

RotorSport UK Ltd

Service Bulletin

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 info@rotorsport.org.

SB No.: 044 Iss1 Calidus ground-cooling system	Related documents MC No: MC-194 CCAR No.: CCAR-014	Classification: OPTIONAL or RECOMMENDED or MANDATORY
Aircraft type & model (applicability) RotorSport UK Calidus	Aircraft serial Nos. effected RSUK/CALS/001 onwards	

Effective date: 06.06.12

Problem description & cause of problem if known

A spell of hot weather in the spring of 2011 introduced a temporary problem with vapour-locking of the fuel system of Calidus aircraft. Pilots found that when the aircraft was shut-down after landing there was difficulty in subsequent hot-starting, together with some misfiring once the engine had been started. Specifically, the 912ULS engine started, but then suffered from vapour lock during full power application. The 914UL engine suffered from extremely poor hot starting, but due to the re-circulating fuel system on this engine did not suffer from full power vapour-lock. It is believed that this temporary problem was exacerbated by available Mogas being “winter-grade”, which is more prone to vapour-locking when used in hot climatic conditions. This modification is to apply to both engine variants, and only when using Mogas.

Notes:

- 1) The problem is not uncommon with Rotax engines and can be remedied by the use of Avgas 100LL instead of Mogas, but long-term use of Avgas 100LL introduces other complications, such as lead build up in the clutch and gearbox, plug fouling, and shorter service intervals. The Calidus Pilots Handbook RSUK0060 Section 2.8 recognises the risk of vapour-locking and recommends the use of Avgas100LL for altitudes above 6,000ft or operation with fuel temperatures above 20°C. Embodiment of this service bulletin SB-044 does not negate this recommendation but will improve the hot-starting situation when Mogas is used. The improvement is achieved by reversing the direction of the fan-assisted cooling-air when the aircraft is on the ground.
- 2) Unleaded Avgas is presently being introduced at certain UK airfields and is approved for use with the Rotax engines used in RotorSport aircraft – pilots should review RotorSport Service Information Letter SIL-010.

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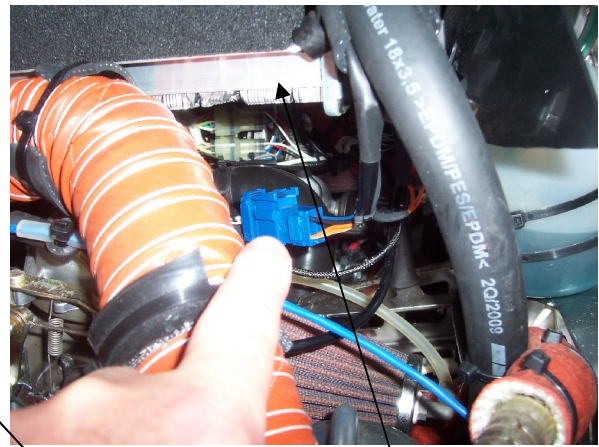
Action required to implement this service bulletin

1. Remove the engine upper cowling as described in Maintenance Manual RSUK0061 Section 9.
2. On the right-hand side of the aircraft remove the orange cabin-heat duct-pipe (if fitted – this is an optional item)
3. Identify and move to an accessible position the blue 6-pole connector that is located under the coolant radiator. Release the plastic locking barb and separate the connector halves
4. On the left-hand side of the aircraft gain access to the Rotax regulator by releasing the lowest screws of the mast cowling to enable flexure upwards. This will require disconnection of the fuel inlet and grounding cable and is aided by steadying the cowling edge with a piece of foam. Temporarily protect the fuel-tank inlet against loose debris by means of an external cover (e.g aerosol canister cap).
5. Release and move to an accessible position the black regulator connector. Remove the terminations from this connector's "L" (Rotax orange cable) and "C" (Rotax red cable) positions, using a flat jewellers screwdriver to release each locking barb. Install the female terminations of the new Regulator Harness to the regulator's terminals "L" (harness' orange/red-trace cable) and "C" (harness' red/orange-trace cable). Loop the short cables so that the harness male terminals engage with the Rotax female terminals maintaining the colour-code above. Insulate these connections with the heat-shrink sleeving provided in the kit. Replace the regulator connector and tidy the new cable installation using cable-ties.
6. Refit the mast cowling, fuel inlet and grounding cable after removing the tank protection and foam support.
7. Route the regulator harness across the aircraft to terminals 5 (harness' orange/red-trace cable) and 2 (harness' red/orange-trace cable). of the radiator 6-pole connector and insert the female terminals into the airframe side of the connector). Use 2mm cable-ties to attach the regulator harness to the throttle cable passing transversely under the coolant radiator.
8. Insert the relay module into the radiator wiring harness connector shells, neatly collate the cables and using cable-ties secure the module under the radiator by attaching to the air-box (914UL engines) or a simple stand-off (912ULS engines). Ensure that the relay module is not rubbing on the radiator fins then refit the cabin-heat duct-pipe.
9. In the cockpit change fuse F10 from 10A to 15A. (This is the penultimate fuse in the stack and provides maintained electrical power when the master switch is off.)
10. The system may now be tested as below. **DANGER** – in order to confirm fan rotation with the engine running it is necessary to stand close to the rotating propeller. With a suitably trained person (e.g. pilot) in the pilot's seat and the parking brake applied, the inspector should stand adjacent to the open canopy on the right-hand-side forward of the suspension bow. From this position it is possible to see the fan rotation.
11. Test 1 – with the engine running at tick-over briefly press the "Fan" button. The LED will illuminate only whilst the button is pressed, but the fan will start and run for 2-5 mins in the "flight" direction shown by the arrow embossed on the fan motor. Verify fan direction (airflow is downwards through radiator matrix)
12. Test 2 – stop the engine and press the "Fan" button again. The fan will start and run in the "ground" direction (airflow is upwards through the radiator matrix). Turn off the master switch and verify that the fan continues for 2-5 mins, then stops.
13. Test 3 – start the engine and bring-up to a CHT 100°C. The fan should automatically start and run in the "flight" direction at a temperature between 90 and 100°C.
14. Verify "Gen" light off with engine running. Allow the engine to cool then shut-down in the normal way. Verify "Gen" light on with engine stopped. Turn off the master switch.
15. Replace the upper engine cowling

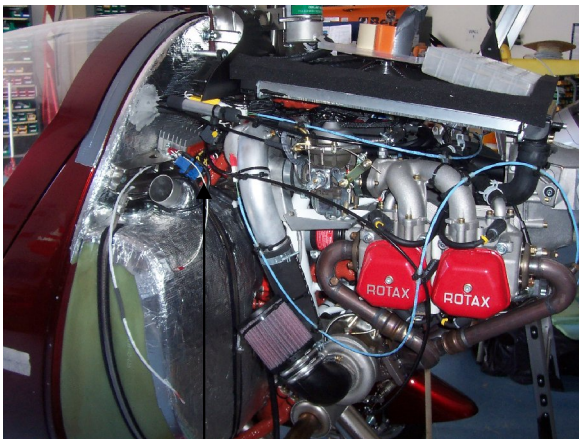
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Photographs of installation:



The blue 6-pole connector is behind the cabin-heat duct-pipe and beneath the radiator
(Left photo 914UL engine, right photo 912ULS engine)



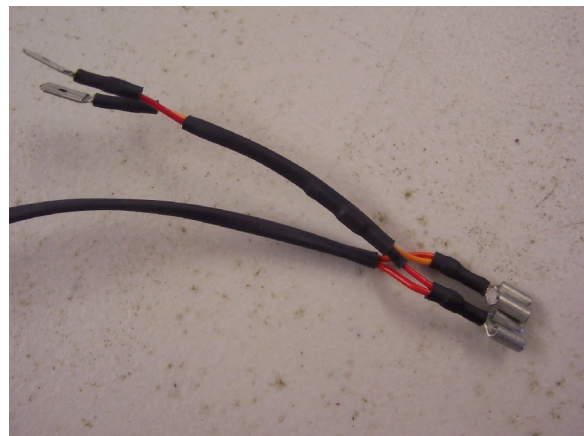
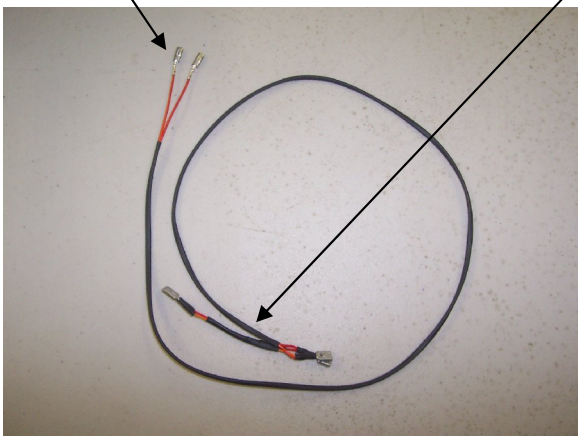
Rotax regulator location on LHS of engine



Black regulator connector

6-pole connector terminations

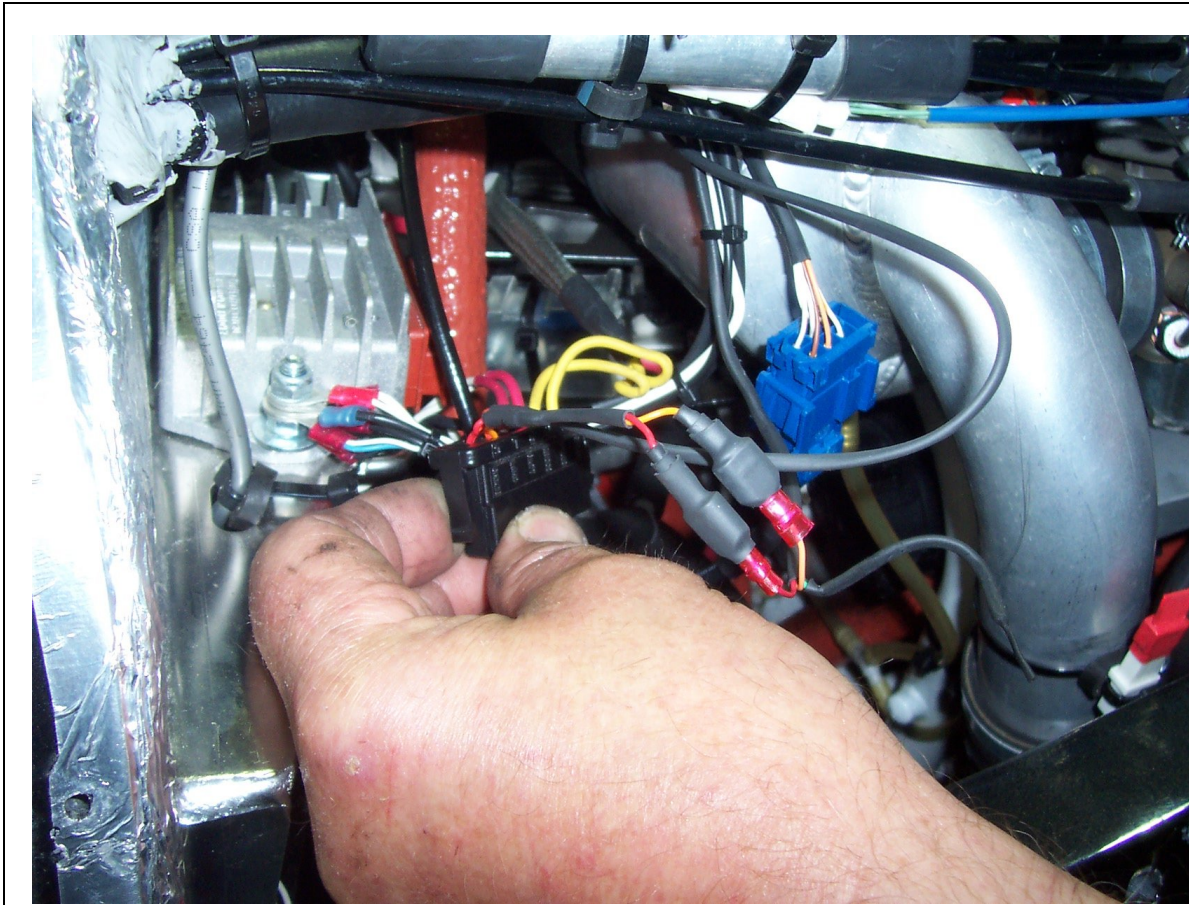
Loop-in/loop-out regulator terminations (magnified at right)



The regulator harness

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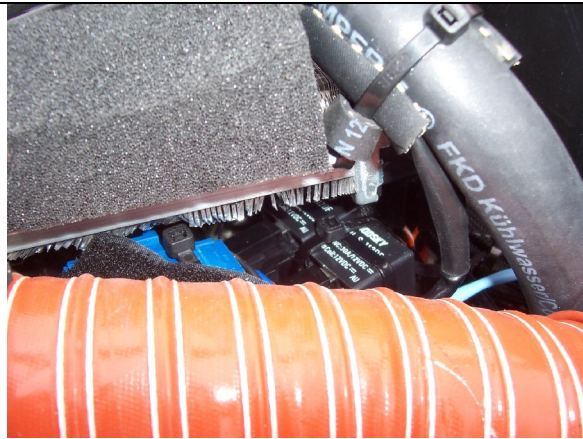
Regulator harness interconnections made and sleeved (see para 5)



Relay module connected into wiring loom

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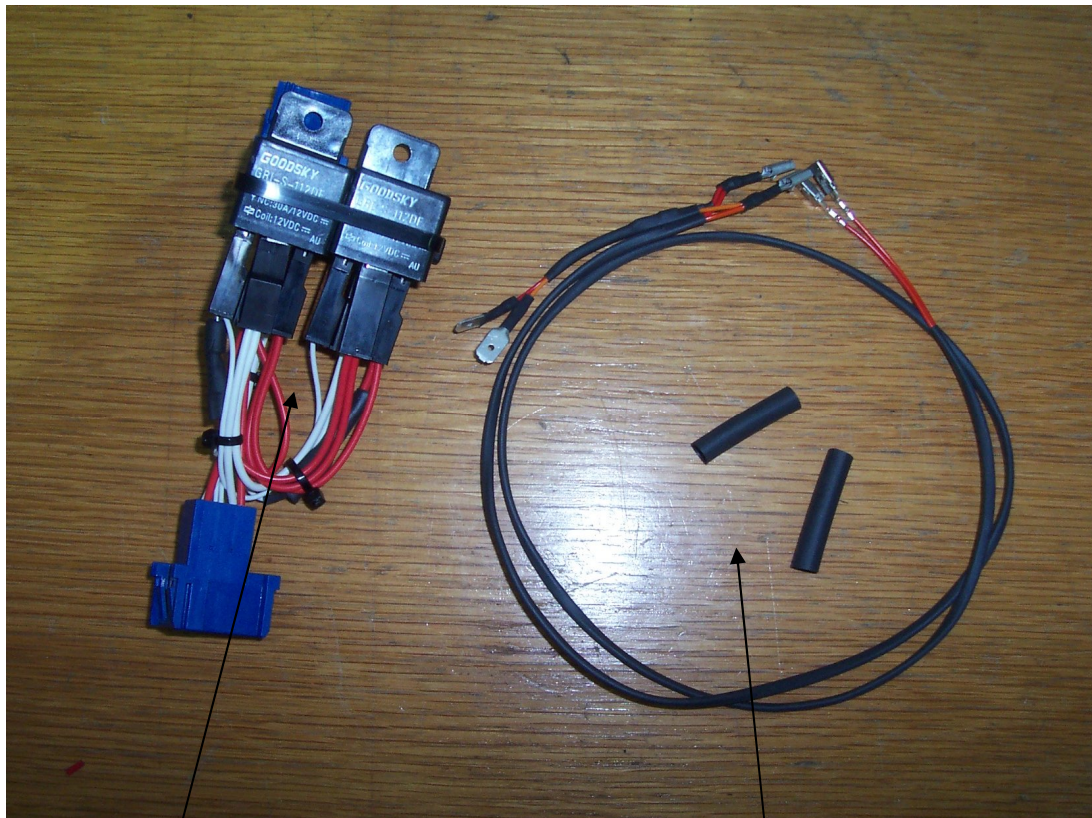
Finished installation with duct-pipe replaced



Fuse location on instrument panel
(second from bottom position)

Parts required to implement this service bulletin

- 1-off Fan reverse kit C.EL01.37 (BG3327) including Regulator Harness RSD7214
- 1-off Blade fuse 15A RSD4479
- 2mm cable ties RSD4206 (as required)
- 4mm Cable ties RSD4207 (as required)
- 50mm length of scrap fuel-hose 6 or 8mm bore (for stand-off in 912ULS installation)



Relay module

Regulator harness with heat-shrink sleeves

Contents of Fan Reverse Kit BG3327

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Effect on aircraft Weight and Balance? Weight increase 100g close to CG location so no significant change.				
Effect on Pilots Handbook or Maintenance Manual? Yes – new text to be incorporated in next revision of Pilots Handbook (RSUK0060) and Maintenance Manual (RSUK0061)				
Service Bulletin Completion action: Issue Permit Maintenance Release Certificate CAA BCAR A3-7 Authorised Person to certify that the work is completed by writing ' <i>SB-044 Calidus ground-cooling system incorporated</i> ' 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.				
<i>The technical content of this document is approved under the authority of the UK CAA Design Organisation Approval Ref: DAI/9917/06</i>				
SB authorised by: (name, signature, and date of signature) This document has been issued according to an approved computer-generated signature procedure				
Quality Conformance Manager	Engineering Manager	Chief Test Pilot (if flight performance or safety effect) <i>Not required</i>	Structures (where required) <i>Not required</i>	Head of Airworthiness
Document completion date:	Issued to:	When	Issuer name	Signature
	Internal			
	CAA			
	Owners			
	LAA/BMAA Inspectorate	No		

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Aircraft serial no. Registration G-	Service Bulletin implementation Worksheet	Date raised: Raised by:	
Purpose – record service bulletin implementation actions taken to inspect aircraft and return to service.		Document reference: SB-044	
Maintenance manual referred-to and issue level/date:	RSUK0061 Iss 4 of 13/03/12		
Note; attach SB sheets to this document			
Task	Notes	Eng`r check/date	Inspector check/date
“L” and “C” Regulator connections made and cabled to blue 6-pole connector			
Mast cowling, fuel inlet and grounding cable replaced			
New module connected in place and secured			
Fuse F10 changed from 10A to 15A			
Test 1 satisfactory	Manual fan selection correct for “flight” operation		
Test 2 satisfactory	Manual fan selection correct for “ground” operation		
Test 3 satisfactory	Automatic fan selection correct for “flight” operation		
“Gen” light off with engine running and on with engine stopped.			
Upper engine cowling securely re-fitted			
Note fan run time in minutes.			
Customer acceptance: Name: Signature/date:		Aircraft hobbs meter reading Confirm logbooks annotated:	
Permit Maintenance Release: The work recorded above has been completed to my satisfaction and in that respect the aircraft is considered fit for flight.			
Engineer/Inspector signature Name: CAA Authorisation code :		Date of work Location where work completed	

Retain this worksheet with the aircraft records.