



# ELECTRIC SHUTTLEWAGON

**FAST CHARGE**

**ZERO  
EMISSIONS**

**REGENERATIVE  
BRAKING**

**PRECISION DRIVE  
TECHNOLGY**





## STANDARD FEATURES

- Zero Emissions
- Continuous Power Electric Motor
- Regenerative Braking
- Precision Drive Technology
- Lithium Ion Batteries
- Battery Management System
- SAE J1772 Connector
- Level 1, 2, & 3 Charging Capability
- External Recharge Strobe Light Indicator
- CAN-Bus Electric System
- Radiator – 12 VDC fans provide air flow for cooling; transmission, traction motors, electrical components and batteries
- 66cfm Air Compressor
- Separate High Voltage Disconnect Boxes
- ABS Vehicle Brakes
- Air Knife
- Anti-Slip Traction Control
- Speed-Based Rail Guidance Pressure
- Lockable EV Electronic Door
- Two Air Ride Operator Seats
- 180 degree Rotating Operator Console
- (4) Video Cameras with Monitor Inside Cab
- (2) 12 Volt DC Power Ports
- (2) USB Charge Ports
- (1) 120 Volt AC 15 Amp Outlet



## MACHINE SPECIFICATION

**Height:** 143.5" (13,465mm)

**Width:** 120" (13,048mm)

**Length:** 296" (7,518mm)

**Wheelbase:** 168" (4,267mm)

**Weight:** 66,000lbs (29,484kg)

### **TRACTIVE EFFORT**

- 45,000lbs Single coupled, without weight-transfer
- Forward and reverse both road and rail

### **DETAILS**

- Electric Motor:
  - Continuous power 155kW
  - Intermittent power 230kW
  - Continuous torque 1400Nm
  - Max torque 2700Nm
- Lithium Ion Batteries with Battery Management System
  - 108 or 162kW Package
- IP65 rated compatible components





## KEY DRIVE COMPONENTS

### Electric Motor and Inverter/Controller:



Traction Motor



Inverter



Automotive  
grade



Readily  
available &  
dependable



Utilized globally  
for heavy duty  
applications





## BATTERY PACK & BATTERY MANAGEMENT SYSTEM

- Batteries- Lithium Ion:
  - 400 VDC, 108kWh-standard offering
  - Optional 162kWh
  - 8-10 year life span
  - End of life capacity = 145kWh
  - \*Life span based on # of charge & discharge cycles
- Battery Management System (BMS):
  - Integrated cell monitoring includes:
    - Amps, Voltage, Temperature
    - Balancing and over current protection
    - Maximize battery and cell life



IP65 rated compatible components



Built and certified  
for the automotive  
industry



Over 1 million  
cells in operation  
since 2004



Driven over 20  
million miles  
since 2004





## LEVEL 1 CHARGING

- Charge provided through 120 volt (V) alternating-current (AC) plug
- Requires dedicated circuit
- Level 1 charging is comparable to a standard household outlet
- Does not require special installation of charging equipment
- Utilizes standard 3-prong household plug with a special connector to vehicle
- 120V, 20A service with 15A of charging power
- Charges at 1.8kWh
- Takes 60 hours for 4 batteries for full charge
- Takes 90 hours for 6 batteries for full charge

## LEVEL 3 CHARGING

- Equipped with CHAdeMO technology (DC fast charging)
- Charge provided through 480 volt (V) direct-current (DC) plug
- Requires installation of charging equipment
- 480V, with 50-100kWh of charging power
- 50kWh charges 4 batteries in 2.2 hours
- 50kWh charges 6 batteries in 3.2 hours
- 100kWh charges 4 batteries in 1.1 hours
- 100kWh charges 6 batteries in 1.6 hours

**Level 3 charging typically provides an 80% charge in 30 minutes**

(Cold temperature may lengthen time)

## LEVEL 2 CHARGING

- Charge provided through 240 volt (V) AC plug
- Requires installation of charging equipment
- Installation requires dedicated 40 amp circuit
- Level 2 charging is compatible with all electric vehicles & plug-in hybrid vehicles
- Charging equipment has a cord that plugs directly into the vehicle in same location used for level 1 equipment
- 208-240V, 30-100A service with 20-80A of charging power
- Charges between 4.1kWh-15kWh
- Takes 7.2 hours for 4 batteries for full charge



Level 2 chargers: (Left) 15-30 AMP  
(Right) 80 AMP



**SHUTTLEWAGON DUTY CYCLE**  
(10 HOUR SHIFT)

ENGINE EFFICIENCY



**VS**

ELECTRIC MOTOR EFFICIENCY



**1.8 GAL/HR**  
(equals 73.26kWh)

**15.69 kWh**

**18 GAL**  
(732.6 kWh)

**156.9 kWh**

Values have been validated during testing at multiple locations.



**OPERATIONAL COST** (10 HOUR SHIFT)

**DIESEL**



**GAL/DAY**

**18 Gallons**



**Cost/Shift (\$2.5/gal)**

**\$45.00**



**Cost/Year (260 days)**

**\$11,700**

**Cost/Life (10 Years)**

**\$117,000**

**ELECTRIC**



**kWh/DAY**

**156.9 kWh**



**Cost/Shift (.08/kWh)**

**\$10.05**



**Cost/Year (260 days)**

**\$3,263**

**Cost Savings: \$8,437/Year**

**Cost/Life (10 Years)**

**\$32,630**

**Cost Savings: \$84,370/Life**





## MAINTENANCE COST

- 10 year machine life (2,000 hrs per year baseline)

**DIESEL= \$66,000**

(Engine oil, filter, fuel filter, transmission fluid, filter, etc.)

**ELECTRIC= \$17,200**

(Coolant, axle oil)

**74% savings over life of machine**



**Nordco**  
MOBILE RAILCAR MOVERS  
HOME OF THE SHUTTLEWAGON





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