

# LASER<sup>®</sup>

## OBDII/EOBD Code Reader (00-)

### Instructions



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#### Guarantee



Distributed by The Tool Connection Ltd

Kington Road, Southam, Warwickshire CV47 0DR

T +44 (0) 1926 815000 F +44 (0) 1926 815388

info@toolconnection.co.uk www.toolconnection.co.uk

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.

The can OBDII/EOBD Code Reader is an innovative and affordable solution specially designed for DIYers to get easy and quick access to engine problems on all OBDII compliant vehicles sold worldwide since 2006.

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## For Technical Assistance email us at

[technical@lasertools.co.uk](mailto:technical@lasertools.co.uk)

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# 1. One-Year Limited Warranty

Subject to the conditions of this limited warranty, The Tool Connection Limited (TC) warrants its customer that this product is free of defects in material and workmanship at the time of its original purchase for a subsequent period of one (1) year.

In the event this product fails to operate under normal use, during the warranty period, due to defects in materials and workmanship, TC will, at its sole option, either repair or replace the product in accordance with the terms and conditions stipulated herein.

The Tool Connection Limited  
Kineton Road  
Southam  
Warwickshire  
CV47 0DR

Tel: (0) 1926 815000  
Fac (0) 1926 815888

# 2. Safety Information

We provide safety messages to help prevent personal injury and equipment damage. Below are signal words we used to indicate the hazard level in a condition.

## 2.1 Conventions Used

For your safety, and to prevent damage to the equipment and vehicles, read this manual thoroughly before operating your code reader. The safety messages presented below and throughout this user's manual are reminders to the operator to exercise extreme care when using this device. Always refer to and follow safety messages and test procedures provided by the manufacturer of the vehicle or equipment being tested. Read, understand and follow all safety messages and instructions in this manual.

| No. | Signal Word  | Hazard Level   |
|-----|--|--|
| 1   |  | Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or to bystanders.  |
| 2   |  | Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator or to bystanders. |
| 2   |  | Indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor injury to the operator or to bystanders.  |

## 2.2 Important Safety Instructions

And always use your code reader as described in the user's manual, and follow all safety messages.

**⚠ WARNING** Do not route the test cable in a manner that would interfere with driving controls.

**⚠ WARNING** Do not exceed voltage limits between inputs specified in this user's manual.

**⚠ WARNING** Always wear ANSI approved goggles to protect your eyes from propelled objects as well as hot or caustic liquids.

**⚠ WARNING** Fuel, oil vapors, hot steam, hot toxic exhaust gases, acid, refrigerant and other debris produced by a malfunction engine can cause serious injury or death. Do not use code reader in areas where explosive vapor may collect, such as in below-ground pits, confined areas, or areas that are less than 18 inches (45 cm) above the floor.

**⚠ WARNING** Do not smoke, strike a match, or cause a spark near the vehicle while testing and keep all sparks, heated items and open flames away from the battery and fuel / fuel vapors as they are highly flammable.

**⚠ WARNING** Keep a dry chemical fire extinguisher suitable for gasoline, chemical and electrical fires in work area.

**⚠ WARNING** Always be aware of rotating parts that move at high speed when an engine is running and keep a safe distance from these parts as well as other potentially moving objects to avoid serious injury.

**⚠ WARNING** Do not touch engine components that get very hot when an engine is running to avoid severe burns.

**⚠ WARNING** Block drive wheels before testing with engine running. Put the transmission in park (for automatic transmission) or neutral (for manual transmission). And never leave a running engine unattended.

**⚠ WARNING** Do not wear jewelry or loose fitting clothing when working on engine.

**⚠ WARNING** Make sure to turn off ignition before connecting or disconnecting the code reader.

## 3. Using This Manual

We provide instructions for the usage of your code reader in this manual. Below is a list of conventions we used in the manual.

### Safety Information

See **Safety Information** on page 5.

### Bold Text

Bold emphasis is used in procedures to highlight selectable items such as buttons and menu options.

Example:

Use the **SCROLL** key to select the desired measurement unit.

### Bold-Italic Text

Bold-italic text is used in the procedures to highlight the menus on the code reader screen.

Example:

Use the **SCROLL** key to select **Language** from **System Setup** screen.

### Symbols and Icons

√ Check Note

Additional information about the subject in the preceding paragraph is introduced by a √ Check Note.

Example:

√ The code reader is set to display English menus by default.

- Solid Spot

Operation tips and lists that apply to specific tool are introduced by a solid spot •.

Example:

**System Setup** allows you to:

- Select menu languages.
- Change measurement unit.
- Adjust display contrast.

### IMPORTANT

**IMPORTANT** indicates a situation which, if not avoided, may result in damage to the test equipment or vehicle.

Example:

### IMPORTANT

Do not soak keypad as water might find its way into the code reader.

### NOTE

**NOTE** provides helpful information such as additional explanations, tips, and comments.

Example:

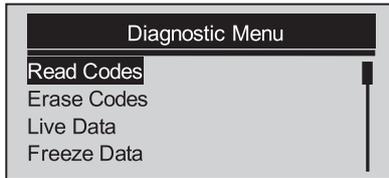
### NOTE

Not all data are supported by all vehicles.

## Screens

Some help messages, information, and data displayed on the code reader are also shown in graphical text boxes. The screens presented are examples only and actual test screens may vary for each vehicle being tested.

Example:



## Arrow Icon

 An arrow icon indicates a procedure.

Example:

 To change menu language:

1. Use the **SCROLL** key to select **Language** from **System Setup** screen.
2. Press the **YES/NO** key to confirm.

# 4. Introduction

**This tool** is specially designed to read/clear codes, read live data, retrieve freeze data and request vehicle information on OBDII/EODB compliant cars, SUVs, light-duty truck and mini-vans sold worldwide since **2000**.

## 4.1 About OBDII/EODB

### What is OBD?

The first generation of On-Board Diagnostics or OBD I was introduced in early 1980's to control engine functions and diagnose engine problems by vehicle manufacturers. As the OBDI lacked standardization of protocols and interface, it allowed different interpretations among vehicle manufacturers.

OBDII, the second generation On-Board Diagnostics, improved in both capability and standardization, is a system developed in mid 1990's by the Society Automotive Engineers (SAE) to standardize automotive electronic diagnosis. EODB is European version of OBDII required in Europe since 2001.

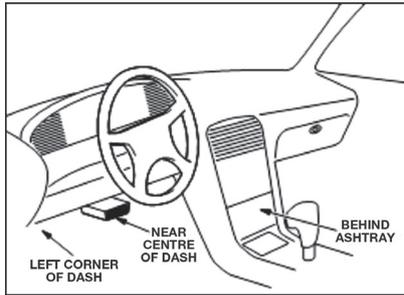
The OBDII standard specifies:

- A generic diagnostic port (Data Link Connector) and its pinout;
- The protocols and the messaging format;
- A standard list of vehicle parameters identifications;
- A standard list of diagnostic trouble codes (DTCs);

## Data Link Connector

The Data Link Connector (DLC) is a standard 16-pin interface located under the dashboard on the driver's side of the passenger compartment. If the DLC is not located under the dashboard as stated, a decal describing its location should be attached to the dashboard in the area where the DLC should have been located.

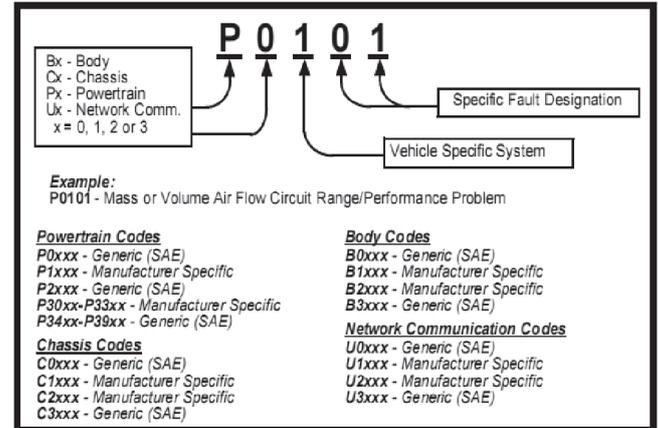
**NOTE** On some Asian and European vehicles the DLC is located behind the "ashtray", which must be removed to access it, or on the far left corner of the dash. If the DLC cannot be found, consult the vehicle's service manual for the location.



## Diagnostic Trouble Codes (DTCs)

Diagnostic Trouble Codes (DTCs) are faults stored by vehicle computers when problems that affect engine performance and emissions are detected. DTCs are used to help identify the cause of a trouble or troubles with a vehicle, and determine the fault location(s).

DTCs consist of a five-digit alphanumeric code. Please see below for the DTCs format and code types.



## 4.2 About the Code Reader

### Code Reader Controls



- A. **OBD II Cable** - provides communication for vehicle DLC.
- B. **LCD Display** – shows menus, test results and operation tips.
- C. **YES/NO Key** – confirms an action or returns to previous screen or level.
- D. **SCROLL Key** - moves selection up or down. Also, press it to enter system setup menu from home screen.
- E. **USB Port** – provides a USB connection for the PC or laptop.
- F. **Rear Decal** – provides serial number of code reader.

**IMPORTANT** Do not use solvents such as alcohol to clean keypad or display. Use a mild nonabrasive detergent and a soft cotton cloth.

**IMPORTANT** Do not soak keypad as water might find its way into the code reader.

### Accessories Included

The first generation of On-Board Diagnostics or OBD I was introduced in early 1980's to control engine functions and diagnose engine problems by vehicle manufacturers. As the OBDI lacked standardization of protocols and interface, it allowed different interpretations among vehicle manufacturers.

| No. | Signal Word   | Hazard Level  |
|-----|---------------|---|
| 1   | User's Manual | Provides operation instructions for the usage of code reader. |
| 2   | USB Cable     | Provides USB communication for updates of software and DTCs.  |

### Specifications

| No. | Signal Word         | Hazard Level  |
|-----|---------------------|---|
| 1   | Display             | Backlit, 128 x 64 pixel display with contrast adjustment. |
| 2   | Working Temperature | 0 to 60° C (32 to 140° F)                                 |
| 3   | Storage Temperature | -20 to 70° C (-4 to 158° F)                               |
| 4   | Power               | 8-18 Volts powered by vehicle battery                     |
| 5   | Dimensions          | 120*75*20mm (4.7*2.96*0.78in)                             |
| 6   | Weight              | 300g  |

## Display Indicators

Below is a list of indicators used to help navigate through menus.

| No. | Signal Word | Hazard Level  |
|-----|-------------|---|
| 1   | \$          | Indicates the control unit number.                          |
| 2   | ⏏           | Indicates more than one screen of information is available. |

## Power

The code reader is powered up by vehicle battery.

- ✓ Refer to **Code Reader Does Not Power Up** in section 7.2 on **page 33** of **Troubleshooting** if there are problems.

▶ To power up the code reader:

1. Locate the diagnostic interface on vehicle.
2. Plug in the code reader's OBDII connector to the DLC.

**NOTE** A plastic DLC cover may be found on some vehicles. Remove the cover before plugging the OBD2 cable.

## System Setup

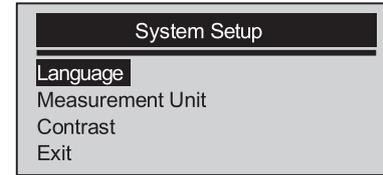
**System Setup** allows you to:

- Select menu languages.
- Change measurement unit.
- Adjust display contrast.

✓ **System Setup** settings remain until change to the existing setups are made.

▶ To do system setup:

1. Press the **SCROLL** key to enter **System Setup** from home screen.



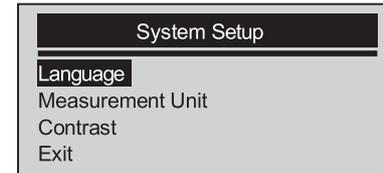
- ✓ Follow on-screen instructions to program the code reader to meet your specific needs.

## Changing Language

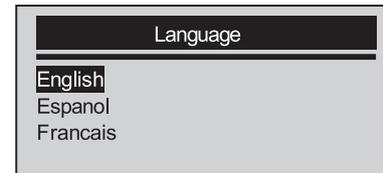
- ✓ The code reader is set to display English menus by default.

▶ To change menu language:

1. Use the **SCROLL** key to pick Language from **System Setup** screen.
2. Press the **YES/NO** key to confirm.



3. Use the **SCROLL** key to select desired language.



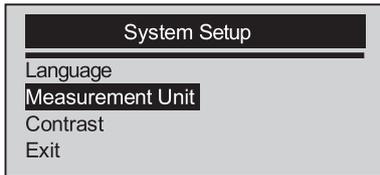
4. Press the **YES/NO** key to save language setting and return.

## Changing Measurement Unit

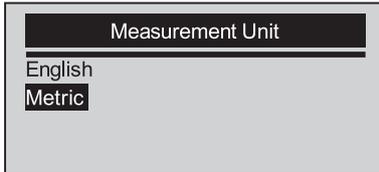
- √ Metric is the default measurement unit.

To change measurement unit:

- ▶ 1. Use the **SCROLL** key to select **Measurement Unit** from **System Setup** screen.
2. Press the **YES/NO** key to confirm.



3. Use the **SCROLL** key to select desired measurement unit.



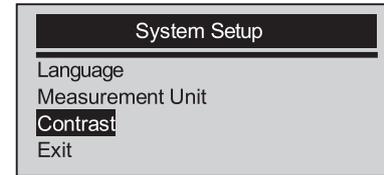
4. Press the **YES/NO** key to save measurement setting and return.

## Adjusting Display Contrast

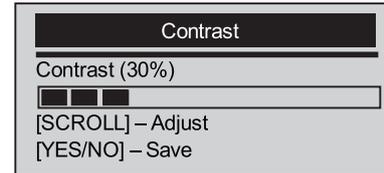
To adjust display contrast:

- ▶ 1. Use the **SCROLL** key to select **Contrast** from **System Setup** screen.

2. Press the **YES/NO** key to confirm.



3. Use the **SCROLL** key to adjust contrast.

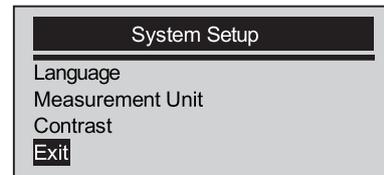


4. Press the **YES/NO** key to save contrast setting and return.

## Exiting System Setup

To quit system setup:

- ▶ 1. Use the **SCROLL** key to move Exit from **System Setup** screen.
2. Press the **YES/NO** key to confirm and exit.



## 5. OBDII/EOBD Diagnosis

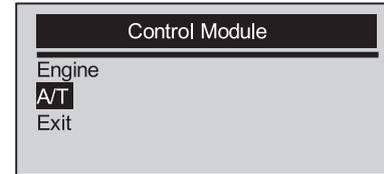
**Diagnostic Menu** allows you to:

- Read DTCs.
  - Clear DTCs.
  - View live datastream.
  - View freeze data.
  - Retrieve vehicle information.
- ✓ The code reader detects the communication protocol when it is connected to the vehicle and uses the protocol throughout the testing till another vehicle is diagnosed.
- ✓ If the code reader fails to communicate with the vehicle a "Communication Error!" message displays. Make sure the OBDII connector is securely attached, and the ignition key is on. Turn vehicle key to off for 10 seconds, then on. If problem still exists, refer to "**Error Messages**" on **page 33** of Troubleshooting.
- ✓ When the code reader links to vehicle, it checks the status of I/M Monitors, and gives a summary report on the display as illustrated below.

| System Status |   |
|---------------|---|
| Code Found    | 3 |
| Monitors N/A  | 4 |
| Monitors OK   | 4 |
| Monitors INC  | 3 |

- ✓ If vehicle is equipped with more than one computer module (for example a powertrain control module [PCM] and a transmission control module [TCM]), the code reader identifies them by their identification names (ID) assigned by manufacturer (i.e. Engine or A/T).
- ✓ Use the SCROLL key to select a control module where the data may be retrieved when more than one module is detected.

- ✓ Use the **SCROLL** key to select a control module where the data may be retrieved when more than one module is detected.



- ✓ To view information of other control unit quit current test and select another module.

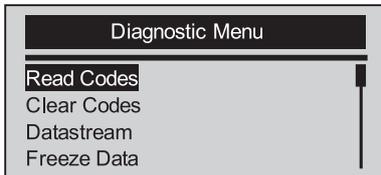
## 5.1 Reading DTCs

The Read Codes function is used to read DTCs (stored codes), which are used to help identify the cause of a trouble or troubles with a vehicle, and pending codes from the vehicle's control modules.

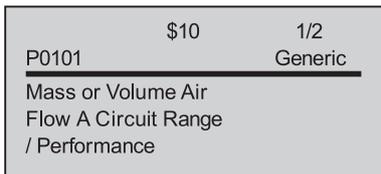
- ✓ When emission-related or drivability fault occurs the control module illuminates the malfunction indicator lamp (MIL).
- ✓ Pending Codes are also referred to as continuous monitor or maturing codes that indicate intermittent faults. If the fault does not occur within a certain number of drive cycles (depending on vehicle), the code clears from memory. If fault occurs a specific number of times, the code matures into a DTC and the MIL illuminates or blinks.
- ✓ This function can be performed with KOEO or KOER.

To read codes from vehicle control modules:

- ▶ 1. Press the **YES/NO** key to start diagnosis from home screen.
2. Use the **SCROLL** key to select **Read Codes** from **Diagnostic Menu** screen.



3. Press the **YES/NO** key to confirm.
4. View DTCs and their definitions.



- ✓ If no DTCs are present a message stating “No (Pending) Codes Found” is displayed.
  - ✓ If any manufacturer specific or enhanced codes detected, a “Manufacturer specific codes are found! Press any key to select vehicle make!” message displays prompting you to select vehicle make before viewing DTC(s).
  - ✓ If manufacturer of the vehicle being tested is not listed, select **Other**.
5. Press the **YES/NO** key to return to **Diagnostic Menu** screen.

The **Clear Codes** function is used to delete DTCs and I/M Readiness data from vehicle’s control module(s). It may also erase freeze data, and set monitors to incomplete or not ready.

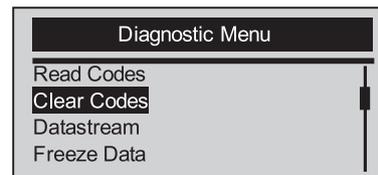
## 5.2 Clearing DTCs

The **Clear Codes** function is used to delete DTCs and I/M Readiness data from vehicle’s control module(s). It may also erase freeze data, and set monitors to incomplete or not ready.

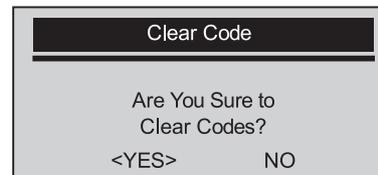
- ✓ Perform Clear Codes function only after systems have been checked completely.
- ✓ After servicing the vehicle, erase stored DTCs and verify no codes have been reset. If a DTC returns, problem has not been fixed or other faults are present.
- ✓ Depending on which monitor sets a code the vehicle may need to be driven and the monitor ran before concluding that the fault is repaired.
- ✓ This function is performed with KOEO. Do not start the engine.

To erase codes from vehicle control modules:

1. Use the **SCROLL** key to select **Clear Codes** from **Diagnostic Menu** screen.



2. Press the YES/NO key to confirm.
3. If codes and diagnostic results are to be cleared, use the **SCROLL** key to select **YES** and press the **YES/NO** key.



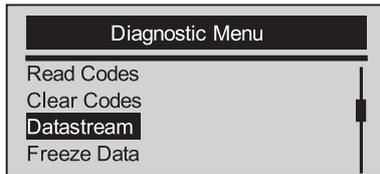
- √ If codes and test data not to be deleted, select **NO**, and a “Command Cancelled!” message displays prompting to press any key to return to **Diagnostic Menu**.
- 4. Wait a few seconds until a “Codes Cleared!” message shows indicating codes are cleared successfully.
- √ If the code reader fails to clear the codes, a “Clear Error! Turn Key on with Engine off!” message displays.
- 5. Wait a few seconds or press any key to return to **Diagnostic Menu**.

## 5.3 Viewing Datastream

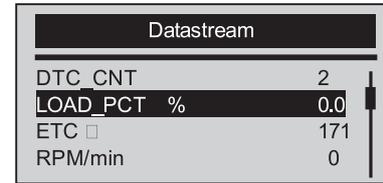
The **Datastream** function allows real time viewing of the vehicle’s electronic control unit’s PID data, including sensor data, operation of switches, solenoids and relays.

To view live datastream:

- ▶ 1. Use the **SCROLL** key to select **Datastream** from **Diagnostic Menu** screen.



- 2. Press the **YES/NO** key to confirm.
- 3. View PIDs on code reader. Use the **SCROLL** key when more than one screen of information is retrieved.



- √ Some vehicle may not support this function, and a “Not Support This Function!” message display.
- 4. Press the **YES/NO** key to return.

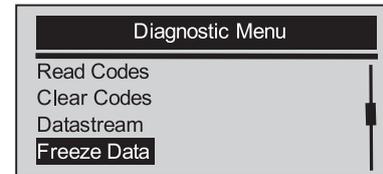
## 5.4 Viewing Freeze Data

The Freeze Data function is used to view freeze frame data, a snapshot of vehicle operating conditions recorded by the on-board computer at the time of an emission-related fault.

- √ If codes were cleared, freeze data may not be stored in vehicle memory depending on vehicle.

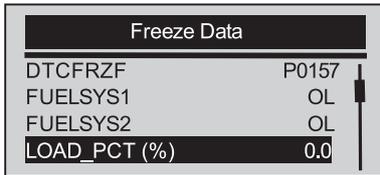
To view freeze frame data:

- ▶ 1. Use the **SCROLL** key to select **Freeze Data** from **Diagnostic Menu** screen.



- 2. Press the **YES/NO** key to confirm.

- View freeze frame data on screen. If more than one screen of information is retrieved, use the SCROLL key to view additional data.



- ✓ If no freeze frame detected, a “No Freeze Data Found!” message displays.
  - ✓ Some vehicle may not support this function, and a “Not Support This Function!” message display.
- Press the **YES/NO** key to return to **Diagnostic Menu**.

## 5.5 Reading I/M Readiness Status Data

The I/M Readiness function is used to view a snapshot of the operations for the emission system on OBDII/EOBD vehicles.

- ✓ I/M Readiness is a useful function used to check if all monitors are OK or N/A.
- ✓ The vehicle’s computer performs tests on the emission system during normal driving conditions. After a specific amount of drive time (each monitor has specific driving conditions and time required), the computer’s monitors decide if the vehicles emission system is working correctly. When the monitor’s status is:
  - OK - vehicle was driven enough to complete the monitor.
  - INC (Incomplete) - vehicle was not driven enough to complete the monitor.
  - N/A (Not Applicable) - vehicle does not support that monitor.
- ✓ **I/M Readiness** function is performed with the KOER or KOEO.

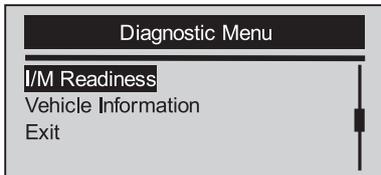
- ✓ There are two types of I/M Readiness tests:
  - Since DTCs Cleared - shows status of the monitors since the DTCs were last cleared.
  - This Drive Cycle - shows status of monitors since the start of the current drive cycle.
- ✓ Below is a list of abbreviations and names of OBD II monitors supported by the code reader.

| No. | Signal Word     | Hazard Level                             |
|-----|-----------------|--|
| 1   | Misfire Monitor | Misfire Monitor                          |
| 2   | Fuel System Mon | Fuel System Monitor                      |
| 3   | Comp.           | Comprehensive Components Monitor         |
| 4   | Catalyst Mon    | Catalyst Monitor                         |
| 5   | Htd Catalyst    | Heated Catalyst Monitor                  |
| 6   | Evap System     | Evaporative System Monitor               |
| 7   | Sec Air System  | Secondary Air System Monitor             |
| 8   | A/C Refrig Mon  | Air Conditioning Refrigerant Monitor     |
| 9   | Oxygen Sens     | Oxygen Sensor Monitor                    |
| 10  | Oxygen Sens Htr | Oxygen Sensor Heater Monitor             |
| 11  | EGR System Mon  | Exhaust Gas Recirculation System Monitor |

**NOTE** Not all monitors are supported by all vehicles.

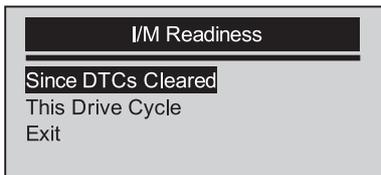
To retrieving I/M Readiness Status data:

- Use the **SCROLL** key to select **I/M Readiness** from **Diagnostic Menu** screen.



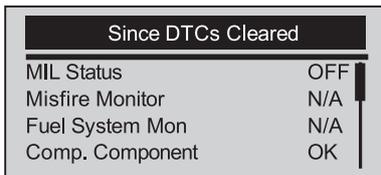
2. Press the **YES/NO** key to confirm.

✓ If vehicle supports both types of monitors, please following screen:

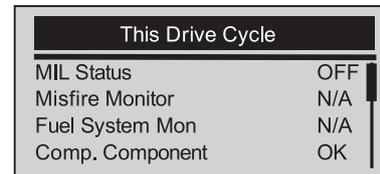


✓ Use the **SCROLL** key to select a monitor type and press the **YES/NO** key to confirm.

3. Depending on readiness test, one of these 2 screens will be present.



Or



✓ If more than one screen of information is retrieved, use the **SCROLL** key to view additional data.

✓ Some vehicle may not support this function, and a "Not Support This Function!" message display.

4. Press the **YES/NO** key to return to **Diagnostic Menu**.

## 5.6 Reading Vehicle Information

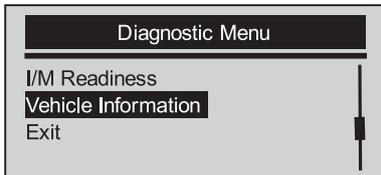
The Vehicle Information function is used to request the vehicle's VIN number, calibration ID(s) which identifies software version in vehicle control module(s), calibration verification numbers (CVN(s)) and in-use performance tracking on model year 2000 and newer OBD II compliant vehicles.

✓ CVNs are calculated values required by OBD II regulations. They are reported to check if emission-related calibrations have been changed. Multiple CVNs may be reported for a control module. It may take several minutes to do the CVN calculation.

✓ In-use performance tracking tracks performance of key readiness monitors.

To request vehicle information:

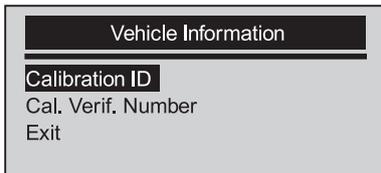
1. Use the **SCROLL** key to select **Vehicle Information** from **Diagnostic Menu** screen.



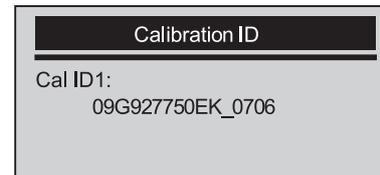
2. Press the **YES/NO** key to confirm.
3. Wait a few seconds or press **YES/NO** key to continue.



- √ Some vehicle may not support this function, and a "Not Support This Function!" message display.
4. Use the **SCROLL** key to select an available item from **Vehicle Information** screen.



5. Press the **YES/NO** key to view retrieved information



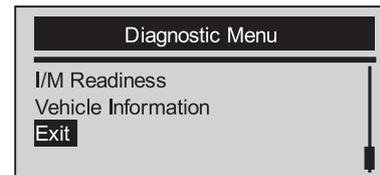
6. Press the **YES/NO** key return.

**NOTE** Not all data is supported by all vehicles.

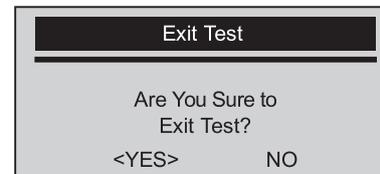
## 5.7 Exiting Test

To exit OBDII test:

1. Use the **SCROLL** key to select Exit from **Diagnostic Menu** screen.



2. Press the **YES/NO** key to confirm.
3. To quit test, use the **SCROLL** key to select **YES** and press **YES/NO** key.



- √ If not to exit, use the **SCROLL** key the select **NO** and press the **YES/NO** key.

## 6. Updating the Code Reader

Laser Fault Code Reader is able to be updated via the internet.

- ✓ The update consists of two parts: program upgrade and DTC upgrade.
- ✓ To update the code reader, you need the following tools:
  - Code Reader
  - Access to Tool [www.lasertools.co.uk](http://www.lasertools.co.uk)
  - PC or Laptop with USB Ports and Internet Explorer with
  - Operation System: Win98/NT, Win ME, Win2000, Win XP, VISTA and Windows 7.
  - CPU: Intel PIII or better
  - RAM: 64MB or better
  - Hard Disk Space: 30MB or better
  - Display: 800\*600 pixel, 16 byte true color display or better
  - Internet Explorer 4.0 or newer
  - USB Cable

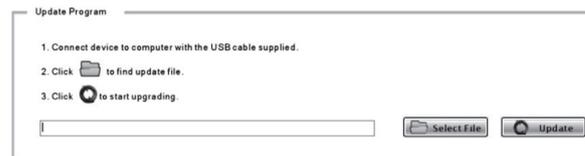
**IMPORTANT** Do not disconnect the code reader from computer, or power off the computer during the process of updating.

To update program:

- ▶ 1. Download the update from our site [www.lasertools.co.uk/Products/5089](http://www.lasertools.co.uk/Products/5089) by selecting Home>Updates>5089 and save the applications and files in computer disk.
2. Unzip the update tool file. Follow instructions on computer screen to install the tool and driver.



3. Double click the desktop icon to launch the application and then **select 5089**
4. **Connect 5089** to computer with the USB cable provided.
5. Use  to locate update file downloaded.

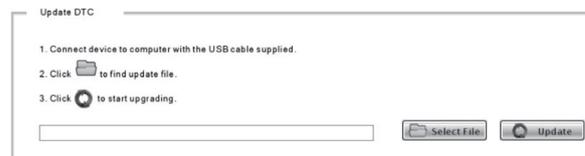


6. Click  to start updating.

To update DTCs:

- ✓ It may takes several minutes to update the DTCs.

- ▶ 1. Use  to locate update file downloaded.



2. Click  to start updating.

# 7. Troubleshooting

## 7.1 Error Message

When a “Communication Error!” message displays, please check the following:

- Verify ignition key is in the ON position.
- Make sure the code reader is correctly attached to vehicle's Data Link Connector (DLC).
- Check DLC for cracked or recessed pins, or for any substance that could prevent a good electrical connection.
- Check OBDII connector for bent or broken pins.
- Make sure the vehicle is OBDII/EOBD compliant.
- Turn the vehicle key to OFF for 10 secs and then back to ON.
- Verify battery voltage is at least 8.0V.
- Verify that the control module is not defective.

## 7.2 Code Reader Does Not Power Up

If Laser 5089 will not power up, communicate with vehicle's control module, or functions incorrectly in any other way, do the following:

- Check DLC for broken or bent pins and clean the pins if need be.
  - Make sure it is correctly connected to vehicle's DLC.
  - Verify battery voltage is at least 8.0V
1. Remove battery cover with a screwdriver.
  2. Remove battery and discard according to your local waste regulations.
  3. Install a new 9V alkaline battery.
  4. Reinstall the battery cover with the screwdriver.

