

ANCEL[®]

AD410

USER'S MANUAL



1. Safety Precautions and Warnings

To prevent personal injury or damage to vehicles and/or the scan tool, read this instruction manual first and observe the following safety precautions whenever working on a vehicle:

- Turn the ignition off first, then connect 16-pin to plug, then turn the ignition on.
- Always perform automotive testing in a safe environment.
- Do not attempt to operate or observe the tool while driving a vehicle. Operating or observing the tool will cause driver distraction and could cause a fatal accident.
- Wear safety eye protection that meets ANSI standards.
- Keep clothing, hair, hands, tools, test equipment, etc. away from all moving or hot engine parts.
- Operate the vehicle in a well ventilated place: Exhaust gases are Poisonous.
- Put blocks in front of the drive wheels and never leave the vehicle unattended while running tests.
- Use extreme caution when working around the ignition coil, distributor cap, ignition wires and spark plugs. These components create hazardous voltages when the engine is running.
- Put the transmission in PARK (for automatic transmission) or NEUTRAL (for manual transmission) and make sure the parking 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 mild detergent on a clean cloth to clean the outside of the scan tool, when needed.

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 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 "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 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 other four characters, all numbers, provide additional information on where the DTC originated and the operating conditions that caused it to be set. Below is an example to illustrate the structure of the digits:

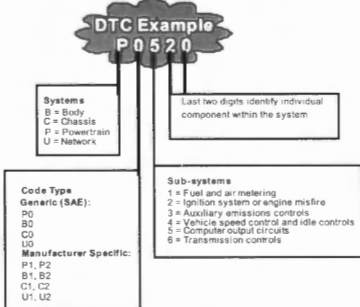
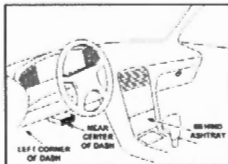


Figure 1-2: Explanation of a diagnostic trouble code.

2.3 Location of the Data Link Connector (DLC)

The DLC (Data Link Connector or Diagnostic Link Connector) is the standardized 16-pin connector where diagnostic scan tools 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's side for most vehicles. If the Data Link Connector is not located under the dashboard, a label should be there revealing its 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.

Figure 1-3: The DLC connector (left) can be found in the area of the car interior seen at right (black arrow).



2.4 OBD II Readiness Monitors

Readiness Monitors 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 the 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 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 - exhaust Gas Recirculation for reducing greenhouse gases.
2. O2 Sensors - monitor and adjust air/fuel mixture.
3. Catalyst - reduces exhaust emissions.
4. Evaporative System - monitors the integrity of the fuel tank system.
5. O2 Sensor Heater - brings O2 sensor to correct operating temperature.
6. Secondary air - reduces exhaust emissions.
7. Heated Catalyst - brings catalyst to correct operating temperature.
8. A/C system - monitors system for freon leaks.

2.5 OBD II Monitor Readiness Status

OBD II systems must indicate whether or not the vehicle's PCM's monitoring has completed testing on each emission component. Components that have been OBD II tested will be reported as "OK". The purpose of recording readiness status is to allow inspectors to determine if the vehicle's OBDII system has tested all the emissions systems. This is handy to know before bringing vehicle to a state emissions testing facility.

The powertrain control module (PCM) sets a monitor to "OK" after an appropriate drive cycle has been performed. The drive cycle that enables a Monitor and sets readiness codes to "OK" varies for each individual monitor. Once a monitor is set as "OK", it 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 "INC" (incomplete). Since the three continuous monitors are constantly evaluating, they will be reported as "OK" all of the time. As long as there are no DTCs stored in memory, the vehicle is running in accordance with the OBD II guidelines. If testing of a particular supported non-continuous monitor has not been completed or not tested, the monitor status will be reported as "INC" (incomplete).

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 vehicle's OBD monitor system ready, please consult your vehicle owner's manual.

2.6 OBD II Definitions

Powertrain Control Module (PCM) – the OBD II terminology for the on-board computer that controls the engine and the 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 can not turn the MIL off until necessary repairs are completed or the condition no longer exists.

DTC – Diagnostic Trouble Codes (DTC) these identify which section of the emission control system has malfunctioned.

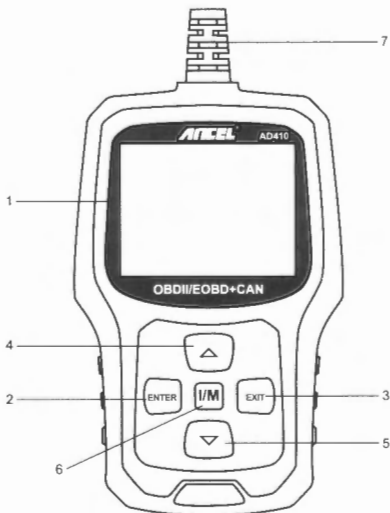
Enabling Criteria – Also termed Enabling Conditions. They are the vehicle-specific events or conditions that must occur within the engine before the various monitors will set, or run. Some monitors require the vehicle to follow a prescribed “drive cycle” routine as part of the enabling criteria. Drive 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 onboard diagnostics. Some form of a drive cycle needs 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 Owner's 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 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.

3. Using the Scan Tool

3.1 Tool Description - ANCEL AD410



1 . LCD DISPLAY – Indicates test results. 2.4" TFT 262K true color,320*240 QVGA LCD display.


2 . ENTER BUTTON – Confirm a selection (or action) from a menu.

3 . EXIT BUTTON – Cancel a selection (or action) from a menu or returns to the menu.

4 . UP SCROLL BUTTON - Uproll item by item in a menu.

5 . **DOWN SCROLL BUTTON** - Down roll item by item in a menu .

6 . **"I/M" BUTTON** - Quick State Emissions readiness check and drive cycle verification.

| I/M Readiness | | | |
|---------------|---|-------|---|
| IGN | Spark | DTC | 0 |
| MIL |  | PdDTC | 0 |
| MIS | ⊘ | EVAP | ⊘ |
| FUE | ✓ | AIR | ⊘ |
| CCM | ✓ | O2S | ✗ |
| CAT | ✓ | HRT | ✗ |
| HCAT | ⊘ | EGR | ⊘ |

Remarks:

MIL Yellow- Dashboard MIL ON

MIL Gray-Dashboard MIL OFF

⊘ -not support

✓ -complete

✗ -not complete

7 . **OBD II CONNECTOR** - Connects 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 50 C (32 to 140 F°)
- 3) Storage Temperature: -20 to 70 C (-4 to 158 F°)
- 4) External Power: 8.0 to 18.0 V power provided via vehicle battery
- 5) Dimensions: 124x77.4x23.5mm
- 6) Weight: 0.35kg

3.3 Accessories Included

- 1) User's Manual -- Instructions on tool operations.
- 2) USB cable - Used to upgrade the scan tool.

Updating the ANCEL AD410

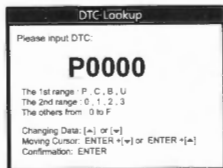
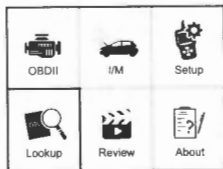
- Attach the USB cable.
- Click on Software Update for ANCEL AD410 and follow on-screen instructions.



3.4 DTC Lookup

The DTC Lookup function is used to search for definitions of Code stored in the built-in Code library.

- From the Main Menu, use the UP/DOWN scroll button to select the Code Lookup and press the ENTER button.



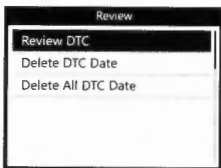
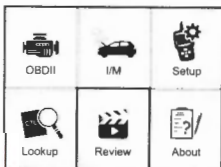
Query the fault code, press enter + up, the cursor to the left; press enter + down, the cursor to the right.

- For manufacturer specific codes , you'll need to select a vehicle make on an additional screen to look for DTC definitions.
- If definition could not be found (SAE or Manufacturer Specific), the scan tool displays "DTC definition not found! Please refer to vehicle service*manual !"

4) To exit to the Main Menu, press the EXIT button.

3.5 Review

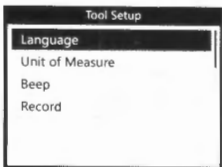
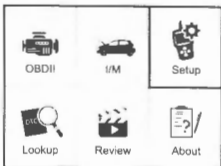
This function is used to review the recorded DTC. Select Review in the Main Menu and press Enter and the screen will display the interface as shown below:



3.6 Tool /Setup

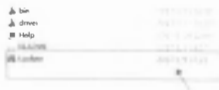
The scan tool allows you to make the following adjustments and settings:

- 1) Select Language: Selects the desired language.
- 2) Unit of Measure: Set measure to English or Metric.
- 3) Beep Set: Turns ON/OFF beep.
- 4) Record: ON/OFF the Record.



3.7 Review&Print diagnostic reports

1. Connect to a computer via USB .
2. Download upgrade files from ANCEL website.
3. Install upgrade driver according to the "upgrade instruction" file.
4. Open the "update" application.

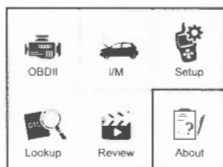


5. Click "Review & print" option. Then could save or print the diagnostic report as needed.



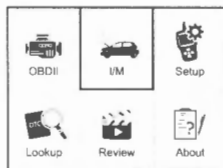
3.8 About

Choose [About] and it displays as follow :



3.9 I/M

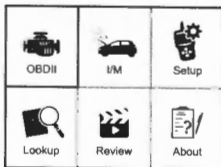
Choose [I/M] and it displays as follow :



4. OBD II Diagnostics

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

- 1) Turn the ignition off.
- 2) Locate the vehicle's 16-pin Data Link Connector (DLC).
- 3) Plug the scan tool cable connector into the vehicle's DLC.
- 4) Turn the ignition on. Engine can be off or running.
- 5) Press ENTER to enter Main Menu . UP /DOWN button to select Diagnostics from the menu.



| View Data | |
|--------------------------------|-----|
| J1850 VPW | X |
| J1850 PWM | X |
| ISO 15765-4 CAN11Bit | X |
| ISO 15765-4 CAN29Bit | X |
| ISO 14230 KWP | X |
| ISO 14230 KWPSBPS | ... |
| ISO 9141-2 | ... |
| Entering system please wait... | |

6) Press ENTER to confirm.

If "LINKING ERROR!" message shows on the display.

- Verify that the ignition is ON;
- Check if the scan tool's OBD II connector is securely connected to the vehicle's DLC;
- Turn the ignition 'off' and wait for about 10 seconds. Turn the ignition back to 'on' and repeat the procedure from step 5.

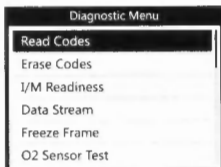
4.1 Read codes

- stored emission-related codes is hard codes which illuminate malfunction indicator lamp(MIL).
- pending codes is current codes or historical codes which will not illuminate malfunction indicator(MIL).

1) Select OBDII in Main Menu and press ENTER , shown as follow :

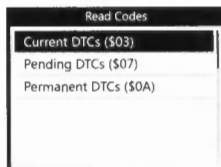
| Monitor Status | |
|-------------------------|-------|
| MIL Status | ON |
| DTCs in this ECU | 3 |
| Readiness Supported | 8 |
| Readiness Completed | 5 |
| Readiness Not Supported | 3 |
| Datastream Supported | 66 |
| Ignition | Spark |
| Protocol Type | VPW |

2) Press ENTER to the Diagnostic Menu, screen will display as follow :

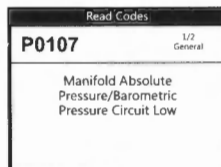


4.2.1 Read Codes

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



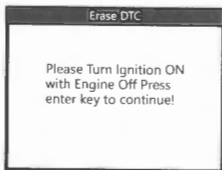
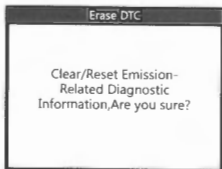
2) According to the above figure to select different item by pressing UP or DOWN and press ENTER to confirm.



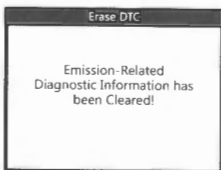
3) After viewing all the codes, you can press EXIT to return to the previous menu.

4.2.2 Erase Codes

- 1) Select Erase Codes, the screen will display the interface as shown below.
Press ENTER to erase DTC's, and the screen will display the interface as shown below:



- 2) According to the above figure to press ENTER and the screen will display the interface as shown on the next page:

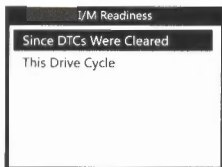


Notes:

- 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 codes using a factory diagnosis guide, then clear the codes and recheck.

4.2.3 I/M Readiness

Select I/M Readiness and press ENTER, the screen will display the interface as shown below:



I/M readiness is to test Misfire / Fuel system / Comprehensive component, You can use UP or DOWN button to select and press ENTER, shown as follow :

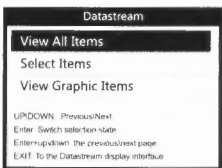
The screenshot shows a black header bar with the text 'I/M Readiness' in white. Below the header is a white rectangular area with a black border. Inside this area, there is a list of components and their readiness status, displayed in black text. The list is as follows:

| | |
|---------------------------------|-----|
| 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 system monitor | INC |

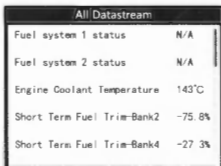
N/A means not available on this vehicle, INC means incomplete or not ready, OK means Completed or Monitor Ok.

4.2.4 Data Stream

Press UP or DOWN 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:



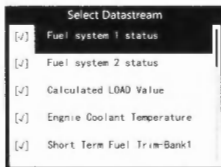
Select [View All Items] and press ENTER button, the screen will display the interface as shown below:



| All Datastream | |
|----------------------------|--------|
| Fuel system 1 status | N/A |
| Fuel system 2 status | N/A |
| Engine Coolant Temperature | 143°C |
| Short Term Fuel Trim-Bank2 | -75.8% |
| Short Term Fuel Trim-Bank4 | -27.3% |

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

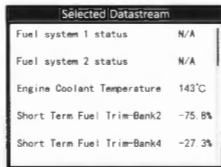
Choose [select items] and press enter button. After that, press enter button again, shown as follow:



| 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.

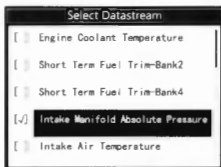
After selected items and press exit, the screen will display as follow:



| Selected Datastream | |
|----------------------------|--------|
| Fuel system 1 status | N/A |
| Fuel system 2 status | N/A |
| Engine Coolant Temperature | 143°C |
| Short Term Fuel Trim-Bank2 | -75.8% |
| Short Term Fuel Trim-Bank4 | -27.3% |

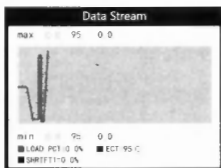
Scroll page, press up to last page, or press down to next page.

Select [View Graphic Items] in Data stream menu and press ENTER, the screen Will display the interface as shown below:



Scroll page, press enter + up, to previous page, press enter + down, the next page. Press enter button again to choose.

Press EXIT to return to display :



Max lines is 3.

Press EXIT to return to previous 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, a snapshot of current vehicle parameter are recorded by the ECU.

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

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

| On-Board Monitoring | |
|--|-------|
| DTC that caused required freeze frame data storage | P2122 |
| Fuel system 1 status | N/A |
| Fuel system 2 status | N/A |
| Calculated LOAD Value | 0.0% |
| Engine Coolant Temperature | 0°C |

You can use UP/ DOWN button to view the data.Press EXIT to return to Diagnostic Menu.

4.2.6 O2 sensor test

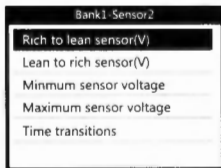
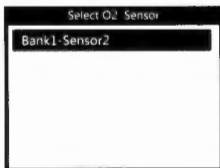
OBD II regulations set by the SAE require that relevant vehicles monitor and test the oxygen (O₂) sensors to identify problems related to fuel efficiency and vehicle emissions. These tests are not on-demand tests and they are done automatically when engine operating conditions are within specified limits. These test results are saved in the on-board computer's memory.

The O2 Sensor 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 Sensor Test function is not supported by vehicles which communicate using a controller area network (CAN). For O2 Sensor Test results of CAN-equipped vehicles, see chapter "On-Board Mon. Test".

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 (Data will be different everytime) :



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 Diagnostic Menu and press ENTER and the screen will display as shown below (Data will be different everytime):

| On-Board Monitoring | |
|---------------------|--|
| Test \$02 Data | |
| Test \$03 Data | |
| Test \$05 Data | |
| Test \$08 Data | |
| Test \$0B Data | |

You can use UP or DOWN button to select an item and press ENTER, the screen will display as shown below (Data will be different everytime):

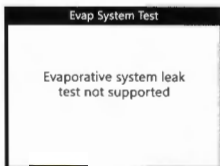
| On-Board Monitoring | |
|---------------------|-------|
| Component ID | \$5e |
| Limit Type | Max |
| Test Value | 33733 |
| Minimum Limit | ----- |
| Status | Pass |

Press EXIT to return to Diagnostic Menu.

4.2.8 EVAP System Test

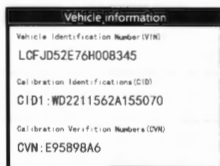
The EVAP test function lets you initiate a leak test for the vehicle's EVAP system. The CReaderVI does not perform the leak test, but signals to vehicle's on-board Computer to initiate the test. Before using the system test function, refer To The vehicle's service repair manual to determine the procedures 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:



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 (different cars will shown different data) :



Press EXIT to return to Diagnostic Menu.

5. Warranty and Service

5.1 Limited One Year Warranty

THIS WARRANTY IS EXPRESSLY LIMITED TO PERSONS WHO PURCHASE ANCEL AD410 PRODUCTS FOR PURPOSES OF RESALE OR USE IN THE ORDINARY COURSE OF THE BUYER'S BUSINESS.

ANCEL AD410 electronic product is warranted against defects in materials and workmanship for one year (12 months) from date of delivery to the user.

This warranty does not cover any part that has been abused, altered, used for a purpose other than for which it was intended, or used in a manner inconsistent with instructions regarding use. The exclusive remedy for any automotive meter found to be defective is repair or replacement, and ANCEL AD410 shall not be liable for any consequential or incidental damages.

5.2 Service Procedures

If you have any questions, please contact your local store distributor.

If it becomes necessary to return the scan tool for repair, contact your local distributor for more information.

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