

Gliding Australia Training Manual

Trainer Guide



Unit 20W

Launch Emergencies (Winch)

AIM

The aim of this GPC unit is for the student undertaking a winch or vehicle (auto tow) launch to:

- Describe types of a winch/autotow launch emergency.
- Understand the actions to take to safely handle a launch failure.
- Recognise the threats and errors that can occur during a launch failure.
- Demonstrate the ability to handle a launch emergency at all stages of the launch.

PREREQUISITE UNITS

- GPC Unit 13W – Launch & Release (Winch)
- GPC Unit 14W – Take-off (Winch)
- GPC Unit 16 – Circuit Joining & Execution
- GPC Unit 17 Stabilised approach and landing

COMPLEMENTARY UNITS

There are no complementary units for this GPC Unit.

COMPETENCY ELEMENTS AND PERFORMANCE STANDARDS

ELEMENT	PERFORMANCE STANDARDS
<p>1. Describes the range of launch emergencies and immediate actions.</p>	<ul style="list-style-type: none"> ● Describe: <ul style="list-style-type: none"> ○ Common causes of launch failures and how these are identified. ○ Actions the pilot can take to reduce the risks of launch emergencies. ○ Actions the pilot must take in the event of a launch failure at different stages of the launch. ○ The direction to turn if a modified circuit is to be performed in the presence of significant crosswind. ○ The Non-Manoeuvring Area (NMA) and how a pilot can enter it and avoid it. ○ The actions required if a cable hook up is suspected.
<p>2. Ground roll emergencies.</p>	<ul style="list-style-type: none"> ● Describe: <ul style="list-style-type: none"> ○ The dangers of allowing a wingtip to touch the ground in the early stages of a winch launch: ○ The immediate actions to take during the ground stage of the winch launch when: <ul style="list-style-type: none"> ● A wingtip touches the ground. ● The aircraft overruns the cable. ● The pilot loses directional control. ● The aircraft balloons too high. ○ Potential consequences of catching a wing tip on the ground.

	<ul style="list-style-type: none"> ● Demonstrate: <ul style="list-style-type: none"> ○ The correct immediate actions for a launch failure that occurs on the ground.
<p>3. Initial climb emergencies</p>	<ul style="list-style-type: none"> ● Describe: <ul style="list-style-type: none"> ○ The immediate three actions to take during the separation through release stage of the winch/autotow launch when: <ul style="list-style-type: none"> ● There is an immediate loss of power in the launch. ● There is a gradual loss of power in the launch. ● the subsequent decisions to be made in handling a winch/autotow launch failure. ○ Potential consequences of rotating too steeply in the initial climb phase of the launch. ● Demonstrate: <ul style="list-style-type: none"> ○ The correct immediate actions for a launch failure that occurs just after separation. ○ The correct three actions and return for safe landing from an abrupt launch failure at a low level and intermediate level (initial climb or early full climb).
<p>4. Full climb emergencies.</p>	<ul style="list-style-type: none"> ● Describe: <ul style="list-style-type: none"> ○ How allowing the aircraft into the NMA will increase the risks during the launch. ● Demonstrate: <ul style="list-style-type: none"> ○ The correct immediate actions for a launch failure that occurs just after separation. ○ The correct immediate actions and return for safe landing from a both an abrupt and gradual winch/autotow launch failure at an intermediate level (mid full climb or higher). ○ Potential consequences of climbing too shallow or steep in the full climb phase of the launch.

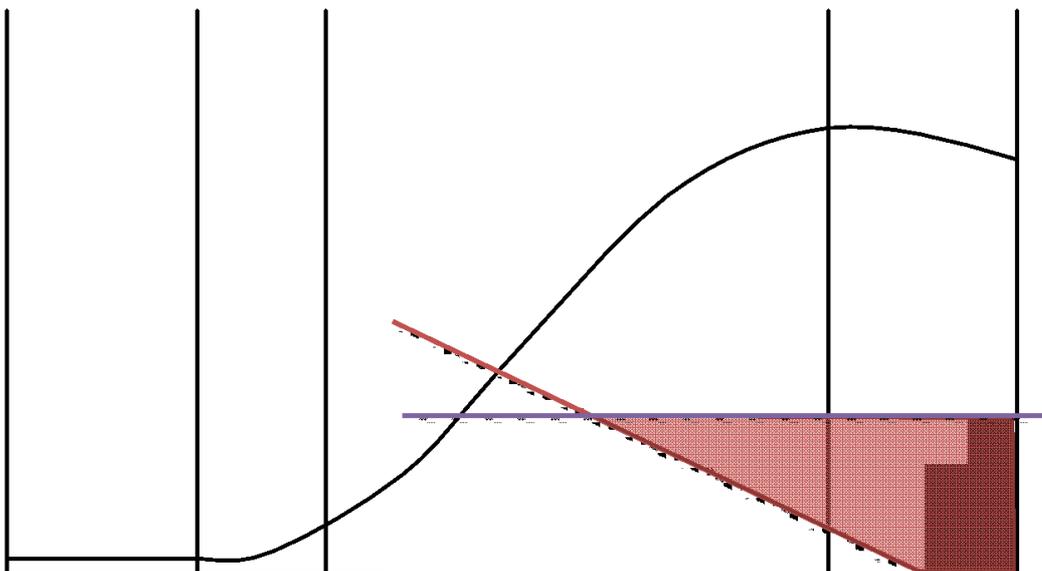
KEY MESSAGES

- Launch failures are easily managed by the pilot provided thought and planning takes place.
- At all times maintain safe speed near to the ground.
- Accidents that occur after a launch failure are generally caused by mismanagement of the aircraft after the launch failure, not through the failure itself.
- Pilots need to recognize that a launch failure can occur at any time from the point of cable hook-on to release. The launch may also be abandoned by the pilot (for example if the airspeed is trending towards the upper winch limit).
- Launch problems do not always manifest themselves as a sudden loss of power – gradual failures can and do occur and require the pilot to recognize that a launch failure is occurring and take appropriate action.
- Pilots must ensure that they never allow the aircraft's airspeed to drop below the minimum launch speed during the launch.
- When a launch failure occurs, no bank must be applied until the aircraft's airspeed is returned to and maintained at or above safe speed near the ground.
- Whilst a launch failure requires specific recovery processes, it is not difficult to recover and providing the aircraft has not entered the NMA it will either be able to land ahead or conduct a modified circuit back to the airfield.
- Locate, identify, and operate controls correctly during all phases of practice emergencies.
- Verbalise options for launch failure on all flights, dual or solo.

LESSON PLANNING AND CONDUCT

Classroom Briefing

- Highlight the stages of the winch/autotow launch.



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- Launch failures can occur through a failure of the winching mechanism or a failure of the cable/rope. In the latter case this can also include the failure of the weak link.
- Identify failure modes that can occur in each stage – particularly the immediate and gradual types of failure as well as where the pilot abandons the launch.
- On the ground if a wing drops there is potential for it to catch, yaw the aircraft and potentially roll the aircraft over, therefore if the wing drops to the ground during the initial stage of the launch release twice and steer the aircraft away from the cable using rudder.
- Similarly, if the pilot loses directional control of the aircraft on the ground then also release and steer the aircraft away from the cable using rudder.
- If a launch failure occurs in flight, landing ahead is always the safest option providing there is sufficient remaining runway or field to do so.
- Emphasise how the Options part of the pre-take-off check allows the pilot to self-brief on actions to take in the event of a launch failure and that this must never be omitted.
- Reinforce the need to know the minimum and maximum airspeed range for the aircraft they are flying. Emphasise the need to remain within this speed band when on launch (allowing for a 10% overspeed in the lower third of the launch), and to abandon the launch if it cannot be maintained.
- Describe the three actions the pilot must do after the launch failure (using ATTITUDE- AIRSPEED-ASSESS):
 1. Immediately lower the nose ATTITUDE to below the horizon.
 2. Wait to regain and maintain safe AIRSPEED near the ground ($1.5 V_s$), operate the cable release mechanism TWICE.
 3. ASSESS the situation, confirm airspeed $\geq 1.5V_s$ and LAND AHEAD unless it is not safe to do so.
- If the student decides not to land ahead then they should proceed as per the pre-take-off launch failure briefing.
- List the post-launch failure immediate actions and decisions, describing how to carry out the action plan.
- Ensure the student has no doubt as to their responsibility for handling the aircraft in the event of an actual launch failure during these training sequences.
- Effect that the crosswind has on deciding which way to turn in the event the aircraft cannot land ahead.

PRE-FLIGHT BRIEFING

- Carefully brief the simulated launch failure to be demonstrated/conducted but note that a (real) failure may occur prior to this in the launch.
- Ensure the student is aware of who is in control of the aircraft at all times.

FLIGHT EXERCISES

Specific demonstration and practice required:

- Flying for this unit requires close coordination with the winch/auto driver pre-flight.
- Demonstrate to the student the delay in regaining speed after a launch failure in full climb by simulating a launch climb attitude when a glider is in free flight.

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- Note how quickly the airspeed decays and how long it takes to return to 1.5 V_s when forward stick is applied.

Launch Failure Instructional Sequence:

- Commence demonstration and student handling at a high point in the winch launch.
 - First ensure the student is competent in lowering the nose ATTITUDE.
 - Then proceed to training the student to regain safe AIRSPEED while operating cable release.
 - Then proceed to training the student ASSESS their situation and decide their subsequent actions.

Launch Failure in various Launch Stages:

- Demonstrate and train the student to handle launch failures at all stages of the launch, starting at height and progressing lower.
- Ensure that both cases of modified circuit and land ahead are covered. For a modified circuit ensure the correct turn direction is briefed and executed.
- Ensure that the student verbalises their decision whether to land ahead as part of their ASSESS step.

Repeat demonstration as many times as needed for the student to recognise the launch failure and undertake the effective recovery. Ensure the application of ATTITUDE AND AIRSPEED is always present with clear reasoning for the decision in ASSESS being evident.

Student practice (under supervision):

- Student to practice immediate actions following a launch failure at particular levels (starting high and progressing lower in the launch as skill and proficiency permits).

Notes:

- Flight demonstrations and exercises must include recovery from a launch failure at all launch stages.
- Launch failures should be both 'hard' (sudden failure such as a cable break) and 'soft' (slow failure such as gradual loss of power) so that the student does not associate launch failures with just one type of event.
- Ensure that the aircraft is never placed in a situation that will endanger the aircrew, other traffic or other personnel on the ground.
- Always refer to the Aircraft Flight Manual or approved placard to determine the maximum winch speed for any glider.
- Practice launch failure is carried out by the trainer pulling the cable release (simulated cable-break) or arranging for the winch driver to cut the power at varying rates (simulated engine failure).
- Brief winch drivers (either directly or indirectly) prior to flight exercises so that they are prepared for the likely events during the flight exercises.
- Ensure launch failures are demonstrated to and flown by the student from a variety of positions during the launch, commencing from higher levels in the full climb stage down to ground run and separation stages.

- Ensure that the student understands the different situations that they are being expected to handle. I.e. when conducting simulated launch failures at height the trainer must make it clear that the student will not be expected to handle launch failures at a low level.
- Do NOT rush this training. The student must be confident and capable of correctly handling a launch failure at any stage of a winch/autotow launch.

COMMON PROBLEMS

Problem	Probable Cause
<ul style="list-style-type: none"> • Inability to detect a gradual failure of the launch. 	Failure to monitor airspeed during work cycle of launch.
<ul style="list-style-type: none"> • Failure to move control column forward fast enough to ensure airspeed is promptly regained to 1.5 V_S. 	Misunderstanding about the rate of speed decay and time needed to recover. G sensitivity.
<ul style="list-style-type: none"> • Failure to wait for sufficient airspeed to build up after lowering nose ATTITUDE. 	Student feels rushed or panics. Emphasise the need for attaining safe speed and that student has time to make considered decisions about how to handle the failure.
<ul style="list-style-type: none"> • Student fails to correctly assess decision to land ahead (or not). 	Student needs to understand the space required to land the aircraft type and how to estimate this from the launch failure point.

THREAT AND ERROR MANAGEMENT

- Poor speed control allows aircraft to enter a stalled condition.
- Failure to confirm adequate airspeed (1.5 VS) prior to turning the aircraft.
- Poor decision-making places aircraft in difficult position to land ahead or conduct modified circuit.
- Poor Options launch failure briefing in the pre-take-off check.
- Other traffic in the circuit during the recovery process.
- Failure to terminate the launch prior to entering the NMA.
- Student confusion and disorientation.

TRAINING MATERIALS AND REFERENCES

- GFA Winch Manual (OPS 0007)
- GPC Pilot Guide Unit 20W
- Videos – BGA winch launch accidents