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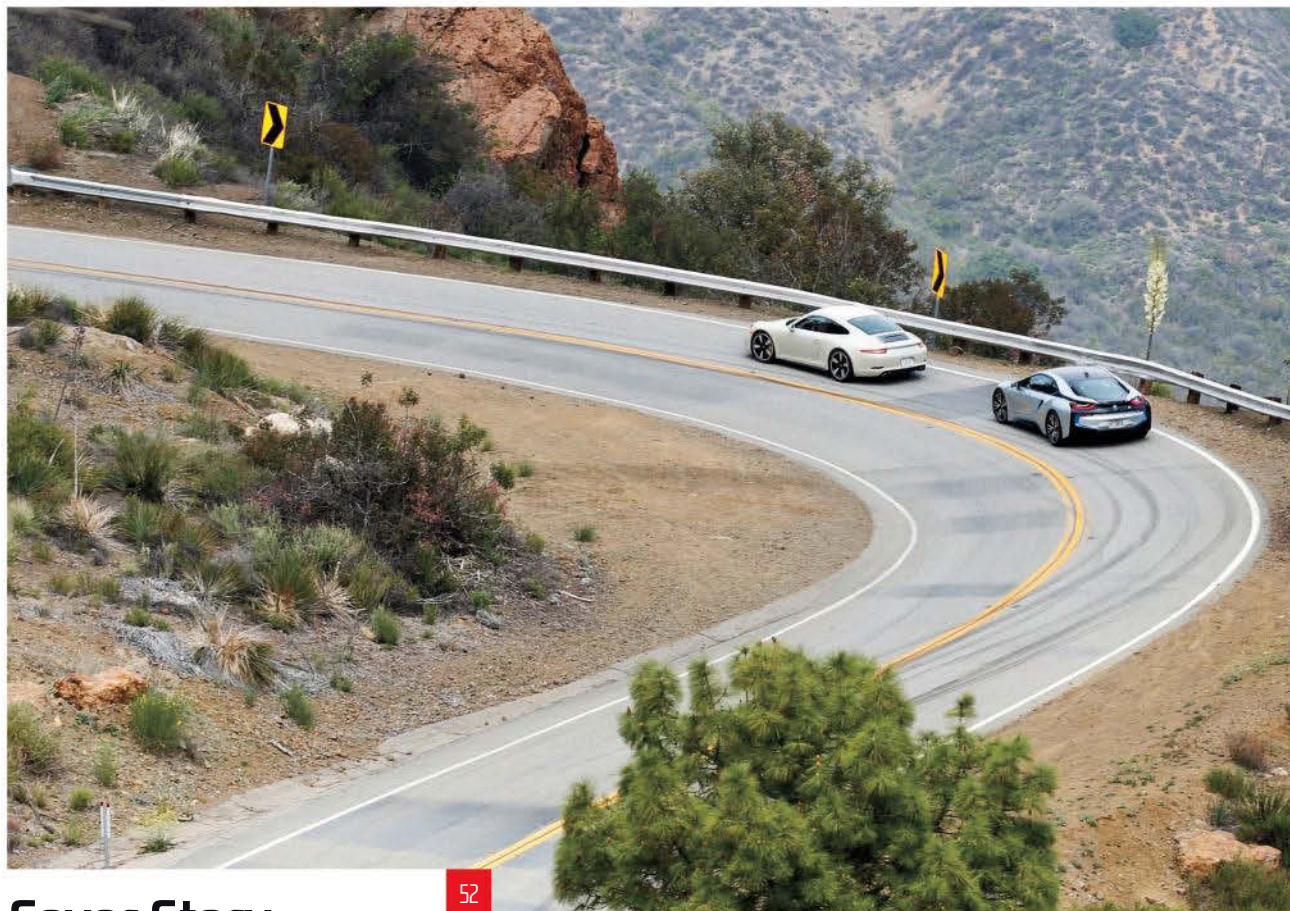
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FOURTITUDE.COM 4





52

## Cover Story

### 52 PORSCHE 911 CARRERA vs BMW i8

German sports cars from different centuries meet to do battle

## Features

### 60 2008 MERCEDES-BENZ CLK63 AMG BLACK SERIES

Joseph Galante takes one of the wackiest cars on the road and gives it 672hp to make it batshit crazy

### 70 2014 PORSCHE 911 TURBO S

TAG Motorsport gives TechArt's take on the new Turbo

### 86 2002 BMW M3

Rafael Cedeno's 489hp supercharger conversion has given him an E46 he intends to keep forever

### 94 2004 VW GOLF R

Jonathan Leung's 409hp turbo upgrade cured him of a Honda addiction

### 100 1995 VW GOLF SPORT

Kipp Farrin injected new life into his Mk3 with a 300hp 1.8T swap

### 116 1987 PORSCHE 944

David Norton's LS1 V8 engine swap makes this front-engine Porsche a track demon



60



70



86



94



100



116





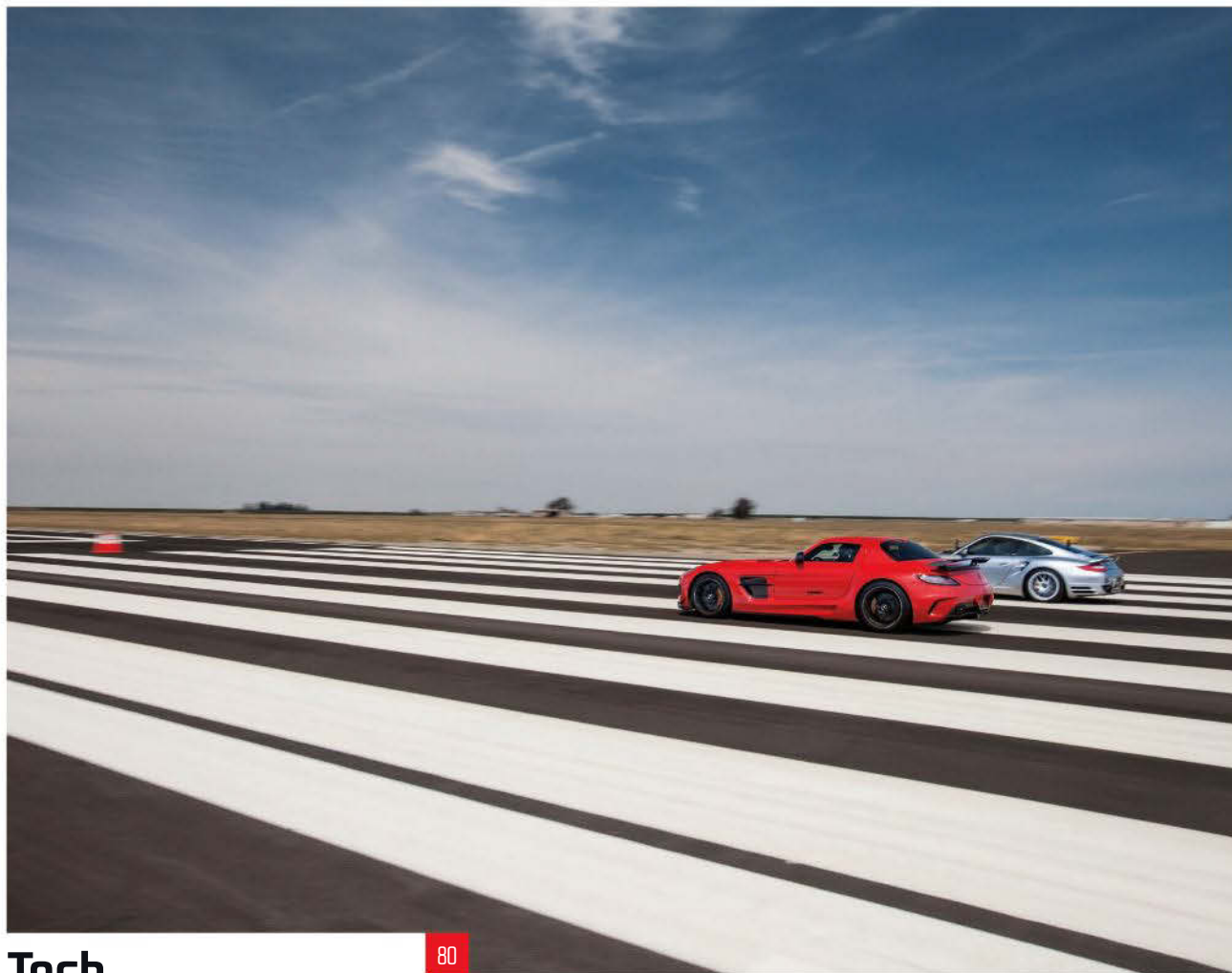
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# contents



## Tech

### 108 INTERIOR CLEANING GUIDE

We team up with Meguiar's to show you the best way to clean your cabin

## Events

### 80 NO FLY ZONE 4

Head-to-head racing on a rural airstrip

## Departments

### 14 BEHIND THE WHEEL

The Editor bids a tearful farewell

### 19 GEAR

The latest products and gadgets

### 28 FIRST DRIVES

McLaren 650S, BMW M3 and M4, BMW i8, Porsche 911 Targa, VW GTI

80



108



28



19

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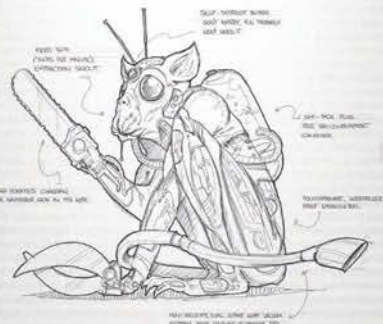
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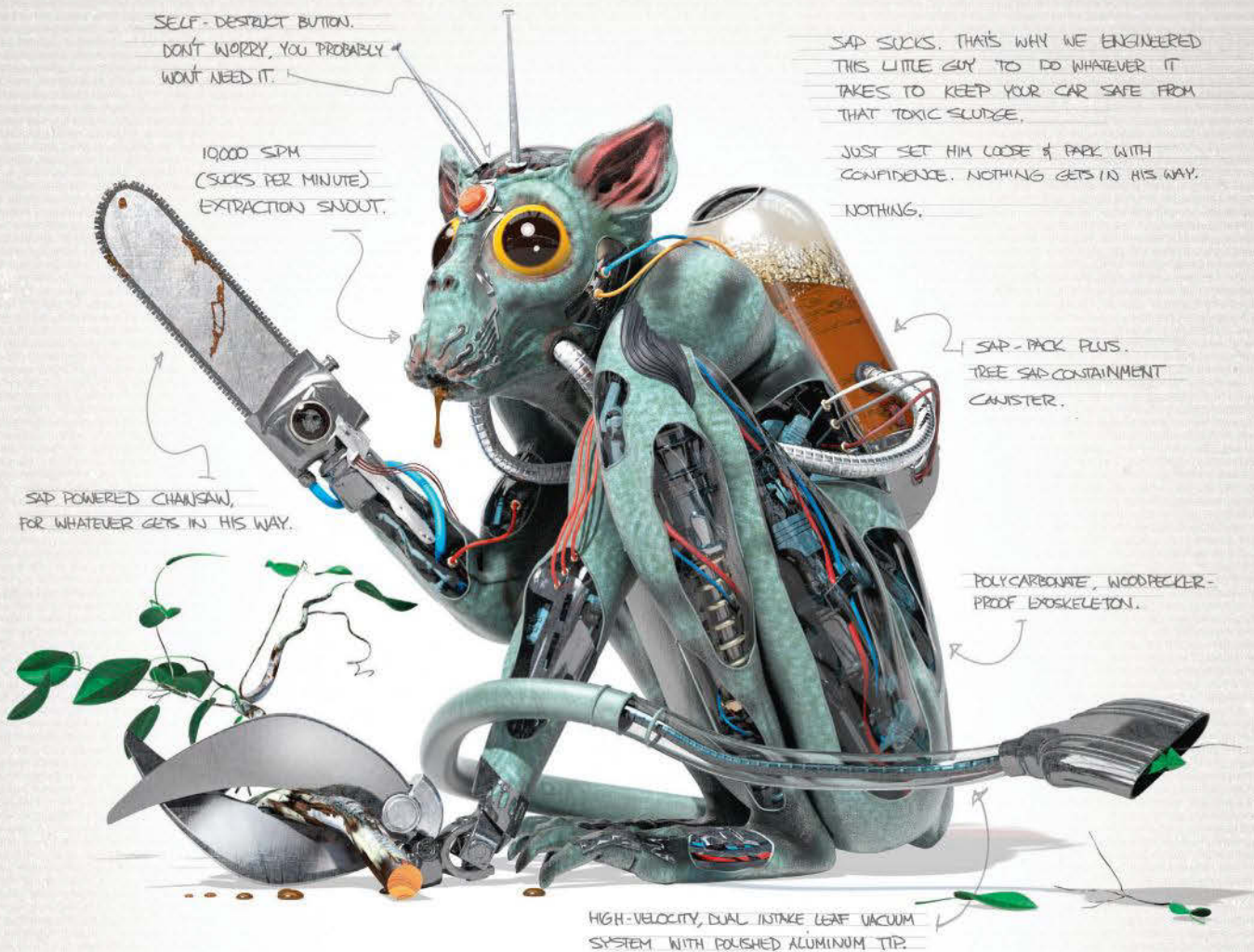


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## behind the wheel



# FAREWELL

**I'VE NEVER REALLY** understood the expression, "If you love somebody, set them free." It's counterintuitive. But it perhaps best explains why I've decided to leave the job I love and the friends I work with in order to try something new.

I've been with the company for ten years. They kindly took in a damp Englishman and kept him warm in the Californian sun. My first tenure was on *europatuner* for eight years, followed by the last two years as the Editor of *European car*.

It's been a huge honor to run these esteemed titles and I'm going to miss the fast cars in exotic locations, as well as the great team of people I've worked with. Not just the current people, but everybody I've been fortunate enough to work with over the past ten years – thanks for all your help and support.

I'm not leaving the industry altogether, but I'll be working behind the scenes with some of the leading brands. I also hope to continue contributing to the magazine and website in the future, so you're not quite rid of me completely!

Compiling this issue made the decision even harder because it represented two of my most memorable events. Both involved very fast cars in exotic locations.

The standout was the new M3 and M4. Flinging these cars through some of the best curves in Portugal made me question my sanity for wanting to leave. You can read my review in this issue, but BMW has certainly created another benchmark.

The same company is on a roll because we also got to drive the new i8 plug-in hybrid. We reviewed it in this issue and also picked up a comparison test against the Porsche 911. We felt it was important enough to run both stories in the same issue, so apologies for a slight overlap in the text.

That said, the i8 could be one of the most important vehicles of the decade because it represents the first "affordable" hybrid sports car from a mainstream manufacturer, backed up by the same warranty and dealer network as any conventional BMW.

"Flinging these cars through some of the best curves in Portugal made me question my sanity for wanting to leave."

The Germans put their full design, engineering, development and retail infrastructure behind this car to ensure the customer has a trouble-free experience. Only time will tell if it's as good as our first impressions suggest. They seem to have anticipated all the potential pitfalls – learning a great deal from the electric Mini and 1 Series experiments that clearly garnered a great deal of information.

Key to the car's success is its holistic approach – designing it from the ground up as a hybrid, as opposed to converting an existing architecture. With a clean sheet of paper, BMW ensured the car was first lightweight with its carbon fiber and aluminum construction. This would compensate for the heavy batteries that were mounted low to help with weight transfer. They also found a tiny three-cylinder motor that could sip fuel, keep weight low and generate enough turbo power to get the i8 moving rapidly.

Zero-to-60mph in 4.2sec is impressive for any vehicle, and the fact it matches the Carrera 4 can't be a coincidence.

The i8 isn't the ultimate sports car – it can't compete with the McLaren P1 or Porsche 918, and was never intended to. But it will offer an alternative to customers who might otherwise buy a 911 or R8, for example.

From our point of view, we were happy to drive a vehicle capable of returning previously unimaginable fuel consumption figures that was stylish to look at and fun to drive. We all gave a collective sigh of relief when we realized the future could be more i8 and less Prius.

**Greg Emmerson**, Editor  
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Designed to deliver impressive traction and handling, the Ventus V12 evo2 (K120) radial's high-grip silica tread compound features an innovative functionalized styrene polymer that lowers tire rolling resistance to enhance vehicle fuel economy without surrendering dry and wet traction in warm, dry and wet conditions. Like all summer tires, the Ventus V12 evo2 is not intended to be driven in near-freezing temperatures, through snow or on ice.



### Directional Tread Design

Notched shoulders and 3D intermediate ribs flanking a continuous center rib promote dry handling and traction.



### Aqua Jet Lateral Grooves

Promote efficient water evacuation from the center of the tire's contact patch to enhance hydroplaning resistance and wet traction.



## ventus S1 noble<sup>2</sup>

**Ultra High Performance  
All-Season**



It's always performance season with the Ventus S1 noble2.

Its sophisticated asymmetric tread design features notched outboard shoulders, intermediate and center ribs to bring together impressive ultra high performance in dry and wet conditions with all-season traction in light snow.



**NEW  
'14**

## ventus V2 concept<sup>2</sup>

**High Performance All-Season**

Designed to combine a cutting-edge appearance with responsive performance, the Ventus V2 concept2 delivers all-season traction in dry, wet and wintry conditions, even in light snow. Ventus V2 concept2 tires feature a high-grip, silica-enhanced tread compound to combine all-season traction with lower rolling resistance that promotes vehicle fuel economy.

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## POWERFLEX TOP MOUNT

The new Powerflex rear shock top mount for the E36 and E46 BMW 3 Series was designed to eliminate rear-end knocking caused by worn rubber in the original shock mounts. Not only will this eradicate the annoying noise, but will improve ride quality as well. This kit includes polyurethane bushings, available in two durometers, with the standard Powerflex lifetime warranty. The top mount brackets have been designed to support the polyurethane bushings from inside the bracket. This prevents the damper from passing through the reinforced assembly. The high-strength steel support plates provide additional support to the original shock tower, helping to reduce fatigue and prevent the mount from punching through the shock tower. The 10mm unit fits standard shocks and some coilover systems (such as Bilstein PSS9/PSS10), while the 12mm fits racing coilovers from companies such as Öhlins, MCS, JRZ, etc. We should point out it doesn't fit all Convertible models.

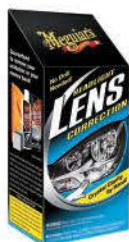
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[powerflexusa.com](http://powerflexusa.com)

## MEGUIAR'S HEADLIGHT RESTORATION

Restore clouded headlights to crystal-clear with the Meguiar's Headlight Lens Correction Kit with PlastX. It's an easy-to-use kit allowing anybody to achieve professional results. The pack includes the necessary sanding pads for removal of oxidation and cloudiness, along with a foam pad to apply the Meguiar's PlastX, which will polish the lens to clarity. Your vehicle will not only look better, but you will have enhanced safety thanks to better visibility at night and in inclement weather. **\$12.99**

[meguiars.com](http://meguiars.com)



## CTEK BATTERY CHARGERS

We've looked at and tested CTEK chargers in the past, but the harsh winter encouraged us to revisit. It appears we hadn't fully appreciated the importance of a good charger and, while the Swedish-based CTEK units are a little more expensive, the advantages are worth the extra cost. To prove the point, CTEK chargers are offered as accessories by most of the European car manufacturers following their own extensive testing. However, you could save some money by going direct to a CTEK stockist.

The company offers a range of chargers with microprocessor circuitry that guarantees the highest charge of almost any charger on the market. It will also manage the charge, ensuring the battery is always at its best. We tried the MUS 4.3 Polar charger, which is recommended for deeply discharged batteries and designed to operate down to -22°F. It can also desulphate batteries that might otherwise need to be replaced, helping to precondition them and extend the operating life.

CTEK chargers come with a couple of connectors, allowing fast connection or long term hookup. There are also functions for smaller batteries such as motorcycle or leisure vehicles. Additionally, CTEK has a range of accessories, such as its Comfort Indicator. This uses LED lights to indicate battery charge at a glance, letting you know if the vehicle is ready for action or needs to be charged. So if you have a vehicle that doesn't see regular use or draws a lot of current, you live in hot or cold climates, or simply have battery problems, we can recommend CTEK products. Check the website for product details.

[smartercharger.com](http://smartercharger.com)

## ARMORALL WIPES

Clean all your vehicle's surfaces with ArmorAll Disinfecting Wipes for everything from ketchup stains to grease and grime. Simply wipe the surface until it's visibly wet, allowing the area to remain damp for 10sec. Let it air-dry, but if the surfaces are extremely dirty, you will want to clean with another wipe before disinfecting. To sanitize hard, nonporous, non-food contact surfaces, wipe the surface with enough wipes to remain wet for 15sec. This is claimed to sufficiently eradicate staphylococcus aureus, klebsiella pneumonia, campylobacter jejuni and most deadly-sounding bacteria.

**\$33.70 per carton**

[armorall.com](http://armorall.com)



## KAHN DESIGN WHEEL

The British-designed Kahn RS600 wheel is sculpted in cast aluminum to be lightweight. The 20" wheel, for example, weighs 48.5 lb, the 22" is 61.7 lb. The sophisticated appearance was intended for vehicles such as Porsche, BMW, Jaguar, Audi, Range Rover, Mercedes and Volvo. As such, it's available in 20x8.5" and 10", 22x9.5" and 11" as well as 23x9.5".

The finish options range from Hyper Silver and gunmetal to matte black. **From \$759 each**

[fierespeed.com](http://fierespeed.com)







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## STEERING WHEEL RIMS

The new custom-molded grips in the Street Racer Program from The Steering Wheel Guy allows drivers to adopt their own steering wheel rims by completing three questions online, provide a photo of your hands and send a video of you driving. The Street Racer Program then designs the grips on any stock, airbag or aftermarket steering wheel. This hands-on approach allows the driver to fine-tune their vehicle's most critical interface and there are plenty of custom options to choose from. Besides enhanced comfort and better grip, the benefit for driving enthusiasts comes from a more relaxed grip on the wheel.

Starting at \$495

[steeringwheelguy.com](http://steeringwheelguy.com)



## MEGUIAR'S BUG SPONGES

Safely remove baked-on bug splatter from almost every exterior surface in minutes with Meguiar's Bug Splat Sponges. By removing bug entrails shortly after contact, you preserve the vehicle's delicate clearcoat finish, eliminating the risk of etching or staining. Meguiar's Bug Splat Sponges are double-sided foam/terry sponges that remove bug residue without scratching even the most delicate paint finish. Each pack contains five individually wrapped sponges, specially formulated for bug biochemistry. The sponges make bug removal easy by loosening and removing the bug debris before washing or detailing the paintwork. **\$8.99**

[meguiars.com](http://meguiars.com)



## WATER PUMP KIT

The Davies Craig EWP80 is a 21.13 gallons/minute remote-mount electric water pump kit that includes adapters and a wiring harness. The benefits of a remote unit include its universal application and the ability to function as a booster to the existing cooling system. The EWP80 can replace the factory unit by simply removing the mechanical impeller. It's capable of cooling up to a 3.0-liter engine on its own, or used in parallel with other pumps for larger capacity. One major benefit of an electric pump is that coolant flow isn't dependent on engine RPM for the maximum efficiency – most vehicles have cooling issues at low speed when a mechanical pump has less flow, or at high speed where a mechanical pump is subject to cavitation due to over-spinning the impeller. **\$245**

[daviescraig.com](http://daviescraig.com)



## OIL ANALYSIS KIT

Oil Analyzers has a new low-cost Value Kit option that allows more of us to take advantage of its oil analysis as a beneficial tool to gauge the current condition of the oil and whether it's suitable for continued use. The Value Kit focuses on four key areas of testing: oil thickness, corrosion potential, metal wear and oil additives. Limiting the testing to these areas allows Oil Analyzers to charge less for the kit and answer the main question consumers have when using oil analysis: Is it time to change my oil or not? The new Value Kit is recommended for vehicles with an existing oil analysis history and with established oil change intervals.

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**From \$43.90**  
[pennzoil.com](http://pennzoil.com)



## PIONEER SHALLOW SUBWOOFERS

Pioneer introduces the ib-Flat subwoofers. Designed for small enclosures with limited depth, the ib range produces sound that rivals traditional large enclosures. These fourth-generation shallow subwoofers were completely re-engineered to provide increased output, higher power handling, higher sensitivity, more installation flexibility and improved cosmetics. They were specifically devised for audio enthusiasts who want to add more bass frequencies in the bottom three octaves (20Hz-160Hz) without the clearance issues of traditional large subwoofers. The ib-Flat subwoofers have a mounting depth of less than 3.25" and only require a small enclosure to reach their optimum performance. **From \$140**  
[pioneerelectronics.com](http://pioneerelectronics.com)



# BMW 3 Series

## Service Manual

325i, 325xi, 328i, 328xi,  
330i, 330xi, 335i, 335is, 335xi  
2006, 2007, 2008, 2009, 2010, 2011

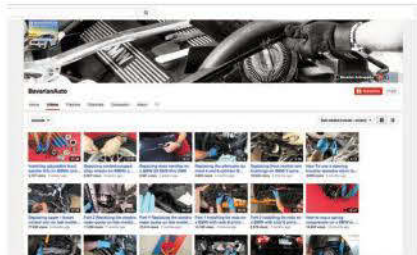


BentleyPublishers.com

## BMW 3 SERIES SERVICE MANUAL

This new repair manual comprehensively covers the 2006-11 E9X BMW 3 Series family, including the E90 Sedan, E91 Sports Wagon, E92 Coupe and the E93 Convertible. Bentley Publishers' BMW team points out the manual also covers the 2012 E92 and E93 that were extended through to the 2012 model year. The manual supersedes the previous 2006-2010 edition, adding the extra model year and more than 150 pages of new technical content. The 1400-page hardcover book features in-depth maintenance and repair information that BMW owners and technicians have come to expect from Bentley Publishers' acclaimed line of BMW repair manuals. **\$149.95**

[bentleypublishers.com](http://bentleypublishers.com)



## BAV AUTO FREE VIDEOS

Bavarian Autosport has produced dozens of easy-to-follow DIY videos for BMW and Mini owners. The free videos provide step-by-step guides for everything from changing an air filter to repairing power windows, replacing the PCV system to installing performance upgrades. The helpful videos have already been viewed more than five million times, assisting enthusiasts with simple repairs to save costly repair bills.

[youtube.com/user/BavarianAuto/videos](http://youtube.com/user/BavarianAuto/videos)

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Pirelli has introduced the latest generation Cinturato P1 Plus tire. It's a summer ultra high-performance tire for luxury, mid, full-size and sport cars. Featuring innovative compounds, structures and tread design, the Cinturato P1 Plus is said to provide consumers with better mileage, outstanding handling and comfort, as well as reduced fuel consumption. Key features include a tread compound with innovative materials for a balanced performance plus safety in wet and dry conditions. There is variable tension control and new mold profile for improved treadwear. Finally, the asymmetric tread pattern and optimized internal structure offers drivers a quieter, more comfortable driving experience.

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[pirelli.com](http://pirelli.com)



## BLAUPUNKT SAN DIEGO 530

The new Blaupunkt San Diego 530 head unit has a 6.2" digital TFT touchscreen display and is both navigation- and steering wheel remote control-ready. It includes built-in Bluetooth for hands-free calling, audio streaming and phone book access. The San Diego 530 also includes WinCE6.0 OS with 256MB RAM, front USB, front micro-SDHC slot (for multimedia or nav), ten-band parametric equalizer, four-channel pre-amp and sub-out, and Bluetooth hands-free via either a built-in or external microphone. **\$429.99**

[blaupunkt.com](http://blaupunkt.com)





## JUMPR BATTERY PACK

JunoPower claims to have the world's smallest and most powerful battery, solving two common problems in one convenient package. The JumpR is a sleek, lightweight design that houses 6000 milliamps and is said to be capable of jumping a dead car battery! The multi-function battery also features a 5V 2.1amp output to charge devices such as smartphones, cameras and tablets. Users will never have to worry about being stranded with a dead phone or car battery if the JumpR is at hand. It's for those moments when a driver forgets to turn off the headlights. This handy device even features a built-in LED flashlight, in case you need to work in the dark. Obviously, we're keen to test these bold claims and hope to have a review in the next issue. **\$89.99**

[junopower.com](http://junopower.com)



## BMW & MINI SPARE TIRE

If you replace the expensive run-flat tires on your BMW or Mini with traditional tires, you're in for a surprise if you get a flat – there's no spare tire or jack in your trunk! Rather than getting stuck out on the road and waiting for a tow, you might want to travel prepared. So Bavarian Autosport offers emergency replacement kits that include a spare tire on a steel wheel plus an OE jack, lug wrench and wheel chock.

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This premium car wash formulation was designed to clean and shine your vehicle, while protecting it from water spots. Its pearlescent polymers will sheet away water to reduce water spots after the thick, rich suds gently lift dirt for an ultra-clean and shiny finish. The ArmorAll wash contains Brazilian carnauba wax, so after rinsing your car to remove loose dirt, pour the wash into a bucket and mix with water to the prescribed amount. Be sure to wash the car with a clean sponge, terry cloth or mitt. Then rinse thoroughly from the top of the vehicle downwards. For best results, dry immediately with a soft, dry terry cloth or chamois. **\$9.99 (48oz)**

[armorall.com](http://armorall.com)

## ARMORALL TIRE GLAZE

Glossy tires are just the trick to give your vehicle a finished look. So ArmorAll developed its new formulation to deliver a deep, rich shine said to last more than 100 car washes. The synthetic polymers bond to the rubber surface giving it exceptional durability. Plus, the formulation dries to the touch, so you avoid unsightly sling. For optimum shine and uniform coverage, don't apply in windy conditions, direct sunlight or hot weather. Allow ArmorAll Outlast Tire Glaze to dry for 30-40min before driving in temperatures above 70°F, longer for cooler conditions. **\$10.99**

[armorall.com](http://armorall.com)



## BOXSTER S EXHAUST

aFe has introduced its Elite cat-back exhaust system for the 2005-12 Porsche Boxster S fitted with the H6-3.4L engine and dual-tip assembly. In recent testing, this exhaust apparently produced max gains of 29hp and 40 lb-ft after aFe spent hours of R&D to create a balance of performance and driving comfort. The system comes with a brushed finish and is TIG-welded by hand for a bolt-on installation and precise fit. No modifications necessary. **\$1569.75**

[afepower.com](http://afepower.com)



## BAVSOUND BMW SPEAKER UPGRADE

The engineers at Bavsound have created another easy-to-install speaker upgrade system specifically designed for the 2010-14 F10 BMW 5 Series and M5 models. The kit offers improved sound quality for a reasonable price. This simple speaker package allows owners to quickly and easily upgrade the listening experience in a matter of minutes with basic hand tools. The Bavsound Stage One speakers produce a higher quality sound with a wider range from the bass and treble thanks to woven fiberglass mid-range drivers and silk tweeters that are claimed to remain distortion-free at higher volumes and provide accurate, natural sound. The Stage One kit features plug-n-play connectors, factory-matched impedances and custom-molded baskets that fit like the factory system, utilizing all the factory fittings. It will give you a sound you can enjoy for years to come, but can easily be converted back to stock on a leased vehicle. **From \$999**

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# 2015 McLaren 650S

LIGHTER, FASTER, SHARPER, BETTER. THE 650S IS HOW THE 12C SHOULD HAVE BEEN...

Words Kyle Fortune  
Photos McLaren

## HIGHLIGHTS

- › Looks great
- › McLaren F1-beating acceleration
- › Remarkable ride comfort
- › Improved paddle-shift
- › Carbon-ceramic brakes standard
- › Increased downforce
- › Improved agility and steering response

## TECHNOLOGY

- › 650hp, 500 lb-ft 3.8-liter V8 twin-turbo
- › ProActive Chassis Control
- › Twin-clutch seven-speed transmission with "inertia push"
- › MonoCell carbon fiber chassis
- › Active aerodynamics

## ELECTRONICS

- › Normal, Sport and Track modes
- › Optional rear parking camera

**IT HARDLY SEEMS** like three years since McLaren introduced its 12C supercar, and yet the British company has learned a lot in that short period. Officially, the 12C remains on sale alongside the new 650S, but it's unimaginable that anybody would choose it over this new derivative.

Stung by criticism that the 12C was rather generic and lacked drama, McLaren's chief designer, Frank Stephenson, gave the 650S a more dramatic look, taking inspiration from the P1 hypercar.

The LED headlamps mimic the McLaren logo and frame a new front splitter, which adds downforce and menace. Blades under the doors clean up airflow along the flanks, while the larger inlet behind the doors feeds more air into the engine bay.

The rear is largely unchanged, but follow a 650S – if you can keep up – and the active rear wing as well as the airbrake will be busier thanks to revised operating parameters.

The hood is adorned with a simple McLaren badge, leaving no ambiguity to its origin. However, its design is a reverential nod to the one on the nose of its legendary F1 relative.

The existence of the F1 was always problematic for the 12C because it was the first road car to roll out of McLaren's gates after its revered 240.3mph three-seater supercar. And while the F1 was



game-changing back in 1992, perhaps too much was expected of the 12C?

To add to its misery, the 12C wasn't helped by the arrival of the incredible 458 Italia. And while the Ferrari bristled with passion, ground-breaking F1-derived technology and incredible performance, the 12C kept pace on the technical side but came up short on the emotion.

Somewhat fulfilling the role of class nerd, McLaren's supercar didn't have the easiest introduction. And while a series of model upgrades helped its case, the 650S is the product of three years of development, three years that included the arrival of the P1.

Even with the P1's arrival, the F1 still casts a long shadow. So the day we were driving the new 650S, social media was pointing out that on the same day in 1998, the F1 set a production car top-speed record.

The 650S can't match the F1's V-max, but by increasing the output of the M838T V8 biturbo





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#### PROS

- › Incredible performance
- › Unrivalled ride quality
- › Steering response and feel
- › Greater stability
- › Excellent brakes

#### CONS

- › Sports exhaust required
- › Sat nav slow and inaccurate
- › Expensive options list

### TECH SPEC

## 2015 MCLAREN 650S

#### LAYOUT

Mid-engine, RWD

#### ENGINE

3799cc V8 twin-turbo

#### DRIVETRAIN

seven-speed dual-clutch automatic transmission

#### BRAKES

six-piston calipers, 394mm carbon-ceramic rotors f, four-piston, 380mm r, active aerodynamics with active air brake

#### SUSPENSION

Double wishbone, coilovers with ProActive Chassis Control f&r

#### WHEELS & TIRES

19x8.5" f, 20x11" r wheels, 235/35 R19 f, 305/30 R20 r Pirelli P Zero Corsa tires

### PERFORMANCE

#### MAX POWER

650hp at 7500rpm

#### MAX TORQUE

500 lb-ft at 6000rpm

#### 0-62MPH

3sec

#### TOP SPEED

207mph

#### WEIGHT

3033 lb (dry)

#### ECONOMY

TBC

#### MSRP

\$265500



engine to 650hp, McLaren has given it power surpassing its ancestor.

The result is an accelerative force that humbles even the F1; the 650S reaches 62mph in 3sec from a standstill, and 124mph in just 8.4sec. That's nothing short of sensational.

The power gains come courtesy of new pistons, cylinder heads, exhaust valves and revised cam timing. So the actual numbers are relatively modest on paper, with the 650S only adding 25hp and 58 lb-ft of torque over the 12C.

Combined with the other revisions, the numbers feel bigger. Significantly bigger. That's partially thanks to the seven-speed transmission offering quicker shifts – the very fastest Track Mode is aided by "inertia push," which punches an impulse of torque as the next gear is engaged.

Push the accelerator to the floor and the result is incredible. The 650S rabidly accelerates, its bespoke Pirelli Corsa tires squirming under the force.

The engine is a masterpiece. It doesn't have the operatic voice of its Italian rival, even with the \$6490 Sports Exhaust option checked – blame the turbocharging for that – but its flexibility and ferocious response is remarkable.

Allied to a slight reduction in mass, a significantly quicker gearbox and more decisive shifting, and the Italian's advantage is less convincing.

The performance gains are genuinely shocking. Yet the defining, and arguably unique, characteristic is the ride quality. Lessons learned from the P1 have given the 650S even greater ability to exploit its performance, thanks to its unsurpassed ability to smooth poor road surfaces.

Lumps, bumps and ripples that would jar the driver, followed by intrusive thumps, resulting in line-changing corrections in rival machines, can be ignored by the McLaren thanks to its ProActive Chassis Control (PCC), which doesn't need anti-roll bars.

PCC mixes body and roll control with a ride that some luxury cars can't manage. Even in its focused Sport mode, the way the 650S shrugs off road imperfections is remarkable, while retaining the taut, confident control necessary in such a potent machine.

The PCC, along with revisions to the suspension geometry, have resulted in not just remarkable ride comfort and control, but improved steering. The response is far more incisive and the nose turns in more eagerly than in the 12C.

McLaren also loosened the reins on the stability and traction control systems, allowing more movement before intervening. Chief Test Driver, Chris Goodwin, confirmed the 650S has more rearward bias and that's obvious on the track, where the 650S can be flung about with more wild abandon than its 12C sibling.

Its character is significantly more engaging and involving than before. There's understeer if you're too ambitious with entry speed, but the overall balance is largely neutral thanks to remarkable grip, while the front-end revisions give you greater confidence at the enormously high speeds it's capable of.

Switch to Track mode on both power and chassis and the 650S feels every inch the racer. The mighty performance and capability are only limited by the Pirellis' ability to absorb the punishment of enthusiastic lapping and power oversteer.

The standard carbon-ceramic brakes deliver a continuous, confident bite regardless of how much abuse you give them. Unlike many similar systems, these brakes also provide an assured feel at everyday road speeds.

If it's a big concern, McLaren offers the 12C's iron discs as a no-cost option, but why anybody would want them is a mystery...

The 650S is such a significant advance that McLaren insisting it will continue to offer the 12C looks like an exercise in futility. Its supercar has come of age, and while it's able to offer the same rounded, useable character of its forbear, it manages to add a layer of insanity that increases its appeal to a level that the 12C couldn't hope to offer.

The 650S remains a different supercar proposition, thanks largely to its lack of compromise, but it's a more complete package now. Admittedly, you pay handsomely for that, but to go any faster you'd need a P1 – and they're sold out! **BC**





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June 13-15

**Road America** – Elkhart Lake, WI  
June 20-22

**Gateway Motorsports Park** – Madison, IL  
July 18-20

**Portland International Raceway** – Portland, OR  
Aug 1-3

**Michigan International Speedway** – Brooklyn, MI  
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## 2015 BMW M3 & M4

### OUT WITH THE V8, IN WITH A TURBO-SIX

**ENTERING ITS FIFTH GENERATION**, few cars carry the weight of expectation like a new M3. Perhaps Porsche's engineers feel the same responsibility, but they're playing in more rarified air. The cost of a 911 means its developers have bigger margins, but a BMW must be practical, versatile and affordable. And for a new M3, it must also be damn fast: able to compete with the 911 on a racetrack.

This year, we're also seeing the birth of a new vehicle, the M4. It could potentially steal the M3's crown with the stylistic advantage of its sleek coupe body. However, Albert Biermann, head of development for BMW M explained that the team went to extraordinary lengths to ensure both cars were virtually identical mechanically and dynamically. "The M3 is an icon," he explained. "We couldn't have it upstaged by the M4!"

So while the 435i has several key advantages over the 335i, you'd be hard pressed to detect the differences once the "M" badge is applied. During two days of hard driving, which included a section of Portuguese road used by the World Rally Championship, and laps of the sublime Autódromo Internacional Algarve in Portimão, we didn't discern any major differences.

The engineers admit the M4 is about 50 lb lighter (US regulations might show a different weight because they must account for popular optional extras) and had miniscule differences in setup – it's slightly lower, has a different weight distribution and center of gravity – but we're only talking about single percentage points.

Some drivers seemed to pick a favorite but the differences are more stylistic. Do you like your toys to have two doors or four? Do you prefer the F80 M3's fender flares, or the F82 M4's cleaner lines?

We're traditionalists. So we'd take the M3. We like the badge and the greater practicality, but concede we felt the M4 drove slightly better, although it's entirely subjective.

What we should be worrying about is how the cars drive. Do they deserve the pedigree the badge commands? To be honest, we were slightly concerned during our first spell behind the wheel...

The two M presets on the steering wheel had been programmed by our hosts with different settings – M1 was more of a comfort program, while M2 was more racy. We were advised to start in M1 and explore some real roads.

On the freeway, the M3 and M4 are hoologans. Both tickle along at 100mph as if it were 55. Pull the paddle two, maybe three times, and you can unleash the sort

Words Greg Emmerson



of accelerative force usually preserved for supercars.

With 0-60mph conservatively quoted at 3.9sec using the M-DCT transmission (4.1sec for the 6MT), there's a surge of acceleration that barely retards in the higher gears. We nudged up to 145mph and found it as eager to continue as it was at 80mph.

Hard acceleration is accompanied by a deep, bassy bellow that initially puts you in mind of the outgoing 4.0L V8, although the new S55 engine only revs to 7600rpm – lower than the V8's 8400 but still high for a turbo-six.

While engine power is similar to the V8, what really differentiates the engines is the S55's abundance of torque. Where the V8 had 295 lb-ft at 3900rpm, the F8X has 406 lb-ft from 1850 to 5500rpm. So while the V8 had to be kept in its sweet-spot at high RPM, the S55 has a different character. You don't need to be as busy with the paddles, which should also suit the manual transmission. And while the M-DCT might be quicker to 60mph and easier to drive on-track, those of us who appreciate and desire greater control were delighted to learn you can still get a manual transmission, cementing the M3 and M4's status as a true driver's car.

There were rumors that the F8X models might not get a manual, especially since most of its competitors have eradicated them. However, BMW expects 20% of its sales to be 6MT. Perversely, most of them will be sold in the US, the country that's otherwise helping to banish the stick-shift, but when it comes to our





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## HIGHLIGHTS

- ▶ First-ever turbocharged M3 engine
- ▶ Joined by new M4 model
- ▶ Widebody styling
- ▶ 425hp, 406 lb-ft
- ▶ 0-60mph in 3.9sec (M-DCT)
- ▶ 3540 lb (6MT) – the first time a new M model has been lighter than its predecessor
- ▶ Six-speed manual or seven-speed M-DCT
- ▶ Improved economy
- ▶ Priced from \$62,925

## TECHNOLOGY

- ▶ S55B30T0 3.0L i-6 biturbo engine
- ▶ Single-scroll turbos
- ▶ Lightweight, forged crankshaft
- ▶ Optional composite brakes
- ▶ Lightweight suspension and body panels
- ▶ Active suspension and differential
- ▶ One-piece, carbon fiber driveshaft

## ELECTRONICS

- ▶ M preset buttons
- ▶ BMW apps
- ▶ Connected Drive
- ▶ Augmented engine noise

sports sedans, we still want a third pedal!

The gearbox was taken from the BMW 1M, which in turn came from the 135i. For this application it was modified internally for strength, gaining carbon-coated synchromesh. They also removed 26 lb, making it 66 lb lighter than the M-DCT.

When using the 6MT, the software provides rev-matching blips on down changes, unless the driver selects Sport Plus. At this point, it's up to him to execute heel-and-toe downshifts.

The original aim of the development team was to get the car under 3500 lb and they came impressively close. A manual transmission and carbon-ceramic brakes will get you to within a few pounds. If it wasn't for the latter's six-piston calipers and the fact it needs larger 19" wheels, they might have succeeded.

This is the first time a new M3 has been lighter than its predecessor, which is a big deal. Weight is the biggest enemy of acceleration, braking, handling and economy, so reversing the trend should pay dividends for owners.

Other weight-saving technologies include the electromechanical power steering, which saved 8 lb compared to the previous M3. Then there is the aluminum front subframe that's 9 lb lighter than on the 435i and gains extra bracing. The hood is 17.5 lb lighter than the E9X, the fenders saved 8 lb and the carbon-reinforced plastic trunk on the M4 is 11 lb lighter than the 435i – the M3 retains its steel trunk but the M4 required the new part because the

coupe is inherently less aerodynamic. As a result, it has a molded spoiler similar to the E46 M3 CSL. This equalized the downforce between the two cars, with the carbon lip on the M3's trunk more of a cosmetic addition than a high-speed requirement.

Although we don't have a figure, the S55B30T0 engine is lighter than the similar N55 3.0L in the 435i. In this application, the steel cylinder liners are replaced with an iron coating sprayed onto the bores. This is then machined to create a very thin friction layer that protects the pistons.

There's also a new crankshaft that's 30% stiffer than the N55 and 4.5 lb lighter. It will inevitably be one of many parts that 335i and 435i owners will eye jealously for their own cars...

The engine has been fitted with what BMW calls its third-generation turbochargers. Two single-scroll units were designed to work with the 7600rpm rev limit, forming part of the company's new high-revving turbo engine philosophy. They don't see why a turbo motor must have a narrow powerband, although getting turbos that are small enough to be lag-free, yet able to provide so much power up to the rev limit is quite an achievement.

The power supply should be consistent because a great deal of effort went into engine cooling. It uses a water-cooled intercooler and has five radiators behind the front bumper to control operating temperatures.

A new exhaust system was designed that not only saves weight but also uses a flap system to essentially bypass the rear muffler. Whether this gains power is unlikely with four catalytic converters upstream (the important ones are nearest the engine, with two additional cats under the car, required by US law, although there was a suggestion a new car could run without them for several years and still comply with most emissions regulations...).

The exhaust flaps open when certain criteria are met for throttle position, engine speed and load. At this point, the sound takes a nasty turn, gaining significant bass and menace. It might put a few exhaust makers out of business because it sounds that good. At speed on the fast straight at Portimao, you wouldn't imagine it could be improved.

Unfortunately, BMW shot itself in the foot again by using augmented noise in the cabin to enhance the engine note at low speed and light loads. Their argument is that an enthusiast wants to know what the engine is doing at all times, and generating an artificial sound through a noise generator will assist the driver.

The problem is that when an enthusiast learns that the sound is augmented, you tend to assume it's because the mechanical noise is insufficient or unappealing. As we said, this is far from the truth – the turbo-six sounds amazing – and the augmentation does give feedback at lower speeds. It's simply the perception that this shouldn't be necessary that undermines what amounts to good execution of a relatively new concept.

Significant weight savings came from the one-piece carbon fiber driveshaft between the transmission and modified M5/M6 active differential (it has different gearing and long fins to avoid a separate cooler). The previous car had a two-piece steel shaft to avoid harmonic resonance but the carbon item has a higher resonant frequency, avoiding the problem. And while this technology isn't







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## PROS

- › Awesome driver's car
- › Sedan practicality or Coupe looks
- › Improved economy
- › Massive torque
- › Manual option
- › Sounds great

## CONS

- › Can't really think of any...



new, Albert Biermann explained that it was how the carbon shaft was attached to its steel joints that made the piece revolutionary.

Back to our driving impressions, and the M3 initially disappointed because the steering was set in Comfort and the throttle in Sport mode. The car felt lazy in the corners, not wanting to turn-in willingly or respond quickly to pedal inputs. Even the brakes felt rather numb with their carbon-ceramic rotors.

Fortunately, the M2 button rectified the situation. It had Sport steering and Sport Plus throttle activation, bringing the car alive. We soon clicked the steering into Sport Plus with the console button to provide the weight and response we wanted. And while all electric steering lacked real feedback, it did everything else almost perfectly.

We should point out that the steering helped disguise the tramlining that would otherwise occur with the wide 255/40 front tires fitted to the cars.

Perhaps our only complaint was the suspension. The roads weren't potholed but the surface was far from flat. We found that the Sport and Sport Plus settings created too much bounce caused by what felt like insufficient suspension travel and stiff springs. Even with the optional Adaptive M suspension, the electronic dampers tried to adapt but the car continued to bounce, affecting traction and confidence.

In this situation, we found the roads were best suited to the Comfort setting, which was far from its sportiest, yet the EDC was able to compensate sufficiently. This removed the bounciness, restoring control, although we did have to contend with a degree of high-speed float.

The Sport and Sport Plus settings were utilized on the racetrack, where the dampers didn't need to absorb major irregularities. On the smooth surface, the car felt taut and controlled, its ideal weight distribution (51.6/48.4% M3, 51.8/48.2% M4 6MT) giving it perfect balance in the turns, with the handling remaining almost neutral unless you entered a turn too fast, after which there was understeer to gather you up. And, of course, you could induce power oversteer on the exit, although the M Dynamic Mode on the traction control would gently bring the tail into line and allow you to maintain phenomenal forward progress. The Active M differential also played a large part in ensuring the power went to the tire with the most grip.

The carbon brakes really shone on the track. They were welcomed on the road but the inability to induce fade meant you could maintain consistently fast laps, braking deeper and deeper as confidence grew.

We found we could accelerate well past the braking markers without ever getting into trouble.

The huge front grip from the wide Michelin Pilot Super Sport tires was greatly appreciated. They followed exactly where you pointed them with the utterly precise steering. On occasion, you'd find yourself sawing to find the maximum grip, only to discover you had it – the car was doing exactly what it should without needing to be coaxed.

Exiting a corner, we found ourselves able to run a gear higher than expected. This was thanks to the torque reserve that would slingshot you towards the next apex.

It was a magnificent experience to drive the M3 and M4 so hard on both the road and track and find no real faults. Sure, the suspension was rather stiff on some road surfaces but it has three settings to cure the problem. The steering could also be rather pedestrian until you again selected the best setting. And while button pressing was required to find the right combination, the reward was an awesome setup once you got it right.

While it's relatively heavy and certainly a large car, the performance potential of the F8X BMW M3 and M4 is a notch above anything that's gone before it. I fear we may regard the E9X as a rather unwieldy tool once we have the chance compare both generations on the track.

Perhaps our only other observation was that the M3/M4 only come alive when driven hard. At regular speeds they felt more pedestrian, but most drivers will always be looking for any opportunity to unleash these beasts.

Our final thumbs up was for the multi-adjustable, plastic-backed sports seats that provided incredible support in the very fast turns at Portimao. Their only snag is the poorly positioned latch that makes entry into the M4's rear seats more difficult than it should be, but it's something you'll acclimate to.

Another factor to consider is fuel economy. The European figures suggest a combined figure of 26mpg, with up to 34mpg on the freeway, which would have been impossible with the V8. That will help reduce the running costs, although the purchase price is higher – the M3 starts at \$62925, while the M4 is \$65125 and the Convertible will be \$73425 (including destination and handling).

As for optional extras, the carbon brakes are \$8150 extra, M-DCT is \$2900, adaptive suspension is \$1000 and 19" wheels are \$1200. However, there's a long list of standard equipment to keep most drivers happy if you can only afford a base model. The cars go on sale this summer. **EC**

## TECH SPEC

### 2015 BMW M3

#### LAYOUT

front-engine, RWD

#### ENGINE

2979cc S55B30T0 inline six-cylinder 24v with two single-scroll turbos, Vanos, Valvetronic, direct injection

#### DRIVETRAIN

six-speed manual or seven-speed M-DCT automatic transmission, Active M differential

#### BRAKES

four-piston BMW/Brembo fixed calipers, 15" rotors f, two-piston, 14.6" r (optional six-piston BMW/Brembo fixed calipers, carbon-ceramic 15.75" rotors f, two-piston, 15" r)

#### SUSPENSION

aluminum double-joint strut-type f, five-link axle r

#### WHEELS & TIRES

18x9" f, 18x10" r wheels, 255/40 R18 f, 275/30 R40 r tires (optional 19" wheels required for composite brakes)

## PERFORMANCE

#### MAX POWER

425hp at 5500-7300rpm

#### MAX TORQUE

406 lb-ft at 1850-5500rpm

#### 0-60MPH

3.9sec (DCT, 4.1sec 6MT)

#### TOP SPEED

155mph (limited)

#### WEIGHT

3540 lb (6MT)

#### ECONOMY

TBA

#### MSRP

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#### HIGHLIGHTS

- ▶ 357hp from 3cyl turbo engine and electric drive
- ▶ 0-60mph in 4.2sec
- ▶ Approximately 94mpg
- ▶ Carbon fiber/aluminum passenger cell
- ▶ Made with renewable energy from recyclable materials
- ▶ 22 miles on electric power
- ▶ Standard 20" wheels
- ▶ Weighs 3270 lb
- ▶ Cd 0.26 drag coefficient
- ▶ Lowest center of gravity of any BMW
- ▶ Unique appearance

#### TECHNOLOGY

- ▶ 228hp/236 lb-ft 1.5L I-3 turbo engine
- ▶ 129hp/64-369 lb-ft electric motor
- ▶ Maximum output 357hp/420 lb-ft
- ▶ Lithium-ion battery pack
- ▶ Front-, rear- or all-wheel drive

#### ELECTRONICS

- ▶ Full LED lighting (laser lights in Europe)
- ▶ Dynamic Damper Control
- ▶ Electric steering
- ▶ Heads-up display
- ▶ BMW Connected Drive
- ▶ BMW Online Entertainment
- ▶ BMW i Remote phone app

# 2015 BMW i8

## WE FINALLY FOUND A HYBRID VEHICLE WE WANT

Words Greg Emmerson Photos BMW, Greg Emmerson

**IT'S DIFFICULT TO** know where to start when dealing with a new automotive concept – a true mid-level sports hybrid – but let's dive in and confirm the BMW i8 looks great, drives even better and confirms there's a future for driving enthusiasts in a new, greener world.

We say this with huge relief because we were concerned that the purity of the Vision EfficientDynamics Concept – first seen at the Frankfurt Auto Show in 2009 – might have been tainted by its short 38-month gestation period. Yet the design looks as fresh now as it did when Ethan Hunt drove it onto the silver screen in *Mission Impossible: Ghost Protocol*.

In fact, two things came to mind when we saw it in bright Californian sunshine (a location chosen because it's the largest single market for a performance hybrid, with 70,000 plugin hybrids sold here to date): firstly, it looks astonishingly similar to the original concept; and secondly, it simply looks astonishing.

We're all used to squinting at concept cars to imagine what the production vehicle will look like, and yet the BMW i8 was barely diluted. It keeps many of the bold features the designers originally envisioned, with seemingly only the transparent doors sacrificed

to the homologation process. Fortunately, it does get a lightweight scissor door arrangement that adds a theatrical element to your arrival and departure.

Put the i8 on Santa Monica Blvd, Pacific Coast Highway or I-405 freeway and you still see the unadulterated concept. Driven alongside Camrys and Altimas, it looks sensational. In truth, it makes everything look rather hackneyed. Even the Porsche 911 and Ferrari 458 appear mundane alongside it.

So while its styling is like nothing else on the road, what's it like to drive?

If you're like us, your experience of hybrids is limited to the unpleasant Prius and entertaining BMW ActiveHybrid 3. Neither of these made a compelling case to buy one, so would the i8 be any different?

The answer is a resounding yes. Thanks to BMW's holistic approach, everything works. The i8 was designed to be a hybrid, rather than modified to run on electricity, so there were almost no compromises.

Perhaps its single greatest attribute is the CFRP (carbon fiber reinforced plastic) and aluminum construction, seen inside the door apertures, allowing the i8 to tip the scales at 3270 lb. In turn, this means the brakes can be smaller and lighter, the acceleration better and the economy previously unimaginable.





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**“BMW has achieved its witchcraft with a combination of gasoline and electric motors, with each playing a vital role.”**



Although US testing was incomplete at the time of writing, European data suggests 0-60mph in 4.2sec, yet with a combined fuel economy of 94mpg. Take a minute to absorb that implication...

It's like low-fat ice cream tasting better than the full fat.

BMW has achieved its witchcraft with a combination of gasoline and electric motors, with each playing a vital role.

In city driving or up to 75mph, the 129hp electric motor gets you moving (unless you've selected the Sport driving mode via the shift lever). It allows you to travel up to 22 miles in relative silence using a two-speed automatic transmission driving the front wheels. The petrol engine kicks in above 75mph, or if you need more acceleration in Comfort Mode, or when you select Sport Mode. It drives the rear wheels through a six-speed auto, giving you sporty RWD characteristics but with the assurance of all-wheel drive when needed.

We can thank the carbon construction for the i8's unique engine – a 1.5L, three-cylinder derived from the new Mini Cooper but turbocharged for this application. As such, it develops a surprising 228hp.

While many people shuddered at the prospect, we knew that a three-cylinder engine meant plenty of torque. And with electric power to fill in the torque gaps, and less weight to propel, BMW found the perfect powerplant.

The only remaining question was how it would sound. Initially, we were impressed by the noise but discovered it was enhanced by the audio system. Having learned nothing from the F10 M5, BMW has done the i8 a disservice because everybody

will assume the engine sound is poor. Yet watching several cars tackle Malibu's canyons, we can assure you the engine sounds great. It has an unusual note with plenty of bass and certainly doesn't need enhancement.

Accelerating hard in eDrive while attempting to plug a gap in traffic, the two-speed transmission seemed to hesitate before the demons were unleashed. Fortunately, that trait was invisible in Comfort or Sport, where the i8's operating system makes the best use of its available power sources and provides rapid, instantaneous, seamless acceleration from any speed.

In fact, seamless best describes the i8's operation because, apart from some minor vibration when the petrol engine fires up, the driver is unaware of the activity happening behind the scenes, relying on the iDrive display to keep you informed.

The logic systems decide what propulsion system you need, when to charge the battery and by how much, which wheels to drive, etc. Having used the electric Mini E and ActiveE research projects, as well as its ActiveHybrid production vehicles to develop the operating system, BMW has created a remarkably efficient machine.

While the ability to run emissions-free is extremely attractive, it's more useful to European cities that limit vehicle use. It will, of course, save you significant money at the pumps and BMW is developing several plug-in charging solutions for customers, including its own solar-powered carport.

The batteries can also be charged on the engine's overrun or with regenerative braking. The latter creates an unusual pedal feel, where the first portion of the brake pedal travel is sharp and communicative. But the harder and longer you push, the more wooden they feel. It's not that the four-piston front brakes won't stop you; they're very effective. However, you'll need to get accustomed to the pedal feel.

Similarly, the steering is excellently weighted but utterly numb. It does exactly as you command, but you'd have little idea if the tires were in trouble. And despite wider 215/45 front and 245/40 rear Bridgestone S001 tires on all US cars, the i8 looks and feels rather under-tired.



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## PROS

- › First proper hybrid performance car
- › Amazing MPG
- › Great acceleration and handling
- › Sounds good
- › Flat cornering

## CONS

- › Storage space
- › Odd brake feel

## TECH SPEC

### 2015 BMW i8

#### LAYOUT

Rear gasoline engine, RWD; front electric motor, FWD

#### ENGINE

1499cc inline B38 three-cylinder 12v gasoline engine with turbocharger, Vanos, Valvetronic, direct injection. BMW eDrive electric motor for EV and hybrid drive

#### DRIVETRAIN

six-speed automatic transmission rear, two-speed automatic front

#### BRAKES

four-piston calipers, 13.4" rotors f, single-piston, 13.4" r

#### SUSPENSION

aluminum double-wishbones f, five-link axle r

#### WHEELS & TIRES

20x7.5" f, 20x8" r wheels, 215/45 R20 f, 245/40 R20 r tires

## PERFORMANCE

#### MAX POWER (GASOLINE)

228hp at 5800rpm

#### MAX TORQUE (GASOLINE)

236 lb-ft at 3700rpm

#### MAX POWER (ELECTRIC)

129hp at 4800rpm

#### MAX TORQUE (ELECTRIC)

64-369 lb-ft

#### MAX POWER (COMBINED)

357hp

#### MAX TORQUE (COMBINED)

420 lb-ft

#### 0-60MPH

4.2sec

#### TOP SPEED

75mph (in EV mode)

#### TOP SPEED

155mph (limited)

#### WEIGHT

3270 lb

#### ECONOMY

approx 94mpg combined (TBC)

#### MSRP

\$137500



This might be psychological since BMW endowed the i8 with an extraordinarily competent chassis. The handling was superb, with a natural lean towards slight understeer. However, it was generally very neutral, with small amounts of oversteer possible after severe provocation. What's more, the car cornered incredibly flat, body roll seemingly alien to its DNA.

Surprisingly, BMW hasn't provided the driver with a Dynamic Damper Control button. Yet the i8 is equipped with DDC as standard – it simply adjusts automatically to the driving mode, road surface and your inputs. That said, it was rather stiff on surface streets, but seemed to be more forgiving as speed increased. Some of Mailbu's roughest canyon roads upset the car's composure slightly because the suspension seems to have a short travel, but it was generally an exemplary and entertaining drive. While not a track car, the i8 will be an enjoyable companion for anybody with a regular commute that involves challenging roads.

As usual, BMW went to extraordinary lengths to ensure the car was perfectly balanced. Placing the batteries down the spine of the vehicle and surrounding them in refrigerant to avoid the danger of fire from overheating.

With the engine at the rear, the weight distribution is a commendable 47/53%, making it almost ideal. And with much of its weight concentrated below the floor, the i8 has the lowest center of gravity of any BMW built to date.

The only meaningful downside we could discover was the wide sills that make egress slightly awkward.

The side windows don't lower fully, leaving an inch of glass to knock your elbow on. And there's a distinct lack of storage space. The rear luggage compartment *might* take an overnight bag but there are no door pockets, with only a couple of stowage areas in the console and a small glovebox. However, BMW has come to your aid with a line of tailor-made Louis Vuitton luggage designed to slot into all the available space, including the rear seats that even young children might find constricting. A rear luggage area might have been more useful, but BMW has tried to make the i8 as flexible as possible by offering four seats. So we look forward to seeing the first Thule roof box mounted to this sportscar.

Not only is the car good looking, fun to drive and remarkably efficient, it also benefits from a raft of support services called 360° Electric. This will include a BMW i Wallbox for home charging (with the solar-powered carport also announced) and a ChargeNow card for a cash-free payment option at public charging stations. There are also a number of efficiency systems to reduce the amount of time you waste looking for parking spaces. Furthermore, BMW is offering easier maintenance, repair and breakdown services.

And there's an app for that. Your phone can monitor the battery's charge, telling you how long it needs to be plugged in, when it's ready and how far you can travel.

The technology even extends to laser headlights, which sadly won't be available in the US because the ancient laws hadn't predicted it might be an option one day. However, the Europeans will enjoy the range and clarity of the beam.

With a base price of \$137500, you have to ask what the i8 is competing against. You have to assume it will attract Tesla drivers who want more visual drama and driving excitement. It should also attract Porsche 911 Carrera owners, who won't get the same visceral sportscar feel, but will enjoy its technology and their contribution to the reduction of global warming.

As a city car, the i8 has few peers. It can slip silently and emissions-free through any metropolis, casting a stylish shadow. Yet it's also able to pick up and go at the press of a button or moving the shift lever.

This might be the moment we discovered the future of performance driving, and it's alright by us! **BC**



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# 2014 Porsche 911 Targa

PORSCHE FOUND INSPIRATION IN THE 1960s FOR ITS LATEST 911 DERIVATIVE

Words Matt Robinson  
Photos Andy Morgan

## HIGHLIGHTS

- › Classic Targa returns after 20 years
- › 15% stiffer than 991 Cabriolet
- › Drives beautifully
- › Huge feel-good factor

## TECHNOLOGY

- › 395hp 3.8L flat-six motor
- › Specific damper rates
- › New rebound buffer springs counter weight
- › Seven-speed manual
- › Optional seven-speed PDK auto
- › Porsche AWD Traction Management
- › Roof arrangement folds in 19sec

## ELECTRONICS

- › Fully automatic top
- › Bi-Xenon headlights as standard
- › Optional Burmester 800w sound system

**WE HERE IN THE US SHOULD BE PROUD.** We're responsible for this new 991-series Porsche 911 Targa. Well, our legislators are... or maybe I should say, "were." Allow me to explain.

In 1948, when Porsche began making its excellent 356, you could buy a Cabriolet from the outset. And when its fabric top was folded away, the passenger compartment was completely open to the elements. Stuttgart was out of the blocks early with a flat shoulder-line on its convertible.

So where did the Targa's distinctive appearance come from? Well, as Porsche was working on the open-top version of its then-new 911 in the 1960s, US safety concerns about open convertibles were coming to light. The fear was that in a rollover, the prospect for the occupants might be bleak. So the government was making noises about potentially banning such machines.

This presented Porsche with a problem, but Zuffenhausen naturally devised a solution. And so, at the 1965 Frankfurt Auto Show, the company showed its first Targa – a 911 with a rollover hoop rising from the B-pillar, and removable roof sections in the center and rear.

Named after the Sicilian Targa Florio race in Italy, where Porsche had seen success, the idiosyncratic design neatly sidestepped the potential convertible



ban and went on sale in 1967.

Thing is, the ban on full convertibles never came. Yet the Targa carried on regardless, even with the arrival of a "proper" open-top 911 in 1982.

In 1996, with the arrival of the Type-993 Porsche 911, the Targa morphed into a Carrera with a big sunroof, dropping the rollover bar and losing its classic styling.

But now it's back. A full 20 years since the last 964 Targa departed the scene, Porsche thinks it can again sustain two fabric-topped convertibles in its 911 portfolio. And taking into account the Type-991 Targa's arresting looks, we have to agree. The new Targa is stunning.

Retro-themed re-imaginings of former classics are nothing new (see the Mini, Ford GT, etc, as proof), but they leave the companies susceptible to accusations



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## PROS

- › Glorious, retro exterior
- › Amazing roof mechanism
- › Drives better than the Cabriolet
- › AWD for year-round use

## CONS

- › 991 steering not as good as before
- › Likely to cost as much as the Cabriolet
- › Poor throttle response in Normal mode

## TECH SPEC

### 2014 PORSCHE 911 TARGA 4S PDK

#### LAYOUT

rear-engine, Porsche Traction Management (PTM) AWD

#### ENGINE

3800cc horizontally-opposed six-cylinder 24v, quad cam, VarioCam Plus variable inlet valve timing and valve-lift adjustment

#### DRIVETRAIN

seven-speed Porsche Doppelkupplung (PDK) dual-clutch automatic transmission, Porsche Torque Vectoring (PTV) with mechanical rear-axle differential lock

#### BRAKES

six-piston monobloc calipers, 340mm drilled rotors f, four-piston, 330mm r

#### SUSPENSION

MacPherson strut f, five-link r; Porsche Active Suspension Management (PASM) with electronically controlled vibration dampers

#### WHEELS & TIRES

20x8.5" f, 20x11" r ten-spoke wheels, 245/35 ZR20 f, 305/30 ZR20 r tires

## PERFORMANCE

#### MAX POWER

400hp at 7400rpm

#### MAX TORQUE

325 lb-ft at 5600rpm

#### 0-62MPH

4.4sec (PDK with Sport Chrono pack)

#### TOP SPEED

183mph

#### WEIGHT

3472 lb (PDK)

#### ECONOMY

TBC

#### MSRP

TBC



of being out of ideas, but reviving the correct Targa shape was nothing short of Germanic genius.

Like the 1967 original, the 991 version is defined by the tasteful stainless steel rollover hoop – complete with its three side gills and the Targa badge at its base. There's also the characteristic wraparound rear screen lacking C-pillars behind it.

Top up or down, it's certainly an eye-catching design that sits well on the 991 platform, while reminding us of the original. But it's how the Targa roofs works that is astonishing.

Unlike the Cabriolet, you can only activate the Targa's roof mechanism when stationary because of aerodynamic limitations (the rear glass would catch the wind like a huge airbrake). It means you'll amaze anybody lucky enough to be walking past as you put the Targa through the motions.

The rear glass lifts into the air and moves backwards. It allows the fabric center section to lift itself over the roll bar and tuck down into a recess behind the tiny rear seats. Then the glass returns to its rightful place and you're ready to go.

The downside of this balletic act is that the body is only half as stiff as the 911 Carrera Coupe, and a significant 242.6 lb heavier. It even weighs 88 lb more than the Cabrio, but at least it's 15% more rigid than the latter.

Every Targa will get an all-wheel drive "4" badge, and there are two engine and transmission choices. The entry point is the 3.4-liter Targa 4 with 345hp and 288 lb-ft. But the 395hp and 325 lb-ft from the 3.8-liter "4S" model is well worth choosing.

With its optional seven-speed PDK dual-clutch transmission (there's a seven-speed manual, too), the Targa is as rapid as you'd expect. But equip it with the Sport Chrono pack and it'll complete 0-62mph in just 4.4sec and on to 183mph.

It also sounds sensationally good as it goes about its business, the mellifluous flat-six blare only heightened by the Targa's open roof.

The Targa is hugely capable in the corners as well. Its all-wheel drive provides monstrous grip and the ability to change line mid-bend without fearing for your long-term well-being. It maintains a vice-like



hold at all times, and you're never aware of the extra weight. In fact, it's easily 99% as capable as a Carrera 4S, and yet you've got miles of sky above you to tilt the feel-good balance in the Targa's favor.

Perhaps more importantly, when you're not driving like you stole it, the Targa makes perfect sense, especially if you opt for the PDK tranny. The T4S rides beautifully, if firmly, but never shows any flex in its structure. Occupants won't be ruffled by wind, because a deflector rises above the windshield to protect you from gusts. And while the 3.8L is never silent, it quiets down enough to make long journeys easy to contemplate.

Flaws? Well, the amount of accelerator movement and the engine's response in Normal mode don't tally; Sport mode is sharper and should be the norm. The steering isn't as exquisite as 911s of old; claiming it is a 2+2 is misleading, and the Targa is likely to cost almost as much as the Cabriolet when US prices are confirmed. But you know what? None of this matters. The price of entry is worth it for the huge smile it puts on your face every time you drive it.

A classy convertible with a slice of '60s style and the Carrera 4's dynamics mean the Targa has made a welcome return. We'd certainly choose it over the Cabriolet, and over lots of other cars, for that matter. It's a fantastic interpretation of a model we never knew we missed. **BC**





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# 2015 VW GTI

## WHAT DOES THE SEVENTH GENERATION HAVE TO OFFER?

Words Greg Emmerson



### HIGHLIGHTS

- › Bigger, lighter, faster, more economical than before
- › Optional Performance Package with +10hp, LSD, bigger brakes
- › Priced from \$24,395
- › Larger trunk space

### TECHNOLOGY

- › 210hp/258 lb-ft 2.0TSI engine
- › Six-speed manual or DSG
- › Optional DCC adaptive damping
- › MQB body structure

### ELECTRONICS

- › Standard Automatic Post-Collision Braking
- › Driving Mode selector
- › Standard 5.8" screen

**IN THE INTEREST** of full disclosure, I have to confess to a soft spot for the Golf GTI. I've owned five in the past and, while it might not always be the best in some individual areas, it's always been the finest all-rounder money can buy.

In the right hands, a GTI should be able to keep pace with almost anything on a twisty road. It will also return decent fuel consumption, accommodate five people, transport furniture, look good and respond well to tuning. What more could you want? It's certainly more sophisticated than any of its domestic or import alternatives such as the Mazda3, Ford Focus, or Subaru Impreza.

With seven generations in the 40 years since the first Golfs were introduced in 1974, more than 30 million cars have been sold. This makes it the most successful European car of all time.

When the first GTI was launched in 1976, it created the hot hatch market and set a high bar for all future models. The formula of a small car with hatchback practicality, sports car handling and a powerful engine has been copied countless times, and yet the GTI still manages to be the best all-rounder. And having been voted the World, European and Japanese Car of the Year, the new GTI seems to be maintaining its enviable market position.

Based on VW's new MQB architecture, the newest Mk7 GTI manages to be larger than the outgoing model but also lighter, faster and more economical.

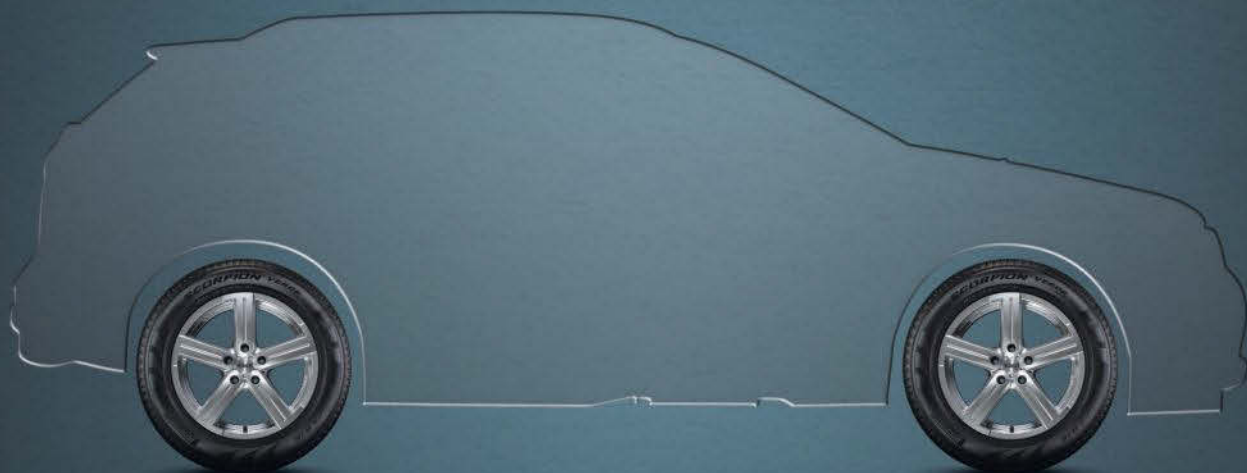


That's an impressive feat, and we can thank the extended use of high-strength steel (28%) for much of the weight savings (51 lb). The third-gen EA888 2.0TSI engine also saved a further 72 lb over the previous motor.

The engine is now up to Mk6 European-spec. Those cars were 210hp years ago, but it's the torque increase that's most appreciated – up almost 25% to a respectable 258 lb-ft at 1500rpm. However, the new Performance Package on the options list will probably tempt readers of this magazine. It adds a further 10hp, taking output to 220hp, while also increasing brake rotor size to 13.4" front and 12.2" rear (calipers remain the same but get a GTI logo), plus a torque-sensing mechanical limited-slip diff.

The package costs an additional \$1495, which is reasonably good value if you're considering the GTI for track days, or if you have the opportunity to regularly drive some amazing roads. VW claims a GTI with this package knocked 8sec off its Nürburgring lap time compared to a stock GTI.





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# PROS

- Good all-rounder
- More power, torque and MPG

# CONS

- Fidgety ride



## TECH SPEC

### 2015 VW GOLF GTI

#### LAYOUT

front-engine, transverse, FWD

#### ENGINE

1984 EA888 TSI four-cylinder 16v single-scroll IHI turbo, variable valve timing, variable exhaust valve lift, direct injection

#### DRIVETRAIN

six-speed manual or six-speed DSG automatic transmission, XDS+ e-diff

#### BRAKES

single-piston calipers, 12.3" rotors f, single-piston, 10.7" r

#### SUSPENSION

strut-type, 24mm sway bar f, multilink, 20mm bar r

#### WHEELS & TIRES

18x7.5" wheels, 225/40 R18 tires

## PERFORMANCE

#### MAX POWER

210hp at 4500rpm

#### MAX TORQUE

258 lb-ft at 1500rpm

#### 0-60MPH

6.5sec (DSG)

#### TOP SPEED

130mph (limited)

#### WEIGHT

2972 lb (2dr, 6MT)

#### ECONOMY

25/34/27mpg (city/highway/combined, 6MT)

#### MSRP

\$24395 (plus \$820 D&D)

If you don't plan to drive the wheels of your GTI, we have to admit the extra power is difficult to detect and the stock XDS+ e-diff does a pretty good job of putting the power to the road and getting you around corners. A mechanical diff obviously has advantages, such as tightening your line as you accelerate through a turn, but in anything but very hard driving it won't be fully exploited.

Another new feature includes the Driving Mode selector. This lets you switch between Normal, Sport and a custom mode. Hitting Sport gives you a sharper throttle response, more engine noise and heavier steering, with the custom setting allowing you to choose a combination of Sport and Normal.

Pay an additional \$800 for the option DCC adaptive damping (only available in combination with the Performance Package) and not only will the selector alter the damper rates in concert with your choice, but you also get a Comfort setting as well.

Unfortunately, we didn't get to sample the DCC and found the ride comfort rather fidgety on uneven surfaces. Perhaps we've been spoiled but the Mk7 didn't seem to have the GTI's trademark composure on country roads that we'd become accustomed to. Hopefully the DCC would rectify the problem by adapting to the bumps more rapidly.

There were no complaints about the braking, and the steering was sharp in the Sport mode. The engine also pulled harder through the rev range, and especially at higher RPM when compared to the Mk6 GTI that was available to us for comparison.

We drove cars with both the DSG and manual transmissions, preferring the three-pedal version for its involvement and control. The gearing also seemed better suited to the twisty roads we encountered, allowing the 2.0T to use more of its torque, where the DSG seemed to be higher in the rev range and needing more shifts. Obviously, this would change for different roads or tracks, but we basically prefer the manual transmission.

The interior gets a standard 5.8" touchscreen that comes with radio, CD, Bluetooth and iPod integration. Unfortunately, navigation can only be added if you get the \$30k GTI Autobahn trim level.

The sports seats and thick-rimmed steering wheel remain perfect for the job. However, the interior overall didn't have a premium feel. It's not an unpleasant environment but it didn't feel special.

However, we were grateful for the new Fender audio option that comes standard on the SE trim level.

When comparing the cost of the Mk6 and Mk7 GTI, VW claims to have cut the cost of the new car by about \$700 when fitted with comparable equipment. So the base GTI S two-door manual starts at \$24395 (rising to \$26095 for a four-door DSG).

The S trim includes 18" wheels, Drive Select, XDS+ e-diff, LED fogs, painted exterior trim, plaid seat cloth, manual lumbar adjust, manual A/C, multifunction steering wheel, touchscreen, iPod integration, Bluetooth, sat radio, Car-Net and Automatic Post-Collision Braking.

The GTI SE 2dr 6MT costs from \$27395 and adds a standard sunroof, keyless entry, rearview camera, Fender audio and leather seats. Finally, there's the GTI Autobahn that's only available as a four-door. The 6MT costs \$29595 while the DSG is \$30695 and it gets standard nav, 12-way seat adjustment and Climatronic A/C.

We were pleased to see a range of VW Accessories on display, with a GTI sporting different wheels, a roof rack, etc. Check out the VW website for the full range.

Overall, the VW GTI remains at the top of our list of affordable all-rounders. However, it's perhaps not the home run that previous models have been. Or perhaps we just needed to drive it on better roads or a racetrack to appreciate it more...

Whatever the case, VW buyers have a great selection of cars, including a new Golf Sport model: limited to 650 cars, it gets a body kit to distinguish it from the regular Golf models. The Golf S will cost from \$18995, but look out for a Golf "Launch Edition" that will retail from \$17995 and come with 15" steel wheels for a retro feel.

Then there's the \$21995 TDI that gets a slight power increase to 150hp. Or you might want to wait until early 2015 for the Golf R model, which is getting good reviews (see our *First Drive* in *EC* 7/14). The Golf Sportswagen will arrive at the same time.

There will also be a Golf R "Evo" or "RS" model to follow. The 395hp Golf R 400 that was unveiled at the Beijing Auto Show earlier this year hinted at it, rather unsuitably. Several VW representatives assured us the car was in the pipeline, but whether it will come to North America, and if we'll get that much power has yet to be seen. It certainly promises a great future for VW enthusiasts. **EC**





**bloque diamond**



**BD-1**

20x9/20x10.5

22x9/22x10.5



**BD-2**

20x9/20x10.5

22x9/22x10.5



**BD-4**

20x8.5/20x10



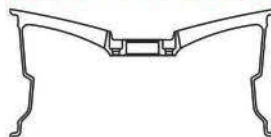
**BD-6**

20x8.5/20x10

22x9/22x10.5

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# OLD vs NEW SCHOOL

PORSCHE 911 CARRERA VS BMW I8







WORDS THOMAS GEIGER, IAN KUAH, GREG EMMERSON PHOTOS FABIAN KIRCHBAUER & ALBERTO MARTINEZ

## GERMAN SPORTS CARS FROM DIFFERENT CENTURIES MEET TO DO BATTLE

**IF YOU'RE GOING** to build a sports car, you have to be prepared to have it judged by the benchmark in the category: the Porsche 911. So when BMW brought its exciting new i8 hybrid to California, we had a Type-991 Porsche 911 50<sup>th</sup> Anniversary Edition Coupe hidden around the corner. And when nobody was looking, we fired up the boxer-six motor.

While the 911 has a pedigree that's half-a-century old and personifies the German sports car, the BMW i8 is the new-kid-on-the-block. It promises driving fun without depleting the world's resources. It's also on the cutting edge of the very latest technology, while the 911 is desperately trying to hold onto its glorious past.

At 7am on another perfect SoCal day, the

cream-coloured 50<sup>th</sup> Anniversary 911 was already basking in the early morning sun in Malibu. It was receiving plenty of admiring glances from early morning joggers, but what would you expect? Fifty years of development have matured the 911 into the iconic sports car, and the current 991 variant is arguably one of the best to date.



A few minutes later we detect a disturbance in the force. The BMW i8 glides into view, looking like a spacecraft from another galaxy. With no obvious soundtrack, it whispers past and comes to rest a few yards away.

We feel convention and tradition falter. The familiar rules of displacement, power, noise and acceleration are beginning to implode. Joggers stop dead in their tracks as all attention is focused on the newcomer.

Suddenly, the previously sleek Porsche looked like yesterday's news. And while the palm trees might still reflect in the i8's nose and voluptuous fenders, once the i8's scissor doors reach for the blue sky, all was lost. The icon has been relegated to the sidelines.

## TECHNOLOGY

We run in tandem from Malibu to Beverly Hills, where Porsches are a common sight. Yet even here, with its unique paint scheme and checkered seats, the Anniversary model barely garners a glance.

In contrast, the BMW is set upon by swarms of people. In a culture that appreciates new and shiny, the i8 is top dog. It's cool by default and dozens of phone cameras are pointed our way, snapping photos that will instantly be posted to social media.

The i8 looks so similar to the original concept car that most people couldn't believe it was already in production and would soon hit BMW showrooms.

If the primary task of a sports car is an extension of its owner's personality; a means to convey themselves to the world, then the i8 is the best sports car on the planet right now. Fast, yet with eco-friendly credentials, it's literally the best of both worlds.

More than that, if you're predisposed to making a grand entrance, this is the ideal car. After making a silent entry under electric power, you gracefully swing open the scissor door, exhibiting the swathes of exposed carbon fiber. After that, you'll be the undisputed local hero.

The only snag is trying to remain dignified while clambering over the wide carbon fiber sills. Practice will inevitably help but ladies might want to consider the length of their skirt...

The i8 not only looks squeaky clean, it drives that way too. So long as you don't have to ascend steep hills, the first 22 miles can be covered silently and emissions-free in the eDrive mode.

Even when the three-cylinder turbocharged motor kicks in to charge the batteries or offer some assistance, you can still cruise while sipping the equivalent of 94mpg thanks to the hybrid drive.

"On average, the i8 consumes about half as much fuel as a conventional sports car in a comparable driving test," explained project manager, Carsten Breittfeld from BMW. As with most cars, if you don't concentrate hard in real world driving, the i8 might struggle to match the advertised numbers, although we only had a relatively short time to assess it.

While the rear of the Porsche packs the usual 3.8-liter flat-six engine with 400hp and 325 lb-ft

of torque, the i8's output comes from two separate motors. Power to the front axle comes from the eDrive electric motor that produces 129hp with anything from 64- to 369 lb-ft torque, depending on gear, load, charge, speed, etc. The e-motor is connected to a two-speed gearbox and draws its power from a 7.1kWh lithium-ion battery pack in the central tunnel.

A three-cylinder 1.5-liter motor derived from the Mini powerplant drives the rear wheels through a six-speed automatic gearbox. Except it was tuned to a healthy 228hp and 236 lb-ft thanks to a small turbocharger. In addition, there's a second, smaller electric motor that acts as a starter and was designed to effectively fill the gaps in the petrol engine's torque curve. Total system output is 357hp with maximum torque of 420 lb-ft.

Because BMW crammed lots of technology into the i8, they spent lots of time attempting to reduce weight in other areas. So, like the i3, it features an aluminium/carbon fiber chassis with a carbon fiber body, dropping the weight to a reasonable 3270 lb.

While this is impressive for a plug-in hybrid with two engines and hundreds of batteries, it's only average for a high-performance sports car. The Porsche, for example, using conventional steel and aluminium construction, but with the weight penalty of its PDK transmission, tips the scales at 3313 lb.

**"On average, the i8 consumes about half as much fuel as a conventional sports car in a comparable driving test."**











Obviously, Porsche also has a hybrid sports car: the impressive 918 Spyder. With an output of 887hp, it's more than double that of the i8. The Spyder can also reach 215mph, travel 19 miles in e-drive and return an overall consumption of 78mpg. However, we're not comparing apples with apples. The 918 also has a price tag almost six-times greater than the i8. So in that respect, when you consider the jaw-dropping theater the BMW delivers, its \$135700 price seems almost a bargain. It's also competitive with the \$121400 911 Anniversary Edition, which is why both cars show up here.

## DRIVING

Mulholland Drive or Latigo Canyon in Malibu is where petrolheads like Jay Leno or Magnus Walker come out to play. Hollywood's high society shows off its automotive jewelry. This is where arriving in a Porsche is seen as a minimum requirement.

Away from the spotlights, the Carrera S sets the benchmark here with a 0-60mph time of 4.2sec. But the i8 can live with serious sports

cars, and its 0-60 is identical. Both cars are also limited to 155mph.

With its battery pack in the middle of the floorpan, the i8 has the lowest center of gravity (18") of any BMW. And the cooperation of its electric and petrol motors delivers a traction advantage. That said, every sports car must be good in the bends, and for a car with this intent, the i8 is immediately handicapped by its relatively narrow 20x7.5 and x8" wheels wrapped in 215/45 and 245/45 tires, respectively — and while these are standard equipment in the US, European versions come with even narrower rubber.

The 911 is more appropriately shod with 20x8.5" and x11" wheels, wrapped in sticky 245/35 and 295/30 rubber, rather than the low-resistance Bridgestones on the BMW. As such, the Porsche feels as if it was born to hug the curves on our hillside test course, effortlessly sweeping around every bend like a well-developed thoroughbred.

Captain Future starts to feel out of his depth here. Even in Sport mode, with its active damping working overtime, the skinny tires screech and the ESP light flickers like a demented disco ball. The i8 protests at being asked to follow the 911, delivering more and more understeer the harder you push it.

This is frustrating because the rest of the car is so good. It feels as if the engineers avoided the temptation to make the i8 handle like a proper sports car, but they did have a lot more to consider...

Maybe canyon roads are simply too "old school" for the BMW, and not a priority for the New Age machine, but whatever the reason, the Porsche won that round by a country mile.

## TECH SPEC 2015 BMW i8

### LAYOUT

rear gasoline engine, RWD; front electric motor, FWD

### ENGINE

1499cc inline B38 three-cylinder 12v gasoline engine with turbo, Vanos, Valvetronic, direct injection, BMW eDrive electric motor for EV and hybrid drive

### DRIVETRAIN

six-speed automatic transmission rear, two-speed automatic front

### BRAKES

four-piston calipers, 13.4" rotors f, single-piston, 13.4" r

### SUSPENSION

aluminum double-wishbones f, five-link axle r

### WHEELS & TIRES

20x7.5" f, 20x8" r wheels, 215/45 R20 f, 245/45 R20 r tires

## PERFORMANCE

### MAX POWER (GASOLINE)

228hp at 5800rpm

### MAX TORQUE (GASOLINE)

236lb-ft at 3700rpm

### MAX POWER (ELECTRIC)

129hp at 4800rpm

### MAX TORQUE (ELECTRIC)

64-369 lb-ft

### MAX POWER (COMBINED)

357hp

### MAX TORQUE (COMBINED)

420 lb-ft

### 0-60MPH

4.2sec

### TOP SPEED

75mph (in EV mode)

### TOP SPEED

155mph (limited)

### WEIGHT

3270 lb

### ECONOMY

TBC

### MSRP

\$135700





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## INSIDE

Both cars carry their respective themes to the interior, with the 911 dashboard exactly what you'd expect from a modern interpretation of a classic design. It has big analog instruments and a plethora of individual buttons that can be fiddly if you need to find something quickly at speed.

The BMW's cockpit could be described as either stylish or sterile, depending on your taste. Yet whoever designed the dashboard got carried away with digital displays. All lit up, it's like a video game with confusing graphics. Initially, it requires some effort to find and interpret the information you need. With each driving mode, not only the color but also the contents of the screens changes.

The good news is that the BMW controls, such as the electric power steering, feel connected and alive rather than like a simulator. In fact, we were surprised that the diminutive three-cylinder motor in the rear sounded as throaty and charismatic as it did.

Thanks to its layout and sound generator adding to the basic engine note, the turbo motor is reminiscent of Porsche's flat-six in an odd way. However, the Porsche motor is the more vocal and authentic of the two by far, especially when you press the button to open the exhaust bypass valve.

Predictably, these two sports cars have a few negative features in common, such as the meager luggage space, almost pointless rear seats and plastic panels denying owners a view of the motor.

## WINNER

So which car is the winner? Is it the old school favorite or the intergalactic ambassador from the future?

With just a morning to compare and

contrast both cars, the answer to the question was far from easy...

Above all else, the BMW had significantly more presence on the road, and was more relaxing to use for regular driving. But add a challenging road into the equation and, besides the abundant torque that launches the i8 out of bends, the accolade for driver's choice sits squarely with the Porsche 911; the paradigm of a traditional German sports car.

And yet that's not really the answer either, because both of these cars are more than the sum of their parts. The Porsche is an emotional delight. It matches your enthusiasm and encourages you to push a little harder, rewarding the driver with a visceral experience.

The BMW can offer rapid transportation that's adept in all situations but maybe doesn't excel in the important areas. It might not be the car you'd pick for a Sunday morning canyon carving session, but it would probably be the one you'd choose for almost every other situation. It's stylish, well built, technologically advanced, fascinating in its complexity yet breath-taking in its application. It allows you to go green in the city and go wild in the country – not quite as wild as the 911, admittedly, but it's no slouch. The i8 has zero body roll, good breaks and great acceleration.

The diehard Porsche fans probably won't give the i8 another thought, although we'd recommend everybody test drive this car to experience how far plug-in technology has come. Porsche has admitted a hybrid will be part of the next generation 911 range. So before long we can see if Stuttgart is able to improve on Munich's fascinating combination of electric power in a sports car.

As for which of these sports cars we'd take, our vote narrowly goes to the BMW i8 for being like nothing else on the road today **EC**

## TECH SPEC

### 2014 PORSCHE 911 50<sup>TH</sup> ANNIVERSARY EDITION

#### LAYOUT

rear-engine, RWD

#### ENGINE

3800cc flat-six DOHC, 24v, VarioCam Plus with Porsche Powerkit

#### DRIVETRAIN

seven-speed PDK dual-clutch transmission, Porsche Torque Vectoring (PTV) with mechanical differential lock, Sport Chrono package

#### BRAKES

six-piston calipers, 340mm drilled rotors f, four-piston, 330mm r

#### SUSPENSION

MacPherson strut f, five-link r, PASM electronically controlled dampers

#### WHEELS & TIRES

20x8.5" f, 20x11" r Fuchs-style wheels, 245/35 ZR20 f, 305/30 ZR20 r tires

## PERFORMANCE

#### MAX POWER

430hp at 7400rpm

#### MAX TORQUE

325 lb-ft at 5600rpm

#### 0-60MPH

4.2sec (PDK)

#### TOP SPEED

186mph

#### WEIGHT

3313 lb (PDK)

#### ECONOMY

TBC

#### MSRP

\$121400





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## NEUSPEED RSE52 APPLICATION GUIDE

SIZE	WIDTH	OFFSET	PCD	HUB BORE	APPLICATION
18 INCH	7.5J	+45	4.100	56.1	
	8.0J	+45	5.120	72.5	
		+45	5.112	57.1	
	9.0J	+40	5.112	66.5*	

\* 57.1MM HUB RING IS INCLUDED FOR VOLKSWAGEN APPLICATION.  
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ENGINE • EXHAUST • SUSPENSION • WHEELS





## *JOE GALANTE INTRODUCED US TO HIS SCHIZ*

**WORDS** GREG EMMERSON  
**PHOTOS** JEREMY CLIFF





# FROM SILENCE TO VIOLENCE

OPHRENIC 670HP CLK63 AMG BLACK SERIES





**THE TEACHING PROFESSION** isn't renowned for its choice of vehicles. Educating a class of students doesn't lead many to want, or to afford, exotic transport. And yet there must always be the exception, and Joseph Galante from Seattle, WA is the rule-breaker.

Although he's a school principal, Joe has belonged to the modified car scene for many years, tracing his participation back to the early days of Hot Import Nights and being involved in several SEMA builds.

Beyond the academic, his achievements have included a 1000hp Toyota Supra that made the cover of *Super Street* magazine, as well as an R34 Nissan Skyline GT-R that played a minor role in *F&F: Tokyo Drift*.

For his next project, Joe knew he wanted something equally as rare and similarly performance focused. "Although the show scene was always about vehicle presentation and aesthetics, I always had a performance mindset," Joe explained. So despite never taking his previous cars near a track, they all had the ability to perform.

With many criteria to fulfill, Galante finally settled on the Mercedes-Benz CLK63 AMG Black Series. A scarce and insane vehicle, he vowed to keep it stock. Yet in the time it took him to find one, a set of wheels and suspension had somehow come into his possession.

With so few cars available, they were being snapped up fast. He only found this example

after hitting refresh on his web browser. In that brief moment, a dealership in Santa Barbara, CA posted the vehicle and a flight was booked.

Only getting two speeding tickets on his way home was seen as a success by Galante, who clearly enjoys his driving but confirmed the lunatic reputation of his chosen transportation.

During the first month of ownership, a series of mild mods included Vorsteiner carbon pieces, wheels, exhaust, etc. "I had no idea it would get out of hand," Joe laughed as he recalled the early days.

Having built many show cars, Galante had secretly fostered a desire to create his own race team. "I had developed the notion that I



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Weistec stage 2 supercharger conversion increases output from 500 to 672hp

wanted to be a racecar driver,” he explained. He wanted a car that could compete for time attack and autocross trophies, rather than simply Best Paint or Best Wheels...

#### FLUID MOTORUNION

He admits to getting “caught up in the dream,” going so far as to contact Fluid MotorUnion (FMU) in Plainfield, IL. He wanted an exhaust system and, after seeing the company’s work online, flew co-owner/founder OJ Lopez to Seattle to discuss the project.

The criteria were simple: he wanted something unique and better than currently available. And while FMU was working on just that, Joe got word that Mobil 1 would exhibit his car at the SEMA Show.

This took everything up a notch and that led to the color change, swapping its silver hue for JG Grey Pearl paint. “JG” stands for Joe Galante, with the custom mix named in his honor. It was created by BASF, a company he’d worked with on numerous builds in the past, and this wasn’t some quick fix. With the engine and interior stripped, the car was painted inside and out, using a six-layer process that included a three-stage clearcoat.

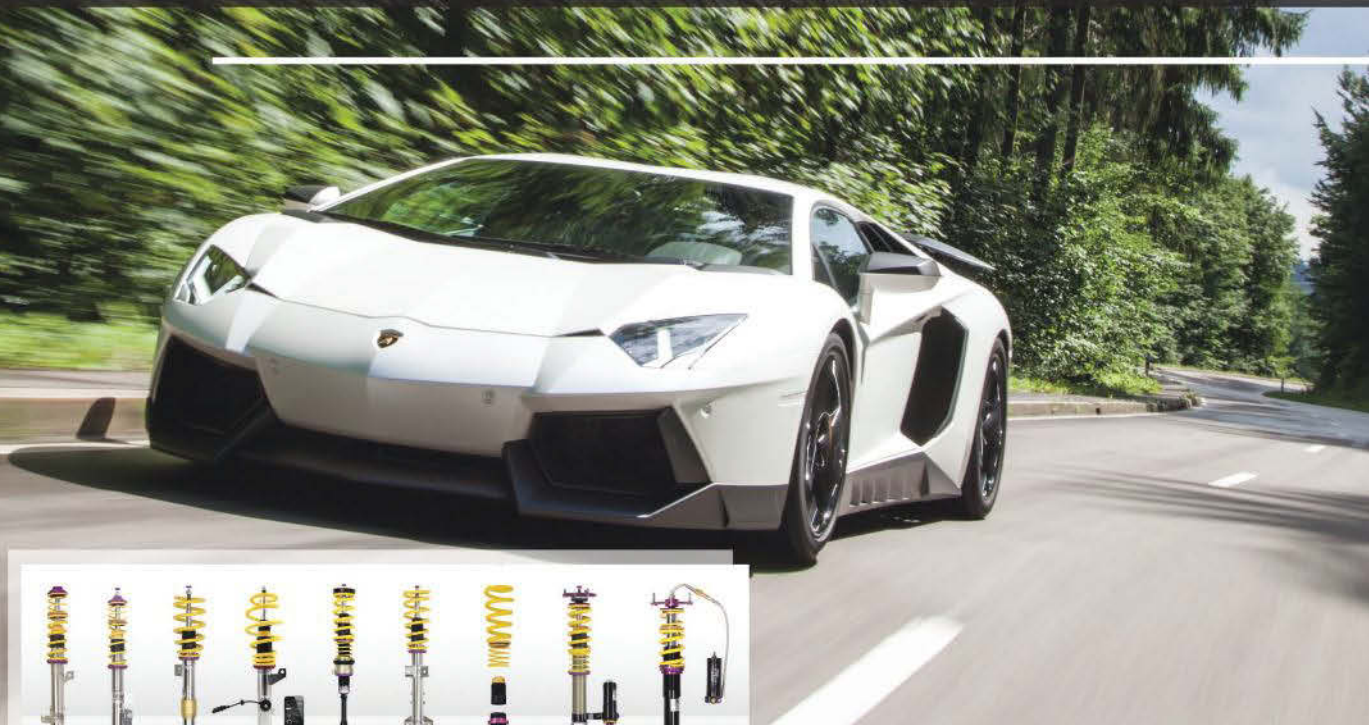
While in the care of Fluid MotorUnion, a company with an enviable reputation for imaginative custom builds, OJ Lopez simply instructed the car’s owner, “Trust me, I have a great idea...”

The idea was a version of what you see here, although the Benz has continually evolved over the three years of ownership. It started with a stage 2 supercharger from Weistec Engineering based on an M156 2.3-liter twin-screw compressor. The kit included an air-to-water intercooler, cast aluminum inlet manifold and throttle body inlet, new fuel rail, mounting brackets, serpentine belt and software.





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Clear trunk floor showcases FMU's extraordinary, valved exhaust system

Stage 2 was intended for cars with a high-flow exhaust system, which FMU took care of with its custom headers, X-pipe and exhaust system. It has a bypass valve, activated by a switch on the console labeled "silence" and "violence," creating the project's name in the process.

The idea was to allow the exhaust to be muted to meet racetrack noise regulations, but with the ability to be uncorked to scare small children, dogs, etc.

Wesitec claims 672hp and 662 lb-ft, and Joe reports seeing around 600hp at the wheels on the dyno. "In the past I used to pay attention to every horsepower but now I'm happy with enough," he laughed.

As for the stock seven-speed transmission, it wasn't designed for motorsport applications so the crew discussed a manual conversion. However, Weistec came to the rescue with its rebuilt 722.9 auto transmission that uses a hardened gearsset and internals, an uprated clutch pack and valve body as well as revised control software that includes rev-matching for downshifts.

The stock 500hp CLK63 AMG already had a reputation as an untamable animal, so the extra horsepower didn't calm it down any. And as if to provoke the beast further, FMU stripped about 500 lb of weight by discarding the air-con, interior panels, insulation material, and radio/nav head unit (now replaced with a panel labeled "Genuine Cardboard Fiber").

"The car still weighs about 3400 lb," Joe proclaimed, "so it's not exactly lightweight, but then it never suffered from a lack of power either. It's definitely a handful to drive but we wanted to be able to overpower the chassis so the car could enter a drift event one weekend, and time attack the next."

#### BLOWN DIFFUSER

Grip is in high demand, so FMU set about ensuring it wasn't in short supply. They began by fitting a second set of ADV.1 wheels – another company Joe had worked with closely in the past, along with Pirelli, Brembo, Moton, etc. All these brands would be involved with the CLK63.

ADV.1 supplied a set of its new one-piece 10.1



"Silence" or "Violence" buttons for the exhaust valves



Custom Moton damper units were supplied directly from Holland

SL Super Light Track Series wheels, designed to shed pounds but maintain strength. Although only 20 lb per corner, the team had wanted to fit 18s to access a broader range of track tires, but they wouldn't fit around the enormously expensive Brembo GT-R motorsport brake kit: "They were about \$17000 and ridiculously expensive!" Joe declared.

Using six-piston calipers up front and four-piston rears, the 15" and 13.6" rotors, respectively, demanded clearance. Fortunately, Pirelli was able to provide its super-sticky P Zero Trofeo tires in 265/35 front and 305/30 rear sizes to alleviate the anticipated grip problems.



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## TECH SPEC

### 2008 MERCEDES-BENZ CLK63 AMG BLACK SERIES

**Joseph Galante**  
Seattle, WA  
School Principal

#### ENGINE

6.2-liter V8 32v with Weistec Engineering stage 2 supercharger, air filters and software, Fluid MotorUnion headers, X-pipe and exhaust system

#### DRIVETRAIN

722.9 seven-speed automatic with Weistec hardened gearset and internals, uprated clutch pack, valve body and control software with rev-matching

#### BRAKES

Brembo GT-R six-piston calipers, 15" grooved rotors f, four-piston, 13.6" r

#### SUSPENSION

Moton two-way PRO remote reservoir dampers, Swift Racing springs, Moton front upper pillow ball mounts, Fluid MotorUnion adjustable rear control arms, Umbrella Auto Design VRH front lift system

#### WHEELS & TIRES

19x10" f, 19x11" r ADV.1 10.1 SL Super Light Track Series monoblock wheels, 265/35 ZR19 f, 305/30 ZR19 r Pirelli P Zero Trofeo tires

#### EXTERIOR

carbon fiber Vorsteiner DTM front spoiler, Varis Euro GT Wing on carbon fiber mounts, Fluid MotorUnion adjustable rear diffuser, shaved hood emblem, gloss black hood vents, Willans red tow straps, car painted BASF JG Grey Pearl

#### INTERIOR

Sparco S-Light carbon fiber seat, six-point harness and P310 steering wheel, Works Bell Rapfix GTC ball-lock steering wheel hub and carbon fiber NEO paddle shifter system, Cantrell Motorsports six-point rollcage, Braille carbon AGM battery with master kill switch

#### THANKS

ADV.1 Wheels, BASF Refinish, Benchmark Auto Salon, Braille Batteries, Cantrell Motorsports, diecutstickers.com, Fluid MotorUnion, JMI Motoring (Paint/Body), Meguiar's, Moton USA, Pirelli North America, Race Technologies/ Brembo, Sparco, Umbrella Auto Design, Varis Japan, Vibrant Performance, Vorsteiner, Weistec Engineering, 425 Motorsports

Lightweight ADV.1 wheels were equipped with sticky Pirelli Trofeo tires and cover race-spec Brembo GT-R brakes



Varis carbon wing on carbon mounts provides extra downforce for the rear Pirellis



FMU created this custom blown diffuser to add even more downforce



Keeping the rubber glued to the road are a series of carbon fiber aerodynamic upgrades that include a Vorsteiner DTM front spoiler and Varis Euro GT rear wing on carbon mounts. However, the FMU adjustable diffuser takes the cake. It's actually a Formula One-style "blown diffuser" that uses the hot exhaust gases to contribute to its aero efficiency. "Our basic math calculated the diffuser contributes about 20 lb of downforce on each side," our school principal explained.

Moton had never built suspension for the Black Series before, so FMU dispatched the stock dampers to Holland and received a set of two-way adjustable, remote reservoir dampers

in return. These were matched to Swift Racing springs and Moton front upper pillow ball mounts, while FMU created adjustable rear control arms to help with suspension geometry.

The final task of setting up the car went to Cantrell Motorsports in Bellevue, WA. As an experienced racecar preparation center, they optimized the geometry and fabricated a six-point welded-in rollcage. Constructed from 1.75" diameter 304-grade stainless steel, the task took a few weeks as they experimented with bracing and arranged several fitting sessions for Joe. There's also an aluminum driver's side impact-suppression structure, which Justin Elin at Cantrell confidently



expects to pass any NASA tech inspection when it finally reaches the racetrack.

Is the project finished? "It's as complete as I'm willing to take it," Joe explained. "It's now time to use it. It's time to smell the flowers."

"Now that I've done some local training, I need more seat time to get comfortable with the car. My goal is to find time to enter a few events and finally create the race team I'd always dreamed about."

With this truly unique supercharged Mercedes-Benz at his disposal, we hope Joe finally gets to live the dream and scare himself witless behind the wheel of this extraordinary CLK63 AMG Black Series. **EC**



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# TAG'S TECHART

TAG MOTORSPORT APPLIES TECHART  
MAGIC TO THE LATEST 911 TURBO S

WORDS PETER WU PHOTOS ALEX BERNSTEIN



THERE'S POWER THAT PUSHES YOU FIRMLY INTO THE SEAT, AS THOUGH YOU WERE BEING STAMP-PRESSED INTO THE BACKREST, AND THEN THERE'S THE LAUNCH CONTROL ON THE TYPE-991 TURBO S...

While the Turbo S feels like almost any other supercar under hard acceleration, from a standstill it pins you to the headrest even before the tires start scraping the asphalt.

It's an uncanny sensation, one that doesn't jibe with what our senses expect, but nobody, certainly not TAG Motorsports' owner, Alex Andonian, is complaining. Knocking out sub-3sec runs to 60mph isn't something he does regularly, generally keeping the car in Eco Mode while driving, but he'll indulge himself occasionally, just to remind him what kind of weapon he drives.

His Turbo S is the first thoughtfully modified example we've encountered. Andonian claims he didn't look anywhere but TechArt when it came time to alter his delivery-mileage 991.

Not only was the car new, but the TechArt parts were pre-production prototypes from the German tuner's first show car.

The kit included a new front lip, which won't interfere with Porsche's speed-activated spoiler. There were also headlight surrounds, side skirts, a rear apron, roof spoiler and Type II rear wing.

According to TAG, the pieces fitted precisely, adding a dose more aggression without diluting the stock car's core design.

Inside, the stock steering wheel gets the TechArt Paddle Shift Upgrade kit, which alters the downshift action from a push to a pull motion, like most other paddle shifters.

Underneath are TechArt coil springs to support the stock electronic dampers. Alex

also opted for TechArt's front lift kit that raises the nose as much as 65mm at the touch of a button to gain valuable clearance.

## POWER

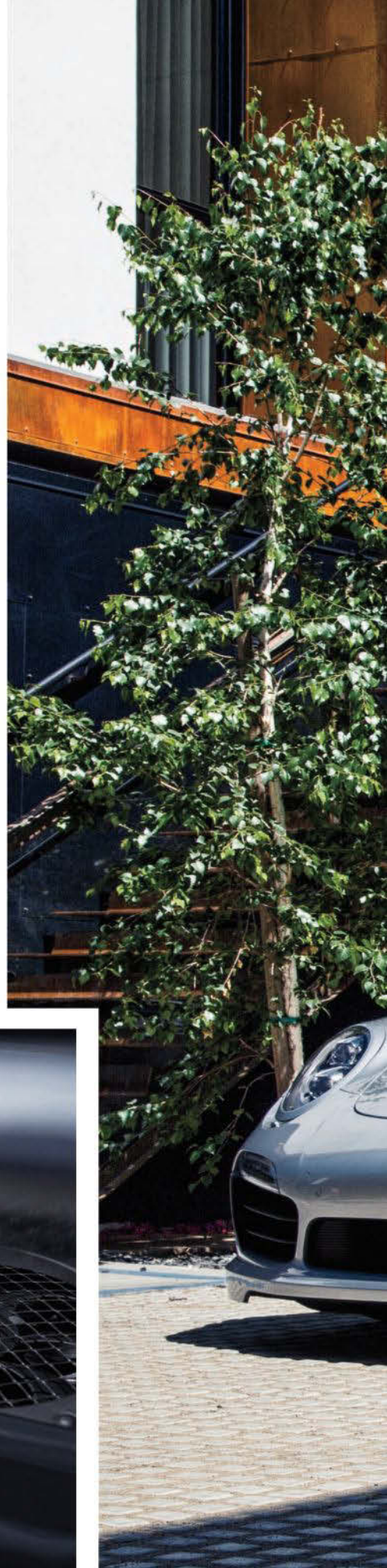
When you enter a 991, you realize how far the current car has come from its older siblings; how it no longer looks or feels like a traditional 911. With its wide center console, you could be in a Cayman or Panamera. But familiarity returns after you fire the 3.8-liter flat-six and hear it settle into its trademark drumbeat idle.

TAG's Turbo S was equipped with an AWE Tuning exhaust system that flows better than stock, making all the right sounds and moving the needle on the visceral meter.

For software tuning, Andonian went with GIAC's code to extract the reserves left untouched by the factory. On an AWD dyno, the Turbo S registered 530awhp (or about 636hp corrected).

Andonian, who knows the difference between stock and tuned engines better than anybody said, "The engine behaves very similar to stock, but it now pulls a lot harder all the way to redline. It gives a harder kick in the pants, especially on a 60-130mph roll."

To lay down the extra power, TAG replaced the stock 20" with a set of forged, 21" HRE P101 centerlock wheels (21x9" f, 21x11.5" r). They have a dark tinted brushed finish and were mounted with the latest Pirelli P Zeros (255/30 f, 325/25 r).











You know before selecting “D” with the PDK that the 991 is a noticeable improvement over the 997 chassis; not just because you’ve read the reviews but you trust the badge on the bonnet.

The longer wheelbase, wider track and better weight distribution should create a more stable chassis, and that’s confirmed after a few clicks on the odometer.

There’s still a 911 underneath the new clothes. The front-end still feels light but less so than before. And it doesn’t succumb to lateral forces as easily, thanks to the wider front track, revised front suspension and, in this case, wider Pirellis.

The TechArt coil springs lowered the car 30mm for flatter cornering at little expense to the ride quality.

You can feel the engine in the back but it doesn’t throw its weight around like the older cars. The purists will say it’s less of a 911, but such is the price of progress.

And forward progress in a Turbo S can’t be confused with the acceleration of any other car. With improvements to the VTG turbos and seven cogs in the PDK, the trademark swell of torque and its jet-engine swoosh of spooling turbines can be had at any time.



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## TECH SPEC

### 2014 PORSCHE 991 TURBO S

**Alex Andonian**  
San Diego, CA  
Owner, TAG Motorsports

#### ENGINE

3.8-liter six-cylinder twin-turbo with GIAC software, AWE Tuning exhaust

#### DRIVETRAIN

stock seven-speed PDK automatic

#### BRAKES

stock

#### SUSPENSION

TechArt lowering springs, stock adjustable dampers and active sway bars

#### WHEELS & TIRES

21x9" f, 21x11.5" r HRE P101 wheels, 255/30 R21 f, 325/25 R21 r Pirelli P Zero tires

#### EXTERIOR

TechArt front lip spiler, headlamp surrounds, side skirts, roof spoiler, Type II rear wing

#### INTERIOR

TechArt paddle shift upgrade

#### CONTACT

tagmotorsports.com



Compared to a 997 Turbo, thanks in part to GIAC's software, the new engine pulls hard to redline. But you won't need it on regular roads, where the lower two-thirds of the rev range work to devastating effect.

What you will need is all your attention. You have to think two steps ahead because warp drive arrives in a nanosecond.

Fortunately, the updates to the chassis and improvements from the minor modifications have made the car more composed than ever. This means you need to push harder to find

anything approaching the car's limits, by which point you're in lose-your-license territory.

With more driving aids than ever before (rear steering, e-diff, active sway bars, etc), there's a cyborg quality to the 991 that makes you wonder if it's you or artificial intelligence running the show. Futurists call the point when machines start to think faster than humans as "The Singularity." And this Turbo S, the result of endless data crunching by Porsche's supercomputers and tweaking by German tuners, may signal the beginning. **EC**



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WORDS & PHOTOS SEAN RUSSELL



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## **"UNIQUELY EXTREME" DESCRIBES**

the fourth No Fly Zone (NFZ) half-mile airstrip roll-race event. Hosted by Omega Motorsport, NFZ4 brought together European supercars alongside fast tuner platforms that ranged from Toyota Supras to Chevy Corvettes –where reaching 160mph was routine for the day.

Unlike other top speed events such as the Mojave Mile, there are no hard classes or rigid run schedules. You simply line up against whomever you'd like, wait your turn, run and repeat continuously. Think test-n-tune format at your local drag strip, but with much higher trap speeds.

This year's two-day event took place in late March and attracted approximately 110 cars, at a participation cost of \$200 per day.

NFZ spectators were afforded vantage points very near the rolling start zone – something not often found at more regulated airstrip attacks. The mood was relaxed, the cars were serious and the action nonstop – local gearheads should definitely put this on their schedule.

Stamped within the flat farming landscape of Shafter, CA, the rural Minter Field airstrip plays host to this "run what you bring" half-mile roll-racing event. Race gas, food vendors and helicopter rentals were also available on-site if needed.

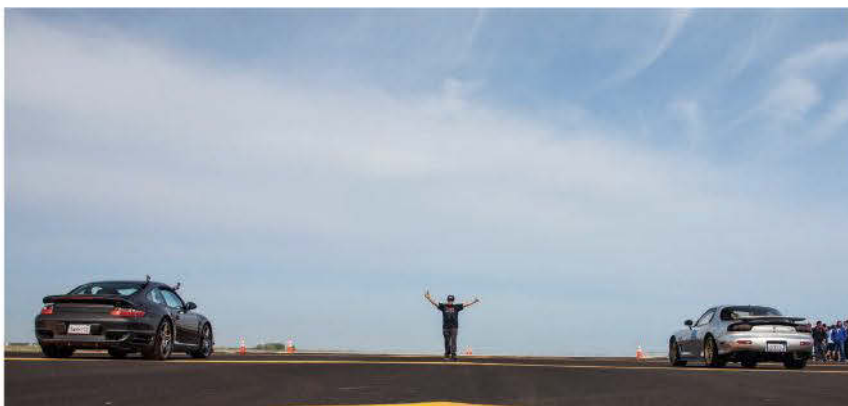
In case you haven't witnessed it before, this style of airstrip racing sees two cars lining up together. When released for their race, they roll together, building speed to 30-50mph before they reach a set of marker cones. Both drivers then mash the pedal once the cones are reached, and the race is on until the finish line.

For the most enthusiastic entrants, it's not impossible to run 30-40 times each day. This isn't the sort of event where there's a lot of waiting around. You jump in your car and wait in line, with cars running continuously.

Event organizer, Tony Lopez from Omega Motorsport, has seen annual event growth since its inception and further explained what occurred this year: "NFZ4 went very well. We remained as efficient as ever, running races about every 30sec. That meant many of the participants received 30 runs or more in a single day. The runway surface offered good grip and there was no wind to speak of."

"A couple of engines didn't survive the day,

We hitched a ride in Travis Ellis' '04 Porsche Carrera GT



Drivers can choose who they want to run against. Running 30-40 times each day isn't unusual

but those drivers vowed to be even stronger next time. And it gives our Fire-Rescue crew something to break their boredom. Thankfully, they only rolled out to check fluid leaks and collect a couple of front splitters from the runway surface."

Multiple shop cars attended, including built BMWs from European Auto Source (EAS) and Burger Motorsports (BMS). So while the EAS-supercharged BMW M3 concentrated on breaking the 165mph mark, Jason D'Ambrossi from BMS in Simi Valley, CA tested and



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resolved drivetrain malfunctions on his modified 2014 BMW 435i.

"We're out here testing our 414hp BMS 435i," D'Ambrossi confirmed. "It currently holds the 435i world record for horsepower. It's running race gas, JB4 BM Performance Tuner as well as our BMS intake and downpipe. I have an E92 and 135i, but the 435i is better than both of them. It looks good, too."

Bisimoto Engineering brought its 771hp 1976 Porsche 911. With its modern technology in a vintage chassis, it was the perfect blend of nostalgia and speed. Tuning legend Bisi Ezerioha gave us a rundown on his electric blue '76 911 widebody. "It may look old but it has the latest technology, including a water-cooled 996 twin-turbo engine, six-speed gearbox, full drive-by-wire system and CAN-BUS communication protocol."

There were unconfirmed rumblings that Bisimoto's 1000hp drag Civic broke 230mph, which would've been a world record, but there was no evidence to confirm.

One man's collection of vehicles attracted a great deal of attention throughout the day. Travis Ellis – a local businessman and NFZ veteran – brought three big-budget performers best described by him: "I brought a 2006 Ford GT modified to just over 1000hp, a 2004 Porsche Carrera GT with a GIAC tune and GMG Racing exhaust, as well as a tuned 2010 Ferrari 458.

"The Ford is the fastest by far, but the Carrera GT is the most fun to drive – it's violent. I ran the Porsche against the 458 and the Porsche won by about five car lengths, which was pretty impressive."

If you saw the video at [europeancarweb.com](http://europeancarweb.com), you'll see we were lucky enough to hop into Ellis' Carrera GT for a run against a carbon fiber-laden 600hp Gallardo. The RWD Lamborghini had mods that included a full exhaust, intake, software and race suspension. The hard-shifting Carrera GT exploded off the 50mph rolling start and walked the Gallardo by a few car lengths at the finish line, reaching a trap speed of more than 170mph. It was clear the Porsche had much more left after blowing over the line, where heavy pressure was applied to the carbon brakes.

We later stepped into the Gallardo for a second chance against the Carrera GT. The result was the same but no less impressive. It

European sports- and supercars were joined by JDM and domestic machines



The Travis Ellis car collection drew many admirers



Bisimoto brought its 771hp '76 911 and 1000hp drag Civic



Speed trap gives competitors an indication of performance



was an experience we won't soon forget.

Be sure to visit [europeancarweb.com](http://europeancarweb.com) for further photos and our video documenting Omega Motorsport's No Fly Zone 4.

The event passed without a hitch and brought together a range of tuner platforms not normally seen running together. While danger is inherent in top speed events, there's no safer place to bury the throttle and see what your car's capable of than on a mile-long airstrip. We hope to see you there next time!

For details about the next event, visit [omegamotorsport.com](http://omegamotorsport.com) **ec**





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# SEEKING EL DORADO

MEET RAFAEL  
CEDENO'S  
**489HP**  
**SUPERCHARGED**  
**BMW M3**

WORDS GREG EMMERSON  
PHOTOS RICHARD LE





## MEET RAFAEL CEDENO from

El Dorado Hills, CA. He's a former BMW technician who later worked for a few years at an independent BMW specialist before establishing his own business six years ago: Foreign Autohaus.

His company concentrates on maintenance, servicing and repairs. "We don't do many modifications because we don't want to be fed up with it when it comes to our own cars," Rafael admitted.

So while he's ensuring his customers' cars are running as the factory intended, he's dreaming up mods for his own vehicles. In the past this has included E30 and E36 M3s as well as E34 and E39 M5s. And while his car collection has moved into classic Detroit iron over the past few years, the apple of his eye remains this

2002 BMW M3.

He bought the car in 2009 when it was completely stock, but it didn't remain that way for long. "I started modifying it almost immediately," Rafael admitted.

Some areas immediately stand out but Cedeno has ticked every box on the tuner's wish list, creating an all-rounder any of us would be proud to own.

At first glance, most people are struck but its gorgeous Imola Red paint and subtle body mods. "We've painted the car twice, the second time using a ceramic clearcoat. It was much harder to work with because it dries quickly but the effect is amazing; it always looks wet," he explained.

Inspired by the European M3 CSL model, Rafael installed a number of choice carbon

fiber pieces. "I'm very particular about my carbon and insisted everything I used had the same 2x2 weave," he told us. "I even had a number of custom parts made for the exterior and interior so they'd match everything else."

His first additions were the Iconz front lip and Vorsteiner diffuser, both of which were left in their original carbon fiber form. The Seibon trunk was painted, however, with a small strip of carbon exposed to reveal the weave.

Other carbon additions included the TMS grilles, side skirt extensions and the custom carbon emblems that were produced specifically for this car. The roof was also wrapped in a carbon-effect vinyl as another tribute to the original CSL.

And since we're talking about the appearance, we shouldn't forget the staggered





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19" SSR GT F01 forged wheels. They were finished in matte black but the SSR logo was machined out, and the M stripes hand-painted by the owner.

The car sits on Bilstein PSS9 coilovers to achieve the correct stance and ride quality, but a glance at the spec list begins to give you an idea this car isn't simply about good looks. "We installed Powerflex bushings everywhere we could," Rafael confirmed. "I don't intend to race the M3, but you certainly could. We used Turner Motorsport reinforcement kits, camber plates, adjustable control arms and fitted Ground Control sway bars front and rear."

A squint behind the wheels will reveal four-piston Brembo calipers at each corner, along with larger rotors, so what's happening under the hood? "We installed a stage 2 supercharger kit from VF," Rafael said.

Initially, the VF Engineering software appeared to have some problems but this was traced to the knock sensors that wouldn't allow the engine to make power past 6500rpm. Once the sensors were replaced, the engine still failed to make a substantial power increase, despite its full exhaust system, ported head and CSL-spec cams. This time it appeared that heat was the culprit, but after installing a direct-port methanol injection kit from Snow Performance, the M3 was able to produce 489hp at the wheels. "It was the savior of the car," Rafael laughed.

The temperature here can get up to 110°F in the summer, and with the supercharger fitted the car just doesn't like all the heat. The SMG transmission doesn't have an external cooler, for example, so I don't use it when the temperature climbs past about 95," he

conceded. "But when it's cool enough, I find I just can't change gears fast enough. I don't race other cars but I know I could beat just about anything – the car is so fast!"

Speaking of the drivetrain, the car has an HPF Feramic clutch and pressure plate designed to cope with the power increase, while a custom rear differential was built to transfer that power to the road. Dinan software was also used to alter the SMG shift points, allowing the driver to hold onto the revs for longer.

Finally, we come to the interior, and again Rafael continued to seek perfection, fitting Sparco race seats, harnesses and even a custom roll-bar in the rear. The rear seats and door cards were actually purchased from Europe while the carbon fiber trim was custom-made by a close friend.





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## TECH SPEC 2002 BMW M3

**Rafael Cedeno**  
El Dorado Hills, CA  
CEO of Foreign Autohaus

### ENGINE

3.2L six-cylinder 24v with VF Engineering stage 2 supercharger, direct-port Snow Performance methanol injection, ported head, port-matched manifolds, heavy-duty valve springs, OEM BMW M3 CSL camshafts, headers and cats, Rogue Engineering exhaust center section with bypass valve, Supersprint Race mufflers

### DRIVETRAIN

six-speed SMG automatic transmission with Dinan software, Feramic clutch and pressure plate, 3.91:1 final drive with 10-disc clutch pack, hardened ring and pinion, machined housing

### BRAKES

Brembo four-piston silver Calipers f&r, 355mm rotors f, 340mm r, stainless steel lines

### SUSPENSION

Bilstein PSS9 coilovers, Vorshlag camber plates, Manson strut brace, Powerflex control arm bushings f, Rogue Engineering shock mounts, Powerflex trailing arm and subframe bushings, Turner Motorsport subframe reinforcement, adjustable lower control arms r, Ground Control sway bars and end-links f&r

### WHEELS & TIRES

19x9.5" f, 19x10.5" r SSR GT F01 forged wheels, powdercoated matte black, 90mm wheel studs, 245/45 R19 f, 275/30 R19 r Michelin Pilot Super Sport tires

### EXTERIOR

carbon fiber CSL-style Iconz lip, Seibon trunk, Vorsteiner diffuser, Turner Motorsport front and side grilles, Downforce USA side skirt extensions, carbon-look vinyl roof wrap, custom carbon emblems, black powdercoated M3 badge, anodized tow hooks, super-white LED angle eyes, 8000k HID bulbs, Depo smoked LED front and side markers plus tail lights

### INTERIOR

Sparco Evo 2 seats, four-point harnesses, European-spec M3 cloth rear seats and door cards, custom carbon fiber trim, Dallas suede steering wheel with M stitching and carbon fiber shift paddles, suede boots, SMG shifter and e-brake handle, Digital Dash pods for Auto Meter boost and wideband AFR gauges, black powdercoated rear roll-bar

### AUDIO/VISUAL


Pioneer double-DIN head unit with rearview camera, Focal component speakers, ARC Audio subwoofers in custom box, ARC Audio amplifiers, Rockford Fosgate 360 sound processor, Dynamat

### THANKS

[foreignautohaus.com](http://foreignautohaus.com), [audiosportsinc.com](http://audiosportsinc.com), [totalkontrolle.com](http://totalkontrolle.com)

With its suede steering wheel, SMG shifter, e-brake handle and boots, the interior is a comfortable environment for the driver. He's able to grab another gear with the carbon fiber shift paddles and monitor the engine with the boost and AFR gauges.

The M3 also has a sound system. In fact, it's had three but Rafael claims this to be the best. "With the Focal speakers, JL amps and Dynamat material, it vibrates your internal organs," he laughed.

So with every aspect covered, Cedeno feels he's reached the end of his journey. And one thing he's learned along the way is that he won't be selling this car. "I regretted selling both the E30 and E36 M3s, so I'm definitely keeping this one forever," he asserted. 

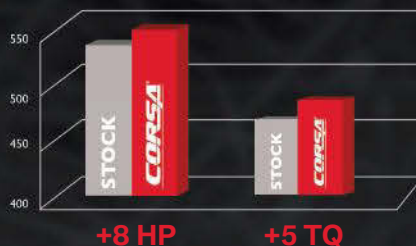


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**IT'S BEEN SAID** that when you marry somebody, you marry their family. And the same holds true for the automotive aftermarket community. The minute you modify a car, you become a part of that community.

We're not suggesting all Camaro owners automatically grow mullets, or budding Porsche owners become deserving of the porcupine joke but, to some extent, purchasing and modifying a car introduces you to its community. Whether it's getting a thumbs-up from a fellow driver, or becoming active in your local car clubs, it will inevitably become a bigger part of your life.

For Jonathan Leung from Richmond, British Columbia, his love for the VW/Audi community brought him back after a mind-numbing stint in a Honda Civic. "I don't like to talk about my low point because I immediately regretted buying the Civic. I had a sinking feeling the moment I pulled out of the parking lot, and it stayed with me until I was involved in the only accident of my life, which totaled the car," Leung said.

# HOTTER HATCH

## JONATHAN LEUNG'S 409HP VW R32 TURBO

**WORDS** Justin Fivella  
**PHOTOS** Jason Manchester

He wasn't happy to get into a fender-bender, but it did get him back into a Volkswagen. "I was raised in a VW household. After my parents went out and bought a Beetle new in the '70s, they never left the marque. So it only made sense I'd get a VW as my first car," he continued.

His first taste of automotive freedom came in the form of a Mk3 GTI 2.0. His parents loaned him the money for the purchase and he spent the subsequent years paying off the debt. "I'm embarrassed to think back to how I modified that GTI, but I was young. . . It was my first car and for the times, I suppose the 5Zigen muffler and JDM style weren't that uncommon," he laughed, trying to justify his early choices.

So he might not have had the best taste in high school, but often our definition of what's cool is determined by what we can afford. Nevertheless, he met some fellow Dubbers, became active in a local club and really enjoyed the experience.

Things changed when he took a job as a traveling salesman that involved lots of driving. That's where the stint in the Civic began and ended... rear-ended, if you will.











## TECH SPEC 2004 VOLKSWAGEN R32

**Jonathan Leung**  
Richmond, BC  
Call Center Manager

### ENGINE

3.2L VR6 24v with CTS Autosport stage 4 turbo kit using head spacer, Precision HP6262S-B 68AR T4 V-band turbo, 3" turbo-back exhaust and short-ram intake manifold, C2 Motorsports 550cc software, GReddy Profec B Spec II boost controller, VF Engineering mounts

### DRIVETRAIN

stock six-speed manual transmission with Clutch Masters FX400 clutch, VF Engineering mounts, Dieselgeek short shifter

### BRAKES

stock

### SUSPENSION

FK Silverline Plus X coilovers, UNIBrace XB brace, Megan Racing adjustable rear control arms, SPC front caster/camber kit

### WHEELS & TIRES

17x8.5" f, 17x9.5" r BW Motorsports/Kinesis 3.6 Cup three-piece wheels with chromed Porsche centers, 205/45 R17 f, 215/45 R17 r Achilles ATR Sport tires

### EXTERIOR

Carbon Creations böser hood, JDM honeycomb grille, Seat Cupra splitter, 20th Anniversary Edition European headlights, smoked M3-style tail lights, stubby antenna, JDM folding stubby mirrors, VW Polo rear wiper

### INTERIOR

black leather with white stitching on seats, headliner and pillars, carbon fiber-look vinyl on seat centers and parcel tray, European-spec FIS gauge cluster, Podi boost gauge, TWM Performance shift knob, Pioneer head unit

### THANKS

Jason Manchester, local VW community, dubberz.com, Clay and Nick at CTS Turbo (ctsturbo.com), Tim at Velocity Upholstery (velocityupholstery.com), Jeff at PG Performance (pgperformance.com)

3.2L R32 motor produces 409hp, 458 lb-ft thanks to the CTS stage 4 turbo kit and C2 software

Don't let this lapse in judgment lead you to assume he's not hardcore. It's quite the contrary. "The R32 was illegal to own until Canada changed its bumper laws a few years ago, so it was really difficult to find one. But when I did, I knew I had to buy it," Leung explained.

"I missed the VW community so much that I wanted to be part of the scene again; the shows and gatherings," he added.

The lawless act of driving an R32 was deemed legal shortly after he bought the car, but for those few glorious months, he was a vigilante for the cause. And speaking of lawless behavior, the previous owner must have driven it like he stole it, because the exterior and

interior were tatty and torn. "The interior was trashed. The headliner was sagging, and the body was dodgy at best. However, the bones of the car were intact," Leung said.

After taking possession, his priority was to return it to pristine condition but it was an expensive endeavor. "I couldn't stand the interior. It was terrible that a sought-after car was in such bad shape, so I had Velocity Upholstery fix it immediately with an OEM+ feel," he continued.

They reupholstered the interior using black leather with white stitching throughout. The seats got carbon fiber-style center panels and the rear headrests were deleted. Even the rear hatch was trimmed.





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Interior was completely reupholstered in black leather and carbon-look vinyl, with the discreet additions hard to spot

Among Jonathon's favorite additions are the European-spec FIS instrument cluster, the boost controller (yeah, it's a turbo – read on...) hidden in the cupholder location, and the stubby JDM folding mirrors that were wired into a New Beetle switch that fold when pushed, or can be operated from the key fob.

"I didn't want to overdo the exterior since the Mk4 R32 was special in stock form, but I'd always been a fan of the böser hood, even though their popularity seems to rise and fall," Jonathan said.

So a carbon böser hood from Carbon Creations replaced the damaged, stock unit, along with a JOM honeycomb grille, Seat Cupra splitter, 20<sup>th</sup> Anniversary Edition Euro headlights as well as niceties such as smoked M3-style tail lights, an OEM VW Polo rear wiper and the stubby antenna.

Part of this car's allure is its stance, but you'd be wrong if you thought it was on air. "Although I run artofstance.com, I'm installing air ride next week simply because there are roads and driveways I have to avoid because my car is so low. It's just a matter of convenience, at this point, since the car is my daily driver," he told us.

Air ride might be the future, but for now it sits on FK Silverline Plus X coilovers. They were aided by a UNIBrace XB chassis brace, Megan Racing adjustable rear control arms and SPC front caster/camber plates.

These parts play a supporting role to the wheels, which have a colorful history. "I spent months looking for a unique set of three-piece wheels. So when I found these, I had to have them," he said. According to the previous owner, the 17" BW Motorsports Kinesis 3.6 Cup wheels were originally custom-made for a Japanese Porsche team using OEM Porsche centers and Kinesis barrels.

Although Leung didn't initially like the chrome finish, it's grown on him, and a set of



Custom 17" BW Motorsports wheels use OEM Porsche centers and Kinesis rims

adapters ensured the 17x8.5" front and 17x9.5" rear wheels bolted to the VW hubs.

So all that remains is perhaps the best part of the build, and the reason the R32 deserves to be called a hot hatch. "I didn't have the car long before deciding to turbocharge it. CTS Autosport in Langley, BC, wanted to develop its stage 4 kit and was looking for a car," Leung said.

Loaning his car to the shop, they fitted a low-compression head spacer, short-runner intake manifold and Precision HP6262S-B turbo with a 68AR housing and T4 V-band adaptor. When run on C2 Motorsports 550cc software with a 3" CTS turbo-back exhaust and GReddy Profect B Spec II boost controller, the 3.2L VR6 motor put down 409hp and 458 lb-ft at the wheels on 23psi boost while sipping 94-octane pump gas.

The conversion turned a decently quick R32 into something that eats Bimmers for breakfast and RS4s for supper. But as fast as it might be, it's not just about speed: it's also about the experience. "Saving gas in a Honda was fine, but when you're missing out on the driving experience and the VW community, it's just not worth it. I'll take my gas-guzzling R32 turbo any day," Leung laughed. **EC**



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**STR 607**

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# Maine

## ATTRACTION

KIPP FARRIN'S '95 VW GOLF SPORT IS A TIMELESS CLASSIC, UPDATED WITH A 300HP 1.8T ENGINE SWAP

WORDS THATCHER SHULTZ PHOTOS RANDY WILLIAMS





**K**IPP FARRIN CERTAINLY isn't your average Volkswagen enthusiast, and that's just one of the reasons we like him... Kipp's somebody you have to meet in person to fully appreciate his personality and style. On the one hand, he's a typical Mainer, with one of the thickest New England accents you'll ever hear.

He was born and raised in Boothbay Harbor, the best-known town in the great state of Maine. It's a picturesque tourist town that exemplifies the state – green, cold, rocky, damp, welcoming.

Modified Volkswagens, however, might be the least popular vehicle in Boothbay where you aren't cool unless you drive a truck. Of course, that never bothered the Kippster, who built the car exactly how he wanted it.

At the age of 16, Kipp's first car was this bone-stock Volkswagen Golf Sport. He definitely didn't rush into the creation, preferring to take his time, never imagining it would one day have an engine swap and OEM+ styling. Actually, he took a really long time, but that's fine because the outcome was gorgeous and worth the wait.

Kipp's vision changed drastically over the years. Yet he remained consistent about his passion for aggressively wide wheels. For many years, the car was equipped with a set of 16x9" Borbet Type T wheels, which looked great but weren't quite right...

He wanted something that couldn't be topped and his patience eventually paid off when a set of 17" Fikse FM5 wheels were found on a Porsche Forum. They had been used on a 996 track car and were pretty rough, but the price was right!



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Kipp's friends at Independent Wheel sourced new polished outer lips and a pair of inner barrels to get the desired sizing; 17x8.5" front with 2.5" outers, and 17x9" rear with 3" outers. This gave the old school look he was after, but they also decided Audi Avus Silver paint for the FM5 centers would provide more contrast to the polished lips. Kipp understood wheels can make or break a car and, in our opinion, the FM5s definitely work their magic.

In order to accommodate the wide wheels, the fenders had to be pulled and rolled before the car was re-sprayed. It was at this point he also took the opportunity to fit a front-mount intercooler behind a smoothed fiberglass Euro bumper with molded Folger lip.

Other exterior additions included Rieger "M3-style" side skirts and a Dietrich rear bumper. It was finished with a shaved tailgate, although yours truly would later provide "Projektzwo-style" custom mirrors for the build.

Kipp prides himself on doing the work himself, but is first to admit the car wouldn't be what it is today without the help of friends like Jake Winslow at Rennen Performance. He had a big hand in the engine conversion that started out as an ATP turbo kit on the factory 2.0L 8v motor.

After testing the limits of this combination at the local New Hampshire drag strip, he walked away craving more. So a 1.8T 20v turbo engine swap was conducted with Jake's help. But, naturally, it wasn't any old 5v – the pair decided to fit a ported head to improve flow for the hybrid T3/T4 60-trim turbo that runs on Unitronic software and sits on VF mounts. There's also a New Beetle intake manifold, custom Rennen charge pipes as well as a downpipe with high-flow cat and a 2.5" Techtonics stainless steel exhaust with a Borla rear muffler.



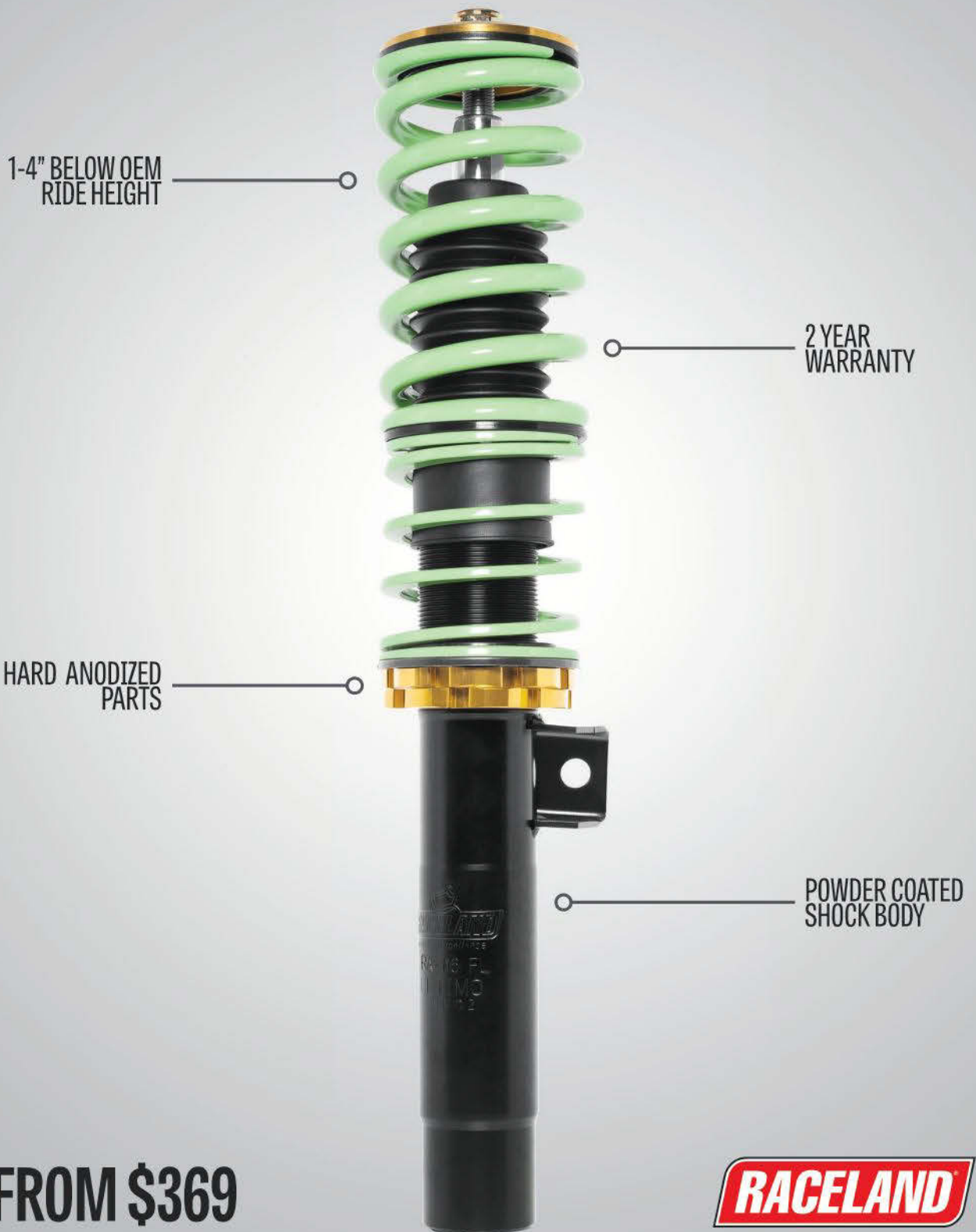
After trying to turbocharge the 2.0L 8v, Kipp did a 1.8T engine swap with hybrid turbo, ported head, Unitronic software, bigger injectors and full stainless steel exhaust

Custom-built 16" Fikse FM5 wheels are the perfect complement to the bodywork and stance





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## TECH SPEC

### 1995 VOLKSWAGEN GOLF SPORT

**Kipp Farrin**  
Boothbay Harbor, ME

#### ENGINE

1998 1.8-liter four-cylinder AEB 1.8T with ported head, T3/T4 60-trim turbo, Tial wastegate and dump tube, Unitronic software, manual boost controller, 310 injectors, VF mounts, New Beetle intake manifold, custom Rennen charge pipes painted Audi Avus Silver, downpipe, high-flow cat, 2.5" Techtonics cat-back stainless steel exhaust, Borla muffler, Yellow Top optima battery

#### DRIVETRAIN

VW 020 transmission, Techtonics lightweight flywheel, Southbend stage 3 clutch and pressure plate, Peloquin LSD

#### BRAKES

drilled and slotted rotors, stainless lines

#### SUSPENSION

Weitec coilovers, Euro Sport Accessories brace

#### WHEELS & TIRES

17x8.5" f, 17x9" r Fikse FM5 wheels with Audi Avus Silver centers, 15mm Motorsport Tech 5x130 adapters, 205/40 R17 f, 215/40 R17 r Falken FK452 tires

#### EXTERIOR

Euro front bumper with molded Folger lip, shaved Dietrich rear bumper, pulled and rolled fenders, Rieger side skirts, Projektzwo-style mirrors, shaved hatch, two-bar badgeless grille, smoked Hella Mk4-look headlights, smoked tail lights

#### INTERIOR

VR6 leather seats, dyed black headliner, Momo shift knob, VR6 leather shift boot, Auto Meter gauges and pod, white VR6 gauge cluster

#### AUDIO/VISUAL

Alpine head unit, Total Mobil Audio amp, 12" JL Audio 12W3 subwoofer

#### THANKS

Dad, Kelly, Elizabeth, Jake Winslow at Rennen Performance ([rennenparts.com](http://rennenparts.com)), Thatcher Shultz at [independentwheel.com](http://independentwheel.com), Randy Williams, Dan Williams at Dan's Auto Repair, Todd Hyson, Mike Doyen, Randy Vail, Mike Wallace, Hooker Holbrook.  
In loving memory of my mom, Robin Farrin.  
"May the wind always be at your back."



Boost gauge is always a good idea when using a manual boost controller

The finished motor dynoed about 300hp, so Jake also installed a Peloquin LSD, Techtonics flywheel and stage 3 Southbend clutch to harness the power.

Having built the car for his personal enjoyment, Kipp likes nothing more than a Sunday cruise with girlfriend, Elizabeth – who's supported his tuning passion for years. That's just as well because after getting paid to play with bulldozers and large trucks all day, he likes to go home and work on a project or two; whether it's one of his '64 Beetles, '83 GTI or maybe the '82 Volkswagen Caddy he's been restoring.

In fact, Kipp's living proof you should love what you do, and do what you love. And nobody can replace the joy he gets driving the car he built and the rest of us admire.

The only bittersweet caveat is that while his friends and family are able share in his enthusiasm, sadly Kipp's mother passed away before we could get these photos into print. She was always very supportive of her son and is missed by all her family. **EC**





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# INTERIOR CLEANING

MEGUIAR'S SHOWS US THE CORRECT WAY TO CLEAN AND MAINTAIN YOUR CAR'S INTERIOR

**T**HE CAR INTERIOR is a harsh environment. It has to deal with extremes of temperature, as well as UV damage that can cause fading or cracking. Then there are deposits from fast food, spilled coffee, animals, babies and so much more. In fact, many interiors could be considered a biohazard and, while shoving your hand down the back of your seats might present a health risk, isn't it time you gave yours a clean?

I'll admit, we're guilty of neglecting our own cars, so over the past few years we've visited our friends at Meguiar's to get a thorough understanding of the correct techniques.

The first article was an exterior car cleaning guide ran in the 12/11 issue of *europatuner* magazine. It can be found under the "Tech" menu at [europatuner.com](http://europatuner.com) or by searching for Meguiar's on the homepage.

We followed it up with some wheel cleaning basics in the 9/12 issue of *europatuner* magazine, which can be found by conducting the same search at [europatuner.com](http://europatuner.com)

For our third installment, we're concentrating on the best way to clean and deodorize your car's interior, the best products to use for each job and the recommended techniques.

As in the past, we sought Meguiar's help because they offer superb online tutorials and even conduct classes at the corporate headquarters, so the team knows how to educate people. In fact, our day began in the classroom with head teacher and Meguiar's Product Expert, Professor Mike Pennington.

Just like paint and wheel care, using the correct products can maximize your effort, ensuring good results and avoiding potential problems. However, Mike always stresses that whether you're using Meguiar's or any of its competitors' products, always read the label before use. If in doubt, test a small, hidden area first.

## ASSESSMENT

Keeping the interior clean is important from a hygiene perspective, as well as maintaining the value of your car. But before you start you need to identify the materials that are used. Generally you will have either cloth, vinyl or leather seats. The leather can be perforated, which introduces different problems, but you might also have suede or microfiber to consider. You will also have glass, plastic, metal, paint and carpet. All these need to be considered when selecting your cleaning products.

You should also assess whether the interior needs to be cleaned/restored or maintained/protected. The former will require a multi-stage process and is generally done before selling a car or when you buy one, or if the interior has been neglected for a while. Simple maintenance/protection is a quicker, one-stage process that can be done on a regular basis along with other car care chores.

When tackling your interior, it's best to start from the top and work down - the



headliner to the carpets, for example. This means you're not getting dirt on clean surfaces as you go.

You should also work from the furthest corner towards yourself. So if you're at the driver's door, start in the rear on the passenger's side and move forwards. Again, this prevents you having to go back over areas you've already cleaned.

## GETTING STARTED

This may sound obvious but let's start with the basics. So remove all the large objects, such as wrappers, bottles, papers, fries, trash, etc from the interior, including under the seats. Slide the seats backwards and forwards to improve access and clean out the seat runners as you go.

The next step is to vacuum thoroughly. Remove the mats and clean separately out of the car. Use a brush with medium-stiff bristles on the mats and carpet as you





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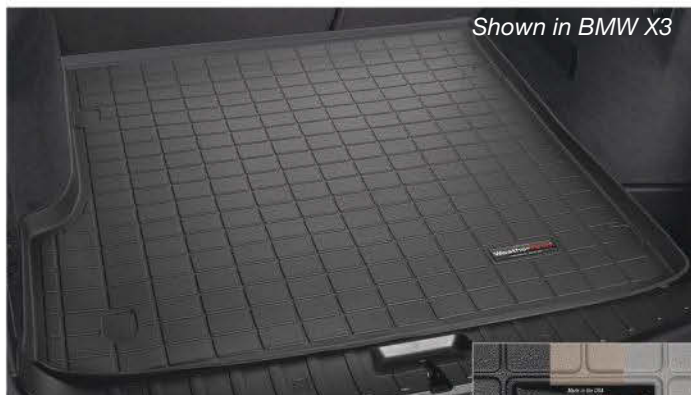
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vacuum. This will lift the fibers, allowing you to clean deeper into the material, but don't brush so hard you damage the cloth.

Use a soft brush to loosen dirt and dust from the vents, console, radio, heater controls, etc. Don't forget to clean in the folds and pleats in the seats, door panels, etc. You may need to pull the cloth to open these areas but they can conceal a lot of dirt.

Cleaning the headliner is a delicate business. Even if you have a fancy microfiber or leather liner, it's recommended you simply wipe with a cloth dampened in water. Wipe in one direction to prevent the dirt being rubbed in, and fold the cloth regularly to expose a clean surface. If you have dirt that water won't remove, Meguiar's recommends you consult the manufacturer because most cleaning products can remove the dye from the headliner, leaving it blotchy.



## HARD SURFACES

The next step is to clean all hard surfaces with something like Meguiar's Quik Interior Detailer. Wiping with a clean cloth will allow you to assess the condition of plastic, vinyl and painted areas such as the dashboard, door cards, console, steering wheel, etc.

## LEATHER

For leather, you have two options. You can use a one-step product such as Meguiar's Rich Leather Cleaner/Conditioner if you're just maintaining the interior. While the separate Meguiar's Leather & Vinyl Cleaner can be applied before the Leather Conditioner if the condition of the hide requires it. The two-stage process will clean, moisturize and protect the leather better but it will take you longer.

One caveat is for perforated leather,

where a regular cleaning lotion can clog the holes. And since the Porsche we were cleaning had perforated seats, we used the Leather & Vinyl Cleaner spray bottle, but gels are also available.

To clean leather, choose the correct product and apply. In this instance we sprayed it on. Then wipe away with a cotton towel applying medium pressure. Despite the clean appearance, we were surprised to

discover the towel was black with dirt after a few wipes. Apply Leather Conditioner to a foam sponge applicator and wipe it over the leather surface. This will fill the microscopic cracks in the leather, provide UV protection and moisturize the hide to reduce further cracking. Many carmakers coat their seats with UV protection but even these surfaces can crack, allowing the conditioner to get into the leather and do its job.



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As an experiment, we taped a seat and cleaned/conditioned on one side. Even on black leather, the difference between the treated and untreated sides was stark, reminding us that even if your car looks clean, it can still benefit from these products.

## VINYL

Vinyl surfaces can also benefit from UV Protection and Meguiar's has two products for this job. The Natural Shine Protectant offers a matte finish, while the Supreme Shine Hi-Gloss Protectant does what its name suggests. Both will put up a shield against fading and cracking, helping the interior to look good for longer.

We applied a sample of both products to the vinyl door card on the Porsche to illustrate the difference. Both gave a richer finish than the untouched vinyl but the Hi-Gloss almost has a wet-look. Some people prefer this because they can see it's been cleaned and it wasn't greasy, tacky or wet to the touch, leaving no residue on your hands. We preferred the Natural matte finish, but it's down to individual choice.

## SUEDE/MICROFIBER

Many European cars use a suedette or alcantara-type material on the interior. These synthetic materials are often more resilient than real suede, which tends to polish easily and look worn. However, both the natural and synthetic materials can be difficult to clean because the color dyes are sometimes rather sensitive.

The trick is to clean the surfaces with a damp towel, moving it in one direction only. Areas like a steering wheel or shift knob, which get a great deal of use, should be cleaned often and gently to prevent them getting to the point where you would need to use potentially harmful cleaners.

Remember to be gentle because such materials are easily marked and damaged.

## CARPET

When it comes to carpets and mats, again test a small area using Meguiar's Carpet & Upholstery Cleaner. The bottle allows you to spray a wide or narrow jet, depending on whether you're doing spot or area cleaning.

Having brushed and vacuumed the mat or carpet, apply a small amount of the cleaner to avoid saturation, then remove it with a cotton towel, turning the towel to expose a clean surface as you go. The foaming agent in the cleaner will lift the dirt, while the chemicals will break down grease and stains.

Once finished, you can use a brush to lift the fibers and create patterns such as stripes, sunrise, etc. This is purely for embellishment but it takes a matter of seconds, depending on your ambition.





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### GLASS

The first task is to remove unwanted decals, etc using a sharp edge and cleaner. Be careful not to damage any heating or antenna wires that might be on the glass as you do this.

Now you can apply something like Meguiar's Perfect Clarity Glass Cleaner. It's able to produce streak-free cleaning and is ammonia-free, so won't affect window tint – the wrong products can make tint go cloudy if you don't check the label...

Glass is one area where you don't need to be timid with the cleaner. You can apply the amount you need without worrying. This is especially true on new cars that get "vinyl gassing." This is a process where the vinyl parts in your new car give off a gas while curing for the first few months. It can leave a residue on the glass that needs to be removed.

Follow the "Frame, Fill, Flip, Finish" procedure where you take a cotton towel and wipe around the glass by the window frame. Then wipe the glass in the middle, before flipping your towel and finish by wiping in one direction.

When you do the exterior glass, follow the same process but wipe at 90° to the interior. This will allow you to identify if a smear is inside or out.

Always lower the window a few inches to get the top of the glass as well.

### CLEAR PLASTIC

Meguiar's PlastX is a clear plastic cleaner and polish, designed specifically for the instrument panel or a convertible's rear window. This also works on headlights

and other surfaces, cleaning without scratching, helping to remove any fading or discoloration.

If applying to a convertible window, take great care not to get it on the fabric hood, since it could discolor the material.

### METAL

Many cars have painted metal surfaces inside. These should be treated like your exterior paint, washing with car soap and water, or simply wiping with Quik Detailer.

If you have polished metal surfaces, such as a metal shift knob, or similar, you can use a metal polish if the previous options don't restore the original shine.

### CONVERTIBLE TOPS/TONNEAUS

Although technically on the exterior, we didn't look at convertible tops in our previous article, so wanted to cover it here. Meguiar's has a Convertible Top Cleaner but Mike stated that the safest option is soap and water, washing it often to keep it clean – the tops are designed to get wet, so don't worry about the frequency.

If the fabric has been neglected, test a small area with the Meguiar's cleaner and use a very soft brush to agitate the chemicals. Don't use much force, since lifting the fibers can lead to problems.

Some other car care companies offer fabric top protectants (although Meguiar's doesn't), which can be used as specified by the instructions.

### ODOR

Vacuuming and cleaning an interior should shift most odors by removing the

## PORSCHE 911

For our cleaning guide we needed a suitable car and Michael Anderson was kind enough to loan us this '86 Porsche 911 Carrera.

You might have noticed it's a rare factory widebody convertible, finished in white with a black interior and top.

Despite having been a daily driver for his father, Darrel, and recently passing 110,000 miles, it was in remarkably good condition. This was partially explained by it becoming a weekend warrior in the mid-90s, before being passed on to his eldest son, Dwight "Andy" Anderson around 2000.

Andy continues to drive the 911 on weekends, preferring the hills around San Diego County as his playground.

We'd like to thank the entire family for helping us with this story and wish them happy motoring for many more years.

source, but it's possible you're left with an unpleasant smell.

The first solution is to use Meguiar's Odor Eliminator. Spray it onto all soft surfaces and areas you can't reach easily such as into vents and under seats, etc. This should encapsulate the smell, trapping it and make removal of the particles easier next time you clean the car.

Alternatively, you can use the Meguiar's Air Re-fresher. It's a fogger can that is placed in the car with the A/C running. Once triggered, it will empty its contents, dispersing into every nook and cranny. This will eliminate odors, replacing it with a "new car smell" that should last a few weeks.

Another option is to change the cabin filter to remove another possible source of odor.

### SUMMARY

Just as we mentioned in the exterior car care article, cleaning the interior shouldn't be hard work, provided it's done frequently enough. Preventative maintenance is always the best practice because it can prevent problems from staining, taking hold and smelling.

You can clean the interior as often as is necessary. A spill should obviously be dealt with immediately, but cleaning the surfaces and using a vacuum once a week when you wash the car will reduce the amount of work you need to do. However, it's always up to the individual and the state of the car.

If you have specific question about particular surfaces, cleaners or the techniques required, Meguiar's offers some excellent tips and FAQs, as well as informative tutorial videos. Failing that, you can speak to a consultant on the phone. **EC**



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# PORSCHEVY





# 944

## WE TAKE A LOOK AT A SMALL-BLOCK CHEVY V8 SWAP IN SPEC CLUTCHES' PORSCHE 944

WORDS **BRYAN JOSLIN**  
PHOTOS **CHAD BEE**



### **PORSCHE TRADITIONALISTS MAY**

have dismissed the 944 long ago on the basis of its front-engine layout and VW/Audi roots, but few would argue it didn't possess an excellent chassis. It always seemed capable of dealing with more power than Stuttgart ever allowed, even the Type-951 Porsche 944 Turbo — a legend in its day — boasted a mere 217hp when it arrived in 1986.

The problem, some suggested, was simply a matter of its cylinder count. The 944 was endowed with exactly half the 928's V8 engine. It might have had one of the bigger four-cylinders ever built, but it wasn't enough. Yet every red-blooded American knows the universal cure for import anemia is a small-block Chevy V8.

As the owner of Spec Clutches, Dave Norton knows a thing or two about getting power to the road. He had bought the 944 Turbo as a track car for his wife, but it spent more time sitting than being driven, eventually getting buried behind other shop projects.

So when a customer blew the engine in his own 944 Turbo, Dave sold him the engine from his dormant track rat, leaving a void between the fenders, which served as motivation to give the Porsche the kind of power it deserved.

Inspired by a friend, Dave built and installed a 383ci LT engine — a stroked iron-block Chevy 350ci (5.7L) V8. But he changed his mind even before firing it up. Looking at the numbers, he decided a newer aluminum LS engine would be a better choice, settling on a 402ci (6.6L) LS2 block topped with LS3 heads for their bigger valves.

The final build spec reads like something Smokey Yunick might have built — with its forged pistons, rods and crank ensuring strength, while ported heads, a high-performance valvetrain and custom Ed Curtis cam keep the gases flowing until they're expelled by custom headers and a fabricated 4" stainless exhaust. The combustion process is managed by a FAST XFi system with injectors, fuel rail, throttle body and ignition. Finally, a C&R radiator and Mocal oil cooler keep temperatures in check.

The Chevy-engined Porsche dynoed at 540hp to the rear wheels, with 498 lb-ft. This is anything but subtle, with the Teutonic growl that's typically emitted by the 944 replaced by the unmistakable bark of a pushrod V8. As Dave says, "It's an attention getter," sounding like "A Nascar Sprint Cup car."

Shoehorning a Chevy V8 into the Porsche chassis required both custom engine mounts and oil pan. A Quick Time bellhousing would mate the all-American engine to an upgraded 944 Turbo S five-speed gearbox. Solid mounts and a custom spherical linkage from Lindsey Racing improved the shifting.

Turning to his specialized subject, Dave installed one of Spec's own 10.5" stage 2+ clutches with billet aluminum pressure plate and flywheel. He also fitted a Guard limited-slip diff to distribute the torque to the 18" Fikse Profile 5 wheels at the rear.





## TECH SPEC 1987 PORSCHE 944 TURBO

**Dave Norton**  
Bessemer, AL  
Owner, Spec Clutches

### ENGINE

6.6-liter GM LS2 V8 with Manley flat-top forged pistons, Callies forged rods and 4340 forged crank, CNC-ported LS3 cylinder heads with Ferrea valves and springs, titanium retainers, Morel lifters, Manton pushrods, Ed Curtis custom cam, FAST XFI fuel injection and ignition with 65 lb injectors, Bosch 044 fuel pump, Weldon fuel regulator, custom C&R radiator, Accusump oil pump, custom oil pan, Mocal oil cooler, custom Danny Smith headers coated by Polydyn, 4" custom exhaust with SpinTech muffler

### DRIVETRAIN

five-speed Porsche 944 Turbo S transmission, Quick Time SFI bellhousing, Spec 10.5" stage 2+ clutch, billet aluminum pressure plate and flywheel, Guard limited-slip differential, Lindsey Racing shifter, spherical linkage, solid mounts

### SUSPENSION

Bilstein coilovers, Blaszak front control arms with Racer's Edge spherical block and bearings, 30mm Lindsey Racing front sway bar with Racer's Edge delrin bushings, Racer's Edge rear "banana arm" and spring plate bushings, Lindsey three-piece crossmember

### BRAKES

Porsche/Brembo 928 GTS "big black" four-piston calipers, 322mm rotors with aluminum hats f, stock four-piston calipers, 289mm rotors r, Hawk DTC 70 pads

### WHEELS & TIRES

18x11" f, 18x12" r Fikse Profile 5 wheels, 295/30 R18 f, 315/30 R18 r Toyo R888 tires

### EXTERIOR

Broadfoot Racing GT2 fender flares, front bumper and side skirts, GT Racing fiberglass hood and nose panel, European-spec Porsche 944 rear bumper, Porsche 968 hatch with spoiler, Kognition Design rear wing, custom LED turn signals, Ford Mustang GT500 Grabber Blue paint

### INTERIOR

Recaro Profi SPG carbon fiber seat, Schroth harnesses, window net and side restraint, Tilton pedal assembly, Sparco 353 suede steering wheel on quick-release hub, Danny Smith shift lever, MGW shift knob, modified instruments with LED lighting, Kirk Racing rollcage

### THANKS

specclutches.com, Jonathan Goolsby at Goolsby Customs, Mike Ramsey at Mirror Image, RadioActive graphics, Danny Smith, Dave Lindsey, Karl Poetl, Stan Chen at Toyo Tires, Mark Stewart, Tom Egan, Kelli Broadfoot, Blake Fuller

Measuring a monstrous 12" wide and wearing 315/30 Toyo R888 rubber, the rear rollers were matched to a set of only slightly narrower 11" wheels up front with 295/30 covers. Under the wheels are "Big Black" front brakes from a Porsche 928 GTS, using its four-piston calipers and 322mm rotors. The rears are stock 944 turbo components.

Dave insists that despite the big-block under the hood, his car never feels like anything but a 944. Credit goes to a supremely balanced chassis with race-spec hardware such as the Bilstein coilovers, Blaszak front control arms and Racer's Edge "banana arms" in the rear. There's additional bracing from a Lindsey Racing three-point crossmember along with a welded Kirk Racing rollcage.

The width of the rolling stock forced the rims beyond the bounds of the stock fenders, so Dave had a local custom shop fit a Broadfoot Racing GT2 widebody kit. It consisted of a front bumper, wider fenders and side skirts. He also sourced a fiberglass hood from GT Racing, as well as the nose panel that would eliminate the front headlights. Both these additions helped shed a few pounds to compensate for the extra cylinders.

Finished in Grabber Blue from the Ford Mustang GT500 palette, the 951 commands attention, especially when fitted with its huge carbon fiber and aluminum Kognition Design rear wing. This was actually mounted to the rollcage to ensure the downforce didn't deform the factory 968 hatch that sits in its shadow.





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**Porsche**

1954-13

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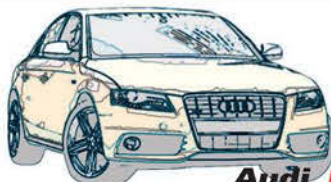
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Inside, there is a pair of Recaro Profi SPG seats with Schroth harnesses. Dave also specified a Sparco steering wheel on a quick-release hub and floor-mounted Tilton pedal assembly. Hollywood Speedometer modified the Porsche gauges to work with the GM sender units before upgrading the illumination with an LED conversion.

The finished project straddles the line between road- and racecar. According to Dave, he can drive it to the track and, with a few minutes spent setting up the aero, it's ready for hot laps. In fact, it's currently set up for NASA and time attack events, but with a few changes could also be competitive in SCCA GT road racing. As Dave put it, the monster 951 is "Streetable, but only just... And only in the dry, only in the daytime, and only in Alabama!" **EC**





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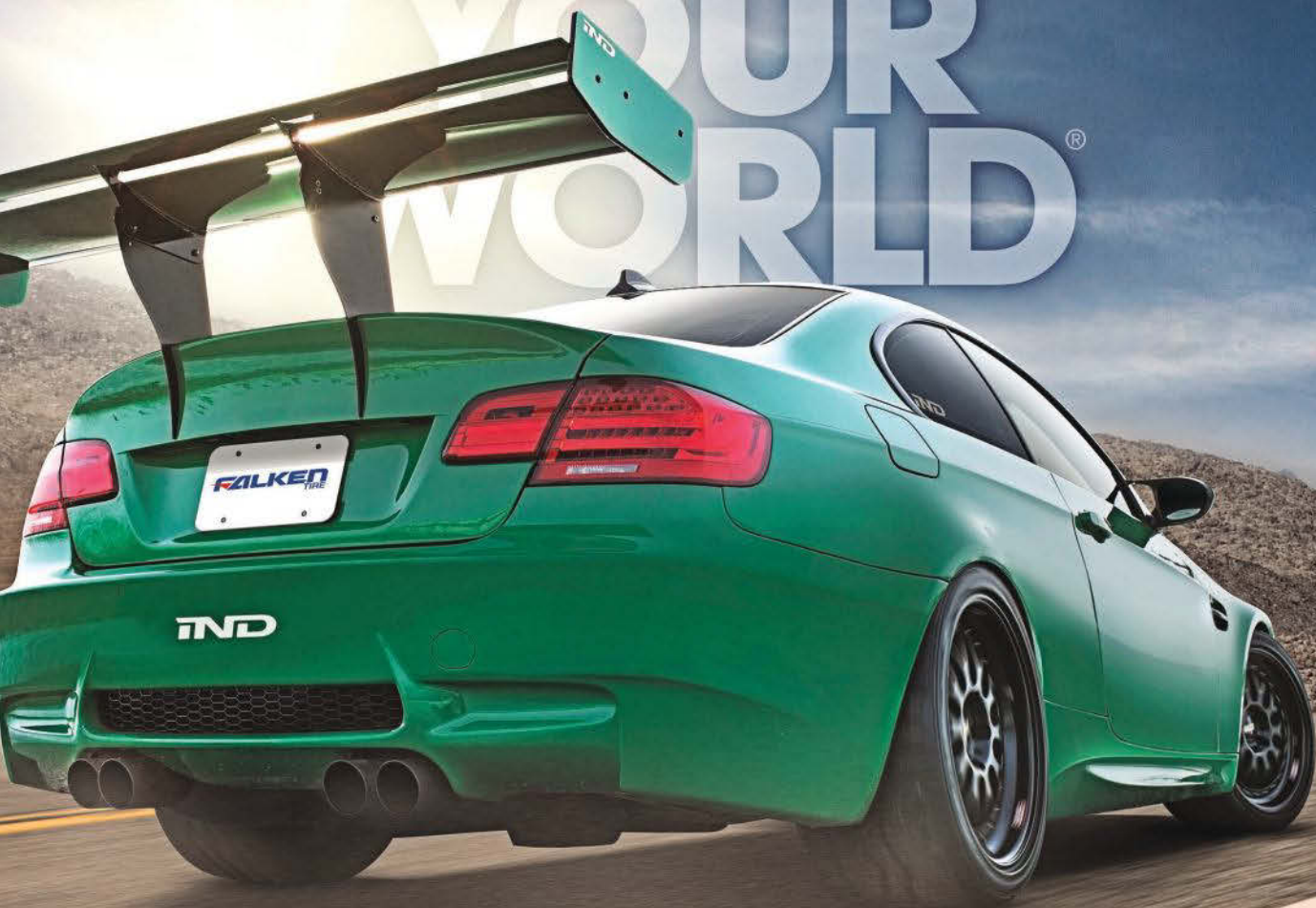
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