



**CANADIAN AUTOMOBILE SPORT CLUBS
ONTARIO REGION**

2011

Appendix 'Q'
Section 'A'

Regulations and Specifications for Formula 1200 Cars



Appendix 'Q'

Regulations and Specifications for Car Classes

Section 'A': Formula 1200

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The Rules and Regulations set forth herein are designed to provide for the orderly conduct of racing Events and to establish minimum acceptable requirements for such Events. These Rules and Regulations shall govern the condition of all CASC Ontario Region RaceOntario Regional Championships Series Events and by participation in these Events, all Participants are deemed to have complied with these rules and regulations.

No expressed or implied warranty of safety shall result from publication of, or compliance with these rules and regulations. They are intended as a guide for the conduct of Competition and in no way a guaranty against injury or death to Participants, spectators, or others.

Italicized text indicates significant changes or amendments.

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ANY AMENDMENTS WILL BE PUBLISHED AFTER THIS DATE IN THE OFFICIAL CASC ONTARIO REGION BULLETIN.

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APPENDIX 'Q', SECTION A: FORMULA 1200

1.0 DEFINITION

- 1.0.1 Single-seat, open-wheel racing Cars based on standard Volkswagen 1200 series Type 1, U.S. model sedan (imported by VW) components.
- 1.0.2 Cars shall comply with the CASC-OR GCR and Race Regulations as well as the Regulations herein.
- 1.0.2 Formula 1200 is a restricted class. Only the modifications, changes, or additions stated herein are allowed. Homologation is required for all Cars registered after 1/1/83.
- 1.0.4 No component of the engine, power train, front suspension, or brakes shall be altered, modified, or changed, nor be of other than VW manufacture, unless specifically authorised.
- 1.0.5 Any external surface of the suspension, brakes, and transmission/rear axle may be painted, plated, or anodized.
- 1.0.6 Engine components shall be assembled in standard configuration. Exceeding the wear limits specified in the VW manual or other official VW guides is not prohibited provided that tolerances, dimensions, and specifications stated in the Regulations are met.

2.0 WEIGHT AND DIMENSIONS

2.0.1 *Minimum weight as qualified or raced, with Driver is 487.6 k (1074.974 lb)*

- 2.0.2 Wheel base, Minimum: 2.070 m
- 2.0.3 Wheel base, Maximum: 2.121 m
- 2.0.4 Track, Front: Standard VW 1.384 m (No spacers, shims or adapters)
- 2.0.5 Track, Rear: 1.336 m + 22.23 mm - 15.88 mm
- 2.0.6 Overall length (including exhaust), Minimum: 3.124 m
- 2.0.7 Overall length (including exhaust), Maximum: 3.226 m
- 2.0.8 Body depth at firewall, Minimum: 635 mm

3.0 SUSPENSION

- a) The front suspension and steering shall be standard VW Sedan as defined herein, or an exact replica of the same material and dimensionally identical. The following modifications are allowed:
 - i) Removal of one torsion bar;
 - ii) The use of any anti-sway bar(s), mounting hard-ware, and trailing arm locating spacers;
 - iii) The use of any shock absorber(s) which can be mounted directly on the standard mounts. Spring shocks are prohibited.

- iv) Relocation of the steering gearbox to any position utilizing an appropriate mounting structure and replacements of the tie rods;
- v) Steering column may be altered or replaced and any steering wheel may be used.
- vi) Use of any desired Pitman arm. Standard steering arms may be altered; however, no modification of the spindle is permitted.
- vii) Modification of the standard front torsion bar(s);
- viii) Front bump stops may be completely or partially removed, or may be bent. This modification shall not be used for any purpose other than routing brake lines.
- ix) Caster and toe in/out settings are unrestricted. Clearancing of carrier or trailing arm to eliminate binding is permitted. Offset suspension bushings are permitted.
- x) Front end ride height adjusters may be used provided they are not adjustable from the cockpit.
- xi) No structure, item or component (including battery) other than bodywork, shall protrude further than 254.00 mm from the lower axle beam tube. Any item protruding further than 203.20 mm must include a vertical safety plate. This plate must be constructed of no less than 1.53 mm 6061-T-6 aluminum or no less than 16 gauge steel. The plate shall have a minimum frontal surface area of 0.027 m², and shall have a height of not less than 101.60 mm and a width of not less than 152.40 mm. The plate may have no more than 12.70 mm curvature or deflection from the horizontal or vertical plane, and shall be attached to the chassis (frame) at all four corners. The lower braces shall not exceed a 15-degree upward angle when measured from the horizontal plane of the lower frame tubes.

If a vented lead acid battery is mounted in front of the axle beam, it shall be encased in a marine-type container.

It is recommended that the front cavity of the nose be filled with foam to aid in impact absorption.

- b) The rear axle assembly shall be standard VW sedan as defined herein with axle location provided by a single locating arm on each axle. The rear axle tube may be rotated about its axis. Coil spring(s) shall provide the primary springing medium, with telescopic shock absorber(s) mounted inside the spring(s).
Cables, straps, or other positive stops may be used to limit positive camber. An anti-roll bar or camber control device may also be used. When said anti-roll bar or camber control device is removed, the required coil springs shall continue to perform functionally.
- c) Wheels shall be steel, EITHER:
 - i) 330 mm by 140 mm or 152 mm, OR:
 - ii) 355 mm by 152 mm),

AND a minimum weight of 5.44 kg each.

Wheels may be balanced only by the use of standard automotive balance weights (adhesive or clip-on). Hub cap clips shall be removed. Wheel bolts may be replaced by studs of equal strength, permanently installed in the brake drum.

d) TIRE SPECIFICATIONS

***The following tires shall be used
Falken Azenis RT 615 (no suffix) or suffix K 95/60/R14***

4.0 BRAKES

- a) Brake drums, backing plates, and wheel cylinders shall be standard VW Sedan as defined herein, or an exact replica of the same material and dimensionally identical. Ribbed-type rear drums (part No. 113-501 615 D or F) may be used in place of the 1200 series rear brake drums.
- b) Cars shall be equipped with a dual braking system operated by a single control. In case of a leak or failure at any point in the system, effective braking power shall be maintained on at least two wheels. Any master cylinder(s) may be used.
- c) A separate hand brake (emergency brake) is not required. Removal of the hand brake and operating mechanism is permitted.

Two 15.87 mm dia. holes may be drilled in each backing plate to provide adjustment of brakes. These holes shall not be used for any other purpose.

5.0 ENGINE

The engine shall be a standard VW power plant, as normally fitted to VW sedans as defined herein. Any engine part(s), listed by the manufacturer (VW) as a current, superseding, replacement part for the standard VW 1200 series, Type 1, U.S. model sedan and interchangeable with the original part(s), may be used. Turbocharging is not permitted.

The engine/transmission shall be mounted in the chassis with the transmission to the rear.

5.1 PERMITTED REPLACEMENT PARTS

The following component parts may be replaced with that of other manufacture, provided said part is of the same material, is dimensionally identical, and meets all other tolerances and specifications stated in the Regulations:

- a) Engine Case
- b) Cylinder Heads
- c) Cylinders (an O-ring for centering is permitted).
- d) Pistons and wrist pins: minimum combined weight without clips or piston rings = 330 g
- e) Cam followers: minimum weight = 60 g
- f) Connecting rods with bolts and small end bushing: minimum weight = 425 g
- g) Oil pump -- exact replica of any standard VW oil pump
- h) Distributor
- i) Ignition points or drop-in ignition triggering module (e.g. Pertonix)
- k) Distributor cap
- l) Fuel pump: any standard type VW fuel pump which can be fitted without modification of any other part

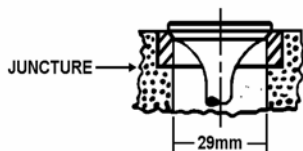
- m) Crankshaft: minimum weight 7.257 kg
- n) Crankshaft gear
- o) Flywheel

- p) Pressure plate or alternate SACHS 211 141 025 DAM pressure plate
- q) Clutch disc - 180mm nominal diameter only
- r) Throw out bearing
- s) Push rods
- t) Push rod tubes

5.2 PERMITTED MODIFICATIONS

- a) Removal of the carburettor air cleaner and choke mechanism. Choke shaft holes may be plugged. Plugs may not protrude into the choke bowl.
- b) Replacement of standard exhaust system with any exhaust system terminating 25.40 mm to 76.20 mm behind the rearmost part of the body.
- c) Lightening of the flywheel to a minimum of 5.44 kg
- d) Balancing of all moving parts of the engine, provided such balancing does not remove more material than is necessary to achieve the balance except on those component parts where weights are specified. The crankshaft may be ground and the case may be machined to accommodate the use of standard factory oversize/undersize crankshaft bearings, provided the crankshaft location is not changed.
- e) Polishing of the intake and exhaust ports provided such polishing does not enlarge the intake port beyond 29 mm inside diameter and the exhaust port beyond 33 mm inside diameter. The measurements are to be taken at the juncture of the seat insert and the aluminum port material, and at the manifold face.

Valve seat angles shall be machined as specified in the official VW Workshop Manual.



- f) Matching of manifold flanges is permitted.
- g) Complete or partial removal of any cooling duct component. Removal of the fan and the fan housing.

Fan belt origin is unrestricted. The use of a fan belt is optional.
- h) Fitting of any standard Solex 28 PCI or 28 PICT carburetor and any jets and emulsion tube may be used. Any venturi of standard VW/Solex dimensions may be fitted without alteration to the carburettor body. The venturi shall be fitted in the standard position, but its internal diameter may be machined. The carburettor may be rotated 180 degrees about its vertical axis. Modification of the float is allowed as long as no change is made to the float chamber and/or float valve.

- i) The carburettor shall remain untouched with the following exceptions:
 - i) No material shall be added.
 - ii) Bead blasting is permitted for cleaning only.
 - iii) The throttle shaft shall be a minimum of 4.70 mm with throttle plate installed. Machined sides shall remain flat and parallel with no chamfering or radiusing.
 - iv) The throttle plate shall be a minimum of 1.35mm, flat and parallel with no chamfering or radiusing. Diameter shall be a minimum of 27.81 mm
 - v) Carburettor top: The junction of the bowl and bore may be radiused. The bore beneath the radius shall be a maximum of 28.45mm. The accelerator pump boss shall remain original. The orifice in the base of the accelerator pump boss shall not allow #56 (1.17 mm) drill bit to pass through i.e. the maximum hole diameter shall be less than 1.17 mm)
 - vi) Carburettor body: Removal of mould flashing from cast surfaces, including the emulsion tube carrier (holder) is permitted, but no additional material may be removed. The emulsion tube carrier (holder) shall not be otherwise modified. Bore diameter from throttle shaft down shall not exceed 28.19 mm.
 - vii) Fitting of any standard VW distributor (not restricted to 1200 series). Use of any standard 6 or 12-volt non-transistorised ignition coil. Mounting location is unrestricted.

- j) The heat riser tube and heat sink shall be removed. Removal of metal from the interior of the intake manifold and rustproofing the interior is allowed provided that the following dimensions are not exceeded:

Down Tube: The down tube shall be measured at two different locations within an area between 12.70 mm and 50.80 mm above the horizontal manifold tube. Each measurement shall be taken four times rotating around the circumference of the tube and averaged. Averaged down tube dimension shall not exceed 28.95 mm OD.

Horizontal Tube: The horizontal tube shall be measured at four different locations on each side of the down tube. The area to be measured on each side of the down tube is defined as being between the bend and a point that is 38.10 mm from the centre of the down tube connection. Each measurement shall be taken four times, rotating around the circumference of the tube, and averaged. Averaged horizontal tube dimension shall not exceed 25.25 mm OD.

These dimensions shall be an average of at least four measurements at equal intervals around the tube at any point.

The manifold shall not weigh less than 680 g.

All exterior surfaces shall be in original condition and unpainted but may have a thin transparent coat of rust proofing material.

The minimum distance between bends of horizontal tube is limited to 45.0 cm (17.75")

At no point in the bends of the horizontal tube should the average O.D. exceed 26.15 mm (1.029"). Measurements shall be taken four (4) times rotating around the circumference of the tube and averaged.

The maximum overall height of the intake manifold is 22.86 cm (9.00"). Measurement is to be taken from the cylinder head seating surface to the top centre of the carburetor mating flange.

Deviation from straight of the horizontal tube between the bends (45.0 cm) may not exceed 6.35 mm (0.250") in any direction.

A 3" scale centred on the bottom of the horizontal tube opposite the down tube should not show a deviation greater than 26.20 mm (0.090") in the bottom of the tube.

- k) Removal of the generator. Voltage regulator may be removed.
- l) The installation of baffles housed completely within the original oil sump and crankcase.
- m) The use of oil temperature indicating device in the crankcase.
- n) The use of any standard VW oil pump is permitted. The oil pump cover may be modified or replaced.
- o) The use of valve spring shims.
- p) The following are the standard VW dimensions and tolerances of engine components:
Maximum bore: 77.21 mm
Stroke: 64.00 mm +/- 0.13 mm
Minimum capacity of combustion chamber in head: 43.0cc
(Polishing and/or tooling are prohibited.)
Minimum depth, top of cylinder barrel to top of piston: 1.00 mm.

The above dimensions may be achieved by machining any previously machined surface, provided that the total surface is machined on the same plane as the previously machined surface. The above dimensions shall be the average of all four cylinders.
- q) The use of any VW clutch of the same diameter as fitted to standard VW sedan as defined herein. The standard clutch operating arm may be modified to allow its attachment in any appropriate position.
- r) An oil sump extension may be fitted utilising the oil strainer cover plate, provided the extension does not extend horizontally beyond the edge of the oil strainer cover plate and the capacity does not exceed 250.00 cc. The oil pump pickup pipe may be extended into the sump extension. Accumulators (Accusump) may be fitted.
- s) Replacement of oil galley plugs with threaded plugs.
- t) The following are the VW standard valve dimensions:
Exhaust valve diameter: 28.00 mm or 30.00 mm
Intake valve diameter: 30.00 mm or 31.50 mm
Reprofiling of valves is not permitted.

- u) The crankcase may be machined to permit the use of standard VW camshaft bearing inserts, provided that camshaft location is not changed. The use of the two-relief valve crankcase, part No. 111-110-025E, is permitted.
- v) Where minimum weights are specified, any lightening is permissible provided the original part complied with the dimensional restrictions set forth.
- w) A VW "D" camshaft, Part Numbers 113-109-015D, 113-109-017D, 113-109-019D, 113-109-021D, 113-109- 023D, 113-109-025D, 113-109-027D, or an exact replica of the same material and dimensionally identical shall be used. The maximum lift at the valve spring collar with zero valve clearance is:
 - i) Intake 9.00mm + 0.00mm
 - ii) Exhaust 8.55mm + 0.00mm

The camshaft profile shall match exactly those which are specified by the official CASC-OR camshaft plots, plus or minus **0.05 mm**. It is permitted to grind the camshaft to duplicate (but not exceed) the official CASC-OR profile. In so doing, the relationship between the centerlines of peak lift at the exhaust/intake lobes shall remain at 214 degrees 15 minutes, plus or minus one (1) degree. (Reference the Official CASC-OR Camshaft Checking Procedure). The camshaft timing may also be changed in its relationship to the crankshaft by utilising an adjustable cam gear that retains the existing helical gear thrust angle and that is statically adjustable only (e.g., no dynamic adjustment mechanisms that respond to engine speed changes). Camshaft timing is unrestricted within the restrictions provided under 5.1 or as authorised above. The camshaft profile shall be checked using the official procedure published by CASC-OR.

Installation of a spark plug hole repair utilising standard thread repair methods, such as Helicoil, and providing that the spark plug centerline is not changed.

- y) A single standard automotive oil filter of not more than 946cc total capacity and a suitable mounting bracket and bypass valve may be installed.

Modification to the lubrication system to facilitate installation of the oil filter is permitted. All components shall be contained within the body to the rear of the firewall.
- z) Alternate exhaust valves are allowed provided the dimensions and materials are the same as standard (VW) exhaust valves.
- aa) Any oil cooler is allowed. Oil coolers shall be mounted completely inside a plumb line extending downward from the outermost edge of the bodywork.
- bb) An alternate oil pressure regulator spring and/or shims may be used.
- cc) Rocker arm wave type spacer washers may be replaced by solid steel type flat washers of suitable thickness.
- dd) Rocker arms may be lightened to a minimum weight of 80.0 grams. VW parts shall be used, from 1200, 1300, 1500, or 1600 Type 1 engines; 1:1 or 1.1:1 ratios only.
- ee) Valve springs are unrestricted providing:
 - i) No more than one spring shall be used per valve.

- ii) The standard spring cap and retainers shall be used.
- iii) Spring shall be made of steel.
- ff) Bolt on valve covers may be fitted.
- gg) Crankshaft pulley is unrestricted and may be fitted with an oil seal. The engine case may be machined to facilitate the installation of an oil seal.
- hh) Rocker arm shafts may be modified or replaced by those of other manufacture, including shafts that replace the stock clips with a solid centre spacer and bolt on end caps/washers.
- ii) The rocker arm shaft assembly may be shimmed out on the cylinder head mounting studs by placing appropriate shims between the cylinder head mounting boss and the blocks on the rocker arm shaft assembly.

6.0 TRANSMISSION AND REAR AXLE

The transmission-rear axle assembly shall be standard VW sedan, as defined herein. The synchromesh components shall be in place and operating on at least three gears.

Reverse gear shall be operable from the Driver's seat.

6.1 PERMITTED MODIFICATIONS

6.1.1 Installation of any standard VW gear set which can be fitted without modification of any component of the transmission or of the gear set itself and the transposing of the ring gear to provide proper axle rotation.

a) Fully synchromeshed transmission:

Gear	Part No.	No. of Teeth	Ratio
1st	113 311 251A	10:38	3.80
2nd	113 311 261	17:35	2.06
3rd	113 311 275	22:29	1.32
	113 331 275B	23:29	1.26
	113 331 275A	23:28	1.22
4th	211 311 341	28:23	0.82
	113 311 341	27:24	0.89
Ring &	211 517 143A	8:35	4.375
Pinion	311 517 143B	8:33	4.125

Partly synchromeshed transmission:

Gear	Part No.	No. of Teeth	Ratio
1st	113 309 251	10:36	3.60
2nd	113 309 261A	17:33	1.94
	113 309 261	17:32	1.88
3rd	113 309 275	23:28	1.22
	113 309 275A	22:27	1.23
4th	113 309 341A	28:23	0.82
Ring &	113 517 141B	7:31	4.43
Pinion			

- b) There are different part numbers for various gears in addition to the ones listed here. This in general indicates changes on the parts such as:

Gear	Part No.	Ratio	Difference
4th	113 311 341	0.82	with Key Way
	113 311 341A	0.82	with Splines
Ring &	113 517 143	4.125	6 mgt. bolts
Pinion	311 517 143	4.124	8 mgt. bolts

However, there are no standard ratios other than the ones listed here. A gear removed from a transmission can be identified by the number of teeth.

6.1.2 Alteration of the shock absorber mounts.

6.1.3 Transmission shall not be installed in an inverted position.

6.1.4 The differential cannot be modified in any way to limit its normal function. Torque biasing, limited slip, and locked differentials are prohibited.

7.0 BALLASTING

Ballasting is permitted, per Appendix "P", hereto.

8.0 FRAME

8.1 CONSTRUCTION

8.1.1 The frame/chassis shall be constructed of steel tubing of a maximum diameter or width of 4in and be of a safe and suitable design. The Driver's feet shall not extend beyond the rear of the front axle beam tubes.

8.1.2 There shall not be frame/chassis rigidity or strength derived by means other than the frame tubes. Stressed skin, monocoque, or semi-monocoque construction is not permitted, except that:

- a) The firewall panel may be rigidly attached to the frame tubes. The undertray/belly pan from the nose to the rear roll hoop shall be no wider than the bodywork at the bottom of the frame rail or no more than 6.35 mm wider (on each side) than the frame rail when the undertray has an upward turned edge that facilitates mounting the undertray to the chassis or that facilitates mounting the body to the chassis. Engine bay undertray(s) shall be no wider than the frame rails in this area or no more than 6.35 mm wider (on each side) than the frame rail when the undertray has an upward turned edge that facilitates mounting the undertray to the chassis or that facilitates mounting the body to the chassis. The undertray(s) between the axle centre lines shall be rigidly attached to the frame provided the curvature of said tray(s), measured vertically from the lowest point to the highest point at their attachment to the frame rail members at the sides, shall not exceed 1in and have no downward turned edges.
- b) Transmission undertrays for Cars with a rear subframe shall be no wider than the subframe, or no more than 6.35 mm wider (on each side) than the subframe when the undertray has an upward turned edge that facilitates mounting the undertray to the subframe or that facilitates mounting the body to the subframe, or 406.40 mm whichever is wider. For Cars without a subframe, the tray shall be no wider than 406.40 mm and both shall be firmly attached.

- c) The area between the upper and lower main frame tubes, or for 355.60 mm above the floor pan, whichever is greater, and between the front and rear roll hoop bulkheads shall be protected by one of the following methods to prevent the intrusion of objects into the cockpit.
- i) Panel(s) of a minimum of either 1.52 mm heat-treated aluminum (6061 T6 or equivalent) or 18-gauge steel shall be attached outside the main frame tubes.
 - ii) A reinforced body of a double layer, 5oz bi-directional, laminated Kevlar material incorporated into the body shall be securely fastened to the frame tubes.

For either method, fasteners shall be no closer than an average of 152.40 mm centres (no stress bearing panels). The material used for the chassis braces in this area shall be at least equivalent to the roll hoop brace material.

9.0 BODY

The chart (figure) illustrates both the intended minimum frontal area and Car configuration.

The rear bodywork shall enclose the engine by surrounding it from a point no higher than the lower edge of the intake manifold and extending from the front of the engine to its rear on each side. The top of the rear bodywork shall extend from the back of the firewall to a point at least 406.40 mm to the rear of the centerline of the rear axle. Any bodywork forward of the centre of the torsion bar tubes shall have a maximum width of 806.45 mm.

No part of the frame or bodywork shall project beyond a plane connecting the vertical centreline of the front and rear tires. Fuel filler necks, caps, or lids shall not protrude beyond the bodywork of the Car. The Driver's seat shall be capable of being entered without the removal or manipulation of any part of panel. Wings (airfoils) are prohibited. Floor and safety equipment shall conform to the Regulations.

A firewall to prevent passage of flame and debris between the engine area and Driver's compartment shall extend the full width of the cockpit and be at least equal to the top of the carburettor in vertical height. Forward facing air ducts may be installed for the purpose of delivering cooling air directly to the engine, cylinder heads, oil cooler, and/or carburettor, provided the ducted air makes a 90 degree bend within the bodywork. Air duct openings may be located within the cockpit area, and/or penetrate the firewall, provided the duct is baffled or the firewall is extended to prevent flame and debris from reaching the Driver. Any shape may be used to form firewall extension. Any other firewall inlet shall also prohibit passage of flame and debris. (Recommend: that ALL of this extension be the same width as the firewall, allowing for bodywork contour limitations, and extend in a horizontal plane back 50.80 mm, minimum, past the carburettor body.)

The bottom of any bodywork that extends beyond the frame members shall be on the same flat plane as the undertray (ref. 5.8) and shall not deviate from that flat plane by more than 25.40 mm. Effective for any newly registered Cars after 1/1/83.

Air ducting may be attached to the carburettor and/or the engine.

The rear locating arm(s), coil spring(s), and shock absorber(s) shall not be faired in and shall be visible from the side without removal or manipulation of any part or panel. Specifically, the front mounting point of the radius pad may be inside the trailing edge of the side body panel so long as the panel does not extend over the locating arm itself.

The front suspension upright(s) (shock absorber mounts), shock absorbers, and/or trailing arms shall not be faired in by covering or shrouding away from the airstream except that the front shocks may be mounted behind the shock uprights.

Wings (airfoils) are prohibited.

10.0 NON-STANDARD REPLACEMENT PARTS

10.1 AUTHORIZED NON-STANDARD REPLACEMENT PARTS

10.1.1 The use of the following non-standard replacement parts is permitted provided that no unauthorized modification of any other component results:

- a) Fasteners (nuts, bolts, screws, etc.)
- b) Wiring
- c) Gaskets and seals
- d) Brake lines and fuel line
- e) Spark plugs (maximum 12.70 mm reach)
- f) Piston rings
- g) Wheel bearings
- h) Connecting rod bearings and crankshaft main bearings of same type and size as standard VW
- i) Brake shoes and brake lining
- j) Valve guides
- k) Ignition points or drop-in ignition triggering module.

11.0 ELECTRICAL

11.0.1 The use of any single 6 or 12 volt battery is permitted to power the starter and engine ignition system. Any secondary batteries connected only to gauges and communications or data acquisition equipment are allowed.

11.0.2 The use of any starter is permitted provided it can be fitted without any modification to the engine/transmission.

12.0 FORMULA 1200 FRONT VIEW

