**The Ludlow Mold Cooling System**

**The Ludlow Model L Typesetting Machines, serial numbers 1-13,999 had an integral fluid tank on the frame which held 5 gallons of fluid, this fluid should be 4.5 gallons of, Ludlow recommended "Distilled Water" due to the different water qualities around the world, and 1/2 pint of "Water Soluble Oil", the oil furnished by Ludlow was a petroleum-based product that would separate from the water if not changed yearly, Ludlow recommended to change every 6 months, but I feel this was to sell more product. Nowadays there are a lot of synthetic replacements that work quite well and are less messy. The Ludlow original oil would turn the water a milky white, the synthetics will do so to a degree but it is not as prominent. Also, with the synthetics I tend to use 1 full pint or up to 1 quart of the oil to each 4.5 gallons water. I am not certain if this is necessary but I tend to err on the side of caution as the synthetics are new to me and I have not done a full study on their effects. The oil in the water was intended to lubricated the mechanical pump, which is metal to metal on the inside and to keep it from rusting and seizing up and also supposedly to keep the inside of the mold from rusting.**

 **The Ludlow model M Typesetting Machine was equipped with a refrigerated water cooler holding approximately 1 to 1.5 gallons of fluid, Ludlow also recommended using the “Water Soluble Oil” in this unit but I find that a mixture of 50/50 antifreeze and water works just as well and is cleaner and does not separate over time and clog things up. The internals on the Refrigerated system are mostly copper and plastic so I do not feel that the oil is necessary as the antifreeze tends to keep the insides from rusting on cars and also it helps to absorb the heat better and discard it through the internal radiator. The Ludlow Model M Typesetting Machine was designed to be faster so that was the reason that Ludlow felt they needed the refrigerated cooler instead of the volume cooled older version. These machines are not used to set the volume of type as they were in years gone by so some people, when having troubles with the refrigerated units, have gone back to the volume cooled systems by adding an external electric pump and a 5-gallon bucket filled with 50/50 antifreeze and water to keep the mold cool. This system works well on the Model M, with the one exception of that it does not cool the slug as fast as the refrigerated system so you have to give the slugs a little more time to sit on the tray before handling them.**

 **With this being said, the refrigerated systems are repairable, the pumps are available and the refrigerated portion is repairable by a competent a/c repair person, if you can find one that will work on it for you.**

 **It has been pointed out, on a Facebook thread, that you can run a Ludlow without water circulating through the mold. While this is true to a certain point, I do not recommend it as you can only set a very few lines before the slugs get very hot and you have to let the machine set for a while before casting more and there is a chance of the mold warping or separating due to excessive heat. Also the hotter the mats themselves get they are more prone to, due to a soldering action, getting typemetal stuck on the bottoms or sides of them and causing hairlines or flashing on the slugs. One other detriment is if the slugs get hot enough, they will not fully solidify on the bottoms and you will get air pockets or soft bottoms to the slugs and the ejector blade can dig into the bottom and cause the slugs to start sticking in the molds. There is also the chance of metal sticking to the inside of the mold cavity and then the slugs will start sticking in the molds.**

 **Now for the mold itself. From time to time the mold will get stopped up, this is due to not using the oil or not changing the water and oil mixture enough or just crud in the system. This is a fixable problem. There are 6 brass plugs on a newer double water-cooled Ludlow mold. What I do is take a Wire Gauge number 36 drill bit and drill a hole in the CENTER of each of the 6 brass plugs. Then I take a coat hanger sized wire and run it through each hole all the way to loosen and dirt and crud that is lodged in the mold cavity. Then I take a pressurized water source and connect it to the mold at each hole if possible and flush out the debris. I do this until I only get clear water coming through. Then I take an 6-32 tap and tap each hole about ½ the way through the brass plug. Then I use a 6-32 headless short screw with some Loctite on it to keep the spot from leaking and screw the screw in snugly, it does not have to be super tight but snug so that it will not leak.**

 **Next is the water tank on the Model L. This tank is prone to getting full of sludge due to the water and petroleum soluble oil separating. There is also a brass filter in the bottom of the tank right under the fill door that can sometimes get clogged due to the same separation process, this filter will need to be removed and cleaned from time to time. The refrigerated cooler does not have the filter but the copper lines and tank inside will get clogged and need to be cleaned periodically as well. Using the 50/50 mixture of antifreeze and water in the refrigerated until will eliminate this effect. If the mechanical pump on the Model L is eliminated and replaced with an electric water fall type pump ( I like to use Grainger number 1P372 ), the oil can also be eliminated in that unit as well.**

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**10-04-2021**