

For release: Thursday 23 September, 2010

FORD FOCUS RS HITS AUSTRALIAN ROADS

Ford Australia today released one of this year's most anticipated new models: the exciting rally-bred Focus RS.

The highly acclaimed, high-performance Focus RS will be sold locally in limited numbers - only 315 of these motorsport-derived cars are heading to Australian shores – ensuring exclusivity as well as excitement for each lucky customer.

It is something Ford Australia President and CEO Marin Burela says has been a regular topic of late.

"My team and I have received so many requests for this special model," he said.

"When we announced we had secured 315 Focus RS models for Australia I think the inquiry rate doubled, such is the passion this car generates.

"The buzz and excitement surrounding Focus RS has spread rapidly around the globe since it was introduced in Europe early last year, winning a host of motoring awards and receiving widespread critical acclaim for its outstanding combination of high-performance road car technology and every day Focus practicality.

"Now it is poised to conquer the Australia market, setting a new benchmark for hot hatch performance in this country and creating a whole new generation of performance car enthusiasts in the process," he said.

The Focus RS is available only one comprehensively-equipped specification level and limited to three exterior colours – Ultimate Green, the signature colour of the latest Focus RS; Performance Blue, the colour of the original Focus RS; and Frozen White, a classic RS colour.

Powered by a turbocharged Duratec RS 2.5-litre engine delivering 224 kW of power and peak torque of 440 Nm from just 2300 rpm, the RS is equipped with an arsenal of high-tech, high-performance components to match its exclusivity.

Focus RS is fitted with unique sports suspension, incorporating the patented Ford RevoKnuckle, along with a Quaife Automatic Torque Biasing Helical Limited Slip Differential, high-performance braking system and Tyre Deflation Detection System (DDS) for the 19-inch alloy wheels and bespoke Continental tyres.

In addition to the largest wheel/tyre combination ever fitted to a Focus, a host of unique Focus World Rally Car-inspired design elements contribute to the bold exterior of the RS, including:

- unique body panels
- flared wheel arches
- custom bonnet design with integrated twin louvres
- side skirts
- aggressive front and rear bumpers

In fact almost every body panel on the sleek three-door body has been revised or modified.

A twin-blade rear spoiler completes the exterior package, complementing the rear bumper venturi and front bumper splitter to deliver the necessary downforce and balance the overall aerodynamic profile of the vehicle.

Other exterior elements include automatic levelling xenon front headlights with washer system and rear parking sensors.

On the inside, Focus RS boasts Recaro sports seats in partial leather trim, dual zone climate control air conditioning, rain sensing windscreen wipers, auto-dimming rear vision mirror and an eight-speaker Sony audio system with six-disc CD player and USB input facility for iPod/MP3 player integration.

Bluetooth hands-free with Voice Control system is also part of the equipment package, along with the Ford Key-Free System incorporating keyless entry and keyless start via the start/stop button.

The Focus RS is offered for sale with a Manufacturer's List Price of \$59,990. First customer deliveries commence at the end of this month.

#

FORD FOCUS RS – IN DETAIL

1: Genesis

2: Power

3: Performance

4: Style

5: Practicality

6: Heritage

1. Focus RS Genesis

“This is a serious machine, with the performance, traction and precision to match far more exotic sports cars. The RS badge is not something we treat lightly and I believe this car proves it.”

Jost Capito, Director, Global Performance Vehicles
& Motorsport Business Development

In the 40-year story of Ford RS, the marque has been applied sparingly, merited by only the most high-performance Ford machines of the time.

Six years have passed since the last Ford RS – the Mk1 Focus RS – finished its strictly limited production run. This special Focus model was not sold in Australia and now the famous badge has returned for its league of devoted fans and a new generation of performance car enthusiasts. It is the first time the RS badge has appeared in Australia since the Escort RS MkII in the late 1970s.

RS – A Significant Event

This new Focus RS is the product of Ford Team RS, headed by Jost Capito, a committed car enthusiast and racer.

Alongside Capito is a small team of dedicated performance car and motorsport engineering specialists, led by Chief Programme Engineer, John Wheeler, whose own expertise stretches over 20 years of Ford performance and motorsport vehicles.

Team RS works hand-in-hand with Ford of Europe experts from across the engineering spectrum to create Ford's performance road car range. More than 100 engineers have been involved in Focus RS and every one understood the weight of expectation that greets a new Ford RS model.

“A new Ford RS is a significant event; the badge is not applied to a new car very often and when it is, it has to be a great car. I know this Focus RS will be thoroughly deserving of the name,” said Capito.

From early in its development programme, the team set a target to create a car with the poise, power, performance and precision to trade lap times with far more exotic vehicles and be a benchmark for performance and value for money.

The result is a car capable of lapping the legendary 20.8 km Nürburgring Nordschleife repeatedly at speed and equally adept at cruising home afterwards; blending Ford Focus practicality with bespoke engineering, dynamics and a turbocharged, 224 kW 2.5-litre Duratec engine.

Starting Point

Defining performance parameters of the new Focus RS began before the last Mk1 Focus RS left the production line. Perhaps surprisingly, that work didn't involve the name 'RS' at all, for the group was concentrating then on fine tuning the latest Focus ST (called XR5 Turbo in Australia) model.

“In developing Focus ST, we reached 166 kW and 320 Nm torque with the 2.5-litre Duratec and the outstanding Focus chassis handled it comfortably. This was already 4 kW more than the previous Focus RS. ST re-framed what we and our customers could expect of a new RS and it became an excellent development base,” explains John Wheeler.

The team’s other benchmark was the previous-generation Focus RS, and here their own opinions and analysis were augmented by the views of owners.

“We’re in regular contact with RS owners and enthusiasts across Europe and their views helped shape our own. The previous Focus RS was created to give that limited edition, ‘World Rally Car for the road’ feel, which made it an extreme experience,” Wheeler continues.

“We didn’t just want to repeat that formula for new Focus RS and the views and requirements of RS fans were incredibly helpful in creating this car’s everyday side.”

The result was a short but complicated set of priorities: the pace and performance feel of the previous RS, but with even more power and greater stability; durable circuit performance, but with greater comfort for everyday driving.

Research work began in earnest, while the timing for introducing the high-performance model was considered. By 2008, Ford of Europe’s flexible manufacturing strategy had created the ability to build low-volume vehicles efficiently and there were several key milestones to mark.

“Our flexible manufacturing and the use of shared commodities really helps to produce vehicles like Focus RS, without having to make large manufacturing investments or build off-line,” adds Capito.

“The 2009 production start for Focus RS has marked the 10th anniversary of Ford Focus and 40 years of Ford RS, backed by two consecutive World Rally Manufacturers’ Championship titles. Combined, these factors make the creation of the new Focus RS very appropriate.”

A Class Apart

Thanks to intensive engineering development from an already high starting point, the new Focus RS is not just be the fastest current Focus model; it is also the fastest and the most powerful front-wheel-drive European Ford ever.

Focus RS is also the only front-wheel-drive, 220 kW+ high-performance car available today, an indication of the challenge of creating such a vehicle and the achievements of Ford Team RS in doing so.

“Historically, RS models have been very different in their approaches. Our strategy was to define and create a new RS, with all the characteristics we wanted to see in it, rather than develop a car to compete with anything else already in the market,” says Wheeler.

With the go-ahead to create a new Focus RS, Team RS had already created an impressive benchmark and base in the new Focus ST, so early effort was directed on setting the two cars apart.

Dolphin and Shark

From NVH to design, powertrain to safety, Ford specialists from across the engineering spectrum were involved with Focus RS, needing to understand quickly its requirements and attributes and the differences in philosophy between the ‘ST’ and ‘RS’ brands.

To illustrate the fundamental differences of approach between an ST (XR5) and an RS, the Team RS engineers created the analogy of ‘Dolphin and Shark’.

Capito explains: “ST and RS should be different animals, as are a dolphin and a shark. Both are highly developed for their roles but have unique characteristics – ST is a balance of performance and refinement, but would not fit the attributes we set for RS and vice versa. It’s surprising how much we used this analogy.”

Those attributes for Focus RS were developed from a definition of “the ultimate production Focus.” In keeping with its heritage, RS is an even more performance-oriented vehicle than ST, developed in every detail with on-track performance of equal importance to on-road behaviour.

An exhaustive set of individual criteria was created for every aspect of the car’s performance, dynamics and durability, a process similar in scope to that required for a whole new carline.

However, for all the differences, there is one area of common ground between Focus ST and RS. Both are front-wheel-drive, one of the first decisions taken in the development of RS and explained by Team RS Chief Engineer, Dirk Densing:

“Front-wheel-drive was our preference all along. All-wheel-drive systems add cost, weight, inertia and consequently, fuel consumption. Compensating for the significant weight of an all-wheel-drive system requires dynamic compromises we preferred not to make.

“If you can achieve the performance you want without steering disturbance, then front-wheel-drive is a better performance car – lighter and with a more precise, linear steering response than AWD. With the work of our advanced research team in Aachen, we were able to achieve this and deliver something genuinely different,” he says.

Great Focus Heritage

In being both a genuine Ford RS and a full member of the Focus family, the new Focus RS represents a significant moment in the legacy of both brands.

The year 2008 marked 10 years since the Ford Focus was first revealed to the world at the Geneva Motor Show in 1998, paving the way for a range of Ford vehicles whose exciting design was matched by class-leading driving quality.

Since this time, more than 5.5 million Ford Focus models have been built in Europe, including Russia, with the car also built and sold in North America, Asia, and South Africa.

Now, the latest generation Focus also wears the famous Ford RS badge with pride, continuing a distinguished heritage that can trace its roots back 40 years and encompasses a wide range of Ford models.

“RS is central to Ford’s high-performance heritage and Focus has played a major part in establishing Ford’s excellent reputation for driving dynamics. The all-new Focus RS embraces and celebrates both of these – a genuine RS and a genuine Focus,” concludes Capito.

#

2. Focus RS Power

“At the heart of every great performance car is a great engine. We’ve cut no corners in the development of the Focus RS engine. This is a bespoke, high-performance powertrain.”

Len Urwin, Powertrain Manager, Ford Team RS

The turbocharged Duratec RS 2.5-litre engine creates Focus RS’ distinctive character, delivering its peak power of 224 kW at 6500 rpm and peak torque of 440 Nm between 2300 and 4500 rpm.

Power Generator

The Focus RS engine shares its fundamental structure with that of Focus ST, but there the similarities end. Powertrain manager Len Urwin knew from the beginning that simply adjusting the engine management system for more power would be insufficient for a true RS.

He explains: “There was never an intention to try to ‘chip’ the ST engine. We evaluated several approaches using the ST engine and none gave us the combination of power delivery, character and durability that we wanted, so we opted to create an RS Duratec, using the ST unit as our base.”

The objective was increasing power and torque without affecting durability. To meet that, multiple detail changes were made to the powertrain including a revised cylinder head gasket, ultra-durable metal sprayed cylinder bores, revised pistons and a bespoke camshaft profile and connecting rods, allowing bigger small-end bearings.

However, the most obvious changes are the new intake system, exhaust manifold and turbocharger. The larger Borg Warner K16 turbo fitted to Focus RS offers a maximum steady state boost pressure of 1.4 bar – double that of Focus ST’s 0.7 bar – to generate the car’s 35 per cent power increase.

Committed to maintaining responsiveness of the engine, Urwin's team focused on three areas:

1. integrating the turbo with the exhaust manifold, to allow subtle manifold tuning and strategically locating the turbo in the engine bay, to optimise crash performance and minimise revision to the exhaust system and associated oil and water pipes;
2. carefully sizing the required larger turbo, to closely match the 'bottom end' engine responsiveness of Focus ST;
3. reducing the induction system and exhaust losses.

Focus RS needed its own, more aggressive performance character so engineers also modified the torque 'ramp-up', to enhance performance feel when on boost.

"While we wanted to be equal on low-end responsiveness and minimise the common off-boost inertia of larger turbos, we didn't want RS to have the same character as ST," explains Urwin. "We wanted a stronger feel of increasing boost; we wanted you to really feel the surge of the turbo."

With the turbo spinning, power arrives quickly. The 224 kW peak is reached at 6500 rpm and holds until the 7050 rpm redline, to allow full use of the top of the power band. After three seconds at this redline, the engine management system recognises no gear shift and then limits revs to the maximum continuous running rpm of 6500 rpm.

"Turbo engines with flat torque curves can often feel like they run out of steam at the top-end, but we wanted to reward drivers who took Focus RS to the red line," states Urwin. "We're really proud of the result – strong mid-range transient response and a free revving top-end."

Straight Torque

However, Urwin believes that the power is unlikely to be the first thing drivers will notice, as to get to that redline they will have travelled along the 440 Nm torque curve.

Offering more torque than any Ford RS production car before it, the torque curve in Focus RS has a steady state peak beginning at 2300 rpm and running to 4500 rpm, meaning torque can be appreciated in any gear and at most road speeds. The 440 Nm peak torque is a 38 per cent increase over Focus ST.

Says Urwin: “Matching low-end responsiveness with a larger turbo and a peak of 440 Nm is a real achievement. That’s a figure you would only have seen in so-called ‘supercars’ just a few years ago. It gives Focus RS a gutsy, strong pull at the lower end of the rev range – great for those wanting a powerful performance feel but also great for more relaxed everyday driving.”

Bespoke Transmission

That combination of performance ability and cruising capacity is made practical by a specially-developed, six-speed Ford RS transmission. It shares its gear ratios with the Focus ST gearbox on which it is based, with minor modifications to bearings and clutch housing and a revised, stronger differential.

Overall, gearing is one per cent longer than ST due to the larger rolling circumference of the specially developed tyres on Focus RS – further evidence of the team’s attention to every detail.

This allows gearing long enough for Focus RS to reach the all-important 100 km/h barrier in second gear.

Differential Difference

Putting the torque on the road is aided by a Quaife helical limited slip differential. The Quaife differential was first developed for the original, five-speed Focus RS in 2002, but revised and improved by Ford Team RS for the new, six-speed Focus RS.

Today, it features a sixth planet gear and has been revised for increased strength and a more subtle intervention and torque transfer.

Computer-aided engineering drove the design of the differential, identifying the potential areas for increased strength. This was aided by measuring rig work and whole vehicle development, with particular attention to refining performance plots for the torque bias function, to maximise dynamic performance.

Concludes Urwin: “We have tuned the differential for a progressive torque transfer. Our work was focused on creating an optimum drive for both road and track, in the dry and the wet. It was in finding this balance that our tuning efforts were directed.”

Cooling RS

Creating a high-performance version of the Duratec 2.5-litre with this level of power also required significant attention to its cooling ability. The cooling strategy was two-fold:

1. create a cooling pack that met the high performance requirements of Focus RS and;
2. match this to a comprehensive aero pack that delivered the required volume of cooling air to the system.

Explains Urwin: “Around 80 per cent of the external cooling for Focus RS comes through the vehicle’s lower front grille aperture and its precise size, shape and mesh density were a critical part of our work with the Aerodynamics team.”

The lower front aperture is approximately 30 per cent larger than that of Focus ST and none of the precious cooling air it collects is allowed to escape, thanks to carefully designed ducting.

This ‘upstream’ ducting focuses airflow channelled into the vehicle's main trapezoidal aperture by the front air splitter and front bumper form, with the exact shape dictated by many hours of research, including Computational Fluid Dynamics (CFD) and wind tunnel work.

Outboard trapezoids either side of the main intake are blanked off, but positioned to give the option of converting to additional cooling systems for serious track use.

A new, 25 per cent larger capacity radiator keeps engine coolant and engine oil temperatures under control, even in the most committed performance driving, in combination with a larger, 14-plate, engine-mounted, water-cooled oil cooler.

The final part of the engine cooling picture is the signature Focus RS bonnet louvres, which Urwin identifies as having a particular benefit:

“The louvres help with idle cooling, especially after high speed running, such as on a circuit, so were an important addition to Focus RS. They’re there for a reason,” Urwin said.

Testing of the cooling pack took place around the world, to find the broad range of required conditions, including Arizona, Southern Italy, the Austrian Alps and a variety of European race circuits.

“CFD helped us in the early stages of cooling development, but there’s no substitute for real-world testing. We spent significant time testing physical prototypes, in wind tunnels and a variety of real-world climate extremes to perfect this work,” explains Urwin.

RS Breathing

The new intake system for Focus RS includes a new body-mounted airbox with a low-loss, cylindrical filter, revised turbo ducting, a modified hot charge duct, high-efficiency intercooler and new cold charge duct.

The airbox also has a unique, double intake entry system to reduce induction losses further.

Intercooling is critical in high-performance engines and the Focus RS intercooler system is new, larger and specially developed for the car. It is capable of reducing air temperatures from 160 degrees Celsius at the compressor, to a maximum of 60 degrees Celsius at the intercooler outlet, in ambient temperatures of up to 38 degrees Celsius.

RS Exhaust

The sports exhaust system is also unique to Focus RS – it uses a one-brick catalyst to enhance flow and reduce exhaust back-pressure, whilst meeting current exhaust emissions requirements.

The design of the turbo and manifold allows Focus RS to use exhaust geometry, downpipe and flex from the ST, with revised hangers to accommodate the 20mm lower subframe on RS.

The exhaust system also features a modified mid-section, with a revised, 4.2-litre mid-muffler, fitted around the larger, 62-litre fuel tank on RS (up from 55 litres on Focus ST/XR5). At the rear, a modified muffler uses two larger, 100mm-diameter, ‘trumpet’ tailpipes to further reduce pressure losses.

The entire system has been tuned to provide a sporty sound. Team RS engineers knew well that, for Focus RS customers, how the exhaust system sounds is as important as how it looks or performs. Every Focus RS customer wants their car to sound ‘right’ and creating an induction and exhaust sound to fit the image and character of Focus RS was another critical aspect of its powertrain development.

Focus RS employs a ‘sound symposer’ system, to amplify selected engine frequencies and convey pleasing engine sounds into the cabin, contributing to that all-important RS performance environment. As in all aspects of the engine, the symposer system has been adapted and tuned to fit the character of the vehicle, giving a raw, motorsport edge not present on Focus ST/XR5.

Urwin’s Powertrain team also created detailed performance characteristics to delight enthusiasts, such as a spark retard that encourages the pop and crackle in the exhaust on throttle lift. Focus RS also has a distinctive, more aggressive idle tempo and engine note, to reinforce performance feel.

All these details were tuned to meet strict EU production car noise regulations, as well as the targets set for Focus RS in terms of fuel economy and durability.

Explains Urwin: “We’ve gone as far as we can for a production car. In all of our engine development, we have to stay within EU drive-by noise limits, provide good overall fuel economy for the class and meet exacting durability and emissions standards – yet still create a high-performance engine with an attractive, sporty induction and exhaust noise. Achieving that is all about balance and a tireless attention to detail.”

###

3. Focus RS Performance

“Creating a 224 kW, front-wheel-drive performance car is a significant engineering effort, but there is equal challenge in refining it to be a true, no-compromise driver’s car.”

Dirk Densing, Chief Engineer, Focus RS

Creating the power of a true Ford RS is one thing; managing that power into accessible yet exhilarating performance and assured traction is another. This challenge was met by Ford’s renowned vehicle dynamics experts.

Under the guidance of Chief Programme Engineer, John Wheeler, the Dynamics team was led by Chief Engineer, Dirk Densing, whose relaxed demeanour belies his passion and pedigree in performance cars and motorsport.

Wheeler and Densing were determined to create a dynamic mechanical set-up that would provide a pure driving experience, rather than manage power with constant electronic interference or truncation systems.

The most obvious change is the vehicle’s wider track, but the team completed their solution with a suspension technology that was under development at Ford’s Research & Advanced Engineering Centre (R&AE) in Aachen, Germany. Called ‘RevoKnuckle’, this innovation was identified early on as offering significant benefit to a new front-wheel-drive RS.

The combination of wider track and RevoKnuckle front suspension is the reason Ford has been able to do what was thought impossible previously: develop a 224 kW (300 bhp), front-wheel-drive car that is not only driveable every day, but faster in many situations than all-wheel-drive performance cars.

Exhaustive testing and refining in the hands of Team RS' dedicated vehicle dynamics expert, David Put, has also created a set-up for Focus RS that forgives the bumps of every day roads, yet rewards on-track commitment.

“It sounds simple, but is a genuine challenge: make a potent performance machine as accessible and useable as any other Focus; able to transform instantly from everyday transport to track-day ‘supercar’,” explains Wheeler. “It’s a combination of innovative technology and class-leading dynamics, finely honed through David’s expertise and commitment that made this possible.”

Torque Talk

The greatest engineering challenge was in managing the impact of the 440 Nm peak torque. Torque steer – the impact of torque on steering in front-wheel-drive vehicles – is one of the key challenges in suspension development of front-wheel-drive cars.

In the real world, torque steer is most often experienced when hard acceleration, cornering or uneven surfaces are combined and its effects are apparent to the driver as a sudden or momentary disturbance on the steering wheel. This is not ‘performance feel’, but a transient ‘error state’ which detracts from steering precision and performance.

Wheeler explains the phenomenon: “Torque steer is experienced when an unequal traction force exists between the left and right front driven wheels. On a good flat surface, driving straight ahead, the left and right driven wheels have equal driving torque and everything is balanced.

“When left and right torque is unequal then the trouble starts. In the design of front-wheel-drive suspension, two main aspects have to be considered to minimise torque steer: keeping the centre of the outer CV joint on the steering axis line, and minimising the offset from the wheel centre to the steering axis. This is most important in performance cars, where wider wheels create a greater offset to begin with,” he continues.

In the physics behind this phenomenon, traction forces at the tyre's contact area with the road are translated in two ways: one force 'couple' transfers harmlessly through the driveshafts, but a second force component acts at the wheel centre. This element creates a turning force about the steering axis. The larger the offset between the wheel centre and the steering axis, the larger the turning torque.

In the design of the suspension geometry, therefore, the first priority is to keep the offset from the wheel centre to steering axis as small as possible.

Even this is not an exact science since, with wide tyres on uneven road, the tyre's contact area with the road can move from the middle to the inside or outside of the tyre.

These unbalanced forces can be exacerbated further by a limited slip differential, as some have a very unforgiving characteristic of locking and applying transfer torque too rapidly.

Considering wide tyres, a wide track and wheel offset and limited slip differential are all present in the front-wheel-drive Focus RS, these areas were the first to be considered by the Dynamics team.

Tuned RevoKnuckle Technology

RevoKnuckle technology was originally conceived as the trend developed for high-torque diesel engines to move from large, often all-wheel-drive vehicles into smaller, front-wheel-drive cars. The Ford RevoKnuckle approach is unique in its design and installation and has been developed and patented exclusively by Ford Research & Advanced Engineering and Team RS.

Ford RevoKnuckle is the product of six years work, beginning in 2001 and led throughout by project engineer, Marc Simon. While Focus RS is R&AE's first performance car application, Simon's team was able to bring significant relevant experience to the project: in 2005, Simon and several other R&AE specialists were seconded to Ford's World Rally team, developing the suspension layout and kinematics of the then-new Focus World Rally Car.

This gave them a sound understanding of the requirements for Ford RevoKnuckle in a high-performance road car, in both its functionality and durability. “There’s a direct relationship between what we were doing in WRC and our work on Focus RS,” Simon states.

RevoKnuckle Structure

The performance demands of Focus RS mean it is the only model in the Focus range not to carry the traditional ‘MacPherson strut’ arrangement.

Regular suspension knuckles are a one-piece design; RevoKnuckle has instead two separate pieces – one part fixed to the strut; one part that rotates with the steering line of the car.

In place of the regular, inverted ‘L’-shaped lower suspension mount, RevoKnuckle features a ‘C’-shaped mount, connected to both the wheel hub, via two arms and to the strut, which is attached at its top.

This approach afforded engineers far greater flexibility to set the suspension geometry to minimise torque steer, particularly by reducing the critical distance – known as the ‘king-pin offset’ – between the wheel centre and the steering axis line.

The structure of RevoKnuckle provides a layout where the familiar spring/damper strut and lower wishbone dictate the basic wheel control and geometry, but provides a separated king-pin axis, more often associated with a double wishbone design. This provides more freedom in suspension set-up – such as application of camber, castor and trail – without the need for an expensive suspension re-design. Most significantly, it also creates a king-pin offset less than half that of a conventional MacPherson with wide track.

“RevoKnuckle allows the strut and lower wishbone to dictate the basic wheel control and geometry, but provides a separate king-pin axis – in effect, moving the turning line of the wheel closer the wheel centre,” explains Densing.

Ford RevoKnuckle Patented

Ford succeeded in combining the new RevoKnuckle with the proven Focus front suspension layout that is normally equipped with MacPherson struts. The work to create this unique combination is now protected by a Ford patent.

RevoKnuckle has been patented by Ford for a key aspect of its design: the additional connection between RevoKnuckle and the front anti-roll bar, critical for its high resistance to rotation.

“RevoKnuckle is a straightforward piece of suspension design, in an innovative application that makes it absolutely right for a high-performance car. The explanation may be a little scientific – the result is genuinely dynamic,” says Simon.

Innovative Mechanical Approach

In Focus RS, RevoKnuckle has been developed to work alongside the differential in enhancing traction and drive in a range of situations. The Quaife epicyclical design on Focus RS relies heavily on friction of the gear surfaces, which builds with differential speed and has been tuned finely to avoid snatch and rapid torque changes.

Such a mechanical approach was very deliberately chosen over other available solutions, such as electronic torque truncation or Electric Power Assist Steering algorithms to ‘mask’ torque steer effect by adding ‘counter-steering’ force into the steering system.

“We weren’t interested in masking torque steer or reducing performance to the point where it wasn’t an issue. We have managed to reduce torque steer to a minimum, yet keep all the performance an RS should have,” concludes Simon.

According to John Wheeler, the importance of RevoKnuckle to Focus RS cannot be underestimated:

“All-wheel drive or rear-wheel drive have long been default options for managing torque in a high-performance vehicle. We used AWD on RS models in the 80s and 90s, but it creates significant compromises in weight, fuel economy and the cost/performance balance. Through the combined efforts of our Research and Dynamics teams, we have created a solution that simply redefines what is possible with front-wheel drive,” he says.

Summarising the benefits of RevoKnuckle, Densing says: “RevoKnuckle gives the adjustability of a race-car style, double wishbone suspension, in a cost-effective MacPherson architecture.”

Stopping Power

With such performance capability on tap, it’s no surprise to find Focus RS offers a vice-like braking performance. Large 336mm x 30mm, ventilated front discs are gripped by stiffer, 60mm single piston calipers, supported by 302mm x 11mm rear discs. Focus RS also boasts unique high-friction brake material and a tandem brake booster, all combining to generate up to 1.2g under braking and give Focus RS a stopping distance of just 34.8 metres from 100km/h.

Anti-lock braking with Electronic Brakeforce Distribution (EBD) is standard, as is Ford’s Dynamic Stability Control (DSC) system, here tuned specifically to allow a high level of sporty driving before intervening.

“In some cars, DSC limits fun for the enthusiast, because it can be used to disguise chassis weaknesses,” explains Densing. “In Focus RS, the DSC system is tuned for later and shorter interventions, so you don’t feel engine intervention and only occasional brake intervention, even on race circuits or in rain.”

The DSC system can be deactivated for circuit driving. However, this may not always be necessary, as Densing highlights.

“Because it’s so precisely tuned, our engineers have lapped the Nürburgring just as quickly with DSC on, as with it off,” he states.

Stable High-Performance Set-Up

By employing RevoKnuckle, the Focus RS Dynamics team was able to retain the Focus suspension layout, including ‘Control Blade’ independent rear suspension set-up for stability and controllability, albeit tuned and lowered by 20 mm for a performance driving character.

“The fundamental dynamic character of Focus makes an excellent base for a high-performance car – it’s agile, responsive and stable. It required only subtle changes for Focus RS,” explains Densing.

At each corner, Focus RS is set up with stiffer springs and higher spring rates, with rear spring rates increased 40 per cent, versus Focus ST. These are matched to thicker and longer, 24 mm anti-roll bars, aiding stability and mechanical grip.

Front and rear track width has been increased by 40 mm versus Focus ST, with the resulting wider wheel offset and increased overall vehicle footprint sharpening handling and improving stability.

At the same time, the front subframe has been lowered 20 mm, giving a low roll centre height.

The highly acclaimed Focus independent rear suspension has been refined to reflect the high performance intent of RS, particularly in managing higher lateral acceleration. This is achieved through a rigid, cast suspension knuckle and larger rear wheel bearings, the combination of which improves stiffness significantly, creating the low rear suspension camber compliance critical to a responsive high-performance car.

The rear anti-roll bar has also been modified to control immediate roll, heightening vehicle stability and maintaining a fun-to-drive character.

The Dynamics team studied and developed further the ‘elastokinematics’ of the Focus rear suspension, generating a more direct build-up of cornering forces through reduced lateral compliance, for a more immediate and linear steering response.

Finally, David Put himself worked closely with tyre manufacturer Continental to develop a specific compound tyre for Focus RS. The 19-inch alloy wheels are thus wrapped in bespoke 235/35 R19 Continental tyres, giving superior road contact and huge lateral grip.

“Behind the wheel, all this translates into a direct response and a high level of cornering controllability, without sudden surprises for the driver. On a circuit, the driver can feel exactly what Focus RS is doing and predict it safely,” says Densing.

Dynamics Tuned for Precision

Ford’s renowned driving dynamics DNA comprises four pillars: stability, precision, comfort and agility and each Ford car carries a different balance of these attributes.

In outright racing cars, comfort is the least important. Yet, while Focus RS drivers will accept a little less comfort for greater high-speed stability, agility and directional precision, engineers needed to maintain the sophisticated Focus ride and handling as far as possible, as the car must be equally competent as everyday transport.

“Focus RS has a different character from Focus ST, with a more overt sporting nature. RS is intended to meet the needs of the serious performance driver when this is demanded, yet still provide a fully acceptable and rewarding vehicle for daily driving. In dynamics terms, that’s a fine balance between raw, race circuit performance and the controlled precision required for on-road driving,” says Wheeler.

With stability and controllability in check thanks to the suspension set-up and RevoKnuckle, dynamics engineers moved on to concentrate on agility and precision.

In Focus, this is characterised by a fundamental turn-in tendency that tucks in the nose of the car on throttle lift. This is more pronounced in Focus RS, by a more acute castor angle to the front wheels, for a keener dynamic response to throttle adjustments.

The Electro-Hydraulic Power Assist Steering (EHPAS) on Focus has also been tuned with a lower ratio (13.2:1 versus 14.7:1 for Focus ST), providing sharper responses and requiring less steering effort in cornering, with just 2.32 turns, lock-to-lock.

Ensuring vehicle weight did not rise too far was critical to handling as well as ensuring good performance feel. Thanks to RevoKnuckle, which negated the need for all-wheel-drive, and the close attention paid to detail throughout its development, Focus RS weighs in at 1492 kg. This is 75 kg heavier than a three-door Focus ST, an increase spoken for by the larger wheels, tyres and brakes, limited slip differential and aerodynamic and cooling aids.

“It doesn’t just feel faster; it’s also sharper and more responsive,” explains Put. “In cornering, you will notice how the improved braking performance, higher lateral mechanical grip and sharper steering responses allow you to carry more speed into and through the corner apex. The car also carries a flatter attitude in a corner and has a more rapid load transfer. It reacts faster to directional changes on twisty roads or race tracks and you can adjust its line on the throttle, so you can get back on the power quickly out of the turn.”

Aerodynamics

Aerodynamics also played a part in the Dynamics team’s work. Says Densing: “Aero is very important to any car, but usually concentrated on not creating lift front to rear. With its sophisticated aero package, Focus RS generates genuine downforce at circuit speeds and we’ve covered thousands of kilometres refining computer simulations to find the right balance of downforce without too much drag.”

The target for high speed stability of a performance car is to position the aerodynamic centre of pressure at a controlled point behind the centre of gravity.

In Focus RS, the starting point was the standard Focus shape, crafted to generate moderate front end and rear end lift at higher speeds. The challenge was to transform this lift into downforce and bring the aerodynamic centre of pressure forward, without undue sacrifice to the drag coefficient and top speed.

Extensive wind-tunnel testing was conducted to refine aerodynamic performance, with a target of delivering about 40 points of downforce at the front and 10 points at the rear.

The resulting aerodynamic elements for Focus RS achieve these targets, creating 26 per cent more downforce than Focus ST, yet with a drag co-efficient (Cd) of 0.38.

The result of all this effort is a car that is not just fast in a straight line. It is the fastest ever car around the infamous handling circuit at Ford of Europe's Lommel Proving Ground in Belgium – known to the team as 'Route 7' – beating even the Ford GT supercar and cementing its dynamic credentials.

In addition, Focus RS has completed over 400 laps (over 8,000km) of Germany's fearsome Nürburgring Nordschleife during its circuit performance development.

The purpose of all this work was to ensure Focus RS continues and enhances Focus' reputation as a driver's car and stays true to its core philosophy of generating pure driving enjoyment by flattering the novice driver, while rewarding the expert.

###

4. Focus RS Style

“Focus RS was an opportunity to take kinetic design into a new, ultra-performance area, where form is much more dependent on function. The challenge was to incorporate all the practical needs of a high-performance machine into a cohesive, integrated and bold design that makes clear this is the ultimate Focus.”

Martin Smith, Executive Director of Design,
Ford of Europe, Asia Pacific & Africa

Focus RS exudes its intent of being the ultimate Ford performance car of its generation and strikes a lasting impression with performance car enthusiasts.

“Kinetic design visualizes the dynamic qualities of a vehicle, transmitting a feeling of driving excitement, but true to the character of each vehicle,” explains Ford of Europe’s Executive Director of Design, Martin Smith. “In design terms, every member of the Ford of Europe family has its own personality. Mondeo is the most premium; Fiesta the most stylish; Ka the friendliest – RS is quite simply the meanest!”

In design as in concept, Focus RS is inspired by Ford’s World Rally Championship success and this is most obvious in its large, gloss-black front trapezoidal air intake, creating an immediate visual link to the Focus World Rally Car – design for the road, true to motor sport principles.

Heightened aerodynamic and cooling needs meant Focus RS required a specific design approach that integrated these requirements and differentiated it from mainstream Focus aerodynamic elements.

Rather than settle for grafting performance detailing onto a standard body shape, designers have revised almost every body panel on Focus RS to create its bespoke shape.

The result is cohesive and dramatic; new front and rear bumpers and integrated side rocker mouldings give Focus RS a lowered, meaner appearance, while a revised bodyside with wider wheel arches, rocker mouldings and vents give the vehicle a more purposeful stance. These are topped by possibly the most dramatic of Focus RS exterior features, the imposing rear spoiler, inspired directly by the Focus World Rally Car.

Necessary aerodynamic elements are contrasted with the body colour of the car by a gloss-black finish and together they provide some of the more distinctive styling cues.

Smaller, secondary cues provide visual differentiation to mainstream Focus models:

- Twin panels of louvres on the bonnet and small vents underneath the headlamps reinforce the performance intent of RS and augment the recognised Ford Focus shape;
- RS badges throughout the car reinforce the RS pedigree: three dimensional RS badges are present on each front wing vent, the upper radiator aperture, tailgate and embossed on each wheel;
- 19-inch polished alloy wheels in a 15-spoke design echo the look of their World Rally equivalents.

“Imagine a Focus WRC roaring through a stage in Monte Carlo – you know immediately what it is from front graphics, flared arches, and distinctive livery. Our intention is to make Focus RS equally and immediately recognisable,” states Smith.

Performance Design, Aerodynamic Purpose

The major design features on Focus RS are all functional, as well as styled to create a lasting impression, with each doing an important job in managing the airflow over and into the car.

“A high performance car like Focus RS has very different and much more sophisticated cooling requirements than a standard car, so design works hand-in-hand with aerodynamics,” explains Chief Exterior Designer, Stefan Lamm.

“RS is also lower and wider, not only to give the right impression, but also to ensure more downforce and less uplift than Focus ST. This is fundamental for responsive high-speed handling on circuits.”

From the outset, Team RS worked with Ford’s design and aerodynamics specialists to ensure performance style met performance requirements. The prominent front air splitter, twin-blade rear spoiler and rear venturi all underwent significant aerodynamic testing to achieve the right cooling and aerodynamic targets.

For example, while echoing the standard Ford trapezoidal silhouette, the intake area and structural cross bars on the front splitter have been precision honed to allow the required volume of air into the cooling system.

The gloss-black front splitter also has a role in controlling exterior airflow, working with the rear venturi in managing air movement under the car, to help develop the required downforce for circuit use. The venturi then channels the air bisected by the front splitter, directing it out from underneath the car and past the rear bumper.

Significant aerodynamic analysis went into the design and construction of the rear venturi tunnel and rear spoiler. Here, Ford’s World Rally expertise came into its own to determine the precise height, ramp angle and position of the twin-blade spoiler, for maximum aerodynamic efficiency.

Explains Lamm: “Customers would expect an RS to have a rear spoiler, but on Focus RS this has been designed very precisely. A large front splitter creates a large aerodynamic force at the front and could make the rear light and nervous in high speed handling. So the rear spoiler and venturi have been developed painstakingly to balance the downforce between front and rear.

"In a true high-performance car like Focus RS, this ability to collect, extract and manage airflow efficiently is critical to its design.”

Distinctive Colour Options

To reinforce the bold, new, motorsport-inspired design, designers knew colour was as vital ingredient of the overall Focus RS package.

The positive reception given to the signature 'Electric Orange' colour that became a highlight of the Focus ST/XR5 launch encouraged the Design team to develop an equally exciting and unique 'hero' colour for the sportier Focus RS.

Their inspiration for the vibrant, new 'Ultimate Green' came from the livery of Focus World Rally Cars. The colour reflects the green signature colour of Ford's global partner and World Rally Championship sponsor, BP, and also stands as a modern interpretation of the 1970s Ford Escort RS Le Mans Green colour.

"Focus RS is a car designed to grab your attention and the choice and use of colour is vital," says Stefan Lamm. "Colour can define a brand, as we saw with Focus ST and in this case we wanted something even more energetic and dazzling. Green is a critical colour that has to have the shade tuned perfectly and 'Ultimate Green' captures and communicates the spirit and energy of Focus RS."

Focus RS will also be available in the classic RS choice of Frozen White or Ford Performance Blue, the colour of the original Focus RS.

High-Performance Interior

On the inside, Focus RS boasts a unique and appropriately performance-oriented interior, designed to appeal to customer tastes and balance genuine sports performance with a strong sense of style and quality.

The cabin is dominated by bespoke Recaro high-performance sports seats, specially designed and trimmed in an authentic motorsport microfibre, a tactile material that also provides the grip and support necessary when driving enthusiastically. The sports seats are partial-leather

trimmed for the Australian market, with leather side bolsters and leather accents, as well as 'RS' and 'Recaro' logos stitched into each backrest.

Rear seats are sculpted, featuring the same detailing and high side bolsters as the front sports seats, making Focus RS a genuine four-seat vehicle.

The centre console is finished in a stylish, carbon-look trim and metallised highlights include air vents, door grab handles, switchgear and gearshift surround and unique RS-branded scuff plates on the door sills. These highlights contrast with a black-trimmed roof lining, emphasising the sporty, cockpit feel.

The driver is also reminded this is no ordinary Focus at every touch, with each interaction refined to match the sporty character of Focus RS.

At the centre of this experience is a chunky, three-spoke steering wheel with RS signature and shorter-throw gear lever, with a slick, precise action and a six-speed gear shift graphic in RS blue. The performance driving environment is completed by aluminium foot pedals and three additional gauges, including turbo pressure, sitting atop the centre console and angled toward the driver.

Explains Martin Smith: "Just as the exterior must describe performance potential, so the interior must create a genuine sporting environment, in looks and performance. For example, the use of microfibre is tactile and grips occupants, while a branded Recaro seat communicates immediately an authentic motorsport capability."

Contemporary 'RS'

Inside and out, Focus RS has been styled for a modern generation of performance car enthusiasts, reflecting modern customer tastes.

For the first time in its heritage, even the 38-year-old RS badge has been restyled subtly, as a more modern interpretation for the new car. It features a bolder, more solid identity and a more subtle chrome surround.

“Focus RS is kinetic design to the max, an all-modern, ultimate performance Focus with attitude. To me, the RS maximises the potential of Focus and defines a new generation of the iconic RS brand,” concludes Smith.

#

5. Focus RS Practicality

“For the customers who buy it, Focus RS has to perform a dual role – to be a high performance circuit machine when required, yet be just as adept in everyday driving.”

John Wheeler, Chief Programme Engineer, Focus RS

Focus RS is not just a new high-performance car, it also marks the pinnacle of the Focus road car range. While it is guaranteed to thrill and excite customers with its power and performance, it must be just as impressive in everyday use.

Sound, Not Noise

Within Ford of Europe, noise, vibration and harshness (NVH) work is known as Sound Quality and Vibration (SQ&V), and is a vital element in keeping Focus RS’ sensory connection between car and driver.

Unwanted noise and vibrations have been minimised, using new, stronger engine mounts to absorb engine vibrations and a new roll restrictor bracket, which improves dynamic engine control by 20 per cent. The interior NVH package from Focus ST has also been used to prevent unwanted wind and road noise entering the cabin.

To reward the enthusiastic driver distinctive and sporting sound qualities have been tuned in to the high throttle opening and higher engine rpm ranges. The sound symposer delivers the powerful intake sound into the cabin, while the exhaust system features a rough and sonorous sound unique to RS.

States Wheeler: “In a performance car, the right sound is important. A sound package that is harmonious with the vehicle’s performance and provides a positive driving experience is as important as the suppressing of unwanted noise.”

Safety and Structure

Under its stylish, performance exterior, Focus RS continues Focus' excellence in active and passive safety.

The Focus RS safety package includes standard ABS, Electronic Brakeforce Distribution, DSC and a rigid passenger safety cell. Among the interior safety systems are driver and passenger front airbags, side curtain airbags and pyrotechnic belt pre-tensioners protecting front and rear occupants.

In November 2004, Focus was the first and only vehicle to be awarded a 100 per cent occupant safety rating by EuroNCAP, for both offset frontal and side impact. It also achieved a 100 per cent test score for child dynamic injury protection for 1½ and 3-year-old child crash test dummies.

Retaining Focus Reliability

All through Focus RS' development, durability has been as important as any other factor and much attention to detail has ensured it will continue Focus' excellent reputation for reliability, despite all its high-performance modifications.

This was especially true for the bespoke suspension design. For all its complexity, creating the function and set-up of Ford RevoKnuckle was just part of the challenge for engineers in Ford Team RS, Vehicle Dynamics and R&AE. Bringing such an innovative development into volume production and meeting Ford's exacting durability standards was equally important.

Explains Wheeler: "Targets for durability are higher for Focus RS than mainstream vehicles, because of its likely use as a track car. It will be driven harder and expected to perform to higher levels than other Focus models."

One of the early decisions in meeting durability targets was to move from an aluminium steering knuckle to a forged part, with the static knuckle in cast iron. This makes for a much

stronger, durable component, designed for serious track use, yet adds only three kg to the overall weight of the car.

RevoKnuckle has also been developed with due consideration for easy service and maintenance, making it simple to maintain and allowing Focus RS to be covered by the standard Ford warranty.

Powertrain modifications were also made with attention to durability. For example, cylinder bores on the engine have been metal sprayed on the inside, to protect against cylinder cracking under the higher engine pressures generated by the larger turbo.

Approximately 10,000 hours of vehicle testing and development and almost 1,000 rig and vehicle-based tests went into assuring durability on Focus RS.

Wheeler explains: “Our focus was on giving the customer a fully engineered car that delivers high performance without the traditional compromises of performance tuning. We’ve worked extensively to make sure Focus RS is as durable as every other Focus and introduced additional test programmes to ensure durability under high speed and race track conditions.”

Straightforward Production

Production of Focus RS is also straightforward, with the car being assembled on Ford of Europe’s principal Focus production line in Saarlouis, Germany. The front suspension and RevoKnuckle is accommodated in a sub-assembly before final assembly, ensuring the only line modifications required were to accommodate the wider track on Focus RS.

“This car is the perfect way to celebrate our success with RS and with Focus, on both road and rally. It’s the fastest European Ford production car ever, the most powerful Ford RS and probably the most powerful front-wheel-drive car on sale today. Any way you look at it, it’s something special,” concludes Wheeler.

###

6. RS Heritage

“One of the greatest things about any new RS is the heritage and pedigree behind it. The new Focus RS is as much a car for driving enthusiasts as every one before it and true to the core RS principles of innovative engineering, high-performance and affordability.”

Jost Capito, Director, Global Performance Vehicles
& Motorsport Business Development

In 1968, man had not yet landed on the moon, Concorde had not yet flown and the newly-created Ford of Europe had just delivered its first car, the Ford Escort.

Against this backdrop, the Ford RS marque was born quietly, in Germany. The 15M RS (P6), 17M RS and 20M RS (P7), all began production in March 1968 and were the first ever Ford vehicles to carry the RS name, though none carried the badge.

It was not until two years later in 1970 that Ford – inspired by early success in “Rallye Sport” – introduced its first European RS performance car, the Escort RS 1600. The RS identity has been an important part of Ford’s sporting image ever since.

In the 40 years since its first appearance, the RS marque has been applied to just 22 of the most special individual Ford road cars, each and every one offering stand-out performance and value for money.

RS Fords have been built in many different forms. They have been front-engined and mid-engined; all-wheel drive, rear-wheel drive and front-wheel drive; and with four-cylinder and six-cylinder, normally-aspirated and turbocharged engines.

Most have employed wind-tunnel testing to evolve aerodynamic features, from Sierra and Escort RS Cosworths right up to new Focus RS.

Yet all have pushed out the boundaries of technology and virtually all have been successful in motorsport. As a result, each has held a unique place in its market and shared in a proud sporting pedigree.

The original Ford RS – the Escort RS1600 – was the first Ford to use a 16-valve twin-overhead-camshaft engine and the first to be assembled in the new Advanced Vehicle Operation factory at Aveley, in Essex, UK.

Like many subsequent RS models, the RS1600 found worldwide success in races and rallies, such as the 1972 East African Safari rally and the 1974 European Touring Car Championship.

Elsewhere, Ford Capri RS2600 and RS3100 models were not only high-powered flagship versions of Ford's best-selling coup érange, but also won scores of races, including the 1971 and 1972 European Touring car Championships.

In the late 1970s, the quad-headlamp RS2000 became the best-selling RS model to date. Escort RS1800s won the 1979 World Rally Championship for Manufacturers, and provided power for both Bjorn Waldegard (1979) and Ari Vatanen (1981) to win their respective Drivers' titles.

In the 1980s, the first front-wheel drive Ford RS, the Escort 1600i, was the first to use fuel-injection and a five-speed gearbox, while the Escort RS Turbo was the first to use a turbocharged engine and a limited-slip differential.

The mid-engined RS200, of which only 200 were produced between 1984 and 1986, was intended for Group B rallying and featured a race-bred aluminium honeycomb, steel chassis, carbon and Kevlar-fibre upper structure, a turbocharged Cosworth BDT engine and all-wheel drive. Strikingly styled by Ghia, the RS200 was the most exclusive and most expensive Ford RS ever sold. In the years since, it has also been a familiar presence in the sport of rallycross.

In the late 1980s, the Cosworth YB-powered, 150mph Sierra RS Cosworth range became successful as fast, value-for-money road cars, while the RS500 derivatives were so dominant

in motorsport that entire Championships had to be re-cast to make sure they did not win every race.

Even so, the 500bhp RS500 race cars won the 1987 World Touring Car Championship and the 1988 European Touring Car Championship, as well as both the Australian Touring Car Championship and the Bathurst 1000 classic in 1988 and 1989.

The following decade saw the Escort RS Cosworth return Ford to the top of rally standings, including victory in the 1994 Monte Carlo Rally – inspiring the birth of the 1990s Escort RS Cosworth road cars. It also led onto the 1997-1998 Escort World Rally Car, which brought the Escort rallying pedigree to a victorious close.

Two high performance versions of the front-wheel drive Fiesta were also created in this period – the RS Turbo and RS1800, the latter with the award-winning Zetec 16-valve, twin-cam engine. Later, there were distinctive front-wheel drive and four-wheel drive Escort RS2000 models.

Ford of Europe's design and engineering revolution followed, which created the Ford Focus, in 1998. The RS name made a welcome return in 2002 on the first-generation, 158 kW Focus RS, which continued the Ford RS pedigree, using a turbocharged Duratec 2.0-litre engine and limited slip differential to create a 'World Rally Car for the road' experience.

Its strictly limited-edition, 4501-unit production run sold out rapidly, proving the enduring demand for high-performance Fords across Europe – a demand which was met in 2009 by the launch of the all-new, 224 kW Ford Focus RS.

Chronology of Ford of Europe RS vehicles:

Model	Launched
Escort RS1600	1970
Capri RS2600	1970
Escort RS2000	1973
Capri RS3100	1973
Escort RS1800	1975
Escort RS Mexico	1976
Escort RS2000 Mk II	1976
Escort RS1600i	1981
Escort RS Turbo	1984
RS200	1985
Sierra RS Cosworth	1985
Escort RS Turbo	1986
Sierra RS500 Cosworth	1987
Sierra RS Cosworth (saloon)	1988
Sierra RS Cosworth 4x4	1990
Fiesta RS Turbo	1990
Escort RS2000	1991
Escort RS Cosworth	1992
Fiesta RS1800	1992
Escort RS2000 4x4	1994
Focus RS	2002
Focus RS	2009

###

FORD FOCUS RS: TEAM PROFILES

Name: Jost Capito

Title: Director, Global Performance Vehicles & Motorsport Business
Development

The figurehead of Ford Team RS – Jost Capito – has a formidable in-tray: he is the man ultimately responsible for all Ford of Europe’s performance road cars.

Obvious immediately is his enthusiasm for performance cars, which is supported by an extensive track record at the highest levels of motorsport and performance road car development.

Capito is first a racer. He began racing in his teens, through endurance bike racing and motocross, winning several titles on his way to compete in the arduous Paris-Dakar rally, winning the truck category in 1985.

He was also able to channel his passion into a career in engineering and after graduating from Munich technical university he joined BMW Motorsport GmbH in the city. After four years as development engineer for BMW's high performance engines, he moved to Porsche AG to oversee the organisation of its various motorsport campaigns.

He then became head of Porsche Motorsport Organisation, before moving to Sauber, initially to build up the powertrain division of the Sauber Petronas Engineering operation and later to administer its racing operations, as COO of the Sauber Formula One team.

Capito joined Ford of Europe in October 2001, as director of its Special Vehicle Engineering division and took responsibility for Ford’s World Rally programme in 2003.

As head of Ford Team RS, he supervised all Ford of Europe’s latest ST and RS models and worked closely with Malcolm Wilson’s M-Sport, the operational force behind the BP Ford Abu Dhabi World Rally Team. Under Capito's leadership, the BP Ford Abu Dhabi World

Rally Team secured the Manufacturer's World Championship title for two years running – 2006 and 2007.

Since January 2009, Capito has been responsible for the global development of Ford's performance vehicles business, overseeing both the North American SVT and European Team RS organizations, focusing on the development of global performance vehicles and the implementation of consistent vehicle attributes and DNA in future Ford performance models.

Additionally, Capito carries responsibility for global motorsport business strategy and aligning Ford's global motorsport plans and programmes. He leads the development of motorsport opportunities for Ford's future global car products around the world, working closely with the company's regional motorsports directors.

###

Name: Martin Smith

Title: Executive Design Director, Ford of Europe, Asia Pacific and Africa

Martin Smith has been in charge of Ford of Europe's design direction since 2004, a responsibility that has since extended around the world, with the development of global cars, such as the new Ford Fiesta.

Smith's European Design team is co-located in the UK and Germany, and has developed, under his leadership, Ford's acclaimed kinetic design form language that has revitalised its European car portfolio.

Born in 1949 in Sheffield, England, Smith's skills first earned him a Bachelor degree in engineering from Liverpool University and then a Masters degree in Design from the Royal College of Art.

Armed with these impressive qualifications, he began his design career working for Porsche AG in 1973 and in the 20 years between 1977 and 1997, held various positions at Audi AG, including heading Audi's external design studio in Munich, from 1984. In 1991, he became Audi's Chief Interior Designer.

Prior to joining Ford of Europe, Smith was Executive Director Design for Opel and Vauxhall and before that, Vehicle Line Design Director for Adam Opel AG, responsible for compact cars.

###

Name: John Wheeler

Title: Chief Programme Engineer, Ford Team RS

John Wheeler's involvement in performance cars and motorsport stretches back 20 years.

Born in 1948, the mechanical engineering graduate began his engineering career with Porsche in the early 1970s, working on 911, 928 and 930 models and it is during this work he also had his first taste of motorsport, with the Porsche Race and Rally programme.

Wheeler's Ford career began in 1980, first at Ford's Motorsport division in Boreham, Essex, UK, with his introduction to RS road cars being the 1986 Ford RS200 project. He continued working on RS models until the mid-1990s and his name is attached to some of the most well-recognised Ford performance and motorsport vehicles, including the Sierra Cosworth Group A rally and race cars, and Escort RS Cosworth production and Group A rally cars.

Such performance car expertise was recognised within the wider Ford family and there followed a three-year assignment as chief engineer at Aston Martin, working on the DB7 coupe and cabriolet, before a return to Ford in time for the first-generation Focus RS, in 2002.

Now, as Chief Programme Engineer, Wheeler has overseen every stage of the development of the new Focus RS, including the introduction of its RevoKnuckle front suspension system.

###

Name: Len Urwin

Title: Powertrain Manager, Ford Team RS

Since leaving university in 1979, Len Urwin's career has involved one of two things – Ford Motor Company or performance cars – and happily for him now involves both of these.

The Newcastle-born, 54-year old joined Ford's Testing Operations and was first involved in RS models testing electrical components for the 'missing' piece of RS production car history, the Escort RS1700T road car that never saw volume production. His work through the 1980s in powertrain development regularly brought him into performance car programmes, but it was in 1994 that he really became immersed, through a five-year assignment with Aston Martin, running powertrain development for both DB9 and V8 Vantage models.

Despite his intense workload, he still found time to earn an MSc in Advanced Automotive Engineering, in 1995, and buy and restore a TVR 3000S, which he still owns today.

Urwin repatriated to Ford and Team RS in 2001, working on the first-generation Focus RS, Focus ST and Fiesta ST, before heading all aspects of powertrain development on the new Focus RS.

###

Name: Dirk Densing

Title: Chief Engineer, Ford Team RS

From the moment he began his apprenticeship as an automotive mechanic, Dirk Densing has never looked back. The 51-year-old graduated with a degree in automotive engineering from Cologne University, then moved straight into a job at Ford Motor Company.

Over the first 22 years of his 30-year Ford career, Densing became an expert in the development of powertrains and transmissions, across a range of vehicles and applications. Alongside this ran a passion for motorsport and performance cars that saw him competing in saloon car racing through the 1970s and 1980s, while owning a series of Ford Escort RS performance cars.

In 2003, Densing moved to focus on quality management in Ford of Europe Product Development and then, in 2007, to Team RS, finally combining his professional expertise with his enthusiasm for the Ford RS brand.

His time in Team RS has been dedicated to Focus RS. As Chief Engineer on the Focus RS programme, Densing has been responsible for the car's performance attributes, under Chief Programme Engineer, John Wheeler.

#

FORD FOCUS RS - TECHNICAL SPECIFICATIONS

ENGINE DATA	
ENGINE TYPE	2.5L 20V DOHC RS
DISPLACEMENT (CC)	2522
BORE (MM)	83.0
STROKE (MM)	93.2
FUEL TYPE, GRADE	UNLEADED PETROL, 95 RON OR HIGHER
MAX POWER (KW) AT ENGINE SPEED (RPM)	224 KW 6500 RPM
MAX TORQUE (NM) AT ENGINE SPEED (RPM)	440 NM 2300 – 4500 RPM
COMPRESSION RATIO	8.5:1
CYLINDERS	5, IN-LINE
CYLINDER HEAD	GRAVITY DIE CAST ALUMINIUM ALLOY WITH SINTERED VALVE GUIDES AND SEATS
CYLINDER BLOCK	HIGH PRESSURE DIE-CAST ALUMINIUM ALLOY WITH BED PLATE, METAL-SPRAYED BORES
CRANKSHAFT	FORGED STEEL WITH 50 MM-DIAMETER CRANKPINS, FULLY BALANCED WITH TEN COUNTERWEIGHTS, SIX 65MM-DIAMETER MAIN BEARINGS AND DAMPED FRONT PULLEY, OVERALL WEIGHT 21.5 KG. LEAD FREE BEARING SHELLS
VALVES PER CYLINDER	4
VALVE GEAR	DOHC
INCLUDED ANGLE BETWEEN VALVES	58 DEGREES
VALVE SIZES (MM)	INTAKE: 31.0 EXHAUST: 27.0
TURBOCHARGER	BORG -WARNER K16 INTEGRATED TURBO SYSTEM, ONE-PIECE PRECISION-CAST THIN-WALL IRON HOUSING
CAMSHAFT DRIVE	TOOTH BELT WITH DYNAMIC TENSIONER, TI-VCT (TWIN INDEPENDENT VARIABLE CAM TIMING), TIMING VARIATION 50° (INTAKE), 30° (EXHAUST)
PISTONS	LIGHTWEIGHT, SHORT-SKIRT SILICON-ALUMINIUM ALLOY PISTON WITH GRAPHITE-COATED PISTON SLEEVES
CONNECTING RODS	FORGED STEEL WITH FRACTURE-SPLIT BIG ENDS, 143 MM LENGTH
MAX ENGINE SPEED (RPM)	7050 RPM TRANSIENT (3 SECONDS) WITH CONTINUOUS AT 6500 RPM
IDLE ENGINE SPEED (RPM)	800 RPM
ENGINE SPEED AT MAX SPEED (RPM)	6175 RPM

ENGINE MANAGEMENT	Bosch ME 9.0 Motor-Management System for Injection and Ignition, EURO Stage 4
FUEL INJECTION	SEQUENTIAL ELECTRONIC FUEL INJECTION (SEFI)
IGNITION	ELECTRONIC DISTRIBUTORLESS
EMISSION CONTROLS	UNDER-FLOOR CLOSED-LOOP THREE-WAY CATALYTIC CONVERTER WITH OXYGEN SENSOR
EMISSION LEVEL	EUROPEAN STAGE IV, WITH ELECTRONIC ON-BOARD DIAGNOSTICS (EOBD)

FLUIDS	
FUEL TANK (LITRES)	62
COOLING LIQUID (LITRES), INCL. HEATER	7.1
OIL QUANTITY, INCL. FILTER OIL CHANGE SERVICE INTERVAL	5.8 EVERY 15,000 KM 12 MONTHS OR EVERY 15,000 KM

TRANSMISSION	
	MANUAL 6-SPEED, SYNCHROMESH ON ALL RATIOS INCLUDING REVERSE
GEAR RATIOS	
6 TH	0.700
5 TH	0.868
4 TH	1.088
3 RD	1.433
2 ND	2.050
1 ST	3.385
REVERSE	3.231
FINAL DRIVE	4.000
CLUTCH TYPE	Single dry clutch with self-adjusting lash mechanism and dual mass flywheel
CLUTCH DIAMETER (MM)	240 mm
DIFFERENTIAL	Mechanical, Quaife helical limited slip differential, six planet gears, 32-degree helix angle

SUSPENSION	
FRONT SUSPENSION	INDEPENDENT MACPHERSON STRUTS WITH OFFSET COIL SPRING OVER GAS FILLED DAMPER UNITS AND LOWER L-ARMS. ANTI-ROLL BAR (24MM). FORD REVOKNUCKLE WITH FIXED MOUNT TO ANTI-ROLL BAR (PATENTED)
REAR SUSPENSION	INDEPENDENT SHORT-LONG ARM (SLA) CONTROL BLADE MULTI-LINK SYSTEM MOUNTED ON REINFORCED SUB-FRAME, GAS-FILLED DAMPERS AND ANTI-ROLL BAR (24MM).

STEERING	
TYPE	RACK AND PINION, RATIO 13.2:1, LOCK-TO-LOCK 2.32
TURNING CIRCLE (M)	KERB-TO-KERB: 12.2

BRAKES	
TYPE	DUAL-CIRCUIT, DIAGONALLY SPLIT, HYDRAULICALLY OPERATED DISCS FRONT AND REAR. VACUUM SERVO-ASSIST. STANDARD ELECTRONICALLY CONTROLLED ANTI-LOCK BRAKING SYSTEM (ABS) WITH ELECTRONIC BRAKEFORCE DISTRIBUTION (EBD). SPECIALLY-DEVELOPED DSC SYSTEM.
FRONT	336 X 30 MM VENTILATED DISCS
REAR	302 X 11 MM SOLID DISCS

WHEELS/TYRES	
STANDARD WHEEL TYPE	ALLOY
STANDARD WHEEL SIZE (IN)	19 X 8.5
TYRES	CONTINENTAL 235/35 R 19

AERODYNAMICS	FULLY OPTIMIZED AERO PACK, INCLUDING FRONT SPLITTER, SIDE ROCKER MOULDINGS, REAR VENTURI AND TWIN-ELEMENT REAR WING
DRAG CO-EFFICIENT (CD)	0.38
FRONT SURFACE (A), M ²	2.35
FRONT / REAR DOWNFORCE	-0.022 / 0.000

BODY	
STRUCTURE	COMPUTER-OPTIMISED, HIGH-EFFICIENCY, UNITARY-WELDED STEEL
SAFETY ELEMENTS - BODY	<p>COMPUTER OPTIMIZED BODY STRUCTURE USING HIGH STRENGTH STEELS AND CUSTOM WELDED MATERIAL.</p> <ul style="list-style-type: none"> • RIGID OCCUPANT PROTECTION CELL • FRONT AND REAR ENERGY-ABSORBING CRUMPLE ZONES • IMPACT-DECOUPLING CHASSIS SYSTEM TO PROTECT FOOTWELL • SIDE IMPACT PROTECTION DOOR BEAMS • HIGH STRENGTH INSTRUMENT PANEL CARRIER BEAM AND STEERING COLUMN SUPPORT
PASSIVE SAFETY AND RESTRAINT SYSTEM FEATURES	<ul style="list-style-type: none"> • FULL-SIZE DRIVER & PASSENGER AIRBAGS (FEATURING LATEST SINGLE STAGE INFLATOR TECHNOLOGY) • HIGH POWER PYROTECHNIC BELT PRE-TENSIONERS AND BELT LOAD LIMITING FOR FRONT-SEAT SAFETY BELTS • THREE-POINT SEAT BELTS IN ALL FOUR POSITIONS • SEAT BELT REMINDERS FOR DRIVER & FRONT PASSENGER • INFLATABLE SIDE CURTAINS FOR FRONT- AND REAR-SEAT OCCUPANTS • HORIZONTAL STROKING STEERING COLUMN FOR OPTIMIZED ENERGY ABSORPTION AND LEG PROTECTION • COLLAPSIBLE PEDAL STRUCTURE • ISOFIX CHILD SEAT ATTACHMENT ANCHORS AVAILABLE ON REQUEST FOR BOTH OUTBOARD REAR SEATS • OPTIMISATION FOR WIDE RANGE OF HUMAN BODY PROFILES, FROM 5TH PERCENTILE FEMALE TO 95TH PERCENTILE MALE.
BUMPER SYSTEM	DAMAGE-RESISTANT, FULL-DEPTH MOULDED REINFORCED POLYPROPYLENE
SECURITY SYSTEM ELEMENTS	<ul style="list-style-type: none"> • PERIMETER ALARM WITH INTERIOR SCANNING CAPABILITY OPTIONAL • ADVANCED FORD PATS IMMOBILISER • KEY FOB-OPERATED DOUBLE LOCKING • KEY-LOCKING BONNET

CORROSION PROTECTION	24-STAGE PAINT AND BODY PROTECTION PROCESS, INCLUDING ZINC PRE-COATINGS FOR ALL EXTERIOR PANELS EXCLUDING THE ROOF, OPTIMISED DIP PHOSPHATE PROCESS, ELECTROCOAT CORROSION PROTECTION, FILLER/SURFACER AND CLEAR-OVER-BASE ENAMEL TOPCOAT, PLUS COMPREHENSIVE CAVITY WAX INJECTION, PVC UNDERBODY COATINGS AND STONE PROTECTION. THICK PVC SEALING BEADS FOR ALL FLANGES. FRONT PLASTIC WHEEL ARCH LINERS, REAR TEXTILE WHEEL ARCH LINERS, ANTI-SCUFF STRIPS ON INNER DOORSILLS AND REAR LOAD SILL. 5 YEAR PERFORATION CORROSION WARRANTY.
----------------------	--

DIMENSIONS & CAPACITIES

EXTERIOR	
OVERALL LENGTH (MM)	4402
OVERALL WIDTH, EXCL. MIRRORS (MM)	1842
OVERALL HEIGHT (MM)	1497
WHEELBASE (MM)	2640
FRONT TREAD (MM)	1586-1606
REAR TREAD (MM)	1587-1607

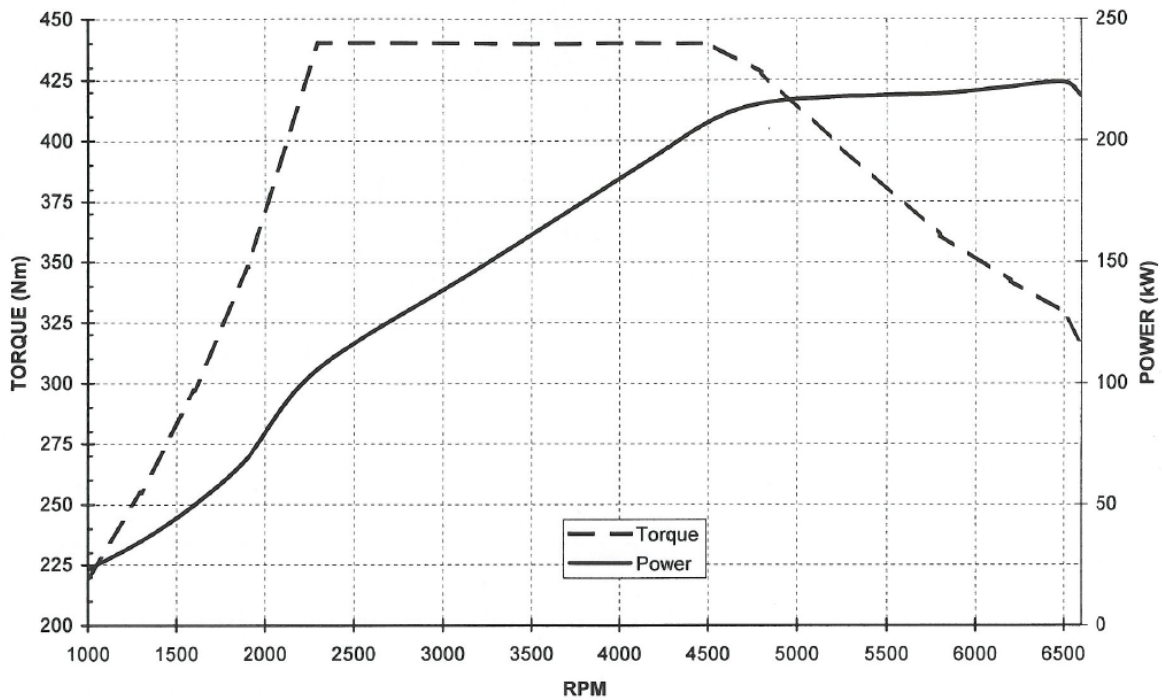
INTERIOR	
HEADROOM FRONT/REAR (MM)	999/978
SHOULDER ROOM FRONT/REAR (MM)	1414/1399
MAX LEGROOM FRONT/REAR (MM)	1100/906
LUGGAGE COMPARTMENT – VDA (LITRES)	385

WEIGHTS	
BASIC KERB (KG)	1492
GROSS VEHICLE MASS (KG)	1860
PAYLOAD (KG)	392
ROOF LOAD (KG)	75
TARE WEIGHT	1458
INERTIA WEIGHT	1592

FUEL CONSUMPTION (ADR81/02)	
URBAN (L/100 KM)	14.9
EXTRA URBAN (L/100 KM)	7.7
COMBINED (L/100 KM)	10.4
CO ₂ – COMBINED MODE (G/KM)	246

PRODUCTION	
PRODUCTION LOCATION	Saarlouis, Germany

POWER/ TORQUE:



Note: This data information reflects preliminary specifications and was correct at the time of printing. However, Ford's policy is one of continuous product development. The right is reserved to change these details at any time without further notice.

ENDS

For further information, please contact Ford Australia Public Affairs:

Sinead McAlary

Communications Manager

Telephone: 03 9359 8498

Mobile: 0412 254 388

E-mail: smcalary@ford.com

Peter Fadeyev

Product Communications Manager

Telephone: 03 9359 8486

Mobile: 0428 012 747

E-mail: pfadeyev@ford.com

