ETA-HAC02

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Control of Test Conduct

Prepared by

Electric Transportation Applications

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1.0 Objective

The objective of this procedure is to identify a common protocol for the conduct of test activities for hybrid electric vehicles which Electric Transportation Applications is responsible, either as the Project Manager, Program Manager or Test Manager.

2.0 Purpose

This procedure establishes acceptable methods for the development, use and completion of processes used in support of performance testing of electric vehicles provided to Electric Transportation Applications for testing to the technical requirements of HEV America. It also provides a means to document deviations from approved test procedures when such deviations are necessary and appropriate.

3.0 Documentation

Documentation addressed by this procedure shall be consistent, easy to understand, easy to read, and readily reproducible. This documentation shall contain enough information to "stand alone;" that is, be self-contained to the extent that all individuals qualified to review it could be reasonably expected to reach a common conclusion, without the need to review additional documentation. Storage and retention of records shall be completed as described in Procedure ETA-HAC01, "Control, Close-out and Storage of Documentation."

4.0 Initial Conditions and Prerequisites

4.1 All documentation required to complete the testing identified in the technical requirements guidelines shall be completed, approved and issued prior to commencing the testing it addresses.

4.2 Individuals assigned as Test Engineers shall be familiar with the all phases and portions of the tests for which they have responsibility, and should be familiar with the entire Test Program.

4.3 Prior to commencing any test, a meeting of the test team shall be held to discuss the following requirements:

4.3.1 Test purpose and requirements;

4.3.2 Test methodologies; and

4.3.3 Personnel requirements.

4.3.4 Expected contingencies and exceptions, including:

4.3.4.1 Reasons; and

4.3.4.2 Justifications.

4.3.5 Safety requirements

5.0 Personnel Qualifications

5.1 All individuals involved in covered test activities shall be trained and certified in accordance with the requirements of ETA-HAC05, "Training and Certification Requirements for Personnel Utilizing ETA Procedures."

5.2 All individuals involved in covered test activities shall have received a briefing on the hazards associated with hybrid electric vehicle propulsion batteries, including:

5.2.1 Type of traction batteries;

5.2.2 Location of traction batteries;

5.2.3 Voltage of traction battery;

5.2.4 Location of traction battery emergency disconnect switch; and

5.2.5 Basic hazard communication information particular to the traction battery on-board.

5.3 All individuals involved in covered test activities shall have received a briefing on the hazards associated with hybrid electric vehicle fueling, including:

5.3.1 Type of fuel used;

5.3.2 Vehicle fueling procedures;

5,3,3 Emergency and spill (for liquid fuels) procedures; and

5.3.4 Basic hazard communication information particular to the vehicle fuel.

5.4 All individuals involved in covered test activities shall have received a briefing on the hazards associated with hybrid electric vehicle accessory batteries, including:

5.4.1 Type of accessory battery;

5.4.2 Location of accessory battery;

5.4.3 Voltage of accessory battery;

5.4.4 Basic hazard communication information particular to the accessory battery on-board; and

5.4.5 Location of accessory battery emergency disconnect switch, if so equipped.

6.0 Activity Requirements

6.1 Test Activities

Testing shall be conducted by the Test Engineer under the supervision of the Test Manger and/'or the Test Director. All testing shall be conducted in accordance with NEV America administrative, quality and test procedures. The results of testing shall be documented in a final report in accordance with the requirements of ETA-NAC007.

During testing activities, if a vehicle fails to meet any "shall" requirement of the then effective NEV America Neighborhood Electric Vehicle (NEV) Technical Specifications for any reason other than a propulsion battery reaching its design DOD limit, the vehicle shall be removed from the Test Program until such time as the manufacturer can repair it. The failure shall be documented by the Test Engineer using a Non-Conformance Report (ETA-HTP11, "Vehicle Receipt," Appendix B). The Non-Conformance Report shall be transmitted to the vehicle supplier for resolution of the non-conformance. Vehicles which are removed from testing due to a failure as stated above shall not be subject to further testing until repairs are complete. Once repairs have been completed, every effort shall be made to complete as much of the remaining tests as possible. Vehicles not repaired in a cumulative total of 72 hours shall be considered to have failed the NEV America Performance Test Program, and shall be removed from the program.

Non-Conformance Reports shall also be used to document any vehicle condition or test result which the Test Engineer considers unusual and requires response from the vehicle supplier. The Test Engineer shall complete the Non-Conformance Report and transmit it to the vehicle supplier, requesting response as soon as possible. The Test Engineer shall make a determination as to the need to halt testing of the vehicle pending resolution of the Non-Conformance Report by the vehicle supplier.

Activities related to specific Performance Testing are addressed by procedures specific to those test activities.

6.1.1 For any testing activity, all personnel assigned test team activities shall be familiar with the following:

6.1.1.1 The test being conducted;

6.1.1.2 The parameters being measured;

6.1.1.3 The anticipated results of the test;

6.1.1.4 The metrology used in the conduct of the test;

6.1.1.5 Contingency actions, in case of test/equipment failure;

6.1.1.6 Emergency response actions in case of equipment damage (specifically battery damage, or failure of the battery and battery compartment); and

6.1.1.7 Safety requirements.

6.1.2 Data sheets shall be filled out as the data is collected, unless the data must be downloaded from a Data Acquisition System (DAS).

6.1.3 If a DAS is used, the data shall be recorded on the data sheets as soon as practicable. At a minimum, all data transcription should be completed no later than seven (7) days following test completion, and verified by the Test Manager or Test Engineer.

6.1.4 Data sheets may be filled out by any member of the test team; however, the Program Manager, Test Manager or Test Engineer shall sign the completed data sheet attesting to the validity of the data collected.

6.2 Test Exceptions

Deviations from approved test methods, requirements and/or procedures shall not be permitted without approval of the Program or Test Manager. All exceptions shall be noted on Appendix A, Test Exception Report (TER). The following requirements apply to TERs:

6.2.1 All Test Exceptions shall be numbered.

6.2.2 The number shall use the format TER-HTPXXX-YYYYY-ZZZ, where:

6.2.2.1 XXX indicates the procedure number being excepted;

6.2.2.2 YYYYY indicates the last 5 digits of the vehicles VIN;

6.2.2.3 ZZZ is the sequential number of all TERs written for that vehicle during the test program.

6.2.3 The number will be issued by the Test or Program Manager at the time of his/her signature.

6.2.4 All Test Exceptions shall be maintained with the Test Manager's Log, and shall be a permanent part of the Test Record.

6.2.5 TERs shall contain the following minimum information:

6.2.5.1 The procedure for which the TER is being written.

6.2.5.2 The specific step being excepted;

6.2.5.2 Why the exception is necessary;

6.2.5.3 The justification for the exception;

6.2.5.4 The date and time of the exception;

6.2.5.5 The printed name and signature of the person requesting the exception;

6.2.5.6 The printed name and signature of the person approving the exception, and the date of the approval.

6.2.6 If a deviation is taken and then subsequently disallowed by the Program Manager or Test Manager, the original step shall be re-performed (as allowed by contract terms and conditions), within the requirements of the applicable Test Procedure, and so documented.

6.2.7 The Program Manager or Test Manager shall notify the test vehicle Supplier as soon as practical of deviations resulting from mechanical or electrical failure of the test vehcile. Time required for the Supplier to remedy the failure shall be tracked and recorded on the Test Exception Report. Repair tme shall be logged in 24 hour increments and shall begin when the Supplier takes custody of the vehicle. Repair time shall end when the Supplier returns custody of the vehicle to the Program Manager or Test Manager. All work performed by the Supplier to repair the test vehicle shall be recorded on the Test Exception Report. Only work required to restore the vehicle to its pre-failure state shall be performed by the Supplier.

7.0 Supplemental Activity Requirements

7.1 Distribution

Distribution of documents shall be in accordance with ETA-HAC01, "Control, Close-out and Storage of Documentation."

7.1.1 Distribution of the original documents or copies of the documents shall be controlled to ensure that only appropriate individuals receive them.

7.1.2 Subsequent to a document's completion (including signatures, as required), the original shall be transmitted in accordance with procedure ETA-HAC01.

7.2 Destruction of Documents

Destruction of original documents shall not be allowed. All test documents, including those for tests which were either suspended or failed, shall be retained as part of the test record. Retention of documents shall be in accordance with the Procedure ETA-HAC01, "Control, Close-out and Storage of Documentation." Any exceptions shall be approved per the requirements of that procedure.

8.0 Glossary

8.1 Data Acquisition System (DAS) - A data recording system, nominally analog or digital, used to collect data for further processing. Usually a strip-chart recorder, a computer, tape recorded, etc. Also known as a DAQ.

8.2 Depth of Discharge (DOD) - The quantified percentage of discharge of a battery, in terms of ampere-hours, kilowatt-hours or miles, expressed as a percentage of the total battery capacity in similar units.

8.3 Effective Date - The date, after which the procedure has been reviewed and approved, that the procedure can be utilized in the field for official testing.

8.4 Program Manager - As used in this procedure, the individual within Electric Transportation Applications responsible for oversight of HEV America. [Subcontract organizations may have similarly titled individuals, but they are not addressed by this procedure.]

8.5 Shall - Items which require adherence without deviation. Shall statements identify binding requirements. A go, no-go criterion.

8.6 Should - Items which require adherence if at all possible. Should statements identify preferred conditions.

8.7 Test Director - The individual within Electric Transportation Applications responsible for all testing activities associated with HEV America.

8.8 Test Director's Log - A daily diary kept by the Test Director, Program Manager, Test Manager or Test Engineer to document major activities and decisions that occur during the conduct of a Performance Test Evaluation Program. This log is normally a running commentary, utilizing timed and dated entries to document the days activities. This log is edited to develop the Daily Test Log published with the final report for each vehicle.

8.9 Test Engineer - The individual(s) assigned responsibility for the conduct of any given test. [Each contractor/subcontractor should have at least one individual filling this position. If so, they shall be responsible for adhering to the requirements of this procedure.]

8.10 Test Manager - The individual within Electric Transportation Applications responsible for the implementation of the test program for any given vehicle(s) being evaluated to the requirements of HEV America. [Subcontract organizations may have similarly titled individuals, but they are not addressed by this procedure.]

8.11 HEV America – Hybrid Electric Vehicle America Performance Test Program, the DOE sponsored test program for independently assessing the performance of vehicles submitted for testing.

9.0 References

9.1 ETA-HAC01 - "Control, Close-out and Storage of Documentation."

9.2 ETA-HAC04 - "Procedure for the Review of Test Results."

9.3 ETA-HAC05 - "Training and Certification Requirements for Personnel Utilizing ETA Procedures."

APPENDIX-A

Test Exception Report
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TER # _____	
Procedure Being Excepted:	**Step Being Excepted:**
Requested by: Printed Name Signature	
Date of Request:	**Time of Request:**
Numbered by: Printed Name Signature	
Approval (Circle ONE) YES NO Signature	
Reason for Request:	
Impact to Test Procedure and/or Test Program	
Reason for Approval or Denial	
Additional Requirements due to Approval/Denial	
Reviewed By: (Printed Name) (Signature) (Date)	
Approved By: (Printed Name) (Signature) (Date)	