

Preface

Germany, 1927: Birth of Nürburgring Nordschleife, the most challenging racetrack in the world. Carved out of the Eifel mountains and spanning an altitude of 300 meters, this 20.83 kilometer track was built with 172 corners, narrow roads and very few escape zones. Exalted as sacred and feared as “The Green Hell”, what better place than the Nürburgring to begin development of the Lexus LFA?

On this holy ground of automotive passion, Lexus developers sought not only to test the utmost limits of the LFA’s dynamic performance, but also to further polish the LFA’s unique driving essence. The LFA was honed to perfection on this venerated track and now shows its gratitude with the Nürburgring Package, a new chapter in supercar history.

With enhanced aerodynamics, a fortified underbody and an engine precisely tuned for even more power, the sharply honed driving performance of the Nürburgring Package offers endless appeal to drivers. This vehicle will enthrall you and every moment you spend in its company will be sheer, hedonistic pleasure.

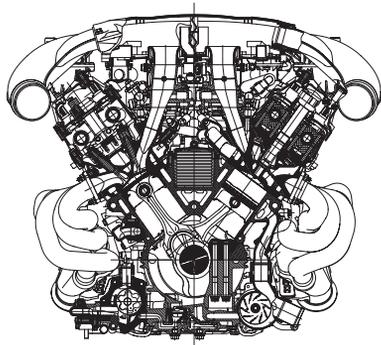
This book tells the story of the driving passion that motivated the developers of this iconic vehicle as well as the effort they went to in the pursuit of ultimate driving pleasure. It also outlines special notices and cautions regarding the Nürburgring Package that you, as the owner of this powerful machine, need to be aware of. Information regarding items that are unchanged from the standard specification model can be found in the Owner’s Manual included with this book.

This book is available in four languages.

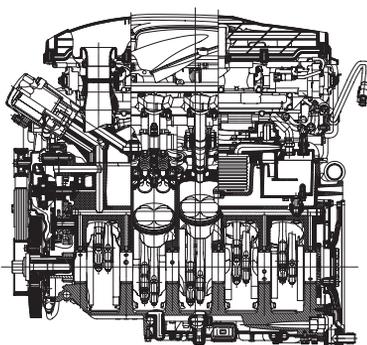
Powertrain

In the pursuit of responsiveness and emotive performance that outperforms the engine in the standard package, the 1LR-GUE engine in the Nürburgring Package reduces friction losses to realize an 8 kW (11 PS) increase in power. An impressive output of close to 88 kW (120 PS) per liter has been achieved.

As proof of this, the surge tank bears a specialized emblem and the oil filter cover comes in a specialized color.



Front view



Side view

N-041

■ Low friction internals

While the engine in the Nürburgring Package is the same engine model as the standard package, by meticulously adjusting items like the amount of oil supplied and the friction surfaces of moving parts, a further reduction in friction has been achieved.

■ Oil feed pump

In the standard engine, an inner relief system that circulates oil inside the oil feed pump has been adopted. This restricts oil level fluctuations in the crankcase and oil pan, achieving a reduction in friction and the occurrence of air bubbles in the oil.

Moreover, an exclusive pump was adopted for the cam timing adjusters (VVT-i). By increasing the pressure of the oil supplied from the feed pump, the VVT-i can be operated even more effectively while the total amount of oil was reduced, thereby contributing to a reduction in total friction.

With the Nürburgring Package, the clearances inside the pump were optimized by balancing the oil supply more precisely, further reducing friction.

■ Piston rings

In the standard package's engine, linerless thermally sprayed bores were adopted for the cylinder bore surface, simultaneously improving heat dissipation and reducing cylinder bore distortion.

This accordingly made it possible to lower the tension of the top & second ring more than that of a common mass-production engine and at the same time a thin 2-piece nitride processed oil ring has been adopted, reducing friction losses.

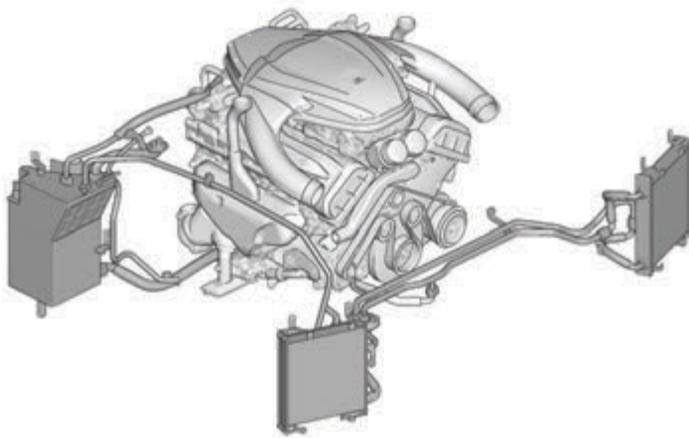
Through the utilization of these aspects and optimized ring specifications, a further reduction in friction has been achieved in the Nürburgring Package.

Dry sump system

In order to lower the center of gravity, the LFA adopts a dry sump system which positions the oil tank separately from the engine itself and does away with a conventional oil pan, enabling the location of the engine to be closer to the ground.

Simultaneously, the center of gravity is further lowered and the yaw moment of inertia is further reduced by placing heavy objects such as the oil pump on both sides of the lower back end of the engine.

As high dimension driving performance was achieved due to these engineering techniques and the packaging of the Nürburgring Package, a lubrication system that could handle up to 2G of lateral acceleration was required.



N-002

In order to secure lubrication performance that could withstand high lateral acceleration, seven independent scavenger pumps were adopted and are located in both sides of the cylinder head, the front and rear chain case and the crankcase, pumping the collected engine oil into the air-cooled oil cooler and the oil tank.

Only the oil with a high temperature collected from the crankcase is pumped into the air-cooled oil cooler, minimizing drops in pressure, which in turn reduces the pump's driving loss.

The oil tank's construction achieves stable oil circulation even during high lateral acceleration due to the adoption of a vertically long shape and specially designed baffle plate.

Within the oil tank, cyclone type gas-liquid separation is performed and air bubbles are removed from the collected oil. The oil is then sent to the lower part of the oil tank and supplied to various parts of the engine via the feed pump which is located on the same horizontal axis as the scavenger pump.

While a similar sequence of circulation is common with the standard package, it plays a more important role in the Nürburgring Package, which pursues an even higher level of driving performance.

Aerodynamics

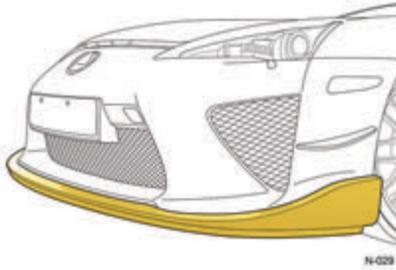
The Nürburgring Package has improved the aerodynamic performance of the vehicle's whole body, so that a high level of handling stability can be acquired during high-speed driving.

A prepreg hollow CFRP (Carbon Fiber Reinforced Plastics) large-sized front spoiler, canards and a fixed type large-sized rear wing have been adopted as exclusive exterior equipment. These items increase downforce as well as precisely control airflow, further improving the LFA's high driving stability.



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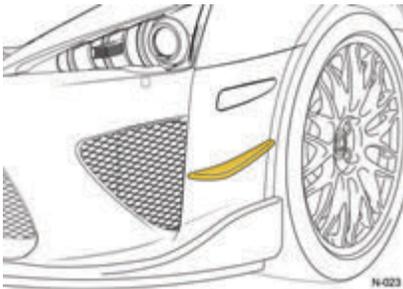
■ Large-sized front spoiler



A hollow structure has been adopted, achieving weight reduction. Additionally, a one-piece front spoiler that extends from the front to the sides has been achieved, ensuring rigidity.

The air that flows along the underbody is precisely controlled, simultaneously increasing downforce.

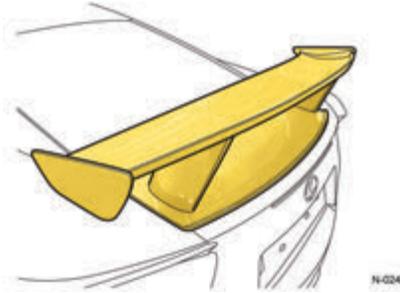
■ Canard



Attached to each side of the front bumper, the front canards have been constructed to be as thin as possible.

By increasing downforce, straightline stability and grip when cornering are enhanced, contributing to an improvement in handling stability.

■ Fixed type large-sized rear wing



By enlarging the wing in a transverse direction and by making the wing and its deflector form a gurney lip, down-force is efficiently generated.

Furthermore, end plates are integrated into both ends of the wing, reducing induced drag and optimizing the wing's efficiency.

■ Aluminum support frame

An aluminum support frame has been mounted in the area where the active rear wing is stored in the standard package, increasing the support's rigidity.

This helped to ensure that the fixed type large-sized rear wing that can withstand a load of 3500 N while also achieving a significant weight reduction.

Cd and Cl

"Cd" is an abbreviation that means "Coefficient of drag". When referring to a car, "air resistance" is proportional to this value multiplied by the frontal area (the surface area that is seen when looking at the vehicle from directly in front). In other words, the lower, more compact the vehicle, the lower the air resistance.

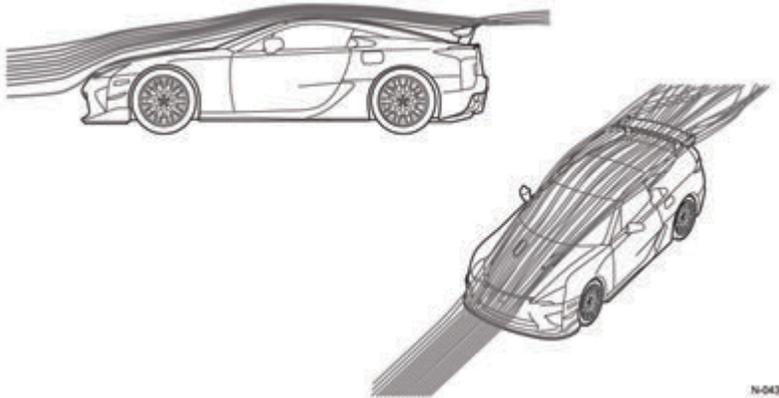
On the other hand, "Cl" is an abbreviation that means "Coefficient of lift". If this value is less than zero, downforce (the force that pushes the vehicle onto the road) is being acquired.

Drag (D) and lift (L) can be calculated using the following formula:

(ρ : Air density V : Velocity (vehicle speed) A : Frontal area)

$$D \text{ (or } L) = \frac{1}{2} \times \rho \times V^2 \times C_d \text{ (or } C_l) \times A$$

With the Nürburgring Package, the Cl value has been enhanced and downforce has been increased by adopting aero-parts, helping to pursue a feeling of reassuring handling stability, even when driving at high speeds.

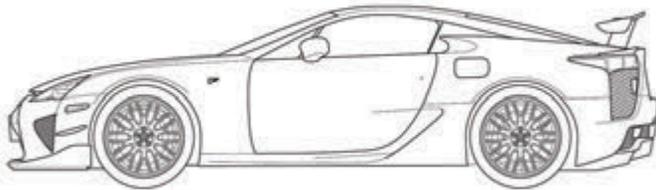


Due to the Nürburgring Package making changes based on circuit driving, minimum ground clearance is lowered. When passing over an uneven surface, drive extremely carefully to ensure the body does not interfere with the road surface.

Chassis and suspension

For the Nürburgring Package, in order to further improve stability and cornering speed, exclusive shock absorbers, coil springs, stabilizers, high grip tires and aluminum wheels that enhance body control and grip have been adopted.

During repeated test runs at the Nürburgring, controllability was increased across all speed ranges from low to high, and a sense of oneness between the driver and the vehicle was pursued.



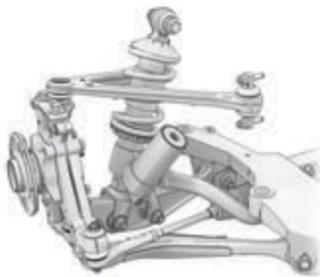
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Suspension

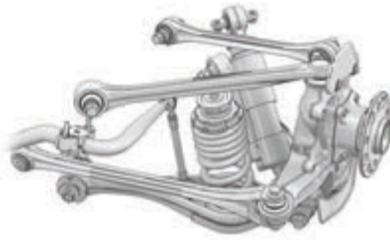
In order to maximize aerodynamic and suspension performance, vehicle height, wheel alignment, coil springs, stabilizers and the shock absorbers were finely tuned for the Nürburgring Package.

Accordingly, an astounding level of both handling with high controllability and stable body control has been achieved.

| Item | Specification differences from the standard model |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Vehicle height | <u>Vehicle height lowered</u> Front: -10 mm Rear: -10 mm |
| Wheel alignment | <u>Negative camber angle increased</u> Front: $-0^{\circ} 45'$ → $-1^{\circ} 10'$ Rear: $-1^{\circ} 45'$ → $-2^{\circ} 10'$ |
| Coil spring | <u>Spring rate increased</u> Front: 86 N/mm → 115 N/mm Rear: 103 N/mm → 155 N/mm (Non-linearly) |
| Stabilizer | <u>Stabilizer gauge increased</u> Front: Diameter: 31.8 mm → 31.8 mm Gauge: 4 mm → 5 mm Rear: Diameter: 25.4 mm → 25.4 mm Gauge: 4 mm → 6 mm |
| Shock absorber | <u>Damping force increased (extend/rebound rate of 0.3 m/s)</u> Front: 1870/1800 N → 2030/1920 N Rear: 2860/2210 N → 2960/2360 N |



Front



Rear

N-GTS

■ Aluminum wheels

Through design changes, the exposed area of the disc surface has been expanded, improving brake cooling performance.



Specification differences from the standard model

Design changed

Twin spoke → Mesh

New design expands exposed disc surface area

Front: 4% increase
Rear: 7% increase

The grip of the POTENZA RE070 tires designed to perform best on dry roads. Refrain from driving at high speeds on wet surfaces, such as on a highway in the rain, as the Nürburgring Package is fitted with wide tires that have narrow tire tread grooves that may increase the risk of hydroplaning. The high-grip tread compound may crack during extremely cold temperatures. Therefore, refrain from driving or storing the tires in temperatures of -4°F (-20°C) or lower.

Interior

In order to further pursue emotive performance in the Nürburgring Package, a weight reduction of the interior equipment has been achieved.

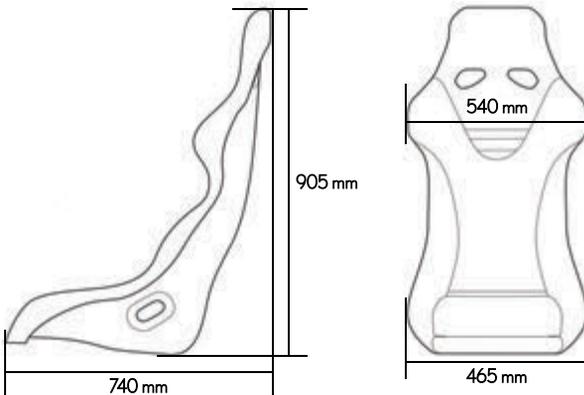
The adoption of full bucket seats and exclusive CFRP (Carbon Fiber Reinforced Plastics) parts reduced vehicle weight and helped contribute to improved drivability. Additionally, the adoption of these interior parts raises the expectation of driving.

■ Full bucket seats (Europe only)

In the Nürburgring Package, full bucket seats (RECARO RS-W) have been adopted to secure a stable driving position across a variety of driving conditions.

For the frame, lightweight and high-rigid CFRP has been adopted, improving drivability due to a vehicle weight reduction and achieving a high level of holding performance even during sharp turns.

Additionally, while maintaining side support performance, the shape of the seats have been optimized, increasing the ease of getting in and out of the vehicle and improving daily usability of the vehicle when compared to those used on racing vehicles.



N-018

■ Holding performance

Even during sharp turns, the full bucket seats hold the driver's body without allowing any body movement and support accurate steering operations and pedal work.

Also, by keeping one's posture, eyepoint is maintained, making it possible to judge distances and respond to object recognition correctly.

With the Nürburgring Package, the full bucket seat's high holding performance enables a precise driving position to be held, allowing the driver to enjoy driving at their will.

■ Weight reductions

The weight applied to the center of the vehicle is reduced by adopting lightweight and high-rigid CFRP for the seat's frame and Alcantara^{®*} for the seat's upholstery, contributing to an improvement in driving performance.

*: "Alcantara[®]" is a registered trademark of Alcantara S.p.A.

Full bucket seats

[Adjustment]

Lift the lever beneath the seat to adjust the seat forward or backward.

[Maintenance]

The seat cushions can be removed.

Remove the seat cushions to clean away dust under the cushions.



N-039

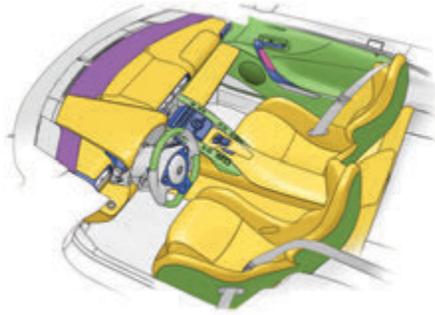
[Label attached to the seat cushion]

The procedure for removing the seat lever is written on the label located under the seat cushion. Take care not to scratch the label when cleaning.

■ Materials used for each component

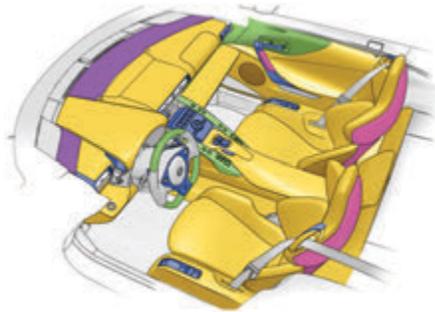
Alcantara®*1 and CFRP have been used for many of the non metal-accented interior components in the Nürburgring Package model, achieving a reduction in vehicle weight and an enhanced sense of quality.

<Europe only>



N-044

<Except Europe>



N-045

-  Matte-coated CFRP
-  Clear-coated CFRP
-  Satin finish metal accent
-  Alcantara®*1
-  Genuine leather

■ Maintaining the vehicle's interior ^{*2}

■ Alcantara[®]*1 areas

After wiping dirty surfaces with a dampened soft cloth, wipe away any remaining moisture with a soft, dry cloth.

■ CFRP/Satin finish metal accent areas

After wiping dirty surfaces with a dampened soft cloth or synthetic chamois, wipe away any remaining moisture with a soft, dry cloth.

■ Leather areas

Remove dirt and dust using a vacuum cleaner and wipe the surface with a dry, soft cloth to remove any remaining moisture.

*1: "Alcantara[®]" is a registered trademark of Alcantara S.p.A.

*2: Refer to the Owner's Manual for details and cautions regarding the maintenance of each component.

Removing and installing floor mats

Floor mats are not provided on Nürburgring Package models.

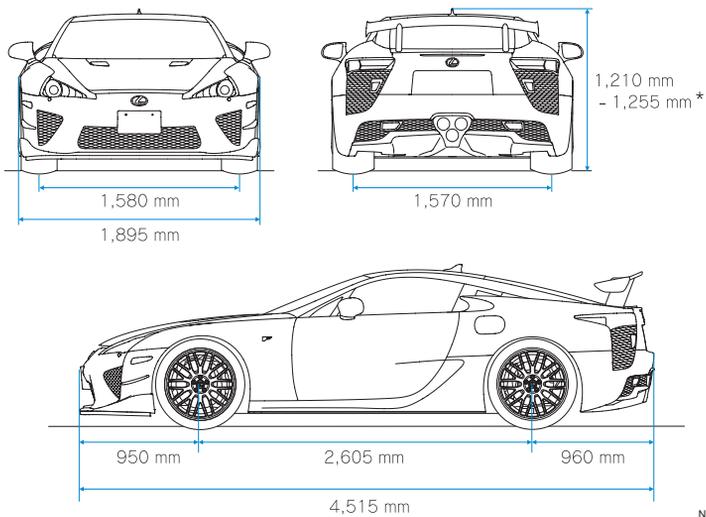
Vehicles with power seats: If installing floor mats, ensure that then only use LFA-exclusive floor mats. Refer to the Owner's Manual for details and cautions regarding installation.

Vehicles with full bucket seats: Do not install floor mats. If floor mats are installed, the floor mat retaining hooks (clips) may interfere with the seat when the seat is adjusted, preventing the correct seat position from being reached.

Technical information

Major Dimensions & Vehicle Weights

| | |
|--------------------------------|----------------------------------|
| Seating Capacity | 2 |
| Minimum Ground Clearance | 100 mm |
| Curb Weight | 1,480 kg-1,590 kg* |
| Gross Vehicle Weight Rating | 1,660 kg-1,755 kg* |
| Fuel Tank Capacity (Reference) | 73 L (19.3 gal., 16.1 Imp. gal.) |

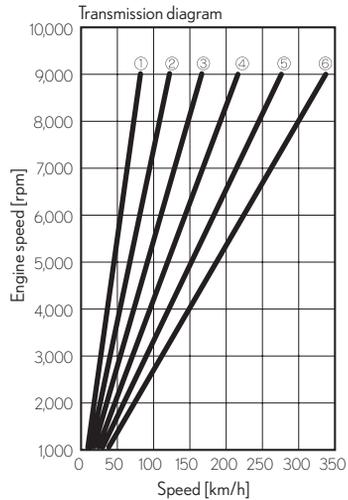
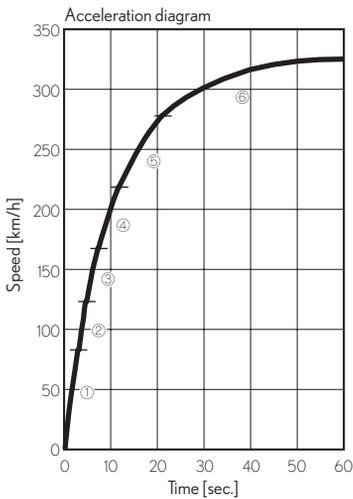


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*: Figures vary according to equipment and destination.

Performance

| | | |
|--------------------------------------|---------------|----------|
| Max. Speed | | 325 km/h |
| Acceleration (with two occupants) | 0 to 100 km/h | 3.7 sec. |
| Max. Allowed Speed | 1st | 83 km/h |
| | 2nd | 123 km/h |
| | 3rd | 167 km/h |
| | 4th | 218 km/h |
| | 5th | 277 km/h |
| | 6th | - |
| Turning Diameter (outside front) | Wall to Wall | 6.1 m |

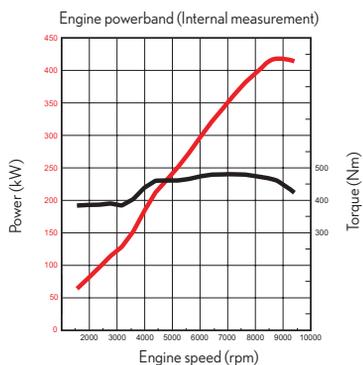
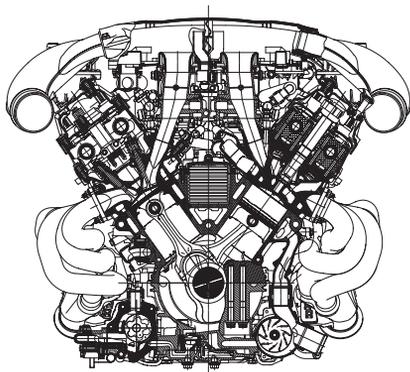


Engine

| | | |
|----------------------------------|----------------------------------|----------------------------------|
| Engine Type | 1LR-GUE | |
| No. of Cyls. & Arrangement | 10-cylinders, 72°V type | |
| Valve Mechanism | 40-valve DOHC, Rocker Arm Type | |
| Bore x Stroke | 88.0 mm x 79.0 mm | |
| Displacement | 4,805 cm ³ | |
| Compression Ratio | 12.0:1 | |
| Spark Plug Type ¹ | PK22HTBR-L8 (DENSO) | |
| Engine Oil | "Mobil 1 5W-50" API SM or SN | |
| Engine Oil Capacity ² | Single Oil Cooler | 13.5 L (14.2 qt., 11.9 Imp. qt.) |
| | Twin Oil Cooler | 14.5 L (15.3 qt., 12.8 Imp. qt.) |
| Lubrication Type | Dry Sump | |
| Coolant Type | Super Long Life Coolant | |
| Coolant Capacity | 25.5 L (26.9 qt., 22.4 Imp. qt.) | |
| Max. Output (SAE-NET) | 420 kW (571 PS) 8,700 rpm | |
| Max. Torque (SAE-NET) | 480 Nm (48.9 kgf•m) 7,000 rpm | |
| Maximum Engine Speed | 9,000 rpm | |

¹: The spark plugs have been developed exclusively for the 1LR-GUE engine.

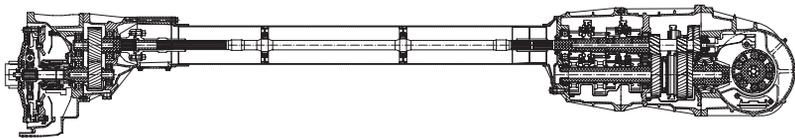
²: The figure shown is the total amount of oil contained in the engine, and not the amount of oil required for an oil change.



Clutch and Transaxle

| | | |
|----------------------------------|---------------|---------------------------------------------|
| Clutch | Type | Dry Single-Plate Clutch Diaphragm Spring |
| | Operation | Hydraulic Cylinder |
| Clutch Cover | Type | Diaphragm Spring Turnover |
| Clutch Disc Diameter | | 240 mm |
| Transaxle Type | | ASG (Automated Sequential Gearbox) |
| Transaxle Model | | RB60M |
| Front Counter Gear Ratio* | | 1.259 |
| Transaxle Gear Ratios | 1st | 3.231 |
| | 2nd | 2.188 |
| | 3rd | 1.609 |
| | 4th | 1.233 |
| | 5th | 0.970 |
| | 6th | 0.795 |
| | Rev | 3.587 |
| Differential Gear Ratio | | 3.417 |
| Differential Type | | TORSEN® LSD |
| Rear Transaxle Gear Oil | Oil Viscosity | "LT 75W-85" API GL-5 |
| Rear Transaxle Gear Oil Capacity | | 5.3 L (5.6 qt., 4.7 Imp. qt.) |

*: The front counter gear is lubricated by engine oil.



Brake and Tires

| | | |
|------------------------|-------|-----------------------------------------------|
| Brake Calipers | Front | Opposed 6-piston monoblock |
| | Rear | Opposed 4-piston monoblock |
| Brake Rotors | | CCM (Carbon Ceramic Material) |
| Brake Rotor (diameter) | Front | φ390 mm x 34V |
| | Rear | φ360 mm x 28V |
| Brake System | | ECB (Electronically Controlled Brake) |
| Brake Fluid Type | | FMVSS No.116 DOT3 |
| Brake Fluid Capacity | RHD | 1.2 L (1.3 qt., 1.1 Imp. qt.) |
| | LHD | 1.1 L (1.2 qt., 1.0 Imp. qt.) |
| Parking Brake | | EPB (Electric Parking Brake) |
| Wheel Size | Front | 20 x 9.5J +45 |
| | Rear | 20 x 11.5J +45 |
| Tire Size | Front | 265/35ZR20 (95Y) |
| | Rear | 305/30ZR20 (99Y) |
| Suspension Type | Front | Double Wishbone |
| | Rear | Multi-link |
| Steering Gear Type | | Rack and Pinion |
| Steering Gear Ratio | | 14.3 |
| Lock to Lock | | 2.35 |
| Power Steering Type | | EPS (Electric Power Steering) |
| Stability Control | | VDIM (Vehicle Dynamics Integrated Management) |

Electrical System

| | |
|-------------------------|----------|
| Battery Size | S75D31R |
| Voltage & Amp.hr. (5HR) | 12V-56AH |
| Alternator Output | 2,640 W |
| Starter Output | 1.7 kW |



