

## AIR POWERED INTERNAL SWD FOR 4 LITRE SAMPLER

- ◆ REMOTE PUSH BUTTON OPERATION
- ◆ MINIMAL OPERATOR FUEL EXPOSURE
- ◆ REDUCED SYRINGE CONSUMPTION
- ◆ PRECISE SAMPLE VOLUME
- ◆ ACCURATE SWD RESULT
- ◆ NEW HIGH VISIBILITY TUBE MATERIAL
- ◆ IMPROVED FILLING RATE



### Introduction and Existing Procedures.

Since the introduction of the Aljac 4 Litre Sampler there have been various approaches to the problem of carrying out the water detector test.

Initially, the lid was opened and the syringe/capsule was dipped into the fuel just as it had been with traditional open sample jars, but this negated some of the advantages of the closed sampling concept. The procedure was refined with the development of the Internal SWD fitting which simplified the method of manipulating the syringe and but was still not ideal.

This was followed by the development of the External SWD fitting which is located on the inlet of the sampler and removed the need to open the lid, because it uses an internal self sealing poppet valve to allow fuel into the capsule/syringe and carry out the test. However, this procedure has also proved not to be a totally problem free. In this device the capsule is not actually immersed in the fuel, and this has a number of drawbacks. There is a small dead volume of fuel within the poppet valve which can trap water and give a false (poor) result. It is also possible to draw air into the syringe if the seal between the capsule and poppet valve surface is not 100% perfect (which is very likely). The problem is further compounded because during this test method the syringe is nearly horizontal so it is impossible to

accurately judge the actual volume of fuel in the syringe. So in practice it is common for less than 5ml of fuel to be taken which will give an inaccurate SWD test result. In addition the poppet valve can leak due to wear or contamination and result in a fuel leakage.

We developed our Air Powered SWD to offer a new approach to the whole procedure.

It is clear that the most representative SWD test is obtained by the capsule being immersed directly into the fuel, so there is no issue with dead volumes and unrepresentative fuel properties. It is also desirable to make the whole test more user friendly and reduce the consumption of syringes. So we set out with these objectives in mind when we developed our Air Powered SWD.

### Description and Operating Method.

Our Air Powered SWD consists of a graduated plastic tube which is permanently fixed to the sampler hinged lid, close coupled to a vacuum generator which creates a vacuum in the tube when air pressure is applied to the 6 mm inlet connection. The sampler is filled with fuel as normal, the lid is opened, a water detector capsule is fitted to the end of the graduated plastic tube and the lid is closed so that the water detector capsule is below the surface of the fuel. Air is fed to the vacuum generator from

the vehicle air system through a hold open 3/2 pneumatic valve (lever or push button operated). This creates a vacuum inside the graduated plastic tube and draws fuel through the capsule. When the required 5ml of fuel has passed through the capsule into the tube (which takes approximately 20-30 seconds) the air supply is removed by releasing the pneumatic valve. The sampler lid is then opened and the capsule is removed and checked. The lid is closed, the jar is emptied as normal and the fuel in the plastic tube drains into the sampler under gravity.

Our new approach has a number of advantages. The capsule is immersed directly in the fuel so there is no dead volume and the test is truly representative. The lid is only open momentarily to fit and remove the capsule from the syringe so there is minimal operator exposure to the fuel and minimal possibility of fuel contamination from the elements. In addition, because the plastic tube does not rely on seals and pistons to draw the fuel volume it very seldom needs replacing, so there is minimal ongoing syringe consumption.

The operator just has to operate a button or lever to carry out the test which is much easier than manipulating a syringe when wearing thick gloves. It was also found that as the fuel level rises in the plastic tube, the fuel/air interface has no bubbles present so it is much easier to judge the true fuel volume than it is when using a conventional syringe, especially when

the syringe is horizontal as it is during the External SWD procedure.

Our Air Powered SWD has already been highly successful with many in service, however, we have now further upgraded it by changing the tube material and markings to offer improved visibility, and designing an improved end cap which increases the fill rate by 30-50%.

**New End Cap design**



**High clarity Tube and graduations**

The Air Powered SWD is available as an option with new Aljac samplers, or as a retro fit kit for existing equipment, and the new design tube assembly can be easily retrofitted to older Air Powered SWDs.

We are also able to supply the ancilliary items as an installation kit (See Typical Installation Schematic).

**Standards.**

The equipment has been subjected to a full risk assessment which included the requirements of the EC directives and harmonised standards. In accordance with European legislation, it has been concluded that the equipment should not carry a CE mark.

**How to Order.**

**Air Powered SWD as an Option.** Part No.6007233252.

**Air Powered SWD Retro Fit (including Sampler Lid).** Part No. 6007233253.

**Graduated Plastic Tube Retro Fit Assembly** (directly replaces older tubes). Part No. 6007233259.



**Typical Installation Schematic Diagram.**

