



Franklin Fueling Systems



Healy Enhanced Vapor Recovery Troubleshooting Guide

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Important Safety Messages

Please refer to California Air Resources Board (CARB) Installation, Operation, and Maintenance (IOM) manuals within Executive Order VR-202 for proper safety information.

Warning  Always secure the work area from moving vehicles. This equipment is mounted on and in dispensers, which puts service personnel working on this equipment in danger from moving vehicles entering the work area. To help eliminate these unsafe conditions, secure the area by using a service truck to block access to the work environment, or by using any other reasonable means available to ensure the safety of service personnel.

Warning  Follow all federal, state, and local laws governing the installation of this equipment. When no other regulations apply, follow NFPA codes 30A and 70 from the National Fire Protection Association. Failure to follow these codes could result in severe injury, death, serious property damage, and/or environmental contamination.

References

Franklin Fueling Systems:

<http://www.franklinfueling.com>

Tech Support: 1-800-984-6266

California Air Resources Board (CARB)

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

CARB Phase II EVR Executive Orders

<http://www.arb.ca.gov/vapor/eo-evrphasell.htm>

VR-201 Healy EVR Phase II without ISD

VR-202 Healy EVR Phase II with ISD

CARB Enhanced Vapor Recovery Compliance Guide

<http://www.evrhome.org/>

CARB Compliance Assistance Programs

<http://www.arb.ca.gov/cap/cap.htm>

ISD Handbook

Introduction to the Guide

The purpose of this guide is to inform installers, operators, and other personnel about the Healy Enhanced Vapor Recovery (EVR) Phase II System with In-Station Diagnostics (ISD) and how to properly troubleshoot these systems. For complete installation, operation, and maintenance details of this system, refer to CARB Executive Order VR-202.

A Healy EVR Phase II System includes one VP1000 vacuum pump per dispenser, one Clean Air Separator (CAS) per site, and the appropriate Healy hanging hardware, including Model 900 nozzles, at each fueling point.

The VP1000 Vacuum Pump is activated for each transaction and provides the vacuum for the Model 900 nozzle to collect vapors at the vehicle. The CAS is a containment vessel connected with the ullage space of all underground gasoline storage tanks to control ullage pressure.

An ISD system is comprised of one vapor pressure sensor per site, one vapor flow meter per dispenser, one tank gauge console, and the appropriate ISD software for use with the console.

The vapor pressure sensor's primary purpose is to continually measure the underground storage tank's vapor containment pressure. This vapor containment area includes the tank ullage area, the vapor piping, and the CAS. ISD continually monitors the vapor pressure sensor and performs assessments for pressurization and leakage in the vapor containment area.

The vapor flow meter is a volume measuring meter. When vapors are returned from a vehicle's gasoline tank to the underground storage tank during dispensing, the volume is measured and analyzed to assess how well the vapor collection process is working.

Requirement Notes

	Clear/Reset Alarm can only be performed by a certified technician. A maintenance log entry must be made documenting the service and reason for the Clear/Reset Alarm. Clear/Reset Alarm must be performed according to the requirements of the local air district having jurisdiction over the site and CARB Executive Order VR-202.
	Exhibit 5 Vapor-to-Liquid testing, ISD Vapor Flow Meter Operability testing, Non-ORVR Vehicle Fueling and ORVR Vehicle Fueling must be a minimum of 4½ Gallons per transaction to ensure accurate results.
	Exhibit 5 Vapor-to-Liquid testing, ISD Vapor Flow Meter Operability testing, Non-ORVR Vehicle Fueling and ORVR Vehicle Fueling must be confirmed with two additional test results if the initial test result is not within the designated range.
	ORVR Vehicle Fueling readings may not be within the ORVR designated range due to variations in the vehicle fillpipe, such as a cap-less fillpipe or a high-end spout sealing fillpipe or a fillpipe that has been damaged in a collision. These vehicle fillpipe variations can result in ORVR Vehicle Fueling readings in the Non-ORVR Fueling designated range, which should not be deemed a failure of the nozzle, unless confirmed with additional ORVR Vehicle Fueling readings.
	All nozzle warranty service must be completely documented on a Returned Goods Product Tag (p/n FFS-0093). Additionally, all nozzle warranty service related to Vapor Collection Alarms MUST have the last 3 days of ISD Daily Reports stapled to the Returned Goods Product Tag.

Introduction to ISD Vapor Collection

ISD vapor collection data compares fueling point V/L's (Vapor over Liquid ratios) based on CARB specifications detailed in CP-201. V/L ratio is the amount of vapor collected in comparison to the amount of liquid dispensed. In the Healy Phase II Vapor Recovery System, the certified V/L range is 0.95 to 1.15, as determined by VR-202 Exhibit 5 testing.

If ISD vapor collection data does not meet the appropriate specifications, ISD will produce a warning alarm and then a failure alarm as specified below.

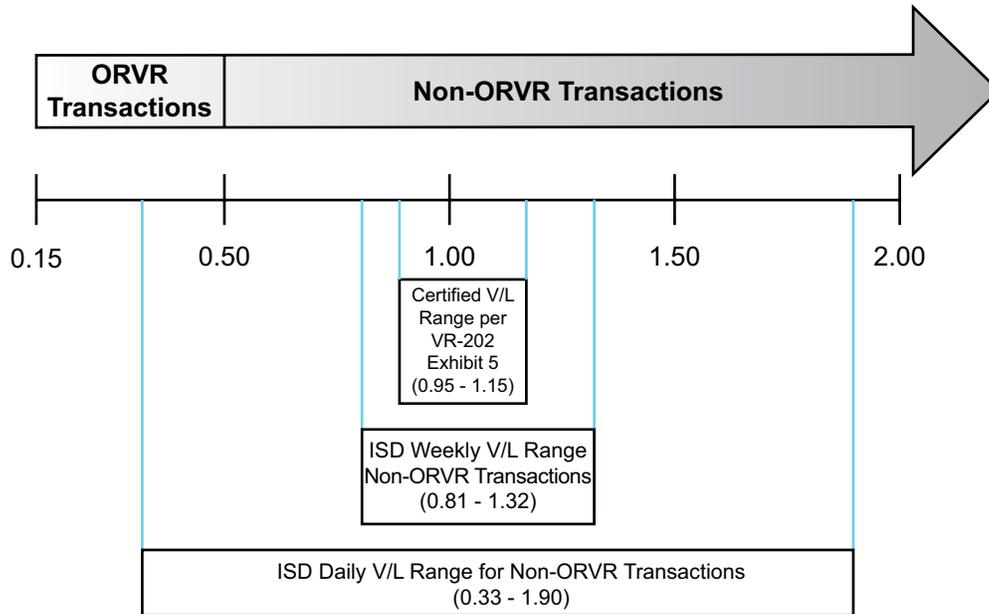


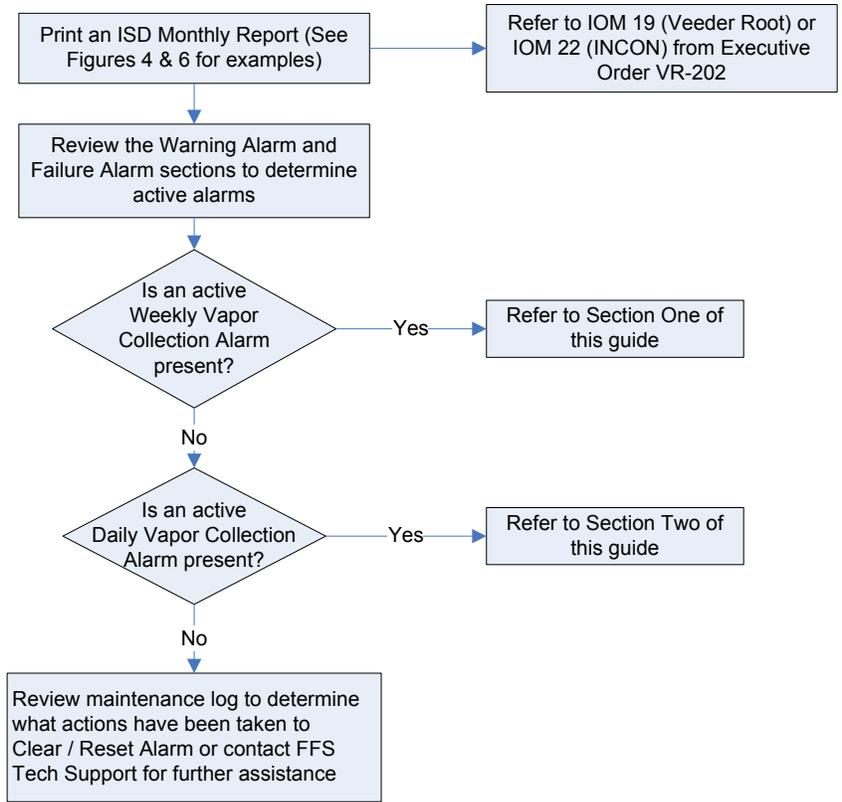
Figure 1: ISD V/L Transaction Graph

Condition	Value	ISD Report Term
Weekly Vapor Collection Alarm (Degradation)	V/L average for Non-ORVR transactions is greater than 1.32 or less than 0.81	INCON – Weekly Vapor Collection Warning Alarm / Failure Alarm VEEDER-ROOT – ISD Degradation Vapor Collection Warning Alarm / Failure Alarm (DGRD)
Daily Vapor Collection Alarm (Gross)	V/L average for Non-ORVR transactions is greater than 1.90 or less than 0.33	INCON – Daily Vapor Collection Warning Alarm / Failure Alarm VEEDER-ROOT – ISD Gross Vapor Collection Warning Alarm / Failure Alarm (GROSS)

Table 1: ISD Vapor Collection Terminology

Note: On-Board Refueling Vapor Recovery (ORVR) equipped vehicles generate fueling point V/L ratios in the 0.15 to 0.50 range. V/L ratios below 0.15 are assessed as no vapor collection by the ISD.

Identifying Collection Alarms



Section One: Weekly Vapor Collection Alarms

Introduction to Weekly Vapor Collection Alarms

This section of the guide is to inform installers, operators, and other personnel about ISD Weekly Vapor Collection warning and failure alarms. A Weekly Vapor Collection Alarm is an indication that based on a minimum of 30 Non-ORVR transactions the fueling point V/L average is beyond the ISD threshold on a weekly basis. This is usually an indication of a small blockage or small leak in the vapor recovery system.

Warning Alarms

A Weekly Vapor Collection Warning Alarm is activated and recorded when the fueling point V/L average for a minimum of 30 Non-ORVR transactions is greater than 1.32 or less than 0.81 for one week. If fewer than 30 Non-ORVR events occur in a week, the ISD system may accumulate events over an additional day or days until a minimum of 30 Non-ORVR events is reached.

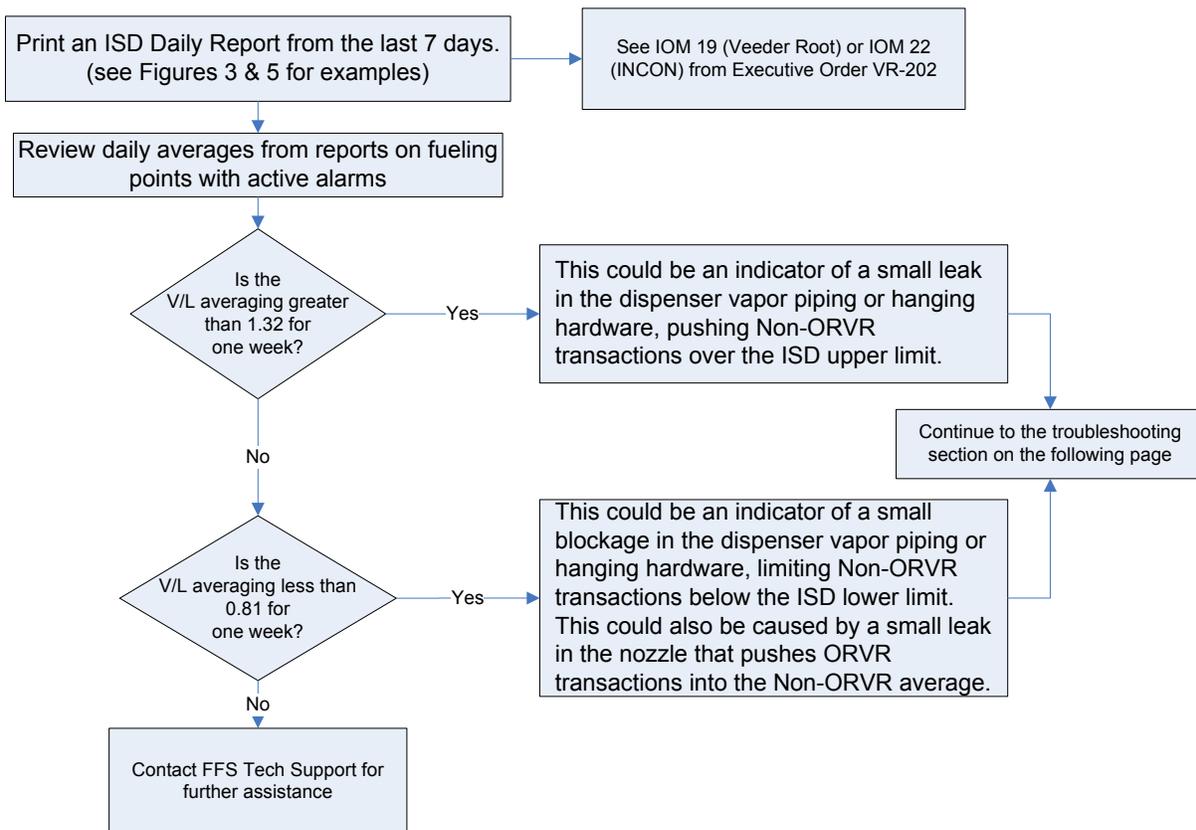
Note: Veeder-Root ISD evaluates “DGRD” alarms on a seven day rolling calendar. INCON ISD evaluates weekly vapor collection alarms on a calendar week basis.

Failure Alarms

When two such consecutive failed assessments occur, ISD will activate a Weekly Vapor Collection Failure Alarm, record that event, and prohibit fuel dispensing from the affected fueling point(s).

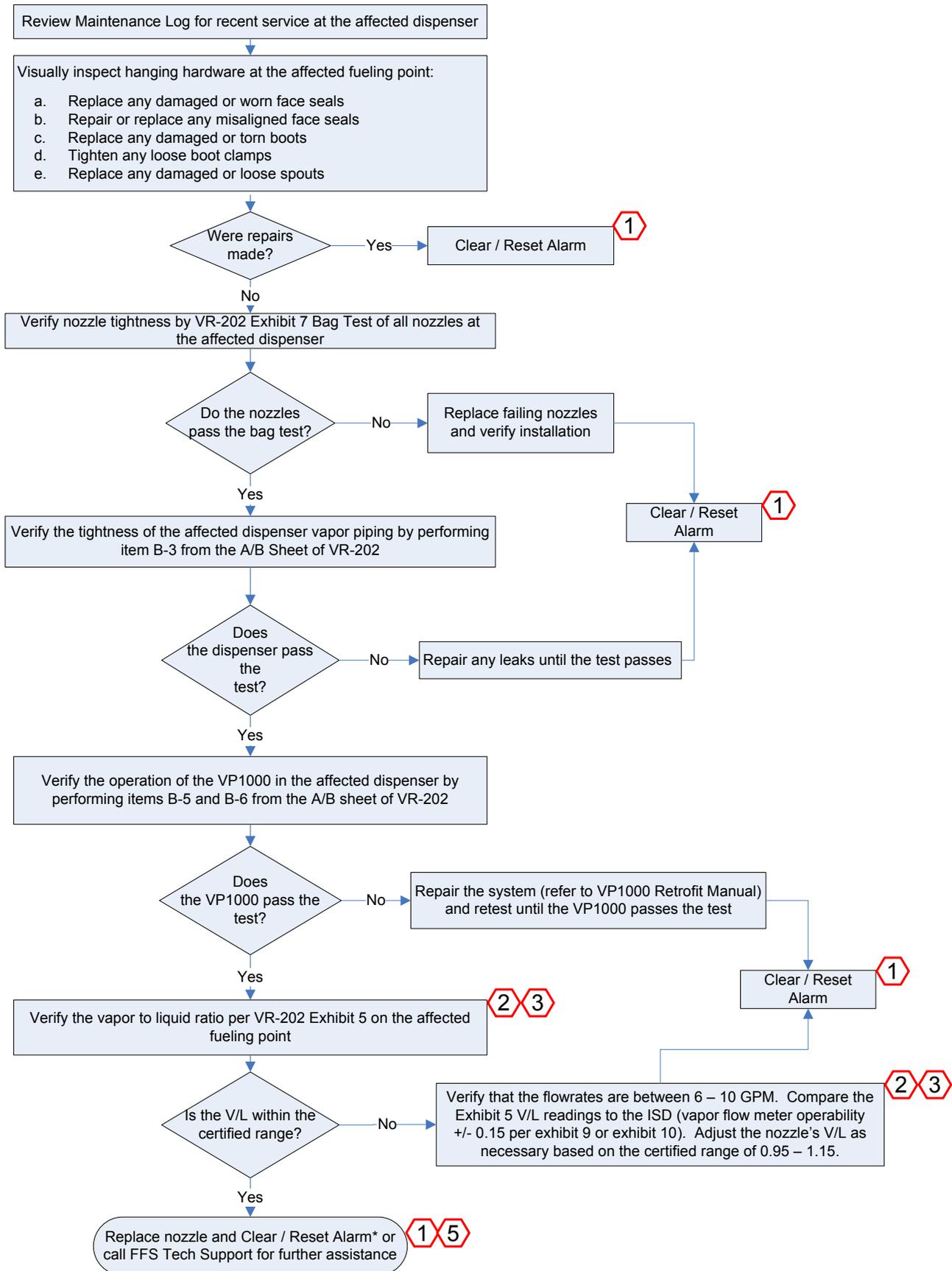
Note: With Veeder-Root ISD if no action is taken to correct a “DGRD” issue, the Veeder-Root ISD will post a “DGRD” warning alarm on day 7 through day 13 and then post the shutdown “DGRD” failure alarm on day 14. The entire site will be shutdown in the event of a “DGRD” failure alarm. With INCON ISD, a warning alarm will be posted on calendar day 7 and then post the failure alarm on calendar day 14 with a shutdown of only the affected dispensers if no action is taken to correct.

Course of Action



Troubleshooting

When responding to Weekly Vapor Collection Alarms the following procedure shall be followed:



See Requirement Notes in the Introduction section of this guide for details.

Section Two: Daily Vapor Collection Alarms

Introduction to Daily Vapor Collection Alarms

This section of the guide is to inform installers, operators, and other personnel about ISD Daily Vapor Collection alarms.

A Daily Vapor Collection Alarm is an indication that based on a minimum of 15 Non-ORVR transactions the fueling point V/L average is beyond the ISD threshold on a daily basis. This is usually an indication of a large blockage or large leak in the vapor line.

A daily vapor collection alarm can also be generated if a Vapor Flow Meter (VFM) is not communicating to the console.

Warning Alarms

A Daily Vapor Collection Warning Alarm is activated and recorded when the fueling point V/L average for a minimum of 15 Non-ORVR transactions is greater than 1.90 or less than 0.33 for one day. If fewer than 15 Non-ORVR events occur in a day, the ISD system may accumulate events over an additional day or days until a minimum of 15 Non-ORVR events is reached.

Failure Alarms

When two such consecutive failed assessments occur, ISD will activate a Daily Vapor Collection Failure Alarm, record that event, and prohibit fuel dispensing from the affected fueling points.

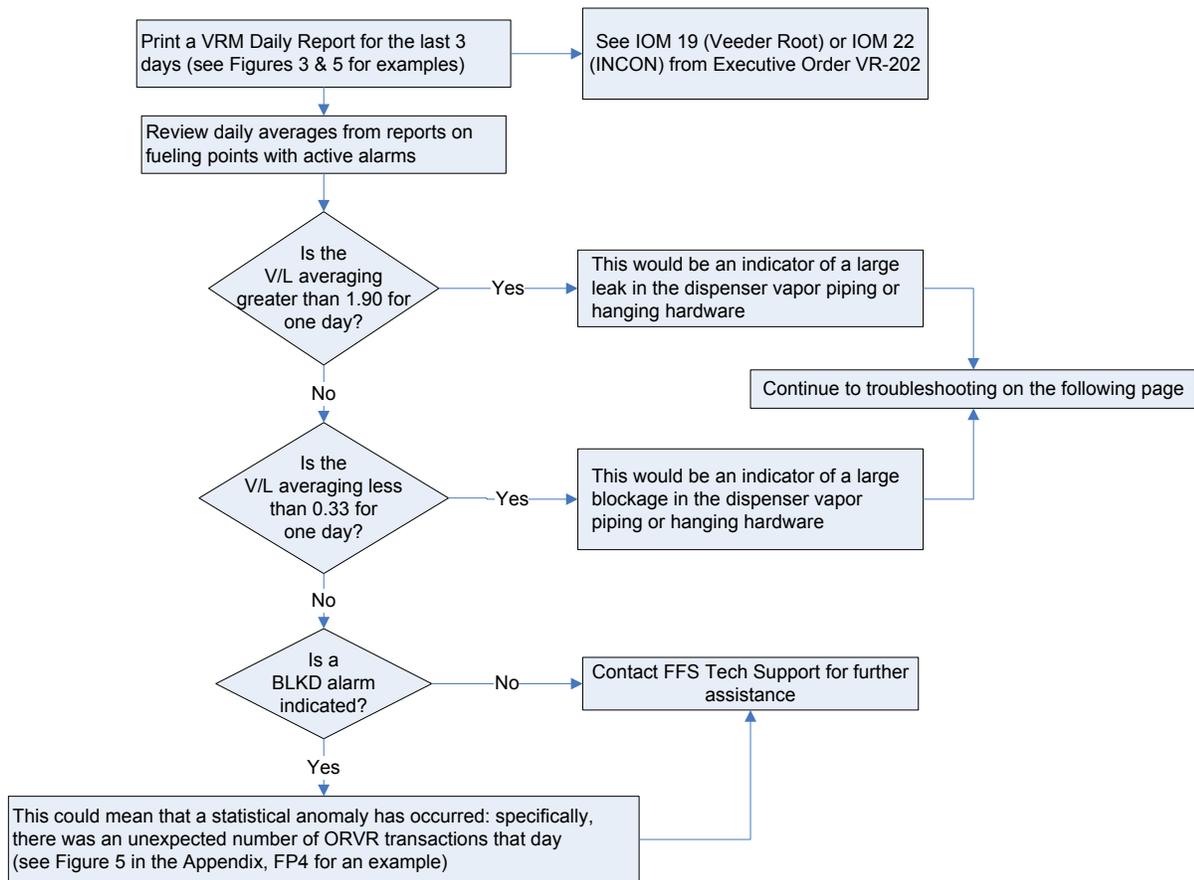
Note: With Veeder-Root ISD, a failure alarm will shutdown the entire site. With INCON ISD, only the affected dispenser will be shutdown with a failure alarm.

BLKD Alarms

When Veeder-Root ISD reports a value of "BLKD" in the "GROSS" section, this is a statistical assessment that there are more blockages than expected from normal ORVR traffic.

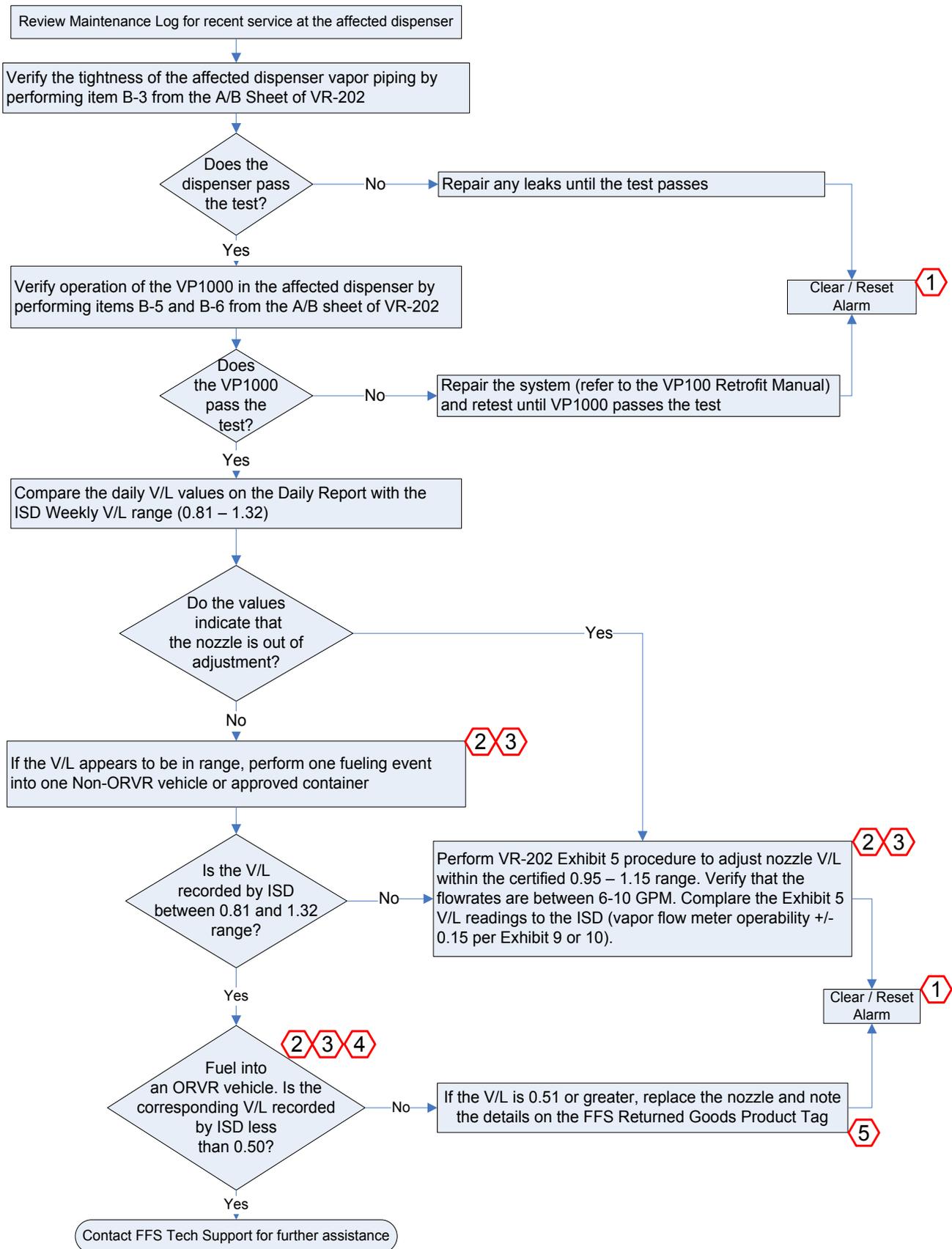
Note: "BLKD" assessments do not occur when using the INCON ISD system, as only numerical assessments are made to determine blockages.

Course of Action



Troubleshooting

When responding to Daily Vapor Collection Alarms the following procedure shall be followed:



See Requirement Notes in the Introduction section of this guide for details.

Introduction to ISD Ullage Pressure

ISD collects ullage pressure measurements and evaluates these measurements in comparison to CARB specifications detailed in CP-201. In a properly maintained Healy EVR Phase II Vapor Recovery System, the ullage pressure will normally be at or below atmospheric pressure, thus limiting the occurrence of the following alarms.

If ISD ullage pressure data does not meet the appropriate specifications, ISD will produce a warning alarm and then failure alarm as specified below.

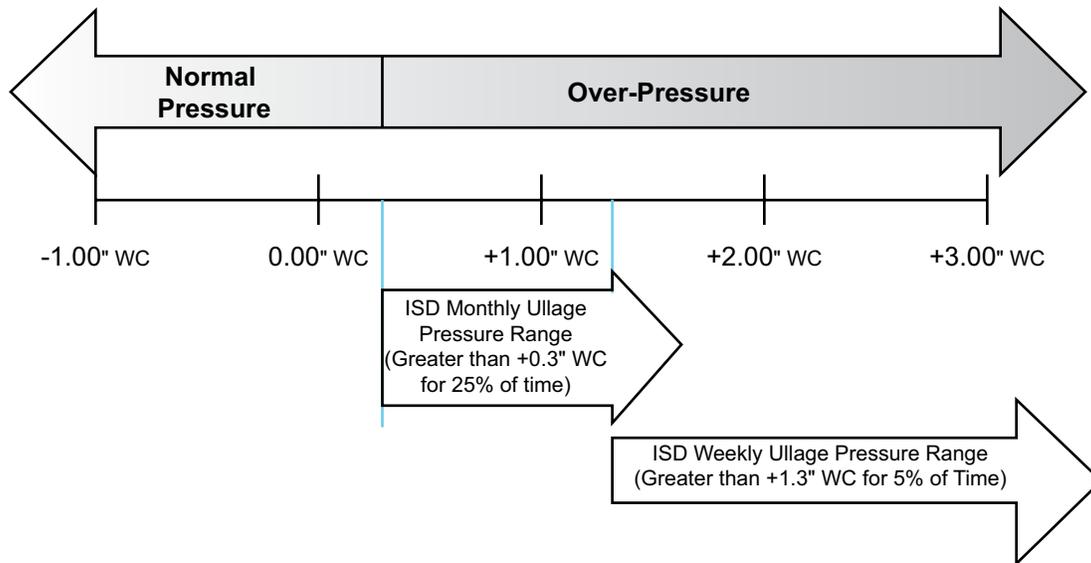
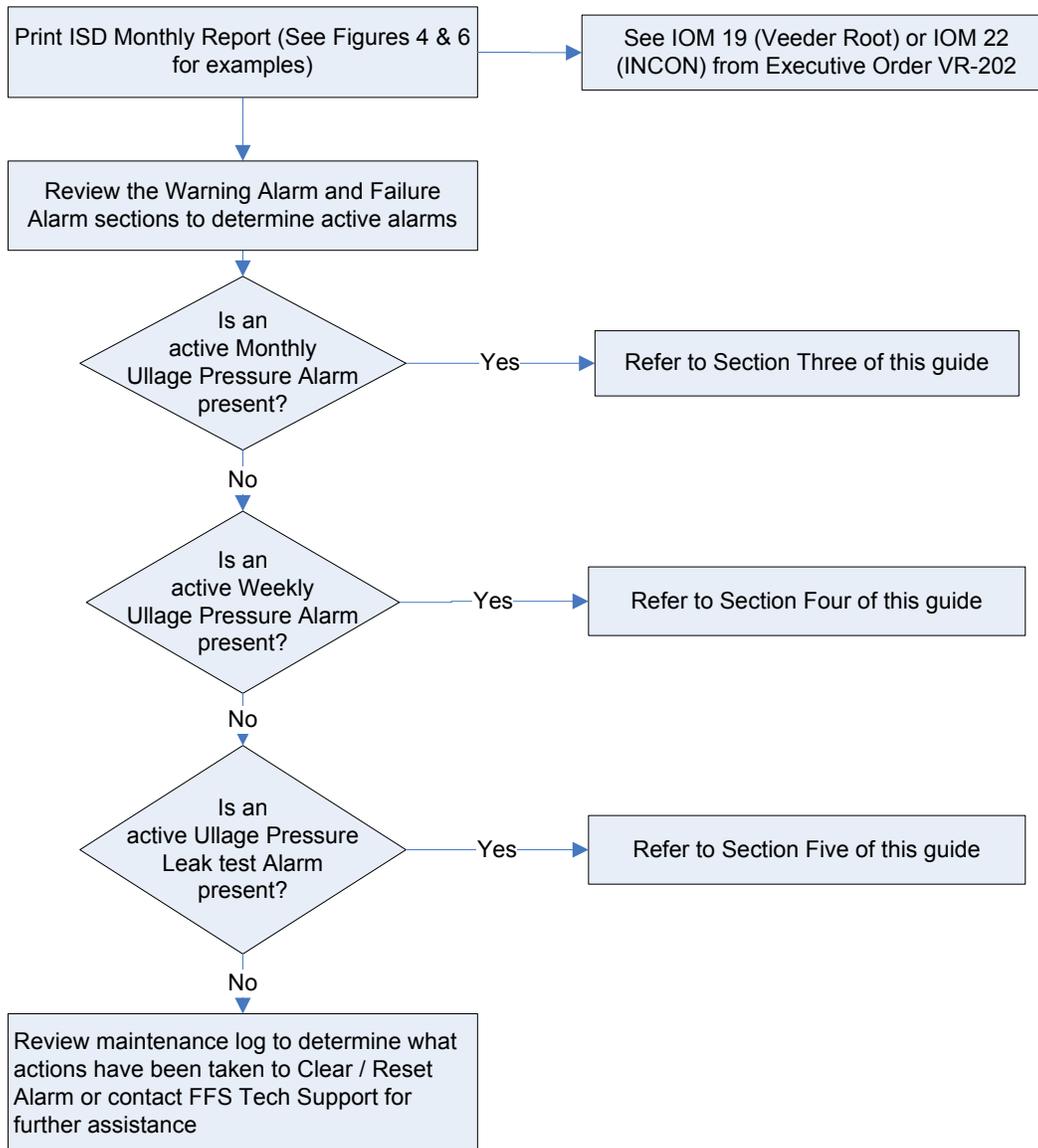


Figure 2: Ullage Pressure Graph

Condition	Value	ISD Report Term
Monthly Ullage Pressure Alarm (Degradation)	Ullage pressure is greater than +0.3" WC for 25% of time	INCON – Monthly Ullage Pressure Warning Alarm / Failure Alarm VEEDER-ROOT – ISD Degrd Pressure Warning Alarm / Failure Alarm
Weekly Ullage Pressure Alarm (Gross)	Ullage pressure is greater than +1.3" WC for 5% of time	INCON – Weekly Ullage Pressure Warning Alarm / Failure Alarm VEEDER-ROOT – ISD Gross Pressure Warning Alarm / Failure Alarm
Ullage Pressure Leak Test Alarm	Leak rate at least 2 times allowable standard from TP-201.3	INCON – Weekly Ullage Pressure Leak Test Warning Alarm / Failure Alarm VEEDER-ROOT – ISD Vapor Leakage Warning Alarm / Failure Alarm

Table 2: ISD Ullage Pressure Terminology

Identifying Pressure Alarms



Section Three: Monthly Ullage Pressure Alarms

Introduction to Monthly Ullage Pressure Alarms

This section of the guide is to inform installers, operators, and other personnel about ISD Monthly Ullage Pressure warning and failure alarms. A Monthly Ullage Pressure Alarm is an indication that the ullage pressure is above the ISD threshold on a monthly basis.

Warning Alarms

A Monthly Ullage Pressure Warning Alarm is activated and recorded when the ullage pressure is greater than +0.3" WC for 25% of the time for one month.

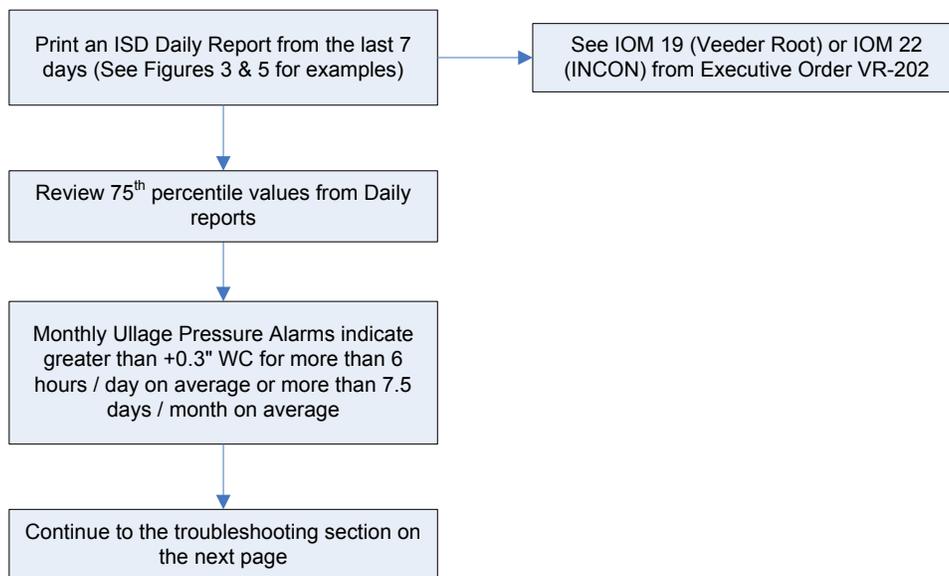
Note: Veeder-Root ISD evaluates "DGRD" alarms on a 30 day rolling calendar. INCON ISD evaluates monthly ullage alarms in a calendar month basis.

Failure Alarms

When two such consecutive failed assessments occur, ISD will activate a Monthly Ullage Pressure Failure Alarm, record that event, and prohibit fuel dispensing for the entire site.

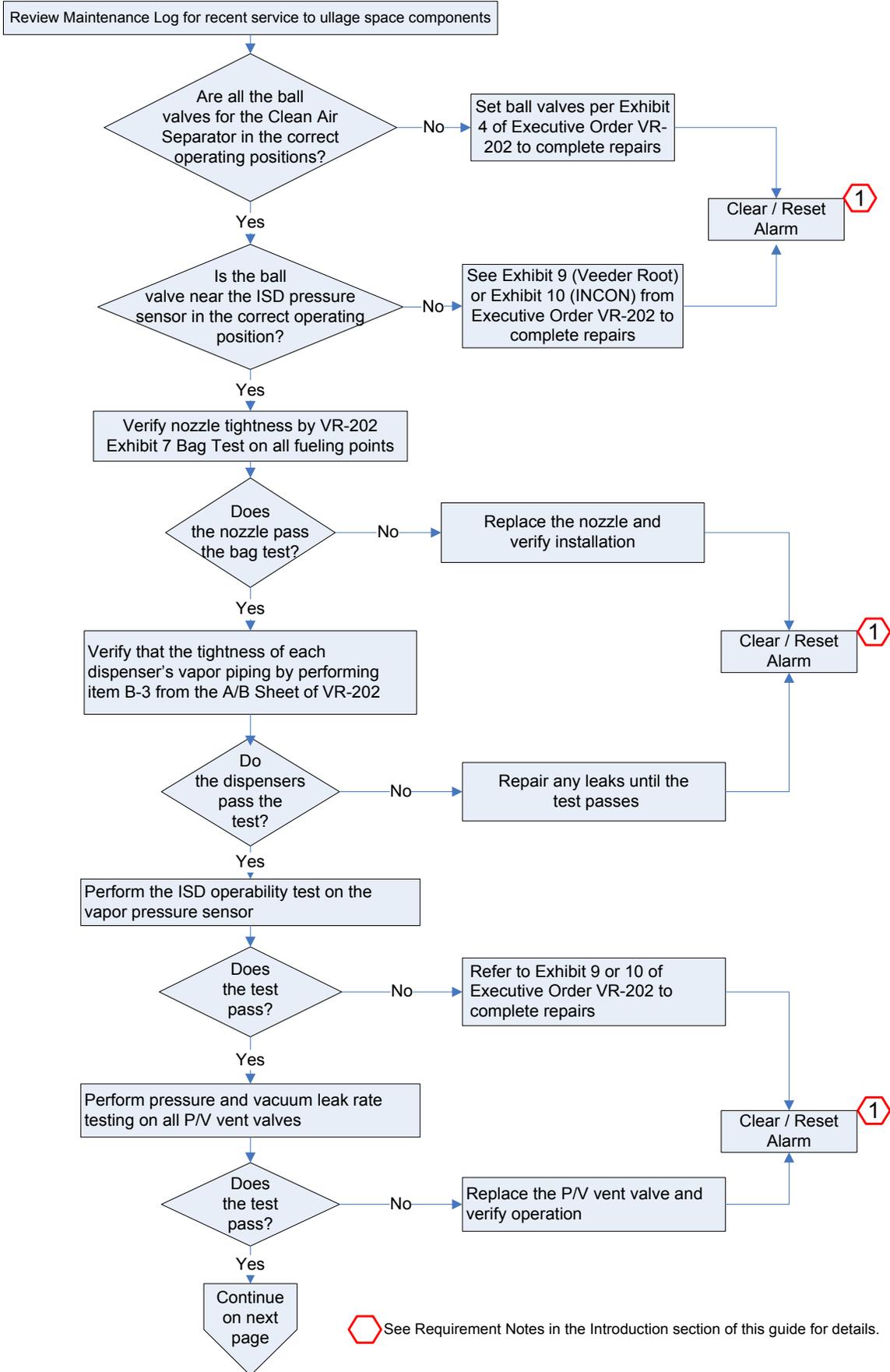
Note: With Veeder-Root ISD If no action is taken to correct a "DGRD" issue, the Veeder-Root ISD will post a "DGRD" warning alarm on day 30 through day 59 and then post the shutdown "DGRD" failure alarm on day 60. With INCON ISD, a warning alarm will be posted on calendar day 30 and then post the failure alarm on calendar day 60 if no action is taken to correct. The entire site will be shutdown in the event of a failure alarm with both Veeder-Root and INCON ISD.

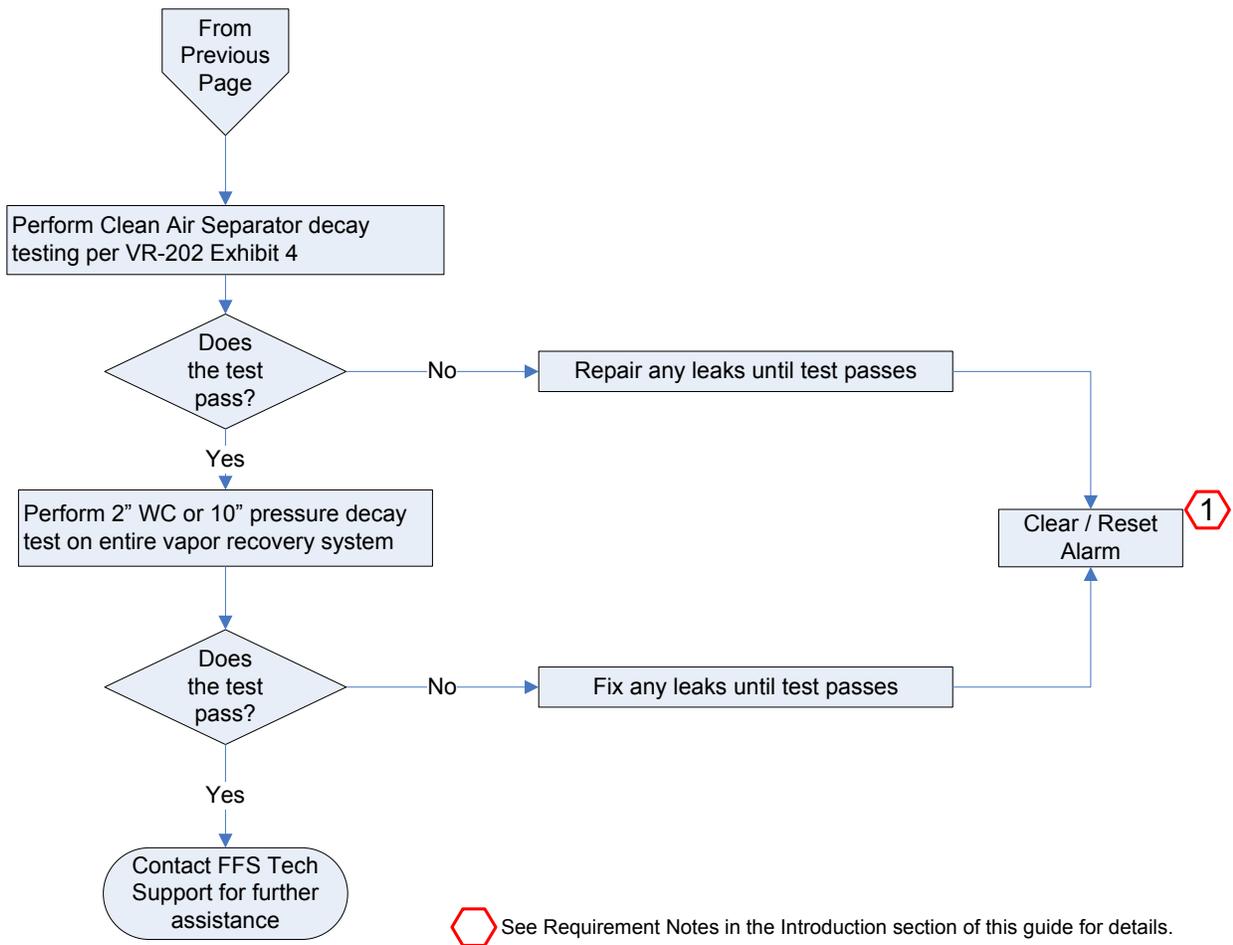
Course of Action



Troubleshooting

When responding to Monthly Ullage Pressure Alarms the following procedure shall be followed:





Section Four: Weekly Ullage Pressure Alarms

Introduction to Weekly Ullage Pressure Alarms

This section of the guide is to inform installers, operators, and other personnel about ISD weekly ullage pressure alarms. A Weekly Ullage Pressure Alarm is an indication that the ullage pressure is above the ISD threshold on a weekly basis.

Warning Alarms

A Weekly Ullage Pressure Warning Alarm is activated and recorded when the ullage pressure is greater than +1.3" WC for 5% of the time for one week.

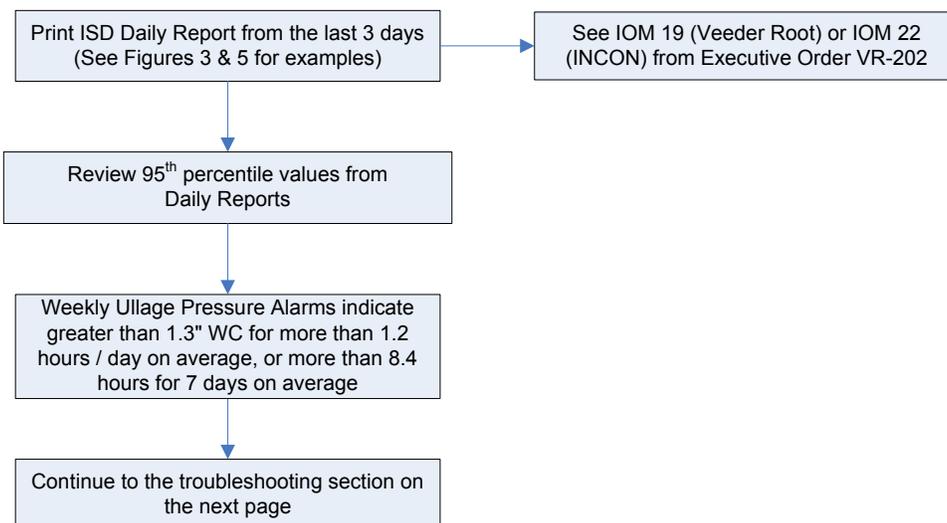
Note: Veeder Root ISD evaluates "GROSS" alarms on a 7-day rolling calendar. INCON ISD evaluates weekly ullage alarms on a calendar weekly basis.

Failure Alarms

When two such consecutive failed assessments occur, ISD will activate a Weekly Ullage Pressure Failure Alarm, record that event, and prohibit fuel dispensing for the entire site.

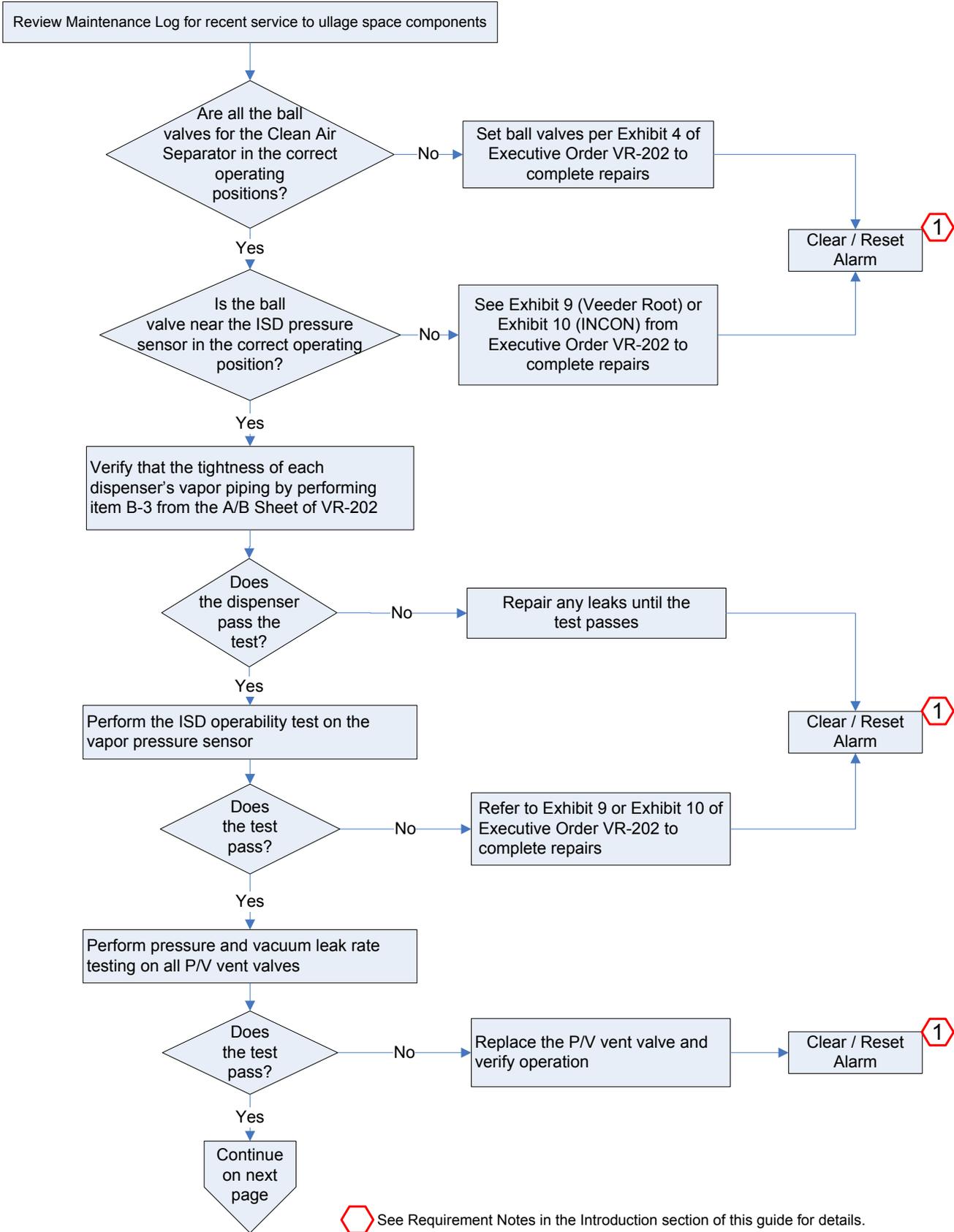
Note: With Veeder-Root ISD if no action is taken to correct a "GROSS" alarm issue, the Veeder-Root ISD will post a "GROSS" warning alarm on day 7 through 13 and then post the shutdown "GROSS" failure alarm on day 14. With INCON ISD, a warning alarm will be posted on calendar day 7 and then post the failure alarm on calendar day 14 if no action is taken to correct. The entire site will be shut down in the event of a failure alarm with both Veeder-Root and INCON ISD.

Course of Action

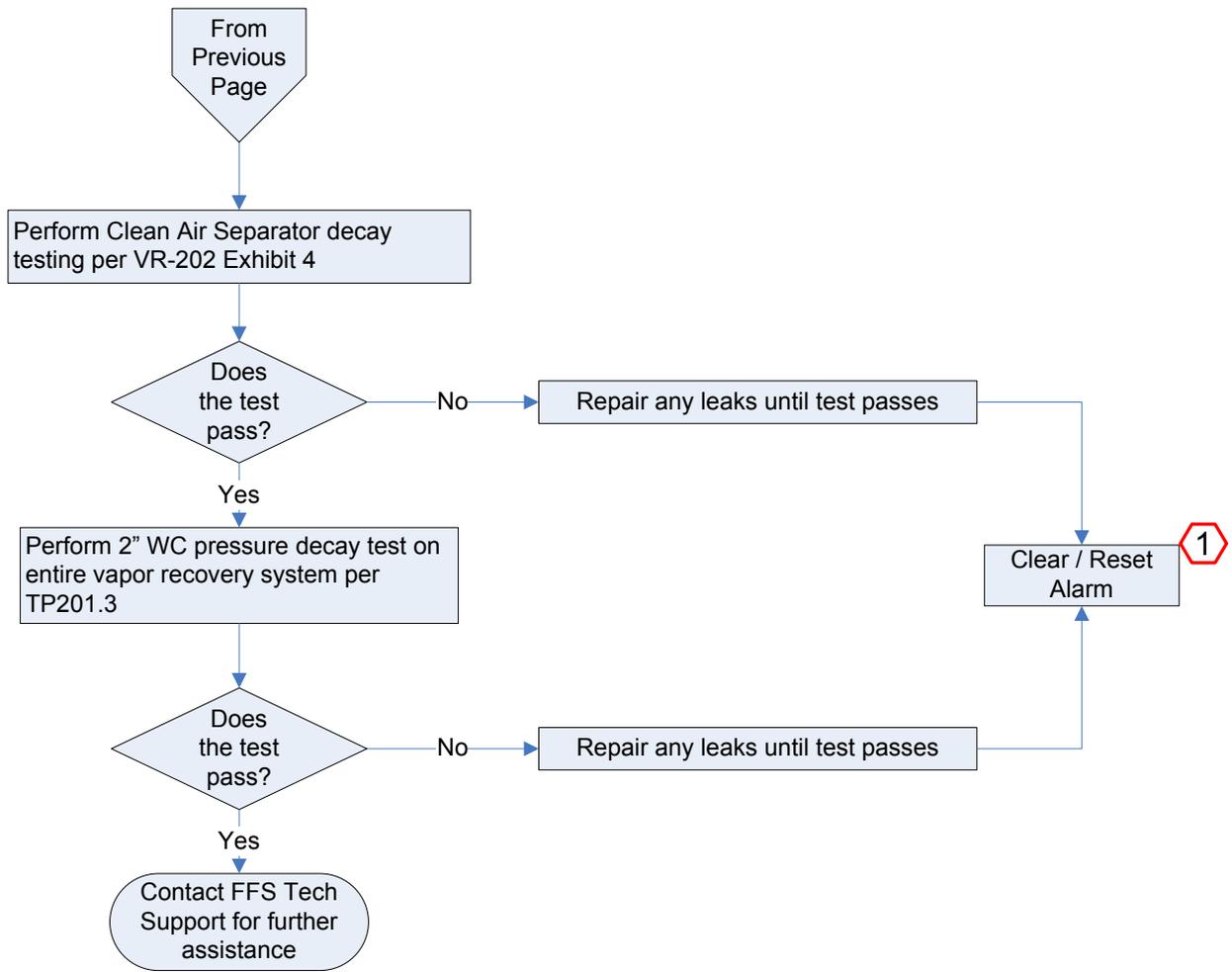


Troubleshooting

When responding to Weekly Ullage Pressure Alarms the following procedure shall be followed:



See Requirement Notes in the Introduction section of this guide for details.



 See Requirement Notes in the Introduction section of this guide for details.

Section Five: Ullage Pressure Leak Test Alarms

Introduction to Ullage Pressure Leak Test Alarms

This section of the guide is to inform installers, operators, and other personnel about ISD ullage pressure leak test alarms. An Ullage Pressure Leak Test Alarm is an indication that a leak in the Phase I and/or Phase II vapor recovery system is in excess of the CP-201 standard on a weekly basis.

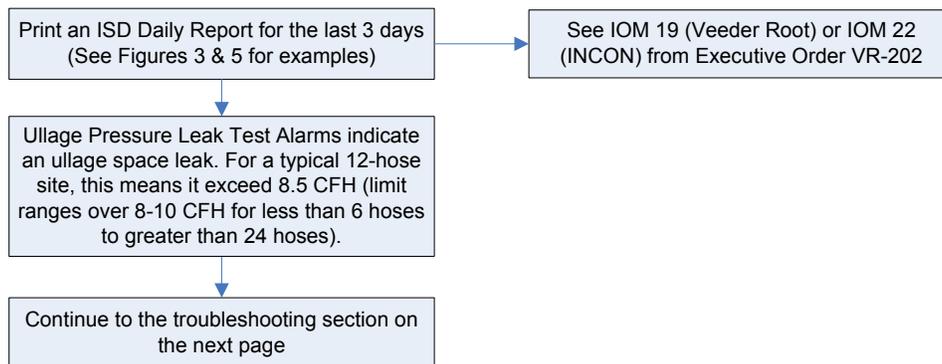
Warning Alarms

An Ullage Pressure Leak Test Warning Alarm is activated and recorded when the leak rate of the vapor recovery system is two times the allowable rate as stated in TP-201.3 for one week.

Failure Alarms

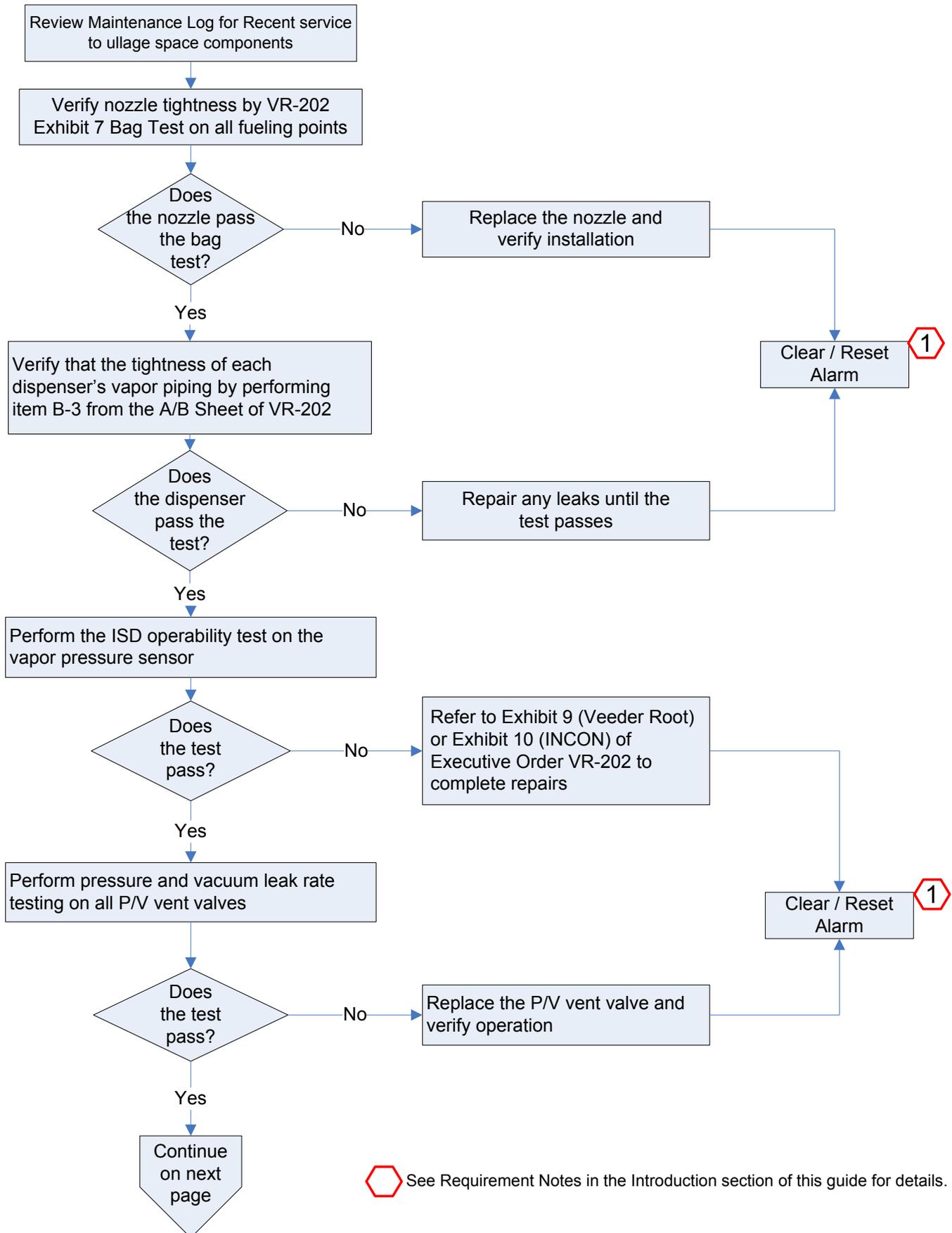
When two such consecutive failed assessments occur, ISD will activate an Ullage Pressure Leak Test Failure Alarm, record that event, and prohibit fuel dispensing for the entire site.

Course of Action

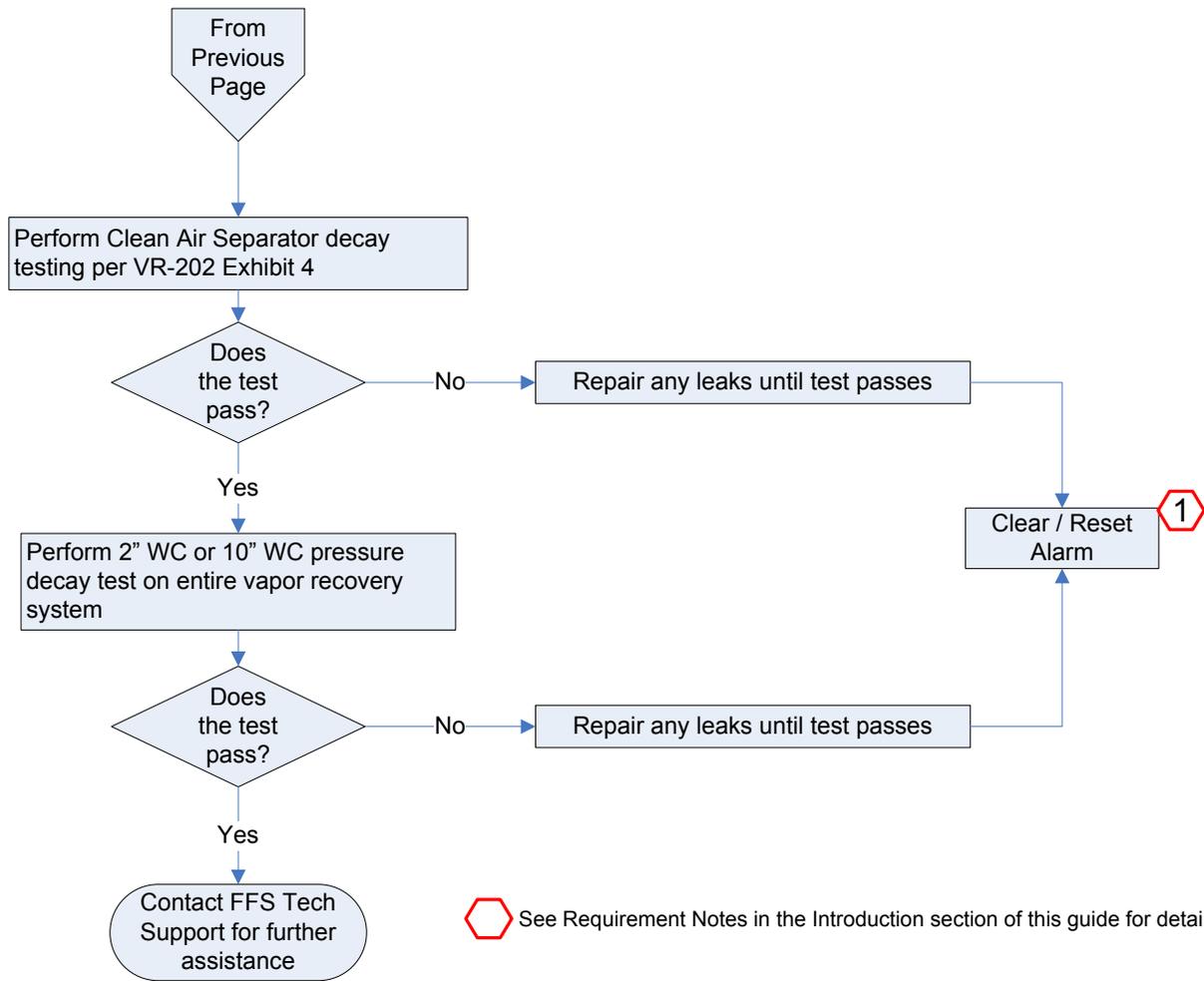


Troubleshooting

When responding to Ullage Pressure Leak Test Alarms the following procedure shall be followed:



 See Requirement Notes in the Introduction section of this guide for details.



 See Requirement Notes in the Introduction section of this guide for details.

Appendix

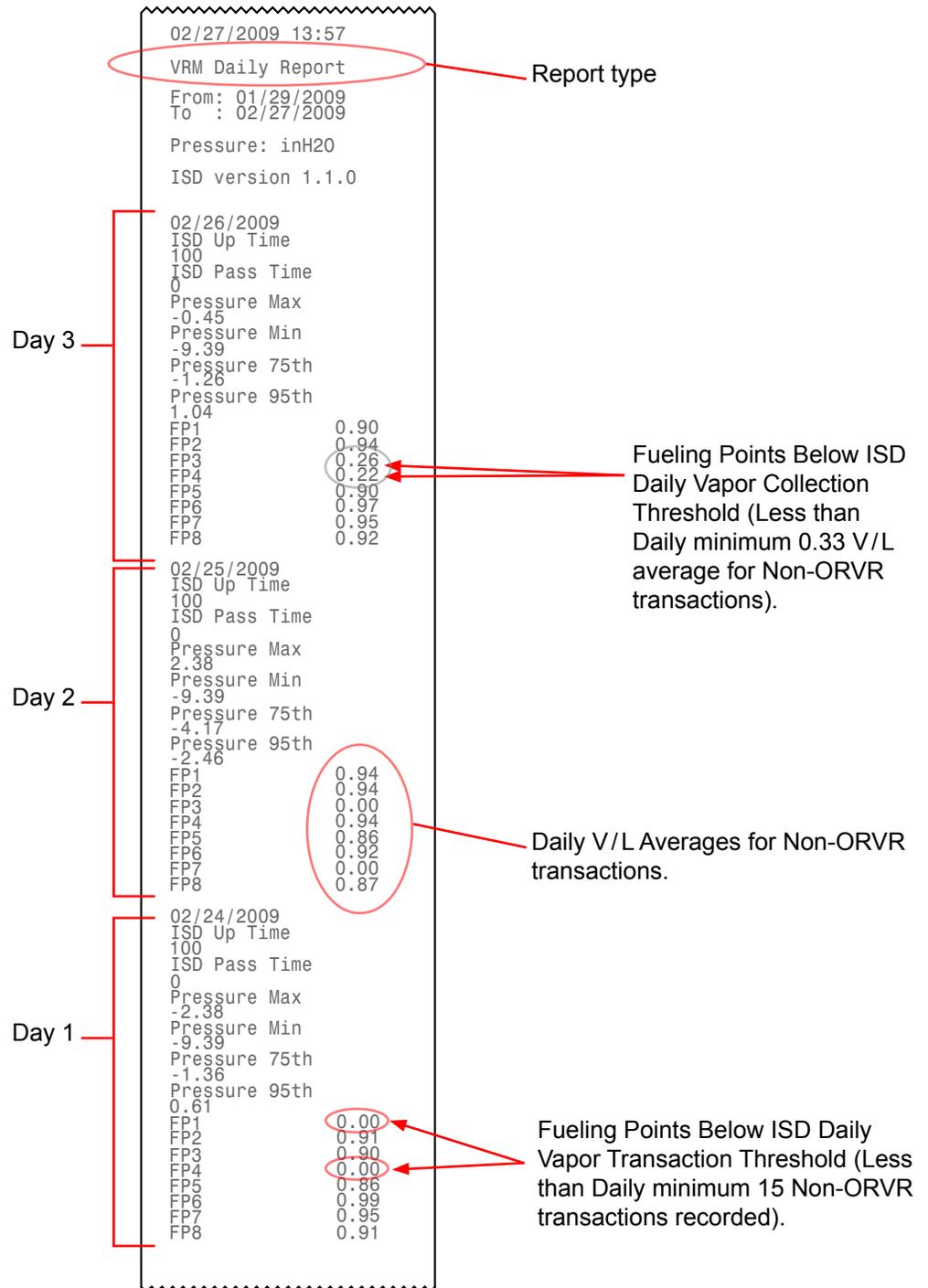


Figure 3: INCON ISD Daily Report (Printout)

Note: For this example on 2/24/2009, fueling points 1 and 4 are below the daily transaction threshold, resulting in no assessment for that day.

Note: For this example on 2/26/2009, fueling points 3 and 4 are below the daily vapor collection threshold, indicating a potential blockage for that day.

Note: On the daily report, pressure 75th and 95th percentile are for the given day and are for reference only.

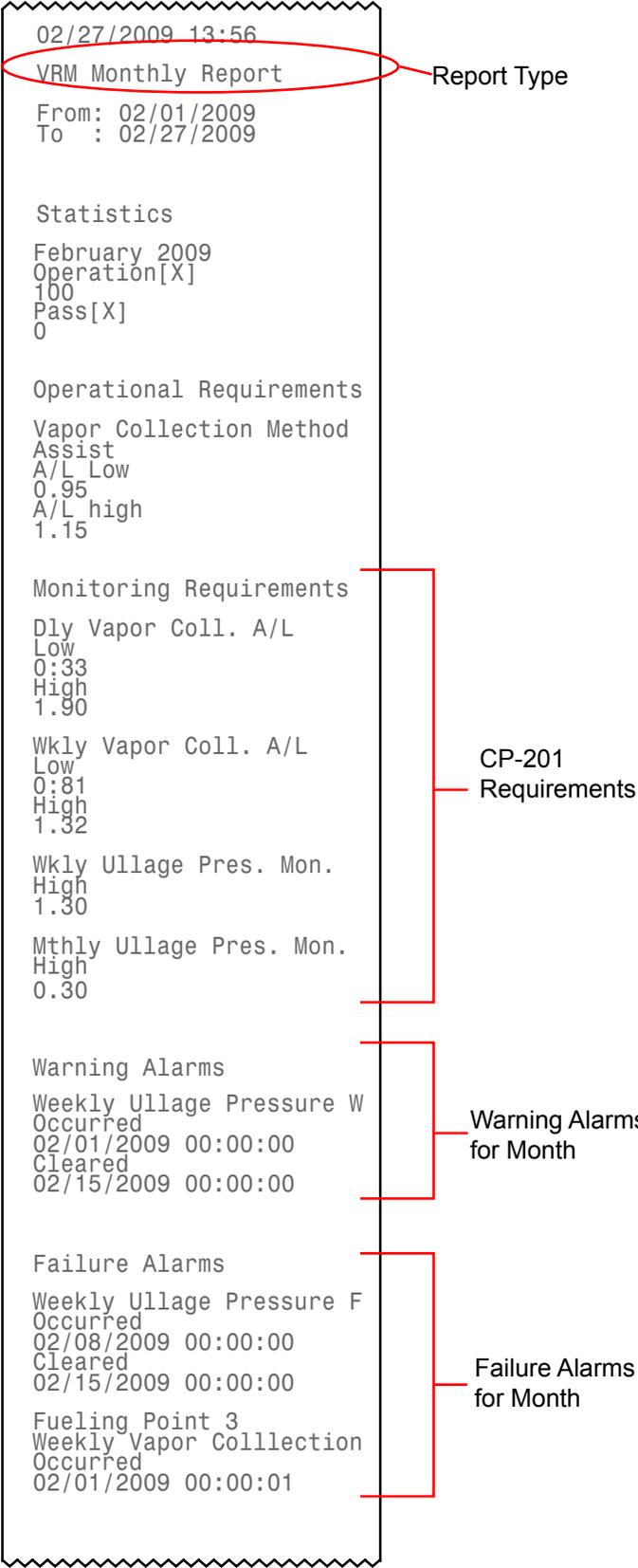


Figure 4: INCON ISD Monthly Report (Printout)

Note: The FP3 weekly vapor collection failure alarm on the report does not meet the monitoring requirements specified by CP-201.

Note: On the monthly report refer to the values listed under monitoring requirements. These are the values that cannot be exceeded for the monitoring period. Under the warning alarm and failure alarm sections, notice the weekly ullage pressure warning alarm and then failure alarm.

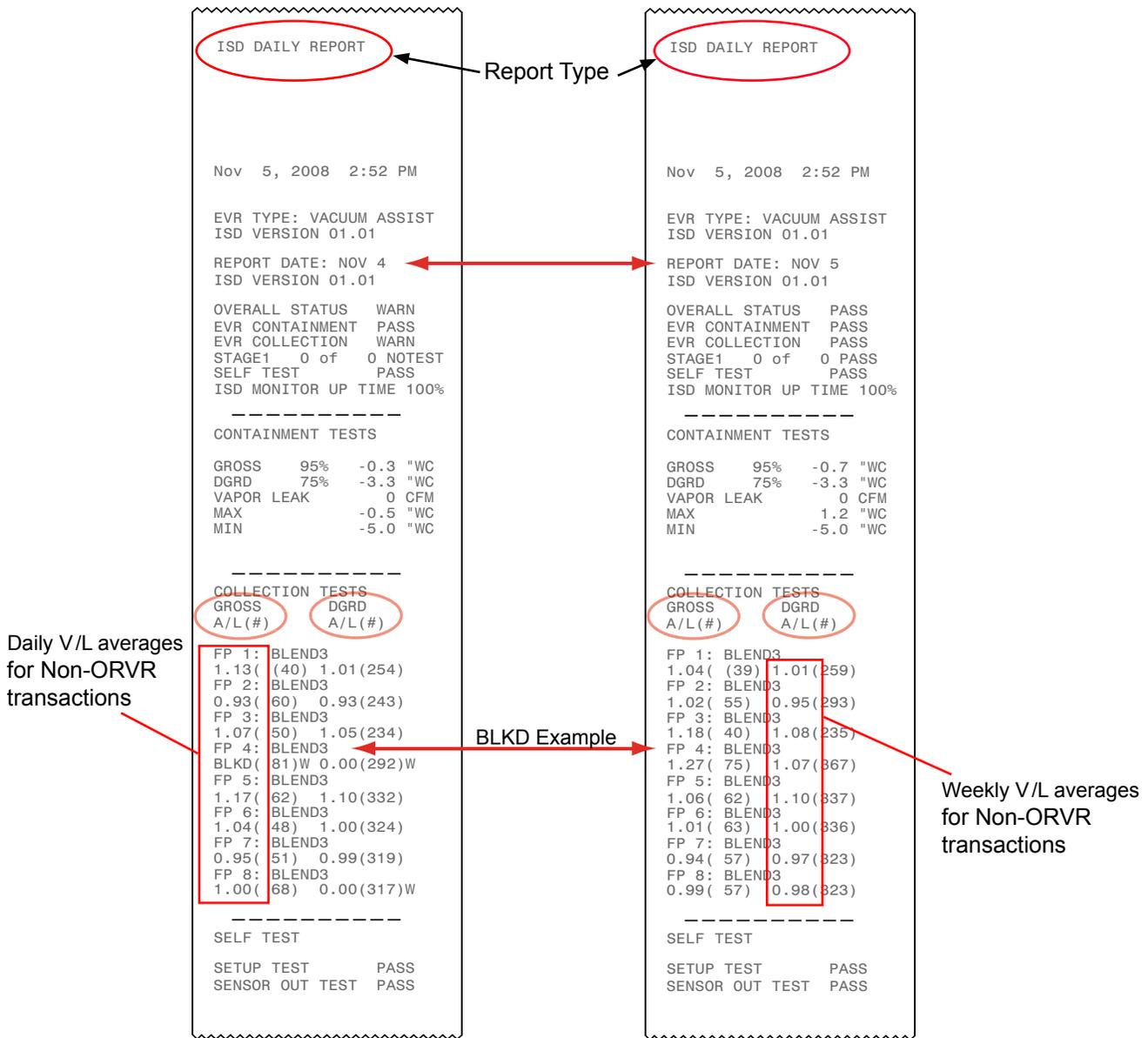


Figure 5: Veeder-Root ISD Daily Report (Printout)

Note: The values on the left side of the report show the most recent daily (GROSS) V/L average for non-ORVR transactions. The values on the right side of the report show the most recent weekly (DGRD) V/L average for non-ORVR transactions.

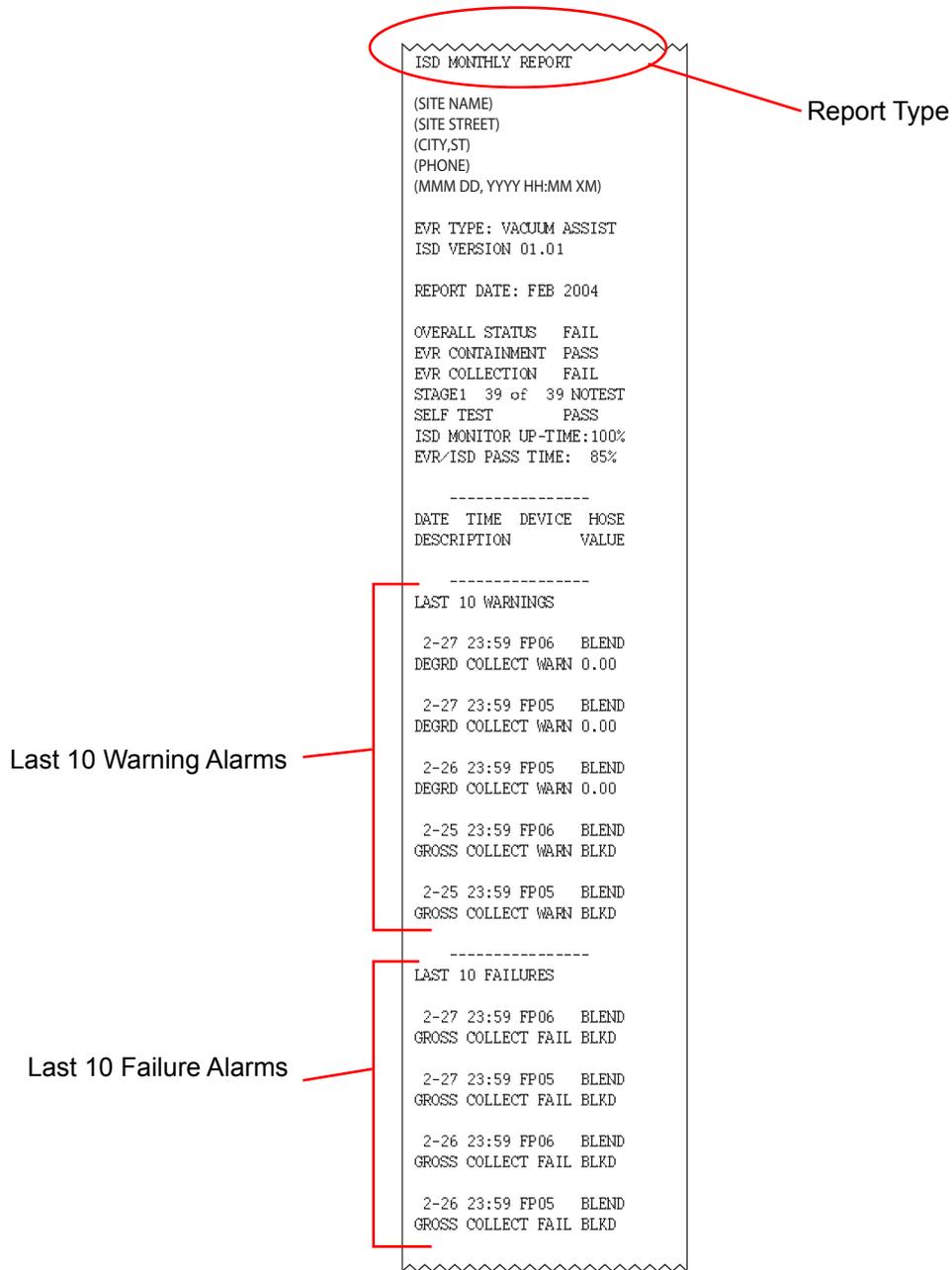


Figure 6: Veeder-Root ISD Monthly Report Printout


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Returned Goods Product Tag

FFS-0093 rev 6

Returned Goods Authorization # _____

Product Return Date _____ Contact FFS Tech Support for RGA# _____

Product Install Date _____ FFS Part Number _____

Distributor Name & Location _____

Distributor Contact name _____

Distributor Contact Phone/E-mail _____

Distributor Notes: _____

If product is returned within warranty period and FFS determines product to have a manufacturing defect, a replacement product will be shipped.

If product returned is beyond the applicable warranty period or FFS determines product to have no defect, I would like (check one):

Core Credit to account Return Product as is
 Return Product after Rebuild (charge to PO# _____)

This side for FFS Distributor use.
 Reverse side **must** also be completed.


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Service Tag

Site Name & Location _____

Service Date _____ Date Code/Serial # _____

Service Company name/Location _____

Service Tech Name _____ Healy Tech. Cert.# _____

Service Notes (Detailed description of symptom, including any active ISD alarms and service performed)

NOTE: For Vapor Collection Alarms, you **MUST staple the last 3 days of ISD Daily Reports to this tag** and provide the following details. Refer to Healy EVR Troubleshooting Guide 405274001 for details.

- Affected fueling point _____ Service Tech ISD Cert# _____
- Vapor-to-Liquid Ratio per Exhibit 5 (V/L 0.95-1.15): #1 _____ #2 _____ #3 _____
- ISD Vapor-to-Liquid Readings (vs Exhibit 5 V/L +/- 0.15): #1 _____ #2 _____ #3 _____
- ORVR Vehicle Fueling reading from ISD (V/L less than 0.50): #1 _____ #2 _____ #3 _____

This side for Service Company use.
Must be completed for prompt processing.

Figure 7: Example of Return Tag (FFS-0093)



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