

Vapor Recovery Annual Test for Sites with Stage I Vapor Recovery Only (No Stage II vapor Recovery)

Rev. 0

Date: 04/07/2016

No. VPR 307

1. Introduction

This procedure is designed for gasoline dispensing facilities with stage I vapor recovery systems that operate under Arizona Administrative Code (AAC) Title 20, Article 10 (sites that only have stage I vapor recovery and do not have stage II vapor recovery). The fee code for the stations covered by this procedure is 056. The procedure sets forth testing requirements and identifies the responsibilities and authorities for the Registered Service Representative (RSR) and the State Inspector. Within each section of the SOP there are four subsections. The first subsection spells out the responsibility and authorities for the RSR, the second subsection spells out the responsibility and authorities for the State Inspector, the third subsection is to be used by the State Inspector for documenting the results of test, and the fourth subsection is to be used by the State Inspector for enforcement actions. When the State Inspector is not present during the inspection, the RSR shall document the entire test results indicated and submit them to the Department within 7 calendar days of test completion.

2. Purpose

The purpose of this SOP is to set forth a consistent procedure for testing vapor recovery systems at gasoline dispensing facilities based on Arizona State law and CARB Executive Orders. This SOP sets forth the responsibilities and authorities for both the vapor recovery RSR and the State Inspector with respect to the initial or annual vapor recovery test. The inspection and testing of these vapor recovery systems under these procedures will be conducted during scheduled inspections. Inspection schedules will be made in advance as scheduled by the RSR. This SOP is meant to summarize the CARB test procedures. Unless specifically, stated, the CARB test procedures shall be followed in the event of conflicts between the summary and the test procedure. CARB test procedures can be found at <http://www.arb.ca.gov/testmeth/vol2/currentprocedures.htm>.

3. Responsibility and Authority

- 3.1. Authority – This inspection is conducted under ARS 41-2065, ARS 41-2132.
- 3.2. Responsibility – The RSR is responsible for conducting the initial or annual test using the methods required under state statute and regulations. Failure to conduct the required testing in accordance with the requirements may result in grounds for suspension, revocation or refusal to renew the RSR license per R20-2-603.
- 3.3. It is the responsibility of the State Inspector to conduct his or her inspection as required under this SOP and in conformance with the Field Force Manager (FFM) protocols and represent the Department as scheduled for witnessed initial or annual tests. Failure to do so by the State Inspector could be grounds for disciplinary action which could include dismissal.

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4. Forms

4.1. Vapor Recovery Test Forms

- a. Pre-Test Checklist
- b. Pressure Decay Test (DWM 77A)
- c. Pressure Vacuum Vent Valve Test Using TP 201.1E
- d. Repair or Replacement Test Verification Report

4.2. Department Forms

- a. Regulatory Bill of Rights (DWM -149)
- b. Administrative Order (DWM-53)
- c. Inspection Comments/Notes (DWM-179)

5. Equipment

5.1. RSR Necessary Equipment – It is the responsibility of the RSR to have all of the equipment necessary to conduct the required testing. If the appropriate equipment is not available, or is not calibrated, the test shall be canceled and owner/operator and/or the RSR may be subject to a civil penalty under AAC R20-2-905 or R20-2-910.

5.2. State Inspector Necessary Equipment - Necessary Equipment: State Inspectors must have a laptop computer to enter data from the examination and to communicate examination data to the office and regulated facility, scanner, printer paper to leave copies of examination results with on-site representative if necessary, a cell phone to track mileage and record time spent on various activities, a digital camera to collect visual evidence of non-compliant issues, hand sanitizer or waterless soap, first aid kit, CARB executive orders, statute book, administrative rules, blue tags and blue tape for enforcement actions and to restrict non-compliant equipment from use, plastic and wire seals to attach enforcement tags, SOAPY WATER solution with SPRAYER for checking connections fittings and unions. LEAK CHECK for testing fill tubes and dry breaks and caps (if issued), MANOMETER for testing systems vapor pressure or vacuum depending on system type.

6. Pre-Inspection

6.1. Registered Service Representative (RSR), Responsibilities and Authorities:

The RSR shall document on the Pre-Test Checklist whether or not a pretest was conducted at the site and the date of the pre-test. A pre-test by the RSR is not required prior to the annual test. However, if a pre-test is conducted, the RSR must have successfully completed that test and documented it on the Vapor Recovery Pre-Test Checklist. Any maintenance performed during the pre-test shall be documented on the Maintenance Log.

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- a. If the RSR has to cancel an initial or annual witnessed test one hour prior to the scheduled start time the RSR must remain at that location until the State Inspector arrives to review the reason for cancellation and release the location for reschedule. It is the responsibility of the RSR to call the Department at 602-771-4920 to appropriately notify of the cancellation.
 - b. All allowable repairs by the RSR must be complete at least one hour prior to the start time of the scheduled test with the State Inspector. The RSR at the scheduled time of the witnessed annual test will present the following documents to the State Inspector prior to conducting the annual test:
 - i. The signed Pre-Test Checklist
 - ii. Current tank inventory
 - iii. Last fuel delivery (per Veeder Root or Encompass systems)
 - iv. Device License for the station being tested
 - v. Inspection logs (Stage I equipment must be inspected at least 1 time every 7 days) and maintenance logs.
 - vi. Tank Chart
 - c. In order to expedite the inspection, the RSR or site owner/operator may remove dispenser panels from both sides to allow viewing of under-dispenser piping for leaks and open panels to check for skimmers.
 - e. The RSR will ensure that spill buckets are drained prior to testing as required.

Note: If the required documentation is not presented before the time of the test, the owner / operator or RSR may be subject to a civil penalty under AAC R20-2 905.
- 6.2. State Inspector Responsibilities and Authorities:
- a. The State Inspector will follow the FFM procedure prior to the start of the inspection. Once this information has been entered, the State Inspector can begin the inspection.
 - b. The State Inspector will identify him or herself and present their Department photo identification, and state the purpose of the visit as required under Department Policies and Procedures No. 100.
 - c. If the RSR does not show up for the test, document the reason why (if known), check the veeder-root and/or stick the tanks to verify the fuel level in the tanks to ensure the tanks have sufficient fuel to conduct the test. Verify the last fuel delivery to identify if it met delivery time testing requirements. Document the findings in the inspection/notes section of the inspection form.

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- d. The State Inspector will request to see the RSR's license and verify that they are holding a valid license in order to conduct the annual or initial test for the vapor recovery system being tested.
- e. The State Inspector will review with the owner, manager or responsible party, the regulatory bill of rights and have them sign, acknowledging receipt on the form (DWM 149), the State Inspector will also review the location's device license in CTU or at the facility to verify the number of devices and contact information is correct. If a location is not licensed, fill out a Placed in Service Report (DWM 38) in its entirety listing: device fee code, device service code, pump number, and NTEP C of C number and record the BMF number. If assistance is required, inform the person in charge of his/her responsibility to provide assistance and any special equipment needed.
- f. The State Inspector will verify that the equipment to be used by the RSR is correct and has been calibrated as required.

7. Pre-Test Requirements

The following shall be done by the State Inspector if the test is witnessed or the RSR if it is an unwitnessed test:

- 7.1. Verify that gasoline sales have been halted for testing purposes. There shall be no gasoline dispensing within 30 minutes prior to the test or during the performance of the test.
- 7.2. Check the drop tube length. There is no minimum height, but the maximum is 6" from the bottom of the tank at its highest point. If the highest point is more than 6" from the bottom of the tank a State Inspector shall issue Stop Sale/Stop Use Order (DWM 53). For a non-witnessed test, the RSR shall stop gasoline sales and notify the Department.
- 7.3. During a witnessed test, the State Inspector will examine the tanks for fuel levels, water content, and drop tube length. Physically "stick" the tanks using water finding paste to check for water and to obtain volume levels. Record liquid volume amount using stick reading and appropriate tank chart, record on WM Pressure Decay form (DWM 77A), do this with no pressure on the tanks. If there is alcohol in the gas per the Product Transfer Documents (PTD) they are not allowed to have any water, if there is water in the tank issue a Stop Sale/Stop Use Order (DWM 53). If there is no alcohol in the gas they are allowed to have up to 1" of water in the tank.
- 7.4. Verify that the liquid level in the storage tank is at least 4 inches above the highest opening at the bottom of the submerged drop tube.

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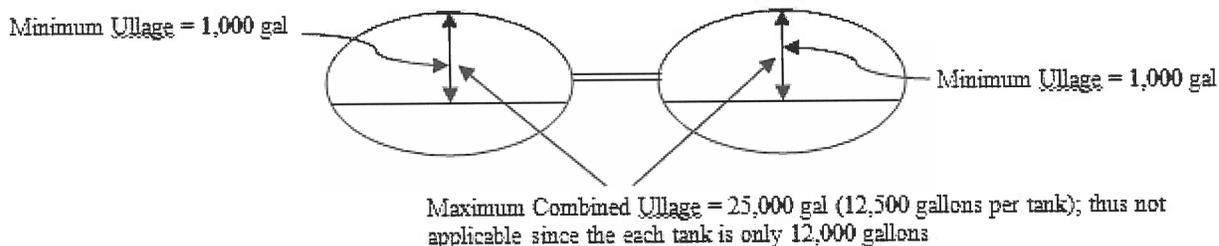
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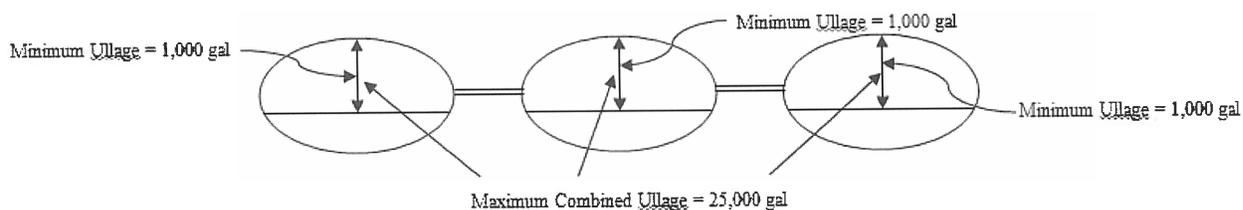
- 7.5. Conduct calculations for tank capacity and ullage. **CALCULATION:** Subtract liquid volume from actual tank capacity. This gives you the amount of ullage in the tank(s) (A - C = ullage). The tank ullage must meet the following requirements:
- Minimum total ullage for each individual tank must be 1,000 gallons or 25% of the tank capacity, whichever is less
 - A maximum total ullage of 25,000 gallons.

All this information is reported on the State form DWM 77A.

Example: Site with 2-12,000 gallon manifolded tanks:



Example: Site with 3-30,000 gallon manifolded tanks:



- 7.6. Check the electronic monitoring system or fuel delivery receipts to verify when the last fuel deliver occurred. There shall be no product deliveries into or out of the storage tank(s) within 3 hours prior to the test.
- 7.7. Vent Stacks - Ensure the vent pipe is painted correctly (55% or greater UV reflectivity).
- 7.8. Verify all equipment installed meets the CARB requirements for the approved vapor recovery system. A State Inspector shall note any modifications on the CTU Vapor screen.
- 7.9. Visually inspect the vault emergency vents (via mirror etc). State Inspector Note: do not enter a confined space according to Department Policy and Procedure 109.

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- 7.10. If available, check the Veeder Root / alarm system and scan a copy into the inspection report.
- 7.11. Twenty (20) minutes prior to the start of testing, the electronic manometer shall begin warming up. The electronic manometer shall have a warm-up period of 15 minutes, followed by a 5 minute drift check. If the drift exceeds 0.01 inches water, the instrument shall not be used.
- The manometer shall be warmed up in a location with consistent temperatures that will be observed during testing (ie. the manometer shall not be maintained in an air conditioned vehicle during warm up and then used outside in warmer temperatures during the test.) If the drift exceeds 0.01 inches water column, the instrument shall not be used.
- 7.12. Equipment shall meet the range, sensitivity, and precision as indicated in the test procedures (TP-201.3, section 3 and TP-201.1E, section 4). Equipment shall be calibrated at least one time every six months and the calibration certification shall be maintained onsite with the RSR as well as provided to the State Metrology lab to maintain RSR licensing.
- 7.13. Stoppage of gasoline sales shall begin either prior to or at the scheduled test time. Gasoline sales are not allowed within 30 minutes prior to the start of the pressure decay test and may not resume until all testing is complete. Upon halting gasoline sales, measure the headspace pressure in the tank. If the pressure exceeds 0.50 inches H₂O, the pressure shall be carefully relieved in accordance with all safety requirements.

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8. Pressure/Vacuum Vent Valve Test

8.1. The pressure/vacuum (P/V) caps shall be removed from the vent pipes and tested prior to conducting the pressure decay test. The P/V cap shall be tested following CARB TP 201.1E, ensuring the pressure, vacuum, and leak rates are within the following CARB limits:

- 2.5 to 6.0 inches H2O Positive Pressure
- 6.0 to 10.0 inches H2O Negative Pressure

The following leakrates are applicable as a combined leakrate for the entire vapor recovery system (eg. if there are 3 PV vent valves for the vapor system, the total leakrate for all three PV Vent Valves must meet the following limits):

- Leakrate at +2.0 inches H2O ≤ 0.17 CFH
- Leakrate at -4.0 inches H2O ≤ 0.63 CFH

8.2. Results shall be documented on the form for recording the Pressure Vacuum Vent Valve Test Using TP 201.1E. If the vent cap is defective, the test will proceed and the cap will be replaced and tested to verify that it is functioning. A civil penalty will be issued. (If no replacement vent cap is available at time of test, the system will be blue tagged.)

8.3. The Pressure Vacuum Vent Valves shall be re-installed following the passage of TP 201.1E prior to conducting the pressure decay test.

9. Pressure Decay Test

The introduction of nitrogen for the test shall begin within thirty minutes (30) of scheduled test time. NO REPAIRS can be made after the scheduled test time.

If the spill bucket is equipped with a drain valve, the test shall be conducted with the drain valve installed and the manhole cover removed.

After 30 minutes of not dispensing fuel has occurred, and prior to the introduction of nitrogen, the headspace pressure shall be lowered if necessary to less than 0.50 inches H2O following appropriate safety procedures. Pressure decay testing will be conducted with caps off of vapor and liquid fills.

9.1. Registered Service Representative (RSR), Responsibilities and Authorities:

- a. Either at the start of the scheduled test time or at a time mutually agreed with the inspector, the RSR may start introducing nitrogen. Nitrogen shall be introduced into the system at a rate NOT to exceed 5 cubic feet per minute (cfm).
- b. The RSR shall pressurize the tanks to at least 2.2 wci, and maintain nitrogen flow until the pressure stabilizes.

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- c. Once stabilized, close and disconnect the nitrogen supply. Start the stop watch to time as the pressure decreases to 2.0 inches water. Verify the test equipment is not leaking using leak detecting solution or a combustible gas detector to verify the test equipment is leak tight.
 - d. If the pressure does not decrease to 2.0 inches after 10 minutes, the test passes. Otherwise, re-start the stopwatch when the pressure has decreased to the initial starting pressure of 2.0 inches H₂O .
 - e. After 5 minutes, record the final system pressure. See A.A.C. Title 20, Chapter 2, Article 9, Table 1 to determine the acceptability of the final system static pressure results (see attached).
 - f. This will be done in conjunction with the Tie-Tank Test below: Upon completion of the pressure decay test the RSR shall check the dry breaks. The RSR will test each dry break to ensure they all seal with no leaks. This will be determined by quickly depressing and releasing the plunger and testing the seal with soapy water. If it fails to hold, the dry break shall be tested no more than 3 times (2 additional), before it is considered defective. If the dry break fails, it must be repaired or replaced and retested by the RSR, and documented on the Maintenance Log. A civil penalty shall be recorded and the product shut down because the equipment is not operating as designed. If this failure also results in failure of the Pressure Decay test, the site is to be issued a Stop Sale/Stop Use Order (DWM-53) per 8.3. The results shall be faxed to the Department upon completion of repairs and retests.
- 9.2. State Inspector Responsibilities and Authorities:
- a. Ensure tank pressure is less than 0.50 inches H₂O prior to beginning introduction of nitrogen.
 - b. Ensure ZERO on the manometer prior to the start of pressurization and at the end of the test.
 - c. Observe introduction of nitrogen into the system – (Not to exceed 5 cfm or 1 psi). Pressure decay test will be conducted with caps off of vapor and fills.
 - d. Document the final test result and whether the system passes or fails.

10. TIE-TANK TEST

- 10.1. Registered Service Representative (RSR), Responsibilities and Authorities:
- a. After the successful completion of the pressure decay test, depress the Phase I vapor return drybreaks at each tank.
 - b. It is the responsibility of the RSR to depress the dry break using a “wooden” dowel upon direction from the State Inspector.

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- c. If the pressure gauge indicates the system is under pressure, but no flow occurs out of the drybreak, then the tank vapor space is not manifolded to the other tanks.
- d. If vapor does not come out of the drybreak, the pressure decay test previously run is an invalid test for that tank and shall be rerun.
- 10.2. State Inspector Responsibilities and Authorities:
State Inspector will observe the test and record results on the state forms.
- 10.3. State Inspector Documentation of Results:
All information will be entered onto Department form DWM 77A.
 - a. BMF No. - get off license or assignment sheet
 - b. Inspection No. - found on assignment sheet
 - c. Test Date - date you are inspecting
 - d. Actual time test(s) begins
 - e. Actual time test(s) ends
 - f. Product: List actual grades (i.e. 87, 89, 91)
 - g. Capacity: Actual capacity in gallons
 - h. Physical stick reading - Record stick reading in inches
 - i. Liquid - convert the stick reading to liquid volume amount using appropriate tank chart.
 - j. Ullage - Capacity minus liquid volume
 - k. Ullage % - Ullage divided by Capacity multiplied by 100
 - l. Actual time pressure decay test begins
 - m. Actual time pressure decay test ends
 - n. Elapsed time - Total amount of time test ran (end time - start time = total elapsed time)
 - o. Record actual test gauge value at start of test
 - p. Record actual test gauge value at end of test. If the value is less than in Table 1 the site fails, and you must issue a Stop Sale/ Stop Use Order (DWM53). (Note: if there is a shift (gain or loss from zero) the Investigator will use the difference to determine pass or fail)
 - q. Record pass or fail for the test. (Failure to pass this test is considered to be a site failure and you must issue a Stop Sale/Stop Use Order DWM 53)
 - r. Have owner/operator initial form or indicate that they "Refused to sign".
 - s. Have the RSR print and sign their name.

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11. Enforcement Guidelines

- 11.1. Blue Tags:
During a witnessed test, any documented failure during the Pressure Decay test will result in a blue tag being issued if it is unable to be repaired and retested. The system or component shall be taken out of service.
- 11.2. During an unwitnessed test, in the event of a documented failure, it is the responsibility of the RSR to place the system or component out of service until it can be repaired, retested, and send in the appropriate test report (including results), along with a placed in service report to the Department. The RSR shall notify the Department as required under R20-2-602(B) (2).

12. Post Inspection Procedure

- 12.1. DATA ENTRY, EXIT INTERVIEW; Complete CTU Screens for test results, DWM-40, and DWM-53 Administrative Order (to record deficiencies regarding tags affixed to devices etc.). Report findings to on-site representative and explain the reports and re-inspection process.
- 12.2. Close the inspection activity in the FFM by ending Shift and log into the new activity.

13. Unwitnessed Inspection Procedure

An RSR that is conducting a test that is not witnessed by a State Inspector is responsible to conduct all testing at the scheduled test time as outlined in this Standard Operating Procedure, Arizona Administrative, and appropriate CARB test methods. All tests conducted shall be documented on forms provided by the Department and available on the website at <https://dwm.az.gov/resource/vapor-recovery-rsr>. All test results shall be submitted to the department R20-2-602(A)(6).

14. Further Site Recommendations

Although not required as part of the Stage I Vapor Recovery test, it is recommended that the site dispensers be inspected for the installation of Skimmers and under dispenser piping leaks.

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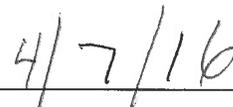
Table 1. Acceptability of Final System Pressure Results for Systems Tested Using TP-201.3

<u>Ullage (gallons)</u>	<u>Minimum Pressure after Five Minutes (Inches Water Column)</u>
500	0.73
550	0.80
600	0.87
650	0.93
700	0.98
750	1.03
800	1.07
850	1.11
900	1.15
950	1.18
1000	1.21
1200	1.32
1400	1.40
1600	1.46
1800	1.51
2000	1.56
2400	1.62
2600	1.65
2800	1.67
3000	1.69
3500	1.73
4000	1.76
4500	1.79
5000	1.81
6000	1.84
7000	1.86
8000	1.88
9000	1.89
10000	1.90
15000	1.93
20000	1.95
25000	1.96

Procedure reviewed and approved by:



Michelle Wilson, Environmental Program Manager



Date

