

SAE J1322 JUN85

**Preferred Conversion
Values for
Dimensions in
Lighting — Inch-
Pound Units/SI**

SAE Information Report
Reaffirmed June 1985

SAE
J1322
JUN85

No part of this publication may be reproduced in any form,
in an electronic retrieval system or otherwise, without the
prior written permission of the publisher.

Copyright 1989 Society of Automotive Engineers, Inc.

**PREFERRED CONVERSION VALUES FOR DIMENSIONS IN LIGHTING--
INCH-POUND UNITS/SI**

1. SCOPE:

- ed. This information report is being issued to cover conversions¹ from inch-pound units to those in the Système International (SI) approach. Since all conversions cannot possibly be covered, the list contained in Section 4 is composed of the lighting oriented items which are found in SAE or Motor Vehicle Safety Standards (MVSS) in North America. This reference is to FMVSS in the United States and to CMVSS in Canada.

2. PURPOSE:

- ed. The purpose of this report is to give guidance for uniformity particularly to those organizations, governmental or otherwise, who may in the future have occasion to express present inch-pound units in metric or SI terms.

1N.B. These preferred conversion values do not alter the obligations imposed for compliance purposes by NHTSA and Transport Canada.

SAE Technical Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

3. BACKGROUND:

The unique character of standards for lighting is aptly illustrated by the requirement of MVSS 108, which provides that various devices "shall be designed to conform" to stipulated specifications. At one and the same time this requirement recognizes, among other things, that lighting items are more subjective than those in any other safety field and that the eye differentiates intensities, for example, on a gross rather than a narrow basis. Additionally, and realistically, some provisions have been derived empirically. A good example is the provision of SAE J586 that visibility of a stop lamp must include the device's having an "unobstructed projected illuminated area of outer lens surface, . . . at least 2 in² in extent, measured at 45 deg. . . .". Some time ago, SAE J586 provided merely that stop lamps must be visible from 45 deg; thus, the addition of a 2 in² requirement was an attempt to define the conditions under which a lamp could be considered as being visible. The 2 in² was determined by viewing a great number of satisfactory lamps already in existence and then picking, in a rounded-off form, a characteristic common to all of them. It is likely that a standard of 1.8 in² or 2.2 in² may in fact have been equally satisfactory. This is the reason that a slightly more rounded-off figure of 12.5 cm² (rather than the literal conversion of 12.9) is used in SAE J586d.

ed. Similarly, 8 in² may more logically be expressed as 50 cm² (instead of the more exact conversion of 51.6) on that day when inch-pound units may be eliminated entirely and initial designs done from a metric standpoint. In the same terms, a guideline of 10 ft for the minimum distance between a lamp filament and a photometer screen may be stated as 3 m.

A metric conversion generally should not increase the severity of a perfectly satisfactory standard which does not demand a strict go or no go in deciding whether to round up or down.

Yet another factor which argues for the adoption of preferred conversion values is the inexact nature of some commonly accepted techniques. 80°F by using common procedures converts to 27°C; yet, 27°C by applying the same principles becomes 81°F.

There are, however, instances in which the importance of a number is such that a most literal conversion is indicated. An example is that of the 80 in vehicle width. This dividing line currently occurs in so many laws, regulations, standards, etc. that a conversion to 2032 mm is the only reasonable path to follow at this time.

The dimensions contained in SAE specifications such as J571, J573, J602, J760, J1049, and J1132 demand more exact conversions, by their very nature. Such dimensions, therefore, are not covered in this information report. Similarly, units quoted from other sources--such as ASTM--are not covered here.

ed. Although SAE J916 sets forth conversion procedures that may apply to the vast majority of instances, this information report is intended to be an extension to J916 which recognizes that in some cases the use of rationalized numbers may be preferable to exact mathematical conversions.