OS601 OBD II SCAN TOOL

-User Manual-
# INDEX

1. Safety Precautions and Warnings .................................................. 2

2. General Information ......................................................................... 3
   2.1 On-Board Diagnostics II (OBD II) ................................................. 3
   2.2 Diagnostic Trouble Codes (DTCs) .................................................. 4
   2.3 Location of the Data Link Connector (DLC) ................................. 6
   2.4 OBD II Readiness Monitors ......................................................... 6
   2.5 OBD II Monitor Readiness Statuses ........................................... 8
   2.6 OBD II Definitions ....................................................................... 10

3. How to Use ....................................................................................... 12
   3.1 Product Overview ........................................................................ 13
   3.2 Package Content .......................................................................... 14
   3.3 Specifications .............................................................................. 14
   3.4 Troubleshooting ........................................................................... 14

4. Software Functions ........................................................................... 15
   4.1 System Configuration ................................................................. 16
   4.2 DTC LOOKUP ............................................................................. 18

5. OBD II Diagnostics ........................................................................... 19
   5.1 Read Trouble Code ...................................................................... 20
   5.2 Erase Trouble Codes ................................................................. 22
   5.3 Read DataStream ......................................................................... 24
   5.4 Component test ........................................................................... 26
   5.5 Freeze Frame Data ...................................................................... 27
   5.6 O2 Sensor Monitoring Test .......................................................... 28
   5.7 Vehicle Information .................................................................... 30
1. Safety Precautions and Warnings

To prevent personal injury or damage to vehicles or the scan tool, please read the following safety precautions carefully before using the scan tool on your vehicle. Keep this manual in a safe place for future reference.

- Always perform testing in a safe environment.
- Wear safety eye protection that meets ANSI standards.
- Keep clothes, hair, hands, tools, test equipment, etc., away from all moving or heated engine parts.
- Operate the vehicle in a well-ventilated area.
- Put blocks in front of the drive wheels and never leave the vehicle unattended while performing testing.
- Be extremely cautious while working around the ignition coil, distributor cap, ignition wires, and spark plugs. Since these components can create hazardous voltages when the engine is running.
- Neutral (for manual transmission) and make sure the sparking brake is engaged.
- Keep a fire extinguisher suitable for gasoline/chemical/electrical fires nearby.
• Don’t connect or disconnect any test equipment while the ignition is on or the engine is running.

• Keep the scan tool dry, clean, free from oil, water or grease. Use a clean cloth with mild detergent to clean the outside of the scan tool, if necessary.

2. General Information

2.1 On-Board Diagnostics II (OBD II)

The first generation of On-Board Diagnostics (called OBD I) was developed by the California Air Resources Board (ARB) and implemented in 1988 to monitor some of the emission control components on vehicles. As technology evolved and the desire to improve the On-Board Diagnostics system increased, a new generation of On-Broad Diagnostic system was developed. This second generation of On-Broad Diagnostic regulation is called OBD II.

The OBD II system was designed to monitor emission control systems and key engine components by performing either continuous or periodic tests of specific components.
and vehicle conditions. When a problem is detected, the OBD II system turns on the Malfunction Indicator Light (MIL) on the vehicle instrument panel to alert the driver typically by the phrase of “Check Engine” or “Service Engine Soon”. The system will also store important information about the detected malfunction so that a technician can accurately find and fix the problem. Here follows three valuable information:

(1) Whether the Malfunction Indicator Light (MIL) is commanded “on” or “off”.

(2) Which, if any, Diagnostic Trouble Codes (DTCs) are stored.

(3) Readiness Monitor status.

2.2 Diagnostic Trouble Codes (DTCs)
OBD II Diagnostic Trouble Codes are codes that are stored by the on-board computer diagnostic system in response to a problem found in the vehicle. These codes identify a particular problem area and are intended to provide you with a guide as to where a fault might be occurring within a vehicle. OBD II Diagnostic Trouble Codes consist of a five-digit alphanumeric code. The first character, a letter, identifies which control system sets the code.
The other four characters, all numbers, provide additional information on where the DTC originated and the operating conditions that caused it to set. Here below is an example to illustrate the structure of the digits:
2.3 Location of the Data Link Connector (DLC)
The DLC (Data Link Connector or Diagnostic Link Connector) is the standardized 16-cavity connector where diagnostic scan tools interface is 12 inches from the center of instrument panel (dash), under or around the driver’s side for most vehicles. If Data Link Connector is not located under dashboard, a label should be there telling location. For some Asian and European vehicles, the DLC is located behind the ashtray and the ashtray must be removed to access the connector, if the DLC cannot be found, refer to the vehicle’s service manual for the location.

2.4 OBD II Readiness Monitors
An important part of a vehicle’s OBDII system the Readiness Monitors, which are indicators used to find out if all of the emissions components have been evaluated by the OBD II system. They are running periodic tests on specific systems and components to ensure that they are performing within allowable limits.

Currently, there are eleven OBD II Readiness Monitors (or/ I/M Monitors) defined by the U.S. Environmental Protection Agency (EPA). Not all monitors are supported by all vehicles and exact number of monitors in any vehicle depends on the motor vehicle manufacturer’s emissions control strategy.

Continuous Monitors – Some of the vehicle components or systems are continuously tested by the vehicle’s OBD II system, while others are tested only under specific vehicle operating conditions. The continuously monitored components listed below are always ready:

1. Misfire
2. Fuel System
3. Comprehensive Components (CCM)

Once the vehicle is running the OBD II system, it is continuously...
checking the above components, monitoring key engine sensors, watching for engine misfire, and monitoring fuel demands.

Non-Continuous Monitors – Unlike the continuous monitors, many emissions and engine system components require the vehicle to be operated under specific conditions before the monitor is ready. These monitors are termed non-continuous monitors and are listed below:

(1) EGR System
(2) O2 Sensors
(3) Catalyst
(4) Evaporative System
(5) O2 Sensor Heater
(6) Secondary Air
(7) Heated Catalyst
(8) A/C System

2.5 OBD II Monitor Readiness Statuses

OBD II systems must indicate whether or not the PCM’s monitor
system has completed testing on each component. Components that have been tested will be reported as “Ready” or “Complete”, meaning they have been tested by the OBD II system. The purpose of recording readiness states is to allow users to determine if vehicle’s OBD II system has tested all the components and systems.

The Power Train Control Module (PCM) sets a monitor to “Ready” or “Complete”, it will remain in this state. A number of factors, including erasing of diagnostic trouble codes (DTCs) with a scan tool or a disconnected battery, can result in Readiness Monitors being set to “Not Ready”. Since the 3 continuous monitors are constantly evaluating, they will be reported as “Ready” all of the time. If testing of a particular supported non-continuous monitor has not been completed, the monitor status will be reported as “Not Complete” or “Not Ready.”

To make OBD monitor system be ready, the vehicle should be driven under a variety of normal operating conditions. These operating conditions may include a mix of highway driving and stop and go, city type driving, and at least one overnight-off period. For specific information on getting your vehicle’s OBD
monitor system ready, please consult your vehicle owner’s manual.

2.6 OBD II Definitions

Power Train Control Module (PCM) -- OBD II terminology for the on-board computer that controls engine and drive train.

Malfunction Indicator Light (MIL) -- Malfunction Indicator Light (Service Engine Soon, Check Engine) is a term used for the light on the instrument panel. It is to alert the driver or the repair technician that there is a problem with one or more of vehicle's systems and may cause emissions to exceed federal standards. If the MIL illuminates with a steady light, it indicates that a problem has been detected and the vehicle should be serviced as soon as possible. Under certain conditions, the dashboard light will blink or flash. This indicates a severe problem and flashing is intended to discourage vehicle operation. The vehicle onboard diagnostic system cannot turn the MIL off until necessary repairs are complete or the condition no longer exists.

DTCs - Diagnostic Trouble Codes (DTCs) identify which section of the emission control system has malfunctioned.
Enabling Criteria (also called Enabling Conditions) - Are the vehicle-specific events or conditions that must occur within the engine before the various monitors will set or run. Some monitors require the vehicle to follow a prescribed “drive cycle” routine as part of the enabling criteria. Drive cycles vary among vehicles and for each monitor in any particular vehicle.

OBD II Drive Cycle - A specific mode of vehicle operation that provides conditions required to set all the readiness monitors applicable to the vehicle to the “Ready” condition. The purpose of completing an OBD II drive cycle is to force the vehicle to run its on-board diagnosis. Some forms of a drive cycle need to be performed after DTCs have been erased from the PCM’s memory or after the battery has been disconnected. Running through a vehicle’s complete drive cycle will set the readiness monitors so that future faults can be detected. Drive cycles vary depending on the vehicle and the monitor that needs to be reset. For vehicle specific drive cycle, consult the vehicle’s user manual.

Freeze Frame Data - When an emissions related fault occurs, the
OBD II system not only sets a code but also records a snapshot of the vehicle operating parameters to help identifying the problem. This set of values is referred to as Freeze Frame Data and may include important engine parameters such as engine RPM, vehicle speed, air flow, engine load, fuel pressure, fuel trim value, engine coolant temperature, ignition timing advance, or closed loop status.

3. How to Use
3.1 Product Overview

DLC Cable: Used to connect the scan tool to the vehicle.

LCD Screen: Shows test results.

Keyboard: Keys include [▲], [▼], [◀], [▶], [ ], [ ] and [HELP].

Mimi USB Port: Mini B connector (5-pin), used to connect scan tool with PC.
3.2 Package Content

1 × Scan Tool
1 × User’s Guide

3.3 Specifications

Display: 320×240p colorful LCD with contrast adjustment
Operation Temperature: -20°C-75°C
Storage Temperature: -40°C -120°C
Input Power: 8V-24V
Dimensions: 125×77×26mm (L×W×H)
Net Weight: 200g
Gross Weight: 250g

3.4 Troubleshooting

- Vehicle Linking Error

A communication error occurs if the scan tool fails to communicate with the vehicle’s ECU (Engine Control Unit). You need to do the following to check up:

(A) Verify that the ignition is ON.
(B) Check if the scan tool’s OBD II connector is securely connected to the vehicle’s DLC.
(C) Verify that your vehicle is OBD II compliant.
(D) Turn the ignition off and wait for about 10 seconds.
(E) Turn the ignition on and continue the testing.
(F) Verify that the control module is not defective.

- Scan Tool Does Not Power Up

If the scan tool does not power up or operates incorrectly, you need to do the following to check up:

(A) Check if the scan tool’s OBD II connector is securely connected to the vehicle’s DLC.
(B) Check if the DLC pins are bent or broken. Clean the DLC pins if necessary.
(C) Check the vehicle’s battery to make sure its power level exceeds 8V.

4. Software Functions

*Note: Don’t connect or disconnect any test equipment when ignition is on or engine is running.*

(1) Turn the ignition off.
(2) Locate the vehicle’s 16-pin Data Link Connector (DLC).
(3) Plug the scan tool cable into the vehicle's DLC, then the scan
tool will be lighted as shown below.

(4) Turn the ignition on. Engine will stop running.

(5) Click any key to enter [MENU].

![MENU interface]

Press [▲] and [▼] to select in [MENU]. Press [enter] to confirm selection.

### 4.1 System Configuration

(1) Language Settings: Select [SYSTEM CONFIGURATION] and press [enter]. The interface will be shown as below:

![Language selection interface]

Press [▲] and [▼] to select different languages, and press [enter] to confirm.
(2) System Information: Select [SYSTEM INFORMATION] in [MENU] and press [\[\]]. The screen will display the interface as shown below:

```
INFORMATION

Serial Number: C20000000502
Hardware ver: V1.1
Software: OBD
Software ver: V4.5
SW date: 2017-11-14
```

Press [\[\]] or [\[\]] to return the [MENU].

(3) Turn On/Off the Beeper: Choose [BEEPER] and press [\[\]].
the screen will display the interface as shown below:

```
MENU

OPEN
CLOSE
```

Press [\[\]] and [\[\]] to select, and press [\[\]] to confirm.
(4) Converting Measuring Units: Choose [UNIT OF MEASURE] and press [ ], the screen will display the interface as shown below:

![Menu Interface](image)

Press [▲] and [▼] to select, and press [↓] to confirm.

4.2 DTC LOOKUP

Select [DAIGNOSE REVIEW] in [MENU] and press [ ]. The screen will display the interface as shown below:

![DTC Lookup Interface](image)

Enter the DTC number.

Press [▲] and [▼] to change the DTC number.
Press [▶] and [◀] to Select.

Press [●] to confirm, it will show the DTC description. As shown below:

Press [●] or [◄] to return the [MENU].

5. OBD II Diagnostics

Select [DIAGNOSE] in [MENU] and press [●]. The screen will display a sequence of messages exhibiting the OBDII protocols until the vehicle protocol is detected.

If the scan tool fails to communicate with the vehicle’s ECU, an “ERROR” message will pop up on the display.

COMMUNICATION ERROR!

In this case, please make sure:

1. Is system equipped?

2. Is cable securely connected?
Maybe you can turn off the key, then turn on the key, and try again.

When the scan tool communicates with the vehicle, the screen will display the [DIAGNOSTIC MENU] as shown:

<table>
<thead>
<tr>
<th>MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read Trouble Code</td>
</tr>
<tr>
<td>Erase Trouble Code</td>
</tr>
<tr>
<td>Read Datastream</td>
</tr>
<tr>
<td>I/M Readiness Status</td>
</tr>
<tr>
<td>Freeze Frame Data</td>
</tr>
<tr>
<td>Component test</td>
</tr>
<tr>
<td>OK</td>
</tr>
</tbody>
</table>

Press [▲] and [▼] to select, [◀] and [▶] to turn pages, and [←] to confirm.

5.1 Read Trouble Code

- Reading Codes can be done with the key on engine off (KOEO) or with the key on engine running (KOER).
- Stored codes are also known as “hard codes” or “permanent codes”. These codes cause the control module to illuminate the malfunction indicator lamp (MIL) when emission-related fault occurs.
- Pending Codes are also referred to as “maturing codes” or
“continuous monitor codes”. They indicate problems that the control module has detected during the current or last driving cycle but are not considered serious yet. Pending Codes will not turn on the malfunction indicator lamp (MIL). If the fault does not occur within a certain number of warm-up cycles, the code clears from memory.

Select [Read Trouble Code] and press [●] in [DIAGNOSTIC MENU]. If there are some codes, the screen will display the codes as show below:

```
<table>
<thead>
<tr>
<th>MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read Current Code</td>
</tr>
<tr>
<td>Read Pending Code</td>
</tr>
<tr>
<td>Read Permanent Code</td>
</tr>
</tbody>
</table>
```

According to the above figure to select different items by pressing [▲] and [▼], press [●] to confirm.
Press [←] or [⇔] to return to [DIAGNOSTIC MENU].

View DTCs and their definitions on screen.

- If there are no Diagnostic Trouble Codes present, “No Trouble Code” will be displayed. Wait a few seconds or press any key to return to [DIAGNOSTIC MENU].
- The control module number, sequence of the DTCs, total number of codes detected and type of codes (Generic or Manufacturer specific) will be observed on the upper right of the display.

**5.2 Erase Trouble Codes**

Note: Erasing Diagnostic Trouble Codes may allow the scan tool to delete not only the codes from the vehicle’s on-board computer, but also “Freeze Frame” data and manufacturer specific enhanced data. Further, the I/M Readiness Monitor Status for all vehicle
monitors is reset to “Not Ready” or “Not Complete” status. Do not erase the codes before the system has been checked completely.

This function is performed with key on engine off (KOEO). Do not start the engine.

Select [Erase Trouble Code] and press [↲] in [DIAGNOSTIC MENU]. The screen will display the interface as shown below:

```
 MESSAGE

 fault codes is erased.

 1/1 BACK
```

Press [↲] or [↤] to return to the [DIAGNOSTIC MENU]

Notes:

(1) Before performing this function. Make sure to retrieve and record the trouble codes.

(2) After clearing, you should retrieve trouble codes once again or turn ignition on and retrieve codes again. If there are still
some trouble codes for hard troubles, please find the reason first and then solve the problem.

5.3 Read DataStream

The Read DataStream function allows viewing live or real-time PID data of vehicle’s computer module.

Press [▲] and [▼] to select [Read DataStream] in [DIAGNOSTIC MENU] and press [←] to confirm. The screen will display the interface as shown below.

![Menu Interface]

Press [▲] and [▼] to select, [◀] and [▶] to turn pages, and press [←] to confirm.

Notes:

You can select show all DataStream or only show the DataStream which was selected by you.
Select [Display All DataStream], and Press[←] to enter DataStream data mode, the screen will display the interface as shown below:

![Data Mode](image)

If [GRAPH] appears on the screen, Press [→] to enter graph mode. Press [<<] to return [DIAGNOSTIC MENU]. The screen will display the interface as below:

![Graph Mode](image)

Press [←] to return data model. Press [<<] to return to [DIAGNOSTIC MENU].
5.4 Component test
The Component Test function allows initiating a leak test for the vehicle's EVAP system. The scan tool itself does not perform the leak test, but commands the vehicle's on-board computer to start the test. Different vehicle manufacturers might have different criteria and methods for stopping the test once it has been started. Before starting the Component Test, refer to the vehicle service manual for instructions to stop the test.

Select [Component Test] in the [DIAGNOSTIC MENU] and press [ ] to enter the activation function.

If the ECU support the function, the screen will show as below:

![Image](image_url)

Press [ ] to confirm selection, the screen will display the relative information about EVAP system. Some vehicles manufacturers do not allow external devices to control vehicles system. If your car supports this function. It may display
as below:

5.5 Freeze Frame Data

When an emission-related fault occurs, certain vehicle conditions are recorded by the on-board computer. This information is freeze frame data which is a snapshot of the operating conditions at the time of an emission-related fault.

Select [Freeze Frame Data] in the [DIAGNOSTIC MENU] and press [ ], the screen will display the interface as shown below:
5.6 O2 Sensor Monitoring Test

- OBD II regulations set by SAE require relevant vehicles monitor and test the oxygen (O2) sensors to identify problems related to fuel efficiency and vehicle emissions. These tests are not on-demand tests and they are done automatically when engine operating conditions are within specified limits. These test results are saved in the on-board computer's memory.
- The O2 Monitor Test function allows retrieval and viewing of O2 sensor monitor test results for the most recently performed tests from the vehicle's on-board computer.
- The O2 Monitor Test function is not supported by vehicles which communicate using a controller area network (CAN). For O2 Monitor Test results of CAN-equipped vehicles, see chapter “On-Board Mon. Test”.

Press [▲] and [▼] to select, [◀] and [▶] to turn pages. Press [ _) to return and press [a] to confirm.
Select [O2 Sensor Monitoring Test] in [DIAGNOSTIC MENU], and press [◄]. The screen will display as shown below:

![Menu Screen]

Press [▲] and [▼] to select, [◄] and [►] to turn pages.

Press [◄] to return and press [כן] to confirm.

Notes:

If the vehicle does not support the mode, an advisory message will be displayed on the screen.

View test results of select O2 sensor:

![Test Results Screen]

Press [▲] and [▼] to...
5.7 Vehicle Information

The Vehicle Info. function enables retrieval of Vehicle Identification No. (VIN), Calibration ID(s), Calibration Verification Nos. (CVNs) and In-Use Performance tracking on 2000 and newer vehicles that support Mode 9.

Select [Vehicle Information] in the [DIAGNOSTIC MENU] and Press [▼]. The screen will display as shown below:

```
MESSAGE

VIN: L23948AH98S973538
CALID: L339EH150L3V5050
CVN: F63F46B4
```

Press [▼] to return to data model. Press [◀] to return to [DIAGNOSTIC MENU].