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WOUNDED WARRIOR

The closed-cockpit Audi R18 TDI glowed in the warm evening light of Road Atlanta's Petit Le Mans, but the No. 2 car of Tom Kristensen, Rinaldo Capello and Allan McNish had a rough outing, finishing 40th after tangling with slower GT cars and pitting twice for major repairs.

PHOTO BY RICHARD DOLE

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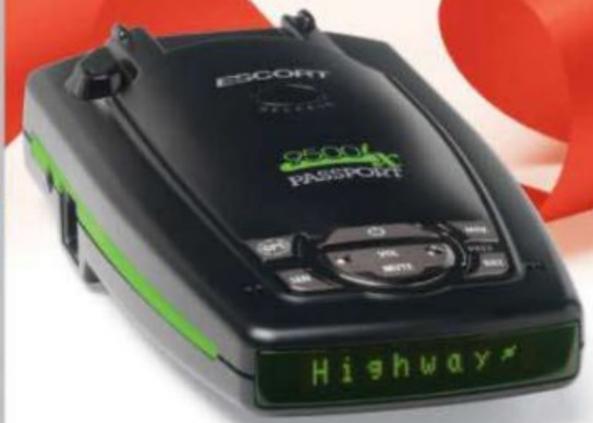


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Map View

Dashboard View

Road & Track invited a select group of driving enthusiasts to test the revolutionary new ESCORT Live! Our revved-up testers jumped at the chance — they would be the first consumers in the nation to try out the device before it hit the shelves. After a short debriefing on how the ESCORT Live! system works, we turned them loose on the road and waited for their reactions. Were they pleased? Read on.



J. Clark: "The system is like a human—it learns. So I won't have to worry about false alarms!"



J. Cohen: "The technology is really good. Once this launches and lots of people get on the network, it will be fantastic—especially when you take trips."



P. Smith: "Since I already have a smart phone, the system is very simple to use. It's very cool and will be a big help on the road!"



L. Molnar: "Having a really good detector like this is huge. But when you add a network feature that allows other people to warn you there's laser ahead, that means the world to me."



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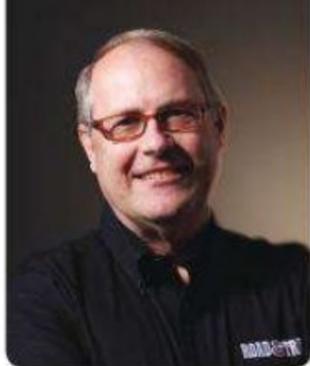
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ROAD AHEAD

BY MATT DeLORENZO
EDITOR-IN-CHIEF

“It’s not every day that the president of a major automaker comes to your parking lot and lays down a strip of rubber.”

Show and Tell

WE GET VISITORS, AND SOMETIMES THEY BRING some pretty interesting stuff with them. Recently, General Motors North America President Mark Reuss stopped by with a Camaro ZL1, well in advance of the car’s Los Angeles Auto Show debut. He was keen to show off his new baby, swaddled in camouflage and fresh from its 7-minute, 41-second lap of the Nürburgring’s Nordschleife.

We weren’t allowed to drive this 580-bhp beast, yet. But we could sit in it, goose the gas pedal, look at the engine and marvel at the vast array of sensors in the trunk that are now an everyday part of an engineer’s kit, which is quite amazing for those of us who recall the days of fifth wheels.

But best of all, Reuss did a burnout for us, right there in our parking lot. For those who despair that cars and the people who build them are becoming dull and homogenized, this little impromptu show was a breath of fresh tire smoke.

Of course, Reuss is the proverbial acorn that didn’t fall far from the tree. His father, Lloyd Reuss, was chief engineer at Chevy, and rose to president of GM before becoming the board of directors’ convenient fall guy in 1992 for the free-spending ways of earlier regimes.

The elder Reuss wouldn’t have been blamed if he turned bitter or disappeared from the scene. Quite the contrary, he remains a true gentleman, never with a bad word for his former employer and has been a tireless advocate for charities in the Detroit area.

Mark joined GM in 1983, an engineer like his father, and progressed through the ranks, including a stint at Holden in Australia. While Chevrolet is close to his heart (he owns a 1969 Camaro), he also had tremendous input in the new generation of Buicks (his daily driver is a Regal GS). These cars are beginning to turn heads with their clean styling, smart-looking interiors and above all, surprising dynamics.

He recognizes the fact that GM has to contend with a tremendous amount of baggage that includes past quality issues as well as the government bailout. But rather than hunkering down and hoping for the storm to pass, Reuss believes the best way to combat these negatives is not just to build good cars, but to build great ones.

Far too long, GM has played it safe and tried to build pretty good cars at the lowest price possible in an effort to keep plants running and dealers supplied with enough incentive money to run product through the system. In other words, GM was pushing cars out the door rather than meeting the pull of strong consumer demand. Rather than getting people excited about the car, the key was to get them excited about the deal.

No more, says Reuss. He insists that “people have to have three or four good reasons to want our cars.” In other words they have to be better than the competition. Just being as good as isn’t good enough anymore.

So far it seems as if he’s off to a good start with cars like the CTS-V, Regal GS and now the ZL1. In the coming year or so, we’ll have even more by which to judge GM. Next year, Cadillac will launch the full-size XTS, the 3 Series-fighting rear-drive ATS and the Volt-like Converj concept coupe as the Cadillac ELR. There’s also a product renaissance at Chevy with the new Sonic and upcoming Spark, Malibu and Impala. Topping it all off will be the C7 Corvette—which we hope to see on one of Reuss’ future visits. Soon.

PHOTOS BY RICHARD M. BARON & ANH CAO



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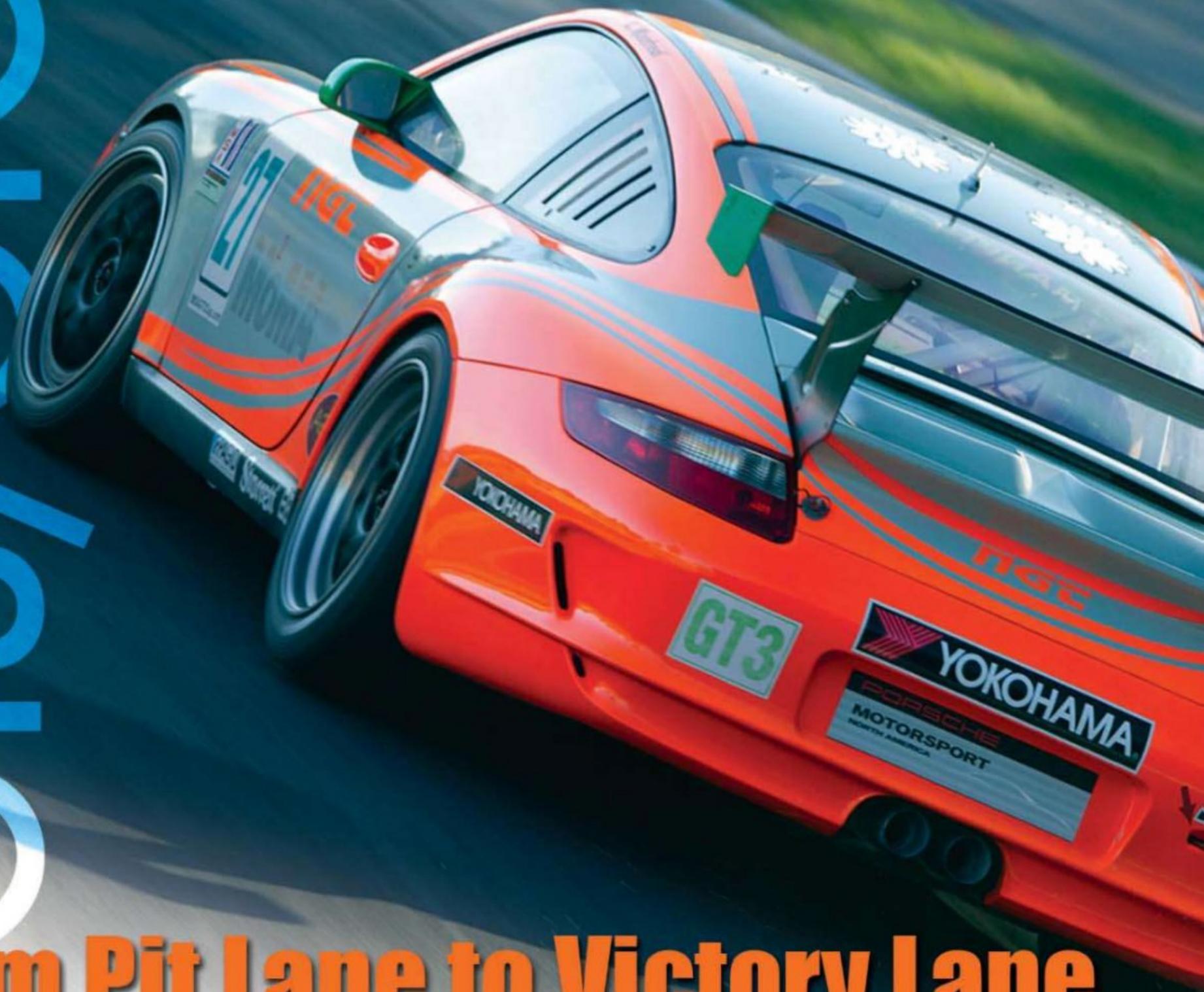
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3 SERIES

The sixth-generation
sets a new benchmark



THE BMW 3 SERIES REACHES ITS SIXTH GENERATION AS THE enthusiasts' exemplary sports sedan with subtle evolution of the company's styling cues, moderate increases in dimensions all around, a new 4-cylinder engine choice, an 8-speed automatic option and a gaggle of trim and equipment variants. Taken in total, they add up to the 2012 BMW 3 Series raising the bar in its class.

In profile, a recurring 3 Series wedge is even more pronounced than in the previous version. Its coefficient of drag is claimed at 0.26. Taut surfaces are accented by a double character line along the car's flanks. The new 3 Series also retains the traditional BMW "Hofmeister kink" at the base of the car's C-pillar. In all, the exterior design is fresh, but still clearly discernible as a BMW—and a 3 Series.

It is a larger 3 Series, in fact. Front and rear tracks grow by 1.5 and 1.9 in., respectively. Overall length is 3.7 in. greater; the wheelbase also grows 2.0 in. Despite the larger size, the new 3 Series is 88 lb. lighter than its comparably equipped predecessor.

The 3 Series will keep its current model designations, which include the 335i powered by the single turbo N55 inline-6 and the 328i with a new turbocharged inline-4. Both engines carry BMW's TwinPower Turbo technology. Note, this isn't twin turbo; rather, it's clever routing of the exhaust flow into a single turbo but with two optimized paths feeding two separate scrolls within the device thereby improving response.

Both engines also feature BMW's Double-Vanos, direct injection and Valvetronic technologies and are teamed with an Auto



Red trim identifies this Sport Line interior.

Start-Stop function. The 3.0-liter dohc turbocharged inline-6 produces 300 bhp and 300 lb.-ft. of torque. BMW cites a 0–60-mph dash in 5.4 seconds for a manually equipped 335i. The inline-4 produces 240 bhp and 260 lb.-ft. of torque. BMW claims a new 328i will accelerate from 0 to 60 mph in 5.7 sec. The aforementioned manual transmission is a 6-speed and comes standard.

The new 3 Series will come in three trims: Sport Line, Luxury Line and Modern Line. Sport Line features high-gloss black accents in its kidney grille slats, trim along its front apron, on its exterior mirrors and window trim. There's contrasting red for



The display offers real-time bhp and torque.



roadandtrack.com/New3series



Clearly a BMW, this new 2012 3 Series sedan shows handsome but subtle restyling. It's also a touch larger in almost every important dimension.



other trim elements, scales on instrument dials and stitching on the steering wheel. Luxury Line replaces the black with high-gloss chrome for the grille slats, front apron trim and inside the cabin. The Modern Line's color is satin aluminum. Wheel, lower front fascia, exhaust tip(s) are among other design differences with trims.

The new 3 Series also has an M Sport package, with all-new aerodynamic elements, 18- and 19-in. wheels and M Sport suspen-

sion. Within, sports seats have distinctive upholstery choices, trim elements have M design blue accent strips and various other M features are included: short shifter, door sill covers, driver's footrest and a new steering wheel.

The new 3 Series Sedan will arrive in February 2012. Look for an ActiveHybrid3—turbocharged inline-6 paired to an electric motor—to come in fall 2012.—Dennis Simanaitis

2013 SUBARU BRZ:

Official Photos and Specs

Our first taste of Subaru's upcoming rear-drive sports car

THE 2013 SUBARU BRZ IS MAKING its world debut right now at the 2011 Tokyo Motor Show. The BRZ is powered by a naturally aspirated and direct-injected 2.0-liter flat-4 engine with 200 bhp and 151 lb.-ft. of torque. The square engine (86.0 x

86.0 mm bore and stroke) will have a 12.5:1 compression ratio, and power is delivered to the rear wheels via either a 6-speed manual or a 6-speed automatic transmission.

With an overall length of 166.7 in., width of 69.9 in., height of 56.1 in. and



roadandtrack.com/BRZ



2013 BMW M3

PHOTO-ILLUSTRATION BY LARSON

TRIPLE TURBO V-6 RUMORS DISCOUNTED

THE RUMOR MILL IS CRANKING OVERTIME REGARDING NEWS ABOUT THE NEW M3. WHILE THE current E90/E92 M3 relies on a naturally aspirated V-8 powerplant, it looks like the new M3 will instead employ a turbocharged 6-cylinder. There has been speculation regarding a V-6 configuration, but considering BMW's history and ubiquity of the potent N55 turbocharged inline-6, the latter "I" avenue makes much more business sense. If we had it our way, we would stuff in the turbocharged V-8 from the new M5. We've heard whispers of a triple-turbo design but we suspect this is due to confusion counting the twin-scroll turbo as two. Expect power in the new M3 to land around the 450-bhp mark.

Regardless of engine specs, the new M3 will retain its rear-wheel-drive layout. Despite this, Albert Biermann, head of product development at M, stated that all-wheel drive is something the company is considering for future M products. Biermann was hush-hush regarding the new M3 but he did reveal that it will not have torque vectoring; instead, look for an electronically controlled differential as found in the M5. A twin-clutch transmission is a sure bet, but don't be surprised if BMW offers a manual transmission for the U.S. Refer to the clutch-pedal-equipped E60 M5s for a case study.—*Carter Jung*

wheelbase of 101.2 in., the Subaru BRZ is bigger than a Mazda MX-5 Miata and closer in footprint to the Porsche Cayman, but taller than both. However, thanks in part to the boxer engine, Subaru engineers tell us that the center of the gravity of the BRZ is only 17.7 in. above the ground, a full inch lower than the Cayman's.

The BRZ's chassis is configured with MacPherson struts up front and a double wishbone rear, where there's a Torsen limited-slip differential. Three drive settings are available: Normal, Sport and Snow. In Sport, the engine mapping quickens the response to throttle inputs. Subaru says

there will be two trim levels available. The base car will have 16-in. wheels, while the premium model wears 17s.

I had a chance to drive a BRZ prototype a few months ago. The car felt light on its feet and it cornered with confidence. The electric-assist steering felt progressively weighted, and there was good directional road sensitivity from on-center to off-center. The power from the boxer engine felt adequate, but the car strained a bit up hills. And although the power peaked at around 6500 rpm, the redline is set at a lofty 7400.

The Subaru BRZ is positioned as more of a premium sports car than the Scion FR-S (Toyota's version of this jointly developed sports-car project).

Rumors abound, however, about a future sportier version of the BRZ, one wearing the company's hal-



■ The BRZ STI Concept made its debut at the L.A. Auto Show, sporting carbon-fiber bodywork, a sportier chassis and a rear wing. The only thing missing is a turbo.

lowed STI badge. We're glad that both of these affordable rear-drive sports cars are on the near horizon, and we suspect the aftermarket—like us—can't wait to get its hands on them.—*Patrick Hong*



& Ampersand



2013 FORD SHELBY GT500

Riding shotgun in Ford's new 650-bhp GT500

SIX MONTHS AGO, I WAS LUCKY ENOUGH TO BE A MEMBER OF THE Ford SVT 2013 Shelby GT500 development team—for a day—200 pounds of ballast in the development mule as it careened around the Nürburgring.

In direct response to the 580-bhp Chevrolet Camaro ZL1, Ford's GT500 will make 650 bhp! It's been achieved by boring the new 5.4-liter aluminum V-8, introduced in 2011, to its maximum intended size of 5.8 liters. A plasma-transferred wire-arc coating protects the bores, and piston oil squirters improve cooling. A new cast-aluminum oil sump has 1.5 liters greater capacity. The forged crank is better balanced to support a new redline of 7000 rpm, up from 6250. Topping

it off, literally, is an Eaton-supplied 4-lobe TVS-style supercharger breathing through a larger 3-row inter-cooler, up from a 2-row. The majority of parts on this Nürburgring mule are not finalized, but functional. The powerful surge to the lofty new redline is seemingly endless, accompanied by a deep mechanical roar.

A slightly larger twin-disc clutch was necessary, and it flows its twist to a Tremec TR6060 6-speed transmission with unique gearing. Of note is the 2.66:1 1st gear that, with the 3.31:1 final drive, allows the 2013 GT500 to hit 100 km/h (about 62 mph) at 7000 rpm, which should dramatically improve the

sprint to 60 mph. Sixth gear remains optimal for cruising, but the car seemed to pull hard in every gear used around the Ring, including 5th. The top speed of the car, 200 mph, is reached in 5th gear.

The 2-piece driveshaft of the previous GT500 is replaced by a single-piece carbon unit that saves 11 lb. The previous viscous differential is now a torque-sensing helical-gear unit, a much-needed upgrade. Both the transmission and differential now feature coolers. The development team had to focus on extreme heat management, thanks to the 100 extra bhp. Bigger Brembo brakes and deflectors that route air to an enlarged radiator with greater cooling capacity are all part of accommodating the power increase.

Putting power to the ground is a stiffer suspension (which still retains its rear live axle) featuring adjustable Damptronic mono-tube Bilstein dampers. The engineers had adjusted both compression and rebound to preset levels that were being evaluated on this drive, with subjective feedback from test driver Gene Martindale and recorded data collected by myriad electrical devices spread throughout the car. From my vantage point in the passenger's race seat, I sensed that the 2013 GT500, in Normal mode, felt as comfortable as the 2011 car, but in Sport mode the bumpiest of roads were unbearable. At speed everything worked better in Sport mode, allowing the GT500 to handle the jumps. Compared to the 2011 model, the 2013 car has sharper and far more precise body motions. Pitch and roll in Sport mode are considerably reduced.

Launch control is planned for the GT500, with an updated 2-stage limiter as found in the Boss 302. This allows for consistent launches at the drag strip. The new GT500 may lack some of the Camaro ZL1's electronic gadgetry, but it should hold its own thanks to its lower curb weight and extra 70 horsepower.—SB



PHOTO BY BRENDA PRIDDY

MERCEDES-BENZ SLS AMG **Black Series**

IF THE 563-BHP 6.2-LITER V-8, ALUMINUM structure and 7:40 Nordschleife lap times of the "base" SLS AMG weren't capable enough, a flat-black Black Series version complete with modified fenders was caught testing at the Ring.

Other than being the fifth Mercedes to undergo the Black Series makeover, not

much is known about the test vehicle. The obvious change to the SLS AMG is the aero, although weight reduction and improved suspension are on the Black Series checklist. As for the engine, two are potential candidates: a retuned version of the 550-bhp twin-turbo 5.5-liter V-8 (recently introduced in the CLS63 AMG)

or the 661-bhp 6.0-liter twin-turbo V-12 (found in the SL65 AMG Black Series). We're hoping for the latter. The transmission will most likely be a 7-speed multi-clutch automatic. While not as quick as M-B's twin-clutch gearbox, the MCT is quite responsive and likely better suited to handle higher torque loads.—CJ



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Ampersand

QUESTIONS WITH **Stephan Reil**

GENERAL MANAGER QUATTRO GmbH



Quattro is more than just Audi nomenclature for all-wheel-drive technology; it is the performance arm of the company bearing the four-ring logo. As the General Manager of Quattro, Stephan Reil is responsible for overseeing the development of Audi's coveted RS line and customer racing program.



1 How does Quattro select which models will receive the RS treatment?

Every RS model has to make its own business case. The Audi RS 4, RS 5 and RS 6 are several generations in and are our main volume models. Therefore, we looked into developing the second-generation TT as a RS model for the first time as part of our product strategy growth.

2 The new S6 and S7 are equipped with twin-turbocharged V-8s, yet the A6 and A7 utilize superchargers. Is there a reason for the differing forced induction?

We select the type of induction based on the character that suits each car best. The supercharger has the advantage in take-off performance and is therefore used in the luxury-oriented A6 and A7 models.

3 It's no secret Audis are tested heavily at the Nordschleife. Has an RS product other than the R8 broken the 8-minute barrier? Is it a target?

Every project of Quattro GmbH has to run an 8000-km (4971-mile) durability test on the Nordschleife. The 8-minute barrier is just a number. The R8 GT is well under it at around 7:30 and the RS 5 and TT RS both run around 8 minutes, although a TT RS equipped with aggressive tires is able to reach the 7:50s. That said, single lap times are not the main objective. Our target is to develop a car that outperforms its competitors.

4 With a big push into customer racing with the R8 LMS and race-prepped TT RS, how will that affect Quattro's future, technically?

There is no better way to test new technical solutions than in racing. An example of this would be the lightweight technology now used in production.

5 With ever-more-stringent CAFE standards, how will the RS line adapt?

Fuel efficiency is a major goal for RS cars. By improving combustion and reducing the internal friction of the 4.2-liter V-8 in the RS 4 and RS 5, as well as the introduction of power recuperation, output went up by 30 horsepower and fuel efficiency improved by nearly 30 percent. Besides engine development, drivetrain efficiency and lighter weight play into this.

BMW Writing Set

The Writing Set from BMW contains a ballpoint pen for everyday use and a classic fountain pen for flair. Rhodium, a rare silver metal, is used in the construction of both, and each features a glossy black finish. Topping them off, literally, is an engraved BMW logo on the cap and end piece. Can you think of a better instrument with which to sign your monthly BMW payments?

• \$184
• bmw-shop.com

Ultimate Garages III

By Phil Berg

Ultimate Garages III goes inside 24 of the greatest garages, revealing extraordinary vehicles displayed in incredible settings. From residential garages to museum-quality exhibits to epic man caves, any of the collections would make an enthusiast gush.

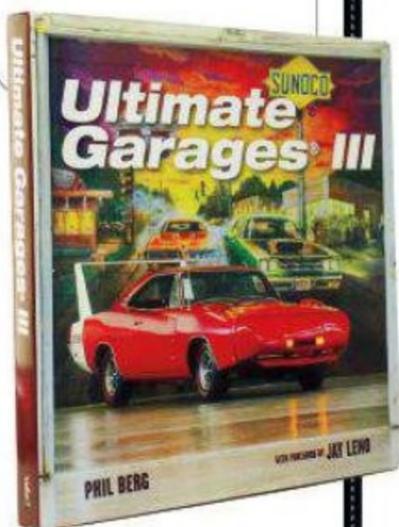
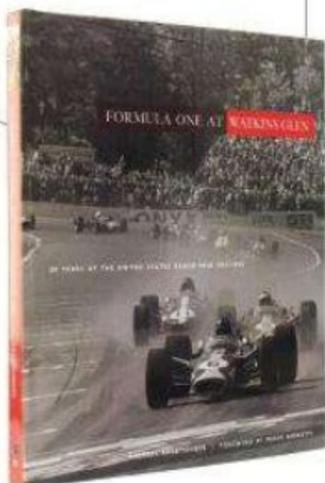
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Formula One at Watkins Glen

By Michael Argetsinger

With Formula 1 returning to the U.S., Argetsinger's book that delves into the golden era of the series during its stateside stint couldn't have come at a better time. Encapsulating 20 years, the account features 240 photos that bring the history of Watkins Glen to life.

• \$50 • 160 pages
• David Bull Publishing
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Trust...V1 earns it one ambush at a time

Bogey Counter

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

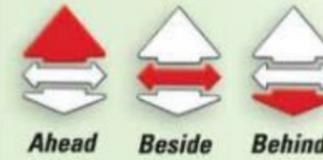
Radar Strength

More LEDs glow as radar strengthens.



Radar Locator

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



RECEIVED BY EMAIL

V1 SEZ:
"LONE RANGER ONCOMING."

Hello Mr. Valentine:

Here's how much I trust my V1. Two beeps and I go Condition Red.

I was on 98 through Florida's panhandle. Only a two laner but the swath it cuts through Tyndall AFB is wide enough for a freeway, a broad ribbon of grass without interruption for a dozen miles, flat as the nearby Gulf of Mexico. A car pulled off the pavement is visible for miles, heh, heh, which means the speed nazis have no place to hide. So they adapt.

V1 gave me two beeps, weak ones, arrow pointing ahead. Then silence.

A few more beeps, arrow ahead, a singleton on the Bogey Counter. Then nothing. Traffic was light, only two cars in sight, one a half-mile ahead, another just a red speck in the distance. And a semi oncoming just my side of the speck.

More beeps, getting stronger, arrow still forward. The car ahead looked about even with the semi. A two-beep warning, by itself, isn't much to go on, but V1 tells me more—one Bogey ahead, strengthening as I go, says "lone ranger coming at me." So I locked the cruise on a legal 60 and waited.

Just as I met the 18-wheeler, "Beeeeeeeeeeeeeep!" And there he was, a Florida black-and-tan tucked in tight behind the semi trailer where oncoming cars couldn't see him, holding his instant-on till I was too close to defend. It's a wicked trap, but V1 had him every time he zapped the cars ahead.

All I had to do is trust V1. How can you not trust a detector that points to the trap?

Mick D. (identity protected)
Tallahassee, FL

RECEIVED BY EMAIL

V1 SEZ: "DON'T BELIEVE IT'S JUST A TRAILER!"

Hey Mike:

I gotta tell you about the Blue-Light Special that V1 found for me. It was Saturday morning and I was in my grins car heading to her house to pick up Danny boy for the day. Heck yes, I took the ridge route.

This road was all fun back before the rock slide. Now it's interrupted by a 25-mph construction zone and a "your speed is" trailer.

No workers today, of course, but the trailer still woke V1 up. As I braked, a string of crotch rockets zoomed large in my rearview, five of them, right on my butt as I passed the trailer.

V1'S WARNING OF A NEW BOGEY. "De-deet," said V1. Then "de-deet" again. And another "de-deet." The Counter showed four signals where I normally see one. One arrow pointed behind to the trailer as usual, but that leaves three in the wild. The flashing arrow points ahead.

We'd barely cleared the zone when the rockets blew by me, exhausts shrieking, the bikes laid over for the uphill left hander. They vanished over the crest. Me, I just moseyed, eyes out for three jokers. Just over the hill—Bingo!—a sheriff SUV hidden in the bushes. That's joker no. 1. Two more somewhere.

At that point the view opens as the road sweeps right over the valley. And maybe a half-mile ahead, light bars strobing blue, jokers no. 2 and 3 angled across the road, blocking five bikers still astride their motionless sickles.

V1 really works, except for those who don't have one yet.

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YOUR TURN



“Koenigsegg makes multiple cars that are all part of the Two Second Club.”

Zackary Miller
Sioux City, Iowa

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PHOTOS/ILLUSTRATIONS BY MARC URBANO & R.H. GURR

Super Sport, Super Style

The Bugatti Veyron 16.4 SS is all about curves, transitions and nontraditional beauty. Photographer Marc Urbano deserves the highest praise for capturing the essential grace of this rolling work of art. I shall never be in a position to acquire one, but I urge someone to do so, then donate it to the Museum of Modern Art.

Frank Orienter
Rochester, New York

For the price of one Veyron Super Sport, you can have 30 Nissan GT-Rs with enough change for almost four fill-ups for each. At that price, I can either parade around with one very exclusive car, or 29 friends and I can be 0.42 seconds slower to 60 mph than the Bugatti.

Eric Savué
Montréal, Québec, Canada

In 1975, Mark Donohue drove a Porsche 917-30 to 221 mph at Talladega. Do we remotely consider taking a “production” Super Sport to Talladega to see if it could equal or exceed the performance of the glorious Porsche 917-30?

Jim Coleman
Orange, California

Can you take the top down on the Veyron? I can on my Porsche Turbo S Cabriolet and be in the Two Second Club. Wait a minute...the Porsche Cab is the only convertible that is in this club. Way to go, Porsche.

Jeff Shaffer
Colbert, Washington

GENETIC ENGINEERING: I got a chuckle when I read “5 Questions” with Wolfgang Durheimer, president of Bugatti, (Ampersand, November 2011) regarding his company’s desire to build a 4-seater that will be considered the best in the world. Prediction: It’s not going to happen if it shares aesthetic DNA with the Veyron. It may have some cool things going from a material, detail and an engineering point of view, but what if it inherits the ugliness?

Mike Van Staagen
Duluth, Minnesota



ROAD TRIP DELUXE: Wonderful article (“Fantastic Voyage,” November 2011). I know the area well and Mr. Losee’s travelogue brought back excellent memories. Just one error slipped in: You have the wrong vehicle at Villa d’Este. I have included the right photograph for your benefit.

Erik de Widt
Mount Airy, Maryland

This was the kind of automotive story that dreams are made of and fuels my imagination. I have also experi-

enced sinuous roads on California’s Coast Highway in a convertible sports car. But somehow seeing my Mazdaspeed MX-5 in front of the Monterey Motel 6 (and needing to drive home dodging the potholes of Highway 101) just doesn’t evoke the same images.

Greg Goodsell
Fairfield, California

Who is Richard Losee and would he like to adopt a 41-year-old son?

Sean Cain
Lake Livingston, Texas

PRETTY TO LOOK AT: The creation of John Bond’s original automotive design (“Retro Renaissance,” November 2011) started me drooling. What a beauty. Then my brain took me back to 1952 when a well-heeled friend of mine actually owned a classic Duesenberg. I drove it once or twice and you had to be in good shape. Once around the block in that monster was a real workout.

Neal Hammon
Shelbyville, Kentucky



I was intrigued when the Sports Car Design No. 18 came out in 1955. The realization of the concept, however, falls somewhat short of the original drawing by R.H. Gurr. That drawing was of a racy, low-slung car, more akin to some of the prewar European designs than to a Model J Duesenberg. The sketch embodied a flowing fender line, a radiator positioned behind the front axle, a flat windshield and a lower top, all of which contributed to the car’s proportions. Also in the sketch: The passenger section appears to be located farther back on the chassis, there are no 1950s’ style wind-wings in the side windows and the spare wheels are covered. These are all important elements in the overall concept. While the finished car is certainly impressive, I feel it would have been so much better if those details could have been more faithfully followed.

Ernest Wrege
Los Angeles, California

Bigger isn't *better*.
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What Matters to You?

Today, America needs fresh leadership to lead us as a nation out of this economic crisis. Leadership must come not only from our political leaders but also from the average citizen. The exporting of American jobs is a trend that must be stopped and reversed. When I walk into my local hardware store, I typically find 85% of the goods for sale are manufactured 7,000 miles away. Recognizable American brands have been forced by shortsighted management and buyers at large national chains to build factories overseas just to save a lousy \$.50 on a tape measure. To these ruthless buyers, it is all about the money. Rarely are product quality, the political system, human rights, animal rights and environmental costs to the planet considered, not to mention the cost to our society of exporting not only jobs, but an entire factory!

At MacNeil Automotive, we are doing our part for the American economy and for our 300 million fellow citizens and neighbors. My philosophy is that if my neighbor doesn't have a job, sooner or later I won't have a job either. For example, we used to have our All-Weather Floor Mats manufactured in England by a company that used antiquated, inefficient equipment. They made a decent floor mat for us, but we thought we could build a better floor mat for our customers using modern American technology, American raw materials and skilled American workers. So in 2007 we transferred all of our floor mat manufacturing back to the United States. Today, we build the best fitting, highest quality automotive floor mats in the world, right here in America.

Our machine shop is equipped with 17 CNC machining centers including four 4 axis mills and one 5 axis mill that produce between 30 to 50 injection and thermoforming molds per month. We have one shift of highly skilled American Journeymen toolmakers and apprentices, but our machines run 24 hours a day, 7 days a week. There is not a more efficient tool and mold making operation in the world - and guess what, it's right here in America. →





David MacNeil
Founder/CEO

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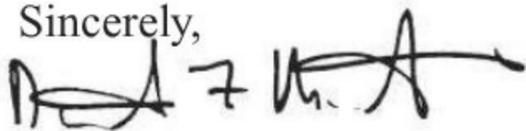
Furthermore, all of our CNC mills are manufactured in Oxnard, CA by Haas. Our 1,000 ton injection molding machines are made in Bolton, Ontario of American and Canadian components. Our thermoforming machinery is made in Carol Stream, IL. The raw steel and aluminum billets which make up our tooling are sourced from American steel and aluminum mills such as Vista Metals in Fontana, CA. The raw materials that make up our All-Weather Floor Mats, FloorLiners, Cargo Liners and Mud Flaps are manufactured in Bellevue OH, Arlington TX, Wichita KS and Jasper TN. Our forklifts are made in Columbus IN and Greene NY. Our warehouse racking is manufactured in Tatamy PA.

At MacNeil Automotive, we are also very aware of sustainability and our responsibility to the environment. We are proactive in controlling waste and recycling all of the unused raw materials from the manufacture of our tooling and products including: aluminum, steel, rubber, TPO, TPE, paper and cardboard.

As you can see, we are as dedicated to designing, developing and manufacturing the finest automotive accessories for our consumer and OEM clients as we are passionate about supporting the American economy, preserving the American industrial infrastructure, and keeping the “money” in our family, a family of 300 million people from all over America.

Life is simple; be good to your fellow man, be kind to animals and the environment, and place building a quality product, supporting your country and your fellow American worker before profit. And, one last thing - let's all do our best to balance family time with work time as our children are the future of America.

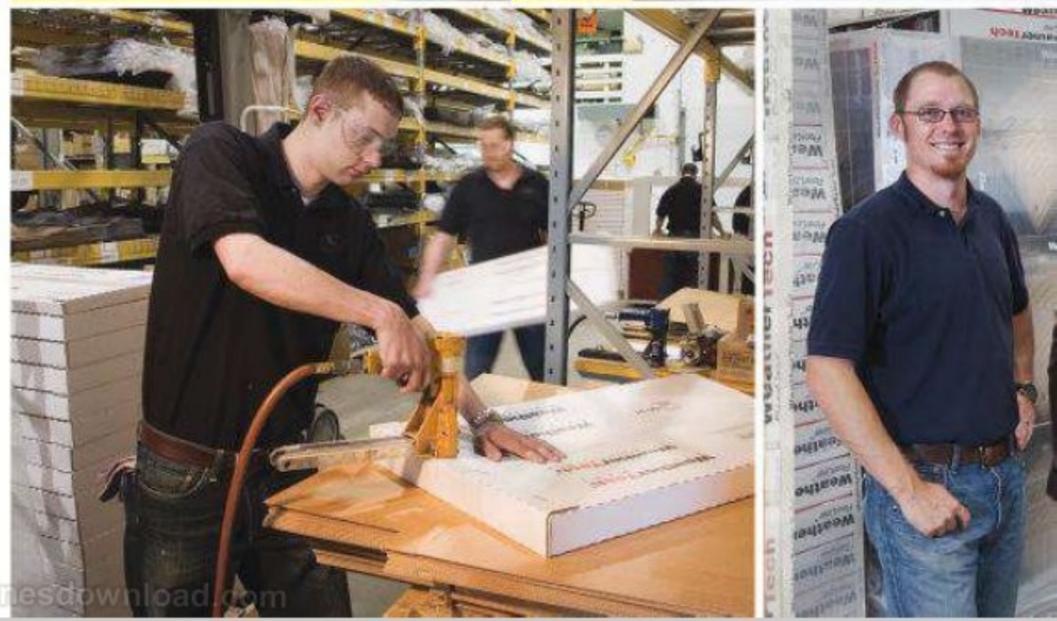
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David MacNeil, Founder/CEO



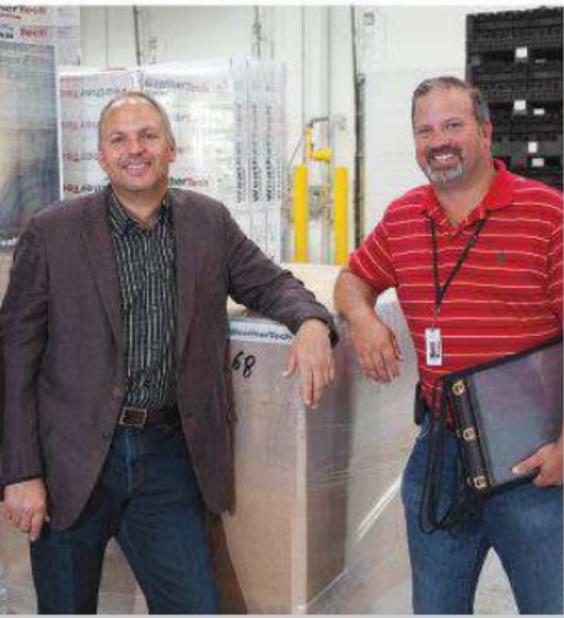
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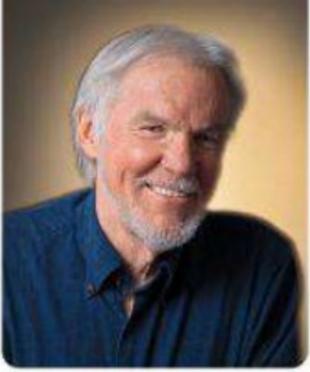




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SIDE GLANCES

BY PETER EGAN
EDITOR-AT-LARGE

First Drive to Connecticut— in a Very Fast Cadillac

FOR SOME REASON, I NEVER SLEEP WELL BEFORE a big road trip, probably because the night always seems like one big lost opportunity to make tracks. With impatience comes adrenaline. And so it was last Wednesday. I set my alarm clock for 6 a.m., but my eyelids popped open in Christopher Lee/Dracula fashion at exactly 4 a.m., so I simply got up and hit the road.

Long before the first hint of rosy-fingered dawn appeared in the east, I was out of Wisconsin and halfway across Illinois, eating a truck-stop apple fritter the size of a catcher's mitt and downing a 16-oz. coffee. It felt good to be on the road, even if the trip wasn't unfolding exactly as planned.

Seven or eight months ago, you see, Barb and I had been invited to attend the Fairfield County Concours d'Elegance in Westport, Connecticut, and we'd decided it might make a fun road trip. Old friends such as Tom Cotter and Rich and Jean Taylor were slated to attend, and the organizers also said they'd like to have me there as "featured artist."

Now, I can't paint or sculpt to save my life, so apparently writing had finally broken through the glass

ceiling and become a bona fide art. I therefore felt a duty to represent artless downtrodden typists everywhere by showing up.

Also, they wanted to present me with an award for being The Oldest Living Person to Have Built a 948 Sprite Engine on His Kitchen Table and Carried it Down a Flight of Stairs Right Before Going to the Hospital with Intense Back Pain That Would Persist Forever.

Actually, that wasn't the exact wording. It was a "Sharing the Passion" award, but the idea was about the same. If we live long enough and suffer greatly from our own stupidity, someone finally notices.

But a more intelligent gentleman, McKeel Hagerty, CEO of Hagerty Insurance, was also getting the same award, and I was glad to hear it. McKeel has worked hard to promote the preservation of vintage cars—as well as my own peace of mind. Every time I spill gasoline all over my workshop floor just as the propane furnace kicks in, I thank God for the Hagerty policy on my '34 Ford as I run from the garage and hide behind a tree. Also, I've taken to scoffing at tornado warnings.

Yet another incentive for driving 1100 miles to Westport was that Barb and I had never seen Connecticut. We'd traveled quite a bit around New York and New England, but had somehow missed that particular slice of the East Coast. I knew Connecticut mostly as the home of such luminaries as the late Paul Newman, Joanne Woodward, David Letterman and Martha Stewart, so I imagined it as sort of a Country Living Zone for people who had so much money they'd been asked to leave Man-

"Connecticut also seemed to be a refuge for those who simply liked sports car roads and garage space."



PHOTOS BY THE AUTHOR

For the First Time Ever, One of Ward's 10 Best Engines, isn't an Engine.

Imagine our surprise when we heard the Nissan LEAF™ had been named one of 2011's best engines. Sure it's revolutionary, but if we're honest, we didn't think a car without an engine could win an award for best engine. Ward's had to evolve the best engine category, to include propulsion systems, like the LEAF's™ electric motor. It's innovation that changes how the engine is defined.

SHIFT the way you move



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Torque Curve, Meet Torque Surge:

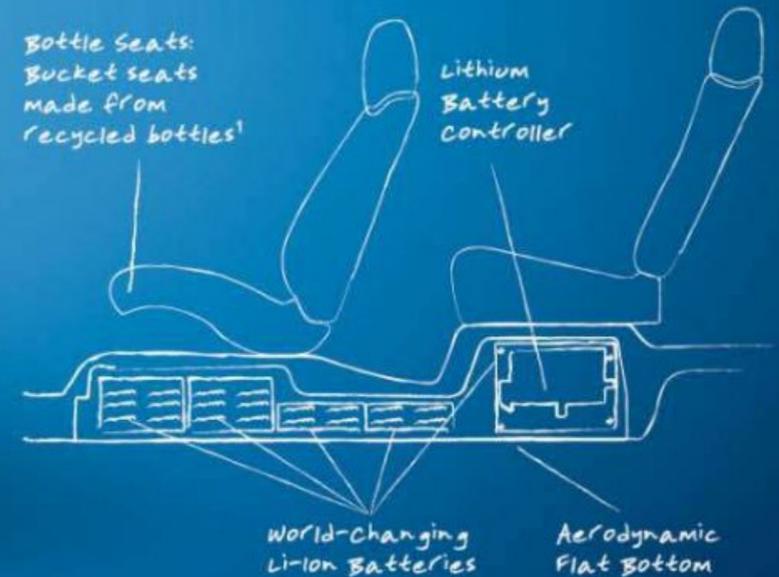
The nice thing about electricity is, it's power. Raw power.

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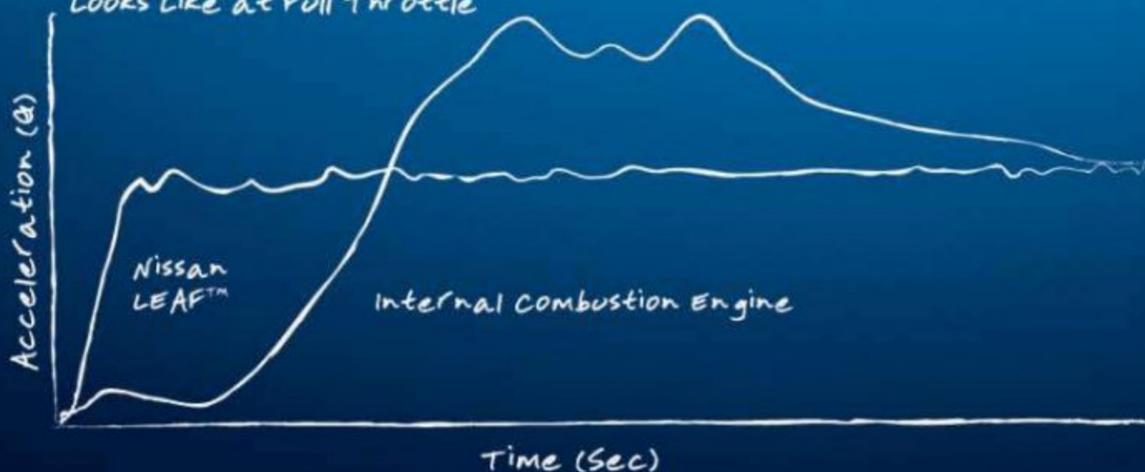


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No Tailpipe!

What Pure Acceleration
Looks Like at Full Throttle



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The 100% electric, no-gas Nissan LEAF™

¹Post-consumer recycled materials will exceed 30%. ²For tailpipe emissions. Always wear your seat belt, and please don't drink and drive. ©2011 Nissan North America, Inc.

“I found myself wandering over to the F1 car display only to discover the old Hesketh 308C driven by James Hunt in 1975.”

hattan so as not to embarrass the Trumps.

But it also seemed to be a refuge for those who simply liked sports car roads and garage space. The whole state was a virtual hotbed of automotive enthusiasm, full of restoration shops, retired race drivers, etc., and half the car nuts I knew lived in Connecticut. Might be fun to check it out.

Unfortunately, our old cat Swanky became very ill just a few days before we left and Barb couldn't bring herself to leave. So it was suddenly a solo trip for me. We'd originally planned to drive our own Cadillac DTS, but it turned out Cadillac was one of the sponsors of the Concours, and they offered me a loaner for the trip.

And what a loaner. A new CTS-V Wagon, with a 6.2-liter 556-bhp supercharged V-8 and 6-speed manual transmission. Black, with black alloy wheels. An evil-looking thing with *Road Warrior* overtones.

To take advantage of this car, I blasted across the flatter portions of Illinois, Indiana and Ohio on the Interstate that first long day, landing in Clarion, Pennsylvania, at sunset. In the morning, I headed into the hinterlands on two-lane Route 6, which swings in a wide arc through the Alleghenies north of I-80. Small towns, twisting roads, forests. It rained all day, but the pockets of cotton-white fog in the valleys only seemed to make the mountains more beautiful.

And the CTS-V was the next best thing to a superbike for getting around slow traffic in the short passing zones between curves. At cruising rpm, the Cadillac had excellent torque, but when you put your foot in it the supercharger had you shrieking up the road like an F1 car. With the thrum of that engine and the hiss of tires in the rain-slick mountains, I felt like Jean-Louis Trintignant in *A Man and a Woman*, though perhaps 2 or 3 percent less handsome. I searched for Samba music on my XM radio.

Nightfall found me in a motel on the Delaware River, and the next morning I swung northeast on I-84, descending toward the Connecticut coast on Highway 7. The area was pretty much as I'd imagined it, full of beautiful old Colonial homes, twisting lanes, big trees, charming

villages and a coastline with two of my favorite things in abundance—oysters on menus and sailboats in harbors.

I checked into the Doubletree Hotel in Norwalk and that evening Concours President John Shuck invited me to a dinner for judges and guests at the bay-side home of Bill Scheffler, chairman of the event, and his wife, Ann.

No more Red Bull and Honey Roasted Peanuts at a toll road oasis for this dude. We had wine and real food, and the garage was full of great cars. I'd crossed the desert and was safely at Ft. Scheffler.

Early the next morning, I released myself onto the green fields of the Fairfield County Hunt Club and began prowling the concours. Packards, Cadillacs, Hemi-powered Chryslers, Porsches and Jags—especially E-Types, to celebrate their 50th anniversary.

I spent much time looking at E-Types, but then found my favorite vehicle of the show. It was a 1963 BMC-Marshall service bus owned by Wayne Carini, the man who hosts *Chasing Classic Cars* on HD Theater. The diesel bus, wrapped in Union Jack paint with a tail-finned body designed by Pinin Farina, was once used by BMC in the U.S. to carry training materials and technical displays to dealerships. It looked like a Triumph Herald metamorphosed into a bus.

Wayne was about to leave for the afternoon road rally, organized by Rich and Jean Taylor, and I asked if I could ride with him. He said yes, and photographer Ed Hyman went with us. He was soon shooting photos out the panoramic windows and singing *Magical Mystery Tour*. We scooped up two more magical tourists when the Mercedes 190 of George and Martina Gates quit running and pulled off the road. Wayne expertly diagnosed their problem as fuel starvation from gas tank debris, and got the Mercedes running well enough to load it on the chase trailer.

Returning to the concours, we were all handed glasses of champagne to celebrate our finish, and I found myself wandering over to the F1 car display nearby, only to discover the old Hesketh 308C driven by James Hunt in 1975. Oddly, I'd just spent the previous evening reading a new Hunt biography by Tom Rubython, and was on the very chapter describing the development of this car by Dr. Harvey Postlethwaite. So, naturally, I had to have myself photographed crouching next to it, champagne glass in hand. It seemed like the right thing to do. Team Hesketh almost single-handedly reinvented high living on the F1 trail.

Speaking of which, on Sunday evening after the concours, a group of us got together for a little farewell dinner at a seafood restaurant on the coast in Norwalk. Clam chowder and oysters, with a window looking out on a bay full of sailboats. A nice finish to the weekend.

Sometimes, as we “mature,” it's hard to remember exactly why we travel long distances to a car show or concours. After a lifetime of looking at cars, are we really going to be entertained or amazed by seeing yet another E-Type, 550 Spyder, Fleetwood, Testa Rossa, Gullwing or Bugatti?

Happily—or perhaps pathetically—the answer always turns out to be “Yes.”

Factor in old and new friends, a ride in a magic bus, a few quiet moments with an old Hesketh, a blitz through the Alleghenies in a good car and a plateful of Bluepoint oysters, and all doubt is removed. It also helps to hear from home that your cat is recovering nicely.



WELCOME TO OUR JUNGLE:

DISTINCT PERFORMANCE

Beautiful cars might be what first come to mind when you think of Jaguar. After putting some of the most groundbreaking designs on the road for over 80 years, that's no surprise. But Jaguar innovation is more than skin deep. Under the handsome sheetmetal of every Jaguar lies a compelling mix of technology, performance, and luxury. Those attributes might not be as immediately arresting as a pretty face, but they are what make initial attraction develop into long-term seduction.



XKR-S


JAGUAR

XJ

XF



THREE WAYS TO BE MOVED

For 2012, the Jaguar lineup consists of three distinct models: The singular and luxurious XJ sedan, the elegant XK performance car, and the extraordinary XF sports sedan. Last year, the XJ sedan, the largest member of the Jaguar family, underwent an extensive redesign. The luxury sedan that emerged dramatically advanced the brand's design language. This year, the sporty XF sedans as well as the XK coupes and convertibles are updated to bring them in line with the big cat's style. Both receive new LED-framed headlights that bear a strong family resemblance to the XJ. New noses and tails on the XF and XK show a heightened sense of aggression. Exquisitely finished, these new Jaguar cars share nothing with the designs of the past, with the exception of their timeless elegance.

EPIC STRENGTH

Today's Jaguar cars have a common heart of uncommon strength. The engine under the hood of every Jaguar is a technologically advanced 5.0-liter V-8 that makes the most out of every drop of fuel. As a result, the XF, XK, and XJ all have at least 385 horsepower. Jaguar isn't always thought of as a performance brand, but when your least powerful car has 385 horsepower, you shouldn't be thought of as anything else. Should 385 prove insufficient for your needs, there's the 470-horsepower XF Supercharged and XJ Supercharged. Still not enough? Jaguar graces the XFR, XKR, and XJ Supersport with a 510-horsepower supercharged V-8. But they don't stop there. Perched at the top of the performance hierarchy is the new Jaguar XKR-S. A two-door aluminum missile with 550 horsepower, the XKR-S is poised to upset the supercar establishment.

XK



A LEGACY OF INNOVATION

Jaguar is a brand that draws great inspiration from its heritage, but the brand isn't mired in the past. Jaguar has always been technologically advanced; today's Jaguar cars are no different. Every Jaguar comes equipped with power-boosting and fuel-saving direct fuel injection. Fuel is delivered directly into the combustion chamber in a more precise and therefore more efficient manner. The XK and the XJ are on the vanguard of aluminum construction. While most car companies are experimenting with making vehicles out of aluminum, Jaguar has aluminum cars in showrooms today. Making the XK and XJ out of the lightweight metal is environmentally friendly (50-percent of the aluminum comes from recycled materials) and it nets a substantial weight savings over steel. The benefits are clear: Lighter cars perform better, return superior fuel economy, and feel more lively and agile.

JAGUAR C-X75 CONCEPT

Jaguar continues to push technological boundaries in its concept cars. Introduced last year, the C-X75 is the brand's take on a sustainable supercar. Constructed of carbon-fiber composite like a Formula

One racecar, the C-X75 is both light and solid. Powering the mid-engine concept is a hybrid system that consists of highly boosted gas engine and two powerful electric motors. Jaguar estimates a zero to 60 mph time of under three seconds and a top speed in excess of 200 mph. While fast, the hybrid system is also efficient enough to return in excess of 50 mpg and it allows the C-X75 to drive on battery power for 31 miles. But the C-X75 is more than just a science project; Jaguar has committed to putting it on the road.



JAGUAR C-X16 CONCEPT

The brand's most recent concept car, the C-X16, made its debut at September's Frankfurt auto show. Like the XK and XJ, the two-seat sports car is built upon a lightweight aluminum structure that is as advanced as it is stunning. A 375-horsepower supercharged 3.0-liter V-6 nearly matches the output of current lineup's naturally aspirated 5.0-liter V-8, but hit the steering-wheel mounted "Push to Pass" button and an electric motor kicks in to provide a boost of 94 additional horses and a top speed of 186 mph. The electric motor isn't just about performance; it also allows the concept to accelerate without burning any fuel at speeds up to 50 mph and helps push fuel economy past 35 mpg.



LUXURY HAS NEVER BEEN MORE EXCITING

While technology and performance may appeal to the rational mind, clever design and opulent materials foster a visceral connection. From the smell and feel of the leather to the eye-catching gloss of the paint and wood, a Jaguar will rally your senses. With at least 385 horsepower on tap, driving one is a rousing and exciting experience, but Jaguar is careful to balance a direct and sporty feel with a supple ride and a refined demeanor. In a Jaguar, luxury, performance, and technology peacefully coexist. Some Jaguar cars have more performance than others, just as some offer more comfort. Finding the right combination is as easy as choosing a Jaguar.



Learn more at your local Jaguar dealer or at jaguarusa.com

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COUNTER STEER

BY SAM MITANI
INTERNATIONAL EDITOR

“Thankfully, no one in the Mazda group committed seppuku after this mission was accomplished, as the samurais had done.”

Is it the End of the Road for the Rotary?

THE STORY BEHIND MAZDA’S DEVELOPMENT OF the rotary engine is the stuff of legend. Tsuneji Matsuda, the then-president of Toyo Kogyo (which later became Mazda), risked the future of the company when he bought the rights to a new type of engine called the Wankel. He would find out later that this compact powerplant was far from production-ready, and the company faced financial ruin unless it made the Wankel work. He handed the assignment to Kenichi Yamamoto and his hand-picked team of engineers called the 47 Warriors (a reference to the famous Japanese story of *Chuushingura* or the 47 Ronin). Yamamoto and his team overcame one obstacle after another until the rotary engine made its way into the company’s first production sports car, the Eunos Cosmo (thankfully, no one in the Mazda group committed *seppuku* after this mission was accomplished, as the samurais had done). And every year since the 1967 introduction of the Cosmo, Mazda has had at least one car in its lineup powered by a rotary engine...the company even won the 24 Hours of Le Mans along the way with the 787B, the only rotary-powered car to ever win the prestigious endurance race. To this day, Mazda is still the only Japanese manufacturer to claim the overall title.

So where is the rotary headed now? I posed this question to some folks at Mazda,

and they would only say, “We’re busy with our SkyActiv engines now, so we can’t really comment on the rotary.”

I decided to gather up some facts and draw my own conclusions, and the outlook for the next-generation rotary engine looks rather dim. Last year, Mazda pulled the RX-8, the only car currently equipped with a rotary engine, from the European market. Then we received news that the 4-door sports car, built entirely in Hiroshima, Japan, will cease to be marketed in the U.S.—the blame going to the high value of the Japanese yen and lack of sales. (Last year, Mazda sold about 1200 units in the U.S., as compared to about 21,000 in 2004.) Now we hear that the RX-8 will be discontinued in Japan, meaning the 44-year streak of the rotary engine is coming to an end with the final edition of the RX-8 called the Spirit R...perhaps never to return.

But before you abandon all hope of the rotary’s survival/revival, we have heard reports of a new version in development called the 16X. On paper, the 16X, which is bigger than the current 13B (1600 cc as compared to 1308 cc), is supposed to be cleaner and more efficient; however, there have been reports that the engineers are struggling to meet their emissions and fuel-economy goals, both categories having historically plagued the Wankel.

And there is always the possibility that the 16X will be converted into a hydrogen powerplant, as we have already seen (and driven) in the RX-8 Hydrogen RE. Still another possibility is it becoming part of a hybrid system, maybe something along the lines of the Audi A1 e-tron show car but using a small Wankel as a range extender when the battery runs low. And what about a SkyActiv version of the rotary, a gasoline-powered variant that’s engineered more for economy than performance?

“It’s not out of the realm of possibility,” said one Mazda official.

In my heart, I still feel that the rotary will somehow survive, and the engineers at Mazda will find a way to adapt this unique engine to conform to today’s greener automotive environment. The little Hiroshima-based company has defied the odds before, and if the company’s current band of engineers shows the same samurai spirit as its predecessors did in the 1960s, I would wager that the rotary will keep spinning along in future Mazda models.



JUDANNA SZACHOWSKA-TARKOWSKA

Drives

- BENTLEY CONTINENTAL GTC
- AUDI S8
- SUBARU IMPREZA
- VOLKSWAGEN GOLF R
- MINI JOHN COOPER WORKS CLUBMAN
- HYUNDAI VELOSTER
- ASTON MARTIN CYGNET
- SCION IQ
- KIA RIO 5-DOOR
- KIA SOUL
- BUICK VERANO
- CLASSIC: 1930 BENTLEY 8-LITRE

JANUARY 2012



roadandtrack.com/GTC

2012 BENTLEY CONTINENTAL GTC

Cruising in style

PULA, CROATIA—WHILE THE just-introduced second generation Bentley Continental GT coupe has an aggressive road presence, the new 2012 Continental GTC changes focus to that of elegance and class. Driving the car will make anyone feel just a bit more sophisticated.

Inside, the luxurious cabin is finished with highest-quality soft-touch leather, cool-to-the-touch metals and deep pile carpets, plus intricate wood veneers that accent the dash and doors. It's royalty on wheels. If you order the neck warmer system and the 10-way massage seats, you may prefer to be pampered in the GTC rather than in your own living room.

While the GTC screams opu-

lence, car enthusiasts will still appreciate its road-holding ability. Thanks to a new 40/60 rear-biased all-wheel-drive system and taut suspension (double A-arms front, multilink rear), not only does the GTC turn into curves with composure, it is also ready to accelerate with the help of its 567-hp twin-turbo

W-12 mated to a quick-shifting ZF 6-speed automatic transmission. The factory tells us the GTC can complete a 0–60-mph sprint in 4.5 seconds, with a top speed rating of 195 mph.

On our drive through the mountains near Pula, the Bentley Continental GTC felt fairly light on its feet, despite its hefty 5500-lb. curb weight. The steering weighting is lighter than preferred, which can cause a driver to initially

dial in too much, then have to readjust midcorner. Top down with the speedometer hovering around 80 mph, normal conversation can be had with your front-seat passenger without too much wind noise interference. Impressive.

The 2012 Bentley Continental GTC starts at \$212,800, and should be at dealerships now. Want to cruise in style? This British grand tourer is hard to pass up.—Patrick Hong



EVENT RECAP

RIDE, DRIVE AND REVIEW



THE 2012
HYUNDAI VELOSTER

HERE'S WHAT ROAD & TRACK READERS HAVE TO SAY ABOUT
THE ALL-NEW HYUNDAI VELOSTER AT A RECENT RIDE, DRIVE AND REVIEW EVENT

"This car has Bluetooth, Pandora, navigation and the paddle shifters and pedals are fun to drive."

-Andrew Canlon

"The Veloster drove great, good handling. I really like the design. I would consider purchasing one."

-Brian Byrne

"I own a Hyundai and they take customer feedback serious, as you will see the changes in their cars a couple months later."

-Warren Basil

"I was pleasantly surprised. It is a much bigger car inside than you think. Hyundai is definitely becoming a better and better brand."

-Julio Franko

SEE VIDEO, PHOTOS AND MORE FROM THE EVENT AT HYUNDAIHUB.COM

ROAD & TRACK



 **HYUNDAI**

CLASSIC DRIVE

1930 BENTLEY 8-LITRE

LE MANS, FRANCE—I am thundering down a leafy French country road with the morning sun breaking through. If it wasn't for the brand-new Mulsanne sedan directly ahead of me, it would be easy to mentally wind back the years to the 1930s when W.O. Bentley drove this very car.

Chassis No. YF002—with its H.J. Mulliner sports saloon body in the Weymann style—has pride of place in Bentley's Heritage Collection since it was purchased in 2007. Since then, under the personal guidance of the then-chairman and CEO, Dr. Ing. Franz-Josef Paeffgen, it has undergone a two-year conservation program. "It's meant to be used," explains Richard Charlesworth, head of Bentley's Heritage Collection, "so it still has the original leather on the seatbacks and even the stuffing."

Once I've mastered the spark advance/retard, hand throttle and choke, the 8-Litre's straight-6 bursts into life. I find 1st gear without too much mechanical graunching from the non-synchro gearbox. The trick, Charlesworth explains, is double de-clutching

on the way up and down the gearbox, with a hint of throttle on downward shifts.

We're soon cruising along at an indicated 60–70 mph, the car remarkably comfortable as are those simple-looking front seats. Steering that was ponderously heavy at low speeds has lightened up.

The big torquey engine pulls well from low revs and it's easy to come off roundabouts in 3rd.

If you ignore the wind noise and occasional rattle, W.O.'s car is refined, although the heat soak from the engine makes the cabin stuffy. Driving to Bentley's spiritual motorsport home in the great man's car—it doesn't get much better than that.—*Ian Adcock*



roadandtrack.com/Bentley8.0



roadandtrack.com/NewS8

2013 AUDI S8

Bigger and brawnier

PAMPLONA, SPAIN—AUDI'S third-generation S8 trumps them all. It's slightly larger, and its new 4.0-liter twin-turbo V-8 packs a whopping 520 bhp. All the expected luxury of the Audi A8 is there of course, but optionally lined with carbon fiber to hint at the large sedan's sporting aspirations. The aluminum space frame and

air-ride suspension of the A8 remain, tuned a bit more stiffly. The U.S. market will have standard 21-in. wheels, but the massive carbon-ceramic brakes of our test car are likely for Europe only.

With adjustable seat bolsters set to stiff and the steering, suspension, engine, transmission, sport differential and ac-

tive exhaust in dynamic mode, the S8 is a great place to appreciate all 479 lb.-ft. of torque, which is sent to the wheels via a quick-shifting 8-speed automatic transmission. Quattro all-wheel drive creates trust on damp back roads, and the predictable handling manners are backed by plenty of electronics to keep the shiny side up. It's easy to fling the S8 into corners because it feels much smaller and lighter than it actually is. It's not as crisp and precise as an S4, but surprisingly nearly as nimble.

The new engine is a jewel; it produces effortless grunt and it can run on four cylinders to improve cruising efficiency, which is some 23 percent better than that of the V-10 it replaces. Active noise control keeps the S8 cabin quieter than before, and active engine mounts minimize vibration at idle and during the switchovers between 4- and 8-cylinder modes.

The new Audi S8 is a challenge for BMW to up its game.—*Shaun Bailey*



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— W. FROM NEBRASKA



"WOW! It is an eye-catcher!"
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2012 SUBARU IMPREZA

Dressed to impress

AN ALL-NEW SKIN AND NEW 2.0-liter flat-4 make this latest Impreza an impressive compact car. Taking styling cues from the larger Legacy, it has crisp character lines and pronounced wheel arches.

The outside rearview mirrors are now door-mounted, which

along with large fixed quarter windows and thinner A-pillars, contribute to better forward visibility. High-strength steel in the rockers lowers them an inch, and an inch higher hip point allows you to slide more easily into the cabin for a commanding seat position.

The new engine makes 148 bhp and 145 lb.-ft. of torque and feels more responsive than the 2.5-liter unit it replaces while delivering superior fuel economy. The 27 mpg city/36 mpg highway ratings are the highest for an all-wheel-drive vehicle.

The fully independent suspension and a nicely weighted electric-assist steering make the Impreza a spirited handler. The addition of a rebound spring inside the front MacPherson struts helps minimize body roll and the inch longer wheelbase contributes to a compliant ride.

The Impreza comes with a choice of a 5-speed manual or CVT. Subaru has tuned the latter to deliver a more linear and less elastic feel under acceleration. Best of all, the paddle shifters allow you to select six distinct “gear” ranges in manual mode. The transmission holds the selected ratio, giving you the ability to run in higher rev ranges. Adding to the car’s surefootedness is the Active Torque Split center differential that sends torque fore and aft as required. The manual transmission uses a conventional viscous locking center differential.

The Impreza is offered as a 4-door sedan or 5-door hatch with prices starting at \$17,495.—*Matt DeLorenzo*

2012 VOLKSWAGEN GOLF R

When 4 trumps 6

ANY QUALMS ABOUT THE GOLF R STRAYING FROM ITS 3.2-LITER V-6 ROOTS TO A DIRECT-INJECTED 2.0-liter turbocharged inline-4 are out the door the moment you mash on the throttle. At full boogie, the Borg-Warner K04 turbo belts out 17 psi of boost, helping the engine produce 256 bhp and 243 lb.-ft. of torque. Turbo detractors should know that lag is minimal—shuffling through the crisp 6-speed manual transmission, the 3415-lb. The 5-door Golf R accelerates from 0–60 mph in 5.7 seconds. The previous R32 did it in 6.0 sec.

The Golf R is equipped with the latest version of 4Motion awd. In moderate driving conditions, power is funneled to the front wheels. During vigorous driving, as much as 100 percent of the power can be diverted to the back wheels via the Haldex clutch pack; handy if your photo shoot is happening in a semi-questionable downtown Los Angeles neighborhood. In fact, expensive photo equipment can be whisked to a safe distance of a quarter mile in 14 sec. flat. If we’re still comparing, the R32 would’ve taken 14.6 sec.

The overall solidness one comes to expect from a German car was evident when performing multiple U-turns during said photo shoot. While not exactly a slalom run at our test track—a challenge the Golf R completes at a swift 69.8 mph—the constant transitions proved the suspension to be taut (despite its surprising compliance while cruising), and the braking more than sufficient. The Golf R is a thoroughly well put-together car. I wish I had more time to appreciate it.

The 3-door model of the Golf R starts at \$33,990.—*Carter Jung*

List price	\$36,090
Price as tested	\$36,860
Curb weight	3415 lb
Engine	2.0-liter turbocharged dohc 16V I-4
Transmission	6-sp manual
Horsepower	256 bhp @ 6000 rpm
Torque	243 lb.-ft @ 2400 rpm
0-60 mph	5.7 sec
0-100 mph	14.0 sec
0-1320 ft (1/4 mile)	14.0 sec @ 100.1 mph
Braking, 60-0 mph	130 ft
Braking, 80-0 mph	230 ft
Our mileage	20 mpg
EPA city/hwy	19/27 mpg

*Electronically limited.

R&T TESTED

0-60 MPH
5.7
SEC

0-1/4 MILE
14.0
SEC

TOP SPEED
130*
MPH

SKIDPAD
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SLALOM
69.8
MPH

roadandtrack.com/GolfR



PHOTO BY CHRIS CANTLE

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Exceeding expectations

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PHOTO BY BRIAN BLADES

R&T TESTED

0-60 MPH	0-1/4 MILE	TOP SPEED	SKIDPAD	SLALOM
6.2 SEC	14.8 SEC	147* MPH	0.87 G	69.3 MPH

SOME THINGS ARE BEST LEFT ALONE. OTHER THINGS WORK BETTER WITH JUST A LITTLE HELP FROM A friend. Mini's friend, John Cooper, hots up cars that, on the surface at least, have no business being hotted up.

The Clubman was never envisioned as the "sports car" in Mini's lineup. With a third door and split rear hatch, it's more in line with a traditional shooting brake than a sports coupe. And yet with a 208-bhp turbocharged direct-injected inline-4 and quick-shifting 6-speed transmission, the little-big Clubman changes perceptions. Thanks to 207 lb.-ft. of torque while in overboost (normally 192 lb.-ft.), it changes that view in a hurry.

Compared to its length-challenged Mini counterpart, the Clubman's longer wheelbase adds a noticeable amount of stability, especially on choppy pavement, but still retains a playful front-end feel. Dual exhaust tips burble and pop during deceleration, making heel-toe downshifts a full sensory experience. Get on the 4-piston Brembos hard while trail-braking into a corner, and the back end comes around predictably and controllably.

On-throttle, an electronic limited-slip differential uses brake application to control wheelspin; it's helpful when driving hard out of tight turns. While we'd prefer a mechanical or clutch-type diff, this is about as good as an electronic system will get.

Pricing is a bit steep (base price, \$31,300, while our tester rang out at \$35,350), but you're definitely getting more than just plain ol' badge engineering. It's an enthusiasts' take on an already enthusiast-friendly car, one that will bring a smile to your face.—*Calvin Kim*

List price	\$31,300
Price as tested	\$35,350
Curb weight	2815 lb
Engine	1.6-liter turbocharged dohc 16V I-4
Transmission	6-sp manual
Horsepower	208 bhp @ 6000 rpm
Torque	192 lb-ft @ 1850 rpm
0-60 mph	6.2 sec
0-100 mph	15.7 sec
0-1320 ft (1/4 mile)	14.8 sec @ 96.9 mph
Braking, 60-0 mph	122 ft
Braking, 80-0 mph	215 ft
Our mileage	28 mpg
EPA city/hwy	25/33 mpg

*Electronically limited.



PHOTOS BY JOHN LAMM

roadandtrack.com/Veloster

2012 HYUNDAI VELOSTER

Big style, great economy, adequate performance

THE HYUNDAI VELOSTER AIMS to address the lack of curb appeal that afflicts many efficiency-focused cars. While the Veloster boasts 28/40 mpg with the manual and 29/38 with the optional dual-clutch 6-speed transmission, it doesn't mean

you have to sacrifice aesthetics for economy.

On the inside, the 4-seat Veloster features a design language that's inspired by motorcycles. A large touchscreen display shows audio, optional navigation and Hyundai's Blue

Link system. Think OnStar, but with more vehicle tracking and notification capability.

The Veloster's three-doors-plus-a-hatch configuration is unusual, yet under that rear hatch is a surprisingly deep cargo area. The front seat

occupants have interior room on par with any standard compact car; rear seat leg room is amazingly average, although there's very limited head room.

The exterior design makes the Veloster look like a sports coupe, but the intent of the car leans more toward economy. Powering the Veloster is a 1.6-liter inline-4 engine. With variable valve timing and direct injection, this powerplant produces 138 bhp at 6300 rpm and 123 lb.-ft. of torque at 4850 rpm. The MacPherson strut front suspension and the torsion beam rear axle do an adequate job of keeping the car flat and level on twisty roads.

Will the Veloster change the tide of small-car ownership? By itself, probably not. But with a broad list of standard features, reasonable price (starts at \$17,300), compact platform and 40-mpg capability, the Veloster is another car that proves that efficiency doesn't have to equal feature-poor blandness.—*CK*



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2012 ASTON MARTIN CYGNET

An iQ as only Aston can do

GAYDON, ENGLAND—ASTON MARTIN IS A COMPANY full of surprises, but the biggest was that we were driving its newest product. Following a factory tour, we were steered away from our 1954 MG-TF toward the Cygnet, its new Scion iQ-based commuter car produced for buyers accustomed to Aston Martin quality.

First impressions: It's much larger inside (at least in front) than it appears from outside, with rear seats that fold down creating a cavernous space for luggage or gourmet groceries. The interior reeks of luxury with leather seats and trim hand-sewn by the same craftsmen we'd seen on the tour.

It has surprising acceleration, a smooth ride and the optional CVT transmission means no shifts. We merged onto the busy M40 motorway and we were at 80 mph before we knew it. The car felt



PHOTO BY THE AUTHOR
roadandtrack.com/Cygnet

solid and stable with no noticeable tire nibble.

And the Cygnet's rack-and-pinion steering handled the crowned winter-worn surfaces without effort.

Body and drivetrain are Toyota but Aston Martin supplies top-quality paint and supreme luxury plus the familiar grille that immediately elevates it over ordinary econoboxes at a price of nearly \$50,000. Most impressive is the parking. Squeezing into an ultra-tight spot, I got the rear end in place, cranked the wheel three turns and I was in.

In saying goodbye, our Aston Martin contact said, "You're the first Americans to drive the Cygnet. Wouldn't it be neat if you were the first Americans to own one?" To sidestep the issue, we slipped away in our MG and began wondering if she might have a point. Wonder what they'd give for an old MG?—Ray DeTournay

2012 SCION iQ

Out-smarting the competition

List price	\$15,265
Price as tested	\$19,841
Curb weight	2180 lb
Engine	1.3-liter dohc 16V I-4
Transmission	CVT
Horsepower	94 bhp @ 6000 rpm
Torque	89 lb-ft @ 4400 rpm
0-60 mph	10.3 sec
0-100 mph	41.5 sec
0-1320 ft (1/4 mile)	17.8 sec @ 78.4 mph
Braking, 60-0 mph	131 ft
Braking, 80-0 mph	240 ft
Our mileage	est 37 mpg
EPA city/hwy	36/37 mpg

PHOTO BY BRIAN BLADES

ALTHOUGH A PORSCHE 911 driver could justifiably point at you and laugh, your Scion iQ microcar poses a very real threat to a Smart Fortwo at the Metered Freeway Onramp Grand Prix. Its 1.3-liter port-injected inline-4 puts out a strapping 94 bhp to the Smart straight-3's 70 bhp, which makes for a 0-60 sprint of 10.3 seconds, a full 3 sec. quicker in this contest. With 175/60R-16 all-seasons at each corner, the iQ has a decent 0.80g of skid-pad grip, though it feels tippy in quick transitions (Smart: 0.72g, with noticeably more understeer). Although anything resembling acceleration will have the engine churning north

of 4000 rpm with the CVT playing catch-up, the iQ is relatively quiet and directionally non-darting at 80-mph cruise, albeit with pitchy ride motions inherent in a car with a wheel-base of just 78.7 in.

At 120.1 in. overall, it's more than a foot longer than the Smart, yet it would still fit within the axles of an Audi A8 L, for instance. It's wide, too, at 66.1 in., about the closest thing to a square-on-wheels when viewed from overhead. Yet, it's a bit puzzling why a featherweight, low-powered car achieves only 36 mpg city/37 mpg highway when the Accents and Cruzes of the world get 40-plus on the open



Bonus Content:

Compare and contrast the Cygnet and iQ in our special side-by-side photo gallery.

roadandtrack.com/Cygnet
roadandtrack.com/iQ

road. That said, it's novel, has a surprisingly roomy front seating area with a playful sense of style, and comes standard with Bluetooth and sweet-sounding 160-watt audio. And how do you put a price on amazing your neighbors by using only half the street's width for a U-turn?—Douglas Kott

R&T TESTED

0-60 MPH
10.3
SEC

0-1/4 MILE
17.8
SEC

TOP SPEED
100
MPH

SKIDPAD
0.80
G

SLALOM
65.4
MPH



roadandtrack.com/iQ


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roadandtrack.com/Rio

2012 KIA RIO 5-DOOR

Kia, once again, gives more

THE NEW 2012 KIA RIO 5-DOOR hatchback scores an impressive 29 mpg city/39 mpg highway (class leading as of April 2011). Credit goes to its ISG idle start-stop system (optional on the EX tested)—unheard of in an economy car—and the all-new, more efficient engine and 6-speed automatic and manual transmissions. Being conscious of weight also helped in the mpg department—the Rio's

body is constructed of high-tensile-strength steel and the engine uses extensive aluminum for reduced weight.

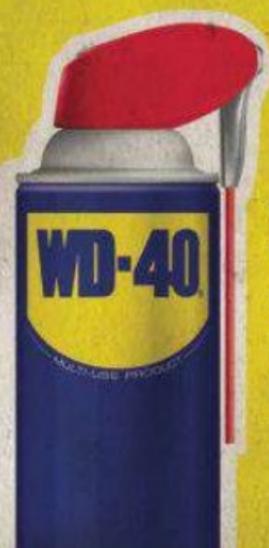
With regard to engines, the revised 1.6-liter found in the 2012 Kia Rio now boasts GDI, as in gasoline direct injection. Good for 138 bhp, the new 4-cylinder sees a 28-bhp bump over the previous iteration. While not fast, the Rio 5-Door is zippy for the most part. Zippy

going up hills. Zippy with a full-size passenger. Zippy around curves? Sort of. The front-drive Rio feels planted with its front MacPherson struts and rear torsion beam, but the skinny 185/65R-15 tires keep this Kia from being a canyon carver. It's more of a canyon whittler...

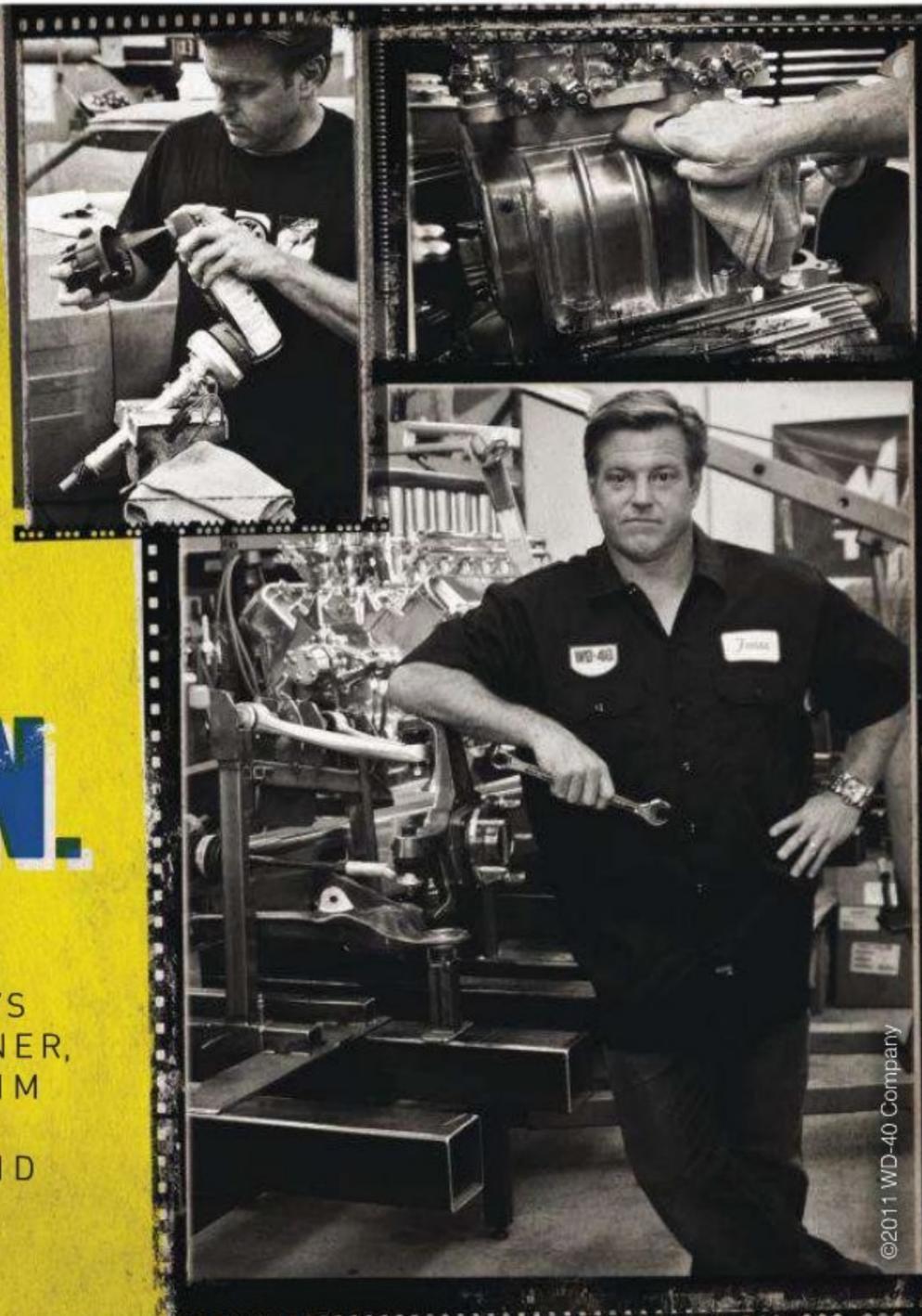
With its faster rake, steep shoulder lines and frowning front end, the new Rio 5-Door looks aggressive. The added width, along with lower ride height and shorter overhangs, also help the car's sporty stance. The interior is equally improved, featuring standard tilting steering column, steering-wheel-mounted audio controls and 60/40 split-folding rear seats. The EX trim adds power windows, cruise control, Bluetooth and a telescoping steering wheel.

The new 2012 Rio is an impressive econobox that shines against its competitors. But if we had it our way, we'd shoehorn Kia's 2.0-liter turbo in place and call it a day.—CJ

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2012 KIA SOUL

Exterior changes to the 2012 Kia Soul include revised turn signals, head- and taillights, hood and front and rear bumpers. Overall length has grown a smidge, by 0.6 in., but all other dimensions remain. A tilt/telescoping steering wheel is standard, and the center stack and shifter area have been polished. A new touchscreen infotainment system (including 7-speaker Infinity audio) and projector headlights and LED taillights are available. The new direct-injected 1.6-liter produces 138 bhp and the revised 2.0-liter makes 164 bhp. The former is rated at 27 mpg city/35 mpg highway; the latter 26/34. Helping achieve those numbers are the new 6-speed manual and automatic gearboxes, plus optional idle stop-start. Behind the wheel, the new 2.0-liter and automatic are huge improvements. The updated Soul starts at \$13,900.—CJ



roadandtrack.com/NewSoul

PHOTO BY BRIAN BLADES

roadandtrack.com/Verano



2012 BUICK VERANO

Econo-luxury,
Buick style

0-60 MPH
7.9
SEC

0-1/4 MILE
16.0
SEC

TOP SPEED
118*
MPH

SKIDPAD
0.83
G

SLALOM
66.3
MPH

R&T TESTED



List price	\$25,965
Price as tested	\$26,850
Curb weight	3400 lb
Engine	2.4-liter dohc 16V1-4
Transmission	6-sp automatic
Horsepower	180 bhp @ 6700 rpm
Torque	171 lb-ft @ 4900 rpm
0-60 mph	7.9 sec
0-100 mph	21.3 sec
0-1320 ft (1/4 mile)	16.0 sec @ 87.9 mph
Braking, 60-0 mph	131 ft
Braking, 80-0 mph	233 ft
Our mileage	est 23 mpg
EPA city/hwy	22/31 mpg

*Electronically limited.

THOUGH AT ITS CORE ARE Delta-platform stampings shared with the Chevrolet Cruze, think of this new, smallest Buick as LaCrosse Lite. This front-driver's structure is solid, its stylish interior shares the soft-touch leathers and plastics of the LaCrosse, and multiple sound-deadening measures—laminated glass, triple-sealed doors, even the engine's intake runners are foam-ensconced—make for impressive over-the-road solitude.

Its 2.4-liter direct-injected Ecotec inline-4 has a torquey tip-in feel and strong midrange, its 180 bhp propelling 3400 lb. through a 6-speed Hydra-Matic

to a 7.9-second 0-60 posting—quick enough to border on entertainment. With a 235/45-18 all-season Continental at each corner and a rear torsion-beam suspension located laterally with sort of a reverse Watt linkage, the Verano's handling is precise and reassuringly linear, posting a laudable slalom speed of 66.3 mph with only slight intervention of its stability control system.

The electric-assist steering is creamy smooth and has a 15.5:1 ratio, quick enough to make the chassis feel lively. If there's any fault, it's a slight front-end lightness at speed, a minor issue that surfaced

on California's rain-grooved super-slabs.

Inside, cramped rear leg room is offset by comfortable leather-lined front seats, blue ambient lighting, a sophisticated Cadillac CTS-esque center stack, and a super-vivid backlit LED infotainment screen that works with your MP3 player (through either Bluetooth or USB links) via Buick's IntelliLink system. The technology-packed Verano is a nice surprise in both refinement and sophistication and well worth a look when cross-shopping the Lexus IS 250, Infiniti G25 and Audi A3.—DK



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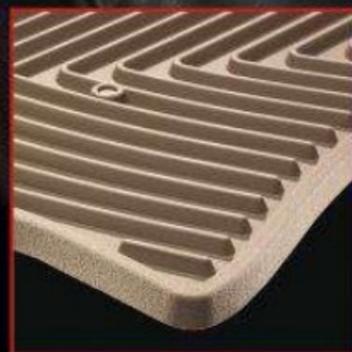
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FERRARI 458 SPIDER

Arachnophilia



We love how this Spider makes the world a better place...to drive  BY JONATHAN ELFALAN



T REGGIO EMILIA, ITALY—Some roads, stitched together by dint of natural topography, are the inspiration for race circuit designers—the kind of curves they'd love to capture for large-scale exposure and credit to their own creative genius. Fluid, rhythmic, wide open—flawless. ❖ What we have here is not that road. But because we're at the wheel of the new 458 Spider—the first mid-engine berlinetta to sport an all-aluminum retractable hardtop, says Ferrari—it at least feels like we're on some of the greatest asphalt ever laid. Cracks, bumps and malicious undulations are all quietly snubbed by this open top's incredibly well-sorted chassis. Pirelli tires stick with little audible protest, while effortless steering and a ratio approaching Formula 1 quickness, allow us to skirt oncoming traffic in our half of the lane with a simple flick of the wrists. Following a lengthy stint of precarious bends and unpredictable apexes, my relaxed state of being and sweat-free brow have me convinced this is one of the most proficient cars in which to go fast.



A great deal of technology is at work here, which we experienced firsthand driving the 458 Italia coupe last year. First is the electronically adjustable magneto-rheological dampers—now employed throughout the entire Ferrari line—that provide active monitoring of and phenomenal response to surface conditions. The suspension, which utilizes double wishbones up front and a multilink rear, benefits from spring rates that play a larger part in body roll control (78 percent versus 60 percent for the F430 Spider) that in turn requires less action from the anti-roll bars. This separation of forces lets the wheels articulate more independently and deliv-

ers better ride quality with enhanced dynamic performance, outshining its 430 predecessor in both. Chassis torsional rigidity for the 458 Spider, aided by reinforced side sills, remains far superior to the F430 Spider's, but is still 30 percent less stiff than the 458 Italia coupe's.

The direct-injected V-8 engine is a specimen in itself. Because of the Spider's aluminum hood and articulating aluminum roof (which deploys or retracts in 14 seconds and saves 55 lb. over the previous generation's soft-top), the engine is no longer flaunted under glass. Furthermore, the air intakes have been shortened and repositioned inside the rear ducts (that also feed the wet





clutches and transmission radiators) while six new vents suck cool air into the engine bay. With no gain or loss in power, this setup affords access to the new high-def harmony produced by an all-new resonator that Ferrari has tuned specifically for an open-air audience. From 4.5 liters, 570 naturally aspirated horsepower is squeezed out at a glorious 9000 rpm, while a 4-stage variable geometry intake manifold works to flatten the torque curve, cresting with 398 lb.-ft. at 6000 rpm. Delivery of this comfortable power reserve, through an excellent 7-speed dual-clutch transmission, is instantaneous and sometimes unexpected—especially when you're tooling around town in anything as aggressive as "Race" on the *Manettino*. Calibrations

for this dial's five settings (Normal, Sport, Race, CT off, CST off) seem well-defined and appropriate for their respective nomenclatures. With each click of the *Manettino*, the throttle, transmission, suspension, traction/stability control (F1-Trac) and electronic differential (E-Diff) are suitably modified for the selected setting. Be sure you have sufficient room and/or talent before you select the full-off position.

As fond as I feel toward Ferrari's latest flip-top, my original takeaway from the 458 wasn't as favorable. Though conditions at our El Toro test track were not ideal for a first impression, the memory of struggling to give steering inputs small enough to thread our 8-cone slalom while managing a throttle that pro-



duced a significant effect from the smallest of inputs, still stands. It took considerable mental discipline to do less and less, quicker and quicker, to go faster and faster. The Italia posted some phenomenal numbers that day, but the experience was akin to using a samurai sword in a small kitchen to slice garlic.

To our knowledge, Ferrari test drivers aren't spending hours on end dodging 6-in. orange cones on an open runway, so to finally experience the 458 in an environment for which it was designed brings a new level of appreciation for the car. The Spider goes on sale in January, but its design team has been working on the roof articulation for this model since June of 2004. Eight years in the making, the result is a design that not only occupies a storage volume smaller than a Lotus Elise's trunk (3.5 cu. ft. total), but adds only 120 lb. to the coupe's curb weight (3035 lb.) and increases the overall drag coefficient of the Italia (at 0.33) by a marginal 0.005 when the roof is closed.

The cabin seals off quite nicely and is insulated well



from wind noise, though this also effectively mutes the exhaust some. The interior is virtually identical to the Italia's, with leather and carbon fiber in tasteful abundance. A large center tachometer is flanked by dual TFT displays that can be configured and scrolled through via dash-mounted knobs and buttons. The right screen is dedicated to multimedia and navigation displays while the left handles the more operational functions, my favorite of which is a color schematic for engine, tire and brake temperatures—a geek's wonderland! The stalk-less steering column (turn signals are on the steering wheel) sports paddles that are marginally smaller than the coupe's while all new 458





models will now benefit from illuminated steering wheel controls. The one major difference between the Spider and coupe cabins, aside from the occasional absence of a roof, lies behind the seats where there's less room but enough preserved real estate to store a regular-size golf bag, relatively stealthily.

Ferrari estimates it will produce roughly 1500 to 2000 458 Spiders yearly, at around \$257,000 a pop. For those fortunate buyers, this will likely be the greatest convertible they've ever driven. At least till the next one. 

■ Top up, you'd be hard pressed to tell this Spider apart from an Italia coupe, other than from the rear where the engine is now entirely concealed under aluminum. The front end still utilizes aeroelastic winglets that flex at speed to decrease drag.



SPECIFICATIONS

List price	est \$257,000
Curb weight	3155 lb
Weight dist, f/r %	42/58
Wheelbase	104.3 in.
Length	178.2 in.
Width	76.3 in.
Height	47.7 in.

ENGINE & DRIVETRAIN

Type	alum. block & heads dohc 4-valve/cyl longitudinal V-8
Displacement	4499 cc
Bore x stroke	94.0 x 81.0 mm
Compression ratio	12.5:1
Horsepower (SAE)	570 bhp @ 9000 rpm
Weight-to-power ratio	5.5 lb/bhp
Torque	398 lb-ft @ 6000 rpm
Redline/limiter	9000/9000 rpm
Fueling	direct injection
Recommended fuel	premium
Transmission	7-speed dual-clutch automated manual

CHASSIS & BODY

Layout	mid engine/rear drive
Body/frame	aluminum
Brakes, f/r	15.7-in. vented & drilled carbon-ceramic discs, 6-piston fixed calipers/14.2-in. vented & drilled carbon-ceramic discs, 4-piston fixed calipers; vac assist, ABS
Wheels	cast alloy; 20 x 8 1/2 f, 20 x 10 1/2 r
Tires	Pirelli P Zero; 235/35ZR-20 88Y f, 295/35ZR-20 105Y r
Steering	rack & pinion, vari power assist
Steering ratio	14.0:1
Suspension, f/r	upper & lower A- arms, coil springs, elect. adj tube shocks, anti-roll bar/multi-link, coil springs, elect. adj tube shocks, anti-roll bar

PERFORMANCE*

0-60 mph	3.3 sec
1/4 mile	11.4 sec
Top speed	199 mph

*Manufacturer claims.

BONUS CONTENT:



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The New Honda Civic

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SEDAN ○○○○○

COUPE ○○○○○

CIVIC SEDAN

Luxury and efficiency aren't mutually exclusive concepts anymore thanks to the next-generation Civic. In the Civic Sedan you can get **39** mpg highway,¹ and available Honda Satellite-Linked Navigation System™ with FM Traffic.²

HYBRID

For those seeking even more efficiency, the Civic Hybrid gets **44** mpg on the highway.¹ The Hybrid even comes with an ECON button³ that helps the driver extract every last mile out of a gallon of gas.

COUPE

The sporty Civic Coupe's 140-horsepower engine, USB Audio Interface,⁴ and customizable i-MID screen⁵ is proof that you can look good and feel good about your car.

HF

Various aerodynamic tweaks allow the Civic HF to achieve an impressive **41** mpg on the highway.¹ And thanks to EcoAssist™³, it helps you drive more efficiently.

Si

For those who want more fun in their lives, there's the 201-horsepower Si that comes in both Coupe and Sedan body styles with a slick-shifting six-speed manual and a lively sporty feel.

NATURAL GAS

A cleaner, low-emissions alternative. The Civic Natural Gas runs on, you guessed it, natural gas. It is the only manufacturer-built natural gas-powered passenger vehicle in the United States.



Si COUPE ○ ○ ○ ○ ○

HF ○ ○ ○ ○ ○

HYBRID ○ ○ ○ ○ ○

¹28 city/39 highway/32 combined mpg for Sedan and Coupe with 5AT. 25 city/36 highway/29 combined mpg for Sedan and Coupe with 5MT. 29 city/41 highway/33 combined mpg for HF. 44 city/44 highway/44 combined mpg for Hybrid. Based on 2012 EPA mileage estimates. Use for comparison purposes only. Do not compare to models before 2008. Your actual mileage will vary depending on how you drive and maintain your vehicle. ²The Honda Satellite-Linked Navigation System is available on EX, EX-L, Natural Gas, Hybrid and Si models in the United States, Canada and Puerto Rico. (FM Traffic service only available in the United States, except Alaska.) Please see your Honda dealer for details. ³ECON logo and Eco Assist are trademarks of Honda Motor Co., Ltd., and may not be used or reproduced without prior written approval. ⁴The USB Audio Interface is used for direct connection to and control of some current digital audio players and other USB devices that contain MP3, WMA or AAC music files. Some USB devices with security software and digital rights-protected files may not work. Please see your Honda dealer for details. ⁵Standard on LX and above models. EX-L Sedan model shown. EX-L Coupe model shown. Si Coupe model shown. HF model shown. Hybrid model shown. ©2011 American Honda Motor Co., Inc.

ROADTEST



2012 Audi **TT RS**

It's more than meets the eye

BY PATRICK HONG PHOTOS BY GUY SPANGENBERG

WE OFTEN JUDGE THE CREDENTIALS OF A sports car by starting with the basics. It must have a powerful engine mounted close to its center of gravity. A precise manual gearbox is essential. Having a properly tuned suspension driving the rear wheels practically goes without saying. The rest? Sexy styling and a purposeful interior complete the package.

Now take this sports car checklist and apply it to the 2012 Audi TT RS. Despite having a powerful 360-bhp turbocharged engine, it is placed far forward over the front axle, not particularly close to its center of gravity. As for having a proper transmission, the TT RS does pass the test with its 6-speed manual. And while the car is equipped with Audi's Quat-



tro all-wheel-drive system that splits the torque 50/50 front/rear under normal conditions, it is still not the preferred rear-drive-biased setup, and with added penalty of carrying more weight. As an RS model, Audi engineers tweaked the suspension to match its high-performance specifications. But what about the sleek styling and no-nonsense interior ergonomics? It gets a passing grade here, too. But frankly, nothing particularly stands out so much to make it a show-stopper on the street.

So what's the big deal with the Audi TT RS?

You have to drive it.

Slip into the properly bolstered driver seat. Find the sport button on the center

console. Twist the ignition key (rare these days with push-button starts) and you are greeted with a low engine growl. Its racy and louder-than-expected exhaust note gives hint to energy within, eager to be released. Slide the shifter into 1st gear, give it a good amount of gas before you let out the clutch and the TT RS will leap forward with a forceful hand. Now give it full power and the turbo 5-cylinder hesitates just a tick before it winds toward its 6800-rpm redline and catapults forward with all its might. Rowing through its well-defined shift gates, the TT RS lunges to 60 mph in just 4.0 seconds, with the quarter-mile mark hurtling past at 12.6 sec. at a speed of 109.6 mph. And your brain struggles to reconcile reality with what on paper

seemed merely a passing-grade sports car: The TT RS is a hungry, asphalt-chewing world-class driving machine.

Delivering surprising performance is not without precedent in Audi's history. Its effort in the World Rally Championship (WRC) with a turbo 5-cylinder Quattro rally car in the early '80s was met with skepticism at first. Others at the time thought the all-wheel-drive system's weight penalty would overwhelm its performance enhancement. But Audi proved everyone wrong by winning WRC championships in 1983 and 1984.

In the modern-day TT RS, the 5-cylinder engine has a special graphite and cast-iron composite block with an aluminum alloy cylinder head. Incoming fresh air for



the powerplant is first compressed to 17.4 psi by a turbocharger fitted with a separate oil supply and cooling system, and then routed through an intercooler before entering the cylinders. In the combustion chambers, fuel is injected directly at 1741 psi to create an even swirling air/fuel mixture for optimal burn. Combined with a 10.0:1 compression ratio and variable cam timing, the TT RS powerplant cranks out a maximum 360 bhp from 5500 to 6700 rpm and 343 lb.-ft. of torque from 1650 to 5400 rpm. All this with EPA city/highway ratings of 18/25 mpg.

Putting the power down to the asphalt falls on the shoulders of Audi's Quattro all-wheel-drive system paired with a short-throw 6-speed manual transmission. The simplicity of the gearbox makes it very exciting as you are more involved in the driving experience rather than just a bystander watching modern-day electronics shift through the gears for you. The Quattro system employs an electronically controlled, hydraulically actuated multiplate clutch

system mounted near the rear axle. It apportions the torque instantly when needed, thanks to a separate electric pump that builds up oil pressure in milliseconds.

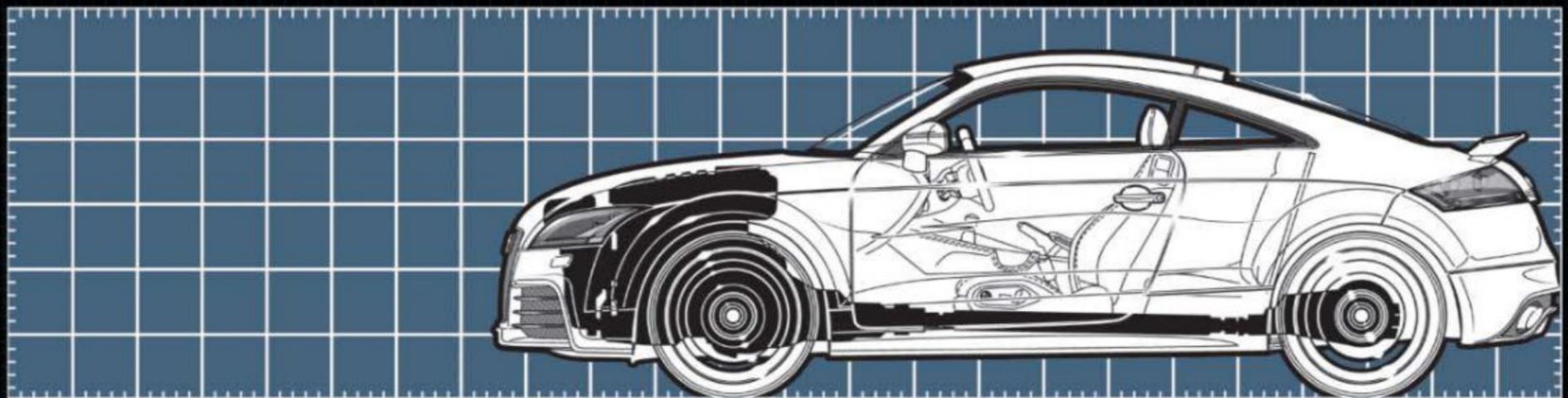
On our test track, the Audi TT RS' road-hugging ability clearly shows.

Around our 200-ft. diameter skidpad, the RS hangs on with impressive adhesion, generating 0.95g of lateral acceleration. Through our slalom, the car threads around the cones at 70.7 mph. To put this in perspective, both numbers easily



■ ■ **Simplicity is a beautiful thing. The Audi TT RS interior is handsomely styled with important gauges and knobs prominently presented and easily accessible. The thick-rim steering wheel, precise shifter and supportive seats complement the car's svelte exterior and sporting nature.**





LENGTH	165.3 IN.	WIDTH	72.5 IN.	HEIGHT	53.1 IN.	CURB WEIGHT	3360 LB
WHEELBASE	97.2 IN.	TRACK, F/R	61.2 IN./60.9 IN.	GROUND CLEARANCE	5.0 IN.	TRUNK SPACE	13.1 CUFT

SCALE: 10 IN. (254 MM) DIVISIONS
DRAWING BY TIM BARKER
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List Price: \$56,850 Standard equipment: AM/FM/CD/DVD/MP3/SAT, Bluetooth, Quattro all-wheel drive, 6-speed manual transmission, auto. climate, cruise control, xenon headlamps, Nappa leather & Alcantara, pwr front sport seats, pwr windows, mirrors & door locks. Options: sport exhaust (\$1500), aluminum matte optic exterior pkg (front spoiler lip, rear valance trim and spoiler) \$950, Suzuka Gray metallic paint (\$950), dest charge (\$875). **As Tested: \$61,125**



SPECIFICATIONS

ENGINE

Type/layout	iron block, alum. head, turbo I-5/transverse
Valvetrain	4-valve/cyl dohc, variable cam timing, chain drive
Displacement	2480 cc
Bore x stroke	82.5 x 92.8 mm
Compression ratio	10.0:1
Horsepower (SAE)	360 bhp @ 5500 rpm
Torque	343 lb-ft @ 1650 rpm
Redline/limiter	6800/7000 rpm
Fuel injection	direct

ACCOMMODATIONS

Seating capacity	2+2
Head room, f/r	38.0 in./31.0 in.
Seat width, f/r	2 x 17.0 in./2 x 18.0 in.
Front leg room	43.5 in.
Rear knee room	17.8 in.
Seatback adj.	40 deg
Seat travel	9.5 in.
Lat. seat support	very good

WARRANTY

Basic warranty	4 years/50,000 miles
Powertrain	4 years/50,000 miles
Rust-through	12 years

INSTRUMENTATION

200-mph speedometer, 8000-rpm tach, coolant temp, fuel level

ADVANCED SAFETY

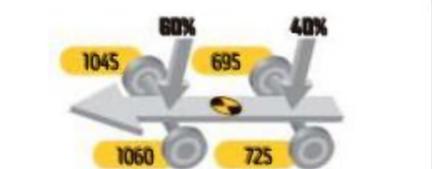
front and side airbags; traction & yaw control

FUEL ECONOMY

Our driving	est 19 mpg
EPA city/highway	18/25 mpg
Capacity/range	15.9 gal./302 miles
Recommended fuel	premium

CHASSIS

Layout	front engine/awd
Body/frame	unit aluminum & steel
Brakes	Front: 14.6-in. vented, drilled & floating discs/4-piston fixed calipers Rear: 12.2-in. vented discs/1-piston sliding calipers
Assist type	hydraulic, ABS
Wheels	cast alloy, 19 x 9J
Tires	Toyo Proxes T1 Sport, 255/35R-19 96Y
Spare tire	puncture kit
Steering	rack & pinion, variable elect. assist
Steering ratio	16.9:1
Steering wheel	14.5 in.
Turns, lock to lock	2.9
Turning circle	36.0 ft
Suspension, f/r	MacPherson struts, lower control arms, coil springs, elect. adj tube shocks, anti-roll bar/multilink, coil springs, elect. adj tube shocks, anti-roll bar



Test weight with driver: 3525 lb
Weight-to-power ratio: 9.3 lb/bhp

DRIVETRAIN

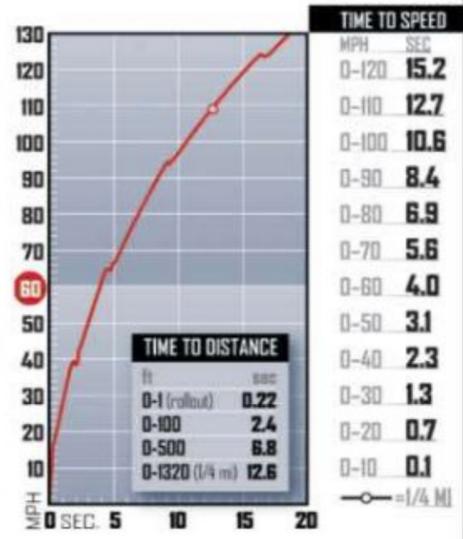
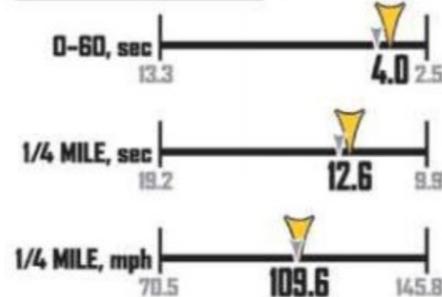
Transmission:	6-speed manual
Gear Ratio Overall ratio (Rpm) Mph	
1st	3.57:1 13.44:1 (7000) 40
2nd	2.16:1 8.13:1 (7000) 66
3rd	1.89:1 5.50:1 (7000) 98
4th	1.43:1 4.16:1 (7000) 129
5th	1.16:1 3.37:1 (7000) 159
6th	0.97:1 2.82:1 est (6400) 174*
Final drive ratio	(1-2)3.77:1, (3-6)2.91:1
RPM @ 60 mph in top gear	2200

* Electronically limited.

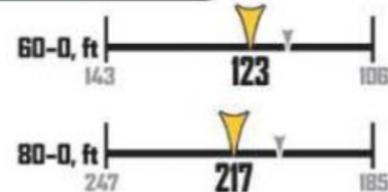
PERFORMANCE

These scales show how the **AUDI TT RS** performs relative to other cars currently in our Road Test Summary. Identified in each category are the extreme values (better →) as well as the median values (∇) of our current test data.

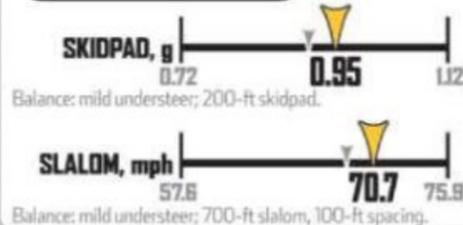
ACCELERATION



BRAKING



HANDLING



INTERIOR NOISE

LIBRARY	30
AT IDLE	60
CONSTANT 50 MPH	75
CONSTANT 70 MPH	78
MAX IN 1ST GEAR	80
JACKHAMMER	100

Sound readings in dBA.

TESTNOTES

TEST CONDITIONS: TEMPERATURE: 73° F • HUMIDITY: 51% • ELEVATION: 350 FT • WIND: CALM • LOCATION: IRVINE, CA

1 To launch the car, set ESP and Dynamic modes to Sport. Rev the engine between 3000 and 4000 rpm. When the tach crests 4000, release the clutch. Mild front wheelspin helps keep the engine from bogging.

2 As speeds decrease during trail-braking maneuvers, the TT RS transitions from understeer to a more neutral state.

3 The RS is the most neutral TT, but turn-in response isn't as crisp as expected. This may be more related to its tires than suspension tuning.

outshine those of the Porsche Cayman S. Quite surprising, considering the TT RS' engine is far out in front as compared to a mid-engine Cayman, and its all-wheel drive typically leads to more understeer.

On mountain roads, the Audi TT RS' sporting nature is also apparent. Thanks to its compact stature and a lively yet confidence inspiring all-wheel-drive system, the TT RS carves its way through switchbacks with utmost smoothness and stability. Even though the car's off-center steering feel is not as precise as preferred, it nevertheless points the front end through the corner with mostly mild understeer behavior. Take the stability control off, and the Audi can be more playful. Romping on the throttle in this mode, you're able to kick the tail out on corner exit. That, along with the engine singing its throaty tunes as you toss the RS toward the apex, immerses you in the magnificent sports-car experience sought by all car enthusiasts.

The more you drive the Audi TT RS, the more you sense the subtleness of the car's character. That "passing grade" is turning more exciting by the minute. The treatment of the large signature grille is by far the best and the most aggressive-looking in Audi's lineup,



roadandtrack.com/TTRS



avoiding the look of a big gaping hole. The front and rear fenders carry a nice cutline to show off its muscular stance. And the sculpted wing blends nicely into the car's rear, giving it a purposeful appearance. Inside, simple elegance is the theme as everything is done for the

driver to focus on the task of driving.

At a list price of \$56,850, the 2012 Audi TT RS is highly competitive and in good company with the likes of BMW 1 Series M, Lotus Evora S and the Porsche Cayman S and R. Often, high-performance cars that look impressive on paper

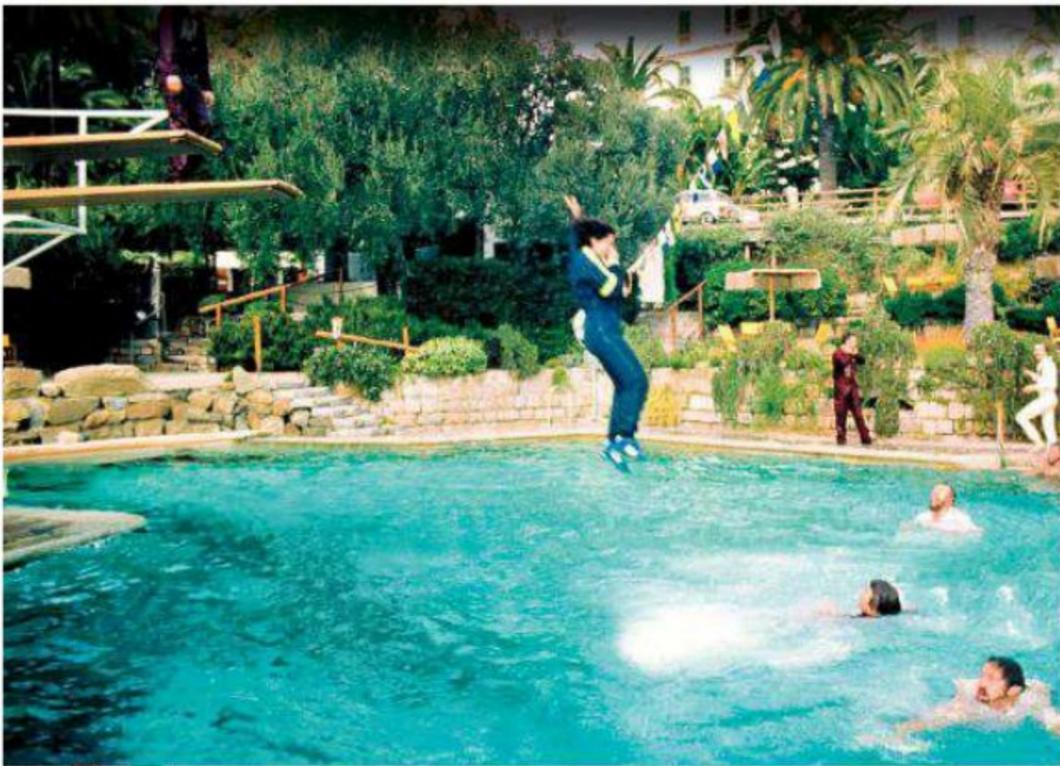


PHOTO BY RALLY SPRINT

POOL PARTY!

Celebrating the 30th anniversary of the first World Rally Championship win by a woman

SANREMO, ITALY—POOLSIDE AT the Hotel Royal in this beautiful coastal town in 1981: Michèle Mouton and her co-driver Fabrizia Pons just won the Sanremo round of the FIA World Rally Championship (WRC) in their Audi Quattro Group 4 rally car. The entire contingent—the drivers, the engineers and the mechanics—is celebrating not only because Mouton is the first woman ever to win a WRC event, but because of Audi's incredible rise to the sport's top ranks, in one short year. Mouton happily jumps into the pool and is being interviewed by the media. Members of the Lancia team, considered the one to beat at the time, also gather poolside and applaud Audi's well-deserved win.

Franz Peter, one of the mechanics for Mouton, recalls the scene to be one of "absolute elation," and "they drank everything that was liquid."

At a streetside restaurant in Sanremo on a cool evening, Peter continues, "Being a new-

comer to rally competition, Audi had to work extra hard to be competitive." Prior to the start of the Rally of Sanremo, Peter notes that the team came here to scout the location with folks who had mostly worked on production cars, who were very inexperienced in rallying. So as the race day neared, the Audi mechanics continued to work through the night while the Lancia team and others were already in bed. Dr. Ferdinand Piëch, now chairman of the supervisory board of Volkswagen Group, then head of engineering for Audi, would assemble the race team's engineers and mechanics together to pepper them with questions about solutions to problems, not just to hear the troubles.

The Sanremo rally in 1981 took place on asphalt and gravel. Peter mentions that Audi brought some 1800 tires for their rally Quattro. With Volkswagen LT45 trucks acting as support vehicles, they leapfrogged the rally stages ahead of the Quattro so the mechanics



fall short of expectations when you climb aboard. But in the case of the TT RS, it is quite the opposite. The more time you spend driving the car, the more you will appreciate the sum of its parts. It's simply one of the most exciting sports cars on the market today. 

■ A wide track helps give the TT RS an agile feel, and the look of the car is highlighted by straked lower inlets up front and broad rear shoulders that are capped by a wing. The TT RS' turbocharged and direct-injected 2.5-liter inline-5 sends 360 bhp and 343 lb.-ft. of torque to the wheels via—what else?—a Quattro all-wheel-drive system. Under the hood, the car's individual ignition modules are styled elements.

■ Even though 27 years have passed, this iconic 1984 Audi Quattro A2 Group B rally car still looks very much at home on the tight mountain roads near Sanremo, Italy. Michèle Mouton, in an earlier Group 4 version, captured her historic first WRC win on these same roads. The turbocharged inline-5 sounds as vigorous as ever.





2012 Audi TT RS

1984 Audi Rally Quattro A2 Group B

Engine	2.5-liter turbo dohc 20V inline-5	2.1-liter turbo sohc inline-5
Transmission	6-sp manual	5-sp manual
Horsepower	360 bhp @ 5400-6500 rpm	265 bhp @ 7000 rpm
Torque	343 lb-ft @ 1600-5300 rpm	332 lb-ft @ 4000 rpm
Length	165.3 in.	173.3 in.
Wheelbase	97.2 in.	99.3 in.
Curb weight	3360 lb	2425 lb
0-100 km/h (62 mph)	4.2 sec	est 4.2 sec



could be ready to fix the car if needed, and swapped fresh tires for the next stage. On the asphalt stages, the Audi would lag behind the competitors. But on gravel the Quattro would shine, sometimes passing the Lancia on several stages even after starting behind them.

For Mouton and her co-driver Pons, there was pressure to perform well at Sanremo. The competition, and even some inside the team, thought having a woman driver was strictly for marketing and promotional purposes. According to Peter, the team was impressed by how hard Mouton worked during practice, and how focused she became during the event. In fact, once the team saw the times turned in by Mouton, there was no more doubt about her ability to drive the Quattro competitively. Peter also remembers that during practice, Mouton treated everyone nicely. But once the event started, she was extremely competitive and serious about the job at hand.

For this 30th anniversary celebration of Mouton's win, Peter and his colleague Thomas Bauch from Audi Tradition brought the 1984 Rally Quattro A2 Group B car down to Sanremo. The A2 is a further evolution of the Quattro driven by Mouton, and was first piloted by Stig Blomqvist and Björn Cederberg at the 1984 Monte Carlo Rally. The pair won the Swedish rally in this same car later that year.

And it was also the same season that Blomqvist finished 1st in the championship and

Audi won the constructor's title.

Today, seeing the iconic Audi Rally Quattro A2 speed through the curvy mountain roads north of Sanremo, and hearing the wonderful throaty engine note from the Quattro's turbocharged inline-5, is an absolute thrill. Riding a bit higher than a modern road car, the A2 feels right at home among the trees and shrubbery that line the road. The big rally headlamps flanking the Audi's 4-ring emblem and the svelte coupe/hatch body profile ending with big oil coolers nested inside the large

rear wing, they create an ambience that makes it seem as if it were 1981 again. Peter takes great care to drive the car at moderate pace so as to not overtax the rare and valuable vehicle. Still, riding inside the cockpit, or outside watching the A2 whizzing by, the engine's eagerness to rev and push forward is mesmerizing.

The only hint of something different in this period scenery is the 2012 Audi TT RS chasing the Quattro A2. Both cars share the basic turbocharged 5-cylinder engine layout with a manual

■ Franz Peter, a former mechanic for Michèle Mouton's rally car, retells the historic Sanremo win.





❖ The TT RS and the Rally Quattro may be years apart (and intended for very different driving surfaces), but their Audi DNA is shared, highlighted by ferocious turbo-charged inline-5 engines and Quattro all-wheel drive, which surprised the competition back in the early 1980s and allows both cars to power out of corners with utmost confidence.

gearbox and all-wheel drive. The TT RS takes the corners just as easily and confidently as the A2. Put the two cars on the drag strip, and the A2 can still keep up with the TT RS to 62 mph.

Completing our visit to Sanremo is a stop at the Ristorante Dall'Ava in San Romolo, in the mountains along the route for the rally. This café was frequented by drivers like Mouton and others, including Walter Röhrl, who is in many of the photos hanging on the wall. In fact, the owner of this establishment, Orlando Dall'Ava, used to be a rally driver for Fiat.

At the Royal Hotel, as we finish up our two-day visit in and around Sanremo, the stunning coastal sunset provides a perfect ending. Sitting outside on the patio of this very historic hotel, with the Audi Quattro A2 positioned in the driveway alongside the pool where Mouton celebrated her victory just a few steps below, we can almost picture the joyous pandemonium that took place here 30 years ago.—PH

QUESTIONS WITH

Michèle Mouton

AUDI SPORT
FACTORY RALLY DRIVER 1981-1985



Michèle Mouton is the first (and so far, only) woman to win a World Rally Championship event. This was accomplished in 1981 at the Rally of Sanremo with her co-driver Fabrizia Pons. Her other wins include WRC rallies in Portugal, Greece and Brazil. In 1984, Mouton won Pikes Peak in the Rally Division piloting an Audi Quattro Sport. In 1985, she won there again, setting a new course record—the first time for a non open-wheel car. We had an opportunity to chat with her after our visit to Sanremo.

1

What inspired you to become a rally driver?

I didn't start out wanting to be a rally driver. However, I do love to drive. A car means freedom and independence. I have been driving since I was 14 years old. And when I was 22, I met a friend who asked me to be a co-driver for a rally in the south of France. After a few races, my father said to me, Why don't you try it yourself? He bought me car and said I have to be the first woman rally driver and have to compete in the most difficult rally in France. So once I had a goal, I never gave up. After winning a few races in my category and also driving for Team Fiat in France, Audi called. I was teamed up with the best rally driver in the world, Hannu Mikkola. Then I pushed myself to be at his level. Later, I realized that my father gave me the chance to do what he would have loved to do.

2

What was it like being a female professional rally driver?

At the beginning of my career, I was winning my category. There were rumors that I won because maybe my car was not legal. But as I continued to win, my car passed scrutineering. After that, no problems. With the other drivers, they were professionals and gentlemen. Inside the car, we were all racers. Outside the car, they were very supportive. I never had any problems.

3

What was the most memorable moment about winning the 1981 Rally of Sanremo?

For me, I remember two things: First, the mechanics were all there waiting for my co-driver Fabrizia Pons and me with a big bunch of flowers. Then they put the flowers on the car. That meant so much and was really important for us. Second, when you realized you won, there is nothing on top of that. I had this really fantastic feeling that we reached another level, maybe we will be able to win more. In the following year, we won rallies in Portugal, Greece and Brazil.

4

What was the rally Quattro like to race at Sanremo?

The car always reminded you that you were in a really safe car. A powerful and strong car. It was not at all like the Peugeot at the time, which was lighter but more nervous to drive. The feeling of the Quattro was a strong car, nothing can happen to you. It really gave you the satisfaction when you wanted do something, you could always do what you wanted with the car. And of course, the noise from the car's turbo was fantastic.

5

Which modern road-going Audi would you like to drive?

Today I drive an Audi A4 from the company. I also own a city car to drive around town. I would like to drive an R8. But if I have such a nice car, I would worry too much about it.



PERFORMANCE OVERLOAD!

Four supercars that declare upscale aftermarket tuning is still alive and kicking

BY SAM MITANI PHOTOS BY GUY SPANGENBERG



“IF ONLY...”

These two words are often uttered privately when we allow our consciousness to fantasize about what life could be like in an ideal world.

For aftermarket tuners, “if only” is their stock in trade. So, we rounded up four examples of the breed, each representing a different price category and each an interpretation of its creator’s ideal car. The D3 Cadillac CTS-V is the value leader of the group, offering excellent performance and driveability at a price considerably south of the \$100,000 mark. The GReddy G43 GT-R is all about high performance, happily sacrificing everyday practicality for the sake of pure unbridled speed. The GMG Audi R8 Le Mans TT represents the most well-rounded example of the group, with a flawless combination of performance, civility and head-turning good looks. And then there’s the stunning CEC Mercedes-Benz SLS, a car that’s more about impressing the in-crowd at a Beverly Hills restaurant than racing on a track. The cars are presented here according to asking price, from low to high. You’ll notice that with the exception of the decals on the GReddy GT-R, visual modifications to the cars were kept to a minimum, with the focus instead placed on performance—keeping the classy aura of the cars intact. After your virtual stint behind the wheel of these four automobiles, we’re hoping that at least one of them will have you whispering to yourself, “If only...”

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D3 CADILLAC

The message from Detroit these days is that the Motor City is back; and by the looks of the new Cadillac CTS-V Coupe, that message comes through loud and clear. Add to the stylish performance coupe the aftermarket package provided by the folks at D3, who specialize in tuning cars from GM’s halo brand, and we’re talking a comeback on the scale of Rocky Balboa.

The D3 Cadillac CTS-V Coupe seemingly has it all: head-turning good looks, a high level of comfort and performance that will scare the sideskirts off of similar cars from Europe and Japan. D3 went to work first under the hood of the car, installing its Stage Three Power Kit, which includes a new intake system, performance pulley system, NGK spark-plugs, a larger intercooler and a custom exhaust system, among other items. The result is 635 bhp at the wheels, which

translates to about 705 bhp at the fly-wheel. Torque sees an increase to 676 lb.-ft. that peaks at 3600 rpm.

As you drive the car on public roads, you’ll hardly notice D3’s engine tweaks. The car rides smoothly, with the cabin staying remarkably quiet; however, when we took it to the test track, it didn’t take long for the D3 CTS-V to reveal its true colors. The car launches exceptionally well, with the stock Michelin PS2 rear tires instantly grabbing hold of the driving surface (Toyo R888 295/30R-19s are also available). As soon as they hook up, the car lunges forward intensely, throwing your torso into the seatback. The exhilarating sensation is complemented by a divine exhaust note that reaches its crescendo when the car passes the 100-mph mark. The D3 CTS-V is a sub-4.0-second car, running to 60 mph in an impressive 3.9 sec., while the



CTS-V COUPE

quarter mile comes and goes in 12.1 sec. at 121.0 mph. What's scary is D3 offers a Stage 4 kit that ups power to about 825 bhp. Just for kicks, we tested a CTS-V Sedan equipped with this kit and it flew to 60 mph in 3.8 sec.

The D3 CTS-V Coupe is an exquisite handling machine, too. The company's custom Stage 1 Competition Suspension has been engineered to provide better overall balance and stability without a sacrifice to ride quality. This package includes custom springs, new interface hardware for the Magnetic Ride Control system and sturdier anti-roll bars at both ends. Because the car was wearing the stock tires, the D3 CTS-V Coupe registered the same skidpad number as the standard car at 0.89g, while its slalom of 69.3 mph was bit off of the stock car's 70.3-mph mark—its suspension perhaps tuned more for long sweepers than quick transitions.

As for the appearance of the car, virtually nothing has been done, except the ride height has been lowered slight-

ly. The folks at D3 felt that the CTS-V Coupe was already plenty stunning, and adding a flamboyant body kit would be like performing plastic surgery on a Victoria's Secret model.

As for the car's asking price, it's remarkably affordable especially when compared to the others in this story. The MSRP of the Cadillac CTS-V is currently \$62,990; add D3's tweaks and you come up with a grand total of \$72,115, which is still less than the sticker on many production cars from Europe.

Said James Gill, V.P. of D3: "As Americans, we feel good that domestic car companies are coming back to the forefront. I think it's important that America's preeminent luxury brand, Cadillac, be competitive with those from Europe and Japan. D3 is more than just a tuner, but a Cadillac tuner that offers Cadillac quality that we develop exclusively for Cadillac customers. If all the luxury brands in Europe and many in Japan have a specialized tuner, Cadillac should be represented with one as well."

	2011 D3 Cadillac CTS-V Coupe	2011 Cadillac CTS-V Coupe
List price	\$72,115	\$62,990
Test weight	4158 lb	est 4400 lb
Engine	supercharged 6.2-liter V-8	supercharged 6.2-liter V-8
Transmission	6-sp automatic	6-sp automatic
Horsepower	est 705 bhp @ 6100 rpm	556 bhp @ 6100 rpm
Torque	676 lb-ft @ 3600 rpm	551 lb-ft @ 3800 rpm
0-60 mph	3.9 sec	4.1 sec
0-100 mph	8.5 sec	9.3 sec
0-1320 ft (1/4 mile)	12.1 sec @ 121.0 mph	12.3 sec @ 116.6 mph
Braking, 60-0 mph	113 ft	117 ft
Braking, 80-0 mph	199 ft	205 ft
Lateral acceleration	0.89g	0.89g
Speed thru 700-ft slalom	69.3 mph	70.3 mph

❖❖ The D3 CTS-V's black paint/wheel treatment is suitably sinister, as is a sub-4-sec. dash to 60 mph, thanks to more boost from the 6.2-liter blown V-8 and an exhaust that'll make small children tremble. Cornering is flat; power is relatively easy to modulate.



The media often refer to big-horsepower Japanese sports cars as “Godzilla.” So let us be the first to refer to the GReddy GR43 GT-R as “Godzilla’s Daddy” because on a racetrack, its wicked power output will spank most any sports car from Japan...or anywhere else in the world for that matter. The words “fast” and “quick” don’t begin to describe the amazing prowess of this heavily modified upscale performance coupe.

Not much of the original componentry remains under the hood of the GR43 GT-R. GReddy engineers increased displacement of the VR38DETT powerplant to 4.3 liters by lengthening its stroke from 88.4 mm to 92.4. They also installed larger turbochargers (manufactured in-house) calibrated to deliver 25.0 psi of boost, as well as a new intercooler, custom titanium exhaust system and special lightweight pistons. All these changes result in 763 bhp on a chassis dynamometer at 6970 rpm, which translates to

about 900 bhp at the flywheel. Torque peaks at 750 lb.-ft. at 3900 rpm. At \$61,000, the engine mods alone cost almost as much as two Nissan 370Zs. The rear-mounted 6-speed twin-clutch transaxle has been upgraded to withstand the extra power, complete with Dodson Motorsport’s heavy-duty Promax clutch. This will run you another \$15,000.

Engage the launch-control system and stomp on the throttle pedal, and the car’s four Toyo R888 tires dig into the road surface and shoot the car forward like a cannonball. We did a double-take when the car’s acceleration results appeared on our VBOX monitor. The GR43 GT-R hit 60 mph in 2.5 sec. and flew to the century mark in 5.1. It broke the 10-sec. barrier in the quarter mile, going 9.9 sec. with a trap speed of 144.5 mph. Now you know why we’re calling this Godzilla’s Daddy.

As for the car’s handling, the GReddy felt balanced and composed on our auto-

cross course. The steering felt precise and quick, and you could rotate it nicely through tight hairpins. It was the quickest car of this group through our handling course, yet despite the aftermarket suspension setup that included KW coilovers and beefy Whiteline anti-roll bars both front and rear, the GR43 GT-R failed to match the skidpad and slalom numbers of the Nissan GT-R Premium we tested in June 2010. Still, the GReddy’s numbers are impressive, as it registered a teeth-clenching 0.99g around the skidpad and ran the slalom at 73.1 mph.

The brakes have been upgraded as well, as the folks at GReddy installed Top Secret’s Big Rotor Kit front and rear. Although pedal feel has improved, we would probably forgo this \$2560 option because stopping distances didn’t improve. The GR43 needed 4 ft. more than the GT-R Premium to stop from 60 mph, and needed another extra 4 ft. (195 ft.) to stop from 80.

GREDDY GR43 GT-R





❑ Clunky on the street but absolutely explosive at the strip, the GReddy GT-R rope-a-dopes your equilibrium with a 9.9-sec. quarter mile. From left to right, Bride racing seats, Brembo 6-piston front brakes and boost—lots of it—from the stroked 4.3-liter twin-turbo V-6.

As for the car's civility—let's just say it belongs on public roads as much as a giant green monster belongs in downtown Tokyo. Ride quality is stiff and the GReddy engine doesn't sound happy when traveling at less than 60 mph. Why this car didn't come with a rollcage is beyond us because it's absolutely track ready. Its flamboyant exterior and interior—highlighted by a custom body kit, 20-in. Rays Volk wheels and Bride racing seats—further acknowledge that this

thing is more race car than street cruiser.

So how much does the entire package cost? Let's start by saying that the modifications total to more than the \$70,000 asking price of a used 2009 GT-R. The total for the GReddy GR43 is a whopping \$176,629 (including the car). But when you consider that this car beat the \$2.7 million Bugatti Veyron Super Sport (November 2011 issue) to 60 mph and to the quarter mile, the GR43 can be regarded as something of a bargain.

	2009 GReddy GR43 GT-R	2009 Nissan GT-R
List price	\$176,629	est \$70,000
Test weight	3935 lb	3960 lb
Engine	twin-turbo 4.3-liter V-6	twin-turbo 3.8-liter V-6
Transmission	6-sp dual-clutch	6-sp dual-clutch
Horsepower	est 900 bhp @ 6970 rpm	480 bhp @ 6400 rpm
Torque	750 lb-ft @ 3900 rpm	343 lb-ft @ 3200–5200 rpm
0-60 mph	2.5 sec	3.4 sec
0-100 mph	5.1 sec	8.6 sec
0-1320 ft (1/4 mile)	9.9 sec @ 144.5 mph	11.8 sec @ 116.5 mph
Braking, 60-0 mph	112 ft	108 ft
Braking, 80-0 mph	195 ft	191 ft
Lateral acceleration	0.99g	1.01g
Speed thru 700-ft slalom	73.1 mph	73.4 mph

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	2010 GMG Audi R8 Le Mans TT	2010 Audi R8 5.2 FSI
List price	\$195,500	\$146,000
Test weight	3620 lb	3905 lb
Engine	twin-turbo 5.2-liter V-10	5.2-liter V-10
Transmission	6-sp manual	6-sp manual
Horsepower	est 780 bhp @ 6100 rpm	525 bhp @ 8000 rpm
Torque	470 lb-ft @ 6500 rpm	391 lb-ft @ 6500 rpm
0-60 mph	3.6 sec	3.7 sec
0-100 mph	7.3 sec	8.4 sec
0-1320 ft (1/4 mile)	11.4 sec @ 131.0 mph	11.9 sec @ 118.7 mph
Braking, 60-0 mph	119 ft	112 ft
Braking, 80-0 mph	197 ft	199 ft
Lateral acceleration	0.98g	0.97g
Speed thru 700-ft slalom	73.5 mph	72.9 mph



GMG

GMG (Global Motorsports Group) knows a thing or two about fast cars. The racing firm located in Huntington Beach, California, has been a fixture in the sports-car racing scene for the past several years, contesting in both the World Challenge GT and American Le Mans Series. Company president James Sofronas is the lead driver of the GMG Porsche 997 Cup Car, and he's fast, with a number of podium finishes on his résumé. The company founders, Sofronas and Fabryce Kutyba (also a racer), decided they would bring their racing knowledge to production

cars, and recently ventured into the after-market tuning world. Their latest creation is the GMG Audi R8 Le Mans TT.

The "TT" in its name stands for twin turbo, meaning they've added forced induction to Audi's already powerful V-10. Our test car came with 667 bhp at the wheels, meaning the twin-turbocharged 5.2-liter FSI powerplant is producing about 780 bhp at the flywheel. That's 175 bhp more than stock. According to

Kutyba, the custom-built turbochargers use dual ceramic ball bearings with both oil and water cooling. Boost can be increased to produce 1000 bhp (but only with extensive engine reinforcement). GMG also installed a handbuilt stainless-steel exhaust system, two custom air-to-water intercoolers, billet water-cooled wastegates and two oversized racing radiators. A look at the engine cover reveals a factory-like appearance

❖ Even with all-wheel drive, the GMG R8's twin-turbo power can flick the tail out in a heartbeat. Below, the symmetry of performance: beautiful pipework and blow-off valves.





AUDI R8 LE MANS TT

and the only signs of the vehicle's true performance are the signature blue blow-off valves and stainless pipes connecting the charge coolers to the intake manifolds. Torque is estimated at 470 lb.-ft. that peaks at 6500 rpm. The power is transferred to all four wheels via a 6-speed manual gearbox, a Kevlar-reinforced clutch (\$2955) and Audi's Quattro awd system. GMG tells us the car weighs less than the stock Audi R8 5.2 FSI, tipping the scales at a lean 3620 lb., which is likely a dry weight.

All this translates to better acceleration times at the test track. The GMG R8 ran from zero to 60 mph in 3.6 sec., besting the stock 5.2 FSI by 0.1 sec., but gets even stronger as the speeds increase, stretching its advantage to more than a second to the 100-mph mark (7.3 sec. to the stock car's 8.4 sec.). It crosses the quarter-mile mark in 11.4

sec. at 131.0 mph, but what's best about the GMG R8 is how it behaves when driven at modest speeds. On the freeway, it's like a sports sedan, totally comfortable at the speed of traffic. But when the need to pass traffic arises, power is available instantly. It takes only 2.16 sec. for the car to go from 30 to 60 mph, somewhat quicker than the stock 5.2 FSI's 2.33 sec.

This R8's handling has also been improved, tuned to match the extra power of the engine. Through our small autocross course, the GMG R8 exhibited excellent balance and response, thanks to the custom suspension package that includes special Eibach springs giving 20-mm lower ride height, and GMG front and rear anti-roll bars (\$1690). It registered an impressive 0.98g around our skidpad and ran through the slalom at 73.5 mph, both figures better than

those of the stock 5.2 FSI. The car is so well-sorted that its owner, Roland Weedon, drives to and from regional autocross competitions—a testament to the car's smooth ride quality, civil manners and reliability.

So what does it take to transform a "normal" Audi R8 5.2 FSI into one of the most finely balanced supercars in the world? It's not cheap: After shelling out \$146,000 for a stock Audi R8 5.2 FSI, GMG asks for an additional \$49,500 for the engine upgrade services (but prices and performance may vary as every car is custom tuned). While it's fair to say that's a lot to pay for such a modest bump in performance, Weedon insists it's a worthy investment. "Once you drive the car, you can feel all the improvements GMG has made, and that's when you realize it's worth every penny," he said.

The "CEC" in the car's name stands for Claus Ettensberger Corporation, whose founder and President Claus Ettensberger has helped define the high-end luxury segment for the past decade. He has represented nearly every notable high-end European tuner from AC Schnitzer to Novitec Rosso but recently decided to take his act solo, creating his own tuning brand. The SLS you see here represents the first complete car under this new banner. Ettensberger says CEC will be creating more complete tuner cars in the future, including those based on Porsche and Ferrari, but he wanted his first car to be a Mercedes-Benz, paying homage to his roots.

"I grew up in Stuttgart and got my introduction to this business when I worked at Lorinser, which specialized in tuning Mercedes-Benz cars. So I have a bit of a soft spot for Mercedes-Benz," he said.

The CEC SLS started life as a Mercedes-Benz SLS AMG. CEC kept visual mods minimal, the most noteworthy change being the wheels. These forged components, manufactured in Italy, significantly enhance the appearance of the SLS, but when combined with the ultra low-profile Michelin Sport tires—275/30R-20 up front and 295/25R-21 at rear—the new sizes actually slow the car down a bit because they alter the overall gearing. To offset that, Ettensberger increased engine power by reprogramming the car's ECU to raise horsepower from 563 bhp to 635 bhp, peaking at 6800 rpm, and torque to 525 lb.-ft. at 4750 rpm, an increase of 46 lb.-ft. The car's newfound power is immediately noticeable when driving on the open road, especially the extra torque that comes on menacingly at midrange rpm.

CEC was still in the process of re-

calibrating the "Race Start" mode to match the car's new power; therefore, our acceleration runs were performed without the launch control system. As we floored the throttle pedal, the car's meaty rear tires had trouble hooking up. Also, controlling wheelspin after each upshift of the 7-speed twin-clutch gearbox presented a challenge. In the end, the CEC SLS ran to 60 mph in 3.7 sec. and crossed the quarter-mile mark in 11.8 sec., which is a bit off the pace set by the standard SLS AMG. Ettensberger maintained that the updated Race Start mode would be available soon, and he claimed the CEC will leave the stock SLS in the dust with the system activated. We'll hold him to his promise and retest his car when it becomes available.

The CEC's handling felt neutral and composed on public roads, but at the track, it was prone to oversteer with the

CEC MERCEDES-BENZ



traction control completely defeated. It came fitted with KW springs that were tuned for a fast race circuit as opposed to our skidpad and slalom tests; that said, the car still managed to register an impressive 0.98g around the skidpad and a 69.2-mph slalom run that was good but not quite up to stock.

No doubt, we'll get letters from critical readers saying why pay \$26,980 for an upgrade that you may or may not be able to use on public roads. A valid point, but with people who can afford cars like the stock \$199,000 Mercedes-Benz SLS AMG, logic hardly plays a role in their everyday decisions. Instead, it's the ecstatic feeling they get when they know they're being admired, and when driving around town in the CEC SLS, getting that sensation is all but guaranteed. 📺

SLS



	2011 CEC M-B SLS	2011 M-B SLS AMG
List price	\$226,480	\$199,000
Test weight	4160 lb	3970 lb
Engine	6.2-liter V-8	6.2-liter V-8
Transmission	7-sp dual-clutch	7-sp dual-clutch
Horsepower	635 bhp @ 6800 rpm	563 bhp @ 6800 rpm
Torque	525 lb-ft @ 4750 rpm	479 lb-ft @ 4750 rpm
0-60 mph	3.7 sec	3.6 sec
0-100 mph	8.1 sec	7.7 sec
0-1320 ft (1/4 mile)	11.8 sec @ 123.4 mph	11.6 sec @ 124.3 mph
Braking, 60-0 mph	116 ft	112 ft
Braking, 80-0 mph	197 ft	194 ft
Lateral acceleration	0.98g	0.96g
Speed thru 700-ft slalom	69.2 mph	71.8 mph



BONUS CONTENT:



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❖ The most oversteer-prone of the bunch, the CEC SLS could've used a little more chassis sorting. But its power is immediate and addictive, with a more pronounced mid-range torque spike than the stock Mercedes Gullwing. CEC wheels do look magnificent, adding some tasteful bling to an already aggressive shape.





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**Finding all
things British
in Southern
California...
at the wheel of
an Aston Martin
Virage**

■ BY PAUL DEAN

■ PHOTOS BY BRIAN BLADES



ARCHITECT JOHN PARKINSON MAY TAKE complete credit, or full blame for it all. For he was the Brit who built Los Angeles, an inspired Lancastrian launching L.A. into the 20th century by designing buildings that became monuments.

In 1928 Parkinson completed Los Angeles City Hall, the bas-relief centerpiece of every LAPD badge since 1940, including the one of fictional Sgt. Joe Friday. Union Station, a curious yet delightful mélange of Mission Revival and something called Streamline Moderne, is another standout among Parkinson's 70 career landmarks.



And the British kept coming. The Comics: Charlie Chaplin, Bob Hope and Stan Laurel. The Actors: Cary Grant, David Niven, and career Cockney, Michael Caine.

William Mulholland, born in Belfast, brought water to a thirsting L.A. as head of the Los Angeles Department of Water & Power. Hence Mulholland Drive. Griffith Griffith, a Welshman, donated 3000 acres of downtown-adjacent land to Los Angeles. A park and an observatory are his eponymous legacies.

There are an estimated 450,000 Brits in Southern California, more than the population of Liverpool. And when it comes to peddling Bentleys and Jaguars, Land Rovers and Rolls-Royces, Aston Martins and Minis, there is no bigger U.S. market for British autos than Southern California.

Ergo, what could be more appropriate than a sentimental journey to British destinations in Southern California aboard a 2012 Aston Martin Virage, a beautifully balanced, and deucedly (as we Brits aver) gorgeous 2+2 bundle from Britain?





It is probably apocryphal, but legend has it that the first British pub opened sometime in the 16th century shortly after close of play at England's first cricket match. Just so players had somewhere to float their victories and drown their defeats.

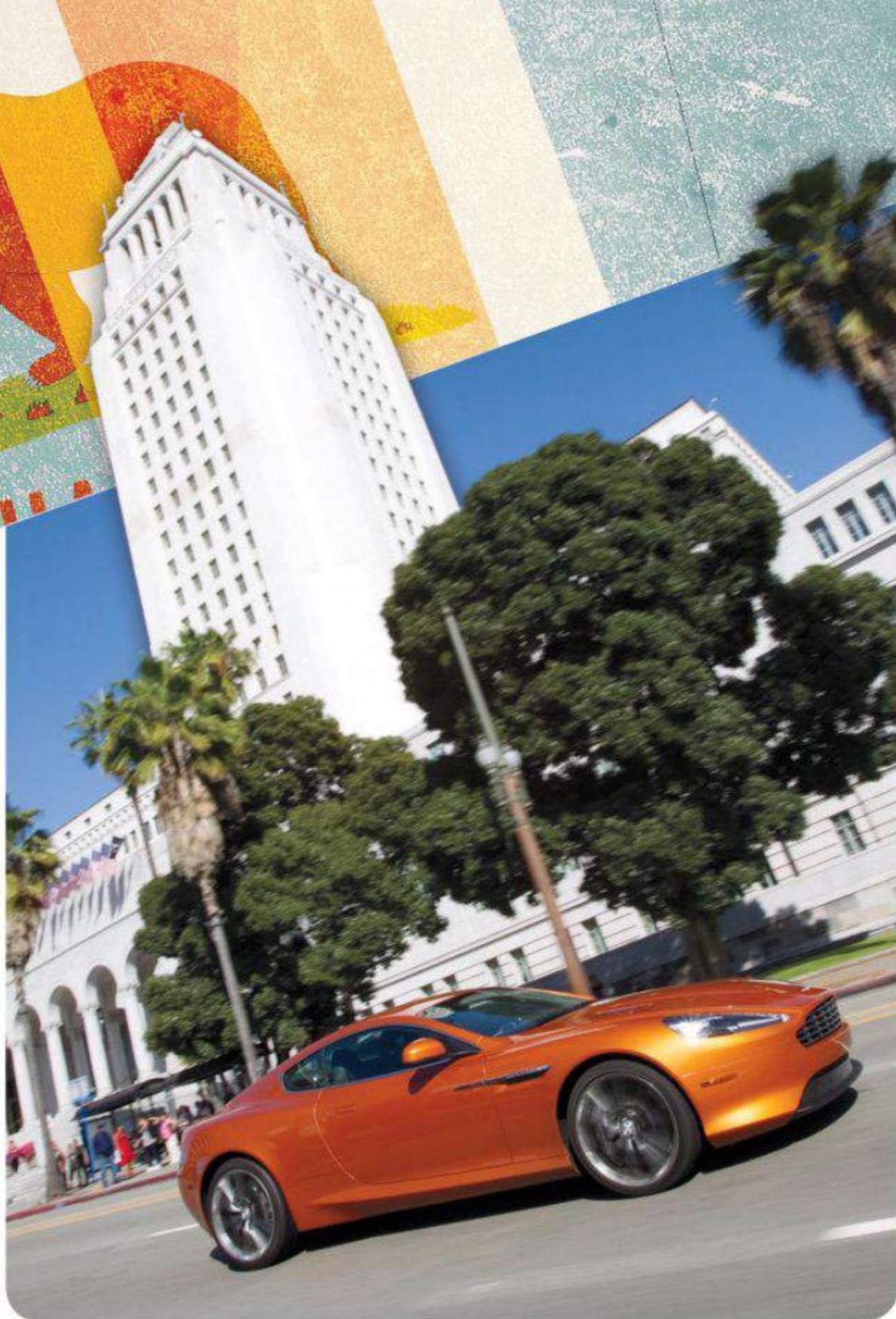
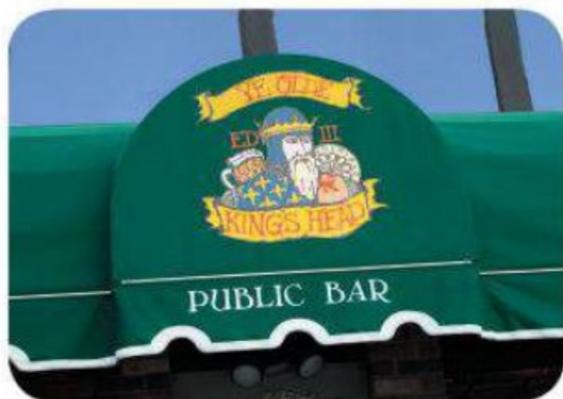
Today, the sport in Southern California is a cottage industry with four world-class playing fields at Woodley Park in Van Nuys, and a regional roster of 5000 players forming 50 teams, including, still, the Hollywood Cricket Club.

Ye Olde King's Head takes up half a city block of Santa Monica and is a monarch among American pubs. It is dark, beamy and always smells like an ale-house. Don't expect to find a seat in the house when Manchester United is on the big screen. And the menu is all Fawlty Towers, a terrifying mix of black pudding, steak and kidney pie, and bangers and mash. As such, the pub has become an institution for resident and arriving Brits, a mandatory destination for visiting celebrities, British Airways crews, Fleet Street journalists and, of course, the King's Head cricket team.

"A pub is people," says owner Phil Elwell. "And it must be a place for all people, the rich and famous, and the Joe Blokes."

"And we've had them all here. Including our friend who will be at the wedding on Friday."

He was referring to Prince William.



Introduced at the 2011 Geneva Motor Show, the front mid-mounted V-12 Virage brings all the Aston Martin DNA that has been a century in the making. One characteristic has been mildly raucous behavior developed to keep drivers ever-poised in their Pikolinos. Then there's the nasty sound of an Aston, a rude rasp that could only have been squeezed from a Vincent Bach trombone.

We (to borrow the Victorian prerogative) are constantly amused by Aston's dedication to genuine oversights. Such as a sharp-edged cupholder that will nibble at a driver's right elbow. Aston plugs it with a removable leather cushion the size of a Hacky Sack and claims that this was a deliberate design feature. Right.

Yet the riddle inside an enigma (Winston Churchill, 1939) of the Virage (from the French, meaning a curve) is its position in Aston's three-car inventory of luxury coupes, all available as Volante

(from the Italian, meaning flying, a large sheet of paper, or patrol car) convertibles. Aston says the Virage is something "luxurious and understated" positioned between the "enduringly elegant" DB9 and the "overtly sporting" DBS.

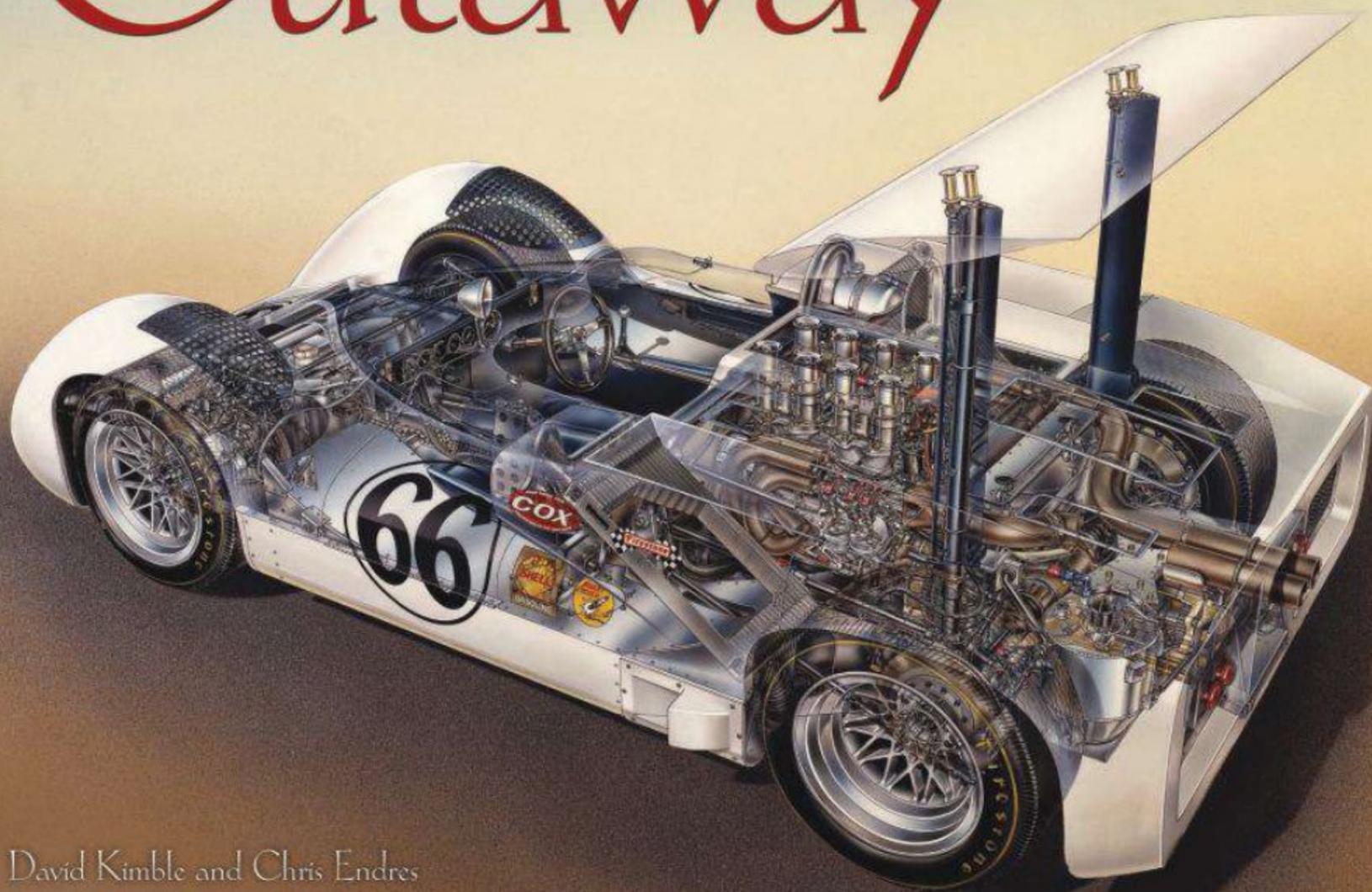
That's overtly poetic, and elegantly put. In reality, all differences among the three motor cars are minuscule and beg the erudite question. Huh?

With the same 6.0-liter engine, identical torque, same ZF 6-speed box with auto/paddle shifting, VH bonded aluminium construction and carbon-fiber driveshaft, the cars are close enough to be triplets. Horsepower is 470 for the DB9, 490 for the Virage and 510 for the DBS and that 40-bhp differential won't get anyone to their first martini any sooner. Acceleration and top speed numbers for the trio (the Virage hits 186 mph) are only cats' whiskers apart.

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A TECHNICAL EXPLORATION BY DAVID KIMBLE

which for the bookend DBS and DB9 coupes round out to \$275,000 and \$191,000, respectively. The Virage in the middle costs \$210,000. That's a spread of more than \$80,000 for essentially the same car with cosmetic differences that might only be noticed by Martha Stewart.

It has been suggested that Aston Martin developed the Virage to buy time while beavering away at its next generation. The company denies it. So does Stuart McIntosh, affable sales manager for Galpin Aston Martin in Van Nuys, California.

He knows that two years is the average purchase cycle for the typical Aston Martin buyer. It has been exactly two years between Geneva introductions of the DBS Volante and the Virage. "Now our customers have a new Aston Martin to buy," he says.

Aston Martins may be considered things of enduring British beauty to be admired alongside Austin roses and Catherine Zeta Jones. The Virage extends that happy habit.

So look for no startling changes, internally or externally, with this latest GT. Stage a lineup with the DB9, DBS and Virage shoulder to shoulder and you'll win money from anyone who thinks they can pick one from t'other.

They all sit low and wide with fabulous haunches, a hallmark for GTs of this century. The Virage's front end has undergone mild surgery with an aluminium grille pirated from Aston's thoroughly limited-edition One-77 custom supercar. It also has LED strips for

headlight surrounds and fender vents.

Inside, the Virage shows the same old magnificence. Everything is logical and to hand, the navigator is abacus simple, and the console and seating compartments flow as any comfy but supportive, six-figure interior should. Brushed aluminium accents and a crystal smart key convert the cabin into a twinkle.

And if you think that Nappa and Connolly leathers are the apogee of luxury linings, know that Aston Martin is now using Bridge of Weir hides for its Virage.

Bridge of Weir is a commuter haven in the Scottish lowlands, known for trout fishing and a century-old company that exports ultra-exclusive upholstery leathers to 30 countries. Using its stuff just might represent a snootier piece of one-upmanship than owning an Aston Martin One-77.

We obviously did not resist doing some canyon cavorting in the Virage. Nothing tire-scorching, with our ultimate deterrent being a procession of 12 California Highway Patrol motorcycle officers on a training run. We focused on canyons less traveled, Malibu and Topanga.

Again, there is nothing revolutionary in what Aston Martin has done to keep the Virage low, level and

secure at speeds from meander to mayhem. Steering is rack and pinion and speed sensitive. Suspension is independent double wishbones, front and rear, with adaptive dampers that now juggle 10 stiffness settings, five apiece for Sport and Normal modes.

Bottom line: The Virage rides softer than the DBS, and isn't quite so prone to misbehaving. It accelerates forcefully, but being long removed from our last ride in a DB9 we cannot report any difference in muscle and punch.

As for oversteer, and with all those monitors ready to grab our right foot, the best we could do was to get the tail to flick out. Just a twitch. The correction was pretty much instantaneous.

Aston says the Virage will compete with Bentley's Continental GT, Ferrari's 599 GTB Fiorano, Mercedes-Benz' SLS AMG and Maserati's GranTurismo.

We say the playing field is level. 



■ James Dean flexed his Porsche 550 Spyder along Mulholland Drive, a 13-mile wriggle of road running across the San Fernando Valley east of the San Diego Freeway. Steve McQueen ran the same route in his Jaguar XKSS. So did a million Mustangs, Corvettes, Jaguars, MGs and Healeys, because it was just their kind of road.

But urban encroachment, several fatalities and many celebrity protests (Jack Nicholson lives there) have taken the sting out of Mulholland Drive. So the scene has sprawled west to Mulholland Highway and the corkscrew canyons of the Santa Monica Mountains.

Sgt. Phil Brooks of the Los Angeles County Sheriff's Department says that between last July and March 2011, 1677 citations were issued to Mulholland motorists and riders.

Jay Leno didn't get one. "I've driven Mulholland in a Mercer Raceabout and a Model T, and it's a road where you don't have to go fast to enjoy it," he says. "The highway is the destination."



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Madame Zooma's NEW YEAR PREDICTIONS

BY JOE TROISE & FRANK ANSLEY



The automobile world's most famous seer polishes her Plexiglas Orb of the Future, cranks up her supernaturally aspirated engine, activates her head-up display, adjusts her front-view mirror, and sets her nav screen to 2012. Road & Track reader, be prepared to be astounded, mystified and enlightened! Well, okay, maybe one out of three.

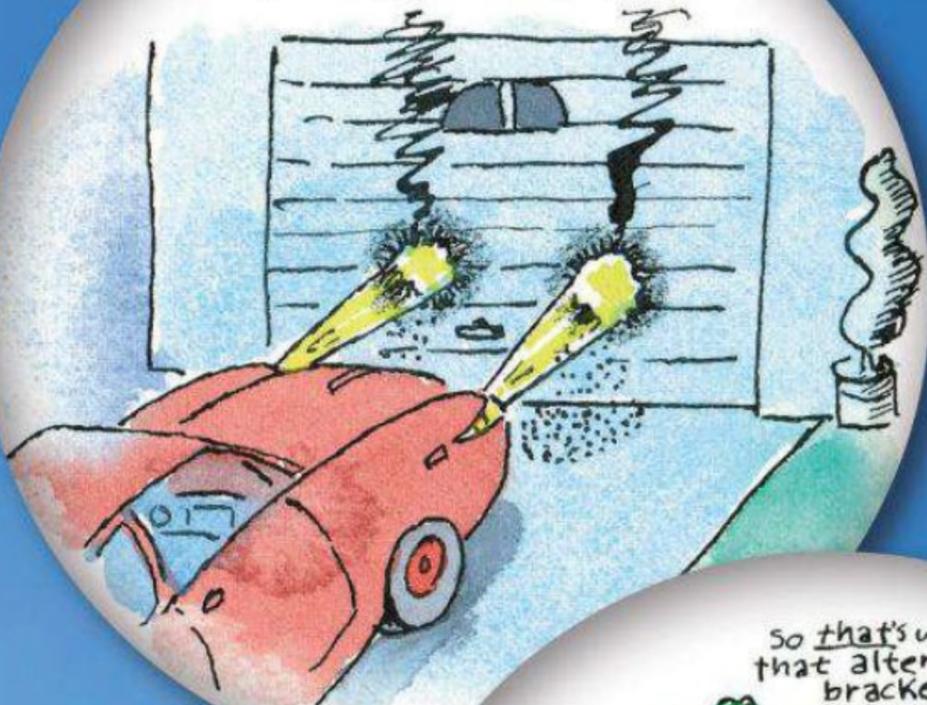
The world's first self-washing car will be recalled for a defect known as "Spin Cycle Malfunction."



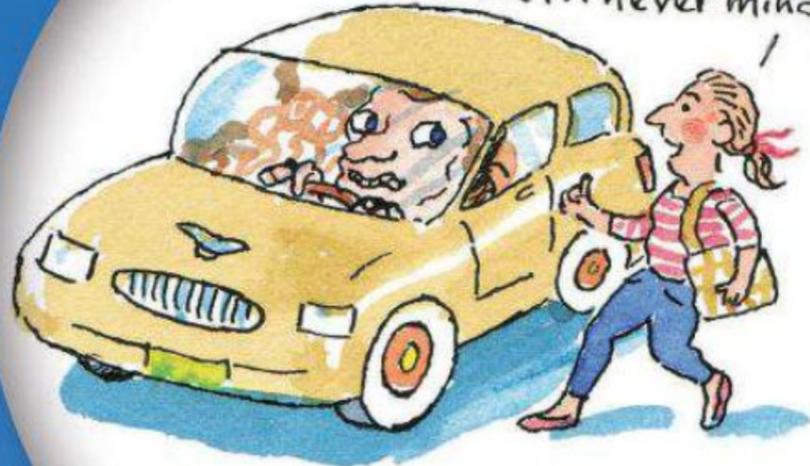
NASCAR, to boost its global TV viewing audience, will place all refreshment stands on the infield of the racetrack.



Newly developed laser headlights will prove highly effective in cutting through fog, haze and garage doors.

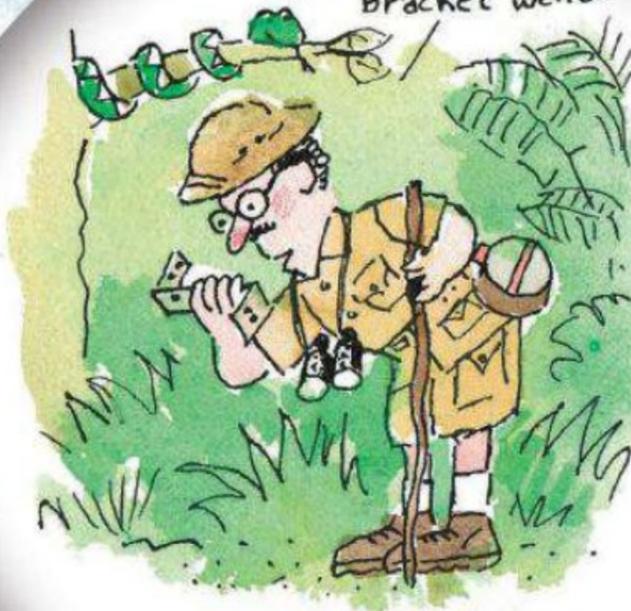


Hey dad, can I borrow the... oh, wait... never mind.



In an effort to market features in new cars that will appeal to the baby-boomer population, automakers will offer a "Vision Enhancement Package," which includes a precision-ground prescription windshield.

So that's where that alternator bracket went.



Biologists exploring the deepest recesses of the Amazon rainforest will discover the legendary Valley of Lost Car Parts.

As new cars continue to downsize, buyers will voice concerns previously unanticipated at dealerships:

Does this car make me look fat?

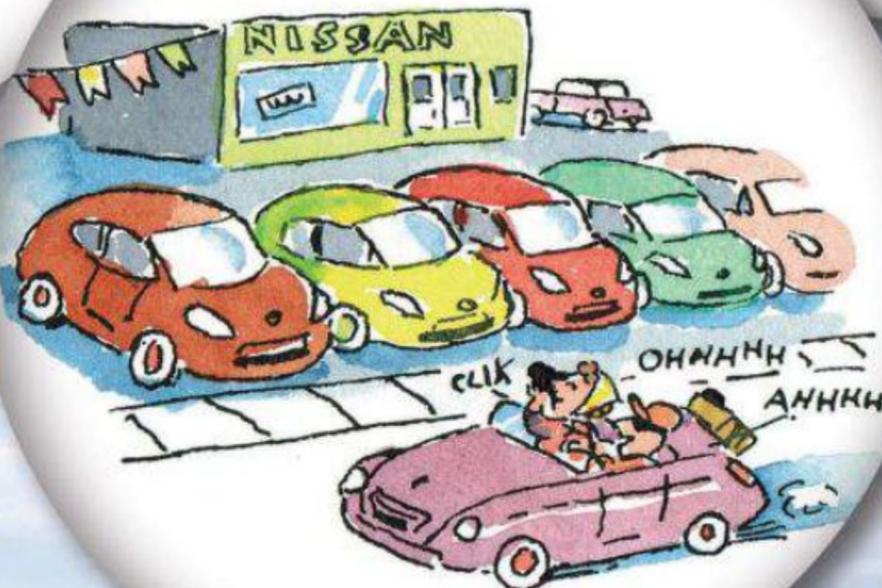
Define "fat."

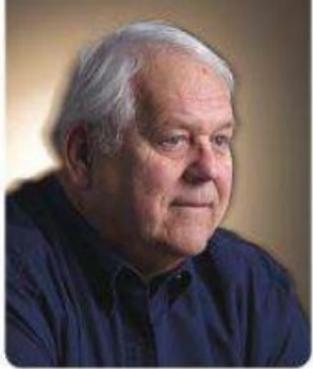


The Ford Motor Company will justify the development of an experimental car with a soybean-based body by saying, "If we build it, they will come." This proves prophetic, as the expensive prototype will be completely devoured by rodents.



Tourists will swarm to New England in the thousands to watch the Nissan Leaf undergo its annual color change.





TECH TIDBITS

BY DENNIS SIMANAITIS
ENGINEERING EDITOR

Is it Hot in Here? Or is it Just—Zap!

HAVE YOU HEARD OF “THERMOELECTRIC GENERATION”? Sure you have: See “BMW Tech Talk,” February 2010. What about “skutterudites”? Less likely, perhaps, unless you also happen to peruse *The Cooling Journal*, published by NARSA, the International Heat Transfer Association. As both of these terms are taking on more automotive currency, here’s an update.

TEGS = ENHANCED MPG: As its name suggests, a thermoelectric generator, TEG, for short, converts heat into electrical energy. It does this through a phenomenon known as the Seebeck effect (beyond the scope of this discussion, though it turns out that Danish physicist Hans Christian Ørsted rectified German physicist Thomas Johann Seebeck’s 1821 misunderstanding about the effect—but why bring that up at this late date?).

The important point: If the difference in temperature across the gizmo is sufficiently large, it produces an electrical current. Not much; nor very efficiently. But, if the heat is free (as in an engine’s exhaust stream or coolant flow), it’s worth the trouble. A TEG inherently reduces heat losses of an engine and lessens the electrical loads of its conventional alternator.

And matters have evolved quickly. In 1988, researchers working with Porsche got a 944’s exhaust system to produce on the order of 10 watts. A few years later, such devices were generating as much as 1 kW, albeit in heavy truck applications, where space and weight constraints are more liberal. On the automotive front, by the late 1990s Nissan research raised the ante to 36 W. GM has now upped this to 255 W, with a potential output as high as 15 kW envisioned for possible future production. And BMW has announced plans to introduce a production TEG by 2013.

HOW TO MAKE A TEG: Skutterudite is a cobalt arsenide mineral, one with just the right sort of cubic-crystal structure to perform thermoelectric generation. The name comes from the Skuterud Mines in Norway; other significant sources are found in Cobalt, Ontario and Franklin, New Jersey.

The GM activity, teamed with Clemson University researchers and funded by the U.S. Department of Energy, is exploring various skutterudite minerals supporting TEG in a Chevrolet Suburban’s exhaust system. GM engineers say the technology could help them improve fuel

economy by as much as 10 percent.

Apart from its TEG properties, another interesting tidbit about the mineral is its giving off a garlic odor when heated or crushed. I have yet to determine whether this is seen as having any automotive benefit.

MORE THAN JUST ELVA: Let’s applaud David Bull and his publishing company. Elsewhere in this issue (in Ampersand), check out Michael Arget-singer’s *Formula 1 at Watkins Glen*. To a bibliophile—and auto enthusiast—books from David Bull are invariably well-researched, well-written and well-executed. Though not inexpensive, they’re consistently of high value too.

And, to me, this typifies *Elva, the Cars, the People, the History*, by János Wimpffen, David Bull Publishing, 2011; 9¼ x 11¼ in., 516 pages, \$99.95, www.bullpublishing.com. On the one hand, this 6.1-lb. volume risks telling me more about Elvas than I want to know. There’s even a accompanying CD giving 572 pages of every Elva race result.

Yet why is this not overkill? Because “*the History*” of this British sports racing car (named from the French: *elle va*, she goes) is likewise an extremely well-crafted tale of the racing scene—both in the U.K. and here in the U.S.—from the 1950s right up to today’s vintage activities. And “*the People*” portion of the title encompasses everyone from Sir Stirling Moss (who contributed a Foreword) and founder Frank Nichols to the likes of Elva drivers Bruce McLaren (some of the earliest McLarens were McLaren-Elvas), Mark Donohue, Carl Haas (selling “Elva” parts well before his Newman-Haas days), Bob Bondurant, Roger Penske, Sam Posey, even Elvis Presley (it was an Elva Mk VI—actually a pair of them—that he drove in *Viva Las Vegas*). Not to be outdone, another real-life driver carried sponsorship from a Chicago strip club.

In truth, I haven’t read all 516 pages as yet. But you can see I’m clearly savoring the experience.

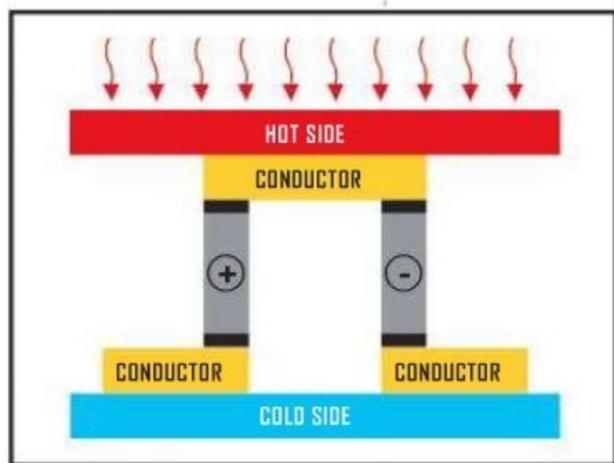
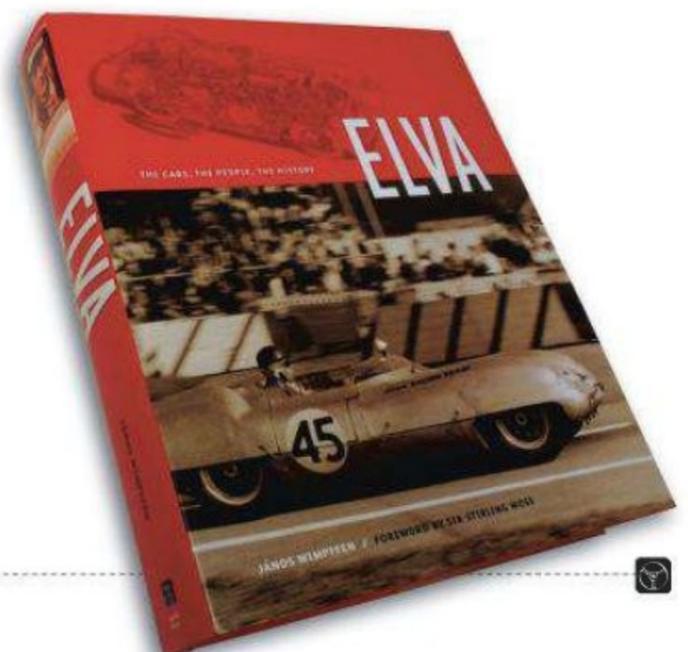


ILLUSTRATION BY RALPH HERMENS

“A hot surface on one side, a cooler one on the other; and, with no other input, a thermoelectric generator makes electricity.”

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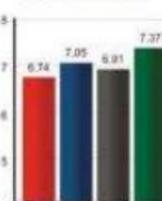


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ON THE TRACK



The test track at our Indiana headquarters provides a safe environment to find out how tires behave in extreme situations. Our team members run multiple laps of our standardized course to

challenge the car's steering response, handling characteristics, braking and cornering capabilities. Additionally, a sprinkler system allows us to evaluate traction, handling and braking distances under consistent wet road conditions.

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Our 6.6-mile Real World Road Ride loop allows our team to experience tires across a variety of conditions. We include two-lane roads, four-lane roads and expressways, as well as a variety of surfaces. This allows us to focus on each product's contribution to ride, noise and light handling qualities.

IN THE SNOW



The purpose-built test track on our headquarters' grounds allows our team to experience how each product would behave in emergency situations and everyday driving in snow. We plow, pack and groom the snow before testing to provide a consistent surface.

AT THE RINK



The smooth ice of a hockey rink replicates the packed snow and polished ice often encountered at intersections during winter, and allows us to compare traction when driving conditions are at their worst. We measure acceleration, braking and cornering.



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All Bridgestone tires listed on this page meet the severe snow service performance standards of the Rubber Manufacturers Association (RMA) and the Rubber Association of Canada (RAC) for snow traction, and are branded with the mountain/snowflake symbol. Due to the traction capabilities of the Blizzak winter tires, Bridgestone recommends using them only in sets of four to provide the best handling characteristics and tire performance.



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GENERAL ALTIMAX ARCTIC



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MICHELIN PILOT ALPIN PA3



MICHELIN PRIMACY ALPIN PA3



MICHELIN X-ICE Xi2



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BRIDGESTONE BLIZZAK DM-V1



BRIDGESTONE BLIZZAK LM-60



BRIDGESTONE BLIZZAK WS70



CONTINENTAL EXTREMEWINTER CONTACT



DUNLOP GRASPIC DS-3

Many winter tires have limited availability. Call now for best selection or visit www.tirerack.com

BRIDGESTONE

Blizzak DM-V1

215/70 R-15	\$99	P245/70 R-17	\$132	P265/70 R-18	\$159
235/75 R-15 ^{XL}	115	245/75 R-17	141	275/60 R-18	182
215/70 R-16	121	255/60 R-17	158	P275/65 R-18	183
225/70 R-16	119	P255/65 R-17	147	285/60 R-18	190
P225/75 R-16	113	P255/70 R-17	136	P235/55 R-19	159
235/70 R-16	126	P255/75 R-17	146	P245/55 R-19	179
P235/75 R-16 ^{XL}	124	265/65 R-17	156	P255/60 R-19	189
245/70 R-16	129	265/70 R-17	152	P245/60 R-20	188
P245/75 R-16	122	P285/70 R-17	161	P245/50 R-20	187
265/70 R-16	141	235/55 R-18	153	P255/55 R-20	175
275/70 R-16	146	235/60 R-18 ^{XL}	156	P265/50 R-20	192
P215/70 R-17	123	235/65 R-18	160	275/40 R-20 ^{XL}	224
225/65 R-17	125	245/60 R-18	161	275/45 R-20 ^{XL}	217
235/65 R-17 ^{XL}	129	255/55 R-18 ^{XL}	168	P275/55 R-20	196
P235/70 R-17 ^{XL}	129	P255/70 R-18	151	P275/60 R-20	208
P235/75 R-17	136	265/60 R-18	175	285/50 R-20 ^{XL}	208
245/65 R-17	138	265/65 R-18	180	P285/45 R-22	269

Blizzak LM-25 4X4 RFT

235/55 R-18	\$295	245/50 R-17	\$242
		245/45 R-18	291
		255/40 R-20	368

Blizzak LM-25 RFT

205/55 R-16	\$167	285/35 R-20	\$398
205/50 R-17	178		
225/45 R-17 ^{XL}	214		

Blizzak LM-50 RFT

225/60 R-17	\$141
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Blizzak LM-60

215/45 R-17	\$166	245/40 R-20	\$298
225/45 R-17	169	245/45 R-20	299
235/45 R-17 ^{XL}	185	P245/50 R-20	293
235/50 R-17	193	255/35 R-20 ^{XL}	337
235/55 R-17 ^{XL}	182	255/45 R-20	309
245/40 R-17	187	255/50 R-20 ^{XL}	297
215/45 R-18 ^{XL}	199	RFT (Runflat)	
225/40 R-18 ^{XL}	197	195/55 R-16	\$160
225/45 R-18 ^{XL}	212	205/45 R-17	182
225/50 R-18	215	225/40 R-18	244
P225/60 R-18	195	235/55 R-18	259
235/45 R-18	212	255/40 R-18	253
235/50 R-18 ^{XL}	231	255/55 R-18 ^{XL}	293
245/40 R-18 ^{XL}	233		
245/45 R-18 ^{XL}	228		

BRIDGESTONE

Blizzak W965

215/85 R-16 ^{XL}	\$156	LT245/75 R-16	\$168	LT245/70 R-17	\$183
LT225/75 R-16 ^{XL}	156	LT265/75 R-16 ^{XL}	173	LT265/70 R-17 ^{XL}	191
LT235/85 R-16 ^{XL}	170	LT235/80 R-17 ^{XL}	181		

Blizzak WS60

175/65 R-14 ^{XL}	\$91	205/60 R-15	\$93	205/40 R-17	\$129
185/65 R-14	87	185/55 R-16 ^{XL}	117	225/40 R-18	179
175/65 R-15	85	195/55 R-16	119	235/40 R-18	186
145/65 R-15	81	195/60 R-16	97	245/40 R-18	194
155/60 R-15	88	205/50 R-16	127	245/50 R-18 ^{XL}	184
175/55 R-15	97	225/55 R-16	132		
195/55 R-15	104	235/60 R-16	121		

Blizzak WS70

185/60 R-15	\$91	225/65 R-16	\$114	225/65 R-17	\$123
185/65 R-15	89	235/65 R-16	119	235/45 R-17	175
195/60 R-15	91	205/50 R-17	137	235/55 R-17	149
205/65 R-15	100	215/45 R-17	149	235/60 R-17	131
215/70 R-15	98	215/50 R-17 ^{XL}	155	235/65 R-17	128
205/55 R-16	123	215/55 R-17	133	245/45 R-17	178
205/60 R-16	107	215/60 R-17	120	P215/55 R-18	172
205/65 R-16	108	215/65 R-17	119	225/45 R-18	164
215/55 R-16	128	225/45 R-17	155	P225/55 R-18	177
215/60 R-16	112	225/50 R-17	165	225/60 R-18	153
215/65 R-16	109	225/55 R-17	137		
225/60 R-16	116	225/60 R-17	125		

Continental

ContiCross Contact Winter

215/65 R-16	\$139
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ExtremeWinterContact LT

235/80 R-17	\$170
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ExtremeWinterContact

185/65 R-15 ^{XL}	\$82	225/65 R-16	\$112	225/60 R-17	\$124
195/55 R-15 ^{XL}	88	205/50 R-17 ^{XL}	129	235/45 R-17	160
205/60 R-15	85	215/50 R-17	141	235/55 R-17 ^{XL}	145
225/60 R-16	109	225/55 R-17 ^{XL}	138	265/70 R-17	152

DUNLOP TIRES

Grandtrek WT M3 ROF

255/55 R-18	\$297
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Grandtrek SJ6

31X11 R-15	\$119
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Grandtrek SJ5

275/60 R-18	\$176
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Graspic DS-3

175/70 R-13	\$59	205/60 R-15	\$82	215/55 R-16	\$105
175/65 R-14	72	205/65 R-15	82	225/55 R-16	113
185/60 R-14	74	205/70 R-15	74	225/60 R-16	100
185/65 R-14	74	215/65 R-15	86	215/45 R-17 ^{XL}	134
185/60 R-15	74	215/70 R-15	79	225/45 R-17	133
185/65 R-15	79	205/50 R-16	103	235/45 R-17	139
195/55 R-15	86	205/55 R-16	102		
195/60 R-15	80	205/65 R-16	88		

SP Winter Sport 3D

195/65 R-15	\$102	225/50 R-17	\$189	245/40 R-18	\$257
205/65 R-15	111	225/55 R-17	169	265/35 R-18 ^{XL}	265
205/55 R-16 ^{XL}	134	235/45 R-17 ^{XL}	189	285/35 ZR-18 ^{XL}	293
205/55 R-16	124	235/55 R-17	191	235/35 R-19 ^{XL}	282
205/60 R-16	133	235/65 R-17 ^{XL}	169	235/45 R-19 ^{XL}	234
215/55 R-16 ^{XL}	152	245/40 R-17 ^{XL}	209	235/50 R-19	233
215/65 R-16	119	245/45 R-17 ^{XL}	203	265/40 R-20 ^{XL}	274
225/55 R-16	153	235/40 VR-18 ^{XL}	212	275/45 R-20 ^{XL}	284
205/50 R-17 ^{XL}	166	235/40WR-18 ^{XL}	241		
225/45 R-17 ^{XL}	185	235/40 ZR-18 ^{XL}	256		

SP Winter Sport 3D RunOnFlat

175/60 R-16	\$134	245/50 R-18	\$297
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SP Winter Sport M3

215/60 R-16	\$122	215/45 R-17	\$165	235/45 R-18	\$209
225/60 R-16	132	215/50 R-17 ^{XL}	153	245/40 R-19 ^{XL}	286

SP Winter Sport M3 ROF

205/55 R-16	\$170
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SP Winter Sport 3D DSST

195/55 R-16	\$142
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18x8 Sport Edition F10
235/50-18 Pirelli Winter 240 Sottozero^{XL}
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Optional Set of TPMS Sensors: \$168



'12 BMW 535i xDrive Sedan
17x8 RIAL Salerno
245/50-17 Bridgestone Blizzak LM-25^{RFT}
Total Package Price: \$1,524
Optional Set of TPMS Sensors: \$212



'12 Toyota Camry V6 SE
16x6.5 New Steel Wheels w/Covers
215/60-16 Dunlop SP Winter Sport M3
Total Package Price: \$747
Optional Set of TPMS Sensors: \$308



Firestone

Winterforce (studdable)

155/80 R-13	\$49	185/65 R-15	\$73	215/55 R-16	\$95
175/70 R-13	54	195/60 R-15	72	215/60 R-16	83
175/65 R-14	66	195/65 R-15	73	P225/50 R-16	102
185/60 R-14	68	205/60 R-15	76	225/60 R-16	90
185/65 R-14	69	205/65 R-15	77	215/55 R-17	99
185/70 R-14	59	205/70 R-15	65	P215/65 R-17	95
P185/75 R-14	58	P205/75 R-15	63	225/50 R-17	129
195/70 R-14	62	215/60 R-15	82	225/55 R-17	99
P195/75 R-14	60	215/65 R-15	78	225/60 R-17	99
205/70 R-14	63	215/70 R-15	68	235/55 R-17	105
P205/75 R-14	62	P205/50 R-16	95	225/60 R-18	108
215/70 R-14	66	205/55 R-16	93		
185/60 R-15	70	205/60 R-16	82		

Winterforce UV (studdable)

215/75 R-15	\$78	215/65 R-16	\$99	P245/75 R-16	\$99
225/70 R-15	80	P215/70 R-16	88	P255/70 R-16	102
P225/75 R-15	79	P225/70 R-16	92	P265/70 R-16	107
P235/70 R-15	87	P225/75 R-16 ^{XL}	95	P235/65 R-17	121
P235/75 R-15	84	P235/65 R-16	108	245/65 R-17	126
P235/75 R-15 ^{XL}	90	P235/70 R-16 ^{XL}	94	P245/70 R-17	105
P265/75 R-15	95	P245/70 R-16	99	P265/70 R-17	114

Winterforce LT (studdable)

215/85 R-16	\$138	LT285/75 R-16 ^{XL}	\$165	LT245/70 R-17 ^{XL}	\$161
LT225/75 R-16 ^{XL}	138	LT225/75 R-17 ^{XL}	149	LT245/75 R-17 ^{XL}	161
LT265/75 R-16 ^{XL}	152	LT235/80 R-17 ^{XL}	160	LT265/70 R-17 ^{XL}	171

GENERAL TIRE GT

AltiMAX Arctic (studdable)

175/70 R-13	\$56	215/70 R-15	\$80	215/55 R-17	\$122
175/65 R-14	68	205/55 R-16	96	215/60 R-17	120
185/60 R-15	74	205/60 R-16	85	225/45 R-17	129
195/55 R-15	92	215/70 R-16	92	225/55 R-17	127
195/60 R-15	75	235/70 R-16	106	235/45 R-17	137
195/65 R-15	76	245/70 R-16	106	235/65 R-17 ^{XL}	130
205/65 R-15	79	205/50 R-17 ^{XL}	114	245/70 R-17	131
205/70 R-15	73	215/45 R-17	126	265/65 R-17	149
215/60 R-15	84	215/50 R-17	123	285/70 R-17 ^{XL}	187

GOODYEAR

Ultra Grip Ice WRT

205/55 R-16	\$121	225/50 R-17	\$162	235/55 R-18	\$151
205/60 R-16	105	225/55 R-17 ^{XL}	135	235/65 R-18	158
215/60 R-16	109	225/60 R-17	122	245/60 R-18	159
215/65 R-16	108	225/65 R-17	123	255/55 R-18 ^{XL}	166
235/65 R-16	116	235/55 R-17	145		
215/55 R-17	131	225/50 R-18	172		

Ultra Grip Ice WRT SUV (studdable)

225/70 R-16	\$118	235/65 R-17	\$126	265/70 R-17	\$147
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Ultra Grip Performance 2 RunOnFlat

245/55 R-17	\$248	Ultra Grip SUV	265/65 R-17	\$161
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Full pattern studding

Available for \$15 per tire on tires marked studdable.



MICHELIN

Latitude Alpin

225/70 R-16	\$126	225/55 R-18	\$203	275/40 R-20	\$240
245/70 R-16	140	255/55 R-18 ^{XL}	205		

Latitude Alpin HP

235/65 R-17	\$204	255/50 R-19	\$319	Latitude Alpin HP ZP	255/55 R-18 ^{XL} \$276
235/50 R-18	230	265/55 R-19	315		

LTX Winter

225/75 R-16	\$153	LT245/70 R-17 ^{XL}	\$196		
LT245/75 R-16 ^{XL}	160	LT275/65 R-18 ^{XL}	204		

Latitude X-Ice Xi2

215/70 R-16	\$134	225/65 R-17	\$150	265/65 R-17	\$194
235/70 R-16	146	235/65 R-17 ^{XL}	149	235/55 R-18	171

Pilot Alpin PA2

255/40 R-18	\$272	265/40 R-18	\$262	295/35 R-18	\$282
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Pilot Alpin PA2 ZP

225/50 R-18	\$173	245/50 R-18	\$275		
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Pilot Alpin PA3

205/55 R-16	\$149	235/55 R-17	\$205	245/45 R-18	\$266
205/50 R-17 ^{XL}	165	245/45 R-17 ^{XL}	225	255/35 R-19	320
215/55 R-17 ^{XL}	182	225/40 R-18	216	255/40 R-19	292
225/45 R-17 ^{XL}	199	225/45 R-18	206	255/45 R-19	252
225/50 R-17 ^{XL}	197	235/40 R-18	232	285/40 R-19	329
225/55 R-17 ^{XL}	195	235/45 R-18	209		
235/45 R-17 ^{XL}	213	245/40 R-18	264		

Primacy Alpin PA3

195/60 R-15	\$113	225/55 R-16	\$144	215/45 R-17	\$175
205/65 R-15	115	205/45 R-17	183	225/45 R-17	188
205/55 R-16	152	205/55 R-17	159		

Primacy Alpin PA3 ZP

225/45 R-17	\$239				
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X-Ice Xi2

175/70 R-13	\$88	205/65 R-15	\$108	205/50 R-17	\$156
175/65 R-14	95	205/70 R-15	100	215/45 R-17	162
175/70 R-14	89	215/65 R-15	125	215/50 R-17	159
185/60 R-14	99	215/70 R-15	111	215/60 R-17	135
185/65 R-14	93	195/55 R-16	139	215/65 R-17	130
185/70 R-14	96	205/50 R-16	142	225/50 R-17	163
175/65 R-15	97	205/55 R-16	126	225/55 R-17	158
185/55 R-15	106	205/60 R-16	114	225/60 R-17	144
185/60 R-15	104	205/65 R-16	121	235/45 R-17	175
185/65 R-15	106	215/55 R-16	136	235/55 R-17	163
185/55 R-15	109	215/60 R-16	127	245/45 R-17	189
195/60 R-15	98	225/55 R-16	138	215/45 R-18	168
195/65 R-15	101	225/60 R-16	125	225/50 R-18	172
205/60 R-15	102	235/60 R-16	127		

PIRELLI

Scorpion Ice & Snow

215/65 R-16	\$111	255/55 VR-18	\$219	275/40 R-20	\$264
215/70 R-16	126	255/60 R-18 ^{XL}	221	275/45 R-20	329
225/70 R-16	125	235/55 R-19	172	275/50 R-20	365
225/65 R-17	139	245/50 R-19	196	295/40 R-20	358
235/65 R-17 ^{XL}	144	255/50 R-19	251	295/35 R-21	359
255/60 R-17	165	265/50 R-19	251	RFT (Runflat)	
275/55 R-17	191	275/45 R-19	281	255/50 R-19	\$336
235/55 R-18	159	245/45 R-20	301	285/45 R-19	349
235/60 R-18	152	255/45 R-20	312	315/35 R-20	442
245/55 R-18	168	255/50 R-20	299		
255/55 HR-18	199	265/45 R-20	333		

Winter 190 Snowcontrol

175/65 R-15	\$82				
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Winter 210 Snowcontrol Serie II

195/45 R-16	\$88	Winter 210 SnowSport RFT	195/55 R-16	\$133
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Winter 210 Sottozero

195/55 R-16	\$107	215/60 R-17	\$144	RFT (Runflat)	
195/60 R-16	100	225/55 R-18	195	205/50 R-17	\$169
				225/45 R-17	189

Winter 210 Sottozero Serie II

205/55 R-16	\$92	215/55 R-17	\$160	RFT (Runflat)	
205/55 R-16	99	225/50 R-17	166	205/55 R-16	\$155
205/60 R-16	108	245/45 R-17	201	225/50 R-17	188
205/45 R-17	153	245/40 R-18	218	255/40 R-18	226
215/45 R-17	156	235/50 R-19	289	245/50 R-18	274
215/50 R-17	159				

Winter 240 SnowSport

205/50 R-17	\$133	265/35 R-18	\$266	265/40 R-18	\$220
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Winter 240 Sottozero

215/45 R-18	\$180	295/35 R-18	\$259	RFT (Runflat)	
235/50 R-18	224	245/40 R-19	313	245/45 R-17	\$212
245/40 R-18	228	255/35 R-20	431	245/40 R-18	232
245/45 R-18	228	285/30 R-20	459		

Winter 240 Sottozero Serie II

205/50 R-17	\$143	235/35 R-19	\$288	RFT (Runflat)	
225/45 R-17	165	255/35 R-19	290	245/45 R-19	\$309
235/50 R-17	185	275/40 R-19	368	275/40 R-19	417
245/50 R-18	221	255/40 R-20	380	245/40 R-20	468
265/40 R-18	252	285/35 R-20	428	275/35 R-20	582
275/45 R-18	348				

Winter 270 Sottozero Serie II

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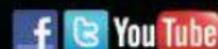
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Trackside

MOTORSPORT NEWS • FEATURES • TECH • OPINIONS

SPEED SECRETS

RRDC drivers on how to be safe and fast

ASK BOBBY RAHAL HOW to win races, and he'll tell you "Safe is fast." The Indy 500 winner concedes that may not sound right. "Everyone knows you win races by having your right foot planted on the floor, letting it all hang out and throwing caution to the wind." But "believe me, safe is fast."

That's the message the Road Racing Drivers

Club (RRDC) hammers home in its innovative video symposium featuring some of the biggest names in racing, who weigh in on topics including "Driver Safety," "Driver Fitness," "Mental Preparation," "Karts to Cars," "Advanced Driving," "Driver Development," "Race Car Systems and Dynamics," "Career Development," and "Marketing and Sponsorship."

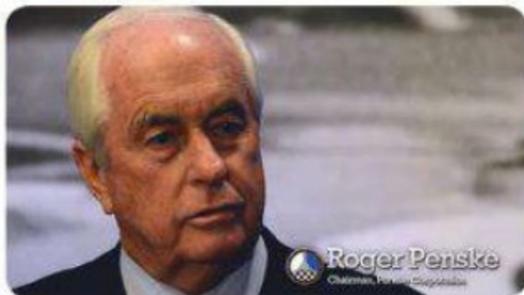
At SafeisFast.com, a website offering free online videos designed to help race drivers achieve their on-track best, experts in a variety of motorsports-related disciplines plus an impressive cadre of professional drivers serve as mentors and share some of their racing secrets

to help racers be SAFE, which is an acronym for Skilled, Assured, Fit and Empowered, qualities the RRDC believes can make you a champion.

Addressing the issue of helmets, for example, Dr. Stephen Olvey urges viewers to use the best. "You can replace a car part, but you can't replace a brain." Fitness guru Jim Leo stresses the importance of proper training and con-

ditioning—"If you're not in shape, you're letting a lot of people down"—while RRDC President Rahal, weighing in on "Mental Preparation," cautions drivers, "If you make a mistake at 200 mph, the consequences can be disastrous."

In "Karts to Cars," NASCAR driver A.J. Allmendinger, who's part of an all-star lineup that includes Ryan Briscoe, Dario Franchitti, David



PROJECT 56



AS A BID TO BE THE NEXT Indy racer, the DeltaWing was met with skepticism and eventually passed over. Its narrow front track, lack of wings and small-displacement engine proved too far out of the realm for the IndyCar series. The players in the project, designer Ben Bowlby, Dan Gurney's All-American Racers, Highcroft Racing and Michelin, though, weren't done. They plan to run the car in the 24 Hours of Le Mans, as the ACO's 56th car (hence the Project 56 moniker), a grid spot traditionally given to a technologically innovative, or "outside-the-box" race car.

The idea behind the controversial car, says Highcroft's Paul Ryan, is "to find out what we could do with a clean sheet of paper, where the priority was to maximize efficiency."

Project goals were to reduce the weight, aerodynamic drag and fuel consumption by half. Adjusting each of these values enabled gains in

other areas of the car. For example, moving the front wheels inboard significantly reduced drag, which meant they could run a smaller engine that burned less fuel, which reduced weight. The process was enlightening, says Ryan, because it showed what could be done with the goal of producing a car that would support competitive, and efficient, racing as the chief priority.

Because the DeltaWing has its center of gravity and its primary aerodynamic downforce located aft, between the rear wheels, the front wheels do not need to be large to maintain the same per-square-inch tire loading.

What a DeltaWing car that weighs 1050 lb. and has 300 bhp can achieve alongside LMP machines that weigh 1985 lb. with about 540 bhp will be an eye-opening experience at Le Mans. In the truest sense, that's what Project 56 is all about. Look for more on the DeltaWing in a future issue. —Calvin Kim

Young Yanks to Watch



PHOTO BY LAT

Alexander Rossi

America's Formula 1 hope, Formula Renault 3.5 Series driver Alexander Rossi, has been named the 2011 Rookie Champion in the hotly contested European series. Driving for Fortec Racing, the 20-year-old Californian finished 3rd in the championship, which was won by Canadian driver Robert Wickens. As for Rossi's future, GP2 is likely in 2012. —JR



Michael Lewis

Another young Californian, Michael Lewis, won three races in the 2011 Italian F3 series, earning the Rookie Championship and a test drive in a Ferrari F1 car at Vallelunga. What's more, the 20-year-old was selected as a finalist to compete in the FIA's 2012 Young Driver Excellence Academy, a 4-day shootout led by former F1 driver Alexander Wurz. —Andrew Bornhop

Donohue and Patrick Long, responds to those who think an IndyCar is just a big go-kart. "Yeah, it's a big go-kart with a ton more horsepower, and it's harder to drive." Without giving away all of his racing strategy, BMW driver Bill Auberlen, appearing in "Advance Driving Techniques," tells racers how he sets a competitor up for a pass, but admits that "I'll never show you when I'm gonna do it."

Supported by the FIA's Motor Sport Safety Development Fund, "SafeisFast" is a work in progress, and new video tutorials are being added to the 90-some minutes of valuable advice that is already loaded onto the site. Although the program is targeted at racers, it's open to anyone who's interested in motorsports. Access is free, upon registration.

—Joe Rusz

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WHAT NOW?

IndyCar struggles in the wake of Dan Wheldon's death

BY TIM TUTTLE



An aerial photograph of a racetrack, showing the asphalt surface, white boundary lines, and several race cars in motion. A large, semi-transparent watermark 'PT' is overlaid on the top half of the image. The text of the article is positioned to the right of the track.

The racing world wept openly

for Dan Wheldon in the most wide-ranging outpouring of grief since the loss of Dale Earnhardt 10 years earlier. Wheldon had touched the lives of many. He made every autograph seeker feel like a friend. Wheldon was also a great talent, evidenced by his two Indy 500 wins.

In addition to memorial services in Wheldon's adopted hometown of St. Petersburg, Florida, and Indianapolis, NASCAR observed a moment of silence before the Sprint Cup and Truck Series races at Talladega, and drivers carried decals of the Lionheart Knight, which Wheldon wore on his helmet, on their vehicles. Halfway around the world, the organizers of the Australian V8 Supercar race at Surfers Paradise renamed the trophy for the top-finishing international driver the Dan Wheldon Memorial Trophy.

With Wheldon's loss came questions and, yes, anger. How did this happen? Who is to blame? What can be done to make IndyCars hurtling around oval tracks at over 220 miles per hour safer?

A

“AS IT HAPPENS IN RACING OVER THE last 40 years, every time there is a fatality, there are a lot of opinions,” said Eddie Cheever, the 1998 Indy 500 winner and ex-Formula 1 driver. “I think it was the perfect storm. I don’t believe any single element created the accident. The push to have a big field—and having a lot of drivers without experience and cars running in a pack—did not help any. You put an Indy 500 winner in the back of the field and he’s coming up through it. It was like two or three hurricanes meeting, the 34 cars, the banking.

“So, how come it didn’t happen in Texas? Was this an accident that was lurking around the corner for the last three or four years? Probably.”

IndyCar hadn’t raced at Las Vegas since 2000. CEO Randy Bernard was desperate to have a spectacle to conclude the season and he thought Sin City was the ideal backdrop. When Bernard couldn’t reach a sanctioning agreement with Speedway Motorsports Inc., IndyCar resorted to renting the track. Bernard took full ownership of the event.

IndyCar will have new chassis and engines in 2012, so Las Vegas was the last race for the cars built with a rules package dating back to 2003. Teams rolled out their backups. There was no reason to worry about crash damage, as the cars would be obsolete. There were 34 entries, eight driven by rookies, some with only a handful of races in an Indy car. It was the largest field ever for an IndyCar race outside of Indianapolis.

Las Vegas had been reconfigured since IndyCar last raced there 11 years ago. The banking in the corners had increased from 12 to 20 degrees, making it more like its sister 24-degree banked track in Texas. But Las Vegas’ 1.5-mile surface is smoother. The banking and high downforce levels allowed the Indy cars to run flat in a huge pack, two and three wide. Drivers were understandably worried that so many cars running so close together could lead to a massive crash.

On the 11th lap, rookie Wade Cunningham’s Dallara, running midpack, touched rookie James Hinchcliff’s car and spun in Turn 1. J.R. Hildebrand’s front tire hooked one of Cunningham’s rears and was launched into the air, hitting the outside wall in Turn 2. Behind them, all hell broke loose.

“I knew, having driven a stock car here, that this wasn’t a track suitable for us and we’ve seen it today.”

—Dario Franchitti

■ Three-abreast racing, high speeds and a huge field set the stage for what Eddie Cheever called the “perfect storm,” below. Like Wheldon, Penske’s Will Power caught more air than an Indy car ever should, but he escaped with a compression fracture in his back.



PHOTOS BY PHIL ABBOTT/LAT

Will Power flew and barrel-rolled into the outside wall after he hooked wheels with Alex Lloyd. Drivers dove to the bottom of the track. Wheldon, who started 34th, ran over Paul Tracy’s rear wheels and took off in a near-vertical climb. His car barrel-rolled and swapped ends, landing above the SAFER barrier in the catch fence. The roll hoop was sheared off, leaving Wheldon unprotected when he came down on the wall. He died of massive head injuries.

Danica Patrick, in perhaps her last IndyCar race, managed to avoid the melee by staying low on the track, out of the “chaos” she had seen up higher on the track earlier in the race. Likewise, the Ganassi duo of Dario Franchitti and Scott Dixon stayed low and out of trouble.

Four-time Indy 500 winner Rick Mears, the spotter for Helio Castroneves, called it “by far the biggest crash I’ve ever seen.”

IndyCar was fortunate that more drivers weren’t seriously injured or killed. For all the criticism of the circumstances that contributed to the crash, the structure of the chassis held up reasonably well in the violent, high g-force environment. Good fortune undoubtedly played a role, but the strength of the cars saved lives.

“I knew, having driven a stock car here, that this wasn’t a track suitable for us and we’ve seen it today,” said Dario Franchitti in the period between the red flag and the decision not to resume the race.

Fans blamed Bernard, who told The Associated Press a week later that he’d received hate mail. Fairly or unfairly, Bernard’s lack of racing knowledge prior to taking the job in early 2010 prompted people to put Wheldon’s death on Bernard.

Bernard had never seen an auto race before being hired by IndyCar. He had been the head of the Professional Bull Riders tour and had built it up in his 15 years of leadership. Taking over for IndyCar founder Tony George, Bernard brought new energy to IndyCar, but some of his ideas and decisions did not sit well with fans and eroded confidence in him.

Prior to this year’s 100th-anniversary Indy 500, Bernard had proposed trying to set a speed record in an exhibition run during the month of May. He thought fans wanted to see Arie Luyendyk’s 237.498-mph lap from qualifying in 1996 broken. What he didn’t understand was that since 1911, every record at Indianapolis had been set in either time trials or the race.



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■ Wheldon was honored in the NASCAR Sprint Cup and Truck series, where each competitor raced with the Lionheart Knight that the 2-time Indy winner always featured on his helmet.

“It’s not the track, it’s the formula... We need less downforce...less downforce means we have to lift in the corners and use the throttle. It puts the driver back into the seat.”

—Rick Mears, 4-time Indy 500 winner

Practice doesn't count. Bernard's idea quickly sank.

Bernard also proposed a \$5 million paycheck to a non-IndyCar regular who could win at Las Vegas, hoping to lure NASCAR stars like Jimmie Johnson and Tony Stewart into the event. It was seen as a publicity stunt and it would have worked if Johnson, Stewart and other NASCAR stars had decided to go for it. None did. Rally and X Games star Travis Pastrana was the only outsider ready to go for it, but he was hurt in an X Games accident. Pastrana has never driven in an open-wheel race, and even if he had passed a rigorous approval process he wouldn't have been qualified to be in the event.

Instead of just dropping the idea, Bernard restructured it to bring in Wheldon, who would have split the \$5 million with a fan by winning from the last starting spot.

In hindsight, it's clear there wasn't full understanding by Bernard of the high level of risk inherent in the circumstances at Las Vegas. It's also fair to ask why veteran teams such as Penske and Ganassi didn't refuse to race, citing driver safety. Yes, they were in a title fight, but they know oval track racing better than anybody. And it was just a stroke of luck that Penske's Will Power, on a flight similar in trajectory to Wheldon's, didn't strike the wall cockpit-first.

Eight days following Wheldon's death, Bernard called a meeting of the drivers and listened to them for three hours on ways to make IndyCar safer.

“Knee-jerk reactions are not what we need right now and everybody is cognizant of that,” said Franchitti. “It's a difficult situation for everybody. On Saturday, we were at Dan's funeral in St. Petersburg and Sunday was the memorial service at Indianapolis. Today, we're back at work. We have Dan on our minds and are going to use this terrible thing that happened to try to make things as safe as possible.”

IndyCar is expected to make additional changes to the 2012 car, named the Dallara DW12, in honor of Wheldon, who did the primary development work on the chassis. Nobody, however, revealed any details of what went on in the meeting.

Mears, an advisor at Team Penske since retiring from driving at the end of 1992, rejects the idea that Indy cars can't race on tracks like Las Vegas. “It's not the track, it's the formula,” he said. “It's really something I've argued for years, even when I was driving, I always thought we needed less downforce. Less downforce means we have to lift in the corners and use the throttle. It puts the driver back into the seat. Certain tracks like Texas, we need to take downforce off and it's got to be a big enough chunk taken off to where we have to lift.”

“You have to keep a decent number [speed] for the fans and the challenge. To me, the magic number is 200 [mph]. When you say 200 to a fan, they can't comprehend that, they've never gone that fast, but it's not too fast. You get a reduced grip level to reduce corner speed to 180, you add horsepower to get the speed back and you put it back into the control of the driver.”

With lifting and throttle response, the drivers will supply the separation between cars and break up the packs on high-banked tracks.

“The only way to pass, to me, is to de-tune the aero. Get rid of relying on most of the grip from aero and put it back into mechanical grip,” Mears explained. “It needs to be well thought out in a different direction.”

Reducing the width of the tires is another method of taking away grip.

“We've never taken a serious enough look at that,” Mears said. “It's almost like taking a step backward, and that wouldn't be the case. It's just a way of cutting down the performance of the car.”

Former Lola chief designer and Reynard North American Technical Director Bruce Ashmore has several suggestions to make Indy cars safer including reduced downforce, increased horsepower and added weight for additional structural strength. But he doesn't think they should be running on high-banked ovals like Las Vegas and Texas.

“They need more horsepower, but also to get rid of downforce on those high-banked tracks and make them more difficult to drive. I don't see how they'll ever make them safer on those high-banked tracks,” Ashmore said.

Ashmore likes the idea of narrowing the tires to promote better racing.

“Indy cars are 14-in. rear width and 10-in. front, and you could cut those down to 10-in. rear and 8-in. front and make a big difference,” he said. “If you ask the opinion of the tire company, they will not want to reduce the width. They don't want the responsibility of building a tire that has to carry higher loads. The tire would have to be harder, and less tread would make it harder to drive and make a better show. I would mandate a narrower tire, and I believe the tire company would love the challenge. But they would never recommend it because it would make them liable.”

The new 2012 IndyCar chassis has rear tire guards to reduce wheel-to-wheel contact and cars flying. What's more, turbocharged engines can have their boost set at horsepower levels that are appropriate for each track.

“The new car is working in the right direction,” Mears said. “With the new body design, they've reduced the odds of wheels climbing over wheels. We've got more options with the new car, without the fixed [rear] wing and with the turbo.” Other options being discussed include the possibility of fitting the cars with some sort of head-protective cage, and even doubling the height of the impact-reducing SAFER barriers at the tracks.

It must be stated, however, that fatalities in IndyCar racing are by no means common. Wheldon, in fact, was the first driver in the history of IndyCar, which began as the Indy Racing League in 1996, to be killed in a race, although Scott Brayton, Tony Renna and Paul Dana died in testing and practice.

“IndyCar is always going to be dangerous,” commented 2004 IndyCar champion Tony Kanaan. “We have an opportunity with the new car to make it a little more safe.”

PHOTO BY LESLEY ANN MILLER/LAT

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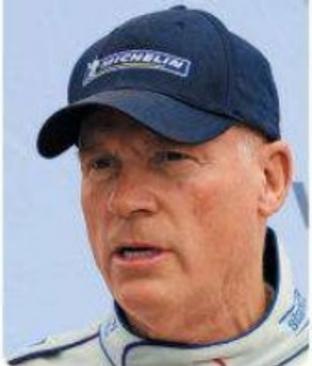
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THE PODIUM

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Businessman, philanthropist and Daytona 24 Hours winner, owner-driver Rob Dyson has fielded one of the most successful teams in endurance racing, most recently winning the 2011 ALMS LMP1 championship.

Race to Live, Live to Race

I WAS A GARAGE KID. THE TRACTORS ON THE FARM, the lawnmowers, my mother's station wagon always sounded better without a muffler. And when you saw a street rod or somebody with a Continental kit on the back of their car, that looked pretty cool. It's like my late mother-in-law said, I have a love affair with the internal combustion engine.

So I bought a '31 Model A coupe that I worked on all the time. Pulled it apart and put it back together again. It was just part of my life to be working on mechanical stuff. And it was a helluva lot more interesting to be under the hood of a car than in a library looking at a book.

Although I never cared what other people thought, when I started racing in the early '70s, I didn't want that widely known. Because in those days, somebody was getting killed in Formula 1, Champ cars or stock cars every weekend, and I didn't want people to think I was some kind of daredevil. I don't think most drivers are daredevils. We're just guys who have a bent toward competing, but I don't think any of us are about to walk a tightrope over Niagara Falls.

I kept my racing quiet until I had one of my more serious wrecks when Paul Newman and I came together at Nelson Ledges. That made the Associated Press and the front page of my local newspaper, so that kind of blew my cover.

The first call I got was from my banker. The second call was from my insurance agent.

"I have a love affair with the internal combustion engine."

Fortunately, nobody got hurt, although my car was totaled. But from that moment on, I became close friends with Newman for the rest of his life.

My first race car was a Datsun 510, but eventually I decided to go pro and ran a Pontiac Firebird in both Trans-Am and IMSA. The tube-frame Firebird was truly a prototype; it was one of a kind, so if anything broke, we had to fix it. It was a beast that didn't accelerate, brake or go through corners very well. But it sure as hell was powerful.

Then I decided to do something a little more professional and settled on a Porsche 962. After I drove it, I said: "Wow, this car really does what you want it to. When you turn the wheel, it works, when you tap on the brakes, it works, when you go through the corners, it works. And when you accelerate, it's got great power. Then if you turn this little knurled knob on the dashboard, you go even faster."

Because I had driven A.J. Foyt's 962 twice, in 1987 he said, "Come run the [Indianapolis Motor] Speedway." So I thought about it on several levels, one of which was, "Do I have the time to do it?" Which, in fact, I didn't. I was the kind of a guy who would get to the racetrack, take off my suit and tie, put on my driving suit and my helmet, and go out and drive. Sometimes I'd get there a little late, miss morning practice or miss the test days. I was so busy businesswise. But another thing I thought about was something a friend had said: "Remember, anything that happens at Indianapolis happens at over 200 mph." So I thought maybe I

better not. It's probably my only regret in racing, although who knows what would have happened. But what's done is done. Still, I think it's the greatest car race on the planet. They can talk Monte Carlo, they can talk Le Mans, but there's no car race that rivals the Indy 500. I think it's the pinnacle of bravery, and of skill, luck, tradition and speed.

At 65, I've done more races in the past than I'm going to do in the future. Although my son Chris has done a phenomenal job driving and leading the team too, I would still like to do a couple of more races, especially another Daytona 24 Hour. There's really nothing like racing as a driver and as a team owner. It's just a very, very stimulating, challenging, competitive environment. That's the reason I got into it in the first place. And I still feel that way. On all levels, racing encompasses everything I find interesting and challenging. But the trick is to do it consistently. And consistently well.

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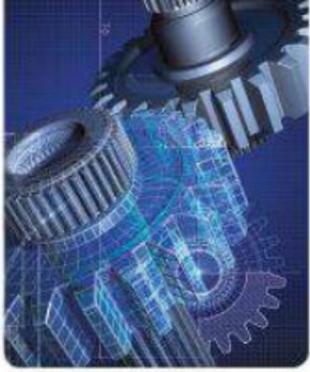
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TECH ADVICE

BY TOM WILSON

“So, even if the political winds blow against ethanol as a nationwide fuel, we expect it to remain abundant in the Midwest.”

Are Aftermarket Wheels Safe?

FLASHY, BUT SAFE?: I own a newer high-performance domestic sports car and am thinking about replacing the OEM wheels with a set of custom chrome wheels sold by one of many specialty producers. As I look through the available choices, I have started wondering: Are the new wheels as safe as the OEM units at high speed? Given that my car is capable of speeds in excess of 190 mph, how do I know the new custom wheels will not self-destruct when subjected to the significant forces accompanying high speeds?

*Jeff Thornton
Gainesville, Georgia*

Currently there is no industry-wide guarantee of aftermarket wheel quality or suitability for the speeds you mention, especially not for street-legal vehicles.

Racing wheels are partially covered by specifications formulated by the SFI Foundation (an offshoot of SEMA specifically focused on racing safety). The SFI specs are quite specific concerning categories such as Driven Wheels on Alcohol Dragsters, and do not address street-legal road wheels.

More germane is SEMA itself. The Specialty Equipment Marketing Association has worked with the Society of Automotive Engineers to develop SAE J2530, “Aftermarket Wheels—Passenger Cars and Light Truck Performance Requirements and Test Procedures.” This covers both performance and wheel-marking requirements for aftermarket wheels using cornering, radial fatigue and impact strength tests. SEMA says these three tests will uncover design flaws and material weaknesses.

Like the SFI criteria, compliance with J2530 is voluntary, so by no means are all wheels sold in the U.S. required to meet those standards. Ultimately we’d discuss your concerns with the wheel manufacturer before spending any money. We believe the better-known race wheel manufacturers will have the experience, manufacturing capability and standards compliance you are looking for.

HOPING FOR E85: What’s the scoop on E85? I’m concerned as the owner of a 1970 Dodge Challenger with a built 572-cu.-in. aluminum Hemi with 13.5:1 compression ratio that is set up as a flex-fuel street machine using E85. I have no idea if E85, currently available in Wisconsin at \$2.85 per gallon, will remain cheap or available for the long term (five years). Otherwise, my Hemi will require race gas at about \$8 per gallon, about \$200 to fill its 26-gal. tank.

*Tom Bush
Mauston, Wisconsin*

With the rate of change in the world today, Nostradamus would have a difficult time postulating what’s going to happen in five years, save death and taxes. So, like the automakers, we can only make

decisions with what we know now.

It’s our understanding E85 will be around for a long time, especially in your part of the country because the industry outlook is for regional solutions when it comes to fuel. Areas with abundant hydroelectric power can support all-electric vehicles; the Midwest is primed for ethanol blends, the open Southwest favors diesel while gasoline will be popular everywhere, as will hybrids in heavily urbanized areas.

So, even if the political winds blow against ethanol as a nationwide fuel, we expect it to remain abundant in the Midwest.

VOLVO STABILITY: I recently purchased a 2008 Volvo S80 T6. It has stability control, and I would like to know what I will see on the dash or feel when it is functioning. Will I have to be over my head in a situation to have it click in?

*Bruce Harper
Reno, Nevada*

Volvo’s stability control for your model is actually a collection of three strategies: Traction Control, Active Yaw Control and Spin Control. When the system is active the small triangle-shaped warning light at the bottom center of the instrument cluster will flash and you’ll likely hear and feel a pulsing sound as the ABS brake motor is activated.

As for being in over your head, that depends on your skill level, we suppose. We doubt you’d consider some wheelspin at parking lot speeds due to snow or ice as being in over your head, but if the Active Yaw Control steps in midcorner, you may well have been on your way to a loss of control.

Usually we find stability control systems aren’t felt much by the driver, perhaps because they were too busy at that instant to notice a flashing light or hear a distant electric motor purring.

Occasionally, a yaw-control system will noticeably help us pull a car around a tight hairpin, but this is a gentle, noninvasive act in most cases. But to address the heart of your question, the stability control system should not activate until things have gotten well beyond normal driving.

HELP FROM FRIENDS: Dar Anderson of Baden, Ontario, Canada, says he had the same problem with broken Cadillac windows as Eugene Spaay (“Tech Advice,” September 2011). Anderson said it’s a mounting ear on the window regulator bracket that breaks off and that he was able to fabricate a new bracket and pop rivet it on for about \$8 for all four windows. Anderson is a self-described “70-year-old geezer and certainly no mechanic,” so if you’re handy, you might want to give it a try.

TURBINE WHEELS: Occasionally, I see a wheel with spokes styled like the vanes of a turbine, prompting me to wonder if a spinning wheel with properly shaped spokes could move enough air mass to, say, cool the brakes. Or, in the same vein as Chaparral and Brabham, pull air from under the vehicle to increase negative pressure. It seems that if this idea were feasible that everyone would be doing it already. So here's my question: Why is this not possible?

*Randall Rich
Citrus Heights, California*

Probably the best answer is air-moving turbine wheels are possible but not practical. On street cars, the inability of the engineer to count on enough wheel speed to move air in meaningful amounts means he can't count on such a wheel for any benefit in stop-and-go traffic, for instance. Furthermore, such wheels might need to be directional for best functioning, requiring at least two left and two right wheels, which is seen as an expensive nuisance at best. On cars with staggered front and rear fitments, this would also mean each wheel would be specific to each corner of the car.

Styling is also heavily compromised by turbine wheels, and we know how infatuated designers and the buying public can be with wheel fashion, no matter practicality. We'd also speculate that meaningful air movement at street car speeds requires relatively thin, difficult to manufacture and generally finicky spokes.

Turbine wheels, or more accurately turbine wheel covers, have been used in racing. Likely the best example is the Porsche 935 of the 1970s, yet even here the wheel covers were not universally fitted. One suspects the practical considerations of weight, wheel attachment access and overall effectiveness worked against the distinctive disc-like wheel covers. That, and with ram air easily and cheaply available by conventional ducting, brake cooling, at least, was more easily achieved by conventional means.

As for a set of wheels generating a meaningful amount of ground-effect suction, a number of factors render the strategy implausible—wheel movement, the inability to seal the area around the wheel and tire assembly, and the airflow obstruction of the brake rotors, for example. 

DO YOU HAVE A TECHNICAL QUESTION?

Send it to RTLettters@hearst.com, or Tech Advice, *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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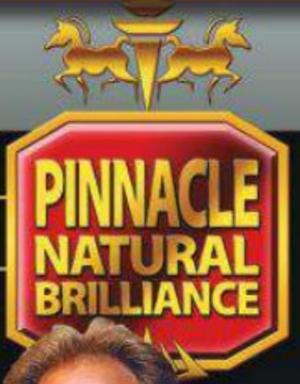


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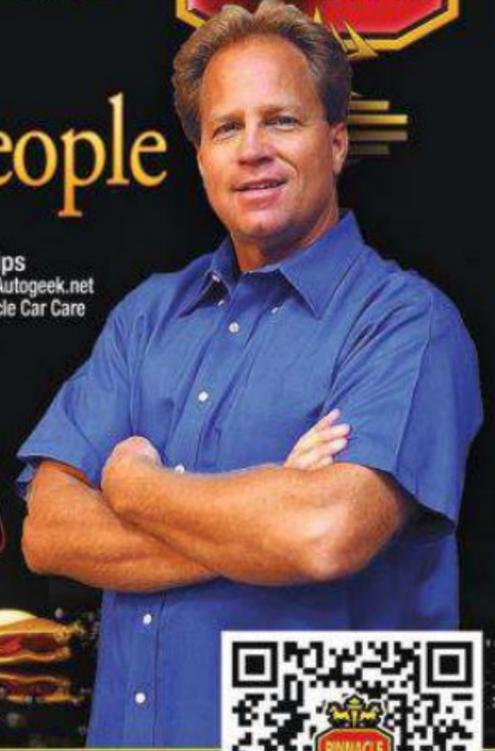
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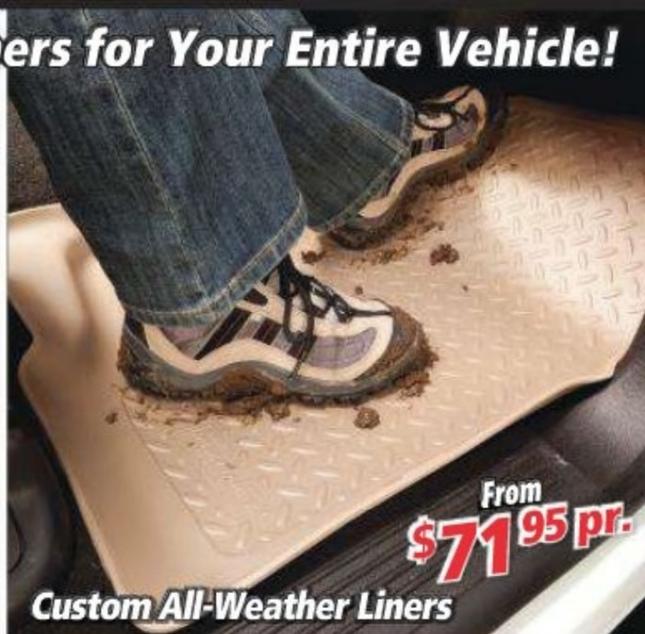
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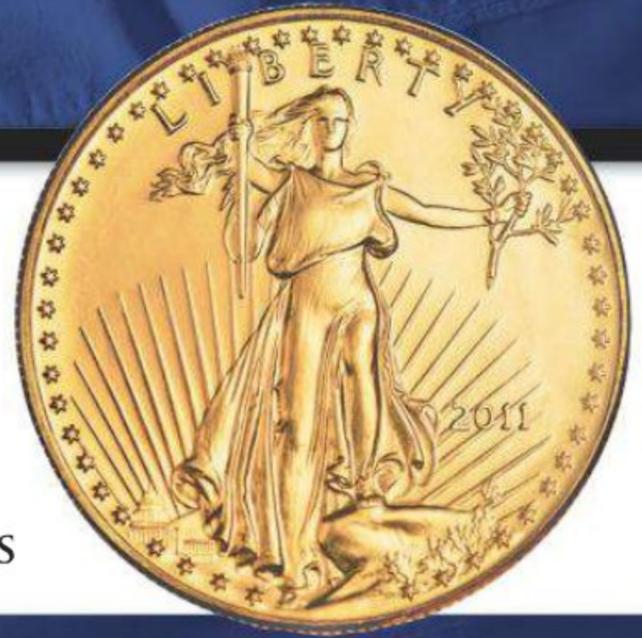
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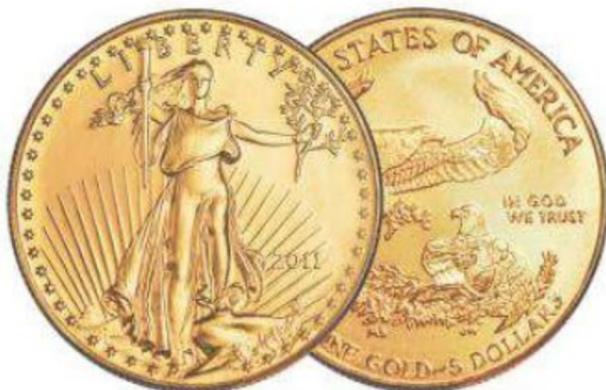
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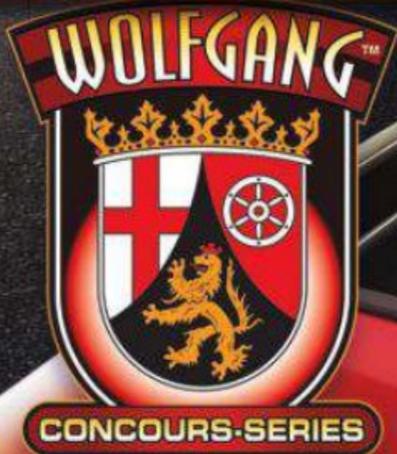
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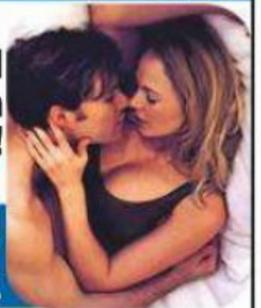


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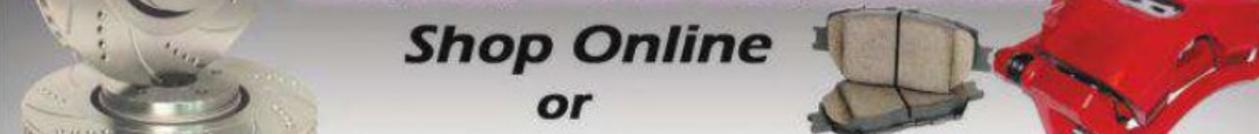
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ROAD TEST LEADERBOARD

0-60 MPH	
	SEC
1 Bugatti Veyron 16.4 Super Sport	2.5
2 Porsche 911 Turbo S	2.6
3 Lamborghini Murciélago LP670-4 SV	2.8
4 Nissan GT-R	2.9
5 Ferrari 458 Italia	3.0

1/4 MI	
	SEC @ MPH
1 Bugatti Veyron 16.4 Super Sport	9.9 @ 145.8
2 Saleen S7 Twin Turbo	10.6 @ 139.8
3 Porsche 911 Turbo S	10.7 @ 128.9
4 Lamborghini Murciélago LP670-4 SV	10.9 @ 129.4
5 Lamborghini Gallardo Superleggera	11.0 @ 128.9

SKIDPAD	
	G
1 Dodge Viper SRT10 ACR	1.12
2 Chevrolet Corvette Z06	1.06
3 Rossion Qi	1.06
4 Callaway Corvette SC606	1.05
5 Chevrolet Corvette ZR1	1.04

SLALOM	
	MPH
1 Porsche 911 GT2 RS	75.9
2 Porsche 911 GT3 RS 4.0	75.8
3 Nissan GT-R	75.4
4 Chevrolet Corvette ZR1	74.9
5 Lamborghini Gallardo Superleggera	74.3

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; V and W describe cylinder configurations; the number following the letter is the number of cylinders. An additional letter, a "t" or an "s" designates turbo- or supercharging; "d" designates diesel; "FC" designates fuel cell; "Elec" designates electric motor; **boldface**=extremes in that particular category, excluding nonproduction cars; **yellow** = newest entries; na=not available, na/U.S.; "CL" Car Life magazine; ¹automatic transmission; ²comparison test; ³price at time of test, some estimated; ⁴estimated; ⁵electronically limited; ⁶DIN bhp; ⁷automated manual transmission; ⁸altitude-affected; ⁹aero-limited; ¹⁰Road Test Update.

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: 0-60 mph, 0.3 sec.; 1/4 mile, 0.5 sec.

TOP SPEED is typically as reported by the manufacturer, but occasionally we measure it on a closed test track.

Significant difference: 5.0 mph.

BRAKING distances are initiated when the pedal is touched, and just enough effort is used to avoid wheel locking; on cars equipped with anti-lock braking systems, the ABS is fully invoked.

Significant difference: 60-0 mph, 10 ft.; 80-0 mph, 15 ft.

HANDLING is quantified two ways: The skidpad measures steady-speed cornering grip around a 200-ft.-diameter circle (run in both directions). The slalom, run through eight cones spaced at 100-ft. intervals, samples both controllability and grip during transient handling.

Significant difference: Skidpad, 0.02g; slalom, 1.0 mph.

Our FUEL MILEAGE is measured largely during urban driving and typically falls between EPA's city and highway estimates.

Significant difference: 0.5 mpg.

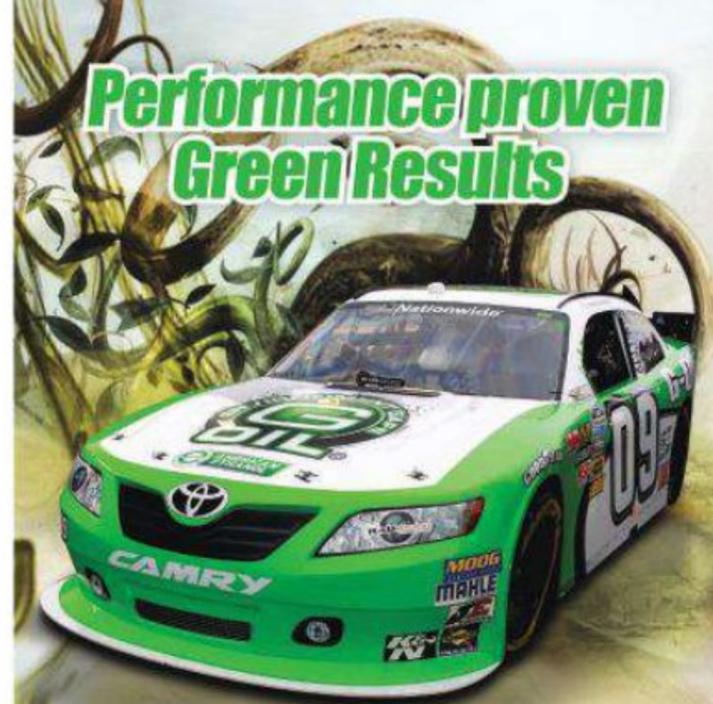
MAKE & MODEL	ISSUE	PRICE AS TESTED ³	ENGINE TYPE	HORSEPOWER, SAE	TORQUE, LB-FT	CURB WEIGHT, LB	0-60 MPH, SEC	0-100 MPH, SEC	1/4 MILE, SEC @ MPH	TOP SPEED, MPH ⁴	BRAKING 60-0 MPH, FT	BRAKING 80-0 MPH, FT	SKIDPAD, G	SLALOM, MPH	OUR FUEL MILEAGE, MPG
Acura TL SH-AWD	5-10 ²	\$44,195	V-6	305	273	3860	5.2	13.1	13.7@102.3	130 ⁵	113	198	0.91	68.4	15.8
Aston Martin Rapide ¹	9-10	\$212,445	V-12	470	443	4385	4.7	10.9	13.1@109.5	188	119	214	0.92	69.7	12.0 ⁴
V8 Vantage S ⁷	8-11 ¹⁰	\$157,670	V-8	430	361	3645	4.3	9.8	12.7@113.7	189	118	204	0.97	73.7	15.0 ⁴
V12 Vantage Coupe	1-11 ²	\$193,755	V-12	510	420	3800	4.3	9.3	12.5@116.8	190 ⁵	106	187	0.98	73.7	13.4
Audi 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
A7 ¹	11-11 ²	\$68,630	V-6s	310	325	4300	4.9	12.6	13.5@103.2	130 ⁵	117	207	0.91	66.7	17.8
A8L ¹	10-11 ²	\$88,375	V-8	372	328	4495	5.0	12.6	13.6@104.0	130 ⁵	112	197	0.93	67.9	18.0
R8 5.2 FSI	1-11 ²	\$170,350	V-10	525	391	3725	3.7	8.4	11.9@118.7	196	112	199	0.97	72.9	13.6
S4 Quattro	8-11 ^{2,10}	\$53,500	V-6s	333	325	3965	4.4	11.0	12.9@108.8	155 ⁵	118	205	0.93	68.4	18.4
TTS	11-09 ²	\$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 ¹	7-11 ¹⁰	\$215,675	W-12tt	567	516	5305	4.3	10.4	12.8@111.3	198	117	207	0.89	65.4	13.0 ⁴
Continental Supersports Conv. ¹	11-11	\$298,590	W-12tt	621	590	5515	3.9	10.1	12.5@110.1	202	117	210	0.89	66.6	13.0 ⁴
BMW Z4 sDrive35is ⁷	8-11 ¹⁰	\$64,225	I-6tt	335	332	3555	4.4	10.6	12.9@109.9	155 ⁵	119	208	0.91	67.8	20.0
1 Series M Coupe	9-11 ²	\$50,460	I-6tt	335	332	3405	4.4	10.8	12.9@108.4	155 ⁵	117	204	0.95	73.4	19.9
335is	3-11 ¹⁰	\$57,450	I-6tt	320	332	3560	4.6	11.2	13.2@106.2	150 ⁵	116	204	0.93	69.0	19.0 ⁴
550i	3-11	\$68,525	V-8tt	400	450	4410	5.0	11.4	13.4@106.8	150 ⁵	125	218	0.88	66.0	17.8
750Li ¹	10-11 ²	\$99,125	V-8tt	400	450	4765	5.1	11.7	13.5@106.9	150 ⁵	120	209	0.86	66.4	15.5
Bugatti Veyron 16.4 Super Sport ⁷	11-11	\$2,765,840	W-16qt	1184	1106	4545	2.5	4.9	9.9@145.8	258 ⁵	124	212	0.99	69.6	9.0 ⁴
Buick Regal GS	12-11 ^{2,10}	\$38,350	I-4t	270	295	3785	6.2	15.6	14.7@99.0	152	119	208	0.90	67.8	23.0 ⁴
Cadillac CTS-V Sedan	8-11 ^{2,10}	\$69,490	V-8s	556	551	4300	4.1	9.2	12.3@118.4	191	114	198	0.92	70.1	15.2
CTS-V Sport Wagon	3-11 ¹⁰	\$70,1885	V-8s	556	551	4510	4.3	9.9	12.6@114.5	190	116	204	0.88	70.4	17.8
Callaway Corvette SC606	9-10	\$116,560	V-8s	606	553	3445	3.8	7.8	11.8@125.3	205	106	193	1.05	74.2	16.0
Chevrolet Camaro SS Conv.	7-11 ²	\$42,180	V-8	426	420	4190	4.8	11.0	13.1@109.3	155 ⁵	116	203	0.89	68.4	16.7
Corvette Grand Sport	2-10 ¹⁰	\$68,365	V-8	436	428	3360	4.1	9.2	12.4@116.5	190 ⁵	112	197	0.96	70.7	17.0 ⁴
Corvette Z06	1-11 ²	\$98,010	V-8	505	470	3305	3.6	8.2	11.9@123.5	193	114	199	1.06	74.1	16.9
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
Cruze Eco	5-11 ¹⁰	\$19,745	I-4t	138	148	3050	8.1	23.1	16.2@86.8	130 ⁵	134	235	0.84	67.3	37.7
Volt ¹	2-11 ²	\$43,485	I-4/Elec	149	273	3825	8.8	28.1	16.8@82.8	101 ⁵	127	231	0.79	62.6	50.0 ⁴
Chrysler 300 SRT8 ¹	12-11	\$57,725	V-8	470	470	4430	4.5	10.6	12.9@111.6	175	120	217	0.82	66.2	14.6
Dodge Challenger SRT8 392	5-11 ²	\$44,380	V-8	470	470	4350	4.6	10.8	13.0@109.8	180	117	198	0.90	68.7	15.0
Charger R/T ¹	4-11	\$39,235	V-8	370	395	4410	5.2	12.7	13.7@104.2	145 ⁵	119	209	0.87	67.8	17.0
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 ⁷	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	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
458 Italia ⁷	12-10 ²	\$280,572	V-8	570	398	3490	3.0	6.7	11.0@128.5	203	112	190	1.00	73.4	13.5
Fiat 500 Sport	10-11 ¹⁰	\$18,350	I-4	101	98	2440	10.2	36.7	17.5@78.0	112	135	237	0.84	68.9	31.0 ⁴
Ford Fiesta SES 5-Door	11-10 ¹⁰	\$19,305	I-4	120	112	2580	9.7	33.2	17.2@80.6	118 ⁵	138	241	0.82	62.2	30.0 ⁴
Focus Hatchback ⁷	9-11 ¹⁰	\$25,830	I-4	160	146	3115	8.1	22.2	16.1@86.9	118 ⁵	118	210	0.91	69.2	28.8
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 Boss 302 LS	5-11	\$47,990	V-8	444	380	3690	4.1	9.1	12.3@117.2	155 ⁵	112	191	1.02	74.0	16.7
Mustang GT Convertible	7-11 ²	\$42,585	V-8	412	390	3745	4.7	10.8	13.1@110.7	145 ⁵	116	203	0.91	69.1	17.0
Shelby GT500	8-11 ^{2,10}	\$55,330	V-8s	550	510	3870	4.3	8.9	12.4@119.4	155 ⁵	116	198	1.01	69.9	14.4
HKS Nissan GT-R ⁷	10-10 ¹⁰	\$107,000	V-6tt	638	606	3900	3.0	6.8	11.1@128.9	195	122	205	0.97	73.8	na
Honda Accord V6 EX-L Coupe	1-11 ¹⁰	\$32,480	V-6	271	251	3475	6.2	15.7	14.8@96.8	130 ⁵	138	225	0.84	62.9	18.0 ⁴
Civic Si Coupe	10-11 ¹⁰	\$23,175	I-4	201	170	2905	6.7	16.6	15.0@95.3	137 ⁵	134	237	0.88	68.0	23.0 ⁴
CR-Z EX	12-10 ¹⁰	\$22,560	I-4/Elec	122	128	2654	8.6	24.7	16.4@83.7	123	128	226	0.82	66.8	32.0 ⁴
Hyundai Equus Signature ¹	10-11 ²	\$58,900	V-8	385	333	4610	6.2	15.0	14.6@98.6	149 ⁵	128	229	0.80	64.2	16.2
Sonata Hybrid ¹	8-11 ¹⁰	\$31,650	I-4/Elec	206	193	3650	8.7	22.8	16.6@86.2	123 ⁵	137	247	0.78	63.6	36.0 ⁴
Sonata SE 2.0T ¹	4-11 ¹⁰	\$25,000	I-4t	274	269	3450	6.1	14.6	14.5@99.6	146 ⁵	131	231	0.83	65.9	23.0 ⁴
Infiniti G25 ¹	4-11 ¹⁰	\$34,225	V-6	218	187	3515	7.7	19.5	15.7@90.2	145 ⁵	124	223	0.87	65.9	21.0 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
M56 ¹	1-11 ²	\$68,145	V-8	420	417	3930	4.6	11.0	13.1@108.7	155 ⁵	121	214	0.87	66.7	17.9
Jaguar XFR ¹	6-11 ^{2,10}	\$80,475	V-8s	510	461	4425	4.3	9.7	12.6@114.0	155 ⁵	116	204	0.86	67.2	17.1
XJL Supercharged ¹	10-11 ²	\$91,950	V-8s	470	424	4395	4.4	10.3	12.8@111.1	155 ⁵	114	203	0.86	65.9	14.1
Kia Optima Hybrid ¹	11-11 ¹⁰														

MAKE & MODEL	ISSUE	PRICE AS TESTED ³	ENGINE TYPE	HORSEPOWER, SAE	TORQUE, LB-FT	CURB WEIGHT, LB	0-60 MPH, SEC	0-100 MPH, SEC	1/4 MILE, SEC @ MPH	TOP SPEED, MPH ⁴	BRAKING 60-0 MPH, FT	BRAKING 80-0 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
CL550 4Matic ¹	7-11	\$128,315	V-8tt	429	516	4775	4.2	10.3	12.7@111.5	130 ⁵	121	209	0.89	66.6	16.0 ⁴
CLS63 AMG ⁷	9-11 ¹⁰	\$130,290	V-8tt	550	590	4275	3.8	8.3	12.0@122.5	186	116	204	0.93	70.3	16.0 ⁴
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 ⁴
E550 ¹	1-11 ²	\$69,625	V-8	382	391	4150	4.6	11.3	13.1@107.9	130 ⁵	120	212	0.86	65.1	17.4
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 ⁷	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 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 ⁴
SLS AMG ⁷	7-10	\$202,150	V-8	563	479	3795	3.6	7.7	11.6@124.3	197 ⁵	112	194	0.96	71.8	10.8
Mini 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	2-09	\$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 ⁴
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 CSR	6-11 ^{2,10}	\$34,755	I-4t	291	300	3600	4.3	11.5	13.0@106.2	162 ⁵	123	210	0.97	70.0	16.5
Lancer Evolution SE ⁷	3-11 ^{2,10}	\$36,550	I-4t	291	300	3625	4.5	12.0	13.2@104.3	162 ⁵	119	207	0.97	70.2	15.0 ⁴
Lancer Ralliart ⁷	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 GT-R⁷	5-11 ¹⁰	\$89,950	V-6tt	530	448	3965	2.9	7.1	11.1@124.3	197	114	189	1.00	75.4	17.4 ⁴
Juke SV	12-10 ¹⁰	\$21,810	I-4t	188	177	2925	7.1	18.6	15.6@91.4	125 ^{4,5}	133	238	0.84	67.3	25.0 ⁴
Leaf SL-E ¹	2-11 ²	\$35,430	Elec	107	207	3415	9.4	na	17.2@79.0	92 ⁵	130	231	0.81	65.5	118.0 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 ⁴
370Z Touring	6-11 ^{2,10}	\$41,895	V-6	332	270	3425	4.9	11.9	13.4@106.8	155 ⁵	118	201	0.99	72.0	18.6
Porsche Boxster Spyder	8-11 ^{2,10}	\$67,820	F-6	320	273	3000	4.4	10.4	12.8@109.2	166 ⁵	111	196	1.01	74.2	21.0
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 ⁴
Cayenne S ¹	6-11 ¹⁰	\$78,895	V-8	400	369	4555	5.6	14.1	14.1@100.1	160 ⁵	116	200	0.89	66.2	15.0 ⁴
Cayman R	9-11 ²	\$81,685	F-6	330	273	3025	4.4	10.2	12.8@110.5	175	114	200	0.97	73.3	21.7
Panamera ¹	2-11 ¹⁰	\$101,669	V-6	300	295	4105	5.4	13.6	14.0@101.4	160 ⁵	113	196	0.96	71.2	19.0 ⁴
Panamera Turbo S⁷	12-11 ¹⁰	\$186,845	V-8tt	550	553	4575	3.4	8.1	11.6@120.8	190	118	207	0.99	69.6	16.0 ⁴
911 Carrera GTS ⁷	3-11 ¹⁰	\$113,605	F-6	408	310	3380	3.8	9.0	12.1@115.4	188	109	192	0.95	72.6	21.9
911 GT2 RS	10-11 ¹⁰	\$260,980	F-6tt	620	516	3230	3.5	7.1	11.3@130.3	205	111	187	1.02	75.9	17.0 ⁴
911 GT3 RS 4.0	10-11	\$198,280	F-6	494	339	3125	3.6	8.0	11.8@122.2	193	109	190	1.04	75.8	17.0 ⁴
911 Speedster	3-11 ¹⁰	\$204,950	F-6	408	310	3520	3.9	9.2	12.2@114.6	190	111	192	0.97	73.4	19.4
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
911 Turbo S ⁷	1-11 ²	\$162,460	F-6tt	530	516	3590	2.6	6.3	10.7@128.9	195	107	185	1.02	73.3	15.1
Rolls-Royce Ghost¹	8-10 ²	\$308,350	V-12tt	563	575	5495	4.7	10.2	12.9@114.3	155 ⁵	119	209	0.85	60.1	16.5
Phantom ¹	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 ⁴
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 ⁴
Shelby GT350	5-11 ²	\$82,658	V-8s	624	540	3950 ⁴	4.2	9.2	12.4@116.7	155 ⁵	117	207	0.99	69.2	14.0 ⁴
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 coupe⁷	3-08	\$15,625	I-3	70	68	1825	13.3	na	19.2@70.5	90⁵	130	230	0.72	57.6	32.0 ⁴
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 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 Limited	3-11 ^{2,10}	\$39,870	F-4t	305	290	3455	4.9	13.3	13.4@100.6	155	119	211	0.91	70.9	16.0 ⁴
Legacy 2.5GT Limited	12-11 ^{2,10}	\$34,340	F-4t	265	258	3545	5.6	14.4	14.1@98.8	150 ⁵	125	223	0.84	66.8	23.0 ⁴
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(kwh) ⁴
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(kwh) ⁴
Volkswagen CC3.6L 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
Golf GTI 3-dr ⁷	8-10 ¹⁰	\$31,900	I-4t	200	207	3370	6.1	15.8	14.6@96.9	130 ⁵	143	247	0.86	66.2	25.0 ⁴
R32 ⁷	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 Polestar C30	11-11	na	I-5t	405	510	3430	4.2	10.8	12.8@110.9	155 ⁵	117	198	0.99	72.5	na
S60 T6 AWD ¹	2-11	\$46,200	I-6t	300	325	3950	5.5	13.9	14.1@100.6	130 ⁵	118	210	0.87	69.5	20.2
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 ⁴

R&T Classics

The following cars are chosen from thousands in our Road Test archives. Some have relevance to stories in this issue, others are here purely to pique your curiosity.

Audi Coupe S2	1-91	\$45,700	I-5t	220	228	3130 ⁴	6.0	na	14.6@96.5	154	144	247	na	61.0	19.0
Ferrari 328 GTS	7-88	\$63,370	V-8	260	213	3170	6.0	15.9	14.5@96.0	149	154	265	0.83	60.3	16.5
Ferrari 348 Spider	6-93	\$130,290	V-8	312	229	3250	5.6	14.0	14.1@101.0	157 ⁴	140	245	0.91	62.8	15.0 ⁴
Ferrari F355 Spider	1-97	\$154,036	V-8	375	268	3390	5.3	12.7	13.7@104.5	175 ⁴	122	219	0.93	66.1	16.0
Ferrari 360 Spider	7-01	\$176,512	V-8	395	275	3495	4.5	10.7	12.9@110.7	180 ⁴	125	221	0.93	66.6	10.8



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