Gravity Sidecar Technical Specification

Revision History

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<tr>
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<td>• Add details of license</td>
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<td></td>
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<td>• Minimum tyre widths</td>
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<td>• No plastic wheels</td>
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The most recent revisions are highlighted in purple (1.2) and blue (1.3).
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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 a participant, spectator or official.

The event organisers shall be allowed to permit deviations from any of these specifications and to impose any further restrictions that in their opinion do not lower these requirements. 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.
3. APPLICATION

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 this document 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 well in advance of the event in order to avoid disappointment. In all matters regarding the interpretation and application of the rules detailed in this document, the organisers’ decision is final.

4. PROPULSION

The vehicle must be powered by gravity alone. Devices which use any form of stored energy for propulsion, whether that energy be stored prior to or during the run, are not allowed.

5. DIMENSIONS AND WEIGHT

- Maximum overall length - 2500mm
- Maximum overall width - 1200mm
- Minimum track width - 700mm
- Maximum weight of vehicle and ballast - 75kg
- Maximum wheel diameter – 550mm
- Minimum tyre width – 44mm

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. All wheel dimensions will be taken as the actual measured values. The nominal sizes marked on the tyre wall will not be used for the purpose of assessing compliance with this specification.

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.

6. 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 sidecar wheel must be on the left of the front and rear wheels.

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.
7. 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 body must be visible from above at all times. The use of transparent materials to evade this rule is not permitted.

8. BRAKES

At least two of the wheels must have its own independent brake system.

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.

9. 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.

10. 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. To this end, the vehicle must be equipped with suitable facilities for the passenger to hold on when leaning out.

11. 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.

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 when leaning out. A passenger handhold on the rear outside of the outfit, opposite the chair and to the back of the driver, is compulsory.

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.

12. TOWING

Note that rule 12.1 (Tow Points) will normally apply at all events but that rules 12.2 (Tow Rope) and 12.3 (Attachment Procedure) apply only at Cairngorm. For other events, please contact the event organiser for information on towing procedures and requirements.

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
- 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 (Cairngorm Only)

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. This tow rope shall be either;

1. A 14mm polypropylene rope eye spliced at both ends
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

Teams may also provide bungee “shock absorbers”.

There may be a limited stock of towing equipment available for purchase at the event, but it is strongly recommended that teams bring their own spares.

The rope, shackle, clip hook and bungees 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.

3. Attachment Procedure (Cairngorm Only)

When attaching your vehicle on to be towed:

1. Use your M10 clip hook to attach your vehicle’s front towing eye to the rear loop of the tow rope in front of you. You may use bungee straps between the rope loop and your clip hook to absorb snatch if you wish.

When attaching another vehicle behind your own:

1. Use your 1 ton shackle to attach your tow rope to the rear loop of the tow rope in front of you. Do not attach it to your bungees, clip hook or your front tow point.

2. Pass your rope to the rear of your vehicle and through your rear tow rope guide. Make sure that it does not foul the wheels, the steering or the brakes.

3. Extend your rope behind your vehicle ready for the following vehicle to be attached to it.

13. BALLAST

Any ballast must be fixed securely to the vehicle.

Ballast may not be taken on or jettisoned while the vehicle is in motion.

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

14. 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
- ACU Approved

The helmet must be “full-face”.

The helmet must be in good condition and worn correctly.

For the avoidance of doubt, skateboard helmets, mountain bike helmets, cycle helmets, riding hats, etc are not acceptable. Only proper motorcycle helmets are allowed.