

# Excel Rally Cars- 2009 National Excel Rally Car Specification



**Category Manager-** National Excel Series Committee

## **Preamble.**

The Excel Rally Series has been adopted by CAMS as a state based **'one make'** rally series. CAMS is ultimately responsible for the approval of the regulations and changes thereto, and responsible for publishing the regulations via the CAMS Manual and associated bulletins as necessary. Vehicles shall conform with the general requirements of Production Rally Cars as laid down in Section 11 of the CAMS Manual.

## **1. Definition.**

To be eligible to score points in the state based EXCEL RALLY SERIES, vehicles must conform to the following National Excel Rally Car specifications:

Models eligible are all Excel 'X3 models manufactured by **Hyundai as sold in Australia** from July 1994 to June 2000. All GX, GL & GLX, Sprint, 3, 4 and 5 door models are eligible. Both the 1495cc DOHC (74kw) & SOHC (66kw) engines are eligible. All vehicles must be standard & comply with the Excel Factory Workshop Manuals for any variations except where allowed by these regulations. Parts from any X3 model **as sold in Australia** may be used upon another vehicle, as long as the part(s) can be clearly identified as a standard Excel replacement part. **The use of aftermarket parts is allowed providing the part is identical in appearance and function to the standard part being replaced.**

The following components are free or may be modified from standard;

## **2. Engine.**

- 2.1. No freedoms are granted to the 12v SOHC Engines. No "performance Parity" changes are allowed for in the regulations.
- 2.2. Cylinders may be bored to a maximum +0.6mm (+0.5mm oversize plus clearance) oversize, and any replacement pistons must be standard configuration (i.e.: compression height, crown design, etc) no machining of the pistons is permitted (i.e.: valve relief).The **standard bore is 75.5mm**, maximum Bore will therefore be 76.1mm.
- 2.3. The only modification to the standard cam shaft(s) is to permit the installation of offset

bushes to the belt driven Camshaft Pulley or the fitment of “vernier Camshaft Pulley” to allow adjustment of overall cam timing relative to the crankshaft, The timing of Camshafts relative to each other and the camshaft profile (lobes and their position) must remain Standard.

- 2.4. Undersized crankshaft bearings may be used. Crankshaft Stroke must remain standard (83.5mm).
- 2.5. The cylinder head mounting face may be machined. No MODIFICATIONS, MACHINING, ADDING OR REMOVING of material from the cylinder head combustion chamber, inlet ports, exhaust ports or any other parts (except for the cylinder head face and valve seats) of the cylinder head is permitted.
- 2.6. Only normal engine reconditioning procedures are permitted within the mechanical specifications and compliance of the workshop manual and the F.I.A. Recognition Document No 5589 CAMS H2-5 (e). These specifications shall be deemed to include factory approved and recommended methods of assembly as well as specific component measurements and finish standard.
- 2.7. Engine mounting bushes are free, however the location and number of engine mounts is not.

## **2.8. Lubrication System.**

2.8.1. Lubrication system must be standard.

2.8.2. Engine oil coolers may be installed.

## **2.9. Cooling System.**

2.9.1. The radiator and its method of fixing are free provided that the original radiator fittings on the car are utilized. (as per PRC regulations).

2.9.2. The fitment of an additional electric fan is permitted. The operation of the fan can be by manual switch or thermostatic control.

2.9.3. Radiator hoses are free.

2.9.4. A radiator screen may be fitted.

## **2.10. Flywheel & Clutch.**

2.10.1. The clutch assembly may be replaced with a ‘heavy duty’ alternative of the standard design.

2.10.2. The clutch & pressure plate assembly should weigh not less than 85% of the original Hyundai component.

2.10.3. The Flywheel weight must be standard.

**Clutch component weights;**

**Clutch Plate 1.06Kg Standard - 0.901Kg Minimum**

**Clutch Pressure Plate 3.70Kg Standard – 3.145Kg Minimum**

**Flywheel 6.4Kg Standard-6.3Kg Minimum**

**2.11. Induction.**

- 2.11.1. The air filter and induction system BEFORE the throttle body is free and may be removed and replaced by any suitable aftermarket system. E.g. “POD” styles as per CAMS regulations.
- 2.11.2. No modifications are permitted to the throttle body or inlet manifold.
- 2.11.3. **Any Type of forced induction is strictly forbidden.**

**2.12. Exhaust.**

- 2.12.1. The Exhaust System after the exit from the Exhaust Manifold is free.
- 2.12.2. The exhaust manifold MUST remain standard, no machining, adding or removing of material is permitted.
- 2.12.3. **Exhaust must comply with the CAMS PRC regulations.**

**3. Fuel System.**

- 3.1. A replacement fuel regulator may be installed to allow better control of fuel supply.
- 3.2. Fuel injectors, ignition computers and electronics must be original Hyundai Excel parts for the models listed and as sold in Australia.
- 3.3. The original fuel pump may be replaced with an external electric type.
- 3.4. The fuel lines, fuel pump wiring and relay system may be replaced or relocated.
- 3.5. An additional fuel pump and/or surge tank may be added.
- 3.6. FUEL MUST BE **Commercial “Pump” fuel as specified in Schedule G of the CAMS Manual of Motor Sport.** eg. UNLEADED or PREMIUM UNLEADED. No leaded fuels, avgas or racing fuels.
- 3.7. Fuel tank must be maintained in standard location, suitable damage protection may be installed.

**4. Transmission.**

- 4.1. Gear selector mechanism may be modified to remove free play and improve gear selection.
- 4.2. Gearbox oil coolers may be installed.
- 4.3. Gearbox ratios are to remain standard as per the Workshop manual.
- 4.4. The lowest final drive ratio used is 3.842, which is standard in the DOHC.
- 4.5. **Limited slip and locked differentials are not permitted.**

**5. Chassis.**

- 5.1. **The use of Chrome Moly for the construction of the roll over protection is not permitted.**

- 5.2. A vehicle may be presented with ROPS manufactured from a material other than mild steel (ie. Aluminium or Chrome Moly) if the vehicle has a valid logbook issued prior to 1<sup>st</sup> January 2007 and the ROPS meets the ROPS technical requirements at the time the log book was first issued.
- 5.3. Seam welding is permitted. Strengthening/plating of the shell can only be carried out as per PRC regulations.

## 6. Wheels & Tyres.

- 6.1. There is no control Tyre, competitors are free to use any suitable 13 inch tyres.
- 6.2. Wheels are free, provided that they can be housed within the original bodywork.
- 6.3. Wheel diameter must be 13".

## 7. Steering .

- 7.1. Steering equipment must be standard, use of normal or power steering racks allowed.
- 7.2. Power steering may be added or removed.
- 7.3. Steering wheel is free.

## 8. Brakes.

- 8.1. Brake friction material and the flexible brake lines are free.
- 8.2. Rear drum brakes must used as per the workshop manual specification.
- 8.3. Brake lines may be rerouted or damage protection added.
- 8.4. Hydraulic or mechanical fly-off hand brake may be fitted.
- 8.5. A suitable parking brake mechanism needs to be retained.
- 8.6. The standard proportioning valve maybe removed or replaced.
- 8.7. An adjustable brake-proportioning valve may be used in the rear brake circuit/s to allow adjustment of rear wheel braking bias.
- 8.8. Disc brake backing plate may be removed.
- 8.9. Cross-drilled or slotted disc rotors are not permitted. The disc rotor specifications must be as per the workshop manual.
- 8.10. The installation of brake pad knock off springs is allowed.

## 9. Suspension.

- 9.1. Springs are free provided their type and location are unchanged. (by type is meant coil). "Coil-over" design permitting the adjustment of ride height are permitted.
- 9.2. Shock absorbers may be externally adjusted for bump or rebound BUT must not be of the external reservoir design. This is to contain costs. Their number and location must remain standard.
- 9.3. Bumpstops are free.
- 9.4. Bushes used at suspension pivot points may be replaced. Spherical Bearings or Rose joints

are not permitted, except in the top strut mount.

- 9.5. Suspensions may be modified so that Camber and Caster may be adjusted *through* the use of eccentric camber pins or washers and caster bush kits.
- 9.6. The use of replacement adjustable strut tops is permitted, providing that they utilise the standard body shell mounting facilities. The removal of metal from the suspension tower is forbidden. **Except that the hole in rear strut towers may be enlarged to a maximum of 60mm diameter and must remain circular.**
- 9.7. Anti-roll bars may be **removed**, upgraded or swapped for aftermarket items provided original sway bar mountings to the chassis are used. Sway bar links are free.
- 9.8. A strut brace may be fitted between the front suspension towers provided it only links the towers. The rear suspension towers may be braced by either the roll cage or a strut brace.
- 9.9. Suspension components may be strengthened in accordance with CAMS PRC regulations; some modifications are allowable to suspension components. Refer to CAMS manual for full details.
- 9.10. The origin of all standard suspension parts must remain clear.

## 10. Electrical Equipment

- 10.1. Spark Plugs & High Tension Leads are free.
- 10.2. No Piggyback ECUs or modifications to ECU wiring harnesses or sensors are permitted.
- 10.3. **The ECU OBD-II diagnostic port must remain serviceable so that ECU sensor readings & other information can be accessed electronically.**
- 10.4. **It may be a requirement that competitors take part in a ballot for ECU's prior to each round of the series. Any competitor may request a Ballot, which will take place after the completion of scrutineering and prior to the Drivers Briefing.**

## 11. Body & Coachwork.

- 11.1. Coachwork must be as per the workshop Manual Specifications except that interior items such as carpet, underfelt, hood lining, rear seat, radio, speakers, console and rear parcel shelf may be removed as allowed in PRC Regulations.
- 11.2. Supplementary gauges may be fitted within the cabin.
- 11.3. Pedal settings may be modified for position but the original mounting fixture must not be changed.
- 11.4. **Deleted**
- 11.5. An air vent/scoop may be fitted in the roof of the vehicle.
- 11.6. Any rubber bush may be changed for a bush made of another material as long as the new bush has dimensions the same as the origin.
- 11.7. **A rear wing may be fitted that meets the following requirements. The wing shall be made of fibreglass and will be for aesthetic purposes only. The wing aerofoil must be fixed ie. not adjustable with tools. The wing must be standard Hyundai low wing, Hyundai Part# 87211-**

22200 or 87211-22500 or Talon High wing part #HYU25 or wing identical to it. The intention is to limit the wing options such that all vehicles look the same.



Figure 1- Talon HYU25- rear view



Fig 2 Talon HYU25 wing

## 12. Weight.

12.1. Vehicle weight must be at least 960kg minimum, The weight is the real weight of the car, without driver & co-driver nor their equipment, including helmets. At no time during the event may a car weigh less than the minimum weight.

## 13. Engine Sealing.

- 13.1. ALL COMPETITORS within the Excel Rally Series must present their vehicles for scrutineering with the engine "sealed" and Vehicle Log Book endorsed "Engine Sealed".
- 13.2. **Failure to make a vehicle available** to have the "seal" attached will result in a competitor failing to score any points for that round of the Series.

13.3. Procedure for engine sealing;

The vehicle and or engine is to be presented at a nominated examiner in a condition that will allow the bore and stroke of the engine to be measured. The cylinder head must be present to allow inspection of the combustion chamber, **including valve size**, inlet port and exhaust port size. The competitor must also be prepared to install the cylinder head and sump at this time so the engine seal can be installed.

**Bore- 75.5mm Std - 76.1 maximum**

**Stroke- 83.5mm**

**Valve sizes are;**

**DOHC- inlet 28.21mm & exhaust 25.00mm.**

**SOHC- inlet 27.33mm & exhaust 32.00mm.**

- 13.4. The competitor will need to provide a hole of 3/16" diameter between the flange of the cylinder block and the engine sump, located on the exhaust side of the engine between the oil filter and dipstick tube. **A second seal between the first bolt hole webbing in the plastic rocker cover adjacent to the timing belt cover on the exhaust side of the engine and the top bolt hole for the power steering pump. If power steering is fitted the hole should be drilled in the power steering pump bracket adjacent to the top bolt hole.** Once the engine has been found to comply with the National Excel Vehicle Eligibility requirements a CAMS approved seal will be attached to the engine via the holes provided.



**Location of the holes required for engine sealing.**

- 13.5. Completed Engine sealing form must be returned to the State Series Organising committee.
- 13.6. Alternatively a competitor may elect to have an engine sealed without measurement and sign a waiver which allows all series points to be stripped if an engine is subsequently found not to comply with the requirements.

**14. Miscellaneous.**

- 14.1. Vehicle air conditioning may be added or removed.

**15. Specified Components.**

None.