

# RotorSport UK Ltd

## Service Bulletin

<b>SB No.: 021 issue 3</b>	CCAR No.: None	Classification:
Aircraft type & model (applicability) RotorSport UK MTOsport series	Aircraft serial Nos. effected RSUK/MTOS/all	<b>OPTIONAL</b> or <del><b>RECOMMENDED</b></del> or <del><b>MANDATORY</b></del>
<p>This form is the response from RotorSport UK Ltd either against a problem found in the product in service requiring a containment or rectification action, or as service information for aircraft modification incorporation. Upon completion of the action, the person responsible must enter details into the aircraft logbook/worksheet with the SB and/or CAA MPD (Mandatory Permit Directive) number and sign as normal (see instructions below). For help, contact RotorSport on 44(0)1588 650769, or email <a href="mailto:info@rotorsport.org">info@rotorsport.org</a>.</p>		
<p><u>Item description</u> Fitment of Woodcomp SR3000/3 variable pitch propeller and Smart Avionics CSC-1/RS constant speed controller in place of existing HTC propeller and engine rpm gauge.</p>		
<p><u>Problem solution:</u> Improved engine performance and noise reduction. Weight penalty around 6.5Kg. Released by the UK CAA under AAN29247 addendum 1. Note: this bulletin may be actioned only by RotorSport UK Ltd as a factory installation.</p>		<p>Effective date: 18.01.10</p>
<p><u>Parts required to implement the Service Bulletin</u></p> <p>Woodcomp propeller kit to RSD4372            Brush-mount flange RSD5124 (for 914UL), alternatively Brush-mount flange RSD5123 and longer studs RSD4482 (for 912ULS)            M4 x 10 socket-head capscrew RSD6304 (cross-drilled)            Lock wire 0.7mm            Pre-rotator drum RSD5125            Tabwashers RSD1110            M8 Nyloc nuts RSD6009            Rubber sleeve (pre-rotator brake) RSD4052/25            Brake spacer RSD2080            Socket screw M6x50 RSD6128</p> <p>CSC-1/RS Controller kit RSD4378            MPS-1 Manifold pressure sensor RSD4353            Green LED RSD4216            10A circuit breaker RSD4374            Fuse holder RSD4379            Glass fuse 1A RSD4380            If line fuse supply required Fuse holder RSD4379 and glass fuse 10A RSD4388</p> <p>Wiring harness RSD7170            Wiring consumables as required            Heat resistant sleeving RSD4381 as required            Silicone tube RSD4438</p> <p>Placards RSD4362</p> <p>Double-sided adhesive tape as required            Self adhesive Velcro as required</p> <p>ASI Field Test Kit RSD7179</p>		
<p><u>Action required to implement this bulletin:</u></p> <p>Preparatory</p> <ol style="list-style-type: none"> <li>1. Remove ignition key and remove earth lead from the battery</li> <li>2. Using a felt-tip pen or masking tape mark the spinner/propeller relationship and remove the spinner from the Woodcomp propeller (may be already marked during manufacture)</li> </ol>		

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### Propeller

1. Remove HTC propeller
2. Remove pre-rotator drum, leaving the drive belt in place
3. Remove pre-rotator brake parts (socket screw, sleeve, spacer) and replace with shorter items from bulletin pack.
4. Using special tool extract the 6-off top-hat bush from the Rotax engine flange. Under no circumstances strike the engine flange bushes.
5. Fit replacement top-hat bushes (supplied with propeller kit) from engine side of the flange and new pre-rotator drum (or existing drum if already drilled with 80pcd holes) over the bushes. The bushes must protrude through the drum (photo 1, 2 & 3).
6. Fit the Woodcomp propeller using new nyloc nuts and tab washers under the nuts. Progressively torque the nuts to 25Nm, and bend over tab washers against nut flats.
7. Fit the Brush-mount flange (i.e. angle bracket) to the engine's fuel pump flange (photo 5 & 6) thus:

For 914UL remove the hex-head bolts and lockwashers, fit brush-mount flange over the blanking plate and replace bolts and lockwashers. Use Loctite 243 and tighten to 15Nm

For 912ULS remove nuts and lockwashers, whilst steadying the fuel pump as it is under spring pressure. Lay fuel pump to one side but do not disconnect the fuel pipes.

Using a stud extractor or two slave nuts remove the two studs and replace with the longer studs from the bulletin pack, positioning the shorter threaded section into the engine casting. Use Loctite 270 Stud Lock on this thread and Loctite 574 Flange Sealant on the gasket/insulator surface. Relocate the fuel pump, fit the brush-mount flange over the studs and replace the nuts and lockwashers, using Loctite 243 on the threads. Tighten nuts to 15Nm.

8. Fit brush carrier to bracket using drilled M4 cap-head screws. Do not use Loctite as the threads in the brush carrier may be damaged on subsequent removal. Tighten carefully to avoid stripping the thread and wirelock.



Photo 1, New top hat bushes fitted to flange



Photo 2, New pre-rotator drum & brake parts fitted

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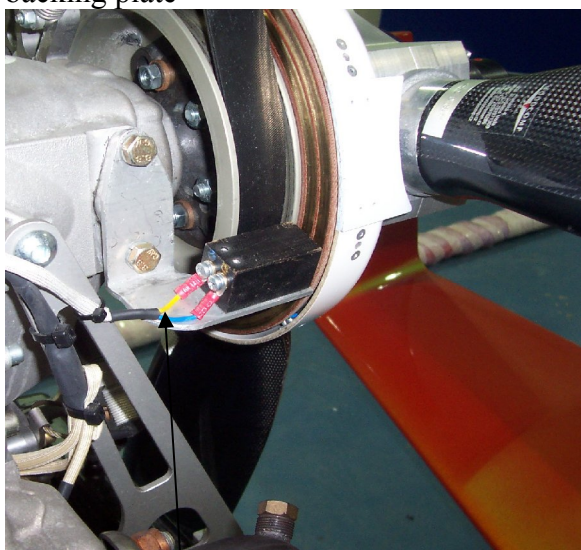
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Photo 3, Shorter brake parts to clear prop backing plate



Photo 4, Propeller in place



Fit Velcro here, & drill 2.5mm hole for cable tie to secure cables



Photo 5, Brush carrier installation (914UL engine) Photo 6, Brush carrier installation (912ULS engine)

The screws retaining the brush box to the bracket must be wire-locked (underneath bracket on 914UL engine, above bracket on 912ULS engine).

### Instrument panel:

1. Remove the instrument panel. . Make reference to RSD1113 Instrument Panel Assembly.
2. Remove the existing engine RPM gauge and modify the panel to accept the CSC-1/RS controller. This requires that the existing hole is enlarged and new mounting holes drilled in place, and is easily configured using special tool set RSD5134 (photo 7).
3. Drill holes and fit "pitch changing" LED and 10A circuit breaker.
4. Fit MPS-1 manifold pressure sensor to the lower rear of the panel using double-sided tape (photo 8).
5. Fit new placards as per photo (LED placard 'pitch change', CB placard, engine rpm placard, manifold pressure placard (914 only))



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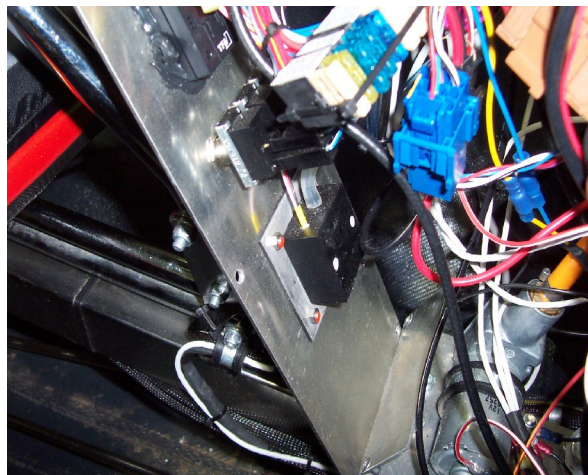


Photo 7, CSC-1/RS controller, LED and C/B in place

Photo 8, Manifold pressure sensor in place

### Wiring and pipework

1. Install wiring to CSC-1/RS controller, manifold pressure sensor, circuit breaker and LED. On newer aircraft a specific supply fuse is available (B11), on early aircraft install a 10A line fuse (photo 10).
2. Install wiring from controller to propeller. Loop the two cables through the ferrite and use heat resistant sleeving in engine area (photo 9).
3. Connect the two cable ends to the brush terminals as defined by wiring diagram RSD7168. Use Loctite 243 on the terminal screws in addition to the lockwashers. To ensure that the cable cannot fret against the Brush mount flange, use a small piece of self-adhesive Velcro (felt-side) to provide a cushion.
4. If not already prefitted, install 4mm plastic pipe from manifold pressure sensor to manifold balance pipe and connect using 200mm silicone tube. NB: remove blanking screw from balance pipe. Connect the same plastic pipe to the manifold pressure sensor using 200mm silicone tube.
5. Refit the instrument panel, ensuring all wiring and pipes are correctly fitted.
6. Remove blocking screw from balance pipe between the carburettors, and connect the pipe to the 4mm black feed to the manifold pressure sensor with a short length of silicon tube from the SB pack. Tie as required for security.
7. Reconnect battery.

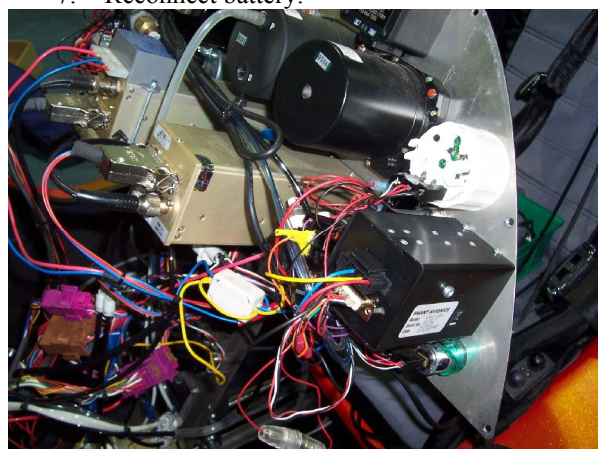


Photo 9, Cables looped through ferrite

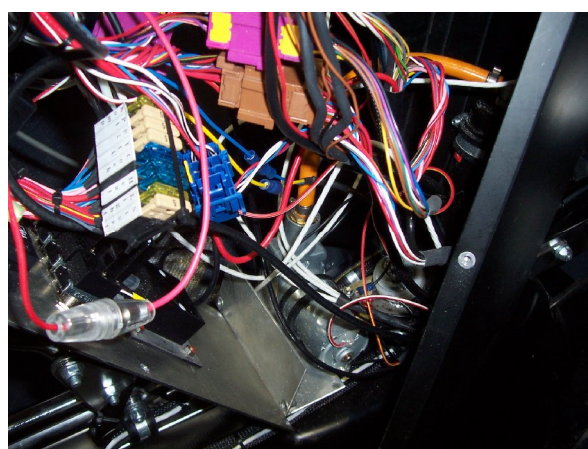


Photo 10 Additional 10A line fuse (if required)

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Photo 11, Completed installation



Tail tie-down for engine tests. Note how the strap goes above the rudder cables and under the front of the tail. Take care not to let the straps catch on the pulley cable retainers as these could be rotated to interfere with the cable. Photo 12.

### Functional tests

1. Using master switch power-up aircraft. Wait until the controller has completed its self-check routine.
2. Select "Disable" and using the small toggle switch confirm that the propeller changes pitch in the correct sense and is stopped at both fine and coarse by its integral limit switches (plus sign indicates an increase in pitch). Confirm LED illuminates during pitch change
3. Check all blade angles and backlash in accordance with Woodcomp Propeller Maintenance Manual RSUK0076. Adjust the microswitch cams if necessary. Record the achieved angles.

Blade 1 angle:
Blade 2 angle:
Blade 3 angle:
Checked initial:

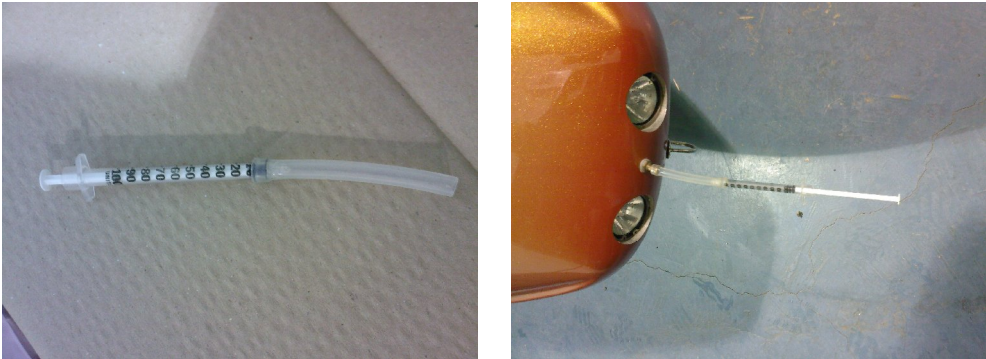
4. Re-fit the spinner to the propeller using Loctite 243 on the screw threads together with the nylon washers. Position to the ident marks made on dismantling
5. Using manual control position the propeller to the fine setting
6. In an area safe for engine run-up tie the aircraft tail to a substantial post or structure using a lanyard of minimum rated load 500kg, attached only as shown in photo 12.
7. Sit in the pilots seat, apply parking brake and guard throughout the remainder of the test.
8. Start engine, confirm RPM and manifold pressure are displayed. Note that with 912ULS engine the display will be atmospheric pressure.
9. After warm-up set full throttle, confirm RPM does not exceed 5700 at fine setting.
10. Set 4000rpm and confirm propeller moves from fine to coarse then back to fine. Audible change of engine note will be apparent.
11. Note that manifold pressure change with throttle setting, and does not exceed limits (914UL only)
12. Set engine to idle for a few minutes then shut-down engine

Functional test.	
Checked by:	Date:
Sig:	




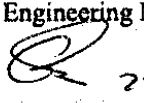

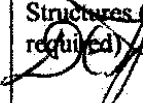
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Quality and Flight tests		Initial
1. Inspect aircraft with particular attention to:		
All propeller nuts present and tab-washers correctly formed		
Lock-wire correctly fitted to brush carrier retaining screws		
All fasteners secure		
Check instrument panel fully operational by the following procedure:		
a) Turn on keyswitch. Check gen light comes on. Check back up fuel pump and ancillary items for normal function.		
b) Check the ASI function and the integrity of the pitot-tube to ASI connection by use of field test kit RSD7179. This consists of a modified Becton Dickinson D U-100 Insulin hypodermic (or equivalent, and the needle is removed) and a short section of 6mm silicone tube. <ol style="list-style-type: none"> <li>1. The hypodermic scale is calibrated 0-100 units, this range being equivalent to 1ml of fluid. For both single and dual ASI installations withdraw the plunger to deliver 100 units.</li> <li>2. Push the silicone tube onto the pitot nozzle at the front of the aircraft. Do not withdraw the hypodermic plunger as the vacuum resulting may damage the ASI.</li> <li>3. Slowly depress the plunger to the end-of-stroke.</li> <li>4. Examine the ASI which should be reading around 70mph (single installation) or around 50 mph (dual installation). The actual value is not critical and is dependent on the length of pipework installed.</li> <li>5. Specifically check that there is no decay of the indicated reading over a period of 10 seconds, this confirms that the system has no leaks.</li> <li>6. Carefully remove the silicone tube from the nozzle. Do not withdraw the hypodermic plunger as the vacuum resulting may damage the ASI.</li> </ol>		
		
c) With a trained person or pilot, start the engine and ensure normal gauge function, and that mag switches turn off the engine. Stop engine		
d) Turn on GPS unit with power lead connected to the aux socket. Remove power lead and note if unit then advises power has been lost, confirms correct power supply.		

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<p>e) Check pneumatic cycle.</p> <ol style="list-style-type: none"> <li>1) In 'Brake' position, engage brake, confirm pump and brake operation, and that function is acceptable.</li> <li>2) Pressurise to maximum (nominal reading 8bar +/- .5bar) Change to flight – check for 2 to 3 sec max to release air from brake system.</li> <li>3) In 'Flight' position check that trim goes on and off in same direction as button (inc rear switch if fitted).</li> <li>4) In 'Flight' position, stick forward. Start pre rotator. Ensure cylinders (2) engage, and when the stick is pulled back they disengage. Note that the head cylinder must engage prior to the engine cylinder.</li> <li>5) Stick to front, release pre rotator and confirm that pressure is applied to trim and stick comes back slightly.</li> <li>6) In 'Brake' position, put 3 bar pressure on and ensure pre rotator does not function.</li> <li>7) Press the 'Interlock release button' and ensure that pre rotator functions (both cylinders, head and engine) with brake engaged.</li> </ol>				
<p>2. Issue Permit Flight Release Certificate</p> <p>3. Test aircraft in accordance with flight test programme F112 incorporating specific variable pitch propeller checks.</p> <p>4. When/if the flight test is completed satisfactorily, and any snags found rectified, then the Permit Maintenance Release is signed in the aircraft logbook</p> <p>NOTE! It is the owners responsibility to advise the CAA of the change in propeller, to allow a modified permit to fly to be issued! Use the form at the end of this document.</p> <p>Name of person embodying the service bulletin .....</p> <p>Name of person checking the embodiment.....</p> <p>Date of embodiment.....</p>				
<p>Effect on Pilots Handbook or Maintenance Manual?</p> <p>Yes, see RSUK0043 issue 3 and RSUK0044 issue 2 or later approved revisions</p> <p>Provide Woodcomp Propeller Maintenance Manual RSUK0076 issue 1 or later approved revisions</p>				
<p>Service Bulletin Completion action:</p> <p>Issue Permit Maintenance Release Certificate</p> <p>CAA BCAR A3-7 appropriately Authorised Person to certify that the work is completed by writing 'SB-021 Woodcomp SR3000/3 propeller Serial No xxx incorporated, Smart Avionics Controller Serial Number yyy incorporated. Aircraft complies with AAN29247 addendum 1. Acceptability proven on flight test no FTR-XXX' in the aircraft logbook white pages, and record the action in the pink pages entitled 'Aircraft Modifications'. Both entries must be signed by the CAA Authorised Person together with their CAA Authorisation number.</p> <p>CAA BCAR A3-7 Authorised Person to issue new Propeller Logbook, make the first entries and sign as above</p>				
<b>SB authorised by: (name, signature, and date of signature)</b>				
<b>Quality Conformance Manager</b>  27/1/10	<b>Engineering Manager</b>  27/1/10	<b>Chief Test Pilot (if flight performance or safety effect)</b>  27/1/10	<b>Structures (where required)</b> 	
Document completion date:	Issued to:	When	Issuer name	Signature
	Internal			
	CAA			
	Owners			

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## Service Bulletin

<b>Permit Change Application</b>	
The purpose of this document is to provide sufficient information to the CAA to allow a change of the Permit to Fly to incorporate a specific aircraft modification or upgrade.	
Aircraft reg no <b>G-</b>	Aircraft serial No. <b>RSUK/</b>
AAN that has been incorporated: AAN29247 addendum 1 (Woodcomp SR3000/3 propeller)	Service Bulletin number incorporated: SB-021 Propeller change to Woodcomp SR3000/3
Owners name and address	
Daytime telephone number	
Email	
Summary of change required: (cross out as required)	
Service bulletin SB-021 incorporated, change of propeller from HTC to WoodcompSR3000/3 with Smart Avionics Constant Speed Controller	
Documents to be included with this application: Photocopy of aircraft and/or engine logbook pages with certifying signatures from RSUK that confirm embodiment of the service bulletin and Permit Maintenance Release certification. Existing CAA Permit to Fly. Application fee as specified in the CAA Scheme of Charges paragraph 6.1 ( <a href="http://www.caa.co.uk/application.aspx?catid=33&amp;pagetype=65&amp;appid=11&amp;mode=list&amp;type=subcat&amp;id=1">http://www.caa.co.uk/application.aspx?catid=33&amp;pagetype=65&amp;appid=11&amp;mode=list&amp;type=subcat&amp;id=1</a> )	
Send to: CAA Applications and Approvals Aviation House Gatwick Airport South West Sussex England RH6 0YR	