

# 2010 UNIVERSAL RACING SERVICES CLASSIC FORMULA FORD 2000 CHAMPIONSHIP

## 5. TECHNICAL REGULATIONS

### 5.1 Introduction:

The following Technical Regulations are set out in accordance with the MSA specified format and it should be clearly understood that if the following texts do not clearly specify that you can do it you should work on the principle that you cannot.

It is appreciated that some original parts are either difficult to source or no longer manufactured. Certain texts within these regulations concerning gaskets and the flywheel and clutch have already been altered to take account of non-availability. If due to further genuine non-availability, it is wished to fit any other non standard parts, it will be necessary to seek PRIOR written permission of the Eligibility Scrutineer.

### 5.2 General Description:

5.2.1 The UNIVERSAL RACING SERVICES CLASSIC FORMULA FORD 2000 CHAMPIONSHIP is for competitors participating in FF2000 single seater racing cars generally **BUILT** and **RACED** before 31.12.83 (except cars built in 1983 for sale as 1984 models) and excluding all 1983 Reynard models.

NB 1992 FIA Regulations allowing F3 style flat bottom cars does not apply.

5.2.2. The Championship will be split into two Classes PLUS an invitation Class (C):

**Class A** – Cars built between 01.01.1981 and 31.12.1983

**Class B** – Cars built before 31.12.1980.

**Class C** – Any car as above which registers after 1<sup>st</sup> September 2010 **AND** 750MC F4 Competitors

### 5.3 Safety Requirements:

The following Articles of MSA Section K Safety Criteria Regulations will apply:

K1.6.3, K1.6.4, K2.1.3, K3.1.2, K3.2.7, K3.2.9.-10, K3.3.1. - 3, K4, K5, K6, K7, K8, K13, & K14.

### 5.4 General Technical Requirements & Exceptions:

All cars must comply with the relevant sections of MSA General Technical Regulations (Sections J & Q) as

Appropriate

### 5.5 Chassis:

The chassis must be of tubular steel construction with no stress bearing panels except bulkhead and undertray, curvature of the undertray must not exceed 2.54cm.

Monocoque chassis construction is prohibited. Stress bearing panels are defined as, sheet metal affixed to the frame by welding, bonding or rivets or bolts or screws which have centres closed then 15.25cm. Bodywork must not be used as stress bearing panels.

The use of stabilised materials, composite materials using carbon and/or Kevlar reinforcement is prohibited.

The chassis specification must remain fundamentally unaltered from original manufacture.

Wheelbase, track and pick-up points must remain to manufacturer's specification.

Ground Clearance as per J5.20.11 at all times, in practice & race including in any post practice or post race scrutineering. No engine oil or water tubes are permitted within the cockpit.

### 5.6 Bodywork:

#### 5.6.1 Modifications Permitted

It is permitted to make any modification of which the primary purpose is safety or driver comfort.

Cars may be updated to the specification of the latest model built by the manufacturer which appears in the list of eligible vehicles.

#### 5.6.2 Modifications Prohibited.

The use of composite materials using carbon and/or kevlar reinforcement is prohibited.

It is not permitted to construct any suspension member in the form of an aerofoil or to incorporate a spoiler in the construction of any suspension member. Issue # 1 – 26/01/10 - Issued by BARC – 2010 URS Classic FF2000 Championship Page 8 of 16

5.6.3 Bodywork must be of a type with a proven competition history for that type of car. Wings must be of a proven period design and must respect period dimensions for the chassis type in question. There is a maximum rear wing height of 90cm measured from the ground.

### **5.7 Engine:**

The only permitted engine is the Ford NE series 2 Litre SOHC with 2 venturi carburettors with nominal bore 90.84mm + 0.5mm rebore allowance and stroke 76.95mm  
Production tolerances are permitted providing the total swept volume does not exceed 2025cc.

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

The addition of any material be it metal, plastic or composite etc. by any means be it welding, bonding encapsulation or encasement to any component is prohibited. However, specific repair of castings may be allowed with the written approval of the eligibility scrutineer responsible for the Formula.

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

Pump, fan and generator drive pulleys and their retention bolts, washers and belts are free.

Mechanical tachometer drives may be fitted

Generators are optional

The use of non-standard replacement fasteners, nuts bolts, screws, studs and washers which are not connected with or which do not support any moving parts of the engine or its compulsorily retained accessories is permitted.

The use of thread locking compounds is permitted

Gaskets are free except for cylinder head and carburettor to inlet manifold gaskets which must be dimensionally identical to original Ford gaskets - see note under compression ratio.

Any process of cleaning may be used on any component providing the surface finish, which must remain standard, is not affected.

Forced induction prohibited.

### **INDUCTION**

The air cleaner may be removed or replaced and a trumpet fitted.

Carburettor Type: Weber 32/36 DGV and DGAV

Number on engine | Maximum dia. of carb outlet to

Number of Main Venturi 2 inlet manifold 32.0/36.0mm

Maximum dia. of Main Venturi 26.0/27.0mm

It is permitted to change jets, open both throttles together, remove cold start devices and diffuser bar, fit internal and / or external anti-surgepipes, remove seals on emission control carburettors.

No other modifications are permitted, chokes must remain standard and no polishing or reprofiling is permitted

Any means of reducing intake air temperature is prohibited

Any form of water injection is prohibited

Flexible mounts for the carburettor may be incorporated providing they do not exceed a maximum of 25.4mm from flange to flange

The bore of the casting must remain untouched and in its original condition. The carburettor seat face may be machined to horizontal in the fore and 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 in the case of both throttles being opened together.

**EXHAUSTS** The exhaust system and manifold are free, within Vehicle Regulations.

### **CYLINDER BLOCKS**

It is permitted, as means of repair, to replace damaged cylinder bores with cast iron cylinder liners, all to standard dimensions.

Localised machining of the cylinder block is permitted to allow fitting of the dry sump system

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

Cylinder blocks may be machined to maintain deck height

### **CYLINDER HEADS**

Non-standard camshaft covers are permitted providing they in no way improve the performance of the engine. Water passages are not permitted in cam covers.

Standard valve spring retainers must be used, only single valve springs are permitted. Shims are permitted otherwise valve springs are free

The only permitted camshafts are the standard Ford production camshafts for 2000SOHC NE engines Issue # 1 – 26/01/10 - Issued by BARC – 2010 URS Classic FF2000 Championship  
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The camshaft and rockers must remain entirely unmodified They must be fully manufactured and ground by the Ford Motor Co

It is prohibited to grind camshafts from blanks or regrind or reprofile

Tuftriding or Parkerising is permitted.

The key/keyway in the camshaft pulley may be offset.

Cylinder head face may be skimmed

Maximum valve lift at determined points by camshaft rotation will be established by using a low rate substitute valve spring (load characteristics 12lb at 1.417in, 30lb at 1.000in), with zero tappet clearance.

The following table / drawing is reproduced from 1992 RAC Blue Book.

#### **Valve Lift Inlet Exhaust**

##### **Angle Opening Closing Opening Closing**

0 10.442 10.442 10.442 10.442

5 10.36 10.36 10.36 10.36

10 10.11 10.11 10.11 10.11

15 9.69 9.69 9.69 9.69

20 9.11 9.11 9.11 9.11

30 7.45 7.45 7.45 7.45

40 5.17 5.17 5.17 5.17

50 2.58 2.59 2.58 2.59

60 0.81 0.86 0.81 0.86

70 0.43 0.54 0.43 0.54

80 0.19 0.37 0.19 0.37

90 0.01 0.20 0.01 0.20

#### **Lift measured in mm, angles measured from point A.**

Valves must remain standard, no reprofiling or polishing is permitted. The original 45deg. seat angle must be retained.

Maximum face diameter inlet 42.2mm Maximum face diameter exhaust 36.2mm

Overall length inlet 111.15 - = 0.5mm. Overall length exhaust 110.55 - = 0.5mm

Maximum valve stem diameter 8.4mm

It is permissible to reshape inlet and exhaust ports by removal of metal within limits. Addition of material in any form is prohibited. Maximum port dimension at manifold head face inlet diameter 39.5mm exhaust 35.5mm X27mm

Sizes may only be exceeded if the castings are oversize, in such cases the castings must be seen to be original and untouched.

An external oil drain pipe from the cylinder head is permitted. The fitting of a union by drilling and tapping is permitted.

It is permitted, as means of repair, to replace damaged valve guides and valve seats by replacement cast iron valve guides and cast iron valve seat inserts all to standard dimensions.

Inlet and exhaust port diameter may be exceeded if the original casting is visible and untouched at the gasket face.

#### **LUBRICATION SYSTEMS**

The lubrication system, external to the engine, is free. Existing standard production oilways, linings or oil grooves may be enlarged or reduced, but no additional ones are permitted.

Standard friction surfaces must remain unchanged. Dry sump is permitted, oil coolers are free

#### **COOLING SYSTEM**

A liquid cooling system is mandatory but radiator and water pump are free provided that the water pump is mechanically operated. (i.e. non electrical)

The radiator if housed in or incorporating a cool air scoop or deflector, must comply with bodywork regulations.

#### **FUEL PUMPS**

Only the standard mechanical fuel pump for the engine is permitted.

Fuel pipes are free. Fuel cooling radiators are permitted, within safety regulations, but must be mounted within the main chassis frame. Issue # 1 – 26/01/10 - Issued by BARC – 2010 URS Classic FF2000 Championship Page 10 of 16

## **DISTRIBUTORS**

Distributors are free providing they retain the original drive and location.

The distributor is defined as the component which triggers the LT current and distributes the HT ignition current. The ignition timing may only be varied by vacuum and/or mechanical means.

It is prohibited to use any other method or component to trigger, distribute or time the ignition. It is permitted to mount a simple indicating pointer to the engine to facilitate the timing of the distributor with respect to the crankshaft/flywheel

## **COMPRESSION RATIO**

The maximum compression ratio will be controlled as follows:

Minimum combustion volume in cylinder head 50cc

Standard Ford cylinder head gaskets part nos 70HM6051 BiA, 70HM6051 B3B, 70HM6051

GIA: minimum compressed thickness 0.9mm minimum diameter of cylinder aperture 92,0mm or dimensionally identical aftermarket gasket.

Pistons must not protrude above cylinder block surface at TDC

Cylinder block face may only be machined flat.

## **PISTONS**

Pistons must be standard Ford or absolutely identical aftermarket production pistons, unmodified in any way except for balancing and as detailed

All three piston rings must be fitted, piston rings must be standard production or similar approved pattern replacements, i.e. the compression rings must be one piece, single homogeneous material type with conventional plain gaps, chromium plating of the top ring is optional, the oil control rings must be either single piece twin land type or apex three piece (two rails and an expander) Molybdenum faced top compression rings are permitted.

To achieve balance, material may be removed from the internal surfaces at any location below the lowest point of the gudgeon pin. All external surface, dimensions and profiles must remain standard with the exception of the top surface of the piston crown which may be subjected to simple machining to achieve balance and the objectives of the section entitled "Compression ratio"

Minimum weight of pistons, plus rings, connection rod, connection rod bolts and nuts, less big end bearings 1255 grms

## **CONNECTING RODS**

Connecting rods must be standard Ford part. Machining is permitted to remove metal from the balancing bosses to achieve balance only.

Tuftriding, Parkersing, shot-peening, shot-blasting and polishing are permitted.

It is permitted to radius the area around the big-end retaining bolt heads and nuts. Big end bolts part no. 905500 are permitted as are similar aftermarket big end bolts.

## **CRANKSHAFT**

A standard crankshaft must be used. Spot machining to achieve balance is permitted.

Tuftriding Parkersing, shot-peening, shot blasting and polishing are permitted. Crankshaft minimum weight 28lbs

It is not permitted to alter the number of bearings or fit bearings of less than standard production width

Standard oversize and undersize bearings are permitted

## **FLYWHEEL AND CLUTCH**

The flywheel must be a standard component. To achieve minimum weight and balance materials may be removed from the originally machined surfaces, rim/flange etc. For rectification the clutch mating face may be resurfaced. Cast surfaces must remain in original condition. Friction material is free

The clutch must be a standard Ford road car unit or aftermarket replacement of identical diameter and type.

Flywheel bolts are free and locating dowels are permitted.

It is permitted to secure the starter ring to the flywheel

Flywheel and clutch assembly minimum permitted weight 12.5kg (including all flywheel and crankshaft securing bolts).

## **ENGINE SEALING**

All engines must have provision for scrutineer's wire seals. 1/16in holes pre-drilled in readily accessible locations on installed engines must be available.

a) Sump - two holes through the cylinder block/sump joint flange, one either side of the engine.

- b) Cam Cover - at least two retaining screw heads must be cross drilled
  - c) Cam Timing Pulley - retaining bolt must be cross drilled
  - d) Inlet Manifold - at least two retaining bolt heads to the cylinder head must be cross drilled.
  - e) Carburettor - at least two retaining nuts to the cylinder head must be cross drilled Issue # 1
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f) Bell housing - at least two retaining bolts to the engine must be cross drilled to enable clutch and flywheel to be adequately sealed OR competitors must be prepared to remove either engine or transmission to enable sealing of clutch and flywheel in which case at least two clutch cover retaining bolts must be cross drilled.

Failure to comply renders the engine ineligible.

### **5.8 Suspensions:**

All parts must be of steel or ferrous material, with the exception of springs, hubs, hub adapters, hub carriers, bearings and bushes, spring caps, abutment nuts, anti-roll bar links, shock absorber caps and nuts.

Remote reservoir and / or light alloy dampers are prohibited.

### **5.9 Transmissions:**

The gearbox must contain not more than four forward gears and include an operable reverse gear, capable of being engaged by the driver whilst normally seated. The ratios are free Rear wheel drive only is permitted.

Final drive ratio is free

Torque biasing, limited slip and locked differentials are prohibited. Non-ferrous differential components prohibited.

### **5.10 Electrics:**

All cars must be equipped with an externally operated circuit breaker having positive ON-OFF positions clearly marked. An internal ignition switch must be operable by the driver when normally seated irrespective of whether a safety harness is worn or not.

### **5.11 Brakes:**

Light alloy brake callipers prohibited, otherwise free.

### **5.12 Wheels/Steering:**

Rear wheel steering prohibited, otherwise free.

13in diameter wheels with maximum front rim width 6in and rear 8in are the only wheels permitted Material is free providing it is metal.

### **5.13 Tyres: (See also Commercial Undertakings, Regulation 6.2)**

The only permitted tyres are:

Front: AVON 6.5 /21.0 X 13 Spec no. 8814 - DRY

AVON 6.5 /21.0 X 13 Spec no. 8829 - WET

Rear: AVON 8.2 /22.0 X 13 Spec no. 8815 - DRY

AVON 8.2 /22.0 X 13 Spec no. 8831 - WET

### **5.14 Weights:** 440kg minimum

### **5.15 Fuel Tank/Fuel:**

Tanks outside the chassis frame must comply with FIA Spec/FT3

Inboard tanks, covered externally with fireproof coating, are acceptable for events of less than 70km

A metal tank coated with GRP does not comply

Maximum capacity 41 litres unless carried in FIA Spec/FT3 tank.

### **5.16 Silencing:**

A mandatory silencer, Ford part no: 9095317 must be fitted and must comply with MSA Regulation J5.17.

### **5.17 Numbers And Championship Decals:**

To be eligible to compete in a Championship race and obtain points it is mandatory to display

a) BARC Shield and b) Championship decals on each side in an unobscured position when viewed from a direct side elevation (assuming decals are available at the meeting signing-on).

Failure to have these in place at scrutineering will render the car ineligible.

NOTE: SEE REGULATION 1.3.3 Issue # 1 – 26/01/10 - Issued by BARC – 2010 URS Classic

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