Gliding Australia Training Manual

Pilot Guide



Unit 14W Takeoff (Winch)



WHAT THIS UNIT IS ABOUT

To develop and demonstrate the skills and knowledge required to safely commence a winch launch, from the cable hook on through to initial climb.

WHAT ARE THE PRE-REQUISITES FOR THIS UNIT?

- GPC Unit 2 Ground Handling, Signals
- GPC Unit 5 Primary Effects of Controls
- GPC Unit 13W Launch and Release (Winch)

COMPLEMENTARY UNITS

- Where crosswind is a factor in the launch, consider complementary training in GPC Unit 19:
- Whilst the precursor for launch emergencies is discussed here (speed out of tolerance) the actual briefing and handling of the emergency is covered in GPC Unit 20 – Launch Emergencies.

KEY MESSAGES

- Winch launches progress quickly you must plan ahead to remain ahead of the aircraft.
- Keep your close to the release to ensure quick launch abort if required.
- On ground maintain positive control of aircraft in direction and keeping the wings level (or held into crosswind).
- Allow aircraft to take-off whilst running on main wheel without using elevator.
- Always abort the launch if the speed is unsafe (fast or slow) or if wing drops and hits the ground.



PILOT GUIDE FOR THIS UNIT

This unit is about the first 2 stages of the launch (ground run/separation & initial climb).



Preparation for take-off

- Pre-launch lookout is critical. Identify clear airspace, conflicting traffic, suitable ground crew.
- The Launch occurs quickly any issues need to be identified & resolved.
- Ensure that the seating position and cushions used in the cockpit will enable the pilot to easily reach and operate the release throughout the launch.

Hook On

- Ensure a Sterile environment no distractions.
- Confirm that correct weak link is used refer to cockpit placards.
- Confirm Minimum (1.3 Vs) and Maximum winch launch speed (Vw). (see aircraft placard)
- Complete pre-take-off checks, including airspace clear for launch and options in case of a cable break. Trim forward in case of cable break.
- Locate & identify release handle. Keep hand close.
- Perform radio launch broadcast if required.
- Monitor cable for commencement of ground run. Check that it does not snag on a ground obstacle or vegetation. If concerned, release.

Ground Run

• Maintain wings level - use opposite rudder to pick up lowered wing at low airspeed, use aileron to keep wings level when airspeed allows. Initial ground run has low airspeed so large



control movements are necessary, but acceleration is high and speed builds quickly. If a wingtip drops and hits the ground, release immediately.

- Control column starting position as required for aircraft typically slightly forward but this varies with aircraft type.
- Looking down the runway
 - maintain direction with rudder,
 - keeping wings level and position the aircraft so that it is balanced on the main wheel (i.e. in the take-off attitude).
 - o Glider will separate from the ground as airspeed increases.
- Actions in the event of a cable overrun Typically, the release is close to the main wheel and there is potential for the cable to become entangled. Release immediately and shout STOP.

Separation

- The aircraft flies when lift generated exceeds weight. Lift increases with speed and you must maintain flying attitude. Do not use elevator to force the glider into a climb, allow the aircraft to rise in the take-off position whilst airspeed is building.
- Avoid large manoeuvres close to ground.
- Allow the glider to weathercock into any crosswind once clear of the ground. Ensure the glider is tracking along the runway.



- Use of flap as appropriate for aircraft.
- Climb not initiated in this stage. If the cable breaks close to the ground then you must be in a position to lower the nose and land. If the nose it too high you risk a stall if the cable breaks.



Transition to Initial Climb - allowing height & speed to build

- Maintain take-off attitude.
- Confirm airspeed at 1.3Vs prior to continuing into Initial Climb.
- Once speed is positively increasing you can raise the nose to adopt the initial climb. You must not pull back to a steep angle until you have enough height/speed to recover from a cable break.
- Progressively increase the climb angle monitoring acceleration and speed.
- Airspeed MAY exceed V_W (Max winch) at this point of the launch but not by more than 10%. Airspeed MUST be back within limits by the start of the full climb stage.

FLIGHT EXERCISES FOR THIS UNIT

- You will be asked to prepare the glider for take-off.
- Instructor will demonstrate the ground run, separation and initial climb, and then allow you to come on the controls for one or more flights. You will then be allowed to take control under verbal guidance.
- You will be expected to
 - maintains directional control with wings level during ground run;
 - verbally identify early stages of launch;
 - o allow aircraft to lift-off and gain height in take-off attitude;
 - o identify criteria for commencement of initial climb.
- As experience is gained you should monitor launch airspeed and take appropriate action:
 - You should recognise loss of airspeed and reduces aircraft nose attitude;
 - You should recognise increasing airspeed likely to exceed permitted upper limit in Aircraft Flight Manual AFM (+10%) and provide effective signal.

Notes

- Maintain a relaxed grip on the control column and ensure controls are adjusted correctly for reach during flight. Ensure that you can reach and operate the cable release whilst on the ground.
- Comply with the correct hand-over/take-over procedure.



THINGS YOU MIGHT HAVE DIFFICULTY WITH

PROBLEM	PROBABLE CAUSE
 Failure to transition aircraft to run on main wheel on the ground: 	Not repositioning control column to neutral position as airspeed increases;
	Not exerting sufficient force on control column to overcome nose or tail mass.
	Reposition control column smoothly into take-off attitude position as airspeed builds.
 Inadequate or excessive pull up through initial climb. 	Not maintaining nose attitude.
 Coarse control of airspeed and climb angle. 	Excessive force used on controls. Maintain a relaxed grip.
 Lack of directional control: 	Incorrect operation of rudder pedals during ground run.
	Look towards the winch to identify track
 Aircraft separates at low speed and/or tail wheel/skid hits ground on rotation. 	Attempt to pull aircraft off ground with elevator.
	Ensure enough time is allowed for sufficient airspeed to allow lift generation over aircraft weight.
 Student uses forward stick to hold aircraft on the ground after flying speed is attained. 	Not recognising speed build up or holding aircraft in incorrect take off position.
	Aircraft will lift off when speed is sufficient. Aircraft should not be held on ground with elevator.

HOW DO YOU DEMONSTRATE COMPETENCE?

- Describe the threats associated with a winch launch through the separation and initial climb.
- Demonstrate Pre-take off checks with options for launch emergencies identified (ABCD-CHAOTIC).
- The need for the correct weak link to be used and how to confirm this is fitted.
- State the airspeed limitations on the aircraft during the early stages of a winch launch.
- Describe the actions of the pilot in each stage of the launch.
- Demonstrate:
 - o positive control of aircraft during ground run;
 - holding correct attitude for separation;
 - \circ ability to maintain wings-level in variety of wind conditions;
 - o smooth transition to take-off attitude;
 - o separation and adopts appropriate initial climb attitude;
 - o monitoring speed and direction and correct accordingly



RESOURCES & REFERENCES

- Australian Gliding Knowledge (AGK) pages 19,65,88,89,99-103
- GFA Winch Manual (OPS 0007).
- The Aircraft Flight Manual.

SELF-CHECK QUESTIONS

- What is the minimum and maximum winch speed for your glider?
- Describe your actions if the winch cable breaks on the ground run and on the initial climb?
- What is the correct weak link strength for your glider?
- What should you do if the glider wing drops to the ground during the ground run?
- How should you get the glider to commence the initial climb?
- How steep should the initial climb be?
- What do you do in a cross-winch winch launch?