



ABT 300HP VOLKSWAGEN GTI DARK

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ALFA 4C vs. FERRARI DINO

A MATCHUP 40 YEARS IN THE MAKING

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VW GLOBAL RALLY CROSS IN L.A.

BMW M3: E90 RACER, E30 DTM TRIBUTE
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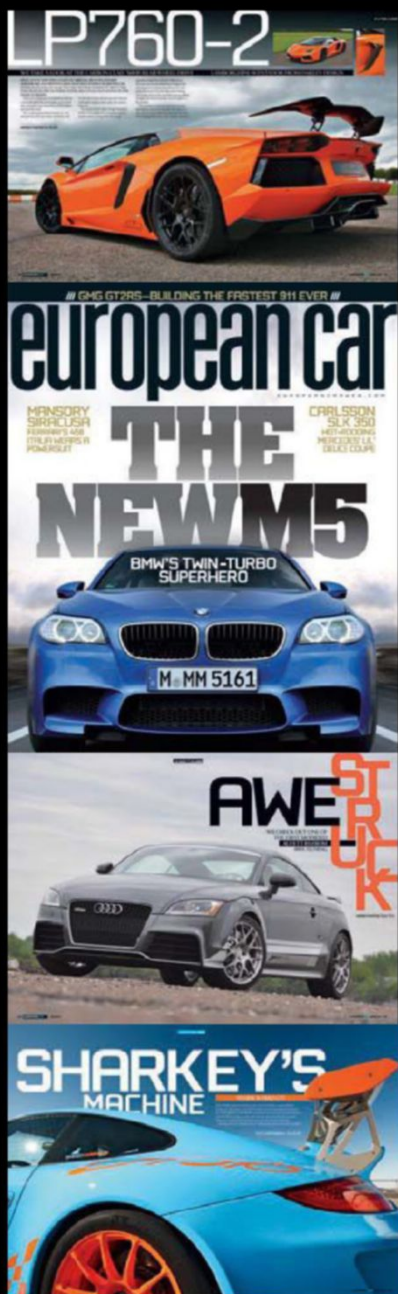


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MY LIFE IN THE TRAVELING CIRCUS

I ALWAYS LEAVE MY COLUMN AS THE FINAL THING I WRITE FOR THE ISSUE, sometimes well past the date I'm supposed to turn it in. I have a very understanding managing editor. One of the reasons I do this, besides my genetic predisposition as a procrastinator, is so that I've read and digested everything in the issue. From my seat, I get to see a magazine morph from mere ideas to an actual, physical product before my eyes.

One of the first things that came together for this month was the cover story involving the Alfa Romeo 4C and the Ferrari Dino. This feature was made possible by the generous (and brave) Mr. Jon Gunderson. I need to thank him again for bringing out not one but two beautiful examples of this Italian classic. I'd never driven a Dino before, and I have to say it was an experience I won't soon forget. One of the things that struck me as odd is how compact the car felt. Were people, specifically Italians, that much smaller in the 1970s?

I'd never driven a Dino before, and I have to say it was an experience I won't soon forget.

Just a few days later, I found myself in Austin, Texas, for the FIA World Endurance Championship and Tudor United Sports Car Series. Audi's endurance effort is second to none and, while F1 rumors are swirling, I would be more interested if Audi's Dr. Wolfgang Ulrich announced he was interested in racing Elon Musk to Mars. I think both are capable of doing it. You can expect to see more about Audi's race effort in a future issue. I was also there to test out the new Audi S3. If you're wondering about my thoughts on that car, you will find it on page 26. The racing was an excellent backdrop for Audi's new compact wonder. Trickle-down effects from the R18 e-tron and R8 LMS to road cars is certainly noticeable.

While walking through the Audi corral in COTA's parking lot, I noticed a beautiful Quattro Coupe an enthusiast had driven from California. When that car was new, Audi was obsessed with rally racing, and the influence is obvious in the Quattro Coupe. Now that Audi is neck-deep in sports car racing, everything from lightweight materials, aerodynamics, and turbocharging technology is directly related to the racetrack. Hopefully the hybrid technology for S and RS cars isn't too far off, either. Who doesn't want to reclaim some of that energy normally thrown away as heat?

After Texas, I was home just long enough to remind my 2-year-old I exist and test our Project Passat. Both went well, with my son rediscovering his love of the Long Beach Aquarium and our Passat showing big gains in performance with help from Neuspeed, H&R, and Yokohama. The new 1.8T is the base engine VW has needed for a few years and will hopefully rekindle an interest in tuning affordable cars—and not just the more expensive models. A base Golf 1.8T could be the gateway to tomorrow's tuners to cut their teeth.

The weeks are flying by and there never seems to be a discernible cutoff for me between issues. One of the last things I did that made it into this issue was a drive of the new Volvo S60 and V60 Polestar models. I drove the original S60 Polestar Concept in Sweden and couldn't wait for something in production form. I'm impressed by what Polestar has done with a tuner car that's available off the showroom floor with a full warranty. This initial run of cars is going to be incredibly rare, a combination of 40 sedans and 80 wagons in the first year. At a little more than 60 grand, I can't think of another car that's so usable yet so exotic. This might prove to be the collector car of the century. Even if it isn't, I struggle to think of another car with the same mix of performance, safety, and luxury features at that price point. A comparably equipped 335i xDrive will cost you slightly more, and you can't get it as a wagon. The only other fast wagon out there is the E63, which is nearly double the price when spec'd to the same level.

Hopefully you're enjoying the changes we've made to the magazine so far. There are still more to come, but I encourage you to give some feedback as we move forward. It's usually only the dissatisfied readers who voice their concerns. Please feel free to drop me a line at the email address you see below and tell me what's working and what isn't.

Michael Febbo, Editor
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034 MOTORSPORT SOLID REAR ANTIROLL BAR

Bolt this to the back of an MkVI GTI, Golf, front-drive TT, A3, or a few other '10 to '13 VW cars, and enjoy greater composure from the 1-inch diameter, solid spring steel construction, and two-way adjustability. The kit includes the antiroll bar, graphite-impregnated urethane bushings, brackets with Zerk options, hardware, and grease.

\$215.

034motorsport.com



BLAQUE DIAMOND BD-1 ALLOY WHEEL

Here's a one-piece cast-aluminum wheel sporting a swish multi-spoke concave design and a deep 6-inch undercut lip. It comes in 20-inch and 22-inch diameters, with widths of 9 inches or 10.5 inches, plus staggered fitments and aluminum center caps. It can accommodate big brake upgrades and will fit most European makes, from reasonably priced VW to high-end Range Rover. **\$420 for 20-inch versions; \$490 for 22-inch versions.**

bd-wheels.com



KW CLUBSPORT/VARIANT 3 COILOVERS H.A.S. KIT

Now available for the F80 BMW M3 and F82 M4 (the new ones), KW's Clubsport coilovers are offered with two- or three-way damping adjustment. On top of that, KW has expanded its Variant 3 range to incorporate new M cars, with or without the factory adaptive M suspension. The company also has height-adjustable springs and cancellation kits available. **From \$2,849.99 for the V3 setup.**

kw-suspension.com/us



FORGE MOTORSPORT TURBO HOSE KIT

This is a "fit and forget" upgrade of a race-quality silicone turbo hose kit for the MkVI VW Golf R. It includes two intercooler hoses and a throttle body hose, plus a CNC alloy coupler. Designed and developed in the U.K., these hoses can take higher temperatures and pressures than the factory equivalents and come in black (for an "OE with attitude" look), blue, or red. **\$240.**

forgemotorsport.com



ULTRA RACING FRONT STRUT BRACE

Ultra Racing is a Malaysian company and sells its products through a British website, but it will ship around the world. One UR product is a front strut brace for the MkVI VW GTI. It's a one-piece steel construction, making it more suited to the task of increasing torsional rigidity than the three-piece units out there. A stiffer GTI front end improves handling and makes the steering more responsive. Even the bolting flanges are relatively thick. This brace has also been designed to work with the car's crumple zones. **133.76 GBP.**

potn.co.uk



COBRA SEATS MILLENNIUM FALCON OFFICE CHAIR

Really not much of a connection here with European cars, but it's still worth mentioning that this seat was designed by a Brit called Geoff Dunsford. He got the call a long, long time ago to create two such pews for a film set, whose title was undisclosed. Turns out they were destined for the bridge of the Millennium Falcon in that little space movie. And now they've been re-created in painstaking detail only with more fire-retardant materials. No mention on how easy it is to brush off Wookiee hair. Limited to a run of 200 units. **690 GBP.**

cbraceats.com



AWE TUNING PERFORMANCE CATALYST AND EXHAUST SYSTEM

Better breathing, thanks to 3-inch mandrel-bent pipes in 304 stainless steel, brings claimed maximum gains of 44 hp and 68 lb-ft at the crank for the McLaren 650S. The high-flow catalysts are HJS HD 200-cell units that allow retention of the factory heat shield. AWE also has a no "check engine" light guarantee as well as a lifetime warranty. Available as a full system or separate pieces—all developed, tested, and handbuilt in-house. **From \$3,595 for the exhaust system with satin black tips.**

awe-tuning.com

GEAR

MILLTEK SPORT EXHAUST

Granted, the '08 to '14 Audi TTS is great, but a Milltek sport exhaust could make it even better. The company makes two options, each using T304 aircraft-grade stainless steel, mandrel-bent, and either TIG- or MIG-welded by hand. One is a free-flowing 3-inch-diameter system with or without a high-flow sports catalyst. The other is a subtler 2.75-inch system that will still bring performance gains (although the company hasn't stated any figures) but at lower sound levels; this can also come with a sport catalyst, if desired. Both are finished off with quad oval tips. **A cat-less downpipe is \$699; downpipe with cat is \$949 and cat-back systems start at \$1,049.**

g-werke.com



EIBACH HOLLOW ANTIROLL BARS

A big cheese in springs, Eibach now makes a range of hollow antiroll bars for several Porsche cars: the 986 Boxster, 996 Carrera 2, and the 997 Turbo models. The company claims its new components are at least 40 percent lighter than stock, with the 996 rear bar nearly 62 percent lighter. Manufactured for an OE fit, these adjustable bars come with uprated SuperPro bushes. **From \$485.10 for the Boxster set.**

eibach.com



EISENMANN HERITAGE VALVED EXHAUST SYSTEM

Fashioned for the current F8X BMW M3/M4 models, this system comes from a German company that provides a lot of original equipment for Porsche and AMG. So it's no doubt engineered with fastidious attention to detail, like consistent wall thickness of the 304 stainless steel tubing and machine-pressed canisters designed to be invisible when looking at the rear of the car, while a set of variable valves provides quiet cruising tones to upper-rev roars. **\$3,395 for the rear section; \$5,882 for the whole system.**

ind-distribution.com





BAVARIAN AUTOSPORT ULTIMATE CAR COVERS

Each one of these car covers is made from a lightweight, technologically advanced fabric (150-denier woven polyester with aluminized polyurethane acrylic). Bavarian Autosport also says they're easy to get on and off and pack up neatly into their compact storage bags. They're tailored to fit specific BMW and Mini models, come with removable and adjustable under-straps, plus an anti-theft cable/lock kit and a lifetime warranty. **From \$169.95.**

bavauto.com



WP PRO CARBON-CERAMIC BRAKES

No doubt some Porsche 911 buyers had a look at the company's carbon-ceramic brake (PCCB) option and the price and thought they'd probably be OK with the excellent regular setup. But then they might wonder "What if?" Or they went with PCCB only to find that the worn discs now need replacing, which is expensive enough to consider steel instead. In either case, take a look at WP Pro's carbon-ceramic brake kits. By using continuous fiber technology as opposed to Porsche's chopped fiber tech, the company claims its discs will last 10 times longer. On top of that, these WP Pro discs can be refurbished up to three times. They come with alloy hats and Pagid RSC1 pads and can fit the 996, 997, 991, Panamera, and Cayenne.

From \$6,200 per axle.

wpprobbrakes.com



BLACK FOREST INDUSTRIES CLEAN CATCH CRANKCASE OIL SEPARATOR

Some of us may be worried about the long-term effects of deposits from oil vapor on the intake and valvetrain of our 1.8T and 2.0T third-generation TSI engines. There is a solution: BFI has created this catch can to remove excess oil and water vapor. We're talking top-notch components like aerospace-grade tubing and CNC aluminum hardware. BFI says it takes just minutes to install and allows retention of the engine cover. **\$349.99.**

blackforestindustries.com

GEAR

XPEL STEALTH PROTECTION FILM

It's called "Stealth" because it's difficult to see. And this film works on cars with matte finishes, which seem to be all the rage these days, thanks to its satin-textured finish. Alternatively, it can be applied to regular glossy cars to achieve that much-desired matte finish. It's made from polyurethane and is claimed to have excellent memory, flexibility, strength, and durability. Check the website for local installers, who will give an idea of price.

xpel.com



HRE CLASSIC ALLOY WHEELS

For all those people with excellent taste who hanker after the older designs of HRE wheels (not that the contemporary styles are too shabby), the company has just launched its Classic line of three-piece and monoblok rims. There's the 300/300M mesh, 301/301M split 9-spoke, 303/303M 13-spoke, 305/305M 5-spoke, and the 309/309M 19-spoke. Diameters go from 18 to 22 inches; widths range from 8 to 13 inches. But the good thing is that they can still meet modern demands, and the simplicity of design means the Classic line can be offered at lower prices than regular HRE wheels. Each one is built to order, and HRE says there are "nearly infinite" options of fitment, color, and finish options. **From \$1,400.**

hrewheels.com



INTEGRATED ENGINEERING ADJUSTABLE CAMBER PLATES

Dial in the right amount of negative camber on 2006-'13 VW Jetta and Golf models, plus Audi A3 and Audi TT cars from the same years. These will provide maximum tire contact for the best grip and contribute to a stable front end. The OEM rubber mounts are replaced by a heavy duty Aurora spherical steel bearing, eliminating unwanted movement under load. But IE also points out that daily driving is still an option. \$499.99.

performancebyie.com

RAYS VOLK RACING ZE40 ALLOY WHEELS

This one-piece/five-lug/ten-spoke alloy wheel represents a brand-new forging for Rays. And although the company typically makes wheels for Japanese cars, some variants of the ZE40 will fit Audi, BMW, Mercedes-Benz, and VW cars. Available in Matte Blue Gunmetal and Bronze. Euro-specific sizes are 18 inches with widths ranging from 8.5 to 10.5 inches, plus 19 inches with 8.5-inch to 11-inch widths. High-type or standard center caps are optional. **From \$807.**

rayswheels.co.jp

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"For Audi or VW owners with turbocharged engines the (P3Cars Vent Integrated Digital interface) digital multifunction gauge is a dream come true!"

-Paul Rivera (Quattro Quarterly Magazine)

"The P3Cars gauge is ready to go straight out of the box... it's been helpful to read boost and EGT, with the adjustable shift light being another handy option. It's certainly a useful tool for modified car owners."
-Greg Emmerson (European Car Magazine)

"They've designed a simple plug-in harness, and a really clean display that reads all sorts of info, and it's in view of the driver and passenger while not cluttering the steering wheel or center console. Better yet, it's affordable in comparison to all those ancient analog gauges as just the desired boost, oil and water temperature and battery gauges would set you back over twice what the retail of P3 Car's VIDI gauge does at it's MSRP!" -Barry Brazier (MC2 Mini Magazine)

With this one gauge I can now read turbo boost pressure, engine coolant temp, intake air temp, exhaust gas temp, battery voltage, rpm, vehicle speed ... Hell, the new gauge even gives me the ability to read and reset engine trouble codes! I was sold the minute I saw it, and all the wilpower in the world couldn't prevent me from plunking down my hard-earned cash for this marvelous instrument."
-MJ Calabrese (Roundel Magazine)

At P3Cars we've been producing the highest quality instruments for some of the world's finest cars since 2009. Our fundamental goal is to retain the gorgeous design of the OEM interior, and also accentuate it by providing an extended cache of metrics to the discerning driver. A new kind of interface was created, and new ways of thinking brought about a revolutionary new product.

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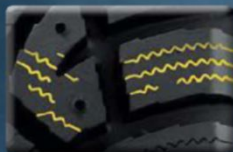
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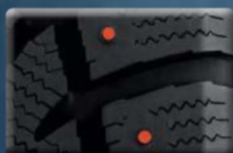
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'14 Audi TTS S Tronic

THIRD-GENERATION AUDI TT DELIVERS A DRIVE BEFITTING OF ITS LOOKS

Words Kyle Fortune Photos Courtesy of Audi

HIGHLIGHTS

- › Exquisite detailing outside
- › Virtual cockpit digital instruments
- › Jet wing-inspired dash with cool air vents
- › Longer wheelbase increases interior space
- › Four-wheel-drive system can push 100 percent of drive to rear
- › Four-cylinder turbo sounds more exotic than it is

TECHNOLOGY

- › 310hp 2.0L turbocharged petrol motor
- › Torque is 280 lb-ft from 1,800-5,700 rpm
- › Six-speed dual-clutch automatic transmission and four-wheel drive
- › Audi Drive Select offers a variety of driving modes
- › Torque vectoring via the ESC system

ELECTRONICS

- › ESC with Sport and off modes
- › Virtual Cockpit digital display instruments and infotainment

NINETEEN NINETY-EIGHT, THE DAY AFTER THE

FIRST-GENERATION AUDI TT WAS LAUNCHED, I'm sat in the passenger seat in the U.K. heading to a test track. It's stopping traffic, the TT's impact impossible to forget, its concept-car-to-reality still utterly captivating today; back then they were like something from another planet.

The figuring session that took place afterward has faded from memory, but the look on people's faces hasn't. The TT has arguably always been best enjoyed from the passenger seat. For all its sensational good looks, it's never quite lived up to its promise on the road. Fast? Certainly, but there have always been better driving rivals.

It is 16 years later and I'm at the launch of the new TT in Spain. Race Resort Ascari is at our disposal, and the roads in this bottom portion of Spain are both testing, and largely traffic free. It's pretty much the perfect environment for launching a car, particularly as, along with all the chat about clever instrument displays and iconic design language, Audi's people are talking about a more engaging driving experience.

By people, I mean Prof. Dr. Ulrich Hackenburg, member of the Board of Management Audi AG, Technical Development, who says "We have moved from the understeer tendency and more toward oversteer with torque vectoring. You can steer it on the throttle." That might be true, but Ascari Audi is reluctant to let us find that out. The ESC system, which is on by default, comes with a Sport mode with higher intervention levels and a fully off mode. Yet here, at a closed circuit in controlled conditions, Audi's people have been fiddling with the electrics to disallow any fully off exploration, despite what the display in that trick new instrument binnacle says.

And it says a lot. Indeed, alongside the usual spiel about reinterpretation of an iconic shape, the main talking point at the TT's launch is its "virtual cockpit." It replaces conventional instruments with a very sharp TFT screen that's controlled via either wheel-mounted buttons, a revised MMI operating system or voice activation. It'll display, along with instruments of varying size, satnav mapping, audio, driver assist, and vehicle status settings in front of you, removing the need for a screen in the center of the dashboard.





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+ PROS

- › Hugely quick
- › Sensational interior fit, finish, and design
- › Clever new virtual cockpit
- › Sounds more exotic than it is
- › Agile and fun

- CONS

- › Rear seats little more than luggage space
- › Transmission paddles need to be bigger
- › Not distinct enough from lesser models
- › TTS bettered by its cheaper relations
- › Virtual cockpit fiddly operation



That virtual cockpit frees up the space for a cleaner, jet wing-inspired dash top, the five air vents, with their neat, integrated push and twist controls dominating the view inside. Audi has stayed true to the TT's design-led form then, the interior fairly spectacular for a car with a starting price of around \$40,000. Indeed, it wouldn't look out of place in a car costing triple that. Don't sit in a TT in an Audi showroom before you get in an R8, unless you want to be disappointed, that is.

There's a bit more space in there, too, thanks to a wheelbase stretch, though the rear seats remain best considered as additional luggage space; it'd be cruel and unkind to expect anyone to sit back there. The trunk remains usefully sized for a coupé, though.

Outwardly, the TT retains its iconic surfacing and profile, with some neat touches, most centered around the LED lights, the aluminum filler cover (now capless underneath), and pronounced wheel arches—an Audi TT signature. In profile, it's obviously a TT, yet its bonnet surfacing and the grille point to the 2010 quattro concept.

It looks good, but then it always has. The range-topping TTS gains Audi's usual performance signifiers of aluminum-capped rearview mirrors, a more intricate dual-element metal grille treatment, and larger 18-inch alloy wheels. Subtle lower sill treatments and re-profiled bumpers with more

aggressive-looking air intakes and a rear "diffuser" complete the changes, along with some TTS badges, in case you don't notice them. Which you might not.

Where it really surprises though is on the road. The journey up to Ascari is in a 2.0 TFSI 230hp quattro model with S tronic, and the TTS's understudy quickly reveals a chassis that's more composed, more agile, and far more involving than any TT before it.

With a 0-62-mph time trailing the TTS by just 0.7 seconds, 230 hp, and just an 8-lb-ft torque deficit, the lesser TT doesn't feel shortchanged on the road. On track, that TTS's additional firepower is apparent, the 2.0L engine's ample urge and any-rev flexibility giving it effortless pace. That's not untrue of its predecessor, though the way the new chassis deals with it is rather revelatory. Turn the flat-bottomed steering wheel and the front tucks in with real urgency. Only foolishly ambitious turn-in speeds will result in push-on understeer and even then it's adjustable with a judicious lift of the accelerator. It'll trim its line, and hold it, the TTS being neutral and benign when you approach and breach its huge limits of grip.

The rear can be brought into the mix, a little, though the TTS remains an entirely predictable and safe choice, thanks in no small part to its quattro drivetrain. It now features torque vectoring, which uses the ESC system and brakes individual wheels to transfer power to the wheels that can best use it. The brakes

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TECH SPEC '14 AUDI TTS S TRONIC

LAYOUT

Front-engine, AWD

ENGINE

1984cc four-cylinder 16v, DOHC, direct injection, turbocharged and intercooled

DRIVETRAIN

Six-speed, twin-clutch automatic transmission

BRAKES

Lightweight aluminum fixed calipers, ventilated f, 338x30mm rotors f, 310x22mm r

SUSPENSION

McPherson struts f, four-link rear r

WHEELS & TIRES

8Jx18 alloy wheels, 245/40 R18 tires

PERFORMANCE

MAX POWER

310 hp at 5,800-6,200 rpm

MAX TORQUE

280 lb-ft at 1,800-5,700 rpm

0-62 MPH

4.6 sec.

TOP SPEED

155 mph (electronically limited)

WEIGHT

3,053 lbs.

ECONOMY

34.6 mpg (U.S. mpg)

MSRP

\$49,900 (est)



themselves are strong, though heavy use results in plenty of smoke and heat. Even so, the pedal retains much of its feel and doesn't go overly long.

The suspension plays a strong role in the TTS's agility, too, as it comes as standard with magnetic dampers, configurable via the Drive Select and MMI system, and delivering fine ride comfort and control—though stray away from the Comfort setting and all you do is increase unnecessary harshness through the car. The steering remains the biggest revelation, though; not just its accuracy and feel, but the response to turn-in, the TTS now living up to its sports car billing.

That's true though of its lesser siblings, albeit without the TTS's firepower and exhaust note—which sounds more pugnacious and historically relevant five-cylinder than its actual four-cylinder format. It might be helped with a sound actuator, and like so much of the TTS, is configurable in the Drive Select

menus, but you'll care little when its tearing up through the revs and roaring and flaring on up- and downshifts via the quick-shifting S tronic gearbox. It's typically good the twin-clutch auto transmission, and while slower and less efficient when picked with a six-speed manual, choosing it would add even more fun to the TTS's remit. Sadly, that's an option that'll likely be denied U.S. customers.

Regardless, the TT, in any guise, is a more engaging, more thrilling drive than it's ever been, yet still as stunning to look at and be in. The TTS, by virtue of being the range-topper, is the fastest, which puts it up against some difficult rivals price-wise, it being perilously close to Porsche's Cayman—a car the TTS just cannot match for driver appeal, even if the Audi has the greater firepower. The sweet spot remains lower down the lineup, but the TT has come a long way in 16 years, finally offering a drive to match those iconic looks. **C**



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Everything's Weirder in Austin, Texas

'15 AUDI S3 QUATTRO

Words Michael Febbo

THE UNOFFICIAL SLOGAN OF AUSTIN, TEXAS, IS KEEP AUSTIN WEIRD. I don't know how long it's been around, but it's working well so far. The hipster capital of Texas is only a 160-mile drive from Houston, which is virtually next door in Texan terms. The artistic, metropolitan and, well, weird Austin is worlds apart culturally from most of the state. It's fitting that Audi chose this worldly mishmash as the epicenter for the U.S. launch of its new S3. Not only does weirdness fit this super-compact's personality, but one of the best racing facilities in the world is right outside the city.

Based on VW and Audi's new transverse modular platform, dubbed MQB, you might think this car would be a simple continuation of the previous-generation A3/S3/Golf. It does share some commonalities, like a 2.0L direct-injected and turbocharged four-cylinder—now with a thumping 292 hp and 280 lb-ft of torque. It also shares the six-speed S-tronic dual-clutch transmission and Haldex all-wheel-drive system of previous cars. Mechanical similarities aside, though, it feels much different. Granted, there's never been an S3 officially imported to the States, and if there were, it would have been a hatchback. This new car has a spiritual connection with the B5 S4, a car some would say defined the Audi we know today.

The turbine-style air vents are more aeronautical than ever, as though you could kick on the afterburners if the weather gets too frigid.

The interior feels a like a fresh start, going for a far different feel than some of the standard A3's over-styled Japanese competition. It still says "Ingolstadt," but there's something else going on. In the same way that the original TT found elegance in simplicity, the designers have shaved off a large amount of unnecessary. Is it too cliché to say it feels a bit Apple-esque? The dash surface looks and feels like a large swath of rubber. It isn't even trying to be leather. Poke and prod at it, and it feels like it's 3 inches thick. The turbine-style air vents are more aeronautical than ever, as though you could kick on the afterburners if the weather gets too frigid. A strip of aluminum bisects the dash and houses rocker switches that would otherwise be scattered around the place. Aluminum adorns almost everything: the shifter, pedals, door releases, and even the steering wheel, which—in typical Audi fashion—is one of the best in the business.

The front seats are well-bolstered, comfortable for larger occupants, and even have the model designation embossed below the headrest. The back seats are a decent size and offer good hip and shoulder room. But friends over average height will likely get to experience the anthracite headliner firsthand. Also,



you will quickly realize how much space child seats consume. A rear-facing seat in the back will require sliding the front seat almost all the way up to the dash. Kids in booster seats will probably be overjoyed at a back seat that seems built just for them.

The driver will also feel the S3 is tailor-made. Vision is excellent, with the positioning of corners and tires immediately obvious. You can place the S3 with complete confidence. The seating position is near ideal and, as you settle in, the car wraps itself around you. While larger Audis have this same ability, an A8 is still huge and will never feel as tight and contained as the S3.

I was lucky enough to experience the Audi in a variety of conditions, with storm clouds rolling through Texas. The all-wheel-drive system works wonders for putting down power. On wet roads, nothing can beat the ability to distribute power to all four corners. The magnetorheological adjustable dampers don't hurt, either. The suspension can go from subtly soft to sporty stiff in the blink of an eye, or the push of the Audi Drive Select button.

The wet, damp, dry, and back again roads outside Austin lead to the Circuit of the Americas, where I got in a couple of hot laps hopelessly trying to chase Allan McNish in an R8 Plus. At least I think it was a Plus. I saw the taillights for all of 2 seconds. At least he wasn't there to distract me for long. Despite being the entry-level S car, the S3 feels shockingly at home on a track. The RS is going to arrive with giant expectations.

The S3 will gladly rotate into turns, either with or without a bit of trail braking. It seems to like a more delicate touch, dialing in the steering with measured confidence. It will still understeer coming off tight turns, so plan throttle input carefully. Around COTA's faster sweepers, the S3 hangs on to a line with

A strip of aluminum bisects the dash and houses rocker switches that would otherwise be scattered around the place.



PROS

- › Modern and elegant interior
- › Strong engine and fast transmission
- › Well-sorted magnetorheological suspension

CONS

- › Tight rear headroom
- › No hatchback



TECH SPEC **'15 AUDI S3**

BASE PRICE
\$41,995

VEHICLE LAYOUT
Front-engine, AWD, five-pass, four-door sedan

ENGINE
2.0L/292hp/280-lb-ft turbo DOHC 16-valve I-4

TRANSMISSION
six-speed twin-clutch auto

CURB WEIGHT
3,450 lbs.

WHEELBASE
103.6 in.

LENGTH X WIDTH X HEIGHT
175.9 x 70 x 54.8 in.

0-60 MPH
4.7 sec. (mfr.)

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more grip than a 3,500-pound car wearing relatively narrow 235/35 19-inch tires should. Its attitude is neutral, and a careful hand will get the back end out just slightly. It feels planted but open to mid-corner corrections. This would be an ideal car for the beginning to intermediate track enthusiast. And it's fun, which is maybe more important than how well it's set up, from a strictly performance aspect. It inspires confidence and makes me want to keep pushing harder. While this car surprises me a little with its capabilities, it never unnerves me.

In this way, the car is like the B5 S4. That model hit the States roughly 15 years ago and changed the

way we thought about performance sedans. The turbocharged engine was great from the factory, but even better with a few wisely chosen modifications. With horsepower north of 500, it was still predictable, easily driveable, and still made you feel like Superman. The S3 touches that same nerve. At just under \$42,000, it's relatively affordable, although it feels smaller than the usual offerings from a luxury manufacturer. It doesn't even necessarily feel like the rest of cars surrounding it in Audi showrooms. I'd hate to call the S3 weird, but it's certainly unique—and that's one of the things that makes it so appealing. **EC**

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Pole Position

'15 VOLVO V60 POLESTAR

Words Michael Febbo

"The beginning of these cars can be traced back a couple of years to the Polestar S60 Concept, which is even more extreme, rare, and expensive."

IF YOU'RE A SERIOUS EUROPEAN CAR FANATIC, your heart probably went aflutter the second you saw this high-performance wagon. You realized the bright-blue beastie you're ogling is a turbocharged Volvo, so its performance pedigree precedes it. If you really know your Swedish speed merchants, you've noticed the Polestar cues and that pushed you over the top. You need one. Sorry to burst your lingonberry, but Polestar is only importing 120 of these 345hp, all-wheel-drive S60 sedans and V60 wagons for 2015. And worse yet, they're all sold.

The mission of the Polestar S60 and V60 is three-fold. One, to satisfy those Volvo enthusiasts who just aren't satiated by the standard R-Design. Two, to be halo cars and attract buyers into Volvo showrooms who might then purchase something more feasible. And three, to rival machines wearing an M, S, or AMG badge. Just like those brands, Polestar cars are purchased straight from dealerships and are covered by a full factory warranty. But Polestar is not just a brand name within Volvo. Starting as a race team, Gothenburg-based Polestar is a separate tuning company that has become the official tuning partner for Sweden's only car manufacturer.



The beginning of these cars can be traced back a couple of years to the Polestar S60 Concept, which is even more extreme, rare, and expensive. The Concept was built on a standard S60 but featured carbon-fiber bodywork with flared fenders, a giant turbo, manual transmission, and a suspension that was almost stiff enough to shake the fan out of even the most fanatical. It was focused, hard-edged, and uncompromising and one of the best sedans I've ever driven. On smooth roads and in decent weather, that is.

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Polestar took the lessons learned from building a handful of the Concept and applied it to models better suited to prime time. To start, the only unique bodywork components are the splitters on the front bumper, and the spoiler and diffuser at the back. The fenders are steel and the flares (while still curvaceous) are the same as any Volvo sedan or wagon on the lot. It's under the skin where most of the action is happening.

Our drive route consisted of mountain roads twisting up and down Southern California's Bear Mountain, plus neither scenic nor smooth freeways on our way to Auto Club Speedway. The Volvo feels right at home on the switchbacks traversing the mountain, as the scenery transitions from desert brush to needled pines. The Öhlins dampers are on the stiff side, allowing the Polestar to transition quickly from side to side. Steering is quick and slightly heavier than I would expect in what is ultimately a family hauler. The firm effort helps it feel stable on center, with good buildup on turn-in. The front end reacts instantly to commands, pointing into turns with the rear following. It doesn't have the rotation of a lightweight sports car, but it rewards smooth, deliberate movements.

Braking is strong, with more travel in the pedal than is preferable, but—unlike a lot of cars with track-based brake packages—engagement is easy and predictable. No grabbiness or dead spots in pedal travel here; well done, Brembo.

Response from the 3.0L inline-six is well matched to the rest of the car's personality. The twin-scroll turbo spins up quickly and the engine's ECU seems to have a good relationship with the six-speed automatic, which is the downfall of too many high-tech powertrains. Peak torque of 369 lb-ft comes on a bit late by modern standards, at 3,000 rpm, but the engine is strong at anything above 2,200. On mountain roads, keeping the engine humming along between 3,000 and 4,500 rpm seems the best bet.

On track, the fun starts at 4,500 rpm and continues all the way up to the 6,500-rpm redline. On the mountain, I never felt like I could get anywhere near the car's potential, mostly for fear of jail time. On the infield short course, however, the limits are easy to approach, surpass, and then reel in again. The Polestar tends toward understeer at the limits, but with ESC in Sport mode, the Haldex all-wheel-drive system sends more power to the rear axle and provides a more neutral feel with big throttle applications.

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Away from public roads with ESC in Sport mode is where this car comes alive. Spring rates are 80 percent stiffer than a standard R-Design and the antiroll bars are 15 percent stiffer. There are 30 levels of damping adjustment, and I'm driving just to the soft side of the middle setting. The dampers have a racing-style knock-off valve, which means I can live out my fantasy of bouncing a Volvo wagon over the red and white curbing just like the 850 British Touring Cars days. I learn pretty quickly that dancing off the curbs is the quickest way to get rotation mid-corner. If you think this is reckless, my curb-assisted cornering was all done under the guidance of three-time Swedish Touring Car champion, Thed Björk.

Auto Club's infield is a short, technical track. The front straight allows for a decent taste of the Polestar's speed. The six-speed automatic could almost use another ratio or two, although the turbo's powerband tends to fill in some of the difference. I find the brake pedal travel long on the road, but the extra modulation is nice to have on the track. The six-piston calipers will haul the car down from speed with huge power, but the chassis plays a major part, too. Polestar has upgraded the control arm bushings

and front damper top mounts, so deflection is minimal. Even under the heaviest braking loads, the car doesn't move around. Trail braking into turns is easy, but only works to lengthen the straights and not necessarily to get the rear end moving on turn-in.

While I wonder how many of these will ever see a track day, both the S60 and nearly identical V60 are more than capable. Besides capable, the thought of seeing a bright-blue wagon thundering around at an open track day is just plain awesome.

We also had the chance to take the V60 out for instrumented testing. We normally like to compare a vehicle's test numbers to something else in the same class. At this point, Volvo is basically on its own. The Audi S4 is no longer available as a wagon in the United States. The Mercedes E63 is roughly \$30,000 dearer and a Golf R Sport Wagon is bound to be another Euro-only dream for North Americans.

So, Polestar Wagon, party of one, your test begins now. The ultimate family hauler got from 0 to 60 mph in just 5 seconds flat. If we must compare something, that's three-tenths faster than the last S60 R-Design we tested. Polestar claims the S60 version is slightly faster due to weight, so it's certainly in the top of the 4-second range. It continues the three-tenths theme in the quarter-mile, running 13.5 seconds at an impressive 102.6 mph compared with the S60 R-Design's 13.8 at 101.3 mph. Those huge, sticky Michelins and big Brembos took 3 feet off the stopping distance: measuring just 108 feet from 60 mph to standstill.

To our surprise, these numbers only added up to a tenth of a second advantage in the figure-eight. The Polestar V60 turned in a 25.5-second lap at an identical 0.74 average g. The V60 is roughly 157 pounds heavier than the S60 in question, but we were expecting a bit more—and we think we could have got it. With factory vehicles, we test them as they are sent to us. If we had been able to play with the dampers (a job Polestar recommends to leave up to dealers), we're pretty sure we could have lopped off at least a couple of tenths by working out some of the understeer. So the performance is there, you might just have to work for it if you are lucky enough to own one.

It says something about the level of refinement and development of Polestar vehicles when my chief complaint is the seat won't drop low enough. Any car with sporting intentions needs a seat that will drop down nearly to the floor to allow taller drivers to sit upright while helmeted. Swedes are not short people and they've been wearing protective headgear (horned or otherwise) for a few thousand years. The complaint is minor, but something to think about if you're over 6 feet.

My other complaint is that I can't have one. Even if I could swing the 60 grand, the dealer doesn't have any to sell me. The encouraging thing is that those who are lucky enough to be getting a Polestar are choosing the wagon over the sedan, two to one. Does this mean more fast wagons for the States? Well, maybe from Volvo, but I'm not sure 100 cars this year and a few hundred in future years will make other manufacturers rush for a piece of the action. The instant success of this model will certainly inspire confidence in Polestar working its magic on other Volvos in the near future. I will be anxiously awaiting a tuned plug-in hybrid wagon. Just make sure that seat goes a little lower. **✎**



TECH SPEC '15 VOLVO V60 POLESTAR

BASE PRICE
\$61,825

VEHICLE LAYOUT
Front-engine, AWD, five-pass, four-door wagon

ENGINE
3.0L/345hp/369-lb-ft turbo DOHC 24-valve I-6

TRANSMISSION
six-speed automatic

CURB WEIGHT (F/R DIST.)
3,985 lb. (60/40%)

WHEELBASE
109.3 in.

LENGTH X WIDTH X HEIGHT
182.5 x 73.4 x 58.4 in.

0-60 MPH
5 sec.

QUARTER-MILE
13.5 sec. @ 102.6 mph

BRAKING, 60-0 MPH
108 ft.

LATERAL ACCELERATION
0.89 g (avg.)

MT FIGURE-EIGHT
25.5 sec. @ 0.74 g (avg.)

EPA CITY/HWY/COMB FUEL ECON
18/27/21 mpg

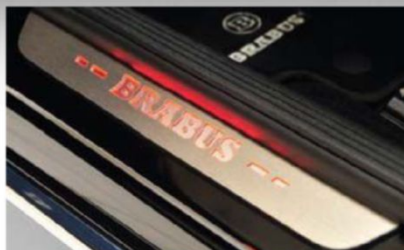


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Mercedes-Benz GLA250/GLA45 AMG

THE LITTLE BENZ WITH BIG CROSSOVER APPEAL

Words Colin Ryan



HIGHLIGHTS

- › Fine blend of talents in the GLA250
- › Excellent steering feel
- › Power lift gate is standard
- › Charming styling
- › The AMG version is quick

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VIRTUES. Build quality, intense attention to the tiniest details, engineering depth, and great design among them. In the '15 GLA250 compact crossover, there's an accumulation of subtle pleasures that makes it a perfect vehicle to own, from handling the grind of the commute to setting off on a road trip.

It's not a car that tries to overstate its case and is all the more agreeable because of it. There are times when we might not want to be super-involved in driving, in which case we can enjoy the GLA's tranquil yet stylish cabin, the comfortable but supportive seats, and take for granted the easy ride quality, the engine's more-than-adequate punch, and the brakes' reassuring abilities.

For other occasions when devilish moods and interesting roads coincide, drivers can recalibrate their senses to tune in more to the GLA's well-sorted chassis, put the seven-speed dual-clutch transmission into sport mode, and have a little tarmac-based adventure.



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“Believe it or not, steering feel is excellent.”



Believe or not, steering feel is excellent. This might just be the fortunate upshot of optional 19-inch wheels wearing 235/40 tires in the Edition 1 package, but the balance of weight and precision ties in with a satisfying directness. There's no need for constant correction. Turn the wheel the desired amount and the GLA responds accordingly. Even rough road surfaces can't deflect it from its course.

Built on the same platform as the CLA compact sedan that offers front-wheel drive or all-wheel drive, the GLA brings an elevated driving position so beloved by a large section of the motoring public along with rear passenger space that will accommodate an average-sized adult, plus cargo capacity that goes from 11.8 cubic feet with the rear seats up (they split and fold in 60/40 fashion) to 42 cubes with them folded down flat. For comparison's sake, BMW's X1 runs to 14.8/47.7 cubic feet. The GLA's power lift gate is standard, by the way.

Factor in standard safety equipment like eight airbags, attention assist, and collision prevention assist with autonomous braking, and that all adds up to a lot of attributes delivered with typical Mercedes-Benz efficiency and style. From a relatively affordable starting price, the GLA250 is a well-rounded package.

So it wouldn't be unreasonable to assume that the high-performance variant, the '15 Mercedes-Benz GLA45 AMG 4Matic, is just as good, only firmer and faster. Well, yes. And no.

Yes because of its engine. In the usual AMG way, this is hand-assembled by one technician who affixes a personalized plaque as a final task. Although it's an aluminum, twin-scroll turbo, 2.0L four-potter like its regular counterpart, Mercedes-Benz says this is essentially one half of the new V-8 going into AMG's second sports car, the '16 GT and the upcoming C63.



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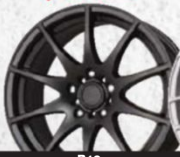
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'15 MERCEDES-BENZ	GLA45 AMG	GLA250 4MATIC
BASE PRICE	\$49,225	\$34,225
PRICE AS TESTED	\$65,985	\$48,705
VEHICLE LAYOUT	Front-engine, AWD, five-pass, four-door SUV	Front-engine, AWD, five-pass, four-door SUV
ENGINE	2.0L/355hp/332-lb-ft turbo DOHC 16-valve I-4	2.0L/208hp/258-lb-ft turbo DOHC 16-valve I-4
TRANSMISSION	seven-speed twin-clutch auto.	seven-speed twin-clutch auto.
CURB WEIGHT (F/R DIST)	3,646 lb. (60/40%)	3,550 lb. (60/40%)
WHEELBASE	106.3 in.	106.3 in.
LENGTH x WIDTH x HEIGHT	175.0 x 70.2 x 58.2 in.	173.9 x 71.0 x 60.0 in.
0-60 MPH	4.3 sec.	6.9 sec.
QUARTER-MILE	12.8 sec. @ 107.9 mph	15.3 sec. @ 89.8 mph
BRAKING, 60-0 MPH	103 ft.	110 ft.
LATERAL ACCELERATION	0.93 g (avg.)	0.84 g (avg.)
MT FIGURE-EIGHT	25.0 sec. @ 0.78 g (avg.)	27.0 sec. @ 0.66 g (avg.)
EPA CITY/HWY FUEL ECON	23/29/25 mpg	24/32/27 mpg



The company claims it's the most powerful series-production turbocharged four-cylinder engine in the world. It makes 355 hp and 332 lb-ft of torque, propels the GLA45 from standstill to 60 mph in 4.2 seconds, and runs through the quarter-mile in just 12.7 seconds at 108.3 mph.

Also yes because all-wheel drive is standard in the GLA45 and can put that power to the pavement without any kind of slip. The electronic stability program (ESP) has been tweaked to enhance dynamics. Its torque vectoring function brakes single wheels to help rotate the car through quick corners, with an emphasis on handling before letting the safety aspect take over.

Ride height has been dropped by 1.8 inches compared with the regular model. The front seats are more bucket-like with plenty of lateral support, and the almost-obligatory flat-bottomed steering wheel has sections of Alcantara wrap at the quarter-to-three position for extra sportiness.

And maybe no because that delicate balance of complementary talents is now upset by the drumming of the tires on the road. It might seem odd, even heretical, to criticize something with more power and greater agility, but the GLA stops being a multitasker and becomes a fast car with a hatchback, stiff suspension, larger antiroll bars, and a noisier cabin. It's like taking a Willie Nelson tune and giving it the AC/DC treatment. Sure, it rocks, but a degree of charm has been lost in the process. Even more so with the gruff-sounding performance exhaust option.

A sporty machine feels right when it has optimum aerodynamics and a low center of gravity, like the CLA45 AMG, which is undoubtedly the driver's choice in that range. But in this case, the AMG formula is compromised. Mercedes has the wonderful A-Class in other markets but has determined the only way to be successful selling a hot-hatch to Americans is under the pretense of a crossover. It's good, but not as great as it could be. If (or, more probably, when) BMW decides to make an M version of its X1 compact crossover, it would be fascinating to see how the two compare. **C**

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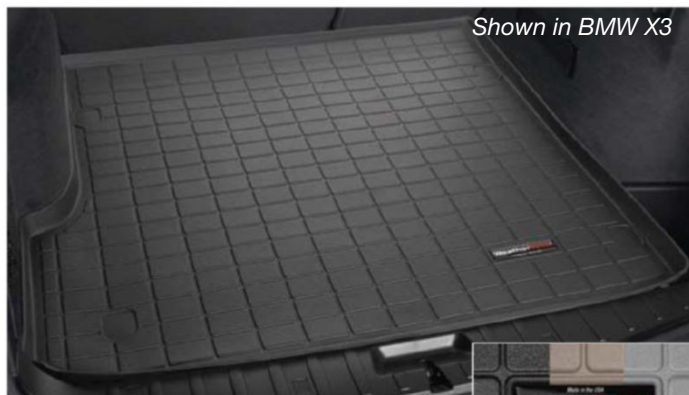
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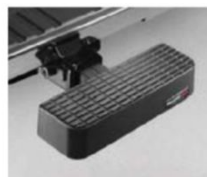


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'14 PORSCHE 911 TURBO S

Words Michael Febbo

THE ADDITION OF THE SMALL S ON THE REAR DECKLID of your 911 Turbo will set you back \$31,600. It does, however, net you an additional 40 hp over the standard Turbo's, bringing the grand total to 560 hp out of the 3.8L twin-turbo flat-six. It also increases maximum torque from 487 to 516 lb-ft, but during brief periods of overboost, that torque spikes at a mighty 553 lb-ft. But that's not all; the S actually stands for value. Besides the power, the package gets you standard carbon-ceramic brakes, Porsche Dynamic Chassis Control with Active Anti-Roll Control, Sport Chrono Package, two-tone black and red interior, 18 adaptive sports seats, center-lock mounted wheels that are half an inch wider in back, and some

different grills on the front air intakes. If you were to option a standard Turbo with all those options, you would pay more than the base price of the S.

So let's start out with the Turbo S's surprising talent: commuting. I used it, one of the fastest cars in the world, on my daily commute for multiple days. My past experience with cars anywhere near this level of performance has been a mixed bag of overheated cars, overheated passengers, broken parts, and broken hearts. Cars this fast aren't normally meant to go slow, and the 405 between Orange County and Los Angeles during the Santa Ana season is the only time you will hear a 100-degree river of concrete described as glacial. The king of the 911s remains unfazed.



Comfort has been raised a substantial few notches with the 991.

Have a seat, drop it in Drive, turn on the ventilated seats, don't concern yourself with Sport Modes, and the nearly two-hour-long, 30-mile drive is as comfortable as anything I've had in cars ranging from Golfs to Continental GTs. We've been saying this since the birth of the 964, but with every generation, Porsche redefines the usable supercar, and this 991-based Turbo S is no different. Visibility is great, as it's been in all 911s. Comfort has been raised a substantial few notches with the 991. The longer wheelbase and extra attention to sound and vibration are really noticeable. What really sets it apart, for those of us who've owned air-cooled 911s, is just how well everything works, even in the heat. The air conditioning components in my personal 911 didn't stay in place for more than a year of my ownership, because while it did move air, it didn't do much to the condition of it.

The ride is smooth thanks to the adaptive suspension and the fact that it's designed from the outset to perform. Most enthusiasts don't realize the key to making a car that both handles and rides well is starting at the very beginning and designing for those

goals. Porsche has the luxury of putting performance before cost, so the center of gravity is low, the car is light, and the multi-link suspension is expensive to build. All of this means Porsche's engineers are starting a step ahead of cars based on economy cars.

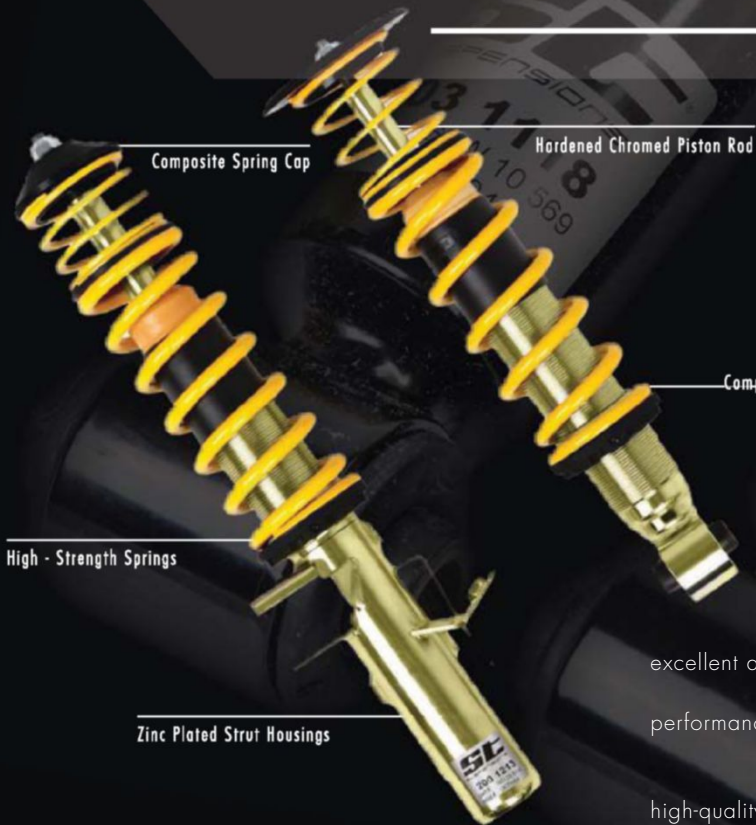
I'm convinced that civil engineers in L.A. believe that concrete sitting in sunlight is an absolute waste. If it isn't under the shadow of a car, then you're not utilizing it. Every once in a while, I'm lucky enough to find complete swathes of road basking in the sun. In those rare instances, the Turbo S comes alive and shows a fraction of its capabilities. I say a fraction because you can't use even half the performance on public roads. Those 560 hp reel in anything lying ahead of the hood in blurred streaks of light. It will go around freeway ramps at speeds so high, you can't see more than a few seconds ahead. Luckily, the Turbo S is still a joy to drive at half speed.

Once at the track, the Turbo S becomes a different car. Suddenly, it isn't held back by silly things like legality and a healthy sense of self-preservation. Acceleration runs start with launch control, meaning you, your mother, or even a well-positioned brick could match our acceleration times. Put the car in Sport Plus mode, one foot on the brake, one pinning the throttle to the floor. Sidestep the brake and you hit 60 mph in 2.6 seconds, faster than anything costing less than \$800,000 dollars, seriously. A 918 does it in 2.4 seconds and the once untouchable Veyron in 2.5 seconds. With these kinds of forces, you become very aware that you're basically a bag of seawater as all the squishy bits inside you compete to be closest to the seatback. The first couple of times you do it, you get tunnel vision. I drive a lot of fast cars, and the Turbo S required a quick recalibration.

Keep the pedal pinned and 100 mph comes up in just 6.8 seconds, or roughly when the average car is hitting 60 mph. Keep going and you're through the quarter-mile in just 10.9 seconds and doing 123.7 mph. When you lift at the end of the speed trap, you realize now might be a good time to try breathing again. The car, however, hasn't broken a sweat. As another media outlet has proven, Porsches are able to do this over and over again, with no ill effect. Braking is equally as impressive, hauling down from 60 mph in just 100 feet.

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TECH SPEC '14 PORSCHE 911 TURBO S

BASE PRICE
\$182,050

PRICE AS TESTED
\$199,065

VEHICLE LAYOUT
rear-engine, AWD, four-pass, two-door coupe

ENGINE
3.8L/560hp/516-lb-ft twin-turbo DOHC 24-valve F-6

TRANSMISSION
seven-speed twin-clutch auto.

CURB WEIGHT (F/R DIST.)
3,610 lb. (39/61%)

WHEELBASE
96.5 in.

LENGTH X WIDTH X HEIGHT
177.4 x 74.0 x 51.0

0-60 MPH
100 ft.

LATERAL ACCELERATION
1.04 g (avg.)

MT FIGURE-EIGHT
23.0 sec. @ 0.93 g (avg.)

EPA CITY/HWY/ FUEL ECON.
17/24/24 mpg



If the acceleration requires a recalibration, the figure-eight requires a new spirituality. The Turbo S is capable of pulling a 1.04 lateral g. Keep in mind, this is at a speed where the car isn't producing any downforce. In higher speed situations, the Turbo S will be even more capable. The figure-eight lap took just 23 seconds, flat. This is on a Pirelli P-Zero that, while good, isn't the stickiest tire Porsche offers as a factory fitment.

The Turbo S has a lot going on while in the turns. There's torque-vectoring pushing power from side to side to get the car to point the nose in the direction you want to go. It's pushing power from front to back to change the balance of the car. The rear tires are steering, directed by an onboard computer. The suspension is changing damping rates and antiroll bar rates several times a second. For a true car nerd, it sometimes becomes difficult to ignore all these things and just enjoy the driving. If you are really trying and are somewhat sensitive to a vehicle's dynamics, you can feel this stuff happening. But, if you can just drive the 911 Turbo S and enjoy it, it delivers the classic Porsche experience.

I don't want to say it's easy to drive fast, because anything at this level is challenging. On top of that, driving a car capable of generating these forces requires a decent level of fitness. Sure, the power steering, supportive seats, and PDK transmission make life easier, but holding up your head, focusing on your line, and making decisions at faster rates than normal will work up a sweat. That's not to say that even a moderately skilled person can be amazingly fast at track days. It's just that driving it to its full potential is not so easy. So don't worry, those of you who work hard honing your driving craft—there will still be a noticeable difference with a skilled driver in a Turbo S.

Porsche estimates more than half of Turbo buyers will opt for the S, and why wouldn't they? If you are buying the Turbo, you want the ultimate in performance. I've already mentioned the value proposition. But the best part is you can add all this performance with no downside to driveability. Stopping a foot short of the finish line would be ridiculous. Get the S, you won't regret it. **EC**

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THE STORY OF BMW'S HOFMEISTER KINK

Words Colin Ryan Photos Courtesy of BMW

NEXT TIME YOU'RE STUCK IN TRAFFIC, or strolling through a parking lot, take a look at all the cars' lowest corners at the rear passenger window. How does the line along the bottom of the glass area intersect with the descending C-pillar? Is it a stark, perfunctory angle? Or is there a little curve that kicks back toward the front? This is not usually the place where an observer's eye will fall first, but it holds a great deal of significance—for BMW designers in particular.

What goes on in this small space is as important an element of the company's styling vocabulary as the famed double kidney grille. This is where the Hofmeister knick, or kink, happens.

One of the big names in contemporary BMW styling is Ohio-born Chris Bangle, who created many influential lines between 1992 and 2009. He also presided over the looks of Mini and Rolls-Royce when he became group design chief in 2007. His thoughts on the kink are enlightening.

"It would be better to use the German spelling 'Hofmeister Knick' not 'kink.' Less 'kinky.' It serves two purposes: one, it permits a reasonable-sized fixed glass triangle to give the rear door window a stabilizing 'straight' drop guide, permitting it to be as far back as possible and still get the glass down all the way. Secondly, it extends the daylight opening of the upper with its extra piece of glass and pushes the door's opening line far back over the wheelhouse, allowing a better entry/exit. If it is too 'pinched' and extended, it actually makes opening the door harder. But beginning the curve of the opening around such a 'knick' is a good way to get a useful opening."

The Hofmeister knick (let's obey Mr. Bangle) is named after Wilhelm Hofmeister, who worked at BMW from 1955 to 1970. As part of a styling team that developed the New Class *Neue Klasse* of BMW cars, he incorporated it into the '61 1500 compact sport sedan and it's been part of the corporate look ever since. As the C-pillar heads downward, it suddenly kinks forward at the pillar's base. This is meant to highlight the car's rear-wheel-drive configuration, another significant component of BMW's core identity.

"Wilhelm Hofmeister was one of the first design directors of BMW," Bangle says. "And, like all of us, passionate about what we do. He got his name attached to something he promoted."

That's right, the knick was not Hofmeister's invention. This shape had been used before as early as 1951 on the Kaiser Deluxe, an American car (despite the German name). Hofmeister was originally a mechanical engineer and had more of a reputation as a good manager than a creative artist. He was in charge of an in-house team but would also commission freelancers such as Giuseppe "Nuccio" Bertone, one of Italy's legendary designers.

Bertone's studio-come-coachworks penned and partially built around 600 examples of the BMW 3200 CS, a coupe whose rearward side windows sported the telltale curve. Both this and the 1500 debuted at the 1961 Frankfurt auto show. So perhaps Hofmeister's legacy owes Bertone a sizable debt of gratitude, since the Hof was no doubt well aware of what was being produced by his outside contractors.

The plot thickens, however, when we learn that a certain stylist who has since become another giant of Italian design, Giorgetto Giugiaro, was working for Bertone at the time. And he might well have been involved in penning the 3200 CS. Looking into the history of the C-pillar corner, Bangle says, "In my time, it evolved rapidly from a weld-and-fill rust generator of the 1960s and '70s to the cut-and-paste weld seam of the Audi and Opel uppers, to the one-piece fully integrated pillar and rear quarter-panel we know today, beginning with the E34 5 Series.

"I was at Fiat at the time and you had to be there to appreciate the shock the E34 had on all of us outside the BMW circle when that C-pillar debuted...super-elegant, it set the tone for all such intersections to



come.” Even if there are no new ideas under the sun, that doesn’t stop other car companies from using the same good ones. The knick is now part of a wider car design language.

“One might think it an imposed restriction,” Bangle says. “But in reality, it is quite a help when designing cars for the brand. The Hofmeister knick—never a ‘dog-leg’—is a wonderfully rich motif and brand icon. Tuning that curve and arguing over the chrome trim—‘Please, God, let them make it in one piece’—and all that goes with it is the stuff that makes designing fun.

“And personal. I would wager every ‘mother’ of a BMW feels only he or she could have made that knick just right. Principal designers on a car are always the car’s ‘mothers.’ Those claiming to be the ‘fathers’ are too numerous to mention and some even try to get their DNA in long after the ‘Conception Time is Over’ bell has rung.”

Kinks, however, are not necessarily sacred cows. Could there ever be a time when BMW might abandon its archetypal arc? Karim Habib, current head of BMW design since June 2012, says: “So much of what influences design is constantly changing, from consumer tastes, social values, and trends to various regulations.

Certain BMW design elements, like the Hofmeister kink, are constants that act as anchors for us. While these elements evolve over time, they allow us to maintain that essential BMW design character that has existed for 50 years.”

Don’t hold your breath waiting for a knick-less BMW, then. ❌



Wilhelm Hofmeister on far left.



WARNING CURVES AHEAD

TWO MINI ITALIAN SUPERCARS 40 YEARS APART

WORDS RORY JURNECKA PHOTOS JESSICA WALKER





IT'S THE SAME STORY AT NEARLY EVERY TURNOUT ON THE ROAD

that twists up Southern California's Palomar Mountain. Motorists pass by slowly, then gawk out their windows. Sometimes they stop for a closer look. Sometimes they've already stopped and saunter over to ask questions, nearly always prefaced by, "That's a beautiful car."

It's tough to blame them. Sitting by the roadside are a '14 Alfa Romeo 4C and a '72 Ferrari Dino 246 GT, two cars that kids from 8 to 80 would agree epitomize excitement on wheels. Although more than 40 years separate our subjects, they're remarkably similar in concept.

The aesthetics strike most people first. Both are voluptuous, with short, low hoodlines and side-mounted scoops aft of the doors—dead giveaways to their mid-engined configurations. With spartan cabins and fixed-back race-inspired seats, each was designed to give the basic elements of a race car experience for the road.

By the time development began on the Dino in the mid-1960s, Enzo Ferrari was certainly no stranger to mid-engined race machines. Ferrari Formula One cars had been mid-engined since 1960 and the marque had a succession of mid-engined sports racers under its belt. Still, *Il Commendatore* was reluctant to build a street car with an engine located behind the driver, worried that its limits would come with too little warning for those whose last names weren't Hill or Surtees. As the story goes, Sergio Pininfarina was instrumental in convincing Enzo otherwise, his studio producing the gorgeous concept for the 1965 Paris motor show and Sergio himself penning sketch after sketch for Enzo's approval. Ultimately, the old man relented.

The engine was deliberately small: The little four-cam V-6 that Enzo's son, Alfredo (nicknamed "Dino"), is said to have helped develop before his early death in 1956 of leukemia. This motor was already successful in F1—a 1.5L version propelled Mike Hawthorne to the 1958 world championship. A few years later, 2.0L

and 2.4L versions made their way into the 206SP and 246SP racers, respectively. Putting it in the Dino had another advantage: It would help with homologation for Formula Two.

To build the engine in suitable numbers, Ferrari relied on its fairly recent partnership with Fiat. If Fiat produced them at its Turin plant, it was free to use them in a car of its own. So was born the front-engined Fiat Dino, but that's a story for another time.

The first Dino 206 GT hit the streets in 1968, producing roughly 180 hp from its all-alloy, transversely mounted 2.0L V-6. The cars themselves were entirely alloy-bodied as well, but construction changed to a mix of steel and alloy panels by late 1969 when the 246 GT debuted. This latter model's 2.4L engine produced a claimed 195 hp and 166 lb-ft of torque, but the power increase only just offset the extra weight.

A five-speed manual gearbox was used in both cars, with disc brakes at all four corners and even a limited-slip differential. As either a tribute to his son or a clever marketing move (perhaps a little of both), no Ferrari badges adorned the exterior of any Dino. Instead, the now-iconic blue "Dino" signature on a yellow background was located on the nose, steering wheel, and wheel caps, the Dino line essentially being a sub-brand. The only place the Ferrari name appeared was on the build tag in the driver-side doorjamb, leading to decades of "is it or isn't it a Ferrari?" debate. Regardless, there's no denying that good examples like our featured car are \$400,000 works of art these days.

The Alfa was designed in a more corporate environment, but the goal was the same: a small, lithe, somewhat affordable baby supercar. To that end, the Alfa is built around a hand-laid carbon-fiber tub, in what is essentially the same expensive process used by F1 manufacturers. It's partly the reason that capacity is just 1,000 units a year, and it's unlikely the company will see much profit from this model.



THE DINO KING

Jon Gunderson restored the silver '72 Dino 246 GT shown in this story at his shop in Escondido, California. Gunderson caught the Dino bug as a young American traveling abroad, going on to own several examples. After retiring, he began tearing down a Dino to satiate his workaholic tendencies. With no previous experience, he went on to restore that car before setting up shop in a local warehouse to restore them for customers. He currently has nearly a decade of experience and multiple restorations completed, with several more in progress. For more information, or to see his current projects, visit dinorestoration.com.



Behind the cabin sits a 1,742cc turbocharged inline-four (Alfa rounds up to 1,750 for legacy's sake) that produces 237 hp and 258 lb-ft of torque. In a car this pure, there will be cries for a good old-fashioned manual gearbox, but those cries will likely go unassuaged, if not unnoticed. Instead, the only gearbox currently on offer is the six-speed dual-clutch unit that also serves duty in the (cough) Dodge Dart. Feel free to substitute Alfa Giulietta for Dodge Dart if that makes you feel any better.

Nevertheless, the Alfa is a proper modern sports car, with a tubular control-arm suspension up front, a fairly technical strut setup in the rear, and Brembo brakes with drilled rotors all around. Our tester also has the optional so-called racing exhaust, which is simply to say there isn't a muffler, just a straight pipe to the catalytic converter. The track package adds a stiffer suspension and quintessentially Alfa 18- and 19-inch wheels wrapped in exclusive

Pirelli P Zero tires. With a few other extras, our 4C Launch Edition comes to nearly \$70,000. Which means you could buy five of them and still have money left over from selling a primo Dino.

But enough quibbling over price—these cars were meant to drive. Jon Gunderson, the man who has not only graciously brought along the Dino but finished its rotisserie restoration just the evening before, throws over his keys and tells me to have fun. The Dino's door opens by pulling a delicate-looking chrome lever just below the window on the trailing edge. A click later and I'm dropping down into the gorgeous burgundy bucket seat and buckling up.

There's not much to the surprisingly roomy and comfortable cabin. The long, chrome shift lever sprouts from traditional Ferrari gates. The half-moon-shaped dashboard is correctly covered in the period "mouse fur" material, with a few switches that look vaguely like

ventilation controls and an aluminum-trimmed instrument panel with jewel-like Veglia Borletti gauges wearing the Dino logo. Turn the Dino's unassuming key to the first position and the electric fuel pump starts whirring out back. Twist the key all the way and the high-pitched starter spins, followed a moment later by a metallic bark as it fires up. Slot the lever down and left into the dog-leg first gear, release the semi-heavy clutch, and we're off.

The Dino is easy to get moving smoothly, despite heavy steering at parking speeds and a typically Italian driving position, with a fairly flat dish to the steering wheel that is a bit too far away (or conversely, the pedals are too close). Never mind, I'm quickly getting used to the car and our mountain road is starting to feel like a hillclimb stage. The Dino engine is an utter joy, with a torquely, silky character that makes it vital to keep an eye on the redline when starting out.



TECH SPEC

'15 ALFA ROMEO 4C

BASE PRICE

\$55,195

PRICE AS TESTED

10/7/20140/7/20140/7/2014

VEHICLE LAYOUT

Mid-engine, RWD, two-pass, two-door coupe

ENGINE

1.7L, 237hp, 258-lb-ft, DOHC 16-valve I-4

TRANSMISSION

six-speed twin-clutch auto

CURB WEIGHT (F/R DIST)

2462 lb. (40/60%)

WHEELBASE

93.7 in.

LENGTH x WIDTH x HEIGHT

157.5 x 73.5 x 46.6 in.

0-60 MHP

4.1 sec.

QUARTER-MILE

12.7 sec. @ 106.7 mph

BREAKING, 60-0 MHP

97 ft.

LATERAL ACCELERATION

0.93 g (avg.)

MT FIGURE-EIGHT

24.9 sec. @ 0.79 g (avg.)

EPA CITY/HWY/CPMP FUEL ECONOMY

24/34/28 MPG

ENERGY COINS., CITY/HWY

140/99 kW-hrs/100 miles

CO2 EMISSIONS

0.70 lb./mile



Power delivery is linear and by the time I've passed 4,500 rpm, the engine absolutely yowls on its way toward the 7,800-rpm redline, the triple Webers lending a throaty induction overtone. Truth is, a well-driven Golf TSI will outrun a Dino any day of the week. Still, there's such a sensation of speed with the low seating position, the view out the wraparound windshield, and the sound of that glorious popping and spitting between rev-matched downshifts into the next hairpin. The car corners nearly flat and the ride quality is shockingly good. It's a highly visceral experience that cements the Dino's place as an extremely special car. I could keep driving this same stretch of road all day, frankly, but there's an Alfa Romeo to get back to.

Like the Dino, there's little to single out as special in the 4C's cabin. There's little in the cabin, period. No armrests, no glovebox, no nifty trim details. Just a pouch under the dashboard for registration and insurance papers, two plastic cupholders mounted as non-ergonomically as possible in the center console, a drive mode toggle switch, and a host of buttons to put the car in gear. With the Alfa's wide carbon sills, it's more of a challenge to get inside. But it's not too bad once you're there, unless you're the passenger. In which case the center stack intrudes on the legs a bit.

Close the door and thumb the start button. Wait a moment, the starter motor engages and sets the engine into a loud thrumming sound. Foot on the brake, push the "1" button for First



TECH SPEC

'72 FERRARI DINO 246 GT

BASE PRICE

\$14,000 (est. cost new) \$400,000 (est. value)

VEHICLE LAYOUT

Mid-engine, RWD, two-pass, two-door coupe

ENGINE

2.4L, 195hp, 166-lb-ft, 3 Weber 40 DCN DOHC 12-valve V-6

TRANSMISSION

five-speed manual

CURB WEIGHT (F/R DIST)

2,500 lb. (est.)

WHEELBASE

92.1

LENGTH x WIDTH x HEIGHT

166.7 x 66.9 x 44.7 in.

0-60 MPH

7.0 sec. (est.)

gear, the “A/M” button to select manual mode, gas it, and go. The steering feels even heavier than the Dino’s moving away; no power assist here. And the cacophony of noises on the other side of the glass behind my head is in full swing. Any brief stab on the throttle has the turbocharger whistling and whooshing, while the engine starts revving with a gravelly bellow. The steering starts to lighten a little and the thick rim of the wheel starts to come alive, following little seams in the road as if laser guided.

It’s clear right away that the 4C is little fun at low speed. It’s noisy, rough-riding, and every little sound seems to get amplified and thrown around the hard-trimmed cabin. A daily driver the Alfa is not. But as speed increases, so does my interest. Acceleration is a rush, especially after the Dino, and the car is so pure, so precise. The brake pedal is firm and there’s not much travel. Like a race car, you push the pedal harder, not farther to stop faster. There’s a hint of initial understeer at most corner entries, easily rectified with a little trail braking or, more entertainingly, a stab of the throttle mid-turn, which brings the rear around just so with the engine rasping at full chat. There are few more focused cars today than the 4C.





Those who want the Alfa Romeo 4C to combine elegance, passion, and performance—basically, a baby Ferrari 458—will be disappointed. There's no such grace in the 4C's driving experience. It's just full-bore madness all the time. It's an Italian-made Radical racer for the street. And yes, your wife will absolutely hate it. The Dino—in contrast, and despite being 42 years old—almost feels like it could be driven every day. It has that magical Ferrari ride quality that somehow manages to make the car feel light, stiff, substantial, and compliant all at the same time. And it's a true rolling sculpture on the road, making great noises to boot. Given a sunny morning and no particular place to be, I'd gladly take either. 

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RACING BUG

TANNER FOUST CATCHES
IT SEVERAL TIMES IN THE
VW ANDRETTI AUTOSPORT
BEETLE GRC

WORDS RYAN JURNECKA

IT'S NOT EVERY DAY A VOLKSWAGEN

Beetle goes flying through the air. However, during one September weekend in Southern California, rallycross fans were treated to just such a sight. It was the seventh and eighth round of the Red Bull Global Rallycross Championship (GRC), where Volkswagen Andretti Rallycross unleashed the car on which its pinned its hopes for next year and beyond: the VW Beetle GRC. It's not just a literal leap, but also a figurative one from the beginning of the 2014 season, when the team fielded two Polos rented from a Swedish team, Marklund Racing. ■





The idea was to use this year as a learning process to build up the team and infrastructure. The driver choices were a good start: Scott Speed (the last American Formula One driver and experienced NASCAR racer) and Tanner Foust, *Top Gear* U.S. co-host, renowned stunt driver, rally driver, and drifter. Foust has enjoyed considerable success in this series, having been champion for the first two years and runner-up last season.

Speed won his first-ever race in GRC at the beginning of last year's season, prompting what was meant to be a one-off drive into a full calendar and scoring a second victory toward the end. "I love (racing in GRC)," Speed says. "It brings me back to when I was racing karts as a kid. The cars are just like super karts."

The Red Bull Global Rallycross Championship held its first race during the X Games in Los Angeles in 2010 and began its first full season in 2011. The 2014 season ran 10 main races, all in the United States—except for the opener, which was part of the *Top Gear* Festival in Barbados.

A typical race weekend includes practice and then qualifying for several six-lap heats of four cars, allowing drivers to earn a bonus point or three depending on where they finish. After the heats come the two semifinals. The top three from each semifinal advance to the main event. The remaining cars go into a Last Chance Qualifying (LCQ) session, where the top four move on to the final.

All the tracks, ranging in length from half a mile to a mile, are temporary. So there's a variety of layouts with dirt or tarmac surfaces, a signature jump, and a "joker" lane. The joker lane tends to have a faster inside line that adds a level of strategy, as it can only be used once. Leading drivers tend to take it on the first lap to extend their advantage, while others wait to use it as their best chance for a late pass.

The Port of Los Angeles meet in San Pedro is the season's only doubleheader, with two main events and double the corresponding heats. Going into this weekend, Speed is third in the championship, trailing the leader—Nelson Piquet Jr. (of F1 crashgate fame)—by more than 50 points and 15 points behind Second-Place Ken Block, gymkhana driver extraordinaire.

With each win worth 50 points, the championship is still open. The team opted to keep Speed in the Polo, while giving Foust, who has had a fraught season with only one victory, the job of development racer for the new Beetle, something the driver is not exactly happy about. "Ultimately, I'm a racer," he says. "I want to win. I don't like doing developing on the track." And this is a tight circuit. "Even though I'm driving a Beetle, it feels like a huge car on a little track."

This is the first year Volkswagen Motorsport and Andretti Autosport have participated in GRC. A VW Polo was raced by Marklund one weekend last season, but the manufacturer was not actively involved at that stage. Behind



the scenes, though, the VW/Andretti partnership was taking shape.

In late 2012, Andretti Sports Marketing ran the final GRC race in Las Vegas. "I really liked it. I thought it had a lot of potential," says Michael Andretti, who still exudes the same charisma he did as a champion driver. "We're going after the millennials. The biggest problem in racing today is that our demographics are getting older, so we have to go where we hopefully have sustainability."

It was also at the Vegas race where

Andretti met Jost Capito, head of Volkswagen Motorsport, who saw the series as a way to attract more attention to the VW brand. "When you're selling small cars in the United States, you have to look to how you can attract customers. And motorsport is always quite good [at accomplishing this]," Capito says. "But we had to find out what the opportunity is for small cars to be involved. Rallycross is the fastest-growing motorsport in the country right now, and interesting and attractive for small cars."



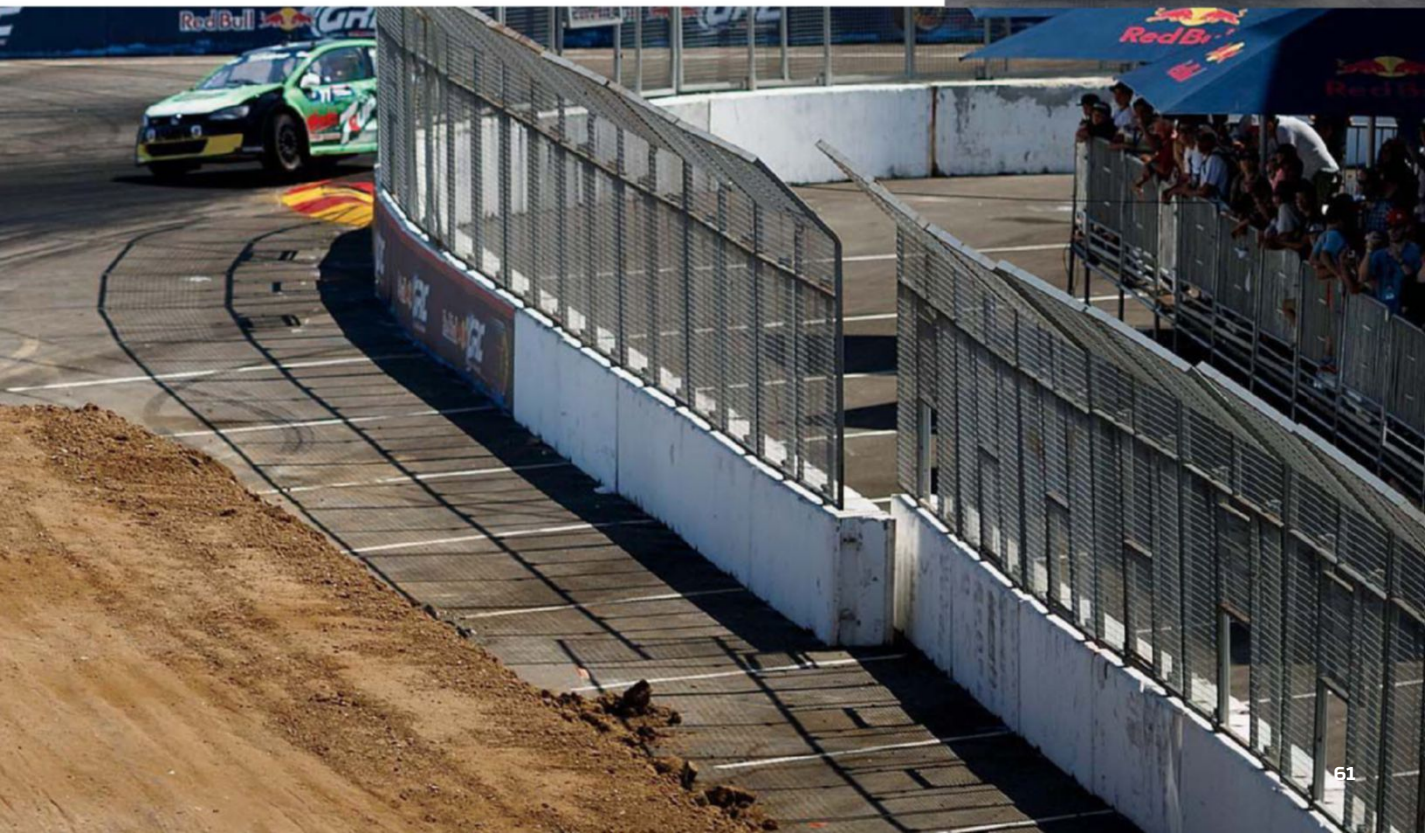


The VW Beetle GRC car rolled out of its trailer on Friday morning, covered in bright-yellow Rockstar Energy Drink sponsorship decals. Interestingly, not a conflict of interest, given the Red Bull-branded series. It shares the same body and chassis as the third-generation road-going version, but that's it. A bespoke 1.6L turbocharged engine propels the car from 0 to 60 mph in just 2.1 seconds, making it probably the fastest Beetle on the planet.

Its practice debut was cautious, though, posting the second-slowest lap time. In

qualifying, the Beetle showed more of its might as Foust finished seventh fastest. But the true test would be the first four-car heat.

The series has an F1-style standing start. After a sequence of red lights, a solid row of green lights signifies the start. It's an exciting moment to hear the engines bouncing off their rev limiters. The crowd stands up and peers at the field to see who will get off the line first, which is crucial for gaining the inside line and not being swamped by door-banging competitors.





With the excitement on the Beetle, we can't overlook Speed's win on Saturday.



During the first standing start, Foust's left foot slips off the clutch pedal, causing the car to roll forward enough for the other teams to complain. Once the heat is under way, he's chasing the leader when a 5-second stop-and-go penalty for the false start is imposed, planting him right at the back. By the closing lap, he challenges Third-Place Bucky Lasek (in a Subaru WRX STI), riding right on his tail but finding no way around.

Drivers dread being on the back foot in these early stages, as the fast-paced schedule creates a snowball effect. Foust will be starting the semifinals at the back, where paint swapping is almost inevitable. However, he's happy. "The Beetle is pretty exceptional right out of the box," he says. And he's surprised with the improved feeling from when he first tested the car in Italy a couple of months before.


Saturday's semifinals begin and the Beetle sees its first bruises of the weekend. Contact with Piquet and Austin Dyne knocks the heat exchanger out of place. Chrome accents are missing and there are scrapes all across its wide front. Foust finishes Fifth. Next stop, the LCQ, where a spot in the top four is vital. Foust and the Beetle do better than that, taking a maiden win while raising cheers from the crowd and bolstering the team's confidence.

A good start during the main event brings the chance to challenge hard for Block's third position. A female fan shouts "Go on, Beetle" as the car slides by the grandstands, showering the crowd in rubber and dust. But with only two laps to go, steam billows out from under the hood and the Beetle's newfound supporters let out an audible groan.

Debris from Block's drifting car hit the Beetle's intercooler, creating a chain reaction of escalating temperatures. The ever-sharp Foust cut the ignition in time to save the engine. Volkswagen Motorsport engineers from Germany make up a small percentage of the team this weekend and the car is ready in time for the first practice session of the next race schedule, where it goes sixth fastest.

On Sunday, things are looking good as Foust places the Beetle fourth in qualifying. Even the heat begins well. The Beetle rockets off the line, prompting cheers from the crowd. Suddenly a spark plug tip breaks off and ricochets around the engine. On the fourth lap, the stricken Beetle is passed by Block. Foust pulls the car off the track soon after.

Back in the garage, the team scramble to repair what they can, but rather than take a chance and destroy the engine in future sessions, they decide to retire the car.

The run was brief, but the potential was shown. Foust in particular takes several highs from the weekend, including a third fastest time up to that point. "The car is wickedly fast," he says. "It's got the whole paddock nervous. It's a crowd favorite and shows so much promise that you can't walk away from here upset." 



HEADS UP

RACING HELMET BUYER'S GUIDE

WORDS COLIN RYAN PHOTO ROBERT GUIO

As well as protecting heads, our buying guide can also offer some protection for the wallet. We have lids here ranging from \$259 to \$6,000, with features from simple straps and visors to intercoms and ingenious methods of emergency removal. All are approved to Snell SA2010 standards. Have fun, be safe.

1. STAND 21 IVOS-DOUBLE DUTY

This full carbon helmet has an aramid inner section and comes with a clear visor and a peak, so it can be used in open- as well as closed-cockpit cars. The visor is 0.12 of an inch (3 mm) thick and tested for fire and impact. The lining is a durable expanded polypropylene. It's available in a couple of forms: The Snell SA2010-spec version comes with HANS M6 terminal post anchors and weighs 3.2 pounds. The FIA 8860-2010 version also has those M6 anchors and weighs 3.4 pounds. The top wing is an optional extra on either model. Stand 21 also has this ingenious item called a Lid Lifter that is part of a Nomex balaclava and allows a helmet to be lifted off gently, without risking further damage to a driver who's been in a crash; this could be the best \$110 you ever spent on race gear. The SA2010 model starts at \$2,099. The FIA 8860-spec equivalent goes from **\$3,090**. stand21na.com

2. OMP SPEED 10

A large aperture and a sunshade, plus full face protection, mean this helmet offers

the best of both worlds. There's even a hole for a drinking tube. As well as those vents across the chin, there are two vents at the top and two at the back. The sun shield can be swapped for a conventional full-face visor if desired. It also does the whole variable cheek padding thing. Composite shell, weighs 5 pounds. Pre-drilled for HANS M6 clips. **\$599**. ompamerica.com

3. ARAI GP-5W

This is one of Arai's most popular helmets for car racers. It has a large aperture (3.5 inches top to bottom), two IC Duct-2 vents at the front, and a Delta Duct around the back, plus pre-installed threaded M6 female studs for the HANS post anchor system. The proprietary Lightweight Super Complex Laminate System (SCLS) construction offsets

any weight issue with having a larger shield. The cheek pads are removable for washing and replaceable with pads of various thicknesses for a snug custom fit. Kevlar straps; Nomex liner. **\$899.95**. araiamericas.com

4. SCHUBERTH SF1

Anyone who follows Formula One will recognize the Schubert name, especially





if they're fans of Fernando Alonso. That F1 helmet expertise is now available to the rest of us, which amounts to 18 layers of Toray T1000 carbon fiber (the kind used in aerospace) and carbon aramid hybrid fiber compressed and hardened into an optimal aerodynamic shape. The polycarbonate visor is 0.15 of an inch thick (4 mm) and it's bulletproof. The visor locks

tight. With 10 air inlets and 6 outlets, 2.6 gallons per second of fresh air blow through the SF1 at 62 mph. The chin strap is flame-resistant aramid fiber. Naturally, it's set up for HANS. A middle size two weighs 3.25 pounds. Certified for Snell SA2010 and FIA 8860-2004. The purchase process involves receiving a personalized fit. **\$6,000**, including three visors of different tints, extra visor

hardware, a set of Racing Optics tear-offs, and a deluxe helmet bag. schubertnorthamerica.com

5. OMP SPORT

OMP's Sport range is the company's cheaper line. But this fiberglass helmet isn't too basic. It still has removable cheek pads, soft-knit fire-retardant lining, air vents and is HANS ready. It comes in white

only and weighs 3.4 pounds. Consider it a safe but economical option. **\$259.**

ompsport.com

6. HJC SI-12R

A super-light composite weave means this helmet weighs just 3.2 pounds. Its anti-fog/anti-scratch shield provides 95 percent UV protection, while the moisture-wicking lining is removable and washable. The front top vent is titanium and is just part of the helmet's advanced ventilation system. The version pictured here is finished in Rubbertone Black. Comes with its own hardshell case and is pre-drilled for HANS posts. Noise-reducing ear cups are optional and sold separately. **\$675.99.**

hjhelmets.com

7. BELL MAG-1 RALLY


This open-face helmet is constructed with a composite shell, features removable cheek pads, and its big selling point is that it comes with a noise-canceling intercom microphone on an adjustable boom. It also has ultra-thin integrated speakers (no ear cups), and the intercom setup is fully compatible with Peltor systems. HANS anchors are pre-installed, so it's ready to rally as soon as it comes out of the box. **\$459.95.**

bellracing.com

8. BELL SPORT

Bell is one of the giants on Planet Helmet, and several of its lids go deep into the four figures. But the company's Sport line is aimed at the entry-level racer whose budget isn't on a par with the whole Ferrari F1 team. Yet it still has pre-drilled HANS points, decent ventilation, and interchangeable cheek pads. All for less than 3 pounds in weight. The composite shell has a standard aperture, protected by a 281 SRV shield and the lower-profile SRV-2 pivot system. **\$299.95.**

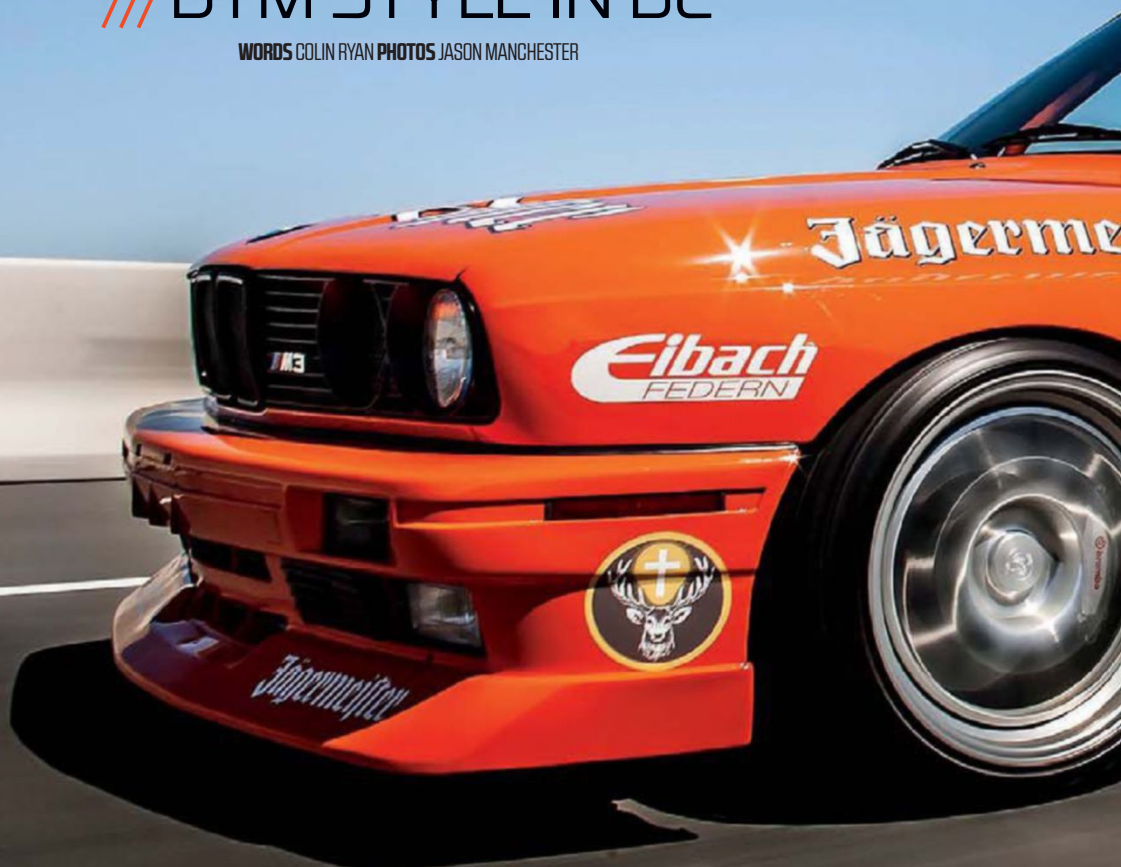
bellracing.com

Our deepest thanks to Subé Sports of Huntington Beach, California, for supplying some of our "models" (Bell, Arai, OMP) and stocking a ton of cool racing-related stuff. Contact them on (714) 847-1501 or through subesports.com. 

ORANGE CRUSH

///DTM STYLE IN BC

WORDS COLIN RYAN PHOTOS JASON MANCHESTER







THERE ARE SOME THINGS JÄGERMEISTER-RELATED WE MAY OR MAY NOT BE GRATEFUL FOR,

but the sticky liquor's involvement in German Touring Cars (DTM) is definitely a plus. This combination of vivid orange livery on one of the most desirable cars in the world is a traffic-stopping, head-turning event.

It's the work of Christian Georg Besemer and his CG Motorsports shop. Based in Richmond, British Columbia (immediately south of Vancouver), Besemer says, "our specialty is anything M." It didn't start that way, though.

"I was a big Volkswagen guy back in the day and wanted to work at the local dealers," Besemer says. "But my dad already worked there and didn't want me to get a job at the same place, just in case people thought there might be any favoritism. So I walked across the street to the BMW dealer and they hired me. This was in 1989. I stayed with them and got a journeyman license."

This was also how Besemer grew to appreciate the many virtues of the blue-and-white roundel, although the VW habit was tough to kick. "All the money I earned at BMW went into Corrados and Sciroccos. My true passion was performance. And being a tech, I'd see cars come in that were modified the wrong way. That was sad for me."

This frustration led to setting up his own shop in 1999. "We originally did VW and BMW tuning, but eventually drifted away from VW. So did my customers. Now we're only BMW. We do a lot of servicing. BMW is building its cars so well these days that it's extremely expensive to make any worthwhile modifications. This Jägermeister M3 is a treat for us."

Besemer owns a couple of M3s himself and has built four cars similar to this one. In fact, client Ari Burstein (erstwhile H&R distributor in Canada and now a big man in the steel business) pestered Besemer regularly to sell him an M3. Finally, Besemer suggested that his shop build one to Burstein's specs. So they looked around for the ideal wheels. "The hunt is the most exciting thing," Besemer says. Incidentally, *jäger* means "hunt" in German.

This car started out as a white E30, but Burstein didn't want to see any trace of the old paintwork when opening the doors or lifting the hood. So it was stripped down completely for the full orange Monty. But what started out as a DTM replica suddenly became an example of mission creep. Burstein wanted a rollcage (it's an OMP unit) and the Euro-spec S50B32 engine from an E36 M3.





“Putting an E36 engine into an E30 bay was fairly straightforward,” Besemer says, with a modesty that doesn’t even hint at the ingenious use of original BMW components. “We didn’t have to build anything fancy. We borrowed from the parts bins of various models, including the E21 (the first-generation 3 Series), E24 (’80s 6 Series), E28 (’80s 5 Series), E32 (’80s 7 Series), E46 (fourth-generation 3 Series), and E53 (first-generation X5). If the techs at BMW had built one of these, they might well have done the same thing.”

Naturally, the quest for power didn’t stop there, not when there’s the chance of adding a supercharger. Besemer turned to Active Autowerke. “They’re the go-to guys for forced induction in BMW cars,” he says. They had a stage one tune all ready to go, but of course, Burstein wanted a stage two, which Active Autowerke had not developed up to that point. “So we transported the car down to their shop in Florida.” And in went a methanol injection system as well. Joining the right kind of Miami vice are CP low-compression pistons and a Walbro 400 liters per hour fuel pump.

TECH SPEC

'88 BMW E30 M3

Ari Burstein

Vancouver, British Columbia, Canada

ENGINE

Euro-spec E36 M3 S50B32, custom Active Autowerke stage two supercharger system w/methanol injection, E36 radiator, oil cooler, headers, Eisenmann muffler

DRIVETRAIN

Z3M limited-slip differential, JB Racing lightweight aluminum flywheel and heavy duty clutch, UUC Motorwerks short shift kit

BRAKES

Brembo four-piston calipers, 13-in. cross-drilled rotors, Hawk HPS track pads (f), Brembo 11-in. cross-drilled rotors, Hawk HPS track pads (r)

SUSPENSION

Ground Control coilovers, Racing Dynamics antiroll bars

WHEELS & TIRES

17x8.5 Fikse Profil 10 forged alloy wheels, 215/40 Toyo Proxes P1 tires (f); 17x10 Fikse Profil 10 forged alloy wheels, 245/35 Toyo Proxes P1 tires (r)

EXTERIOR

Evo II front chin, Sport Evo rear wing, Hamann fuel door, custom E36 M3 side mirrors, Jägermeister livery

INTERIOR

OMP roll cage, Graphic Design seatbelts, Recaro Sportster CS front seats, Podi vent system, Hamann pedals and aluminum gear knob

THANKS

Rudolf Buchler, main technician/fabricator; Walter Siu, Bismark Collision

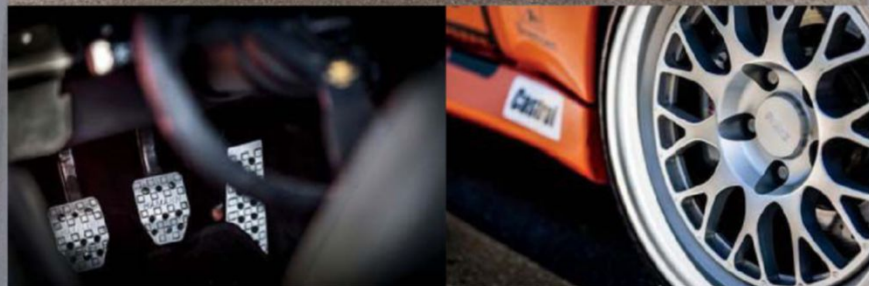
"The big hurdle was the intercooler,"

Besemer says. "We modified everything in the kit to make all the pipes fit." Plumbing in general has been a challenge. Take the headers, for example. "It's best to have all six tubes the same length. We found the factory E36 headers were not only a beautiful design, but they also worked the best. We customized a mandrel-bent centersection and that goes to an Eisenmann muffler." As well as servicing the aftermarket, Eisenmann is an OE supplier to Porsche and AMG.

The few transmission tweaks were a JB Racing lightweight aluminum flywheel and heavy-duty clutch, UUC Motorwerks short shift kit, and the limited-slip differential from a Z3M. "It holds an extra liter of oil," Besemer says. "And the fanned casing helps keep things cool."

This idea of cannibalizing later models to benefit a BMW from the past was repeated with the steering rack. It's another Z3M component, chosen for its close-ratio gearing. And note the front fascia from an Evolution II M3, a variant that never came to the United States.

No go-faster build is complete without the ability to slow down. Besemer installed a Brembo big brake setup at the front, with four-piston calipers biting on 13-inch one-piece cross-drilled discs with Hawk HPS track pads. The rears have 11-inch Brembo cross-drilled discs and the same Hawk pads.



Ground Control coilovers and Racing Dynamics antiroll bars (thankfully, an over-the-counter purchase that didn't need any extra tweaking) collude with Toyo Proxes P1 tires on Fikse Profil 10 forged alloy wheels to provide dynamics, traction, and grip. Which is where the real fun starts. "The widest rear tire you can fit on this M3 is a 245," Besemer says. "This car will light those tires up in Third gear. The power is almost unusable."

Almost, but somehow Burstein manages to drive it, even though the dyno says 414 hp at a screaming 7,300 rpm and 317 lb-ft of torque at a similarly busy 6,500 rpm, measured at the wheels. He sits in a Recaro Sportster CS seat, buckles up his orange Graphic Design seat belt, adjusts his E36 side mirrors, squints at Podi vent-mounted gauges, then puts his feet on Hamann pedals.

And he'll be heading to Area 27 as soon as that project is completed. It's a new racing facility in South Okanagan (apparently one of the warmest and driest places in Canada) with a track designed by former F1 racer Jacques Villeneuve.

"It's not just a straight-line machine," Besemer says. "It has the power and the handling. It's the best of all worlds." Not that we should ever think of this build as finished. Besemer says, "This is the type of car that will never be done." ■







WORDS MATT ZUCHOWSKI PHOTOS IVAN VASSILEV

DRIVING A VINTAGE ROADSTER is way more enjoyable than the average Ford Focus. But there's a good reason why we don't see more classic Benzes and Alfas around. In real life, they're a pain in the neck. The driver has to take care of so many things that are now handled automatically, constantly reminded of the limitations in half-century-old technology. It's true they don't build 'em like they used to, but that means something totally different to the owner than it does to the enthusiastic onlooker.

Classic cars are romanticized. Sentiment keeps our eyes on the good and closes them toward the bad. The 280 SL, the most potent version of the Mercedes-Benz W113 (like the dark green car seen here), debuted in 1969, the same year as Woodstock. Today, that festival is remembered as an exceptional event, something that will never happen again. Not many, though, remember the dirt, the two fatalities during the three days, and the fact that Hendrix eventually appeared on stage at 8:30 in the morning for those few people who had endured until then.

It's a similar case with the Pagoda (or any other '69 car, for that matter). Yes, it's still a drop-dead gorgeous roadster, maintaining its inimitable style thanks to elegant proportions and that distinctive concave roof. But even with virtually indestructible build quality and relatively simple engineering, the Pagoda is no match for today's cars in terms of safety, reliability, or performance.

It's tempting, then, to conceive of a car that retains the best aspects of an old-school driving experience but also comes with modern-day sophistication. Mechatronik has done it and made it. It's the dark gray car in the photos, the Mechatronik M-SL 430. And it's ideal.

Less than 20 years old, the Mechatronik workshop is younger than the cars inside. But it has managed to earn such a good reputation that the 60,000-square-foot high-tech garage in the small German town of Pleidelsheim attracts classic Benzes of all sorts from all over the world. It's no exaggeration to say Mechatronik achieves a level of artisanship that Mercedes-Benz, as a mass producer, simply cannot afford to match.

The restored green Pagoda here is ammunition for that argument. To say it seems as if it has come straight from the showroom would be an understatement. It looks better than any Pagoda that ever left the factory. No wonder, given that it took Mercedes-Benz 200 hours to build one SL, while Mechatronik spends 1,500 hours rebuilding it.

Mecha Stars

MECHATRONIC TAKES A CLASSIC SL TO NEW HEIGHTS



This means that when a Pagoda or any other post-'45 Mercedes-Benz is taken in for a full restoration job, the finished product won't be ready for about two years. Over this time, the car won't be gathering dust. It takes the team of 50 workers six to eight months just to bring the oily bits up to Mechatronik standards. Even a seemingly straightforward process as painting takes two months.

"A chromed pimple is still a pimple," says Thorsten Klenk, Mechatronik's managing director and, unsurprisingly, a perfectionist. If an original part needs replacing with a new one, Mechatronik bases its work on its own parts whenever possible. The company will go as far as building a new wiring harness.

To give the owner an idea of what he has paid so much for, he's given a big book with photos documenting each step of the renovation. The back is finished with the same leather as the one used in the car's interior and then covered in the same cloth as the convertible roof. Talk about attention to detail.

Company founder Frank Rickert gained his experience from building prototypes at Mercedes-Benz. His specialization in restoration quickly evolved into making them even more special. As clients kept asking for a classic Benz they could use every day, he began toying with the idea of putting a modern drivetrain into a Pagoda. After experimenting with a couple of Mercedes-Benz engines, he ended up with a

4.3L M113 V-8 that had originally served in the C43 AMG of the early 2000s.

Lift the hood of the M-SL and in place of the regular inline-six and some auxiliary units on the sides, the engine bay is crammed with the modern plastic cover of an alloy AMG engine. That's the size and weight limit a Pagoda can bear without making changes to the body structure. Which brings us to one of the most interesting things about these Mechatronik cars: although it takes a great amount of time and money to strip a Pagoda down to the last nut and rebuild it to the customer's taste, every change is totally reversible and the old parts are kept in the shop so the owner can revert to the original state without leaving any trace of this rejuvenation process.

The M-SL looks almost original. Only after comparing it with the green Pagoda does it reveal its performance purpose, wearing wider tires and sitting closer to the ground.

Inside are more hints of the tremendous effort Mechatronik has devoted to each of these cars: the period-looking Becker radio is actually a modern unit with an advanced sound system and navigation; side windows are now electric; a gear lever with the shift pattern introduced decades later reveals the presence of the 5G-Tronic automatic transmission; the seatbelts are three-point; the big, over-stuffed seats are as well sprung as ever, but now they're also heated.



“Company founder Frank Rickert gained his experience from building prototypes at Mercedes-Benz.”



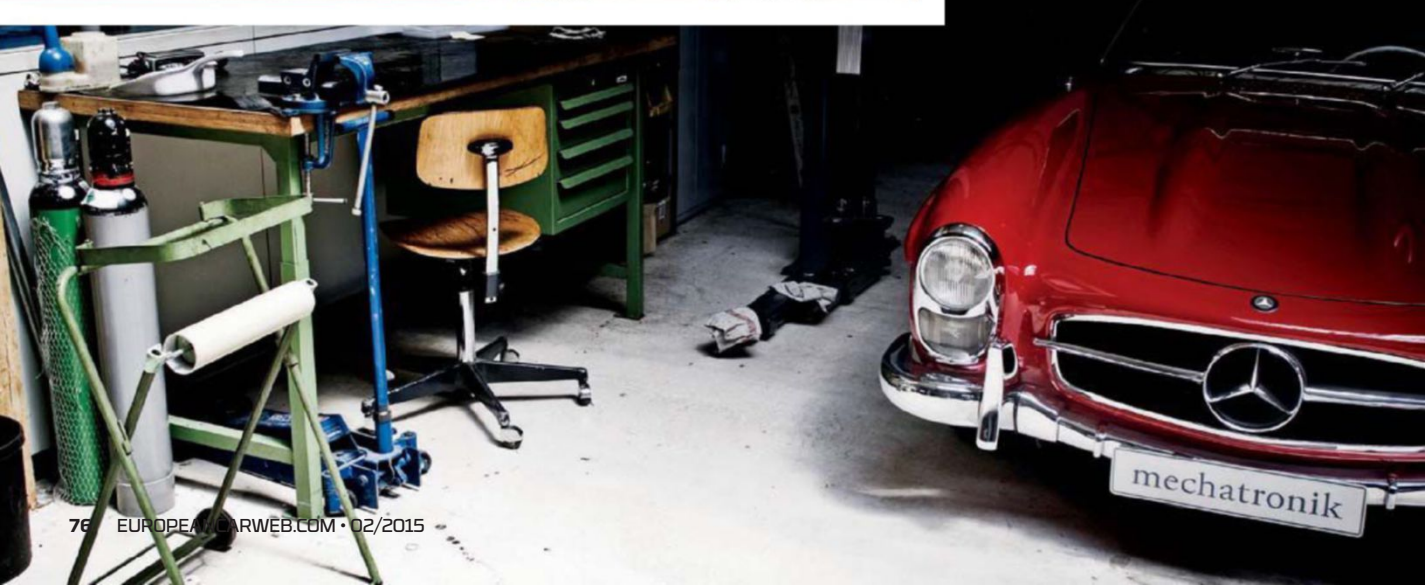


The driver's right elbow now settles on a masterfully integrated leather armrest sitting on the wood-veneered center console. Everything about the interior is new, but it looks so perfectly correct that Janis Joplin would still have prayed for one of these.

To appreciate how good the Mechatronik car is, I start by taking an original Pagoda for a spin. It's a peaceful experience. Like most period Benzes, the Pagoda is coveted for its comfort, and it's no different today, with the car floating gently on soft springs. I don't know if it's the presence of the 80 percent more powerful and 70 percent more torque counterpart beside it, but I soon wish for more power.

And that's exactly where the Mechatronik M-SL Pagoda shines. It will sprint from standstill to 60 mph in 6.5 seconds, while the top speed is limited electronically to 145 mph. It's a properly fast car for a '69 convertible. So, for the ultimate Pagoda experience, Mechatronik has installed modern brakes with ABS and traction control, together with an uprated suspension of Eibach springs and KW dampers.

The crisp, vibrant note from a '69 inline-six is succeeded by a deep V-8 rumble, although the relaxed nature of a luxury convertible remains. The M-SL still moves quietly and effortlessly with the driver kept in awe by the jitter-free ride, which is nowhere to be found in a modern car with such performance figures. From behind the delicately thin, bus-diameter plastic steering wheel, I don't really feel like pushing hard. But when I eventually stab the right pedal, massive torque hits instantly, making the rear tires struggle for traction. And it's not only the lower region of the rev counter where the M113 engine excels. Having just driven the original Pagoda, the M-SL is almost shocking in its willingness to rev. The steering system and the transmission stay on the relaxed side, but the whole chassis forms an instantly reactive, impressively dynamic package.






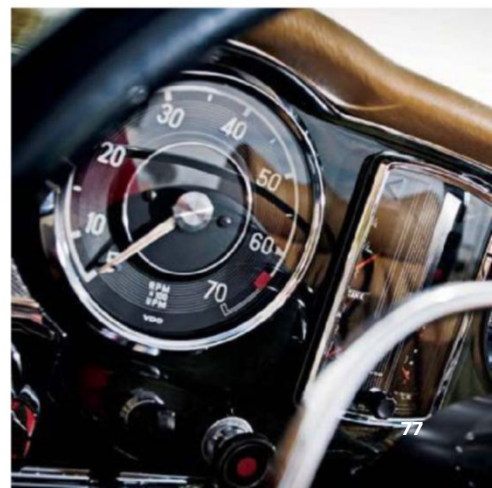
Germany has the advantage of derestricted autobahns. The speedo quickly shows 130 mph, and it surely wouldn't stop there but for the incredulity of other road users. Even at high speeds, the Mechatronik Pagoda remains impressively planted—and it's comforting to know the brakes will do what's expected by modern standards.



Mercedes-Benz once embarked on a similar project, a Pagoda with an M100 V-8. It was an experiment by Erich Waxenberger, the legendary head of M-B's technical department, a man we should thank for making the legendary W109 300SEL 6.3, paving the way for all future fast Benzes. "Hot Wax" would surely be impressed by how his cars are still preserved, but I bet he'd so much rather get to drive the car created by Mechatronik, one that embodies his idea of a V-8 Pagoda from more than 50 years ago.



And yet for some reason, Mechatronik still hasn't filled the streets with perfectly behaved classics. Perhaps it's because such a great effort from German specialists using only the highest quality materials doesn't come cheap. One of these cars will set you back around \$350,000. For this, you can get a '15 Mercedes SL63 AMG plus an original Pagoda... and then another one. Mechatronik argues that the best world-class, concours-original 280 SLs already get similar numbers and are currently rising in value, so choose wisely and you could actually make money. 





NEED TO GET
SOMEWHERE
IN A HURRY?

CHECKMATE!



WORDS GREG EMMERSON PHOTOS GARRETT WADE

I'M SURE WE'VE ALL HAD THAT CAB RIDE FROM HELL, where the driver disregards speed limits, traffic signs, and common sense to reach your destination while arguing on the phone with the dispatcher. It's an unpleasant experience, leaving you sweaty and shaken—but it doesn't have to be like that.

The original French *Taxi* movie franchise (written by Luc Besson, starring Samy Naceri—not the appalling Jimmy Fallon/Queen Latifah remakel) illustrated that a skilled driver in the right machine could get you to your appointment in the minimum time with maximum proficiency. And while most of us are nervous passengers by default, all of us can appreciate a skilled driver.

Pete Melian, owner of suspension specialists BC Racing in Oviedo, Florida, is no different from the rest of us, and was in a position to have some fun with the concept of a well-driven taxi when he was approached by one of his sponsored drivers.

You see, Philip Grabow from road-race prep specialists Element Tuning was in a pickle. He was leading the U.S. Time Trial Championship when his regular race car caught fire and was burnt beyond quick repair. All he needed was to score points at the next race and the 2013

TTU class title would be his. So a call was placed to Pete to discover what might be lying around. By chance, Pete had his '08 BMW M3 in the workshop. Originally Frozen Silver, it had been treated to a number of tasty modifications, not least of which included a Gen 2 Level 3 supercharger kit from Miami specialists Active Autowerke.

This is Active's most powerful E9X M3 blower kit, boasting a substantial 700 hp and 480 lb-ft at 9 psi from the Rotrex C38-92 supercharger. The blower is mounted using a machined bracket and uses a dedicated drivebelt system, rather than sharing the car's accessory belt.

The Rotrex has its own oil supply, and Active gave it a separate oil cooler to keep temperatures under control during the harshest conditions. The company also fitted a front-mount intercooler to cool the charge air once it entered through the dedicated cold-air intake.

Compressed air passes into the large Active plenum chamber and is evenly distributed to the eight velocity stacks. The air is mixed with extra fuel from the large Bosch Motorsport injectors, at a rate determined by the custom software developed in-house by Active for the M3's ECU.



AA's own bypass and blow-off valves create a lot of hissing and whooshing as they bleed off boost when the driver lifts his foot. And to avoid detonation on low-grade fuel or at high temps, the Level 3 system comes with water/methanol injection as extra insurance. The performance increase was nothing short of astonishing. On first acquaintance, it's one of those conversions that almost feel as if it has too much power. Of course, that's not possible, but it was insanely fast and very loud with the X-pipe and blow-off valves.

Pete originally bought the M3 because his company offers a full range of suspension kits. While catering to a wide number of vehicles, he has a soft spot for BMWs, as does his development and test driver, Chelsea Denofa, a man who has run most versions of the 3 Series in the Formula Drift championship.

BC Racing prides itself on offering custom suspension setups for individual vehicles, developing each coilover kit for its intended application. Whether its street or track, the company has driven the car under those conditions and valved the dampers to suit. BC Racing can also provide custom springs and will revalve the dampers if you require. All the dampers are fully rebuildable, so they are ideal for track day or club motorsport drivers.

For his personal M3, Pete fitted the top-of-the-range BC Racing ER Type coilovers. These have a twin-piston design, with larger external fluid reservoirs to control heat, as well as separate 30-way rebound and compression adjustment to allow for fine-tuning. In fact, the reservoirs house the secondary piston that controls the compression damping. These particular coilovers also have a Swift Spring upgrade, an optional extra that gives customers access to a wide range of quality coil springs.





Taxi! Did somebody call for a taxi? This should be one hell of a ride with a 700hp Active Autowerke-supercharged V-8 under the hood!



TECH SPEC '08 BMW M3

Pete Melian
Oviedo, FL
Owner, BC Racing

ENGINE

4.0L S65 V-8 with Active Autowerke Gen 2 Level 3 supercharger kit including Rotrex C38-92 supercharger, plenum with eight high-flow velocity stacks, blow-off and bypass valves, dedicated belt-drive system, larger Bosch Motorsport injectors, software, front-mount intercooler, supercharger oil cooler, cold-air intake box and filter, oil breather system, new oil line with A/N fitting system, Race X-pipe and exhaust system

TRANSMISSION

six-speed manual transmission

BRAKES

Hawk DTC pads

SUSPENSION

BC Racing ER Type coilovers, Swift springs

WHEELS & TIRES

18x8.5" f, 18x9.5" r BC Forged TM14 wheels, 265/30-18 f, 295/30-18 r Toyo Proxes R888 tires

EXTERIOR

Carbon-fiber diffuser, taxi checker stripes, taxi roof light, yellow vinyl wrap

INTERIOR

Awron AC-delete gauge panel with boost, oil temp, water temp gauges, g-meter, acceleration timer and power meter

CONTACT

bcracing-na.com, activeautowerke.com, pyspeed.com

Carbon diffuser and Active Autowerke tailpipes hint at something being different.





Built for the track, the M3 sits on BC Racing ER Type adjustable coilovers, 18-inch BC Forged TM14 two-piece wheels, and Toyo R888 race rubber.

With its track chassis, Pete stuck with 18-inch wheels to give himself the widest possible selection of tires—in this instance choosing semi-slick Toyo R888 rubber. The Toyos are mounted on BC Forged TM14 wheels. These are from a one- and two-piece wheel range. It was originally developed by BC Racing but is now distributed by PYSpeed as BCR continues to concentrate on its suspension systems. The two-piece wheels are manufactured from aircraft-grade T6061 aluminum and custom-made to individual specifications using a concave spoke design, although other designs are available.

When Phil came looking for a race car, we were surprised to learn Pete volunteered his 700hp E90 M3. The guy clearly has a sense of humor—he decided to wrap the silver paintwork in bright yellow 3M vinyl and apply taxi checkers to the side: a job he did himself over the course of three days with company General Manager Tim Griffith.

The result is a machine that might rival the thrill factor of BMW's own Nürburgring Taxi fleet. In fact, the team even added a taxi pricing structure to the doors, charging 50 cents per quarter-mile, or \$3 per lap.

With a taxi light added to the roof for our photos, Phil proceeded to finish second at the last race of the 2013 season at Sebring, claiming the USTT TTU championship. In fact, you can see the story unfold in the exclusive video shot for us by BCR's marketing manager, Cody Slack. It recounts Phil's request and Pete's loan of his M3. The video is online at europeancarweb.com and well worth a visit.

As a final thought, Cody reported that several unsuspecting people actually tried to hail this taxi while it was being shot on the local streets. Apparently one guy went running over to it but changed his mind when he saw what he was about to step into—that was probably a very wise decision! 🚗



Active Autowerke Gen 2 Level 3 supercharger conversion puts out 700 hp and 480 lb-ft with Rotrex blower, FMIC, larger plenum chamber, bigger injectors, in-house software, and full exhaust.



DARK MATTER

ABT SPORTSLINE TUNES UP THE SEVENTH-GEN GTI BY JUST THE RIGHT AMOUNT

WORDS & PHOTOS IAN KUAH





TIME REALLY DOES FLY WHEN YOU'RE HAVING FUN, and it's hard to believe the legendary Golf GTI is now in its seventh iteration, set to celebrate its 40th anniversary in 2016.

The GTI timeline can also read like a description of the way cars in general have evolved to address safety and emissions legislation, as well as the demands of increasingly sophisticated buyers with more and more lifestyle-led requirements. So where the original weighed just 1,852 pounds, its successor tips the scales at 3,020 pounds—a 39 percent increase. Not only is the new Golf physically much larger but, as with all modern cars, it's also laden with safety and convenience features.

Making appreciably more power and torque but with better economy and lower emissions is a modern trick enabled by electronics. Some rudimentary electronics in early GTIs controlled the ignition, but the ECU of today's average family car is far more powerful than the room-sized super-computers that sent man to the moon in the 1960s. Directing everything from direct fuel injection, ignition curves, and active suspension damping, many of these microchips work in a closed-loop system. This means having to know exactly what happens whenever parameters of one aspect are altered because of the possible knock-on effect elsewhere.

Abt Sportsline is a partner of Audi and VW (the former at official DTM race team level), and so it's one of the few aftermarket tuning houses with direct access to information from the factory development department. Because of this close co-operation, Abt's enhanced outputs are relatively restrained and take longevity into account—along with OE and Abt full vehicle warranties. In this respect, Abt upgrades for the GTI are an almost classic case of conservative tuning.

The MkVII GTI's 1,984cc, direct-injected motor makes 210 hp and 258 lb-ft of torque. That's almost double the horsepower and more than double the torque of the original GTI of 1976, whose 1,588cc SOHC engine made 110 hp and 103 lb-ft. With the Performance Pack, the GTI hits 220 hp between 4,700 and 6,200 rpm (torque remains the same). This delivers a brisk zero-to-62-mph time of 6.4 seconds, plus a top speed of 150 mph.

The Abt Sportsline conversion uses a remapped ECU to match the factory R version and now produces 300 hp between 5,000 and 6,200 rpm, with a lusty 310 lb-ft of torque from 1,500 to 4,600 rpm. This 30 percent increase in power and 20 percent increase in torque was engineered while heeding factory advice on safe tolerances for mechanical components, particularly the DSG transmission.

Even so, these hikes are sufficient to make a big enough difference to the way the car drives that belies the stopwatch numbers. So while the zero-to-62-mph sprint is reduced to 5.8 seconds and top speed goes up to 160.3 mph, the real gains in everyday driving are in the low and middle ranges, where that extra torque brings improved driveability.





TECH SPEC

ABT '15 VOLKSWAGEN GTI DARK

BASE PRICE

\$29,915

PRICE AS TESTED

\$43,000 (est.)

VEHICLE LAYOUT

front-engine, FWD, five-pass, four-door hatchback

ENGINE

2.0L/300hp/310-lb-ft turbo I-4: Abt Software

TRANSMISSION

six-speed twin-clutch auto

CURB WEIGHT (F/R DIST)

3,020 (mfr. est.)

WHEELBASE

103.6 in.

LENGTH X WIDTH X HEIGHT

168.0 x 70.8 x 55.4

0-60 MPH

5.8 sec. (mfr. est.)

QUARTER-MILE

14.0 sec. @ 100 mph (est.)

BRAKING, 60-0 MPH

100 ft.

LATERAL ACCELERATION

0.96 g avg. (est.)

EC FIGURE-EIGHT

25.0 sec. @ 0.77 g avg. (est.)

Comparing the power and torque curves of the stock versus tuned cars, it's immediately apparent that the outputs of the Abt-tuned motor mirror the standard curves, just at a higher level. Some tuners ramp up the torque of the lower rev range in particular (which is easy to do with a forced induction motor), but this puts extra load on the drivetrain. Maintaining the factory characteristics gives more of everything at a given engine speed, but with the kind of smooth and seamless delivery for which GTI is renowned.

All this is done with the standard intercooler, although it is possible to fit a high-efficiency replacement and even reduce boost pressure to achieve the same outputs with less thermal stress. But this would cost more. Of course, a customer could do this as an individual modification. As it stands, though, the conversion kit is fully type-approved by the German TÜV authorities as a dealer-fitted bolt-on with carbon dioxide emissions of 149 g/km being identical to the standard car.

Driving Abt's GTI on country roads and at higher speeds along the local autobahn, the power and torque increases make for an even more enjoyable experience. The extra punch for overtaking or simply joining the autobahn is extremely useful. And thanks to a clever factory electronic differential, this extra clout does not induce any of the wheelspin or torque steer histrionics that afflict so many front-drive cars.

Ah, front-wheel drive. Unlike the factory Golf R (whose 300hp power output this car mirrors), the Abt car lacks the 4Motion all-wheel-drive system. And that's why it's 0.8 of a second slower to 62 mph. Ultimately, there's no substitute for putting big horsepower through

all the wheels for perfect traction off the line.

In its ECU re-mapping, Abt also takes variable fuel quality into account. So those who live in a country where it is hot and/or has poor fuel quality, the sensors will retard the ignition timing to protect the engine. Of course, power output will be reduced commensurately, but at least the motor will be safe.

Applied to a standard GTI, this is a great conversion, but Abt Sportsline does not hide its proverbial light under a bushel, so it decided to do something different for the 2014 Geneva Motor Show, where this particular car made its international debut.

The special theme here is the Dark Edition, a limited edition of 50 cars featuring metallic black paintwork with color-coded 9x20-inch ET40 wheels wearing 235/30 Continental SportContact 3 tires, sports suspension, Abt Sportsline aero kit, plus the 300hp power upgrade with a four-exit sports exhaust system.

Abt's proprietary aerodynamic styling kit consists of grille, front spoiler, headlight covers, side skirts, rear valance insert, rear hatch roof spoiler, carbon-look mirror caps, darkened taillights, and Abt decal set. Contrasting red accents are also applied to highlight the shapes of the aero kit and wheels.

The height-adjustable sports suspension is made for Abt by KW from the company's DDC range, specifically tailored for cars with adaptive damping like the GTI. It features a button fitted to the dash that alters settings among Comfort, Sport, and Sport Plus. In this car, it's set up to ride 1.4 inches lower than the factory height. Abt also supplements the uprated spring and damper kit with larger-diameter antiroll bars.






The coilovers and the 20-inch wheels with their ultra-low-profile rubber seem like the perfect recipe for a rock-hard ride, but the amount of compliance in Comfort mode comes as a pleasant surprise, at least on German roads. However, 20-inch wheels in places with less well maintained roads are a potentially expensive mix.

In Sport mode, the handling is noticeably tauter. The car turns in crisply and chases apexes like a foxhound, while still retaining a fair measure of comfort for the inevitable imperfections of real-world roads. The Sport Plus setting, on the other hand, might as well be called the Hockenheim setting, only doing its best work on billiard table-smooth tarmac. Overall, the Sport setting is the best compromise for a twisty road. The combination of potent motor, quick steering, perfectly tuned

suspension, and the lower mass of the MkVII (154 pounds lighter than its predecessor) delivers rapid point-to-point times with deceptive ease.

The cabin already wears a black-and-red GTI plaid cloth seat trim theme from the factory, so the finishing touch is a set of Abt Sportsline mats in black with red piping and the word "Dark" in red. Beyond that, the Abt logo is stitched in white into Alcantara-covered headrests.

While competing hot hatches show occasional sparks of genius, the Golf GTI (with the arguable exception of the MkIII) is the only one that has been consistently well honed from day one. The latest GTI is a brilliant all-rounder and the perfect platform for well-executed aftermarket tuning. The Abt Sportsline Dark Edition is a prime example. 





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WORDS & PHOTOS DOUG NIELSON





FOR YEARS, EUROPEAN CAR MANUFACTURERS have had to comply with strict EU laws on sound levels for production models. A great deal of time and effort is spent to develop suitably subdued exhaust systems. Such mufflers fit the available space and, in some cases, have pressed surfaces and shapes designed to attenuate unwanted sounds like droning. They are also made from good-quality stainless steel, designed to last the lifetime of the car.

Many enthusiasts in North America, however, feel the need for a more aggressive exhaust note because OEM systems are so muted. This means swapping out factory mufflers and/or other components to achieve a more desirable sound quality and volume. A huge pile of OEM mufflers are ditched each year. It's a waste of material, resources, and engineering to toss an OEM muffler into the dumpster. This is where FD Motorsports (FDM) in Brentwood, California, steps in to make admirable use of an otherwise unwanted item.

FDM currently has several lines of Fister-modified OEM mufflers for Porsche 993, 996, 997, and Boxster/Cayman models. Modifications consist of either adding an external partial bypass pipe between the muffler's input and output, making internal alterations to the muffler itself, or a combination of both processes. This usually lightens the muffler by a pound or two and definitely creates a more aggressive, motorsport-inspired accompaniment.

FDM claims these Fister mufflers for the 993 and 993 Turbo have no drone or resonance and are lighter than stock. They also deliver a healthy growl at idle and a more aggressive bark under acceleration, while still being mild during casual driving. The added bonus is that these mods do not affect emissions. A win-win. They're available in three ascending levels of volume coupled with descending weights.

For 996, 997.1, 997.2, and early Boxster/Cayman models, modifications consist of adding a stainless steel external partial bypass pipe to the muffler, along with a couple of proprietary tricks, adding about a pound in the process. Newer Boxster and Cayman versions get an internal treatment that gives a pleasing sound and better flow characteristics. This results in a sportier idle tone and more volume under hard acceleration, yet remains mellow while cruising.

A pair of FDM stage three mufflers on a 993 sounds louder in general (perfect with a helmet on), much more aggressive on throttle, a nice burble off throttle, and an overall refined yet sporty note. It's possible to ship OEM mufflers to FDM for conversion (exchange units are also available). They come back modified and finished in the one of five optional ceramic coating choices.

FDM MUFFLER PRICING

993: Stage 1/2/3	\$300/\$410/\$460 w/exchange; \$195 optional ceramic coating
996	\$290 w/exchange; \$225 optional ceramic coating
997	\$290 w/exchange; \$225 optional ceramic coating
Boxster/Cayman	\$450 w/exchange; \$260 optional ceramic coating

The company has also started producing aftermarket 200-cell sport cat systems for the naturally aspirated Porsche 993, in cooperation with Leistung Motorsports. These turn up the volume, along with some extra power (10 to 12 whp).

FDM isn't single-handedly saving the world by recycling mufflers, and perhaps our environment is a touch higher in ambient noise because of such modifications. But for enthusiasts, flat-six exhaust sounds are much sweeter.

MODERN PERFORMANCE EXHAUST 101

To achieve maximum power output from a modern performance exhaust, it needs to be engineered as a complete system from the manifold all the way back to the mufflers. Ideally, a performance exhaust optimizes back pressure and exhaust gas velocity.

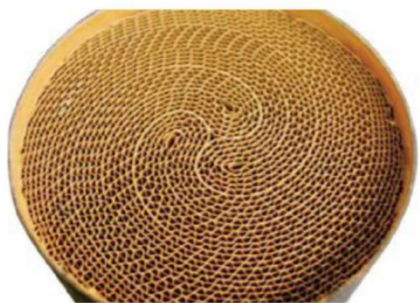
The choice of tubing diameter is normally related to engine displacement, output, and rpm operating range. But there is no magic formula to calculate what should be used. Also, diameters need not necessarily be constant from downpipe to muffler tip due to changes in pressure and temperature throughout the system, both of which decrease toward the exit. Bends and curves must also be as gentle as possible to avoid turbulence or restriction. But the available space in modern vehicles is often limited, making this process more difficult.

When modifying modern vehicles, the additional performance potential of the cat-back portion is limited. Swapping out mufflers is not likely to add much horsepower. It will most likely improve sound levels and timbre only. Fortunately, there is usually plenty of room for performance improvements in the header/manifold and catalytic converter sections to make this engineering process worthwhile. >>



HEADERS

Improved header design is a major factor for strong performance gains in aftermarket exhaust systems. The main reason is that the measured pressures after the OEM header or exhaust manifold can be lowered by a more efficient design. In other words, the OEM setup is too restrictive. Typically, different header pipe diameters of a prototype are dyno-tested to determine the optimum output that matches displacement and powerband characteristics. It is also important to test the header merge volume and shape to optimize exhaust gas scavenging, balance, and velocity.



HIGH-FLOW CATALYTIC CONVERTERS

OEM cats used by most European manufacturers are made with a ceramic material prone to melting in the extreme heat of a highly tuned engine or long sessions on the racetrack. Ceramic cats are also quite restrictive due to thick walls and small cell size, typically 400 or 600 cells per square inch (CPSI).

In performance applications, more expensive race metallic cats are used. These have a thin metal foil core. Cell wall thickness is reduced, resulting in less frontal area of the core surface and allowing cells to be larger (100 or 200 CPSI), therefore less restrictive. A metal-core cat's heat resistance is much greater than ceramic. Adhesion of the metal catalysts to the core walls is also improved, which is critical for long-term durability.

High-quality metallic cats are manufactured by a German company, Emitec/HJS, and come in diameters of 93, 108, 120, 130, and 150

millimeters, and cell counts of 100 and 200 CPSI. These varied diameters and cell counts allow for many volume combinations that can alter back pressure profiles. For street use, 200-cell metallic cats are the best choice as they are less likely to activate the "check engine" light.

MUFFLERS

Mufflers must satisfy volume level requirements, conform to the space available, and create a desirable sound. So performance muffler testing can be extensive. Several different designs are usually tested with various canister volumes, shapes, and inner constructions. Such tests will alter the back-pressure profile throughout the system, so care must also be taken not to lose power.

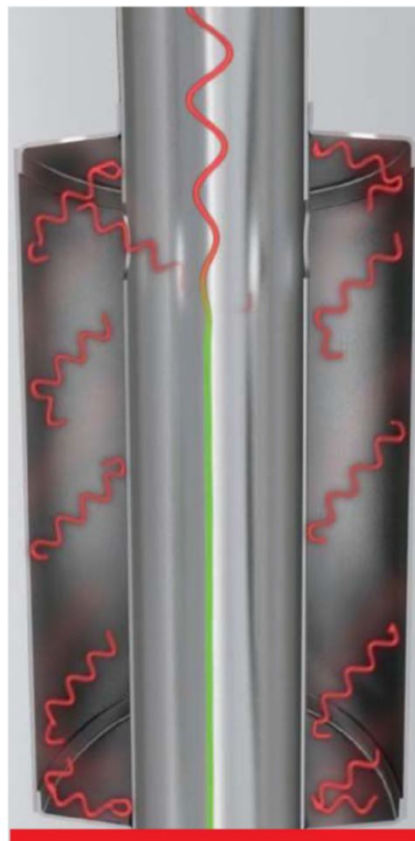


There are several types of flow-through resonated mufflers currently available. Here are some examples. The longer the exhaust path in a flow-through resonated muffler, the quieter the note.

A simple type of muffler is the louder single flow-through resonated design, where exhaust gases move down a perforated tube encased in sound-absorbing materials.

Supersprint's Powerloop double flow-through design optimizes limited space by gently looping the exhaust twice through the insulated muffler housing for additional noise suppression.

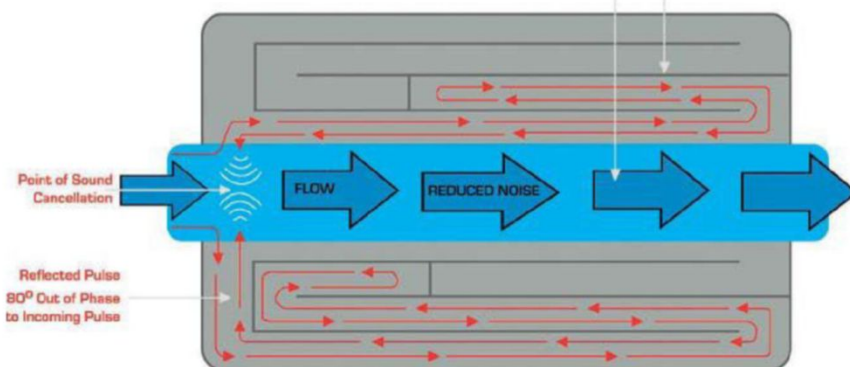
AWE Tuning 180 Technology is a cambered resonator that flows exhaust gases through strategically located ports and into reflection chambers. By adjusting the size and location of these ports and chambers on any given application, sound waves exit the chambers and rejoin the main exhaust flow at 180 degrees out of phase, canceling out problematic frequencies.



APR RSC Reflective Sound Cancellation allows for maximum gas flow while completely eliminating in-cabin resonance. This is done with limited use of packing materials and no baffles for a completely straight and free-flowing exhaust path through the muffler. Undesirable sound waves combine (destructively) with each other to attenuate volume and cut the low-frequency tones that create drone. **X**

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OLD TRUMPS NEW

THE 2014 GOODWOOD REVIVAL

WORDS & PHOTOS EZEKIEL WHEELER

RESPECT YOUR ELDERS. It's a phrase that's been repeated throughout history. No doubt cavemen had their own version daubed as images on rock walls to make sure this message lived forever. Why respect our elders? Because they've lived. They've pushed the boundaries so we might enjoy a world of flappy paddle gearboxes and nine-speed automatics. They alone can share wisdom to help shape our future decisions. Like, "Should I own a stripped-down race BMW 2002 tii or spring for a '67 Porsche 911 S?"

The Goodwood Revival is an annual homage to such conundrums. What would Daimler have done without Benz? What would Enzo have done without Alfa? Why the hell did the Italians love and hate Carroll Shelby so damn much? All answers can be found in the Goodwood paddock.

For many in attendance, the thought of dressing in fashions of the 1940s, '50s, and '60s is attractive. For me, it's an opportunity to slip into a fresh mind-set. The chance to forget about hybrid hypercars, flame-throwing Aventadors, and early-morning parking lot meets. This is how mechanical obsession began for many of our forefathers: a walk among the machinery, drivers and team owners as they shouted, hammered, and revved their way into immortality.



RAW

Yes, seeing a vintage Bugatti navigate a chicane, hearing historic Formula One cars raise their oil temperatures, and witnessing Le Mans GT racers rumble in the paddock is euphoric. When you roam the grounds of Goodwood and see the fans in all their regalia (it's hard not to look up from the row of D-Types every now and then to appreciate the time and effort these wonderful women put into their

fashion research), then you begin to respect the dedication of owners and racers, ensuring the next generation understood what they were up against. Adjustable suspension? Why bother? Sequential gearbox needed? Hell, put a dog box in there and hammer it home out of the kink like Thor. The rear end faster than the front? Countersteer, dummy. The back half has the right idea.



TAKE A LAP

It's easy to get caught up in the hustle and bustle at the main entrance. There really is so much to see: vendors, private clubs, beer stations, and the vintage taxi service area. The amount of detail that invades the senses is overwhelming. Lord March and his team have gone above and beyond to offer a truly time-warping experience.

I took a walk with my friend and main reason for my attendance this year—Justin Jurgens, co-owner of British Sports Cars in San Luis Obispo, California—to see if we could find a worthwhile vantage point. We did.

After cutting through the vintage motorcycle paddock on the east side of the track, we walked across a live airstrip. Goodwood isn't just a playground for machines on the ground, it also hosts a magnificent display of craft from various periods of aviation history, most notably World War II fighter planes (from both the Allied and Axis sides).

Emerging from runway nirvana, we entered the back straight stands. The racers erupt out of a sweeping corner and rip down the straight. Formula Junior cars shatter eardrums and TT-class cars reorganize innards. And the aforementioned 18 D-Types were pure aural bliss.

Once we had our fill of wide-open throttle elation, we made our way to the opposite corner of the track. It's here that we found the S-turn and camped out for the next several hours. It conveniently featured a beer and food station without a line. A miracle in itself. A few British bitters and a proper ice cream cone with a chocolate Flake, and we realized we had stumbled upon gold. This is where the battles are fought, where engines and suspensions make or break the racers. Here is more passing, more fire-spitting, and more oversteer action than on any other part of the track. This alone justifies the price of admission.




RIGHT OF PASSAGE

For Americans, the initial journey may not be easy. First, renting a car is expensive. Then driving on the right-hand side will take some getting used to. Third, the roads in the U.K. aren't what you would call "road trip-friendly." They duck, dodge, and veer into all sorts of chaos if you miss your turn. Simply exiting and turning around aren't always options. So take a co-pilot to share the stress of getting back on the right track. What England lacks in conventional urban planning and organization, it makes up for in amazing driving roads with breathtaking scenery.

Chichester, the nearest town to Goodwood, is roughly an hour away from London's Heathrow Airport (Gatwick is closer). The city of Portsmouth is about 30 minutes' drive southwest and the best place to find a deal on hotels; the Red Lion Hotel is a good choice. But it's worth noting the need to book at least a few months in advance. And beware, tickets for the event sell out faster than the hotels.

If you do all three days, finding an appropriate outfit for the weekend requires planning and budgeting. Stroll in with modern clothing (e.g. jeans, T-shirt, and sensible footwear) and you'll feel like an outcast. The point is to make the event honest, and it's worth doing right. Women like a man in a decent three-piece suit who will cut a rug in the champagne-fueled swing dance hall.

The Goodwood Revival ranks among the top destinations for automotive aficionados, whether rich in passion or pounds Sterling. Every car races the same track, every team is given the same amount of paddock space, everyone has the opportunity to stand next to their heroes. It's all about celebrating a glorious era and its magnificent machines. 



'14 VOLKSWAGEN PASSAT SEL PREMIUM PROJECT: CHAPTER 2

UNLEASHING THE SPORTS SEDAN WITHIN

Words Michael Febbo
Photos Robert Guio

THE PREVIOUS UPDATE ON EUROPEAN CAR'S LONG-TERM PASSAT

covered the aesthetic makeover of air suspension and 20-inch wheels. While I liked the looks, I was a bit disappointed that this roomiest of VW sedans neither handled nor rode as well as when it left the factory. It seemed like a shame, since the Passat at its core is rather enjoyable. The steering communicates well, the chassis is nicely balanced, and—with the new 1.8L turbo—it has a great powerband. Considering this magazine's new focus is to shift

from aesthetic to performance mods, it seemed appropriate to scratch the go-fast itch.

Step One: get the suspension sorted out. The factory car has spring and damping rates that are well matched to each other, but lean more toward ride comfort than handling (no pun intended). I wanted some ride height adjustability and not over-lower the car for the sake of appearances. After checking out a few alternatives (from just sport springs all the way up to fully adjustable damping coilovers), I decided H&R Street Performance coilovers were the way to go. They were installed and adjusted by Eurosport Accessories in Anaheim, California.

Ride height was set about 1.5 inches below factory, slightly higher than with the H&R Sport Springs. It left plenty of suspension travel, kept the roll center well above ground level, and made sure each tire stayed in the favorable part of the camber curve. Ride quality is substantially better than the air suspension and, while subtle, it makes the Passat look 10 times better than stock.

It's certainly stiffer than the factory setup. Impacts are now more pronounced, and broken pavement is more obvious. But lower-frequency stuff is handled better. There is no longer any float or wallow, even over the biggest bumps and even at high speeds. The car exhibits a more tied-down feel. High-speed cruising is more like an Audi S6.

With the suspension resolved, it was time for more grip. The 20-inch tire and wheel package looked great, and the Continental 5Ps have lots of grip and are quiet at all speeds. The big Rotiforms were heavier than I would have liked and the short side-walls made things a little choppy. For this stage, I decided a 19-inch wheel would probably be the ideal size for both comfort and grip. The Neuspeed RSe14 weighs just 25 pounds and the 9-inch width is ideal for the 245/35 tires I was able to squeeze under the fenders.

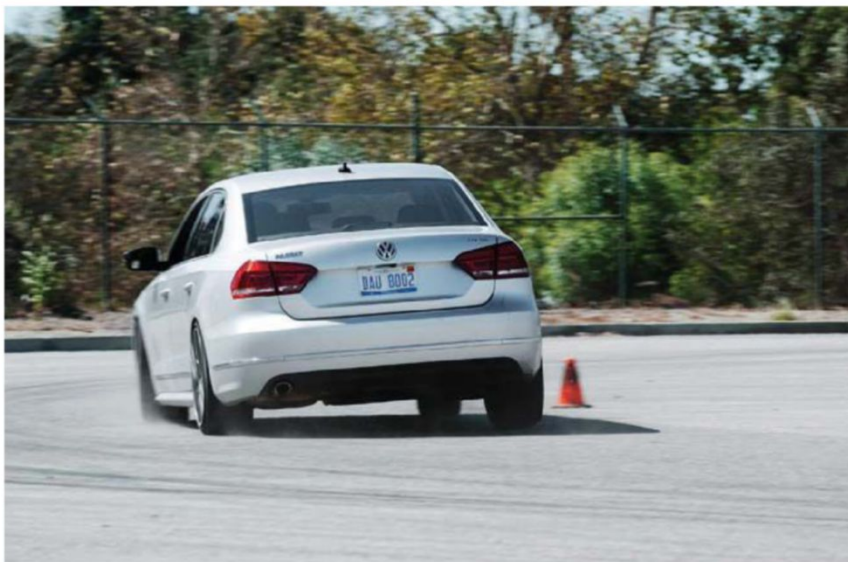
I decided on a Yokohama ADO8R this time, as I wanted something a bit more aggressive than the Continentals. The new tire certainly has a substantial amount of grip, but that also comes with more noise. It's far from excessive, but next to the whisper-quiet Contis, it's noticeable. The ride quality improved as well, but it would be tough to say if that was due to the tire itself, or the extra half-inch of sidewall and lighter overall package. This suspension, tire, and wheel formula is exactly what I was hoping for. Better body control, loads more grip, and ride quality appropriate to a sports sedan.

When I started this project, I had dreams of big turbos, giant front-mount intercoolers, and a screaming 3-inch exhaust. None of those were on the cards at the time of writing. As I've mentioned before, the new generation of 1.8T is a good engine right off the showroom floor, but I was curious what a couple of bolt-ons could do.

While Neuspeed had my attention with the wheels, the company told me about its new plug-and-play power module developed for the 1.8T. It connects to the boost sensor and MAP sensor and essentially convinces the factory ECU it's producing less boost than it actually is. This isn't just a diode; the billet aluminum case contains a circuit board that has to match the two signals together or else the ECU will fall into limp mode.

Installation took about 15 minutes with handtools in the *European Car* Global Command Center parking lot. The power module can be removed easily when taking the car in for servicing. I did just that and the service manager didn't threaten me with a voided warranty, so I'm guessing they never knew the difference. My only complaint with the power module is that it mounts (or is supposed to mount) to the plastic engine cover with sticky backed Velcro. It doesn't work, the Velcro won't stick to the cover, and you end up with the gorgeous, black anodized billet aluminum block swinging around by the wiring harness. A wire tie will go a long way here.

Neuspeed's Aaron Neuman also mentioned that his engineers had found the biggest restriction on the 1.8T to be the turbo discharge pipe that connects the turbo outlet to the intercooler. The factory piece is a flattened plastic tube that looks like it would be more at home connecting air conditioning vents behind the dash than creating power under the hood.



Neuspeed makes an aluminum pipe with new billet connectors that is a direct replacement. Installation took nearly an hour from jacking up the car to dropping it back down. I followed the instructions exactly, but my advice would be to leave the bellypan in place, remove the wheel, then the fender liner, and follow the directions from there on out.

With the power module already installed, there is a noticeable difference in top-end power with the discharge pipe. Before installation, the power module seemed to make a big difference in low- and midrange punch, but it flattened off at the top. After the discharge pipe was installed, the increased power is noticeable almost to redline. The power module has a switch for both 91- and 100-octane. I've never felt the urge to drop \$9 a gallon on gas, so it has stayed in 91-octane mode the entire time.

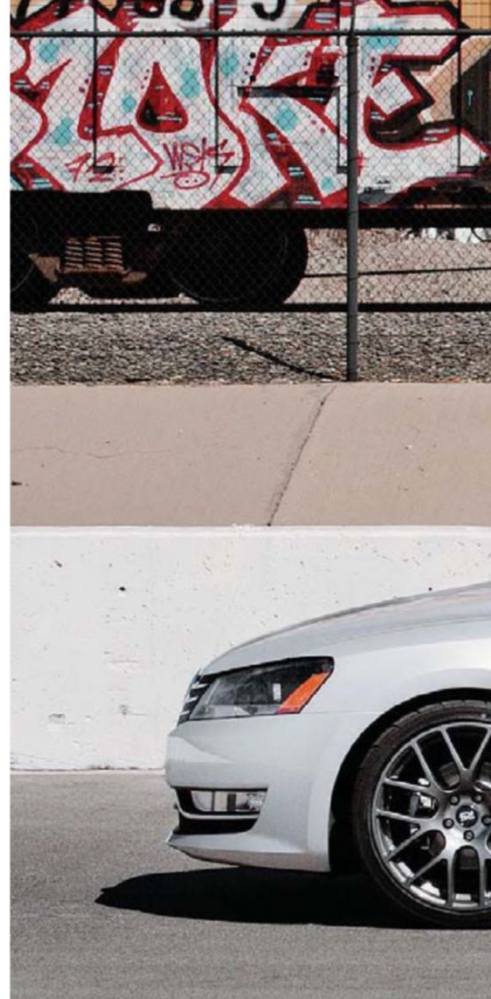
Some modifications are more psychosomatic than real-world performance, so I decided to test our project Passat against a Passat Sport 1.8T to see how much of an improvement I had made. The weight difference between the two is relatively small, with the well-equipped long-termer weighing 3,469 pounds and the Passat Sport at 3,309 pounds. The long-term Passat is nearly a second faster from standstill to 60 mph, doing it in 7 seconds flat compared to the Sport's 7.9 seconds. I was actually a little surprised it was that much better.

Both cars are difficult to launch. If there's any wheelspin, the undefeatable traction control kills the power. Also, both cars are traditional automatics and the shifts are on the slow side. A DSG transmission would have my Passat in the mid-to-high-6-second range.

The long-term car held on to its lead in the quarter-mile, running 15.3 seconds at 92.3 mph, compared with the Sport's 16 seconds at 87.3 mph. I did the testing on a hot Southern California day and the factory intercooler was definitely feeling the heat by the end of the quarter-mile. A front-mount intercooler would do wonders for the 1.8T, or another option I'm tempted to try would be water/methanol injection. It would add greater charge cooling as well as adding the extra octane to try that 100-octane mode.

The heat certainly didn't help figure-eight times, either. But the modified Passat still ran an impressive 25.5-second lap. Again, the intercooler was cooked on the relatively low-speed, but high-heat track.

Figure-eight guru and *Motor Trend's* testing director, Kim Reynolds, also gave the car a workout. Reynolds drives just about every car for sale in the United States and is a walking database of handling characteristics. He had nothing but positive things to say about the modifications to our Passat. "The car still has a great balance. The clarity through the steering and brakes is superb. It does exactly what I want and it never surprises. It is a genuinely fun car to drive."



H&R STREET PERFORMANCE COILOVERS

I've tested H&R products on everything from MKI Golfs to 911 Turbos and never been disappointed. This application starts with a monotube damper with a threaded body, allowing height adjustment and corner balancing with minimal hassle. The fitment for the Passat offers 1.25 to 2.5 inches of lowering, based on the factory ride height. Available from dealers all over the country. And you didn't hear it from me, but you can probably pay less than retail.

Suggested retail: \$1,480

hrsprings.com



NEUSPEED RSE14 WHEEL

Classic styling along with modern flow-formed manufacturing define Neuspeed wheels. Lighter than factory but just as strong, these are a lifetime part. Available in silver, gun metal, or black, they have a finish that will work with any car color. The 19-inch version is available in either 8- or 9-inch widths and weighs between 21 and 25 pounds. I really loved the OE-yet-aggressive look. Combined with lowering, it drew the eye of enthusiasts, but not necessarily the law.

Suggested retail: \$359.95

neuspeed.com



Y

Some of the petroleum in this tire is replaced with more environmentally friendly orange oil. If you don't care about that, the compound also uses a higher level of carbon and micro-silica with a new polymer blend to increase grip in both dry and wet conditions. I was blown away by the grip and only noticed the extra tread noise with the stereo off. The trade-off was well worth it. Even after a day at the test track, the tires barely had a knick on them.

Tirerack: \$306

yokohamatire.com



NEUSPEED HI-FLO TURBO DISCHARGE CONVERSION

VW always seems to build in a roadblock to power addition, either inadvertently or not. Like the previous 1.8T in MkIV models, the pipe leading from turbo to intercooler is flattened out, creating a restriction in flow. Neuspeed's discharge pipe is claimed to add an additional 8 to 10 hp, especially with other modifications. Billet aluminum connectors and a silicone hose are included. Installation is a bit more involved than the power module, and you will need a jack and jackstands.

Suggested retail: \$249.95
neuspeed.com



NEUSPEED POWER MODULE

Plug-and-play modules allow additional boost without changing timing, fueling, or any factory safety protocols. You can see this as a positive or a negative, as timing and fueling changes might net a few more ponies, but ultimately not have the same level of self-preservation as the factory ECU. Neuspeed claims an additional 35 hp and 35 lb-ft of torque on the 4-psi 91-octane setting. Adding boost is the biggest bang for the buck in a modern turbo car. Install is quick, even for a journalist.

Suggested retail: \$399.95
neuspeed.com



Special thanks to Eurosport Accessories
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'14 VOLKSWAGEN PASSAT	TSI SE SPORT	SEL PREMIUM
PRICE AS TESTED	\$28,730	\$31,715
VEHICLE LAYOUT	front-engine, FWD, five-pass, four-door sedan	front-engine, FWD, five-pass, four-door sedan
ENGINE	1.8L/170hp/184-lb-ft turbo DOHC 16-valve I-4	1.8L/170hp/184-lb-ft turbo DOHC 16-valve I-4
TRANSMISSION	six-speed automatic	six-speed automatic
CURB WEIGHT (F/R DIST)	3,309 lb. (59/41%)	3,469 lb. (57/43%)
WHEELBASE	110.0 in.	110.0 in.
LENGTH x WIDTH x HEIGHT	191.6 x 72.2 x 58.5 in.	191.6 x 72.2 x 57.0 in.
0-60 MPH	7.9 sec.	7.0 sec.
QUARTER-MILE	16.0 sec. @ 87.3 mph	15.3 sec. @ 92.3 mph
BRAKING, 60-0 MPH	118 ft.	108 ft.
LATERAL ACCELERATION	0.85 g (avg.)	0.95 g (avg.)
EC FIGURE-EIGHT	27.0 sec. @ 0.64 g (avg.)	26.1 sec. @ 0.64 g (avg.)



Reynolds was a bit surprised at the level of grip achieved by the Yokohamas. The 0.95 g is right up there with some of the best cars on the road. Even the 26.1-second figure-eight lap puts it in some rare company. If you're wondering: A much smaller '14 BMW 320i and a similarly sized '14 Mercedes S65 AMG ran exactly the same time. The Passat Sport was 0.7 of a second slower, which equates to a lifetime in the figure-eight.

Overall, I am thrilled with the results. The power modifications totaled a most reasonable \$650. We spent another \$1,480 on the coilovers, plus \$2,660 on tires and wheels. The upshot is a car that could easily be badged as a Passat GLI.

As stated earlier, I would like to try a front-mount intercooler and even a turbo-back exhaust. By the time you read this, upgraded intercoolers should be available, although I'm still not sure anyone will make

an exhaust. I suspect a Jetta downpipe might fit and the rest of the exhaust could be fabricated by a decent shop. I would also like to try these modifications on a manual-transmission car. A MkVII Golf 1.8T (which is substantially lighter than our Passat) with these power modifications would likely come close or even exceed a MkVI GTI in performance.

Sadly, the Passat went back shortly after testing, so this was as far as the project could go. But this project clearly demonstrates the car's potential, even with the base engine. With a few more well-chosen modifications, I could quite possibly get this family cruiser to GTI-like track performance. If I was to do this again, I would start with the Passat Sport with a manual transmission. The transmission and lighter weight would mean better performance and the lower entry price would mean all this for right around 30 grand. ❌

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An Affordable Design Icon

'00-'06 AUDI TT COUPE

Words Colin Ryan

CONCEPT CARS, WHAT A DISAPPOINTING BUNCH.

All those grand ideas trumpeted at auto shows and then we end up with the Honda CR-V or some other common conveyance made lukewarm by meetings and focus groups. Not the Audi TT, though.

Either by luck, determination, or a bit of both, what began as an intriguing design study translated into a road-going model with little compromise, essentially a mild re-drawing of the roof line. And it might even be argued that the production version looks better for it. The idea was to create a desirable car that would still be affordable for many people. The eye of the beholder notwithstanding, the TT has generally been desirable and used versions are becoming more affordable all the time.

As the TT moves into its third generation, the first (code-named 8N) still has a purity of design, an integrity where subsequent face-lifts would only stray from the original point and lessen the impact. This aesthetic angle is one of the many pleasures of TT ownership. Never underestimate the thrill that always happens when walking up to the door while taking in its shapes and proportions, clicking the car open, and stepping inside. It's a thrill that continues in the cabin, because the interior received just as much styling skill and attention to detail as that striking exterior. The design team included J Mays, Freeman Thomas, and Peter Schreyer, all of whom have become leading figures in their discipline.

Just a couple of ergonomic downsides. The roof's leading edge is low, so overhead traffic lights are hard

to see and a cricking of the neck may be involved.

And consider this compact coupe a two-seater despite those little seats in the back. Only those really small or with a crush on their chiropractor would even attempt to squeeze themselves in.

Although the first-generation Audi TT will always be held up as an example of great car styling, its underpinnings are the same as the MkIV Golf (platform PQ34). This helped with affordability, but didn't necessarily make it the driving machine of anyone's dreams. Still, the 225 version with all-wheel drive makes decent progress (zero to 60 mph in 6.1 seconds) with reassuring grip. Early European models had issues with high-speed stability, but these were recalled and re-engineered, including the addition of a rear wing, suspension tweaks, and ESP. Those changes became part of the production process.

The engine is another staple of the VW Group: a 1.8L turbo four. By now, this unit has been tried, tested, tuned, and thrashed. It's a well-known quantity that can handle high miles as long as it gets the proper maintenance. More on that in a moment. It's also a prime candidate for an ECU re-flash or an upgraded turbo system.

From the factory, this 20-valve engine powered the 180 and 225 versions. Those numbers are based on the metric PS rating (pferdestärke), which translates to 178 and 222 hp. Torque is 173 and 207 lb-ft, respectively. The lower-power version is easy to distinguish from the outside: It only has one exhaust

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TECH SPEC '00-'06 AUDI TT COUPE

LAYOUT

Transverse front engine, front-wheel drive/all-wheel drive

ENGINES

1.8L, DOHC, 20-valve, inline-four

TRANSMISSION

five-speed manual/six-speed manual/six-speed dual-clutch semi-automatic

SUSPENSION

MacPherson struts, coil springs, antiroll bar (f); semi-independent torsion beam, coil springs, antiroll bar (r)

PERFORMANCE

PEAK POWER

178 hp @ 5,500 rpm (180), 222 hp @ 5,900 rpm (225), 247 hp @ 6,300 rpm (V-6)

PEAK TORQUE

173 lb-ft @ 1,950 rpm (180), 207 lb-ft @ 2,200 rpm (225), 236 lb-ft @ 2,500 rpm (V-6)

0-60 MPH

7.1 sec. (180), 6.4 sec. (225), 5.9 sec. (V-6)

TOP SPEED

134 mph (180), 151 mph (225), 155 mph (V-6: limited electronically)

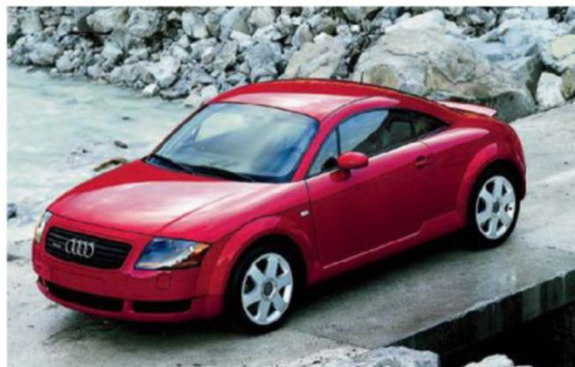
pipe as opposed to the two in the 225, which also has a larger KO4 turbo and a second intercooler. The base 180 is a front-drive model, with all-wheel drive as an option. Drivers shift their own gears: five in the 180, six in the 225.

A V-6 version was introduced for 2004. It makes 247 hp and 236 lb-ft of torque from 3.2 liters of naturally aspirated displacement. It came coupled to the then-new DSG dual-clutch transmission. It's fast as heck, has a stiffer suspension, and all-wheel drive is standard.


Let's get back to maintenance. There was a class action suit claiming that the timing belts in the 1.8L engines of several '99 to '03 Audi and VW models failed prematurely. A settlement was reached, but be especially wary of this aspect.

Timing belts should be replaced at least every five years, maybe every three years or 60,000 miles, just to be on the safe side. It's a good idea with a new purchase whose service history might have grown sketchy to budget for a belt change along with a tensioner. While it's in the shop, replace the factory water pump with a stronger aftermarket alternative.

Tired front suspensions will make noises going over bumps and the TT is not light, so pay attention to the braking system as well. Check the alloy wheels for scuffs, probably good ammunition for price haggling right there. The TT is low, so look underneath in case it's been scraped against those curb stops in parking spaces. A low level also means further for the driver to fall into the seat, so inspect the left bolster for wear.



The instrument panel was the subject of more legal action, focusing on TT models built between 2000 and 2005. Examples up for sale could well be working with less than its full complement of pixels. Specialist companies offer a complete rebuild for around \$350, not including the cost of removing and refitting the instrument cluster, plus shipping.

A '00 180 with front-wheel drive is valued at \$2,900, but good luck finding one in the classifieds for that little. Buying a V-6 version requires something in the region of \$12,000. Occupying a sweet middle ground between those two, a '03 225 with all-wheel drive is booked at \$6,460. Out in the real world, spending around \$10,000 will buy a decent example. With plenty of parts available and prices remaining sane, now is a great time to acquire what is destined to become a classic. 



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B31



B35

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