OBDII/EOBD auto scanner

User manual

2.8" Color Auto scanner
Multilingual

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1. INTRODUCTION

The CReader VI is a game changer in the world of portable Automotive Diagnostics. Is it a code scanner, or is it a scan tool? The CReader VI blurs the lines by being the first full color, 4 PID graphing code scanner in the market. The CReader VI boasts an industry leading 2 frames per second data capture, while having the ability to store, record and playback over 29 data files, lasting over 8 hours! The CReader VI is also very easy to use. With built-in help menus and code definitions, diagnosing and repairing that dreaded Check Engine Light is now easier than ever! And we don't top there. The CReader VI also features the following bi-directional "pecial tests? EVAP, 02 Sensor, I/M Readiness, MIL Status, VIN Info, and On-board

monitors testing.

NOTICE: AUTO SCANNER MAY AUTOMATICALLY RESET WHILE BEING DISTURBED BY STRONG STATIC ELECTRICITY. THIS IS A NORMAL REACTION.

2. General Information-About OBDII/EOBD

2.1 On-Board Diagnostics (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 Diagnostic system increased, a new generation of On-Board Diagnostic system was developed. This second generation of On-Board Diagnostic regulations is called "OBD II".

The OBD II system is 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 a warning lamp (MIL) on the vehicle instrument panel to alert the driver typically by the phrase of "heck Engine

Engine Soondetected malfunction so that a technician can accurately find and fix the problem. Here below follow three pieces of such 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 second character, a number, 0-3; other three characters, a hex character, 0-9 or A-F 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:
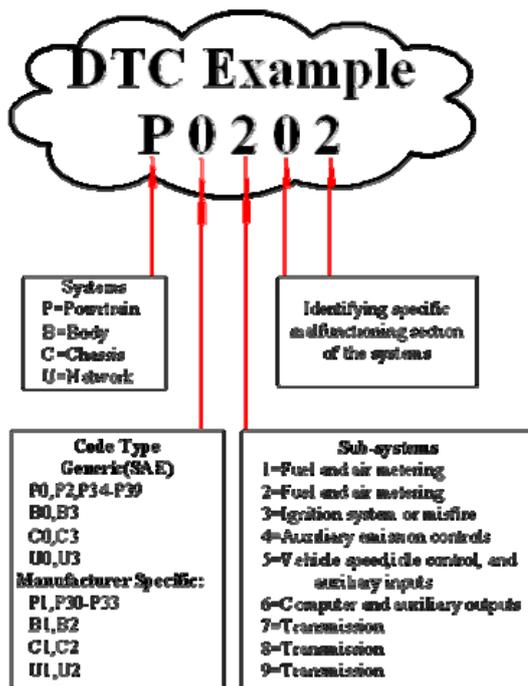
2.3 Location of the Data Link Connector (DLC)

The DLC (Data Link Connector or Diagnostic   Link Connector)   is the standardized 16-cavity connector where diagnostic code readers interface with the vehicle's on-board computer. The DLC is usually located 12 inches from the center of the instrument panel (dash), under or around the driver
side for most vehicles. If Data Link Connector is not located under dashboard,
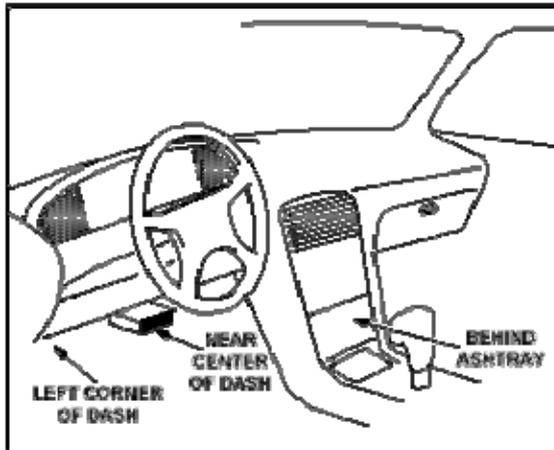
a label should be there telling location. For some Asian and European vehicles, the DLC is located behind the ashtray and the ashtray must be removed to access the connector. If the DLC cannot be found, refer to the vehicle.

2.4 OBD II Readiness Monitors

An important part of a vehiclewhich 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 in every vehicles and the exact number of monitors in any vehicle depends on the motor vehicle manufacturer

Continuous Monitors-- Some of the vehicle components or systems are
continuously tested by the vehicleonly 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 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:

 EGR System
 O2 Sensors
 Catalyst
 Evaporative System
 O2 Sensor Heater
 Secondary air Injection
 Heated Catalyst
 A/C system

2.5 OBD II Monitor Readiness Status

OBD II systems must indicate whether or not the vehiclesystem has completed testing on each component. Components that have been tested will be reported as "Rady? or "Compete? meaning they have been tested by the OBD II system. The purpose of recording readiness status is to allow inspectors to determine if the vehicleall the components and/or systems.

The powertrain control module (PCM) sets a monitor to "eady?or "ompletecycle that enables a monitor and sets readiness codes to "eady?varies for each individual monitor. Once a monitor is set as will remain in this state. A number

of factors, including erasing of diagnostic trouble codes (DTCs) with a code reader or a disconnected battery, can result in Readiness Monitors being set to monitors are constantly evaluating, they will be reported as "Redy?all of the time. If testing of a particular supported non-continuous monitor has not been completed, the monitor status will be reported as Ready.

In order for the OBD monitor system to become 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 vehicleowner.

2.6 OBD II Definitions

Powertrain 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 and/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 the necessary repairs are completed or the condition no longer exists.

DTC -- Diagnostic Trouble Codes (DTC) that identifies which section of the emission control system has malfunctioned.

Enabling Criteria -- Also   termed Enabling Conditions. They 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 cycles vary among vehicles and for each monitor in any particular vehicle.

Please refer to the vehicle's factory service manual for specific enabling procedures.

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 "eady?condition. The purpose of completing an OBD II drive cycle is to force the vehicle to run its onboard diagnostics. Some form of a drive cycle needs to be   performed   after DTCs have been   erased from the PCMmemory or after the battery has been disconnected. Running through a vehiclefaults 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 service 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 in 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.

Fuel Trim (FT) - Feedback adjustments to the base fuel schedule. Short-term fuel trim refers to dynamic or instantaneous adjustments. Long-term fuel trim refers to much more gradual adjustments to the fuel calibration schedule than short-term trim adjustments. These long-term adjustments compensate for vehicle differences and gradual changes that occur over time.

3. Product Descriptions
3.1 Outline of AUTO SCANNER

①. **Cable with OBD II CONNECTOR** -- Connects the AUTO SCANNER to the vehicle

②. **LCD DISPLAY** -- Indicates test results.

③. **ENTER BUTTON**--Confirms a selection (or action) from a menu list.

⑤/⑦. **RIGHT/LEFT BUTTONs** -- Move cursor right or left for selection; Or turn page up or down when more than one page is displayed.

⑥/④. **UP/DOWN BUTTONs**-- Move cursor up or down for selection.

⑧. **USB PORT** -- Connects to computer to update the AUTO SCANNER online.

⑨ **ESC BUTTON** -- Returns to previous menu.

3.2 Specifications

Screen: 2.8

Input voltage range: 8~32V

Operating current: <100mA@12V (Typical)

Power consumption: <1.2W (Typical)

Operating temperature: 32_~122

Storage tempetature: -4_~158_ / -20_ ~70_ @ RH60%

Outline dimension: 15*8*2.5CM

Weight : <17.6 oz (500g)

3.3 Accessories Included

User

USB cable--Connect to a computer for upgrading online

3.4 Power supply

The power of the AUTO SCANNER is provided via the vehicle Data Link Connector (DLC). Follow the steps below to power it up:

A. Find DLC on vehicle: A plastic DLC cover may be found for some vehicles and you need to remove it before plugging the OBDII cable.

B. Plug the connector at the end of OBD II cable to the vehicle

3.5 Tool Setup

Select [Tool Setup] in the Main Menu and press [ENTER], the screen will display the interface as shown below:

to make the following adjustments, settings:

1). Select language: Selects desired language.

Choose [Language] and press [ENTER], the screen will display the interface as shown below

You can press［▲］［▼］key to select any language and press [ENTER] to confirm. The system will convert to the chosen language interface at once.

2). Beeper: ON/OFF the Beeper.

Choose [Beep] and press [ENTER], the screen will display the interface as shown below:

Press [▲] or [▼] to select ON/OFF and press [ENTER] to confirm.

3). Time and Date: Set time and date.

Choose   [Time   and Date] and press [ENTER], the screen will display the interface as shown below:

Press [▲] or [▼] to change input, press [LEFT] or [RIGHT] to select position, then press [ENTER] to confirm.

4). Record: ON/OFF the Record.

Choose [Record] and press [ENTER], the screen will display the interface as shown below:

Press [▲] or [▼] to select ON/OFF and press [ENTER] to confirm. When this function is ON, and the icon record Datastream and record Freeze Frames.

3.6 Vehicle Coverage

The AUTO SCANNER is specially designed to work with all OBD II compliant vehicles, including Control Area Network (CAN). It is required by EPA that all 1996 and newer vehicles (cars and light trucks) sold in the United States must be OBD II compliant   and this includes all   American, Asian and European vehicles.

A small number of 1994 and 1995 model year gasoline vehicles are OBD II compliant. To verify if a 1994 or 1995 vehicle is OBD II compliant, check the Vehicle Emissions Control Information (VECI) Label, which is located under the hood or by the radiator of most vehicles. If the vehicle is OBD II compliant, the   label will   designate "OBD II Cetifiedregulations mandate that all OBD II compliant vehicles must have a "comon".For the vehicle to be OBD II compliant it must have a 16-pin DLC (Data Link Connector) under the dash and the Vehicle Emission Control Information Label must state that the vehicle is OBD II compliant.

4. OPERATION

4.1 Connection

1). Turn the ignition off.

2). Locate the vehicle

3). Plug the OBDII cable into the vehicle

4). Turn the ignition on. Engine can be off or running.

  After finishing, press [ENTER] button to enter Main Menu as following picture:

CAUTION: Don't onnect or disconnect any test equipment with ignition on o engine running.

4.2 Diagnostic

Select [Diagnostic] in Main Menu and press [ENTER], the screen will display Monitor Status interface as following
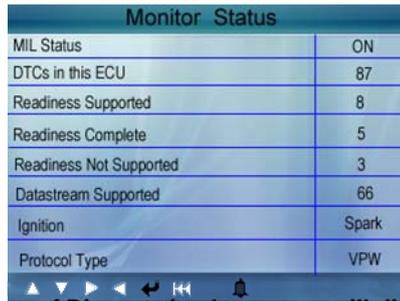
Monitor Status	
MIL Status	ON
DTCs in this ECU	87
Readiness Supported	8
Readiness Complete	5
Readiness Not Supported	3
Datastream Supported	66
Ignition	Spark
Protocol Type	VPW

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Press [ESC] to back to the Main Menu of Diagnostic, the screen will display as following

Diagnositc Menu

Read Codes
Erase Codes
I/M Readiness
Data Stream
Freeze Frame
O2 Sensor Test
On-Board Monitoring
Evap System Test

▲ ▼ ► ◄ ↵ I◄◄ 🔔   1/2

4.2.1 Read Codes

Select [Read Codes] and press [ENTER] in Diagnostic Menu. If there are some codes, the screen will display the codes as shown below:

Read Codes

Current DTCs ($03)
Pending DTCs ($07)
Permanent DTCs ($0A)

▲ ▼ ► ◄ ↵ I◄◄ 🔔

According to the above figure to select different item by pressing [▲] or [▼] and press [ENTER] to confirm.
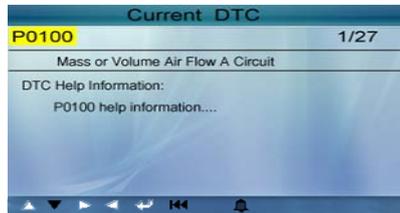
Current DTC

P0100   1/27

Mass or Volume Air Flow A Circuit

DTC Help Information:
    P0100 help information....

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1/27 indicates there are 27 codes total and now P0100 is the first code to display.

The screen will also show the content of the code below the number of code.

You can use [▼]key to view the next code.

After viewing all the codes, you can press [ESC] to return to the Diagnostic Menu.

4.2.2 Erase Codes

Select [Erase Codes], the screen will display the interface as shown below:
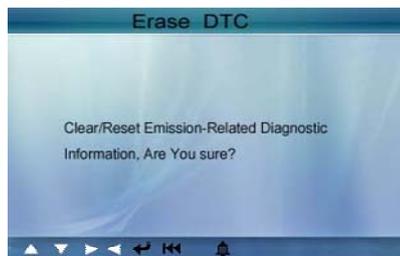
Erase DTC

Clear/Reset Emission-Related Diagnostic
Information, Are You sure?

▲ ▼ ► ◄ ↵ I◄◄ 🔔

Press [ENTER] to erase DTC shown below:
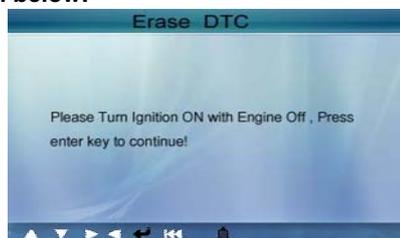
Erase DTC

Please Turn Ignition ON with Engine Off , Press
enter key to continue!

▲ ▼ ► ◄ ↵ I◄◄ 🔔

According to the above figure to press [ENTER] and the screen will display the interface as shown on the next page:
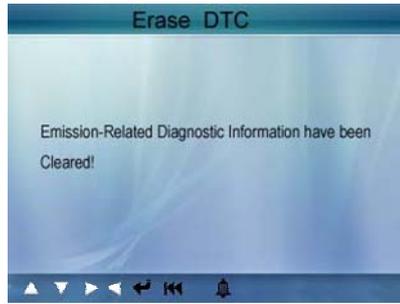
Notes:
  ◆ **Before performing this function, make sure to retrieve and record the trouble codes.**
  ◆ **After clearing, you should retrieve trouble codes once more or turn ignition on and retrieve codes again.If there are still some trouble codes in the system, please troubleshoot the code using a factory diagnosis guide, then clear the code and recheck.**

4.2.3 I/M Readiness

I/M refers   to Inspection and Maintenance that is legislated   by the Government to meet federal clean-air standards. I/M Readiness indicates whether or not the various emissions-related systems on the vehicle are operating properly and are ready for Inspection and Maintenance testing.

The purpose of the I/M Readiness Monitor Status is to indicate which of the vehicledescribed in Chapter 2.5), and which ones have not yet run and completed testing and diagnosis of their designated sections of the vehiclesystem.

The I/M Readiness Monitor Status function also can be used (after repair of a fault has been performed) to confirm that the repair has been performed correctly, and/or to check for Monitor Run Status.

Select [I/M Readiness] and press [ENTER], the screen will display the interface as shown below:
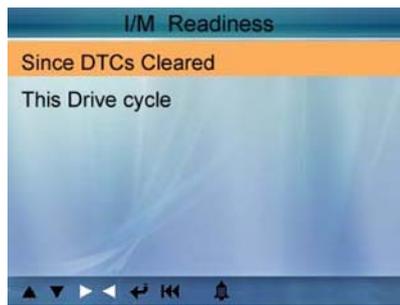
You can use〔▲〕〔▼〕button to select and press [ENTER], the screen will display the interface as shown below:

You can use [LEFT] [RIGHT] button to view other data of vehicle. Press [ENTER] to return to Diagnostic Menu.

N/A means not available on this vehicle, INC means incomplete or not ready, OK means Completed or Monitor Ok.

4.2.4 Data Stream

Press〔▲〕or〔▼〕button to select Data Stream in Main Menu interface and then press [ENTER] button to confirm, the screen will display the interface as shown below:
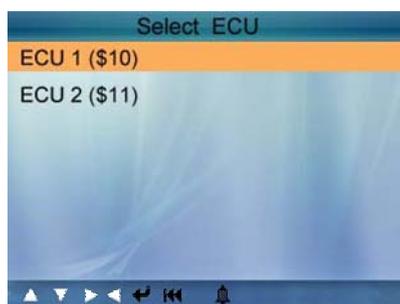
As shown the picure above and press [ENTER] button, the screen will display the interface as shown below:

Select [View All Items] and press [ENTER] button, the screen will display the interface as shown below

You can use [LEFT] [RIGHT] button to view other data streams. Press [ENTER] to return to Diagnostic Menu.
Select [select Items] in Data stream menu and press [ENTER], the screen will display the interface as shown below:

You can use [▲] [▼] button to select data stream items, and press [LEFT] [RIGHT] button to turn page, the screen will display the interface as shown on the next page:

After selected items and press [ENTER], the screen will display the interface as shown below:

Press [ESC] to return to Diagnostic Menu.
Select [View Graphic Items] in Data stream menu and press [ENTER], the screen will display the interface as shown below:

You can use [▲] [▼] button to select single data stream items to view item of live data with a graph, and press [ENTER] button, the screen will display the interface as shown below:

Press [ESC] to return to Diagnostic Menu.

You can view all data stream items or select a certain item of live data with a graph.

4.2.5 View Freeze Frame

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

Note: if DTCs were erased, Freeze Data may not be stored in vehicle memory depending on vehicle.

Select [Freeze Frame] in main menu interface, the screen will display the interface as shown below:

You can use [LEFT] [RIGHT] button to view the data.

Press [ESC] to return to Diagnostic Menu.

4.2.6 O2 sensor test

The results of O2 sensor test are not live values but instead the results of the ECUlive sensor screens such as Graph Screen.

Not all test values are applicable to all vehicles. Therefore, the list generated will vary depending on vehicle. In addition, not all vehicles support the Oxygen Sensors screen.

For results of latest mandated on-board oxygen sensor monitoring test, see the below:
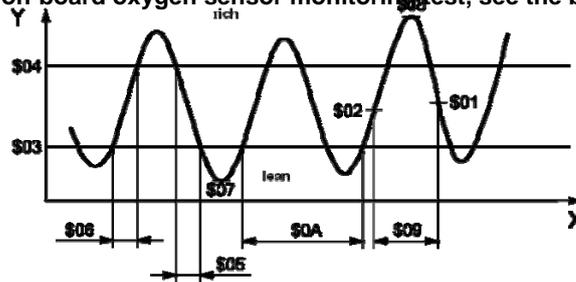
Select [O2 Sensor Test] in Diagnostic menu and press [ENTER] and the screen will display as shown below

Press [ENTER] button, the screen will display as shown below:
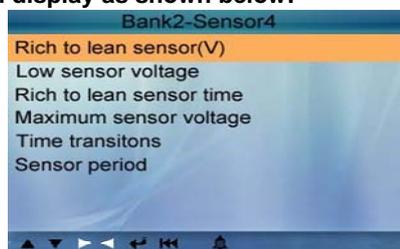
You can use [▲] [▼] button to select an item and press [ENTER], the screen will display as shown below:

Rich to lean sensor(V)	
Test ID	$01
Test Value	0.900
Munimum Limit	0.425
Maximum Limit	0.000
Status	Fail

Press [ESC] to return to Diagnostic Menu.

4.2.7 On-board monitor test

This function can be utilized to read the results of on-board diagnostic monitoring tests for specific components/systems.

Select [On-board Monitoring] in main menu and press [ENTER] and the screen will display as shown below:

On-Board Monitoring
Test $02 Data
Test $03 Data
Test $05 Data
Test $08 Data
Test $09 Data
Test $0B Data
Test $0C Data
Test $12 Data
1/2

You can use [▲] [▼] button to select an item and press [ENTER], the screen will display as shown below:

Test $02 Data	
Compnent ID	$5e
Limit Type	Max
Test Value	33733
Minimum Limit	------
Maximum Limit	39982
Status	Pass

Press [ESC] to return to Diagnostic Menu.

4.2.8 EVAP System Test

The EVAP test function lets you initiate a leak test for the vehiclesystem. The AUTO SCANNER does not perform the leak test, but signals to vehiclefunction, refer to the vehicleprocedures necessary to stop the test.

Select [EVAP System Test] and press [ENTER], the screen will display the relative information about EVAP system. Some vehicle manufacturers do not allow external devices to control vehicle system. If the car supports this function, it will display as below:

Evap System Test
Evaporative system leak test pass

4.2.9 Vehicle Info

Select [Vehicle Info] and press [ENTER], the screen will display the information, such as VIN (Vehicle identification Number), CID (Calibration ID) and CVN (Calibration verification number), as shown below:

Vehicle information
Vehicle Identification Number(VIN):
LCGJD52E76H238345
Calibration Identifications(CID):
CID1:JC7BJEMNK314284K
Calibration Verification Numbers(CVN):
CVN:AJ234HX

Press [ESC] to return to Diagnostic Menu.

4.3 Code Lookup

Select [Code Lookup] in the Main Menu and press [ENTER] and the screen will display the interface as shown below
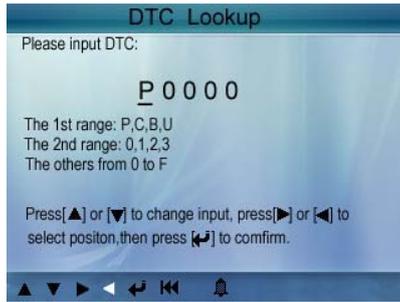
You can use ［▲］［▼］ key to change the first letter. It can be switched among.press [LEFT] [RIGHT] key to input number.

After you input the code number, press [ENTER] to view the definition of the code.

After viewing the definition, press [ESC] to return to the Main Menu.

4.4 Review

This function is used to review the recorded Data Streams, DTC, and Freeze Frame.

Select [Review] in the Main Menu and press [ENTER] and the screen will display the interface as shown below:

CAUTION: About the record function, please view the chapte Tool Setup

1). Review DTC

Select [Review DTC] in the Review and press [ENTER] and the screen will display the interface as shown below:

The recorded DTC will be displayed as shown in Figure 4-31.

You can use ［▲］［▼］ key and press [ENTER] button to view detailed information,

2). Review Data stream

The operation is similar to the "eview DTC" function.

3). Review Freeze Frame

The operation is similar to the "eview DTC" function.

4). Delete DTC

Select [Delete DTC] in the Review and press [ENTER] and the screen will display the interface as shown below:

Press [ENTER] to confirm, and press [ESC] to return to Main Menu.

5). Delete Data stream

The operation is similar to the "elete DTC

6). Delete Freeze Frame

The operation is similar to the "elete DTC

4.5 Help

This function is used to view Tool Information, About OBD, and About Data stream.
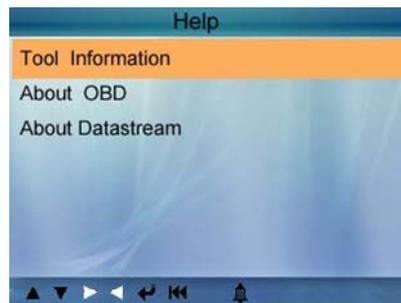
Tool Information includes: software version,   hardware version, serial number, supported, time and date.

About OBD: Relevant introductions information about OBD.

About Data stream: Relevant introductions information about Data stream.