

# NUMEROLOGY

## MODEL YEAR 2013 FOR FORD WILL BRING MORE 40-PLUS MPG VEHICLES AND A SURPRISINGLY POTENT 1-LITER 3-CYLINDER ENGINE BY JOE SAGE



We flew to Dearborn, Michigan this summer to learn what's new at Ford—not just their complete 2013 model year lineup in general, but their recent successes, their technological thrust of the past few years, and their mission to continue massively improving fuel economy over the next few years, demonstrated by a tremendous variety of new product hitting the marketplace right now.

### 5 YEARS 8 VEHICLES 40 MPG

We first met with Mark Fields, Ford Executive Vice President and President of the Americas. He emphasized what is on many consumers' minds—fuel economy—and he was reporting from an enviable position. Ford will have eight vehicles achieving 40 MPG or better by year's end, which is twice as many as last year, and they state is unmatched by any other manufacturer.

Most of Fields' comparative analysis was over a five-year run, and notable improvements fall across the product lineup. The new Ford Fusion brings MPG from 33 five years ago to an anticipated 40 or 40-plus in the 2013 model (which was at our event, but not yet ready for

driving—stay tuned). The Taurus with its 4-cylinder EcoBoost engine (see our launch drive in the May/June 2012 issue) boasts 32 MPG, compared to the same-slot Ford Five Hundred at 26 in 2007. The Mustang, without taking its eye off fun and performance, has moved up 24 percent, from 25 to 31 MPG. The all-new Escape, with two different EcoBoosts, is up as much as 32 percent, to 32 MPG. The Explorer over five years has increased fuel mileage from 20 to 28 (with a V6), a 40 percent gain. And America's best-selling vehicle, the Ford F-150, has moved from 19 to 23 MPG, a 21 percent gain.

Credit Ford's EcoBoost engines with most of these gains—a family of designs that combine direct injection with turbocharging (and a generous dose of other breakthroughs) to bring horsepower and torque roughly to par with engines a category higher—a V6 that feels like a V8, or a 4-cylinder that feels like a V6—while running on noticeably less fuel (mileage on average is 20 percent higher) and with lower emissions.

### KEEPING THE CUSTOMER SATISFIED

Knowing full well that awareness and acceptance of electric vehicles is still moving a little bit more slowly than technical breakthroughs—with conventional liquid fuel powertrains still the “main customer preference”—Ford is proud to have seven vehicles for model year 2013 that will boast the smallest displacement engines in their respective segments. Ford has its share of hybrids and electrics, but the energy and ingenuity they've applied to EcoBoost has paid off handsomely. Ford expects to be producing some 1.5 million EcoBoost engines annually by next year, which is about 200,000 more than expected.

It's all a far cry from classic horsepower wars. But it's not just what the law increasingly requires;

it's what the customer increasingly wants. Though thirty-five percent of shoppers are driving fewer miles now than they did the year before, improved fuel economy has given them a new reason to buy. Ford has made the math easy for their buyers, calculating a “value equation” that combines purchase and operating costs. For example, they figure you can save \$1650 over a normal life cycle with a Focus over a Camry, or \$2245 with a new Escape over a RAV4. Your mileage may vary.

Through clever technologies—EcoBoost engines, hybrid and electric powertrains, new fuel-saving 6-speed transmissions in every car and SUV and pickup, weight shaving including 75 percent implementation of electric power assist steering (EPAS), and drag coefficients increased by 10 to 12 percent or better—Ford is tackling the challenge of meeting that fuel economy need, while still delivering a satisfying and even exciting ride.

And that's exactly what we have traveled to Michigan, to the Dearborn Development Center—Ford's home turf test track—to confirm.

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On the track at Dearborn, lead photo, are a silver Ford Focus Electric and two golden EcoBoost turbo gasoline models. At right, top to bottom: the new Ford F-150 Limited, the updated F-150 Raptor, the next Ford Fusion (present this day for looking only, not for driving), a Ford Taurus fleet including those with the new 2.0-liter EcoBoost inline-4, and displays of the full EcoBoost lineup.

 <p><b>3.5L EcoBoost</b> TAURUS SHO FLEX EXPLORER SPORT F-150 POLICE INTERCEPTOR SEDAN</p>	 <p><b>2.0L EcoBoost</b> FOCUS ST FUSION TAURUS ESCAPE EDGE EXPLORER</p>	 <p><b>1.6L EcoBoost</b> FUSION ESCAPE</p>	 <p><b>1.0L EcoBoost</b> COMING IN 2013</p>
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## FUEL EFFICIENCY AND FUEL ELIMINATION

As many consumers tune in to the presence of electric vehicles in the marketplace and sharing their roads, Ford has been consistently developing the category and is now introducing the Focus Electric, to be followed by a Transit Connect Electric delivery van, and "Energi" plug-in hybrid versions of their upcoming Fusion and C-MAX (both available also as gasoline-electric hybrids). They will offer six electric or plug-in hybrid models by the end of 2012, with capacity expected to triple in 2013.

## FOCUS: ELECTRIC AND 1-LITER 3-CYLINDER

We first drove the new Ford Focus at launch in Southern California (see our March/April 2011 issue). We had just driven the Focus Electric briefly in Phoenix, shortly before heading to Dearborn (see prior article in this issue). And we gave you detailed information on the Electric's hot weather cooling technologies last year (see our July-August 2011 issue). Track time in Dearborn was our next chance to drive them all again. And Ford already had something new for us to check out.

Not released yet, but due next year, is an initially startling prospect we are now immediately used to: a 1.0-liter 3-cylinder EcoBoost engine, which the engineers have already fitted to the Focus. Bearing memories of the gutless 3-cylinder, 66-hp Subaru Justy of the 1980s, we slipped behind the wheel and fired it up. This was not on the streets of Dearborn, mind you, but on Ford's best test track, with dips and turns, hairpins and straightaways—and this little Focus lit it up. With a manual transmission, we chirped the tires on our shifts, and we noted that others did the same. We were highly impressed and can't wait for more time behind the

wheel. The one-liter Focus is also equipped with Auto Start/Stop fuel-saving technology.

This 1.0L 3-cylinder EcoBoost has already been in use in Europe, where it won "2012 International Engine of the Year" honors as the smallest, quietest conventional engine ever built. Its design reduces fuel consumption, emissions and vehicle weight, in a triple win.

A repeat drive of the Focus Electric, this time on the track rather than in downtown Phoenix, confirmed its smooth drivetrain, satisfying power and the impressive full-band torque a full electric drivetrain provides.

## FORD F-150: NEW MODELS AND ENGINES

Ford had two F-150 model updates for us: a new Limited series, and the latest Raptor. The Raptor breaks from the day's theme, in that it has a powerful, segment-topping 6.2-liter V8 with 411 horses and an 11/16 MPG city/highway fuel mileage rating. But we love it. The 2013 model brings new 17-inch wheels, HID headlamps, and SYNC technology or a MyFord Touch upgrade.

Joining F-150 special edition King Ranch and Platinum models is a new Limited, starting at \$52,455, which raises the bar further on comfort, convenience and connectivity. Features include MyFord Touch, navigation with SiriusXM Travel Link, rain-sensing wipers and HID headlamps, special graphics, 22-inch polished aluminum wheels, red and black leather, and aluminum and piano black interior finishes.

But most pertinent to this day was the well-established news that Ford's F-150 sales have moved to over 50 percent EcoBoost V6 engines—a success they had not fully anticipated. Our mission was to compare these with the competition. Is the move to the V6 a fuel-econ-

omy-seeking compromise? Or a win-win? To find out, we drag-raced the Fords against their main competitors, with thousands of pounds loaded into the beds. As the Christmas tree lights turned green, the F-150's punch was immediate. You know they wouldn't have set this up if they didn't think they'd prevail, and they did. Overall, the V6 EcoBoost option is a proven win-win.

## TAURUS: NOW WITH 4-CYLINDER ECOBOOST

The Ford Taurus has consistently won awards as the "best large family sedan" and sometimes even as the sportiest (partly attributable to the SHO version). We drove the new Taurus lineup last spring in Oregon (see our May/June 2012 issue), including with the 2.0-liter EcoBoost four-cylinder engine, which we drove again in Dearborn. For this one, we left the proving grounds and roamed sweeping boulevards through River Rouge Park in the metro Detroit suburbs around Dearborn.

Ford is not alone in planting an efficient four-cylinder turbo in their big family sedan: we've driven the same combo over the past year in the Audi A6, BMW 5 Series and others. It takes no time at all to realize that a great 2-liter four-cylinder is more than up to the task of moving this much automobile. Fuel mileage—and its closely related factor, vehicle weight—is the reason for this move. Ford has achieved a 32 MPG figure for the 2.0L EcoBoost Taurus, which delivers 240 hp and 270 lb-ft of torque. This compares with the 3.5L non-EcoBoost V6 at 288 hp and 254 lb-ft, with a highway rating of 29 MPG. The base price for a Taurus SE with V6 is \$26,600 and for the EcoBoost, \$27,595. (There is also a 3.5L EcoBoost only in the Taurus SHO, but at just under \$40,000, that's a different equation.) Is it worth more to buy the 2-liter, for a three-MPG-highway advantage and higher torque, but for \$995 more? That's a tough call, but it's about a 10 percent fuel advantage, for only a 3 or 4 percent price hit. For early adopters of technology, the 2-liter EcoBoost is compelling—and smoothly capable (and could ultimately impact resale value, too).

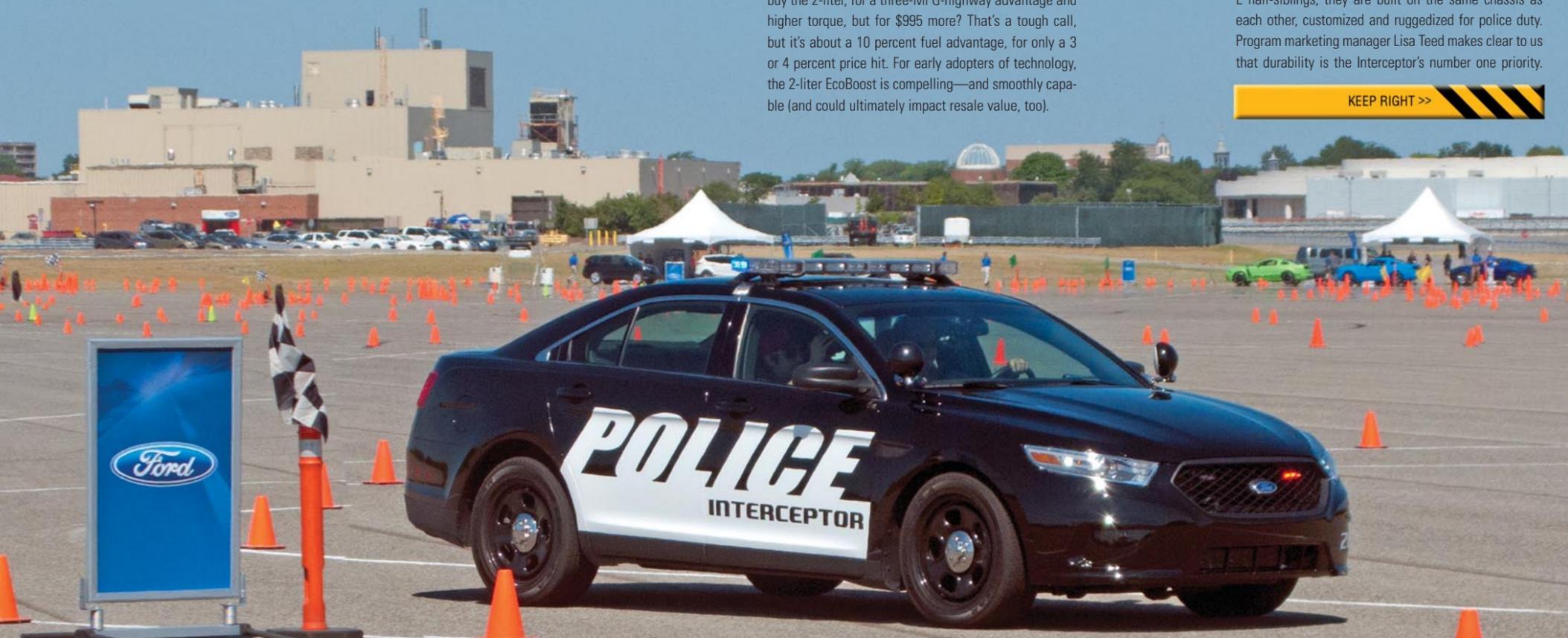
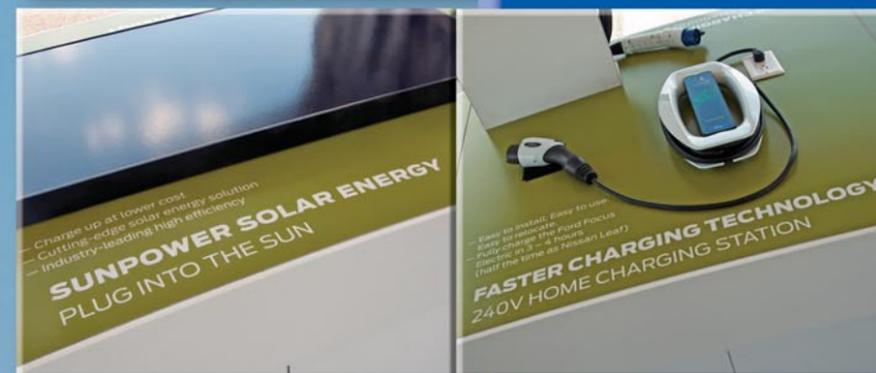
At right, top to bottom: the upcoming Ford C-MAX hybrid and C-MAX Energi plug-in hybrid (upper left) bridge somewhat between minivans and the new Ford Escape (upper right). With Ford's electric offerings come new power accessories, such as this solar installation for harnessing Mother Nature or this 240-volt fast-charging station for tapping the conventional power grid. The spacious and luxurious leather interior is inside the diminutive C-MAX. Ford has two new law enforcement machines: the Police Interceptor Sedan and Police Interceptor Utility. As for the Mustangs in the Interceptor Sedan's background, there was not enough time in the program for these, but see our May/June 2012 issue for our Mustang launch drive in Oregon.

## FORD POLICE INTERCEPTORS

When we first reviewed the current-generation Ford Taurus (see our Jan/Feb 2010 issue), we had thought that, especially with the increasingly capable and right-sized Fusion in the mix, the Taurus could absorb the Crown Victoria's spot in the lineup, if only it were not front-wheel-drive, especially given the Crown Vic's police duties. The Crown Vic ceased production after 2011, and a lot of police have been driving new Dodge Chargers while Ford prepared its next move.

There are two new Ford Police Interceptors, and while they clearly look very much like a prominent sedan and a prominent SUV in Ford's lineup, the T word and E word are not part of the program. One is the Ford Police Interceptor Sedan, the other the Ford Police Interceptor Utility. You can find the more traditional 3.7-liter flex-fuel-capable V6 in either, while the Sedan offers an optional 3.5L EcoBoost V6, as well. As with their T and E half-siblings, they are built on the same chassis as each other, customized and ruggedized for police duty. Program marketing manager Lisa Teed makes clear to us that durability is the Interceptor's number one priority.

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As we gaze upon the two perfectly handsome vehicles, Teed tells us they spent no money on looks: these are all about performance. Hence their visual similarity to the Taurus and Explorer that they are not. Top speed in the Interceptor Sedan is 148 mph; in the Utility, 131 mph. Ford is proud that in a rear crash, the new Interceptor stands up as the outgoing Crown Vic. We drove both on the dry track, then on a slick water track, at pursuit speed. Power was ample and tracking was solid. As for catching up with the competition after a model year's absence, Ford is not worried.

### FORD FUSION: SNEAK PEEK

It has been common knowledge that there is a great new Fusion coming, yet Ford is surprised and gratified that sales for the 2012 model have continued to set records. The Fusion has been a stellar offering for years, in our opinion, and the new one looks to be further transformative in defining its continually rising stature.

Buyers who waited will find the new Focus available with five powertrains, including a hybrid (HEV), a plug-in hybrid (PHEV), a normally aspirated 4-cylinder engine, a 4-cylinder EcoBoost turbo and soon that same new 1.0-liter 3-cylinder EcoBoost as in the Focus. You can get a new Fusion with front-wheel or all-wheel drive. And you will have a choice of automatic or manual transmission. (We do not yet know whether every combination will be available, e.g. an AWD manual.) For additional fuel savings, the Fusion will also include Auto Stop/Start.

### ALL-NEW FORD ESCAPE

Driving the new Ford Escape was not part of our day, but its statistics were. Dealer inventories at that time were just 4.5 days' worth, moving even faster than the red-hot Explorer (which was new a year and a half earlier). Some 57 percent of Escape buyers go for the high end of the lineup, with Titanium models standing at just a 3-day supply. Escape is available with either the 1.6L or 2.0L EcoBoost inline-4, and 93 percent of sales are EcoBoost. (The other seven percent are with a traditional 2.5L four.) We were struck by a certain degree of potential overlap, in product and buyers, with the new C-MAX.

### FORD C-MAX HYBRID, ENERGI PLUG-IN HYBRID

This "multi-activity vehicle" functions in much the same niche as a minivan (and brings back the "mini" in that term), while looking considerably like the new Escape—and may be the hottest news item in the group. C-MAX will be offered as a conventional gas-electric hybrid and as a C-MAX Energi plug-in hybrid.

The presence of this new vehicle has knocked the Escape Hybrid out of production, which for now eliminates an all-wheel-drive hybrid this size. The C-MAX was another display-only model: no driving yet. Ford is positioning it solidly against the Toyota Prius, especially the Prius v due to its size and shape, which it beats by several points in fuel mileage, at 47 MPG—and with a price anticipated to be \$1300 lower.

### TECHNOLOGY FOR THE DRIVE AND THE DRIVER

To Ford Group VP for Global Product Development Raj Nair, technology should be about being smart. He loves "what makes a driver better and makes the drive safer." Ford is among the legions working with automatic distance and spacing for freeway driving, which they calculate can reduce travel time by 37.5 percent, save fuel and make the trip safer. This may not be an enthusiast's dream, but the morning commute falls a bit short, anyway, and most everyone thinks this is coming.

Ford VP of Engineering for Global Product Development Hau Thai-Tang reminds us that it has already been five years since SYNC arrived as the company's benchmark electronic hands-free system. Evolving through MyFord Touch, things are moving toward all voice commands, for all devices, with apps and interfaces from your own smartphone that can be continuously updated. Many have eagerly awaited this approach. Working with ongoing partner Microsoft, Ford is pursuing faster touchscreens, with simpler interface, faster response, and upgrades you can perform yourself (or at the dealer, if you prefer). Tests of these systems show a 25 percent increase in user satisfaction, with 69 percent of respondents indicating the self-installation process is "very easy." This approach also enables Ford to implement revisions in response to customer feedback, such as having moved time and temperature toward the center.

The MyFordTouch system is intended to increasingly make drivers not more distracted but rather more aware, acting as their "sixth sense." Driver assistance technologies include blind spot information (from two multi-beam radar modules), cross traffic alert (when backing up), active park assist (cars that parallel-park them-

selves and soon will add perpendicular parking), adaptive cruise control, drift-pull compensation and a multi-faceted lane keeping system.

Senior Technical Leader for Ford Research and Advanced Engineering Jeff Greenberg introduced us to the latest synthesis of human and electronic engineering, Ford's Driver Workload Estimator. What you quickly realize is that existing onboard sensors, cameras and radar contain so much information already, it's one brilliant leap to integrate massive amounts of information from outside and inside the car. They combine vehicle response (speed, acceleration, lateral loads, yaw rate), driver cabin activity (steering wheel angle, pedal activities, instrument panel interaction, phone use), driving environment (traffic density, road surface and more) and biometrics (seat sensors measure your temperature, heart rate and respiration, as well as ambient temperature). Psychologists say driving is "overlearned," leading to boredom, monotony and fatigue when the workload is low, or to distraction and confusion when a driver pushes skill limits. A Do Not Disturb button can be manually activated for e.g. a long drive in a snowstorm. But workload limits are more transient. One immediate application of Driver Workload data is an intelligent Do Not Disturb function. Estimates based on average population are customizable for individual drivers. Information gleaned and applied through these systems—for example to send calls to voicemail when the car knows you shouldn't be answering—can in turn dictate information displayed on contextual touchscreens.

### GLOBAL POSITIONING STRATEGY

Ford EVP Mark Fields had told us that Ford is pursuing a "One Ford" global strategy—an elusive concept the industry has dreamed about for decades, but which has traditionally been difficult to implement, as regional tastes and needs have varied so much, along with materials and manufacturing technologies. Now a major convergence is occurring, from the US to Europe to China.

Group VP Raj Nair tells us the company is already about a year ahead with their plan, consolidating design and production around a series of global platforms. From 2011 to 2015, the company will move from 22 platforms to just ten—with 80 percent of their products on just five global platforms. You may know these as the B, C, C/D, commercial van and light truck platforms. Product names will still vary around the world—e.g. the Escape is the Ford Kuga in Europe—and styles can be tweaked, as well as powertrains. This approach allows not only economies of scale but more rapid development of breakthrough technologies.

The counterintuitive result of global consolidation is that you now have more intriguing new choices than ever, when you visit your local Ford dealer. ■