

# MORE MPG FOR YOUR SUPERDUTY

## PART I: THE PRODUCTS AND THE TESTING

WE ANALYZE THE COST, THE BENEFIT, AND THE BREAKEVEN POINT

### THE PROBLEM:

After nearly taking out a loan to fill our Ford Super Duty, we started to ponder our options to make paying for fuel a little less painful. We began to look seriously at what aftermarket modifications we could make to burn less fuel. In this first story of a 2-part series, we'll walk you through the series of modifications that we tested. Next month, in Part II, we'll analyze the costs, compute the breakeven point, and show you what it would take to install these products yourself. Our test unit happened to be a Ford, but the kinds of products and tactics we use here should apply to any diesel.

### THE GUINEA PIG:

The truck is our daily driver, a 2004 F-250 Super Duty Crew Cab Short Bed 4WD. This truck has the 6.0-liter Power Stroke, along with 3:73 gears and the stock 265 / 75R16s.

### THE IDEA:

We figured there must be a good combination of aftermarket products that will deliver better mileage. But which ones, and in what combination? So we set about to quantify how much we could improve mpg, and to develop a process to determine whether or not these changes would be cost-effective. We did anticipate significant mpg gains. What we did not anticipate was such significant increases in power at the same time...as we shall see.

### THE BASELINE:

Once we had determined the products we would use, we set the driving course (exact same route, exact same miles, exact same stations to fill up at, exact same driving conditions, set driving speed). We then determined the order in which the products would be installed, came up with the appropriate mathematical calculations to use. We decided to rely on pen, paper and measure by the tank full, rather than rely on the mileage display in the truck.

### POWER DOCUMENTATION:

Just as the testing was to begin, we started thinking about whether or not we would lose power by making the truck more fuel efficient. The last thing we wanted would be to go backwards-i.e., lose both power and mileage due to a bad combination of parts or improper installation. So it was decided to dyno test the truck after each product was installed to check performance as well.

### STEP 1: BASELINE TESTING

After topping off, we began our first test, to set the appropriate baseline for what our mpg was on our stock F-250. We drove the course at 67 mph with the rpm between 1900 and 1950, topped off again, printed our receipt and then began calculating our fuel economy (miles traveled / gallons of fuel used=MPG). We would start with a baseline of 17.2 mpg. Keep in mind that this is basically highway cruising in the engine's sweet spot rpm range. Then we headed over to our friends at Performance Diesel (Emory, TX) and got a baseline dyno pull of 250 hp. With all of that information in tact, it was time to move on to the install of the first product.

### PRODUCT #1: SYNTHETIC FLUID SWAP

Since we've heard that swapping out a vehicle's fluids for synthetic fluid has been known to help with mileage, we contacted the folks at Royal Purple down in Porter, TX to perform a complete fluid swap on the truck from dinosaur oil to synthetic. We changed the motor oil to Royal Purple's 15W-40 (4 gallons), swapped out the gear lube in each axle with RP synthetic Max-Gear 75W-90 along with the automatic transmission fluid with RP's Max ATF.

Repeating the exact same process for testing as we did for the baseline, we calculated out the new mpg thanks to the fluid swap and saw a 10 percent increase bringing our mpg up to 18.92. Then we took it over to our friends at Performance Diesel (Emory, TX) and had them give it a good dyno run. Our horsepower is now at 258 hp; 3.2 percent more horsepower over the stock. Cost of fluids: \$205. As we shall see in Part 2 of this story, this turns out to be an economical upgrade when you figure in the benefit of less-frequent oil changes.

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For our mileage testing, we drove the test course at 67 mph, keeping rpm between 1900 and 1950, then topped off again. Our baseline was 17.2 miles per gallon.



Our performance testing was done at Performance Diesel of Emory, TX. We started with a baseline of 250 hp on our 6.0 liter Power Stroke.



Our first idea was to test the effect of replacing the natural fluids with synthetic.

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## PRODUCT #2: EXHAUST UPGRADE

From there we called the people at Magnaflow and got a turbo back exhaust system (pn#15952). After installing the new exhaust system, we repeated our tests and now showed the truck getting 19.06 miles per gallon, an increase of .7 percent. Then, back at Performance Diesel, we put the truck on the dyno once again and let her rip. This time we saw an increase of 16 hp, or 6.2 percent, bringing our current horsepower numbers to 274 hp. The cost of the exhaust system was substantial, \$886, but the gain in power was significant, and there will also be a documented reduction in operating costs, as we shall see.

## PRODUCT #3: AIR INTAKE SYSTEM

Our next product to install was a new intake system (pn#400-131-1) from Airaid Filter Company (Phoenix, AZ). We followed the instructions provided and changing out the intake from the factory setup to the Airaid intake was a snap. With the new intake installed, we began our testing once again using all the same methods, routes and tests as before. The results showed that by upgrading our intake system, we saw a gain of .62 miles per gallon bringing our total mpg up to 19.68, a 3.5 percent increase since we installed this system.

After the dyno run was complete, we were now producing 293 hp, a gain of 19hp, which is a 6.9 percent increase overall. When we had the truck on the dyno, the Airaid system showed most improvement in low-end torque and horsepower, possibly why it was effective in saving money at the pump.

## PRODUCT #4: PROGRAMMER

We met up with Stan Waddell from Quadzilla (Fort Worth, TX) to get the new XZillaraider with Commander performance chip (pn#FXZ6LS-CM) installed and then got right to testing. We tested all three levels of the chip and found that level three seemed to provide the best fuel economy for us. Just by adding the chip we gained 2.68 miles per gallon an increase of 13.6 percent on top of our already-installed products.

To see what kind of performance this baby would put out, we went back to the dyno at Performance Diesel. Level one showed a total of 353 hp; on Level Two 385 hp, and on Level Three 411 hp. We were now up to 411 hp, an overall increase of 118 hp or 40 percent. Plus we were now running at 22.36 miles per gallon, just by adding the Quadzilla to the mix of products already installed.

## PRODUCT #5: HARD TONNEAU COVER

We'd heard that cleaning up the air stream off the back of a truck would make a measurable improvement in mileage, so we added it to our list. Off to see Nils Forssman at Truck Covers USA to get another product installed, an American Roll Cover (pn#CR141) tonneau cover. The installation took less than an hour and it was back to replicate our testing methods one last time.

As it turned out, after the final fill up, we saw an additional 1.56 miles per gallon, an increase of fuel economy by 7 percent...just from the tonneau cover. With everything combined, we are now running at 23.92 miles per gallon.

Our final horsepower number remained at 411 hp, significantly up from the 250 hp shown when we did our baseline. That's an overall increase of 161 hp or 64.4 percent over the stock model, which we started with.

## COST?

We're out of space for this month, but next issue we'll break down the cost of each improvement, estimate the savings (using \$2.69 / gallon cost of fuel) and take a look at roughly how many miles you would have to drive to get back the dollars invested. In a nutshell, you'll find that some of these products take longer to return the investment than others, but then there are performance benefits to consider. We'll also show you installation tips, and share some driving tips that can improve mileage. Stay tuned!

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Our second test was to install a Magnaflow turbo back exhaust system. Mileage increased by just seven tenths of a percent, but power increased by 6.2 percent.



We got a 6.9 percent increase in power and 3.5 percent increase in mileage with this Airaid intake.



This Quadzilla Commander chip yielded significant mileage and horsepower gains. Best fuel economy increase came at performance level 3.



This American Roll cover was installed at Truck Covers USA. The resulting improved aerodynamics gave us another 1.56 mpg.

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## **SOURCES**

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