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PASSENGER CAR
WINDSHIELD WIPER SYSTEMS - SAE J903

SAE Recommended Practice

Report of Body Engineering Committee approved August 1964.

1. SCOPE

The scope of this SAE Recommended Practice is to establish uniform test procedures and minimum performance requirements for passenger car windshield wiping systems and wiper blades. This recommended practice also pro-

vides a uniform terminology of windshield wiper system characteristics and phenomena. The test procedures are limited to those tests that can be conducted on uniform test equipment by 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 data regarding windshield wiping system performance are developed.

2. DEFINITIONS

2.1 WINDSHIELD WIPER SYSTEM - The wiper system consists of an apparatus for clearing the exterior surface of windshield glazing together with the necessary devices and controls to actuate and arrest the operations.

2.2 WINDSHIELD WIPER BLADE - A device for cleaning the effective wipe pattern, capable of receiving pressure from an arm, comprising a suitable superstructure, supporting and controlling a wiper blade element.

2.3 WIPER BLADE ELEMENT - The resilient member of the wiper blade that contacts the windshield glazing surface.

2.4 EFFECTIVE WIPE PATTERN - That portion of the windshield glazing surface which is cleaned when the wiper blade travels through a cycle.

2.5 TANDEM PATTERN - The pattern produced by the wiper blades moving in the same direction across the windshield glazing surface simultaneously.

2.6 OPPOSED PATTERN - The pattern produced by the wiper blades moving in opposite directions across the windshield glazing surface simultaneously.

2.7 CHATTER - Irregular movement of the wiper blade usually accompanied by temporary visible radial lines and/or noise.

2.8 BALLOONING - Unwiped areas within the wiper pattern varying in size and usually round.

2.9 STREAKING - Fine arcuate lines of unwiped moisture within the wipe pattern.

2.10 SCALLOPING - Uneven wipe at the outer periphery of pattern.

2.11 LACE CURTAIN - A maze of fine individual water droplets which are formed after the wiper blade passes over the windshield glazing surface.

2.12 HAZING - An aerated film spread by the blade and resulting in a transient trailing band on the windshield glazing surface.

2.13 CYCLE - A cycle shall consist of wiper blade movement during system operation from one extreme of the windshield wipe pattern to the other extreme and return.

2.14 SNOW LOAD - The load imposed on the wiper system by the accumulation of packed snow resulting in a limitation of blade travel.

2.15 MOTOR STALL TORQUE - The maximum torque that the motor can maintain for two cycles at specified conditions.

2.16 SYSTEM TORQUE - Torque necessary to overcome maximum friction of the wiper blade and the driving mechanism under specified conditions.

2.17 DAMP DRY - The condition of the windshield which produces the highest friction during the transition from a wet to a dry surface.

2.18 MOISTURE - Atmospheric water precipitation in

liquid, semiliquid, or frozen state (snow).

2.19 RELATIVE AIR SPEED - The vector sum of vehicle air speed and the component of the wind speed parallel to the direction of travel of the vehicle.

3. GENERAL PERFORMANCE REQUIREMENTS

3.1 WINDSHIELD WIPER SYSTEM REQUIREMENTS -

3.1.1 General - The windshield wiper system shall be capable of operating between temperatures of 130 F (55 C) and -20 F (-30 C).

3.1.2 Area to be Cleaned - The windshield wiper system shall always be capable of cleaning an area equal to 75% of the effective wipe pattern using test procedures and test conditions established in paragraph 4.1.

3.1.3 Frequency - All windshield wiper systems shall be capable of attaining an operating frequency of at least 45 cycles/minute, using test procedures and test conditions established in paragraph 4.1.

3.1.4 Durability - Wiping system, except for element of wiping blade, must remain functional after operating 1,500,000 cycles, using test procedures and test conditions established in paragraph 4.1.

3.1.5 System Strength - The system shall be capable of withstanding the loads induced by stall using test conditions and test procedures established in paragraph 4.2, with all mechanical components remaining functional.

3.1.6 Accessibility - The control for the wiper system should be positioned so that it is readily accessible to the driver.

3.2 WINDSHIELD WIPER BLADE REQUIREMENTS -

3.2.1 Durability - Using test procedures and test conditions described in paragraph 4.1, the windshield wiper blade, except for wiper blade element, must remain functional after operating 1,500,000 cycles and the wiper blade element must meet the requirements of paragraph 3.1.2 after 500,000 cycles.

3.2.2 Aging - The wiper blade element of the wiper blade assembly must withstand the ozone test established in paragraph 4.3, with an ASTM Rating of two or better, as defined in ASTM D 1171, Method of Test for Weather Resistance Exposure of Automotive Rubber Compounds.

3.2.3 Chemical Resistance - The wiper blade element must not be adversely affected by a 50% solution of methyl of isopropyl alcohol.

4. TEST METHODS

4.1 WIPER SYSTEM DURABILITY TEST -

4.1.1 Test Equipment -

(a) Test Buck - A test buck shall consist of a structure capable of rigidly maintaining, throughout the test, the proper relationship of the glazing surface and the windshield wiping system components as established by the vehicle manufacturer. Fig. 1 illustrates a typical test buck.

(b) Power Source - Must be capable of supplying power to the drive motor as specified by the vehicle manufacturer.