

Disqualifications from Endurance and Efficiency Events at Formula Student 2016

As is usual practice, following the Endurance and Efficiency events the fastest finishers (both IC and EV) and cars with good fuel consumption were kept in parc ferme conditions and checked for compliance with the rules in various areas.

Subsequent to these inspections five cars were disqualified from the Endurance and Efficiency events; one of the EV's for exceeding the maximum power limit during endurance, and the remaining four due to infringements of the aerodynamic dimensional regulations.

Two of the teams were disqualified for front wing width infringements (T9.2.1 b), one for both front wing and mid-wing height infringements (T9.4.2) and the final car for excessive rear wing overhang (T9.3.1). As a result of the various non-conformities each team was also found to be in breach of T1.2.3, which requires that the car conforms to the rules at all times during the event.

All measurements were taken by experienced scrutineers on a flat and level surface and witnessed by team members. Most of the infringements were greater than 5mm. One team was 3mm outside the allowable dimension, consequently their car was subjected to a further inspection with a team member reviewing and agreeing to each measurement, and the same 3mm non-compliance was measured.

The four teams excluded for aerodynamic irregularities all lodged formal protests. A protest committee was convened and considered each of the individual points raised in the protests, the measurements provided by scrutineering and the robustness of the measuring technique in determining non-compliance with the rules.

In all cases the protests were not upheld and the decision to disqualify the teams stood. A formal statement was issued to each of the teams and also posted with the rest of the results at Event Control. Subsequently each team has received a more detailed document addressing each of their points of protest. IMechE will not release these documents in to the public domain, but each of the teams is free to do so should they wish to.

The protest committee found that in all cases the method of measurement used, which relies on a relative rather than absolute measurement, was sufficiently robust such that it was beyond doubt each of the cars disqualified were outside the allowable dimensions of the rules.

To reduce the likelihood of disqualifications at future events teams are reminded that:

- The rules limits are absolute and not subject to any tolerance, they should not be treated as design targets.
- Many of the aerodynamic rules are measured relative to the tyres. These can vary due to legal setup changes (e.g. tyre pressures, ride height, other suspension adjustments, tyre changes, etc) made by the team following the original measurement at scrutineering.

- Passing the initial scrutineering/technical inspection is not a guarantee that the car will pass future inspection(s) at any time during the event.
- It is established and common practice for the fastest cars to be taken to parc ferme after the Endurance and Efficiency event, where detailed inspection of the cars takes place and which may be to a more rigorous level than that completed during the initial scrutineering/ technical inspection.
- Should any non-conformance clearly be the result of damage sustained to the car, for example by hitting cones, then the scrutineers may choose to ignore the non-conformance.
- It remains the responsibility of the team to ensure their car complies with the rules at all times during the event.

Unlike most Formula series the rules are wherever possible non-prescriptive, leaving it to the teams to assess and decide their solution to the many possible design trade-offs. In the particular case of aerodynamic device sizes, the measurements are relative to the tyres so teams must consider wing size vs track width to optimise the car performance amongst other compromises, thus increasing the variety of possible solutions and providing additional challenges to the design process.

Although viewed as harsh by many observers, as the Event Organisers we remain convinced that the correct action was taken. To ignore the rules infringements would have been unfair to the teams that successfully completed the Endurance and Efficiency events and passed parc ferme inspection.

The 2017 FSAE Rules are already published with only one significant change within Article 9, if you have any questions about the legality of your future design please submit a Rules Question to your relevant event organiser.

The FSAE Rules Committee are reviewing whether guidelines on how aerodynamic devices should be measured are published, so teams can check their cars prior to future events.