

VEHICLE TECHNOLOGIES PROGRAM

All-Electric Conversion of the USPS Long Life Vehicle (LLV)

Vehicle: USPS eLLV Conversion by EDAG, Inc. - USA

Vehicle ID: 8201107

Seatbelt Positions: One (right hand drive)

Standard Features:

Cabin Heat (gasoline fired heater)

Power Steering

Power Brakes (vacuum assist)

Regenerative Braking

Steel wheels

Additional Features:

Front Wheel Drive

Four Wheel Disk Brakes

Low Rolling Resistance Tires



Battery

Type: Ni-NaCl, (Zebra Battery)

Pack Locations: Underbody (inboard of frame rails)

Nominal System Voltage: 371 V Rated Capacity (C/3): 150 Ah Cooling Method: Electric fan

Powertrain

Motor Type: DC Brushless Number of Motors: One

Motor Cooling Type: Oil to air heat exchanger

Drive Wheels: Front Wheel Drive Transmission: Single Gear Reduction

Charger

Location: Underhood

Charger Port: Driver's side, front quarter panel

Type: Conductive (J1772 connector) Input Voltage(s): 120 or 240 VAC



Chassis

Aluminum Body on Steel Frame

Rear Suspension: Solid Axle with Leaf Springs Front Suspension: Dual A-arm with Coil Springs

Weights

Design Curb Weight: 4525 lbs Delivered Curb Weight: 4366 lbs Distribution F/R: 52.9/47.1%

GVWR: 5725 lbs⁷

Max Payload: 1159 lbs + 200 lbs driver⁷

Performance Goal Payload: 1000 lbs + 200 lbs driver¹

Dimensions

Wheelbase: 100.5 inches Length: 175.5 inches Width: 76 inches Height: 85 inches

Tires

Tire Mfg: Bridgestone Tire Model: Ecopia EP100 Tire Size: P215/60R16 Tire Pressure F/R: 40/40 psi²

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Performance Statistics

Acceleration 0-50 Mph (332 Lbs Payload)

At 90% SOC: 19.9 sec At 50% SOC: 20.3 sec

Max. Battery Power: 54.5 kW

Acceleration 0-50 Mph (1000 Lbs Payload)

At 90% SOC: 22.6 sec At 50% SOC: 22.3 sec

Max. Battery Power: 55.8 kW

Braking From 60 Mph (332 Lbs Payload)

Controlled Dry: 148.3 feet Course Deviation: 0.0 feet

Braking From 60 Mph (1000 Lbs Payload)

Controlled Dry: 174.5 feet Course Deviation: 0.0 feet Performance Goal: 216 feet

Gradeability (Calculated) (332 Lbs Payload)

Maximum Speed @ 3%: 47.1 mph Maximum Speed @ 6%: 43.6 mph

Maximum Grade: 24%

Maximum Speed @ 50% Soc (332 Lbs Payload)

At 1/4 Mile: 54.3 mph At 1 Mile: 62.2 mph

Constant Speed Range @ 45 Mph, 6 (332 Lbs Payload)

Range: 117.8 miles

Energy Used: 39.2 DC kWh

Recharge Energy: 51.2 AC kWh @ 240 VAC

Efficiency: 332 DC Wh/mile Efficiency: 435 AC Wh/mile

Constant Speed Range @ 60 Mph,⁶ (332 Lbs Payload)

Range: 65.0 miles

Energy Used: 36.4 DC kWh

Recharge Energy: 50.7 AC kWh @ 240 VAC

Efficiency: 560 DC Wh/mile Efficiency: 780 AC Wh/mile

USPS Delivery 25 Mile Cycle^{4,5} (1000 Lbs Payload + 200 Lbs

Driver)

Driving Distance: 25.2 miles Energy Used: 17.7 DC kWh

Recharge Energy: 30.7 AC kWh @ 120 VAC

Efficiency: 701 DC Wh/mile Efficiency: 1217 AC Wh/mile

Driving Cycle Range (J1634)⁶ (332 Lbs Payload)

Range per J1634: 106 miles Energy Used: 38.2 DC kWh

Recharge Energy: 63.3 AC kWh @ 120 VAC

Efficiency (J1634): 598 AC Wh/mile Efficiency UDDS: 335 DC Wh/mile Efficiency HWFET: 372 DC Wh/mile

Charger Level 1 (@120 Vac / 13A) Time to Fully Recharge: 50 hours

Charger Level 2 (@240 Vac / 13A) Time to Fully Recharge: 26 hours

Test Notes:

- 1. Design Payload Value is 1000 lbs plus one 200 lbs driver (no passengers)
- 2. DOT Side-wall Tire Air Pressure Rating
- 4. At test termination, vehicle was still able to maintain the required drive schedule.
- 5. USPS Delivery Cycle: 8 miles city, 6 miles freeway, and 11 miles stop/go with 700 stops.
- 6. At test termination, vehicle was not able to maintain the required drive schedule.
- 7. Chassis was redesigned for Front Wheel Drive (FWD) and increased GVWR load handling capability. Documentation was provided by the conversion company to support GVWR rating.

Values in **Red** indicate the Performance Goal was not met.

USPS Requirement Specifications

- 1. Vehicle has a payload of at least 1000 pounds.
- 2. Seating capacity is one (1) driver occupant.
- 3. The cargo space has not been intruded upon by the electrical conversion components or materials.
- 4. The vehicle consumes no liquid fuel for propulsion.
- 5. The vehicle has a parking mechanism per SAE J2344 section 4.10 Mechanical Safety to prevent unintended motion of the vehicle when placed in "P" (PARK) or when the key is removed.
- 6. The vehicle contains a vehicle crash sensor automatically disconnect high voltage in case of a crash.
- 7. The vehicle has a minimum range between charges of at least 25 miles when loaded with 1000 lbs payload and one 200 lbs driver over the specified USPS drive cycle including 8 miles of city driving, 6 miles of freeway driving, and 11 miles of delivery driving with 700 stops.
- 8. The vehicle is capable of accelerating from 0 to 15 mph in 5 seconds, 0 to 50 mph in 22 seconds, and 0 to 55 mph in 35 seconds.
- 9. The vehicle is capable of coming to a complete stop from 60 mph in 216 feet, 30 mph in 57 feet, and 20 mph in 25 feet.
- 10. The vehicle manufacturer has certified the charger is capable of accepting input voltages of 110V single phase 60 Hertz alternating current service. Charger input current is compatible with a 15A branch circuit.
- 11. 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.
- 12. The vehicle will be accompanied by manuals for service, operation, maintenance, and towing
- 13. Propulsion power is isolated from the vehicle chassis.
- 14. Charging circuits are isolated from the vehicle chassis.

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