

Winch Driver Training Syllabus



SCOTTISH GLIDING CENTRE

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Parts & Sections

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PART 1 – INTRODUCTION**1 OVERVIEW**

The purpose of creating a standardised training syllabus is ensuring the quality of new winch drivers not only matches the current high quality but is also high enough to provide club members and visitors with a high level of safety.

2 AUTHORISATION TO TRAIN

- 1 Only people trained and authorised by a person authorised under section 2.2 may provide training to winch drivers.
- 2 Only people authorised by the Winchmaster may train other people to train winch drivers.

3 AGE REQUIREMENTS & QUALIFICATIONS

- 1 No person under the age of 14 may operate the winch.
- 2 A person under the age of 18, but over the age of 14, may receive training to operate the winch under the condition of the club receiving consent from a parent or legal guardian.
- 3 No person under the age of 15 may operate the winch whilst not being supervised by a person authorised under section 2.1.
- 4 No person who does not hold a full driving license may drive the Land Rover or tow the winch in the car park, including during hangar packing and unpacking. They cannot drive beyond the airside boundary.
- 5 Training mainly takes place on the club's Skylaunch 2, and a winch driver may only drive winches that they are familiar with. An authorisation to operate unsupervised is only valid on winches the driver has been trained to operate.

PART 2 – THEORETICAL KNOWLEDGE**4 PUBLICATIONS**

A student must show their understanding of:

- SGC Winch Driver Manual – <https://pilots.scottishglidingcentre.co.uk/winch>
- BGA Safe Winch Launching – <https://members.gliding.co.uk/safety/safe-winch>
- BGA Managing Flying Risk – <https://members.gliding.co.uk/safety/managing-flying-risk-index>

Understanding may be checked by the instructor by asking questions regarding the publications and their contents. A student is not expected to remember the entirety of the documents, however the general objective of them and their key points relating to safety must be understood.

5 LAUNCH ASPECTS OF GLIDERS

A student must show their understanding of:

- The winch's power presets (A thru F), their purpose, and how to determine the correct setting to use.
- The winch's headwind settings. The student must understand that the headwind component during a launch is very rarely the wind speed, and that a crosswind or tailwind will require substantially more power compared to a direct headwind.
- The effect weight has on the launch. Specifically, a higher power requirement and the fact the glider is likely to accelerate slower. Emphasis should be made on ballasted gliders.
- That gliders with a large wingspan look larger in the windscreen and the effect this can have on the glider's perceived speed up the winch's windscreen.
- The effect of wind speed on launch characteristics.

6 THE PRESSURE GAUGE

A student must show their understanding of:

- That the pressure gauge must not be used until the glider is in the full climb.
- That, on many occasions, the pressure gauge may not be a reliable information source due to pilot error or very light gliders.
- The expected pressure values for different aircraft types.
 - 70 – 80 PSI for a single-seater
 - 90 – 100 PSI for a two-seater

7 TELEMETRY

A student must show their understanding of:

- That most gliders are not fitted with telemetry.
- That telemetry can produce erroneous information and should not be relied upon.

PART 3 – WINCH SETUP

8 HANGAR PACKING & UNPACKING

ONLY PERSONS HOLDING A FULL DRIVING LICENSE MAY BE TRAINED FOR THIS SECTION

A student must demonstrate their ability to:

- Remove the winch from the blister hangar.
- Safely reverse the winch whilst remaining aware of their surroundings.
- Move the winch using the Land Rover.
- Return the winch to the blister hangar.

9 DAILY INSPECTION

A student must demonstrate their ability to:

- Check and complete the DI book.
- Check coolant levels are sufficient and top-up if necessary.
- Check brake and transmission fluid levels are sufficient.
- Check oil levels are sufficient and top-up if necessary.
- Confirm that the cables and attached strops are safe for launching.

Where coolant and/or oil levels do not require a top-up, a student may still be signed off as 'satisfactory' so long as they can correctly explain to the instructor how they would complete those tasks.

10 SETUP IN A SUITABLE POSITION

A student must demonstrate their ability to:

- Tow and reverse the winch safely to a suitable position and orientate it towards the launch point.
- De-hitch the winch from the Land Rover.
- Apply the winch's parking brake.
- Earth the winch using the earthing stake and cable.
- Lower the winch's chocks.
- Unstow the cables.
- Perform a final inspection of the winch's setup before launching begins.
- Perform a light and radio check.

11 STARTING, WARMING UP & STOPPING

A student must demonstrate their ability to:

- Start the winch when it is cold and hot.
- Check the winch's temperature and explain the importance of a warm engine before launching.
- Stop the winch.

PART 3 – WINCH SETUP**12 CABLE RETRIEVAL**

A student must show their understanding of:

- The importance of a safe speed whilst towing.
- That no one may drive over the Dyneema, steel cable, strops or parachutes.
- What to do if an aircraft is approaching during tow-out.

A student must demonstrate their ability to:

- Attach the cables correctly to the rear of the Land Rover.
- Safely operate the Land Rover.
- Tow the cables at a constant speed.
- Maintain a straight line between the winch and launch point.
- Come to a safe and steady stop at the launch point.
- Controllably reverse a few inches to relieve tension on the cables after tow-out.

13 END-OF-DAY PROCEDURES

A student must demonstrate their ability to:

- Wind-in the cables safely to relieve their tension.
- Stow the cables, strops and parachutes in the winch.
- Raise the winch's chocks.
- Remove and return the earthing stake and cable.
- Disengage the parking brake.
- Hitch the winch to the Land Rover.

PART 4 – SIGNALLING

14 RADIO COMMUNICATIONS

A student must demonstrate their ability to:

- Make radio transmissions in-line with general radio etiquette (including the use of 'standby').
- Perform and provide a radio check.
- Receive and respond to transmissions from the launch point and gliders.
- Receive and respond to 'glider type and cable' transmissions.
- Handle 'take up slack' and 'all out' transmissions.
- Respond correctly to a 'STOP' signal.

15 SIGNAL LIGHTS FROM LAUNCH POINT

A student must demonstrate their ability to:

- Make use of light signals from the launch point.
- Differentiate 'take up slack', 'all out', and 'STOP' signals.

16 SIGNALS FROM PILOTS

A student must show their understanding of:

- The 'too fast' signal – the glider using its rudder to wag its tail.
- The 'too slow' signal – the glider lowering its nose.
- That glider pilots may utilise the radio, the standardised signals, or both, and that the radio may be hard to hear in the winch over the engine's noise.

17 PRACTICE 'STOP' SIGNAL TEST

The purpose of the practice 'STOP' signal test is to ensure that the winch driver can identify and correctly respond to a 'STOP' signal from the launch point.

The following procedure should be used, preferably with the student being unaware:

1. Request that the launch point moves a glider online and levels its wings.
2. The launch point provides the glider type and cable transmission as normal but **DOES NOT** connect the glider to the winch line, with the 2nd cable (if applicable) pulled well clear.
3. After a few seconds, the launch point issues the 'take up slack' signal over radio and using the lights.
4. After a further few seconds, the 'all out' signal is given over radio and using the lights.
5. About 1 second after the 'all out' signal, the launch point issues the 'STOP' signal utilising **ALL AVAILABLE MEANS**.

The test is satisfactory when, given the circumstances (including the prevailing conditions, visibility, use of radio and/or lights in the signal, and the launch point's performance), the distance the cable was allowed to travel before laying to rest is reasonable. As there is no load on the cable it will travel further than it would have with a glider attached. Nevertheless, if the instructor is required to take over, the test is unsatisfactory.

PART 5 – NORMAL LAUNCHING**18 OVERVIEW**

Launch conditions are split into 3 main categories:

- Low / nil headwind, where the headwind component is below 5 knots. The air is very calm.
- Moderate headwind, where the headwind component is up to 15 knots.
- High headwind / rough air, where the headwind is over 15 knots and the air is rough and bumpy.

Additionally, crosswinds and their associated considerations may be signed off separately. A student must have at least 1 launch condition signed off before allowed to operate the winch unsupervised.

19 BASIC REQUIREMENTS

For each launch condition separately, a student must demonstrate their ability to:

- Select an appropriate headwind preset and power setting.
- Select the correct drum and drive only once the launch point has given the 'take up slack' signal.
- Provide a smooth acceleration to an appropriate throttle position over 3 – 4 seconds.
- Allow the glider to enter a stable full climb.
- Ensure the glider maintains a stable and acceptable speed throughout the launch.
- Back-off the power as the glider nears the top of the launch.
- Safely reel the cable in after the glider releases.
- Stop the cable a reasonable and safe distance from the winch.
- Deselect drive, disengage the drum selector, and allow the engine to cool before turning off.

20 CROSSWINDS

For crosswind launching specifically, a student must demonstrate their ability to:

- Perform all the actions required in section 19.
- Understand the correct headwind component preset.
- Explain how and in what direction the pilot should lay-off and to correct for the crosswind.
- Explain the circumstances where they should cut the power to prevent danger to the public, members, aircraft, and/or property.

PART 6 – LAUNCH FAILURES

21 BASIC REQUIREMENTS

For any launch failure scenario, a student must show their understanding of:

- Why a launch failure may occur.
- How a glider may respond to a launch failure.
- How much space is likely required for a glider to land ahead.
- The potential of the glider to perform a reciprocal approach.

22 CABLE BREAKS – LAND AHEAD

A student must demonstrate their ability to:

- Quickly identify a cable or strop break.
- Determine whether it was the cable or strop that has broken.
- In a timely manner, cut the power, deselect drive, and engage the brake.
- Determine that the glider is landing ahead.
- Disengage the drum selector.
- After the glider has landed, decide whether the cable can be reeled in.
- Communicate with the launch point as required.

23 CABLE BREAKS – NO ROOM AHEAD

A student must demonstrate their ability to:

- Quickly identify a cable or strop break.
- Determine whether it was the cable or strop that has broken.
- In a timely manner, cut the power, deselect drive, and engage the brake.
- Determine that the glider cannot land ahead and is going around.
- In a timely manner, select drive and reel the cable in.
- If the glider turns in before the cable is clear from their landing path, cut the power, deselect drive, and engage the brake.

24 SIMULATED POWER FAILURES

A student must demonstrate their ability to:

- Receive and understand a request from an instructor for a simulated power failure.
- Ensure that the conditions allow for a power failure to be performed safely.
- Gauge the rough height of the glider going up the launch.
- Smoothly reduce the power to simulate the power failure.
- Respond as required by section 22 or 23 to the ensuing launch failure.

PART 6 – LAUNCH FAILURES

25 ULTRA-LOW CABLE BREAKS

A student must show their understanding of:

- The severity of an ultra-low cable break. **(Must be made abundantly clear)**
- The risks involved when performing an ultra-low cable break.
- The requirement for the cable break to only be flown by an instructor.

A student must demonstrate their ability to:

- Receive and understand a request from an instructor for an ultra-low cable break, including understanding the importance of ensuring the instructor understands what they are asking for.
- Ensure that the conditions allow for an ultra-low cable break to be performed safely.
- Allow the glider to accelerate just enough to lift-off from the surface.
- Cut the power at exactly the right moment to cause the glider to release a few feet from the ground.
- After cutting the power, immediately deselecting drive and engaging the brake.
- Disengage the drum selector.
- Communicate with the launch point as required to recover the cable.

26 CROSSED CABLES DURING LAUNCH

BRIEFING ONLY EXERCISE

A student must show their understanding of:

- Why the second cable may be picked up during a launch.
- How a picking up the second cable can be identified.
- That the safety of the pilots is the first and immediate priority.
- That once the pilots are at a safe height, the power must be cut, drive deselected, and the drum disengaged.
- How to inspect the cable after an incident.
- The requirement to report the occurrence via FlySafe.

27 GLIDER UNABLE TO RELEASE

BRIEFING ONLY EXERCISE

A student must show their understanding of:

- Why a glider may be unable to release.
- How a release failure can be identified.
- How the guillotine works.
- How to operate the guillotine.
- That the power must be cut and drive deselected, then the guillotine operated followed by the brake.
- The requirement to report the occurrence via FlySafe.

PART 6 – LAUNCH FAILURES**28 CABLE FALLING INTO OBSTRUCTED AREA****BRIEFING ONLY EXERCISE**

A student must show their understanding of:

- Why a cable may fall into an obstructed area.
- That the safety of members of the public and the club's members and visitors are the top priority.
- That damage to property must be avoided wherever possible.
- That if the cable falling into an obstructed area is inevitable, the power must be cut, drive deselected, and the brake firmly applied until the cable comes to a stop.
- That power cannot be applied to remove the cables from hedges, trees, etc.
- How to recover a cable that has fallen inside or outside the airfield's boundaries.
- The requirement to report the occurrence via FlySafe.

PART 7 – WINCH MAINTANENCE

29 REFUELLING

IT MUST BE MADE CLEAR TO THE STUDENT THAT THIS IS NOT A SIGN-OFF TO REFUEL UNSUPERVISED

A student must show their understanding of:

- The risks of refuelling and how they can be mitigated.
- The emergency procedures.
- How to operate the emergency cut-off.
- Who to contact if something goes wrong.

A student must demonstrate their ability to:

- Check the winch's fuel levels.
- Correctly connect the refuelling attachment and hose to the winch's tanks.
- Open and lock the attachment's valve.
- Operate the refuelling pump.
- Unlock the attachment's valve and remove the attachment and hose from the winch's tanks.
- Secure the fuelling station after refuelling.

30 WEAK LINK REPLACEMENT

A student must show their understanding of:

- The different colours of weak link and how they can be identified.
- The purpose of the weak link.

A student must demonstrate their ability to:

- Remove the original weak link from the strop assembly.
- Select the correct replacement weak link.
- Re-assemble the strop, applying the correct amount of torque to its bolts.
- Check that the shackles move freely and are not gripping the weak link.

31 STROP ASSEMBLY

A student must demonstrate their ability to:

- Cut sheathing to the correct length.
- Feed Dyneema through the sheath, cut it to the correct length, and splice both ends.
- Select the correct weak link and assemble its holder in accordance with section 30.
- Attach the weak link assembly to the strop.
- Inspect a strop to ensure it is safe to use.

PART 7 – WINCH MAINTANENCE**32 DYNEEMA SPLICING**

A student must demonstrate their ability to:

- Retrieve the broken ends of the cable.
- Cut the broken ends to a sharp point.
- Splice the Dyneema, feeding a sufficient length of the Dyneema through the cable.
- Inspect the Dyneema after the repair.

33 PARACHUTE ASSEMBLY

A student must demonstrate their ability to:

- Remove the original parachute.
- Inspect the new parachute for faults.
- Attach the new parachute in the correct position.
- Inspect the cable to ensure it is safe to use.

34 GUILLOTINE RESETTNG

A student must show their understanding of:

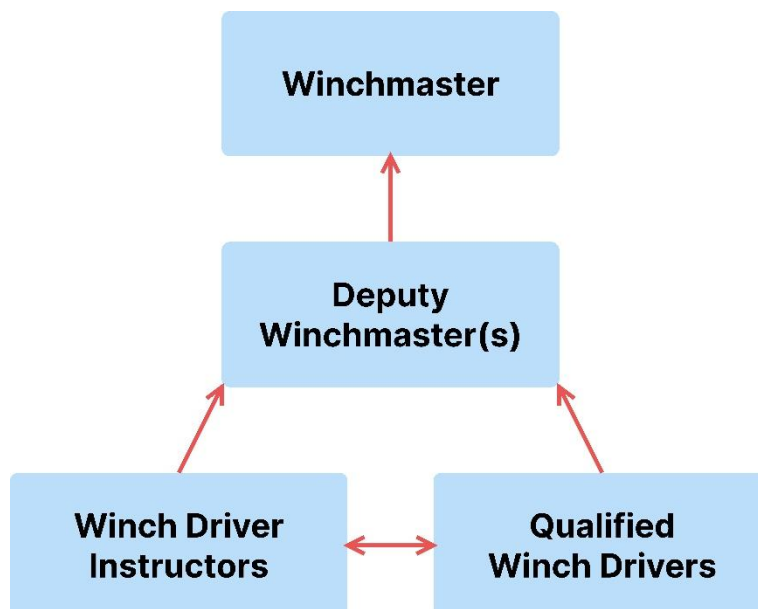
- How the guillotine works.
- How to safely perform work on and around the guillotine's mechanism.
- Why the guillotine's serviceability is essential.

A student must demonstrate their ability to:

- Safely insert a block of wood into the guillotine to prevent the cable from being cut during a dry test.
- Activate the guillotine normally.
- Reset the guillotine's mechanism in accordance with Skylaunch's instructions.
- Safely remove the block of wood used during dry tests.
- Complete the guillotine testing documentation.

PART 8 – NOTES FOR INSTRUCTORS

35 STRUCTURE



36 CONDUCTING TRAINING

Ultimately, the goal of training new winch drivers is to support the club. The club's main goal when training winch drivers is ensuring they can operate the winch and its associated equipment in a safe yet efficient manner, and in a standardised and predictable fashion.

The training is designed to be modular, however some sections ought to be completed before others. The following order should be followed wherever possible, but it is understood that sometimes it must be deviated from for the sake of not unnecessarily delaying training:

- 1st. Publications to be read
- 2nd. Principles of safe winch launching
- 3rd. Signalling
- 4th. Normal launching
- 5th. Launch failures

Winch setup and maintenance can be trained on an 'as and when' basis; however, ideally winch setup should be fully complete or nearly completed before the student is sent solo. Note that only persons holding a full driving license may drive vehicles beyond the airside boundary (i.e., in the car park).

Especially during the initial stages of training and when teaching a new topic or scenario, **the instructor MUST be able and prepared to take over control at a moment's notice**. The instructor cannot be afraid to grab the student's hand if more or less power is required, and instructors are encouraged to discuss this scenario with early-stage students.

PART 8 – NOTES FOR INSTRUCTORS

37 SOLO STANDARD

A person can only be sent solo if, at a minimum, the following are signed off on their training card:

- **Section 4** – ALL publications to be read
- **Sections 5 thru 7** – ALL principles of safe winch launching
- **Sections 9 thru 13** – ALL winch setup EXCEPT FROM hangar packing & unpacking
- **Sections 14 thru 17** – ALL signalling INCLUDING a practice 'STOP' signal test
- AT LEAST ONE flight condition (section 19), preferably with crosswinds as well (section 20)
- **Sections 21 thru 23** – ALL (real, unintentional) cable breaks
- **Sections 26 thru 28** – ALL emergency scenario briefings

Exceptions may be made in exceptional circumstances at the discretion of the Winchmaster.

38 CURRENCY & STATE OF MIND TO TRAIN

The currency of winch driver instructors is especially important. Before offering training, ensure that you are current and in a good state of mind to teach someone. **If you have any doubts, STOP** and talk with someone authorised to train new winch driver instructors (see below) or the Winchmaster.

39 GOT ANY QUESTIONS?

If you have any questions, you should contact a person authorised to train new winch driver instructors (a list can be found at <https://pilots.scottishglidingcentre.co.uk/winch>) or the Winchmaster.

40 REPORTING OCCURENCES

If during winch driving or training you witness or are involved in any incident or occurrence that could have affected, or actually did affect, flight safety, you should make a FlySafe report at <https://scottishgliding.com>.