



NEV AMERICA

US DEPARTMENT OF ENERGY FIELD OPERATIONS PROGRAM



2001 Frazer-Nash CityCar NEV

VEHICLE SPECIFICATIONS

PURPOSE-BUILT VEHICLE

Base Vehicle: 2001 Frazer-Nash
CityCar

VIN: SFBCS41A81M000002

Seatbelt Positions: Four

Standard Features:

- 4-Wheel Drive
- 4-Wheel Disc Brakes
- Regenerative Braking
- Three Point Safety Belts
- Odometer
- Speedometer
- State-Of-Charge Meter
- Back-Up Alarm
- Roof Mounted Solar Assist Array
- AM/FM/CD Audio system
- Air Conditioning
- Tilt Wheel
- Electric Windows
- Electric Mirror Adjust
- Remote Control Locking
- Remote Control Immobilizer

BATTERY

Manufacturer: Electrosources
 Type: Absorptive Glass Mat
 Number of Modules: 8
 Weight of Modules: 26.2 kg
 Weight of Pack(s): 210.0 kg
 Pack(s) Location: Underbody
 Nominal Module Voltage: 12V
 Nominal System Voltage: 48V
 Nominal Capacity (C/2): 136Ah

WEIGHTS

Design Curb Weight: 1954 lb
 Delivered Curb Weight: 1961 lb
 Distribution F/R: 50/50 %
 GVWR: 2593 lb
 GAWR F/R: 1104/1489 lb
 Payload: 640 lb²
 Performance Goal: 400 lb

DIMENSIONS

Wheelbase: 86.6
 Track F/R: 52.8 / 55.9 inches
 Length: 122.0 inches
 Width: 66.0 inches
 Height: 62.0 inches
 Ground Clearance: **3.9**
 Performance Goal: 5.0 inches

CHARGER

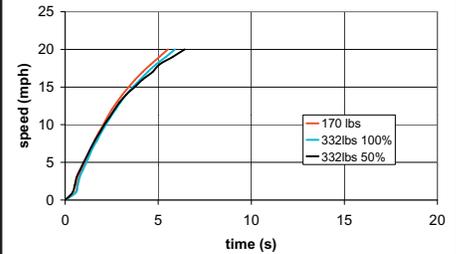
Location: Off board
 Type: Level 3 Conductive
 Input Voltages: 480VAC 3-Phase

TIRES

Tire Mfg: Continental
 Tire Model: Conti-Eco Contact EP
 Tire Size: 175/55 R15 77T
 Tire Pressure: 44 psi
 Spare Installed: No

PERFORMANCE STATISTICS

Acceleration



Acceleration (0-20 mph) @ 332 lbs Payload

At 100% SOC: 5.8 seconds

At 50% SOC: **6.4 seconds**

Performance Goal: 6.0 seconds

Maximum Speed @ 170 lbs Payload

(FMVSS 49 CFR 571.500 S5.a)

At 100% SOC: 24.6 mph

Performance goal ≤ 25 mph

Maximum Speed @ 332 lbs Payload

At 100% SOC: 24.6 mph

At 50% SOC: 24.5 mph

At Maximum Speed Range^{1,4,6}

Range: 30.9 miles

Energy Used: 5.29 kWh

Average Power: 4.24 kW

Efficiency: 171.2 Wh-DC/mile

Specific Energy: 25.2 Wh/kg

Braking From 20 mph

Controlled Dry: 17 feet

Controlled Wet: 24 feet

Panic Wet: 22 feet

Course Deviation: 0.0 feet

Handling

Average time: 70.1 seconds

Average NEV Time⁸: 77.3 seconds

Gradeability (Calculated)

Maximum Speed @ 3%: 24.6 mph

Maximum Speed @ 6%: 23.1 mph

Maximum Grade: 26 %

Charging Efficiency:

Efficiency: (Level 3)⁷

Energy Cost: @ \$0.10/kWh: (Level 3)⁷

Charger

Max Ground Current: <0.01 mA

Max Battery Leakage: <0.01 MIU

Max DC Charge Current: 95 A

Max AC Charge Current: (Level 3)⁷

Peak Demand: 6270 W

Time to Recharge: **56 Minutes**

Performance Goal: 80% SOC within 30
Minutes

TEST NOTES:

1. Vehicle was operated at maximum attainable speed until 18 mph could no longer be maintained.
2. As delivered payload was 633 lbs.
3. Vehicle was removed for one 24 hour period to repair front shock mount (NCR-NTP005-00002-005).
4. Vehicle was removed for one 24 hour period to repair main battery pack (NCR-AC006-00002-001).
5. Vehicle 12VDC auxiliary battery was repaired (NCR-AC006-00002-003).
6. Vehicle was removed for one 24 hour period to update software (NCR-NTP002-00002-004).
7. Level 3 charger testing was not conducted.
8. Average handling time was determined by comparing 10 NEVs that were enrolled during the first NEV America Program

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 the mandatory requirements of NEV America Technical Specifications, Revision 0 as follows.

- (1) Vehicles shall comply with Federal Motor Vehicle Safety Standard 500 as promulgated on the date of manufacture. Such compliance shall be certified by the Supplier in accordance with 49 CFR 567.
- (2) Suppliers shall provide a completed copy of Appendix B with their proposal, indicating the method of compliance with each required section of 49 CFR 571.500.
- (3) Vehicles shall be certifiable under current California Air Resources Board (CARB) regulations as vehicles that meet ZEV emission requirements and qualify for ZEV credits. If the vehicle is equipped with a fuel-fired heater, the heater shall also comply with this requirement.
- (4) Suppliers shall provide Material Safety Data Sheets (MSDS) for all unique hazardous materials supplied with the vehicle.
- (5) Suppliers shall provide recycling plans for batteries and other vehicle hazardous materials including how the plan has been implemented.
- (6) All vehicles shall comply with the FCC requirements for unintentional emitted electromagnetic radiation, as identified in 47 CFR 15, Subpart B, "Unintentional Radiators" over all anticipated operating and charging conditions.
- (7) Vehicles shall have a minimum payload of at least 400 pounds.
- (8) Suppliers shall provide the curb weight and rated payloads of their vehicles.
- (9) For conversion vehicles, Suppliers shall specify the OEMs gross vehicle weight rating (GVWR) and shall not exceed such rating.
- (10) For conversions, OEM Gross Vehicle Axle Weight Ratings (GAWR) shall not be increased.
- (11) Suppliers shall provide axle weights for the vehicle as delivered, and at full rated payload.
- (12) Odometers shall be provided as standard equipment or as an option and shall have an accuracy of at least $\pm 5\%$.
- (13) The Supplier shall offer a standard or an optional tire conforming to the following requirements:
 - Tires provided shall correspond to the requirements of the placard installed in accordance with 49 CFR 571.109, and 110, as applicable.
 - Suppliers shall specify manufacturer, model and size of the standard tire for the vehicle and for the tire provided.
 - Tire size and inflation pressure for the tire provided shall be in accordance with the requirements of the placard.
 - At no time shall the tire's inflation pressure exceed the maximum pressure molded into that tire's sidewall.
 - The tire provided shall be operable across the entire operation/load range of that vehicle.
 - Replacements for the tire provided shall be commercially available to the end user in sufficient quantities to support the purchaser's needs.
 - Tires provided as original equipment by the Supplier shall not have warranty restrictions in excess of those of the tire's manufacturer, unless the Supplier provides the warranty for the tires.
- (14) Seating capacity shall be a minimum of 1 driver. Suppliers shall specify seating capacity (available seat belt positions) for their vehicle. If a conversion vehicle's seating capacity is changed from that specified by the OEM on their FMVSS placard, the seat(s) being added or abandoned shall be modified as required by 49 CFR 571.207, et al, and a new FMVSS placard installed as required by 49 CFR 567, 568 or 571, as applicable.
- (15) The controller/inverter shall limit the minimum battery discharge to prevent degradation of battery life.
- (16) Regenerative braking shall not adversely impact the vehicle's service brake capability on varying road surfaces.
- (17) Vehicles shall comply with the requirements of 49 CFR 571.500.S.(b).(7).
- (18) The vehicle top speed shall not exceed 25 mph in any configuration
- (19) Suppliers shall provide a description of areas of non-compliance (if any) with the requirements of Section 6.5.
- (20) Concentrations of explosive gases in the battery box shall not be allowed to exceed 25% of the LEL (Lower Explosive Limit).
- (21) Suppliers shall indicate the depth of discharge below which the batteries should not be discharged.
- (22) Suppliers shall describe how battery boxes will be vented, to prevent battery gas accumulation during and following normal charging, abnormal charging and operation of the vehicle.
- (23) Suppliers shall provide a description of areas of non-compliance (if any) with the requirements of SAE J1718 on Battery Gas Evolution.
- (24) Maintenance requirements for the batteries shall be described and any associated cost(s) to the consumer/end user should be clearly defined.
- (25) Vehicles shall not contain exposed conductors, terminals, contact blocks or devices of any type that create the potential for personnel to be exposed to 60 volts or greater (the distinction between low-voltage and high voltage, as specified in SAE J1127, J1128, et al.).
- (26) Access to any high voltage components shall require the removal of at least one bolt, screw, cover or latch.
- (27) Devices considered to be high voltage components shall be clearly marked as HIGH VOLTAGE.
- (28) Cable and wire marking shall consist of orange wire and/or orange sleeves as identified in SAE-J1127.
- (29) Propulsion power system operating at greater than 60 volts shall be isolated from the vehicle chassis such that leakage current does not exceed 0.5 MIU.
- (30) Charging circuits shall be isolated from the vehicle chassis such that ground current from the grounded chassis does not exceed 5 mA at any time the vehicle is connected to an off-board power supply and shall be compatible with operation using a 5 mA GFCL.
- (31) Vehicles using HIGH VOLTAGE traction systems shall be equipped with a key operated "master" switch that shall interlock controller propulsion functions and battery contactor(s), if any, to render the propulsion system inoperative. Contactor(s) used in conjunction with the master switch shall be capable of interrupting maximum rated controller/inverter current.
- (32) A manual service disconnect for vehicles using a HIGH VOLTAGE traction system shall also be required. It shall have the following characteristics:
 - Manual action to break the connection
 - The disconnection is physically verifiable
 - The disconnection does not create exposed conductors capable of becoming energized while exposed.
- (33) The vehicle shall be prevented from being driven with the master switch key turned on and the drive selector in the drive or reverse position while the vehicle's charge cord is attached.
- (34) The following controller/inverter interlocks shall be present:
 - The controller shall not initially energize to move the vehicle with the direction selector in any position other than "PARK" or "NEUTRAL;"
 - The master switch key shall be removable only when the switch is in the "OFF" position,
 - With a pre-existing accelerator input, the controller shall not energize such that the vehicle can move under its own power in this condition.
- (35) Electrically powered windshield wipers shall be provided as standard or optional equipment.
- (36) An electrically powered warning horn operable by the vehicle driver shall be provided as standard or optional equipment.
- (37) Vehicles shall be equipped with an on-board or off board battery charger capable of recharging the propulsion battery to a state of full charge from any possible state of discharge in less than 12 hours.
- (38) On-board and off board chargers shall have the capability of accepting input voltages of 120V (Level 1), 208V or 240V (Level 2) single phase 60 Hertz alternating current service, with a tolerance of $\pm 10\%$ of rated voltage.
- (39) On-board charger personnel protection systems, which may include ground fault circuit interrupters (GFCI), shall be in accordance with the provisions of UL Standards 2202.
- (40) Suppliers should describe the type, size and location of the point of the vehicle charging port. Level 2 charge connector shall comply with the requirements of SAE J1772 or SAE J1773, as appropriate.
- (41) Regardless of the charger type used, the charger shall conform to the requirements of UL Proposed Standard 2202.
- (42) Suppliers shall specify all optional equipment required to meet the requirements of this Vehicle Specification.
- (43) Vehicles shall be accompanied by non-proprietary manuals for parts, service, operation and maintenance, interconnection wiring diagrams and schematics.

This information was prepared with the support of the U.S. Department of Energy, Office of Transportation Technology, Fleet Operations Program under Award No. DE-FC07-00ID 13859. However, any opinions, findings, conclusions or recommendations expressed herein are those of the author(s) and may not reflect the views of the U. S. Department of Energy.