



**PIPER MEMORIAL AIRPORT
353 PROCTOR STREET
LOCK HAVEN PA 17745**

**Evektor SportStar Modification
Bulletin SportStar-002a Alternate Compliance**

**AvSport SI-EVSS-02
12 November 2012**

<p>OPTIONAL SERVICE INSTRUCTION</p>
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Statement of the Problem

Due to engine left radiator rubber hose thermal damage caused by insufficient clearance between the radiator hose and the left front cylinder exhaust pipe, Evektor in 2005 issued Mandatory Bulletin No. Sportstar-002a, requiring verification of exhaust pipe clearance, recurrent with every replacement of the oil filter. Compliance has required separating the left front cylinder exhaust manifold elbow from the cylinder head during every oil change. This procedure has necessitated repeated flexing of the bendable section of the exhaust pipe, inducing stresses in LH Front Exhaust Tube PN E6 10-16 01, reducing the reliability of said component. Field experience has shown the exhaust pipe to be subject to failure from cracks when repeatedly flexed, leading to exhaust system leaks. The problem is exacerbated by the use of leaded fuel (100LL), due to vaporized lead condensing on, and thus coating, inside exhaust system surfaces.

In 2011, Rotax introduced a new oil filter (PN 825012) which is 3.6 mm longer than the previous filter (PN 825706). The new filter dimension has reduced the space available for ensuring adequate pipe-to-filter and pipe-to-radiator hose clearances, requiring even more extreme flexing of the exhaust pipe when complying with Evektor Mandatory Bulletin No. Sportstar-002a. Additionally, in accordance with Rotax Service Instruction SI-912-016 R4, the use of leaded fuel requires that oil and filter change interval be reduced to 50 operating hours, with a recommended oil change interval of 25 operating hours. Thus, when the engine is operated on leaded fuel, the flexing stresses imposed on the subject exhaust pipe occur with increased frequency, further shortening its service life.

Proposed Solution

AvSport hereby recommends an alternative method of compliance with Evektor Mandatory Bulletin No. Sportstar-002a, in order to eliminate the requirement for removal, flexing, and reinstallation of the left front exhaust pipe at every oil and filter change. The modification involves installing firesleeve over the vulnerable rubber radiator hose, protecting it from thermal damage and thus reducing the required spacing between the hose and the exhaust pipe. A new position of the exhaust pipe is then established, which permits oil filter replacement without requiring the pipe's repeated removal and reinstallation. Evektor has on 09 November 2012 issued a temporary Letter of Authorization, to facilitate testing of this proposed solution on SportStar s/n 2006-0810, registration N66AV, currently with 1316.5 total hours in service.



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Required Materials

Firesleeve, 35 mm ID: Aeroquip AE 101-22, Stratoflex 2650-22, or equiv., 20 cm length
Firesleeve Clamps: Aeroquip 900591B-3C, Stratoflex 32CR, or equivalent, 4 ea.
Firesleeve End Seal Dip or high temperature silicon RTV, as required
Approved coolant per Rotax Service Instruction SI-912-016 R4, as required

Required Tools

#2 Philips screwdriver
Firesleeve Clamp tool, A-B Thermal Technologies PN C-FCT-1 or equivalent
Socket wrench, 13 mm
Ratchet handle for above
Coolant funnel

Installation Procedure

1. Remove engine cowling
2. Prepare two 10 cm lengths of firesleeve
3. Seal ends of firesleeve with end dip or RTV to prevent fraying and fluid wicking
4. Slide two firesleeve clamps onto firesleeve
5. Drain engine coolant
6. Remove left side rubber hose from radiator by loosening hose clamp
7. Slide firesleeve over rubber radiator hose
8. Reinstall hose onto radiator and secure hose clamp
9. Slide one firesleeve clamp to within 5 mm of each end of firesleeve
10. Secure firesleeve to hose by tightening both firesleeve clamps
11. *Optionally:* Repeat steps 6 through 9 on the right side rubber radiator hose
12. Refill radiator and cooling system with approved coolant
13. Reinstall engine cowling

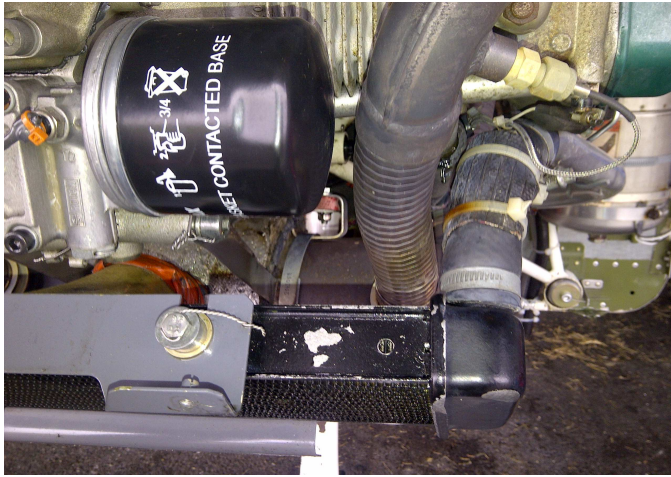
Test Procedure

1. Start engine and immediately verify indication of proper oil pressure
2. Warm engine at 2500 RPM maximum until oil temperature reaches +50 C (+122 F)
3. Perform engine runup, closely monitoring exhaust gas and coolant temperatures
4. Remove upper engine cowling and inspect system for leaks and firesleeve integrity
5. Verify final hose temperatures per Engineering Test Protocol below
6. Check coolant level – top off if necessary
7. Re-install upper engine cowling and document alteration in aircraft logbooks

Weight and Balance Computation

Item	Weight	Station	Moment
Install: firesleeve and clamps	+ 5 oz	-45.5"	-14 inch pounds
Change:	negligible		negligible

Installation Photographs



Pre-modification clearance



Materials



Consumables



Required tools



Firesleeve sections prepared

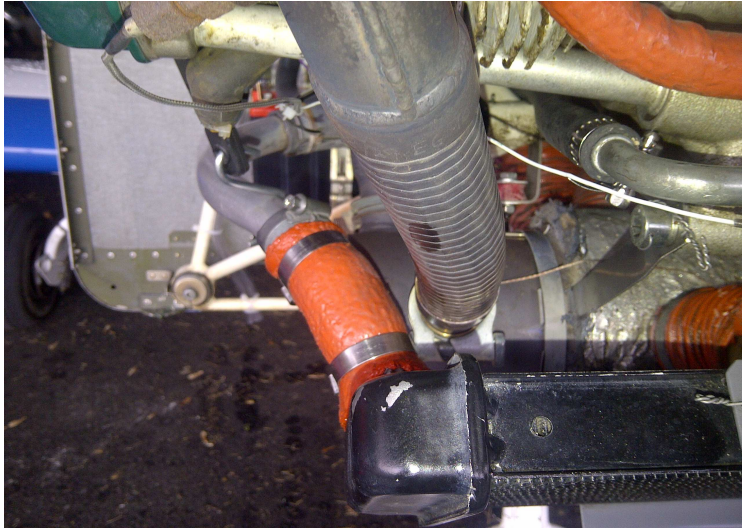
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Post-modification clearance – left side



Clearance – right side (mod optional)



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Engineering Test Protocol

Date 13 November 2012
Facility AvSport of Lock Haven, KLHV
Engineer H. Paul Shuch, Ph.D. LSRM-A 3550588
Aircraft EVSS s/n 2006-0810 reg. N66AV

<u>Test Phase</u>	<u>Pipe to Hose</u>	<u>OAT</u>	<u>Cyl #2</u>	<u>Measured surface temperature °C</u>	
	<u>Clearance</u>	<u>°C</u>	<u>EGT °C</u>	<u>Exhaust Pipe</u>	<u>Radiator Hose</u>
Pre-modification	<u>20 mm</u>	<u>+5</u>	<u>671</u>	<u>268</u>	<u>256</u>
Post-modification	<u>08 mm</u>	<u>+5</u>	<u>655</u>	<u>248</u>	<u>161</u>

Summary: The firesleeve adequately protects the radiator hose from heat damage.
All objectives of this modification have been satisfied.

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