POWER GENERATION UTILITY VEHICLE WITH MOBILE CHARGING SYSTEM (MCS) PAYLOAD

A Commercially Available, 4x4 Utility Vehicle Is Modified into a 9 kW Self-Propelled Power Generation System with Modular Mobile Charging System (MCS) Payload

APPLICATIONS

This modified utility vehicle, self-propelled generator has over a 100-mile range to support maneuver elements and provide as much as 9 kW of power all within its normal footprint. With or without the MCS battery charging payload, the utility vehicle provides significant export power for a variety of mission needs. Based on a commercially available rugged, 4x4 utility vehicle platform from Club Car that has been modified to serve as a self-propelled, export power 9-kW power generation system. CME further integrated a cargo-deck charging system payload with modular, military battery charging racks to support company sized unit's battery charging needs. The system provides clean electric power for a wide range of mission payloads.

- Efficient, self-propelled power generation platform, easily transportable by ground vehicles and aircraft
- Supports maneuver elements or teams, logistics support, crisis response, or other needs of inland maneuver via an easily transportable/mobile, low-cost package that is simple to operate
- Embedded power generation for up to 9 kW. Provides a power dense, transportable, generator and mobile battery replenishment capability
- MCS payload charges a complete IBCT company compliment of all 578 batteries within 18 to 21 hours
- Smallest logistics footprint impact and supports austere, distributed sustainment
- Application potential for vehicle to tactical micro-grid interface

DESCRIPTION

A smart and innovative power approach for the war fighter, the self-propelled utility vehicle prototype with an integrated MRAP alternator to provide significant export power. In this case, the prototype vehicle has a payload called the Mobile Charging System (MCS). The MCS is capable of concurrently charging all the batteries of an Infantry Brigade Combat Team (IBCT) Company to keep charged batteries as close to the action as possible. In addition to the Li-145 battery from the Nett Warrior, the IBCT company can operate with three other types of radio batteries that are used in the Harris Falcon, Rifleman, and MBITR radios. Much smaller and lighter than a HMMWV, the MCS provides engine powered, wheel vehicle platform charging system in the smallest configuration possible to re-charge a 24-hour mission complement of IBCT company as rapidly as possible, as far forward as possible.

KEY FEATURES

- Modifications include a military-rated 24VDC alternator, power distribution components, a manual throttle, a canvas-covered frame over the flatbed, a shock mounted rail system, and a safety interlock system.
- An internally integrated, 28V 570 Amp Industrial / Military alternator
- MCS cargo payload module integrates chargers for Nett Warrior Li-145 batteries, Harris Falcon radio batteries, Thales MBITR radio batteries, Thales Rifleman Batteries.
- Removable racks in the MCS payload space suitable for platoon level application with removable power distribution panels
- Flexible cable connectivity, NATO slave cables, and use of Nett Warrior common connector
    - Resettable circuit breakers for each power attachment (inputs and outputs)
    - Storage for charged/uncharged batteries
    - Safety assessment completed
    - Internally transportable by fixed/rotary-wing cargo aircraft

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SPECIFICATIONS

VEHICLE TYPE:	Current configuration based upon host vehicle (Club Car Carryall 295 SE Diesel, 4X4 long bed utility), a 20 HP flatbed utility vehicle. Vehicle max speed of 25 mph (governed). Two high back seats with seat belts
EXPORT POWER CAPABILITY	CME integrated 9-kW maximum export power generation capability from prime mover alternator modification. Run or Charge mode lockout switch provided. Rated to provide 350 amps at 26.5 VDC (~ 9300 watts)
TRANSMISSION	Continuously Variable Transmission, 2 or 4-Wheel Drive)
VEHICLE DIMENSIONS:	12′ 10″ length (154 in) x 4′ 11″ (59 in) max width x 6′ 7″ height (79-in MCS compartment travel configuration). Minimum ground clearance is 8.2 in
CARGO DECK DIMENSIONS:	50 in wide x 79 in long as modified
STRUCTURE/CHASSIS:	Heavy duty, reinforced frame with special reinforced shock absorbers. High ground clearance for climbing over moderate obstacles
WEIGHT:	Dry Weight: ~ 1700 lb, Wet Weight ~ 1834 lb
ENGINE	Proven 3-cylinder, 20-hp, EPA compliant diesel engine for prime power and power generation
FUEL	Diesel and JP8 fuel compatible. Fuel Capacity: 6.5 gal (~100 mi to single tank); and three 5 gal containers mounted on bed
WHEELS	Rough terrain, with optional extended mobility run flat tires
PAYLOAD	2000 lb payload capacity (soldiers, equipment, charger rack modules, and batteries). Max load for cargo bed is 1200 lb
CHARGING SYSTEM PAYLOAD	Export power provides charging for fully integrated, onboard payload of modular battery charging racks to recharge soldier radios (578 batteries within 18 - 21 hours). Extendable roll bar cage over battery charging racks to support covered payload bay canopy for enhanced weather-proofing of charging bays. Shock/vibration isolated open frames for se-curable slide-out shelves for chargers
OUTPUT POWER	24 VDC to 28 VDC at up to 350 amps: Maximum Power Output 9300 watts at 26.5 VDC. Power Output per NATO Slave 100 amps (fused)
INPUT POWER	Input Power limit per Rack Pair is 100 amps (circuit breaker). Input Power limit per Rack is 50 amps (circuit breaker). Nominal power per rack (all batteries fully discharged): Two charger configuration: 40 amps; Three charger configuration: 30 amps.
TOTAL NOMINAL POWER	280 amps at 28 VDC
BATTERY CHARGING	Simultaneous charging of 48-ea LI-145 and 256-ea Rifleman or 128-ea PRC-148/-152 or a combination of each
POWER QUALITY	<3Vp-p noise and ripple with 50 amp load
OTHER OPTIONS	Blackout lights, Keyless ignition, Tie-down rings for transport (color or camouflage colors if specified)