

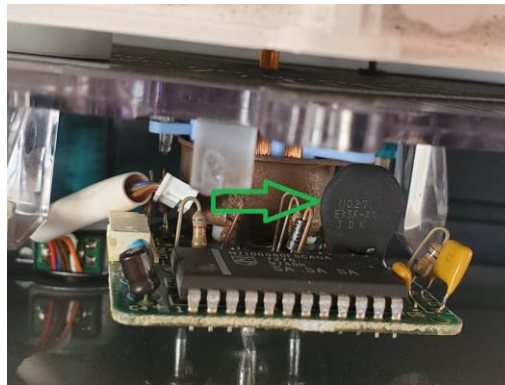
1994-1998 Mustang Instrument Cluster Preventative Maintenance

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I repair a lot of SN95 instrument clusters for people and, these days, I am seeing a lot of failures due to age. One particular failure can be pretty catastrophic.

The instrument clusters in SN95 cars have been in service for about 25 years now and there is an Always-Hot power trace that goes to the speedometer in the cluster. That means that part of the speedometer circuit has been under constant power for 25 years minus the time you have had a dead or unhooked battery.

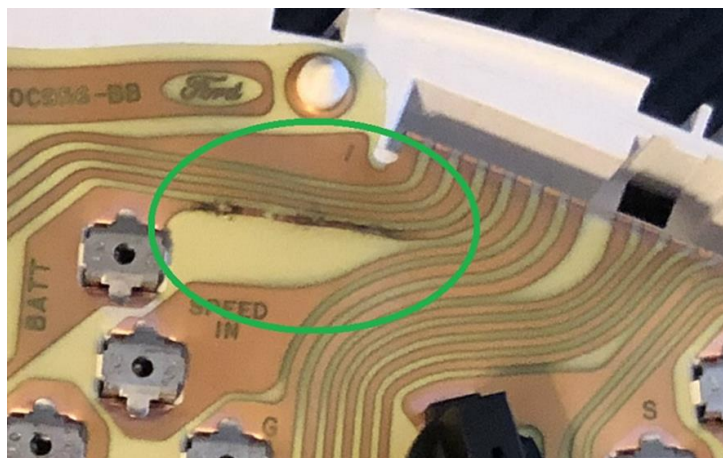
One of the components that is constantly powered is a surge suppression device called an MOV (Metal Oxide Varistor.) The MOV is designed to route any power surges it sees to ground, and to look like an open circuit at battery voltages. The MOV is the black disk show in this photo of the speedometer PCB:



Unfortunately, when these MOVs fail due to old age, they usually short out straight to ground. The fuse for the Always-Hot circuit is too large to protect the instrument cluster. As a result, the Always-Hot PCB trace on the back of the instrument cluster often burns out but sometimes the fuse will blow. Here is a photo of a typical burned trace (circled in green):



Here is a closeup of a burned trace:



I have also seen a couple of cases where the speedometer MOV has not completely failed, but has created a large current draw that will drain your battery. If you are seeing excessive current draw when your key is off, the speedometer is a likely culprit.

There are also MOVs in other modules of the SN95 instrument clusters, but they all are in switched power circuits, so they have not been powered up for nearly as many hours. I have not seen any of the other modules fail yet. But they are equally as old. It may make sense to replace all of the MOVs in your cluster.

The tachometer also has an MOV. Early SN95 clusters have fuel gauge anti-slosh modules in them, but they did not have an MOV in the circuit. However, all of the later fuel anti-slosh modules do have an MOV in them. Some SN95 cars also have an anti-slosh module in the low coolant light circuit. If your cluster is equipped with a low coolant anti-slosh module, it will also have an MOV surge suppressor.

I recommend that, at a minimum, you replace the speedometer MOV in your cluster to prevent a burned PCB trace. While you are at it, you could replace the 1 to 3 other MOVs in your cluster although the risk to those power traces is probably much lower.

You can replace the MOV with a new TDK B72210S0140K101 MOV. You will need to order this part from an electronics distributor such as Digikey. I recommend that you use a low wattage soldering iron so you don't damage the PCB. You will also need to use copper braid and/or a solder sucker to ensure that you have the PCB holes open and clean prior to soldering in the new MOV.

While you have the cluster out of the car, it is a good time to replace the odometer gears. The old original OEM gears have become very fragile with age and they will fail soon if they haven't already. There are plenty of good videos on YouTube that can show you how to remove the instrument cluster from your car and how to replace the odometer gears. New odometer gears are also widely available on the internet. Here is a photo of how the gear normally breaks against the worm gear:



While you have the instrument cluster out of the car, don't drive it. The charging indicator circuit in the instrument cluster is part of the alternator circuit. Without the cluster in place, the alternator won't charge the battery and you will be stranded when the battery dies if you drive the car.

Good luck with your instrument cluster and your preventative maintenance should you decide to undertake this project.