2018 MOTORSPORT IRELAND FORMULA VEE CHAMPIONSHIP TECHNICAL REGULATIONS

1. Technical Regulations

Formula VEE Is a low cost formula designed for single seater (Monoposto) racing cars, based on original VW components of Types 1, 2 and 3. Original VW components are only recognised as such if they are contained in the Spare Parts Catalogue of Volkswagenwerk and/or bear a clear identification mark as original VW components and have undergone all the working processes prescribed by the manufacturer for production and/or were fitted as standard equipment on road going vehicles of types 1, 2 or 3. Any components which are not covered in the above paragraph are permitted only if covered in these regulations, Section 1 to 7, and Appendices 1 to 3. Original Standard VW Components must be reworked only as described in sections 1 to 7 and appendices 1 to 3, It must be possible at all times to establish their identity as standard VW parts. It is not permitted to add, apply or remove material to the standard VW components in any form or manner, unless expressly permitted in Sections 1 to 7 and Technical Notes 1 + 2.

No extra parts, washers, or spacers may be fitted to alter the performance of the engine other than that mentioned in Section 2, Camshaft etc. and in Technical Note 2 under Valve Springs.

FOR THE PURPOSE OF THESE REGULATIONS:

TYPE 1	=	BEETLE 1200, 1300
TYPE 2	=	TRANSPORTERS
TYPE 3	=	1500, 1600 VARIANTS AND FASTBACK

All with aircooled engines.

IMPORTANT: The onus of proving that his/her car is eligible rests entirely with the driver/entrant.

2. Engine

An engine must be used, having a maximum piston displacement of 1603.08cc, with a stoke of 69mm $\pm$ 0.1mm. Maximum piston size 85.96mm and a maximum bore size of 86.018mm. This engine must consist of standard VW components of Type 1, 2 or 3. Any form of supercharging is prohibited. Pistons, rings, bearings and con-rods are unrestricted as regards manufacturer, but must confirm in dimension, specification and weight to the original VW part. CRANKSHAFT and CON-RODS must be unmodified, apart from any machining necessary to balance or recondition same.

NOTE:

1. For the balancing of con-rods and piston assemblies, it must always be possible to establish the identity of one standard unmodified piston and con-rod in each group of four in any one engine.

2. All engine parts much be assembled in the manner described in the official workshop manual – in particular.

a) Pistons must have arrow facing flywheel.
b) Con-Rods must have forge marks facing up.

c) Camshaft drive gear must be fitted to crankshaft with concave face towards flywheel and timing mark towards the crankshaft pulley end.
d) All Gaskets may be substituted by gasket cement or totally removed.

CAMSHAFT, as supplied by Kent Cams to Formula VEE Ireland Specification must be fitted.

CAM FOLLOWERS, PUSH RODS and ROCKERS and all pertaining parts must be standard (Technical Note 1). Only aluminium Push Rods to be used. The length of the push rods must be 281-282mm. If difficulty is found in obtaining tappet clearance, the rockers may be filed or ground at the adjusting end only. Alternatively, a 1mm thick spacer may be placed under the rocker shaft pedestal, if required, to assist in obtaining the correct valve clearance. Cam followers with a lubricating hole are permitted (e.g. Lube-a-Lobe). Hydraulic cam followers are not allowed. The mating of the Camshaft to the CAM drive should be held by two or three bolts. The timing of the Camshaft Gear to the Camshaft cannot be altered. The fitting of spacers in any form between the cam bearing and camshaft is not permitted. Machining of the camshaft to alter valve timing is not permitted. Any type of **PUSH ROD TUBES** may be fitted. Valves other than VW Valves may be used, provided that they conform in spec. to the original part (Technical Note 2).

High Ratio rocker arms and swivel head tappet screws are not permitted.

CRANKSHAFT PULLEY may be turned down or replaced by a non standard pulley.

PISTON DECK HEIGHTS may be altered by skimming the cylinder barrels, but the piston may not protrude above the top of the barrels at T.D.C.

OIL SYSTEM sump baffle and sump extension may be fitted. Oil pump may be replaced by larger capacity unit. Dry sump system not permitted. Oil cooler and remote filter permitted. Cylinder block may be tapped to re-route oil feed to cooler and filter. All oil pipes fitted must be able to withstand a pressure of 10 bar, which is equivalent to 145 Ibs p.s.i. If the 'top hat' projects below the floorline of the car, an adequate sump guard must be fitted.

VALVE SPRINGS as per Technical Note 2.

CYLINDER HEADS – Standard VW Twin-port cylinder heads as per Technical Note 2 only, permitted. Heads using long reach plugs may be used so long as all other specifications are as original.

ROCKER COVERS. To help prevent oil leakages from Cylinder Head Rocker Covers, any type of Rocker Cover may be used, and the standard Rocker Cover may be modified as per Appendix 3.

INLET MANIFOLDS – Standard VW type 2 or 3. They may be polished internally, but internal diameter at bottom end, adjacent to Cylinder Head must not exceed 33mm. A stack may be fitted between each inlet manifold and the carburettor and both stacks may be joined by a balance pipe. Dimensions of stacks and balance pipe unrestricted.

CARBURATION Two Zenith VN 2 Carburettors, unmodified in any way, apart from the altering of jets and removal of choke butterfly (if required) must be used. 29mm chokes only may be used.

Alternatively, from the 1998 season, two Weber 34 ICT Carburettors, with a choke size of 29mm complete with aluminium inlet manifolds, as supplied to Formula VEE in kit form by McNamara Carburettor and Injection Centre or by Autocavan Ltd., may be used instead of

the Zenith VN2 Carburettors. The aluminium inlet manifolds must be used 'as cast' and may not be modified in any way, except to grind the outside surface to permit the free movement of the mounting nuts at the cylinder head. The part number for the kit comprising the carburettors and manifolds is 234 ICT098. The Throat diameter of the manifold is 33mm.

Throttle linkage, air cleaners are free. It is recommended that a separate throttle return spring is fitted to each carburettor. A minimum of three throttle return springs must be fitted.

EXHAUST SYSTEM must not extend further than 60cms from the axis of the rear axle. The height of the exhaust system at outlet(s) must be no higher than 60cms. (Driver in car, car in race trim).

SILENCER, an adequate silencer must be fitted and secured using BOLTS. It must be included in any exhaust system dimensions. The dimensions of the silencer are free. Two independent forms of fixing must be applied. All cars must comply with relevant circuit requirements.

FUEL PUMP & TANK A manual fuel pump suitable for VW Type 1, 2 or 3 only, must be used. A non-return valve may be fitted to the fuel tank breather pipe. If a non-return valve is not fitted, the breather pipe must be looped higher than the top point of the tank (filler) and must then continue to under the bottom point of the chassis, where it must be secured, e.g. run through a hole in the sump guard and tied securely.

CLUTCH Mode of operation, clutch lining and springs unrestricted. Number of springs may be changed. Clutch may not be lightened.

FLYWHEEL Standard Type 1, 2 or 3 flywheel must be used, but it may be lightened and balanced by the removal of material. Additional or larger dowel pins and larger gland nut may be used for fixing the flywheel.

COOLING The standard fan, fan housing and shrouds may be altered/removed. Additional cooling ducts may be fitted.

ELECTRICAL EQUIPMENT An operable electrical starter and a dashboard ignition switch are compulsory. The ignition switch and starter button must be operational from the driver's seat with seat belts fastened. In addition to this, a separate rear light switch must be installed. This switch must operate a rearward-facing red warning light of a minimum of 21 watts, with surface area minimum 20 cm^2, maximum 40 cm^2, which must be located within 10cms of the centre line of the vehicle and be clearly visible from the rear. The warning light must be switched on when visibility conditions are reduced, or when instructed by an official. Only bayonette-type bulbs or LED lights may be used. If using LED lights then a minimum of 75% of the LEDs must be working. Battery unrestricted. Only dry cell batteries must be used.

Ignition unrestricted, except double ignition not allowed. A 009 distributor must be used using either contact breaker points or Lumenition (or similar) contactless ignition which must be connected directly to the coil with 2 wires and fitted inside the distributor cap. Generator and pedestal may be removed. Master switch must be fitted to the lower main hoop of the rollover bar and must be identified from outside the car. Driver must be able to operate master switch when fully seated in car with belts fully tightened.

3. THE GEARS AND AXLE DRIVE

A fully synchromesh VW Type 1 or 3 gearbox must be used. All four forward gears as well as reverse gear must be present and in operative condition. Shift linkage free. The fitting of a locking differential, even with a limited slip, is prohibited.

The following gear ratios may be used:

Gear	SET 1 TYPE 3 **(Variant)**
FIRST	3.80
SECOND	2.06
THIRD	1.26 *(29:23 or 63:50)*
FOURTH	0.89 *(24:27) or 0.88 (53:60)*
DIFF	4.125

Reverse gear must be fitted and operational.

The internals of the gearbox must be assembled as originally intended by the manufacturer (with the exception of the differential, which may be reversed to allow for the repositioning of the gearbox at the rear of the car).

4. CHASSIS

Construction unrestricted but must be of ferrous metal construction. However, it must be able to withstand with an adequate degree of safety, all the stresses encountered in operation. Minimum ride height is 4cms. Engine covers, made of aluminium or fibreglass and painted to complement the remainder of the bodywork, must be fitted. The cover must be at least the height of the top of the firewall and must cover the length and breadth of the crankcase, enveloping the upper chassis rails and must not terminate before the rear crossmember.

FRONT AXLE must be original VW Type 1 or trailing arm torsion spring design. Connection of the front axle to the chassis is unrestricted. The front axle must be fitted with telescopic shock absorbers, manner of operation and make unrestricted. Coil springs may be used in conjunction with front shock absorbers.

The arrangement and method of fixing the shock absorbers is unrestricted. The shock absorber attachment horn of the front axle may be altered or removed, but the piece (connection) between the torsion bars may not be removed. For adjustment of the suspension, one torsion spring may be replaced by a stabiliser, anti roll bar and the other may be altered. The fitting of a further stabiliser in any form is permitted. The centre grubscrew mounting, retaining the torsion springs, may be repositioned by cutting and rewelding the tube, or by fitting an adjustable grubscrew mounting.

STEERING GEAR Standard Beetle steering box or any steering rack may be fitted, and steering arms are unrestricted.

Drop arm between steering box and steering arm assembly must be the original standard part. An extension of minimum thickness ¼" may be fitted between the drop arm and steering rods but it must be bolted to both parts. It may also be welded.

REAR AXLE The rear axle/rear suspension must be of trailing link construction. Coil springs, together with telescopic shock absorbers, must be used for the suspension of the

rear wheels. Mode of operations, construction, make and fixing of shock absorbers is unrestricted. Dual systems are not permitted. The removal of shock absorber horn from axle tube is permitted.
Dampers with remote canisters are not permitted.

The fitting of a stabiliser or an equaliser is allowed. The use of VW double jointed axle (even partially) is not permitted.

BRAKE SYSTEM All components of the wheel brakes must be VW Standard TYPE 1 or 3. From the 1997 season, front disc brakes are optional. The specification and part numbers as agreed with and provided to the MI Race Committee. The foot brake must be constructed as a dual circuit brake. Each brake master cylinder must be fed by a separate fluid reservoir. The make and type of master cylinder and make of brake linings is unrestricted. The fitting of a brake pressure distributor is permitted. For cooling the brakes, cooling air ducts may be fitted.
WHEELS Wheels are supplied by Weller or Starco to Formula VEE Ireland.
Two specifications exist and both of these are permissible.

Wheels may be fastened to hubs using standard VW wheel bolts, or alternatively using proprietary screw-in after-market M14 wheel studs and nuts. The studs must be threaded into the wheel hub and welded to the inside of the hub to prevent loosening

TYRES The only tyres permitted are TOYO PROXES R888 **or R888R** (GG Compound). **All tyres on the car must be either R888R or R888 and no mixing is allowed.** Minimum tread depth of 1.6mm is to be maintained around the circumference of the tyre measured across 75% width of the tyre.
Permitted Compounds:
Toyo Proxes R888R
Front: Toyo Proxes R888R 185/60R13 80V GG (Medium Hard) Compound
Rear: Toyo Proxes R888R 205/60R13 86V GG (Medium Hard) Compound

Toyo Proxes R888
Front: Toyo Proxes R888 185/60R13 80V GG (Medium Hard) Compound
Rear: Toyo Proxes R888 205/60R13 86V GG (Medium Hard) Compound
Nominated supplier: SW ADAIR TYRES. 49 Killymore Rd, Newtownstewart, Co. Tyrone BT78 4DU. Tel No: 048 8164 8428.

BODY must not project beyond the rearmost point of the gear shift rod. The driver must, at all times, be able to get in and out of the car without removing any part of the bodywork. Wings, aerofoils and enveloping bodywork is not allowed. No part of the body, frame or suspension may project beyond a vertical axis in a plane connecting the front and rear tyres. Two adequate rear-view mirrors must be fitted. Side Pods may be fitted from 1.1.99. Technical Specifications will be published at a later date. All bodywork, including engine cover, must be in place at the start of qualifying and racing.

5. TECHNICAL DATA
Minimum weight in race trim without driver is 385kgs.
Minimum weight with driver is 485kg. No fuel may be added during qualifying or racing.

6. SAFETY

6.1 Fire Extinguishers

As per current MI Regulations. Fire extinguishers must be operational from driver's position in cockpit, and must be plumbed in. Extinguisher nozzles must be directed at the fuel tank and both carburettors. Control must be identified from outside the car.

6.2 Seat Belts

A six point harness must be fitted and in good condition.

6.3 Overalls

All drivers in Formula VEE must wear overalls, gloves, boots, socks, balaclava and helmet to the approved standards as per Appendix 2 of the current Motorsport Ireland yearbook. Underwear must be flame-resistant. Driver's name and blood group must be permanently affixed to the suit.

7. GENERAL

Only proprietary fuels, such as those available in normal petrol stations shall be used. Additives which shall alter the properties (octane value, etc) of the fuel are not permitted. The maximum permitted rating for fuel is 99 octane.

All cars must be presented for scrutiny and event in a clean and raceworthy condition. Any car which, in the opinion of the appointed scrutineer, does not meet with these requirements will be excluded from the event.

Exhaust pipes and silencer must be painted with a heat-resistant paint.

At the discretion of the appointed scrutineer, after the first two laps of practice, all cars must return to the pit lane for an oil check, when cars which pass this check shall return to the track for a minimum of a further 10 minutes of practice.

Technical Note 1

Kent Camshaft

A Camshaft supplied by Kent Cams to Formula VEE Ireland must be used.
All components in the operating train of the valve gear must be of standard production quality, dimensions and tolerance, especially in regard to their operating geometry.
With the use of the Kent Camshaft, the gear wheel may be moved to obtain the correct timing through the gearwheel and camshaft of 7 degrees 30 minutes BTDC maximum, with 1mm of clearance at the inlet valve. The gearwheel must be drilled through into the camshaft, these must then be pinned. From the beginning of the 2007 season, only Kent camshafts made from original blanks to the proper specification may be used. Re-profiled camshafts may be used provided they have been sent back to Kent Cams for testing and stamped, if they are found by Kent Cams, to be within tolerances.

Technical Note 2

FORMULA VEE

Cylinder Head Volkswagen Type 2 or 3 Twin-Port with the following dimensions:

Rocker ratios should be 1.1:1.0

MINIMUM COMBUSTION CHAMBER VOLUME IN CYLINDER HEAD	50.0cc
MAXIMUM DIAMETER OF INLET PORT AT HEADFACE	32.0mm
MAXIMUM DIAMETER OF EXHAUST PORT AT HEADFACE	32.5mm
INLET VALVE HEAD DIAMETER	35.55mm
EXHAUST VALVE HEAD DIAMETER	31.9mm
INLET AND EXHAUST PORT FINISH	AS CAST
INLET VALVE LENGTH	112.0mm
EXHAUST VALVE LENGTH	111.9mm
VALVE SPRINGS: 6.5 COILS O/D	31.1mm
WIRE DIAMETER	3.9mm
UNCOMPRESSED LENTH	Not to exceed 52.5mm

SPACERS MAY BE FITTED UNDER THE VALVE SPRING. THE TOTAL LENGTH OF THE UNCOMPRESSED SPRING PLUS THE SPACERS MAY NOT EXCEED 54.8mm.

The step in the Combustion Chamber on some Cylinder Heads may be removed. As stated above, minimum combustion chamber volume in cylinder head is 50cc. Cylinder heads may be machined to allow for this. A steel spacer may be placed between the head and the barrel to achieve the required volume.
These dimensions are given as a minimum/maximum size for each section of the cylinder head. The standard part must not be machined in order to obtain these dimensions unless specifically advised by these regulations.

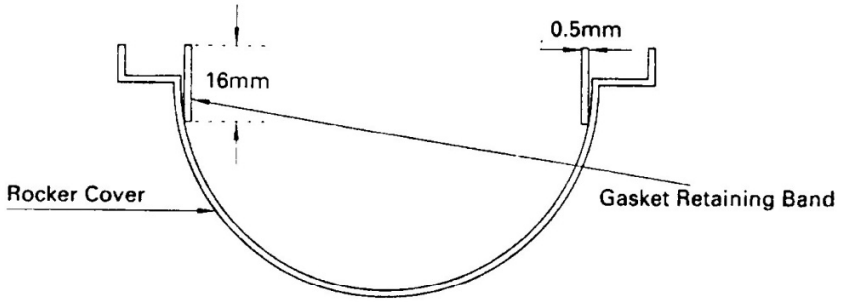
In the event of an engine being stripped for an eligibility check, excess carbon must be removed from the combustion chamber and top of piston.

The final decision regarding the eligibility of any car rests with the appointed eligibility scrutineer. At a meeting of drivers and officials held in November 1996, it was decided that the maximum claimable in any case for an engine strip would be €500, and for a gearbox strip, €500. The onus is on the competitor to ensure that his/her car complies with the regulations.

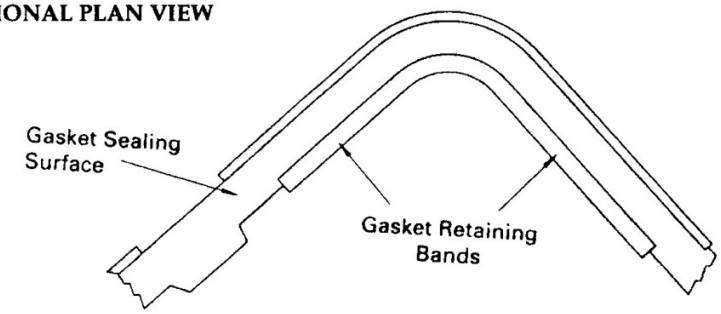
APPENDIX 3

CROSS SECTION VIEW

GASKET SEALING SURFACE



SECTIONAL PLAN VIEW



Dimensions given are in mm ± 0.5mm