



Coffee Break Training - Fire Protection Series

Building Construction: Residential Garage Fires and Built-in Protection

No. FP-2013-47-1 November 19, 2013

Learning Objective: The student will be able to explain how residential garages can be equipped with built-in protection to control fire and life safety risks that are inherently part of a home or residence.

Fire services personnel respond every day to hundreds of fires involving residential occupancies, and most of these residences have either an attached or unattached garage. This training focuses on attached garages because of their imminent threat to the life safety of inhabitants, particularly when fire originates in this area. From 2009 to 2011, there were 6,600 garage fires in residential buildings resulting in 30 deaths, 400 injuries, and \$457 million dollars of property loss. Ninety-three percent of these occurred in one- and two-family dwellings. While most fires occur in December and January, there is a spike of occurrence in July as well. Additionally, like most residential fires, the time of day when most garage fires occur is between 4-9 p.m. Over 45 percent of these incidents see extension of fire beyond the garage area to the building or outside of the building. The leading causes are “electrical malfunction,” “unintentional careless action,” and “open flame,” in that order (U.S. Fire Administration, National Fire Incident Reporting System 5.0).

What is interesting when considering the threat of garage fires are the combustibles. Automobiles, boats, blowers and trimmers, lawn mowers, cans of paint and thinners, containers of gasoline and oil, and an entire myriad combustible products such as boxes and paper products stored on shelving or in crawl spaces above are likely to be present. With the advent of electrical charging capability for vehicles, yet another potential ignition source may be present. If ignition occurs, particularly in an area that is not lived in, the detection time may be protracted, allowing the fire to gain headway if not flashover before detection occurs. So, what should local fire officials recommend and advocate for the public in view of this threat?



The photo shows the installation of a single sprinkler head on the interior wall adjacent to the entry door from the garage to the home. (The head can be seen to the top right of the door.)

Aside from promoting good housekeeping practices within the garage area, the three components that most readily can be encouraged by fire services officials to homeowners are sprinklers, separation and early detection.

- National Fire Protection Association (NFPA) 13D (2013) states that piping in areas that cannot be maintained reliably above 40 F shall be protected by an antifreeze, dry-pipe, or pre-action system or a dry sidewall sprinkler extended from the pipe in heated areas. Therefore it may be possible that a single (sidewall) sprinkler head can be placed adjacent to the entry door to the home. (See photo.) Even in garages that may be subject to freezing temperatures, if properly installed, this single head on the interior wall should not freeze. (Note: Some communities with residential sprinkler ordinances may have stricter requirements for installation and coverage, and fire officials are encouraged to review NFPA 13D and locally applicable codes.)
- The wall separating the garage from the interior home should of course comply with a 30-minute fire-resistive separation code requirement (accomplished with a single layer of 5/8-inch Type X Gypsum wallboard on the garage side) and should extend through any above attic or crawl-space area. The door going into the home should be fire rated and tightly closing.
- In regard to early detection, since there are often exhaust fumes emitted from vehicles or lawn equipment present that may activate smoke detectors in a garage area when running, a rate of rise (heat) detector device should be installed. Ideally, this alarm will be installed and wired to notify both residents and a central monitoring location when activated. (According to NFPA 72, *National Fire Alarm and Signaling Code*, heat alarms or heat detectors are not required, but the homeowner is encouraged to use them in areas of the residence, including “integral or attached garages” (NFPA 72, A.29.8.4., 2013)).

For more information on sprinklers, go to http://www.usfa.fema.gov/citizens/home_fire_prev/sprinklers/.



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