

STATIONARY FIRE PUMPS

BY BEN PEETZ

Drill #4 - Pump types:

Pumps can be either positive displacement or centrifugal.

Positive displacement pumps move a substance by trapping a fixed amount of it, then forcing that substance out of the discharge pipe. Because of the fixed nature of the mechanisms, there is little to no slippage within the pump, and thus they are typically capable of moving air as well as water. Positive displacement pumps are typically limited to self-priming pumps and are not used as firefighting supply pumps. A rotary pump is a type positive displacement pump used commonly for apparatus priming pumps, because they are capable of pumping air.

Centrifugal pumps are non-positive displacement, but are capable of adding velocity to water supply, which translates as pressure. This type of pump uses a spinning device called an impeller that draws water in near the center and accelerates it radially outward from the center of the pump housing, giving it velocity.

Horizontal split-case and vertical turbine pumps are the most commonly seen centrifugal fire pumps, though other types do exist. Horizontal split-case pumps are often used for water supplies that have enough head pressure to enter the pump at ground level without a need for priming. They are often supplied by municipal systems, or elevated or on-ground tanks.

Vertical turbine pumps are used where water must be drawn up from a well or pit. This type of pump maintains the driver at ground level, while a shaft of needed length powers turbines that are in place at the lowest portion of a dip tube or well casing. Because the impellers are located below the water level, there is really no suction by the pump. Instead, this pump stays primed by having impellers located below the water level, and thus pushes the supply up from that level upon activation. For ponds or cisterns, the pump may only have a short distance to elevate the water, while some deep well pumps have shafts that are very long. For these pumps, an electric motor driver is installed in a vertical orientation directly above the turbine shaft, while in the case of a diesel engine, a right-angle gear must be used to drive the pump.

