

 SURFACE VEHICLE RECOMMENDED PRACTICE	SAE J845 JUN2013
	Issued 1963-01 Revised 2013-06 Superseding J845 NOV2007
(R) Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles	

RATIONALE

The definition of LIGHT SOURCE was renamed to EWD LAMP ASSEMBLY.

Test voltages were added to accommodate the electrical system voltages of industrial vehicles.

The flash rate limits were revised from “at least 1 Hz and not more than 4 Hz” to “at least 1.0 Hz and not more than 4.0 Hz” to eliminate rounding errors.

References to SAE J2139 were added as an alternative to SAE J575 to accommodate devices intended for vehicles wider than 2032mm.

A provision was added to allow the use of the wideband random vibration test defined in SAE J575 in place of the vibration test procedure specified in SAE J2139 for large devices, such as light bars, since these devices are too large to be accommodated on the vibration machine specified in SAE J2139.

A requirement was added that test samples which exhibit a partial outage of non-filament EWD lamp assemblies must still comply with the photometric requirements upon the completion of any of the required tests.

The photometric test procedure was revised to ensure that sources whose output increases prior to stabilizing will still comply with the photometric requirements at their lowest output levels.

The photometric test procedure was revised to clarify how optical warning devices containing multiple EWD lamp assemblies should be evaluated.

The optical warning device class definitions were revised to differentiate between omnidirectional and selective coverage devices.

The definition of pseudo-random flash pattern was added.

Requirements for pseudo-random flash patterns were added to section “FLASH RATE AND FLASH PATTERNS”.

Sections 5.7 and 6.7 were renamed “FLASH RATE AND FLASH PATTERNS”.

The “Optical Warning Devices Containing Multiple Light Sources” and “Flash Pattern Compliance” guidelines were moved from the Installation Guidelines section to the appropriate locations in Section 5, “Tests”.

SAE Technical Standards 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 revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2013 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
 Tel: +1 724-776-4970 (outside USA)
 Fax: 724-776-0790
 Email: CustomerService@sae.org
 http://www.sae.org

SAE WEB ADDRESS:

Full document details: [SAE J845_201306](http://www.sae.org)

SAE values your input. To provide feedback
 on this Technical Report, please visit
http://www.sae.org/technical/standards/J845_201306

1. SCOPE

This document provides design guidelines, test procedure references, and performance requirements for omnidirectional and selective coverage optical warning devices used on authorized emergency, maintenance and service vehicles. It is intended to apply to, but is not limited to, surface land vehicles.

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 J575	Test Methods and Equipment for Lighting Devices 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 J1330	Photometry Laboratory Accuracy Guidelines
SAE J1889	L.E.D. Signal and Marking Lighting Devices
SAE J2139	Tests for Signal and Marking Devices Used on Vehicles 2032 mm or more in Overall Width

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 J387	Terminology - Motor Vehicle Lighting
SAE J595	Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles
SAE J2498	Minimum Performance of the Warning Light System Used on Emergency Vehicles

3. DEFINITIONS

3.1 OMNIDIRECTIONAL OPTICAL WARNING DEVICE

An optical warning device that projects light in a horizontal 360 degree arc and vertically from 5 degrees up to 5 degrees down. It will project flashes of light to an observer positioned at a fixed location within the arc of coverage. This would include all 360 degree beacons.

3.2 SELECTIVE COVERAGE OPTICAL WARNING DEVICE

An optical warning device that projects light in a defined horizontal arc of more than 40 degrees, but less than 360 degrees and vertically from 5 degrees up to 5 degrees down. It will project flashes of light to an observer positioned at a fixed location within the arc of coverage. This would include all directional warning devices and omnidirectional devices within a lightbar that have a portion of their light beam blocked by internal components.

3.3 EWD LAMP ASSEMBLY

Any single, independently mounted, light-emitting component in the lighting system. An Emergency Warning Device (EWD) lamp assembly may consist of a single optical element or a fixed array of any number of optical elements whose geometric positioning relative to each other is fixed by the manufacturer of the device and not intended to be modified. To be considered a single source, the optical elements must be adjacent and operate simultaneously in all modes if the mode of the device is vehicle operator adjustable.

3.4 OPTICAL ELEMENT

Any discrete light emitter such as, but not limited to, an incandescent filament, HID or individual light emitting diode.

3.5 PRIMARY OPTICAL WARNING DEVICE

A device or group of devices that is intended to provide the primary visual optical warning signal as called out in each service class. Unless prohibited by law or regulation, a Class 1 device may be used in place of a Class 2 device and a Class 1 or 2 device may be used in place of a Class 3 device.

3.6 SECONDARY OPTICAL WARNING DEVICE

A device or group of devices of lower performance that can be used to provide supplemental optical warning to that provided by the primary optical warning device or devices.

3.7 CLASS 1A OMNIDIRECTIONAL OPTICAL WARNING DEVICE

A device utilized on authorized vehicles to capture the attention of motorists and pedestrians and warn of a potentially hazardous activity or emergency situation. It provides 360 degrees of visual warning coverage. The device can also consist of an array of individual selective coverage EWD lamp assemblies within a common housing whose coverage angles overlap or adjoin such that 360 degrees of warning coverage results.

3.8 CLASS 1S SELECTIVE COVERAGE OPTICAL WARNING DEVICE

A device utilized on authorized vehicles to capture the attention of motorists and pedestrians and warn of a potentially hazardous activity or emergency situation. A single device of this Class will not provide 360° of warning coverage.

3.9 CLASS 2A OMNIDIRECTIONAL OPTICAL WARNING DEVICE

A device utilized on authorized vehicles to capture the attention of motorists and pedestrians and warn of traffic hazards such as a lane blockage or a slow moving vehicle. It provides 360 degrees of visual warning coverage. The device can also consist of an array of individual selective coverage EWD lamp assemblies within a common housing whose coverage angles overlap or adjoin such that 360 degrees of warning coverage results.

3.10 CLASS 2S SELECTIVE COVERAGE OPTICAL WARNING DEVICE

A device utilized on authorized maintenance or service vehicles to capture the attention of motorists and pedestrians and warn of traffic hazards such as a lane blockage or a slow moving vehicle. A single device of this Class will not provide 360° of warning coverage.

3.11 CLASS 3A OMNIDIRECTIONAL OPTICAL WARNING DEVICE

A device utilized on authorized vehicles to identify them to pedestrians and motorists. It provides 360 degrees of visual identification coverage. The device can also consist of an array of individual selective coverage EWD lamp assemblies within a common housing whose coverage angles overlap or adjoin such that 360 degrees of warning coverage results.

3.12 CLASS 3S SELECTIVE COVERAGE OPTICAL WARNING DEVICE

A device utilized on authorized vehicles to identify them to pedestrians and motorists. A single device of this Class will not provide 360° of warning coverage.

3.13 LIGHT PULSE

A single, visually continuous emission of optical energy. High frequency modulation is permitted.

3.14 FLASH

A light pulse or a train of light pulses, where a dark interval of at least 160 ms separates the light pulse or the last pulse of the train of light pulses from the next pulse or the first pulse of the next train of light pulses. To be considered a train of light pulses, each pulse in the train must begin within 100 ms after the end of the preceding light pulse. Dark interval luminous intensity shall not exceed 2% of the maximum luminous intensity of a flash.

3.15 OPTICAL POWER

The integration of the luminous intensity of the flashing EWD lamp assembly for a time of 60 s ($\int Idt$). Units are Candela·s/min.

3.16 PSEUDO-RANDOM FLASH PATTERN

A flash pattern that varies over time and is composed of blocks of compliant flashes presented in a sequential or random order.

4. LIGHTING IDENTIFICATION CODE, MARKINGS, AND NOTICES

In accordance with SAE J759, the optical warning device may be identified by the codes:

- “W3-1”, for Class 1A omnidirectional devices
- “W3-2”, for Class 2A omnidirectional devices
- “W3-3”, for Class 3A omnidirectional devices
- “WS3-1”, for Class 1S selective coverage devices
- “WS3-2”, for Class 2S selective coverage devices
- “WS3-3”, for Class 3S selective coverage devices

If the optical warning device is a selective coverage device the angle of coverage may also be indicated in parentheses. For example, a Class 1 device providing 120 degrees of signal may be marked WS3-1 (120).

A device may only have one class rating if its mode of operation is vehicle operator adjustable. The rating shall be based on the mode with the lowest performance level.