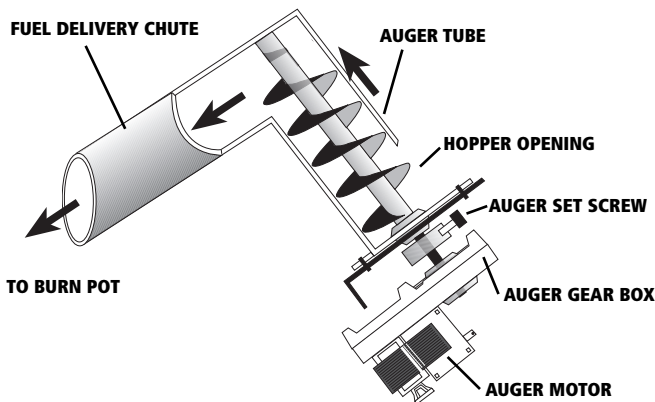
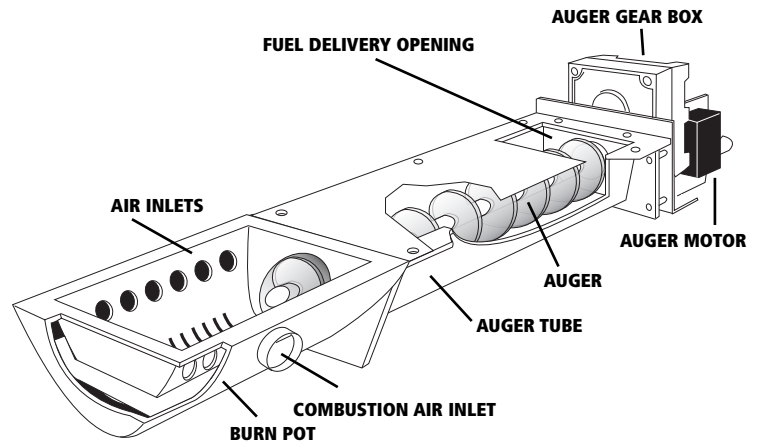


1.2 AUGER SYSTEM

The auger system is the "fuel feed control mechanism" referred to in the NFPA 211 definition of pellet appliances. By delivering small, measured amounts of fuel, the auger system contributes to both efficient combustion as well as long burn times. The auger system commonly consists of the auger, auger tube, and auger motor.



Auger System: Top Feed



Auger System: Bottom Feed

The auger is a screw type device whose flighting (action of the rotating threads) pushes fuel forward through a tube that leads to the combustion chamber. An electric gear reduction motor drives the auger rotation at a precise speed and operates at intervals determined by operator settings of the electronic controls. Different control settings deliver different amounts of fuel at a time by changing the length of time the motor feeds pellets, the speed of the motor, and/or the length of off time when no pellets are added to the fire. Thermostatically controlled systems in some appliances stop fuel feed when heat demand in the room is satisfied and restart the fire with an automatic ignition system when the room thermostat signals heat demand again. Other thermostat control systems reduce fuel feed to a low setting when heat demand is satisfied. This action, sometimes referred to as a pilot fire, keeps the fire going until heat demand signals the need to return to a higher fuel feed setting.

Each manufacturer calibrates the speed of the turning auger, as well as the on/off cycles of the auger motor in order to deliver the appropriate amount of fuel at each setting. The size and density of pellets result in unexpected fuel delivery in some appliances and require an adjustment to the supply of combus-

tion air. Manufacturer's instructions should be followed closely. It is advisable to order a replacement auger motor from the appliance manufacturer because the auger motor is calibrated to operate at specific rotation speeds for a particular appliance. The differences in auger system fuel delivery location are discussed below in the section on fuel delivery designs. Safety features of auger systems are discussed in Chapter 7.

1.3 BURN POT SYSTEMS

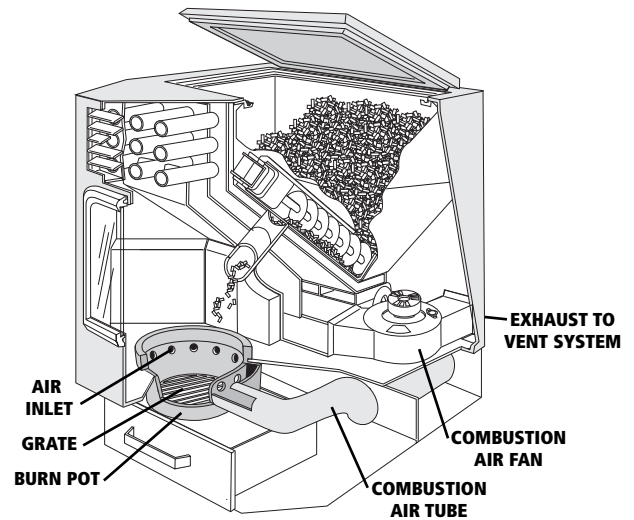
The device which receives the fuel and on which it burns may not appear at first to be a part of the fuel delivery system. We will consider it here because its design and function depend on the fuel delivery system. It is an integral part of the basic system design that determines fuel grade tolerance.

The term burn pot is used loosely in the industry, but here it refers to the component whose walls have holes that deliver combustion air from the air delivery system to the fire. Burn pots may be round or rectangular; they may be made of steel, stainless steel, cast iron, or ceramic materials.

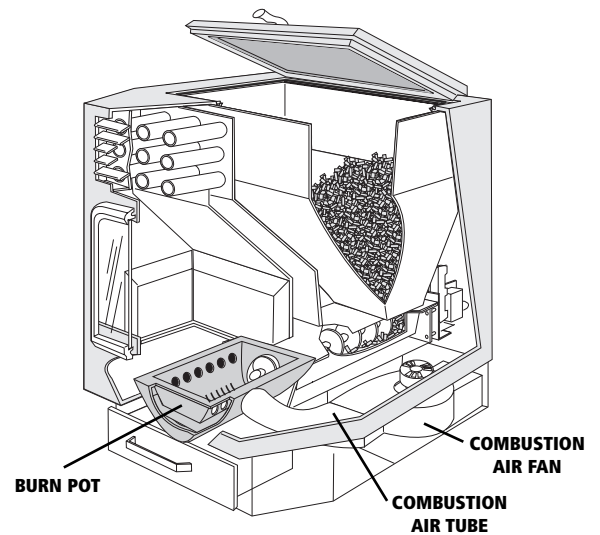
Some designs use a grate as part of the component. In some designs air enters directly to the fire; in others the air flows from the burn pot through a grate to the fire. The grate, if used, is a usually a steel or cast iron plate shaped to fit into the burn pot (generally cylindrical or squared-U-shaped) with holes for incoming air or stainless steel rods with spaces in between. Other units may have a hinged bottom instead of a grate. This bottom can be opened to remove ashes and clinkers with a pull rod.

As will be discussed further below, burn pot systems vary with appliance design, but they can be categorized generally according to function. In most top feed systems (see below) their purpose is to gather and deliver combustion air and to allow ashes to be blown away from the combustion area. Most have grates that fit down into the burn pot. Common variations include a grate whose spaced rods allow heavier ash and fusible materials that can form clinkers to drop to a collection area below.

In most bottom feed systems, both air and fuel flow directly into the burn pot without an intervening grate. Instead of being designed to promote ashes being blown away, the burn pot allows incoming fuel to push spent ashes and combustion by-



Burn pot: Top Feed



Burn pot: Bottom Feed