SURFACE VEHICLE STANDARD

J583™	OCT2015
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Front Fog Lamp

RATIONALE

Revised Figure 2 - Photometric requirements for harmonized front fog lamp luminous intensity (cd) to correct errors and harmonize with current ECE R19 requirements.

1. Revised left side of drawn Line 1, 2, 3, 4, 5, 6, and 7 in the figure to end at correct angular value. Current lines extend to the left beyond specified angular extent of each line.

2. Reordered footnotes to list in a more logical order.

3. Separated current footnote #3 into footnote #4 for Line 6 and #5 for Line 7 to help with clarity.

4. Corrected footnote #4 that line 6 is a maximum and minimum measured line.

5. Corrected footnote #5 to state Line 7 is required to be less than 50% of Line 6 maximum. Current footnote incorrectly states Line 7 is required to be less than 50% of Line 6 minimum.

6. Revised drawn Line 6 and 7 along with modifying the text box pointing to each to indicate there is an asymmetric option to reduce the inboard angular extent if the lamps are a pair of lamps with an asymmetric beam pattern. This harmonizes with the current ECE R19.

7. Added footnote #7 allowing inboard angular relief for lines 6 and 7 consistent with figure modification above.

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TABLE OF CONTENTS

1. SCOPE

This SAE standard provides test procedures, performance requirements, design guidelines and installation guidelines for front fog lamps.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J387 Terminology - Motor Vehicle Lighting

SAE J575 Test Methods and Equipment for Lighting Devices and Components for Use on Vehicles Less than 2032 mm in Overall Width

SAE J576 Plastic Material or Materials for Use in Optical Parts Such as Lenses and Reflex Reflectors of Motor Vehicle Lighting Devices

SAE J578 Color Specification

SAE J588 Turn Signal Lamps for Use on Motor Vehicles Less than 2032 mm in Overall Width

SAE J599 Lighting Inspection Code

SAE J759 Lighting Identification Code

SAE J1383 Performance Requirements for Replaceable Bulb Motor Vehicle Headlamps

SAE J2139 Test for Signal and Marking Devices Used on Vehicles 2032 mm or More in Overall Width

SAE J2442 Harmonized Provisions for Installation of Lamps and Retro-Reflecting Devices on Road Vehicles except Motorcycles

2.1.2 CMVSS Publication

Available from Transport Canada, Road Safety and Motor Vehicle Regulation Directorate, P.O. Box 8880, Ottawa Post Terminal, Ottawa, Ontario, K1G 3J2, www.tc.qc.ca.

CMVSS 108 Canadian Motor Vehicle Safety Standard for Exterior Lighting

2.1.3 ECE Publication

Available from United Nations Economic Commission for Europe, Palais des Nations, CH-1211, Geneva 10, Switzerland, Tel: +41-0-22-917-12-34, www.unece.org.

ECE R19 Uniform Provisions Concerning the Approval of Motor Vehicle Front Fog Lamps

3. DEFINITIONS

3.1 FRONT FOG LAMP

A lighting device designed to provide illumination forward of the vehicle under conditions of fog, rain, snow, or dust.

3.2 GRADIENT

A measure of the change in light level over a change in location within the beam. It is an objective means to measure cutoff sharpness and determine cutoff location.

3.3 CUTOFF

A generally horizontal, visual/optical aiming cue in the beam that marks a separation between areas of higher and lower luminance.

3.4 CUTOFF LINE

The line where the maximum vertical photometric gradient is located.

3.5 ASYMMETRICAL LAMPS

Specifically designed lamps intended to be used together on a vehicle having beam patterns that are not symmetrical with respect to the vertical axis through H-V.

3.6 SYMMETRICALLY OPPOSITE LAMPS

Lamps with beam patterns that are mirror images of each other with respect to the vertical axis through H-V.

3.7 HARMONIZED FRONT FOG LAMP

A lamp for use with or without headlamps providing illumination forward of the vehicle under adverse weather conditions designed to harmonize with international front fog lamp requirements.

4. LIGHTING IDENTIFICATION CODE, MARKINGS AND NOTICES

Front fog lamps meeting the requirements of Photometry Figure 1 of this document may be identified by the code “F” in accordance with SAE J759. Front fog lamps meeting the requirements of Photometry Figure 2 of this document may be identified by the code “F3” in accordance with SAE J759.

5. TESTS

5.1 Test Voltage

The test voltage shall be the design voltage ±0.1 Vrms measured at the terminals of the lamp under test unless otherwise specified.

5.2 The following test procedures of SAE J575 apply to this document; however, front fog lamps designed for universal mounting applications or for vehicles having an overall width greater than 2032 mm shall be tested according to test procedures of SAE J2139

5.2.1 Vibration Test

5.2.2 Moisture Test

5.2.3 Dust Test

5.2.4 Corrosion Test

5.2.5 Photometry Test

The lamp shall be mounted on a test fixture, which simulates the vehicle mounting system and any optically significant surrounding structures (e.g., grille, fascia, etc.) in its design operating position and orientation, at a distance of at least 10 m from the photometer.

Light sources used for testing shall meet the requirements of SAE J575. For lamps requiring incandescent bulbs, accurate rated bulbs operated at their rated luminous flux based on a design voltage of 13.2 volts shall be used. Alternatively, an accurate rated incandescent bulb operated at its rated luminous flux based on a design voltage of 12.8 volts can be used for testing provided that the photometric candela measurements are scaled by a factor of 1.10.

The optical axis of the front fog lamp to be tested shall be centered horizontally on the photometer axis with maximum gradient positioned as determined in 5.2.5.1.

5.2.5.1 Gradient Measurement Procedure

Conduct a vertical scan of the lamp beam pattern along the V-V line and at 1 degree right and 1 degree left of the V-V line over a sufficient vertical distance to locate the maximum gradient and determine the shape of the gradient curve. The gradient G_{log} should be calculated using the mathematical expression: $G_{log} = \log_{10} I(\alpha) - \log_{10} I(\alpha+0.1)$. Where I is the measured candela value and α is the vertical angular position in degrees. Plot the results G_{log} vs. α.

5.2.5.2 Gradient Position in the Beam Pattern

The lamp aim shall be adjusted until the vertical angular position at which the maximum gradient measured along the V-V line is located at 0.75 degree down for a front fog lamp designed to conform to the requirements of photometry Figure 1 of this document or 1 degree down for a front fog lamp designed to conform to the requirements of photometry Figure 2 of this document. The front fog lamp shall then be tested photometrically per SAE J575.

5.2.5.3 If the front fog lamp is combined with a headlamp such that it cannot be aimed separately from the headlamp, the headlamp shall be aimed correctly and the front fog lamp shall then be photometered per SAE J575.

5.2.6 Impact Test

5.2.7 Chemical Resistance Test

5.2.8 Abrasion Test of Plastic Headlamp Lens Material

5.2.9 Thermal Cycle Test

5.2.10 Humidity Test

5.2.11 Internal Heat Test

5.3 The following test procedures of SAE J1383 as specified for headlamps apply to this document:

5.3.1 Aiming Adjustment Test

5.3.2 Color Test

SAE J578 applies for this document.

5.4 Plastic Materials

Plastic materials used in optical parts shall be tested in accordance with the procedures in SAE J576.

5.5 Sealed Beam Unit Tests

Sealed beam units designed for use as front fog lamps are not subject to moisture, dust, and corrosion tests.

6. REQUIREMENTS

6.1 Test Voltage

All performance requirements shall be met at the design voltage as measured at the terminals of the front fog lamp unless otherwise specified.

6.2 SAE J575 Requirements or SAE J2139 Requirements

A device, when tested in accordance with the test procedures specified in Section 5.2, shall meet the following requirements of SAE J575 or SAE J2139, whichever is applicable:

6.2.1 Vibration

6.2.2 Moisture

6.2.3 Dust

6.2.4 Corrosion

6.2.5 Photometry

6.2.5.1 Gradient - The lamp shall be designed to conform to the following requirements:

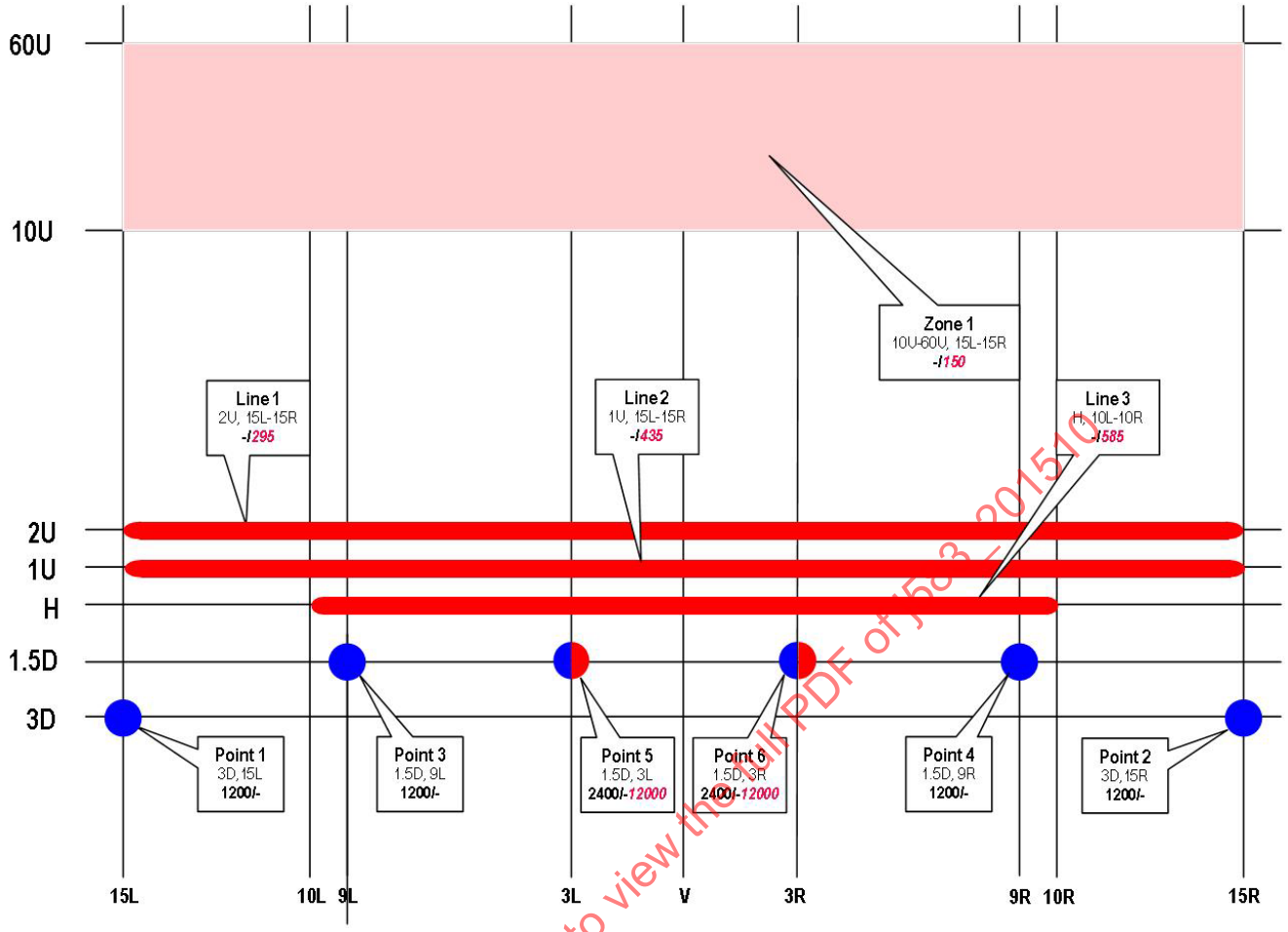
6.2.5.1.1 The maximum vertical gradient G_{log} along the V-V line as measured in Section 5.2.5.1 shall be ≥ 0.08.

6.2.5.1.2 The graphical plot of G_{log} vs. α in $\log_{10}$ units shall demonstrate a well-defined single peak.

6.2.5.1.3 The cutoff line shall be essentially flat from 2.5L to 2.5R. The vertical location of the highest gradient at the ends of the minimum width shall be within ± 0.2° of the vertical location of the maximum gradient measured at V-V.

6.2.5.2 Light Distribution for Front Fog Lamp

The lamp shall be designed to conform to the light intensity distribution (candela) values as shown in Figure 1 when tested in accordance with section 5.2.5. If the front fog lamp does not pass the photometric requirements of Figure 1, it may be re-aimed vertically, provided the location of the maximum gradient falls within the range of 0.5 degree down to 1.0 degree down.



Notes:
1. A tolerance of ±0.25 degrees in location is allowed at any test points or lines.
2. A scan shall be performed in Zone 1 in 1-degree increments both horizontally and vertically. If any point exceeds 150 cd during the scan, a maximum of 600 cd is permissible if contained within a ±2-degree angle.
3. All-line scans are to be performed on lines 1,2 and 3 for maximum cd.
4. Values shown in **black** (bold) denote minimum cd values. Values shown in **red** (bold italics) denote maximum cd values.

Figure 1 – Photometric requirements for front fog lamps luminous intensity (cd)

6.2.5.2.1 Asymmetrical Lamps

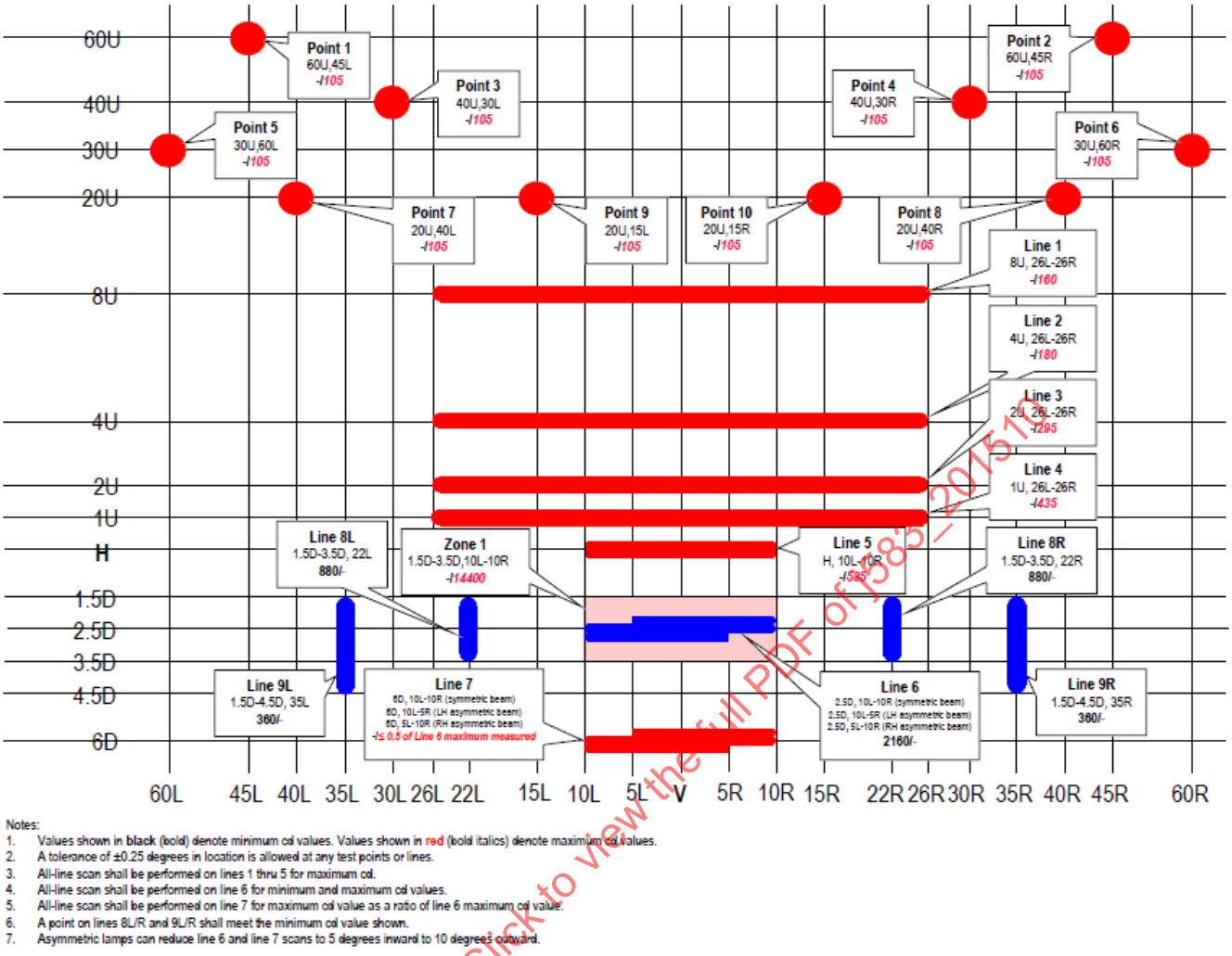
Sum the left and right hand lamp test point 3D/15L light intensities and the left and right hand lamp test point 3D/15R light intensities. The sum of the recorded candela values at 3D/15L and the sum of the recorded candela values at 3D/15R shall each equal or exceed twice the requirement for Point 7.

6.2.5.2.2 Symmetrically Opposite Lamps

Sum the test points 3D/15L and 3D/15R light intensities for a single lamp. The sum of the recorded candela values shall equal or exceed twice the requirement for Point 7.

6.2.5.3 Light Distribution for Harmonized Front Fog Lamp

The lamp shall be designed to conform to the light intensity distribution (candela) values as shown in Figure 2 when tested in accordance with Section 5.2.5. If the front fog lamp does not pass the photometric requirements of Figure 2, it may be re-aimed vertically, provided the location of the maximum gradient falls within the range of 0.75 degree down to 1.25 degree down.



Notes:
1. Values shown in **black** (bold) denote minimum cd values. Values shown in **red** (bold italics) denote maximum cd values.
2. A tolerance of ±0.25 degrees in location is allowed at any test points or lines.
3. All-line scan shall be performed on lines 1 thru 5 for maximum cd.
4. All-line scan shall be performed on line 6 for minimum and maximum cd values.
5. All-line scan shall be performed on line 7 for maximum cd value as a ratio of line 6 maximum cd value.
6. A point on lines 8L/R and 9L/R shall meet the minimum cd value shown.
7. Asymmetric lamps can reduce line 6 and line 7 scans to 5 degrees inward to 10 degrees outward.

Figure 2 – Photometric requirements for harmonized front fog lamp luminous intensity (cd)

6.2.5.3.1 Asymmetrical Lamps

Sum the left and right hand lamp's 22L maximum light intensities and the left and right hand lamp's 22R maximum light intensities. The sum of the recorded candela values at 22L and the sum of the recorded candela values at 22R shall each equal or exceed twice the requirement for Line 8L. Sum the left and right hand lamp's 35L maximum light intensities and the left and right hand lamp's 35R maximum light intensities. The sum of the recorded candela values at 35L and the sum of the recorded candela values at 35R shall each equal or exceed twice the requirement for Line 9L.

6.2.5.3.2 Symmetrically Opposite Lamps

Sum the 22L and 22R maximum light intensities for a single lamp and sum the 35L and 35R maximum light intensities for a single lamp. The sum of the recorded candela values at 22 degrees shall equal or exceed twice the requirement for Line 8L. The sum of the recorded candela values at 35 degrees shall equal or exceed twice the requirement for Line 9L.

6.2.6 Impact Test

6.2.7 Chemical Resistance Test

6.2.8 Abrasion Test of Plastic Headlamp Lens Material