

In-Station Diagnostics

Troubleshooting Guide

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Warranty

TLS-350R, TLS-350 PLUS, TLS-350J MONITORING SYSTEMS.

We warrant that this product shall be free from defects in material and workmanship for a period of one (1) year from the date of installation or twenty-four (24 months) from the date of invoice, whichever occurs first. During the warranty period, we or our representative will repair or replace the product, if determined by us to be defective, at the location where the product is in use and at no charge to the purchaser. LAMPS, FUSES, AND LITHIUM BATTERIES ARE NOT COVERED UNDER THIS WARRANTY.

We shall not be responsible for any expenses incurred by the user.

This warranty applies only when the product is installed in accordance with Veeder-Root's specifications, and a Warranty Registration and Checkout Form has been filed with Veeder-Root by an authorized Veeder-Root Distributor. This warranty will not apply to any product which has been subjected to misuse, negligence, accidents, systems that are misapplied or are not installed per Veeder-Root specifications, modified or repaired by unauthorized persons, or damage related to acts of God.

If "Warranty" is purchased as part of the Fuel Management Service, Veeder-Root will maintain the equipment for the life of the contract in accordance with the written warranty provided with the equipment. A Veeder-Root Fuel Management Services Contractor shall have free site access during Customer's regular working hours to work on the equipment. Veeder-Root has no obligation to monitor federal, state or local laws, or modify the equipment based on developments or changes in such laws.

MODULES, KITS, OTHER COMPONENTS (PARTS PURCHASED SEPARATE OF A COMPLETE CONSOLE).

We warrant that this product, exclusive of lithium batteries, shall be free from defects in material and workmanship for a period of fifteen (15) months from date of invoice. We warrant that the lithium batteries shall be free from defects in material and workmanship for a period of 90 days from date of invoice. We will repair or replace the product if the product is returned to us; transportation prepaid, within the warranty period, and is determined by us to be defective. This warranty will not apply to any product which has been subjected to misuse, negligence, accidents, systems that are misapplied or are not installed per Veeder-Root specifications, modified or repaired by unauthorized persons, or damage related to acts of God.

We shall not be responsible for any expenses incurred by the user.

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Introduction

This manual contains troubleshooting procedures for Veeder-Root In-Station Diagnostics (ISD).

Contractor Certification Requirements

Veeder-Root requires the following minimum training certifications for contractors who will install and setup the equipment discussed in this manual:

Installer (Level 1) Certification: Contractors holding valid Installer Certification are approved to perform wiring and conduit routing; equipment mounting; probe, sensor and carbon canister vapor polisher installation; tank and line preparation; and line leak detector installation.

TLS-350 Technician (Level 2/3 or 4) Certification: Contractors holding valid TLS-350 Technician Certifications are approved to perform installation checkout, startup, programming and operations training, troubleshooting and servicing for all Veeder-Root TLS-300 or TLS-350 Series Tank Monitoring Systems, including Line Leak Detection and associated accessories.

In-Station Diagnostics (ISD-PMC) Technician Certification: ISD PMC Contractors holding a valid ISD/PMC Certification are approved to perform (ISD/PMC) installation checkout, startup, programming, and operations training. This training also includes troubleshooting and service techniques for the Veeder-Root In-Station Diagnostics system. A current Veeder-Root Technician Certification is a prerequisite for the ISD/PMC course.

Veeder-Root ISD/PMC Including Carbon Canister Vapor Polisher Contractor Certification: This Certification includes Executive Orders 203, 204 and the Veeder-Root Vapor Polisher. This certification is required for setup and service of the Veeder-Root Vapor Polisher.

Warranty Registrations may only be submitted by selected Distributors.

Related Manuals

577013-800	ISD Install, Setup and Operation Manual
577013-842	ISD Quick Reference Guide
577093-796	Vapor Flow Meter Installation Manual
577093-797	Pressure Sensor Installation Manual
576013-635	Veeder-Root Serial Interface Manual
576013-818	TLS-3XX Troubleshooting Manual (Feature / Version list Section 3, Table 3.-3)
577013-948	PMC Install, Setup & Operation Manual For Veeder-Root Vapor Polishers
577013-801	PMC Install, Setup & Operation Manual For VST ECS Membrane Processors
577013-937	ISD Install, Setup & Operation Manual for VST ECS Membrane Processors and Veeder-Root Vapor Polisher
577013-920	Carbon Canister Vapor Polisher Installation Manual.

Safety Precautions



FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.

The following safety symbols are used throughout this manual to alert you to important safety hazards and precautions.

 <p>EXPLOSIVE Fuels and their vapors are extremely explosive if ignited.</p>	 <p>FLAMMABLE Fuels and their vapors are extremely flammable.</p>
 <p>ELECTRICITY High voltage exists in, and is supplied to, the device. A potential shock hazard exists.</p>	 <p>TURN POWER OFF Live power to a device creates a potential shock hazard. Turn Off power to the device and associated accessories when servicing the unit.</p>
 <p>WARNING Heed the adjacent instructions to avoid equipment damage or personal injury.</p>	 <p>READ ALL RELATED MANUALS Knowledge of all related procedures before you begin work is important. Read and understand all manuals thoroughly. If you do not understand a procedure, ask someone who does.</p>

ISD with Healy Assist System Checklist

Procedure		
The following recommended procedure can be followed at the completion of the ISD software setup:		<input type="checkbox"/>
STEP 1.	EVR TYPE is set to VACUUM ASSIST?	<input type="checkbox"/>
STEP 2.	VACUUM ASSIST TYPE is set to HEALY VAC?	<input type="checkbox"/>
STEP 3.	NOZZLE A/L RANGE MAX is set to 1.15 and MIN is set to 0.95?	<input type="checkbox"/>
STEP 4.	VAPOR PROCESSOR TYPE is set to NO VAPOR PROCESSOR?	<input type="checkbox"/>
STEP 5.	There is a wired and ENABLED "AIRFLOW METER" (i.e. ISD Vapor Flow Meter) in each vapor recovery dispenser?	<input type="checkbox"/>
STEP 6.	There is a wired and ENABLED "PRESSURE SENSOR" (i.e. ISD Vapor Pressure Sensor)?	<input type="checkbox"/>
STEP 7.	The FUEL HOSE TABLE is setup and filled out for each vapor recovery hose?	<input type="checkbox"/>
STEP 8.	The ISD FUEL GRADE HOSE MAP does not contain entries for non vapor recovery hoses (e.g. diesel)?	<input type="checkbox"/>
STEP 9.	On the TLS press the MODE key until the DIAGNOSTIC MODE menu is displayed (this will cause a TLS console System Self Test).	<input type="checkbox"/>
STEP 10.	Using the Troubleshooting Guide respond to all ISD Setup ALARMS posted on the printer tape.	<input type="checkbox"/>
STEP 11.	Repeat Steps 8 & 9 until there are no ISD setup or self-test alarms. The TLS Console display reads ALL FUNCTIONS NORMAL.	<input type="checkbox"/>
STEP 12.	Using the ISD PC Setup Tool and the ISD Vapor Pressure Sensor calibration valve: The ISD Vapor Pressure Sensor reads an ambient pressure reading with an offset no greater then +/- 0.20 IWC?	<input type="checkbox"/>
STEP 13.	Returned the ISD Vapor Pressure Sensor calibration valve so that the sensor is reading UST vapor pressure?	<input type="checkbox"/>
STEP 14.	Using the ISD PC Setup Tool: An ISD A/L reading is coming in for each gas hose at the location?	<input type="checkbox"/>
STEP 15.	The TLS console clock is set to the correct date & time?	<input type="checkbox"/>

Question

Why are the V/L extremely low or non-existent when running tests with the PC Setup Tool immediately after installation?

Explanation

1. Refer to Post Installation Checklist (on page 3) to review installation.
2. If the V/L are non-existent or extremely low (50%) for all nozzles during the Operability Test - it indicates an air flow meter problem.
 - If the BirProtocolDim is installed make sure there is a 'G' in the DIM string.
 - Healy Vacuum pump V/L needs to be set.
 - Check the ball valve between the Healy pump and air flow meter is not closed or partially closed.
 - Check that the installed meter does not still have the dust caps on. This will significantly reduce airflow for both all nozzles on the dispenser.

See fnn: CHK VAPOR FLOW MTR troubleshooting procedures (on page 23).

Question

How come some of the SmartSensor airflow meters do not show up in the EVR/ISD > AIRFLOW METER SELECT setup menu so I can ENABLE them?

Explanation

- ISD can only use SmartSensors numbered 1 - 26. Ensure that all the ISD SmartSensors are numbered 1 - 26 by moving the ISD SmartSensors to be ahead of other SmartSensors installed in the system. If SmartSensors were moved to change the SmartSensor numbers of the airflow meters into the range of 1 - 26 you may need to cold boot the system before ISD will add them to the list of available airflow meters.

ISD with VST Balance system/VST EMC Membrane Processor CheckList

Procedure	
The following recommended procedure can be followed at the completion of the ISD software setup for VST Balance Systems with VST EMC Membrane Processor:	
STEP 1.	EVR TYPE is set to BALANCE? <input type="checkbox"/>
STEP 2.	The Balance Nozzle Type is VST? <input type="checkbox"/>
STEP 3.	The Vapor Processor set to VST Vapor Processor? <input type="checkbox"/>
STEP 4.	There is a wired and ENABLED Hydrocarbon Sensor? <input type="checkbox"/>
STEP 5.	There is a wired and ENABLED 'AIRFLOW METER' (i.e. ISD Vapor Flow Meter) in each vapor recovery dispenser? <input type="checkbox"/>
STEP 6.	There is a wired and ENABLED 'PRESSURE SENSOR' (i.e. ISD Vapor Pressure Sensor)? <input type="checkbox"/>
STEP 7.	The FUEL HOSE TABLE is setup and filled out for each vapor recovery hose? <input type="checkbox"/>
STEP 8.	The ISD FUEL GRADE HOSE MAP does not contain entries for non vapor recovery hoses (e.g. diesel)? <input type="checkbox"/>
STEP 9.	PMC setup Vapor Processor Max Runtime is set to 30 minutes? <input type="checkbox"/>
STEP 10.	PMC setup Turn Off Vapor Processor is set to -0.2 IWC? <input type="checkbox"/>
STEP 11.	PMC setup Turn On Vapor Processor is set to +0.2 IWC? <input type="checkbox"/>
STEP 12.	On the TLS press the MODE key until the DIAGNOSTIC MODE menu is displayed (this will cause a TLS console System Self Test). <input type="checkbox"/>
STEP 13.	Using the Troubleshooting Guide respond to all ISD Setup ALARMS posted on the printer tape. <input type="checkbox"/>
STEP 14.	Repeat Steps 12 & 13 until there are no ISD setup or self-test alarms. The TLS Console display reads ALL FUNCTIONS NORMAL. <input type="checkbox"/>
STEP 15.	Using the ISD PC Setup Tool and the ISD Vapor Pressure Sensor calibration valve: The ISD Vapor Pressure Sensor reads an ambient pressure reading with an offset no greater then ± 0.20 IWC? <input type="checkbox"/>
STEP 16.	Returned the ISD Vapor Pressure Sensor calibration valve so that the sensor is reading UST vapor pressure? <input type="checkbox"/>
STEP 17.	Using the ISD PC Setup Tool: An ISD A/L reading is coming in for each gas hose at the location? <input type="checkbox"/>
STEP 18.	The TLS console clock is set to the correct date & time? <input type="checkbox"/>

ISD with VST Balance system/VR Vapor Polisher CheckList

<p>Procedure The following recommended procedure can be followed at the completion of the ISD software setup for VST Balance Systems with Veeder-Root Vapor Polisher:</p>		
STEP 1.	EVR TYPE is set to BALANCE?	<input type="checkbox"/>
STEP 2.	The Balance Nozzle Type is VST?	<input type="checkbox"/>
STEP 3.	The Vapor Processor set to Veeder-Root Polisher?	<input type="checkbox"/>
STEP 4.	There is a wired and ENABLED 'AIRFLOW METER' (i.e. ISD Vapor Flow Meter) in each vapor recovery dispenser?	<input type="checkbox"/>
STEP 5.	There is a wired and ENABLED 'PRESSURE SENSOR' (i.e. ISD Vapor Pressure Sensor)?	<input type="checkbox"/>
STEP 6.	The FUEL HOSE TABLE is setup and filled out for each vapor recovery hose?	<input type="checkbox"/>
STEP 7.	The ISD FUEL GRADE HOSE MAP does not contain entries for non vapor recovery hoses (e.g. diesel)?	<input type="checkbox"/>
STEP 8.	On the TLS press the MODE key until the DIAGNOSTIC MODE menu is displayed (this will cause a TLS console System Self Test).	
STEP 9.	Using the Troubleshooting Guide respond to all ISD Setup ALARMS posted on the printer tape.	<input type="checkbox"/>
STEP 10.	Repeat Steps 8 & 9 until there are no ISD setup or self-test alarms. The TLS Console display reads ALL FUNCTIONS NORMAL.	<input type="checkbox"/>
STEP 11.	Using the ISD PC Setup Tool and the ISD Vapor Pressure Sensor calibration valve: The ISD Vapor Pressure Sensor reads an ambient pressure reading with an offset no greater then ± 0.20 IWC?	<input type="checkbox"/>
STEP 12.	Returned the ISD Vapor Pressure Sensor calibration valve so that the sensor is reading UST vapor pressure?	<input type="checkbox"/>
STEP 13.	Using the ISD PC Setup Tool: An ISD A/L reading is coming in for each gas hose at the location?	<input type="checkbox"/>
STEP 14.	The TLS console clock is set to the correct date & time?	<input type="checkbox"/>

ISD Alarm Message Diagnostics

ISD VAPOR LEAKAGE

A Vapor Leakage Detection test failure occurs when the vapor recovery containment system leaks at 2 times the allowable CARB standard defined in the TP-201.3. For a typical 12-hose site, that means it exceeds 8.5cfh (limit ranges over 8-10 cfh for <6 to >24 hoses).

ISD MONITORING CATEGORY

Vapor Containment Monitoring as implemented by over-pressurization and Vapor Leakage Detection tests, is responsible for ensuring that UST ullage pressure and system leak rate stay within regulatory boundaries. The Vapor Leakage Detection test will check all components for leaks including: P/V valves, dispenser piping, vacuum assist motors, nozzles, hoses, breakaways, vapor processor piping and elements as well as any other piping and fitting or component connected into the UST ullage space.

DIAGNOSTIC PROCEDURE

- Run a TP 201.3 test and use common field techniques for determining the source of the containment system leak.
- Fix all FLOW COLLECT alarms in a balance site first prior to diagnosing this alarm.

COMMON CAUSES

3. Phase I equipment, including but not limited to: dry breaks, spill buckets, tank inventory gauge caps, P/V valves, fill caps.
4. Phase II equipment, including but not limited to: breakaways, hoses, nozzles, whips, vacuum assist motors, solenoid valves, vapor shear valves.
5. Check drop tubes for leaks.

Refer to the Clear Test Repair Menu (on page 37) for clearing this alarm on the TLS after repairs are complete.

ISD GROSS PRESSURE

A gross over-pressure failure occurs when the 95th percentile of 7-days' ullage pressure data exceeds the gross over-pressure requirement. That means the pressure is greater than 1.3"wc for more than 1.2 hours a day on average or more than 8.4 hours for 7 days.

ISD MONITORING CATEGORY

Vapor Containment Monitoring as implemented by over-pressurization and Vapor Leakage Detection tests, is responsible for ensuring that UST ullage pressure and system leak rate stay within regulatory boundaries. The Vapor Leakage Detection test will check all components for leaks including: P/V valves, dispenser piping, vacuum assist motors, nozzles, hoses, breakaways, vapor processor piping and elements as well as any other piping and fitting or component connected into the UST ullage space.

COMMON CAUSES

1. Failure of pressure management control devices (e.g. check to make that the Healy Clean Air Separator is properly connected to UST's vapor space)
2. Failure of ORVR blocking Vapor Collection systems, including but not limited to: ORVR detecting assist nozzles
 - a. Check nozzle flow rates, change fuel filters on dispensers with low flow rates.
 - b. Check nozzle boots to make sure they are not torn
3. Faulty Phase I equipment leading to persistent over pressure conditions during bulk deliveries. (Refer maintenance personnel to EVR manufacturer troubleshooting guides for diagnostic procedures.)
4. Failure of ISD pressure sensor.

Refer to the Clear Test Repair Menu (on page 37) for clearing this alarm on the TLS after repairs are complete.

FIELD NOTES

1. Check that the EVR fittings are tight in the dispenser.
 - Loose fittings caused excessive leaks between the nozzle and vacuum pump which led to over collection, and the nozzle not identifying ORVR vehicles. These conditions lead to an overpressure condition.
 - If the nozzle hoods are broken or worn this can lead to an over pressure condition. It can also lead to Gross Collect alarms on nozzles that do not have a problem.
 - If the nozzle that triggered the alarm checks out OK, check the boots on the other nozzles at the site and repair the damaged ones. If the rubber boot on a nozzle is broken or worn, or the fuel filter is clogged lowering the fuel flow rate, it will cause the nozzle to not correctly identify ORVR vehicles. When there are several broken at the site, nozzles with good boots looked blocked to ISD and trigger this alarm.
 - This condition will also lead to IsdGrossPressure warning also. When nozzles fail to identify ORVR vehicles because of the worn boot or clogged fuel filter, too much air is ingested into the underground tank which lead to an over pressure condition.
 - Clogged fuel filters will reduce fuel flow rate can contribute to overpressure conditions.
2. Some regulator tests can cause warning.

Check if a 2 inch pressure decay test on the day the IsdGrossPressure alarm posted. If that is the case - the alarm will clear on its own in 7 days unless there is another contributing problem. We do not recommend using Clear Test Repair Menu to reset test data unless a repair has been documented.

DEGRD PRESSURE

A degradation over-pressure failure occurs when the 75th percentile of 30-days' ullage pressure data exceeds the degradation over-pressure requirement. That means the pressure is greater than 0.3"wc for more than 6 hrs a day on average or more than 7.5 days for 30 days.

ISD MONITORING CATEGORY

Vapor Containment Monitoring as implemented by over-pressurization and Vapor Leakage Detection tests, is responsible for ensuring that UST ullage pressure and system leak rate stay within regulatory boundaries. The Vapor Leakage Detection test will check all components for leaks including: P/V valves, dispenser piping, vacuum assist motors, nozzles, hoses, breakaways, vapor processor piping and elements as well as any other piping and fitting or component connected into the UST ullage space.

DIAGNOSTIC PROCEDURE

Perform an operability test on the pressure sensor to ensure the ISD system is not causing the fault. See ISD Setup & Operation Manual in Related Manuals.

COMMON CAUSES

- See ISD Gross Pressure (page 9)
- Refer to the Clear Test Repair Menu (on page 37) for clearing this alarm on the TLS after repairs are complete.

FIELD NOTES

1. Check that the EVR fittings are tight in the dispenser (see ISD GROSS PRESSURE, Field Note 1 on page 9).

GROSS COLLECT

1-Day Gross A/L Test failure occurs when the A/L ratio is at least 75% below the lower certified A/L ratio or at least 75% above the upper certified ratio.

ISD MONITORING CATEGORY

Vapor Collection Monitoring for sites equipped with assist vapor recovery systems is responsible for ensuring that proper front-end vapor capture is occurring during fueling events. Among other components, front-end equipment includes the nozzle, hose and the breakaway. Vapor collection is assisted by vacuum motor(s) located inside the dispenser vapor return piping.

DIAGNOSTIC PROCEDURE

1. Find the hose that triggered the alarm by looking at the Collection Tests in the ISD Daily Report in the normal menu.

```

-----
COLLECTION TEST

GROSS      DGRD
A/L (#)    A/L(#)

FP01: UNLEADED
1.13 (288) W-0.10(288)
      :
      :
FP: LABEL
1.13 (188) -0.10 (188)

```

*These lines appear if
EVR type=VACUUM ASSIST*

W - Warning is on FP 1 unleaded hose.

ISD-EVR/fig1.eps

2. A certified technician for the EVR equipment manufacturer must inspect the equipment.

Refer to the Clear Test Repair Menu (on page 37) for clearing this alarm on the TLS after repairs are complete.

COMMON CAUSES

- Failure of the EVR equipment.
- GrossCollectAllHoses: All hoses have extremely high A/L.

The most common cause of High A/L on all Nozzles at the same time is the dispenser events are artificially low. This can be caused by the DIM not having a 'G' in the DIM setup string. The only DIM that requires this is the BIR Protocol Dispenser Interface Module P/N 330280-001.

FIELD NOTES

If the nozzle that triggered the alarm checks out OK, check the boots on the other nozzles at the site and repair the damaged ones.

This alarm should not occur at a VST Balance site. If it does check EVR Type setup in ISD.

DEGRD COLLECT

A 7-day Degradation A/L Test failure occurs when the A/L ratio is at least 25% below the lower certified A/L ratio or at least 25% above the upper certified ratio.

ISD MONITORING CATEGORY

Vapor Collection Monitoring for sites equipped with assist vapor recovery systems is responsible for ensuring that proper front-end vapor capture is occurring during fueling events. Among other components, front-end equipment includes the nozzle, hose and the breakaway. Vapor collection is assisted by vacuum motor(s) located inside the dispenser vapor return piping.

DIAGNOSTIC PROCEDURE

- Perform the TP 201.5 A/L test. To find the hose that triggered the alarm by looking at the Collection Tests in the ISD Daily Report in the normal menu.
- Refer to the Clear Test Repair Menu (on page 37) for clearing this alarm on the TLS after repairs are complete.

FIELD NOTES

This alarm should not occur at a VST Balance site. If it does check EVR Type setup in ISD.

FLOW COLLECT

A 1-Day Vapor Collection Flow Performance Test failure occurs when the vapor collection flow performance is less than 50%.

ISD MONITORING CATEGORY

Vapor Collection Monitoring for sites equipped with balance vapor recovery systems is responsible for ensuring that front-end vapor collection is operating within certified range with respect to the baseline collection performance during fueling events. The baseline collection performance is established by CARB and is the V/L standard for the system. Among other components, front-end equipment includes the nozzle, hose and the breakaway. A balance vapor recovery system relies upon a tight bellows seal in order to allow displaced vapors to return to the UST during fueling events.

DIAGNOSTIC PROCEDURE

- Perform the TP201.4 test.
- Find the hose that triggered the alarm by looking at the Collection Tests in the ISD Daily Report in the normal menu.
- Refer to the Clear Test Repair Menu (on page 37) for clearing this alarm on the TLS after repairs are complete.

FIELD NOTES

This alarm should not occur at a Healy Assist site. If it does check EVR Type setup in ISD.

ISD VP STATUS

1-Day Processor Test

ISD MONITORING CATEGORY

Vapor Processor Monitoring is responsible for ensuring that the vapor processor is operating within normal parameters with no risk of releasing excessive HC effluent emissions.

DIAGNOSTIC PROCEDURE

- Refer the problem to a certified technician for the processor manufacturer.
- Refer to the Clear Test Repair Menu (on page 37) for clearing this alarm on the TLS after repairs are complete.

COMMON CAUSES

- TLS Console Controlled Processor (VST)
 - VP EMISSIONS FAIL
 - VP DUTY CYCLE FAIL
- Non-TLS Console Controlled Processor (OPW)
 - Inn: EXTERNAL INPUT ALARM

FIELD NOTES

The Healy EVR does not have a vapor processor so you should not see this type of alarm.

ISD VP PRESSURE

1 Day Over-Pressure Test

ISD MONITORING CATEGORY

Vapor Processor Monitoring is responsible for ensuring that the vapor processor is operating within normal parameters with no risk of releasing excessive HC effluent emissions.

DIAGNOSTIC PROCEDURE

- TLS controlled processor:
 - Put the processor in manual ON mode and see if the pressure drops. Perform the operability test required by the processor.
- Non-TLS controlled processor:
 - Clear all collection alarms prior to fixing this problem.
 - Verify processor operation.

Refer to the Clear Test Repair Menu (on page 37) for clearing this alarm on the TLS after repairs are complete.

FIELD NOTES

The Healy EVR does not have a vapor processor so you should not see this type of alarm.

ISD SENSOR OUT

System Setup Self-Test

ISD MONITORING CATEGORY

System Self-Test Monitoring algorithms are designed to ensure the proper setup and operation of the ISD monitor. Among other items, the self-test algorithms will check for a properly configured TLS Console monitor as well as the correct number of functioning sensors and interface modules.

System Self-Test Monitoring algorithms are broken down into two types of tests:

1. ISD sensor out self-test, designed to monitor for properly functioning sensors.
2. Setup self-test, designed to verify the monitor configuration.

DIAGNOSTIC PROCEDURE

Verify that the ISD setup is complete.

COMMON CAUSES

The following conditions will generate this warning:

- PROBE OUT (Tank Inventory device)
- Mnn: DISABLED DIM ALARM (MDIM Module device)
- Enn: DISABLED DIM ALARM (EDIM Module device)
- Enn: COMMUNICATION ALARM (EDIM Module device)
- snn: COMMUNICATION ALARM (Smart Sensor device)
- mnn: COMMUNICATION ALARM (Mod bus device)
- CHK VAPOR FLOW MTR

Refer to the Clear Test Repair Menu (on page 37) for clearing this alarm on the TLS after repairs are complete.

ISD SETUP

One or more of the ISD setup requirements are incomplete.

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests are designed to monitor and ensure proper monitor configuration. Setup self-test will verify:

1. That the ISD system is properly setup to shutdown affected fueling point(s) as required by CP-201 regulations.
2. At least one tank contains gasoline.
3. At least one fuel position and gas hose is setup.
4. At least one Vapor Flow Meter is setup.
5. At least one Vapor Pressure Sensor is setup.
6. An external input is setup if a non-TLS Console Controlled Processor is installed.
7. A control relay is setup if a TLS Console Controlled Processor is installed.

Setup self-testing occurs following power-up as well as at daily intervals at the Daily Test Time. A failure will result in a setup self-test warning and warning event recording. Consecutive failures over a 7-day period will result in a setup self-test alarm, failure event recording, and attempted shutdown of the affected fueling point(s).

DIAGNOSTIC PROCEDURE

1. Look for one of the Common Cause alarm conditions
2. Remove the alarm conditions and the ISD SETUP condition can be removed.
3. Once all the conditions are removed, enter and exit the Setup Menu using the MODE key, then press the red ALARM button on the TLS and the condition should clear.

There are two times when the ISD system setup is checked:

1. Just prior to the programmed ISD Analysis time (See Setup Manual)
2. When exiting the SETUP MENU at the TLS front panel

Refer to the Clear Test Repair Menu (on page 37) for clearing this alarm on the TLS after repairs are complete.

COMMON CAUSES

The following conditions will generate this warning:

- MISSING RELAY SETUP
- MISSING HOSE SETUP
- MISSING TANK SETUP
- MISSING VAPOR FLOW MTR
- MISSING VAPOR PRESS SEN
- MISSING VP INPUT
- AIRFLOW MTR SETUP
- PMC SETUP FAIL

MISSING RELAY SETUP

One or more required shutdown alarms have not been assigned to a control device.

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests (ref. page 17) are designed to monitor and ensure proper monitor configuration. Setup self-test will verify that the ISD system is properly setup to shutdown affected fueling point(s) as required by CP-201 regulations.

DIAGNOSTIC PROCEDURE

Once all the Common Causes are removed, enter and exit the Setup Menu using the MODE key, then press the red ALARM button on the TLS and the condition should clear.

COMMON CAUSES

- Tanks are configured with a control device (Relay, PLLD, WPLLD, or VLLD). The control device does not have all the correct alarms assigned. The following ISD alarms must be assigned to the relay:
 - ISD GROSS PRESSURE FAIL
 - ISD DEGRD PRESSURE FAIL
 - ISD VAPOR LEAKAGE FAIL
- When there is a Vapor Processor installed the following ISD alarms must be assigned:
 - ISD VP PRESSURE FAIL
 - ISD VP STATUS FAIL
- When ISD system is configured as an EVR Balance type the following HOSE alarms must be assigned:
 - FLOW COLLECT FAIL
- When the ISD system is configured as an EVR Vacuum Assist type the following HOSE alarms must be assigned:
 - GROSS COLLECT FAIL
 - DEGRD COLLECT FAIL

FIELD NOTES

- When configuring Relays, do not fill in the Tank ID field for relays that are not used by ISD to shut down tank STP. For example, when PLLD is used as the primary control for shutting down the STP and a relay is used to signal a tank overfill alarm, do not fill in the Tank ID field for the relay controlling the overfill alarm signal. This will cause a MISSING RELAY SETUP warning.

MISSING TANK SETUP

There are no vapor recovery (gasoline) tanks defined, or a gasoline pump has not been assigned to a control (shut down) device in at least one tank.

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests (ref. page 17) are designed to monitor and ensure proper monitor configuration. Setup self-test will verify at least one tank contains gasoline.

DIAGNOSTIC PROCEDURE

1. Configure the tanks and assign one of the following control devices:
 - RELAY
 - PLLD
 - WPLLD
 - VLLD
2. Then assign all the required ISD alarms to the controlling device.
3. Once all the causes are removed, enter and exit the Setup Menu using the MODE key, then press the red ALARM button on the TLS and the condition should clear.

MISSING HOSE SETUP

The Fuel Grade Table does not have any hoses assigned to it.

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests (ref. page 17) are designed to monitor and ensure proper monitor configuration. Setup self-test will verify at least one fuel position and gas hose is setup.

DIAGNOSTIC PROCEDURE

- This warning indicates the mapping of the hose devices to the dispensed products has not been started. Refer to the ISD Setup manual (P/N 577013-800) to map hoses to the fuel products.
- The absence of this alarm does not mean the map is correct. The alarm indicates that the Fuel Grade Table has no hoses assigned.
- Once all the hoses are mapped, enter and exit the Setup Menu using the MODE key, then press the red ALARM button on the TLS and the condition should clear.

COMMON CAUSES

Hose mapping has not been started.

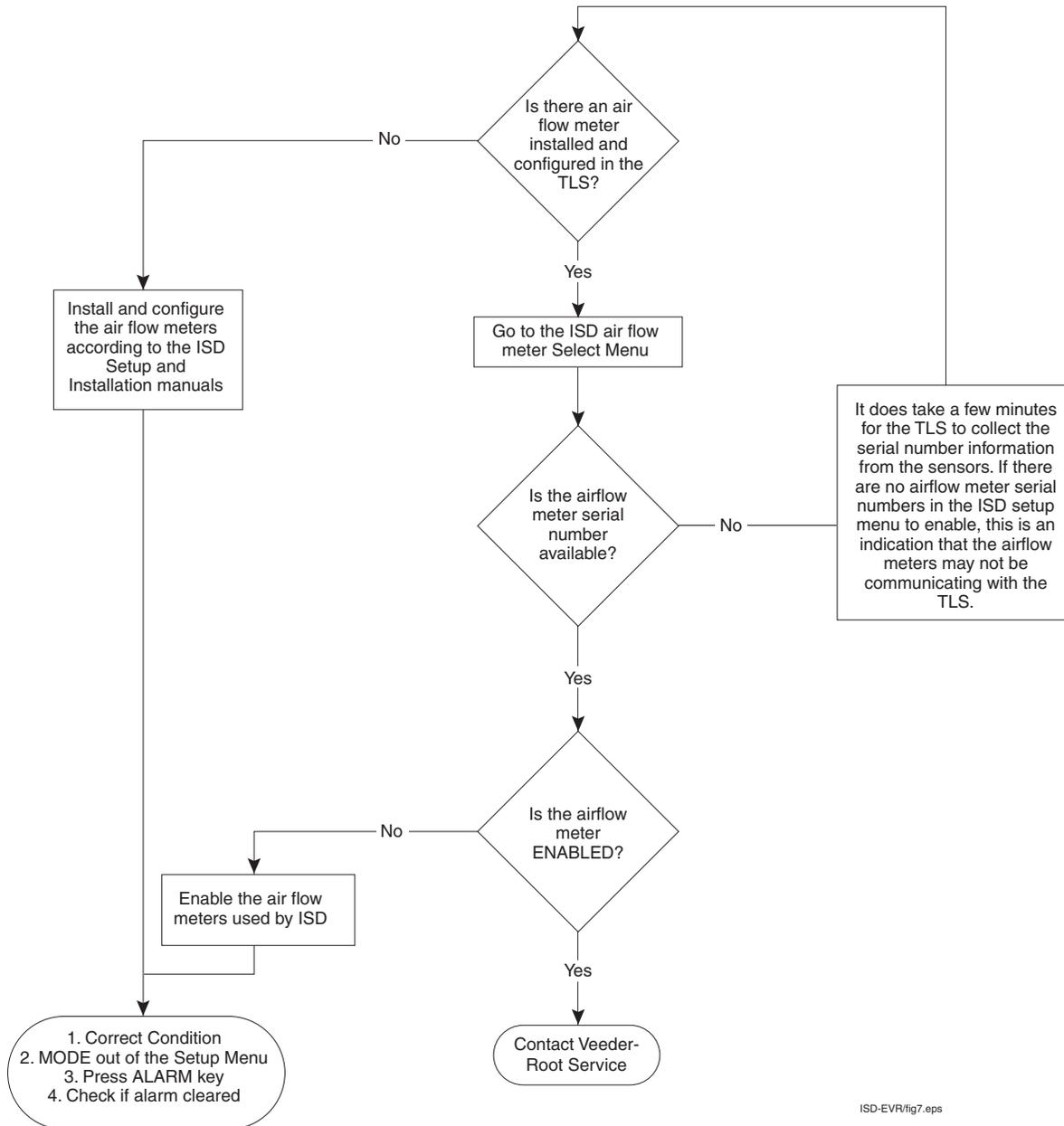
MISSING VAPOR FLOW MTR

There is no Vapor Flow Meter setup or detected.

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests (ref. page 17) are designed to monitor and ensure proper monitor configuration. Setup self-test will verify at least one Vapor Flow Meter is setup.

DIAGNOSTIC PROCEDURE



ISD-EVR/fig7.eps

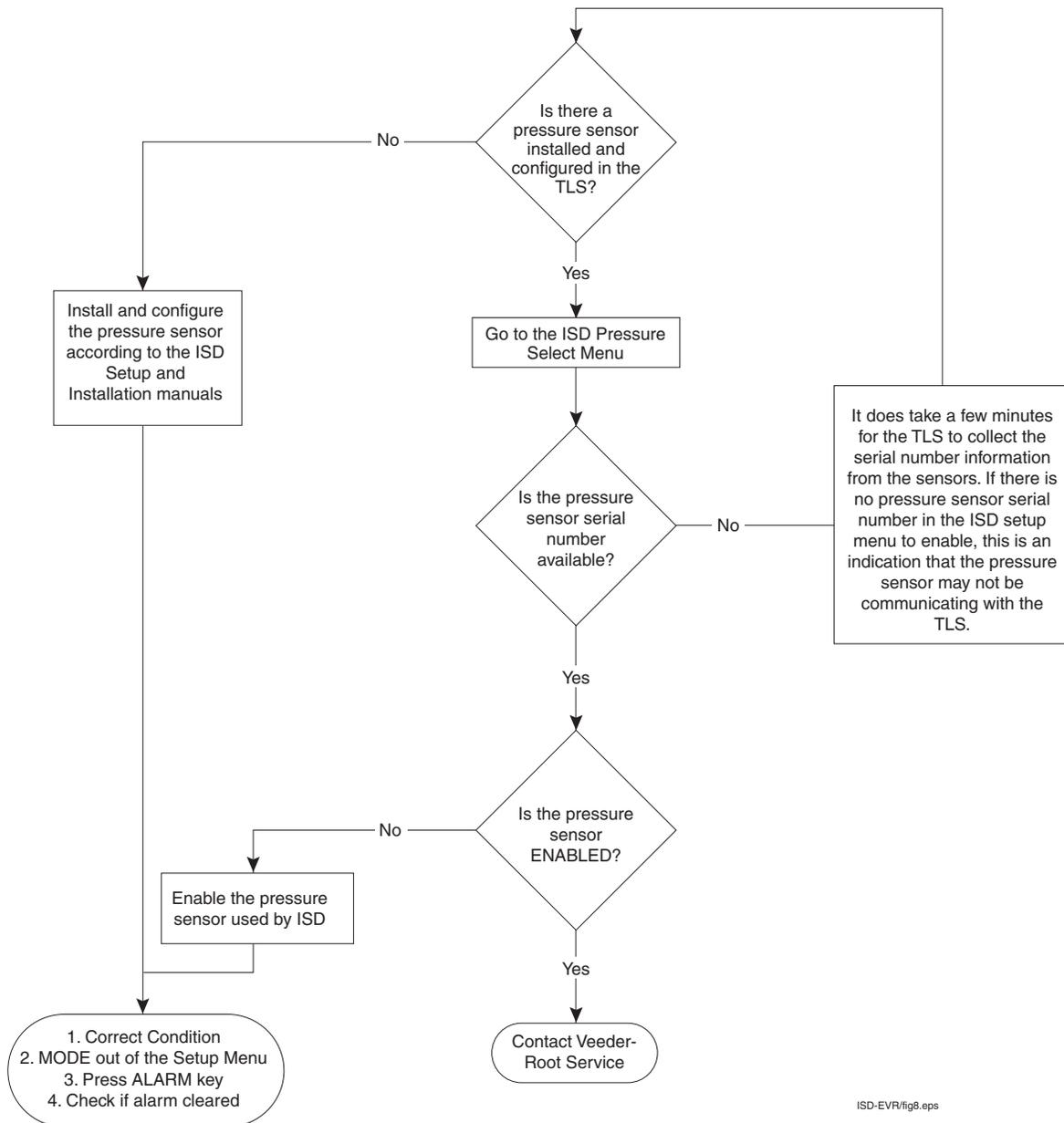
MISSING VAPOR PRES SEN

There is no Vapor Pressure Sensor setup or detected.

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests (ref. page 17) are designed to monitor and ensure proper monitor configuration. Setup self-test will verify at least one Vapor Pressure Sensor is setup.

DIAGNOSTIC PROCEDURE



ISD-EVR/fig8.eps

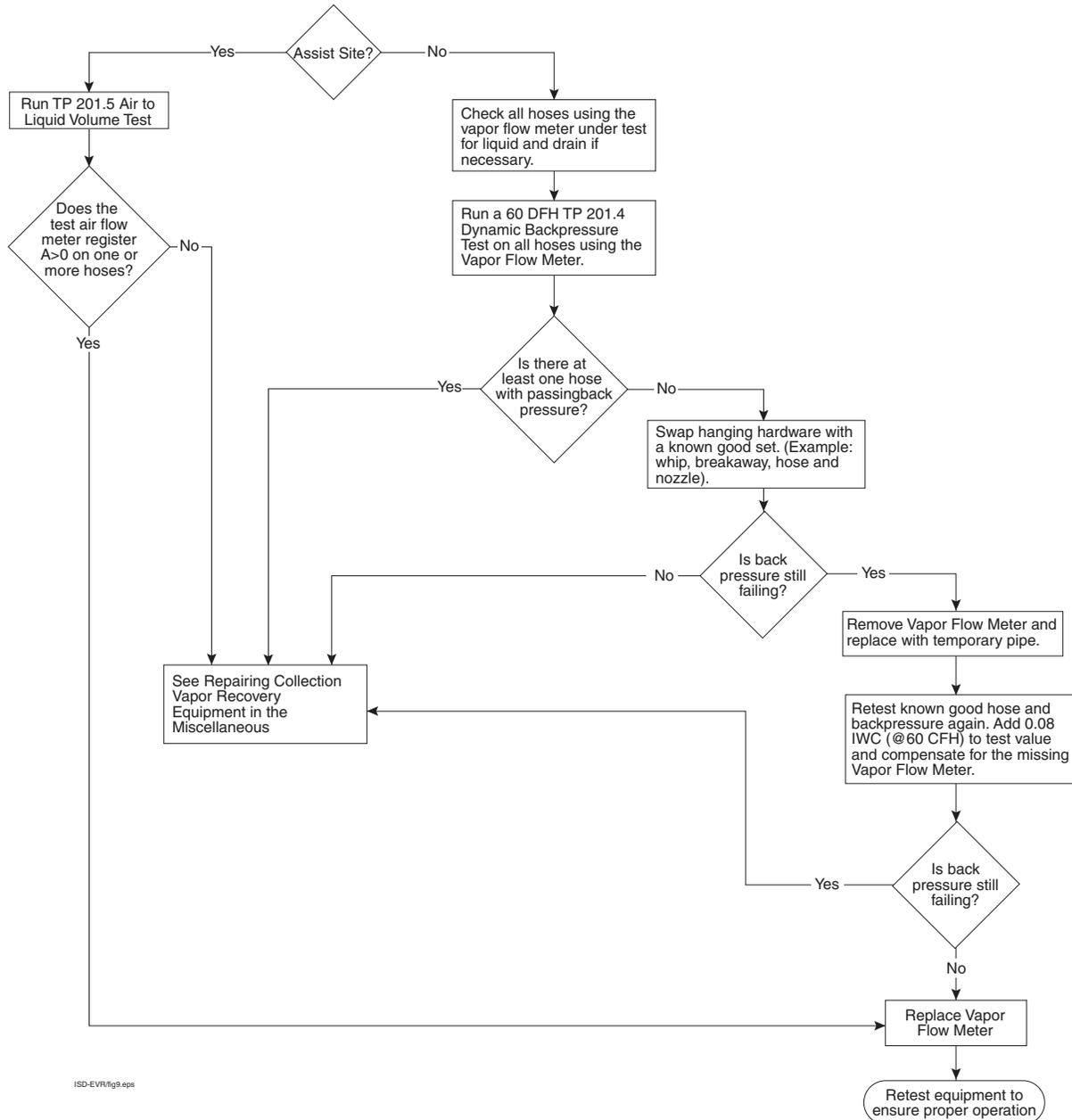
fnn: CHK VAPOR FLOW MTR

Failure of locked rotor test - possible locked vapor flow meter

ISD MONITORING CATEGORY

System Diagnostic

DIAGNOSTIC PROCEDURE



ISD-EVTR/fig9.eps

FIELD NOTES

See "Removing & Replacing Vapor Flow Meters" on page 34 when replacing a vapor flow meter.

hnn: VPRFLOW MTR SETUP

Incoming transaction from a hose with an unavailable Vapor Flow Meter.

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests (ref. page 17) are designed to monitor and ensure proper monitor configuration. Setup self-test will verify at least one Vapor Flow Meter is setup.

DIAGNOSTIC PROCEDURE

- Using the ISD Hose Setup Menus print out the ISD Hose Table (see example printout below).

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

ISD AIRFLOW METER MAP			
ID	SERIAL NUM	LABEL	
1	03001401	AFM1	FP1 -
2	03001402	AFM2	FP3 -
3	03001403	AFM3	FP5 -
4	03001404	AFM4	FP7 -
5	03001405	AFM5	FP9 -
6	03001406	AFM6	FP11

ID = Hose ID
 FP = Mapped fuel position as TLS Console recognizes it
 (-1 = unassigned)
 FL = Fuel position label as written on dispenser
 HL = Hose label
 AA = Airflow meter ID assigned
 RR = Relay ID
 UU = unassigned

ID = Airflow meter ID assigned
 Serial Number = Airflow meter's
 serial number

hosetableprtout.eps

- Find the AFM assigned to Hose nn.
- Verify that the AFM is still configured in the TLS.

PMC Alarm Message Diagnostics

This manual provides instructions to install, setup, and operate the components of Veeder-Root Pressure Management Control (PMC) equipment. The PMC feature is an option for the TLS console platform, and as such, many of the installation/setup/operation instructions for non-PMC specific tasks are covered in TLS-3XX supplied literature. Do not use this manual when PMC is installed with ISD. Use the ISD Setup & Operation Manual, 577021-800.

Veeder- Root Vapor Polisher Site Requirements

Below are the requirements for all PMC installations:

- V-R TLS-350R/EMC w/BIR, TLS-350 Plus/EMC Enhanced, TLS-350/EMC and ProMax consoles with ECPU2 - install as per TLS-3XX Site Prep manual, setup following instructions in TLS-3XX System Setup Manual.
- A flash memory board (NVMEM203) for PMC software storage - installed on the ECPU2 board in place of the console's 1/2 Meg RAM board - install as per TLS-350 Series Board and Software Replacement Manual, no setup required.
- Vapor Pressure Sensor and Smart Sensor Module- install and connect following instructions in the Vapor Pressure Sensor Installation Guide.
- Carbon Canister Vapor Polisher - install and connect following instructions in the Carbon Canister Vapor Polisher Installation Guide.
- An RS-232 Port will be available for use by contractor or government inspectors.

VST ECS Membrane Processor Site Requirements

Below are the requirements for all PMC installations:

- V-R TLS-350R/EMC w/BIR, TLS-350 Plus/EMC Enhanced, TLS-350/EMC and ProMax consoles with ECPU2 - install as per TLS-3XX Site Prep manual, setup following instructions in TLS-3XX System Setup Manual.
- A flash memory board (NVMEM203) for PMC software storage - installed on the ECPU2 board in place of the console's 1/2 Meg RAM board - install as per TLS-350 Series Board and Software Replacement Manual, no setup required.
- Smart Sensor Module and Vapor Pressure Sensor. Install and connect following instructions in the Vapor Pressure Sensor Installation Guide.
- Mod UBus Module connected to a hydrocarbon sensor module installed according to processor manufacturers specifications.
- A 4-Relay or I/O Combination Module to control the vapor processor motor and setup as instructed in this manual.
- An RS-232 Port will be available for use by contractor or government inspectors.

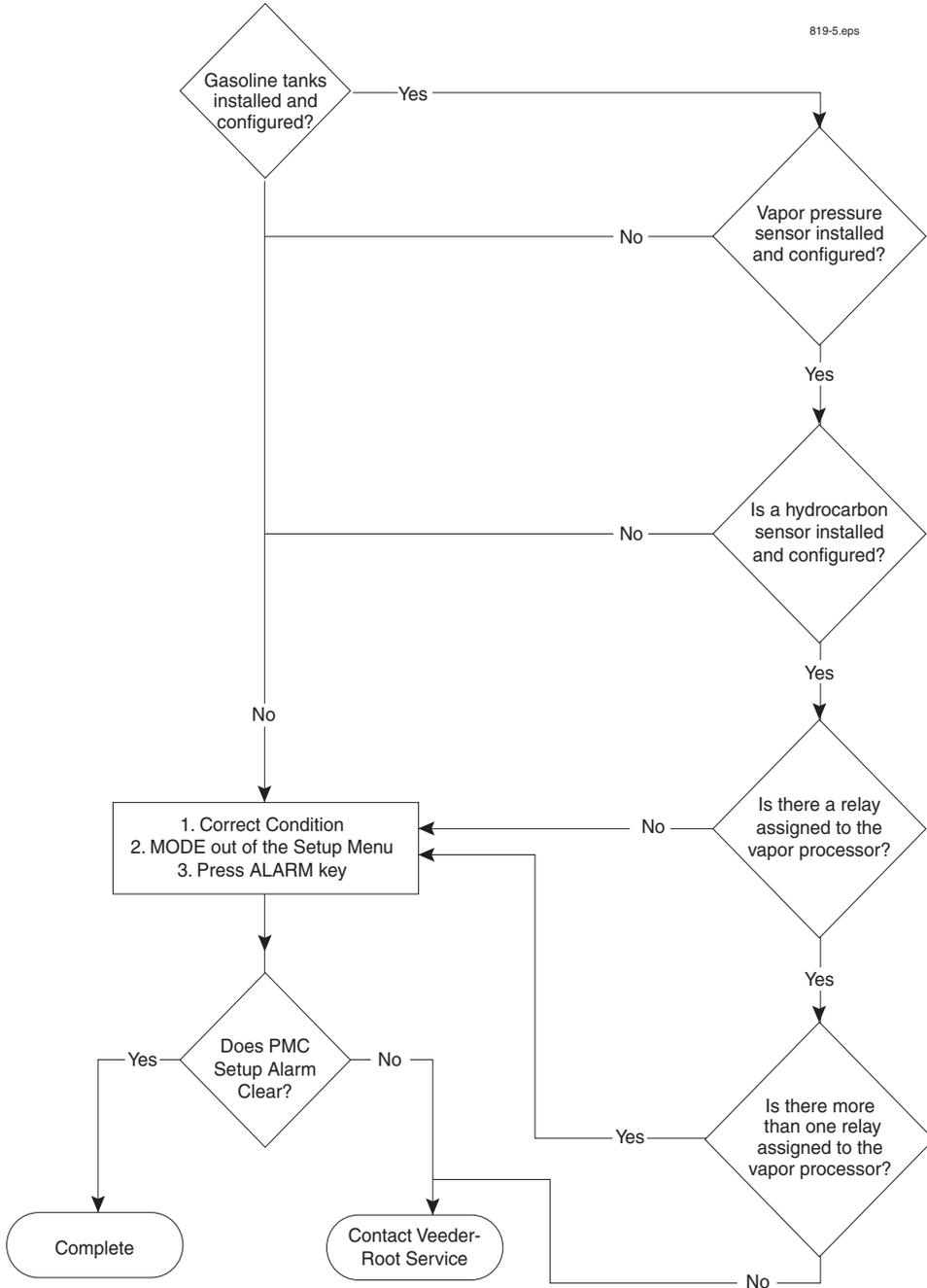
PMC SETUP

Incomplete PMC Setup requirements

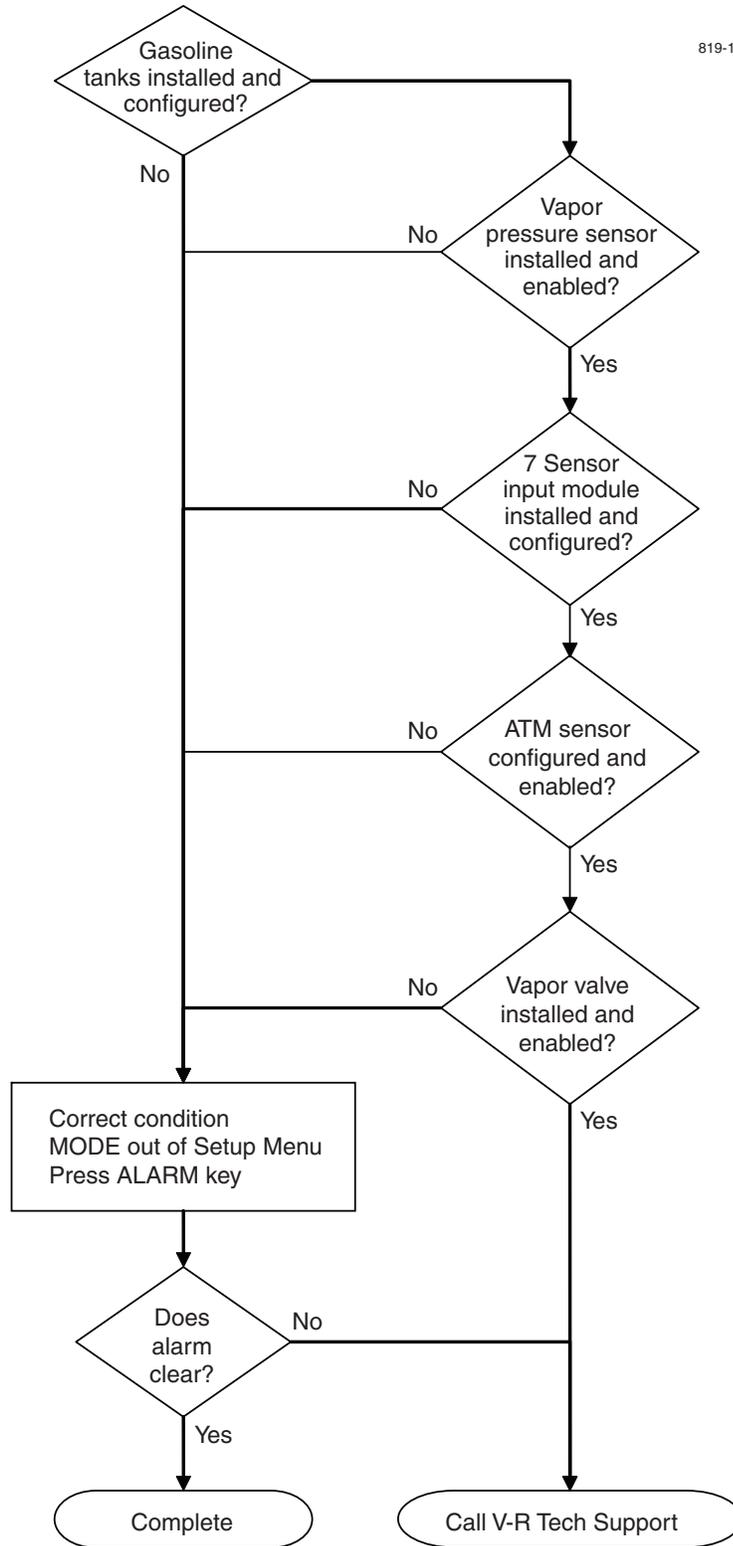
ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests (ref. page 17) are designed to monitor and ensure proper monitor configuration. Setup self-test will verify that the Pressure Management Control is configured.

VST ECS MEMBRANE DIAGNOSTIC PROCEDURE



V-R VAPOR POLISHER DIAGNOSTIC PROCEDURE



PMC Sensor Fault

Table 1 contains a listing of the Smart Sensor Device generated alarms including their cause and suggested troubleshooting. TLS Console PMC alarms may be interspersed amongst non-PMC alarms, please see TLS Series manuals for more information.

Table 1. Smart Sensor Device Alarm and Fault Summary

Alarm Type ¹	Smart Sensor Device	Cause	Suggested Troubleshooting
Communication Alarm	Vapor Valve, Pressure Sensor, Tank Probe	Device not communicating with Smart Sensor Module	Check wiring and connections from the Smart Sensor board to the device in alarm.
Smart Sensor Fault	Vapor Valve	Vapor Valve component inoperative, see example below: <ul style="list-style-type: none"> • Valve command fault • Cap not charging • Cap not holding • Temperature out of range 	Check installation of all Vapor Valve components including Thermal Probe and Vapor Sensor Assembly. Refer to manual 577013-920.

¹All Smart Sensor Device Alarms and Faults are indicated with a Yellow Light on the TLS Console.

```

IB6100
FEB 4, 2008 1:09 PM
s 2:Vapor valve

VAPOR VALVE
SERIAL NUMBER      123456
VALVE POSITION:     OPEN
OPEN CAP:          CHARGED
CLOSE CAP:         CHARGED
AMBNT TMP:         65.08 F
OUTLET TMP:        75.05 F
SENSOR FAULTS:
VALVE COMMAND FAULT
    
```

```

IB6100
FEB 4, 2008 1:09 PM
s 2:Vapor valve

VAPOR VALVE
SERIAL NUMBER      123456
VALVE POSITION:     OPEN
OPEN CAP:          CHARGED
CLOSE CAP:         CHARGED
AMBNT TMP:         65.08 F
OUTLET TMP:        75.05 F
SENSOR FAULTS:
CAP NOT HOLDING
    
```

```

IB6100
FEB 4, 2008 1:09 PM
s 2:Vapor valve

VAPOR VALVE
SERIAL NUMBER      123456
VALVE POSITION:     OPEN
OPEN CAP:          CHARGED
CLOSE CAP:         CHARGED
AMBNT TMP:         65.08 F
OUTLET TMP:        75.05 F
SENSOR FAULTS:
CAP NOT CHARGING
    
```

```

IB6100
FEB 4, 2008 1:09 PM
s 2:Vapor valve

VAPOR VALVE
SERIAL NUMBER      123456
VALVE POSITION:     OPEN
OPEN CAP:          CHARGED
CLOSE CAP:         CHARGED
AMBNT TMP:         65.08 F
OUTLET TMP:        75.05 F
SENSOR FAULTS:
TEMPERATURE RANGE
    
```

MISSING VP INPUT

An external input for the OPW and ARID vapor processor cannot be found.

ISD MONITORING CATEGORY

System Self-Test Monitoring algorithms are designed to ensure the proper setup and operation of the ISD monitor. Among other items, the self-test algorithms will check for a properly configured TLS Console monitor as well as the correct number of functioning sensors and interface modules.

System Self-Test Monitoring algorithms are broken down into two types of tests:

1. ISD sensor out self-test, designed to monitor for properly functioning sensors.
2. Setup self-test, designed to verify the monitor configuration.

DIAGNOSTIC PROCEDURE

- This warning only applies to EVR systems with an OPW or ARID vapor processor.
- Ensure the input line is properly configured and installed for the processor.
- Once all the causes are removed, enter and exit the Setup Menu using the MODE key, then press the red ALARM button on the TLS and the condition should clear.

FIELD NOTES

This warning will not appear on a Healy EVR system.

VP EMISSIONS

The effluent emissions concentration test occurs at daily intervals at the daily assessment time after at least one day's HC%, processor run time and station throughput has been collected. A failure occurs when the mass emission exceeds the defined threshold for the system. A failure of the effluent emissions concentration test will result in a warning and warning event recording. Two consecutive 1-day periods of effluent emissions concentration test failures will result in a failure alarm, failure event recording, and shutdown of the site. The processor is not allowed to operate while the emission FAILURE is active

ISD MONITORING CATEGORY

Vapor Processor Monitoring is responsible for ensuring that the vapor processor is operating within normal parameters.

DIAGNOSTIC PROCEDURE

- Refer problem to the processor manufacturer certified technician.
- Refer to the Clear Test Repair Menu (on page 37) for clearing this alarm on the TLS after repairs are complete.

COMMON CAUSES

- The processor is hydrocarbon emissions are exceeding defined limits.

FIELD NOTES

- This warning will not appear on a Healy EVR system.

VP PRESSURE

The processor over-pressure test occurs at daily intervals at the daily assessment time after at least 1-day's UST ullage vapor pressure data has been collected. A VST ECS Membrane Processor failure occurs when the 90th percentile of 1-day's ullage pressure data (i.e. 10% of the pressure data) is equal to or exceeds 1" wc. A Veeder-Root Polisher failure occurs when the 90th percentile of 1-day's ullage pressure data (i.e. 10% of the pressure data) is equal to or exceeds 2.3" wc. A failure of the processor over-pressure test will result in a warning and warning event recording. Two consecutive 1-day periods of processor over-pressure test failures will result in a failure alarm, failure event recording, and shutdown of the site.

ISD MONITORING CATEGORY

Vapor Processor Monitoring is responsible for ensuring that the vapor processor is operating within normal parameters with no risk of releasing excessive HC effluent emissions.

DIAGNOSTIC PROCEDURE

- For a VST ECS Membrane Processor, refer problem to the processor manufacturer certified technician. For a Veeder-Root Polisher, perform the operability tests as outlined in Exhibit 11 of VR 203/ VR 204.
- Refer to the Clear Test Repair Menu (on page 37) for clearing this alarm on the TLS after repairs are complete.

FIELD NOTES

- This warning will not appear on a Healy EVR system.

VP DUTY CYCLE

The processor duty cycle test occurs at daily intervals at the daily assessment time after at least 1-day's on-time data has been collected. A failure occurs when the duty cycle exceeds 18 hours (75%). A failure of the duty cycle test will result in a warning and warning event recording. Two consecutive 1-day periods of processor duty cycle test failures will result in a failure alarm, failure event recording, and shutdown of the site

ISD MONITORING CATEGORY

Vapor Processor Control

ISD MONITORING CATEGORY

Vapor Processor Monitoring is responsible for ensuring that the vapor processor is operating within normal parameters with no risk of releasing excessive HC effluent emissions.

DIAGNOSTIC PROCEDURE

- Refer problem to the processor manufacturer certified technician.
- Refer to the Clear Test Repair Menu (on page 37) for clearing this alarm on the TLS after repairs are complete.

FIELD NOTES

This warning will not appear on a Healy EVR system.

Exhibit 11 Failures

PRESSURE INTEGRITY TEST

- Check that lockable three way valve is in the test position. If not in test position switch valve to test position and rerun Pressure Integrity test.
- Verify the Polisher solenoid control valve is in the closed position by accessing the TLS PMC Diagnostics. If Control valve is in open position, close Valve by accessing PMC Diagnostics and rerun Pressure Integrity test.
- Check for leaks on your test equipment. Find leaks using leak detection solution (I.E. Soap and Water) and repair. Rerun Pressure Integrity test.
- Check all fittings and connections on the VR Vapor Polisher for leaks. Find leaks using leak detection solution (I.E. Soap and Water) and repair. Rerun Pressure Integrity test.
- Check the Filter basket for leaks Tighten four filter basket screws and check filter o-ring and replace if necessary. Rerun Pressure Integrity test
- Check for leaks around the manifold If leaks found call Veeder-Root Technical support at 800-323-1799.

FLOW TEST

- Verify all test equipment has current calibrations. Have equipment calibrated per NIST specifications.
- Check that lockable three way valve is in the test position If not in test position switch valve to test position and rerun Pressure Integrity test.

- Verify the Polisher solenoid control valve is in the open position by accessing the TLS PMC Diagnostics. If Control valve is in closed position, put valve in manual mode, and then open the valve. Rerun Pressure Integrity test.
- Verify your nitrogen flow rate is at 18.0 SFCH Adjust flow rate per test procedure and rerun Flow test. If flow test continues to fail contact Veeder-Root Technical support at 800-323-1799.

THERMOMETER TEST

- Replace Tank probe if gas tank thermometer fails all tests.
- Replace Vapor Valve thermometer if Vapor Valve thermometer fails all tests.
- Replace ambient temperature sensor if ambient temperature sensor is out of range.

Exhibit 12 Failures

- Run Vapor Polisher operability test as outlined in Executive Order 203/204 Exhibit 11 to check for leaks. Run only the pressure integrity portion of Exhibit 11 at this time.
- If the Vapor Polisher fails any part of the test run the force purge procedure as outlined in Executive Order 203/204 Exhibit 12 Appendix A.
- Perform Vapor Pressure Sensor operability test as outlined in Executive Order 203/204 Exhibit 10.

Miscellaneous Maintenance

Repairing Collection Vapor Recovery Equipment

ALL SYSTEMS (HEALY)

Check common vapor recovery piping both before and after the ISD vapor flow meter.

ASSIST SYSTEMS (HEALY)

Check common vacuum assist electronics

BALANCE SYSTEMS

Check hose liquid extraction

Removing & Replacing Vapor Flow Meters

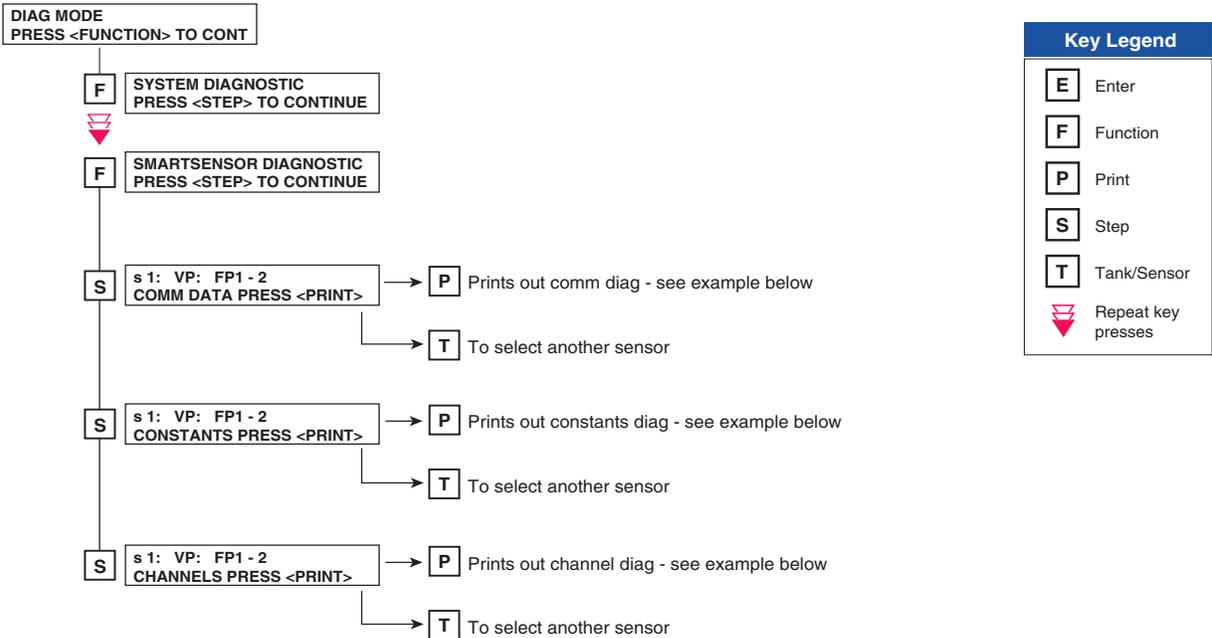
When removing and replacing a vapor flow meter follow these steps:

1. Deconfigure the air flow meter in the SmartSensor Setup Menu.
2. Replace the air flow meter according the instructions in the Related Manuals.
3. Reconfigure the air flow meter in the SmartSensor Setup Menu.

No changes are required to the ISD Setup.

ISD/PMC Diagnostic Menus

The diagnostic menus below are viewed from the TLS Console front panel. Consult manual 577013-800 for the procedure used to selecting/changing Diagnostic Mode setup parameters via the front panel keys.



Key Legend	
E	Enter
F	Function
P	Print
S	Step
T	Tank/Sensor
	Repeat key presses

```

SS COMM DIAG
-----
s 1: AFM1  FP1-2
SAMPLES READ  58
SAMPLES USED  54
PARITY ERR    0
PARTIAL READ  0
COMM ERR      0
RESTARTS     0
  
```

ISD-EVR/fig2.eps

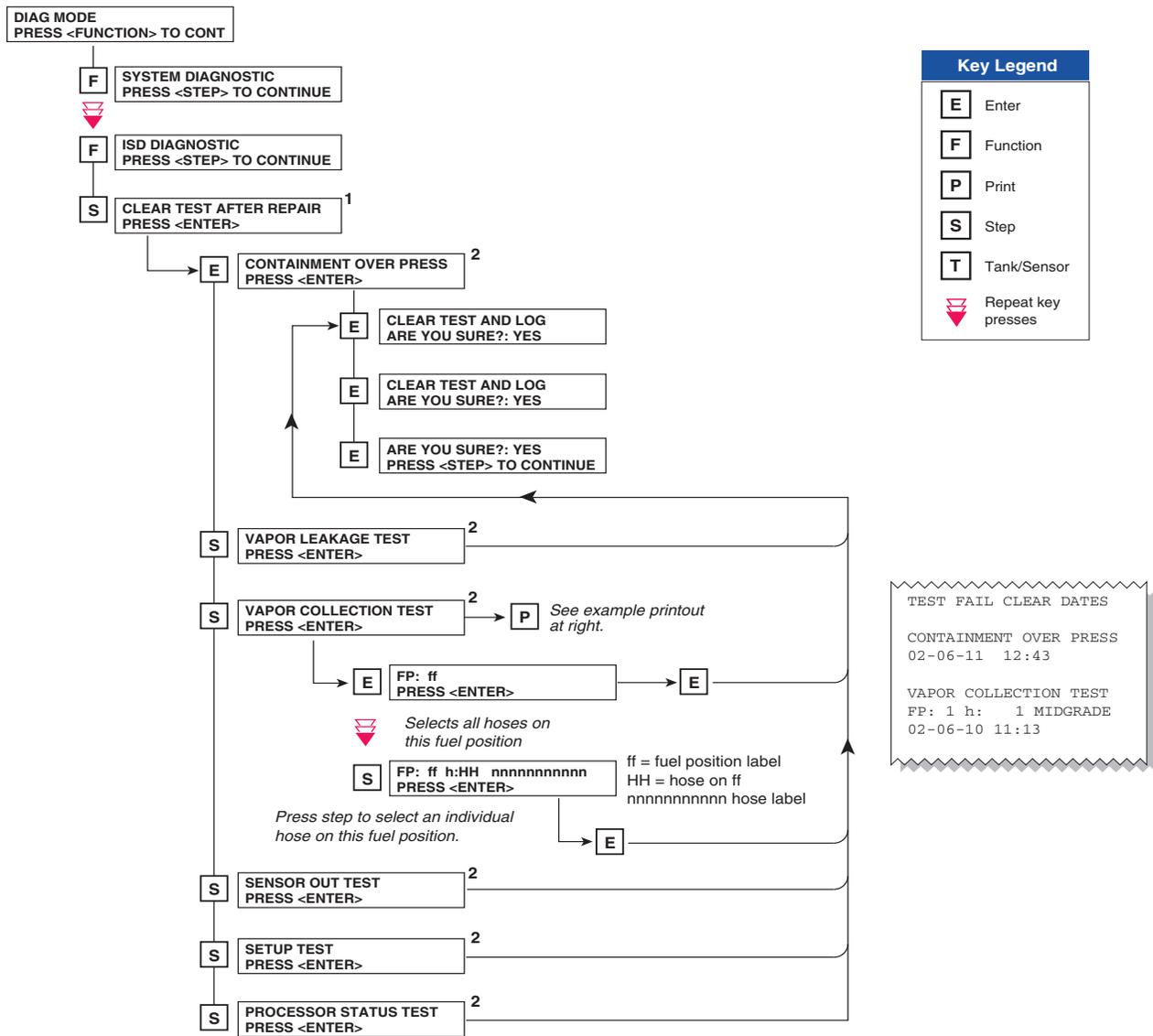
```

SS CONSTANTS DIAG
-----
s 1: AFM1  FP1-2

VAPOR PRESSURE
SERIAL NUMBER  1007
PROTOCOL VERSION  0
  
```

```

SS CHANNEL DIAG
-----
s 1: AFM1  FP1-2
YY-MM-DD  HH:MM:SS
C00 B50B 3D68 00E0 0000
C04 0000 03EF 0000 0004
C08 0A3C 3D68 5693 0081
C12 80C4 80A4 0104 2579
C16 0000 0000 00A3 03D6
C20 0709 0032 04C9 880F
  
```



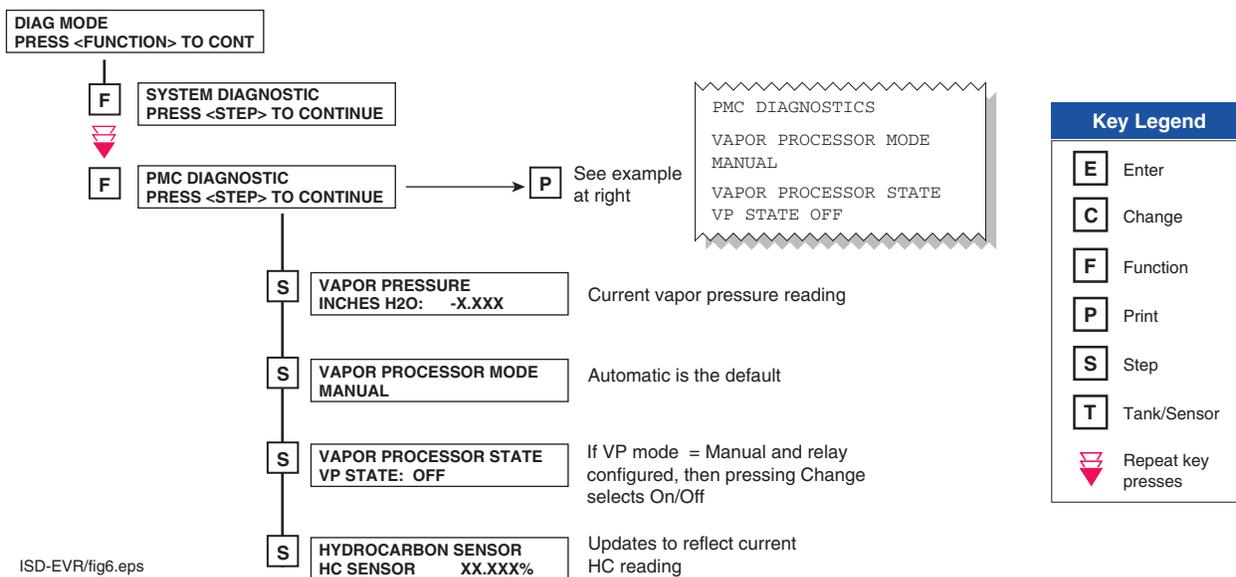
Notes:

1. All repair dates are saved in the Miscellaneous Event Log.
2. Reference the Clear Test Repair Menu table on the next page.

ISD-EVR/fig4.eps

Table 2.- Clear Test Repair Menu

Menu Selection	Clears Alarms	Reset Dates
Containment Over Press	ISD GROSS PRESSURE WARN ISD GROSS PRESSURE FAIL ISD DEGRD PRESSURE WARN ISD DEGRD PRESSURE FAIL ISD VP PRESSURE WARN ISD VP PRESSURE FAIL	Containment Test Time
Vapor Leakage Test	ISD VAPOR LEAKAGE WARN ISD VAPOR LEAKAGE FAIL	Vapor Leak Test Time
Vapor Collection Test	GROSS COLLECT WARN GROSS COLLECT FAIL DEGRD COLLECT WARN DEGRD COLLECT FAIL FLOW COLLECT WARN FLOW COLLECT FAIL AIRFLOW MTR SETUP	Hose Test Time
Sensor Out Test	ISD SENSOR OUT WARN ISD SENSOR OUT FAIL	Sensor Out Test Time
Setup Test	ISD SETUP WARN ISD SETUP FAIL	Setup Self Test Time
Processor Status Test	ISD VP STATUS WARN ISD VP STATUS FAIL VP EMISSIONS WARN VP EMISSIONS FAIL VP DUTY CYCLE WARN VP DUTY CYCLE FAIL	Valid Vapor Processor Test Time



ISD Reports

Daily Detail Report

A Daily Detail example report is shown below:

```

IV0700
MMDDYY HH:MM XM
S--- STATION HEADER ---
ISD DAILY REPORT DETAILS
EVR TYPE: VACUUM ASSIST
ISD TYPE: 01.03
VAPOR PROCESSOR TYPE: NO VAPOR PROCESSOR
OVERALL STATUS           :WARN          EVR VAPOR COLLECTION :PASS
EVR VAPOR CONTAINMENT    :WARN
ISD MONITOR UP-TIME      : 99%          STAGE I TRANSFERS:  9 of 20 PASS
EVR/ISD PASS TIME       : 90%
  
```

Status Codes: (W)Warn (F)Fail (D)Degradation Fail (G)Gross Fail
 (ISD-W)ISD Self-Test Warning (ISD-F)ISD Self-Test Fail (N)No Test

ISD		---CONTAINMENT TESTS---					STAGE		---COLLECTION TESTS---DAILY AVERAGE HOSE A/L RATIO-----				
DATE	EVR STATUS	%UP TIME	GROSS 95%	DGRD 75%	MAX "WC	MIN "WC	LEAK CFH	I XFR	VAPOR PRCSR	FP1 BLEND	FP2 BLEND	FP3 BLEND	FP4 BLEND
12/16	PASS	100%	3.2N	2.8N	3.0	-5.0	0	PASS		0.88	1.04	0.98	0.91
12/17	PASS	100%	3.5N	3.2N	3.6	0.4	0			0.93	0.96	0.95	1.01
12/18	PASS	100%	3.5N	3.2N	3.8	2.4	0			0.88	0.90	0.90	1.01
12/19	PASS	100%	3.5N	3.3N	3.7	2.2	0			0.92	0.95	0.96	0.97
12/20	PASS	100%	3.5N	3.3N	5.0	-5.0	0	FAIL		0.95	0.91	0.97	1.01
12/21	W	99%	3.5W	3.2N	0.3	-2.9	0	FAIL		0.83	1.02	0.93	1.02
12/22	PASS	100%	0.3N	0.2N	0.4	-0.2	0			0.97	0.99	0.93	0.95
12/23	PASS	100%	3.4N	3.2N	3.6	0.0	0			0.93	0.93	0.89	1.05
12/24	PASS	100%	3.4N	3.1N	3.7	1.8	1			0.94	1.00	0.92	0.84
12/25	PASS	100%	3.4N	3.1N	3.4	-5.0	0	PASS		0.94	0.82	0.94	0.98
12/26	PASS	100%	3.4N	3.2N	3.9	1.9	0			0.96	0.95	0.92	1.01
12/27	PASS	100%	3.5N	3.2N	3.7	2.4	0			0.92	0.97	0.94	0.99
12/28	W	100%	3.5W	3.2N	5.0	-1.8	0	PASS		0.95	1.01	0.95	0.98
12/29	PASS	100%	0.4N	0.2N	0.5	-0.2	17N			0.95	0.98N	0.95	0.99
12/30	PASS	100%	0.4N	0.2N	0.7	-5.0	3N	FAIL		0.96	1.00	0.93	0.90
12/31	PASS	100%	0.3N	0.1N	0.4	-0.7	3N			0.94	0.99	0.95	1.01
01/01	PASS	100%	0.3N	0.1N	0.3	-0.4	2N			0.96	0.98	0.93	1.00
01/02	PASS	100%	0.3N	0.1N	0.3	-0.3	2N			0.98	1.04	1.00	1.03
01/03	PASS	100%	0.3N	0.1N	0.5	-0.3	3N			0.95	1.01	0.93	1.03
01/04	PASS	100%	-0.0N	-0.3N	0.0	-0.8	3			0.92	0.89	0.93	0.98
01/05	PASS	100%	-0.1N	-0.3N	0.5	-5.0	2	PASS		0.95	0.99	0.92	1.03
01/06	PASS	100%	-0.2N	-0.5N	-2.1	-5.0	2			0.96	0.98	0.88	1.04
01/07	PASS	100%	-0.2N	-0.7N	-0.4	-2.1	1			0.98	1.00	0.94	1.01
01/08	PASS	100%	0.0N	-0.4N	0.3	-1.2	2			0.96	0.97	0.93	1.01
01/09	PASS	100%	0.1N	-0.1N	0.3	-0.3	2			0.98	1.00	0.87	1.02
01/10	PASS	100%	0.2	0.0N	0.3	-0.4	2			0.97	0.98	0.90	0.98
01/11	PASS	100%	0.2	0.0N	0.8	-4.3	2	PASS		0.98	1.00	0.93	1.02
01/12	PASS	100%	0.2	0.0N	0.3	-3.2	2			0.99	1.02	0.92	1.00
01/13	PASS	100%	0.2	0.0N	0.4	-0.4	3			0.96	1.00	0.92	0.97
01/14	PASS	100%	0.6	0.0N	3.7	-0.9	3	PASS		0.99	0.99	0.93	1.01
01/15	W	100%	3.5W	0.1N	4.1	2.0	1			0.95N	1.01	0.95	0.97N

DAILY DETAIL STATUS CODES

Question

When and why do the status codes appear? (see example below.)

Status Codes: (W)Warn (F)Fail (D)Degradation Fail (G)Gross Fail
 (ISD-W)ISD Self-Test Warning (ISD-F)ISD Self-Test Fail (N)No Test

DATE	STATUS	ISD	ISD	---CONTAINMENT TESTS---					STAGE	---COLLECTION TESTS-DAILY AVERAGE HOSE A/L RATIO---					
				%UP	GROSS	DGRD	MAX	MIN		LEAK	I	VAPOR	FP1		FP2
12/15	PASS	100%	3.2N	2.8N	3.0	-5.0	0	PASS		N	N	1.04	0.98	0.91	No Test, no events
12/16	PASS	100%	3.2N	2.8N	3.0	-5.0	0	PASS		0.88	N	1.04	0.98	0.91	No Test, low events
12/17	WARN	100%	3.5N	3.2N	3.6	0.4	0			BLKD	W	0.96	0.95	1.01	Stat Warn
12/18	FAIL	100%	3.5N	3.2N	3.8	2.4	0			BLKD	F	0.90	0.90	1.01	Stat Fail
12/19	WARN	100%	3.5N	3.3N	3.7	2.2	0			0.78	W	0.95	0.96	0.97	Degr Warn
12/20	WARN	100%	3.5N	3.3N	3.7	2.2	0			0.30	W	0.95	0.96	0.97	Gross Warn
12/21	FAIL	100%	3.5N	3.3N	3.7	2.2	0			0.30	G	0.95	0.96	0.97	Gross Fail
12/22	FAIL	100%	3.5N	3.3N	3.7	2.2	0			0.78	D	0.95	0.96	0.97	Degr Fail
12/23	PASS	100%	3.5N	3.3N	3.7	2.2	0			0.92		0.95	0.96	0.97	All Pass
12/24	ISD-W	100%	3.5N	3.3N	3.7	2.2	0			0.92		0.95	0.96	0.97	ISD Self Test Warn
12/25	ISD-F	100%	3.5N	3.3N	3.7	2.2	0			0.92		0.95	0.96	0.97	ISD Self Test Fail

Explanation

Assist Systems - Hose W,F,G,D Results

Next to each hose collection daily average A/L result there is an assessment. The absence of any of the results listed above indicates a pass. If any of the listed conditions **W,F,G** or **D** exist, they will post before a pass. The assessment can indicate the result for one (or combination) of three tests called Statistical Test, Gross Test and Degradation Test.

- **F** - Statistical Failure - A BLKD is posted instead of an A/L value.
 - Automobiles equipped with ORVR equipment appear as a blocked dispensing event (A/L very low). ISD separates out this type of activity from blockages that are caused by something other than ORVR vehicles. It does this statistically using multiple dispensing events. When there are more blockages than would be expected from normal ORVR traffic, a BLKD warning is issued.
- **G** - Failure for Gross Test and will appear with A/L value.
- **D** - Failure for Degradation Test and will appear with A/L value.
- **W** - Warning for Statistical (BLKD), Gross (A/L) and/or Degradation (A/L).
 - Indicates a statistical warning if BLKD appears instead of the A/L value.
 - Indicates either a Gross or Degradation warning if the A/L value appears next to it. You can distinguish which of the two warning conditions it is by comparing the A/L value with the gross and degradation ranges defined in the IV00 or IV02 reports. It is important to make this distinction as a gross test will convert to a failure and shut down on the 2nd day and the degradation test will convert to a failure and shut down on the 8th day.

ISD MONITORING TEST PASS/FAIL THRESHOLDS

	PERIOD	BELOW	ABOVE
VAPOR COLLECTION ASSIST SYSTEM A/L GROSS FAIL	1DAYS	0.33	1.90
VAPOR COLLECTION ASSIST SYSTEM A/L DEGRADATION FAIL	7DAYS	0.81	1.32
VAPOR CONTAINMENT GROSS FAIL, 95th PERCENTILE	7DAYS	----	1.30"wcg
VAPOR CONTAINMENT DEGRADATION, 75th PERCENTILE	30DAYS	----	0.30"wcg
VAPOR CONTAINMENT LEAK DETECTION FAIL @2"wcg	7DAYS	----	8.00cfh
STAGE I VAPOR TRANSFER FAIL, 50th PERCENTILE	20MINS	----	2.50"wcg

Assist Systems - Hose N No Test Result

- If the Degradation test did not run and the Gross test did not run, then an **N** is posted.
- If there were no events received to make any conclusion about the A/L value for the hose, the A/L value is replaced with N.
- If there are some events received, enough to calculate an average, but not enough to complete a test, the No Test result will appear with an A/L average.

Assist Systems - Hose Pass Result

- When none of the above results **W,F,G,D,N** appear then it is a pass.
- If the Degradation test did not run (no test), but the Gross test passed, the result is a **PASS**.
- If the Gross test did not run (no test), but the Degradation test passed, the result is a **PASS**.

Assist Systems - Code Precedent (listed high to low)

1. **G, F** - Gross Failure (A/L) and Gross Stat Failure (BLKD)
2. **D** - Degradation Failure (A/L)
3. **W** - Gross Warning (A/L) and Gross Stat Warning (BLKD)
4. **W** - Degradation Warning (A/L)
5. **Pass** - Pass Gross and/or Degradation test.
6. **N** - No Test - Neither Gross nor Degradation test completed.

Assist Systems - Self Test Codes

- **ISD-W** - A self test warning condition exists. See ISD SETUP
- **ISD-F** - A self test warning condition persisted for 7 days and resulted in a Failure.

COLLECTION REPORT FP ORDERING

Question

Should I be concerned if the fueling position numbers are out of order in the header?

Explanation

When using a Gilbarco current loop DIM the fueling position numbers may not be in order in the header. The fueling position numbers come from the current loop and may not match the numbers on the side of the dispenser or on the POS.

See following example:

```
IV0700
MMDDYY HH:MM XM
---STATION 1 HEADER---
```

```
ISD DAILY REPORT DETAILS
EVR TYPE: VACUUM ASSIST
ISD TYPE: 01.03
VAPOR PROCESSOR TYPE: NO VAPOR PROCESSOR
OVERALL STATUS :WARN EVR VAPOR COLLECTION :PASS
EVR VAPOR CONTAINMENT :WARN
ISD MONITOR UP-TIME : 99% STAGE I TRANSFERS: 23 of 23 PASS
EVR/ISD PASS TIME : 86%
```

Status Codes: (W)Warn (F)Fail (D)Degradation Fail (G)Gross Fail
 (ISD-W)ISD Self-Test Warning (ISD-F)ISD Self-Test Fail (N)No Test

DATE	ISD EVR STATUS	ISD %UP TIME	---CONTAINMENT TESTS---					STAGE I XFR	VAPOR PRCSR	--COLLECTION TESTS-DAILY AVG.HOSE A/L RATIO---			
			GROSS 95%	DGRD 75%	MAX "WC	MIN "WC	LEAK CFH			FP4 BLEND	FP1 BLEND	FP2 BLEND	FP3 BLEND
02/01	PASS	100%	0.2N	0.0N	0.4	-0.0	0N	PASS	N N	N N	N N	N N	
02/02	PASS	100%	0.2N	0.1N	0.2	-0.0	10N		N N	N N	N N	N N	
02/03	PASS	100%	0.2N	0.0N	0.3	-0.8	33N		0.89	0.96	0.95	0.98	

CONTAINMENT DEGRADATION RESULTS

Question

Why is the Degradation Test Result a No Test?

Explanation

Containment Degradation Results will not post until after the system has been running 7 Days.

When the containment pressure remains at or below -5"wc for most of the day (Look at MAX "WC and MIN "WC) there may not be enough samples available over the past 7 days to perform an assessment, so a N test is reported.

ISD STATUS MISSING TEXT

Question

Why are the ISD EVR status and % Up time sometimes missing for the last day in the report?

Explanation

The daily detail report sometimes does not have the ISD Average and ISD EVR STATUS and ISD % UP TIME for the last day, but it does have all the other results for the day (containment and collection). If there is a post delay configured in ISD, the daily detail report will not show ISD EVR STATUS or % UP TIME if it is pulled during the time period between the assessment and the post. The ISD EVR STATUS and % UP TIME are part of the daily post and have not occurred yet. After the post time the ISD EVR STATUS or % UP TIME will show up in the daily detail report.

The post delay is not to be used in ISD. Instead of using the post delay the assessment time must be scheduled for the time they want the alarms to post.

MISSING ALL REPORTS FOR ONE DAY

Question

Why am I missing all the results for one day?

Explanation

In the example report below there is one day where all the reports are missing.

1. One possible cause is the assessment time was programmed for a new hour. The assessment time may not be reached until the next day, so it looks like a day is missing. However, the test has been done, but more than 24 hours were included in the test following the missing one. You can tell this has happened by looking at the time warnings were posting previously and the time they are posting presently. The time will be different.
2. The TLS clock time was changed to a time beyond the assessment time, skipping the test for that day. The Miscellaneous Event log will show the time change.
3. The TLS was not powered during the programmed assessment time and the assessment was skipped for that day. The Miscellaneous Event log will show an ISD SHUTDOWN and ISD STARTUP event that will show it was down during the assessment time.

IV0700

MMDDYYYY HH:MM XM

--STATION HEADER--

ISD DAILY REPORT DETAILS

EVR TYPE: VACUUM ASSIST

ISD TYPE: 01.03

VAPOR PROCESSOR TYPE: NO VAPOR PROCESSOR

OVERALL STATUS :WARN EVR VAPOR COLLECTION :PASS
 EVR VAPOR CONTAINMENT :WARN
 ISD MONITOR UP-TIME :100% STAGE I TRANSFERS: 26 of 26 PASS
 EVR/ISD PASS TIME : 96%

Status Codes: (W)Warn (F)Fail (D)Degradation Fail (G)Gross Fail
 (ISD-W)ISD Self-Test Warning (ISD-F)ISD Self-Test Fail (N)No Test

ISD		---CONTAINMENT TESTS---						STAGE			---COLLECTION TESTS-DAILY AVERAGE HOSE A/L RATIO-----						
DATE	EVR	%UP	GROSS 95%	DGRD 75%	MAX "WC	MIN "WC	LEAK CFH	I XFR	VAPOR PRCSR	FP7 BLEND	FP8 BLEND	FP4 BLEND	FP5 BLEND	FP6 BLEND	FP1 BLEND	FP2 BLEND	FP3 BLEND
02/17	PASS	100%	-5.0	-5.0N	-4.1	-5.0	1			0.99	N N	0.93	0.85	0.91	0.92	1.06	0.91
02/18	PASS	100%	-5.0	-5.0N	-5.0	-5.0	1N	PASS		1.00	N N	1.00	0.86	0.88	0.96	1.08	0.89
02/19	PASS	100%	-4.6	-5.0N	0.7	-5.0	1	PASS		0.98	N N	0.96	0.84	0.87	0.90	1.04	0.88
02/20	PASS	100%	-4.7	-5.0N	-5.0	-5.0	1N			0.99	0.93	0.96	0.85	0.90	0.90	1.04	0.90
02/21	PASS	100%	-2.6	-5.0N	-0.5	-5.0	1N	PASS		0.98	0.98	0.92	0.86	0.92	0.92	1.02	0.88
02/22	PASS	100%	-2.4	-5.0N	2.6	-5.0	1	PASS		0.96	0.94	0.92	0.86	0.85	0.91	1.02	0.92
02/23	PASS	100%	-2.2	-5.0N	0.8	-5.0	1	PASS		0.96	0.90	0.92	0.87	0.88	0.94	1.07	0.88
02/24	PASS	100%	-1.6	-5.0N	-0.0	-5.0	1	PASS		0.95	0.89	0.91	0.85	0.95	0.90	0.98	0.86
02/25	PASS	100%	-1.4	-5.0N	1.0	-5.0	1	PASS		0.95	0.83	0.95	0.91	0.92	0.93	1.07	0.85
02/26	PASS	100%	-2.4	-5.0N	-2.7	-5.0	2	PASS		0.95	0.89	0.93	0.93	0.99	0.96	1.07	0.91
02/27	PASS	100%	-2.4	-5.0N	-3.9	-5.0	2			0.99	0.90	0.97	0.88	0.89	0.91	1.04	0.91
02/28	PASS	100%	0.0	-5.0N	5.0	-5.0	3	PASS		0.98	0.91	0.90	0.91	0.97	0.96	1.05	0.95
03/01	PASS	100%	0.1	-5.0N	0.2	-5.0	4			0.95	0.96	0.88	0.87	0.90	0.89	1.05	0.97
03/02	PASS	100%	0.1	-5.0N	0.8	-5.0	5	PASS		0.96	0.95	0.95	0.84	0.92	0.94	1.01	1.04
03/03	W	100%	0.1	-5.0N	-2.9	-5.0	13W			1.00	0.91	0.94	0.82	0.94	0.93	1.08	1.03
03/04	PASS	100%	0.1	-5.0N	-4.3	-5.0	4	PASS		0.95	0.90	0.94	0.88	0.89	0.94	1.08	1.03
03/05	PASS	100%	0.1	-4.9N	-3.1	-5.0	4			0.99	0.92	0.98	0.88	0.90	0.94	1.03	1.02
03/06	PASS	100%	0.1	-4.9	-5.0	-5.0	4	PASS		0.95	0.83	0.93	0.85	0.91	0.91	1.08	1.08
03/07	PASS	100%	-0.0	-4.9	-4.9	-5.0	0			0.99	0.86	0.95	0.91	0.91	0.94	1.09	1.02
03/08	PASS	100%	-3.5	-4.9	0.0	-5.0	2	PASS		0.99	0.94	0.97	0.89	0.93	0.93	1.13	1.07
03/09	PASS	100%	-3.5	-4.8	-1.7	-5.0	2			0.99	0.92	0.96	0.89	0.94	0.92	1.05	1.06
03/10	PASS	100%	-2.9	-4.6	-2.1	-5.0	2	PASS		1.01	0.93	0.96	0.89	0.91	0.89	1.08	1.02
03/11	PASS	100%	-2.9	-4.8	-5.0	-5.0	2			0.99	0.88	0.98	0.91	0.89	1.02	1.04	1.05
03/12	PASS	100%	-2.9	-4.9	-5.0	-5.0	2			0.99	0.91	1.00	0.90	0.91	1.00	1.07	1.07
03/13	PASS	100%	-2.9	-4.9	-0.0	-5.0	2	PASS		0.99	0.90	0.97	0.93	0.90	1.00	1.01	1.06
03/14	PASS	100%	-2.9	-4.9	-2.5	-5.0	2	PASS		0.91	0.86	1.00	0.93	0.89	0.95	1.14	1.03
03/15	PASS	100%	-3.0	-4.9	-5.0	-5.0	2	PASS		0.97	0.90	0.96	0.94	0.84	0.98	1.12	1.02
03/16	PASS	100%	-4.3	-4.9	-3.8	-5.0	2			0.91	0.91	0.99	0.91	0.94	1.00	1.10	1.02
03/17																	
03/18	PASS	100%	-5.0N	-4.9	-4.9	-5.0	0N			0.97	0.91	1.00	0.89	0.91	1.00	1.09	1.09
03/19	PASS	100%	-5.0N	-4.9	-4.7	-5.0	0N			0.98	0.94	0.97	0.90	0.90	1.01	1.04	1.05

HIGH A/L ON ALL NOZZLES

Question

Why is my report is showing large A/L for all Dispensers?

Explanation

- The most common cause of High A/L on all Nozzles at the same time is the dispenser events are artificially low. This can be caused by the DIM not having a 'G' in the DIM setup string. The only DIM that requires this is the BIR Protocol Dispenser Interface Module P/N 330280-001.
- Gross Collect warnings and alarms can result from this condition. See example reports from two sites below.

-----**Example Site Report with High A/L**-----

IV0500

MMDDYYYY HH:MM XM

--STATION HEADER--

ISD DAILY REPORT DETAILS

EVR TYPE: VACUUM ASSIST

ISD TYPE: 01.03

VAPOR PROCESSOR TYPE: NO VAPOR PROCESSOR

```

OVERALL STATUS           :FAIL           EVR VAPOR COLLECTION :FAIL
EVR VAPOR CONTAINMENT   :WARN
ISD MONITOR UP-TIME     : 99%           STAGE I TRANSFERS: 30 of 30 PASS
EVR/ISD PASS TIME      : 50%
    
```

Status Codes: (W)Warn (F)Fail (D)Degradation Fail (G)Gross Fail
 (ISD-W)ISD Self-Test Warning (ISD-F)ISD Self-Test Fail (N)No Test

DATE	ISD STATUS	ISD %UP TIME	---CONTAINMENT TESTS---				STAGE		
			GROSS 95%	DGRD 75%	MAX "WC	MIN "WC	LEAK CFH	I XFR	VAPOR PRCSR
05/24	ISD-W	100%	0.0N	0.0N	0.0	0.0	0N	PASS	
05/25	ISD-W	100%	0.1N	0.0N	5.0	-5.0	N	PASS	N N N N N N
05/26	PASS	99%	0.0N	0.0N	0.4	-0.2	0N	PASS	N N N N N N
05/27	PASS	100%	0.1N	0.0N	0.0	-0.0	N		N N N N N N
05/28	PASS	100%	0.1N	0.0N	0.0	-0.0	N		N N N N N N
05/29	PASS	100%	0.0N	0.0N	0.0	-0.0	N		N N N N N N
05/30	PASS	100%	0.1N	0.0N	0.7	-0.3	N		7.93N 8.00N N N
05/31	PASS	99%	0.1N	0.0N	0.4	-0.4	N		5.54N 6.39N 1.94N
06/01	W	99%	0.1	0.0N	0.3	-0.3	W		4.91N 6.22N 3.12N
06/02	W	100%	0.1	0.0N	2.7	-1.1	14N	PASS	4.41W 6.35N 3.25N
06/03	F	100%	0.2	0.0N	0.9	-0.8	8N		4.40G 6.23W 2.90N
06/04	W	100%	0.1N	-0.4N	0.2	-2.9	1N		4.14N 5.00N 2.71W

---COLLECTION TESTS-DAILY AVERAGE HOSE A/L RATIO-----

```

05/24
05/25
05/26  N N  N N  N N  N N  N N
05/27  N N  N N  N N  N N  N N  N N  N N  N N  N N
05/28  N N  N N  N N  N N  N N  N N  N N  N N  N N
05/29  N N  N N  N N  N N  N N  N N  N N  N N  N N
05/30  3.74N 4.17N 4.02N  N N 4.26N  N N 4.23N 1.08N  N N
05/31  3.62N 3.91N 3.90N 2.82N 4.26N 3.79N 3.28N 1.65N 4.06N
06/01  3.70N 2.92N 3.90N 1.92N 2.86N 3.02N 3.54N 2.18N 4.06N
06/02  3.12N 2.56W 3.80N 2.28N 2.25N 2.81W 3.29N 2.05W 2.50N
06/03  2.51W 2.35G 3.06N 2.17W 2.21N 2.92G 3.22W 2.32G 2.57N
06/04  3.09N 1.90N 2.94N 2.99N 2.20N 2.20N 3.81N 2.86N 2.70N
    
```

Diagnosing CVLD Reports

Question

NO TEST is reported every day. What can cause this?

Explanation

- The first 7 days after startup CVLD will always report NO TEST.
- If the pressure is below -5 " wc every day (look at max min value in Daily Detail Report under Containment) a test is not performed.
- If there is pressure above -5 " wc check and make sure the thermal coefficients on the gasoline tanks are in the correct range greater than or equal to 0.00060 and less than or equal to 0.00079. (Typically gasoline coefficients are programmed to 0.000700).

