



TECHNICAL REGULATIONS

FOR

FORMULA FORD

EFFECTIVE FROM: 1st March 2009

*" Unless it says you can do
it, you cannot"*

Technical Regulations

Formula Ford 1600

GENERAL

As with all regulations, "***UNLESS IT SAYS YOU CAN DO IT. YOU CANNOT***".

1 DESCRIPTION

Four wheel, single seater racing car, as defined for Formula 3 (1985) and these regulations fitted with a Ford 1600cc GT "Kent" Engine.

2 SAFETY

These regulations are based on the current RACMSA Yearbook (Blue Book). All relevant end current RACMSA regulations apply. See Appendix 'A' for some of the more specific regulations.

3 CHASSIS

3.1 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. The undertray/floor (E 13.2.4) extends from the bulkhead forward of the pedals to the bulkhead between the fuel tank and the engine. Monocoque chassis construction is prohibited. Stress bearing panels are defined as, sheet metal affixed to the frame by welding or bonding or by rivets, bolts or screws which have centres closer than 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.

- 3.2 Cars built after 1.1.87 and before 1.1.95 The internal cross section area of the cockpit from the driver's feet to behind his seat, shall nowhere be less than 700 cm² and a minimum width must be 25cm over the whole length of the cockpit. The only intrusion permitted into the cross sectional area being the steering column.
- 3.3 Cars built after 1.1.95 The free internal cross section of the cockpit from the soles of the driver's feet to behind his seat shall at no point be less than 700cm². The only thing which may encroach on this area is the steering column. A free vertical section of minimum 25cm width maintained to a minimum height of 25cm with corners of maximum 5cm radius must be maintained over the whole length of the cockpit with the steering wheel removed. The driver normally seated in his driving position with the seat belts fastened and the steering wheel in place must be able to raise both legs together such that his knees reach the plane of the steering wheel in the rearwards direction: this action must not be obstructed by any part of the car.
- 3.4 Cars built after 1.1.87 The soles of the feet of the driver, seated in the normal driving position and with his feet on the pedals in the inoperative position, shall not be situated to the fore of the vertical plane passing through the centre line of the front wheels.
- 3.5 No engine oil or water tubes are permitted within the cockpit
- 3.6 Cars built after 1.1.95
The chassis must include an impact-absorbing structure fitted ahead of the front bulkhead of the tubular steel frame. This structure must be independent of the bodywork and must be solidly fixed to the extremities of the bulkhead (i.e. with bolts requiring tools for removal). It must constitute a box of 30cm minimum length, 15cm

minimum height in any vertical section and 400cm² minimum total cross section. It must be metallic using honeycomb sandwich construction with a panel thickness of 15mm minimum. It is recommended, but not mandatory, that this safety feature is fitted to older cars.

3.7 Cars built after 1.1.96:

Must be built with a LATERAL PROTECTION STRUCTURE, defined as continuous panels whose projection on a vertical plane parallel to the longitudinal axis of the car shall be at least 15cm high, shall extend on either side of the car, at a minimum distance of 55cm from the car's longitudinal centre line between at least the transverse planes passing through the fuel tank rear face and the frontal extremity of the minimum cockpit opening, and at a minimum distance of 35cm from the car's longitudinal centre line between at least the transversal planes passing through the above extremity and the front rollover bar hoop. These panels shall be made from a composite material of 30cm² minimum cross section with a honeycomb core in metal giving adequate resistance to compression. The external skins shall be of aluminium alloy of a minimum thickness of 0.5mm or made up of another assembly of materials of equivalent efficiency. The panels must be securely attached to the bottom and at the upper extremity to the main structure of the car in such a manner as to ensure absorption of a lateral impact. The radiators may play the role of protective panels or of transversal struts. The periphery of the bodywork covering the Lateral Protection Structure, when viewed from below, must be curved upwards with a minimum radius of 5cm, and a maximum radius of 7cm with the exception of air entry and exit openings into the Lateral Protection Structure. The floor of the side pod must reflect the plan of the upper surface. The floor is to be in the same plane as the undertray in both directions, i.e. transverse and

longitudinal, subject to all points being within 2.54cm of any flat plane situated under the car (see Art 3.1).

4 BODYWORK

See table of single seater dimensions. (Appendix "B"). The use of composite materials using carbon and/or Kevlar reinforcement is prohibited. Bodywork is not required behind the vertical plane taken through the front of the topmost portion of the roll over structure. If bodywork is used it must conform with the following regulation.

- 4.1 Any device designed to augment aerodynamically the downthrust on the vehicle is prohibited, as are aerofoils, nose fins or spoilers of any type.
- 4.2 For cars built after 1.1.87 The engine cover must not extend rearwards past the rearmost point of the gearbox housing (no gearbox extensions permitted). The shape of the cover must not include any reflex curves and no flat surfaces are permitted within 15° of the horizontal
- 4.3 For cars built after 1.1.87 The lower rear bodywork (located below the wheel centre line) is only permitted alongside and beneath the engine and can only extend from behind the cockpit to a line drawn through the rear axis. The incorporation of suspension or other fairings in this bodywork or separately is prohibited.
- 4.4 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
- 4.5 All cars must have at least two mirrors mounted so that the driver has visibility on both sides of the car (minimum surface area of each one: 55cm².)
- 4.6 For cars built after 1.1.95 Cockpit opening:

The opening giving access to the cockpit must allow a designated horizontal template to be inserted vertically into the cockpit (not considering the steering wheel) down to 25mm lower than the lowest point of the cockpit opening. This template is defined by dimensions J,K,L in Appendix "B".

4.7 See also Lateral Protection Structures.

5 ENGINE

5.1 GENERAL

- a) Engines will be mounted upright, and aligned fore and aft in the chassis.
- b) 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 the mounting points of the cylinder block to the transmission or chassis are allowed, whilst other casting repairs may be allowed with prior written approval of the Technical Commissioner responsible for the Formula.
- c) Balancing of reciprocating and rotating parts is permitted only by removal of metal from locations so provided by the manufacturer.
- d) Pump, fan and generator drive pulleys and their retention bolts, washers and belts are free.
- e) Mechanical tachometer drives may be fitted.
- f) Generators are optional.
- g) 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. Freedom granted to any fastener does not allow for freedom to move items relative to each other. For components that are granted the freedom for the fitment of a key or dowel, then material may be removed to allow the fitting of the key or dowel. Only one hole or keyway per component is allowed.

- h) The use of thread locking compounds is permitted.
- i) Gaskets are free except for the cylinder head, intake and exhaust system gaskets which must be standard Ford manufacture for the engine, and inlet manifold to cylinder head gasket which must be of approximate production thickness (see 5.2e).
- j) Any process of cleaning may be used on any component providing the surface finish, which must remain standard, is not affected.
- k) Forced induction is prohibited. Ram Air generated by the forward motion of the car is not considered as forced induction.
- l) The exterior surfaces only (of the complete engine assembly) of ferrous parts and the exterior surface of the aluminium Rocker Cover may be protected by paint or similar means. No internal component or surface may be coated by any protective finish. Other Ford produced aluminium components may be protected only on their external surfaces by a transparent clear varnish, or similar.
- m) Part numbers quoted were correct at the time the regulations were drafted. However, as with all companies, the Ford Motor Company Limited

reserve the right to make changes to components for reliability or other reasons. Consequently the part numbers quoted may be superseded by later released parts. Full Ford part numbers do not necessarily appear on all parts.

5.2 PERMITTED ENGINE

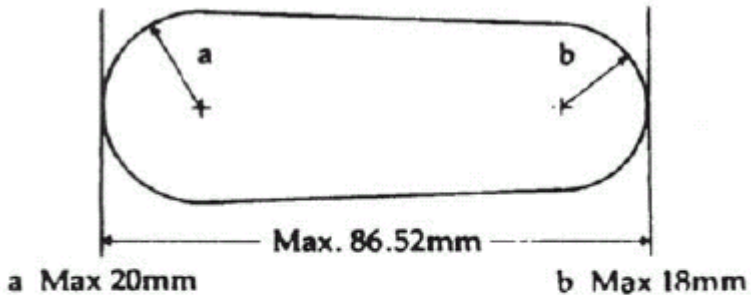
The only permitted engine is the Ford 1600 GT "Kent" (also referred to as Mark II Escort 1600 "Sport") with a nominal bore 81 mm and stroke 77.6mm. Production tolerances are permitted providing the total swept volume does not exceed 1600cc.

5.3 INDUCTION

- a) The air cleaner may be removed or replaced and a trumpet fitted.
- b) Carburettor Type: Weber 32/36 DGV and DGAV (from 1600 GT "Kent" or 2000 SOHC NE engine).
Number on engine 1 Number of Main Venturi 2
Maximum dia. of Main Venturi 26.0/27.0mm
Maximum dia. of carb outlet to inlet manifold 32.0/36.0mm
- c) It is permitted to change jets, open both throttles together, remove cold start devices and diffuser bar, fit internal and external anti-surge pipes, 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.
- d) Inlet manifold: standard Ford production inlet manifold for 1600 GT "Kent" engine. The carburettor seat face may be machined to horizontal in the fore and aft plane. The water passage must remain intact but may be blanked off or plugged. The manifold

may be machined externally to clear the throttle mechanism in the use of both throttles being opened together.

- e) Carburettor to inlet manifold gasket Thickness $5.7\text{mm} \pm 0.35\text{mm}$
Inlet manifold to cylinder head Thickness 0.86mm (max)



Manifold port diameter may be exceeded in vertical plane if casting is original and untouched

5.4 EXHAUST SYSTEM

- a). The exhaust system and manifold are free, within Vehicle Regulations.
- b). A mandatory silencer, Ford Part No. 9095317 (or old unit 9094277) must be fitted

5.5 CYLINDER BLOCK

- a). It is permitted, as means of repair, to replace damaged cylinder bores with cast iron cylinder liners, all to standard dimensions.
- b). Localised machining of the cylinder block is permitted to allow fitting of the dry sump system.
- c). The crankcase breather may be altered or removed, but all breathers must discharge into a catch tank.
- d). May be machined to maintain deck height.

5.6 CYLINDER HEAD (INCLUDING VALVES AND VALVE GEAR)

- a). Non-standard rocker covers are permitted providing they in no way improve the performance of the engine. Water passages are not permitted in rocker covers.
- b). Standard valve spring retainers must be used, only single valve springs are permitted. Shims are permitted, otherwise valve springs are free.
- c). Push-rods, rockers, tappets, pedestals and shafts must remain standard except that recontouring of the valve stem contact pad on the rocker arm is permitted providing the maximum specified lift at the spring cap is not exceeded. Rocker shaft springs are free.
- d). Maximum permitted lift at the spring cap with zero tappet clearance: inlet 9.042mm, exhaust 9.093mm. Maximum permitted lift at the top of the push rod: inlet 5.917mm, exhaust 5.943mm.

- e). Valves must remain standard, no reprofiling or polishing is permitted. The original 45° seat angle must be maintained. Distance apart at centres 39.12 ± 0.5mm.
Maximum face diameter, inlet 39.62mm; exhaust 34.00mm.
Overall length inlet 110.92 ± 0.5mm.
Overall length exhaust 110.61 ± 0.5mm.
Valve stem seals are optional.
- f). 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 diameter at manifold face: inlet 36.12mm, exhaust 29.41mm.
Inlet and exhaust port diameter may be exceeded if the original casting is visible and untouched at the gasket face.
- g). It is permitted, as means of repair, to replace damaged valve guides and valve seats by replacement valve guides and valve seat inserts, all to standard dimensions

5.7 COMPRESSION RATIO

- a). The maximum compression ratio will be controlled as follows:
- (i). Minimum combustion volume in piston 41cc (with piston at TDC in cylinder and no account taken of volume down from the crown to the top piston ring).
 - (ii). Standard Ford cylinder head gasket Part No. 781M 6051 AA / 931M 6051 AA minimum compressed thickness 0.85mm, minimum diameter of cylinder head aperture 82.50mm.

- (iii). Pistons must not protrude above the cylinder block face at TDC. The cylinder block surface may be machined.
- (iv). Maximum permitted protrusion of the valves into the combustion chamber 1.2mm.

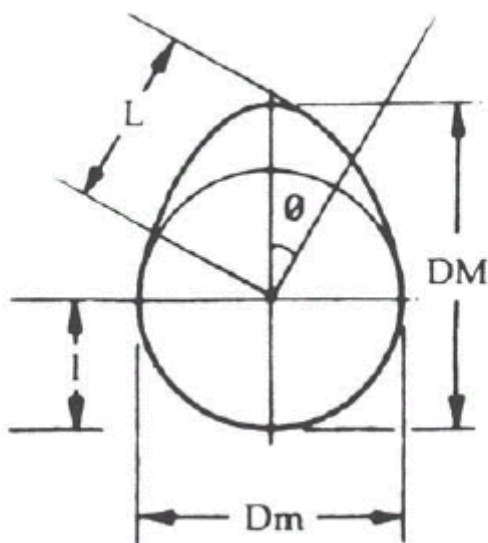
5.8 CAMSHAFT

- a). The only permitted camshaft is the Ford production camshaft for the 1600 GT "Kent" engine.
- b). The camshaft must remain entirely unmodified. It must be fully manufactured and ground to the Ford Motor Company profile. It is prohibited to grind from blanks, regrind or reprofile. Tuftriding or Parkerising is permitted.
Shot peening, shot blasting or polishing are prohibited. Offset dowels are permitted.
- c). The cam profile is defined by determination of lift (L-l) against a flat footed follower at various angles (\emptyset). Maximum lift at all points on the camshaft must not be exceeded.

Standard Ford tolerances apply to the following camshaft drawing:

Dimension	Symmetrical	
	Inlet	Exhaust
DM (max)	33.60mm	33.65mm
Dm	27.78mm	28.15mm
Lift at 0°	5.37mm	5.89mm
Lift at 5°	5.81mm	5.85mm
Lift at 10°	5.64mm	5.67mm
Lift at 15°	5.38mm	5.41mm
Lift at 20°	5.00mm	5.03mm
Lift at 30°	4.01mm	4.04mm
Lift at 40°	2.69mm	2.77mm
Lift at 60°	0.46mm	0.61mm
Lift at 90°	0.05mm	0.20mm

Angle between major axes of inlet and exhaust cams:
109°.



5.9 PISTONS

- a). Pistons must be standard Ford production pistons for the 1600cc engine, unmodified in any way except for balancing and as detailed.
- b). All three piston rings must be fitted, piston rings must be standard production or similar replacements, i.e. the compression rings must be one piece, 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.
- c). Localised machining of the bowl including valve relief and gudgeon pin bosses of the piston to achieve volumetric and weight balance and minimum weight is permitted.
Minimum weight complete with piston rings and gudgeon pin: 520gm, weight of gudgeon pin: 115 ± 2.0 gm.

5.10 CONNECTING RODS

- a). Connecting rods must be standard Ford Part No. 2737E 6200 B. 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) 640gm.

5.11 CRANKSHAFT

- a). A standard crankshaft must be used. Spot machining to achieve balance is permitted. Tuftriding, shot peening and shot blasting are permitted. Polishing is prohibited. Crankshaft minimum weight: 11.2kg.

- b). Crankshaft pulley is free as is tooth belt drive.
- c). It is not permitted to alter the number of bearings or fit bearings of less than standard production width.
- d). Standard oversize and undersize bearings are permitted.
- e). The rear main journal may be fillet rolled in the radius

5.12 FLYWHEEL AND CLUTCH

- a). The flywheel and clutch assembly must be standard components. To achieve minimum weight and balance, material 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. It is permitted to use a similar pattern replacement clutch (i.e. conventional single diaphragm spring) driven plate with shock absorber springs. Organic friction material only is permitted. Racing clutches are prohibited.
- b). Flywheel bolts are free and locating dowels are permitted.
- c). It is permitted to secure the starter ring to the flywheel.
- d). Flywheel and clutch assembly minimum permitted weight: 13.16kg. (including all flywheel and crankshaft mounting bolts).

5.13 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.

5.14 COOLING SYSTEM

- a). A liquid cooling system is mandatory but radiator and water pump are free.
- b). The radiator, if housed in or incorporating a cool air scoop or deflector, must comply with bodywork regulations.

5.15 FUEL PUMP

- a). Only the standard mechanical fuel pump for the engine is permitted.
- b). Fuel pipes are free. Fuel cooling radiators are permitted, within safety regulations, but must be mounted within the main chassis frame.

5.16 DISTRIBUTOR

- a). Distributors are free providing they retain the original drive and location.
- b). 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.
- c). 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.

6. SUSPENSION

- a). The following parts must be of alloy steel or other ferrous material: wishbones, rockers, push and/or pull rods. All other stress bearing components must be metallic with no composite materials allowed. It is permitted to incorporate suspension mounting points on the engine and transmission assembly.
- b). Active suspensions are prohibited, as is any system which allows control of the flexibility of the suspension springs, shock absorption and trim height when the car is moving.
- c). Anti-roll bars for front and/or rear suspension may be capable of manual adjustment by the driver when seated in the car.
- d). Simple ovalised tubes which have the same section top and bottom are not considered to be an aerofoil.

7 BRAKES

Only brake discs made predominantly from Ferrous material are permitted. Calipers must be of Ferrous material with a maximum of two working cylinders per calmer. Brake pad materials, including carbon metallic, are free.

8 SHOCK ABSORBERS

Light alloy casings and/or separate reservoirs for fluid/gas are prohibited, otherwise free. Any form of active damping is prohibited. Any method of altering the damper performance by the driver whilst seated in the car is prohibited. The shock absorber casing is defined as the item which contains the piston, fluid/gas, and moving parts which control the damping action.

9 STEERING

The steering must consist of a mechanical link between the driver and the wheels, rear wheel steering prohibited, otherwise free.

10 WHEELS & TYRES

- a). 13 inch diameter steel wheels with a maximum rim width of 5.5 inch are the only wheels permitted. They must be of standard manufacture but the off-set may be altered. (It is recommended that weekly checks for cracks be carried out and that the wheels be replaced twice a year).
- b). The only tyres permitted are those listed in the Sporting Regulations for the event. Minimum tread depth 1mm at the start of each practice session and race.
- c). Tyre warmers are not permitted. Tyre covers whose only function is to protect the tyre in the paddock area are allowed. Tyre warmers found at the circuit will be judged to be available for use.

11 TRANSMISSION

- a). 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.
- b). Rear wheel drive only is permitted.
- c). Final drive ratio is free.
- d). Torque biasing, limited slip and locked differentials are prohibited. Non-ferrous differential components prohibited.

- e). Gear change must be manual in operation. The gearchange must use the conventional 'H' pattern gearchange gate. Any gear change mechanism that only allows sequential selection of gears is not permitted.
- f). The only position for the main gear cluster will be wholly behind the rear axle output shaft centre line, and in line with the crankshaft centre line. Transverse, vertical, or other non in-line configuration will not be allowed.

12 FUEL SYSTEM

- a). Tanks outside the chassis frame must comply with FIA Spec FT3.
- b). Inboard tanks, covered externally with a fireproof coating, are acceptable for events of less than 70km.
- c). Protection must at all times comply with J20.1.1 and E 13.2.3 (Bulkheads). A metal tank coated with GRP does not comply.
- d). Maximum capacity 41 litres unless carried in FIA spec FT3 tank or better.
- e). No fuel can be used which exceeds BS 7800: 1992 (Super Unleaded), or BS 4040 (Premium Leaded) or equivalents outside the UK. A mixture of fuels is not allowed. Event regulations are allowed to specify a single source fuel which meets these minimum standards, but do not exceed it.
- f). At the end of practice and the race at least 3 litres of fuel from the tank of the competing car must be available to the scrutineers for analysis. Compliance with minimum weight for the car will be taken before the fuel is removed.

13 STARTING

- a). Compulsory electric starter with electrical source of energy carried on board the car, and able to be controlled by the driver when normally in his seat.
- b). A supplementary external source of energy temporarily connected to the car may be used to start the engine whilst in the pit area.

14 WEIGHT

Minimum car weight at any time during the competition
420Kg

15 ENGINE SEALING

All engines should have provision for scrutineer's wire seals. 1/16 inch dia. holes predrilled in readily accessible locations on installed engines must be available. Failure to comply renders the entrant liable to a fine.

- a). Sump - two holes through the cylinder block/ sump joint flange, one either side of the engine.
- b). Timing Cover - at least two retaining screw heads must be cross drilled.
- c). Rocker Cover - at least two retaining screw heads 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.
- f). Bellhousing - 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.

16 MISCELLANEOUS

- a). Use of titanium, high strength composites, and similar materials is prohibited.
- b). Electronic dashboards and Data logging equipment are allowed subject to them having no influence whatsoever on the behaviour of the car during competition. All information obtained from any Data logging or storage equipment shall be made freely available to the Scrutineer on request.
- c). Competitors are reminded that only modifications or additions specifically covered by these regulations are permitted. Engine components not covered by these regulations must remain completely standard and unmodified. In cases of dispute on engines, reference will be made to Ford Motor Company Limited drawings.
- d). Vehicles defined in these regulations are required to comply with the section of the RAC MSA yearbook covering General Vehicle and Race Vehicle which apply to single seater racing cars, a summary of which is given in Appendix

PRE-1974 FORMULA FORD 1600

1 DESCRIPTION

Single seater racing cars complying with current Formula Ford 1600 regulations, and these regulations, manufactured prior to 1st January 1974.

2 CHASSIS

The chassis specification must remain fundamentally unaltered from original manufacture. Wheelbase, Track, and pick-up points must remain to manufacturers specification.

3 PERMITTED MODIFICATIONS

To current Formula Ford-1600 regulations.

- 3.1 Any modification of which the primary purpose is safety or driver comfort.
- 3.2 Bodywork is free within FF-1600 dimensions.
- 3.3 Coil springs, shock absorbers, anti-roll bars and steering rack are free providing they fit to the same original locations.
- 3.4 Wheel off-sets may be varied to alter track dimensions by a maximum of 3 inch.
- 3.5 All transmissions in production before 1st January 1974 in FF are permitted.
- 3.6 Make and type of drive shaft is free.
- 3.7 The number, type and location of radiators is free.

4 MISCELLANEOUS

4.1 Cars may be updated to the specification of the latest model built by the manufacturer which appears in the list of eligible vehicles (e.g. Merlyn Mk1 1A up to Mk24 specification).

4.2 ELIGIBLE CARS if built prior to 1st. January

1974

Alexis Mk 1 4B to 24B

Cougar

Crossle 1 6F & 20F

DRW Mk8

Dulon LD4, LD4A to LD4C, LD9, MP15 & MP1 5B

Eldon Mk8, Mk10 to 1 0C

Ginetta G18, G1 8B

Hamlen FF69

Hawke DL2A, DL2B, DL9, DL10, DL11

Huron FF

Image FF1

Jamun T2, T3

Jomic Mk2A

Jomo

Lola Mk5A, T200, T202, T204

Lotus 51, 61, 61M, 61R, 61X, 69

Macon

Matek

McNamara

Merlyn Mk9, Mk11A, Mk17, Mk17A, Mk20A, Mk24

Mirage M5

Mistrale

MRE FF72, FF73

U2 Mk9

Nike Mk10B (prior to 1.1.74)

Nomad KH/FF16

Norvic
Oscar
Palliser WDF1, WDF2, WDF3
Ray 71, 72, 73
Rostron CT2, CT3, CT4
Royale RP3, RP16, RP1 6A
Titan Mk4, Mk5, Mk6A to 6C
Van Diemen RF73
Specials
Brabham BT21 /28
Chevron B1 5/17
March 718/2
Varo (Lotus 22 derivative)