



THE NUMBER ONE DODGE/CUMMINS TURBO DIESEL RESOURCE

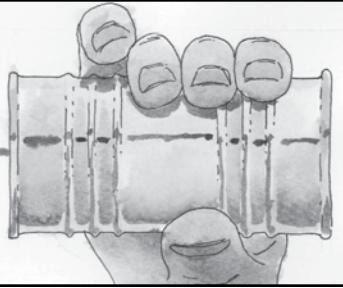
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INSIDE: 2010 RAM "MR SCHWARZ" GETS MORE UPDATES Your Story on page 46

MEMBER 2 MEMBER



I think you will agree with me when I categorize Turbo Diesel owners as independent people who are not afraid to try something new. You are an ingenious membership who reinvents and improves a product to make it better serve your needs. You show a strong willingness to share your shadetree solutions. With your input each quarter, we publish the "Member2Member" exchange to give you a forum to tell other members how you solved a problem.

WHAT TO DO ABOUT THE FUEL TRANSFER PUMP ON YOUR '03-NEWER TRUCK — OR — THE FOOL PUMP RETROFIT

What to do?

With greater and greater frequency the "What to do?" question is asked at least three times a day to the staff at Geno's Garage.

I've overheard the conversation too many times. The Geno's staff's line of questioning, "Are you a TDR member?" allows them to skip the ten-minute lecture about how the '98.5-'02 fuel system is totally different than the '03-current HPCR fuel system.

TDR guys already know that the worst thing that happens if the transfer pump fails is that the '03-current truck won't start and/or run.

Wait, don't let me get sidetracked on '98.5-'02 vehicles. If you are new to the TDR and want to know about this sad story, see the TDR's Turbo Diesel Buyer's Guide (TDBG) at our web site. Read the entire article, "Fuel Transfer Pumps Revisited"

Now, back to the story: What should a good Boy Scout do to be prepared. After all, we've all read stuff on the interweb (misuse of terminology intended) about how the fuel transfer pump is going to fail on our '03-current truck.

Or is it?

Remember the reference I made earlier about the non-TDR member? Now the Geno's staff will have to educate the owner about the fuel transfer pump on the '03-'04.5 truck (transfer pump on the engine) and the '05-current truck (transfer pump in the fuel tank).

The location of the fuel transfer pump on the '03 and newer trucks has quite a bit to do with the advice that the Geno's staff gives to the customer. But, before I get into the specifics for the '03 and newer trucks, let's do a quick review of the fuel transfer pump recommendations of the Geno's staff for *all* year models of the Turbo Diesel.

A Quick Review

'89-'98, 12-Valve 5.9-Liter Engine

This engine has a robust, mechanical fuel transfer pump. Should the fuel transfer pump fail, it will not harm the Bosch VE or Bosch P7100 fuel injection pump. Replacement fuel transfer pumps can be purchased at Geno's, Cummins, or auto parts stores. Purchase a replacement and install it now. Keep the working pump as a spare and tools to allow you to change it if an emergency arises. The need to monitor the fuel pressure from the transfer pump to the fuel injection pump is minimal—no gauge needed.

'98.5-'02, 24-Valve 5.9-Liter Engine

This engine has a fuel transfer pump that is electrical. It is located on the engine next to the fuel filter. At best, its life span is marginal. Should this electrical fuel transfer pump fail, the lack of cool fuel to the expensive Bosch VP44 fuel injection pump *will cause the VP44 to fail*. Replacement OEM-design fuel transfer pumps can be purchased at Dodge, Cummins, or aftermarket locations. The Geno's Garage folks will not sell this pump to a customer. Again, it is a marginal design.

Geno's Garage and others offer the FASS Direct Replacement Pump (DDRP-02) for these trucks as well as complete FASS high performance pumps and pump/filter combinations. Purchase a replacement and install it now. Keep the working pump as a spare and tools to allow you to change it if an emergency arises.

'03-'04.5, HPCR 5.9-Liter Engine

This engine has a fuel transfer pump that is electrical. Its life span is 80,000 to 120,000 miles. Should this electrical fuel transfer pump fail, it will not harm the expensive HPCR/Bosch CP3 fuel injection pump. The Dodge and Cummins parts networks do not sell a replacement pump for these year model trucks. Instead they sell a kit (\$350-\$400) that changes the fuel pump's location to an in-tank design. Labor for this conversion can easily run another \$400. Do not allow this modification/repair/replacement to be done to your truck. When the pump is in the tank you cannot do a side-of-the-road repair.

Geno's Garage does offer a replacement fuel transfer pump for the '03-'04.5 trucks. It is part number FPD4089602 for \$179. They also offer FASS high-performance pump/filter combinations. The need to monitor the fuel pressure from the fuel transfer pump is minimal—no gauge is needed. Purchase an external transfer pump replacement and install it now. Keep the working pump as a spare and tools to allow you to change it if an emergency arises.

'05-'12, HPCR 5.9-Liter and 6.7-Liter Engine

This engine has a fuel transfer pump that is electrical. It is located in the fuel tank. However, unlike all the previous Turbo Diesel trucks ('89-'04) this transfer pump doesn't lend itself to a quick side-of-the-road repair. It appears to be a solid design.

Do you trust the in-tank design? I called one of my friends at the factory hot-line for problems. His response, "It has been since 2005 and the 'test of time' is somewhat complete. The in-tank design is a good one and we did not see warranty numbers that caused any concerns."

For me, that was/is reason enough to "not worry and be happy." However, in my further conversation about the fuel system, he was quick to emphasize (as have many of the TDR's writers in our discussions on injectors) that clean fuel is paramount to long injector life. Regular 15,000 mile fuel filter changes should be rigorously performed. Injectors are expensive (a minimum of \$350 each, \$2100 total) and, should you wish to add extra fuel filtration to the system, I can see that as a great precautionary modification.

There you have it, a reason to modify your truck! And, a reason to be a good Boy Scout.

The Fool Pump Retrofit – My Boy Scout Plan

Here is the Boy Scout plan. Using the tip from TDR writer David Magnoli (Issue 69, page 67) I will install a parallel fuel transfer pump setup on my 2010 "Mr. Schwarz" truck. A FASS single filter unit will become the primary fuel pump, the in-tank fuel pump will serve as the spare. Some brass ball valves, extra hose, a draw straw and fittings will keep me entertained for an afternoon of making modifications to the truck.

Before I go too far with this plan, let's take a look at the financials of the project: A) Replacement of the existing Dodge pump with a new part, #68058692AA, \$245; B) Replace the Dodge pump with a Mopar remanufactured unit, #RL079472AA, \$164; C) Altogether replace the Dodge pump with a FASS, single filter, Titanium system, \$550; D) Do the FASS Boy Scout project with a FASS, single filter, Titanium system plus a draw straw, and hardware and fittings to direct fuel flow from the chosen pump, \$625.

Now, time for commentary:

- A) Replacement with new part – Compared to the price of the Mopar remanufactured unit this option was \$80 more expensive. However, a search of the Mopar parts system shows the number is superseded to the reman unit, RL079472AA. Proceed to scenario B.
- B) Given the seal-of-approval input from my Dodge contacts and the affordable price of the Dodge reman unit, this option seems the most practical to me. Hindsight has 20/20 vision. However, with the transfer pump in the tank if the pump unexpectedly fails you cannot do a roadside repair. The Boy Scout dilemma: where do you draw the line?

C) If you are going to the trouble of doing this much work at this much expense, I would spend the extra \$75 for a draw straw, hardware and fittings and do the FASS Boy Scout project outlined in scenario D. Likewise if your transfer pump had failed and you wanted the extra filtration of the FASS and the peace-of-mind of the Boy Scout technique, spend the extra money: replace the failed Dodge unit and install the FASS. Proceed to scenario D.

D) I've done a bit of rambling to get to this point. As I mentioned in my commentary for item B, hindsight has 20/20 focus and if I were simply faced with a need to replace the transfer pump, scenario B is all I would do.

However, I was already in the middle of doing project D, before I learned about B. And, my factory pump is still operative, so I will be a diligent Boy Scout and have two pumps that I can choose from.

So, what did I learn in my quest to complete the Boy Scout project/scenario D? I think you can tell by the title that I made some mistakes—I'm thankful that I have an old car for alternate transportation. I'm thankful that I have a small workshop that is out of the weather. I'm thankful that I have a hydraulic lift.

I'm thankful for friends that can help with lifting and alignment. This is not a quick and easy project. But, if you must, take some time and learn from my experience and mistakes.

I could take you through the project with a step-by-step set of instructions—you know, "Before proceeding, remove the battery connectors at the battery terminals, put on your safety glasses, ear protection and hard hat, etc." but I will assume you have the skill set to tackle the scope of this project. Likewise, it is much more entertaining to read about the editor's mistakes and tips learned doing the project than it is to read about the nut and bolt sizes. Here goes: mistakes and tips learned with the '05-'12 Fool Pump Retrofit.

Big Mistake

Big mistake: I've got this project 90% completed, only some simple wiring to do to switch from the FASS to the factory pump. Everything is buttoned up; the wiring and plumbing are set for the factory pump to operate. The truck fires up and it is off for a test drive and to fill up the fuel tank. With the tank filled up, I hop in to return to the shop and do the balance of the wiring. Oops, the fuel gauge does not move from its reading of near empty. "Shazam" was not the expression I used to convey my displeasure with my workmanship. I suspected what the problem was—the float for the fuel tank sending unit was stuck against the newly installed draw straw fuel inlet pipe for the FASS pump.

I was quick to suspect the problem, why was I not more careful in my reassembly?

Please learn from this key mistake. (Yes, the float was hitting the draw straw.)

MEMBER2MEMBER . . . Continued

Now that the truck has 30+ gallons of fuel (30×7.15 pounds = 215 pounds), I would not be dropping the tank any time soon.

However, my big mistake gives me the opportunity to tell you how to access the fuel tank by removing the truck's bed. You didn't think I was going to drop a 215+ pound fuel tank, did you?

And now, on the positive side, things I learned doing the Fool Pump Retrofit project.

What Did I Learn?

First, the obvious—there are two ways to tackle this project: drop the fuel tank from underneath the truck or remove the truck's bed for access to the fuel tank.

You are correct to assume that I have used both methods to access the fuel tank. And, rather than give just my opinion, I asked the three other guys that helped me in the course of this project (Geno's Garage staff members) which way they would choose to access the fuel tank. Wouldn't you know it, the vote was split 50/50.

So, for the two guys that did not vote like I did—well, they can start their own magazine.

Seriously, I'll try to give you the pros and cons of each method, but you'll easily note that my bias is toward removing the truck's bed for access to the tank.

Bed Removal

Pros:

- If you've never worked with those pesky fuel line clips this is the only way that you can get clear access to them.
- As mentioned, you do not have to be concerned with the amount of fuel in the fuel tank.
- Less time lying on your back.

Cons:

- You still have to go underneath the truck to mount the FASS unit and do the fuel line cutting and splicing.
- You need three (possibly only one if he and you are the strong types) other folks to help you remove the truck bed.
- More junk to have to remove and reinstall.

Bed Removal Tips

If there is a way to over-complicate a project, I can discover it. Long story—short version: I attached tie-down straps to the four corners of the truck bed and the four arms of my hydraulic lift. With the lift at full-up, the truck's tires would not quite go underneath the raised bed. Yes, I tried letting the air out of the rear tires. In "Three Stooges" fashion, a group of us finally got the bed high enough to clear the rear tires.

Our efforts to reinstall the bed were just as comical. Time spent needlessly fumbling around: about two-hours.

I am pleased to report that the bed went back on without scratches or dents. However, with my pride in check, I must report to you that the bed lift could have been done much easier. How so? With four guys, one at each corner, lift the bed. Next, walk backwards about two feet and rest the front of the bed on the rear tires. The back of the bed can be supported with a floor jack(s).

Somewhere else in this article I've mentioned that hindsight has 20/20 vision...

Tips for bed removal:

- Remove the tailgate to make the lifting of the bed easier. Again, my buddies tell me that two strong guys lifting at the wheel well arches can get the job done.
- The bed is held in place with six, 18mm bolts: two at the front, four at the rear. The bolts were assembled with Loctite. The front bolts are difficult to access and require that the plastic wheel well liners are removed.
- Remove the plastic wheel well liners to get access to the hose clamps that hold the fill neck/vent pipe onto the side of the truck bed. Don't forget to remove the nearby ground strap.
- Since you have to remove the wheels/tires to remove the wheel well liners, it is a great excuse to rotate your tires.
- Remove the truck's rear bumper (six, 16mm bolts) so that you can lift the bed upward and not scratch the lower part of the rear bed or the front of the bed at the cab.
- If you remove the truck's bed you don't have to worry about how much fuel is in the tank.
- With the bed removed you'll notice that there is a long horizontal plastic "snubber" that is attached to the truck's bed. From Issue 75, page 46, I learned that this snubber is on the bed to prevent errant tie straps from blowing down between the cab and bed, wrapping around the driveshaft and then bending the bed prior to the strap snapping. TDR members complain that the snubber catches grit and removes paint from the cab. Below is a picture of the snubber. I noted the scratched paint on my cab, painted it with undercoat paint and removed the snubber from my truck's bed.



The truck's plastic bed snubber.



The abrasion at the cab.



Intercept the wiring harness at the area of the driver's door and you can manually operate the fuel transfer pump.

Oops, turning the pump on solves only half of the problem. Where do you disconnect the fuel supply line? (This is a trick question.) Answer: don't over think this one. Simply open the fuel drain petcock at the fuel filter. And, if you've previously taken five minutes to extend the fuel drain line (see Issue 75, page 80) and the fuel will drain directly into a five-gallon jug(s).



Utilizing the fuel drain line extension tip from Issue 75 it is easy to drain the fuel tank.

- Alternately, you can insert a 1/2" thin-walled hose (it has to be a smallish hose to slip past the roll-over ball in the tank's fill neck) and siphon the fuel out of the tank.
- Once the fuel is removed from the tank it's time to remove the two tank straps and drop the tank to the ground. Not so quick... Go to the driver's side and remove the hose clamps that hold the fill neck/vent pipe to the fuel tank.
- In order to get access to the fill neck/vent pipe you may have to remove the rear tire/wheel and then remove the wheel well plastic liner. This is a great excuse to rotate your tires.
- Remove the two 16mm bolts that hold the drive shaft in place. Push the driveshaft to the passenger side of the truck for a better visual of the top of the tank.
- Now, with a deep-well, 16mm socket, remove the nuts that hold the tank straps in place. Drop the tank low enough so that you can feel the clips that have to be pinched to allow you to remove the fuel supply and fuel return lines.

Tank Removal Tips

Again, without a lift, I really don't know how you would do this project. Well, yes, I do know: you would either remove the truck's bed or you would jack the truck up as high as possible and spend the day going back-and-forth underneath the truck on a crawler or sliding on top of a sheet of cardboard. Not my idea of fun.

Tips for underneath-the-truck tank removal:

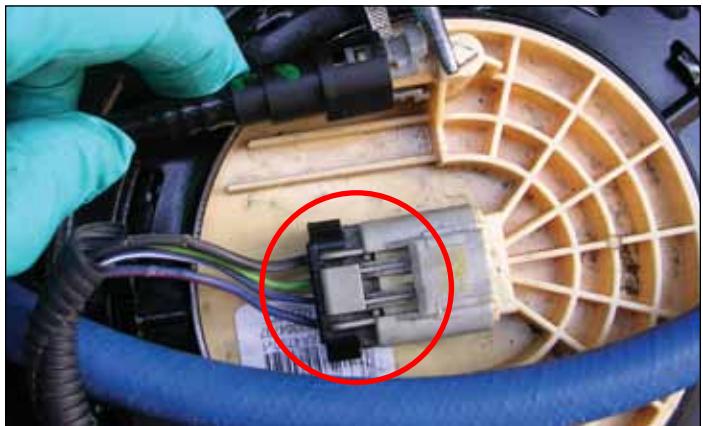
- Since you are doing this work as a FASS Boy Scout project you've already driven around until the tank was empty, right?

What, the truck still has half a tank of fuel? No problem, let's use the fuel transfer pump to remove the 15 gallons of diesel fuel.

Here's how: With my 2010 truck I learned that the 12-volt positive wire to the fuel transfer pump is blue with a red stripe. From underneath the truck intercept the wiring harness at the driver's door area, slice into the cover and locate the blue/red power wire. With a long wire fastened to battery positive you can crimp wires and turn the fuel pump on to drain the tank.



The pesky "pinch-in" clips that hold the fuel lines to the fuel pump assembly.



To remove the wiring harness you have to pinch down the grey tab to release the connector.

- You'll also have to disconnect the wiring harness for the fuel pump/fuel sending unit.



From this photo (yes, the bed was really removed) you can see how it all goes together.

- I've given you clear pictures of these fuel lines and electrical wires because you will not get a visual of these from the on-your-back vantage point. For a visual you'll need a flashlight and a mirror or you can take a peek from the driver's side wheel well.

- Drop the tank and slide it from underneath the truck for the necessary modifications: addition of draw straw, and the supply and return fuel lines.



Here is a picture of the tank that has been removed from the truck. Look to the front and you can see the location of the new FASS drawstraw.

General Notes

- From some of the other photos you, may have noted the air horns, air tank and air compressor that I had already installed on the truck. Therefore, there was no room for the FASS unit. Wait... I have yet to use the floorboard storage compartments, so I removed the door and its compartment from the inside of the truck. I test fitted the FASS directly underneath the storage door. I fabricated a metal cover to protect the interior from the elements. I located the FASS or stock control switch on the metal cover.



From above, a picture of the FASS unit that I installed on the outside of the driver's side frame rail.

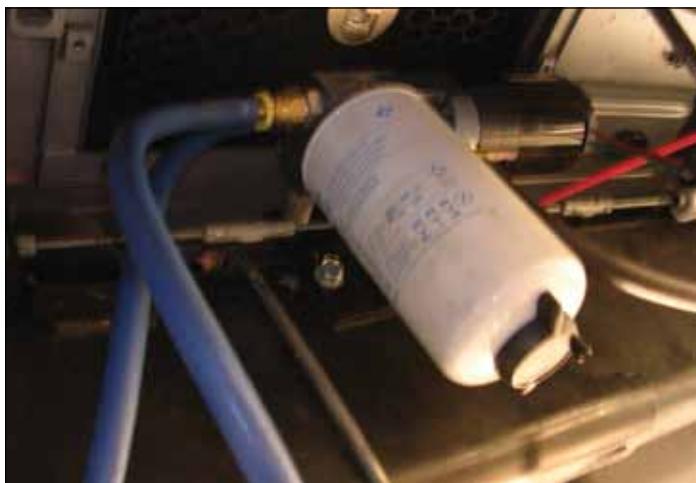


Open the driver's side rear floor compartment and you can see my FASS switch panel.



Stock valve is open, FASS valve is closed.

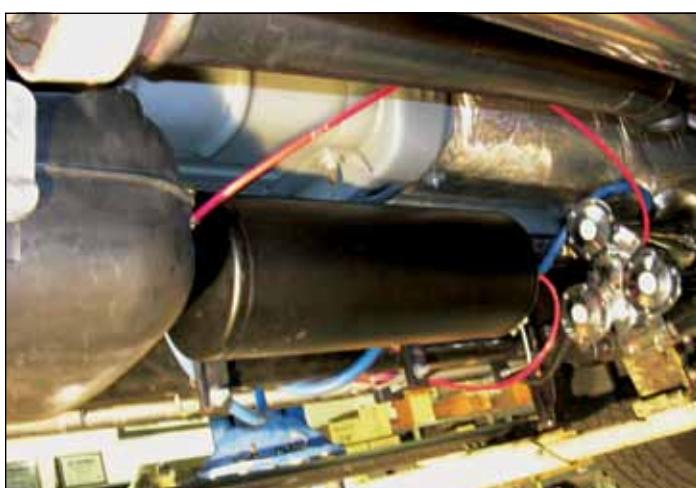
- I spliced some 3/4" heater hose and wrapped it around the new fuel lines to protect them.



The FASS unit from the underside.



Heater hose for fuel line protection.



The inside of the driver's side frame rail holds an air tank and air horns.

Conclusion

I learned quite a bit by doing this project. It wasn't difficult, however it was time consuming. One last time, looking at it financially, it would cost \$164 to fix a failed factory pump versus \$625 to do this project. That's almost four times the money.

Yet, should either pump fail, I can continue my trip. And, with the FASS unit, I can rest assured that the fuel system is well filtered. Is the piece-of-mind worth \$461? For that answer I'll let you be the judge.

Robert Patton
TDR Writer

- With the air horns and the air tank removed, the next photo shows the plumbing of the FASS and stock fuel lines.