

Swaffham Raceway Lightning Rod Specifications **2012**

Unless the rules state that you can do it, you CANNOT DO IT

Drivers are reminded that scrutineer checks can be carried out at any time throughout meetings

This is a non-contact formula. It is intended to be a cheap rod formula using a common and readily available car...the ford mondeo, the idea is to keep the rules as basic as possible to get as many cars on track at an affordable cost.

There must be no contact of any sort. Any driver making deliberate contact will receive an immediate black flag and disqualification with further penalties a possibility.

CARS

Only right hand drive Ford Sierra hatchback or Saloon cars are permitted.
One driver per car and one car per driver is allowed at each race meeting.

The Ford 2 litre Pinto engine must be in standard form but may have a modified camshaft and may be prepared to the following specifications:

Engine

- a) Nominal bore size 90.84mm plus 1.5mm oversize. Standard stroke 76.95mm.
- b) Block and head may be skimmed but the pistons may not protrude above the block. Pistons may not be skimmed or modified in any way. A standard crankshaft must be used.
- c) Engine balancing : CRANKSHAFT – spot machining only; CON RODS – Spot machining only on the counter weight balance pad area at the big and small end. ONE con rod must remain original and untouched. Con rod bolts may be changed but con rods must not be drilled or modified to accept them; PISTONS – Spot machining only and one piston must be original and untouched. All four pistons must have original marking on crown.
NOTE: Spot machining means you can either hand grind, drill or machine.
- d) Only standard pistons or standard replacement pistons (i.e. KS Karl Schmidt, Mahle, Hepolite/Wellworthy AE) may be used. Any make of piston ring may be used providing the number of rings remains the same as standard and no machining of the pistons or rings other than gapping is required. No forged pistons are allowed. (See 2c for balancing).
- e) Camshafts are free, vernier cam wheels may be used and any single valve spring may be used that fits without any modification to the standard spring tops. Extended ball studs are permitted. Rocker arms are free with the exception or roller rockers. Heavy-duty valve retaining caps are permitted for use.
- f) Head: You may use any standard 2 litre S.O.H.C. Sierra/Pinto head. No modification is allowed except valve spring seats may be machined. Valves must be standard and of standard Ford length. N.B. On Standard Ford Inlet Valves only, where the back of the valve meets the valve seat, there may be a slight lip, this may be ground

away at a 30° angle, to a maximum width of 2.5mm. Over size valve stems are allowed, and valve seats may be re-cut. A three angle valve seat may be used to the following specification: Angle 1 – Combustion Chamber 30°, Angle 2 – Valve Seat 45°, Angle 3 – Port 60° - 65°, with valve seat width free. No gas flowing or adding of material to the ports or combustion chamber. Replacement valve guides may be used but must use original position. Bronze valve guides are not permitted, but thin wall bronze inserts may be used.

g) Flywheel and Clutch: Any standard Pinto engine flywheel may be used which may be lightened. Only the standard type clutch may be used. Flywheels **MUST** be dowelled to the crank.

h) No competition gaskets allowed. Only Ford, Payen or standard American version may be used.

i) Standard Motorcraft or Bosch distributors must be used with either points and condenser or electronic ignition. *
See rule 14. The mechanical advance may be altered, and the vacuum advance may be altered or removed.

j) Engine Mounts: Engine mounting brackets must remain standard, but the mounting may be modified. The engine must occupy its original position. The charging system: Power steering pumps may be removed, fan belts are free but standard pulleys must be used. Blocks may be rebored to size, sleeved, line bored and surface ground. No other modifications are allowed. Sumps: No alloy sumps. Standard steel sumps must be used. Pick up pipes may be modified and sumps may be baffled. No outside alterations may be made.

k) Oil coolers may be fitted using a sandwich plate between the oil filter and block. Oil coolers must be fitted within the engine compartment. No remote oil filters.

l) The engine must be fitted with a metal catch tank of 1 litre minimum capacity. It must have a minimum of 2 breather pipes connected to it, one from the rocker box and one from the crankcase. The only modification allowed to the rocker cover is for breathing purposes only.

m) No turbos, no fuel injection, no forced induction of any kind.

n) The exhaust manifold must be in standard form and standard to the Sierra/Pinto 2 litre. The inlet manifold must be standard with the exception of water circulation holes, which may be blanked off.

o) All engine parts not mentioned above must remain standard.

p) Water cooling systems may be modified, provided that all modifications are inside the original bonnet outline.

3. EXHAUST SYSTEM

The standard exhaust system may be retained, or AX891, Laws or Simpson ORC225. The front downpipe must remain standard and can only be modified at the tail end to allow the exhaust to run through the car, by shortening by up to 1". If this modification is made, the joining pipe must either fit inside the front pipe or it may be butt-welded to the front pipe. The flange may be removed. If exhaust systems pass through the car they must be covered. If a silencer becomes ineffective during racing or practice, the car will be withdrawn from the event. Exhaust must terminate towards the rear of the car and may not terminate through the side of the car.

4. CARBURETTOR & INLET MANIFOLD

Only the standard Weber 32/36 DGV or DGVA carburettor may be used. No polishing or reprofiling is allowed. No

modifications to the carburettors body or original design. All gaskets must remain standard and original. A single original spec insulator block must be fitted between carburettor and inlet manifold, with two gaskets; approximate total thickness = 5mm. Main jets, primary and secondary jets, auxiliary venturi and emulsion tubes may be changed but must face downwards towards the butterflies. Accelerator pump jets may be changed but face downwards towards butterflies. Chokes may be modified to open together and replacement spindles may be fitted with standard screws. Cold starting devices may be removed with retaining lugs and subsequent holes blanked off. Air and fuel galleries may not be enlarged or modified, and fuel may enter on either side. Floats may not be modified or weighted, and must control the fuel flow. Needle valves may not be larger than 250, and not enlarged or modified. The power valve must be fitted in the base of the bowl, but may be sealed off, and the diaphragm may be removed. No trumpets are allowed. It is permitted to use a grub screw or similar device to fix the auxiliary venturi to the carburettor body. Top end enrichment devices may not be blanked off or modified. A secondary fixing on the fuel inlet feed line is required. *The Inlet manifold must be standard & not faced to alter the angle of the manifold to the carburettor.* No inlet port matching of the carburettor to the manifold or the manifold to the head. No material may be added or removed from the gas flow area, it must be as standard

5. GEARBOX & DIFFERENTIALS

Must be standard to the range and fitted by the manufacturer with the exception that the P100/Ford Cortina gearbox may be fitted into the Sierra. All gearboxes must have a conventional type bell housing and the gear change must require a clutch and must be operated by a lever arm. No competition type gearboxes allowed. No aluminium bellhousings allowed. **Differential ratios are free and MUST be locked by welding only. No limited slip differentials,** no Cosworth, XR4 or 4 x 4 parts to be used. No torque biasing assemblies. Axle and diff must remain the same concept as original. Propshaft is free. Gear sticks are free. The differential must not be moved in any way from its original position.

6. FRONT SUSPENSION

Positive camber on the offside front wheel is allowed, this can only be achieved by the drilling of the cross member only and the offside bottom arm must remain standard length, the anti-roll bar may be modified to suit. Negative camber on the nearside front wheel is permitted but not adjustable. This may be achieved by re-drilling the cross member AND lengthening the nearside bottom arm by a maximum of 2", the roll bar may be modified accordingly. Anti-roll bars may be modified to suit. Lengthening must not be achieved with threaded bar. Positive camber on the O/S front wheel is allowed. The springs are free and the car may be lowered. All suspension parts must be located by

original mounting points on the chassis and body, with the exception of front bottom arms. Solid bushes are allowed but not competition or Cosworth type. The exception to this is that you may re-drill a maximum of two extra holes (one on each side) in the front cross member bottom arm location. Strut braces may only be fitted on the front struts and may be triangular shape and bolted to the bulkhead only not the roll cage. Top mounting plate may be modified to locate 2¼" springs. Dampers may be up-rated, the Leda leg with non standard spring platform & the Gaz equivalent may be used, but no metal must be added to them.

7. REAR SUSPENSION

The components are to be standard & original in length. No adjustable parts or modifications are allowed. Only standard bushes are permitted, no competition parts. Suspension may be lowered. Springs are free. Positive or negative camber may only be achieved by shimming the drive shaft location. No rear Steer. Top spring cups maybe modified to take 2 ¼" springs.

8. STEERING

The Steering rack must occupy it original position, & manual racks can replace PAS systems. Quick racks can also be used. The steering rack arms may be modified: Nearside rack arm may be lengthened, the Offside may be shortened. The steering column height may be adjusted & reinforced at the top bracket. A quick release steering wheel is recommended.

9. WHEELS AND TYRES

Any steel or alloy wheel can be used to a maximum of 7". Wheel studs are free. No wheel spacers allowed, whether welded to the wheel or not, unless fitted as standard. The only tyre permitted is the remold Kingpin Radial 185/60/14...Kingpin Valour 185/65/14 and the Pacer 175/70/13. Tyre gaiters are not permitted. No alteration can be made to the original tread pattern by tyre cutting.

10. BRAKES

To be original and to work on all wheels. Handbrake is compulsory. No biased braking. No ABS, no 4 x 4 or Cosworth parts allowed. Brake pipes may be allowed to pass through the car. The use of competition brake pads is permitted, however, the use of competition brake pipes is not allowed.

11. BODYWORK

To remain standard including floor pan with removal of inner door panels permitted but any removal of structural stiffeners is not permitted, with the exception of the bonnet and boot stiffeners. No holes are allowed in any panel, other than original. On two door shells, the inner skin may be removed between the B and C posts below the waistline of the car. No armouring whatsoever. All doors must be fixed closed when racing. No spoilers or aerofoils unless fitted as standard to the range of car. No roof pods or fins. Grilles must remain in their original position. Replacement

grilles must be made of plastic. Fibreglass grilles are allowed and may include headlamp apertures. Front and rear light apertures may be blanked using a maximum thickness of 2mm aluminium and must not overlap apertures by more than 25mm. Headlamps may be blanked on the front or back of the apertures. All flammable material must be removed. Any replacement dashboards for gauges etc. must be made of aluminium. Wheel arches may be relieved to a maximum of 2" but the original shape must be retained They may be re-welded, but no adding of extra metal and no sharp edges should remain. A metal upright $\frac{3}{4}$ " x $\frac{3}{4}$ " must be welded or bolted into the windscreen aperture, one third of the way along the driver's side.. Rover 400 Series/Rover 45 or Ford Escort Mk V bumpers may be used as replacements. Additional means of fixing are allowed, but these must not be used as armouring. All fixing bolts must be the coach bolt type with the head of the bolt facing outwards. Standard lifting/towing eyes must be retained. No foam filled panels are allowed. Fabricated doors including the rear quarter are allowed, but must be of professional appearance; the maximum thickness of steel sheet used must be 1mm. There must be no overlapping and should be no thicker than original. Fibre Glass Front/Rear bumpers are permitted and should consist of a maximum of three layers, one of which maybe KEVLAR. The total maximum bumper thickness allowed is 10mm. The circular area of the spare wheel carrier may be removed but must be replaced with a steel plate of equal thickness to the original metal – You may not remove any other sections of the boot floor.

12. ROLL CAGES

The minimum requirement is a four post roll cage with down bars in support of the A & B posts, constructed from mild steel members, minimum size of 32mm x 32mm x 3mm box or tube (1.25" x 1.25" x 3mm), all securely welded at all joints as shown and must include the following.

1. A 230 mm square plate, minimum 3mm thick, welded between the base of the uprights and the floor for additional strength
2. One horizontal bar between A Posts (at dashboard level)
3. One horizontal bar between B posts at approximately mid height and adapted to form support to the seat / seat headrest or a seat hoop.
4. Two "chicken" bars in the drivers door aperture and one in the passenger door aperture. Chicken bars to fit between A & B post support down bars and no further.
5. Two down bars, one each side from the roll cage top, to either, the rear suspension turret (5) or (5A) into the boot well, terminating 100mm short of the back panel.

The following members may be added (to the same material specification as the roll cage) :

6. One additional chicken bar in the passenger door aperture
7. Two bars, one each side, from the B post down bar base, rearward to the suspension turret.
8. A cross bar fitted across the rear suspension turrets, this may be cranked and welded to the floor panel in a central location.
9. Members may be positioned from the roll cage, forward through the bulkhead and connected to the front

suspension turrets. Members must be within the engine bay aperture and horizontal (within practical limits)

10. Additional bars in passenger side to support front roll bar, rear mounting area (in the footwell). Bars must be

positioned low down such that access to the driver is not limited.

11. One horizontal bar each side between A & B post support down bars at sill height and between B posts (to

protect legs/feet in a side impact situation).

12. One diagonal member between either B post support uprights or rearward members described in (5)

Further Notes

No suspension components may be fixed directly to roll cage / support members.

All members must be positioned within the body lines and fitted as supports/protection NOT armouring.

No other members must be added as the list above describes the full limit of roll cage construction that is allowed.

13. SCREEN

All glass must be removed. Front screen must have a central bar of 19mm x19mm or 3/4" x 3/4" SHS welded in

place. An interior mirror must be fitted. A drivers door mirror must be fitted, mounted in such a position that

it does not project further out than the body. (Must not be able to get knocked off whist in racing traffic)

14. STOP LIGHTS

Either two stop/brake lights or one single stop/brake strip-light must be fitted facing rearwards. If two lights, they must

be a minimum of 30 inches (762 mm) apart. Lamp(s) must be operated by the standard stop light switch as fitted to

the particular model of car. No other switches or modifications to switches to be made. Bulbs to be of 21 watt

intensity. For round type lamps: minimum diameter 3" (76mm), maximum diameter 5" (127mm). For square/rectangular type lamps: minimum 3" (76mm) square, maximum 5" (127mm) square. For strip type lamps,

minimum of 8" (203mm), maximum of 16" (406mm) width and should be fitted securely to allow a clear view from the

rear. All bulbs must be working.

15. SEATS

You must have a Competition type Driving Seat with a head restraint.

The seat should occupy its original position where possible and be suitably

supported at shoulder height and on both of the sides and back, with a suitable framework or seat stiffener's.

16. BATTERIES & ELECTRICAL

May be brought inside the car, **but the floor must not be cut to accommodate the battery**. They must be firmly

fixed and covered with a material which will not rot due to acid contamination. Contact between the safety harness

and batteries must not be possible. Batteries must be a minimum of 6" (152mm) from fuel tank. An electrical cut off

switch must be fitted to the R/N/S corner of the car. If Lumination is used they must be of the following part nos: Ford:

Bosch fitting kit FK221 power module PMA50, Motorcraft FK9 PMA50. A 24 volt starter system is permitted.

17. NUMBERS

The driver's racing number must appear on the doors of the car. They should be preferably in large American style numbers on a contrasting background. The bigger the better. You should also paint your number in black on white or white on black in the rear corner of your roof to assist with lap scoring at tracks with race controls that are located in a high position. A 'Sun Visor' made of metal and having a depth of at least 6" must be fitted to the top of the windscreen aperture when no laminated glass or perspex is fitted. The drivers name only must appear across the sun visor position. All signwriting must have a professional appearance. Scrutineers will instruct drivers to change their numbers if lap scorers find it difficult to read them. The whole of the roof of the car (with the exception of number triangle) must be painted in the drivers current grade colour.

18 FUEL SYSTEM

Fuel tanks must be metal or FIA approved with a maximum capacity of 4 gallons or less are permitted. These must be fitted rear of the driver but in front of the rear axle centre line, i.e. they are no longer allowed to be fitted in the boot area. They **MUST NOT BE FITTED BELOW THE CHASSIS RAILS** of the car, and the floor must not be cut in any way to accept the tank. All tank filler caps must be of a secure leak proof metal or screw fitting. Petrol pipes must be of metal or metal covered and have a shut off tap within easy reach of the driver. All tanks must be fitted with a breather system which prevents spillage if a car is inverted. The fuel tank must be a minimum of 6" (152mm) from the battery. All petrol pick up pipes must draw through a stand pipe from the top of the fuel tank. Four 2" holes must be drilled at the lowest point under tanks to allow spilled petrol to drain. A firewall between fuel tank including filler cap/pump and driver must be fitted. Fuel regulators may be used.

20. WEIGHT

Warning : Cars can be weighed at any time before, during or after a meeting, without driver. They must always achieve the minimum weight; the adding of fuel or any other liquids is not allowed to achieve this minimum weight.

The minimum car weight is 845Kg. The use of ballast to achieve this weight must be steel plate bolted to the floor.

The internal plating must be of equal proportions on both sides and front to rear of the car both in construction and gauge. I.E. If a 10Kg weight is fitted in the front offside foot well, a 10 Kg weight must also be fitted in the nearside foot well. Bolts of the same size and material must be used to fit the plates and the bolts must be welded.