First Responders Guide

Important Notice

This Guide has been prepared by Autocar, LLC ("Autocar") for reference and use by First Responders who may be called to an accident or emergency involving an Autocar E-ACTT™ electric vehicle.

Autocar has exercised reasonable care and diligence to present accurate, clear and complete information and instructions regarding emergency response to an Autocar electric vehicle.

This guide covers service of Autocar products as configured when they leave the factory. This manual does not cover or apply to Autocar products that have been modified after leaving Autocar’s factory. Autocar is not liable for any damage or failure of components added by a body builder or any other modification company not contracted by Autocar, or the failure of original components caused by any modification or alteration of the Autocar product.

Autocar, LLC
Center Point, Alabama, U.S.A.
SAFETY DEFINITIONS

The following safety indicators are used in this guide:

⚠️ DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury or damage to equipment or other property.

The High Voltage Warning Label (Figure 1) alerts you to the potential presence of high voltage. Use the correct PPE and follow all safety procedures when servicing this component.

Figure 1

⚠️ WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury or damage to equipment or other property.

⚠️ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury or damage to equipment or other property.

⚠️ NOTICE

NOTICE is used to address practices not related to physical injury which, if not complied with, may result in damage to equipment or other property.

SAFETY INSTRUCTIONS

Safety instructions (or equivalent) indicate specific safety-related instructions or procedures.

Note: A note defines an operating procedure, practice, condition, etc., which is essential to proper operation of the vehicle.
ELECTRIC VEHICLE (EV) IDENTIFICATION

The Autocar E-ACTT can be identified by the following:

- No fuel tank
- No exhaust/muffler system
- Unique warning labels
- An “N” in the seventh position of the VIN
- Large rectangular battery boxes on each side of the frame behind the cab (Figure 2)

**DANGER**

If damage is present to either High Voltage Battery Box do not touch or come in contact with any portion of the vehicle unless you are protected by the correct HV PPE.
ELECTRIC VEHICLE (EV) RESPONSE CONSIDERATIONS

In the event of damage, fire, or flooding involving an electric vehicle:

- Always assume the high voltage (HV) battery and associated components are energized and fully charged.
- Exposed electrical components, wires, and HV batteries present potential HV shock hazards.
- Venting/off-gassing HV battery vapors are potentially toxic and flammable.
- Physical damage to the vehicle or HV battery may result in immediate or delayed release of toxic and/or flammable gases and fire.
- A HV battery in a flooded vehicle may have high voltage and short circuits that can shock and cause fires.

EMERGENCY RESPONSE INITIAL STEPS

Immobilize the Vehicle

1. Block the wheels
2. Set parking brake
3. Place vehicle into NEUTRAL (N)

The layout of the high voltage system is shown in Figure 3. Items in orange indicate high voltage components and cables.
DANGER

Never cut, breach or touch high voltage components or cabling. Doing so could result in serious injury or death. High voltage cables are orange.

DANGER

When shutting done the high voltage system wait at least fifteen minutes for the complete discharge of high voltage capacitors.

DANGER

HV system shutdown procedure is designed to disable the vehicles HV system, not to discharge the HV battery. THE BATTERY WILL REMAIN ENERGIZED.
High voltage components and cables are shown in orange in Figure 4 and Figure 5.

Componenets in **ORANGE** indicate HIGH VOLTAGE

**Figure 4**

Componenets in **ORANGE** indicate HIGH VOLTAGE

**Figure 5**

**WARNING**

This vehicle does not have an internal combustion engine. Lack of noise does not mean the vehicle is OFF.
DISABLE THE VEHICLE
High Voltage Disconnect Procedure

⚠️ DANGER

Never cut, breach or touch high voltage components or cables while energized.

⚠️ NOTICE

The high voltage system discharge procedure is designed to disable the vehicle HV system, NOT to discharge the HV batteries. The batteries will remain energized after this procedure is completed.

⚠️ WARNING

This vehicle does not have an internal combustion engine. Lack of noise does not mean the vehicle is OFF.

1. If vehicle is on, turn the vehicle ignition key off. Remove the key and secure away from the vehicle. If the vehicle is fitted with a LV battery cutoff switch, turn it to the OFF position and lockout.
2. Remove LV battery cover to get access to the battery terminals/circuit breakers.
   • The battery cover is held in place by four wing nuts
   • Remove the front two wing nuts completely
   • Loosen the back two wing nuts and slide the cover off the vehicle

Figure 6
3. Remove the cables from the top battery and press the red button on the circuit breaker.

4. If access to the battery terminals is not possible, cut the three 12V cables in the location shown in Figure 8.
If the Vehicle is Charging

• Turn the ignition switch to the OFF position, if possible.
• Disconnect the vehicle from the charging station. Some of the high-voltage components are activated during charging. Remove the charging connector to deactivate these components.

VEHICLE FIRE RESPONSE

Safety Hazards for Damage or Fire Involving an EV battery or EV Vehicle:

If the fire involves a lithium-ion battery, it will require large, sustained amounts of water for extinguishment. If there is no immediate threat to life or property, consider defensive tactics and allow fire to burn out.

Note: To fully extinguish an EV battery fire, 5,000 gallons or more of water may be required.

• If there is active fire, follow local procedures for vehicle fires. Wear appropriate Personal Protective Equipment (PPE) and Self Contained Breathing Apparatus (SCBA) at all times.

⚠️ DANGER

First Responders must be approved to wear SCBA breathing apparatus.

• If occupants are still inside the vehicle or are trapped, use a CO2 or dry chemical fire extinguisher to protect the occupants until a hose line is available or until the occupants are removed.
• Establish a secure perimeter around the vehicle.
• Use a hose line to apply water to extinguish the fire while continuing to cool the HV battery and its casing.

⚠️ DANGER

Never attempt to penetrate the HV battery or its casing to apply water.

⚠️ DANGER

Avoid contact with orange high voltage cabling and areas identified as high voltage risk by warning labels.

• There is a potential for delayed ignition or re-ignition of a lithium-ion battery fire even after it is believed to be extinguished. This may remain an issue until the lithium-ion battery is properly discharged.
• As with any vehicle fire, the by products of combustion can be toxic and all individuals not properly trained, dressed, and equipped to fight the fire should be directed to leave the area upwind and uphill from the vehicle fire and out of the way of oncoming traffic.
Always assume the high voltage battery and associated components are energized and fully charged.

- Exposed electrical components, wires and high voltage batteries present potential high voltage shock hazards.
- Venting/off-gassing high voltage battery vapors are potentially toxic and flammable.
- Physical damage to the vehicle or high voltage battery may result in immediate or delayed release of toxic and/or flammable gases and fire.
- If you detect leaking fluids, sparks, smoke, flames, increased temperature, gurgling, popping or hissing noises from the high voltage battery compartment, ventilate the area if possible.

Small Battery Fire (battery only, not in vehicle)

- Remove all jewelry, watches, necklaces and earrings. Remove any metal objects that are conductors of electricity.
- Wear the necessary PPE. Wear safety glasses, electrical insulated gloves with leather gloves, face shield, and apron.
- Put on SCBA breathing apparatus.
- If at all possible:
  - If the vehicle is charging, shut off and disconnect the battery from the charger.
  - Remove the battery and move it outdoors to burn out.
  - For best result use a foam extinguisher:
    - CO2
    - ABC dry chemical

First Responders must be approved to wear SCBA breathing apparatus.

Be alert. There is a potential for delayed fire with damaged lithium-ion batteries.

Electrical Shock Rescue

- Wear protective equipment such as high-voltage gloves, if available.
- Stand on a clean, dry surface, or stand on a dry rubber blanket or other insulating material.
- Identify the electrical source and disconnect the energy.
- Separate the victim from the source. If the electricity has not been shut off, do not touch the victim, even with a non-conducting instrument. Once you are sure there is no current, use a Safety Rescue Hook to separate the victim from the source.
First Aid Procedures

• In case of contact with electrolyte, gases, or combustion by-products from a lithium-ion battery release, the following first aid measures should be considered:
  • **EYES:** Immediately flush eyes with a direct stream of water for at least 15 minutes with eyelids held open, to ensure complete irrigation of all eye and lid tissue. Get immediate medical attention.
  • **SKIN:** Flush with cool water or get under a shower, remove contaminated garments. Continue to flush for at least 15 minutes. Get medical attention, if necessary.
  • **INHALATION:** Move to fresh air. Monitor airway breathing and circulation. Take appropriate first aid and/or CPR actions, as necessary. Get immediate medical attention.

**EV WATER SUBMERSION**

Damage to or deterioration of the HV system components may not be evident when the vehicle is submerged.

Water intrusion can damage all electrical components regardless of system voltage.

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**DANGER**

Never come in contact with a submerged EV or the water surrounding it without proper PPE. Electrocution resulting in serious injury or death may result.

Handling a submerged truck without appropriate Personal Protective Equipment (PPE) may result in serious injury or death due to electric shock.

Avoid any contact with the traction motor high voltage cables and electrical components.
EV VEHICLE TOWING AND STORAGE

Towing Procedures

The preferred method is to tow the vehicle with the rear wheels suspended. If towed with the rear wheels on the ground, the driveshaft must be removed between the traction motor and rear axle.

**CAUTION**

Failure to remove the driveshaft or axle shafts prior to towing may result in damage to the traction motor.

The Autocar E-ACTT vehicle may be towed a short distance to remove it from a roadway. To guarantee oil supply in the traction motor, the ignition must be switched on and the range selector in NEUTRAL (N). If the power cannot be supplied to the traction motor, do not tow without removing the driveshaft or axle shafts.

**NOTICE**

Advise the tow truck operator that re-ignition of a fire is possible at any time with a damaged high voltage system. If possible, use a thermal or infrared camera to verify the HV batteries are cold before towing the vehicle.

**CAUTION**

The maximum towing speed with the driveshaft attached and the ignition in the ON position with the specified tire size in the forward direction are as follow:

<table>
<thead>
<tr>
<th>11R22.5 Tire Size</th>
<th>Final Drive Ratio</th>
<th>Max Towing Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.14</td>
<td>30 mph</td>
</tr>
<tr>
<td></td>
<td>7.17</td>
<td>25 mph</td>
</tr>
<tr>
<td></td>
<td>10.62</td>
<td>15 mph</td>
</tr>
</tbody>
</table>

**CAUTION**

The maximum towing speed with the driveshaft attached and the ignition in the ON position with the specified tire size in reverse direction are as follow:

<table>
<thead>
<tr>
<th>11R22.5 Tire Size</th>
<th>Final Drive Ratio</th>
<th>Max Towing Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.14</td>
<td>5 mph</td>
</tr>
<tr>
<td></td>
<td>7.17</td>
<td>4 mph</td>
</tr>
<tr>
<td></td>
<td>10.62</td>
<td>3 mph</td>
</tr>
</tbody>
</table>
Damaged EV Vehicle Storage

Damaged vehicles should be isolated outdoors until inspected. Separate the vehicle from all combustibles and structures by a distance of at least 50 ft (15 m). Open windows and doors during isolation to avoid the potential accumulation of gases in the cab.

If possible, remove the HV batteries from the vehicle and store them outside away from any combustible materials.

Refer to the “Autocar E-ACTT Safety Service Manual - AWE 00400” for more information.