

Electric Glider Winches



PRESENTER

Mike Groves – Ex professional winch driver from the Long Mynd (UK) / Skylaunch founder and Winch Designer.

- 35 years experience**
- - More than 170 winches, so far.**
 - Supplying 45 countries.**

Subjects

Electric Glider launch winches

Electric Retrieve winches

Pros and cons of electric winching

Questions



Modern Winch Manufacturing





- Winches have evolved in many ways but the principle has remained the same



First Skylaunch Winch



Current Winch model

■ Evolution of the Glider Winch



Single Drum Winches

Multi Drum Winches



Electric Winch

**Operating voltage = 580-700
(charging up to 800v)**

Peak amps = 430

Peak power = 250 kw

Power consumption:

0.8 – 1.5 kwh per launch

(Junior – k21)

(Based on 1000m cable length)

Electric Winch



First electric winch model Designed and manufactured 2010

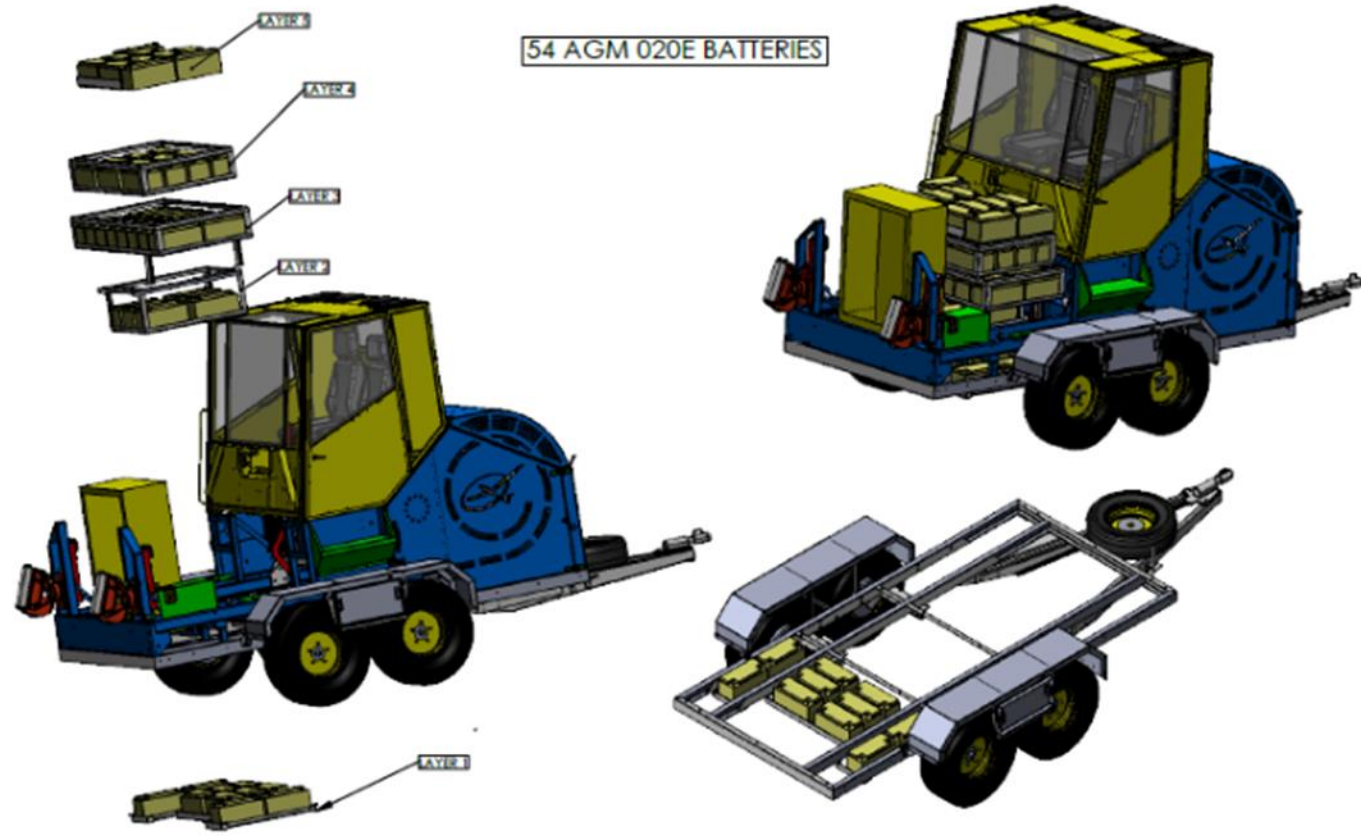
First Electric Winch



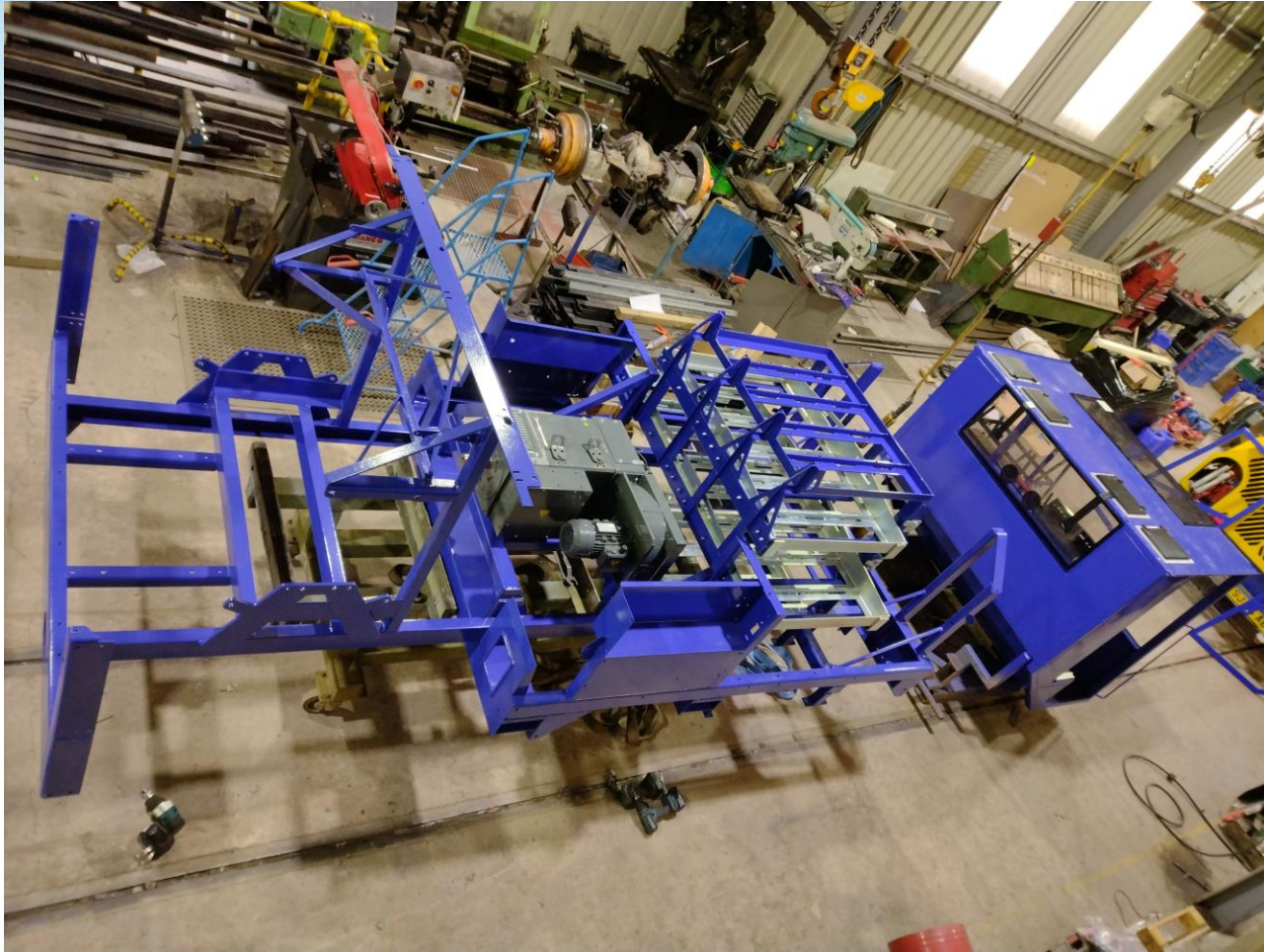
latest Electric Winch



Electric Winch



Electric Winch



Electric Winch



Electric Winch



Electric Winch



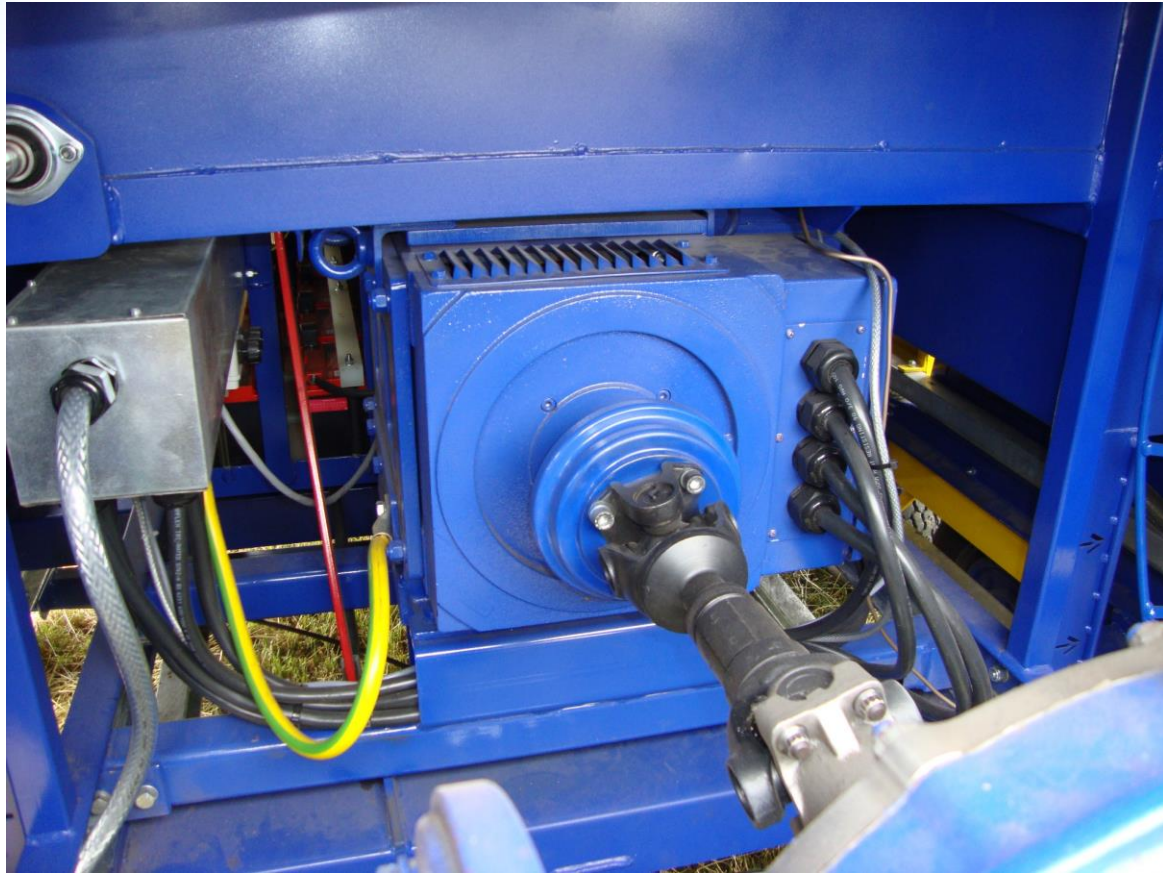
■ Electric Winch Controls

Electric Winch



- Electric Winch Controls

Electric Winch



- Electric Motor

Electric Winch



- Lithium Batteries (cordless)
- AGM Batteries (plug in)

Electric Winch



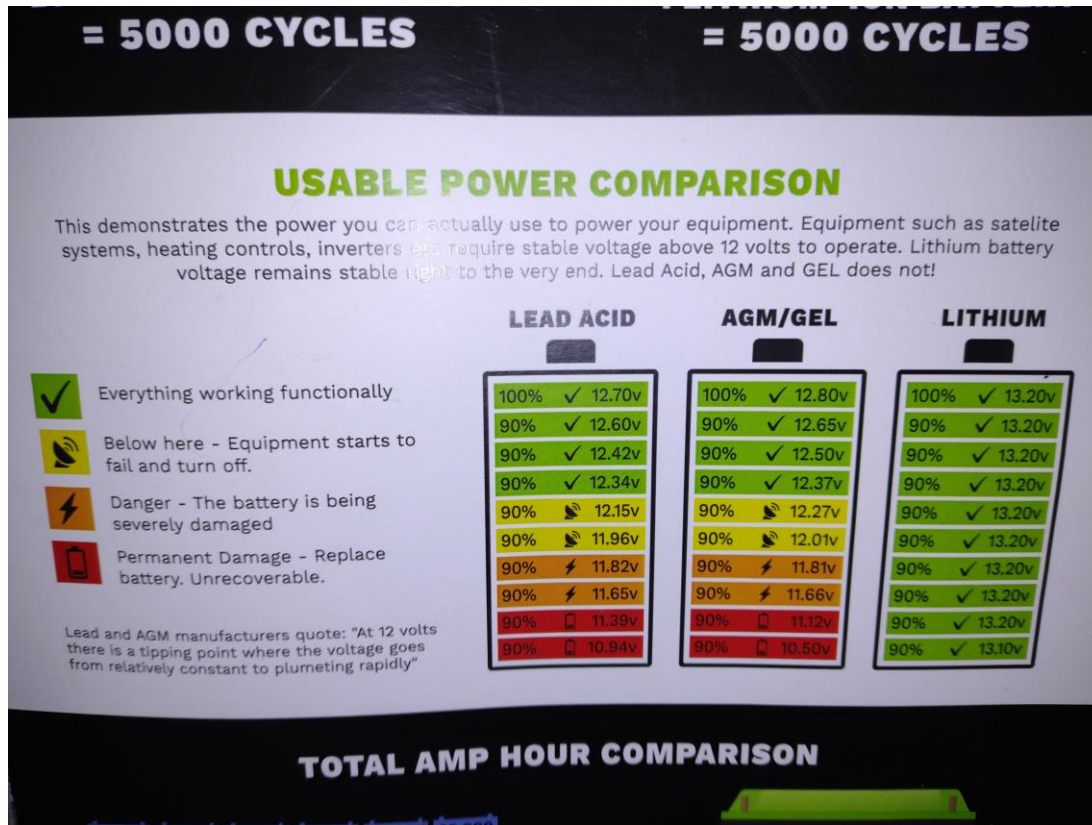
- Lithium power packs required for cordless operation

Electric Winch



- Solar Panels can be used to recharge the batteries in the week days.

Electric Winch



■ Usable Power

Electric Winch



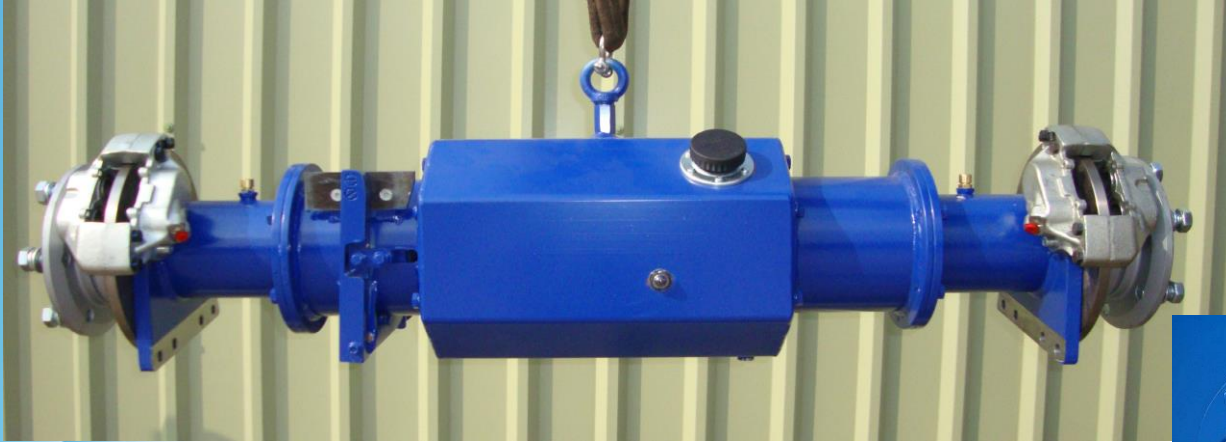
- Battery charger unit

Electric Winch



- Industrial inverter systems

Electric Winch



- Final drive and brake system are all the same as used with conventionally powered winches

Electric Winch



- Final drive gear ratio to suit the electric motor RPM range.

Electric winch otherwise same as conventionally powered winch



Electric Winch



ICE Winches can be upgraded to Electric power

Electric launch



Advantages and disadvantages of Electric winching



Advantages and disadvantages of Electric winching

Advantage

Mechanically very simple

Disadvantage

Electronically complicated

Advantages and disadvantages of Electric winching

Advantage

Less general servicing of the winch required

Disadvantage

Care and specialist knowledge can be required as high voltages and currents involved (700 + volts DC)
Battery life/replacement costs must be considered

Advantages and disadvantages of Electric winching

Advantage

Normally purchased with funding as seen to be environmentally friendly- more grants may be available for “clean” energy options

Disadvantage

If no funding available, electric winches are more expensive than Propane (or Petrol) winches. If Lithium (cordless) winch model price could be up to double ICE

Advantages and disadvantages of Electric winching

Advantage

No emissions at the airfield if plugged into the electric grid or cordless operation.

Cordless winch could be charged from solar panels on non-flying days

Disadvantage

Suitable power supply at airfield will be expensive - the cost and/or legalities may be significant if site is not owned by the club

Advantages and disadvantages of Electric winching

Advantage

If powered from the grid, Onsite fuel storage for the winch is no longer required.
Solar panels could reduce the demand from the grid if limited capacity.

Disadvantage

If grid power is unavailable, a generator may be required which negates the positives of clean energy – unless solar/wind power could be used.

Advantages and disadvantages of Electric winching

Advantage

Public relations image will improve as seen to be environmentally responsible, because of this funding maybe available.

Disadvantage

Additional charges may apply for upkeep of the electrical infrastructure

Advantages and disadvantages of Electric winching

Advantage

Quieter operation and no engine warm-up required.

Disadvantage

If the airfield is remote then the required 3 phase power supply may be difficult or expensive to install -
Unless solar is possible

Advantages and disadvantages of Electric winching

Advantage

After winch purchase and infrastructure is in place, then cost per actual launch should be lower.
(But battery life must be considered)

Disadvantage

If powered from the grid, the winch position / launch direction is limited by the access to power supply
(Unless cordless option chosen)

Advantages and disadvantages of Electric winching

Advantage

Further simplifies winch driving techniques to help with consistent and safe launches

Disadvantage

The batteries required for an electric winch makes it much heavier than an Propane (or Petrol) powered winch

Skylaunch electric retrieve winches



- Can be powered from electrical socket at Glider end of airfield, or cordless with batteries

Electric retrieve winches



- Power consumption from this high speed system is much lower than using vehicle retrieve, so std batteries can be used to reduce costs. 41
- Or Lithium if many retrieves needed.

Electric retrieve winches

- Using an electric Retrieve Winch means that the launch system is all electric – zero emissions at Airfield for winching
- Launch winch would require less energy when used with the Retrieve winch, as the cables are not wound back to the launch winch after each cable release – up to a 30% energy saving for the whole launch cycle.

Electric retrieve winches

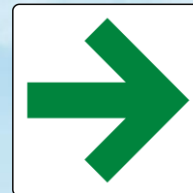
- Saves using a cable retrieve vehicle
- Reduces wear/damage on the airfield
- Launch rate using a retrieve winch is much faster than even a 4 or 6 drum winch – up to 30 gliders/hr.

OTHER WINCHES



OTHER WINCHES

Other winches could be converted to all-electric operation, depending on final drive ratios and drums core diameters



Any questions?



Electric gliding Winches

Thank you for listening

