Monitors In Suspension?

Monitors can be one of the toughest issues to deal with when repairing a vehicle with the final goal of passing the OBD-II emissions test. Knowing enable criteria, and being able to duplicate such criteria, can sometimes be a challenge. But what happens when a PCM suspends a monitor? On top of that, what if the scan tool you are using doesn't tell you if, or why, a monitor is suspended.

Let's use a 1999 Caravan as an example. The problem is that the O_2 sensor monitor will not run, and subsequently the catalyst and EGR monitors won't run because their enable criteria includes the running of the O_2 monitor. The only thing that looks out of place are fuel trim numbers. Could the fuel trim numbers be the cause of this issue? Here are some possibilities.

One issue that could skew fuel trim numbers enough to suspend the O_2 monitor applies to flex fuel vehicles that use the O_2 sensor to learn the ethanol content of the fuel. In this case a whole new set of rules is added to the game. The PCM determines this percentage by monitoring key cycles and fuel level changes between these key cycling events. Once the PCM has determined an addition of fuel to the tank has been made it monitors the O_2 sensor and calculates the amount of fuel delivery change required for the new fuel. E85, for example, requires a richer air to fuel ratio and is reflected in the O_2 sensor readings. Flex fuel Caravans can be quickly identified by the 8th digit of the VIN, or the presence of a green, instead of white, fuel pump module that is visible without removing the fuel tank.

If a flex fuel vehicle uses O_2 readings to determine Ethanol content then everything else must be working correctly for this percentage to be accurate. Additionally, not all scan tools display an Ethanol % PID. Inaccurate Ethanol percentage, and fuel trims that are out of bounds, could definitely cause the O_2 monitor to stay dormant.

Another issue, albeit rare, is the installation of the incorrect engine. Chrysler 3.3 liter engines and a 3.8 liter engines share the same casting numbers, the blocks only differed in bore diameter. There are also no externally visible markings, flanges or bolt holes that distinguished one motor from the other. My inquiries to engine re-builders also unveiled a disturbing fact: 3.8 liter engines can't be bored oversized so re-builders often bore 3.3 liter blocks to an OE 3.8 liter bore. Is it possible that a re-builder could have placed an engine on the wrong shelf in their warehouse? Or labeled the finished product with the wrong tag? I'm afraid it could, and does, happen.

What could point us towards this possibility... trim numbers? If we calculate the difference in displacement between the two engines as a percentage we would arrive at a number that equates to their difference in fuel demand. A 3.8 liter engine requires approximately 15% more fuel than a 3.3 liter engine. Fuel trim numbers near the range of +15%, if everything else is working correctly, could indicate this issue.

Chrysler Flex Fuel vehicles are easily identified by the presence of a green (vs. white) fuel pump module.

In conclusion, getting all of a vehicle's monitors to run might require a bit of digging from time to time. Unseen issues can slow this process down and potentially make it a frustrating experience. Knowledge of what can cause a PCM to suspend a monitor from running will hopefully steer you down the right diagnostic path.

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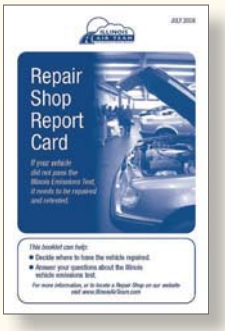
We are inching closer in making Monitor Rejects count in the Report Card



We are working with our contractor, Applus+ in having monitor rejects be part of grading system. We have realized for some time that this needs to be part of the overall evaluation of a shop's performance. Please review the News & Information on the Dashboard for when this will become reality. It is important to attend the Outreach Seminars which focus on setting readiness. Stay in the habit of always setting readiness. Your Grade will depend on it!