

## 2021 QATAR GRAND PRIX

18 - 21 November 2021

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<b>From</b>	The FIA Formula One Technical Delegate	<b>Document</b>	53
<b>To</b>	The Stewards	<b>Date</b>	21 November 2021
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### Technical Delegate's Report

#### Before the race:

The exhaust system components of car numbers 33, 11, 14, 31, 16, 55, 22, 10, 07, 99, 09, 47, 63 and 06 were checked against the declaration submitted by the relevant team before the Event.

A fuel sample was taken from car numbers 11, 18 and 55 and analysed during the race.

An engine oil sample was taken from car numbers 18 and 55.

On the grid it was checked that all cars had fitted their tyres when the "5-Minutes" signal was given.

On the grid it was checked that the top ten cars had fitted the tyres which they had used when doing their fastest lap in Q2.

On the grid the temperature of the LHS and RHS front and rear tyre was checked on car numbers 44, 77, 33, 11, 03, 04, 18, 05, 14, 31, 16, 55, 10, 07, 99, 09, 47, 63 and 06.

On the grid the minimum tyre starting pressure of the LHS and RHS front and rear tyre was checked on all cars.

#### After the race:

The following cars were weighed:

<b>Number</b>	<b>Car</b>	<b>Driver</b>
44	Mercedes	Lewis Hamilton
33	Red Bull Racing Honda	Max Verstappen
11	Red Bull Racing Honda	Sergio Perez

03	McLaren Mercedes	Daniel Ricciardo
04	McLaren Mercedes	Lando Norris
18	Aston Martin Mercedes	Lance Stroll
05	Aston Martin Mercedes	Sebastian Vettel
14	Alpine Renault	Fernando Alonso
31	Alpine Renault	Esteban Ocon
16	Ferrari	Charles Leclerc
55	Ferrari	Carlos Sainz
10	AlphaTauri Honda	Pierre Gasly
07	Alfa Romeo Racing Ferrari	Kimi Räikkönen
47	Haas Ferrari	Mick Schumacher
63	Williams Mercedes	George Russell

The steering wheel of all cars has been checked.

Car numbers 11, 18 and 16 were checked for the following:

- 1) Bodywork around the front wheels
- 2) Front wing height and overhang
- 3) Rear wing height and overhang
- 4) Front and rear wing width
- 5) Rear wing configuration
- 6) Rear bodywork area
- 7) Rear winglet height
- 8) Skidblock thickness
- 9) Stepped bottom
- 10) Diffuser height
- 11) Diffuser area
- 12) Overall height
- 13) Overall width

The profile of the in Article 3.3.1 of the 2021 Formula One Technical Regulations prescribed front wing section was checked on car numbers 11, 18 and 16.

The minimum distance between the adjacent rear wing sections at any longitudinal vertical plane was checked on car numbers 11, 18 and 16.

It was confirmed for car numbers 11, 18 and 16 that any vertical cross section of bodywork normal to the car centre line and situated in the volumes defined in Article 3.5.7 form one tangent continuous curve on its external surface with a radius no less than 75mm.

The concave radius of sections of the two rear wing elements which are in contact with the external air stream was checked on car numbers 11, 18 and 16.

The front and rear brake air duct dimensions were checked on car numbers 11, 18 and 16.

The engine high rev limit bands were checked on all cars.

The oil consumption was checked on car numbers 44, 33, 11, 04, 18, 05, 14, 31, 16 and 55.

The plenum temperature was checked on all cars.

The ES state of charge on-track limits were checked on all cars.

The lap energy release and recovery limits were checked on all cars.

The MGU-K power limits were checked on all cars.

The maximum MGU-K speed was checked on all cars.

The maximum MGU-K torque was checked on all cars.

The maximum MGU-H speed was checked on all cars.

The session type has been confirmed for all cars.

Chassis FIA checksum was checked on all cars taking part in the race.

The torque coordinator demands were checked on car numbers 44, 33, 11, 04, 18, 05, 14, 31, 16 and 55.

The torque control was checked on car numbers 44, 33, 11, 04, 18, 05, 14, 31, 16 and 55.

The rear brakes pressure control was checked on all cars.

The brake temperature warnings were checked on all cars.

The race start data of all cars have been checked.

Single clutch paddle use for the race start has been checked on all cars.

The MGU-K use at the race start was checked on all cars.

It was checked on all cars that the ES was not charged while the car was stationary in the pits.

It was checked that no car exceeded 80 km/h when leaving the formation grid prior to the start of the race.

It was verified on all cars that the PCU dash display configuration was not changed during Parc Fermé.

The tyre starting pressures of all cars during the race were checked.

The tyres used by all drivers during the race today have been checked.

It was checked that all cars did not exceed 15000 rpm during the race.

The fuel pressure of all cars during the race was checked.

The logged pressure within the engine cooling system during the race was checked on all cars.

Fuel flow meter calibration checksums were checked on all cars.

The instantaneous fuel mass flow of all cars was checked.

The fuel temperature of all cars was checked.

The total fuel mass consumed by all cars during the race was checked.

A fuel sample was taken from car number 05.

The fuel samples have been checked for density and analysed by gas chromatography.

The results of all the fuel analyses show that the fuels were the same as ones, which had been approved for use by the relevant competitors prior to the Event.

Further the density change of the fuel samples taken today was within the permitted limits.

An engine oil sample was taken from car number 44.

The engine oil samples have been analysed by FTIR spectroscopy and viscometry.

The results of the FTIR analyses show that the sampled oils were consistent with reference engine oil samples which had been approved for use by the relevant competitors prior to the Event.

All car weights and the items checked were found to be in conformity with the 2021 FIA Formula One Technical Regulations.

**Jo Bauer**

**The FIA Formula One Technical Delegate**