

The Dreaded Vapor Lock

Why Does My Model A Not Want to Run Right on a Hot Day?

Back in February, our club had a tour out to the Chino Airport to visit the Air Museum. The morning of the tour was clear and cool and it was a pleasure to get the car out for an extended drive after the long COVID shutdown of activities. On the 28 mile drive out to the museum, my Tudor ran well but that afternoon when returning back home it was another story. After a few miles of driving, when I would have to come to a stop at a traffic light, the engine would not want to idle and had a great deal of difficulty getting back up to speed again. Once up to speed, the car would run better and was fine until the next stop light was encountered. I was able to nurse the car home but there were a few times that I thought I may have to stop and raise the hood. I suspected the problem was in the carburetor with a piece of dirt that had gotten into in one of the jets.

The next morning, I took the car to my shop to fix the problem. It was cool and the Tudor ran very well with no apparent problems. Upon disassembly of the carburetor, I did not find any evidence of dirt and everything seemed to be in order so what was going on? Model A problems usually do not just fix themselves on their own but require some kind of intervention.

A few days later when I heard some others who had been on the tour had similar problems, it finally dawned on me that what we had experienced was "Vapor Lock". Vapor lock usually only happens in the summer on a hot day when driving in the mountains. Our tour was in February and we were also near sea level so how could this have happened?

Vapor Lock occurs when somewhere in the fuel delivery system, the liquid fuel boils, or changes state from a liquid to a gas (or vapor). The Model A carburetor depends on the fuel being in a liquid state in order for it to meter and atomize the fuel into the correct mixture with the incoming air.

The tendency for liquid fuel to change state from a liquid to a gas is governed by 3 factors: temperature, atmospheric pressure and the fuel itself. Elevated temperature and low atmospheric pressure, such as driving to the mountains on a hot day can promote boiling of the liquid fuel. The formulation of the fuel itself will also determine its boiling point. California mandates a special "Winter Blend" fuel for our area that has a lower vapor pressure or boiling point than the "Summer Blend" fuel that is sold during the hotter summer and fall weather. The February day this tour took place was unusually hot and we were using winter blend fuel. When our cars would stop at a traffic light, the engines were warm and with very little fresh fuel being delivered to the carburetor at idle, the fuel in the hot carburetor would boil and the symptoms of vapor lock would occur. After once

again getting back up to speed, the cooler fuel entering the hot carburetor would reduce the temperature of the fuel already in the carburetor and the boiling would stop. The engine would then run well until the next time the car had to come to a stop.

What can be done if vapor lock is encountered? The immediate cure is to cool the fuel that is in the carburetor. Park the car for 10-15 minutes with the hood up to allow the engine compartment to cool, use water from a squirt bottle or just pour water over the carburetor or, as some owners do, place ice on top of the carburetor.

What can be done to prevent vapor lock? We cannot reduce the tendency of the fuel to boil by increasing the atmospheric pressure so this is not an option. We cannot reduce the temperature of the fuel in the tank unless we want to use some sort of a refrigeration system which is not practical. However, we can do a few small things such as insulators or heat shielding to reduce the temperature of the carburetor itself. But, this is not effective enough to completely prevent vapor lock from happening if the conditions are right.

The most effective remedy available to us is to increase the boiling point of the fuel itself. This can easily be done by adding something to the fuel which many owners of old cars have been doing for years. Fuel stabilizers such as "Sta-bil" not only extends the life of today's fuels but will also raise the boiling point a little. However, this can be costly especially if driving long distances such as when on an extended tour. Adding Marvel Mystery Oil (MMO) will help and also keep the valves lubricated.

A more cost effective solution may be to add a little diesel fuel or mineral spirits (paint thinner) to every tank full. Early V-8 Ford owners have been using mineral spirits or diesel fuel for many years in their flat head Fords which are very prone to vapor lock.

You will have to experiment a little to find the right amount of additive that will work well for you. For fuel stabilizers, start with half the amount suggested on the label for fuel in long term storage. For Mystery Marvel Oil, start with 1 ounce per 5 gallons and adjust from there. If you want to try mineral spirits or diesel fuel, ½ pint per 5 gallons is a good place to start. Personally, I like to use diesel fuel. It is inexpensive and readily available if on a tour. I carry a one gallon can with me which is good for about 150 gallons of gas. If you have the choice, purchase fuel that does not contain ethanol. Ethanol free fuels will have a higher boiling point than fuel that contains ethanol.

