

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS FT-1
		Former Designation: <i>CEMS FT-1</i>
TITLE: HVAC-TXV Durability Testing		CURRENT REV No.: 1802
		DATE: Feb. 2018
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1.0 APPLICATION

Thermal Expansion Valves (TXV) mounted on rear auxiliary HVAC units typically located in the sleeper area of a cab

1.0 SCOPE

This method is to define the procedure for testing the mechanical vibration durability of the Thermal Expansion Valve (TXV) as it is mounted on the rear auxiliary HVAC unit.

2.0 REFERENCE DOCUMENTS

Unless otherwise specified the latest issue of all referenced standards shall apply. The following specifications and standards are referenced in this specification:

NAVISTAR MPAPS P-9543	WRTS 02-6402
NAVISTAR MPAPS F-6021	WRTS 12-37282

2.1 Definitions

2.1.1 Terminology

2.1.1.1 Rear Auxiliary Unit – A secondary HVAC module that is typically located in the sleeper area of a cab.

2.1.2 Acronyms/Symbols

2.1.2.1 HVAC – Heating/Ventilation/Air Conditioning

2.1.2.2 TXV – Thermal Expansion Valve

3.0 APPARATUS

3.1 A single-axis shaker capable of meeting the frequency and amplitude requirements for the tested vocational inputs.

3.2 Pressure gages and/or transducers to monitor the pressure on each side (high and low) of the test article(s)

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4.0 TEST PREPARATION(S)

4.1 Test Fixturing

A fixture should be created/used that can act as an attachment between the shaker and the TXV. This fixture should be capable of orienting the TXV (and its associated piping) in all three vehicle directions (Longitudinal, Lateral, and Vertical) without removing the TXV or disturbing its fasteners. Figures 1 thru 3 show examples of a fixturing design that accomplishes this.

Additionally, a setup should be created to directly monitor both the high and low side pressures of each individual test article throughout the testing.

4.2 Test Article(s)

The TXV should be sealed in such a manner that each side of the valve can maintain its own independent pressure. Typically, a thin plate of metal is sealed to the back of the block during this process. Once sealed, each tested valve should be pressurized and allowed to rest (sometimes referred to as “soaking”) for 24 hours to be sure it can maintain pressure.

4.3 Test Data

Test data should be gathered from a production representative vehicle of the correct vocation. Once this data has been collected, a frequency response or “break point” table shall be created for each orthogonal direction. A procedure for creating such a table can be found in the report for Work Request 02-6402. Table 1, below, shows an example of such a table used on a TXV shaker for a ProStar Sleeper cab with the Line Haul #1 (LH1) vocation. This data is used to set up the corresponding shaker program(s).

5.0 PROCEDURE

5.1 Connect the test article(s) to the shaker via the fixturing. Use the prescribed O-rings and fasteners, as well as the prescribed torque.

5.2 Pressurize the test article(s) to the prescribed vehicle pressures. Typically used gases include air and nitrogen.

5.3 Perform the shaker program corresponding to the installed orientation.

5.4 Repeat steps 1 and 2 until all three orientations have been performed. **DO NOT REMOVE THE PIPES FROM THE TXV OR RELEASE THE PRESSURE DURING THE POSITION CHANGES!!**

5.5 Once all three orientations are complete, allow the TXV to remain attached to the fixture in the position of its last run, and allow the TXV to ‘soak’ for 16 hours to see if any slow leaks have developed.

5.6 At the end of the soak, prior to disassembly, check and record the torque of the nut that holds the hose clamping plate to the TXV block:

- Set the value of the torque wrench to the same value used to tighten the nut down.
- Advance the nut in the tightening direction until relative motion occurs, or until the original torque value is reached, whichever comes first.
- Record the value.

5.7 Acceptance Criteria

- No leakage of the pressurized gas shall occur between the beginning of the test and the end of the 16-hour soak period.
- No damage or cutting of the o-rings shall be present at the end of the test.

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6.0 REPORT

6.1 Materials Tested

6.2 An itemized parts list

6.3 Assembly conditions

6.4 Fluids used

6.5 All test reports shall meet the requirements of MPAPS P-9543.

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