INSTRUCTIONS FOR:
FUEL INJECTOR TEST
DEVICE 12V - PETROL
MODEL No: VS211.V2

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 AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY.

1. SAFETY INSTRUCTIONS

- WARNING: Not to be used on Diesel engined vehicles.
- ✓ Wear approved eye protection.
- ✓ Operate the vehicle in a well ventilated area. Do not inhale exhaust gases or fuel vapour.
- ✓ Keep yourself, tools, and test equipment away from all moving or hot engine parts.
- ✓ Ensure the vehicle is in Neutral (manual transmission) or Park (automatic transmission), and that the parking brake is firmly applied. Block the drive wheels.
- ✓ Always keep a fire extinguisher suitable for fuel/electrical/chemical fires close by.
- ✓ Always turn ignition key to ‘OFF’ when connecting or disconnecting electrical components, unless otherwise instructed, and take extreme caution when touching electrical components.
- ✓ Use a rag to cover fuel line fittings, when connecting or disconnecting fuel lines or gauges. Avoid contact with petrol.
- ✓ Dispose of all rags properly.
- ✓ Clean up all fuel spills immediately.
- ✓ Keep away from engine cooling fan. On some vehicles, the fan may start up unexpectedly.
- ✓ You must follow vehicle service manual cautions when working around the air bag system. If the cautions are not followed the air bag may deploy unexpectedly, resulting in personal injury. Note that the air bag can still deploy several minutes after the ignition key is turned ‘OFF’ (or even if the battery is disconnected) because of a special energy reserve module.
- ✓ Follow the vehicle manufacturer’s warnings, cautions and service procedures.
- ✓ Always relieve fuel pressure before disconnecting fuel lines.
- ✓ The Fuel Injector Tester can be used in conjunction with an optional fuel pressure gauge for fuel injector testing. Always follow all safety guidelines and testing procedures contained in the instruction manual provided with the fuel pressure gauge.
- ✗ Never lay tools on vehicle battery. This may short the terminals together, causing harm to yourself, the tools, or the battery.
- ✗ Never smoke or have open flames near vehicle. Vapours from petrol and charging batteries are highly flammable and explosive.
- ✗ Never leave vehicle unattended whilst running tests.
- ✗ Do not confuse Air Conditioning schrader valves with the fuel rail test port.
- ✓ After testing, ensure all connections are restored.
- ✓ When finished with tester, store it in a safe, dry, childproof location.

2. INTRODUCTION

Operates injectors individually to diagnose fuel delivery problems on petrol vehicles with electronic fuel injection. Works with engine off, and pulse timer may be used with fuel pressure gauge. Powered by vehicle’s 12V battery.

Can be used to locate fuel system faults such as:
✓ Clogged or leaking fuel injectors
✓ Sluggish or sticky fuel injectors
✓ Wiring harness faults
✓ Fuel injector driver signal faults.
3. TESTING PROCEDURE

3.1. Pre-Test checks.
3.1.1. Carry out a thorough visual and hands-on inspection of the engine and fuel system. Look for loose or cracked electrical wiring, battery cables, ignition wires, and fuel or vacuum lines.
3.1.2. Verify that the battery is fully charged and fuel tank has adequate fuel.
3.1.3. Verify that the inertia fuel cut-off switch (if fitted) has not been actuated - see vehicle's manual.
3.1.4. Verify that all fuel system fuses are OK.
3.1.5. Verify that the fuel vapour recovery system and filler cap are in good condition.
3.1.6. Verify that the manifold vacuum is within manufacturer’s specification (typically 18-20 in.Hg at idle).
3.1.7. Inspect for fuel leaks and wipe up any spill fuel immediately.
3.1.8. Do not take shortcuts. Inspect wiring which may be difficult to see because of location beneath air cleaner housings, alternators, etc.
3.1.9. Check electrical connectors for corrosion on pins, Bent or damaged pins.
3.1.10. Check other vehicle systems:
- Ignition - for safety reasons, many engine management systems will not deliver fuel without an ignition spark.
- Electronic Control Unit (ECU) - The engine management system ECU has special drivers which energise the fuel injectors. These drivers are fragile and can easily fail. If an ECU driver problem is suspected, check by replacing the ECU with a known good one and retest.
- Perform diagnostic procedures as described in the vehicle’s service manual to eliminate other possible causes of problems.
3.1.11. Note: Problems with connectors are common in the engine control system - inspect carefully. Note that some connectors use a special grease on the contacts to prevent corrosion. Do not wipe off! Obtain extra grease, if needed, from your vehicle dealer. It is a special type for this purpose.
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- Perform diagnostic procedures as described in the vehicle’s service manual to eliminate other possible causes of problems.

3.2. Testing Injectors visually when removed.
3.2.1. Turn off the vehicle’s engine and ensure the ignition key is in the OFF position.
3.2.2. Connect the black clip (negative) to the negative terminal of the vehicle’s battery and the red clip (positive) to the positive terminal of the vehicle’s battery.
3.2.3. Carefully disconnect wiring harness from fuel injector to be tested. Note: Do not jerk or pull on wires - some harnesses are attached with clips. It is a good idea to test injectors in sequence, beginning with cylinder No.1.
3.2.4. Connect tester to fuel injector. For most injectors it does not matter which wire is connected to which terminal on the injector.
3.2.5. Make sure the injector adaptor wires are securely fastened to the fuel injector terminals and that there is no exposed metal between them.
3.2.6. As fuel will be sprayed from the injector and the engine may be hot, it is best to have some form of receptacle to place near the injector to capture the spray, such as a jam jar or similar.
3.2.7. Select one of the tester's modes by pressing the MODE SET button, the mode No. will be displayed:
- Single Pulse test will test for clogged injectors. Multiple Pulse tests will test for sticky or sluggish injectors.
- MODE 1 - SHORT - the tester outputs 1 pulse which lasts for approximately 250ms.
- MODE 2 - MEDIUM - the tester outputs 50 pulses, each pulse lasts for approximately 7ms.
- MODE 3 - LONG - the tester outputs 100 pulses, each pulse lasts for approximately 3.5ms.
- MODE 4 - CONTINUOUS - the tester outputs pulses continuously at the approximate rate of 50 pulses per 1450ms, each pulse lasts for approximately 7ms. This mode can be cancelled at any time by pressing the MODE SET button again.
3.2.8. Press the PULSE button to energise fuel injector. The Pulse Indicator will light as injector is energised by the tester.
3.2.9. Observe for correct spray pattern from the injector and also for leaks from the injector. If necessary, repeat the test by pressing the PULSE button again.
3.2.10. If the pulse mode needs to be changed after a test, disconnect the unit from the battery and re-connect it, then select the new pulse mode, before continuing with a new test.
3.2.11. When finished testing, replace all injectors and parts.

3.3. Testing Injectors in conjunction with a fuel pressure gauge.

3.3.1. Depressurise the fuel system by following the procedure outlined in the vehicle service manual. On most vehicles, this involves disconnecting or deactivating the electric fuel pump(s) and operating the engine until it stalls. Note: Some vehicles may have more than one fuel pump - deactivate all fuel pumps. Failure to do so can result in personal injury, vehicle damage, spill fuel, fire or other hazardous conditions.
3.3.2. Connect a fuel pressure gauge to the fuel line. Some vehicles have a schrader valve located on the fuel rail for this purpose. On vehicles without a schrader valve, the fuel line must be opened at the appropriate point to insert a fuel pressure gauge adaptor. Open fuel line at point specified in vehicle service manual. Connect adaptor to fuel line. Attach fuel pressure gauge to adaptor and tighten fitting until finger tight.
3.3.3. Test for fuel system leaks.
3.3.4. Re-pressurise fuel system by cycling vehicle's ignition 'ON' and 'OFF' every ten seconds, until fuel pressure is up to the vehicle manufacturer's specification - check the vehicle's service manual.
3.3.5. Observe fuel pressure gauge connection points for leaks. If leak occurs, clean all fuel spills immediately and check all fittings for tightness.
3.3.6. If the pressure does not drop, continue with fuel injector testing. If fuel pressure does drop, continue looking for leaks by blocking off the return line between the fuel pressure regulator and the fuel tank. Re-test as described above.
3.3.7. If the pressure drops again, there may be one or more leaky injectors. Later tests will identify malfunctioning injectors.

IMPORTANT: Read and follow all pre-test checks, safety instructions, and fuel pressure testing procedures contained in this document and in the vehicle's service manual.

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4. MAINTENANCE

4.1. Keep the tester's electrical connections clean and free of corrosion.

4.2. If tester face becomes dirty, wipe clean with a damp cloth. DO NOT use strong solvents as they may remove face printing.

4.3. Use care to prevent the tester's wiring insulation from becoming chafed or broken. Do not use tester if insulation or wiring is damaged.

4.4. When not in use, store instrument in a safe, dry, childproof location.

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 product.

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 postcode.