

THE 2013 MODEL YEAR McLAREN 12C: A 'PURE' McLAREN DRIVER-FOCUSED SPORTS CAR

- Uncompromised McLaren design philosophy based on Formula 1 principles
- Unique carbon fibre MonoCell chassis means lower weight, better strength, greater safety and improved packaging – plus superior performance and handling
- ProActive Chassis Control mates executive car ride comfort with sports car handling
- Enhanced 3.8-litre twin turbo V8 engine designed by McLaren Automotive is power boosted to 625PS for 2013

The McLaren 12C was the first in a new range of high performance sports cars from McLaren Automotive. Designed and built like no other sports car, the 12C benefits from McLaren's Formula 1 world championship-winning heritage, and has been developed by a world-class team of designers and engineers with hands-on Grand Prix experience.

Formula 1 technology includes the one-piece carbon fibre MonoCell chassis – for greater strength and lower weight – plus Brake Steer and an 'active' aerodynamics McLaren Airbrake (although these last two technologies have now been banned from Formula 1 as they offered performance advantages). The 12C uses technologies born on the track and offered for the first time on a road car. The technologies and processes used in the development of the 12C are also borrowed from Formula 1 racing, not from normal car making.

The result is a car totally focused around the driver, offering class-leading all-round performance and the best efficiency in its class as standard.

For the 2013 Model Year, enhancements have been made to the 12C to improve performance and responsiveness. An increase in power by 25PS takes maximum output up to 625PS, while the seven-speed SSG transmission has been improved with a new calibration. These changes mean the 12C is even faster and more intuitive, but with no loss in efficiency. These latest upgrades are being offered to existing 12C owners as a complimentary package.



A brand new type of sports car – and bespoke McLaren

According to Antony Sheriff, McLaren Automotive's Managing Director, the overriding principle of the 12C is 'pure' McLaren. *"This means that each and every component is conceived, designed and produced to McLaren's specification to meet the extreme requirements of the 12C, from its revolutionary carbon MonoCell to the switchgear. There are no carryover components in the 12C. Similarly, our test programmes, production processes and after-sales plans are also brand new and bespoke to McLaren."*

"One fundamental result of this passion to produce a 'pure' McLaren is that the 12C is what I call the 'and' car. Compared to main rivals, it has better performance 'and' is more fuel efficient as standard; it is lighter 'and' stronger, safer 'and' fully equipped; it is smaller in its exterior dimensions 'and' spacious inside; it's handling characteristics will deliver unbeatable track times 'and' yet it is more comfortable on road."

The key performance aim is efficiency

According to Sheriff, the key aim with the performance was efficiency. *"With 625PS, it is the most powerful car in its class yet, with a CO₂ figure of just 279g/km, at launch it produced each horsepower more efficiently than any car on sale featuring a petrol, diesel or even hybrid engine."*

The latest 12C uses the upgraded 625PS engine, introduced as part of the 2013 Model Year upgrade. Acceleration – 0- 62mph (100km/h) – takes just 3.1 seconds (when fitted with Pirelli P Zero Corsa tyres). Fuel consumption and emissions are unchanged despite the power rise, returning 24.2mpg on the EU combined cycle and 279 g/km of CO₂. The figures are much better than most high performance sports cars, in keeping with McLaren's commitment to class-leading fuel efficiency. Maximum speed increases to 207mph (333km/h).

Part of that drive to greater efficiency naturally includes light weight – one of the key McLaren mantras. *"We have done everything possible to reduce weight,"* says Sheriff. *"From the carbon chassis, to the lightweight plastic composite body panels, to the elimination of brackets during the car's design; even the exhaust system has been redesigned to cut weight. Weight is the enemy of performance, the enemy of efficiency."*

The 12C weighs 1,434kg (kerb weight DIN, or 3,161lbs) or just 1,301kg (dry – in its lightest configuration, or 2,868lbs). That's much lighter than most rivals.

Full of technical innovation

The 12C bristles with technical innovations. These include the carbon fibre MonoCell chassis, which not only gives handling and performance advantages (because of its rigidity and light weight), but packaging advantages too. The MonoCell is one-piece moulded into an ideal shape, meaning improved packaging – including more space and improved visibility – over rival mid-engine sports cars.

The 12C was also the first road car to use the innovative Proactive Chassis Control system. *“The aim with the 12C was to deliver a ‘no compromise’ suspension – executive car like ride quality and sharp reactive handling,”* says Antony Sheriff. The suspension uses double wishbones with coil springs, like a Formula 1 car. However it also features adaptive interconnected damping that provides much higher stiffness in roll compared with conventional suspension and yet greater comfort in a straight line. The system means conventional anti-roll bars – which are heavy and compromise ride quality – are not necessary.

A McLaren Airbrake – part of the rear wing – maintains balance front and rear while adding drag and rear downforce under braking, helping the car to decelerate, reducing stopping distances and improving stability. This ‘active’ aerodynamic aid is another technology developed and honed from expertise learned in Formula 1.

Brake Steer – like the McLaren Airbrake, a Formula 1 technology that is now banned from the track – applies braking pressure to the inside rear wheel, improving cornering turn-in, and encouraging later braking into corners and earlier power delivery when exiting.

The 12C was developed by McLaren Automotive at its headquarters in the McLaren Technology Centre (MTC) in Woking, UK, and is built in the new £40 million McLaren Production Centre (MPC) nearby.

12C: THE DETAILS



The 12C is a 'pure' sports car, designed to offer maximum driver appeal and performance, with unmatched efficiency. It is a mid-engine two-seat rear-drive sports car that, unlike its rivals, uses a carbon fibre monocoque chassis, the MonoCell. This Formula 1-style technology gives major advantages in weight, strength, safety and torsional rigidity – conferring benefits in performance, ride and handling.

Unique carbon fibre MonoCell chassis

The MonoCell is a unique one-piece moulded chassis that weighs just 75kg (165lbs). It is 25 per cent stiffer than an equivalent all-metal structure and 25 per cent lighter than a comparable aluminium chassis – and has an even greater margin of superiority over steel. It is also stronger and safer in a crash, acting as a safety survival cell, as it does in a Formula 1 car.

“The carbon MonoCell provides the perfect combination of occupant space, structural integrity and light weight,” explains Chief Engineer Neil Patterson. *“It is the ideal chassis to deliver groundbreaking efficiency and performance in the sports car market.”*

The MonoCell provides numerous dynamic benefits, adds Claudio Santoni, Function Group Manager for Body Structures at McLaren Automotive: *“With the carbon MonoCell, the 12C offers owners more than just exceptional occupant safety. It is incredibly light, which helps reduce the 12C’s CO₂ emissions and improve fuel efficiency. For the same reason, acceleration, braking, changes of direction and vehicle stability are all significantly improved. Using a carbon composite means we can manufacture the MonoCell with aerospace industry levels of precision, which is fundamental to accurate dynamic suspension geometry control.”*

The high torsional rigidity means less compromise for the flexibility of the suspension itself, making it easier to develop the unique balance between supple ride and precise handling.

The carbon MonoCell has greater dimensional accuracy than any metal, improving build quality and the predictability of performance. Carbon composites also do not degrade over time like metal structures, which fatigue. The 12C will feel 'as good as new' for decades.

There are also advantages in ease of repair. Front and rear aluminium extrusions and castings are designed to absorb impacts and are easy to fix. Cars with full aluminium, or steel, chassis use their structure to absorb and crumple on impact, causing more damage and expense to the whole structure, including the passenger cell.

McLaren: The carbon innovators

The carbon fibre MonoCell of the 12C and 12C Spider follows more than three decades of McLaren carbon innovation. In 1981, McLaren Racing introduced the carbon monocoque to Formula 1™. It offered an unbeatable combination of strength and weight-saving, and soon recorded the first victory for a carbon-based F1 car, at the British GP, driven by John Watson.

The legendary McLaren F1 road car, launched in 1992, was the first road car to use a carbon chassis and body. In fact, since 1981 McLaren has never built a car without a carbon chassis.

ENGINE AND TRANSMISSION

Lightweight and efficient new 625PS engine

The unique M838T engine is a British-built 3.8-litre twin turbo V8 engine, designed by McLaren Automotive. At launch, the 12C produced 600PS, but this was increased to 625PS for the 2013 Model Year. Despite this improvement in performance, this has not affected fuel economy and associated CO₂ emissions which have remained the same. The enhanced 12C returns 24.2 mpg (11.7 l/100km) on the EU combined cycle, and 279 g/km of CO₂.

Weighing just 199kg (439lbs), the M838T features a dry sump lubrication system and a flat plane crankshaft, which has allowed McLaren Automotive's engineers to place the engine extremely low in the chassis, lowering the 12C's centre of gravity and in turn optimising the car's handling responses.

At the rear, high-level exhaust pipes exit the car from a mixing box rather than a conventional silencer unit, saving weight. An optional Sport Exhaust system made from Inconel, an extremely heat-resistant nickel-chromium-based alloy, further reduces weight and enhances the exhaust note.

Seven-speed SSG transmission

Mated to the M838T is a dual clutch, seven-speed 'SSG' transmission. Using the Active Dynamics Panel situated in the centre console of the 12C's cockpit, the characteristics of the SSG transmission, as part of the 'Powertrain' settings, can be switched through three different modes: 'Normal', 'Sport' and 'Track' modes. Each provide a progressive immediacy of gear shift, operated through finger-tip controls mounted on a rocker behind the 12C steering wheel: upshift by either pulling with the right hand or pushing with the left, and vice versa to downshift. This 'one-hand shifting' principle, and the satisfying mechanical 'click' during gearshift, is reminiscent of the shift mechanics introduced and still used in Formula 1 cars.

Modification of the transmission for 2013 has resulted in crisper throttle response and improved clutch control for gear changes that are both faster and smoother.

'Automatic' mode, 'Launch Control' and 'Winter' modes can also be selected on the Active Dynamics Panel, the latter changing all electronic functions to suit low grip conditions and delivering maximum driver aid and support.

Another example of McLaren's determination to reduce weight was the decision to use a new lithium ion battery – saving more than 10kg (22lbs) compared with a conventional lead acid battery.

Programmable Intake Sound Generator (ISG)

Revisions have also been made to the innovative Intake Sound Generator (ISG). This system works by controlling engine intake noise within the cabin at differing levels, depending on the Powertrain mode selected for the car. Moving up through 'Normal', 'Sport' and 'Track' Powertrain modes enhances the aural drama and driving experience of the 12C, allowing more of the natural sound of the V8 engine to enter the cabin.

With the 2013 specification 12C, the driver is able to select the level of engine noise permitted in each mode through an electronic menu accessible via the instrument cluster.

SUSPENSION



Working to the McLaren mantra of ‘no compromise’, McLaren Automotive’s Vehicle Dynamics engineers set about creating a brand-new suspension system for a sports car with the aim of delivering executive car-like ride quality and a sharp, reactive handling response.

ProActive Chassis Control

The groundbreaking system introduced on the 12C, named ProActive Chassis Control, features Adaptive Damping, and provides much higher stiffness in roll compared with conventional suspension systems, and greater comfort in a straight line. The suspension is based on Formula 1-style double wishbones with coil springs. Yet, unusually, the dampers are interconnected hydraulically and linked to a gas-filled accumulator, providing adaptive responses depending on road conditions and driver preference.

Paul Burnham, McLaren Automotive Vehicle Dynamics Manager – and formerly McLaren Racing Senior Vehicle Dynamics Engineer – was determined the 12C would innovate in every area, including suspension design. *“An anti-roll bar is a common and simple solution to support handling, but the disadvantage is that stiffness is always there, whether the driver requires it or not. It is important to us that the 12C is rewarding and comfortable to drive at low and high speed, on the daily commute and on the track.”*

The ProActive Chassis Control features driver-adjustable roll control that replaces the mechanical anti-roll bars that have been a standard feature of road cars for years. It allows the car to maintain precise roll control under heavy cornering while decoupling the suspension in a straight line for excellent wheel articulation and compliance.

As with the powertrain, but independent from it, 12C drivers are able to select ‘Normal’, ‘Sport’ or ‘Track’ settings for the suspension through the Active Dynamics Panel. Each mode is responsible for managing roll control system pressure, Adaptive Damping and Electronic Stability Control (ESC) settings. This ensures bespoke tuning between handling, ride and powertrain for focused track activity, dynamic road driving or comfortable cruising.

Burnham continues: *“Adaptive Damping works by electronic sensors monitoring the movement of the body and wheels and only increasing damping when required. We believe Adaptive Damping, as part of ProActive Chassis Control, is the best system for a driver to set the car to his or her preferred driving modes. Its speed of response is particularly effective.”*

The fundamental principle behind ProActive Chassis Control is simple physics: dampers featuring an hydraulic system of high and low pressure valves interconnected left to right, front to back. When high pressure meets high pressure under roll conditions, stiffness results; when high pressure meets low under heave and warp, there is more ‘give’ and comfort prevails.

Vehicle Lift

New for 2013 is the optional Vehicle Lift. The system, which is integrated into the ProActive Chassis Control, allows the 12C to be raised front and rear for improved ground clearance. This technology permits the vehicle to be raised by up to 40mm at the front and 25mm at the rear, and may remain in position at up to 37mph (60kph). If the 12C exceeds this speed the system will automatically reset to the lowered position.

DESIGNED FOR TRACK, DEVELOPED FOR ROAD

Brake Steer

Brake Steer is a variation on McLaren’s electronic driver aid used successfully in Formula 1 on the 1997 McLaren MP4-12. It was subsequently banned, indicating its clear performance advantage, but has been developed for the 12C as the control system to aid cornering by bringing the vehicle’s nose into the apex.

The system uses the same hardware as the 12C’s Electronic Stability Control (ESC) system, preventing wheel spin, reducing understeer and significantly boosting track times.

The system applies braking forces to the inside rear wheel when the car is entering a corner too quickly to make the desired radius – supporting either a driver who has

misjudged the corner or a skilled driver seeking the fastest possible entry and exit from a corner. It supports later braking into corners, and earlier power delivery on exit.

The ESC system fitted to the 12C is managed electronically by the driver-operated Active Dynamics Panel settings. The 12C provides ample grip and safety in 'Winter' or 'Normal' modes, yet ESC offers increased slip in 'Sport' or 'Track' modes. ESC can be switched off.

Unique Airbrake provides active aerodynamics

A unique McLaren Airbrake maintains balance front and rear, while adding drag and rear downforce when deployed under braking, helping the car to decelerate and shorten stopping distance. Adding rear downforce also improves the car's stability under braking to give a more secure feel and optimum track performance.

Under heavy braking above 95 km/h (59mph), a piston operated by the transmission hydraulics raises the Airbrake to 32°. Once the first stage 'wing angle' is set, and the Airbrake is pushed into the airflow, the centre of aerodynamic pressure forces the bottom of the 'wing' back up to 69°: aerodynamics raise the Airbrake to its full and maximum angle rather than relying on a larger, and therefore heavier, motor. This weight-saving solution took almost 50 per cent of weight out of the mechanism.

At the press of a button on the Active Dynamics Panel inside the 12C cabin, the Airbrake can be manually raised to 15°. Chris Goodwin, McLaren Automotive's Chief Test Driver, explains that this operation allows the driver to significantly adapt the 12C's handling characteristics. *"Raising the Airbrake increases downforce and therefore stability through corners. It glues the 12C to the track and the result is clear: a faster lap time."*

"The option of engaging the Airbrake is indicative of McLaren DNA present in the 12C. Some performance cars only offer one setting, drama, whereas technology in the 12C, evolved from that designed by McLaren for its Formula 1 cars, produces a range of driving experiences. Owners will enjoy discovering the depths of the 12C's dynamic performance on road and track, and as you'd expect with race-bred technology, it will be applied in the safest possible package."

Standard brakes – forged aluminium bell and cast iron ventilated and cross-drilled discs – are optimised for weight, saving around 8kg (18lbs) from standard cast iron. Optional Ceramic Composite Matrix (CCM) brake discs are also available, saving a further 3.7kg (8.1lbs).

INTERIOR

“The design of the car starts with the driver,” notes Design Director Frank Stephenson. *“This is the most driver-focused sports car on the market.”*

Interior design and packaging

Ergonomically, the 12C delivers on its aim of making the driver feel as comfortable as possible, whether driving in town or on a track. The steering column is centred on the driver, and is parallel to his or her seat and shoulders. The brake and throttle pedals are also placed directly in-line with the driver. All primary controls are within a hands-reach, yet surfaces and switches do not intrude or interfere during spirited driving.

Packaging was fundamental to support the low weight targets set for the 12C. Externally, the car had to be compact, yet internally it had to offer an unparalleled driver and passenger environment where space, comfort and driving enjoyment were not compromised.

At 4509mm long, 1895mm wide at the front axle (1908mm rear), and 1199mm high, the 12C is compact externally, smaller in all dimensions than, for example, the Ferrari 458 Italia, yet the interior is spacious, being designed to accommodate 98th percentile adults in comfort.

“With the interior, we have created a real step forward in the packaging of a sports car,” says Frank Stephenson. *“The MonoCell concept allowed us the freedom to design the occupant space around the driver, just like in a Formula 1 car. And this also brings the driver closer to the centre of the car, improving control and driver enjoyment. Positioning the pedals inboard improves the problem of wheel well intrusion. We also repackaged many of the major components that normally sit under the dashboard to allow for more space and a unique form.”*

“Packaging in sports cars is often an after-thought – ‘now, what can we fit in and where?’ – but with the 12C it was fundamental. The occupants have to enjoy being in this car more than any other sports car they have ever owned.”

This has been partly achieved by the seven-inch touch screen IRIS telematics system oriented in ‘portrait’ mode. This is a first for the automotive industry and is more intuitive than ‘landscape’ orientation – we read down a page and our mobile telephones and other personal information devices are configured this way. It has also been designed with the minimum of command buttons in order to minimise the complexity of its operation, and can be viewed by both driver and passenger.

McLaren designers paid great attention to all-round visibility from the car for both safety and driving precision.

The low windscreen cowl gives a full six degrees downward vision from eye height and, importantly, allows the driver a clear view of the front of the car. The view of the top of the front wings, with the highest point positioned directly above the centre of the wheel, also facilitates perfect placement of the 12C in a corner. Rear vision is excellent too and an internal buttress with a rear three-quarter glass provides a clear rearward view.

The steering wheel is probably the most important sensory item for any driver. Apart from the feel and feedback from the front wheels, the actual grip and design of the wheel itself is paramount. The steering wheel is ‘clean’ – there are no buttons to distract the driver. It is also small and very tactile.

McLaren designers and engineers found the solution to the steering wheel design challenge under their own roof. Having employed an advanced and compact airbag, the steering wheel design was then inspired by McLaren’s racing expertise. The steering wheel grip of the 12C is as technically precise as a McLaren racing driver’s wheel. This is because past McLaren world champions’ grips were modelled on a CAD system and scanned to produce an exact replica on the 12C’s steering wheel.

Such attention to detail is to be found throughout the 12C’s interior and it does not suffer from an over abundance of switches, knobs and dials.

For components that customers can see and touch, it is even more important that they are 'pure' McLaren. None of the switches are carry-over parts from another maker: all are bespoke items designed exclusively by McLaren for the 12C.

It is not only the appearance of the switchgear that is important: the haptics and ergonomics are essential ingredients in providing a unique environment for the 12C buyer. Haptics – the 'look', 'feel' and 'touch' of a control – and ergonomics – how accessible they are and what kind of feedback they give the driver – have been the subject of considerable focus at McLaren.

The layout and ergonomics of the interior are aided by the 12C's packaging. The driver and passenger sit closer together, giving the driver a better feeling of control for placing the car on the road accurately as well as leaving more room between the driver and the door panel. This allows not only more space for arm movements during hard driving, but also provided space for an additional 'door console'.

The 12C cabin design offers a range of material and colour options allowing customers a great degree of freedom to personalise their car. This includes the, new for Model Year 2013, exclusive Semi-Aniline leather interior, which features a higher quality and more naturally textured leather. If selected, Semi-Aniline leather is applied to all major interior surfaces including doors, seats, dash and the centre console. The new interior option includes flat piping around the perimeter of the seat and along the edge of the door card insert. The piping finish will be in Carbon Black as standard, but can also be specified in McLaren Orange, Harissa Red or Stone Grey.

Active Dynamics Panel

The Active Dynamics Panel on the middle centre console provides two rotary switches, 'P' and 'H' – 'P' for Powertrain and 'H' for Handling, each having three positions for 'Normal', 'Sport' and 'Track' modes. 'P' changes throttle response and acoustics, gearbox strategy, shift times and impulse (how much one can feel the gearchange). The coaxial 'Manual' button controls use of manual gearbox functions.

'H' changes stability control, adaptive damping, suspension firmness and roll stiffness. The coaxial 'Aero' button allows the driver to deploy the Airbrake to a 15° position for increased downforce.

In addition, there are four push buttons for: the keyless ignition, 'Active' which automatically engages the driver's preferred settings, the 'Winter' setting and the 'Launch' control system for maximum standing start acceleration.

Launch Control

Launch control is designed to offer the maximum acceleration from a standing start.

The launch control system is initiated when the button is pressed. With the brake pedal fully depressed, the accelerator is then held down and the engine speed will increase to 3,000 rpm. When the brake pedal is released, the launch control system will perform a launch start to give maximum acceleration.

Winter

Winter mode overrides both handling and powertrain controls. In winter mode, the roll stiffness, adaptive damping and Electronic Stability Control settings are changed to give the maximum assistance to the driver in slippery conditions. The engine speed, gearshift points and shift speed are also optimised for the slippery conditions.

EXTERIOR DESIGN

The design of the 12C was driven by aerodynamics and engineering innovation; the reason why McLaren Automotive believes it will remain contemporary and elegant throughout its lifetime as well as distinctive among its rivals.

Frank Stephenson, McLaren Automotive's Design Director, finalised the design: *"I feel that the end result communicates the 12C's engineering integrity and technical benefits and it is this purity that makes the design timeless and the product premium."*

The overall design theme supports engineering and aerodynamic ambitions. Purity of line then gives the car its character. All the fins, vents and the flat underbody are there for a reason. No styling addenda have been incorporated simply for appeal or style.

This aerodynamic purity explains why this car can hit top speed of 207 mph (333 kph) with great stability without resorting to overt wings or deep front air dams.



A perfect example of the exterior design resulting from the combination of aerodynamics and engineering innovation is the front of the car, from the A-pillar forwards. It is very low and narrow, since it does not have to house large engine cooling radiators, two of which are mounted longitudinally at the sides behind the occupants. This offers the added benefit of segment-leading space for storage under the bonnet.

This intelligent use of airflow defines the car. Moving the radiators back also means that the same air that flows through the radiators also cools the engine, while it also reduces the length of pipework within the car and volumes of associated fluids, reducing weight.

The windscreen of the 12C is deep and low for superb forward visibility and redolent of the McLaren F1 road car: in wet weather it is swept by a single weight-saving pantograph wiper blade, as was the F1.

Stephenson adds: *“The 12C does not reproduce the F1 design, but it unashamedly builds on its functionally-driven engineering and design highlights such as the large, deep windscreen and the low cowl to give the driver good visibility for accurate placement on the road. Any similarities are there for a reason.*

“We evolved the design in the wind tunnel and this resulted in some great final touches to the front end in particular. The larger air intakes, more pronounced and personalised headlight units, and the removable front splitter give the car a great face.”

From the side, the 12C cannot be mistaken for any other sports car. The dominant side air inlets are divided by dramatic turning vanes that help direct cooling air over the side radiators. This shape was designed and optimised using McLaren’s extensive Formula 1-inspired Computational Fluid Dynamics (CFD) capability. Likewise, the scalloped shoulders drive airflow to the Airbrake, thereby enhancing its effectiveness aerodynamically.

The 12C’s rear is unique. Exhaust pipes exit high, in the centre of the car and straight out from the engine – minimising their length and therefore their weight. The rear features a bank of slats and vents to ensure efficient evacuation of hot air from the engine bay, and the engine itself is visible through a thin glass cover on the rear deck.

The LED tail light clusters do not dominate the rear – they are only visible when illuminated – and appear ‘hidden’ behind horizontal black bars. The two upper bars at the rear light up as LED brake lights and turn indicators. Below the light clusters, the business-like appearance is completed with the car’s downforce-optimised rear diffuser, edged with the reverse light and rear fog light.

The 12C is short, narrow, and low, and has short front and rear overhangs due to its long 2670mm wheelbase – a layout that promotes stability and assists handling response.

Dihedral doors

The other prevailing design characteristics are the dihedral doors (a hereditary gene from the McLaren F1). They have a clear purpose, like every other element of McLaren’s design ethos.

The concept of dihedral doors is simply to allow the driver and passenger to get into and out of the car as easily as possible as well as allowing a smaller door opening than would otherwise be necessary. The simple act of moving the door forward and upwards invites the driver to step across the sill and sit in the car more easily. The door can be opened and closed from the seating position.

With its single hinge, the dihedral doors offer weight-saving features. They are unique to McLaren.

A new door entry system is a feature of the new 12C. A small button mounted on each door replaces the 12C’s touch sensor system. In line with customer feedback, this modification is intended to simplify the user experience. The ability to unlatch each door using the 12C key fob is retained, as well as the locking touch sensor.

WHEELS AND TYRES

Wheels

The design of the standard cast alloy wheels (19-inch front, 20-inch rear) was driven by McLaren’s light weight objectives: the styling was agreed in concept, and then the



wheel was tuned using finite element analysis to take a further 4kg (8.8lbs) out of the wheels.

Three optional wheel designs offer further weight-saving, and are available in multiple finishes – standard Silver, optional Stealth and eye-catching Diamond Cut. Two different Lightweight designs offer a saving of 6 kg, while the 10-spoke Super-Lightweight design reduces weight by 10 kg.

Tyres

As McLaren's sole tyre supplier and technical partner, Pirelli has developed bespoke versions of the P Zero and P Zero Corsa for the 12C for road and track use.

The P Zero tyres for McLaren are the result of close collaboration between Pirelli's researchers and McLaren's engineers in Woking, with the dual objective of harnessing all the power of the new car while ensuring total control. At the heart of the project is the complete integration of the tyre design with the 12C's construction architecture and the sophisticated electronic technology in order to make the P Zero tyres a fundamental component of the car.

The perfect harmony between car and tyre guarantees driving pleasure and precision, an immediate response under a variety of different forces and an instant reaction to changes in aerodynamic loads and set-up, no matter what the conditions of usage.

Thanks to the experience gained by Pirelli in Formula 1™ as well as other high-profile motorsport championships, Pirelli's engineers developed tyres in record time that are capable of meeting the needs of three distinctive characteristics that define the 12C and 12C Spider:

- A high power output, generated by the twin-turbo engine, which requires a tyre capable of laying the torque down in a progressive and consistent way.
- A high-performance suspension system developed along with that type of tyres. Once more, the experience gained in Formula 1™ was essential, as in grand prix cars the tyres form a vital part of the suspension. In exactly the same way, the suspension settings of the 12C and 12C Spider have been based precisely on the characteristics of the P Zero and P Zero Corsa.

- A high power-to-weight ratio, plus varying aerodynamic downforce loads, which require a tyre that can generate maximum grip and traction under any circumstances.

Pirelli's development work with the bespoke McLaren tyres concentrated on both the structure and compound. The objective for the tyre structure was to ensure flexibility and grip, while at the same time guaranteeing enough rigidity to cope with high aerodynamic loads. In order to be sure of this versatility, the structure of the front and rear tyres have been developed individually to respond to the different demands placed on them. For this reason the front tyres have a rounded profile while the rears are squarer.

The work carried out on the construction obviously has an important effect on the compounds, which have been designed to warm-up quickly and complement the whole tyre's rapid reaction to direction changes, while providing consistently high levels of grip.

The nanotechnology used by Pirelli in the design of these tyres allowed the Italian firm to develop 'intelligent compounds', which react instantly to adapt themselves to the varying forces acting on the car at any given time.

These compounds make full use of the most advanced Pirelli's technology during their production, to ensure complete precision in the compound mix.

Pirelli's engineers also made use of cutting-edge virtual modelling technology while developing the P Zero and P Zero Corsa for McLaren, in order to collect data and simulate the different usage and stress levels that the tyres are subjected to under different circumstances.

The Pirelli P Zero family

The specialised P Zero and P Zero Corsa tyres developed for the 12C and 12C Spider are based on the standard P Zero and P Zero Corsa models: Pirelli's range-topping Ultra High Performance tyres.

Launched in 2007, P Zero is Pirelli's iconic Ultra High Performance tyre. High safety standards and reduced braking distances, together with enhanced roadholding and perfect comfort, are the tyre's defining characteristics. Special nano-composites in the compounds and bead ensure a comfortable drive allied with sporting performance. The three wide longitudinal grooves on the tread pattern guarantee maximum grip in the wet and reduced noise levels. The structure guards against any deformation in the tyre even at speeds of up to 370kph.

P Zero Corsa System is the most sporting product in Pirelli's range, suitable for use on the road and on the race circuit as well. It provides maximum performance and perfect safety both in the wet and in the dry, thanks to its directional precision and roadholding through corners. The tyre's original development began in 2003: seven years later Pirelli launched the P Zero Corsa System, which combined the P Zero Corsa asymmetric tyre with an evolution of the preceding directional tyre. These two different tread patterns – directional on the front and asymmetric on the back – help to delay the onset of aquaplaning even in extreme conditions.

MANUFACTURING

The 12C, like the 12C Spider, is built at the new £40 million McLaren Production Centre (MPC) facility in Woking, Surrey, adjacent to the McLaren Technology Centre (MTC). The manufacturing facility was opened in November 2011 by UK Prime Minister David Cameron and McLaren Group Chairman Ron Dennis.

By the middle of this decade, McLaren Automotive will be producing a range of premium carbon-based high performance, highly efficient sports cars in Woking.

TECHNICAL SPECIFICATION

Drivetrain Layout	Longitudinal Mid-Engine, RWD	Track, F/R (mm)	1656 / 1583
Engine Configuration	V8 Twin Turbo / 3799cc	Length (mm)	4509
Engine Material	Aluminium Block & Cylinder Heads	Width (mm)	1908
PS / rpm	625 / 7500	Height (mm)	1199



Torque Nm / rpm	600 / 3000 - 7000	Dry Weight (kg / lbs)	1336 / 2945
Transmission	7 Speed SSG	Active Aerodynamics	McLaren Airbrake
Body Structure	Carbon Fibre MonoCell with Aluminium Front and Rear Frames	Suspension	ProActive Chassis Control
Wheelbase (mm)	2670	ProActive Chassis Control Modes	Winter / Normal / Sport / Track
Tyres (F/R)	Pirelli P Zero 235/35 R19 / Pirelli P Zero 305/30 R20	Powertrain Modes	Winter / Normal / Sport / Track
Wheel Sizes (F/R)	19" x 8.5" J / 20" x 11" J	Brakes	Cast Iron Discs with Forged Aluminium Hubs (F 370mm/ R 350mm)

PERFORMANCE DATA

Efficiency	CO ₂	279 g/km
	Fuel consumption (combined)	24.2 mpg (UK)
	Power to weight (with lightweight options)	459 bhp/tonne
	CO ₂ /power	0.45g/km per bhp
Speed	Maximum speed	207 mph
Acceleration	0-100 kph (62 mph)	3.1 s *
	0-200 kph (124 mph)	8.8 s *
	0-400 m / ¼ mile	10.6 @ 136 mph *
Braking	Braking	200-0 kph 124 m (407ft)
		100-0 kph 30.7 m (101ft)

*with Pirelli P Zero Corsa tyre option

All figures apply to a European specification 12C

Ends

Notes to Editors:

About McLaren Automotive:

McLaren Automotive is a British manufacturer of luxury, high-performance sports cars, located at the McLaren Technology Centre (MTC) in Woking, Surrey.

Following the company's global launch in 2010, McLaren Automotive launched the groundbreaking 12C and 12C Spider and, in keeping with its plan to introduce a new model each year, recently unveiled the McLaren P1 at the Paris Motor Show. The brand continues to expand, operating through a dedicated global network of retailers in every major automotive market.

McLaren Automotive Technical Partners

In the development, engineering and manufacture of its range of innovative and highly acclaimed sports cars, McLaren Automotive has partnered with world leading companies to provide specialist expertise and technology. These include AkzoNobel, AkzoNobel, ExxonMobil and Pirelli.

Designed for the track; Developed for the road

The connection between Formula 1 and road cars at McLaren is a natural process of experience, knowledge, principles and process transfer. Through the integration of 50 years of Formula 1 racing expertise and knowledge, and 20 years of heritage in producing landmark sports cars, McLaren Automotive designs, develops and builds the technologically advanced, groundbreaking and no compromise 12C and 12C Spider.



McLaren has pioneered the use of carbon fibre in vehicle production over the past 30 years, and since introducing a carbon chassis into racing and road cars with the 1981 McLaren MP4/1 and 1993 McLaren F1 respectively, McLaren has not built a car without a carbon fibre chassis.

Visit www.mclarenautomotive.com for more details.

Further information

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