

# Towing and Recovery Electric Vehicle Water Recoveries

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## Objective

Discuss the hazards tow operators face when working with vehicles that have been submerged in water, particularly with a hybrid or electric vehicle. Understanding common safety issues with these vehicles can help keep operators safe.

Hybrid, electric, and fuel cell vehicles are designed to be safe in water, even when fully submerged. The High Voltage (HV) system is isolated from the chassis and is designed to NOT pose a shock and NOT energize the surrounding water.

- Never remove a submerged service disconnect.
  - Submersion in water (especially salt water) can damage low and high voltage components. Although not a common occurrence, this could result in an electrical short and potential fire once the vehicle is no longer submerged.
  - Damaged HV batteries can produce flammable gas. Venting the passenger compartment is recommended once the vehicle is out of the water. Do not store vehicle indoors.
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- Avoid contact with HV components, cabling, or service disconnects on a submerged vehicle.
  - If possible, turn the ignition off in a submerged vehicle, but do not attempt any other disabling activities.
  - If ignition cannot be turned off, wait until the vehicle is no longer submerged and is drained of water before attempting to disable it.
  - In some instances, small bubbles may be seen coming from an immersed HV battery. This is referred to as micro-bubbling. This DOES NOT indicate a shock hazard and DOES NOT energize the surrounding water.

Avoid contact with a damaged HV battery; a significant shock hazard may exist. An HV battery should always be considered to contain a charge and should never be touched or pried open.

Do not interact with vehicles exhibiting signs of damaged or overheating HV batteries including leaking fluids, sparks, smoke, bubbling noises, and/or unusual odors. If you detect any of these signs, immediately contact fire personnel.

