Joint Service Power Expo

On-Board Vehicle Power

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Briefing Topics

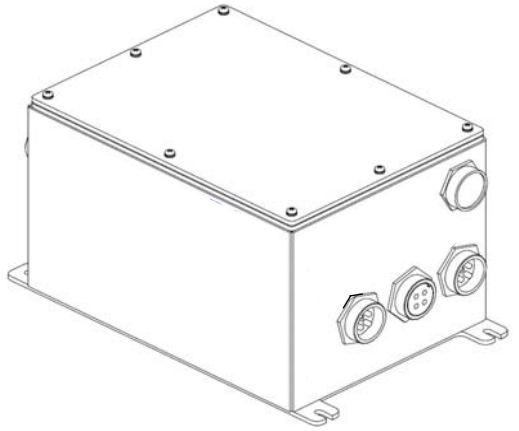
- OBVP - Inverters (1-3 kW)
- OBVP – Small (10 kW)
- OBVP – Medium (20-30 kW)
- OBVP – Large (120 kW)
- Aux. Power Units (5-15 kW)
- Vehicle Mounted Battery Charger

Why all the power?

OBVP - Inverters

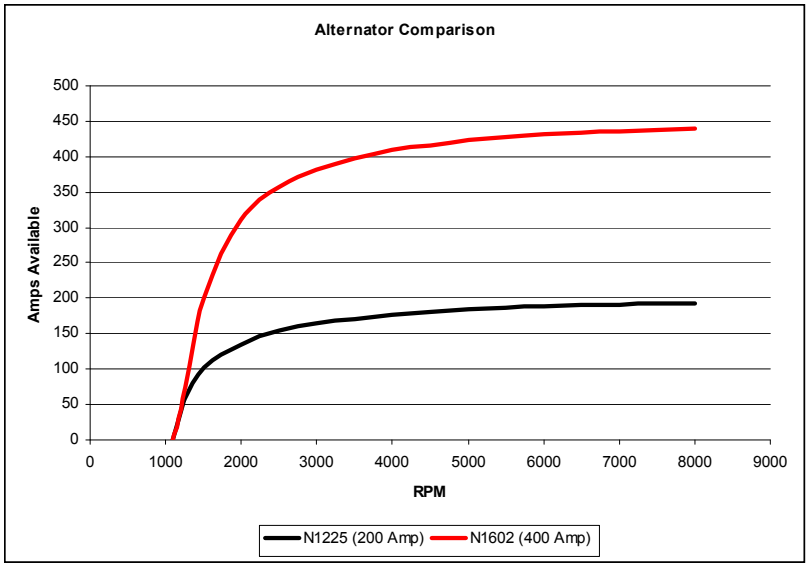
- USMC currently fields / centrally manages **QP-1800** Inverter
  - Competitively selected 2006
  - Semi-ruggedized
  - 1800 watts output

- Other USMC PMs have requested an **enhanced model**
  - Currently in Source Selection
  - Non-Developmental procurement
  - Critical Parameters:
    - 2000 - 2500 watts
    - Fully ruggedized (unprotected environments)
    - AC / DC input and output / battery charging



OBVP - Small

- 400 Amp Alternator
- Targeted for HMMWV A2 and ECVs (pre-2009)
- NSN: 2920-01-466-1855
- P/N: N1602-5
- Replaces 200 Amp Alternator
- Coupled with new pulley, provides ~4X power at idle.
  - N1225 @ idle: 55 Amps
  - N1602 @ idle: 190 Amps



OBVP - Medium

- HMMWV 20-30 kW
- RDT&E funded (ARRA Economic Stimulus)
- RFP releases ~ June Timeframe
- Multiple Awards
- 60 days to respond
- Bid samples required

* For planning purposes only. Details are subject to change.

OBVP - Medium

- **Proposed Process – Source Selection**

Bid Sample

+

Proposed Solution

- Ability to achieve Program Objectives
- Engineering / Integration Plan
- Estimated Production Cost
- BEST VALUE

* For planning purposes only. Details are subject to change.

OBVP - Medium

- **Proposed Process – Phase I – 5 months**

Down Select

NTE $500k

+

GFE: M1152A1

* For planning purposes only. Details are subject to change.

OBVP - Medium

- **Proposed Process – Phase I – Down Select**

- **Product Verification Testing**
  - **Power Quality**
  - **Max Power**
  - **Limited Endurance**
  - **High / Low Temp**
  - **Limited EMI**
  - **(see SOO for more information)***
- **Testing at Aberdeen Test Center**

* For planning purposes only. Details are subject to change.

OBVP - Medium

- **Proposed Process – Phase II – 12 Months**

~ $2,500,000

+

GFE: 6x M1152A1 (B2)

* For planning purposes only. Details are subject to change.

OBVP - Large

- Objectives:
  - **120 kW** of stationary export power
  - 21 kW of power on the move (POTM)
  - Retrofit of existing MTVR platform
  - Maximize commonality with base MTVR
  - Retain MTVR vehicle performance
  - Minimize weight / payload impact

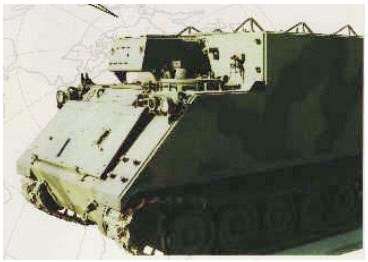
- Approach:
  - Diesel electric drivetrain
  - Common drive and export power AC Bus
  - AC converter provides power on the move (POTM)

OBVP - Large

ONR OBVP Prototype Contract Award	July 2005
OBVP Prototype Kit Installation Completed	January 2007
OBVP Testing at Aberdeen Started	January 2008
OBVP Program Transitioned to USMC	October 2008
Aberdeen Testing Completed	May 2009
USMC OBVP Contract Award	June 2009
First USMC OBVP Kit Installed	December 2009
Fifth USMC OBVP Kit Installed	August 2010
Aberdeen OBVP Assessment and Testing	March 2011

Auxiliary Power Units

- Auxiliary Power Units (APUs) have been around for some time now.
- Previous Defense Platforms and Systems
  - Abrams Tank APU – 2 kW 28 VDC
  - Armored Personnel Carrier – 5 kW 28 VDC
  - SICPS Shelter – 10kW 120/240 VAC



- Previous design focused on stationary power

Auxiliary Power Units

- APU needed for on-the-move power
- Two size ranges
  - 3 – 5 kW
  - 10 – 15 kW
- Defense Acquisition Challenge Program funds provided to buy and test COTS / NDI APU solutions
- Multiple vendors / multiple IDIQ awards

Auxiliary Power Units

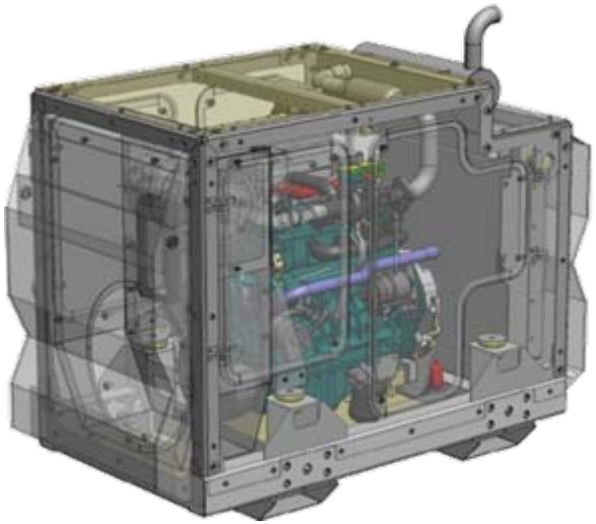
MARVIN LAND SYSTEMS

M67854-09-D-5041

- Power Rating: 12.5 kW
- Dimensions: 24” x 28” x 48”
- Weight: < 490 lbs
- EPA Tier 4 Compliant
- Permanent Magnet Generator
- Liquid Cooled

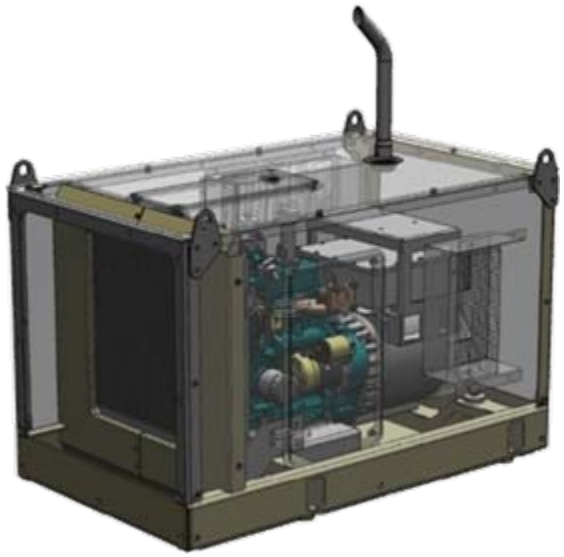
- Power Rating: 5.0 kW
- Dimensions: 24” x 24” x 36”
- Weight: < 330 lbs
- EPA Tier 4 Compliant
- Permanent Magnet Generator
- Liquid Cooled

Auxiliary Power Units



MECHRON
POWER SYSTEMS
A DIVISION OF TOROMONT INDUSTRIES LTD.

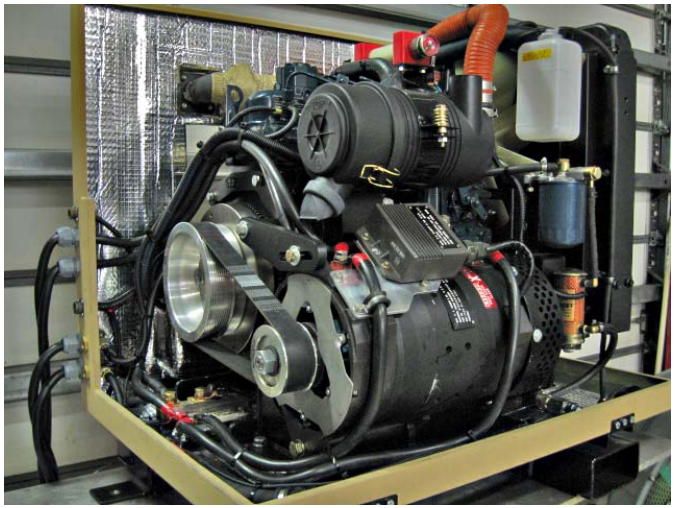
M67854-09-D-5043



- Power Rating: 15.0 kW
- Dimensions: 31” x 37” x 56”
- Weight: 1500 lbs
- EPA Tier 4 Compliant
- Brushless, Homopolar Generator
- Liquid Cooled

- Power Rating: 5.0 kW
- Dimensions: 25” x 26” x 41”
- Weight: 675 lbs
- EPA Tier 4 Compliant
- Brushless, Homopolar Generator
- Liquid Cooled

Auxiliary Power Units



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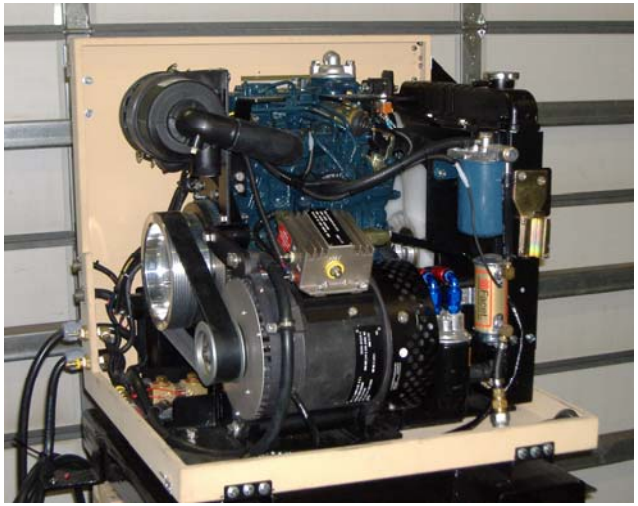

- Power Rating: 15 kW
- Dimensions: 25” x 29” x 35”
- Weight: < 500 lbs
- EPA Tier 4 Compliant
- Neihoff 570A Generator
- Liquid Cooled

- Power Rating: 5.0 kW
- Dimensions: 24” x 24” x 26”
- Weight: < 325 lbs
- EPA Tier 4 Compliant
- Neihoff 250A Generator
- Liquid Cooled

Auxiliary Power Units

M67854-09-D-5042

- Power Rating: 4.0 kW
- Dimensions: 24” x 24” x 36”
- Weight: 300 lbs
- EPA Tier 4 Compliant
- Neihoff 250A Generator
- Air Cooled

Multi-Radio Power Adaptors

Current
12V Multi-SINCGARS Power Adapter (MSPA)

- Powers 6 SINCGARS radios
- UPS capable when connected to both AC and DC power
- Power Input: 110VAC or 12VDC, 40-70 Hz
- Weight – 110 lbs with case

New Start
24V Radio Power Adapter Tower

- 24V system with at least 4 radio bays
- Power Input: 110-280VAC or 24VDC, 40 – 400Hz
- < 80 lbs without case
- Currently in Source Selection
- Anticipated fielding start FY10

Questions

Concept Design: Wind Powered OBVP

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