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THE LEXUS RC F

INTRODUCTION

"There's a perception that many high-performance cars are hard to drive. In fact, they're easy in the right hands because they've been purpose-built for the skill level of their drivers. It's the same with the RC F, which I have built to be enjoyed by all enthusiasts, no matter what their level of expertise. Electronics can be modified instantly on board to provide performance and protection appropriate to each driver's abilities. But even in its basic settings, it's a blast."
Yukihiko Yaguchi, Lexus RC F Chief Engineer

The RC F is one of the most powerful, versatile and responsive cars Lexus has created. It is designed to be enjoyed by all driving enthusiasts, no matter what their level of expertise. At its heart is a 5.0-litre V8 engine, producing 457bhp and 520Nm of torque.

The RC F's striking design is derived from the show-stopping LF-LC and LF-CC concepts Lexus revealed in 2013. The coupe follows the IS F as Lexus's second generation V8 F model and benefits from the best in tuning and technology from the LFA V10 supercar.

The F designation stands for Fuji Speedway, the international race circuit where Lexus carries out much of its high-speed development work. F models are the sporting pinnacle of the brand, bringing together intoxicating performance and pure driving pleasure and adding depth to the entire model range.

In everyday road driving the coupe delivers superb performance and high-speed stability, together with superior levels of comfort, equipment and safety technology. The experience is heightened by the inimitable high-revving soundtrack of the naturally aspirated V8 engine.

Equally the RC F can deliver excellent track day performance. It's equipped with numerous sophisticated technologies to enable instant modification of the powertrain, steering and chassis to suit each driver's abilities, from amateur to expert, providing appropriate levels of protection and assistance to help them hone their driving skills.

The eight-speed Sports Direct Shift transmission has five selectable modes, including a new G-sensor AI-Shift control which monitors G forces to optimise gear ratio selection for high-performance sports driving.

In a first for Lexus and exclusive to F models, the Vehicle Dynamics Integrated Management system features both Sport and Expert modes, giving drivers an unprecedented breadth of non-intrusive assistance and protection.

For 2019, the RC F underwent an improvement programme, taking inspiration from the car's race-winning success in international GT racing. The revisions included some styling changes, revised equipment specifications, the introduction of a launch control system and the addition of a new performance-focused version, the RC F Track Edition, featuring additional CFRP composite parts, carbon ceramic Brembo brakes and a fixed rear spoiler.

DESIGN

- Exterior styling dedicated to maximum aerodynamic and cooling efficiency
- Four-link active rear wing
- RC F Carbon features carbon fibre composite bonnet, roof and rear wing, reducing overall weight by 10kg
- Driver-focused interior with RC F-specific instrument meters, steering wheel, seats, pedals and trim
- Advanced on-board technologies, including new Remote Touch Interface and multi-layer climate control
- 17-speaker Mark Levinson audio with Clari-Fi digital source-enhancing technology

EXTERIOR

With functional beauty the guiding principle, every element of the RC F's exterior styling has been designed to maximise either aerodynamic or cooling efficiency.

At the front the grille and the outer sides of the bumper form a double spindle shape. The grille, which has a graduated F mesh pattern, ventilates the 5.0-litre V8 engine and also ducts cooling air to the front brakes, via apertures in its outer corners.

Further grilles are located in the outer extremities of the outer spindle, ducting air to the oil radiators. Above, the signature three-LED lamp headlight design is underscored by separate LED running lights arrayed in the Lexus L motif.

The RC F uses proven technology from World Endurance Championship racing, with a small, thermostatically controlled cooling fan fitted behind each lamp cluster to secure the best possible operating efficiency over an extended lifetime. Outlets in the top of the bonnet and in the wings behind the front wheels vent air from the engine bay and brake discs. The smooth flow of vented air over the top and sides of the car contributes to high-speed stability.

The far edges of the front and rear bumpers are shaped to direct air smoothly along the side of the car, while front and rear wheel spats reduce the amount of airflow hitting the tyres. Liners in the wheel arches reduce air turbulence around the wheels. The front wheel arch liner has a grooved profile to smooth the forward flow of air generated by the tyre's rotation. The beaded profile of the rear liner directs airflow from tyre rotation outwards, improving aerodynamic performance at the rear and further improving vehicle

stability.

Aero-stabilising fins integrated in the door frame moulding next to the door mirror and in the rear combination lamps also promote straight line stability and suppress vehicle wobble when turning. On the RC F and RC F Carbon, the rear lip of the boot incorporates a four-link active rear wing to optimise airflow and generate downforce for added stability when driving at high speed. The wing is automatically deployed at speeds above 80km/h (50mph) and retracts when vehicle speed falls below 40km/h (25mph). When the driver selects Eco mode through the Drive Mode Select system, the wing will not deploy at speeds below 130km/h (81mph), improving fuel efficiency. The driver can also control wing deployment at any time from the cockpit.

The underbody features comprehensive aerodynamic measures to smooth and control airflow beneath the vehicle. Undercovers for the engine, transmission and centre and rear floor sections incorporate aero stabilising fins to suppress turbulence and smooth airflow. The rising rear floor undercover also has rectifying fins to ensure a smooth flow of air away from the underside of the car. The aerodynamic measures combine to produce a notably low coefficient of drag – Cd0.33.

The RC F Track Edition has additional bodywork elements to improve aerodynamics and performance, including a carbon fibre composite front lip spoiler and fixed rear wing. The roof, bonnet, rear cabin partition and bumper reinforcement are also made from lightweight but strong carbon fibre material. Further weight is saved through using a titanium exhaust silencer and tailpipes. Using titanium – rarely seen on production cars – not only reduces weight, it also gives the Track Edition a polished look and a unique sound.

Styling changes for the 2019 RC F included a new headlight design with a stacked arrangement of LEDs, with integrated daytime running lights. The signature spindle grille was revised with a lower lip opening that spans the base of the grille, creating the effect of a shorter front facia. At the rear, new tail lights were integrated into a reshaped bumper, giving a cleaner, more chiselled appearance.

DRIVER-FOCUSED INTERIOR

The RC F’s driver-focused interior features a number of components unique to the model, including the instrument meters, steering wheel, seats, pedals and trim.

The F model-exclusive instrument meters mark a further development of the switchable, driving mode-dependent central dial that Lexus introduced in the LFA. The design is inspired by aircraft instrumentation, providing a wide range of information in a clear, concise form (for more details refer to the -section on Mode-Selectable Driving Dynamics).

The large, centrally positioned tachometer alters in appearance according to driving mode. There are also digital and analogue speed read-outs, a torque vectoring monitor (in models fitted with the Torque Vectoring

Differential), a G-force meter, oil and coolant temperature gauges, mileage information and even a stopwatch.

The RC F is fitted with a 370mm three-spoke steering wheel with a thick-grip elliptical cross section, helping the driver maintain greater control during performance driving. The location, shape and operation of the paddle shifts on the wheel have been tailored for fast, accurate gear changes.

The design of the high-back seats is influenced by modern close-fitting sportswear. Generous bolstering gives the driver excellent support for the back, shoulders, torso and legs under high-G acceleration, braking and cornering.

The seats are made using Lexus's integrated foaming technique, ensuring a highly supportive, cossetting fit, with no movement between the seat padding and upholstery. Upholstery is in semi-aniline leather in the RC F and RC F Carbon, and a combination of black leather and blue Alcantara in the RC F Track Edition.

ADVANCED ON-BOARD TECHNOLOGY

The RC F may be engineered for high-performance, but it still provides the kind of advanced on-board technologies Lexus customers expect.

All UK versions of RC F are equipped with the Lexus Navigation System, with information displayed on both a high-resolution 10.3-inch centre console screen and a 4.2-inch TFT screen in the driver's instrument binnacle.

Lexus developed a new version of its Remote Touch Interface, as part of its design of the cockpit centre console's operation zone. It has a touchpad control that smartphone users in particular will find simple to operate, including flick and pinch commands.

The driver can use the Remote Touch Interface to select the audio, navigation or vehicle system information displayed on the centre screen, without having to take their eyes off the road.

The cursor is moved simply by passing a finger over the surface of the touchpad; pressing down or double-tapping on the pad enters a selection. A feedback function vibrates the surface of the pad when the cursor moves over an icon on the navigation screen, which means the driver is aware of the cursor's movement without having to look at the display.

For the 2022 model year, all RC-F versions are equipped with a compact, 17-speaker 835W Mark Levinson system, featuring ClariFi technology, which automatically analyses and improves the audio quality of all types of compressed, digitalised music sources. This system can be specified as an option on the standard RC F.

The RC F has state-of-the-art climate control and air-conditioned front seats with a carbon heater system. Making fine temperature adjustment is easy thanks to new electrostatic switches and a high-contrast liquid

crystal display on the control panel.

The air conditioning system includes two-layer control of internal and ambient air and upper/lower independent air mixing, as well as independent left and right temperature control.

POWERTRAIN

- High-revving 5.0-litre engine
- Output adjusted to 457bhp/341kW to meet emissions standards for 2018,
- Active Sound Control enhances exhaust, intake and mechanical sounds inside the cabin
- Improved eight-speed Sports Direct Shift transmission
- Torsen limited-slip differential

The RC F's 5.0-litre engine is the most powerful Lexus V8 yet manufactured and is mated to Lexus's eight-speed Sports Direct Shift transmission. The powertrain also benefits from a Torsen limited-slip differential, which significantly enhances traction, handling and driving stability.

LEXUS'S MOST POWERFUL V8

The 4,969cc 32-valve V8 is a development of the engine originally introduced in the Lexus IS F. At launch, it was 12 per cent more powerful than the unit from which it derives, but for 2018 adjustments required to meet new emissions standards required a slight dialling back of horsepower to 457bhp/341kW.

The engine has been designed to deliver instantaneous torque, as in the LFA, so that the driver can actually feel the torque output increasing during acceleration. An increase in the compression ratio to 12.3:1 boosts torque across the entire rev range, with a maximum 520Nm from 4.800rpm. Technical adjustments for 2019 included re-routing of the intake and a lower rpm trigger point for the second intake opening (2,800rpm vs 3,600rpm).

Driving through an eight-speed Sports Direct Shift transmission, the engine gives nought to 62mph acceleration in 4.5 seconds and 50 to 75mph in just 3.7 seconds. From a standing start, the RC F can cover 400m in 12.5 seconds. The maximum speed – electronically governed – is 168mph.

To secure the sharpest acceleration from a standing start, a new electronic launch control system has been added as standard. This automatically adjusts the traction and throttle control for maximum take-off performance. The driver simply needs to press and hold the brake pedal, then engage the system by pressing a button on the centre console. This enables nought to 62mph to be accomplished in just 4.3 seconds.

In fettling the V8 for the RC F, many new parts were introduced, including intake manifold and throttle body, intake and exhaust valvetrain, motor-driven variable valve timing system, cylinder head and head cover, D-4S dual injection system, spark plugs, piston and piston rings, connecting rod, crankshaft, crank main

bearing and cap, exhaust manifold and heat insulator, oil pan and baffle plate, alternator clutch system and engine and transmission oil coolers.

Specific measures were taken in the engine's design to raise engine rpm, including the use of titanium inlet and exhaust valves, new high-strength forged connecting rods and new main-bearing materials. Crank pin diameter, big-end bearing size and crank counterweight size have all been reduced, to lower reciprocating weight.

Uniquely for a Lexus performance engine, the V8 switches to the more fuel-efficient Atkinson cycle when operating at cruising speeds, reverting to the Otto cycle when required to deliver higher performance.

It uses Lexus's VVT-iE electric motor-driven intelligent variable valve timing, with a new intake camshaft profile to increase valve lift. The VVT-iE technology has been redesigned to extend the range of inlet camshaft timing adjustment for the Atkinson cycle. The inlet valves are held open longer than usual to allow a reverse flow of intake air into the intake manifold. This reduces pumping losses and increases the engine's thermal efficiency.

Using the Atkinson cycle is one of a number of strategies to optimise fuel economy and achieve compliance with Euro6 and LEV3-ULEV70 emissions standards. For instance, the stoichiometric air-fuel ratio range has been expanded to 220km/h (137mph) to gain a substantial increase in practical fuel economy during performance and high-speed driving.

The Lexus D-4S dual-injection system has been redesigned, with higher 18MPa injection pressure and improved fuel atomisation pattern, to optimise power and fuel economy while minimising emissions. At the same time, the throttle diameter has been increased from 76 to 83mm.

The engine's breathing has been improved thanks to new cylinder heads with improved porting and a high-flow, high-tumble ratio. In addition, the capacity of the intake surge tank has been optimised, as have the length and diameter of the intake manifold.

The exhaust system features large-diameter front pipes to minimise back pressure and ensure high power output. The merged areas of the exhaust pipes have been enlarged to produce a clearer engine sound. Additionally, the structure of the main silencer has been designed to achieve both quietness at low rpm and dynamic volume at mid-to-high revs.

Finally, new air-to-oil coolers for both engine oil and transmission fluid increase circuit driving durability.

ACTIVE SOUND CONTROL

Creating excitement through sound is one of the cornerstones of Lexus's F philosophy. To that end, the RC F has an Active Sound Control system which delivers enhanced exhaust, intake and mechanical sounds into the cabin.

The system divides the engine sound into eight components and uses an ECU to monitor engine speed, throttle position and vehicle speed. It calculates the optimum sound for any given set of driving conditions and creates auxiliary sound to match through a speaker located beneath the instrument panel. This speaker is completely independent from the car's audio system.

The designers' intention was to approach the kind of aural experience -delivered by the LFA, which is renowned for its stirring intake and exhaust notes.

The auxiliary sound pitch changes in a linear progression in response to engine speed and the degree of throttle opening. Up to 3,000rpm, it produces a steady, low and deep tone; as revs increase, this transforms into a higher-pitched note that blends with the engine's mechanical sounds to create a rising sensation that culminates in a free-soaring sound beyond 6,000rpm.

Active Sound Control is activated when the RC F is in Sport S+ mode.

EIGHT-SPEED SPORTS DIRECT SHIFT TRANSMISSION

The RC F has an improved eight-speed Sports Direct Shift (SPDS) transmission in which the control programme has been refined to suit the engine's higher speeds and deliver more linear response to throttle inputs. It provides a balance of linear acceleration, fuel economy, smooth shift feel, quietness and driveability in all conditions.

It can operate in five driver-selectable modes: Eco, Normal, Sport S, Sport S+, and Snow. These are fully described in the section on Mode--Selectable Driving Dynamics. For 2019, the final drive ratio was raised from 2.93 to 3.13 to give sharper off-the-line performance.

TORSEN LIMITED-SLIP DIFFERENTIAL

A Torsen limited-slip differential is featured on the standard. Performance-proven in the IS F, it offers high levels of traction, handling performance and driving stability. It has three principal benefits for different driving situations, to suit driving style and road conditions.

In straight-line driving it controls the left-right speed differential to maintain straight-line stability. On entering corners, more of the coasting torque created by engine braking is distributed to the outside driven wheel than to the inner. And in mid-corner and corner-exit, it distributes drive power according to the load on each rear wheel to ensure high traction and manoeuvrability.

MODE-SELECTABLE DRIVING DYNAMICS

- Drive Mode Select transmission control
- Vehicle Dynamics Integrated Management system with Lexus's first Sport and Expert modes
- Optional Torque Vectoring Differential gives greater traction and control for exceptional handling and performance
- Centre instrument dial adapts display content and appearance in line with selected driving mode

The Lexus RC F has been designed to be enjoyed by all driving enthusiasts, no matter what their level of expertise.

To this end, it is equipped with sophisticated, switchable technologies which allow instant modification of the powertrain steering and chassis to suit individual drivers' abilities and any driving environment, from the everyday commute to high-performance track day.

The eight-speed Sports Direct Shift transmission has six -selectable modes, and a G-sensor AI-Shift control which monitors G force to optimise gear ratio selection for high-performance driving with manual, sequential shift operation.

A first for Lexus and exclusive to its F models, the VDIM system features Sport and Expert modes, giving the driver an unprecedented range of non-intrusive assistance and protection.

The RC F and RC F Carbon can also be equipped with an optional Torque Vectoring Differential (standard on the Track Edition model). This is the first system of its kind in the world to be fitted to a front-engine/rear-wheel drive coupe and it significantly improves traction and control.

The instrumentation features a central dial, developed from that produced for the LFA, which automatically adapts its display according the selected driving mode, TVD operation and VDIM status.

DRIVE MODE SELECT

The Sports Direct Shift transmission offers drivers a choice of five selectable operating modes: Eco, Normal, Sport S, Sport S+ and Snow.

Eco mode promotes environmentally responsible driving by controlling engine output, throttle opening and air conditioning settings to minimise fuel consumption. Engine response to accelerator inputs is automatically modulated and the air conditioning system's compressor operation, airflow volume and recirculation function are adjusted for fuel efficiency.

Normal mode is the default Drive Mode Select setting, automatically engaged on vehicle start-up. Engine

output in relation to throttle opening is automatically controlled to provide gentle pulling away, seamless acceleration and the best balance of power delivery under all driving conditions.

Sport S mode includes a new G-sensor AI-shift control, which uses information from the vehicle's G-sensors to select the best gear ratio for high-performance sports driving. The transmission will automatically downshift during hard braking for a corner, hold a lower gear through the corner for greater control, and then select a suitable low gear on corner exit to give the driver greater throttle response.

Sport S+ mode builds on these sports driving benefits by performing quicker downshifts than Sport S and by consistently holding the engine at higher speeds. In addition, Sport S+ automatically adjusts the weighting of the electric power steering to better suit circuit driving conditions and activates the VDIM system's new Sport mode.

ECO mode promotes environmentally efficient driving by controlling engine output, throttle opening and air-conditioning settings to minimise fuel consumption. Engine response to excessive accelerator operation is automatically modulated, and air-conditioning compressor operation, airflow volume and recirculation are optimised to prioritise fuel efficiency.

In ECO mode, the RPM gauge is replaced by a blue ECO driving indicator which diminishes, anticlockwise, the harder the vehicle accelerates.

NORMAL mode is the default Drive Mode Select setting, automatically engaged on vehicle start up. Engine output in relation to throttle opening is automatically controlled to provide gentle start off, seamless acceleration and the optimum balance of power delivery under all driving conditions.

In NORMAL mode, the RPM gauge occupies 270 degrees of the dial, leaving the portion at the bottom right for the display of driving mode and TVD status. The dial centre features a digital speed and gearshift range display.

SPORT S mode features a new, G-sensor AI-Shift control which monitors G force to optimise gear ratio selection for high-performance sports driving. The transmission will automatically downshift during hard braking for a corner, hold a lower gear through the corner for greater control, and then select a suitably low gear on corner exit to give the driver greater throttle response.

In SPORT S mode, the RPM gauge is recalibrated to place the 7,000 rpm at the top for at-a-glance reading during sports driving. A rev indicator light system illuminates in three stages to give the driver visual shift-timing cues, and the speed and gearshift range displays are inverted to give prominence to the latter.

SPORT S+ mode builds on these sports driving benefits by performing quicker downshifts than SPORT S and by consistently holding the engine at higher speeds. In addition, SPORT S+ automatically adjusts the

weighting of the Electric Power Steering (EPS) to better suit circuit driving conditions, and activates the new SPORT mode within the RC F's VDIM system.

SPORT S+ mode features a bar-type tachometer display to make engine speed instantly readable during performance driving. In addition to vehicle speed and shift position, the centre meter display also shows water and oil temperatures.

MANUAL SEQUENTIAL SHIFT MODE

Moving the shift lever into M mode gives the driver manual, sequential shift control either using the shift lever itself, or the paddles on the steering wheel. M mode features full torque converter lock-up from second to eighth gear for clutchless, manual shifting. Up-changes are accomplished in just a tenth of a second, with throttle blipping control matching the engine speed to the gear selected.

DRIVE START CONTROL

Drive Start Control is a standard feature on the RC F (from 2018 model year) which helps prevent abrupt starts and suppresses excessive acceleration when using the shift lever.
If the driver operates the shift lever while depressing the accelerator, Drive Start Control regulates power output from the engine to keep speed and acceleration below a pre-determined level. At the same time, a warning will light up in the instrument panel. The system does not operate when the car's traction control is switched off.

VDIM WITH NEW SPORT AND EXPERT MODES

The RC F is the first Lexus to feature a new Sport mode in its Vehicle Dynamics Integrated Management, and a new Expert mode in VDIM-off, in which the system only operates to prevent the vehicle going into a spin.

VDIM integrates the usually discrete ABS, VSC and TRC functions to provide proactive, seamless control of the vehicle's safety and stability systems. It anticipates any loss of traction and provides smooth control, from normal driving right up to the limits of performance.

In the RC F, VDIM has four modes:

- **NORMAL,** for smooth driving and a high degree of active safety under normal driving conditions.
- **SPORT**, to give priority to driver control. This mode offers greater safety and enjoyment when on a race track, applying optimum VSC/TRC mapping for circuit driving.
- **OFF**
- **EXPERT** mode, which is designed to allow the driver to make full use of their driving skills in a similar fashion to VDIM Off mode, but with an extra layer of protection to prevent a spin.

In addition, Lexus has extended the VDIM co-operative control function, allowing the system to delegate two

brake control functions to the Torque -Vectoring Differential: drive-force distribution and yaw-movement control. VDIM controls the torque transfer co-operatively with the TVD for more seamless torque distribution, smoother power delivery and greater vehicle balance at the limits of performance.

TORQUE VECTORING DIFFERENTIAL

The RC F is available with a Torque Vectoring Differential (a standard feature on the RC F Track Edition), a world-first application of torque-transfer type system in a front engine/rear-wheel drive vehicle.

It forms one element in the state-of-the-art package of chassis technologies, systems and mechanisms in the RC F that are all designed to heighten driving enjoyment, particularly when cornering. The result is a natural feeling, with the driver unaware of the system operating, and increased driving pleasure when using the throttle under cornering.

The TVD has three switchable operating modes, independent of the transmission's Drive Mode Select: -

- Standard (default) for an ideal balance of agility and stability
- Slalom, for an emphasis on nimble steering response and the agility of a smaller vehicle
- Track, for an emphasis on stability during high-speed circuit driving

The Lexus TVD is unique in its use of precisely controlled multi-plate clutches to vector torque, rather than the vehicle's ABS.

Electronic control and precision actuator motors, adjusted in units of one-thousandth of a second, ensure the appropriate amount of torque is distributed to each rear wheel.

The system has been designed to make best use of the vehicle's yaw moment when turning, giving the feeling that the direction of travel and the direction of the vehicle are perfectly aligned. It enables the best possible torque transfer to be generated regardless of how great or small the engine torque is, creating a yaw moment around the car's centre of gravity.

Vehicles fitted with the TVD have an exclusive final drive unit and TVD ECU, which calculates the amount of torque to be transferred and provides co-operative control with other systems, including the VDIM.

The TVD has three, switchable operating modes, which may be activated independently of the transmission's Drive Mode Select function:

STANDARD, the default setting, for an ideal balance of agility and stability
SLALOM, for an emphasis on agility, crisp turn-in and nimble steering response
TRACK, for an emphasis on stability during high speed circuit driving

How the TVD works

The Lexus torque vectoring differential's drive-force control mechanism consists of two compact, highly responsive motor control units and two multi-plate clutches. This also includes a set of speed-multiplication planetary gears for each drive shaft.

The brushless electric motors have a built-in, high-precision resolver (rotation angle sensor). Using technology developed for hybrid vehicle motor control, they allow the motor angle to be monitored and adjusted in units of one-thousandth of a second, for precise torque distribution control during acceleration and deceleration.

Each electric motor controls the pressure on the corresponding multi-plate clutch via a ball-cam actuator.

Special features of the TVD electronic control include feed-forward and feed-back control technology. Feed-forward control is derived from driver operations; feed-back control aims for the ideal vehicle condition, even in situations such as counter-steer during a drift, for more enjoyable vehicle manoeuvrability.

The feed-forward control group includes steering angle feed-forward control, and limited-slip differential control during counter-steering and deceleration. The feedback control suite comprises a yaw rate feedback control, differential rotation suppression control and VDIM co-operation control.

DRIVE MODE-SPECIFIC INSTRUMENT METERS

The TFT central tachometer display automatically adapts to include Drive Mode Select, Torque Vectoring Differential (where fitted) and VDIM status with vehicle performance information, in line with the driving mode the driver has selected.

In Normal mode, the rev counter takes up three quarters of the dial, leaving the section in the bottom right to display the driving mode the TVD status. The centre of the dial shows a digital speed read-out and gear shift range.

In Eco mode, the rpm gauge is replaced a blue Eco driving indicator which diminishes, anti-clockwise, the harder the vehicle accelerates.

In Sport S mode, the read-out is recalibrated so that the 7,000rpm mark is at the top, making for easy at-a-glance reading during sports driving. A rev indicator light illuminates in three stages to give the driver visual cues for shift-timing, and the speed and gear shift range switch position so the latter is made more prominent.

Sport S+ mode features a bar-type tachometer so that engine speed is instantly readable during performance driving. As well as vehicle speed and shift position, the centre meter display also shows coolant and oil temperatures.

The driver can choose a number of other display functions, including a lap timer, TVD torque distribution display and G-force meter.

PRECISION-TUNED CHASSIS

- Highly rigid bodyshell with large road footprint
- Performance-tuned double wishbone front and multi-link rear suspension
- Adaptive Variable Suspension fitted as standard
- Electronic power steering with damper-less intermediate shaft, for better responsiveness
- Brembo brake system, with vertical G sensor

Every aspect of the RC F, from its footprint on the road and its body rigidity, to its suspension, brakes, steering and chassis electronics, was designed to achieve the best grip and agile handling.

Right from the prototype stage, the RC F was evaluated on race tracks around the world, including Fuji Speedway and the Nürburgring Nordschleife. The chassis development included taking part in the endurance racing events at the Nürburgring and using feedback from Lexus IS F and CCS-R race car drivers in Japan.

BODYSHELL RIGIDITY

Although the RC F has relatively compact overall dimensions – 4,705mm long, 1,845mm wide and 1,390mm high – its 2,730mm wheelbase, 1,555mm front track and 1,560mm rear track give it a surprisingly large road footprint, helping maximise the car's driving dynamics potential.

The bodyshell follows the example set by the Lexus GS in being particularly strong and rigid, tuned for stability at high speed and promoting ultra-precise handling and steering in all driving conditions.

To increase cabin strength and handling stability, the rocker cross-section is almost double the size of that in the IS, the front apron panel has been made thicker and a centre floor gusset has been installed.

In conjunction with this, the RC F features a cowl side brace and a front rocker brace that has more coupling points, as well as a rear brace, rear rocker brace and rear body brace. This comprehensive bracing, which connects left and right sides of the underbody, improves body control and steering response.

Using body adhesive in panel joints improves body rigidity and suppresses vibration. Additional spot welding points add further rigidity, and using laser screw welding at a shorter pitch than conventional welding helps suppress cross-sectional deformation.

The front and rear screens are secured using a high-rigidity structural adhesive, effectively making them part of the car's torsional structure.

Finally, bodyshell weight has been minimised by using high-tensile sheet steel and aluminium in key areas. The bonnet inner and outer skins and the bumper reinforcement are all made of aluminium. On the RC F Carbon, the CFPR bonnet, roof and rear wing together reduce overall vehicle weight by 10kg.

PERFORMANCE-TUNED SUSPENSION

The RC F is equipped with double wishbone front and multi-link rear suspension, honed under the demanding conditions of race circuits around the world.

The front suspension features forged aluminium upper and lower arms, to save weight and maximise rigidity. The steering knuckle and lower arm are designed to alter the king-pin offset, while high camber angles and toe-angle rigidity further improve cornering power and reduce the required steering angle.

The rear suspension geometry has been defined exclusively for the RC F. All five suspension arms have been designed for a revised geometry, and the upper number two arm and the end section of the toe-control are made of aluminium to reduce unsprung weight.

The upper number one arm benefits from the highest possible torsional rigidity and the bushing characteristics of the other four arms have been revised.

Together these measures ensure outstanding responsiveness, with crisp turn-in and well controlled, progressive body roll, while maintaining the smooth, pliant ride that’s to be expected from even a high-performance Lexus.

Adaptive Variable Suspension is also a standard feature of the RC F. As well as improving vehicle ride and controllability, this system is integrated with the RC F’s Pre-Collision System, adjusting the damping force of the shock absorbers to improve the vehicle’s responsiveness if a high collision risk is detected.

For 2019, a series of measures were taken to reduce the car’s weight, without diminishing its overall feel of refinement and solidity. The details are small, but telling, including the use of hollow half-shafts in place of solid components, a slimmer intake manifold and a smaller air conditioning compressor. More kilogrammes have been saved by using aluminium for a number of suspension parts, while maintaining overall stiffness.

To gain a more refined feel, stiffer bushings have been added to the suspension arms and steering rack mounts, while the use of more rigid engine mounts helps the RC F better exploit the power of its normally aspirated 5.0-litre V8 engine.

ELECTRONIC POWER STEERING

The RC F’s electronic power steering is designed to achieve excellent dynamic performance and steering

feel. Intensive testing and calibration of the power assistance curve ensure the steering feel ideally matches the vehicle's dynamic characteristics, even in track driving.

A damper-less intermediate shaft has been added to the steering column to increase system rigidity and secure a high degree of responsiveness to steering input. The new shaft features an expandable/contractible stroke mechanism to absorb shaft length changes when driving. This gives a smoother steering feel and a reduction in response lag.

BREMBO BRAKE PACKAGE

The RC F has a Brembo brake package, with improved cooling and a vertical G-sensor integrated in the ABS.

At the front there are 380 x 34mm discs with opposed six-piston aluminium callipers; at the rear the discs measure 345 x 28mm, with opposed four-piston aluminium callipers. Using integrated aluminium 15onobloc callipers provides high rigidity while also reducing weight.

The ventilated front discs are slotted rather than drilled, helping to keep the brake pads clean and their effectiveness consistent under all driving conditions. The front discs are equipped with spiral fins which, in conjunction with improved cooling duct efficiency, ensure excellent cooling performance.

Brake pad effectiveness has been improved by a revision to the pad surface, to ensure uniform wear and preserve pad life.

A two-stage servo booster delivers high braking effectiveness and controllability. With a shorter pedal stroke and better response, braking is initially linear; in the second stage, deceleration increases relative to pedal force for greater effectiveness and maximum stopping power.

The adoption of a G-sensor is a direct result of testing at the Nürburgring. It means the system can allow for changes in vertical loads, and hence optimise braking force control the instant load returns to the tyres after jumping a crest.

The brake pedal itself has more rigid linkages and an optimised lever ratio. Exclusive RC F hydraulic control circuitry optimises brake control and interaction with the ABS/VDIM mode select feature.

RC F Track Edition with carbon ceramic brakes

The RC F Track Edition is fitted with Brembo carbon ceramic brake discs which are not only significantly lighter than their steel counterparts, they are also better able to withstand the extreme heat cycling associated with performance driving. They are gripped by red callipers and surrounded by a set of lightweight 19-inch BBS forged alloy wheels with a design derived from the RC F GT3 race car. Between

the wheels, brake discs and callipers, the Track Edition posts a 25kg unsprung weight reduction on the front of the car alone.

WHEELS AND TYRES

The RC F runs on 19-inch forged alloy wheels with twin sets of 10 spokes, the inner series set 30 degrees ahead of the outer; for the RC F Track Edition the wheels are 19-inch lightweight forged BBS alloys.

The RC F uses Michelin Pilot Sport 4S tyres, designed specifically for the coupe. These have a unique profile and tread pattern and are made from a special rubber compound. They have been designed to help reduce understeer, improve lateral grip and increase durability in extreme driving conditions. Different size tyres are used at the front and rear, respectively 255/35R19 and 275/35R19. A weight-saving tyre repair kit is provided as standard.

SAFETY

- Lexus Safety System+ standard on all RC F models
- Functions include Pre-Collision System, Dynamic Radar Cruise Control, Lane Departure Alert, Road Sign Assist and Automatic High Beam
- High-tensile steel body structure

Lexus designs all its cars to the highest safety standards and the RC F is no exception. In fact, its performance and handling characteristics are actually enhanced rather than compromised by its active, passive and preventive safety systems.

For the 2018 model year, Lexus Safety System+ became a standard feature on all RC F models, in addition to a Vehicle Dynamics Integrated Management system that includes Lexus's first Sport and Expert modes.

Additional standard safety systems include a Blind Spot Monitor, Rear Cross Traffic Alert and an auto-location tyre pressure warning system.

The car's rigid body structure provides exceptional car-to-car impact performance. In the cabin, occupants are protected by a suite of eight airbags.

LEXUS SAFETY SYSTEM+

Pre-Collision System

The Pre-Collision System uses a millimetre-wave radar to detect vehicles and pedestrians on the road ahead. If it calculates a risk of a collision, it automatically warns the driver with a buzzer and alert on the multi-information display, and the Pre-Collision Brake Assist engages to provide extra braking force the

moment the brake pedal is pressed. If the driver fails to react and the system judges a collision to be imminent, the brakes are automatically applied to reduce vehicle speed and the force of any impact.

Dynamic Radar Cruise Control

The Dynamic Radar Cruise Control uses the same radar as the PCS (above) to help the driver maintain a safe distance from the vehicle in front.

It can be used like a conventional cruise control system to maintain a constant speed, or it can provide vehicle-to-vehicle distance control to automatically slow the RC to match the speed of the vehicle ahead. Once the way is clear, it will smoothly accelerate the car back to its pre-selected cruising speed.

Lane Keep Assist

The package includes Lane Keep Assist, which recognises when the car is deviating from its lane on the highway and helps the driver steer the vehicle safely back to its correct path. It uses a camera on the windscreen to track the vehicle's course between lane markings painted on the road surface. If it judges that the vehicle is about to move out of its lane without the turn indicator being used, the system lights up a warning on the multi-information display and vibrates the steering wheel. It will also apply appropriate steering control force to help bring the vehicle back on course.

It provides an extra layer of assistance, automatically providing steering inputs to keep the car safely within its lane, notably when the Adaptive Cruise Control is being used. It can be used even at very low speed, when the Adaptive Cruise Control is operating. The driver can also choose which alert they prefer (warning sound or vibrating steering wheel) and the sensitivity of the warning, via the multi-information display. The system can also be switched off, if desired.

The system also includes a Sway Warning function. This monitors the car's position in its lane and the driver's steering inputs. If it detects degrees of vehicle swaying, caused by driver distraction or drowsiness, it will sound an alert and display a warning on the multi-information display, recommending the driver takes a break.

Automatic High Beam

The Automatic High Beam system that uses a camera to detect the lights of on-coming traffic and vehicles ahead, automatically switching the headlights to low beam to avoid dazzling other drivers. This maximises the use of high-beam, improving night-time illumination.

Road Sign Assist

Road Sign Assist recognises traffic signs using the windscreen-mounted camera, repeating the information on the multi-information display. This helps prevent the risk of the driver failing to notice important warnings or commands on major routes, including speed limits and lane closures. The system can detect signs that

are designed according to the international standards of the Vienna Convention on Road Signs and Signals.

BLIND SPOT MONITOR AND REAR CROSS TRAFFIC ALERT

The blind spot monitor covers a wide area with rear-mounted radar sensors, reaching up to 60m behind the vehicle. The system helps the driver when changing lanes by giving an alert not only of any vehicles in the blind spot, but also those approaching from behind in adjacent lanes.

It calculates the time an approaching vehicle will take to reach the back of the RC F and gives an alert when this time falls below a threshold value. Thus, the timing and distance at which the system triggers a warning change in line with relative vehicle speeds.

The Rear Cross Traffic Alert uses the blind spot monitor's radar to warn the driver of approaching vehicles when reversing out of a parking space. When an approaching vehicle is detected, the system flashes the indicator lights on the corresponding door mirror and sounds a warning buzzer.

AUTO-LOCATION TYRE PRESSURE WARNING

The auto-location tyre pressure warning system uses sensors in the tyre air valves to provide data on the pressure values for each tyre on the driver's instrument binnacle. When low pressure is detected, the figure is highlighted in amber.

Conventional systems do not show the driver which specific tyre is affected, whereas Lexus's auto-location system clearly indicates which of the four has low pressure.

BODY STRUCTURE

The RC F's body structure exemplifies Lexus's stringent car-to-car compatibility standards. Comprehensive use of high-tensile steel allows for optimum transfer and dispersal of impact loads, minimising cabin deformation in a collision.

Front and side collision measures include the use of 980Mpa high-tensile steel for the forward-projecting rocker structures and the pillar rail outer reinforcement, and hot-stamped sheet steel up to 1,620Mpa in key body areas, such as the side impact bars in the doors.

The five-part centre pillar structure uses a range of high-tensile steels, while 980Mpa steel is used for the rocker panel bulkheads.

Roll-over protection measures include centre pillar reinforcement, high-tensile steel roof rails and a substantial, three-part front header section.

AIRBAGS

All versions of the RC F are equipped with eight airbags – dual stage driver, dual stage and dual chamber front passenger, driver's knee, front passenger cushion, front side and full-length curtain shield airbags.

UK MODEL RANGE

- Grade line-up comprises RC F, RC F Carbon and RC F Track Edition
- All versions feature LED headlights, 10.3-inch Lexus Navigation, launch control system and Lexus Safety System+
- RC F Carbon equipped with carbon fibre roof and bonnet
- RC F Track Edition features carbon ceramic Brembo brakes, Torque Vectoring Differential, 19-inch lightweight forged BBS alloys, a fixed rear wing, red Alcantara upholstery and additional carbon fibre parts

The RC F range offers three versions of the coupe: RC F, RC F Carbon and RC F Track Edition

The RC F benefits from the comprehensive array of comfort, safety and advanced technology features, including Lexus Safety System+ active safety and driver assistance functions (details above).

All versions are equipped with Adaptive Variable Suspension, LED headlights, multimedia system with Lexus 10.3-inch Navigation, DAB, DVD player and Remote Touch touchpad control; dual-zone climate control; and Drive Mode Select.

The safety provisions include eight airbags, a reversing camera, Hill-start Assist Control, and Sport VDIM, which co-ordinates performance of the ABS, brake assist, traction control vehicle stability control and electronic brakeforce distribution.

The specification further runs to semi-aniline leather upholstery, front and rear parking sensors, electric, auto-dimming, folding and heated door mirrors, an auto-dimming rear-view mirror, electric steering column adjustment and keyless Smart Entry.

The electrically adjustable front seats in the RC F and RC F Carbon have integrated heating and ventilation functions and there is an "automatic away" function for the driver's seat and steering column to make it easier to get in and out of the car. Throughout the interior there are Lexus 'F'-themed details, including the steering wheel, pedals, trim and seat design.

The RC F Carbon benefits from additional performance features in the form of a CFRP (carbon fibre-reinforced plastic) roof, bonnet and active rear spoiler. It is further distinguished by a dedicated 19-inch forged alloy wheel finish.

The RC F Track Edition reflects the model's motorsports success, being equipped with a series of advanced parts to improve aerodynamics and performance. These include a carbon fibre composite front lip spoiler, a fixed carbon fibre rear wing, a Brembo braking system with ceramic discs and lightweight 19-inch BBS forged alloy wheels. More weight has been saved by using additional carbon fibre composite parts, including the roof, bonnet, rear cabin partition and bumper reinforcement.

As standard, the RC F Track Edition comes with a Torque Vectoring Differential, red leather interior with Alcantara upholstery accents and red carbon trim details. The body colour choices are Ultra White and Matt Mercury Grey – the latter exclusive to the Track Edition.

A Track Pack option is available for the RC F and RC F Carbon, comprising 19-inch lightweight forged BBS alloy wheels, Torque Vectoring Differential, and carbon ceramic brakes with red Brembo callipers.

RC F Timeline

2014	January	The Lexus RC F is unveiled at the Detroit motor show.
	March	The RC F makes its first European appearance alongside the RC coupe at the Geneva motor show.
	August	UK prices and specifications are announced, first customer orders are taken.
2014	December	The first RC F models are delivered to UK customers.
2016	October	Adaptive Variable Suspension becomes a standard equipment feature.
2018	January	2018 RC F introduced with Lexus Safety System+, new Plus Pack grade and revised V8 engine output.
	July	Introduction of the limited-run RC F 10th Anniversary.
2019	April	The 2019 RC F is released, including a new Track Edition model with ceramic carbon brakes.

LEXUS RC F TECHNICAL SPECIFICATIONS

ENGINE		
Engine code		2UR-GSE
Cylinders and arrangement		V8
Valve mechanism		32 valve DOHC, Dual VVT-i
Displacement (cc)		4,969
Bore x stroke (mm)		94.0 x 89.5
Compression ratio		12.3:1
Fuel injection system		EFI, D-4S
Euro emissions standard		Euro6
Max. power (bhp/DIN hp/kW @ rpm)		457/464/341 @ 7,100
Max. torque (Nm @ rpm)		520 @ 4,800
PERFORMANCE		
Max. speed (electronically limited, mph)		168
Max. cruising speed (mph)		150
Acceleration 0-62mph (sec)		4.3
FUEL CONSUMPTION, EMISSIONS, INSURANCE & SERVICING		
Fuel consumption – WLTP combined, (mpg)		23.9
CO_2 emissions – WLTP combined (g/km)		268
Fuel tank capacity (l)		66
Insurance groups		48 RC F 50 RC F Carbon
Servicing		10,000 miles/annually
TRANSMISSION		
Type		8-speed Sports Direct Shift automatic
Driveline		Front engine/rear-wheel drive
Gear ratio	1st	4.596
	2nd	2.724
	3rd	1.863
	4th	1.464
	5th	1.231
	6th	1.000
	7th	0.824
	8th	0.685
	Reverse	2.176
Differential gear ratio (rear)		3.13
BRAKES		
Type	Front	Brembo ventilated and slotted discs
	Rear	Brembo ventilated and slotted discs
Diameter/thickness (mm)	Front	380/34 380/38 Track Edition
	Rear	345/28 380/30 Track Edition
Parking brake		Electronic
Front		Double-wishbone, Adaptive Variable Suspension
Rear		Multi-link, Adaptive Variable Suspension
STEERING		

Type		Electric power assisted
Ratio		13.2:1
Turns lock to lock		2.84
Min. turning radius	Tyre (m)	5.4
	Body (m)	5.7
SUSPENSION		
Front		Double-wishbone, Adaptive Variable Suspension
Rear		Multi-link, Adaptive Variable Suspension
STEERING		
Type		Electric power assisted
Ratio		13.2:1
Turns lock to lock		2.84
Min. turning radius	Tyre (m)	5.4
	Body (m)	5.7
DIMENSIONS		
Overall length (mm)		4,710
Overall width – without mirrors (mm)		1,845
Overall width – with mirrors (mm)		2,070
Height (mm)		1,390
Wheelbase		2,730
Front track (mm)		1,555
Rear track (mm)		1,560
Front overhang (mm)		930
Rear overhang (mm)		1,050
Min, running ground clearance (mm)		130
Coefficient of drag (Cd)		0.33
Effective headroom	Front (mm)	960 928 (with sunroof)
	Rear (mm)	888 878 (with sunroof)
Interior length (mm)		1,835
Interior width (mm)		1,520
Interior height (mm)		1,120 1,110 (with sunroof)
Couple distance (mm)		833
Seating capacity		4
Load space volume (l)		366
WEIGHTS		
Kerb weight (min/max, kg)		1,715/1,825
Gross vehicle weight (kg)		2,250
WHEELS & TYRES		
Wheels		19in forged alloy
Tyres	Front	255/35R19
	Rear	275/35R19

LEXUS RC F EQUIPMENT SPECIFICATIONS

SAFETY & DRIVING DYNAMICS	RC F	RCF CARBON	RC F TRACK EDITION
Lexus Safety System+: Pre-Collision System, Dynamic Radar Cruise Control, Lane Keep Assist, Automatic High Beam, Road Sign Assist	✓	✓	✓
Lane Change Assist	×	✓	✓
Driver dual-stage airbag	✓	✓	✓
Front passenger dual stage, dual chamber airbag	✓	✓	✓
Front side airbags	✓	✓	✓
Driver & front passenger knee airbags	✓	✓	✓
Curtain shield airbags	✓	✓	✓
Isofix child seat anchors on rear seats	✓	✓	✓
ABS with Brake Assist System and Electronic Brakeforce Distribution	✓	✓	✓
Vehicle Stability Control	✓	✓	✓
Traction control	✓	✓	✓
Vehicle Dynamics Integrated Management with G-force sensor	✓	✓	✓
Limited-slip differential	✓	✓	×
Torque Vectoring Differential	Opt[1]	Opt[1]	✓
Hill-start Assist Control	✓	✓	✓
8-speed Sports Direct Shift transmission with selectable drive modes	✓	✓	✓
Rear Cross Traffic Alert	✓	✓	✓
Blind Spot Monitor	✓	✓	✓
Emergency brake signal	✓	✓	✓
Pop-up hood	✓	✓	✓
SECURITY	**RC F**	**RCF CARBON**	**RC F TRACK EDITION**
Alarm with incline and glass breakage sensors	✓	✓	✓
Engine immobiliser	✓	✓	✓
Double door locks with power locking	✓	✓	✓
VIN etching	✓	✓	✓
COMFORT & CONVENIENCE	**RC F**	**RCF CARBON**	**RC F TRACK EDITION**
Power front windows	✓	✓	✓
Rain-sensing wipers	✓	✓	✓
Steering column power adjustment and easy entry function	✓	✓	✓
Smart entry and start	✓	✓	✓
Card key	×	✓	✓
Frameless auto-dimming rear-view mirror	✓	✓	✓
Front and rear parking sensors	✓	✓	✓
TFT combination meter	✓	✓	✓
Analogue speedometer	✓	✓	✓
Analogue clock	✓	✓	✓
VENTILATION	**RC F**	**RCF CARBON**	**RC F TRACK EDITION**

Dual-zone climate control with auto recirculation	✓	✓	✓
SEATING, UPHOLSTERY & TRIM	**RC F**	**RCF CARBON**	**RC F TRACK EDITION**
High-back sports front seats	✓	✓	✓
Semi-aniline leather upholstery	✓	✓	×
Black leather and blue Alcantara upholstery	×	×	✓
Heated and ventilated front seats	✓	✓	×
Power front seat adjustment – 10-way driver, 8-way passenger	✓	✓	✓
Driver's seat lumbar adjustment	✓	✓	✓
Front seats with one-touch walk-in function with memory	✓	✓	✓
Fixed rear seats with luggage hatch	✓	✓	×
Power steering wheel adjustment	✓	✓	✓
F steering wheel with Alcantara trim	✓	×	✓
Heated F steering wheel with leather trim	✓	✓	×
F gear lever with Alcantara trim	✓	✓	✓
Aluminium pedals and footrest	✓	✓	✓
F aluminium scuff plates	✓	✓	✓
F aluminium effect trim	✓	✓	×
Red carbon-effect trim	×	×	✓
AUDIO, COMMUNICATION & INFORMATION	**RC F**	**RCF CARBON**	**RC F TRACK EDITION**
17-speaker Mark Levinson premium audio	✓	✓	✓
10.3-inch Lexus navigation with connected services and reversing camera	✓	✓	✓
Remote Touch touchpad control	✓	✓	✓
USB x2 and Aux-in x1	✓	✓	✓
Bluetooth	✓	✓	✓
Smartphone integration with Apple CarPlay/Android Auto	✓	✓	✓
EXTERIOR	**RC F**	**RCF CARBON**	**RC F TRACK EDITION**
Seven twin-spoke 19-inch alloy wheels	✓	×	×
19-inch forged alloy wheels	Opt	✓	×
19-inch lightweight forged BBS alloy wheels	Opt[1]	Opt[1]	✓
Auto-dimming, power-folding door mirrors with integrated turn indicators	✓	✓	✓
LED rear lights and high-level brake light	✓	✓	✓
LED headlights with automatic high beam	✓	✓	✓
LED daytime running lights	✓	✓	✓
Spindle grille with F-motif mesh	✓	✓	✓
Active/retractable rear spoiler	✓	✓	×
Fixed rear spoiler	×	×	✓
Sunroof	Opt	×	×
CFRP carbon roof, bonnet and rear spoiler	×	✓	✓
Orange Brembo brake callipers	✓	✓	×
Carbon ceramic brakes with red Brembo callipers	Opt[1]	Opt[1]	✓
Tyre repair kit	✓	✓	✓
Metallic paint	✓	✓	✓

Special metallic paint	Opt	Opt	Opt
Matt Mercury Grey paint	×	×	Opt

[1] Features in the optional Track Pack

ENDS

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