**Chapter 25: Vehicle Rescue and Extrication**

**Chief Concepts**

* The design of motor vehicles is constantly evolving. As a fire fighter, you need to keep up to date on the design of motor vehicles.
* The most common types of vehicles on the road are conventional vehicles, which use internal combustion engines that burn gasoline for power. Alternative-powered vehicles may be powered by CNG, LNG, or LPG (i.e., propane). The hazards posed by these vehicles include fuel fires.
* Electric-powered vehicles are propelled by an electric motor that is powered by batteries. These vehicles pose electrical hazards due to the large number of batteries needed to power the engine.
* Hybrid vehicles use both a battery-powered electric motor and a gasoline-powered engine. As a consequence, these vehicles pose both electrical hazards and fuel fire hazards.
* The main parts of a motor vehicle include the following components:
	+ The A posts form the sides of the windshield.
	+ The B posts are located between the front and rear doors of a vehicle.
	+ The C posts are located behind the rear passenger windows.
	+ The bulkhead divides the engine compartment from the passenger compartment.
	+ The passenger compartment (also called the occupant cage) includes the front and back seats.
	+ The two common types of vehicle frames are the platform frame and the unibody. The platform frame is used for SUVs and trucks; it uses beams to form the load-bearing frame of a vehicle. The unibody is used in most passenger vehicles; it combines the vehicle body and the frame into a single component.
* Extrication should follow a series of logical steps:
	+ Safely respond to the scene—Pick the best route, drive in a safe manner, and wear your safety belt.
	+ Arrival and scene size-up—Assess the hazards and determine whether additional resources are needed. Be aware of the traffic and any spilled fuel.
	+ Stabilize the scene—Reduce, remove, or mitigate the hazards at the scene.
	+ Stabilize the vehicle—Use cribbing and/or rescue- lift air bags to stabilize the vehicle before the victim can be removed.
	+ Access the victim—The victim may be accessed (and assessed) through a door, window, or a removed roof.
	+ Disentangle the victim—Using hand and power tools, remove the tangle of metal from around the trapped victim.
* The following tools are used for stabilizing a vehicle:
	+ Cribbing
	+ Step chocks
	+ Wedges
	+ Rescue-lift air bags
* Four techniques may be used for gaining access to and disentangling the victim of a motor vehicle collision:
1. Stabilize or hold an object or vehicle.
2. Bend, distort, or displace.
3. Cut or sever.
4. Disassemble.
* The following classes of tools are used for extrication:
	+ Tools for stabilization—Cribbing, rescue-lift air bags, step chocks, high-lift jacks, and stabilization jacks
	+ Tools to displace, bend, and distort metal—Pry axes, short pry bars, long pry bars, hacksaws, screwdrivers, hammers, and Halligan tools
	+ Tools for cutting—Axes, bolt cutters, cable cutters, hacksaws, manual hydraulic cutters, air chisels, and power saws
* To gain access to the victim, the following techniques are used:
	+ Open the door.
	+ Break a window.
	+ Force open the door.
* To disentangle the victim from the vehicle, the following techniques are used:
	+ Displace the seat.
	+ Remove the windshield.
	+ Remove the steering wheel.
	+ Remove the steering wheel: loops or spokes.
	+ Displace the dashboard.
	+ Displace the roof.
* The final phase of the extrication process consists of removing and transporting the victim to the hospital. During this phase, the victim is stabilized, packaged, removed from the vehicle, and transported to a medical facility.