SAE International™

SURFACE VEHICLE STANDARD

SAE J588 JUL2008

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Superseding J588 MAR2000

(R) Turn Signal Lamps for Use on Motor Vehicles Less than 2032 mm in Overall Width

RATIONALE

-- Moved rationale to the beginning of the document as required in the template.
-- Added Table of Contents.
-- Removed Foreword and Introduction since they no longer apply to this document.

This document was revised to incorporate changes based on comments received from the June, 2006 balloted document and changes to the photometric tables so they are replaced with the “new user friendly” photometric figures balloted on October 7, 2006.

- Section 2.1.1 SAE telephone numbers and web site added.
- Section 2.2.1 SAE telephone numbers and web site added.
- Federal publication web site added.
- European Community web site added.
- Section 3.1 and 3.2 Definition of turn signal lamps was revised.
- Section 5.1.5.1 thru 5.1.5.3.2 Removed underlining, bold text, and made numbering consistent. Figures 1, 2, and 3 etc. replaced Tables 2A and 2B.
- Section 5.1.5.3 Removed “size 2 or 3 lamps or”.
- Section 5.1.5.3.1 removed statement on size 2 or 3 lamps – redundant.
- Renumbered subsequent paragraphs.
- Section 6.1 Statement on the requirements for LED lamps added.
- Section 6.1.5.1 and 6.1.5.2 Bold lettering removed. Figures 1, 2, 3, etc. replaced Tables 2A and 2B.
- Section 6.1.5.4 corrected reference to 6.1.5.3.
- Table 2 was completely changed to the new format. Figures 1, 2, and 3, Figures 1F, 2F and 3F, and Figures 1YR, 2YR, and 3YR. These figures show the location of test points and zones.
- Section 6.4.2 The EPLLA was changed to 50 sq cm from 37.5 sq cm to align with FMVSS 108.
- Section 6.5.2a Wording was modified for consistency with FMVSS 108.
- Figure 4 correction was made to the location of 15° angles.
- Section 7.1.2 was added to identify stop signal priority to turn signal.
- Section 7.1.2.1 Turn signal has priority since typically there are two other stop lamps to signal deceleration or a stopped vehicle.

TABLE OF CONTENTS

1. SCOPE

This SAE Standard provides test procedures, requirements, and guidelines for turn signal lamps intended for use on vehicles of less than 2032 mm in overall width.

2. REFERENCES

2.1 Applicable Publications

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 J759 Lighting Identification Code

SAE J1319 Fog Tail Lamp (Rear Fog Light) Systems

SAE J1889 L.E.D. Signal and Marking Lighting Devices

2.2 Related Publications

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

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 J222 Parking Lamps (Front Position Lamps)

SAE J387 Terminology—Motor Vehicle Lighting

SAE J585 Tail Lamps (Rear Position Lamps) for Use on Motor Vehicles Less Than 2032 mm in Overall Width

SAE J586 Stop Lamps for Use on Motor Vehicles Less than 2032 mm in Overall Width

SAE J592 Sidemarker Lamps for Use on Road Vehicles Less than 2032 mm in Overall Width

SAE J594 Reflex Reflectors

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

SAE J1957 Center High Mounted Stop Lamp Standard for Vehicles Less than 2032 mm Overall Width

SAE J2040 Tail Lamps (Rear Position Lamps) for Use on Vehicles 2032 mm or More in Overall Width

SAE J2042 Clearance, Sidemarker, and Identification Lamps for Use on Motor Vehicles 2032 mm or More in Overall Width

SAE J2261 Stop Lamps and Front- and Rear-Turn Signal Lamps for Use on Motor Vehicles 2032 mm or More in Overall Width

2.2.2 Federal Publications

Available from the Superintendent of Documents, U.S. Government Printing Office, Mail Stop: SSOP, Washington, DC 20402-9320, http://www.gpoaccess.gov/cfr/index/html.

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

2.2.3 European Community / United Nations 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.

ECE Regulation No. 6 Uniform Provisions Concerning the Approval of Direction Indicators for Motor Vehicles and Their Trailers

3. DEFINITIONS

3.1 Turn Signal Lamps

Turn signal lamps are the signaling elements of a turn signal system which indicate an intention to turn or change vehicle direction by giving a flashing light on the side toward which the turn or lane change will be made.

3.2 Multiple lamp arrangement is defined in SAE J387.

3.3 Turn Signal Lamp arrangement means all the elements or components that comprise the turn signal lamp function.

3.4 The terminology contained in SAE J387 shall apply to this standard.

4. LIGHTING IDENTIFICATION CODE

Turn signal lamps for use on vehicles less than 2032 mm in overall width may be identified by the codes I, I3, I4, or I5, in accordance with SAE J759.

5. TESTS

5.1 The following tests in SAE J575 are applicable with modifications as indicated.

5.1.1 Vibration Test

5.1.2 Moisture Test

5.1.3 Dust Test

5.1.4 Corrosion Test

5.1.5 Photometry Test

5.1.5.1 Test distance shall be at least 3 m or at least 10 times the maximum linear extent of the effective projected luminous area of the signal lamp, whichever is greater. The H-V axis shall be taken as parallel to the axis of reference of the lamp as mounted on the vehicle.

TABLE 1 - EFFECTIVE PROJECTED LUMINOUS AREAS

Effective Projected Luminous Area	Size
Less than 225 cm^2	1
225 to 450 cm^2	2
Greater than 450 cm^2	3

5.1.5.2 The photometric requirements specified in Figures 1, 2, 3, 1YR, 2YR, 3YR, 1F, 2F, and 3F shall be applied based on the effective projected luminous area for the entire turn signal function on each side of the vehicle as depicted in Table 1 and the following paragraphs.

5.1.5.3 Photometric measurements of multiple lamp arrangements shall be made by one of the following methods:

5.1.5.3.1 If a multiple lamp arrangement on each side of the vehicle is used to obtain the turn signal function, all lamps shall be photometered together provided that a line from the optical axis of each lamp to the center of the photometer sensing device does not make an angle of more than 0.6 degree with the photometer H-V axis. When lamps are photometered together, the H-V axis shall intersect the midpoint between their optical axes. If these conditions are not met use the following method.

5.1.5.3.2 Each lamp shall be photometered separately by aligning the axis of each lamp with the photometer. The photometric measurement for the multiple lamp arrangement shall be determined by adding the photometric outputs from each individual lamp at corresponding test points.

5.1.5.4 The test methods and procedures of SAE J1889 shall also be applied if LED light sources are present in the turn signal lamp(s).

5.1.6 Warpage Test for Devices with Plastic Components

5.2 Color Test

The color of turn signal lamps shall be determined by SAE J578.

5.3 Materials Test

Plastic materials used in the optical parts shall be tested according to SAE J576.

6. REQUIREMENTS

6.1 Performance Requirements

A device when tested in accordance with the test procedures specified in Section 5, shall meet the following requirements per SAE J575; in addition lamps with LED light sources shall also meet the requirements of J1889.

6.1.1 Vibration

6.1.2 Moisture

6.1.3 Dust

6.1.4 Corrosion

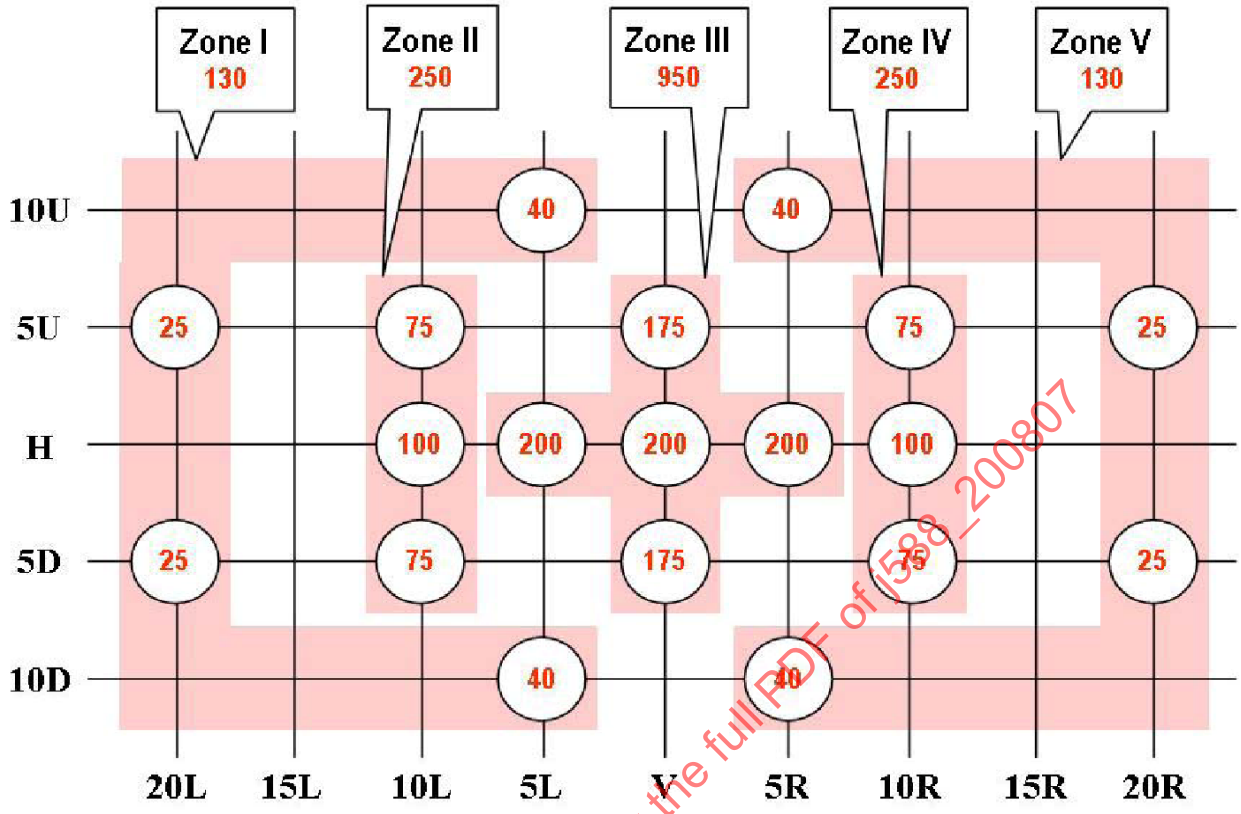
6.1.5 Photometry

6.1.5.1 The lamp shall be designed to conform to the zone total photometric requirements of the corresponding figures: Figure 1, 2 or 3 (Rear Red) or Figure 1YR, 2YR or 3YR ((Rear Yellow) or Figure 1F, 2F or 3F (Front Yellow) Photometric Requirements and their footnotes. The summation of the luminous intensity measurements at the test points in a zone shall be at least the value shown. The lamp size, either 1, 2 or 3 is determined by its effective projected luminous area from Table 1.

6.1.5.2 A multiple lamp arrangement on each side of the vehicle may be used to meet the photometric requirements of a turn signal lamp. If multiple lamps are used and the distance between optical axes does not exceed 560 mm for two lamp arrangements and does not exceed 410 mm for three lamp arrangements, then the entire lamp arrangement must be used to meet the photometric requirements for the corresponding figure and size of lamp,. Two lamps meet Size 2; 3 lamps meet Size 3 respectively (see Figures 2, 2YR or 2F and Figures 3, 3YR or 3F). If the distance between adjacent optical axes exceeds the previous dimensions, each lamp shall comply with the photometric requirements in the corresponding Figure 1 – Size 1, Figure 1YR – Size 1 or Figure 1F – Size 1.

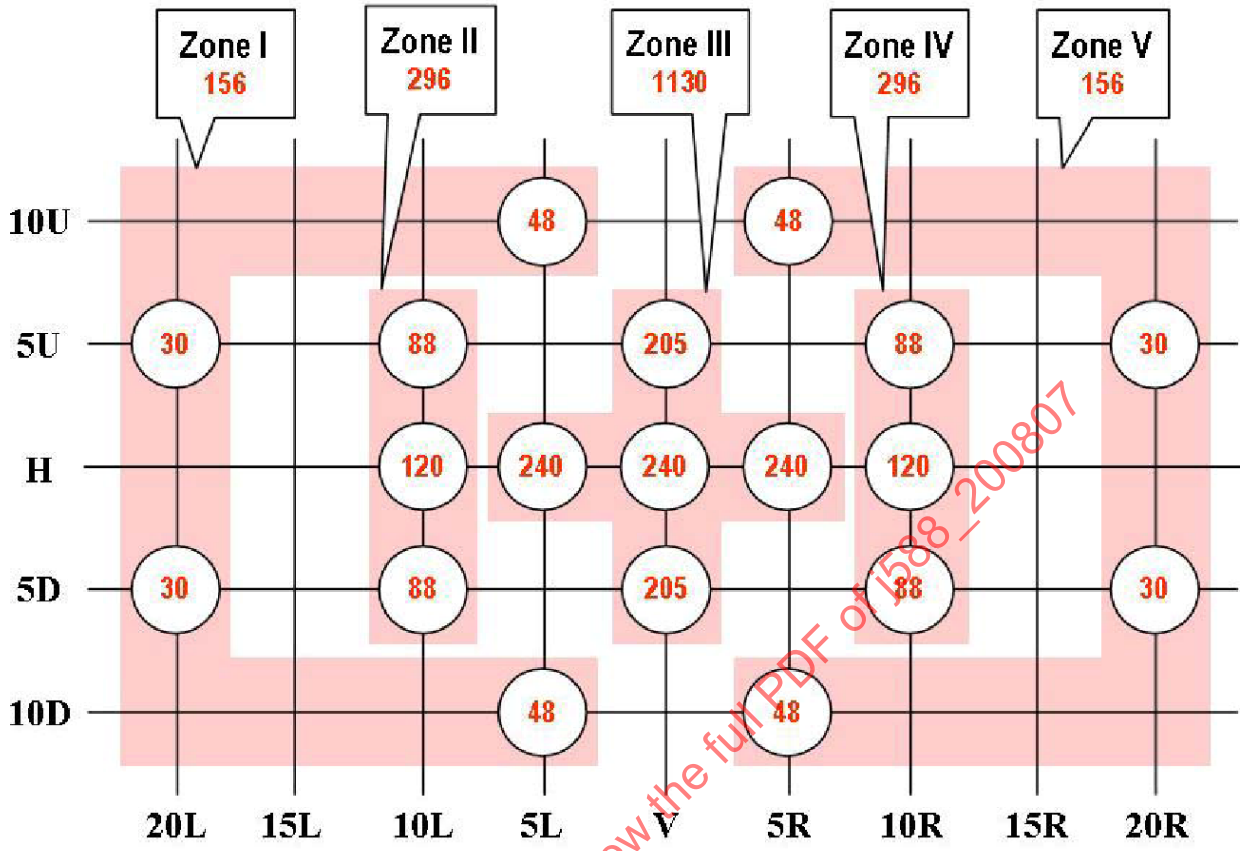
6.1.5.3 When a tail lamp or parking lamp is combined with the turn signal lamp, the signal lamp shall not be less than three times the luminous intensity (a) of the tail lamp at any test point, or (b) of the parking lamp at any test point on or above horizontal except that at H-V, H-5L, H-5R, and 5U-V, the signal lamp shall not be less than five times the luminous intensity of the tail lamp or parking lamp. If a size 2, 3 or multiple lamp arrangement is used and the distance between optical axes for both the tail lamp (parking lamp) and the turn signal is within the dimensions specified in 6.1.5.2, the ratio of the signal to the tail lamp (parking lamp) shall be computed with the entire lamp or all the lamps lighted. If a multiple lamp arrangement is used and the distance between optical axes for one of the functions exceeds the dimensions specified in 6.1.5.2, the ratio shall be computed for only those lamps where the tail lamp or parking lamp and turn signal are optically combined. When the tail lamp is combined with the turn signal lamp, and the maximum luminous intensity of the tail lamp is located below horizontal and within an area generated by a 0.5 degree radius around a test point, the ratio for the test point may be computed using the lowest value of the tail lamp luminous intensity within the generated area.

6.1.5.4 In the case where the front turn signal is mounted in close proximity to the low beam headlamp or any additional lamp used to supplement or used in lieu of the low beam, such as an auxiliary low beam or fog lamp, Table 2 multipliers shall be used to modify Figures 1F, 2F or 3F intensity values.



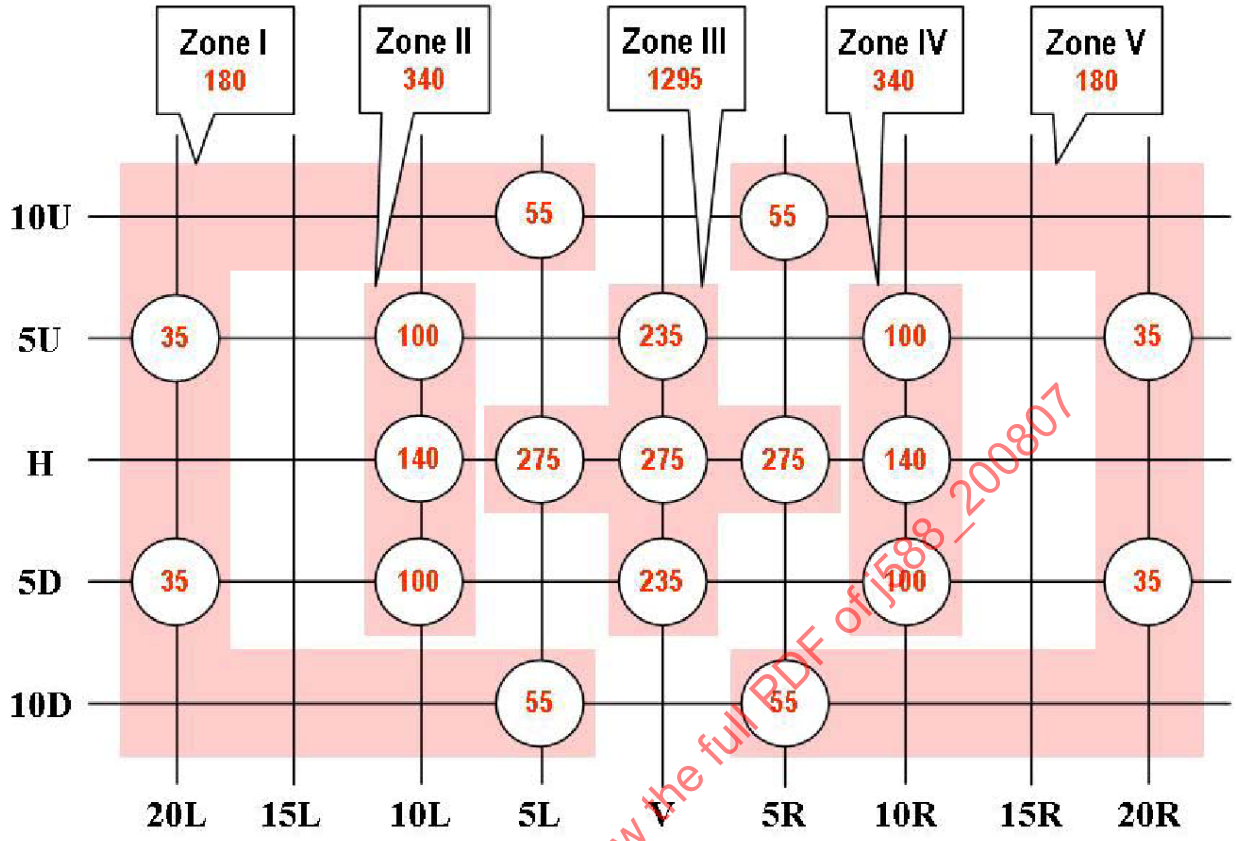
1. The Measured value at each test point shall not be less than 60% of the required minimum value for that individual test point location.
2. The sum of the luminous intensity measurements at each test point within a zone shall not be less than the zone total shown. The luminous intensity measurements at each discrete test point shown within the corresponding zone are the values used to calculate the specified zone total.
3. Ratio requirements of 6.1.5.3 apply.
4. Multiple lamps requirements of 6.1.5.2 apply.
5. Multipliers of Table 2 are applicable per 6.1.5.4

FIGURE 1F - FRONT SIGNAL LAMPS (YELLOW) PHOTOMETRIC REQUIREMENTS
Minimum Luminous Intensity (cd) Size 1 (less than 225 cm^2)



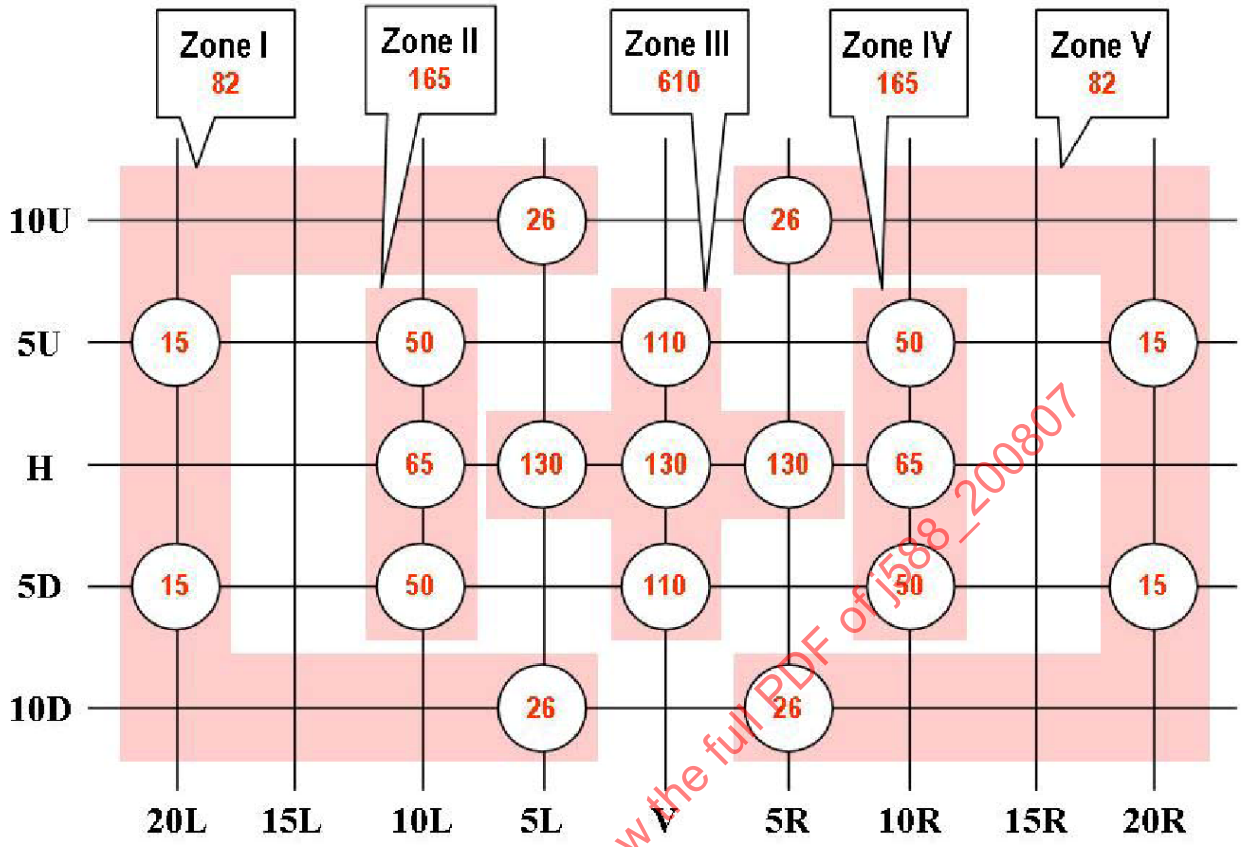
1. The Measured value at each test point shall not be less than 60% of the required minimum value for that individual test point location.
2. The sum of the luminous intensity measurements at each test point within a zone shall not be less than the zone total shown. The luminous intensity measurements at each discrete test point shown within the corresponding zone are the values used to calculate the specified zone total.
3. Ratio requirements of 6.1.5.3 apply.
4. Multiple lamps requirements of 6.1.5.2 apply
5. Multipliers of Table 2 are applicable per 6.1.5.4

FIGURE 2F - FRONT SIGNAL LAMPS (YELLOW) PHOTOMETRIC REQUIREMENTS
Minimum Luminous Intensity (cd) Size 2 (225 to 450 cm^2)



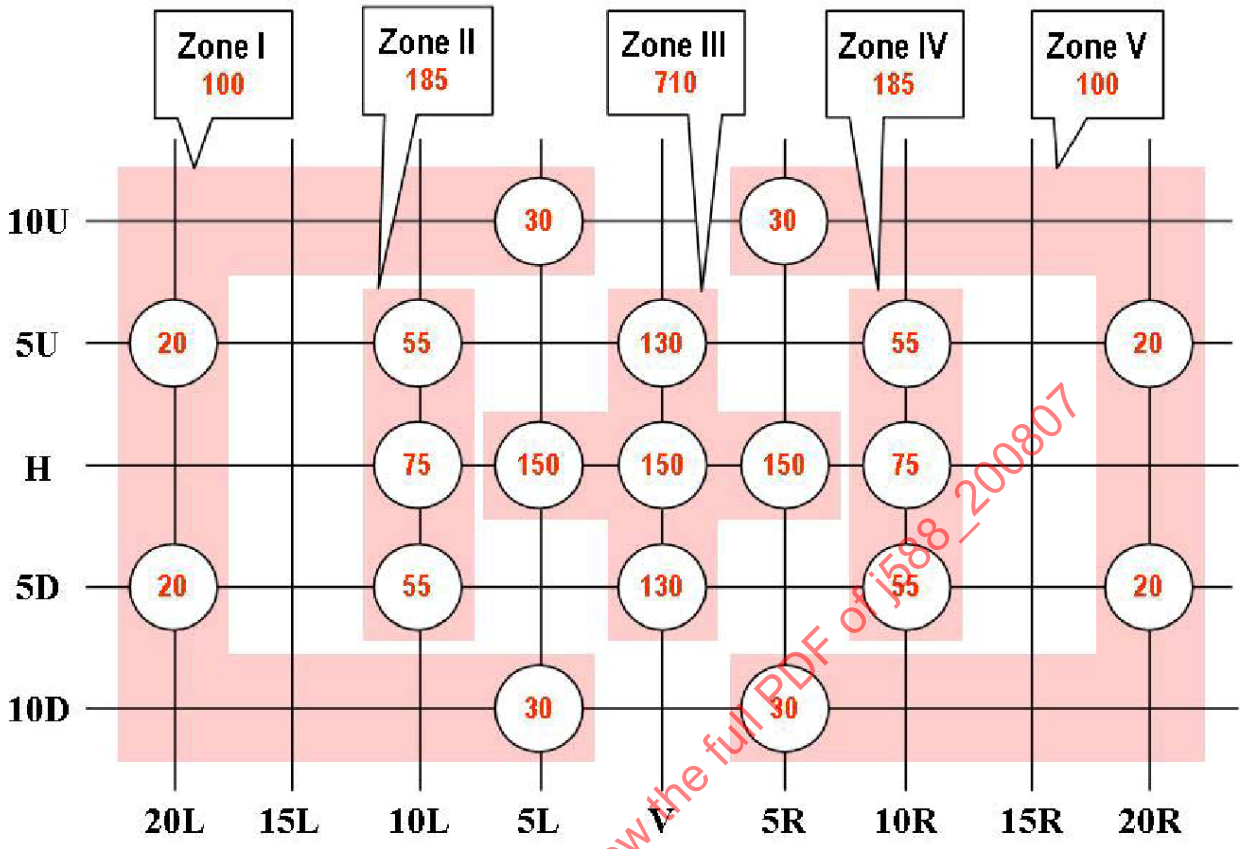
1. The Measured value at each test point shall not be less than 60% of the required minimum value for that individual test point location.
2. The sum of the luminous intensity measurements at each test point within a zone shall not be less than the zone total shown. The luminous intensity measurements at each discrete test point shown within the corresponding zone are the values used to calculate the specified zone total.
3. Ratio requirements of 6.1.5.3 apply.
4. Multiple lamps requirements of 6.1.5.2 apply.
5. Multipliers of Table 2 are applicable per 6.1.5.4

FIGURE 3F - FRONT SIGNAL LAMPS (YELLOW) PHOTOMETRIC REQUIREMENTS
Minimum Luminous Intensity (cd) Size 3 (greater than 450 cm^2)



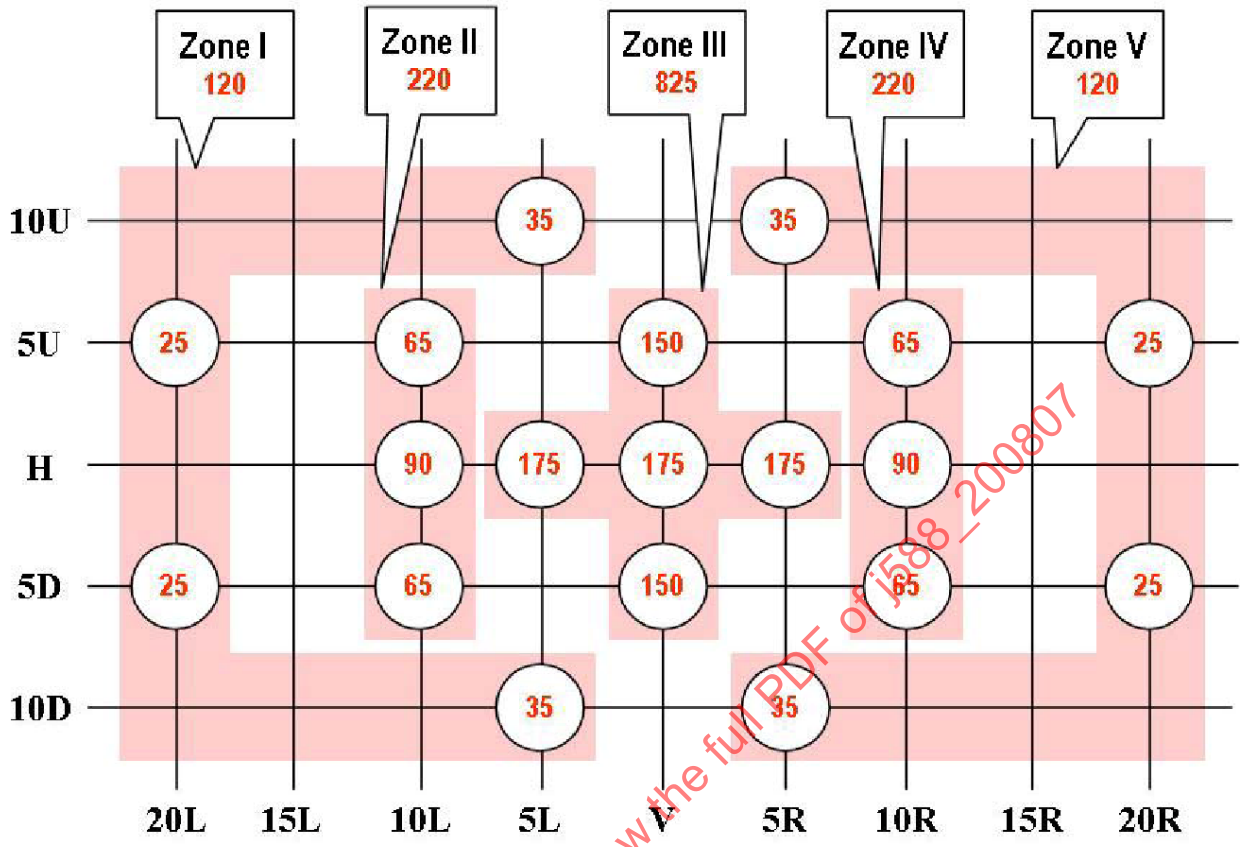
1. The maximum luminous intensity is 750 cd within the photometric pattern shown.
2. The Measured value at each test point shall not be less than 60% of the required minimum value for that individual test point location.
3. The sum of the luminous intensity measurements at each test point within a zone 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 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. Ratio requirements of 6.1.5.3 apply.
6. Multiple lamps requirements of 6.1.5.2 apply.

FIGURE 1YR - REAR SIGNAL LAMPS (YELLOW) PHOTOMETRIC REQUIREMENTS
Minimum Luminous Intensity (cd) Size 1 (less than 225 cm^2)



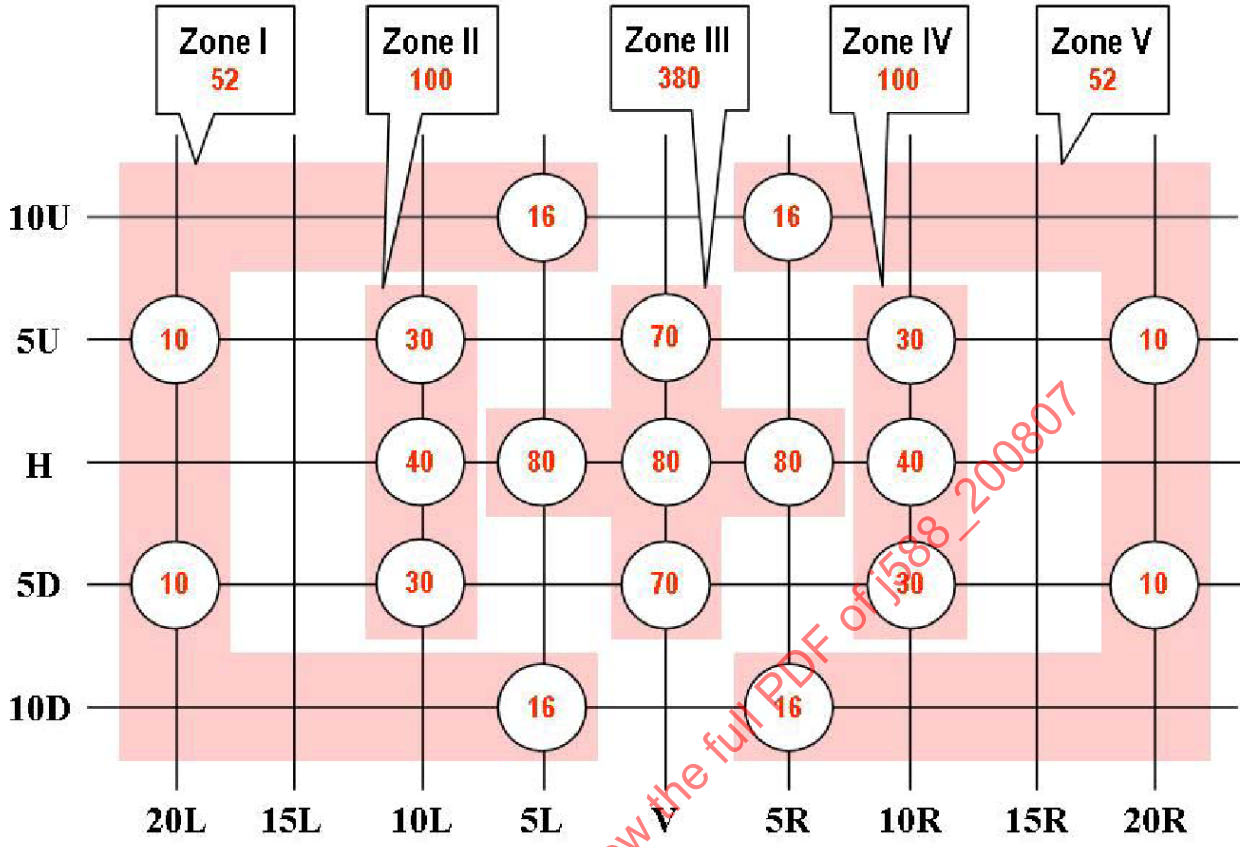
1. The maximum luminous intensity is 900 cd within the photometric pattern shown.
2. The Measured value at each test point shall not be less than 60% of the required minimum value for that individual test point location.
3. The sum of the luminous intensity measurements at each test point within a zone 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 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. Ratio requirements of 6.1.5.3 apply.
6. Multiple lamps requirements of 6.1.5.2 apply.

FIGURE 2YR - REAR SIGNAL LAMPS (YELLOW) PHOTOMETRIC REQUIREMENTS
Minimum Luminous Intensity (cd) Size 2 (225 to 450 cm^2)



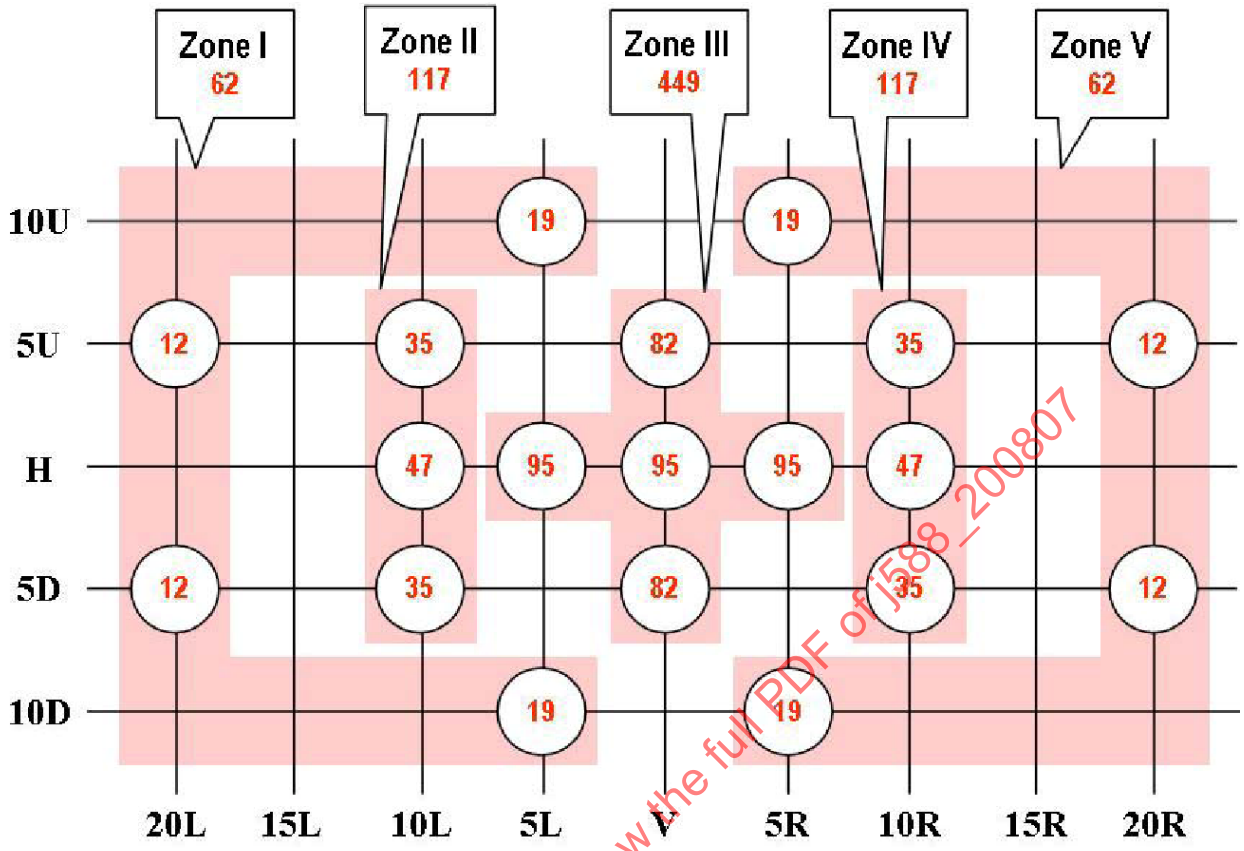
1. The maximum luminous intensity is 1050 cd within the photometric pattern shown.
2. The Measured value at each test point shall not be less than 60% of the required minimum value for that individual test point location.
3. The sum of the luminous intensity measurements at each test point within a zone 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 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. Ratio requirements of 6.1.5.3 apply.
6. Multiple lamps requirements of 6.1.5.2 apply.

FIGURE 3YR - REAR SIGNAL LAMPS (YELLOW) PHOTOMETRIC REQUIREMENTS
Minimum Luminous Intensity (cd) Size 3 (greater than 450 cm^2)



1. The maximum luminous intensity is 300 cd within the photometric pattern shown.
2. The Measured value at each test point shall not be less than 60% of the required minimum value 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 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. Ratio requirements of 6.1.5.3 apply.
6. Multiple lamps requirements of 6.1.5.2 apply.

FIGURE 1 - REAR SIGNAL LAMPS (RED) PHOTOMETRIC REQUIREMENTS
Minimum Luminous Intensity (cd) Size 1 (less than 225 cm^2)



1. The maximum luminous intensity is 360 cd within the photometric pattern shown.
2. The Measured value at each test point shall not be less than 60% of the required minimum value 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 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. Ratio requirements of 6.1.5.3 apply.
6. Multiple lamps requirements of 6.1.5.2 apply.

FIGURE 2 - REAR SIGNAL LAMPS (RED) PHOTOMETRIC REQUIREMENTS
Minimum Luminous Intensity (cd) Size 2 (225 to 450 cm^2)