minutes of no air or liquid flow activity on the dispenser with the airflow meter being tested.

4.9 With the notebook PC connected to the TLS Console ISD, and the IV8700 Report page open, record the initial meter total for the VFM being tested on the worksheet.

4.10 Record the initial gas volume meter reading on the worksheet.

4.11 **Ensure the dispenser is <u>not</u> enabled to dispense product.** Simultaneously squeeze the nozzle handle to the full dispensing position and turn the ball valve to the open position to allow nitrogen to flow.

Note: Only one fueling point and grade per dispenser needs to be tested. If the nozzle handle is not engaging the vapor/product valve within the

nozzle, turn off the nitrogen flow using the ball valve; remove the Balance Nozzle Adapter from the nozzle to release the nitrogen pressure build up and repeat steps 4.7- 4.10. Excess pressure build up in the nozzle will engage the automatic shut-off diaphragm and not allow the vapor/product valve within the nozzle to open.

4.12 Monitor the gas volume meter display. Simultaneously stop the flow once 1.0 cubic feet (cf) +/- 0.10 cf of nitrogen is reached by turning the ball valve to the closed position and also releasing the nozzle handle.

Note: Final volume values may be biased if the ball valve and the nozzle handle are not activated at the same time.

4.13 Record the end meter reading from the gas volume meter. Calculate the total cubic feet value by subtracting the initial meter reading obtained in step 4.11 from the final meter reading in this step.

4.14 Convert the total cubic feet value to gallons using the equation on worksheet. Record the final gallon value on the worksheet.

4.15 Wait two minutes after each test run before obtaining the VFM reading from the notebook PC that is connected to the TLS Console ISD. A period of two minutes is required by the ISD system to receive and document total flow from the VFM.

4.16 Calculate the total VFM volume by subtracting the initial reading on step 4.8 from the final reading on step 4.14 and record the value on the worksheet.

4.17 Calculate the percent difference between the final gallons reading from the gas volume meter and the final VFM reading using the equation shown on the worksheet.

Pass: If the volume percent difference between recorded ISD VFM and the gas volume meter is within 15%, check “Pass” on the worksheet, and repeat the Test Procedures for the next dispenser.

Fail: If the volume percent difference between recorded ISD VFM and the gas volume meter is not within 15%, then go to Step 4.18.

4.18 Repeat Test Procedures using the opposite side of the dispenser. If test passes, continue to the next dispenser. If test fails, go to Step 4.19.

4.19 Conduct the leak test in step 3.3 to evaluate the test equipment. If the equipment passes the leak test, the ISD flow meter is not in compliance with Exhibit 2. If equipment leak test fails, repair the leak and go to Step 4.1.

5. POST-TEST PROCEDURES

5.1 Remove the Balance Nozzle Adapter and all equipment from the nozzle assembly.

5.2 A post-leak test of the equipment is not required if all the VFMs are within range. For the VFMs that are not within range, the leak test in step 3.3 will be conducted to further evaluate the test equipment.

5.3 If the system has a Hirt VCS 100 Processor installed, locate the Hirt Indicator Panel. Turn POWER to processor ON at Indicator Panel.

5.4 Prior to transportation, the inlet and outlet of the gas volume meter shall be carefully sealed to prevent foreign matter from entering the meter.

SECTION B. SITE SHUTDOWN VERIFICATION TEST

1. TEST PROCEDURES

1.1 This test must be performed by a certified Veeder-Root contractor due to possible backup battery issues. Before testing see Veeder-Root "Technical Support Service Alert", dated August 11, 2011 or contact Technical Support at 1-800 323-1799 or technicalsupport@veeder.com

1.2 Remove power from TLS console.

1.3 Confirm power to submersible pumps is off by verifying that gasoline dispensing has been disabled.

1.4 Restore power to TLS console.

1.5 Complete Site Shutdown Worksheet

Operability Test Procedure Data Worksheet

Veeder-Root In-Station Diagnostics (ISD)
Balance Vapor Flow Meter Operability Test Procedure

		Date of Test
Service Company Name		Service Company's Telephone
Service Technician		Veeder-Root Tech Certification #
Station Name		District Permit #
Station Address	City	State Zip

		ISD Flow Meter Total			Gas Flow Meter Total						
4.3	4.3	4.9	4.14	4.15	4.9	4.12	4.12	4.13	4.15		
Meter SN	Fueling Pos	Start	Stop	Difference Gal (Stop – Start)	Start	Stop	Difference Cubic Feet (Stop – Start)	Cubic feet To gallons[1]	% Diff[2]	Pass	Fail

[1] $Gallons = CubicFeet \times 7.481$

[2] $\%Diff = \frac{ISDDiffGal - GasFlowMeterDiffGal}{GasFlowMeterDiffGal} \times 100$

Veeder-Root In-Station Diagnostics (ISD)
Site Shutdown Test Worksheet

DATE OF TEST _____

SERVICE COMPANY NAME	SERVICE COMPANY'S TELEPHONE
SERVICE TECHNICIAN	VEEDER-ROOT TECH CERTIFICATION #
STATION NAME	DISTRICT PERMIT #
STATION ADDRESS CITY STATE ZIP	

STEP 1.	POWER REMOVED FROM TLS CONSOLE?	☐
STEP 2.	POWER TO SUBMERSIBLE PUMPS REMOVED BY TLS Console? (VERIFY GASOLINE FUELING DISABLED)	☐
STEP 3.	POWER RESTORED TO TLS CONSOLE?	☐

COMMENTS (INCLUDE DESCRIPTION OF REPAIRS MADE)