



MR. Y2000

Email questions to: c5dan@c5registry.com with "Mr. Y2000" in subject line

Q: I'm new to this group. I've got two convertibles, a Torch Red LT4-'96 and a 2000 DB Green. I bought Corsa Indys with Tigershark tips while in Nashville at the 50th and have had a kick rapping them for all my same age buddies. We're in Washington State for the summer, but went to Bowling Green with the Arizona-New Mexico caravan from Phoenix. My wife and I are essentially retired, but still own a small business in Washington.

I experienced the gas gauge problem for the first time (a few months out of warranty) on the way back from Nashville. Had around 20,000 miles on the 2000. Pulled into a gas station and filled up with about eight gallons of gas, and the gauges worked OK. Since then it drops to "empty" somewhere below a half tank. I thought I had it figured out, but have run out of gas twice and now carry a gallon with me. I canceled my second appointment with the Chevy dealer after hearing about Techron. I'm running on my first tank with the additive now, but have not reached the critical (for me) half tank level to see if anything has changed.

Mr. Y2000: The C5 Corvette has two fuel tanks, left and right hand. The left hand tank contains the electric fuel pump that supplies fuel to the engine. The right hand tank has a pump, which transfers fuel from the right tank to the left tank. The pump in the right hand tank has no moving parts and is not really a pump. It is a siphon device that uses fuel pressure from the left hand pump to start a siphon that transfers fuel from the right hand tank to the left hand tank. In order to create this siphon, the fuel line that goes to the engine splits and a small amount of pressure is routed to the right hand tank to start the siphoning. The fuel that is being siphoned is routed through another hose to the left hand tank. If the left hand tank is full, the fuel transfers back to the right hand tank through the large filler tube located at the top of the tanks. The idea is to always keep the left hand tank full whenever there is fuel in the right hand tank. When the fuel gauge reaches a half tank, the right hand tank is empty and the left hand tank is full. Both tanks have a float and sender that measures the fuel level in the tank. These signals go to the Powertrain Control Module (PCM) which interprets the information and sends a signal to the Body Control Module (BCM) which then sends a signal to the fuel gauge in the Instrument Cluster.

Because of the variation in tanks and sending units, the PCM doesn't always read the actual fuel level in the tank. Above or below preset voltage limits, the fuel level is estimated. The voltage limits for each sending unit, right and left, are set to represent "full" and "empty." When one or both tanks have exceeded the preset limits, either "full" or "empty," the system is estimating the actual fuel level. This happens when both tanks are full, gauge is "full;" when the right tank is empty and the left tank is full, "half" on the gauge, or when both tanks are empty, gauge is at "empty."

This estimating strategy and the physical layout of the system results in an unusual fuel gauge characteristic that may be noticeable to some people. When the fuel level is at or near half tank, the right hand tank is empty and the left hand tank is full, so the system is estimating the actual fuel level. Because of the siphoning system, when the car sets without running, the fuel level equalizes in the two tanks. When the car is first started, the system is actually

reading the fuel level in both the right and left hand tanks. After running for several minutes, the fuel in the right hand tank has been transferred to the left hand tank, leaving the right hand tank empty and the left hand tank full. The change in the fuel levels results in the system changing from reading the actual fuel level to estimating the fuel level. This change results in the fuel gauge reading actually indicating more fuel than when the car was first started.

One of the common concerns with the Corvette is the fuel gauge goes to "empty" intermittently. First, let's discuss why this happens. As previously mentioned, the system estimates the fuel level at certain times. When the signal from the left hand sender is above the preset voltage limit, the system estimates the left hand tank fuel level to be full. When the signal from the right hand sender is below the preset voltage limit, the computer estimates the

Continued on page 24

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right hand tank fuel level to be empty. In this situation, left tank full and right tank empty, the computer estimates the fuel level and sets that gauge at half tank. Once the fuel level in the left hand tank goes below the preset voltage limit, less than full, the computer begins reading the actual fuel level and setting the gauge accordingly. At this time the computer expects to see the voltage signal from the right hand tank stay below the preset limit that indicates empty. The problem comes from the fact that the signal from the right hand tank does not stay below the preset limit. When the computer sees the right hand signal voltage exceed the preset empty limit, it assumes that there is a problem in the fuel transfer system, which is a possibility. When this condition exists, the computer software turns on the Check Gauges light and commands the fuel gauge to the empty position. The logic for this is, if there were a problem with the fuel transfer system and fuel was not being transferred from the right hand tank into the left hand tank, you could have the gauge indicate half tank, when then the left hand tank would be empty and the right hand tank would be full. In this situation you

would run out of gas and be walking.

On some Corvettes the situation that is occurring now is the result of the right hand sending unit being attacked by compounds within reformulated gasoline. This condition manifests itself as an erratic voltage signal from the right hand sending unit. In the above scenario, left tank full and right tank empty, gauge at half, the computer looks for the voltage signal from the right hand tank to stay below a preset level. The erratic voltage signal caused by the reformulated gasoline causes the computer to think there is fuel in the right hand tank when there is not. When this happens the computer software turns on the Check Gauges light and commands the fuel gauge to empty. GM has issued a revised computer software, for 1999 through early 2002 models, that raises the right hand preset voltage empty limit to prevent the erratic voltage signal from causing this situation. While it has proven to be an effective solution, it has not corrected the concern in all instances. Another possible resolution is to use Techron fuel system cleaner. This has also worked in many, but not all cases.

Q. On June 19, 2003 you posted information regarding the replacement of the AGM battery for the C5 with a warranty replacement #78-H6YR. I own a 2002 coupe and the battery failed internal diagnostics performed by my dealer. However, when I asked them about the 78-H6YR warranty replacement, they knew nothing about it. They also contacted GM and they insist that the replacement battery is the same AGM model. What was your source of information for this bulletin? I've searched the NHTSA site for recall information, but none is posted. I'd appreciate any information from you that might help me resolve this. Thanks for your help and I love reading your column.

Mr. Y2000: My understanding is that the AGM battery is no longer being produced. This does not mean that there are not some still available. The Delco recommended replacement is a 78-H6YR. I have heard that the 78-H6YR is not available, however, a suitable replacement is a 78-6YR. The only difference is that it does not have a handle (thus the missing "H").

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