



Hyundai Excel Racing Association of Victoria inc

Hyundai Excel Racing Association Vic. Inc. Regulations

Recognition Document

**Issue No. 2
Effective 1 January 2017**

These regulations are to be read in conjunction with the CAMS regulations “3rd category Circuit Excel”

1. PREAMBLE

Hyundai Excel Racing Association Vic. Inc. (HERA Vic. Inc.) is a budget entry-level touring car category. The aim of this series is to provide an affordable and safe environment where members can learn and improve their race craft in a fun and competitive series. CAMS is ultimately responsible for the approval of the regulations or changes thereto, and responsible for publishing the regulations as necessary. All vehicles in races and other speed events must comply with the General Requirements of Automobiles (see “General Requirements for Cars and Drivers” in the CAMS Manual of Motor Sport).

The Log Book Category is Category 3 – Group 3E – Touring Cars Circuit Excel. Only vehicles issued with a log book as above and which comply with the regulations identified in this document may compete for Hyundai Excel Racing Association Vic. Inc. championship points.

DEFINITION

1.1. Hyundai Excel Racing Association Vic. Inc. Automobile

These regulations apply to Hyundai Excel Racing Association Vic. Inc. competition vehicles including and limited to Hyundai Excel X3 models manufactured between 01/07/1994 and 31/06/2000. All model iterations of GX, GL, LX, GLX and Sprint are eligible. Single cam (SOHC) and twin cam engine (DOHC) variations shall compete with equal parity. To be eligible each automobile must remain identical in all respects to the specific production model on which they are based, as supplied by Hyundai Australia and as detailed in the relevant CAMS/FIA homologation documents A5554 and N5554 together with the factory Hyundai workshops manuals and bulletins. No component of the automobile shall be modified or altered unless specifically authorised within these regulations.

1.2. Coachwork

All entirely sprung parts of the car in contact with the external air stream, except the parts definitely associated with the mechanical functions of the engine, transmission and running gear.

1.3. Wheel

The complete wheel flange inclusive of the flange, rim and tyre and any additional fittings.

1.4. Decorative Strips

This means any parts following the external contours of the bodywork and less than 100mm high, the function of which is to prevent minor body damage or is decorative. This includes badges describing the vehicle manufacturer and/or model.

1.5. Telemetry

The collection and transmission of data from or to the car whilst moving is prohibited and is considered telemetry.

1.6. Standard Part

Standard part means a part to be used as a replacement on the automobile for a worn or broken part, and must be standard replacement parts from any manufacturer. The parts must be of similar configuration, dimensions and material to the parts they replace.

2. MODIFICATIONS AND ADJUNCTIONS PERMITTED OR OBLIGATORY

2.1. Implied Restriction

A modification or tuning practice which is not permitted by the regulations is expressly forbidden.

2.2. Allowable

The only work which may be carried out on the automobile is that necessary for normal servicing, or for the replacement of worn or damaged parts. The limits of the modifications and fittings permitted are specified hereinafter.

2.3. Parts and Materials

Any worn or damaged part can only be replaced by a standard part. The use of other parts is not permitted unless its use is otherwise specifically permitted by these regulations.

3. ELIGIBILITY

3.1. Racing Weight

Each vehicle must comply with the 1000kg minimum racing weight with driver as raced. Ballast may be fitted to achieve such a weight and must be fitted in accordance with the requirements of the CAMS Manual of Motorsport. The use of fuel as ballast is not recommended, as vehicles can be weighed at any time.

3.2. Safety Cages

Each vehicle shall be fitted with a safety cage and side intrusion bars as detailed in Schedule J of the CAMS Manual of Motor Sport.

3.3. Seats

Each vehicle shall have all standard seats removed. Factory seat tracks and brackets may also be removed. The driver's seat shall be replaced with an approved ADR, FIA SFI, one piece race seat. Refer to CAMS Manual of Motor Sport for specifications.

3.4. Body Appearance

Appearance shall be neat and clean. Vehicles that are dirty, either externally or in the engine and passenger compartment, or show excessive body damage may not be approved for competition. The determination in this respect is at the discretion of the Chief Scrutineer and/or the Clerk of Course and is final and shall not be appealed. Decorative strips may be removed.

Strut towers must NOT be modified – no redrilling top of towers front or rear, except that the hole in each rear strut tower may be enlarged to a maximum of 60mm diameter and provided it remains circular and concentric with the original opening.

Seam welding is not permitted, except for the bracket that attaches the front lower control arm to the body.

Signwriting is encouraged. "Nick-names" may be fitted to the bottom left hand corner of the windscreen in the oblique section of the windscreen. The left hand windscreen wiper may be removed.

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Both front mudguards, the top of the windscreen and the top of the rear screen, both headlights, rear number plate and the space between the top of the race number panel and the bottom of the front door windows on both sides are to be left vacant for Association sponsors.

The Association Sponsors stickers must be on the vehicle in the correct location and unmodified to receive points for the Hyundai Excel Racing Association Vic. Inc. Championship.

3.5. Tow Points

Towing eyes shall be fitted to both front and rear of the vehicle in accordance with the CAMS Manual of Motor Sport.

Tow points must be marked with red "Tow" stickers

3.6. Tyres

The control tyre for Hyundai Excel X3 cars will be the **Federal 195/50ZR 15 82W RS-R**.

They are available from: Exclusive Tyre Distributors Unit 1/1 Healey Road Dandenong.

The control tyre is subject to ongoing review as the category develops.

Tyre buffing is not permitted.

3.7. Non-Genuine Parts

Freedom of source of supply is granted for all fasteners, belts, gaskets, seals, flexible hoses, liquid carrying pipes, mechanical cables, bearings, clamps, spark plugs and spark plug leads, filters, batteries and battery cables, globes and LEDs, fuses and electro mechanical relays and windscreen glass provided no additional modifications are made to facilitate the fitment of the replacement part. The parts must be standard replacement parts and must respect the configuration and functional dimensions of the parts they replace and be of similar material. The use of non-genuine parts must not result in the unauthorised modification to any other component. The use of recycled genuine parts where appropriate is encouraged.

4. ENGINE

4.1. General

The engine shall be the G4FK (DOHC) or G4EK (SOHC).

Unless specified otherwise below, tolerances for machining, finishing and weighing of engine components will be in accordance with "Definitions - Technical, Measuring Tolerances" within the "General Requirements for Cars and Drivers" section of the CAMS Manual of Motor Sport. All plastic shrouding located in the engine bay, the sole purpose of which is aesthetic, may be removed. Soundproofing material and trim fitted to the underside of the bonnet that is not visible from the outside may be removed. Engines and their component and replacement parts shall remain identical in all respects to the original production components as supplied by the automobile manufacturer and be assembled in no other configuration.

Engines may be sealed by officials at any time during the season to be checked by an official at a time to be organised at the competitor's expense. Any number of vehicles in the State Championship may have their engines sealed and checked.

4.2. Mounts

The dampening material of the engine mounts is free provided the location, position and orientation of the engine remains standard, original engine mounting points must be used in an unmodified form.

4.3. Cylinder Block

It is permitted to increase the cylinder block bore diameter by a maximum of 0.6mm, to a maximum of 76.1mm. It is permitted to fit a sleeve to a unitary block.

4.4. Cylinder Heads

It is permitted to remove material from the head gasket contact face of the cylinder head for normal reconditioning purposes, provided the engine's compression ratio remains within the automobile manufacturer's limits. It is also permitted to re-grind valve seats provided that the grinding process does not remove any of the cylinder head casting.

Other than these exceptions, no modifications, machining, addition or removal of material from the cylinder head is permitted.

NOTE: Bead blasting or similar process and angle machining are not permitted.

4.5. Piston Rings

Piston rings may be replaced provided the number of compression and oil rings remains the same as the standard piston.

4.6. Camshaft/s

The cam timing and associated hardware must remain standard and unmodified. Slotted gears, offset bushes and vernier type cam pulleys are specifically excluded. The cam shaft(s) must remain standard and unmodified. Refinishing is not permitted. No modification of camshafts or camshaft timing.

4.7. Lubrication

The sump may be baffled and the oil pickup pipe extended as required. Any baffling shall be completely enclosed within the sump. No additional external pressure devices are permitted.

It is permitted to fit an engine oil-cooler provided that the sole purpose of the cooler is to reduce the oil temperature, and the direction of oil flow within the engine is unchanged. All coolers and associated components must remain inside the external bodywork of the automobile. The only modification permitted to facilitate the fitment of coolers and associated components is the relocation of the oil filter and the drilling of holes for mounting purposes.

4.8. Throttle Air Intake

Intake manifold is to be original and un-modified. The rest of the intake is free before the original throttle body and air flow meter. Pod filters are permitted. Forced induction is not permitted.

4.9. Electronic Engine Control Unit

The standard manual Hyundai engine control unit (ECU), applicable to the engine type (DOHC or SOHC) must remain unmodified. No ECU piggy backs are allowed. The ECU diagnosis connector must be in place and operable. Data loggers are not to be installed into the ECU. The ECU must be easily accessed to enable swapping of the ECU by officials at any time.

No resistors are to be fitted in the wiring harness.

4.10. Cooling System

Radiators may be replaced provided the width, height and position of the replacement radiator is the same as the standard radiator. No additional modifications are permitted to be made to facilitate the fitment of a replacement radiator. It is permitted to fit a protective screen mounted in front of the radiator provided no additional modifications are made to facilitate the fitment.

4.11. Exhaust

The exhaust system is free after the first juncture. Exhaust must exit from rear of vehicle. Systems must comply with appropriate noise controls and decibel readings.

The original cast manifold must be used and is not to be modified in any way.

4.12. Air Conditioning / Heating Components

Any components solely associated with the air conditioning / heating system of the automobile may be removed from the engine compartment and cabin.

5. TRANSMISSION

5.1. Mounts

The dampening material of the transmission mounts is free provided the location, position and orientation remains standard and must be used in an unmodified form. The gear shifter mount may be modified to reduce free travel in the mechanism. The gear shift mechanism may be raised only by the addition of spacers.

5.2. Gear Box Ratios

Gearbox ratios shall remain standard, as per specification sheet, (table 1)

A final drive ratio of 3.842 (DOHC) or 3.656 (SOHC) is permitted.

Any suspended wheel must rotate freely at all times. No locked or limited slip differentials permitted.

5.3 Gear Box type

M5AF3

5.4 Gear Box ID

H – 1973

Note: the second position on the ID is the year, it can be R, S, T, V, W, X or Z

5.5 Flywheel and Clutch

Machining of the flywheel is not permitted, save for the friction surface

Any component of the clutch assembly may be replaced provided it respects the original design specifications and continuous friction material.

NOTE: A solid centre friction disc is not permitted.

6. SUSPENSION

6.1. General

The suspension is a controlled item. To be eligible to receive points for the HERA Vic. Inc. Championship the following suspension must be fitted, which is: **XYZ coil over system - Part No. HY01-RS** which is available from: Performance Suspension 14/239 Brisbane Road Labrador, Qld. 4215

Phone (07) 5529 2366.

Original mounting point locations are not to be altered and must be used.

The adjustment of suspension geometry within the range of adjustment provided for by the manufacturer, or as permitted by such modifications as are permitted by the present technical regulations, is free. The suspension package must be fitted as supplied.

6.2. Anti-Roll Bars

It is permissible to fit aftermarket anti Roll bars, however the rear must not exceed 18mm maximum in thickness and the front must not exceed 22mm maximum in thickness. Original chassis mounting points must be retained and used in an unmodified form. The anti roll bars must be non-adjustable.

6.3. Camber

Camber is set at 4.0 degrees per wheel maximum. Camber and Caster may be adjusted through the use of eccentric camber plates, pins or washers and/or by the use of a caster bush kit. The top mounting strut holes must remain untouched. A strut brace connecting the front strut mounting points only is permitted.

6.4. Coil Springs

Coil springs form part of the controlled suspension package and must be fitted as supplied.

6.5. Suspension Bushes

Suspension bushes may be replaced with alternative elastomer materials.

6.6. Ride Height

Each fully sprung part of the automobile must be at least 100mm above the ground when measured at any point within the wheelbase. The automobile ride height will be measured as raced, including the driver and apparel and excluding the exhaust. Will be checked with control tyres set at 2.0 bar +/- 0.1 bar air pressure.

6.7. Steering

The locking system of the anti-theft steering lock must be rendered inoperative. Steering wheels are free but must meet ADR, FIA & CAMS standards. Refer to CAMS manual of Motor Sport.
Power steering may be added or removed.

7. WHEELS

7.1. General

Wheels shall be 15" in diameter and a one piece casting. Width is a maximum of 7", however any set of fitted four wheels shall be identical in width and offset and interchangeable front to rear.
Wheel spacers are permitted, to a maximum width of 10mm per wheel, fixed to the mating face of the wheel or hub and with Schedule E of the CAMS manual.
Longer wheel studs are highly recommended to be fitted if wheel spacers are used.
Wheels and tyres must fit within unmodified guard profile.

8. BRAKES

8.1. Pads

Brake friction linings are free.

8.2 Brake Rotors

Standard Excel front discs and callipers must be used
Slotted or cross drilled rotors are not permitted
Air ducting is permissible to front and rear brakes
It is permissible to replace the bolts that retain the brake rotor with counter sunk bolts of the same grade.

8.3. Calipers

Front brake calipers must be standard as per manufactured.

8.4. Flexible Brake Lines

Flexible brake lines are free.

It is permitted to fit a mechanical proportioning valve to a brake line provided such valve is not adjustable from within the cockpit.

8.5. Backing Plates

The disc rotor backing plates may be removed.

8.6 Rear Brakes

The rear drum brakes must be standard. The friction material is free.

A functional parking brake mechanism shall be fitted

8.7 Brake Cooling

It is permitted to remove a blanking plate or cover or a fog light assembly and associated hardware located in the lower section of the standard front bumper bar, for the sole purpose of providing additional cooling air to the front brakes.

It is permitted to fit a single duct to the braking system of each front wheel, solely to direct ambient air from the existing unmodified opening in the standard front bumper bar to each front brake rotor. Each brake duct must be wholly contained within the external shape of the standard bodywork and must not be visible when viewed from the front of the automobile (except through an opening in the front of the duct). The front disc brake backing plates may be modified for the purpose of an attachment of a brake duct or removed in their entirety

Each brake duct must not exceed 80mm inside diameter except for the brake duct fitting within 150mm of the external surface of the standard front bumper bar; and within 80mm of the brake rotor.

9. FUEL SYSTEM

9.1. Fuel

Fuel shall be Commercial Pump Fuel as specified in Schedule G of the CAMS Manual of Motorsport.
Fuel additives are not permitted.

Octane boosters are not permitted,

Racing fuel is not permitted. Fuel samples may be taken at any time by officials.

9.2. Fuel Pump

The fuel pressure regulator is free. The original fuel pump may be replaced by an external type, providing the pump and fuel lines are not located within the cabin.

Each fuel injector shall be an original and unmodified factory Hyundai Excel component for a model sold in Australia.

9.3 Fuel Tank

It is permissible to modify the standard fuel tank with the addition of tank safety foam only.

Surge tanks / Swirl pots are not permitted.

10. ELECTRICAL EQUIPMENT

Chipping and wiring harness modifications are not permitted.

Each vehicle must be fitted with a battery isolation switch which isolates all electrical circuits from the battery. A cable connected to the switch shall be mounted on the scuttle adjacent to the driver's side wiper arm to enable the switch to be operated externally if needed.

The battery may be relocated to a suitable location within the vehicle. The battery type is free, however lead-acid type batteries must be fully enclosed within a battery box and securely affixed.

The battery location must be clearly marked with a blue triangle.

The original electrical system comprising head and tail lights, brake lights and indicator lights shall function normally.

The standard rear high level brake light in either the rear window or the spoiler must be operational.

The original rear fog lamp must function as a rain lamp.

The use of data storage devices including multi-display dashes with the ability to store car data is not permitted, excluding recall tachometers.

Supplementary gauges of oil pressure, water temperature, tachometer and lap counter are the only gauges permitted, providing that is their only function.

The use of Pit to car radios are permitted but car to car radios are expressly prohibited.

The wiring of any tachometers **must** be to the original plug at the base of the steering column.

There will be no additional wiring to or from the original wiring loom or the ECU.

It is permissible to remove excess switches, alarm systems, central locking but steering column controls must remain in their original location.

11. BODYWORK

11.1. Exterior

It is permitted to reform the wheel arch lip fold against the inside of the wheel arch and remove the plastic inner guard liners. The guard/panel shall retain the original shape, profile and width.

Plastic shrouds fitted under the body of the automobile (licked by the air flow) may be removed.

Charcoal canister located under the front passenger side may be removed.

Washer bottle located under the front driver's side may be removed.

Rear wiper and wiper motor may be removed with resulting hole covered.

Protective headlight film must be fitted.

The bonnet shall be fitted with safety pins.

Use of light weight window materials is not permitted. No Perspex (polycarbonate) materials.

Vehicles must not have any tint on any windows.

11.2. Interior

The driver's seat shall be replaced by one that complies with ADR, SCI, FIA 8855/99 standard. The driver must use a safety harness that complies with Schedule I (General Requirements for Cars and Drivers).

The following may be removed from the cockpit:

- 1 roof padding and lining;

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- 2 carpets and insulating material;
- 3 sound insulation and internal plastic trim;
- 4 components solely associated with the air conditioning / heating system
- 5 restraint systems and supplementary restraint systems;
- 6 boot lining, spare wheel and wheel changing equipment;
- 7 radio and speakers centre console and gear shift boot
- 8 Glove box and heater box.

The removal of above items is permitted, provided that no additional modifications are made to facilitate their removal. The dash and factory door trims shall remain in place or may be replaced with alternate material. In respect to the dash assembly, cover plates shall replace the cavities left by the removal of radio, air conditioner controls, consoles etc. The original dash may be replicated totally in GRP (glass fibre reinforced plastic) or capped in a similar material to repair cracks and damage as required.

The only components which can be added in the cockpit are as follows:

- 1 Safety equipment and structures;
- 2 window safety nets - mandatory;
- 3 additional instruments, switches, shift lights and alarms;
- 4 battery;
- 5 driver air ducting;
- 6 stored video and on board video camera (with approval from scrutineer)
- 7 ballast; and
- 8 aftermarket front windscreen demister.

None of the above items may hinder cockpit exit or driver's visibility or increase the engine power or influence the steering, transmission, brakes, or roadholding of the automobile in a direct or indirect manner.

12 Miscellaneous

The reinforcement of jacking points is permitted only by the addition of metal plate/s and provided any reinforcement plate does not exceed 150mm x 150mm x 3mm and follows the contours of the original structure.

Eligibility Officers will check vehicles during the course of the racing year.

Any modification not specifically noted is *not allowed*. Please check before you make any changes that may place your vehicle outside the rules.

If it is illegal and you are caught, which you will be, there are heavy penalties involved.

Remember, if it doesn't say you can – you can't.

Appendix 1

Block prefix – G4FK - DOHC

Cylinder bore	76.1mm maximum
Stroke	83.5mm maximum
Cylinder block height	257.7mm minimum
Block tolerance (Limit for correction of cylinder block upper face distortion)	0.25mm
Crankshaft weight	11.2kg minimum
Piston protrusion	+0.05 (+/- 0.15mm)
Piston material	Aluminium alloy (Cast)
Piston height from gudgeon pin centre to piston crown	30.5mm (+/- 0.1mm)
Piston weight, with gudgeon pin, circlips and rings	317.2g minimum
Piston rings – number (includes oil control ring/s)	3
Conrod weight including fasteners	495.0g minimum
Total combustion chamber volume	42.95cc minimum
Cylinder head combustion chamber volume	37.80cc minimum
Cylinder head height (from gasket plane to camshaft centre)	147.0mm minimum
Cylinder head	No angle milling permitted
Inlet valve seat insert – throat diameter	25.0mm maximum
Exhaust valve seat insert - throat diameter	22.5mm
Inlet valve diameter	28.2mm maximum
Exhaust valve diameter	25.0mm maximum
Valve stem - diameter	6.0mm
Valve spring installed height	35.0mm
Inlet port (tolerance -2%, +4%)	Drawing 1
Inlet manifold (tolerance -2%, +4%)	Drawing 2
Inlet manifold throat	No match porting
Exhaust port (tolerance -2%, +4%)	Drawing 3
Exhaust manifold (tolerance -2%, +4%)	Drawing 4
Exhaust manifold Outlet (tolerance -2%, +4%)	2 x 34mm
Inlet camshaft lobe dimension (Drawing 5)	(A) 36.00mm minimum (B) 43.2484mm maximum
Inlet Valve lift	7.20mm (+/- 0.2mm)
Exhaust camshaft lobe dimension (Drawing 5)	(A) 36.00mm (B) 43.8489mm
Exhaust Valve lift	7.8mm (+/- 0.2mm)
Throttle body internal diameter	48.0mm (+/- 0.25mm)
Flywheel thickness	29.0mm minimum
Flywheel weight	6.5kg minimum
Gearbox and final drive ratios	Table 1
Outer track - measured at Racing Weight at the widest point of the outside of the tyres set at 2.0 +/-0.1bar	Front = 1720mm maximum Rear = 1710mm maximum
Wheelbase	2400mm (+/- 20mm)
Body width – Front	1611mm (+/- 15mm)
Body width – Rear	1620mm (+/- 15mm)
Anti-roll bar diameter - Front	22.0mm maximum
Anti-roll bar diameter - Rear	18.0mm maximum

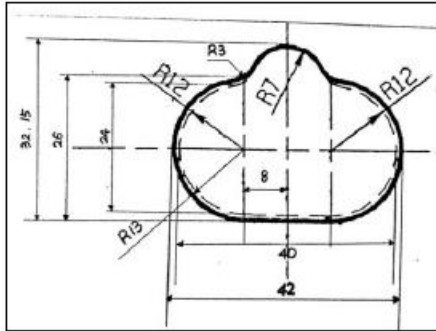
Approved Engine Sealers – Victoria.

John Mahncke

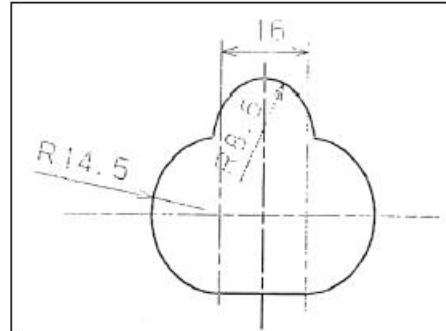
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Appendix 2

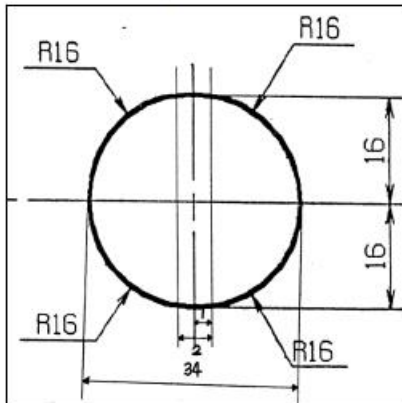
Drawing 1 Inlet Port



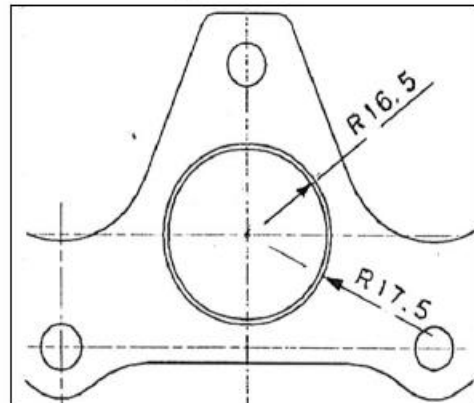
Drawing 2 Inlet Manifold



Drawing 3 Exhaust Port



Drawing 4 Exhaust Manifold



Drawing 5 Camshaft Dimension

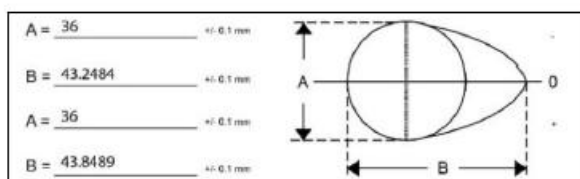


Table 1 Gear Ratios

	No. of teeth	Ratio	Synchro
1	13/45	3.462	Yes
2	19/39	2.053	Yes
3	27/37	1.370	Yes
4	32/33	1.031	Yes
5	37/31	0.838	Yes
R	12/29/39	3.250	-
F/Drive	—	3.842	DOHC
F/Drive	—	3.656	SOHC