

(R) Terminology - Motor Vehicle Lighting

RATIONALE

ECE references added

Definition added, 3.1.5

The following definitions were modified for the intent of consistency between standards and to improve the clarity and accuracy of the definitions with brevity:

3.1.9 LED - definition revised to ANSI standard

3.1.10 Average Rated Lab Life - definition revised

3.2.1 Adaptive Forward Light System (AFS) - revised to be consistent with J2591

3.2.7 Full AFS added

3.2.9 "Aimable" changed to "Aimed"

3.2.10 Lamp Size - definition added

3.2.13 Warning Light added

3.4.1 Stop Signal Function - definition revised

3.4.2 Stop Lamp - "lamp" added and definition revised

3.4.3 Turn Signal Lamp - "lamp" added and the text inserted "or change direction" added to the definition to be consistent with J588.

3.4.4 Center High Mounted Stop Lamp (CHMSL) - "The CHMSL Is intended to provide a signal to the both the operator of the following vehicle as well as through intervening vehicles" was added to be consistent with J1957.

3.4.5 Backup Lamp - "Lamp" and "(reversing)" added to be consistent with J593; ECE reference added.

3.6.1 Parking Lamp (Front Position) - definition completely revised to be consistent with J222; the word "burning" replaced with "operating" to include the use of LEDs.

3.6.2 Tail Lamp (Rear Position) - the word "burning" replaced with "operating" to cover LED sources.

3.6.3 Sidemarker Lamp - definition revised

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- 3.6.4 Clearance Lamp - definition changed to agree with J2042
- 3.6.7 Rear Fog/Tail - reference to SAE J585 added to be consistent with J1319
- 3.6.8 Daytime Running Light (DRL) - definition revised to agree with J2087
- 3.7.1 Rear Facing Cargo Lamp - Definition revised to agree with J1424
- 3.7.2 Side Facing Cargo Lamp - Definition revised to agree with J1424
- 3.7.3 License Plate Lamp - "plate" added
- 3.7.4 Puddle Lamp definition added
- 3.8.2 Headlamp - "an upper and /or lower beam "changed to "a high and /or a low beam" to be consistent with J1383
- 3.9.1 Auxiliary High Beam - Definition revised; J582 requires revision to allow only the use of the term "high beam" and not be interchanged with "upper and "driving".
- 3.9.2 Front Cornering Lamp - Definition revised requiring changes to J852
- 3.9.3 Front Fog Lamp - Definition revised to agree with J583.
- 3.9.4 Rear Cornering Lamp - "lamp" added

## 1. SCOPE

This SAE Recommended Practice provides definitions of common terms used in SAE Documents pertaining to motor vehicle lighting. It covers not only basic lighting terms but also terms which identify major segments of technical reports.

## 2. REFERENCES

There are no referenced publications specified herein.

## 3. DEFINITIONS

### 3.1 LIGHT SOURCE

An emitter of visible radiant energy.

#### 3.1.1 Accurate Rated Light Source Unit, Bulb

A seasoned light source operated at design mean spherical luminous intensity and having its light source(s) positioned within strict tolerances as specified in the applicable standard.

#### 3.1.2 Design Life

An operational time objective in hours of a light source at the test voltage.

### 3.1.3 Design Voltage

The voltage used for design purposes.

### 3.1.4 Discharge Bulb or Discharge Lamp

A device in which light is produced by an electric discharge through a gas, a metal vapor, or a mixture of gases and vapors.

### 3.1.5 Filament

A wire formed, or wound into a coiled body which is heated to incandescence when voltage is applied.

### 3.1.6 Filament Bulb or Filament Lamp

Device in which light is produced by means of one or more filaments heated to incandescence by the passage of an electric current.

### 3.1.7 Filament Rotation

Any non-parallelism of either coil with respect to the centerline of design nominal filament location or any additional width of the end view of the filament in excess of the outside diameter of the first full turn.

### 3.1.8 Gaging Standard

A gage to calibrate filament location measuring equipment; the gage is capable of measuring to one-tenth the stated tolerance of the filament for the applicable bulb design requirement.

### 3.1.9 Light-Emitting Diode (LED)

A pn junction semiconductor device that emits incoherent optical radiation when forward biased. The optical emission may be in the ultraviolet, visible, or infrared wavelength regions. (ANSI definition)

### 3.1.10 LED Light Source

A light source made up of one or more LED's that emit visible radiation. An LED light source may or may not require an additional electronic control unit and may or may not require additional provisions for thermal management.

### 3.1.11 Light Source

One or more elements emitting visible radiation, which may be assembled with one or more transparent envelopes and with a base for mechanical and electrical connection which may also be the extreme outlet of a light-guide, as part of a distributed lighting or light-signaling system.

### 3.1.12 Average Rated Lab Life

Samples obtained from production runs are tested in laboratories over long periods of time at their specified test voltage. It is meant to partially describe a manufactured product's life recognizing that individual lifetimes vary greatly. It is not the same as service life which is generally shorter due to environmental conditions such as vibration, voltage fluctuations and temperature.

### 3.1.13 Rated Voltage

The nominal circuit or vehicle electrical system voltage classification. (Example: 12 V headlamp)

### 3.1.14 Replaceable Bulb

A light source with related envelope and mounting base which is removable from the head lamp or signal lamp for the purpose of replacement.

### 3.1.15 Seasoned Light Source, Bulb

A light source unit energized at design voltage (or current for LEDs) for 1% of its average rated lab life or 10 h maximum, whichever is shorter.

### 3.1.16 Test Voltage

The specified voltage and tolerance to be used when conducting a test.

## 3.2 LAMP

A divisible assembly which contains a light source unit(s) and generally an optical system such as a lens, a reflector, or both and which provides a lighting function(s).

### 3.2.1 Adaptive Forward Lighting System (AFS)

A forward lighting system intended to adapt a forward lighting device's beam pattern to improve driver visibility based on inputs such as vehicle speed, road geometry and/or environmental conditions. The system is comprised of one or more forward lighting devices and the entirety of components required to control and operate the devices.

### 3.2.2 Aiming Screws

Screws with self-locking features used for adjusting horizontal and/or vertical aim and to retain the headlamp unit in the proper position.

### 3.2.3 Centroid of a Lens Area

The geometric centroid of a plane area which is perpendicular to the axis of reference of the vehicle and upon which the projection of the light-emitting lens area falls.

### 3.2.4 Cutoff

A visual/optical aiming cue in the low beam that marks a separation between areas of higher and lower luminance.

### 3.2.5 Daytime Running Lamp Telltale (Indicator)

An illuminated indicator that provides a visual signal to advise the driver that only his DRLs are on. (reference 3.6)

### 3.2.6 Direct Reading Indicator

A device that is mounted in its entirety on a headlamp or headlamp aiming or headlamp mounting equipment, is part of a VHAD, and provides information about headlamp aim in analog or digital format.

### 3.2.7 Full Adaptive Forward Lighting System or "System"

A lighting device providing low and/or high beam patterns capable of automatic adaptation to varying conditions. The system consists of the "system control", one or more "supply and operating device(s), if any, and the "installation units" of the right and of the left side of the vehicle.

### 3.2.8 High Beam Function

A beam intended primarily for distant illumination and not for use when meeting or following other vehicles.

### 3.2.9 High Beam Lamp

A lamp providing the high beam function. Also referred to as "Main Beam" and "Driving Beam" in ECE regulations.

### 3.2.10 Low Beam Function

A beam intended to illuminate the road ahead of the vehicle when meeting or following another vehicle.

### 3.2.11 Low Beam Lamp

A device that provides the low beam function. Also referred to as "Passing Beam" and "Dipped Beam" in ECE regulations.

### 3.2.12 Mechanically Aimed Headlamp

A headlamp having three pads on the lens, forming an aiming plane or an aiming ring, the aiming plane or aiming ring being used for laboratory photometric testing and for inspecting the aim of the headlamp when installed on the vehicle.

### 3.2.13 Lamp Area

Minimum Luminous Intensities for signal lamps are based on the Effective Light Emitting Surface (3.3.4) and Effective Projected luminous Lens Area (3.3.5). The three levels of luminous intensity are for lamp sizes that are less than 225cm<sup>2</sup>, 225cm<sup>2</sup> to 450cm<sup>2</sup> and greater than 450cm<sup>2</sup>.

### 3.2.14 Multiple Lamp Arrangement

An array of two or more separate lamps on one side of the vehicle which operate together for a particular lighting function.

### 3.2.15 Warning Light

An adequately visible light used for signaling to vehicle operators, road users and pedestrians alike of an impending danger. Specific colors, intensities and flash modes may be used to indicate the right of way or emergency.

### 3.2.16 Optical Axis (Lamp Axis)

The optical axis is a line formed by the intersection of the horizontal and vertical planes through the light source center (or the centroid of multiple LED arrays) which possibly may not be center of multiple LED array and parallel to the vehicle longitudinal axis for front or rear mounted lamps, or perpendicular to the vehicle longitudinal axis for side mounted lamps.

NOTE: If the optical axis of a headlamp is not at the geometric center of the lens, then the location will be indicated by manufacturer on the headlamp.

### 3.2.17 Optical Center

The optical center is the point of the intersection of the optical axis with the external surface of the lens. For a lamp function with more than one light source, use the closest optical center for lamp spacing measurements. When multiple compartments and lamps are photometered together, the H-V axis shall intersect the midpoint between their light sources.

### 3.2.18 Optically Combined

Lamps having separate light sources or a single light source operating under different conditions, (for example optical, mechanical, electrical differences) totally or partially common optically functional lens area.

### 3.2.19 Remote Reading Indicator

A device that is not mounted in its entirety on a headlamp or headlamp aiming or headlamp mounting equipment, but otherwise meets the definition of a direct reading indicator.

### 3.2.20 Turn Signal Pilot Indicator (Telltale)

An illuminated indicator that provides a visual signal to advise the driver that his turn signals are on.

## 3.3 PHOTOMETRY TERMS

### 3.3.1 Aiming Plane

A plane defined by the surface of the three aiming pads on the headlamp lens or by the forward surface or an aiming ring.

### 3.3.2 Aiming Reference Plane

A plane which is perpendicular to the longitudinal axis of the vehicle and tangent to the forward most aiming pad on the headlamp or, where such a plane would intersect the surface of the lens between the aiming pads, a plane which is perpendicular to the longitudinal axis of the vehicle and is located forward of and as close to the lens as possible without causing interference.

### 3.3.3 Axis of Reference

The characteristic axis of the lamp for use as the direction of reference ( $H = 0^\circ$ ,  $V = 0^\circ$ ) for angles of field for photometric measurements and for installing the lamp on the vehicle.

### 3.3.4 Effective Light Emitting Surface

The portion of a lamp that directs light to the photometric test pattern, and does not include transparent lenses, mounting hole bosses, reflex reflector area beads or rims that may glow or produce small areas of increased intensity as a result of uncontrolled light from an area of  $\frac{1}{2}^\circ$  radius around a test point.

### 3.3.5 Effective Projected Luminous Lens Area

The area of the orthogonal projection of the effective light-emitting surface of a lamp on a plane perpendicular to a defined direction relative to the axis of reference. Unless otherwise specified, (i.e. visibility angles), the direction is coincident with the axis of reference.

### 3.3.6 H-V Axis

A line from the center of the principle light source (or the centroid of multiple LED arrays) formed by the intersection of the horizontal (H) and vertical (V) planes which intersect the light source center and are perpendicular to the test screen. When multiple compartments are photometered at the same time, the H-V axis shall intersect the midpoint between the light sources parallel to the applicable longitudinal or transverse vehicle axis.

### 3.3.7 Light Emitting Surface

All or part of the exterior surface of the transparent or translucent lens that encloses the light source or signaling device and allows conformance with photometric and colorimetric requirements.

### 3.3.8 Ratio - License Lamps

The measurement of the ratio of the two highest test points to the two lowest test points.

### 3.3.9 Ratio - Signal Lamps

In an "Optically Combined Lamp", ratio refers to the intensity at a test point of the major function to the same test point of the minor function. Examples are stop/tail and turn signal/park ratio.

## 3.4 Signaling Devices

A vehicle lighting device providing operator intention; these lamps include the following:

### 3.4.1 Stop Signal Function

A steady light to the rear of a vehicle to indicate the intentional deceleration or stopping of a vehicle.

### 3.4.2 Stop Lamp

A device providing the stop signal function.

### 3.4.3 Turn Signal Function

A flashing light to the front, side and rear of a vehicle on the side toward which a change of direction is intended.

### 3.4.4 Turn Signal Lamp

A device providing the turn signal function. Also referred to as "Direction Indicator" in ECE regulations.

NOTE: Also see 3.5.3, Side Turn Signal. (Referred to as "Side Repeater" in ECE regulations)

### 3.4.5 Center High Mounted Stop Lamp (CHMSL)

An additional lamp of the stop lamp system, giving a brake actuated steady warning light to the rear of the vehicle. The CHMSL is intended to provide a signal to both the operator of the following vehicle as well as through the intervening vehicles.

### 3.4.6 Backup Lamp

A lighting device used to provide illumination behind the vehicle and to provide a warning signal to pedestrians and other drivers when the vehicle is backing up (reversing) or is about to back up. (Also listed as a road illumination device). Also referred to as a "Reversing Lamp" in ECE regulations.

### 3.5 SUPPLEMENTAL SIGNALING DEVICES

A lighting device intended to supplement standard lighting functions. These lamps include the following:

#### 3.5.1 Front Cornering

See Section 3.9

#### 3.5.2 Rear Cornering

See Section 3.9

#### 3.5.3 Side Turn Signal

A lighting device normally mounted on the side of a vehicle at or near the front, and used as part of the turn signal system to indicate a change in direction by means of a flashing warning signal on the side toward which the vehicle operator intends to turn or maneuver. Also referred to as a "Side Repeater" in ECE regulations.

### 3.6 MARKING DEVICES

The following lamps signal the presence of a vehicle:

#### 3.6.1 Parking Lamps (Front Position)

Whether separate or in combination with other lamps, parking lamps are located on both the left and right front of the vehicle which show to the front and are intended to mark the vehicle when parked. In addition, these front lamps serve as a reserve front position indicating system in the event of headlamp failure.

#### 3.6.2 Tail Lamp (Rear Position)

Whether separate or in combination with other lamps, tail lamps are located on both the left and right rear of a vehicle to indicate the presence and width of a vehicle by a steady operating, low intensity light when viewed from the rear.

#### 3.6.3 Sidemarker Lamps

Lighting devices used to indicate the presence and length of the vehicle by a steady operating, low intensity light when viewed from the side.

#### 3.6.4 Clearance Lamp

A clearance lamp provides light to the front or rear of a vehicle to indicate the overall width and height of vehicles 2032mm or more in overall width. Also referred to as "End Outline Marker Lamp" in ECE regulations.

#### 3.6.5 Identification

A group of three lamps in a horizontal row which provide light to the front or rear or both, to identify vehicles 2032 mm or more in overall width.

#### 3.6.6 Reflex Reflectors

Devices that are used on vehicles to give an indication of presence to an approaching driver by reflected light from the headlamps on the approaching vehicle. Also referred to as "Retro Reflectors" in ECE regulations.