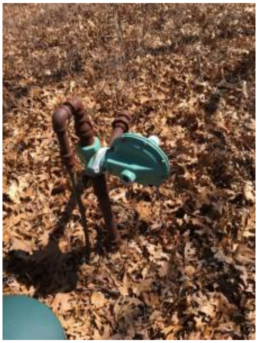
Furnaces and Forced Air Heat 101

YORK
ENERGY STAR

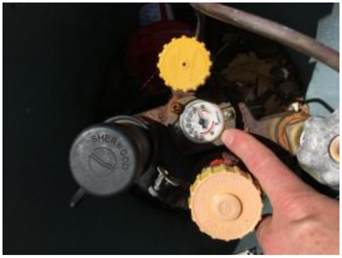
The descriptions and pictures below are designed to foster a basic understanding of the parts of your ***furnace and forced air*** system. When you call for service, we hope they will help you to identify those parts of your system that may need service. When you receive an invoice from us, we hope the information below will help clarify which parts and systems we worked on during our service visit.

A furnace is a device with combustion and the heating and delivery of warm air. Most of the furnaces we service and install are condensing with PVC flue pipes.



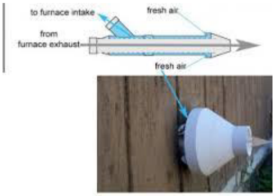
The **propane regulator** reduces the high pressure found in the propane tank to a safer pressure found in the pipe from the tank to the equipment inside. The regulator is either on the house or near the tank. Sometimes in the winter it can freeze up and get stuck, resulting in no propane to the house and no heat.

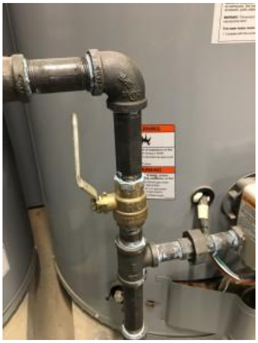
To check the **level of propane** in the propane tank, lift the lid and look at the percent gauge.



If your furnace is oil fired, then you can look at the **level gauge on your oil tank** (inside or outside). We do not service oil burners but we do service the forced air part of your furnace.

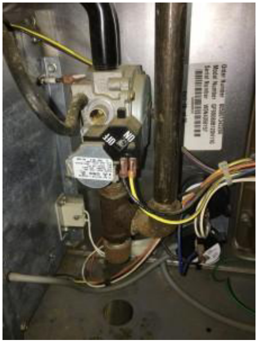
The fresh air intake and the exhaust pipe for the flue gases are commonly terminated outside of the building with a **concentric flue connection** (they must be located above the snow line to prevent blocking the flue)

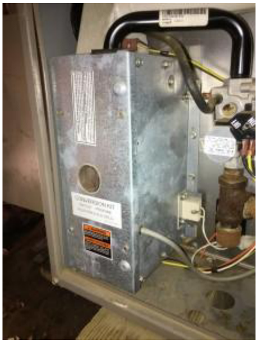




The propane is shut off before the furnace with a **gas shut off valve**

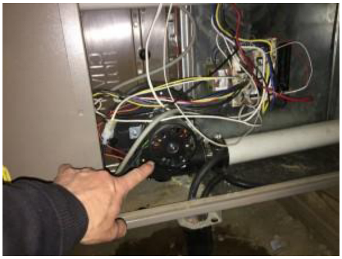
The **gas valve** admits propane into the burner tubes and is controlled electrically. This particular model has a pilot light that is lit by a spark during every heating cycle.





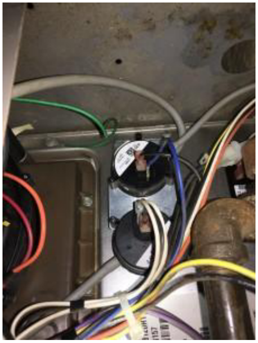
The **fresh air inlet box** is where the fresh air from outside is able to mix with the propane in the burner tubes

The **burner tubes** are located inside this fresh air inlet box – propane is forced through a small orfice to propel it through the burner tube into the heat exchanger.



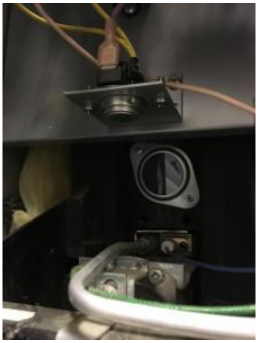
The **draft inducer** pulls the propane – air mixture through the heat exchanger and out through the concentric fitting outside.

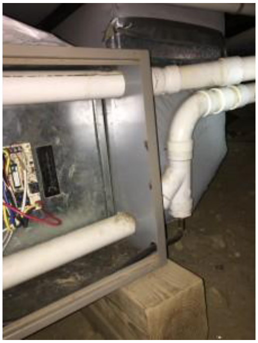
There are **pressure switches** which need to detect the proper flow of air through the heat exchanger before they will permit the gas valve to open to admit propane into the burner tubes.



Once the pressure switches determine that there is proper flow of air, the control energizes the **hot surface ignitor**. This glows bright red and ignites the propane – air mixture.

After the gas valve opens and there is ignition, the furnace is protected by **flame roll out switches** which detect when the flame is backing up and not flowing correctly through the heat exchanger.





The **flue exhaust pipe** and the **fresh air inlet pipe** are both made of plastic PVC pipe.

The entire sequence of combustion and operation is controlled by the central control board.

The furnace condenses a lot of water vapor out of the exhaust stream in the form of condensate. This is then collected and sent to a **condensate pump**. This pump sends the water outside via a small vinyl tube. Sometimes the condensate pumps fail and a large puddle forms under the furnace.

Once the heat exchanger is warm enough, the **furnace blower** will start flowing air through the furnace and the forced air ductwork system.