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Combating Fires, *Confined Space & Compartmentalized* Piercing Nozzles

By Capt. Frank Palmisano

The Challenge

Fires in confined and enclosed spaces such as, motor vehicles, trailer and box trucks, mobile and trailer homes, lightweight construction voids, attics, balloon walls, storage sheds, basements, air and exhaust ducts, shipping containers, trash bins, and the list continues to grow, are rapidly becoming more difficult and dangerous to attack and extinguish. We have all fought and will fight many more of these type fires during our careers in the Fire Service. Most, if not all, of these fires require some type of immediate and most times risky forcible entry operations which are, in most situations, dangerous and time consuming and can result in injuries.

New Technology

Recent advances in piercing applicator technology have improved the methods used to combat compartmentalized fires. They include newly designed piercing nozzles for both Extinguishers and Hoselines that allow a single firefighter, or a two-man team of firefighters, to quickly and safely apply extinguishing agents directly to the seat of the fire. These nozzles, when used with portable extinguishers, are ideal for "First Responders" to car fires. The newer designs give firefighters the ability to more safely and efficiently extinguish confined space fires without having to be exposed to direct flames, smoke, and many hidden dangers. Thermal imaging cameras, another technology advance, can easily locate fires in walls, air ducts, ceilings, attics, basements, etc. that can then be quickly and effectively extinguished using a piercing nozzle tools before attempting forcible entry and overhaul operations. These tools, when utilized to extinguish fires and then used during overhaul operations, also tend to limit property damage.

Advantages

There are some real advantages in keeping fires confined in enclosed spaces and combating them using the indirect method of attack with a piercing nozzle. These benefits include: keeping the fire contained, eliminating the need for immediate forcible entry, restricting air flow that will feed and intensify the fire, and allowing steam expansion and lack of oxygen work to your advantage. Another advantage is that you achieve maximum effectiveness of extinguishing agents while minimizing the amount of agent required to extinguish these types of fires. Most importantly, this method of attack allows firefighters to operate from a safer position.

Car Fires

Probably the most frequent and one of the most difficult of these confined space fires to extinguish are in motor vehicles. These fires comprised 20.2% of the reported fires in 1999

and occurred at a rate of one (1) every 85 seconds. Engine compartment fires are by far the most common type of car fires and present the greatest challenge where safe access is almost impossible as the hood release cable is one of the first components to malfunction. Even if the release functioned properly, a firefighter could be seriously injured from exploding bumper shock absorbers, and collapsible hydraulic and gas struts. Exposure to a back draft while standing in front of a vehicle attempting to disengage the hood's safety latch is another potential hazard.

Even if the hood could be opened safely, there are many other hazards associated with engine compartment fires that must be considered such as: heavy smoke, toxic fumes, gases produced by burning materials and fluids, explosive devices like gas filled struts, air conditioner gases, etc. It is strongly recommended, when combating engine compartment fires, that the fire be attacked from the side of the vehicle and knocked down before attempting to open the hood. Some piercing nozzles allow firefighters to safely approach burning vehicles from the side and quickly penetrate the hood of the engine compartment, the roof, windshield and dashboard of the passenger compartment, or lid of the trunk compartment and discharge extinguishing agents directly into the enclosed space. It is amazing how much fire, and how fast, a 2-1/2 gallon water foam extinguisher can knock down or put out in an engine compartment if the hood remains closed. Similar results can also be accomplished with dry chemical and CO2 portable extinguishers.

Hoselines

The first arriving Engine Company at the scene of a compartmentalized fire, if equipped with a piercing nozzle, can begin immediate fire suppression operations with minimum manpower. Attacking confined space fires with a piercing nozzle connected to a Hoseline is the equivalent of installing an instantaneous sprinkler head. Discharging water based extinguishing agents directly into the enclosed space produces steam with a ratio of about 1500 hundred to one, thus suffocating the fire and, at the same time, cooling the enclosed area which can then be safely vented and accessed.

Summary

In summary, piercing nozzles, when used properly, can be the ultimate option for combating difficult hard to get to confined space fires. These tools can provide instant knockdown during the early stages of extinguishment while increasing the safety factor for the firefighter. Frank Palmisano has spent most of his 16-year Fire Services career in both Engine and Truck Companies as a firefighter and officer.