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 fault is detected.

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


PLUG
AND PLAY
FULL
OBD2 MODES
TURN OFF
ENGINE LIGHT
O2
SENSOR TEST
LATEST
UPGRADE INDICATOR
AHTIFO
OK
EXIT

THANK YOU !!!