2008 World Challenge Participant Bulletin 20

To: World Challenge Participants

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Regarding: Summary of Touring Car changes for 2009

Objective: Reduce the cost to build a World Challenge Touring Car. This will be accomplished by reducing suspension modifications and lowering power output.

The new rule set is for all cars built after 2008. Existing Touring Cars will be allowed to compete under the existing rules; performance will be adjusted as needed.

ENGINE AND DRIVE TRAIN:

1. The approximate horsepower will be 260 bhp, with a weight and restrictor varying to match the power of the individual configurations. See the subsequent pages for a comparison of the 2009 versus current performance output.
2. Standard gearboxes will be required. Alternate gearboxes from the manufacture or sequential gear boxes may be approved on a case by case basis. If a sequential is approved. An up front penalty would be added for cars using a sequential gearbox.
3. A single set of transmission gear and final drive ratios will be specified for each car.
4. Clutch disc must be full diameter. Carbon clutches are prohibited.
5. Flywheel must be the stock diameter and ferrous material.

SUSPENSION AND STEERING:

1. Ride height shall be 3.5 inches measured rearward from the front axle center line. The front splitter height will remain at 3 inches.
2. Suspension pick up / pivot axis points can be reinforced but must remain in the stock location / orientation. Control arms must pivot on the stock pick-up point.
3. Control arms may be modified to accept rod ends, spherical bearings, etc.
4. Rear independent suspension mounting holes can be slotted about the lateral axis within the limits of the stock mounting structure, box, tab, web, etc. for the sole purpose of camber and/or toe adjustment.
5. The use of offset steering rack bushings and/or offset tie rod ends for bump steer correction are allowed. Spindles may be machined so that tapered tie-rod end bolts can be replaced with straight bolts.
6. Wheelbase must meet the specification on the vehicle's VTS sheet. A tolerance of +/- 0.75 in. will be allowed for caster changes. Front and rear track will be specified on the vehicle's VTS sheet.
   Note: wheelbase and track specs will be established based on the allowed suspension and wheel/tire changes. The intent of this rule is to provide a quick way to identify modifications beyond the scope of the rules.

For 2009, we are planning to reduce the acceleration of the Touring cars to a level which would allow a car with a current stock BMW 3.0l motor to be competitive.

Figure 1 on the next page shows speed vs. distance plots for two simulated acceleration runs. One is a simulation of a 2008 spec car, which would be competitive with the current set of touring cars. The other is the proposed 2009 spec. For 2009 cars will be adjusted to match the 2009 curve.

Table 1 shows the inputs that were used to generate the acceleration curves in Figure 1. The power and torque curves are 'at the wheels'.

Table 1: Simulation Inputs

2008 Spec Car	2009 Spec Car
Weight: 2825 lbf Driven Wheel Radius: 12.03 in CdA (drag area): 7.5 ft^2 Rolling Resistance: 40 lbf Gear Ratios: 3.17, 2.07, 1.65, 1.35, 1.14, 1.10 Final Drive Ratio: 3.76	Weight: 2825 lbf Driven Wheel Radius: 12.03 in CdA (drag area): 7.5 ft^2 Rolling Resistance: 40 lbf Gear Ratios: 3.17, 2.07, 1.65, 1.35, 1.14, 1.10 Final Drive Ratio: 3.76

Engine Speed (rpm)	**Torque (ft-lbs)**	**Power (hp)**
5000	175	167
5500	175	183
6000	175	200
6500	175	217
6750	175	225
7000	173	231
7250	172	238
7500	166	237
7800	152	226

Engine Speed (rpm)	**Torque (ft-lbs)**	**Power (hp)**
5000	166	158
5500	166	174
6000	166	190
6500	166	206
6750	166	214
7000	164	219
7250	163	226
7500	158	225
7800	144	215

Figure 1: Simulation Results