



Helpful Questions to Ask on No Heat Calls

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2015 Minnesota State Energy Conference

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Weatherization Field Monitors

Energy Related Repair (ERR) Program

- Provides emergency repair or replacement of heating systems for Energy Assistance clients
- Runs October 1 – May 31
- To qualify:
 - Must be approved for Energy Assistance
 - Own home
 - Have a non-functioning heating system

Different from LIHEAP & WAP

- Low Income Home Energy Assistance Program (LIHEAP)
 - Helps homeowners and renters with payment of home heating costs
 - Grant is based on household size, income, fuel type and energy usage
 - Federally funded
- Weatherization Assistance Program (WAP)
 - Helps income-qualified households permanently reduce their energy bills by making homes more energy efficient
 - Services include: Energy audits, insulation, sealing, replacing mechanical systems, occupant education
 - Federally funded

Happy Customers



Easy Questions First

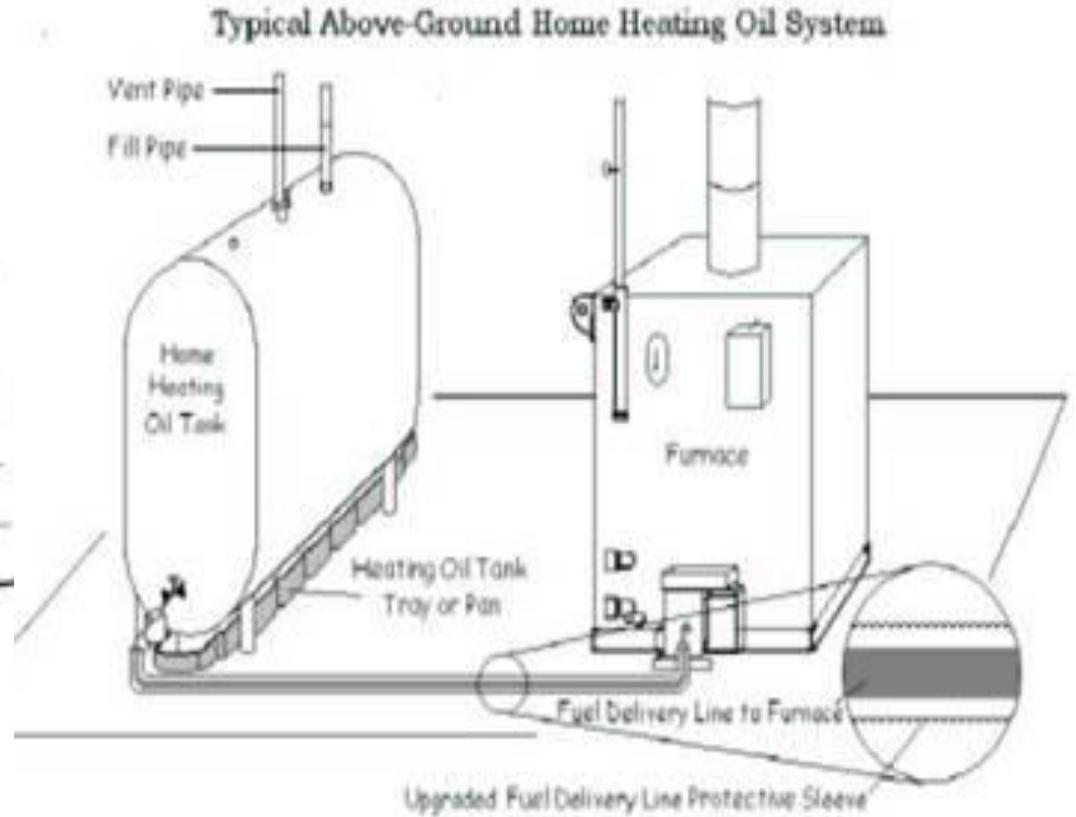
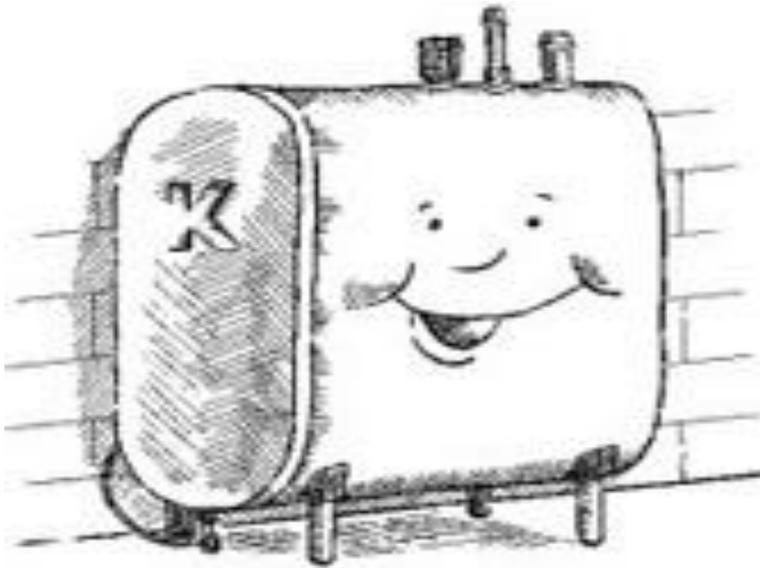
- Is the gas or fuel oil turned on?
 - ON/Off valve closed

- Is there ice or snow covering the chimney exhaust or intake?

Ask if there is fuel in the tank.



One & Two Pipe

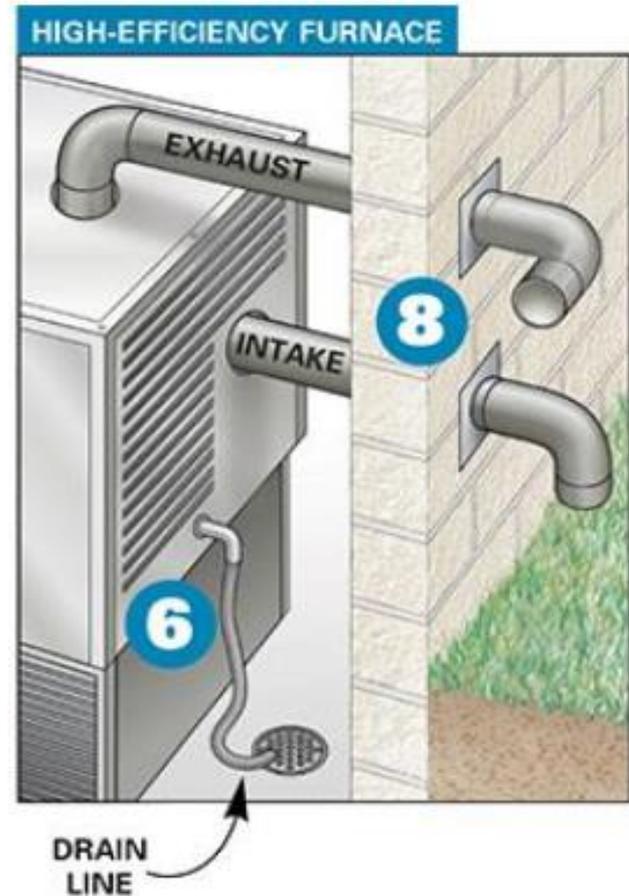


Snow can cover the exhaust PVC

Exterior vents



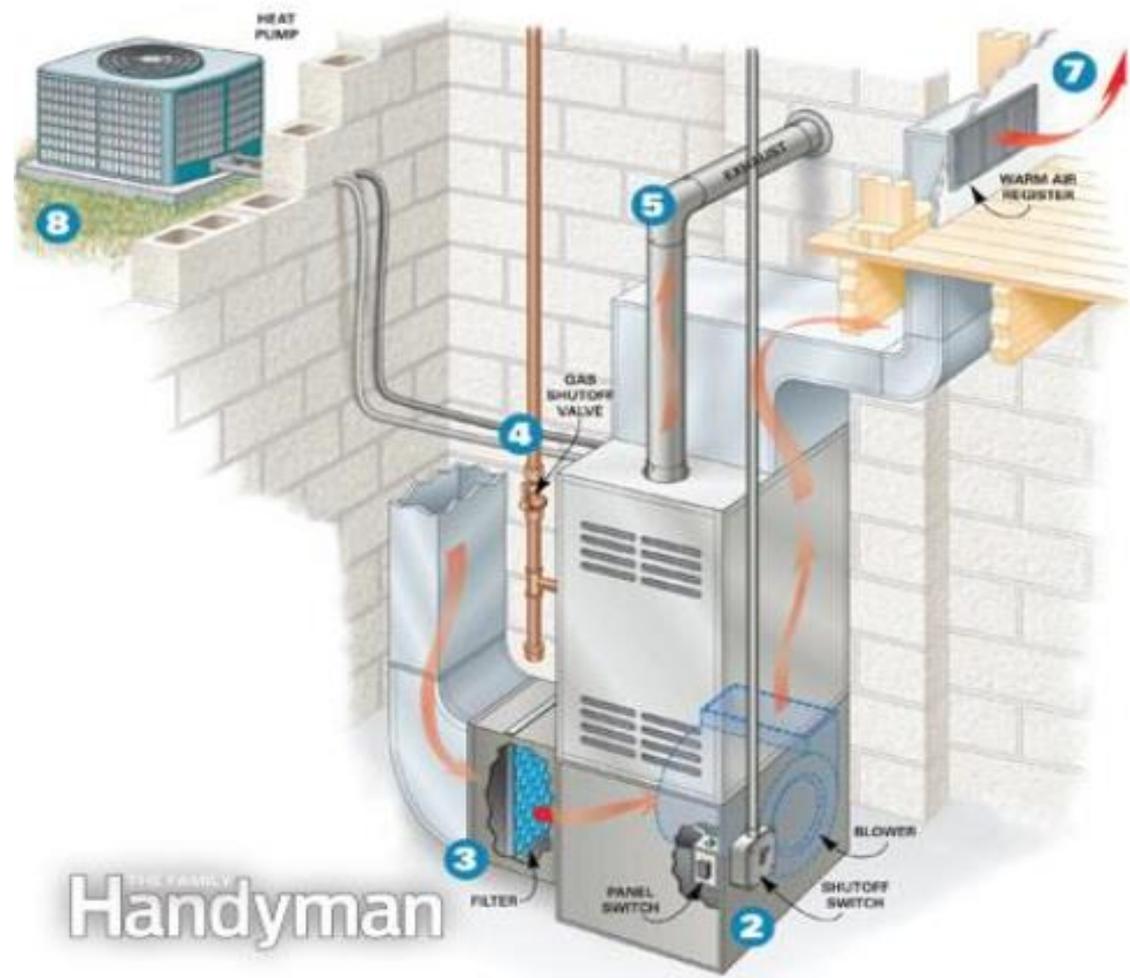
Source: Star Tribune 12/12/2010



Frost & Snow Build up



Basic HVAC System



THE FAMILY
Handyman

Thermostat Check

1. Is the system selector switch in the "HEAT" and "ON" position?
2. If your thermostat is electronic, are the batteries working? Is the display showing?
3. Listen to the furnace fan. If you cannot hear the fan, check if any air is coming out of the ducts. If the fan is not running, there may be no power to the furnace.

Thermostat



New and Old Set Back Types



MH Type



Next

- If the thermostat is set properly, next step is to check to see that there is power to the furnace.
- **ELECTRICAL CHECK – Furnace Switch**

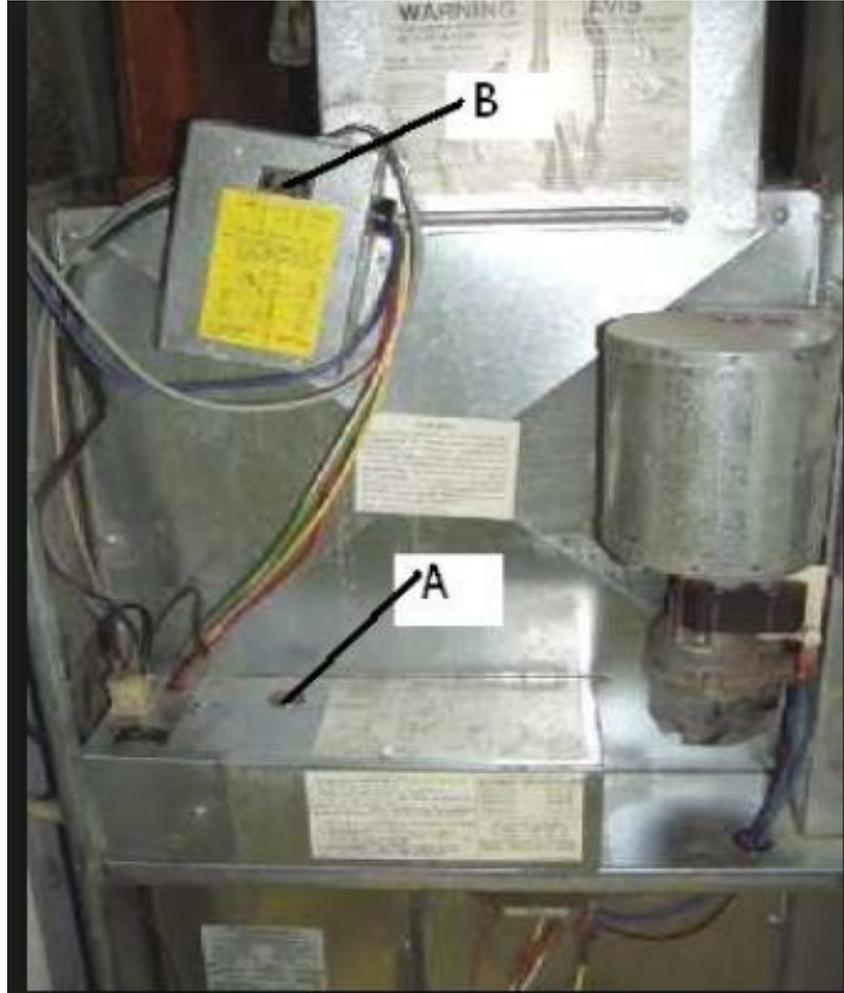
Emergency Switch

- Emergency shut-off switch for the furnace. Locate it and make sure it is turned on. In most homes the emergency shut-off switch looks just like a regular light switch and will be located on the side or close to the furnace.

In Mobile Homes

- In mobile homes the switch is behind the removable cover and in front of the blower motor.

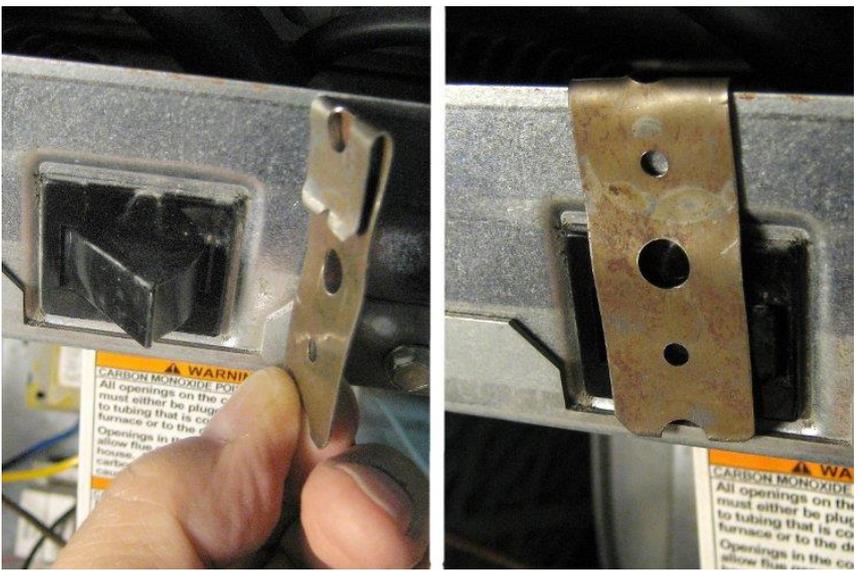
MH Switches



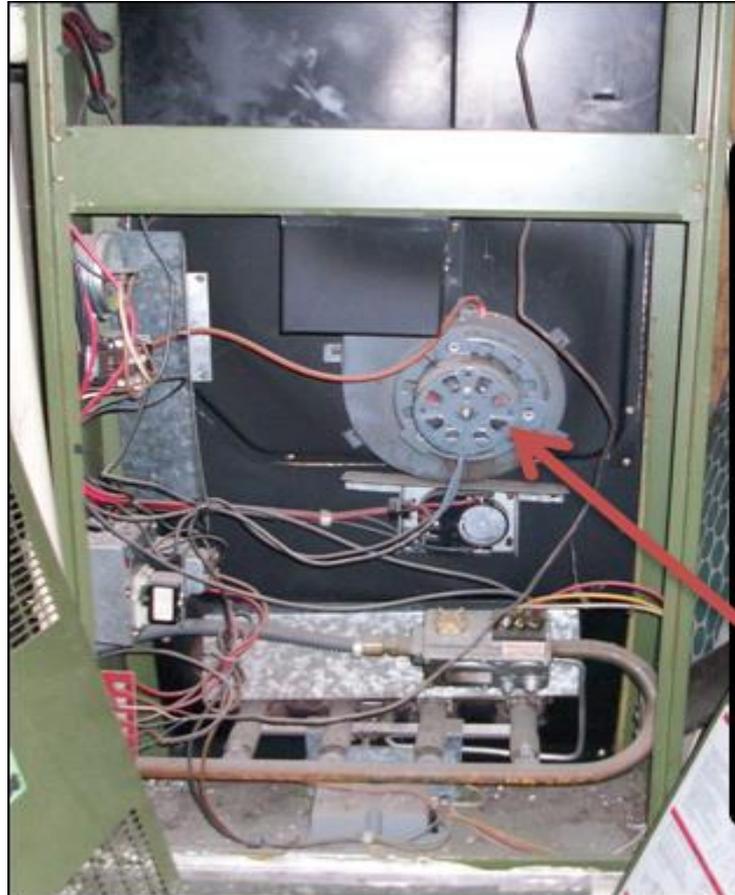
Emergency Cabinet Switch

- Some heating systems also have emergency cut-out switches that are activated when a door or service panel is removed.
- Check to make sure all access doors are properly secured and fitted.

Cabinet Switches are Behind a Cover

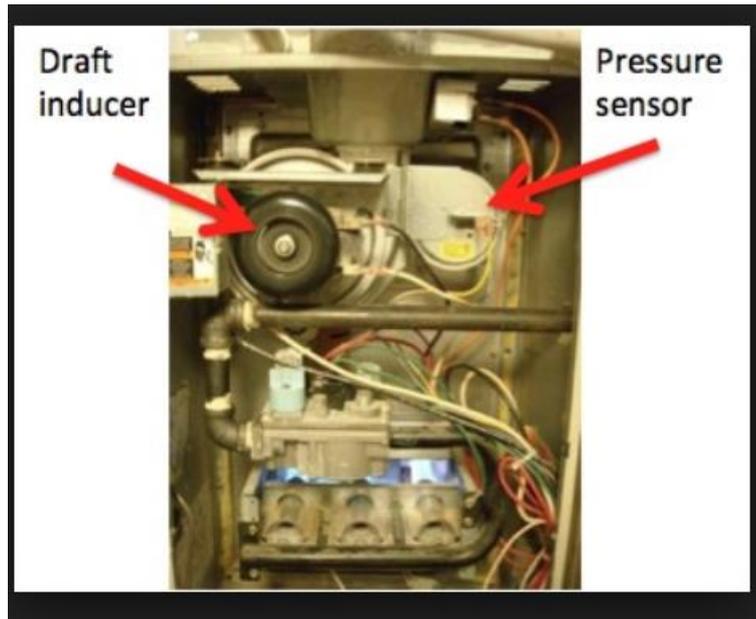


Inducer Motor

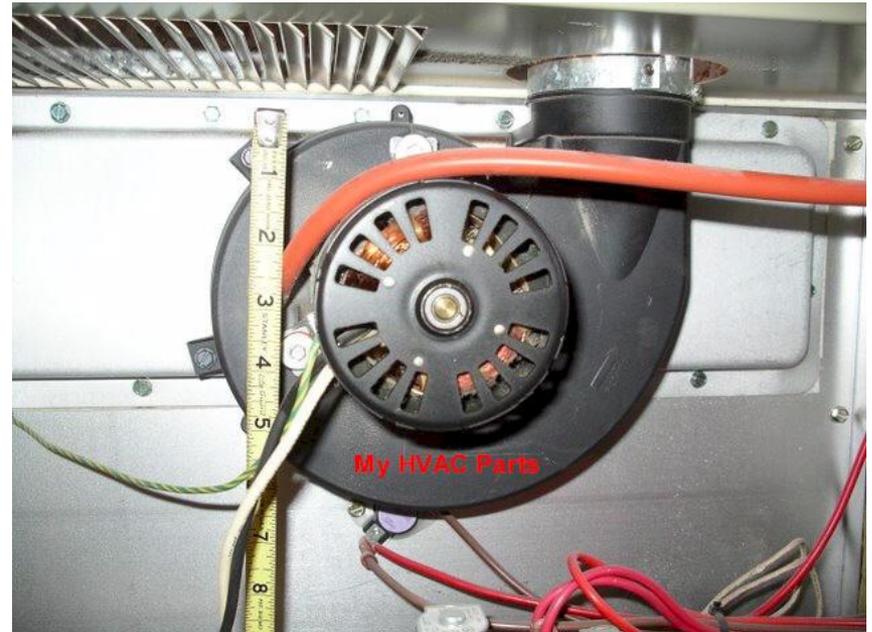


Draft Problems

Inducer and Sensor



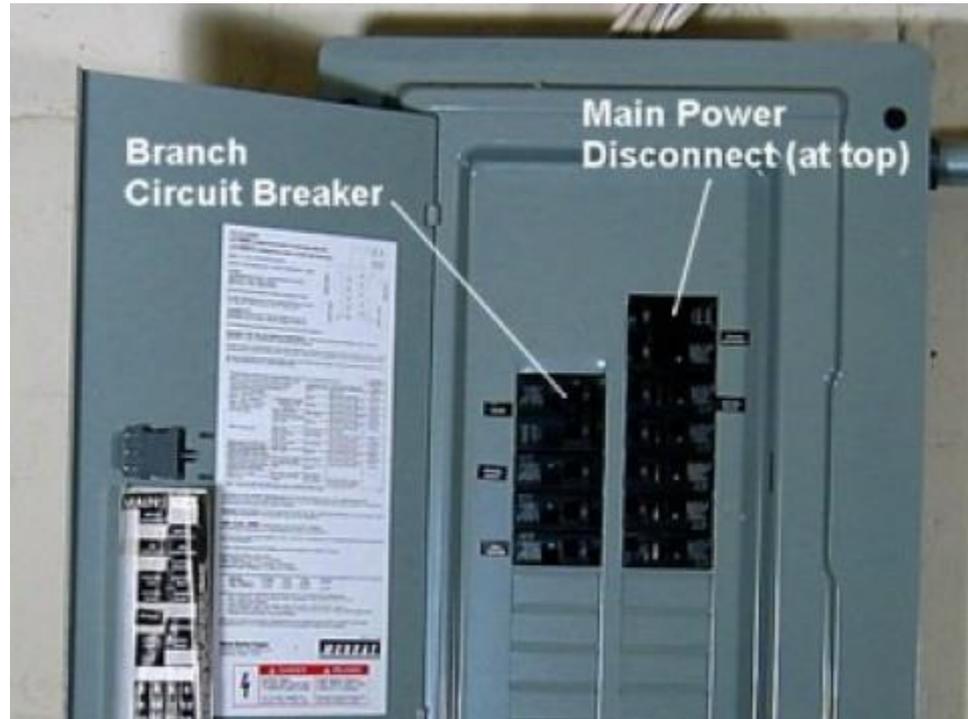
Inducer



What to Check Next

- It is quite common for this switch to be turned off accidentally.
- If the switch is ON, but the fan still doesn't operate, proceed to the **ELECTRICAL PANEL CHECK.**

Circuit Breakers



Fuses



Fuse Types

EDISON-BASE FUSE



TYPE S FUSE AND ADAPTER

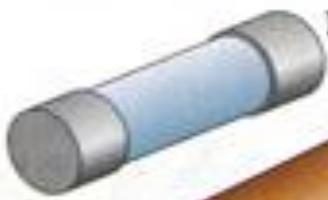


Good Fuse



Blown Fuse

CARTRIDGE FUSES



Ferrule

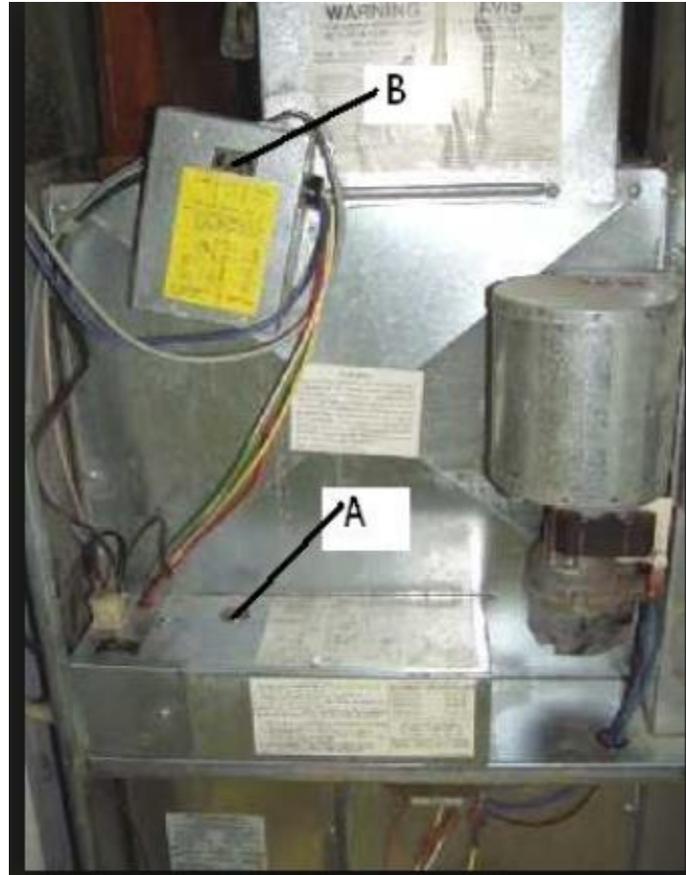


Knife-Blade



SINGLE-POLE CIRCUIT BREAKER

Switches on Mobile Home Furnace



90%+ MH Furnace



Mobile Home Furnace Gas 80%



Bad Chimney

Bad chimney no liner



High smoke from burner



Chimney Problems

Wall hanging chimney



Cracked



Problems

Animals



Iced up



Chimney



Types

B vent



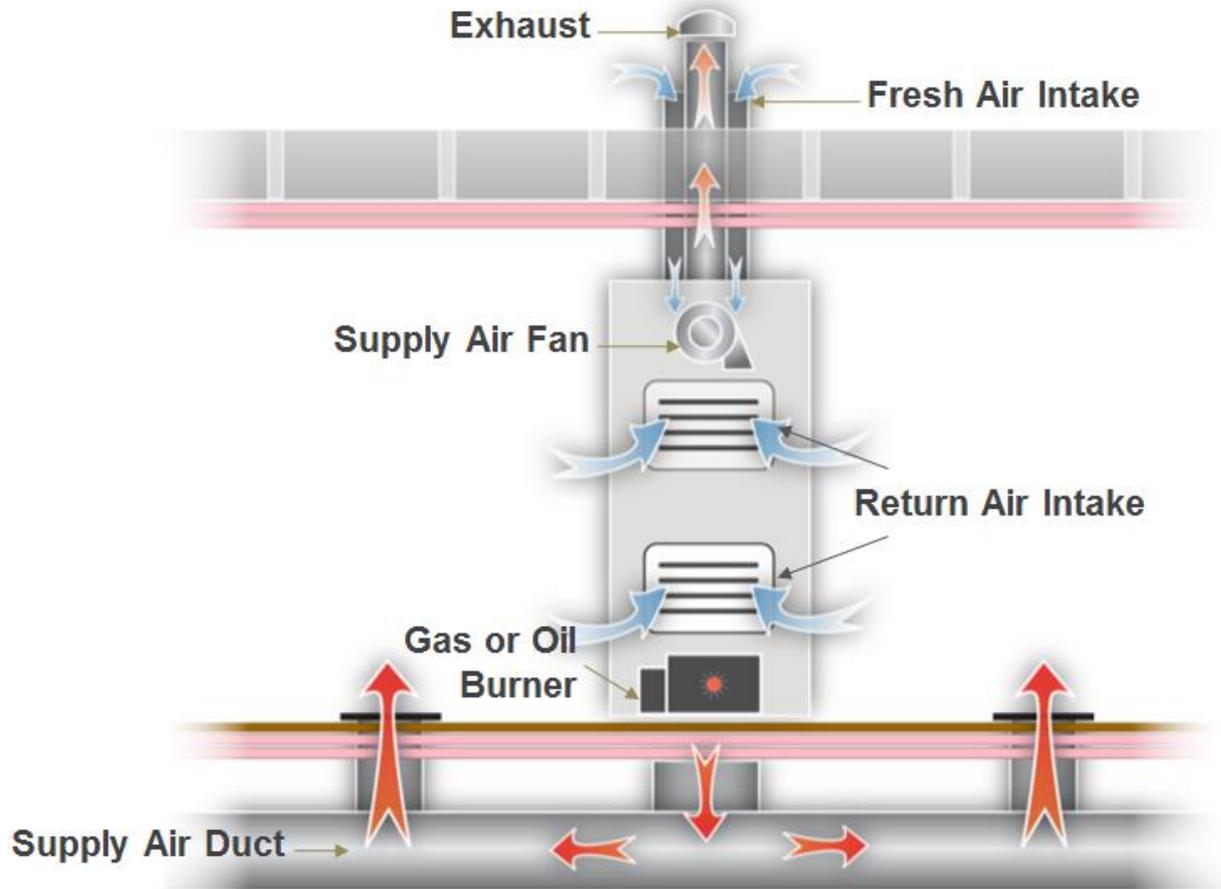
MH



Mobile Home Chimney

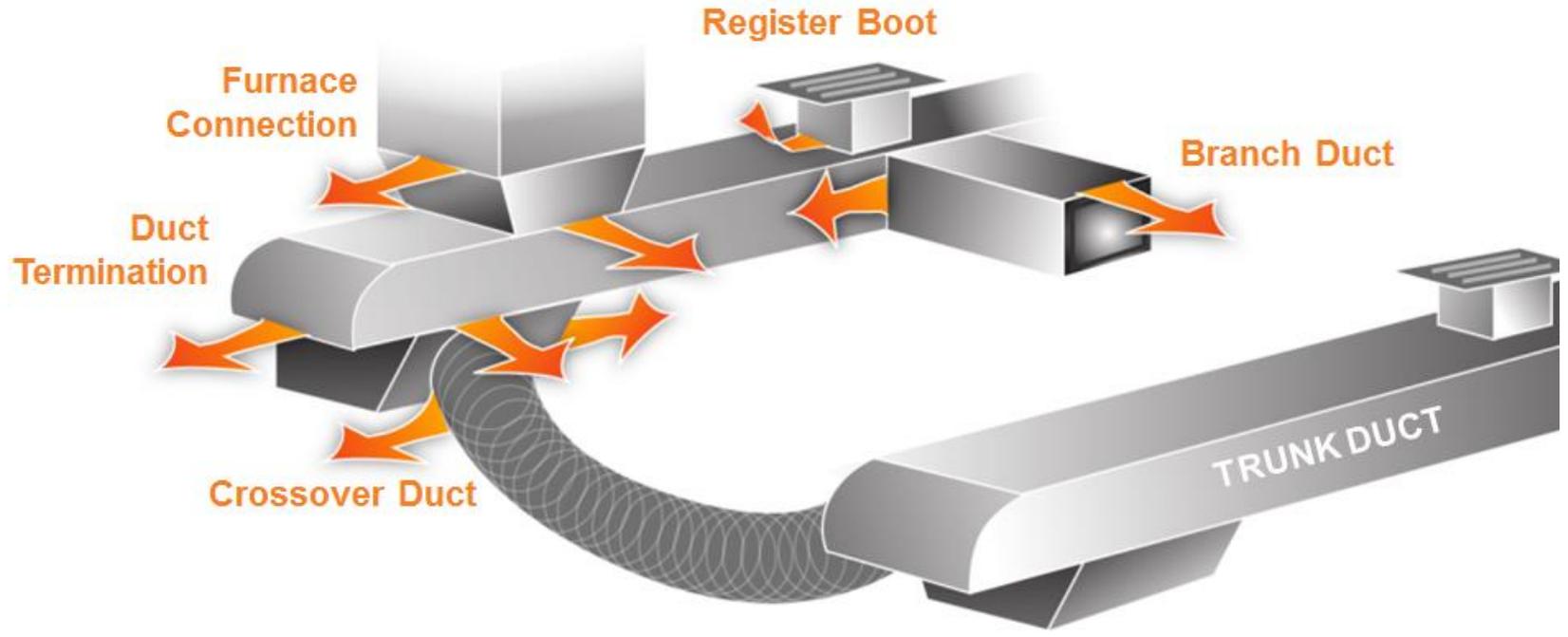


Entire Mobile Home System

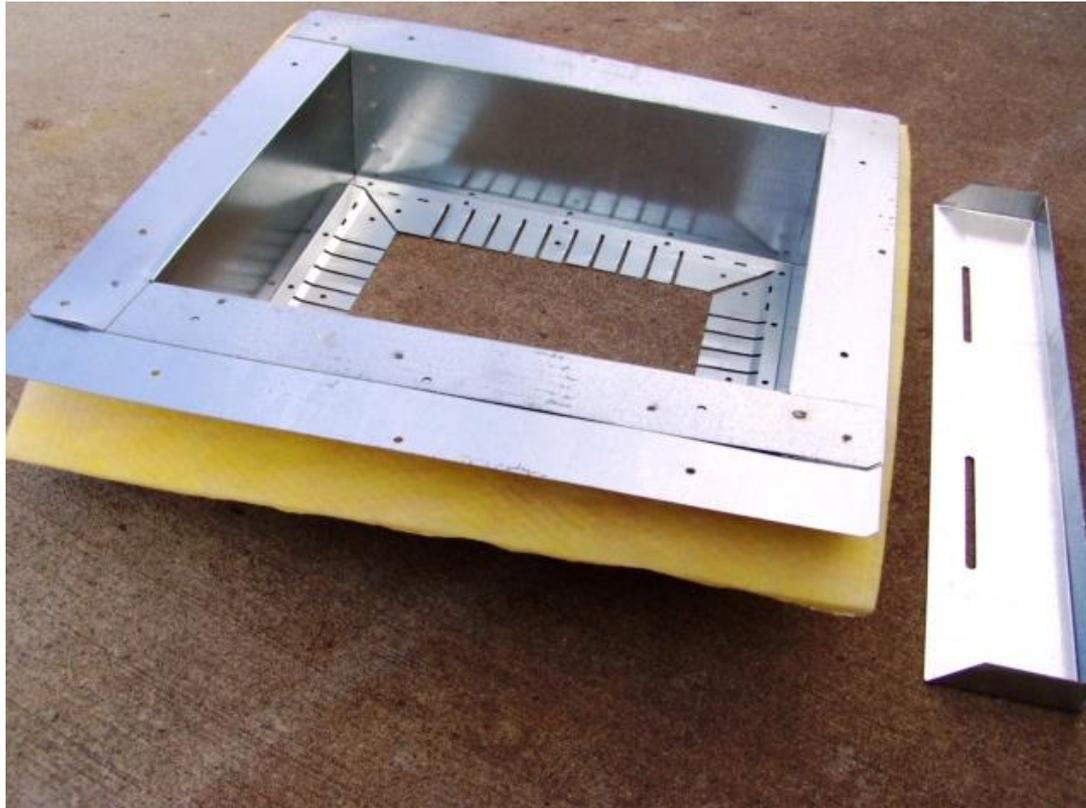


Double Wide MH Ducts

Typical Air Leakage Locations



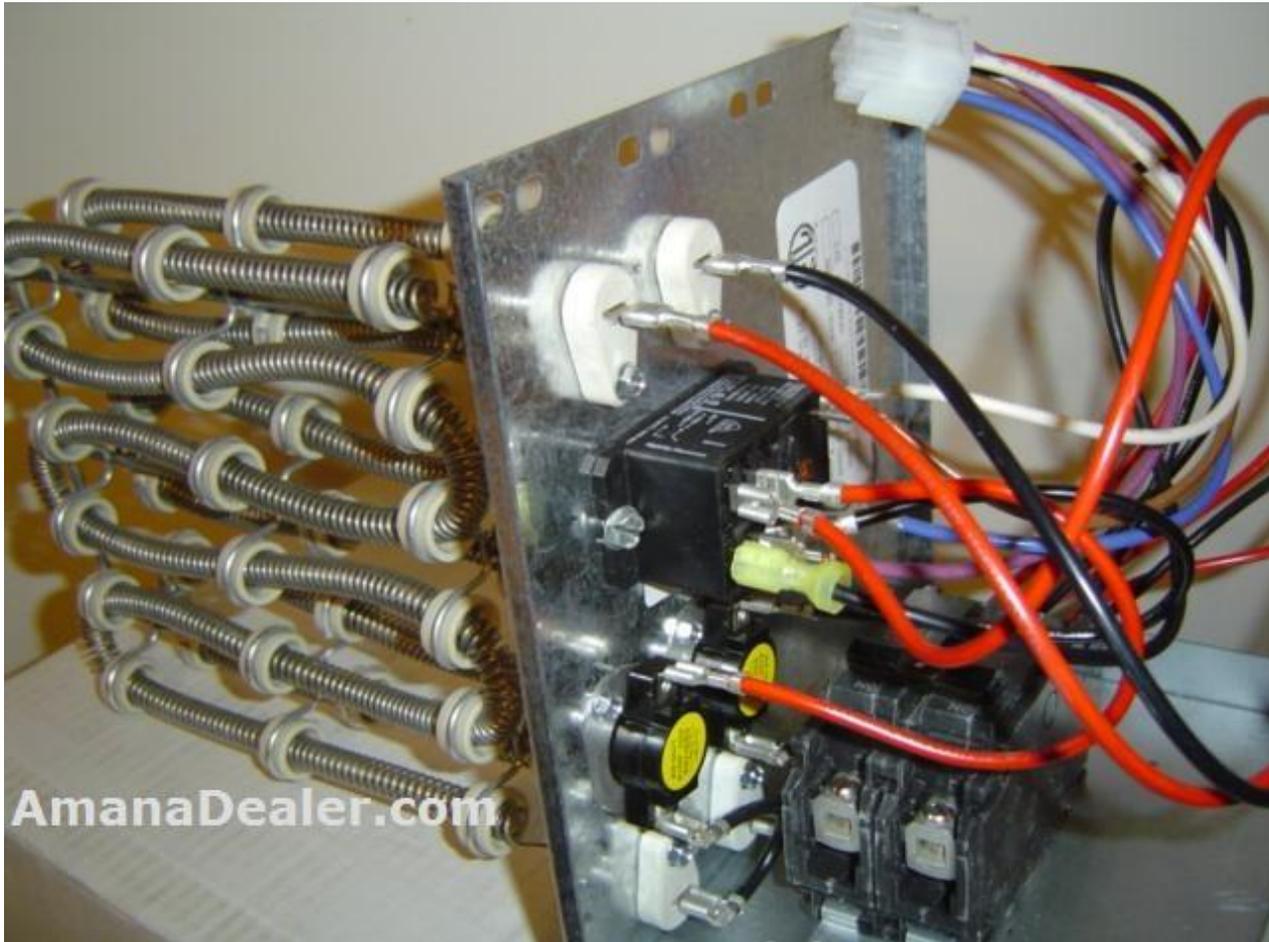
Needs to be Included on an Installation



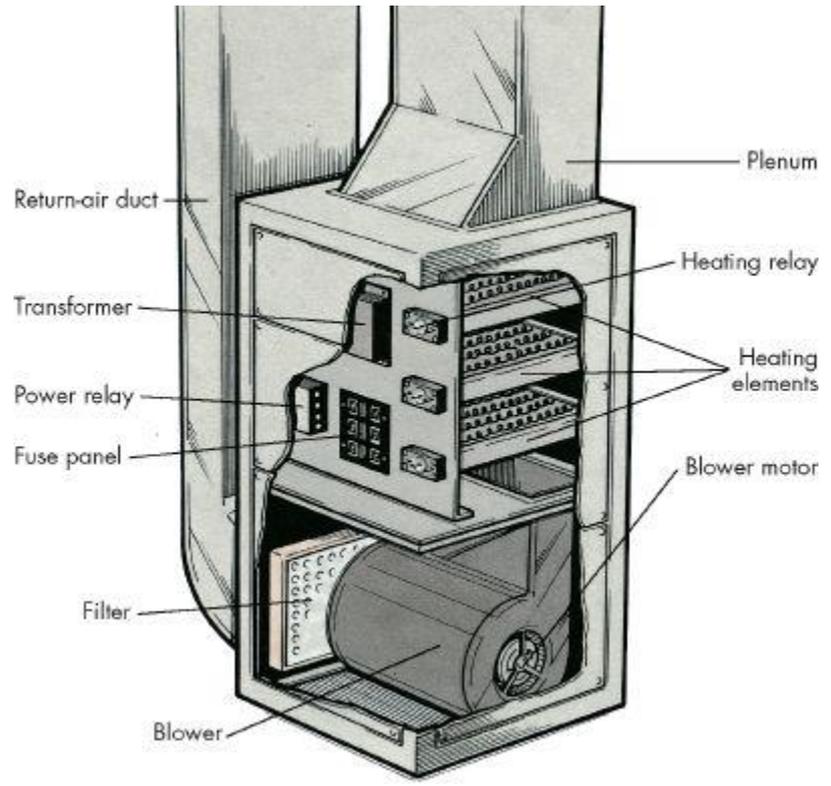
MH Duct in Factory



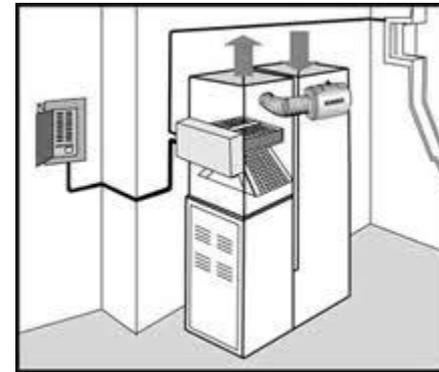
Electric Furnace Element



Electric Furnace Diagram



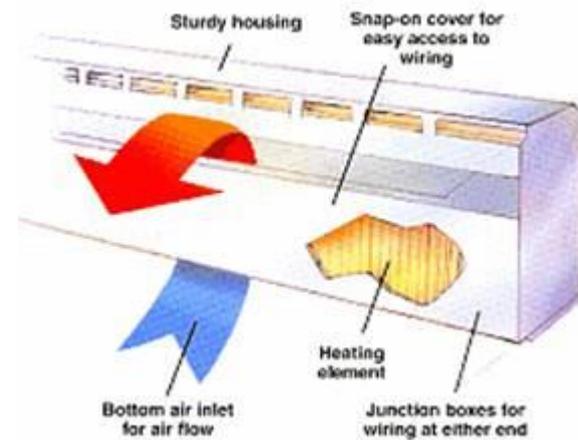
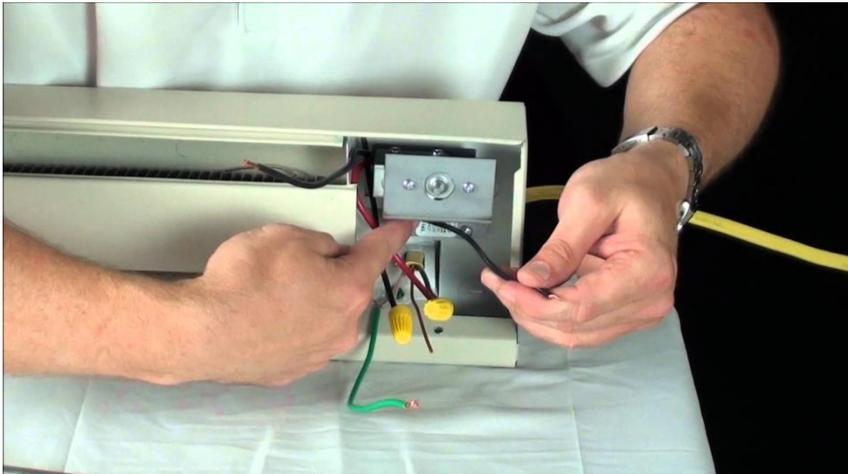
Plenum Electric Heater



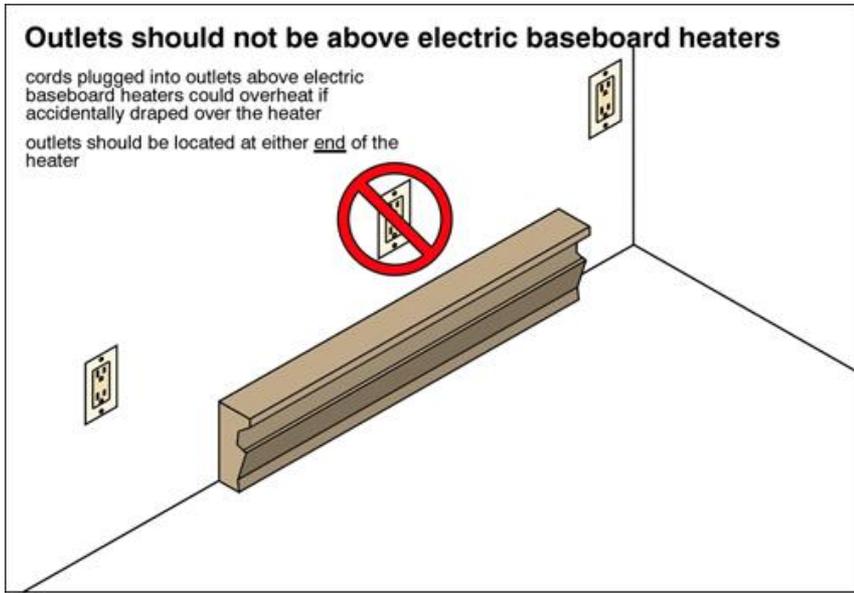
Electric Baseboard Thermostats



Electric Baseboard



Clearance and Safety



Radiator Key



Radiators



Boilers



Boilers



Gas Valves



Check Breakers or Fuses

- Locate the breaker or fuses in your home's main electrical panel for the furnace.
- Make sure the breakers are not tripped and the fuses are not blown.
- If a breaker has been tripped it will be in a position that is between ON and OFF. Reset the breaker (turn all the way OFF, then back ON).
- If the fuse is blown, replace it with the **SAME SIZE AND TYPE** of fuse.

Breaker Continued

- **WARNING:** If a breaker keeps tripping or a fuse keeps blowing, you should contact a qualified service technician to inspect your system to determine why you are having problems

Ignition Check

- If your heating system seems to be operating, but is not producing any heat, the furnace may not actually be firing.

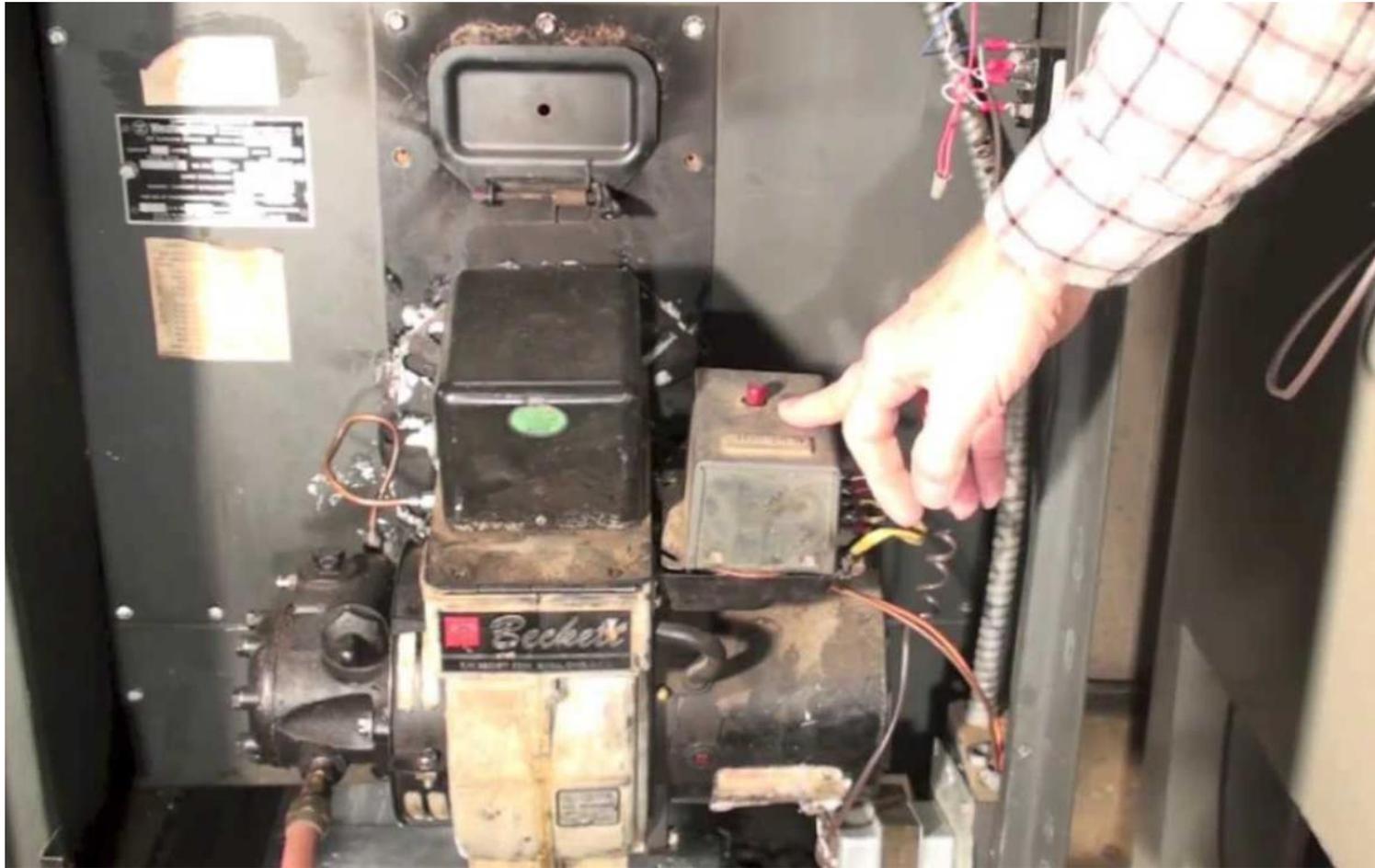
If this is the case, check the following:

- Do you have fuel? If your unit is oil or propane fired, check the level of fuel in the tanks.
- If you ran out of fuel and got more fuel, and now your furnace will not start, your furnace may have to be reset.

Resetting Some Systems

- Some systems have a red reset button on the burner. These systems can be reset with this button.
- Other systems can be reset by turning system power off then back on.
- If the furnace is oil-fired, the fuel pump may need to be primed.
- After a fill of fuel let the system's oil tank settle.

Reset Button Oil



Oil Burner Keeps Tripping the Reset Button

- If your oil burner stops running, the first thing you should check is the reset button.
- If you press it and the burner fires up, then that was the problem.
- If the button trips again, then there is a definite problem.
- Do not keep resetting the button and ignoring the problem. **Fuel is sent in the fire pot every time.**

Puff Backs



Pedestal Type Burner

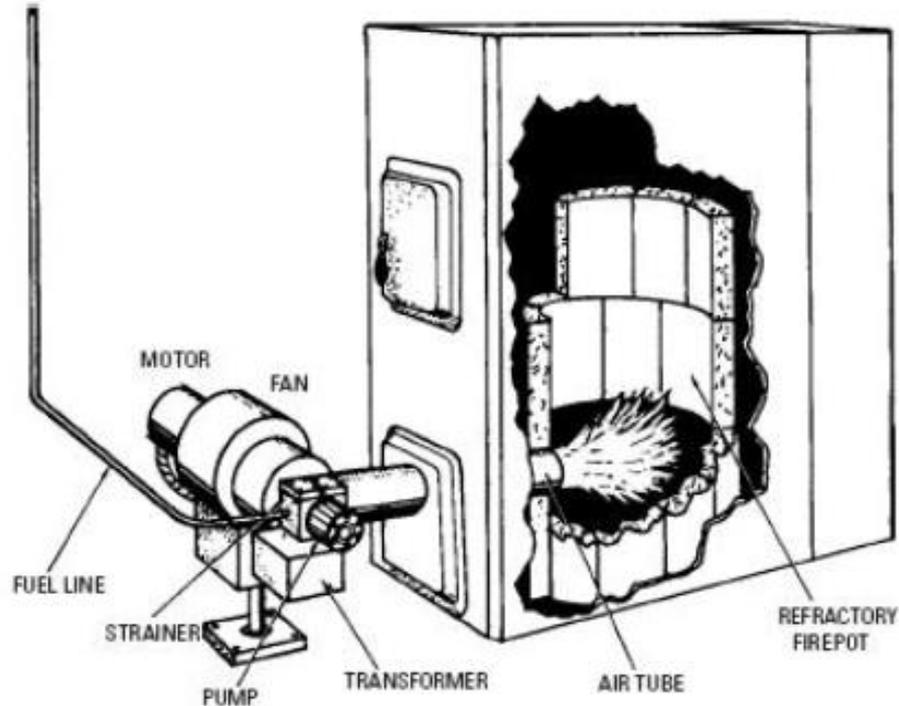
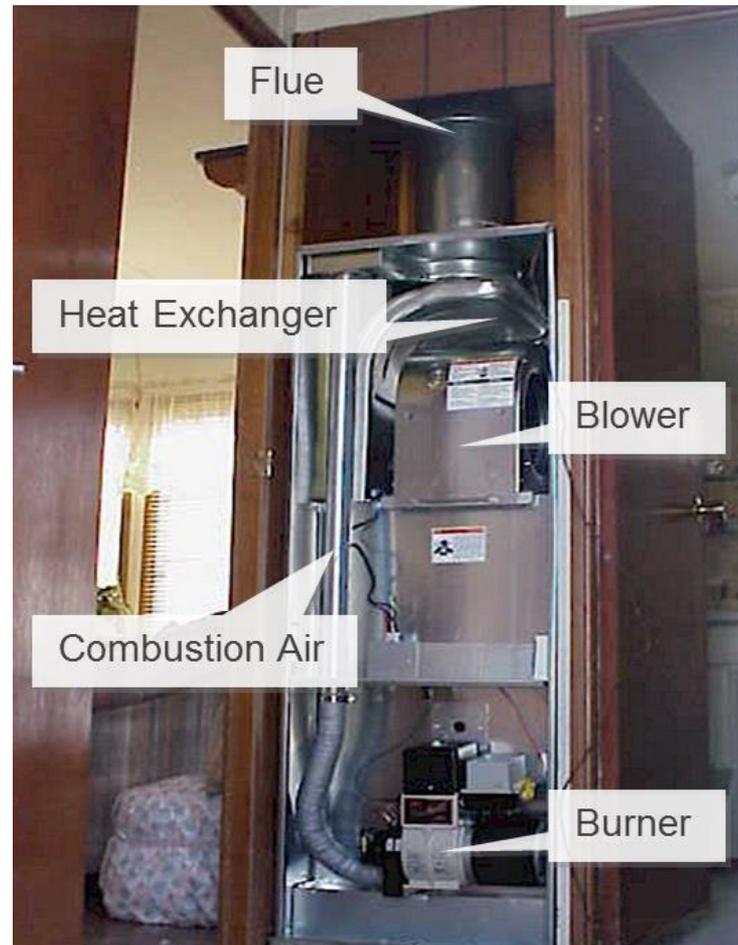


Figure I-3 Gun-type oil burner firing into furnace combustion chamber. (Courtesy U.S. Department of Agriculture)

MH Oil Furnace



What the Red Button Does

- It is a safety device.
- It shuts the burner down when it thinks there is a problem.
- It is on the primary control and is hooked up to a cad cell -- a light sensor (Like an outside light that turns off and on at dusk/dawn).

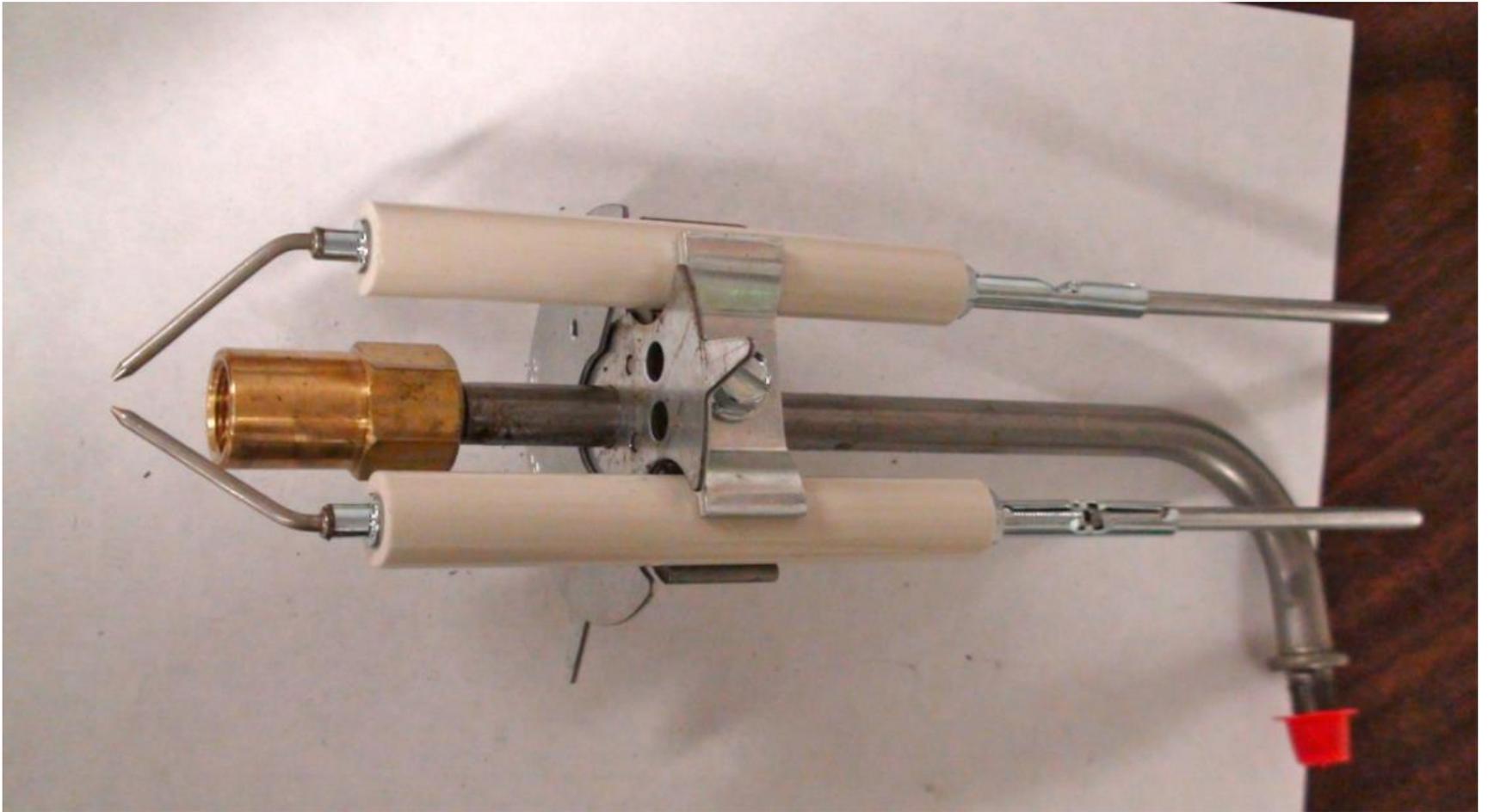
Why There is a Problem with Starting the Burner

- Bad or dirty cad cell
- Faulty primary control
- Bad or weak ignition transformer
- Bad burner motor
- Bad fuel pump
- Blocked oil filter, strainer or nozzle

Filter Pump & Oil Lines



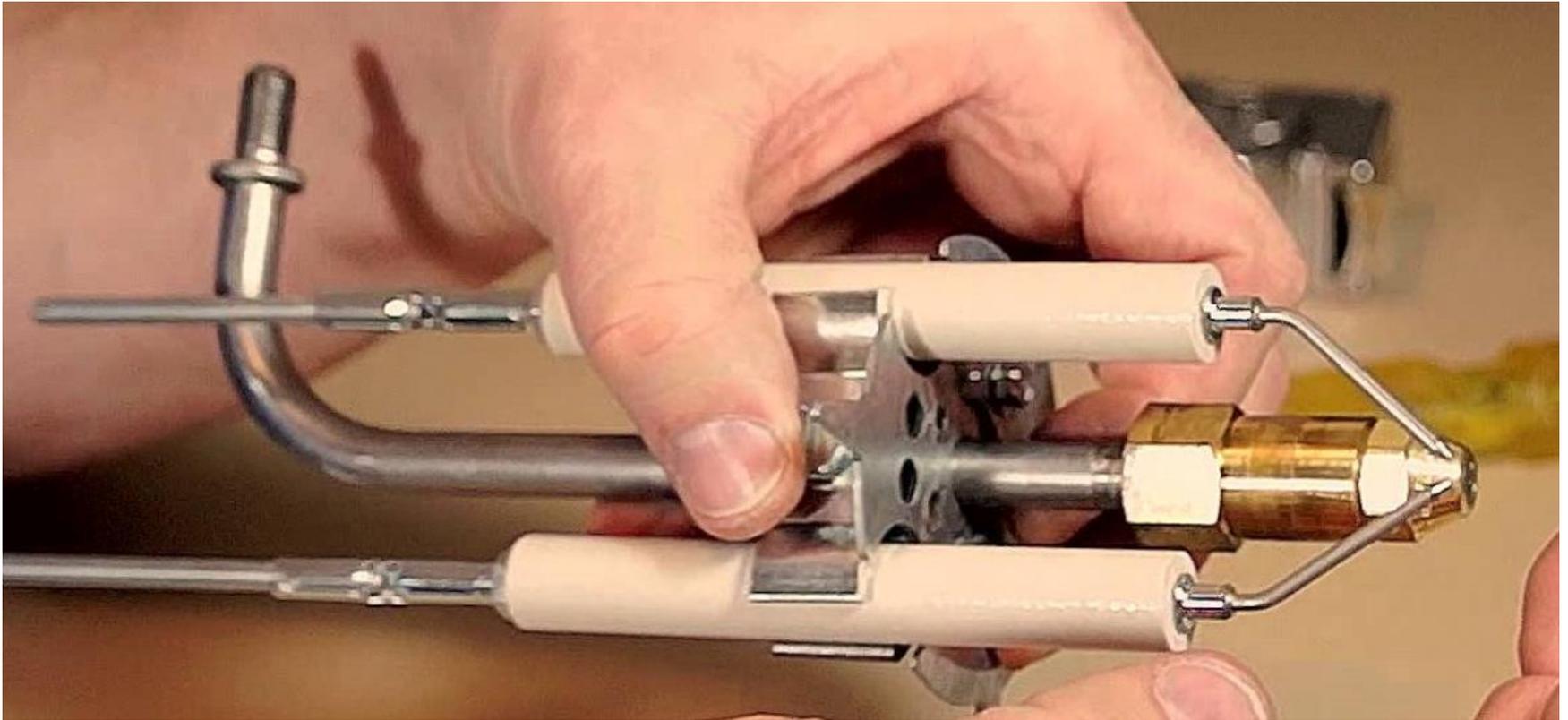
Cracked Electrodes



Nozzles Can Cause High Smoke



Electrode Alignment



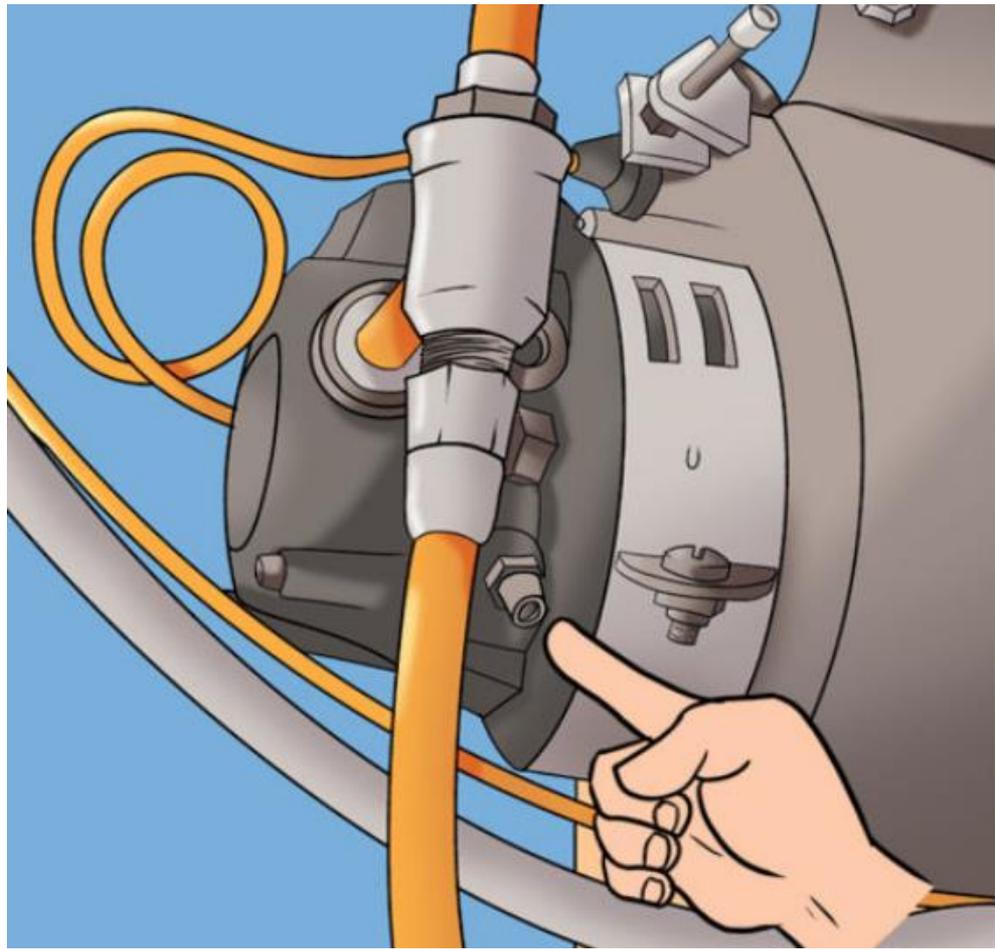
Oil Nozzle in Burner



Burner Flame



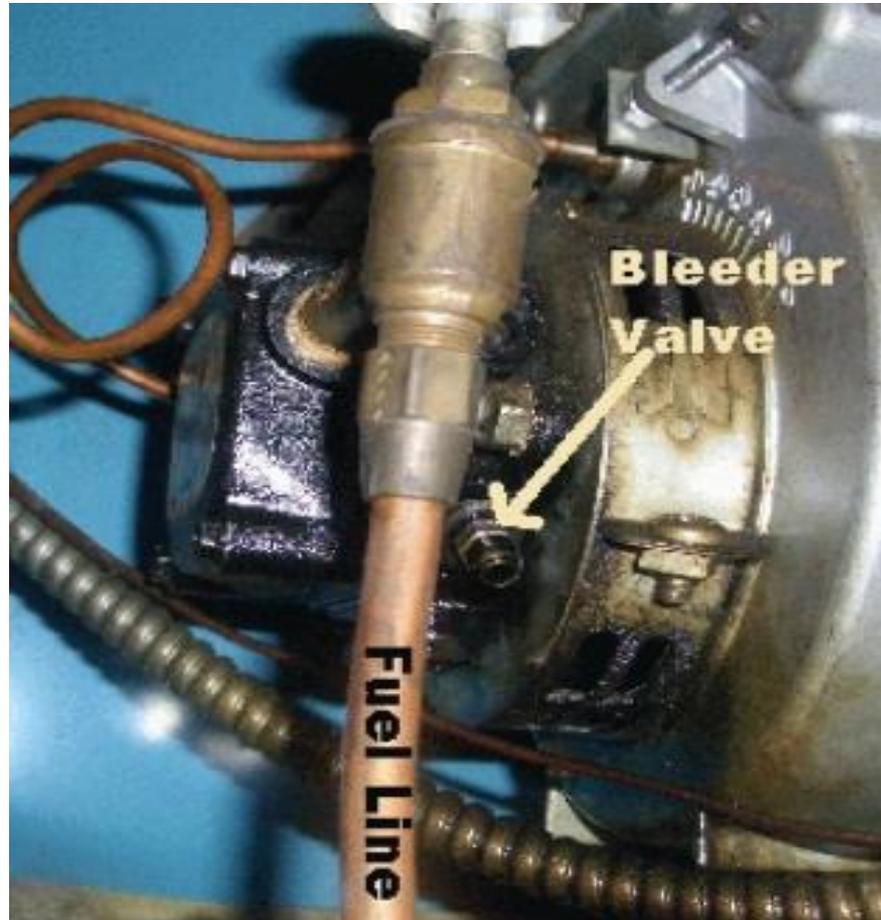
Where the Air Line is Bled



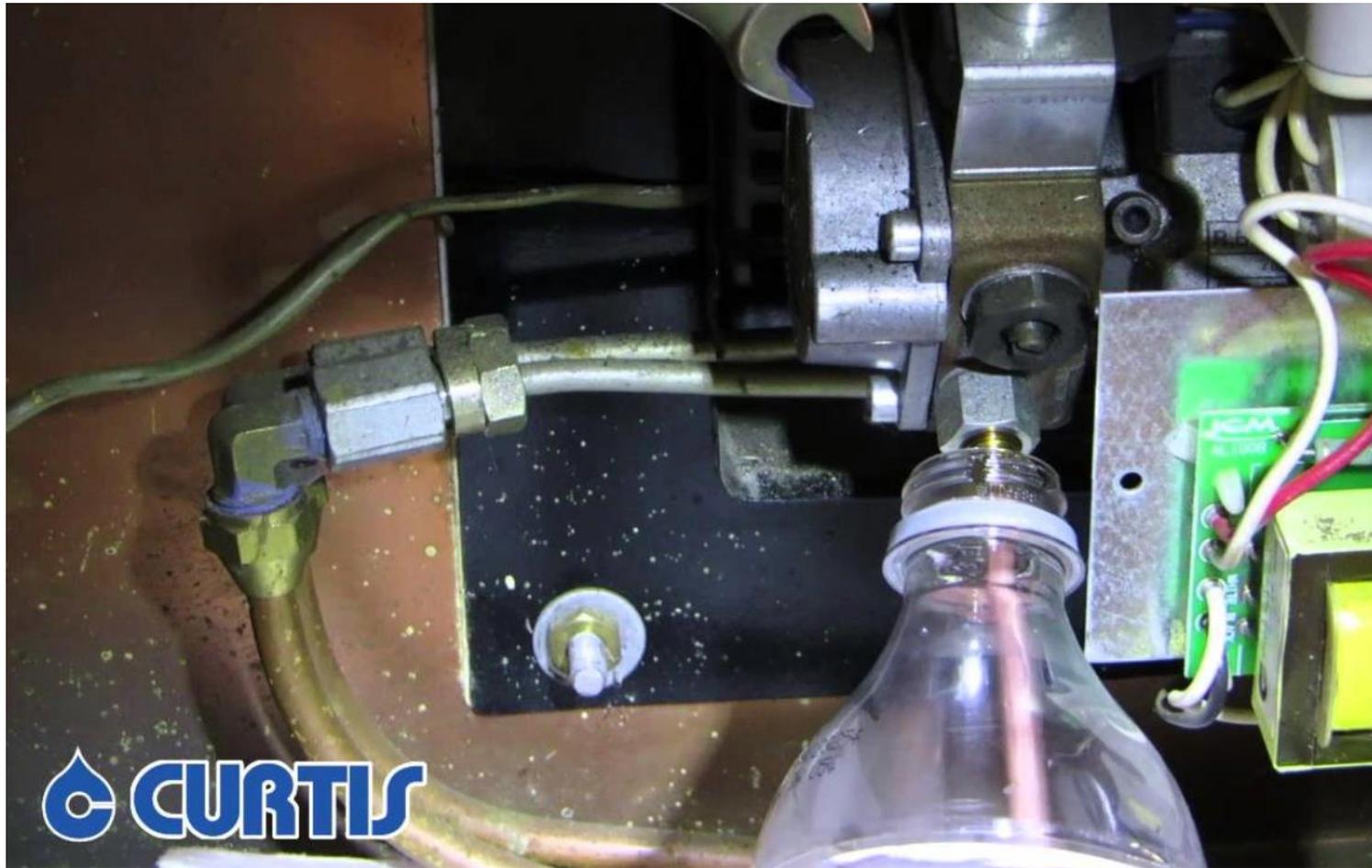
Oil Pump on Burner



Bleeder Valve



Bleeding the Pump



Problems with Furnaces

- Burner running with a very high smoke, can be seen from outside the home.
- Burner sooted up
- Loose electrical connections
- Damaged flexible coupling
- Water in oil tank, sediment from running dry.
- Chimney blocked -- Have it cleaned

Gas Furnace/Space Heater with a Standing Pilot

- If you have a standing pilot (one that is on all the time), look inside your furnace to see if it is on.
- If it is not on, follow the instructions on the furnace to re-light the pilot.
- If the pilot will not light or stay lighted, this may be a bad thermocouple .

Mechanical Problems

- Broken or extremely loose fan belt.
- Bound or tight blower motor (large motor) -- With power OFF, try to turn blower shaft (should spin freely).
- Bound gas inducer motor (small motor) -- If the furnace isn't working but the inducer is very hot, it could be stuck. Also makes a grinding noise before it stops working.
- Broken gas ignitor (looks like a spark plug).

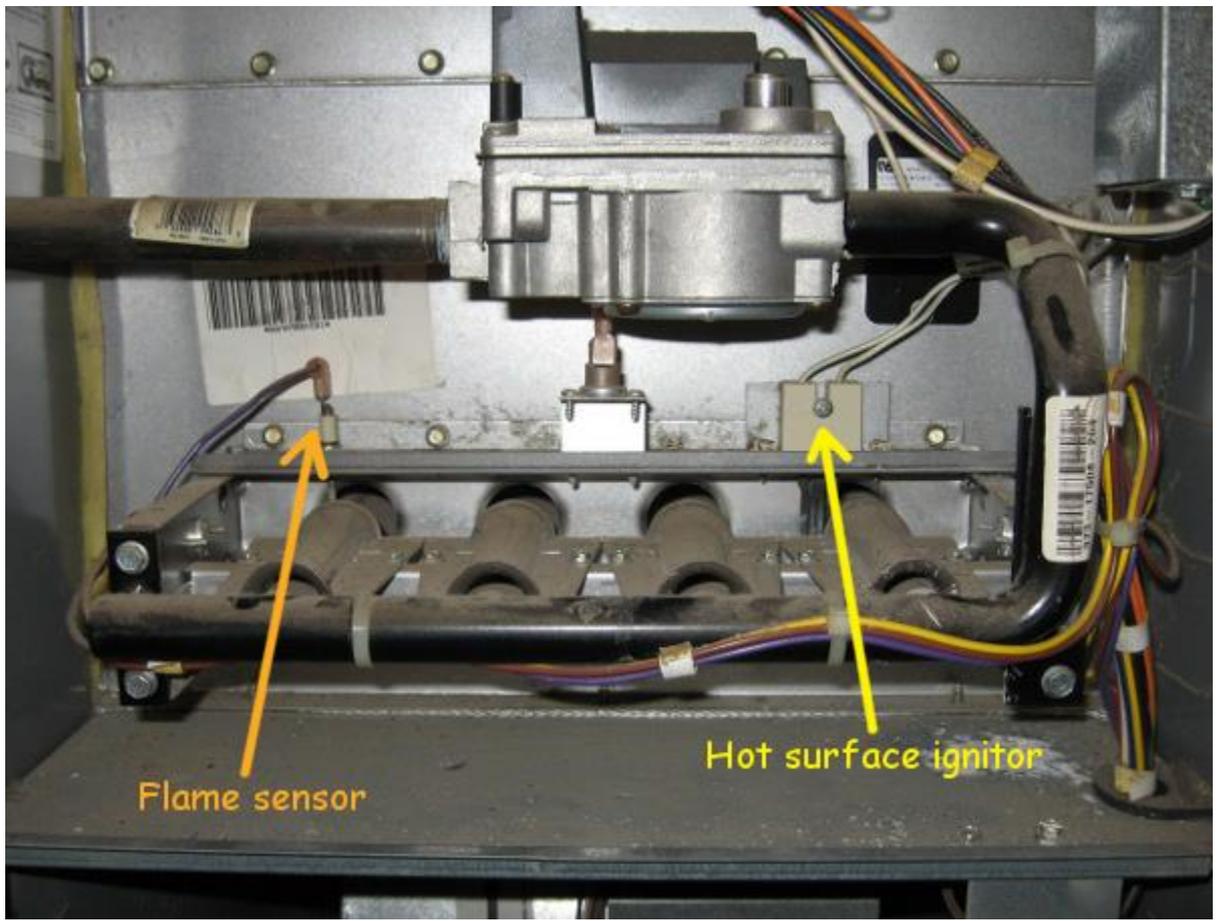
Ribbon Burners



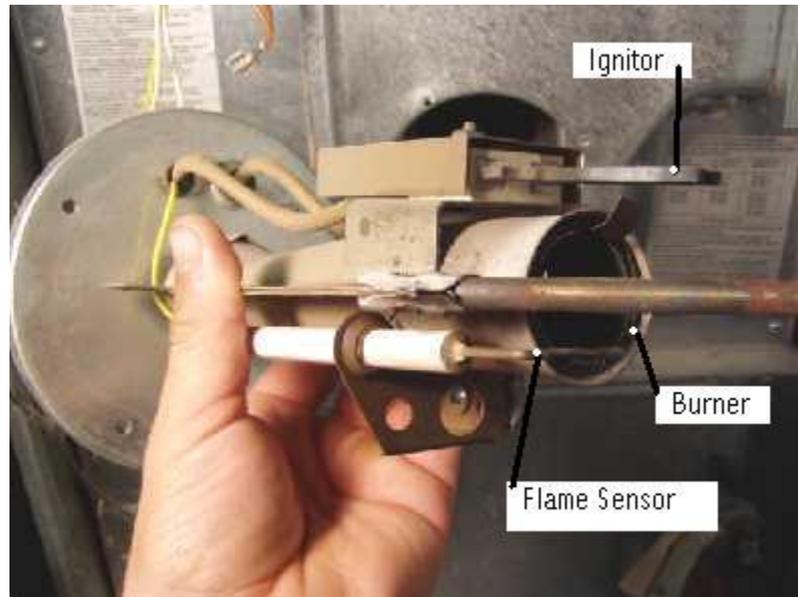
Burners Lighting Up



Ignitor and Sensor Location



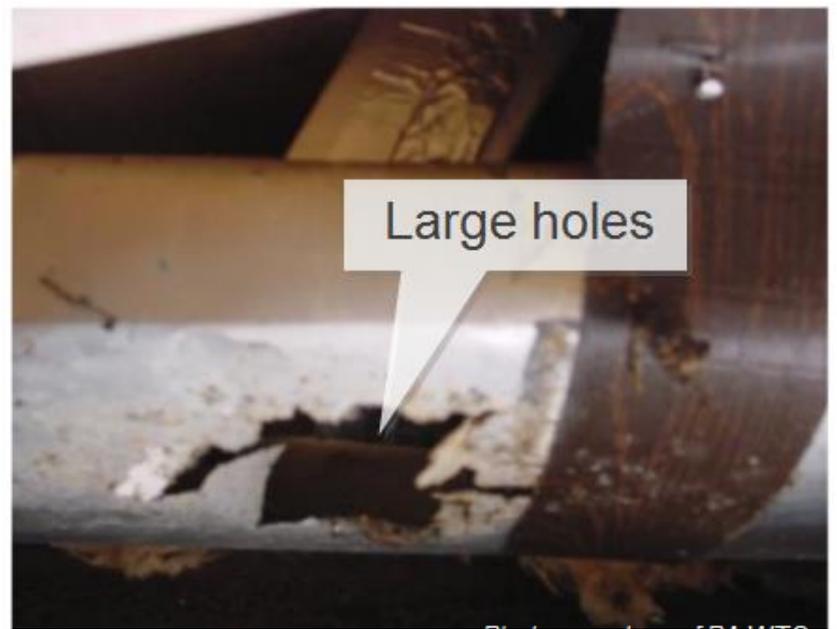
MH Ignitor



Why High Electric Bills?

- Check the obvious things first.
- Open window for example. This is for the most part a winter-time heating complaint.
- Stuff placed in front of radiators or register.
- Register closed.

Duct Problems & Heat Bills



Bad Ducts Cause High Heat Bills



Dirty Blower



High Heat Bill Continued

- Many things can cause high electric bills
- A mistake on the electric bill
- A poorly insulated home
- Open windows, not latched windows
- Inefficient appliances like electric water heaters, refrigerators and freezers
- Trying to heat areas that are not living areas
- Not knowing how to conserve energy

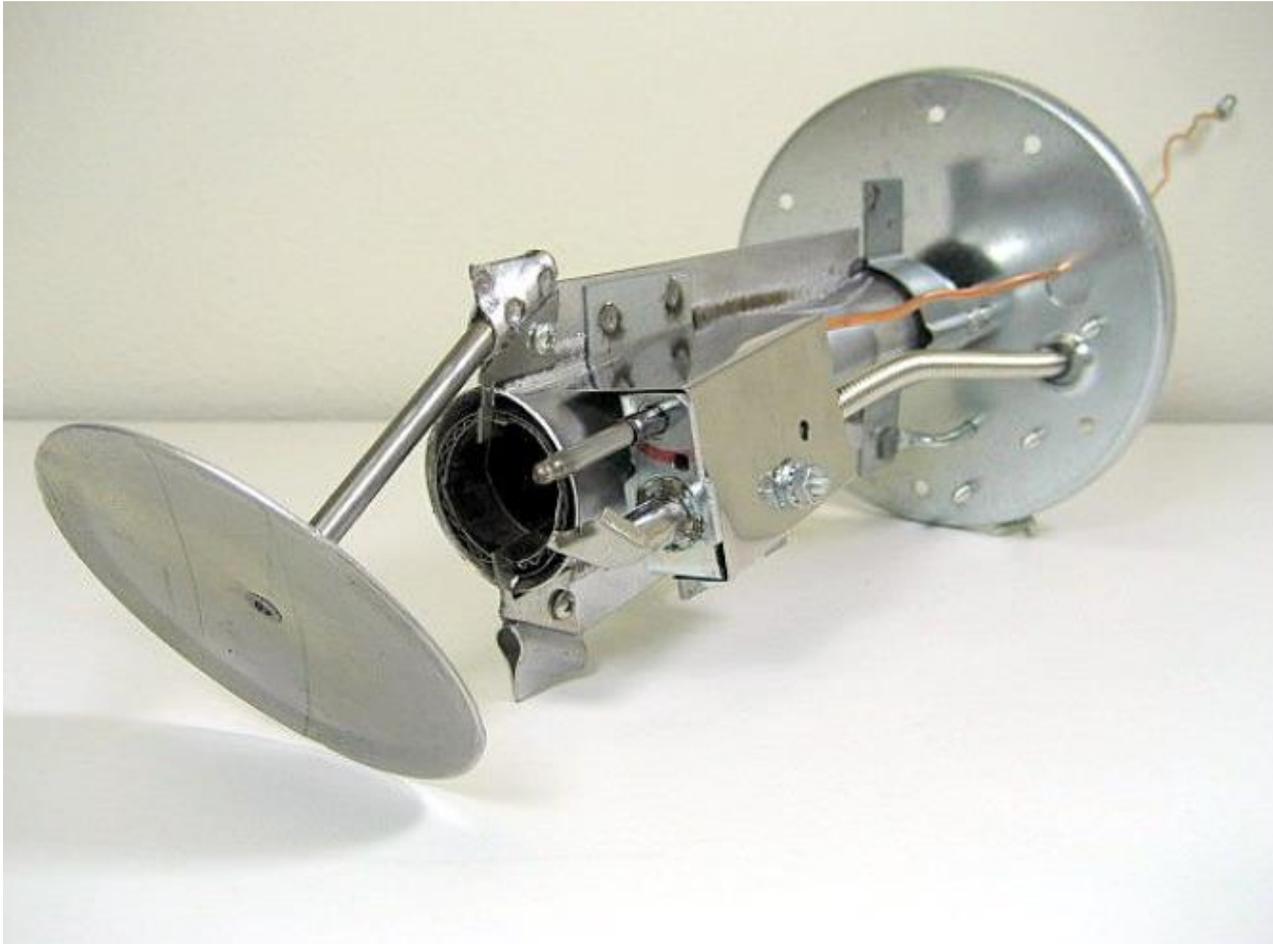
Old Boiler



Old Boiler with Oil Retrofit



MH Gas Burner



Cracked Heat Exchanger



Another Cracked Heat Exchanger



Forced Air Blowers



Space Heaters



Problems with Portable Space Heaters



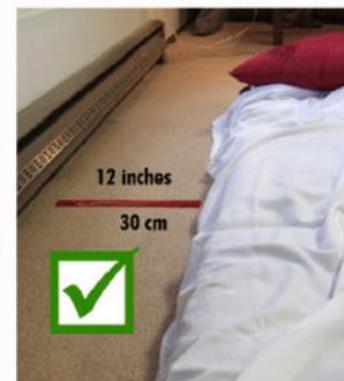
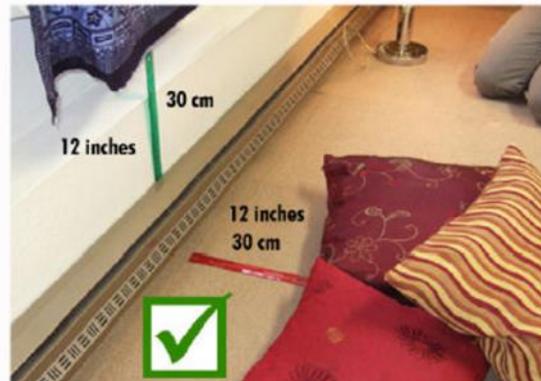
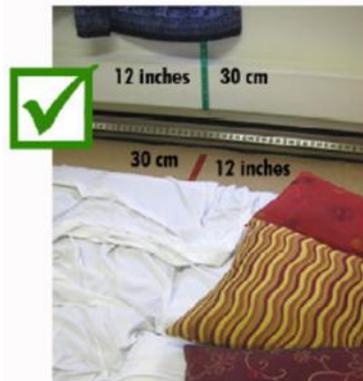
Space Heaters



Vented and Non-vented Heaters



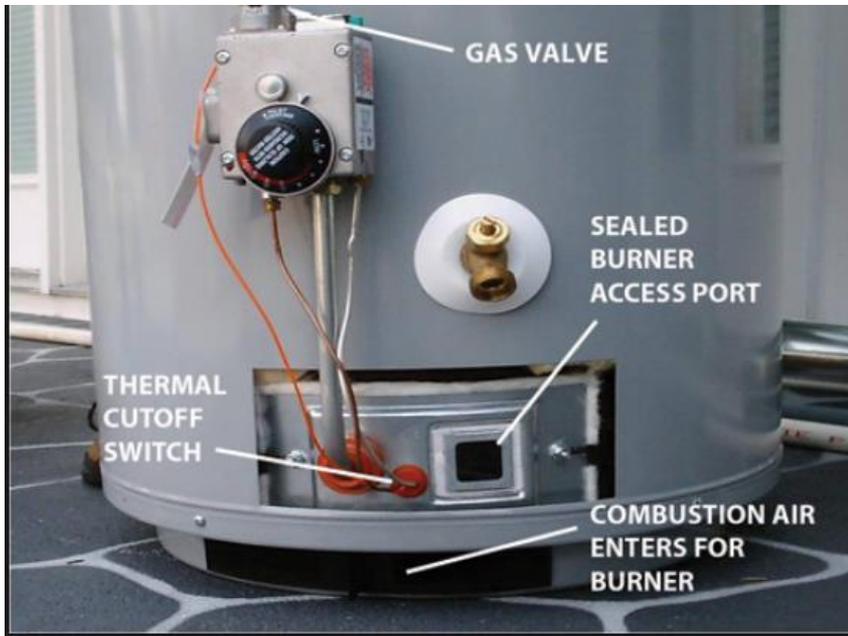
Clearances Needed



Portable Space Heater



Water Heaters



Leaning WH Tank



WH Leak



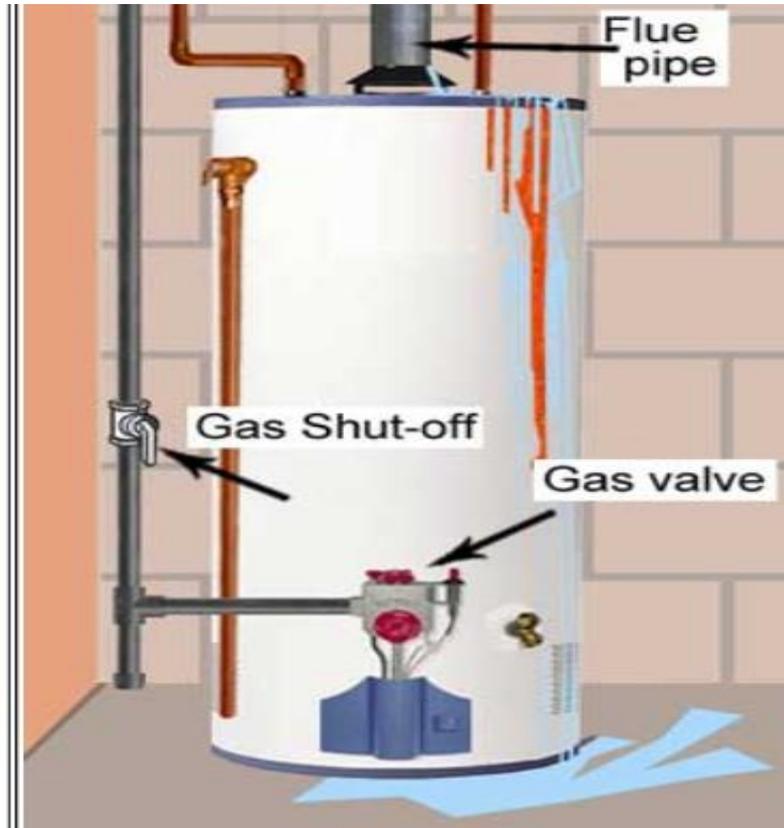
Leaking WH



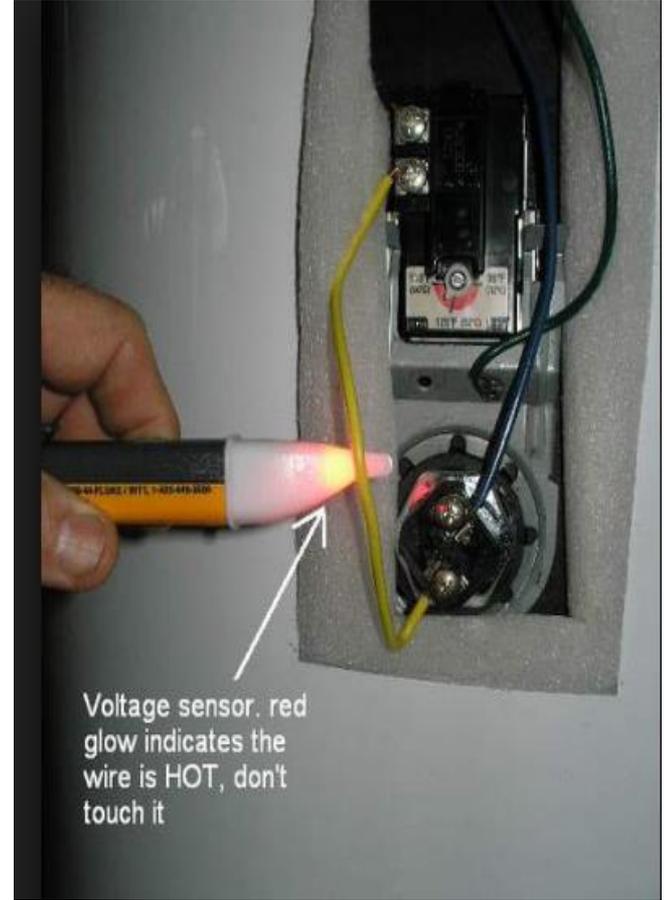
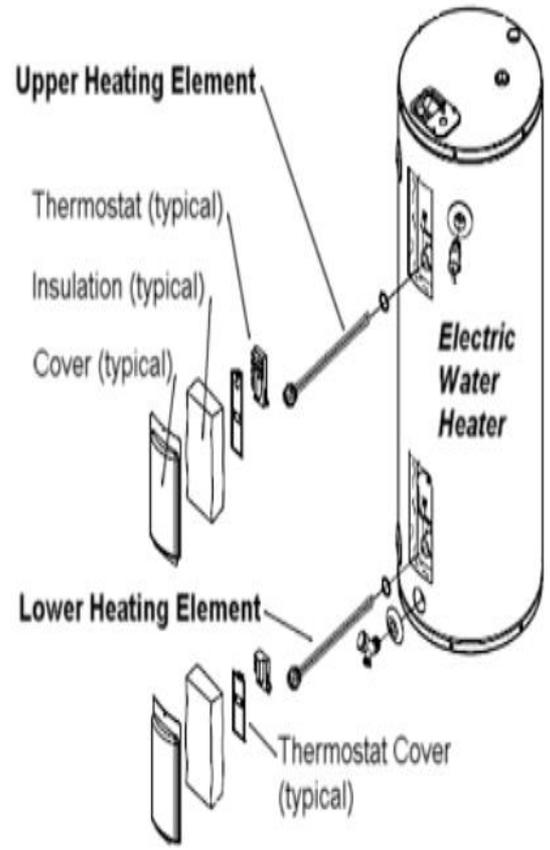
Oil WH



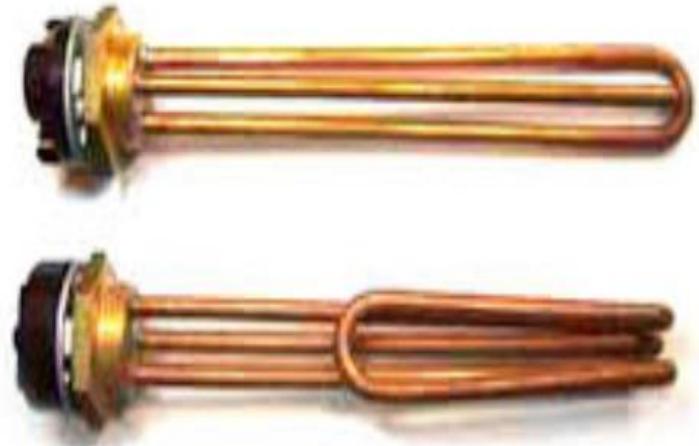
WH Leaks - Do not Stand in Water



WH Elements Location



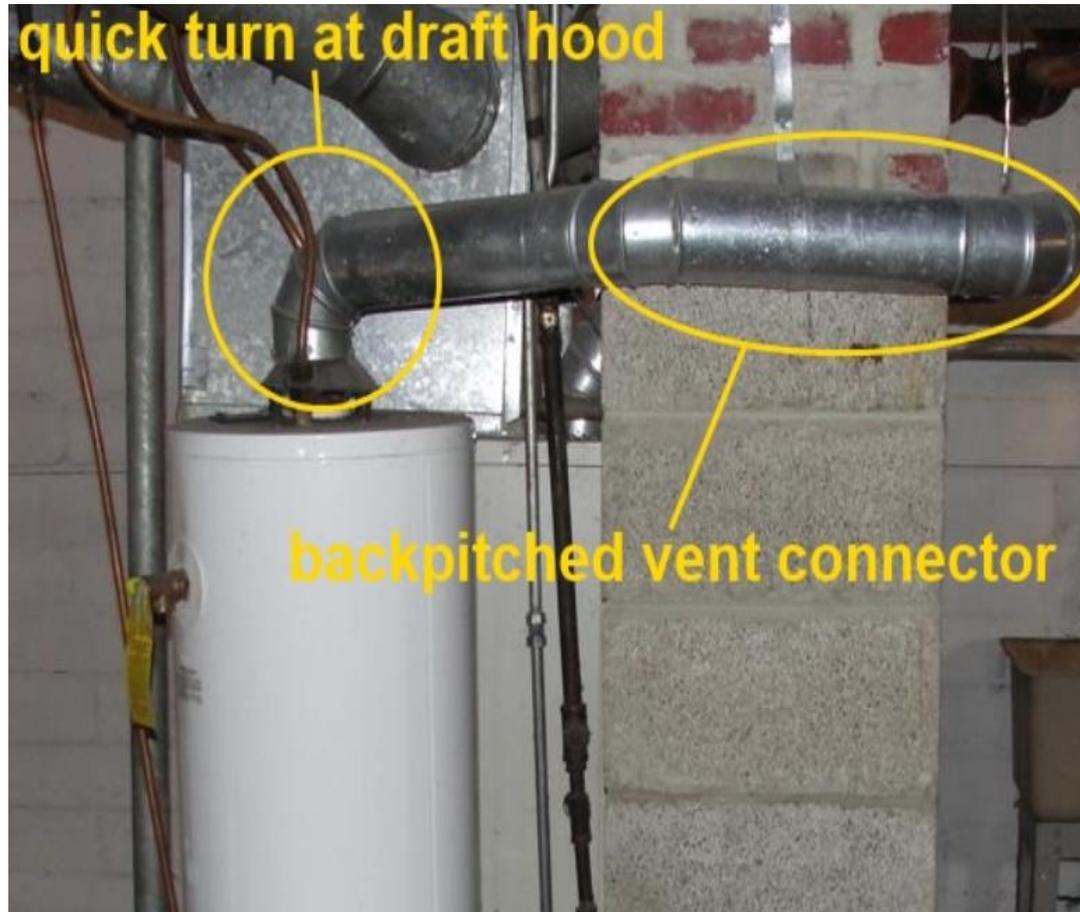
Electric WH Elements



Anode Rods



Bad Flue



Resources

- Minnesota Department of Commerce
www.mn.gov/commerce
- What else???

Questions

Thank You!

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