

Troubleshooting

Self Test LED Sequence – Fault Indication (Flash Codes):

The 5112 software has been programmed with the ability to self check the system during a test. If the test is aborted due to a machine fault the software can indicate the possible cause by flashing the red LED, which indicates a fault exists, and by giving a fault code number by flashing the Blue LED.

Flash Codes:

- Blue LED flashes 2 times = control loop failed to control during the pre-acceleration delay stage (start test again, if fails again call Technical Assistance).
- Blue LED flashes 3 times = sensor reading for 'No Smoke' reading too low (call Technical Assistance).
- Blue LED flashes 4 times = sensor reading for 'No Smoke' reading too high. Check pipe work and fan ducts for debris and dirt, (call Technical Assistance).
- Blue LED flashes 5 times = 'No Smoke Detected' during acceleration phase (check sample hose and exhaust for leaks).
- Blue LED Flashes 6 times = the measured incoming DC voltage is too low (check vehicle battery voltage and supply).

**For Technical Assistance please
Call 01926 818181**



Safety First. Be Protected.



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Guarantee

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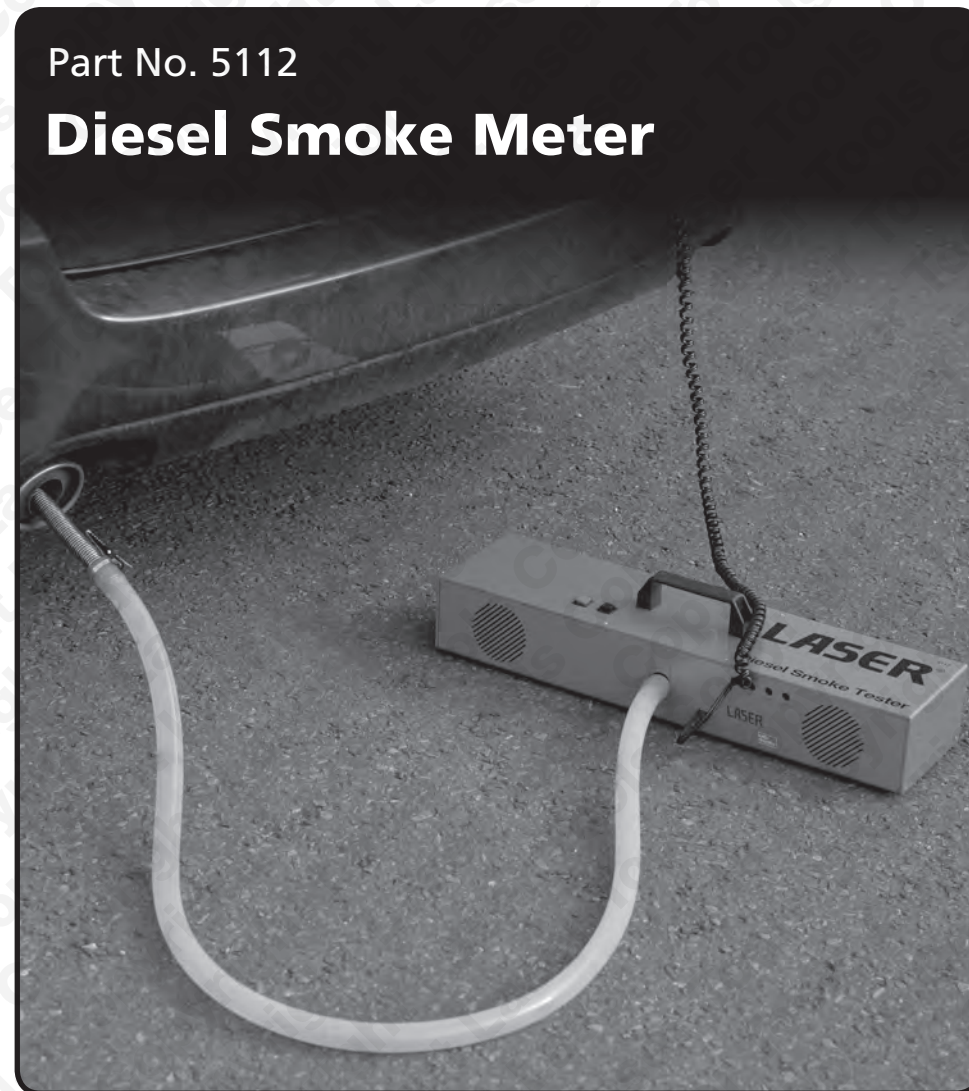
If this product fails through faulty materials or workmanship, contact our service department direct on: **+44 (0) 1926 818186**. Normal wear and tear are excluded as are consumable items and abuse.

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LASER®

Part No. 5112

Diesel Smoke Meter



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Diesel Smoke Meter

The Laser Diesel Smoke Meter (part no: 5112) has been developed to offer a fast and cost effective solution to checking the emissions from a diesel engine exhaust. The technology used to measure the exhaust emissions is the same as that used in current MOT machines; it measures the smoke level of the exhaust gas in the same way and to the same specifications.

It has been developed to allow the professional garage and home mechanic to check the emissions from a diesel engine for service and pre-MOT purposes. The 5112 is not approved for use for the MOT test; it cannot be linked to a PC or the MOT vehicle database.

Suitable for all turbo and non-turbo diesel engines.

SPECIFICATION

Pre-July 1st 2008 Non-Turbocharger Diesel Opacity:

Lower than 2.5km-1 = **PASS** Light ON
Higher than 2.5Km-1 = **FAIL** Light ON

Pre-July 1st 2008 Turbocharged Diesels Opacity:

Lower than 3Km-1 = **PASS** Light ON
Higher than 3Km-1 = **FAIL** Light ON

From and including July 1st 2008 (All) Diesel Opacity:

Lower than 1.5Km-1 = **PASS** Light ON
Higher than 1.5Km-1 = **FAIL** Light ON

Note: Not for use on spark ignition engines (petrol engines).

Preparation

Important: As for any emissions test, there are certain pre-test conditions that must be observed. Failure to comply with these conditions could cause a false test result or even major engine damage.

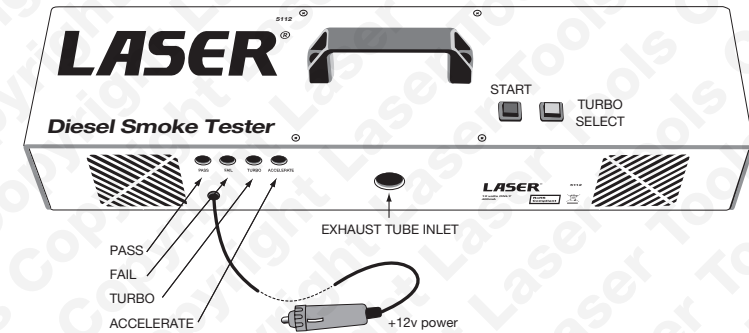
Disclaimer:

The diesel emissions test process requires the engine being tested to be run at full throttle with no load. This means the engine will run at maximum revolutions per minute (RPM). For this reason, The Tool Connection Ltd, its representatives and distributors cannot be held responsible for damage caused due to engine failure during testing.

Pre-Test Checks:

- Mechanical Condition** - as stated above the test requires the engine to be run at full throttle. It is therefore very important that the engine is mechanically sound. Camshaft drive belts are of particular concern, ensure the camshaft drive belt and its idlers are in good serviceable condition. If the belt is due for change it is advised this is done prior to the test.
- Fuel system condition** - check the fuel filters and fuel pipes are in good general condition. For best results ensure the fuel filter is free from air leaks and the presence of water (drain the water separator).
- Air filter and engine breather system** - always ensure the air filter and oil breather system is clean and operating correctly.
- Oil level** - insufficient oil and excessive oil in the sump can both do significant damage to a diesel engine. Insufficient oil both in quality and quantity can cause premature engine failure. Excessive engine oil quantity can cause oil to enter the combustion chambers of the engine via the engine breather and air filter system. This engine oil will be burnt as fuel and could cause the engine to start running on its own oil allowing it to run at un-governed engine speeds and resulting in major engine damage.
- Pre-Test engine temperature** - the engine must be at full operating temperature for the test. The MOT test specification requires the engine oil to be at or above 80° Celsius. This equates to the engine being at full operating temperature. It is recommended the engine be driven (not left to idle) for a minimum of 15 minutes prior to the test.
- Exhaust system** - the exhaust system must be free of leaks for the test to be considered valid.

Basic Summary of 5112 LED functionality:



The four LEDs on the 5112 are used to indicate the machine's system status. Each LED is a different colour as shown below:

- | | | |
|---------------|---|-----------------------------------|
| 1. PASS | = | GREEN |
| 2. FAIL | = | RED |
| 3. TURBO | = | ORANGE |
| | | (‘K’ level selection - see below) |
| 4. ACCELERATE | = | BLUE |

System Ready:

After connecting the 5112 to a 12v DC power supply the 5112 is ready to run a test when the green and blue LEDs flash alternately. In this condition the Turbo threshold can be selected.

This is done by pressing the **Turbo Select (RED)** button:

- Orange Turbo LED off - **Pre-2008 Non turbo vehicle** - default (do not press turbo selection button)
- Orange Turbo LED on - **Pre-2008 Turbo Vehicle** - press turbo selection button once
- Orange Turbo LED flashing - **All Post 2008 vehicles** - press turbo selection button twice

Pressing the **Start** button (BLACK) will start the smoke test.

Smoke Test Sequence:

Care Point: do not connect sample hose to the vehicle till instructed below. From initial switch-on allow the machine to stabilise for approximately one minute. After test allow the machine to run with the sample hose disconnected to allow the 5112 to self clean.

- After connecting the 5112 to a suitable 12v DC supply the system software will boot up. When the GREEN and BLUE LED lights are flashing alternately the ‘K’ level (smoke opacity) can be selected as described above with the **Turbo Select** button.
- Press the **Start** button, the green and blue LEDs should stop flashing and the RED LED will be ON. In this state the 5112 is sampling fresh air and calibrating itself to the no-smoke level.
- After a short period of time the RED LED will start to flash, this indicates to the user to connect the sample pipe to the exhaust.
- Now press the **Start** button, the BLUE LED should now start to flash for 10 seconds indicating the operator should prepare to accelerate the engine to full throttle. When the BLUE LED stops flashing and switches to full ON the operator should accelerate the engine to full throttle.
- The throttle should be held full on till the BLUE LED goes OUT, release throttle.

Results:

GREEN LED ON = **PASS**
RED LED ON = **FAIL**