

	Standard Modification Issue 1	Mod No. SM 12748
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		Compiled : A Draper
		Approved : F Donaldson

TITLE : Installation of Fuel Flow Monitoring System

APPLICABILITY : **All Tecnam Sierra variants**

Mod Type : **Retro-fit**

1. Introduction

The fitting of fuel flow transducers, in conjunction with a suitable display/analysis unit can provide accurate fuel consumption data. This can be a significant safety improvement, particularly during long range touring. This modification covers the fitting of the FloScan 201A-6, 201B-6 or the Electronics International FT-60 fuel flow transducers only. If two transducers are installed, both must be identical. They may be used with a variety of display/analysis units such as:-

- a) Grand Rapids EIS2000 (see grtavionics.com)
- b) Stratomaster Infinity FF1 or FF3 (From Parts For Aircraft, 02877 765796)
- c) JPI FS-450 (see jpinstruments.com), used in FAA approved systems.
- d) A wide range of combined EFIS/engine monitoring systems

2. Parts List

Qty	Part No.	Description	Source
1+	FloScan 201A-6 or B-6	Fuel flow transducer	Various, normally supplied by the display manufacturer
1+	FT-60 (Red Cube)	Fuel flow transducer	Various, normally supplied by the display manufacturer
2+	AN840-6D	Hose adaptors	Various
1	FloScan 150-004* (If required)	Pulsation damper	Parts For Aircraft
Note 1.The FloScan 201B-6 flow transducer is functionally identical but some 100 grams heavier than the 201A-6. Note 2.The hose adapter (-6D) is for 3/8 (8mm) ID hose.			

List of related drawings

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3. Action

- 3.1 The transducers are designed to be mounted with the electrical connections pointing up (to allow vapour venting). Refer to the appropriate manufacturer's installation literature.
- 3.2 If it is unavoidable, the transducers may be suspended in flexible pipe work if the precautions set out below are met. In this case the electrical connections must pass through a suitable fire resistant bulkhead fitting.
- 3.3 Flow turbulence may cause erratic reading from the transducer. This can be avoided by ensuring that at least 100mm of straight (or gently curving) pipe precedes the transducer and 50mm after the transducer. *In extreme cases the FloScan pulsation damper may be required to achieve accurate results.

3.4 The Rotax 912-ULS engine uses a mechanical fuel pump located at the front of the engine. The return flow to the tank is controlled by a fixed flow restrictor. While the return flow will vary with engine speed (mechanical pump pressure) and use of the electric pump this variation is relatively small. Satisfactory results have been obtained with a single flow transducer (suitably calibrated). Alternately a return flow transducer can be utilised.

3.5 **Suspended Mounting.** See figure 1 below

- i) Both the inlet and outlet hoses must be flexible and the same size as the original.
- ii) The hoses must be supported by a clip either side of the transducer which should be no more than 400mm apart.
- iii) The unit must be mounted with the electrical connections oriented upwards to ensure against vapour entrapment. The mounting must not allow the unit to rotate in use.
- iv) The transducer must be wrapped in fire sleeve. A small hole should be made in the sleeve for the wires to exit. This hole must be sealed with RTV sealant.

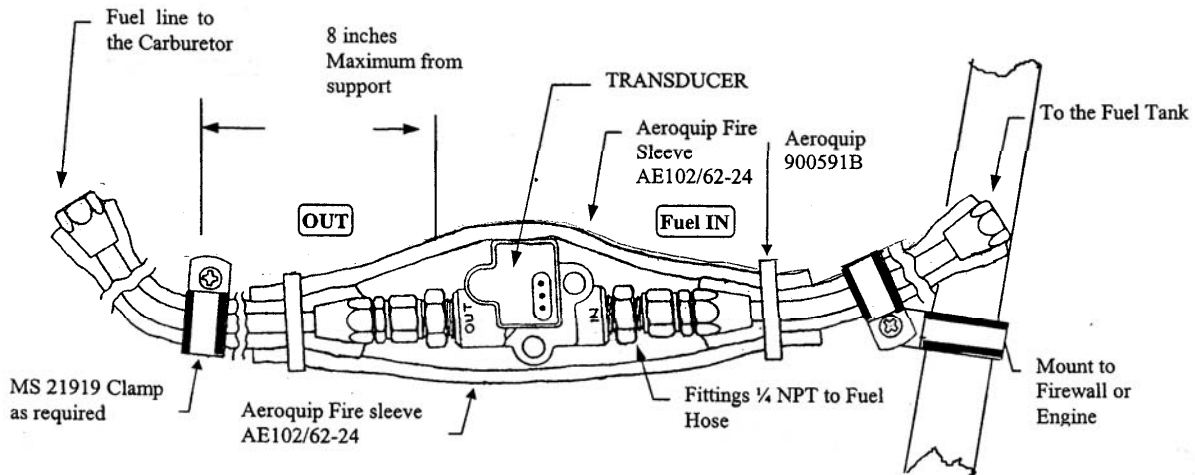


Figure 1. Suspended mounting of transducer

3.6 **Wiring**

Carefully wire the units according to the instructions supplied with the display/analysis unit.

4. **Weight and Balance**

	Weight (lb/kg)	CG (in/mm)	Moment
Existing A/C			
Weight Added			
Post Mod A/C			

The change in weight due to the transducers is very small, some 0.35lbs. The location will depend on the installation. If other changes to the aircraft are made a full weight and balance may be necessary.

Amend the aircraft weight and balance schedule accordingly.

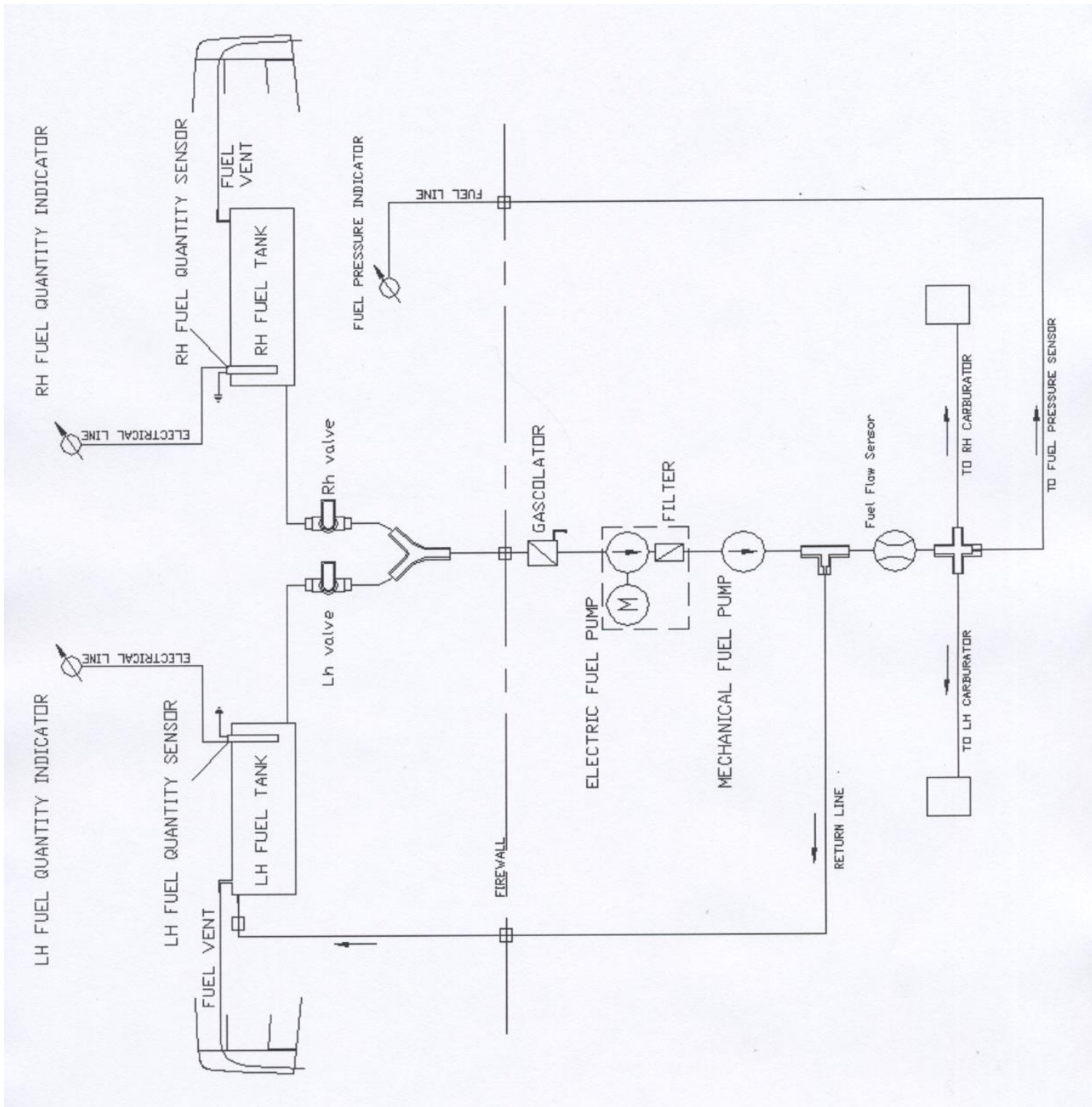


Figure 2. Sierra fuel system schematic

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5. Flight Test and Special Instructions

Before the modified aircraft may be flown: -

- 1) An LAA inspector must check the installation of the fuel flow monitoring system.
- 2) A fuel flow check must be carried out according to the method described in technical leaflet TL 2.20 and the results verified by an LAA inspector and recorded on fuel flow checklist LAA/IC-FF which should then be attached to the aircraft logbook. It is acceptable to conduct this check with the engine-off and with the electrical pump running only. Note that the maximum fuel flow for the Rotax 912-ULS engine is 27 litres/hour.

One of the most common causes of engine failures on homebuilt aircraft is inadequate fuel flow leading to fuel starvation or vapour lock.

The purpose of the fuel flow check is to ensure that there is at least a 25% surplus of fuel flow available over and above the maximum amount required by the engine at full throttle and maximum rpm, without allowing the carburettor inlet fuel pressure to drop below the minimum recommended by the engine manufacturer.

The fuel flow recorded should be well in excess of the minimum figure. If it is not, it is likely that some restriction does exist within the fuel system and this must be investigated before further flight.

- 3) With the above found to be satisfactory, a logbook entry must be made, making reference to the modification number and the inspector must sign a Permit Maintenance Release (PMR).
- 4) The display/analysis unit MUST be calibrated during initial testing.

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