

Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High-Voltage Batteries

(Law Enforcement/Emergency Medical Services/Fire Department)

Electric and Hybrid-Electric Vehicle Considerations

In the event of damage, fire, or flooding involving an electric vehicle (EV) or hybrid-electric vehicle (HEV):

- 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.

DETERMINE IF THE VEHICLE IS AN ELECTRIC OR HYBRID-ELECTRIC VEHICLE, and if it is, advise Dispatch and all responders that an electric or hybrid-electric vehicle is involved.

IF YOUR LOCAL STANDARD OPERATING PROCEDURES (SOPs) ALLOW IT AND YOU ARE PROPERLY TRAINED AND EQUIPPED, which includes using personal protective equipment, then consider the following:

Vehicle Shutdown and High-Voltage System Disabling

IMMOBILIZE VEHICLE

- Always approach vehicle from the sides to stay out of potential travel path. It may be difficult to determine if the vehicle is running due to lack of engine noise.
- If possible, chock the tires, place the vehicle in Park, and set the parking brake.

DISABLE VEHICLE

- Turn off the vehicle, activate hazard lights, and move vehicle keys at least 16 feet away from the vehicle.
- Disconnect the vehicle's 12-volt battery.
- CAUTION: Safety restraints, air bags, and other safety systems may be active for up to 5 minutes after disconnecting the 12-volt battery.

Law Enforcement and Emergency Medical Services	Fire Department
CRASHES DAMAGING THE AREA OF THE HV BATTERY	
<p>NOTE: Follow local standard operating procedures (SOPs) for personal protection and safety.</p> <ul style="list-style-type: none"> • If you detect leaking fluids, sparks, smoke, flames, increased temperature, gurgling, popping, or hissing noises from the HV battery compartment, ventilate passenger area (i.e., roll down windows or open doors) and request fire department response. • If you detect any unusual odors or experience eye, nose, or throat irritation, move away from the vehicle and evacuate others from the immediate area. Rapid extrication may be needed for injured or trapped occupants. • Remain a safe distance upwind and uphill from the vehicle and out of the way of oncoming traffic until other appropriately equipped emergency responders arrive. • Avoid contact with orange high-voltage cabling and areas identified as high-voltage risk by warning labels 	<p>NOTE: Follow local standard operating procedures (SOPs) for personal protection and safety.</p> <ul style="list-style-type: none"> • If you detect leaking fluids, sparks, smoke, flames, increased temperature, gurgling, or bubbling sounds from the HV battery compartment, assume there is a battery fire and ventilate the passenger area (i.e., roll down windows or open doors). • Move away from the vehicle and evacuate others from the immediate area if you detect any unusual odors or experience eye, nose, or throat irritation. Wear full Personal Protective Equipment (PPE) and Self-Contained Breathing Apparatus (SCBA). • Be alert. There is a potential for delayed fire with damaged lithium-ion batteries.
FIRES INVOLVING OR EXPOSING THE HV BATTERY	
<ul style="list-style-type: none"> • If you are unable to quickly remove the occupants, use a fire extinguisher to protect them from the flames. • As with any vehicle fire, the byproducts of combustion can be toxic and all individuals should be directed to move to a safe distance upwind and uphill from the vehicle fire and out of the way of oncoming traffic 	<p>NOTE: If the fire involves a lithium-ion battery, it will require large, sustained volumes of water for extinguishment. Consider defensive tactics and allow fire to burn out.</p> <ul style="list-style-type: none"> • If there is active fire, follow local standard operating procedures (SOPs) for vehicle fires. Wear appropriate Personal Protective Equipment (PPE) and Self Contained Breathing Apparatus (SCBA). • If occupants are still inside the vehicle or trapped, a fire extinguisher may be used to protect the occupants until a hose line is available or the occupants are removed. Consider establishing a water supply to support long-term operation. • Use a hose line to apply water to extinguish the fire while continuing to cool the HV battery and its casing. Never attempt to penetrate the HV battery or its casing to apply water. • Avoid contact with orange high-voltage cabling and areas identified as high-voltage risk by warning labels. • Be alert. 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 byproducts of combustion can be toxic and all individuals should be directed to move to a safe distance upwind and uphill from the vehicle fire and out of the way of oncoming traffic.

Post-Incident

- Always assume the HV battery and associated components are energized and fully charged.
- Ensure that passenger and cargo compartments remain ventilated (i.e., open window, door, or trunk).
- Notify an authorized service center or vehicle manufacturer representative as soon as possible as there may be other steps they can take to secure and discharge the HV battery.
- Do not store a severely damaged vehicle with a lithium-ion battery inside a structure or within 50 feet of any structure, vehicle, or combustibles.
- Request fire department (if appropriate) if you observe leaking fluids, sparks, smoke, flames, or hear gurgling or bubbling from the HV battery.



Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High-Voltage Batteries

(Towing and Recovery Operators and Vehicle Storage Facilities)

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- 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.

- **DETERMINE IF THE VEHICLE IS AN ELECTRIC OR HYBRID-ELECTRIC VEHICLE**, and if it is, advise Dispatch and all responders that an electric or hybrid-electric vehicle is involved.
- Be alert. There is a potential for delayed fire with damaged lithium-ion batteries.
- Consult with the responding fire department to determine the actions it took.
- If you detect leaking fluids, sparks, smoke, flames, increased temperature, gurgling, popping, or hissing noises from the HV battery compartment, call 911.
- **Notify an authorized service center or vehicle manufacturer representative as soon as possible as there may be additional steps necessary you or they can take to secure and, discharge, handle, and store the HV battery and vehicle.**
- Notify the storage facility of your actions and the actions the Emergency Responders told you that they took.

If you are properly trained and equipped, which includes using personal protective equipment, then consider the following:

Vehicle Shutdown and High-Voltage System Disabling

RECOVERING/TRANSPORTING VEHICLE

- **Call an authorized service center or vehicle manufacturer representative to determine additional steps that you should take to safely recover or transport the vehicle.**
- Always approach vehicle from the sides to stay out of potential travel path. It may be difficult to determine if the vehicle is running due to lack of engine noise.
- Place vehicle in Park, set the parking brake, turn off the vehicle, activate hazard lights, and remove keys to a distance at least 16 feet from the vehicle until loading the vehicle for transport.
- Refer to vehicle manual/recovery guide to locate proper attachment/connection points and transport method.
- Avoid contact with orange high-voltage cabling and areas identified as high-voltage risk by warning labels.

STORING VEHICLE

- Do not store a severely damaged vehicle with a lithium-ion battery inside a structure or within 50 feet of any structure, vehicle, or combustibles.
- Ensure that passenger and cargo compartments remain ventilated.
- Prior to placing and while located in storage area/tow lot, continue to inspect vehicle for leaking fluids, sparks, smoke, flames, gurgling, or bubbling sounds from the HV battery and call 911 if any of these are detected.
- Maintain clear access to stored vehicles for monitoring and emergency response if needed.

