ANCEL®

AD410 Pro
USER'S MANUAL

ANCEL® AD410 Pro

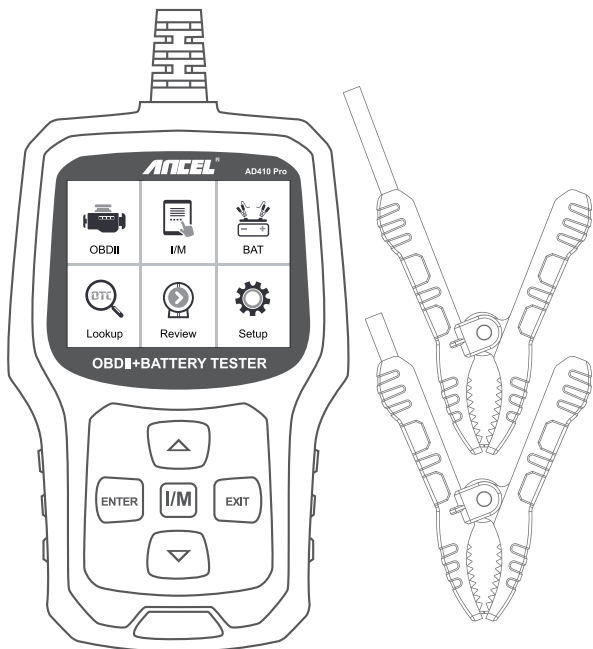OBDII | I/M | BAT

Lookup | Review | Setup

OBDII+BATTERY TESTER

ENTER | I/M | EXIT

1. Safety Precautions and Warnings

To avoid injury or damage to the vehicle and/or scan tool, first read this manual and observe the following safety precautions when working on a vehicle:

- Always perform vehicle tests in a safe environment.
- Do not attempt to operate or observe the unit while driving a vehicle. Operating or observing the device distracts to the driver and may result in a fatal accident.
- Wear safety glasses that meet the standards of ANSI.
- Keep clothing, hair, hands, tools, test equipment, etc. away from all moving or hot engine parts.
- Operate the vehicle in a well-ventilated area: Exhaust fumes are toxic.
- Place blocks in front of the drive wheels and never leave the vehicle unattended while performing tests.
- Use extreme caution when working near the ignition coil, distributor cap, ignition wires and spark plugs. These components generate dangerous voltages when the engine is running.
- Keep a fire extinguisher nearby that is suitable for gasoline, chemical, and electrical fires.
- Keep the scan tool dry, clean, and free of oil/water or grease. If necessary, use a mild detergent on a clean cloth to clean the outside of the scan tool.

2. General Information

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 (CARB) and introduced in 1988 to monitor some components of vehicle emission control. With the advancement of technology and the desire to improve the on-board diagnostic system, a new generation of on-board diagnostic system was developed. This second generation on-board diagnostic system is called "OBD II".

The OBD II system is designed to monitor emission control systems and major 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 light (MIL) on the vehicle's instrument panel to alert the driver, typically with the words "Check Engine" or "Service Engine Soon." The system also stores important information about the detected malfunction so a technician can accurately find and fix the problem. Below are three such valuable pieces of information:

1) Whether the malfunction indicator lamp (MIL) is set to 'On' or 'Off';
2) Whether diagnostic trouble codes (DTCs) are stored and if so, which ones;
3) Status of the standby monitor.

2.2 Diagnostic Trouble Codes (DTCs)

OBD II Diagnostic Trouble Codes are codes stored by the on-board computer diagnostic system in response to a problem detected in the vehicle. These codes identify a specific problem area and are intended to give you an indication of where in the vehicle a fault may be occurring. OBD II Diagnostic Trouble Codes consist of a five-character alphanumeric code. The first character, a letter, indicates which control

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system sets the code. The other four characters, all numbers, provide additional information about where the DTC originated and what operating conditions triggered it. Below is an example that illustrates the structure of the digits:
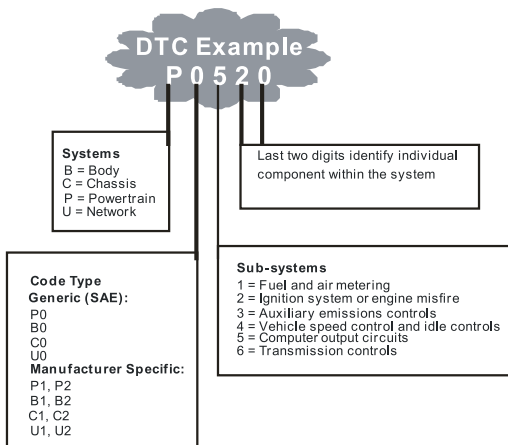

Figure 1-2: Explanation of a diagnostic trouble code.

2.3 Location of the Data Link Connector (DLC)

The DLC (Data Link Connector or Diagnostic Link Connector) is the standardized 16-pin connector used to connect diagnostic tools to the vehicle's on-board computer. The DLC is typically located 12 inches from the center of the instrument panel (dashboard), under or on the driver's side of most vehicles. If the Data Link Connector is not located under the dashboard, there should be a sticker there indicating its location. On some Asian and European vehicles, the DLC is located

behind the ashtray and the ashtray must be removed to access the connector. If you can not find the DLC, check the vehicle's service manual to see where it is located.
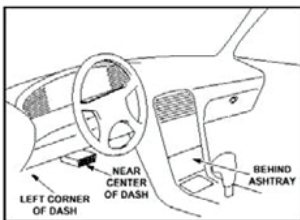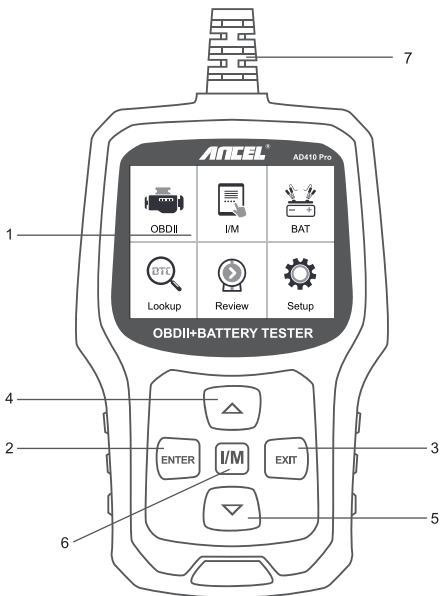

Figure 1-3: The DLC connector (left) is located in the area of the vehicle interior you see on the right (black arrow).
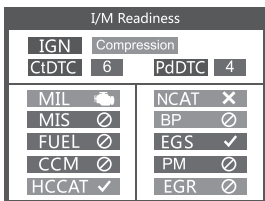
3. Using the Scan Tool

3.1 Tool Description - ANCEL AD410 Pro

1) **LCD DISPLAY** - Displays test results. 2.4" TFT 262K true color, 320*240 QVGA LCD display.

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

3) **EXIT BUTTON** - Cancels a selection (or action) from a menu or returns to the menu.

4) **UP SCROLL BUTTON** - Scroll up an item by item menu.

5) **DOWN SCROLL BUTTON** - Scroll down an item-by-item menu.

6) **"I/M"BUTTON** - Quick State Emissions Readiness Check and Drive Cycle Check.

I/M Readiness			
IGN	Compression		
CtDTC	6	PdDTC	4
MIL	☁	NCAT	✕
MIS	⊘	BP	⊘
FUEL	✓	EGS	✓
CCM	⊘	PM	⊘
HCCAT	✓	EGR	⊘

Comments:

MIL Yellow- Dashboard MIL ON

MIL Grey-Dashboard MIL OFF

⊘ -no support

✓ -complete

✕ -not complete

7) **OBDII CONNECTOR** - Connect the scan tool to the vehicle's Data Link Connector (DLC)

3.2 Specifications

1) Display: 2.4" TFT 262K true color
2) Operating temperature: 0 to 60°C (32 to 140 °F).
3) Storage temperature: -20 to 70°C (-4 to 158 °F).
4) External power supply: 8.0 to 18.0 V power supply from vehicle battery

3.3 Supplied accessories

1) ANCEL AD410 Pro OBD2 diagnostic tool
2) 16PIN connection cable and clamps
3) USB Cable - Connect to a computer for online upgrade
4) User Manual - Instructions for operating the tool

3.4 BAT FUNCTION

Preparations before the test

When performing the test in the vehicle, make sure all auxiliary loads are turned off, the key is not in the ignition, and the doors are closed.

Connecting the tester

1) Connect the red clamp to the positive (+) terminal and the black clamp to the negative (-) terminal.

2)To make a proper connection, move the clamps back and forth. The tester requires that both sides of each clamp be firmly connected before testing. If the connection is poor, a CHECK CONNECTION OR WIGGLE CLAMPS message will appear, clean the clamps and reconnect the clamps.

3) The preferred test position is at the battery terminals. If the battery is not accessible, you can also perform the test at the jumper terminal; however, the measured available power may be lower than the actual value.
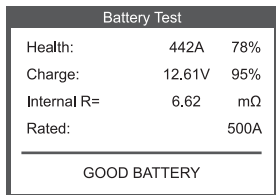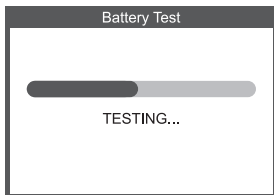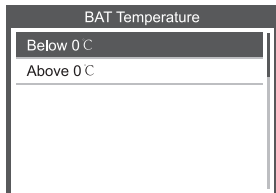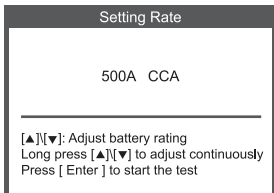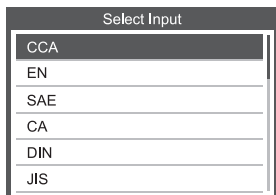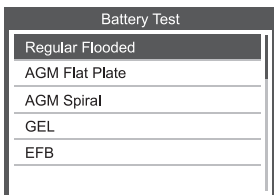
3.4.1 Battery Test

From the main menu, use the navigation keys LEAF / RIGHT to select the menu BAT and press the key ENTER. The screen will display the interface shown below:
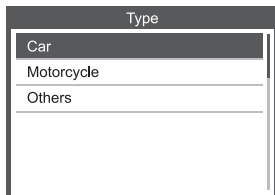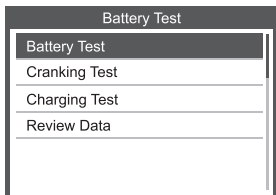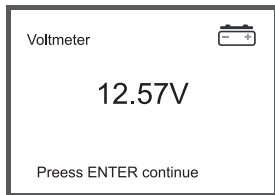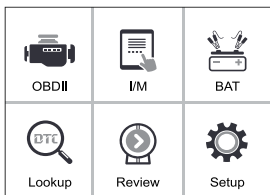
Battery Type:Scroll to and select Regular Flooded, AGM Flat Plate or AGM Spiral, if applicable.

Battery Standard:Scroll to and select the battery's rating system.Not all rating systems are available for every application.

Standard	Description	Range
CCA	Cold Cranking Amps,as specified by SAE.The most common rating for cranking batteries at 0 ℉ (-17.8℃)	100-2000
DIN	Deutsche Industrie-Norm	100-1200
JIS	Japanese Industrial Standard,shown on a battery as a combination of numbers and letters.	26A17 thru 245H52
EN	Europa-Norm	100-2000
IEC	International Electrotechnical Commission	100-1200
GB	China National Standard	30-220Ah
SAE	Society of Automotive Engineers Standard	100-2000
MCA	Marine Cranking Amps standard, effective starting current value at 0℃	100-2000
BCI	Battery Council International standard	100-2000
CA	Cranking Amps standard, effective starting current value at 0℃	100-2000

Battery Test		Select Input	
Regular Flooded		CCA	
AGM Flat Plate		EN	
AGM Spiral		SAE	
GEL		CA	
EFB		DIN	
		JIS	

Setting Rate	BAT Temperature
500A CCA	Below 0℃
	Above 0℃
[▲]\[▼]: Adjust battery rating	
Long press [▲]\[▼] to adjust continuously	
Press [Enter] to start the test	

Battery Test	Battery Test		
	Health:	442A	78%
TESTING...	Charge:	12.61V	95%
	Internal R=	6.62	mΩ
	Rated:		500A
	GOOD BATTERY		

Battery Test Results

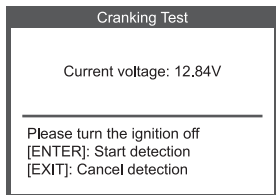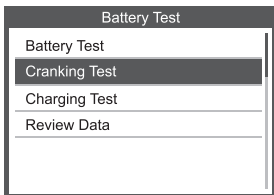| Decision	Interpretation
GOOD BATTERY	Return tbe battery to service
GOOD-RECHARGE	Fully charge the battery and return it to service

CHARGE&RETEST	Fully charge the battery and retest.Failure to fully charge the battery before retesting may cause inaccurate result.If CHARGE&RETEST appears again after you fully charge the battery,replace the battery.
REPLACE BATTERY	Replace the battery and retest.A REPLACE BATTERY result may also mean a poor connection between the battery cables and the battery.After disconnecting the battery cables,retest the battery using the out-of-vehicle test before replacing it.
BAD CELL-REPLACE	Replace the battery and retest.

Note: In the battery test, select the appropriate data according to the actual situation of the battery to finally determine the health of the battery.
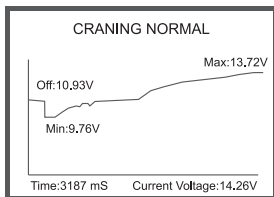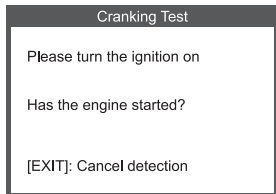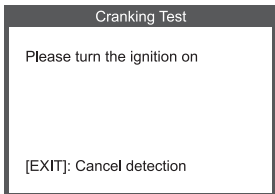
When you select the battery current size, press the UP button once to set the 5A current up, and press the down button once to set the 5A current down. You can adjust the current according to the actual situation of the battery.

3.4.2 Cranking test
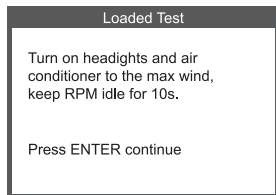With this function you can read the battery voltage in real time.
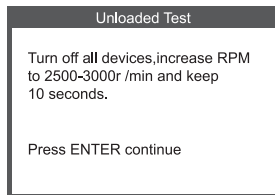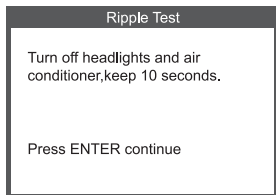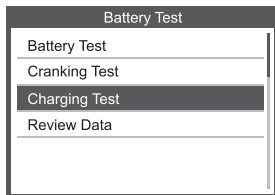

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If you press[ENTER]and start detection, the interface will be displayed:

Cranking Test	Cranking Test
Please turn the ignition on	Please turn the ignition on
	Has the engine started?
[EXIT]: Cancel detection	[EXIT]: Cancel detection

CRANING NORMAL

Max:13.72V

Off:10.93V

Min:9.76V

Time:3187 mS   Current Voltage:14.26V

3.4.3 Charging test

Press charging test and it will display:

Battery Test	Ripple Test
Battery Test	Turn off headlights and air conditioner,keep 10 seconds.
Cranking Test	
Charging Test	
Review Data	Press ENTER continue

Unloaded Test	Loaded Test
Turn off all devices,increase RPM to 2500-3000r /min and keep 10 seconds.	Turn on headlights and air conditioner to the max wind, keep RPM idle for 10s.
Press ENTER continue	Press ENTER continue

Charging Test	
Unloaded	12.16V
Loaded	12.05V
Ripple	1201mV
VOLTAGE LOW	

3.4.4 Review Data

When you press Check data, the data of the last battery test is displayed as follows:

Battery Test
Battery Test
Cranking Test
Charging Test
Review Data

Review Data
Battery Test Report
Cranking Test Report
Charging Test Report

Battery Test		
Health:	442A	78%
Charge:	12.61V	95%
Internal R=	6.62	mΩ
Rated:		500A
GOOD BATTERY		

3.5 DTC Lookup

The DTC Lookup function allows you to search for definitions of codes stored in the built-in code library.
1) From the main menu, use the UP /DOWN keys to select Code Lookup and press ENTER.

DTC Lookup

Please input DTC:

P0000

The 1st range : P , C , B , U
The 2nd range : 0 , 1 , 2 , 3
The others from : 0 to F

Changing Data: [▲] or [▼]
Moving Cursor: ENTER+ [▲] or ENTER+ [▼]
Confirmation: ENTER
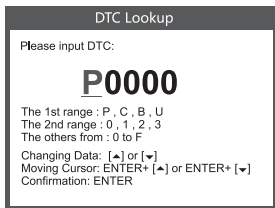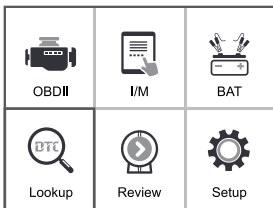
To query the error code, press enter + up, cursor to the left; press enter + down, the cursor to the right.

For manufacturer specific codes, you must select a vehicle make in an additional screen to search for DTC definitions.
If no definition is found (SAE or manufacturer specific), the scan tool will display "DTC definition not found!". Please refer to the vehicle's service manual".

2) Press the EXIT key and return to the main menu.

3.6 Review

This function allows you to review the recorded DTCs. Select the [Review] menu and press the ENTER key. The screen will be displayed as follows:
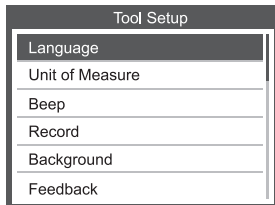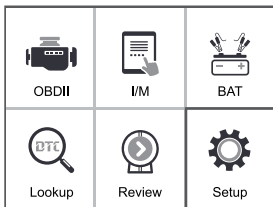

Review

Review DTC
Delete DTC Data
Delete all recorded DTC
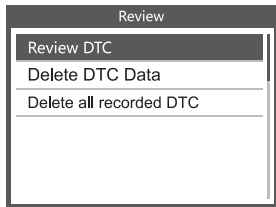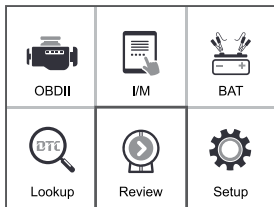
3.7 Setting up the tool

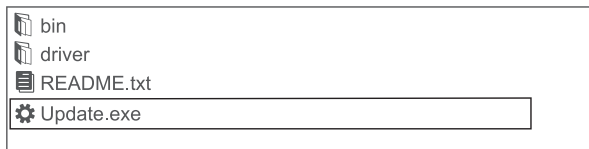The scan tool allows you to make the following adjustments and settings:

1) Select language: Select the language you want to use.

2) Unit of measurement: Set the unit of measurement to English or Metric.

3) Set Beep: Switches ON /OFF beep tone.

4) Record: ON Turns recording on/off.

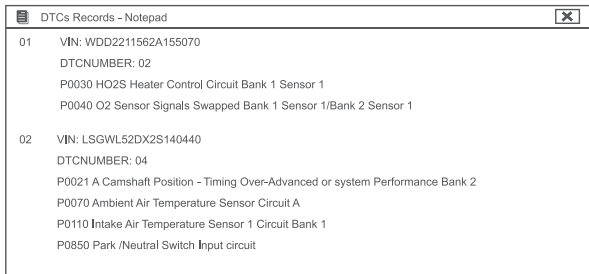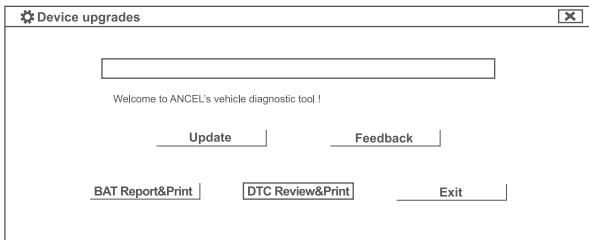Turn on the recording function to record the error code information (operation on vehicle).

Reviewing and printing diagnostic reports(operation on a computer)

*Download the upgrade file from the ANCEL website.

*the device is connected to the computer via a USB cable. .
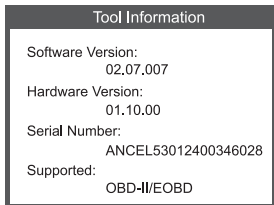
*open the "Update" application.

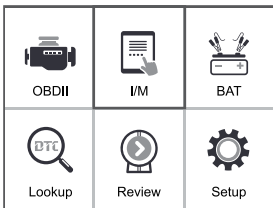*Click " Review & Print " and automatically generate diagnostic DTC reports.

Device upgrades ☒

Welcome to ANCEL's vehicle diagnostic tool !

| Update | Feedback |

| BAT Report&Print | DTC Review&Print | Exit |

📋 DTCs Records – Notepad ☒

01   VIN: WDD2211562A155070

     DTCNUMBER: 02

     P0030 HO2S Heater Control Circuit Bank 1 Sensor 1

     P0040 O2 Sensor Signals Swapped Bank 1 Sensor 1/Bank 2 Sensor 1

02   VIN: LSGWL52DX2S140440

     DTCNUMBER: 04

     P0021 A Camshaft Position – Timing Over-Advanced or system Performance Bank 2

     P0070 Ambient Air Temperature Sensor Circuit A

     P0110 Intake Air Temperature Sensor 1 Circuit Bank 1

     P0850 Park /Neutral Switch Input circuit

5) Background.

6) Feedback.

7) Tool information.

Tool Information

Software Version:
02.07.007

Hardware Version:
01.10.00

Serial Number:
ANCEL53012400346028

Supported:
OBD-II/EOBD

3.8 I/M

Select [I/M] and the following is displayed:

OBDII	I/M	BAT
Lookup	Review	Setup

I/M Readiness	
IGN	Compression
CtDTC 6	PdDTC 4
MIL 🔧	NCAT ✗
MIS ⊘	BP ⊘
FUEL ⊘	EGS ⊘
CCM ⊘	PM ⊘
HCCAT ✓	EGR ⊘

3.9 OBD II Diagnostics

1) Turn on the ignition.
2) Locate the vehicle's 16-pin Data Link Connector (DLC).
3) Plug the scan tool cable connector into the vehicle's DLC.
4) Press ENTER to enter the main menu. UP Use the /DOWN key to select Diagnostics from the menu.

OBDII	I/M	BAT
Lookup	Review	Setup
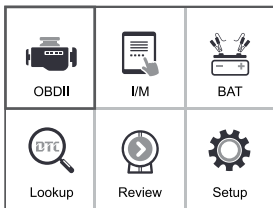
| Entering System	
J1850 VPW	✗
J1850 PWM	✗
ISO15765-4 CAN(11bit)	✗
ISO15765-4 CAN(29bit)	√
ISO14230-4 KWP	
ISO14230-4 KWP(5BPS)	
ISO9141-2	
Entering system please wait...	

5) Press ENTER to confirm.

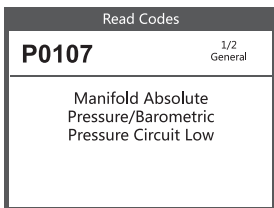If the message "LINKING ERROR!" appears on the display.
- Make sure that the OBD II connector of the scan tool is firmly connected to the DLC of the vehicle;
- Turn off the ignition and wait for about 10 seconds. Turn the ignition back on and repeat the test.

3.9.1 Read Codes

1) Select [Read Codes] and press ENTER in the diagnostic menu. If there are some codes, the screen will display the codes as follows.

Diagnostic Menu
Read Codes
Erase Codes
I/M Readiness
Data Stream
Freeze Frame
O2 Sensor Test
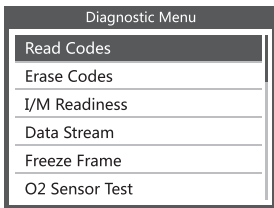
2) According to the above figure, select another item by pressing UP or DOWN and press ENTER to confirm.

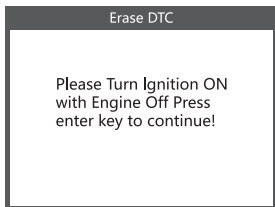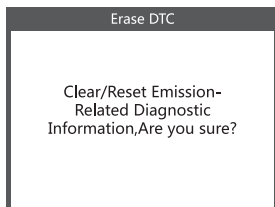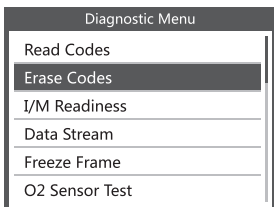| Read Codes |
|---|
| **P0107** 1/2 General |
| Manifold Absolute Pressure/Barometric Pressure Circuit Low |

3) After viewing all codes, you can press EXIT to return to the previous menu.

3.9.2 Erase Codes

1) Select [Erase Codes], the screen will display the interface shown below.
Press ENTER to delete the DTCs, the screen will display the interface shown below:

Diagnostic Menu	Erase DTC
Read Codes	
Erase Codes	Clear/Reset Emission-Related Diagnostic Information,Are you sure?
I/M Readiness	
Data Stream	
Freeze Frame	
O2 Sensor Test	

Erase DTC

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

2) Press ENTER according to the figure above. The screen will display the interface shown on the next page:

Erase DTC

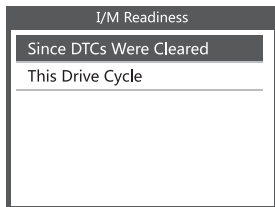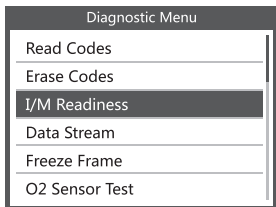Emission-Related Diagnostic Information has been Cleared!
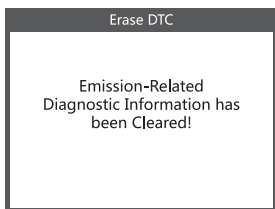
Notes:

Before performing this function, be sure to retrieve and record the error codes.

After clearing, retrieve the error codes again or turn on the ignition and retrieve the codes again. If there are still error codes in the system, please troubleshoot the codes using factory diagnostic guide, clear the codes and check them again.

3.9.3 I/M Readiness

Select I/M readiness and press ENTER. The screen displays the interface shown below:

| Diagnostic Menu		I/M Readiness
Read Codes		Since DTCs Were Cleared
Erase Codes		This Drive Cycle
I/M Readiness		
Data Stream		
Freeze Frame		
O2 Sensor Test		

I/M readiness is to test misfire/fuel system/comprehensive component, you can use UP or DOWN to select and press ENTER as follows:

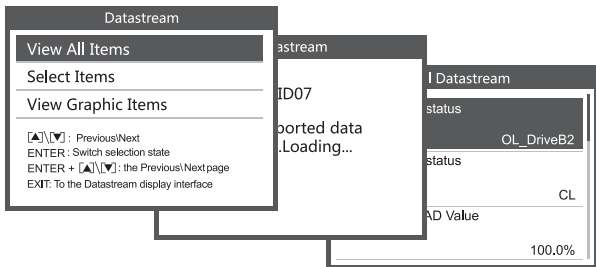| I/M Readiness	
Misfire monitor	N/A
Fuel system monitor	N/A
Comprehensive component monitor	OK
Catalyst monitor	N/A
Heated catalyst monitor	N/A
Evaporative system monitor	N/A
Secondary air system monitor	N/A
Oxygen sensor monitor	INC
Oxygen sensor heater monitor	INC
EGR and/or VVT syetem monitor	INC

N/A means not available for this vehicle, INC means incomplete or not ready, OK means completed or monitor is ready.

3.9.4 Data stream

Press the UP or DOWN key to select Data Stream from the main menu, then press ENTER to confirm. The screen will display the interface shown below:
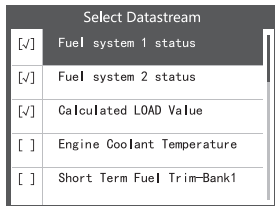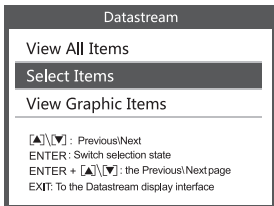
Diagnostic Menu	
Read Codes	
Erase Codes	
I/M Readiness	
Data Stream	
Freeze Frame	
O2 Sensor Test	
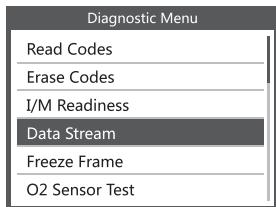
Select [View All Items] and press the ENTER key. The screen displays the interface shown below:

Datastream
View All Items
Select Items
View Graphic Items
[▲]\[▼] : Previous\Next
ENTER : Switch selection state
ENTER + [▲]\[▼] : the Previous\Next page
EXIT: To the Datastream display interface

...astream

ID07

...ported data
...Loading...

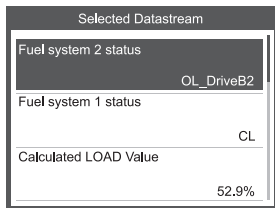l Datastream

status
OL_DriveB2

status
CL

AD Value
100.0%

Scroll the page, press up to the last page or down to the next page.

Select [Select item] and press Enter. Then press the Enter key again, which will be displayed as follows:

Datastream
View All Items
Select Items
View Graphic Items
[▲]\[▼] : Previous\Next
ENTER : Switch selection state
ENTER + [▲]\[▼] : the Previous\Next page
EXIT: To the Datastream display interface

| Select Datastream	
[√]	Fuel system 1 status
[√]	Fuel system 2 status
[√]	Calculated LOAD Value
[ ]	Engine Coolant Temperature
[ ]	Short Term Fuel Trim-Bank1

Scroll page, press enter + up, to previous page, press enter + down, the next page.

After you select something and press exit, the screen will be displayed as follows:
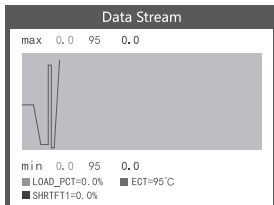

Select [View Graphic Items] from the Data Stream menu and press ENTER. The screen displays the interface shown below:
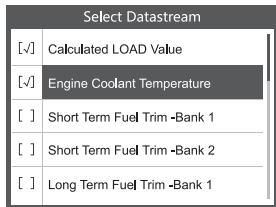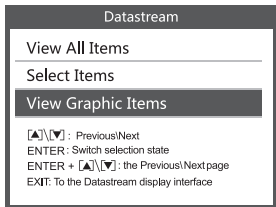
Scroll, press enter + up, to previous page, press enter + down, to next page. Press enter again to select.

Press EXIT to return to the display:

Maximum number of lines is 3.

Press EXIT to return to the previous menu.

3.9.5 Display Freeze Frame

When an emission-related error occurs, a snapshot of the current vehicle parameters is recorded by ECU.
Note: If the DTCs have been deleted, the freeze data may not be stored in the vehicle.
From the main menu, select Freeze Frame. The screen will display the interface shown below:
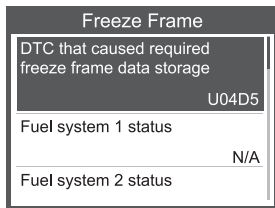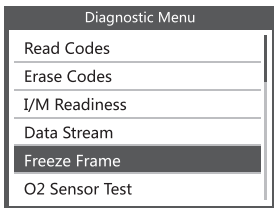
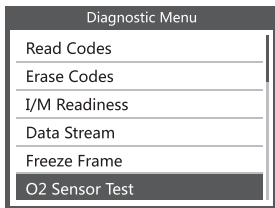You can use the UP / DOWN key to view the data. Press EXIT to return to the Diagnostics menu.

3.9.6 O2 sensor test

OBD II regulations established by SAE require that applicable vehicles monitor and test oxygen (O2) sensors to detect problems related to fuel efficiency and vehicle emissions. These tests are not demand tests and are performed automatically when engine operating conditions are within specified limits. These test results are stored in the on-board computer memory.
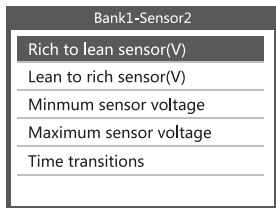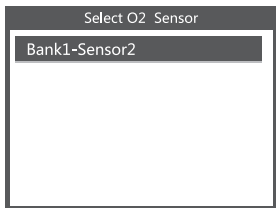
The O2 Sensor Test function allows you to retrieve and display the O2 Sensor Monitor test results for the most recently performed tests from the vehicle's on-board computer.

The O2 sensor test function is not supported by vehicles that communicate via a Controller Area Network (CAN). The results of the O2 sensor test of vehicles with CAN can be found in the "On-Board Mon. Test" chapter.

Select O2 Sensor Test from the Diagnostic Menu and press ENTER. The screen will be displayed as shown below:

Diagnostic Menu
Read Codes
Erase Codes
I/M Readiness
Data Stream
Freeze Frame
O2 Sensor Test

Press ENTER, the screen will be displayed as shown below (data is different each time):

Select O2 Sensor
Bank1-Sensor2

Bank1-Sensor2
Rich to lean sensor(V)
Lean to rich sensor(V)
Minmum sensor voltage
Maximum sensor voltage
Time transitions

3.9.7 On-board monitor test

This function allows you to read the results of the on-board diagnostic monitoring. Tests for specific components/systems.

Diagnostic Menu
On-Board Monitoring
Test or Component
Vehicle Information
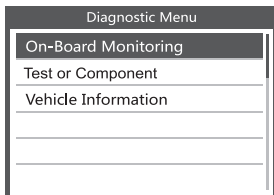
3.9.8 Test or Component (Evap System Test)

The OBD2 system monitors the fuel system for fuel vapor leakage to ensure that no hydrocarbons (HC) leak into the atmosphere. EVAP monitor does two things:
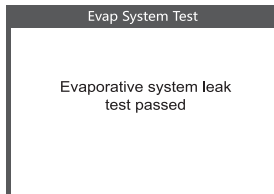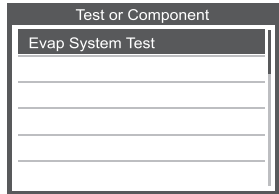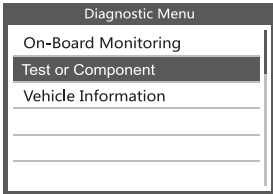
1. Ensure that the gasoline vapor is sent to the intake pipe at the right time, and mixed with the air to enter the engine for combustion.

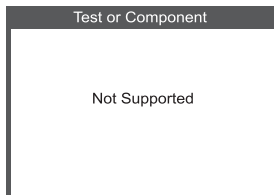2. Prevent fuel vapor in the fuel pipe from leaking into the atmosphere and polluting the environment.
[Evap SystemTest] function:
The external diagnostic device can't control the fuel evaporation control (EVAP) of the OBD system, and the diagnostic device only displays its status and test results.
If the car supports this function, it will display as below:

Diagnostic Menu
On-Board Monitoring
Test or Component
Vehicle Information

Test or Component
Evap System Test

Evap System Test
Evaporative system leak test passed

If the car not supported the function ,it will display as below:

Test or Component
Not Supported

3.9.9 Vehicle Information

Select [Vehicle Information] and press ENTER. The screen displays information such as (Vehicle Identification number), (Calibration Identifications), and(Calibration Verification), as shown below (different data will be displayed for different vehicles):

Diagnostic Menu
On-Board Monitoring
Test or Component
Vehicle Information

vehicle Information
Vehicle Identification Number
Calibration Identifications
Calibration Verification
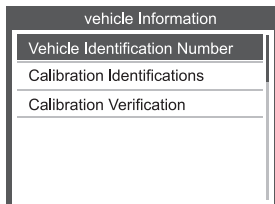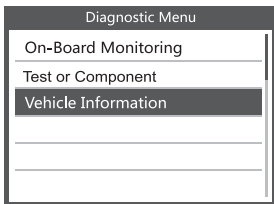
Press EXIT to return to the diagnostics menu.

4.Update
1) Download the update software and unzip the file.
2) Connect the device to the computer using a USB cable.
3) The update software is only supported by 7/8/10. In Windows 7, you need to install the driver, in Windows 8/10, you can run the update software directly.

Note:
Windows XP and Apple computers do not support upgrades.
If you do not understand the upgrade steps in the instructions, please contact ANCEL customer service.
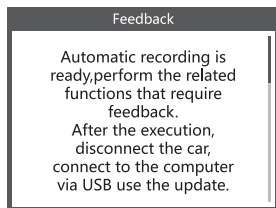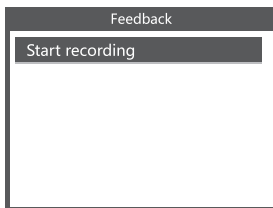
5. Feedback
1. If the [OBDII] function indicates an error associated with the vehicle, please use the feedback function.
Select [Feedback] and the following will be displayed:

Tool Setup
Language
Unit of Measure
Beep
Record
Background
Feedback
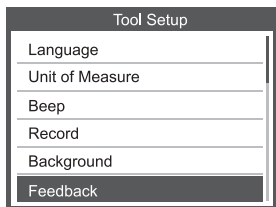
Select [Start recording] to open the recording function and the following will be displayed:

Feedback
Start recording

Feedback
Automatic recording is ready,perform the related functions that require feedback. After the execution, disconnect the car, connect to the computer via USB use the update.

Next: Press EXIT and return to the main menu.
Select the [OBDII] menu to restart the detection and record the data

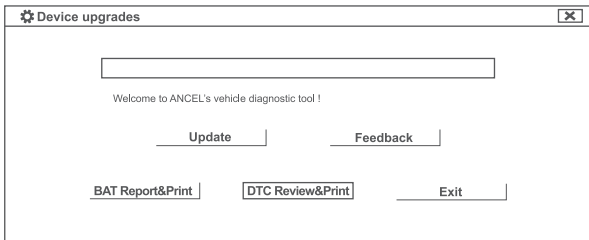Transfer the data to your computer and generate the feedback file.
Download the upgrade file from the ANCEL website to your computer.
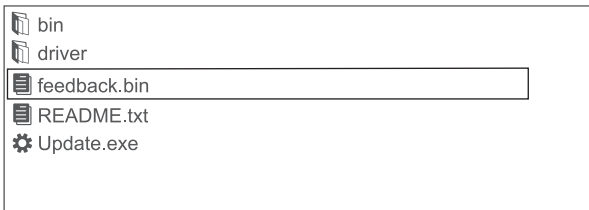The device is connected to the computer via a USB cable.
Select the "Update" file and the following is displayed:

bin
driver
README.txt
Update.exe
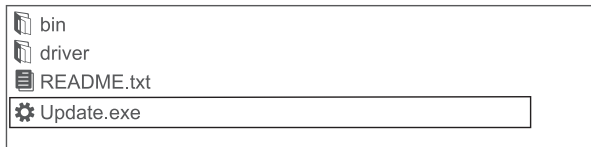
Click on "Feedback" and the following will be displayed:

Please send the feedback.bin file to support@anceltech.com.

6. Warranty

1) This warranty is limited to the person who purchases ANCEL products.
2) ANCEL products are warranted against defects in materials and workmanship for a period of one year (12 months) from the date of shipment to the user.

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