

## SPECIFICATIONS OF AUTOMOBILES

### 3rd Category – Touring Cars

#### Group 3E – Circuit Excel

Modified Article	Date of Application	Date of Publication

**Recognised Association: Circuit Excel Management Committee.** [www.austcemc.org](http://www.austcemc.org)

### 1. PREAMBLE

These regulations apply to each Circuit Excel automobile when entered as a Circuit Excel in a competition. Each automobile shall comply with Group 3E Series Production Car Regulations except where a variation is authorised by these Regulations.

#### MODIFICATIONS PERMITTED OR OBLIGATORY:

- (a) Unless authorised by these regulations, each automobile must remain unmodified, in compliance with these regulations and identical in every respect to the standard production model as supplied by the original automobile manufacturer and detailed in the Hyundai Factory Excel Workshop Manual/s.
- (b) Any modification or tuning practice not permitted by these regulations is forbidden. A worn or damaged component shall be replaced only by a standard production component which is compliant with these regulations.
- (c) The use of carbon fibre or carbon/Kevlar® composite, ceramic material or titanium alloy, is not permitted unless such component/material was fitted/used as a standard part by the manufacturer, or unless permitted in these regulations.

### 2. ELIGIBILITY

- (a) Any Hyundai Excel X3 model manufactured by Hyundai Motor Company between 1 July 1994 and 31 June 2000 and sold in Australia is eligible.
- (b) Each engine and transmission shall be sealed prior to the commencement of any competition. Each seal shall be affixed only by a person as detailed in Appendix 5. This shall not prohibit the addition of a seal by an event official for judicial or scrutiny purposes. The presence of a seal will not protect the car from being subject to a protest, or from examination by scrutineers.
- (c) A Circuit Excel automobile subject to a log book issued prior to 1 January 2015 shall not be deemed ineligible due to the presence of the following modifications:
  - (i) Seam welded bodyshell; and/or
  - (ii) Relocated brake lines.

### 3. COMPONENTS

Any component of any Australian specification Excel X3 model may be used, either original Hyundai or aftermarket provided it performs the same function and is equivalent to the standard component which it replaces.

### 4. ENGINE

#### 4.1 GENERAL

- (a) The engine shall be the G4FK (DOHC) 74kw or G4EK (SOHC) 66kw.
- (b) The cylinder bore may be increased over the standard dimension by a maximum of 0.6mm.
- (c) Any replacement piston shall be standard in material and in each functional dimension. Forged pistons are not permitted.
- (d) The camshaft profile (lobes & their position) shall remain standard.

- (e) The timing of camshafts in relation to each other and the crankshaft shall remain standard as detailed in the Hyundai Factory Excel Workshop Manual/s.
- (f) Undersized crankshaft bearings may be used.
- (g) Crankshaft stroke shall remain standard.
- (h) The gasket face of the cylinder head and of the block may be machined within the tolerances specified. It is permitted to re-grind a valve seat. The cylinder head casting immediately under the valve seat may be machined to a maximum 3mm depth but must not be greater than the maximum valve seat throat diameter (refer Appendix 1). 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.
- (i) Only normal engine reconditioning procedures are permitted within the mechanical specifications and compliant with FIA Homologation Forms A5554 and N5554, and the Hyundai Factory Excel Workshop Manual/s. These specifications shall be deemed to include factory approved and recommended methods of assembly as well as specific component measurements and finish standards.
- (j) Engine mounting bushes are free.
- (k) The location and number of engine mounts shall remain.

#### **4.2 LUBRICATION SYSTEM:**

- (a) An engine oil cooler is permitted.
- (b) Baffling of the sump is permitted provided that any baffle is completely enclosed within the removable portion of the engine sump.
- (c) The oil pickup may be modified

#### **4.3 COOLING SYSTEM:**

- (a) The radiator and its method of fixing are free provided that the original radiator vertical orientation and attachment points are used. Any replacement radiator shall be of the same height and width as the original radiator whilst the thickness is free.
- (b) An additional electric fan is permitted.
- (c) The operation of the fan may be controlled by a manual switch or thermostatically.
- (d) Each cooling system hose is free.
- (e) A screen may be fitted in front of the radiator.

#### **4.4 FLYWHEEL AND CLUTCH:**

- (a) Machining of the flywheel is not permitted, save for the friction surface
- (b) 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.

#### **4.5 INDUCTION:**

- (a) The air filter system is free upstream of the throttle body.
- (b) The induction system shall be supplied only with ambient air.

#### **4.6 EXHAUST:**

The exhaust system is free downstream of the manifold and shall exit only from the rear of the automobile.

### **5. FUEL SYSTEM AND FUEL**

- (a) Fuel shall be Pump Fuel compliant with Schedule G of the Manual.
- (b) The fuel tank, or any replacement, shall be maintained in the original location but may be modified by the installation of safety foam. Any replacement tank shall comply with Schedule N of the Manual. Protection for the fuel tank may be added only in the area of the tank.
- (c) The fuel pump may be replaced by an external electric type provided the pump and fuel lines are not located within the cabin.

- (d) The fuel pressure regulator is free.
- (e) Each fuel injector shall be an original and unmodified factory Hyundai Excel component for a model sold in Australia.

## **6. TRANSMISSION**

- (a) The original gear selector mechanism may be modified to reduce free travel in the mechanism. Any modification to the selector mechanism must not alter the pattern of gear selection.
- (b) The gear shift mechanism may be raised only by the addition of spacers.
- (c) Gearbox and final drive ratios shall be as detailed in Appendix 2.
- (d) Limited slip or locked differentials are not permitted.
- (e) It is permitted to fit a drive shaft from an X2 Hyundai Excel provided no other modification is performed.

## **7. CHASSIS**

- (a) Each automobile shall be fitted with a safety cage compliant with Schedule J of the Manual.
- (b) It is permitted to locally strengthen suspension control arm mounting points which must remain in the original location.

## **8. WHEELS AND TYRES**

- (a) Wheels are free, provided that each complete wheel and tyre is housed within the original bodywork. Each wheel must be of one piece construction. The maximum wheel diameter and rim width shall be 15" X 7". Each wheel shall be the same rim width on each axle.
- (b) The control tyre is the Federal RSR 195/50/15.
- (c) Tyre buffing is not permitted.
- (d) A wheel spacer of maximum thickness 10.0mm, fixed to the mating face of the wheel or hub and compliant with Schedule E of the Manual is permitted at each wheel.

## **9. STEERING**

- (a) The steering rack shall be either:
  - (i) a standard Hyundai Excel power steering rack; or
  - (ii) a standard Hyundai Excel non-assisted steering rack.
- (b) Power steering may be added or removed.
- (c) The steering wheel and its method of attachment are free save that it must not contain any wood.

## **10. BRAKES**

- (a) Brake friction material is free.
- (b) The brake lines are free.
- (c) It is permitted to fit a mechanical proportioning valve to a brake line provided such valve is not adjustable from within the cockpit.
- (d) The rear drum brake backing plate may be modified only by the removal of material for the purpose of cooling.
- (e) The parking brake mechanism shall be operational.
- (f) Each front disc brake assembly shall be either:
  - (i) standard Hyundai Excel brake rotor, caliper and hub axle combination; or
  - (ii) J2 Hyundai Lantra brake rotor, caliper and hub axle combination.
- (g) Cross drilling and/or slotting of a brake rotor is not permitted.

- (h) The installation of brake pad knock off springs is permitted.
- (i) Brake Cooling
  - (i) 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.
  - (ii) 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
  - (iii) 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.

## 11. SUSPENSION

- (a) Springs are free provided their type and location are unchanged. Original Hyundai or aftermarket McPherson Struts with non-adjustable spring platforms are permitted. The use of a "coil-over" design is permitted. Where a coil-over damper is used it shall be selected from the control suspension list. The suspension spring shall form part of the selected control package and must be used as the manufacturer specified: refer Appendix 3.
- (b) The number and location of dampers shall remain as original. Any damper which is externally adjustable for bump and/or rebound is permitted. External reservoir designs are not permitted.
- (c) Bump stops are free however if used shall be in the original location.
- (d) Each original bush used at a suspension pivot point may be replaced only by another of elastomeric material.
- (e) A spherical bearing is permitted only in a suspension strut top mount.
- (f) The use of replacement adjustable strut tops is permitted, providing that each uses the standard body shell mounting points exclusively. The removal of metal from the suspension tower is prohibited, 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.
- (g) 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.
- (h) An anti-roll bar may be replaced. Any replacement shall use only the original mounting points. The anti-roll bar link/s is free. Maximum diameter: refer Appendix 1.
- (i) A strut brace may be fitted between the front suspension towers provided it only links the strut towers. The rear suspension towers may be braced by the safety cage or an additional strut brace.
- (j) Camber shall not exceed 4.0 degrees negative.
- (k) The ride height of the ready-to-drive automobile (with the driver in the automobile and control tyres set at 2.0bar +/- 0.1 bar air pressure) must not be less than 100mm excluding exhaust system.

## 12. ELECTRICAL EQUIPMENT

### 12.1 GENERAL

- (a) A standard manual Hyundai ECU, applicable to the engine type (DOHC or SOHC) shall be used. No modification or addition to the ECU is permitted. The ECU diagnostic port must remain fully serviceable so that ECU sensor readings and other information can be accessed. The ECU may be relocated provided no modification to the ECU harness is made. The ECU may be interchanged with another ECU of a competing automobile or sample ECU at any time during competition.
- (b) Ignition coils, igniters and triggers shall be compliant with original equipment specifications.
- (c) Spark plugs and high tension leads are free.
- (d) A high level brake lamp must be fitted either as standard or, where a wing is fitted, incorporated within the wing.

- (e) The original rear fog lamp must function as a rain lamp.

## 12.2 TELEMETRY/DATA LOGGING

- (a) Data logging and telemetry are only allowed as per below:
  - (i) A standalone Lap Timer Unit that use a trackside beacon.
  - (ii) A standalone GPS Lap Timer System.
  - (iii) A smartphone with a Lap Timer Application. The phone must be solidly mounted in a mount approved by the scrutineers of the meeting.
  - (iv) An action type video camera in an approved solid mount attached to vehicle Safety Cage Structure.
- (b) The use of a data logging system that is hard wired into a vehicle to log engine speed or other vehicle performance data is not permitted.
- (c) The use of a data logging system that interface with the vehicle ECU or connect to an OBD port are not permitted.
- (d) It is not permitted to use of any form or type of real time telemetry or the transmission of any data other than a lap trigger signal to or from the vehicle.

## 13. BODY, COACHWORK AND COCKPIT

- (a) All coachwork shall comply with the Hyundai Factory Excel Workshop Manual/s specification except that interior items including carpet, underfelt, hood lining, internal plastic trim, rear seat, glove box, radio, speakers, console and rear parcel shelf, demister, heater and air conditioning components may be removed.
- (b) Original door trim may be replaced by substitute solid material. A replacement dash board of fibreglass reinforced plastic is permitted provided 90% of the silhouette of the standard dash remains (top, front and side). The panel where the original radio and climate control are situated may be removed below a horizontal plane defined by the upper edge of the glove box aperture. Quarter panel trim may be removed or replaced with a substitute solid material.
- (c) Supplementary gauges and switches may be added within the cockpit.
- (d) Two-way communication between a driver and their pit is permitted.
- (e) No car-to-car communication is permitted.
- (f) Pedal settings may be modified provided the original mounting points to the body remain unchanged.
- (g) To facilitate the installation of a replacement driver's seat, the original seat tracks and brackets may be reinforced and/or removed. Modification to the floor pan to facilitate fitment of lower seat mounts is permitted.  
  
NOTE: If any metal is removed, the modified section of the floor must be plated with similar material.
- (h) A rear wing may be fitted provided it is:
  - (i) a standard Hyundai low wing, Hyundai part number 87211-22200 or 87211 22500; or
  - (ii) a standard Talon High wing part number HYU25; or
  - (iii) identical to either of the above; and
  - (iv) not adjustable.
- (i) It is permitted to reform the wheel arch by folding the lip against the inside of the wheel arch. The guard/panel shall retain the original shape, profile and width. It is permitted to remove the plastic inner guard liners.
- (j) The front and rear bumper bar shall remain unmodified save for the fitment of front and rear tow points.
- (k) It is permitted to remove the rear window wiper motor assembly. The resulting hole must be covered.

## 14. WEIGHT

The minimum racing weight is 1000kg.

**15. MISCELLANEOUS**

- (a) The reinforcement of jacking points is permitted only by the addition of metal plate/s and provided any reinforcement plate does not exceed 150 mm x 150 mm x 3 mm and follows the contours of the original structure.
- (b) A lap timing device (Dorian or similar) shall be positioned under the left front foot well (refer images)



Inside Left Foot-well



Left under Foot-well

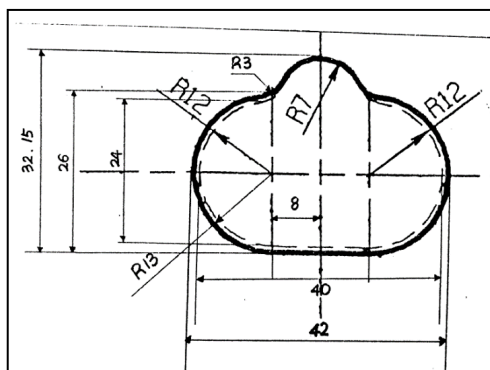
# Appendix 1

## 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	37.00cc minimum
Cylinder head	No angle milling permitted
Inlet valve seat insert – throat diameter	25.0mm maximum
Exhaust valve seat insert - throat diameter	22.5mm maximum
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	6.2kg 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

## Appendix 2

Drawing 1 Inlet Port



Drawing 3 Exhaust Port

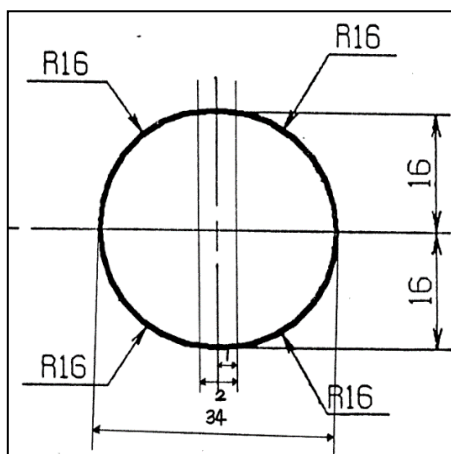
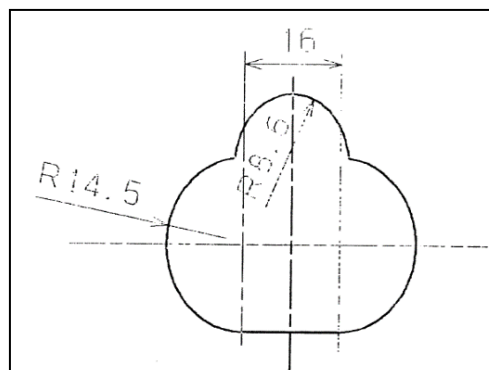


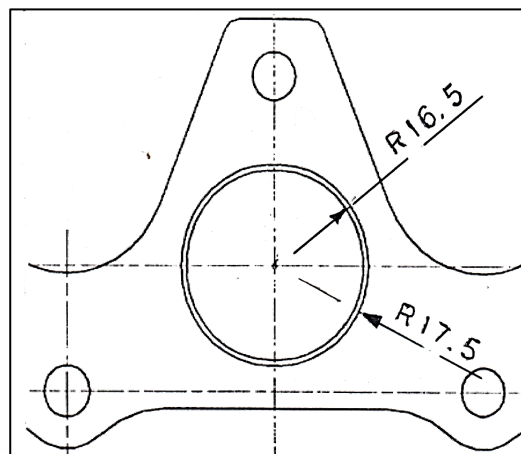
Table 1 Gearbox Ratios

	Number of teeth	Ratio	Synchro
1	<b><u>13/47</u></b>	<b><u>3.615</u></b>	<b><u>Yes</u></b>
2	<b><u>19/39</u></b>	<b><u>2.053</u></b>	<b><u>Yes</u></b>
3	<b><u>27/37</u></b>	<b><u>1.370</u></b>	<b><u>Yes</u></b>
4	<b><u>32/33</u></b>	<b><u>1.031</u></b>	<b><u>Yes</u></b>
5	<b><u>37/31</u></b>	<b><u>0.838</u></b>	<b><u>Yes</u></b>
R	<b><u>12/29/39</u></b>	<b><u>3.250</u></b>	—
F/Drive	—	<b><u>3.842</u></b>	<b><u>DOHC</u></b>
F/Drive	—	<b><u>3.656</u></b>	<b><u>SOHC</u></b>

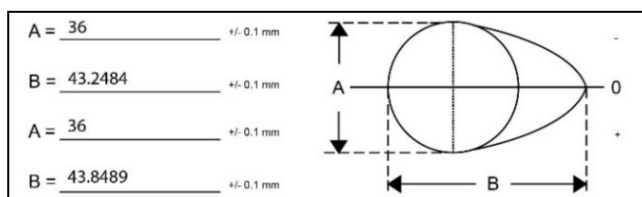
Drawing 2 Inlet Manifold



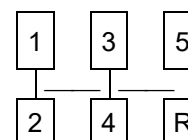
Drawing 4 Exhaust Manifold



Drawing 5 Camshaft Dimensions



Gear change pattern





## Appendix 3

### Control Suspension Supplier List

A Circuit Excel which is the subject of a log book issued after 31 December 2016 and fitted with coil-over suspension must use a complete coil-over suspension package from a supplier listed in Appendix 3.

Brand	Model	Part Number	RRP	Spring Identification	Supplier
XYZ	Super Sport Coil overs	HY01-RS	\$1,300	<b>Front:</b> 180x10.5 <b>Rear:</b> 180x9.5	Performance Suspension Racing, QLD
MCA	Blue	MCA-XLR-B	\$1,450	<b>Front/Rear</b> 20006	MCA, QLD
MCA	X-R Series	MCA-XLR-XR	\$2,050	<b>Front/Rear</b> 20006	MCA, QLD
Spax	Krypton Gas	RSX 926	\$1,650 (excluding tops)	<b>Front:</b> KING KPS027 <b>Rear:</b> KING KP303 + SPAX R0019	Suspension Concepts, NSW
SupaShock	Excel Pack	<b>Front:</b> SEP-016-01 <b>Rear:</b> SEP-016-02	\$1,999	<b>Front:</b> SEP-016-01-SF <b>Rear:</b> SEP-016-02-SR	SupaShock, SA

## Appendix 4

### Continuance of Eligibility

Yellow Speed	Dynamic Pro Sport	MX5 Mania, NSW
Yellow Speed	Premium Competition	MX5 Mania, NSW
KS Racing	K-Sport	A&B Motorsports
Ceika	Type 1M	Ceika Performance

A Circuit Excel which is fitted with a coil-over suspension package listed in Appendix 4; which is the subject of a log book issued prior to 1 January 2017 in which the suspension package is recorded; and with the approval of the State association where the car is based, shall remain eligible so long as the coil-over suspension package is unchanged.

## Appendix 5

### Approved component sealers (to be approved by each Circuit Excel State Association)

<b>Queensland</b>	Shane Beikoff	0418 722 156	<b>South Australia</b>	Fred Severin	0418 850 826
<b>New South Wales</b>	Reece Harradine	0428 163 698	<b>South Australia</b>	David Shaw	0409 887 733
<b>Victoria</b>	John Mahncke	0418 387 974	<b>Western Australia</b>	Tony Ierace	0418 917 710
<b>Victoria</b>	Laurie Griffin	0407 946 944	<b>Western Australia</b>	Rob Mitchell	0433 692 554
<b>Tasmania</b>	Lew Bush	0407 333 825			