



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, D.C. 20590

OCT 23 2013

Mr. Danny Shelton
President
Hazmat Resources, Inc.
124 Rainbow Drive, Suite 2471
Livingston, TX 77399

Ref. No.: 13-0147

Dear Mr. Shelton:

This responds to your July 16, 2013 letter requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to pressure relief devices on specification DOT 400 series cargo tank motor vehicles. Specifically, you ask what the requirements are for testing and inspection of specification DOT 400 series cargo tank motor vehicles pertaining to pressure relief valves and pressure relief systems.

As provided in § 180.407(d)(3), all reclosing pressure relief valves must be externally inspected for any corrosion or damage which might prevent safe operation. Additionally, all reclosing pressure relief valves on cargo tanks carrying lading corrosive to the valve must be removed from the cargo tank for inspection and testing. Finally, each reclosing pressure relief valve required to be removed and tested must open at no less than the required set pressure and no more than 110 percent of the required set pressure, and must reseal to a leak-tight condition at no less than 90 percent of the start-to-discharge pressure or the pressure prescribed for the applicable cargo tank specification.

Under the general design and construction requirements applicable to specification DOT 400 series cargo tank motor vehicles (see § 178.345), the pressure relief system requirements provided in § 178.345-10(d) state that the set pressure of the pressure relief system is the pressure at which it starts to open, allowing discharge. The set pressure of each primary relief valve must be no less than 120 percent of the maximum allowable working pressure (MAWP), and no more than 132 percent of the MAWP. Additionally, the valve must reclose at not less than 108 percent of the MAWP and remain closed at lower pressures. Finally, the set pressure of each pressure relief valve used as a secondary relief device must be not less than 120 percent of the MAWP. This standard equally applies to original construction and requalification under parts 178 and 180 of the HMR, respectively.

I hope this satisfies your inquiry. Please contact us if we can be of further assistance.

Sincerely,

T. Glenn Foster
Chief, Regulatory Review and Reinvention Branch
Standards and Rulemaking Division

Nickels
3178.345-10
Cargo Tanks
13-0147

Drakeford, Carolyn (PHMSA)

From: Betts, Charles (PHMSA)
Sent: Tuesday, July 16, 2013 7:27 AM
To: Drakeford, Carolyn (PHMSA)
Cc: Billings, Delmer (PHMSA)
Subject: FW: Your Information on the testing of 407 vents
Attachments: DOT407 vent testing revised for Field Testing.pdf; Danny Shelton.vcf

Importance: High

Carolyn –

Please log and assign to a specialist for handling. Please assigned to PHH-10's Cargo Tank subject matter expert.

Thanks,
Charles

From: Danny Shelton [mailto:shelton10104@gmail.com]
Sent: Tuesday, July 16, 2013 5:02 AM
To: Ford, David (FMCSA); Swedberg, Richard (FMCSA); Fleener, Arthur (FMCSA)
Cc: Betts, Charles (PHMSA); Mike B Thorpe; John Cannon ; 'Peter Weis'; Solomey, Joe (PHMSA); Staniszewski, Stanley (PHMSA)
Subject: FW: Your Information on the testing of 407 vents

Good morning gentlemen, see the following from Girard where they have revised the bench testing guidelines for their 400 series vents. A copy of that page is attached showing a revision date of July 8, 2013. They make a comment in the last sentence they are waiting on official guidance from the competent authority regarding the bench testing requirements for 400 series vents. David and Richard, can you please run this information up your chain of command and I will do the same on the public side with PHMSA. We can at least start to get the bench testing of 400 series vents clarified after 12 years of struggle.

Mr. Betts, please accept this e-mail as my request to clarify the re-testing of 400 series pressure relief devices (PRD) to clearly communicate to the reader that PRD's must perform during a re-test in the same manner as the design requirements clearly identified in 178.345-10. It is my understanding and it is industry practice that the set pressure of the pressure relief system is the pressure stamped on the vent in accordance with 178.345-10(h)(3) and is the minimum pressure at which it starts to open, allowing discharge. This should be spelled out in the requirements. Re-closing pressure relief devices must perform as follows during a bench test: Each re-closing pressure relief device must open between 120 and 132 percent of the MAWP and reseal to a leak tight condition at no less than 108% of the MAWP. In addition, each re-closing pressure relief device for a DOT 406 cargo tank motor vehicle (CTMV) must open between 110 and 138 percent of the MAWP and reclose to a leak tight condition at no less than the MAWP.

Regards

Danny Shelton

HazMat Resources, Inc.
President

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From: Glen Harm [mailto:GHarm@girardequip.com]
Sent: Monday, July 08, 2013 12:05 PM
To: 'Danny Shelton'; Dave Girard
Subject: RE: Your Information on the testing of 407 vents

Dave,

I have carefully gone through the example by Mr. Shelton. I understand the point he is making. However, I do not necessarily agree with it. The 180.407 can be interpreted two different ways. The way Mr. Shelton interprets it, allows a more liberal passing of the test, where by only a lower limit is applied to the range of reseating. The example he gives is 25 MAWP would reseal > 27 PSI (that is, the test technician can not pass the valve if it is lower or less than 27 PSI). Engineering at Girard has taken an approach of interpreting the 180.407 regulation to be applied to both the upper and lower Start to Discharge Pressure. There for we have always used a range for reseating. Girard does not have any issues holding this tolerance in production. Girard would not want any debate with DOT or FMCSA, that we (Girard) have improperly interpreted the regulation. So Girard has taken the "safe" route on interpreting 180.407
I have taken the liberty of revising the test page recommendation published by Girard, per Mr. Shelton's suggestion. Please review the contents, and if satisfied we can publish this more liberal tolerance for bench testing in the field. However, I would recommend that Girard maintains the stricter interpretation during the bench test at Girard, until a ruling is made by the federal regulating agency.

Best regards,

Glen Harm

Mechanical Engineer
Girard Equipment Inc.
Phone: 908 862 6300 x228
Mobile 772 626 5625

From: Danny Shelton [mailto:shelton10104@gmail.com]
Sent: Monday, July 08, 2013 7:01 AM
To: Dave Girard
Cc: Glen Harm
Subject: RE: Your Information on the testing of 407 vents

David, all I did was give an example of how your vent is designed to operate based on the specification. And to be brief the vent must open between 120% and 132% of the MAWP so that means for a 25 MAWP tank the vent **MUST** open between 30 and 33. The specification for your vent goes on to say that the vent must reseal no less than 108% of the MAWP. So 108% of 25 is 27. As an example the vent is tested and it opens at 32.9. This is within the range of 30 – 33 so the vent opens as designed. The vent closes at 31. The design specification says the vent must close no less than 108% of the MAWP and 31 is greater than the MAWP and the vent is functioning as designed.

I refer back to your reply and I just highlighted that section that permits this vent that was designed this way to also be re-

tested the same way it was designed. The key word in this section is **OR**

Once again it is poorly written but the design specifications are clear and concise and as long as your customers and mine are re-testing 400 series vents in accordance with the second part of 180.407(d)(3) which states: **pressure prescribed for the applicable cargo tank specification**, they cannot go wrong. Under your scenario in your document you say the vent must close at a pressure no greater than 29.7 but that is not the way the vent was designed. The vent was designed to reseal at a pressure less than the open pressure and greater than 27. If the vent opened at 32.9 and closed at 31 the vent is operating as designed; It does not have to reseal between 27 and 29.7, that is not what the design specification for the vent requires.

DOT407 VENT BENCH TESTING

As prescribed by 180.407(d)(3) of the External Visual Inspection



- Remove the vent from the tank.
- Make sure the vent is free from any foreign matter.
- Place Vent on the tester and proceed to testing procedures:

Testing Procedures

1. Close the blow down valve.
2. Slowly open air input valve until needle on the pressure gauge at the rate of the second hand on your watch (approx. 1 pound per second).
3. Place hand around vent seat area to feel any escaping air. Listen for any air escaping and watch air gauge to see when the upward movement stops. When the gauge stops record the pressure, this is the **SET PRESSURE**.
4. Close the inlet air valve and watch gauge. The gauge needle will back down slowly and will stop this will be **RESET PRESSURE**.

M.A.W.P	SET PRESSURE (MARKED ON VENT)	SET PRESSURE (VENT MUST OPEN BETWEEN 120% and 132% of MAWP) ¹	RESET PRESSURE (VENT MUST RESET AT 90% OF START TO DISCHARGE) ²
25	30	30 – 33	≥ 27 ³
30	36	36 - 39.6	≥ 32.4 ⁴
35	42	42 – 46.2	≥ 37.8 ⁵
40	48	48 – 52.8	≥ 43.2 ⁶

¹ Per 178.345-10

² Per 180.407(d)(3)

³ Cannot be less than 27

⁴ Cannot be less than 32.4

⁵ Cannot be less than 37.8

⁶ Cannot be less than 43.2