GM WORLDWIDE ENGINEERING STANDARDS	Test Procedure	GMW15771

Tire Compressor Performance Test

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. To validate that the Tire Sealant Compressor Kit (TSCK) can inflate the punctured tire to placard pressure within the specified time, while exposed to the operational temperature range.

1.2 Applicability. All vehicles with TSCK.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

None

3 Resources

3.1 Facilities. Test shall take place using a climate controlled chamber (with a dynamometer, if Sealant Performance Test is done subsequently). Test written as a full vehicle level test, but may be modified into a lab test upon written authorization from GM Product Engineering (Design Responsible Engineer (DRE) or equivalent).

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment.

3.2.1 DC Power Supply.

3.2.2 Stopwatch.

3.2.3 Laptop Computer (manual data input).

3.3 Test Vehicle/Test Piece.

3.3.1 Test Vehicle. Any vehicle from the associated program/platform is acceptable to use.

3.3.2 Test Piece.

3.3.2.1 Three (3) TSCK Compressors.

3.3.2.2 Six (6) GM Production Tire/Wheel Assemblies.

3.3.2.3 In the event of multiple tire size releases, the largest tire relative to width and radius shall be selected for testing.

3.3.2.4 In the event of multiple tire types, the worst case shall be selected for testing by GM Product Engineering and Validation Engineering.

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3.3.2.5 Production Tire Performance Criteria (TPC) specification tires from the production manufacturer shall be tested (or written authorization from GM Product Engineering, DRE or equivalent if unavailable).

3.3.2.6 Outside tread area (e.g., high, mid, low, etc.)

3.3.2.7 Wheel must be approved by Tire and Rim Association (T&RA) or the European Tire and Rim Technical Organization (ETRTO), rim contour for the production size tire.

3.3.2.8 Production tire inner liner materials shall be used.

3.4 Test Time.

Calendar time:	4 d
Test time:	72 h
Coordination time:	24 h

3.5 Test Required Information. See Appendix A, Data Sheet A1.

3.6 Personnel/Skills. Personnel familiar with climate controlled chamber and TSCK operation is required.

4 Procedure

4.1 Preparation.

4.1.1 Soak the test tires and TSCK at specified test temperature for minimum of 4 h in a climate controlled chamber.

4.1.2 Remove test tire from climate controlled chamber.

4.1.3 Adjust test tires to placard pressure.

4.1.4 Puncture the outboard circumferential groove of the tread area of the tire with a 6 mm diameter spike at ambient temperature. Puncture shall be positioned at 12 o'clock. The valve stem shall be positioned at 6 o'clock.

4.1.5 Puncturing object shall be removed from the tire for testing.

4.1.6 Record puncture air loss from placard pressure to 0 kPa (0 psi) (pressure vs. time) in 20 s increments using a stop watch and calibrated pressure gauge.

4.1.7 Mark the puncture on the tire sidewall with a paint pen for later reference.

4.1.8 Mark each tire with an identification number for tracking and report purposes, enabling a plot of pressure vs. time that can be matched to its corresponding tire.

4.1.9 Conduct test per 4.3.

4.1.10 Repeat preceding steps for each test tire (six (6) tires per temperature).

4.1.11 Submit air loss rates, plots of pressure vs. time (P, t), and raw data for each tire with test report. See Appendix B, Figure B1 for sample graph.

4.2 Conditions.

4.2.1 Environmental Conditions. Not applicable.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.2.2.1 Testing shall be performed at -30 °C, 23 °C and 55 °C.

4.2.2.2 Operating voltage (12 V to 14 V).

4.3 Instructions.

4.3.1 Remove TSCK and Tire/Wheel Assembly from Climate Chamber.

4.3.2 Record TSCK and Tire/Wheel Assembly Identification Numbers.

4.3.3 Turn on DC Power Supply for TSCK.

4.3.4 Unwrap the Air Hose and Electrical Cord.

4.3.5 Connect the Air Hose to the Valve Stem and the Power Plug to the DC Power Supply.

4.3.6 Start the Power on the TSCK and Inflate the Tire to Placard (psi).

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4.3.7 Turn off TSCK and DC Power Supply Once Placard is Reached. Record Time on Appendix A, Data Sheet A1.

4.3.8 Repeat steps 4.3.1 to 4.3.7 for each Tire/Wheel Assembly conditioned in temperature range. (Use All three (3) Compressors for Evaluation).

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results.

5.2.1 Total inflation time shall be less than or equal to the specified time.

5.2.2 Compressor shall not blow Auxiliary Power Outlet (APO) fuse or internal plug fuse, if equipped.

5.2.3 Sealant hose, air hose and electrical cord shall be flexible and not break or crack within operating temperature range.

5.3 Test Documentation. See Appendix A, Data Sheet A1 and Appendix B, Figures B1 and B2. The supplier shall work with the GM Lead Engineer to comprehend these requirements.

6 Safety

This Engineering Standard may involve safety requirements for hazardous materials, the method of operations and equipment. This standard does not propose to address all the safety issues associated with its use. It is the responsibility of the user of this standard to ensure compliance with all appropriate safety and health practices. This would include any specific training that may be required. The safety and health standards include site specific rules and procedures, company rules and procedures, and Government Standards. Contact shall be made with the appropriate site Safety and Health personnel for further direction and guidance in these matters.

7 Notes

7.1 Glossary. Not applicable.

7.2 Acronyms, Abbreviations, and Symbols.

APO	Auxiliary Power Outlet
DRE	Design Release Engineer
ETRTO	European Tire and Rim Technical Org
GSSLT	Global Subsystem Leadership Team
MY	Model Year
P/N	Part Number
T&RA	Tire and Rim Association
TPC	Tire Performance Criteria
TSCK	Tire Sealant Compressor Kit

8 Coding System

This standard shall be referenced in other documents, drawings, etc., as follows:

Test to GMW15771

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