SURFACE VEHICLE STANDARD

J1495™ NOV2018

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Superseding J1495 NOV2017

Test Procedure for Battery Flame Retardant Venting Systems

RATIONALE

This standard is being revised to clarify test procedure recommendations.

1. SCOPE

This SAE Standard details procedures for testing lead-acid SLI (starting, lighting, and ignition), heavy-duty, EV (electric vehicle), and RV (recreational vehicle) batteries, to determine the effectiveness of the battery venting system to retard the propagation of an externally ignited flame of battery gas into the interior of the battery under sustained overcharge conditions.

NOTE: At this time, 2018, there is no known comparable ISO Standard.

2. REFERENCES

2.1 Applicable Documents

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 International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J537 Storage Batteries

3. SAFETY PRECAUTIONS AND PROCEDURES

WARNING: Testing of a battery venting system can result in an explosion. Extreme caution must be exercised to avoid personal injury, including the selection of appropriate personal protective equipment (PPE). PPE, including hearing protection, must be carefully selected to match the protection needs of the specific test conditions. Absolutely no testing should be permitted where the prescribed safety precautions and procedures are not followed or exceeded.

3.1 All test apparatus, except the charging source, must be fully contained in an externally vented explosion test chamber (for example, see Figure 1).

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SAE WEB ADDRESS: http://www.sae.org

3.2 The battery-charging source must be located outside the explosion test chamber convenient to the control of the testing personnel. The charging circuit must have two emergency disconnect switches (1) readily accessible to the testing personnel, and (2) located at a remote position at least 3 m from the explosion test chamber. These disconnect switches are intended for emergency use only, since their use may damage some types of chargers.

3.3 A suitable test area should be designated, for example, 3 m^2 or more. Signs restricting unauthorized persons from this area should be posted and observed while any electrical circuit in the explosion test chamber is or could be energized.

3.4 During testing, entry to the area in which the explosion test chamber is located should be clearly marked to restrict all persons not fully familiar with all safety requirements and not wearing full protection from the hazard to be encountered.

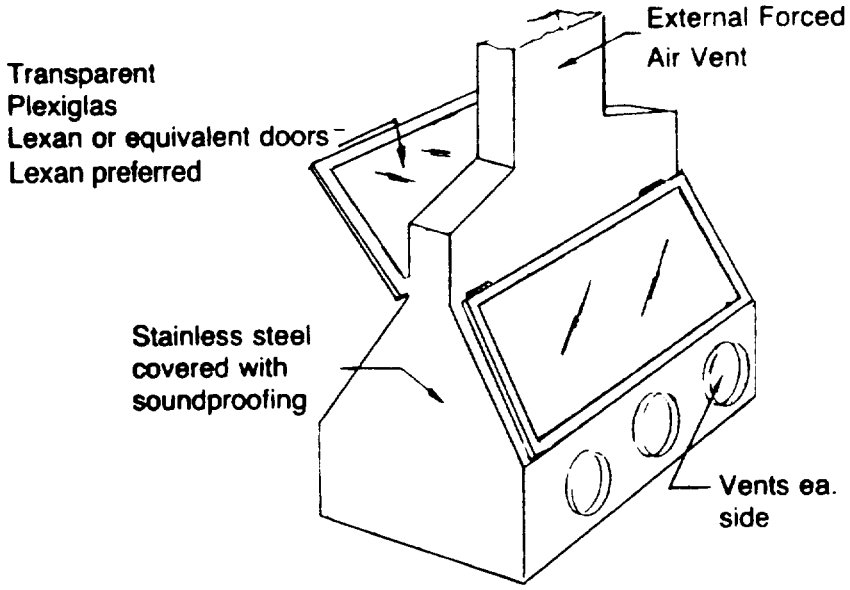

Figure 1 - Potential test chamber construction

3.5 Smoking, open flames, unprotected lights, or other spark sources must not be permitted in the area during testing.

3.6 Full-face protection devices must be worn by all persons within the restricted area.

3.7 The battery spark source circuit must have an emergency disconnect switch readily available to the testing personnel.

3.8 The exhaust fan of the explosion test chamber, if so equipped, should be capable of operation during the entire spark test procedure. If active ventilation is found to interfere with the ability to ignite the gases from the specific test samples, a damper in the exhaust fan stack may be used during the test to avoid removing the gas to the extent that the spark does not ignite the hydrogen. Optionally, the exhaust fan can be turned off via an externally accessible switch during the test to avoid removing the gas to the extent that the spark does not ignite the hydrogen. In either case, using a damper or turning off the exhaust fan, the duration of such a reduction of ventilation should be limited to prevent any excessive buildup of hydrogen in the test chamber. On completion of any test sequence, all charging and sparking circuits used for the testing must be interrupted for at least 5 minutes (with the exhaust fan operating, if available) before anyone is permitted access to the chamber. This time interval allows any hydrogen to be purged from the chamber and to preclude the possibility of a delayed explosion occurring due to a sustained "hidden" flame.

WARNING: Hydrogen gas can burn without visible flame.

4. EQUIPMENT RECOMMENDED FOR SPARK TEST

4.1 Spark Testing Conducted Using a Battery

Spark testing is always conducted with the vent(s) installed on a battery for final design verification testing.

4.1.1 An explosion chamber (for example, Figure 1), recommended to be equipped with an explosion-proof fan of adequate size to prevent any excessive buildup of hydrogen in the test chamber, vented directly to the exterior of the building. Adequate fan sizing will be dependent upon the expected gassing rates to be trialed in the test chamber.

4.1.2 A battery-charging source capable of current control, with an output current of 40 to 100 A at 18.0 V.

4.1.3 A fully-charged 12 V battery equipped with a functional flame-retardant venting system to serve as an ignition source for 12 V spark source systems.

4.1.3.1 Optionally, an external high-voltage supply may be used to power the ignition source.

4.1.4 A remotely controlled water source may be utilized as a precautionary measure to extinguish aborted/failed tests.

4.1.5 Battery on which the test is to be performed.

4.1.6 Wiring and fixture equivalent to those shown in Figures 2A or 2B.

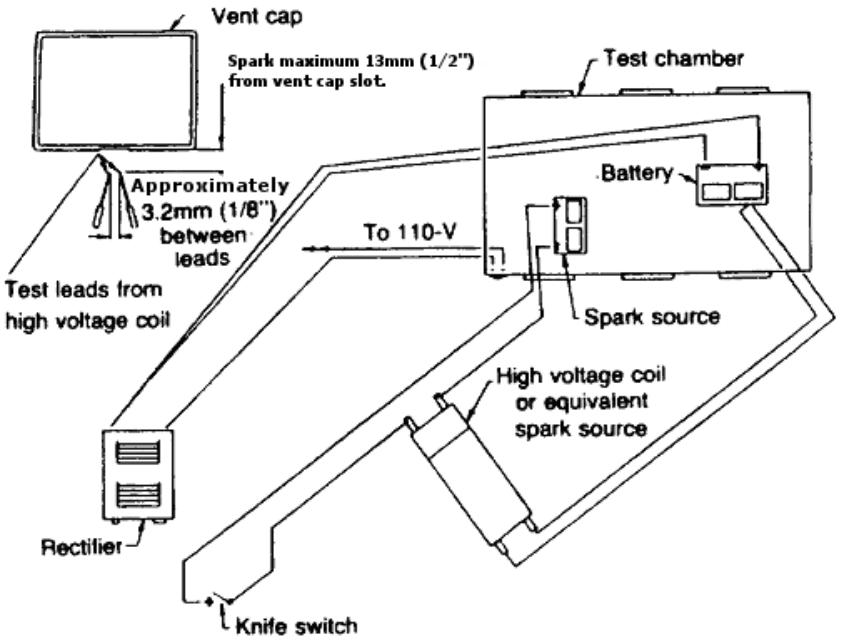

Figure 2A - Schematic for test on battery