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11(c)	01/01/2024	01/01/2024
12.2(a)(iv) and (b)	01/01/2024	01/01/2024
13(d)(iii)	01/01/2024	01/01/2024
Appendix 4	01/01/2024	01/01/2024

Recognised Association: Circuit Excel Racing Association www.circuitexcelracing.com.au

1. PREAMBLE

These regulations apply to each Circuit Excel *Automobile* when entered as a Circuit Excel in a competition.

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.
- (b) Any modification or tuning practice not permitted by these regulations is forbidden. A worn or damaged component must 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. Replacement racing seats are excluded from this regulation.
- (d) Each reference to a Schedule within these regulations means a Schedule of the Technical Appendix in the *Motorsport Australia Manual*. Each *Automobile* must comply with each relevant Schedule.
- (e) Unless specified otherwise in these regulations the tolerances for machining, finishing and weighing of engine components will be in accordance with *Motorsport Australia Manual*; Technical Appendix – Definitions Technical.
- (f) These regulations should be read in conjunction with the 3E Circuit Excel Technical Guide which contains additional information and advice on measuring, checking, sealing and lists some of the eligible products that may comply with these regulations.

DEFINITIONS

Engine Bay

The engine bay of the *Automobile* is defined as being the area in front of the firewall, behind the radiator support panel, above the bottom of the radiator support panel, and below the closed bonnet and between the inner guards.

Commercially available product

A commercially available product is one which is or was produced in commercial quantities and is sold new to be owned outright to any person without ongoing charges for its use (i.e. not rented or leased). The product must currently be available or have been available and in stock as this complete product at this price for a minimum of one year. The product must be or have been stocked by an Australian supplier and be able to be purchased outright by any person within Australia at the same commercial price.

Commercial price

The new commercial price of a product is the total price of a product in Australian Dollars, including the full cost of the product, any required taxes and any other charges to a purchaser in exchange for the complete working product. This price must include all possible options, and features, both hardware and software required or available for use in this system, whether in use or not. Any optional hardware that is physically separate from the base device is not included in the commercial price unless it is to be used. If the optional hardware it is to be used, then the total commercial price must also include the price of the optional device, wiring, sensors and all other parts of that option in the total commercial price. The price must be for the product when sold brand new.

Wet Cell Battery

An electrolyte filled wet cell lead Acid battery which can be either serviceable or maintenance free.

AGM Battery

A sealed lead acid battery manufactured using Absorbed Glass Matt construction.

GEL Battery

A sealed lead acid battery with suspended electrolyte and a silica additive.

Free

means that the original part, as well as its function(s), may be removed or replaced with a new part, on condition that the new part has no additional function relative to the original part.

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 must be sealed only by a person as detailed in Appendix 5 of these regulations and in accordance with the sealing requirements as described in the CERA Technical Guide prior to the commencement of any competition where any the following applies:
 - (i) at a National level event i.e. (Supercar Event, Bathurst, Shannons Nationals and Excel Nationals)
 - (ii) before the next event that the vehicle is entered into, after an event in which the *Automobile*, during qualifying or a race, records a lap time less than 103% of the official lap record published by CERA on the official CERA website.
- (c) This will 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.
- (d) A scrutineer or an appointed Circuit Excel Technical Delegate may:
 - (i) Check the eligibility of an *Automobile* or of a *Competitor* at any time during the Event.
 - (ii) Require an *Automobile* to be dismantled by the Competitor to make sure that the conditions of eligibility or conformity are fully satisfied.
 - (iii) Require a *Competitor* to supply them with such parts or samples as they may deem necessary.

- (iv) Require a *Competitor* to replace a "controlled item" (for example an ECU, Damper etc) with one provided by an appointed Circuit Excel Technical Delegate, at any time during a race meeting.
 - (v) Require a *Competitor* to deliver an *Automobile* or component to a specific location for compliance testing within a specified timeframe after an event.
 - (vi) [Require a competitor to produce the CERA sealing sheet which is relevant to the seals currently attached to the engine and gearbox of an *Automobile*, to verify the authenticity of the seals fitted.](#)
- (e) A Circuit Excel *Automobile* subject to a log book issued prior to 1 January 2015 will 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 unless otherwise specified in these regulations.

A list of replacement components, that may comply with these regulations, can be found in the 3E Circuit Excel Technical Guide.

3.1 REPLACEMENT OF COMPONENTS

Where these regulations permit the replacement of a component, that replacement component is free, unless the replacement component is otherwise restricted by these regulations.

3.2 NON-GENUINE PARTS

There is no restriction on the use and source of supply for all fasteners, [coolant thermostat](#), [indicator assembly](#), [headlight assembly](#), belts, gaskets, seals, flexible hoses, liquid carrying coolant 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 modification is made to facilitate the fitment of the replacement part, and on condition that the new part has no additional function relative to the original part.

4. ENGINE

4.1 GENERAL

- (a) The engine must be the G4FK (DOHC) 74kw ~~or G4EK (SOHC) 66kw.~~
- (b) With the exception of approved aftermarket components as shown in article 3 all engine components must be original Hyundai Excel X3 components.
- (c) Only the following engine reconditioning procedures are permitted within the limits of these regulations, mechanical specifications and compliant with FIA Homologation Forms A5554 and N5554.
 - (i) Cylinder Boring
 - (ii) Cylinder Honing
 - (iii) Decking and Facing
 - (iv) Line Boring
 - (v) Line Honing
 - (vi) Conrod Resizing
 - (vii) Thread Repair
 - (viii) Replacement of Welsh and Gallery plugs
 - (ix) Cleaning, other than any cleaning process that may remove or modify any original material.
 - (x) Bead blasting or similar process and angle machining are not permitted.
 - (xi) Crankshaft journal grinding

- (xii) Crankshaft journal finishing
- (xiii) Valve seat machining
- (d) The location and number of engine mounts must remain. The location, position and orientation of the engine and the attachment of the mount/s to the engine and body/crossmember must remain standard.
- (e) Engine mounting bushes are free.
- (f) The fitment of an engine crankcase catch can discharging to atmosphere, compliant with schedule B is permitted. Hoses connecting the engine to the catch can must be a maximum inside diameter of 13mm. These hoses must only be connected to the engine via the original engine breather connections. The PCV valve internal components may be removed.

4.2 CYLINDER BLOCK/ CRANK / RODS / PISTONS

- (a) The cylinder bore may be increased over the standard dimension by a maximum of 0.6mm.
- (b) Pistons are free, provided they are manufactured from cast alloy and the same as OE pistons in each functional dimension, which as a minimum will include outside diameter, crown height, dome height and shape, pin diameter, overall height, and shape and height of the original cast area including the valve reliefs. Forged pistons are not permitted. Flat top Pistons are not permitted, either original or aftermarket. Machining of any pistons is not permitted, except for the purpose of balancing. Removal of material must only be from the underside of the piston, and a minimum of one piston must remain unmodified.
- (c) Undersized crankshaft bearings may be used.
- (d) The crankshaft, pistons and conrods must remain standard except that:
 - (i) Localised spot machining of the outer (i.e., larger) circumference of the counterweights, or the outer face of the inner (i.e. smaller) circumference of the big end surfaces may be undertaken only to achieve balance.
 - (ii) A minimum of one of the respective pistons and big end / lower half of one conrod must remain standard original as per manufacturer without any form of metal removal from balancing or polishing.
 - (iii) Performance balancing procedures that involve lightening, smoothing, or polishing of original castings over more than small, localised areas is not permitted.
 - (iv) It is permitted to remove a maximum of 0.5mm of material from any crankshaft bearing journal.
 - (v) Other machining or finishing of the crankshaft is not permitted.
 - (vi) Crankshaft stroke must remain standard
- (e) It is permitted to replace each piston ring provided:
 - (i) the number of compression rings must be 1 per groove (total 2) and one oil ring assembly (3 piece oil ring)
 - (ii) the number of components per ring remains the same as the standard piston rings (i.e. a single piece compression ring may not be replaced by a two piece 'gapless' ring); and
 - (iii) the area of the piston ring which is in contact with the cylinder wall is not less than that of the standard ring. Gas ported rings or pistons are not permitted.
- (f) It is permitted to fit a strengthening plate as per Appendix 7 to the centre main bearing cap. The plate must be manufactured from 20mm x 12mm gauge plate tool steel only and must be fitted with ARP P/No 663-1010 bolts. When fitting the manufactured strengthening plate, the main bearing cap must be machined flat to accommodate the plate.

4.3 CYLINDER HEAD / CAMSHAFT / VALVES

- (a) The camshaft profile (lobes & their position) must remain standard. No machining of the camshaft is permitted.
- (b) The timing of camshafts in relation to each other and the crankshaft must remain in the resultant position from the unmodified factory camshaft wheel and sprockets installed in the standard position.

- (c) The gasket face of the cylinder head and of the block may be machined by parallel machining only, other than listed below. No modifications, machining, addition or removal of material from the cylinder head is permitted.
- (d) It is permitted to regrind the valve seats, including over cuts and undercuts, the purpose of which is to obtain the desired valve seat width. The top cut of the valve seat is limited to a maximum overall diameter of 29.0mm for exhaust and maximum overall diameter of 32.0mm for the inlet valve seats. Concurrently the maximum distance between the valve head to combustion chamber wall is 3.0mm. "The removal of any other casting material from the combustion chamber is NOT permitted.
- (e) Each cylinder head valve throat between the valve seat and valve guide may be machined to a maximum depth as specified in Appendix 9.

The machined cylinder head valve throat diameter must not be greater than the maximum valve seat throat diameter, refer Appendix 1.

Where the machined valve throat meets the cylinder head port a distinct edge is formed, which must not be modified either by hand or by compound throat machining.
- (h) Valve seat inserts may be replaced but must be no larger than the original OE inserts or their .012" and .024" oversize variants and must be fitted in the original locations.
- (i) Valve throat machining must be concentric to the original valve guide position and orientation. Valve guides must be original dimensions and position within the cylinder head.
- (j) Other than these exceptions, no modifications, machining, addition or removal of material from the cylinder head is permitted.
- (k) Valve springs must be OEM or aftermarket equivalent in all dimensions and ratings. Springs must be parallel inside and out.
- (l) The replacement of components with componentry from other Hyundai models or with replacements machined from billet materials is not permitted.
- (m) K Line Valve Guide Inserts can be used to bring valve stems in cylinder heads back to within standard specifications
- (n) Valve heads must maintain original cast finish and be equivalent material and specification to OEM. Custom made valves are not permitted. Swirl polishing is not permitted. No cuts or dishes are permitted to be machined into the valves other than valves may be back-cut to a minimum cut diameter of 22.0mm for inlet and 18.0mm for exhaust valves.

4.4 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

4.5 COOLING SYSTEM:

- (a) The radiator and its method of fixing are free provided that the original radiator vertical orientation and the original attachment points on the upper and lower radiator support panels are used. Any replacement radiator must be within the dimension limits listed in Appendix 1 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.

4.6 FLYWHEEL AND CLUTCH:

- (a) Machining of the flywheel is not permitted, save for the friction surface
- (b) The flywheel must adhere to the dimensions and weights listed in Appendix 1 at all times
- (c) 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.

- (d) It is permitted to fit an extension to the clutch bleeder line, and to replace the clutch line from the mount on the chassis to the clutch slave cylinder.

4.7 INDUCTION:

- (a) The air filter system is free upstream of the throttle body.
- (b) The induction system must be supplied only with ambient air. Additional cooling of the intake air is not permitted.
- (c) The entire induction system must be fully contained within the engine bay.

4.8 EXHAUST:

The exhaust system is free downstream of the manifold and other than:

- (a) The exhaust must exit only from the rear of the *Automobile*
- (b) The exhaust must follow the original route of the standard exhaust.
- (c) factory heat shielding to the fuel tank must be retained.

5. FUEL SYSTEM AND FUEL

- (a) Fuel must be Pump Fuel compliant with Schedule G of the Manual.
- (b) The fuel tank inspection cover may be replaced by a secure metal cover of free design.
- (c) The original fuel tank must be maintained in the original location but may be modified by the installation of safety foam. Protection for the fuel tank may be added only in the area of the tank.
- (d) The fuel pump may be replaced by an external electric type provided the pump and fuel lines are not located within the cockpit.
- (e) The fuel pressure regulator is free and an adjustable fuel pressure regulator may be used under the following conditions:
 - (i) The fuel pressure must not exceed 420kpa (60.9 psi) at any time.
 - (ii) The fuel pressure of a running engine may only vary directly in line with manifold pressure.
- (f) Each fuel injector must be an original and unmodified factory Hyundai Excel component for a model sold in Australia. It is permitted to recondition or replace with an approved reconditioned exchange unit as long as the original specifications (including flow rate) are retained.
- (g) The carbon canister may be retained in its entirety or removed. If it is removed, the fuel tank must be vented safely external to the cockpit and incorporate a vent system with a gravity activated roll-over valve.
- (h) Each Automobile must be fitted with the quick-break fuel sampling fitting kit as purchased from CERA, in the approved position, for the purpose of extraction of a fuel sample from the engine fuel rail.
- (i) The cover located inside the cockpit, which provides access to the top of the fuel tank, must be fitted and sealed in compliance with the following:
 - (i) It is not permitted to use the original OEM plastic cover. The cover must be of a metal material held in place with a minimum of 6 Rivnut-style fasteners. It is not permitted to use metal-style self-tapping screws.
 - (ii) A polyurethane type of sealant/adhesive resistant to heat and fuel degradation must form a gasket-type seal around the entire perimeter of the cover to prevent fuel from entering the cabin.
 - (iii) Adhesive race tape or any other type of tape is not permitted to hold down and seal the fuel pump cover.
 - (iv) The rubber wiring grommet must be in place and in good condition without any cracks or holes. It must be sealed using a polyurethane sealant/adhesive resistant to heat and fuel degradation to stop fuel from penetrating the rubber wiring grommet.

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 original gear ~~lever must remain, but~~ selector mechanism or an identical aftermarket mechanism brand approved by CERA is permitted. It is permitted to add ~~or remove the minimum amount up to 60mm of material required to the vertical shift lever and to the swivel bracket below the pivot on original shift mechanism~~ to alter the distance from the gear lever pivot to the cable attachment point for the purpose of altering the distance required to shift gears. ~~or~~ It is permitted to alter the length of the hand lever above the pivot point.
- (c) The addition or modification of gear shift stops are permitted provided that they serve no other function.
- (d) The gear shift mechanism may be raised only by the addition of spacers.
- (e) Gearbox and final drive ratios must be as detailed in Appendix 2. Final drive ratios apply to their respective engine design, i.e. cars fitted with twin cam engines must use the twin-cam final drive ratio. The method for testing of gearbox ratios, in the instance a gearbox is not dismantled, is detailed in the 3E Circuit Excel Technical Guide.
- (f) Limited slip or locked differentials are not permitted. It is not permitted to tighten differential centres by fitting thicker shims or multiple shims. The sun and planetary gears must rotate freely by hand. If a vehicle is in neutral and has both front wheels raised off the ground, turning of one front wheel by hand must not cause the other front wheel to rotate in the same direction. The full method for testing the differential gear action, is detailed in the 3E Circuit Excel Technical Guide.
- (g) It is permitted to fit a drive shaft from an X2 Hyundai Excel provided no other modification is performed.
- (h) It is permitted to fit a reinforcement plate to the gearbox cross member front mount.

7. CHASSIS

- (a) Each *Automobile* must be fitted with a safety cage compliant with Schedule J of the Manual.
- (b) It is permitted to locally strengthen individual front suspension control arm mounting points which must remain in the original location. These modifications are only permitted within the area, on each side of the vehicle, shown by the marked box in appendix 6.

8. WHEELS AND TYRES

- (a) Wheels are free, provided that:
 - (i) each wheel must be of one-piece construction.
 - (ii) The maximum wheel diameter and wheel width must be 15" X 7".
 - (iii) Each wheel on the *Automobile* must be the same width, diameter and offset.
- (b) The control tyre is the ~~Federal RSR 195/50/15~~ Dunlop Direzza DZZ3 82V 195/50/15.
- (c) Tyre buffing / mechanical cleaning is only permitted outside of a race meeting.
- (d) Prior to practice or racing, each tyre must have a tread depth in excess of 1.5mm, save on the shoulder or up to one localised flat spot where localised wear may occur (see Diagram 2). ~~and up to one localised flat spot.~~ The tyre shoulder is the area of tread finishing 40mm from a perpendicular line from the outer sidewall (balloon) of the tyre.
- (e) Regrooving or chemical treatment of a tyre is not permitted.
- (f) A wheel spacer of maximum thickness 10.0mm, compliant with Schedule E of the *Manual* – Technical Appendix is permitted at each wheel.
 - (i) Extended wheel studs must be fitted if using wheel spacers, the maximum length must be 73 mm. The entire stud and wheel nut must not protrude past the outer face of the rim
 - (ii) Each wheel nut must be of a ferrous material and the outer end is not permitted to be enclosed.
- (g) The tyre and wheel, down to the flange over the wheel hub centre must be within the perimeter of the *Automobile* when viewed vertically from above (see diagram 1).

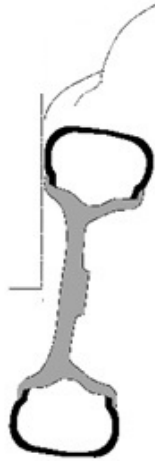


Diagram 1

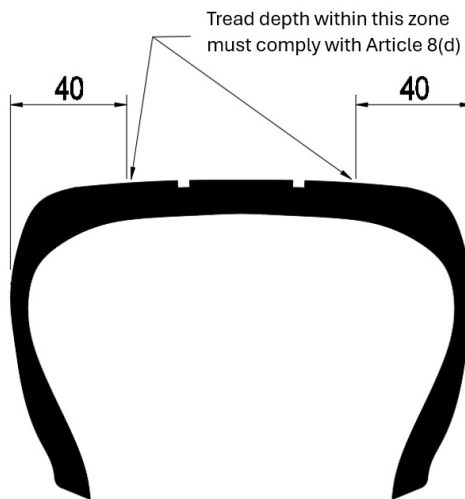


Diagram 2

9. STEERING

- (a) The steering rack must be either:
 - (i) a standard Hyundai Excel power steering rack; or
 - (ii) a standard Hyundai Excel non-assisted steering rack.
- (b) The original power steering may be added or removed.
- (c) The steering wheel must not contain any wood. It is permitted to add a steering wheel boss, incorporating a quick release mechanism.
- (d) The power steering pump and accessories may be removed if not in use.

10. BRAKES

- (a) Brake friction material is free.
- (b) The original flexible brake lines are free but must be securely mounted. [Except where varied in these regulations](#), all steel brake lines must remain the same length, size, routing, and location as original, except it is permitted to remove each steel rear brake wheel cylinder line and fit a longer flexible line from each rear wheel cylinder to the original unmodified steel brake line at the body.

- (c) It is permitted to retain the original brake distribution valve and diagonal pairing of the brake circuit. It is permitted to remove the original brake distribution valve, located underneath the original brake master cylinder, and change the brake circuit from diagonal to front/rear tandem pairing by:
- (i) Option 1: reconnecting the unmodified original lines to two t-pieces as per Photo 3 Appendix 4; or
 - (ii) Option 2: reconnecting the unmodified original lines to an aftermarket brake distribution valve as per Photo 2 Appendix 4.

In either option 1 or 2 it is permitted to fit a rear brake pressure limiting valve near the master cylinder, as per Photo 2 Appendix 4, in which case two short additional brake lines may be used as per Photo 2 Appendix 4. Such a valve must only operate on the rear tandem circuit and must not be adjustable from within the cockpit.

~~It is permitted to fit a mechanical proportioning valve to a brake line provided such valve is not adjustable from within the cockpit. Minor localised modification of steel brakes lines required solely for fitment of a proportioning valve is permitted.~~

- (d) The rear drum brake backing plate may be modified only by the removal of material to allow access for adjusting and for the purpose of cooling.
- (e) The parking brake mechanism must be operational.
- (f) Each front disc brake assembly must 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.
 - (iii) XD Hyundai Elantra 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

The control Excel suspension package as supplied by Supashock Australia must be used. The control suspension components must be used as supplied by the control supplier and must not be modified or added to in any way. As per Appendix 3.

- (a) The front control Supashock suspension units, including top bearing assemblies, must only be installed in the orientation as specified by Supershock, with the camber adjusting slots following the east-west plane of the vehicle (vehicle lateral y-axis).
- (b) Bump stops must be as per Supashock control Excel suspension package only, no bump stop modifications permitted.
- (c) Each original bush used at a suspension pivot point may be replaced only by another of elastomeric material (for a definition of Elastomer and Elastomeric Bushing see "Definitions – Technical" in the Motorsport Australia Manual) and in compliance with the following:
 - (i) The front suspension lower rear caster bushes may be of offset manufacture with a central crush tube of 24mm maximum OD and no other metallic part is permitted.

- (ii) Each other elastomeric suspension bush must have a central crush tube with a maximum OD of 20mm and a minimum ID of 12mm.
- (iii) Each other elastomeric suspension bush is not permitted to include any other metallic or non-elastomeric elements within the bushes or flanges.
- (d) It is permitted to fit steel shim material between the suspension leg and the hub clevis mounting point to allow for clevis wear or variations in the original clevis thickness. See samples in Appendix 3.
- (e) It is permitted to fit a positive locking camber washer or camber stop of free design to each lower suspension to the hub clevis mounting point, provided that no modifications are made to the damper or hub for its fitment and that it does not perform any other function. See samples in Appendix 3.
- (f) Aftermarket antiroll bars are permitted with the following conditions.
 - (i) Any replacement must use only the original mounting points on both the chassis and control arm.
 - (ii) Adjustable antiroll bars are not permitted.
 - (iii) Maximum diameter of the antiroll bar is defined in Appendix 1.
 - (iv) antiroll bars must be a one-piece design, available for sale at widely represented retail outlets, and rear antiroll bars must follow the same original shape and form as either Super-Pro RC0069R-18, Whiteline BHR45 or OE Hyundai Excel X3 with dimensions of each as specified in the Technical Guide.
 - (v) The antiroll bar link/s is free but must mount to antiroll bars eyelets manufactured in the same orientation as an original antiroll bar and may not incorporate spherical bearings, rose joints, or spring elements. The original antiroll bar link bushing and other elastomeric bushings are permitted.
 - (vi) It is permitted to disconnect one front and one rear antiroll bar link.
- (g) 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 and/or an additional strut brace.
- (h) Camber must not exceed 4.0 degrees negative.
- (i) The ride height of the *Automobile* must not be less than 100mm excluding exhaust system with the driver in the *Automobile*. When checking ride height, if any tyre pressure is less than 2.0bar, then it may be raised to 2.0 bar to check ride height.

12. ELECTRICAL EQUIPMENT

12.1 GENERAL

- (a) A standard Australian Delivered manual Hyundai ECU, applicable to the engine type (DOHC or SOHC) must 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. It is recommended that the ECU be relocated to the right front kick-panel or the steering column 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 must 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.
 - (i) Each *Automobile* must be fitted with a rain light centrally mounted on the rear hatch/boot immediately above the rear registration/number plate recess.
- (e) The vehicle Battery may remain in the factory location or be relocated into the cockpit of the vehicle provided:
 - (i) The battery must be securely mounted to the floor of the vehicle in the vehicle cockpit, The mounting is subject to the approval of race scrutineer(s) or category Eligibility Officer(s).
 - (ii) The Battery type is either a Wet Cell, AGM or GEL Type battery.
 - (iii) If mounted in the cockpit, only an AGM or GEL Type battery is permitted.

- (iv) The positive terminal of the battery must be insulated to prevent short circuiting.
- (f) No modification to the engine wiring harness or under-dash wiring loom is permitted. It is not permitted to add any additional covering to the wiring loom (e.g. heat shrink, electrical tape, cloth tape or conduit) other than to the minimum amount required to repair a damaged wiring loom. Any wiring loom repairs must be able to be exposed for eligibility checks.
- (g) The Idle control valve may be fitted with a blanking plate with the sole purpose to block off the sensor to prevent over revving if the sensor fails. All other sensors must remain unmodified and remain in their original position and remain connected.
- (h) Front and rear indicators must remain in place and must be operative. Side guard indicators may be removed.
- (i) It is only permitted to connect a tachometer trigger wire to Pin 4 on the engine loom or to the blue connector located next to the steering column.

12.2 TELEMETRY/DATA LOGGING/CAMERAS

- (a) Data logging is only permitted as per below:
 - (i) A standalone Lap Timer Unit that uses 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) A data logger (or combined data logger and display) is permitted on the condition that it is a commercially available product and has a commercial price that does not exceed ~~\$1000~~ \$2000 AUD including all hardware, software, sensors and wiring. No data logger is permitted to connect to any original vehicle wiring, or original vehicle sensors other than the vehicles battery power, ground or to read an RPM trigger.
- (b) The use of a single video camera / video recording system in an approved solid mount attached to vehicle Safety Cage Structure is permitted on the condition that it is a commercially available product and has a commercial price that does not exceed ~~\$1000~~ \$2000 AUD including all hardware, software and wiring. Only wires used to supply vehicle power to a camera system are permitted to be wired into a camera system.
- (c) The use of a data logging system that interfaces with the vehicle ECU or connects to an OBD port is 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 must remain standard. 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.
- (b) It is permitted to reform the wheel arch by folding the lip against the inside of the wheel arch.
 - (i) The guard/panel must retain the original shape, profile and width. Flaring of the guard is not permitted.
 - (ii) It is permitted to remove the plastic inner guard liners.
- (c) It is permitted to remove any plastic shroud / undertray fitted under the body of the *Automobile* that is licked by the airflow. No additional solid or flexible underbody panels or trays are to be fitted.
- (d) The front and rear bumper bar must remain unmodified save for the fitment of front and rear tow points.
 - (i) The metal reinforcements behind front and rear bumper covers must be retained.
 - (ii) Addition of solid or flexible elements below or behind the bumper covers is not permitted.

- (iii) Lightweight stays to support lower corners of bumpers when plastic inner guards are removed are permitted. **The rear bumper must remain in its original shape, form and position and must not be manipulated to gain any aerodynamic or other advantage.**
- (iv) An additional support, behind the headlight and or indicator, with its only function to retain the front indicator is permitted.
- (e) It is mandatory to remove the rear window wiper motor assembly. The resulting hole must be covered.
- (f) Soundproofing material and trim fitted to the underside of the bonnet and engine bay that is not visible from the outside may be removed.
- (g) Exterior side mouldings may be removed, and the resultant holes may be sealed with a suitable covering.

13.2 WINDOWS

- (d) The original glazing material of each window must be retained, unless otherwise permitted in these regulations.
- (e) On an *Automobile* with 2 doors, it is permitted to fit an insert of clear polycarbonate material in part of the glazed area of the front doors. The polycarbonate material may incorporate a single ventilation duct. The original window glass must be retained and must secure the polycarbonate material insert.
- (f) On an *Automobile* with four doors it is permitted to fit an insert of a clear polycarbonate material in part of the glazed area of each rear door. The polycarbonate material may incorporate a single ventilation duct. The original window glass must be retained and must secure the polycarbonate material insert.
- (g) It is permitted to replace the front windscreen with one that incorporates electrical demister elements.
- (h) Both windscreen wipers must be functional
- (i) Standard washer bottle and associated components may be removed from the vehicle.

13.3 INTERIOR

- (a) The following components may be removed from the cockpit:
 - (i) internal plastic trim and glove box;
 - (ii) roof padding and lining;
 - (iii) carpets and insulating material, including soundproofing material bonded to interior panels;
 - (iv) front passenger and rear seats;
 - (v) radio, speakers, console and associated wiring. It not permitted to fit a non-standard console.
 - (vi) restraint systems and supplementary restraint systems; and
 - (vii) boot lining including linings and parcel shelf in the boot space of hatchback versions, spare wheel and wheel changing equipment.
- (b) It is permitted to remove or modify the components associated with the vehicle heating or air conditioning system. Either a windscreen internal effective demisting fan system or a heated screen system must be retained, whereby this system must be free.
- (c) Any void/s in panels created by such removal of components must be closed in a professional manner using suitable panel/s.
- (d) Original door trim and Quarter panel trim may be replaced by substitute solid material.
- (e) A replacement dashboard 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
- (f) The only additional components which are permitted in the cockpit are:
 - (i) safety equipment and structures;
 - (ii) supplementary gauge / gauges that have no logging ability greater than one sample point are permitted on the condition that the product or products are commercially available products and have a combined commercial price that does not exceed \$1000 AUD including all

hardware, software, sensors and wiring. No display system is permitted to connect to any original vehicle wiring, or sensors other than the vehicles battery power, ground or to read an RPM trigger;

- (iii) Electrical switches or dials;
 - (iv) driver cooling system;
 - (v) driver drink system;
 - (vi) ballast, if required, must be located in the confines of the driver's cockpit, be clearly visible, be accessible by Scrutineers and be in compliance with the Motorsport Australia Manual – Technical Appendix requirements for Ballast and Ballast Retention.
 - (vii) Radio system for two-way communication between the driver and their team or receive only from Race control. No car-to-car communication is permitted; and
 - (viii) electrical equipment as defined in section 12;
 - (ix) It is permitted to fit a drivers footwell floorplate with maximum floor lift height of 25mm and maximum dimensions of 730mm x 530mm.
 - (x) It is permitted to fit a knee guard to the driver's side of the gearshift control area, as per appendix 8.
- (g) None of the above items may be installed in a manner which will actually or potentially hinder the driver's vision, hinder the ability for the driver to extricate from the *Automobile* or affect the engine power or influence the steering, transmission, brakes, or roadholding of the *Automobile* in a direct or indirect manner. Each of the items must be suitably secured.
- (h) Each control must retain its standard function although it is permitted to adapt each control to affect its use and accessibility.
- (i) Steering column switches must remain fitted and operative in their original location other than the ignition barrel which can be removed, and its switches relocated.
- (j) Pedal settings may be modified provided the original mounting points to the body remain unchanged.
- (k) 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.

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) must be positioned under the left front foot well (refer images below)



Inside Left Foot-well

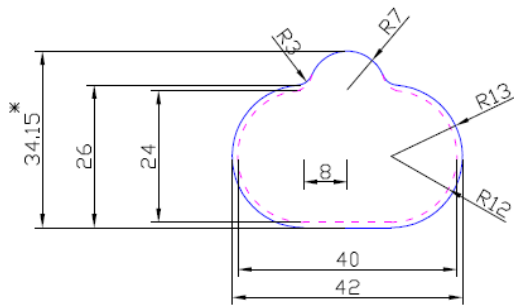


Left under Foot-well

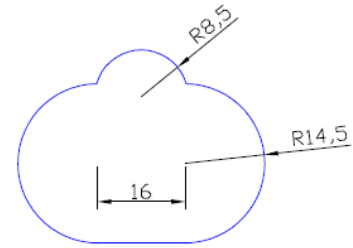
Appendix 1 – Specifications Block prefix G4FK DOHC

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 (Single counterweight “Black-top” version) with tone wheel	11.2kg minimum
Crankshaft weight (Double counterweight “Silver-top” version) with tone wheel	12.0kg 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 rings – number (includes oil control ring/s)	3
Combined weight of conrod, fasteners, w/o bearings, piston, pin and rings	792.2g 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 41mm
Inlet Camshaft lobe dimension (Drawing 5)	(A) 35.90mm to 36.10mm (B) 43.32mm max
Inlet Valve lift	7.20mm (+/- 0.06 mm)
Exhaust Camshaft lobe dimension (Drawing 5)	(A) 35.90mm to 36.10mm (B) 43.90mm
Exhaust Valve lift	7.8mm (+/- 0.06 mm)
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
Effective 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	1630mm (+/- 15mm)
Body width – Rear	1620mm (+/- 15mm)
antiroll bar diameter - Front	22.0mm maximum
antiroll bar diameter - Rear	18.0mm maximum
Combined Flywheel and Clutch Assembly weight	9.8kg minimum
Radiator height excluding cap	453mm (+/- 15mm)
Radiator Width minimum	610mm
Radiator Width maximum	685mm

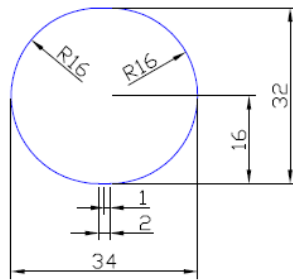
Appendix 2 – Dimensions / Ratios



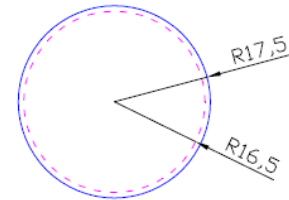
INLET PORT DIMENSIONS



INLET MANIFOLD DIMENSIONS



EXHAUST PORT DIMENSIONS



EXHAUST MANIFOLD DIMENSIONS

Table 1 Gearbox Ratios

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

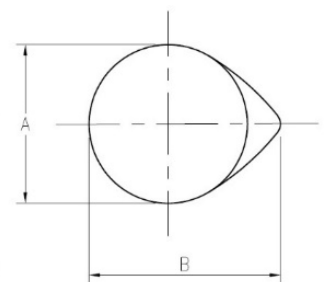
Drawing 5 Camshaft Dimensions

INLET

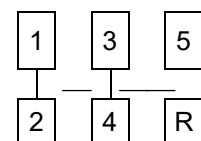
A = 35.90mm to 36.10mm
 B = 43.32mm Maximum
 B minus A = Maximum 7.26mm

EXHAUST

A = 35.90mm to 36.10mm
 B = 43.90mm Maximum
 B minus A = Maximum 7.86mm



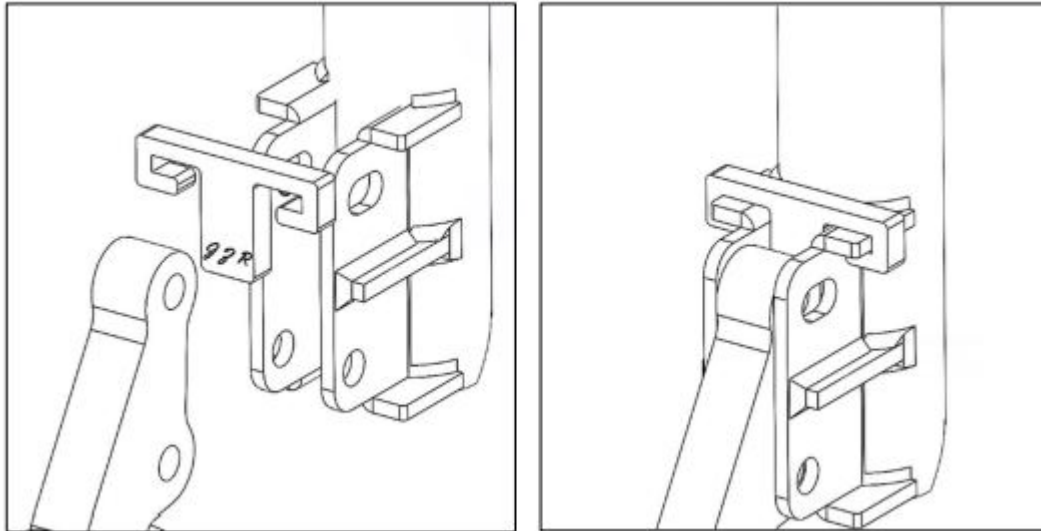
Gear change pattern



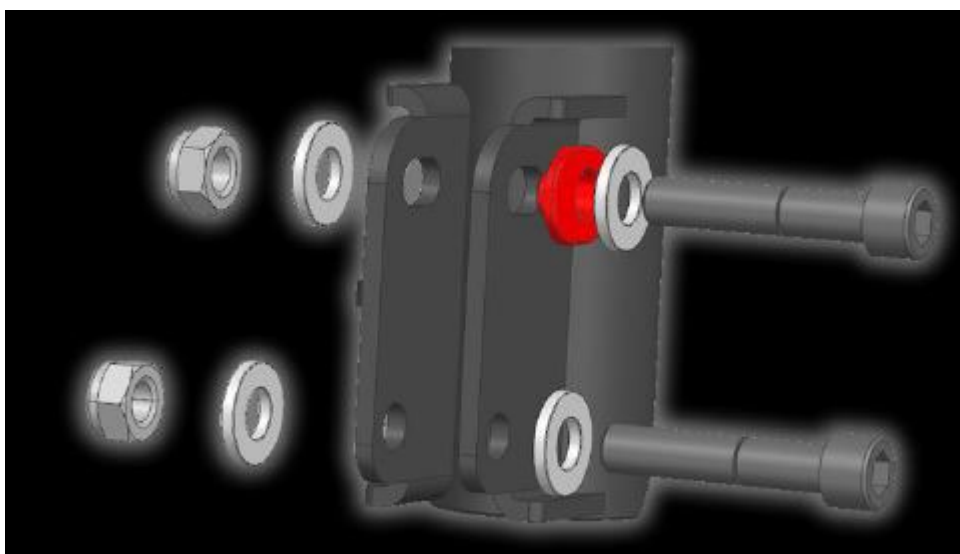
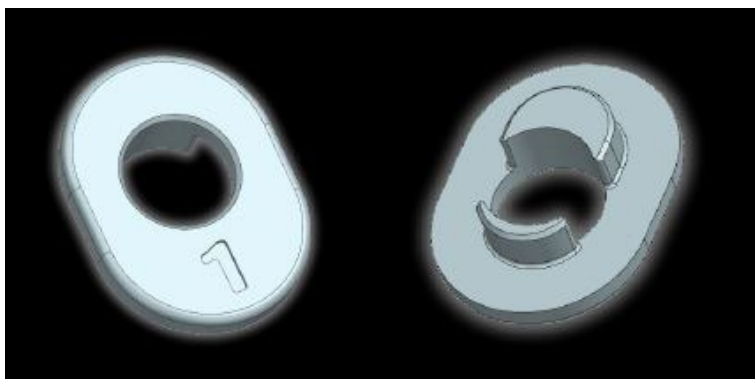
Appendix 3 - Suspension

Control Suspension Package: The SS-CERA-EXCEL SUSPENSION PACKAGE

Camber stops sample:



Positive locking camber washer sample:



Shims Sample



Appendix 4 – Brake Circuit

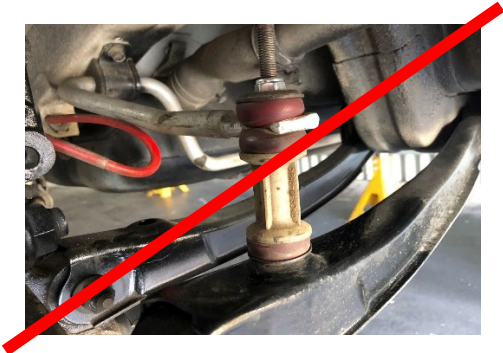


Photo 2



Photo3



Appendix 5 - Sealers

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

QLD	Shane Beikoff	0418 722 156	SA	Fred Severin	0418 850 826
NSW	Pat Rhodes Ken McCauley	0428 631 950 0407 916 562		Henry Madden	0431 738 686
VIC	Laurie Griffin Bob Buck Phillip Buggee	0407 946 944 0418 374 447 0417 307 189	WA	Tony Lerace Mike Holdcroft	0418 917 710 0458 998 395
			TAS	Graham Smedley	0408 312 924

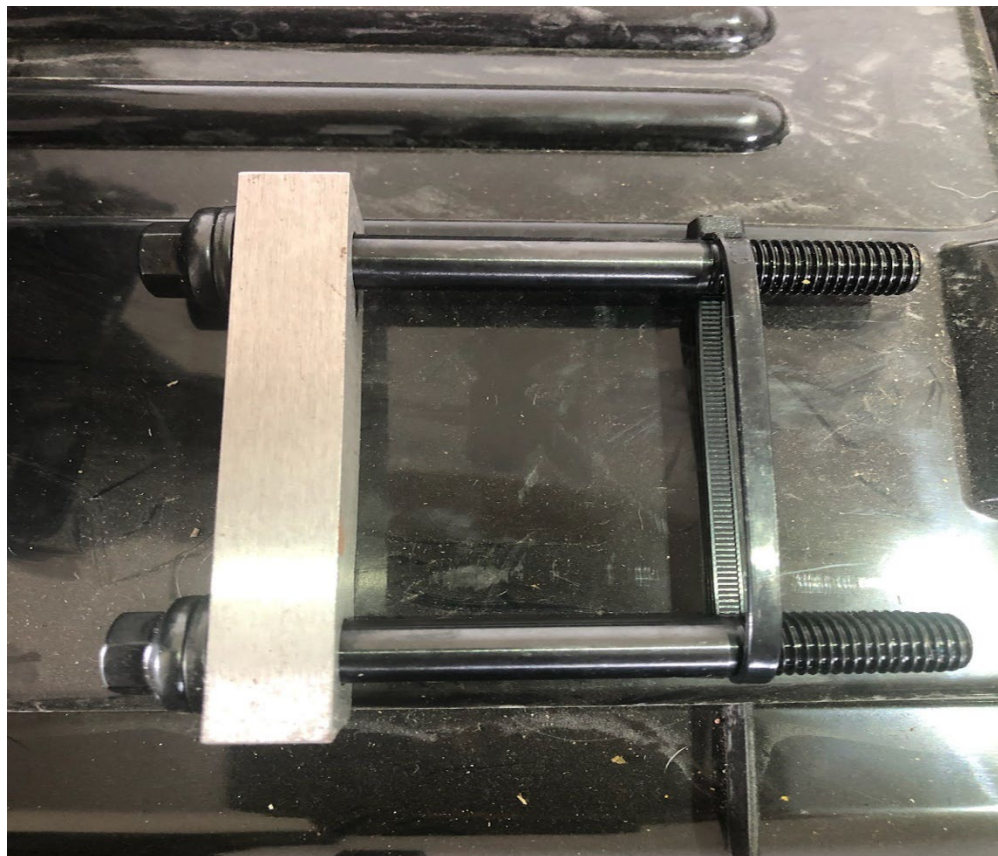
Appendix 6 - Chassis

Chassis strengthening location.



Appendix 7 – Engine bearing cap

Centre main bearing cap strengthening plate



Appendix 8 – Knee guard

Knee Guards must not exceed a height of 220mm and 600mm in length



Appendix 9- Cylinder Head

Cylinder Head Valve Throat Machining

Maximum Depth

Inlet valve throat: 11.5mm

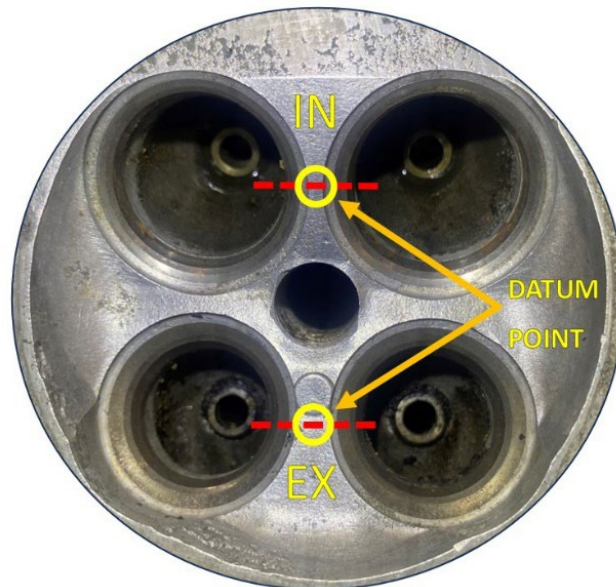
Exhaust valve throat: 13.5mm

The tolerances applied in Motorsport Australia Manual; Technical Appendix – Definitions Technical are not applicable to cylinder head valve throat machining.

Datum Area

The datum area to measure the maximum depth of the machined cylinder head valve throat is determined as the narrowest point of the original casting combustion chamber (excluding any casting mark/irregularity) between the inlet (IN) valves and the exhaust (EX) valves.

Datum area diagram – cylinder head combustion chamber:



Valve throat cross section diagram:

