Continuing Education for the Fire Fighter

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Fire Control

Module 2

Chapter *17*

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LEARNING OBJECTIVES

Describe situations that may require suppression of Class C fires.

Identify hazards associated with suppressing Class C fires.

LEARNING OBJECTIVES

Describe actions associated with suppressing Class D fires.

Explain actions taken when suppressing a vehicle fire.

Compare methods used to suppress fires in stacked and piled materials, small unattached structures, and trash containers.

Summarize the main influences on ground cover fire behavior.

Compare types of ground cover fires.

LEARNING OBJECTIVES

Describe elements that influence ground cover fire behavior.

Identify the parts of a ground cover fire.

Describe protective clothing and equipment used in fighting ground cover fires.

Describe methods used to attack ground cover fires.

Summarize safety principles and practices when fighting ground cover fires.

SUPPRESSION OF CLASS C FIRES REQUIRES KNOWLEDGE OF ENERGIZED EQUIPMENT.

WARNING

Before initiating fire suppression activities, stop the flow of electricity to the device involved.

CLASS C FIRES MAY OCCUR AROUND DELICATE ELECTRONIC EQUIPMENT.

- Require use of Halotron® type agents
- Multipurpose dry-chemical agents may be chemically reactive
- Require considerable cleanup
- Must not include water

TRANSMISSION LINES AND EQUIPMENT CAN BE DAMAGED AND START FIRES.

Reduce risk of shock by current in the ground

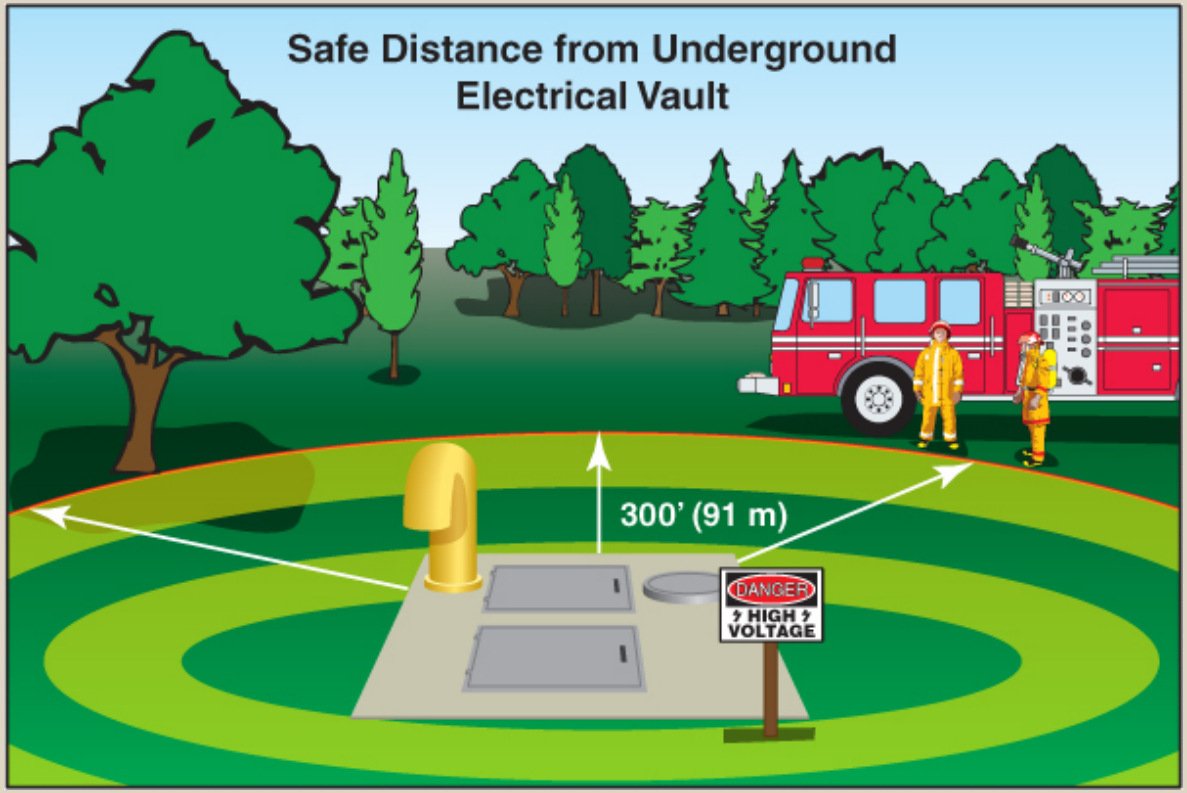
- Cordon off circle with radius equal to distance between power poles where line contacts earth
- If ground cover fire starts – Wait for fire to burn away from point of contact before attempting extinguishment
- For maximum safety – Only utility personnel should cut power lines

WARNING

Assume that all power lines are energized until the power company informs you otherwise.

FIRES IN ELECTRICAL TRANSFORMERS ARE RELATIVELY COMMON.

UNDERGROUND TRANSMISSION LINES CAN CREATE EXPLOSIONS WHICH REQUIRE FIREFIGHTERS REMAINING A SAFE DISTANCE AWAY.



WARNING

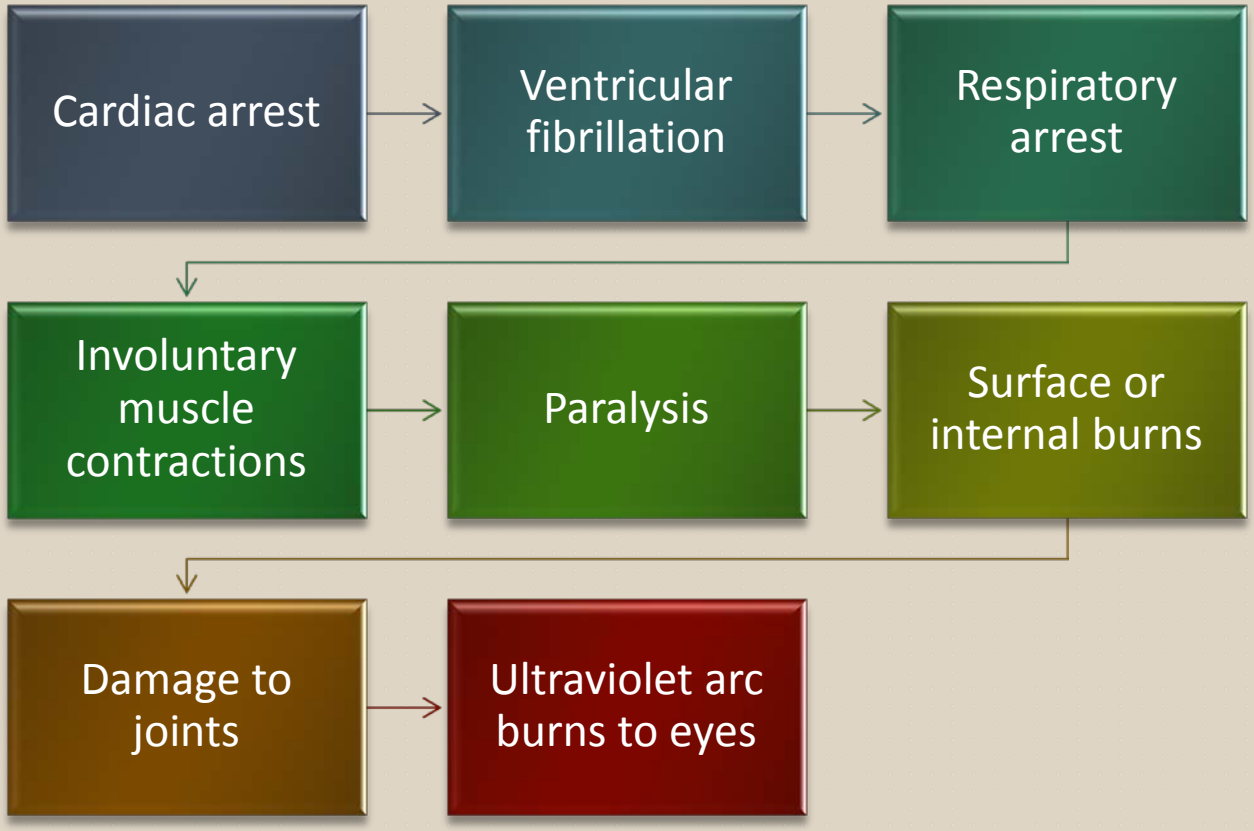
Only personnel who are properly trained and equipped for confined space entry should enter a utility vault.

COMMERCIAL HIGH-VOLTAGE INSTALLATIONS REQUIRE SPECIFIC KNOWLEDGE.

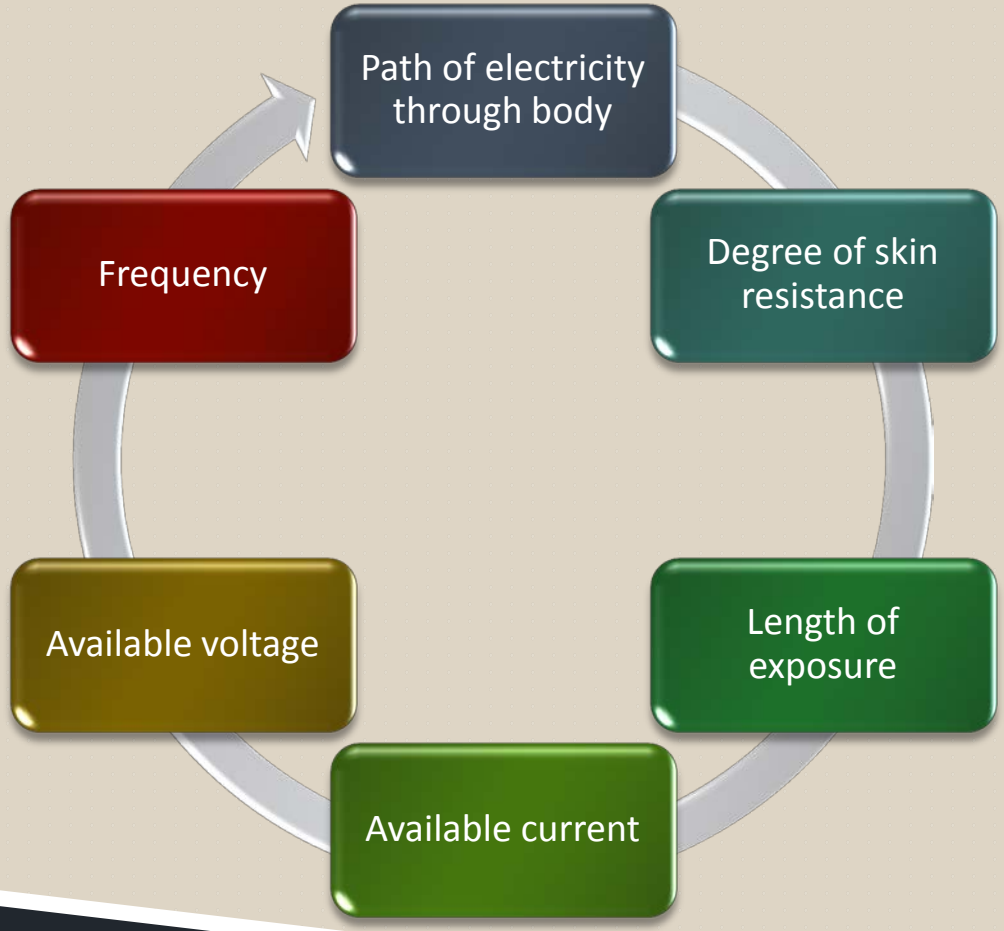
CAUTION

Before cutting into walls and ceilings that may contain electrical wiring or gas piping, verify with the Incident Commander that electrical and gas utilities have been shut off.

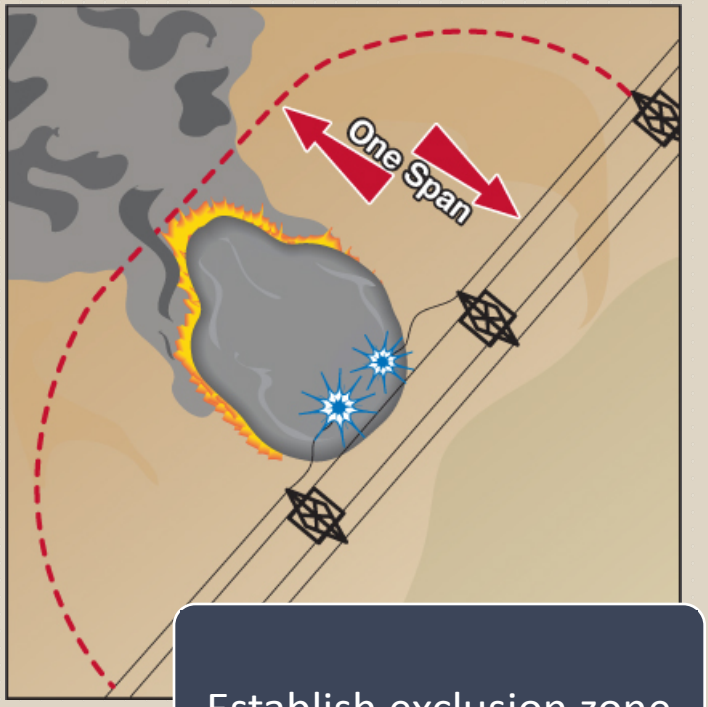
THERE ARE SEVERAL CONSEQUENCES OF THE ELECTRICAL HAZARDS THAT ARE PRESENT AT CLASS C FIRES.



SEVERAL FACTORS INFLUENCE THE SERIOUSNESS OF AN ELECTRICAL SHOCK.



YOU SHOULD KNOW THE GUIDELINES FOR ELECTRICAL EMERGENCIES.



Establish exclusion zone

Short circuit may weaken other wires

Wear full protective clothing, use only tools with insulated handles

Guard against shocks, burns, eye injuries from electrical arcs

YOU SHOULD KNOW THE GUIDELINES FOR ELECTRICAL EMERGENCIES.

- Wait for utility company to cut any power lines
- Use lockout/tagout devices
- Stay at least 10 feet (3 m) away from power lines when raising or lowering ladders or aerial devices
- Do not touch vehicle, apparatus in contact with electrical wires
- Do not use solid and straight streams on fires in energized equipment
- Use fog streams with at least 100 psi (700 kPa) on energized equipment

YOU SHOULD KNOW THE GUIDELINES FOR ELECTRICAL EMERGENCIES.

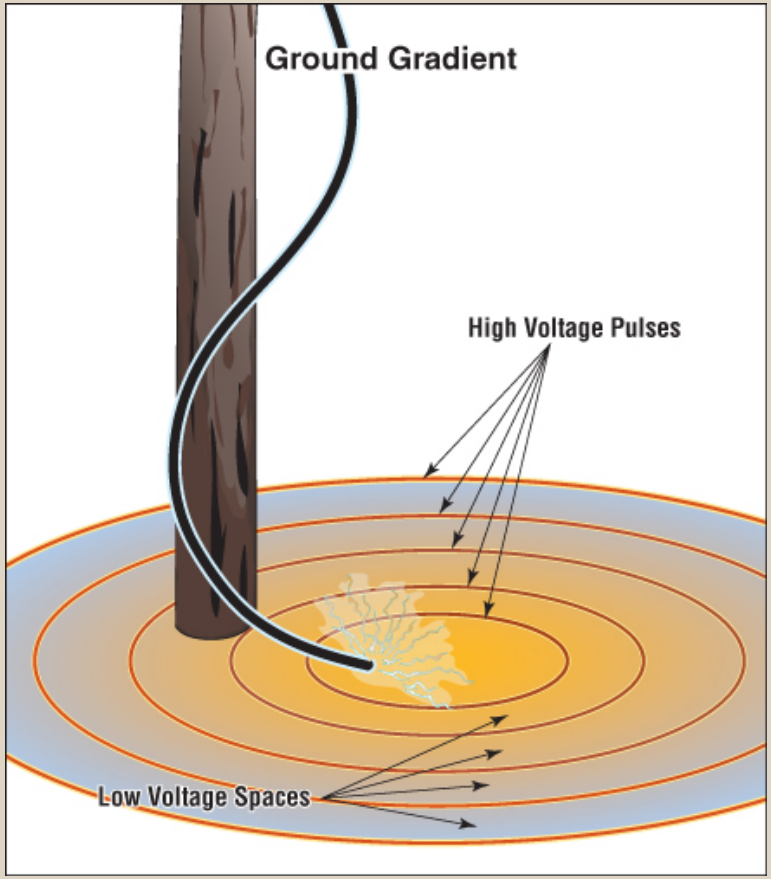
Be aware live wires outside of field of view may be in contact with mesh or rail fences, energizing them

When wires down – Heed any tingling sensation felt in feet and back away

Maintain large safety zone around downed wires

Remain inside vehicle or apparatus in contact with power lines – Jump clear if you must leave; keep both feet together

YOU SHOULD KNOW THE GUIDELINES FOR ELECTRICAL EMERGENCIES.



If inside – Put or place feet together; hop or shuffle out of area

Do not walk or crawl

CAUTION

To exit a ground gradient area, keep both feet in contact with each other and hop or shuffle out of the affected area.

SUPPRESSING CLASS D FIRES CAN PRESENT UNIQUE PROBLEMS.

Courtesy of NIST

Burning at extremely high temperatures

Reactive to water

SUPPRESSING CLASS D FIRES REQUIRES UNDERSTANDING CERTAIN CHARACTERISTICS.

- Extinguishing agents
  - Manually shoveled or scooped onto
  - Applied using Class D extinguisher
- Emit brilliant white light
  - Only diminishes when ash layer covers
- Do not assume extinguished when flames not visible
- May be extended time before area, substance cools to safe levels

VEHICLE FIRES ARE AMONG THE MOST COMMON TYPES OF FIRES.

- May be result of collision, malfunction, intentional act
- Require full PPE, including SCBA
- Generate toxic, nontoxic smoke/vapors
- Fuel sources

YOU SHOULD KNOW VEHICLE INCIDENT SIZE-UP CONSIDERATIONS.

- Decide if traffic diversion required
- Follow DOT guidelines to protect scene
- Determine if victims are in vehicle, if require extrication
- Determine if vehicle on fire or leaking fuel
- Confirm type of fuel, select appropriate extinguishing agent
- Avoid components under constant pressure

YOU SHOULD KNOW VEHICLE INCIDENT SIZE-UP CONSIDERATIONS.

- Follow department SOPs for establishing scene protection
- Isolate vehicle from or eliminate ignition source
- Stabilize vehicle
- Control downed power lines
- Address additional hazards
- May need to use defensive techniques

VEHICLE FIRE ATTACK REQUIRES KNOWLEDGE OF SEVERAL CONCEPTS.

Basic attack procedures

Be aware of extraordinary hazards

Conduct overhaul to check for hidden fires

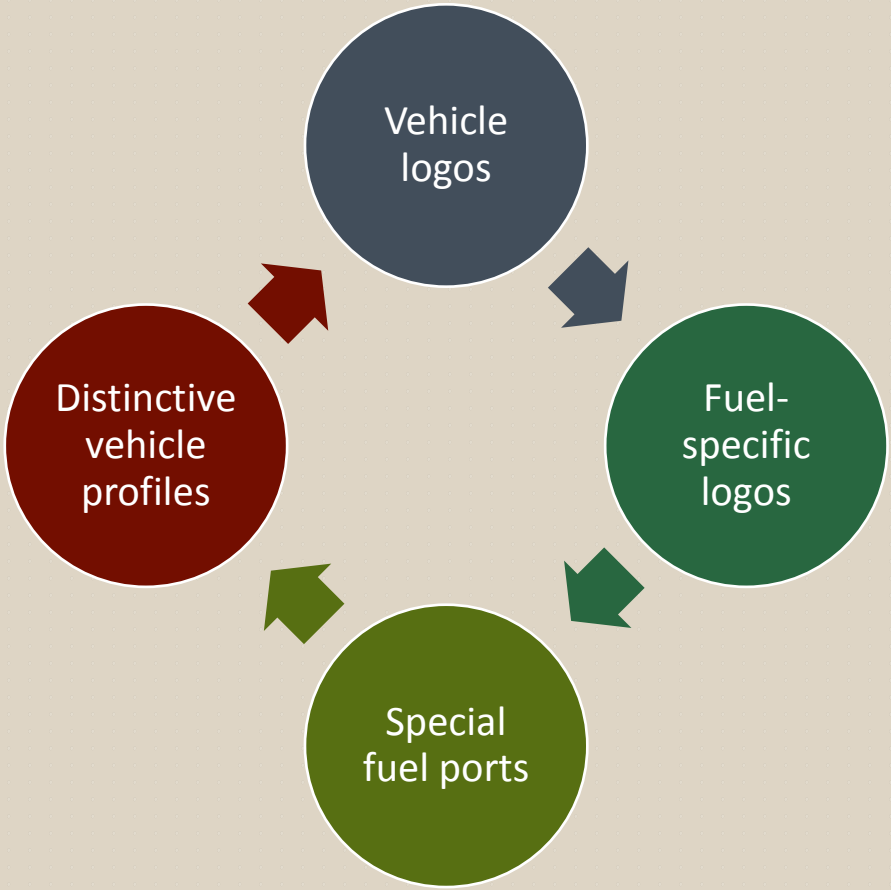
FIRES IN DIFFERENT PARTS OF THE VEHICLE REQUIRE SPECIFIC PROCEDURES.

Passenger compartment

Engine or trunk compartment

Undercarriage

ALTERNATIVE FUEL VEHICLES MAY BE APPARENT BY CERTAIN VISUAL INDICATORS.



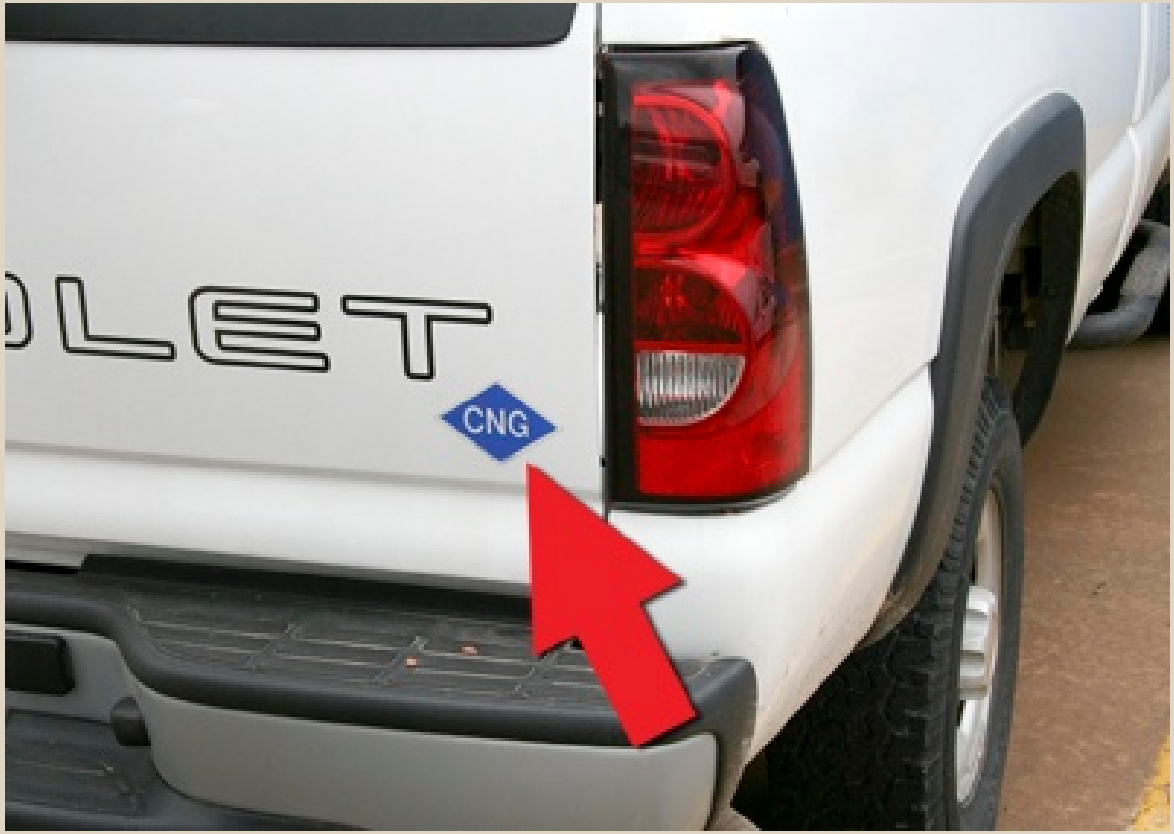
CAUTION

There may be no visual indicators that a vehicle uses an alternative fuel source.

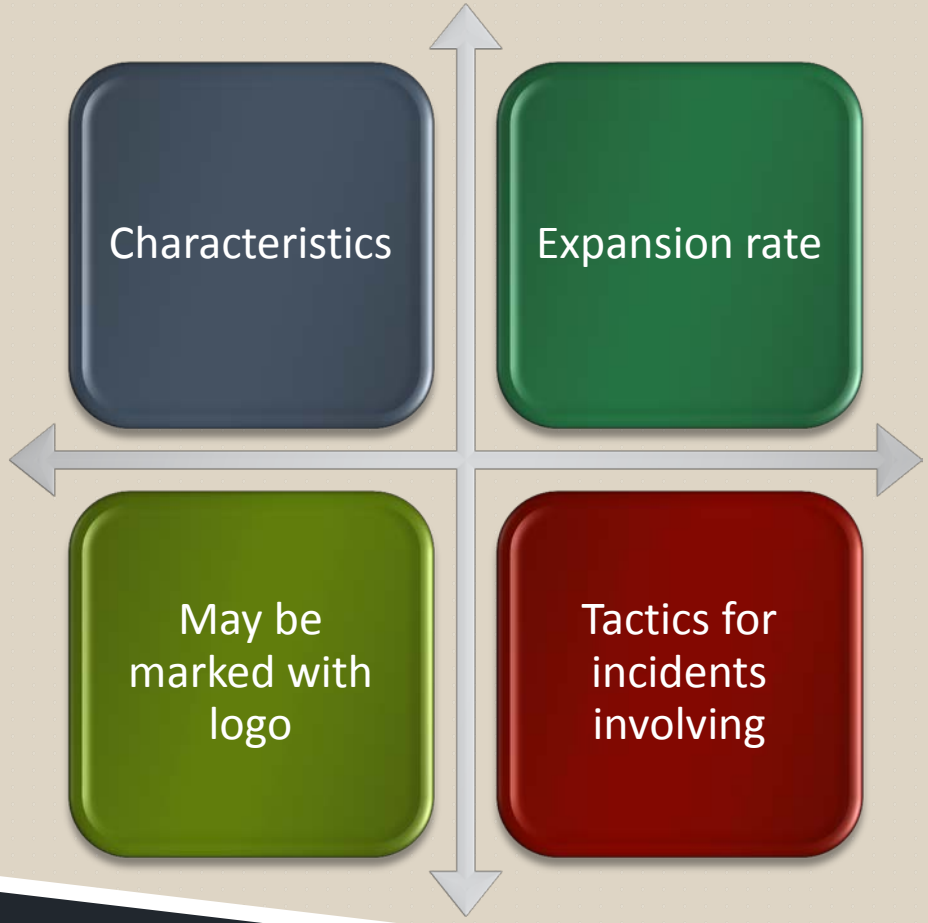
THERE ARE SEVERAL TACTICS TO CONSIDER AT ALTERNATIVE VEHICLE FUEL FIRES.

- Park apparatus minimum 100 feet (30 m) from incident
- Approach from uphill and upwind, if possible
- Approach from 45-degree angle to vehicle
- Wear full PPE including SCBA
- Use nonsparking extrication tools
- Do not use flares
- Deploy backup hoseline
- Select extinguishing agent specific to type of fuel or battery pack

NATURAL GAS IS USED IN ONE OF TWO FORMS AND HAS SPECIFIC PROPERTIES.



LIQUEFIED PETROLEUM GAS IS THE THIRD MOST COMMON VEHICLE FUEL TYPE.



ELECTRIC ALTERNATIVE FUEL VEHICLES SHOULD HAVE VISIBLE INDICATORS.

WARNING

Do not cut or contact any orange, blue, or yellow color-coded electrical cables or components in electric or hybrid electric vehicles.

THERE ARE SEVERAL OTHER ALTERNATIVE FUEL TYPES THAT MAY BE PRESENT.

Ethanol/methanol

- Gasoline blends

Biodiesel

- Blend of liquids made from natural plants and diesel

Hydrogen

- Used in some areas, mostly concept stage

STACKED AND PILED MATERIALS PRESENT UNIQUE SUPPRESSION CONSIDERATIONS.

SMALL UNATTACHED STRUCTURES ARE FOUND IN ALL JURISDICTIONS.

CAUTION

Chemicals used in the production of some illegal drugs are extremely toxic and volatile. Incidents involving them may require the assistance of trained hazardous materials personnel.

TRASH CONTAINER FIRES VARY IN SIZE AND CREATE TOXIC COMBUSTION PRODUCTS.

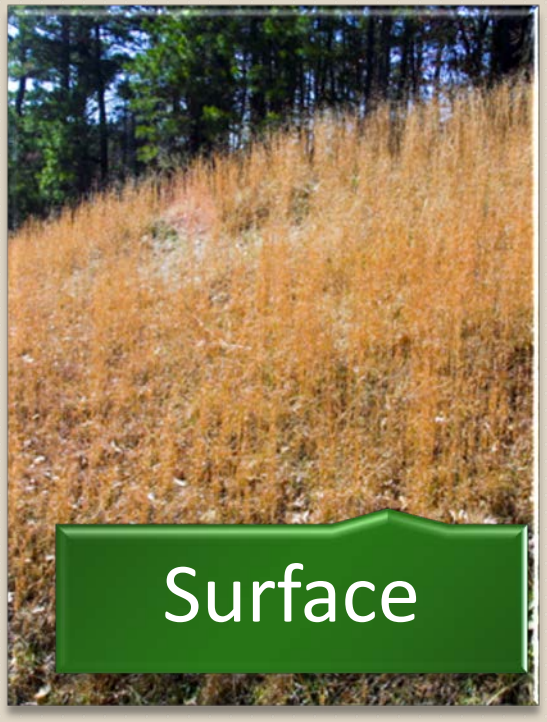
GROUND COVER FIRES VARY IN SIZE, LOCATION, AND CAUSES.

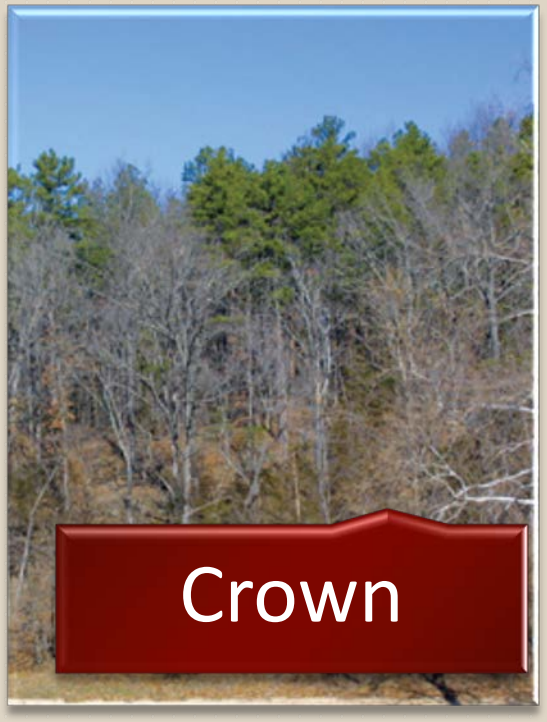
- **Size**
  - Vary greatly
- **May occur**
  - Number of different places
- **Causes**
  - Natural
  - Human
- **Characteristics**
  - Different than buildings
- **Influences**
  - Fuel
  - Topography

WARNING

Ground cover fires can be deadly to firefighters even if they are working in very light fuels or working during the overhaul phase of an operation.

THERE ARE SEVERAL TYPES OF GROUND COVER FIRES FIREFIGHTERS SHOULD KNOW.

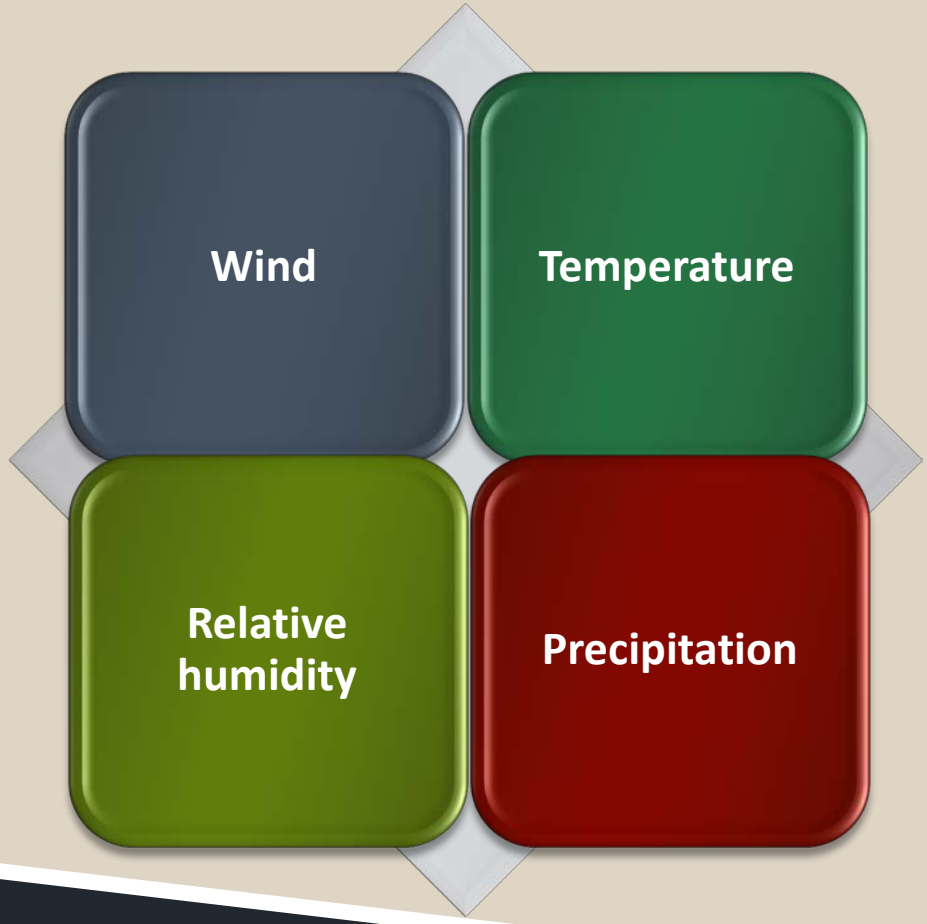




GROUND COVER FIRE BEHAVIOR IS INFLUENCED BY FUEL AND ITS CHARACTERISTICS.

Categorized based on location	Factors affecting burning
• Subsurface • Surface • Aerial	• Fuel size • Compactness • Continuity • Volume • Fuel moisture content

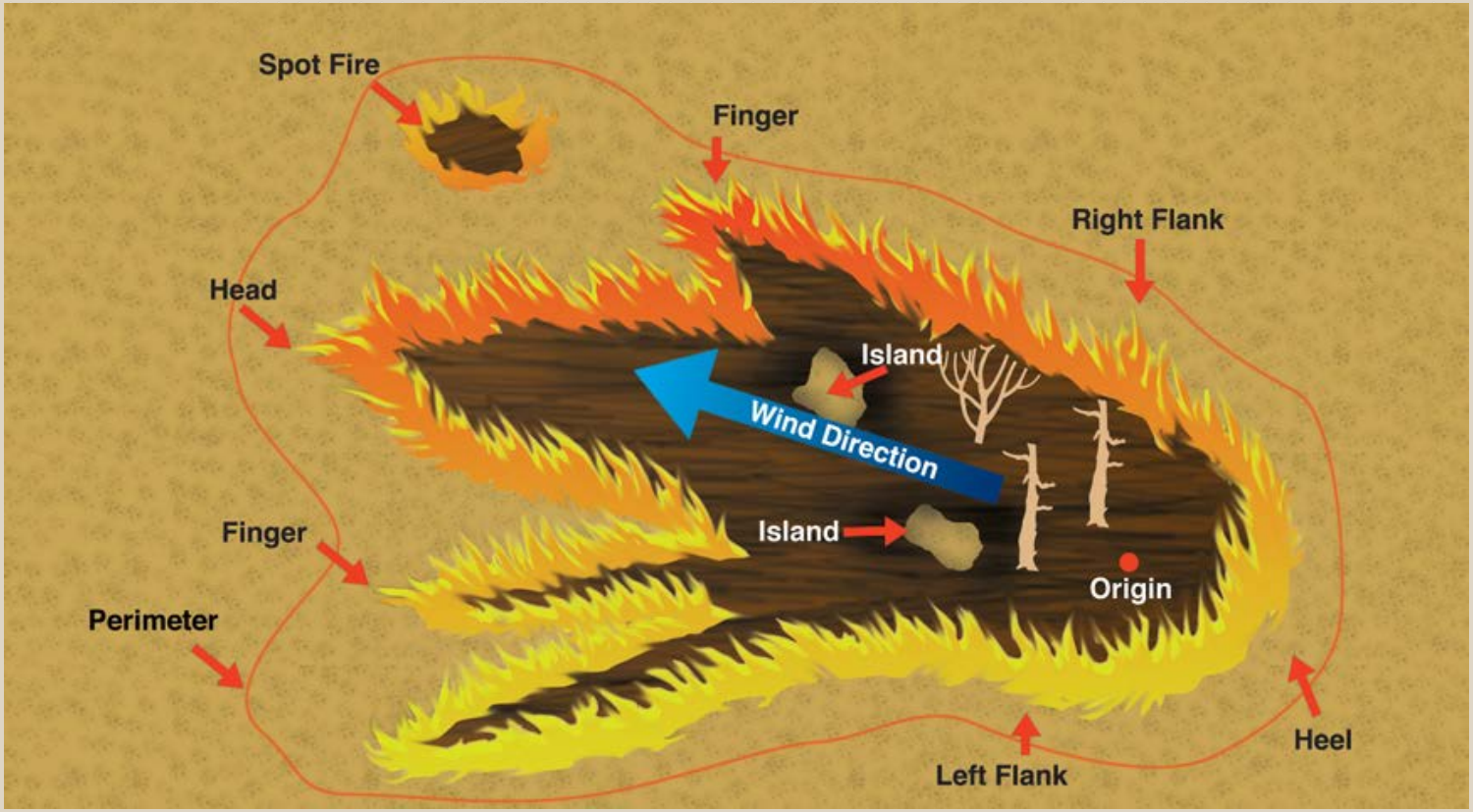
GROUND COVER FIRE BEHAVIOR IS AFFECTED BY CERTAIN WEATHER FACTORS.



GROUND COVER FIRE BEHAVIOR IS INFLUENCED BY TOPOGRAPHY.

- Steepness of slope
- Aspect
- Local terrain features
- Drainages

FIREFIGHTERS SHOULD BE ABLE TO IDENTIFY PARTS OF A GROUND COVER FIRE.



WILDLAND PROTECTIVE CLOTHING AND EQUIPMENT IS DIFFERENT FROM STANDARD STRUCTURAL TURNOUT CLOTHING.

- Must meet NFPA® 1977
- NFPA® 1500 establishes minimum
- Agencies may also provide

GROUND COVER FIRES MAY BE ATTACKED DIRECTLY OR INDIRECTLY.

Courtesy of National Interagency Fire Center

Direct

Indirect

- Varying distances
- Allow unburned fuel to self extinguish
- Used against fires too hot, big for direct

SIZE-UP INFORMATION AT GROUND COVER FIRES INCLUDES SEVERAL CATEGORIES.

- Fire location
- Fire type
- Incident access
- Exposures
- Weather conditions
- Wind direction
- Wind velocity
- Topography
- Visibility
- Resources

THE LECS CONCEPT CAN HELP SITUATIONAL AWARENESS BE MORE EFFECTIVE.

Lookouts

Know where the fire is and where it is going.

Communications

Know who is operating above, below, and adjacent to you.

Escape Routes

Know more than one way out of the area you are working in.

Safe Zones

Know how to quickly get to an area of refuge.

THE TEN STANDARD FIRE FIGHTING ORDERS CAN ALSO BE USED AT GROUND COVER FIRES.

- Keep informed on fire weather conditions and forecasts
- Know what the fire is doing at all times
- Base all actions on current and expected behavior of the fire
- Identify escape routes and safety zones, and make them known
- Post lookouts when there is possible danger

THE TEN STANDARD FIRE FIGHTING ORDERS CAN ALSO BE USED AT GROUND COVER FIRES.

- Be alert, keep calm, think clearly, and act decisively
- Maintain prompt communications with your forces, your supervisor, and adjoining forces
- Give clear instructions and ensure that they are understood
- Maintain control of your forces at all times
- Fight fire aggressively, providing for safety first

THERE ARE OTHER NON-FIRE HAZARDS YOU SHOULD BE AWARE OF AS WELL.

- Unstable hazard trees
- Animals
- Insects
- Electrified fences
- Electrical power lines
- Explosives

THERE ARE OTHER NON-FIRE HAZARDS YOU SHOULD BE AWARE OF AS WELL.

- Hazardous materials
- Rolling or falling debris
- Pits or shafts
- Animal traps
- Lightning
- Heart failure

SUMMARY

Firefighters need to know how to safely and effectively attack and extinguish fires involving structures, vehicles, stacked and piled materials, and ground cover.