

Lubricator – Some facts by Mike Chaney

The purpose of the lubricator, (and I include this for those who are new to steam locomotives), is to add oil to the steam feed and form a lubricating film between the sliding parts of the cylinders and steam chest. There are two principal types of lubricator used on model steam locomotives.

1. Mechanical, where a pump is driven by the motion of the locomotive. These are more normal on the larger "ride-behind" gauges and uncommon, but not unknown, in Gauge 1.
2. Displacement, where steam is introduced into the top of a sealed container containing oil, condenses into water which, being denser, sinks to the bottom displacing oil as it does so.

Displacement lubricators may then be further sub-divided:-

- a) In-Line. The steam pipe passes through the lubricator on its way from regulator (throttle) to the cylinders. A small hole in the pipe allows steam to escape into the lubricator and the displaced oil to enter the steam line. This type is often located in the cab, which means that the oil has to pass through any steam drying or superheating pipes on its way to the cylinders, which may cause carbonisation and eventual blocking and failure of the steam pipe.
- b) Dead-Leg. A small diameter pipe is feed into the main steam pipe or the steam chest, its other end terminating inside the lubricator. Its action is otherwise the same as the in-line type. The dead-leg has many advantages of which the principal one is that it can be mounted downstream of the superheater, close to the cylinders. It is also much easier to fit some form of needle regulator to adjust the oil delivery. There are those who claim that it cannot possibly work. (Aerodynamicists have proved that the bumble-bee cannot possibly fly. The bumble-bee however, having no knowledge of science, just carries on flying.) In fact, the constantly varying pressure in the steam chest whilst the loco in motion causes a pumping action allowing the alternate passage of steam and oil, in opposite directions, down the same pipe. ("Alternate" is used in its Brit speak meaning of "one and then the other and so on".) For it to work there must be space in the top of the lubricator for the steam to compress and expand and there must be NO sump in the pipe where condensate may collect.
- c) Parallel-Feed (for want of a better name.) A variation on the In-Line, where a separate feed is taken from the regulator, via a metering valve, to the lubricator. The outlet pipe bypasses any superheater and is fed directly to the steam chest. Although more complicated to make, this is probably the most effective as oil is only delivered when the regulator is open, and the flow may be adjusted as the loco becomes run in and needs less oil, resulting in a cleaner engine.

Q1. Is a little hole in the end of the pipe better than a big one? The size of the hole is not important - what seems to matter is the steam space above the oil and the volume of the steam chest (or its equivalent), as these determine the extent of the pumping action. In both cases, the larger they are, the more oil you get. In my lubricators (Mamod-Mod, Kitten, Hero, Catatonk 24T Shay and 14T Heisler), the filler cap is hollowed out to give the optimum conditions.

Q2. The amount of condensate I get out of the drain plug is minimal or nonexistent. This could have something to do with the "S" curve in the supply pipe that I had to put in to place the lubricator?

You could be right. The pipe may go "up and over" but never "down and under" an obstruction. Water will collect in the dip and prevent the oil from passing.