

Product Information

FERRARI 458 CHALLENGE



December 2010



Ferrari 458 Challenge

Product Information

Attn: Dealer Responsible's Attention

Product Marketing Communication No. 5/2010
Maranello, 7th December 2010

Dear Sirs,

We are sending you these Product Notes to give you an outline of the main characteristics and technical specifications of the new Ferrari 458 CHALLENGE, which will be allotted from January 2011.

Best regards,

Andrea Bassi

A handwritten signature in black ink, appearing to be 'A. Bassi', with a period at the end.

Commercial and Marketing Division

Product Marketing



Ferrari 458 Challenge

Product Information

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INTRODUCTION TO THE 458 CHALLENGE



This new berlinetta, which will flank the F430 Challenge in the 2011 Ferrari Challenge Trofeo Pirelli, is the fifth model used by Ferrari in its single-make championship, which from next season onward also includes an Asia-Pacific series.

The 458 Challenge continues and enhances Ferrari's track tradition, setting new style and performance standards by:

- Upping performance on the track to the limits
- Offering new content completely unprecedented in the history of the Ferrari Challenge
- Hailing a major evolution with regard to its predecessors
- Taking track-derived experience and making it available to Ferrari's own clients.

MAIN CHARACTERISTICS/PERFORMANCE



The 458 Challenge's main characteristics with respect to the F430 Challenge include:

- Significantly boosted performance: 1.6 seconds faster lap time at Fiorano
- A completely new engine with record-breaking performance levels (particularly in terms of specific power output and rpms)
- New exhaust system
- Dual clutch F1 gearbox with even lower gear-shifting times
- More high performance, second generation CCM brakes
- Larger tyres which make the car quicker into corners and less oversteer
- New suspensions that guarantee absolutely unprecedented grip
- First use of Dynamic Vehicle Control Systems (E-Diff and Traction Control) on a Challenge car
- Steering wheel-mounted manettino
- New racing steering wheel with integrated controls
- New, TFT display on dashboard which also provides telemetry readings and has improved, more driver-friendly graphics
- New evolved data acquisition system (derived from 599XX) with more telemetry channels and more memory
- Lighter than road-homologated version despite the retention of certain specific content (e.g. air conditioning)

MAIN CHARACTERISTICS/PERFORMANCE



The main differences between the 458 Challenge and the homologated road-ready version are:

- Bigger slick tyres, 19" wheel rims and wider tyre channel
- Bushing replaced with rigid joints at suspension attachments, aluminium single-calibration dampers, specific steel springs, specific set-up, specific steering wheel, etc.
- New dedicated exhaust system
- Significant weight reduction thanks to introduction of new interiors and lightweight materials
- -50 mm kerb height.

PRINCIPLE PERFORMANCE

	458 CHALLENGE	F430 CHALLENGE
Maximum power output	570 CV at 9000 rpm	490 CV at 8500 rpm
Maximum torque	540 Nm a 6000 rpm	465 Nm a 5250 rpm
Weight/power	2.14	2.44
Fiorano lap time	1'.16.5	1'.18.1

ENGINE ASSEMBLY

The 458 Challenge's direct injection V8 is strictly a production engine, although the following modifications have been made in the light of its specific use:

- Air intake system
- Exhaust system
- Gear ratios and calibration of F1 dual clutch gearbox

Engine



	458 Challenge	F430 Challenge
Bore and stroke:	94mm x 81 mm	92mm x 81 mm
Displacement:	4,499 cc	4,308 cc
Maximum power output:	570 CV (419 kW) at 9,000 rpm	490 CV (360 kW) at 8,500 rpm
Rev limiter:	9,200 rpm	8,500 rpm
Specific power output:	127 CV/Litre (93 kW/Litre)	114 CV/Litre
Maximum torque:	550 Nm (56 Kgm) at 6,000 rpm	465 Nm at 5,250 rpm
Compression ratio:	12.5:1	11.3:1

Air intake system

In order to reduce weight, the new evolved air intake system now includes:

- Flexible tubes
- Carbon-fibre filter box
- Carbon-fibre plenum

ENGINE ASSEMBLY

Exhaust system

The 458 Challenge also sports a new Racing exhaust system. It is lighter than the version used on the homologated car with Inconel plenums, specific catalysers and a new look with two central tail pipes.

The modifications are in detail:



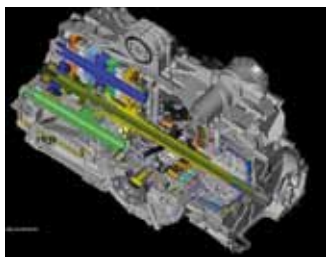
- Specific GT2-derived Inconel plenums that are lighter than the production version
- Specific racing catalysers (FIA-homologated) which are lighter with less back pressure
- Free tail pipes which are lighter and more high performance
- Optional racing silencer for circuits that require noise control.

The dual-clutch gearbos

The new 7-speed-plus-reverse F1 dual-clutch gearbox has significantly boosted performance by cutting gear shifting times to practically zero.

The gear ratios are the same as the road-going version with the exception of 7th which is shorter. The parking lock has also been removed and there is no hand brake either.

The gear ratios are as follows:

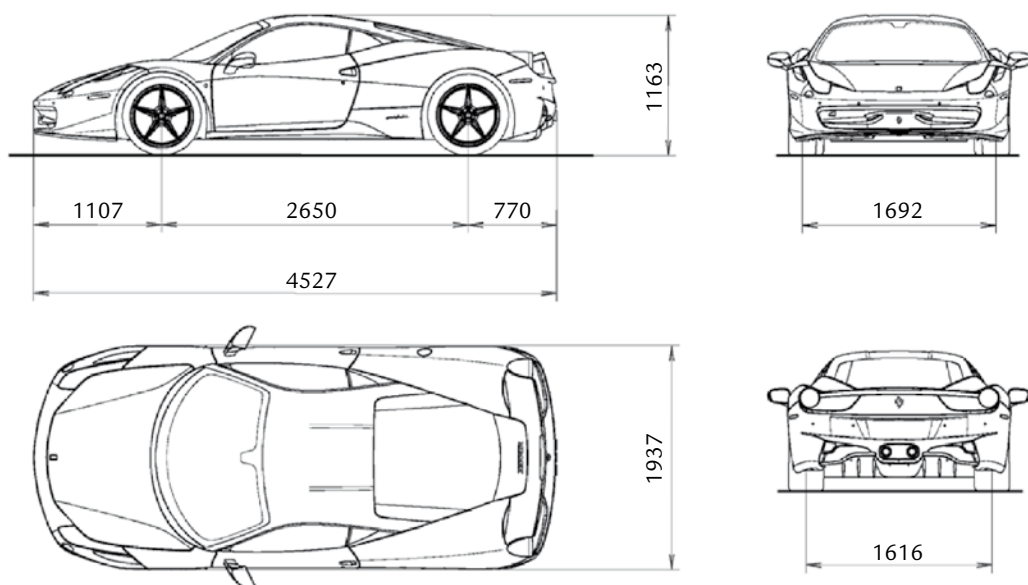


- 1° 15.81
- 2° 11.14
- 3° 8.29
- 4° 6.55
- 5° 5.24
- 6° 4.28
- 7° 3.52

Thanks to the fact that the tyres have a smaller rolling radius, the resulting ratio on the ground is also shorter for all gears than on the road-going version. As with the latter, however, the gearbox has been integrated with the E-Diff 3, to be benefit of the car's overall architecture and weight.

CAR DIMENSIONS AND SET-UP

The front and rear tracks and kerb height have all been redesigned to enhance the car's dynamic behaviour.



DIMENSIONS	458 CHALLENGE	F430 CHALLENGE
• Length [mm]	4,527	4,512
• Width [mm]	1,937	1,923
• Height [mm]	1,163 (-50 vs 458 Italia)	1,184 (-30 vs 430)
• Wheelbase [mm]	2,650	2,600
• Front Track [mm]	1,692	1,669
• Rear track [mm]	1,616	1,616

SUSPENSIONS



The 458 Challenge's suspension now consists of double wishbones at the front with Multilink to the rear. Multimatic dampers are also used. These features combined with specifically honed tyres make for superb cornering and maximum lateral acceleration of 1.6 g.

Front suspension	
Kinematics:	double wishbone
Dampers:	Multimatic (second softer calibration optional)
Springs:	150 kg/mm standard and 190 kg/mm optional
Ø Bar:	21 mm with slots adjustable by 10%
Rear suspension	
Kinematics:	Multilink with rigid joints (Flamblock) for improved handling
Dampers:	Multimatic (second softer calibration optional)
Springs:	180 kg/mm standard and 240 kg/mm optional
Ø Bar:	23 mm with slots adjustable by 10%

CONTROL SYSTEM

E Diff3, F1 Trac, High Performance ABS

The fact that the new car incorporates the E-Diff is a major difference between it and the previous track-dedicated models.

Another new addition is the F-Trac, the world's most sophisticated traction control system. Developed by Ferrari, it continually monitors grip levels and uses that information to enhance performance. Two track-specific calibrations have been developed for this particular system with logics and control strategies derived from Ferrari's F1 and GT racing experience. They are also fully integrated with the E-Diff to maximise performance both into and out of corners.

The E-DIFF and F1-Trac control software are contained in the same CPU which cuts communication time between them to the bone.

This means that the system can estimate grip and then optimally distribute torque, thus guaranteeing a significant improvement in performance out of corners.

The car is also equipped with new generation ABS which integrates the EBD (hence there is no mechanical distributor) which optimises braking in all the various driving and grip conditions the car will encounter (straights, cornering, rubbing strip). The result is, of course, shorter stopping distances and greater stability under braking.

The various ABS/EBD, E-Diff and F1-Trac calibrations are controlled from the steering wheel-mounted manettino, another first for a Ferrari Challenge model. The driver can thus choose between three different configurations: OFF position (traction control deactivated), position 1 and position 2. The latter two settings offer progressively more intervention from the control systems and are selected in accordance with track grip conditions.

BRAKING SYSTEM



The car has Brembo second generation CCM2 brakes. The discs at the front are thicker and coupled with new pads that are more durable and deliver superior performance than the previous model. At the rear the discs are larger with pads the same size as the ones used on the F430 Challenge. In-depth optimisation work was also done on the venting both front and rear.

		F430 CHP	458 CHP
ANTERIORI / FRONT	Dischi/Rotors	398 x 36	398 x 38
	Pastiglie/ Pads	CE253	CE450
POSTERIORI / REAR	Dischi/Rotors	350 x 34	380 x 34
	Pastiglie / Pads	RS19	RS19

RIMS AND TYRES



The single-nut light alloy wheel rims sport 255 -650 R19 x 9” tyres at the front and 305 – 690 R19 x 11” at the rear, ensuring that the car is quicker into corners with less understeer.

TYRES

	458	458 Challenge	Variation	F430	F430 Challenge	Variation
Front	235	255	+20	225	235	+10
Rear	295	305	+10	285	298	+10

The light alloy rims are also forged to reduce the weight of unsprung masses which improves handling and stability.

STANDARD SPECIFICATION

- Carbon-fibre monocoque seat with longitudinal movement and adjustment to make getting in and out easier. Two sizes available
- Black ALCANTARA interior with red stitching and carbon-fibre inserts
- High resistance steel roll-bar cage that can be dismantled (upgraded to meet new FIA regulations)
- Compatible with HANS (Head and Neck Safety System)
- 6-point safety harness
- Integrated pneumatic jack
- Lexan windshield
- Front, rear, side and sliding side windows all Lexan
- Electrical equipment: Colour TFT display with data recording facility (64MB)
- Racing battery
- Fire-extinguishing system
- FIA-standard battery isolator switch
- Optional passenger kit (available and can be retrofit)

STEERING WHEEL



The steering wheel features numerous innovations. The removable steering wheel isn't just ISO GT2 compliant but also introduces the manettino to a Ferrari Challenge car for the first time, resulting in fast, easy dynamic control setting.

The buttons on the steering wheel are:

- MANETTINO (3 settings)
- FLASH: Flashes lights
- PIT: Pit speed limiter
- SCROLL: change page on display
- RADIO: Open communication with pits
- WATER: Wash windows
- WIPER: Wipers
- INDICATORS: Right and left

TFT DISPLAY



The new TFT display incorporates additional features and improved graphics not seen on the F430 version.

New screens/functionality:



- **SPLIT-BEST SPLIT:** with the PC the circuit can be divided into “Split” 1. When car crosses the “Split”, the intermediate time appears. If this is also the best time, the screen will turn blue.

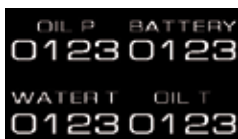


- **BEST LAP:** As per split but linked to finish line
- **LAP TIME:** As above but shows current time from finish line in real time

Screens similar to F430 Challenge



- **WARMUP-RACE:** Normally used during track sessions and shows vehicle data
- **ALARM:** Appears in case of anomaly or if PIT LIMITER is on/active



- **FINISH LINE:** appears when car crosses finish line and displays lap time for 10s
- **MECHANICS:** Provides specific information on car.

DATA ACQUISITION

- More memory: 64 Mega v 8 Mega on 430CHP
- More data acquisition channels (458CHP: 128 channels v 40 430CHP)
- Data Acquisition and TFT display integrated into a single component.

OPTIONAL FEATURES AND OPTIONAL SPARES

- **Passenger kit (Cod. Modis RSCP):** clients can opt to have their car factory-delivered with a passenger seat kit complete with specific FIA-homologated roll-bar, safety harness, footrest and sliding Lexan windows. Like the driver's seat, the passenger seat is available in a choice of 4 different sizes. The kit adds 22 kg to the car's weight. Owners may also purchase its various elements through the spares service at a later date (all cars are retro-fit-ready).
- **Carbon-fibre sills (Cod. Modis CEXS):** lighten car by a further 2 kg. Bare carbon-fibre sill available as a special equipment.
- **External paintwork with undercoat:** the car can be ordered in any of the colours in the range, the standard version is without undercoat to reduce the car's weight. External paintwork with undercoat can be ordered as special equipment .
- **Livery:** the livery sported by the 458 Challenge used in official photographs and at its various presentations, is not part of the standard spec. It is, however, available to clients but must be specifically requested as a "special" feature when the car is being ordered. In such instances, however, none of the decals provided will be applied in the factory – this will be left to the client or his/her regular garage.

SPARES

Aside from the abovementioned optionals (which can be selected when ordering the car), the spares catalogue also offers other features. These include:



- **Silencer for sound critical circuits**

Cod. 269961

REAR SILENCEER, RIGHT

Cod. 269962

REAR SILENCEER, LEFT

- **Alternative, stiffer springs:**

Cod. 274235

FRONT DAMPER SPRING K=190

Cod. 274236

REAR DAMPER SPRING K=240

- **Alternative, softer dampers:**

Cod. 265646

FRONT DAMPERS

Cod. 265647

REAR DAMPERS

DIMENSIONI E PESI DIMENSIONS AND WEIGHT		MOTORE ENGINE	
Lunghezza <i>Overall length</i>	4.527 mm 178.2 in	Tipo <i>Type</i>	V8 - 90° V8 - 90°
Larghezza <i>Overall width</i>	1.937 mm 76.3 in	Alésaggio e corsa <i>Bore and stroke</i>	94 x 81mm 3.7 x 3.2 in
Altezza <i>Height</i>	1.163 mm 45.8 in	Cilindrata totale <i>Total displacement</i>	4.499 cm ³ 274.5 cu in
Passo <i>Wheelbase</i>	2.650 mm 104.3 in	Rapporto di compressione <i>Compression ratio</i>	12,5:1 12.5:1
Carreggiata anteriore <i>Front track</i>	1.692 mm 66.6 in	Potenza massima <i>Maximum power</i>	570 CV a 9.000 giri/min 419 kW at 9,000 rpm
Carreggiata posteriore <i>Rear track</i>	1.616 mm 63.6 in	Potenza specifica <i>Specific output</i>	127 CV/l a 9.000 giri/min 1.53 kW/cu in
Peso a secco <i>Dry weight</i>	1.218 kg 2,685.2 lb	Coppia massima <i>Maximum torque</i>	540 Nm a 6.000 giri/min 398 Nm at 6,000 rpm
Distribuzione dei pesi <i>Weight distribution</i>	42% Ant - 58% Post 42% Front - 58% Rear	PRESTAZIONI PERFORMANCE	
Capacità serbatoio <i>Fuel tank capacity</i>	113 l 29.8 US/gal	Velocità massima <i>Maximum speed</i>	310 km/h 192 mph
PNEUMATICI TYRES		Max accelerazione laterale <i>Maximum lateral acceleration</i>	1,6 g 1,6 g
Anteriori <i>Front</i>	255/650 19"x 9" 255/650 19"x 9"	Peso / Potenza <i>Weight / Power</i>	2,14 kg/CV 6.4 lb/ KW
Posteriori <i>Rear</i>	305/690 19"x 11" 305/690 19"x 11"	Tempo giro di Fiorano <i>Fiorano lap time</i>	76,5 s 76,5 s
FRENI BRAKES		TRASMISSIONE E CAMBIO TRANSMISSION AND GEARBOX	
Anteriori <i>Front</i>	398 x 38 mm 15.7 x 1.5 in	Cambio F1 a doppia frizione 7 marce <i>F1 dual clutch transmission 7 gears</i>	
Posteriori <i>Rear</i>	380 x 34 mm 15 x 1.34 in		
CONTROLLI ELETTRONICI ELECTRONICS			
E-diff3, F1-Trac, ABS prestazionale Manettino 3 posizioni			
E-diff3, F1-Trac, high performance ABS 3 position manettino			