## Automotive & Embedded Info

Never Forget Basics Whether its Life or Anything Else ... Basics are Cores. While seeing a Tree how can we forget Seed...

# Diagnostic Overview

Now a day's automobile is more than an engine and a body. We have seen a constant stream of innovations and improvements in automobiles. In today's automobile most of the things controls and operates electronically via ECU-Electronic Control Unit. The different ECUs used can be for the transmission, traction control or ABS, AC, body functions and lighting control, engine, air bags, or any other system a vehicle may have.

Within one vehicle/system most of the ECU communicates to each other. Detecting a failure in this complex machine would be a tedious task. To detect the failure of the system or ECU diagnostic needs to implement in ECU. Failure detection is one thing, with diagnostic user can change multiple conditions/parameters and can check/test behaviour of ECU.

We can say within ECU there will be a diagnostic stack that will take care failure detection, log/store the failure, analysis of multiple condition/test ECU programming etc.

## Diagnostic

Diagnostics involve remote execution of routines, or services, on ECUs. To execute a routine, you send a byte string as a request to an ECU, and the ECU usually answers with a response byte string.

It is used to identify the cause of a problem or a situation. Whenever ECU finds/detects any problem, it will get store in ECU memory (EEPROM) for further analysis.

## Diagnostic Protocol

Protocol refers to a set of rules/regulation for communication. Like we use UART, CAN, Flex Ray, LIN etc. for serial communication and all have a different set of rules and regulation.

Same we can say to diagnostic of ECU we shall follow some set of rules and regulation or protocols and these protocols are called Diagnostics Protocol. ECU diagnostic software shall follow all set of rules and regulation as required by ISO standard.

The automotive industry has come up with Diagnostics protocols in Automotive Industry:

1. K-Line,
2. UDS (Unified Diagnostics Services),
3. KWP (Keyword Protocol),
4. CAN (Control Area Network) etc.

## Diagnostic Session

Diagnostic ensures data flow concerning diagnostic requests and responses, supervises and guarantees diagnostic protocol timing and

Diagnostic session makes sure the communication between the ECU and the diagnostic tool. Different types of diagnostics sessions:

1. Default Diagnostic Session,
2. Programming Session
3. Extended Diagnostic Session.
4. Safety System Diagnostic Session.

After power on, ECU will be switched to a Default Diagnostic Session. After receiving different request from Diagnostic Tool, the ECU will be switched to different diagnostic session.

## Automotive Diagnostic Services:

The diagnostic services available in UDS are grouped in functional units and identified by a one-byte code (Service ID).

The Automotive Diagnostic Command Set supports the following services:

- Diagnostic Management
- Data Transmission
- Stored Data Transmission (Diagnostic Trouble Codes)
- Input/output Control
- Remote Activation of Routine

## To know more in detail about diagnostic kindly go through UDS (Unified Diagnostic services).

https://automotiveembeddedsite.wordpress.com/uds/

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