

SKYLAUNCH OPERATING AND MAINTENANCE COSTINGS
(Based On 3000 Launches Per Year) –
SKYLAUNCH 2 EVO MAIN WINCH, LPG powered (TWIN DRUM) MODELS 2013
(using Skyrope launch cable)

<u>SERVICE OPERATION</u>		Every 6,000 launch service	Every 12,000 launch service	Every 36,000 launch Service	Every 5 years LPG engine <u>only</u>	NOTES + Spares and consumables All parts are normally ex-stock from Skylaunch HQ England	Costs When Service / Renewed, Etc	Cost Per Launch
		✓/x	✓/x	✓/x	✓/x		UK POUNDS	+VAT
1	Check fuel level	♦	♦	♦	-	Typical fuel usage per launch = 0.8 litre using the larger 8.2 litre GM V8 engine and 1000m cable length.	-	£0.40
2	Check operation of all controls, lamps & warning lights	♦	♦	♦	-	-	-	-
3	Operational checks (switch on A/C for 2 minutes, if fitted)	♦	♦	♦	-	-	-	-
4	Check exhaust system	♦	♦	♦	-	Manifold gaskets last approx 20,000 launches	£19.74	0.00099
5	Renew transmission fluid & filter	-	♦	♦	-	Filter (inc gasket) +10 litres ATF	£41.88	0.00349
6	Check transmission level	♦	♦	♦	-	With the latest transmission governor / modulator set up and adjustment techniques, the life expectancy is even longer than the original Skylaunch winches. (Of which nearly every customer is still using the original unit) For costing allow for full rebuild every 20 years.	Estimate £850.00	0.01416
7	Renew engine oil & filter	♦	♦	♦	-	Filter +7 litres of semi synthetic automotive engine oil	£24.54	0.00409
8	Check engine oil level	♦	♦	♦	-	-	-	-
9	Renew final drive oil	-	♦	-	-	8 litres EP85/140 oil	£17.12	0.00143
10	Check final drive oil level	♦	♦	♦	-	-	-	-

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11	Renew fuel filter (petrol engine only)	♦	♦	♦	-	-	-	-
12	Check all fluid lines for leaks/damage	♦	♦	♦	-	-	-	-
13	Check engine drive belts & pulleys	♦	♦	♦	-	Our newer winches have a crank shaft driven fan system (not belt driven) much reducing belt wear and only 1 or 2 belts now fitted. (earlier models had 3 or 5 belts). Average life 15,000 launches.	£9.66	0.00064
14	Check alternator bearings and charging voltage	♦	♦	♦	-	Alternators typically last 10-15 years (Average 12.5)	£120.13	0.0032
15	Check cooling radiators	♦	♦	♦	-	Some main engine radiators have been replaced / re-cored after 10-15 years, (average 12.5) depending on water hardness in local area and operators 'cooling off after launch' technique. Our newer winches have an improved design radiator with a separate header system which increases life significantly.	Average cost £600.00	0.016
16	Check radiator temperature sender	♦	♦	♦	-	Some have failed on earlier models but later models are fitted with relays to reduce the current through the contacts. Average life expected 12.5 years.	£35.51	0.00094
17	Check engine coolant concentration	♦	♦	♦	-	-	-	-
18	Renew engine coolant	-	-	♦	-	10 Litres universal antifreeze (50% mix with water)	£14.15	0.00039
19	Check engine coolant level	♦	♦	♦	-	-	-	-
20	Renew brake fluid (every 2 years)(option)	-	-	-	-	We check condition and normally it is ok for 4-5 years (average 4.5) @ 0.5 litre	£1.93	0.00014
21	Check brake fluid level	♦	♦	♦	-	-	-	-
22	Renew engine spark plugs	-	♦	♦	-	8 Spark plugs	£26.78	0.00223

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23	Carry out engine compression test	-	-	♦	-	None of the 100 Skylaunch winches built over the last 20 years have so far had engines rebuilt / replaced due to wear. (Clean LPG fuel helps give exceptional engine life). For costing allow for rebuild every 25 years.	Estimate £2000	0.02666
24	Check engine spark plugs	♦	-	-	-	-	-	-
25	Renew engine air filter and clean carburettor if required	♦	♦	♦	-	Paper type air filter element	£12.60	0.00210
26	Check engine crankcase breather	♦	♦	♦	-	-	-	-
27	Renew engine distributor cap, rotor arm & HT leads subject to condition	-	-	♦	-	Costs/interval based on the much more reliable later type 'large' distributor fitted in all new winches from 2010	£88.64	0.00246
28	Check engine HT ignition system	♦	♦	♦	-	-	-	-
29	Check engine idle speed	♦	♦	♦	-	-	-	-
30	Check Carburettor goes to full travel when throttle is fully open	♦	♦	♦	-	-	-	-
31	Check LPG Vaporiser for heavy ends	♦	♦	♦	-	This is a check for LPG contamination if poor quality fuel used. Some winches have needed diaphragm repair kits, others have not needed any repairs. (Average 30,000 launches)	£111.41	0.00371
32	Lubricate battery terminals	♦	♦	♦	-	-	-	-
33	Check Battery Fluid Level (If not fully sealed)	♦	♦	♦	-	Latest type fitted is fully sealed, typical life 8-12 years (average 10)	£69.94	0.00233
34	Check engine auto-flywheel (flex plate) starting teeth and	♦	♦	♦	-	If starter motor is adjusted correctly, flex plate life should be 3x starter motor life or more.	£170.63	0.00379

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	check 3 (or 6) bolts for tightness							
35	Check starter motor + bolts	♦	♦	♦	-	Later type gear reduction type now fitted, giving average life of 15,000 launches	£128.10	0.00854
36	Check valves and connections on LPG tank(s)	♦	♦	♦	-	-	-	-
37	Check fuel tank(s)	-	♦	♦	-	-	-	-
38	Renew pressure relief valve(s) (PRV) on LPG tank(s)	-	-	-	♦	For automotive use - codes of practice specify to change PRVs every 5 years due to corrosion from Highway salt/moisture. For gliding clubs these are usually inspected and re-greased only, as they have a much less corrosive environment.	-	-
39	Check fixings on LPG tank(s)	-	-	-	♦	-	-	-
40	Hydraulic pressure test to LPG tank(s) (Every 10 years)	-	-	-	-	For automotive use - codes of practice specify to retest the tank every 10 years (due to corrosion in highway use). For gliding clubs these are usually inspected with an endoscope and reused. For costing allow for a new tank every 20 years.	£220.00 Per Tank	0.00366
41	Check all wiring for external damage/correct routing	♦	♦	♦	-	-	-	-
42	Check cable tow-out brake, interlock & switch	♦	♦	♦	-	-	-	-
43	Lubricate automatic tow-out brake centre linkage pivot	♦	-	-	-	Standard Grease/ Gun.	-	-
44	Check operation of cable drum brake system and drum hub bolts for tightness	♦	♦	♦	-	-	-	-

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45	Check condition of cable drums, brake discs & pads	♦	♦	♦	-	Brake pads average life: - launching - 30,000 -cable tow out - 15,000	£29.14 £38.64	0.00097 0.00258
46	Check drum brake calliper bolts	♦	♦	♦	-	Brake callipers typically last approximately 15 years, before corrosion on the pistons can cause leaks.	£133.00 X 2	0.00592
47	Check bevel box outer bearing housing semi-fluid grease	♦	♦	♦	-	-	-	-
48	Check drum hub grub screws – 4 off	♦	♦	♦	-	-	-	-
49	Check condition of mounting rubbers	-	♦	♦	-	-	-	-
50	Check chassis assembly	-	♦	♦	-	-	-	-
51	Lubricate controls & linkages	♦	♦	♦	-	Oil can or aerosol oil / grease.	-	-
52	Check prop shaft U/J's & fasteners	-	♦	♦	-	-	-	-
53	Lubricate prop shaft	♦	♦	♦	-	Standard Grease / gun.	-	-
54	Check general fasteners for tightness	♦	♦	♦	-	-	-	-
55	Check all cable rollers & pulleys	♦	♦	♦	-	Pulley/roller/bearing wear/damage varies depending on operators, airfield surface / cable type, etc. Average life 25,000 launches.	Average Cost £60.32 each x8	0.0193
56	Check guillotines & linkage condition + fixings/bearings for tightness, lubricate linkages and grease points.	♦	♦	♦	-	Aerosol oil / grease + standard grease / gun.	-	-

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57	Check countersunk screws in plastic cable pulleys (if fitted)	♦	♦	♦	-	-	-	-
58	Guillotines refurbishment.	-	-	-	-	Guillotines refurbishment recommended at 24 x 28 days (1 month) of actual launching (average 30 launches per day = 20,000 approx) (+ Estimated delivery £50.00)	£307.00 for both	0.01785
59	Guillotines test/checks & reset.	-	-	-	-	Recommended every 28 days of actual launching (1 month), or after refurbishment and reassembly on the winch.	-	-
60	Check communications equipment	♦	♦	♦	-	-	-	-
61	Check dash linkage + levers spring into slots correctly + lubricate	♦	♦	♦		-	-	-
62	Check drum cover hinges and rubber retainers on all panels where applicable.	♦	♦	♦	-	-	-	-
63	Lubricate drum cover hinges	♦	♦	♦	-	Aerosol oil / grease.	-	-
64	Lubricate cab door latches/locks/hinges	♦	♦	♦	-	Aerosol oil / grease.	-	-
65	Renew air conditioning receiver / drier filter (if option fitted) -every 2 years	-	-	-	-	(Option)	(Option)	(Option)
66	Check wheel brakes	♦	♦	♦	-			
67	Check wheel nuts	♦	♦	♦	-			

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68	Check wheel chocks/switch, Lubricate pivots / latches / switch & check clearance from chassis. (if option fitted)	♦	♦	♦	-				
69	Check tyre pressures	♦	♦	♦	-				
70	Check trailer wheel brake system	♦	♦	♦	-				
71	Lubricate tow hitch & stand	♦	♦	♦	-	Standard grease / gun.			
72	Check trailer wheel bearings and tyres	-	♦	♦	-	Tyres typically last 10-15 years depending on airfield surfaces (average 12.5). Remoulds or second hand Land Rover tyres usually fitted. (Unless towed frequently on the highway).	£50.00 x 4	0.00533	
73	Check cab trim, etc	♦	♦	♦	♦				
74	Miscellaneous	-	-	-	-	General wear and tear/damage/miscellaneous (broken window? / rubber panel retainers / paint, etc)	Estimate £100 per year	0.0333	
TOTAL COST PER LAUNCH <u>INCLUDING FUEL</u>									£0.56
TOTAL COST PER LAUNCH <u>WITHOUT FUEL</u>									£0.18

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A	Launching Cables					2x1200m of 10mm Skyrope. Average life of 1500 launches per roll (will vary with airfield Surface/shape) (+Estimated delivery £50.00)	2 rolls £504.80	0.168
B	New Skylaunch 2 Evolution Capital payback					Assuming a Payback period of 20 years, 3,000 launches per year, and an average new price of £65,000 (New twin Drum Winch prices vary from £55,000 to £70,000) Purchase cost divided by 60,000 launches = NOTE: After 20 years a Skylaunch winch should still have a value of £10,000 - £15,000.	-	£1.083
C	Fully Re-engineered Tost winch costs					Note 1 Bevel box coupling cap head screws can wear, after several thousand launches Note 2 Guillotine blades will last longer as not chisel and anvil type – (Not impact design as fitted to new Skylaunch winches) Summary These differences from a new Skylaunch winch should even the costs out, for there to be no noticeable difference.	-	See Above
D	General Note					Due to improved launch control and accuracy with the Skylaunch system fewer weak links should be broken – saving money from loss of strops (glider rings alone cost approx £25.00 each).	-	-