

Gravity Sidecar Technical Specification

Revision History

Version	Date	Notes
1.0	26 Nov 2009	First Version
1.1	25 Jan 2010	<ul style="list-style-type: none"> • Add details of license • Minor spelling corrections
1.2	14 Nov 2011	<ul style="list-style-type: none"> • Left hand car only • Minimum tyre widths • No plastic wheels
1.3	5 Jan 2012	<ul style="list-style-type: none"> • Revised in line with CSEx soapbox tech' spec' 2.3
1.4	25 Jan 2013	<ul style="list-style-type: none"> • Clarify passenger visibility (rule 7) • Revised in line with soapbox tech spec
1.5	23 Mar 2014	<ul style="list-style-type: none"> • Removed left hand car requirement. • Removed maximum width and length
1.6	12 Jun 2014	<ul style="list-style-type: none"> • Minor rewording of brake requirement to allow dual brake systems operating on the same wheel



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2. DISCLAIMER

No expressed or implied warranty of safety shall result from publication of or compliance with this specification.

This specification is not a guarantee against injury or death to any participant, spectator or official.

Event organisers should satisfy themselves that this specification is appropriate for their needs.

Event organisers shall be allowed to impose any further restrictions and to permit deviations from any of these specifications. Any deviations from this specification are left to the discretion of the event organisers. No expressed or implied warranty of safety shall result from any such deviation from this specification.

4. APPLICATION AND INTERPRETATION

In all matters relating to the interpretation of these rules, the decisions of scrutineers and event organisers will be final.

Competitors intending to exploit any apparent loopholes or ambiguities in order to gain an unfair advantage or to avoid having to comply with its spirit or intent are strongly advised to discuss their plans with the Technical Officer for the event well in advance in order to avoid disappointment.

Should a vehicle fail to conform to this specification on a technicality, the organisers may allow it to take part provided that they are satisfied that all safety related conditions have been met. Such vehicles will not be eligible for any race prizes. The decision to exercise this option is entirely at the discretion of the organisers and is intended to apply only to minor non-conformance to specifications that are not safety related (e.g. vehicle dimensions, etc.). Gross technical non-conformance without prior agreement or failure to reach the minimum safety standards will result in the vehicle being excluded from the event.

These rules apply only to the construction of the vehicles. They do not specify to how any competition involving these vehicles is conducted. Event organisers are free to run their own events as they see fit and make their own decision on matters such as age limits, whether or not pushing is allowed, how many people must be in a team, whether multiple drivers are allowed, etc.

This specification and specifications derived from it should not be used in isolation. It should be supported by a competent Risk Assessment and Safety Plan carried out by the event organisers.

5. PROPULSION

The vehicle must not be fitted with any devices that provide motive power to the vehicle.

Note that this does not preclude event organisers, at their discretion, from allowing external pushing by team members or event marshals at the start line or at any point on the course if necessary.

6. DIMENSIONS AND WEIGHT

- Minimum track width - 700mm
- Maximum weight of vehicle and ballast - 75kg
- Maximum wheel diameter: 20 inches (nominal)
- Minimum tyre width – 44mm* (see below)

The track is the shortest distance between centre of the sidecar tyre where it contacts the ground and a line drawn between the centre of the front and rear tyre contact patches.

Wheel diameter includes the fully inflated tyre and is taken from the nominal diameter as marked on the tyre.

A tolerance of 5% shall be allowed on the measurement of the maximum weight. **Any** deviation over this margin will be classed as a failure to meet the technical requirements.

* The minimum tyre width rule is at the sole discretion of the event organisers, but is *strongly recommended* for events where heavy braking from in excess of ~45mph is likely to be required. Owing to the misleading nature of nominal tyre widths as marked on tyres, the *actual measured width* of the tyre should be used for the purpose of assessing compliance with this specification. Competitors will be informed if they are required to comply with this rule.

7. WHEELS AND TYRES

A sidecar outfit will have a front wheel, a back wheel and a sidecar wheel.



All wheels must be in load bearing contact with the road during normal operation.

The front wheel must steer.

The rear wheel must be directly behind the front wheel.

The spindle of the sidecar wheel must not be behind the spindle of the rear wheel, and may not be forward of a point half way between the front and rear wheels.

The top half of the rear wheel must be covered on both sides. The sidecar wheel must be covered on the inboard side.

Tires must be in good condition with no visible cracks in the sidewall or tread.

Wheels with plastic spokes are not allowed.

8. CHASSIS

The wheels must not move about their "direction of travel" axis relative to the chassis. Linkages which allow any of the wheels to change their angle of camber or caster while in motion are not allowed.

Fairings are allowed, but they must not impede the driver or passenger from entering or exiting the vehicle. It must be possible for the driver and passenger to mount and dismount the vehicle without opening or closing any access hatches, panels, doors, canopies, etc.

The driver's torso and the passenger's entire body must be visible from above at all times. The use of transparent materials to evade this rule is not permitted.

9. BRAKES

There must be at least two independent brake systems.

The brakes must be capable of holding the vehicle on a dry horizontal road surface, when laden with crew and any ballast, against a horizontal load of 500 Newtons (51KgF) exerted on the front towing eye.

The brakes must be designed such that failure of the brake operating on one wheel does not result in complete failure of the braking system.

Brakes must not act on either the tires or on the road surface. The primary brakes should be designed such that they can be operated effectively while keeping both hands on the steering control.

10. STEERING

The vehicle must be steered by a non-adjustable handlebar that is directly fixed to the front wheel mounting.

The steering must not be overly sensitive, have excessive free play or any characteristic tending to promote instability.

11. DRIVING POSITION

Driver must sit or kneel astride the line between the front and rear wheels.

The passenger must be positioned to the side of the driver and should be able to lean out of either side of the sidecar.

12. BODYWORK AND SAFETY FEATURES

1. General

There must be no sharp edges or protrusions either inside or outside the vehicle.

No glass, Perspex or other materials that would shatter or cause injuries to drivers and spectators in the event of a crash can be used in the construction of the vehicle.

Any protrusions must be designed and fitted such that puncture injuries cannot happen.

Bodywork and controls must not impede the driver or passenger from exiting the vehicle unaided.

No items (e.g. tools, etc.) may be carried loose within the vehicle. All items must be securely stowed.

There must be no weaponry or items that can be propelled or released from the vehicle (e.g. water, spikes, paintballs, ballast, tools, etc.)

The passenger must be free to lean out of either side of the sidecar. To this end, the vehicle must be equipped with suitable facilities for the passenger to hold on to at all times, including when leaning out on either side.

2. Visibility and Warning

The driver must have good all round vision, including to both sides and the rear. If necessary, mirrors should be fitted in order to achieve this.

The vehicle must have a clearly audible warning device. It must be possible to operate this device while keeping both hands on the steering control.

3. Batteries

If batteries are used to power the horn or any other electrical equipment, they shall be securely fitted.

The following battery types are not permitted;

- Lithium Ion and Lithium Polymer batteries (this does not apply to small devices with internal batteries rated 6.0 Watt Hours or less)
- Wet lead/acid batteries

Gel filled sealed lead acid batteries are allowed.

13. TOWING

1. Tow Points

Vehicles must be fitted a permanent towing eye at the front and a tow rope guide at the rear.

Front Towing Eye

The front towing eye must be;

- clearly visible and easily accessible
- made of;
 - steel bar of at least 10mm diameter
 - or –
 - steel plate with appropriate hole for an M10 clip hook so long as the minimum 10mm all round thickness is retained
- of size and location such that a M10 clip hook can be easily attached to it
- permanently attached during the course of the event

Rear Tow Rope Guide

Vehicles must have a tow rope guide at the rear through which the tow rope can be passed to stop it from fouling on the wheels of the cartie. This does not need to be load bearing and will not be used as a tow point. It is to stop the tow rope from moving from side to side during towing.

The rope guide must be;

- clearly visible and easily accessible
- directly in line with the front towing eye

It should be possible to quickly and easily pass the tow rope through it (e.g. a snap hook or similar).

The towing eye and tow rope guide must be positioned to allow the tow rope to pass freely to the rear of the vehicle without fouling the wheels, the steering or the brakes, and should allow sufficient clearance that the rope is not damaged by the road surface.

2. Tow Rope

Each team shall provide at least one tow rope sufficient to allow between 2.5m and 3.0m separation between the rear of their vehicle and the tow point of the following vehicle. Typically this means that the tow rope will need to be between 5m and 6m long. The tow rope shall be either;

1. A 14mm polypropylene rope eye spliced at both ends
or
2. A BSEN1492 compliant duplex lifting sling rated to at least 1 ton

In addition, each team shall provide;

- At least one 1 ton rated D or bow shackle
- At least one M10 clip hook

The rope, shackle and, clip hook must be securely stowed in the vehicle when not in use and easily accessible to the event crew when needed for towing. Towing equipment must be stowed in such a way that it cannot interfere with the normal operation of the vehicle.

14. BALLAST

Vehicles may carry no more than 15Kg of ballast. All ballast must be solid, and it must be securely bolted to the vehicle. It may not be altered after scrutineering.

The driver and passenger may not carry any ballast on their person.

15. CLOTHING

The driver and passenger's body and limbs must be fully covered by suitable abrasion resistant clothing such as motorcycle leathers or similar.

Sturdy footwear and abrasion resistant gloves must be worn.

A properly fitted neck support is strongly advised at all times when competing or when being towed.

The driver and passenger must wear a helmet at all times when competing or when being towed. The helmet must at least comply with, and carry the appropriate markings for, any one of;

- BSI 6658-85

- BSI 2495-77
- EN 22.05
- DOT FMVSS 218
- SNELL M2005, M2010, SA/K2005 or K-98
- ACU Approved

The helmet must be “full- face”.

The helmet must be in good condition and worn to the manufacturers recommendations.

For the avoidance of doubt; skateboard helmets, mountain bike helmets, cycle helmets, riding hats, saucepans, Tupperware containers, Viking helmets (whether fitted with horns or not), etc. are not acceptable. Only proper motorsport/motorcycle helmets are allowed.