



# Technical Report Preprint

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# J953

## Passenger Car Backlight Defogging System - SAE J953 SAE Recommended Practice

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### 1. SCOPE

The scope of this SAE Recommended Practice is to establish uniform test procedures and minimum performance requirements for sedan passenger car backlight defogging 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 in this recommended practice, are based on currently available engineering data. It is the intent that all portions of the recommended practice will be periodically reviewed and revised as additional knowledge regarding defogging performance is developed.

### 2. DEFINITIONS

2.1 Fog - Moisture deposited on the glass in a translucent form.

2.2 Defog - Remove fog from the inside surface of the glass with the defogging system.

2.3 Windshield Defroster System - Means intended to defrost or defog the windshield.

2.4 Backlight Defogging System - Means intended to defog the backlight of passenger cars.

2.5 Backlight - The window located at the rear of the roof panel.

2.6 Defogged Area - That area of the passenger car backlight from which fog has been removed.

2.7 Rear Vision Area - The width of the rear vision backlight area is to be established by a horizontal field of view described by an angle of 20 deg, with its apex at the projected eye point of the inside rear view mirror, and with the resultant field of view symmetrical about the centerline of the backlight. Height of the area is to extend from the lower edge of the backlight to its upper edge.

The projected eye point is to be determined by using the eye ellipse (95th percentile tangential cutoff) as specified in SAE J941. In establishing the projected eye point, the true distance from the eye point to the mirror must be used. The eye point in the plan view is that point on the left eye ellipse which is furthest from the mirror center. In the side view, it is a point on the major axis of the eye ellipse, established by projecting a vertical line from the plan view eye point through the major axis of the side view ellipse.

### 3. GENERAL REQUIREMENTS

3.1 After 10 minutes of operation of the defogging system, in accordance with Paragraph 4.4.9, the rear vision area as defined in Paragraph 2.7 shall be at least 75% defogged.

### 4. DEFOGGING TESTS

#### 4.1 Test Equipment -

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

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

(c) Engine tachometer.

(d) Stop watch or other timing device.

(e) Thermometers or other temperature measuring devices.

(f) Throttle control device (if desired).

(g) Device for introducing water vapor into interior of vehicle at a controlled rate. (See Appendix for description of a typical device.)

(h) Device for measuring quantity of water used.

(i) Auxiliary power supply for vehicle blower motors.

#### 4.2 Cold Chamber -

(a) Cold Chamber Temperature -  $0 \pm 5$  F ( $-18 \pm 3$  C).

(b) Engine Speed - 1500 rpm neutral gear.

(c) Wind Velocity - 1 mph (1.6 kmh) maximum.

(d) Soak Time - 8 hr minimum (see paragraph 4.4.2).

(e) Number of Vehicle Occupants During Test - Driver only.

(f) Test Voltage - to be 15% over nominal system rating (for example, 13.8 v on a 12 v system) at the motor or the supply end of motor dropping resistor.

(g) All engine, heater, windshield defroster and rear window defogging units shall be standard production parts adjusted to specified limits.

(h) Engine hood, doors, windows and vents (except heater intake) closed.

(i) The backlight shall be thoroughly cleaned, prior to placing the vehicle in the cold room, using a 3-10% ammonia-water solution. The solution shall be applied with a clean cheesecloth; and then dried and polished with another clean and dry cheesecloth.

#### 4.3 Test Instrumentation -

4.3.1 The temperature of the engine coolant shall be measured in the thermostat pocket below (upstream of) the engine thermostat.

4.3.2 The temperature of the coolant entering and leaving the heater unit shall be measured as close to the unit inlet and outlet tubes as possible.

4.3.3 The temperature of the windshield defroster air shall be measured at a point in the defroster outlet (or outlets) that is in the main air flow and which is at least 1 in. (2.5 cm) below (upstream of) the plane of the defroster outlet opening. Where a rear heater is used, the temperature

