

Home Heating Safety Tips

Each year in the US, thousands of fires occur in homes because of issues related to home heating. The best way to prevent hazards associated with home heating systems is routine maintenance by a qualified individual. Home heating systems should be inspected and serviced by a qualified individual each year before the start of the heating season. Most of the issues outlined in the following sections can be discovered and prevented by a routine service and maintenance program for your home's heating system. Typically, the provider of your home's heating fuel can provide a service inspection of your heating appliances. If you have concerns or questions relative to your home's heating system you can also contact your local building inspector or fire official.

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Space Heaters

Space heaters should be used sparingly, if at all in the home. Many fires occur each year because of space heaters being used inappropriately. Space heaters should be kept at least 3 feet away from combustible items such as curtains, bedding or clothing. Space heaters should NOT be left on while you are sleeping and should have an automatic shut off feature if the appliance is knocked over. Space heaters should be plugged directly into a grounded outlet. They should NOT be plugged into zip cords, extension cords or relocate-able power taps. Space heaters should be listed by a testing agency such as



Underwriters Laboratories (U.L.). Portable unvented kerosene or propane heaters should NOT be used inside homes due to the hazard of carbon monoxide.

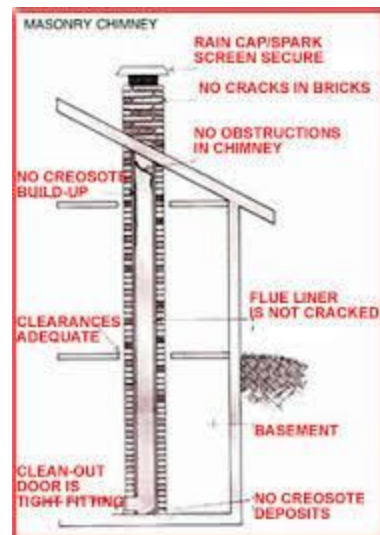
Smoke and Carbon Monoxide Alarms

Each level of your home, including the basement should have smoke and carbon monoxide alarms installed and they should be tested monthly by pushing the test button on the face of the detector. Ideally, the alarms should be powered by house electricity with a battery back up. The battery should be replaced at least once a year.

Wood Burning and Chimney Safety Tips

All wood stoves require specific minimum clearance distances from the bottom, top, sides, front and back of the stove to any nearby combustible materials. Insufficient clearance could cause heat produced from the stove to ignite nearby combustibles. Manufacturers of wood stoves typically provide installation literature regarding required setbacks that are important to follow.

NEVER, under any circumstances, should an unlined, single brick chimney be used for venting a wood stove. Single brick chimneys are prone to deterioration, which may allow a potentially dangerous situation to develop. Some older homes have unlined chimneys constructed of double brick. These may be used for a wood stove



after being carefully inspected by a professional for cracked mortar or loose or

missing brick. Metal sleeves that are listed by the Underwriters Laboratory (U.L.) may be used as chimney liners if they were designed for such use.

Chimneys require a minimum of a 2 inch clearance from combustible construction such as wood studs and joists. Residential chimneys should terminate at least 3 feet above the highest point of where it passes through a roof.

A wood burning stove should NEVER be connected to a flue which vents an oil burner. Unburned vapors from the oil burner could back up into the wood stove and the room where it is located creating a hazardous condition.

Venting the stove is the most important part of the wood-burning system. 90% of all wood stove-related fires originate within the venting system. A venting system is NOT a chimney-it consists of 24-gauge or heavier stove pipe which connects the stove to an approved chimney.

The vent must be as short as possible, with no more than 2 right angle elbows. The sections of stove pipe should be assembled with crimped, male ends of the sections facing down towards the stove. Stove pipe sections should be fastened with at least 3 sheet-metal screws or other fasteners. Seams must overlap and face up on inclined runs.

Stove pipe should NEVER be used as a chimney because the outdoor elements will cause it to rust. Where possible, the stove pipe should go directly into a lined masonry chimney. Stove pipe clearance is extremely important. If a stovepipe must pass through a wall or ceiling to reach the chimney, maintain an 18-inch minimum clearance to all combustibles or use metal thimbles designed for this purpose. If you have questions regarding the wood stove installation consult with your local building inspector or fire official.

Wood Stove Operation and Maintenance

Wood burning stoves require proper operation and regular maintenance. Ensure that you use the proper DRY seasoned hardwoods, such as maple, beech, ash, hickory or oak which are the best fuels for a wood stove.

At least once a year, use a wire brush to clean your stovepipe and chimney. NEVER use items such as chains, bricks, or hard brush on the end of a rope, because they could damage the interior chimney liner.

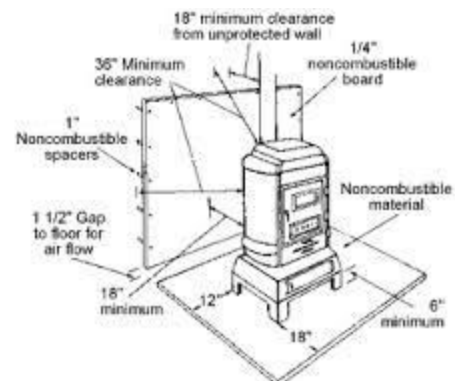


Figure 1. Minimum clearances from combustible walls and ceilings

Creosote is a highly combustible fuel that burns intensely. A slow burning fire such as those found in a modern, airtight stove dampered way down, produces a flue temperature in the 100-200 degree F range. These relatively low temperatures do not sufficiently carry all of the unburned, combustible gases up into the atmosphere. Instead they condense along the walls of the stovepipe and the

chimney as creosote. The appearance of creosote is typically either a sticky dark liquid, flaky black deposits or a hard glazed tar. In sufficient quantity, this creosote can ignite causing a fire in your chimney or stovepipe. NEVER use a wood stove or fireplace to burn household trash or plastic items.

What to Do In The Event of a Gas Leak

If you smell an odor of gas (cabbage-rotten egg smell) in your home, camper or RV, you should IMMEDIATELY follow these suggestions:



- Extinguish all open flames or other sources of ignition, including smoking materials and vacate the building, vehicle or area
- DO NOT stay in your home, vehicle or RV to open windows or doors
- Move away without using any electrical switches, appliances, thermostats, computers or telephones
- Once outside, and if able to, close the gas shut-off valve on the propane tank
- Call 911 once outside from either a cell phone or a neighbors house
- Even if you no longer smell gas, never reenter the home or area until the air has been checked by the fire department or gas company
- If a leak is found, make sure it is repaired by a properly trained, licensed gas service technician
- Return to the building, camper, RV, or vehicle ONLY when the service technician or emergency responders indicate it is safe to do so

Sidewall Direct Venting Systems

Care should be taken when selecting a sidewall termination point for a direct vent gas appliance. Typically, a gas appliance vent should NOT be located within 12" of a window or door opening. The vent should also NOT be located under porches, patios, decks, roof eaves or near air conditioned equipment. Particular attention should also be taken when terminating the vent on the eaves side of the home. Manufacturers



Manufacturers recommend raising the vent at least 1 foot above the anticipated snow depth for your area, which typically raises the vent to approximately 36 inches off the ground

in Northern New England. Failure to avoid these installation mistakes could result in blockage of the venting system, leading to deadly levels of carbon monoxide entering into your home.

Cracks or Holes in Heat Exchangers in Gas Furnace

Failed heat exchangers in furnaces can lead to unsafe conditions in the home. Signs of a failing heat exchanger can include: short start up and shut-off of furnaces; high humidity levels noted in the home and around furnace; burner flames may waver and fluctuate in size and scorch marks may be seen on the sides of the furnace.

Holes in the heat exchanger can develop as a result of rust caused by condensation. The heat exchanger can also be damaged by improper burner alignment, poor airflow to the furnace, metal fatigue and over-firing of furnace.



The main hazard of a faulty heat exchanger is the possible release of carbon monoxide into the home.

Delayed Ignition of Gas Furnace

A delayed ignition of a gas furnace is usually caused by a problem with the crossover igniter system. Signs of a delayed ignition problem include: noisy ignition; flame rollout; and repeated pilot blow outs.

The igniters for the furnace can become clogged or misaligned. This can lead to a potential flashback or explosion, as gas can be dumped into the burner chamber without being ignited immediately.



Delayed Ignition of Oil Burner

A common issue seen with oil burner appliances is a delayed ignition of the burner. Most often this occurrence is minor, however the potential for a significant problem is there.

Signs of a possible delayed ignition problem with your furnace include: heavy soot production; thick dark-grayish smoke from the chimney and black flame tips in the burner.



A delayed ignition, puff back, or as they are also sometimes called, blow backs, can occur in a heating system when unburned atomized fuel oil is ignited at the start of the burner cycle resulting in an explosion. The explosion itself can vary in size and effect. It can be as minor as a small thud sound followed by a puff of dark smoke-(this is the most common), or It could also be more intense resulting in the dislodging of the vent pipe causing the basement to fill with smoke and carbon monoxide. In some cases the delayed ignition can cause the fire box of the heating appliance to blow open sending fire across the room, which is another reason why it's important to keep combustibles at least 3 feet away from heating appliances.

Possible causes of a delayed ignition are: partially clogged oil filter; poor burner adjustment; dirty fan inlets and worn or damaged burner nozzles.

Barometric Dampers

Barometric dampers are devices used to regulate the draft on oil-fired heating equipment such as furnaces, boilers, or water heaters. The barometric damper or draft regulating device we are discussing here is normally used only on oil-fired heating equipment, not on gas-fired equipment.

On oil fired equipment the barometric damper, or draft regulator is typically a round Tee inserted in the flue vent connector between the heating appliance and the chimney. The face of the tee contains a round "door" with an adjustable weight.

If the barometric damper is stuck open or closed, it can create a potentially hazardous condition in the home. Too much draft can also increase chimney temperatures to an unsafe level. Too little draft can result in incomplete combustion, soot-clogging of heating equipment (dangerous), and more dangerous heating appliance malfunctions such as oil burner puff backs and in some cases dangerous production of carbon monoxide gas that leaks into the building (a potentially fatal problem).

Possible causes of damper problems are: improper mounting (out of level) on the flue pipe; counter weight of the barometric damper has been misadjusted; damper is shared by two different heating units. Signs of trouble are typically seen with water leakage onto the exhaust flue and damper along with noticeable poor energy efficiency of the appliance.



Leaking Oil Tank

Oil tanks have a typical life cycle of 15-20 years. After 15 years, tanks should be regularly inspected by a qualified individual to ensure its integrity. Tank failures can lead to a fire hazard and a significant environmental cleanup cost. Most



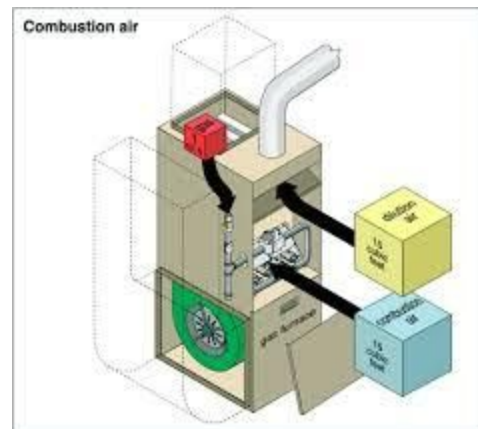
oil tanks used in homes today have a capacity of 275 gallons. Needless to say, a leak of this much fuel oil can ruin a home.

Tank leaks are most often caused by rust. Water that enters the tanks, usually from condensation, settles to the bottom of the tank because the water is heavier than the heating oil. Water can also enter the oil tank if the cap for the fill pipe is missing or damaged. The water in the tank reacts with the sulfur content of the oil causing a weak sulfuric acid. This sulfuric acid then causes rust in the tank.

Signs that your tank is in need of replacement include the following: strong persistent smell of oil in the home; staining on bottom side of tank; staining around fill pipe at top of tank; heavy staining to fuel filter on base of tanks; dark staining of floor under tank and the need for increased fuel deliveries.

Appliance Combustion Air

Most furnaces require adequate combustion and dilution air for efficient, safe operation of the heating unit. Problems can occur if a furnace is installed in a small enclosure, such as a closet and the area is restricted in air movement. Sometimes this problem can happen after a home has gone through remodeling and had energy efficiency upgrades to windows and doors and the home becomes too tight for adequate air movement. Another possible cause of inadequate combustion air is when the home has too many pieces of equipment exhausting air, such as kitchen and bathroom exhaust fans, water heaters, fire places and clothes dryers.



A common sign of poor make up air around an appliance is rusting around venting connections such as a draft hood, which is cause by back drafting.

The problem of inadequate make up air for combustion could result in deadly levels of carbon monoxide entering the home.

Drip Leg on Gas Piping

The drip leg is intended to catch foreign material in gas piping before it gets into gas valves, burner, etc. of gas appliances.

Typically, at least the first appliance downstream of the gas meter must have one. You can look for the drip leg at the bottom of the vertical gas pipe going into the appliance.



If there is not a drip leg installed, or if it has been damaged or obstructed, it is possible that it could lead to foreign material entering the appliance creating a blockage in the pilot creating a hazard.

Support of Gas Piping and Gas Check Tests

Inadequate support of gas pipe and tubing can create stress on the system which could cause fractures of the piping material allowing gas to leak inside the home, possibly leading to an explosion or fire. The support of the piping should not be so firm that it doesn't allow for some movement of the piping system.

Typically, piping support should be done in the following manner:

- ½ inch diameter or less the pipe should be supported horizontally at least every 6 feet
- ¾ inch diameter pipe should be supported horizontally at least every 8 feet
- 1 ¼ inch or greater diameter pipe should be supported horizontally at least every 10 feet

Vertical support of piping should be done at each floor at 6 feet spacing.

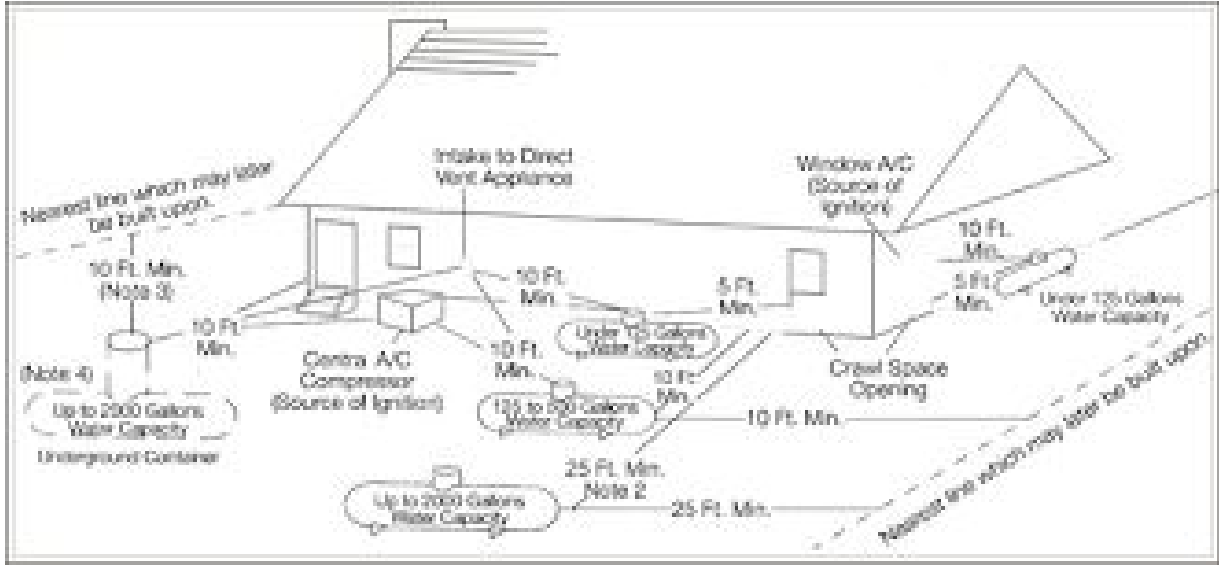
A pressure test should be done on all new gas piping installations. A leak test is also required whenever a new gas appliance is installed or re-activation of the gas service occurs following an interruption of service. Both tests should be performed by a qualified gas technician/gas fitter.

Burying of Gas Lines

Depending on location, trench depth for burying gas lines for the home can vary between 12 and 18 inches. If plastic tubing such as polyethylene is used, a tracer wire and foil tape should be installed in the trench for identification purposes. The trench should also be free of rocks or other sharp objects and be back filled with fine sand. Cement should NEVER be poured directly onto gas piping in a trench. Metallic piping should not be buried without protection from corrosion.



Propane Set Backs



Home owners who use propane must be aware of setback requirements for tank installations and associated equipment. Most homes use either a 120 gallon capacity container or 500 gallon tank. 120 gallon containers can be installed up against the home (NEVER inside), while 500 gallon tanks must be at least 10 feet away from the home and abutting property lines which can be built upon. Above ground tanks greater than 500 gallons must observe 25 foot setbacks. Portable tanks should NEVER be used to fuel heating appliances in your home due to the explosion hazard. Tank regulator and relief valves should also be positioned away from openings into the home, such as fresh air intakes (10 ft) as well as possible ignition sources, such as compressors for AC units (10 ft). The tanks should also be located so that they are protected from falling snow or ice coming off the roof of your home or from falling tree limbs. If an underground tank is used, a dome cover/protector should be installed on top of the tank valves for protection and ease of filling. The top of the dome cover should be raised and never flush with the surrounding ground, this prevents water and ice from entering the dome cover which could lead to problems with valves. And remember to maintain an accessible path to your tank during the winter months for your fuel delivery driver.

CSST Gas Piping

Corrugated stainless steel tubing is a flexible stainless steel pipe system that can be used to supply propane to appliances in your home. Coated with a yellow or sometimes black plastic covering, CSST is usually routed beneath, through or alongside floor joists, wall cavities or along the top of ceiling joists in attic spaces. Like all gas piping systems, CSST must be properly installed by a qualified professional.



It is vitally important that the CSST piping system be properly bonded and grounded. Care should be taken when installing CSST to maintain as much separation as reasonably possible from other electrically conductive systems in the home. A bonding device should be installed on the gas system in order to prevent a possible electric shock to people who come in contact with gas piping and other metal objects connected to the grounding system. Lightning strikes have also been known to damage CSST systems in homes where the system was not properly bonded and grounded. In those instances, the lightning caused small holes in the thin CSST causing gas leaks which contributed to fires. CSST run in walls or ceiling cavities should also have strike protection installed to protect the thin wall of the tubing from being pierced by a nail or screw.

For more tips on home heating safety you may also want to check the following web sites:

1. www.NFPA.org
2. www.nh.gov/safety/divisions/firesafety
3. www.usfa.fema.gov