

Balance of Performance in LMGTE Pro in FIA WEC Automatic System of Adjustment

The FIA, the ACO and the GTE Manufacturers entered in the FIA World Endurance Championship have finalised the plan for the governance of Balance of Performance (BOP) for the 2017 season. It is a very innovative and ground-breaking system which will start from the opening round of the 2017 season at Silverstone.

The basis for having BOP

As the cars are based on production models, they are fundamentally different from each other and the performance of each is adjusted to allow each car model to be competitive. The BOP is not meant to eliminate the groundwork done by technicians in order to make road-going GTs real racing cars. The conversions authorised during the homologation process for these cars are the ones that contribute most to their performance (a performance window is defined and it is up to the manufacturer to develop its car to allow it to be within that window). However, some fine adjustments are necessary in order to guarantee the competitiveness of all, and this is the BOP.

Between the 2016 and 2017 seasons, a working group consisting of technical experts from the ACO, FIA, Aston Martin, Ferrari, Ford, Porsche, Corvette and BMW (invited because of its planned entry in the 2018 FIA WEC) have agreed a new process for managing BOP. Coordinated by the FIA and the ACO, this specific working group has met eight times from October to March, each party having contributed to the creation of the project by providing calculations, simulations, data and principles.

The fundamental principle

Adjustments to the balance of performance for cars entered in the LMGTE Pro category during the season will now be made automatically after certain rounds, according to evaluation criteria defined and agreed by all parties before the start of the season. A calculation tool has been created which will allow the targets for balancing the different car models to be met, without human interpretation or decision-making, and using mathematical formulas based on the quantified, public, specific, measured data obtained during each race.

- The gaps between the different car models will be balanced automatically from one race to the next. The data recorded during the race will be used and, from this, a mathematical algorithm will automatically set the adjustments for the next race. The principles in place meet several criteria established by the ACO, the FIA and the manufacturers.
- The mathematical tool will dictate whether the adjustment should increase the performance of slower cars or slow down the fastest cars in order to maintain the overall performance and stability of the class throughout the season.
- The performance data from only the fastest of each car model (the one having recorded the best level of performance) will be taken into consideration.
- 60% of the distance covered (the fastest laps) will be used in order to take into account the best of the car's performance as well as its efficiency with worn tyres.
- Straight-line performance is a parameter that will also be considered (not just lap time) in order to achieve similar performance profiles (a higher top speed that may be favourable in the race, for example).
- The calculation also takes into account the performance of each car by sectors at a circuit (these may differ with twisty or fast sections)

- The system also provides rules for determining whether each car is eligible to receive an adjustment. No adjustments will be made if:
 - A car has not covered enough distance
 - A car has been excessively slow
 - There were abnormal weather conditions
- A table has been put in place to define the frequency of adjustments. If the gaps are great, and if they can be measured over a greater number of races, there will be a greater possibility of an adjustment to a car.
- The manufacturers and regulators have decided not to make the first adjustments until after the first two races so as not to over-react. It has therefore been agreed that the first adjustments will be calculated after Spa, for Nürburgring race (Le Mans being treated separately).
- The adjustable variables are: weight and power. The adjustments are capped (maximum 20 kg and 10 KW by race which can be either added or removed)
- An initial BOP will be applicable for the first 2 events (Silverstone and Spa) which has been defined and published on the basis of multiple parameters:
 - Taking into account the performance of cars racing in the final rounds of the 2016 season
 - Taking into account the technical data provided by each manufacturer at the time of homologation (data sheet), the measurements taken at the tests carried out at the Ladoux track (dynamic measurements), on the engine dynamometer, as well as those obtained in the Windshear wind tunnel, especially for the new Porsche.
- At the same time, the regulations have been reviewed so that the introduction of new tyre specifications (which have a significant impact on performance) is possible only at certain set dates, and in an identical number for each car model for each season.
- The 24 Hours of Le Mans race is treated separately and do not form part of the WEC BOP procedure. Therefore, it is not possible for a competitor to freely perform at a lower level before the 24 Hours of Le Mans in the hope of obtaining a favourable adjustment for the main event in June. The 24 Hours of Le Mans BOP will be published independently of the first WEC events, and will be based on a system similar to 2016 (reporting system and penalties applicable in the event of non-compliant performance).
- This new system has already been tested using data from the previous two seasons, the outcome of this simulation having given very satisfactory results which reassured all the parties in their choice of the procedure.
- The BOP procedure of the LMGTE Am category for 2017 remains exactly the same as in 2016.