EVAMERICA U.S. DEPARTMENT OF ENERGY ADVANCED VEHICLE **TESTING** ACTIVITY



2009 MINI E **VEHICLE SPECIFICATIONS**

BASE VEHICLE: 2009 BMW MINI E

Seatbelt Positions: Two Standard Features: Front Wheel Drive Front Disc and Rear Disc Brakes Regenerative Braking With Coast Down Three-Point Safety Belts Speedometer Odometer State-Of-Charge Meter

BATTERY

Type: Lithium Ion Number of Modules: 48 Weight of Pack(s): 260 kg Pack(s) Location: Behind the front seats in the rear cargo area Nominal System Voltage: 380V

POWER PLANT

Motor Controller: AC Propulsion Type: AC Induction Motor Power: 150 kW (200hp) Torque: 220 Nm (162 ft/lb)

WEIGHTS

Design Curb Weight: 3230 lb Delivered Curb Weight: 3306 lb Distribution F/R: 51/49 % GVWR: 3660 lb Pavload²: 354 lb Performance Goal: 400 lb

DIMENSIONS

Wheelbase: 97.1 inches Track F/R: 57.4/57.8 inches Length: 145.6 inches Width: 66.3 inches Height: 55.4 inches Ground Clearance: 6.0 inches Performance Goal: 5.0 inches

CHARGER

Level 1: Location: On-board Type: Conductive Input Voltages: 120VAC Level 2: Location: Off-board Type: Conductive Input Voltages: 240 VAC

PERFORMANCE **STATISTICS**

Acceleration (0-50mph) @ 332 lbs Payload

At 100% SOC: 8.3 seconds Max Power: 150.2 kW At 50% SOC: 8.5 seconds Max Power: 109.7 kW Performance Goal (0-50mph): 13.5 sec

Maximum Speed @ 332 lbs Payload

At 100% SOC: 81.1 mph At 50% SOC: 80.7 mph Performance Goal: 70 mph

Constant Speed Range @55mph¹

Range: 129.5 miles Energy Used: 30.273 kWh Efficiency: 233.8 Wh-DC/mile Specific Energy: 116.4 Wh/kg Charging Energy: 36.14 AC kWh Performance goal: 50 miles

Constant Speed Range @65mph¹

Range: 104.15 miles Energy Used: 29.344 kWh Efficiency: 281.7 Wh-DC/mile Specific Energy: 112.9 Wh/kg Charging Energy: 35.40 AC kWh

Driving Cycle Range (UDDS)

Range per SAE J1634: 142.45 miles Energy Used: 29.656 kWh Efficiency: 208.2 Wh/mile Specific Energy: 114.1 Wh/kg Charging Energy: 36.86 AC kWh Performance Goal: 60 miles

Driving Cycle Range (HWY)

Range per SAE J1634: 137.34 miles Energy Used: 30.677 kWh Efficiency: 223.4 Wh/mile Specific Energy: 118.0 Wh/kg Charging Energy: 36.86 AC kWh

Gradeability:

Maximum Speed @ 3%: 80.4 mph Maximum Speed @ 6%: 80.3 mph Maximum Grade: 33%

Charging Efficiency:

Efficiency: 258.7 Wh-AC/mi Energy Cost: @ \$0.10/kWh: \$0.025/mi

Level 1 Charger (@110V/12A)

Time to Recharge to Complete: 26.5 hrs

Level 2 Charger (@240V/32A) Time to Recharge to Complete:4.5 hrs

Level 2 Charger (@240V/48A) Time to Recharge to Complete: 3 hrs

EST NOTES:

Vehicle was operated at the specified test speed until the vehicle could no longer maintain the desired speed.. As delivered payload was 354 Lbs. Hours were calculated at time that charger indicated completion.

This vehicle meets all EV America Minimum Requirements listed on back.

Values in red indicate the Performance Goal was not met. • All Power and Energy Values are DC unless otherwise specified

This vehicle complies with mandatory requirements of EV America Vehicle Technical Specification, Revision 1 as follows.

- 1. Vehicle has a payload of at least 400 pounds.
- 2. The OEM GVWR has not been increased.
- 3. The OEM GAWRs have not been increased.
- 4. Seating capacity is a least two (2) occupants.
- 5. A battery recycling plan has been submitted.
- 6. The OEM passenger space has not been intruded upon by the electrical conversion materials.
- 7. The vehicle has a parking mechanism or parking brake as required by 49 CFR 571.105.
- 8. The vehicle has a minimum range between charges of at least 50 miles when loaded with two 166-pound occupants and operated at a constant 45 mph.
- 9. The vehicle manufacturer has certified that this vehicle complies with the Federal Motor Vehicle Safety Standards (FMVSS) applicable on the date of manufacture.
- 10. The vehicle manufacturer has certified the batteries and battery enclosures comply with SAE J1766 and 49 CFR 571.301.
- 11. Batteries comply with the requirements of SAE J1718 and NEC 625 for charging in enclosed spaces without vent fans.
- 12. The vehicle manufacturer has certified that concentrations of explosive gases in the battery box do not exceed 25% of the Lower Explosive Limit (LEL) during
 - and following normal or abnormal charging and operation of the vehicle.
- 13. The battery charger is capable of recharging the main propulsion batteries to a state of full charge from any state of discharge in less than 12 hours.
- 14. The vehicle manufacturer has certified the charger is capable of accepting input voltages of 208V and 240V single phase 60 Hertz alternating current service, with

a tolerance of 10% of rated voltage. Charger input current is compatible with the requirements for Level II chargers and complies with the requirements of SAE J1772.

Personnel protection systems are in accordance with UL Proposed Standards 2231-1 and 2231-2.

- 15. The charger has a true power factor of .95 or greater and a harmonic distortion rated at < 20% (current at rated load).
- 16. The charger is fully automatic, determining when "end of charge" conditions are met and transitioning into a mode that maintains the main propulsion

battery at a full state of charge while not overcharging it, if continuously left on charge.

- 17. The vehicle does not contain exposed conductors, terminals, contact blocks or devices of any type that create the potential for personnel to be exposed to 50 volts or greater.
- 18. The vehicle will be accompanied by non-proprietary manuals for parts, service, operation, maintenance, interconnection wiring diagrams and schematics.
- 19. The vehicle has a state of charge indicator for the main propulsion batteries.
- 20. Propulsion power is isolated from the vehicle chassis and battery leakage is less than 0.5 MIU under static conditions.
- 21. Charging circuits are isolated from the vehicle chassis such that ground current from the grounded chassis any time the vehicle is connected to a charger does not

exceed 5 mA in accordance with UL Proposed Standards 2231-1 and 2231-2.

- 22. Replacement tires are commercially available to the end user.
- 23. The vehicle is interlocked such that: The controller does not energize to move the vehicle with the gear selector in any position other than "Park" or "Neutral".

The start key is removable only when the "ignition key" is in the "Off" position, with the drive selector in "Park". The controller does not initially energize or

excite with a pre-existing accelerator input, such that the vehicle can be moved under its own power from this condition

24. The vehicle manufacturer has certified that the vehicle complies with the FCC requirements for unintentional emitted electromagnetic radiation, as identified in

47 CFR 15, Subpart B, "Unintentional Radiators."

25. The vehicle manufacturer has certified failure of a battery or battery pack has deemed to have occurred if the actual battery capacity is not at least 80% of the

nominal ampere hour capacity.

- 26. This vehicle is equipped with an automatic disconnect and a manual service disconnect.
- 27. The charging system is compatible with the Personnel Protection requirements of SAE J1772.
- 28. Material Safety Data Sheets (MSDS) have been supplied for all on-board batteries.
- 29. The level of charge below which the batteries should not be discharged and how the controller automatically limits battery discharge below this level have been identified by the manufacturer.
- 30. The vehicle manufacturer has verified that the method(s) of charging the propulsion batteries and the charging algorithm have been reviewed and approved by the battery manufacturer.
- 31. The charger is capable of meeting the requirements of Section 625 of the National Electric Code (NEC).
- 32. The vehicle complies with the requirements of 49 CFR 571.301 for fuel fired heaters.
- 33. The vehicle has an on-board Battery Energy Management System (BMS).

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