INSPECTION CHECKS

APPLICABLE TO THE INSPECTION OF LAA AIRCRAFT FITTED WITH ROTAX 2 STROKE ENGINES TO CHECK SUITABILITY FOR USE OF UNLEADED MOGAS CONTAINING UP TO 5% ETHANOL	LAA/IC-ULM-ROTAX 2 STROKE Issue 5

A/C Type:	Reg:	Engine Model:

This checklist is to be completed by a suitably approved LAA inspector. LAA inspectors are only acceptable for carrying out this task if their LAA approval includes the ability to carry out LAA Permit renewal inspections on the aircraft concerned.
This checklist should be used in conjunction with LAA Technical Leaflet TL 2.26. Check the website for the latest issue.

Item	Description	Inspector's Signature
1	Check that engine type is one of those listed below: Rotax 377, 447, 462, 503, 508, 532, 582 or 618. (Delete as appropriate)	
2	Check that the engine's fuel system is installed in accordance with the features called for in the 'Installation Instructions for Rotax Ultralight Engines', in particular:	
	Fuel system configured per Figure 1 below.	
	Standard Rotax fuel pump fitted.	
	Fuel pump impulse line length not more than 500 mm and of stiff and fire-resistant material.	
	Fuel pump installed in a cool place (not on the engine itself for example) with the small drain hole near the impulse connection orientated downwards or sideways, not upwards.	
	If possible, the fuel pump should be situated below the fuel tank level. If the pump has to be mounted considerably above the tank level (more than a metre), then a back up electric pump (eg Facet 480615) should be fitted, low down in the system, connected in parallel with the pulse pump.	
	Fuel filter of approx. 0.1 – 0.2 mm mesh size situated between tank and carburettor.	
	Fuel filter (finger strainer) of approx. 0.3 mm – 1.0 mm mesh size situated in each tank.	
	Fuel tank fitted with provisions for draining.	
	Fuel pipe material fire-resistant and bore 5 mm diameter minimum.	
	Fuel cock fitted between engine and tank (exception permitted in some aircraft with tank below engine).	
3	Check that the installation is configured in such a way as to make vapour-lock problems unlikely, in particular:	
	Fuel pipes not routed adjacent to hot components (metal heat shields may help).	
	Fuel tank vent pipes forward-facing to pressurise tank.	
	No 'S bends' (local high-points and low-points) in fuel pipe runs which will tend to trap vapour bubbles.	
4	Check that each fuel tank is not made of a material likely to be chemically attacked by components within unleaded fuel containing 5% ethanol. Whilst metal tanks, and those moulded from polythene tanks, are likely to be satisfactory with unleaded fuel, some tanks laminated using polyester, vinylester or epoxy resins are known to be attacked. If in doubt, consult the aircraft kit manufacturer and/or carry out a sample test (two weeks duration suggested) to check for signs of the surface becoming 'gummy'.	
5	Check that fuel tanks are not treated with a 'sloshing sealant' likely to chemically detach from the tank inner surface and block fuel outlet. If in doubt, test over two-week period and check condition.	
6	Check that fuel system components such as rubber or plastic pipes, seals in fuel cocks, sight gauge tubes, fuel tank floats, filters, etc, are not made of a material likely to be chemically attacked by components within unleaded fuel containing 5% ethanol. Any fuel system components manufactured for the automotive industry since around 1990 or so are likely to have been made compatible with unleaded fuel. If in doubt, test components in a jam jar of fuel and observe results after appropriate period (two weeks).	
7	Check carburettor ice protection provisions, heat muffs, carb heaters etc. If reliance is placed on 'undercowl temperature' for carb ice protection, ensure that under cowl temperatures are not being accidentally reduced due to loose or worn baffles, air seals etc.	

8	Check that fuel level is visible in sight-gauges. Unleaded fuel, being almost clear in colour, may be hard to see in sight-gauges that have become stained with age, in which case sight-gauge tubes will need to be replaced. A card marked up with diagonal close-pitched lines inserted behind the gauge will help to show up fuel level due to refraction effect – fuel in the sight-gauge appears to alter the angle of the lines.	
9	Carry out a fuel flow check in accordance with Rotax requirements as described in enclosed information sheet. Surplus flow available must not be less than 25 % of maximum engine fuel demand.	
10	Carry out engine ground run using unleaded Mogas fuel to BS EN 228, 95 RON (Min) and check that running and instrument indications are normal. Mixture strength should not need adjusting. Note that it is normal to find a slightly different grey exhaust pipe deposit with unleaded fuel than with leaded fuel which may give a false impression of changed mixture strength. Check fuel system for leaks and filter(s) for contamination	
11	Fit cockpit placard regarding unleaded Mogas fuel use (available from LAA).	
12	Fit placard adjacent to each filler specifying: 'E5 Unleaded Mogas BS EN 228, 95 RON (MIN).'	

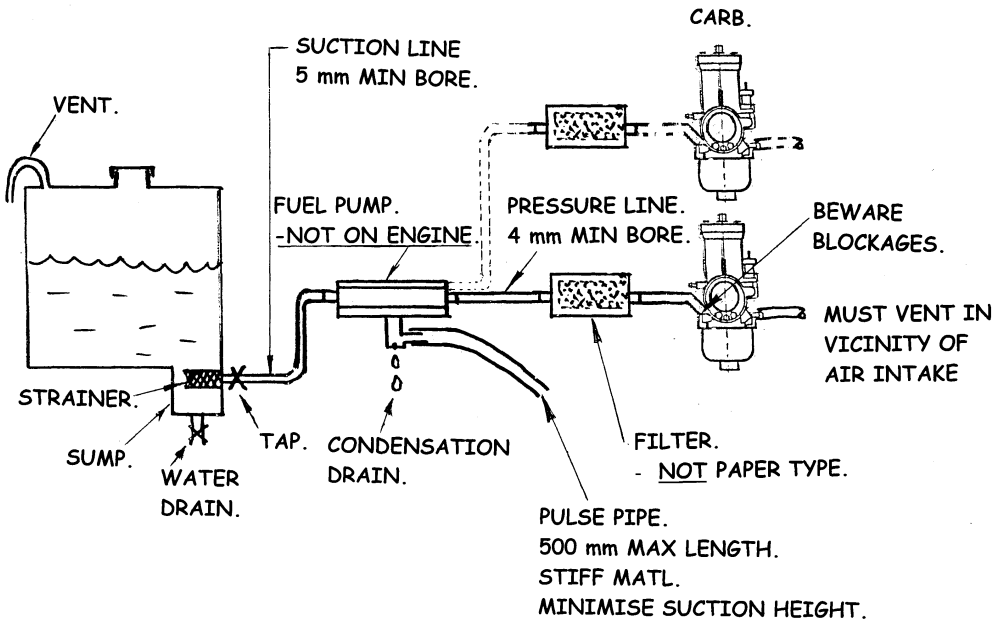

Figure 1. Typical Fuel System Installation for 2-Stroke Rotax Engine.

After completion, this checklist is to be signed, dated and stapled into the aircraft's airframe logbook, together with a copy of LAA TL 2.26. The inspector is to add declarations in the engine and airframe logbooks stating:

'This aircraft / engine has been checked in accordance with the procedures in TL 2.26 and may be run on E5 unleaded petrol to BS EN 228, 95 RON (MIN) in accordance with the operating procedures and special operating limitations contained in TL 2.26'.

DECLARATION BY LAA INSPECTOR

I declare that the aircraft, registration **G-**_____, has been checked against items 1 to 12 listed above and has been found to comply in all respects.

Name:	Signed:	Insp. No.:	Date: