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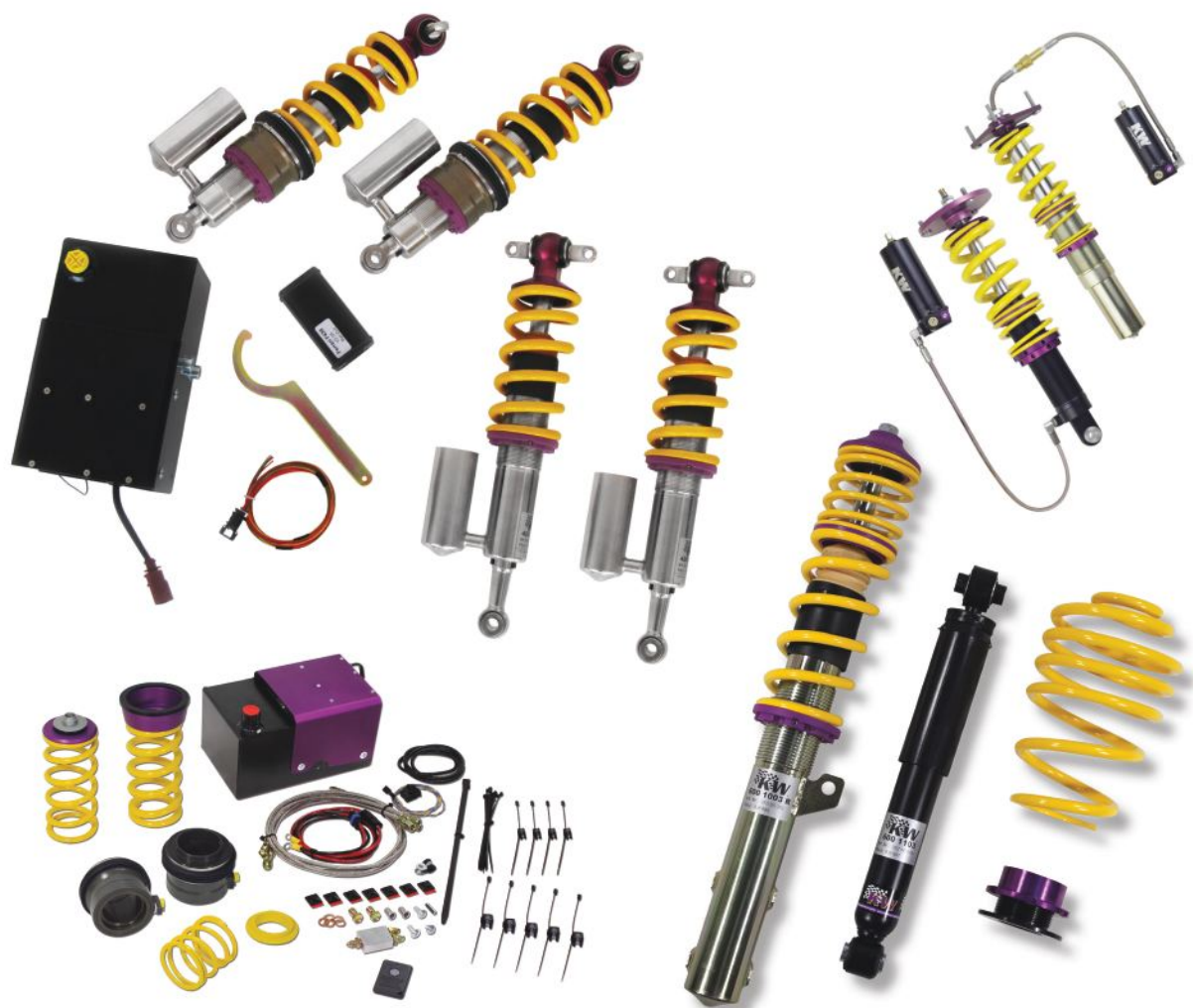
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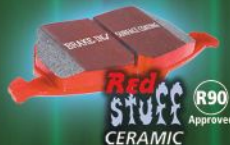
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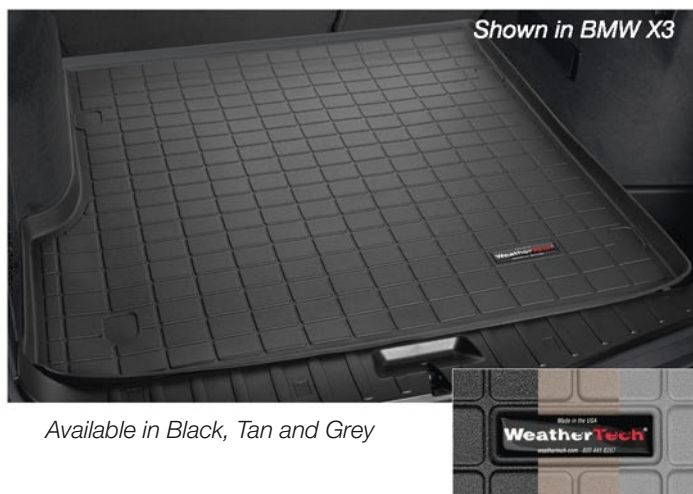
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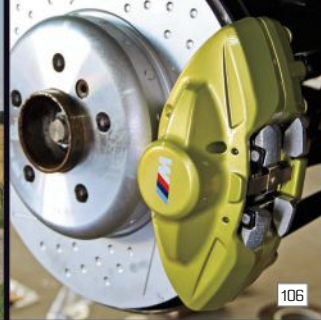
We attempt to silence the debate and answer the age-old question of whether air suspension can ever be as good as traditional coilovers for performance driving, using both objective and subjective testing

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EDITOR **GREG EMMERSON**
MANAGING EDITOR **LUCIA SALAS**
SENIOR FEATURES EDITOR AND PHOTOGRAPHER
ALEX BERNSTEIN
ASSOCIATE EDITOR **EZEKIEL WHEELER**

Contributors

LES BIDRAWN, MAX EAREY, JUSTIN FIVELLA, KYLE FORTUNE, ED FOX, ROBERT KERIAN, IAN KUAH, JAMIE LIPMAN, SHANE O'DONOQHUE, COLIN RYAN, WILLIAM STERN, PETER WU

Art

ART DIRECTOR **JEREMY MOYLER**
ARCHIVIST **THOMAS VOEHINGER**

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DAVID SONSKY 310/531-9084
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ASSOCIATE GROUP PUBLISHER
WILLIE YEE 310/531-9182
WILLIE.YEE@SORC.COM

SALES DIRECTOR, ENTHUSIAST MEDIA
SCOTT TIMBERLAKE 310/531-5969
SCOTT.TIMBERLAKE@SORC.COM

ACCOUNT MANAGERS
GREG YAMAMOTO 310/531-9892
GREG.YAMAMOTO@SORC.COM

DERRICK YEE 949/705-3182
DERRICK.YEE@SORC.COM

SOCIAL MEDIA ASSOCIATE
MIKE SABOUNCHI 949/705-3162
MIKE.SABOUNCHI@SORC.COM

ADVERTISING OPERATIONS COORDINATOR
IRENE GONZALEZ 949/705-3328
IRENE.GONZALEZ@SORC.COM

OPERATIONS ASSISTANT
ELIZABETH HERNANDEZ 949/705-3145
ELIZABETH.HERNANDEZ@SORC.COM

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After building our Jaguar XFR+ we were full of confidence, but seeing it parked next to the BMW M5 with its manual transmission and all that pedigree it brings, I honestly thought we'd aimed too high. The Jag is a great car but I'd already composed the excuses in my head about why our car had finished a distant second.

After prolonged, intensive and extended development, our drive into the hills around LA was the first time I'd driven the car and it would also be the last. The very next day it was stripped, returned to stock and is out there with its new owner who probably wonders why it feels so quick – we left them a small surprise!

Yet from the instant the 5.0 V8 fired, I knew we'd created something rather special. It was the GSR exhaust that got the spine tingling first and I advise you to watch our video at europeancarweb.com to understand just how good it sounded. A similar exhaust system can be yours if you contact the tuner...

The exhaust note wasn't going to win

the battle, and yet the first time I turned-in to carve a canyon, I again understood this wasn't your average XFR. Admittedly, the stock car is a great foundation to build upon, but the relatively simple changes of sports spring rates and grippy 21" tires on Vorsteiner's lightweight wheels had done the unimaginable. We'd built a car to rival the M5. Turn the pages to the main story and you'll see that we beat the BMW in several aspects.

Now admittedly, it wasn't a level playing field. We were testing our tuned car against a stock BMW. With the same sort of mods on the M5, I'm sure the outcome would have been closer to our original predictions. And yet, there's one area the M5 can't hope to win – appearance. No matter what you do, the Jaguar is a prettier car, even without the well-placed Vorsteiner carbon pieces.

All we have left are the photos – hopefully you saw our studio pics last month? – but this is a car we'll certainly remember for a very long time.

GOOD TIMES

Sometimes it's hard to convince people we don't actually have the best job in the world – a lack of staff and unrealistic deadlines see to that – but a couple of days with the new S-Class and a track day in the new 435i take some beating.

Yet for all the great stuff we do, driving through an obstacle course inside a Boeing 747 for the Range Rover Sport launch will probably always be in the top ten best things we've done. Again, the video is at www.europeancarweb.com for you to share the experience. It managed to upstage the off-road course we'd tackled the day before,

which was equally memorable but almost forgotten as soon as our 21" tires hit the metal ramp and we ascended into the belly of the Jumbo.

AIRED OUT

Another memorable event this month was taking part in our suspension test. It's something I'd been trying to coordinate for years without success, and something I've never seen anywhere else. Yet a conversation with Ben Terry at AccuAir quickly got it organized and the results are in this issue.

Air suspension has polarized the European tuning scene, with traditionalists being suspicious of it. Yet it's difficult to overlook the advantages of being able to alter the ride height to clear obstacles. So we finally got two identical cars together, each using the very latest technology from the coilover and air suspension sides of the business.

I won't spoil the outcome, but please turn to the feature to read the results. We were scientific in our approach, using the same test *MotorTrend* puts all new cars through. But the most important aspect was always going to be the seat of the pants. How would each car feel, where would each system have an advantage?

Well, the results are in and both technologies have something to offer driving enthusiasts, as well as the stance crowd. So even if you hate the idea of air suspension, please read the story with an open mind.

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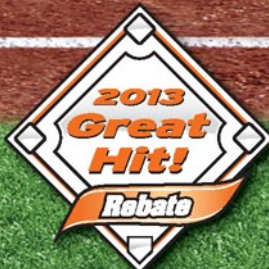


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Attractively priced, the Ecsta PA31 delivers Kumho Tire's unparalleled combination of ride comfort, low noise and all-season traction, even in light snow.

NEW '13



ECSTA 4X

- **Ultra High Performance All-Season**
48 sizes available in 15" to 20"

A street-smart all-season performance tire that offers a track-inspired road feel at an attractive price that keeps dry, wet and light snow traction within reach.



ECSTA LE Sport

- **Max Performance Summer**
40 sizes available in 16" to 20"

Racing bred with street manners, ride comfort and cockpit quietness for driving enthusiasts looking for wet and dry traction and handling.

Like all summer tires, the Ecsta LE Sport is not intended to be driven in near-freezing temperatures, through snow or on ice.



ECSTA LX Platinum

- **Grand Touring All-Season**
38 sizes available in 15" to 19"

A grand touring tire that blends responsive handling, long wear and a quiet, comfortable ride with all-season traction, even in occasional light snow.



*For complete offer details, visit www.tirerack.com/specials.

Receive a \$50 Visa® prepaid rebate card when you purchase a set of four (4) Kumho Ecsta PA31, Ecsta 4X, Ecsta LX Platinum or Ecsta LE Sport tires from in-stock inventory. Valid 9/1/2013 to 10/31/2013.

GEAR

★ NEW PRODUCTS FOR YOUR CAR AND LIFESTYLE ★



AWE COLDFRONT SYSTEM

★ Developed to minimize heat soak in B8 and B8.5 models of the Audi S4 and S5, AWE's ColdFront System includes a larger-than-stock heat exchanger and cooler reservoir (above), plus a drain plug and bleed screw in the heat exchanger. The company claims its direct replacement system lowers coolant temps by a maximum of 24° F and lowers air intake temps by 15° F, virtually eliminating power loss from heat soak. **\$1349.95**

awe-tuning.com



NM ENGINEERING BILLET CATCH CAN

★ Fashioned from billet 6061 aluminum alloy and sporting an anodized finish, NM's oil catch can was designed for the N18 engine in the 2011 Mini Cooper S and Countryman S. The catch can is intended to collect sludge and moisture that would otherwise go back into your engine, and the kit can be disassembled completely for thorough cleaning. Silicone hoses are supplied and the kit uses factory hose connections.

\$399.95

nm-eng.com



NEU-F WHEELS

★ The lightweight 17x7.5" wheels (above) from Neuspeed's Fiat products division weigh just 16.5 lb apiece. When shod with 215/40 BFGoodrich KDW tires, the RSe05 saves around 3 lb over the factory Fiat 500 Abarth 17x7" wheel and 205/40 tire combo. The RSe05 is compatible with the stock Abarth wheel cap, TPMS and lug bolts, as well as all aftermarket big brake kits currently available. Color choices are black, red or white. **\$269.95** per wheel.

neu-f.com



HITCASE MOUNTS

★ As long as an iPhone 4 or 5 user already has the Hitcase Pro waterproof and shockproof case, it's now possible to mount the phone to various places like handlebars or rollcages for video and/or still images. The MotoR unit latches onto tubes between 0.5-1.25" diameter; the RollR mount snaps onto bars from 1-2.1" in diameter.

\$39.99 (MotoR) and **\$44.99** (RollR)

hitcase.com



WILWOOD BILLET MASTER CYLINDERS

★ We've got not one but two new 4oz billet aluminum master cylinder fluid reservoir kits from Wilwood. One is for direct mount applications and uses an 11/16-20 threaded adapter that connects to any one of Wilwood's compact remote master cylinders. The other is a remote-mount version that includes a billet mounting bracket and a 3/8-24 thread -3 AN fluid connector (braided stainless steel lines are available separately). From **\$91.74**.

wilwood.com

MEYLE STABILIZER LINKS

★ The German Meyle brand makes HD stabilizer links for all major European marques. What makes these different from OE parts is an integrated wrench attachment at the ballpin, making it easier to install and remove. The ball surface is also 50% greater, improving load capacity. And they're tough: the company claims zero joint play after one million test cycles. Prices vary from model to model, but if we look at a 2004 BMW 325i, the front link is **\$43.43**, **\$27.87** for the rear.

meyle.com



INJEN AIR INTAKE

★ Injen's new aluminum Short Ram SO Series air intake, horn and nano-web filter is intended for the 2012 Audi A7 3.0L

TFSI Supercharged. The company claims the resulting airflow is greater and smoother than the stock arrangement, giving improved fuel consumption and gains in output of up to 5hp and 6.75 lb-ft of torque. Also available in a black wrinkle finish. **\$254.60**

injen.com



TURNER/BOSCH MS4.0 ECU

★ Turner Motorsport and Bosch Motorsport have collaborated on a plug-n-play tunable ECU for the E46 BMW M3. Designed for track use (no limp mode), it's pre-loaded with dyno-tuned base maps for many popular modifications and is also updatable. The setup offers several levels of power output. It comes with Lambda sensors and works with the factory wiring and CAN system. Installation can be as quick as one hour. From **\$6495**.

turnermotorsport.com



MILLTEK EXHAUST

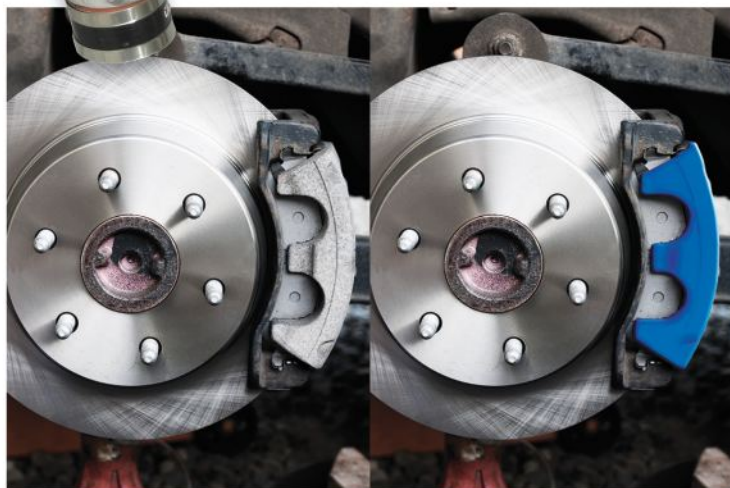
★ Using technology and experience gained from its involvement in the British Touring Car Championship, Milltek has revised its T304 stainless steel exhaust system for the VW Golf R. Using 3", mandrel-bent tubing, the system is lighter and provides the optimum balance of gas flow and back pressure. The company

hasn't given any numbers, but claims a hike in performance and drivability, especially in the mid-range. The silencer box has no internal valving, for a richer exhaust note. It's available in polished, black or titanium finishes. From **\$1350**. milltekspport.com

AMSOIL MIRACLE WASH

★ There's a new look and a revised formula for Amsoil's Miracle Wash Waterless Wash & Wax spray. Just apply to a vehicle's bodywork and let the surfactants lift and trap all the dust and grime. Then the shiny finish is protected against ultraviolet rays and dirt. The price stays the same: **\$9.40** for 13oz can.

amsoil.com



PLASTIKOTE CALIPER PAINT

★ This aerosol will spray brake calipers with paint that can withstand temps of 500°F. It comes in a variety of colors including yellow, red, blue, silver and black. The company also claims that an

innovative pressure pad requires 33% less finger effort while applying the high-gloss finish, if you were concerned about fatigue during the painting process. **\$8.49** plastikote.com



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SHIFT TO A HIGHER STANDARD.

SPECCLUTCH.COM



P3CARS VENT-MOUNTED DISPLAY

★ Here's another of those clever digital readouts that fit in the dashboard vent. This time it's for the Audi R8 supercar. It has an OEM look and can display information on a variety of functions such as sprint and braking times, battery voltage plus a fault code read and clear facility. **\$489**
p3cars.com



HOTCHKIS SWAY BARS

★ Made for the 2012/13 VW Golf R, the front and rear adjustable anti-roll bars combat understeer and body lean, making the Golf R a sharper drive. They're both 1" diameter, with the front bar offering an increase in stiffness from 65% to 100% over the factory setup, depending on which setting you choose. The rear

unit's goes from 55% up to 145%. Made in the US, the bars are finished in an "anthracite" powdercoat. They also feature welded center rings, "greaseable" polyurethane bushings and heavy-duty brackets with built-in Zerk fittings for ease of maintenance. **\$565.80**
hotchkis.net



BALLISTIC PHONE CASE

★ Waterproof, dustproof and guaranteed against damage caused by drops of up to 8ft, the new iPhone 5 case from Ballistic uses polycarbonate and thermoplastic elastomer materials to protect your device. It comes in a variety of colors and the company claims these cases are toddler-proof. **\$79.99**
goballisticcase.com

MEGUIAR'S WATER SPOT REMOVER

★ Water spots, those dried mineral deposits that detract from a clean car's appearance, can be eliminated quickly and easily with Meguiar's newest product. It works on any vehicle's hard surfaces (such as paintwork, chrome or glass) and provides the defect correction of a compound, but the gloss enhancement of a polish. **\$12.99**
meguiars.com



M5 DOWNPIPES

★ More muscle throughout the powerband, better throttle response and no turbo lag are some of the claims Alpha Performance makes for its stainless steel downpipes designed to fit the 2012 F10 BMW M5 and F12/F13 M6. Instead of a short transition from 3.5" down to 3" that can create turbulence and disrupt flow, Alpha has opted for a smooth transition, while using factory O2 sensors, heat shielding and brackets for an OE fit. Included are all parts and hardware needed for the installation. A 300-cell race catalytic converter is also available. From **\$1799.95** for catless downpipes.
alphaperformance.com





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The police retired this cruiser after 90,000 hard miles. The taxi company is hoping for another 300,000—with the help of Mobil 1™ synthetic motor oil. Learn more at **mobil1.us**.

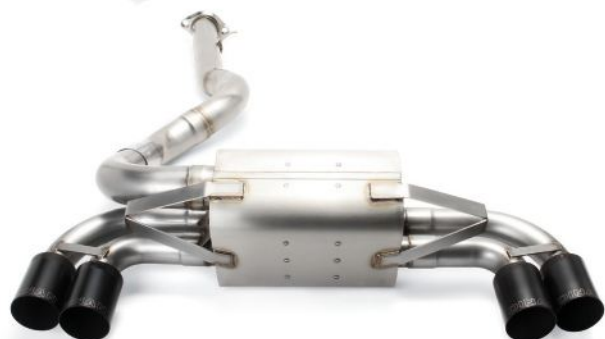
KEEP YOUR ENGINE RUNNING LIKE NEW. Mobil 1™



FORGE WASTEGATE

★ Using a piston-actuated mechanism rather than the more common, but less durable, diaphragm setup means the new Forge Motorsport wastegate can cope with more horsepower and high temperatures with no loss of function. The piston body has a 44mm actuator and is made from aero-grade alloy. Other parts are stainless steel. The unit comes with inlet and outlet mating flanges, plus V-band clamps with a 360° boost connector. It's suitable for all high-performance cars with forced induction. **\$480**

forgemotorsport.com



DINAN 1M EXHAUST

★ The limited edition BMW 1 Series M Coupe was one of the hottest BMWs to hit the road in many years. The main difference was exclusivity. While you can find an M3 around nearly every corner, the 1M was something special. So Dinan wanted to enhance the

experience with its new axle-back exhaust system. Constructed from 20-gauge 304 stainless steel, installation should be straightforward, and the exhaust note enhanced considerably.

\$TBD

dinancars.com



GULF OIL T-SHIRTS

★ They won't make your car any faster, but these Gulf Oil T-shirts give off a retro racing vibe. There are several designs to choose from, each featuring vintage Gulf iconography. M&P Speed Shop also has plans for Gulf Oil caps and jackets to follow. Sizes are S to XXL. From **\$35**.

mpspeedshop.com

BILSTEIN PORSCHE SUSPENSION

★ New Bilstein coilover kits offer drivers of any 997-model Porsche 911 more suspension control and lower ride heights. The B16 Damptronic setup is fully compatible with Porsche Active Stability Management, allowing changes to be made on the fly. The PSS-10 coilovers, with ten-way adjustment, are intended for cars without PASM fitted. Both options come in either Club Sport or Comfort specification, depending on your application. Ride height can be dropped 40mm lower than stock. From **\$4300**.

Bilsteinus.com

BRAVEN 855s BLUETOOTH SPEAKER

★ Something handy to have in the workshop, at home or when traveling, the rugged Braven 855s speaker unit is 10" long and 4" tall. Made from aero-grade aluminum, the housing is wrapped in a tough, rubberized shell to make it more resilient to everyday bumps and knocks. What's more, the 855s is water-resistant, meaning it won't mind being left in light rain or splashed poolside, provided you've removed the charging cable and shut the connector door seal. Charging takes 4-6 hours from empty but, in turn, it can charge your USB devices like a phone or

iPod. You can even answer phone calls using the phone button on top. To sync your Bluetooth device, simply press the play key and wait for the beep. Then pair it to your phone and play music or take calls for up to 20 hours thanks to its rechargeable lithium-ion battery. And there's an auto shutdown function if you leave it unused for more than 90min. Get two of these Braven speakers and you can pair them for stereo sound from two different locations. The compact speaker kicks out 20 watts of high-quality audio and we're happy to report this isn't one of those nasty sounding speakers you regret buying. The tone is rich, with lots of bass and will give you plenty of volume without distorting. It also has good spatial reproduction, making



the audio fill the space rather than being focused in one spot. The soft-touch controls are very simple to use. The power button does what you expect, and turning it on will automatically reconnect the Bluetooth. There's a play button that will also pause your music, plus volume buttons that can be controlled from your iPod. With the phone button completing

the lineup, Braven seems to have thought of everything, and made it man-friendly by ensuring it doesn't matter if it gets knocked over, splashed or left on. If it could cook the perfect steak we might consider marriage. This gets our thumbs up for a great design and good value. **\$299.99**

braven.com

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RSe WHEELS

NEUSPEED has been the leading manufacturer of high quality and cutting edge performance parts and accessories for almost four decades. With such experience, NEUSPEED proudly introduces the RSe Wheel series; the ultra-lightweight alloy wheels with unmatched quality, individually spec'd specifically for your vehicles.

Every NEUSPEED RSe wheel is manufactured utilizing the latest hybrid forging technology called Flow-Forming. In a nutshell, the wheel center is low-pressure cast and the barrel is rotationally forged. This process rearranges the alloy's grain direction, which essentially strengthens the barrel structure matching the conventional forged wheels strength.



RSe12

RSe05

RSe14

RSe-07

2013 VW Golf R
18x80+45mm :: 19.3 Lbs.
Gun Metal Finish
225/40R18 Michelin Pilot Sport
Stoptech 355mm / 4-piston Trophy Kit

ULTRA LIGHT WEIGHT

With the average of 1lb/inch weight ratio, the NEUSPEED RSe wheel will enhance your driving experience by reducing the rotational mass or unsprung weight. Improved braking, faster launch, quicker throttle pick up, responsive steering, as well as increased fuel efficiency are the common side effects of installing NEUSPEED RSe wheels.

BIG BRAKE COMPATIBLE

Every RSe Wheel is specifically designed and engineered to be "Big Brake Kit Friendly." Installation of most big brake kits will not require the use of adapters, spacers, shims, or any other safety impairing devices.

Wilwood	Stoptech	Brembo
VW Racing	JCW	AP Racing

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NOVEMBER 2013

FIRST DRIVE



► 2014 Range Rover Sport

THIS MIGHT BE THE
ONLY CAR YOU'LL
EVER NEED

WORDS / Greg Emmerson
PHOTOS / Alex Bernstein



WE'RE OFTEN ASKED ABOUT OUR FAVORITE CAR BUT THE MORE CARS YOU DRIVE, THE HARDER IT IS TO ANSWER THAT QUESTION.

So most people have a dream garage, with maybe a sports car, SUV, sedan, etc. However, we recently got to drive perhaps the only car you'll ever need: We traveled to Merry Olde England to drive the all-new 2014 Range Rover Sport.

Where the old car was based on the LR4 platform, the new Sport is now closer to the flagship Range Rover, gaining an aluminum bodyshell, panels and suspension, losing about 800 lb in the process (V6 model), being 25% stiffer but having 75% different parts from the 2014 Range Rover.

So while it's the fastest Land Rover ever built, and gains a third row of seats to meet demands for greater capacity, the new Range Rover Sport is the Swiss Army knife of automobiles. It can do absolutely anything.

The problem for Land Rover is how to demonstrate the massive ability of such a versatile vehicle in a few short hours. So we went on a relatively long distance tour into Wales enjoying great GT comfort, got sporty on the country roads, accelerated to 150mph on an airfield, did 0-100-0mph in 17sec, waded through a river, traversed thick muddy trenches, climbed slippery banks, and tackled an obstacle course inside a Jumbo Jet. Yes, you read that right, and can see the video at europeancarweb.com

Land Rover pulled out all the stops to get its message out. Driving up and down steep ramps, several storeys high, leaning over at ridiculous angles and showing tremendous wheel articulation, all while passing through the first class cabin of a 747 made the point emphatically.

So if you're looking for a GT, sports car, off-roader, tow vehicle, family transport and speed demon with fantastic ability in every area, may we recommend the 2014 Range Rover Sport?

Originally conceived as an SUV with better



SEE THE VIDEO AT
WWW.EUROPEANCARWEB.COM





road manner than the Range Rover, it's easy to forget how good the Sport can be in difficult conditions. When the water is splashing onto the windows, you know the river is deep, yet the RRS can climb an almost vertical bank to extricate itself from the water using the same Pirelli M+S road tires we would later take to 150mph on an airport runway. All you need to do is select the correct setting on the Terrain Response 2 system and the suspension will raise, traction control will adjust, diffs lock; everything operates to ensure the driver emerges without drama.

We loved the first Sport model for its chunky fender flares and no-nonsense attitude, initially feeling this replacement was a little soft. However, in the flesh the new RRS has real presence, but also a restraint and sophistication that perhaps the old car lacked.

There's tremendous attention to detail that makes this Sport more intimate. It invites you to absorb the intricacies such as the side vents, puddle lights, logo between the doors, headlight surrounds, etc.

Inside, they've gone the other way, mimicking the Range Rover and reducing the number of

switches and buttons. Most features are now centered on the nav screen, with the Terrain Response selector by the shift lever.

The shifter allows you to access the new eight-speed automatic transmission, which is a peach. It's used by several other manufacturers and might be the best auto in the business. The shifts are crisp and instantaneous, it always seems to be in the correct gear, and you've got paddles if you're feeling sporty.

Having been put on a strict aluminum diet, the RR Sport feels almost agile for a 5100 lb SUV (V8 model). This is also thanks to its lightweight independent suspension components and advanced technology such as air aprings at each corner that help to keep the car level but also assist in providing up to 21" of wheel travel to cushion any blows or overcome virtually any obstacle.

When driving off-road, the electric, variable-ratio, speed-sensitive steering means you always have what you need. At high speed, it has weight and accuracy; while rock-crawling, it has quick responses but won't kick-back in your hands.

The Terrain Response system has a Dynamic

Mode for on-road behavior that gives a firmer ride with less body roll and sportier steering, making it feel less of an SUV and more like a GT. And when this is partnered with Dynamic Response active lean control, Dynamic Active Rear Locking Differential, plus Torque Vectoring by Braking, a blindfolded passenger would never know you were in a Range Rover. It drives more like a sports car, with its (optional) 155mph top speed, plus incredibly powerful braking thanks to six-piston Brembos up front.

All these systems operate seamlessly, helping you to hustle a very heavy car through some of the trickiest roads in Wales, with only free-ranging sheep to worry about. On these roads, the surface could be far from ideal, but the Adaptive Dynamics kept varying the damper rates to absorb all but the worst imperfections. The Torque Vectoring also helps considerably by applying power to the outside wheels to aid turn-in, with the e-diff ready to step in if you over-cook it.

So while this SUV drives better than most cars, it's only tickling the surface of the iceberg underneath. The off-road ability is immense and Terrain Response 2 is there to help you.



SPRINGS

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COIL OVERS

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BMW 335i Sedan
equipped with H&R Street Performance Coil Over
and H&R TRAK+ Wheel Spacers



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highest quality spring steel

For lightweight, durable,
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upside down mono-tube shock

Reduced side loading and
precise alignment.

heavy duty mounting brackets

Engineered for extreme use
and precise fit.

durable spring seat and locking ring

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with robust Tr52x1.5
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Leave it in auto and the car will calculate what's best, but set it manually and it knows what to expect. The system works with another raft of assistance technologies that are again seamlessly integrated, with perhaps the Hill Descent control the only one you really notice as you plummet down a near-vertical cliff to your death. Except the system uses the gearing and brakes to ensure you float down on daisies to land in a blanket of feathers, or so it seemed...

Just like the Range Rover, the air intake draws from the hood shut lines, so the wading depth has been increased by 6" to an impressive 33.5" for the global-warming flood you may now be, or soon be, experiencing.

For people wanting to get into the new Sport on a budget, the good news is that the SE model starts at \$63495 and comes with the sweet 3.0L supercharged V6 found in the Jaguar XF, XJ and F-Type. Boasting 340hp, it's superior to the naturally aspirated 5.0 V8 in the old Sport, sprinting to 60mph in 6.9sec (0.3sec quicker) and will be 27% more economical as well.

European drivers will enjoy diesel and even a diesel-hybrid model to save them more money at the pumps. There's also a petrol-hybrid coming, which might reach the US one day.

People with larger families can also rejoice at the third-row seating that will provide temporary perches for little ones. It also folds flat at the touch of a button for convenience. The car is 7" longer in the wheelbase than before, increasing rear passenger space. Yet it's shorter and 100 lb lighter than the Range Rover it's based on.

Land Rover knows we like to individualize our cars, and with the Evoque's comprehensive options list setting a new trend for the

company, Sport customer also have thousands of combinations. These include 19 paint options, three roof colors, 11 interior color themes with more seats colors, four aluminum and three wood trims, 19-22" wheel options, black exterior trim and a Dynamic Pack on the top V8 models that brings color-matched exteriors and more interior options.

Whatever colors you choose, this is a handsome car with a lavish interior you can spend hours inside. The 14-way adjustable seats were always comfortable, especially when wrapped in the soft leather of our test car. The tactile trim rewards the fingers with wood and aluminum, while the eyes fall upon luxury not often seen fording a deep river. Yet with triple seals on the doors, no water gets in, which is just as well because you wouldn't want to damage the 27 speakers in the top-flight Meridian audio system!

And if that wasn't enough, the Sport will tow up to 7700 lb and is available with Tow Assist and Trailer Stability Assist so even a rookie can get the job done.

We spent two days in a car we'd previously enjoyed, but found ourselves constantly amazed at the Range Rover Sport's immense ability and flexibility. We couldn't imagine a single scenario where this vehicle wouldn't be up to the task, but were able to imagine a few uses we'd never previously considered...

Is this the only car you'd ever need? Of course not, but if you can only have one car in the garage, this might be the best one out there for every occasion because, while the Porsche Cayenne or BMW X5M might be as competent on-road, neither will live with the Range Rover Sport off it.

2014 LAND ROVER RANGE ROVER SPORT SUPERCHARGED

LAYOUT > front engine, all-wheel drive

ENGINE > 4999.7cc V8 DOHC 32v, quad-cam Dual Independent Variable Cam Timing

DRIVETRAIN > ZF 8HP70 eight -speed automatic transmission, permanent 4WD with locking center diff, Terrain Response 2, locking rear diff [option]

BRAKES > six-piston Brembo calipers, 15" rotors f, 14.3" r

SUSPENSION > SLA suspension with twin lower links f, integral link suspension r, air springs f&r

WHEELS & TIRES > 20x8.5", 255/50 R20



PERFORMANCE

POWER > 510hp at 6000-6500rpm

TORQUE > 461 lb-ft at 2500-5500rpm
0-60 MPH > 5sec

TOP SPEED > 140mph (155mph option)

CURB WEIGHT > 5093 lb

ECONOMY > 14/16/19mpg
[city/highway/combined]

MSRP > \$79995

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Engine oils must withstand the strenuous rigors of today's modern engines while maintaining proper fluidity and viscosity. Motul's 8100 100% Synthetic engine oil range has many approvals by some of the top European automotive manufacturers, by meeting or exceeding their individual specifications and torture tests.

MOTUL



ADVAN

Sport® V105

Developed at Nürburgring race complex.

Those who know ADVAN performance revel in the difference Yokohama brings. From its innovative compound to its race-bred construction, the ADVAN Sport V105 delivers a thrilling drive, confidence in the wet, and refined comfort for discerning enthusiasts everywhere.



WET PERFORMANCE
DRY HANDLING



MAXIMUM WET & DRY GRIP

ADVAN Sport® V105 delivers impressive traction – rain or shine – with its specialized compound and enhanced tread design.

SPORT COMPOUND 5S

Yokohama's Sport Compound 5S was developed with leading European car manufacturers to create high levels of wet and dry grip.

ASYMMETRICAL PATTERN

Wider tread blocks on the outside of the tread enhance dry performance, while the increased groove area on the inner portion maximizes wet performance.

PRECISION HANDLING

The ADVAN Sport V105 incorporates technology developed in world-class racing to enhance stability and steering precision.

MATRIX RAYON BODY PLY

Incorporating race tire technology, body plies constructed of lightweight, heat-resistant material are turned up from the sidewall at a precise angle for increased rigidity and enhanced steering precision.

CIRCUMFERENTIAL GROOVES

Optimum groove placement allows the widest circumferential groove to gravitate to the center of the contact patch under lateral load, enhancing wet grip during high-speed cornering.

UNIQUE SPORT PROFILE RIBS

Precisely control ground pressure for improved stability at high speeds, while promoting regular wear.

REFINED COMFORT

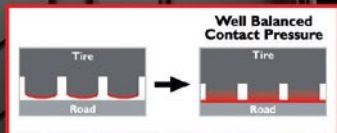
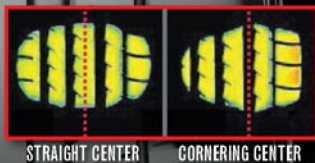
Not only is the ADVAN Sport V105 an overachiever in performance, it provides quiet comfort other ultra-high performance tires can't.

VARIABLE PITCH TREAD

Reduces pattern noise offering a quiet and comfortable ride.

QUIET SIPES DESIGN

Strategically placed sipes on the inside ribs provide excellent grip and reduced road noise.



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► 2014 Mercedes-Benz S550

**MERCEDES
CLAIMS TO HAVE
“THE BEST CAR
IN THE WORLD”**

WORDS / *Greg Emmerson, Colin Ryan*

WHEN THE MERCEDES-BENZ SPOKESMAN CONFIRMED THEY BELIEVED THE NEW S-CLASS WAS THE BEST CAR IN THE WORLD, I COULDN'T HELP BUT SHUDDER SLIGHTLY. That kind of statement often leads to disappointment, mainly because our idea of what makes a car “best” isn’t always the same as the average driver. But more importantly, could this four-door sedan live up to the hype?

First impressions are positive. It might not be as distinctive as the slightly challenging previous W221 model, but the new W222 is handsome and slightly understated. It also disguises its size, looking shorter than its 17ft length.

We had the chance to speak to exterior design chief, Robert Lesnik, who was enjoying what he described as the best job in the world because he had a wide portfolio of projects to work on, stating the difference between the new CLA and S-Class as proof.

He also pointed out that Mercedes is the only car company in the world with two grilles – one with the three-pointed star on the hood, and the other with the large star in the grille. And while the new E-Class gets both options, he felt the more refined S should receive the classic grille treatment.

Interestingly, this was Robert’s first assignment at Mercedes, his design being selected three months after he joined the company in 2009, giving him another four years to create the production version.

“This car is all about proportion,” he stated. “We wanted the details to be seen close up rather than from afar, so the defined wheel arches have gone but it has the classic long hood and rearward cabin of a RWD car.”

“After the A-Class and CLA designs, people were worried about how the S-Class would

look,” he continued, “but people have fewer expectations of the smaller cars, so we could push the envelope further. Whereas there have been six generations of S-Class so we needed to be more evolutionary. We worked hard to get the proportions right and hide the fact it’s slightly longer than the previous model. In fact, everything is built around the rear seat passengers for legroom, headroom, audio, etc. Many of these cars are chauffeur driven so we needed to get that right while incorporating the new safety regulations, which is one of our biggest challenges.”

The new S-Class undoubtedly has presence, as testified by the number of motorists scampering out of our way as we barreled down upon them. And yet the cabin remains serene in all but fast corners.

Although the S550’s weight is currently undisclosed, it’s claimed to be almost 220 lb lighter and 50% stiffer than before. Yet it’s no featherweight. Even in Sport mode, the car leans into turns. It remains relatively flat but you sense the mass moving below you, which is a shame because the 449hp V8 biturbo gets



🚦 Dummy was used to vividly demonstrate pedestrian avoidance measures

you moving along nicely.

Slow down, select Comfort, and the Merc regains its composure. In fact, Mercedes has given it Magic Body Control, which frankly sounded rather silly until it was properly demonstrated: approaching a speed bump at respectable speed, the car's stereoscopic cameras (first seen in the 2014 E-Class) read the road, see the obstacle and discreetly raise the front suspension in anticipation. The car then glides over the hump as if it were, well... magic. It describes the effect perfectly since you feel absolutely nothing.

The car has sensors like we use our eyes and ears. This new generation flagship deploys radar, infrared, ultrasound and its dual cameras to create a 360° picture of its surroundings. It can distinguish between animals and humans, even at night. It can read the road surface and adjust the air suspension as we mentioned, and even detect approaching traffic and take steps to avoid an accident if necessary.

Steering assistance goes to another level. The electrical system (there's a nice weight to it, by the way) doesn't only exist to park the



car for you... It will gently nudge you to keep the car safely within lane demarcations. If you ignore it and are veering into oncoming traffic, the brakes are applied on one side to return the car to its correct lane. It doesn't actually say:

"I can't let you do that, Dave." But the level of awareness is uncanny.

The engineers have taken it a stage further by offering the first glimpse of autonomous driving. Although regulations don't allow this



in the pure sense, the S550's cruise control can now follow a car or remain in a lane at a pre-determined speed and distance, while steering through turns itself. There are some safeguards to ensure the driver is giving regular inputs but we experienced a low-speed corner taken behind another car and coming to a halt without any input from the driver. Regarded as a safety device, it seems to provide the opportunity for the driver to occupy himself with other tasks, but it's a glimpse of the future.

The new S-Class is all about soothing its occupants, relieving them of the drudgery of congested driving. It does so by employing more than 20 interacting systems that include parking assistance, blind spot monitoring, night vision, intelligent cruise control and intelligent headlights. Add to that a Burmester audio system and you have a great long distance cruiser. However, these aren't the S550's greatest trick.

Navigating the onscreen menu, you can instruct the infinitely adjustable seats to provide you with a hot stone massage, altering the pressure and location to suit your aches. There's also a scent diffuser in the glovebox that wafts your selected scent on a gentle breeze of ionized air, creating a relaxing spa environment.

Therefore, it should be no surprise that you can also select the color and intensity of electric light, although not a single bulb is deployed in the new S. It houses 500 LEDs that, of course, last longer and require less energy.

If the right option boxes are checked, the double-glazed cocoon brings 43.5° reclining

rear seats like those in the first class cabin on an airplane. They can similarly massage, heat or cool you and, in our car, were trimmed in a "quilted" leather. This was actually diamond-shaped perforations rather than full quilting but the effect was appreciated.

And Benz claims the elegant and functional cabin is virtually hand-built. Where faux is a no-no, it uses real leather, wood and metals throughout. It's library-quiet and aerodynamically efficient thanks to a drag coefficient of 0.24, which beats a well-known Japanese hybrid.

Trunk capacity of 18cuft gives the S-Class an advantage over the Audi A8 and BMW 7 Series, yet it doesn't look awkward in proportion, even on the long wheelbase versions that will be standard in the US.

As the best-selling car in the sector, and with 20,000 advance orders, it looks as if the 2014 S-Class is guaranteed success. And there's an AWD 4Matic version around the corner, plus a V6 hybrid model to follow.

Since the demise of the ultra-luxurious Maybach brand, the S-Class is left to fill the rather small void, with rumors of a model along the lines of an S600 Pullman waiting in the wings. And while Europe will get several other engine options, including a thrifty diesel hybrid, all models will be more efficient than the outgoing ones. Prices are also expected to be close to the outgoing models.

So is this the best car in the world? Rolls Royce might claim more luxury, BMW might be more sporting, but nobody seems to have more

technology. The 2014 S-Class may well be the safest car in the world, and for many of us that would make it the best...

2014 MERCEDES-BENZ S550

LAYOUT > longitudinal front engine, RWD (4Matic AWD optional)

ENGINE > 4.7-liter V8 DOHC 32v biturbo

TRANSMISSION > seven-speed automatic

SUSPENSION > four-link/air springs f, multi-link/air springs r

BRAKES > 13.2" discs f, 11.8" r

WHEELS & TIRES > 18x8", 245/50 R18



PERFORMANCE

PEAK POWER > 449hp at 5250rpm

PEAK TORQUE > 516 lb-ft at 1800-3500rpm

0-62MPH > 4.8sec

TOP SPEED > 130mph

WEIGHT > TBC

ECONOMY > TBC

MSRP > TBC

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Jetta, EOS, Passat
CC, GLI

BMW: 5 series (E60,
F10), 3 series (E46,
E90, F30, Z4), E85,
1 Series (E8X, F20)



WORDS / Greg Emmerson

LIKE MOST PEOPLE, WE'RE OCCASIONALLY SKEPTICAL OF CHANGE.

Often it can be refreshing, but sometimes you wonder why they didn't simply leave it well alone. And so we approached the new BMW 4 Series with a degree of trepidation, mourning the division of one of the greatest family of cars ever built.

We were concerned there wouldn't be sufficient differentiation between the 3 and 4 Series to justify the new nomenclature, but first sight of the attractive new 435i Coupe put our minds at ease. A BMW representative also explained that with extra models scheduled, it would be easier to identify the workhorses from the racehorses – the F30 sedan would be

joined by an F31 wagon and (F34) Gran Turismo model, while the F32 coupe would spawn an F33 convertible and even a (F35) Gran Coupe, and who knows if there'll be an X4 SUV to follow?

On first acquaintance, the 435i we'd be driving had elements of the 6 Series design, with its sharper nose and swage lines creating a more defined wedge shape. There's also a dose of 3 Series familiarity to preserve the family heritage, but overall the F32 looks pleasingly distinctive.

Its unique elements include a lower roofline and wider track than the 3 Series. It gets a different front-end, using new headlights (full LED option), slightly forward raked grille and a front valance that ducts air around the wheels to smooth the airflow. They work in conjunction with the "boomerang" Air Breather gills on the side to contribute to the car's low 0.28 Cd figure

that helps with efficiency and stability.

With its typical long hood and rearward cabin structure, the prominent swage lines along the flanks draw attention to the rear fenders. And for the first time on a BMW (we find this hard to believe), those rear fenders are wider than the door handles. This emphasizes the car's sporting nature, making it appear more purposeful from the rear.

Being a BMW, it's not all window dressing. The F32 gets the obligatory 50/50 weight distribution that made it so balanced on the Estoril racetrack where we sampled the car. It also sits 10mm lower than the equivalent 3 Series, and the center of gravity is below 20" – making it the lowest of any BMW and further contributing to its stability and cornering ability.

The suspension is different to the F30,

2014 BMW 435i

BMW HAS
TAKEN TWO
FROM 3
TO GET 4



having additional front bracing, different pivot points and the lower ride height. We spoke to Sebastian Sauerbrei, head of 3 and 4 Series vehicle dynamics testing, who explained: "The most important thing for chassis tuning is the body... We have a good relationship with the designers, which is useful because it's easier to change a sketch than the body in white."

Sebastian then outlined how the F32 has different control arm mounting points on new axle hubs, giving it a 19mm lower roll center than the F30. The new bracing reinforces the front subframe to the sill rails, creating a stiffer platform and allowing more precise reaction to steering inputs.

Similarly at the rear, the wider track required new components to mount the five-link axle, repositioning the pivot points and altering the car's characteristics in comparison to the

existing sedan version.

The coupe gets electric power steering with Servotronic speed-sensitivity. There's also a variable ratio rack option, which lessens input at low speed or in sudden maneuvers. The 435i has four-piston front brakes and the cars were equipped with the excellent eight-speed ZF automatic with paddle shifters. However, a no-charge six-speed manual is available on the 428i, 435i and 435i xDrive, the only exception being the 428ix.

Starting at \$40500 for the 428i and rising to \$48000 for the 435ix, the coupe is priced considerably higher than the equivalent sedan, but will be better equipped. It comes in the usual Modern, Luxury, Sport and M Sport Lines that bring their own equipment and trim levels to reflect the theme, with the sporting models getting black window surrounds, boomerang,

intakes, mirrors, valances, etc.

This was also our first chance to sample the new iDrive Touch controller that allows you to input finger movements onto its upper surface, spelling out a location, for example.

The coupe gets automatic seatbelt feeders to save you reaching back for the belt after entry. There's also an interesting optional two-tone door and side panel trim that makes the interior feel more cossetting. The red trim on our Sport models ran across the dash, as it does on the F30, and onto the doors to create more flow. While the rear bench was sculpted to create two individual seats – which is unfortunate for a fifth person, who would have to sit on the center divider...

As with the exterior, the changes have created a different look and feel for the interior, all of which benefit the occupants and



differentiate the coupe from the sedan.

You may have seen us driving the 435i on the famous Estoril racetrack in Portugal in a video on *Roundel* magazine's website. The surprisingly small but technical circuit gave the 435i a chance to shine, with long straights where it could get into its stride, and tight hairpins to demonstrate the remarkable lack of body roll, as well as the punch from the engine. With traction control off, the coupe would light up its tires without too much provocation, leading to some very predictable drifts that merely added to the overall entertainment.

The powerful brakes and precise steering gave you total confidence to keep pushing for the limits, with the stability control stepping in at the last minute to avoid any embarrassment.

The six-cylinder's rich engine note and its abundance of torque allied to the wonderful eight-speed auto meant the engine was

🔥 BMW M Performance cosmetic and tuning parts are already available for the 4 Series

constantly in its sweet spot, able to power out of any turn, no matter how tight.

We heard some complaints about lack of steering feel, which is inevitable with low-energy electric systems, but crucially the car went exactly where you pointed it. With its natural balance, the 435i is utterly predictable. This means you know what the car is going to do and can instinctively correct any situation.

For larger, heavier cars such as a BMW 4 Series, the notion of racecar steering feedback is redundant. And while we mourn its passing, the alternative we have here is an excellent replacement in what is a truly excellent car for both the road and track. We don't know how they do it every time, but BMW has scored another perfect ten.

2014 BMW 435i

LAYOUT > front engine, rear-wheel drive

ENGINE > 2979cc i-6 DOHC 24v N55B30M0, twin-scroll turbo, direct injection, Valvetronic variable valve control, Vanos

DRIVETRAIN > eight-speed 8HP45 ZF automatic with manual shifting

BRAKES > four-piston calipers, 13.4" rotors f, single-piston, 13" r

SUSPENSION > aluminum double-joint strut f, five-link axle r

WHEELS & TIRES > 18x8" wheels, 225/45 R18 tires



PERFORMANCE

POWER > 302hp at 5000-6000rpm

TORQUE > 295 lb-ft at 1200-5000rpm
0-60MPH > 5sec

TOP SPEED > 155mph

CURB WEIGHT > 3610 lb

ECONOMY > 23/33/26mpg
[city/highway/combined, EPA est]

MSRP > \$46000



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► 2014 Aston Martin Rapide S

FOUR-DOOR BRILLIANCE

WORDS & PHOTOS / *Les Bidrawn*

HERMAN TIKE, YOU'RE ONE MAD BASTARD.

That two-mile stretch of pavement called Atlanta Motorsports Park you designed makes a guy wonder if you were hoping to punish somebody, maybe a divorce lawyer or something?

Never in 24 years of racing, have I been assaulted by more blind rises, high-speed, off-camber curves, double apexes, dizzying elevation changes and genuine bowel-loosening fear. Great job, man!

Formula One fans will recognize Tike as one of the foremost architects of F1 circuits. Why the good old boys in Georgia chose to hire this guy is puzzling, but there it sits. And the crew from Aston Martin took over the facility for a few weeks, bringing a bunch of snarky Rapide S cars with them.

The Rapide S possesses a profile that appears more suited to the Autobahn or Bonneville Salt Flats. Considering its 190mph top speed (yes, faster than the Vanquish), it wouldn't be out of place at either. Moreover, you could carry your family with you, being a four-door and all.

The idea of adding extra doors was a solid move, which fleshed out the company's product roster very well. Here was the quintessential

British sports car with room for you and three close friends.

Perhaps it's the Rapide's practicality that made Aston Martin nervous, though. Maybe people would assume the Rapide S compromised the awesomeness carefully cultured over the last 100 years. Never mind that the new-n-improved Rapide S boasts 550hp, can breach 60mph in 4.7sec and features active suspension smarter than HAL, you have to show people it's still an Aston. So here we were, in the middle of moonshine central, on this twisted piece of tarmac with orders to "go at it." Helmets on, strapped in, we did just that!

Although we've covered the basic technical aspects of the Rapide in a former issue, here's a brief summary: The new S model is a Limey hot rod. I visited the Gaydon factory where Dr Bez and his team do crazy shit like stuffing V12s into Cignets or building supercars like the One-77. The Rapide S is much the same, but they're making more of them.

Sporting a revamped (AM11) V12 engine, the new car lends another 80hp and 30 lb-ft of twist to the equation, bringing its total to an impressive 550hp at 6750rpm and 457 lb-ft, respectively.

Nifty tech like hollow, variable profile cams, and CNC'd combustion chambers provide the lion's share of the new found ponies.

The main differences on the 'AM11' engine are a revised block, new head with dual variable valve timing (first seen on Vanquish), new crankshaft, camshafts, thermostat, uprated

fuel pump, enlarged throttle bodies (+6mm), a revised 'big' wing intake manifold, and machined combustion chambers. The latter increases airflow within the chamber, increasing the compression ratio and providing more consistent output from each cylinder. Knock sensing allows air/fuel mixture detection to extract maximum power and fuel economy.

As a result of the new parts, the engine is 22 lb lighter than its predecessor in the original Rapide. And, as much fun as it is to talk about the magnificent V12 motor from a technological standpoint, it becomes irrelevant once the engine fires.

The sound from the naturally aspirated powerplant is reminiscent of the low-frequency growl of a tiger just before it rips your face off. You just sorta sit behind the wheel, paralyzed as this gorgeous machine comes to life.

Aston Martin's David Harington shot me a glance. "Are you feeling alright, then?" Apparently I'm sweating despite the fact the cabin is at 72 °F. I pretend to take a phone call. Never mind, I'm wearing a helmet...

Within two turns I'm lost. David suggests I'd like to use the navigation system. He's only half joking. After ten laps I've managed to remember seven of the corners. I'm getting better and the Rapide S has forgiven my transgressions, it's working with me.

I've got the back straight wired. By the time we hit the first kink, the Rapide S is tickling 132mph. I barely nick the inside line and let the Aston drift to the next apex. It's beautiful.

At this speed, barely perceptible rises



2014 ASTON MARTIN RAPIDE S

LAYOUT > front/mid-mounted engine, rear-wheel drive

ENGINE > 5935cc V12 DOHC 48v, aluminum block and heads, port fuel injection, variable valve timing

DRIVETRAIN > six-speed Touchtronic 2 automatic with manual shift mode

BRAKES > six-piston calipers, 15.6" grooved rotors f, two-piston, 14.2" r

SUSPENSION > independent double wishbones f & r, Adaptive Damping System

WHEELS & TIRES > 20x8.5" f, 20x11" r wheels, 245/35 ZR20 f, 295/30 ZR20 r Bridgestone Potenza S001 tires

EXTERIOR > S grille and trunk lid



PERFORMANCE

POWER > 550hp at 6750rpm

TORQUE > 457 lb-ft at 5000rpm

0-60 MPH > 4.7sec

TOP SPEED > 190mph

CURB WEIGHT > 4410 lb

ECONOMY > 13/19/15mpg

[city/highway/combined]

MSRP > \$199950 [\$223595 as tested]

become daunting ramps; I start wondering what the car will feel like airborne. It never happens. The latest Gen4 of Aston Martin's Adaptive Damping System (ADS) offers three settings: Normal, Sport and Track. Obviously, we're in the latter and the ride is very firm, almost hard. Yet the Rapide feels stuck to the pavement by gigantic magnets, body roll is minimal. Dropping the engine another 19mm undoubtedly helped with the center of gravity a good deal.

Whatever code the Aston propeller-heads programmed into the Rapide's Dynamic Stability Control, it appears to be the least intrusive system I've ever driven. I wonder if it's even on. I make David switch it off and find another 2sec per lap.

After several dozen laps I've got it wired. I still miss an apex or two, but who cares? I'm having fun. Then David suggests I temper my throttle inputs. "Why the hell would I want to do that?" "Because you'll go faster and save the tires!" he replied. Grudgingly I respond and it rewards me with 139mph on the back straight.

I'm using much more braking now but they don't seem to care. Bearing six-piston calipers and gigantic 15.6" rotors, the Rapide S sheds speed well, like "crashing into a mountain of Silly Putty." This particular car wears 20" alloys shod with 245/35 front and 295/30 rear Bridgestones.

In less than two hours I've reduced the Rapide S to something just north of a BTCC ride. Not sure that's what Aston intended, but that's how I used it.

I don't think I even looked at the cabin except to push the big "D" button on the dashboard to engage the transmission.

The cockpit is nice... really nice, a mixture of old world craftsmanship combined with a tasteful mix of organic and synthetic materials. This particular car was trimmed in a full-grain leather with alcantara headliner, navigation, 1000W B&O audio system with pop-up tweeters, electroluminescent displays and a pop-up LCD screen with back-up camera. And, wow, look at that – paddle shifters! I didn't even know they were there.

David tells me I'm in a "red haze" and it's time to cool down. He puts the Rapide S into "Normal" mode and the car instantly relaxes; I follow suit.

I'd been dancing on the edge for a while, so the change of pace was actually a relief. Plus, I get to remove my helmet and enjoy the noise from the magnificent V12 again.

Once outside, the Rapide's impossibly handsome face is worth crawling across broken glass to experience. Aston's cosmetic overhaul includes a striking new grille, rear deck profile and petulant trunk flip.

While I've been fortunate to drive a great many luxury grand touring cars, I can't remember one as engaging as the Rapide S. While the current crop of high-end Euros is impressive, they can make the driver feel as though he was an afterthought. The Rapide isn't like that. For more than two hours I felt like a king behind the wheel, an integral part of a beautiful machine.

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Photo by Klaus Schnitzer



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2014 Bentley Flying Spur

THE SEDAN IS REVISED
TO BE MORE THAN A
STRETCHED COUPE



WORDS / *Kyle Fortune*
PHOTOS / *Max Earey, Jamie Lipman*

OBJECTS IN THE MIRROR MAY BE CLOSER THAN THEY APPEAR AND, IN THIS INSTANCE, EVERYTHING IS TOO CLOSE FOR COMFORT AMID THE MAELSTROM OF TRAFFIC. The sharp detail lines tapering over the rear fenders to the Spur's new pinched rear-end are in serious danger of being punctuated by damaging contact with the traffic.

Beijing, China in a \$200,500 cocoon of serenity among the chaos of daily road users makes it easy to understand why China's elite are buying Bentleys in such large numbers. The supple leather, plus the turned metal and veneered surfaces offer respite from the madness outside.

The old Continental Flying Spur never sat particularly comfortably. Too close to the GT coupe, the styling was too similar, making it look as if the coupe had been unceremoniously stretched into four doors.

No such accusations can be levelled at

the new Flying Spur. Bentley even dropped the Continental name to distance it further, although the change of styling direction gives greater separation from the GT.

The link is obvious; Bentley didn't dispose of its DNA with the Spur, but merely modified it. Longer, wider and lower, the Spur is more assertive, sharper. The creases down its flanks are so sharp Bentley altered its manufacturing techniques to create them. And the bold front grille, with its glorious detailed mesh, underlines the company's attention to detail.

There's some deco to its looks. The confidence to mix curves with defined lines and intricate detailing delineates the Flying Spur from mainstream luxury sedans from Mercedes, BMW and Audi.

Previously alone, the Spur now shares its price bracket, being pinched from above and below. Mercedes-Benz's Dr Zetsche is on record saying the S-Class will span from its existing base to the rarefied bracket where Rolls-Royce exists. The Flying Spur sits in the middle, with its \$200k price tag (bank on spending at least 10% more on options) making it appear like conspicuously good value.

You only need to spend a few seconds inside the Spur to understand why it eclipses its volume luxury rivals. The hand stitched finish on the beautiful leather is both a tactile and visual treat. The wood veneers, richly polished to a mirror finish, are likewise an exercise in futility to resist touching the smooth surface. Add cool chrome and machine-turned metal, if you've optioned it, and the Flying Spur is a sensual overload.

It's quiet too. Significantly more so than the previous model. Bentley has suppressed extraneous noise, with the 6.0-liter twin-turbocharged W12 only heard when pushing the accelerator deep into the carpet.

Billing the Flying Spur as the most powerful Bentley sedan – the W12's 616hp betters the Mulsanne's output, but its 590 lb-ft isn't able to match the flagship model's 740 lb-ft.

Those figures manifest in a 0-60mph time of 4.3sec and the headline 200mph top speed. It's AMG performance, but despite an effortless ability to change velocity quickly, Bentley admits the Flying Spur has changed from a once overtly sporting sedan to a more luxurious conveyance. As a result, the Flying Spur's time-



2014 BENTLEY FLYING SPUR

LAYOUT > front-mounted engine, four-wheel drive

ENGINE > 5998cc twin-turbocharged W12

DRIVETRAIN > eight-speed ZF automatic transmission, AWD

SUSPENSION > four-link double wishbones f, trapezoidal multi-link r, self-levelling air suspension with Continuous Damping Control

BRAKES > 405mm f, 335mm r (optional Carbon-Silicon Carbide 420mm drilled f, 356mm r)

WHEELS & TIRES > 20x9.5", 275/40 ZR20 (19" standard)



PERFORMANCE

POWER > 616hp at 6000rpm

TORQUE > 590 lb-ft at 2000rpm

0-60MPH > 4.3sec

TOP SPEED > 200mph

WEIGHT > 5451 lb

ECONOMY > 12/20/15mpg

[city/highway/combined]

MSRP > \$200500

bending pace is a by-product of its breeding more than its focus.

That's immediately evident when entering Beijing traffic. The Spur's response was more measured and calmer than before, from the slick efficiency with which the new eight-speed automatic deals with its numerous ratios, to its reaction to the accelerator pedal as you flex your right ankle.

The steering, curiously heavy and leaden at manoeuvring speeds, lightens once moving, although never totally losing its initial resistance. No doubt the weighting aids stability when approaching the double century, but it detracts at more normal speeds.

It's rare that a manufacturer admits dialling back suspension settings, but the Flying Spur's rates are 15% softer. The changes also include bushings that are 25-38% more compliant. This has removed the harder edge ride for a more supple suspension, but also robbed the car of some of its roll control, even in the firmest of the four damper settings. The Flying Spur certainly feels more luxurious than sporting in the bends.

This is all relative, of course. The Flying Spur

will still hustle if you're in the mood. There's more initial roll when turning-in, and pitch on braking or acceleration, but the power is still delivered to all-four wheels, but with a greater 40/60 rearward bias. Not that you'd know it... the Spur's nose being the first to give up grip, signalled by protest from the front tires rather than through the steering. However, to reach that point, the Spur is travelling faster than most drivers will want, and any passenger in the back will desire. If speed is your aim, Bentley's inevitable Flying Spur Speed model will satiate hardcore desires.

As it stands, the Flying Spur is a confident change of direction for a brave new world. It works. It remains a unique proposition at its price point, and a better car for not chasing outright dynamic ability but focusing on luxury, refinement and comfort.



► 2013 Ducati Monster 1100 Evo

WORDS / Alex Bernstein

TWENTY YEARS AGO, DUCATI RELEASED WHAT'S BECOME AN ICON IN THE WORLD OF TWO-WHEELED BEAUTY. Known for its exposed engine and frame, the Monster is regarded as a "naked" bike for its lack of fairings. Having consistently accounted for a large portion of Ducati's sales, it holds a place in many riders' hearts and, to us, has always hit the sweet spot.

In celebration of 20 years of Monster mayhem, Ducati released the Monster 1100 Evo 20th Anniversary Edition, along with a 696 and 796 option as well. However, the 1100 Evo is the one, offering the Monster family's full package of functionality, style and sport.

It packs a 100hp punch at 7500rpm and generates 76 lb-ft at 6000rpm, along with Marzocchi front suspension, a minimalistic tail-end and the Ducati Safety Pack (DSP) that gives you ABS and four levels of traction control. All this in a bike that weighs only 373 lb, making the Monster 1100 Evo the lightest in its class. It's a bike that could surely kill you but, fortunately, it doesn't want to!

Once you're past its stunning Ducati red paint, exposed bronze trellis frame and gold Brembos, you hop on to find the seating position feels homely, at least for my 5' 9" frame. The upright bars are exactly where they should be and, as I inserted the key to awaken the twin-cylinder animal, my ears were met with pure metallic glory; the clutch chattering, and an L-twin rumble only a Ducati emits.

The exhaust on this Monster wouldn't need changing; it's quiet enough to stop your neighbors loathing your existence, but loud enough to cause bystanders to salivate. It sings a glorious tune of Italian heritage and brilliance.

Around town, the Monster isn't particularly comfortable. It wants to be ridden hard, as its name suggests. The L-twin is relatively rough below 3000rpm, causing a bit of hesitation on throttle input. This can sometimes be expected on a Ducati, although it's something you learn to love. A change of habit, making you hold onto gears to higher revs at low speeds is all it takes to be ridden smoothly.

Riding up Pacific Coast Highway in the early morning fog towards Malibu at speed, with bursts of second to fourth gear rips, the Evo is idyllic. You hit the 10,000rpm limiter because you just don't want the acceleration to stop, not for a second. This bike is a drug I was addicted to over the 300 miles I rode it, and in its absence I'm still in withdrawal.

I can't get over its versatility. Often times, a bike is geared toward track or touring, and bikes that claim to do it all fall short. Yet the Monster suffers no weakness. It's strong across the board. Into the canyons, there's torque everywhere, spitting you out of turns with the balance of a ballerina. The ABS light shouldn't be flickering at you, nor should the traction control, but knowing they're in attendance undoubtedly increases your level of confidence.

Down a long highway, cruising at triple-digit speeds (sorry, LAPD), the 1100 Evo is comfortable, stable and agile. The Monster's

evolution is surely not complete, but with 20 years under its belt, it's hands-down one of the most impressive, seductive and greatest performing bikes of our time.

2013 DUCATI MONSTER 1100 EVO 20TH ANNIVERSARY EDITION

ENGINE > 1100cc Desmodue Evoluzione L-twin, 4v

TRANSMISSION > six-speed manual with wet, multi-plate slipper clutch,

BRAKES > Brembo four-piston calipers f, two-piston r, 320mm rotors f, 245mm r, ABS

SUSPENSION > adjustable 43mm Marzocchi forks, rising-rate Sachs rear damper with adjustable spring pre-load and return damping

WHEELS & TIRES > 17x3.5" f, 17x5.5" r, 120/70 ZR17 f, 180/55 ZR17 r Pirelli Diablo Rosso II tires



PERFORMANCE

POWER > 100hp at 7500rpm

TORQUE > 76 lb-ft at 6000rpm

0-60MPH > N/A

TOP SPEED > N/A

WEIGHT > 373 lb

ECONOMY > N/A

MSRP > \$12495

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BMW M5 IN
A BATTLE OF
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WORDS
Greg Emmerson

PHOTOS
Robert Kerian



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LAST MONTH WE INTRODUCED OUR LATEST PROJECT: THE JAGUAR XFR; A BUILD WE COMMENCED ONLY WEEKS BEFORE JAGUAR ANNOUNCED ITS OWN XFR-S AT THE LA AUTO SHOW.

Undeterred, our plan was to create a super sedan we'd call the XFR+ that could take on the best in the segment, and give existing XF owners some aftermarket options for their highly capable cars. With only 100 examples of the XFR-S coming to the US, the majority of Jag owners will never see one of these rare and elusive cats, yet our tuning parts will be applicable to every XF model, in one form or another.

When embarking on the project with GSR Autosport and Vorsteiner, it was always our goal to one day compare it to the mighty BMW M5. The German four-door helped define what a sports sedan should be and still sets the benchmark.

Going into this comparison test, we wanted our plucky Brit to do well but knew it was a daunting challenge, so we're still slightly shell-shocked by the result that saw the Jag not only hold its own but come out on top in certain key areas.

Sharing driving duties would be Michael Essa from GSR Autosport. As an accomplished track driver, professional drift racer and co-owner of GSR Autosport, he was as curious as us to discover whether the Jag had what it took to depose the king. Would it stand a chance?

[1] Vorsteiner JSR-V carbon front lip

[2] Vorsteiner's carbon rear diffuser fits the stock rear bumper. Stainless steel tailpipes were powdercoated grey by GSR to match the wheels and Daley Visual's exterior trim

[3] Carbon JSR-V trunk spoiler is larger and more contoured than the stock piece

[4] 21" Vorsteiner VS-190 wheels were finished in gunmetal. Stock brakes were surprisingly effective





2



3



4



MODS

To recap last month's article, our 2012 Jaguar XFR became a rolling laboratory for both GSR and Vorsteiner. Michael's company would develop a coilover suspension system for the car, based around the Jaguar's standard adaptive Bilstein damping system and adding Eibach springs on adjustable perches. They also fitted a smaller supercharger pulley to increase the boost pressure, and looked at both the exhaust system and intake to aid breathing.

While we ran out of time to fully develop the prototype intake, the XFR+ sported GSR's custom stainless steel axle-back exhaust system, that would let this Jaguar growl and roar.

For Vorsteiner's part, they designed and created a carbon fiber front lip, rear spoiler and diffuser. We would also step up to the company's own 21" wheels, clothed in Nitto Invo tires.

The final alteration came courtesy of Daley Visual, which wrapped the acres of chrome in grey vinyl to further emphasize the sporting credentials

our Jag now possessed.

Wearing its battle armor, the first meeting of these deadly foes saw a decisive victory for the XFR. It was the Battle of Britain all over again, with the Germans underestimating the will to win.

When the two cars met at 5am in a deserted gas station, the luminescent lighting would shine brightest on the Jaguar. Ever since the notorious Bangle-designed BMWs hit the streets, the company's design language has been challenging to many eyes. Admittedly, the latest generations are



continually looking back.

The "R" model is again only subtly different from regular XFs, and yet those changes are more dramatic and leave little doubt as to this car's intentions. And with our embellishments laid over the top, it provided a killer combination to floor the M5 in a TKO.

With its carbon spoilers, lower suspension, wider stance and wrapped brightwork, the Italian Racing Red Jaguar was instantly appealing, receiving all the comments from fellow motorists as they wiped the sleep from their eyes, appearing to wonder why these two sedans were lurking under the lights at such an ungodly hour.

The Vorsteiner formula had again worked its magic. By adding just the right amount of muscle in exactly the right places, our Jaguar came out punching like a pro.

To be fair, if we'd also dressed the BMW M5 in Vorsteiner's latest carbon fiber pieces and plus-sized wheels, the points scoring might have been slightly different, but it would remain a victory for the Jag. Stock or modified, it's a more attractive car.

PUNCH

While we always expected the XFR+ to win the visual contest, we knew it would be a different story on the road. With its torquey, 560hp V8 biturbo motor, adjustable suspension and multi-stage traction control among its many weapons, the M5 is almost over-equipped. Add the optional six-speed manual transmission fitted to our test car, and we couldn't imagine the Jaguar had a hope in hell.

From this point we expected to be explaining how the Jaguar put up a good fight but was simply overwhelmed. But hang on a minute...

🔴 Jag's 5.0L V8 supercharged motor received a smaller pulley, stainless steel exhaust and sports air filters – the noise was wonderful. Check out the video at europeancarweb.com

more handsome, but some of the convex curves and sharp lines are still an acquired taste.

The F10 model may also be one of the most conservative M5s. There are few additional bulges or extra spoilers over a stock 5 Series, relying instead on badges and jewelry to distinguish it from lesser models.

Conversely, the Jaguar XF is one of the most elegant sedans on the market. Its athletic proportions and sleek lines giving the company a design direction that moves forward, rather than





the outcome wasn't clear-cut. This fight would go down to the wire.

What surprised us most when swapping between the cars was the Jag's composure. It managed to shine a completely different light on the BMW, making it feel laggy and nervous.

I can honestly say I was initially confused by the M5's behavior. At first I thought something was wrong with the car. But as we became more aware of each car's strengths, it was apparent the student was teaching the master.

During our morning canyon driving exercise – a challenging environment for such large, heavy and powerful machines – the XFR+ would leap out of each corner. It's Eaton supercharger giving instant torque and allowing it to gain a few yards on the M5. This had the effect of making the M5 feel as if it had turbo lag, taking longer for the twin-turbos to spool up. As I mentioned, this was something neither Michael nor I had previously experienced at the wheel of the F10 M5, but there it was. . .

Conversely, as the Jag's 5.0L V8 started to run out of puff at higher revs, the high-revving M5 was getting into its stride, and would hurtle towards the slowing XFR at alarming pace.

This trait was highlighted in our dyno tests, where the smaller supercharger pulley fitted by GSR gave the 510hp 5.0L V8 Jaguar engine an extra 20hp at the wheels throughout the rev range, but tapered off at the top-end. Ideally, it needs software tuning or bigger injectors to get more power at high revs, but for our purposes it was strong enough.

Both cars had enormously powerful brakes,

allowing them to scrub speed for the tight turns with ease. Again, the Jag pedal felt a little more reassuring but neither car was compromised in this area. However, the Jag's slightly slower steering meant its corner turn-in was effortless, creating a graceful arc. Whereas, the previously stunning

M5 seemed to want to turn-in early and needed mid-corner correction. Its quicker steering made it fussy through the turns – again, a trait we'd never noticed before today.

In short, the Jaguar was holding its own. Driven on a racetrack, the M5's power advantage



📌 Michael Essa being interviewed during the test for our online video



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and superior traction control system would undoubtedly allow it to pull ahead, but on these roads, the XFR was easier to drive quickly, and more relaxing to do so.

We were even surprised by the Jaguar's six-speed automatic transmission. Our 2012 car pre-dates the latest eight-speed ZF automatic, which is the best in the business and widely used. As a result, we assumed it would struggle in our test but the paddles responded to aggressive downshifts, or selected the next cog with haste. And while it wasn't as quick as many dual-clutch set-ups, it didn't detract from the experience either, suiting the XFR's more relaxed demeanor.

So the modifications we'd installed were definitely playing their part. The lower center of gravity and stiffer spring rates from GSR had reduced body roll, giving the car more poise. The extra boost pressure from the smaller supercharger pulley was also allowing it to get a jump on corner exit. And we have to acknowledge the lightweight wheels that reduced unsprung weight slightly, as well as the lower profile sidewalls on the Nitto Invo tires that offered impressive mid-corner grip for such a heavy and powerful car.

However, we've left the best until the end: The GSR stainless steel exhaust. Driven gently, or when cruising on the freeway, you had no indication of the joy that would be unleashed at wide-open throttle. Again, its stock exhaust unfairly handicapped the M5 but we advise you to watch our online video to hear the glorious engine note from the XFR+. It made your spine tingle, especially bouncing off the canyon walls in the crisp morning air. You'd hear the V8 several

corners before it emerged, and the sound would reverberate around the rock face, leaving our entire crew grinning.

Our two tuning partners came up trumps, creating a package for the XFR that's put it on par with one of the best super sedans in the business on extremely demanding roads. And as we examined last month, many of these parts will fit other XF models in the range.

2012 JAGUAR XFR

ENGINE > 5.0L V8 32v with Mina Gallery supercharger pulley, GSR 3" stainless steel exhaust with powdercoated grey tips, GSR intake system

DRIVETRAIN > stock six-speed automatic

BRAKES > stock two-piston calipers, 15" rotors f, single-piston, 14.8" r

SUSPENSION > stock Adaptive Dynamics suspension with GSR coilover adapters, Eibach springs

WHEELS & TIRES > 21x9" f, 21x10.5" r Vorsteiner VS-190 wheels, finished in gunmetal powdercoat, 255/30 R21 f, 295/25 R21 r Nitto Invo tires

EXTERIOR > Vorsteiner carbon fiber JSR-V front spoiler, rear diffuser, trunk spoiler, Daley Visual grey vinyl-wrapped chrome trim

INTERIOR > stock

CONTACT > vorsteiner.com, gsrautosport.com, daleyvisual.com, minagallery.com, jaguarusa.com

2013 BMW M5

ENGINE > 5.0L V8 DOHC direct injection, two twin-scroll turbochargers, reverse flow, cross-bank exhaust manifold, Valvetronic, Double Vanos

DRIVETRAIN > six-speed manual transmission, Active M Diff, RWD

SUSPENSION > Double-wishbone front, multi-link rear, adjustable damping

BRAKES > 15.7" rotors f, 15.6" r drilled, six-piston calipers f, single-piston r

WHEELS & TIRES > 20x9.5" f, 20x10.5" r Style 343M wheels, 265/35 R20 f, 295/30 R20 r tires

EXTERIOR > M-specific front spoiler, flared fenders, side gills, mirrors, rear apron, diffuser, trunk spoiler

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NEXT MONTH We'll look at Vorsteiner's development of the carbon fiber styling parts and Daley Visual's vinyl wrap.

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2014 RUF CTR3 CLUB SPORT

WORDS & PHOTOS / *Ian Kuah*







I

FIRST DROVE THE RUF CTR3 PROTOTYPE IN OCTOBER 2008, AND SINCE THEN RUF HAS SOLD MORE THAN 20 OF THESE HAND-BUILT, MID-ENGINE SUPERCARS. It's also continued to develop it for more power, better handling and ease of use.

From day one, the CTR3 had a six-speed sequential transmission commissioned from Hör Technologie. While it let you grab each of the six forward ratios via a race-style lever, you still needed the clutch pedal with each shift.

For the 2014 model year, prospective CTR3 owners now have the option of a seven-speed PDK dual-clutch gearbox instead, after requests for faster and smoother shifting from customers.

Another upgrade that came through the requests from keener drivers was an even more hardcore CTR3 Club Sport version, which made its debut at





the Geneva Auto Show earlier this year.

Both the vanilla CTR3 and hot chilli Club Sport benefit from a 10% bump in output to 777hp at 7100rpm and 723 lb-ft at 4000rpm. The PDK adds an extra \$51000 on top of the \$700,000 Ruf asks for the Club Sport with sequential 'box. And that's already \$64000 more than the base CTR3!

777

It was a long, hard winter in Europe and even now, at the end of June, the weather was unstable when we visited Ruf Automobile in Pfaffenhausen, Germany. Rain is the last thing you need with 777hp going through the rear wheels. Yet predictably, as I was all set to depart on my Club Sport test drive, a downfall kept us in the garage longer. Thankfully, the sun returned, and soon dried the tarmac.

Ruf cars are consistently usable on an every day basis. So while the low roof and Group C-style windows on the CTR3 mean poor visibility and require constant vigilance in traffic, the mighty engine was as docile as a pussycat.

Despite its humungous output, the twin-turbo flat-six rivals a standard Porsche Turbo for tractability. We drove through several villages at 30mph or less in third gear at around 1200rpm, and any request for acceleration was met with a willing response. And while some purists might prefer to row their own gears, there's no arguing with the seamless change of ratios the PDK delivers. However, the Ruf paddle shifters were surprisingly short and stiff, requiring more force than any production car.

[1] 3.8L flat-six develops 777hp, 723 lb-ft
[2] Ruf CTR3 now features Porsche's PDK transmission for faster, smoother shifting but paddles are short 'n stiff





However, shifts were lightning fast, and when braking into a bend, the combination of the Group C front windshield, hugely powerful brakes and the snappy PDK gearbox inspired Le Mans fantasies. That would be further enhanced on a racetrack, which is a big part of the CTR3 Club Sport's overall driving experience.

962

Back in the early '90s, I drove several Porsche 962LM Group C cars in 650hp qualifying trim. At 1800 lb, they were significantly lighter than the 3131 lb CTR3 Club Sport. And yet the 2.6-litre race motor in the 962C is substantially outgunned in terms of torque by the 3.8-litre Ruf motor.

With modern aerodynamics, the Club Sport also slips through the air more easily than the 962C, reaching 236mph with the tallest final drive offered. That's a good deal faster than the factory Le Mans racer, which topped out at 217mph.

Out of the box, the Club Sport will blast to 62mph in 3.2sec, and double that in 9.2sec, while returning an average fuel consumption of 17mpg.

On track, the 962C would corner better than the CTR3 thanks to its suspension and ground effects. But road-legal 962 variants created by some aftermarket companies were raised to conform to the regulations and would probably be no better than the Ruf, with its state-of-the-art race-derived suspension that makes full use of the vastly

🏠 **Group C-inspired bodywork reduces visibility but undoubtedly looks spectacular**

superior modern rubber.

"The CTR3 Club Sport was born out of our usual policy of continuous development," explained Alois Ruf. "A few of our CTR3 customers asked for such a car, and it was a logical thing to do since the basic car had so much race-derived technology in it."

"We've slowly ramped up engine output since we launched the car in 2008," he continued. "We started with 700hp at 7000rpm and 656 lb-ft at 4000rpm, with the extra output making a discernable difference to the acceleration. There's



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no additional lag when you go into the throttle, but the power delivery is now more aggressive, particularly for the last 2000rpm.”

“We started the PDK project in October 2012 and finished it in June,” Alois recalled. “I’m not going to say it was a piece of cake, but the biggest challenge as usual was the electronics, so we ended up with a new ECU.”

“In terms of hardware, because the engine and gearbox are the other way around than in the 911, we had to make new transmission casing and mounts,” Alois explained.

Both the PDK trans and the sequential gearbox weigh around 240 lb, so there’s no change to the balance of the car.

“The visual changes to the Club Sport are the new front section with a splitter, more pronounced flares that add 15mm each side, plus the larger, fixed carbon-fiber rear wing.”

The track is wider thanks to different wheel offsets, while the wheel and tire sizes are unchanged at 19x8.5” and 20x12.5”, with 265/30 and 345/30 Michelin tires, respectively.

The spring and damper rates had been increased, and I noticed a firmer ride but it’s fully adjustable, so you have the option of making it supple for the street.

On fast country roads around Ruf’s HQ, the Club Sport felt resolutely damped down at speed, while the perfectly weighted power steering made you feel at one with the car very quickly.

Long, open curves with good visibility enabled you to explore the performance of the car within reason. Its stability gave you great confidence in fast sweepers, where you could feel the new splitter and



rear wing pressing the CTR3 into the tarmac.

The CTR3 Club Sport is a testament to Ruf’s ability to design and build a car that mixes the best Porsche components with the company’s own parts, thereby producing a unique vehicle that offers the performance enthusiast yet another option for track days or sheer fun on the open road. ☺

CONTACT

rufauto.us



2014 RUF CTR3 CLUB SPORT

ENGINE > 3.8-liter flat-six biturbo

DRIVETRAIN > modified Porsche PDK dual-clutch seven-speed transmission, RWD with LSD

BRAKES > Ruf/Brembo six-piston calipers and 380mm ceramic rotors f&r

SUSPENSION > Double wishbones all round, coilovers f, horizontally opposed coilovers r, adjustable anti-roll bars

WHEELS & TIRES > 19x8.5” f, 20x12.5” r forged Ruf wheels, 265/30 ZR19 f, 345/30 ZR20 r Michelin Pilot Super Sport tires

EXTERIOR > steel passenger cell and front crash structure, carbon fiber body, aluminum doors, fixed rear wing, extended front splitter

INTERIOR > Ruf/Recaro seats, integrated rollcage

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WHEN IT COMES TO SUSPENSION TUNING, THERE ARE WORDS PURISTS LOATHE. WORDS LIKE STANCE, RAKE, TUCK, POKE, SLAMMED AND AIRED-OUT. And while we appreciate the latest trends and innovations, we're also traditionalists at heart.

That said, we still like to get the car sitting right. The stance is still important to us but perhaps we don't go to the extremes of notching the frame for clearance, cracking subframes, oil pans and spines just to look cool.

In what must be the last ten years or so, people started looking towards the lowrider scene to get their cars even lower, first adopting hydraulics but quickly opting for air-ride. And while these systems allowed height adjustment to clear speed bumps and driveways, the cars often rode worse than a

Honda on cut springs. Let's just say I was confident I'd never install such a system on my car, but Editor Emmerson kept telling us things were improving. For years he's been on a mission to compare air suspension to coilovers to assess exactly how the latest technology stacked up, devising this cunning test in an attempt to get a definitive answer to whether a car on air-ride could handle as well as one on coilovers.

Before now, it had been hard to find identical cars with the latest systems but AccuAir recently approached us with claims its new "Sport" air system developed on the B8 Audi S4 was revolutionary and suggested it could outperform a coilover-equipped car. Skeptical, we were intrigued to see if this was possible and found a similar S4 on KW coilovers for our ultimate suspension shoot-out.

THE MULES

For this test we had three 2013 Audi S4s at our disposal. There was a bone-stock example, the car from AccuAir and a third with KW coilovers. The two modified vehicles had been built by TAG Motorsports in Escondido, CA and featured similar bolt-on parts – nothing that would give either car an advantage over the other. And to ensure a level playing field, each was fitted with high-performance Continental ContiSportContact 5P tires for consistency.

ACCUAIR

"It's important to note that the capability the AccuAir B8 system demonstrated in this test is something new for air suspension," stated AccuAir co-founder Reno Heon. "Many people will have legitimate reservations about its performance





ability based on previous experience from poorly engineered air systems. Some of those experiences are because many previous air systems were simply designed to make the car go up and down, without considering vehicle dynamics. Many systems were also poorly installed or were a mixture of parts that left too much room for installer error," he continued.

Essentially, Reno is suggesting we should toss away our negative preconceptions about air suspension, because no previous kit has been engineered like this one.

The AccuAir Sport kit is comprised of four air springs, four height sensors, two compressors and an e-Level air management package. It includes everything needed to install it on your driveway and is priced at \$4850. Admittedly, this is expensive by traditional coilover standards, although not some of the more advanced systems, as we shall see...

Anybody with deep pockets can further invest in options like the iLevel Wi-Fi receiver that can be operated by the AccuAir iPhone app, or RF receiver on a key fob to control the system remotely.

The company estimates approximately 15 hours for installation, although it's relatively straightforward since every piece was constructed to fit the car perfectly, with almost no modification necessary, aside from several small holes in the trunk floor to route the air lines.

The new Sport system was designed to utilize the factory struts, which means it retains Audi's Drive Select feature that adjusts damping for comfort or dynamic driving styles. However, the main piece of the equation is the air springs. They sit atop the dampers and have been painstakingly engineered to perform in this environment.

There are a few basic requirements AccuAir

has for its air springs. They must fit into the space dictated by the factory spring pockets, so no modification is required to fit them. Next, the

ABOVE: AccuAir-equipped S4 cornered noticeably flatter than KW (middle) and stock S4 (bottom), generating the highest lateral-g number

LEFT-TO-RIGHT BELOW:

- [1] AccuAir S4 wore 20" HRE wheels
- [2] Control panel allows driver to select three height positions or adjust manually
- [3] Air compressors, management system and electronics hidden in spare wheel well
- [4] Air tank in trunk acts as reservoir for air springs
- [5] KW S4 rode on 19" HRE wheels
- [6] KW DDC and HLS controls on the center console
- [7] HLS control module sits in spare wheel well
- [8] The KW DDC module activates damper settings at each corner





springs must have enough travel to allow the car to be raised to at least stock height, while sitting low enough when aired out (deflated) without needing inner fender or body modifications. The final criterion is the air spring rate – this is what you feel and is the most important aspect.

With an air spring, the rates change depending on the overall shape, type of rubber construction and the internal air volume. Once installed, each height setting creates a different spring rate, with the lower settings softer and higher settings harder. So the AccuAir engineers are able to fine-tune the spring rates for a given “driving height.”

In order to do this, AccuAir went to great lengths to ensure the springs were designed to the factory suspension parameters. To do this, they use a Vehicle Spring Rate Tester (VSRT) that places the car on scales to measure the change in force at the wheels, keeping the tires level, while pneumatic cylinders pull the chassis down. String potentiometers are placed on the fenders to measure the change in displacement at the wheels.

Once the stock spring rates are known, the air bags are matched to the same rates or stiffened accordingly. Once installed, the AccuAir e-Management control system ensures the springs are correctly inflated to maintain a level ride.

With three programmable ride heights, the system constantly compensates for the weight of the car to maintain the correct spring rates and ride

height. So it'll ride the same with just you or a car full of passengers, and whether you're cruising or driving hard.

Air pressure is provided by two air compressors in the spare wheel well that fill the air tank in the trunk. The tank is essentially a reservoir the bags can draw from when necessary to ensure rapid response, with the compressors topping up the tank as pressure drops.

So unlike many systems that are cobbled together, you're not getting a makeshift setup designed to dump your car on the floor. This custom built AccuAir system for the Audi S4 was engineered to give you the best of all worlds; from canyon carving to driveway clearance, wheel tucking and family comfort. It's a no-compromise system, with more specific applications to follow.

KW

You know KW. It's a household name among performance enthusiasts, known and respected for making some of the best suspension components in the world, offering both aftermarket and motorsport applications.

For our test, TAG Motorsports fitted the second Audi S4 with KW's Dynamic Damping Control system. This is KW's response to the latest performance cars with factory dynamic damping systems, allowing you to retain suspension adjustment functions but with the height

adjustment of a conventional coilover system.

There are three damping modes to choose from at the touch of a button: Comfort, Normal and Sport. Comfort is great for poor surfaces or a highway trek, while Normal feels a little sportier than the stock S4, giving good control

with acceptable comfort. The Sport setting is significantly stiffer and would seem most suitable for the racetrack.

The coilovers are part of KW's stainless steel “inox-line,” able to withstand heavy use or salted winter roads. To reach the desired stance, TAG lowered the S4 to the point where some driveways and speed bumps were unapproachable. And this was where KW's optional HLS (Hydraulic Lift System) came in handy.

Fitted to the S4, HLS provides additional clearance for lowered vehicles by raising the car with a hydraulic cylinder placed on the coilover body between the spring and its perch. When activated via a console-mounted button, 45mm of lift is provided, gaining clearance for obstacles.

The KW DDC coilover kit retails for around \$4000, plus an additional \$3600 for the HLS system. This puts it well past the AccuAir system in terms of price, on par in terms of versatility. So which would we prefer?

THE TEST

To begin, we gained access to the top-secret test facility used by our sister magazine, *MotorTrend*, at Auto Club Speedway in Fontana, CA. They use a figure-eight test course to accurately measure lateral g-forces as well as lap times. With *MotorTrend*'s road test editor Scott Mortara at the wheel, he put the cars through the identical test that every new car undergoes. And having driven everything on the road, Scott's feedback was invaluable to us.

The results of the test in the table (left) don't tell the complete story, but did fall in line with what we felt through our trouser dyno. The most important numbers were the average lateral acceleration g-forces, which is the measurement of accelerative force directed perpendicular to the direction of travel. So if you're driving a car and turn the wheel hard in one direction, the force you feel is lateral g,

CAR	LAP TIME	LATERAL ACCEL
Stock S4	25.3sec	0.95g
KW S4	25.1sec	0.98g
AccuAir S4	25.2sec	0.99g



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And more lateral grip means better handling. So while the differences are very small, it does show that the AccuAir system offered an improvement in grip over both the stock and KW-equipped cars

The figure-eight lap times are also very close; within a tenth of a second of each other. To put it in perspective, *MotorTrend* tested the Audi R8 V10 Plus on the same course and it set a 23.5sec time. More interestingly, its lateral accel was the same 0.99g as the AccuAir S4 on its grippy Continental SportContact 5P tires.

The KW-equipped S4 ran 0.1sec faster around the track, but we agreed the KW spring rates were too stiff and with another few laps, the air-ride S4 could be driven as fast or faster.

"The coilover car was disturbed more by bumps on the course and had similar understeer as the stock car," said Scott.

The stock S4 did exhibit lots of understeer at the limit, and the coilovers exaggerated this trait to an extent, making it difficult to get the car to rotate.

"The air-ride Audi S4 would be my overall choice," Scott claimed. "The ride felt good and initial turn-in was better than the coilovers, all the way through the corner and especially on the exit. I'd drive the air suspension every day," laughed Scott. And we would, too...

We found ourselves laughing because we weren't expecting these results, especially when we arrived to find the AccuAir S4 sat on the floor, with its wheels sucked into the fenders. Sure, it might look silly to some traditionalists, but it's a growing trend in the European tuning scene and something many enthusiasts are after. Yet with the press of a button on the touchpad, the car raises and calibrates itself in seconds to the appropriate driving height where it went on to handle (and look) the best.

So against all predictions and our preconceptions, the AccuAir car was the star of the *MotorTrend* figure-eight test. Now we headed to the hills to assess the handling under the toughest conditions.

ROAD TEST

Heading into the nearby mountains, the cars would be in their natural environment. The challenging turns and uneven road surface would be a demanding test for any suspension system, and this is where we expected the coilovers to claw back the lead.

Once in the canyons, we were able to gain speed, tipping into triple digits on occasions, experiencing everything from long sweepers to tight twisties. And yet the AccuAir system remained flawless. Road imperfections were absorbed without any disturbance, and the limit of adhesion was extremely hard to find.

Initially, we were surprised the air-ride wasn't crashing into potholes, and couldn't believe how flat the car cornered, with barely a hint of body roll. It also remained flat under acceleration and braking, giving excellent grip out of corners as the e-Level management ensured all four corners remained at the same height.

It was hard to believe that a car could drive this

well on these uncompromising roads at very high speed, and yet would be able to raise itself over a driveway at our destination and drop itself to show off at an event. . .

In contrast, the KW DDC exhibited slightly more harshness even in its Normal setting – Sport was simply too stiff for these uneven roads, causing the car to become twitchy. However, even in Normal, mid-corner bumps could cause the front-end to transmit the disturbance into the cabin, with the rear-end bouncing along behind.

The coilovers also seemed to give less steering feel, and the overall agility was reduced when compared to the AccuAir system.

We felt the DDC kit might be improved with softer spring rates to reduce its tendency to bounce in corners. That said, the owner had dropped his S4 almost to its lowest setting, giving the suspension less travel than it might ordinarily have.

Raising the car would doubtlessly improve the situation, but our test was to compare lowered cars on air and coilovers, so a lower ride height was part of the equation. And while the KW DDC did offer impressive handling compared to the stock car, we found that the choice of air suspension was a no-brainer in any situation, on any road.

These results seem truly remarkable. This day set a new milestone and will be remembered as the moment we learned to appreciate a well-developed aftermarket air suspension system.

It's clear that AccuAir's intention of redefining air suspension has been an overwhelming success. The company has created a system unlike anything else currently on the market, and unlike anything that we, as enthusiasts, have previously experienced. For the price, convenience, looks and dynamics, the AccuAir Sport air suspension system was the clear winner in our test. ☺



The two modified 2013 Audi S4s were built by TAG Motorsports in Escondido, CA and share similar components to give them great performance, handling and style.

They both share identical engine modifications, using an AWE Tuning supercharger pulley to increase boost pressure, as well as an S-Flo intake, exhaust and downpipes. The only real differences were that John Holdridge's

black car had unresonated downpipes (and sounded better for it) as well as GIAC stage 2 DSG software that made it slightly more responsive.

The black S4 had the AccuAir Sport air suspension kit, and sat on 20x10" HRE P44SC wheels finished in Brushed Gold. Behind them was a 380mm StopTech ST60 brake kit that offered powerful stopping.

Dennis Tang's white S4 was on the KW DDC coilover kit with the KW HLS kit on the front. The fenders were

filled with 19x9.5" HRE P43SC wheels finished in satin black as well as the same 380mm StopTech ST60 brake kit. Further differentiating the two was a EuroCode Alu Kreuz drivetrain stabilizer.

The exterior was kept subtle, in true Audi fashion, with both cars getting OEM Euro headlights, black grille and foglight grilles plus TAG Motorsports' blackout package. Additionally, the white S4 had gloss black exhaust tips and white StopTech brake calipers.



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WHAT'S THE DIFFERENCE BETWEEN 650 AND 700HP?

Does your head snap back that much harder, or does the g-force push you into the seat that much deeper? Does the scenery blur more? And does it matter when 650hp is already enough to lay waste to most challengers?



In the supercharged M3 arms race, it does matter because 650hp is where you'll find the stage 2 kits from ESS Tuning and VF Engineering maxing out, with G-Power's rated at 610hp. So getting more power usually requires a stage 3 kit with different internals to handle the higher boost.

With that in mind, we were naturally intrigued when Active Autowerke told us about its new Generation 2 Level 3 supercharger kit developing 700hp on stock internals. We decided to investigate this further.

Most of Active's competitors limit stage 2 boost to around 8psi, including the company's own 640hp Level 2 kit. And while it may seem unfair to compare Active's (Level) stage 3 to another company's stage 2 kits, the key here is retaining the stock internals.

Level 3 is apparently rated at 9psi at redline, with an extra 0.5psi spike just before the throttle closes, giving a peak of 9.5psi.

Karl Hugh, Active's Technical Director, explained how they were able to control boost by careful manipulation of the S65 engine's Vanos variable

timing system, controlling cylinder pressures, valve overlap and scavenging.

Hugh also discussed how the new Rotrex C38-92 trim supercharger, which is the basis for the Generation 2 kits (replacing the previous gen HKS GTS 8555), maximizes the scavenging. He chose the Rotrex because it made more power and had better adiabatic efficiency.

To lower the engine's intake temperatures, a front-mounted air-to-air intercooler is fitted. It further has the benefit of methanol injection, which is distilled 50/50 with water.

BLITZ

The E92 M3 shown here has become known as "Blitzkrieg" after it got its name from Active's enthusiastic Facebook fans. It's the company's showcase for the Generation 2 Level 3 supercharger system. It's also home to a prototype big brake kit the Active is producing, along with their own 20" ACW wheels.

The car is also covered in a Skinz Wrap vinyl wrap with a blueprint graphic created by Active's

in-house designer for maximum impact.

Finally, there's a Mode Carbon front spoiler and BMW M Performance trunk spoiler plus an Auto Carbon rear diffuser.

You can hear the faint whine of the supercharger as the revs climb, but it's not intrusive or any noisier than other systems on the market.

At regular driving speeds, the supercharged engine feels smooth, neither jerking nor snatching when getting on or off the throttle.

The supercharger comes on early, and the extra grunt overcomes the S65's lack of low-end torque. Active claims the torque peaks at 380 lb-ft to the wheels, (46% more than stock) just before 8000rpm. Yet 80% of that is available from 3300rpm. The horsepower peaks at 8200rpm, registering 590hp at the wheels.

So when you push the right pedal harder, power builds with rabid ferocity. There are demons being exorcised every time you run to redline, screaming through Active's stainless exhaust system, which features an X-pipe and high-flow cats. You can't feel any hesitation or let up in the power curve, it's just



a building crescendo of annihilating force.

Whether or not it's faster than a 650hp stage 2 set up is hard to say without a head-to-head race. It's like trying to tell the difference between taking a blow to the head from a 5 lb and an 8 lb sledgehammer.

I will say that I've never driven a supercharged M3 that accelerates from 30-150mph at the rate of this one. Nor have I driven one as explosive, that races for the redline as quickly as Active's *Blitzkrieg*.

Even when approaching 150mph, the rate of acceleration only tapered off slightly as the engine began to fight wind resistance. There was plenty left but we ran out of road.

KRIEG

An amazing thing happens when you stand on the prototype brakes. The gargantuan 12-piston front calipers squeeze 405mm (15.9") slotted rotors, with an eight-piston/15" set up in the rear. The forged aluminum calipers are mounted on CNC-machined steel brackets for maximum rigidity. The front calipers also use six pads per corner, with

the rears using four, for a total of 20 brake pads. Consider that when it's time for maintenance!

Predictably, these giant stoppers grab instantly, and with such force you'd think the car was going to flip end-over-end. They didn't show any signs of fade, even after three stops from 150mph.

Active worked closely with the brake supplier to find the right brake bias, switching from six to eight-piston on the rear to achieve the overall balance they wanted.

In addition to the ACW wheels (20x9" front, 20x10" rear) and Nitto Invo tires (255/30, 295/25 respectively), *Blitzkrieg* rides on JRZ Pro coilovers with external nitrogen canisters. The combination produces a firm ride with sharp turn-in response and hardly any body roll.

In the rapidly-evolving supercharged M3 segment, where we've seen incremental steps to greater power, Active's Gen 2 Level 3 kit looks and feels like it's set the benchmark for bolt-on power. Maybe we'll get to compare it to one of its competitors on the road or track to get a definitive impression of who rules the roost.

[1] Gen 2 Level 3 conversion for S65 V8 produces 700hp (590whp) on stock internals from 9.5psi
[2] Carbon diffuser outlines Active's full exhaust system

[3] Active's own 20" wheels conceal prototype 12-piston calipers, with 15.9" rotors and six brake pads per side

[4] Efficient Rotrex C38-92 blower is the heart of the new system

E36

The second M3 in this article is owned by Active customer, Chris Ritter. It wears similar Skinz Wrap vinyl after he saw *Blitzkrieg* and had to have it.

The E36 is a reminder of Active's roots, harking back to when the company was first featured in this magazine in *EC5/97* with a trio of M3 turbos that instantly made everybody take notice.

The company has since moved away from turbos to more emission-friendly superchargers, but its expertise with the E36 chassis was on full display with the track-spec car featured here.

Active took this '99 five-speed and removed all the dead weight before welding in a four-point



rollage. It now weighs 2950 lb. Thanks to chassis reinforcement, you can feel every imperfection through the Sparco race seats, and hear every pebble thrown up by the sticky Nitto Invo tires.

Although street legal, it's probably not something you'd drive daily unless you need to get your adrenaline moving in the morning. It gives a raw driving experience, making modern cars feel like sensory deprivation tanks.

The engine is the familiar 3.2-liter S50, but

it generates an extra 200hp thanks to Active's Stage 2+ C-38 Rotrex-based supercharger kit. It's supplemented by a custom 3.5" intake pipe and Schrick cams as well as Active ECU programming.

As before, the internals remain stock while the exhaust consists of Active headers and race system.

To maintain engine temps, it runs an oversized radiator and high-performance fan clutch. Oil is cooled by another Active radiator.

After you've tightened the harnesses, you push

[5] Stage 2 kit uses Rotrex C-38 at 11psi for 450hp
[6], [7], [8] Race-bred interior features Sparcos, rollage and extra gauges

on a stiff race clutch that makes smooth starts challenging, requiring throttle manipulation. Once underway, swapping gears required little effort, however, thanks to Active's short-throw shift kit.

With the car sitting as low as you dare on the street, and the tight suspension providing quick



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responses, the car felt like a ¼-scale M3. It was the lightest 2950 lb car I've ever driven thanks to its lightning reactions. Shedding 200 lb and adding 200hp has given the car a respectable power-to-weight ratio.

Wind it out and you're bombarded by the unfiltered soundtrack of the race exhaust. And as the Rotrex C-38 instantaneously springs to action, it just doesn't quit. Maximum boost is set at 11psi, developing 450hp.

Fitted with Ground Control coilovers and Koni inserts, the turn-in is razor sharp and the car holds a tight line. Yet getting the tail loose only requires a stab of throttle to overwhelm the tires, then a dose of countersteer brings it back into line. That kind of balance and adjustability makes this E36 so entertaining.

Getting to sample two generations of M3, albeit two cars with completely different missions, gave us a great picture of how much things have changed, and yet stayed the same.

Obviously, the E92 *Blitzkrieg* is better in nearly every aspect but, as many have lamented, the bigger car has added weight and sacrificed steering feel. However, it's raised the bar for the supercharged M3 segment and boggles the mind with its ability. Yet I'll admit, the E36 M3 left me with a bigger grin! ☺

CONTACT

activeautowerke.com



2012 BMW M3

ENGINE > 4.0-liter S65 V8 32v with Active Autowerke Gen 2 Level 3 supercharger system, X-pipe and high-flow catalytic converters, cat-back exhaust system

DRIVETRAIN > M-DCT seven-speed automatic transmission

BRAKES > Active Autowerke 12-piston calipers, 15.9" slotted rotors f, eight-piston, 15" r

SUSPENSION > JRZ Pro coilovers with external canisters

WHEELS & TIRES > 20x9" f, 20x10" r Active Autowerke ACW-20 wheels, 255/30 R20 f, 295/25 R20 r Nitto Invo tires

EXTERIOR > Mode Carbon front spoiler, BMW M Performance trunk spoiler, Auto Carbon diffuser, Skinz Wrap vinyl wrap

INTERIOR > AEM Uego boost and oil pressure gauges in Macht Schnell pod



1999 BMW M3

ENGINE > 3.2-liter S52, six-cylinder 24v with Active Autowerke Stage 2+ supercharger kit, Schrick cams, Active software, race headers and exhaust

DRIVETRAIN > five-speed manual transmission, Active clutch, lightweight flywheel, short-throw linkage

BRAKES > Active Autowerke four-piston calipers, 13.1" rotors, race pads f, stock r with race pads

SUSPENSION > Ground Control coilovers with Koni inserts, 28mm f, 17mm r adjustable anti-roll bars

WHEELS & TIRES > 18x8.5" f, 18x9.5" r D-Force wheels, 235/40 f, 255/35 R18 r Nitto Invo tires

EXTERIOR > carbon fiber hood, Skinz Wrap vinyl wrap

INTERIOR > Sparco race seats, five-point harnesses, four-point rollcage



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StarrPower

WHEN A RACECAR TURNS SHOW CAR

WORDS / *Justin Fivella*
PHOTOS / *Ed Fox*



NOPE, IT'S NOT NIMBUS GRAY, NOR IS IT THE ULTRA-EXCLUSIVE SUZUKA GRAY. Since you'll never guess, and are likely dying to know, we'll save you the trouble of searching: it's called Sport Classic Gray and is from the rare Porsche 911 Sport Classic – only

250 examples were built and tracking down the color was anything but easy.

"I called Porsche dealer after dealer, without luck. They wouldn't give me the paint code without a VIN number, and months of internet searching and phoning shops all over the country produced similar results," explained Webb Starr, owner of this 1990 VW GTI.



"After months of searching, pretty much everybody online knew I was looking for the color and I caught a break when I got the screen name of a guy in Norway who'd apparently cracked the code; thankfully he was nice enough to share it with me. Finally, after nine months of searching, I found what I was looking for!"

Funny thing is, that wasn't the only paint-related story in this Mk2's tale. "The first time I decided to paint the car I wanted it Jazz Blue, and thought I'd start with the engine bay and interior. So I paid a visit to a local dealer for the paint code," Starr began. "Well, the parts guy gave me a legitimate code, but it was the wrong one!" he laughed.

That's right, after giving the paint code to the body shop, a return trip a few days later produced jaw-dropping results. "It was the wrong color and was far too purple. I verified the paint code was a legitimate VW Indigo Blue. It just wasn't the color I wanted."

Not easily deterred, Starr took the car out of paint and decided he'd work on other aspects

before returning to the booth. By "other aspects" we mean everything. You see, to understand the magnitude of this Mk2, we have to step back to ground zero.

"A buddy of mine bought the GTI many years ago as a clean stocker and intended to daily drive it, but life got in the way and he parked it until enough bugging on my part prompted him to sell it to my wife as a Father's Day present for me," he explained.

The unmolested GTI 8v proved the perfect candidate for a Time Attack car and over a two-year span, Starr drove the hatch up and down the West Coast to the different track events, having a blast in the process. "It was a street-legal racecar I drove to every event, raced the heck out of and drove home," he said.

When basic engine, chassis and suspension mods weren't enough for the up-and-coming racer, he decided the path to greatness was paved with 12 valves of fury. "I knew it would make it nose-heavy, but I didn't care. To me, the AAA VR6 motor is

simply awesome, so I found an OBDI example and proceeded to swap it with the help of Dynamic Racing Solutions in La Habra, CA," he said.

This wasn't any old swap, though. Webb lives in the smog-state of California, so he transferred the entire engine, harness and all the associated emissions equipment to get the car road-legal. And for those who don't know, it's a serious undertaking.

Returning to the beginning of our story, this was the time at which Starr grew tired of the factory red paint and decided it was time for a change. While the engine was out and interior stripped, he decided to add what he thought was Jazz Blue... Despite the major flub, Webb wasn't about to redo the freshly painted interior and engine bay with the proper color, so instead he left the exterior red and completed the swap. More track time was in order!

The good ol' VR6 12v was stout in factory trim, but Starr couldn't leave it alone, so a Techtonics chip, 2.75" mandrel-bent custom exhaust with a Magnaflow muffler, Unorthodox pulleys and a



K&N open-element helped boost power.

With the new motor in place, Starr was able to hit a few more track days before reality set in. "Although the VR6 made it heavy up front, it was still a blast to drive and lots faster, but when my wife had our first baby it struggled to handle the duties of life and attend track days, so I decided to retire it from the track," he said.

Thankfully, Starr didn't retire the car altogether. Instead he morphed it into a show car for the many SoCal events he could attend. However, a few years slipped by without much progress until Webb decided on a new plan of attack. "The hiatus gave me time to arrive at the racecar/show car theme. And during that time I discovered the Sport

[1] Cobra seats and five-point harnesses left over from the GTI's Time Attack years

[2] 16" BBS E50 wheels from Porsche racecar have magnesium centers and polished 2" lips

[3] OBD1 VR6 12v swap included all the emissions gear and wiring to make it California legal



✦ Custom rollcage is another indication of the car's recent past

1990 VW GTI

WEBB STARR

RIVERSIDE, CA

ENGINE > 2.8L VR6 12v OBD1 with Techtonics Tuning chip, custom 2.75" exhaust, Magnaflow muffler, 3" stainless steel turn-down tip, Unorthodox pulleys

DRIVETRAIN > D2A five-speed transmission

BRAKES > five-lug swap with gold G60 front calipers, rear disc conversion, 11" f, 8.9" r ABD Racing drilled rotors, braided lines

SUSPENSION > FK Silverline coilovers, Neuspeed rear sway bar, custom rear tie-bar

WHEELS & TIRES > 16x9" f, 16x10" r BBS E50 wheels, magnesium centers, polished 2" lips, 205/40 R16 Falken ZE512 f, 215/40 R16 Falken FK452 r tires

EXTERIOR > shaved front bumper, turn signals, foglights, plate recess, hood vents, side markers, roof antenna, hatch wiper, washer nozzle, keyhole, exhaust cut-out, tow door, rear seams, badgeless grille, ABD Racing grille spoiler, Aero lower grille insert, '86 Golf hatch, Jetta windshield, painted Porsche 911 Sport Classic gray with VW Indigo Blue interior and engine bay

INTERIOR > Cobra Monaco seats, Crow Racing five-point harnesses, Momo steering wheel, custom six-point rollcage, Auto Meter Pro Comp speedo, tachometer, water temp, oil pressure, fuel pressure and volt gauges

AUDIO/VISUAL > JVC head unit, Sony 5.5" mids, 2" tweeters, 6x9" speakers, amp

THANKS > My family, dubNation, Tina and Dave Elledge, Matt and Brad at fifteen52, Ron at Falken Tires, Dave Meister at Meister Werks, Loren at WhanAB.com

race barrels that were from a legitimate Porsche racecar, so I had to have them," Webb explained.

The 16x9" front and 16x10" rear wheels with 2" lips are beyond rare and packed with heritage, so Starr wanted to preserve some patina. So while fifteen52 re-finished the faces, Botelho Custom Trucks polished the barrels without removing the deep nicks and scrapes from their racing past.

The interior retains its racecar roots, built around a custom six-point rollcage Starr designed, along with motorsport items like Crow Racing five-point harnesses slung over the Cobra seats. There's also a Momo steering wheel and plenty of gauges to keep an eye on the VR6's vitals.

Starr went one step further, adding splashes of carbon fiber throughout, along with plenty of tributes to the ALMS cars he adores, thanks to items like home-made door cards with simple pulls and small latches.

Details like the teal grille stripe pay homage to VW Motorsport, and the gold engine and interior accents tie the wheels to the VR6. And although Starr is happy with his creation, it's far from complete. Since he logs thousands of miles each year traveling to shows, he's planning some Techtonics cams and other motor mods. He might even get the Jazz Blue bay and interior he's always wanted. "It's been many years since I first tried for Jazz Blue and I think it's time I see it through," Webb laughed.

Who would have thought a miscommunication over paint could have led to such a one-off build? Maybe it's proof there's always a silver lining, or in this case, Sport Classic Gray lining. 🏁

Classic paint, which really makes the car stand out," he added.

Underneath the gray paint lies a shaved big bumper with deleted turn signals, fogs, plate recess, hood vents, side markers and roof antenna along with the exhaust cutout and tow hook. The rear seams were shaved, and other classic touches include an ABD Racing grille spoiler and Aero lower grille insert over the badgeless grille, plus an '86 Golf hatch sans the third brake light. There's also a Jetta windshield without the factory rearview mirror mount but with a Scirocco single-wiper conversion.

The five-lug swap with G60 front calipers and rear disc conversion was anchored by FK Silverline coilovers, but it's the 16" BBS E50 wheels wrapped in Falken rubber that steal the show. "I looked for rare BBS wheels for a long time and bumped into these E50s with magnesium centers and genuine

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EVENT

WUSTE EUROPEAN CAR FESTIVAL 2013

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AN INVITATION TO LAS VEGAS IS A HARD THING TO PASS UP. Especially if it's laced with the promise of some of the best modified Volkswagens and Audis on the West Coast. The Wuste (pronounced 'woo-stah') European Car Festival 2013, Lucky #7 was just that invitation – which we happily accepted.

The Palace Station Hotel & Casino graciously (or reluctantly; the verdict is still out...) offered its

multi-level parking garage to the swarm of Wuste attendees, who managed to occupy nearly every parking space from the fourth floor to the roof.

Music echoed throughout the concrete structure as owners became reacquainted with old friends. If you happened not to be acquainted with anybody at this point, you simply grabbed a brew and looked to strike up a conversation. Everybody was there to celebrate their love for VAG culture and so the atmosphere



2



5



6

- [1] A jam-packed showcase inside the LVMS Neon Garage area
- [2] Jason Magliano's '03 Audi A3 with all the OEM+ parts you could ask for
- [3] Classic VWs filled the garages to remind the modern water boys who got the party started
- [4] This E46 is slated for a turbo upgrade
- [5] Joshua Zetnia's Mk4 GTI received a complete overhaul including a full leather interior upgrade
- [6] Brian McCauley's Mk3 Cabrio (eurotuner.com feature car) drove from Phoenix to enjoy the Vegas heat

was very relaxed.

Most attendees plan for this small slice of the Southwest Euro show scene a year in advance, and with the Las Vegas Strip as the backdrop, you couldn't ask for a better setting.

Admittedly, it felt like a car show on the surface of the sun, but the heat didn't seem to bother many people, despite triple-digit temps from midnight to noon as the cars kept coming.

SHOW TIME

Utilizing a new venue for Wuste 7, Las Vegas Motor Speedway packed an estimated 1300 cars and 3500 people into the pit garages and parking areas around the Neon Garage infield.

As the temperature hit 105°, the Neon Garage courtyard was filled wall-to-wall with the best custom cars in the show field. Even the garages were occupied with fine examples, including our

EVENT



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9

friends at Janky Garage who brought Grant Keller's Mk4 R32 and Jeff Lockhart's Mk4 Jetta (EC 9/13).

We met Joshua Zetnia, who drove from Los Angeles to unveil his latest work – a 2000 GTI VR6 complete with full engine build and turbo. If that wasn't enough, the car received a new coat of Rave Green metallic paint to highlight the extensive

bodywork, like R32 bumpers and a razor-straight shave. Inside, nearly every surface was covered in peanut butter leather with white topstitching.

Jason Maglinao took his '07 Audi A3 to a new level when he decided to outfit it with an S-Line aero kit, shaved trunk and custom rear bumper to allow for a quad-tip exhaust system. Thanks to

[7] Rare Wheels unveiled its new m-teq wheels with customizable lips, barrels and face sizes on this VW CC

[8] All the way from Mexico, this hypnotic Cabrio had us spinning

[9] fifteen52 showed its Mk6 Jetta with Golf R bumper

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EVENT



10



AccuAir suspension, the 19" BBS LMs tucked nicely behind massaged fender flares. Inside, a tasteful leather and suede upgrade was seen on the seats and headliner.

Waste 7 proved that Southwest VAG

enthusiasts have been busy in their garages building exceptional show cars. Having attended some of the nation's top Euro shows on three consecutive weekends, we can't help but get excited for the forthcoming Waterfest and H20.

We look forward to seeing you there and will report our findings in print and online.

[10] Stay tuned for a future feature on Unitronic's GLI project car next month

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HOPEFULLY YOU'RE ALREADY FAMILIAR WITH THE SPORT OF DRIFTING AND, ALTHOUGH A RELATIVELY NEW FORM OF MOTORSPORT, IT'S ONE THAT REQUIRES TONS OF SKILL TO MASTER AND ENORMOUS DEDICATION TO BREAK THROUGH INTO THE PROFESSIONAL RANKS. And naturally, you need a thoroughly developed, highly modified machine to be competitive.

Our good friend Michael Essa happens to be a Formula Drift driver who's sitting pretty in second place in the championship as we write. His shop, GSR Autosport, built his E46 M3 in-house and was nice enough to bring it to our studio, enabling us to show you the battle-scarred beast, warts and all, in its full glory.

With an autocross and road-racing background, it's unusual for a guy like Essa to gravitate towards drifting. The sport has a certain stigma, partially because scoring is based on style rather than time, which appears to confuse the purists. "There's plenty of sports in the Olympics that are judged!" Michael countered. "Even freestyle motocross, skateboarding, BMX; these are all judged sports based on style and they all have huge followings, so why should drifting be seen any differently?"

You don't have to be a fan of racing to enjoy drifting. No matter who you are, it's downright jaw-dropping to see these guys running door-to-door, completely sideways, with smoke pouring from the fenders as their bumpers scrape the track

- [1] Garrett turbo boosts 3.2L S54 engine to 750hp to make the car competitive
- [2] Short runs and relatively little braking means drift cars only need small brakes
- [3] Wisefab steering kit allows crazy wheel angles to maintain high-speed drifts
- [4] Quick-release diff sits perilously close to the floor, but ground clearance is rarely a problem in drifting







walls. This is why there are big sponsors and the events are completely sold out.

Essa's involvement is no surprise when he explains that while he enjoys racing against the clock, he's "always enjoyed overdriving cars and sliding them around."

"Although I wasn't into drifting, I took my Datsun 510 Rotary turbo to the first D1 Drift event at Irwindale Speedway and saw the guys drifting like maniacs. It was pretty cool and I knew I could do it," he recalled.

After some searching around, he found local organization 626 Drift and competed with them in a few events at Willow Springs Raceway. "I threw an LSI motor in my Mazda RX7, but after a few events they stopped letting me compete because I kept winning," he laughed.

Fortunately, there was another place for Essa and his RX7. A place where the skilled drifters could compete in billowing smoky glory: Formula Drift.

"I was invited to a Red Bull drift event in Arizona and scored second place in the qualifier, which got my license," Essa said. "After that I went straight to Formula D in my RX7."

FORMULA D

This series pits the best drivers against one another in a test of style, speed, agility and proximity. Essa was new to the field but up against some seriously talented drivers. In his first year, 2009, his best finish was sixth place in Las Vegas, but for 2010 he teamed up with Nick Richards to form GSR Autosport with plans to continue in Formula D.

That year they built an E92 BMW 335i, which

was memorable for its E60 M5 V10 motor, yet it wasn't powerful enough to be competitive. So the car was transformed for road-racing duty and GSR moved on to a BMW Z4 that would be a better drifting platform. And while it evolved rapidly over two seasons, the short wheelbase proved too twitchy to drive at the limit.

"At the end of the 2012 season I realized I needed to make a big push," Essa said. "I knew I could do better with the Z4 but decided that if we switched to the E46 chassis and took the drivetrain from the Z4, the longer wheelbase would be more competitive. So we took a chance and it worked out great!" he laughed.

Now in his fourth year of Formula Drift competition, Essa finally took his first steps on the podium and is in a close battle to actually win the championship. "I've learned a lot over the years," he admitted. And while his skill level has undeniably increased, the E46 was exactly what he needed to take his career to the next level.

DRIFTMACHINE

So what would it take to transform a regular BMW into the tire-slaying battleship you see here? Well, the GSR M3 started life as a humble 2005 325i, but was converted to M3 spec. It's since been dubbed "Die Ultimate Driftmaschine", which is German for The Ultimate Drift Machine.

There are many regulations to comply with when building a Formula D car, so the chassis hasn't been modified drastically. In general, like any street or race build, the GSR M3 is a combination of parts that could be fitted to any E46 M3.

It utilizes the factory S54 3.2-liter block but GSR built the internals to withstand the boost pressure since the main power adder is a Garrett GTX35/28R twin-scroll turbo mounted on a DOC Race tubular exhaust manifold. This provides a 750hp wallop to the rear wheels, or about 500hp more than stock!

Since the factory transmission wasn't up to the quick shifts, high loads and constant beating, GSR machined the bellhousing to accommodate Tex Racing four-speed dog gears and a Clutch Masters 850-series twin-disc clutch. The power is then transmitted to a quick-change OS Giken SuperLock limited-slip diff, which required some modifications to the rear subframe to fit.

A common misconception is that drift cars are unbearably stiff and bouncy, running on worn all-season tires without an inch of suspension travel. Sure, you could set up a car this way if you want to slide around in a parking lot, but at the professional level, the cars aren't much different from a road-racing spec. The main difference is the amount of steering angle, and that comes from the specialized Wisefab high-angle kit. It's an insane piece of equipment that allows almost 70° of steering angle at full lock!

There's no camber adjustment on the car, just double adjustable Bilstein MDS Motorsport coilovers (as found on E46 M3 and Z4 GT racecars around the world) and the Wisefab arms.

Like any racer, more rubber on the road is an advantage, so GSR used the GTR widebody kit from DTMFiberwerkz. Inspired by the E46 M3 GTR V8 racecars, the kit gives the E46 an extra 8"



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of width up front, allowing the team to increase the car's track width for greater stability. The styling also demands the M3 get some respect from the field of JDM missiles and Domestic brawlers.

When it comes to stopping, drift cars don't need to deal with heat accumulation, so the brakes can be relatively small, making them light by competition standards. As a by-product, the reduction of unsprung weight and rotating mass is an easy way to improve the car's handling dynamics and acceleration.

Wilwood four-piston calipers take care of the front, with two-pistons out back. And the trick to initiating a drift or scrubbing speed is the hydraulic handbrake. It gets its own two-piston Wilwood Dynalite calipers on the rear, offering instant lock-up.

It's no secret, Michael Essa has been one of the most improved and exciting drivers to watch

this year. His attack angle and speed, as well as the sound of the boosted S54 and its angel-eye headlights peeking through the smoke mean he just might take the championship. "I try not to think about it," he told us. "I'll just keep doing what I've been doing and see what happens. The closer we get to the last race, the closer I am to winning the championship as a privateer."

In case you didn't know, that's a big deal when you're a small team competing against fully sponsored rivals.

Under his calm exterior, Michael is obviously excited, and why not? He's put himself in an amazing position to be crowned as one of the best drivers in the country, and he's doing it at the wheel of a BMW M3 in a sport that's been dominated by Japanese and domestic cars. It's a triumph of epic proportions and we'll be there, win or lose, to cheer him at the finish.



2005 BMW M3

GSR AUTOSPORT LAKE FOREST, CA

ENGINE > 3.2-liter S54 straight-six 24v with built internals, Garrett GTX35/28R twin-scroll turbo, DOC Race exhaust manifold, Radium Engineering billet fuel rail, Ignition Projects high-power coils, Pectel management, Litespeed Engineering exhaust

DRIVETRAIN > Tex Racing four-speed dog gears, Clutch Masters 850-series twin-disc clutch, Thorough Concepts lightweight aluminum driveshaft, OS Giken SuperLock LSD

BRAKES > Wilwood four-piston calipers f, two-piston r, 12.5" two-piece rotors with aluminum hats f, 11.5" r, hydraulic handbrake with two-piston calipers

SUSPENSION > Bilstein MDS Motorsport double-adjustable coilovers, Wisefab high-angle steering- and control arms

WHEELS & TIRES > 18x8.5" f, 18x9" r Forgestar CF5 wheels, 235/40 R18 f, 265/40 R18 r Yokohama ADO8R tires

EXTERIOR > DTMFiberwerkz GTR widebody kit with front spoiler, four fender flares, side skirts, rear bumper

INTERIOR > Sparco seat and harnesses, steering wheel, Motec CDL3 dash with datalogging, rollcage

CONTACT > gsrautosport.com, dtmfiberwerkz.com, bilsteinus.com, forgestar.com, yokohamatire.com, wilwood.com

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NOW ENTERING ITS SEVENTH YEAR, FASTIVUS 2013 TOOK PLACE OVER THE LONG MEMORIAL DAY WEEKEND AND FOLLOWING LAST YEAR'S SUCCESS, THE EVENT WAS NOW OPEN TO ALL VW MAKES AND MODELS, RATHER THAN LIMITED TO R MODELS AS IN THE PAST.

With the floodgates open to all VW fans throughout Southern California, more than 400 cars and 600 enthusiasts turned up, making opening day truly memorable.

Something else new for 2013 was the ability to bring camping gear and provisions to spend the night at Willow Springs Raceway. This beat the prospect of commuting back and forth to the track for Sunday morning's driver briefing.

SHOW

Past Fastivus events were reserved for VW Golf R32 and R models from the first edition Mk4 to the latest Mk6. But with the new format, we were delighted to

see a healthy showing of everything from GTIs to the Beetle, Passat and Jetta. And, of course, some Audis turned out to celebrate the new open-door policy.

APR Motorsport was this year's title sponsor. The company brought its big rig, fresh from its duty at SoWo the weekend before. After driving across the country, the APR crew was at the ready to meet attendees with performance parts and software from its tuning catalogue. They even brought a few "coming soon" products, including the highly anticipated Roots-style supercharger for the RS5 and R8 V8.

As the sun blazed and the wind blew, showgoers weren't the least bit deterred. After applying the sunscreen and pitching a tent, it was time to crack open a few adult beverages. You were bound to have a good time!

With the help of VW of America, the Fastivus organizers hope to make the show the major event on California's Euro calendar. Let's be honest, the East Coast shows rule the roost so it will be good to have something to crow about out West. And with events



like nighttime head's up drag racing, show 'n shine, and the track-day racing experience, it looks as if they're well on their way to making it a reality.

Additionally, Fastivus has become renowned for its raffle. From humble beginnings, giving away a simple HPA short shifter, this year saw nearly \$25000 in premier VW parts on offer for the winning tickets. VW chipped in three roof racks for the Mk4, Mk5 and Mk6, while Rotiform kicked in a set of wheels and SoloWerks gave a set of coilovers.

If you have any hesitation making plans for next year, we suggest you look at the raffle prizes on the Fastivus website and pack your bags the next time summer heats up.

For more information, check out fastivus.com

[1] The SEMA 2012 GT Award-winning Super Beetle made its first West Coast appearance
[2] Our Beach Cruiser Beetle arrived at the track, fitted with forged Revo wheels over the company's big brakes





PART 3

PROJECT BMW 335i

BMW M PERFORMANCE PARTS INSTALLATION

WORDS & PHOTOS / *Greg Emmerson*

IT'S BEEN TOO LONG SINCE WE LAST VISITED OUR 2012 F30 BMW 335i PROJECT.

In fact, our last installment was in *EC 4/13* when we compared our Mineral Grey car on its H&R Street Performance coilovers, 20" HRE C100 wheels and Nitto Invo tires to a similar car from LTMotorwerks. Our intention was to compare its suspension to the KW Variant 2 coilovers on the second 335i since we rarely see tests like that.

It was a fun exercise and, while we love the suppleness of the H&R components, the KWs did appear to provide slightly more control at high speed. You can read the full report in the 4/13 issue or online at european-car.com

The ensuing delay can be attributed to the lack of available parts for the F30. But having waited for the aftermarket to get its act together, we decided to go with official BMW M Performance parts, available from any BMW dealership or online at bmwmperformance.com

There's a comprehensive catalog of officially

authorized performance and cosmetic components. These can either be financed and fitted on a new car, or added to an existing vehicle such as ours. There are parts for most models in the BMW range, so you don't have to own a 3 Series, but all the parts are OE quality, as you'd expect, and won't affect your factory warranty. When you visit the website it will display component prices and fitted prices, so you know what to expect.

We limited our cosmetic upgrades on our car to black kidney grilles and carbon mirror covers because we wanted to focus on the performance side. So we would also fit the engine Power Kit, big brakes and exhaust. This was fairly ambitious in our tight timeline, aiming to have the car ready for Bimmerfest and subsequently run the 335i against one of its competitors in the next issue.

To help us, we enlisted European auto source in Anaheim, CA for the mechanical parts, and to verify the improvements on their dyno. We'd also had the assistance of local BMW tech, Derek Vieira, who had worked on previous projects and was very familiar with the correct installation procedures. He would install the grilles, mirrors and engine hardware, while EAS worked on the brakes and exhaust before dynoing the Power Kit software.

Kidney Grilles

Fitting is relatively straightforward but you must be prepared to get stuck-in. The correct procedure would be to remove the front

bumper but Derek found a shortcut...

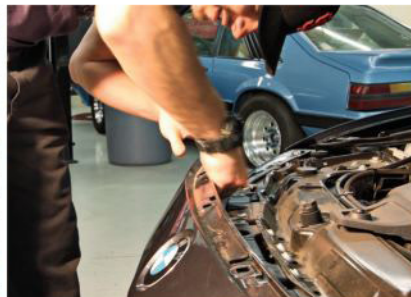
Begin by undoing six T30 screws on the top edge of the

bumper, under the rubber seal. There are also two T20 screws above the headlight housings.

Once removed, pull the top of the bumper away from the car and get your hand behind one of the grilles. Push the middle of each securing tab to release them. Work your way around the tabs to

remove the grille. You'll need thin arms, long fingers and patience.

To fit the BMW M Performance black grilles, simply position and press until all the clips snap into place. You may need to apply some force. Then replace the screws in the top of the bumper and refit the rubber seal to finish.



Carbon Mirrors

Using a plastic blade and some force, lever behind the mirror glass to snap it out of its retaining clips. Then disconnect the heating

wiring. The plastic mirror cover is held by three pinch clips, which should be released.

The new BMW M Performance

carbon fiber covers are secured with supplied T10 screws and washers. To accommodate these, you need to bend or break the plastic tabs in the base plate for clearance.

Unlike the plastic covers, there's no ridge along the top edge to locate the carbon pieces, so the

seal isn't as good. However, the screws seem to hold the new covers in place properly.

Finally, refit the glass by placing it over the center circle and wiggle it until the clips snap into place. It might be advisable to work with a cloth under the car in case the glass falls.



Exhaust

The BMW M Performance exhaust replaces the rear muffler on the 335i with a stainless steel

part that has chromed 3" tailpipes (rather than the stock black tips on our Sport model) that are etched



with the "M" logo. The muffler is fitted with the flap actuator to control backpressure, is supplied with full instructions (including a guide for where to cut) and comes with a large pipe clamp.

Arriving at european auto source, the first task was to mark

the stock pipe for the saw cut. Measure carefully because you want the tailpipes to be in the correct place.

Once cut, disconnect the vacuum hose from the flap and undo two 13mm bolts on the hanger. The muffler can then be removed. The hanger should be transferred to the M Performance exhaust.

Before we fitted the new part we weighed both mufflers. The stock piece was 24.2 lb and the M Performance replacement was 21.3 lb, saving us almost 3 lb.

Having filed the sawn pipe smooth, slide the supplied clamp over the OE system and fit the end of the new muffler into the clamp. Then bolt the hanger back onto the car. Tighten the clamp once the tips are aligned in the bumper apertures. You then want to reconnect the flap.

This is a 20min DIY job, provided you have a lift and a good saw to get through the stock pipe.

Power Kit

As a relatively new addition for US cars, the BMW M Performance Power Kit in this instance consists of engine software, a new air box plus an M Performance engine

cover that lets everybody know you have something special.

Our car, being one of the very first 2012 models in the country, it couldn't be reprogrammed with

a software flash, so a replacement ECU was supplied that would allow us to flash it. This makes our car more expensive but we're assured the results would be the same.

Installation of the hardware was straightforward. The stock engine cover sits on four columns, secured by rubber bungs. To remove, simply pull upwards. You'll need to exert some force but it will come off. Fitting the new engine cover simply required it to be pushed into place.

The replacement air box was another simple installation. Start by releasing the four metal clips around the air box lid. Then release the MAF sensor plug and unscrew

the inlet hose clip from the other side of the engine bay. The plastic hose lifts off a rubber bung and is removed with the air box lid as one piece.

The base of the air box sits on another two bungs, so simply pull it upwards and away from the lower ducting.

The new base unit has an additional intake, outlined in orange. This will increase the air drawn into the intake and has increased induction noise slightly, as well as turbo whistle.

Push the new base unit onto the bungs, refit the filter element and the lid with new clips supplied. Then screw the inlet pipe back into position and reconnect the MAF.

For most owners, the installation will be complete. The car must then visit a BMW dealer to have the software flashed. It will require a software update as well as re-coding, so could take 3-5 hours. Our car required the ECU to be fitted, which was a more complicated job because of the ECU placement. It was then updated and flashed.

The overall flashing procedure is far slower than a software upgrade by aftermarket tuning companies, but BMW is re-coding and updating many functions on the car simultaneously, meaning this part isn't a DIY task.





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Brakes

Everybody likes a big brake kit and BMW offers its M Performance brake system with Brembo four-piston front and two-piston rear calipers. These require a minimum of 18" wheels and are available in red, yellow or orange. We selected yellow, which is reminiscent of the E46 M3 Phoenix Yellow, as it contrasted our grey paint nicely.

The rotor size is increased from 340mm front, 330mm rear to 370 and 345 respectively. They're also dimpled and grooved to aid pad performance. As a result, they make a slight thrumming sound when applied, which we like.

The kit is supplied with calipers, rotors, pads, heat shields, sensor wires, pad grease and nuts/bolts.

To install, undo the two 18mm front caliper bolts and release the pad sensor wire (it's only on the driver's side). Then hang the caliper safely out of the way. Undo the 6mm allen screw in the rotor and remove. You may need a rubber mallet to persuade the rotor off the hub. The hub should be cleaned and anti-seize solution liberally applied.

We opted to retain the stock heat shields since they were the same as supplied. So simply screw the new M Performance dimpled rotors into place and bolt on the yellow calipers. We used the supplied bolts for the latter, torqued to 60ft-lb.

Insert the pads (after applying

more anti-seize to the backs) and secure with the supplied steel pins and spring clips. You can fit the new sensor wire at this point.

Leaving the messy job until last, use a 11mm open wrench to undo the brake line inside the fender well. You want to do this quickly to lessen fluid loss, reducing system bleeding. Brake fluid will strip paint, so clean any spills. The line then swaps over to the new caliper and screws into the fitting.

The procedure is exactly the same at the rear, but now the caliper is held by two 16mm bolts and the pad sensor is on the passenger's side. Re-torque the new caliper bolts to 60ft-lb again when refitting.

The final job, once the hardware is installed, is to bleed the brake fluid. European auto source uses an air pressurized shop system to make it easier, but consult an

expert if you're unsure how to bleed brakes. Leaving air bubbles in the line can lead to a soft pedal or even a crash.

Equally important is to bed-in the pads before regular use. This matches the pads to the rotor face to ensure efficient operation.

There are several different techniques but we did it with repeated 60mph stops, allowing the brakes to cool before repeating. Ordinarily, this would give us a firm pedal and powerful stopping but we suspect BMW specified softer street pads that don't require the warm-up period of harder pads. So while they do stop efficiently, scoring well in *MotorTrend's* testing for its online video we'll discuss next month, the pedal feels a little numb. But that doesn't seem to detract from their overall ability, and they certainly look good, which also helps.



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Dyno

When the car arrived at European auto source we gave it an initial dyno run to record baseline numbers. The N55 3.0L turbo engine in the F30 335i is renowned for getting hot on the dyno, so EAS typically does several runs then allow it to cool down. Taking an average, our car recorded 261hp at the wheels and 299 lb-ft of torque. Not bad considering it's supposed to have 300 lb-ft at the crank!

After the BMW M Performance exhaust had been installed, we returned to the dyno and saw identical numbers. The guys at EAS explained that they'd run an F30 without a cat-back exhaust fitted and found no gains, so they weren't expecting much from the rear muffler.

On the plus side, the etched tailpipes look good, but ours sounded almost like stock. Obviously, you don't want a noisy exhaust, but you do want to hear how you spent your money. However, the M Performance muffler was very close to stock. So with no power increase and very little difference in noise, it comes down to a cosmetic consideration.

After visiting the local BMW dealer, we returned to the dyno

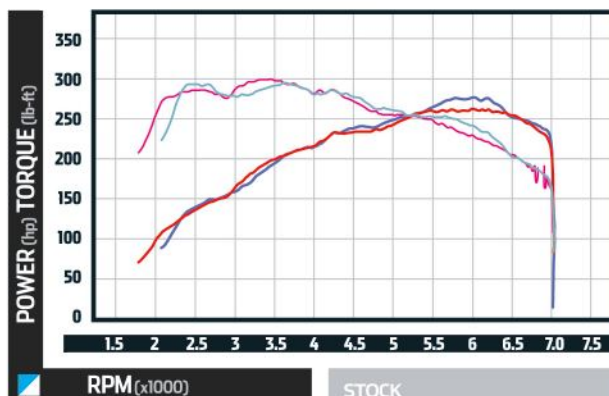
to test our new M Performance Power Kit with its new air box and software. The car felt slightly more peppy on the road but it wasn't like the 335is cars, for example.

On the dyno we saw peak wheel figures of 276hp and 295 lb-ft. The power gains come after 4500rpm, with a useful spike from 5500-6500rpm, which means you have to work the car to feel the benefits. It also gets a torque increase at the same engine speed.

What makes a car feel fast is a boost in mid-range torque, which is evident from 4500rpm, but it loses torque from 3000-3500rpm, which disguises the benefits in the mid-range.

People who have driven later 335i models with the same software claim the cars feel faster

DYNOJET BMW 335i TEST



than ours, meaning our ECU swap possibly didn't release the full benefits of the new software. So overall, for the cost of the exhaust and Power Kit, we have to conclude that the results were rather disappointing. But if you're looking for mods that won't affect your warranty, these are the best options available.

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▶ NEXT MONTH WE'LL TEST OUR PROJECT 335i AGAINST A MODIFIED CADILLAC ATS

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Carbon fiber mirrors	BMW M Performance	\$715 (pair)
Black kidney grilles	BMW M Performance	\$143 (pair)
Exhaust	BMW M Performance	\$1375
Brake kit	BMW M Performance	\$2540 (front & rear)

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PART 4

PROJECT BMW 335i P3CARS VENT GAUGE INSTALLATION

WORDS & PHOTOS
Greg Emmerson

EVERY OWNER OF A MODIFIED CAR WANTS TO KNOW WHAT'S HAPPENING UNDER THE HOOD.

Many modern cars give access to lots of information, but a series of auxiliary gauges can support the car's main instrumentation in relaying information quickly to the driver. However, it can be difficult to place extra gauges tidily inside the car. Fortunately, there are plenty of options, with A-pillar, steering wheel cowl and vent gauges being the most popular.

Recently, we found a new product from P3Cars and, after watching the excellent 2min fitting video on p3cars.com we decided to have a go ourselves – after all, if it only takes a couple of minutes to explain how to install it, how hard could it be?

The gauge plugs into the car's OBD2 port and reads information directly from the sensors, giving you accurate, instantaneous readings. It can display turbo boost/vacuum, temperature for coolant, intake air and exhaust gas as well as speed, RPM with a shift-light, throttle position and battery voltage. There's also a 0-60mph timer and it can accommodate up to three analog inputs for additional sensors. It can even read fault codes and reset them if needed.

The gauge comes in left- or right-hand drive versions for different markets and the display color is matched to your vehicle's interior lighting. You can order it pre-installed into an OEM vent (\$449), or save some money and install the gauge yourself into your

existing vent (\$389). Either way, it fits neatly with simple connections and will give you instant readouts or record peak numbers plus 15sec of data for review.

Perhaps the only thing missing from this box of tricks is an oil temp reading, which we consider useful information for the driver. But otherwise the P3Cars gauge appears to be a clever piece of kit.

At present it's available for a range of BMW, VW and Audi models, such as the A3, A4, TT, R8 1, 3 and 5 Series plus the GTI, Golf, Jetta, Passat, Tiguan and more. The full list is at p3cars.com

To ensure we got it right, we

enlisted BMW tech Derek Vieira. He works at a local dealership and has helped with all our previous BMW projects, ensuring we do things by the book.

The parts supplied included the P3Cars gauge pre-installed into an OEM vent, control box and OBD2 plug. The tools required were a plastic blade and small screwdriver or pick.

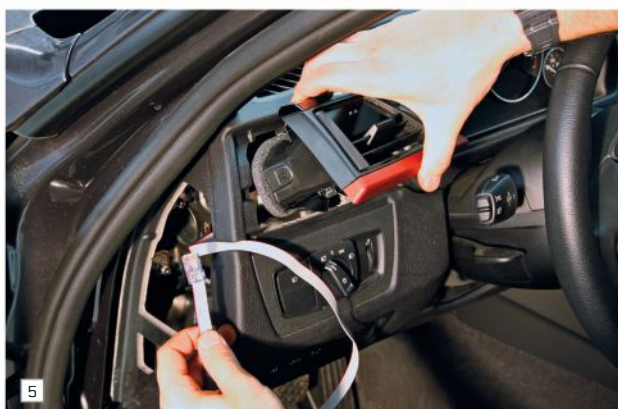
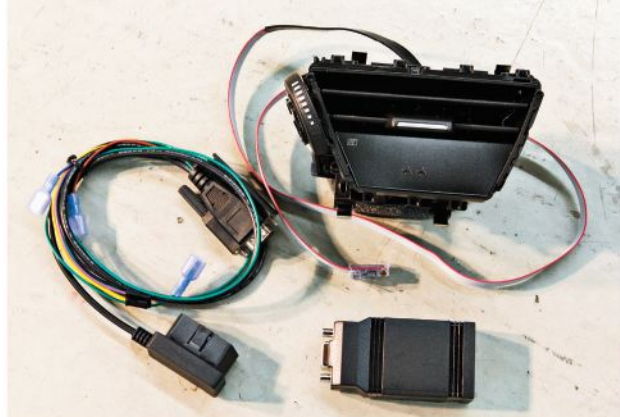
FITTING

To be honest, you could skip this and visit the company's website listed above to watch the video. However, we'll recap to give you an idea of how simple it is:

NEXT INSTALLMENT We'll have a test between our Project 335i and a modified Cadillac ATS in the next issue.

CONTACT

P3Cars
p3cars.com



[1] Start by removing the dashboard side panel with a plastic blade to loosen the clips. You may want to remove the rubber door seal in this area to improve access

[2] Push the vent from behind to release it from the dashboard

[3] Use a small pick or screwdriver to release the top clips securing the front trim panel to the vent

[4] Fit the P3Cars gauge and vent into the OE trim panel by clipping it into place from the bottom

[5] Pull the gauge wiring through the dash and fit the new gauge vent

[6] Plug the gauge into the control box, then the box into the OBD2 plug. This plug goes into the OBD2 port and its wiring is tucked behind the lower trim panel. The control box itself is tucked into the dashboard before the side panel is replaced. We zip-tied the cables to keep it neat

IN USE

The P3Cars gauge is ready to go straight out of the box. There are two small buttons on the display panel, with the left one accessing the peak recall or 15sec of data playback. The right button will display the current mode or allow you to scroll through the menu to reach the desired information.

The buttons are placed above the display, meaning you obscure the readout when pressing the buttons. So you need to remove your hand each time to identify what parameter was selected.

In the set up menu, you can switch between English or metric units and ensure the device is set for your engine – the F30 gauge fits our 335i as well as the 328i and 320i, for example...

We've not encountered any



fault codes on our car, but they will be displayed as a four-digit code when you start the engine. These can be identified on the company's website, and reset if desired.

With our recent engine software

upgrade and dyno sessions, 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. ☺

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WORDS / Justin Fivella
PHOTOS / Justin Fivella, Goodyear

TIRE TEST GOODYEAR EAGLE SPORT ALL-SEASON

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AN AUTOCROSS COURSE HAS A WAY OF UNWINDING THE MOST SORTED CHASSIS, WHILE SIMULTANEOUSLY UNCOVERING ANY WEAKNESS A TIRE MIGHT HAVE, DESPITE THE BEST ATTEMPTS OF MARKETING JARGON.

Unlike road courses with smooth transitions, autocross tracks can best be described as busy; with constant and aggressive throttle, braking and steering inputs required to navigate the tight course at a high rate of speed. But things get interesting when the course becomes wet and dry, you're suddenly asking the tires to keep pace while transitioning between adhesion extremes. And that's when it's true character comes to light, good or bad.

The clock hands still hadn't touched noon and the searing Arizona heat at the Bondurant School of Performance Driving was already hot enough to cook an egg on the tarmac. But it didn't deter us from making hot laps around the autocross course in a new Audi A4 2.0T quattro.

We were despatched in the aforementioned A4s shod with either new Eagle Sport All-Season tires (a new high-performance (HP) all-season tire slotted below the Ultra High Performance (UHP) Eagle F1 Asymmetric All-Season).

We first experienced the Eagle's performance around the track, before jumping into identical cars shod with the Firestone Firehawk Wide Oval AS tires.

The track had low- and high-speed slaloms along with decreasing radius turns and a threshold-braking area

intermingled with wet and dry tarmac.

The first few laps on the Goodyears were remarkably fun, as the car stuck well in the dry and hung in there like a champ in the wet. Inevitably, understeer set in at the limit, but there was some lift-off oversteer only an ankle wag away.

In all honesty, we'd forgotten we were on an HP tire rather than a UHP variant, until we hopped into the cars fitted with the competitor tires. Within three corners we'd already blown two apexes, nearly clipped several cones and, while it was admittedly fun to slide the Audi around, the first wet turn induced so much understeer we slid to the outside of the turn and almost through the cones. If this was a

public road, we'd have been across the yellow lines and in trouble.

And then we were reminded that we weren't testing max-grip tires here, but rather all-season rubber made for every day and every season. The fact that Goodyear was able to make its tires perform so well meant we'd forgotten their price-point, which was impressive in itself.

ALL-SEASON

The new Eagle Sport All-Season replaced the Eagle GT and while they performed well at the limit in the wet and dry, it's important to remember they're an HP tire akin to the Firestone Firehawk Wide Oval or Bridgestone Potenza RE97AS, rather than Michelin,

Pirelli or Continental all-season products that the Eagle F1 Asymmetric was built for.

While UHP all-season tires are considered the highest performers, it's no secret they give up some winter traction for better rain and dry adhesion. But Goodyear was willing to sacrifice outright numbers for ice and snow performance with its Eagle Sport. The tread design is tangible proof of that, with full-depth sipes for snow and ice. In fact, Goodyear will offer nearly 50 sizes and expects to see them in OE applications, as an idea of the intended use.

DESIGN

It's well known that tires are more complicated than simple hoops of rubber. In fact, the technology of the latest products is mindboggling. Some of the highlights of the Eagle Sport include TredLock, TripleTred and ComfortTred, designed to give optimized traction across wet, dry, snow and ice conditions. While the Cantled Grooves slant the tread-block walls for stability under high cornering and braking loads, providing confidence and remaining communicative in the corners, yet quiet on the highway.

Other noteworthy tidbits include a new blend of silica-enhanced rubber with an even greater tread-wear warranty, which means these high-performance haulers carry a 50,000-mile warranty.

SUMMARY

Building a competitive HP all-season tire can be a daunting task because it has to be a master of everything, such as a good ride and competitive price-point in addition to its performance. Although our test regimen was limited to the autocross, we can vouch that the performance limits are remarkably high. While road noise and NVH might be more pronounced than the OE tire on your daily driver, you might want to consider trading some comfort for better all-season performance. After all, you want the tires to work if you ever need to make a panic stop.

Pricing wasn't available, but visit goodyear.com for info.





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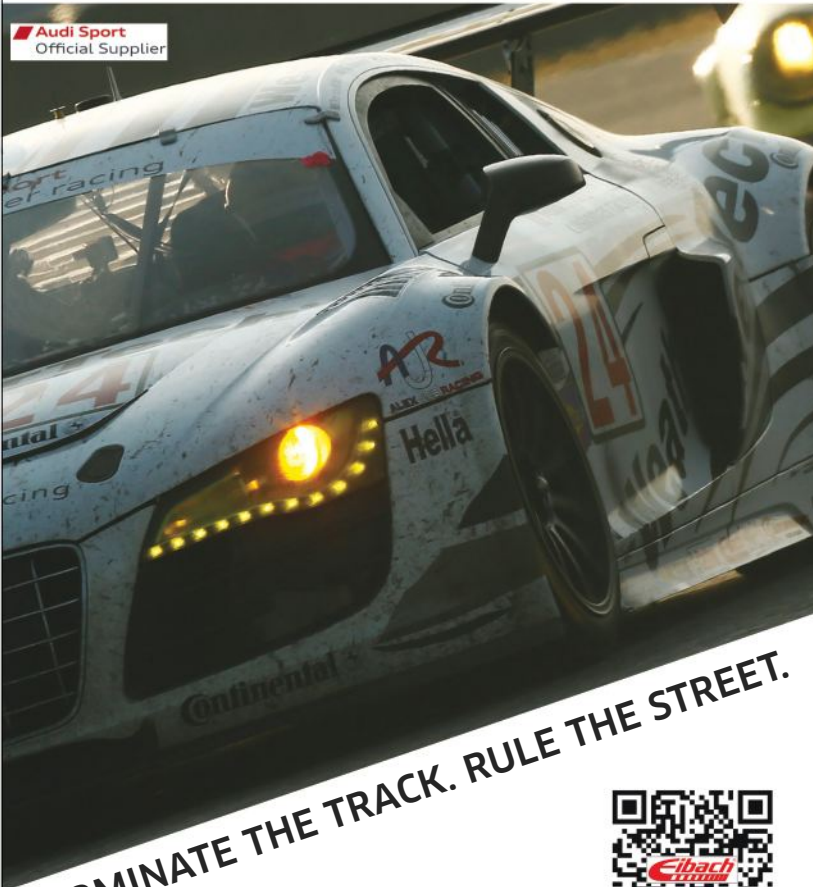


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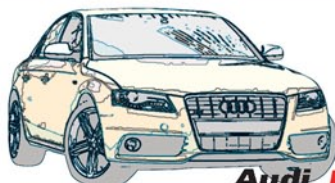
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2013 EVENTS CALENDAR

CAR SHOWS FROM AROUND THE GLOBE AND
IN YOUR BACKYARD

OCTOBER

4-6 Occupy Big Bear (formally Oktoberfest)

occupybigbear.com

5 DubRun to the Poconos

www.vortex.com/forums/events

13 Black Forest Industries Oktoberfest

blackforestindustries.com

13 Texas Invitational

texasspeedsyndicate.com

20 Dubs at the Gap

fb.com/dubsatthegap

24 Petersen Museum Gala 2013

petersen.org

27 Art Center Car Classic

artcenter.edu/carclassic

TBD Del Mar Concours

delmarconcours.com

NOVEMBER

5-8 SEMA

sema.show.com

22-Dec 1 Los Angeles Auto Show

laautoshow.com

23 FixxFest

fixxfest.com

28-Dec 1 San Francisco Auto Show

sfautoshow.com

29-Dec 1 Festivals of Speed
festivalsofspeed.com

REGULAR EVENTS

Cars & Coffee

forums.carsandcoffee.info

Bob's Big Boy

bobsbigboy.com

Breakfast Club Cruise-In

petersen.org

Supercar Sunday

supercarsunday.com

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FIXXFEST

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LA AUTO SHOW

Because of its location in the world's largest single car market, the Los Angeles Auto Show is known to showcase surprises each year. It has everything from the basement aftermarket pavilion to the thousands of square feet of manufacturer booths filled with nearly every model from every brand. It's your chance to see the latest and greatest production cars, or maybe slip behind the wheel of something exotic. Right now, several manufacturers are choosing to debut new models and concepts in Los Angeles, so make sure it's on your list of things to do in November. laautoshow.com



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