RotorSport UK Ltd

Aircraft serial no. RSUK/CVLN	**Aircraft Long Term Storage and Return to Service Worksheet (Cavalon)**	Aircraft registration no: G-
	Unique worksheet no. (if required/used):	Worksheet date: Worksheet type: LTSRS

Task No	Task Description	Repetition or comments	Actions taken & comment	Eng'r initial	A3-7 Certifier
Purpose of this worksheet: To be applied when preparing for storage, when in storage, or when returning the aircraft to service from a long period of storage/disuse, normally longer than one year. Also to be used when the storage of an aircraft under Form F178 exceeds one year. Refer also to Maintenance Manual RSUK0288. Most of the checks and serviceability are 'on condition', meaning the Engineer has the responsibility to decide if it is acceptable for service.					
Preparing for storage task list					
NB: It is assumed that the aircraft will be stored in a clean, dry, well-ventilated (but not necessarily heated) building with a sealed floor. Should this not be the case (e.g wet floor, condensation, significant dust) then RSUK should be consulted to consider whether additional actions are required.					
P1	Drain fuel	Do not store for subsequent replacement. Mogas should not be used after 3months			
P2	Arrange 240V AC mains supply for Cetek battery charger	Battery will be charged via the external charging point as noted in S5 below.			
P3	Prepare engine in accordance with Rotax recommendations	Ref: Rotax Heavy Maintenance Manual Section 71-00-00 para 5.2.			
P4	Protect aircraft enclosure/engine with RSUK aircraft cover				
P5	Remove rotors from aircraft and store in a suitable crate with soft liner and interleaving	Available from RSUK			
P6	Wrap rotor head in a dust-sheet				
P7	Fit cover to pitot-tube (with vent for breathing)	Must have flight-safety lanyard or be attached to tie-down cord			
P8	Cover static vents (2) with a piece of micro-porous adhesive tape	Each tape must be attached to a lanyard of conspicuous colour			
	Intentionally blank	Intentionally blank	Intentionally blank	Intentionally blank	Intentionally blank

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Task No	Task Description	Repetition or comments	Actions taken & comment	Eng'r initial	A3-7 Certifier
In-storage task list – the 3month interval					
S1	Jack aircraft, spin wheels. Check tyre pressures and tyres for cracks	Spinning avoids flats and brake binding No cracks will be acceptable for Return to Service	Record each action, its date and initial on a separate sheet attached to this worksheet		
S2	Check engine for corrosion (propeller shaft/flange, connectors)	Clean and protect with WD40 or if required	Record each action, its date and initial on a separate sheet attached to this worksheet		
S3	Check for oil or coolant leaks	Arrange rectification if found.	Record each action, its date and initial on a separate sheet attached to this worksheet		
S4	Check for bird or rodent nests, wash-off any droppings	Air filters, exhaust, behind instrument panel (use mirror and torch), enclosure foot-wells, luggage lockers, engine bay. Pull-back stick gaiters for access to controls.	Record each action, its date and initial on a separate sheet attached to this worksheet		
S5	Check the open-circuit voltage (OCV) of the battery. This may be done by attaching the special magnetic charging cord to the aircraft's external power point (on the RH lower engine cowling), separating its in-line connector and using a multimeter at the two connector terminals. There must be no external load on the battery when the reading is taken.	If less than 12.6VDC (i.e. 2.10 volts per cell) then charge for a 12 hour period or until this OCV is reached. Use only the Cetek charger or the battery may be damaged	Record each action, its date and initial on a separate sheet attached to this worksheet		
S6	Periodically clean aircraft including rotors. Inspect rotors for corrosion, if found consult RSUK	Do not use washing-up liquid	Record each action, its date and initial on a separate sheet attached to this worksheet		
S7	Annually repeat the engine preparation in accordance with Rotax recommendations	Ref: Rotax Heavy Maintenance Manual Section 71-00-00 para 5.2 & 5.3	Record each action, its date and initial on a separate sheet attached to this worksheet		

Return to Service task list					
	Airframe Inspection	All items – repeat inspections as shown unless stated otherwise			
1	Remove upper and lower engine cowlings, mast cowling. Thoroughly check aircraft for evidence of missing parts or instruments.	Check against aircraft SAC that aircraft is still to the required build standard. Refer to AMM RSUK0288 for detail information on cowling removal and replacement			
2	Check security of upper mast attachment	Whilst standing on the rear seat rock the upper mast independently in the pitch and roll axes and confirm no free-play evident in the two rubber bushes or their mountings.			
3	Check - Bolt security – other				
4	Inspect - Wheel bearings smooth operation (3 places)	Wheel bearings sealed for life. Raise aircraft with jack under rear keel.			
5	Op/C - nosewheel fork for straightness and free operation.	Tip the aircraft onto its tail and visually assess the straightness of nose-wheel fork. The nose-wheel fork must rotate freely to the limit stops in the nose of the aircraft. There should be minimal play in the bearings of the nose-wheel fork.			
6	Inspect nose-wheel fork rubber buffer for security and condition	No cracks or splits			
7	Inspect - landing gear spar and attachments to airframe for damage or fatigue (cracks & deformation).	**If any cracks or deformation found then ground aircraft and contact RSUK immediately**			
8	Inspect – tyres for wear or damage. Replace if needed.	No fabric to show through the tread area. Recommended 0.5mm min tread. Ensure no flat spots or wall cracks from storage			
9	Check - tyre pressures & tyre creep (mainwheels 1,8-2.2bar if heavily loaded, nose 2.0-2.2bar)		Pressures OK Nose Main LH Main RH		

10	Change brake fluid	Recommended at 3years, or when brakes become spongy. Refill from master cylinder with callipers immersed in fluid. If system is spongy after bleeding, check discs for flatness and wheel bolts for straightness.	(on condition)		
11	Inspect - airframe for damage, twisting, buckling, or other deformation, or cracks, especially at welded joints at bottom of the mast.	**If found ground aircraft and call RSUK for advice. Use of crack detection fluid at base of mast is appropriate to ensure a thorough check is done.**			
12	Inspect - External structure of enclosure sound and firmly fixed to airframe				
13	Inspect – Canopy attachment to enclosure, canopy latch forces and function of canopy latch interlock	Refer to Pilots Handbook RSUK0287 Section 6.12 for detailed procedures			
	Electrical/instruments				
14	Inspect - panel connections for security				
15	Inspect – sealed battery for leakage	Ensure battery is charged and holding charge (use Cetek charger for 12 hour period or follow S5 above).			
16	Op/C Check strobe function if fitted				
17	Op/C check nav light function if fitted				
18	Op/C check backup fuel pump functions				
19	Op/C check landing light function if fitted				
20	Op/C – Roll trim. Operate roll trim (where fitted) fully left. Ensure panel indicator shows fully left. Then operate trim fully right. Ensure indicator shows fully right				

	Rotor head				
21	Time-related 1500hr: Renew main bearing	Replace bearing at 1500hrs (no extension permitted). Bearing bolt torque 160Nm+/-20Nm (plus split pin) NOTE: when tightening hub onto backing plate ensure that the clearance between the main gear and bendix gear is minimised from 0.05 to 0.15mm Glue bearing temp sensor in with hot melt adhesive. Clearance of rotor speed sensor to gear is 1 to 2mm (confirm function via tacho)	1st inspection Name: A3-7 authorisation no: Sig:…… 2nd inspection Name: A3-7 authorisation no: Or, qualified pilot licence no: Sig:……		
22	Check split pin present and no sign of chaffing or looseness. If present, check nut torque and replace split pin.	Second signature required if pin replaced	1st inspection Name: A3-7 authorisation no: Sig:…… 2nd inspection Name: A3-7 authorisation no: Or, qualified pilot licence no: Sig:……		
23	Op/C - Ring gear security and bolt attachment	Note any wear patterns			

24	Check, Service/lube - teeter bolt & bearings for damage & wear.	Regrease via nipple on top of rotor (where fitted). Grease with Castrol LM or equivalent . Removal, clean, inspect and refit is recommended every 100hrs. If wear or signs of distress, remove rotor assembly, inspect and replace bushes or bolt if required. Clean, regrease & refit. NB: Excess wear is more than 0.5mm of vertical play, bolt to bushes, and will cause rotor vibration. Nut must not be more than finger tight, about 1 to 2Nm, and the bolt able to turn by hand.	1st inspection Name: A3-7 authorisation no: Sig:…… 2nd inspection Name: A3-7 authorisation no: Or, qualified pilot licence no: Sig:……		
25	Check bushes in teeter-tower sides. If worn, replace	Small sideways float between hub bar and bushes required for low vibration			
26	Time related 100hr: Service/lube –gimbal joints, check for wear & regrease.	Grease with Castrol LM or equivalent. If wear evident or noticeable looseness, disassemble gimbal joints, check for wear, regrease and reassemble. Torque up bolts to clamp side plates to gimbal block as per RSUK0288 Strip and inspect recommended every 200hrs of operation Check - with the rotor removed assess the stick force/stiction effect when moving aft and fwds. The stick should be moved slowly away from each end-stop until the "stiction" effect is overcome. The maximum allowable forces are in RSUK0288. NB: the difference in force is due to the weight of the rotor-head acting on the control cable.	Record: Stick force moving aft…….. Stick force moving fwd…… _____ 1st inspection Name: A3-7 authorisation no: Sig:…… 2nd inspection Name: A3-7 authorisation no: Or, qualified pilot licence no: Sig:……		
27	Check four split pins present and secure	Main bearing, teeter bolt, pitch and roll bolts. Required even if no disassembly actions.			
28	Lubricate Bendix gear & spiral gear	WD40 or similar			
29	Lubricate rotor brake pivot.	WD40 or similar			

30	Inspect - brake pad for function & wear	Change pad and backplate as one unit (service item)			
31	Op/C - Check Trim cylinder for free function and shaft damage or excess seal leakage.	Seal service kit is available from RSUK			
32	Op/C – Check Roll Trim cylinder (if fitted) for free function and shaft damage or excess seal leakage.				
33	Protect bare metal with Motor Plus, WD40, chain wax or equivalent				
	Rotor Head Controls				
34	Service/lube - clean rod ends (if appropriate)				
35	F/C- rotor head reaches pitch and roll stops				
36	Inspect - all cables undamaged, all bearings free, all bearing retaining rivets secure, no foreign bodies or debris in control tubes	Pull-back stick gaiters for access to controls. Check also for insect or animal residue			
37	Op/C - for free play in stick control e.g. bearings or wear				
	Rudder controls				
38	Op/C - Check pedals for ease of movement				
39	Inspect for cable freedom of movement at tail and pedal attachment, and turnbuckle wirelocking. Check Nicopress sleeves for signs of movement.				
40	Inspect - rudder cables for frays, corrosion, wear or chaffing	Particular attention to cable exit from keel-tubes.			
41	Inspect - tail bearings for looseness and freedom of operation				
42	Inspect - tail for security to airframe (4 bolts, 15Nm)	Loctited – if loose, remove and refit with loctite 243. Check to 12Nm			
43	Inspect tail and rudder for signs of composite damage.	Include waggling the side fin in case of internal structural damage.			
44	Inspect – rod-ends and plate at base of rudder for free rotation, security & wear				
45	Inspect – rudder to tail fastenings	Check to 12Nm	Confirm if possible rudder offset to pedals		
46	Inspect – security of rudder trim tab				
47	F/C - rudder control cable tension	For limits and methods see AMM RSUK0288 Section 9 l)	Gauge no. Reading		

48	Inspect – that all rod end joints are fitted with a snubbing failsafe washer.				
49	Check that all control system bolts are correct items, properly fitted and tight				
50	**Engine** **NOTE! All engine checks to be in accordance with manufacturers manual!**	For engine servicing refer to the engine manual issued with the aircraft (Rotax 912ULS or 914UL). The full annual engine service is required only when no engine servicing has been carried out in the last 12 months. Otherwise apply 'on condition'. Servicing must be carried out in line with, and recorded on, the Rotax service schedule contained within the 'Line Maintenance' manual for the engine fitted. The Rotax service centre will advise additional checks subject to the method of storage used. (e.g. borescope checks)			
51	Wirelocking – ensure present on: Oil tank drain plug, Aftermuffler (transverse types), Oil banjo under engine, Carb air filters (if wire-locked), Oil pump				
52	Engine service fasteners	If the magnetic inspection plug or the crankshaft locking screw plug are disturbed then any wire-locking present must be properly reinstated			
53	Inspect – oil tank breather pipe for blockage				
54	Service/lube - Lubricate carburettor choke levers if no free movement	HSC2000 spray grease or equivalent			
55	Service/lube - Ensure choke and throttles move freely from stop to stop, and that turbo detent can be felt correctly. Ensure cables are synchronised.				
56	Inspect – engine mount rubbers for deterioration				
57	Inspect engine bearer bolts for paint stripe, and if moved, re loctite and tighten to 35Nm. Otherwise check bolt torque. Re-apply paint stripe as required.				
	Fuel system				

58	Check - whilst fuel tank(s) empty, check that low fuel warning LED lights. Service/lube –Fuel tanks. Flush tanks with about 1 litre of fuel then fill with fresh. Ensure water drain points function correctly on refill, and confirm no tank debris. Check – when fuel tanks filled check that low fuel warning light extinguished	There may be a small amount of leakage until the rubber seals swell due to the effect of the fuel. If the fuel drain wirelock is removed, it MUST be replaced, with a dual inspection signature.	1st inspection Name: A3-7 authorisation no: Sig:…… 2nd inspection Name: A3-7 authorisation no: Or, qualified pilot licence no: Sig:……		
59	Service/lube - Change fuel filters if dirty (two filters on 912ULS engine, two on 914UL)	Plastic and metal filters are used in different locations – ensure correct replacements are used			
60	Inspect - fuel tank cap for seal deterioration & security of fit, and cleanliness of vent hole.				
61	Inspect – security of fuel tanks and tightness of tank straps	Fuel tanks must not be deformed by straps and protective strips must be in place.			
62	Op/C - functionality of fuel gauge	ie that the reading matches that shown on the tank sight gauge.			
63	Inspect – fuel-tank breather pipe for blockage.	If 914UL engine also inspect clear airbox/carb-tray drain pipe			
64	Inspect - all hoses for cracks and deterioration in the visible areas adjacent to the barbed metal fittings.	Change as required			
	Pre rotator				
65	Op/C – whilst turning the uj located at the base of the mast by hand (thru a full rotation) – check drive shaft joints for free movement and bearings for play etc				
66	Inspect - universal joints for corrosion	Clean as required (use a kitchen plastic scouring pad) and spray with oil or chain wax			
67	Inspect - drive unit (bendix) engagement to rotor drive gear.	Do not grease this unit! – very light oil only or it will start to jam.			
68	Inspect - Ensure slider shafts move freely, and are greased				
69	Not used				

	Trim System, Rotor Brake & Pneumatics				
70	Inspect – all hoses for leaks and slave cylinder(s) for looseness				
71	Op/C – Roll trim. Operate roll trim (where fitted) fully left. Ensure panel indicator shows fully left. Then operate trim fully right. Ensure indicator shows fully right				
72	Change (or dry out) compressor water absorber	Normal 100hr task			
73	Inspect – compressor. Listen for undue noises in operation.				
74	Op/C - Full functional check pneumatic system – refer as required to the maintenance manual for fault finding and rectification, and a more comprehensive understanding of the test background.	With selector set to 'Brake' position, engage brake by pressing button, confirm operation, and that function is acceptable. Pressurise to maximum. Change to flight – check 8 sec max to release air from brake system). In 'Flight' position check that trim goes on and off in same direction as button (inc left stick if fitted). In 'Flight' position, stick forward. Start pre rotator. Ensure bendix drive cylinder rises to engage, and when the stick is pulled back it disengages. Stick to front, release pre rotator and confirm that pressure is applied to trim and stick comes back slightly. In 'Brake' position, put 3 bar pressure on and ensure pre rotator does not function. Press the 'Interlock release button' and ensure that pre rotator functions with brake engaged.			
75	Op/C – check compressor can give full pressure of 7bar (~8bar with new compressor). If under 5.5bar, either find leak or replace.		Note pressure obtained		
	HTC Propeller				
76	F/C - tracking to manufacturers recommendations	(none required at the time of writing)			

77	Check - prop bolt torque stripe between bolt thread and propeller hub has not been broken (indicating that the bolt has slackened).	If torque stripe broken or missing, remove bolts, inspect, and refit with loctite 243 – and re-apply torque stripe (Engineer task!) Removal of spinner (if fitted) will be required.			
78	Measure prop blade pitch angle relative to hub. Nominal requirement: 19.5deg (912ULS) 20.5deg (914UL)	Recommend pitch to be within 0.5deg of each other.	Blade 1 Blade 2 Blade 3 Hub (datum) angle		
79	Inspect - blades to manufacturers recommendations for any damage, splits etc.	Repair only as manufacturer's recommendations (see AMM)			
	Rotors				
80	Inspect - blades to manufacturers recommendations for any damage, splits etc.	Repair only as manufacturer's recommendations			
81	Inspect - blade to hub bar attachment bolts for corrosion	Light corrosion should be coated in chain wax or WD40/equivalent. If bolts are significantly corroded, remove and replace as appropriate. Lubricate with chain wax or equivalent on refitment			
82	Check - torques on blade to hub bar bolts/nuts	If any evidence of blade to hub looseness, disassemble blades from hub bar. Check holes for wear or fretting Bolt torque 25Nm. Refer to Sect 9 General Notes of the Maintenance Manual for re-usage of nyloc nuts.			
	Other				
83	Inspect - for wheel-brake pad wear. Replace as necessary, and if less than 2mm pad remaining (later pads have witness groove).	If calipers are sticking or uneven wear is found, loosen/turn wheel bolts and check for straightness – if OK retighten. Alternatively, clean brake pad bushes & lubricate calipers around seal			

84	Inspect – brake ratchet pawl for excessive wear. If found, replace.	Teeth of lever must not be visibly deformed or protrude less than 1.5mm			
85	Remove pitot and 2-off static vent covers				
86	Inspect - Confirm all placards readable and in line with Operating Limitations	See Pilots handbooks for placards required – or consult CAA TADs publication.			
87	Check aircraft weight and balance	No annual check required, but confirm weighing certificate available and matches wt on placard			
88	Inspect all seat belt attachment points for tightness and security				
89	Inspect each seat belt for damage or frays, and for security of main connection				
90	F/C - ASI function	Verify function using field-test kit RSD7179 (as described in AMM RSUK0288 Section 9)			
91	F/C – compass function	Position aircraft on each cardinal point and confirm compass readings consistent			
92	F/C – altimeter function	Verify function using field-test kit RSD7179/RSD7180 (as described in AMM RSUK0288 Section 9)			
93	Op/C - Instrument checks	Transponder - Check that mode S code matches G-INFO database. Check that pressure altitude consistent with altimeter reading. Full functional check highly recommended. Radio – confirm PTT buttons cause 'T' on panel. Turbo TCU data (where fitted) may be downloaded for analysis			
	Final ground run checks prior to release				
94	Inspect - Power plant and coolant system for leaks				
95	Inspect – security of oil-thermostat insulator pad				
96	Inspect – instruments for measurements consistent with ambient conditions				
97	Replace all cowlings and check all access covers secure				

98	Op/C - verify correct function of Fire-Warning system	Turn on Master switch. The fire warning lamp will pulse red three times to confirm correct system function and then go off if the system functions normally. If not it will stay solid red (system fault), in which case stop and investigate			
99	Securely tie aircraft down and run to full power. Ensure engine rpm achieves at least 5,400 on one fuel pump only, and with both pumps running..		RPM achieved:……..		
100	Complete mag drop checks at 4,000rpm	See Pilots Handbook for limits	Mag drop#1…….. Mag drop#2……..		
101	Confirm 'Gen' light is on when engine not running, and off (or flickering gently) when running at above 2000rpm.				
102	Confirm low fuel lamp is not lit (providing the fuel covers the sensor)				
103	Ensure all log book entries completed appropriately, and service record up to date				
Confirm Service bulletins incorporated (from RSUK website, full list available with applicability)					
Confirm Rotax Service Bulletins incorporated (from Rotax website)					
Confirm Mandatory Permit Directives incorporated (from CAA website, & CAP747) Up-to-date information must be checked!					
CAP 747 Document date or issue checked, plus notes:					
EASA MPD or AD check (EASA website): note date checked and any actions required					
Confirm compliance to BG06 Type Approval Data Sheet (TADS) for Calidus Note any non-compliances and actions taken.					

Tasks completed by (name): Signature: Initial:…… Date: (to compare to check sheet)	Engine hours logged: Airframe hours logged: Aircraft hourmeter hrs logged:
Permit Maintenance Release: The work recorded above (all pages) has been completed to my satisfaction and in that respect the aircraft is considered fit for flight. Signature: Initial: Date: (to compare to check sheet) Inspector or licence no.: Company Approval ref Inspector Authority: CAA letter ref 9/ dated	Comments:
Note to Engineer; remember to reference this worksheet and RSUK0288 within the logbooks, together with your CAA authorisation code. Work undertaken may be noted on this worksheet, or if required on another sheet (such as F093) also referenced in the logbook. Modifications undertaken must be noted with their MC approval no. Check the back pages to complete these too for modifications, service bulletins, MPDs, etc.	

Appendix

Requirements for certifying signatures/initials on this worksheet

With the exception of "Permitted Pilot Maintenance" (see the relevant RSUK Aircraft Maintenance Manual and CAA publication CAP 733), all maintenance work on RSUK gyroplanes must be certified by a CAA A3-7 Authorised Person.

Case 1: for work not involving engine controls, or flying controls, or vital structural points

The person(s) performing the work should complete the worksheet columns as below:

- *If the person completing "Eng'r" does not have A3-7 authorisation there must be a second initial by an A3-7 authorised person in each adjacent "A3-7 certifier" cell, denoting acceptance of the task specified.*
- *If the person has A3-7 authorisation the "Eng'r" cell should be struck out and a single entry of initials made in the A3-7 certifier cell*

Case 2: for work where engine controls, or flying controls, or vital structural points are disturbed, where a duplicate inspection is required (and shown in the worksheet).

The person(s) performing the work should complete the worksheet columns as shown above and repeated below:

- *If the person completing "Eng'r" does not have A3-7 authorisation there must be a second initial by an A3-7 authorised person in each adjacent "A3-7 certifier" cell, denoting acceptance of the task specified.*
- *If the person has A3-7 authorisation the "Eng'r" cell should be struck out and a single entry of initials made in the A3-7 certifier cell*

In addition to the above there is a requirement for inspection, then duplicate inspection (by an independent person) of the finished task:

- *The A3-7 engineer certifying the task must enter his name, CAA authorisation number, and full signature under "1st inspection".*
- *The independent second person must enter his name, CAA authorisation number or Pilots Licence number, and full signature under "2nd inspection".*

This second person must be suitably qualified and may be:

- *another A3-7 authorised engineer*
- *a qualified gyroplane pilot. In this case the pilot must append his Pilot's Licence number to his signature.*

It is the second signatory's responsibility to ensure he/she understands the task and what it is they are inspecting and signing for.

Verification of Initials, Signature and Authorisation
The person performing the work must complete the "Tasks completed by" statement towards the end of the worksheet.
The A3-7 authorised engineer must complete and sign the "Permit Maintenance Release" on the last page of the Worksheet.