IMSA TECHNICAL BULLETIN IWSC #17-17

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To: All IMSA WeatherTech SportsCar Championship Competitors

From: IMSA Competition

Date: 16 February 2017

Re: Boost Control Strategy Update

Effective starting at the 2017 February Sebring Test, there is an update to the Boost Control Strategy referenced in:

- 2017 Prototype Technical Regulations - Article 9.10.3
- 2017 Grand Touring Le Mans Technical Regulations - Article 9.10.3
- 2017 Grand Touring Daytona Technical Regulations Article 9.10.3

The changes to the regulation consist of filtering the Actual Boost Pressure with an exponentially weighted moving average. To determine the Resultant Boost, the Filtered Boost Pressure is used as an input instead of the Actual Boost Pressure.

There are no changes to the Calculation Method (Article 9.10.4). The updates to the Boost Control Strategy Inputs are indicated in red below:

9.10.3. Boost Control Strategy Inputs

Parameter	Description	TB*
Maximum Boost Pressure Ratio (Max Pboost Ratio)	Curve of Maximum Boost Pressure Ratio as a function of Engine RPM	TB
Actual Boost Pressure (Pboost)	Intake manifold pressure measured in accordance with these Technical Regulations In case of two separate intake manifolds, the average of the two manifold pressure sensors will be referenced	
Filtered Boost Pressure (Pboost Filtered)	Exponentially weighted moving average of Actual Boost Pressure. Defined as: $(Pboost\ Filtered)_n = (Pboost)_n * (Ce_{Filt}) + (Pboost\ Filtered)_{n-1} * (1 - Ce_{Filt})$	
Filter Coefficient (Ce_{Filt})	Coefficient that defines weighting for Filtered Boost Pressure	TB
Barometric Pressure Reference	Absolute barometric pressure reading will be recorded by IMSA's calibrated barometer at noon on setup day of a race event The official reading will be promptly released in a Technical Bulletin and is in effect for the remainder of the event	TB
Actual RPM	Unfiltered RPM value measured in accordance with these Technical Regulations	
Actual Throttle	Engine throttle position measured in accordance with these Technical Regulations In case of two engine throttles, the maximum value of the two throttle positions is referenced	
RPM Threshold	An RPM threshold which is used as a condition	TB
Resultant Boost	(Pboost Filtered) – (Barometric Pressure Reference) * (Max Pboost Ratio)	
Integral	Area under the Resultant Boost as a function of time curve in units of pressure-time	
Integral Time Step	Time step of the Integral	TB
Integral Decay	A value in units of pressure-time subtracted from the Integral when the integral is positive	TB
Low Overboost Level	A lower overboost limit in units of pressure time	TB
Lower Overboost Counter	A counter which is incremented when the Low Overboost Level is met or exceeded Low Overboost Counter limits must never be exceeded	TB
Low Overboost Counter Reset Condition	A time-based condition that will reset the Low Overboost Counter	TB
High Overboost Level	A maximum overboost limit in units of pressure-time that can never be met or exceeded	

* All parameters indicated with TB are defined via Technical Bulletin.

The Filter Coefficient has been added to the Boost Control Strategy Inputs table, indicated in red below:

Technical Classification	RPM Threshold	Throttle Threshold	Integral Time Step	Integral Decay	Filter Coefficient	Low Overboost Level	High Overboost Level	Low Overboost Counter Limit	Low Overboost Counter Reset Condition
	[RPM]	[%]	[s]	[mb*s]		[mb*s]	[mb*s]		
P	2000	25	0.001	5	0.1718	30	100	5	Crossing Pit-Out Timing Loop
GTLM	2000	25	0.001	5	0.1718	30	100	5	Crossing Pit-Out Timing Loop
GTD	2000	25	0.001	5	0.1718	30	100	5	Crossing Pit-Out Timing Loop

The boost calculations and status Competitors receive from the IMSA Scrutineering Loggers will comply with this regulation update.