

Southern Cross Gliding Club Inc

Towing of Gliders Guide (TOG Guide)

Version 2011

Introduction

This document provides general guidance to assist members when towing glider trailers. It is to be read in conjunction with the “Statement of Towing Vehicle Capacity and Acknowledgement by Member”, which is available on the SCGC website.

This guide is not intended to be definitive – there is no substitute for common sense when towing glider trailers. However, members are expected to observe the requirements of these guidelines unless there is a compelling operational reason not to do so.

This guide assumes that the matters relating to the towing vehicle and trailer as referred to in the SCGC Operations manual, and the Statement of Towing Vehicle Capacity have been complied with, including:

- Any specified minimum tare weight and/or engine capacity of the towing vehicle;
- The towing vehicle is in good condition, and steering, suspension, tyres and brakes have been checked prior to the journey;
- The vehicle towing capacity and towbar/towball capacity are adequate for the intended tow;
- the glider has been derigged and loaded into the trailer correctly;
- The glider/trailer combination is properly balanced with the towbar tongue weight within limits; and
- The towing vehicle has been properly loaded with passengers and luggage distributed forwards in the car as necessary.

If there is any doubt about derigging or loading the glider into the trailer, or any of the matters referred to above, seek the guidance of an experienced member.

Before Connecting the Trailer

The trailer must be checked prior to connecting it to the towing vehicle. Examine the following items:

Registration – ensure the trailer is registered with the registration sticker properly displayed.

Brakes – ensure that the brakes are correctly adjusted and work. Confirm that the over-ride brake mechanism greased and the brake over-ride lock disengaged.

Lights – ensure they are working, without cracked or broken lenses and that the colour of the lense has not faded.

Tyres (including spares) – check that all tyres are in good condition and at the correct pressure. It is generally preferable to adopt the manufacturer’s maximum pressure in order to achieve optimal grip and less sidewall flex and roll.

Wheels – examine wheels to ensure they are in good condition and that the wheel nuts are properly tightened.

Tools – confirm that there is a suitable jack and wheel brace. Make sure you have a flashlight in case you need to inspect something at night.

Safety chains and shackles – confirm chains and shackles are in good condition and properly connected.

Tie down kit for trailer – ensure that the trailer tie down kit is available. The kit should consist of at least 5 pegs with adequate rope.

Aircraft – Confirm the aircraft is secure in the trailer. In particular, ensure that fittings are not left loose or unrestrained.

Trailer Doors - closed and secure.

Trailer centre of gravity (CG) – Ensure that the trailer CG is just ahead of the trailer’s wheels (about 10 – 20cm is best). The CG position (in cm ahead of trailer axle) is calculated as:

Noseload in kg

Multiplied by distance between towball and trailer axle in cm

Divided by trailer gross weight in kg.

Driver – ensure that the driver is approved to tow and is fit for the journey (not too tired or ill).

Time – plan the journey so that there is sufficient time to complete it comfortably. Where possible, avoid driving at night when there is an increased risk of animal hazard, and allow sufficient time for breaks every two hours.

Connecting the Trailer

Become methodical about hitching up and unhitching so that you do not forget anything. The following is a general outline which should be modified as appropriate for the trailer you are using:

Apply the trailer handbrake, remove any towball and electrical socket dust covers and security devices then wind the jockey wheel to the required height. Do not attempt to lift the front of the trailer.

Check the towball is lightly oiled (not greased).

Get a helper to stand with their hands showing you where the hitch is. If no helper is available, use a broomstick or similar to indicate the position of the hitch. Reverse slowly back using the guidance of your helper.

Over the last 30cm or so, your helper should use their hands to show you the actual distance between towball and the trailer hitch.

If you have to stop a few centimetres short, judge how far back you are going by comparing the movement of the front wheels to something on the ground.

Lower the trailer hitch by means of the jockey wheel assembly onto the towball of the vehicle.

Once the hitch appears to be locked on, lower the jockey wheel again for a few turns to lift the back of the vehicle to prove the trailer hitch is firmly connected, then fully raise the wheel before unclamping it and, finally, securely locking it fully raised. Check that the locked jockey wheel is not interfering with the operation of the coupling overrun mechanism. Where appropriate, remove the jockey wheel and store it securely in the trailer

Plug in the electrical connection. The plug only fits one way, so line up its cut-out with the lug on the bottom edge of the socket. If your vehicle has two sockets use the one with the black cover flap - the one with the white flap is for caravan supplementary electrical systems.

It is your responsibility as the driver to ensure all lights work. Turn on the car lights and check the trailer's lights. With the ignition on, make sure the correct indicators are working – car and trailer indicators not matching is a common fault – then get someone to see if the trailer brake lights work. (If you are alone, use a short stick between the pedal and the seat to hold down the brake pedal.)

Attach safety breakaway cable(s) to the rear of vehicle. This cable will apply the trailer brakes if the trailer becomes detached whilst towing. Clip the breakaway cable onto the special rings some towbars have or loop it around the bar, making sure it cannot foul the towball. Do not loop it round the towball neck unless you can find no alternative. Check that the breakaway and lighting cables have enough slack for cornering but do not touch the ground.

Ensure the tow hitch safety chain is securely and separately attached to the towbar, is not too tight and does not drag on the ground. Ensure any trailer security pins are properly attached.

Adjust both external mirrors so that a clear view down both sides of the trailer can be obtained. If this cannot be achieved, extension mirrors should be fitted.

Step back and observe the vehicle/trailer combination to confirm that the trailer is level.

Commencing the Journey

If something is going to come loose in the trailer it will probably do so quite early in the journey. Stop at the gate and look inside the trailer to confirm that everything in the trailer is still secure.

Stop at 10 km and 20 km to check the brakes and all the fittings and connections. At the 20 km stop feel the wheels to assess whether a high temperature might indicate a problem with tyre pressures, binding brakes or faulty wheel bearings.

Every time you stop, do a thorough walk-around to re-check the combination in a similar way you would pre-flight an aircraft.

While Towing

General

Avoid sudden acceleration or braking.

Never coast downhill with the car out of gear.

Do not use cruise control while towing, as it is necessary to be in full control of the vehicle and trailer at all times

Do not follow other long or heavy vehicles in close convoy: you must allow room for overtaking cars to pull in between you and the vehicle in front. Remember the towing rule that, if driving on a street without street lights, you must leave a gap of at least 60 metres between you and a long or heavy vehicle in front of you. Generally, you should leave sufficient room in front to allow an overtaking vehicle to safely pull into the gap. This means allowing a gap of at least four seconds between your vehicle and the one in front.

Anticipate that an overtaking vehicle may be driven by someone who considers your car/trailer combination to be just another car. There is a real possibility that they may grossly underestimate the distance required to overtake in the face of oncoming traffic. The best action is to just slow down and let them pass you as soon as possible.

Do not travel in the right-hand lane of a motorway with three lanes or more.

When refuelling, avoid small petrol stations and, even at large petrol stations, ensure that there is sufficient room to manoeuvre the car and the trailer. If there is any doubt at all, or if access involves crossing a dipped driveway, park outside the petrol station, unhitch the trailer and refuel your vehicle.

At all times concentrate on driving, without distractions like mobile phones, i-pads and stereos.

Braking

Avoid harsh braking as this can produce download on the vehicle-towing hitch and can lead to front-wheel lock-up, significant reduction in braking effectiveness and severe understeer. Although ABS can help prevent front wheel lock-up, moderate braking is always preferable. If your vehicle is not fitted with ABS, we suggest you learn and practice cadence braking (which involves pumping the brake pedal fairly rapidly but deliberately, to make the wheels lock and unlock, thus maintaining directional control while braking when the wheels have low traction).

Brake in a straight line whenever possible for maximum safety and control.

Do not brake sharply on a bend, as this could possibly cause the trailer to jack-knife. Reduce speed before the bend and take the appropriate gear for the speed you are doing, then gently accelerate out of the bend.

Speed

Although the maximum legal speed limit while towing is 90 kph (or less where signposted), it is club policy that a maximum speed limit of 80 kph should be adopted. The Club has adopted this policy because:

- it minimises fuel consumption;
- it leaves some power available if it becomes necessary to pull out slight trailer instabilities. Excess speed will make such instabilities worse;
- it minimises the effect of vertical motion and jolting vertical accelerations on the coupling and possible large shifts in weight on and off the rear and front wheels of the car which can dramatically diminish braking effectiveness and, in extreme cases, steering effectiveness;
- it minimises wear and tear on the glider and trailer fittings; and
- it makes it easier for overtaking traffic.

If compliance with this Club policy of an 80 kph speed limit causes inconvenience to other road users (e.g. on a highway where the legal limit is 100kph), or if it may encourage delayed drivers to risk an overtaking manoeuvre in unsafe conditions, then pull over to the side of the road and allow the line of traffic to pass unimpeded.

Due to the dynamic forces acting on the trailer, it is generally safer towing at higher speeds pulling uphill, while lower speeds are necessary going downhill. When driving in undulating country, the recommended technique is to accelerate from near the base of the hill and going uphill, but decelerate before reaching the crest and keep speed lower going downhill. Slow down before going downhill. It is much harder and more dangerous to decelerate during the downhill run.

Sway

The stability of the vehicle / trailer combination is affected by many factors, including speed, other traffic, road surface conditions, wind conditions, tyre pressures and weight distribution. It is also affected by driving technique and the driver's awareness, anticipation and attitude.

The forces acting on the vehicle and trailer combination increase exponentially with speed. At higher speeds, the effect of disturbances caused by potholes, dips in the road, wind gusts or turbulence from heavy vehicles is significantly greater. The large side area of glider trailers means that trailer sway is more likely to occur in gusty winds, or when passing close to semi-trailers or other heavy vehicles.

The best approach to trailer sway is not to let it happen in the first place by always driving at a safe speed (depending on the road conditions and traffic this could be between 60 and 80 km/h) and applying all the controls (steering, brakes and accelerator) smoothly and gently. Avoid the need to apply rapid or harsh control inputs by anticipating the required actions and looking well ahead and assessing how the traffic is flowing. Stay clear of tight traffic knots with drivers jockeying to get ahead of the pack. Inconsiderate drivers may cut across the path of others forcing them to apply brakes suddenly and you don't want to be behind one of these vehicles.

Should you detect sway developing in the trailer, do not panic. Remember that, if the vehicle is braked with the trailer displaced sideways, the trailer has its own forward momentum and may try to overtake the towing vehicle. **DO NOT BRAKE** until the combination has stabilised (unless braking is absolutely essential in order to avoid an even worse outcome)!

As each sway event is unique, there is no single correct method to resolve the problem. A successful outcome will depend upon a calm and measured response without abrupt control inputs. As a general guideline:

- Allow the car/trailer combination to decelerate gradually by lifting your foot off the accelerator.
- Only use steering input (as lightly as possible) to keep your car moving in a straight line, don't attempt to use countersteer to correct the sway, you will probably make it worse, not better.
- If, even as your speed is coming down, the sway continues to increase you will need to change your tactic. This requires the courage to do something counterintuitive (just like moving the stick forward to recover from a spin in a glider). You may need to accelerate firmly and steadily until the sway disappears, then take your foot off the accelerator until your speed comes down to your desired cruise speed.

Turning

Take great care when turning corners or making U-turns to allow for the entire length of the trailer. Take a wider turning circle than normal to ensure that the trailer clears the kerb.

Overtaking

Remember the length of the trailer when overtaking. You must have enough time and space to return the car and trailer to its correct lane.

Pulling over

When towing, braking distances are substantially increased. Allow sufficient distance to pull over and do not try to stop in a hurry.

When pulling off the road for any reason, watch for deep gutters and overhanging awnings.

Reversing

Before reversing, get out of the vehicle and check that all is clear to the rear before making the manoeuvre. Be on the look out for children and pedestrians. If possible, get someone to watch while the manoeuvre is made.

Tips for the gentle art of reversing:

- Start reversing with vehicle and trailer in the same straight line;
- Slowly reverse the trailer, turning the vehicle in the opposite direction to the one in which you wish the trailer to turn;
- As the rear of your vehicle turns away from the direction you want the trailer to travel, the rear of the trailer will turn in the direction you wanted;
- Do not, however, continue too far or the car and trailer will jack-knife;
- Once the trailer is moving in the right direction, reverse the steering on the vehicle and follow the trailer into the turn and finally straighten it up when you reach the correct direction.

When reversing, appreciate that with “override” brakes (hydraulic or mechanical brakes which depend on the trailer tending to over-ride the vehicle to actuate the brakes) you need to engage the lock on the trailer coupling which disables the over-ride brake operation.

SCGC: August 2011