



Vehicle Dust Intrusion - Lab Test in Dust Chamber

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 assess dust intrusion into a vehicle using a controlled environmental dust chamber with severe dust conditions.

1.2 Applicability. Passenger cars, vans, and light duty trucks.

1.3 Remarks. This dust intrusion test was developed to provide a repeatable method of evaluating airborne dust intrusion into vehicle interior. This analysis is rated using the GMW14264 subjective scale and actual pictures of performance examples (CG4869). This test can be used as a development or validation test.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW14264 GMW15470 (ID)

(ID) = This standard is limited to internal distribution within General Motors and shall not be distributed outside this company. Contact the GM Lead Engineer for further instructions.

2.3 Additional References.

- CG4869 Subjective Dust GMUTS Ranking Photos
- CG5165 Vehicle Static Air Leakage Qualification Data Sheet
- CG5282 Vehicle Dust Intrusion Data Sheet
- US Patent, US 7127958 B2 information
- Vehicle Technical Specification (VTS)

3 Resources

3.1 Facilities. The Environmental Dust Chamber, Building 7, Vehicle Sealing Lab at the General Motors Milford Proving Ground, Milford, Michigan or equivalent.

Note: Reference Dust testing facility for motor vehicles US Patent - US 7127958 B2.

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.

GM Confidential

© Copyright 2018 General Motors Company All Rights Reserved

February 2018

Page 1 of 4

3.2 Equipment.

3.2.1 One (1) airflow measurement device, Body Leak Tester (BLT), capable of maintaining 125 Pa (0.5 in of H₂O) interior pressure vacuum.

3.2.2 BLT side window template, used in the Full Vehicle Static Air Leakage testing (GMW15470), for connecting the BLT to the vehicle.

3.2.3 GM approved sealants for sealing leak areas that are not to design intent.

3.2.4 Safety Protection. A National Institute of Occupational Safety and Health (NIOSH) approved particulate, full face, dual cartridge respirator with High Efficiency Particulate Air (HEPA) filters is required when entering the chamber environment following a test sequence for inspection, while cleaning chamber and vehicle surfaces and during system re-supply and filter maintenance activities.

Note: Approved noise reduction ear muffs are required when entering the dust chamber during operation.

3.3 Test Vehicle/Test Piece. Integration level vehicle with complete production-intent content.

3.4 Test Time.

Calendar time: 2 d

Test time: 4 h

Coordination time: 6 h

3.5 Test Required Information. Results of the Full Vehicle Static Air Leakage test (GMW15470) and related root cause/repair work.

3.6 Personnel/Skills. Personnel with skills to operate the equipment and to root cause and repair leaks to design intent.

4 Procedure

Note: General Information. Consult the VTS for requirements.

4.1 Preparation.

4.1.1 Qualification Static Air Leakage Test. Prior to dust testing, vehicle is required to undergo the GMW15470 Full Vehicle Static Air Leakage Qualification testing (CG5165).

The results of this test will determine if the air leakage rate meets the design specifications. If the vehicle does not meet the design specifications, specific leak pathways should be evaluated and sealed to design intent before proceeding with the dust test.

4.1.2 Vehicle Preparation. Clean and thoroughly dry the vehicle a day before testing. Dry vehicle is a requirement for placement in the dust chamber.

4.1.3 Vehicle Inspection. Check vehicle drain holes, doors, and deck lid seals, rear compartment grommets, pressure relief valve flaps, etc., for proper design and installation.

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.

4.2.3 Vehicle Setup.

4.2.3.1 Insert the BLT side window template and tape it into the passenger or driver side window opening, so it aligns with the BLT hook-up lines when the vehicle is placed in the dust chamber. All remaining windows and doors should be closed, including sunroof(s).

4.2.3.2 For vehicles with an "access" from the passenger compartment to the rear stowage compartment, such as fold-down seats, pass-throughs, etc., the vehicle should be tested with the "access" in the open position.

4.2.3.3 Seal the Body Air Inlet (BAI) with tape, as in the Full Vehicle Static Air Leakage testing (GMW15470).

GM Confidential

© Copyright 2018 General Motors Company All Rights Reserved

February 2018

Page 2 of 4



Documents

Document Sharing Hub