94-98 Ford Mustang Instrument Cluster Troublehooting

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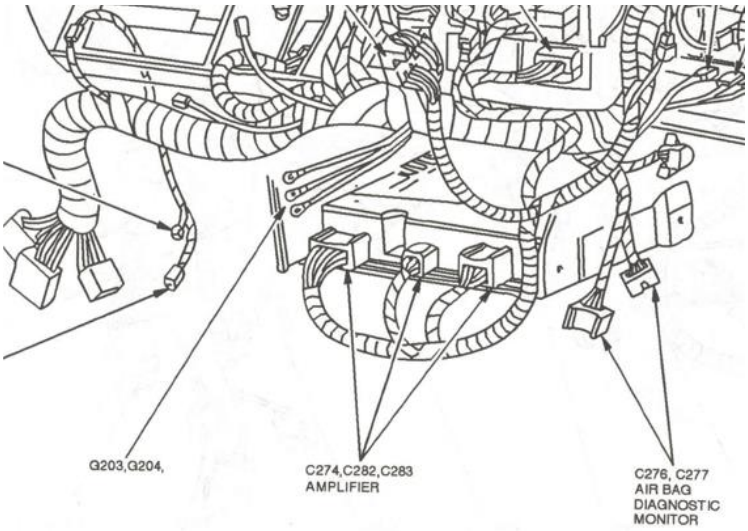
If you are having problems with your 1994-1998 Mustang instrument cluster, there are some things to do first before sending your cluster in for service.

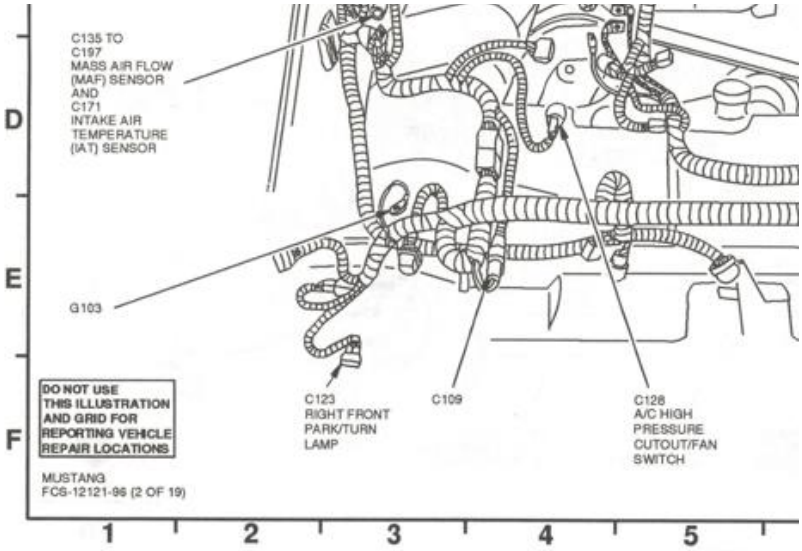
Grounds and Connectors

When clusters start getting flakey, the first suspects are grounds and connectors. Check grounds for looseness and ground and connector pins for corrosion. Clean all grounds of any corrosion. I like to protect them with a little dielectric grease to help them stay good for a long time. You can carefully clean the cluster pins on the harness connector and the flexible PCB on the back of the cluster with an eraser.

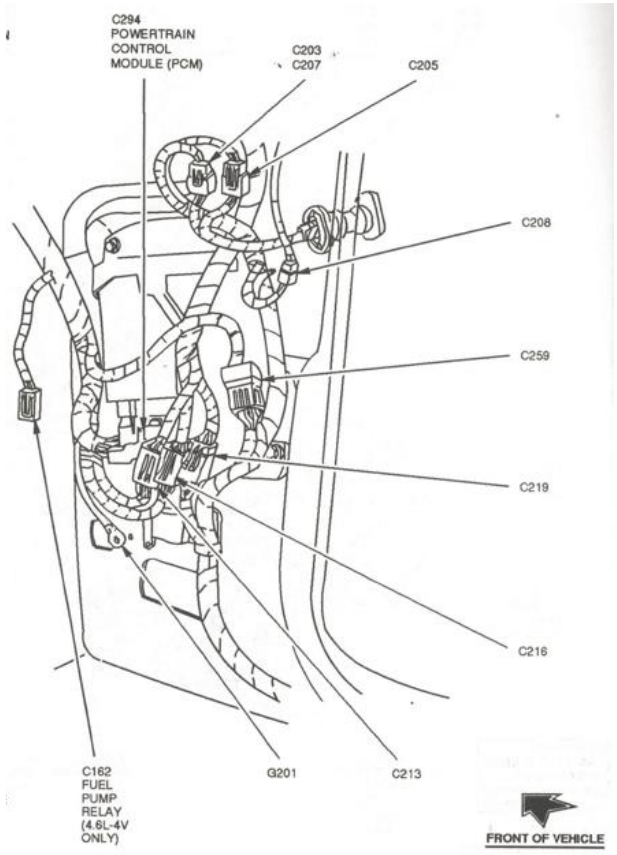
The temperature gauge, fuel gauge, tachometer, voltmeter and oil pressure gauge all share a common ground, G203 (BK/W). G203 is located just to the right of the stereo amplifier in the center console:



In V8 cars, the tachometer is set to 8 cylinder mode by grounding the cylinder select pin. The ground for that pin is on the passenger side of the engine compartment on radiator mounting bracket just to the right of the radiator. If the tachometer is reading high in a V8 car, check this ground G103 (BK):



The speedometer is grounded at G201 (PK/O), which is in the passenger side kick panel near the PCM:



Needle Binding Issues

If a cluster cover has been taken off, it is possible that the needles were accidentally pressed too far down on the gauge shafts so the needle binds on the face. Make sure that the tines of a dinner fork will fit between the needle button and the gauge face. If it doesn't, gently lift the needle up on the shaft to provide clearance. Be careful not to pull the needle off of the shaft or you will have to get the gauge recalicrated.

Fuel Gauge Diagnostics

It can be hard to get to the fuel gauge sensor and wiring without substantial dismantling work. The easiest way to test it is to remove the instrument cluster and test the resistance between the fuel signal (Y/W) wire and ground at the cluster connector. You can find the connector and pin number for your car (different years use different pins) in the download section of the Accutach Co. website here: https:// websites.godaddy.com/blob/1975f84f-4935-4131-8404-5a914da1afb7/downloads/ 1bfptlo0o_97459.pdf?7801d48a.

Measure the resistance between the fuel gauge sensor signal pin and ground. If the tank is empty, the resistance should be about 22 ohms. If it is full the resistance should be about 145 ohm. If it is partially full, the resistance should be in between. If you get these resistance readings, then the sensor and wiring are probably good and the problem is in your fuel gauge.

If you can get access to the fuel level signal wire with the instrument cluster in place, you can open up the sensor signal, power up the cluster and the gauge should go above the full mark. If you short the sensor signal wire to ground, the gauge should move towards below empty VERY slowly. If it does move VERY slowly, then you know that your anti-slosh module is working correctly. If you power the cluster down and up again with the sensor signal grounded, the needle should quickly go to below the empty mark.

If both the fuel gauge and the temperature gauges are misbehaving, it is possible that someone has swapped a 98 cluster into a 96/97 car or vice versa. In 1998, two cluster connector pins were swapped. 98 clusters are the only ones with a diode on the back. See the connector pin number document referenced earlier to learn which pins to swap on your cluster connector.

Temperature Gauge Diagnostics

The temperature gauge system is much easier to test than the fuel gauge system. You can do a quick test of the temperature sensor with the sensor in the car. The sensor resistance to ground with the sensor wire unplugged should be well above 10 ohms, with higher resistance for colder engines. 1994 to early 1997 cars have a one wire sensor while late 97 and 98 cars have a 2 wire sensor. With the 2 wire sensors, measure the resistance across the two pins. With the one wire sensors, measure the resistance across the signal pin and an engine or chassis ground.

There is an additional consideration in 96 and early 97 Cobras. They use the one wire sensor and depend on the crossover tube to ground the sensor to the engine. Pipe paint or corrosion must be cleaned off to ensure a good ground.

To test the temperature gauge and wiring, you can simulate a sensor signal at the sensor connector. The signal wire is a R/W wire in both cases. In the 2 wire sensor cars, the signal return (ground) wire is a BLK/WHT wire. Disconnect the sensor connector and power up the instrument cluster. The gauge should go beyond the cold mark. Ground the signal wire and the gauge should go above the hot mark. If you have access to a 10 ohm resistor (or a pot set to 9.7 ohms) connect it across the signal and ground wire, and the needle should go to the hot mark. It all of these tests are passed, then your temperature gauge and the wiring is good. If not, check the wiring between the sensor and the cluster. In the late 97 and 98 cars, check the signal return wire to ground.

Speedometer Diagnostics

If your speedometer is not working at all, the easiest place to start is to hook a scan tool to the OBD2 port and drive the car to see if the PCM is seeing the speed signal. If the scan tool is showing the speed, then you know that the speed sensor is working. If it is not seeing a speed then you can start by testing the VSS sensor. Remove the sensor from the transmission tail. Put an AC voltmeter across the pins and spin the sensor with your fingers or a drill. You should see a small AC voltage on the voltmeter. Here is a YouTube video on how to do it: https://www.youtube.com/watch?v=Ij7G8TLxlpg

If your VSS sensor is working then you will need to check the speedometer and wiring. You can use a small AC transformer such as a 16V door bell or 24V irrigation system transformer to generate a signal to test your speedometer. Connect the output of the transformer to the 2 pins of the VSS connector. Power up the cluster and the speedometer should go to 27 MPH. If it doesn't, check the speedometer wiring to the cluster connector. There is a writeup on how to test the speedometer and tachometer in the Downloads section of www.accutach.com: https://websites.godaddy.com/blob/1975f84f-4935-4131-8404-5a914da1afb7/downloads/1bget8n5o_114329.pdf?2089e5c1

If your speedometer is occasionally dropping out or it slams all the way beyond the top speed, it is probably an intermittent loss of power or ground to the speedometer. Check the power and ground wires going to the cluster.

Tachometer Diagnostics

If the tachometer is not working, then the first thing to do is test the tachometer on the bench using an old fashioned car battery charger. The writeup on how to test the tachometer is in the Downloads section of www.accutach.com here: https://websites.godaddy.com/blob/1975f84f-4935-4131-8404-5a914da1afb7/downloads/1bget8n5o_114329.pdf?2089e5c1

If the tachometer is working on the bench, but not in the car, check the power and ground wiring to the tachometer. Also check the tach signal wire from the PCM to the instrument cluster. If the wiring is good, your PCM may have a problem. An expert will probably need to be called in to diagnose your problem.

Battery Gauge Diagnostics

The volt gauge in the cluster is pretty foolproof. It should read slightly higher when the engine is running than it does with the key on, engine off. If it doesn't and the oil pressure gauge is working, then the volt gauge is probably bad.

The volt gauge and the oil pressure gauge share power and ground. If they both are failing, then check the power and ground for the two gauges.

Oil Pressure Gauge Diagnostics

To test the oil pressure sender, disconnect the sender wire. Using an ohmmeter, you should read an open circuit between the sensor signal pin and ground with the engine off and you should read continuity to ground with the engine running. If that doesn't happen, then the sender is probably bad.

To test the gauge and the wiring, leave the sender wire disconnected and power up the cluster, The oil pressure should read below the low mark. Ground the sensor wire and the gauge should read somewhere in the normal range. If that doesn't happen, check the signal wire between the sender and the instrument cluster. If that wire is not open or shorted to ground, then your gauge is suspect.

Accutach Company (www.accutach.com) provides 94-98 Mustang instrument cluster testing, repair and calibration services.

We hope that this document proves to be helpful for people trying to diagnose instrument cluster problems.