

	TRAVIS COUNTY ESD #5 MANCHACA FIRE RESCUE Department Best Practices	A301
	Authorized by:  Fire Chief Chris Barron	Effective: 12-27-2018 Rescinds: Reference: Application: Shift Personnel
Vehicle Fires		

I. Purpose

To provide guidelines for fighting motor vehicle fires.

II. Background

Vehicle fires present a variety of hazards including location on roadways, flammable liquids, combustible metals, alternative fuels, projectiles, unknown cargo, and electrical hazards. Vehicles can range in size from small passenger cars to large semi-trucks that may create water supply and fire attack challenges.

III. Best Practices

The following best practices should be followed at all firefighting and emergency scene operations, except where deviation can be justified by Fire Officers. Any significant deviation should be communicated to responding/on-scene units as soon as possible.

A. **Assumption of command.** The initial arriving Company Officer should assume command, perform an initial size up, and risk assessment of the scene.

B. Scene safety.

1. **360 survey.** Command should assess the vehicle and surrounding area for exposures for the vehicle's current position and the potential for the vehicle to roll. The area should be checked for additional scene hazards such as downed wires and spilled fuel. Spectators should be kept a safe distance from the vehicle. Consider requesting law enforcement to assist with securing the scene and diverting traffic.

- a. **Occupants.** The 360 should include assessing the scene for occupants both in and out of the vehicle as well as the existence of any injuries.

2. **Apparatus positioning.** The apparatus should be positioned to provide a shielded workspace for firefighters, especially when operating on roadways. The apparatus should also be positioned to protect the pump operator from oncoming traffic. Consider the use of traffic cones and scene illumination to better delineate the scene.

- a. **Apparatus exposure.** Avoid placing the apparatus in a position where hazardous runoff from the scene could expose the apparatus to damage or contamination. The apparatus should be positioned so that the pump operator does not operate within the smoke. Proper positioning could necessitate the use of longer attack lines.
3. **Fuel type.** Personnel should be cognizant of the variety of fuel types that available for powering vehicles. Vehicles may not be clearly marked for alternative fuel systems. The occupant of the vehicle should be asked if the involved vehicle has alternative fuels. Some of these fuels include:
 - a. **Gasoline or Diesel:** While gasoline is a commonly encountered flammable liquid, gasoline blends of 10-85% ethanol can burn with characteristics of a polar solvent (alcohol) fire. Diesel is a combustible liquid and can be blended with biodiesel in percentages from 10-100%. Biodiesel has burning and extinguishment characteristics similar to regular diesel.
 - b. **Compressed natural gas.** CNG vehicles may have a small blue and silver diamond emblem on the rear of the vehicle or at the fuel fill connection.
 - c. **Liquefied petroleum gas.** LPG vehicles may have a small black and silver diamond emblem on the rear of the vehicle or at the fuel fill connection.
 - d. **Electric or Hybrid-Electric.** The drive system for electric vehicle is high voltage (300-600 volts). Many of these batteries are Lithium-Ion batteries and can suffer thermal runaway and prove difficult to extinguish. These vehicles also have a 12-volt electrical system like other vehicles. Disabling the 12-volt system will disable the vehicle but battery packs and high voltage cables can remain energized.
 - e. **Hydrogen.** Used as a compressed gas that quickly dissipates when released. When burning, the flame is very difficult to see in daylight and produces no smoke. A PPV fan can be used to disperse leaking hydrogen vapors.
4. **Attack and supply considerations.** An appropriately sized line should be selected for the fire load present. The line should be of sufficient length to reach around the entire vehicle. A minimum of a 1 ¾" hoseline should be used for a working vehicle fire. Multiple or larger lines may be needed for larger vehicles or cargo fires.
 - a. **Tender response.** For fires reported in larger vehicles or alternative fuel vehicles, consider responding a tender in addition to the engine for additional water supply.
 - b. **Foam.** CAFS or class A foam is appropriate for vehicle fires not involving flammable liquids. Fire fires involving flammable liquids; consider alcohol-resistant class B foam, or dry chemical/CO₂ extinguishers.

- c. **Approach.** Crews should approach a burning vehicle in full PPE, including on air with SCBA. The approach should be at an angle to the front or rear of the vehicle or perpendicular to the sides of the vehicle.
- d. **Sweep and cool.** On the approach to the vehicle, the nozzle operator should sweep a fire stream under the vehicle and around the bumper and wheel area to address fire under the vehicle and to cool objects that could become explosive projectiles.
- e. **Extinguishment.** If the passenger compartment is involved, the reach of the fire stream should be used from 15 to 20 feet away to sweep the dash and steering column to determine if there will be a violent reaction due to the presence of combustible metal components. Crews should also avoid working directly in front of or behind the vehicle until extinguished and cooled. The engine compartment and trunk should be attacked from the side to avoid being in line with pneumatic or hydraulic strut mechanisms used in some hood/trunk systems.
 - 1) **Exposed tanks.** If the vehicle has exposed fuel tanks, an effort should be focused on cooling and protecting the tanks if threatened by fire.
 - 2) **Large vehicles.** For larger vehicles, such as semi-trucks, Dispatch will often dispatch the call as a Hazardous Condition with an AFD rescue unit responding. For working fires involving semi-trucks, consider additional resources such as a Light Box response.
 - 3) **Electric/Hybrid vehicles.** The high voltage systems and batteries can be attacked directly with water. DC current does not seek a path to ground like AC current. Crews may consider allowing battery packs to burn themselves out while cooling and controlling fire in the rest of the vehicle. Extensive cooling will be needed to prevent reignition of the battery pack assembly. Do not overhaul high voltage components. High voltage components can remain energized even after damaged by fire.
 - 4) **Overhaul.** During overhaul operations, crews should remain on air until there is no smoke production. Beware of air bag components during overhaul. Watch for fuel spills that need containment or present an ignition hazard. For incidents in the City of Austin, the Watershed Protection Department should be notified through Dispatch for fuel spills greater than 5 gallons or for spills entering a storm drain or waterway.