



Tech Tip

FILTERS 139

FILTERING GM'S DURAMAX DIESEL Some Tips on Servicing the Duramax Turbo Diesel

Diesel engines have a healthy appetite for air. Couple that with a turbocharger, and the engine is really inhaling a lot of air. Any restriction in the airway can result in some major engine or turbocharger damage. Filtering the air and keeping the air filter intact in the air box can be a challenge, especially when the filter becomes contaminated with debris. Until recently, most of the failures we have encountered have involved the Ford Power Stroke, mainly due to the popularity of that engine. We have seen filters that have been pulled apart and shredded by the turbo, while others were pulled from the air box, as a result of neglected maintenance, leaving the system without proper filtration. This can result in some very expensive repairs. Other conditions, such as damaged air box latches, resulting from installer error, may render the filtration system inoperative, allowing unfiltered air to be pulled into the engine. Keeping the air filter clean and secured is imperative in preventing a major system failure. Ford went through several filter and air box design changes to alleviate the problem with the Power Stroke. With the increased popularity of the GM Duramax, we are experiencing challenges with those systems, too.

SIMILAR CHARACTERISTICS

The air filter for GM's 8.1L gas engine has the same dimensional characteristics as the air filter required for the 6.6L Duramax diesel engine. Some service techs have elected to consolidate the two mentioned applications and install the air filter for the gas application in the Duramax diesel. That's playing Russian roulette with a very expensive engine. The air filter for the gas application will not stay in position.

Considering the turbo-diesel engine consumes a much greater volume of air than a normal aspirated engine, it requires a much stronger air filter. The filter required for the Duramax applications from 2001–2005 is a flat panel filter that utilizes a wire mesh screen on one side of the filter media and glue strips on the opposite side, which gives strength to the filter pleats. It takes a strong filter to withstand the forces, especially when the filter becomes restricted. If the filter required for the 8.1L gas application is installed in the Duramax, the filter can be pulled from its mounted position, shredded, and sucked into the turbocharger and engine, resulting in major component

damage. Sometimes the filter will remain intact, but will be pulled from its mounted position. When this occurs, unfiltered air enters the engine, resulting in wear on the turbo vanes and the cylinder walls of the engine. The components will appear to have been blasted with an abrasive compound. The turbo applications, regardless of vehicle manufacturer, must have a heavy-duty design air filter to remain intact in the air box. GM redesigned the air filter for the 2006 Duramax. It is a round filter that incorporates a filtering media that resembles a honeycomb (see Fig. 1). This design is much like the filter Ford released for the 2003 6.0L turbo-diesel, except smaller in size.



Fig. 1

AIR SYSTEM MODIFICATION

You may encounter some 2004–2005 2500/3500 series GM trucks that incorporate the 2006 design air filter (see Fig. 1). This is not a cataloguing error. The vehicle has been updated with the new style air filter.

Some customers may complain of overheating when towing a trailer, or if the vehicle is loaded and driven on a long upgrade climb, especially in high ambient temperatures. Further, the engine may encounter a loss of power, or the air conditioning may not function properly. If any of those conditions are present, GM states that the

following should be explored:

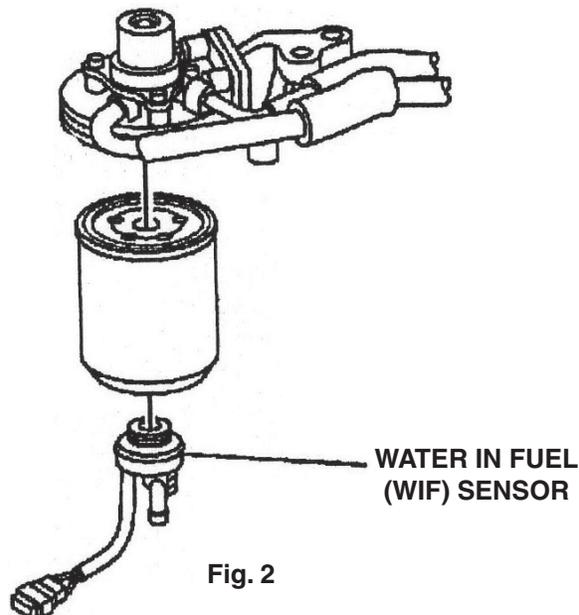
- a) Check for any modifications to the air intake area such as an aftermarket custom grille. Make certain all air dams are in place and are not modified.
- b) Inspect the Charge Air Cooler (CAC) to be sure it is not plugged externally. Make certain all pipe connections are properly sealed and the CAC does not have a leak.
- c) Monitor the fan clutch for proper operation. If the fan is cycling on and off when the engine RPMs are above 2800, this could indicate a belt slip condition.
- d) Monitor the actual and desired turbo vane position to verify that the turbocharger is performing properly.
- e) Make certain the transmission is not overfilled, as it can add heat to the cooling system.
- e) Inspect the air induction system to be certain that the filter is in good condition and not restricted.

If no issues are found in the mentioned inspections, install the 2006 style air filter (see Fig. 1) and necessary housing, utilizing the procedure and parts illustrated in GM service bulletin #06-06-04-036D.

FUEL FILTER/WIF SENSOR REPLACEMENT

When replacing the fuel filter on a Duramax 6.6L engine, you may notice a difference in the style of the replacement fuel filter compared to an earlier style or the original design filter. The newer filter is slightly longer and has a stepped shape bottom. The end of the filter that screws onto the filter adapter is fitted with a rubber grommet. When replacing the filter, make certain the old rubber grommet comes off with the filter. **To prevent fuel leaks, lubricate all O-rings prior to installation.** GM recommends replacing the filter at the following intervals: 15K miles for the C/K and C4500/C5500 models, and 20K miles for the Express/Savana models. The proper filter replacement interval and clean diesel fuel that is free of water and contaminants are both imperative in maintaining good engine performance and the longevity of the fuel system components. Fueling the vehicle at a high volume retailer improves the odds that the fuel will be of good quality and clean.

When replacing the fuel filter, it will be necessary to transfer the water in fuel (WIF) sensor from the old filter to the new filter (see Fig.2). A new O-ring for the WIF sensor will be included with the new filter. The WIF sensor is made of plastic and should only be tightened by hand. Once the WIF sensor and the filter make contact with the lubricated O-ring, tighten the sensor 1/2 turn. Do not use pliers or other tools. Doing so will damage the sensor, requiring replacement. Remember, you are tightening a



plastic sensor, not torquing a cylinder head bolt. Once the system is filled with diesel fuel and the air bled from the system, start the engine and check for fuel leaks.

FUEL FILTER LIFE RESET

If the vehicle is fitted with a Fuel Filter Life reset indicator, it will be necessary to reset it once the filter has been replaced.

For vehicles fitted with steering wheel controls:

- 1) To reset the fuel filter monitor, press and hold the select button for five seconds while the "Fuel Filter Life" message is displayed. The message will appear on the DIC for ten seconds.

For vehicles without steering wheel controls:

- 1) Without pressing the pedals, turn the ignition key to the "ON" position, without starting the engine.
- 2) Wait five seconds.
- 3) Press the brake and accelerator pedals simultaneously and hold for ten seconds. The system is now reset.
- 4) Turn the ignition key to the off position.

The next time the engine is started, the message will clear.

Turbocharged diesel engines require good filter maintenance and premium quality filters. Clean fuel and air are critical in maintaining good performance, fuel economy, and increasing the life of the engine.

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