

	<b>SURFACE VEHICLE RECOMMENDED PRACTICE</b>	<b>J2510</b>	<b>CAN- CELLED JAN2006</b>
		Issued 2003-12 Cancelled 2006-01	
		Superseding J2510 DEC2003	
Harmonized Front Fog Lamp			

## RATIONALE

SAE J2510 has been merged into SAE J583. All requirements contained in SAE J2510 that were not in SAE J583 have been added.

## TABLE OF CONTENTS

1.	SCOPE.....	1
2.	REFERENCES.....	1
3.	DEFINITIONS.....	2
4.	LIGHTING IDENTIFICATION CODE.....	3
5.	TESTS.....	3
6.	PERFORMANCE REQUIREMENTS.....	4
7.	GUIDELINES.....	6

### 1. SCOPE

This SAE recommended practice provides performance requirements, test procedures, and design and installation guidelines for front fog lamps that harmonize with international front fog lamp requirements.

### 2. REFERENCES

#### 2.1 Applicable Documents

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

##### 2.1.1 SAE Publications

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

SAE J387	Terminology
SAE J575	Tests for Motor Vehicle Lighting Devices and Components
SAE J576	Plastic Materials for Use in Optical Parts Such as Lenses and Reflectors of Motor Vehicle Lighting Devices

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**SAE WEB ADDRESS:**

SAE J578	Color Specification
SAE J583	Front Fog Lamp
SAE J588	Turn Signal Lamp 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 Motor Vehicle Headlamps
SAE J2139	Tests for Lighting Devices and Components Used on Vehicles 2032 mm or More in Overall Width
SAE J2442	Harmonized Installation Provision for Installation of Lamps and Retro-Reflective Devices

#### 2.1.2 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.gc.ca](http://www.tc.gc.ca).

CMVSS 108 Canadian Motor Vehicle Safety Standard for Exterior Lighting

#### 2.1.3 ECE Publications

Available from United Nations Economic Commission for Europe, Palais des Nations, CH-1211, Geneva 10, Switzerland or at [www.unece.org](http://www.unece.org).

ECE R19 Uniform Provisions concerning the approval of Motor Vehicle Front Fog Lamps

### 3. DEFINITIONS

#### 3.1 Harmonized Front Fog Lamp

A lighting device 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.

#### 3.2 Gradient

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

Specifically designed pair of 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.

#### 3.5 Symmetrically Opposite Lamps

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

#### 4. LIGHTING IDENTIFICATION CODE

A front fog lamp meeting this recommended practice shall be identified by the code "F3" in accordance with SAE J759.

#### 5. TESTS

##### 5.1 Test Voltage

The test voltage shall be the lamp design voltage  $\pm 0.1$  V DC measured at the terminals of the lamp under test unless otherwise specified.

5.2 The following tests of SAE J575 apply to this recommended practice; however, front fog lamps designed for universal mounting applications or for vehicles having an overall width greater than 2032 mm shall be testing according to SAE J2139:

Vibration Test  
Moisture Test  
Dust Test  
Corrosion Test

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

Impact Test  
Aiming Adjustment Test  
Chemical Resistance Test  
Abrasion Test of Plastic Headlamp Lens Material  
Thermal Cycle Test  
Humidity Test  
Internal Heat Test

##### 5.4 Photometry Test

The front fog lamp shall be mounted on a test fixture which simulates the vehicle mounting system and any optically significant surrounding structures in its design operating position and orientation. The aperture of the receiving photocell shall be no greater than 1/1000 of the measuring distance. Light sources used for testing shall meet the requirements of SAE J575 with an accurate rated light source operated at rated luminous flux. The optical axis of the fog lamp to be tested shall be centered horizontally on the photometer axis with maximum gradient positioned as determined in Section 5.4.2.

##### 5.4.1 Gradient Measurement Procedure

Conduct a vertical scan of the front fog lamp beam pattern at a minimum distance of 10m from the photometer along the vertical line at 1 degree right and at 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:

$$G_{\log} = \log_{10} I(\alpha) - \log_{10} I(\alpha+0.1) \quad (\text{Eq. 1})$$

where:

$I$  is the luminous intensity in candela  
 $\alpha$  is the vertical angular position in degrees

Plot the results  $G_{\log}$  vs  $\alpha$ .

#### 5.4.2 Gradient Position in the Beam Pattern

The fog lamp shall be vertically adjusted such that the maximum gradient determined in Section 5.4.1 is located at 1.0 degree down. The fog lamp shall then be tested photometrically per SAE J575.

5.4.3 If the front fog lamp is part of a headlamp assembly and it can not be aimed separately from the headlamp, the headlamp shall be aimed to its correct setting and the front fog lamp shall then be photometered per SAE J575.

#### 5.5 Color Test

SAE J578 applies for this recommended practice.

#### 5.6 Plastic Materials

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

#### 5.7 Sealed Beam Unit Tests

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

### 6. PERFORMANCE REQUIREMENTS

#### 6.1 Test Voltage

All performance requirements except photometry shall be met at the lamp design voltage as measured at the terminals of the fog lamp.

#### 6.2 SAE J575 Requirements or J2139 Requirements

A front fog lamp, when tested in accordance with the test procedures specified in Section 5.2, shall meet the requirements in SAE J575 or SAE J2139 if tested according to SAE J2139:

##### 6.2.1 Vibration

##### 6.2.2 Moisture

##### 6.2.3 Dust

##### 6.2.4 Corrosion

#### 6.3 SAE J1383 Requirements

A device, when tested in accordance with the test procedures specified in Section 5.3, shall meet the following requirements in SAE J1383:

##### 6.3.1 Impact Test

##### 6.3.2 Aiming Adjustment Test

##### 6.3.3 Chemical Resistance Test

##### 6.3.4 Abrasion Test of Plastic Headlamp Lens Material

##### 6.3.5 Thermal Cycle Test

##### 6.3.6 Humidity Test

## 6.3.7 Internal Heat Test

## 6.4 Photometry

## 6.4.1 Gradient

The maximum vertical gradient  $G_{\log}$  as measured in Section 5.4.1 shall be  $> 0.08$ . The graphical plot of  $G_{\log}$  vs.  $\alpha$  in  $\log_{10}$  units shall demonstrate a well defined single peak. The cutoff shall be essentially flat from 2.5 degrees left to 2.5 degrees right.

## 6.4.2 Light Distribution

The fog lamp shall be designed to conform to the light intensity distribution (candela) values as shown in Table 1 when tested in accordance with Section 5.4.

If the front fog lamp does not meet the photometric requirements per Table 1, it may be re-aimed vertically, provided the location of the maximum gradient falls within the range of 0.75 degrees down to 1.25 degrees down.

TABLE 1 - PHOTOMETRIC REQUIREMENTS FOR HARMONIZED FRONT FOG LAMP

Designated Line or Zone	To Comply	Vertical Position	Horizontal Position	Candela (cd) Max	Candela (cd) Min
Zone	Entire Zone	35L to 35R	10U to 60U	125	-
Line 1	All line	26L to 26R	8U	125	-
Line 2	All line	26L to 26R	4U	150	-
Line 3	All line	26L to 26R	2U	240	-
Line 4	All line	26L to 26R	1U	360	-
Line 5	All line	10L to 10R	0	480	-
Line 6	All line	10L to 10R	2.5D	-	2400
Line 7	All line	10L to 10R	6.0D	< 0.5 of Line 6 max	-
Line 8	A point on line	22L & 22R	1.5D to 3.5D	-	1000
Line 9	A point on line	35L & 35R	1.5D to 4.5D	-	400
Zone	Entire Zone	10L to 10R	1D to 3 D	12000	-

1. A tolerance of  $\pm 0.25$  degree in location is allowed at any testing point.
2. In the zone defined by 35L to 35R and 10U to 60U, 550 cd is permitted within a 2-degree conical angle.

6.4.3 If two lamps of asymmetrical or symmetrically opposite design are used, compliance with the requirements for the fog lamp of lines 8 and 9 shall be determined as the follows:

## 6.4.3.1 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 8.

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 9.

## 6.4.3.2 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.