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SAFETY PRECAUTIONS AND WARNINGS

To prevent personal injury or damage to vehicles and/or the test equipment, please read this user's manual first carefully and observe the following safety precautions at a minimum whenever working on a vehicle:

• There are no user serviceable parts. Have the device serviced by a qualified repair person using only identical replacement parts. This will ensure that the safety of the device is maintained. Disassembling the device will void

the warranty right.

- CAUTION: This tool contains an internal Lithium Polymer battery. The battery can burst or explode, releasing hazardous chemicals. To reduce the risk of fire or burns, do not disassemble, crush, pierce or dispose of the battery in fire or water.

- This product is not a toy. Do not allow children to play with or near this item.

- Do not expose the device to rain or wet conditions.

- Do not place the device on any unstable surface.

- Never leave the device unattended during charging process. The device must be placed on a non-flammable surface during charging.

- Handle the device with care. If the device is dropped, check for breakage and any other conditions that my affect its operation.

- Do not operate the tool in explosive atmospheres, such as in the presence of flammable liquids, gases, or heavy dust.

- Keep the tool dry, clean, free from oil, water or grease. Use a mild detergent on a clean cloth to clean the outside of the device when necessary.

- People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to heart pacemaker could cause pacemaker interference or pacemaker failure.

- 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 work area: 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 P (for A/T) or N (for M/T) 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.

FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

Table of Contents

1. Introduction

This TPMS activation & diagnostic tool is specially developed by LAUNCH, which enables users to trigger TPMS sensor, program TPMS sensor, perform the relearning procedure and check sensor part number. Additionally, it also supports all 10 modes of OBD II test for a complete diagnosis.

With built-in help menus and code definitions, diagnosing and repairing that dreaded Check Engine Light is now easier than ever!

This tool provides the following functions:

TPMS:

• Trigger the TPMS sensor

• Program the TPMS sensor

• Provide TPMS relearning procedures and sensor OE number lookup

OBD diagnosis:

• Read dynamic data streams and MIL

• Read readiness status

• Freeze frame data

• Read DTCs

• Clear DTCs

• O$_2$ sensor test

• On-board monitor test

• Read vehicle information

Moreover, it can be updated via the memory card to keep synchronized with the latest available software version.

Note: This tool may automatically reset while being disturbed by strong static electricity. THIS IS A NORMAL REACTION.

This tool is specially designed to work with all OBD II compliant vehicles, including Controller 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 following:

1. **Vehicle Emissions Control Information (VECI) Label**. It 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 Certified".
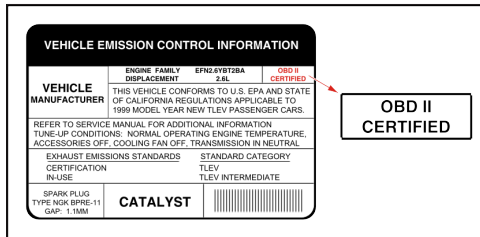
2. Government regulations mandate that all OBD II compliant vehicles **must** have a "common" 16-pin **Data Link Connector (DLC)**.
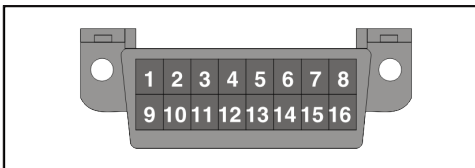
Note: Some 1994 and 1995 vehicles have 16-pin connectors but are not OBD II compliant. Only those vehicles with a Vehicle Emissions Control Label stating "OBD II Certified" are OBD II compliant.

2. General Information-About OBDII/EOBD

2.1 On-Board Diagnostics (OBD) I

📇 Note: With the exception of some 1994 and 1995 vehicles, most vehicles from 1982 to 1995 are equipped with some type of first generation On-Board Diagnostics.

Beginning in 1988, California's Air Resources Board (CARB), and later the Environmental Protection Agency (EPA) required vehicle manufacturers to include a self-diagnostic program in their on-board computers. The program would be capable of identifying emissions-related faults in a system. The first generation of Onboard Diagnostics came to be known as OBD I.

OBD I is a set of self-testing and diagnostic instructions programmed into the vehicle's onboard computer. The programs are specifically designed to detect failures in the sensors, actuators, switches and wiring of the various vehicle emissions-related systems. If the computer detects a failure in any of these components or systems, it lights an indicator on the dashboard to alert the driver. The indicator lights only when an emissions-related problem is detected.

The computer also assigns a numeric code for each specific problem that it detects, and stores these codes in its memory for later retrieval. These codes can be retrieved from the computer's memory with the use of a "Code Reader" or a "Diagnostic Tool."

2.2 On-Board Diagnostics (OBD) II

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".

In addition to performing all the functions of the OBD I System, the OBD II System has been enhanced with new Diagnostic Programs. These programs closely monitor the functions of various emissions-related components and systems (as well as other systems) and make this information readily available (with the proper equipment) to the technician for evaluation.

The California Air Resources Board (CARB) conducted studies on OBD I equipped vehicles. The information that was gathered from these studies

showed the following:

- A large number of vehicles had deteriorating or degraded emissions-related components. These components were causing an increase in emissions.
- Because OBD I systems only detect failed components, the degraded components were not setting codes.
- Some emissions problems related to degraded components only occur when the vehicle is being driven under a load. The emission checks being conducted at the time were not performed under simulated driving conditions. As a result, a significant number of vehicles with degraded components were passing Emissions Tests.
- Codes, code definitions, diagnostic connectors, communication protocols and emissions terminology were different for each manufacturer. This caused confusion for the technicians working on different make and model vehicles.

To address the problems made evident by this study, CARB and the EPA passed new laws and standardization requirements. These laws required that vehicle manufacturers to equip their new vehicles with devices capable of meeting all of the new emissions standards and regulations. It was also decided that an enhanced on-board diagnostic system, capable of addressing all of these problems, was needed. This new system is known as "On-Board Diagnostics Generation Two (OBD II/OBD 2)." The primary objective of the OBD II system is to comply with the latest regulations and emissions standards established by CARB and the EPA.

The Main Objectives of the OBD II System are:

- To detect degraded and/or failed emissions-related components or systems that could cause tailpipe emissions to exceed by 1.5 times the Federal Test Procedure (FTP) standard.
- To expand emissions-related system monitoring. This includes a set of computer run diagnostics called Monitors. Monitors perform diagnostics and testing to verify that all emissions-related components and/or systems are operating correctly and within the manufacturer's specifications.
- To use a standardized Diagnostic Link Connector (DLC) in all vehicles. (Before OBD II, DLCs were of different shapes and sizes.)
- To standardize the code numbers, code definitions and language used to describe faults. (Before OBD II, each vehicle manufacturer used their own code numbers, code definitions and language to describe the same faults.)
- To expand the operation of the Malfunction Indicator Lamp (MIL).

• To standardize communication procedures and protocols between the diagnostic equipment (Diagnostic Tools, Code Readers, etc.) and the vehicle's on-board computer.

2.3 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. **DO NOT** replace parts based only on DTCs without first consulting the vehicle's service manual for proper testing procedures for that particular system, circuit or component.

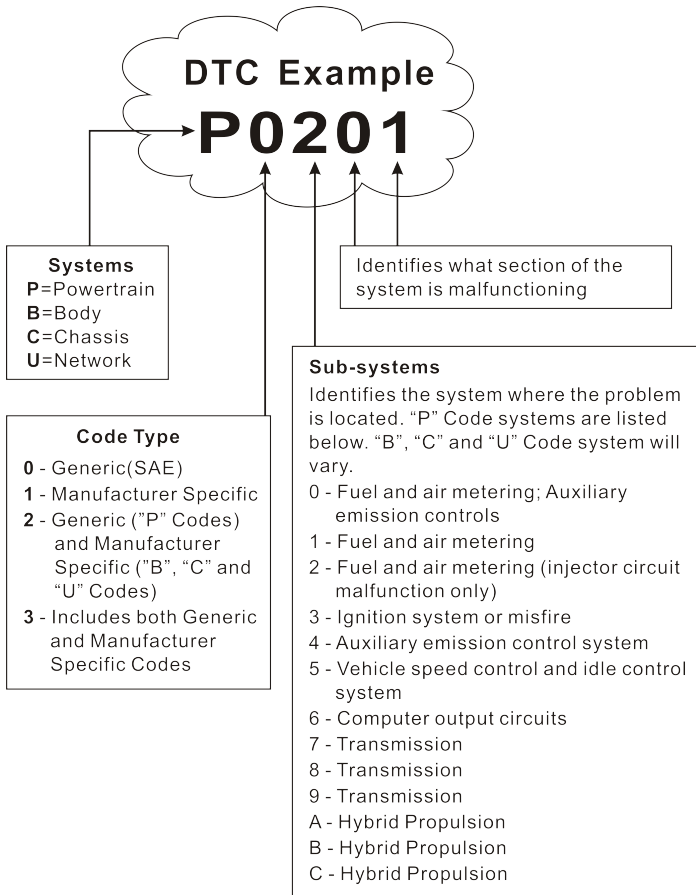OBD II Diagnostic Trouble Codes consist of a five-digit alphanumeric code.

• The 1st character is a **letter** (B, C, P or U). It identifies the "main system" where the fault occurred (Body, Chassis, Powertrain, or Network).

• The 2nd character is a **numeric digit** (0 thru 3). It identifies the "type" of code (Generic or Manufacturer-Specific).

Generic DTCs are codes that are used by all vehicle manufacturers. The standards for generic DTCs, as well as their definitions, are set by the Society of Automotive Engineers (SAE).

Manufacturer-Specific DTCs are codes that are controlled by the vehicle manufacturers. The Federal Government does not require vehicle manufacturers to go beyond the standardized generic DTCs in order to comply with the new OBD II emissions standards. However, manufacturers are free to expand beyond the standardized codes to make their systems easier to diagnose.

• The 3rd character is a letter or a **numeric digit** (0 thru 9, A thru F). It identifies the specific system or sub-system where the problem is located.

• The 4th and 5th characters are **letters** or **numeric digits** (0 thru 9, A thru F). They identify the section of the system that is malfunctioning.

DTC Example
P0201

Systems
P=Powertrain
B=Body
C=Chassis
U=Network

Identifies what section of the system is malfunctioning

Code Type

0 - Generic(SAE)

1 - Manufacturer Specific

2 - Generic ("P" Codes) and Manufacturer Specific ("B", "C" and "U" Codes)

3 - Includes both Generic and Manufacturer Specific Codes

Sub-systems

Identifies the system where the problem is located. "P" Code systems are listed below. "B", "C" and "U" Code system will vary.

0 - Fuel and air metering; Auxiliary emission controls

1 - Fuel and air metering

2 - Fuel and air metering (injector circuit malfunction only)

3 - Ignition system or misfire

4 - Auxiliary emission control system

5 - Vehicle speed control and idle control system

6 - Computer output circuits

7 - Transmission

8 - Transmission

9 - Transmission

A - Hybrid Propulsion

B - Hybrid Propulsion

C - Hybrid Propulsion

P0201 - Injector circuit malfunction, Cylinder 1

2.4 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's side for

most vehicles. If Data Link Connector is not located under dashboard, a label should be there telling location. For some Asian and European vehicles, the DLC is located behind the ashtray and the ashtray must be removed to access the connector. If the DLC cannot be found, refer to the vehicle's service manual for the location.
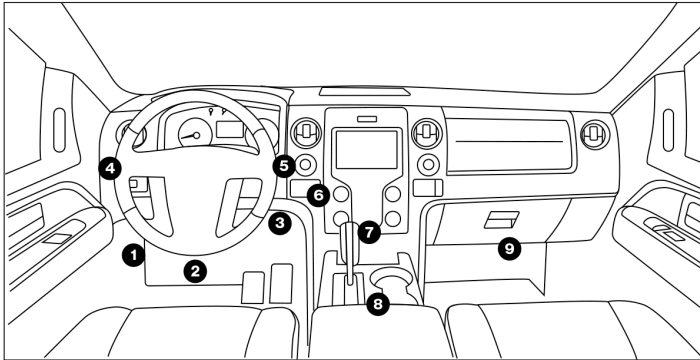
2.5 OBD II Terminology

The following terms and their definitions are related to OBD II systems. Read and reference this list as needed to aid in the understanding of OBD II systems.

Powertrain Control Module (PCM) -- The PCM is the OBD II accepted term for the vehicle's "on-board computer." In addition to controlling the engine management and emissions systems, the PCM also participates in controlling the powertrain (transmission) operation. Most PCMs also have the ability to communicate with other computers on the vehicle (ABS, ride control, body, etc.).

Monitors -- Monitors are "diagnostic routines" programmed into the PCM. The PCM utilizes these programs to run diagnostic tests, and to monitor operation of the vehicle's emissions-related components or systems to ensure they are operating correctly and within the vehicle's manufacturer specifications. Currently, up to fifteen Monitors are used in OBD II systems. Additional Monitors will be added as the OBD II system is further developed.

Note: Not all vehicles support all fifteen Monitors.

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

Trip - A Trip for a particular Monitor requires that the vehicle is being driven in such a way that all the required "Enabling Criteria" for the Monitor to run and complete its diagnostic testing are met. The "Trip Drive Cycle" for a particular Monitor begins when the ignition key is turned "On." It is successfully completed when all the "Enabling Criteria" for the Monitor to run and complete its diagnostic testing are met by the time the ignition key is turned "Off." Since each of the fifteen monitors is designed to run diagnostics and testing on a different part of the engine or emissions system, the "Trip Drive Cycle" needed for each individual Monitor to run and complete varies.

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 service manual.

Note: Do not confuse a "Trip" Drive Cycle with an OBD II Drive Cycle. A "Trip" Drive Cycle provides the "Enabling Criteria" for one specific Monitor to run and complete its diagnostic testing. An OBD II Drive Cycle must meet the "Enabling Criteria" for all Monitors on a particular vehicle to run and complete their diagnostic testing.

Warm-up Cycle - Vehicle operation after an engine off period where engine temperature rises at least 40°F (22°C) from its temperature before starting, and reaches at least 160°F (70°C). The PCM uses warm-up cycles as a counter to automatically erase a specific code and related data from its memory. When no faults related to the original problem are detected within a specified number of warm-up cycles, the code is erased automatically.

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.

2.6 OBD II Monitors

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

Monitor operation is either "Continuous" or "Non-Continuous," depending on the specific monitor.

2.6.1 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 Monitor

This Monitor continuously checks for engine misfires. A misfire occurs when the air-fuel mixture in the cylinder does not ignite. The misfire Monitor uses changes in crankshaft speed to sense an engine misfire. When a cylinder misfires, it no longer contributes to the speed of the engine, and engine speed decreases each time the affected cylinder(s) misfire. The misfire Monitor is designed to sense engine speed fluctuations and determine from which cylinder(s) the misfire is coming, as well as how bad the misfire is.

There are three types of engine misfires, Types 1, 2, and 3.

• Type 1 and Type 3 misfires are two-trip monitor faults. If a fault is sensed on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The MIL is not commanded on at this time. If the fault is found again on the second trip, under similar conditions of engine speed, load and temperature, the computer commands the MIL "On," and the code is saved in its long term memory.

• Type 2 misfires are the most severe type of misfire. When a Type 2 misfire is sensed on the first trip, the computer commands the MIL to light when the misfire is sensed. If the computer determines that a Type 2 misfire is

severe, and may cause catalytic converter damage, it commands the MIL to "flash" once per second as soon as the misfire is sensed. When the misfire is no longer present, the MIL reverts to steady "On" condition.

The Misfire Monitor is supported by both "spark ignition" vehicles and "compression ignition" vehicles.

2. Fuel System Monitor

This Monitor uses a Fuel System Correction program, called Fuel Trim, inside the on-board computer. Fuel Trim is a set of positive and negative values that represent adding or subtracting fuel from the engine. This program is used to correct for a lean (too much air/not enough fuel) or rich (too much fuel/not enough air) air-fuel mixture. The program is designed to add or subtract fuel, as needed, up to a certain percent. If the correction needed is too large and exceeds the time and percent allowed by the program, a fault is indicated by the computer.

The Fuel System Monitor is supported by both "spark ignition" vehicles and "compression ignition" vehicles. The Fuel System Monitor may be a "One-Trip" or "Two-Trip" Monitor, depending on the severity of the problem.

3. Comprehensive Components Monitor (CCM)

This Monitor continuously checks all inputs and outputs from sensors, actuators, switches and other devices that provide a signal to the computer. The Monitor checks for shorts, opens, out of range value, functionality and "rationality* (*See Note*)."

Rationality: Each input signal is compared against all other inputs and against information in the computer's memory to see if it makes sense under the current operating conditions.

Example: The signal from the throttle position sensor indicates the vehicle is in a wide-open throttle condition, but the vehicle is really at idle, and the idle condition is confirmed by the signals from all other sensors. Based on the input data, the computer determines that the signal from the throttle position sensor is not rational (does not make sense when compared to the other inputs). In this case, the signal would fail the rationality test.

The CCM is supported by both "spark ignition" vehicles and "compression ignition" vehicles. The CCM may be either a "One-Trip" or a "Two-Trip" Monitor, depending on the component.

2.6.2 Non-Continuous Monitors

"Non-continuous" Monitors perform and complete their testing once per trip. The "non-continuous" Monitors are:

1. O$_2$ Sensor Monitor

The Oxygen Sensor monitors how much oxygen is in the vehicle's exhaust. It generates a varying voltage of up to one volt, based on how much oxygen is in the exhaust gas, and sends the signal to the computer. The computer uses this signal to make corrections to the air/fuel mixture. If the exhaust gas has a large amount of oxygen (a lean air/fuel mixture), the oxygen sensor generates a "low" voltage signal. If the exhaust gas has very little oxygen (a rich mixture condition), the oxygen sensor generates a "high" voltage signal. A 450mV signal indicates the most efficient, and least polluting, air/fuel ratio of 14.7 parts of air to one part of fuel.

The oxygen sensor must reach a temperature of at least 600-650°F, and the engine must reach normal operating temperature, for the computer to enter into closed-loop operation.

The oxygen sensor only functions when the computer is in closed-loop. A properly operating oxygen sensor reacts quickly to any change in oxygen content in the exhaust stream. A faulty oxygen sensor reacts slowly, or its voltage signal is weak or missing.

The Oxygen Sensor Monitor is supported by "spark ignition" vehicles only. The Oxygen Sensor Monitor is a "Two-Trip" monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.

2. O$_2$ Sensor Heater Monitor

The Oxygen Sensor Heater Monitor tests the operation of the oxygen sensor's heater. There are two modes of operation on a computer-controlled vehicle: "open-loop" and "closed-loop." The vehicle operates in open-loop when the engine is cold, before it reaches normal operating temperature. The vehicle also goes to open-loop mode at other times, such as heavy load and full throttle conditions. When the vehicle is running in open-loop, the oxygen sensor signal is ignored by the computer for air/fuel mixture corrections. Engine efficiency during open-loop operation is very low, and results in the production of more vehicle emissions.

Closed-loop operation is the best condition for both vehicle emissions and

vehicle operation. When the vehicle is operating in closed-loop, the computer uses the oxygen sensor signal for air/fuel mixture corrections.

In order for the computer to enter closed-loop operation, the oxygen sensor must reach a temperature of at least 600°F. The oxygen sensor heater helps the oxygen sensor reach and maintain its minimum operating temperature (600°F) more quickly, to bring the vehicle into closed-loop operation as soon as possible.

The Oxygen Sensor Heater Monitor is supported by "spark ignition" vehicles only. The Oxygen Sensor Heater Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.

3. Catalyst Monitor

The catalytic converter is a device that is installed downstream of the exhaust manifold. It helps to oxidize (burn) the unburned fuel (hydrocarbons) and partially burned fuel (carbon monoxide) left over from the combustion process. To accomplish this, heat and catalyst materials inside the converter react with the exhaust gases to burn the remaining fuel. Some materials inside the catalytic converter also have the ability to store oxygen, and release it as needed to oxidize hydrocarbons and carbon monoxide. In the process, it reduces vehicle emissions by converting the polluting gases into carbon dioxide and water.

The computer checks the efficiency of the catalytic converter by monitoring the oxygen sensors used by the system. One sensor is located before (upstream of) the converter; the other is located after (downstream of) the converter. If the catalytic converter loses its ability to store oxygen, the downstream sensor signal voltage becomes almost the same as the upstream sensor signal. In this case, the monitor fails the test.

The Catalyst Monitor is supported by "spark ignition" vehicles only. The Catalyst Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On" and saves the code in its long-term memory.

4. Heated Catalyst Monitor

Operation of the "heated" catalytic converter is similar to the catalytic

converter. The main difference is that a heater is added to bring the catalytic converter to its operating temperature more quickly. This helps reduce emissions by reducing the converter's down time when the engine is cold. The Heated Catalyst Monitor performs the same diagnostic tests as the catalyst Monitor, and also tests the catalytic converter's heater for proper operation.

The Heated Catalyst Monitor is supported by "spark ignition" vehicles only. This Monitor is also a "Two-Trip" Monitor.

5. EGR (Exhaust Gas Recirculation) System Monitor

The Exhaust Gas Recirculation (EGR) system helps reduce the formation of Oxides of Nitrogen during combustion. Temperatures above 2500°F cause nitrogen and oxygen to combine and form Oxides of Nitrogen in the combustion chamber. To reduce the formation of Oxides of Nitrogen, combustion temperatures must be kept below 2500°F. The EGR system recirculates small amounts of exhaust gas back into the intake manifold, where it is mixed with the incoming air/fuel mixture. This reduces combustion temperatures by up to 500°F. The computer determines when, for how long, and how much exhaust gas is recirculated back to the intake manifold. The EGR Monitor performs EGR system function tests at preset times during vehicle operation.

The EGR Monitor is supported by both "spark ignition" vehicles and "compression ignition" vehicles. The EGR Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.

6. EVAP System Monitor

OBD II vehicles are equipped with a fuel Evaporative system (EVAP) that helps prevent fuel vapors from evaporating into the air. The EVAP system carries fumes from the fuel tank to the engine where they are burned during combustion. The EVAP system may consist of a charcoal canister, fuel tank cap, purge solenoid, vent solenoid, flow monitor, leak detector and connecting tubes, lines and hoses.

Fumes are carried from the fuel tank to the charcoal canister by hoses or tubes. The fumes are stored in the charcoal canister. The computer controls the flow of fuel vapors from the charcoal canister to the engine via a purge solenoid. The computer energizes or deenergizes the purge solenoid (depending on solenoid design). The purge solenoid opens a valve to allow

engine vacuum to draw the fuel vapors from the canister into the engine where the vapors are burned. The EVAP Monitor checks for proper fuel vapor flow to the engine, and pressurizes the system to test for leaks. The computer runs this Monitor once per trip.

The EVAP Monitor is supported by "spark ignition" vehicles only. The EVAP Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the PCM commands the MIL "On," and saves the code in its long-term memory.

7. Secondary Air System Monitor

When a cold engine is first started, it runs in open-loop mode. During open-loop operation, the engine usually runs rich. A vehicle running rich wastes fuel and creates increased emissions, such as carbon monoxide and some hydrocarbons. A Secondary Air System injects air into the exhaust stream to aid catalytic converter operation:

• It supplies the catalytic converter with the oxygen it needs to oxidize the carbon monoxide and hydrocarbons left over from the combustion process during engine warmup.

• The extra oxygen injected into the exhaust stream also helps the catalytic converter reach operating temperature more quickly during warm-up periods. The catalytic converter must heat to operating temperature to work properly.

The Secondary Air System Monitor checks for component integrity and system operation, and tests for faults in the system. The computer runs this Monitor once per trip.

The Secondary Air System Monitor is a "Two-Trip" monitor. If a fault is found on the first trip, the computer temporarily saves this fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.

2.6.3 OBD II Reference Table

The table below lists current OBD II Monitors, and indicates the following for each Monitor:

A. Monitor Type (how often does the Monitor run; Continuous or Once per trip).

B. Number of trips needed, with a fault present, to set a pending DTC.

C. Number of consecutive trips needed, with a fault present, to command the MIL "On" and store a DTC.

D. Number of trips needed, with no faults present, to erase a Pending DTC.

E. Number and type of trips or drive cycles needed, with no faults present, to turn off the MIL.

F. Number of warm-up periods needed to erase the DTC from the computer's memory after the MIL is turned off.

Name of Monitor	A	B	C	D	E	F
CCM	Continuous	1	2	1	3	40
Misfire Monitor (Type 1 and 3)	Continuous	1	2	1	3 - similar conditions	80
Misfire Monitor (Type 2)	Continuous	1	1	1	3 - similar conditions	80
Fuel System Monitor	Continuous	1	1 or 2	1	3 - similar conditions	80
Catalytic Converter Monitor	Once per trip	1	2	1	3 trips	40
O_2 Sensor Monitor	Once per trip	1	2	1	3 trips	40
O_2 Sensor Heater Monitor	Once per trip	1	2	1	3 trips	40
EGR Monitor	Once per trip	1	2	1	3 trips	40
EVAP system Monitor	Once per trip	1	2	1	3 trips	40
Secondary Air System Monitor	Once per trip	1	2	1	3 trips	40

2.7 DTCs and MIL Status

When the vehicle's on-board computer detects a failure in an emissions-related component or system, the computer's internal diagnostic program assigns a diagnostic trouble code (DTC) that points to the system (and subsystem) where the fault was found. The diagnostic program saves the code in the computer's memory. It records a "Freeze Frame" of conditions present when the fault was found, and lights the Malfunction Indicator Lamp (MIL). Some faults require detection for two trips in a row before the MIL is turned on.

Note: The "Malfunction Indicator Lamp" (MIL) is the accepted term used to describe the lamp on the dashboard that lights to warn the driver that an emissions-related fault has been found. Some manufacturers may still call this lamp a "Check Engine" or "Service Engine Soon" light.

There are two types of DTCs used for emissions-related faults: Type "A" and Type "B." Type "A" codes are "One-Trip" codes; Type "B" DTCs are usually Two-Trip DTCs.

When a **Type "A"** DTC is found on the First Trip, the following events take place:

• The computer commands the MIL "On" when the failure is first found.

• If the failure causes a severe misfire that may cause damage to the catalytic converter, the MIL "flashes" **once per second**. The MIL continues to flash as long as the condition exists. If the condition that caused the MIL to flash is no longer present, the MIL will light "steady" On.

• A DTC is saved in the computer's memory for later retrieval.

• A "Freeze Frame" of the conditions present in the engine or emissions system when the MIL was ordered "On" is saved in the computer's memory for later retrieval. This information shows fuel system status (closed loop or open loop), engine load, coolant temperature, fuel trim value, MAP vacuum, engine RPM and DTC priority.

When a **Type "B"** DTC is found on the First Trip, the following events take place:

• The computer sets a Pending DTC, but the MIL is not ordered "On." "Freeze Frame" data may or may not be saved at this time depending on manufacturer. The Pending DTC is saved in the computer's memory for later retrieval.

• If the failure is found on the second consecutive trip, the MIL is ordered "On." "Freeze Frame" data is saved in the computer's memory.

• If the failure is not found on the second Trip, the Pending DTC is erased from the computer's memory.

The MIL will stay lit for both Type "A" and Type "B" codes until one of the following conditions occurs:

• If the conditions that caused the MIL to light are no longer present for the next three trips in a row, the computer automatically turns the MIL "Off" if no other emissions-related faults are present. However, the DTCs remain in the computer's memory as a history code for 40 warm-up cycles (80 warm-up cycles for fuel and misfire faults). The DTCs are automatically erased if the fault that caused them to be set is not detected again during that period.

• Misfire and fuel system faults require three trips with "similar conditions" before the MIL is turned "Off." These are trips where the engine load, RPM and temperature are similar to the conditions present when the fault was first found.

Note: After the MIL has been turned off, DTCs and Freeze Frame data stay in the computer's memory.

• Erasing the DTCs from the computer's memory can also turn off the MIL. If a Diagnostic Tool or Scan Tool is used to erase the codes, Freeze Frame data will also be erased.

3. Product Descriptions

3.1 General Controls
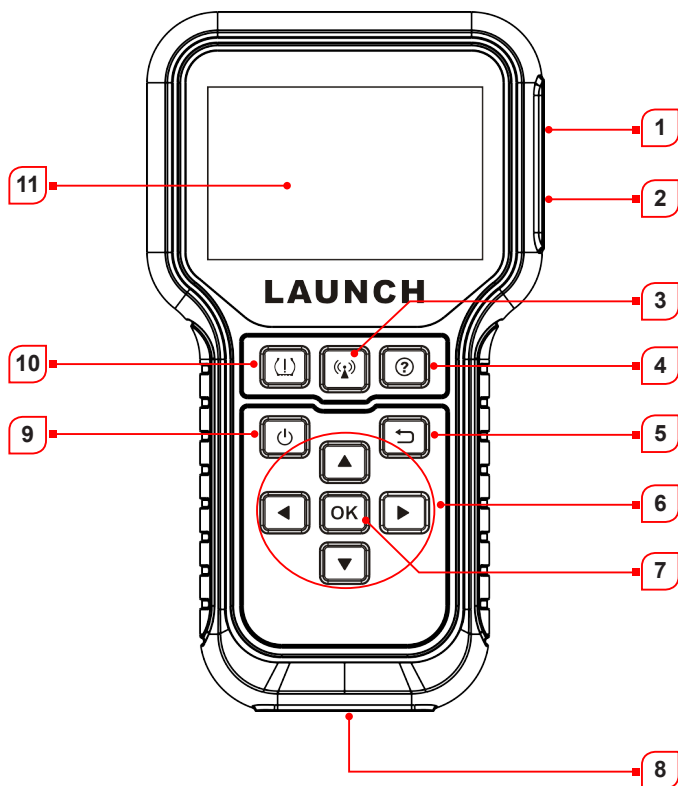
No.	Name	Notes
1	**Charging / Data I/O PORT**	Connects the tool to computer via charging/data cable for upgrade.

2	**MEMORY CARD SLOT**	Insert the memory card into it to read or write the data/file stored in the memory card.
3	((ᵢ)) **BUTTON**	Press it to trigger the vehicle sensor.
4	(?) **BUTTON**	Quick access to Help function.
5	↩ **BUTTON**	Returns to previous menu.
6	▲ **BUTTON**	• When in MENU mode, scroll UP through the menu and submenu line by line. • When in DATA VIEW mode, scroll through the screen data to the PREVIOUS page.
	▶ **BUTTON**	When in MENU/DATA VIEW mode, scroll through the screen to the NEXT page.
	▼ **BUTTON**	• When in MENU mode, scroll DOWN through the menu and submenu line by line. • When in DATA VIEW mode, scroll through the screen data to the NEXT page.
	◀ **BUTTON**	When in MENU/DATA VIEW mode, scroll through the screen to the PREVIOUS page.
7	**OK BUTTON**	Confirms a selection (or action) from a MENU list.
8	**DB-15 DIAGNOSTIC CONNECTOR**	Connects the tool to the vehicle's Data Link Connector (DLC).

9	⏻ **BUTTON**	Press it for about 3 seconds to turn it on.
		• Screen On: Press it once to enter hibernate mode.
		  • If the tool is not charged and there is no operation made for the preset auto power-off interval, it will automatically power off.
		  • If the device is charging and there is no operation made for 5 minutes, it will automatically enter hibernate mode to conserve battery power.
		• Screen Off (hibernate): Press it once to wake it up.
		Press it for about 8 seconds to turn it off.

10	⟨!⟩ **BUTTON**	Quick access to TPMS function.
11	**LCD SCREEN**	Indicates test results.

3.2 Specifications

• Screen: 3.5" LCD display with a resolution of 320*480 pixels
• Input voltage: 9 ~ 18V via OBD diagnostic port / 5V via USB cable
• Operating temperature: 32°F~122°F / 0°C~50°C
• Storage temperature: -4°F~158°F / -20°C ~70°C @ RH60%
• Size: 200*115*35 mm
• Weight: <450g

3.3 Accessories

The following accessory items are only for reference. For different destinations, the accessories may vary. For details, please consult from the local dealers.

1) TPMS Activation & Diagnostic Tool

2) Diagnostic Cable

3) Memory Card

4) Memory Card Adaptor

5) Charging Cable & Power Adaptor

6) User Manual

7) Sensors (Optional)

4. Initial Use

4.1 Charging & Turning On/Off

4.1.1 Charging

There are three methods available for charging the tool.

1. Via AC outlet

Connect one end of the charging cable to the charging port of the tool, and other end to the power adaptor. Plug the power adaptor into a AC outlet to start charging.

When charging is finished the charging complete symbol ⬜ replaces the charging symbol. Unplug the power adaptor from the AC outlet and disconnect the charging cable from the tool.

2. Via Computer

Connect one end of the charging cable to the charging port of the tool, and other end to a USB port on the computer to start charging.

When charging is finished the charging complete symbol ⬜ replaces the charging symbol. Disconnect the charging cable from the tool and the computer.

3. Via OBD Diagnostic Port (Not recommended)

If the tool is properly connected to the vehicle's DLC(Data Link Connector) port, it will be charged automatically.

Note: Attempting to charge the tool via OBD diagnostic port will consume vehicle's battery power. You are not recommended to charge the tool in this way except for OBD diagnosis operations.

4.1.2 Turning On/Off

Press ⏻ for about 3 seconds to turn it on.

Press ⏻ for about 8 seconds to turn it off.

4.2 Main Menu

4.2.1 Function modules

The main menu screen includes the following function modules:
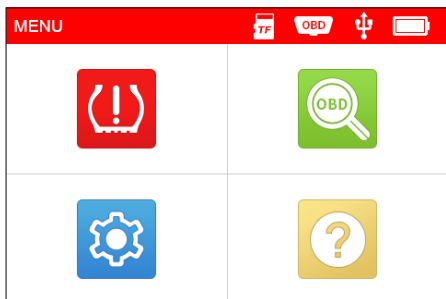
Figure 4-1

Modules	Descriptions
⚠ TPMS	This function allows you to perform the TPMS sensor activation, programming and relearning functions.
OBD	This option presents a quick way to check for DTCs, isolate the cause of the illuminated Malfunction Indicator Lamp (MIL), check monitor status prior to emissions certification testing, verify repairs, and perform a number of other services that are emission-related.
⚙ SETUP	Displays the tool setup menu, which lets you make several adjustments and settings to configure the tool to your particular needs.
? HELP	Helps you have a general knowledge of the DLC location, tool information etc.

4.2.2 Icons & Symbols

The table below lists some possible on-screen icons and symbols and the definitions.

Icon	Descriptions
TF	The memory card is ejected or removed from the memory card slot.
OBD	It appears when the tool is connected to the vehicle's DLC port via the diagnostic cable.
⚡	It appears when the tool is connected to the PC via the charging cable.
▭	Battery level indicator

4.3 Settings ⚙

Select ⚙ on the main menu screen and press [OK], the system will enter the following screen:

TOOL SETUP
Sensor Pressure Units
Sensor Temperature Units
ID Format
Datastream Units
Auto Power Off
Beeper
1/8

Figure 4-2

1) Sensor Pressure Units

Set the air pressure units of the sensors (kPa, PSI or Bar).

2) Sensor Temperature Units

Set the temperature units of the sensors (C° or F°).

3) ID Format

Change the format of the sensor ID display (Auto, Decimal or Hexadecimal).

4) Datastream Units

Set the measurement units of the datastream items (Metric or Imperial).

5) Auto Power Off

This option enables you to set the time to turn off the tool automatically after not being operated.

If the "Disable" option is selected, it will disable this auto power-off function.

6) Beeper

Turn the buzzer to On/Off.

7) Region

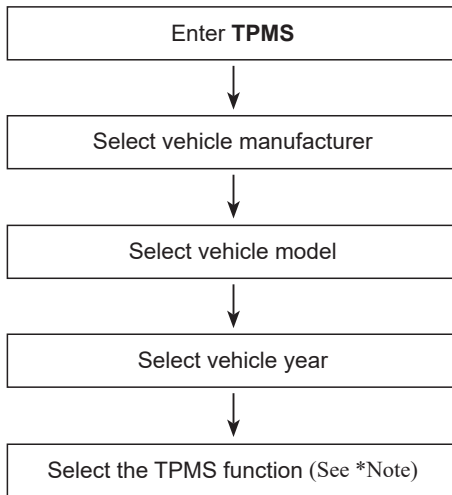Set the desired vehicle region when accessing the TPMS module.

8) Language

Configure the system language of the tool to your preference language.

5. TPMS Operations ⚠️

For initial use, please follow the flow chart below to start using it.

```
┌─────────────────────────────────────┐
│          Enter TPMS                  │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│     Select vehicle manufacturer      │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│        Select vehicle model          │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│         Select vehicle year          │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│  Select the TPMS function (See *Note)│
└─────────────────────────────────────┘
```

📇 Note: For indirect TPMS vehicle, only the Relearning function is supported. For vehicle using Direct TPMS, it generally includes: Activation, Programming and Relearning. The available TPMS functions may vary for different vehicles being serviced.

Take **Mercedes Benz** for example to demonstrate how to perform the TPMS functions.

1. Select ⚠️ on the main menu screen and press the **OK** button to enter the vehicle selection screen.

Vehicle selection (US)
MCLAREN
MERCEDES
MERCURY
MINI
MITSUBISHI
NISSAN
38/58

Figure 5-1 (Select **MERCEDES**)

2. Select **B Class** and press the **OK** button to enter the vehicle year selection screen.

MERCEDES
A Class
AMG GT
B Class
C Class
CL Class
CLA Class
1/28

Figure 5-2 (Select **B Class**)

3. Select **2014~2018** and press the **OK** button to enter the TPMS function selection screen.

```
┌─────────────────────────────────────────┐
│ MERCEDES B Class                         │
├─────────────────────────────────────────┤
│ 2014~2018                                │
├─────────────────────────────────────────┤
│ 2019~2020                                │
│                                          │
│                                          │
│                                          │
│                                          │
├─────────────────────────────────────────┤
│ 1/2                                      │
└─────────────────────────────────────────┘
```

Figure 5-3 (Select **2014~2018**)

4. Select **2014~2018** and press the **OK** button to enter the TPMS function selection screen.

```
┌─────────────────────────────────────────┐
│ MERCEDES B Class 2014~2018               │
├─────────────────────────────────────────┤
│ CHECK SENSOR                             │
├─────────────────────────────────────────┤
│ PROGRAM SENSOR                           │
├─────────────────────────────────────────┤
│ TPMS SERVICE                             │
│                                          │
│                                          │
│                                          │
├─────────────────────────────────────────┤
│ 1/3                                      │
└─────────────────────────────────────────┘
```

Figure 5-4

Note: For indirect TPMS vehicle, only the Learning function is supported. For vehicle using Direct TPMS, it generally includes: Activation, Programming and Relearning. The available TPMS functions may vary for different vehicles being serviced.

5.1 Check Sensor

This function allows users to activate TPMS sensor to view sensor data such as sensor ID, tire pressure, tire frequency, tire temperature and battery condition.

1. Select **CHECK SENSOR** and press the **OK** button to enter the following screen.

MERCEDES B Class 2014~2018

↩ = Exit   📶 = Trigger
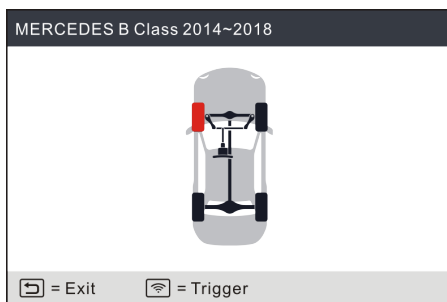
Figure 5-5

2. For universal sensors, place the tool alongside the valve stem, point toward the sensor location, and press the 📶 button.
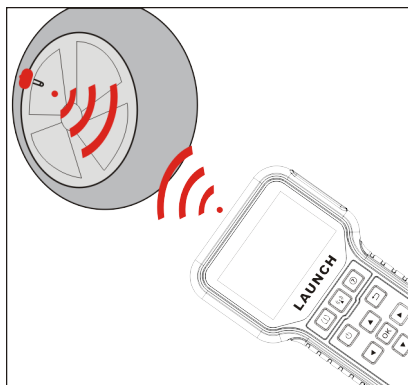

Figure 5-6

Notes:
1. For early magnet-activated sensors, place the magnet over the stem and then place the tool alongside the valve stem.
2. If the TPMS sensor requires tire deflation (of the order of 10PSI), then deflate the tire and place the tool alongside the stem while pressing the 📶 button.

Once the sensor is successfully activated and decoded, the tool will sound a beep and the screen will display the sensor data with a tick ✓.
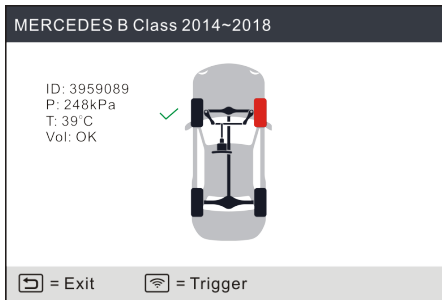
Figure 5-7

📇 Notes:
1. The tool will do TPMS test in a sequence of FL (Front Left), FR (Front Right), RR (Rear Right), LR (Rear Left) and SPARE, if the vehicle has the option for the spare. Or, you can use the ▲ / ▼ / ◀ / ▶ button to move to the desired wheel for testing.
2. If the sensor fails to be triggered, the ✗ icon will appear next to the wheel position.
3. If the sensor data is abnormal, it will be displayed in red.

---

3. Repeat Step 2 for other vehicle sensors. After all sensors are successfully activated, the following screen will appear:
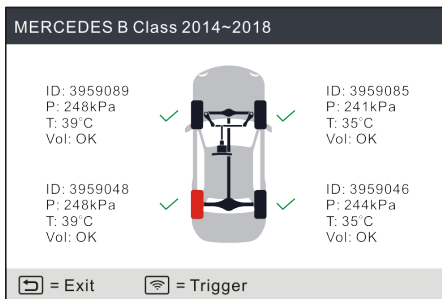
Figure 5-8

*ID: indicates the sensor ID.

*P: indicates the tire pressure.

*T: indicates the tire temperature.

Vol: indicates the battery power level.

Note: The sensor ID format, the measurement units of the tire pressure and temperature can be set to your preference in the ⚙ module.

5.2 Program Sensor

This function allows users to program the sensor data to the LAUNCH-sensor and replace faulty sensor with low battery life or one that is not functioning.

The following options are available for programming LAUNCH-sensor: Auto Create, Manual Create, Copy ID by Activation and Create Multi-sensor (1-8).

Select **PROGRAM SENSOR** and press the **OK** button to enter the following screen.

PROGRAM SENSOR
CREATE SENSOR
MANUAL INPUT
COPY ID BY ACTIVATE
CREATE MULTI-SENSOR (1-8)
1/4
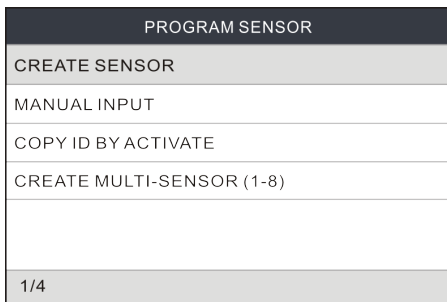
Figure 5-9

5.2.1 Auto create

This function is designed to program the LAUNCH-sensor by applying random IDs created according to the test vehicle when it is unable to obtain the original sensor ID.

Select the wheel which needs to be programmed on the tool, place a LAUNCH-sensor close to the TPMS antenna of the tool, and select **CREATE SENSOR** to create a new random sensor ID.
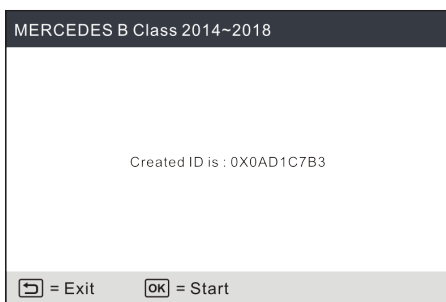
MERCEDES B Class 2014~2018

Created ID is : 0X0AD1C7B3

⮌ = Exit   OK = Start

Figure 5-10

Press the **OK** button to start detecting the sensor and writing the new created sensor ID to the LAUNCH-sensor.

PROGRAM SENSOR

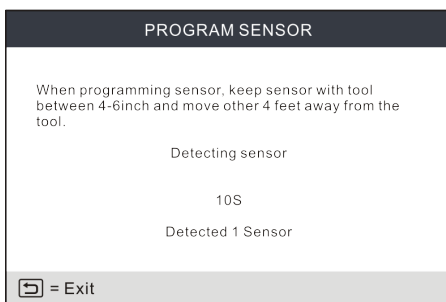When programming sensor, keep sensor with tool between 4-6inch and move other 4 feet away from the tool.

Detecting sensor

10S

Detected 1 Sensor

⮌ = Exit

Figure 5-11

A progress bar will appear on the screen indicating the programming process.

PROGRAM SENSOR

Programming

24%

Detected 1 Sensor

⮌ = Exit
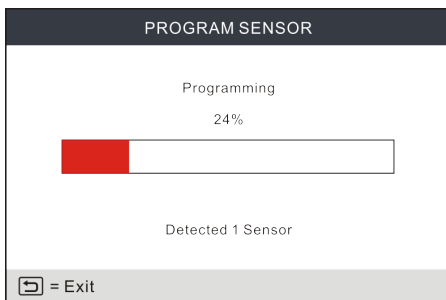
Figure 5-12

Once the sensor is successfully programmed, the following screen will appear.

```
PROGRAM SENSOR


            Programming
              100%


            Successful

 = Exit        OK = Program
```
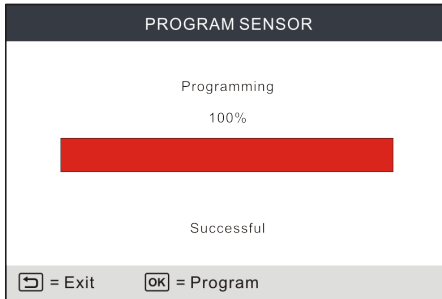
Figure 5-13

Press the ⟵ button to return to the previous screen. Press the **OK** button to continue programming other sensors.

Note:If Auto Create is selected, the TPMS Relearn operation needs to be performed after programming all required LAUNCH-sensor.

5.2.2 Manual input

This function allows users to manually enter sensor ID. Users can enter the random ID or the original sensor ID, if it is available.

Select **MANUAL INPUT** to enter the following screen.

```
MERCEDES B Class 2014~2018


        Please input 8 characters ID

                              (8)

    0   1   2   3   4   5   6   7   8   9
            A   B   C   D   E   F

 = Exit        OK = Select
```
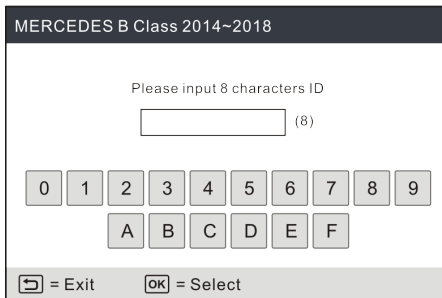
Figure 5-14

Use the on-screen virtual keypad to input a random or original (if available) sensor ID and press **OK**.

```
MERCEDES B Class 2014~2018




                Input ID is : 431A431B




 [↩] = Exit      [OK] = Start
```
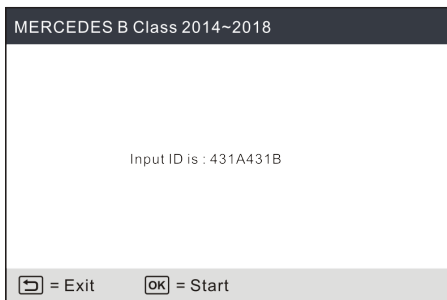
Figure 5-15

Note: Do not enter the same ID for each sensor.

Select the wheel which needs to be programmed on the tool, place a LAUNCH-sensor close to the TPMS antenna of the tool. Press the **OK** button to start writing the new sensor ID to the LAUNCH-sensor.
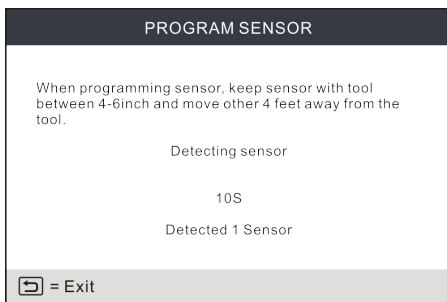
```
              PROGRAM SENSOR

 When programming sensor, keep sensor with tool
 between 4-6inch and move other 4 feet away from the
 tool.

              Detecting sensor

                   10S

            Detected 1 Sensor

 [↩] = Exit
```

Figure 5-16

A progress bar will appear on the screen indicating the programming process.

PROGRAM SENSOR

Programming

24%

Detected 1 Sensor

⮌ = Exit
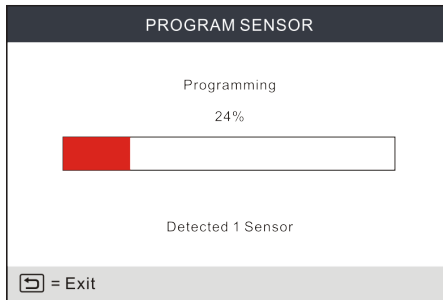
Figure 5-17

After the sensor is successfully programmed, the following screen will appear.

PROGRAM SENSOR

Programming

100%
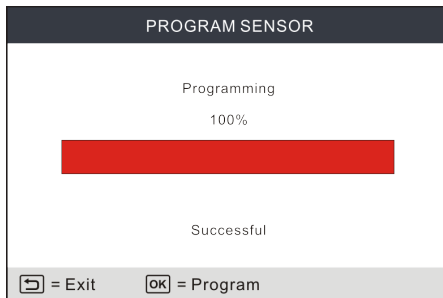
Successful

⮌ = Exit   OK = Program

Figure 5-18

Press the ⮌ button to return to the previous screen. Press the **OK** button to continue programming other sensors.

Notes:
1. If a random ID is entered, please perform the TPMS Relearn function after programming is finished. If the original ID is entered, there is no need to perform Relearn function.
2. If a vehicle does not support relearn function, please select the Manual Input option to enter the original sensor ID manually, or trigger the original sensor at the activation screen to get its information, before programming the LAUNCH-sensor.

5.2.3 Copy ID by activation

This function allows users to write in the retrieved original sensor data to the LAUNCH-sensor. It is used after the original sensor is triggered.

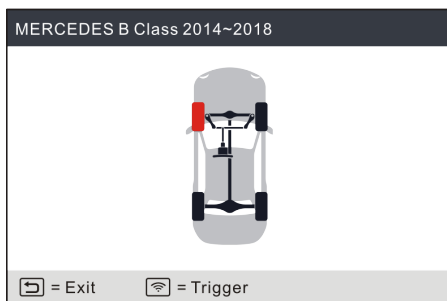Select **COPY ID BY ACTIVATE** and press the **OK** button to enter.

Figure 5-20

Select the specific wheel position and press the 🔊 button to trigger the original sensor. After the information is retrieved, it will be displayed on the screen.
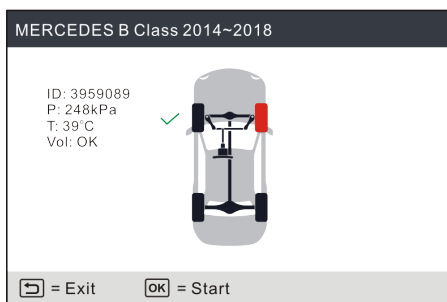

Figure 5-21
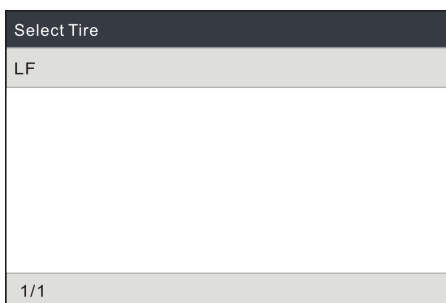
Press the **OK** button to continue.

Select Tire
LF
1/1

Figure 5-22

Select the specific wheel position and press the **OK** button to create a sensor ID.

MERCEDES B Class 2014~2018
ID = 0X2C4DF597
⮌ = Exit   OK = Start
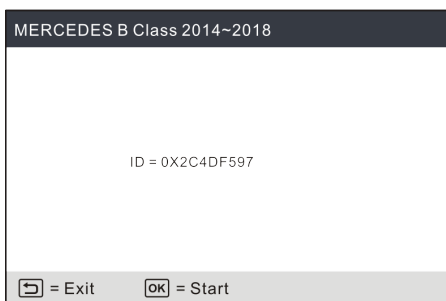
Figure 5-23

Press the **OK** button to start writing the new sensor ID to the LAUNCH-sensor.

PROGRAM SENSOR
When programming sensor, keep sensor with tool between 4-6inch and move other 4 feet away from the tool.
Detecting sensor
10S
Detected 1 Sensor
⮌ = Exit
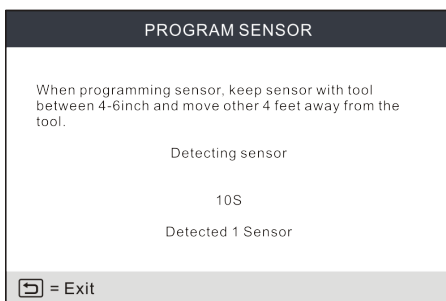
Figure 5-24

After the sensor is successfully programmed, the following screen will appear.

```
PROGRAM SENSOR

          Programming
            100%


          Successful

⮐ = Exit      OK = Program
```
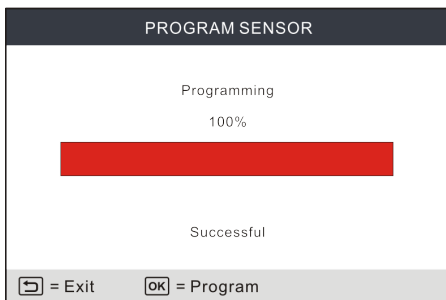
Figure 5-25

Press the ⮐ button to return to the previous screen. Press the **OK** button to continue programming other sensors.

5.2.4 Program multi-sensor

This function allows users to program multiple sensors simultaneously. Up to 8 sensors can be programmed at the same time.

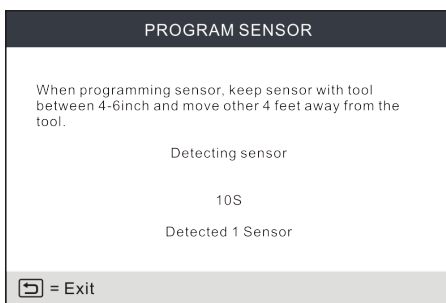Stack up multiple sensors, select **CREATE MULTI-SENSOR (1-8)** to start programming.

```
PROGRAM SENSOR

When programming sensor, keep sensor with tool
between 4-6inch and move other 4 feet away from the
tool.

          Detecting sensor

            10S

        Detected 1 Sensor

⮐ = Exit
```

Figure 5-26

After the sensors were successfully programmed, the following screen will appear.
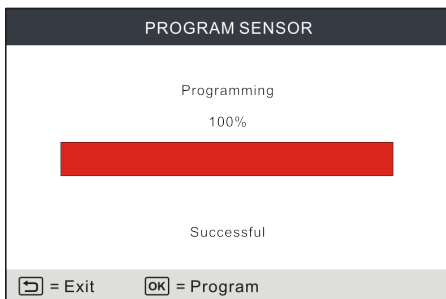
Figure 5-27

Press the ⬅ button to return to the previous screen. Press the **OK** button to continue programming other sensors.

5.3 TPMS Service

This function includes two modules: Relearn Procedure and Part Number Lookup.

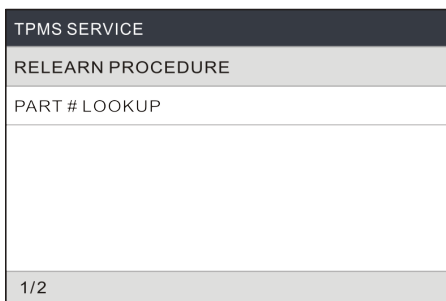Select **TPMS SERVICE** and press the **OK** button to enter the following screen.

Figure 5-28

5.3.1 Relearn procedure

This function allows you to check and view the detailed TPMS sensor relearn procedures.

Relearn operation applies only when the newly programmed sensor IDs are different from the original sensor IDs stored in the vehicle's ECU. Relearn is

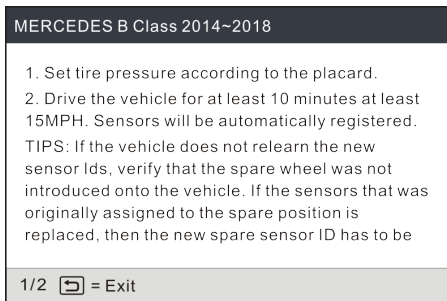used to write the newly programmed sensor IDs into the vehicle's ECU for sensor recognition.

```
MERCEDES B Class 2014~2018

1. Set tire pressure according to the placard.
2. Drive the vehicle for at least 10 minutes at least
15MPH. Sensors will be automatically registered.
TIPS: If the vehicle does not relearn the new
sensor Ids, verify that the spare wheel was not
introduced onto the vehicle. If the sensors that was
originally assigned to the spare position is
replaced, then the new spare sensor ID has to be

1/2   �   = Exit
```

Figure 5-29

5.3.2 Part number lookup

This function allows you to check the OE number of the sensors.

6. OBD Diagnosing

This option presents a quick way to check for DTCs, isolate the cause of the illuminated Malfunction Indicator Lamp (MIL), check monitor status prior to emissions certification testing, verify repairs, and perform a number of other services that are emission-related.
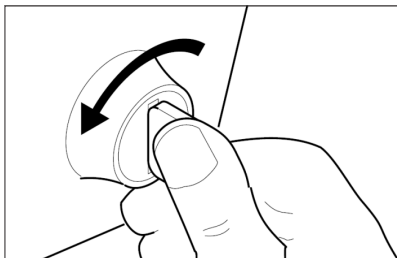
6.1 Connection

1). Turn the ignition off.

Figure 6-1

2). Locate the vehicle's 16-pin Data Link Connector (DLC). Refer to Chapter 2.4.

3). Plug one end of the diagnostic cable into the vehicle's DLC(Data Link Connector) port, and the other end to the DB-15 diagnostic connector of the tool, and then tighten the captive screws.
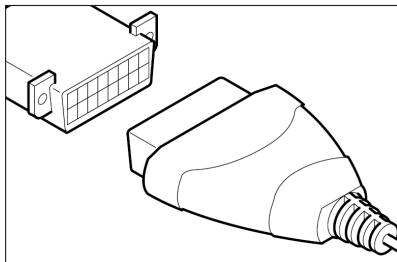

Figure 6-2

📇 Notes:

- A plastic DLC cover may be found for some vehicles and you need to remove it before plugging the diagnostic cable.

- The cable connector is keyed and will only fit one way. If you have problems connecting the cable connector to the DLC, rotate the connector 180° and try again.

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

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

5). The system automatically turns on and navigates to the main menu screen.

6.2 Start OBD Diagnostics

After the tool is properly connected to the vehicle's DLC, select 🔍 on the main menu screen and press **OK**. The tool will automatically start a check of the vehicle's computer to determine which type of communication protocol it is using. When the tool identifies the computer's communication protocol, a communication link is established and then the screen will display the Monitor Status.

📇 Note: A PROTOCOL is a set of rules and procedures for regulating data transmission between computers, and between testing equipment and computers. Now five different types of protocols (ISO 9141, Keyword 2000, J1850 PWM, J1850 VPW and CAN) are in use by vehicle manufacturers.

Monitor Status	
MIL Status	OFF
DTCs in this ECU	108
Readiness Completed	5
Readiness Not Completed	2
Readiness Not Supported	3
Datastream Supported	119
Ignition	Spark
Protocol Type	CAN
OK	

Figure 6-3

Press **OK**, the following screen will appear:

Diagnostic Menu
Read Codes
Erase Codes
I/M Readiness
Data Stream
Freeze Frame
O2 Sensor Test
1/9

Figure 6-4

It mainly includes the following functions:

1. Read Codes

This function allows you to view the Diagnostic Trouble Codes (DTCs) retrieved from the vehicle's on-board computer.

Note: Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed testing instructions.

Select **Read Codes** from the Diagnostic Menu and press **OK**. The system will

automatically read the SAE-standard DTCs and a screen similar to Figure 6-5 will appear.
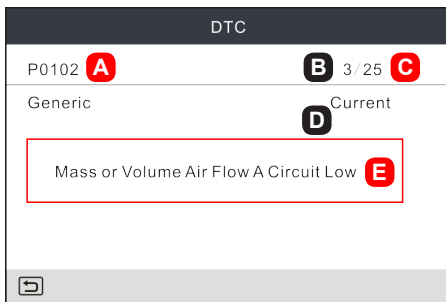

Figure 6-5

In Figure 6-3,

- **A - DTC**: Displays the Diagnostic Trouble Code (DTC) number. Each fault is assigned a code number that is specific to that fault.
- **B - Code Number Sequence**: The tool assigns a sequence number to each DTC that is present in the computer's memory, starting with "1." This number indicates which code is currently displayed.
- **C - Code Enumerator**: Indicates the total number of codes retrieved from the vehicle's computer.
- **D - Code Type**: Indicates the type of code being displayed: Generic Current, Generic Pending, Generic Permanent, etc.

  Pending DTC: A code recorded on the "first trip" for a "two-trip" code. If the fault that caused the code to be set is not detected on the second trip, the code is automatically erased.

  Permanent DTC: It indicates there is a problem in one or more of the vehicle's systems. In this case, the Malfunction Indicator ("Check Engine") lamp on the vehicle's instrument panel will light steady on.

- **E - Test Data Display Area**: Displays DTC definitions.

If more than one DTC was retrieved, press ◀ / ▶ to view different DTCs.

In the case of long code definitions, use ▲ / ▼ to view the additional information.

After viewing all the codes, press ↩ to return to Diagnostic Menu.

Note: In case the diagnostic codes are manufacturer-specific, users need to select the manufacturer manually and the following prompt message will appear on the screen.
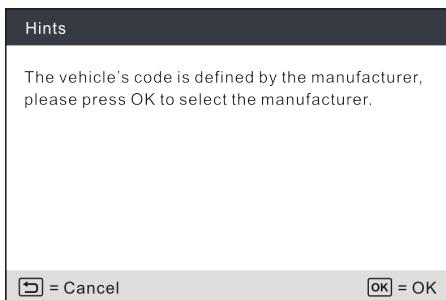
```
Hints

The vehicle's code is defined by the manufacturer,
please press OK to select the manufacturer.




= Cancel                                    OK = OK
```

Figure 6-6

Press **OK** to enter to select the manufacturer. Figure 6-7 will be shown on the screen.

```
Diagnostic Menu

FORD

GM

CHRYSLER

BENZ

BMW

VW

1/28
```
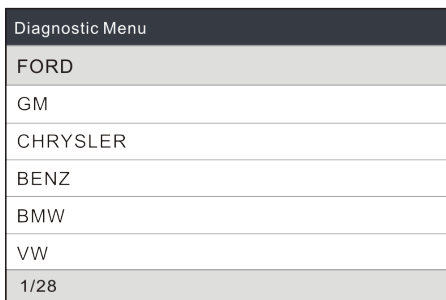
Figure 6-7

Press ▲ / ▼ to select different manufacturer; press the ◄ / ► button to turn to next or previous page. After selecting the desired one, press **OK** to confirm.

• If some DTCs are found, the screen will display the DTCs (Refer to Figure 6-5).

• If the DTC can not be found, a screen similar to the following figure will appear:
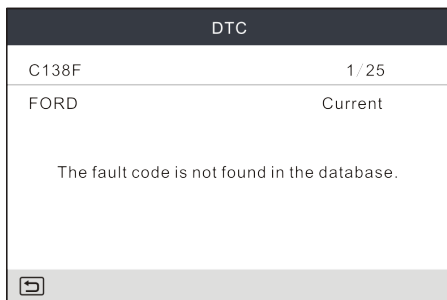
DTC	
C138F	1/25
FORD	Current
The fault code is not found in the database.	
⏏	

Figure 6-8

2. Erase Codes

📇 Note: When this function is used to erase DTCs from the vehicle's on-board computer, "Freeze Frame" data is erased and "Permanent" DTCs ARE NOT erased.

If you plan to take the vehicle to a Service Center for repair, **DO NOT** erase the codes from the vehicle's computer. If data is erased, valuable information that might help the technician troubleshoot the problem will also be erased.

After reading the retrieved codes from the vehicle and certain repairs have been carried out, you can use this function to erase the codes from the vehicle. Before performing this function, please be sure the vehicle's ignition key is in the ON position with the engine off.

Select **Erase Codes** from the Diagnostic Menu and press **OK**, the following screen will appear:
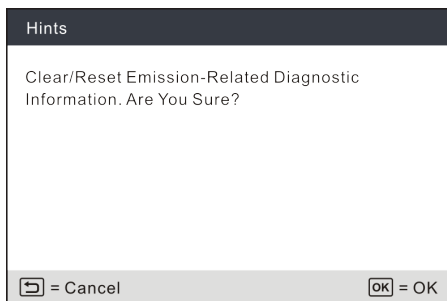
Hints	
Clear/Reset Emission-Related Diagnostic Information. Are You Sure?	
⏏ = Cancel	OK = OK

Figure 6-9

Press **OK** to erase DTCs, and the following screen will appear:

```
┌─────────────────────────────────────────┐
│ Hints                                    │
├─────────────────────────────────────────┤
│                                          │
│  Please Turn Ignition On with Engine Off,│
│  Press OK Key to Continue!               │
│                                          │
│                                          │
│                                          │
│                                          │
│                                          │
│  ⟲ = Cancel                   OK = OK    │
└─────────────────────────────────────────┘
```
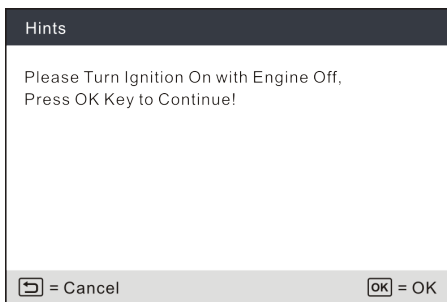
Figure 6-10

Follow the on-screen prompts to turn the ignition on with engine off, press **OK** to clear the DTCs.

📋 Note: When data is erased from the vehicle's computer memory, the I/M Readiness Monitor Status program resets the status of all Monitors to a "Not Completed" status. To set all of the Monitors to a "Completed" status, an OBD II Drive Cycle must be performed. Refer to your vehicle's service manual for information on how to perform an OBD II Drive Cycle for the vehicle under test.

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.

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 vehicle's Monitors have run and completed their diagnosis and testing, and which ones have not yet run and completed testing and diagnosis of their designated sections of the vehicle's emissions system.

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** from the Diagnostic Menu and press **OK**, the screen will display the I/M readiness result.

I/M Readiness	
Misfire monitor	N/A
Fuel system monitor	OK
Comprehensive component monitor	INC
Catalyst monitor	N/A
Heated catalyst monitor	INC
Evaporative system monitor	OK
1~6/10 ⤺	

Figure 6-11

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

Press ⤺ to return to Diagnostic Menu.

4. Data Stream

This option retrieves and displays live data and parameters from the vehicle's ECU.

Select **Data Stream** from the Diagnostic Menu and press **OK**, the following screen will appear.

Datastream
View All Items
Select Items
View Graphic Items
1/3

Figure 6-12

- Select **View All Items** and press **OK**, the screen will display the dynamic data of all data stream items:

Datastream	
Fuel system 1 status	—
Fuel system 2 status	---
Calculated LOAD Value	52.9%
Engine Coolant Temperature	54°C
Short Term Fuel Trim - Bank 1	-44.5°C
1~5/87 ⤺	

Figure 6-13

Press the ◀ / ▶ button to turn page to view other data streams.

Press ⤺ to return to Diagnostic Menu.

- Select **Select Items** in Data stream menu and press **OK**, the following screen will appear:

Select Datastream	
[ ]	All Datastream of Page
[ ]	Fuel system 1 status
[ ]	Fuel system 2 status
[ ]	Calculted LOAD Value
1~5/87 OK = Select ⤺ = Confirm	

Figure 6-14

Press the ▲ / ▼ button to check data stream items, and press the ◀ / ▶ button to turn page.

After selecting items, press ⤺, the screen will display the selected data stream items.

To select all data stream of the current page, check the option "All Datastream of Page" and press **OK**, √ will appear before all items. To deselect all, just press **OK** again.

- If **View Graphic Items** is selected in Data stream menu and press **OK** to enter the graphic items selection screen.

Press the ▲ / ▼ button to select single data stream items, and press **OK** button, the screen will display the selected items of live graphic data.

Press ↰ to return to Diagnostic Menu..

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.

6. O$_2$ sensor test

OBD II regulations require that applicable vehicles monitor and test operation of the oxygen (O$_2$) sensors to identify problems that can affect fuel efficiency and vehicle emissions. These tests are performed automatically when engine operating conditions are within predefined limits. Results of these tests are stored in the on-board computer's memory.

The O$_2$ Sensor Test function lets you retrieve and view O$_2$ sensor monitor test results for the most recently completed tests from your vehicle's on-board computer.

7. On-board monitor test

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

8. EVAP System Test

The EVAP test function lets you initiate a leak test for the vehicle's EVAP system. This tool does not perform the leak test, but signals to vehicle's on-board computer to initiate the test. The vehicle manufacturer determines the criteria and method for stopping the test once it has been started. Before using the system test function, refer to the vehicle's service repair manual to determine the procedures necessary to stop the test.

9. Vehicle Info

Select **Vehicle Info** from the Diagnostic Menu and press **OK**, the tool will

retrieve a list of information (provided by the vehicle manufacturer) from the vehicle's on-board computer. This information may include:

- **VIN** (Vehicle identification Number). It is applicable to model year 2000 and newer OBD II-compliant vehicles.

- **CID** (Calibration ID). These IDs uniquely identify the software version(s) for the vehicle's control module(s).

- **CVN** (Calibration Verification Number). CVNs are used to determine if emission-related calibrations for the vehicle under test have been changed. One or more CVNs may be returned by the vehicle's computer.

7. Help

This menu enables you to view device information and OBD introduction.

On the main menu screen, select and press **OK** to enter the following screen.

HELP
DLC Location Information
Tool Information
Library version
Software update guide
2/4

Figure 7-1

7.1 DLC Location Information

This option helps you to find the location of the vehicle's DLC.

7.2 Tool Information

In Figure 7-1, select **Tool Information** and press **OK** to view the related information of the tool.

Tool Information	
Boot version	V1.01
Display program version:	V02.32
Diagnostic program version:	V11.22
Diagnostic library version:	V11.22
Serial Number:	964890000012
Register Code:	2F1D39363831
2/4	

Figure 7-2

Note: You are strongly recommended to note down the Serial Number and Register Code in Figure 7-2 since these 2 pieces of information are required while registering your tool.

Press ↰ to return to the previous screen.

7.3 Library Version

This option allows you to view the database and relearn procedure version.

7.4 Software Update Guide

This option introduces brief operation steps on how to update the diagnostic software.

8. Register & Update

Prerequisite conditions:

1. Go to http://www.x431.com/CRT511 to download the update tool and install it on the computer.

2. System requirements: Windows XP, 7, 8 or Windows 10.

The tool can be updated via memory card.

1. Note down the Serial Number and Register code.

1). Connect one end of the USB cable to your tool, and the other end on the computer.

2). After the tool has powered up and entered the main menu screen, move the highlight bar on the ⑦ icon and press **OK**.

HELP
DLC Location Information
Tool Information
Library version
Software update guide
2/4

Figure 8-1

3). Highlight the **Tool Information** and press **OK**.

Tool Information	
Boot version	V1.01
Display program version:	V02.32
Diagnostic program version:	V11.22
Diagnostic library version:	V11.22
Serial Number:	964890000012
Register Code:	2F1D39363831
2/4	

Figure 8-2

4). Write down the Serial Number and Register code for later use.

2. Register the scanner on the update tool .

⚠ For better experience, it is recommended to register and upgrade the tool first. But if not, the tool can also be used normally.

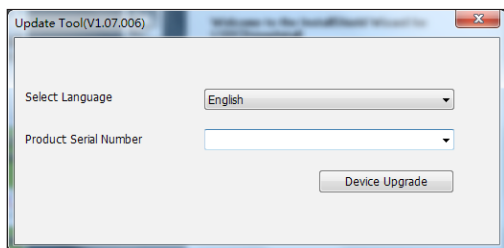1). Launch the update tool, the following screen will appear:

Figure 8-3

2). Select the target language and enter the Serial Number, click **Device Upgrade**, the following screen will appear.
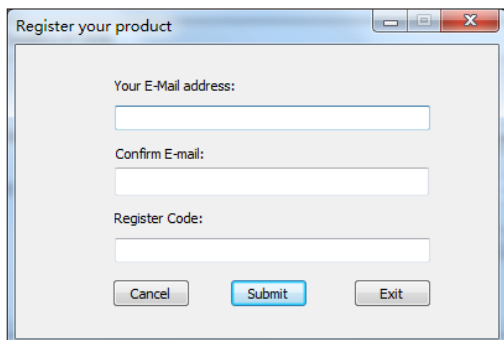
Figure 8-4

3). Enter the required E-mail address and Register Code, click **Submit** to finish the sign-up.

⧉ Note: For initial update, user needs to go through a registration process. Once you finished it, the registration screen will not appear again each time you click the **Device Upgrade** button in the future.

3. Copy the update package into the memory card.

1). Install the memory card from the tool into the supplied memory card adaptor and insert it into the USB port of the computer.

2). Reopen the update tool, select the updates you would like to perform or click **Select All**, and then click **Download** to start downloading the update package into the memory card.

4. Reinsert the memory card into the tool and start update.

1).Once all steps are complete, reinsert the memory card into the tool and power up the tool via USB cable.

2). The tool starts verifying the consistence of the local files with the files in the memory card. If difference exists, the tool will automatically start updating and a green update progress bar will appear on the bottom of the screen. Be patient to wait until the update is completely finished.

9. FAQ

Here we list some frequently asked questions and answers relating to this tool.

Question: System halts when reading data stream. What is the reason?

Answer: It may be caused by a slackened connector. Please turn off the tool, firmly connect the connector, and switch it on again.

Question: What to do when encountering screen flickering or font damage during use?

Answer: This bug can be fixed ONLY by doing the following:

1. Keep the memory card inserted into the tool and then connect the tool to the PC via USB cable.
2. The system will automatically upgrade the firmware and then reboot.

 Note: Although the tool can get power from vehicle's OBD II port via the diagnostic cable, it only allows users to perform vehicle diagnostics. It does not apply to software update or firmware fix operation.

Do not attempt to connect the tool to the vehicle's OBD II port to fix this bug.

Question: Screen of main unit flashes at engine ignition start.

Answer: Caused by electromagnetic disturbing, and this is normal phenomenon.

Question: There is no response when communicating with on-board computer.

Answer: Please confirm the proper voltage of power supply and check if the throttle has been closed, the transmission is in the neutral position, and the water is in proper temperature.

Question: Why are there so many fault codes?

Answer: Usually, it's caused by poor connection or fault circuit grounding.

Question: What to do if the tool fails to boot up?

Answer: Please connect the tool to the USB port of a computer to fix the firmware.

Warranty

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

LAUNCH 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 LAUNCH shall not be liable for any consequential or incidental damages.

Final determination of defects shall be made by LAUNCH in accordance with procedures established by LAUNCH. No agent, employee, or representative of LAUNCH has any authority to bind LAUNCH to any affirmation, representation, or warranty concerning LAUNCH automotive meters, except as stated herein.

Order Information

Replaceable and optional parts can be ordered directly from your LAUNCH authorized tool supplier. Your order should include the following information:

1. Quantity
2. Part number
3. Item description

Customer Service

If you have any questions on the operation of the unit, please contact local dealer, or contact LAUNCH TECH. CO., LTD: