SAE International™

SURFACE VEHICLE STANDARD

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Comprehensive Life Test for 12 V Automotive Storage Batteries

RATIONALE

This test was developed through an industry sponsored laboratory and automotive fleet study to improve the correlation of test results versus time in the field for a broad spectrum of 12 V lead-acid battery manufacturing technologies.

INTRODUCTION

The SAE Storage Battery Committee commissioned a task force to investigate alternatives to the current high temperature (75 °C) SAE J240b life test. The objective for the task force was to develop a life cycle test that would produce the failure modes found in high temperature service for the most common commercially available 12 V Starting Lighting and Ignition lead-acid battery manufacturing technologies. This test procedure is the result of a three year industry sponsored study involving large-scale laboratory testing and vehicle fleet.

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1. SCOPE

This SAE Standard applies to 12 V, flooded and absorptive glass mat lead acid automotive storage batteries of 180 minutes or less reserve capacity and cold crank capacity greater than 200 amperes.

This life test is considered to be comprehensive in terms of battery manufacturing technology; applicable to lead-acid batteries containing wrought or cast positive grid manufacturing technology and providing a reasonable correlation for hot climate applications.

This document is intended as a guide toward standard practice, but may be subject to change to keep pace with experience and technical advances.

1.1 Purpose

This life test simulates high heat automotive service when the battery operates in a voltage regulated charging system. It subjects the battery to charge and discharge cycles comparable to those encountered in automotive service. Other performance and dimensional information is contained in the latest issue of SAE J537.

NOTE: Caution must be exercised when using this test as a means to provide an absolute value for battery life, as recommendations for sample size are not contained in this procedure.

2. REFERENCES

2.1 Applicable Publication

The following publication forms a part of the specification to the extent specified herein. Unless otherwise indicated, the latest revision of SAE publications shall apply.

2.1.1 SAE Publication

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

SAE J537 Storage Batteries

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 Publication

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

SAE 2007-01-0637 High Temperature Application Accelerated Cycle Life Test for 12 V Lead-Acid SLI Automotive Storage Batteries

3. TEST PROCEDURE

3.1 Cycle life testing shall begin within sixty days of the final nondestructive test as shown in 3.3 of SAE J537 (Table 1). Begin test with a fully charged/conditioned battery per SAE J537.

3.2 The battery is tested in a water bath maintained at 75 °C ± 3 °C (167 °F ± 5 °F)

3.3 Water level of the bath specified in 3.2 is to be maintained at a height equal to or greater than 75% of the overall height of the battery container or within 12 mm (1/2 in) of the metal bushing of side terminal batteries.

3.4 The test cycle is performed as follows:

a. Discharge 18 seconds, 25 amps

b. Charge 30 minutes, 14.2 volts, max 25 amp

c. Discharge 15 minutes, 3 amps

d. Charge 30 minutes, 14.2 volts, max 25 amp