



FMVSS 108 AHBA Component Level Certification Procedure

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. Certify that the Front Camera Module (FCM) meets component level requirements set forth in FMVSS 108 S14.9.3.11; Semiautomatic Headlamp Beam Switching Device Tests.

1.2 Applicability. This procedure applies to all FCM which supports the Automatic High Beam Adjust (AHBA) feature which must comply with FMVSS 108 S14.9.3.11.

1.3 Remarks.

- FMVSS 108 S14.9.3.11; Semiautomatic Headlamp Beam Switching Device Tests was originally written for AHBA features in which a photodiode controlled a headlamp switching element. Photodiodes are simple devices which react only to light intensity. These tests are run in a static environment.
- By comparison, today's AHBA features use an FCM which interprets scenery and light intensity in a dynamic environment.
- Tier 2 Digital Signal Processor (DSP) software includes a Reduced Sensitivity Mode (RSM) calibration that accounts for the requirements of FMVSS 108.

2 References

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

2.1 External Standards/Specifications.

FMVSS 108 SAE J670

2.2 GM Standards/Specifications.

None

2.3 Additional References.

- CG4958, FMVSS 108-FCM-Certification
- Supplier Compliance Letter

3 Resources

3.1 Facilities. This procedure is best executed in an indoor "light tunnel" or "dark room" at least 30.48 m (100 ft) long. The walls and ceilings of these facilities are typically painted flat black, or otherwise covered in black cloth, to reduce reflected light. Black carpet or floor tile is used. Doors and windows are sealed to minimize external light infiltration.

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 Light Source A. A light source capable of providing a variable intensity of at least (1.5 to 150) cd at 30.48 m (100 ft) from the tested device.

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3.2.2 Light Source B. A light source capable of producing 1080 lux (100 ft-c).

3.2.3 Luminous Intensity Meter. Instrumentation capable of measuring luminous intensity. Luminous intensity has System International (SI) units of candela with symbol cd. This meter must measure at least 100 cd.

3.2.4 Illuminance Meter. Instrumentation capable of measuring illuminance. Illuminance has SI units of lux with symbol lx. Illuminance also has non-SI units of foot-candle with abbreviation ft-c. This meter must measure at least 53 820 lux (5000 ft-c).

3.2.5 Test Fixture. A fixture to which the FCM, the FCM bracket and production intent windshield plaque is mounted. The test fixture itself does not provide adjustment along or about any of the X-Y-Z-axis in the SAE J670 vehicle coordinate system. The test fixture is mounted to a goniometer.

3.2.6 Goniometer. An instrument that allows an object to be rotated to a precise angular position. The goniometer must allow:

- Vertical adjustment (displacement along the Z-axis) sufficient to align with the light source
- A minimum of six (6) degree yaw adjustment (rotation about the Z-axis) in either direction
- A minimum of one (1) degree pitch adjustment (rotation about the Y-axis) in either direction

3.2.7 Digital Multi Meter (DMM). An instrument capable of measuring voltage, current and resistance.

3.2.8 Alignment Laser. To align the test light source along the optical axis of the FCM under test.

3.2.9 Vibration Fixture. A vibration fixture capable of creating a 5g constant acceleration for ½ h in each of the three axes (X-Y-Z) with an adjustable frequency range of at least (30 to 200) Hz.

3.2.10 FCM Interface. Instrumentation, typically laptop based, which can be used to confirm and monitor RSM operation and FCM commands regarding high beam operation.

3.3 Test Vehicle/Test Piece.

3.3.1 FCM. Production intent FCM with the production-level software and calibrations.

3.3.2 Bracket. An FCM bracket which is the mechanical interface between the windshield and the FCM. This bracket must maintain the production intent "rake" angle between the windshield and the face of the FCM lens.

3.3.3 Windshield. A windshield plaque with production intent materials, thickness, tinting, construction and optical characteristics.

3.4 Test Time.

Calendar time: 10 days

Test time: 200 h

Coordination time: Not applicable

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. The personnel running the test has to know how to use the required equipment as well as have a working knowledge of the FCM and RSM. In addition, personnel running the test need to be familiar with light measuring techniques and practices and know the differences between various light measurements as well as how they relate to one another.

4 Procedure

4.1 Preparation. The FCM should be mounted in the test fixture behind a production intent windshield plaque which is mounted in the production intent rake angle. The lens of the FCM and the light source have to be on the same optical axis.

4.2 Conditions.

4.2.1 Environmental Conditions. This test is generally conducted indoors (see facilities) for 1 h in bright noonday sunlight (5000 ft-c minimum illumination with a clear sky).

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.

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