



SURFACE VEHICLE RECOMMENDED PRACTICE

J198™

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Windshield Wiper Systems - Trucks, Buses, and Multipurpose Vehicles

RATIONALE

This revision corrects errors in the Truck COE values found in Table 1A. The corrected values revert to those found in the 2012 and earlier versions of this recommended practice.

1. SCOPE

This SAE Recommended Practice establishes testing methods and performance requirements for windshield wiping systems on trucks, buses, and multipurpose passenger vehicles with a GVWR of 4500 kg (10000 pounds) or greater and light-duty utility vehicles with a GVWR of less than 4500 kg (10000 pounds).

The test procedures and minimum performance requirements outlined in this document are based on currently available engineering data.

It is the intent that all portions of the document will be periodically reviewed and revised as additional data regarding windshield wiping system performance are developed.

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 +1 724-776-4970 (outside USA), www.sae.org.

SAE J680	Location and Operation of Air Brake-Controls in Motor Truck Cabs
SAE J687	Nomenclature - Truck, Bus, Trailer
SAE J941	Motor Vehicle Drivers' Eye Locations
SAE J2349	Electric Windshield Wiper Switch - Trucks, Buses, and Multipurpose Vehicles

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2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D518 Test Method for Rubber Deterioration - Surface Cracking

ASTM D1171 Test Method for Rubber Deterioration - Surface Ozone Cracking Outdoors or Chamber (Triangular Specimens)

2.1.3 ISO Publications

Copies of these documents are available online at <https://webstore.ansi.org/>.

ISO 9259:1991 Passenger Cars - Windscreen Wiper Systems - Wiper Arm to Blade Connections

3. DEFINITIONS

3.1 CAB-ALONGSIDE-ENGINE (CAE)

A vehicle in which the driver's compartment and controls are located alongside the engine compartment.

3.2 CAB-BEHIND-ENGINE (CBE)

A vehicle in which the driver's compartment and controls are located at the rear of a hood-enclosed power plant or are located partially over the rear of the power plant or located partially beside the rear of the power plant.

3.3 CAB-OVER-ENGINE (COE)

A vehicle in which all, or a substantial part of, its engine is located under the cab.

3.4 CYCLE

Wiper blade movement during system operation from the first extreme position of the wipe pattern to the second extreme and then back to the first extreme.

3.5 DAYLIGHT OPENING (DLO)

The maximum opening of any glass aperture which is unobstructed by moldings, masking, frits, or framing.

3.6 EFFECTIVE WIPE PATTERN

That portion of the wet windshield glazing surface which is cleared when the wiper blade travels through a cycle with system on highest frequency.

3.7 EYELLIPSE

A statistical representation of the driver's eye location in a motor vehicle, as defined in SAE J941.

3.8 INTERMITTENT

Wiping action consisting of an individual complete sweep (start to start) with an interval between stop and subsequent activation.

3.9 LIGHT-DUTY UTILITY VEHICLE

A personnel and/or cargo carrying vehicle with basic GVWR of 4500 kg (10000 pounds) or less (Class 1 and 2).

3.10 LINKAGE ASSEMBLY

The multicomponent member that connects to the wiper motor (where applicable) to transmit its action into oscillating motion for driving the wiper arm.

3.11 MULTIPIECE WINDSHIELD

A windshield consisting of two or more windshield glazing surface areas.

3.12 MULTIPURPOSE PASSENGER VEHICLE

A motor vehicle with motive power, except a low-speed vehicle or a trailer designed to carry ten persons or fewer, which is constructed either on a truck chassis or with special features for occasional off-road operation.

3.13 TARGET WINDSHIELD VIEWING AREA

The area of the windshield through which the driver should be able to see to operate the vehicle.

3.14 VAN

A personnel and/or cargo carrying vehicle with a relatively flat front and a GVWR of greater than 4500 kg (10000 pounds).

3.15 WIPED AREA

The specific area on the glazing surface that is swept by the effective wiper pattern.

3.16 WIPER ARM

A device to both interconnect the wiper blade and the output shaft of the wiper motor or linkage assembly.

The wiper arm has the dual function of:

- a. Maintaining the wiper blade into its desired position throughout the wipe pattern
- b. Exerting a load onto the wiper blade sufficient for its function

3.17 WIPER BLADE

A device for clearing the effective wipe pattern, capable of receiving a load from an arm, comprising a suitable superstructure supporting and controlling a wiper blade element.

3.18 WIPER BLADE ELEMENT

The resilient member of the wiper blade that contacts the windshield glazing surface.

3.19 WIPER CONTROL VALVE/SWITCH

The manually actuated mechanism that allows passage of pneumatic or electric signal to the wiper motor for activating the wiper system into its various operating or nonoperating modes.

3.20 WIPER MOTOR

That mechanism, operated by an external power media/source (electric, pneumatic, or hydraulic), that provides a controlled power to the other components of the system (either by direct drive to the wiper arm(s) or to the linkage) and is activated by the wiper switch/valve.

3.21 WIPER SYSTEM

A group of devices used for clearing the exterior of the windshield glazing surface of water or snow, together with the necessary devices and controls to start and stop the operations.

4. WINDSHIELD WIPER SYSTEM REQUIREMENTS

4.1 Target Windshield Viewing Area

4.1.1 A B C Zones

The target windshield viewing area is described by three specific areas on the exterior windshield glazing surface. The three areas are developed with the vehicle loaded to the manufacturer's base design load and are identified in Table 1 as areas A, B, and C. Each area has been established using the angles of Tables 1A and 1B applied as shown in Figure 1.

4.1.2 Side View

In the side view, the upper and lower boundary of the area is established by the intersection of two planes with the windshield surface. These planes are seen as lines in the side view. These planes are fixed by the angles (from Table 1A or 1B) above and below the XX line and originating from points based on the seat H-Point as shown in Figure 1.

4.1.3 Plan View

In the plan view, the left and right boundary of the area is established by the intersection of two vertical planes with the windshield surface. These planes are fixed by angles (from Table 1A or 1B) to the left and right of the XX line and originating from points based on the seat H-Point as shown in Figure 1.

4.1.4 Excluded Areas

The target windshield viewing areas exclude those areas on the exterior glazing surface that are within 25 mm (1 inch) of the edge of the daylight opening.

The target windshield viewing area may be reduced in instances where the driver's view through the glass is of some obscuring feature of the vehicle rather than of the vehicle surroundings. This may include the hood, bumper, aerial bucket, concrete chute, molding, masking, frits, framing, or other feature of the vehicle, the view of which would not be important to driving visibility. To accommodate such features, any of the four bounding planes can be distorted into a complex surface that remains straight along the line of sight from the tangent point on the eyellipse but that conforms to the outermost portion of the obscuring feature. The minimum wiped area thus created should include any line of sight that is useful to a driver whose eyes are within the volume of the projection from the eyellipse.

The target windshield viewing area may be reduced in instances where the curvature of the windshield glass at the edges is so great that it is not practical to get a wiper blade to follow the contour of the glass. To accommodate this situation, the angle of the bounding plane on the side where the curvature takes place may be reduced until the plane touches the outermost edge of the area where the wiper blade is able to sweep and still maintain contact with the glass surface.

4.1.5 Right Hand Drive

Table 1A assumes a left side driving position. For right side driving positions, reflect the angles so that the left values are used for the right and the right angles for the left.

4.2 Wiping Performance Criteria

Each windshield wiping system shall wipe the percentage of the target windshield viewing area specified in Table 2 when tested in accordance with Section 6.

Table 1A - Target windshield viewing area - standard cab

Classification	F Dimension Millimeters	F Dimension Inches	Area	Angle Up Degrees	Angle Down Degrees	Angle Left Degrees	Angle Right Degrees
Truck	0-1020	0-40	A	10	5	18	56
Cab Behind Engine (CBE)			B	5	3	14	53
Cab Alongside Engine (CAE)			C	5	1	10	15
	1020-1270	40-50	A	8	7	18	56
			B	3	5	14	53
			C	3	3	10	15
	1270-Up	50-Up	A	6	9	18	56
			B	1	7	14	53
			C	1	5	10	15
Truck	1020-Up	40-Up	A	6	9	18	56
Cab Over Engine (COE)			B	1	7	14	53
			C	1	5	10	15
Bus, Cab Behind Engine (CBE)	1270-1520	50-60	A	7.5	22	22	62
School and Commercial			B	3	22	22	62
			C	1	16	22	15
Bus, Cab Over Engine (COE)	1270-1520	50-60	A	7	14	18	65
Forward Control, School and Commercial			B	2	11	18	65
			C	1	11	18	25
Forward Control or Multipurpose	All	All	A	9	7	18	56
			B	4	4	14	53
			C	2	2	10	15
Light-Duty Utility Vehicle	All	All	A	7	5	16	49
			B	4	3	13	49
			C	4	2	8	13
Van	Open	Open	A	7	12	18	58
			B	2	11	15	56
			C	1	6	10	15

Note 1: Refer to SAE J687 for nomenclature.

Note 2: Angles are minimum.