

Chapter II

Supplemental Rules for the Shell Eco-marathon Youth Challenge UK 2009

In 2009, the Shell Eco-marathon Youth Challenge UK will be held on 30th June and 1st July at the Rockingham Circuit

The rules in this Chapter II are supplemental to the rules in Chapter I. In case of any inconsistency between the provisions of Chapter I and Chapter II, the provisions of this Chapter II shall prevail.

1 – GENERAL

Article A: The Competition

The competition is promoted and organised by Shell Global Solutions (UK) (a division of Shell Research Limited) and Goose Communications Limited (the 'Organisers'). The rules of the competition comprise Chapter I and Chapter II of these regulations and any written instructions that the Organisers may issue for the event.

The participating teams must complete 7 laps of the Eco-marathon circuit at the Rockingham Circuit. For their attempt to be validated, teams must complete the 7 laps at a minimum average speed of 15 miles per hour.

Teams shall be allowed six official attempts. The best result shall be retained for classification and, in the event of a tie; the second best results will be used to differentiate teams. All teams will have the option to take practice laps prior to the competition; however, these practice laps will not be considered official attempts and teams are not required to undertake any practice laps.

The earliest and latest starting times that a vehicle can use of the track will be posted prior to the competition and notified in the Final Instructions. The 'Clerk of the course' appointed by the Organisers will perform the role of Competition Director.

There will not be classes for hydrogen fuelled or Urban Concept vehicles

Article B: Entry

Entries must be submitted by [5 p.m.] on 15th May 2009. The entry form will be considered only if submitted in full and on the official form contained within these regulations. The Organisers will review all entry forms. The Organisers reserve the right to accept or refuse any applicant and the Organisers' decisions shall be final.

Drivers may be nominated at a later date using the official form.

Article C: Insurance

Public Liability insurance is in place, which covers the Organisers and their nominated officials, the promoter and sponsors and any participant authorised to compete in the event.

Competitors participating in this event are also covered by a separate Personal Accident Insurance policy, which provides cover in respect of Permanent Total Disablement, Loss of Limb or Death.

Copies of both insurance policies are available upon request from Motion Works Management Limited.

Article D: Damages Not Covered by the Organisers

Any damage caused by competitors to circuit facilities and surroundings and/or to Shell Eco-marathon equipment shall be charged to the teams having caused said damage.

Article E: Social Responsibility

In the interest of respect for others, noise levels shall be kept to a minimum. Team managers will be responsible for enforcing this article, in the interest of his/her team and other teams. Each team is also responsible for the upkeep and cleanliness of its immediate environment, including waste management and waste clearing-up.

Article F: Schools Class

The construction of the Schools Class vehicle is subject to Chapter I and Chapter II of these regulations, with the exceptions and restrictions in this article.

Chassis shall be made of steel, aluminium, wood or glass fibre. The use of carbon/epoxy based composites for the chassis is forbidden. The structure must be firm and solid, with all axles, sub frames and steering equipment being attached to the chassis. Bodywork (where fitted) should be made from:- metallic sheets, fabrics, wood, plastic or glass-fibre. The use of carbon based composite materials is forbidden. Tyre type is free, except for the special Michelin radial slick tyres as supplied to Eco-marathon competitors which are not allowed. The Michelin crossply tyres are allowed.

The engine should be a proprietary item (specially made engines are prohibited). Gasoline engines shall be fuelled by a carburettor or fuel injection provided the team can prove that children have involvement in the implementation (active part). Diesels are allowed.

Article G: Honda Engined Schools Initiative

This class is specifically for schools that have been supplied with a Honda engine, as part of the Schools Initiative. The construction of the Schools Class vehicle is subject to Chapter I and Chapter II of these regulations, with the exceptions and restrictions in this article.

Chassis shall be made of steel, aluminium, wood or glass fibre. The use of any carbon/epoxy-based composites for is forbidden. The structure must be firm and solid, with all axles, sub frames and steering equipment being attached to the chassis. Bodywork (where fitted) should be made from:- metallic sheets, fabrics, wood, plastic or glass fibre. The use of carbon composite materials is forbidden.

The engine shall be as supplied by the Organisers. The engine should remain as standard; no internal adjustments/modifications/blueprinting is allowed. The plastic fuel tank should be removed. The fitting of an electric started motor is allowed.

Tyre type is free, except for the use of the special Michelin slick tyres as supplied to Eco-marathon competitors which are not allowed. Competitors can use treaded Michelin tyres.

Vehicles must, as a condition of entry, display any Honda engine identification stickers as provided by the Organisers, two on each side of the vehicle each sticker being 12 cm wide x 2.7 cm high.

COMPETITION

Article H: Starting Order and Procedure

On the days designated for competition, teams shall depart from the starting grid on a "first come, first served" basis.

Vehicles shall be at a full stop and shall receive no outside assistance during starting. Any pushing of the vehicle is prohibited; vehicles must drive away from the start line, with the engine running and unaided by the starter motor. If the event officials are not happy with the starting procedure, the run will be terminated and included as one of the total number of runs permitted.

The vehicle may be accompanied to the starting area by a maximum of two team members (not including the Driver). Once the vehicle has left the starting line, all team members shall leave the starting area with their equipment.

Article I: Fuel Consumption

Before the start:

Competitors shall proceed to the starting line with the fuel system nominally full of the fuel supplied by the Organisers.

In the case of **LPG-powered** vehicles, an LPG cartridge shall be fitted to the vehicle after weighing.

For **gasoline-powered** vehicles the fuel tank will be filled to the line and the temperature taken.

For teams expecting better than 5000mpg, the fuel tank, line and injector will be weighed with a precision balance. The fuel system (tank, hose and injector) shall be compact and easily dismantled in order to facilitate weighing. Before approving reinstallation of the duly weighed fuel system, Inspectors shall verify that the engine is the one that was inspected and validated. They shall also ensure that gasoline is not present in the air intake.

At the finish line:

Competitors shall refrain from any work on their vehicles prior to inspection of the vehicle by the fuellers. Fuellers are the only persons authorised to fill or top-up the tank.

A maximum of two team members per team with ID badges (not including the Driver) may be present at the finish area for the measurements.

For vehicles using a fuel that is in the liquid state at atmospheric pressure (petrol, diesel, E100, etc.), the quantity of fuel needed to refill the fuel tank shall be the basis for calculating fuel consumption. This volume shall be corrected for temperature variations. The volume consumed shall be measured at the reference temperature of 15°C.

For top-ranked gasoline vehicles, after reinstallation of the duly weighed fuel system the starter shall be verified by the scrutineers to ensure that the clutch setting has not been tampered with since the technical inspection.

The scrutineers may also request that the vehicle be brought to an enclosed area so that further inspection can be conducted prior to posting of the results.

For LPG-powered vehicles, the cartridge shall be removed and weighed by a fueller.

The Organisers will post the final starting time for competition. No vehicle shall be allowed to enter the starting area after the ending time of the competition.

Article K: *Provisional Timetable*

Tuesday 30th June 2009

Signing-on, scrutineering and tank measuring from 08:30 hours

Driver briefing 0930 hours

Practice: Track open between 1000 - 13:30 and 14:00 - 1700 hours

Event: Track available for competition between 1400 to 1700 hours

Wednesday 1st July 2009

Late arrival signing-on/scrutineering 0900 to 1030 hours

Driver briefing 0915 hours

Competition begins at approx 0930 hours

Competition ends and *track closes at approx 1615 hours*

Article L: *Awards and Presentation*

The trophies shall be presented to the winning teams after the competition. Prize money shall be paid by cheque and shall be sent by mail to the team manager designated on the team's entry form. Other Awards and Trophies will be given to team at the awards ceremony.

Article M: *Judicial Procedure*

Only team managers may protest. Protests must be in writing, stating the grounds of the protest, and must be handed to the Clerk of the Course, together with a protest fee of £15 within 15 minutes of the matter protested becoming apparent.

Judges, Scrutineers, Timekeepers, Starters, Fuel Measurers and other officials appointed to adjudicate on the conduct of the event are Judges of Fact and only in exceptional circumstances will protests against their decisions be considered.

Article N: *Judge of Fact*

All Scrutineers will be Judges of Fact in relation to matters concerning vehicle compliance with technical and safety regulations, fuel systems and fuel measurement. In these last two respects, the fuel measurers will be a Judge of Fact.

All Time Keepers, Starters and Fuel Measurers will be Judges of Fact in relation to compliance with the starting procedure.

Article P: *Local Regulations and Specifications of Items covered in Chapter I*

NB: All competitors and vehicles deviating from the regulations set out in Chapter I by making use of the provisions of this Article, will not be eligible to claim an official Fuel Economy World Record.

The following Articles of Chapter I shall be amended as set out below. Save as amended in this section, the remainder of the provisions of the relevant Articles of Chapter I shall continue to apply.

----- **DRIVER EQUIPMENT** -----

Article 21: Driver Weight

Drivers of 'School Class' and 'Schools Initiative Class' vehicles need not comply with the minimum weight of 50kg (in full driving gear).

For 2009, competitors not wishing to be eligible for a Fuel Economy World Record need not comply with this minimum weight limit.

Article 22: Helmets

For practice and competition, drivers must wear motorcycle style crash helmets currently produced for use by motorcyclists. They should be a minimum of $\frac{3}{4}$ face or full face. All helmets will be subject to approval by the scrutineers.

It is recommended that MSA approved helmets are used, these include:

- FIA 8860-2004
- SNELL SA2005
- SNELL SA2000
- SFI Foundation 31.1A, 31.2A
- BS 6658 Type A/FR
- BS 6658 - 85 Type A (Type B is not acceptable)
- SNELL K98 and K2005

Competitors should provide their own helmets. There will be a limited number of helmets available for loan by the Organisers.

It is the competitors' responsibility to inspect any helmets or other equipment provided by the Organisers and to satisfy themselves that any such items are safe and fit for purpose.

All drivers must wear face shields, goggles or safety glasses. Bicycle, mountain climbing, or other helmets not designed for motor use are strictly forbidden.

Article 23: Driver Clothing

All drivers must wear flame retardant racing style suits as the outermost layer of clothing and those competitors not having such suits will be loaned them by the Organisers.

Drivers shall, without exception, wear gloves and shoes.

Article 24: Equipment and Materials

Operational 6kg dry powder extinguishers will be supplied in each garage by the Organisers and Rockingham Circuit.

----- **VEHICLE DESIGN** -----

Article 26: Dimensions

All new vehicles must comply with Article 26 of Chapter I. Vehicles that have previously competed at the Shell Eco-marathon UK and no longer comply with Article 26 of Chapter I will be allowed to compete in 2009. **Urban concept vehicles are not permitted.**

Article 34: Horn

All new vehicles must be equipped with the authorised horn that can be purchased from the Organisers. For vehicles that have previously competed at the Shell Eco-marathon UK the horn must be loud enough to be heard by other drivers. Therefore it should be capable of being heard at least 30m away from the vehicle with its engine running. The horn may be powered by a battery dedicated to this effect, employing a simple electrical circuit (battery, pilot contactor). "Air horns" will not be allowed due to the potential for the decibel level of these horns to cause injury.

Article 37: Wheels, Axles and Wheel Hubs

It is recommended that a chain guard is fitted above the drive chain. This should prevent the chain from flailing outside the vehicle in the event of breakage during 'warming up'.

Article 40: Braking

All vehicles shall be equipped with two independently activated brakes or braking devices, each including command control, command transmission (cable or hose) and an activator (calliper or shoe). One device shall act on the front wheel(s), the other on the rear wheels(s) as stipulated in Chapter I.

Article 45 - 67: Urban Concept Group

These vehicles cannot compete at the UK event.

----- **ENERGY SOURCES** -----

Article 68: General

There will be no class for hydrogen fuelled vehicles.

Article 70: Engine Lubricants

The Organisers will provide at the event (during signing-on) Shell Helix Ultra 5w/40 engine oil for use by the competitors during the competition. Oil samples will be taken at random to ensure competitors comply with this. If competitors wish to use this oil for practice before the practice day, then they should purchase the oil.

Competitors may use a two-stroke fuel supplied by the Organisers and consisting of a mixture with two or four percent of high-performance synthetic oil (Shell Advance Racing X or SX, 2-Stroke). This lubricant will be supplied on the practice day. This addition shall be considered as fuel consumed by the engine.

Article 74: Fuel Tanks (Combustion engine with the exception of LPG)

For the UK event fuel tank size and supply is unrestricted (no need to have 'APAVE' stamped on them).

Article 76: LPG Cartridge

The LPG cartridge shall be visible at all times from the outside of the vehicle. A standard LPG cartridge containing approximately 230g of LPG (plus fittings) is required and cannot be modified. Alternatively, a standard 'Primus' 2000 or 2012 cylinder must be used.