

# **DIAMOND DIESEL and TURBOCHARGER SERVICE, Inc.**

## 7.3L INJECTOR SLEEVE REPLACEMENT

CALL 1-800-4-DIESEL FOR MORE INFORMATION



### **Diamond Diesel & Turbo Service**

- Oakland, CA
- West Sacramento, CA
- Sparks, NV

**1-800-434-3735**



# ◀ DIAMOND DIESEL and TURBOCHARGER SERVICE, Inc.

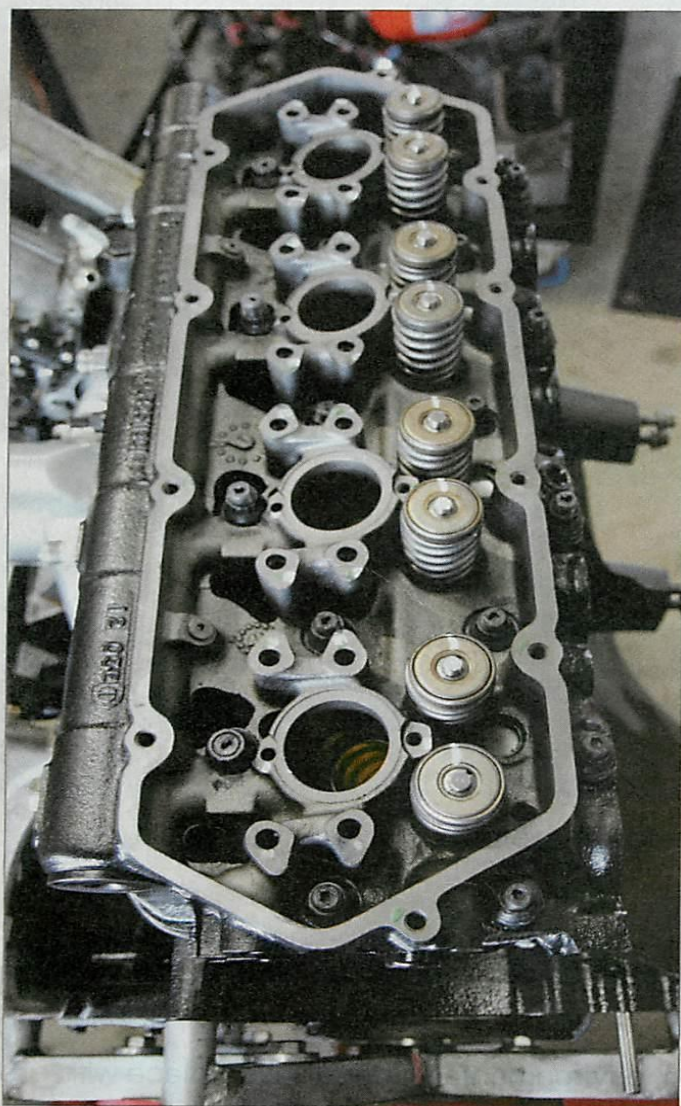
TEXT AND PHOTOS BY MIKE MCGLOTHLIN

**T**he 7.3L Power Stroke isn't known for its mechanical flaws. In fact, the engine's one Achilles' heel issue is out-of-the-blue camshaft position sensor failure. But that doesn't mean everything else is bulletproof. This month, we're introducing you to a rare problem found on '94½ to '03 engines: injector sleeve failure.

Known also as an injector cup, its primary functions are to seal and protect the immediate area of the injector bore within the cylinder head and keep the fuel system separate from the cooling circuit. Sleeves protect the cylinder head when aged, distorted injector O-rings begin to allow moisture inside the injector bore. In the 7.3L,

they're made from brass, a soft alloy, which conforms to the shape of the injector bore in the cylinder head. A secondary job is to help cool the injector.

While it's not your everyday, every-engine occurrence, 7.3L Power Strokes that continue to rack up miles may end up encountering injector sleeve failure. Remember, it's been a decade since the last engine rolled off the assembly line—so even if you don't experience failure firsthand, it's worth considering during a rebuild. Recently, our friends at Flynn's Shop showed us how the sleeves are replaced, and the injector experts at Rosewood Diesel Shop supplied us with the tools needed to perform this unique service procedure.



Although the task can be performed with the heads still on the block (and the engine still in the truck), it's easiest to pull the cylinder heads. The first order of business for Flynn was cleaning each injector hole with brake cleaner (to make sure no foreign debris obstructed the puller tool's operation).



Each 7.3L Power Stroke injector sits in one of these brass sleeves, which is pressed into the cylinder head. Its purpose is to keep the injector and fuel separate from engine coolant, as well as help seal the fuel side of the injector. When a sleeve splits or cracks, you'll find fuel in the cooling system. This is because the 7.3L's fuel system typically sees 60 to 70 psi of fuel pressure, as opposed to less than 16 psi in the cooling system (essentially, fuel wins the battle and contaminates the cooling circuit). Being quite labor intensive, it's best to replace all of them at the same time.



Getting started with the removal process, Flynn made sure the nut on the sleeve remover was halfway up the bolt and threaded the puller into the factory injector sleeve by tightening the bolt head using a ½-inch, 12-point wrench. Rosewood Diesel's puller tool is hard-coat anodized for durability, and it works by digging its threads into the brass sleeves.



# ◀ **DIAMOND DIESEL and TURBOCHARGER SERVICE, Inc.**



Once the tool had bottomed out in the sleeve, Flynn tightened the nut using a 3/4-inch-deep well socket, and the sleeve was slowly dislodged from the injector bore. Here, you can see it being removed from the head.



To get the puller tool back, Flynn put the old sleeve in a vise and loosened the bolt head. From there, he used a fine wire brush to remove any residual sealant left behind in the cylinder head and thoroughly cleaned the injector bore with brake cleaner. Then, compressed air was used to dry the sealing surface. We'll also note that prior to installing the new sleeve, Flynn cleaned out the high-pressure oil galleries and the fuel gallery.



In this photo, you can see that only the top and bottom of the sleeves make contact with the injector bore (the centersection does not touch the bore). This is where the sealer is applied to the new sleeves before they're installed.



With a small amount of grease applied to the end of the installer tool, the new sleeve won't fall off when lowering it into the injector bore.



Next, the top and bottom of the sleeve were coated with Motorcraft Threadlock 262—a high-strength, permanent thread locker. Once in, the excess runoff at the larger end of the sleeve was cleaned up using fresh paper towels.



The last step for Flynn was carefully installing the new sleeve in the injector bore. According to Rosewood Diesel, the new sleeve will press in 1/4 inch before it's in place. Flynn hit the new sleeve with a hammer until it bottomed out. While Motorcraft Threadlock 262 is said to dry in just 20 minutes, it's best to let the newly installed sleeves set up for a few hours before reinstalling the heads and injectors.

## **Diamond Diesel & Turbo Service**

- 2550 E 12<sup>th</sup> St, Oakland, CA 95691
- 2785 A Del Monte St, West Sacramento, CA 95691
- 840 Marietta Way, Sparks, NV 89431

**1-800-434-3735**