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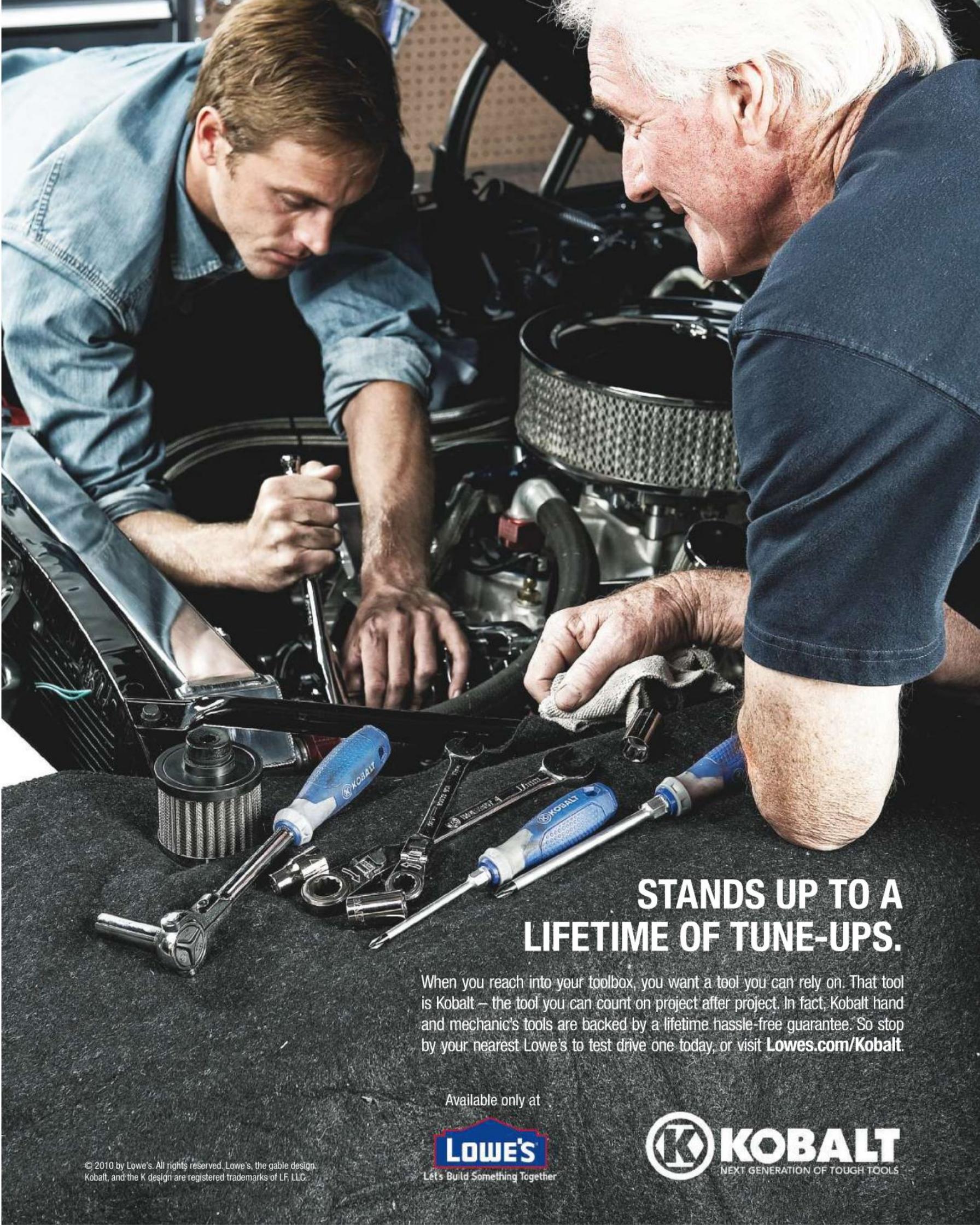
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Rivals!

There’s competition on the road as well as track. Chevy versus Ford V-8s. Chevy versus Ford V-6s. And then there’s even Rolls-Royce versus Bentley. Arguments commence on **p. 48**

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“GREATEST DAY OF MY LIFE”

Red Bull’s Mark Webber had reason for a celebratory dip in the pool at Monaco—the talented Aussie had just won two Grands Prix in a row, at Spain and Monaco, and was leading the World Championship. That’s Adrian Newey at left, designer of the RB6 that dominated at both tracks.

PHOTO BY PETER J. FOX

Canon EOS-1Ds Mark III 1/400s at f/5.0.
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¹Based on Edmunds.com lateral skidpad testing. Kizashi attained higher lateral force than Infiniti G37, Acura TSX and Mercedes C300 Sport. ²Government star ratings are part of the National Highway Traffic Safety Administration's (NHTSA's) New Car Assessment Program (www.safercar.gov). ³Engine output claim based on manufacturers' web sites as of 5/10/10. Class defined as IHS Global Insights' MY10 Lower Midsize segment. MSRP does not include tax, license, title or destination charges. Dealer prices may vary. Audi A4, Acura TSX, Infiniti G37, Mercedes C300, Volvo S40, Rockford Fosgate, and AutoWeek are registered trademarks. Kizashi GTS as shown \$22,729. Professional driver on environmentally approved closed course. Do not attempt. Vehicle shown upon a designated off-road trail. Along with concerned conservationists everywhere, Suzuki urges you to Tread Lightly[®] on public and private land. Preserve your future off-roading opportunities by showing respect for the environment, local laws and the rights of others. © American Suzuki Motor Corporation 2010. Suzuki, the "S" logo and Suzuki model names are Suzuki trademarks or ©.



The Road Ahead

BY MATT DELORENZO >> EDITOR-IN-CHIEF

Not Lost in Translation

One of the greatest attributes of the automobile is its universal appeal. Car people exist all over the world and their passion knows no bounds when it comes to national borders, customs or even language. Many times I've found myself sitting across from an engineer or a designer with a translator providing that critical bridge of communication between us. What's not needed, however, is someone to interpret the enthusiasm of a fellow automotive aficionado.

Nobuhiro Hayama is director and senior managing executive officer of Mazda Motor Corp. and a certified gearhead. As an engineer, his specialty is engine technology and he's lost none of his passion for the craft even as he's moved up the management ranks at the Japanese automaker.

And while he needs a translator to communicate in English, his love for what he does and how he feels about cars comes through loud and clear. During a Teppan-yaki dinner with Hayama, we talked about the future of powertrains in a wide-ranging discussion that included gasoline engines, diesels and Mazda's venerable rotary. Maybe it was the sake talking, but the message I got was that while hybrids continue to be fashionable in all quarters, Hayama believes that internal combustion will still be the primary motive force in cars for many years to come.

While he has respect for the advancements that have been made in hybrid and electric powertrains, Hayama believes there is still plenty of efficiency and performance left in so-called conventional engines. Where he differs from other engine engineers is that he's not a big fan of forced induction, either turbo- or supercharging high-revving small engines to give the power of a larger one. Rather, his approach is to use longer-stroke smaller displacement normally aspirated engines to do the work of larger motors. So instead of a 1.4-liter blown engine to do the work of a 2.0-liter normally as-

pirated powerplant, he'd prefer to optimize a 1.6-liter engine to find that sweet spot between economy and performance. He also favors this approach because the normally aspirated engines are less complex and therefore not as costly to produce. It's no coincidence that the engine he helped to develop for the original Miata displaced 1.6 liters. Hayama is a champion of torque over absolute horsepower—he believes it contributes to a snappy feel right at throttle tip-in that many short-stroke, high-revving turbo engines lack.

Along those lines, Hayama is also a big believer in diesel technology for precisely the same reason. Compression ignition technology offers the promise of high efficiency, low revs and plenty of twist. Mazda is about to introduce a new version of its European diesel powerplant, called Sky-D, which Mazda is readying for U.S. sale.

Our conversation then turned to the Wankel rotary engine and while there's no possibility ever of a compression-ignition variant of that engine (the compression required would be too high for it to seal properly), that doesn't mean alternative fuels are out of the question for this innovative engine. In fact, Hayama has long championed the idea of using hydrogen in the rotary. His vision of the perfect hybrid would be a hydrogen fuel cell coupled to a hydrogen-burning rotary engine where both power sources draw on the same fuel source.

Many of the powertrain initiatives championed by Mazda are being developed under the Sky banner—the new direct-injection gasoline engine is called Sky-G, the diesel goes by Sky-D and a new automated manual transmission is called Sky-Drive. While this naming convention has its green overtones in terms of its clean air implications, Hayama, always the engineer and dreamer, believes what it really means in terms of his approach toward his job and his passion—is that the sky is the limit. 

Instant Video at Your Fingertips:



Scan this code with your smartphone to see our bonus "Adrenaline Rush" video.

Speaking of advanced technology, you'll notice in this issue strategically placed 2D icons in the shape of a steering wheel that will allow you to view story-related videos on your smartphone. For information on how to download and use the free tag reader, check out the instructions on page 10. We're excited about this 2D coding because it allows us to further enhance the print experience with high-quality video that was previously accessible only through our website. These changes are part of our ongoing commitment to deliver an editorial experience like no other.

Revved-Up

For notable quotables, video links
and general automotive shenanigans,
go to: roadandtrack.com/rev



This is not a Video Game!

It's actual in-car footage of a
Porsche 911 GT3 RS road car com-
peting in this year's Nürburgring
24! Yes, the race was sponsored by
Sony PlayStation, but there's no
doubt this lap is for real. Enjoy!

(Also check out our Nürburgring
24 Hour story on page 108.)



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SEE PAGE 10 FOR FULL DETAILS!

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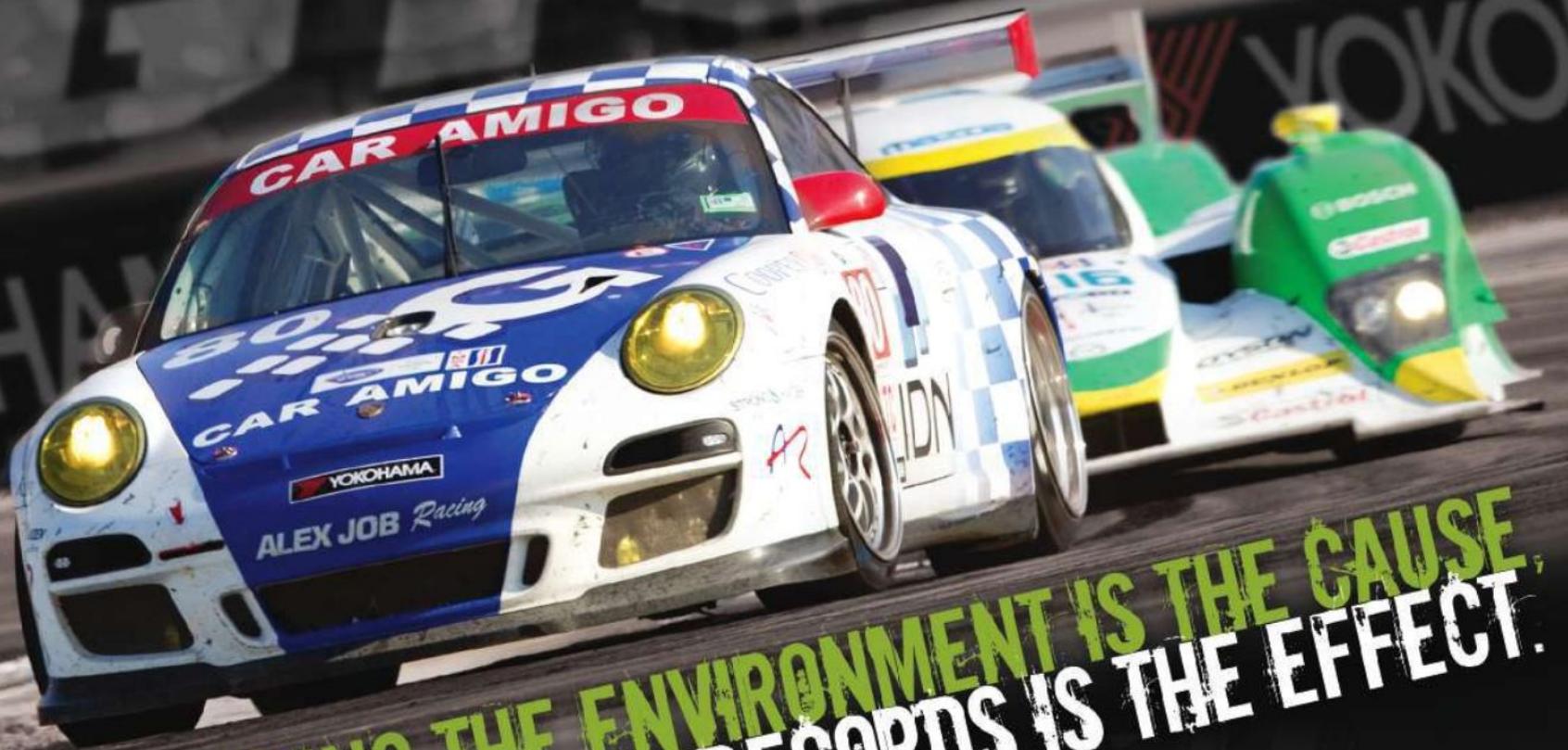
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Edited by Mike Monticello

Ampersand



King Kong Turbo

With 620 bhp, the 911 GT2 RS is the most powerful production Porsche ever



» Lightweight seats and door panels shave precious pounds from the GT2 RS; red Alcantara graces the steering wheel, shifter, handbrake lever and roof liner.

Porsche has managed to squeeze another 90 bhp from its venerable 3.6-liter twin-turbo flat-6 to create the 2011 GT2 RS, the most powerful road-going model in the company's history. That's right, the GT2 RS's 620 bhp even eclipses the 605 bhp of the mighty Carrera GT, a race car for the road that was powered by a 5.7-liter V-10. While Porsche wasn't specific about where the extra horses came from (more information will be released at the car's official launch at the Moscow Auto Show on August 25th), we were told it came largely from "tuning" and increased boost pressure.

If the 911 GT3 RS is the ultimate naturally aspirated 911, then the "997 II" version of the GT2 RS—which is available only in rear-wheel-drive form and with a 6-speed manual transmission—stands as the purist's turbo model. Emphasizing the enthusiast point even further, Porsche trimmed 154 lb. from the GT2 compared with the

already light 2008/2009 model, bringing curb weight to just 3020 lb. While probably of little concern to the folks who will plop down \$245,000 for the thrill of driving a GT2 RS, Porsche says the weight savings combined with a more efficient engine netted a 5-percent reduction in fuel consumption.

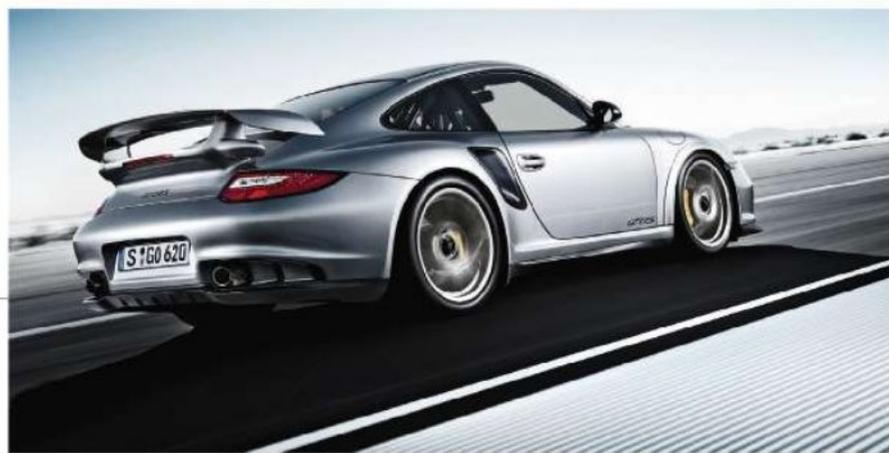
The GT2 RS comes standard with the ultra-light, ultra-expensive and fade-free Porsche Composite Ceramic Brakes. The new GT2 RS also has 10-mm-wider front tires, now up to 245/35ZR-19; the rear tires keep the same huge footprint as before—325/30ZR-19. The car's stiff suspension setup is specific to the GT2 RS, while the stability and traction control functions of the Porsche Stability Management (PSM) system can be switched off independently from each other.

The result of the GT2 RS's increased power, lightweight and suspension modifications is a 7-minute, 18-second lap around the

famed Nürburgring, some 14 sec. quicker than the previous 530-bhp GT2 (which, incidentally, also lapped the Ring 14 sec. quicker than the GT2 before it). Porsche claims the GT2 RS hits 60 mph in 3.4 sec., a typically conservative Porsche figure, as we accomplished that time with the previous model. Top speed is up by 1 mph to 205.

The new GT2 RS won't be hard to distinguish from lesser 911 models, what with a matte-black carbon-fiber hood, new light-alloy center lock wheels, wider front fender flares and a large rear wing. The racy interior features highly bolstered carbon-fiber seats with red Alcantara inserts, while the rich red suede-like material also graces the headliner, shifter, steering wheel and parking brake lever.

Porsche will build only 500 examples of the GT2 RS. The first cars will hit dealers in Europe in September with deliveries to the U.S. commencing in October.—Mike Monticello



Dear Mr. Valentine:

Every fighter pilot knows – cover your six. After one day with my new Valentine One, I see why everybody at the base keeps talking about their Vee-Ones.

I picked up a beep on the Interstate, slow at first but quickening, just like I was coming up on something. But the Radar Locator pointed behind – something was coming up on me!

He was hard to spot, a slick-top sneaking up through traffic. He went on by and got small. Then I saw blue flashes in the distance.

When I caught up he had a Mustang, its ordinary detector still winking red in the windshield. Of course, ordinary detectors don't look behind. Vee-One is like driving with a buddy for back-up.

Yours truly,

Slam

L.C. "Slam" Lewis
Tucson, AZ

Trust...V1 earns it one ambush at a time

Radar Locator

Tracks one or more radars at the same time; points to each.



Ahead



Beside



Behind

Bogey Counter

Tells how many:
Radar hiding within a false alarm? Two radars working the same road?
Reads instantly.

Control Knob

Turns On/Off, adjust volume, press to mute.

Muted-Volume Lever

Sets volume you hear after muting.

Radar Antenna

Scans behind for radar.

Radar Strength

More LEDs glow as radar strengthens.



Memo To: Mike Valentine

Kansas, 54 west to Liberal, so flat I can see next week. No traffic, really, except for the Durango I've been closing on through four or five iPod tunes (George Jones was made for Kansas).

Off the shoulder ahead, maybe a half mile, what, a furniture van? Tailgate up, brown-shirted guy inside; looks like he's rearranging the load. V1 lets loose an EEEeeeEEEE sound. Laser! I hammer the brakes. EEEeeeEEEE.

Can't be laser. There's nothing around. Just me and the Durango, now passing the van. Wait...inside with the furniture, dang, another brown shirt, crouched behind a sofa, steadying his laser gun over the backrest. Double dang! The first shirt is talking into a cop radio as I go by.

And now I see what the deal is; three cruisers backed up in a tight line against the nose of the van. The lead car is rolling, in pursuit of the Dodge I was fixing to pass. The others stay. Whew! V1 must have caught a laser glint as it ricocheted off the SUV.

Sincerely amazed,

Sal Molinari

Sal Molinari
Hartford, CT

C. Phillips

Clay Phillips
Tulsa, OK

Dear Mr. Valentine:

Just east of Texarkana on I-30, my Valentine One picked up X-band. The Radar Locator pointed "Ahead." Over the rise, sure enough, flashing lights. Smokey had a semi on the shoulder.

As I eased past, I watched the Radar Locator; it's kinda fun seeing it tracking radar from "Ahead" to "Beside" to "Behind" as you go by. It stayed "Ahead." What the #@?! Man, I saw Smokey. And I put him behind me. But the Locator still pointed ahead. Could it be?

Yep. Over the next hill, another Smokey, harvesting the ignorant. Without the Radar Locator, I would have been one of them. Valentine One is like having my own AWACS.

Thanks, Big Guy

Ted Reynolds

Ted Reynolds
Dallas, TX

Dear Mr. Valentine:

Hey, I think I owe you one.

My commute goes past two miles of malls, which my old detector said was one long X-band false. Nope. Now I see it's two miles of little alerts that blur together. The Radar Locator tracks each one as I drive by – pointing Ahead first, then Beside and finally Behind.

Yesterday, it pointed out the usual places. And one more. Hmmmm. The Ahead arrow flashed insistently. Guess what? Radar shooting commuters from the shoe-store parking lot.

My old unit would have beeped, same as always. But yours saw the trap. That could be an ad, right? Valentine One is the one to have when there's more than one alert.

Go ahead, use it, because I definitely owe you.

Sincerely amazed,

Sal Molinari

Sal Molinari
Hartford, CT

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TOYOTA WORKING ON A BABY FT-86

The FT-86 has caused a big stir for Toyota since its introduction at last year's Tokyo Motor Show. Now we hear that Toyota is also working on a slightly smaller (and milder) sports car, one that'll be some \$5000 less expensive than the \$20,000-plus FT-86 (which is scheduled to go on sale next year). Toyota had originally wanted to keep the FT-86's price tag below the \$20,000 mark; however, development costs



are running over budget, and we hear that Toyota is resigned to the fact that the FT-86 will not be as inexpensive as initially planned.

To fill the sub-\$20,000 sports-car hole in its lineup, the company is re-

portedly working on a baby FT-86. This car will measure about 150 in. front to rear and be powered by the company's 3SZ-VE engine, a 1.5-liter inline-4 that produces 109 bhp, mated to a 5-speed manual gearbox.

The car will feature a front-engine/rear-drive layout, as with the FT-86. The question is whether selling this car in the States will take sales away from the Scion tC. But due to the rear-drive layout of the baby

FT-86, it should appeal to the enthusiast driver far more than the front-drive tC. If Toyota does decide to bring the baby FT-86 stateside, look for it to make its debut sometime in 2012. —Sam Mitani

NEXT INFINITI G37 TO GET HYBRID OPTION



The G37 sedan and coupe have been perennial winners at Infiniti dealerships, and the company intends to keep the ball rolling with the next-generation model. To that end, sources tell us to expect a

version drastically different from the current car.

We were told the styling will take a completely new turn, with the sedan looking considerably more upscale and decidedly German. The coupe, on the other hand,

will take on an even sportier look. The overall styling of both sedan and coupe will borrow heavily from the Infiniti Essence show car.

But the most surprising news about future Gs is that they will have optional

hybrid power. Rumors suggest Nissan is considering mating a 3.5-liter V-6 with an electric motor, transferring the power to the rear wheels through a 7-speed automatic transmission. Power output? About 400

bhp. Naturally, the car's fuel economy will also be greatly improved. Our sources say the price tag of the hybrid car will probably be around \$60,000 (versus about \$35,000 for the gasoline-powered version). —SM



PHOTO-ILLUSTRATION BY BEST CAR

PHOTO-ILLUSTRATION BY BEST CAR

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Mr. Kanaoka noticed this was the most natural perspective from which to get a sense of your surroundings. Especially when considering the size of the all-new Infiniti QX. "It's important for the customer to have peace of mind," he stated. "We want them to feel more in control!"



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Mitsubishi Lancer Evo XI... with hybrid power?



PHOTO-ILLUSTRATION BY BEST CAR

With the launch of the Outlander Sport compact crossover as well as the electric i-MiEV, it seems Mitsubishi Motors is intent on adopting a green image. Word from Japan is that the company is slowly scrapping its sporty-car program in favor of more

economical products.

The company's in-house tuner, Ralliart, has been all but shut down, while plans for the next-generation Lancer Evolution have allegedly been put on hold. However, an inside source tells us that death reports of the next-generation

Evo are premature. He informed us that there are still a few people within Mitsubishi who don't want to see the company's image car go away, and that development is underway on a plug-in hybrid version of the high-performance sports sedan.

"This way, it will conform to the company's overall strategic plan of building fuel-efficient cars," he says. "Yet it will have all the performance that the current Lancer Evo possesses."

Although nothing is set in stone, it seems that at

this point if there is to be another Evo, it will probably have some sort of hybrid option, which is an infinitely better scenario than having no Evo at all. And from what we've been told, the new car won't be a slouch at the test track, either.—SM

CAUGHT!

2012 AUDI S7 SPORTBACK



PHOTO BY GLENN PAULINA/KGP

Even though Audi has yet to say anything on record about an S version of the upcoming A7 Sportback, an eagle-eyed spy photographer caught a test mule in the flesh—before the production version of the standard A7 has even made its official appearance (currently scheduled for a worldwide debut at the Paris Auto Show in October).

For sure what we're seeing in this photo is much more than the regular, 5-door hatchback A7: The prototype in question sports large front air intakes, enormous alloy wheels housing aggressive brakes, and quad-outlet exhaust tips, the last a dead giveaway that this is an S version.

Since Audi has yet to acknowledge the existence of an S7

Sportback, it's understandable that the German company is tight-lipped about any type of future drivetrain. Still, very good sources tell us the S7 Sportback will be powered by a supercharged 4.0-liter V-8. Dubbed the 4.0 TFSI, this engine is said to produce 394 bhp. It will come mated to a 7-speed version of Audi's paddle-shift S tronic twin-clutch gearbox, along with standard Quattro all-wheel drive.

The A7 Sportback may go on sale as early as the end of this year, but it will be at least another year after that before the S7 hits the market. It will likely arrive in mid- to late-2011 as a 2012, because Audi S models usually come out a year after the standard car makes its debut.—MM



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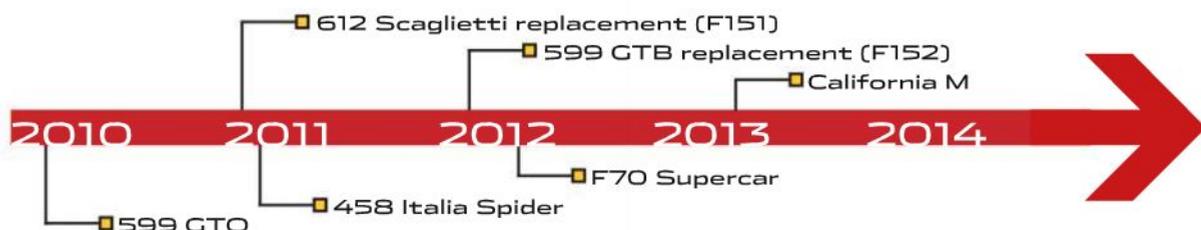
MOVING FORWARD

We know it's Toyota's tagline, but it also underscores the change in mind-set at Ferrari since Luca di Montezemolo took over in the early 1990s, in that the Italian company must have new product regularly—or die. In the 5-year product plan for the Fiat Group unveiled by CEO Sergio Marchionne, the pace of new product development will continue unabated at our favorite Maranello car company.

First up next year will be an all-new 612 Scaglietti—the replacement for the front-engine V-12 2+2



PHOTO-ILLUSTRATION BY BRENDA PRIDDY



GT goes by the codename F151. A Spider version of the recently introduced 458 Italia is also in the cards for 2011. The 612 Scaglietti's

front-engine stablemate, the 599 GTB Fiorano, gets the GTO variant now (see page 82 of this issue), and then an all-new ver-

sion—codenamed F152—in 2012. A year later the California will have a facelift significant enough to warrant the new designation of

California M (which stands for Modification). And somewhere in the mix is a supercar successor to the Enzo.—Matt DeLorenzo

DRIVEN: 2011 Porsche Cayenne S Hybrid



Before you proclaim that Porsche has officially sold out to the soccer mom demographic by building not just an SUV, but a *hybrid* SUV, trust us, this new Cayenne will not leave you yawning. Using a 333-bhp

supercharged V-6 (from Audi's S4), an all-new Aisin 8-speed automatic transmission and a sleek hybrid module slotted between the two, the 2011 Cayenne S Hybrid puts out a combined 380 hp and 428

lb.-ft. of torque. Porsche claims this enables the nearly 5000-lb. Cayenne to hit 60 mph in just 6.1 seconds and ultimately a top speed of 150 mph. The load of nickel/metal-hydrate batteries sitting

beneath the rear cargo floor provides up to 1.85 kilowatt hours of energy for the drivetrain's parallel electric propulsion and the converted hybrid-specific ancillaries, including the steering pump and air conditioner.

If not for the discreet front fender "hybrid" badges or charge-monitoring gauges inside, you'd be hard-pressed to notice the "hybridization" of this sport ute. The dry-clutch interface between the engine and electric motor delivers the seamless integration

of a CVT less the horrid motorboating sensation. It also makes a fuel-saving mode called "sailing" possible, in which the engine shuts down and decouples, leaving you freewheeling (think coasting in neutral) at speeds up to 97 mph.

EPA fuel economy figures are not yet available, but Porsche estimates a 20–25-percent increase in efficiency versus the 2011 V-8-powered Cayenne S. The Hybrid arrives this fall and will start at \$67,700.

—Jonathan Elfalan





Cosworth Impreza STI CS400



Just 75 of these very special Cosworth-tweaked Impreza STIs are going on sale in the U.K., at a price of \$72,000. The legendary engine builder has boosted the power of Subaru's turbocharged 2.5-liter flat-4 by 33 percent, to 395 bhp and 400 lb.-ft. of torque. Cosworth claims that with its newfound power, the all-wheel-drive STI can hit 62 mph (100 km/h) in just 3.7 seconds.

Internal upgrades include high-performance pistons and forged connecting rods with Cosworth engine bearings. Heavy-duty cylinder head studs, high-performance multilayered head gaskets and a higher-pressure oil pump are also fitted. Other changes include a Cosworth turbocharging system with a new compressor design and wastegate actuator, a

freer-flowing exhaust and a remapped ECU.

To handle the increased power, Cosworth applied carbon synchromesh to the top three ratios of the STI's 6-speed manual transmission, along with a short-throw linkage. There's also

an upgraded single-plate clutch with a revised pressure plate, bearing and disc.

Suspension changes include Eibach springs, Bilstein dampers and a 10-mm-lower front ride height. Although the rear brake system remains

stock, the AP Racing front brakes feature 14-in. rotors and 6-piston calipers.

Interior highlights include new leather Recaro sport seats and piano black trim. There are no plans to bring the Cosworth STI to the States.—*Ian Adcock*



FIRST IMPRESSION: Chevrolet Cruze Eco

We came away suitably encouraged after driving the "Eco" version of Chevrolet's forthcoming Cruze

at GM's Milford Proving Grounds in Michigan. Content-wise, the Cruze Eco—which has its own

body kit—sits in the middle of the Cruze lineup. With it, you get Eco-specific 17-in. alloy wheels, low-rolling-

resistance tires and special aerodynamic bodywork, including automatically closing air shutters in the front fascia as well as a blade that directs air around and away from high-drag areas such as the fuel tank and rear suspension. With a 10-mm-lower ride height and wider-spaced gear ratios, the Cruze Eco will achieve an EPA estimate of 27 mpg city/40 highway.

The Cruze Eco's turbocharged 1.4-liter inline-4 makes 138 bhp and 148 lb.-ft. of torque, and when mated to a 6-speed manual transmission it feels stronger than those

numbers might indicate. Although the Cruze uses a twist-beam rear axle, it was stable and communicative through Milford's suspension-testing bumps and undulations.

The Cruze has seating for five along with an impressive 15.4 cu. ft. of trunk space. Combined with 10 standard airbags and features such as Bluetooth, USB-audio and speech control, the Cruze will make a compelling case to consider the small car segment when it hits dealers this winter. Pricing has yet to be announced.

—*Calvin Kim*

Chevrolet Spark

Chevrolet's new Spark, which will hit U.S. dealers in 2011, proves that Ford's Fiesta isn't going to have it all its own way in the subcompact segment. Designed and engineered in Korea, the Spark is a global car. Says GM's Jim Trucksis, "We wanted a car that could be a Chevrolet around the world and draw people from the 'B' segment down with its own identity."

At 143 in. from bumper to

bumper, the Spark is a full 12 in. shorter than its Ford rival, as well as 5 in. narrower. The last is immediately noticeable from inside the car: Driving through the crowded streets of Athens, Greece, my fellow journalist drive partner and I got quite intimate at times.

Despite that, the Spark has a supple ride and informative steering, along with a slick manual gearbox. Between the two 4-cylinders

available—a 1.0-liter with 67 bhp and a 1.2-liter with 80 bhp—it's a case of "less is more," as the smaller engine is the sweeter of the

two due to its willingness to rev. (The U.S. Spark will likely have a 1.4-liter, the same as in the Cruze.)

The Spark's interior trim is a bit low rent, but keep in mind Chevrolet says this car will be very attrac-

tively priced (as yet unannounced). The question is whether that low price, combined with 46 mpg on the European drive cycle, will be enough to attract a large number of Americans to such a small car...—*IA*

DRIVEN IN EUROPE:



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2011 Suzuki Kizashi Sport

You won't exactly be able to chase down Nissan GT-Rs with it, but this Sport model, available in both GTS and SLS trim levels, improves slightly on Suzuki's surprisingly refined 4-cylinder 4-door sedan. Changes are largely cosmetic, with a more aggressive front fascia, plus bold chrome-edged lower body appliques and a rear lip spoiler. Although the generously sized P235/45R-18 Dunlops are the same, they're mounted on Sport-specific 18-in. wheels that are 2 lb. lighter apiece than the standard alloys they replace.

And while no changes have been made to spring rates or shock valving, a 10-mm-lower ride height does make for slightly crisper transitions, and allows the Kizashi Sport to pull a claimed 0.93g on the skidpad. Inside, there's a new metallic-accented steering wheel covered in perforated leather, and contrasting stitching when leather is ordered for the seating surfaces.—*Douglas Kott*

The Nissan Juke causes a stir everywhere it goes. So, are excellent driving dynamics and a cool interior enough to help you get past its strange "urban buggy" front end? Power for the 162.4-in.-long Juke (which is based on the platform of the 5-door Versa) comes courtesy of an all-new 1.6-liter turbocharged and direct-injected 4-cylinder with an estimated 180 bhp and 170 lb.-ft. of torque. Although there's noticeable turbo lag down low, once on boost it's impressively strong for such a small engine, especially from 4000–6000 rpm. All-wheel-drive mod-

els come only with a CVT, but front-drive models can be equipped with a 6-speed manual. Nissan sees this small crossover as a competitor for the Mini Cooper, and feels a Juke buyer could be "a guy who would be considering a used BMW 3 Series." That's probably a stretch, but body roll is minimal, grip is excellent and the Juke flat out eats up bumpy, twisty back roads. Helping the awd model is a multilink rear suspension (fwd models get a torsion-beam setup) as well as the first B-segment use of rear torque vectoring. The one



DRIVING IMPRESSION: 2011 Nissan Juke

downside when driving the Juke with aggression is its CVT, which can be shifted manually, but occasionally gets confused as to which "gear" you want it to be in.

The Juke will start under \$20,000 when it goes on sale in the U.S. in October, with fully loaded awd models coming in around \$25,000. Overall, it's a

comfortable and highly competent sporty crossover. The question remains whether its polarizing styling will turn people on, or turn them away.—*MM*



2011 Jeep Grand Cherokee

Maybe you can chalk it up to parent company Chrysler's short forced marriage with Mercedes-Benz paying dividends, or just good business, but either way the all-new 2011 Jeep Grand Cherokee serves as a major upgrade. While augmenting its vaunted off-road prowess, the Grand Cherokee has added no-excuse refinement in an effort to honestly challenge the BMW X5, Lexus RX 350 and Mercedes ML. Features abound across the four-model Grand Cherokee line, from a power liftgate to full

navigation and entertainment electronics, plus plenty of leather and wood. A vastly stiffer unit-body and upgraded interior design and materials provide a pleasing, quiet cabin, while the handsome exterior sets Jeep's new design direction. Although riding on a 5.3-in.-longer wheelbase and wearing four-wheel independent suspension for the first time (replacing the live-axle rear), the Grand Cherokee can still climb anything it can put a tire on, thanks to its multiple sophisticated 4-wheel-drive systems, each with

low range. Furthermore, air suspension lifts and lowers the Grand Cherokee nearly 5 in., while brake intervention provides limited-slip differential action front and rear. Power comes from an all-new 3.6-liter V-6 with variable valve timing, producing 290 bhp and 260 lb.-ft. of torque. A 5.7-liter V-8 (with 360 bhp and 390 lb.-ft. of torque) is optional for those preferring the best in off-idle torque and a 7400-lb. tow capacity. And best of all, the new Grand Cherokee even costs less, with prices starting at \$30,995.—*Tom Wilson*

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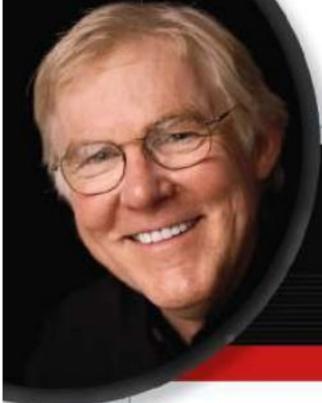
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Side Glances

BY PETER EGAN >> EDITOR-AT-LARGE

Defeating the Mighty Wind

And so convertible season returns to the frozen tundra, that magical time when you dismantle the Rube Goldberg top on your Lotus Elan and Mercedes flies you to the Smoky Mountains for the American press introduction of its new E-Class Cabriolet, all in the Month of the Exploding Dandelions, as Native Americans might once have called it here in Wisconsin, but probably didn't.

First, we journalists flew into Knoxville last week, walked outdoors and were immediately handed the keys to either an E350 or E550 Cabrio. We then drove toward a famous resort called Blackberry Farm in the nearby mountains, about an hour away by scenic winding road. My fellow scribe David Schmitt and I put the top down (electrically, in 20 seconds) and drove to the resort through a sunny green landscape filled with blooming dogwood, log cabins and faded barns urging you to See Rock City.

We arrived at Blackberry Farm in late afternoon and it was quite a place. Big "rustic" cabins with vaulted timber ceilings and

bathroom fixtures that cost more than my Nikon. Wooded hills, riding stables, an on-site sheep ranch and gardens to raise vegetables for the gourmet restaurant at the Main Barn. The lack of James Agee-style privation was conspicuous wherever you looked.

In the morning the Mercedes folks gave us a tech presentation on the Cabrio. Which—to a person like me, who still thinks remotely adjustable mirrors are a minor miracle—was quite an eye-opener.

For instance, the Cabrio has a computer that reads, analyzes and stores your driving habits for the first 20 minutes and then senses, through steering and throttle anomalies, when you're becoming inattentive or falling asleep at the wheel and beeps out a wake-up warning.

This is just the opposite of my own first convertible, a 1959 TR-3 that couldn't even remember to store voltage in the ignition coil, let alone analyze my driving habits. The car itself kept falling asleep while I was wide awake.



JON DAHLSTROM

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BOSCH
Invented for life

Fascinating system, but I was more interested in a presentation on the car's top-down comfort technology.

Seems Mercedes engineers have spent about two decades researching wind flow in open cars, using test dummies, infrared imaging and wind tunnels with smoke to find out what makes us happy or unhappy in an open car.

What they learned simply reiterated what we—and they—already knew instinctively: People don't enjoy noise, wild hairdos or cold wind on the backs of their necks. So they came up with a pair of systems called "Aircap" and "Aircarf."

The Aircap is a compact spoiler on a mesh screen that rises magically from the top of the windshield and directs wind flow over your head while allowing air through the screen to pressurize the cockpit slightly to keep cold air from flowing in. This handy little device is said to have 211 parts and is electronically deployed by a button on the console.

The Aircarf, meanwhile, is a set of blower nozzles built into the headrest that waft warm air onto your neck and possibly balding head. The heater itself is a compact and efficient ceramic affair built into the seatbacks. The fan operates automatically at three different speeds, and the nozzles can be adjusted through a range of 36 degrees (not merely 35 degrees!) to keep the occupants coddled in "a sea of warmth."

We tried this dual system on a chilly, cloudy all-day drive in the mountains and it really worked. My co-driver was Mercedes' Bret Melillo, and the Aircarf and Aircap not only kept us almost immune to the inclement weather just outside the umbra of our cockpit, but kept the wind flow so quiet we were able to talk about cars and airplanes all day without developing the typical "convertible sore throat" that keeps you from enjoying a good Islay scotch in the evening. A perfectly enjoyable top-down drive on a day you wouldn't normally go outside.

When I got home to Wisconsin from the trip last Thursday, I naturally had to do a comparison test and get my Lotus Elan out of the garage. It was a balmy late spring evening, so I decided to put the top down and take Barb for a sunset cruise through the countryside.

I've left the convertible top up for the past month or so, not only because the weather has been iffy, but because disassembling and storing the top on a Lotus Elan is no small matter. It's like breaking camp on a backpacking trip—lots of snaps, poles, tent stakes, careful folding, quenching your campfire, etc., before you can store the whole apparatus in your trunk, where it fills most of the space not taken up by your 340-piece emergency repair toolbox and the extra fire extinguishers.

Nevertheless, I got 'er done, and was once again reminded how pleasant this car is to drive with the top down. Not E-Class calm, but the wind flow is relatively serene around the gently rounded windscreen, and the car itself sounds about 80 percent more reliable without the top echoing all the drivetrain and chassis noises into the cockpit. In an old Lotus, deafness is bliss.

It was a pleasant evening, but, as the sun went down and the moon rose, the air suddenly cooled and pockets of fog began to appear in low fields. So I turned on the heater, but noticed Barb was, nevertheless, busily pulling the hood up from her jacket and tying it over the top of her baseball cap, a subtle fashion shift from carefree Chelsea Girl to more of a North Sea fisherman look. "My neck is cold," said a small voice somewhere within the shadows of her hood.

I have a slightly higher convertible pain threshold than Barb,

"What they learned simply reiterated what we—and they—already knew instinctively: People don't enjoy noise, wild hairdos or cold wind on the backs of their necks."

so I manfully resisted extreme measures before we got home, but I did put the collar up on my usual convertible wear, an A-2 style leather flying jacket. Better, but a scarf would have been better still.

Mercedes was right: The first thing we notice in a convertible is that our necks get cold.

As we headed back to the house, I started thinking about all the convertibles we'd owned over the years and wondering which, if any, were better than others.

Our first sports car, that Triumph TR-3 I mentioned, was pretty good, I think. It had small plastic wind wings on the sides of the windshield, and I have fond memories

of that low, open cockpit with the cutaway doors being a pleasant place to sit with the top down. I don't remember the wind being terribly cold at night, but maybe that's because I had to walk to a farmhouse whenever the headlights failed, so I was getting plenty of exercise.

Our two MGBs had pretty nice wind flow, as did the E-type roadster we briefly owned, what with their smooth wraparound windshields placed relatively close to the driver and passenger. The only car I remember as having peculiar cockpit aerodynamics was our Lotus Seven, whose wind flow with the top down was not as smooth as it could be. Which is sort of an understatement, like Emperor Hirohito telling the Japanese people that the war had not necessarily worked out to their advantage.

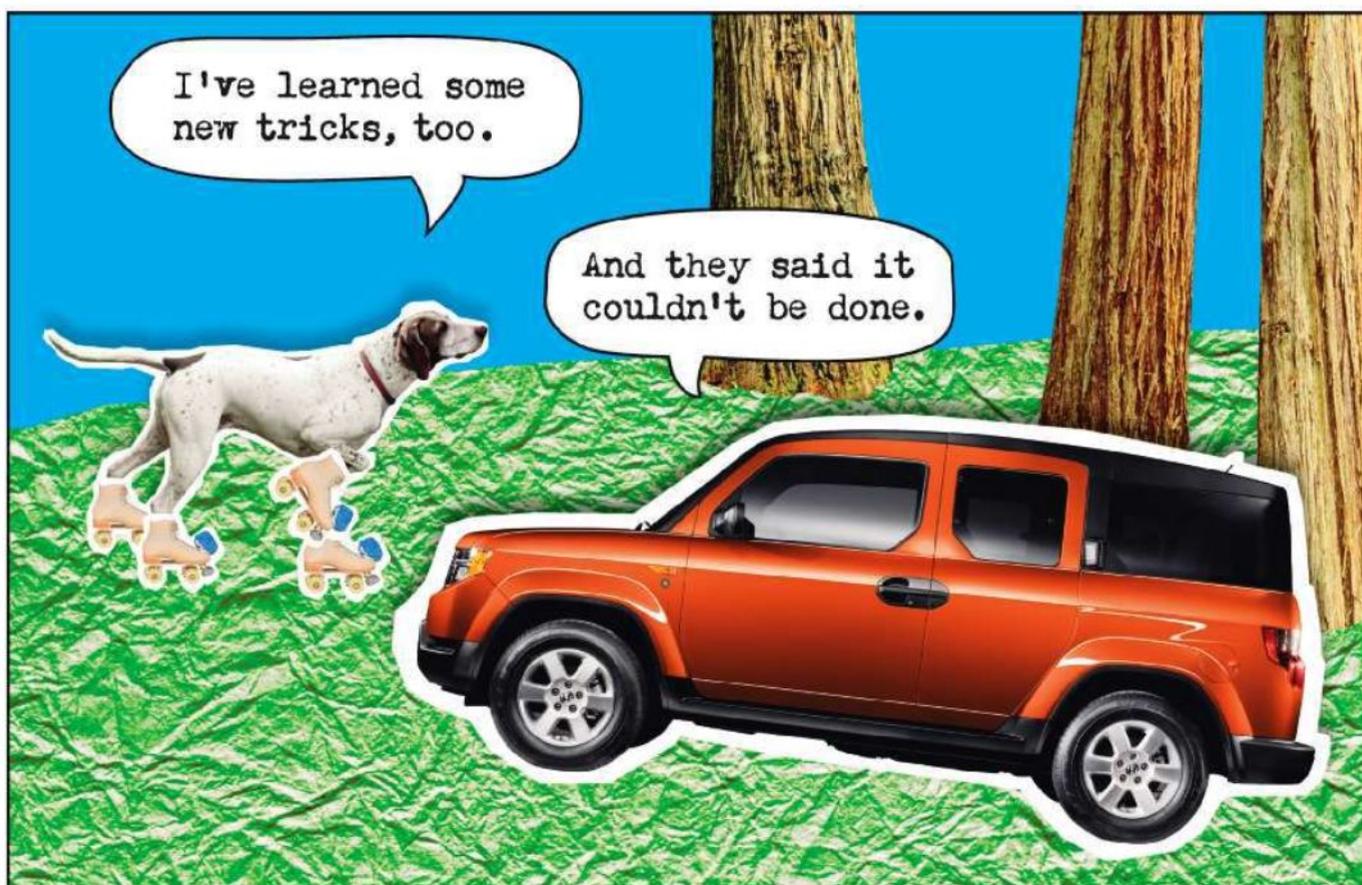
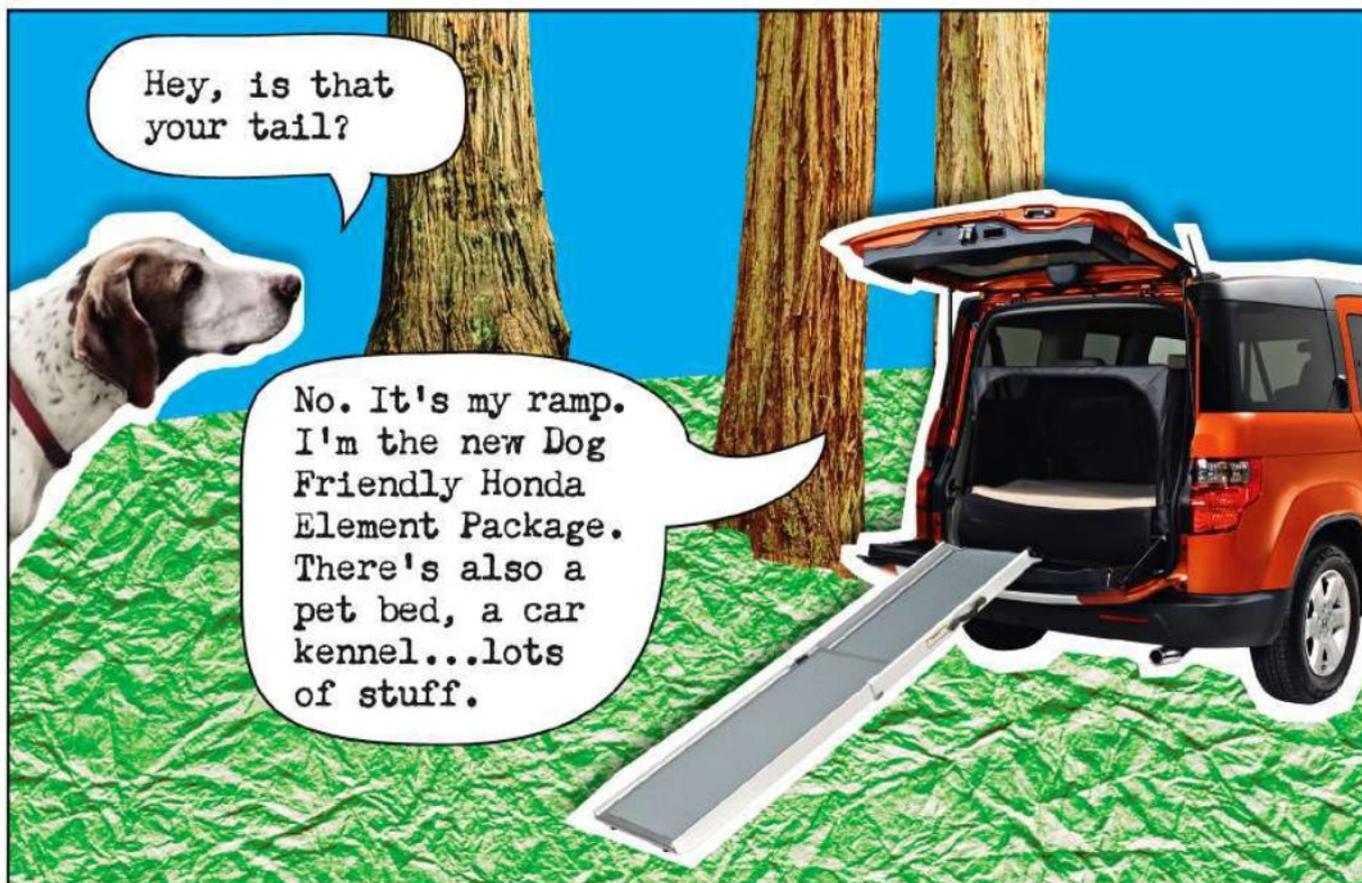
In a Seven, the air seems to flow over the top of the flat, rectangular windshield and then swirl down and forward like the tumbling current beneath a waterfall. The kind that breaks your canoe in half and leaves nothing but a floating hat for your relatives to bury. As a result, your hair blows forward and gives you a kind of comb-over look, like Donald Trump free-falling backward out of an airplane. My friend and fellow Seven fanatic Chris Beebe says that if you wore a necktie it would extend straight out in front of you like a shelf.

The secret, of course, is to avoid neckties and wear a hat, which is what I've always done. A nice tweed British cap works well. It looks appropriate to an old British car of the '60s, holds your remaining hair down and alerts attractive young college women that you've been out of the gene pool for at least a decade and are quite harmless.

With a hat and small plastic "wind wing" deflectors on the sides of the windshield, the wind flow in a Seven is really pretty pleasant, unless it's cold out. Then you get a lot of wind on your neck and start wondering if you should buy one of those expensive RAF Irvin jackets with the sheepskin lining and the tall collar. I've always wanted one of those jackets, but have never quite made the leap. In my mind, I think I'm holding out until I finally buy either a Morgan or an MG-TC, or some car with the correct Biggin Hill or Middle Wallop aerodrome ambience.

In any case, it's nice that Mercedes has finally taken us beyond the sheepskin phase of convertible comfort. Aircap and Aircarf aren't quite as romantic as a flying jacket and a white silk scarf, but they do give you the freedom to drive all day, top down, and discuss the many virtues of the de Havilland Gypsy Moth or your Lotus Elan without growing hoarse.

The Elan, of course, has nothing comparable to the Aircap or Aircarf, unless the smell of hot transmission oil can be said to warm your neck. And I'm frankly quite glad it doesn't have these systems, as I didn't really need an extra 211 windshield parts to restore or complex heaters hidden in the seats. The vacuum-operated headlight buckets were bad enough. 



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EX model shown with accessory Dog Friendly Honda Element Package. Package not intended for dogs larger than 80 lbs. 1-800-33-Honda © 2009 American Honda Motor Co., Inc. The Dog Friendly Logo is a trademark of Honda Motor Co., Ltd.



F1's failure was due to a "stacked deck" in favor of Europe and Great Britain ("Lessons from US F1," *The Road Ahead*, June 2010). That perceived favoritism simply doesn't exist; just ask the members of the British Racing Drivers Club who have had to move heaven and earth to keep the British GP on the F1 calendar, or the heirs of Tom Wheatcroft, who now preside over a shambles where the Donington Park circuit used to be, the result of a broken contract with F1 Promotions to host the same race. Bernie [Ecclestone] and Max [Mosley] only care about three things: money, money and money. US F1 would certainly be on the grid now had sufficient funding been available to develop and build a car in a timely fashion.

Brooks Esser
MENLO PARK, CALIFORNIA

MISSED CALL

It was a pleasure meeting Peter Egan at the Amelia Island Concours ("A Car We'd Most Like to Drive Home," *Side Glances*, June 2010). He came over to



congratulate me and shake my hand for my 1957 Bandini Sport International winning the Etceterini Class. The second-place awards were split between the 1955 Siluro he mentions and a beautifully restored Stanguelini. Peter was great to talk to and with the number of cars, I'm sure it was difficult to remember which Bandini was which.

Marc Richelsoff
BELMONT, NORTH CAROLINA

Egan says this is precisely why he requested the Turnip Truck class when the judging chores were handed out.—Ed.

HITTING INTO A DOUBLE PLAY

After reading about the Mazda Demio/Mazda2 ("Small Won-

ders," June 2010), I thought, finally, a sporty non-hybrid subcompact that can deliver near Toyota Prius fuel economy. But the Mazda2 website states only the 1.5-liter engine will be available here, and its target fuel economy numbers are 28/35 mpg. The only "wonder" here is how a car with the potential to get 54 mpg in Japan is only targeted to get 35 mpg in the States. A gasoline-fueled Chevy Equinox will get 22/32 mpg yet Mazda is asking us to buy half

the car with only marginally better fuel economy? If this thing flops, people will once again say that Americans just don't want small cars. The truth is I want one, but I'm not willing to trade so much utility for such a paltry return on fuel economy.

Eric E. Saboley
MARIETTA, OHIO

COMEBACK WIN

Credit Dennis Simanaitis ("Lighting the Fire," *Technology Update*, June 2010) with my subscription renewal. I wasn't going to because of his relentless drivel about hybrid and electric cars. I consider his public marriage to such tech as a sellout to the Greenies. But "Lighting the Fire" is useful, well-written information.

Joe Baxter
FORT MILL, SOUTH CAROLINA

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2011 ASTON MARTIN V12 Vantage

British brawn

BY SHAUN BAILEY

NÜRBURG, GERMANY—KEYS to an Aston Martin V12 Vantage, exclusive access to the Nordschleife...I guess wishes do come true. But today the Green Hell is currently White Hell—the Eifel Mountains are clogged with fog so dense it's hard to see the other edge of the track from the pit wall. I'm not the only one concerned; the teams that will be campaigning Astons in the upcoming 24-hour Nürburgring race are also here to shake down their cars.

A line of U.S.-spec V12 Vantages with their 510-bhp engines sits quietly along the pit wall, the lead Vantage a limited-production \$194,950 Carbon Black variant (40 of which are slated for America). Its 50-man-hour paint job sparkles in the diffused light. If black's not your thing, no worries. The base \$179,950 V12 Vantage is more than enough for most. It already comes with the same performance plus a carbon-fiber splitter, Alcantara steering wheel, raised spoiler and carbon-ceramic brakes.

For the V12 Vantage, the 5.9-liter engine replaces the 4.7-liter V-8, and it is mated

to the only transmission available—the superb Graziano 6-speed manual transaxle shared with the 8-cylinder model. As the Aston Martin VH chassis architecture was designed to cradle the longer engine, it required only a slight modification to the radiator placement and structural bracing needed to meet U.S. safety requirements.

Perfectly balanced and well developed, the V-12 is a staple of the brand, with quad cams, 4 valves per cylinder and port injection. It makes torque just off idle...enough to spin the rear 295-width Pirelli P Zero Corsas when leaving a stoplight with any vigor. The sprung center clutch of the V-8's gearbox is replaced by a lighter, solid center clutch that gives better feel, but results in a bit of gear chatter at low speeds and light loads. There are other quirks as well. The limited-slip differential squeaks on tight turns around town. The brakes are fabulously strong, but make a grumbling noise at low speed. And although the engine is quiet at idle, it starts with a menacing bark that any enthusiast would love.

The V12's chief platform

manager, Paul Barritt, says this is a driver's car; a notch above the V8. It's meant for those who appreciate the techniques of rev-matching, heel-toe downshifting and making music with an uncorked exhaust. It's biased toward proper driving feel and performance, not fuel economy and comfort. The mechanical noises emanating from the car don't detract at all, but rather draw out the flavor, like balsamic vinegar to fresh cut strawberries. To sweeten the mixture, a sport button opens the exhaust and gives the throttle a quicker response. On back roads, the V12 was subdued and surprisingly quiet. But hit the sport but-

ton and aim for speeds only legal on the *Autobahn*, and it will awaken your senses like a strong hit of smelling salts. Fortunately, later in the day the fog lifts and the Ring is open for business. We went quickly to work, strapping into the bolstered seats and inserting the sapphire key fob. As the V-12 came to life, my heart started to beat to the rpm of the engine while the Vantage thundered into Turn 1. With stability control engaged there is little fear. The V12's stiffer suspension, Bilstein dampers and added negative camber force the corners to yield and the apexes to succumb. Even with four extra cylinders extending beyond the front axle resulting in a 51/49 weight bias compared to the V8's 49/51, there is no tendency to understeer. The extra 154 lb. of mass up front is of no concern.

With stability control disabled and the sport mode engaged, the V12 Vantage's ride and performance are sublime, with easily correctable understeer and benign power-on oversteer. It was the ride of a lifetime, that is until the Rapide and Vantage competition cars shot by at race pace. Although the V12 was more than capable on the track, it wasn't until a ride in a team-prepped car with slicks that I realized just how fast they could be when on proper rubber. The uprated Vantage really is a wolf in sheep's clothing. Beyond the superb leather, aluminum and carbon fiber, what's left is superb speed and handling, precisely what makes enthusiasts giddy. We're glad the visceral V12 Vantage is coming; it's sure to make more dreams come true. ☑

» Although the big 5.9-liter V-12 adds 154 lb. to the nose of the Vantage, this new Aston does not understeer much, thanks largely to its added camber, stiffer springs and Bilstein dampers. Note the engine's twin intake plenums and the triangulated chassis bracing.



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2011

FORD Shelby GT500

Taking a turn for the better

BY DOUGLAS KOTT

ALTON, VIRGINIA—IF THERE were an automotive version of *Dancing with the Stars*, let's just say that last year's Ford Shelby GT500 would have Buzz Aldrin's chance of making the finals. The Shelby-fied supercharged V-8 Mustang was many things, but "agile corner-carver" wasn't one of them.

Great news for 2011, though, as this racing-striped chunky monkey has shed considerable weight and, at the same time, gained a bit of power. And to fully leverage its new leaner self, the GT500 is available with a transformative SVT Performance Package (a \$3495 option) that trades the suspension equivalent of Bingo Arm for ripped muscle.

The lion's share of mass reduction—a full 102 lb.—comes from substituting aluminum for cast iron in the V-8's block, especially advantageous in reducing the car's nose-heaviness. The block, which shares basic architecture with the GT supercar's but tweaked for wet-sump oiling here, represents Ford's first use of a plasma transferred wire arc coating for the cylinder bores, in

lieu of heavier cast-iron liners. The Eaton M122 Roots-type blower still packs a maximum of 9.0 psi into 5.4 liters of displacement, but now there's a twin-row charge cooler with 40 percent more cooling capacity. As before, all the main twirling and reciprocating bits are forged (steel crank and rods, aluminum pistons), but the exhaust tubing diameter grows from 2½ in. to 2¾, with an H-pipe crossover instead of the former X-pipe. With 38 percent less backpressure, the new exhaust is primarily responsible for the 10-bhp bump, increasing total output to 550 bhp at 6200 rpm and 510 lb.-ft. of torque at 4250 rpm.

But the oyster's pearl is the SVT Performance Package that helps bring cornering speeds in line with obvious straight-line potential...Ford claims 12.3 seconds in the quarter mile at 119 mph. The new Goodyear Eagle F1 Supercar G:2 tires (265/40ZR-19 front, 285/35ZR-20 rear) play a huge role; the outer half of each tire's unidirectional tread resembles a lightly grooved slick. They're mounted on forged

wheels that remove a total of 13.6 lb. of unsprung weight compared to the standard GT500's alloys. Front and rear spring rates are a respective 20.5 and 9.5 percent stiffer than the 2011 base car's, and ride height is reduced by 11 mm in front and 8 mm rear. To cap it off, the SVT package swaps the standard 3.55:1 final drive for a more drag-strip-friendly 3.73:1 gearset.

The changes make for a far more serious track car, as back-to-back drives of both the 2011 SVT Package cars and 2010 cars would attest—around

» **Same basic supercharged 5.4-liter V-8, now 102 lb. lighter thanks to an aluminum block.**

the full 3.27-mile length of a world-class circuit, Virginia International Raceway. Where the 2010 would howl and push in the tighter stuff, the 2011 SVT version cornered with flatter, locked-down conviction, keeping the front contact patches far happier (and quieter) at the limit as well as providing more confidence on turn-in. It also felt significantly more composed under hard braking and the firmer damping resulted in less, um, rear axle indecision over the track's characteristic high-speed crests. Ford spokespeople claim the changes are good for nearly 5 sec. a lap here (2:58.5 versus 3:03.3) under similar conditions with the same driver, and I have no reason to doubt that number.

On the road drive portion, the 2011 SVT-equipped car rode firmly but stopped short of gut-busting jiggleness, wholly appropriate for the car. The new electric-assist steering was indistinguishable from the 2010 car's already praiseworthy hydraulic system. Shifting? The linkage of the Tremec TR6060 6-speed is direct and gates are well defined, though it's a little balky when really manhandling the cue-ball-capped lever. That foible is easy to forgive, though, when the boost builds, the exhaust disgorges big rumbling chunks of sound and the GT500 starts punching an ever-bigger hole through the air.

Calling the 2011 Ford Shelby GT500 a (relative) lightweight is no insult, because it's now a true heavyweight in the midst of its track-day peers. Pricing starts at \$48,645 for the coupe, and \$53,645 for the convertible. 





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2011

BENTLEY Mulsanne

True to its founders' beliefs

BY IAN ADCOCK » PHOTOS BY THE AUTHOR

EDINBURGH, SCOTLAND—THE new Mulsanne looks resplendent on its 21-in. wheels, glinting in the early spring sun. This is a handsome car with a confident stance, its Heffernan and Greenley-inspired swage line, so reminiscent of their Bentley Continental R's shoulder line, swooping along the car's flanks. The Windsor Blue coachwork is perfectly complemented by the shortbread leather and oak veneer interior: a combination, coincidentally, chosen by Bentley CEO Dr. Franz-Josef Paefgen—whom I spent part of the morning chauffeuring—for his own car.

Slide into the driver's seat and you're immediately aware of a command driving position more akin to an SUV than a luxury saloon, and ahead of you through the double-glazed windscreen the muscular bonnet and fenders culminate in a



newly designed Flying B with its softer edges.

The cabin is a sybarite's delight: cold chrome on brass organ stops and bull's-eye air vents, silky smooth cross-banded veneers, supple hides and toe-warming carpets assault the senses and are exquisitely assembled by the craftsmen and craftswomen at Crewe.

Instrumentation is simple white on black, with piano black inserts on the center console. After firing the engine, I pull back on the gear paddles and immediately feel diamond-pattern etching on their under surfaces, a hidden delight that's also found on the door pulls. Unseen attention to detail sets this car apart from others.

The totally new 6.75-liter V-8, still a pushrod ohv design, rumbles into life, only its capacity and twin Mitsubishi turbos carried over from the outgoing engine. This latest iteration of an engine that first sprang to life 52 years ago is lighter and more efficient than before. Cylinder deactivation helps with the latter, a system that effectively cuts the engine to a V-4 under light loads at commuting pace or cruising speeds in the 60–80-mph band, although you'd never notice it.

The headline power and torque figures of 505 bhp and 752 lb.-ft. torque remain unchanged but are now delivered at a lowly 1750 rpm and channeled to the rear wheels via ZF's superlatively slick, new 8-speed automatic, while ride quality is addressed by Bentley-tuned air suspension.

As for performance, Bentley

promises 0 to 62 mph (100 km/h) in 5.4 seconds and a mammoth 184-mph top speed.

For the first few miles I play with the suspension settings, swapping among Comfort, Sport and Bentley before settling for the last, which Paefgen also believes delivers the right compromise of dynamic balance, ride and meaty steering.

Aware that I am not only driving Bentley's boss, but also at the wheel of a car costing \$330,000 in this specification, I treat it with circumspection: easing in the throttle and trying to make the smoothest of steering inputs. But as the roads open up and I become more accustomed to the Mulsanne, confidence grows and I find myself whipping past slower traffic, barely brushing the milled throttle pedal to unleash the waves of torque the V-8 delivers practically from tick-over.

It's then that memories of driving previous Mulsannes and the Continental R start to flood back: the quicker you drive, so the car seems to shrink around you. The elevated driving position combined with the front fenders mean you can perfectly place the car through swooping bends with barely a correction of the hand-

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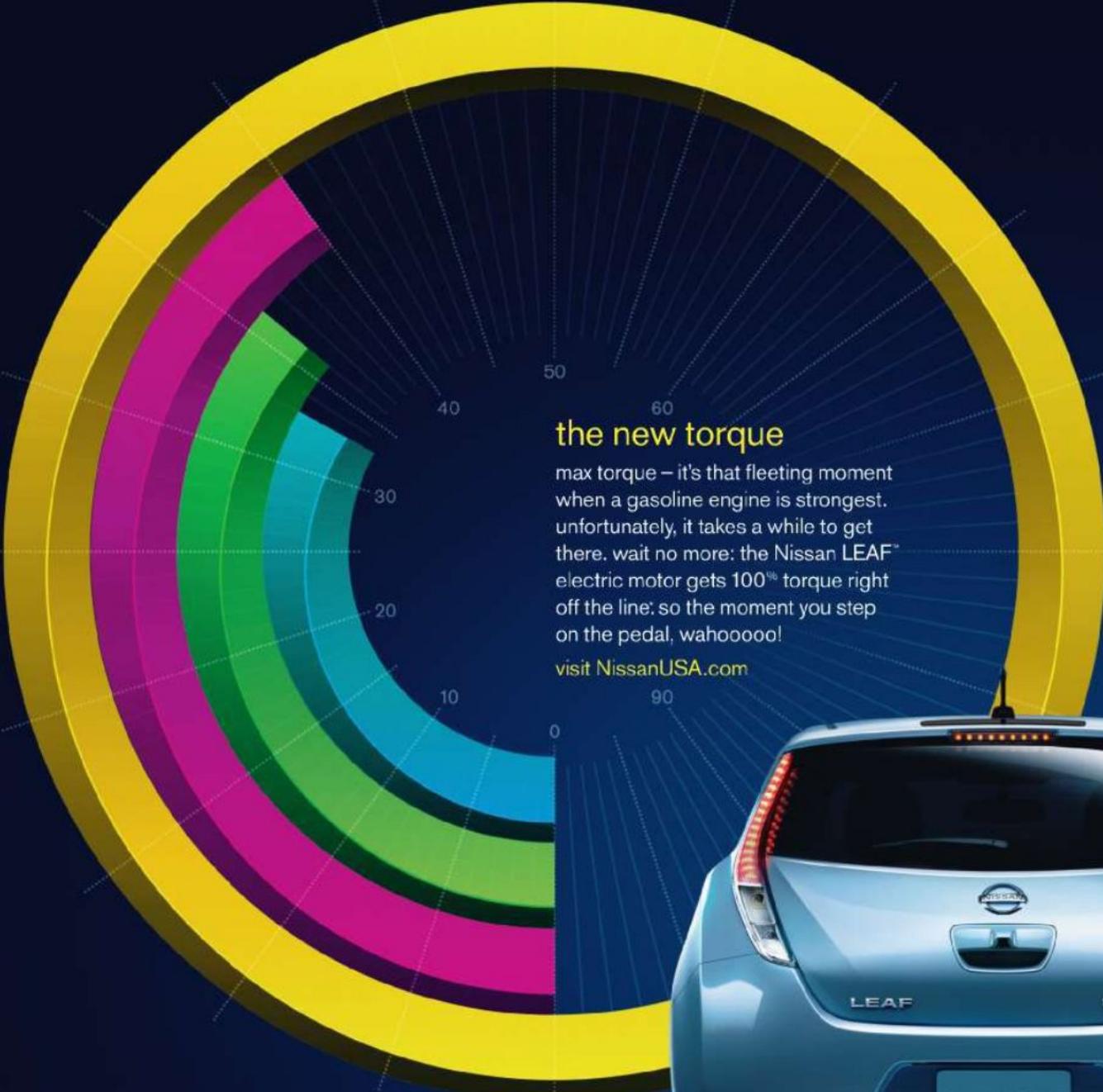


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stitched steering wheel at velocities that almost defy nature, only accompanied by a distant rumble as aluminium pedal meets Wilton and the Flying B rises slightly as the 5700 lb. car thunders toward the horizon at an indecently quick pace. In previous Mulsannes this would have been a case of accelerate, brake, turn-in. On this car, you stitch them all into one seamless action.

The Mulsanne, based on a new chassis that's stronger and lighter than the Arnage's, is more than just Bentley's finest car to date, it represents something far more significant in the company's history. Alongside the press cars was an 8.0-liter saloon, the last pure Bentley designed by W.O. before the marque was bought by Rolls-Royce. In the intervening 80 years, subsequent Bentleys were all spun off Rolls-Royces.

With the division of Rolls-Royce and Bentley to BMW and Volkswagen AG, respectively, Paefgen and his team at Crewe have had the opportunity to slough off the Rolls connection and develop a Bentley true to its founders' beliefs.

» In classic Bentley fashion, the finest hides and beautiful California walnut grace the Mulsanne's spacious interior. The Flying B hood ornament is most appropriate on a car with a 184-mph top speed.

BENTLEY'S NEW V-8

Bentley has completely re-engineered its 6.75-liter V-8 for the new Mulsanne saloon. In doing so it has pared more than 66 lb. from the engine, a 10-percent weight reduction over the old power unit that traces its design to 1959.

"We looked at a number of alternatives including V-8, W-12 and W-16," said Simon Atkinson of Bentley's powertrain department. "But none had that unique, lazy torque delivery you get from a big capacity engine with large piston faces and a long crank throw."

As with the outgoing engine, the all-new V-8 produces 752 lb.-ft. of torque from 1750-4000 rpm and 505 bhp at 4200 rpm, but it's now mated to ZF's 8-speed automatic.

The headline news for the twin-

turbocharged engine is the introduction of cam phasing for the first time, as well as cylinder deactivation to close down four cylinders (two on either bank) under light load conditions. This, says Atkinson, means the engine meets Bentley's self-imposed targets of a 15-percent CO₂ reduction by 2012, by which time the engine will also be bio-fuel compatible.

Engineered and designed at Bentley's Crewe, England, factory where the engines are assembled by hand, each power unit is balanced as precisely as a modern F1 engine prior to installation in a car.—IA





2010 Honda Pilot 4x2

MPG: 23 - EPA est hwy

A Consumers Digest Best Buy: no

Powertrain Warranty: 60,000 miles/5 years*

Automatic Crash Response: not available

Stolen Vehicle Assistance: not available

*Whichever comes first. See dealer for limited warranty details. **Visit onstar.com for details and system limitations.



2010 GMC Acadia FWD

MPG: 24 - EPA est hwy

A Consumers Digest Best Buy: yes

Powertrain Warranty: 100,000 miles/5 years*

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Stolen Vehicle Assistance: OnStar/1 year standard

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Nothing in life seems as sure as the fact that history will repeat itself. And so here we are again, just one year from when we drove the Mustang, Challenger and then all-new Camaro across the country (“The Pony Express Rides Again,” October 2009). Then, the 2010 Mustang GT had 315 bhp, not exactly a fair fight, what with the Camaro SS and Challenger R/T having a healthy dose more—426 and 376 bhp, respectively. ❖ That’s no longer the case. The 2011 Mustang GT now has 97 more galloping ponies under its muscular hood for a total of 412 bhp. That the 2010 car, even with its power disadvantage, won our last comparison test should portend its absolute domination of the Camaro SS, but we’re not taking these cars on a cruise across the country this time. We’re taking them to the back roads, the drags, the beach and the racetrack. Free range for these two to strut their stuff, and we’ve left the Challenger at home because the Camaro and Mustang are natural rivals that are perfectly suited for the hard driving that Managing Editor Andrew Bornhop and I will be doing this time. >>



2nd

2010 CHEVROLET CAMARO SS

POINTS: **384.4**

LAP TIME: **1:37.7**

THERE IS NARY A DIFFERENCE BETWEEN the last Camaro we tested and this one, and Chevrolet isn't making any significant changes for the 2011 model year. The SS we have here is as sporting as it gets, complete with the RS appearance package and 20-in. wheels, and its 6.2-liter V-8 taken from the heart of a Corvette. Until the new 5.0-liter Mustang came about, the SS was the absolute king of the V-8 pony cars at the drag strip. And no, the specialty models from the likes of Dodge (SRT) and Ford (SVT) don't count. If you must compare them, wait for the Camaro Z28 to arrive.

From the friendly side of the Camaro's gunsight the driver finds himself in a simple yet modern interior. Ambient blue lighting abounds over vast expanses of barren dash and door panels. The deep-dish steering wheel is pretty to look at, but pretty frustrating to grab onto when in pursuit of the Ford. Bornhop found the Camaro a bit cramped for his 6-ft.

4-in. frame. The headrests that protrude outward from the seatback couldn't be adjusted not to touch his shoulder blades. I had no trouble with them, and preferred them to the Mustang's that cant forward a little too much.

Unlike the complicated rear transaxle arrangement of the Corvette, the Camaro SS uses a conventional transmission mated to the aluminum block of its pushrod V-8. And as simple or old-tech as you might consider this engine, it's not. See our review of the engine technology on page 59 for some insight. Also not old-tech is the suspension. The Camaro forgoes its live-axle past with fully independent suspension fore and aft. No getting saddle butt from a long ride in the SS. Unfortunately, there isn't a performance suspension option from the factory to improve handling further; it is what it is. And that's actually quite good, but not as sporting as we'd like it to be. Ford, on the other hand, has given us the option with its Brembo performance package that includes big brakes (taken off the Shelby GT500), and stiffer springs, shocks and anti-roll bars. The Camaro SS has excellent brakes already; but it seems that

little was done in the way of offering a performance package upgrade while GM reorganized itself in bankruptcy.

Equipped with near-equal-compound Pirelli P Zero tires, the two are close in cornering grip. The Camaro, however, goes for that muscle-car look with staggered widths offering 8-in.-wide wheels up front and 9-in.-wide rears, while the Mustang runs the same size front and rear. The Camaro's under-tired front is noticeable in our slalom and skidpad tests where a moderate push is found. On the back roads this wasn't so noticeable—that is, until it tried keeping up with the Mustang. There's nothing like the taillights of a Ford to get a Camaro driver to dig his spurs in. Where the Mustang will clip a corner apex with a rear tire, sometimes throwing bits of vegetation and dirt back to mock the Camaro, the Chevy would gracefully arc past the same apex running a tad wide. Stability on, off or in competition mode made no difference. Well, that's not completely true. Turn off the electronic neuter and the Camaro can be coerced into stable oversteer bliss. Yee-haw! But it still can't catch the Mustang in the corners.

Down the straights is a different matter.



At the Drags...

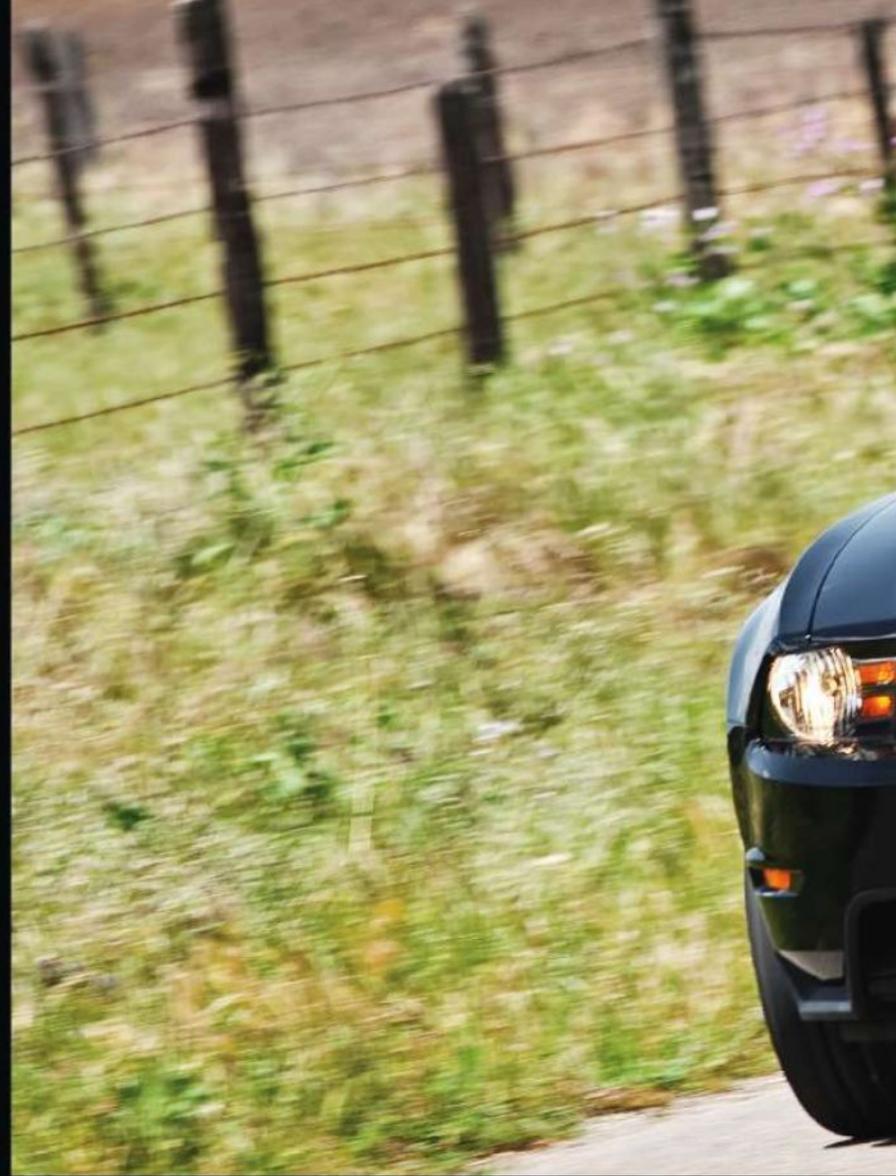
Nothing is more appropriate than these ponies appearing at a local run-what-you-brung drag night. The 1/8-mile grudge match drag event at Willow Springs was the perfect venue to burn rubber and practice hitting that third yellow on the Christmas tree start lights. Run after run, the modern muscle cars did their thing with perfection. The V-8s never lost to the locals who challenged them, and it was always a toss-up on which V-8 would win. We did, however, avoid confrontation with that Mercedes-Benz CLS AMG, for obvious reasons.



The Camaro beats the Mustang by 2/10ths in the quarter, even offering launch control to help the novice. We defeated the system for our fast runs, though. The tall gearing of the Camaro allows for an ultra-lazy freeway cruise at 1400 rpm, but drop to 3rd for that hard acceleration from 75–110 mph, which is the perfect sweet spot for passing. The Mustang's tighter-ratio transmission and optional final drive of 3.73:1 require a 3–4 shift in the middle of that same passing maneuver.

» The Camaro SS is a hot rod with narrow window openings, squared gauges and optional four-pack gauge cluster. Note the importance of defeating the traction control: Its oblong button (ahead of the shift lever) is four times the size of the door lock button.





1st

2011 FORD MUSTANG GT

POINTS **397.5**

LAP TIME: **1:37.6**

» The 5.0's dash is adorned with aluminum, and the optional glass roof provides a bit of a convertible feel, but without the wind. Four-piston front brakes are a part of the Brembo performance option; the new 6-speed transmission is standard. Large exhaust tips hint at the enormous power and race-car sounds that emanate from the V-8.

YES, IT'S STILL LACKING AN INDEPENDENT rear suspension. Nobody expects Ford to change that anytime soon. Why would they when it works this well? This is particularly true when talking about performance on a smooth road, as we had for the majority of our test. As such, our 5.0 GT equipped with its new 6-speed manual, quad-cam aluminum V-8 and optional Brembo Brake Package was in heaven. The 3-link live rear axle compromises some ride comfort on bumpy stuff, but gives up little to none out at the track. Drag racers prefer this setup for its robust nature and lack of wheel hop on launch, the latter in stark contrast to the Camaro.

An all-new 6-speed transmission is fully utilized with gear ratios neatly spaced so that the electronically limited top speed of 145 mph is reached in 6th, unlike the Camaro, which can do it in 4th, 5th and 6th. Mustang GT drivers will enjoy shifting this close-ratio box. Like the Camaro, there is now a skip-shift feature,



an EPA mileage Band-Aid that forces the driver to shift from 1st–4th under moderate acceleration. Interestingly, it is far more of a nuisance in the Camaro because 1st gear is so much taller.

Where the Mustang really shines, though, is in its relatively low weight. Our test car gained just 80 lb. over the previous version. The majority of that extra weight can be chalked up to the optional glass roof panel and bigger brakes. But all said, it's still more than 200 lb. (6 percent) lighter than the Camaro. Unfortunately, it remains nose-heavy in its balance, although you'd never know it by its crisp turn-in and ability to clip apexes.

The electric-assist power steering on all 2011 Mustangs is superb, equal or better than the hydraulic assist of the Camaro. It features drift-pull compensation to help the car go straight on crowned roads and in crosswinds, and can even remove the effects of tire nibble over rain grooves. Put the stability control in sport mode or turn it off, and the steering effort becomes heavier and the aids are removed. This was most noticeable under braking for the Omega complex (Turns 3–5) at Big Willow where there's some braking

chatter produced by the track surface that generates some oscillation in the steering wheel. Leave stability control on and it's not noticed, but turn it off and you'll want both hands on the wheel (of course, both should be there anyway).

That steering wheel is about perfect, with its thick round rim nicely wrapped in leather. It's considerably more ergonomic than the Camaro's, but the column lacks the telescope feature, making it a little

more challenging to get comfortable. And unlike the Camaro with its tall sills and narrow bunkerlike window openings, the Mustang is open with good sightlines all around. It has improved side-view mirrors and our GT was equipped with an optional backup camera that displays in the rear-view mirror when in reverse.

Headrests for the rear passengers are hard to see around, but can be flipped down with the press of a button. It seems

In My Opinion...



Andrew Bornhop

MANAGING EDITOR

» In my world, "Mustang" and "5.0" are a natural fit, like "Porsche" and "flat-6." But truth be told, I wish the new 4-cylinder in the Mustang, which makes good power all the way to redline, had the immediate low-end grunt I savored in the sleeper pushrod LX 5.0-liter models of the early 1990s. Nevertheless, the new Mustang GT wins this battle.

that every year now the Mustang is being improved, and it's hard to count all the little revisions. As a whole, it's clear the Mustang has far more options than the Camaro, whose upgrade list is comparatively barren.

We could have done without the \$1995 glass roof and the weight it brings, but from an aesthetic point of view, it's very nice. Particularly for rear passengers at night when the stars are out. The rear seats in both these 2+2s are adequate for short trips, but don't allow for much breathing room. Claustrophobic types should avoid the cramped darkness that is the Camaro's rear seating area.

In My Opinion...



Shaun Bailey
DETROIT EDITOR

» Stock is awesome. I've long said that the car which meets one's needs unmodified is best. Before the 5.0, that was the Camaro SS.

Today, I switch camps and proclaim the Mustang the better car. Not just for its engine, that wouldn't be enough, but for the Mustang GT as a whole—a car that drives right, stick-axle or not.



Last year, the Camaro V-6 wowed us with its 304-bhp V-6. Yeah, it was thrashier and slower than the V-8, but compared to the Mustang's anemic cast-iron V-6 lump, it rocked. The Camaro's all-aluminum 3.6-liter V-6 with direct injection trounced Ford's larger 4.0-liter,

a pushrod engine that made a sad, rental-car-destined 210 bhp. Like Ford's V-8, its V-6 was simply outdated. That's been remedied with a 3.7-liter Duratec borrowed from the Lincoln lineup, necessitating a longitudinal mounting. It's a modern engine with dual vari-

able valve timing that makes excellent torque from down low and one more horsepower than the Chevy, with 305 bhp. Noticeably missing, however, is direct injection. A future version might include this for an extra boost in performance. Even without DI, the Mustang

Chevrolet Camaro V-6 vs. Ford Mustang V-6

Two fewer cylinders are still motivating six to the power of eight



At the Track...

The words "Fastest Track in the West" are emblazoned on the wall around the daunting 2.5-mile 9-turn circuit, commonly referred to as Big Willow. The large-radius high-speed turns at Willow Springs Raceway let the cars stretch their legs and minimize the understeer that can be found on tighter tracks. Perfect for our high-powered ponies.

We assumed from the Camaro SS's comfortable ride and docile understeer behavior that it would fall apart at the racetrack. And that the Mustang GT with its upgraded suspension would destroy

the Camaro. We were wrong, as only the slightest margin separates the two. A tighter track might give the Mustang a bigger advantage, but out here the Camaro puts its power and independent suspension to good use in order to stay within 0.1 sec. of the Ford. The Mustang gains time in each corner by pulling just slightly more mid-corner speed, but the Camaro gathers it back up down each straight, starting at corner exit where the Mustang takes a gentle touch to keep its rear end from drifting wide. The Camaro, with its tendency to push, can be hammered on

with the confidence that it will just squat and go. A rise at Turn 6 is nearly a jump for a fast car, but the Camaro sucks it up at full throttle, keeping all four wheels on the ground. The Mustang goes flat as well, but requires a line change to keep the front wheels on the tarmac. Into Turns 8 and 9, the Camaro loses time as it scrubs its front tires hard and has to pull itself out of the hole down the straight. Which it does, eventually hitting 130 mph, just 0.7 mph faster than the Mustang and enough to bring their laps to within a single tenth of a second. Much closer than we'd have guessed.

V-6 makes more power than the 1999 Mustang Cobra, and rivals Acura's high-performance V-6 engine in the TL!

Best, though, is its nod to the enthusiasts who don't need the V-8 power or insurance premiums that go with it. What's more, the V-6 can be outfitted with a

\$1995 performance package that ups the suspension settings to a level comparable with the GT, but also includes a 3.31:1 final drive, the same Pirelli P Zero tires and brakes from the GT with performance pads and a strut tower bar. Our car had this and a \$995 Mustang Club of America looks package with a unique billet grille, side stripes and blacked-out decklid. The MCA 18-in. aluminum wheels were replaced by the larger ones included in the performance package.

With two fewer cylinders hanging off the front end, there's a better weight balance of 53/47, though not quite as good as the Camaro V-6's 52/48. Our test car was also outfitted with the 6-speed manual. It makes for a spirited drive that any enthusiast would enjoy. Not quite to the level of the V-8s, but far beyond what the Camaro V-6 offers, even when equipped with its 6-speed. And both V-6s offer decidedly better fuel economy than the V-8s. Yeah, they're still destined for the rental car fleet, but this isn't their only home.

On our travels with the V-8s, the V-6s followed. Bornhop noted, "In an odd sort of way, it's more fun to extract max performance out of a lesser-powered car than one with, say, 426 bhp." Around Big Willow it wasn't much different. The V-6s did everything the V-8s did, just slower and with more understeer. It was quite interesting to find the V-6 Mustang hit its 113-mph speed limiter entering

Turn 8 and again down the main straight. All told, it spent about 8 seconds per lap on the limiter, but it still creamed the V-6 Camaro by over a second. And that's with the Camaro V-6 just touching its limiter of 118 mph down the straight. What hurts the Camaro V-6 is its soft suspension that clearly isn't meant for track driving. The Mustang V-6 has the market cornered on performance here.

Everywhere else on our drive, the V-6s held their own with very similar levels of grip. Curiously, though, the V-6 Mustang was also the car we turned to when it was dark and we needed directions to the nearest steakhouse. The large screen of its optional navigation system gave us directions and weather updates through Travel Link. Currently, navigation is not an option on the Camaro models. And although Bornhop and I

both preferred the Mustang V-6, our Associate Managing Editor Cheryl Cooper found the Camaros more to her liking than either Mustang. Not just for their styling, but ease of driving. With the Mustangs, "Shifting to 5th required some awareness on my part; it's a deliberate movement of the shift knob to the right. I sometimes found myself reaching 3rd instead." She found no such fault with the Camaros.

What we know for sure is that Ford won't let the Mustang stagnate. It's been improved for the past two years, and there's no sign of letting up now. Maybe there's hope yet for a twin-turbo EcoBoost V-6? The Camaro, on the other hand, needs attention. It's only been on the market for a year and Ford has raised the stakes. Can Chevrolet get its game back and take the fight to Ford?—SB



	2010 Chevrolet Camaro 2LT Coupe	2011 Ford Mustang V-6 Coupe Premium
List price	\$26,875	\$25,845
Price as tested	\$29,175	\$33,055
Curb weight	3810 lb	3520 lb
Engine, transmission	3.6-liter V-6, 6-sp manual	3.7-liter V-6, 6-sp manual
Horsepower, bhp @ rpm	304 @ 6400	305 @ 6500
Torque, lb-ft @ rpm	273 @ 5200	280 @ 4250
0-60 mph	5.9 sec	5.4 sec
0-100 mph	14.6 sec	13.5 sec
0-1320 ft (1/4 mile)	14.4 sec @ 99.4 mph	14.0 sec @ 101.4 mph
Top speed	118 mph*	113 mph*
Braking, 60-0 mph	115 ft	115 ft
Braking, 80-0 mph	206 ft	199 ft
Lateral accel (200-ft skidpad)	0.85g	0.92g
Speed thru 700-ft slalom	68.4 mph	69.2 mph
Our mileage, EPA city/highway	18.3, 17/29 mpg	20.6, 19/29 mpg
* Electronically limited.		
Lap Times	1:41.2	1:39.6



THE Results

PERFORMANCE

Performance points based on proportional scale (normalization).

		2010 Chevrolet Camaro	2011 Ford Mustang
0-60 mph time	30 pts	30.0	30.0
0-1/4 mile time	30 pts	30.0	29.5
Slalom	30 pts	29.2	30.0
Skidpad	30 pts	29.0	30.0
Braking, 60-0 mph	30 pts	29.2	30.0
Braking, 80-0 mph	30 pts	29.3	30.0
Fuel economy, EPA	20 pts	18.7	20.0
SUBTOTAL	200 pts	195.4	199.5

SUBJECTIVE

Subjective ratings based on points awarded in each of 12 categories by editors and scored based on a proportional scale.

		2010 Chevrolet Camaro	2011 Ford Mustang
Driving excitement	20 pts	18.0	20.0
Engine	20 pts	20.0	20.0
Gearbox	20 pts	19.0	20.0
Steering	20 pts	18.0	20.0
Brakes	20 pts	20.0	20.0
Ride	20 pts	20.0	18.0
Handling	20 pts	18.0	20.0
Exterior styling	15 pts	15.0	15.0
Interior styling	15 pts	13.5	15.0
Seats	10 pts	9.5	10.0
Ergonomics/controls	10 pts	9.5	10.0
Luggage space	10 pts	8.5	10.0
SUBTOTAL	200 pts	189.0	198.0

TOTAL POINTS (Price independent)	400 pts	384.4	397.5
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Final Standings	2	1
	2010 Chevrolet Camaro	2011 Ford Mustang

STANDINGS, PRICE DEPENDENT

Points based on a proportional scale; points range based on percentage of top price.

Price as tested	200 pts	200.0	195.7
		\$36,265	\$39,680
Price-sensitive total points		584.4	593.2
Price-sensitive standings		2	1

And The Winner Is...

The Mustang. It wins again, improving its rating scores to the point where it is almost a clean sweep. It loses in only two categories: 1/4-mile and ride. It also runs a quicker lap, and is more fun on the track. Yes, it is more expensive with all the options, but you can build one minus the glass roof, backup camera and comfort package. The performance will be the same if not better and cost less than the Camaro SS. The base prices for both pony cars are very competitive, starting at \$29,645 for the Mustang GT and \$30,945 for the Camaro SS. ❖ Are we advocating that live axles are the way of the future? No. We just know Ford has made it work—kind of like Porsche sticking with a rear-engine design for its 911. It's just a part of the car's character.



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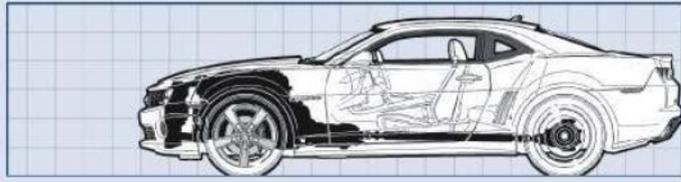
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Chevrolet

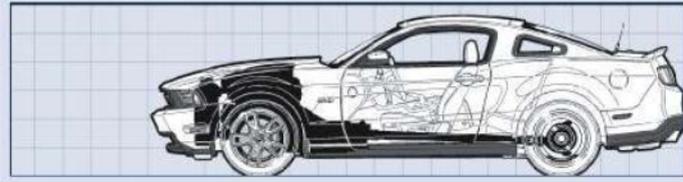
Camaro SS Coupe

Chevrolet Motor Division, 30007 Van Dyke Rd., Warren, Mich. 48090;
www.chevrolet.com

SCALE: 10 IN. (254MM) DIVISIONS • DRAWINGS BY TIM BARKER

Ford

Mustang GT Premium

Ford Motor Company, P.O. Box 49, Dearborn, Mich. 48121;
www.ford.com

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Chevrolet
Camaro SSFord
Mustang GT

GENERAL DATA

	Chevrolet Camaro SS	Ford Mustang GT
List price	\$33,745	\$32,845
Price as tested	\$36,265	\$39,680
	Price as tested incl std equip. (ABS, dual front & side curtain airbags, yaw & traction control, limited slip differential, Brembo brakes, AM/FM/CD/MP3/SAT, a/c, cruise control; pwr windows, mirrors & door locks), RS pkg (20-in. wheels, HID lights w/halo rings, unique taillamps & roof molding) \$1200, polished wheel finish (\$470), dest charge (\$850).	Price as tested incl std equip. (ABS, dual front & side curtain airbags, yaw & traction control, limited slip differential, AM/FM/CD/MP3/SAT, Sync, a/c, cruise control; pwr windows, mirrors & door locks), glass roof (\$1995), Brembo pkg (\$1695), comfort pkg (\$595), HID lights (\$525), security (\$395), 3.73:1 final drive (\$395), backup camera (\$385), dest charge (\$850).
Curb weight	3870 lb	3665 lb
Test weight	4035 lb	3830 lb
Weight dist (w/ driver), f/r, %	52/48	54/46
Wheelbase	112.3 in.	107.1 in.
Track, f/r	63.7 in./63.7 in.	62.3 in./62.9 in.
Length	190.4 in.	188.1 in.
Width	75.5 in.	73.9 in.
Height	54.2 in.	56.1 in.

ENGINE

	Chevrolet Camaro SS	Ford Mustang GT
Type	aluminum block & heads, ohv V-8	aluminum block & heads, dohc 4-valve/cyl V-8
Displacement	376 cu in./6162 cc	302 cu in./4951 cc
Bore x stroke	4.06 x 3.62 in./103.3 x 92.0 mm	3.63 x 3.65 in./92.2 x 92.7 mm
Compression ratio	10.7:1	11.0:1
Horsepower (SAE)	426 bhp @ 5900 rpm	412 bhp @ 6500 rpm
Torque	420 lb-ft @ 4600 rpm	390 lb-ft @ 4250 rpm
Redline/limiter	6500/6600 rpm	6800/7000 rpm
Fuel injection	elect. sequential port	elect. sequential port
Rec fuel	premium	premium

CHASSIS & BODY

	Chevrolet Camaro SS	Ford Mustang GT
Layout	front engine/rear drive	front engine/rear drive
Body/frame	unit steel	unit steel, aluminum hood
Brakes Front:	14.0-in. vented discs/4-piston, fixed calipers	14.0-in. vented discs/4-piston fixed calipers
Rear:	14.4-in. vented discs/4-piston fixed calipers; vac assist, ABS	11.8-in. vented discs/2-piston sliding calipers; vac assist, ABS
Wheels	cast alloy; 20 x 8 f, 20 x 9 r	cast alloy, 19 x 9
Tires	Pirelli P Zero; 245/45ZR-20 f, 275/40ZR-20 r	Pirelli P Zero, 255/40ZR-19
Steering	rack & pinion, hydraulic assist	rack & pinion, electric assist
Steering ratio	16.1:1	15.6:1
Turns lock to lock	2.5	2.6
Suspension, f/r	MacPherson struts, lower control arms, coil springs, tube shocks, anti-roll bar/multilink, coil springs, tube shocks, anti-roll bar	MacPherson struts, lower control arms, coil springs, tube shocks, anti-roll bar/live axle, 3-link, Panhard rod, coil springs, tube shocks, anti-roll bar

ACCOMMODATIONS

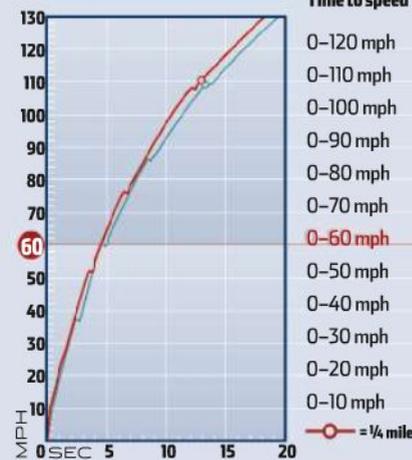
	Chevrolet Camaro SS	Ford Mustang GT
Seating capacity	4	4
Head room, f/r	37.5 in./33.5 in.	37.0 in./33.5 in.
Front-seat leg room	43.0 in.	43.5 in.
Rear-seat knee room	19.5 in.	19.5 in.
Trunk space	11.3 cu ft	13.4 cu ft

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Camaro SSFord
Mustang GT

ACCELERATION

Time to distance, seconds

0-1320 ft (1/4 mile) 13.0 @ 110.7 mph 13.2 @ 109.3 mph



BRAKING

Minimum stopping distance

From 60 mph	119 ft	116 ft
From 80 mph	209 ft	204 ft
Total swept area	659 sq in.	583 sq in.
Swept area per ton	341 sq in.	318 sq in.

HANDLING

Lateral accel *	0.88g	0.91g
Balance	moderate understeer	mild understeer
Slalom speed**	68.6 mph	70.6 mph
Balance	moderate understeer	mild understeer

*200-ft skidpad; **700-ft slalom, 100-ft spacing.

DRIVETRAIN

Transmission	6-speed manual	6-speed manual
Gear/Ratio/Overall/(Rpm) Mph		
1st,:1	3.01/10.38/(6600) 52	3.66/13.65/(7000) 39
2nd,:1	2.07/7.14/(6600) 76	2.43/9.06/(7000) 59
3rd,:1	1.43/4.93/(6600) 110	1.69/6.30/(7000) 85
4th,:1	1.00/3.45/est (6500) 155*	1.32/4.92/(7000) 108
5th,:1	0.84/2.90/est (5500) 155*	1.00/3.73/(7000) 143
6th,:1	0.57/1.97/est (3700) 155*	0.65/2.42/est (4600) 145*
Final drive ratio	3.45:1	3.73:1
Engine rpm @ 60 mph in top gear	1400 rpm	1900 rpm

*Electronically limited.

FUEL ECONOMY

Our driving	16.9 mpg	17.5 mpg
EPA city/highway	16/24 mpg	17/26 mpg
Cruise range	304 miles	263 miles
Fuel capacity	19.0 gal.	16.0 gal.

INTERIOR NOISE

Idle in neutral	51 dBA	52 dBA
Maximum, 1st gear	86 dBA	80 dBA
Constant 50 mph	67 dBA	69 dBA
Constant 70 mph	72 dBA	74 dBA

TEST CONDITIONS

Temperature	63° F	Elevation	350 ft	Location	Irvine, California
Humidity	44%	Wind	light		



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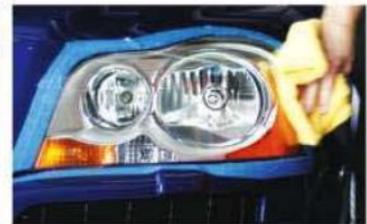
Sunlight, heat, cold, rain, smog, and harsh chemicals can accelerate the affects of oxidation, dulling and degrading headlights.



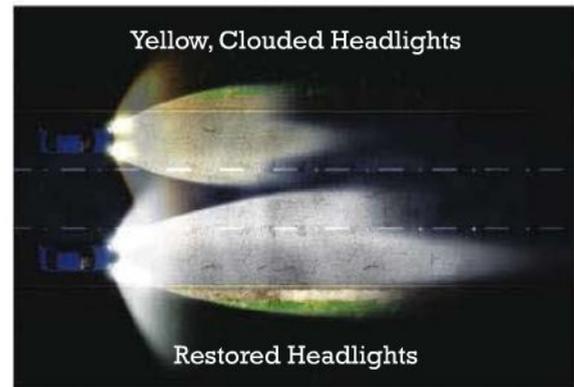
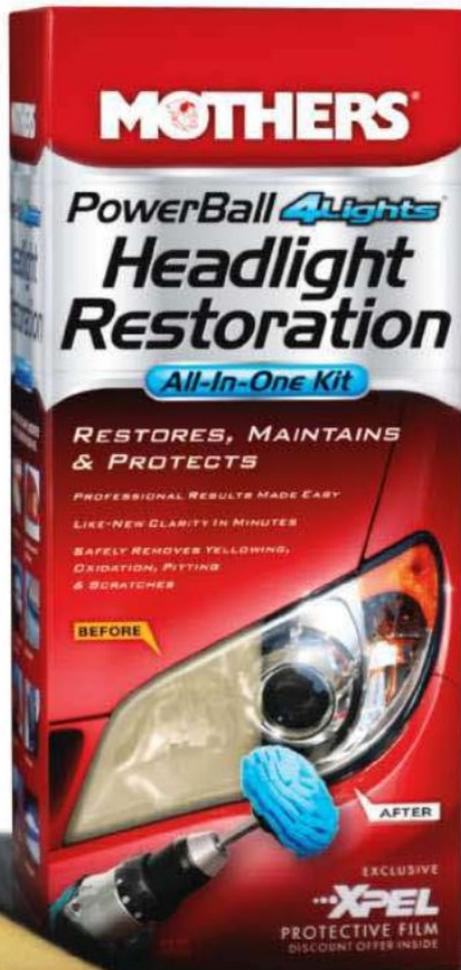
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The classic Ford vs. Chevy battle
has spawned a pair of great,
but quite different,
V-8 engines

BY TOM WILSON

RIVAL

VEES

Ford and Chevy fans have squared off in their respective Mustangs and Camaros for decades, even though a detached assessment of most classic pony cars shows that in their heyday of the 1960s, they were nearly identical. The pair faithfully followed the time-tested pushrod V-8 and live rear axle layout in a 2-door coupe body. You could use the same loose-fitting car cover on both, yet the owners would just as soon glare at the other guy than acknowledge he was from the same automotive tribe. Such are the dangers of allegiance to rival brands. ❖ But after 45 years of evolution, the Camaro and Mustang have gone separate ways, not only the former's switch to an independent rear, but also underhood, where the Camaro's LS3 V-8 and the Mustang's new 5.0-liter TiVCT V-8 or "Coyote" hold court. GM sticks with a traditional push-

rod V-8, polished to a blinding gleam. Ford, on the other hand, has doubled down on its use of overhead cams since it introduced the sohc 4.6-liter modular V-8 in the Mustang back in 1996. Is one engine better than the other? ❖ Before exploring the differences between these two great engines, it's important to note that even these classic rivals share a fair amount of technology. ❖ Both engines are all-aluminum 90-degree V-8s. Both use composite intake manifolds, coil-on-plug ignition and returnless, multiport fuel injection. Neither engine employs direct fuel injection—yet. Both engines boast roller rocker arms, both engines have rollers where the camshaft(s) meet the rest of the valvetrain, and both hydraulically adjust their valve lash. Variable cam timing is a feature on each, and neither cuts cylinders for fuel economy reasons.



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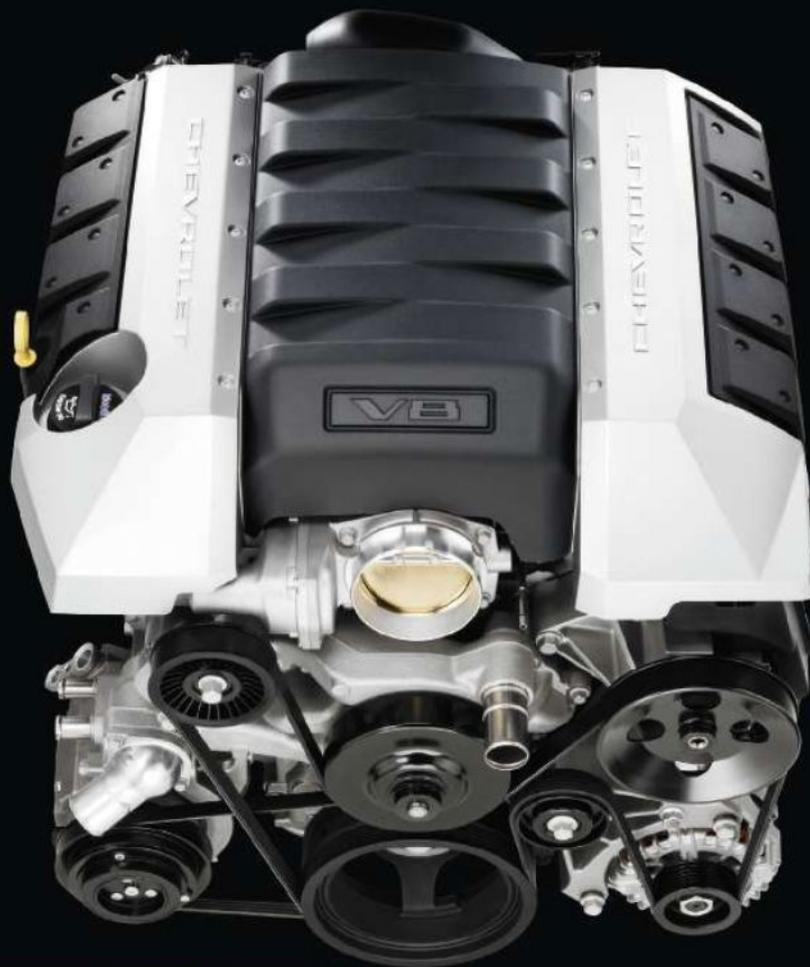


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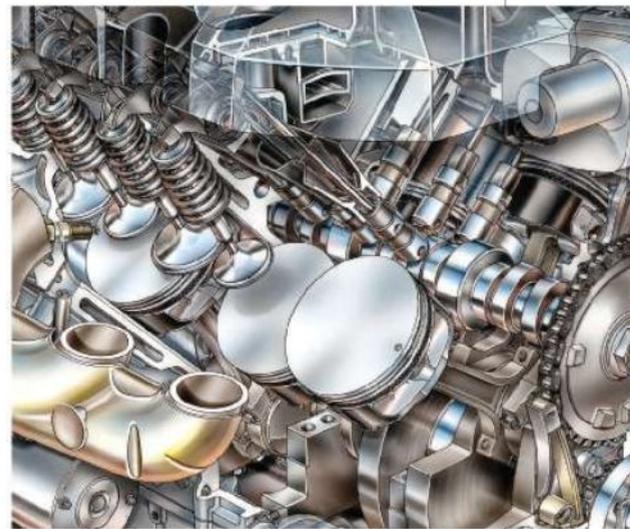
426 bhp @ 5900 rpm

BOWTIE BRUISER

The more senior engine is Chevrolet's LS3. Measuring a generous 6.2 liters or 376 cu. in., the LS3 is a direct descendant of the hallowed small-block Chevy V-8 introduced in 1955. While it shares only its fundamental 90-degree vee angle, 4.4-in. (112-mm) bore spacing and overhead valve layout with its predecessor, the LS3 benefits from 55 years of Chevrolet pushrod V-8 production and racing experience. We first saw this latest iteration of the small-block in the 2008 Corvette.

While it's fashionable to decry the Chevy's pushrod layout as antiquated, it has many inherent advantages. With only one camshaft nestled deep in the block, the engine is physically compact—the LS3 packs massive cubic displacement in considerably less volume than the sprawling Coyote with its large cylinder heads. Immediately, the LS3 is ahead where it counts most: power. Bigger engines generally make more power with less trouble and more durability than smaller engines, and that's especially true when comparing the LS3's 426 bhp at 5900 rpm to the Coyote's 412 bhp at 6500. For the record, the LS3's torque peak of 420 lb.-ft. is reached at 4600 rpm, whereas the Coyote's 390 lb.-ft. arrives at a lower 4250

“What weight the LS3 has is centered lower in the engine than in the taller Ford with its four steel cams, wider heads and four cam phasers sitting high and wide. There's a definite handling advantage to having a lower center of gravity.”



» With its cam in the block and pushrod/rocker-arm valves, Chevrolet's LS3 V-8 is more compact than Ford's dohc V-8.

rpm, thanks in part to its dual variable valve timing. As a more physically compact powerplant than the Ford, the LS3 can be employed in a smaller car, while also allowing for more working room in an existing engine compartment.

Almost as important, the 2-valve Chevy's single-cam valvetrain has many fewer parts than the Ford's jewelry store



» Chevrolet's compact LS3 V-8 has a cast-aluminum block, the valley of its vee filled with a hollow camshaft and valvetrain components. Pressed-in cast-iron liners are used in the cylinder bores.

of valves, springs, rocker arms, lash adjusters, cams, phasers, pulse wheels, timing chains and tensioners. Fewer parts means less cost—always a good thing—and fewer parts can also translate into less weight. What weight the LS3 has is centered lower in the engine than in the taller Ford with its four steel cams, wider heads and four cam phasers sitting high and wide. There's a definite handling advantage to having a lower center of gravity.

One benefit of the pushrod valvetrain, which the current LS3 does not take advantage of, is cylinder deactivation, or Active Fuel Management as Chevy calls it. The long travel inherent in a pushrod engine's hydraulic lifters makes this easy, but Chevy has found the mechanical connection provided by the LS3's manual transmission's clutch telegraphs too many vibrations during transitions and 4-cylinder operation. The almost identical LS99 engine used in automatic-transmission Camaros does employ AFM, however.

Negatives for the pushrod LS3? They also center on the valvetrain and its high reciprocating mass. With just two of them per cylinder, the LS3's valves need to be large and the pushrods and sizable hydraulic roller lifters add to the top end's weight. All together, this added mass asks much of the valve springs. Even with Chevy going to the expense of hollow intake-valve stems, the LS3 is limited to 6600 rpm, and to spin the engine any higher would require either prohibitively heavy valve spring pressures that usurp power and stress these components, or pricey titanium valves.

Furthermore, with one camshaft it is difficult to vary the intake and exhaust valve timing independently. The four camshafts in the 5.0-liter Ford make

wildly varying cam timing easy, although the calibration engineers who must write the engine management software might disagree. Simple or not, this ability to customize the valve events for everything from idle to max power contributes greatly to the Ford's efficiency.

DEARBORN HOWLER

When Ford's engineers penned the 5.0-liter TiVCT V-8, their only constraints were to use the hugely expensive machine tools already on-hand in Ford's engine plants. Management had also decreed that the new engine, known internally as the Coyote, would not, at least at first, use EcoBoost, Ford's combination of turbocharging and direct fuel injection.

Practically speaking, this stunted the Coyote's bore size because of the production machinery's limitations of a 3.937-in. (100-mm) bore spacing. However, because the historically significant 5.0-liter

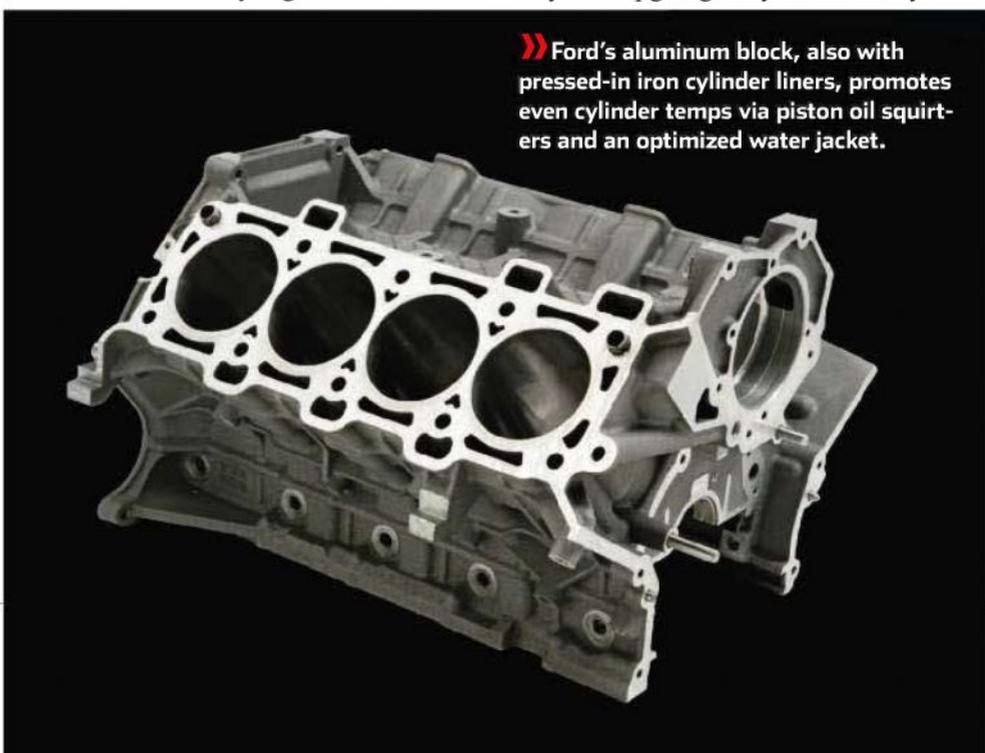
(302 cu. in.) displacement was reachable with the tight 3.623-in. (92.2-mm) bore (and because the engineers had free reign to design for maximum efficiency), this was hardly a disqualifying limit.

Airflow is key to maximum efficiency, and the Coyote obliges with a take-no-prisoners 4-valve cylinder head that outflows any mainstream production car head. Matter of fact, the Coyote head shames many race cylinder heads. With its outstanding breathing, light reciprocating parts, excellent high-rpm oiling, intricate headers and other attributes, the Coyote easily hits 7000 rpm and 412 bhp. That's 1.4 horsepower for each of its 302 cu. in. (The LS3 manages a still respectable 1.1 bhp per cu. in.)

Besides yielding such superior breathing, the Coyote's overhead cam layout frees the engineers from accommodating pushrods. Thus, the all-important intake and exhaust ports can be more ideally shaped, and the water jacket optimized for even cooling across the heads. This lessens cylinder-to-cylinder temperature variation, supporting more aggressive tuning.

As noted, the Coyote's 4-cam layout allows tremendous opportunities in variable valve timing. This let Ford engineers tune the Coyote for power—it has quite aggressive camming—then de-tune it on the fly for cruising economy whenever maximum power is not required.

Of course, the Coyote's many but tiny valves pose little challenge to the valve springs, so the 5.0-liter is a carefree rever. Again, this means more power up high and less fuel burn at cruising rpm because there's less displacement to feed. For at least partial proof, consider the Camaro SS's EPA ratings are 16 mpg city/24 mpg highway, while the lighter, smaller-engine Mustang GT ekes out 17 mpg city/26 mpg highway. The reality here:



» Ford's aluminum block, also with pressed-in iron cylinder liners, promotes even cylinder temps via piston oil squirters and an optimized water jacket.



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390 lb-ft @ 4250 rpm

412 bhp @ 6500 rpm

The Mustang GT accelerates about as fast as the more powerful Camaro SS, but gets better fuel economy.

The price Ford paid for their more efficient V-8 was physical bulk—the Coyote looks more like a big block than a 5.0-liter when stuffed in the Mustang. It's also more costly to build than the old sohc 4.6-liter V-8.

All this aside, determining which engine is superior depends on what you value. To many, “there ain't no replacement for displacement,” as the old hot rodder's creed goes. And true to form, the pushrod Chevy offers a welcome torque hit down low and some freedom from shifting. On the other hand, as fuel prices rise, the Ford's inherent efficiency is compelling, and in this league any bump in fuel economy is a boon.

For further argument, consider Chevy's Camaro V-6, which, like the Mustang's, follows the many cams, many valves school. So when efficiency counts, Chevy also votes for mechanical sophistication. When cubic inches count, Ford discards some cams and valves. Just look at the new 2-valve 6.2-liter sohc V-8 found in the F-150 SVT Raptor, which is also the base engine in Ford's F-250/350 pickups.

Of course, for perpetuating a V-8 rivalry, having two different engines in the pony car arena is a godsend. Each side has

“Airflow is key to maximum efficiency, and the Coyote obliges with a take-no-prisoners 4-valve cylinder head that outflows any mainstream production car head. Matter of fact, the Coyote head shames many race cylinder heads.”



» Dual independently variable valve timing allows the dohc Ford V-8 to tune for economy or power, whatever the driver demands.

legitimate bragging rights, and each powerplant has the sophistication needed to ensure a V-8-powered pony car future. But when it comes to side-by-side contests between these two modern pony cars with their very different V-8s, it all boils down to this: personal preference and how much talent you have behind the wheel.



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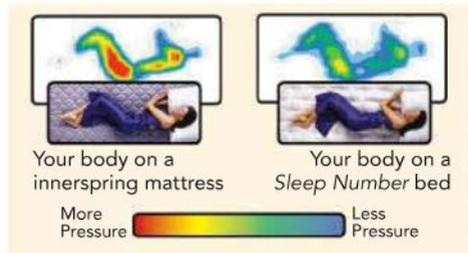
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ROAD TEST

After the **GOLD RUSH**

RIVALS: ROLLS-ROYCE GHOST VS. BENTLEY CONTINENTAL FLYING SPUR SPEED

Ambling—with surprising swiftness and agility—through the Mother Lode with two of the finest cars a successful '49er can buy

BY PETER EGAN
PHOTOS BY GUY SPANGENBERG





WHERE BETTER TO TEST THESE TWO VERY expensive cars from exalted old-money British companies (now owned by Germans), we asked ourselves, than California's Highway 49 through the fabled Gold Country? Winding roads, vineyards, restored mining towns and the clinging aura of huge fortunes made and lost, of sudden good luck and dynastic fortunes established. Old money mixed with new. Quite symbolic.

And let's admit that once you spend more than about \$25,000 on a car, part of its value almost always becomes symbolic rather than purely rational. And the more you spend beyond that, the greater the mythical content, so to speak. Add another \$200K or \$300K to that figure and people grow just a little quiet around your car and start to ponder its larger meaning, as if visiting the Pyramids or the Sphinx. And some like to return home from the Nile with souvenirs. We could see it on this trip.

Consider the lovely "Spirit of Ecstasy" hood ornament that adorned our Rolls-Royce Ghost test car. These things have been broken off and stolen so often that Rolls engineers have now installed the old girl on a pedestal that disappears under a small hatch any time you hit the lock button on the key fob. You can also raise or retract it with the touch of a menu button in the console.

Good idea.

When we left to test-drive these two cars on a 3-day outing from our Newport Beach offices north to the Mother Lode,

» Check out the Ghost's Spirit of Ecstasy hood ornament, which disappears behind the classic upright grille via a touch of a button. Twin-turbo V-12, of BMW origin, provides the effortless power required of any Rolls-Royce, and makes the Ghost significantly quicker than its larger Phantom sibling. LED headlights are a modern touch.

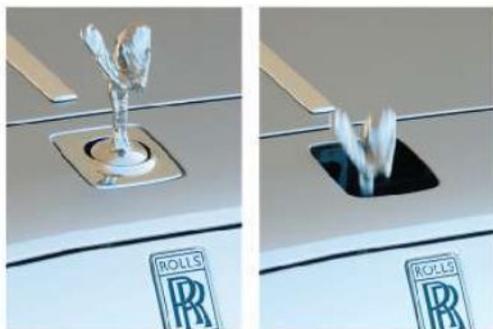


we decided to beat L.A.'s rush (?) hour by leaving in the morning darkness, speeding over Tejon Pass and rendezvousing for breakfast at a restaurant in Grapevine.

I got there a little earlier than Managing Editor Andrew Bornhop and his

Bentley, so I stayed in the driver's seat, writing a few notes. Moments later, a restaurant patron strolled past the Rolls, then stopped in his tracks and came back. He looked the car over, then came right up to the Spirit of Ecstasy hood ornament and stared at it. Hard. A little too hard for my own custodial comfort.

Suddenly he realized I was sitting in the car, flinched visibly and left quickly in a straight line, like a man who'd ac-





identally bounced off an unseen tree and hoped no one had noticed. I lowered the statue and continued writing. The man's intentions may have been good—pure curiosity or admiration—but he made me feel like a guard in an art museum. This isn't a feeling I have in many other cars.

No, indeed. These two are different.

Besides having historically resonant names, they're expensive. The Ghost has a Manufacturer's Suggested Retail Price,

» **Bentley's W-12, of VW origin, is an engineering masterpiece, but is mated to a 6-speed transmission that's not as responsive as the 8-speed in the Rolls. As a far more understated design, the Flying Spur Speed doesn't need an active hood ornament.**

as tested, of \$308,350 (including a \$9950 "Rear theater configuration" and \$6000 for "Individual Lounge Seat configuration"), while the Flying Spur Speed can be enticed to leave the showroom for a mere \$226,485, its most expensive option being a \$6900 NAIM Premium Audio System.

Second, they're large—yet sporty for their type—and have a lot of horsepower. The 5495-lb. Rolls-Royce, borrowing some 7 Series architecture from its BMW mother company, has a new and exclusive aluminum alloy 6.6-liter 48-valve 60-degree twin-turbo V-12 rated at 563 bhp.





All that power goes to the rear wheels only, through an 8-speed electronically controlled transmission. No flashy F1 paddle shifters here; the gearshift is a rather delicate lever on the steering column, and one need only select Drive to be transported quietly and with crushing quickness into the distance. It's as if you'd set the *Queen Mary* in motion by stirring the olive in your martini. And rightly so!

The Flying Spur Speed, meanwhile, propels its 5575 lb. with 600 bhp of twin-turbo 6.0-liter W-12 (picture two narrow-angle V-6s sharing a crankshaft) descended from the VW Phaeton. There's also a standard, non-Speed version that makes only 552 bhp, but we needn't trouble ourselves about that. The Spur has a 6-speed transmission with both paddle shifters and a standard console-mounted lever, feeding all four wheels through a Torsen center differential.

So these cars both have plenty of wallop under the hood, but they deliver it in slightly different ways. The Rolls delivers power almost like a steam engine, moving out

with instant, uninterrupted torque at any speed with just a touch of the throttle. Very smooth, quiet and strong, without a hint of driveline lash. The Bentley thinks for a few milliseconds, selects a gear, crouches and then rushes down the road in a flurry of revs and heady acceleration. Both cars are immensely fast and the Bentley makes more horsepower, but the tight, seamless power delivery of the Rolls makes it easier to drive smoothly on winding roads where you're off and on the throttle.

And—after an extended freeway drone up through California's Central Valley—

» Massaging diamond-pleated seats, a traditional gear lever, shift paddles, organ-stop vents, folding tray tables (with vanity mirrors) and a classic Breitling clock highlight the Bentley's interior, in which leather and dark wood abound. It's a driver's car, for sure, but one that treats you well.

we hit plenty of tight winding roads when we finally turned off into the Sierra foothills and the Gold Fields on Highways 49 and 4, well watered and green with recent spring rains. It even snowed a bit the night we got to the little restored mining town of Murphys in Calaveras County, Mark Twain country. We passed his cabin on the way to Murphys.

On those beautiful back roads, more differences cropped up between our two celebrated cars.

When you climb out of the Rolls and into the Bentley, it immediately feels smaller, lower and tighter, more like a high-performance sport sedan than a luxury car. The steering is responsive and the height-adjustable suspension is stiffer and flatter under hard cornering. But it's also a bit harsher on the rougher back roads, even with the 4-way damping switch set to the Comfort position. When you drive the Bentley, you tend to remember the Rolls as taller, softer and a bit more trundling. Which it is.

But when you jump back in the Ghost, it warms a slightly different part of your heart. The steering, for such a large, heavy luxury car, is surprisingly com-

In My Opinion...



Peter Egan, EDITOR-AT-LARGE

» For my money—which I don't have—it's the Rolls. Not as reserved in style as the Bentley, nor as much an active driver's car at the limit, but a car of pleasingly high averages in all things. It has a smooth, powerful engine that pulls from all speeds like the world's largest electric motor, beautifully damped suspension, communicative steering, all-day comfortable seats and a remaining whiff of Old Englishness, from a time when luxury cars smothered one in solid comfort rather than technology. Like the staff of a good hotel, it knows when to leave you alone.

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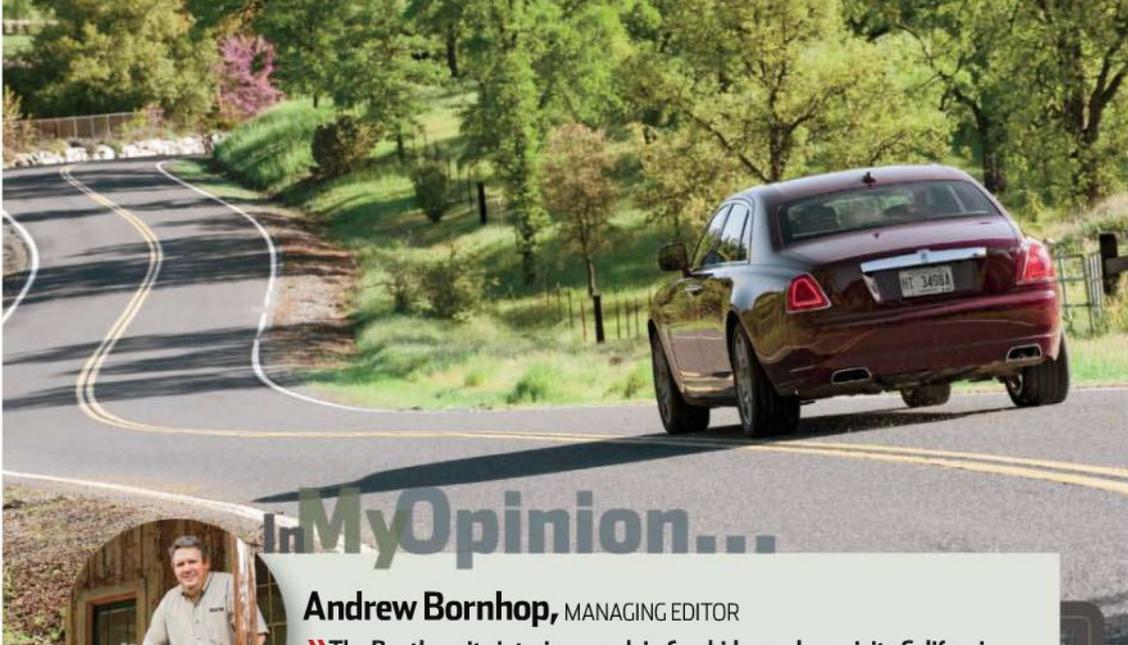
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In My Opinion...



Andrew Bornhop, MANAGING EDITOR

» The Bentley—its interior awash in fine hides and exquisite California walnut—is the driver’s car, far more alive through the slalom. But on anything but the smoothest of roads, the Speed model is simply too harsh, even on the softest suspension settings. Had our test car been a standard Continental Flying Spur, it likely would have fared better against the more opulent Ghost, which drives like a smaller car than it really is and reveals its heft only when driven foolishly fast. At these prices, a comfortable ride should be a given. All considered, make mine the Rolls.

municative and direct, and ride quality is forgiving and compliant without being overly soft. The Rolls heels over and leans more than the Bentley in hard corners, yet still maintains a pleasant level of tautness in transitions.

» The Ghost exudes quality, whether it’s in the feel of the beautifully stitched leather upholstery or in the actuation of the fold-down rear trays and handy pop-out umbrellas. Optional theater package lets rear passengers watch the nav screen or their own movies.

Rolls positions this car as a sporting, non-chauffeur-driven alternative to the larger and more traditionally plush Phantom, and its dynamics are pretty much on target. It still feels like a Rolls, but it’s a fun and agile Rolls. And the horsepower

is right there, ready to drive the car out of a corner without hesitation. Our drag strip and slalom numbers bear out these impressions; the Bentley’s a bit quicker around the skidpad and through the slalom, and it’s also quicker off the line and reaching 60 mph, but the two cars have identical quarter-mile times, and the Rolls has a higher trap speed. You might say the Bentley has its hair on fire while the Rolls smolders—albeit at a very high temperature.

Beyond raw performance, luxury in our age stresses “features,” and both cars throw more systems, menus, toggles and buttons at you than a 4-engine bomber, so full enjoyment of either involves a good session with the owner’s manual or a training video. Some of the controls are obvious, while others seem a needless reinvention of the wheel. Of the two, the Rolls is a bit more intuitive, with—for example—a simpler, easier-to-use set of a/c/heater controls, but it also has a few irritants. While reaching for the tiny gearshift lever, for instance, we kept hitting the nearby wiper/washer lever. Also, as-delivered settings meant we had to pull the door latches twice (maddeningly) to open the door. The huge side mirrors also block your view while turning into driveways or tight corners. And the Rolls also has a turn signal stalk with no detent, so you keep flipping on your right signal while trying to cancel the left during lane changes. Then back to right. Meanwhile, a cop follows you and thinks you’re trying to be funny. Or drunk.

There are some remarkable features, however. The Ghost’s GPS images are de-



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THE Results

PERFORMANCE

Performance points based on proportional scale (normalization).

		2010 Bentley Continental	2010 Rolls-Royce Ghost
0-60 mph time	30 pts	30.0	27.4
0-1/4 mile time	30 pts	30.0	30.0
Slalom	30 pts	30.0	29.5
Skidpad	30 pts	30.0	28.3
Braking, 60-0 mph	30 pts	30.0	29.2
Braking, 80-0 mph	30 pts	30.0	29.0
Fuel economy, EPA	20 pts	16.0	20.0
SUBTOTAL	200 pts	196.0	193.4

SUBJECTIVE

Subjective ratings based on points awarded in each of 12 categories by editors and scored based on a proportional scale.

		2010 Bentley Continental	2010 Rolls-Royce Ghost
Driving excitement	20 pts	20.0	16.0
Engine	20 pts	17.0	20.0
Gearbox	20 pts	16.0	20.0
Steering	20 pts	17.0	20.0
Brakes	20 pts	20.0	20.0
Ride	20 pts	14.0	20.0
Handling	20 pts	20.0	15.0
Exterior styling	15 pts	14.2	15.0
Interior styling	15 pts	15.0	15.0
Seats	10 pts	9.0	10.0
Ergonomics/controls	10 pts	10.0	9.5
Luggage space	10 pts	9.0	10.0
SUBTOTAL	200 pts	181.2	190.5

TOTAL POINTS (Price independent)	400 pts	377.2	383.9
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Final Standings

2	1
2010 Bentley Continental	2010 Rolls-Royce Ghost

STANDINGS, PRICE DEPENDENT

Points based on a proportional scale; points range based on percentage of top price.

Price as tested	200 pts	200.0	186.7
		\$226,485	\$308,350
Price-sensitive total points	577.2	570.6	
Price-sensitive standings	1	2	

tailed and vibrant, and it also has a multi-camera backup screen that gives you a perfect and realistic overhead image of the car on the road—or about to back off the road. The Rolls also has some wonderful Old Empire touches: silver-handled umbrellas that pop out of the front door sills when needed, and rear “suicide” doors that close silently with a vaultlike click with the touch of a button on the rear window pillar. No reaching necessary. Also, the “RR” emblems in the wheel centers are “self-righting,” meaning they are always upright and readable, even at speed.

The Bentley features a Breitling clock on the walnut dash, a button that closes the trunklid with almost hydraulic smoothness and fully adjustable rear seats. Both cars have superb, sink-into-nirvana rear seats with individual a/c controls, vanity mirrors, ashtrays (twin lighters!) and DVD screens. Your friends will love riding with you, and so will your kids—if, for some reason, you haven’t already dropped them off at a decent boarding school.

Styling—as always—is subjective. Three of our four editors and photographers on the trip preferred the more flowing, low-key look of the Flying Spur, while one dissident thought it looked a bit too restrained and conventional for a car in this class and was more enamored of the less inhibited old-money frankness of the Ghost, with its 2-tone paint and perpendicular front end treatment. It makes more of a statement—even if you don’t want it to. Neither car went unnoticed by

virtually anyone on the highway, however, and both have such beautiful paint and metal trim that driving them through rush-hour traffic makes you defensive, like someone trying to carry a Ming vase though a crowded cocktail party.

DECISIONS, DECISIONS

This is a tough one. We at R&T have generally favored driver’s cars—those with the best handling and most performance—in our comparison tests. But Bornhop asked the question, “Are people who pay \$225,000 or more for a luxury car really looking to out-Ferrari a Ferrari, or are they simply looking for the utmost in comfort and composure at a dignified pace?”

We suspect those who come down on the side of comfort and traditional luxury will like the Rolls better—as we did. Those flying a little faster—and lower under the radar—will prefer the Bentley. And those who favor the Bentley Drivers Club over the Rolls-Royce Owners Club have the further option of buying the more civilized non-Speed version of the Spur or the standard (and, we think, more beautiful) Continental GT—two of our favorite cars. They may not miss the extra 48 bhp.

The Bentley won the objective performance numbers game here, but, between these two, we’ll come down on the side of hedonism, for once, and give the nod to the Ghost. It’s an old-money car that feels just agile and modern enough to enjoy driving yourself. No reason the chauffeur should have all the fun.



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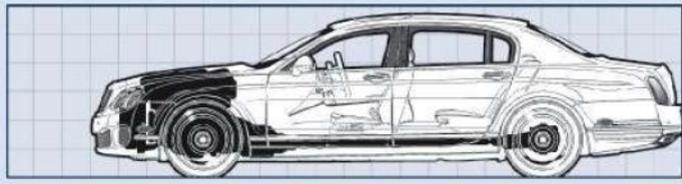
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Bentley

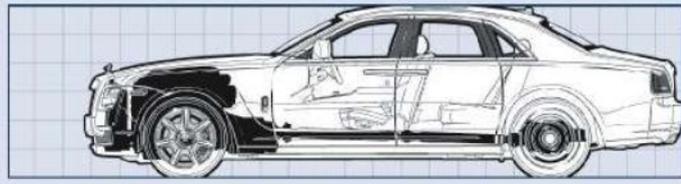
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Bentley
ContinentalRolls-Royce
Ghost

GENERAL DATA

List price	\$202,500	\$245,000
Price as tested	\$226,485	\$308,350
	Price as tested incl std equip. (ABS, dual front, side & side curtain airbags, yaw & trac ctrl, cruise ctrl, 4-zone climate ctrl, lifetime Sirius, Torsen center diff, pwr door latches, trunk, windows, mirrors & door locks), NAIM audio (\$6900), misc. interior options (\$5680), Convenience Spec (\$3220), sunroof (\$1060), heated steering wheel (\$540), Mulliner fuel cap (\$290), gas-guzzler tax (\$3700), dest charge (\$2595).	Price as tested incl std equip. (ABS, dual front, side & side curtain airbags, yaw & trac ctrl, dynamic cruise ctrl, 4-zone climate ctrl, self-righting wheel centers, front door housed umbrellas, premium audio w/16 speakers; pwr door latches, trunk, windows, mirrors & door locks), interior options (\$15,950), exterior options (\$14,600), gas-guzzler tax (\$1700), dest charge (\$2000).
Curb weight	5575 lb	5495 lb
Test weight	5755 lb	5675 lb
Weight dist (w/ driver), f/r, %	57/43	50/50
Wheelbase	120.7 in.	129.7 in.
Track, f/r	63.9 in./63.3 in.	63.9 in./65.4 in.
Length	208.3 in.	212.6 in.
Width	77.8 in.	76.7 in.
Height	57.7 in.	61.0 in.

ENGINE

Type	twin-turbo dohc 4-valve/cyl W-12	twin-turbo dohc 4-valve/cyl V-12
Displacement	5998 cc	6593 cc
Bore x stroke	84.0 x 90.2 mm	89.0 x 88.3 mm
Compression ratio	9.0:1	10.0:1
Horsepower (SAE)	600 bhp @ 6000 rpm	563 bhp @ 5250 rpm
Torque	553 lb-ft @ 1700-5600 rpm	575 lb-ft @ 1500 rpm
Redline/limiter	6500/6600 rpm	na/6000 rpm
Fuel injection	elect. sequential port	direct
Rec fuel	premium	premium

CHASSIS & BODY

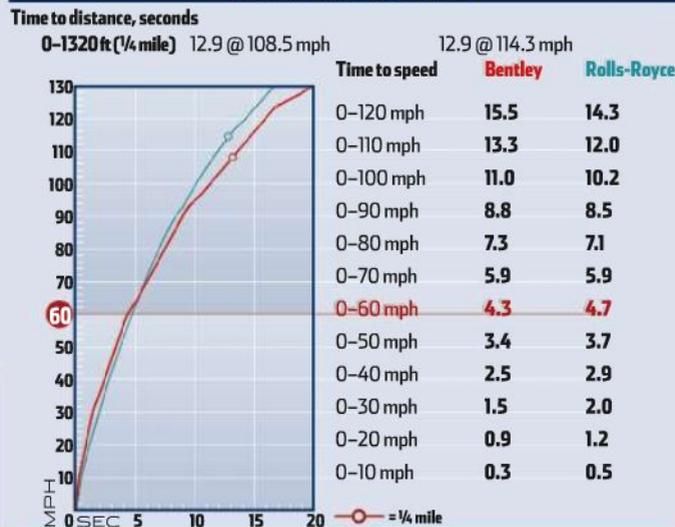
Layout	front engine/all wheel drive	front engine/rear drive
Body/frame	unit steel	unit steel, aluminum hood
Brakes, front	15.9-in. vented discs/2-piston sliding calipers	16.1-in. vented discs/2-piston sliding calipers
rear	13.2-in. vented discs/1-piston sliding calipers; vac assist, ABS	15.8-in. vented discs/1-piston sliding calipers; vac assist, ABS
Wheels	alloy, 20 x 9½	alloy; 20 x 8½ f, 20 x 9½ r
Tires	Pirelli P Zero; 275/35ZR-20 f, 275/35ZR-20 r	Goodyear Excellence ROF; 255/45ZR-20 f, 285/40ZR-20 r
Steering	rack & pinion, vari. power assist	rack & pinion, vari. power assist
Steering ratio	15.4:1	16.1:1
Turns lock to lock	2.6	3.1
Suspension, f/r	upper and lower A-arms, adj air springs, elect. adj tube shocks, anti-roll bar/multilink, adj air springs, elect. adj tube shocks, anti-roll bar	upper and lower A-arms, adj air springs, elect. adj tube shocks, anti-roll bar/multilink, adj air springs, elect. adj tube shocks, anti-roll bar

ACCOMMODATIONS

Seating capacity	5	5
Head room, f/r	37.0 in./37.0 in.	38.5 in./36.5 in.
Front-seat leg room	44.5 in.	44.0 in.
Rear-seat knee room	29.5 in.	29.0 in.
Trunk space	16.7 cu ft	17.3 cu ft

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ACCELERATION



BRAKING

Minimum stopping distance		
From 60 mph	116 ft	119 ft
From 80 mph	202 ft	209 ft
Total swept area	737 sq in.	989 sq in.
Swept area per ton	264 sq in.	360 sq in.

HANDLING

Lateral accel*	0.90g	0.85g
Balance	mild understeer	neutral
Slalom speed**	61.2 mph	60.1 mph
Balance	mild understeer	mild understeer

*200-ft skidpad; **700-ft slalom, 100-ft spacing.

DRIVETRAIN

Transmission	6-speed automatic	8-speed automatic
Gear/Ratio/Overall/(Rpm) Mph		
1st,:1	4.17/14.72/(6600) 36	4.72/13.27/(6000) 41
2nd,:1	2.34/8.26/(6600) 64	3.14/8.84/(6000) 61
3rd,:1	1.52/5.37/(6600) 99	2.11/5.92/(6000) 91
4th,:1	1.14/4.02/(6600) 132	1.67/4.69/(6000) 115
5th,:1	0.87/3.07/(6600) 173	1.29/3.61/(6000) 149
6th,:1	0.69/2.44/est (6100) 201	1.00/2.81/est (4870) 155*
7th,:1		0.84/2.36/est (4090) 155*
8th,:1		0.67/1.88/est (3250) 155*
Final drive ratio	3.53:1	2.81:1
Engine rpm @ 60 mph in top gear	1800 rpm	1250 rpm

*Electronically limited.

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Maximum, 1st gear	79 dBA	69 dBA
Constant 50 mph	70 dBA	62 dBA
Constant 70 mph	73 dBA	63 dBA

TEST CONDITIONS

Temperature	83° F	Elevation	350 ft	Location	Irvine, California
Humidity	29%	Wind	calm		

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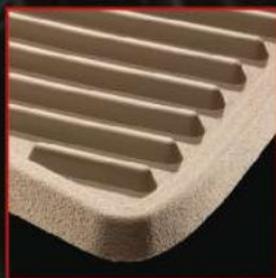
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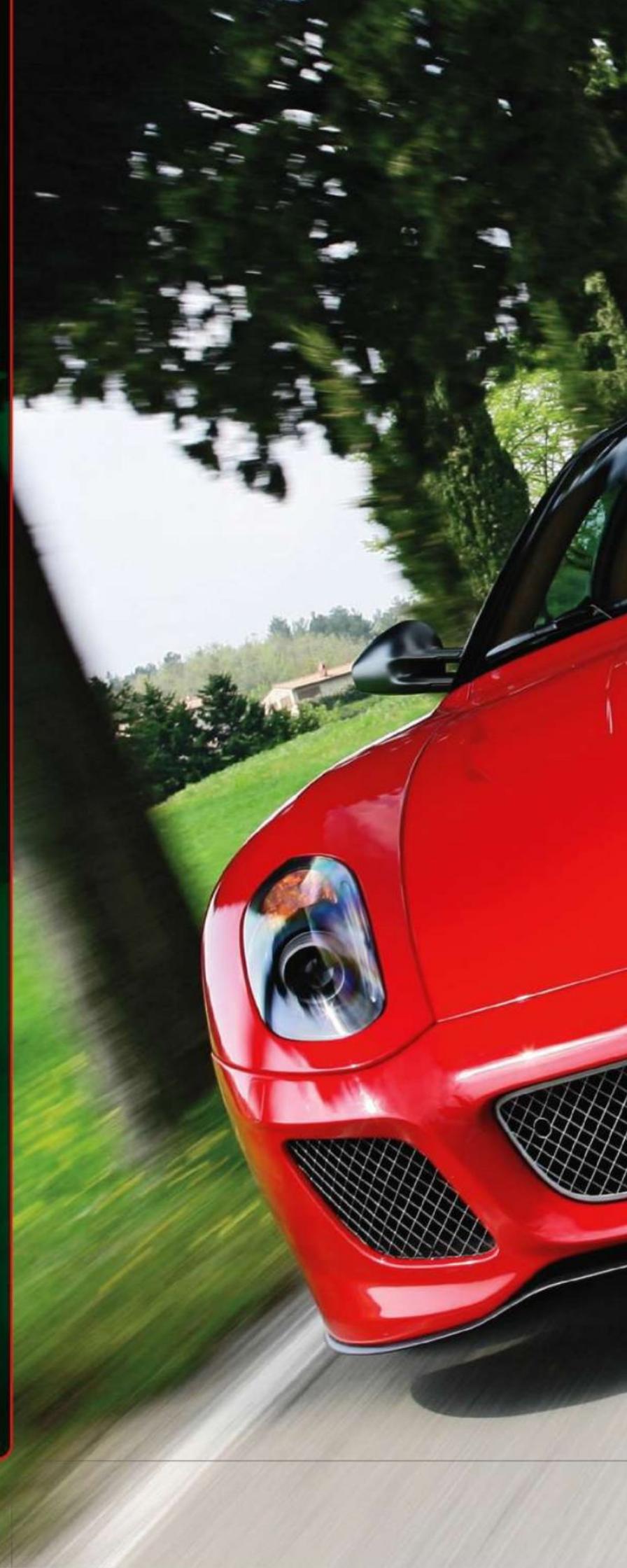
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2011 Ferrari 599 GTO

Worthy of those three famous letters?

BY MIKE MONTICELLO

SCARPERIA, ITALY—GTO. IT STANDS FOR *Gran Turismo Omologato*, Italian for Grand Touring Homologated. It's a very special designation in the world of Ferrari, as only two prior cars—the 1962 250 GTO and the 1984 GTO (see sidebar, “GTO lineage”)—have been so named. Back in the day, homologation specials were built in road-going form to satisfy the requirements of a particular racing series. While the 599 GTO isn't being built with racing in mind, Ferrari considers it the “homologation version” of the track-only 599XX, from which the GTO borrows much knowledge and many parts. In Ferrari's words: “GTO expresses the maximum of sportiness,” and after driving the car around Autodromo del Mugello, a 3.3-mile ribbon of undulating asphalt located not far from Florence, Italy, we can't disagree. ❖ In producing the 599 GTO, the engineers in Maranello focused on four areas: increasing power, decreasing weight, reducing understeer and improving downforce. The first step was the car's front/mid-engine 6.0-liter V-12, which Ferrari says is “about





90 percent of the 599XX's engine." Besides adopting the 599XX's crankshaft and intake system, the GTO V-12 has new connecting rods and pistons, raised 11.9:1 compression (up from the GTB's 11.2:1 ratio) and a version of the 599XX's exhaust system. The result is 661 bhp at 8250 rpm and 458 lb.-ft. of torque at 6500, which makes the 599 GTO the most powerful road-going Ferrari ever (for reference, the 599 GTB puts out 611 bhp at 7600 rpm and 448 lb.-ft. at 5600; see 599 GTB Road Test, May 2007 issue).

The GTO is designed to be wound out high and hard to its 8400-rpm redline, all the better to bask in the glorious, hair-raising cacophony that's accompanied by the most wondrous snap, crackle and pop from its exhaust with each shift. Ferrari says upshifts from the 6-speed single-clutch F1 gearbox have been reduced to 60 milliseconds and downshifts take just 120. The

GTO can also perform multiple downshifts by simply holding in the left carbon-fiber paddle shifter—just as on the 599XX.

Besides being more powerful, the 599 GTO is 220 lb. lighter than the GTB due in part to new composite components and thinner-gauge aluminum and glass. Nearly every area of the car was put on a diet, including the interior, body, transmission, exhaust and carbon-ceramic Brembo brake system, the last of which uses ceramic pads for the first time on a road car. Ferrari says the increased efficiency of the brakes were required to cope with the 599 GTO's newfound speed.

In an effort to achieve "the almost complete absence of understeer," Ferrari gave the GTO quicker steering, stiffer springs, a larger rear anti-roll bar and second-generation magnetorheological shock absorbers. But the biggest difference maker might be the 40-mm wider front tires, now

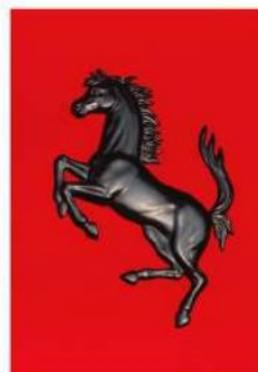
at 285/30ZR-20, with the rears only increasing by 10 mm, to 315/35ZR-20.

Out on the Mugello circuit, the 599 GTO proved an amazing handler, about as neutral as you'll find. Throw this Prancing Horse into a corner and the front Michelin Pilot Super Sport tires barely protest. The GTO begs you to dive harder and later into corners, willed on by the enormous stopping power of the brakes and a chassis that stays rock-solid even when hauling the car down from nearly 170 mph for Turn 1. Top speed is said to be over 208 mph.

Due to the array of driver aids available through the *manettino* switch on the large diameter steering wheel, you'd be hard-pressed to get very out of shape anyway. The Low Grip, Sport and Race settings (each with their own parameters for engine calibration, the F1 gearbox, shock absorbers, ABS, traction control and ESP) all utilize Ferrari's F1-Trac traction control system,



» Those "wheel doughnuts" (at left) come from F1; the 599 GTO's 6.0-liter V-12, which makes a screaming 661 bhp, is basically a street-legal version of the engine found in the track-only 599XX. The steering wheel *manettino* switch (below right) controls the parameters of the stability and traction control systems.



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which reacts incredibly quickly in curbing oversteer, although it also takes some driver involvement (and skill) out of the equation. While Race mode makes for fast and supremely secure lap times, the CT-Off setting eliminates traction control and

allows corner-exit oversteer, although the stability system cuts in on the fun too early and a bit abruptly. True men (and those who can afford to wad up a car that's estimated to cost between \$425,000–\$450,000 in the U.S.) will want to engage the CST-Off mode, which does away with stability and traction control completely.

No doubt the 599 GTO's aerodynamics—including a new underbody, front bumper and lower spoiler, larger sills with



» Welcome to the loud end of the 599 GTO. The Mugello circuit proved a fantastic setting to test the GTO's high-speed handling. Speaking of which, the GTO makes twice the downforce of the GTB.



carbon-fiber skirts, a wider rear bumper, larger trunk spoiler and a new “double-curve” rear diffuser—were hard at work keeping the car secure around the track. While the GTO doesn't apply all of the 599XX's radical aero pieces, the GTO's 317 lb. of downforce at 124 mph is twice that of the GTB, without any increase in drag. Also of technical interest are the Formula 1-derived “wheel doughnuts,” which Ferrari says lessen wheel turbulence and

improve brake cooling.

Out on the road, the 599 GTO's neck-snapping acceleration and the immediacy of each full-throttle upshift are even more impressive than at the track. Get hard on the brakes for that slippery hairpin turn while grabbing the left paddle for an ear-splitting downshift. Understeer? What understeer? The 599 GTO goes exactly where you point it, almost too quickly at times, its steering oh-so-sensitive. Then hard on the gas exiting the turn, get a little oversteer with the *manettino* in CT-Off (the lightweight and grippy race seats holding you firmly in place), and delight as the red shift lights illuminate atop the steering wheel. Everything happens so quickly in this car.

Ferrari will build only 599 examples of the GTO, and not surprisingly, all are spoken for. It's a very special car, and worthy of the name *Gran Turismo Omologato*. 🏁



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GTO Lineage

Ferrari has built two other cars with the GTO moniker: The 1962 250 GTO and the 1984 GTO (the last commonly referred to as the “288 GTO”).

The **250 GTO** was built to compete in the Manufacturer's GT Championship, which Ferrari won from 1962–1964. It was based on the 250 GT SWB, but

used a more aerodynamic body as well as a 300-bhp Testa Rossa 3.0-liter dry-sump V-12. The car's no-nonsense cockpit exemplified its “race-car-for-the-street” character, while the 250 GTO's forgiving handling helped it win many races in the early '60s in the hands of private owners.

Somewhere between 36–40



250 GTOs were built (depending on whom you talk to), which meant Ferrari didn't actually meet the 100 cars required to qualify for the Grand Touring regulations in 1962—causing a stir with competitors. Possibly the most coveted Ferraris ever built, 250 GTOs are valued in the \$7–\$11 million range.

Using the 308 GTB as a starting point, the 1984 **GTO** was built to meet the homologation requirements of FISA Group B racing. Although Group B soon folded, Ferrari built 272 road-going cars.

The GTO's performance was phenomenal for the era, its

longitudinally mounted 2.9-liter twin-turbocharged V-8 producing 400 bhp at 7000 rpm and 366 lb.-ft. of torque at 3800 rpm. Test results from our August 1984 issue showed 0–60 in 5.0 seconds and the quarter mile in 14.1. The GTO's top speed of 189 mph classified it as the fastest production car in the world. The GTO's price in 1984 was \$83,400, but these days they trade hands in the \$400,000–\$700,000 range. For fans of the 308 series, the 1984 GTO was the ultimate example of the breed.—MM

PHOTO BY JOHN LAMM





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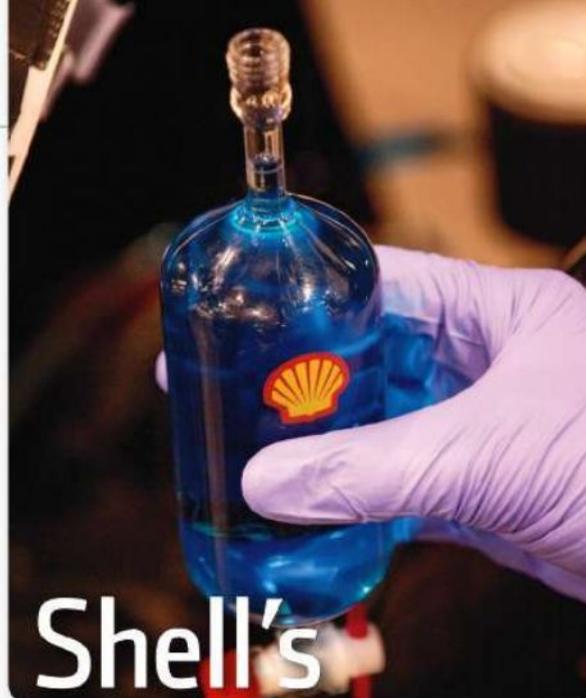
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As technology has progressed, it was no longer practical to retain the original one gallon volume of gasoline. Think of just how long that might take the winning team from Canada, the Université Laval, which achieved 2488 mpg while averaging roughly 15 mph. They'd be running for almost seven days straight across the country. The 2010 Shell Eco-marathon—Americas competition, however, would last only two; it was held in March near Shell's North American headquarters in Houston.

Ten laps around the city's central park was the regulated distance, about six miles with a completion time of 25 minutes or less. Laval used just 0.00241 gallons on its winning run. To accurately measure this ridiculously small amount of fuel requires skilled technicians who go so far as to take into account the thermal expansion of the fuel from temperature.

The cars fall in two classes, Urban Concept and Prototypes. The most common is the lightweight, under 100 lb. Prototype class—its loose set of rules makes for the most efficient vehicles. Urban Concepts are required to have doors and theoreti-



Shell's

Eco-marathon

Running on fumes

BY SHAUN BAILEY

cally fit two people. I was given the opportunity to lap the track in a Shell-built car that was designed around the styling of Sean Coleman, whose design won the Autodesk Real World Challenge. Unlike the competitors' cars that tended to use the smallest engine possible, often a 50-cc scooter engine, the one I drove had considerably more pep with a 150-cc single

cylinder easily tootling me around at a relatively thirsty 100 mpg or so, I'm sure.

Prototype cars are built for the maximum reduction in drag and frontal area. Before attending the event in Houston, I met up with a local Southern California team, Loyola Marymount University. I arrived at their shop to find them stuffing their smallest team member into





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their newly molded carbon-fiber bodywork. The cramped coffin-like body offered only a tiny window to see out of. A rule requires the driver's feet to point forward, and thus no ultra-aerodynamic Superman-style head-first positioning is allowed. Most of the rolling components are borrowed from recumbent bicycles. Unique tires from Michelin are designed for low rolling resistance and are made specifically for competing teams.

Although aerodynamics is a part of the equation, so are engine tuning, rolling resistance and strategy. To optimize energy usage, the team's engine only fires at full throttle (via a finger trigger on the steering wheel in some cases) and for short periods of time usually on uphill sections, if there are any. They then coast downhill using gravity to full effect.

Gasoline isn't the only fuel allowed; a total of seven categories exist, including fuel

cell and solar electric. For parity there is an equivalency calculation for each fuel type based on its power density, so teams can be compared. The majority use gasoline for simplicity and many run a well-tuned carburetor on a Honda 50 single-cylinder, engines of this type capable of nearly 1000 mpg. To reach the extremes, though, teams like record-holder Microjoule of French technical school St. Joseph La Joliverie build something much more complicated. Their record stands at 8870 mpg.

As I watched the 40 cars *putt-putt-putt-puff* around the track, I pondered the energy in a can of Red Bull that could power Feature Editor Mike Monticello around the track on his snazzy carbon-fiber bicycle. I know he would be able to pace these cars no problem for the requisite six miles, burning about 250 calories. That's the energy in 2.3 Red Bulls! (Note: Calories are actually kilocalories.) In

comparison, the winning team, Laval, used just 75 calories' worth of fuel in their run.

When I left the event, and shook hands with the LMU team I'd made friends with, it occurred to me that I want to develop a car. I'd done something similar with Formula SAE during my college days, but then it was about speed and power. This focus on fuel economy is somewhat foreign. But to the students at LMU, it is still the passion for automobiles that drives them, as it did me. The world is changing, and fuel economy is the next performance hurdle that sports cars will have to clear. Maybe the technology showcased here at the Shell Eco-marathon will keep sports cars alive well into the future. 



PHOTOS BY THE AUTHOR

» Loyola Marymount University's entry uses a hyper-tuned single-cylinder 50-cc Honda. Its tires are specially designed Michelins with extremely low rolling resistance.

SLICK FUTURE

With the ever-looming requirement of better fuel economy, there's a new oil standard coming out. This happens periodically as technology evolves, but rather than having each manufacturer specify its own, there's a joint effort from the International Lubricant Standardization Approval Committee. The

result is an American Petroleum Institute-certified bottle of oil on the shelf at your local auto parts store. As of October 2010, there will be a new API SN and SN/Resource Conserving label. The new specification of ILSAC GF-5 and API SN has the potential to improve fuel economy by a half-percent; negligible to the

consumer, but hugely beneficial on a global scale. Other benefits of the new oil spec include better resistance to deposits, reduced start-up emissions and improved catalyst life. This is already being implemented in Pennzoil's newest oil—Ultra, oil that should meet the coming API SN certification, and one

that promises to keep an engine's internals nearly as clean as the day it went together. Ford has announced that all 2011 models will allow for 10,000-mile oil change intervals...likely an indication that they'll be putting the newer and more robust engine oil specification to work saving fuel.—SB

Long-Term Test

BY JONATHAN ELFALAN >> ROAD TEST EDITOR

2010 Suzuki Kizashi GTS

Suzuki's Genesis



PHOTOS BY JOHN LAMM

LONG TOUTED FOR THEIR EXCELLENCE in building fast, 2-wheeled land rockets, the folks at Suzuki were constantly looking for angles with which to parlay the appeal into some of their more mild-mannered 4-wheel products. Maybe we're alone on this, but we have little reason to believe that the cross-marketing efforts had much effect in convincing people that a piece of Suzuki's sport-bike soul came infused in everything from the 150-bhp SX4 to the XL7 family hauler. Marketing can get you so far but like most other things, the best products are the ones that can speak for themselves.

On the surface, the all-new Suzuki Kizashi appears to speak a sporty language that we are familiar with, so we decided to find out for sure by arranging a long-term for a whole year. From the get-go, the Kizashi is not an easy product to place in terms of immediate competition. It's a bit larger than a compact, but not quite as big as other midsize vehicles. It's

styled quite sportingly, but manages to incorporate just enough class and elegance into its front and rear fascias to distance itself from the sport-compact crowd.

Under the hood is a fairly punchy, smooth-revving 2.4-liter inline-4 that makes 185 bhp when mated to a 6-speed manual transmission (as in our car; the CVT option by comparison is limited to 180 bhp), with 170 lb.-ft. of torque coming in at 4000 rpm. This manages to get us up to speed in a decent amount of time while returning some respectable fuel economy numbers (EPA 20/29, city/highway) that have been hovering around the 24.2-mpg range with our editors behind

>> The Kizashi's 185-bhp 4-cylinder is smooth and refined; power is adequate.



the wheel. While today is a time when we need to be more mindful of fuel conservation, our inner enthusiast can't help but feel that there's plenty of overhead left in this solid chassis. If Suzuki or any of its affiliates (such as Road Race Engineering) decide to introduce a 50-state legal hop-up kit, you can be certain we'll be first on that wait list.

Performance potential aside, we're looking forward to more than a handful of road trips given the level of comfort built into this car. When you get into the Kizashi for the first time, it's hard to be entirely sure you haven't stepped into a different echelon of Suzuki automobile—one that's a bit more deluxe than the Suzukis you may recall. The cockpit is remarkably quiet, with soft-touch surface treatments and materials that belie the sticker price of a vehicle starting at just \$19,000. And that's before we even get into the additional items that come with our \$22,500 GTS trim. Some of the nicer things in

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Mazda 3	2005-09	2.0L	69-6010TS	+5 hp
Nissan Altima	2007-10	2.5L	69-7061TS	+6 hp
Toyota Tacoma	2005-10	4.0L	63-9025	+10 hp

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2010 Suzuki Kizashi GTS	
Delivered price	\$22,897
Total miles	5123
Maintenance costs to date	\$0
Repair costs to date	\$0
Our mileage to date, EPA city/highway	24.2, 20/29
Best mpg (avg of 3)	31.3
Worst mpg (avg of 3)	18.7



clude dual-zone climate control, sport seats (10-way power adjustable for the driver), a leather-wrapped steering wheel and shift lever, a 425-watt 10-speaker CD/MP3/iPod audio system by Rockford Fosgate, Bluetooth music streaming capability and phone connectivity, as well as a power sunroof and fender-filling 18-in. alloy wheels.

In fact, all but a few features were included in our GTS-level trim. The premium metallic black paint, chrome body side molding (not by our choice) and premium floor mats set us back a whopping \$380. Beyond this, you can specify all-wheel drive (\$2400) for wetter, rougher climates, and in retrospect we probably should have requested the Kenwood navigation system, which has Garmin software.

The Kizashi is surely a showing of new strength in Suzuki's 4-wheel department,

» Soft-touch materials, comfortable seats and plenty of luxury features can make you question whether you're truly in a Suzuki.

and its praises are thus far echoing off our office walls. And how about that...not one mention of a 2-wheeler anywhere!



Chaparral 2F

JIM HALL'S WINGED WONDER



Jim Hall's Chaparrals were always ahead of their time, boldly playing with aerodynamics long before the science became so important in racing. And the 2F from 1967 is a great example, boasting a huge rear wing that was driver-adjustable! Phil Hill—who won the 500-mile race at Brands Hatch with Mike Spence—said that any time his right foot was on the 2F's throttle, his left foot was on the wing pedal, lessening downforce. With a big-block Chevy V-8 the 2F was especially fast, but a fragile

automatic transmission was its downfall, limiting the car to that one historic win, which was Phil Hill's last.

If you'd like to remember this classic Chaparral, we're offering this exquisitely detailed 1/18-scale model—configured as it raced at Le Mans in 1967. It's an amazingly accurate model, right down to the opening luggage lockers in the front fenders and the Texas license plate that always graced Jim Hall's Chaparrals.



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Ford Type C Racing Transporter & Porsche 935

With models, it's not often you get a race car *and* its transporter together as one set. But that's what we have here: a 1/43-scale Ford Type C box truck and a Porsche 935, both bedecked in classic Martini & Rossi colors. It's a meticulously detailed set, the truck even featuring a clear skylight roof for its cargo box, which has a folding loading ramp.

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An UPDATE on the Road & Track Fleet



» Acura TL SH-AWD: 16,408 miles.



» Mazda MX-5 PRHT: 9389 miles.

» At left, the Acura TL serves as photo/video chase vehicle around Spring Mountain Motorsports Ranch for our June 2010 cover story. Below, our Miata suffered a minor parking encounter with a concrete wall.

barren roads at rates that are slightly illegal. A trivial complaint is the light steering wheel feel that makes crosswinds more apparent, but there were other things to take my mind off that, like the pleasure of an adequately cooled driver's seat. The navigation made travel convenient, and helped us re-route around road construction with ease. The rear seats don't fold down (there's only a pass through), but the trunk was still large enough to swallow the wheels and our gear with only some of it spilling over into the back seat. Even then, there was plenty of space for three.

—Shaun Bailey, Detroit Editor



PHOTOS BY BRIAN BLADES

ACURA TL SH-AWD

While serving as a chase vehicle for our recent Ultimate Shootout cover story, our TL encountered an inexplicable sidewall contusion to one of the Michelin performance tires (our new partners at Spring Mountain Motorsports Ranch just happened to have a comparable replacement, albeit slightly used, that they graciously swapped in for us). Our desert driving unfortunately required us to change our cabin and air filters slightly ahead of schedule, but aside from that, the TL has proven to be extremely reliable and certainly a car we didn't have to wait for in the caravan.

"Whenever I drive our TL, I'm reminded of how entertaining a really good shifter can be, even in a luxury sedan. The TL profits from this, together with its responsive powerplant. However, what with that aggressive (and, to my eye, overly brushed-chrome) nose, I'd still rather be in a TL than viewing it."

—Dennis Simanaitis, Engineering Editor

HYUNDAI GENESIS 4.6

Comfort: The underlying reason the Genesis gets picked for trips such as the recent one Detroit Editor Shaun Bailey took to Utah.

"A 1500-mile weekend adventure to Wendover, Utah/Nevada, meant I was definitely taking the Hyundai Genesis sedan. Its 6-speed automatic, powerful Tau V-8 and copious space met my requirements of carrying four extra wheels and tires, plus passengers, to a race. The road to Wendover is desolate and runs north out of Las Vegas. Radar detectors are a good idea here especially in cars like the Genesis, which gulp down large stretches of straight

MAZDA MX-5 PRHT

The Miata (both inside and out) has been nothing but smiles since it arrived. It's also looking to be one of those wonderful low-cost maintenance cars that make owning one so appealing. We just have to remember to dial it back a little on this second set of tires.

"It seems every time I think I'm going to get access to our long-term Miata for the night, Senior Feature Editor Doug Kott beats me to the punch and snags the keys first. Kott must feel the same way I do, that it's fun to drive a really good slow car, fast. There's so much good about the Miata, particularly its precise short-throw 6-speed manual shifter and feedback-oriented handling, that the sore points seem minor: a loud cockpit, tiny trunk and only moderate power. The Miata shines where many cars these days do not, in that it makes every drive a good time."

—Mike Monticello, Feature Editor

2010 Acura TL SH-AWD	
Delivered price	\$44,195
Total miles/miles since last report	16,408/4360
Maintenance costs to date	\$378
Repair costs to date	\$0
Our mileage to date, EPA city/highway	20.6, 17/25

2010 Hyundai Genesis 4.6	
Delivered price	\$43,000
Total miles/miles since last report	21,673/6942
Maintenance costs to date	\$300
Repair costs to date	\$0
Our mileage to date, EPA city/highway	20.8, 17/25



» Hyundai Genesis 4.6: 21,673 miles.

2010 Mazda MX-5 PRHT	
Delivered price	\$31,150
Total miles/miles since last report	9389/2650
Maintenance costs to date	\$801
Repair costs to date	\$0
Our mileage to date, EPA city/highway	23.6, 21/28

PHOTO BY BRUCE BENEDICT



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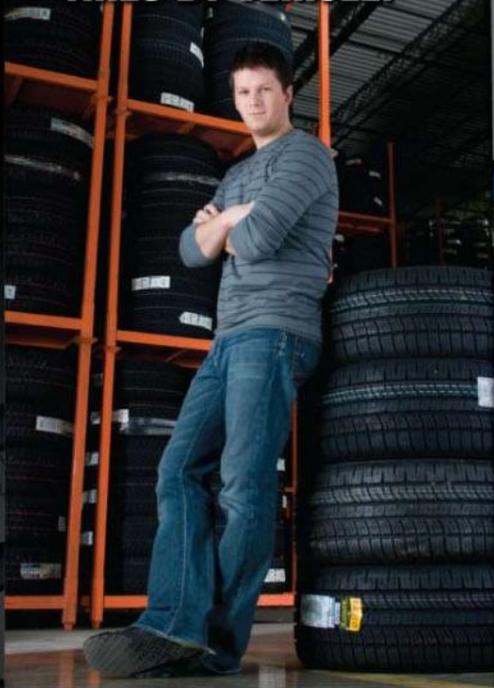


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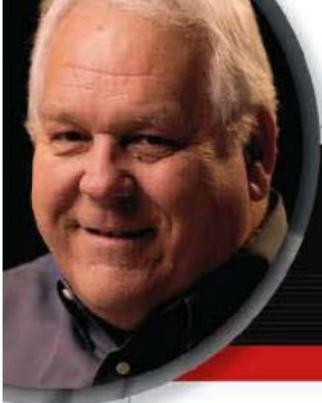
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Tech Tidbits

BY DENNIS SIMANAITIS >> ENGINEERING EDITOR

Think "Moo" When You Say DEF

Diesel Exhaust Fluid, DEF, appears to be the new environmentally preferred name for the chemical supporting SCR, Selective Catalytic Reduction of diesel NO_x. However, striving to maintain technical Truth in Advertising, I note that it's still a mixture of 2/3 purified water and 1/3 urea, bovine urine being one source of the latter. I confess I began this item poking fun at the euphemism DEF, but as I researched it a bit I warmed to the subject. No. Wrong metaphor.

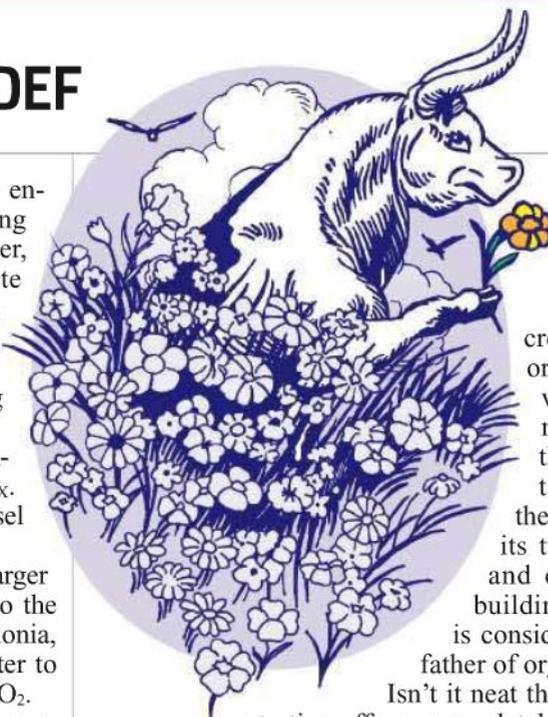
Here's how SCR works. First, understand that a diesel's inherently high compression ratio leads to high output of NO_x. What's more, there's a conflict of NO_x control with that of diesel particulates. What's good for the one is bad for the other.

Smaller diesel engines get by with other techniques, but larger ones seem to require the magic of SCR. When injected into the diesel exhaust, the urea, (NH₂)₂CO, decomposes into ammonia, NH₃, which in turn reacts with NO_x in the catalytic converter to form nitrogen, N₂, and water, H₂O. The urea's C ends up in CO₂.

The downsides are nontrivial, but manageable. Onboard supplies of DEF need periodic replenishment, roughly at oil-change intervals. The stuff gets slushy at around 12 degrees Fahrenheit, so provisions for cold-temperature operation must be made. There's also a challenge of containing the ammonia that's produced within the exhaust system, as it has a particularly pungent odor.

DISCREDITING "VITALISM"

There's an interesting aspect of science history associated with urea. It was identified as a component of urine back in 1773 by French chemist Hilaire Rouelle. The fascinating part came in 1828 when German chemist Friedrich Wöhler, trying to do something else entirely, found that urea could be made by treating silver isodyanate with ammonium chloride. This was a big deal because both of the latter are inorganic materials, that is, not associated with living things, yet their product, am-



monium cyanate, turns out to be precisely urea—most definitely an organic compound.

This finding helped discredit "vitalism," the theory that chemicals of life were somehow fundamentally different from those of inanimate matter. We now recognize the unity of chemistry with its two branches, inorganic and organic, sharing basic building blocks. And Wöhler is considered by many to be the father of organic chemistry.

Isn't it neat the things you stumble on starting off on a completely different path?

QUIET ON THE SET! BUT BRING ON THE H₂

I learned yet another use for hydrogen fuel cells, namely producing electricity at remote film sites. A chief advantage is the quiet operation of a proton exchange membrane fuel cell, especially compared with the noise of a diesel generator. Hitherto, the latter had to be isolated from the set, heavily muffled and connected by lengthy cables to its high-powered lighting.

If you happen to have watched the 82nd Annual Academy Awards ceremonies from Los Angeles, you've seen the result of PEM FC illumination. In fact, Altery Systems brought its Freedom Power System unit to the event. As one PR person observed, "It made the Red Carpet especially green."

I predict that before long, Hollywood celebs will leave their hybrids and limos parked and arrive in FCEVs.

What'll You Drive in 2030? Anything??

Alas, there are plenty of futurists predicting the demise of personal transportation. Thus, it's encouraging when a scholarly book comes along that incorporates some automotive enthusiasm. And so it is with *Reinventing the Automobile: Personal Urban Mobility for the 21st Century*, by Lawrence D. Burns, Christopher Borroni-Bird and William J. Mitchell; MIT Press, 2010; Amazon.com offers it for \$14.93.

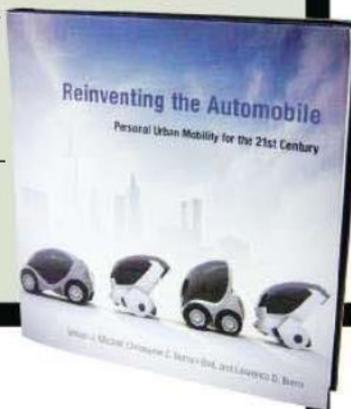
And, indeed, the automotive enthusiasm comes as no surprise: Larry Burns retired only last year from the position of vice president of research and development at GM. (I knew him

as one of the company's principal proponents of its fuel-cell program.) Borroni-Bird is GM's director of advanced technology vehicle concepts. Mitchell directs the Smart Cities research group at MIT's Media Lab.

The book develops a synergy of four proposals: First, restructure the DNA of personal urban mobility from its current internal-combustion stand-alone status to one of wireless-linked electric vehicles (these, in the broadest sense of EVs, hybrids and fuel-cell cars). Second, optimize their use through a Mobility Network, sort of a road-going vehicle-to-vehicle analog of the

net. Third, power them with smart-grid technology. And fourth, base their economics on a rethinking of pricing, everything from electric utilities to parking and road space to shared use (think computer-based hourly rentals).

Heady thoughts, all of these. But, as noted, they're also leavened with elemental enthusiasm for the automobile and its aspects of personal entertainment.



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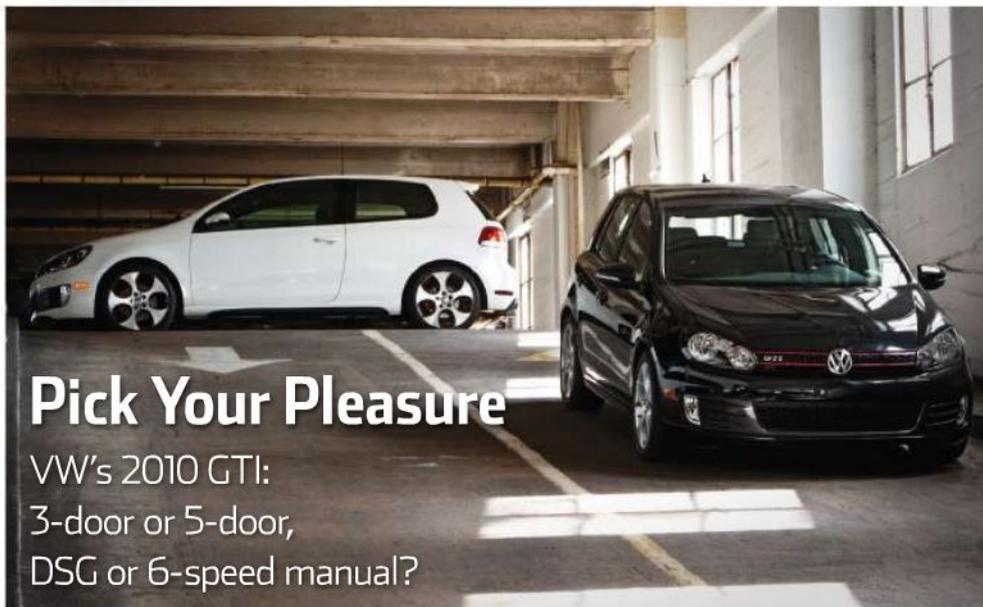
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ROAD TEST

Update



PHOTOS BY CHRIS CANTLE

Pick Your Pleasure

VW's 2010 GTI:
3-door or 5-door,
DSG or 6-speed manual?

IN THE MARKET FOR A GTI? YOU'RE A wise person. The boxy little hot hatch—now in its 6th generation—is more entertaining than ever, thanks to a firmly sprung but well-damped suspension and a gem of an engine: VW's direct-injected and turbocharged 2.0-liter 4-cylinder, which sends 200 bhp to the front wheels in silky smooth fashion. On boost, this 16-valve twincam powerplant pulls the GTI around with surprising alacrity; off boost, such as when cruising down the freeway, you get all the economy you'd expect of a reasonably small 4-cylinder. EPA highway fuel economy is in the low 30s.

Problem is, which GTI to get? The 3-door or the 5-door? Although you might not expect this, both have the same 101.5-in. wheelbase, and both are

about 165 in. long. What's more, both are built in Wolfsburg, Germany, and they're available with either a 6-speed manual transmission (standard) or a 6-speed dual-clutch DSG gearbox, an \$1100 option. This transmission has both automatic and manual modes, the latter employing shift paddles that invoke super-quick upshifts and beautifully rev-matched downshifts.

To answer our question, we arranged two GTIs, a Candy White 3-door with DSG and just about every conceivable option (and a hefty price of \$31,900), and a more modestly equipped Deep Black 5-door with a 6-speed manual that came in at \$24,789.

Leaving the line at the track, the DSG GTI, as expected, is quicker, leveraging its launch control software and lightning-

2010 Volkswagen Golf GTI	5-Door 6M	3-Door DSG
List price	\$23,890	\$23,290
Price as tested	\$24,789	\$31,900
Curb weight	3285 lb	3370 lb
Engine, transmission	turbo 2.0-liter I-4, 6-sp manual	turbo 2.0-liter I-4, 6-sp DSG
Horsepower, bhp @ rpm	200 @ 5100	200 @ 5100
Torque, lb-ft @ rpm	207 @ 1800	207 @ 1800
0-60 mph	6.6 sec	6.1 sec
0-100 mph	16.1 sec	15.8 sec
0-1320 ft (1/4 mile)	14.9 sec @ 96.2 mph	14.6 sec @ 96.9 mph
Top speed	130 mph*	130 mph*
Braking, 60-0 mph	136 ft	143 ft
Braking, 80-0 mph	237 ft	247 ft
Lateral accel (200-ft skidpad)	0.88g	0.86g
Speed thru 700-ft slalom	67.1 mph	66.2 mph
Our mileage, EPA city/highway	est 25, 24/31 mpg	est 25, 24/32 mpg

*Electronically limited.

quick upshifts to hit 60 mph in 6.1 seconds—that's 6/10ths swifter than VW claims and a half-second ahead of the 5-door manual GTI. The gap narrows in the quarter mile (14.6 sec. versus 14.9), but the fact of the matter remains: Both are fast enough to be lots of fun.

In the slalom, the 5-door GTI proved quicker, weaving through our cones at 67.1 mph and with a bit better balance than the 3-door car, at 66.2 mph. This may be related to its lighter weight (fewer options means it tips the scales 85 lb. lighter than the 3-door), and its 17-in. 225-width all-season Continentals felt like they had better limit behavior than the 3-door's more aggressive 18-in. Pirellis. This was also borne out on the skidpad, where the 5-door lapped at 0.88g, slightly better than the 3-door's 0.86g.

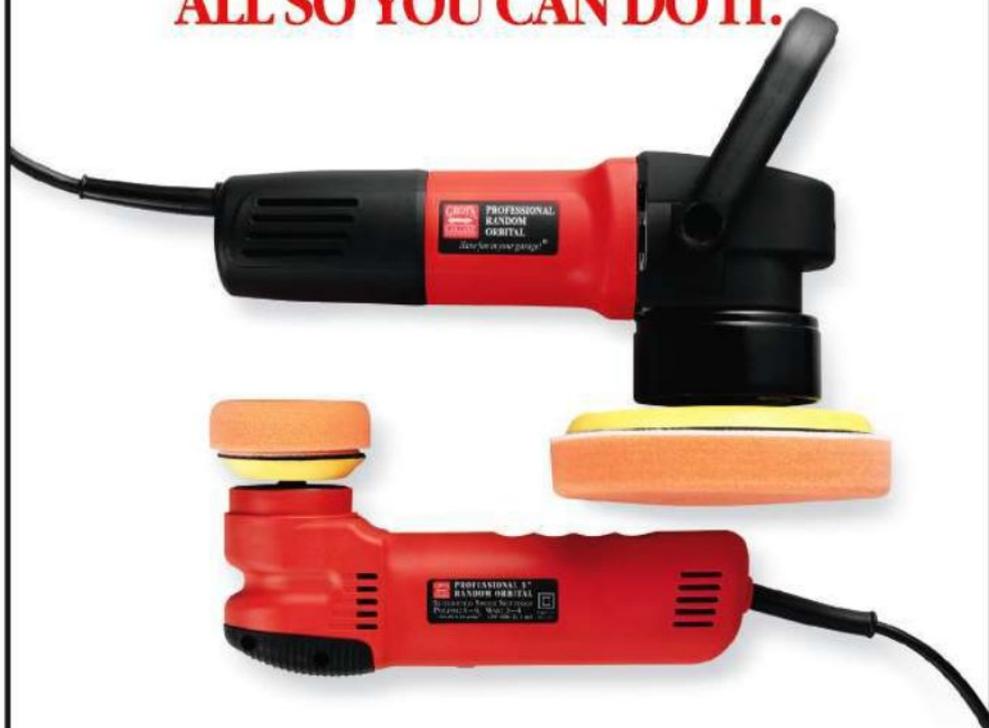
On the inside, both GTIs are handsomely styled and fitted with high-quality materials and a meaty-rimmed steering wheel. The optional leather-covered sport seats of the 3-door are quite comfortable, but we'll give the nod to the seats in the 5-door, whose plaid pattern recalls the first GTIs of 1983...and hopefully not that old Members Only jacket your wife made you throw away just last year. Also on a positive side, there's room for tall drivers in each GTI, and although the back seats of each are equally spacious, access to the bench is obviously aided by the extra doors.

So, 3-door or 5-door? Tradition says go with the 3-door, but it also tells us that GTIs have always been about affordable fun, for the enthusiast who might still be paying off some student loans. On the other hand, the 5-door is kind to any folks you might need to schlep around, and it doesn't seem to detract from the sporting experience. And as for DSG, it really is the best of both worlds, a mistake-free automatic that can shift quicker than humanly possible, but lacks the driver engagement of the standard light-action 6-speed manual. Our final verdict: We'll take a 3-door manual with very few options to keep it near the \$23,290 base price. And don't forget the plaid seats!—*Andrew Bornhop*

» Both GTIs offer an excellent driving environment, with a thick-rim steering wheel.



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Trackside



AMERICAN CARS RULE IN EUROPEAN GT RACING

Callaway Corvettes and Ford GTs lead the way

BY JOE RUSZ

Formula 1 is a fickle mistress. Love her as we may, she has spurned our advances. There hasn't been a U.S. team in F1 since the '70s. And when's the last time you saw a Yank on a Grand Prix podium?

(That would be 1993, when Michael Andretti finished 3rd at the Italian Grand Prix at Monza in his final race for McLaren.) GT racing, on the other hand, is America's sweetheart. All over Europe and the Middle

East, U.S. cars are taking names and kicking tail in a variety of GT-based series.

In this year's FIA GT3 European Championship, arguably the best of the foreign series, a Callaway Corvette won the season opener at

Silverstone, beating Aston Martin, Audi, BMW Alpina, Ferrari, Ford, Lamborghini and Porsche. And then in next two rounds, at Brno in the Czech Republic, Callaway Corvettes won both events, even sweeping the top three spots in the wet Saturday race. Meanwhile, in the Automobile Club de l'Ouest-backed Le Mans Series, Ford GT coupes powered by Roush-Yates engines finished 1-2-3 in the Spa 1000 Kilometers, just weeks after one of the Fords had won the opening round of the FIA GT1 World Championship in Abu Dhabi, where a Corvette finished 2nd.

Of the various series, FIA GT3 and the ADAC GT Masters, a German series backed by that country's auto club, are the handiwork

of the Stephane Ratel Organization. Because they share similar rules, there's often a crossover of entries. Case in point: The Callaway Corvettes race in both contests. Based on the current Z06 road car, the Vettes are race-prepped in the Callaway facility in Leingarten, Germany, where craftsmen gut the interior, install the requisite rollcage (bolted in place because the cage is steel and the chassis is aluminum), fuel cell, safety equipment, air jacks and other gear, and then substitute the company's unique carbon-fiber bodywork for the production Corvette's. AP Racing brakes replace the stock discs,

PHOTO BY WALT THURN





the other hand, are “free” in rules book jargon, so instead of the stock gearbox, the Callaway sports a Hewland sequential-shift 6-speed, which bolts to the production GM rear differential. By the way, if swapping trans-axles seems like a stretch of the rules in a production-car-based series, consider the dispensation given to Audi, whose purpose-built R8 LMS coupes have been converted to rear-wheel drive because awd isn’t allowed in GT3. The American connection in European GT racing is not just limited to hardware since two of the Audis are driven by Americans Zak Brown, Michael Guasch and Mark Patterson.

Despite the Callaway’s Chevy underpinnings, the car is no longer considered a Chevrolet by the sanctioning bodies and is homologated (approved for racing) as a Callaway Corvette Z06.R. “We wave the flag for Corvette in the FIA GT3 championship,” says company founder Reeves Callaway. In fact, in FIA GT1 and in the Le Mans Series, the half dozen or so Corvette C5-Rs and C6.Rs are hand-me-down factory cars fielded by privateers.

while meaty Michelin tires mounted on OZ center-lock wheels take the place of the original units.

Changes to the road car’s Chevrolet LS7 V-8 engine are modest and stress reliability over horsepower (at 520 bhp, the Callaway has plenty and has already been restricted for the sake of parity). Transmissions, on

With GM and other manufacturers out of the picture, GT1 will likely be reconfigured in 2011. The no-holds-barred category, which stretched the meaning of “production-based,” was dominated by certain factory teams. This discouraged privateers and reduced the number of entries. To keep this from happening in GT3, the rules don’t allow factory teams and strive for car equality. Each car, of note, must be evaluated by an FIA-appointed test driver in a so-called “Balance of Performance” testing session conducted at Circuit Paul Ricard, an extensively instrumented racetrack in France. If necessary, the cars are handicapped either



PHOTO BY CALVIN KIM



» To prove the durability of its new 4-door sedan, Aston Martin raced a Rapide in this year’s Nürburgring 24. Likely the only car in the event with a standard torque-converter automatic (a paddle-shift 6-speed), the Rapide ran flawlessly all race and was driven to a 2nd-place class finish by CEO Ulrich Bez and teammates.

by adding ballast or by fitting an air restrictor to the engine, or both. Additionally, 44 lb. of ballast is tacked on to a winning car before its next race to keep it from dominating the series.

The series also strives for parity among drivers with a slew of rules that spells out who is allowed to race in GT3, where each team must enter two cars

with two drivers sharing the same car. There are four driver categories: platinum (essentially pros, including Indy, Le Mans, F1 winners and “works” drivers under age 55), gold (winning semi-pros or platinum drivers over 55), silver (advanced amateurs under 30 with winning records or extensive single-seater experience) and bronze (ama-

teurs). Platinum drivers are not allowed at all, but all of the other drivers are mixed and matched—gold with bronze; silver with silver or bronze; bronze with gold, silver or bronze—to further level the playing field.

But level or not, GT racing is the one European playing field where American cars have come to play—and win!



Dinan, who has been tuning BMWs for 31 years from his shop in Morgan Hill, California, builds the engines that have powered the Ganassi-Sabates Riley-BMW to three straight wins in the 2010 Rolex Daytona Prototype series, defeating the likes of Porsche, Ford and Chevrolet. We caught up with Steve before the Lime Rock race.

1 Your Daytona Prototype BMW engines are now winning lots of races. What’s behind all this success?

The engine has always been very competitive. However, this year, we finally got the

best team. Winning in racing takes everything to be right, the equipment, the preparation, the engineering and driving. Those stars have lined up for us this year and you can see the results.

2 How many BMW engines have you built for the series?

We have built almost 100 engines since we entered the Rolex series in 2004, and we are currently providing engines for four cars.

3 Is it true that, with continuous testing on the dyno, you’re happy to find maybe 1 or 2 bhp per month?

The rules are so tight that finding 1 or 2 horsepower is great progress. I wouldn’t say I am happy with that, but that’s all there is to find.

4 Do you personally spend more time on the

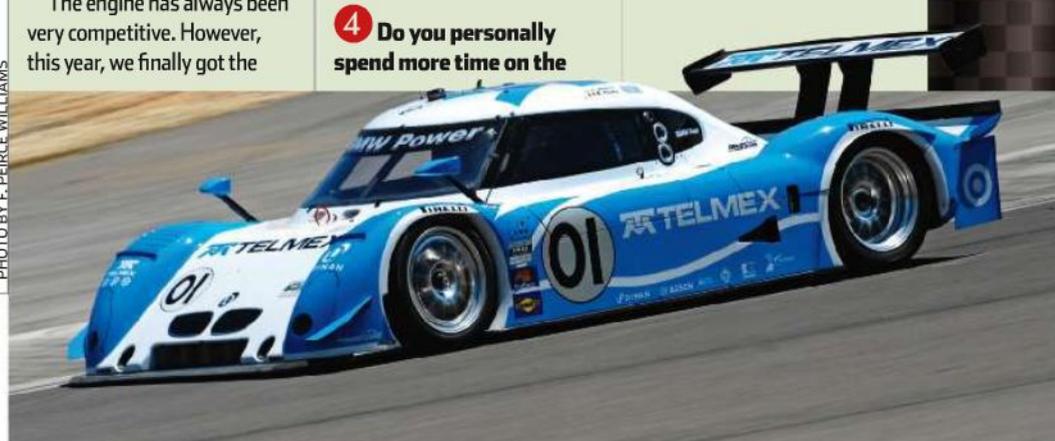
race engines or on your road car programs?

I personally split my time equally between racing and the street car program. I act as the technical director at Dinan so I am involved in all development.

5 Has the race engine-building program benefited your street cars?

Definitely. When there are no rules like you have with street car engine development, it’s easy to make power. When you have to dig deep to find things, it teaches you much more about the technology of how an engine works. This knowledge depth finds its way into your street car engine programs as well. Basically, once you have learned something, that knowledge is with you and everything you do benefits from it.

PHOTO BY E. PERCE WILLIAMS





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NÜRBURG, GERMANY—THE BRILLIANT Ferdinand Porsche was a man ahead of his time. Consider this: He developed a hybrid electric car in 1900. Called the “Semper Vivus” Lohner-Porsche, it was fitted with two combustion engines, a battery and each of its front-drive wheels had an electric motor. Nevertheless, it’s fair to say that Porsche, along with other German carmakers, has been a reluctant adopter of hybrid technology in its road cars. That is changing quickly; witness the upcoming Cayenne and Panamera hybrids.

In fact, hybrid technology is already at work in Porsche’s racing world. The Stuttgart company made a big splash this year by entering a 911 GT3 R Hybrid in the 24 Hours of Nürburgring, where 198 pro-

duction-based cars were unleashed on a 15.8-mile course that combines the modern Grand Prix circuit with the classic Nordschleife. More than 200,000 crazy campers—some mulleted, many fortified by Bitburger or Warsteiner—attend this huge event, standing for hours behind the triple Armco barriers and watching the cars buzz, roar and blast on by.

The Nordschleife is the Mecca, the beating heart, the proving ground of Germany’s rabid car culture, and a BMW M3 GT2—essentially a Rahal ALMS car driven by Jörg Muller, Augusto Farfus, Uwe Alzen and Pedro Lamy—took the overall win, ending a run of four straight

victories by a 911. And an Italian interloper, a Ferrari 430 GTC—the only Ferrari in the race—sliced its way from 46th on the grid to an impressive 2nd, driven at times by Leh Keen, an American with only 10 laps of experience on the Ring before the race began. “From a driver’s standpoint, it can’t get any more intense than this,” confessed Keen, a Rolex Grand-Am GT champion who said his headlights would blind slower traffic at night, which made the long uphill section after Adenau especially hairy, particularly given the fast closing speeds that his Farnbacher Ferrari had on slower traffic.



38TH ADAC ZÜRICH
24 HOURS OF
NÜRBURGRING

Future FLYER

Porsche's new 911 GT3 R Hybrid goes fast,
but can't quite conquer the Green Hell

BY ANDREW BORNHOP

but was able to squeeze more miles out of its regulation 120-liter fuel tank.

The 911 Hybrid needed to pit for fuel every 10 laps, whereas the V-10 Audi R8s, one of which had qualified on the pole, had to come in every eight. Given a race distance of 154 laps (the M3's winning total), that means the Porsche Hybrid would need to stop four fewer times than the Audis. And with an average pit-in/pit-out time of 2 minutes 30 seconds (no fancy refueling rigs allowed), the Hybrid would spend 10 less minutes in the pits than the Audis...more than a lap's advantage on a track where the lead cars were circulating in the 8-min. 45-sec. range.

The secret to the 911 GT3 Hybrid's efficiency? Its 400-volt electric-assist system, developed by the Williams F1 team and featuring a flywheel mounted low on the passenger floorboard, right next to the driver. This vertical-axis flywheel—which weighs 40 kilograms and spins in a vacuum at an operational range of 28,000 to 40,000 rpm—stores electrical energy that can be sent to a pair of 60-kW electric motors at the front wheels, but only for a 6-sec. burst before a recharge is needed.

And how does that happen? Regenerative braking, just like in your Prius. But rather than having the kinetic energy recharge batteries, it's used in the 911 Hybrid to power the composite flywheel back up to 40,000 rpm. Of note, quick charge/discharge ultracapacitors were considered, but they have heat issues when subjected to repeated cycling. With the flywheel, Bergmeister said all it takes is a few heavy braking zones—in which the driver downshifts from 6th to

2nd—to fully charge the 911 Hybrid's flywheel, which stores its energy for a lengthy but unspecified amount of time. Of note, the Hybrid driver also has a red *Rekup* button on the steering wheel that uses the electric motors—independent of any braking—to power the flywheel up to speed on, say, a warm-up lap, to ensure that the car has all available power on tap once the race begins. In another technique, the driver can open the throttle a little bit during deceleration to help speed the recharging of the flywheel.

Another interesting tidbit: Once the 911's flywheel is fully up to speed (at which point it emits a high-pitched whine) the car automatically switches to purely mechanical braking—sometimes right in the middle of slowing for a corner. Because of this, and because the feel of the pedal changes significantly at the switchover point, the driver needs to know when this is going to happen. Hence, the 911 Hybrid is fitted with a “State of Charge” number on its Motec dash, although Bergmeister had the team augment the readout with vertical LEDs on the dash that are much easier to see.

A single metal paddle, on the back side of the steering wheel at the 9 o'clock position, allows the driver to send 120 kilowatts (about 160 hp) to the front wheels of the 911 Hybrid whenever he desires, but, again, only in 6-sec. bursts. The paddle is an on/off switch, so the 911 Hybrid has nine proprietary driver-selectable settings that manage the power delivery to the front wheels, each taking into account parameters as varied as steering angle, gear, throttle position, vehicle speed and state of charge.

One car he wasn't closing in on, though, was the white and orange Porsche 911 GT3 R Hybrid. The factory-supported Manthey Racing effort led the race for 8 hours—and almost certainly would have won if its 480-bhp 4.0-liter flat-6 engine hadn't gone kaput with less than two hours remaining. Driven by Jörg Bergmeister, Richard Lietz, Marco Holzer and Martin Ragginger, the 911 Hybrid—a technically fascinating machine that points to a new era of racing efficiency—was able to lap at essentially the same pace as the leaders

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Bergmeister, reigning ALMS GT2 champion, says the topography of the long and hilly Nordschleife suits the Hybrid well, and that he found the electric assist most helpful on uphill sections and while exiting low speed corners, where the front drive allows him to get on the throttle earlier than usual and even pull the back end into line if it decides to step out a bit. "At Adenauer Forst I always get exit oversteer in the rain. Now, when the Traction Control light kicks on I simply pull the lever and feel the car just go," said the tall German, who grew up not far from the Ring. He notes as well that the flywheel assist is also a handy "push to pass" feature.

All told, the hybrid system—with flywheel, motors, cabling, management, cooling system and box-shaped scatter shield made of aluminum, magnesium and Kevlar—adds about 375 lb. to a standard 911 GT3 R. Bergmeister likens it to having a passenger in the car, and says he adjusts his braking points accordingly. Because the flywheel is mounted so low in the chassis—near the 911's center of gravity—the drivers say they feel no gyroscopic effect on the car's handling.

Although the Hybrid drivers publicly said they'd use the flywheel assist about six times per lap on the Nürburgring, it's believed that they used it as often as possible, perhaps four times that much. And why not? Using the system improves both speed and fuel economy, especially the latter when the drivers short-shift into a higher gear to allow the excellent torque of the electric motors to work its magic.

Based on the GT3 R Hybrid's solid performances in a pair of VLN races prior to the 24, race organizers added 25 kilos (55 lb.) to the car, so it raced at 1375 kg (3032 lb.). Even so, it managed to stay ahead of the gaggle of 1350-kg Audi R8s in the race, and even maintained the lead following a 12-minute late-race stop to replace a broken exhaust header. A bit later, though, with 1 hour 45 minutes left



PHOTO BY TIM CONSIDINE

» Charging to the front: For 8 hours the 911 Hybrid led the huge Nürburgring field, which included several Audi R8s, the winning BMW M3 and the 2nd-place Ferrari F430.

in the race—and only one more pitstop needed before the finish—Bergmeister heard a loud *thunk* from the back of the car. It was terminal; the 911 Hybrid had to retire, not a victim of an electronics glitch but rather some part in the time-proven flat-6 engine.

"For me as a driver, of course, I was disappointed," said Bergmeister. "You always want to win, especially when you're that close. But in the end, it was a really great experience and I really learned a lot. We had the same pace of the Audis and the BMWs, but we had the big advantage of better fuel efficiency. Everybody said it was going to be a 24-hour sprint race. And that's what it was. We weren't holding back anything. We were pushing flat-out."

The pre-race weight penalty assessed to the 911 Hybrid did not sit well with Porsche Motorsport boss Hartmut Kristen, who felt that extra-efficient race cars should be encouraged to participate, not discouraged. Porsche's goal with the Hybrid was simple: "We wanted to show that, with a heavier car, we can keep up the performance level and drive more efficiently," said Kristen. Al-

though Porsche publicly stated that it would be satisfied with a 10th place or better for the Hybrid, the disappointment shown on R&D boss Wolfgang Dürheimer's face was palpable, proof that Porsche thought outright victory was possible.

And if it weren't for some internal part in Porsche's flat-6, the 911 GT3 R Hybrid clearly would have won. Nevertheless, it was an impressive performance for an experimental car that made its track debut only last December, a car that helps teach Porsche about energy management strategies for upcoming road cars such as the 918 Spyder, and could conceivably be used next in a single-marque Carrera Cup series.

It also makes Kristen wax philosophical about the future of auto racing. "Horsepower alone does not create performance. All of us manufacturers can make a GT car with 500 bhp. What's the message being sent to the public?"

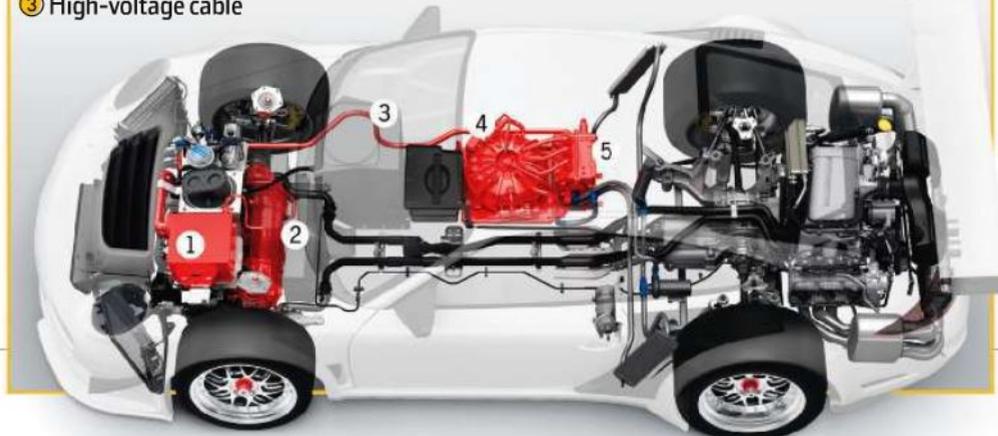
To that end, Kristen advocates a future racing series in which the cars are not equalized for performance but are given a limited energy supply for each race, which would allow the public to see which manufacturer works best within a given framework of rules. "Keeping up the performance is not a problem," said Kristen, who adds that in 10 years' time, fuel economy improvements of "25, 30, 50, even 60 percent may be required, which means we'll have to try many different ways."

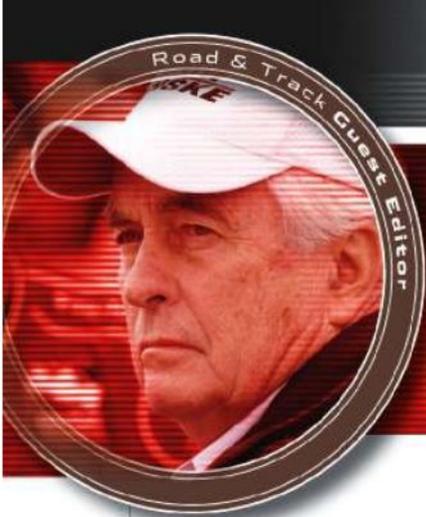
In the meantime, Dürheimer said a diverse future is in store for Porsche, and that an upcoming GT2 model could conceivably feature a flywheel electric-assist system like that of the 911 GT3 R Hybrid.

And speaking of that race car, it has some unfinished business and will race next at the Petit Le Mans. If you want to see Porsche's race car of the future in action, head to Road Atlanta in September. ☺

What's **WHAT** in the Porsche 911 GT3 R Hybrid

- ① Power electronics
- ② Two electric motors
- ③ High-voltage cable
- ④ Flywheel battery
- ⑤ Power electronics





The **PODIUM**

Roger Penske

The Captain's "Five Cs" Control Cost

It is difficult to go back to my first Indianapolis 500 victory and know what the feeling was in 1972 when Mark Donohue won the race. That was many, many years ago. And each Indy victory is so important. Danny Sullivan spinning and winning in 1985, Rick Mears getting his fourth win in 1991, Bobby Unser and the year we had to wait six months to find out we won the 1981 Indy 500, winning with a Mercedes engine in 1994. And then there's Helio Castroneves, who came back last year and won his third Indy 500 title after he went through a difficult personal situation. Every year is interesting and obviously creates a lot of emotion. But I never look back. I spend my time looking forward.

With the amalgamation of CART/Champ Car and the IRL, we are enjoying an Indy car racing renaissance. We're seeing races with

the costs would be lower because everyone would share the same components. For example, today we all run the same gearbox. The costs are less, and the pieces are readily available.

There's also been a lot of discussion about engines. Should we go to a turbocharged V-6 or an inline-4? To me, it doesn't matter. However, I do believe that we should have push-to-pass, which has really made a difference because you don't have cars hanging around in long lines like you see in Formula 1 and other series. There has also been a lot of discussion about the Delta Wing car, which I find very interesting and would support its development. But it is hard to look at things only on paper; we have to see the car on the racetrack. I am taking the approach that if it makes the racing better, if it brings more fans into the stands, then we have to look at it.

Today you do not have the edge that you had in the past when you could be more innovative or use a different car or a different engine than the competition. Today it is a level playing field from the standpoint of equipment, so it is the little things that make a difference. Like quality, reliability and strategy. You also need drivers who know how to win. Drivers like Ryan Briscoe, Helio Castroneves and Will Power, who can provide feedback to their engineers, who are committed to the sport, and have the ability to promote themselves and the team. This may be marketing, but it is important. To build your team you have to look for young

"My motivation: Take people, give them an opportunity and see them succeed."



25-car fields, and as the fields increase, so does the interest of the fans. We've got Danica Patrick with her notoriety, and now Simona de Silvestro adding a little bit of rivalry as another talented female driver. Izod has brought excitement as the new series sponsor, the teams seem to be very competitive and attendance has been strong.

But while I think the Izod IndyCar Series is headed in the right direction, my big concern right now is cost. One of the good things that Tony George did was reduce the costs of IndyCar racing. Running an IndyCar operation now costs 25 to 30 percent of what it costs to field a NASCAR team. That's why I've talked about the five Cs, where you would have the cylinder head, cylinder block, crankshaft, camshaft and connecting rods made by one organization so five different companies would not have to pay for the tooling. Another company could do the top end, the fuel injection and so forth, and put its technology on the Internet to keep a level playing field. It would be great to have multiple engine manufacturers using their own blocks fitted with common components. The companies could promote their own brand, but

talent—like Justin Allgaier and Brad Keselowski, drivers who are starting to win on the NASCAR side, and Parker Kligerman, who is just out of high school. By the way, we have never had anybody buy a ride at Penske Racing. We pick the drivers and always tell them: "You have got the job; you are not auditioning. You do not have to drive the car transporter."

Racing is the DNA of Penske Corporation. We use it as our advertising medium and our marketing medium. It attracts people to our brand and has been a tremendous resource for us. Racing is about quality, about integrity. It is all about performance and execution. But more than that, I think the key to our success in racing has been the continuity of our people, the low turnover and the ability to have hundreds of years of experience on our team. It is the human capital; it is the people who are important and just associating with everyone involved has been a thrill for me. In fact, it has been my motivation: Take people, give them an opportunity and see them succeed. And I would not do anything differently in my career.

PHOTOS BY PHILLIP ABBOTT AND MIKE LEVITTLAT



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BY TOM WILSON

Low-Mile Maintenance, Filter Fundamentals

AUDI PAMPERING

I'll soon be taking delivery of a new Audi A5, a 3.2-liter automatic, and would like some advice for maintaining what will be a low-mileage car. The car will be driven 7000 to 8000 miles a year and will sometimes sit for a month or more without being driven. What oil change regimen should I follow? Should I be concerned about a high number of short trips that very likely will be made? Any other suggestions? I am particularly concerned about carbon buildup with the high compression ratio of the engine.

Joseph Korte

ISSAQUAH, WASHINGTON

Congratulations on the new Audi. Our primary recommendation for any car expected to live a long life is to garage it every minute it is possible to do so. Cars die more from faded paint and upholstery, dead weatherstripping, rotted plastics and rust than they do from worn engines.

Practically speaking, engine life is maximized by frequent oil changes and clean air filters. With short tripping and low mileage, a one-year maximum per oil change is indicated. It is also beneficial to drive at freeway speeds for at least a half-hour to help evaporate water out of the oil between changes, so take the Audi on a good drive occasionally.

We would not worry about the inevitable six weeks of downtime. That's not long enough to make preservative measures useful, so simply park it indoors or in a parking garage when you go on vacation.

As for carbon deposits and the engine's high 12.5:1 compression, it's not an issue. Run a high-detergent, name brand premium gasoline to keep the injectors clean and let the inherently clean-running electronic fuel injection do the rest.

CHECKING ON CHECKING

Just when should one check the oil? I've been told to check it when the engine is warm, a few minutes after shutting it off, but what's the official word?

Michael Herbert

DELAWARE, OHIO

It's best to check the oil under repeatable conditions, and the most repeatable situation is with a warm engine and the car on level ground. Wait a half minute for the oil to drain back into the sump, then check it. This lets you check the oil

level at the usual fuel stops as well as at home.

Checking the oil first thing in the morning is also legitimate assuming the car is on level ground. There could be a slight difference in this overnight versus the hot oil level, so compensate if necessary.

In our experience there isn't too much rocket science in any of this. The one thing that definitely makes a difference is keeping the car level. This is especially true of cars with relatively shallow, wide or long sumps.

POWER AND ECONOMY?

How do the manufacturers of high-flow air filters claim increases in both power and fuel economy? I'm thinking that if the air filter allows more air into the engine, more fuel will be required for proper and efficient combustion. This will result in more power and more fuel use. Am I missing something?

David Kozisek

WASHINGTON, D.C.

Maybe what you're forgetting is the throttle controls airflow until the throttle is fully open. Low-restriction air filters improve engine efficiency because less horsepower is wasted trying to drag air through the restriction posed by the air filter. The driver can take this bonus either as extra power—just mash the throttle and more power is made (and more fuel burned). Or extra economy is enjoyed at less than maximum power because slightly less power is lost drawing the air into the engine, so the throttle need not be opened as far. Thus, you can gain power or fuel economy, but not both at the same time.

STEEP LEARNING GRADIENT

Is parking and starting your car on a steep incline bad for the car, particularly the drivetrain? When I shift into Park there is a distinct *thunk*, which does not sound good.

Lyle Kan

MONROVIA, CALIFORNIA

In short, no. But some drivetrains, especially when worn, emit a healthy clunk when shifted as you describe. The sound comes from the lash in the driveline being taken up with authority.

One way to avoid this is to use the parking brake to hold the car before it is shifted into Park. Do this by parking the car, leaving it in Drive and keeping the brake pedal pressed. Then apply the

parking brake sufficiently to hold the car from rolling. Shift the car into Park, then release the pedal. This technique holds the car in position, keeping the driveline lash from being taken up in the rearward direction.

When starting out, start the engine, press the brake pedal, put the transmission into Drive, then release the parking brake. There should be no, or reduced, thumping.

TURBO COOLING

I would love to buy a fuel-efficient sporty car to keep for years; a small car with a turbo is the best fit. Considering I want to maintain my car so it will last, what is the proper way to cool the turbo before turning off the engine? What if I just took a quick trip without racing around? How about taking it easy for the last mile after I really run the car? I am not interested in a turbo timer that might void the factory warranty.

Brandon Geiling
HARRISBURG, PENNSYLVANIA

In your case, the easiest method is to let the engine idle for a few seconds before shutting it off. As you know, this allows cooling water to flow while the turbine and compressor wheels are spinning more slowly, plus it allows (rather) limited air-cooling of the turbo as the mass of exhaust gas flowing through the turbo is reduced when the throttle is closed.

We're expecting the amount of turbo cooling

required to diminish with the newer, mass-produced systems now reaching the market. On one hand, these smaller turbos spool up (begin to rotate more quickly) sooner than older performance turbos. This means they might be active more often than we think during a run to the corner store for a quart of milk.

On the other hand, improved materials, cooling capacity and extensive testing by the manufacturers should make turbo technology essentially bulletproof, even in the face of brutal general public use. We've received no special instructions on turbo handling in the newest systems from the engineers, and expect turbo engines to be just as refrigerator-reliable as other modern engines.

BIG WHEELS FOR KIDS?

Other than me-too styling and pandering to the automotive press' road tests, I can't see the point of putting 20-in. wheels and ultra-low profile tires on a general purpose vehicle. Tread life, ride and bad weather performance have to be far inferior to the more traditional rim sizes and aspect ratios. Am I crazy?

Dick Souren
CANTON, GEORGIA

You're not crazy, Dick, you're right on. For a typical car, a wheel diameter around 17- to 18-in. is optimal. Typically, a larger wheel and tire combination increases unsprung weight, which hurts handling and ride quality, and also increases rotating mass, which can hurt acceleration.

Going larger can improve steering feel with shorter, stiffer sidewalls, but really, it's just vanity, and at high financial and technical cost.

ACTIVE WEAR

I own a 2008 Honda Accord V-6 with "cylinder deactivation" that works very well. But because the same cylinders are consistently left "active," I wonder if this adversely affects engine life.

George Miners
AUBURN, CALIFORNIA

All manufacturers with cylinder deactivation systems report no meaningful difference in cylinder wear between active and inactive cylinders.

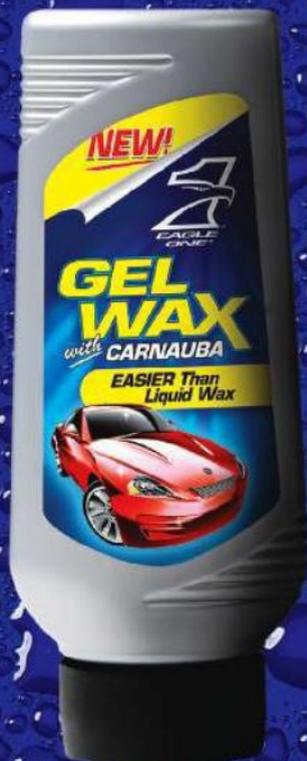
CORRECTION

We absent-mindedly tripped over our toolbox when advising Jake Pullian on disconnecting his Ford Galaxie's battery cables (Plugs, Points & Condenser, June 2010). As always, disconnect the *negative* ground first, and re-connect it last whenever isolating the battery.

Do you have a technical question?

Send it to RTLettters@hfmus.com, or Technical Correspondence, *Road & Track*, 1499 Monrovia Ave., Newport Beach, Calif. 92663. Be sure to include your first and last name, hometown and state.

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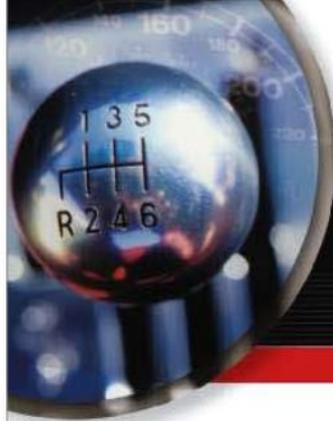
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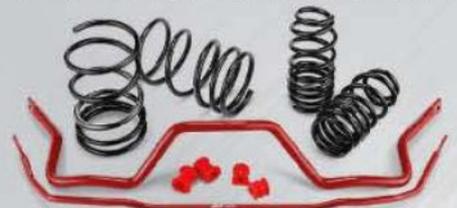


Road Test Summary

Make & Model	Issue	Price as Tested ³	Engine Type	Horsepower	Torque, lb.-ft.	Curb Weight, lb.	0-60 mph, sec.	0-100 mph, sec.	1/4 mile, sec. @ mph	Top Speed, mph ⁴	Braking from 60 mph, ft.	Braking from 80 mph, ft.	Skidpad, g	Slalom, mph	Our Fuel Mileage, mpg
Acura RL ¹	5-09 ¹⁰	\$54,860	V-6	300	271 4085	6.2 15.3	14.7@97.8	130 ⁵	126 226	0.86 673	17.0 ⁴				
TL SH-AWD	5-10 ²	\$44,195	V-6	305	273 3860	5.2 13.1	13.7@102.3	130 ⁵	113 198	0.91 684	15.8				
TSX V-6 ¹	9-09 ¹⁰	\$38,760	V-6	280	254 3630	5.9 14.6	14.4@99.3	130 ⁵	133 241	0.85 64.1	19.0 ⁴				
Alfa Romeo 8C Competizione	1-08	\$253,750	V-8	450	354 3495 ⁴	4.2 9.3	12.4@115.4	181	105	196	1.02 na	14.0 ⁴			
Ameritech McLaren FL	12-97	\$1,131,120	V-12	627	479 2840	3.4 7.7	11.6@125.0	231	127	215	0.86 64.5	11.5			
Aston Martin DBS ¹	3-09 ¹⁰	\$276,140	V-12	510	420 3940	4.1 9.2	12.4@114.9	191	111	193	0.95 71.4	na			
V8 Vantage Roadster	4-10 ^{10,2}	\$157,630	V-8	420	346 3775	4.5 10.2	12.8@113.3	180 ⁵	119	211	0.95 72.5	10.9			
Audi A4 3.2 Quattro ¹	5-09 ²	\$49,975	V-6	265	243 3810	5.9 15.3	14.4@97.5	130 ⁵	125 224	0.86 66.2	18.3				
A5 2.0T Quattro	4-10 ¹⁰	\$45,150	I-4t	211	258 3645	6.2 16.4	14.8@95.2	130 ⁵	118 204	0.94 68.9	21.3 ⁴				
A6 3.0 Quattro ¹	6-09 ¹⁰	\$56,025	V-6s	300	310 4125	5.5 13.8	14.0@100.8	130 ⁵	126 227	0.85 64.1	19.0 ⁴				
R8 5.2	2-10 ¹⁰	\$172,250	V-10	525	391 3745	3.3 7.6	11.5@123.1	196 ⁵	118 210	0.99 73.2	14.0 ⁴				
S4 Quattro	5-10 ²	\$58,675	V-6s	333	325 4010	4.5 11.0	12.9@108.6	155 ⁵	114 202	0.96 70.1	14.4				
TTS ²	11-09	\$52,075	I-4t	265	258 3235	4.6 11.8	13.2@105.2	155 ⁵	115 202	0.98 72.0	19.9				
Bentley Continental GT Speed ¹	5-08 ¹⁰	\$226,555	W-12tt	600	533 5170	4.0 9.9	12.5@113.4	202 ⁵	116 199	0.90 66.2	11.0				
Continental Supersports ¹	3-10 ¹⁰	\$274,055	W-12tt	621	590 4915	3.6 8.7	11.9@117.4	204	118 207	0.90 66.3	13.0 ⁴				
BMW M3 Coupe DCT	12-08 ¹⁰	\$65,000	V-8	414	295 3670	4.3 10.0	12.7@112.4	155 ⁵	116 205	0.93 71.1	13.1				
X6 M ¹	2-10 ¹⁰	\$95,025	V-8tt	547	502 5095	4.2 10.5	12.7@110.5	155 ⁵	120 218	0.90 65.7	12.7				
Z4 sDrive35i	7-09	\$57,500	I-6tt	300	300 3460	4.8 11.7	13.3@106.7	150 ⁵	116 206	0.89 66.2	21.6				
135i	11-09 ²	\$38,175	I-6tt	300	300 3375	4.7 11.7	13.3@105.3	150 ⁵	117 209	0.92 71.0	19.7				
335d ¹	5-09 ²	\$50,895	I-6td	265	425 3960	5.3 13.4	13.8@101.4	149 ⁵	116 208	0.92 70.5	25.5				
335i	5-10 ²	\$47,625	I-6tt	300	300 3570	4.7 11.7	13.3@105.7	150 ⁵	119 210	0.91 68.4	18.4				
550i Gran Turismo¹	7-10 ¹⁰	\$74,025	V-8tt	400	450 4720	5.1 11.6	13.4@106.5	150 ⁵	122 220	0.89 66.7	16.0 ⁴				
750Li ¹	8-09	\$110,170	V-8tt	400	450 4735	4.9 11.8	13.4@106.0	150 ⁵	120 207	0.87 68.7	15.9				
Bugatti Veyron 16.4	2-07	\$1,482,700	W-16gt	1001	922 4470	2.6 5.5	10.2@142.9	253	111	199	0.94 68.0	9.0⁴			
Cadillac CTS-V	8-09 ²	\$66,835	V-8s	556	551 4130	4.1 8.8	12.3@118.8	191	114 198	0.90 70.1	15.6				
Chevrolet Camaro RS V-6 ¹	6-09 ¹⁰	\$29,400	V-6	304	273 3785	6.1 15.2	14.5@97.5	155 ⁵	121 212	0.86 66.5	19.0 ⁴				
Camaro SS	10-09 ²	\$32,390	V-8	426	420 3875	4.6 10.5	12.9@110.2	155 ⁵	121 212	0.89 66.4	20.8				
Corvette Grand Sport	2-10 ¹⁰	\$68,365	V-8	436	428 3360	4.1 9.2	12.4@108.8	190 ⁵	112 197	0.96 70.7	17.0 ⁴				
Corvette Z06	5-08 ²	\$79,595	V-8	505	470 3190	3.4 8.0	11.7@123.7	193	111 189	0.99 70.6	17.5				
Corvette ZR1	6-10 ²	\$121,425	V-8s	638	604 3365	3.5 7.3	11.5@128.7	205	112 194	1.04 74.9	14.0				
Dodge Challenger R/T	10-09 ²	\$38,170	V-8	376	410 4135	5.8 13.8	14.1@101.2	142 ⁵	136 246	0.83 62.7	20.3				
Charger SRT8 ¹	3-09 ²	\$46,125	V-8	425	420 4185	4.9 11.4	13.2@108.8	165 ⁵	124 220	0.88 65.8	18.5				
Viper SRT10 ACR	4-08 ¹⁰	\$98,110	V-10	600	560 3430	3.4 8.0	11.6@122.6	177 ⁵	109 187	1.12	73.4	na			
Ferrari California	2-10	\$200,822	V-8	453	358 3925	3.5 8.6	11.9@116.9	193	106 188	0.96 69.2	14.0 ⁴				
Enzo	7-03	\$652,830	V-12	650	485 3230	3.3 6.6	11.1@133.0	218	109 188	1.01 73.0	13.3				
599 GTB Fiorano FI	5-07	\$319,408	V-12	611	448 3865	3.2 7.0	11.2@129.3	205	109	1.86	97.0	10.0 ⁴			
Ford GT	12-03	\$150,525	V-8s	500	500 3390 ⁴	3.8 8.8	12.2@121.6	190	117 199	0.99 69.5	15.0 ⁴				
Mustang GT	10-09 ²	\$34,130	V-8	315	325 3585	5.3 12.7	13.8@104.0	145 ⁵	115 202	0.93 69.1	23.4				
Shelby GT500KR	10-08 ¹⁰	\$83,300	V-8s	540	510 3885	4.7 10.2	12.9@116.0	155 ⁵	121 211	0.93 66.8	13.0 ⁴				
Taurus SHO ¹	12-09 ²	\$42,985	V-6tt	365	350 4285	5.2 12.8	13.6@103.2	131 ⁵	122 216	0.88 64.8	17.5				
Hennessey HPE700 Camaro	4-10	\$125,000	V-8s	725	741 3930	4.1 8.0	12.0@125.4	201	117 204	0.92 71.0	11.0 ⁴				
Honda FCX Clarity ¹	5-09	\$600/mo.	FC	134	189 3575	8.6 27.3	16.8@84.3	100 ⁵	129 241	0.82 64.1	na				
Hyundai Genesis 4.6L V8 ¹	5-09	\$42,000	V-8	375	333 4015	5.5 13.0	13.9@103.8	149 ⁵	120 218	0.86 63.8	18.0 ⁴				
Genesis Coupe Track	6-09 ²	\$30,345	V-6	306	266 3470	5.7 14.7	14.4@99.1	149 ⁵	118 211	0.90 69.3	18.0 ⁴				
Sonata SE¹	7-10 ¹⁰	\$25,195	I-4	200	186 3340	7.5 20.6	15.8@89.1	130⁵	128 222	0.85 65.4	26.6				
Infiniti G37 Coupe Journey ¹	6-09 ²	\$45,045	V-6	330	270 3700	5.4 13.0	13.8@103.2	155 ⁵	118 206	0.89 68.4	19.0 ⁴				
G37S Sport	5-10 ²	\$40,085	V-6	328	269 3665	5.1 12.3	13.6@105.6	155 ⁵	117 210	0.90 67.8	16.6				
Jaguar XFR ¹	8-09 ²	\$80,000	V-8s	510	461 4405	4.3 9.6	12.6@115.3	155 ⁵	117 206	0.88 66.1	16.7				
XKR Coupe ¹	8-08 ²	\$98,525	V-8s	420	413 3880	4.2 10.1	12.6@111.9	155 ⁵	121 209	0.90 69.4	17.2				
Kia Forte Koup SX	6-10 ¹⁰	\$20,090	I-4	173	168 2920	6.9 18.9	15.4@92.3	130 ⁵	125 220	0.89 67.2	23.0 ⁴				
Lamborghini Gallardo Balboni	11-09	\$255,295	V-10	550 ⁵	398 3210 ⁴	3.5 7.5	11.5@126.7	199	115 200	0.95 72.5	13.0 ⁴				
Gallardo LP560-4	11-08	\$251,260	V-10	552	398 3595	3.2 6.9	11.2@129.5	202 ⁵	112 192	1.00 72.1	10.0 ⁴				
Murciélago LP670-4 SV	11-09	\$480,325	V-12	670 ⁵	487 3660 ⁴	2.8 6.8	10.9@129.4	209	114 193	0.97 70.0	10.0 ⁴				
Lexus HS 250h ¹	11-09 ¹⁰	\$39,150	I-4/Elec	187	138 3690	8.2 na	16.2@88.6	112 ⁵	126 226	0.77 63.7	28.3				
IS 350C ¹	12-09 ¹⁰	\$49,415	V-6	306	277 3895	5.5 13.9	14.0@100.7	141 ⁵	135 236	0.81 64.5	19.0 ⁴				
LFA	7-10	\$388,475	V-10	560⁵	354 3580	3.8 7.8	11.8@124.4	202⁵	112 193	1.04 74.2	16.0⁴				
Lincoln MKS EcoBoost ¹	10-09 ¹⁰	\$56,625	V-6tt	355	350 4440 ⁴	5.0 12.4	13.6@103.8	131 ⁵	123 214	0.90 62.6	21.4				
Lotus Exige S 260 Sport	10-09 ¹⁰	\$79,420	I-4s	257	174 2005	4.1 10.4	12.6@110.1	150	112 196	0.97 74.5	21.0 ⁴				
Maserati Gran Turismo ¹	8-08 ²	\$118,525	V-8	405	339 4350	4.7 11.7	13.3@106.2	177 ⁵	112 194	0.95 71.0	16.6				
Mazda Mazda3 s	5-09 ¹⁰	\$22,130	I-4	167	168 3035	7.5 20.0	15.7@89.3	130 ⁵	132 230	0.86 66.8	22.0 ⁴				
Mazdaspeed3	2-10 ¹⁰	\$25,090	I-4t	263	280 3250	6.1 14.5	14.4@99.6	155 ⁵	126 219	0.90 68.8	17.0				
RX-8R3	12-08 ¹⁰	\$32,580	R-2	232	159 3110	6.3 16.4	14.8@95.2	148 ⁵	122 218	0.90 70.8	16.6				



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Make & Model	Issue	Price as Tested ¹	Engine Type	Horsepower	Torque, lb.-ft.	Curb Weight, lb.	0-60 mph, sec.	0-100 mph, sec.	1/4 mile, sec. @ mph	Top Speed, mph ⁴	Braking from 60 mph, ft.	Braking from 80 mph, ft.	Skidpad, g	Slalom, mph	Our Fuel Mileage, mpg
Mercedes-Benz C63 AMG¹	6-08 ²	\$63,930	V-8	451	443 3920	4.1 9.7	12.5@114.4	155 ⁵	113	201	0.93	69.3	15.1		
C350 Sport ¹	9-07	\$44,500	V-6	268	258 3630	5.8 14.8	14.3@98.2	130 ⁵	135	241	0.81	63.8	21.0 ⁶		
CL600 ¹	8-07 ²	\$148,775	V-12tt	507	612 4810	4.1 9.6	12.4@114.8	155 ⁵	119	211	0.86	62.6	13.0		
CLK63 AMG Black Series ¹	8-07 ²	\$138,300	V-8	507	464 3810	4.1 9.6	12.4@115.0	186 ⁵	115	199	0.98	70.6	13.9		
E63 AMG ¹	6-10 ¹⁰	\$93,075	V-8	518	465 4285	4.1 9.5	12.5@115.1	155 ⁵	119	207	0.92	68.2	15.0 ⁶		
E320 Bluetec ¹	7-07 ¹⁰	\$59,375	V-6td	208	388 3860	6.7 17.2	15.0@93.2	130 ⁵	129	232	0.83	62.0	24.0		
E550 Coupe ¹	9-09	\$67,225	V-8	382	391 3810	4.7 11.1	13.1@108.9	130 ⁵	137	252	0.84	63.2	15.7		
SL63 AMG ¹	4-10 ^{10,2}	\$143,460	V-8	518	465 4420	4.0 9.5	12.4@115.3	186 ⁵	120	211	0.89	66.6	10.0		
SL65 AMG ¹	2-09	\$198,175	V-12tt	604	738 4555 ⁴	3.7 8.1	11.8@121.6	155 ⁵	115	202	0.89	67.4	13.4		
SL65 AMG Black Series ¹	3-09	\$304,350	V-12tt	661	738 4215	3.9 7.9	11.8@126.3	199 ⁵	112	192	0.99	70.3	14.2		
SLR McLaren ¹	7-05	\$455,750	V-8s	617	575 3860	3.5 7.5	11.5@126.1	207	107	186	0.97	69.6	18.0 ⁶		
SLS AMG¹	7-10	\$202,150	V-8	563	479 3795	3.6 7.7	11.6@124.3	197⁵	112	194	0.96	71.8	10.8		
Mini Cooper S Clubman	7-08 ¹⁰	\$29,100	I-4t	172	177 2845	6.8 18.2	15.3@92.1	139 ⁵	120	213	0.89	67.2	27.0 ⁶		
Cooper S	11-07 ²	\$28,850	I-4t	172	177 2665	6.4 17.7	15.0@92.6	139 ⁵	122	214	0.85	67.9	29.8		
John Cooper Works	4-10	\$31,450	I-4t	208	192 2655	6.0 14.8	14.4@98.9	147 ⁵	121	210	0.91	71.3	27.0 ⁶		
Mitsubishi Eclipse GT	8-07 ²	\$27,694	V-6	263	260 3570	5.9 14.7	14.5@99.3	148	121	217	0.84	63.9	19.6		
Lancer Evolution GSR	3-08 ²	\$33,625	I-4t	291	300 3555	4.9 13.3	13.6@100.9	162 ⁵	124	217	0.97	71.7	15.0 ⁶		
Lancer Evolution MR Touring	12-09 ²	\$44,234	I-4t	291	300 3690	4.6 12.1	13.2@103.6	162 ⁵	120	211	0.92	69.2	18.1		
Lancer Ralliart	11-08 ²	\$29,915	I-4t	237	253 3540	5.4 15.1	14.1@97.2	130 ⁵	129	227	0.84	66.7	17.3		
Nissan Altima 3.5 SE Coupe	8-07	\$25,515	V-6	270	258 3200	5.7 13.9	14.2@101.2	130	130	234	0.84	65.2	18.7		
GT-R Premium	6-10 ²	\$85,340	V-6tt	485	434 3920	3.3 8.0	11.6@120.4	193	112	190	1.01	74.8	14.4		
Maxima 3.5 SV ¹	9-08	\$34,940	V-6	290	261 3610	6.1 15.4	14.6@97.7	149 ⁵	121	219	0.86	65.4	18.8		
Nismo 370Z	9-09 ¹⁰	\$39,540	V-6	350	276 3300	5.0 12.0	13.5@106.6	155 ⁵	123	214	0.93	69.9	19.0 ⁶		
Sentra SE-R Spec V	6-07 ²	\$22,715	I-4	200	180 3075	6.6 16.9	15.0@94.2	130 ⁵	134	246	0.87	65.3	22.1		
370Z	4-09 ²	\$33,740	V-6	332	270 3360	5.2 12.8	13.7@103.9	155 ⁵	115	208	0.98	69.5	18.7		
Pontiac G8 GT¹	6-08	\$29,995	V-8	361	385 3910	5.0 12.3	13.5@104.9	140 ⁵	119	221	0.85	64.3	16.0 ⁶		
G8 GXP ¹	3-09 ²	\$43,280	V-8	415	415 4000	4.7 11.1	13.1@109.4	155 ⁵	120	221	0.88	65.0	17.8		
Porsche Boxster Spyder	3-10	\$79,210	F-6	320	273 2940	4.4 10.4	12.8@109.6	166 ⁵	112	202	1.02	74.6	19.0 ⁶		
Carrera GT	6-04	\$460,400	V-10	605	435 3530 ⁴	3.6 7.0	11.3@131.6	205	124	199	0.99	71.1	11.0 ⁶		
Cayman S	4-09 ²	\$65,780	F-6	295	251 3100	4.8 11.6	13.3@105.0	171	111	195	0.97	70.8	17.8		
Panamera Turbo	12-09	\$153,615	V-8tt	500	516 4635	3.4 8.4	11.7@118.0	188	116	204	0.96	69.1	16.3		
911 Carrera S	4-08 ¹⁰	\$94,815	F-6	355	295 3295	4.1 10.3	12.6@111.9	182	111	193	1.00	72.5	19.0 ⁶		
911 GT2	12-08	\$198,875	F-6tt	530	501 3265	3.4 7.7	11.5@123.9	204	108	187	1.03	75.9	15.0 ⁶		
911 GT3	9-09	\$133,135	F-6	435	317 3075 ⁴	3.7 8.3	11.8@119.5	193	106	186	1.04	75.9	13.0 ⁶		
911 Turbo	6-10 ²	\$149,370	F-6tt	500	480 3535	3.5 7.9	11.7@121.8	194	112	195	1.01	73.0	16.0		
Rolls-Royce Phantom¹	8-06 ¹⁰	\$346,650	V-12	453	531 5810	5.9 15.3	14.5@97.4	149 ⁵	123	219	0.77	57.9	11.7		
Rosion Q1	1-10	\$108,151	V-6tt	450	390 2675	3.2 7.8	11.6@121.6	185	130	217	1.06	73.0	18.0 ⁶		
Saab 9-3 Turbo X SportCombi	10-08 ¹⁰	\$44,755	V-6t	280	295 3910	6.4 19.2	15.0@91.8	155 ⁵	127	225	0.80	65.1	17.3		
Saleen S7 Twin Turbo	9-06 ¹⁰	\$602,442	V-8tt	750	700 2900 ⁴	3.3 6.0	10.6@139.8	250	119	210	1.03	69.9	13.0 ⁶		
Saturn Astra XR	3-08	\$20,330	I-4	138	125 2820	8.6 na	16.6@84.4	129 ⁵	120	213	0.87	67.0	23.0 ⁶		
Shelby GT500 Super Snake	12-07	\$70,670	V-8s	605	590 3915	4.4 9.1	12.5@119.9	150 ⁵	118	204	0.93	68.4	15.6		
Smart For Two passion coupe	3-08	\$15,625	I-3	70	68 1825 13.3	na	19.2@70.5	90⁵	130	230	0.72	57.6	32.0⁶		
Spyker C8 Spyder	3-07	\$296,785	V-8	400	354 2985	4.4 10.3	12.7@112.0	160	120	204	0.92	67.1	18.0		
Subaru Impreza 2.5i	12-07 ¹⁰	\$17,640	F-4	170	170 3055 ⁴	8.2 22.9	16.1@85.6	120 ⁵	138	249	0.79	64.2	21.0 ⁶		
Impreza WRX	11-08 ²	\$28,660	F-4t	265	244 3230	5.1 13.5	13.8@101.0	140 ⁵	124	221	0.87	67.0	22.2		
Impreza WRX STI	3-08 ²	\$39,440	F-4t	305	290 3360	5.0 14.1	13.6@98.2	155	119	209	0.90	69.8	16.0 ⁶		
Legacy 2.5GT Limited	5-10 ¹⁰	\$34,146	F-4t	265	258 3500	5.8 15.2	14.3@97.2	150 ⁵	116	222	0.84	67.2	19.0		
Legacy 3.6R Limited ¹	12-09 ¹⁰	\$32,383	F-6	256	247 3555	6.5 16.7	14.9@95.6	149 ⁵	129	232	0.81	63.8	19.2		
Tesla Roadster	2-09	\$118,400	Elec	248	276 2750	4.0 11.1	12.7@105.3	121	119	210	0.92	68.6	132/hg ⁷		
Roadster Sport	5-10 ¹⁰	\$159,145	Elec	288	295 2790	3.7 10.9	12.6@104.9	125 ⁵	123	210	0.96	70.3	160/hg ⁷		
Volkswagen CC 3.6L 4Motion¹	7-09 ²	\$42,630	V-6	280	265 3855	6.1 15.5	14.5@97.0	130 ⁵	127	225	0.91	66.5	19.2		
Golf TDI	4-10 ¹⁰	\$27,090	I-4td	140	236 3120	8.8 24.5	16.6@83.9	125 ⁵	132	233	0.84	64.4	38.9		
GTI	6-07 ²	\$29,290	I-4t	200	207 3255	6.3 16.8	14.9@94.0	130 ⁵	120	210	0.89	66.8	17.3		
R32	12-07 ¹⁰	\$35,430	V-6	250	236 3720	6.0 16.3	14.6@95.0	130 ⁵	134	237	0.85	65.9	18.2		
Volvo C30 Version 2.0	11-07 ²	\$27,700	I-5t	227	236 3200	6.5 16.3	14.9@95.8	149 ⁵	122	218	0.85	66.3	22.8		
C70	4-07 ²	\$40,400	I-5t	218	236 3785	7.5 18.9	15.7@91.2	150 ⁵	120	217	0.83	65.0	25.8		
S80 V8 AWD ¹	6-07	\$56,025	V-8	311	325 4080	5.6 14.3	14.2@99.4	155 ⁵	123	210	0.85	64.6	16.3		
V70 ¹	5-08 ¹⁰	\$34,410	I-6	235	236 3530	7.3 18.6	15.6@92.3	130 ⁵	131	230	0.82	63.0	21.5 ⁶		

Data apply to the model at the time (issue date) of testing. Legend: For engine types, I is an inline design, F is a flat and R is a rotary. The number following the letter is the number of cylinders or rotor chambers. An additional letter, a "t" or an "s" designates turbo- or supercharging; "d" designates diesel; "FC" designates fuel cell; **boldface**=extremes in that particular category, excluding nonproduction cars; **red** = newest entries; na=not available, na/U.S.; ¹automatic transmission; ²comparison test; ³price at time of test, some estimated; ⁴estimated; ⁵electronically limited; ⁶DIN bhp; ⁷from previous test; ⁸altitude-affected; ⁹aerodynamically limited; ¹⁰Road Test Update; ¹¹performance data, no sideview. For purchasing back issues, see info on PS page.

INTERPRETING THE NUMBERS: Factors that affect test numbers include air temperature, barometric pressure, condition of track surface, tune of test car. When comparing cars' performances, look for the **Significant differences** in each category, as listed below. This is the amount of difference that is meaningful. **WEIGHT** of a car is generally accurate to **within 1 percent**.

ACCELERATION numbers are obtained using drop-clutch starts and lift-throttle shifts. **Significant difference: 0-**



Speed Zone

BY DOUGLAS KOTT >> SENIOR FEATURE EDITOR

Radar Detectors

It's a dark and stormy night, and the headlight/running light signature of the car slowly gaining on you appears to be that of a stiffly sprung Crown Vic...and is that a light bar I see silhouetted against the drizzle, or am I just imagining things? As the police cruiser inches closer, you're sweating bullets—.44 caliber—but the half-expected flurry of red lights and sirens doesn't materialize. Phew, close one! Nobody likes to be hassled by The Man, but in these economically desperate times, county and state governments are brazenly making

up their budget shortfalls by issuing more speeding tickets, and going after smaller and smaller fish, e.g., folks doing 10 mph over the limit instead of 13. What's a reasonably law-abiding citizen to do? Well, a radar detector is a good option for some, a tool that won't guarantee avoiding a citation but will give you a fighting chance. Here are three top-of-the-line examples that offer motoring peace of mind, but not if you live in Virginia, Washington, D.C. or the eastern provinces of Canada, where they're illegal.



ESCORT PASSPORT 9500IX

www.escortradar.com

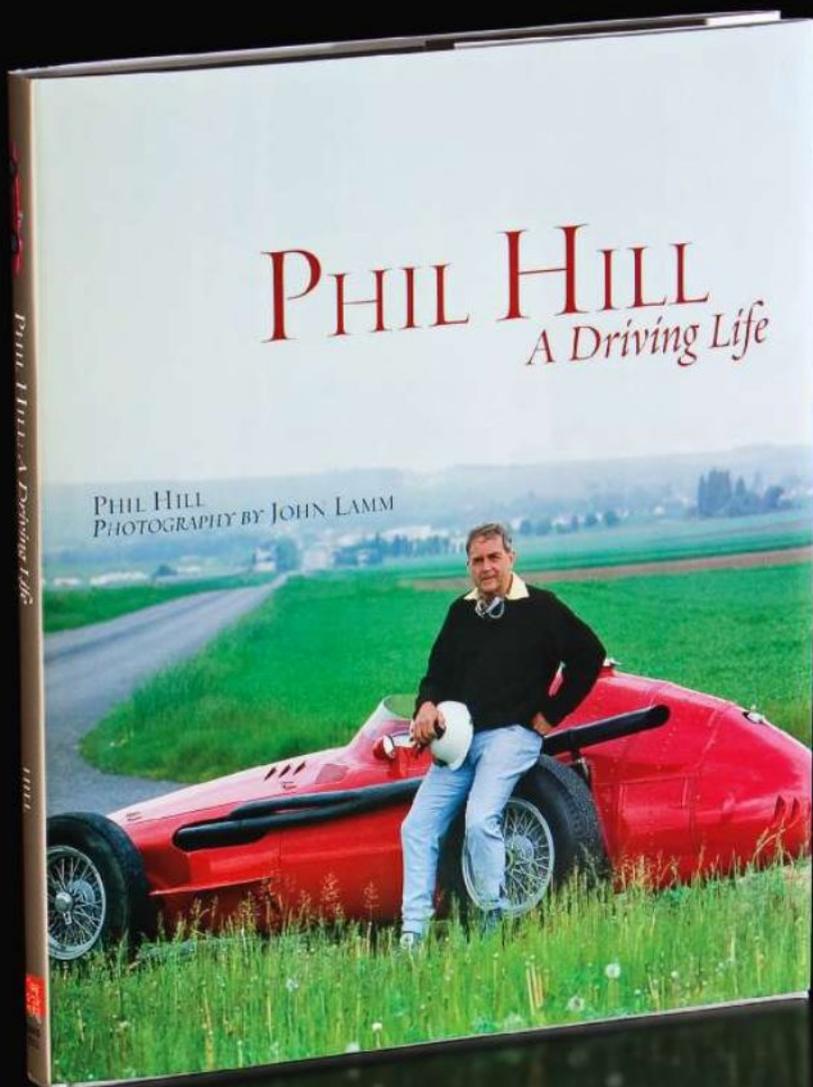
2.8 x 5.3 x 1.2 in.; 8.5 oz.

\$499.95

Escort's history dates back to 1978, the company an offshoot of Cincinnati Microwave Inc. The original Big Box metal-cased detectors were sophisticated for their day and reliably picked up both X- and K-band police radar signals, but this new 9500ix takes it to a whole new level, with detection of X, K, Superwide Ka, Ku and instant-on POP modes, as well as 360-degree LIDAR (laser radar) detection afforded by multiple sensors. It's also GPS-enabled, and thousands of locations of fixed-position speed cameras and red light cameras are already loaded into its database, with online updates available for \$19.95 a year. A bar graph displays signal strength and a synthesized voice issues a warning as well. There's also a feature called TrueLock, where the user can manually lock out false signals from motion sensors, automatic door openers, etc., and AutoLearn that analyzes them over time and automatically disregards them. It's said that the unit needs to experience that signal about three times to put it on the "ignore" list.

PHOTOS BY BRIAN BLADES

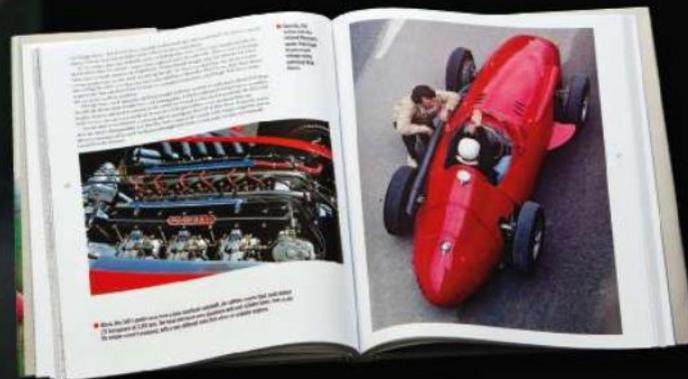




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BELTRONICS GX65 PROFESSIONAL SERIES

www.beltronics.com

2.9 x 5.2 x 1.2 in.; 8.5 oz.

\$469.95

As Beltronics is a division of Escort, it's no surprise that this GPS-enabled multiband unit has most of the same features (with the exception of auto power-down and AutoLearn) as the 9500ix, and shares roughly the same dimensions and button layout. But there are some differences, as the display is red (versus blue), the speaker output is on top (versus bottom), the buttons are slightly larger, and the power cord plugs into the right side of the case. It's also \$30 cheaper. The packaging is less fancy, but where the 9500ix comes in a larger display-worthy case, the GX65 includes a smaller zippered travel pouch. Both units have a so-called SmartPlug coiled cord whose plug housing incorporates both a mute button (in addition to the one on the detector) and an alert light, so the main unit's display can go into Dark mode for stealthier operation. Also, depending on your car's power port location, the mute button may be an easier reach.





VALENTINE ONE

www.valentine1.com

3.5 x 4.3 x 1.0 in.; 6.8 oz.

\$399; concealed display, \$39

As Mike Valentine founded Cincinnati Microwave Inc. with his father and co-invented the original Escort, he knows a thing or two about detectors, and decided on a different approach with this design that bears his name. The Valentine One detects X, K, Ka, Ku, instant-on POP mode and LIDAR, and while not GPS-enabled, the unit has both forward and aft-facing radar sensors. It has directional arrows (front, sides and rear) that show where the radar is coming from, and is certainly the most "chatty" of all the detectors. By interpreting the sequence, frequency and urgency of warning tones, the number of radar sources and direction of the source, the user can determine the severity of the threat. The owner's manual offers nine different scenarios. The Valentine One is smaller and lighter than the others, has a magnesium case, and has its simple controls on the faceplate. The optional concealed display offers all the information of the main unit, but can be mounted down low so as to not tip off other motorists that you have a detector.



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Countersteer

BY SAM MITANI >> INTERNATIONAL EDITOR

Witnessing the Changing Face of Racing

It began as a casual conversation over dinner with my friend, former Formula 1 racer and now IndyCar pilot Takuma Sato, about how racing may change in the next several years and beyond. Will our grandchildren be watching the same sort of cars running laps around ovals and road courses? The conversation gradually moved on to other topics, but a couple of weeks later, it came up again, this time spurred from a call I received from an old friend, Ikuo Hanawa.

Hanawa is an avid off-road racer based in Japan. His résumé includes 15 Baja Rallies, with a Class 3I championship in 2002. He also participates in a number of off-road events in Asia. He informed me that he was preparing to take on Pikes Peak this year, but not in his customary mega-bhp Toyota prototype truck. Rather, he'd be in something I would have never expected: an electric vehicle. My first reaction was: "He's gone soft. What's next, soapbox derbies?"

Then he started explaining the reasons for his decision, and slowly a vision began forming in my mind that showed the future of motor racing.

"I'm still very active in off-road racing, but I started racing EVs about five years ago because that's where I see the future of not just racing, but cars in general. I'm a staunch believer in the performance potential of EVs, and I wanted to get my point across to more people. And I figured the best way was to enter an EV in a race that included gasoline-powered cars. However, the major weak point in today's EVs is they can't run for a prolonged period of time; therefore, I looked for an event with a short driving distance, yet possessed worldwide appeal. Pikes Peak fit the bill perfectly," he said.

At the Pikes Peak International Hill Climb, cars are timed over a 12.4-mile course going up this mountain near Colorado Springs, Colorado. Most of the course is now paved, but there still remain sections of dirt where one mistake can make your

car sail off a cliff. Located in the heart of the Rockies, Pikes Peak is breathtakingly beautiful, an ideal place to bond with Mother Nature. And there's no car that Mother Nature appreciates more than an EV, one that's gentle on the environment. What's more, Hanawa's car is fitted with special Yokohama prototype tires, based on the ENV-R2, which use orange oil instead of petroleum in their tread compound.

The car is designed completely inside Hanawa's shop. Power comes via an electric motor, mounted amidships, supplied by AC Propulsion, arguably a worldwide leader in EV technology. The motor is an evolved version of the AC-150 found in the Mini E. Dubbed in-house as the AC-180, it produces 200 kW (or 268 bhp) at 6000–7000 rpm and 258 lb.-ft. of torque from zero to 5000 rpm. This means that this thing gets off the line like a jet fighter.

The car is relatively heavy for a race car, at 2530 lb. Most of this bulk is the battery pack comprised of Sanyo lithium-ion cells. According to Sanyo, the batteries are mainly used for power tools, but because of their potential to discharge high amounts of power, they proved ideal for Hanawa's race car.

Hanawa points out that one advantage an EV has at Pikes Peak over its gasoline-powered counterparts is that EVs don't need oxygen to operate effectively. The high elevation at Pikes Peak means thin air, which dramatically decreases the power of a conventional engine.

Perhaps Pikes Peak will be the first place where EVs will compete on a comparable level with cars that run on fossil fuels. Hanawa says if his car is running right, he thinks he can win his class and place among the top overall finishers. "The car is that fast; top speed is about 250 km/h (156 mph)," he says.

By the time many of you read this, the Pikes Peak event will be over, and you'll know if Hanawa's goals were realized. We'll also know if we are closer to witnessing the face of motorsports changing into one where EVs run laps around ovals and road courses. 🏁

"If the car is running right, he thinks he can win his class and place among the top overall finishers."

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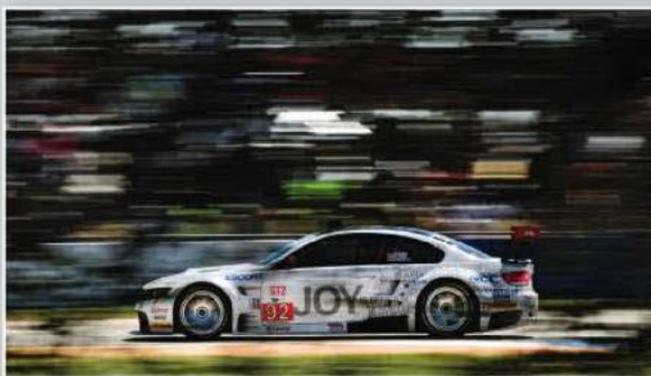
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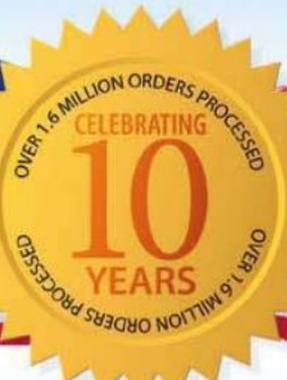
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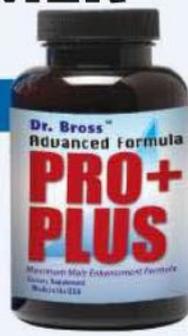
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Ask Anna:

Ask Anna: vol 43 The Scandinavian Sex Secret

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Dear Anna, I spent several years in Northern Europe. I always recall my time there very fondly because it is where my husband really took his lovemaking to another level. I had heard rumors from some of the other company wives about a certain natural “randiness” that permeated the male population in that region of Europe. I vividly remember the first time Dave came home early one afternoon with a grin on his face, a twinkle in his eye...and the **most enormous erection I’d ever seen. I had to have him immediately!** His co-worker had given him two different “formulas” to try, Rhyno BFS and ÖMax. He told him that once he tried it, he would never have sex again without taking it...

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Michelle M

Thank you for writing Michelle. It is always a pleasure to get real advice from real men and women. I have supplied information on how to buy these products below. I’d add more, but I think you said it all!

Anna is a performance artist and glamour model from Oslo, Norway. She is also a contributing writer covering the topics of fashion, fetish & sexuality.

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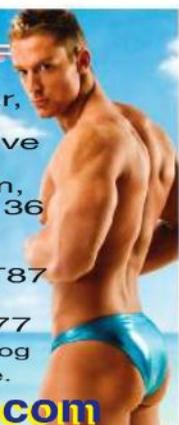
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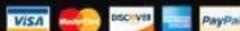


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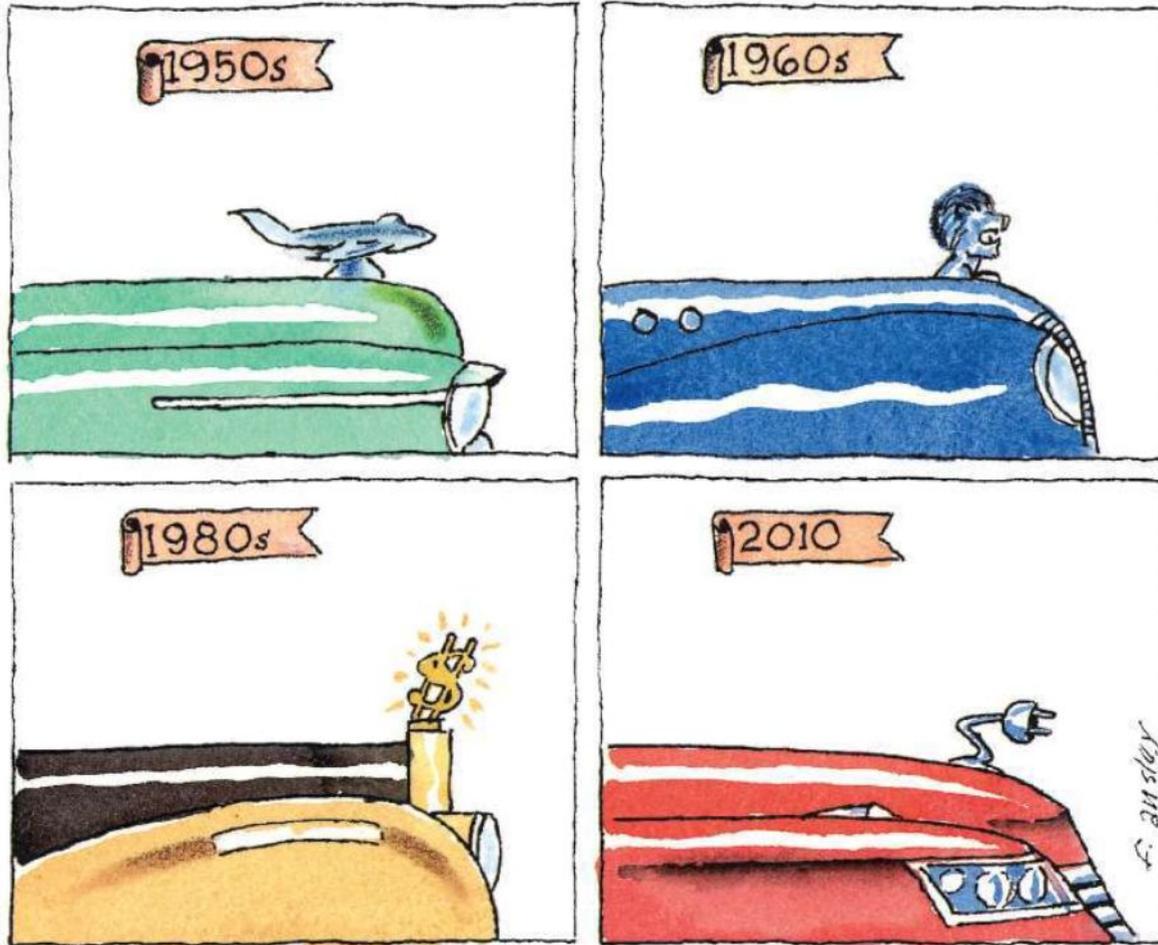
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The History of Hood Ornaments



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