

**LAMBDA WINDOW: TITANIA SENSOR: RICH & LEAN SIGNALS ARE REVERSED.**

Normally a Lambda/O<sub>2</sub> sensor operating under acceptable conditions will result in the display LED array illuminating continuously from lean to rich then back again as shown in FIG 3. This pattern is repeated constantly. If there is a fault with the Lambda/O<sub>2</sub> sensor or ECU the normal pattern described above will not occur and the activity in the LED array will be limited to either the rich or lean sector of the display window, dependant on the type of fault.

As a basic test to begin to identify the source of the fault, use the simulation feature of the tester to introduce a RICH or LEAN SIGNAL and observe whether this produces a change in the LED activity present. By pressing +V (**Titania, press 0V**) the tester will transmit a RICH signal to the ECU.

If the circuit is functioning correctly the mixture will be weakened and the result should be apparent by a decrease in the engine speed occurring. Ideally, a four-gas analyser should be used to verify that the mixture strength varies in response to the false signals introduced. No reaction would suggest a wiring/connection problem or faulty ECU. Faulty fuelling, faulty ignition or faulty management sensors (located on the engine) could also produce the same effect. If the response to the simulated signals IS detected, then the Lambda/O<sub>2</sub> sensor should be inspected, cleaned and tested and substitution or replacement undertaken as necessary.

In some management systems a simulated signal may flag into the system's memory and be shown as a fault code when checked with a code reader. Some management systems also contain a "limp home device" which activates when the Lambda sensor fails. The ECU will input a firm value signal of approx. 500mV to the sensor to allow the vehicle to be driven at low speeds. This condition will show on the display area of the tester when either the first or the second LED is lit constantly in the Lambda window.

**General Maintenance:** The Lambda tester is a sensitive electronic instrument and should be treated as such. Avoid high temperatures, mechanical shock and damp environments. Occasional inspection of cables for damage and/or loose connections together with battery replacement is the only required maintenance.

**Battery Replacement:** When the battery voltage is low the single red LED in the ident panel will illuminate.  
 (1) Remove the battery lid on the rear of the instrument by sliding in the direction of the arrow.  
 (2) Unplug the wire connector and install a new, good quality, alkaline type PP3 9V battery. Replace the battery lid.

**Specifications:**

- Power Supply: One 9V alkaline type PP3 battery.
- Connectors: One wire-piercing clip and one black ground clip.
- Display: Output crossover of signal displayed as a light path in the LED array.
- Ident Panel: Indicators to identify heater supply, ECU supply, open circuit LED, ground supply and low battery indication.
- Test Leads: Quality silicone leads able to withstand high temperatures.
- Enclosure: ABS.
- Dimensions: 145mm x 80mm x 34mm.
- Warranty: 1 year. The warranty is invalid if the instrument has been subject to misuse or abuse. The warranty does not cover batteries or any other materials that wear out during normal operation of the instrument.

**CE Declaration of Conformity**

We, the sole importer into the UK, declare that the product listed here is in conformity with the following standards and directives. The construction file for this product is held by the Manufacturer and may be inspected, by a national authority, upon request to Jack Sealey Ltd.

<p style="text-align: center;"><b>Lambda Tester &amp; Simulator Model VS925</b></p> <p><b>73/23/EEC Low Voltage Directive.</b>  <b>89/336/EEC EMC Directive.</b>  <b>93/68/EEC Marketing Directive.</b></p>	<p style="text-align: right;">Signed by Mark Sweetman</p> <p style="text-align: right;"> 14th September 2005</p>
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For Jack Sealey Ltd. Sole importer into the UK of Sealey Professional Tools.

**NOTE:** It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.

**IMPORTANT:** No liability is accepted for incorrect use of this equipment.

**WARRANTY:** Guarantee is 12 months from purchase date, proof of which will be required for any claim.

**INFORMATION:** For a copy of our latest catalogue and promotions call us on 01284 757525 and leave your full name and address, including



INSTRUCTIONS FOR:  
**LAMBDA TESTER & SIMULATOR**  
 Model: **VS925**

*Thank you for purchasing a Sealey Product. Manufactured to a high standard this product will, if used according to these instructions and properly maintained, give you years of trouble free performance.*

**IMPORTANT:** PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS AND CAUTIONS. USE THIS PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. PLEASE KEEP INSTRUCTIONS SAFE FOR FUTURE USE.

**1. SAFETY INSTRUCTIONS**

- WARNING!** Ensure Health and Safety, local authority and general workshop practice regulations are adhered to when using tools.
- DO NOT** use tester if damaged.
- Maintain tester in good and clean condition for best and safest performance.
- Ensure that a vehicle which has been jacked up is adequately supported with axle stands.
- Wear approved eye protection. A full range of personal safety equipment is available from your Sealey dealer.
- Wear suitable clothing to avoid snagging. Do not wear jewellery and tie back long hair.
- Account for all tools and parts being used and do not leave any on or near the engine.



Sole UK Distributor, Sealey Group, Bury St. Edmunds, Suffolk.

01284 757500 01284 703534

[www.sealey.co.uk](http://www.sealey.co.uk) **E-mail:** [sales@sealey.co.uk](mailto:sales@sealey.co.uk)

## Introduction

The Lambda Tester is designed to measure the crossover changes which occur in the closed loop control system. The product will analyse both Zirconia and Titania type sensors.

This analyser can simulate the sensor signals to the ECU to verify acceptance of the signals and confirm that the ECU acts upon them.

The unit allows the operator to verify which wire the instrument is connected to, a feature which is particularly useful when working with heated sensors.

## Features

- ❑ Tests 1, 2, 3 and 4 wire sensors.
- ❑ Tests heated and non-heated sensors.
- ❑ Unique ident panel identifies which wire the instrument is connected to i.e. ground, heater or ECU supply (where applicable). Open circuit indicator identifies bad connection.
- ❑ Rich or lean simulation to check ECU reaction.
- ❑ Wire piercing clip for ease of connection.
- ❑ Unique LED light path displays the crossover signals of the Lambda sensor.
- ❑ Runs off internal 9V alkaline battery with indicator to show when battery is running low.
- ❑ One year limited warranty.
- ❑ Sealed control switches for workshop environment.
- ❑ Durable ABS enclosure.

## Warnings

Failure to follow the warnings indicated here may result in personal injury and/or damage to property and the instrument. Misuse or improper application of the instrument will invalidate the warranty.

The instrument is designed for analysing Lambda/O<sub>2</sub> sensor systems and simulation of the Lambda signal output to the ECU. It is not intended for use on any other vehicle systems. Always wear the correct eye protection and keep hands and clothing from coming into contact with rotating engine parts.

Lambda/O<sub>2</sub> sensors are located within the exhaust system, when working on them be well aware of extremes of heat.

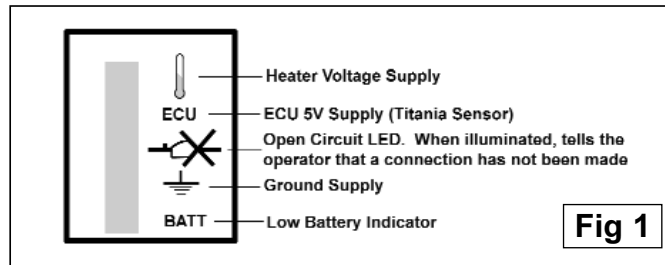
Ensure the handbrake is applied on the vehicle under test and if the vehicle has automatic transmission, put it in the **PARK** position.

Always ensure there is adequate ventilation when working with engine running. Emissions of carbon monoxide (if inhaled) can cause serious damage to health.

## Indicator Panel:

**NOTE:** Cross count is disabled - it only indicates connection to Titania sensors by displaying "t" in the cross count box.

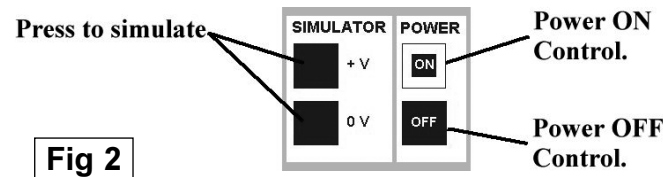
One of the unique features of the Lambda Tester is its ability to indicate to which wire on the Lambda sensor the unit is connected. This tells the operator which is the signal wire for measuring the Lambda output and also identifies the presence of the heater supply voltage (where applicable) and the sensor ground condition. **Refer to Fig 1.**



## Operating Instructions:

**NOTE: DEFAULT SETTING IS ZIRCONIA. TITANIA SENSOR MUST BE MANUALLY SELECTED (see below) & THE RICH & LEAN VALUES ARE REVERSED.**

**SELECTING TITANIA:** Before switching on, press either +V or 0V button, keep pressed down whilst switching unit ON, then release. **Refer to Fig 2.** This puts the unit into Titania mode, confirmed by "t" appearing in the cross count box at the top left of the unit in **Fig 3.**



**NOTE: The engine must be at normal operating temperature and running at 1500-2000RPM to test the O<sub>2</sub> sensor.**

The tester is fitted with a wire-piercing clip allowing it to pierce the sensor wires without damage, (the insulation congeals back to its original state after removal).

Switch on the tester by pressing the ON button at **Fig 2.** Connect the black ground clip to a good chassis ground, or the negative terminal of the vehicle's battery. Connect the wire-piercing clip to any of the sensor wires: the tester is capable of testing 1, 2, 3, and 4 wire sensors.

In the case of 2, 3 or 4 wire sensors the indicator panel will identify which wire you are connected to (refer to **Fig 1**). Reading from the top of the panel, if the first LED lights up this indicates the clip is connected to the heater supply voltage. If the second LED lights up this is an indication of connection to the ECU 5V supply, (applicable in the case of Titania sensor, where fitted).

The open circuit LED lights up when the tester is first switched on but not connected to any of the sensor wires, this is an open circuit indicator. This LED will stay lit if a bad connection is made to any of the sensor wires, it will go out if a good connection is made, one of the other lights will then be lit. When connection to the signal wire is made the lights on the vertical display will go out, then the display LED array in the Lambda window will activate.

A good sensor will show movement across the light path and will illuminate the LEDs in or across the "Lambda Window" (see diagram over) Once the LED array is activated, ignore any occasional flickering of the indicator lights on the panel to the left.

If connected in default (ZIRCONIA) mode, but only the top 2 lights on the right hand side are flickering, this could indicate a Titania sensor. Leaving the unit connected to the signal wire, switch the unit off and follow instructions for selecting Titania sensor. If the lights then show movement across the Lambda window (display LED), this would then indicate a Titania sensor on the vehicle.

