

# **FORMULA FIRST**

First Draft

**December 31, 2001**

**Competition Rules**

(Adaptation from Australian Formula First Rules)

**Part 1:** Definition

**Part 2:** General requirements

**Part 3:** Weights and measurements

## **PART 1: DEFINITION (GROUP)**

- 1.1 Formula First is an entry-level open wheel category using production car components in a single seat, steel space frame. It is intended for the rules to emphasis driver ability and to encourage the participation owner/ builder/ preparer.
- 1.2 The current class of Formula First is based on an evolution of Formula Vee using any VW type 1 componentry as permitted within these regulations. Cars log booked as Formula Vee are permitted to race in this class with the option of updating, in part or fully, to Formula First regulations. It should be noted that compliance with these regulations dose not entitle a car to be entered as a Formula Vee.
- 1.3 No component of the engine, gearbox, front end, or brakes may be altered unless stated within these rules. The term standard shall mean to be of VW tolerance. Any VW Type 1 componentry, both genuine and aftermarket, may be used unless specifically specified herein by a certain part number or manufacture that must be used.

## **PART 2: GENERAL REQUIREMENTS (GROUP)**

### **2.1 FRAME: (BONOW)**

- The frame must be of tubular steel (max. 4" cross section) construction.
- The use of side impact protection per SCCA GCR

### **2.2 BODY (BONOW)**

- The body must be constructed of fiberglass, Kevlar and or sheet metal/aluminum. Carbon Fiber is not allowed.
- The body must not be rigidly attached to form part of the structural integrity of the car.
- The body dimensions must comply with measurements given in part 3
- Fan shroud silhouette rule still applies.

### **2.3 SUSPENSION AND STEERING. (BONOW)**

- The use of any standard VW Type 1 H beam front-end suspension is permitted.
- The following deviations from standard of the front suspension are permitted:
  - Removal of one complete set of torsion bar leaves and one or more leaves from the second torsion bar.
  - Installation of an internal sway bar and spacers.
  - Removal of the shock towers above the upper H beam tube.
  - Removal of the standard external anti-sway bar and any brackets
  - The installation of a ride height adjuster(s) to the H beam to rotate the spring pack is permitted. (No cockpit adjustment device of ride height is permitted).
  - The removal of the backing plates from the stub axles (spindles).
  - Redrilling of the stub axle (spindle) steering arm tie rod mounting holes.
  - Replacement of all torsion bar rubbers with spacers of another material.
  - Relocation of the shock absorber is permitted. Shock absorbers are free. Actuation mechanism for the shock absorber is free.
  - Welding of lugs and the drilling of holes for the purpose of locating the H beam to the chassis is permitted.
  - Brackets may be attached to the H beam tubes.
  - Front suspension ride height shall be achieved by the combination of torsion bars and the ride height adjuster(s).

#### **Steering:**

- Steering mechanism is free but must attach to the steering arm on the stub axle.
- The use of any standard VW Type 1 swing axle rear suspension is permitted.

#### **Rear Suspension:**

- Each axle shall be restrained in a longitudinal direction by a single pivot point. Axle tubes may be rotate to facilitate fitment.
- The standard shock mounting point may be removed and any mounting holes redrilled.
- Shock absorber/s, spring/s and actuation mechanism are free.
- Camber control devices are free.
- Brackets may be attached to the axle tubes.
- Brake pipe brackets may be removed from the rear axle tube.

## **2.4 BRAKES. (BONOW)**

- The use of standard VW Type 1/3 brake componentry is permitted.
- The use of any standard VW Type 1/3 caliper on front and rear axles is permitted.
- The removal of rear brake drum units and replacement with VW/Porsche 914 style rear disc rotor is permitted. Flanges for mounting of the rear disc rotor may be VW Type 3 flanges or machined from VW Type 1, (4) lug drums. Rear brake rotors with machined in axle splines are permitted.
- The fitment of an adapter plate to mount front and rear brake calipers is permitted.
- Cross drilling or grooving of rotors is not permitted.
- Brake pads and shoes are free.
- All brake componentry must remain within the safety tolerances set by the component manufacture.

## **2.5 WHEELS AND TIRES. (BONOW)**

- Wheels shall be of 13" diameter and constructed of any metallic material.
- A maximum of (6" or 7") width only.
- Minimum weight of wheel is 10 (6") or 12 (7") lbs.
- Spacers between rims and hubs are not permitted.
- Tires to be determined after a shitload of testing.

## **2.7 ENGINE. (SCHINGS)**

- The engine shall be standard VW 1600cc twin port, as in rule 1.4 unless stated otherwise in the following rules.
- Standard engine reconditioning practices are permissible as listed below. Such machining shall occur on the same plane as original VW specification. It is not permissible to add any metal or other material to any engine component.
- Balancing of the following parts is permitted. Pistons, Conn. Rods, Crankshaft, Flywheel, Front Pulley and Clutch.
- Flywheel (180 mm or 200 mm) may be lightened to a minimum of 12 lbs.
- Polishing of moving parts contact faces is permitted
- The use of any VW 1200 cc to 1600 cc crankcase is permitted.
- Drilling of the case to accept external oil cooler/ filter is permitted.
- Standard reconditioning of the case halves permitted.
- Grinding of crankshaft to accept standard VW undersize bearings permitted.
- Reconditioning of flywheel dowels permitted.
- Machining of the flywheel clutch plate surfaces is permitted.
- Camshaft to be nominated by FFC.
- Cam timing may be achieved by offset keys or adjustable cam gear.
- Reconditioning of the cam followers is permitted.

## **2.7 ENGINE (Continued) (SCHINGS)**

- Pistons and barrels shall be standard VW replacement.
- The standard 040 twin port cylinder head only permitted.
- The ports are to remain "as cast" in condition.
- Replacement of valve seats is permitted.
- Replacement or reconditioning of valve guides is permitted.
- Valve springs are free providing that single springs are to be used require no unauthorized modification to other parts.
- Combustion chambers to remain standard as cast condition. Fly cutting of the head to obtain desired compression ratio is permitted.
- Maximum compression ratio shall be 8.3: 1
- Shimming of valve springs is permitted
- The use of any aluminum pushrod is permitted, length is free.
- Removal of metal from rockers to provide clearance is permitted.
- The uses of swivel feet valves adjustment screws are permitted.
- Shimming of the rocker post is permitted.
- The use of the 1600 type standard rockers only to be permitted. (The 2 bars need to be visible), wave washers may be replaced with spacers.
- Oil system blue printing permitted. No dry sumping permitted.
- Any VW Type 1 oil pump may be used.
- The use of a sump extension is permitted.
- Engine dimensions must conform to the rules in section 3

## **2.7 ENGINE ANCILLARIES. (SCHINGS)**

The Solex 34 PCIT/3 carburetor (details under development)

### **2.7.1 INLET MANIFOLD. (SCHINGS)**

- The inlet manifold must be standard VW Type 1 1600 twin port unless stated otherwise in the following rules.
- The heat sink casting may be removed or modified.
- The standard 1600 manifold end castings must be untouched other than for the purpose of match porting.
- Match porting to a depth of .25" in the manifold casting at the manifold/head joining face is permitted.

### **2.7.2 EXHAUST. (SCHINGS)**

- The exhaust is free, but must comply with the SCCA noise requirements

### **2.7.3 COOLING SYSTEM (SCHINGS)**

- The air-cooling system for engine cylinders and heads is free.
- Oil cooler, hose sizes (details under development)

### 2.7.4 IGNITION. (SCHINGS)

- The distributor must be standard VW mechanical advance, or Bosch 009, with the following modification permitted.
- The advance curve may be adjusted
- One set of points only may be used.
- Transistorized ignition is not permitted.

### 2.8 TRANSMISSION. (LYBARGER)

- The standard VW Type 1 transmission must be used unless stated otherwise in the following rules.
- For cars using the 1600cc engine only the ratios listed in part 3 are permitted.
- The crown wheel must be transposed in the transmission case.

## Part 3: (GROUP)

### 3.1 WEIGHTS AND DIMENSIONS. (GROUP)

- Racing weight. 1600 cc cars 1100 lbs min.
- Wheel base 81.5" to 85.5"
- Front overall width at wheels 61.8" + or - .25"
- Rear overall width at wheels 63.4" + or - .25"
- Overall length (max) 130"

### 3.2 ENGINE DIMENSIONS (SCHINGS)

- Crankshaft stroke max. 69.1
- Cylinder bore max. 85.7mm
- Intake port dimensions of head max. 31mm
- Exhaust port dimension of head. max. 32mm
- Inlet valves max. 35.5 mm
- Exhaust valves max. 30 mm
- Inlet manifold horizontal inside diameter max. 32.0mm
- Manifold casting diameter at flange max. 31.0mm
- Maximum lift of valve 9.8mm
- Max. Lift at 45 after peak lift 3.27mm
- Max. Lift at 45 before peak lift 3.22mm
- Gear box ratios- (Lybarger)
  - 1<sup>st</sup> - 3.80
  - 2<sup>nd</sup> - 2.06
  - 3<sup>rd</sup> - 1.26
  - 4<sup>th</sup> - 0.89 (or 0.82)
  - Diff. - 4.125