

**Electric Windshield Wiper Switch—Trucks, Buses, and Multipurpose Vehicles**

1. **Scope**—This SAE Recommended Practice establishes for trucks, buses, and multipurpose vehicles with GVW of 4500 kg (10 000 lb) or greater:

- a. Minimum performance requirements for the switch for electrically powered or electro-pneumatically windshield wiping system.
- b. Uniform test procedures that include 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 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 Publications**—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, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J258—Circuit Breaker—Internal Mounted—Automatic Arrest

SAE J2348—Electric Windshield Washer Switch—Trucks, Buses, and Multipurpose Vehicles

2.2 **Related Publications**—The following publications are provided for information purposes only and are not a required part of this document.

2.2.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J112—Electric Windshield Wiper Switch

SAE J198—Windshield Wiper System—Trucks, Buses, and Multipurpose Vehicles

SAE J553—Circuit Breakers

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### 3. Definitions

**3.1 Electric Windshield Wiper Switch**—Part of an electric or electro-pneumatic windshield wiper system by which the operator of a vehicle causes the windshield wipers to function by activating or interconnecting the electrical circuit.

**4. Reference Standard**—If the switch employs an internal circuit breaker(s), the circuit breaker shall comply with the requirements of SAE J258.

### 5. Temperature Test

**5.1** To insure basic function, the switch shall be manually cycled for 10 cycles at design electrical load at  $24\text{ }^{\circ}\text{C} \pm 5.5\text{ }^{\circ}\text{C}$  ( $75\text{ }^{\circ}\text{F} \pm 10\text{ }^{\circ}\text{F}$ );  $74, +0, -2.8\text{ }^{\circ}\text{C}$  ( $165, +0, -5\text{ }^{\circ}\text{F}$ ); and  $-32, +2.8, -0\text{ }^{\circ}\text{C}$  ( $-25, +5, -30\text{ }^{\circ}\text{F}$ ) after a 1 h exposure at each of these temperatures. The switch shall be electrically and mechanically operable during each of these cycles.

**5.2** This same switch shall be used for the endurance test described in Section 6.

### 6. Endurance Test Setup

**6.1** The switch shall be set up to operate its design electrical load.

**6.2** The test shall be set up to operate the switches for the prescribed number of completed cycles. One complete cycle shall consist of sequencing through each position from Lo, Medium (if applicable), Hi (with dwell in each position) and return with dwell in intermediate positions to the initial position. The test equipment shall be so arranged as to provide the following mechanical time requirements:

a. Travel Time—0.1 to 0.5 s (time from one position to the next)

NOTE—If the switch employs a rheostat, the travel time through the rheostat segment in each direction shall be 1.0 to 3.0s.

b. Dwell Time—0.50 to 1.0 s (time in each position)

NOTE—After switching to OFF, if a motor is used, sufficient dwell time shall be provided to allow the motor to park. The dwell time in OFF can then be greater (if required) than the dwell time range indicated previously.

**6.3** During the test, the switch shall be operated at 12.8 V dc for a 12-V system, or 25.6 V dc for a 24-V system. These voltages shall be measured at the input termination on the switch. The power supply shall not generate any adverse transients not present in motor vehicles and shall comply with the following specification:

a. Output Current—Capable of supplying the continuous current of the design electrical load.

b. Regulation

1. Dynamic—The output voltage at the supply shall not deviate more than 1.0 V from zero to maximum load (including inrush current) and shall recover 63% of its maximum excursion within 100 ms.

2. Static—The output voltage at the supply shall not deviate more than 2% with changes in static load from zero to maximum (not including inrush current), and means shall be provided to compensate for static input line voltage variations.

c. Ripple Voltage—Maximum 300 mV peak-to-peak.

**7. Endurance Requirements**

**7.1** The switch shall be capable of satisfactorily operating for 10 000 complete cycles at a temperature of  $24\text{ }^{\circ}\text{C} \pm 5.5\text{ }^{\circ}\text{C}$  ( $75\text{ }^{\circ}\text{F} \pm 10\text{ }^{\circ}\text{F}$ ) followed by 1 h ON in low position at  $24\text{ }^{\circ}\text{C} \pm 5.5\text{ }^{\circ}\text{C}$  ( $75\text{ }^{\circ}\text{F} \pm 10\text{ }^{\circ}\text{F}$ ).

**7.2** The average voltage drop from the input terminal(s) to the corresponding output terminal(s) shall be measured before and after the endurance test and shall not exceed 0.30 V (excluding rheostat), the average of three consecutive readings, at design load. If wiring is an integral part of the switch, the voltage drop measurement shall be made at switch terminals.

**8. Combination Windshield Wiper and Washer Switch**—The same combination switch shall be used for the test of each function. If the washer and wiper functions are mechanically coordinated, the functions shall be tested simultaneously. The wiper switch shall meet the requirements of this document. The washer switch shall meet the requirements of SAE J2348.

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