



**Purpose:**

To establish a policy to maximize safety and efficiency when responding to collisions/extrications/vehicle fires involving Hybrid (Gas/Electric powered) and Electric vehicles.

**Scope:**

This SOP will apply to all members of the Pacific Fire Protection District.

**Guidelines:**

Conform a plan that should be used to accomplish tasks safely, rapidly, and efficiently.

In the event of damage to or fire 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 (Anywhere from 100V to 800V).
- 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.

**Procedure:**

The goal for responders in securing the scene and providing a safe environment for rescue and incident stabilization is to satisfy the Four I's: **Identify** the vehicle is a Hybrid or Electric, **Immobilize** the vehicle, **Isolate** the power sources for the vehicle, and **Inspect** the vehicle for hazards.

**Identify**

- 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.

**Immobilize**

- 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 into Park, and set the parking brake.

## **Isolate**

- Place vehicle in Park, set parking brake, turn off the vehicle, and move vehicle keys at least 16 feet away from vehicle.

## **Inspect**

- For any visible damage to any electrical components up to and including batteries and orange power cable. DO NOT Disconnect power cable unless you have been trained.
- 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).

Extricate patients based on SOP for vehicle rescue.

## **Fire Procedure:**

- If there is fire, and occupants are still inside the vehicle or are trapped, use a fire extinguisher to protect the occupants until a hose line is available or until the occupants are removed.
- Be alert. There is a potential for delayed fire with damaged lithium-ion batteries.
- NOTE: If the fire involves a lithium-ion battery, it will require large, sustained volumes of water for extinguishment. If there is no immediate threat to life or property, consider defensive tactics and allow fire to burn out.
- Establish a safe perimeter around the vehicle.
- 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.
- 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.
- Wear appropriate Personal Protective Equipment (PPE) and Self-Contained Breathing Apparatus (SCBA) at all times.
- Avoid contact with orange high voltage cabling and areas identified as high voltage risk by warning labels.

**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)
- Vehicle should be monitored for leaking fluids, sparks, smoke, flames, gurgling or bubbling sounds from the HV battery, and if detected, assume the HV battery is burning and follow above guidance to extinguish the fire.