TITLE : ThermoStasis P6-H-*** Thermostatic Oil Bypass Valve

APPLICABILITY : **Rotax 91x series engines**
Mod Type : **New build and Retro-fit**

1. Introduction

The fitting of a thermostatic oil bypass valve between the engine and the oil cooler offers the following benefit:-

1) Quicker initial engine warm-up.
2) Overcooling in cold weather is prevented.
3) The *** in the part number denotes the cartridge opening temperature in °F.

This modification describes the installation of the ThermoStasis P6-H-*** thermostatic oil bypass valve. The valve opens up a path for the oil to flow around the engine whilst mostly bypassing the oil cooler. This thermostat has several different temperature cartridge options ranging from 77°C to 102°C. The suggested cartridge is the 88°C (190°F) one. This has been found to provide suitable oil operating temperatures.

The valve must not be fitted without reference to the aircraft manufacturer and adherence to any detailed instructions they may have. DO NOT install this valve if a) the oil cooler is installed inverted (with the connections at the bottom) or b) the oil cooler is mounted vertically and the outlet hose cannot be made to the upper fitting. See Figures 3 and 4.

2. Parts List

Qty	Part No.	Description	Source
1	ThermoStasis P6-H-***	Thermostatic valve	ConAir Sports Ltd Wayland House, Station Fields Fenny Compton Southam, CV47 2XD tel 01295 771088 www.conairsports.co.uk
1	Oil hose	Oil hose as required	
4	3/8in NPT hose fittings	Fittings with bore ≥9mm	
4		Hose clamps	

List of related Drawings / Photo's

Drawing No.	Title / Description	Issue
Figure 1 & 2	Installation diagram for horizontal and vertical mounted coolers	1
Figures 3 & 4	Unsuitable installations	1

Action

3.1 Installation Overview. See any instructions provided by the aircraft manufacturer. Carefully read the ThermoStasis's installation instructions. Disconnect the aircraft battery. Given the rigidity of the oil pipes it is not essential to firmly mount the valve to the aircraft structure. If loosely mounted, it is essential to ensure that the valve is not allowed to move sufficiently to contact any surrounding structures. Mount the valve clear of fuel hoses and other temperature sensitive components. In extreme cases the valve's body could reach temperatures of 150°C.

3.2 Oil hoses. Remove the oil hoses and clamps referring to any aircraft manufacturer's instruction

3.3 Thermostatic Valve Due to it's position in the oil system any debris left in the valve could damage the oil pump before being trapped by the oil filter. Thoroughly inspect the valve. Screw on the four (3/8in NPT) hose fittings using Loctite 2701 or Loctite 648. Flush the valve with clean engine oil. Angled or Banjo type fittings are usually too restrictive to ensure adequate oil

flow. The minimum bore of fittings should be 9mm (or equivalent cross sectional area) without sharp bends. If the suitability of the fittings is questionable a suction measurement on the oil inlet close to the oil pump should be carried out in accordance with the Rotax installation manual.

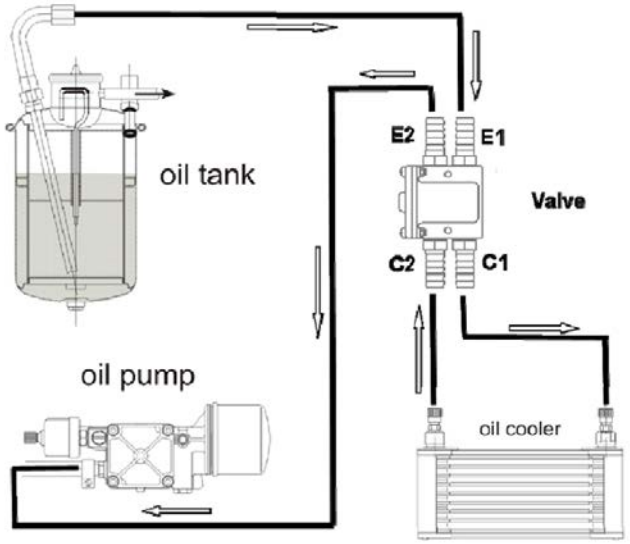

Figure 1 Installation for HORIZONTAL cooler
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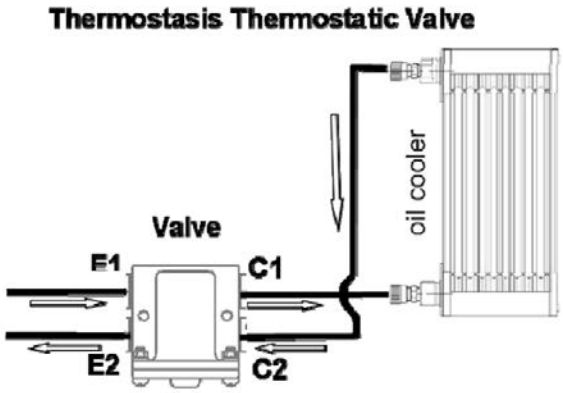

Figure 2 Installation for VERTICAL cooler
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3.4 Connections. See Figures 1 & 2 and connect the valve as follows:-

a) Connect C1 with the inlet hose to the oil cooler
b) Connect C2 with the outlet hose from the oil cooler
c) Connect E1 with the suction hose from the oil tank
d) Connect E2 with the suction hose to the oil pump

Do not install the oil hoses with small radius bends. Do not over tighten the hose clamps

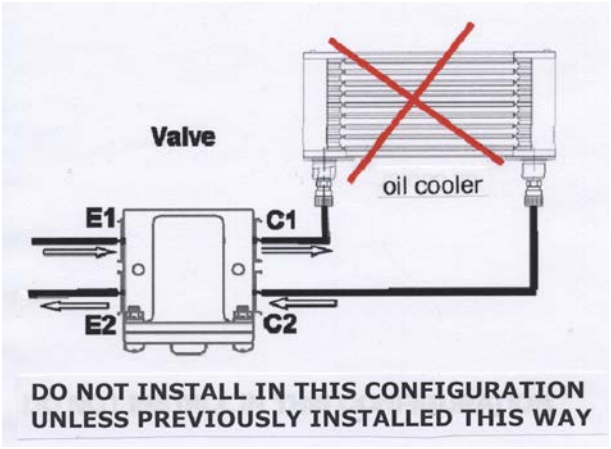

Figure 3. Inverted oil cooler may only be used if oriented this way before installing valve.

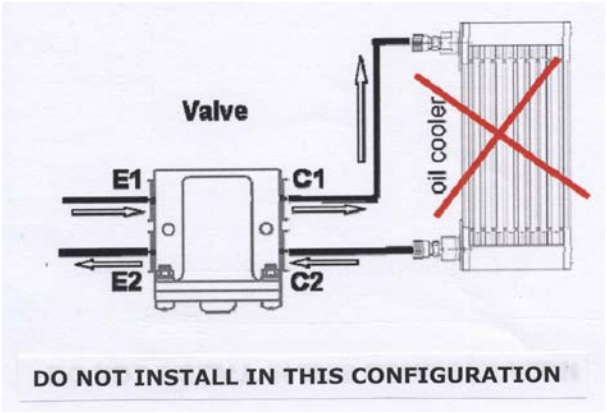

Figure 4. Unsuitable down flow

3.5 Fill and purge oil system. Refer to the current issue of the Rotax instructions SI-27-1997 "Oil level check" and SI-04-1997 "Venting of lubrication system".

3.6 Testing. Reconnect the aircraft battery and restore the aircraft to the original operating configuration. Ground-run the engine for a short time then check for oil leaks. If no leaks or

other problems are found run the engine again, this time until the oil temperature has stabilised. During all ground runs monitor all engine parameters, paying particular attention to the oil pressure and temperature indications. Carry out magneto checks at the appropriate rpm, and then run the engine at full throttle for at least 1 minute. After engine shut down, check again for leaks, hose clamp security & any other problems and correct any found before further engine running.

4 Weight and Balance

	Weight (lb/kg)	CG (in/mm)	Momen (lb.in)
Existing A/C			
+/- Weight Change	+1 lb (0.5Kg)		
Post Mod A/C			

Amend the aircraft weight and balance schedule accordingly.

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 SM12808 and sign a Permit Maintenance Release (PMR).

5.2 Conduct a flight including a 5 minute continuous climb at best rate of climb speed, V_Y and at full throttle. Do not allow engine to exceed limits. Monitor the oil temperature throughout the flight and record the maximum. Some oil will always flow through the oil cooler. If the oil cooler is oversized the oil temperature may still struggle to reach optimum operating levels. If oil temperatures fails to exceed 80°C contact ConAir Sports Ltd for advice on how to proceed.

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