HEV America
BASELINE TEST SEQUENCE
Revision 1

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Prepared by

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HEV PERFORMANCE TEST PROCEDURE SEQUENCE

The following test sequence shall be used for conduct of HEV America Baseline Performance Testing. This sequence of testing confirms vehicle conformance with all "shall" statements contained in the HEV America Hybrid Electric Vehicle (HEV) Vehicle Specifications. Additionally, submittal of all information required by the HEV America Hybrid Electric Vehicle (HEV) Vehicle Specifications is verified and selected "should" statements are verified.

1. ETA-HAC06 Receipt Inspection

Conduct of this test procedure accomplishes the following test objectives.

- Should data submittal verification
- Should data submittal accuracy verification by inspection
- Should data submittal accuracy verification by vehicle measurement
- Testing for selected should requirements not verified by specific Performance Test Procedures (ETA-HTPXXX)

2. ETA-HTP11 Vehicle Verification (Initial Phase)

Conduct of this test procedure is accomplished in two phases. The initial phase accomplishes the following test objectives.

- Shall data submittal verification
- Shall data submittal accuracy verification by inspection
- Testing for shall requirements not verified by specific Performance Test Procedures (ETA-HTPXXX)

3. ETA-HTP04 Electric Vehicle Constant Speed Range Tests

This procedure is applicable only to vehicles operable in "RESS only mode."

Conduct of this test procedure accomplishes the following test objectives.

- Vehicle "RESS only mode" range verification
- Determination of durability at maximum speed
- Speedometer accuracy should requirement verification
- Odometer accuracy shall requirement verification
- SOC meter accuracy should requirement verification
- Maximum RESS discharge shall requirement data collection
- DOD calibrations for subsequent "RESS mode only" tests

NOTE;
For vehicles operable in "RESS only mode" this testing is performed only in "RESS only mode."

HEV PERFORMANCE TEST PROCEDURE SEQUENCE

4. ETA-HTP05 Rough Road Course Test

Conduct of this test procedure accomplishes the following test objectives.

- Rough road completion shall requirement verification
- Rough road impairment should requirement
- RESS leakage current to chassis shall requirement data collection
- Charger leakage current to ground shall requirement data collection for vehicles capable of grid connection
- Charging efficiency data collection for vehicles capable of grid connection in accordance with ETA-HTP08, "Rechargeable Energy Storage System (RESS) Charging."

NOTE; *For vehicles operable in "RESS only mode" rough road testing is performed in "RESS only mode." For vehicles only capable of operating in "normal operating mode," rough road testing is performed in the "normal operating mode."*

5. ETA-HTP02 Acceleration, Gradeability and Deceleration

Conduct of this test procedure accomplishes the following test objectives.

- Acceleration should requirement verification
- Gradeability should requirement verification

NOTE: For vehicles operable in "RESS only mode" this testing is performed in "RESS only mode" at and RESS SOC of 100% and 50% and in "normal operating mode." For vehicles only capable of operating in "normal operating mode," rough road testing is performed in the "normal operating mode."

6. ETA-HTP01 SAE J1263 Coastdown

Conduct of this test procedure accomplishes the following objectives.

- Develop road load coefficients for use in SAE J1634 dynamometer testing

NOTE; This procedure is conducted for all vehicles that will be tested using ETA-HTP03.

7. ETA-HTP06 Brake Testing

Conduct of this test procedure accomplishes the following test objectives.

- Regenerative braking interaction shall requirement verification
- Braking distance data collection

NOTE; For conduct of this test, all vehicles are operated in the "normal operating mode."

8. ETA-NTP010 RESS Charger Performance Testing

This procedure is applicable only to vehicle capable of grid connection.

Conduct of this test procedure accomplishes the following test objectives.

- Maximum RESS discharge shall requirement data collection
  (Note; This testing requires a separate RESS discharge to verify repeatability of the discharge limiter data collected by ETA-NTP004 using ETA-NTP011)
- Charge time shall requirement verification
- Automatic termination shall requirement verification
- Charger input voltage shall requirement verification
- Charger operating data collection
- Charger ground leakage current data collection
- Charging efficiency data collection and calculation
- Out of service endurance should requirement verification

NOTE; This procedure is conducted for all vehicles capable of grid connection, regardless of the vehicles operating mode capabilities.

9. ETA-NTP011 Vehicle Verification (Final Phase)

Conduct of this test procedure accomplishes the following test objectives.

- Verification of maximum DOD limit repeatability (using ETA-NTP04) for vehicles capable of grid connection or operation in "RESS only mode"
- Repair time shall requirement verification (using Non-Conformance Reports)
- Charger leakage current verification for vehicles capable of grid connection

10. ETA-HTP03 SAE J1634 Dynamometer Testing

Conduct of this test procedure accomplishes the following objectives.

- Determine hybrid vehicle fuel efficiency without air conditioning loads
- Determine hybrid vehicle fuel efficiency with air conditioning loads
- Determine "RESS only mode" range
- Provide a format to evaluate EMI in accordance with ETA-HTP09

NOTE; For vehicles operable in "RESS only mode" dynamometer testing is performed in "RESS only mode" " at RESS SOC of 100% and in "normal operating mode." For vehicles only capable of operating in "normal operating mode," dynamometer testing is performed in the "normal operating mode."

11. ETA-HTP14 Evaluation of Hybrid-Electric Vehicle Battery Packs

Conduct of this test procedure accomplishes the following objectives.

- Determine hybrid C1 battery capacity
- Determine hybrid battery power capability

HEV CONDUCT OF RESS CHARGING PROCEDURES

During conduct of testing, the vehicle RESS shall be charged using the following procedures.

A. ETA-HTP08 RESS Charging

Conduct of this test procedure accomplishes the following test objectives.

- Provides guidance for RESS charging activities using Level I or II off-board or onboard charging
- Determination of RESS 100% SOC
- Determination of charging efficiency for vehicles capable of grid connection

NOTE; This provides guidance for determination of 100% RESS SOC for all vehicles, regardless of operating mode capabilities.

B. ETA-HTP12 Vehicle Energy Management Evaluation

Conduct of this test procedure accomplishes the following test objectives.

- Evaluation of the effectiveness of the hybrid vehicle energy management system throughout HEV America testing.

NOTE; This provides guidance for determination of hybrid energy management systems for all vehicles, regardless of operating mode capabilities.