



Rear Visibility System Confirmation 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 define the tests that will determine if a vehicle meets the performance requirements of the National Highway Traffic Safety Administration (NHTSA) Federal Motor Vehicle Safety Standard (FMVSS) 111 for rear visibility devices and systems S5.5 Rear Visibility and S6.2 Rear Visibility.

1.2 Applicability. This procedure applies to all motor vehicles with Gross Vehicle Weight Ratings (GVWR) of less than or equal to 4536 kg (10 000 lb) per the phase-in schedule listed in the FMVSS 111 S15 Rear visibility phase-in schedule. 10% after May 1, 2016, 40% after May 1, 2017, 100% after May 1, 2018. Per FMVSS 111 the Field of View requirement only applies after May 1, 2016 and all requirements apply after May 1, 2018. The New Car Assessment Program (NCAP) applies the Field Of View, Image Size and Response Time requirements only during the phase in period ending May 1, 2018.

1.3 Remarks. This procedure covers the test requirements of FMVSS 111 S14 Rear Visibility Test Procedure. Obtain the latest version of the standard (see Section 2 References) and review prior to performing this procedure. The latest versions can be obtained from Uniform Resource Locator (URL): www.gpo.gov/. See 2.3. This procedure will refer to FMVSS 111 and follow its steps. The test is to evaluate the ability of a Rear Visibility System (RVS) to present the specified rearview image to the driver.

2 References

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

2.1 External Standards/Specifications.

ASTM B117-03 DOT HS 811 512 FMVSS 111 SAE J826

2.2 GM Standards/Specifications.

GMW3172

2.3 Additional References.

- ASTM B117 Standard Practice for Operating Salt Spray (Fog) Apparatus can be found at URL <https://www.astm.org/>
- CG3800 RVS Summary Data Sheet
- DOT HS 811 512 Vehicle Rearview Image Field of View and Quality Measurement (Appendix 1) is available at URL: www.nhtsa.gov/DOT/NHTSA/NVS/Human%20Factors/Visibility%20and%20Lighting/811512.pdf
- FMVSS 111 can be obtained from the United States Government Publishing Office at URL: www.gpo.gov/ under Federal Digital System, Search Government Publications, 49 CFR 571.111
- SAE J826 Devices for Use in Defining and Measuring Vehicle Seating Accommodation can be found at URL: <http://standards.sae.org/>

3 Resources

3.1 Facilities. See FMVSS 111 S14 Rear Visibility Test Procedure. At the Milford Proving Ground (MPG), the Active Safety Test Area (ASTA) and building can be used for this testing.

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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. Complete the Instrument Calibration Data Sheet in CG3800.

3.2.1 Tire pressure gauge with operating pressure of 700 kPa (100 psi), increments of 1.0 kPa (0.1 psi) and accuracy of at least $\pm 2.0\%$ of the applied pressure.

3.2.2 Illuminance meter with an operating range of at least 500 lux to 20 000 lux and an accuracy of at least $\pm 5\%$ of measured value.

3.2.3 A quantity of 45 kg weights to be placed on the seat pans of the available seating positions and 23 kg weights to be placed on the floorboards at each designated occupant position.

3.2.4 A Three Dimensional (3D) manikin, per SAE J826, see URL: <http://standards.sae.org/>, used for seat adjustment and a bracket to mount the digital camera in the correct location. See Figure 1.

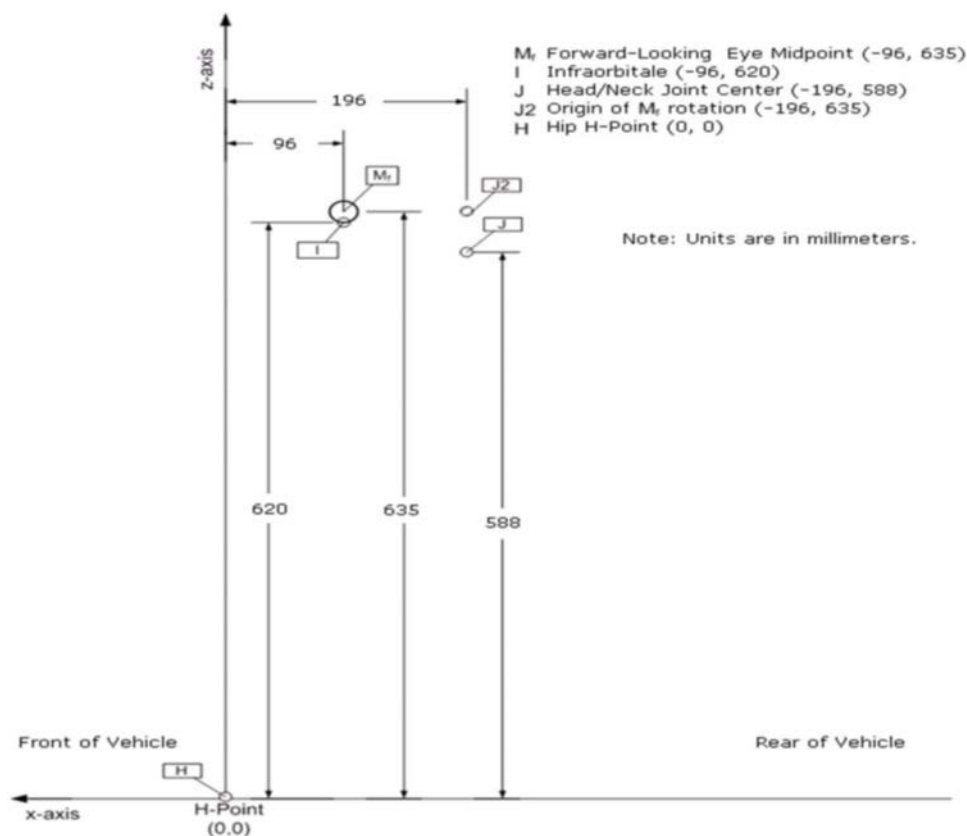


Figure 1: Camera Location

3.2.5 Test objects shown in Figure 2. Each object is a right circular cylinder 0.8 m (32 in) high and 0.3 m (12 in) external diameter. They are labeled A through E as follows:

- Objects A, B, C, D, E are marked with a horizontal band encompassing the uppermost 150 mm (5.9 in) of the side of the cylinder.
- Objects F and G are marked on the side with a solid vertical stripe of 150 mm (5.9 in) width extending from the top to the bottom of the cylinder.
- Both the horizontal band and vertical stripe shall be of a color that contrasts with the rest of the cylinder and the background of the test area.

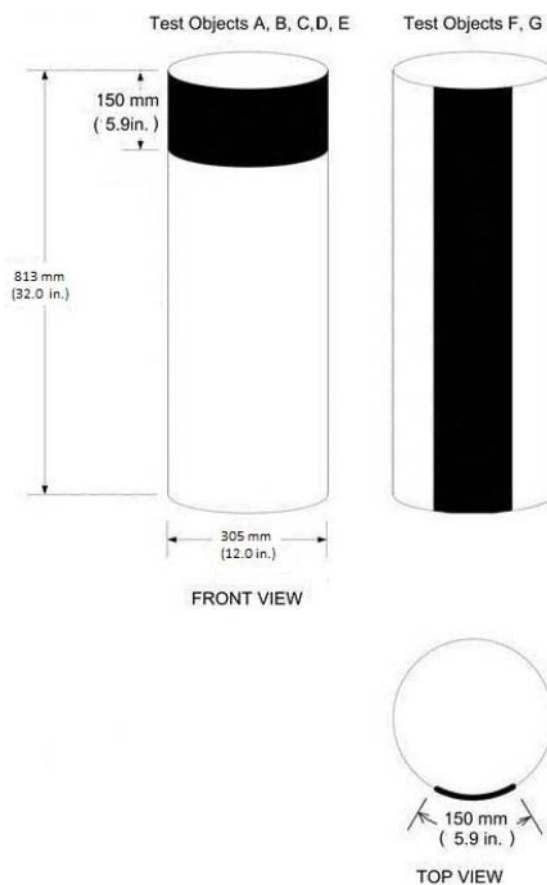
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**Figure 2: Test Objects**

3.2.6 Test object placement grid as shown in Figure 3. Each test object A-G above is placed according to the painted grid.

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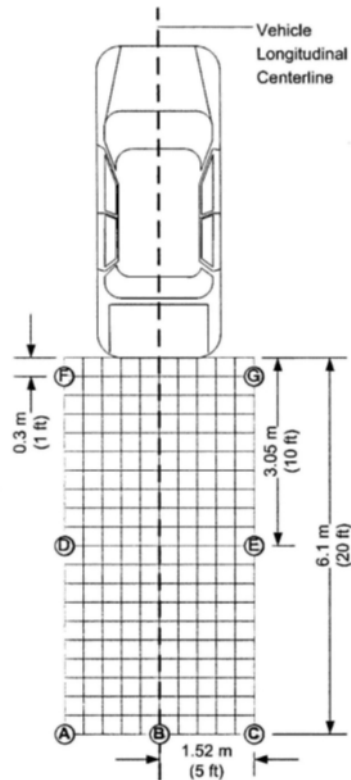


Figure 3: Test Object Placement

3.2.7 Digital cameras (still and video) to record the field of view and monitor the display, shifter and driver door. Cannon Power Shot 110 digital camera and Video VBox (from Racelogic) are available at MPG.

3.2.8 Data Acquisition (DAQ) system to record the required data. Laptop computer with Vehicle Spy 3 and NeoVI Fire (from Intrepid Control Systems) are available at MPG.

3.2.9 Digital thermometer to measure ambient temperature.

3.2.10 Ruler, no larger than the video display screen, measuring in millimeters.

3.2.11 Wheel chocks.

3.2.12 Vehicle scale.

3.3 Test Vehicle/Test Piece. The Subject Vehicle (SV) should be equipped with the RVS system to be tested and should be selected as being representative of the group of vehicles whose compliance to this standard is being demonstrated. For certification to this standard, all components involved must have the latest production intent released hardware, software and calibrations.

3.4 Test Time.

Calendar time: 5 d

Test hours: 24 h

Coordination hours: 16 h

3.5 Test Required Information.

3.5.1 Alignment procedure for the RVC, if needed.

3.5.2 Completed production intent alignment of the rear display guidelines and warnings.

3.5.3 Cold tire inflation pressure from vehicle placards or optional tire inflation pressure labels.

3.5.4 Determine which method the RVS uses to end the backing event (vehicle speed, distance travelled, or time).

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