**SAE STANDARD J253 APR84**
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# Headlamp Switch—SAE J253 APR84

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# ϕ HEADLAMP SWITCH—SAE J253 APR84

**SAE Standard**

Report of the Lighting Committee, approved July 1971, completely revised April 1984. Rationale statement available.

*1. Purpose*—This standard defines the test conditions, procedures, and performance specifications for 6-, 12-, and 24-volt manually actuated headlamp switches (circuit breaker(s) may be incorporated for circuit overload protection).

*2. Definition*—The headlamp switch is an operator-activated device intended primarily to control functioning of headlamps, parking lamps, tail lamps, and certain marking lamps. Secondarily, the device may control functioning of various accessory and instrument lights.

*3. Test Requirements*

**3.1 Test Equipment and Instrumentation**

3.1.1 POWER SUPPLY—The power supply shall comply with the following specifications:

(a) Output Current—capable of supplying the continuous and in-rush currents of the design load (Ref.: paragraph 3.2.1.1).

(b) Regulation

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

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

(c) Ripple Voltage—maximum 300 mV peak-to-peak.

3.1.2 VOLTMETER—0—30 V maximum full scale deflection, accuracy ± ½%.

NOTE: A digital meter having at least a 3½ digit readout with an accuracy of ± 1% plus one digit is recommended for millivolt readings.

3.1.3 AMMETER—Capable of carrying full system load current, accuracy ± 3%.

**3.2 Test Procedures**—Environmental conditions have been selected for this standard to help assure satisfactory operation under general customer use conditions. It is essential to duplicate specific environmental conditions under which the device is expected to function.

3.2.1 ELECTRICAL LOADS

3.2.1.1 The design load applied to the switch is the electrical load specified by the number and type of bulbs (or other electrical load devices) to be operated by each circuit of the switch. For example, the design load for the headlamp circuit may be four sealed beam headlamp units (2-4651 and 2-4652) and four–#194 bulbs.

3.2.1.2 The switch shall be operated at 6.4 ± 0.2 V d-c for a 6-volt system, 12.8 ± 0.2 V d-c for a 12-volt system, or 25.6 ± 0.2 V d-c for a 24-volt system. These voltages shall be the open circuit voltage measured at the input termination on the switch.

3.2.2 TEMPERATURE TEST PROCEDURES

3.2.2.1 The switch shall be exposed for 1 h without electrical load to each of the following temperatures: 25 ± 5°C; 74 + 0°, −3°C; −32 + 3°C, −0°C. The switch shall be manually cycled at each temperature for ten cycles at design load.

3.2.2.2 The same switch shall be used for the endurance test described in paragraph 3.2.3.

3.2.3 ENDURANCE TEST PROCEDURE

3.2.3.1 The switch shall be electrically connected to operate its design load (both primary and secondary circuit function design electrical loads) at a temperature of 25 ± 5°C.

3.2.3.2 The switch shall be operated for a minimum of 11 000 cycles[1]. One complete cycle shall consist of sequencing through each position (with dwell in each position) and return without dwell in intermediate positions to the initial position.

The test equipment shall be arranged to provide the following switch operating time requirements:

| | |
|---|---|
| Travel Time: | 0.1—0.5 s (time from one position to the next) |
| Dwell Time: | 1.0—2.0 s (time in each position) |
| Make and Break Rate: | 130—150 mm/s |

3.2.3.3 At the completion of the cycle testing, the switch shall be operated for 1 h in the headlamp position with the design load(s) connected.

3.2.4 VOLTAGE DROP TEST PROCEDURE

3.2.4.1 The voltage drop from the input terminal(s) to the corresponding output terminal(s) shall be measured at design load before and after the completion of the endurance test and shall be the average of three consecutive readings. These voltage drop readings should exclude the voltage drop across the circuit breaker(s). If wiring is an integral part of the switch, the voltage drop measurement shall be made including 75 ± 6 mm of wire on each side of the switch; otherwise the measurement shall be made at the switch terminals.

*4. Performance Requirements*

**4.1** During and after each of the cycles described in paragraphs 3.2.2.1 and 3.2.3, the switch shall be electrically and mechanically operable.

**4.2** The voltage drop shall not exceed 0.3 V when measured as in paragraph 3.2.4, before and after completion of the tests described in paragraph 3.2.3.

[1] 11 000 cycles represents three cycles of headlamp switch operation every day for approximately 10 years, or one cycle for each 4.5 miles driven for 100 000 miles with 50% night driving.

The ϕ symbol is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.