

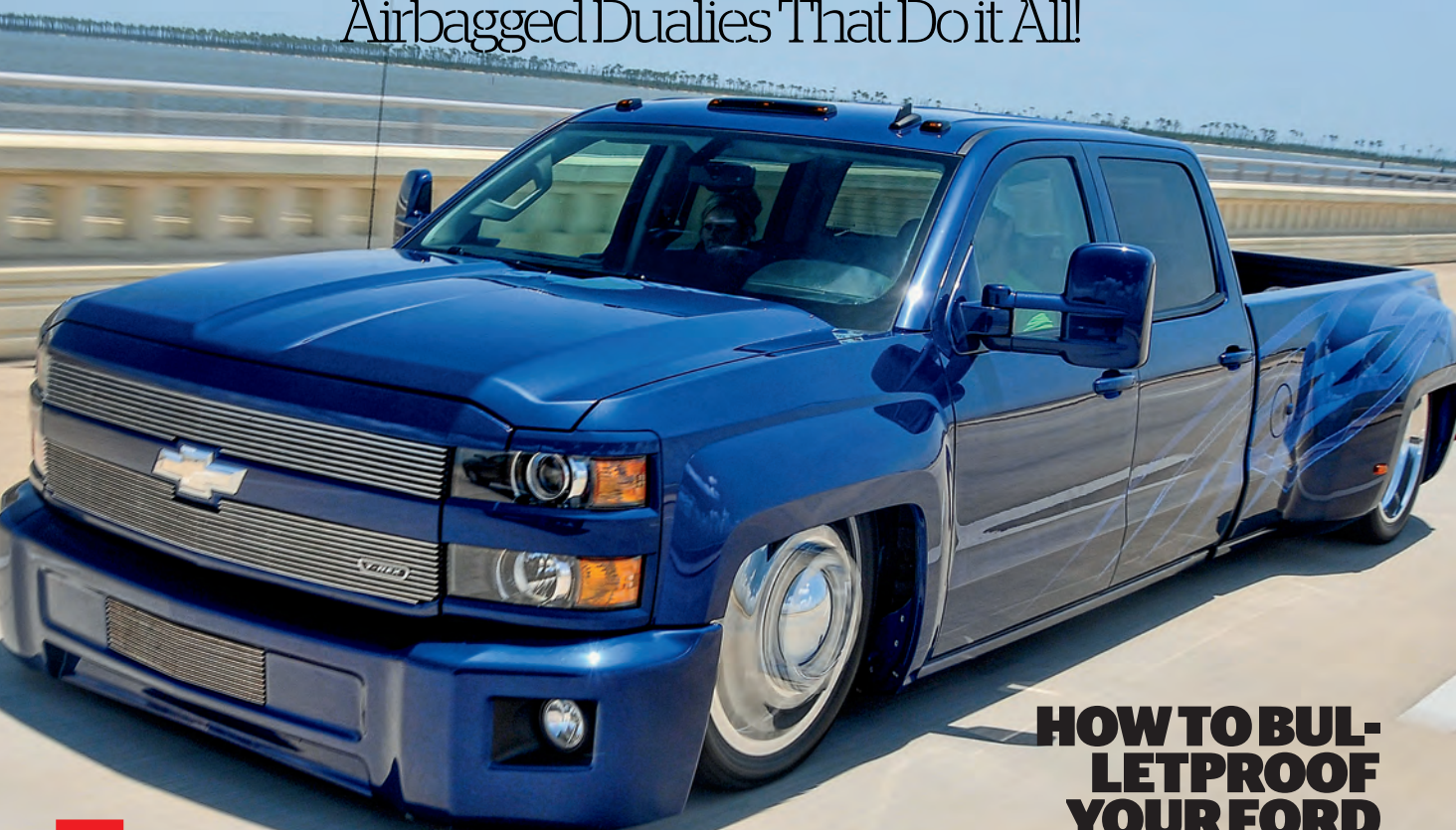
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WORLD'S LEADING TRUCK PUBLICATION

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DIESEL**
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YOUR RAM** XES FOR COM-
FOR A SMOOTH MON PROBLEMS
REAR END

**OUR READERS BATTLE
HEAD-TO-HEAD** THROW-
DOWN 2015
PART 2: DRAGS, SLALOMS,
AUTOCROSS



WRENCHIN'

BY JEREMY COOK
PHOTOGRAPHY: JEREMY COOK

Bulletproof Your 6.0L Diesel

Making a Ford Power Stroke Last Damn Near Forever



If you've been following along in recent months, we've been tinkering with a '04 F-250 by adding some exterior mods as well as adding some ponies under the hood in the form of an S&B air intake, a MBRP Exhaust system, and an SCT tuner. Even with the bad reputation of these engines, we figured the truck could handle it—it has had regular maintenance, along with a new turbo and a couple EGR coolers. But a few months into our newfound power, we began to have problems. After a diagnosis at our go-to diesel stop in SoCal, Bud's Diesel, we determined the culprit to be a failing high-pressure oil pump, or HPOP. If you don't already know about the Super Dutys, replacing many of the troubled components requires raising the cab to get to a few areas, namely, replacing the heads or studding the block. While you can add pretty much any bolt-on in the world to most gas V-8s without reinforcements, most diesels, and specifically 6.0L Power Strokes, have some issues, almost entirely having to do with heat and cylinder pressure issues.

So since we would soon be pulling the cab, which is actually easier than it sounds assuming you have access to a lift (eight body mounts, two radiator hoses, unplugging a whole bunch of electronics, disconnecting the steering, and a few other odds and ends), we decided to do pretty much every single thing the pros recommend to help ensure that this cab was not coming back off for a long, long time. The bulk of the parts came from Bullet Proof Diesel, who have been making these 6.0-liters just that for many years in the name of stronger, cooler running engines, thanks to tougher and better-performing parts. We also looked to Sinister Diesel for their coolant filter kit as recommended by Bud's and a host of new factory Ford parts, many of which have had small improvements made to them and adding to the overall performance of the engine.

Taking our time so we could learn as much as we could along the way, we spent about three days total on the truck from start to finish. This is definitely not a step by step for all you at home. We would need about 10 more pages for that. Instead, we went straight into the nitty gritty of things to show you exactly what is involved to make your 6.0-liter bulletproof for years to come. We started with new heads, head studs, and head gaskets and worked our way out. Also, keep in mind that while there's no room to mention it with every step, there are exact torque specs and new seals for every single component installed or reinstalled. Spending the day with the skilled techs at Bud's made us realize the importance of taking every precaution along the way. Thoroughly cleaning and blueprinting, chasing threads, and fixing loose or bald wires along the way are the reason why when this truck was fired up for the first time, it was right and ready to roll. Thanks again to the crews at Bud's, Bullet Proof, and Sinister, for their help and advice along the way. Now for the real

test: after a day of hard testing, and a couple weeks of regular driving, we took the truck to Baja as a tow/chase vehicle during the Mexican 1000. After 2,000 miles, many of which were off-road, there were zero problems to report. In fact, we'll let you know right here if and when something fails on our now-bulletproof 6.0-liter, and let you know just how we fixed it. Follow along to see just what it takes to rid your Power Stroke of its bad reputation! **TM**



Sources:

BUD'S DIESEL
714.902.1467
www.budsdiezel.com

BULLET PROOF DIESEL
888.967.6653
www.bulletproofdiesel.com

SINISTER DIESEL
888.966.6543
www.sinisterdiesel.com

1.


1. The first on our comprehensive list of improvements is the Bullet Proof Diesel OEM-style Oil Cooler Remote Mount Kit (PN VK688). This kit makes it possible to remote mount the stock engine oil cooler, which is normally located down in the valley between the cylinder banks. This makes the once-daunting task of replacing the oil cooler a simple affair.

3.


3. Since our upgrades required taking the top end down to the heads anyway, we decided to stud the block, using the complete Head Gasket Install Kit from Bullet Proof Diesel. This kit comes with all the required parts to replace your head gaskets—most importantly, the ARP head studs.

5.


5. Sinister Diesel's Water Coolant Filter Bypass System (PN SD-COOLFIL-6.0) removes any contaminants in the coolant system adding extended life to your water pump, EGR cooler, and engine oil cooler.

7.


2. Most 6.0L experts agree that if you only make one upgrade to your truck, this is it. Whether your truck requires the round or square version of Bullet Proof Diesel's lifetime warranty EGR Cooler (PN NT-EGRC-1), they utilize stainless tubing instead of fins to minimize fatigue and heat stress failure and is fully TIG-welded.

2.


4. Rounding out the bevy of Bullet Proof Diesel parts is their Billet Water Pump that includes an upgraded billet housing to replace the stock plastic unit. Last but not least was the Bullet Proof Diesel FICM (fuel injection control module) that features an updated, rugged circuit board and a billet aluminum finned case to better dissipate heat.

4.


6. The HPOP was what started all this in the first place, so we ordered one from Ford through Sinister. Unfortunately, we're showing you the late '04 pump and we needed the early one, which delayed our start time a couple days. The EGR Valve and IPR were ordered up as well. Again, every gasket, seal, and O-ring that came off was replaced with a new part as well.

6.


7. We had to skip the raising of the cab and teardown due to space limitations, and it is quite involved, but it was a very straightforward process. Batteries, wiring harness, radiator hoses, and a handful of other items were removed, and the cab was unbolted and slowly raised up and out of our way. Then, the top end of the engine was stripped down systematically, until the heads could be removed. Here, the block and pistons were all cleaned up and inspected before we installed our new head studs.

8.


8. Since we were going this far, we opted to spend the extra money with Bud's for a set of their rebuilt and resurfaced cylinder heads with a fresh valve job. They were bagged and waiting for us to bolt on!

9. Reassembly begins with applying some ARP Ultra-Torque lubricant to each of the ARP studs and threading them into the block. Studding the block is a great first step in bulletproofing our Power Stroke. The new head gaskets were then set over the studs.

9.

10.


10. Once the studs were torqued to spec we set the heads into place.

11.


11. Next, we set the rocker carriers in place over the heads, and reinstalled the cleaned-up pushrods and rocker assemblies.

12. Now all of the nuts and bolts were torqued to their respective values.

12.

13.


13. Bud's crew did comprehensive diagnostic testing when we brought the truck in, and determined all the injectors to be in good working order, so they were cleaned up and reused.

14.


14. We dropped the injectors into place, and were almost ready to button up the valvetrain.

15. The high-pressure oil rails were reinstalled next, and as always, torqued to spec. We also reinstalled the exhaust manifolds at this time. As soon as the valve covers were cleaned up, they were reinstalled, too.

15.

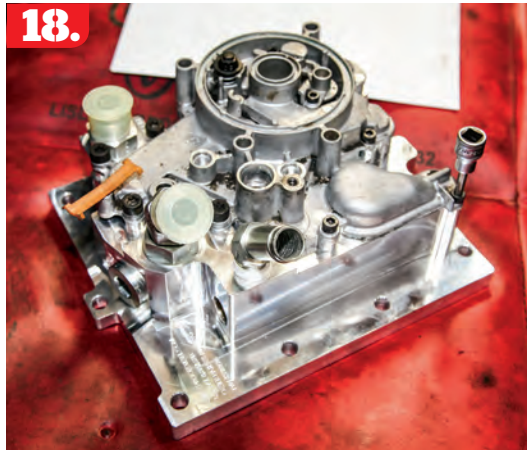
16.


16. Moving our bulletproofing elsewhere on the engine, we removed the oil cooler housing from the engine valley.

17.


17. Now the oil filter base was removed from the cooler housing and cleaned up.

18. With all the new seals in place, the filter housing is bolted up to the Bullet Proof Diesel Billet Oil Transfer Block using both new and existing hardware.

18.




19. With no oil cooler down below, the new assembly was bolted back in place in the engine valley.



22. Using all the new seals, the intake manifold assembly was now bolted into place.



25. The now-bulletproof FICM was bolted into place above the left valve cover.



28. From here we can begin to route the oil cooler lines over toward the passenger fender where the cooler will be located.

20. We removed the fan assembly and belt and pulleys to access the stock water pump, which was promptly removed to make room for the Bullet Proof Diesel Billet Pump. Then, everything was put back into place.



23. Now the filter housings were added, along with the new EGR valve.



26. At this point, the new HPOP showed up, so we were finally installing the component that brought us here in the first place.



29. The factory turbo had been replaced with a rebuilt unit about a year ago, but on inspection, we decided to do some polishing before we reinstalled it.



21. The previously removed intake manifold was cleaned and surfaced until it looked brand new. Then, the Bullet Proof Diesel EGR Cooler was bolted up, followed by the polished up throttle body.



24. The stock FICM was split in half, and OE bottom half was attached to the Bullet Proof Diesel billet top section. These heavy-duty FICMs can be bumped up from 48 volts to 53 or 58 volts, but shown here, we are adjusting them to the stock output.



27. With the new seals in place, the pump cover is reinstalled and torqued to spec.



30. With the turbocharger looking better than new we buttoned it back up and reinstalled it on the turbo pedestal. At this point, the cab is dropped back down and all of the electrical is reconnected. We're in the home stretch now.

31.

32.

33.


31. For the oil cooler relocation, the stock vacuum reservoir was removed, and the mounting bracket was installed using three vibration isolators.

32. The brand-new, factory-style oil cooler was prepped with all new seals.

33. Now the cooler was bolted up to the relocation plate.

34. The complete assembly was then bolted into the mounting bracket.

35. Finally, the oil and coolant lines were routed and installed.

34.

35.

36.


36. A new, compact vacuum reservoir is bolted into a stock hole on the inner fender.

37. The battery tray and battery were returned to their original location. Then the Sinister Diesel Coolant Filter Kit was installed. The filter base bracket bolts over an existing stud on the core support.

37.


38. The filter lines were then tapped into the coolant lines as per the instructions.

39. At this point, the filter and cooler lines were completed, new fluids were added, and a thorough inspection of the engine compartment was made. With the checklist complete, the truck was fired up!

38.

39.

40.


40. Even before a test drive, the diagnostic computer was hooked up and the SCT tune was reinstalled. We got a clean bill of health, except for a weird hesitation off the line. We quickly found the culprit—a bald wire on a switch to the transmission, most likely caused by yours truly climbing all over the chassis to get shots of the top of the engine.

41. With that mystery solved, we did some extensive testdriving, namely, 2,000 miles at the NORRA 1000 in Baja. We didn't really add horsepower (although it sure felt like it), but now we were more than confident we could use the available power and maintain reliability for years to come!

41.
