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# Billet Excellence

## Bullet Proof Water Pump Upgrade for the 6.0L Power Stroke

**BY KEVIN WILSON**
PHOTOGRAPHY: KEVIN WILSON AND NEAL TECHNOLOGIES, INC.

The old saying, "Necessity is the mother of invention," couldn't be more appropriate when it comes to aftermarket solutions for common automotive problems. You'd think buildings full of engineers and unlimited budgets for durability testing on the OE side would weed out most issues with diesel trucks; and for the most part, the process works.

However, there's no substitute for real-world testing and downright abuse to bring out the weak points in a vehicle's design—and, more importantly, its components. Diesels are famous for getting abused on a regular basis by pulling heavy trailers and extreme-duty use in general as work trucks. So, parts with weaknesses become common replacement items.

Case in point is the water pump on the 6.0L Power Stroke. As if the 6.0L didn't have enough issues on its own, folks who regularly depend on their trucks have probably replaced a water pump or two over the years. And the pumps normally aren't replaced because of the typical water pump failure scenario, in which the bearing or seal craps out, and the pump begins to leak out of the "weep" holes. They actually can break the impeller, leading to costly repair bills.

The OE 6.0L Power Stroke water pump utilizes a composite (plastic) impeller that is prone to cracking, flexing and breaking, according to the 6.0L experts at Neal Technologies Inc./Bullet Proof Diesel. The pump also sees huge spikes in water pressure against the impeller fins as the water moves past the inlet and outlet openings—somewhat similar to a water hammer. This puts an uneven strain on the plastic impeller fins, which can actually break the fins or the impeller itself.

Bullet Proof Diesel has developed its own fix for the 6.0L water pump with its new, anodized-aluminum water pump impeller, which the company installs on brand-new stock pumps. According to Bullet Proof, not only does the billet impeller improve the longevity and function of the water pump, it is also a more rigid material that will reduce cavitation and water pump housing erosion.

The pump is available in two sizes: a 90mm unit for the 2003 and early-2004 Power Strokes and a 100mm version that fits the late-2004-2007 6.0L, as well as the 2004-2009 E-Series versions.

Installation is technically four bolts on and off, once you actually get to the water pump by removing the fan shroud, fan, etc. However, the operation is simple enough for the average driveway mechanic.

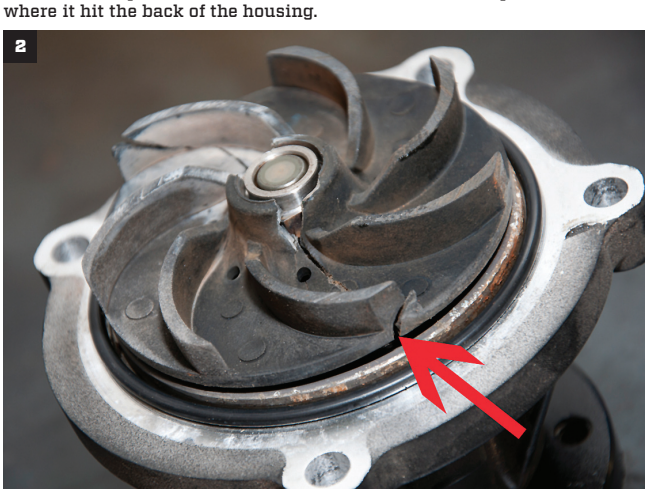
We shot an "install" on a test motor at Bullet Proof's Mesa, Arizona, facility to show you how it goes on.

If you own a 6.0L Power Stroke and have already replaced at least one water pump, you might consider using the Neal Technologies/Bullet Proof Diesel upgrade when it comes time to replace another broken stocker. **DW**


1

The stock water pump on the 6.0L Power Stroke features a composite (plastic) impeller that's been know to crack and fail. The damage is obvious on this impeller. Also note the score marks on the impeller fins where it hit the back of the housing.

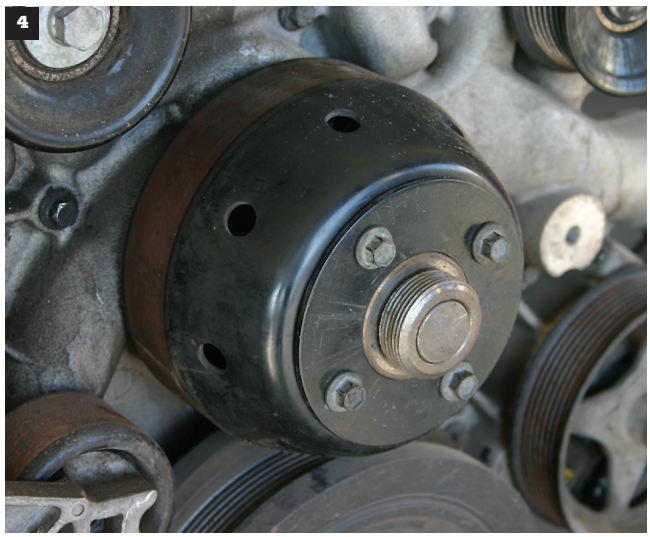
2



This closeup shot shows a more detailed look at the damage. The broken impeller obviously causes overheating issues, since the hub now spins freely.

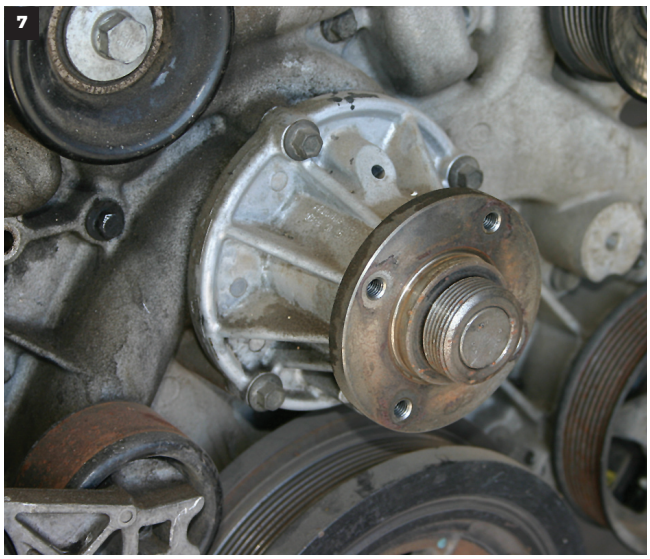
3

The Bullet Proof Diesel answer to the problem is an anodized billet aluminum impeller installed on a brand-new stock water pump. According to Bullet Proof, the added rigidity of the aluminum reduces pump cavitation and damage to the water pump housing.

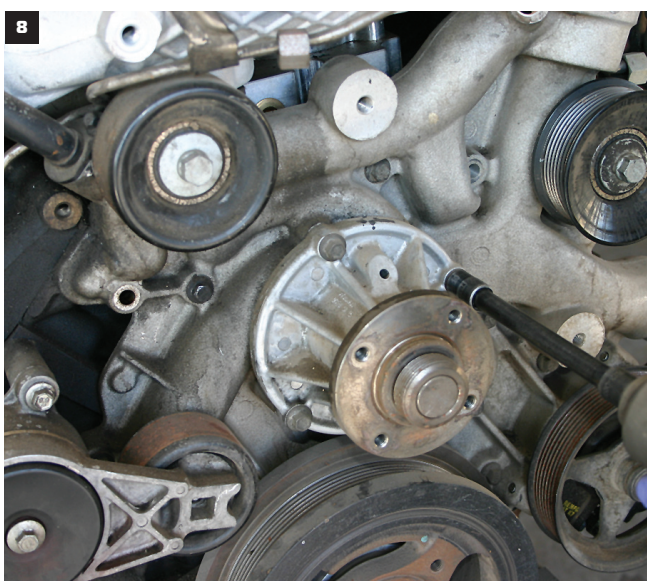



A water pump swap on the 6.0L is a four-bolt, straightforward R&R once you get the fan shroud and cooling fan out of the way. For illustrative purposes, we shot this R&R on a bench motor.

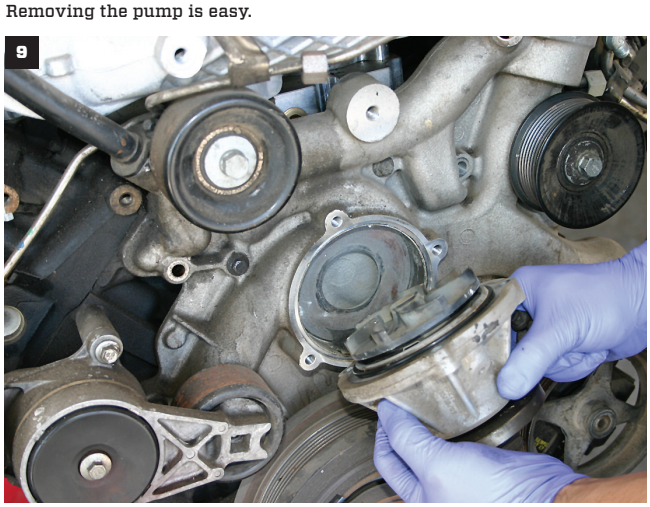

**5 & 6** The outer pulley that drives the pump comes off first by removing four bolts.


This is what sits behind the pulley: a simple, four-bolt water pump.




Removing the pump is easy.




Once unbolted, the pump just pops out. And since there's an O-ring that seals the pump to the housing, you don't have old gaskets to scrape off.

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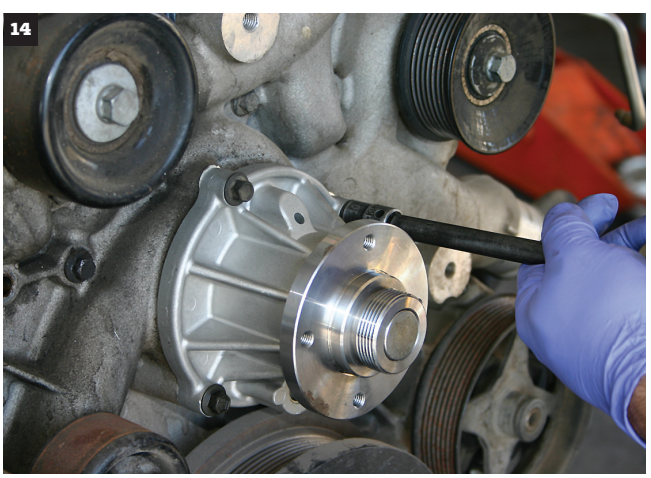
You can see where the stock pump impeller has cut a groove into the water pump housing from flex.


Here's a side-by-side comparison of the stock pump (left) and the new billet pump (right). Notice the difference in the overall impeller shape, which improves efficiency.


**12 & 13** Putting the new pump on is as simple as it was to remove it. Make sure the new pump is fitted with the new O-ring before installation.


Tighten the bolts to factory specs.


Last up, install the drive pulley and put the rest of the cooling system, (i.e., the fan and fan shroud) back on the truck. Refill with coolant—and you're done.

## SOURCE

**Neal Technologies, Inc./Bullet Proof Diesel**
888.967.6653
www.bulletproofdiesel.com