

RotorSport UK Ltd Service Bulletin (Permit)

Title: IVO-prop gearbox overhaul		
SB-125 Iss1	Related documents Modification: MC-276, -294, -318, -323 CCAR No.: CCAR-64, -66, -70	Compliance Category: OPTIONAL or RECOMMENDED or MANDATORY
Applicability		
Aircraft type & model: Any RSUK type fitted with IVO-prop DL3-68 VP-propeller	Aircraft serial Nos. affected: Any RSUK type fitted with IVO-prop DL3-68 VP-propeller	
The maintenance manual to be referenced is this stated or subsequent issue.		MT-03 RSUK0012 Iss 10 MTOsport RSUK0044 Iss 9 Calidus RSUK0061 Iss 7 Cavalon RSUK0288 Iss 5
<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. For help, contact RotorSport on 44(0)1588 505060, or email compliance@rotorsport.org.</p> <p>The technical content of this document is approved under the authority of the UK CAA Design Organisation Approval Ref: DAI/9917/06</p>		

Documentation (Service Bulletin Completion action)

- a) Entries within the aircraft logbooks, eg CAA BCAR A3-7 Authorised Person to certify that the work is completed by writing '*SB-125 IVO-prop gearbox overhaul incorporated*' 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.
- b) Completion of the SB worksheet attached, This must contain a PMR statement, and a final check item that no tools or equipment have been left within the aircraft)
- c) No Type Approval change application document is required
- d) Any other Permit Maintenance Release to Service form requirements.

Document approval signatures			
Engineering Manager	CVE (as required)	Chief Test Pilot (if flight performance or safety effect)	Head of Airworthiness
		Not required	

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Reason and overview of the Service Bulletin (cause of problem if known)

A number of IVO-prop DL3-68 variable pitch propellers on RSUK gyroplanes have suffered drive motor failure. This has been investigated by RSUK and it has been established that:

- The tightness of the three nuts at the end of the gearbox assembly can adversely influence the axial load incurred by the internal thrust bearings, leading to premature wear and excessive current draw by the motor.
- The grease used by the OEM is better replaced by a Molykote type grease

This SB-125 addresses these issues and results in improved reliability of the IVO-prop pitch-change mechanism. If necessary a replacement motor may be fitted.

Manpower estimates

Accomplishment of this Service Bulletin requires the following personnel

- (i) A3-7 Authorised engineer

Estimated man-hours to complete the task as a stand-alone item are; 2 - 3 hours

Tooling required

Hand tools including Imperial-sized spanners and sockets

Weight and Balance Effects

No effect

Manuals affected

POH RSUK and AMM RSUK are not affected, however the IVO-prop maintenance manual RSUK0325 will be updated with the content of this SB-125.

Previous Modifications that affect the SB

MC-323 Improved IVO-prop motor refers to the same assembly

Accomplishment instructions (Action required to implement this bulletin):

Effective date of this SB is 19 September 2017

There is no relevant MPD or other outside body documentation to be referenced.

Instructions

Refer to IVO-prop manual RSUK0325 for further information

1. Position the aircraft on level ground and apply the parking brake/chock the wheels. Remove engine cowlings for access to the propeller hub (see aircraft AMM)
2. Verify that the two Mag-switches and the Master Switch are OFF
3. Using a suitable marker pen or adhesive tape mark the spinner/propeller/hub relationship to ensure precise replacement (particularly the blades, which are numbered 1,2,3)
4. Remove the spinner
5. Remove the brush carrier and tie to one side
6. Remove the propeller complete by releasing (progressively) the six 3/8" AN hex bolts/nuts and transfer to the workbench. DO NOT REST THE PROPELLER ON THE BLADE TIPS.
7. Making reference to the propeller manual RSUK0325 remove the three blades then the motor/gearbox assembly



Motor/gearbox assembly removed

8. Using a $\frac{1}{2}$ " AF spanner progressively release the three nuts. Tap and pull the end cap then the sleeve off the protruding studs to expose the electric motor



9. Using a plastic mallet tap the end of the leadscrew through the flange until the motor and planetary gearbox are released. **Caution – do not drop the gears! NOTE! The small gear on the end of the motor is a slide fit!**





10. There are three layers of gears. During dismantling and cleaning be sure to keep the layers together as a set.



11. Using petrol or Amberklene LO30 solvent (RSD4655) thoroughly clean all grease from the gearbox assembly and motor mounting plate.
12. The leadscrew/nut assembly cannot be dismantled so clean as an assembly and use compressed air to remove any debris. Ensure that the parts spin freely and smoothly. For information a sectioned view of this assembly is shown below



13. If a new motor is to be fitted remove the centre pinion then release the two cap-screws retaining the electric motor into the mounting plate. Feed the two electrical cables through the correct holes and fit the new motor to the mounting plate ensuring that the correct PCD threaded holes are selected and Loctite 243 is applied to the threads





14. Visually inspect the gearbox components for burrs (remove as necessary) then re-pack the gearbox assembly with Molykote BR2 Plus (Part number RSD4878) and re-lubricate the leadscrew assembly with Molykote and internal thrust bearings with Ballistol oil (Part number RSD4639)
15. Refit the small gear to the motor shaft and reassemble in reverse order. The self-locking nuts may be re-used provided they are undamaged, have sufficient residual torque and Loctite 243 is applied to the threads. Progressively tighten these ½"AF nuts to 10Nm only
16. Using a bench power-supply (or freshly charged 12V battery and multimeter) fused at 10A apply 12VDC to the two leads to verify that the leadscrew spins freely in both directions and draws no more than 2A to do so. **Caution: the torque reaction is significant – hold the motor/gearbox securely**
17. Rebuild the propeller and fit to the mounting flange in accordance with the propeller manual and related service bulletins, ensuring the nylocs have sufficient residual torque or are replaced with new nuts. Refit the brush carrier in accordance with the propeller manual.
18. Following safe practice a qualified gyroplane pilot or appropriate person must ground-test the propeller in accordance with the instructions in the Pilots Handbook, ensuring that fine pitch selected in the cockpit gives propeller fine pitch (in case the wires are reversed. If this is the case, swop-over the connections to the brush-box)
19. Refit the engine cowlings and spinner (if fitted) in accordance with the aircraft AMM.
20. Update aircraft and propeller documents accordingly.
21. Flight-test the aircraft to ensure proper flight operation.

Material information (Parts required to be made to implement this service bulletin):

No parts made during embodiment

List of components (with purchasable part nos)

Consumables used:

Molykote BR2 Plus (RSD4878)

Ballistol oil (RSD4639)

Amberklene LO30 (RSD4655)

Loctite 243

If required:

3-off Replacement AN365-524 (aka MS21044-N5 or 94-104) or equivalent nyloc nuts if originals found unusable

Improved electric motor for IVO-prop (RSD4848)

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Interchangeability

Not affected

Parts disposition

- a) Disposal requirements – Normal waste
- b) Environmental hazards of parts containing hazardous materials - None
- c) Scrap requirements (e.g. mutilate scrapped items beyond use) – Not applicable

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Service Bulletin implementation Worksheet

Aircraft type:	Serial no:	G-	
Worksheet completed by:		Document ref:	
Worksheet cross-checked by (if applicable):		SB-125 Iss 1	
Purpose – record service bulletin implementation actions taken to inspect aircraft and return to service.			
Maintenance manual referred-to and issue level:			
Note: attach SB sheets to this document			
Task	Notes	Eng'r check/date	Inspector check/date
Remove engine cowlings as required for access			
Remove propeller and check no damage to brushes			
Record inner and outer shim pack thickness			
Dismantle, lubricate and re-assemble the motor/gearbox.	Fit new motor if required		
Bench test motor/gearbox			
Reassemble propeller and fit to aircraft in accordance with manual RSUK0325	Ensure original component relationship maintained		
Refit engine cowlings			
Ground-test propeller, ensuring the fine pitch selected gives propeller fine pitch, and vice versa.			
Satisfactory flight test completed.			

Customer acceptance:	
Name:	Aircraft hobbs meter reading:
Signature/date:	Confirm logbooks annotated:
Permit Maintenance Release:	
<i>'The work recorded above has been completed to my satisfaction and in that respect the aircraft is considered fit for flight. I confirm that no tools, equipment or debris have been left in the aircraft'</i>	
Engineer signature and date:	Location where work completed
CAA PMR Authorisation ref :	