

HOW DO YOU CHANGE THE 6.7-LITER ENGINE'S FUEL FILTER

If you are an experienced diesel owner feel free to skip this article. But, be forewarned, the convention of the TDR is to add information to an article that will make it worth reading for the seasoned professional. Let's see what can be added to this simple project to validate the worth of your TDR subscription.

FUEL FILTER BASICS

You can browse through your Dodge Owner's Manual, you can preach the virtues of maintenance to your friends and your offspring, but nothing makes a lasting impression like practicing what you preach. Maybe I should rephrase this to read nothing makes a lasting impression like not practicing what you preach. Admittedly I'll end up replacing an entire assembly because of my lack of maintenance to a component part of the assembly. Just like running out of fuel when you're the driver...it's my fault and I end up taking the long costly road to correcting the situation.

The most delicate part of a diesel engine is the fuel injection system. Because of the extremely close tolerances, the fuel injection system cannot tolerate contamination. Contamination can cause damage and, at a minimum, erratic performance.

The majority of low mileage fuel injection pump failures that are seen by Cummins' warranty research department are a result of trash in the fuel system. Considering that trash is not a defect in material and workmanship, the resulting repair can be an expensive lesson in fuel system maintenance. Replace the assembly, or perform maintenance on a component part, the choice is yours.

In this issue our back-to-the-basics article will show you how to change a fuel filter on a 2007.5 to current model year engine.

On a one-to-ten scale, this maintenance procedure ranks about a two in difficulty. However, fuel filter maintenance is often overlooked as new-to-diesel owners don't realize that fuel filter maintenance is called for every 15,000 miles. After all, when was the last time you changed your other gasoline-powered vehicle's fuel filter? Why only 15,000 miles between fuel filter changes with a diesel? The obvious answer, diesel fuel is less refined than gasoline and is more susceptible to contamination by water and microbial activity.

Additionally, to the diesel novice the job of changing a fuel filter can be intimidating. Influenced by diesel folklore, the novice is concerned that the injectors and/or fuel system will have to be bled of trapped air, a task that he does not know how to perform. And as recently as the '98 model year, air (and an accompanying squirt of diesel fuel) had to be vented using the manual fuel lift pump purging the air from a bleed screw. With the '98.5 24-valve engine's electric fuel lift pump and self-venting fuel system, the bleedscrew/squirt of diesel problem went away. However, the I-don't-know-how intimidation factor remains.

Like the '98.5-'02 and '03-'07 trucks, owners of 2007.5 and newer trucks have a fuel filter system that has an electric fuel lift pump and is self-venting. For '98.5 and '99 owners the fuel filter how-to was covered in Issue 25, pages 84-86. For '00-'07 owners the how-to was in Issue 45. We've established the need and the reasons for fuel filter maintenance. Without further ado, let's get started on the how-to section of this article for the newer '07.5 audience.

2007.5 and Newer Fuel Filter Change

First, let's present three tips that will save you time and aggravation.

- Purchase your fuel filters in quantity. This prevents the excuse that you could not change the filter due to a not-in-stock situation. Additionally, a spare fuel filter should be in your box of emergency parts that you carry inside the truck. You cannot predict when or where you might receive a bad fill of fuel.

- Extend the fuel drain hose. The existing drain hose is about 18" long and hangs directly below the fuel filter housing. When fuel is drained it is difficult to catch because the drain hose is not easily accessible. To correct this condition I slipped a three-foot length of 5/8" heater hose over the existing drain hose (perfect inside-to-outside diameter interference fit). Extend and tie-wrap your longer drain hose to a convenient drain location.
- Purchase a one-gallon *plastic* fuel container. Keep it full with quality diesel and use the fuel to pre-fill your filter. *Do not* store diesel fuel in metal, zinc-lined cans: the diesel fuel reacts with the zinc and forms a goo that can clog a filter and damage a fuel injection pump.

The advisability of pre-filling the filter was debated in Issue 43, on page 148. Caterpillar heavy equipment mechanic and TDR member Craig Hubachek maintains that this technique is a service no-no as it puts unfiltered liquids (fuel or oil) on the filtered side of the filter. The audience should use due caution should you use the pre-fill technique. Note that since the '98.5 model year, with the truck's electric fuel lift pump and self-venting fuel system, the self-priming nature of the fuel system make the pre-fill unnecessary.

Let's Begin the Fuel Filter Change

- Position your newly-added drain hose to an easy-to-reach, easy-to-catch location. Open the drain valve and drain the fuel from the filter canister. Unlike the '00-'07 trucks, when you open the fuel filter drain valve there is only a trickle of fuel. Instructions in the Mopar filter box will tell you to drain only about 8 ounces. You'll be lucky if that much drains out.
- Remove the water-in-fuel (WIF) sensor electrical connector from the bottom of the filter's plastic cartridge. The tang on the connector wires is pushed out and the connector wires and female socket can then be pulled downward. In shadetree fashion, I cut the tang so that the connector will be easier to remove in the future. I'll let you debate the merits of tang-cutting.

As I mentioned in Issue 59, page 42, the fuel filter is buried under a myriad of electrical wires, electrical relays and cables. The fuel filter is next to impossible to access.

I tried to access the filter from above—no way. An accepted field service practice on 4x4 trucks is to hug the front tire and come in from the side in between the gap in the plastic wheel-well liner and the frame. Two-wheel drive guys need to remove the 8mm screws that hold the fender wheel-well liner in place and drop the liner out of position.

For the truck's initial fuel filter service I chose the under-the-vehicle service technique and a strap wrench to remove the filter.

Subsequent fuel filter changes can be done from above if you take the time to move the aforementioned electrical wires, relays and cables to the side. You will have to move the oil dipstick tube to the left and modify the bat wing to accept the new dipstick location.



Relocate the oil dipstick tube to the valve cover.



With one hand above and one hand below you can get to the fuel filter from above.



Modified "bat wing" with new dipstick location.

Once the fuel filter is removed, following the Mopar/Fleetguard directions is very easy. The next several steps are from the instruction sheet.

- A screwdriver blade and an upward pry will enable you to pop the fuel filter from its plastic cartridge. Remove the filter and inspect the filter and the cartridge for contaminants. Likely the filter is discolored and is black in color. No cause for alarm, the filter is doing its job.

There is cause for concern if you find lots-of-funk in the plastic cartridge. An accumulation of junk could indicate microb activity in the fuel tank. Draining the tank and treating the fuel system would be the necessary service technique.

- Discard the old parts
- Confirm the used end seal is removed from inside the head.
- Wipe clean the sealing surfaces of the new o-ring and end seal inside the head.
- Install canister sealing o-ring and confirm the end seal is in place on the canister.
- Lubricate the canister o-ring with clean engine oil. Do *not* pre-fill the canister with fuel.
- Install to the point of first contact for canister-flange and head.
- Tighten the canister an additional ½-inch of rotation.
- Reconnect the WIF sensor electrical connection and ensure proper connection is made.
- Reinstall the drain hose.

It is now time to re-prime the fuel filter canister. With the key in the ignition, briefly bump the starter, but don't attempt to crank the engine. Let the key fall back to the run position. Listen for the electric fuel transfer pump to operate. It should hum for about 20 seconds. The transfer pump is located in the fuel tank so you'll have to either carefully listen or have someone crawl under the truck and listen. Repeat this bump-and-prime procedure four or five times. Now, the moment of truth...Crank the engine and let it run for 20-30 seconds. Check the filter area and confirm that no fuel leaks are present.

Restart your engine and you are good-to-go for another 15,000 miles.

Robert Patton
TDR Staff

THE SEARCH FOR A 6.7-LITER FUEL FILTER ONLY

Short answer: You cannot purchase a fuel filter only. The replacement kit is sold through Mopar (05183410AA), Fleetguard (FS43252) and Cummins (4936025) as a filter, gasket, o-ring and plastic cartridge assembly. Yes, you get the plastic cartridge whether you need it or not.

Long Answer: The plastic cartridge is reusable, right? To no avail, the Geno's Garage staff tried for 18 months to purchase the required gasket, o-ring and filter from Fleetguard. Fleetguard makes and packages the filter kit for Mopar. I've seen the notes from the e-mail and the telephone conversations and the words dogged-determination describe their pursuit for the lower cost filter-only.

It is not to say that the Fleetguard FS43252 is outrageously expensive. At less than \$30 it is fairly priced. Be glad you're not a PowerStroke owner where the price for a 6.0-liter engine fuel filter package is \$55.

How about the Mopar-boxed fuel filter kit. Would you believe the Geno's folks sell the kit for \$10? That is not a typo—the Geno's staff knows that their price from their Dodge dealership is too low/not correct. Being forthright, they advised the Dodge dealership and the dealership advised Mopar. Oh well... Owners of the 6.7-liter truck should take advantage of this pricing glitch while you can. The folks at Geno's will honor the price as long as possible. They have 500 filter kits in stock.

As a postscript, I received a follow-up phone call from Fleetguard. The response, "the plastic cartridge unit was not designed as a lifetime product. As such there has not been validation done to substantiate the cartridge's use long term."

So, the final answer: There is not much hope for a fuel filter only, so get 'em (the mis-priced Mopar fuel filter kit) while you can.

THE HARVEY BARLOW METHOD

Those that frequent the TDR's web site are likely familiar with Harvey Barlow and his helpful post in the 6.7-liter area of the discussion forums. In early August Harvey discovered another (and perhaps easier?) way to change the 6.7-liter fuel filter. The following is Harvey's method.

Using this do-it-yourself tip it is not necessary to remove the left front tire or even the left front fender inner lining. As Patton suggests, you may want to spend some time from above and below tie-wrapping cables and wiring to make it easier to access the fuel filter.

From below the truck, reach up and disconnect the water-in-fuel sensor wiring plug from the base of the fuel filter canister. Again, as Patton suggests, you may want to de-tang the sensor wiring plug connector.

I like the idea of extending the fuel filter drain hose. Do so by slipping some 5/8" ID hose over the existing plastic hose, or remove the plastic hose and permanently replace it with a longer length of 3/8" ID hose. Loosen the drain valve on the bottom of the canister by twisting the 2" plastic "star wheel" counterclockwise and allow the canister to drain. As mentioned, you'll not be able to drain much fuel. Now for the tip-of-the-quarter: Using a 1/2" ratchet and a 1/2" extension long enough to reach the bottom of the canister, insert the 1/2" drive tip of the extension in the slot in the bottom center of the filter and back it out one turn. You can now remove the canister by hand from above or below, taking care not to spill the remaining fuel in the canister.



I'll bet you didn't know that there was a 1/2" drive indentation on the bottom of the filter canister.

The replacement canister contains a new filter element and the water-in-fuel sensor. Simply apply the supplied replacement O-ring to the male end of the canister and screw it in by hand. Hand tighten it. Reconnect the water-in-fuel sensor plug.

Cycle the key twice, just enough to bump the starter but do not turn the engine over. This will cycle the fuel transfer pump in the fuel tank to refill the canister.

Start the engine and test for leaks.

Record the date and mileage in your truck maintenance record book.

If your truck runs and doesn't leak fuel, you did good!

HBarlow

And the editor thought to himself, "Why didn't I discover the 1/2" drive indentation on the bottom of the canister?" As you inspect the canister you'll notice that is an off-only type indentation. Thanks, Harvey, for the tip.