

FORMULA VEE

The following is the Australian version of "Formula Vee" as adopted by the Committee of the Formula Vee Association of Australia, and recognised and approved by CAMS.

Vehicles shall conform with the General Requirements of Automobiles as laid down by the CAMS, and the Rules and regulations of the Formula Vee Association of Australia.

The Formula Vee Association of Australia was formed in April, 1969 and comprises the Formula Vee Associations of New South Wales, South Australia, Tasmania, Victoria and Queensland, and is recognised by Volkswagen Australia Pty Ltd and by CAMS.

Should an Association suspend or expel a member, an appeal to CAMS shall have the effect of setting aside such suspension or expulsion until such time as the Appeal is resolved.

No national championship may be held for this Formula.

Any driver wishing to compete in events for Formula Vee must be a member of the Formula Vee Association in the State in which that driver's CAMS licence is issued, and must abide by the rules and regulations of the Formula Vee Association of Australia.

Enquiries regarding interpretations of, and activities relating to, Formula Vee should be directed to Mr John Parmiter, 16 McKay Avenue, Northfield, South Australia, 5085; Phone 08-297 9666 Bus.; 08-262 6655 A.H.

The Formula Vee Association of Australia reserves the right to nominate the brand of racing tyres used, but the safety requirements of CAMS regarding tyres must be adhered to.

The officers of each Formula Vee State Association derive the power, in conjunction with the CAMS, to police Formula Vee regulations.

Breaches of rules requiring penal action will be referred by State officers to the CAMS for action within the CAMS judicial procedures.

It is required that all cars be fitted with approved seals in accordance with the F.V.A.A. sealing procedures.

1. DEFINITION:

A formula for single seat, open wheel racing cars based on Volkswagen 1200 Series Australian Type I sedan components from those vehicles marketed and manufactured in Australia prior to 1967, and restrictive in specifications so as to emphasise driver ability rather than design and preparation of the car.

No component of the power train, front suspension or brakes may be altered, modified, or changed, nor be of other than Volkswagen manufacture, unless specifically authorised in these regulations.

The use of serviceable used parts is recommended but is not mandatory.

2. WEIGHTS AND DIMENSIONS:

Minimum weight—375 kg.

Wheelbase, minimum—2070 mm; maximum—2120 mm.

Track, front, standard VW—1305 mm \pm 10 mm.

rear, standard VW (to be measured at zero camber)—1288 mm \pm 12 mm.

Overall body length—to be measured horizontally from the forward most part of the body, to a vertical plane passing through the rear most point of the gear selector housing, minimum—3125 mm; maximum—3226 mm.

Body depth at the firewall, minimum—635 mm.

Body width at the firewall, minimum—860 mm.

The body width shall be achieved by measuring in a horizontal plane from one outside surface to the opposite outside surface of the main body profile at its widest point in line with the firewall. This rule shall not make ineligible any vehicle issued with a CAMS log book prior to 1st January 1983.

Ballast may be used to achieve minimum weight requirements and if used shall comply with CAMS requirements and shall not exceed 5 kg in weight.

3. FRAME:

1. The frame must be of mild steel tube construction and be of such design as to present no hazard to either the driver or other competitors.

4. BODY:

1. The body may be constructed of either glass fibre, sheet metal, or similar material.
2. A substantial proportion of the frame, forward of the firewall shall be enclosed by the body panels (floor pan excepted).
3. The top of the bodywork rear of the firewall must extend to a point in line with a vertical plane passing through the rear most point of the gear selector housing and may have air intake openings.
4. The driver's seat must be capable of being entered without the removal or manipulation of any component.
5. Air ducting may be used provided it is attached to the body or frame of the car. Ducting may not be made part of or attached in any way to the engine assembly.
6. Under no circumstances may any part of the coachwork be less than 4 cm above the ground, the car being in normal trim with the driver on board.
7. It is desirable that the bodywork enhance the appearance of the vehicle.

5. SUSPENSION:

1. Front—The front suspension and steering shall be standard Volkswagen as defined in Section One. The following modifications are allowed:
 - (a) Removal of one complete torsion bar, to allow installation of anti sway bar/s. It is allowed to remove one or more leaves from the remaining torsion bar. Removal of the rebound rubbers is allowed. Replacement of two torsion bar sealing rubbers with metal spacers of similar dimensions is permitted. The ride height shall be achieved solely by the standard Volkswagen torsion bars as defined.
 - (b) Relocation of the steering box, and replacement of the tie rods with others of a suitable length, and the use of any tie rod end is allowed.
 - (c) Any steering column and steering wheel may be used.
 - (d) The standard steering arms and pitman arm may be realigned and the tie rod end holes may be redrilled, but modification to the stub axle is not permitted.
 - (e) The use of type 3 steering box or pitman arm is permitted.
 - (f) External anti sway bar components may be removed.
 - (g) The steering damper bracket may be removed.
 - (h) The redrilling of the shock absorber mounting holes is permitted.
 - (i) the welding of "lugs" for the sole purpose of locating the front suspension tubes relative to the chassis frame, or locating the steering box to the front suspension tubes is allowed.

.2 Rear—

- (a) The rear axle assembly shall be standard Volkswagen as defined in Section One and each axle shall be restrained in the longitudinal direction by a single member having a single pivot point on the chassis. This point may be located forward of or behind the axle. Axle tubes and brake assemblies may be rotated as desired.
- (b) Lower shock absorber mountings, and spring plate mounting holes in the rear axle bearing housing may be redrilled.
- (c) Telescopic shock absorbers shall be used, and any springing medium may be employed.
- (d) Cables, straps and/or positive stops may be used to limit positive camber.
Any anti-sway bars and/or camber control device may also be used.
- (e) Brackets may be attached to the rear axle housing tubes.
- (f) Brake pipe brackets may be removed from the rear axle tubes.

6. BRAKES:

- .1 Brake drums, backing plates and wheel cylinders shall be standard Volkswagen as defined in Section One.
- .2 Any lining may be used on the brake shoes and may be bonded to the shoes.
- .3 Cars shall be equipped with a double circuit braking system so arranged that the pedal normally operates on the four road wheels, and in the event of leakage at any point in the braking system, the pedal shall still control the braking of two wheels on the same axle.
- .4 Any master cylinders may be used.
- .5 A separate hand brake (emergency brake) is not required, and all hand brake components may be removed.
- .6 the fitting of any VW 1300 5 stud sedan brake drums as replacement for the original 1200 drum is permitted, but brake shoes must comply with the requirements of Section One of these regulations.

7. WHEELS:

- .1 Wheels shall be the standard 15 x 4J five stud wheel as fitted to Volkswagen 1200 Series I sedans as defined in Section One.
Volkswagen Australian part numbers for these wheels are:
 - a. 111-601-025C
 - b. 12A-601-005
 - c. 111-601-025E
- .2 Hub cap retaining clips and rivets must be removed.

8. ENGINE:

- .1 The engine shall be a standard Volkswagen automotive power plant, as normally fitted to Volkswagen sedans as defined in Section One, and coupled with the transmission may be rotated 180 degree as a whole unit.
Volkswagen universal crankcase part no. 111-101-025e may be used.
 - (a) Crankcase halves may be faced and line bored.
 - (b) Camshaft tunnels may be modified to accept standard VW camshaft BEARINGS.
 - (c) The crankcase may be drilled and tapped to accept a temperature gauge sender unit.
 - (d) The reconditioning of all studs threads is permitted.
 - (e) The installation of baffles housed completely within the original oil sump and crankcase is permitted.

- (f) Modification to the oil filler baffle plate located within the crankcase at the base of the generator tower is permitted.
- (g) The use of any standard Volkswagen oil pump is permitted. The installation of 1500 Volkswagen type 1 oil pick up pipe, and the enlarging of the inlet oil gallery to suit the 1500 pick up, are permitted.
The removal of the original oil cooler, and the fitting of an external oil cooler is permitted. An orifice measuring not more than 75 mm x 30 mm may be cut in the faces of the fan housing to facilitate the passage of oil lines from the original cooler orifices in the crankcase to the external cooler.
The fitting of an external oil filter is permitted.
Modification of the engine case and oil pump to facilitate the fitting is permitted. If fitting at the oil pump is desired, an accessory oil pump cover plate incorporating an outlet fitting may be used.
- (h) Crankshaft bearing journals may be reground.
Grooving of the crankshaft bearing journals is not permitted.
- (i) Drilling the crankshaft to flywheel face on the crankshaft and/or flywheel is permitted.
- (j) Heat treatment of the crank or cam shafts and cam followers is permitted.
- (k) Connecting rod big ends may be resized and gudgeon bushes may be replaced.
- (l) Flywheel to clutch faces may be reconditioned.
- (m) The flywheel may be lightened to a minimum weight of 5.4 kg.
- (n) Cam followers may be machined at the cam lobe contact face only.
Only camshafts bearing the cast in Volkswagen part numbers 113-109-101B 040-109-101-1 113-109-101C shall be allowed.
The camshaft shall comply with the following specifications:
Dimensions—
Base Circle Diameter 31.2 mm \pm 0.1 mm
Base Circle to Lobe Crown 38.8 mm + 0.4mm - 0.8 mm.
Timing—
Inlet open 4° to 7½° B.T.D.C.
Inlet close 32° to 37° A.B.D.C.
Exhaust open 41° to 44½° B.B.D.C.
Exhaust close 1° to 4° A.T.D.C.
- (o) No modifications or reconditioning whatsoever are to be made to the camshaft. (Heat treating excepted).
Only camshaft/crankshaft timing according to Volkswagen standard specifications is allowed.
- (p) Balancing of moving parts of the engine is permitted. Polishing of moving parts is not permitted, other than working surfaces (i.e. bearing journals, cam followers, contact faces).
- (q) In any set of components one component must be completely untouched, e.g. 4 pistons being balanced 1 piston must be untouched original.
In the case of connecting rods, however, one half of one conrod encompassing one end of 1 rod must remain untouched.
- (r) Any metal removed from the piston must be from the inside surface of the piston (i.e. gudgeon pin boss, inner skirt).
- (s) The top piston ring shall be a one piece type ring.
- (t) The fitting of an extension to the sump is permitted. The capacity of such extension shall not exceed 500 ml. It must be attached without any modification to the crank case. The oil pick-up pipe may be extended into the extension.

.2 Cylinder Head—

- (a) Polishing and porting of the intake and exhaust ports are permitted provided such porting and polishing do not enlarge the exhaust port beyond 33 mm inside diameter at the flange face, and the intake port not beyond 29 mm inside diameter at the flange face. The removal only of metal is permitted.
- (b) The steel inserts are part of the ports and, as such, may be ported.
- (c) Machining of the cylinder head at the barrel spigot contact face is allowed to achieve 43 cc combustion chamber volume.
The cylinder barrel spigot face may not be below the machined head face and the adjacent cylinder head cooling fin may be machined to gain clearance where necessary.
- (d) Valves shall remain standard; no profiling whatever shall be permitted.
The standard 45° seat angle must be used and a tolerance of $\pm 1.5^\circ$ is allowed.
Throat and cap cuts on the insert is permitted but these cuts must be confined to the steel insert.
- (e) Valve guides may not be flushed off or modified in any way and must be positioned in the normal Volkswagen manner.
- (f) Reconditioning of the spark plug hole thread is permitted.
- (g) The valve spring fitted length shall be 40 mm and shims may be used to achieve this dimension.
- (h) Valve train shall remain standard, i.e. 1.1 to 1 ratio. Shimming of the rocker post is permitted to maintain standard geometry.
- (i) Any standard Volkswagen valve springs, retainers, and collets may be used.

9. MANIFOLD:

- .1 No artificial turbulence device may be fitted in the inlet tract.
- .2 No machining, cutting or polishing of the inlet manifold is permitted unless specifically authorised within these regulations.
The machining of the inlet manifold orifices to a depth of 20 mm is permitted.
The removal of the heat riser tube is permitted.

10. ENGINE ANCILLARIES:

The carburettor shall be from a Volkswagen 1200 Series I sedan as defined in Section One.

- .1 The use of any size venturi, jets or float which may be fitted without alteration to the carburettor is permitted.
- .2 Removal of the Carburettor air cleaner and choke mechanism is allowed.
The air cleaner may be replaced by an air filter which does not measure more than 150 mm in a horizontal plane, and no part of which is more than 75 mm above the top of the carburettor. It is permitted to plug the choke shaft holes flush with the inner and outer faces of the carburettor body.
- .3 The exhaust system is free but must comply with the general requirements for 1st Category Automobiles.
- .4 Nothing must be done to interfere with the normal battery charging function of the generator.
The minimum charging output must be 6.8 volts at a constant 3500 r.p.m. at the engine.
- .5 Removal of cooling ducts is permitted with the exception of the fan, fan housing and fan blades. The fan must function normally. The fan housing

may be modified, but only so as to provide for the passage of roll bar bracing; the cut out must be air tight.

- .6 The fitting of any standard Volkswagen automotive distributor is allowed. Advance curve may be adjusted.
- .7 Any 6 volt Volkswagen starter motor may be fitted and must be capable of starting the engine at the start of the event; none of its parts may be removed during the event.

11. ENGINE DIMENSIONS:

The following standard dimension and tolerances of engine components are included for information and shall be observed.

Bore: 77.21 mm

Stroke: 64 mm + 0.1 mm

Exhaust Valve Diameter—27.99 mm (36 h.p.)

29.97 mm (40 h.p.)

Inlet Valve Diameter—29.97 mm (36 h.p.)

31.49 mm (40 h.p.)

Minimum Capacity of each Combustion Chamber in Cyl. Head: 43 cc.

Minimum Depth, Top of Cylinder Barrel to Top of Piston: 1 mm to be measured with the cylinder barrel in place and pulled down at 3.0 to 3.2 mkg, i.e. 22 to 23 ft/lbs. Cylinder base paper gaskets must not exceed 0.5 mm under each cylinder, and steel shims may be used to achieve those requirements.

Valve Guide Length—60 mm to 65 mm.

Minimum Valve Spring fitted length—40 mm (dimension does not include valve collett retainer or base spacing shims).

12. TRANSMISSION:

The transmission-rear axle assembly shall be standard Volkswagen swing axle type.

- .1 Installation of any standard Volkswagen Type 1, 2, or 3 components which can be fitted without modification of any component of the transmission or of the gear set itself is permitted.
- .2 The synchromesh must be in place and operating on at least three gears.
- .3 Standard Volkswagen gear ratios permitted to be used are:

1st:	3.6:1 — 3.8:1
2nd:	2.06:1 — 1.88:1 — 1.94:1
3rd:	1.22:1 — 1.23:1 — 1.26:1 — 1.32:1
4th:	0.82:1 — 0.89:1 — 0.79:1
Reverse:	3.61:1 — 3.88:1 — 4.63:1
C/W Pinion:	4.125:1 — 4.375:1 — 4.430:1

Any combination of these ratios may be used.

- .4 The transposition of the crown wheel ring gear to provide correct axle rotation is permitted.
- .5 The installation of the transmission in an inverted position, the use of any "limited slip" device, and removal of reverse gear are all prohibited. Reverse gear must be operable from the driver's cockpit.

13. NON GENUINE PARTS:

The use of the following non genuine standard VW replacement parts is allowed. These parts must be normal replacement parts and shall not result in any unauthorised modification of any other component.

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- Gasket and seals
- Barrels and pistons (of same size type and weight as standard genuine VW)
- Bearings
- Valve guides
- Engine valves
- Valve springs
- Piston rings
- Ignition coil (6 volt)
- Fuel pump and fuel filters
- Distributor
- Voltage regulator
- Fan belt
- Brake shoes, linings, wheel cylinders
- Clutch and pressure plate
- Shock absorbers
- torsion arm link pins, king pins
- Axle boots
- Camshaft—ref. Rule 8.1(n).
- Steering box

14. AUTHORISED PARTS

The following parts are permitted to be from any source, provided that their use does not result in the unauthorised modification of any other component.

- Fasteners (nuts, bolts, screws, etc.)
- Wiring
- Brake lines
- Fuel lines
- Spark plugs
- Master cylinders
- 6-volt battery or batteries connected in parallel
- Carburettor jets and venturi
- Push rod tubes

15. FUEL

Only commercial fuel, as defined by CAMS, may be used.