

The vario needle should go down and the ASI needle should increase. At 40 kts stop applying pressure. The ASI should hold steady and the Vario needle should come back to zero. If it should show a rate of climb and the ASI value decreases then you have a leak.

If all is well decrease the pressure, the vario will show climb and then settle at zero.

Further checks

If all was not well with the last check then we need to dig deeper.

Testing the Capacity.

This time connect a pipe from the “T” fitting on the syringe line direct to the capacity. Apply pressure and check to see that it holds a steady reading on the ASI. A decrease in ASI value means there is a leak.

Testing the Vario

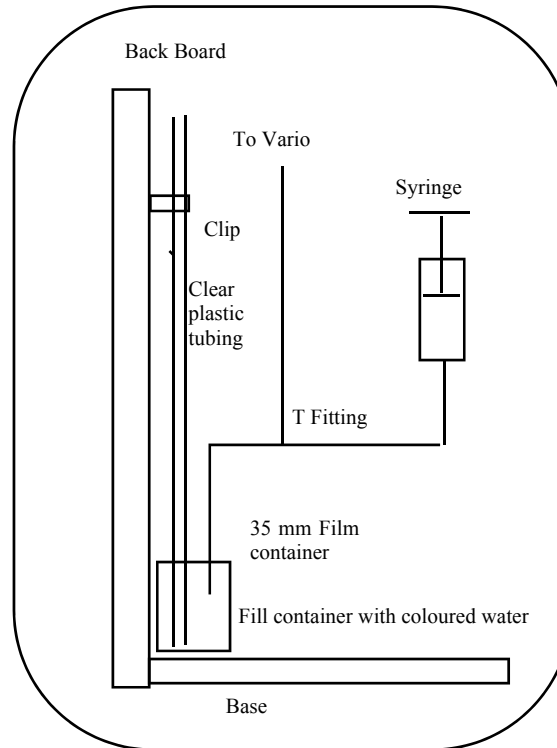
With a plug in the line to the capacity re-test the vario. If there is still a leak suspect the vario case or glass.

Testing the Total Energy Line.

This is much the same as above. Plug the point at which the TE probe joins the fuselage and pressurise the line using the ASI as a leak indicator. Leaks in the TE line will be hard to trace as the pipe may be inaccessible over some of its length. In the past we have found most leaks either at the TE fitting in the fin or forward of the wheel area.

Building a Vario test rig

Whilst the test system we have discussed is good for simple tests it relies on the ASI being in good condition. By using a simple manometer you can construct a simple and reliable piece of test equipment. Make sure the unit is sealed at the point the pipes enter the lid of the film canister using silicon.



Use the unit in the same way that you used the ASI. Test occasionally by plugging the pipe to the vario and checking that the water level is steady.

Good luck

WEEKEND WORKSHOP SERIES

Fault Finding Vario Problems

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Of all the instruments within the glider cockpit the Variometer is by far the most important.

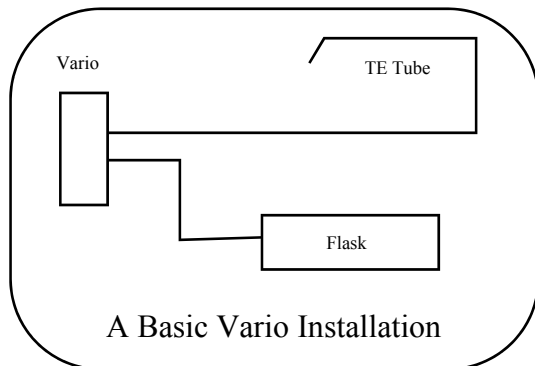
Within this booklet we will take a look at some of the problems and how to track them down and rectify them.

The Instrument

In its simplest mechanical form the Vario is a vane supported on a shaft and displaced by air moving past it. Air moving in one direction moves the needle up whilst air in the other direction moves the needle down.

The Air Movement

The air within the Vario moves only slightly due to changes between the pressure in a sealed flask and that of the air around the glider in flight.



It is not essential that you fully understand the theory behind the Total Energy system since most problems are related to poor installation rather than deeper physics.

Identifying the Problem

Before we get down to major fault finding spend 5 minutes going over the vario installation and checking the following points.

Basic Checks.

A) Is the needle at zero on the ground in still air. If the answer is No then there are two likely problems.

1) The springs that balance the needle have been stretched by either a heavy landing or over loading the instrument.

2) The jewels upon which the vane run are damaged and are causing sticktion within the system.

In both the above cases the instrument needs to be sent away for overhaul.

B) Are the pipes and associated plumbing in good condition free of kinks and tight bends.

C) Is the flask in good condition and mounted securely.

D) Are any associated systems like bleeds, and by pass switches in good working order and free of debris.

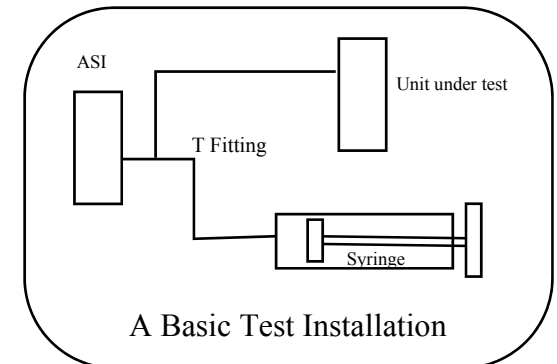
E) Is the Total Energy tube a good fit in the fin. White tape will not seal the joint. Use Silicon tubing or heat shrink.

F) Is the instrument glass fitted correctly, seals or O Rings in place, no cracks, is the glass locking ring loose?

If none of the above are the cause of the problem then we need to look further.

Fortunately you have a built in test instrument in all gliders. The ASI, we can use the ASI to look for leaks in the system. But first we need to check that the ASI is sealed and working fine.

First mark both pipes that are fitted to the ASI so that you put them back correctly. You now need a large syringe and some tubing. Connect the syringe to the PITOT side of the instrument and gently apply pressure to the ASI, the needle should show and increase. When the needle shows 60 knots stop and wait. The needle should stay at that value, if it falls then you have a leak.



Reduce the pressure and you are ready to start on the vario. Take a pipe from the Total Energy side of the vario and "T" it into the pipe from the syringe. This time apply pressure very slowly.