

## 2021 BRAZILIAN GRAND PRIX

11 - 14 November 2021

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<b>From</b>	The FIA Formula One Technical Delegate	<b>Document</b>	21
<b>To</b>	The Stewards	<b>Date</b>	12 November 2021
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### Technical Delegate's Report

#### **During the first free practice session:**

The tyre starting pressures of all cars during P1 were checked.

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

The fuel flow meter calibration checksum was checked on all cars.

The instantaneous fuel mass flow of all cars was checked.

The fuel temperature of all cars was checked.

The plenum temperature of all cars was checked.

#### **After the first free practice session:**

It was checked that all cars did not exceed 15000 rpm during the first free practice session.

The fuel pressure of all cars during the first free practice session was checked.

The logged pressure within the engine cooling system during the first free practice session was checked on all cars.

The plenum temperature was checked on all cars.

The IVT code and calibration checksums were checked on all cars.

The IVT temperatures were 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 custom software versions were checked on all cars.

The ECU software versions were checked on all cars.

Chassis FIA checksum was checked on all cars.

The rear brakes pressure control was checked on all cars.

Torque sensor software version checks have been carried out on all cars.

Torque sensor calibration checks have been carried out on all cars.

An engine oil sample was taken from car number 10.

**Before the qualifying practice session:**

A fuel sample was taken from car numbers 09 and 63.

An engine oil sample was taken from car numbers 09 and 63.

**During the qualifying practice session:**

Car numbers 11, 03, 18, 31, 16, 55, 22, 99, 47 and 06 were weighed.

The weight distribution was checked on car numbers 11, 03, 18, 31, 16, 55, 22, 99, 47 and 06.

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

**After the qualifying practice session:**

Car numbers 44, 77, 33, 11, 03, 04, 14, 16, 55 and 10 were weighed.

Car numbers 44, 77, 33, 11, 03, 04, 14, 16, 55 and 10 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) Stepped bottom
- 9) Diffuser height
- 10) Diffuser width
- 11) Overall height
- 12) Overall width

The chassis identification transponders have been confirmed for car numbers 44, 77, 33, 11, 03, 04, 14, 16, 55 and 10.

The profile of the prescribed front wing section in Article 3.3.1 of the 2021 Formula One Technical Regulations was checked on car numbers 44, 77, 33, 11, 03, 04, 14, 16, 55 and 10.

The minimum distance between the adjacent rear wing sections at any longitudinal vertical plane was checked on car numbers 44, 77, 33, 11, 03, 04, 14, 16, 55 and 10.

It was confirmed for car numbers 44, 77, 33, 11, 03, 04, 14, 16, 55 and 10 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 44, 77, 33, 11, 03, 04, 14, 16, 55 and 10.

The front and rear brake air duct dimensions were checked on car numbers 44, 77, 33, 11, 03, 04, 14, 16, 55 and 10.

The inclination, the diameter and the position of the last 150mm of the exhaust tailpipes were checked on car numbers 44, 77, 33, 11, 03, 04, 14, 16, 55 and 10.

The flexibility of bodywork lying on the step plane and visible from above was checked on car numbers 44, 77, 33, 11, 03, 04, 14, 16, 55 and 10.

The uppermost rear wing element adjustable positions were checked on car 44, 77, 33, 11, 03, 04, 05, 14, 16, 55, 22, 10, 47 and 63.

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

The plenum temperature was checked on all cars.

The IVT code and calibration checksums were checked on all cars.

The IVT temperatures were 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 qualifying sessions.

Torque sensor software version checks have been carried out on all cars.

Torque sensor calibration checks have been carried out on all cars.

The torque coordinator demands were checked on all cars.

The torque control was checked on all cars.

The rear brakes pressure control was checked on all cars.

Gear shift data checks have been carried out for car numbers 44 and 11.

The steering wheel of all cars has been checked.

It was verified on all cars that the PCU dash board display configuration was not changed.

Custom software version checks have been carried out on all cars.

SECU software version checks have been carried out on all cars.

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

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.

Fuel samples were taken from car numbers 14, 16 and 10.

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

The results of 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 14.

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.

The following software versions have been used by the teams during the qualifying sessions:

<b>Team</b>	<b>FIA Standard ECU system version</b>
Mercedes-AMG Petronas Formula One Team	1311
Red Bull Racing Honda	1311
McLaren F1 Team	1311
Aston Martin Cognizant Formula One Team	1311
Alpine F1 Team	1311
Scuderia Ferrari Mission Winnow	1311
Scuderia AlphaTauri Honda	1311
Alfa Romeo Racing ORLEN	1311
Uralkali Haas F1 Team	1311
Williams Racing	1311

Apart from the uppermost rear wing element adjustable positions of car number 44 (see Document 18), all the above items were found to be in conformity with the 2021 FIA Formula One Technical Regulations.

**Jo Bauer**

**The FIA Formula One Technical Delegate**