Winch Drivers’ Code of Practice
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Introduction

This document is not intended as a definitive instruction manual for driving the winches at Devon and Somerset Gliding Club. It is, however, intended as a supplement to the existing winch manuals (where available). It is intended that it will clarify some issues and ensure that all winch drivers perform to the same standard.

By following an agreed system it is expected that the quality of launches will be consistently the best possible and the wear and tear on the equipment will be reduced to a minimum. In this way the pilots will get best value for their launch money and the club as a whole will benefit by minimum maintenance costs.

It is a concern that our backup (Supacat) winch is now rarely used and so a section is included to list the operating practices which differ. It is believed that the notes provided within this document will allow a competent Skylaunch driver to convert to the Supacat winch with minimal additional training.

General advice

Driving the winch can be a rewarding and enjoyable part of your day as it requires both skill and judgement; however, the winch is remote from the main operations and winch drivers are prone to be taken advantage of. For this reason, ensure that you enter your name in the operator’s log (so you know when you started) and, unless you particularly want to, do not drive for more than 2 hours. As a general rule a one hour session on a normal flying day is sufficient especially until you have gained experience as tiredness leads to mistakes and potentially accidents.

Try to give at least half an hour’s warning that you need a relief together with a time when you intend to stop (if appropriate).

Hygiene

When driving the winch you are likely to handle the cables which become muddy and soiled due to the livestock on the field. For hygiene reasons and to protect your hands, especially when working with the steel cables of the Supacat, you are advised to use a pair of light gardening gloves.

At the time of writing a bottle of disinfecting hand wash is available in the winch. As alcohol gel does not kill all germs, it is the author’s opinion that the gel should not be relied on as protection and a barrier (gloves) is to be recommended.
Daily Inspection

The daily inspection routine is outlined on the laminated card in the winch a copy of which is to be found in Appendix D.

Critical areas are:

- Back axle oil
- Engine Oil
- Coolant level (approx 1 cm below header tank central line)
- Gearbox Oil

Note: a coolant level higher than that suggested above will just result in an overflow after a couple of launches with worrying quantities of steam!

Take great care when replacing the coolant cap as it is easy to cross thread it but with a little patience it can be replaced square and correctly set.

Part of the DI is an engine run and it should be noted that the cold engine needs to be cranked for several revolutions until it will fire.

N.B. The engine will not start unless the starboard chock is dropped. Ensure that the chock is raised again after starting the engine and prior to moving the winch.

It is important to check that the warning lights are on before starting the engine (with the ignition on) and that the transmission temperature warning light comes on when the test button is pressed. Once the engine is running the warning lights should go out but it may be noted that the generator warning light remains on. This should go out once the revs have been raised sufficiently (but not excessively) for a brief time.
Re Fuelling

Definitely no smoking while refuelling!

Protective gloves and eye shields are recommended.

1. Open the cover on the rear of the winch and expose the tanks. Earth the winch via the earth lead to the crash barrier.

2. Turn on the bulk tank supply (red switch on right of roller hanger door).

3. Turn the supply cock under the bulk tank so that the lever is in line with the pipe.

4. Using the key on the winch ignition key ring, remove the two padlocks on the 'control post'.
Turn on the switch on the 'control post'.

5. Release the supply hose from the 'control post' and connect the filling head to the tank to be filled – N.B. full is with the gauge registering approximately 70%. Ensure that the connection is not cross threaded and is tight.

6. Pull and latch the tap handle on the filling head.

7. Press and hold in the green button on the 'control post' until the note from the pump changes indicating that the tank is full.

8. Release the tap handle on the filling head and allow the excess gas to escape. N.B. take care – it’s very cold!

9. Repeat 5 – 8 if necessary for the second tank.

10. Refit the filler head to the control post, switch off and lock.

11. Shut off the cock under the tank (right angles to the pipe) and switch off the red tank supply switch by the roller hanger doors.

12. Disconnect the earthing lead and secure.

Setting Up

The process of setting up and positioning the winch is best learnt by experience. The following considerations should be taken into account :-

1. Ensure that the Winch is in the correct place as requested by the Duty Instructor, in line with the Launch point, the jack is down and secure, the handbrake is on and the two chocks are down.
2. Press the earthing rod into the ground and connect the earthing lead.

3. Connect the communication line up, ensuring that it is plugged into the 'Master' line.

4. Lay out the two cables and ensure that the parachute fittings and parachutes are in good condition and secure.

5. Supervise the towing out of the first set of cables ensuring that the 'run' is as straight as possible.

6. Check each drum and ensure that there is sufficient cable to allow for loss due to breaks etc..

Ensure the engine has warmed up before attempting the first launch. The needle on the temperature gauge should be about 11 o’clock.

Do a communications check as soon as possible to ensure all is well and to prevent hold ups later.

**Shut Down**

The shutdown procedure is predominantly the reverse of the setting up; however, particular attention should be paid to the following :-

1. Ensure both cables are drawn fully out and then wound in without tension to avoid damage to the drums.

2. Make sure that the handbrake is off, both chocks and the jack are up before attempting to move the winch.

3. Ensure that the comms headset is removed and stored in the parachute cupboard as damp damages the microphone.
Launch Sequence

N.B. If, prior to the commencement of the launch you consider that there is a potential hazard and that the launch cannot be completed safely or that the glider would be launched into a hazardous situation (i.e. rain) – STOP!! This includes cables being crossed, or potentially too close to each other – Skylaunch rope will cut through a touching rope, while Supercat wire will pick up the other wire; neither eventuality is desirable, and could be very dangerous.

As is usual with all aviation communications – all critical instructions should be repeated back. You must read back the glider type, the cable selected, and the orders to take up slack and the all out. If you do not understand, or believe an error has been made – question it or STOP.

Before commencing launches a wind vector setting should be agreed with the Duty Instructor.

1. An initial call indicating the type of glider should be received in advance. This will allow the appropriate power setting to be selected on the control panel – see Appendix C.

2. On receiving the call confirming the glider type, cable to be used and the request to 'take up slack' repeat the instruction back and …

3. Check that the area is clear of personnel and there are no potential hazards...

4. Select the appropriate cable with the black drum select lever to your left, start the engine (if not already running)[1], engage drive (D) on the lever just to the left of the console and check that the correct cable is being drawn in...

5. On receiving the command 'All out' repeat the instruction back and advance the throttle using both thumbs steadily to the bar taking 2-3 seconds. Watch the controls – due to the shape of the field you won’t see the glider anyway!

6. Transfer your left thumb to the bottom of the throttle slot to prevent you closing the throttle fully (see footnote [2]).

7. When the glider has appeared above the horizon reduce the throttle setting approximately one centimetre [3] and hold it in this position [4].

8. When the glider reaches the bar at the top of the cab reduce the throttle setting progressively at about the same rate as you opened it. The object is to gently cause the glider to back release without causing strain and jolts to the glider, cable or winch.

9. As soon as the cable releases from the glider, increase the throttle setting sufficiently to prevent a build-up of loose cable which can cause a tangle.

10. Draw the cable in steadily without using excessive engine speed, dropping the throttle setting so that it is fully closed as the parachute reaches the ground (to minimise wear). Continue drawing in the cable until the parachute is approximately 50 yards (metres) from the cab then move the gear lever to N (Neutral).
11. Allow the cable to continue to run in under the inertia of the drum and at approximately 20 yards (metres) ease the black drum select lever to the vertical neutral position [5]. The drag brakes should remove any remaining motion.

12. Switch off the engine when the temperature gauge is vertical or left of vertical. If you shut down when the engine is hotter you may have difficult with the engine starting and / or idling.

13. As soon as all is in neutral and safe – call the launch point to inform them 'Cable Clear' so they can prepare the next launch.

14. Uncross the cables if the used cable has dropped across the next cable and wind up the shock rope to save time loading the cable retrieve vehicle.

Foot notes :-

[1]  By doing it in this sequence it will be found much easier to get the drum selected.

[2]  This is to prevent fully closing the throttle which, particularly in high wind conditions, can cause the engine to stall at the top of the launch when there is maximum load and minimum throttle setting. This results in an impressive tangle and loss of time (normally when the ridge is working!).

[3]  This is a rough guide and need to be reduced proportionally when the maximum throttle setting is reduce i.e. for the lighter glider.

[4]  Wooden gliders, being much lighter, have to be treated rather differently and they need to have the throttle setting reduced progressively. This is a matter of experience but a rough guide is that they need to pass each grid of the mesh screen every 4 seconds.

[5]  This method prevents the use of the main brake which tends to 'wind up' the drum selector mechanism causing difficulty in selecting or de selection.

NOTE: There is no advantage in pulling in the cable close to the winch or bringing them in at high speed. Both practices invite errors due to pulling the parachutes into the rollers causing damage and are likely to waste far more time than they save.
Driving differences (Supacat)

The Supacat is of rather more robust construction and design than the Skylaunch, diesel powered and is of half the rated horsepower. Being diesel however, there is plenty of torque available.

At the time of writing it uses wire rather than the 'polysteel' rope used by the Skylaunch and this is the first major difference in that a paying on / cable stacking mechanism is used that must be engaged at the start of use and 'caged' at the end (to prevent damage when towing).

The drag / towing out brakes are manually operated and not automatic as on the Skylaunch. The drum selector lever incorporates a brake system which brakes the power / prop shaft.

The manual throttle control has been replaced by a computer controlled system which, in the opinion of many of the experienced winch drivers, has never been fully 'debugged'. Unfortunately the computer system has removed most functions from the driver and consequently, its shortcomings cannot be corrected.

A typical launch sequence would be as follows :-

1. Select wind vector.

2. Select glider type on the multi position switch.

3. With the right hand engage the appropriate brake lever and then take off the appropriate drag brake off and put your foot on it as an aid mémoire.

4. Change hands on the brake lever and with your right hand pull the drum select lever back to stop the power / prop shaft – then sideways to engage the selected drum while easing the drum brake off allowing the drum to turn slowly until the gear engages. This is actually easier to do than it first seems!

5. Release the power shaft brake fully and control the taking up of the slack with the drum brake. N.B. Unlike the Skylaunch, the Supercat winch will naturally bring in the cable far faster than required so great care is needed to ensure that the taking up of the slack is fully under control using the brake.

6. At 'all out' fully advance the throttle joy stick smoothly and firmly (you are under computer control) and hold it at the front stop.

7. When the glider drops the cable – close the throttle completely and then manipulate it and the brakes to bring in the cable.

8. Return the drum select lever to the central position and re engage the drag brake using the reverse procedure to (4) above.

NOTE: In the event that a 'too fast' signal is given, bring the throttle / control lever back only about 1 cm. Any further and the computer will assume that the launch is complete.
Appendix A

Daily Inspection Check-List
# Skylaunch Daily Inspection Check-List

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ensure Jack leg is raised before moving the winch.</td>
</tr>
</tbody>
</table>
|2. | Lift rear lid and …  
Check fuel level in the tanks. For a full days flying start with full tanks)  |
|3. | Visually check the thickness of all four pairs of brake pads.  |
|4. | a) Check the oil level in the final drive unit through the 'sight glass' – it should be to the top of the sight glass.  
b) Check for oil /fluid leaks from the brakes and final drive unit – close lid.  |
|5. | Open the right hand drum guard and ..  
a) Check that there are no slack loops of rope hanging from the drum.  
b) Check that the yellow pointers on the drum centralfixing nuts are pointing inwards.  
c) Check drum for damage – especially the outer rails.  |
|6. | Check that the wheel chocks are raised and locked for transport.  
(No excessive side movement).  |
|7. | Check tyres for damage / adequate inflation / excessive wear. Tyre pressure 4.5 bar / 65 PSI.  |
|8. | Raise RHS engine cover …  
a) Check engine oil with dip stick – top up with 10W40 semi synthetic oil (not from bulk oil supply).  
b) Check brake fluid level.  
c) Check gear box oil (about 1cm above high mark when cold).  
d) Check guillotine is free from debris & corrosion – Keep fingers clear of blade!  
e) Check for oil or fluid leaks then close engine cover.  |
|9. | Check cable guide swivel units  
a) Check the 'set screws' on each of the nylon rollers for tightness.  |
b) Check that the side rollers and nylon pulleys run freely, are free from damage and not excessively worn.

| 10. | Check engine coolant level is approximately 1 cm below the header tank centre moulding line. Top up if necessary with antifreeze water mix. |
| 11. | Raise the LHS engine cover …  
   a) Visually check the battery for signs of leakage / loose terminals.  
   b) Check guillotine is free from debris & corrosion – Keep fingers clear of blade!  
   c) Check for oil or fluid leaks then close engine cover.  
| 12. | Open the left hand drum guard and ..  
   a) Check that there are no slack loops of rope hanging from the drum.  
   b) Check that the yellow pointers on the drum centralfixing nuts are pointing inwards.  
   c) Check drum for damage – especially the outer rails.  
| 13. | Check that the wheel chocks are raised and locked for transport.  
   (No excessive side movement).  
   Check wheel brake off  
| 14. | Check tyres for damage / adequate inflation / excessive wear. Tyre pressure 4.5 bar / 65 PSI.  
| 15. | a) Switch on ignition and check warning lights are illuminated (transmission overheat when button pressed).  
   b) Start the engine and ensure warning lights go out. Note that revs may need to be increased initially to get generator on line.  
   c) Check automatic gear box fluid level (ideally after a launch so fluid is warm).  
   d) Check guillotine lever is in the locked position.  
   e) Complete any necessary maintenance & defect entries in the relevant section of the winch log book.  

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Appendix B

Circuit Diagram
Appendix C

Recommended Launch Settings
## Recommended Launch Settings

<table>
<thead>
<tr>
<th>Model</th>
<th>Setting</th>
<th>Launch Type</th>
<th>Wind Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>DG505</td>
<td>A+</td>
<td>K6</td>
<td>F</td>
</tr>
<tr>
<td>K21</td>
<td>A</td>
<td>K8</td>
<td>F</td>
</tr>
<tr>
<td>K13</td>
<td>D</td>
<td>Kestrel 19</td>
<td>C</td>
</tr>
<tr>
<td>Junior</td>
<td>E</td>
<td>LAK 12</td>
<td>B</td>
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<td></td>
<td>LS 3/4/5/6/7/8</td>
<td>D</td>
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<td>ASK25</td>
<td>A+</td>
<td>Libelle</td>
<td>E</td>
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<tr>
<td>Astir</td>
<td>D</td>
<td>Nimbus 4</td>
<td>A+</td>
</tr>
<tr>
<td>ASG 29</td>
<td>C</td>
<td>Nimbus (Mini)</td>
<td>D</td>
</tr>
<tr>
<td>ASW 19/20/24/27</td>
<td>D</td>
<td>Oly 460</td>
<td>F</td>
</tr>
<tr>
<td>B4 Pilatus</td>
<td>E</td>
<td>Pegasas</td>
<td>D</td>
</tr>
<tr>
<td>Cirrus (Std)</td>
<td>E</td>
<td>PIK 20</td>
<td>D</td>
</tr>
<tr>
<td>Cirrus (Open)</td>
<td>C</td>
<td>Puchasz</td>
<td>B</td>
</tr>
<tr>
<td>Dart</td>
<td>E</td>
<td>SF 27</td>
<td>E</td>
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<tr>
<td>Duo Discus</td>
<td>A+</td>
<td>Swallow</td>
<td>F</td>
</tr>
<tr>
<td>Discus Turbo</td>
<td>C</td>
<td>Skylark 2/3/4</td>
<td>E</td>
</tr>
<tr>
<td>Discus</td>
<td>D</td>
<td>T21/31</td>
<td>E</td>
</tr>
<tr>
<td>DG 100/200/300</td>
<td>D</td>
<td>Ventus Turbo</td>
<td>C</td>
</tr>
<tr>
<td>Eagle</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jantar</td>
<td>D</td>
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<td></td>
</tr>
</tbody>
</table>
Appendix D
Splicing rope
Get 2 clean ends and open each end about 7 inches (a hands span).
Bind each end with approximately 1 inch of tape (do not heat seal – sharp edges can cut into adjacent rope on the drums)
Bind one end 7 inches in (optional) for ease and speed.

Move the two ends symmetrically together and bind with tape over the previous binding to hold all secure (optional)
Working away from the secured half, pass each end in turn and going across the strands of the 'base' rope, over a strand then under the next strand.

Repeat this pulling tight regularly until you run out of ends. You should have 4 complete cycles.
Remove the central bindings and continue in the other direction

It will pull tight and look tidier after being used a couple of times