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BUILT TO OUTRUN
THE LAW!**

OCTOBER 2009



E60 BMW M5

BASIC BOLT-ONS

TEXT / Pablo Mazlumian

VEHICLE DATA

Engine: S85 5.0-liter V10, dohc, 40-valve
Transmission: Six-speed manual
Mileage: 6,000
Current modifications: Forgestar wheels

Dyno Data
 Dynojet 424x
Temperature: 72-80°F
Test gear: Fourth

BASELINE

(Sport mode)
Peak power: 445 hp @ 7700 rpm
Peak torque: 336 lb-ft @ 6200 rpm
4000-8000 rpm dyno acceleration: 6.35 sec.
Temperature: 72°F

(P400 mode)
Peak power: 327 hp @ 7600 rpm
Peak torque: 275 lb-ft @ 5300 rpm
4000-8000 rpm dyno acceleration: 8.13 sec.

TEST NOTES

The most time-consuming part of this test was getting a baseline. The M5 was factory-equipped without a traction control-delete option, initially making dyno-testing impossible. Fortunately, we were able to get an updated ECU reflash at the dealer, under warranty, giving us this option that now showed up on our Heads Up Display.

Back at MKC, the technicians strapped the car down for a baseline run. To keep testing fair and accurate, we first had to eliminate any potential spark issues, so we installed a new set of OEM NGK sparkplugs specially made for the S85 engine (part no. LKR8AP). While you can get them from your dealer at about \$22 a pop, you save half at Sparkplugs.com. These trick, revolutionary new plugs feature dual grounds and a monitoring system that can detect the initial stages of both misfiring and detonation, enabling the engine management system to adjust its settings on a cylinder-by-cylinder basis.

With two factory power modes available (P400 and P500), we tested both to see the difference. It turned out to be well more than a 100-hp difference after all. Additionally, the P400 mode gives more of a typical V8-like curve, with all its peak torque at the beginning, and falling off up top. More akin to a racecar with wild cams, Sport mode, on the other hand, ramps up torque for a huge power surge by 6000 rpm.

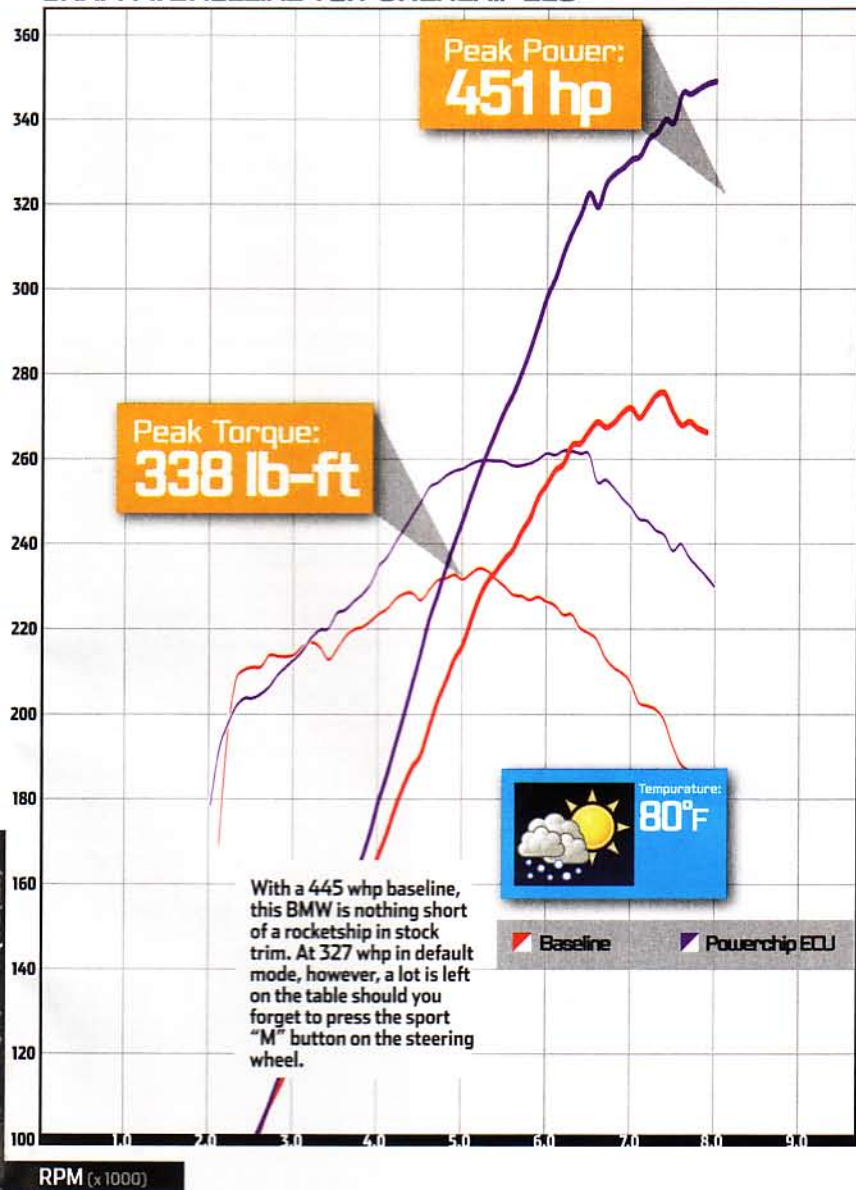
With a 445 whp baseline, this BMW is nothing short of a rocketship. At 327 whp in the P400 default mode, however, a lot is left on the table should you forget to press the "M" button on the steering wheel.

All our testing was done while using MKC's OBD-II scan tool to monitor intake air, coolant and oil temperatures, as well as ignition timing, to keep testing as accurate as possible. Only when all parameters were met was the run validated.

We also found testing in fourth gear yields between 15 and 20 more hp than third gear for both P400 and P500 settings.

POWERCHIP STAGE 1 SOFTWARE, 91 OCTANE

GRAPH 1: BASELINE VS. POWERCHIP ECU



TEST 1

PERFORMANCE

Peak power: 451 hp @ 7700 rpm
Peak torque: 338 lb-ft @ 6200 rpm
Max power gain: 10 hp @ 5600 rpm
Max torque gain: 10 lb-ft @ 5600 rpm
4000-8000 rpm acceleration: 6.33 sec.

Parts: Factory ECU removed and sent to Powerchip

Options: 93-octane software also available

Tools needed: Screwdriver, Torx drivers, 10mm socket wrench

Installation time: 1 hour

MSRP: \$990

PROS

- Rev limiter increased to 8200 rpm
- Top-speed governor removed
- Improve throttle response

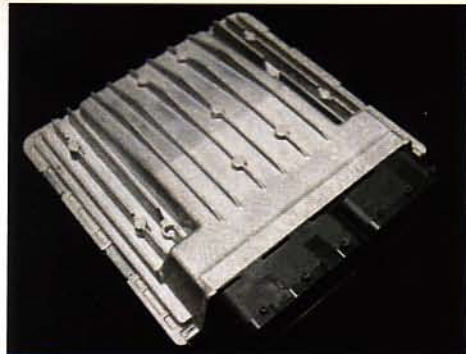
CONS

- Downtime shipping ECU to and from Powerchip

TEST NOTES

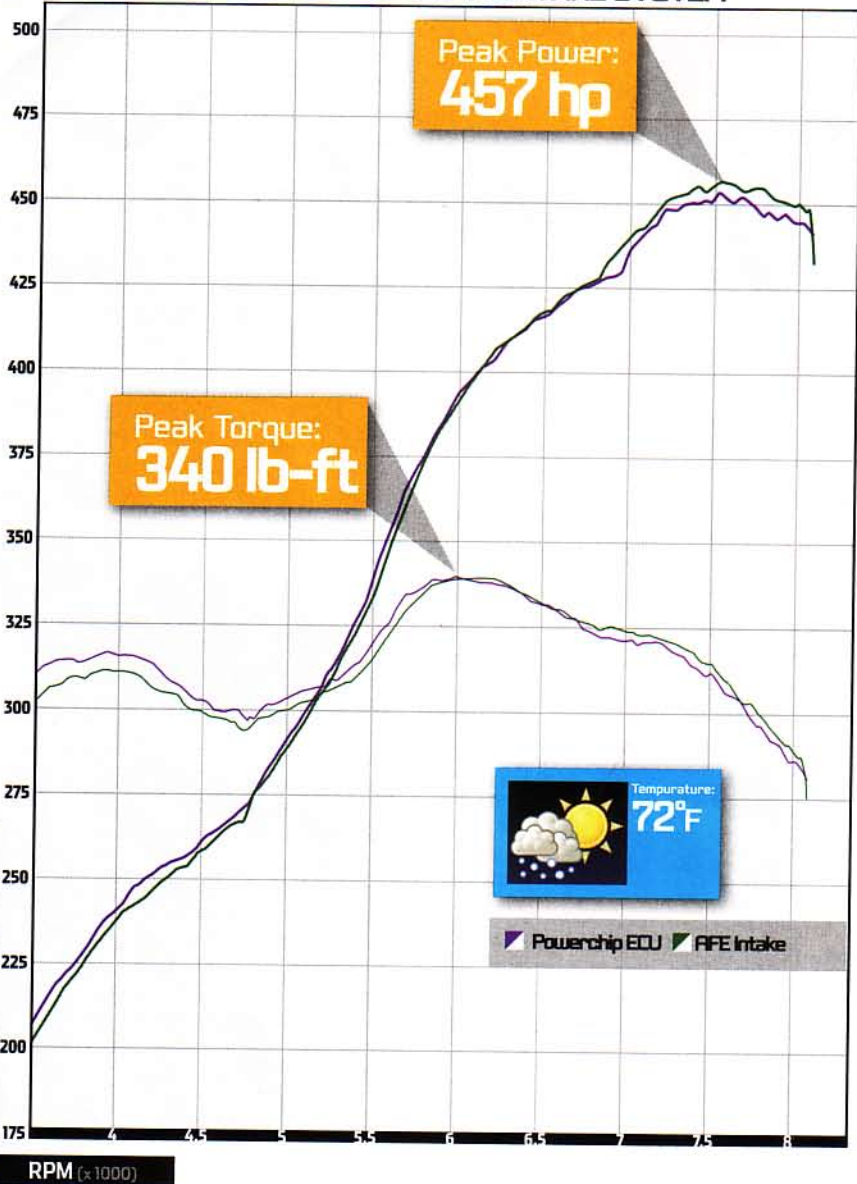
The improved throttle response is immediately noticeable; otherwise the car behaves as stock. We witnessed a few degrees of ignition advance at the top of the rev band, as indicated by MKC's OBD-II scanner. The extra revs will further help acceleration over stock because you can now stay in gear longer, and see increased revs into the next gear. And in a car with a wicked top end like the M5, acceleration numbers will improve.

While the only drawback involves the time shipping the ECU to Powerchip and getting it back, we were able to do this whole process in less than 48 hours with overnight delivery. Unfortunately, the weather worsened, dropping 8 degrees F under our baseline test temperature, which surely hurt acceleration times on the dyno.



AFE INTAKE SYSTEM

GRAPH 2: POWERCHIP ECU VS. AFE INTAKE SYSTEM



DYNO 2

PERFORMANCE

Peak power: 457 hp @ 7600 rpm
Peak torque: 340 lb-ft @ 6100 rpm
Max power gain: 9 hp @ 7900 rpm
Max torque gain: 6 lb-ft @ 7900 rpm
4000-8000 rpm acceleration: 6.12 sec.

Parts: Two sets of conical air filters, heat shields and cold-air diverters, mounting hardware, installation instructions
Tools needed: Screwdriver, Torx drivers, 8- and 10mm sockets
Installation time: 1.5 hours
MSRP: \$619

PROS

- Improved fuel economy
- Improved intake sound
- Factory-like fitment

CONS

- None

TEST NOTES

The new induction roar coming from the free-breathing V10 was immediately evident. It's sweet and menacing at the same time.

We weren't sure if it involved ECU adaptation for fuel or not, but we initially noticed a decrease in horsepower during the first couple of passes. Not convinced that freer-flowing filter elements should worsen power, we kept giving the same cooldown, allowing all parameters to return to normal, and repeated the runs. A few more tries and the power rose and stayed there.

