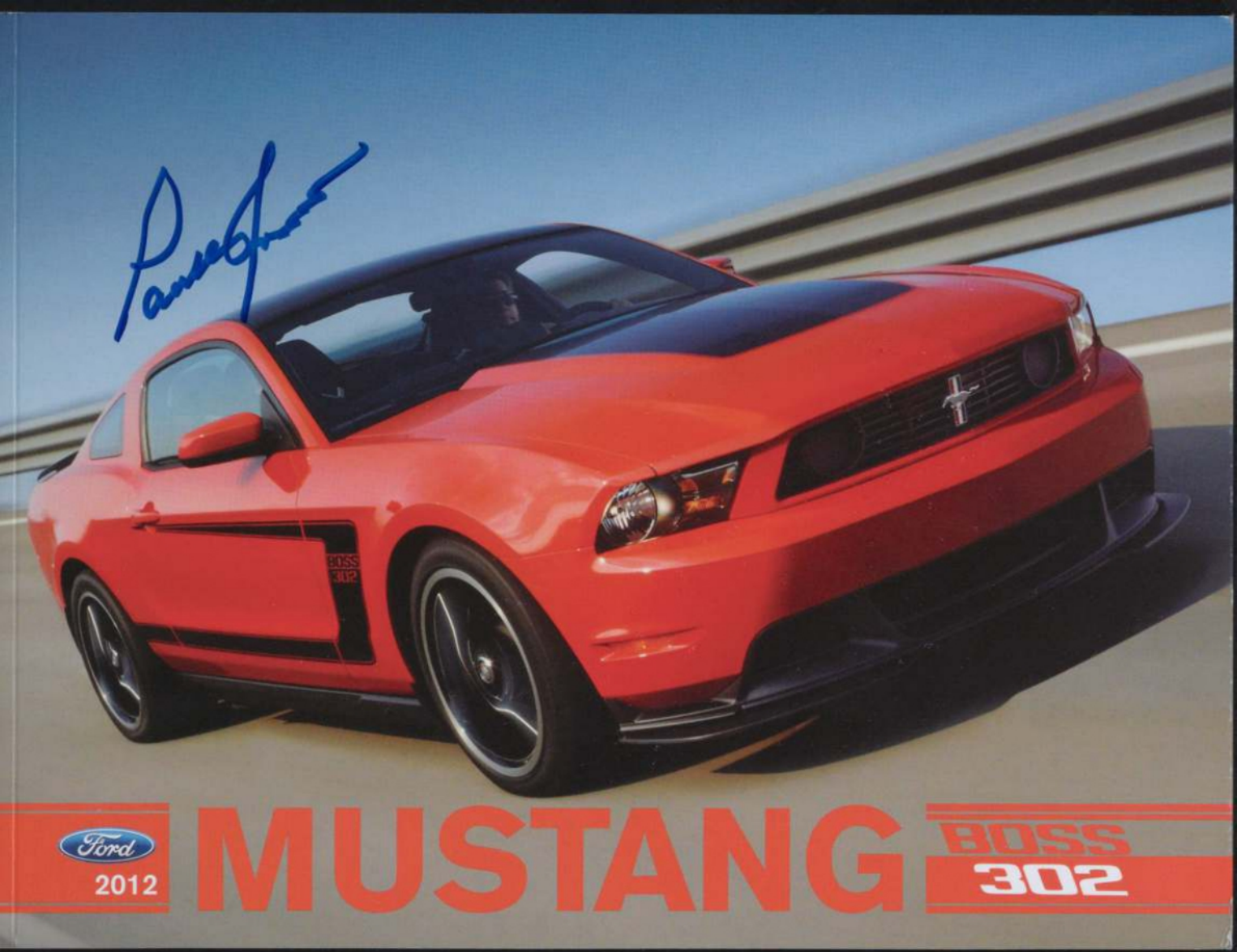



Ford

2012

# MUSTANG

BOSS 302

# 2012 MUSTANG BOSS 302 OVERVIEW

## THE BOSS IS BACK: 2012 FORD MUSTANG BOSS 302 BRINGS ROAD RACING LEGEND BACK TO THE STREETS

Ford gave the green light only once before: 1968. Management approved a special Mustang – a car that sacrificed nothing in its quest to be the best all-around road-going performance machine ever created by Ford Motor Company. That car became the 1969 Mustang Boss 302, and it remains one of the world's most sought-after examples of American performance.

Forty-two years later, Ford has given the green light again.

The team of engineers, designers and stylists – all Mustang enthusiasts to the core – that created the groundbreaking 2011 Mustang GT has distilled a new model to its purest form, strengthening, lightening and refining each system to create a race car with a license plate. Its name: The 2012 Mustang Boss 302.

"The decision to build a modern Boss was not entered into lightly. The entire team at Ford felt the time was right and with the right ingredients, the world-class 2011 Mustang could support a successful, race-bred, worthy successor to the original Boss 302. For us that meant a production Mustang that could top one of the world's best – the 2010 BMW M3 – in lap times at Laguna Seca. We met our expectations."

**– Derrick Kuzak, group vice president, Global Product Development**

To celebrate the racing heritage of the new Mustang Boss 302, Ford will also offer a limited number of Boss 302 Laguna Seca models, named for the track where Parnelli Jones won the 1970 Trans-Am season opener in a Boss 302. Aimed at racers more interested in on-track performance than creature comforts, the Boss 302 Laguna Seca has increased body stiffness, a firmer chassis setup and an aerodynamics package carried over almost in its entirety from the Ford Racing Boss 302R.

BOSS 302

# MUSTANG BOSS 302

## PHILOSOPHY AND POWERTRAIN

"The new Boss 302 completely redefines Mustang capability," said Mark Fields, Ford president of The Americas. "That the Mustang team was able to take the current Mustang GT – already a world-class performance car – and refine it further for peak track performance shows the commitment Ford has to this car and its legions of fans."

Driving the 2012 Mustang Boss 302 was intended from the outset to be a visceral experience, packed with raw, unbridled performance across the spectrum: Acceleration, handling, braking and top speed are all equally matched on a car operating within the framework of legally defined safety, noise and emissions regulations.

"The Boss 302 isn't something a Mustang owner can buy all the parts for out of a catalog or that a tuner can get by adding a chip. This is a front-to back re-engineered Mustang with every system designed to make a good driver great and a great driver even better."

**– Dave Pericak, Mustang chief engineer**

The V8 engine team approached Boss from the top down: With 412 horsepower from 5.0 liters, the 2011 GT engine was already an incredible performer. But to achieve the high-rpm horsepower that would make the engine competitive on the track, a new intake was essential. The resulting runners-in-the-box plenum/velocity stack combination the engine team developed was impressive enough that it got the green light after one short drive.

Helping the intake build power, revised camshafts using a more aggressive grind are actuated with the same twin independent variable camshaft timing (Ti-VCT) mechanism used on the Mustang GT. More aggressive control calibration yields 440 horsepower at 7,500 rpm and 380 lb.-ft. of torque at 4,500 rpm, while still offering a smooth idle and low-end torque for comfortable around-town driving.

A race-inspired clutch with upgraded friction materials transmits power, while a short-throw, close-ratio six-speed manual transmission handles gear change duties.

Power is delivered to a 3.73 ratio rear axle using carbon fiber plates in the limited-slip differential to improve torque handling and longevity. For those who want even more precise control over power delivery, a torque-sensing (Torsen) limited-slip differential is an available option coupled with Recaro front seats.

# MUSTANG BOSS 302

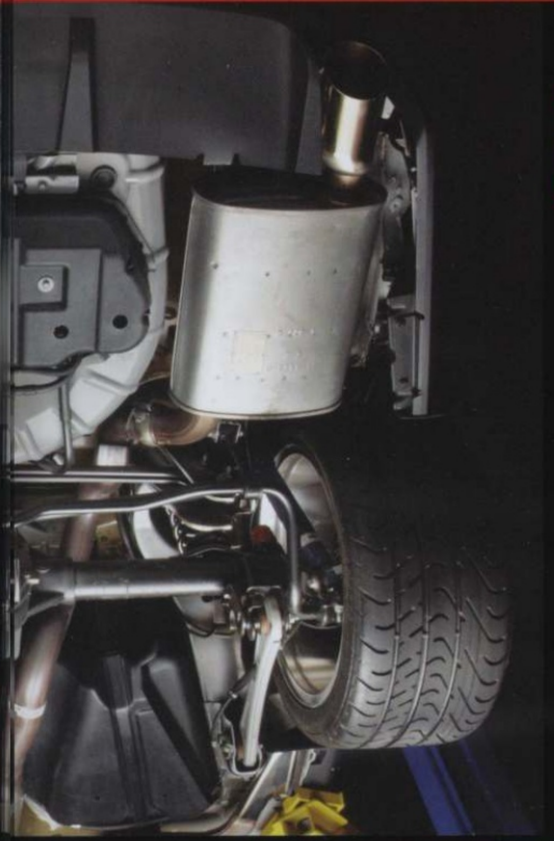
## SOUNDS LIKE THE BOSS


While the powertrain team defined output targets that would yield an ideal balance with the chassis, another team made sure the car made the kind of sounds owners and enthusiasts would expect from a Mustang Boss.

Up front, a Boss-specific intake system is tuned to feed the engine with minimum restrictions. A retuned induction sound tube provides concrete aural evidence of what's taking place. And in the Boss exhaust system engineers really had some fun.

Every Boss features a unique quad exhaust system: Two outlets exit in the rear similar to a standard Mustang GT. The other two outlets exit to either side of the exhaust crossover, sending exhaust through a set of metal discs that act as tuning elements before the pipes terminate just ahead of the rear wheel opening.

Visually subtle, the side pipes flow very little exhaust but a lot of exhaust sound, providing a sonic experience unlike any other Mustang. The noise attenuation discs are removable and include a spacer plate sized to match aftermarket exhaust dump valves, giving home tuners an additional avenue for modification.

## SUSPENSION AND STEERING

In keeping with the Boss mandate to provide the best-handling Mustang ever, the already strong 2011 Mustang GT suspension system has been further refined. Higher-rate coil springs on all four corners, stiffer suspension bushings and a larger-diameter rear stabilizer bar all contribute to the road racing mission, and Boss models are lowered by 11 millimeters at the front and 1 millimeter at the rear versus the Mustang GT. The real key to Boss handling, though, is in the adjustable shocks and struts, which are standard.

Drivers have the option of five settings: One is the softest, two is the factory setting and five is the firmest, with a noticeable change between each.

"What's unique is that drivers will find – thanks to the way the suspension works as a complete system – the softest setting isn't too loose and the firmest setting isn't too controlled; each step just provides additional levels of control."

**– Brent Clark, supervisor, Mustang vehicle dynamics team**

Also unique is the method of shock adjustment. Ditching the weight and complexity of electronic wizardry, the Mustang team opted for traditional race-style hands-on adjustability – similar to the Gabriel shocks available on the original Boss 302.

The shock adjustment screw is built into the rod at the top of the shock tower, easily accessible from under the hood or inside the trunk and turned with a small flat-head screwdriver.

To complement the suspension, the speed-sensitive electronic steering system has been retuned to maximize feedback and road feel to the driver. The driver is also given the option of fine-tuning the steering feel to his liking by selecting one of three settings through the instrument cluster menu: Comfort, normal and sport modes help offer track-tuned steering when desired without sacrificing low-speed maneuverability in parking situations and everyday commuting.

Similarly, Boss receives unique traction control system (TCS) and electronic stability control (ESC) settings to help drivers achieve maximum performance whether on the street or at the track. Both systems can be completely disabled in controlled track situations where maximum driver skill is utilized, or fully engaged for maximum safety during normal driving or in less-than-ideal traction conditions. Intermediate sport mode allows drivers to push their cars hard at the track without completely disabling the safety systems, permitting more aggressive driving before the TCS and ESC systems intervene.

# BRAKES, WHEELS AND TIRES

Working in concert with the suspension upgrades, Boss 302 receives unique, lightweight 19-inch black alloy racing wheels in staggered widths: 9 inches in front, 9.5 inches in the rear. The Pirelli PZero summer tires are sized specifically for each end of the vehicle, with the front wheels receiving 255/40ZR-19 tires while the rear stays planted thanks to 285/35ZR-19 rubber.

The combined suspension and tire package allows Boss to achieve a top speed of 155 mph and become the first non-SVT Mustang ever to achieve more than 1.0 g of lateral acceleration.

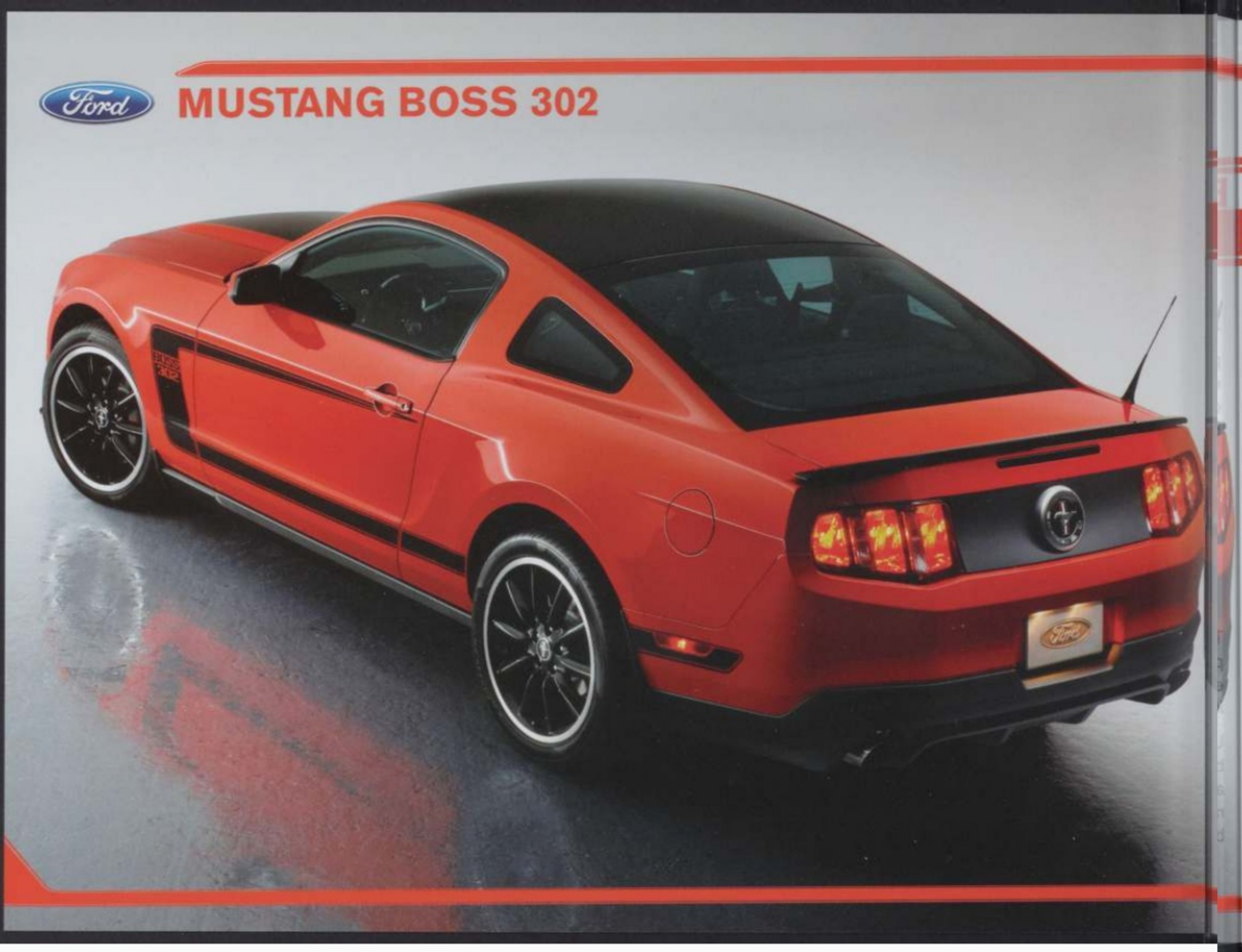
Boss braking is also up to the challenge, using Brembo four-piston front calipers acting on 14-inch vented rotors up front. In the back, standard Mustang GT brakes are upgraded with a Boss-specific high-performance pad compound. Combined with vented brake shields and unique Anti-Lock Brake System (ABS) tuning, Boss drivers get maximum control and rapid, repeatable fade-free stops in road and race situations alike.

The Mustang team spent considerable time ensuring the brake pedal feel met the expectations of performance drivers. Boss receives unique low-compressibility brake lines that expand up to 30 percent less than traditional flexible brake lines, allowing maximum fluid pressure to reach the calipers in the least amount of time, giving the driver a sensation of being connected directly to the brake pads.

As a result 60-0 stopping distances for the Boss are improved by approximately three feet versus the Mustang GT with available brake package; combined with suspension and engine improvements, Boss is expected to show approximately a two-second lap time improvement over the GT on a typical road race course. But the numbers tell only part of the story.

"What's harder to quantify is how much better these brakes feel to a driver in a race situation. Like everything on this car, the brakes are more than the sum of their parts: They're tuned from pad to pedal to work as a system, and the difference is dramatic."

**– Brent Clark, supervisor, Mustang vehicle dynamics team**



# EXTERIOR AND INTERIOR DESIGN

Changes to the Mustang Boss exterior are subtle but unmistakable. True to its race-bred heritage, every component that could potentially aid aerodynamics or engine/brake performance was examined to make the vehicle more competitive, while chief designer Darrell Behmer refined the styling to evoke the 1969 Boss in a contemporary way.

"We approached this as curators of a legend. We've taken design cues from the '69 Boss street car and the menacing Bud Moore/Parnelli Jones race cars and carefully updated them to give the 2012 the proper bad-boy attitude that is unmistakably a Boss Mustang."

**– Darrell Behmer, Mustang chief designer**

To set Boss apart, each car will have either a black or white roof panel, coordinated to the color of the side C-stripe. Available exterior colors are Competition Orange, Performance White, Kona Blue Metallic, Yellow Blaze Tri-Coat Metallic and Race Red.

Up front, a unique fascia and grille are highlighted by the blocked-off fog lamp openings and aggressive lower splitter, a version of the design used – and proven – on the Boss 302R race car. The front splitter is designed to function at high speeds by efficiently managing the air under and around the car. It helps to reduce underbody drag and front end lift while more effectively forcing air through the Boss-specific cooling system. At the rear of the car, the spoiler was chosen to complement the front aero treatment and minimize overall drag.

Inside, a unique Boss steering wheel covered completely in Alcantara suede complements the standard seats, which are trimmed in cloth with a suede-like center insert to firmly hold occupants in place. Boss customers who want the ultimate seating experience can select a package that includes Recaro buckets, designed by Ford SVT in cooperation with Recaro for high-performance Mustang models, and shared between the Boss and GT500.

A dark metallic instrument panel finish, gauge cluster and door panel trim also differentiate Boss from the standard Mustang, while a black pool-cue shifter ball and "Powered by Ford" door sill plates further remind customers they're in a special car.

"Boss is a hallowed word around here. We couldn't put that name on a new Mustang until we were sure everything was in place to make this car a worthy successor," said Pericak. "We were either going to do it right or not do it at all – no one on this team was going to let Boss become a sticker and wheel package."


MUSTANG BOSS 302
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302

# MUSTANG BOSS 302

## A TOTAL APPROACH TO THE PERFECT MUSTANG

The 2012 Mustang Boss 302 is not a trim package. It is not a collection of parts that can be purchased through the aftermarket. Boss is a balanced re-engineering of the Mustang GT focused on offering dedicated Mustang customers a track-ready package that could be driven home after the race. From splitter to spoiler, Boss is a truly unique creation.


Limited-slip 3.73 ratio rear axle using carbon fiber clutch plates, with optional Torsen differential available

Rear spoiler

Quad-pipe exhaust system with noise-attenuated side outlets sized to match aftermarket exhaust dump valves

Larger-diameter rear stabilizer bar

Boss-specific high-performance rear pad compound

Lightweight 19-inch black alloy racing wheels in staggered widths: 9-inch front, 9.5-inch rear

Manually adjustable shocks and struts

Fully defeatable traction control system (TCS) and electronic stability control (ESC) settings

Unique Boss steering wheel, seats and door panel trim

Available Recaro front bucket seats

Low-compressibility brake lines

Race-inspired clutch and short-throw, close-ratio six-speed manual transmission

Comfort, normal and sport modes for variable electric power-assisted steering (EPAS)

Boss-specific 440-hp 5.0-liter V8

Aggressive front splitter

Firmer coil springs and suspension bushings at all four corners

14-inch vented front rotors with Brembo four-piston calipers

Pirelli PZero summer tires; front: 255/40ZR-19, rear: 285/35ZR-19

BOSS 302

# BOSS LAGUNA SECA OVERVIEW

## LAGUNA SECA PACKAGE TAKES NEW 2012 FORD MUSTANG BOSS 302 TO TRACK-READY CONDITION

How do you amp up a performance car package as complete as the new 2012 Mustang Boss 302 – already a street-legal race car in its own right? Pull out everything that doesn't make it go faster and add in more of what does. The result is the limited-production Laguna Seca package – the ultimate 2012 Boss, named to commemorate the first-place Boss 302 finish at the 1970 Trans-Am series opener.

"The Laguna Seca package puts a race-ready version of the new Mustang Boss 302 directly into enthusiasts' hands. Laguna Seca isn't intended for Boss buyers who simply want an exhilarating daily driver. Think of it like a factory-built race car, which we hope avid racers and track-day fans are going to love."

**– Mark Fields, Ford president of The Americas**

Boss Laguna Seca builds on the bumper-to-bumper improvements found on the standard Boss while further stiffening the chassis and installing an aerodynamics package carried over almost in its entirety from the Ford Racing Boss 302R.

"Drivers who know how to get the most from a tuned race car on a closed course are going to be amazed by what the Laguna Seca is capable of," said Derrick Kuzak. "The balance and agility, the tuning of each vehicle system, places the driver at the center of the machine, completely connected to everything the car is doing."

# BOSS LAGUNA SECA



Laguna Seca cars are powered by the same smooth, high-winding 440-horsepower 5.0-liter V8 as the standard Boss, since the engine was already tuned specifically for road racing. Instead, engineers turned their attention toward delivering power to the ground most efficiently, and getting the car around a track in the quickest possible time.

"When we built the Boss, we had to step back and ask ourselves 'How do we improve on this?' That car is so strong we realized the Laguna Seca package was going to have to be just a fraction of a step back from the Ford Racing 302R to top it."

**– Dave Pericak, Mustang chief engineer**

Laguna Seca cars eliminate the rear seats, instead adding a cross-car X-brace that couples the structure between the rear wheels. The brace offers chassis stiffness improvements of as much as 10 percent and allows the suspension tuning – precisely calibrated by Mustang team members – to better do its job.

Standard Recaro front seats were designed by Ford SVT in cooperation with Recaro for high-performance Mustang models, and are shared between the Boss and GT500. An Alcantara-covered race steering wheel provides a solid grip for hard cornering.

# CHASSIS ENHANCEMENTS

Engine power routes through a six-speed close-ratio manual gearbox to a standard 3.73-ratio Torsen limited-slip differential, helping the revised rear suspension deliver maximum torque and traction under the punishing conditions encountered on the track.

Higher spring rates and a larger rear stabilizer bar – all upgraded over Boss specifications – help generate unrelenting grip. And drivers can dial in exactly the level of shock stiffness a particular track requires using the four standard, independently adjustable dampers with Laguna Seca-specific valving.

The final touch for a proper race car was to add the proper wheels and tires: Laguna Seca models use lightweight 19-inch alloy racing wheels in staggered widths: 9 inches in front, 10 inches in the rear. R-compound ultra-high-performance tires, 255/40ZR-19 in the front, 285/35ZR-19 in the rear, maintain contact with the pavement – a job that ended up being trickier than expected.

The R-compound tires on the Laguna Seca provided so much traction engineers had to retune the rear suspension to ensure drivers could get the most out of them. As a result, the rear stabilizer bar is the largest ever installed on a production Mustang – including any SVT product. The rear spring rates are also maximized to work with the massive rear tires and balance the car for shortened lap times.

While standard Boss 302 cars get vented brake dust shields to help cool the rotors, Laguna Seca models receive Ford Racing front brake ducts that force outside air directly onto the 14-inch vented front rotors, helping to eliminate brake fade and ensure hard, repeatable late braking on the track. Combined, the braking changes help refine the sense for drivers of being directly connected to the pads – an essential edge during car-to-car combat on a road course.

Added up, the further improvements to Boss Laguna Seca result in the best-handling Mustang ever, with more than 1.03 g of lateral acceleration, stopping distances shortened by three feet from 60 mph over Boss, 0-60 acceleration improvements of one tenth of a second, and an overall expected lap time improvement of one to two seconds over the standard Boss on a typical road course.

BOSS 302

# BOSS LAGUNA SECA

## STYLING EVOKES RACING, IMPROVES AERODYNAMICS

As a race car should, Boss 302 models with the Laguna Seca package look like nothing else on the road. A bright red C-stripe offsets either Black or Ingot Silver paint, and is complemented by a red roof panel. Red also sets off the front grille, mirror caps and rear pedestal spoiler, while Laguna Seca rear badging and unique two-tone red and silver wheels complete the transformation.

Adding both to appearance and aerodynamics, an aggressive front splitter adds downforce at the front of the car, while helping channel air under and around the car. At the same time, air impacting the front end is funneled into the radiator and brake ducts, supporting cooling even under grueling race conditions.

At the back, a large rear spoiler is sized to exactly complement the effect provided by the front splitter and underbody aero treatments, with the combination adding as much as 90 pounds of downforce at 140 mph.

"Balance is the key on Boss, and even more so on Laguna Seca," said Pericak. "It's not for everyone: It's stiffer, there's no back seat, and the aero package is designed for downforce, not speed bumps in the mall parking lot. But for hard-core Mustang track racers who want something they can occasionally drive on the street, to shows or whatever, Laguna Seca is the car they've been waiting for, and they're not going to be disappointed."



Additional information and photos available at media.ford.com

BOSS 302

# BOSS LAGUNA SECA

## DESIGNED TO GET THE HEART RACING

The Laguna Seca package stands out on the road – appropriate, considering its performance. A bright red C-stripe offsets either Black or Ingot Silver paint, complemented by a red roof panel. Red accents set off the grille, mirror caps and rear spoiler. And unmistakable Laguna Seca-unique red wheels complete the appearance package. It's a design that evokes Trans-Am race cars of the past while keeping all four tires planted squarely in the future.

The Laguna Seca package includes all standard Boss 302 equipment, in addition to:


BOSS 302

# NEW 2012 MUSTANG BOSS 302 TRACK-TESTED THANKS TO FORD RACING BOSS 302R

It's no secret that, near the end of 2009, Ford Racing announced the Mustang Boss 302R, a full-race, off-road-only vehicle complete with roll cage, race seats, safety harness, data acquisition, race dampers/springs and Brembo brakes. Since its first start at Daytona, the 302R has earned two pole positions in seven races so far this year.

What racing fans haven't known is that the Boss 302R has also been serving as a very public test bed for the all-new road-going Mustang Boss 302, a car that, until recently, has been secret even to many people at the company.

The old adage that "racing improves the breed" held true as Ford was building the production Boss 302. The track experience was helpful in identifying improvements for the production Boss – particularly the Laguna Seca model – to provide a competitive race car right off the showroom floor.

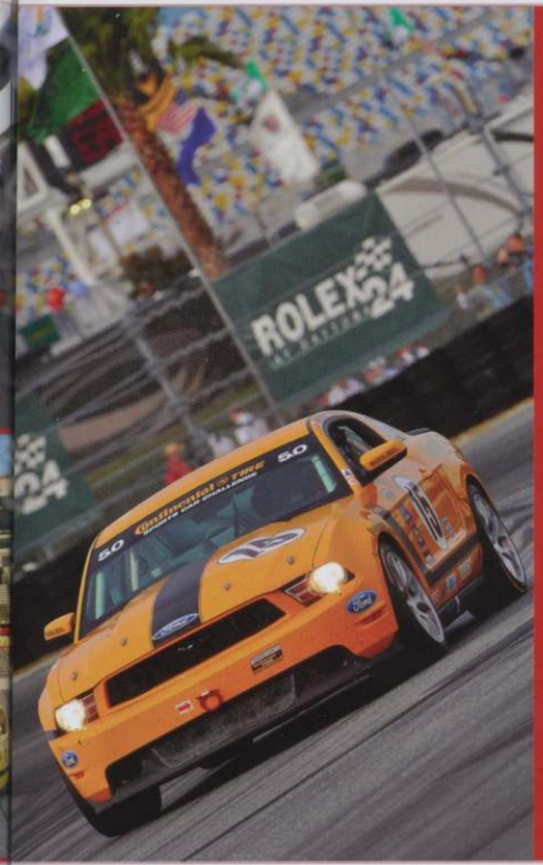
Boss 302R race cars used many of the Mustang team's planned production parts, giving them the advantage of six months' worth of racing telemetry to add to the standard battery of environmental tests pulled from the 2011 Mustang program.


## Identical parts, repeatable results

Collaborating with Ford Racing, the Mustang team decided if they were going to use the 302R for full-scale testing, then the race car would need to use planned production components to get valid data. As a result, engineers installed the first Boss 5.0-liter engine that came off the line directly into the 2011 302R development mule for track testing.

The results using the initial engine design were encouraging, though the data pointed out potential concerns with both engine cooling and oil control. Specifically, the car needed more of both, so aerodynamic elements in the front of the car were revised to improve airflow efficiency.

Also, under the hood the Boss radiator was redesigned and plumbing changes were implemented to more effectively use the additional airflow the new fascia aero treatment was able to supply – all changes that have been implemented on standard production Boss models and the race-ready Laguna Seca cars.


Using software that plotted oil pressure at specific g loads and at particular parts of the track, engineers isolated the motions causing oil starvation. Based on the track telemetry, baffles were added in specific locations, eliminating the issue without adding any more weight than necessary.

To aid the brakes, an aggressive engine braking algorithm was employed in the powertrain control module (PCM) – the engine braking allows the driver to brake later in turns, reducing wear on the friction brakes. Brake cooling ducts from Ford Racing were found to dramatically improve fade resistance – the ducts became standard on the 302R and the Boss Laguna Seca, and are available over the counter for standard Boss models.

The 5.0-liter block and architecture in the Mustang Boss 302R is the same as the 2011 Mustang GT, and many of the 302R components and much of the engineering knowledge shared between teams will soon be available to customers in the 2012 Mustang Boss 302.

"The tradition and the spirit of Boss, a car born for the track, remain today and you can bet more than a few Ford Racing employees will have a Boss 302 in the garage soon."

**– Jamie Allison, director, Ford Racing**

Additional information and photos available at media.ford.com

**BOSS 302**

# BOSS ENGINE

## HIGH-REVVING FORD 5.0-LITER V8 DELIVERS POWER, FLEXIBILITY BEFITTING BOSS NAME

The new 5.0-liter DOHC V8 in the 2011 Mustang GT is already the most powerful naturally aspirated production V8 Ford has ever produced. To make it worthy of the Boss name, Ford engineers tweaked more than a few bits of the engine.

They re-engineered an entire dynamometer cell to handle the engine's 7,500 rpm redline; put the first engines into Boss 302R race cars and sent them straight onto the track; and they designed a torture test equivalent to running the Daytona 250 race flat-out more than 175 times – in a row.

Only when the 440-hp V8 passed these tests, ensuring maximum power output without sacrificing durability, reliability and driveability, was it worthy of being called a Boss.

# ENGINE

## BULLETPROOF AND BLOWER-FREE

Planning began with a small group of engineers within the 5.0-liter V8 team. Starting with open minds and enlisting the help of two members of the original 1969 Boss 302 design team, the group began working its way toward the ultimate evolution of the new 5.0-liter: 440 horsepower at 7,500 rpm and 380 lb.-ft. of torque at 4,500 rpm, along with a broad, flat output curve all the way through its 7,500 rpm redline.

Though the Mustang team knew a supercharger would be the simplest way to extract significant power improvements from the new 5.0-liter V8, they elected not to pursue forced induction for the 2012 Boss in order to stay true to the original Boss 302 engine.

"The core group of engineers on the Boss 302 engine understands and respects the heritage of the name and the history behind the original engine."

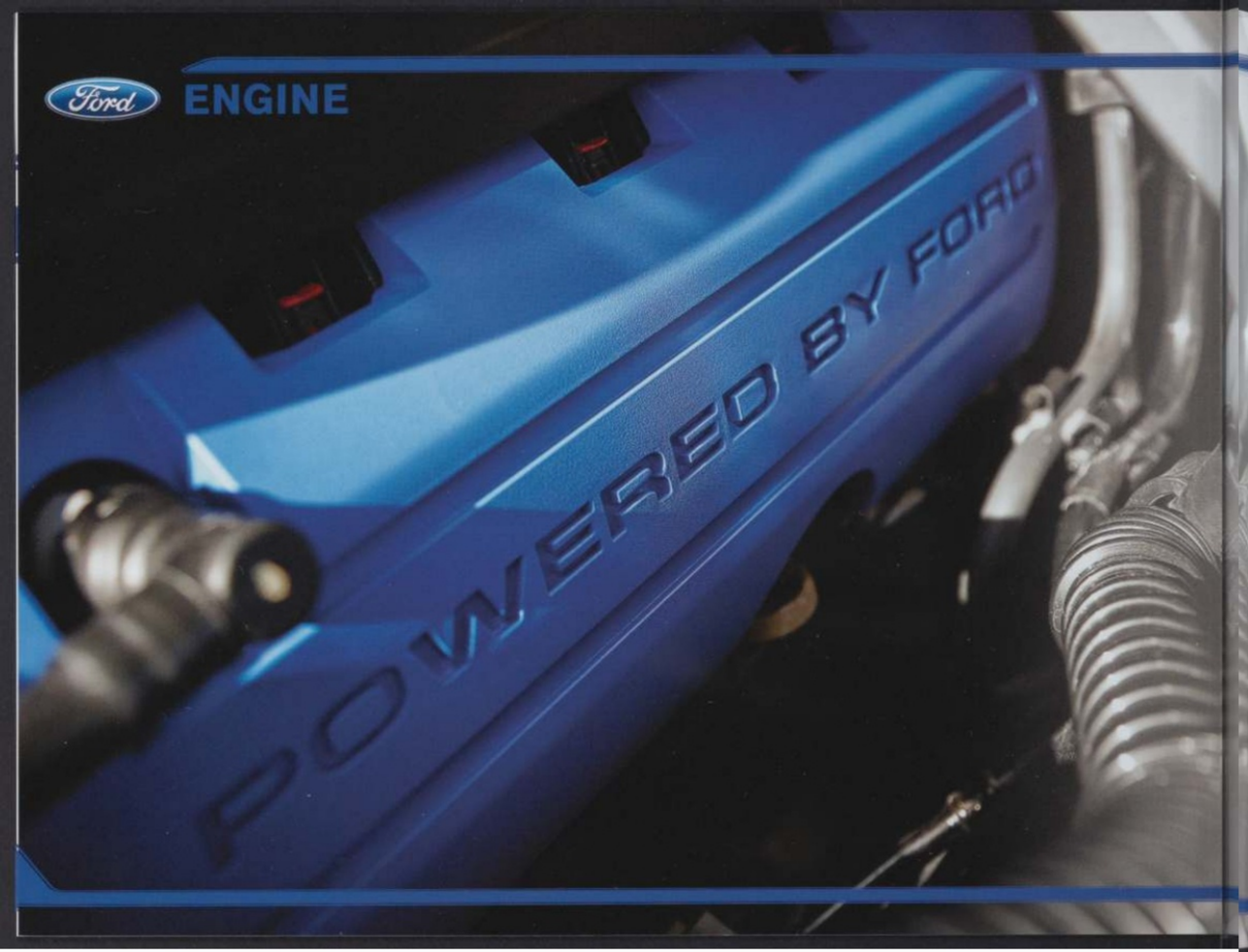
**– Mike Harrison,**
**Ford V8 engine program manager**

The first Boss 302 was a specially built, free-breathing, high-revving small V8 that gave it certain desirable characteristics on a race course. Ford captured that essence in the new engine.

Not only did the engine team feel that adding a blower would constitute taking the easy way out, they also realized the additional hardware meant more weight, the bane of any racing program and the opposite of what the Boss design team was attempting to achieve. Instead, the same technology that has made the new Mustang GT engine such a formidable force was applied to the Boss 302.

In keeping with the spirit of the original, the new Boss 302 engine achieves its maximum power output at a lofty 7,500 rpm. Unlike the original engine, however, low-speed torque and driveability are uncompromised thanks to twin independent variable camshaft timing (Ti-VCT) technology and computer-aided engineering design tools.

The Boss team began by maximizing the engine's ability to breathe – essential to the production of horsepower. Since high power production between 5,000 rpm and 7,000 rpm is required for credible track performance, a new approach to intake manifold design was needed.




# ENGINE

Borrowing from the Ford Daytona Prototype engines, the resulting short-runners-in-the-box design virtually eliminates lag when the throttle is snapped open while producing peak power output at 7,500 rpm.

To take advantage of the racing intake manifold, cylinder head airflow was fully optimized by CNC porting the entire intake and exhaust port and combustion chamber. The painstaking machining process takes 2.5 hours per head to complete.

To accompany the higher peak-power engine speed, the team had to engineer a lightweight, high-speed valvetrain and bulletproof reciprocating assembly that would not only hold together for 150,000-plus miles, but also produce power at peak rpm.

"What most people don't realize is that engine stresses increase exponentially as engine speeds rise. So going from GT's 7,000 rpm redline to 7,500 rpm in the Boss required significant re-engineering of many different parts, since sacrificing reliability and usability over the GT engine was never an option."

**– Mike Harrison,**
**Ford V8 engine program manager**

Some Boss-specific parts contributing to the Boss 302 V8 engine's output and durability include:

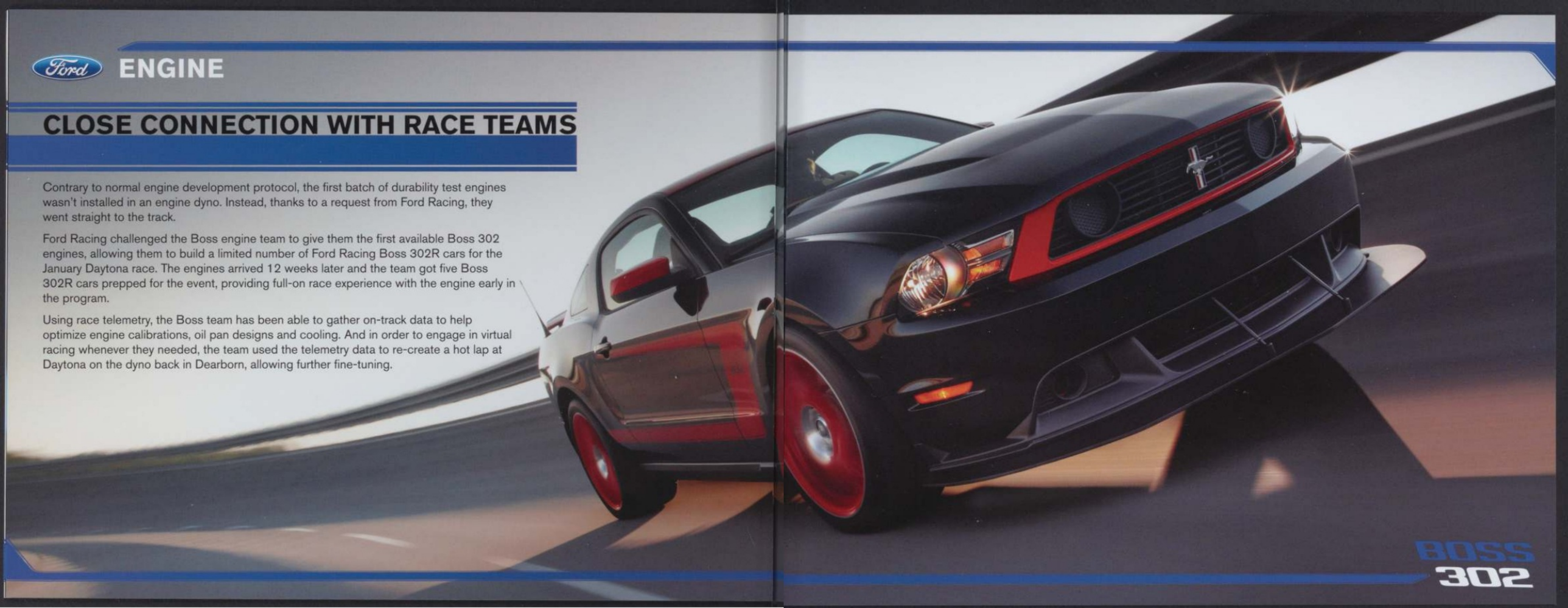
- Revised composite intake system with shorter runners, inspired by Daytona Prototype racing engines, for high-rpm breathing
- Forged aluminum pistons and upgraded sinter-forged connecting rods for improved strength, needed for the higher combustion pressures and engine speeds
- New high-strength aluminum-alloy cylinder heads with fully CNC-machined ports and chambers for exceptional high-rpm airflow without sacrificing low-speed torque
- Lightened valvetrain components to provide excellent dynamic performance up to speeds well above the engine redline
- Sodium-filled exhaust valves for improved heat dissipation
- Race-specification crankshaft main and rod bearings for higher load capability and improved high-speed durability
- 5W50 full-synthetic oil with engine oil cooler for improved oil pressure and longer-lasting lubrication during extreme racing conditions
- Revised oil pan baffling for improved oil control under racing conditions and during cornering loads greater than 1.0 g

# CLOSE CONNECTION WITH RACE TEAMS

Contrary to normal engine development protocol, the first batch of durability test engines wasn't installed in an engine dyno. Instead, thanks to a request from Ford Racing, they went straight to the track.

Ford Racing challenged the Boss engine team to give them the first available Boss 302 engines, allowing them to build a limited number of Ford Racing Boss 302R cars for the January Daytona race. The engines arrived 12 weeks later and the team got five Boss 302R cars prepped for the event, providing full-on race experience with the engine early in the program.

Using race telemetry, the Boss team has been able to gather on-track data to help optimize engine calibrations, oil pan designs and cooling. And in order to engage in virtual racing whenever they needed, the team used the telemetry data to re-create a hot lap at Daytona on the dyno back in Dearborn, allowing further fine-tuning.



# ENGINE

## PRODUCTION ENGINE DURABILITY TESTING

Despite its racing heritage – and the rigors of track-day testing – the Boss 302 V8 is still a production Ford engine, built alongside the 5.0-liter GT engine at Essex Engine Plant in Ontario, Canada. That means it has to meet or exceed all the standard durability testing any Ford engine is required to complete. The high-winding engine presented a problem, however: The engine had no trouble staying together at its redline, but the Ford durability dynamometers weren't designed to operate at the speeds the Boss engine was capable of.

One of the problems Ford ran into building a 7,500-rpm V8 was that the company had no engine test cells built to run at that kind of sustained speed. Ford Racing had one, but it wasn't instrumented to do production durability testing. So the team re-engineered a dyno cell with new balancers and jackshafts allowing it to run at redline hour after hour.

Once an adequate test stand was configured, the Boss engine was run at its full rated output for tens of millions of cycles, eventually outperforming its specifications at every stage of testing. Engineers calculated that the test regimen was equivalent to running the Daytona 250 race flat-out more than 175 times – in a row.

Team members also devised an additional durability test specific to the Boss 302 engine – one that reflects the unique demands of Boss drivers. The engine was subjected to a regimen simulating 1,500 quarter-mile races typical of events at drag strips across the country.

"It's really an engineering accomplishment that a Boss owner can thrash his car on the track and still expect the same outstanding reliability that the owner of a regular Mustang GT will enjoy."

**– Mike Harrison, Ford V8 engine program manager**

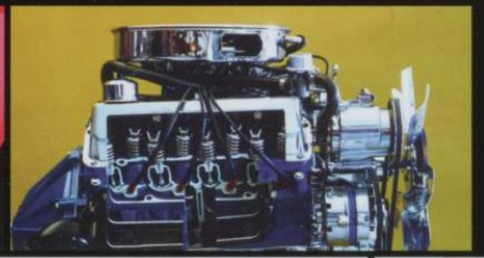
# MUSTANG BOSS HISTORY

## THE BOSS LEGEND: THREE MUSTANGS THAT HELPED INSPIRE THE 2012 BOSS 302

For 2012, Mustang Boss revives a legendary name known for uncompromising performance on the road and the track. Arriving in 1969, the first Mustang Boss was forged from a simple mandate by Ford management to the designers and engineers: Create a Mustang that would be unbeatable on SCCA race courses and local drag strips alike.

By then, Mustang sales success was assured thanks to its sporty nature. As a true high-performance icon, however, the car's history had yet to be written. That changed when company leaders decided to pursue dominance in the popular SCCA Trans-Am road racing series. They chose to homologate their new NASCAR 429 engine using the Mustang, directing engineers to begin creating performance that would become legendary.

The result – Boss – spanned three engine configurations across two Mustang bodystyles, each of which remains a coveted classic among enthusiasts and collectors today.



BOSS
302

# MUSTANG BOSS HISTORY

## 1969-70 BOSS 302

With styling tweaked by newly arrived Ford designer Larry Shinoda, the new-for-1969 Boss 302 sported front and rear spoilers, a black-out hood treatment, and racy side stripes for a look that screamed performance.

Under the bodywork, the Boss 302 didn't disappoint. Its engine combined a four-bolt main Windsor small-block with reworked heads from the then-new 351 Cleveland engine. A forged steel crankshaft, connecting rods and pistons rounded out the reciprocating assembly. The result was a free-breathing, high-revving powerplant making what Ford claimed was 290 gross horsepower – though actual output is estimated to be significantly higher.

Ford engineers also thoroughly massaged the Mustang's suspension in an effort to meet then-boss Semon "Bunkie" Knudsen's mandate to "build absolutely the best-handling street car available on the American market." Stiffer springs and shocks, special sway-bar tuning, a stiffened chassis and wide tires led to the fastest Mustang ever to lap the Ford test track up to that point.

## 1969-70 BOSS 302 SPECIFICATIONS

**Engine:** 302-cubic-inch (5.0-liter) OHV V8
**Horsepower / torque (advertised):**
290 hp @ 5800 rpm / 290 lb.-ft. @ 4300 rpm
**Transmission:** Four-speed manual
**Production:** 8,641

BOSS 302

# MUSTANG BOSS HISTORY

## 1969-70 BOSS 429

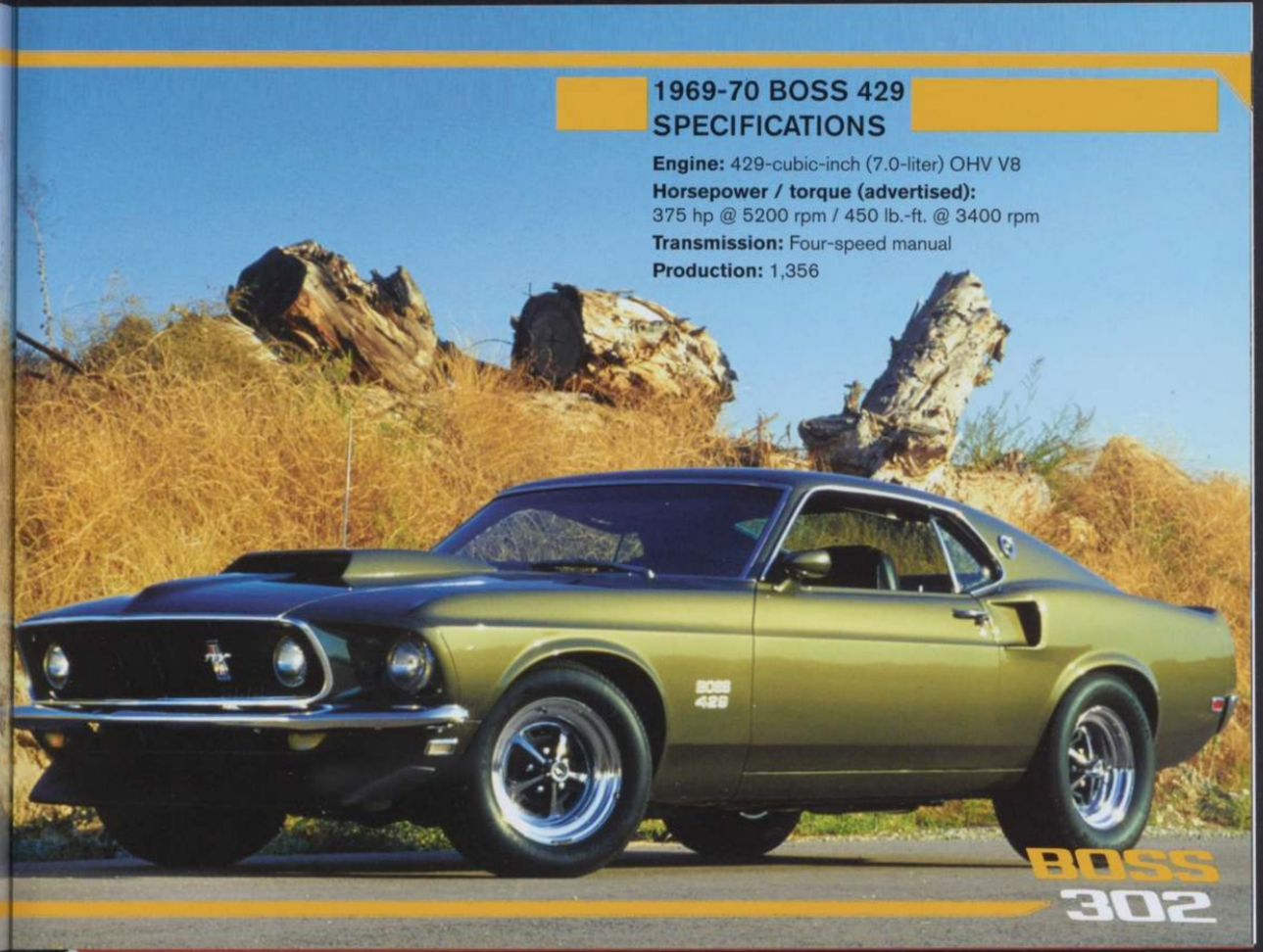

While the Boss 302 was intended to be a perfectly balanced road race car, the Boss 429 had a decidedly different mission in life – uncompromised acceleration. Although the exterior appearance was similar to that of the Boss 302, the 429 engine under the hood was a heavily detuned version of a new Ford NASCAR racing powerplant.

The choice of Mustang as the model used to meet the 429's homologation requirements – rules dictating a certain number of a manufacturer's stock car engines were actually sold in production vehicles – was considered unusual given that Torino was Ford's NASCAR flagship at the time. Plus, the effort required to shoehorn the huge 429 between the narrow Mustang shock towers dictated that the cars were heavily modified under the skin – work farmed out to Ford vendor Kar Kraft. Much of the front suspension was re-engineered to make the transplant work, and the battery was relocated to the trunk to provide additional room.

Even with special chassis bracing and a unique rear sway bar, the "Boss Nine" was at its best when pointed in a straight line: With a few owner modifications to undo the factory detuning, the car could yield quarter-mile times in the low-12-second range. That performance, coupled with big-block appeal and low production numbers, has conspired to make the Boss 429 perhaps the peak of Mustang collectibility.

## 1969-70 BOSS 429 SPECIFICATIONS

**Engine:** 429-cubic-inch (7.0-liter) OHV V8
**Horsepower / torque (advertised):**
375 hp @ 5200 rpm / 450 lb.-ft. @ 3400 rpm
**Transmission:** Four-speed manual
**Production:** 1,356



# MUSTANG BOSS HISTORY

## 1971 BOSS 351

Boss returned for one more year, this time wearing the new-for-1971 sheet metal marking a longer, lower and wider Mustang than ever before. Under the hood, changes were equally dramatic, with the company's 351 Cleveland V8 supplying the basis for motivation, matched as always with a four-speed manual gearbox. But with Ford pulling out of all factory-sponsored motorsports after 1970, the Boss 351 was denied a key element cementing the status of its predecessors: the proof testing provided by an official racing program.

Still, the Boss 351 offered exciting performance and eye-catching looks aided by the 60-degree sloping fastback body and twin-scoop contrasting hood. Interiors also gained luxury options; coupled with the improved tractability of the 351 Cleveland engine, it was easier for prospective buyers to turn this final early Boss into a comfortable high-speed cruiser than was possible with the race-bred 302 and 429 iterations.

At the end of 1971 model year production, the Boss name slipped into history, the result of changes in corporate priorities and pressure on the performance car market from the insurance industry. Now, more than 40 years later, a passionate group at Ford has blended art and technology, engineering a renaissance. The 2012 Mustang Boss 302 will prove worth the wait.


### 1971 BOSS 351 SPECIFICATIONS

**Engine:** 351-cubic-inch (5.8-liter) OHV V8
**Horsepower / torque (advertised):**
330 hp @ 5800 rpm / 380 lb.-ft. @ 3400 rpm
**Transmission:** Four-speed manual
**Production:** 1,806

BOSS 302

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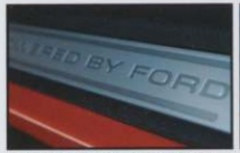

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Additional images are available at media.ford.com

BOSS 302

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Information subject to change


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