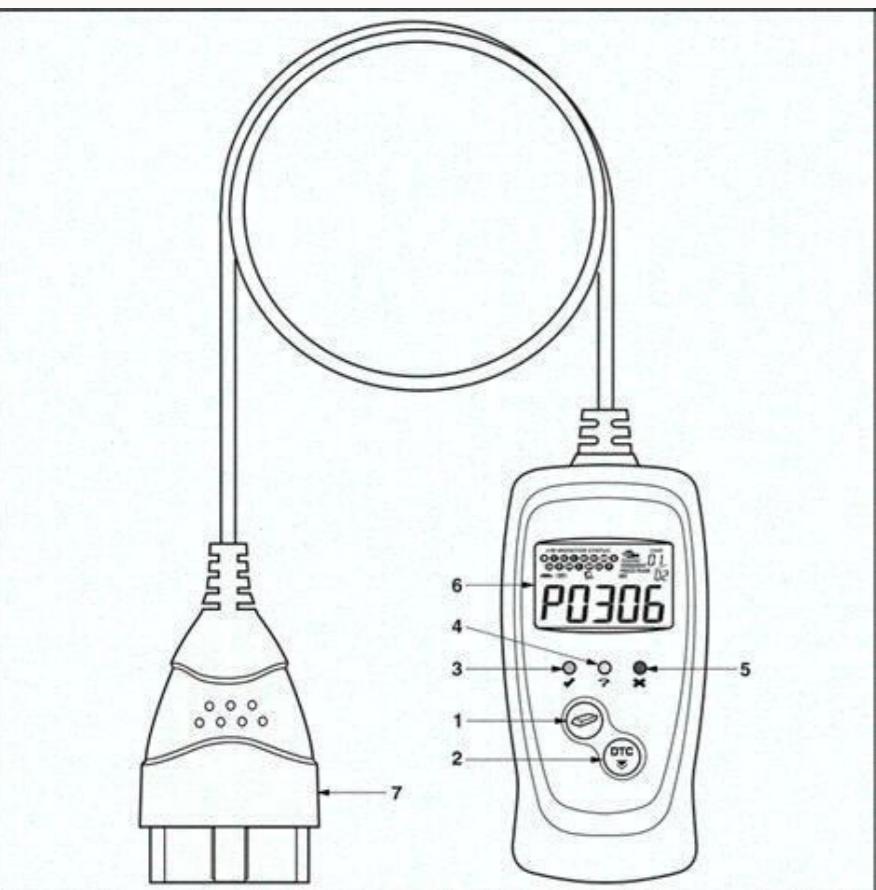


I am not a robot!

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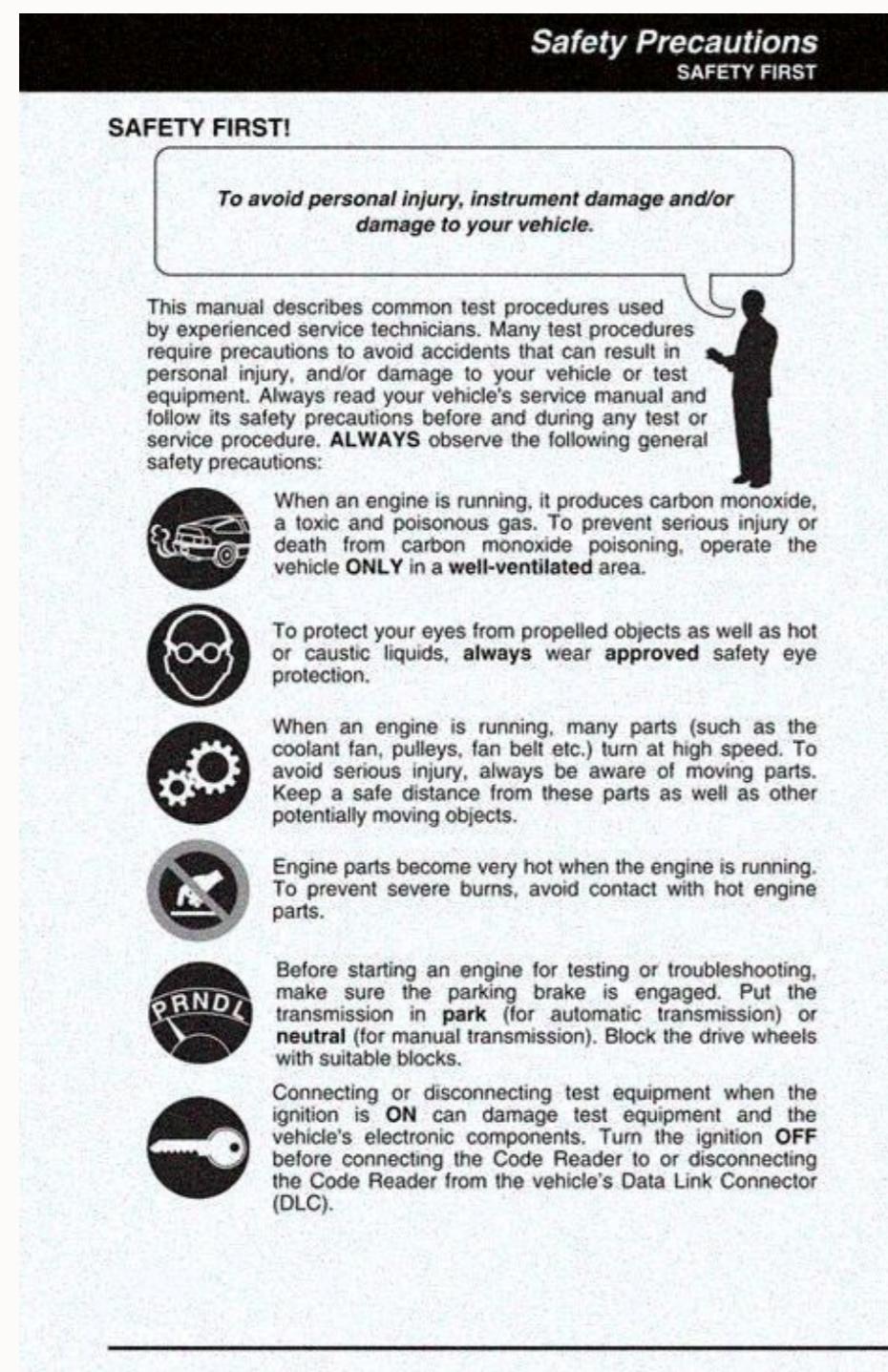
INNOVA 3020b - CanOBD2 Diagnostic Tool User Guide: Easy to Use, View, and Define. Connect the Code Reader to your vehicle's test connector. Turn the ignition key "On," but don't start the engine. The tool will automatically link to the vehicle's computer. This process is easy and straightforward. The code reader displays stored codes, I/M Monitor Status, and Vehicle Health Status on its LCD screen. LED indicators provide additional information. For detailed fault code definitions, visit www.innova.com or the manufacturer's website. Safety Precautions: Prioritize Safety! This guide describes common test procedures used by experienced technicians. Many procedures require precautions to avoid accidents that can cause personal injury or damage to your vehicle or equipment. Always read your vehicle's service manual and follow its safety guidelines before starting any test or service procedure.



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* Engage the parking brake before starting the engine for testing or troubleshooting. * Disconnect test equipment while the ignition is off to avoid damaging equipment or components. VEHICLES COVERED: The Code Reader supports all OBD2 compliant vehicles. This includes all Domestic, Asian, and European vehicles from 1996 onwards. Some 1994 and 1995 vehicles are also OBD2 compliant.



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The required Data Link Connector (DLC) is usually found under the dashboard, accessible from outside with the door open. Consult the service manual if unsure. 1. ERASE button: Resets Diagnostic Trouble Codes (DTCs) and "Freeze Frame" data. 2. button: Scrolls LCD display for multiple DTCs. 3. GREEN LED: Indicates normal engine function with no issues. 4. YELLOW LED: Signals possible problem with pending DTC or incomplete monitor testing. 5. RED LED: Indicates system problem(s) with present DTC(s). 6. LCD Display: Displays test results, Code Reader functions, and Monitor status information. 1. Vehicle icon: Indicates proper power connection through the vehicle's DLC connector. 2. Link icon: Confirms communication between Code Reader and vehicle computer. 3. Computer icon: Indicates link to personal computer via USB cable (purchased separately). 4. DTC Display Area: Displays Diagnostic Trouble Code numbers for specific faults. 5. MIL icon: Signals status of Malfunction Indicator ("Check Engine") lamp on the instrument panel. Please note that the original text contained figures (1 and 2) which are not included in this paraphrased version. The Indicator Lamp (MIL) is a vital component of a vehicle's dashboard, alerting drivers to potential issues through various icons. The MIL icon only appears when a Diagnostic Trouble Code (DTC) has triggered the lamp. There are three main types of icons: * Pending icon: Signals that the displayed DTC is pending. * Permanent icon: Indicates that the displayed DTC is permanent. * Freeze Frame icon: Signals that the vehicle's computer has stored data related to the displayed DTC. Additionally, there are four other icons: * ABS icon: Indicates that the displayed DTC is related to the Anti-Lock Braking System (ABS). * Code Number Sequence: A sequence number assigned by the Code Reader to each DTC in the vehicle's computer, starting from "01." * Code Enumerator: Displays the total number of codes retrieved from the vehicle's computer. * Monitor icons: Indicates which Monitors are supported by the vehicle and whether they have completed diagnostic testing. Solid icons indicate completed tests, while flashing icons indicate pending tests. These icons play a crucial role in ensuring that vehicles comply with emissions and fuel efficiency standards set by state and federal governments. The increased air pollution in large cities led to stricter regulations, prompting vehicle manufacturers to develop more efficient engine controls. This resulted in the creation of Onboard Diagnostics Electronic Computer Control Systems, which enable compliance with these regulations. Modern vehicle systems require instantaneous responses to optimize performance, fuel efficiency, and emissions. To achieve this, Computer Control Systems calculate the ideal air/fuel mixture and ignition timing for various driving conditions without compromising vehicle performance or fuel economy. By switching from mechanical to electronic controls, manufacturers can precisely control fuel delivery and spark timing. The on-board computer is the core component of these systems, containing pre-programmed values for different driving scenarios, such as idle, low-speed, high-speed, and varying loads. These values represent the optimal air/fuel mixture, spark timing, transmission gear selection, and other parameters for each condition. The computer compares sensor data from throughout the engine with its preset reference values and makes adjustments to ensure perfect matching. Sensors and switches provide input signals representing current engine conditions, while actuators perform actions in response to computer commands. The on-board computer continuously monitors and adjusts various engine parameters, including coolant temperature, engine speed, load, throttle position, air/fuel ratio, and more, to maintain optimal operating conditions and ensure precise control over fuel injectors, idle air control, EGR valve, and ignition timing. Within predetermined boundaries, most vehicles from 1982 to 1995 feature a type of On-Board Diagnostics - First Generation (OBDI). With the exception of some 1994 and 1995 models, this technology became widespread starting in 1988. California's Air Resources Board (CARB) and later the Environmental Protection Agency (EPA) mandated that vehicle manufacturers integrate self-diagnostic programs into their onboard computers by 1988. These programs identify emissions-related issues within a system. OBDI refers to a set of programmed instructions for self-testing and diagnostics in the vehicle's on-board computer, designed to detect failures in sensors, actuators, switches, and wiring for various emissions-related systems. If a failure is detected, the computer illuminates an indicator light on the dashboard alerting the driver. The system assigns a numeric code for each specific problem, storing these codes in memory for later retrieval using a "Code Reader" or "Scan Tool." On-Board Diagnostics - Second Generation (OBDII) enhances OBDI by closely monitoring emissions-related components and systems, making information readily available to technicians with the proper equipment. The terms "Monitor has run" and "Monitor has not run" refer to whether a particular diagnostic test has been completed or not, respectively. This manual uses these phrases to describe the status of various emissions system components. A "Trip" is a specific driving scenario that meets the necessary conditions for a Monitor to perform its diagnostic testing. Each vehicle model requires unique Trip Drive Cycles to meet the Enabling Criteria for its respective Monitors. An OBDII Drive Cycle is an extended set of driving procedures that simulates real-life scenarios, such as starting from cold and performing various maneuvers like accelerating or cruising. This cycle must meet the Enabling Criteria for all applicable Monitors on a particular vehicle to qualify as an OBDII Drive Cycle. Vehicle manufacturers determine these procedures, which can be found in the service manual. A Warm-up Cycle refers to the process of operating the vehicle after an engine off period, where the engine temperature rises at least 40°F (22°C) from its previous temperature and reaches a minimum of 160°F (70°C). The Powertrain Control Module (PCM) uses warm-up cycles to automatically erase specific codes and related data from its memory. If no related faults are detected within a specified number of warm-up cycles, the code reader erases Diagnostic Trouble Codes (DTCs) and related data from the vehicle's emissions system. These codes should only be used as a guide for proper Diagnostic Trouble service procedures found in the vehicle's service manual. Do not replace parts based solely on DTCs without consulting the service manual first. Diagnostic Trouble Codes (DTCs) are alphanumeric codes used to identify problems in vehicle systems monitored by the on-board computer (PCM). Each code has a message identifying the circuit, component, or system area where the issue was found. OBDII DTCs consist of five characters: the first letter identifies the main system, while the next two characters pinpoint the specific system or sub-system experiencing issues. When a problem is detected, the PCM assigns a DTC and records a "Freeze Frame" of conditions present at the time of failure. It also lights the Malfunction Indicator Lamp (MIL) to alert the driver. There are two types of DTCs: Type "A" One-Trip codes and Type "B" Two-Trip codes. When a Type "A" code is found, the MIL flashes once per second until the issue resolves. Each DTC has an assigned message detailing the system or component affected by the problem. When a car's computer detects an issue, it stores information about the problem in its memory for later retrieval. This data includes fuel system status, engine load, coolant temperature, and more. If a Type "B" issue is found on the first trip, the computer sets a pending code but doesn't turn on the check engine light (MIL) yet. The computer may or may not save "freeze frame" data at this time, depending on the manufacturer. If the same issue isn't fixed by the next trip, the MIL turns on and "freeze frame" data is saved in the computer's memory. If the issue is still present, the pending code is erased from the computer's memory after three consecutive trips without the issue being detected. The MIL stays lit until one of two conditions occur: either the issue that caused it to light up is no longer present for three consecutive trips, or a new emissions-related fault is detected. In this case, the computer automatically turns off the MIL if no other faults are present. However, the codes remain in the computer's memory as a history code for 40 warm-up cycles. Misfire and fuel system faults require similar conditions to be met before the MIL turns off. After the MIL has been turned off, diagnostic trouble codes (DTCs) and "freeze frame" data stay in the computer's memory until erased or until a new fault is detected. To ensure correct emissions-related component operation, a diagnostic program was developed for on-board computers. This program includes various procedures and diagnostic strategies to monitor components and systems. Each procedure runs diagnostic tests on specific components or systems to ensure they're within manufacturer specifications. These procedures are called "Monitors" in OBDII systems, and there are currently 15 supported by these systems. Additional Monitors may be added due to government regulations as the system grows and matures. Not all vehicles support all 15 Monitors, and some Monitors are specific to spark or compression ignition vehicles. Monitor operation can be either continuous (running constantly when the engine is running) or non-continuous. Monitors play a crucial role in modern vehicles. There are two types of Monitors: Comprehensive Component Monitor (CCM) and "non-continuous" Monitors. The CCM continuously checks all inputs and outputs from sensors, actuators, switches, and other devices to ensure their functionality and rationality. Rationality refers to the ability of each input signal to make sense when compared to others. On the other hand, "non-continuous" Monitors perform one test per trip. These include Oxygen Sensor Monitor, Oxygen Sensor Heater Monitor, Catalyst Monitor, Heated Catalyst Monitor, EGR System Monitor, EVAP System Monitor, Secondary Air System Monitor, NMHC Monitor, NOX Adsorber Monitor, Boost Pressure System Monitor, Exhaust Gas Sensor Monitor, and PM Filter Monitor. Starting from 2010, the following Monitors will be standard: NMHC Monitor, NOX Adsorber Monitor, Boost Pressure System Monitor, Exhaust Gas Sensor Monitor, and PM Filter Monitor. These Monitors are not supported by vehicles produced before this time. Here's a brief explanation of each Monitor: * Comprehensive Component Monitor (CCM): This Monitor continuously checks all inputs and outputs from sensors, actuators, switches, and other devices to ensure their functionality and rationality. * Fuel System Monitor: This Monitor uses a Fuel System Correction program called Fuel Trim to correct for a lean or rich air-fuel mixture. The program is designed to add or subtract fuel as needed up to a certain percent. * Misfire Monitor: This Monitor continuously checks for engine misfires by sensing changes in the crankshaft speed. Note: Some Monitors may be either One-Trip or Two-Trip. In contrast, Type 2 misfires are two-trip monitor faults that temporarily save the fault in memory without triggering the MIL initially. If the same fault is detected on the second trip, the computer commands the MIL to turn on, and the code is stored long-term. Type 3 misfires are two-trip monitor faults that temporarily save the fault in memory without triggering the MIL initially. If the same fault is detected on the second trip, the computer commands the MIL to turn on, and the code is stored long-term. In contrast, Type 2 misfires are more severe and trigger the MIL immediately when a fault is sensed. If the misfire is deemed severe enough to cause catalytic converter damage, the computer flashes the MIL once per second until the issue resolves. The Misfire Monitor supports both spark ignition and compression ignition vehicles. The Catalytic Converter helps convert unburned fuel and carbon monoxide into harmless emissions by reacting with exhaust gases. The computer monitors oxygen sensors located before and after the converter to check its efficiency. If the converter loses its ability to store oxygen, the downstream sensor signal voltage decreases the upstream signal, failing the test. The Catalyst Monitor is a two-trip monitor that only supports spark ignition vehicles. The Heated Catalyst Monitor performs similar tests but also checks the heater's proper operation and is supported by spark ignition vehicles only. The EGR system helps reduce Oxides of Nitrogen formation during combustion by recirculating exhaust gas into the intake manifold, lowering combustion temperatures up to 500°F. The computer controls EGR flow based on temperature and engine conditions. The EGR Monitor performs system function tests at present times, supporting both spark ignition and compression ignition vehicles. The EVAP system prevents fuel vapors from evaporating into the air by carrying fumes from the fuel tank to the engine for combustion. It consists of a charcoal canister, purge solenoid, vent solenoid, flow sensor, leak detector, and connecting tubes. The computer controls fuel vapor flow from the canister to the engine via a purge solenoid, drawing vapors into the engine where they are burned. The EVAP Monitor checks for proper fuel vapor flow and pressurizes the system to test for leaks, supported by spark ignition vehicles only. The Oxygen Sensor Heater Monitor tests the oxygen sensor's heater operation in open-loop mode when the engine is cold or under heavy load conditions. During this time, the computer ignores oxygen sensor signals for air/fuel mixture corrections, prioritizing engine efficiency during these conditions. Closed-loop vehicle operations result in lower emissions due to precise air/fuel mixture corrections. This condition is ideal for both emission reduction and vehicle performance. During closed-loop operation, the computer adjusts the air/fuel mixture based on the oxygen sensor signal. To enter closed-loop mode, the oxygen sensor must reach a minimum temperature of 600°F, facilitated by the oxygen sensor heater. The Oxygen Sensor Heater Monitor supports "spark ignition" vehicles only and employs a Two-Trip strategy to detect faults. The Oxygen Sensor monitors exhaust gas oxygen levels, generating a voltage signal up to one volt based on oxygen content. This signal is used to adjust air/fuel mixture. A 450mV signal indicates the most efficient and least polluting air/fuel ratio. For closed-loop operation, the oxygen sensor must reach a temperature of at least 600-650°F, with the engine at normal operating temperature. The Oxygen Sensor only functions when the computer is in closed-loop mode. A functioning oxygen sensor quickly responds to changes in exhaust gas oxygen content, while a faulty sensor reacts slowly or produces weak/missing voltage signals. The Secondary Air System Monitor aids catalytic converter operation during cold-start engine warm-up, injecting air into the exhaust stream to oxidize leftover combustion byproducts. This injection also supplies the catalytic converter with necessary oxygen for efficient operation. The catalytic converter reaches operating temperature more quickly during warm-up periods. It needs to heat up to function properly. A Secondary Air System Monitor controls the oxygen sensor's heater operation in open-loop mode when the engine is cold or under heavy load conditions. During this time, the computer ignores oxygen sensor signals for air/fuel mixture corrections, prioritizing engine efficiency during these conditions. Closed-loop vehicle operations result in lower emissions due to precise air/fuel mixture corrections. This condition is ideal for both emission reduction and vehicle performance. 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(AIR) Monitor, NMHC Monitor, NOx Adsorber Monitor, Boost Pressure System Monitor, and Exhaust Gas Sensor Monitor all check once per trip. PM Filter Monitor checks as well. Before starting any test, fix known mechanical issues and refer to your vehicle's service manual or consult a mechanic. Check the engine oil, power steering fluid, transmission fluid (if applicable), engine coolant, and other fluids for proper levels. Top off low levels if necessary. Verify the air filter is clean and in good condition. Ensure all air filter ducts are properly connected, and check for holes, rips, or cracks. Inspect engine belts for damage, wear, or improper tension. Secure and properly connect mechanical linkages to engine sensors. Check rubber hoses (radiator) and steel hoses (vacuum/fuel) for leaks, cracks, blockage, or damage. Make sure all spark plugs are clean and in good condition. Verify battery terminals are clean and tight, and check for corrosion or broken connections. Perform a compression check, engine vacuum check, timing check (if applicable), etc., if necessary. Consult your vehicle's service manual or contact Haynes Publications, Mitchell 1, Motor Publications, Ford, GM, Chrysler, Honda, Isuzu, Hyundai, or Subaru Service Manuals for more information on repair procedures and maintenance. Each Diagnostic Test Connector (DTC) has its own set of procedures, instructions, and flowcharts that must be followed to identify the source of the issue. This information can be found in the vehicle's service manual. Always consult the service manual for detailed testing instructions. Before performing any tests, thoroughly inspect your vehicle. Refer to Preparation for Testing for more details. Always follow safety precautions when working on a vehicle. See Safety Precautions for further information. Turn off the ignition and locate the 16-pin Data Link Connector (DLC). Connect the Code Reader's cable connector to the vehicle's DLC. The cable connector is keyed and will only fit one way. If you encounter issues connecting the cable, rotate it 180° and try again. If problems persist, check the DLC on both the vehicle and the Code Reader. Refer to the service manual for proper DLC inspection. After connecting the test connector properly, the Vehicle icon should appear to confirm a good power connection. Turn the ignition back on. Do not start the engine. The Code Reader will automatically link to the vehicle's computer. The LCD display will show "ReAd" if everything is working correctly. If the display is black, it indicates there is no power at the DLC. Check your fuse panel and replace any burned-out fuses. If replacing the fuse(s) does not resolve the issue, consult the repair manual to locate the proper computer (PCM) fuse/circuit. Perform any necessary repairs before continuing. After 4-5 seconds, the Code Reader will retrieve and display any Diagnostic Trouble Codes present in the vehicle's computer memory. If "Error" is displayed on the LCD screen, it indicates a communication problem between the Code Reader and the vehicle's computer. In this case, turn off the ignition key, wait for 5 seconds, and then turn the key back on to reset the computer. Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED for verification information. Read and interpret the Diagnostic Trouble Codes using the LCD display and the green, yellow, and red LEDs. The LED serves as visual aids along with the LCD display to help determine engine system conditions. The green LED indicates that all engine systems are "OK" and functioning normally. All monitors on the vehicle are active and performing their diagnostic testing, and no trouble codes are present. A zero will appear on the Code Reader's LCD display for further confirmation.

The yellow LED indicates one of the following conditions: pending code presence or monitor status (see below). If a pending code is confirmed by the presence of a numeric code and the word "PENDING" on the LCD display, the yellow LED is lit. If no pending code is displayed, the yellow LED indicates Monitor Status. When the yellow LED is lit on your Code Reader, it indicates that some monitors have not finished their diagnostic self-testing yet. This is confirmed by blinking monitor icons on the LCD display. A blinking icon means a monitor hasn't run its test yet, while a solid icon means it has completed its testing. On the other hand, if the red LED is lit, it signifies a problem with one or more vehicle systems. In this case, the Malfunction Indicator lamp on the instrument panel will light steadily. The Code Reader will display a code if codes are present in the vehicle's memory, and you can retrieve additional codes by pressing the button. You can check your Code Reader's firmware version by holding down the button while connecting it to the vehicle's DLC. You can also erase diagnostic trouble codes (DTCs) from the vehicle's computer using the ERASE function on the Code Reader. However, be careful not to erase the codes if you plan to take the vehicle to a Service Center for repair, as valuable information will be lost. To erase DTCs, follow these steps: Connect your Code Reader to the vehicle's DLC, turn the ignition on without starting the engine, and then press and release the ERASE button. The LCD display will indicate "SurF" for confirmation. If you change your mind, you can return to the code retrieval function by pressing the button again. The Code Reader will reconnect to the vehicle's computer and display "donF" on the LCD screen. Erasing DTCs does not fix the underlying issue causing the codes; proper repairs are necessary to resolve the problem. If the issue is not addressed, the codes will reappear when the vehicle is driven long enough for its monitors to complete testing. The Manufacturer offers a limited one-year warranty that covers defects in materials and workmanship under normal use and maintenance. The warranty period starts from the date of original purchase. If the unit fails within this period, it can be repaired or replaced at no additional cost when returned prepaid to the Service Center with proof of purchase. This warranty does not apply if the product is damaged due to improper use, accident, or neglect. Additionally, it excludes damage caused by improper voltage, service, fire, flood, lightning, or other acts of God. The Manufacturer will not be liable for any consequential damages resulting from breach of this written warranty. The Manufacturer retains copyright ownership and reproduction rights to this document. Any copying or reproduction without permission is prohibited. This warranty is non-transferable.

For service or repair, please send the product via UPS (if possible) prepaid to the Manufacturer. Allow 3-4 weeks for processing. If you have questions or require technical support, contact your local store, distributor, or Service Center, USA and Canada: Call (800) 544-4124 (Monday through Saturday, 6:00 AM-6:00 PM PST). All others: Call (714) 241-6802 (Monday through Saturday, 6:00 AM-6:00 PM PST). FAX: (714) 432-3979 (24-hour service) Web: www.innova.com After connecting the scan tool, it establishes a successful communication link and promptly displays the Check Engine diagnostic trouble codes on the screen. These codes are listed in order of severity, accompanied by descriptive explanations. To navigate through additional codes if present, use the UP or DOWN buttons. For more diagnostic options, press the System Status button on the left side of the tool and utilize the navigation buttons to explore further. In this scenario, the scan tool reads OBD2 (Check Engine) and ABS (Anti-lock Brake) diagnostic trouble codes.

Once you've made your selection, press ENTER to proceed. When finished reviewing your check engine codes or other diagnostic information, disconnect the wired connection from the OBD2 port while ensuring the ignition is turned OFF. The scan tool will store the vehicle data in its memory for future reference.