

# 2019 SINGAPORE GRAND PRIX

## 19 - 22 September 2019

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<b>From</b>	The FIA Formula One Technical Delegate	<b>Document</b>	52
<b>To</b>	The Stewards	<b>Date</b>	23 September 2019
		<b>Time</b>	00:23

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### Technical Delegate's Report

#### Before the race:

The following parts have been replaced today after 19:05 and before the start of the race:

#### Red Bull Racing Honda:

Car 23: Driver's drink bag

#### Renault:

Car 27: RHS rear autolocker assembly

A front floor deflection test was carried on car numbers 77, 16, 33, 04 and 26.

The flatness of the reference and step plane and their position to each other was checked on car numbers 77, 33 and 04.

A fuel sample was taken from car numbers 05, 07 and 10 and analysed during the race.

An engine oil sample was taken from car number 44 and 05.

On the grid it was checked that all cars had fitted their tyres when the 3-Minutes signal was given.

On the grid it was checked that the top nine 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 11, 99, 10 and 63.

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
77	Mercedes	Valtteri Bottas
05	Ferrari	Sebastian Vettel
16	Ferrari	Charles Leclerc
33	RBR Honda	Max Verstappen
23	RBR Honda	Alexander Albon
27	Renault	Nico H      lkenberg
08	Haas Ferrari	Romain Grosjean
04	McLaren Renault	Lando Norris
18	Racing Point Mercedes	Lance Stroll
99	Alfa Romeo Ferrari	Antonio Giovinazzi
10	Toro Rosso Honda	Pierre Gasly
88	Williams Mercedes	Robert Kubica

The steering wheel of all classified cars has been checked.

Car numbers 99 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) 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 2019 Formula One Technical Regulations prescribed front wing section was checked on car numbers 99 and 10.

The minimum distance between the adjacent rear wing sections at any longitudinal vertical plane was checked on car numbers 99 and 10.

It was confirmed for car numbers 99 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 99 and 10.

The front and rear brake air duct dimensions were checked on car numbers 99 and 10.

A front wing flap deflection test was carried out on car numbers 99 and 10.

The oil consumption was checked on car numbers 44, 77, 05, 16, 33, 23, 03, 27, 08, 55 and 10.

The plenum temperature was checked on all cars.

The IVT code and calibration checksums 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 TAG320 locked status 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, 05, 16, 33 and 23.

The torque control was checked on car numbers 44, 05, 16, 33 and 23.

The rear brakes pressure control was checked on car numbers 44, 05, 16, 33 and 23.

The brake temperature warnings were checked on car numbers 44, 05, 16, 33 and 23.

The race start data of car numbers 44, 77, 05, 16, 33, 23, 03, 27, 55 and 04 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 60 km/h when leaving the formation grid prior to the start of the race.

It was verified on all cars that the MD5 checksum of the PCU8 (dash board display) used on the car matched the configuration lodged with the FiA prior to the qualifying session.

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.

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 23.

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 04.

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 2019 FIA Formula One Technical Regulations.

**Jo Bauer**

**The FIA Formula One Technical Delegate**