PASSENGER CAR WINDSHIELD DEFROSTING SYSTEMS — SAE J902a

SAE Recommended Practice

Report of Body Engineering Committee approved August 1964 and last revised March 1967. Editorial change June 1967.

1. Scope—The scope of this SAE Recommended Practice is to establish uniform test procedures and minimum performance requirements for passenger car windshield defrosting systems. It is limited to tests that can be conducted on uniform test equipment in commercially available laboratory facilities.

The test procedures and minimum performance requirements outlined herein reflect the extensive knowledge and experience which automotive engineers have accumulated in development of windshield defrosting practices. Current engineering practice prescribes that for laboratory evaluation of defroster systems an ice coating, rather than frost, be applied to the windshield to provide more uniform and repeatable test results, frost formation of uniform density being the more difficult to accomplish. The time element for ice removal, therefore, is longer than that required to remove frost, which is the prime purpose of the defroster system.

In accordance with established policies of the SAE Technical Board, all portions of this recommended practice will be reviewed and revised to reflect technological progress regarding vehicle defroster performance.

NOTE: Because of such differing factors as greater vehicle size, engine operating characteristics, windshield configuration, etc., a separate SAE Recommended Practice is under development covering test procedures and requirements for defrosting systems of trucks, multi-purpose vehicles, and buses.

2. Definitions

2.1 Defrost—Melt frost or test ice coating on the inside or outside surface of the glass with the defroster system.

2.2 Windshield Defroster System—Means intended to defrost the windshield.

2.3 Defrosted Area—That area of the windshield composed of dry surface and melted or partially melted (wet) frost, and excluding that area of the windshield covered with dry frost, and which is defined and qualified by the following:

2.3.1 The driver's seat in the rearmost position. (See Fig. 1.)

2.3.2 The 95th percentile tangential cutoff two-dimensional eye range contour in accordance with the SAE J941 shall be used. (See Table 1.)

2.3.3 The plan view reference line which is defined as the plan view line outboard of the steering wheel centerline and parallel to the vehicle centerline at a distance 0.15 of the dimension from the steering wheel center to the left-hand extremity of the shoulder room dimension. This dimension can be determined by taking 0.50 of the shoulder room dimension minus the distance from steering wheel centerline to centerline of car, and multiplying by 0.15. (See Fig. 2.)

2.3.4 The glazing surface reference line which is defined as the line of intersection of the glazing surface with the horizontal plane 25 in. above the manikin H point as defined in the SAE J826. (See Fig. 1.)

3. General

3.1 Area to be Defrosted—The minimum windshield area that shall be defrosted is described by the use of three specific areas identified in Table 1 as area A, B, and C. Each area has been established using the angles of Table 1 applied as shown in Figs. 1 and 2. In Fig. 1, the upper and lower boundaries of the area are established by the intersection of two planes, tangent to the upper and lower sides of the eye range contour, with the windshield glazing surface. The planes are fixed by angles above and below the glazing surface reference line. In Fig. 2, the left and right boundaries of the area are established by the intersection of two planes tangent to the left and right sides of the eye range contour. The planes are fixed by angles to the left and right of the plan view reference line. Using the test procedures established in paragraph 4.4, a minimum of 80% of area A, 95% of area B, and 100% of area C should be defrosted in 30 minutes. The 5% undefrosted portions of area B shall be located only along the periphery of this area. Fig. 3 illustrates all of the areas on a typical windshield.

NOTE: It is recognized that in some small passenger cars the areas defined in Table 1 may be off the windshield glazing surface. In such instances, the defrosting requirement shall apply only to those portions in the areas which are actually on the windshield glazing surface.

TABLE 1 — AREAS TO BE DEFROSTED

Area	Minimum Percent Defrosted in 30 min	Angles, Deg[a]			
		Left	Right	Up	Down
A	80	18	56	10	5
B	95	14	53	5	3
C	100	10	15	5	1

[a] See Figs. 1 and 2.

4. Defrosting Test

4.1 Test Equipment

(a) Test chamber sufficiently large to contain the basic vehicle, with provision for circulating cold air.

(b) Means for recording the boundaries of the windshield areas defrosted. (A wax pencil is commonly used for outlining defrosted areas.)

(c) Engine tachometer.

(d) Stopwatch or other timing device.

(e) Thermometers or other temperature measuring devices.

(f) Throttle control device (if desired).

(g) Spray gun for applying water to windshield (Binks Model 62 spray gun, with fluid nozzle 66 and air nozzle 66SD, 66SF, or equivalent equipment).

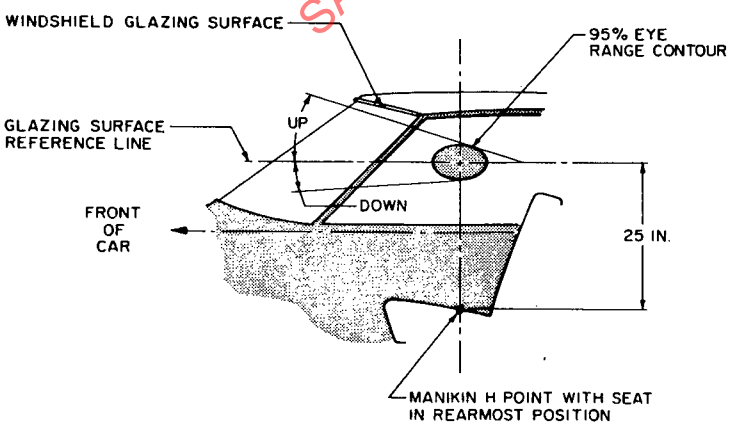

FIG. 1—SIDE VIEW OF AREA GENERATION

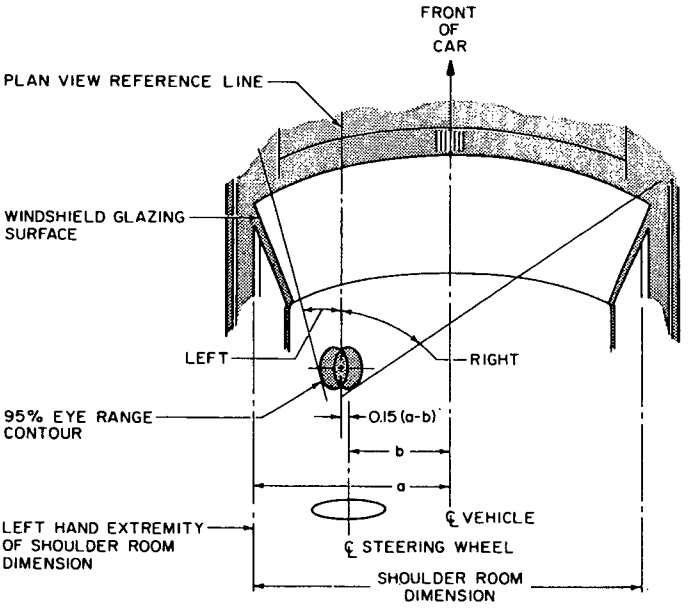

FIG. 2—PLAN VIEW OF AREA GENERATION