

# NLGC Standard Operating Procedures – Tost Winch

These operational notes are to be followed strictly, firstly to ensure safety standards are maintained and secondly to ensure launches are delivered in a consistent and standardised manner.

Further refinement of these notes may occur and if so, amended notes will be issued. Should any Club Member wish to raise any points that he/she feels needs changing, the matter should be put to the Committee in writing for consideration.

## Pre-checks

1. Check Petrol level (unleaded 96)
2. Remove the two Front mesh covers on the battery side of the winch
3. Check engine oil (use 15w 40 mineral oil only)
4. Check coolant level on radiator at centre of the feed end of the winch
5. Check auto transmission fluid level after the first launch (on the right hand side of the winch looking towards the launch point on the gearbox).
6. Liven the electrics by turning the metal key (L.H. side of engine looking up the strip)

## Set up

**Ensure drum brakes are engaged** before towing and do not rig the safety cage until the winch is in position due to excessive movement when driving down the strip.

1. Align the winch straight down the strip – in line with the cable tow out line. (It is critical with a two wire operation that the tow out track is completely straight.)
2. Remove the pins to lower the legs. Take care to replace the pins and D rings in them.
3. Lift the winch on the corner jacks one end at a time - draw bar end first to prevent load on the jockey wheel. Wind down the jacks until the weight is off the wheels. Each jack should be wound down a little at a time to ensure the weight is taken evenly on the jacks. The road wheels should be just free- wheeling off the ground.

If two persons are available wind the jacks at the same time.

4. Rig the safety cage.
5. Ensure the aerial is erected.

## Towing Out the Cables

1. Ensure both dog clutches are and the auto transmission are disengaged
2. Partially apply both hand brakes with the correct amount of restriction (see details of technique below). Once set **do not** touch the handbrakes during the tow out, the hydraulic truck brakes are vicious and have no "feel".
3. Ensure the transmission is in neutral.
4. Start the engine, using the first pull out to warm the engine. (Do not over-rev until the engine is warm). The tow out must be less than 25 km/hr.

Note that the self-laying gear operates during pull out irrespective of whether the engine is running or not.

5. Connect the cables. When connecting the cables for two drum operation the tow out car must park directly in front of the winch. Cables are to be brought to the car. The car **must not** be driven off line for cable connection purposes. The winch **must not be left unattended** while cables are towed out.
6. For two drum operations, tow the cables **only** in a straight line to the wing tip **specified by the winch driver**, normally the upwind wing tip. (It is dangerous for the launch to tow too far to one side). The tow out car must **slow down gradually** to prevent overruns.
7. Once stopped, the winch driver must view both drums to ensure no overrun has occurred, and then **apply both hand brakes fully on - to the first click**. Do not pull the hand brakes on hard. This will only be a small movement on top of the tow-out position. (Due to the very high mechanical advantage, the linkages to the master cylinders are easily bent).
8. The first cable to be attached to the glider will always be the one closest to the centre of the glider **irrespective** of wind direction.
9. Once the engine is warm, the driver must ensure the choke is fully off and the engine idling between 500 and 600 rpm. Check daily that the throttle returns to this idle setting under its own spring tension and remain vigilant to ensure this idle setting is maintained at all times. If not maintained this will result in the cable slack being taken up at excessive speed.

## Technique for Application of Brakes for Cable Pull Out

1. Apply each brake and check drum braking restriction by turning by hand through the access ports adjacent to the drums. Make minor adjustment if necessary, to ensure moderate braking restriction is applied, but the drum can just be turned by hand. Once set, do not attempt to alter during the pull out. (These brakes are vicious with no feel.)
2. Give the tow out driver both thumbs up. This shows your hands are nowhere near the drums from a safety perspective and is the signal to take up slack. Click the transmit button twice to signal that speed can be increased to maximum tow out speed of 25 kms/hr once drums are rotating smoothly.
3. When tow out is complete, engage the first drum with the dog clutch and then apply both brakes until they are fully on (see 7 above).

## The Launch (First Cable)

Cables are to be referred to strictly as "the road" or "the river" cables and standard radio terminology is to be used as per the NZLE Standard Operating Procedures at all times). Check that people are well clear of the front of the winch before launching.

1. With engine running, **transmission in neutral** and both handbrakes applied, depress the drive shaft foot brake (the spinning driveshaft can be seen through the round hold in the floor) to stop it rotating. Engage the dog clutch for the **selected drum** (if necessary using the drive shaft foot brake to rotate the shaft slightly to allow the dog clutch gearing to engage). If the tow out is completed and the engine turned off you can engage the appropriate drum by releasing the brake and moving the drum a little by hand while moving the dog clutch handle to engage. When a drum is engaged the light on the dash on the side of that drum will come on.
2. Glider will call "(Glider registration) Take up slack" twice – confirming the cable in use.
3. Winch driver will repeat "Taking up slack" and include which cable is in use.
4. Select drive by pushing the transmission control rod (white knob) in toward the console.
5. Release the handbrake slowly down to the bottom detent, and the drum will rotate by itself without the need for throttle.

Upon the call for "All out" accelerate smoothly/gradually to the required power for the given glider and the given wind. A slight overspeed is preferable to a slower speed because there is a better safety margin for the glider – the load on the cable is not excessive at low level. Do not chase speed. At 5kts over/under, decrease/increase speed.

Instruct the glider to move "to the road" or "to the river" to position parachute for centre of strip landing.

When the glider gets to the 55° to 60° point in the launch, progressively reduce the throttle setting, cutting it completely at the top of the launch, and then advise over the radio "Launch over".

This must be strictly adhered to. The call by any pilot for full power right to the top of the launch **must** be ignored.

6. **Immediately the glider is seen to release**, smoothly increase power sufficiently to deploy the parachute maintaining a slight tension on the cable to prevent it from touching the ground. This ensures a clean wrap onto the drum with no loose looping.
7. As the parachute gets to within 100m or earlier of the winch, close the throttle, **slip the transmission into neutral** by (pulling out the white knob) and allow the wire to continue towards the winch, now controlling the cable gently with the hand brake. The throttle should have been closed gently so that the parachute is just flying further out unless there is a strong cross wind and getting the chute over the fence is an issue.
8. Stop the cable approximately 10m from the winch.
9. Disengage the first drum and apply the hand brake to the first click.
10. Leave the engine to idle for 2-3 mins after a launch

## Second Drum Launch

1. Check that the first wire and parachute are pulled to one side and well clear.
2. Ensure the hand brake is applied to the first click on the second drum.
3. Apply the drive shaft foot brake and engage the dog clutch for the second drum.
4. The second launch mimics the first i.e. upon the call "Take up slack", engage the transmission to drive, let off the hand brake upon which the slack will start to be taken up (push hand brake into bottom detent) and proceed as per the first launch.
5. Remove parachutes from both cables, and line up the cables with the winch. Tow out in tandem as per the "Towing out the Cables" section.

## Cable Breaks / Launch Failures

In the event of either of the above occurring:

1. Immediately close the throttle.
2. Slip the transmission into neutral.
3. Apply the brake.

## Cable Cutting Guillotines

There are two "tee" handles one on each side of the cab that operate the cable cutting guillotines. Familiarise yourself with their location and **think about their operation** in the case of an emergency. **Do not** operate them unless in an emergency as they are extremely difficult to reset.

Emergencies requiring the cable to be cut include a glider being unable to release, or a cable across the State Highway being a hazard to motorists.

## Packing Up

Cables are to be pulled in with the tyre on, **one at a time** at the end of the day.

1. Use a consistent and low throttle setting, which is no faster than 1500 rpm. (Pulling in tyres at high speed-particularly in wet conditions can result in loops being thrown on the drum).
2. Reverse the setting up procedure as per "Setting Up" above ensuring the tow bar end jacks are lowered **last** to prevent excessive load being placed on the jockey wheel. Use the tow bar jack to lower it on to the tow car. When raising the jack legs **do not** wind them on to their upper stop and be careful to remember to raise the leg extensions and reinsert the pins and D rings.
3. Turn off the radio at the set, retract the aerial (for hanging) and isolate the electrical system using the switch on the left side of the engine.
4. Retrieve any equipment and store in the cab, checking that all equipment has been uplifted from the area surrounding the winch.
5. Release the handbrake before driving off.

### **Extra Notes**

- If the second launch is to occur immediately, the winch should be left running between launches. (This is to allow the engine time to cool down following heavy load and to reduce wear and tear on the starter motor).
- If the drive shaft brake is not working correctly, the dog clutches can be engaged with the engine off, by turning the drums by hand through the square access holes (adjacent to the driver's seat).
- Section 3.2 of the Australian Winching Manual provides a very good explanation of the stresses on a glider during a winch launch which all pilots should note.
- If there are insufficient tow-out drivers the wire may be towed out without the winch being manned, but only by people approved by the CFI/Winchmaster with a maximum tow out speed of 15kmh and where possible with a single wire.

### **Directions for Cable Tow Out Car**

1. Place parachute in rear seat, attach cable by cord and wait for winch to signal "Take up slack"
2. Take up slack smoothly and slowly until winch gives "All out", then accelerate smoothly, remaining less than 25kms/hr.
3. Proceed dead straight aiming at the left hand wing of the next glider.
4. If the winch calls "STOP, STOP" brake to a stop rapidly.
5. At 50 – 100m from the launching point, begin to smoothly slow down and on arrival reverse several metres to release the tension on the cable.
6. Remove the parachute from the rear.
7. If vacating the vehicle at the launch point ensure that the gear lever is in park and the handbrake fully on or the engine is switched off.
8. If gliders are waiting to launch the tow out car must return to the winch in order to ensure a rapid turnaround or to assist in the event of a cable break or recovery of cable and chute if it falls over the boundary fence.

Note: If a glider is not ready to launch, leave the cable at the River side of the runway and the parachute clear of the strip.

## Cable on the Road Emergency

A cable across the road is a dangerous situation and club members attending the recovery must ensure that they are not at risk. A vehicle on the road may collect the cable and drag it onto anyone in the vicinity.

1. The launch controller should immediately proceed to the point where the wire crosses the road, ensuring his/her own safety and putting on the high vis jacket.
2. Assess the situation as to approaching traffic, how much wire is across the road and whether the cable is lying flat across the road.
3. In the case of approaching traffic where it is not possible to get the cable off the road in time, quickly ensure that the cable is flat on the road and not suspended by fences on either side. **Ensure that you are positioned on the approaching traffic side of the cable to eliminate the possibility of being hit should a passing vehicle pick up the cable.** If time, signal approaching traffic to stop.
4. If no traffic is approaching and the amount of cable across the road is manageable, quickly retrieve the cable/equipment back onto the strip. If not use the safest and most practical option determined at the time, which may involve cutting the wire.
5. Retrieve the cable by winding in with the winch only if in radio contact with the winch and if measures are taken to ensure that stress is not placed on the cable or the fence when doing so (e.g. use manuka stick). If traffic approaches, stop retrieve immediately, ensure cable is flat on the road and all personnel are safely positioned on the approaching traffic side as previously mentioned.

The winch driver is to ensure that no one enters the hazardous area around the winch while a launch is in progress.

