



**SUBJECT: Adding 12v Upfit Accessories**  
**MODEL YEARS: 2024 & Beyond**  
**AFFECTED MODELS: UU Model THREE**  
**INITIATION DATE: 05/22/2024**  
**REVISION: xx/xx/xxxx**

**AWARENESS:**

**Description of Concerns:**

- Upfit vehicle accessories may require a 12v DC source. Care must be taken to insure upfit accessories when added to the 12v start battery circuit do not overload the battery and sensitive powertrain electronics.
- The 'Second Stage Manufacturer' when adding upfit accessories must insure the 'Completed Vehicle' FMVSS compliance with the Mullen Rev 4 Incomplete Vehicle Document (IVD).

**Solution:**

- The Dealer, Second Stage Manufacturer, Lease or Owner should adhere to the following recommendations when installing upfit accessories requiring a 12v D.C. electrical power source.
  - Use the 12v Battery or Source. The High Voltage (HV) battery is off limits.
  - Follow OEM EV recommended electrical precautions.
  - Follow Accessory Manufacturer Instructions and Precautions for installing Lighting, Lifts, Pumps, Compressors, Hoists etc.
  - Follow SAE electrical Best Practices.
  - Follow FMVSS electrical requirements for conformance.
- Upfit Accessory operations that are susceptible to voltage or current spikes must inhibit protective features (fuse, high current relay/solenoid etc.) in the upfit circuit.
- Use approved OEM 12v power source for Upfit Accessory connections.

**12v Battery Source / Connection Instructions**

- 1) Locate 12v Chassis source; Start Battery (Lead Acid) under Cab (Figure 1), Master Switch (Figure 2) or Chassis fuse center box on chassis (Figure 3).
- 2) Determine best routing solution from Upfit Electrical Accessory to either of the above 12v sources.
- 3) Install and route Accessory wiring harness/electronic components securely per Upfitter manufacturer's instructions & Best Practices
- 4) Connect & properly ground Upfit Accessory electrical connections at 12v Start Battery or Chassis fuse center accessory terminal posts.
- 5) Do not exceed OEM Chassis & Upfit Accessory max Voltage and Current loads.
- 6) Do not install Upfit Accessories that produce voltage draw when not in operation.

### 12v Battery / Recovery

7) Follow OEM vehicle powertrain operation instructions when using Upfit Electrical Accessories.

- Use the HV power source (turn ignition key to 'Ready' position) for 12v battery charge recovery while operating Upfit Electrical Accessories.

### Regarding 'Ignition off loads' 12v start battery

An ignition off load is defined as a current draw on the 12v battery when the ignition is in the off position. Ignition off loads is important because they will lower the charge in the battery between vehicle uses. The ignition off amperage draw of all equipment connected to the vehicle's 12v battery should not exceed 28 milliamps. If equipment inclusion into the vehicle's electrical system would cause the amperage draw to exceed 28 milliamps, the equipment should be connected to an auxiliary battery, isolated battery bank or hybrid inverter.



Figure 1 OEM 12v 750 CCA Start Battery located under the Cab



Figure 2 OEM Chassis 'Master Switch' located just aft of Cab.  
(D.C. + / - terminal connection posts)

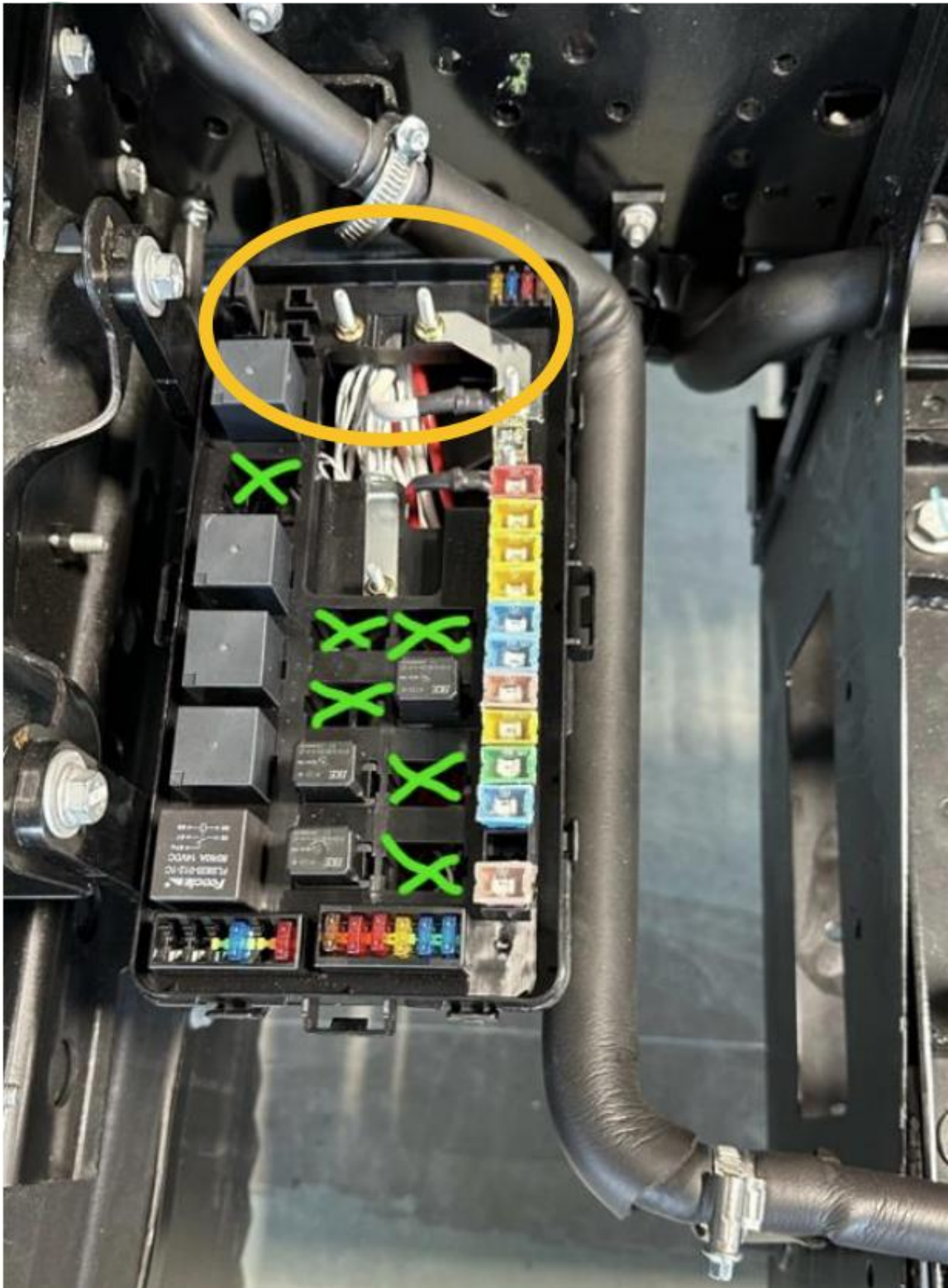


Figure 3 OEM Chassis Fuse Center located aft of Cab.  
(D.C. + / - terminal connection posts)