

Miniature Small Scale Live Steam Locomotives

All the locomotives you are watching run on this layout are powered by steam not electricity.

What does that mean?

It means inside the locomotive boiler there is a fire where a fuel (either Alcohol, Butane, or Coal) is burned to produce heat. The heat is used to boil water thus producing steam. The steam contains a lot of kinetic energy; which is used to push the pistons, which in turn drives the wheels of the engine around. We use distilled water to keep sediment down inside the small boilers. In addition to fuel and water we also use an oil to lubricate the pistons and valves of the engine.

How does a steam locomotive work?

A valve called the throttle is placed between the steam dome, on top of the boiler, and the valves that control the timing of the steam into the drive cylinders. This valve operates like the valves that controls the water faucet in your house. If you shut it off no steam flows and the locomotive does not move. If you open it full the steam flows to the cylinders causing the engine to run very fast. Setting it somewhere in-between will cause the engine to run slower or faster depending on the setting. There are also valves that allow steam to enter the cylinders at certain intervals to control which direction that the locomotive will operate.

What else is used to control the locomotive?

There are many more controls and indicators used to control the operation of the locomotive and to know what is happening inside the locomotive boiler. We determine how much water is in the boiler with a sight glass. We know how much pressure is in the boiler with the pressure gauge. Some locomotives need a blower to create an artificial draft to help keep the fire burning properly when stopped and running with no load. A safety valve protects the boiler from too much pressure.

How do you add water to the locomotive?

There are several ways to add water to the boiler. One method is through a filler sometimes provided on the top of the boiler. Other boilers are connected to a hand-powered water pump in the tender. Still other locomotives have a pump connected to an axle and water is pumped in continuously when the locomotive is running. There needs to be a check valve that lets the water into the boiler but does not let the steam out when there is pressure in the boiler. Water may need to be added during the run to avoid running the boiler dry and damaging it.

How do you add fuel to the locomotive?

On an alcohol fired locomotive the fuel is added to a fuel tank, like the one in your car only much smaller, using a syringe. On a butane gas fired locomotive there is a filler valve on the top of a pressure tank like those on a cigarette lighter. Propane is too dangerous to use as pressures can be too high for the small tanks. A locomotive

using coal is the closest to the real thing when firing. Charcoal soaked in lighter fluid is first used to start the fire and then small pieces of coal are added until there is a nice hot fire. Most locomotives operate from fifteen minutes to over an hour on one fueling.

How is oil used in the locomotive?

A special **steam oil** is used to lubricate the pistons in the cylinders and is stored in the lubricator. Most engines use what is called a displacement lubricator. As steam passes through the lubricator some of it condenses into water and sinks to the bottom forcing a small amount of oil into the steam line. This oil is then carried to the cylinders and valves where it is used to lubricate the internal moving parts. External lubrication of bearings and moving parts is done before a run with a light weight oil.

How much can a locomotive pull?

A small steam locomotive may pull only a few cars. Larger locomotives can pull 50 or more cars. Some locomotives are so big and strong that even on the larger outdoor layouts no one knows just how many cars can be added. The power of a locomotive is determined by many factors most of which are the same as for real locomotives - axle loading, track conditions, and locomotive control settings.

Where can I buy a live steam locomotive?

Most locomotives are ordered by mail-order directly from the manufacturer or one their sales representatives. Some traditional hobby shops are beginning to carry this type of trains. Some times the wait for a new locomotive can be a few years. Look for information in magazines about the model railroad hobby and in particular garden size railway publications, i.e.; *Garden Railways*, *Steam in the Garden*, and *Finescale Railroader*.

How much do locomotives cost?

Locomotives are available in ready-to-run or in kit form. Manufactures are found all over the world - Australia, Great Britain, China, Japan, North America and other countries. They can cost from about \$400 up to the high end equaling the cost of a mid-size automobile for a large articulated type locomotive. Many locomotives are hand-made by the individual only from plans and raw materials or parts.

Web sites to visit for more information.

<http://www.nmia.com/~vrbass/steam/steamfaq.htm>

<http://www.mylargescale.com/>

<http://mssls.info/>

<http://www.southernsteamtrains.com/>

Or go to a search engine like Google on the internet and type in "Live Steam" for much more information. Many times attending a show or convention or joining a group is an ideal way to meet people with similar interests that will be more than willing to answer any questions and share their personal experiences.