

On the Line

Air Intake Restrictions Due to Inclement Weather Conditions

The Chevrolet Silverado equipped with a 6.6L Turbo Diesel was down on power, the malfunction indicator lamp (MIL) was illuminated and a PO101 mass air flow sensor (MAF) performance code was set in the current failure and history file, and the Power Reduced Message was displayed on the instrument cluster. Running the diagnostics on the trouble code had been futile. Deleting the trouble code would restore engine performance, but that was not the long term solution. Following a second vehicle failure, it would be determined that the symptoms occurred due to inclement weather conditions.

CONDITIONS FOR SETTING PO101 CODE

The code will set if the electronic control module (ECM) detects that the MAF sensor air flow ratio is not within a pre-determined range of the calculated MAF sensor air flow ratio within a given time frame. The following action will be taken: (1) PO101 failure code will be set, (2) ECM will command reduced power, (3) Reduced power indicator will be illuminated, (4) Diesel particulate filter regeneration will be inhibited.

POTENTIAL CAUSES OF STORED PO101 CODE

- ✓ Increased resistance on the MAF sensor ignition voltage circuit.
- ✓ Non-compatible air filters (do not meet OE specs).
- ✓ Dirty or deteriorated air filter.
- ✓ Restricted, damaged or misaligned air intake duct.
- ✓ Restrictions to air inlet probe of the integrated Mass Air Flow/Intake Air Temp (MAF/IAT) sensor.
- ✓ Contaminated or inaccurate sensing element on the MAF/IAT sensor.
- ✓ Modified air induction systems.
- ✓ Air intake restrictions.
- ✓ Un-metered air entering the engine downstream of the MAF sensor.



"YOU'RE RIGHT, ELMER... THOSE DIESELS WILL INHALE ANYTHING THAT EVEN GETS CLOSE TO THE AIR INTAKE!"

- ✓ Reduced backpressure due to performance exhaust system.
- ✓ Defective or improperly open/closed exhaust gas recirculation (EGR) valve.
- ✓ Intake manifold leak.

The technician ran the diagnostics and spent a substantial amount of diagnostic time trying to identify the reason for the loss of power symptom, but his efforts had failed.

POWER STROKE DOWN ON POWER

The next day a Ford Power Stroke diesel arrived at the same shop on a roll-back wrecker with the same symptoms as the Silverado. The technician isolated the problem in a matter of minutes.

The difference was...this time the technician had evidence to assist him in the diagnostics. The grille was totally encapsulated with snow and ice. The air intake and air filter displayed the same. The engine was starving for air due to the snow and ice impaction. The mystery of the Silverado being down on power had been solved. The Silverado had thawed out before the technician performed his diagnosis, losing all traces of evidence.

Rain and road splash can result in the same conditions and symptoms. Numerous vehicle manufacturers have encountered these same conditions resulting in air intake modifications.

Tech Tip #174 *Air Filter Restrictions* will illustrate vehicles that have a history of snow and ice related restrictions. Factory solutions will be identified to alleviate those symptoms. The Tech Tip will identify some gas burners which can encounter the same.

Summary: Water, ice and snow restrictions should be a part of your diagnostics when diagnosing power loss related symptoms. When these conditions are present, the air filter should be replaced, as a damaged filter can cause major damage to the engine or turbocharger.



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