NORTH ISLAND HISTORIC FORMULA FORD REGULATIONS JULY 2010

This schedule **shall be read in conjunction with the safety schedule as detailed in Appendix Two, Schedule A of the current Motorsport Manual**

1. General. As with all regulations: **"UNLESS IT SAYS YOU CAN DO IT. YOU CANNOT".**

2. Description.

Single seater racing cars complying with New Zealand Formula Ford regulations manufactured before 01-07-1980 shall be designated Class1 and cars complying with New Zealand Formula Ford regulations, manufactured between 01-07-1980 and 31-12-1989 and using a gearbox incorporating a Volkswagen transaxle casing assembly shall be designated Class 2. Cars using a Hewland LD 200 series gearbox are **not** permitted. All cars must have a Certificate of Description issued by Motorsport New Zealand.

3. Historic motorsport is that branch of the sport where cars from the past are used in friendly competition. It is not a branch of the sport where series and trophies for winning races are held in higher regard than the enjoyment of competing. The spirit of these Regulations should be understood to imply that all competitors are expected to assist in keeping the cost of Historic Formula Ford racing within reasonable bounds.

4. Safety.

a) Roll protection shall comply with the requirements of the Motorsport Manual.

b) Cars must be fitted with a rearward facing red warning (rain) light of at least 15 watts, or LED equivalent, operative from the cockpit at the order of the Clerk of the Course. This light must be mounted as high as possible on the centre line of the car and be clearly visible from the rear. The warning light must be switched on by order of the Clerk of the Course.

c) The fitting of an operable circuit breaker, easily reached from inside as well as outside the car is mandatory. The location of the circuit breaker shall be indicated by a blue triangle and spark situated on the outside of the car.

d) A fire extinguisher shall be installed in compliance with Schedule A. Additionally a plumbed-in (mounted) system as defined in FIA Appendix J, is permitted.

e) Fluid systems shall comply with the provisions of Schedule A.

f) Safety harness must comply with the provisions of Schedule A

5. Chassis.

The chassis must be of tubular construction with no stress bearing panels except bulkheads and under-tray, but the curvature of the under-tray must not exceed 25.4mm (1 inch). No engine oil or water may be transmitted through the chassis tubes.

Monocoque construction is not permitted.

Stress bearing panels are defined as sheet metal affixed to the frame by welding, bonding or rivets or bolts or screws which have centres closer than 152.54mm (6 inches) The use of stabilized materials and composite materials (incorporating carbon and/or Kevlar material reinforcement) is prohibited.

6. Bodywork and Aerofoils

Any device incorporated as part of the body, e.g. fairings, engine covers or noses which augments downforce on the vehicle is prohibited. Aerodynamic devices such as skirts and/or spoilers are not permitted. Suspension fairings must retain a symmetrical upper and lower surface and the centre line of these surfaces must be parallel to the ground when the vehicle is at racing position.

No part of the car, except for the tyres may be closer to the ground than 40mm. This measurement shall be taken with the driver seated at the steering wheel, the car in race trim and with the road wheels pointing straight ahead.

The maximum coachwork height (excluding rollbar) shall not exceed 80cm at any point above the lowest point of the entirely sprung structure of the car, except for carburettor air boxes installed solely for supplying air to the carburettor. The height of such air boxes is not to exceed 110cm above the lowest fully sprung portion of the car.

No part of the coachwork shall extend more than 60cm behind the centre line of the rear axles.

7. Engines.

1. GENERAL

1.a The Ford 1600cc Kent GT crossflow engine, with nominal bore of 81mm and of stroke 77.62mm, is the only engine permitted. The following specifications apply to the subject engine from 1971, including those fitted to Cortina and Escort model derivatives. Part numbers, including variations are detailed as appropriate.

1.b Engines will be mounted upright and aligned fore and aft in the chassis.

1.c The single, standard carburetor only will be used on a standard inlet manifold. The carburetor type will be:

· Weber 32/36 DGV or DGAV

- Number on engine: 1
- Number of main venture: 2
- Maximum diameter of main venture 26.0/27.0mm
- Maximum diameter of carburetor outlet to inlet manifold: 32.0/36.0mm

The aircleaner may be removed and substituted by an aftermarket filter or trumpets.

Jets may be changed,

The carburetor may be modified for both butterflies to open together.

The cold start device and diffuser bar may be removed.

Internal or external anti-surge pipes may be fitted.

The power enrichment circuit may be blocked and/or power jet may blocked or removed.

Twin accelerator jets are permitted.

No other modifications are permitted – chokes must remain standard and no polishing or profiling is allowed. .

The throttle mechanism shall remain standard with a mechanical connection to the pedal.

1.d The addition of material by any means to any component is prohibited.

1.e It is permitted, as a means of repair, to replace, to standard dimensions:

- damaged valve guides
- valve seats
- cylinder bores

Class 1 cylinder blocks may be re-bored to a maximum of 0.040 inches

Class 2 cylinder blocks must be standard bore.

1.f Balancing of reciprocating and rotating parts is permitted only by removal of metal from locations so provided by the manufacturer.

1.g Non standard rocker covers are permitted provided they in no way improve the performance of the engine. Water passages are not permitted in the rocker cover.

1.h Aftermarket valve springs are allowed provided they are steel and only one spring per valve is used. Aftermarket valve spring retainers are allowed, providing they are of ferrous material. The addition of shims is allowed, as is the machining of the head casting under the spring seat.

1.i The exhaust system and manifold are unrestricted, within vehicle regulations and Schedule A noise levels.

1.j The lubrication system is free. A dry sump is permitted. Localised machining of the cylinder block is permitted to allow fittings of the oil pump. Oil coolers are unrestricted.

1.k A liquid cooling system is mandatory, but the radiator and water pump is unrestricted. The radiator, if housed in or incorporating a cowl air scoop or deflector, must comply with body regulations. The water pump shall be belt driven by the crankshaft.

1.l Only the standard mechanical fuel pump, or direct replacement is permitted.

1.m The ignition distributor make is free, providing the original drive and location is retained. The low tension circuit must be triggered from within the distributor body and the high tension ignition circuit must be distributed from the distributor unit. It is not permitted to fit/use any other components to trigger, time, or distribute the ignition current. The ignition timing may only be varied by mechanical means (weights and springs) from within the distributor body and a 90 degree firing angle shall be maintained. The electrical wiring from the distributor to the ignition coil must be separate from all other wiring. Only one ignition coil may be used. **No transistorized or electronic ignition is permitted.**

1.n The only inlet manifold permitted is the standard Ford production item. No modifications will be permitted and the bore of the casting must remain untouched and in its original condition. The carburetor seat face may be machined to horizontal in the fore to aft plane. The water passage in the inlet manifold may be blanked off or plugged. The manifold may be machined externally sufficiently to clear the throttle mechanism.

1.o Gaskets and seals are free except as follows:

a) Carburetor to inlet manifold gasket and spacer shall be a total maximum thickness of 6.1mm.

b) Inlet manifold to cylinder head gasket shall be singular with a maximum thickness of 1.0mm.

c) The cylinder head gasket shall comply with the following dimensions:

maximum diameter of cylinder aperture = 82.5mm

minimum compressed thickness = 0.80mm

1.p Pump, fan and generator drive pulleys are unrestricted.

1.q The crankcase breather may be altered or removed, but all breathers must discharge into a catch tank.

1.r Mechanical tachometer drives may be fitted.

1.s Generators or alternators are options.

1.t Oversize and undersize bearings, including brandline components of equivalent type are permitted.

1.u The use of replacement fasteners , bolts, nuts, screws, studs and washers which are not connected with or which do not support any moving parts of the engine or its compulsory retained accessories is permitted. The use of thread locking compounds is permitted.

1.v **Only modifications or additions specifically covered by these regulations are permitted. All engine components not covered by these regulations must remain completely standard and unmodified.**

2. DETAILED ENGINE DESCRIPTION

2.a Pushrods, rockers, tappets, pedestals and shaft remain standard.

2.b The rocker (valve stem) contact pad may be re-contoured to achieve the maximum specified lift. The rocker pedestal may be shimmed (with a parallel strip of steel) to compensate for surfacing of the cylinder head.

The maximum valve lift (measured at the spring cap with zero tappet clearance) is 9.1mm for both inlet and exhaust valves. The maximum lift at the top of the pushrod is 6.0mm for both inlet and exhaust valves

2.c Camshaft

The only permitted camshaft is either a Ford production camshaft for the 1600 GT "Kent"engine (part Number 771M 6250BA) or a camshaft with the identical specifications and dimensions of a Ford 1600 GT camshaft. Tuftriding or parkerising is permitted. Shot peening, shot blasting or polishing is prohibited.

Lobes heel to toe inlet 33.29mm

Exhaust 33.32mm

Camlift measured to inlet 5.867 +/- 0.05 mm

Top of pushrod exhaust 5.892 +/- 0.05 mm

Offset camshaft/sprocket dowels are permitted.

Base circle radius 13.716 +/- 0.5mm.

Competitors are encouraged to use a certified and logged camshaft from KELFORD CAMS, Christchurch.

It is the competitor's responsibility to ensure that their camshaft complies with these regulations.

Camshaft compliance may be checked at any time.

2.d Crankshaft

The crankshaft shall be the standard FoMoCo unit from the subject engine Part Number 711M6303 AE or a SCAT (cast steel) crankshaft.

- Spot machining to achieve balance is permitted.
- Polishing of the crankshaft is prohibited.
- Tuftriding, shot peening and/or shot blasting of the crankshaft is permitted.
- The crankshaft may be machined on the bearing friction surfaces in accordance with normal reconditioning procedures, providing the stroke remains Standard (77.6 +/- 0.1mm)
- Oversize and undersize bearings, including brand line components of an equivalent type are permitted.
- Minimum Crankshaft weight: Standard Crankshaft 11.1 kg
  SCAT Crankshaft 11.5kg
- Crankshaft pulley is free, as is tooth belt drive.
- It is not permitted to alter the number of bearings or fit bearings of less than standard production width.
- Main bearing cap bolts may be replaced by ferrous bolts of similar type and dimensions.

2.e Flywheel and Clutch Assembly

The flywheel and clutch must be standard components.

The flywheel may be machined provided that an overall diameter of no less than 254mm is maintained and solely for the purposes of:

a) Refacing the clutch plate mating face and

b) Achieving the minimum weight and

c) Balancing.

A direct replacement clutch assembly (single diaphragm pressure plate and single driven plate) is permitted, provided that the driven plate has more than one shock absorbing spring and only organic friction material is used.

- Racing clutches are prohibited.
- Flywheel bolts are free and locating dowels are permitted.
- Combined flywheel and clutch assembly minimum weight is 11.79kg including flywheel fixing bolts and pressure plate bolts. The clutch assembly is defined as the rotating components, bolts, pressure plate and clutch plate.

2.f Compression Ratio

The maximum compression ratio shall be controlled as follows:

a) Minimum combustion chamber volume in piston crown shall be 41cc with piston at TDC in the cylinder, with no account taken of the volume down to the top piston ring.

b) Cylinder head gasket dimensions:

minimum diameter of cylinder aperture = 82.5mm

minimum compressed thickness + 0.80mm

c) The cylinder block surface may be machined parallel to the original surface, however pistons shall not protrude above the cylinder head face when at TDC (at ambient temperature)

d) Maximum permitted protrusion of the valves into the combustion chamber 1.2mm.

The equipment and method of checking the combustion chamber volume is as follows:

a) Burette

b) Checking fluid (50/50 mix Kerosene and ATF)

c) Transparent flat plate with filling/air bleed holes and grease for sealing.

Measurement shall be performed at ambient temperature and in an “as run” condition. Carbon may only be removed from the piston crown “squish band” to facilitate sealing of the flat plate. With the piston at BDC apply a light smear of general purpose grease around the cylinder wall. Raise the piston to TDC. Wipe away the excess grease. Seal the flat plate to the gasket face of the cylinder block with a light smear of grease. Fill piston chamber from burette to establish volume.

2.g Cylinder Head

The cylinder head shall be either:

a) The Ford cast unit from a Kent 1600cc GT cross-flow engine, or

b) The Ford cast iron unit from a Kent 1600cc (non GT) cross-flow engine

It is permissible to reshape the inlet and exhaust ports by the removal of metal within limits providing the diameter of the ports at the manifold faces remain in accordance with the dimensions below. Addition of material in any form is prohibited.

The cylinder head combustion chamber may not be re-profiled as this is a fully machined part. Polishing only is permitted.

Maximum diameter of ports at manifold head face:

Inlet measured external to chamber: 36.7mm

Exhaust: 29.5mm

2.h Inlet Manifold

The inlet manifold may have the carburetor seat face machined to the horizontal. On standard inlet manifolds the outer ports sometimes exceed the maximum of 31.5mm at the head face in the vertical measurement and this will be accepted if the casting is in its original state and untouched.

The carburetor manifold flange aperture must have:

maximum length of 86.6mm

maximum primary choke ends radius 18mm, and

maximum secondary choke ends radius 20mm.

2.i Pistons

These shall be standard Ford production pistons, or brand line direct equivalent pistons. Forged direct equivalent pistons may be used.

Pistons may be machined as follows:

a) Piston bowl and valve relief to achieve correct volume

b) Gudgeon pin bosses to achieve balance

c) Underside and top of crown to achieve balance & piston weight

The minimum complete piston weight (including rings, gudgeon pin & circlips) is 520 grams. The individual gudgeon pin weight shall not exceed a maximum of 123 grams when weighed separately.

Class 1 cars are permitted to utilise replacement pistons to a maximum oversize of 0.040 inches. Class 2 cars must use standard pistons only.

2.j Piston Rings

All piston rings shall be fitted. Direct brand line replacements are permitted as follows:

a) Compression rings shall be one piece with conventional plain gaps

b) The top ring may be chromium plated or molybdenum-faced.

c) Oil control rings shall be either one piece or “Apex” type 3-piece.

2.k Valves

The inlet valves shall be either **Standard** (marked FoMoCo or FFI) or direct brandline replacements with the same specifications. The exhaust valves shall be either **Standard** (marked FoMoCo or FFI), or direct brandline replacements with the same specifications. No re-profiling or polishing is

permitted, however, re-facing of the valve seat face is allowed. The original 45 degree seat angle must remain.

Distance apart at centres = 39.1mm +/- 0.5mm

Maximum inlet valve head face diameter = 39.7mm

Maximum exhaust valve head diameter = 34.0mm

Overall inlet valve length = 110.9 +/- 0.5mm

Overall exhaust valve length = 110.6 +/- 0.5mm

Maximum protrusion of valve head from cylinder head face = 1.2mm.

2.l Connecting Rods

Standard connecting rods only may be used – Part number 2737E 6200B.

- Machining is permitted to remove metal from the balancing bosses on the big end cap and at the little end to achieve balance only. Polishing is prohibited. Minimum weight, (including bolts and small end bearing) shall be not less than 640gms. Connecting Rod bolts may be replaced by ferrous bolts of similar type and dimensions.

2.m

Any form of water injection is prohibited.

8. Suspension

All parts must be steel or ferrous material with the exception of bell cranks, tracking or alignment arms, hubs, hub adaptors, bearings and bushes, spring caps, abutment nuts and anti-rollbar links. Titanium is prohibited. The use of composites for load bearing components is prohibited.

9. Brakes

Brake components are free, provided that the calipers and discs are of a ferrous material. Calipers shall have a maximum of two working cylinders per caliper.. Bake pad materials are free.

10. Shock Absorbers

Shock absorbers are free except for the following:

a) Only non adjustable or single adjustable shock absorbers may be used.

b) Separate reservoirs for fluid/gas are prohibited.

c) Any method of altering the shock absorber performance, by the driver, whilst seated in the car is prohibited.

11. Steering

Steering components are free, provided rear wheel or four wheel steering is not employed. The use of composites for load bearing components is prohibited.

12. Wheels and Tyres

Aluminium alloy or steel wheels are allowed on the following conditions:

That they are:

a) A production type (produced in significant numbers)

b) One piece construction only except for wheels that were standard equipment when the car was manufactured.

c) Manufactured to comply with a recognized standard (e.g. Australian Std 1638)

Wheels for both Class 1 and Class 2 shall be of the following dimensions (inches):

Diameter 13 inches

Rim Width Front 5.5 inches maximum

Rear: 7.0 inches maximum.

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The only racing tyres permitted for Class 1 and Class 2 cars are either:

- Dunlop Formula Ford Racing tyres
- Front 135/545 x 13 CR82
- Rear 165/580 x 13 CR82

or:

- Avon ACB 10 Formula Ford Racing tyres
    - Front 6.0/21.0 x 13
    - Rear 7.0/22.0 x 13

This ruling is to be reconsidered at the end of the 2010/2011 racing season.

At the commencement of any qualifying session or races, the depth of tread shall be no less than 1.0mm

13. Transmission

(a) The gearbox must include an operable reverse gear, capable of being engaged by the driver whilst normally seated, and contain not more than four forward gears. The ratios are free.

(b) Rear wheel drive only is permitted.

(c) Final drive ratio is free.

(d) Torque biasing, limited slip and locked differentials are prohibited.

14. Fuel System

The fuel tank is free, provided the tank is mounted within the chassis frame and the capacity does not exceed 41 litres.

Any tanks outside the chassis frame must comply with FIA Spec FT3.

Only commercial fuel as specified in Appendix Two shall be used.

15. Weight.

(a) The minimum vehicle weight is 400kg.

(b) The minimum racing weight is 495kg, including any ballast necessary to maintain this minimum weight. The racing weight is the complete weight of the car in 'race trim', including driver, which may be measured at any time during competition.

16. Miscellaneous

(a) A starter motor is mandatory (either inertia or pre-engaged type) capable of starting the engine (from an on board energy source) operated by the driver when normally seated.

(b) Electronic dashboards, and Data logging equipment, are not permitted.