



Tech Tip

FUEL SYSTEM 168

AERATED DURAMAX Getting the Air Out of the Fuel System

Imagine performing a fuel filter service on GM's Duramax 6.6L Turbo Diesel. You just installed a new fuel filter and performed the proper priming procedure to bleed the air from the system. The engine starts and runs perfectly. The next morning you receive a call from the customer complaining of a no-start condition. A service call is made and it is determined that aerated fuel is the cause of the no-start condition. The system is bled and the engine starts and runs perfectly. Unfortunately, the same no-start condition repeats itself the following day. When these conditions occur, the filter is almost always blamed for the performance symptoms. The quality of the filter had nothing to do with the aerated fuel condition; however, the fact that the fuel filter was changed could have caused the problem. Does that make sense? The information contained in this Tech Tip should help clarify how these symptoms can occur following a fuel filter replacement, even with the vehicle manufacturer's original equipment filter.

Important: For a diesel engine to perform properly, the fuel lines must be full of fuel and free of air. Sources that can promote aerated fuel include:

- 1) Running the fuel tank empty.
- 2) Replacing the fuel filter.

- 3) Fuel lines disconnected during a service procedure.
- 4) The filter water drain opened while the engine is running.

If air does enter the system, priming/bleeding the system will be necessary to restore engine operation.

PRIMING THE SYSTEM

Purging the air from the fuel system is required following a fuel filter replacement. It is imperative that you never dry start an engine following a fuel filter replacement. Make certain there is adequate fuel in the tank, the filter has been properly tightened, all fuel lines secured, and dirt and debris has been removed from the bleeder/vent valve positioned on top of the fuel filter adapter.

- 1) Open the vent valve on top of the filter adapter by turning the screw counterclockwise several turns (see Fig. 1).
- 2) Depress and release the priming pump until a small amount of fuel seeps from the vent valve. Allow the priming pump to fully return to its upright position between pump strokes (see Fig. 2). When fuel seeps from the vent valve, the system is primed.

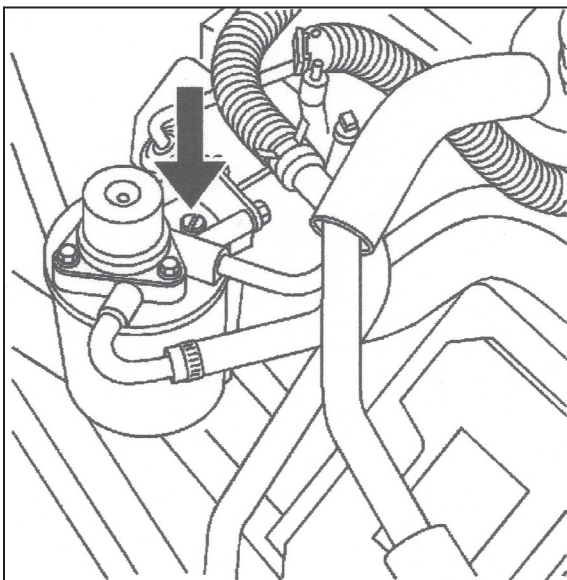


FIG. 1

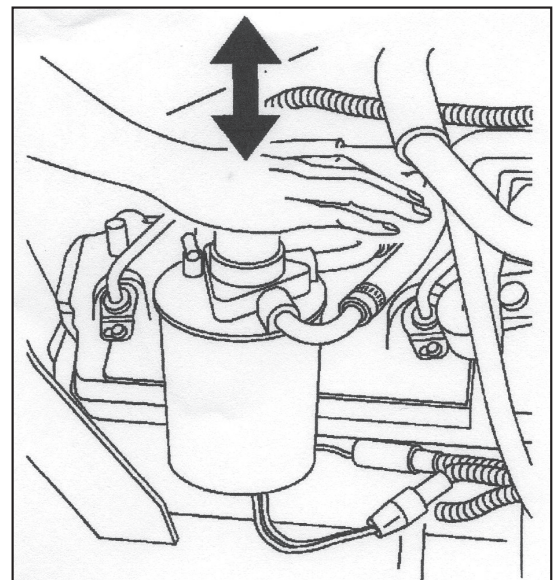


FIG. 2

- 3) Turn the vent valve screw clockwise until fully seated.
- 4) Clean any fuel from the filter adapter and filter.
- 5) Start engine and allow it to idle for a few minutes to further purge any air from the system.
- 6) Check the system for fuel leaks.

AERATED FUEL SYSTEM

When the customer returns or the vehicle gets towed in with aerated fuel related symptoms following a fuel filter installation, many are quick to blame the filter. That is a normal assumption, as the engine was running fine until the filter replacement. Unfortunately, the vehicle is often towed to the dealer, where they are told that the aftermarket filter is the reason for the symptom. The customer is given a repair order for an OE filter, labor charges to diagnose the system and replace the components. Naturally, the customer returns to your shop expecting full reimbursement, and what choice do you have? Of greater concern...the customer has been convinced that you installed inferior parts and possibly didn't know how to make a proper filter installation. Read on to determine the cause and what actually solved the aerated fuel condition.

WHAT WENT WRONG

There was nothing wrong with the quality of the filter that you installed or your installation procedure. The problem

stems from some aged O-rings and seals within the primer pump and filter adapter (see Fig. 3). It is common for these components to fail, especially during the bleeding procedure following the installation of the new filter. Once the aged seals or O-rings are disturbed, they may lose their ability to properly seal, allowing air to be drawn into the system. When this condition occurs, there is usually no evidence of fuel leakage on the filter adapter, as this is a suction type system. The system may prime perfectly and then become aerated hours or days later, resulting in a no-start or poor performance condition.

In one case, we disassembled the priming pump and determined that a fragment of plastic from the filter wrapping had lodged between the seals, allowing the system to pull air in and aerate the fuel. Removing the plastic eliminated the aeration concern.

Some aftermarket suppliers offer seal and O-ring repair kits to rebuild the priming pump/filter adapter. The rebuild kits do not incorporate two rubber check valves, which are a part of the assembly, and they are not available as a replacement item. Therefore, your rebuild may or may not be successful.

The GM dealer will replace the priming pump/filter adapter housing with GM replacement part number 12642623 that lists for \$157.89, plus labor cost. The mentioned adapter comes packaged with a new fuel filter.

When a Duramax system repeatedly encounters aerated fuel, there is a reason for it, and it is not the design of the fuel filter. Being familiar with the system and identifying the cause of the aeration concern can save you and the customer much grief. Installing the second or third fuel filter is not the solution.

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FIG. 3

