

eurotuner

620HP M3

VORSTEINER'S SUPERCHARGED
CARBON WIDEBODY BMW

Poster
Inside



\$5.99 U.S. / \$6.99 CAN. • MARCH 2011 • EUROTUNER.COM



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> 330HP VW GOLF R

> 900HP VW R32 TURBO

> 400WHP VW JETTA 1.8T



PLUS

- > AUDI A4 1.8T WAGON
- > 350WHP CORRADO VR6
- > 1965 VW NOTCHBACK VR6
- > FIXXFEST, VAG FAIR REPORTS

TUNER NEWS

THE LATEST NEWS, PRODUCTS AND RUMORS...



1. Mk4 VW INTERCOOLER

EURO SPORT ACCESSORIES

MSRP: starting at \$549.95 • **Info:** eurosportacc.com

If you have engine modifications on your Mk4 Golf or Jetta 1.8T, it's time to start thinking about an intercooler upgrade. When pushing the limits of the car, the factory unit is inefficient and undersized, which causes heat soak and loss of power. Euro Sport Accessories offers an affordable solution that fits cars with manual transmissions. Constructed with an aluminum bar-and-plate core with cast aluminum end-tanks, the intercooler is significantly larger than stock and can be placed behind the front bumper to keep intake temps much cooler. Cars will benefit from a bump in linear power, eliminated surging and up to 10whp gain.

2. VW TDI WATER/METH INJECTION

SNOW PERFORMANCE

MSRP: \$639 • **Info:** snowperformance.net

Our Project Jetta TDI averaged 40-50mpg even when we increased power and torque by 15-20% with Revo software. However, we missed the chance to test Snow Performance's new water/meth injection for the TDI engine. Snow's MPG-Max kit uses a new management controller that disperses a jet of water/meth mixture across the rev range. This provides an increase in efficiency and power without needing to inject more fuel. Snow has seen its technology translate to 15% better fuel economy, or approximately 6mpg. There's also an option for more power using larger nozzles to inject more fluid. This is said to be capable of adding up to 40hp.

3. Mk6 VW GTI INTAKE

aFe POWER

MSRP: \$345 • **Info:** afe-power.com

Upgrading the factory airbox to a cold-air intake has the potential to increase power and throttle response. And aFe is no stranger to these solutions for almost all cars, including our Project M3 elsewhere in this issue. The company has just released its stage 2 intake system for the Mk6 VW GTI 2.0T TSI. It comes with a powdercoated shield to block heat from the engine. The intake also features aFe's Pro-5R or Pro Dry S filter for better filtration and flow. According to aFe, they've seen 14hp and 15 lb-ft of torque in testing.

4. ESM 008TA WHEEL

ESM WHEELS

MSRP: from \$125 per wheel • **Info:** esmwheels.com

Older VW and BMW guys will like these. Available only in 4x100, ESM Wheels is offering a classic mesh wheel with up to 3" of lip. Pictured here is the flat-black version with red "time attack" stripe, but standard colors are also available. Best of all, the wheels won't cost you more than your old-school ride is worth because they start at only \$125 a corner.



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PROJECT M3 **PART 5** MAKEOVER

WORDS, PHOTOS & VIDEO
GREG EMMERSON

HAVING UPDATED THE CHASSIS AND BODYWORK ON PROJECT M3, IT WAS TIME TO ADD AN aFe INTAKE AND EXHAUST TO THE 4.0 V8.

Since this is part 5 in our tuning series on our 2011 BMW M3 with Competition Package, you can assume we've come a long way since the beginning. To date, we fitted carbon fiber pieces from BMW Performance and Turner Motorsport (TMS). Mechanically, there's been a six-piston Brembo brake conversion as well as some wheel spacers and H&R springs from TMS, plus 19" Forgestar wheels with Continental ContiSportContact3 tires.

This month, we're embarking on the first of our explorations into the 4.0 V8. This engine has become legendary both for its 414hp output as well as its 8400rpm redline. Yet despite exceeding 100hp/liter, this naturally-aspirated motor is also gaining a reputation for some remarkable dyno numbers.

We're regularly seeing many tuners proclaiming surprising numbers from conventional tuning parts, so we thought it was time to get elbow-deep in the discussion.

To kick-off our engine tuning program, we visited Advanced Flow Engineering (aFe) in Corona, CA. Specializing in domestic truck intake systems, aFe has broadened its reach with a range of BMW tuning parts for everything from the E36,

PART	SUPPLIER	PRICE
Stage 2 cold-air intake w/Pro 5 R	aFe	\$470.40
Mach Force XP cat-back exhaust	aFe	\$2619.75

E46 and E9x 3-Series through the 5-, 6- and 7-Series to the X5, Z4 and the latest 335i.

Company president, Nick Niakan has a particular affinity for BMWs, and is the driving force behind the new range of replacement filters, throttle body spacers, cold-air intakes and now cat-back exhaust systems.

With some impressive horsepower numbers quoted in the company's marketing literature, we were interested to see if we could replicate the numbers on our Project car.

With the aFe exhaust reported to give 13hp and 16 lb-ft of torque, we wanted to try it for ourselves. Never mind, 18hp and 15 lb-ft from a cold-air intake. So we headed out to the company's manufacturing and development center to have the parts fitted and dynoed.

INTAKE

aFe has two cold-air intake systems for the E9x M3. One replaces the stock air box with a 6" cone filter. Supplied with

a heatshield and air scoops, it's quoted to give 15hp and 13 lb-ft.

A more stealthy approach is with the CAI we chose. It has a large oval filter and plastic intake tube but retains the stock air box to reduce noise and avoid underhood heat. A molded recess in the aFe intake tube seals the air box to ensure a cold air supply.

Surprisingly, aFe claims this system produces up to 18hp and 15 lb-ft thanks to an increase in airflow of 41% over the factory intake.

There's a choice of an oil-free Pro Dry S synthetic fabric filter or the oiled washable/reusable Pro 5R five-layer filter with progressive media to provide high-flow with best protection. We started out with the dry filter but switched to the oiled one searching for more power, with no measurable difference.

Fitting the intake is straightforward and definitely a DIY proposition. There is a slight increase in induction noise, but it's not as distinctive as the conical intake would be.

» SEE THE VIDEO ONLINE AT EUROTUNER.COM AND YOUTUBE.COM/EUROTUNER



aFe In-airbox cold-air intake system



1 Remove lid by undoing seven T25 torx screws to access paper filter



2 Use 6mm socket on two intake hose clamps, and squeeze vacuum hose to release it



3 Fit the silicone coupler over the aFe intake tube, then slide the coupler onto the plenum and clamp it



4 Clamp the filter to other end and refit vacuum hose



5 Refit lid, concealing filter, leaving only the intake tube as visible sign of modification; very stealthy

EXHAUST

We were first drawn to aFe's shiny Mach ForceXP cat-back exhaust system by its intriguing 3" resonance chambers. They sit alongside the mufflers and are designed to give a broad power curve while canceling high frequency sound waves. We're told this would produce an aggressive note on full-throttle but make it smoother at cruising speeds.

The 3" exhaust system is made from TIG-welded, mandrel-bent, polished 304 stainless steel with quad 3.5" tips. It certainly looks very good and is claimed to weigh 49 lb, saving 20 lb over the factory exhaust but uses the stock mounting points.

The company claims 15hp and 16 lb-ft for the system, which is again simple to fit but requires two people and a lift ideally.



aFe stainless steel cat-back exhaust system



1 The stock suitcase muffler occupies a lot of space



2 Side by side, it's easy to see the difference



3 The front, middle and rear hangers and brackets must be transferred from the stock system



4 The center pipe is loosely clamped in position to allow for adjustments later



5 The rear hangers should look like this before being bolted into place



6 The aFe system slides over the stock cats and is clamped



7 Refit brackets and hangers, then align system under the car and in the rear bumper before tightening everything



8 With the suitcase gone it looks empty but the fit and finish of the aFe system is very good

RESULTS

Before the aFe parts were fitted, two of the company's technicians, Jonathan Perez and Carlos Villegas expertly strapped Project M3 to their Mustang dyno.

Because it sits in traffic most days, it took a few runs to get the ECU thinking properly, and on the fourth of five runs we recorded peak output of 287whp and 216 lb-ft of torque.

Ordinarily, we'd fit and test the parts individually, but aFe wanted to do everything at once so we returned to the dyno with the exhaust and intake installed. It was a relatively cool day, so the temperature and humidity hadn't changed much during the hour or two between the runs.

Unfortunately, after five or six runs, we weren't seeing any gains from the new parts. In fact, we were struggling to find the stock output. It was decided that a few miles on the ECU would help it recalibrate to the improved airflow.

We returned to aFe's dyno several weeks later and, as the graph shows, we still couldn't find the promised horsepower increase. The aFe personnel were clearly disappointed and suggested a problem with the dyno was a possible cause.

The 'seat of the pants' dyno suggests the V8 has lost a little tractability pulling from low revs in a high gear, but does seem to rev more cleanly through to redline.



The red power, torque and AFR lines are stock, the blue lines are after the aFe intake and exhaust were fitted – sadly not much difference but dyno problems could be the cause...

Having lived with the aFe parts for several weeks, we can report the exhaust has a very distinctive sound. Unfortunately, it drones little at low speed, which is a shame if your commute involves lots of traffic like ours. But once you get above 2600rpm, those resonance chambers start working and make it much quieter. It would be great for track days or for anybody who wants extra attention around town; it certainly gets you noticed!

Overall, the quality of the aFe parts is what surprised us most. The welds, the plastic molding, the fit; it's all first rate. And since the system is significantly



From left to right, aFe's skilled dyno techs Jonathan Perez and Carlos Villegas plus Jason Bruce and Jeff Krangnes

lighter than stock, it again makes sense for track use.

So while we didn't make any power, there are lots of reasons to use the aFe components, which would probably see more benefits from a car with software.

MADE IN USA

With so much manufacturing now done overseas, we were pleasantly surprised to discover all aFe's products are produced right here in California, and most of them in the Corona facility.

Employing a large staff of designers and engineers, the company develops all its own products, buying new cars whenever necessary to ensure a perfect

fit and good results.

With a 3D modeling machine connected to the designer's computers, prototype systems are created and revised rapidly as they search for the desired numbers.

Once satisfied with the product, the in-house machine shop fabricates the tooling to produce plastic intakes and rubber end-pieces for the cotton gauze

or oiled filter media.

Workers then build the filters and send them to the packaging department still hot from the molds. The system is flexible enough to fulfill one-off orders or large batches, depending on the orders in the system.

Using American technology, invention and workers, aFe is one company we can all get behind. (afepower.com)

MODIFICATIONS TO DATE	SUPPLIER	EUROTUNER
carbon dash & door trim	BMW Performance	10/10
black kidney grilles	BMW Performance	10/10
carbon mirrors	BMW Performance	10/10
carbon kidney grilles	Turner Motorsport	10/10
carbon hood vents	Turner Motorsport	10/10
carbon side vents	Turner Motorsport	10/10
wheel spacers	Turner Motorsport	10/10
longer wheel bolts	Turner Motorsport	10/10
Gran Turismo brake kit	Brembo	11/10
carbon door trims	BMW Performance	12/10
carbon front splitters	BMW Performance	12/10
carbon trunk spoiler	BMW Performance	12/10
Sport springs	H&R	1/11
19" F14 wheels	Forgestar	1/11
ContiSportContact 3	Continental Tires	1/11
TPMS sensors	BMW	1/11
cat-back exhaust	aFe	3/11
cold-air intake	aFe	3/11



NEXT MONTH

In part six of our M3 makeover, we hope to swap the aFe parts for some Gruppe M or even BMW Performance components to compare results. [et](#)

Contact

Advanced Flow Engineering
(afepower.com)