The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

SURFACE VEHICLE STANDARD

SAE J1076

REV. MAR90

Issued 1974-02
Revised 1990-03-16

Superseding J1076 FEB74

Submitted for recognition as an American National Standard

(R) BACKUP LAMP SWITCH

1. ***Scope—***This standard defines the test conditions, procedures and performance specification for 6, 12, and 24 V backup lamp switches which are intended for use in motor vehicles.

2. ***References—***There are no referenced publications specified herein.

3. ***Definitions—***The backup lamp switch is an operator activated device intended primarily to control the function of the backup lamps. There are three types:

3.1 **Type "A"—**A transmission mounted backup lamp switch is that device which is mounted in or on the transmission and actuated by a moving part within the transmission that energizes the backup lamps when the transmission is shifted into reverse.

3.2 **Type "B"—**A backup lamp switch performing the same function as Type "A", except that it is operated by a mechanism external of the transmission but not mounted in the passenger compartment.

3.3 **Type "C"—**A backup lamp switch performing the same function as Type "A" but mounted in the passenger compartment and actuated by movement of the shift mechanism or linkage.

4. ***Test***

4.1 **Test Equipment and Instrumentation**

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

a. Output current - capable of supplying the continuous and inrush currents of the design 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 should 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 variations.

c. Ripple Voltage - maximum 300 mV peak to peak.

4.1.2 VOLTMETER—0 – 30 V maximum full scale deflection, accuracy ±1/2%.

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NOTE—A digital meter having at least a 3-1/2 digit readout with an accuracy of ±1% plus 1 digit is recommended for mV readings.

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

4.2 Test Procedures—Environmental conditions have been selected for this document 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.

4.2.1 ELECTRICAL LOADS

4.2.1.1 The design load applied to the switch is the electrical load specified by the number and type of lamp(s) or other electrical load device(s) to be operated by each circuit of the switch. For example, the design load for the backup lamp circuit may be two 1156 bulbs.

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

4.2.2 TEMPERATURE TEST PROCEDURE

4.2.2.1 *Type "A" and "B"*—The switch shall be exposed for 1 h without electrical load to each of these temperatures: 25°C ± 5; 107 (+0°, -3°C); -32 (+3°C, -0°C). After each of the one h temperature exposures, the switch shall be manually cycled for ten cycles at the design electrical load to insure basic electrical and mechanical function at these temperatures.

4.2.2.2 *Type "C"*—The temperature test shall be conducted the same as for Type "A" and "B" except the ambient temperatures shall be 25°C ± 5°C; 74 (+0, -3°C); -32 (+3, -0°C).

4.2.2.3 This same switch shall be used for the endurance test described in 3.2.3.

4.2.3 ENDURANCE TEST PROCEDURE

4.2.3.1 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°C ± 5°C.

4.2.3.2 The switch shall be operated for a minimum of 30 000 [1] cycles. One complete cycle shall consist of sequencing through each position (with dwell in each position) and return without dwelling in each of the 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: 0.5—2.0 s
(time in each position)
Make &
Break Rate: 130—150 mm per s

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

1. 30 000 cycles represents 8 cycles of backup lamp switch operation every day for approximately 10 years, or one cycle for each 3.3 miles driven for 100 000 miles.

4.2.4 VOLTAGE DROP TEST PROCEDURE

4.2.4.1 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. If wiring is an integral part of the switch, the voltage drop measurement shall be made including 75 mm ± 6 mm of wire on each side of the switch; otherwise the measurement shall be made at the switch terminals.

5. Performance Requirements

5.1 During and after each of the cycles described in 3.2.2 and 3.2.3, the switch shall be electrically and mechanically operable.

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

6. Notes

6.1 **Marginal Indicia—**The change bar (l) located in the left margin is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. An (R) symbol to the left of the document title indicates a complete revision of the report.

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