SAE International™

SURFACE VEHICLE STANDARD

SAE J2087 JAN2011

Issued 1991-08
Revised 2011-01

Superseding J2087 MAR2006

(R) Daytime Running Light

RATIONALE

This document was revised to incorporate changes to the new more user-friendly photometry format balloted and approved in June 2006. There are photometry requirements changes to this document. The current Table 1 – Photometric Requirements is replaced with the new format Figure 1 - Photometric Requirements for a Dedicated Lamp Providing the DRLF (Function) Having Effective Projected Luminous Lens Area of 200 cm_2 or Less, Figure 1 will allow closer harmonizing with the ECE DRL. Table 2 - Photometric Requirements is replaced with the new format Figure 2 Photometric Requirements for a Dedicated Lamp Providing the DRLF (Function) Having Effective Projected Luminous Lens Area More Than 200 cm_2. A Figure 3 - Photometric Requirements for a Turn Signal or Park Lamp Providing the DRLF (Function) has been added. This gives an alternate solution for Turn and/or Park functions, and is referenced in CMVSS 108, paragraph 47, as SAE J2087 1991 Table 2. In Figure 2 and 3 the HV value remains at 500 cd to harmonize with Canada and their latest updates to CMVSS 108 Which made reference to Table 1 in 6.2.1, SAE J2087 MAR2006, will be replaced with Figure 1 and reference to Table 2 in 6.2.2, SAE J2087 MAR2006, will be replaced with Figure 2.

The Lighting Identification Code has been updated to allow all marking codes from U.S. and Canada, as well as the SAE and ECE codes.

Section 6.7.4, DRL Function Location With Respect to Other Lamps, has had the ECE option of 40 mm separation between lighted edges added to the 100 mm separation requirement and the new reduced intensity option as opposed to switching the lamp off. This is done to comply with ECE requirements and the Canadian option to comply with the ECE requirement.

Changed “shall be” to “should be” in 8.4 to coincide with the guidelines section rather than a requirement.

Changed lower beam to low beam and upper beam to high beam to agree with revised SAE terminology.

Changed 5.7 to read …..photometer located at least 3 m from the point where the optical axis intersects the outer surface of the DRL lens.

Reworded 6.7.3 (b) and (c) to improve wording and make more easily understood

Changed 6.7.3(c) to read.. in the case of an high beam headlamp whose reduced luminous intensity at test point H-V is 2000 cd or less

There have been are several editorial updates and corrections made to parts of this document that have no effect on the technical content.

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http://www.sae.org/technical/standards/J2087_201101

Changed 6.7.2.to read; The device will conform when operated at 2.5X intensity and conforming to one of the front turn signal distribution figures, or when the device under test shall be designed to conform to the light intensity distribution (candela) values as shown in Figure 3 when tested accordance with 5.7 This change simplifies the design and use of turn signal lamps as DRL and will not exclude those already designed to Figure 3.

Changed in 6.7.3(b); not less than 50% to 40% to more accurately reflect paragraph 48 of CMVSS the voltage reduced to 75% which is approximately 40% intensity reduction.

Added “or Parking Lamp” to title of Figure 3

Reworded 6.9.1(c) to clarify and show compliance with FMVSS 108 and CMVSS 108

Removed from 7.1.2 the words “yellow colored” since some manufacturers are using the blue high beam telltale

Expanded 7.3.2 min and max range of mounting to harmonize with all possible U.S. Canadian, and ECE applications

In 8.2.3, added the words “and/or fog lamps” are switched on.

NOTE: For the purpose of alignment and harmonization of this SAE standard with requirements of Canadian regulation that makes installation of devices providing daytime running light function mandatory, this standard contains wording and figures that partially or entirely reproduce the text and figures from the draft Canada Motor Vehicle Safety Standard No. 108.

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1. SCOPE

This SAE Standard provides test procedures, requirements, and guidelines for a daytime running light (DRL) function.

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 724-776-4970 (outside USA), www.sae.org.

SAE J567 Lamp Bulb Retention System

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 J759 Lighting Identification Code

SAE J1050 Describing and Measuring the Driver's Field of View

SAE J2560 Forward Lighting Halogen Bulb Performance Requirements for Motor Vehicles

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 SAE Publications

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

SAE Lighting Committee DRL Test Reports, 1974–1989, nine separate reports

2.2.2 CIE Publications

Available from Commission Internationale de L'eclairage, CIE Central Bureau, Kegelgasse 27, 1030 Wien Austria, see also: national organizations of CIE in the case of the USA: United States National Committee of the CIE, c/o Ronald B. Gibbons, Virginia Tech Transportation Institute, 3500 Transportation Research Place, Blacksburg, VA 24061, U.S.A., e-mail: gibbons@vtti.vt.edu, http://www.cie-usnc.org

CIE TC4.13 Report Automobile Daytime Running Lights (DRL), Third Draft, July 1990

2.2.3 UMTRI Publications

Available abstracts, http://www.umich.edu/~industry/complete.html

2.2.4 United Nations UNECE Publications

Available from United Nations Economic Commission for Europe, Palais des Nations, CH-1211, Geneva 10, Switzerland, Tel: +41-0-22-917-12-34, http://www.unece.org/trans/main/wp29/wp29regs.html.

UNECE Regulation No. 48 Uniform Provisions Concerning the Approval of: Vehicles with Regard to the Installation of Lighting and Light-Signalling Devices

UNECE Regulation No. 87 Uniform Provisions Concerning the Approval of Daytime Running Lamps for Power-Driven Vehicles

2.2.5 CMVSS Publications

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

Canadian Motor Vehicle Safety Standard (CMVSS) 108 Lighting System and Retroreflective Devices

2.2.6 FMVSS Publications

Available from the Superintendent of Documents, U.S. Government Printing Office, 732 North Capitol Street, NW, Washington, DC 20401, http://www.gpoaccess.gov/cfr/index/html

CFR Title 49 Part 571.108; Lamps, Reflective Devices and Associated Equipment (FMVSS 108)

3. DEFINITIONS

3.1 DAYTIME RUNNING LAMP (DRL)

A lamp providing the daytime running light function.

3.2 DAYTIME RUNNING LIGHT FUNCTION (DRLF)

Steady burning light signal used to improve the conspicuity of a vehicle from the front and front-sides when the regular headlamps are not required for driving.

3.3 DAYTIME RUNNING LIGHT FUNCTION TELL-TALE

An indicator that provides a visual signal to advise the driver that only the lamps providing DRLF are operating.

4. LIGHTING IDENTIFICATION CODE, MARKINGS AND NOTICES

Lamps providing DRLF meeting the performance requirements of Section 6 of this document may be identified by the code DRL in accordance with SAE J759.

5. TESTS

SAE J575 is a part of this document. The following tests, from that document, are applicable with the modifications as indicated.

5.1 Vibration Test

5.2 Moisture Test

5.3 Dust Test

5.4 Corrosion Test

5.5 Warpage Test on Devices with Plastic Components

The bulb operation for this test shall be steady burning.

5.6 Color Test

White to Yellow as specified in SAE J578

5.7 Photometry

In addition to the test procedures stated in SAE J575, the following applies: Photometric measurements shall be made with the photometer located at least 3 m from the point where the optical axis intersects the outer surface of the DRL lens.

6. REQUIREMENTS

Performance Requirements

A DRL, when tested in accordance with the test procedures specified in Section 5, shall meet the following requirements:

6.1 Vibration

SAE J575.

6.2 Moisture

SAE J575.

6.3 Dust

SAE J575.

6.4 Corrosion

SAE J575.

6.5 Warpage

SAE J575.

6.6 Color

SAE J578. The color of the light from a DRL shall be white to yellow as specified in SAE J578.

6.7 Photometry

Shall meet requirements as tested per SAE J575 to the following lamp function types:

6.7.1 Dedicated DRL

The device under test shall be designed to conform to the light intensity distribution (candela) values as shown in Figure 1 or Figure 2 when tested accordance with 5.7.

6.7.2 Turn Signal or Parking Lamp Providing the DRLF

The device will conform when operated at 2.5X intensity and conforming to one of the front turn signal distribution figures, or when the device under test shall be designed to conform to the light intensity distribution (candela) values as shown in Figure 3 when tested accordance with 5.7.

6.7.3 Headlamp High or Low Beam Providing the DRLF

A headlamp providing daytime running light function shall have:

a. in case of low beam headlamp, not more than 100 percent of its designed photometric intensity when tested in accordance with SAE J575 or;

b. When using the low beam headlamps that are designed to meet SAE J1383 requirements to achieve DRLF, the light output from the lamp shall be reduced to the range of greater than 40% but less than 100% of the its designed photometric intensity values when tested in accordance with SAE J575. Such light output reduction requirement can be conformed at test point 1.5D-2R of the low beam headlamp.

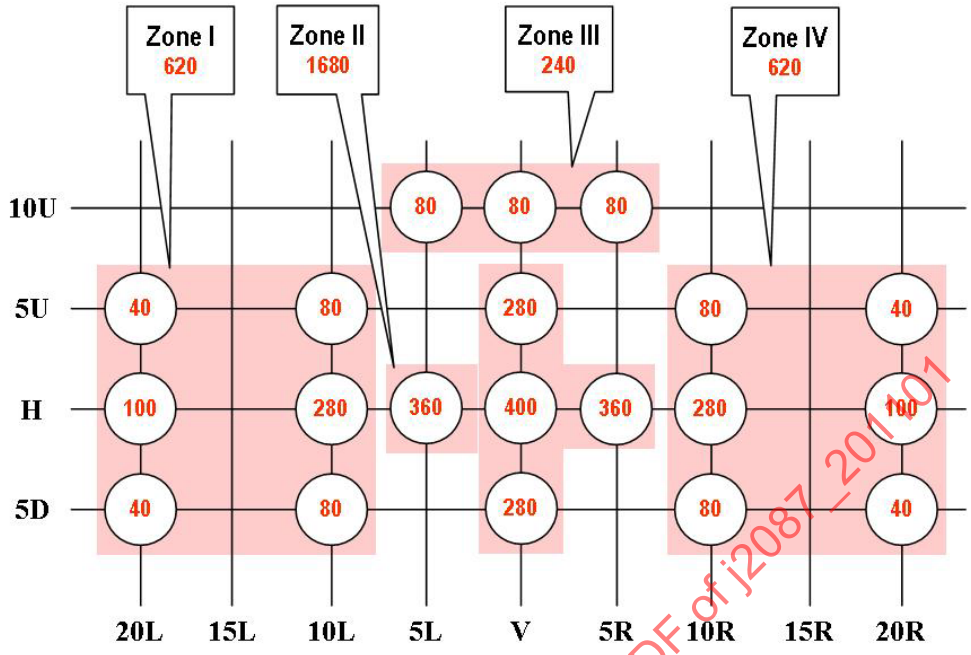
c. When using the high beam headlamps that are designed to meet SAE J1383 requirements to achieve DRLF, luminous intensity value shall be greater than 2000 cd but less than 7000 cd at test point of H-V when tested in accordance with SAE J575.

6.7.4 DRL Function Location With Respect to Other Lamps

If a DRL is located such that the lighted edge is within 100 mm of the optical center of the front turn signal lamp, or within 40mm of the lighted edge of the front turn signal lamp, then;

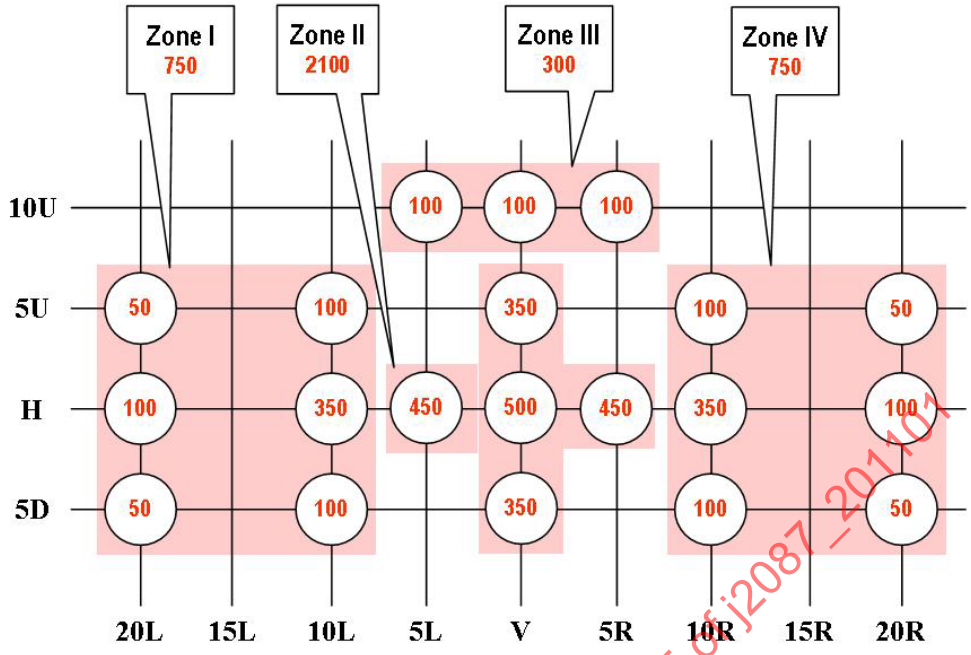
a. the front turn signal lamp shall meet 2.5 times photometry requirement, or

b. the DRL adjacent to the front turn signal lamp is extinguished or its intensity shall be reduced to a maximum of 250 cd or less at the H-V axis of the lamp during the turn signal operation.



1. The maximum luminous intensity shall be 2500 cd within the photometric pattern.
2. The Measured value at each test point shall not be less than 60% of the required minimum value shown for that individual test point location.
3. The sum of the luminous intensity measurements at each test point within a zone shall not be less than the zone total shown. The luminous intensity measurements at each discrete test point shown within the corresponding zone are the values used to calculate the specified zone total.
4. The listed maximum cd shall not be exceeded over any area larger than that generated by a 0.5 degree radius within the solid angle defined by the test points.
5. Multipliers are applicable per 6.2.4a
6. The off-mode applies per 6.2.4b

FIGURE 1 - PHOTOMETRIC REQUIREMENTS FOR DEDICATED LAMP PROVIDING DRLF
(with projected luminous lens area of 200 cm^2 or less)
Minimum Luminous Intensity (cd)



1. The maximum luminous intensity shall be 2500 cd within the photometric pattern.
2. The Measured value at each test point shall not be less than 60% of the required minimum value shown for that individual test point location.
3. The sum of the luminous intensity measurements at each test point within a zone shall not be less than the zone total shown. The luminous intensity measurements at each discrete test point shown within the corresponding zone are the values used to calculate the specified zone total.
4. The listed maximum cd shall not be exceeded over any area larger than that generated by a 0.5 degree radius within the solid angle defined by the test points.
5. Multipliers are applicable per 6.2.4a
6. The off-mode applies per 6.2.4b

FIGURE 2 - PHOTOMETRIC REQUIREMENTS FOR DEDICATED LAMP PROVIDING DRLF
(with projected luminous lens area greater than 200 cm^2)
Minimum Luminous Intensity (cd)