



Determination of Mass and Trim Heights

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. Determination of vehicle mass and trim heights.

1.2 Applicability. For all passenger cars and light trucks.

1.3 Remarks. This procedure defines the method for direct measurement of vehicle trim heights. An example of the typical heights to be measured ("P", "R", "Z" and "D") are shown in Appendix A, Figures A1, A2 And A3. Heights measured in the most common engineering tests are referred to in this procedure.

2 References

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

2.1 External Standards/Specifications.

ISO 9001

2.2 GM Standards/Specifications.

None

2.3 Additional References.

Trim Height Control Drawing (or Master Process Document (MPD) number 3956000)

3 Resources

3.1 Facilities. A surface which is flat within 3 mm, level and large enough to accommodate the vehicle being measured.

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.

Note: Verify that all instrumentation is calibrated per required testing laboratory standards.

3.2.1 Linear measuring instruments such as scales, calipers and height gauges with sufficient resolution to measure to the nearest 0.5 mm.

3.2.2 A weight scale facility, preferably one with four (4) independent platform scales positioned to measure the vehicle mass at each tire.

3.2.3 Tire pressure gauge having a resolution of 7 kPa (1 psi).

3.3 Test Vehicle/Test Piece. A complete vehicle having sufficient content to determine its height measurements according to the requirements outlined in this test procedure, or as specified by the requesting test engineer.

GM Confidential

© Copyright 2014 General Motors Company All Rights Reserved

October 2014

Page 1 of 6



Documents

Document Sharing Hub

3.4 Test Time.

Calendar time: 1 day
Test hours: 3 hours
Coordination hours: 0 hours

3.5 Test Required Information.

 Not applicable.

3.6 Personnel/Skills. The test operator must be qualified and documented as capable to run the test as required by ISO 9001. If a drive-on vehicle hoist is used to measure trim heights, the operator must be trained and certified for hoist usage according to local policies.

4 Procedure

4.1 Preparation.

4.1.1 Confirm that the vehicle is free of ice, snow and mud accumulations. Record vehicle and option information on Vehicle Height and Weight Audit Form (refer to Appendix B).

4.1.2 Unless otherwise specified by the test engineer, fill fuel tank.

4.1.3 Set the front and rear tire pressures (cold) to within ± 7 kPa (± 1 psi) of the pressures recommended on the tire placard. Record data on Vehicle Height and Weight Audit Form (refer to Appendix B).

4.1.4 If the vehicle has air shocks and/or air springs, set the pressure to design specifications.

4.1.5 If the vehicle has automatic level control, the system must be operational.

4.1.6 Confirm that the spare tire and/or tools are properly located and secured.

4.1.7 Close trunk lid, engine compartment hood, station wagon tailgate, convertible top, and all doors.

4.1.8 Position front seat(s) to rearmost location. If the test vehicle is a station wagon, position the second seat up and the third seat down. This contributes to repeatable measurements.

4.1.9 Measure the vehicle weight at the four (4) tire contact points. Record this information on Vehicle Height and Weight Audit Form (refer to Appendix B).

4.1.10 Test engineer to supply details of exact measurement locations.

Note: Similar weights should be maintained from test to test on the same vehicle if the data will be compared.

4.2 Conditions.

4.2.1 Environmental Conditions. Not applicable (test should be performed in a workshop).

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.

4.3 Instructions.

4.3.1 Drive the vehicle onto the measuring platform. Confirm that the front seat is still in the rearmost location for repeatable measurements.

4.3.2 If static loaded radius is to be measured, remove wheel covers to gain access to spindle and axle center points. Measure vertically from the center of the spindle to the ground, and record on Vehicle Height and Weight Audit Form (refer to Appendix B).

4.3.3 Record codes and/or part numbers from all springs, if available on Vehicle Height and Weight Audit Form (refer to Appendix B)

4.3.4 Front Left and Right Height Dimensions.

Note: Refer to the Trim Height Control Drawing (or Master Process Document (MPD) number 3956000) for vehicle specific measurement locations.

4.3.4.1 At vehicle centerline, lift up the front bumper approximately 30 mm (1.2 in), gently remove hands and let vehicle settle. Repeat twice for a total of three (3) times.

4.3.4.2 Measure the "Z" (Z inner and Z outer), and "P" dimensions (refer to Appendix A, Figures A1 and A2) on the left and right side of the vehicle, as well as other height measurements requested by the test engineer, to the nearest 1 mm. Record the dimensions on Vehicle Height and Weight Audit Form (refer to Appendix B) as the "up" measurement.

GM Confidential

© Copyright 2014 General Motors Company All Rights Reserved

October 2014

Page 2 of 6