

ACU Formula Two Sidecar Specifications. Nov / 03

Introduction: The object of this specification is to make use of cheaper, more readily available engine units of theoretically similar power outputs and of widely different configurations and hopefully provide less expensive racing of a more traditional kind to the benefit of the competitors, constructors and spectators. Hub-centre steering, remote steering linkages and the use of articulated joints in the steering mechanism are excluded.

Engine Types.

The only permitted engines for this class are:

- Up to 350cc, two-stroke, twin cylinder.
- 501-600cc, four-stroke, four cylinder, production based.
- Rotary engines are not permitted.
- Over-boring is not permitted.

Induction Systems.

- Up to 350cc two-stroke: 39mm maximum carburettor choke size.
- 501-600cc four-stroke

Carburettor engines: Any carburettor is permitted. A restriction of 32mm maximum diameter over a minimum of 24mm length of the induction tract between the butterfly/slide and the cylinder head must exist.

- 501-600cc four-stroke.

Fuel-injection engines:

Fuel injection systems are permitted using ONLY the throttle-bodies as homologated for the engine concerned.

Throttle-bodies intake insulators may be modified.

The injectors must be standard units as on the homologated engine.

Bell-mouths may be altered or replaced.

Variable length intake tract devices that function while the engine is operating are not allowed

Butter-fly cannot be changed or modified.

Fuel pump is free.

Homologated pressure regulator must be used unmodified.

The fuel injection management computer chip (EPROM) may be changed.

The use of flash memory ("flash ram") for fuel injection mapping is allowed.

Ignition/engine control system (CDI) may be modified or changed.

The sum of the cross-sectional areas of all air intakes into the air-box, may not exceed that of the homologated production motorcycle. Measured at the point of entry into the air-box.

General.

The sidecar may be placed either side of the motorcycle. Hinged sidecars and steerable sidecar wheels are forbidden. Neither the rider or passenger may be attached to the machine. Remote steering linkages and the use of articulated joints in the steering mechanism are excluded. By definition an articulated joint is one allowing movement in more than one plane.

- (i) The three wheels may be disposed as to give two or three tracks.
- (ii) If three tracks are made then the centres of the tracks of the motorcycle shall not be more than 75mm apart.

- (iii) A passenger must be carried and must always be protected from the road wheels and both primary and final drives either by mudguard or some other means.

Construction.

The construction of the frame shall be of good quality steel tube. The tubing used for the construction of the frame may be of a circular or non-circular section. If circular the outside diameter shall not exceed 4 inches. If non-circular, the maximum cross-section shall not exceed 4 inches measured at right-angles to any flat face.

The swing-arm is not restricted by the above.

Reinforcement of the steering-head is allowed to a maximum of 10 inches from the centre line of the steering-head.

Monocoque construction is forbidden. The use of composite construction is forbidden with the exception of the sidecar platform. (I.e. aluminium or carbon-fibre skinned honeycomb).

The use of titanium in the construction of the frame, front forks, handlebars, swing-arms and wheel spindles is forbidden.

For wheel spindles the use of light-alloys is also forbidden.

Engine position.

The engine must be positioned in such a way that the centre-line of the engine (by definition a position midway between centre-lines of outermost cylinders) shall not exceed 160mm beyond the centre-line of the rear wheel of the motorcycle.

The engine must be positioned behind the steering-head and in front of the rider.

The drive must be transmitted to the road through the rear wheel of the motorcycle.

An engine positioned behind the rider and in front of the rear wheel is forbidden.

Dimensions.

Weight: minimum 300 lbs (136.5kg) without fuel. The addition of ballast to reach this weight is forbidden.

Width: overall maximum 62 inches (1570mm)

Wheelbase: maximum 65 inches (1651mm).

Track: minimum 31.5 inches (800mm) and maximum 43.5 inches (1100mm). The distance is measured from the centre of the track left by the rear wheel to the centre of the track left by the sidecar wheel.

Height: overall maximum 31.5 inches (800mm).

Ground clearance. The ground clearance measured over the entire length and width of the vehicle race ready, fully loaded with rider, passenger and fuel must be not less than 65mm with the handlebars in a straight position. No device is permitted to reduce the 65mm ground clearance during the course of the event.

Streamlining and Bodywork.

The streamlining must be easily detachable for scrutineering. Aerofoils or spoilers are not permitted on streamlining.

The forward extremity of the streamlining shall not be more than 400mm in front of the line taken from a vertical tangent to the front tyre.

The extreme rear edge of the streamlining must not be more than 400mm to the rear of the line taken from a vertical tangent to the rear tyre.

The provision of coachwork or streamlining is optional, but the vehicle must have accommodation for a passenger and the coachwork or streamlining shall not impede complete freedom of movement by the rider or passenger at all times.

Whatever the position of the handlebars, there must be a space of at least 20mm between the streamlining and the ends of the handlebars or any other parts of the steering mechanism or front wheel.

A solid and effective protection must be fitted between rider and engine, this protection must prevent direct contact between the riders body or clothing and escaping flames or leaking fuel or oil.

The fairing must be mounted in such a way as to ensure the integrity of the whole installation in the event of failure of any individual mounting.

Passenger Platform.

Minimum dimensions 800mm by 300mm measured 150mm above the platform.

Rider.

The rider in the normal riding position must be completely visible, with the exception of their arms, legs and feet from above.

Passenger.

The passenger must be able to lean out to either side of the sidecar, for this purpose the vehicle must be fitted with suitable hand-holds for the passenger to hold onto when leaning out.

The hand-holds must be of the CLOSED-LOOP type, a single projection hand-hold is not permitted.

Air Intakes.

Cooling air intakes must be so constructed that there is no forward projection/protrusion to catch or foul in the event of an accident.

Oil and coolant containment. In the area directly below the engine, the oil containment tray must be constructed to hold, in the case of an engine breakdown at least half of the total oil and engine coolant capacity used in the engine (min 5 litres).

The surrounding edges of the tray must be at least 30 mm above the bottom of the tray.

This tray should incorporate a maximum of two holes of 25 mm diameter and be closed with rubber plugs. These holes must remain closed in dry conditions, and only opened when wet-race conditions have been declared by the clerk of the course.

The frontal edge from the oil tray wall must be extended upwards to arrive just below, (within 20 mm) the exhaust ports of the engine.

Holes for engine mounts (hangers) must be sealed.

From a vertical view, the engine must be located completely inside the oil tray platform.

The rear wheel must be protected from any possible oil spray. To make this protection, the engine and the rear wheel compartment must be separated.

This separation must be created by installing a solid divider (wall) running from the top of the inside of the bodywork to the bottom of the oil tray. This divider (wall) must overlap the rear edge of the oil tray down to the bottom.

All machines must use this tray.

All sidecars shall attach oil-absorbent materials of no less a quality than 3M product T156 or CEP Sorbents product CEP-EP100.

This material shall be securely fixed to the following areas of the sidecar.

1. The entire oil-tray, both the bottom and inside walls of the same. The volume of material used in this area, according to the manufacturer's specifications, shall absorb not less than 3 litres of oil.
2. Any bodywork directly covering the engine

In the event that oil is absorbed by the material, it must be replaced before the next track session.

The material must be attached in such a way that it should be easily replaced, yet must not become dislodged whilst on the track, and its effectiveness is not inhibited, i.e. if an adhesive is used it must not clog the material, causing it to lose its absorbent properties.

All absorbent material shall be non-flammable by design.

Oil-lines containing positive pressure, if replaced, must be of metal reinforced construction with swaged or threaded connectors.

Oil coolers must not be mounted on or above the bodywork of the sidecar.

The location of the oil tank and oil cooler should be placed in a location where it is least likely to be damaged in an accident.

Air-box. An air-box must be used with all four-stroke engines.

The air-box intake size is not restricted, except for fuel injected engines.

The air-box must completely close around the induction bell-mouths.

The carburettors or throttle-bodies may be entirely within the air-box.

The engine must have a closed breather system (see diagram C)

The engine breather must be connected and discharge in the air-box.

The air-box must cover and collect fluids discharged from the bell-mouths.

The air-box must be constructed in such a way as to prevent any oil discharged in the air-box from spilling on the track.

This oil containment must hold a minimum of 1000 cc of oil.

The air-box must be sealed to prevent any spillage of oil or fuel.

Oil catch tanks.

Two-strokes. Where an oil breather pipe is fitted, the outlet must discharge into a catch tank located in an easily accessible position and which must be emptied before the start of the race. The minimum size of catch tank shall be 250 ml for gearboxes.

All four-stroke motorcycles must have a closed breather system. The oil breather line must be connected and discharge in the air box.

Wheels.

The minimum diameter of an inflated tyre must be 400mm. All wheels must be of metal construction, any modification to the rim or the spokes of the original cast or composite wheel as supplied by the manufacturer is prohibited.

Steering.

Steering of the front wheel must be accomplished by non-adjustable handlebars securely fixed to the steering head of the motorcycle. They must be secured to steering members turning the front wheel and its supports directly with no intermediate push or pull rods.

Handlebars and all steering bearings must be located on the sprung portion of the suspension.

Any form of remote steering is forbidden.

Handlebar width 450mm (minimum).

Steering lock angle each side of the straight ahead position, and measured horizontally at ground level to be 20 degrees (minimum).

Whatever the position of the handlebars, the front wheel must never touch the streamlining.

Handlebar clamps must be carefully radiused and engineered so as to avoid fracture points in bar.

Throttle Controls.

Throttle controls must be self-closing when not held by the hand.

Control Levers.

All handlebar levers (clutch, brake, etc) must be ball-ended. The ball diameter must be at least 19mm permanently fixed and forming an integral part of the lever.

Front Suspension.

The front suspension is to be either leading or trailing fork, or links with the wheel equally supported on each side.

Minimum suspension travel to be 20mm.

Brakes. A sidecar brake is mandatory. The brake system must consist of:

- a) One main system with at least two circuits operating separately. One of the circuits must operate on at least two of the three wheels.
- a) An emergency system operated by a handlebar lever with a simple circuit operating on either the front or rear wheel of the motorcycle.

Only ferrous brake discs allowed.

Tyres.

For all meetings the use of slick tyres is permitted. The wheel rim shall be at least 254mm in diameter and 64mm in width. The diameter of the tyre must be at least 400mm and the width 100mm. The maximum front tyre width is 220mm.

Slick Tyres. The surface of a slick tyre must contain two or more hollows at 180 degree intervals or less, indicating the limit of wear on the center and shoulder areas of the tyre.

When at least two of these indicator hollows become worn on different parts of the periphery, the tyre must no longer be used.

Mudguards and Wheel protection.

The rear driving wheel must be covered down to the level of the sidecar platform on the nearest side to the sidecar wheel, and to the top of the rear wheel rim flange on the outside.

The rear facing section of the seat must cover the rear driving wheel down to the level of the rear wheel spindle.

The sidecar wheel must be enclosed from the sidecar platform and level with the sidecar platform on the outside and around the periphery. Provision for checking of the sidecar wheel tyre pressure is allowed.

Exhaust Pipes.

The exhaust system must fulfill all the requirements concerning noise control.

Exhaust fumes must be discharged towards the rear but not in a manner as to raise dust, foul the tyres or brakes or inconvenience a passenger or any other rider.

The furthest extremity of the exhaust pipe must not exceed a vertical line drawn at a tangent to the rear edge of the sidecar platform.

On the side opposite a sidecar the exhaust pipes must not extend beyond the streamlining.

On the other side the exhaust pipes must not extend beyond the width of the sidecar. Exhaust pipes must be fitted/positioned so that it is impossible for them to become entangled with another machine.

Fuel Tank.

Fuel tanks must be sufficiently independently protected from the ground.

A non-return valve must be fitted to the petrol tank breather pipe. This pipe must discharge into a suitable catch tank, minimum capacity 500 ml.

The fuel filler cap must be fitted in such a way that it does not protrude from the fairing and cannot be torn off in an accident.

Battery.

The battery must be covered in such a way that neither the rider or the passenger can come into contact with the battery or its contents.

Cut-out Device.

A cut-out device must be fitted which must be in a prominent position within easy reach of the rider and a marshal.

The device must be prominently marked and may be a conventional switch or a push-button type. If of a push type it must "kill" the engine when pushed and not rely on the button being held down for any length of time.

Any electric fuel pump must be wired in such a way as to cut out if the engine "kill" device is operated.

Fog lamp. Sidecars must be equipped for all the duration of the event with a functional rear-facing red anti-fog lamp, measuring a minimum of 30 sq. cm., and producing a minimum of 1500 MCD light.

The light must be installed at least 100 mm off the ground, located in the area between the back wheel and the sidecar platform.

The light must be mounted on a part of the suspended body, (not on any unsuspended parts) and ensure no obstruction from the fairing and/or the passenger.

Traction Control.

Any electronic traction control system is forbidden.