LEXUS LFA
The LFA marks a watershed point for Lexus – its global debut marks the spectatorial arrival of a new flagship for the F portfolio of Lexus performance models. The creation of an exclusive and highly focused band of performance-oriented engineers, the LFA represents the distillation of their passion, engineering genius and pride. In an ever-increasing market place it is, unsurprisingly, unique – a Lexus that single-handedly creates new boundaries to redefine the Japanese supercar for the 21st Century.

"From the very beginning of automobile history, supercars have represented dreams, hopes and aspirations," explains Haruhiko Tanahashi, chief engineer of the LFA's development programme. "For Lexus, a brand that aims to provide customers enlightened moments and memorable experiences, the development of a world-class supercar was an indispensable next step."

That indispensable next step centred on the creation of a supercar that would deliver the supreme driving experience. To achieve this uncompromising goal, Tanahashi-san and his team created the LFA from scratch – a true clean-sheet design. And in a radical departure from standard Lexus development practice, they approached the LFA from a non-traditional angle, pushing their technological, material and engineering boundaries at every step.

The result is the rear-wheel drive LFA, a dynamically styled supercar powered by a sophisticated new high-revving 4.8-litre V10 engine that generates 412kw/560hp and 480Nm of torque for adrenalin-fuelled 325km/h performance. This bespoke powerplant is hooked up to a unique six-speed Automated Sequential gearbox (ASG) with paddle shifters for ultimate driver control. Linked by a rigid torque tube for excellent drivetrain integrity, the ASG is located in a transaxle layout over the rear axle for an optimal 48:52 front-to-rear weight distribution.

Lightweight, powerful and balanced, the Lexus features advanced Carbon Fibre Reinforced Plastic (CFRP) construction for its chassis and bodywork to deliver a light, incredibly strong and impact-resistant structure. Rather than out-source this sophisticated materials technology, in a radical move, the LFA team developed its own CFRP processes internally for ultimate quality control and to make a sound engineering investment in the future.

Motorsport-developed lightweight aluminium alloy suspension componentry is complemented by Carbon Ceramic Material (CCM) brake discs and an innovative electrically assisted steering set-up. The LFA driver sits in low-slung cabin that is as painstakingly constructed as it is driver focused, with every key control perfectly positioned and every creature comfort catered for.

"The LFA is a thoroughbred supercar, a machine engineered to achieve one single goal – to deliver a supreme driving experience," explains Tanahashi-san. "Over the past decade we have pushed every boundary in the pursuit of this goal. I believe that we have created the most driver-oriented car we possibly could."
SUMMARY

• Global debut of the Lexus LFA - a thoroughbred supercar developed solely in the pursuit of the supreme driving experience
• A supercar unlike any other and one that creates new boundaries to redefine the Japanese supercar for the 21st Century
• Clean-sheet design and development undertaken by an elite Lexus engineering team
• Singular focus on lightweight carbon fibre construction, dynamic balance and usable 325km/h performance
• Production limited to 500 models, each being hand-assembled, with no more than 20 models assembled each month

The LFA is a car of firsts. It is the first supercar developed by Lexus to meet and exceed the company’s exacting standards, and it is the first supercar that is as dynamic and engaging around the nürburgring nordschleife as it is tackling a favourite mountain pass. Featuring advanced carbon fibre technology, a high-revving 412kw /560dIn hp 4.8-litre naturally aspirated v10 engine and rear-mounted six-speed sequential transmission, the mid-front engined LFA combines lightweight construction and ideal chassis balance to deliver exhilarating and usable 325km/h performance.

“Ever since the LFA project was started in 2000, my team and I have been driven by a passion to create a world-class supercar, a car to make Lexus proud,” says Tanahashi-san. “For Lexus - a brand that aims to provide customers with enlightened moments and memorable experiences - the development of a world-class supercar with real visual drama was an indispensable next step.”

In 2000, Tanahashi-san and his close-knit team embarked on one of the greatest engineering challenges Lexus had ever faced. The project would focus their minds on new technologies, new materials and new processes as they strove to create the car they envisaged, irrespective of the difficulties they encountered in the process. In doing so they would create a dynamic new approach point for Lexus, which would recalibrate the company’s approach to the design of all its models.

Weight-saving measures were taken at each and every step of the LFA’s development. They include a high-strength Composite Reinforced Plastic (CRFP) monoque chassis and bodywork – a world first for Lexus – as well as carbon ceramic material brake discs, and extensive use of aluminium, titanium and magnesium in the powertrain and transmission assemblies. Even the steering wheel employs carbon fibre elements to make it lighter and more natural in its responses – a typically driver-centric detail of the LFA. With a low 1480kg kerb weight, the LFA steps confidently into the supercar arena with an effective power to weight ratio of 378dIn hp/278 kw per tonne.

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“The LFA is a car with relentless power delivery and an accompanying exhaust note to give you goose bumps,” enthuses Tanahashi-san. “It successfully brings together motive performance, measured by times and graphs, and emotive power – that inexpressible performance that can only be felt in one’s heart and soul. While conventional cars focus on the destination, the LFA is all about the journey.”

Only 500 LFA vehicles are planned for production, all hand-assembled by skilled technicians at a rate of no more than 20 per month. Although these inspirational, dreamlike moments will unfortunately only be experienced by a lucky few, says Tanahashi-san, “I firmly believe the spirit of the LFA will be the pride of any Lexus admirer.”
POWER AND PERFORMANCE
CARBON FIBRE REINFORCED PLASTIC CONSTRUCTION

• Radical rethink sees LFA switch from aluminium to Carbon Fibre Reinforced Plastic (CFRP) construction to achieve exceptional dynamic integrity and performance-enhancing light weight construction.
• A trio of sophisticated CFRP moulding processes for an impressively low 1480kg kerb weight – an estimated 100kg saving over an equivalent aluminium construction.
• CFRP technology pioneered internally by an elite team of materials engineers to meet Lexus’ exacting standards.
• Pursuit of the new technology results in an advanced new joining process for CFRP and metal alloys.
• Internal development means this world-class quality CFRP production process is primed for future mass production applications.

According to Haruhiko Tanahashi, chief engineer of the LFA’s development section create an exceptionally stiff and strong structure, it would also deliver an equivalent aluminium construction. Working with CFRP would also significantly reduce the lengthy manufacturing time for the LFA’s componentry. The decision to develop its own CFRP materials technology would also ensure the quality of the carbon fibre used met with Lexus’ own stringent standards.

Unlike the handful of performance vehicles that feature CFRP construction, the advanced resin technology used in the LFA’s chassis is the same employed in today’s most cutting-edge aerospace programmes, favoured for its unmatched weight and strength qualities. This extensive use of CFRP accounts for 65% of the LFA’s body-in-white weight, with aluminium alloys comprising the remaining 35%. Lightweight CFRP was even used for the bonnet support strut, replacing the traditional, and heavier, hydraulic bonnet struts.

Three different CFRP moulding processes were employed in the structure, according to its dynamic load, form and structure, location, the expansive, and labour intensive, Prepreg hand-laid process, where carbon fibre sheets impregnated with liquid thermosetting resin are moulded, heated and pressed in a furnace, was primarily used for the cabin to create a hugely stiff and stable structure.

CFRP for the integrated floor panel and transmission tunnel, roof and bonnet was produced using the Resin Transfer Moulding (RTM) process, where liquid resin is impregnated into dry preformed carbon fibre before being heated and cured. And the Sheet Moulding Compound process, where short fibre materials are hot pressed in a die, was used to manufacture the C-pillar and its supports as well as the rear floor.

And in a move that underlines Toyota Motor Corporation’s origins as and of the world’s most advanced textile weaving companies – a vital historical resource that Tanahashi-san’s team drew on when developing the LFA’s CFRP structure – the undersides of both the bonnet and boot lid were left unpainted to leave the naked CFRP on display.

As well as pioneering the use of CFRP at Lexus, the LFA team also focused their attention on how best to join the carbon fibre and metal components – traditionally a complicated process. Most joining process use a threaded aluminium insert that is wrapped in CFRP, but the LFA team decided against this method. Instead, they developed an innovative system quite different to traditional methods, pressing on threaded aluminium pins or direct CFRP contact, it employs a flanged aluminium collar to link the two materials and overcome the inherent weaknesses in such joints.

While this switch to CFRP construction pushed back the LFA’s market debut, it was exactly the kind of evaluation embodied by the spirit of the LFA team to push against all new boundaries in the pursuit of excellence. The result was that within a short three-year period, the engineers not only mastered carbon fibre production for the LFA but also developed groundbreaking new processes to create a new LFA that was stronger, stiffer and lighter than any metal-based alternative could ever be.

Drawing on Toyota Motor Corporation’s legacy of weaving and loom-making expertise, the spirit of LFA team – the Toyota LFA project manager Sayuki Iwai – is now primed for future mass production, and will prove invaluable when it comes to work on future Lexus projects.
EnGinE

• breathtaking performance from an all-new 4.8-litre V10 powerplant rich in motorsport technology
• High-revving engine develops an exceptional 412kW /560dIn hp at 8700rpm and 480nm of torque at 6,800rpm
• Rear-wheel drive LFA rockets to 100km/h in 3.7 seconds and has a top speed of 325km/h
• Low-friction powerplant features motorsport-developed independently controlled throttle body for each cylinder and dry sump lubrication
• Front-mounted engine: V10 as small as a traditional V8 engine and as light as a conventional V6 engine yet generates 85.7 kW /117dIn hp per litre

“what we needed – and what we have created – is a car that moves the driver in more ways than one,” explains Haruhiko Tanahashi, the LFA’s chief engineer. “the LFA is a car that stirs all the senses.”

At the heart of the LFA lies a bespoke v10 engine that sets new automotive standards for compact dimensions, lightweight architecture and scintillating performance. From the outset, tanahashi-san and his engineers determined the LFA’s front mid-mounted powerplant would have a 4805cc capacity, would develop 412kw /560dIn hp and rev to a wailing 9,000rpm redline. it would feature a wide 72° angle between cylinder heads – the perfect angle for both primary and secondary balance in a v10 engine for incredibly smooth running characteristics. It would be naturally aspirated for a linear and predictable power delivery, with exceptional throttle response from individual, electronically controlled throttle bodies for each cylinder.

It would feature a dry sump lubrication system that would not only position the block deep within the engine bay to lower the centre of gravity and lower the car’s moment of inertia, but also enable the engine to handle sustained, high-speed cornering. And it would deliver exceptional mid-range responsiveness as well as a powerful top-end performance.

The V10 powerplant generates 480Nm of torque at 6,800rpm. the application of intelligent vVT-i variable valve timing on both intake and exhaust combined with equal length exhaust manifolds and high-volume 12-hole fuel injectors results in 90% of this formidable torque being available between 3,700rpm and the 9,000rpm red line, for searing in-gear acceleration at any engine speed and in any gear. the result is a 0-100km/h time of just 3.7 seconds and a top speed of 325km/h – exhilarating performance from a bone fide supercar.

with a low 1480kg kerb weight – achieved by the extensive use of lightweight carbon fibre reinforced plastic (CFRP) for the chassis and bodywork – and an explosive 412kw /560dIn hp, the LFA steps into the supercar arena with a heady power to weight ratio of 278 kw /378 dIn hp per tonne. the combination of a high, 12:1 compression ratio, low friction internals and optimised intake and exhaust flow results in the LFA’s powerplant developing an exceptional 85.7 kw/117dIn hp per litre, one of the highest specific outputs amongst the current crop of supercars.

Alongside the low kerb weight vital – the key to achieving these incredible goals was the use of exotic and innovative materials including titanium and magnesium, an unwavering focus on low inertia and, wherever possible, the exploitation of cutting-edge motorsport technologies.

Naturally, the valvetrain came under intense scrutiny, and as a result, the engine’s cylinder head features elements more likely to be found on a racecar than a road-going two-seater coupe. Titanium valves and connecting rods – a full 40% lighter than the equivalent iron component – are complemented by ultra-lightweight solid rocker arms with Diamond-Like Carbon with Silicon coating and integrated oil jets.

Further track-inspired highlights include forged aluminium pistons, low-inertia cylinder-shaped valve springs, a fully integrated lightened crankshaft with paired cylinder valley designed to reduce pumping losses and a magnesium alloy cylinder head cover. A dual air intake system also enhances engine performance, switching from a primary inlet port to low to medium engine speeds to dual ports at higher revs to boost breathing efficiency.

Drawing on its motorsport experience (the LFA competed in the gruelling Nürburgring 24 Hours race in Germany in both 2008 and 2009) the LFA team also engineered the powerplant with a track-oriented dry sump system, allowing it to withstand sustained cornering forces in excess of 2G –
This necessitated the need for a digital rev counter, since an analogue system simply could not keep pace with the engine's incredible ability to gain and lose revolutions. To further reduce the engine's size, the valley between the cylinder heads accommodates both oil cooler and the Positive Crankcase Ventilation (PCV) chamber. Equipped with passages that lead to different areas of the crankcase, the PCV ensures the continual and effective evacuation of gases from within the crankcase.

The result is a powerplant like no other, one that instantly redefines the size and weight characteristics of ultra-high performance engines. While the LFA's cutting-edge V10 is as small as a traditional V8 engine and as light as a conventional V6 engine, it delivers undiluted supercar performance. At 9,000rpm its pistons are moving at approximately 25 metres a second, making it one of the highest revving and most powerful engines ever unleashed in production. Despite its formidable performance, the exotic materials used in its construction and its incredibly high tolerance levels, the LFA's powerplant meets the same reliability and refinement standards as any other Lexus powerplant.

It also exceeds stringent Euro V emission regulations, helped by an air injection system that ensures the engine starts up smoothly even after a cold start. The LFA's powerplant meets the same reliability and refinement standards as any other Lexus powerplant.

This groundbreaking engine was developed in conjunction with Yamaha, the result of the collaborative structure that exists between Toyota Motor Corporation and the Japanese engineering specialist. This Yamaha-assisted development was controlled and managed by Toyota at each crucial stage to meet its exacting standards.

GEARGEARBOX

- Lighting-quick Automated Sequential Gearbox (ASG) that always puts the driver in full control
- Six-speed ASG drives the rear wheels through a ultra-stiff torque tube for exceptional drivetrain integrity
- Unique paddle-shift feeling, with the choice of seven gears
- Transaxle layout over the rear axle results in an ideal 48:52 weight distribution for exceptional cornering agility and high-speed controllability
- Ultra quick shifts – carried out in just 0.2 seconds – complemented by four driving modes – AUTO, SPORT, NORMAL and WET for exceptional versatility

While many believe that a 50:50 weight distribution is the most desirable for a high-performance sportscar, the perfect weight ratio for any vehicle is one that will allow it to live up to its full dynamic potential. With this in mind, the LFA's development engineers aimed for a 48:52 weight distribution, a balance that combines the controllability and straight-line stability of a front-engined rear-drive layout with the handling dynamism and cornering agility of a mid-engined rear-drive platform.
Operated by steering wheel column-mounted paddle shifters, the ASG transmission works hand-in-glove with the engine to put the driver in full control even under the most extreme driving conditions. Fitted with micro-polished gears for precise gearshifts and to reduce gear whine, this intelligent transmission is engineered to execute incredibly quick gearshifts, and can upshift in just 0.2 seconds.

In addition to the traction-enhancing limited slip differential, the ASG transmission also features four driving modes – AUto, SPort, norMAL, and wEt – actuated by a dash-mounted Mode dial. Featuring specific gearshift programming, each mode has its own engine and brake control logic systems, allowing the driver to select the mode best suited to under-tyre conditions.

Engine Mounts

In Auto mode, the shift speed is fixed in the second speed stage for smooth and comfortable gear changes. The LFA’s strong driver-centric focus is perfectly encapsulated by the operation of the paddle-shifters. As well as being fixed onto the steering column rather than the wheel itself so that the driver doesn’t have to hunt for them during cornering, the force necessary to operate the right-hand upshift paddle and left-hand downshift paddle is different. While the upshift requires the slightest flick of the fingers, the downshift paddle requires more effort to enhance the mechanical link between driver and transmission.

Engine and transmission are connected by a torque tube that unites the drivetrain to create a rigid and flex-free link between powerplant and transaxle – a crucial element in the LFA’s ultra-stiff chassis construction. Fitted with rubber insulators, this tube allows the engine mounts – two on either side of the block – to be spaced further apart, mimicking unwanted powertrain movement.

The two mounts supporting the transaxle have been located as close to its centre of gravity as possible, and adjacent to the connection between differential and transmission cases to further reduce unwanted vibrations. These engine and transmission mounts were developed and tuned based on feedback gathered from the LFA after it competed in the gruelling Nürburgring 24 Hours race in 2008 and 2009.

Together, this exceptionally advanced engine and transmission define the LFA’s unique character. It’s a bone-fide supercar for the track as much as the road, one with the ability to deliver relentless adrenaline-fuelled performance.
The superb acoustics of the LFA’s V10 engine have been acoustically tuned to deliver a unique and nape-tingling Formula 1-inspired soundtrack:

- Horizontally split intake surge tank mimics the acoustic chambers of wind and string instruments for a rich and resonant bass.
- Tuned large diameter, equal-length exhaust manifolds run through a lightweight titanium dual-stage main silencer.
- Motorsport-inspired main silencer features valve-actuation and lightweight titanium construction.
- Three acoustically optimised sound channels ensure the LFA’s cabin is filled with the engine’s sonorous intake and exhaust soundtracks.

“The Lexus LFA is a car with relentless power delivery and an accompanying exhaust note to give you goose bumps,” enthuses its chief engineer Haruhiko Tanahashi. He and his team have enhanced and fine-tuned the acoustics of the LFA’s ground-breaking V10 powerplant to deliver an awe-inspiring soundtrack – from rumbling idle note to a nape-tingling red-line wail – for those both inside and outside of the cabin.

The LFA’s acoustic team studied the unmistakable soundtrack generated by a Formula 1 car at maximum revs. By emphasising the secondary combustion frequency of the LFA’s engine and then introducing primary, secondary and tertiary firing harmonics, Tanahashi-san and his team created a signature exhaust note unlike that of any other road car and called it ‘Octave Harmony’.

This incredible soundtrack that significantly enhances the sensation of acceleration and speed was only made possible by meticulously tuning the LFA’s four-stage exhaust system. The left and right banks of the engine feature separate, equal-length, large diameter exhaust manifolds that not only enhance high-rev torque levels but also create a crisp and harmonious sound quality. After exiting the catalytic converters, the separate left and right exhausts flow through a smaller silencer box and then into the main multi-stage silencer housed behind the rear transaxle gearbox.

The main silencer features lightweight titanium construction, and employs a valve-actuated, dual-stage structure that channels exhaust flow according to engine speed. At 3,000rpm and below, the exhaust valve remains closed to route the exhaust through multiple chambers for an unobtrusive exhaust note. Above this threshold, the valve opens, letting the exhaust bypass the chambers, flow into a single resonance chamber and exit directly through the LFA’s strikingly stacked trio of exhaust outlets.

As well as tuning the exhaust note, the V10’s induction system was also modified to complement the engine’s acoustic qualities. The powerplant’s uniquely formed horizontally split resin surge tank mimics the acoustic chambers of wind and string instruments. At up to 4,000rpm, it emits the engine’s primary firing frequency of 300Hz. This changes to 400-500Hz as the engine revs climb to 6,000rpm, before peaking at 600Hz as the engine wails towards its 9,000rpm redline. In addition, the V10’s primary air intake port is fashioned from porous duct material to generate bass to mid-range tones. Tanahashi-san and his team called this acoustic effect the ‘Resonated Complex Harmony’.
The engine’s induction and exhaust soundtrack are carefully channelled into the LFA’s cabin. The main sound channel that pipes in the engine’s induction notes runs from the surge tank through into the cabin below the main dash panel. This is complemented by two further sound channels - the upper cowl opening and the lower reflector.

The upper cowl opening, positioned at the top of the dash structure, is mainly responsible for piping mid- to high-range tones directly into the cockpit, while the lower reflector at the base of the cabin envelopes the LFA’s occupants in rich and resonant engine notes. Along with the primary sound channel, these two acoustic enhancers ensure the driver sits at the centre of what the LFA team call the 3D Surround Sound Concept – a stirring soundscape that also acts as a constant aural reminder of the engine’s performance.
DYNAMICS
BALANCE

- The LFA delivers superb dynamic balance in every situation, allowing the driver to fully exploit its V10 engine’s incredible performance.
- Mid-front engine mounting with a rear transaxle layout delivers the ideal 48:52 front-to-rear weight distribution vital for optimal dynamic balance.
- Front and rear aluminium subframes are mounted on to an advanced Carbon Fibre Reinforced Plastic (CFRP) cabin section.
- All major ancillary components are weight-optimised and located within the wheelbase, including the saddle-shaped 73-litre fuel tank and boot-mounted battery.

While the LFA is always the driver that takes the lead, says chief engineer Haruhiko Tanahashi, “and the vehicle follows.” Before embarking on the LFA programme, Tanahashi-san and his development team were acutely aware that the car’s fundamental architecture would determine its dynamic behaviour. Only a car with perfect dynamic balance would allow Tanahashi-san to achieve his goal of developing a supercar worthy of the Lexus badge.

The dynamic balance of the car being paramount, Tanahashi-san opted for a mid-front engine mounting with a rear transaxle. Not only would this classic layout deliver the ideal 48:52 front-to-rear weight distribution vital for an ultra-high performance vehicle, but it allowed the driver and passenger seats to be positioned lower and closer to the centre of the car for enhanced weight distribution, allowing the driver and passenger seats to be positioned lower and closer to the centre of the car for enhanced weight distribution.

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Lightweight aluminium brake callipers are positioned towards the vehicle’s centre of gravity, helping to further lower the moment of inertia, while the disc sizes themselves are fashioned from lightweight Carbon Ceramic Material (CCM), saving a full 20kg (5kg per wheel) over traditional steel discs.

The LFA’s battery is located directly over the back axle, while the rear-mounted radiators and their electric fans are also mounted behind the transaxle to achieve ideal weight distribution, a balance helped by locating the screen washer bottle and Electric Parking Brake (EPB) unit in the rear of the car. Moreover, stacking the torque tube above rather than alongside the exhaust pipes has created a narrower central transmission tunnel, in turn allowing the driver and passenger seats to be positioned lower and closer to the centre of the car for enhanced weight distribution.

- Two-piece CCM brake discs deliver exceptional fade-free braking performance and a longer life than conventional steel.
- Large 390mm diameter front discs are gripped by six-piston, aluminium opposed monoblock callipers; the 360mm diameter rear discs feature four-piston aluminium opposed monoblock callipers.
- Highly rigid monoblock callipers fitted with differential pistons ensure that the brake pads are evenly loaded and fit perfectly throughout.
- A floating disc construction, with 10 bushings connecting the centre hub to the disc, reduces vibrations and ensures the disc is perfectly aligned with the wheel hub at all times.

BRAKING

- The LFA’s development team switched from steel to Carbon Ceramic Material (CCM) brake discs for the ultimate in braking performance.
- The LFA’s braking system has been precisely tuned to provide a level of high-speed stopping power and anti-fade performance that gives the driver utter confidence irrespective of speed, road or weather conditions. Compared to conventional steel brake discs, CCM discs also deliver exceptional fade-free braking for confidence-maxing performance under even the most demanding of driving conditions.

Appropriate to the immense power of this high-revving V10 engine, chief engineer Haruhiko Tanahashi and his team equipped the LFA with one of the most advanced and powerful braking systems fitted to a production car. “In order to go, you have to be able to stop,” explains Tanahashi-san, “and we have engineered the LFA brake system to give any driver the confidence to explore speeds in the realms of 325km/h.”

While the LFA development car that competed in the 2008 and 2009 Nürburgring 24-hour races used conventional steel brake discs, Tanahashi-san initiated a switch to advanced Carbon Ceramic Material (CCM) brake discs. The LFA development car that competed in the 2008 and 2009 Nürburgring 24-hour races used conventional steel brake discs, but the LFA production car that competed in the 2009 Nürburgring 24-hour race used advanced carbon ceramic Material (CCM) brake discs.

- The two-piece brake discs are made of Carbon Ceramic Material (CCM), chosen for its lightweight nature and long service life. Those at the front measure 346mm in diameter, are 34mm thick and are gripped by six— V10 engine
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piston, aluminium, opposed monoblock callipers, while the rear discs - 360mm in diameter and 28mm thick - feature four-piston aluminium opposed monoblock callipers.

The monoblock callipers combine high rigidity with a lightweight design, and the LFA engineers specified differential bore sizes - 38mm, 32mm and 28mm at the front, 30mm and 28mm at the rear - to allow pressure from the unequally sized pistons to push the pad against the rotor in a progressive pattern. Here, the larger leading piston applies the least force, with the trailing piston applying the most. The resultant 'self-servo effect' forces the disc's rotational movement to squeeze the pad more evenly for significantly more effective pressure distribution.

To ensure constant stopping power regardless of brake temperature and vehicle speed, the brake discs are gripped by bespoke, high-friction micron pads that are manufactured exclusively for ccM brake discs, and feature a larger swept friction-generating pad-to-disc contact. Pad wear at each corner is monitored by the LFA's Electronic Pad Wear Indicators, which monitor the state of the pads and inform the driver with an audio-visual warning should they need attention.

The brakes feature a floating disc construction, with 10 bushings connecting the centre hub to the disc. As a result, disc deformation due to expansion at high temperatures is more readily absorbed to reduce vibrations under braking. Extensive use of Computational Fluid Dynamics (CFD) in the development of the brakes resulted in a 20% improvement in cooling efficiency for enhanced performance, without interfering with the car's overall aerodynamic performance. In addition, a highly reliable internal fluid passage has been adopted to connect the inner and outer calliper sections to offer better protection from debris kicked up during driving, and the pistons are thermally insulated to help suppress vapour lock during high-performance driving.

To control a brake booster that multiplies the driver's own brake input, a setup where brake performance and effectiveness will vary depending on the amount of engine vacuum present at any given time, the braking system comes under the control of the Electronically controlled Brake (ECB) system. Conventional brake systems use an engine-generated vacuum. The ECB system uses an electric pump to generate hydraulic pressure, providing consistent braking power under any conditions without relying on engine vacuum for effective braking.

**Suspension**

- The LFA's track-tuned suspension was engineered after intense development work at the Nürburgring Nordschleife circuit for optimal balance between control and comfort
- The bespoke double wishbone front and multi-link rear suspension layout is aluminium alloy intensive for high strength and low weight
- The aluminium, remote-reservoir monotube dampers are the same as those fitted to the LFA Nürburgring 24 Hour racecar
-Forged aluminium knuckles and suspension arms, and hollow anti-roll bars further reduce unsprung weight
- The LFA's 20-inch forged aluminium wheels are shod with asymmetric Bridgestone tyres - 265/35 ZR20 at the front and 305/30 ZR20 profile at the rear

**Front Brake Disc: Opposed 6-Piston Monoblock Callipers**

**Rear Brake Disc: Opposed 4-Piston Monoblock Callipers**

**Self-servo effect**

- Piston to pad pressure
- Pad to disc pressure (including self-servo effect)
- Equal piston sizes
- Leading trailing
- Differential piston sizes
The LFA rides on a new, high-performance, double wishbone front and multi-link rear suspension layout, developed after extensive work at the Nürburgring Nordschleife, to deliver clear and vital steering and chassis feedback to the driver, perfectly balancing on-the-limit capability, exceptional levels of grip and secure high-speed stability.

Manufactured from aluminium, the hollow suspension members are stiff and strong enough for track work, this rigidity effectively controlling tyre contact patch and toe angle when cornering, delivering excellent cornering control, both at initial turn-in and mid-turn, and exceptional levels of outright traction.

The two independent lower wishbones feature an H-beam profile rather than a traditional I beam for added strength. They shorten the offset of the virtual kingpin axis from the tyre centreline for excellent road compliance and neutral response in all driving situations. The straight extended arms reduce unwanted suspension movement for exceptional grip over undulating surfaces, while the aluminium, remote-reservoir monotube dampers are the same as those fitted to the LFA Nürburgring 24 Hour racecar.

Developed exclusively for the LFA for their uncompromised straight-line and cornering dampening force at any speed, the dampers feature piston rods coated in a Diamond-Like carbon compound and Nickel-Silicon plated cylinder walls for exceptional, friction-free response. The remote reservoir cylinders employ expanding and contracting metal bellows that are connected to the main cylinder via base valves.

Focused on lowering weight wherever possible, the suspension features forged aluminium knuckles and suspension arms to further reduce unsprung weight and maintain high-speed stability, as well as hollow anti-roll bars.

To ensure exceptional chassis rigidity, the LFA features ingeniously engineered bracing along the bottom of the chassis to create a rigid and robust platform for the suspension members and to balance the LFA with high torsional and flexural rigidity needed to effectively manage the high G-loads encountered at extreme speeds.

Born out the LFA’s two gruelling Nürburgring 24 Hour races, the front and rear cross bracings are connected by a lattice-style central brace. This bracing is complemented by a CFSP performance rod and aluminium delta braces, which connect the right and left upper and lower members of the front chassis.

The LFA rides on 20-inch forged BBS aluminium wheels. To forge these intricate 10-spoke wheels, billets of aluminium are heated to 450°C before entering a 9,000 tonne capacity press applying approximately four tonnes per cm² of pressure. Unlike a cast wheel that has a porous non-continuous composition, a forged wheel features a dense fibrous composition that significantly boosts the wheel’s strength. Designed to accommodate the large diameter brake discs, they also feature a wide drop center as possible to further reduce unsprung mass.

The wheels are shod with Bridgestone tyres – 265/35 ZR20 at the front and 305/30 ZR20 profile at the rear – that have been developed specifically for the LFA, and feature an asymmetrical tread pattern making them ideal for maximum attack on the track irrespective of the weather conditions.

The specialized needs of the LFA demanded a tyre with greater emphasis on lateral rather than vertical rigidity. This was accomplished by selecting an appropriate tyre cross-section and aspect ratio height after racking up thousands of miles of testing.
The LFA employs a direct-type Tyre Pressure Warning System that constantly monitors air pressure and warns the driver if attention is necessary.

AERODYNAMICS

• The LFA’s stunning style is complemented by class-leading aerodynamics for optimal drivetrain cooling, high-speed stability and superb high-speed handling.

• Extensive aerodynamic wind-tunnel testing has resulted in the LFA’s wind-cheating profile that scores an exceptionally low drag coefficient of just Cd 0.31.

• Sophisticated air-flow management results in precisely controlled airflow over, under and around the LFA.

• The LFA’s carbon fibre rear diffuser and flat underbody generate significant downforce for heightened high-speed security.

• An active rear wing, complete with a Gurney flap on the leading edge, further boosts aerodynamic downforce.

The LFA’s sleek and arresting shape is the work of hundreds of hours of wind-tunnel testing and relentless computer modeling using powerful Computational Fluid Dynamics programming. The result is a supercar with both head-turning looks and extraordinary aerodynamic qualities. Qualities that deliver excellent front and rear downforce distribution, superb high-speed stability and a wind-cheating profile – with its wing retracted the LFA boasts a drag coefficient of just Cd 0.31, an incredible achievement given the degree of downforce generated at high speed.

Optimally shaped aerodynamic components, designed to precisely manage airflow over, under and around the LFA, are effectively positioned throughout the body to enhance steering precision in all conditions. At the front, the centrally positioned bonnet inlet is fitted with rubber seals at the sides to prevent excessive airflow into the engine compartment, ensuring superior aerodynamic performance.

At the point where the A-pillar meets the windscreen the LFA is fitted with small, turbulence-reducing fins to enhance both straight-line and crosswind stability, while four ridges on the inner surface of the wing mirrors help channel air into the rear radiator inlet to further reduce engine coolant temperature.

The lower edge of the front bumper features a lip made of EPDM – a synthetic rubber - that smoothly channels air beneath the car, while the bonnet vents are fitted with fins on the leading and rear edges that allow hot air from the engine compartment to be expelled without disrupting the external air flow over the upper part of the bonnet.

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The LFA’s flanks feature subtle rocker fins to direct airflow along the sides of the car and also control the amount of air exiting from beneath the vehicle during cornering, for greater stability. Air-kick inserts positioned above the rear air intake reduce unwanted turbulence and wheel spats manage the airflow ahead of the wheels, preventing it from spilling into the wheel housing.

The active rear wing, complete with a Gurney flap on the leading edge, deploys in accordance with the vehicle’s speed and driving mode. It is retracted at low speeds or when the car is stationary, but rises at speeds of 80km/h and above, shifting the centre of pressure towards the rear of the car and increasing high-speed stability. As you would expect, the LFA is fitted with a smooth and flat underbody, generating significant downforce by causing air flowing beneath the car to travel quicker than air flowing over the top. This flat undertray works together with a lightweight CFRP rear diffuser, which sweeps upwards at an optimum angle and radius, contributing to excellent high-speed handling and stability.

Steering

The LFA’s race-tuned steering delivers outstanding response and feedback to create the perfect dynamic link between the driver and the car.

The constant rate rack pinion steering system features an innovative column-assist Electric Power Steering (EPS) set-up that creates an instant connection between driver and wheels. The EPS system is engineered to translate the driver’s inputs as accurately and precisely as possible and, in return, provide him with uncorrupted and transparent feedback from the wheels.

Realising these goals called for a high level of rigidity to ensure linear steering performance and seamless feedback, and a reduction in steering system load on the engine to maximise its performance potential. The large diameter column shaft and steering wheel joint create a highly rigid steering column structure, which in turn is mounted directly to the firewall of the central carbon fibre structure using a robust torque-quelling aluminium-alloy support bracket. Further integrity is achieved by fastening the steering gearing housing to the front suspension member with four rigid mounts.

The gearing box also employs a narrow angle joint creating a highly responsive connection that allows even the subtlest of steering inputs to be accurately conveyed to the front wheels. To create a clear and direct link between the driver’s hands and the front wheels, the LFA team developed bespoke powder grease for the motor-driven section of the steering column, which significantly reduces unwanted friction and rotational drag.

With 28mm cut away from its lower half, the flat-bottomed design creates a higher rotational centre closer to the steering wheel’s centre of gravity, making it less affected by centrifugal force. And a lightweight carbon fibre rim and a weighted lower end mitigate the moment of inertia that occurs when winding off lock and returning the wheel to centre, providing the driver with a more natural self-centring steering feel.

The LFA’s tactile steering wheel – which houses the engine start button and instrument information selector switch – has also been designed for ultimate driver control. At just 360mm in diameter, the compact, three-spoke wheel is manually rake and reach adjustable, and perfectly sized for rapid steering inputs.
**EXTERIOR DESIGN**

Sleek, athletic and muscular, the LFA marries supercar styling with contemporary materials and technology. Despite the LFA’s radical styling, the car immediately be identified as a Lexus through adherence to the three key characteristics of the Lexus L-finesse design philosophy. Rooted deeply in Japanese culture, the L-finesse design rationale expresses three fundamental elements: ‘Incisive Simplicity’ or purity; the ‘Seamless Anticipation’ of emotional appeal; and the ‘Intriguing Elegance’ of superlative performance. The LFA’s clean styling is also free of token fripperies, reflecting both the L-finesse design approach to uncluttered design and the mechanical purity that lies beneath its composite skin. Its numerous air intakes and aerodynamic features, for example, fulfil a functional role first and an aesthetic role second – a clear example of form following function in the L-finesse idiom.

The LFA features advanced lighting systems: piercing, bi-Xenon high-intensity discharge headlamps, complete with wiper-linked jet cleaners are complemented by a trio of high visibility LED brake lights. And reflecting LFA chief engineer Tanahashi-san’s ethos of functionality first, the wing mirrors are designed to offset the polished rims of the exhausts. It also features an imperceptible gap between the exhaust pipe and the baffle to enhance its technical appearance.

The LFA’s form following function design ethos is also exemplified in the car’s shoulders into the rear air intakes. Tanahashi-san’s ethos of functionality first, the wing mirrors are designed to offset the polished rims of the exhausts. It also features an imperceptible gap between the exhaust pipe and the baffle to enhance its technical appearance.

The LFA’s rear features a striking exhaust baffle with a trio of stacked exhaust outlets. Finished in heat-resistant black coating, this stainless steel baffle offsets the polished rims of the exhausts. It also features an imperceptible gap between the exhaust pipe and the baffle to enhance its technical appearance.

**INTERIOR DESIGN**

Swinging open the LFA’s doors reveals a dramatic low-slung cockpit that has been intelligently designed and hand-assembled with the finest materials to reflect the car’s driver-centric dynamics. The remote two-seater cabin has been conceived at every stage – ergonomics, acoustics, materials, comfort and visibility levels have all been painstakingly engineered – to put the driver at the centre of the driving equation.

The cabin is logically divided into three zones. The first is the mechanical zone, the skeleton that aesthetically underpins the LFA’s superlative performance. Next is the human zone, the seats to support occupants even during extreme driving. And finally the driving zone, the instrumentation interface that brings driver and machine together.

The LFA’s leather-wrapped seats are orthopaedically designed with a split rear backrest, pronounced side bolsters and eight-way electric adjustment to deliver both support, long-distance comfort and outstanding levels of support. Adopting a mid-front engined layout created the ideal longitudinal position for the seats – at the centre of the vehicle’s wheelbase and laterally as close to the car’s centre as possible, a position that allows the driver to feel and respond intuitively the changes in the vehicle’s behaviour. Creating a narrow centre partition that also merges horizontally with the central baffle allows the LFA’s engineers to position the seats as low and as close together in the chassis as possible, further enhancing driving control and pleasure.

**Swinging open the LFA’s doors reveals a dramatic low-slung cockpit that has been intelligently designed and hand-assembled with the finest materials to reflect the car’s driver-centric dynamics.**

**Instrumentation**

The hooded instrument panel takes centre stage. Despite its compact dimensions, its advanced technology enables it to deliver an exceptionally high level of information to the driver in a clear and logical manner. It combines a Liquid Crystal Display panel with a rotary ‘Touch’ and a multi-driver selection knob. The instrument panel is divided into three sections. The first is the mechanical zone, the skeleton that aesthetically underpins the LFA’s superlative performance. Next is the human zone, the seats to support occupants even during extreme driving. And finally the driving zone, the instrumentation interface that brings driver and machine together.

**Swinging open the LFA’s doors reveals a dramatic low-slung cockpit that has been intelligently designed and hand-assembled with the finest materials to reflect the car’s driver-centric dynamics.**

**Removing the car’s conventional door handles, the LFA’s door handles are secreted in the door uppers, and in a similar move, the LFA features a double-bayed, single-wipe wiper with a consistently generous wipe area.**

**The LFA’s leather-wrapped seats are orthopaedically designed with a split rear backrest, pronounced side bolsters and eight-way electric adjustment to deliver both support, long-distance comfort and outstanding levels of support.**

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The acrylic lens in the metal ring is composed of multiple layers to create an advanced, three-dimensional appearance. The overall appearance of the meter changes according to the vehicle’s mode, acting as an unmistakable reminder to the driver of the mode in which the car is operating.

When the engine speed exceeds 9,000rpm, the tachometer display area turns red to prime the driver for the next upshift. The display area can also be set by the driver to change illumination – to either yellow or green - when the engine speed reaches a user-selected range.

Toggling the information selector switch mounted on the left-hand side of the carbon fibre and leather-wrapped steering wheel allows the driver to customize the data displayed, adjust the level of cabin illumination and operate the LFA’s track-ready stopwatch system. This allows the driver to monitor lap times and display information such as previous lap time, fastest lap time and total time.

To build on the sense of occasion when firing up the LFA, the instruments follow an engaging sequence. When the ignition is turned on, the digital speedometer illuminates and the gear display blinks; when the shift paddles are operated, the tachometer needle glows into life and the watch-like RPM batons around the circumference of the tachometer light up in an animated sequence from zero to ten. And finally, as the engine fires into life, the four digital dials that monitor oil and water temperatures, fuel levels and oil pressure radiate from the centre of the revcounter and take up their positions on either side of the central dial. On ignition shutdown, this display sequence is reversed.

The raised centre console that divides the cabin houses the seven-inch integrated display screen as well as the intelligently located controls for the climate control and infotainment systems. It’s coated in satin metal accents and leather, a tactile combination complemented by the 10 matte black buttons running down the console’s flanks that control the driver and passenger climate control temperatures and associated functions. A number of different hues are available for the satin metal accents, allowing LFA drivers to further customize their cars.

Like recent Lexus models, the LFA features the innovative Remote Touch system. Located precisely where the driver’s hand falls for optimal comfort and ease of operation, this multi-function control device operates on the same fundamental principles as a computer mouse and its on-screen cursor. Using an advanced two-axis haptic joystick mechanism with reaction force feedback to guide the cursor, the Remote Touch system offers intuitive and quick access to the LFA’s satellite navigation, configuration and infotainment functions.
Cabin Trim

The sumptuous and hand-finished quality of the LFA’s cabin materials is a direct reflection of the premium character and high quality synonymous with Lexus. The cabin adopts an innovative, three-dimensional overlapping design that employs pronounced steps and gaps between components to enhance their presence. Soft, hand-finished leather or Alcantara with accent stitching are complemented by both matt and glossy Carbon Fibre Reinforced Plastic and satin metal accents.

The ends of the leather and Alcantara upholstery have been folded back and stitched to create a rounded three-dimensional shape, and all major touch points are heavily padded for enhanced tactility. Bringing the exterior inside, the cabin features genuine carbon fibre. An expansive fillet of matt-coated carbon fibre sits below the windscreen to reduce reflected sunlight, while glossy coated carbon fibre lines the centre console and is used on the steering wheel and door panels.

Further reflecting the materials used in the LFA’s chassis, the cabin sports numerous metal accents. The lateral air vents, centre console and door pulls all feature brushed satin metal accents. While the floor-hinged brake and throttle pedals are single-piece forged aluminium. Other touches that highlight Lexus’ inimitable attention to detail include a padded side-moulding to assist with entry and exit, a mirror-finish aluminium plate next to the accelerator pedal to assist with quick footwork, a grippy, stitched left foot support and an aluminium foot brace in the passenger footwell. Naturally, LFA drivers will be able to choose from a wide range of textures and hues, to truly personalise their cabins.

In addition LFA drivers will enjoy the totality synonymous with the Lexus marque, with comprehensive equipment levels that include dual-zone climate control and Hard Disc Drive satellite navigation systems.

To complement the LFA’s low-weight ethos, Lexus has developed a 12-speaker lightweight high-output audio system that employs high-efficiency speakers and Lexus First Class D amplifiers. These compact and lightweight amplifiers combine extremely high amplification efficiency with high-output even on a low electrical current, and generate little residual heat. As well as being 37% lighter than the optional 12-speaker Mark Levinson® Premium Surround Sound System, these newly adapted amplifiers offer a 33% increase in output, a 37% decrease in weight, a 35% size reduction, and a 90% saving in power.
**SAFETY**

- The Lexus LFA supercar sets class-leading active and passive safety standards for the last word in on-the-move security.
- The stiff and robust carbon fibre reinforced plastic central structure provides exceptional occupant protection.
- Front crash boxes made from triaxial woven CFRP and extruded aluminium deform in a controlled manner, effectively absorbing high impact energy levels.
- Sport Vehicle Dynamics Integrated Management system has been recalibrated to bring together Anti-lock Brake System (ABS), TRAC and Traction Control systems, and Vehicle Stability Control (VSC) programmes.
- The LFA’s track-tuned Electronically Controlled Brake (ECB) software has been enhanced to deal with all degrees of cambers.

**PASSIVE SAFETY**

The LFA is the first supercar to wear the Lexus badge and, as with every Lexus, the LFA meets and exceeds industry standards for occupant protection by incredibly strong and rigid carbon fibre side members. They feature an innovative, corrugated pattern with the underside filled with rigidity-enhancing urethane for uncompromised structural integrity. The Hollow Cast Aluminium Side Members – which uses aluminium for its inner panel and glass overhangs and a lower kerb weight.

The inclusion of glass Microballoons (gMB) for its outer skin also houses the robust horizontal aluminium impact beam to further mitigate the effects of a side impact. Pedestrian impact protection is enhanced by the engine’s deformable resin surge tank situated directly beneath the bonnet.

Standard safety equipment also includes SRS front and seat belt airbags for driver and passenger as well as single-stage knee airbag for driver. The driver-side SRS front airbag displays in two stages, controlled according to the position of the seat, the intensity of the impact and whether or not the driver is wearing a seatbelt.

The LFA’s passenger occupancy system uses a sensor to detect the presence of an occupant in the passenger seat and controls the deployment of the dual-stage airbag according to the weight of the passenger and whether or not the passenger is wearing a seatbelt.

**ACTIVE SAFETY**

Integrating both tracking and traction control, Lexus’ sophisticated Sport Vehicle Dynamics Integrated Management (VDM) system has been fine-tuned exclusively for its LFA application to take into account a broad range of drivers – from those who enjoy relaxed cruising to those wanting to push as hard as possible on a streaming wet circuit.

In the event of a lateral impact, those aboard are offered exceptional protection by incredibly strong and rigid carbon fibre side members. They feature an innovative, corrugated pattern with the underside filled with rigidity-enhancing urethane for uncompromised structural integrity. The Hollow Door Structure – which uses aluminium for its inner panel and Glass fibre reinforced-Sheet Moulding Compound (G-SMC) strengthened by hybrid door Structure – which uses aluminium for its outer skin also houses the robust horizontal aluminium impact beam to further mitigate the effects of a side impact. Pedestrian impact protection is enhanced by the engine’s deformable resin surge tank situated directly beneath the bonnet.

In the event of a frontal impact, the LFA’s track-tuned Electronically Controlled Brake software has been enhanced to deal with all degrees of cambers such as the carousel corner at the Nürburgring.

In addition, the LFA’s Electronically Controlled Brake software is enhanced with purpose-built vertical acceleration and roll rate sensors that facilitate the creation of an estimation logic known as the Observer Programme. The Observer Programme uses sensor feedback to estimate the road camber angle. This data is fed through to VDM, which in turn estimates the vehicle’s behaviour in order to detect and respond quickly and accurately to changes in road camber. Designed to be as versatile as possible, the system is compatible with all manner of cambers, from lightly banked turns of around two degrees to steeply banked corners approaching 20 degrees such as the Curiousel corner at the Nürburgring.

For its application in the LFA, the ECU receives information from a variety of sensors and control components, collating critical data including brake master cylinder pressure, brake pedal stroke length, longitudinal, lateral and vertical acceleration rate, accelerator pedal angle, yaw and roll rates, individual wheel speed and individual brake pressure. Via VDM’s integrated Vehicle Stability Control and Traction Control systems (TRAC/ TRC), steering angle, braking force on individual wheels and engine torque can be adjusted to suit purposes under-, over- and neutral cornering, resulting in excellent stability and safety levels at all times. This in turn gives the driver greater freedom and confidence to experience the LFA’s full performance.
DEVELOPMENT AND MANUFACTURING

- The LFA, the vision of project leader Haruhiko Tanahashi, is the result of a relentless nine-year project to develop a supercar worthy of the Lexus badge.
- The elite LFA team developed the LFA from scratch and sought to challenge its engineers and designers at every turn.
- The development process included entering the LFA into the gruelling Nürburgring 24 Hours race in both 2008 and 2009.
- Only 500 LFA models will be assembled, all by hand at no more than 20 a month, at the LFA Works at Motomachi plant in Toyota City.
- In keeping with the LFA’s bespoke nature, each V10 engine will be hand-built by a single engineer and bear his signature.

The LFA programme was initially established by Toyota Motor Corporation at the beginning of 2000 as a relatively straightforward research and development project. However, with the arrival of project leader Haruhiko Tanahashi from Lexus, the newly founded ‘LFA team’ gained immediate impetus and transformed into a bespoke Lexus development programme. The LFA team was no ordinary group, it was a special team staffed by talented engineers who shared a passion for both high performance driving and unconventional engineering methods.

Right from the start of the programme, the LFA’s engineers and designers decided to intentionally deviate from traditional Lexus development processes, a move initiated to inspire and stimulate them to approach the car’s development from a myriad of different angles. It was an open arena, one that allowed them to pursue exciting new avenues in materials, performance and process technology. Working from a blank canvas, the close-knit LFA team drew up an exhaustive list of 500 key assets – ‘must haves’ – which the LFA should achieve.

Within a year of Tanahashi-san’s arrival, work began on the LFA’s V10 engine, and by mid-2003 the first LFA prototype was completed. Several months later, in October 2004, an LFA prototype lapped the Nürburgring Nordschleife circuit for the first time. Just five challenging years after the project began, Lexus pulled the wraps off the first LFA design study at the 2005 North American International Auto Show in Detroit. This first study made extensive use of aluminium for its chassis and bodywork, but a radical rethink of the LFA’s key objectives lead to the LFA team’s difficult decision to switch to carbon-fibre construction.

While the decision to employ Carbon Fibre Reinforced Plastic for the LFA’s construction might have disconcerted other development teams, the Lexus engineers in the LFA team relished the challenge this move offered. Rather than outsource this process to a third-party, the team drew on Toyota Motor Corporation’s rich heritage of loom-making and weaving experience to develop the CFRP technologies in house, arming them with the necessary knowledge to tackle future Lexus projects.

Under the stewardship of new Toyota president and motorsport fanatic Akio Toyoda, Lexus entered the LFA not once but twice into the punishing Nürburgring 24 Hours race in 2008 and 2009, arguably the world’s most demanding and taxing race. The objective was simple – to push the LFA as hard as possible under the most testing of conditions. Toyoda-san himself joined the race team in May 2009, a clear indication of his enthusiasm and confidence in the car and the development team behind it. Nothing better could prepare it for its world debut at the 41st Tokyo International Motor Show in Japan.

The Lexus LFA will be hand-assembled at the LFA Works at Motomachi plant in Toyota City. Only 500 examples will be built at a maximum rate of just 20 per month to ensure peerless build quality and attention to detail during the customisation process. Assembled by a single engineer, each V10 engine will bear his signature, a testament to the LFA’s bespoke nature.
# VEHICLE SPECIFICATIONS

## Engine

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<thead>
<tr>
<th>Specification</th>
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<tr>
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## Transmission

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## Performance

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### Wheels

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### Suspension

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<tr>
<td>Rear</td>
<td>Multi-link, anti roll bar</td>
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### Steering

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<tr>
<td>Gear Type</td>
<td>Rack and Pinion</td>
</tr>
<tr>
<td>Ratio</td>
<td>14.3</td>
</tr>
<tr>
<td>Lock to lock</td>
<td>±2.35</td>
</tr>
<tr>
<td>Power aided</td>
<td>Electric Power Steering</td>
</tr>
</tbody>
</table>

### Electrical System

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery Capacity, Voltage and Ampere-hour</td>
</tr>
<tr>
<td>Alternator Output, Watts</td>
</tr>
<tr>
<td>Starter Output, kW</td>
</tr>
</tbody>
</table>

### Dimensions, Weights and Volumes

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length, mm</td>
</tr>
<tr>
<td>Width, mm</td>
</tr>
<tr>
<td>Height, mm</td>
</tr>
<tr>
<td>Wheelbase, mm</td>
</tr>
<tr>
<td>Track, mm</td>
</tr>
<tr>
<td>Front</td>
</tr>
<tr>
<td>Rear</td>
</tr>
<tr>
<td>Offset</td>
</tr>
<tr>
<td>Kerb Weight, kg</td>
</tr>
<tr>
<td>Gross Vehicle Weight, kg</td>
</tr>
<tr>
<td>Fuel Tank Capacity, litres</td>
</tr>
<tr>
<td>Minimum ground clearance, mm</td>
</tr>
<tr>
<td>Approach Angle, degrees</td>
</tr>
<tr>
<td>Departure Angle, degrees</td>
</tr>
<tr>
<td>Seating Capacity</td>
</tr>
</tbody>
</table>
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