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Volumetric Measuring Devices	Issued: 2015-10-01	Revision Number: 3	

Performance—Check valve, anti-drain valve, spin-up and creep tests

Application

This test applies to all liquid measuring devices, such as dispensers, refuellers and vehicle-mounted meters that are equipped with a delivery hose and nozzle.

Exception: This test does not apply to dispenser or refueller inspections at authorized service providers' (ASPs) or dealers' premises where a test hose or nozzle is used in place of the factory supplied hose, nozzle and anti-drain valve. Under this condition, the ASP assumes full responsibility to ensure that the factory supplied equipment will function correctly when installed on location. Where a test hose or nozzle is used, the certificate of inspection must be annotated with the following (or words that clearly convey the same meaning):

Dispenser/refueller (as applicable), serial number ##### (as applicable) was not tested with the original equipment manufacturer hose or nozzle. Upon final installation, the outlet end of the delivery hose(s) must be equipped with a spring-loaded anti-drain valve or its equivalent.

Note: A collapsible delivery hose on an aircraft refueller and hoses used on a meter designed to defuel aircraft are not required to have an anti-drain valve (R.286.2). The delivery hose of a liquefied gas (e.g., propane or liquefied petroleum gas (LPG), anhydrous ammonia (NH₃), liquefied natural gas (LNG), etc.) meter is not required to have an anti-drain valve.

Purpose

In accordance with weights and measures regulation R.286, the outlet end of the delivery hose of a pump-supplied meter must be equipped with an anti-drain valve (or equivalent) that will prevent the drainage of the hose. The tests in this procedure will ensure that the check-valve or anti-drain valve is installed and functioning correctly, that a register returns properly to a stable zero indication before use and that there are no indications on any register when a delivery is not being made and the delivery nozzle is closed.

Legislative References

R.233, R.238, R.252, R.281 and R.286.

Procedure (check valve and anti-drain valve)

- Following any high flow (fast) run, turn the pump off.
- Place the nozzle in a suitable vessel to catch any product which may flow.

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Performance – (Check Valve, Anti-Drain Valve Spin-up and Creep Test)

- Open the nozzle while holding the hose above the level of the nozzle.
- Ensure that product does not flow from the nozzle.

Note: A small amount of product (the content of the nozzle) may flow from the nozzle as it empties, but there should not be a steady flow.

Note: Some nozzle models have integrated check valves; however, the anti-drain valves may also be separate components located at the connection between the hose and the nozzle. If this is the case, the quantity of product emptied from the nozzle may be significant. In this case, draining of the nozzle is acceptable.

If necessary, close the nozzle, reset the meter to zero without re-priming the hose and perform another accuracy test.

Interpretation of Results

When there is evidence that the anti-drain valve or check valve cannot hold enough pressure to retain the product in the hose, it must be replaced. The dispenser may be rejected and no further testing is required until the issue has been resolved.

While there is no specific limit of error for product leaking from a faulty check-valve or anti-drain valve, any leakage must not affect the accuracy of subsequent tests in such a manner that it will cause measurement errors beyond the absolute value of the limit of error for the meter under test. The limit of error is evaluated from a datum point established during a previous, or subsequent, fast flow test.

Procedure (roll-up / spin-up)

Immediately after starting the dispenser, and with the nozzle valve closed, monitor the quantity display for at least 10 seconds to ensure that it remains at zero indication. Most issues will be immediately obvious as there will be a jump in the quantity indication as the system pressurizes.

Interpretation of Results

Any apparent roll-up or spin-up indication which is not suppressed or masked, as per the requirements in STP-24, is cause for rejection of the device (R.252).

Note: It may be noted that roll-up is most common after a dispenser has been unused for a prolonged period and therefore may be more common first thing in the morning. This should be considered in the case of a reported roll-up issue that cannot be duplicated (e.g., complaint).

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Performance – (Check Valve, Anti-Drain Valve Spin-up and Creep Test)

Procedure (meter creep)

After any high flow (fast) run, allow the system to remain in an active state with the nozzle valve closed. Wait several seconds to allow the pressure to equalize, then make note of the quantity and price indications. Continue to monitor these displays for an additional 30 seconds to ensure that they remain stable and do not continue to increment. If after 30 seconds the display remains stable, no further testing for meter creep need be done. If meter creep is noted, additional testing may be conducted to confirm if the bypassing product is being delivered (i.e., leak in the nozzle valve) or is being lost elsewhere.

Interpretation of Results

There may be a small indication change in the first few seconds after closing the delivery nozzle. However, beyond this there should be no further incrementing of the delivered volume or total price. It should be noted that a relatively common source of meter creep is an internally leaking delivery nozzle. In this case, the fuel is actually being delivered to the customer and seizure action may not be warranted. In all cases, meter creep is cause for rejection (R.233) of the device, as it indicates a leak somewhere in the system.

Revision 3

- Clarified the anti-drain valve test procedure.
- Reworded certificate annotation for non-original equipment manufacturer hose or nozzle.
- Added test for meter roll-up/spin-up.
- Added test for meter creep.
- Renamed STP to reflect additional tests.