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SMALLER INJECTIONS

Seeing How VW's New TDI Benefits From Snow's Water/Meth Injection

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PHOTOGRAPHY: DW STAFF

Whether it's 1 liter or 40, a four-cycle diesel engine is a four-cycle diesel engine as far as basic principles are concerned. While the idea of "replacement for displacement" remains, the reality is that European companies are bringing over smaller diesels in passenger cars, and they're becoming a viable alternative to a hybrid when it comes to efficiency.

We've done several articles on how water/meth injection affects mileage and power in larger diesels like the 6.7L Cummins and 6.4L Power Stroke. With the new 2.0L TDI offering in the Volkswagen Jetta, we decided to take a look at what kind of benefits would come from water/meth injection on a smaller engine. Would the gains be measurable like on the bigger diesel trucks, or would they be miniscule due to the





1. After looking over the layout of the car, available space was at a premium. The EGR throttle plate near the intake manifold is hard to access, with many small bolts in hard-to-reach spots. Further, it is also visible in the engine bay. Looking for the OEM, the ideal nozzle location turned out to be in the intercooler hard pipe directly below the EGR throttle plate assembly:

This view is looking slightly upward from the driver-side front of the car. The radiator and electrical fans are on the left of the picture. The oil pan (shrouded by a fabric-like heat retention material), is on the right side of the picture. The smaller MPG nozzle is located above the power nozzle.

Note also the boost fitting installed into the pipe, slightly left of the two nozzles. This provides the MPG-MAX controller with a reliable boost signal to control injection. This entire area is completely hidden when the stock under-body aerodynamic panels are in place, and it is not visible from above. In fact, the only visible sign of the system in the entire engine bay is the ground wires of the system on the factory grounding location next to the battery and the EGT probe.



2. Routing the hoses and wires proved to be fairly simple. On the driver side is a large open area below the headlight. There are several wires actually hanging loose in the area from the factory. However, in the Snow setup, the /wires and tubes were shielded with loom for appearance and protection from road debris:

This picture is looking upward from under the center/front of the car. The nozzles themselves and the boost fitting and line are directly behind the camera in this shot. The aluminum casing to the left in the picture is the transaxle housing. The large white metal area is part of the body of the car.

Note the first of two solenoids on the left side of the picture with red tube running from it to a "T" fitting. This solenoid only opens under injection, allowing the controller maximum control over the entire system. The "T" fitting then runs directly to the mpg nozzle from one outlet (the red tube running to the top center of the picture) and to the power mode solenoid from the other (curving down and to the right from the "T"). The wiring is principally located in this area, as well, since the battery and grounding point is almost directly above this picture.

small engine size? The only way to find out for sure was to take a 2009 Jetta with a six-speed transmission and install an MPG-Max System from Snow Performance.

Off the boat, the TDI arrives from Germany with a 140hp rating and produces 236 lb-ft of torque. EPA estimates put the mileage somewhere around 30/41 depending on the options, but a lot of TDI owners have found those numbers to be conservative. Starting with lower numbers to begin with, we expected the results to also be lower. Figure a 5-percent increase in horsepower with a 360hp LBZ Duramax would be 18, while a 5-percent gain on a 140hp TDI would yield seven additional ponies; hardly anything to jump up and scream about for most people.

With expectations set low, the Jetta was taken to the dyno at Advanced Auto Repair in Fountain, Colo., once the Snow Performance MPG-Max system was installed. Baseline, the Jetta made a peak 151 hp at 3,150 RPM – maybe we had a ringer in our hands. For torque, numbers maxed out at 276 lb-ft at 2,350 RPM. Advanced Auto Repair made a few pulls with the Snow system activated, tweaking the nozzle and system settings for optimum results.

Once the Snow system was tuned, the Jetta put down a peak 170 hp at 3,100 RPM, a gain of 19. Peak torque numbers also increased, going from 277 lb-ft at 2,350 to 318 lb-ft at 2,550, an increase of 41 lb-ft of torque. The numbers show the Snow Performance MPG-Max system increased horsepower 13 and 15-percent gains in torque.

In the case of the Jetta we tested, the gains in power were not only measurable, they were more than we were expecting. While the Snow Performance MPG-Max water/meth

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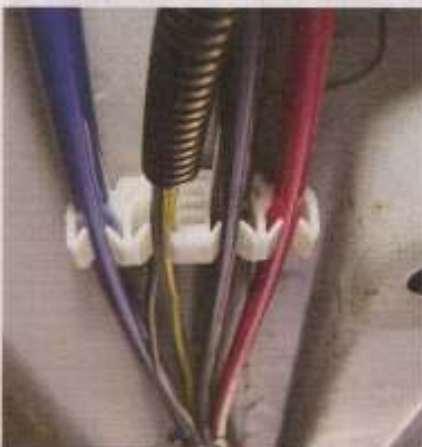
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3. The reservoir and pump in an MPG-MAX diesel system are virtually always located in the rear of the vehicle, and we did that in this case, as well. The Jetta had some excellent areas for routing both the methanol tubing and the wiring for the pump.

This picture is looking upward from below the car, just after the engine bay on the passenger side. The aluminum plate on the right of the picture is a brace running under the body of the car for suspension mounting, etc. You can see the methanol tube and wiring for the pump covered with black corrugated loom exiting the hole on the upper right of the picture and running along the brace in the middle of the picture. The wiring for the pump runs parallel with the tube, from the bottom of the picture (which is the driver side), over to the passenger side. It is secured to the brace itself and then factory wiring harness with tie-wraps.

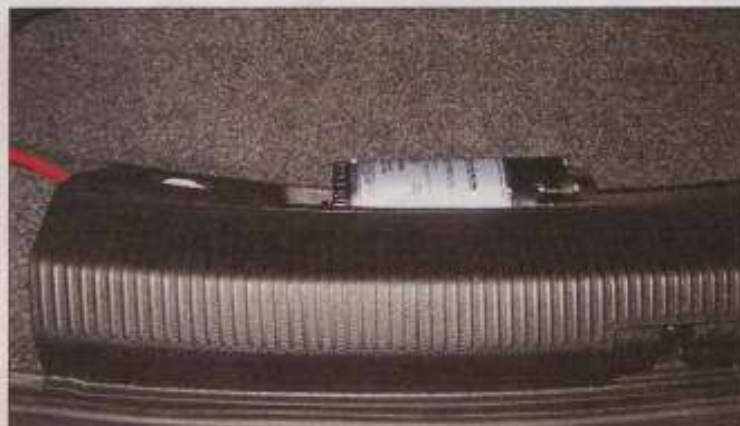


4. Here we are looking at one of the stock wiring clips on the passenger-side floor pan. This picture is looking from the front of the car toward the back. This entire area is covered by an under-body aerotray. The red tube is our methanol line, which fits perfectly into the clip. The yellow and black wires for the pump are in the second position from the left. Further along in the picture you can see a tie-wrap securing everything together. The blue and black lines are factory VW.



5. Here we are looking up at the rear suspension of the passenger side. Note the loom-covered lines running above the suspension-mounting bar in the middle of the picture. The wiring and methanol line runs from the area covered by the under-body aerotray; up over the suspension as shown, and then finally around to the back of the car and

the pump itself. The system is essentially invisible unless you actually start removing



6. This picture is looking down at the floor of the trunk while standing directly over the trunk opening (note the latch mechanism for the trunk lid on the right side of the picture). The white area at the bottom of the picture is the rear bumper. Unless you stand over the trunk and look straight down you really cannot see the pump, as it rests mostly in a cavity in the interior panel. The pump is held in place using the included washers and screws. Due to the smoother operating nature of the new SHO pump and also the rubber isolators built into its included mounting bracket, there is virtually no vibration conveyed into the passenger compartment.



7. The tank is mounted behind the wheel well on the driver side of the trunk. We used a 2.5-gallon tank in this application, as it fits quite well in the trunk and yields great range, as well. Note the outlet red tube exiting from the left. This then runs to the pump that is directly below the camera in this shot.



8. The controller is installed in the center console area. It is attached using the included adhesive. This position provides good visibility and easy access to the firewall for routing the wiring.



8. The accessory 12V circuit is also an ideal key-on power circuit, and it is located just a few inches away (just to the right of the shifter knob).

system does advertise increases in horsepower, it's supposed to increase fuel efficiency as well by adding a smaller nozzle that turns on under part-throttle use, hence the MPG-Max name.

We turned the owner loose for a few weeks to monitor the results on mileage with the Snow system installed. Before water/meth, the Jetta was averaging 38 mpg with combines city and highway driving. Post-installation, mileage increased to 41.7 mpg after a few tank fill-ups.

While the overall power numbers might not be along the lines of previous tests we've done with water/meth injection, percentage-wise, they're along the lines with previous articles. On the mileage side of things, we've typically managed to gain 2-to-3 mpg in truck applications, which was what we picked up with the Jetta. Going from 12 to 15 mpg is a little more impressive than 38 to 41.7 mpg, but anytime you can gain power and economy together with a part, it's worth consideration.

SOURCES:

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