

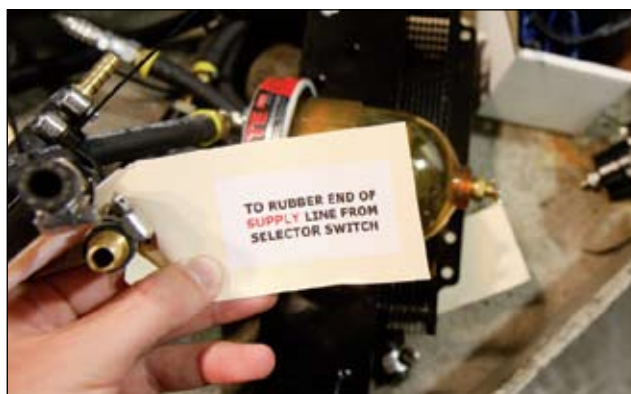


# COMPLETE FUEL SYSTEM

## HOW TO SOLVE ALL YOUR 7.3L POWER STROKE'S FUELING ISSUES

**O**n International's first go-round with the 7.3L Power Stroke ('94 to '97), its hydraulically actuated, electronically controlled unit injector (HEUI) fuel system was considered a modern marvel and was at the forefront of electronically controlled diesel engines in pickups.

However, the job of getting adequate fuel to the rails and ultimately the injectors, was left up to a mechanical lift pump in the engine valley that ran off the camshaft. And while being mechanically controlled isn't always a bad thing, in the '94½ to '97 7.3L Power Stroke's case, it led to



Everything in the CPR kit was labeled and showed just how much the folks at DieselSite care about their customers. Between the extensive parts labeling and an 18-page manual with detailed photos, we could tell they wanted the install to be as painless as possible.

sporadic fuel pressure levels, which yielded inconsistent fuel supply to the injectors, an inefficient injection event, and a notorious lobe at start-up until the lift pump could pressurize the fuel system.

In order to solve this problem and see the true potential of the after-market injectors in our '97 F-350 Power Stroke, we contacted DieselSite for one of its complete, pre-filtered, regulated (CPR) fuel systems. The folks at DieselSite have put together a one-time solution to all of the 7.3L Power Stroke's fueling woes. The kit comes with a new fuel filter, water separator, fuel cooler assembly, an inline electric fuel pump, a post-pump fuel filter, a fuel pressure regulator, and all the fuel lines, fittings, and hardware required for the install. DieselSite's goal with this kit is to provide superior fuel delivery, fuel filtration, water separation, air removal, and even fuel cooling.

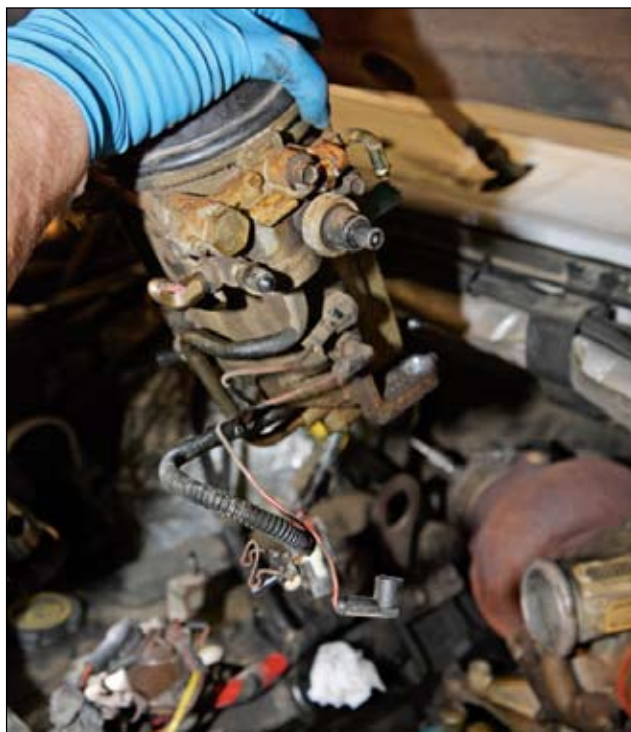
For the install, we took our official towing truck at *Diesel Power* to OC Diesel Shop in Mission Viejo, California. An up-and-coming facility specializing in Power Stroke and Duramax diesels, it's owned and operated by Bud Anderson, a man with more than 20 years of experience working on Fords. With a reputation of providing customers top-notch quality and customer service, we figured OC Diesel Shop would be the perfect place to install a quality fuel system on our 7.3L Power Stroke. **DP**



OC Diesel Shop's Matt Stranz performed the install and began by removing all of our intercooler plumbing and stuffed some paper towels into the intake manifold ports.



In order to remove the fuel bowl assembly and mechanical lift pump in the engine valley, the fuel lines running from the top of the lift pump to the fuel bowl were cut using a pair of pliers.

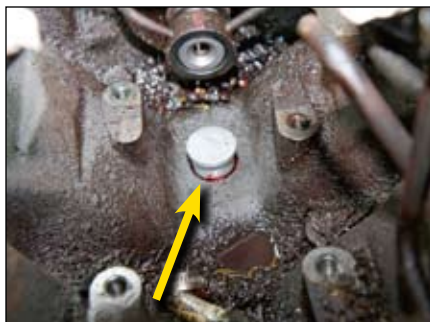


Next, all fuel lines in the engine valley were sprayed down with brake cleaner, the fuel lines running to the fuel bowl assembly were disconnected (including the hose and hose clamp connected to the lift pump), the IPR (injection pressure regulator) harness and plug were removed, and the fuel bowl was pulled.





Before the factory lift pump could be removed, a 1 1/4-inch wrench had to be used to loosen the banjo bolt at the rear of the pump (under the turbo pedestal). Then, the mounting bolts for the lift pump were removed and Stranz carefully pulled it from the engine. According to the OC Diesel Shop guys, if you're not careful during this process, you can break the bottom off in the block. Here you can also see what might have been causing a performance-ailing fuel leak on the truck (fuel slipping past the seal and pooling in the engine valley).



Next on the to-do list, and because DieselSite's CPR system deletes the factory lift pump, the supplied fuel pump delete plug was installed in the engine valley. For the best seal possible, Stranz put anaerobic gasket maker on the plug.



After that, the fuel lines had to be removed from both the driver and passenger side rear of the cylinder heads. The driver side had a 90-degree fitting and couldn't be unscrewed without removing the turbo. DieselSite recommended the fitting be cut off at the 90-degree bend, which then made it possible to remove it from the head. The OC Diesel Shop guys used a dye grinder to get the job done. Then the steel fuel line was collapsed, pulled out from under the turbo, and removed from the engine.



Following along with DieselSite's directions, the front passenger-side fuel line was removed, then the supplied 45-degree swivel fitting (shown) was fitted to the front passenger-side fitting in the head and tightened up. For length reasons, a second 45-degree fitting, also supplied by DieselSite, was connected to the first 45-degree fitting to make the fuel line reach the driver-side fuel line.



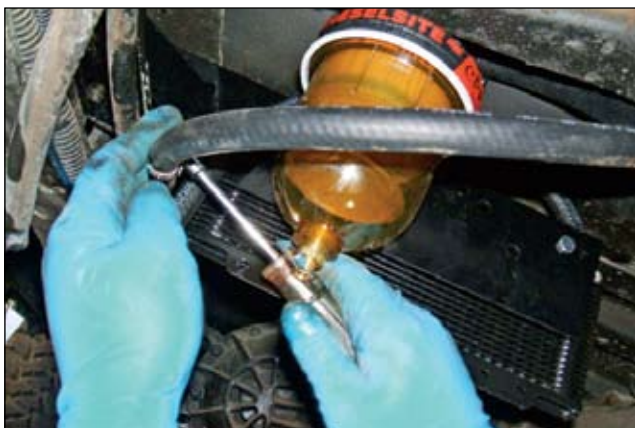
Next, the diesel fuel-compatible Aeromotive fuel pressure regulator was mounted on the existing cover bracket (for the factory engine cover) by drilling two 1/4-inch holes and using the supplied hardware. Stranz also modified the cover bracket by grinding down the area that seemed a little too close to the regulator gauge and used several washers as shims to keep the bracket from sitting on the high-pressure oil pump reservoir once installed.



Then, the rear passenger-side fuel line was run under the turbo pedestal (to avoid heat) and up to its port in the regulator (it enters the regulator from the driver side). The new fuel line on the rear driver side of the head was run to the existing steel fuel supply line in the engine valley and connected via the supplied hose clamp, and the return line from the regulator was run to the other existing steel fuel return line in the engine valley. After that, the IPR harness and main connection was reinstalled, and the leftover fuel bowl connections were taped up and zip-tied together behind the high-pressure oil reservoir. Then all intercooler plumbing was reinstalled.

## CPR SYSTEM BENEFITS:

- We now have consistent fuel pressure flowing in and out of the cylinder heads.
- What we really like is that the second you bump the starter, you've got 60 psi of fuel pressure. There's no more waiting around for the mechanical pump to begin pumping.
- Right off the bat our injectors have fuel, and thanks to a self-purging system, our fuel lines are free of air.
- The electric fuel pump improved the engine's idle tenfold.
- All fuel lines included with the kit are biodiesel compatible.



The fuel cooler and filter assembly was mounted perpendicular along the driver side of the frame behind the transfer case. First, the four bracket holes were marked, drilled out with a 1/4-inch drill bit, and mounted using the supplied bolts, washers, lock-washers, and nuts. A pre-pump, 2-micron fuel filter is used to remove large particulates and water from the fuel, and the cooler itself should remove most of the heat created in the cylinder heads, further maximizing performance.



After that, the OEM return line was cut close to the factory hose clamps and the two cooler lines were connected using the supplied union and hose clamps. The "to-tank" line coming off the fuel filter was connected to the OEM supply line in the same manner. Then the new electric fuel pump and Aeromotive post-pump filter was mounted in front of the fuel cooler and filter assembly along the driver-side framrail (shown). From there, the fuel line from the filter and cooler assembly was connected to the inlet of the fuel pump, the new fuel line from the outlet of the post-pump filter was connected to the hard OEM supply line (return that loops back around), and the fuel supply line (to the engine) was connected to the outlet of the fuel pump assembly.



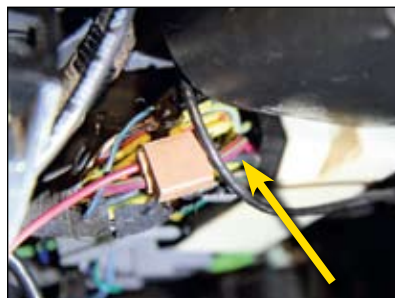
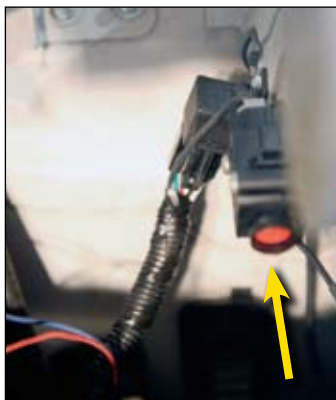
Three 3/8-inch holes were marked and drilled in the frame in order to mount the electric fuel pump. Here you can see the black ground wire running from the fuel pump over the framrail and secured behind the top mounting nut.



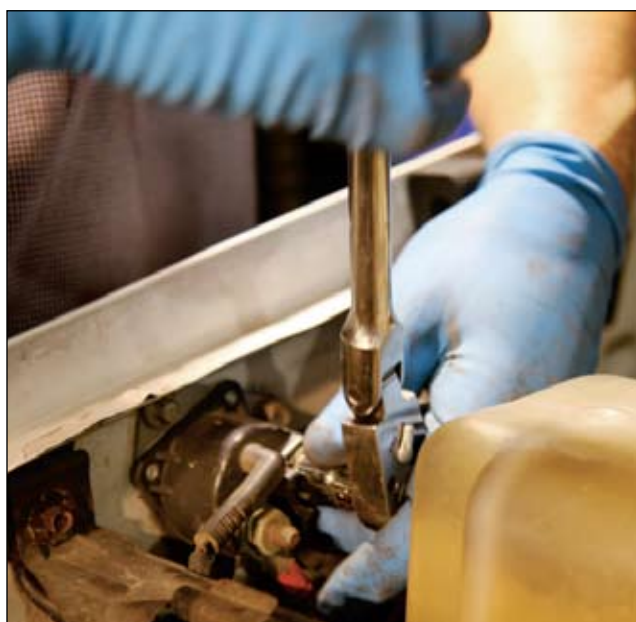
As a safety feature, the CPR fuel system came with an oil pressure cut-off switch (which was wired to the fuel pump), which cuts power in case the engine dies. It was mounted in the oil pressure port just above the oil filter with a 1/16-inch socket used for ICP sensor removal and installation.



Next, the inertia switch (also a nice safety feature) was mounted on the driver side inside the engine bay, and just above the IDM (injector drive module). The switch had to mount horizontally, be level, and face the front of the truck in order for the engine to start. The purpose of the inertia switch is to kill all power to the fuel pump in the event of an accident. In a wreck, the red button (arrow) will push out and can be reset by simply pushing it back in. The inertia switch connects to a relay that was mounted just behind it. The relay was then tied into the fuse panel (for power), the oil pressure switch, the fuel pump, and of course, a ground.



For key-on power, the terminal on the oil pressure switch was connected to the red wire with a green tracer (arrow) under the dash in the main steering column bundle using the provided brown quick splice (or scotch block).



The blue wire from the oil pressure switch was connected to an eyelet and installed on the starter solenoid. The guys at OC Diesel Shop put plastic wire loom, black electrical tape, and zip ties around all wiring for a nice, clean, finished look.



Before starting the engine, the entire system was checked for leaks. Then the truck was fired up and the fuel pressure regulator was adjusted to 60 psi, which was what DieselSite recommended we leave it set at. Adjusting the regulator is simple: To lower fuel pressure, you loosen the nut on top and loosen (back out) the Allen bolt, and to raise fuel pressure, you loosen the nut on top and tighten (screw in) the Allen bolt.



To see how well the CPR fuel system complemented our existing modifications, we put the truck on Westech Performance's SuperFlow dyno in Mira Loma, California, for some new baseline numbers. Combined with our ATS intercooler, Stage 1 injectors, and custom six-position chip from Bean's Diesel Performance (and using SuperFlow's correction factor), we made 303 hp and 642 lb-ft.

## DRIVING IMPRESSIONS

- We experienced more mid-range and top-end power
- The throttle is more responsive, and acceleration is quicker
- Boost is maintained when the transmission shifts
- It's comparable to the difference we felt with aftermarket injectors. The upgrade is very noticeable!
- Exhaust gas temperature is cooler (no more air being sucked in by a failing lift pump)
- Overall, the truck is much more fun to drive and seems more eager to run
- The truck made 300 hp or more from 2,600 rpm to 3,150 rpm on the dyno

## Sources

### DieselSite

(888) 414-3457 • [www.dieselsite.com](http://www.dieselsite.com)

### OC Diesel Shop

(949) 297-8477 • [www.ocdieselshop.com](http://www.ocdieselshop.com)

### Westech Performance Group

(951) 685-4767 • [www.westechperformance.com](http://www.westechperformance.com)