Maxwell ESM Start Module training overview Sample

Maxwell esm

model number: ultra 31/1800

Understanding safe practices for our new capacitor start modules

THE INTERNALS

- Even though this module is lightweight it's still needs to be handled with care.

Plastic lid
Thermal weld (heat plate) to case

Electronics assembly
With DC-DC converter and controller electronics

Laser-welded cell pack
(12 each 3000-Farad Maxwell Ultracapacitor cells) with plastic spacers and terminals

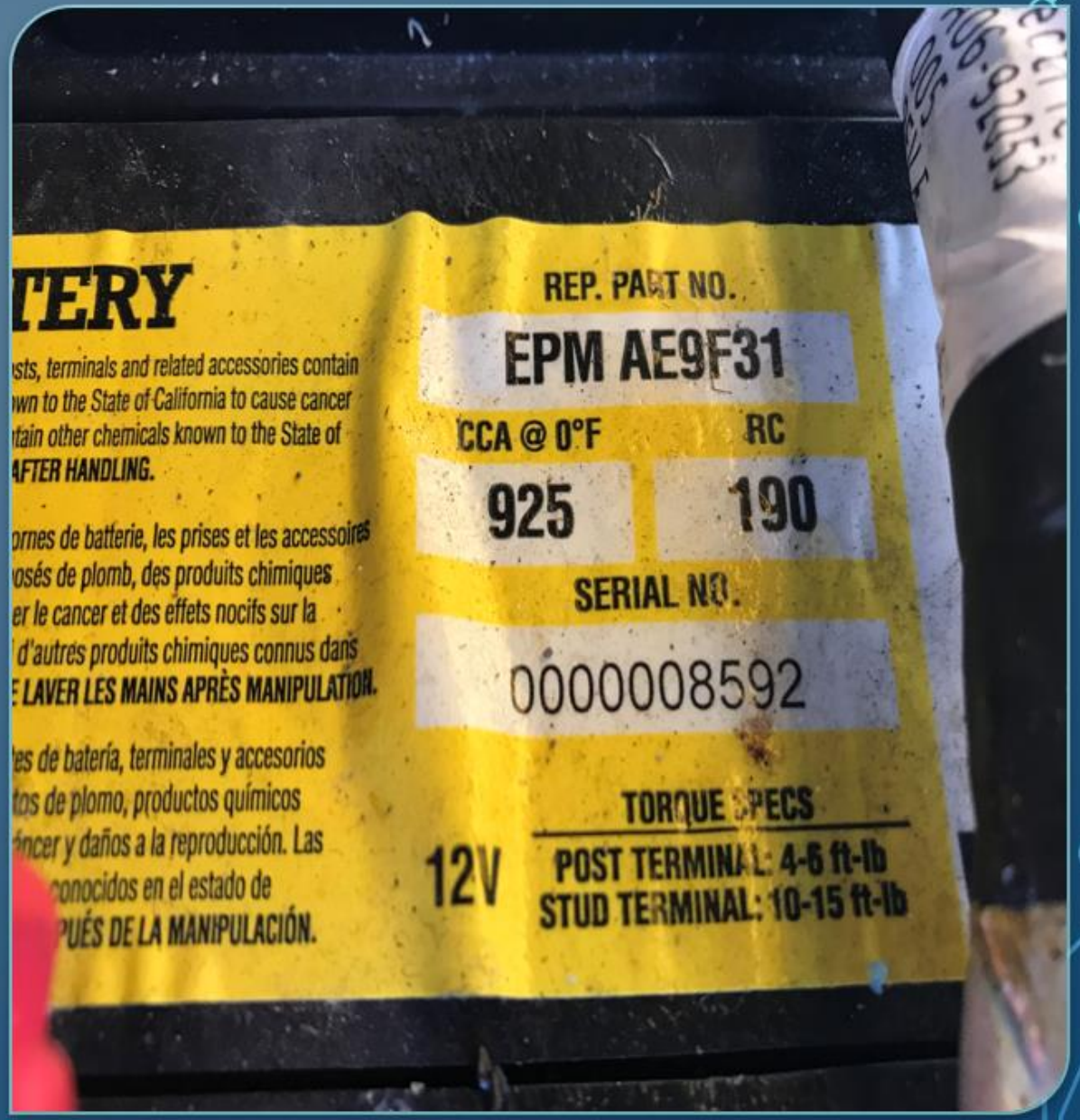
Polypropylene plastic case

THIS IS NOT TO BE TREATED LIKE YOUR TYPICAL BATTERY WHEN SERVICING!

- Procedures need to be followed when handling any of these Engine Start Modules to ensure your safety.

THE BATTERIES USED ON OUR TANDEM FREIGHTLINER TRUCKS ARE "ACID GLASS MEDIA" OTHERWISE KNOWN AS "AGM".

PART NUMBER: 9F31



THE ADVANTAGES OF AN AGM BATTERY

- The battery stands up well to low temperatures and has a low self-discharge. The leading advantages of AGM are a charge that is up to five times faster than the flooded version, and the ability to deep cycle.

Important Benefits

Ultracapacitor-based engine start technology provides fleets with the following business advantages:

Provides burst power to start the engine, regardless of the charge state of the batteries, ensuring that batteries are left free to power other loads

Increases the output voltage as temperatures get colder, ensuring successful cold-weather starts and preventing drivers from being stranded after lengthy engine shutdowns

Resilient in hot temperatures

Ensures drivers can reliably shut off the engine for long periods of time without worrying about being able to restart the engine, helping drivers to comply with anti-idle laws and avoid excessive fuel consumption due to idling

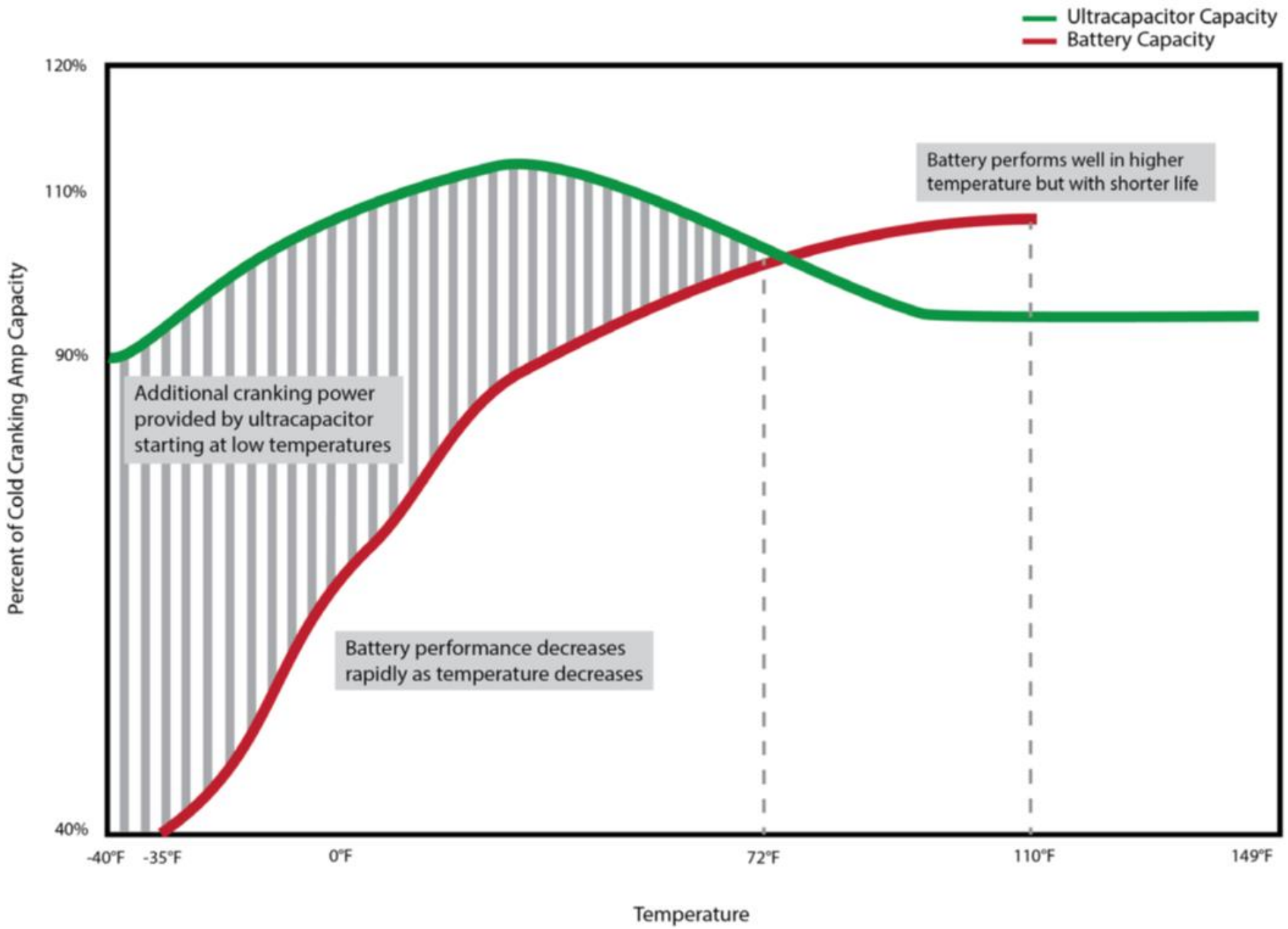
Enables drivers to confidently shut off and re-start the engine as many times as needed throughout the day without risking that the alternator will not be able to sufficiently charge the batteries to keep up with starting demands

Provides hundreds of thousands of start cycles during its lifetime, compared to thousands of start cycles for batteries

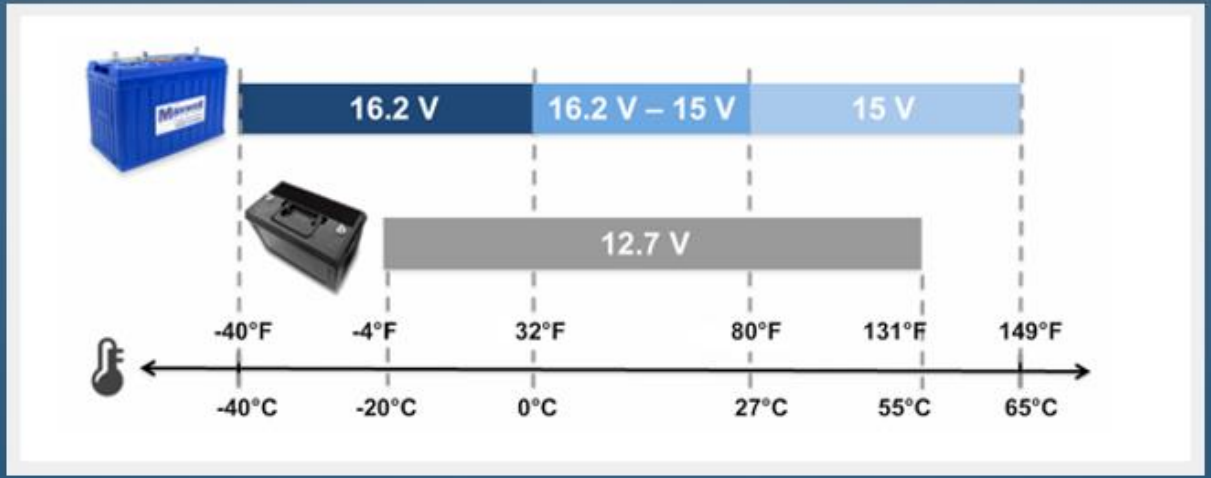
Provides longer product life than lead-acid batteries

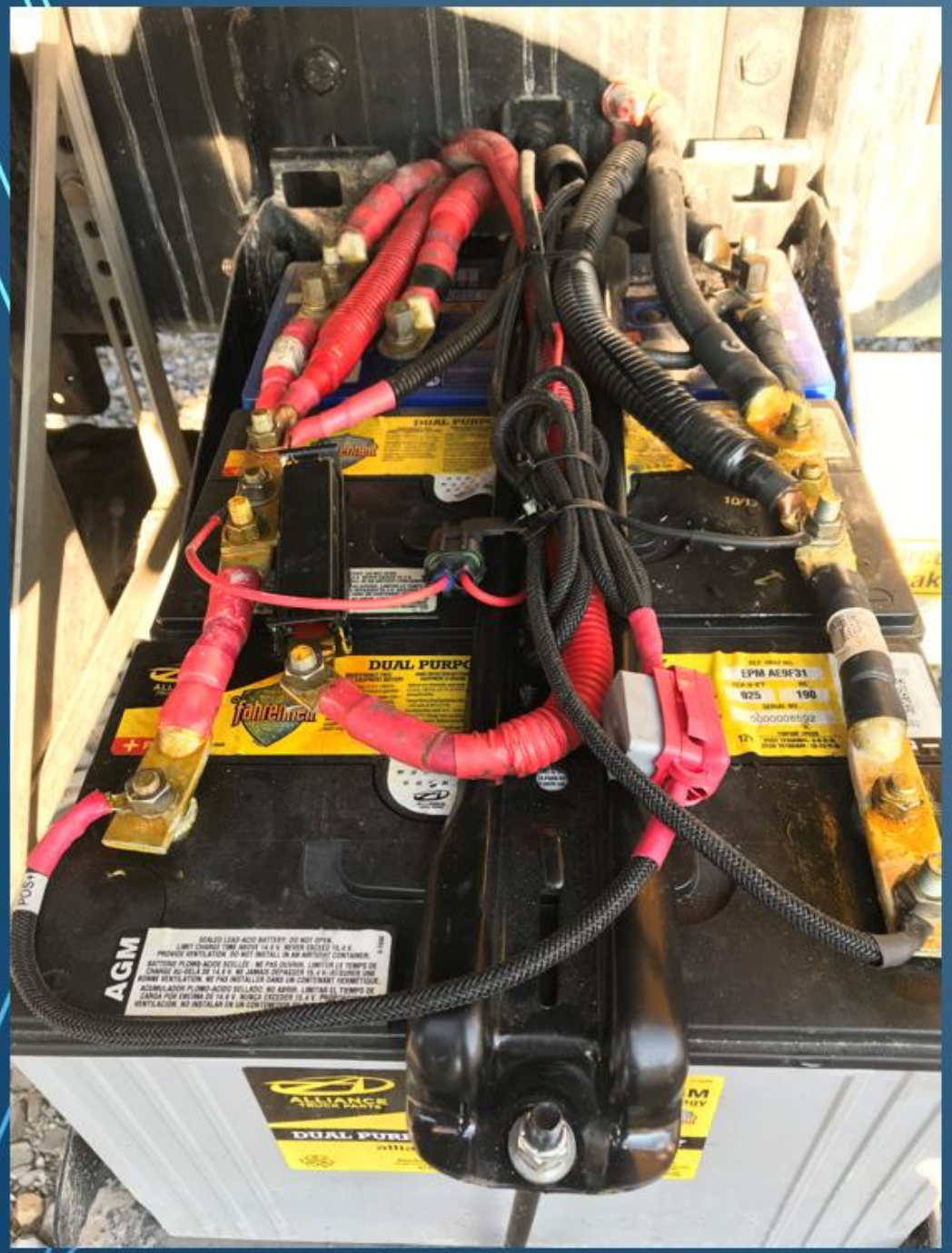
Recharges in minutes after a successful engine start

Reduces tare weight (up to 120 pounds) by replacing one or more heavier batteries


Ultracapacitor Capacity
Battery Capacity
120%
110%
90%
40%
Percent of Cold Cranking Amp Capacity
Battery performs well in higher temperature but with shorter life
Additional cranking power provided by ultracapacitor starting at low temperatures
Battery performance decreases rapidly as temperature decreases
-40°F
-35°F
0°F
72°F
110°F
149°F
Temperature

SO YOU WILL NOTICE AT 32° THE VOLTAGE AUTOMATICALLY INCREASES.



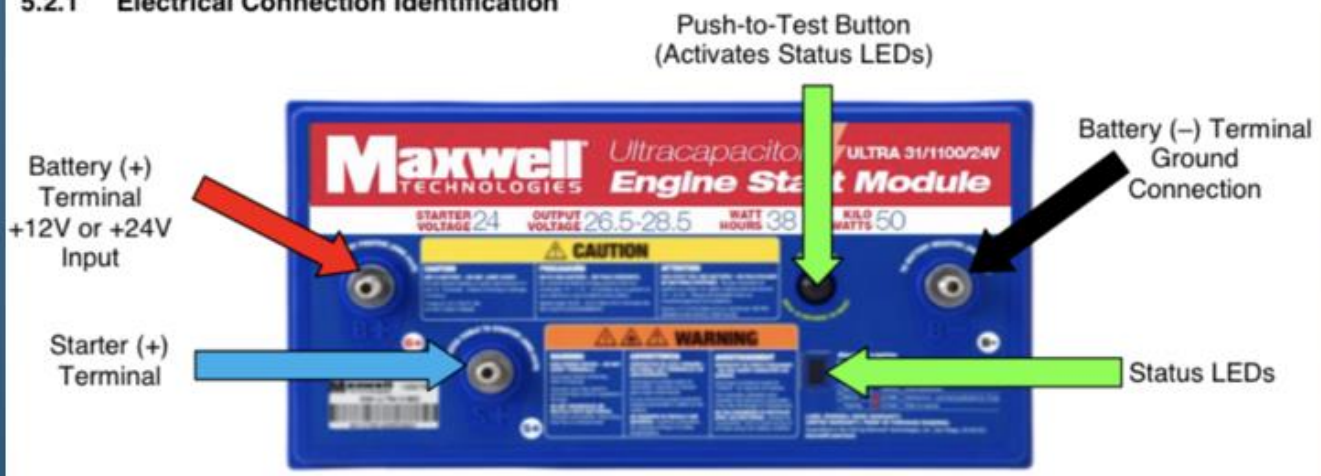


HERE'S THE LAYOUT OF THE BATTERIES ON OUR 377 CLASS TRUCKS.

- The ESM is nearest to the frame.

IT'S VERY IMPORTANT TO KNOW WHAT EACH TERMINAL IS!

5.2.1 Electrical Connection Identification



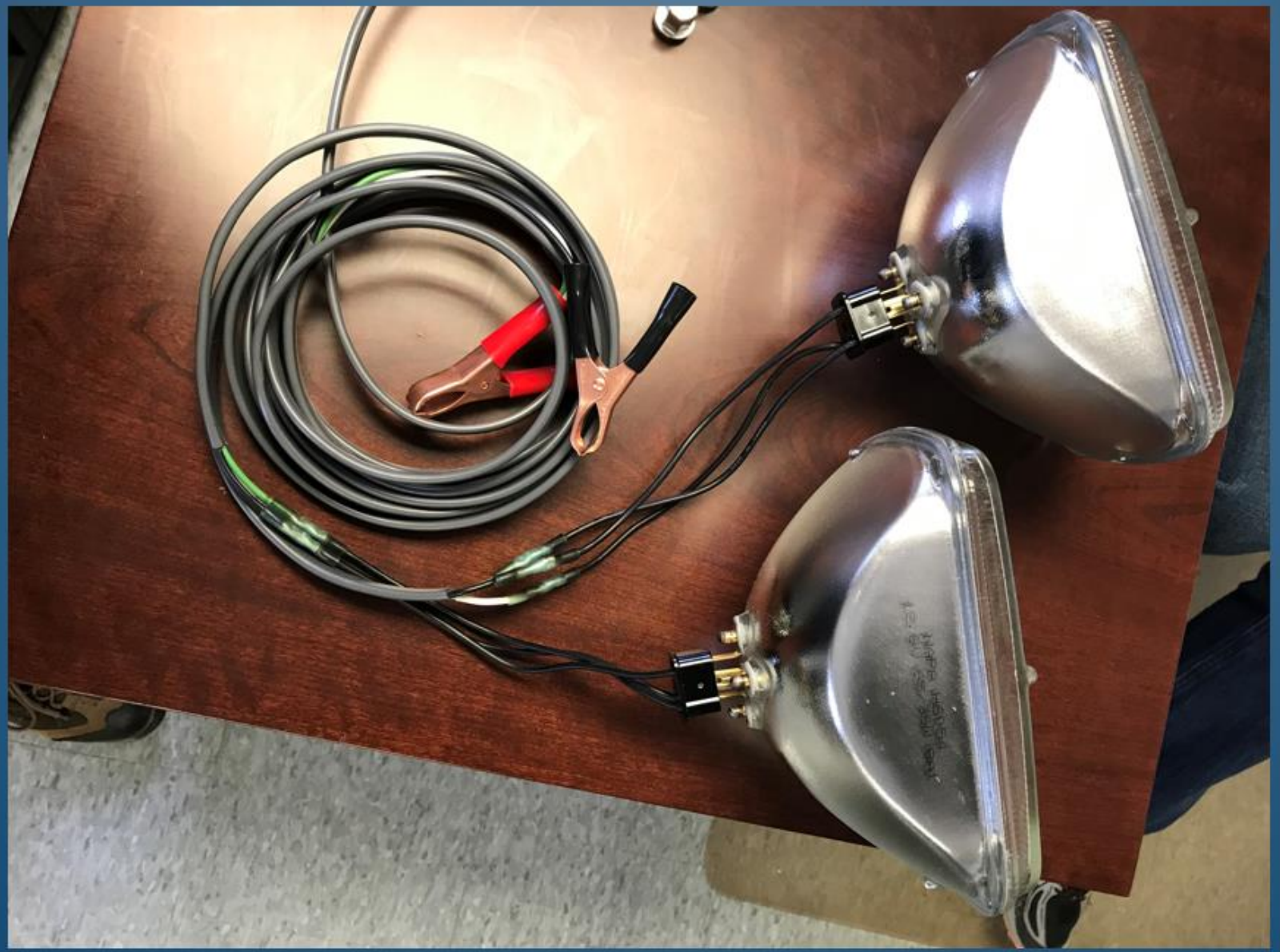
ULTRA 31/1100/24V shown for illustration purposes

WITH A FULLY CHARGED SOURCE BATTERY IT WILL TAKE APPROXIMATELY **28 MINUTES** TO OBTAIN A FULL 15 VOLTS IN THE ESM.

AT THIS POINT THE ESM STOPS DRAWING FROM THE SOURCE BATTERY, UNTIL THE ESM VOLTAGE DROPS TO 14.5 VOLTS, THEN IT DRAWS FROM THE SOURCE BATTERY AGAIN TO TOP OFF THE VOLTAGE BACK TO 15 VOLTS AGAIN.

THE RECOMMENDED LOAD TO DICHARGE THE ESM

- OBTAIN from NAPA
- (2) H6054N HEADLIGHT BULBS
- (2) LS6235 HEADLIGHT PIGTAILS
- 12’ 16 GAUGE 2 CONDUCTOR WIRE
- (2) 784612 ALLIGATOR CLAMP SET
- Cut wire into 2 equal lengths and using Butt connectors connect the high and low beam wires to the positive wire alligator clamp and connect the ground wire to the ground wire alligator clamp.



DISCHARGING THE ESM

CONNECT THE RECOMMENDED LOAD TO THE ESM AFTER THE **12 VOLT +** CABLE FROM THE SOURCE HAS BEEN REMOVED FROM THE ESM

LEAVE THE LOAD CONNECTED UNTIL THE S+ VOLTAGE IS BELOW **1 VOLT!**

THE ESM MUST BE DISCHARGED PRIOR TO REMOVAL OR SERVICE WORK INSIDE OF THE BATTERY BOX!

- DISCHARGE THE ESM, LABEL ALL CONNECTIONS TO THE ESM, AND REMOVE THEM, THEN DISCONNECT BATTERIES PRIOR TO ANY WELD REPAIRS!
- IT IS RECOMMENDED THAT THE ESM IS FULLY DRAINED BEFORE ANY ELECTRICAL SERVICE WORK, INCLUDING ANY STARTER MOTOR SERVICE IS PERFORMED!

ESM
JUMP STARTING

- In an emergency situation where the truck needs to be moved quickly, the wire attached to the "**S+**" of the ESM, needs to be removed and reattached to the "**B+**" of the ESM. Then you can jump start in a conventional manner.
- ***DO NOT jump start or charge directly at the S+ terminal, ESM damage will occur!***