

SNS COLLEGE OF TECHNOLOGY



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DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE NAME: 19AUB204 – AUTOMOTIVE ELECTRICAL AND ELECTRONICS ENGINEERING

II YEAR / IV SEMESTER

Unit 5 – Electronics Systems

Topic: Onboard Diagnostic System



INTRODUCTION



- ❖ An Onboard Diagnostic (OBD) system is an integrated system in vehicles that monitors and reports on various engine and vehicle functions.
- ❖ The primary purpose of the OBD system is to provide real-time data and diagnostics about the health and performance of the vehicle, particularly its engine, transmission, and emissions systems.
- ❖ The first generation, introduced in the 1980s, provided basic diagnostic capabilities and emission control.
- ❖ The second generation, mandated in the United States from 1996 onward, significantly expanded the scope and standardization of diagnostic



COMPONENTS



- **ECU (Engine Control Unit):** The computer that controls engine functions and processes data from various sensors.
- **Sensors:** These monitor various parameters such as oxygen levels, engine temperature, vehicle speed, and more.
- ❖ **Diagnostic Trouble Codes (DTCs):** Codes generated by the ECU when a malfunction is detected. These codes can be read using an OBD scanner.
- **MIL (Malfunction Indicator Light):** Also known as the "check engine light," it illuminates to alert the driver to a detected issue.



FUNCTIONS AND CAPABILITIES



- * Real-time Data Monitoring: Tracks parameters like engine RPM, vehicle speed, fuel level, and more.
- ❖ Diagnostic Trouble Codes (DTCs): Stores codes that indicate specific problems, which can be retrieved using an OBD scanner.
- Emissions Monitoring: Ensures the vehicle meets emissions standards by monitoring systems such as the catalytic converter, oxygen sensors, and EGR Readiness Tests: Checks if certain emissions-related components are functioning correctly.
- **Freeze Frame Data:** Captures the vehicle's operating parameters at the moment a



CONTRUCTION AND WORKING



- ❖ A 16-pin standardized connector located within 2 feet of the steering wheel, usually under the dashboard.
- ❖ Various protocols like ISO 9141-2, SAE J1850 (VPW and PWM), ISO 14230-4 (KWP2000), and ISO 15765-4 (CAN) are used for communication between the ECU and diagnostic tools.
- Standardized codes used to request data from the vehicle's ECU.
- Connect the scanner to the OBD-II port, turn on the ignition, and retrieve the DTCs.



CONTRUCTION AND WORKING



- * After repairs, the codes can be cleared to reset the MIL.
- View real-time data from various sensors to assist in diagnosing issues.
- ❖ Access information like VIN (Vehicle Identification Number), calibration identification, and more.



BENEFITS OF OBD SYSTEM



- **Early Detection of Problems:** Helps identify issues before they become severe, reducing the risk of major engine damage and costly repairs.
- **Emissions Control:** Ensures the vehicle remains compliant with environmental regulations, reducing pollution.
- **Enhanced Maintenance:** Provides insights into the vehicle's health, assisting in preventative maintenance.
- **Consumer Empowerment:** Allows vehicle owners and independent mechanics to access diagnostic information, reducing reliance on dealership services.



APPLICATION BEYOND DIAGNOSTICS

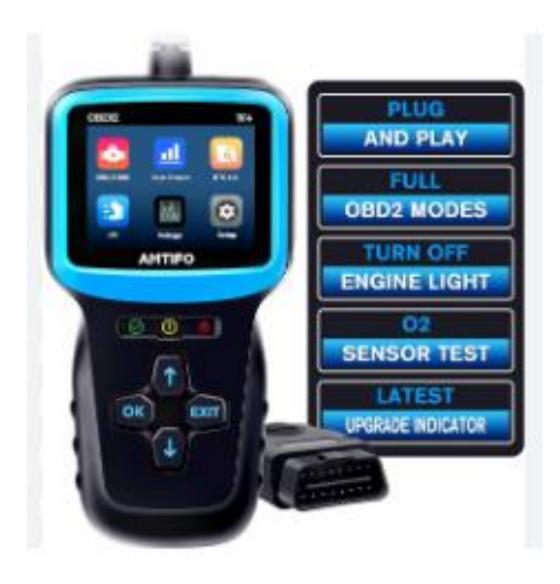


- **Telematics and Fleet Management:** Integrating OBD data for real-time tracking, vehicle health monitoring, and maintenance scheduling.
- **Performance Tuning:** Used by enthusiasts to monitor and adjust vehicle performance parameters.
- **❖ Insurance:** Usage-based insurance programs utilize OBD data to assess driving behavior and determine premiums.



OBD









THANK YOU!!!