

	Standard Modification Issue 1	Mod No. SM13017
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		Compiled : S Rance
		Approved : F Donaldson

TITLE : Thermostatic Oil Cooler Adaptor

APPLICABILITY : **Jabiru 2200-3300 engines**
Mod Type : **New build and Retrofit**

1. Introduction

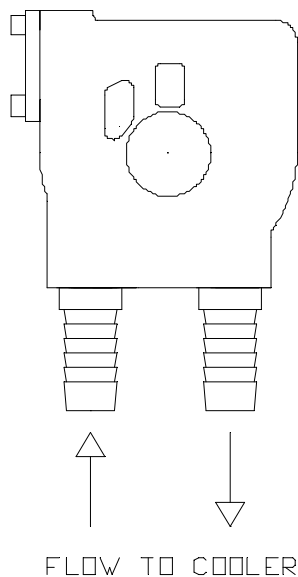
In addition to this modification leaflet, read also the document entitled 'Thermostatic Oil Cooler Adaptor (TOCA) for Jabiru 2200A and 3300A Engines' which is provided with the TOCA unit.

Fitting the Thermostatic Oil Cooler Adaptor between the crankcase and oil filter as a replacement for the Jabiru non-thermostatic adaptor offers the following benefits:

1. Quicker initial engine warm up
2. Significantly better flow of cold oil on engine start
3. Smoother oil flow through larger, less restrictive internal oil galleries
4. Better control of oil temperature in air temperature extremes
5. Avoids the need to remove or mask off the oil cooler in winter.

This modification describes the installation of a Thermostatic Oil Cooler Adaptor to a Jabiru 2200A or 3300A engine. The actuating valve is a thermostatically controlled sliding piston that opens and closes the ports. When the oil is cold, about 99% of it will be redirected back to the engine, bypassing the oil cooler. As the oil temperature reaches approximately 80°C the piston begins to close off the engine oil return port and open the oil cooler inlet port. The oil cooler inlet port will be fully open when the oil temperature reaches 95°C with the engine oil return port fully closed.

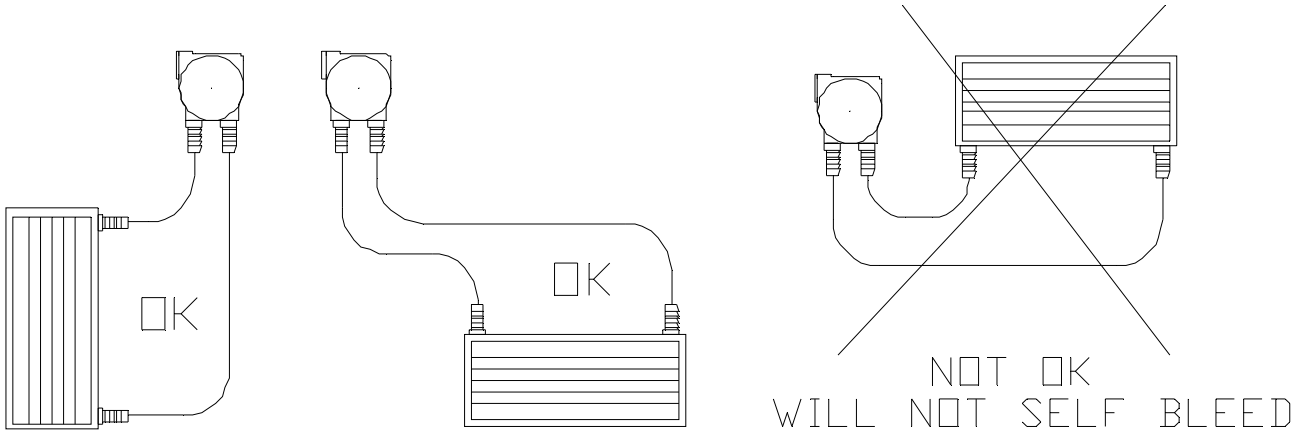
The TOCA body is supplied with a choice of BSP or NPT threads. In most instances the Ryco or equivalent oil filter will fit straight on the TOCA but on earlier engines (those with the thicker fins) a fin may need to be trimmed to clear the filter cartridge body.



Typical neat installation with firewall mounted oil cooler

The TOCA body may be rotated +/- 20 degrees from the 6 o'clock position (fittings pointing downwards) to aid installation.

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Preferred mounting configurations.

½" diameter bore hoses are preferred but 3/8" hoses are acceptable. Make sure all hose fittings have a minimum bore of approximately ¼" (6.5mm) otherwise an excessive pressure drop will result due to flow restriction.

2. Parts List

Qty	Part No.	Description	Source
1	TOCA Valve body	Thermostatic valve	SR Designs e-mail: micro.light@ntlworld.com
1	BS228	O-ring	
1	Thread adaptor	Male/female ¾" UNF	

3 Action

Read and understand the instructions supplied with the TOCA then carry out the installation accordingly. Route hoses to avoid any chafing and secure appropriately as required. Fit fire-sleeve where necessary.

Normal aviation practise requires the hose from the TOCA's outlet to be connected to the oil cooler's lower inlet if vertically mounted. As the Jabiru engine's oil system is pressure fed it is not so important to abide by convention if it makes hose routing difficult. If the oil cooler is mounted horizontally, connect the hoses to suit using straight or angled fittings.

4 Weight and Balance

	Weight (lb/kg)	CG (in/mm)	Moment (lb.in)
Existing A/C			
+/- Weight Change	+1.3 lbs / +0.6 kgs	As measured	
Post Mod A/C			

Amend the aircraft weight and balance schedule accordingly.

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5 Flight Test and Special Instructions

- 5.1 Before the modified aircraft may be flown. A suitable LAA inspector must check the installation. When satisfied, the inspector must make an appropriate logbook entry, including the modification number SM13017 and sign a Permit Maintenance Release (PMR).
- 5.2 After it has been established that the TOCA is working correctly, conduct a flight including a 5 minute continuous climb at best rate of climb speed, V_Y and at full throttle. Do not allow the engine to exceed limits. Monitor the oil temperature and pressure throughout the flight and record the values. Use the tables below for this.
- 5.3 No significant amount of oil should flow through the oil cooler until the oil temperature reaches at least 80°C. If the oil temperature struggles to reach 80°C then an excessive amount of cooling air over the sump may be the cause. Contact micro.light@ntlworld.com for advice.

ENGINE LIMITATIONS (From Pilot's Operating Handbook)

MAX OIL TEMPERATURE	MIN/MAX OIL PRESSURE
_____ °C / _____ °F*	_____ / _____ bar/psi*

* Delete as appropriate.

5 MINUTE CLIMB DATA

TIME (min)	ALTITUDE (FT) 1013 mb	IAS knots / mph*	RPM	OIL TEMP °C / °F*	OIL PRESS bar / psi*
0					
1					
2					
3					
4					
5					

Approved:	F Donaldson B.Tech C.Eng FRAeS Chief Engineer	Signed:	
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