

BEST IN CLASS: 440HP SECOND-GENERATION 6.7L POWER STROKE



DIESEL POWER

THE WORLD'S LARGEST DIESEL MAGAZINE

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BUILD IT RIGHT

ULTIMATE POWER PLAN FOR YOUR **DURAMAX**
600HP 13-SECOND '05 **SUPER DUTY**
BULLETPROOF **6.0L** OIL COOLER



SPECIAL EVENTS SECTION

WORLD AG EXPO
THE WORK TRUCK SHOW
2014 EVENTS CALENDAR

10-SECOND,
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L'I'L RED EXPRESS

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'13-'14 RAM POWER-ADDER



TRACKED FIGHTING VEHICLES

CHIEFTAIN VS. FV423



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STANDARD

HEAVY-DUTY DEEP

HEAVY-DUTY TALL

Bullet Proof Diesel has three different oil coolers to choose from: standard, heavy-duty deep, and heavy-duty tall. If you choose the heavy-duty coolers, the deep style is used with the optional cold-weather package, and the tall without.

HEART ATTACK PREVENTION

COOLER AND CLEANER BLOOD FOR YOUR 6.0L

Engine oil and coolant are the interrelated lifeblood of the 6.0L Power Stroke, and if a clot should form or the fluids become mixed, serious internal trauma is likely. Like most diesel engines, the 6.0L uses an oil-to-coolant heat exchanger to cool the engine's oil, and this method is a very efficient way to remove unwanted heat from the oil. However, the oil in a 6.0L is quite possibly the hardest working oil in diesel. It is not only responsible for



This is what we are replacing. Tucked deep in the engine's valley, underneath the intake manifold, is the oil transfer block. Note: The factory oil filter housing has been removed in this photo.

lubricating the rotating assembly and cooling the pistons, but is also used as a hydraulic fluid to drive the high-pressure fuel injection system. While most diesel engine oils get exposed to around 60 psi of pressure (on the high end), in the 6.0L pressures of more than 3,000 psi routinely punish the lube, which in turn creates a ton of heat.

Controlling this heat is the job of the factory stacked-plate oil cooler mounted in the lifter valley of the engine, underneath the intake manifold. When new, these coolers work wonderfully and virtually eliminate the possibility of leaks. However, over time the coolant passages within the exchanger become plugged up with contamination. When this happens, the flow of coolant is restricted, causing the cooler to effectively quit functioning. The superheated oil is then sent back into the high-pressure oil pump, out to the injectors, and through the crankcase. The additional heat can eventually cause the failure of one or all of these vital systems. In addition, when the coolant flow is restricted in the oil cooler it is not allowed to flow freely to the EGR cooler, ultimately causing its demise as well. Fortunately for 6.0L owners, Bullet Proof Diesel of Mesa, Arizona, has the solution.



Below, and attached to, the transfer block is a plate-style oil-to-coolant heat exchanger. While it is highly efficient at lowering oil temperatures, notice that nearly every other row looks to be plugged up with contamination. This is caused by debris that forms in or enters the cooling system. When the factory cooler fails from contamination, superheated oil is returned to the turbocharger, high-pressure oil pump (HPOP), injectors, and rotating assembly, and can eventually lead to premature failure.



We're going to skip all the boring stuff and dive right into the fun. To get to the oil cooler on our '06 F-550, Bullet Proof Diesel master mechanic Jacob Lopez removed the turbocharger, intake manifold, fuel filter housing, coolant degas bottle, and all of the lines, wires, and hoses associated with them. Along with tearing down the engine's intake system, Lopez also removed the truck's grille and A/C condenser.



The first step in installing the new heavy-duty oil cooler is getting the transfer block torqued into place. This beautiful unit is machined out of billet-aluminum and has a built-in stainless steel HPOP screen, which replaces the failure-prone plastic factory unit. It's important to note that oil pressure and temperature sensors are to be reused.



In mid-2006, Ford changed the mounting location of the power steering cooler to the top of the radiator, near the hood latch. On earlier trucks, the cooler was mounted low, near the bottom of the radiator. For the BPD oil cooler to work on '06 to '07 trucks, the cooler needs to be relocated to the lower position.



Fortunately, Bullet Proof has a relocation kit that moves the power steering cooler into the earlier location (near the bottom of the radiator). Included with the kit is the '07-style cooler, and the proper length hoses with push-lock fittings. When installed, the new cooler will be mounted safely behind the front bumper, leaving plenty of room for the oil cooler up top.



Replacing the factory oil cooler with the company's air-to-oil cooler ensures oil is kept cool and coolant keeps flowing. Offered in both standard and heavy-duty options, Bullet Proof Diesel's 6.0L oil cooler utilizes a billet-aluminum transfer block and extreme-duty stainless steel braided hoses, and is available with both an optional external spin-on oil filter and cold-weather kit. This simple fix can mean the difference between years of faithful service and a lifetime of heartache.

Follow along as we install a Bullet Proof Diesel heavy-duty oil cooler kit with all the bells and whistles on a hard-working '06 Ford F-550.



A nice option for Power Stroke owners who live in frigid climates is the optional cold-weather kit. This provides a 180-degree thermostat and bypass line, allowing oil to circumvent the cooler when needed to prevent overcooling.



Tech tip: It's recommended to leave the hose fittings handtight until they have all been attached, which will ensure a perfect fit and seal. This is especially important when installing the cold-weather kit.



Mounting the oil cooler is simple. All three sizes utilize the same bracket and attach to the backside of the A/C condenser with self-tapping screws. It is important not to forget the included spacers, as these create a much needed air gap between the two coolers.



The only cutting involved in the install of the oil cooler is a quick trim of the plastic grille shroud. Lopez made short work of the task with his air saw.



With the oil cooler mounted to the condenser and all fittings tightened, Lopez gently lowered the unit back in place. All the factory mounts are reused when fitting the condenser back in place.



Since the intake manifold and EGR cooler need to be removed to gain access to the oil cooler, this is the perfect time to install a new Bullet Proof EGR cooler. Doing both at the same time saves money by reducing labor costs, and in our opinion swapping the EGR cooler should be a no-brainer for any 6.0L owner.



Each kit comes with everything needed for a complete install, including quality Victor Reinz gaskets and O-rings. Before you go too crazy, the blue and green O-rings (pictured on the right) are not used.



In addition to improved cooling, better filtration is another benefit. The kit offers a much larger spin-on filter element, which eliminates a lot of the issues associated with the factory cartridge-style unit. Because of its large size, the new filter is mounted on the driver side of the truck, directly behind the bumper. To prevent road debris from contacting the filter element, a steel guard is provided.

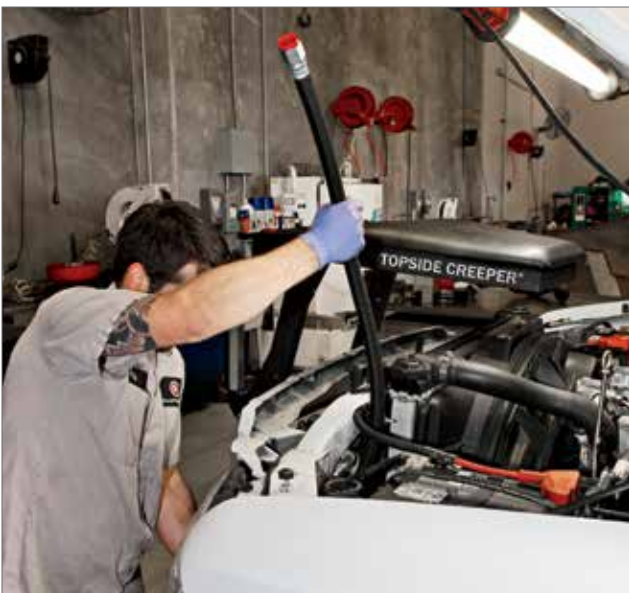
After installing the EGR cooler on the intake manifold, Lopez lowered the whole unit into place and torqued it down. He then set to work reconnecting all the wires and hoses that were removed in the beginning.



Next up was reinstalling the turbocharger, which had received a thorough cleaning while it was removed, ensuring many more years of trouble-free service.



Throughout its short lifespan, the 6.0L was subjected to a multitude of design changes, one of which was the change from a metal to plastic cold-side intercooler pipe during the '05 model year. Swapping in the older-style pipe is a simple bolt-on affair, and Bullet Proof recommends it for anybody with the new plastic-style pipe. This simple change can prevent many headaches down the line.



The last step of the installation is connecting the oil hoses to the transfer block and cooler. Paying close attention to the instructions is vital at this point, because while the hoses will definitely fit, one misstep and you'll come up an inch too short.



From this angle, you can clearly see the proper routing of the driver-side hose, which skirts around the intercooler pipe and under the airbox.



When all is said and done, the only indication anything has been changed is the pair of inconspicuously routed braided hoses. One of the most important upgrades for the 6.0L is also one that commands no attention. However, the protection and peace of mind it provides is invaluable. **MP**

Source

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