



*Helpful Questions to Ask on No Heat Calls*

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# 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 home owners 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, air sealing, replacing mechanical systems, and occupant education
  - Federally funded

# Happy Customers



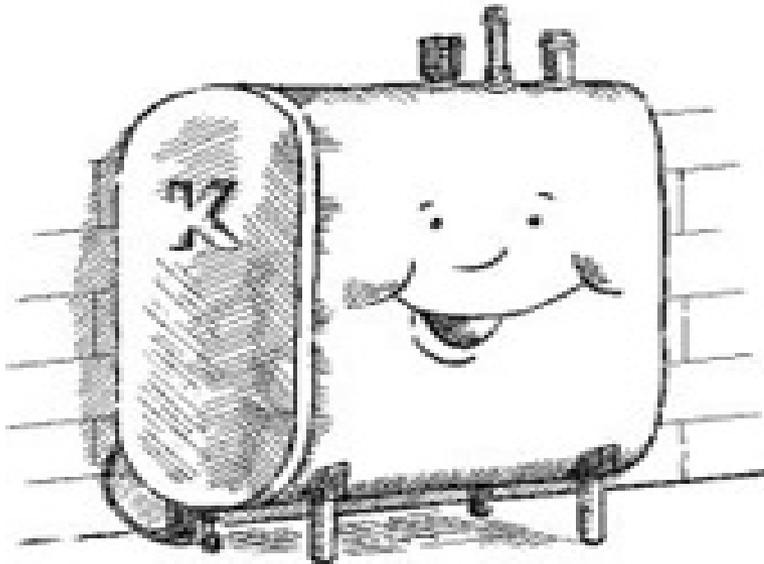
# Easy Questions First

- Is the gas or fuel oil turned on?
  - ON/Off valve closed
  
- Is there ice or snow covering the chimney exhaust or intake?

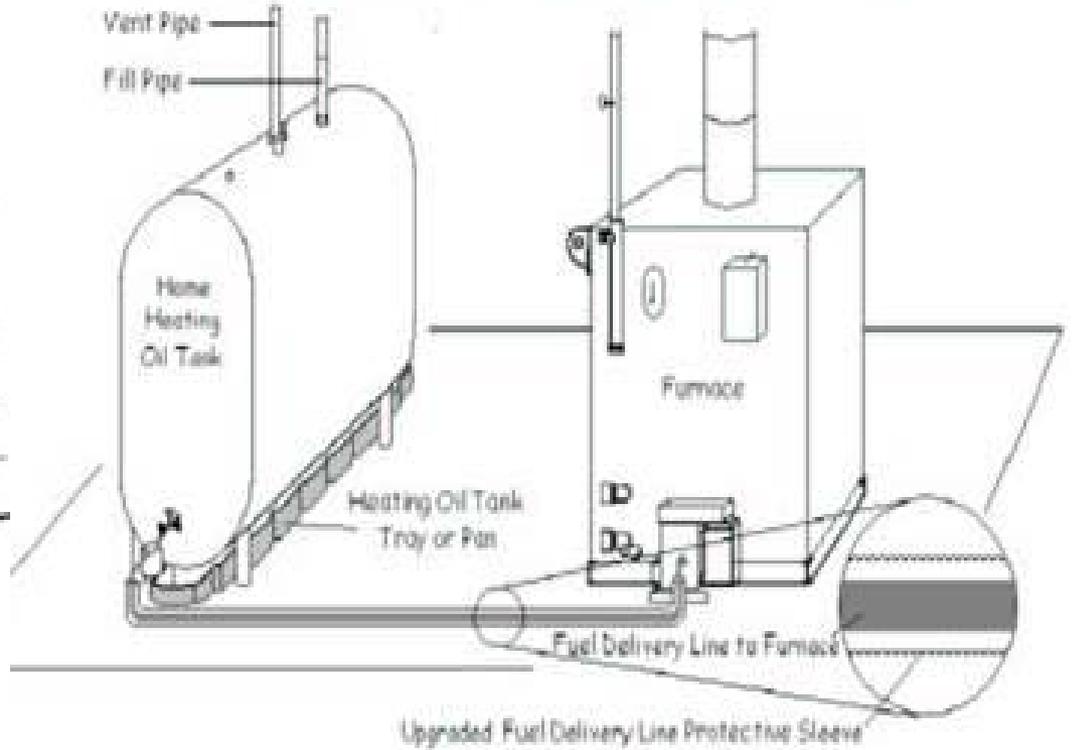
# Ask if there is fuel in the tank.



# One & Two Pipe



Typical Above-Ground Home Heating Oil System



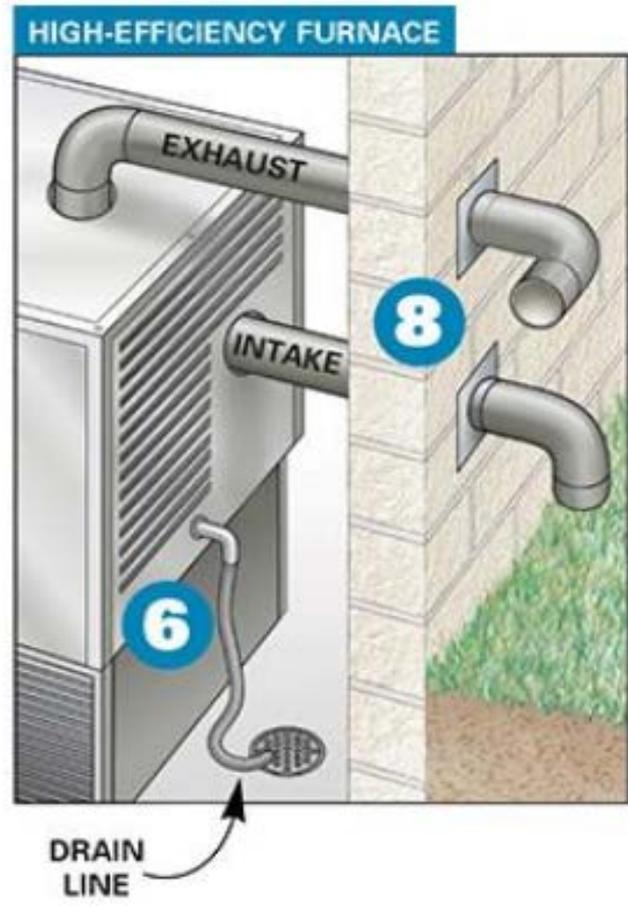
# Two Pipe Oil Example

Longer Runs and more lift capacity



# Snow can cover the exhaust PVC

## Exterior vents

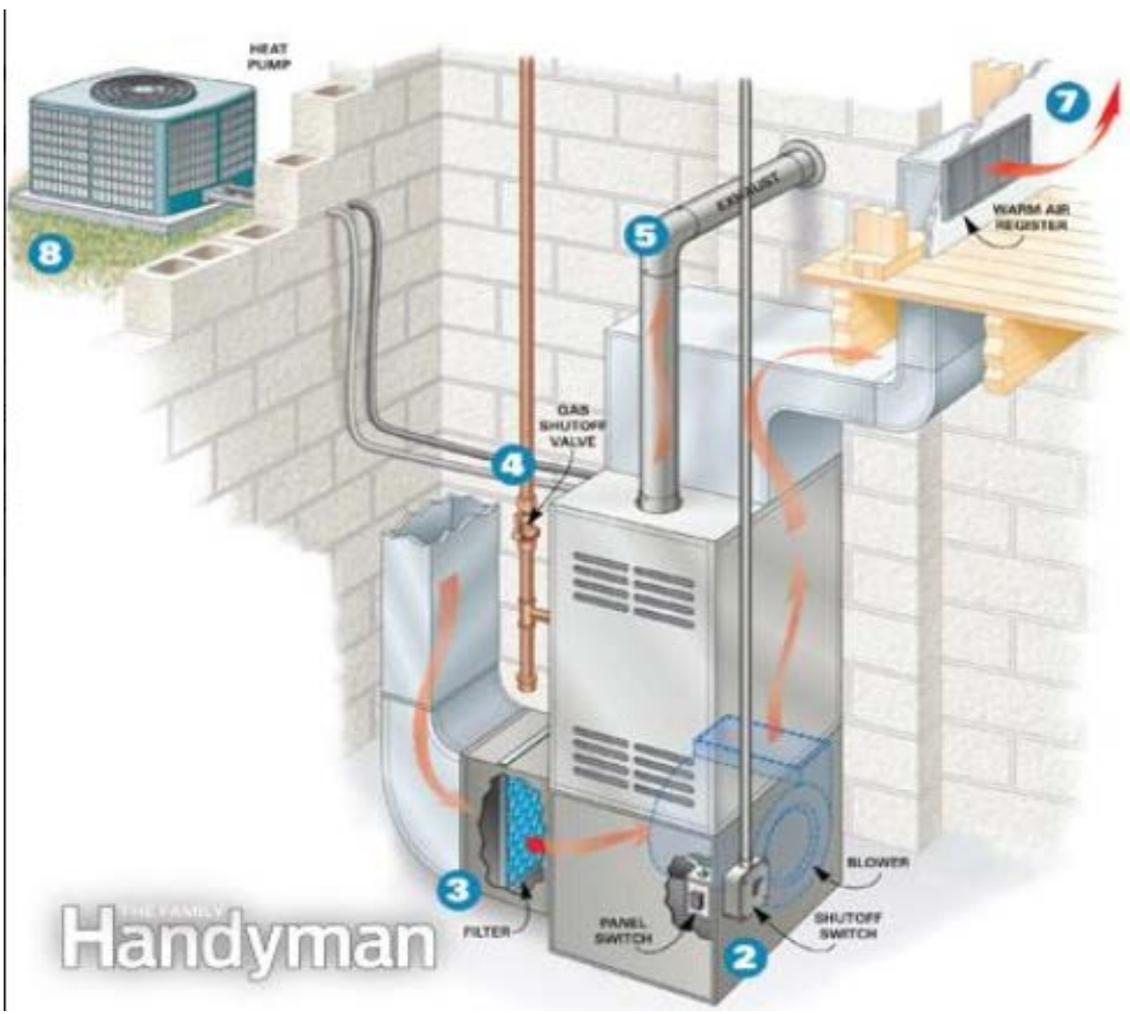


Source: Star Tribune 12/12/2010

# Frost & Snow Build up



# Basic HVAC System



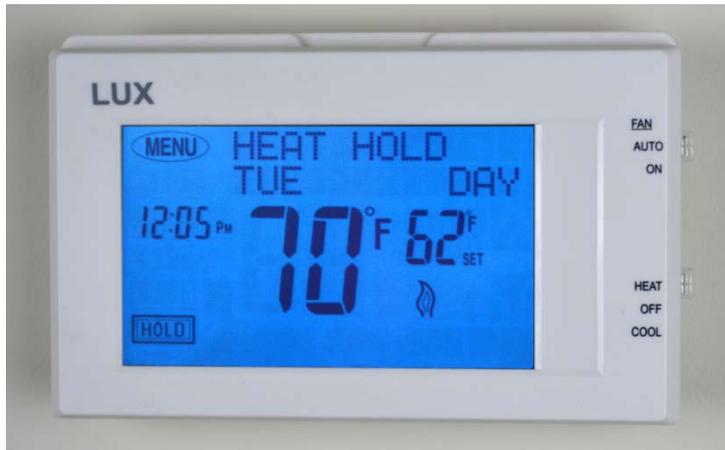
# Thermostat Check

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**

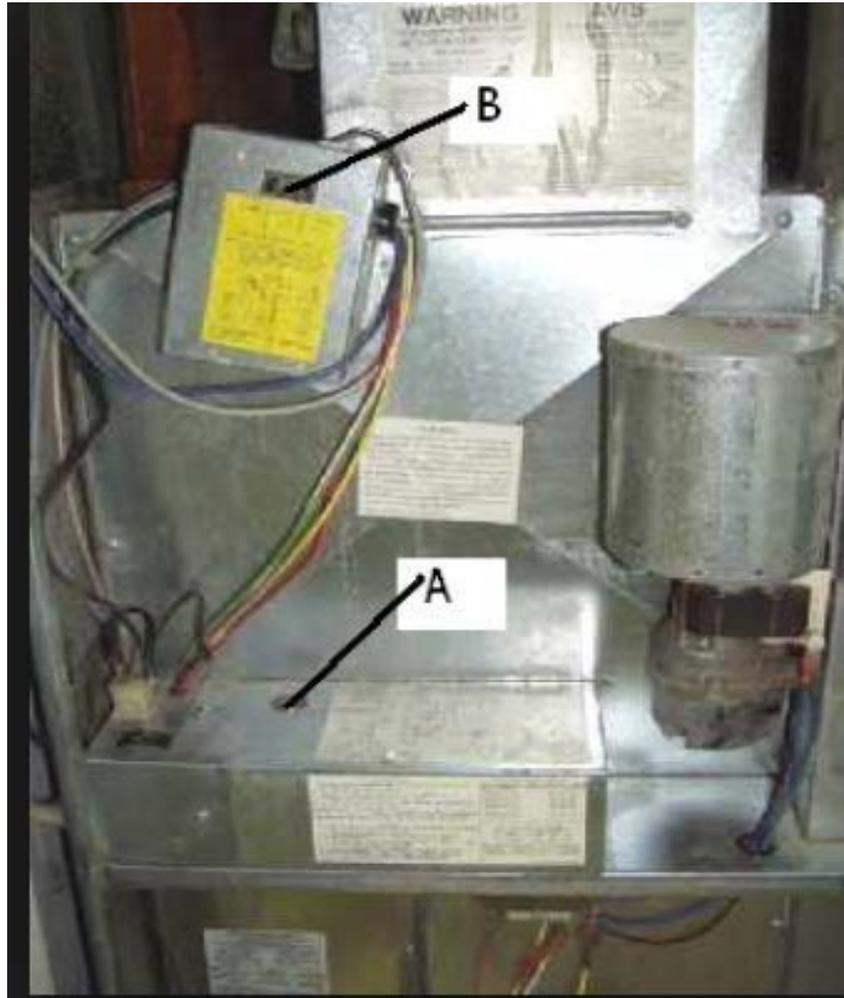
# Emergency Switch

- 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



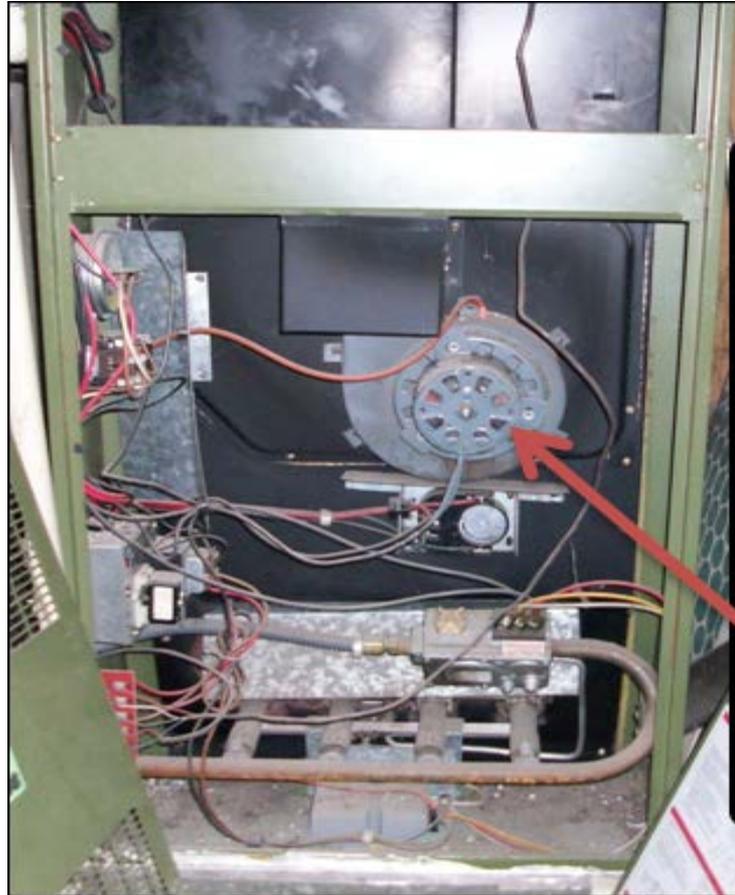
# Emergency Cabinet Switch

- 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

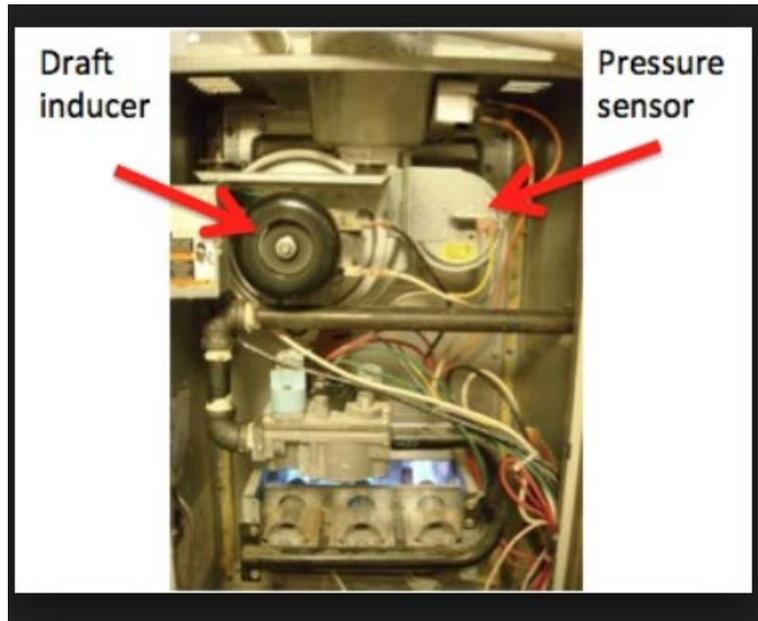


# Inducer Motor

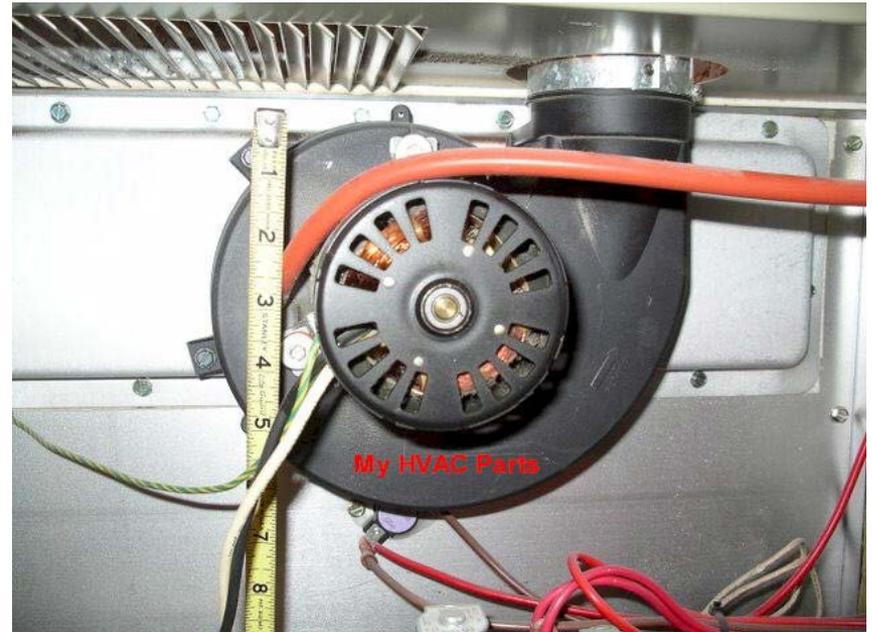


# Draft Problems

## Inducer and Sensor



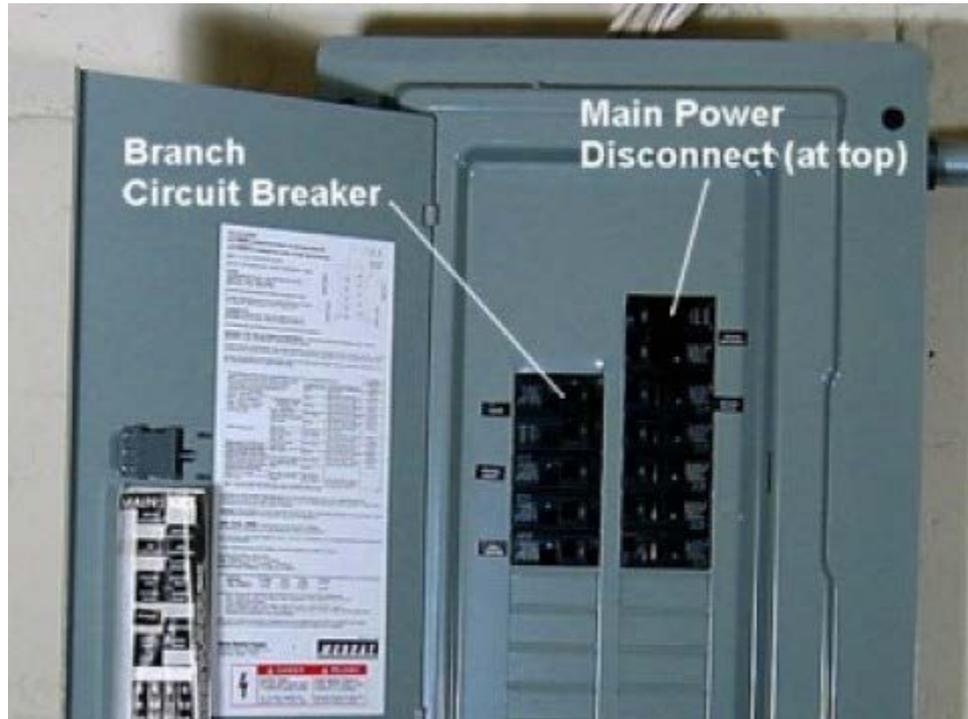
## Inducer



# 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



Good Fuse



Blown Fuse

TYPE S FUSE AND ADAPTER



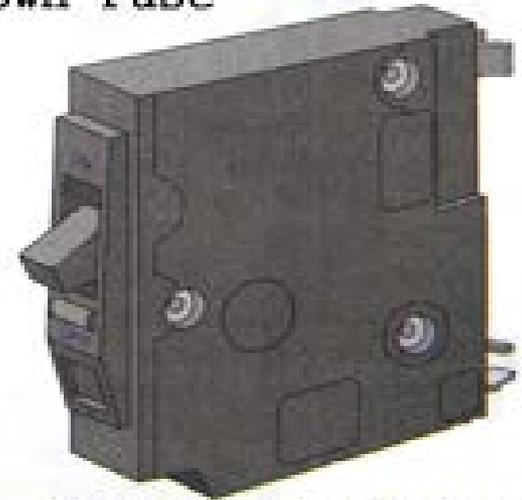
CARTRIDGE FUSES



Ferrule

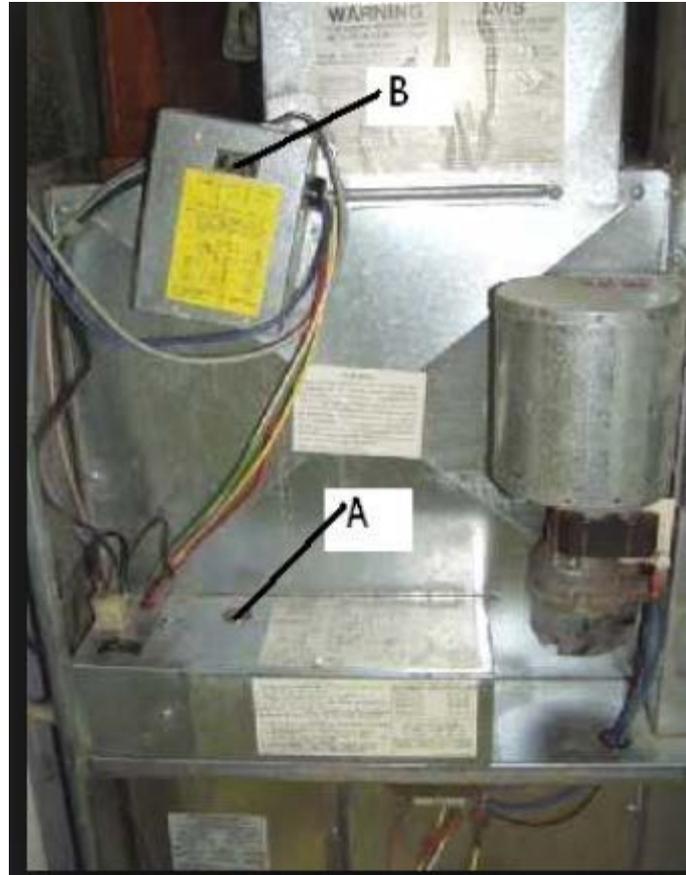


Knife-Blade



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**



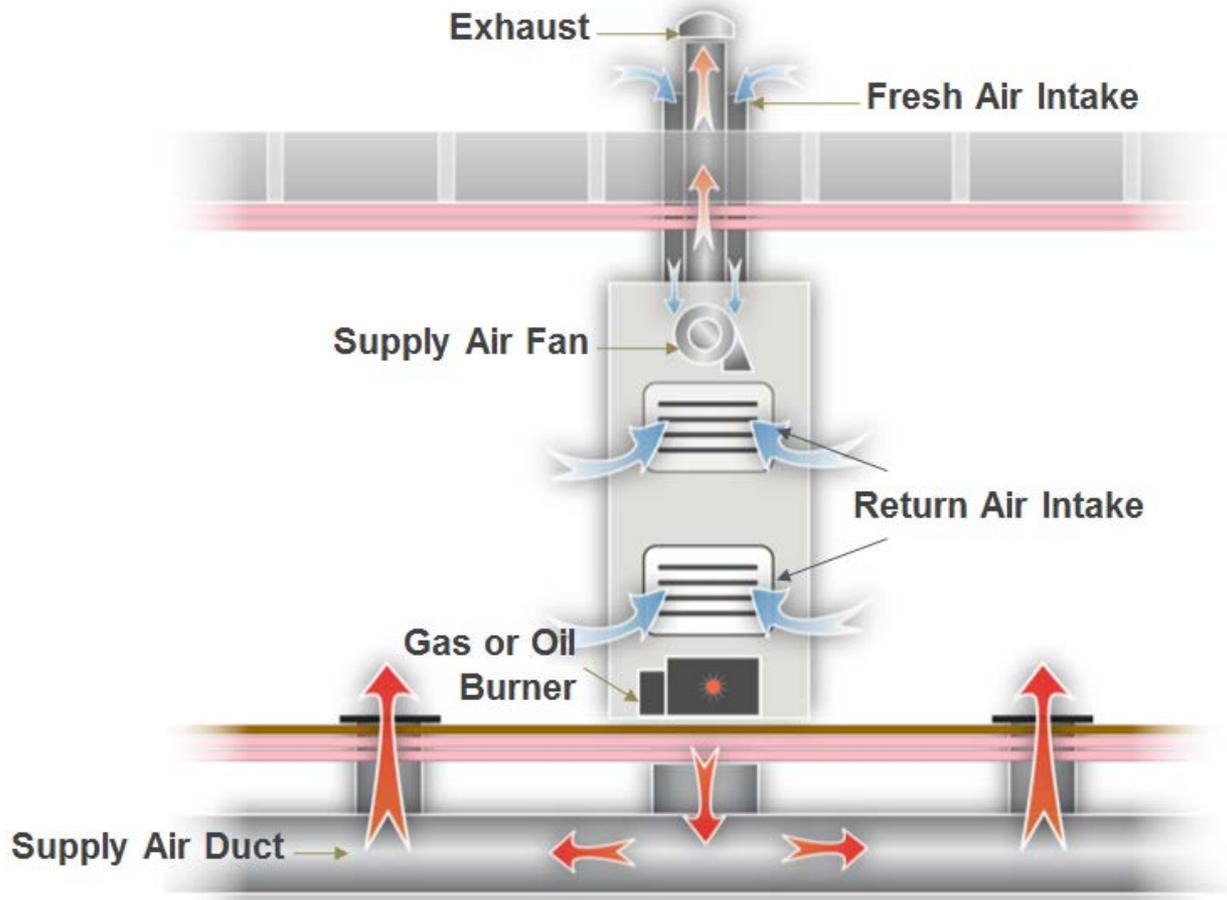
**MH**



# Mobile Home Chimney

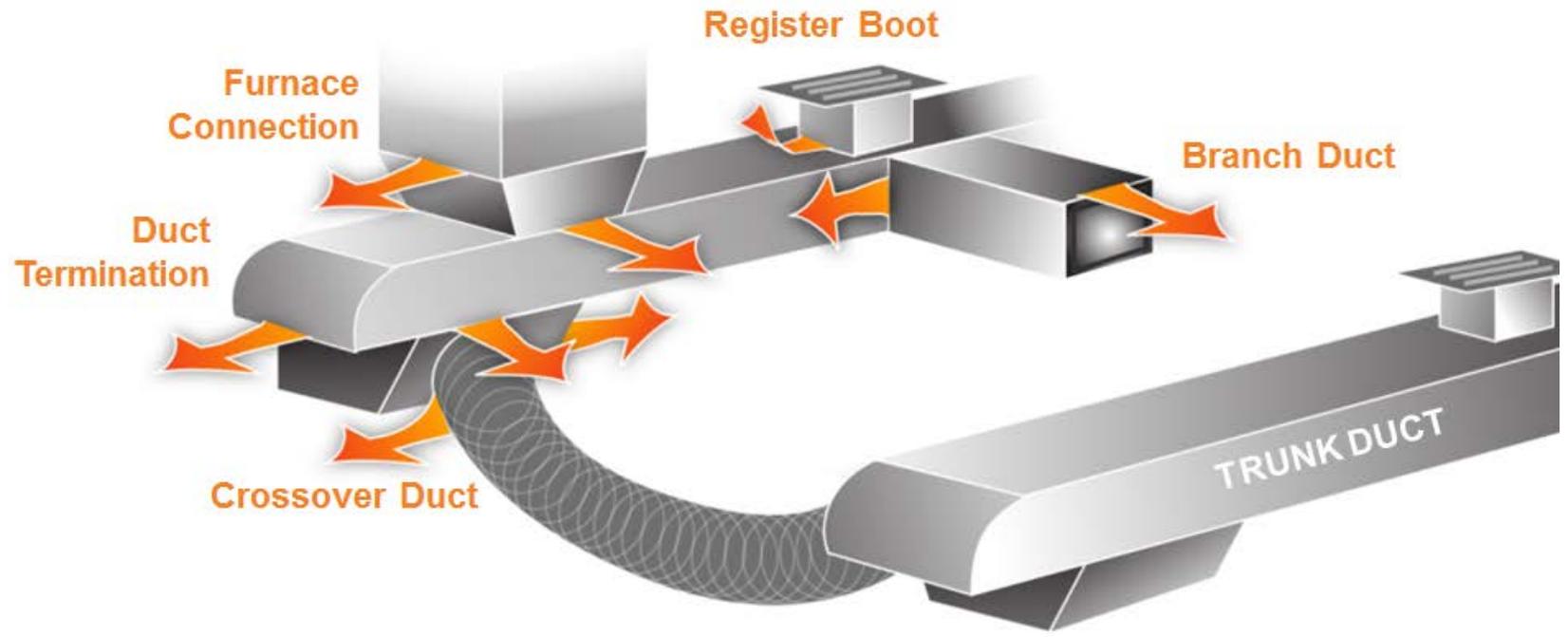


# Entire Mobile Home System

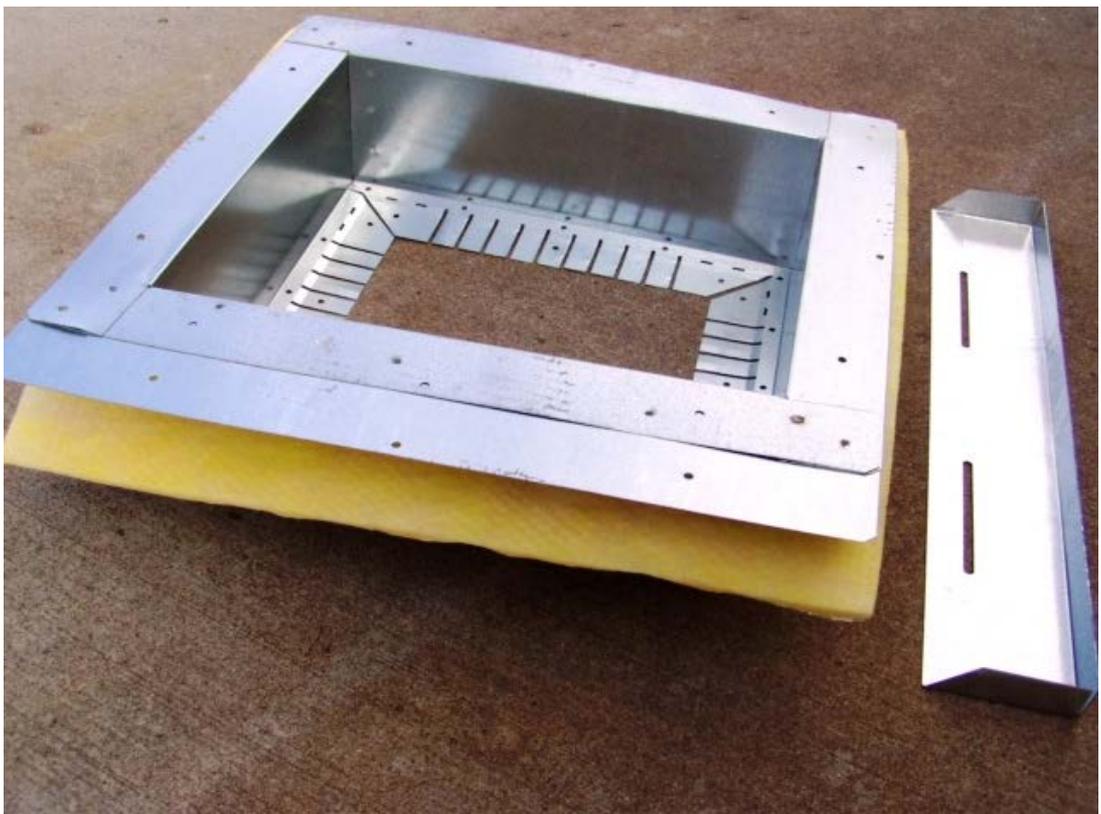


# Double Wide MH Ducts

## Typical Air Leakage Locations



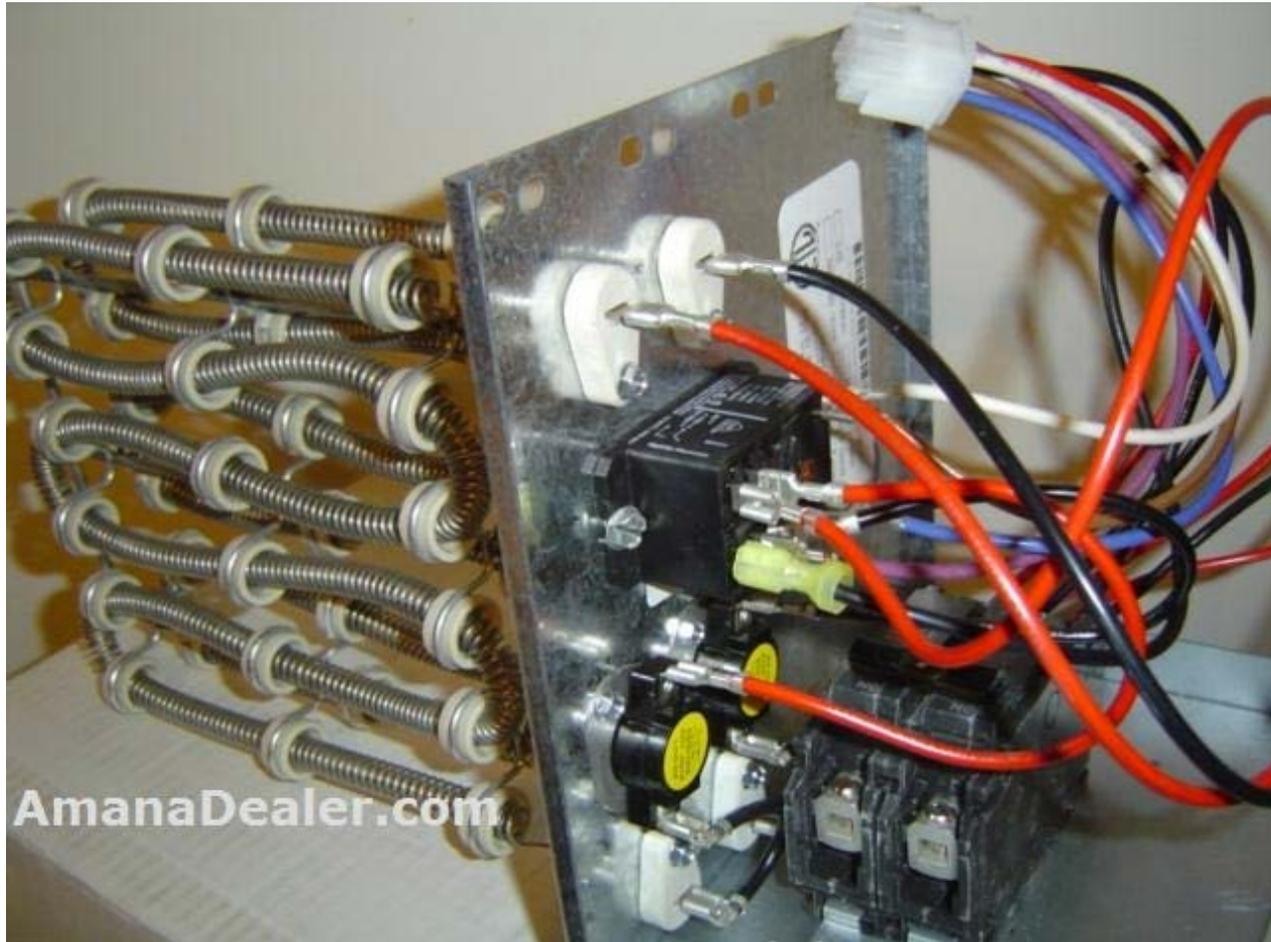
# Needs to be Included on an Installation



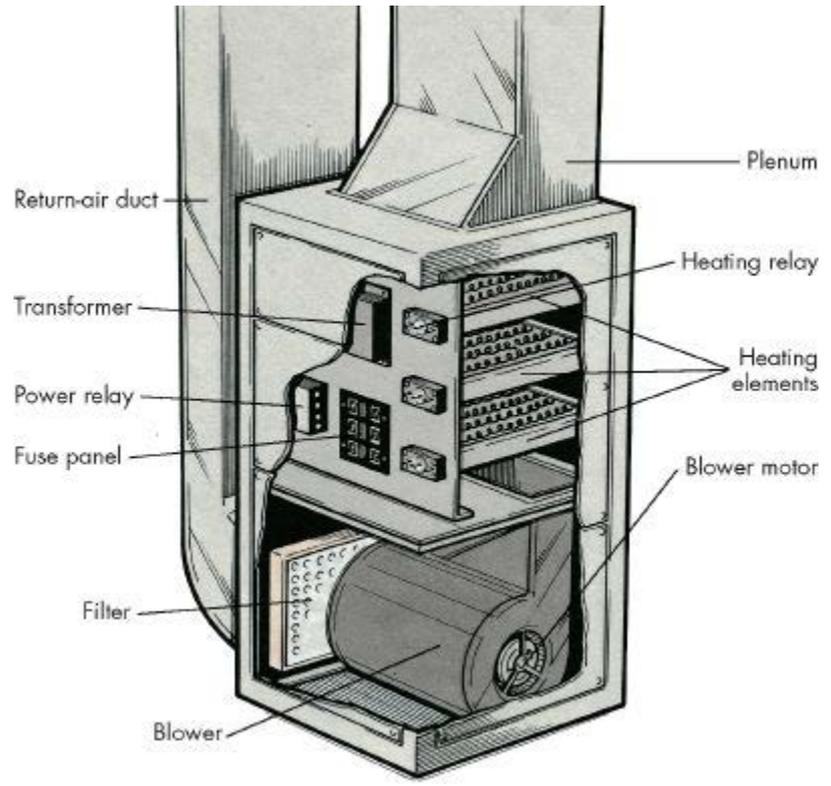
# MH Duct in Factory



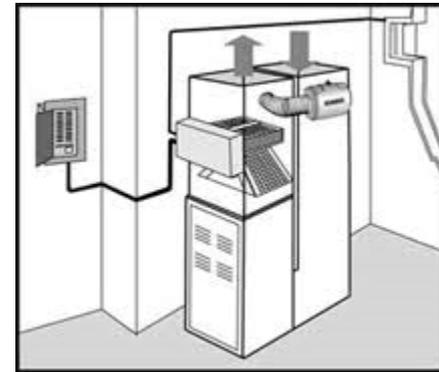
# Electric Furnace Element



# Electric Furnace Diagram



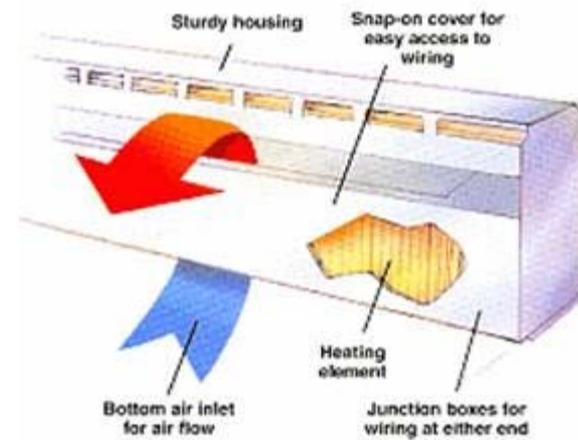
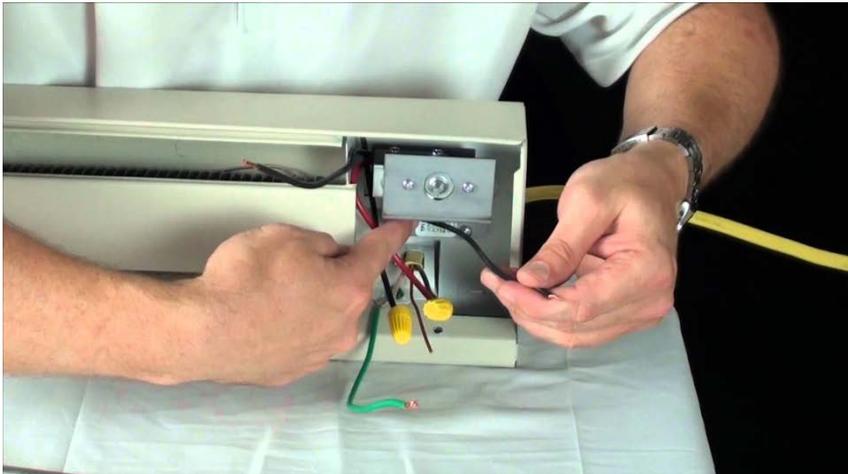
# Plenum Electric Heater



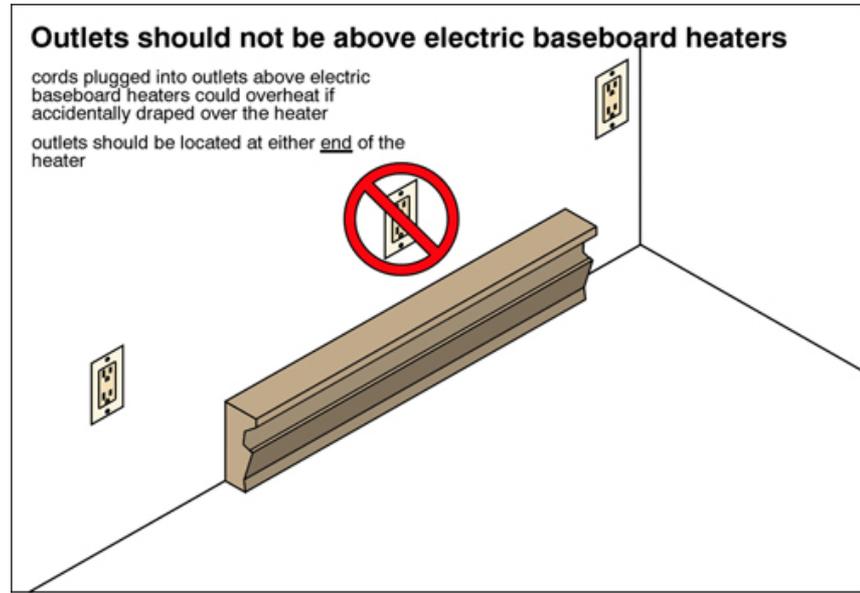
# Electric Baseboard Thermostats



# 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.

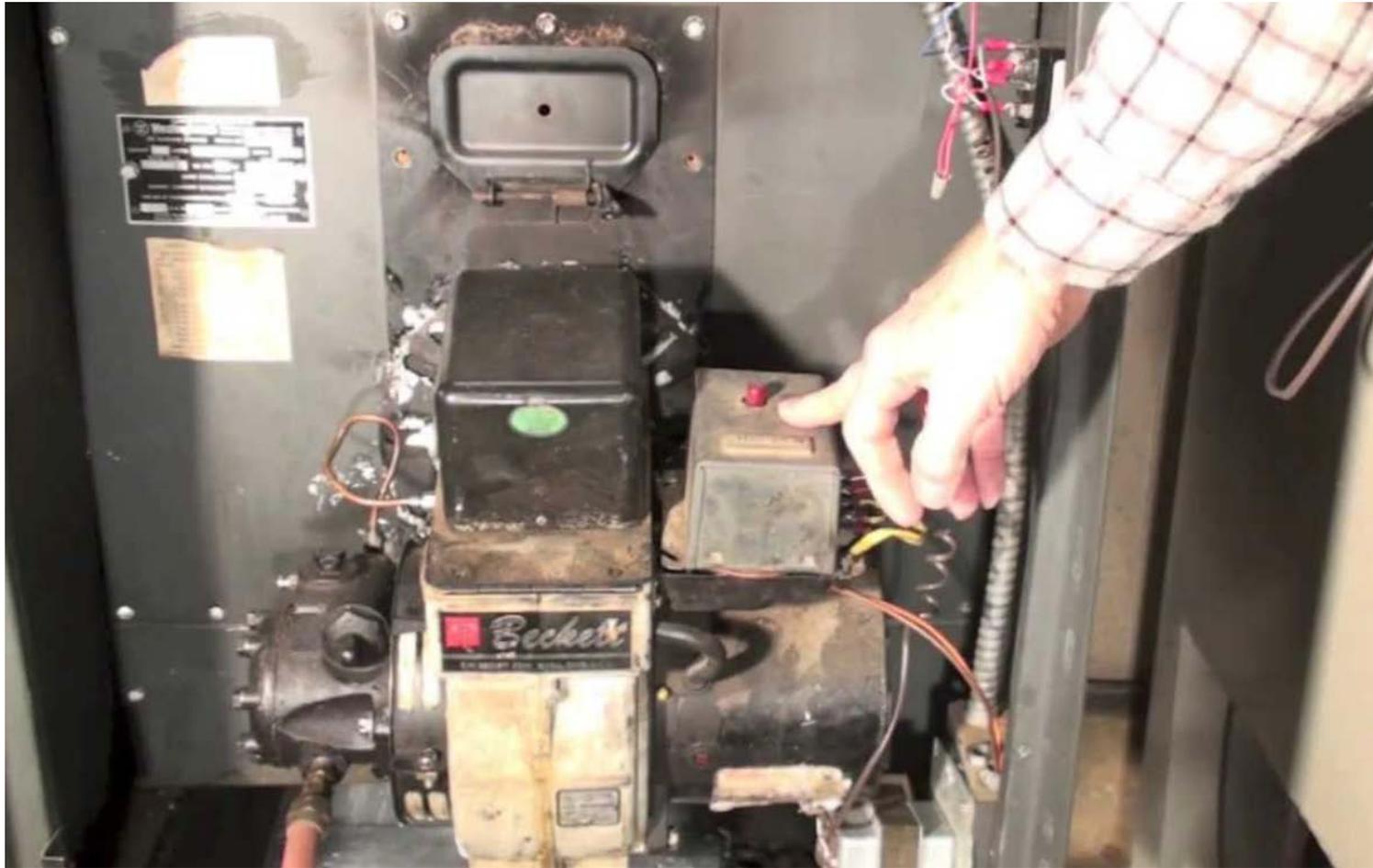
# If this is the case, check the following:

- 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



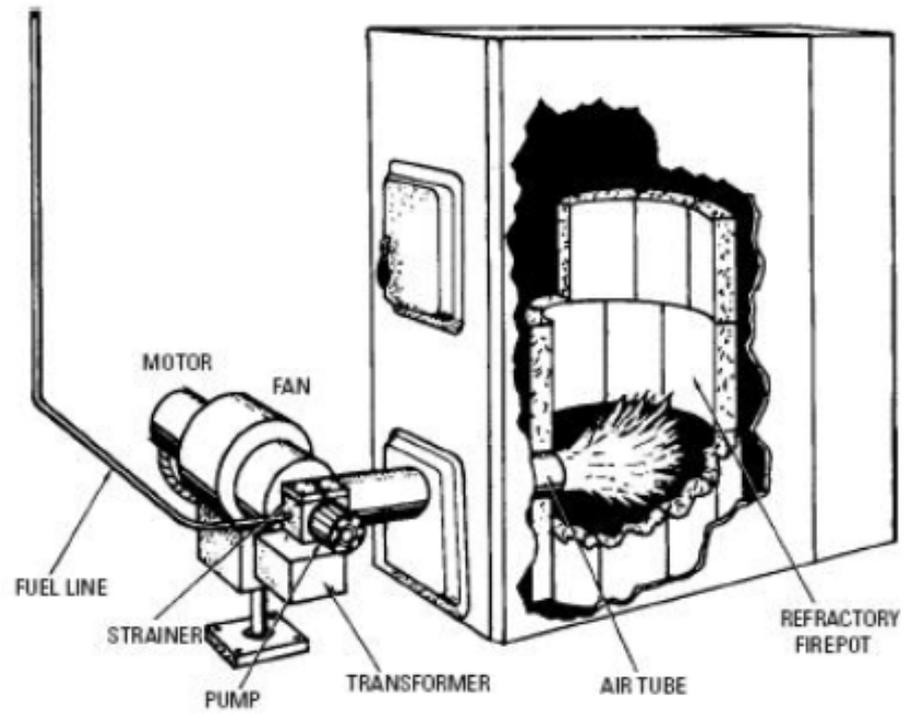
# Oil Burner Keeps Tripping The Reset Button

- 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

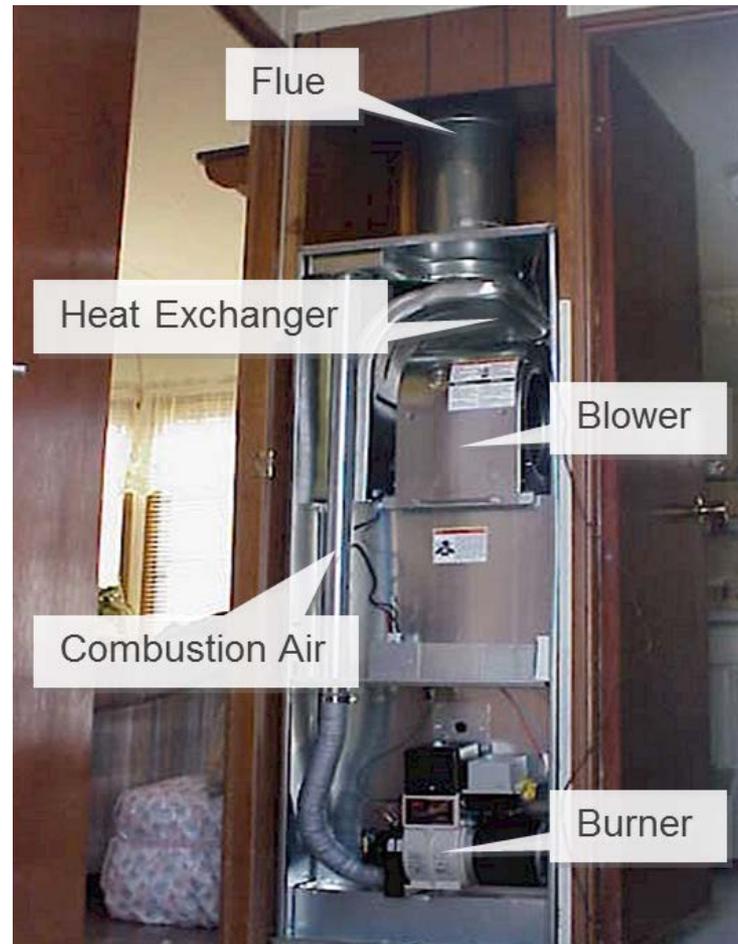


# Pedestal Type Burner



**Figure 1-3** 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).

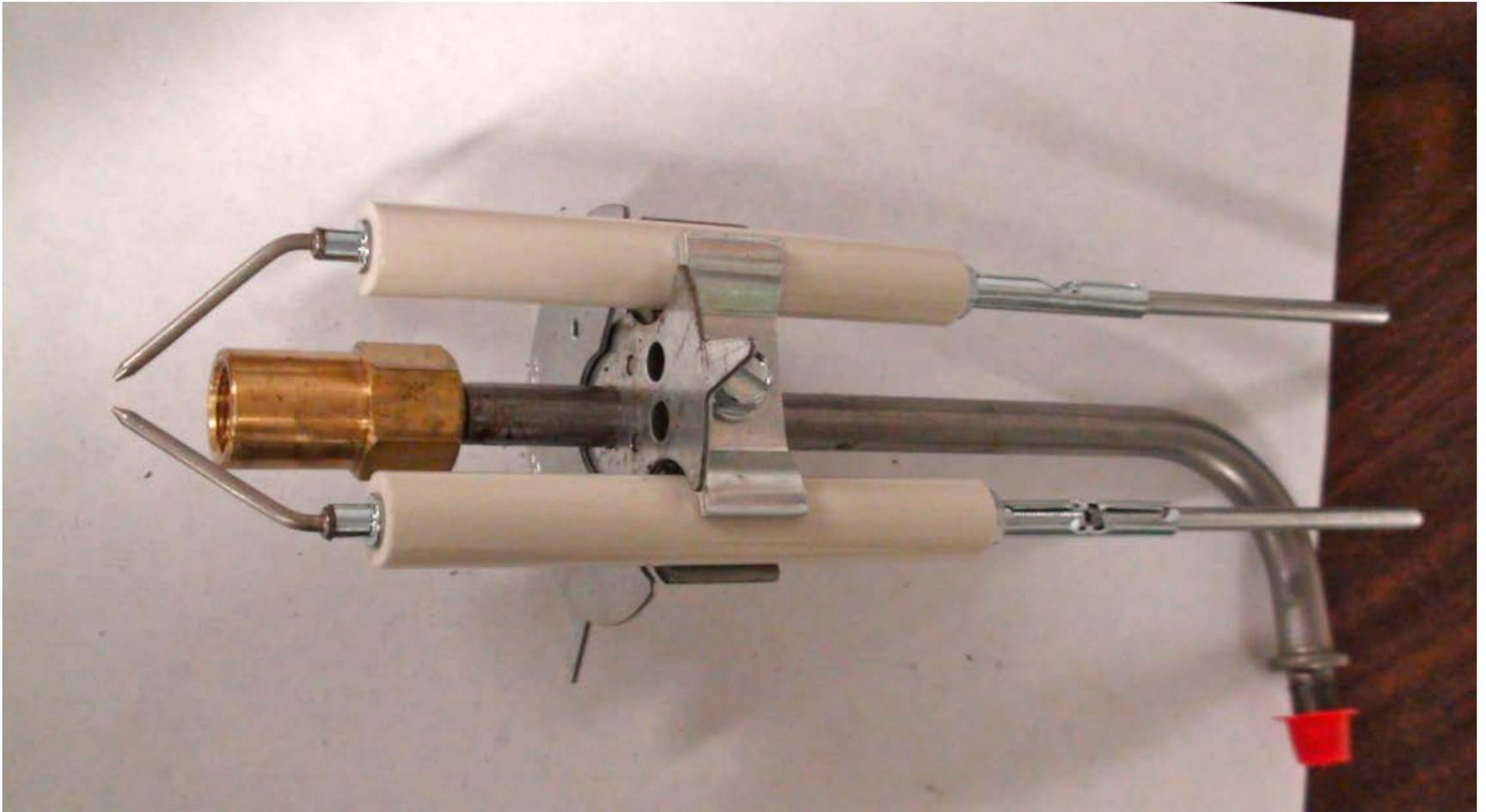
# Why There is a Problem with Starting the Burner

- 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



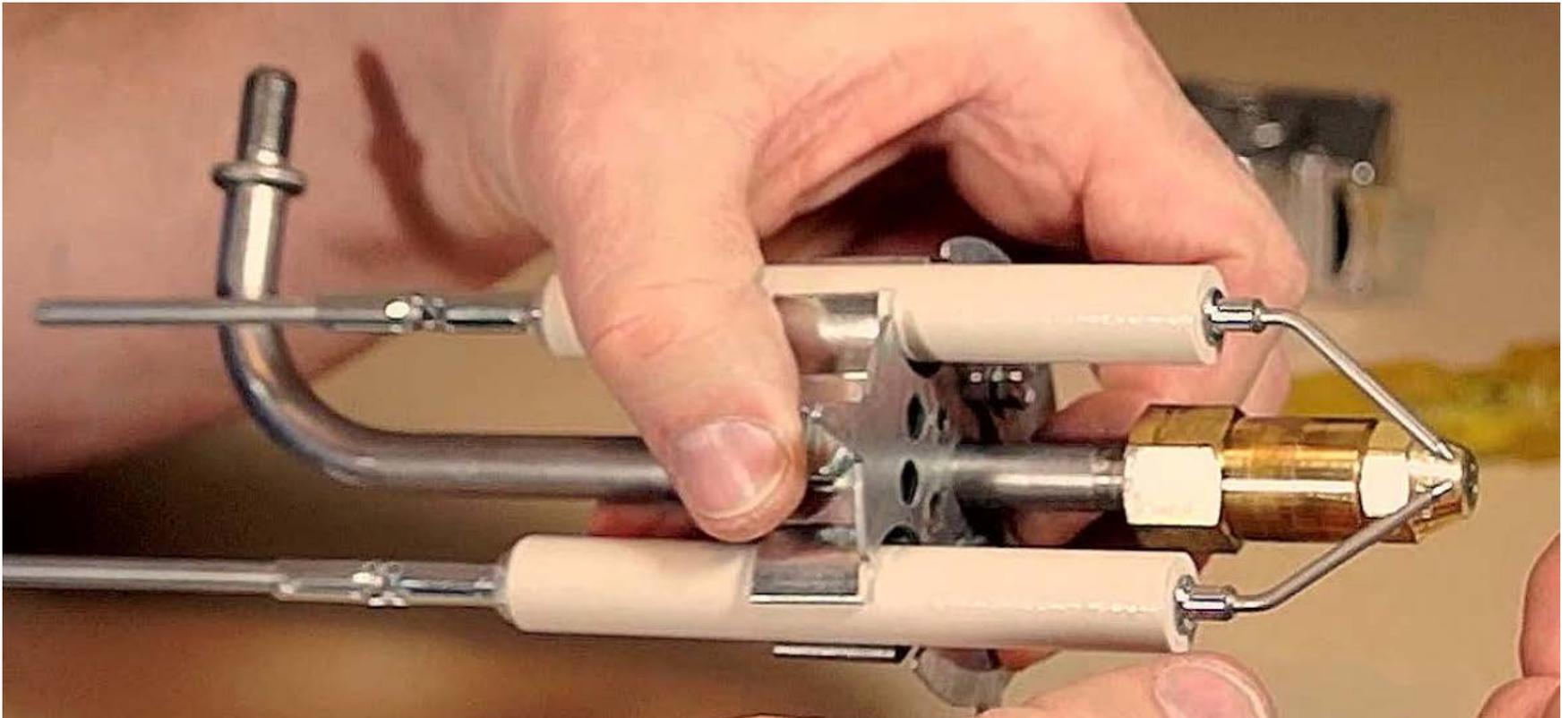
# Cracked Electrodes



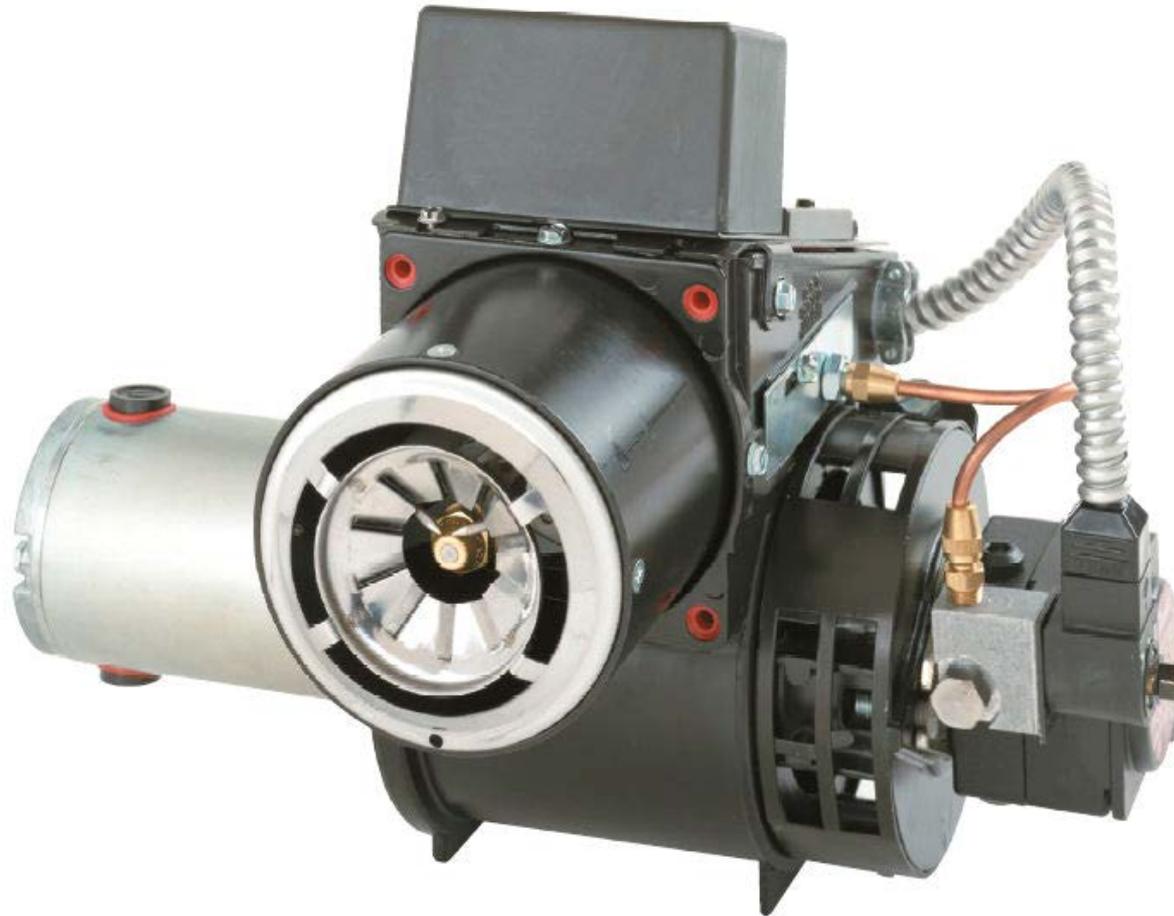
# Nozzle's Can Cause High Smoke



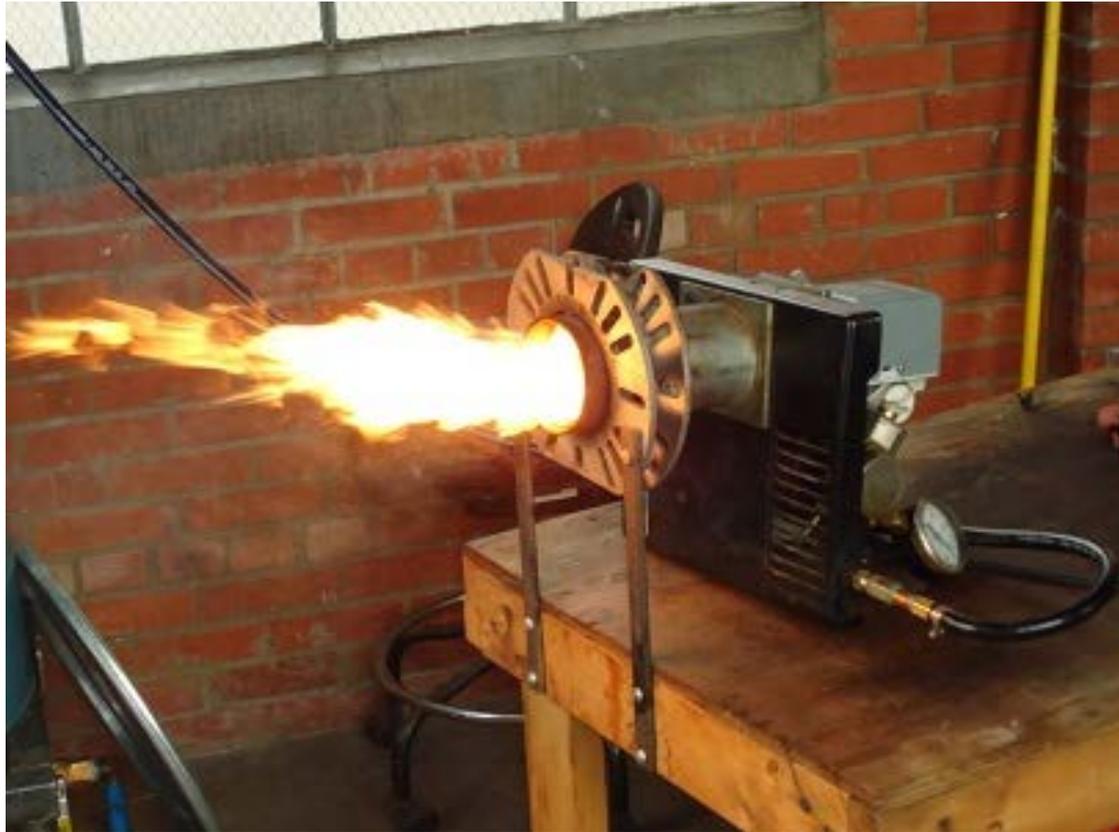
# Electrode Alignment



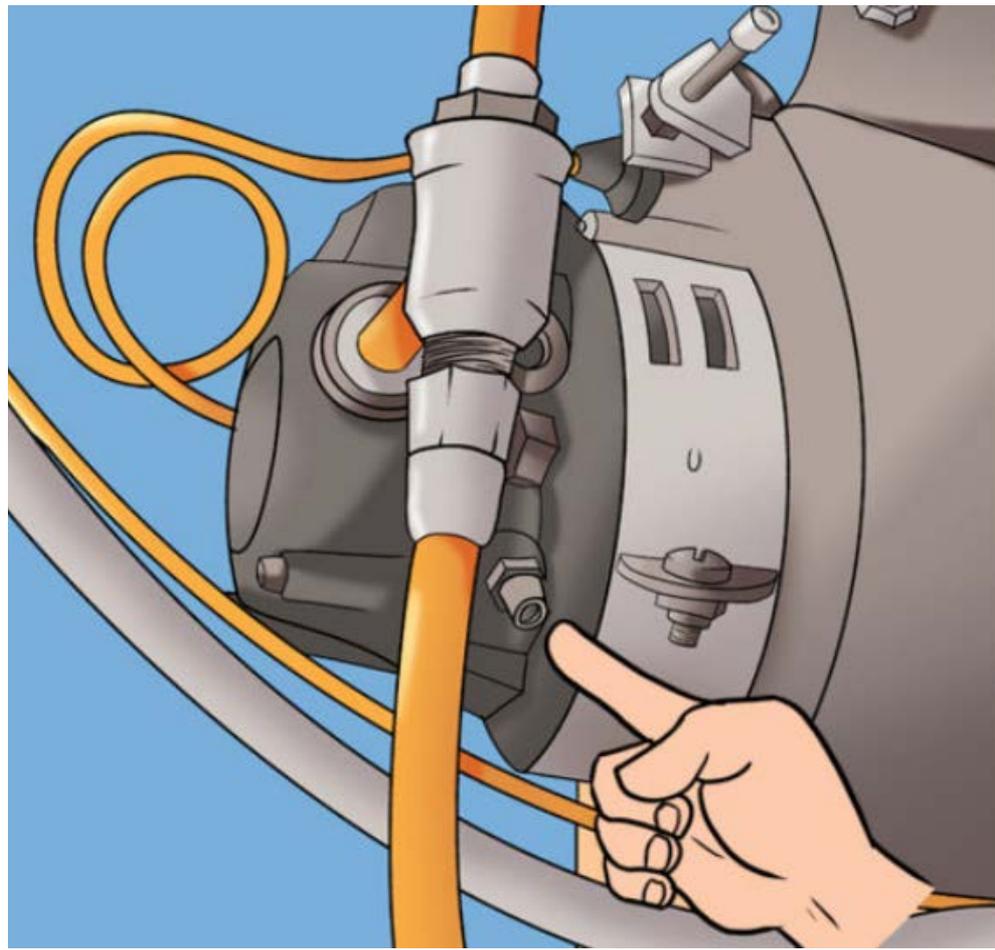
# Oil Nozzle in Burner



# Burner Flame



# Where the Air Line is Bleed



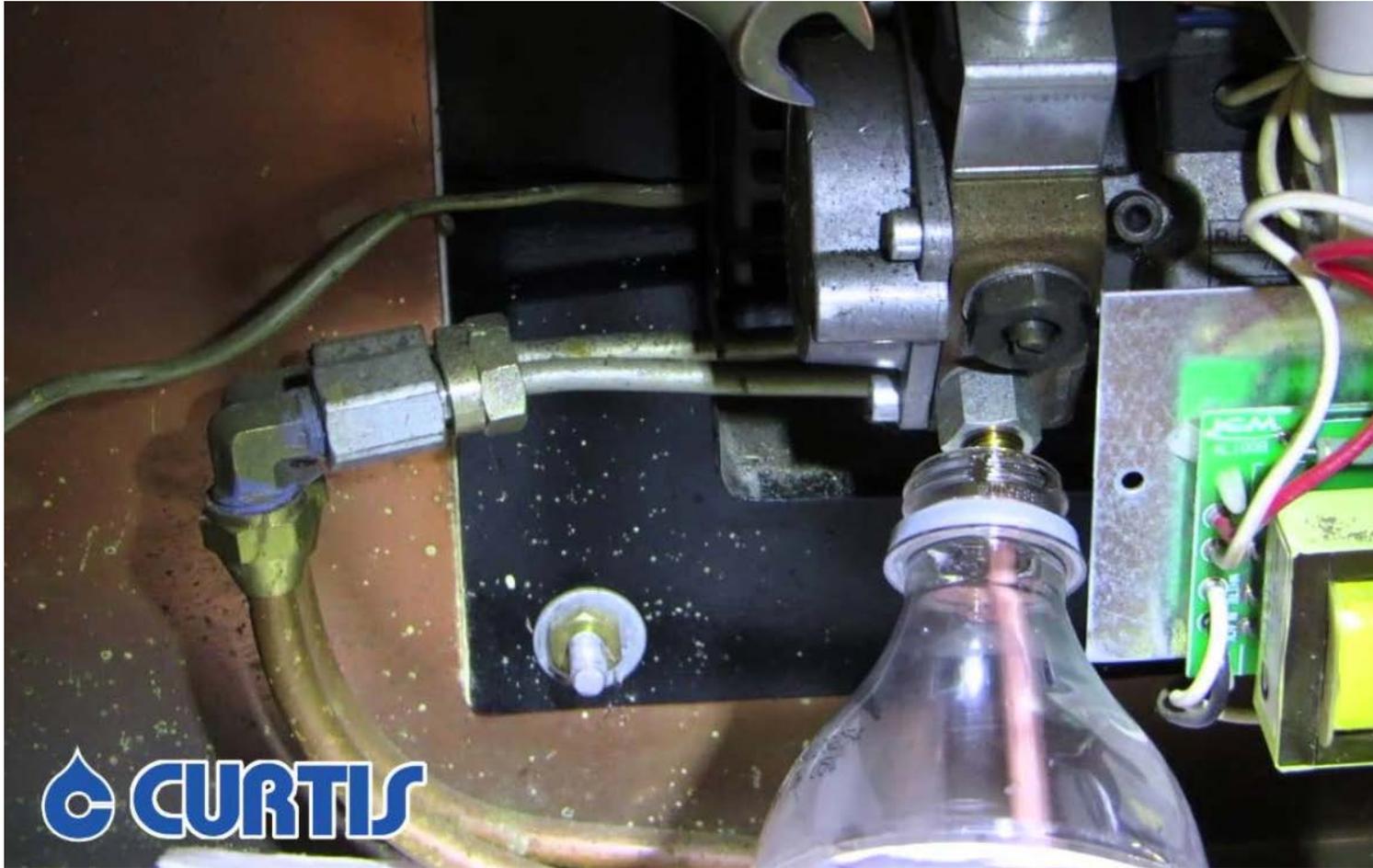
# Oil Pump on Burner



# 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 ).

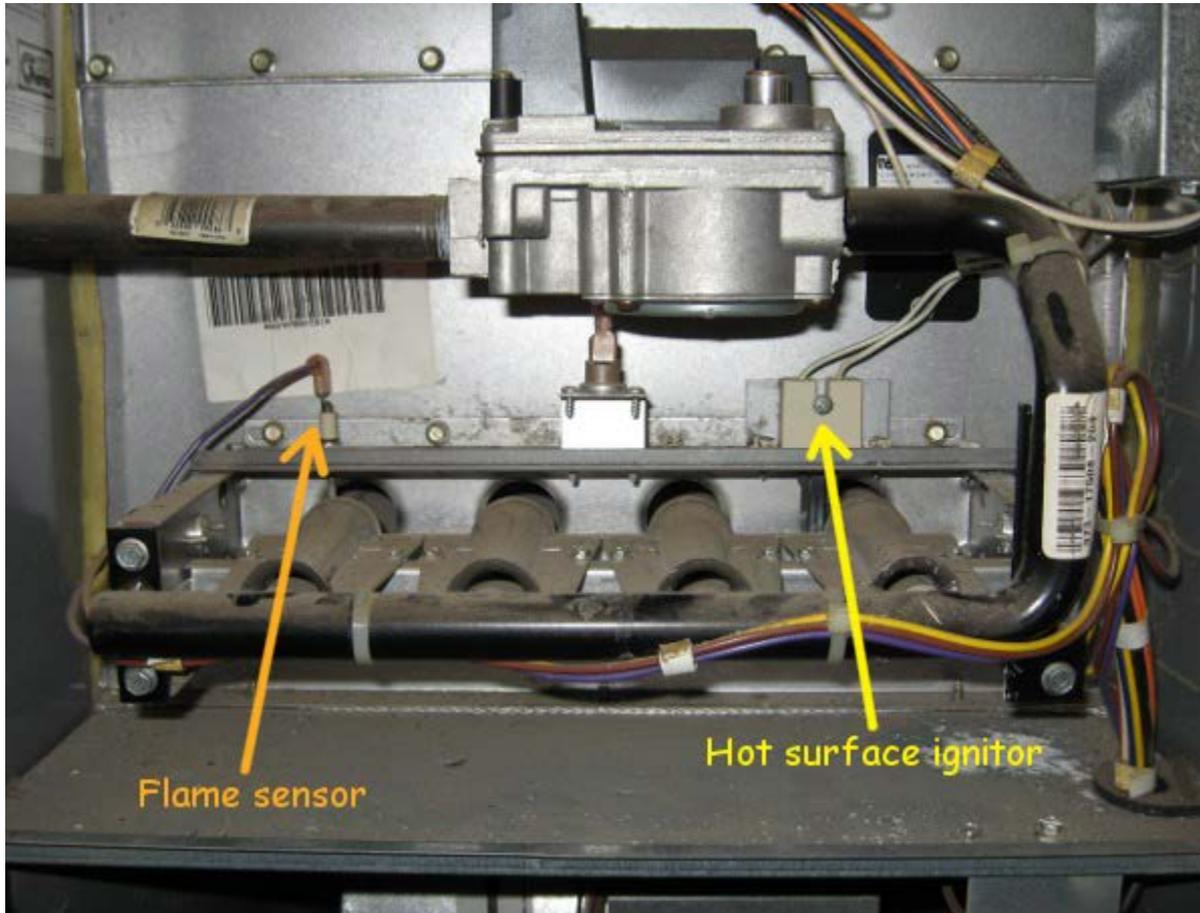
# Ribbon Burners



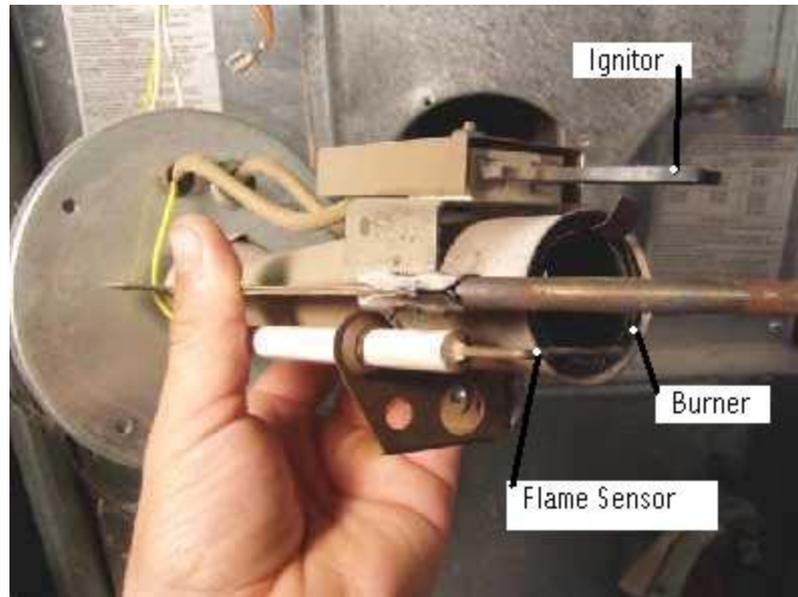
# Burners Lighting Up



# Ignitor and Sensor Location



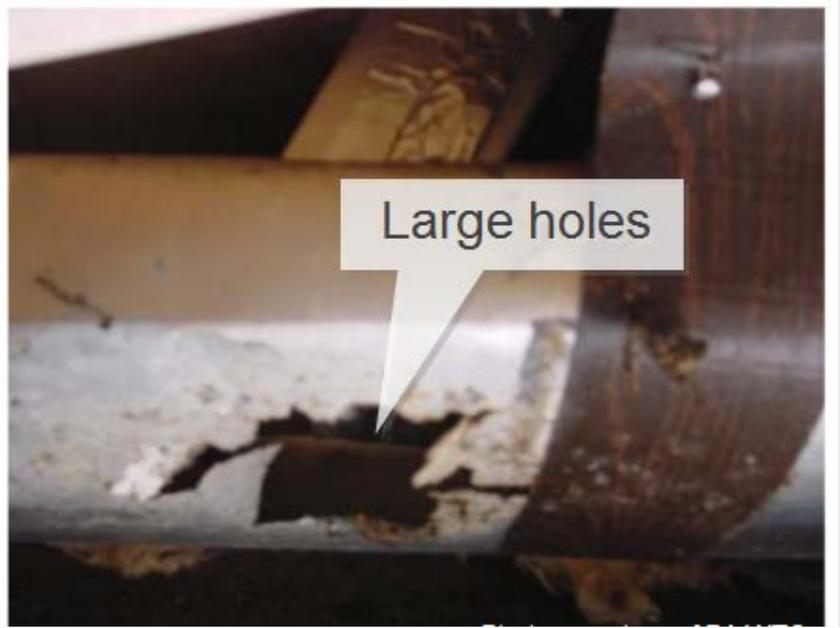
# MH Ignitor



# 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.

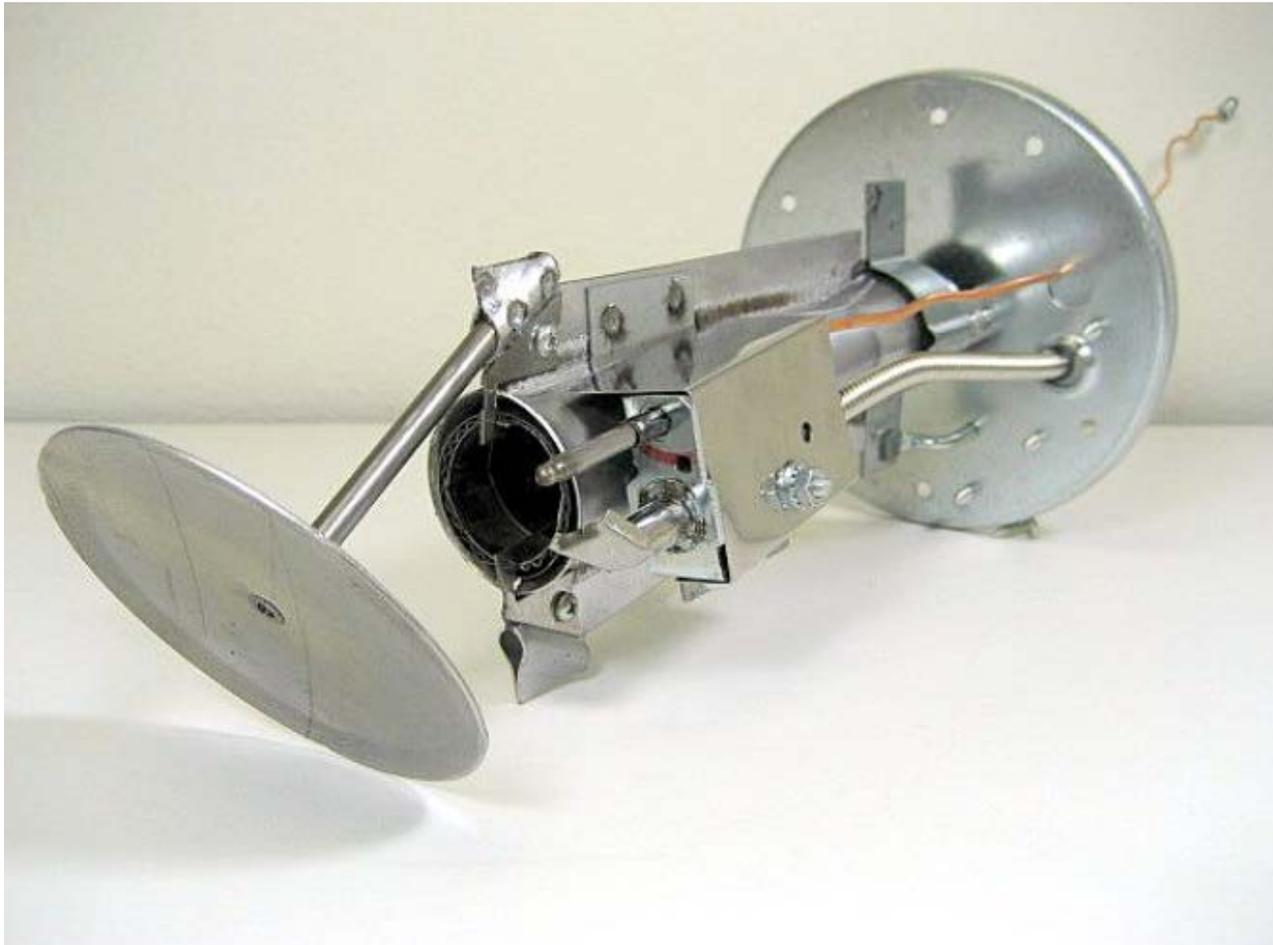
# Old Boiler



# 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



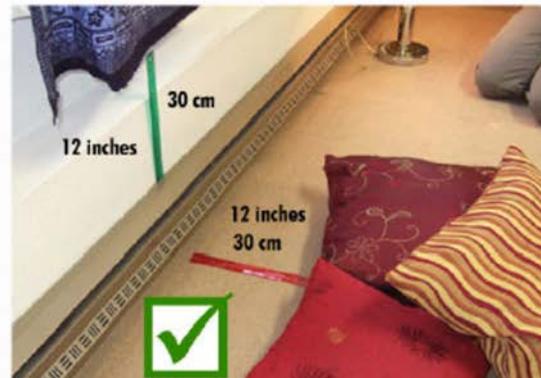
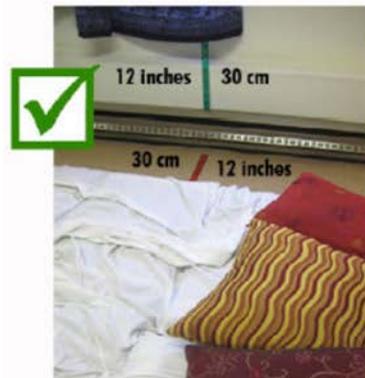
# Space Heaters



# Vented and Non-vented Heaters



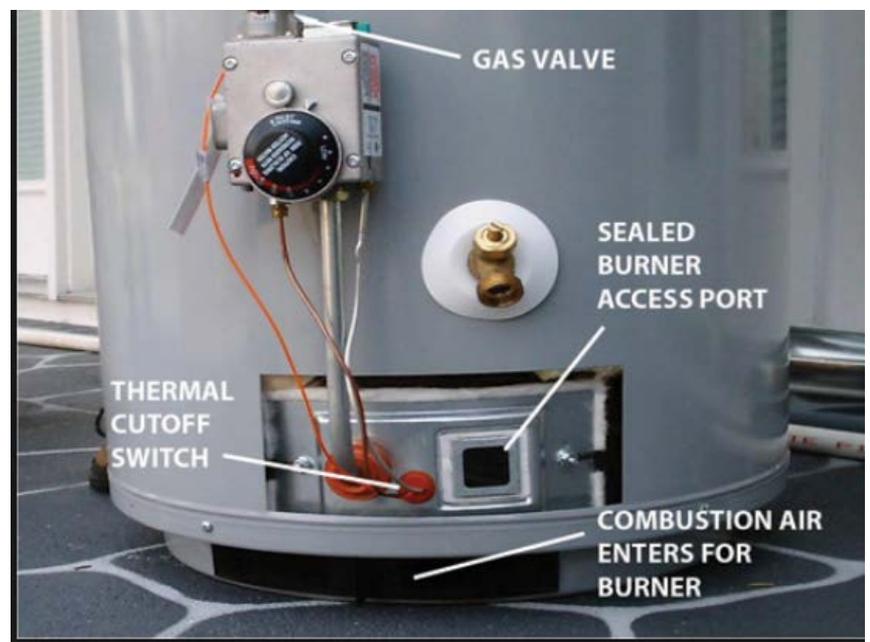
# Clearances Needed



# Portable Space Heater



# Water Heaters



# Leaning WH Tank



# WH Leak



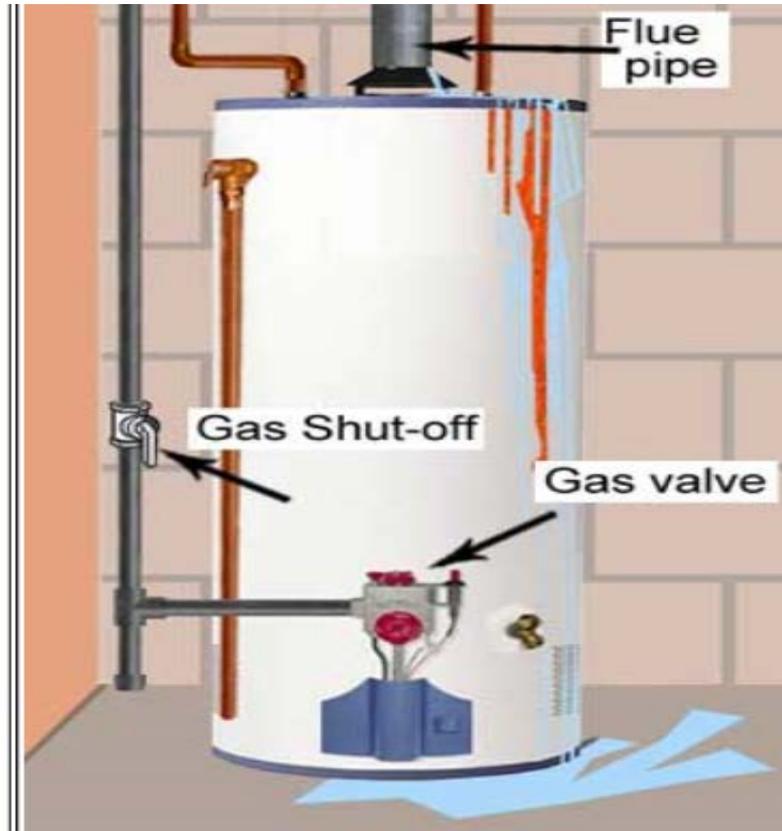
# Leaking WH



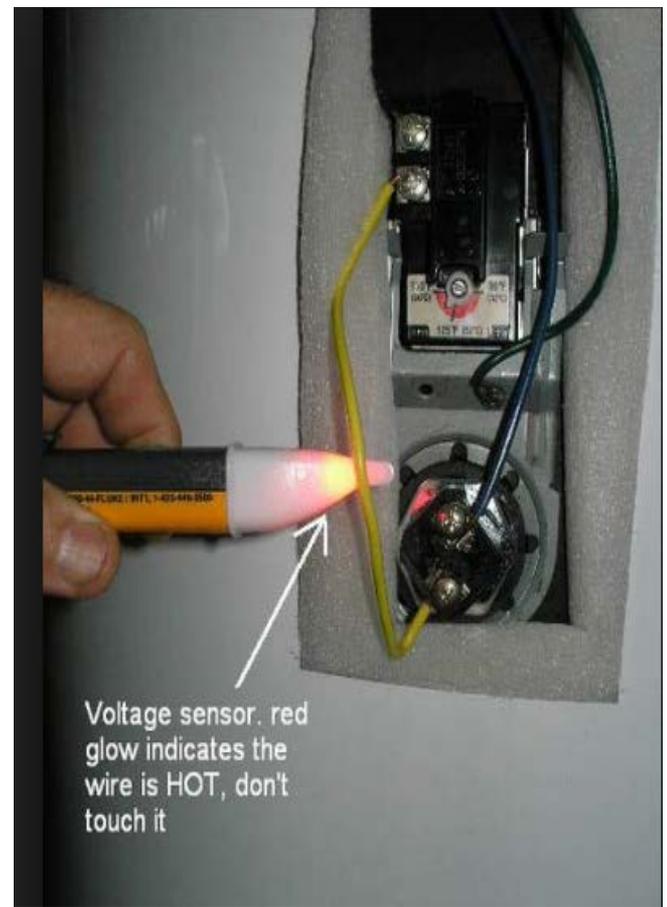
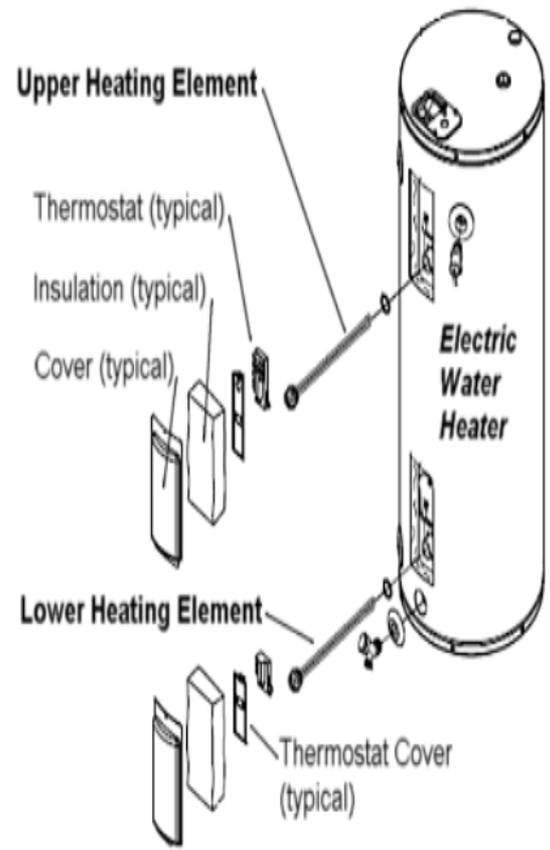
# Oil WH



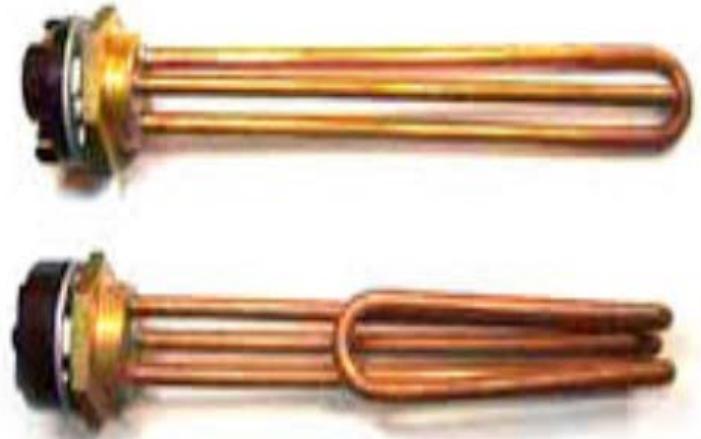
# WH Leaks - Do Not Stand in Water



# WH Elements Location



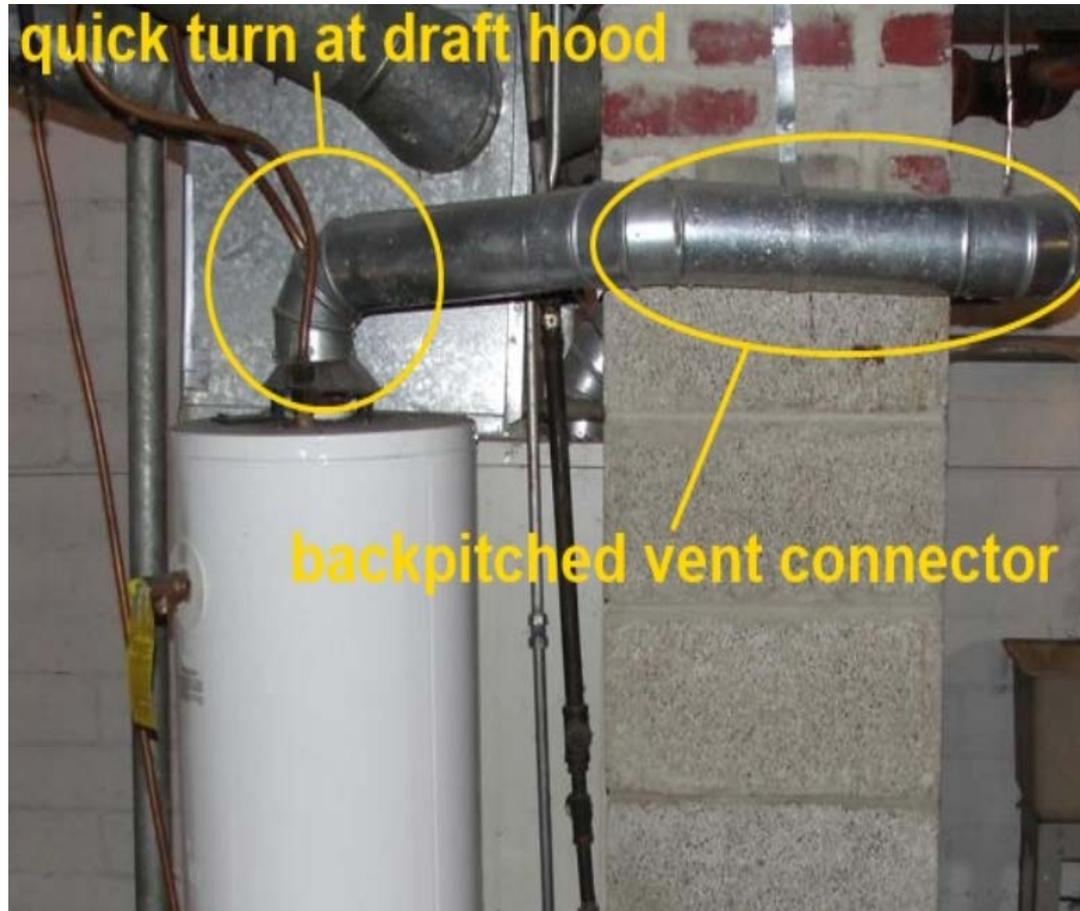
# Electric WH Elements



# Anode Rods



# Bad Flue



# Questions

# Thank You!

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