

Cotswold Gliding Club

Winch Launch System

Operating Procedure

COTSWOLD GLIDING CLUB

Retrieve Vehicle Operating Procedure

Daily Inspection

Check vehicle oil & water levels & top up if necessary

Check condition of tyres & replace if any areas with no tread

Ensure there is enough fuel for the day's operation

Check ability of retrieve arm to self-return

Check security of arm self locking system (self locks on return & cannot be pulled out of lock)

Check serviceability of cable attachments & replace if necessary

Check radio operation

Safety Note

The only permitted method for towing winch cables is the retrieve vehicle (unless out of operation)

DO NOT move the cables without confirming ok with winch operator.

Vehicle **MUST NOT** be used if any one of the retrieve arms do not self return or lock

Operation

The retrieve vehicle **MUST NEVER** be driven unless the retrieve arms are **SECURLEY LOCKED.**

Cables get crossed easily on a multiple pull-out. If the pull-out has not been straight, or it is suspected the cables are close together, they should be separated before the start of the launch.....

1. Wait in safe area until launching is completed
2. Attach the cables to tow out weak links on swing arm.
3. On signal TAKE UP SLACK
Move gently forward. Do not snatch the cables.
4. On ALL OUT signal, accelerate smoothly to approx. 25mph

Do not move cables if stop light on the winch is showing
Monitor the winch during the retrieve for a STOP signal.
If you stop the tow-out before reaching the launch-point, do not
Start without a signal from the winch driver.

5. Drive in a straight line to the launch point

Aim to keep within 1 meter from the grass edge

If a weak link breaks during retrieve, then continue with the other cable to the launch point,
BUT ONLY IF NO STOP SIGNAL IS RECEIVED FROM THE WINCH. Treat as for a cable
break.

6. If the cable run deviates from a straight line the inform the duty instructor and Winch driver.

It is important not to launch with a risk of crossed cables

7. Avoid excessive use of the brakes to stop at the launch point

This helps prevent the winch drums from over-running.

Allow the drag of the cables to bring the vehicle to halt

8. Back up retrieve vehicle to relieve tension in the cables.

Allow swivels to stop rotating before removing the cables.

9. For the safety of personnel, the launch strops must be flaked or coiled at the launch Point.

10. Cable breaks

Discuss possible action with winch driver. Carry a tyre in vehicle to attach winch end of
Cable.

Return broken end to winch only when given UP SLACK from launch point controller

11. Runway priority

While retrieving cables the retrieve vehicle has priority over all vehicles & aircraft don not stop
the retrieve unless it is felt dangerous to continue.

**Under no circumstances are the retrieve vehicles to be used other than to retrieve the Winch
or its cables.**

Winch Operating Procedure

The following section is taken directly from the BGA Winch operator's guide

Note!

Repairs & guillotine testing are to be carried out by specifically authorized personnel only.

Ensure there is nobody in the cab when passing cable through the guillotines.

DO NOT put hands between guillotine blades.

The daily inspection sheets provided with the winch must be completed and any faults found reported in the D.I book.

All serious faults must be reported to the relevant person immediately.

This is required to enable the required maintenance to be carried out; Failure to do so may result in the winch warranty being invalidated.

Simon Lucas

Operations Manager

Skylaunch Winch

Before the winch is moved the following checks must be carried out

Ensure all covers & doors are securely closed, chocks locked up, hitch stand secured up and handbrake released.

The payout brake must be engaged when towing to prevent the drums from rotating—it must be released & reset before towing is commenced each morning (this allows for any loss of pressure during storage)

Ensure the following equipment is stored in the winch at all times

1x Long handled cable cutters

1x Fire extinguisher

Cable Replacement

Lay out the new cable taking it from the bottom of the roll; attach a swivel and a weight to the loose end to allow the cable to be held stationary and twist.

Once the complete cable has been laid out attach the loose end to the winch drum **ensuring it is wound on from the bottom.**

Start the winch & slowly wind the cable in, repeat process for the second cable.

See section on cable renewal and initial launches later in manual

Note:

The winch warning beacon only operates when drive engaged i.e.: Launch in progress

Daily Inspection (DI)

BGA Operational Regulation 4.2 states:-

All equipment used for launching, including the wire, rope or cable must have been inspected and approved as serviceable each day before being used. Winches and towcars shall, as a minimum be checked for sufficient fuel, oil and water for the proposed launches and for serviceability of the cable cutting or releasing mechanism.

Before the first launch of the day, all winches and prime movers are to be given a daily maintenance in accordance with the following schedule:-

Item	Action
Fuels	Check. Ensure contents are sufficient for the day's operation. Replenish as necessary.
Coolant	Check coolant level. No obvious leaks
Oils	Check levels in engine and transmission
Brakes	Check operation and fluid level
Warning lights and beacons	Check warning lights and gauges for correct indication and function
Prime mover and winch cabs	Check clear of broken cable and debris. All controls accessible and free
Pan-on Gear, all rollers and pulleys	Check serviceability and freedom of movement
Cable cutting and joining equipment	Examine. Ensure serviceable and adequate cleats for days operation.
Tyres	Visual check
Guillotine	Operational and checked within last month
General	Check for oil leaks from engine(s), transmission, drums, pay on gear and brakes
Safety Note	Check fuels, oils, antifreeze, battery acid and chemicals stored in accordance with COSHH recommendations.
Safety Check	Guards Fire extinguisher(s) First Aid Kit Earth Stake Wheel Chocks Communication equipment (radio telephone bats etc.)
D.I. Book	Complete and record any defects. A glider DI book is adequate for this purpose.

SETTING UP THE WINCH

Safety Note:

If cable runs are near to each other, such that it may be possible for cables to cross, then:-

- (a) Only one glider may be attached to a cable at any one time and**
- (b) After every launch, the used cable must be draw in to the winch or cleared from the area before another cable is used.**

1. Advise the Duty Instructor of the winch status and determine his requirements regarding the positioning of the winch and condition of the airfield, before moving out.
2. Drive the winch slowly to site and align with the launch point
3. Apply the hand brake firmly on the prime mover and select first gear.
4. Securely position the wheel chocks
5. Press the earth stake firmly into the ground in a position such that it will not be a hazard.
6. Connect and carry out functional communications check.
7. Ensure the retrieve driver is fully aware of the pull-out and cable break procedures.
8. Obtain Duty Instructor's permission to pull cables out to launch point.
9. Carry out cable and parachute daily inspection. (See below)
10. When cables have been pulled out:
 - a) Apply winch drum brakes(s)
 - b) Ensure transmission is dis-engaged.
 - c) Warm up winch engine to operating temperature.

DAILY INSPECTION OF CABLES AND PARACHUTES

Safety Note:

While work is being carried out on a cable, the engine should not be run, nor should any cable retrieve mechanism be used.

CABLES

1. Cut out short lengths of unserviceable cable, worn ferrules and closely spaced joins and replace, using the procedure described under 'Cable repair procedure'
2. If a new section of cable is required, refer to 'Cable Renewal'

PARACHUTES, STROPS AND WEAK LINKS

BGA Operational regulation 4.4 states:-

The glider end of launching cables must be fitted with linked rings designed to fit the release mechanism of the glider. Distorted or cracked rings may not be used.

1. Inspect the parachute canopy for wear, tear and security of shroud attachments.
2. Check for tangled, twisted or broken shroud lines. If the parachute is defective, obtain a replacement and enter replacement in Defect Log.
3. Inspect all connectors, shackles and quick-release units for security wear and damage and ensure they function freely and correctly.
4. Inspect the STROP for wear and fraying and check that the shackle attachment to the parachute is serviceable.
5. Inspect the linked rings for wear and / or distortion and their attachment to the strop for security. Replace where necessary. Attach parachute assemblies to the cables.
6. Check the WEAK LINK assembly and that the weak link has not been stretched or distorted. Replace as necessary.

The assembly should contain only one weak link at a time

SIGNALS OPERATOR

1. **Ensure communication** between launch point and winch driver.
2. **Confirm** launch and emergency procedures with the winch driver.
3. **Check with winch driver that it is clear ahead & ready to launch.**
Confirm which cable to use and glider type.
Look and see that the field is clear ahead
Where would the cable fall, following a cable break?
4. **Monitor launch-point for safe operation.**
Is the correct cable being attached?
Are persons clear of the glider?
Are persons clear of the second parachute and cable?
5. **On "Take up Slack" signal.** (Take off path still being clear)
Relay the signal to the winch driver.
Repeat verbal signals, as required.
Be ready to give a STOP signal.
6. **On "All Out" signal.**
Relay the signal to the winch driver.
Continue the signals until you are sure the winch driver can see the glider.
7. **Launch Failures.**
Following a weak link break or an instructor-simulated break, the winch driver may require an "all clear" (take up slack) signal, before pulling the cable back to the winch. The broken end is towed to the winch for repair.

In either case, in co-operation with the winch and retrieve vehicle drivers, use the stabilised communication system to ensure safe movement of the cables.
Be especially watchful during this procedure and keep people clear of the cables, etc.
8. **After the Launch Cable is clear.**
In a multi-cable winch, ensure that the first cable is clear and it is safe to handle the second cable. DO not allow the second cable to be handled while the first is "live" as there is always a risk of the two cables becoming entangled and the second cable thus becoming "live" also. Confirm to the launch point when the cable is clear.

LAUNCH PROCEDURES

Safety note:

If there is any jerk or hesitation in power at the commencement of the launch, the winch or car driver must terminate the launch and wait for a fresh set of signals before re-starting. If the pilot suspects over-running or other failure at the start of the launch, he should release the cable at once and treat as a launch failure

Introduction

The objective is to accelerate the glider smoothly and rapidly to its optimum launch airspeed whilst avoiding any snatching which over-stresses the cable or tail-banging which over-stresses the glider.

Method

1. **Ensure that the engine is warmed up**, in accordance with the manufacturers manual.
2. **Confirm with the launch controller** which cable is to be used.
3. **On receipt of TAKE UP SLACK -**
Engage drive.
To take up slack in cable.
4. **On receipt of ALL OUT -**
Open the throttle smoothly and progressively to the MAXIMUM SETTING FOR THE GLIDER TYPE AND CONDITIONS.
5. **Maintain the power setting** until the glider is established in the climb and then adjust to suit glider type, signals from the glider and general impression of speed, rate of climb etc.
6. **Reduce power as the glider approaches the top of the launch** and close the throttle fully to ensure that the launch is terminated well before the vertical position is reached.
7. **Immediately the glider is seen to release**, smoothly increase power sufficiently to deploy the parachute, maintain a slight tension in the cable and prevent the cable from touching the ground. This ensures a clean wrap onto the drum with no loose looping.
8. **Adjust the power to "fly" the parachute back to the winch**, clear of the ground, the parachute may be drawn closer to the winch VERY SLOWLY.
9. **Disengage drive.**
10. **Advise the launch controller CABLE CLEAR, if appropriate.**

Note on engine handling: After winding in the cable, allow the engine to return to normal operating temperature before switching off.

Repeat sequence for other cables.

Retrieve cables to launch-point.

EMERGENCY PROCEDURES

The winch driver is responsible for understanding how to use the emergency cable cutting equipment.

In certain circumstances an immediate reaction is essential to ensure the safety both of pilots and glider. Emergencies can be considered under the following four categories:-

1. Launch Failures, including simulated launch failures.
2. Failure of the glider to release on completion of the launch.
3. Launch obstruction.
4. Winch power failure.

1. Launch Failures

Provided that the cable daily inspection has been completed correctly and that there has been no incident which has caused a cable fault, the majority of launch failures will be due to failure of the weak link . This means that the parachute assembly will remain attached to the "live" cable and will deploy when the break occurs. Some tension in the cable will be maintained in the cable and the cable will lie straight.

A break elsewhere in the cable will mean that, due to spring back, there will be an unknown length of "dead" cable, complete with parachute that has floated down somewhere between the launch-point and the winch. There will also be a length of "live" cable, still attached to the winch.

As subsequent actions are dependent upon where the break has occurred, it is important that this should be quickly identified.

If Possible, the launch point controller should advise if a simulated cable break exercise is to be carried out, especially if planned to occur below 200 feet.

Launch Failure Procedures

1. Because it is often difficult to determine whether the failure is a weak link or cable break, reduce power immediately to bring the cable to rest and avoid any possible conflict between the glider and the cable / parachute assembly. **On no account should the cable be winched in until it is safe to do so.**
2. If a weak link has failed, the cable should be winched in for weak link replacement at the winch.
3. If the cable has failed, the cable retrieve crew will retrieve the broken end and return it to the winch, for cable repair.

Note:

It is strongly advised that following any cable break which involves cable looping or kinking - or if the second cable has been caught or fouled during a launch - a full inspection should be carried out on the cable(s) in question. This may appear to be time-consuming but the delay ensures continuing cable integrity.

2. Failure of glider to release the cable

Providing that the throttle is closed to terminate the launch at the appropriate point, the cable should back-release before it is carried to the vertical position by the glider. Once the cable has reached or passed vertical, it may be assumed that the glider is unable to release the cable. If this happens:-

Operate appropriate guillotine
Apply brake
Dis-engage drive
Stop engine
STAY INSIDE CAB UNTIL EMERGENCY IS OVER

3. Launch Obstruction

If at any time there is reason to believe that there is an obstruction or the risk of an obstruction by people, animals or vehicles, the launch should immediately be stopped and no further cable movements made until confirmation is received from the launch controller that it is clear to proceed.

Safety Note

A Stationary or falling cable does little damage. A running cable is potentially lethal.

4. Winch Power Failure

If any loss of power is experienced during a launch, the cause should be investigated before another launch is attempted.

CABLE REPAIR PROCEDURES

Safety Note

Should the winch operator be required to carry out any work on the winch cable system with the cables laid out on the field, He must first.

- 1. Switch on the winch stop light**
- 2. Inform launch control to keep clear of cables.**
- 3. Confirm with retrieve driver that he is clear of the cables**

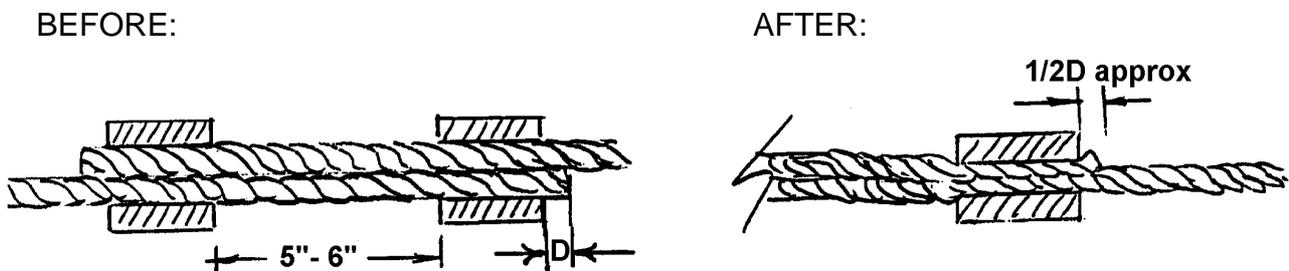
The winch cables must not be moved if the winch stop light is on

To do so could result in serious injury

1. Cable repairs must be carried out at the winch, using Tallurit or Intall cleats or ferrules and a hydraulic press.
2. Check that the press has been set up with the correct dies and the correct sized ferrules are stowed in the ferrule box.

Procedure

1. Clean cut each end of the cable with the cable cutters, provided.
2. Thread on two ferrules and overlap the cable by 125 - 150 mm (5 - 6 Inches) as shown in the diagram below



D = Diameter of cable

3. Place the ferrule (and cable) between the dies, vertically and centrally.
4. Tighten the release valve and operate the hand pump until the swage faces just meet.
5. Unscrew the release valve to release the ram and extract the formed swage.
6. Repeat for second ferrule. N.B. Time can be saved between pressings by allowing the swages to open only sufficiently to allow the ferrule to be inserted or extracted.

ATTENTION - WARNINGS

DO NOT APPLY MORE PRESSURE THAN IS REQUIRED TO BRING THE SWAGES FACE TO FACE.

DO NOT OVER-TIGHTEN RELEASE VALVE.

DO NOT PRESS "FLASH" BACK INTO SPLICE.

DO NOT USE ANY FERRULES OTHER THAN THOSE PROVIDED.

CLOSEDOWN PROCEDURES

1. Engine OFF.
2. Drive DISENGAGED.
3. Retrieve cables by rotating drums by hand and stow parachutes. Secure free end of cables.
4. Apply winch brakes ON.
5. Switch accessories OFF.
6. Stow chocks and earthing spike.
7. Disconnect telephone cable etc. if appropriate.
8. Enter any defects and operating details in the Winch Log Book.

CABLE RENEWAL

Cable should be taken from the top of the cable drum to the top of the winch drum or from the bottom of the cable drum to the bottom of the winch drum.

Initial Launches

The first series of launches with a new cable are critical to its life;. at least 20 launches must be carried out observing the following conditions:-

1. No low or simulated launch failures.
2. No release under tension.
3. Maintain a normal cable load during the launch.

List of Appendices

Appendix A	N/A
Appendix B	Monthly Maintenance
Appendix C	Annual Maintenance (to be carried out by authorised personnel only)
Appendix D	Guillotine System – Routine Checks (as Annual Maintenance)
Appendix F	Cable Configurations

Appendix B

MONTHLY MAINTENANCE *

At the beginning of each calendar month, all winches and prime movers are to be given monthly maintenance in accordance with the following schedule

Action	Item
Daily maintenance	Carry out daily inspection (See page 2)
Guillotine operation	Carry out monthly check (See Appendix D)
Transmission	Check bolts for security
Brakes	Check operation. Adjust as necessary.
Radiator	Check cooling ducts free
Battery	Check electrolyte level and replenish with distilled water. Check battery stowage mounting and terminals.
General	Clean winch thoroughly. General lubrication as necessary.
Prime mover ball joints	Check all steering ball-joints for lift or excessive free play. Rectify faults to ensure safe vehicle handling
Prime mover wheel brake	Check brake pads. Adjust and carry out functional checks.

* Or more frequently, if specified by the manufacturers.

Appendix C

ANNUAL MAINTENANCE

All winches and prime movers are to be given annual maintenance, according to the following schedule:-

Daily Maintenance	Carry out daily inspection (DI). (See page 2)
Monthly Maintenance	Carry out monthly maintenance (appendix B)
Brakes	Strip and Inspect. Adjust as required
Drum	Check security of drum nuts. Tighten as necessary.
Roller guides	Clean complete unit. Check all roller guides for smooth running. Replace all worn bearings and grooved rollers. Lubricate.
Engine Oil and Air Systems (winch and prime mover)	Change engine oil and filter Service air filter.
Ignition system	Check serviceability. Replace spark plugs or service injectors.
Pay-on gear	Check drive belt wear and tension.
Fuel system (winch and prime mover)	Check the fuel filters. Clean or replace as necessary.
Engine cooling system	Check specific gravity of the antifreeze. Check hoses, water pump and radiator ducts.
Belt drives	Tension belts and renew as necessary.
Guillotine	Carry out Guillotine Full Functional Check (See appendix D)
Structure and Bodywork	Inspect body and chassis for damage, corrosion and loose paint. Restore paint surface use primer) undercoat and finish coats.
Prime mover steering linkage	Check steering linkage. Checking the amount of free play at the steering wheel will indicate the degree of wear in the steering box and linkage. Rectify faults to ensure safe vehicle handling.

Appendix D

GUILLOTINE SYSTEM ROUTINE CHECKS

The Guillotine is a vital safety feature of any winch and it is essential that the cable cutting equipment is maintained so that it will work efficiently, if needed in an emergency. There is a wide range of types and it is vital to protect and preserve the cutting edge in order to maintain effective operation.

Serviceability Check

To ensure correct operation, the guillotine should receive a serviceability check as and when required. It is advised that this check is performed **at least once** every month.

The frequency of this check is dependent, amongst other things, upon the dirt and debris collected upon the guillotine mechanism from the passing cable, it will therefore vary according to the state of the ground over which the cable passes.

Check full range of movement and operation of the guillotine, assembly and mechanism (without cutting cable).

Full Functional Test (with cable)

The guillotine full functional test is to be carried out as often as considered necessary to ensure correct operation but at a minimum frequency.

- a. as recommended by the winch manufacturer
- b. after any repairs to the guillotine.

Operate guillotine system from the winch cab. Ensure that the cable is severed cleanly. If the cable is not severed completely, dismantle the guillotine system, clean and if necessary replace worn or defective parts with sound parts, reassemble and carry out a further functional test.

A record of guillotine inspection and testing should be kept on the daily log sheets (see Appendix A).

Appendix F

Cable Configuration

Notes on the correct attachment of parachutes, weak-links and towing strops.

General Principles

1. The relative position of the component parts is critical. The weak-link should always be positioned between the glider and the parachute, leaving the parachute attached to the cable when the weak-link fails.
2. No part of the parachute assembly and strops should be capable of storing energy. Any elasticity in this assembly can result in damage to the glider.
3. The assembly should contain the minimum number of metal parts to reduce weight and potential impact damage.
4. The assembly must not be able to damage, obscure or become entangled with the glider at any time, especially following a cable-break or weak-link failure.
5. All sections should be capable of quick and easy assembly and detachment.

The Component Parts

Attachment to cable. The end of the cable is fashioned into an eye by swageing the cable round a thimble which protects the strands from wear.

A **shackle-bolt** passes through the thimble -eye

The **shackle** holds the ends of a fabric strop which gathers together the shrouds of the **parachute**. Fabric is employed to minimise friction and wear on the parachute shrouds.

The **canopy** of the parachute is attached to the weak-link assembly, using another strop of shroud material.

The **weak-link** assembly incorporates a link to suit the glider being launched (see Appendix E) and this remains with the parachute assembly. (At some sites, a selection of weak-links, suitable for launching each of the glider types in the club's fleet, may remain permanently attached to the parachute assembly. This is convenient, but calls for extra care in ensuring that the correct link is chosen for each launch.)

N.B. The Tost weak link system is designed for use either with a single link or with double links. If the double-link system is employed, it is essential that the links are of different design (the main link having round holes and the reserve link having slotted holes). Using two weak links, each of the same design doubles the breaking load and renders the whole assembly ineffective. Because of the risk of assembling two weak links incorrectly, the single-link assembly is recommended as the more foolproof system.

A **quick-release** coupling attaches the launch strop to the weak-link assembly.

The **launch strop** is constructed either of steel cable, shrouded in plastic hose or of heavy hemp rope. It is essential that the strop does not store energy or it may catapult back to the glider, following a launch failure. The length of the strop must be such that it cannot foul any of the control surfaces of the glider, following a failure of the cable or the weak-link.

The cable assembly is attached to the glider's release mechanism by means of a **circular steel link** which is attached to the launch strop via a larger steel link. Any wear or distortion of either the link or of the release mechanism renders the cable-release unserviceable. It is also desirable that the release mechanism and the attachment links should be of the same make.

The use of Ottfur cable rings is no longer recommended due to the risk of permanent distortion or failure when employed at loads in excess of 1650 lbs.

SKYLAUNCH SUGGESTED THROTTLE GUIDE SETTING CHART

WARNING

THESE SETTINGS ARE APPROXIMATE AND SHOULD BE TREATED AS A GUIDE ONLY
ALWAYS TAKE ACCOUNT OF PILOT INSTRUCTION/FEEDBACK WHEN CHOOSING SETTINGS
ALWAYS TAKE CARE IN VARIABLE WEATHER CONDITIONS - INCLUDING CROSS-WINDS

The headwind guide is based on approx 5 knots (9 Km/h) per setting starting with 0 = 0 knots (0 km/h)

If the headwind is between the 5 knots (9 km/h) increments, increasing with altitude, gusting or the glider is launching into thermals then throttle will have to be adjusted accordingly - always allowing for any cross-wind element.

NOTE: Guide settings are based on 8.2 litre engine. For 7.4 litre engine all A's will move up to A+

WEAK LINKS		
BLACK	No 1	1000 daN = 2200 lbs
BROWN	No 2	850 daN = 1870 lbs
RED	No 3	750 daN = 1650 lbs
BLUE	No 4	600 daN = 1320 lbs
WHITE	No 5	500 daN = 1100 lbs

GLIDER TYPE	WEAK LINK	SUGGESTED LAUNCH SPEED	SUGGESTED THROTTLE GUIDE SETTING
ASTIR/GROB SINGLE	BLUE	60 kts (110 km/h)	E+
ASTIR/GROB TWIN	RED/BROWN	60 kts (110 km/h)	A
ASH 25	BROWN	60-65 kts (110-120 km/h)	A+
ASH26	RED	60 kts (110-120 km/h)	D
ASK14	RED		
ASK18	WHITE	55 kts (100 km/h)	E
ASK21	BLACK	60-65 kts (110-120 km/h)	A
A5K23	BLUE	60 kts (110 km/h)	E
ASW15	WHITE	55 kts(100-110 km/h)	E
ASW17	BLUE	60 kts (110 km/h)	B-
ASW19	BLUE	60 kts (110 km/h)	E+
ASW20	BLUE	60 kts (110 km/h)	D-
ASW22	BROWN	60-65 kts (110-120 km/h)	A-
ASW24	BLUE	60-65 kts (110-120 km/h)	D
ASW27	BLUE	60-65 kts (110-120 km/h)	D
AUSTRIA STD	BLUE	55 kts (100 km/h)	E
BERGFALKE 2	BROWN	55 kts (100 km/h)	C
BERGFALKE 3	BLACK	55 kts (100 km/h)	C

BERGFALKE 4	RED	55 kts (100 km/h)	C
BG135	BLUE	55 kts (100 km/h)	E
BIJAVE	BLUE		
BLANIK	BLUE	55 kts (100 km/h)	C+
BOCIAN	BLACK	55-60 kts (100-110 km/h)	B+
BREQUET 905	BLUE		
CADET MK1	WHITE	45-50 kts (85-95 km/h)	F
CADET MK2 (T21)	WHITE	45-50 kts (85-95 km/h)	E
CADET MK3 (T31)	WHITE	45-50 kts (85-95 km/h)	E
CAPRONI A21	BLUE	55-60 kts (100-110 km/h)	C
CAPSTAN	BLUE	55-60 kts (100-110 km/h)	D+
CARMAN JP15	BLUE	55-60 kts (100-110 km/h)	E
CENTAIR 101 (PEGASE)	BLUE	60 kts (110 km/h)	E+
CIRRUS (OPEN)	BROWN	60 kts (110 km/h)	D-
CIRRUS (STD)	BLUE	60 kts (110 km/h)	E+
COBRA	BLUE	55-60 kts (100-110 km/h)	E+ (BELLY HOOK)
COBRA	BLUE	55-60 kts(100-110 km/h)	E- (COMPROMISE HOOK)
CONDOR	BLACK	55 kts (100 km/h)	D-
CUMULUS	WHITE	50K 5km/h	F
DART	WHITE	60 kts (110 km/h)	E+ (BELLY HOOK)
DART	WHITE	60 kts (110 km/h)	E- (COMPROMISE HOOK)
DELPHIN	BLUE		
DG 100/200/300	BLUE	66 kts (110 km/h)	E+
DG 400/600/800	BLUE	60 kts (110 km/h)	D
DG 500/505	BLACK/BROWN	60- 65 kts (110-120 km/h)	A+
DIAMANT 16/18-5	BROWN	55-60 kts (100-110 km/h)	C+
DISCUS	BLUE	60-65 kts (110-120 km/h)	D
DISCUS 2	BLUE	60-65 kts (110-120 km/h)	D+
DUO DISCUS	BROWN	60-65 kts (110-120 km/h)	A+
DOPPELRAAB	RED		
EAGLE	BLUE	55 kts (100 km/h)	C
ELFE S2	WHITE		
EON PRIMARY	WHITE		F--
EON BABY	BLUE	45-50 kts (85-95 km/h)	F-
FALCON	WHITE	45 kts (85 km/h)	F-
FAUVEL	WHITE		
FAUVEL AV36	BLUE	55-60 kts (100-110 km/h)	E
FAUVETTE 905	BLUE	55 kts (100 km/h)	E
FOKA 3/4/5	BLUE	55-60 kts(100-110 km/h)	E+ (BELLY HOOK)
FOKA 3/4/5	BLUE	55-60 kts (100-110 km/h)	E- (COMPROMISE HOOK)
GEIER II	RED		
GLASFLUGEL 604	BROWN		
GOEVIER III	BLACK	50-55 kts (95-100 km/h)	C
GRUNAU /5	WHITE	45-50 kts (85-95 km/h)	F-

GULL 1/3/5	WHITE	45 kts (85 km/h)	F-
HARBINGER	WHITE		
HORNET	WHITE	60 kts (110 km/h)	E+ WEAK LINK CAN EASILY BREAK
HUTTER17	WHITE		
IRIS (D77)	WHITE		
IS28 B2	BLUE		
IS29	BLUE		
IS30	BLUE		
IS32	BLUE		
JANTAR (STD)	BLUE	60 kts (110 km/h)	D
JANTAR	BLUE	60 kts (110 km/h)	D
JANUS B	BLUE	60 kts (110 km/h)	A WEAK LINK CAN EASILY BREAK
JANUS C	RED	60 kts (110 km/h)	A WEAK LINK CAN EASILY BREAK
JASKOLKA	WHITE		
JAVELOT	WHITE		
JUNIOR	BLUE	60 kts (110 km/h)	E
JP36A	WHITE		
KA1/3	WHITE		
KA2	BLUE		
KA4	BROWN		
KA6	BLUE	50 kts (95 km/h)	F+
KA7	BLACK	55 kts (100 km/h)	D
KA8	BLUE	50-55 kts (95-100 km/h)	F
KA13	BLACK	55 kts (100 km/h)	C
KESTREL 17/19	BLUE	60 kts (110 km/h)	D
KITE 1/2B	WHITE		
KRANICH 11/111	BROWN		
KRANJANEK	WHITE		
LAK12	BLUE		
LIBELLE	BLUE	55-60 kts (100-110 km/h)	E
LO-100	BLUE		
LS1	WHITE	55-60 kts (100-110 km/h)	E WEAK LINK CAN EASILY BREAK
LS3	BLUE	60 kts (110 km/h)	E+
LS 4/6/7	BLUE	60 kts (110 km/h)	D-
LS8	RED	60-65 kts (110-120 km/h)	D
M100	BLUE	55 kts (100 km/h)	E
M200	BLUE		
ME7	WHITE	55 kts (100 km/h)	F
MEISE	BLUE		
MISTRAL	WHITE	60 kts (110 km/h)	E+ WEAK LINK CAN EASILY BREAK
MOSQUITO	BLUE	60 kts (110 km/h)	E+

MOSWEY	BLUE		
MINIMOA	WHITE		
MUCHA STD	RED		
MU13	WHITE		
NIMBUS 2	BLUE	60 kts (110 km/h)	C+
NIMBUS 3	RED	60-65 kts (110-120 km/h)	A
NIMBUS 3D (2 SEAT)	BLACK	60-65 kts (110-120 km/h)	A+
NIMBUS 4	BLACK	60-65 kts (110-120 km/h)	A
NIMBUS 4D (2 SEAT)	BROWN/BLACK	60-65 kts (110-120 km/h)	A+
NIMBUS MINI	BLUE	60 kts (110 km/h)	
OLYMPIA 1	WHITE		
OLYMPIA 2 (B)	WHITE	50 kts (95 km/h)	F-
OLYMPIA 460/463	WHITE	50-55 kts (95-100 km/h)	F+ WEAK LINK CAN EASILY BREAK
OLYMPIA 419	BLUE	50 kts (95 km/h)	
PEAK100	BLUE		
PETREL	WHITE		
PHOEBUS	BLACK		
PIK16	BLUE		
PIK20	BLUE	60 kts (110 km/h)	D
PIK20E	BLUE	60 kts (110 km/h)	D
PILATUS B4	WHITE	55-60 kts (100-110 km/h)	E+ WEAK LINK CAN EASILY BREAK
PIRAT	BLUE	55 kts (100 km/h)	
PREFECT	WHITE		
PUCHACZ	RED	55 kts (100 km/h)	B WEAK LINK CAN EASILY BREAK
PW5	BLUE	55-60 kts (100-110 km/h)	E
RHEINLAND	WHITE		
RHONLANDER 2	WHITE		
RHONLERCHE 2	BROWN		
RHONSPERBER	WHITE		
SAGITTA	BLUE		
SB5	BLUE		
SF26	BLUE	55 kts (100 km/h)	F+
SF27	RED	55 kts (100 km/h)	F+
SF34	BLUE		
SG38	WHITE		
SHK	BLUE	55 kts (100 km/h)	E
SIE 3	BLUE	55 kts (100 km/h)	F+
SILENE	BLUE	55-60 kts (100-110 km/h)	C+ WEAK LINK CAN EASILY BREAK
SKY	WHITE	50 kts (95 km/h)	F+ WEAK LINK CAN EASILY BREAK
SKYLARKS	BLUE	55-60 kts (100-110 km/h)	E
SPATZ	WHITE		

SPERBER	BLACK		
STEINADLER MG 19 A	BROWN	50-55 kts (95-100 km/h)	D- (COMPROMISE HOOK)
SUID III	WHITE		
SWALLOW	WHITE	50 kts (95 km/h)	F WEAK LINK CAN EASILY BREAK
SWIFT	WHITE		
TS3/YS53	RED	55 kts (100 km/h)	B- WEAK LINK CAN EASILY BREAK
T21	WHITE	45-50 kts (85-95 km/h)	E WEAK LINK CAN EASILY BREAK
T31	WHITE	45-50 kts (85-95 km/h)	E WEAK UNK CAN EASILY BREAK
TORVA	WHITE		
TUTOR	WHITE	45-50 kts (85-95 km/h)	F
VEGA	BLUE	60 kts (110 km/h)	D-
VENTUS/VENTUS 2	BLUE	60-65 kts (110-120 km/h)	C-
VIKING (VGC)	WHITE		
WASSAMER	WHITE		
WEIHE	BLUE		
ZUGVOGLEL	BLUE		

NOTE: Any glider listings not filled in have yet to be assessed by Skylaunch to complete the data.

Please note that Skylaunch endeavour to make settings as similar as possible between machines, but this cannot be guaranteed. In consequence this table should be treated AS A GUIDE ONLY, and you should adjust it in the light of your own experience with your machine.

E&OE