



## Improved Production Cars

### 1. Overview

#### 1.1. PREAMBLE

Improved Production has been adopted by HRC as a sporting-level touring car category. HRC is ultimately responsible for the approval of the regulations or changes thereto and responsible for publishing the regulations via the HRC. The Improved Vehicles shall conform with the General Requirements of Automobiles as laid down in "General Requirements for Cars and Drivers" in the MSNZ Manual of Motor Sport and these regulations. The series will be controlled by an administrator. Competitor committees can be set up to advise the administrator.

#### 1.2. DEFINITIONS

##### 1.2.1. SCHEDULE A:

The section of the MSNZ Manual with which all vehicles in races and other speed events must comply. (See General Requirements: Vehicles and Drivers)

##### 1.2.2. SERIES or IPC:

The Improved Production Car series of race events as promoted and administered by HRC

##### 1.2.3. ADMINISTRATOR

HRC or any individual or group of individuals as nominated by HRC to oversee the running of the Series

##### 1.2.4. IMPROVED PRODUCTION CAR:

A competition vehicle derived from a registered production automobile, with limited modifications to improve performance and reliability in race or speed events on circuits or other licensed tracks. To be eligible, the models of vehicles must be or have been mass-produced touring cars, the model of which has been:

- a) Homologated by the FIA in Group A. Sporting Evolutions (ES) and Variant Options (VO) shown in the FIA homologation papers shall not be eligible unless provided for in 1.1(b) or 1.1(c) below;
- b) Commercially available to the general public Worldwide as new cars through a manufacturer's dealer network. At least 200 such models must have been registered for road use Worldwide; or
- c) Otherwise recognised by HRC, at its sole discretion, for Improved Production Racing. In general, such cars will be available on a large scale, possibly as an imported used car. The interior dimensions shall comply with the homologation requirements of FIA Group A. Prospective competitors desiring to use such cars must provide information regarding the number registered for road use, a basic recognition



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document containing all such technical details, photographs and other specifications as may be required by HRC. The HRC will be the final arbiter of acceptance or otherwise of any model.

### 1.2.5. 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.

### 1.2.6. WHEEL:

This means the complete wheel: flange, rim and tyre and any additional fittings.

### 1.2.7. AUTOMOBILE MAKE AND MODEL:

Vehicles manufactured by the same company but under a different brand name are considered to be the same make, eg, Nissan/Datsun, Mazda/Eunos, Toyota/Lexus etc. Any component fitted to a production vehicle will be regarded as belonging to that manufacturer of that vehicle irrespective of the actual source of manufacture. Manufacturers are not considered to be the same solely by virtue of having a common parent or holding company. Model refers to a member of the same family of vehicle as produced by the manufacturer.

### 1.2.8. TRACTION CONTROL:

Traction control is defined as any form of program, device, system or mechanism or the purpose or effect of preventing or limiting loss of traction. The direct control of the throttle position or brakes as effected by the driver does not fall within this definition.

### 1.2.9. AUTOMATIC TRANSMISSION:

Automatic transmissions are defined as being transmissions that use a fluid coupling instead of a friction plate clutch system.

### 1.2.10. ELASTOMERIC BUSHINGS:

Suspension components utilising an elastomer (eg, rubber, polyurethane) to permit freedom of movement in three axes at suspension pivot points. Where the bush incorporates an outer metal shell and/or central crush tube, they shall be regarded as part of the bushing. Where the bushing is integral with the arm or other secondary component, only the elastomer material shall be regarded as the bushing for replacement purposes.

### 1.2.11. ROTARY ENGINE:

Engines with rotary (rather than reciprocating) motion of the compressing medium (Wankel-type). A rotary engine is defined as the rotor housings, intermediate and end plates.

### 1.2.12. PERIPHERAL PORT:

A port on a Rotary Engine allowing the passage of gasses though the periphery of the rotor housing. Any bridged induction port in the end or intermediate plates of a rotary engine that is extended radially beyond the original outer edge of the inner water seal is, for the purposes of these regulations, considered to be a peripheral port.

### 1.2.13. DECORATIVE STRIPS:

Any parts following the external contour of the bodywork and less than 100mm high, the function of which is to prevent minor body damage or is decorative. Badges describing the vehicle manufacturer and/or model are considered to be within this definition.

### 1.2.14. TELEMETRY:

The transmission of data from a moving car. A timing transponder required by regulation shall not be regarded as telemetry.

### 1.2.15. MINOR RESHAPING:

Reshaping of existing material. This excludes the addition, replacement or removal of material and must not result in a loss of integrity of the panel.

### 1.2.16. FREE:

A component, deemed to be free under these regulations may, where fitted to the vehicle as standard, be removed or replaced. Where the removed component is replaced, the replacement is not restricted in SPECIFICATIONS OF AUTOMOBILES design or material (unless otherwise specified) providing it performs



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only the same function. No modification may be made to surrounding components or body-work to which the replacement is fitted, unless otherwise permitted. Where freedom is granted for the fitment of any component, such freedom is restricted to that component and such modifications as are allowed in Article 3.17. For the purpose of this article, a component shall be deemed to include all other components with which it is integral, or to which it is attached by means the manufacturer intended to be permanent. Where a system is deemed as free, all components solely associated with that system are regarded as free, as per above.

### 1.2.17. HATCHBACK:

Any vehicle on which the rear window is attached to a rear facing door or hatch.

### 1.2.18. AERO DEVICE

An item fitted to the vehicle which is in direct or indirect contact with the airstream whose primary purpose is the manipulation of the airflow for the purpose of improving performance.

### 1.2.19. RACING CLASS (Also referred to as CLASS)

The Improved Production Series will consist of three Racing Classes. The Classes will be called simply IPC1, IPC2 and IPC3. The Classes are defined by a range of best lap times around the Hampton Downs National Race Circuit. The exact make up and lap times that define each Class will vary from season to season, depending on the capabilities of the entrants involved in any given season. Each Class will have its own points tally to promote competition within each Class, rather than between Classes. Vehicles will be required to display a sticker denoting which Class it is racing in.

The organisers envisage the Classes being defined approximately as follows:

IPC1	1:14.00 to 1:18.00
IPC2	1:18.00 to 1:22.00
IPC3	1:22.00 and up

Breakout times will be set at 1.00 seconds below the fastest permissible lap times for each class.

### 1.2.20. CLASS GRADING

The first round of racing each season will be treated as a Grading Round, to enable all entrants that compete on the day to be graded (or grouped) into Classes. The exact definitions of each Class will be confirmed after the end of Round One and will remain unchanged for the duration of the season.

Any entrant wishing to take part in the Series is requested to make every effort to attend and race at the Grading Round however it is acknowledged this may not always be possible. Competitors wishing to enter the Series without having attended the initial Grading Round will be placed into an appropriate Class by the Administrator using any information which is available and deemed reliable, including lap times at previous events, where the competitor feels comfortable and in the best interests of IPC as a whole. The final placement of any entrant into a Class will be at the sole discretion of HRC.

### 1.2.21. BREAK-OUT TIMES

Each Class will have Break-Out times, which competitors must not exceed on two or more consecutive race laps, or more than three times in any Round. In the event that a competitor is deemed to have "Broken Out" of their Class, they may be required to add ballast at the discretion of the organisers in an attempt to help keep the competitor within the appropriate Break-Out times for their Class, or they may be Promoted up into the next Class. Championship points may be deducted for competitors who are in breach of the Break-Out rules as described above. See 3.1.5 for details on penalties.

### 1.2.22. PROMOTION / RELEGATION

Competitors who experience a significant decline in performance such that they become uncompetitive in their Class may apply to be relegated into a lower Class. Additionally, the organisers reserve the right to relegate any competitor if it is deemed in their best interests and/or in the best interests of IPC in general.

In any case where a promotion or relegation occurs, points will be transferred unaltered into the new Class. Entrants may then apply to have their points tally reviewed and will be responsible for providing supporting information for the organisers to assess. The final decision as to the points and/or standings within any Class rests with HRC in the interests of fairness to all competitors.

## 2. Technical

### 2.1. REGULATIONS

#### 2.1.1. ROLE OF HRC:

The following technical regulations for Improved Production Cars are issued by HRC and must be read in conjunction with the relevant Schedules of "General Requirements for Cars and Drivers" in the MSNZ Manual.

#### 2.1.2. PUBLICATION DATE FOR AMENDMENTS:

Each year in September at the latest, HRC will publish all changes made to these regulations. Changes made for safety may come into force without notice. Rule changes are effected by a ballot of all registered members of the Improved Production Car Racing Association of New Zealand and a two-thirds majority is required to effect a change. MSNZ reserve the right to alter regulations at its discretion.

#### 2.1.3. PERMANENT COMPLIANCE WITH REGULATIONS:

Automobiles must comply with these regulations in their entirety at all times during an event, save through any damage or malfunction sustained in competition.

#### 2.1.4. LOG BOOK/ELIGIBILITY:

The Competitor is responsible for furnishing any documentation to prove the eligibility of any part used or modification performed otherwise outside of these regulations.

#### 2.1.5. LIMITATIONS TO MODIFICATIONS:

The entire vehicle must remain unmodified except for specific freedoms allowed in these regulations and modifications necessary to comply with "General Requirements for Cars and Drivers". Competitors are entitled to apply for a dispensation for any modification which may fall outside these regulations. The final approval of any application for dispensation will be at the sole discretion of the Administrator on the basis that the modification shall not cause an unfair advantage or disadvantage to any competitor.

### 2.2. BODYWORK AND DIMENSIONS

#### 2.2.1. STRENGTHENING:

It is permitted to seam weld the bodyshell. Metal to a thickness of up to 5mm may be added to fully sprung components to a distance of 75mm from the edge of each suspension pivot point aperture. Such metal must follow the contour of the original metal at all times. It is not permitted to add or incorporate any other components which contribute to the rigidity of the bodyshell, other than the safety cage structure as described in Regulation 2.13.1, and a strut tower brace as described in Regulation 2.8.7.

#### 2.2.2. TRANSMISSION TUNNEL:

Minor reshaping of the body is permitted to enable fitment of replacement gearboxes and clutch assemblies and/or relocation of the driver's seat where required to increase the safety or comfort of the driver.

#### 2.2.3. GEARSHIFT HOLE:

It is permissible to cut or enlarge a hole in the floor, of the minimum necessary dimensions, for the gearshift and associated mechanism. At all times, there must be some form of covering around the gearshift to prevent the ingress of material into the cockpit.

#### 2.2.4. WHEEL ARCH FLARES:

It is permitted to add wheel arch flares, provided that the increase in the total width of the coachwork is less than 100mm, (or 50mm per side) as measured above the corresponding wheel centrelines. No part of the flare is permitted to extend further than 200mm from the original wheel arch opening. The operation of any door must not be affected. In any case, the dimensions of the wheel arch flare should be the minimum required to cater for the maximum allowable tyre size and location as described in Regulation 2.10.2 and 2.8.11

#### 2.2.5. TYRE CLEARANCE:

For the purpose of wheel and tyre clearance, minor reshaping of impinging bodywork is permitted. Where a wheel arch flare is fitted in accordance with article 3.4, it is permitted to remove up to 75mm of original bodywork measured radially from the edge of the wheel arch outwards. A maximum of 10mm of the cut edge may be reformed into a folded-over beading. Any cavity exposed in a door or rear wheel arch through the removal of metal must be covered by the addition of a metal closing panel. Any body joint protrusions must



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be rendered safe. The operation of any door must not be affected. It is permitted to remove plastic stone shields from within the wheel arch.

### **2.2.6. VEHICLE EMBELLISHMENTS:**

External decorative strips and mud flaps may be removed. Sump guards/splash guards may be removed or added. No part of any additional or replacement sump/splash guard may extend to the rear of the rearmost point of the engine block or rear rotor end plate.

### **2.2.7. REGISTRATION PLATES:**

Registration plates, registration plate mountings and associated lighting components may be removed.

### **2.2.8. SOUND DEADENER:**

Sound deadener (bitumen and fabric types etc) may be removed from the body shell and hung panels.

### **2.2.9. WINDSCREEN, WINDOWS AND MIRRORS:**

The windscreen must be of laminated glass, and may incorporate defrosting equipment. Side windows and the rear windscreen may be replaced with a polycarbonate or other equivalent substitute, and external rear view mirrors may be replaced or deleted, provided that Schedule A (refer "General Requirements for Cars and Drivers") is respected at all times.

### **2.2.10. FUEL FILLER APERTURE:**

It is permissible to make a hole in the bodywork of minimum necessary dimensions for access to inspection plates or fuel fillers in replacement fuel tanks when fitted subject to article 5.2. Under no circumstance may the access hole exceed 300mm in any dimension.

### **2.2.11. BONNET & BOOT CATCHES:**

The original bonnet & boot fasteners and release mechanisms may be replaced with a safe alternative.

### **2.2.12. WINDOW REGULATORS:**

Where a car is fitted with electric window regulators, it is permitted to replace them with manual window regulators and, where necessary, door trims from the same family of vehicle.

### **2.2.13. GENERAL:**

Holes may be drilled for fasteners, eg, bolts, screws, rivets etc. Holes of the minimum necessary dimension are permitted to be made for the passage of wiring and fuel, brake, oil and intercooler lines/hoses.

### **2.2.14. TIMING DEVICE:**

It is permitted to remove the minimum amount of metal necessary to facilitate fitment of a timing transponder to the upper surface of the cockpit floor.

### **2.2.15. BRACKETS:**

Unused brackets/supports attached to the chassis/bodywork can be removed, unless they are supports for mechanical/suspension components that are not permitted to be moved or removed.

### **2.2.16. FLOORPAN:**

It is permitted to modify the floorpan in the immediate area of the driver's seat, to permit the fitment of a replacement seat. No part of the modified bodywork may extend any lower than the surrounding original bodywork.

### **2.2.17. SAFETY CAGES:**

Safety cages may have bracing to the front suspension towers as per drawing 253-11 of Schedule J-37. Where fitted, they shall be mounted to the front suspension top mounting points

### **2.2.18. DOOR ANTI-INTRUSION BARS:**

The side anti-intrusion bars may be removed from doors subject to the safety cage structure providing lateral protection in the same general area for any occupant.



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### 2.2.19. LIGHTWEIGHT PANEL REPLACEMENTS

Lightweight (eg, Fibreglass or Composite) panels of any type may not be fitted in place of the original metal guards, doors or any other body panels except where the original production vehicle was supplied with parts of this nature (as standard or as an option). Vehicles racing in IPC1 are exempt from this regulation to the extent of bolt-on parts only. Any vehicle fitted with Lightweight Panels as described in this Regulation will automatically be entered into Class 1. Drivers of any such vehicles will have the right to apply to HRC for relegation to a lower Class.

### 2.2.20. JACKING POINTS:

It is permitted to strengthen the jacking points on the bodyshell and /or add new jacking points provided that each jacking point does not exceed an equivalent surface area of more than 150mm x 150mm. The use of an air jack system is free provided no compressed gas is carried aboard.

### 2.2.21. FASCIA:

It is permitted to replace non-metallic front and rear bumper bar fascias. The replacement items must be identical to the originals when viewed from above and be completely contained within the perimeter of the original vehicle (save for any permitted aero devices). The replacement items may not expose any bodywork or components that were not exposed when the original bumper bars were fitted to the car. Any undertray incorporated into the replacement front fascia must comply with the requirements of article 2.15. It is permitted to add a mechanism for the quick release of the front bumper fascia. Any such mechanism must not project more than 10mm from the surrounding coachwork, and must serve no other purpose.

## 2.3. ENGINE

### 2.3.1. GENERAL:

Subject to the limitations contained in 2.3.2 and 2.3.3 below, the engine and components directly associated with its function are free. The crankshaft centreline as viewed from above must be parallel to that of the original engine.

### 2.3.2. BLOCK:

The block must have the same number of cylinders/rotors and the same configuration as was standard or available as a manufacturers option for that particular model (eg, in line, horizontally opposed).

The block must be from the same manufacturer (eg, Ford, GMH, Nissan) as the original car.

The cylinder block must either be:

- a) derived from an eligible car as detailed in Regulation 1.2.4

**OR**

- b) derived from the same family of engines as an eligible car using identical internal dimensions (with differences only in transmission mounting pattern, minor external casting differences etc). The block type must be clearly identifiable, ie, Nissan SR20DE, SR20DET, BMW M50 – M54 Series, Toyota 4AG series etc. The derived block must be identifiable as being from a mass-produced vehicle, not exclusively developed for sporting evolution models produced for homologation purposes in small numbers for competition use only. HRC will be the final arbiter in determining the eligibility of a block.

HRC reserves the right to add any engine block at its discretion. Engine blocks included in this definition are: Nissan FJ20.

### 2.3.3. ROTARY ENGINES:

A reciprocating engine may be interchanged with a twin rotor rotary engine from the same manufacturer. The rotor housings, intermediate and end plates shall be identifiable as mass produced Mazda items.

### 2.3.4. ENGINE MOUNTS:

Engine mounts are free.

- a) The engine mounting points on the bodyshell may be removed, modified or added to facilitate engine fitment. There must be no other alterations made to the body to fit a replacement engine except for minor reshaping of panels, other than the bonnet, for the fitment of engine mounted ancillaries and exhaust.

- b) Engine mounting brackets bolted or welded to the crossmember may be removed, modified or added to facilitate the installation of a replacement engine. No other modifications to the crossmember may be made in order to provide clearance for the replacement engine.
- c) It is permissible to reverse the orientation of the engine crossmember provided no alteration to the bodywork or crossmember is necessary.
- d) Where a replacement engine from another eligible model is fitted, the crossmember from the block's donor vehicle may be used provided that it is a direct bolt in replacement, and no modifications to the bodywork or replacement crossmember are required.

**2.3.5. SUPERCHARGING: (Also incorporates TURBOCHARGING)**

Supercharging is permitted only when all of the following conditions are met:

- a) A supercharger/s is recognised as a standard production item for the model.
- b) All components associated with the induction system remain operable, in situ, and unmodified.
- c) There are no additional components associated with the induction system fitted.

**2.3.6. EXHAUST:**

The complete exhaust system is free downstream of the exhaust port (save for turbo supercharged vehicles complying with Regulation 2.3.5 where the exhaust is free from the exit of the turbocharger) provided it complies with Schedule A (refer "General Requirements for Cars and Drivers"). The original exhaust mounting brackets may be removed and additional brackets may be fitted, provided that their sole function is the location of the exhaust.

**2.3.7. INDUCTION & FUEL INJECTION**

The entire intake system is free upstream of the intake port (save for turbo supercharged vehicles complying with Regulation 2.3.5 where the intake is free prior to the intake of the turbocharger) provided it complies with Schedule A (refer "General Requirements for Cars and Drivers"). The original intake mounting brackets may be removed and additional brackets may be fitted, provided that their sole function is the location of the intake. Throttle bodies or carburettors are free and may be modified or replaced with larger or multiple items as desired. Fuel injectors, rails, pressure regulators and connecting lines are free. Also see Article 2.14.

**2.3.8. FUEL:**

Only standard petrol of up to 98 octane may be used in the IPC Series. Refer Schedule A

**2.3.9. AIR:**

Only air may be mixed with the fuel as an oxidant. No other systems including water injection, Nitrous or any other pressurised induction/combustion aids are permitted.

**2.3.10. ENGINE CONTROL SYSTEMS / TUNING**

Engine management systems are free. Tuning may be applied to the factory ECU or an aftermarket ECU may be fitted and tuned if desired. The location of the ECU and any associated looms and connectors are free.

**2.4. PIPING AND FUEL TANKS****2.4.1. FUEL TANKS:**

- a) The fuel tank may be replaced by one of free but safe design; an FIA-approved bladder tank is recommended. Where the standard fuel tank is retained or the replacement is not an FIA-approved Safety tank, it must be fitted with anti-spray foam in conformity with Schedule A (refer "General Requirements for Cars and Drivers").
- b) It must be mounted in the same general location in relation to the floor pan and nearest axle centreline or it may be mounted in the boot area. Where a tank is relocated to the boot area the replacement tank must be an FIA-approved bladder tank.
- c) For vehicles which are manufactured with the fuel tank in the cockpit, or where the tank is mounted in the boot, a flame- and liquid-proof bulkhead must be fitted between the tank and driver.

**2.4.2. TANK FILLERS:**

The position of the tank filler is free, subject to Regulation 2.4.1. Dry break fittings are permitted. Tank fillers must not protrude beyond the bodywork and must be installed in such a way that no fuel spilt in the filling process will leak into the interior compartments of the car. If the filler hole is situated inside the car, it must be separated from the cockpit by a liquid tight bulkhead. Where retained, the standard filler orifice may be modified to accept a replacement cap of free design. Tank fillers must be designed to ensure an efficient closing action which reduces the risk of accidental opening following a crash impact.



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### 2.4.3. FUEL PUMPS/FILTERS:

Fuel pumps, fittings, fuel lines and filters are free. Where the fuel lines pass through the cockpit, there must be no connections within the cockpit save at the front and rear bulkheads.

## 2.5. COOLING / OIL SYSTEM

### 2.5.1. RADIATOR AND RADIATOR COWL/SHROUD:

The radiator and all associated cowls or shrouds are free. It is permitted to add or remove shrouds or ducting.

### 2.5.2. ENGINE COOLING FANS:

Engine cooling fans are free.

### 2.5.3. OIL COOLERS:

Oil coolers are free subject to Regulation 3.9.

### 2.5.4. INLET CHARGE AIR COOLING:

Devices for the cooling of the inlet air in Supercharged systems in accordance with Regulation 2.3.5 are permitted.

## 2.6. STARTING

### 2.6.1. STARTER:

A starter must be fitted and be able to be controlled by the driver when seated normally. The starting system must be capable of starting the engine at all times.

### 2.6.2. STARTING THE ENGINE:

A supplementary battery temporarily connected to the car may be used while starting the engine in the pits and on the dummy grid.

## 2.7. TRANSMISSION TO THE WHEELS

### 2.7.1. GEARBOX/TRANSAXLE:

- a) Vehicles in any Class may use the OE gearbox or transaxle in an unmodified state, regardless of the number of forward ratios, shift mechanism or location. However any gearbox other than the OE item must comply with the following regulations:
  - i. On IPC2 and IPC3 vehicles the replacement gearbox or transaxle must be from the same manufacturer incorporating no more than six selectable forward gears. All gears must be selected by the driver exclusively via a non-sequential mechanical linkage. This permits "H" pattern gear change mechanisms only.
  - ii. On IPC1 vehicles the replacement gearbox or transaxle may be from any manufacturer incorporating no more than six selectable forward gears. It is permitted to use either an "H" Pattern or Sequential shift mechanism. Any vehicle fitted with a sequential shift gearbox will automatically be entered into IPC1, however the competitor will have the right to apply for relegation.
  - iii. Where the replacement gearbox incorporates more than 6 forward gears any additional gear/s must not be able to be selected by the driver and transmit drive at any time during an event. Each additional gear shall be physically removed from the gearbox or a gear selection lock-out system shall be fitted. A gear selection lock-out system must be able to be sealed in place for the duration of the event.
  - iv. The gearbox or transaxle must remain in the same general location as the original.
- b) All vehicles shall have an operable reverse gear
- c) The gearbox crossmember and mounting points are free.
- d) Any additional lubricant cooling device, including a fan is permitted. The circulating pump, radiator, and air intake may not be located in the cockpit.
- e) Drive must be taken only to those wheels as envisaged by the manufacturer.

### 2.7.2. REAR AXLE/DIFFERENTIAL FOR RWD VEHICLES:

A separate rear differential may be replaced by one from the same manufacturer. Refer Regulation 2.8.10 for details on location and mounting. A rear mounted transaxle may be replaced by another which complies with 2.7.1 above.



**2.7.3. CLUTCH:**

The clutch must be operated by pedal action with the method of operation otherwise free. The position of any master cylinder for hydraulic operation is free. The complete clutch assembly, flywheel and bellhousing are free.

**2.7.4. TAILSHAFT/DRIVESHAFTS/AXLES:**

The tailshaft / driveshafts / axles and associated universal or CV-joints are free.

**2.7.5. TRACTION CONTROL:**

The use of traction control is forbidden.

**2.8. SUSPENSION AND STEERING****2.8.1. SPRINGS:**

Springs are free provided that the type and location are unchanged (by type is meant: coil, torsion bar, leaf etc.)

**2.8.2. BUMP STOPS:**

Bump stops, being the components designed to ultimately limit the suspension travel, are free and may be repositioned.

**2.8.3. BUSHES:**

Elastomeric bushes used at suspension pivot points (which are not otherwise specified in these regulations) may be replaced by other elastomeric bushings. Elastomeric bushes/isolators used at sub-frame to bodyshell mounting points are free.

**2.8.4. SUSPENSION DAMPERS:**

The make and size of suspension dampers are free. The number of dampers and pivot point locations may not be altered. The fitment of adjustable dampers is permitted provided adjustment may only be made when stationary.

**2.8.5. FRONT SUSPENSION COMPONENTS:**

Steering tie rods and suspension control arms may be replaced with equivalent parts from an eligible vehicle or a direct bolt-in replacement (eg for the purposes of camber adjustment). Stub axles, steering arms, hubs, bearings and tie rod ends are free. MacPherson strut tubes are free. In cases where the steering arms are separate components, it is permitted to fit spacers between the steering arm and stub axle assembly using extended bolts.

**2.8.6. MACPHERSON STRUT TOP MOUNTS:**

MacPherson strut top mounts are free providing that they utilise the standard bodyshell mounting facilities.

**2.8.7. STRUT TOWER BRACE:**

A brace of free design may be fitted between the towers and/or triangulated rearwards.

**2.8.8. SWAY BARS (ANTI-ROLL BARS):**

Sway bars, their pivot points and associated linkages are free, provided no adjustment can be made from the cockpit while the vehicle is moving. Sway bars may be of the adjustable type, however adjustments may only be made while the vehicle is stationary using basic hand tools. (Vehicles running in the IPC1 Class are exempt from this regulation where sway bars may be adjustable by the driver at any time. Any vehicle fitted with a driver-adjustable sway bar system will automatically be entered into IPC1. Drivers of any such vehicles will have the right to apply to HRC for relegation).

On strut type suspensions where the sway bar acts as a control arm it is permitted to change the thickness of the bar only. The inclusion of spacers at the sway bar mounting points is permitted, but only by extending bolts in the original body mounts.

**2.8.9. RIDE HEIGHT ADJUSTMENT:**

Adjustable spring platforms, rear leaf spring shackles, spacers located directly at either end or between coil springs, lowering blocks of solid/rigid material and torsion bar ride height adjusters are all free.

**2.8.10. REAR SUSPENSION COMPONENTS:**

Devices for the lateral location of the rear wheels on vehicles with a live axle, and any associated brackets on the body, are free (brackets may also be welded to the body). On independent rear suspension vehicles, suspension control arms may be replaced with equivalent parts from an eligible vehicle or a direct bolt-in replacement (eg for the purposes of camber adjustment). All other components which have any function in the location of the rear wheels must be retained unmodified except for bushings, which must comply with 2.8.3 above. Drive flanges, trunnions, hubs, stub axles and wheel bearings are free. It is permissible to add additional longitudinal rear suspension arms provided that all bushings are elastomeric and that the mounting points on the body only involve the addition of metal, save for a single hole per arm of maximum diameter 25mm.

**2.8.11. WHEEL TRACK:**

The track dimension is free save that the upper part of the tyre, down to the flange over the wheel hub centre must be within the perimeter of the vehicle when viewed vertically from above (see diagram 1).

**2.8.12. MINIMUM RIDE HEIGHT:**

All fully sprung parts of the car, with the exception of the entire exhaust system, must be at least 85mm above the ground when measured on a flat level surface with the vehicle at Racing Weight.

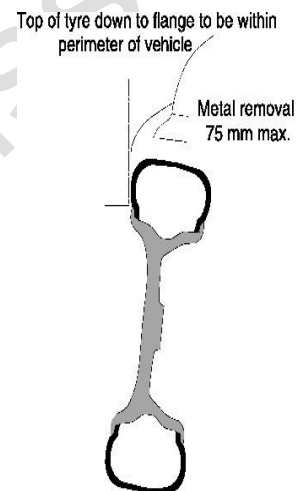
**2.8.13. STEERING:**

It is permitted to alter the steering ratio by the replacement of internal components within the steering rack assembly or box. A power steering rack assembly or box may be interchanged with a manual steering rack assembly or box respectively provided that the original mounting points on the body or crossmember are used, the replacement rack assembly or box is an unmodified part from an eligible vehicle and no other modifications (eg, steering column etc) are needed. Where a manufacturer offers both systems as options for other variants of the same family of vehicle, either system, and any associated crossmember may be used.

All other components of the power steering system are free.

**2.8.14. WHEEL ALIGNMENT FACILITIES:**

The wheel alignment settings are free. Refer to Regulations 2.8.5 and 2.8.10 for details on locating suspension components governing wheel alignment.



*Diagram 1: Positioning of tyre within wheel arch*

**2.9. BRAKES**

**2.9.1. BRAKE CONTROLS:**

Brakes must be controlled by a double circuit hydraulic system so arranged that the pedal normally operates on the four road wheels. In the event of fluid leakage at any point in the system, the pedal shall still control two wheels on the same axle, or on diagonally opposite wheels if produced in this format by the vehicle manufacturer.

**2.9.2. BRAKE BIAS**

For vehicles running in the IPC1 Class only, it is permissible to add a facility to allow for the adjustment of the front/rear brake bias by the driver when seated in the normal driving position. For the purpose of adjusting brake bias, it is permissible to change from a diagonal split system, to a front/rear split system. An adjustable brake proportioning valve may be fitted in another suitable location in any of the racing Classes. Any vehicle fitted with a driver-adjustable Brake Bias System will automatically be entered into IPC 1. Drivers of any such vehicles will have the right to apply to HRC for relegation.

**2.9.3. MASTER CYLINDERS:**

For vehicles running in the IPC2 and IPC3 classes, power boosters, master cylinders and associated pushrods are to remain as close to the manufacturer's design and location as possible given the fitment of roll cages and the like. For vehicles running in the IPC1 class, power boosters, master cylinders and associated pushrods are free. Fluid lines and hoses are free in all Classes. Brake proportioning valves are free in all Classes noting the provisions of 2.9.2 above as regards location.



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### 2.9.4. BRAKE ROTORS:

Brake rotating friction surfaces must be made from a ferrous material but are otherwise free. Disc mounting hats are free subject to their being made from aluminium alloy or ferrous material.

### 2.9.5. BRAKE CALIPERS:

- On IPC1 vehicles, brake calipers are free, subject to the main housing being made of a ferrous material or an aluminium alloy. Where freedom is not otherwise granted, suspension components may be modified to permit fitment of replacement calipers.
- On IPC2 and IPC3 vehicles, brake calipers may be upgraded to an equivalent item from the same manufacturer.
- Drum brakes may be replaced with a disc brake system in compliance with a) or b) above.
- Brake pads are free.

### 2.9.6. HANDBRAKE:

The entire handbrake system is free.

### 2.9.7. BRAKE COOLING:

Protection shields/stone guards on unsprung components may be added or removed. It is permitted to fit ducting for the passage of air to the brakes provided that it remains within the perimeter of the coachwork when viewed from above and that no bodywork alterations are required.

### 2.9.8. ABS:

If a model of automobile was manufactured with an Anti-Lock Braking System (ABS) as standard equipment, that system can be retained on the condition that the ABS unit and all related software remain unmodified. Alternatively, the entire system can be replaced with a non- Anti-Lock Braking System otherwise complying with this section.

## 2.10. WHEELS AND TYRES

### 2.10.1. WHEELS:

- Wheels must be of a type originally found on a standard production vehicle.
- Centre-lock wheels are not permitted unless originally supplied on the actual vehicle. Centre-lock wheels may not be retro-fitted, even where they were an option on a model from the same family.
- Wheel sizes are free, taking note of the regulations described in 2.8.11 above regarding protrusion outside of the body work and in 2.2.4 as regards the fitment of wheel arch extensions.
- See Regulation 2.12.1 regarding removal of the spare wheel.

### 2.10.2. TYRES:

Each tyre must:

Be DOT rated. (For clarity, semi-slicks are acceptable however full slicks and full race wets are not)  
Have at least a minimum tread depth. The tread wear indicators as provided by the tyre manufacturer will be the definitive method of determining minimum tread depth. At no time prior to practice or racing may any tread wear indicator be exposed or in the case where the indicator is a dimple in the tyre, worn below such indicator. This does not apply to the shoulder of the tyre. In all areas where there is no tread wear indicator, the original tread pattern must be clearly visible.

Be fitted onto a rim in compliance with Schedule A

Have a minimum aspect ratio of 45% and comply with the following maximum width regulations based on vehicles at race weight (including driver): (IPC2 and IPC 3 only) Tyre sizes are free for vehicles racing in IPC1.

Vehicles up to 875kg	205mm
Vehicles up to 1025kg	225mm
Vehicles up to 1175kg	245mm
Vehicles up to 1325kg	265mm
Vehicles over 1475kg	285mm

## 2.11. ELECTRICAL

### 2.11.1. ELECTRICAL SYSTEM:

The wiring and electrical connectors, switches, fuses and circuit breakers, starting, ignition and generating systems are free. A panel incorporating additional/ replacement switches and/or circuit breakers may be

added. The starting, lighting and turn signalling apparatus must be in working order at the start of each competition. All globes must at least meet the original equipment specification.

**2.11.2. BATTERY:**

The battery and its location are free but it must be safely and securely mounted in accordance with Schedule A. It must be adequately covered so as to prevent short circuits and leakage, in any position.

**2.11.3. WINDSCREEN WIPERS:**

The windscreen wiper mechanism may not be modified with the exception of the tensioning springs and wiper blades. Wind deflectors may be added. Headlight and rear window wipers and washers may be removed. The windscreen washer bottle, pump and hoses and any mounting bracket are free. Windscreen wipers must rest in the same location as on a standard car of that make and model.

**2.11.4. EXTERNAL LIGHTING:**

Each tail light assembly may be replaced by a non-genuine OE (Original Equipment) equivalent item provided that the replacement assembly is legal for road use. Each headlight assembly may be removed on the provision it is replaced by a blanking plate or air intake. Any headlight assembly that remains fitted must be an OE equivalent item that is legal for road use.

**2.12. COCKPIT / DRIVER'S COMPARTMENT****2.12.1. STEERING WHEEL:**

The steering wheel may be replaced by one which is of at least 300mm diameter. It is permitted to add a steering wheel boss, possibly incorporating a quick release mechanism, to enable the fitment of a permissible steering wheel. The steering column may be lowered by the addition of spacers/ longer bolts at the rear mounting points provided no other modifications are required.

**2.12.2. CONTROLS:**

All driving controls must retain the role laid down for them by the manufacturer. Footrests and heat protection panels may be added to the driver's footwell cavity. Pedals and pedal boxes are to remain as per original equipment for the model of vehicle, or may be upgraded using parts from another eligible model on the basis that no modification to body panels or mounting points is required. An exemption may be granted at the sole discretion of HRC for the purposes of preventing untenable driver ergonomics.

**2.12.3. INSTRUMENTS:**

Instruments are free, but the original dash must remain. Any holes in the dash resulting from the removal of instruments must be neatly closed by the addition of a closing panel. Where possible, all replacement instruments must be mounted in the dash where the original instruments were situated.

Where the original dash incorporates an integral console connecting to the transmission tunnel this panel must be retained. Where the console is attached to the dash via fasteners the console may be removed.

**2.12.4. TELEMETRY:**

The use of telemetry is forbidden. The use of lap data recorders (eg cell phone app) is permissible so long as no data display is visible to the driver when seated in the normal driving position.

**2.12.5. CARPET AND INTERIOR TRIM:**

Floor carpet and associated "underfelt", roof lining and interior trim down to the lower edge of the windows, and consoles on the transmission tunnel may be removed. Original door trims may be retained or replaced with a rigid, moulded or flat panel. Where a replacement door trim is fitted, it must be an opaque, moulded or flat panel constructed from an upholstered rigid material or non-metallic rigid material. The replacement door trim must cover all openings and door skin/frame as achieved by the original trim. Door handles, opening levers and window winders may be replaced by one of free design situated in the same general location. Where the original dash incorporates an upholstered crash pad, it may be replaced by one of the same design and re-upholstered.

**2.12.6. SEATS:**

The driver's seat may be replaced with one in compliance with Schedule A (refer "General Requirements for Cars and Drivers"). Seat mountings are free provided they are of a high quality and fitted securely in accordance with Schedule A. All other seats, and associated seat belts are free.

**2.12.7. HEATER & VENTILATION:**

All components solely associated with the heating, air-conditioning and ventilation system are free. Any openings created by the removal of ducting, vents and controls from the dash must be closed by the addition of panels, which may be used to mount additional instruments or controls. Some form of ventilation and windscreen demisting is recommended.

**2.12.1. REMOVAL OF UNNECESSARY ITEMS:**

The removable rear window shelf in two volume cars may be removed together with its supports, or may be held down by additional fasteners. Trim in the boot/luggage space may be removed. The spare wheel, jack and any associated brackets and tools may be removed. The radio, aerial, speakers and speaker mounts may be removed. Fog/driving lights which are separate from the main lighting system may be removed as may internal cockpit lights.

**2.13. SAFETY STRUCTURES**

**2.13.1. SAFETY CAGE STRUCTURES:**

Safety cage structures must comply with Schedule A (refer "General Requirements for Cars and Drivers"). It is not permitted to fit additional bracing, other than a strut tower brace as described in Regulation 2.8.7. It is permitted to attach parts of the safety cage, either by welding or bolting. The removal of the minimum amount of material to assist the fitment of the safety cage members is permitted.

**2.13.2. SAFETY HARNESS:**

Where the vehicle is not registered for road use, the original driver's seat belt must be replaced by a safety harness, complying with Schedule A (refer "General Requirements for Cars and Drivers"), with at least four belts in contact with the driver.

**2.14. AERODYNAMIC AIDS:**

Modest aerodynamic aids are permitted as described in this section. Any Aero Device fitted:

- a) May not be used for any additional or alternative functions (eg, for mounting an oil radiator);
- b) Must be rigidly secured to the entirely sprung part of the car (rigidly secured means not having any degree of freedom); and
- c) Must remain immobile in relation to the sprung part of the car.
- d) Must be free of any sharp or jagged edges

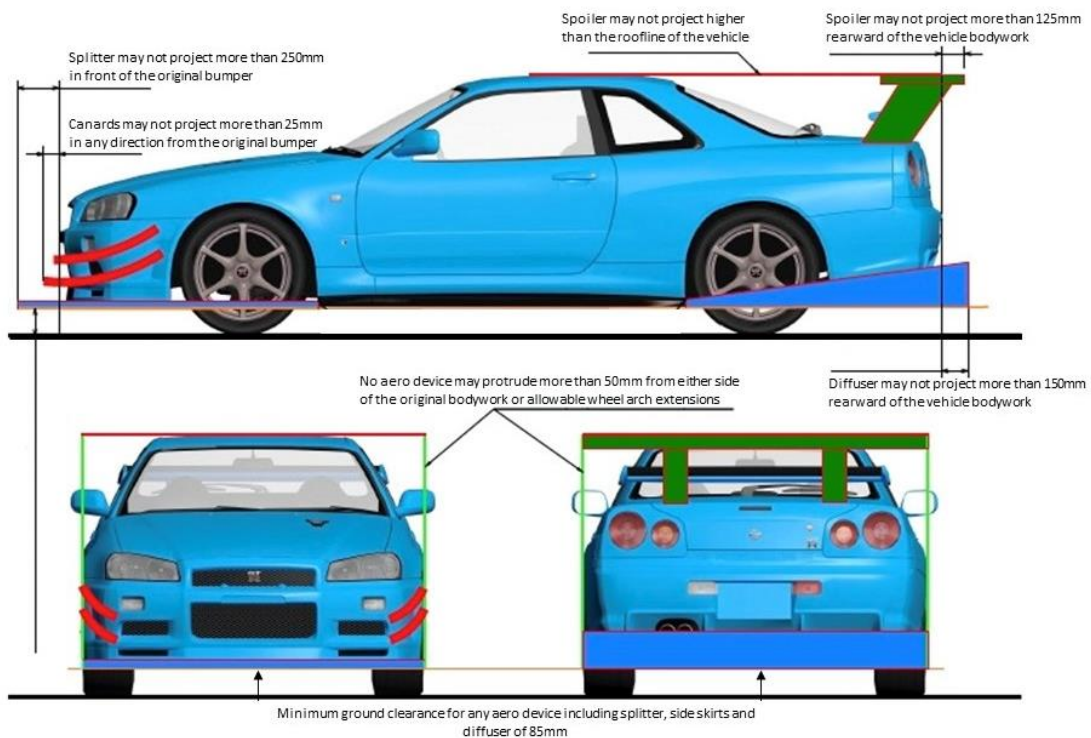


Diagram 2: Maximum dimensions of aero devices

**2.14.1. FRONT SPOILERS, AIR DAMS and UNDERTRAYS:**

It is permitted to fit an airdam and/or splitter and/or undertray (together the Frontal Aero Assembly) to the front of the car, subject to the following restrictions (see diagram 2).

- a) It may not extend more than 250mm forward of the vertical projection of the original car, or 50mm outboard of the original bodywork including permitted flares (in plan view).
- b) No part may extend further rearward than the wheel arch opening and shall remain at least 20mm clear of the wheel/tyre assembly regardless of steering position and/or suspension travel
- c) Any undertray or splitter shall be mounted such that it is predominantly parallel to the vehicle sills

**2.14.2. REAR DECK SPOILERS:**

It is permitted to fit a rear deck spoiler which complies with the following (see diagram 3):

- a) It was supplied as standard with the particular model of vehicle as sold in New Zealand

OR it must comply with the following:

- b) No part of it is further than 125mm from the nearest original bodywork, and it does not exceed the standard width of the bodywork excluding any flaring of the mudguards by more than 50mm

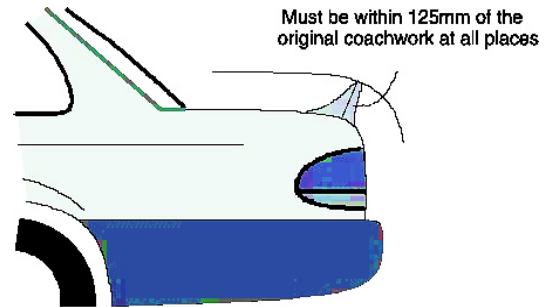


Diagram 3: Maximum dimensions of a rear spoiler

Must comply with the MSNZ definition of a spoiler (as defined by MSNZ Definitions - General – refer “General Requirements for Cars and Drivers”)

May not extend more than 125mm rearwards of the rearmost extremity of the coachwork including the bumper bar

Must not be fitted above the rear window or on the roof

No part of the spoiler may extend any further forward than the centre line of the rear axle.

Where the particular model of vehicle as sold in New Zealand was supplied as standard with a rear spoiler, the original item may be removed.

**2.14.3. REAR WING:**

A rear wing may be fitted, or be replaced by another wing, complying with the prescriptions of this article. An OE rear wing may be removed.

The wing assembly shall also comply with the following requirements:

- a) The wing must consist of a single rigid element;
- b) The wing element may be straight or curved, and the longitudinal cross section rule as described below shall apply regardless (see diagrams 4 and 5). The method of attachment of the wing assembly is free, however no part of the wing assembly may protrude above the highest point of the vehicle’s roofline.
- c) It must be fixed in position while the car is in motion;
- d) The wing angle may be adjustable, provided adjustment is only possible when the vehicle is stationary via the use of hand tools from outside the cockpit;
- e) Any other rear wing or deck spoiler shall be removed
- f) i) IPC2 & IPC3 Vehicles (except Hatchbacks):

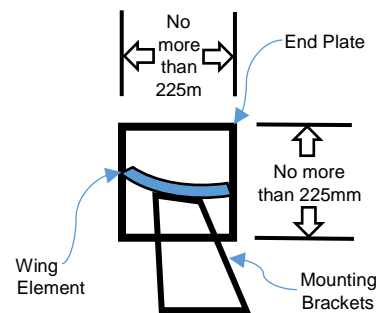


Diagram 4: Cross Section of Rear Wing Element and End Plate

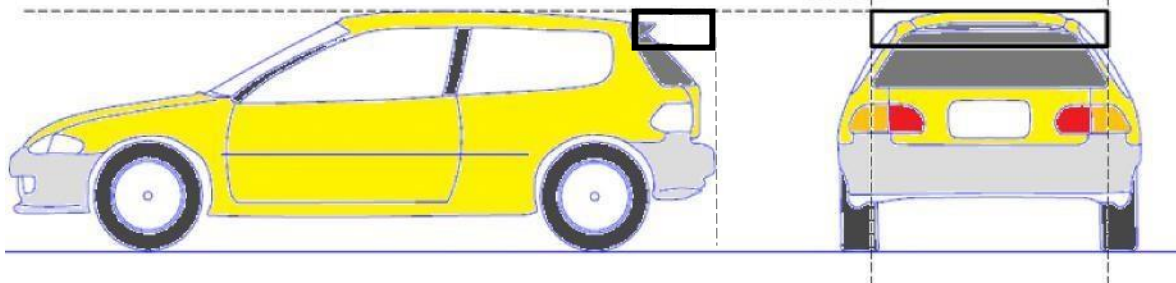
Any longitudinal cross section of the wing element, and any end plates, (but excluding mounting brackets) must be contained within a vertical square 225mm long by 225mm high at any point on its length (see diagram 4). The maximum difference in vertical height of the wing from its lowest point to its highest, including any end plates, is 225mm. The wing assembly must be attached rearwards of the rear window and shall not exceed the outline of the car when viewed from above (plan view) in any location.



Diagram 5: Plan View of Curved Rear Wing

- ii) IPC1 Vehicles (except Hatchbacks): Any longitudinal cross section of the wing element, and any end plates, (but excluding mounting brackets) must be contained within a vertical square 325mm long by 325mm high at any point on its length. The maximum difference in vertical height of the wing from its lowest point to its highest, including any end plates, is free. The wing assembly must be attached rearwards of the rear window assembly and is permitted to exceed the outline of the car when viewed from above (plan view) by no more than 50mm in any location.
  
- g) Hatchback vehicles: In the case of a hatchback, the wing must be attached to any part of the Hatch. The Hatch is defined as the part of the body/coachwork (or door) positioned at the rear of the vehicle which is hinged at the top and which lifts upward to provide access to the luggage and/or passenger compartment. The wing assembly may be above or below the rear window.
  
- ii) All vehicles except IPC1: Any longitudinal cross section of the wing element, and any end plates, (but excluding mounting brackets) must be contained within a vertical square 225mm long by 225mm high at any point on its length. (See diagram 5) The maximum difference in vertical height of the wing from its lowest point to its highest, including any end plates, is 225mm. No part of the wing may be higher than the highest part of the roof on a horizontal plane or wider than the widest part of the hatch assembly (see diagram 6). The wing assembly shall not exceed the outline of the car when viewed from above (plan view) in any location.

Diagram 6: Fitment of a rear wing to a hatchback (IPC2 and IPC3)

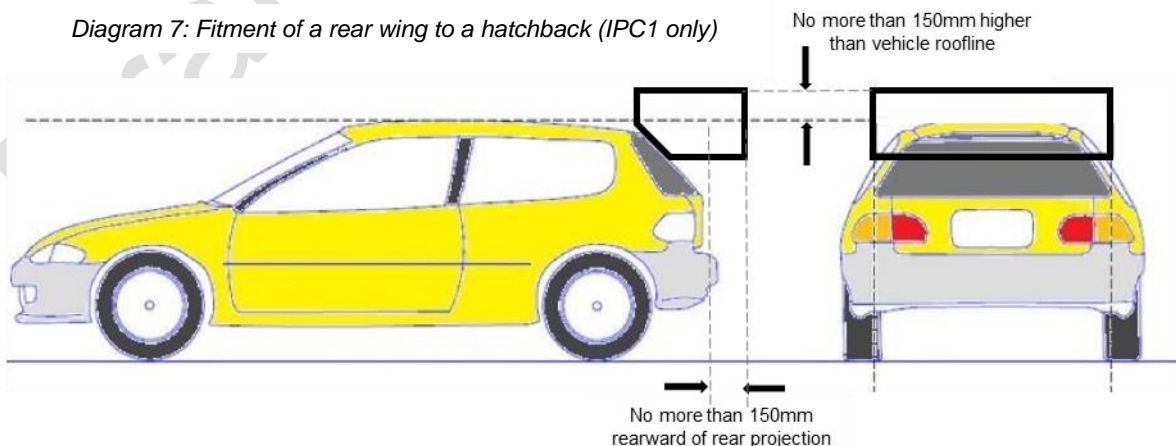


*Side elevation: No part of the wing should be higher than the highest part of the roof in a horizontal plane or extend rearward of the rear projection of the original coachwork.*

*Rear elevation: The wing shall be no wider than the widest part of the hatch assembly.*

- ii) IPC1 vehicles: Any longitudinal cross section of the wing element, and any end plates, (but excluding mounting brackets) must be contained within a vertical square 325mm long by 325mm high at any point on its length. The maximum difference in vertical height of the wing from its lowest point to its highest, including any end plates, is free. The width of the wing assembly may not exceed the widest part of the hatch. The wing assembly may protrude past the rear projection of the vehicle by no more than 150mm at any point. The wing assembly may exceed the height of the vehicle roofline by no more than 150mm at any point.

Diagram 7: Fitment of a rear wing to a hatchback (IPC1 only)



*Side elevation: No part of the wing shall be higher than the highest part of the roof in a horizontal plane, or extend rearward of the rear projection of the original coachwork by more than 150mm.*

*Rear elevation: The wing shall be no wider than the widest part of the hatch assembly.*



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### 2.14.4. OTHER AERO DEVICES:

It is permitted to fit any other aerodynamic device which complies with the following:

- a) It was supplied as standard with the particular model of vehicle as sold in New Zealand

OR it must comply with the following:

- b) No part of it extends more than 50mm from the original bodywork or allowable wheel arch extensions
- c) No part of it impinges on the minimum ground clearance requirement of 85mm
- d) Side skirts must not project more than 10mm forward of the rear edge of the front wheel arch, or 10mm rearward of the front edge of the rear wheel arch. The side skirts may not extend more than 50mm from the nearest original coachwork.

Draft for discussion





### 3. Race Format and Scoring

The series is designed to promote close racing within each Class, not necessarily between Classes.

The following Race Format is therefore designed with a view to separation of the Classes, competitor safety and practicality of managing the event.

#### 3.1.1. QUALIFYING

The round will begin with qualifying to determine the grid for Race 1.

#### 3.1.2. RACE 1

Competitors will line up on the grid in their Classes: IPC1 at the front, in order of qualifying, followed by IPC2 and then by IPC3, each in qualifying order.

Where practicable, one or preferably two blank rows will be left between Classes.

All Classes will commence the race simultaneously and race for 30 minutes.

#### 3.1.3. RACE 2

For Race 2, competitors will line up on the grid, once again in their respective Classes, however this time in order of the fastest lap from Race 1.

As with Race 1, one or preferably two blank rows will be left between Classes if possible.

All competitors will start the race simultaneously and race for 30 minutes.

#### 3.1.4. POINTS ALLOCATION

Points will be allocated within each Class as described earlier. There will still be an overall championship points tally covering all Classes, however the main focus of each competitor should be kept within their own Class. It should be noted that the championship position of any competitor will not be affected by racing another competitor from a different class. (That is to say the only way to earn points is to score well within your own class.)

Position within Class	Points
1	50
2	45
3	40
4	35
5	31
6	28
7	25
8	22
9	20
10	18
11	16
12	14
13	12
14	11
15	10
16	9
17	8
18	7
19	6
20	5
All positions after 20	5



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### 3.1.5. ENDURANCE RACES

From time to time, the organisers may elect to run an endurance race as part of the series. Any such races will still form part of the championship. Each endurance race will attract double points based on finishing position as per 3.1.4 above.

### 3.1.6. PENALTIES

Any competitor may be docked an appropriate number of championship points for breaches of the IPC regulations. HRC will be the arbiter of whether or not a breach has occurred, and the penalty applicable to any breach deemed severe enough to warrant it.

While the organisers have chosen not to publish a list of penalties here, as the underlying principle of the Series is fairness based on lap times, the following penalties shall be applied for breaking out of the minimum lap time for a given Class.

For clarity, an Offence as referred to below is a breach of the rule: “Each Class will have Break-Out times, which competitors must not exceed on two or more consecutive race laps, or more than three times in any Round.” A single break-out in isolation will not constitute an Offence.

On each occasion where a Break-Out offence occurs, the competitor will receive no points for that round.

The organisers would prefer that competitors take it upon themselves to operate within the Break-Out times for their class. In the event a competitor is breaching the Break-Out rule on a regular basis, the organisers shall have the option of requiring the competitor to carry ballast or promoting them to the next highest class.

### 3.1.7. BONUS POINTS

Each season, competitors will be eligible for a number of bonus championship points where ALL of the following conditions have been satisfied:

- a) The competitor has entered and participated in every round of racing for the season.
- b) The competitor has committed no more than ONE Break-Out offence
- c) No other penalties or sanctions have been applied by either HRC or MSNZ during the race season.

The number of bonus points awarded shall be equal to the competitor's points tally after the final race, divided by the number of race meetings held during the season. (ie the average number of points scored in a round throughout the season.)