Instructions for using the
KWA LS-2003 Leak Detector Tester
are on Page 7 of the
Veeder-Root Operational Testing Guide

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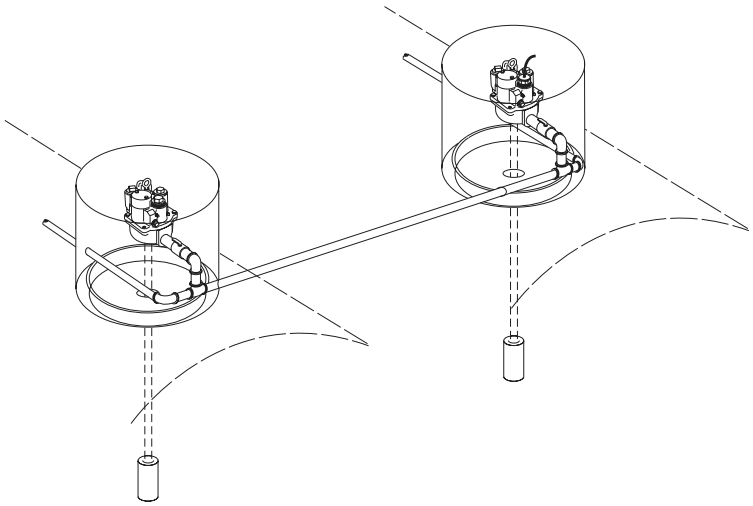
Operability Testing Guide

Line Leak Detection Systems, UST Leak Detection Equipment, and Sensors



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For the parts return procedure, please follow the appropriate instructions in the "General Returned Goods Policy" and "Parts Return" pages in the "Policies and Literature" section of the Veeder-Root **North American Environmental Products** price list.

Introduction

Verifying Operability of WPLLD & PLLD Systems

Verifying Operability of UST Leak Detection Equipment

Verifying Operability of Sensors

Introduction

This manual contains instructions to verify operability for Veeder-Root WPLLD and PLLD Line Leak Systems, UST Leak Detection Equipment and Sensors to satisfy requirements of state or local regulations, as applicable.

Veeder-Root environmental monitoring systems installed in accordance with installation manual requirements are designed to detect and report conditions that inhibit proper operation. Veeder-Root systems self-diagnose essential components, and if a component failure is detected, will not complete and report tank and line tests. The system will issue an audible and visual alarm when a failed or disconnected sensor is detected.

Veeder-Root does not require periodic operability testing. These procedures are provided only as a guide for use where operability testing is required by Federal, State, and/or Local regulations.

General Testing Requirements

- A level 2/3 certified Veeder-Root Technician must be available (on site) to assist in these types of testing.
- Comply with all recommended safety practices identified by OSHA and your employer.
- Follow all installation requirements per NFPA 30A.
- Review and comply with all the safety warnings in the manuals listed above and any other national, State or Local requirements.

Reference Documents

The following reference documents may be helpful when performing the operability tests outlined in this manual.

WPLLD & PLLD SYSTEMS

- Veeder-Root TLS-350 Operators Manual (576013-610)
- Veeder-Root TLS-350 Setup Manual (576013-623)
- Veeder-Root W/PLLD Troubleshooting Guide (577013-344)
- Veeder-Root Performance results Certification Reports (576013-308)
- Veeder-Root Line Leak Application Guide (577013-465)
- Red Jacket Test Procedures for Electronic Leak Detectors (RJP-2018 Rev. A 2/01)
- Red Jacket Engineering Report Test Procedures for Mechanical Leak Detectors (Red Jacket document RJ-20)
- Red Jacket Engineering Report Testing Mechanical Leak Detectors with the FX Tester (Red Jacket document 051-272)

UST LEAK DETECTION EQUIPMENT

- Veeder-Root TLS-350 Operators Manual (576013-610)UST Sensor Testing

SENSORS

- Veeder-Root TLS-350 Operators Manual (576013-610)
- Veeder-Root TLS-350 Setup Manual (576013-623)

Safety Precautions

The following safety symbols may be used throughout this manual to alert you to important safety hazards and precautions

 **EXPLOSIVE** Fuels and their vapors are extremely explosive if ignited.	 **FLAMMABLE** Fuels and their vapors are extremely flammable.
 **ELECTRICITY** High voltage exists in, and is supplied to, the device. A potential shock hazard exists.	 **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.
 **WARNING** Heed the adjacent instructions to avoid equipment damage or personal injury.	 **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.

⚠ WARNING

This product is installed in systems operating on lethal voltages, near locations where highly combustible fuels or vapors may be present.

Fitting test equipment to dispenser shear valves could cause environmental damage if the pump were switched on during its installation.

Serious injury or death from shock, explosion, or fire may result if power is switched on to pumps when making wiring changes for testing.

Product spillage could create serious environmental and safety hazards.

1. **Read and follow all instructions in this manual, including all safety warnings.**
2. **Turn off, tag, and lockout power to pumps before removing dispenser shear valve fittings and when disconnecting pump wiring.**
3. **Dispose of drained fuel properly. Use an approved container suitable for moving fuel. Dispose of fuel soaked materials properly and not into trash barrels that may be used by customers.**
4. **Comply with all applicable codes including: the National Electrical Code; federal, state, and local codes; and other applicable safety codes.**

Verifying Operability of WPLLD & PLLD Systems

Scope:

These procedures can be used at field sites to determine the operability of Veeder-Root line leak detection systems. Testing line leak detection equipment in accordance with this procedure will verify the equipment's operability for leak detection at 3 gph (gallons per hour), 0.2 gph (if equipped and programmed for this capability), and 0.1 gph (if equipped and programmed for this capability).

Reference Documents:

- Veeder-Root TLS-350 Operators Manual (576013-610)
- Veeder-Root TLS-350 Setup Manual (576013-623)
- Veeder-Root W/PLLD Troubleshooting Guide (577013-344)
- Veeder-Root Performance results Certification Reports (576013-308)
- Veeder-Root Line Leak Application Guide (577013-465)
- Red Jacket Test Procedures for Electronic Leak Detectors (RJP-2018 Rev. A 2/01)
- Red Jacket Engineering Report Test Procedures for Mechanical Leak Detectors (Red Jacket document RJ-20)
- Red Jacket Engineering Report Testing Mechanical Leak Detectors with the FX Tester (Red Jacket document 051-272)

Before You Begin:

- Verify that the TLS-350 is programmed correctly for the Site and the application. Print out the applicable line leak setup and line leak test history before you start the testing (see Figure 1).
- Identify all breakers for disconnecting power to the pumps (STP).
- Identify and lock all dispenser nozzle handles, which could interrupt this test. It is recommended that the entire station be shut down during this testing to prevent a test from being interrupted.
- Review System Overview of W/PLLD (reference manual 576013-344) prior to beginning the test.

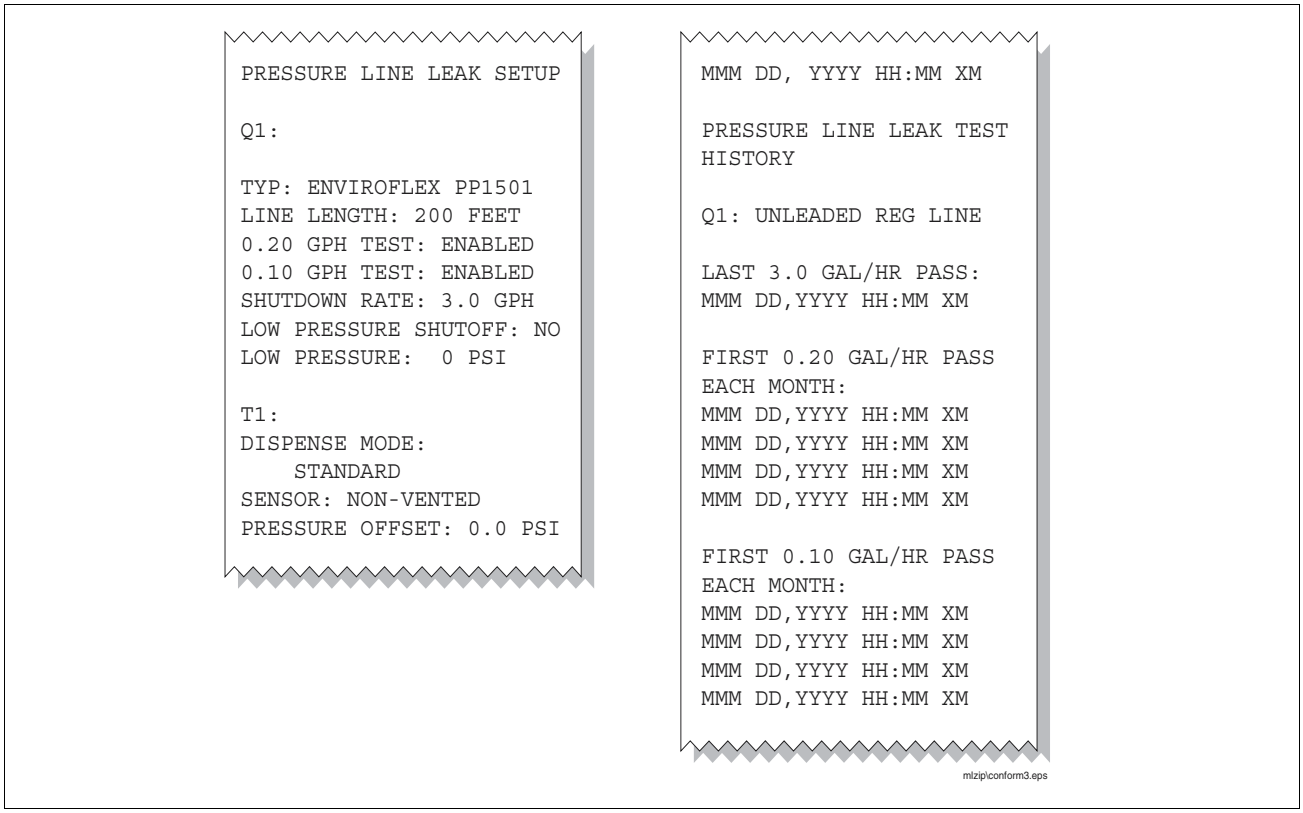

Figure 1. Pressure Line Leak Setup and History Report Examples

3 GPH testing utilizing the Red Jacket FTA

HARDWARE NECESSARY:

Reference Red Jacket RJ-20 Page 8

TESTING PROCEDURE:

1. Shut off, lock out, and tag the circuit breakers that provide pump power to the STP. Disconnect the electrical power yoke at the STP for the product being tested.
2. Install the Red Jacket FTA leak simulating apparatus in the impact valve following the procedures defined in the RJ-20 document (pages 2-4, Section I, steps 1 - 10).
3. Calibrate the leak rate corresponding to 3.5 gph at 10 psi (pounds per square inch) per Section V (page 5, steps 22 - 26) of the RJ-20 document.
4. Rotate V1 to the vertical position to remove the pressure regulator from the fluid circuit and to place the simulated leak on the product line. Place the discharge hose into a suitable test container.
5. Re-connect the STP yoke, turn-on the circuit breaker, and authorize the fueling position. Verify that no product is leaking from the connections to the FTA. Dispense approximately 5 gallons from the dispenser to ensure the line is purged of air.

6. When a steady stream of product is observed flowing from the hose, hang up the nozzle (this will initiate a 3 gph leak test).

7. With the TLS in the DIAGNOSTIC mode, monitor the front panel display. When the test is complete, the front panel display will read "Test Complete Handle Off", the system will alarm, and will shut down the line. Press the "Alarm/test" key to silence the alarm.

   Note: During the 3 gph test, the STP will turn On and Off intermittently. Do NOT assume the test has completed until the TLS-350 console has alarmed. When the test is complete, the WPLLD or PLLD diagnostics (must be in DIAGNOSTIC mode) on the front panel display will read "Test Complete Handle Off".

   Note: If the test does NOT fail, the leak rate needs to be confirmed. Confirm the leak rate at pump pressure by referring to the procedure on page 2 of the RJP-2018 document (note that 3.5 gph at 10 psi with a pump-on pressure of 28 psi = 369 ml (millilitres)/minute). If the leak rate is correct, refer to the W/PLLD Troubleshooting Guide for instructions.

8. Close the ball valve to stop the leak, shut off, lock out and tag the STP's circuit breaker, and disconnect the electrical power yoke at the STP for the product being tested.

9. Remove the leak testing hardware and replace the plug on the shear valve using the appropriate sealant on the threads and torque per the manufacturer's specification. WARNING: Over tightening the shear valve plug may result in damage to the shear valve.

10. Print the leak test history report for your records.

11. Re-connect the STP yoke and turn-on the circuit breaker. Go to the front panel of the TLS to initiate another line test. The console should display the prompt "Start Line Leak Test Press <Enter>". Visually verify that product is not leaking from the shear valve port during the test, and confirm that the line now passes the 3 gph leak test.

3 GPH testing utilizing the Red Jacket FX tester

HARDWARE NECESSARY:

Reference Red Jacket 051-272 Page 9

TESTING PROCEDURE:

1. Shut off, lock out and tag the circuit breakers that provide power to the STP. Disconnect the electrical power yoke at the STP for the product being tested.

2. Install the Red Jacket FX Tester leak simulating apparatus in the impact valve following the procedures defined in the 051-272 document (page 6-7, Section II - J, steps 1 - 4).

3. Re-connect the STP yoke, turn-on the circuit breaker, and authorize the fueling position. Verify that no product is leaking (except into the test can). Dispense approximately 5 gallons from the dispenser into a suitable test container to ensure the line is purged of air.

4. Calibrate the leak rate corresponding to 3.5 gph at 10 psi per the Table 1 below.

Table 1

Pump Operating Pressure (psi)	Flow rate to set at Pump Pressure (gph)
20	5.0
22	5.2
24	5.4
26	5.6
28	5.9
30	6.1
32	6.3
34	6.5
36	6.7
38	6.8
40	7.0

5. Set the FX Tester to the leak test position per Section II - B (page 3, step 2a-c) of the 051-272 document.
6. When a steady stream of product is observed flowing from the hose, hang up the nozzle (this will initiate a 3 gph leak test).
7. With the TLS in the DIAGNOSTIC mode, monitor the front panel display. When the test is complete, the front panel display will read "Test Complete Handle Off", the system will alarm, and will shut down the line (if programmed for shut down). Press the "Alarm/test" key to silence the alarm.

   Note: During the 3 gph test, the STP will turn On and Off intermittently. Do NOT assume the test has completed until the TLS-350 console has alarmed. When the test is complete, the WPLLD or PLLD diagnostics (must be in DIAGNOSTIC mode) on the front panel display will read "Test Complete Handle Off".

   Note: If the test does NOT fail, the leak rate needs to be confirmed. Confirm the leak rate at pump pressure by referring to the matrix on page 2 of the RJP-2018 document (note that 3.5 gph at 10 psi with a pump-on pressure of 28 psi = 369 ml/minute). If the leak rate is correct, refer to the W/PLLD Troubleshooting Guide for instructions.

8. Close the ball valve to stop the leak, turn-off, lock out and tag the circuit breaker of the STP for the product being tested, then disconnect the electrical power yoke at that STP.
9. Remove the leak testing hardware and replace the plug on the shear valve using the appropriate sealant on the threads and torque per the manufacturer's specification NOTE: Over tightening the shear valve plug may result in damage to the shear valve.
10. Print the leak test history report for your records.
11. Re-connect the STP yoke and turn-on the circuit breaker. Go to the front panel of the TLS to initiate another line test. The console should display the prompt "Start Line Leak Test Press <Enter>". Visually verify that product is not leaking from the shear valve port during the test, and confirm that the line now passes the 3 gph leak test.

3 GPH testing utilizing the KWA LS 2003 Leak Detector Tester

1. All fuel accumulated during the testing should be collected in an approved container and returned to the tank at the conclusion of the testing.
2. Shut off, lock out and tag the circuit breakers that provide power to the STP(s) for the product line being tested. Install the quick-connect fittings in the shear valves for the tested pipeline beneath the dispensers or other convenient location.
3. Turn On the power to the turbines.
4. Authorize a dispenser to pressurize the line. Dispense approximately 5 gallons into a suitable container to ensure that the line is purged of air.
5. Connect the blue hose to the quick connect in the shear valve on one end and the KWA (Ken Wilcox Associates) LS 2003 on the other end. The selector should be in the "Off" position when connecting the hose.
6. Turn the selector valve to the "Calibrate" position.
7. Set the outlet pressure on the LS 2003 to 10 psi on the pressure gauge using the built-in regulator provided with the system.
8. Set the leak rate to 3.5 gph, (221±10 ml/min) at 10 psi using a stopwatch and the 500 ml graduated cylinder. The position of the float on the flow meter may vary slightly from site to site.
9. Switch the selector valve to the "Test" position on the LS 2003.
10. Hang up the nozzle to shut Off the dispenser. The leak detector should automatically perform a 3 gph leak test.
11. Turn Off, lock out and tag the turbines at the breaker panel and on the pump controllers.
12. Remove the quick-connect fittings from the shear valves beneath the dispensers. Check to make sure the safety valve on the shear valve has not been accidentally tripped.
13. Print the leak test history report for your records.
14. Re-connect the STP yoke and turn-on the circuit breaker. Go to the front panel of the TLS to initiate another line test. The console should display the prompt "Start Line Leak Test Press <Enter>". Visually verify that product is not leaking from the shear valve port during the test, and confirm that the line now passes the 3 gph leak test.

Verification of 0.2 and 0.1 GPH Performance (if present)

This procedure verifies that the system is performing 0.2 and 0.1 gph testing, if desired, and if the system is programmed to perform these tests.

Note: Since the hardware and system set-up parameters used for 0.2 and 0.1 gph testing are the same as those used for 3 gph testing, this test procedure can be used to verify system operability for all levels of line leak detection.

TESTING PROCEDURE:

1. Press the <Function> key on the TLS Console until the display reads "Pressure Line Results". Then press <Step> to obtain the most recent line leak test results. Pressing <Step> once provides the 3 gph results; pressing it again provides 0.2 gph results, and pressing it a third time provides 0.1 gph results.
2. If a printout is desired and a printer is present, pressing the <Print> button will print out the test results (see Figure 2).

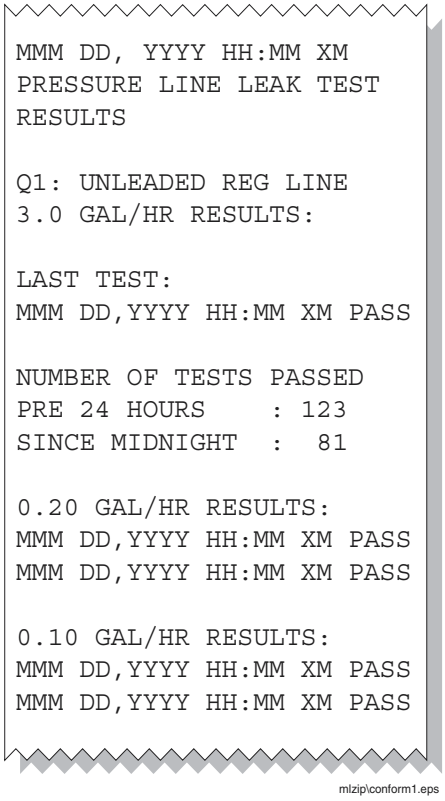

Figure 2. PLLD Line Leak Test Results Report Example

Verifying Operability of UST Leak Detection Equipment

Scope:

These procedures can be used at field sites to determine the operability of Veeder-Root's underground storage tank leak detection systems. Testing underground tank leak detection equipment in accordance with this procedure will verify the equipment's operability for leak detection at 0.2 gph static, 0.1 gph static, and Continuous Statistical Leak Detection (CSLD).

Compliance Inspection Recommendations:

Veeder-Root TLS systems self-diagnose essential components, and will not complete and report passing tank tests in the event of failure of components used in the test. Completed tank tests, whether 0.2 gph static, 0.1 gph static, or using CSLD, are evidence that the system was powered as needed for the duration of the test, and that its components are in working order.

The unit provides audible and visual alarms on tank test failures. This feature is standard and not programmable.

In-tank probes do not require periodic calibration.

Completed compliance tests are evidence that, during the test,

- The system was properly powered for the data collection periods.
- All necessary tank probes were connected.
- All tank probes were operating within specification.
- All internal components were operating within specification.

Veeder-Root recommends that TLS tank testing systems be inspected periodically to determine that compliance tests, which can be 0.2 gph static tests, 0.1 gph static tests, or CSLD are being completed in accordance with local regulations. Since the leak detection system is required to compensate for changes in product level due to temperature changes in the tank in order to pass a leak test, a review of completed and successful periodic tank tests provides sufficient verification of system operability and should satisfy local agency requirements.

Reference Documents:

- Veeder-Root TLS-350 Operators Manual (576013-610)

Testing Procedure:

1. Press the <Function> key on the TLS Console until the display reads "In-Tank Test Results". Then press <Step> to obtain the latest test result. Pressing the <Tank/Sensor> button will scroll through the results for each tank.
2. If a printout is desired and the console is equipped with a printer, pressing the <Print> button will print out the results.

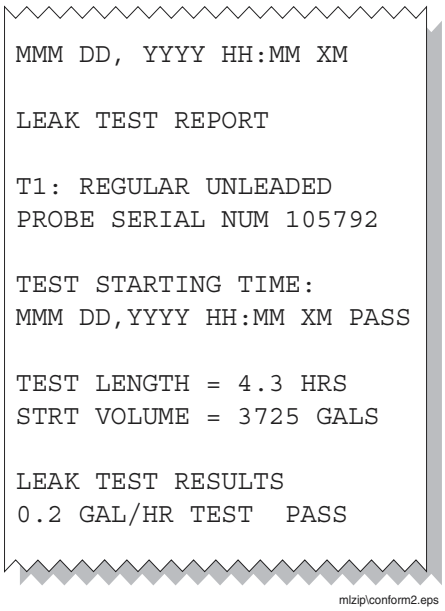

Figure 3. In-Tank Test Results Report Example

Verifying Operability of Sensors

Table 2 lists Veeder-Root sensors by part number and test procedure.

Table 2

Part No.	Sensor	Test Procedure
794380-320	Solid State Discriminating Pan Sensor	Ref Procedure A
794380-350	Solid State Discriminating Sump Sensor	Ref Procedure A
794380-322	Discriminating Pan Sensor	Ref Procedure A
794380-352	Discriminating Sump Sensor	Ref Procedure A
794380-36x series	Fiber trench Sensor	Ref Procedure A
794380-341, -343	Discriminating Interstitial Sensor	Ref Procedure B or D
794380-208, -209	Piping Sump sensor	Ref. Procedure C
794380-321	Solid State Pan Sensor	Ref. Procedure C
794380-351	Solid State Sump Sensor	Ref. Procedure C
794390-420, -460	Interstitial Liquid Sensor for Steel Tanks	Ref. Procedure C
794380-341, -343	Discriminating Interstitial Sensor (Used in the non-discriminating mode)	Ref. Procedure D
794380-340	MicroSensor	Ref. Procedure D
794390-40x series	Interstitial Sensor for Fiberglass Tanks	Ref. Procedure E
794380-301, -302, -303	Hydrostatic Sensor	Ref. Procedure F
794380-62x	Groundwater Sensor	Ref. Procedure G
794390-700	Vapor Sensor	Ref. Procedure H
847990-001, -002	Standalone Dispenser Pan Sensor with Dispenser Control Interface	Ref. Procedure I
794380-323	Position Sensitive Sensor	Ref. Procedure J

Reference Documents:

TLS-350 Operators Manual (576013-610)

TLS-350 Setup Manual (576013-623)

Before You Begin:

Verify that the TLS 350/350R console is programmed correctly for the Site and the application. Print out the system setup and sensor alarm history (Ref. Manual 577013-610 History Reports). Document any programming changes you have made from the original configuration.

If the console is in Simplicity mode, it must be switched out of this mode for this testing.

Required Hardware:

- Safety equipment to perform this testing as required by your Organization, Customer's requirements, and all state/ local safety mandates.

- Two Test containers that are suitable to be used for fuel. Containers used in Procedure A must be able to support a liquid depth of 30 inches and should be marked to indicate the liquid heights specified in the test procedures. Containers used in Procedure B for testing the 794380-341 sensor must be non-metallic containers which are approved for use with gasoline and must be properly grounded when filling them with gasoline. Containers used in Procedures H and I must be able to support a liquid depth of 4 inches and should be marked to indicate this liquid height. Procedures C, E, and J require a vessel which can support a liquid depth of 2 inches and have a mark to indicate this liquid height. Procedures D and F require a depth that will cover the sensor.

Testing Procedure A:

Discriminating Pan/Sump Sensors 794380-320, 794380-350, 794380-322, 794380-352; Fiber trench Sensors 794380-360, 794380-361, 794380-362

1. Print out system status, sensor configurations, and alarm histories and save for your records.
2. Fill one of the test containers to obtain the level of Water specified in Table 3 below in order to test the Low Liquid alarm:

Table 3

Sensor	Water Level (Inches)
794380-320	2
794380-350	2
794380-360	23
794380-361	13
794380-362	3
794380-322	2
794380-352	2

3. Remove sensor carefully from tank or containment area. Visually inspect the sensor for any damage as defined by sensor category in the Operators manual P/N 576013-610, such as damage to the cable or the sensor housing.
4. While holding the sensor vertically, place the sensor into the container until it is submerged. Test only one sensor per test container (multiple test containers may be used). Wait up to 5 minutes for the console to alarm. If it does not alarm after 5 minutes, the sensor has failed the test.
5. Remove the sensor from the test vessel after observing a response. Allow the sensor to completely dry off in order to clear the alarm. Document the alarm and proceed to the next step.
6. In order to test the High Level Alarm, add Water to the test container until the top of the sensor is submerged. Then repeat steps 4 and 5.

7. Fill the second test container with a minimum of one inch of product (fuel). Then insert the sensor being tested in the second container and wait for up to 20 minutes for gasoline and 60 minutes for diesel fuel for the console to alarm (in most cases, the sensor will alarm more quickly). If it does not alarm after the wait time, the sensor has failed the test.

   Optional procedure for faster recovery times (applicable to testing in gasoline only):

   Instead of keeping the sensor immersed in the product until it registers a Fuel alarm, remove it after 3 - 4 minutes of exposure. If it does not alarm after 8 minutes from the start of the immersion, the sensor will need to be immersed again until it alarms.

   Note: If it is required by National, State, or Local requirements to test the sensor in fuels other than gasoline, the sensor response time may be significantly longer than 20 minutes. Also, it will be necessary to soak the sensor in Coleman Fuel for half an hour after testing before beginning the recovery period.

8. Remove the sensor from the test container after observing a response and allow the test fuel to completely dry off the unit. Document the alarm and proceed to the next step. Due to the time sensors take to recover when immersed in fuel, it may take up to one hour after testing in Gasoline (in most cases the sensor should recover within 30 minutes) and up to three hours after testing in Diesel or Kerosene for the sensor to return to a Normal state

9. Press the alarm/test key on the console to clear the alarm before moving on to the next sensor.

10. Reinstall the sensor(s) upon verification of proper operation.

11. Print the test history and console status for your records. This completes the test procedure. Report any performance concerns to Veeder-Root while on site.

Testing Procedure B:

Discriminating Interstitial Sensors 794380-341, 794380-343

1. Print out system status, sensor configurations and alarm history

2. Fill one of the test containers with enough Water to completely cover the sensor.

3. Remove sensor carefully from tank containment area. Visually inspect the sensor for any damage as defined by sensor category in the Operators Manual P/N 576013-610, such damage to the cable or the sensor housing.

4. While holding the sensor vertically, place the sensor into the container until it is submerged. Test only one sensor per test container (multiple test containers may be used). Test times may run as long as 10 minutes depending upon console type and configuration. If it does not alarm after 10 minutes, the sensor has failed the test.

   Note: The 794380-343 sensor must be tested in a dark container. If there is too much ambient light, this may prevent the sensor from going into alarm.

5. Remove the sensor from the test container after observing a response. Allow the sensor to completely dry off in order to clear the alarm. Document the alarm and proceed to the next step. For the 794380-341 sensor, it is important that the sensor be tilted at an angle after removal because the sensor may trigger a false fuel alarm if small amounts of water are trapped in the window of the sensor.

6. Fill the test container with enough Fuel to completely cover the sensor.

7. Insert sensor to be tested in the container and wait up to 10 minutes for the console to alarm. Ensure that the sensor is completely submerged for the duration of the test. If it does not alarm after 10 minutes, the sensor has failed the test.

When testing, the sensor must be completely submerged. Also, the P/N 794380-341 sensor must be tilted at an angle after removal from the test container so that liquid does not become trapped in the window of the sensor.

8. Remove the sensor from the test container after observing a response. For the P/N 794380-343 sensor, dip the sensor into a small container of alcohol and briefly swirl it around to rinse off the unit.
9. Document the alarm, press the alarm/test key on the console to clear the alarm, and proceed to the next sensor.
10. Print the test history report for your records.
11. Reinstall the sensor (s) upon verification of proper operation.
12. This completes the testing. Report any performance concerns to Veeder-Root while on site.

Testing Procedure C:

Piping Sump Sensors 794380-208, 794380-209, Interstitial Sensors 794390-420, 794390-460, Solid-State Pan Sensor 794380-321, and Solid State Sump Sensor 794380-351

1. Print out system status, sensor configurations, and alarm histories and save for your records.
2. Fill one of the test containers with a minimum of 2inches of Water.
3. Remove sensor carefully from tank or containment area. Visually inspect the sensor for any damage as defined by sensor category in the Operators manual P/N 576013-610, such as damage to the cable or the sensor housing.
4. While holding the sensor vertically, place the sensor into the container until it is submerged. Test only one sensor per test container (multiple test containers may be used). Test times may run as long as 5 minutes depending upon console type and configuration. If the sensor does not issue a "Fuel" alarm after 5 minutes, the sensor has failed the test.
5. Remove the sensor from the test vessel after observing a response. Allow the sensor to completely dry off in order to clear the alarm. Document the alarm and proceed to the next step.
6. Press the alarm/test key on the console to clear the alarm before moving on to the next sensor.
7. Reinstall the sensor(s) upon verification of proper operation.
8. Print the test history and console status for your records. This completes the test procedure. Report any performance concerns to Veeder-Root while on site.

Testing Procedure D:

MicroSensor 794380-340; Discriminating Interstitial Sensors 794380-341, 794380-343 used in the Non-discriminating mode

1. Print out system status, sensor configurations and alarm history.
2. Remove sensor carefully from the interstitial containment area. Visually inspect the sensor for any damage as defined by sensor category in the Operators manual P/N 576013-610, such as damage to the cable or the sensor housing.
3. Fill the test container with enough Fuel to completely cover the sensor.

4. Insert sensor to be tested in the container and wait up to 10 minutes for the console to alarm. Ensure that the sensor is completely submerged for the duration of the test. If it does not alarm after 10 minutes, the sensor has failed the test.

   Note: When testing, the sensor must be completely submerged.

   Note: The 794380-340 and 794380-343 sensors must be tested in a dark container. If there is too much ambient light, this may prevent the sensor from going into alarm.

5. Remove the sensor from the test container after observing a response. For the P/N 794380-343 sensor, dip the sensor into a small container of alcohol and briefly swirl it around to rinse off the unit.
6. Document the alarm, press the alarm/test key on the console to clear the alarm, and proceed to the next sensor.
7. Print the test history report for your records.
8. Reinstall the sensor(s) upon verification of proper operation.
9. This completes the testing. Report any performance concerns to Veeder-Root while on site.

Testing Procedure E:

Interstitial Sensors for Fiberglass tanks 794380-401, -404, -407, and -409

1. Print out system status, sensor configurations, and alarm histories and save for your records.
2. Fill one of the test containers with a minimum of 2 inches of water.
3. Remove sensor carefully from the interstitial containment area. Visually inspect the sensor for any damage as defined by sensor category in the Operators manual P/N 576013-610, such as damage to the cable or the sensor housing.
4. While holding the sensor flat and with the side with the Red dot facing upwards, place the sensor into the container until it is submerged. Test only one sensor per test container (multiple test containers may be used). Test times may run as long as 5 minutes depending upon console type and configuration. If the sensor does not issue a "Fuel" alarm after 5 minutes, the sensor has failed the test.
5. Remove the sensor from the test vessel after observing a response. Allow the sensor to completely dry off in order to clear the alarm. Document the alarm and proceed to the next step.
6. Press the alarm/test key on the console to clear the alarm before moving on to the next sensor.
7. Reinstall the sensor(s) upon verification of proper operation.
8. Print the test history and console status for your records. This completes the test procedure. Report any performance concerns to Veeder-Root while on site.

Testing Procedure F:

Hydrostatic Sensors 794380-301, 794380-302, 794380-303

1. Print out system status, sensor configurations, and alarm histories and save for your records.
2. Remove sensor carefully from tank reservoir. Visually inspect the sensor for any damage as defined by sensor category in the Operators manual P/N 576013-610, such as damage to the cable or the sensor housing.

3. For Hydrostatic sensors, removal of the sensor from the tank reservoir represents the "Low Liquid" Alarm condition for a Dual Point sensor and a "Fuel" Alarm condition for a Single Point sensor. Time to alarm may run as long as 5 minutes depending upon console type and configuration. If the sensor does not alarm after 5 minutes, the sensor has failed the test.
4. For Dual Point Hydrostatic sensors, a second alarm condition representing a "High Liquid" alarm is present. To test this alarm, completely submerge the sensor in water. Time to alarm may run as long as 5 minutes depending upon console type and configuration. If the sensor does not alarm after 5 minutes, the sensor has failed the test.
5. In order to clear the alarm, re-install the sensor in the reservoir. Document the alarm and proceed to the next step.
6. Press the alarm/test key on the console to clear the alarm before moving on to the next sensor.
7. Print the test history and console status for your records. This completes the test procedure. Report any performance concerns to Veeder-Root while on site.

Testing Procedure G:

Groundwater Sensor 794380-621, 794380-622, 794380-624

1. Print out system status, sensor configurations, and alarm histories and save for your records.
2. Remove sensor carefully from monitoring well. Visually inspect the sensor for any damage as defined by sensor category in the Operators manual P/N 576013-610, such as damage to the cable.
3. For Groundwater sensors, removal of the sensor from the monitoring well represents the "Water Out" Alarm condition. Test times may run as long as 5 minutes depending upon console type and configuration. If the sensor does not alarm after 5 minutes, the sensor has failed the test.
4. In order to clear the alarm, re-install the sensor in the monitoring well. Document the alarm and proceed to the next step.
5. Press the alarm/test key on the console to clear the alarm before moving on to the next sensor.
6. Print the test history and console status for your records. This completes the test procedure. Report any performance concerns to Veeder-Root while on site.

Testing Procedure H:

Vapor Sensor 794390-700

1. Print out system status, sensor configurations, and alarm histories and save for your records.
2. Fill one of the test containers with a minimum of 4 inches of water.
3. Remove sensor carefully from monitoring well. Visually inspect the sensor for any damage as defined by sensor category in the Operators manual P/N 576013-610, such as damage to the cable.
4. Submerge the sensor in the water to produce a "Water Alarm" condition. Test times may run as long as 5 minutes depending upon console type and configuration. If the sensor does not alarm after 5 minutes, the sensor has failed the test.
5. In order to clear the alarm, remove the sensor from the container. Document the alarm and proceed to the next step.

6. Press the alarm/test key on the console to clear the alarm before moving on to the next sensor.
7. Print the test history and console status for your records. This completes the test procedure. Report any performance concerns to Veeder-Root while on site.

Testing Procedure I:

Standalone Dispenser Pan Sensor with Dispenser Control Interface 847990-001, 847990-002

1. Fill one of the test containers with a minimum of 4 inches of Water.
2. Remove sensor carefully from dispenser pan. Visually inspect the sensor for any damage as defined by sensor category in the Operators manual P/N 576013-610, such as damage to the cable or the sensor housing.
3. While holding the sensor vertically, place the sensor into the container until it is submerged. Test only one sensor per test container (multiple test containers may be used). The Alarm state is indicated by the dispenser power being turned off (i.e., there is no other visible or audible alarm).
4. Remove the sensor from the test vessel after observing a response and allow the sensor to completely dry off. Document the alarm and proceed to the next step.
5. Reinstall the sensor(s) upon verification of proper operation.

6. Turn Off power to the dispenser for at least 5 seconds in order to re-enable dispensing.

Testing Procedure J:

Position Sensitive Sensor 794380-343

1. Print out system status, sensor configurations, and alarm histories and save for your records.
2. Fill one of the test containers with a minimum of 2 inches of Water.
3. Remove sensor carefully from the pan or containment area - this should result in a “Sensor Out” alarm. Visually inspect the sensor for any damage as defined by sensor category in the Operators manual P/N 576013-610, such as damage to the cable or the sensor housing.
4. While holding the sensor vertically, place the sensor into the container until it is resting securely on the bottom of the container (this should clear the “Sensor Out” alarm). Test only one sensor per test container (multiple test containers may be used). Test times may run as long as 5 minutes depending upon console type and configuration. If the sensor does not issue a "Fuel" alarm after 5 minutes, the sensor has failed the test.
5. Remove the sensor from the test vessel after observing a response. Allow the sensor to completely dry off in order to clear the alarm. Document the alarm and proceed to the next step.
6. Press the alarm/test key on the console to clear the alarm before moving on to the next sensor.
7. Reinstall the sensor(s) upon verification of proper operation.
8. Print the test history and console status for your records. This completes the test procedure. Report any performance concerns to Veeder-Root while on site.

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