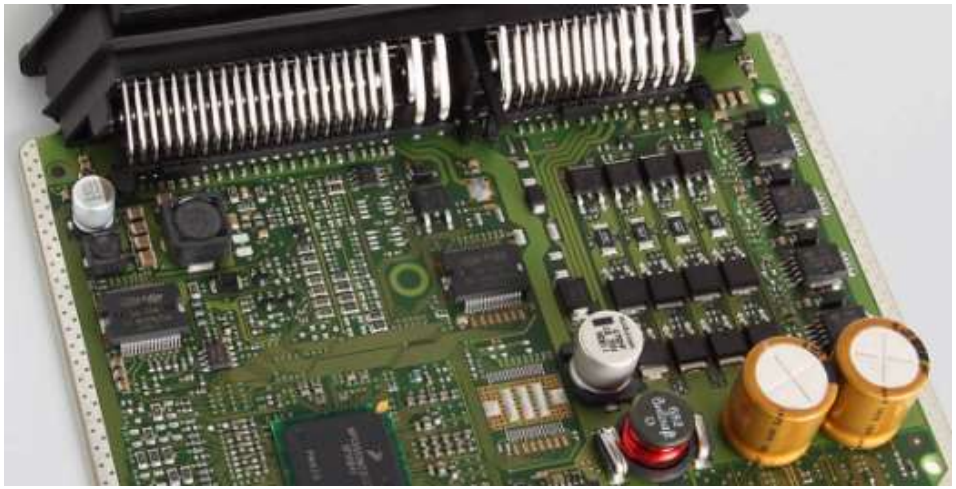
Write Data by Identifier

Client wants to write the Part number as data into ECU

How to write the data in ECU ?



Terms – Write Data by ID

Data Identifier

- This parameter **identifies** the server **data record** that the tester is requesting to write some data into the server with respect with this identifier. Each data have unique Identifier that can be retrieved by the same only

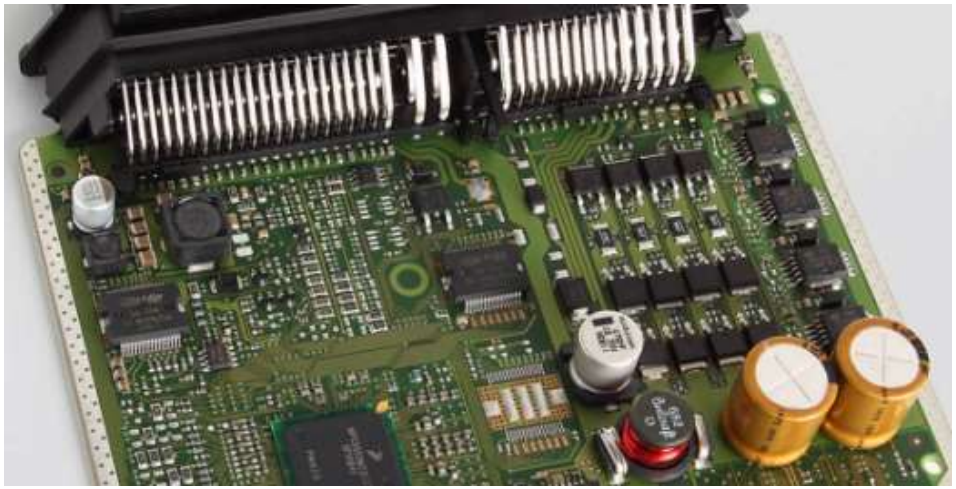
Data Record

- This parameter provides the data record associated with the data Identifier that the tester is requesting to write in to the server as **data**.

Write Data by Identifier

Client wants to write the Part number as data into ECU

How to write the data in ECU ?



```
-------------------------------------------------------------------------------
Address 65: Tire Pressure         Labels: 8J0-907-273.lbl
   Part No SW: 8J0 907 273 A    HW: 8J0 907 273 A
   Component: J502_RDK         H02 0300
   Revision: --H02-D0    Serial number: 1267977137077
   Coding: 0860022
   Shop #: 06435 000
   VCID: 2F381AE0EB1C309F843-807A

 Address 72: Door, Rear Right         Labels: 8P4-959-802.lbl
    Part No SW: 8P4 959 802 E    HW: 8P4 959 802 E
    Component: Tuer-SG          H04 0040
    Coding: 0001176
    Shop #: 000 1012544
    VCID: 42DE4354488EADF77BD-8016
-------------------------------------------------------------------------------
```

Assumption Scenario

The part number as follows

Requirements

- For Writing Data, ECU should be in extended session
  - **Identifier** : **4A 21**
  - **Data** : 80 2E

“Purpose : Write data into server using Identifier”

This service does not use a sub-function

Description on SID

- ✓ The Write Data By Identifier service is used to write some information into the ECU at an **internal location** specified by the provided **data identifier**(DID).
- ✓ The written data record can be identified by a data Identifier that may or may not follow security algorithm for the data record **(Security Access (0x27)** may or may not be included as prior service).
- ✓ Dynamically defined data Identifiers (**service)** will not be used with this service.
- ✓ This is **vehicle manufacturer's** constraints that the server conditions are met when performing this service**. (NRC 22)**

Description on SID

What can be written ? What are the limitations ?

- Configuration information can be written into the ECU (e.g.Part number, Hardware number, SW number etc.)
- Erasing **NVM Data**
- Resetting **calibration values** or Learned values
- Setting **option** content
- Not all the identifiers are **re-writable,** some may be read only (as defined by the system supplier/vehicle manufacturer for **read-only** identifiers, etc.).

Frame Format of **Write Data by ID**

- Request Frame:

Service Id

Data Identifier

Data

- Positive Response Frame:

Service Id

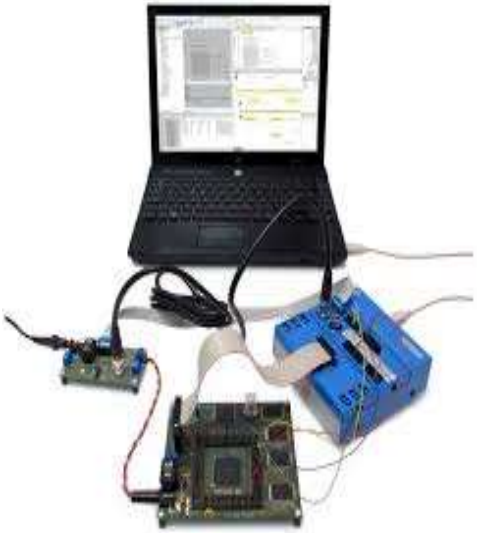
Data Identifier

- Negative Response Frame:

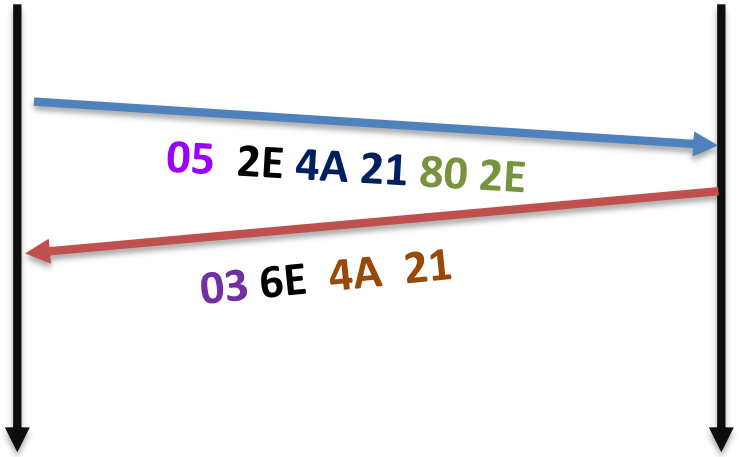
Negative Response (7F)

Service Id

NRC Code



Request & Response

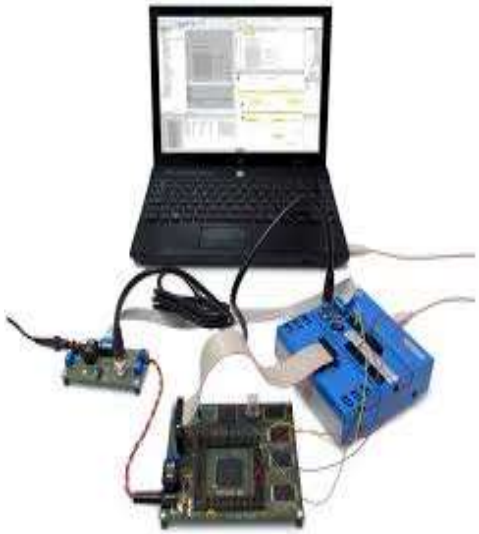


Assumption Real-time Scenario

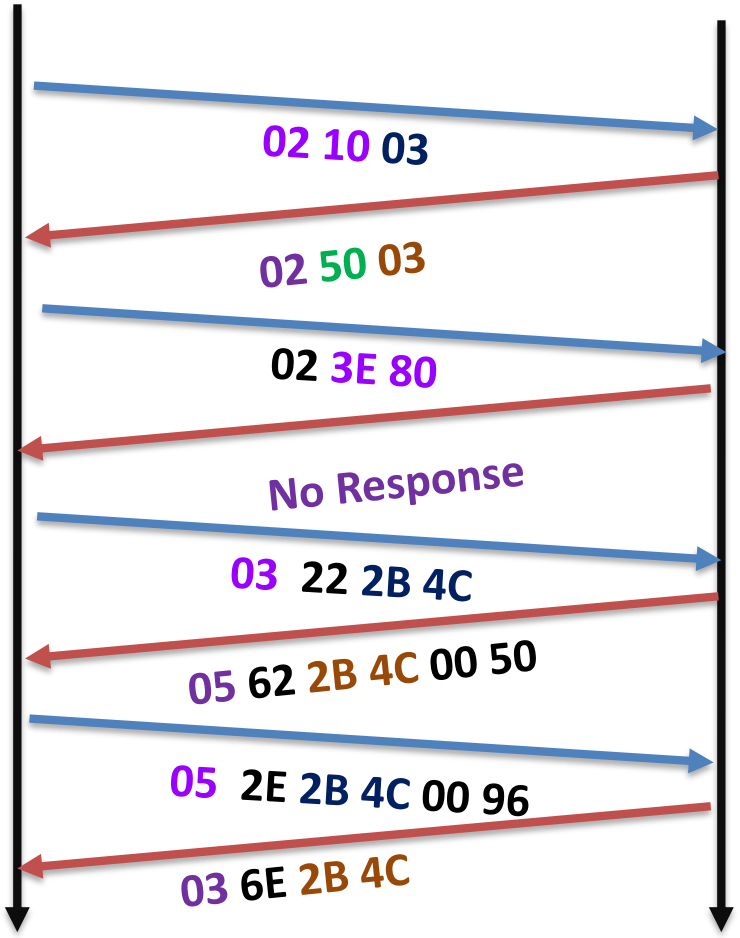
Customer wants to reset the calibration value of speed governor from the value **80 KmpH** to **150 KmpH**

Diagnostic Engineer needs to get the Data Identifier for **speed governor** calib value **(if it is implemented with DID)**

Found the DID is **2B 4C** and ensured that **Security Access** is not required for writing the data in the DID **&** Writing can be applicable only in extended session

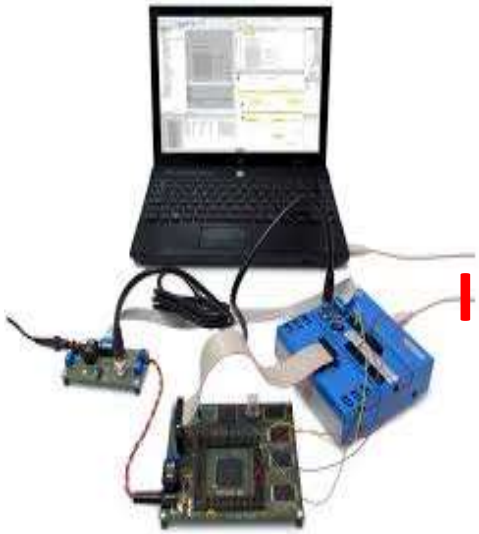


Request & Response

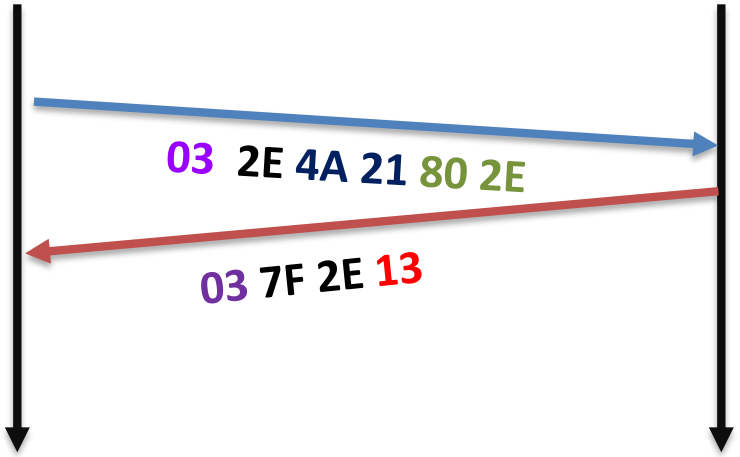


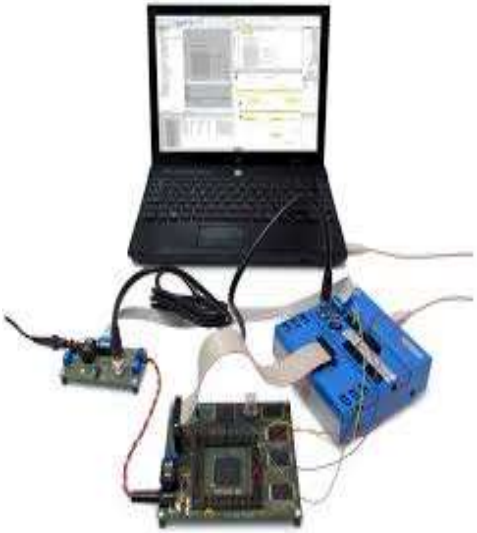
List of NRCs Supported – 0x2E

- 0x13 Incorrect Message Length
- 0x22 Conditions Not Correct
- 0x31 Request Out of Range
- 0x33 Security Access Denied
- 0x72 General Programming Failure

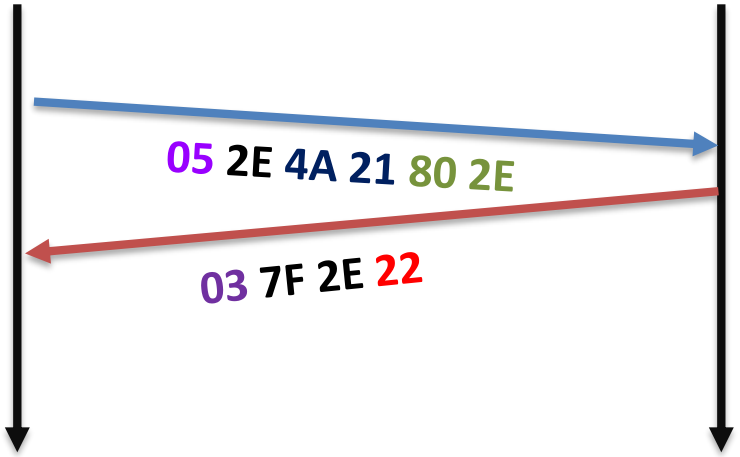


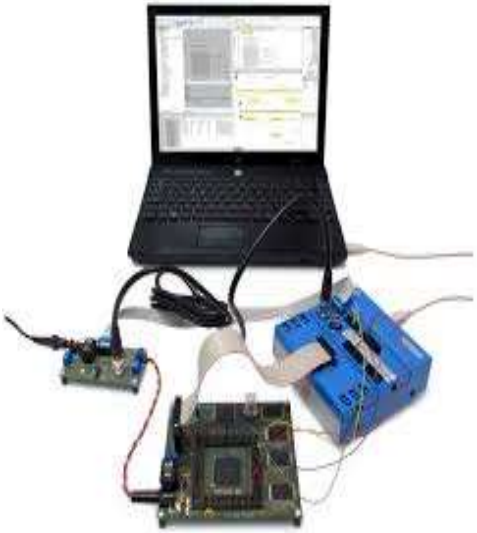
Incorrect Message Length



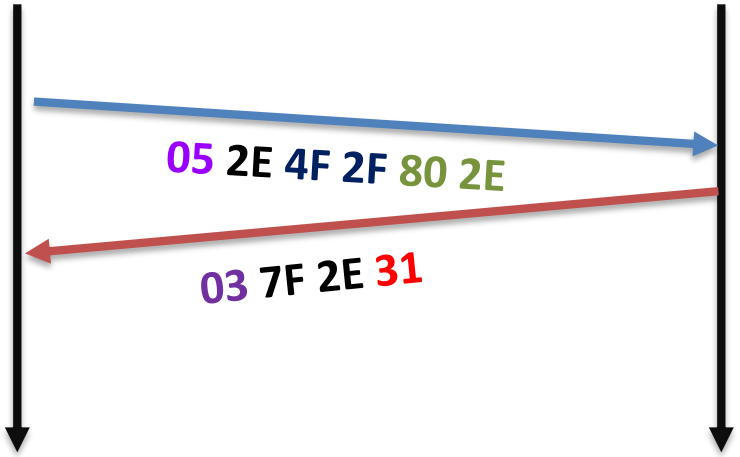


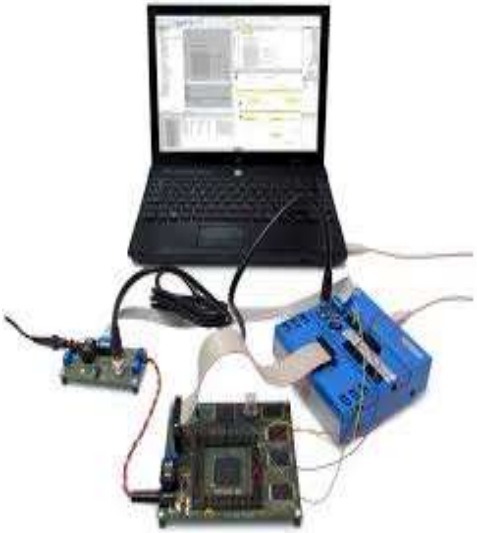
Conditions not correct



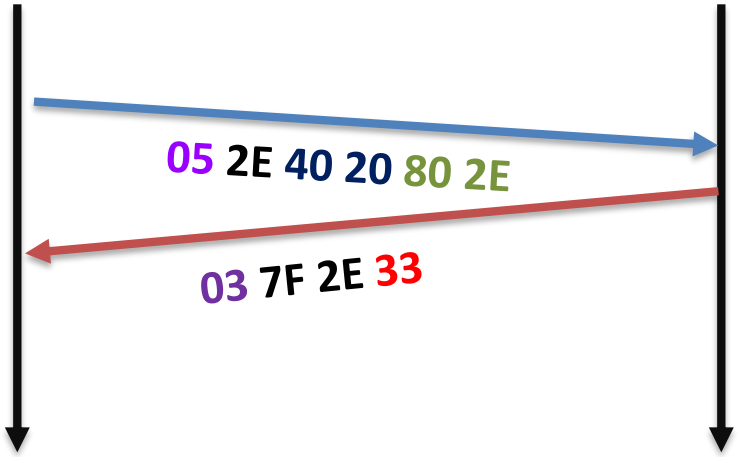


Request Out of Range

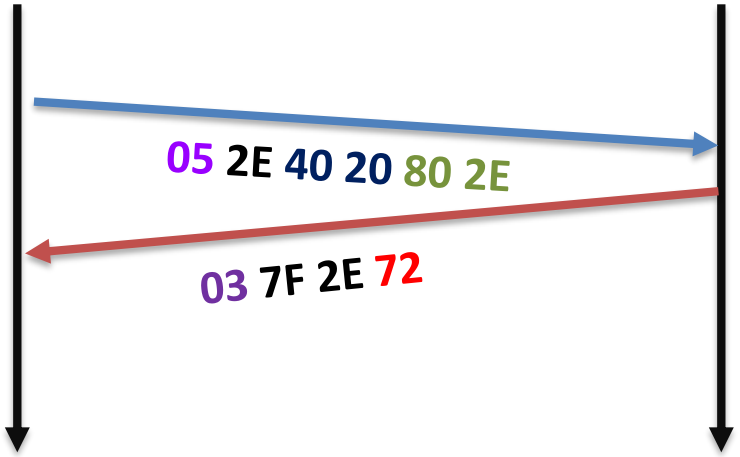




Security Access Denied



General Programming Failure



Sample Test Case

S.No	Pre-Condition	Test Procedure	Expected Result
1			

Sample Test Case

S.No	Pre-Condition	Test Procedure	Expected Result
1	1. Power supply to be active 2. CAN Transmission & Reception should be active		

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1	1. Power supply to be active 2. CAN Transmission & Reception should be active	1. Flash the software into hardware 2. Include the Database 3. Using Tool, Send the below mentioned frame as input in the message id 111 hex **06 2E AK E3 24 4D CE**	

Sample Test Case

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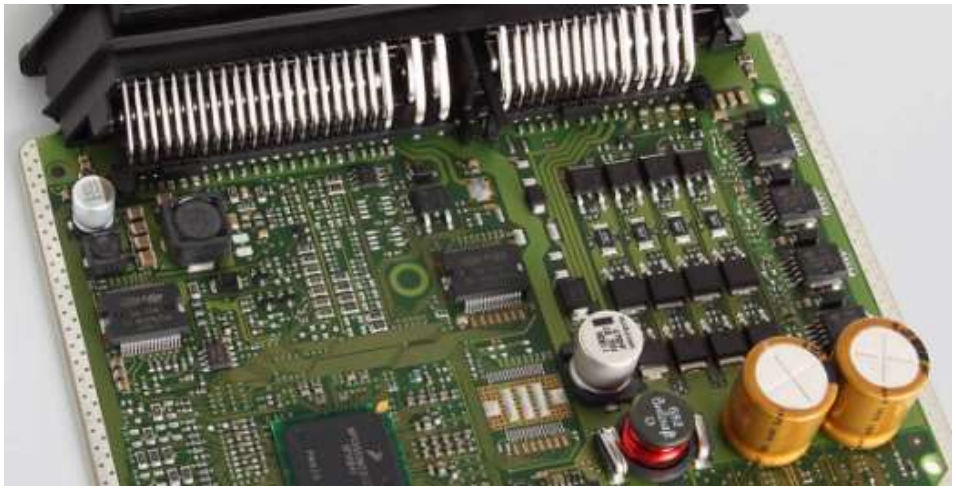
1	1. Power supply to be active 2. CAN Transmission & Reception should be active	1. Flash the software into hardware 2. Include the Database 3. Using Tool, Send the below mentioned frame as input in the message id 111 hex **06 2E AK E3 24 4D CE**	From message id 112 hex the response frame should be as **03 6E AK E3**


The
End

Read Data by Identifier

Client wants to read some data from ECU

How to read the data from the ECU ?



Terms - Read Data by ID

Data Identifier

- This parameter **identifies** the server **data record** that the tester is requesting to write some data into the server with respect with this identifier. Each data have unique Identifier that can be retrieved by the same only

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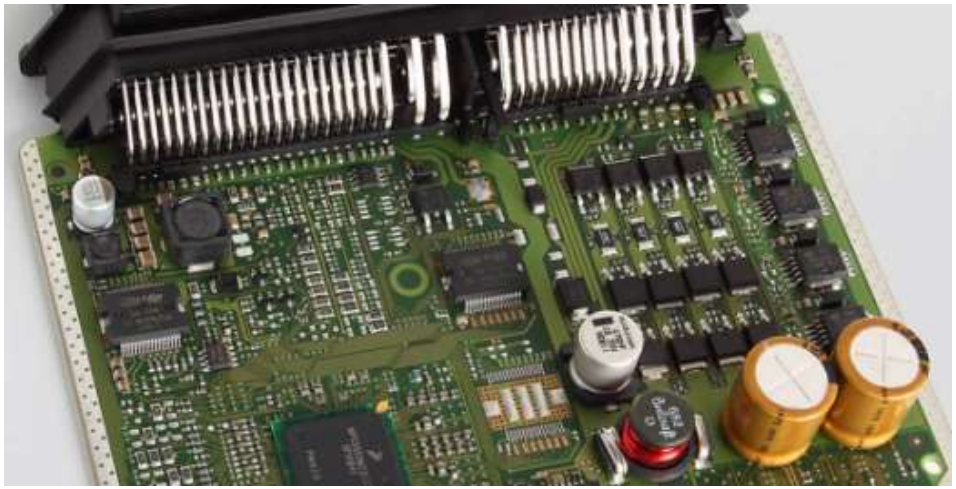


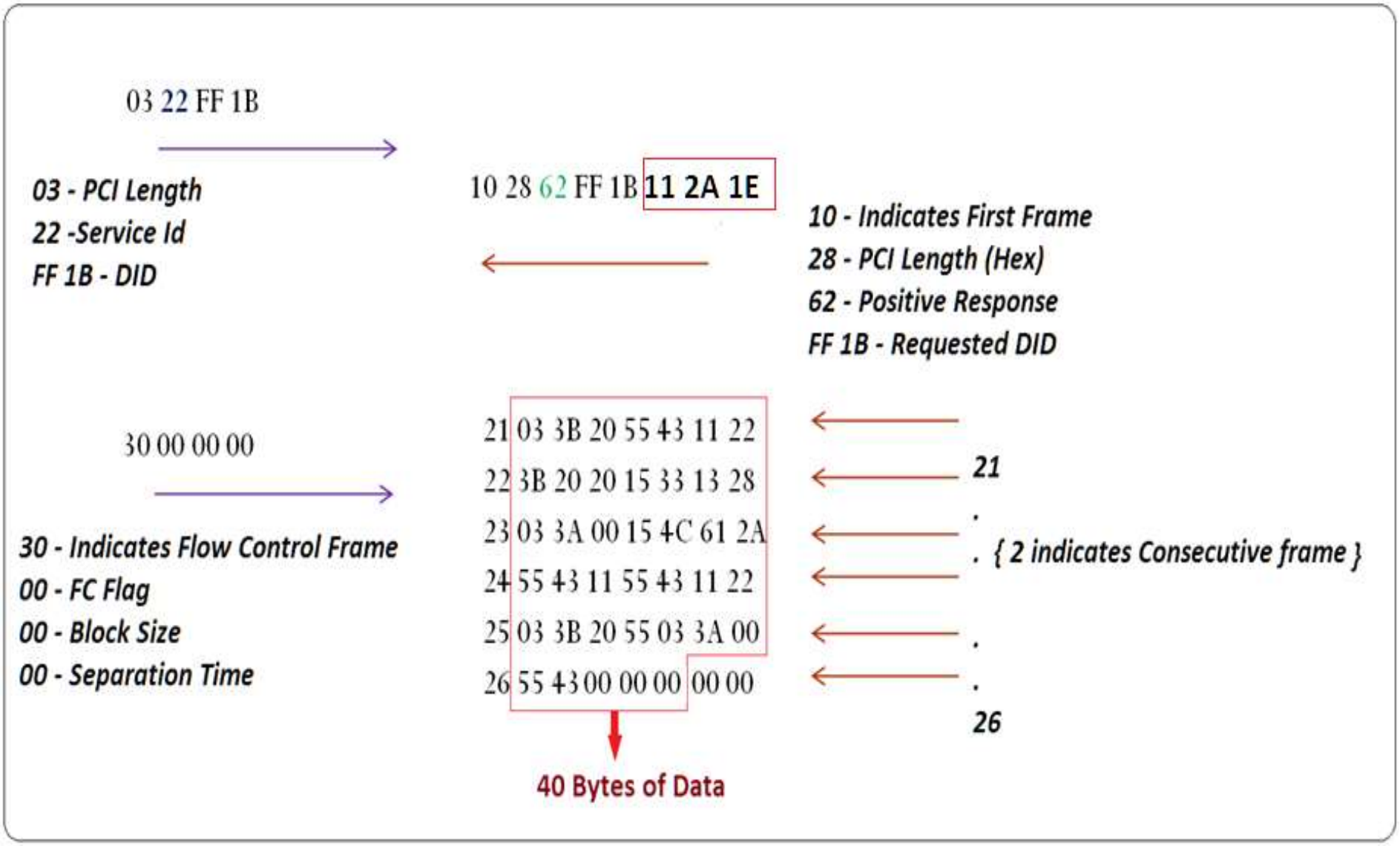
Assumption Scenario

Requirements

- For Reading Data, ECU should be in extended session
  - **Identifier** : **FF 1B**

“Purpose : Read data from the server using Identifier”

This service does not use a sub-function


03 22 FF 1B
03 - PCI Length
22 -Service Id
FF 1B - DID
10 28 62 FF 1B 11 2A 1E
10 - Indicates First Frame
28 - PCI Length (Hex)
62 - Positive Response
FF 1B - Requested DID
30 00 00 00
30 - Indicates Flow Control Frame
00 - FC Flag
00 - Block Size
00 - Separation Time
21 03 3B 20 55 43 11 22
22 3B 20 20 15 33 13 28
23 03 3A 00 15 4C 61 2A
24 55 43 11 55 43 11 22
25 03 3B 20 55 03 3A 00
26 55 43 00 00 00 00 00
21
.
. { 2 indicates Consecutive frame }
.
.
26
40 Bytes of Data

Read Data by Identifier

- On receiving a Read Data by Identifier request, the server shall access the data elements of the records specified by the data Identifier parameter and transmit their value in one single Read Data by Identifier positive response containing the associated data Record parameter.
- The request message may contain the same data Identifier multiple times.
- The server treat each data Identifier as a separate parameter and respond with data for each data Identifier as often as requested.

Read Data by Identifier

Read data by Identifier can be used for:

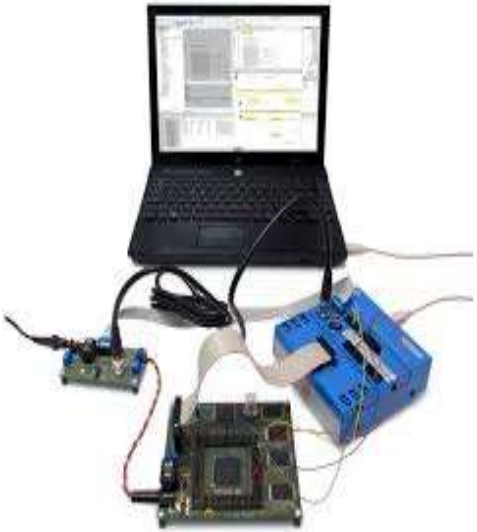
- Read information into the ECU (e.g. VIN number, ECU Serial Number)
- Reading **non-volatile memory**
- Read **calibration** values
- Read Setting option content
- The server may **restrict** or prohibit read access to certain data Identifier values (as defined by the system supplier/vehicle manufacturer for read-only identifiers, etc.).

Real-time scenario

Requirement from Customer –

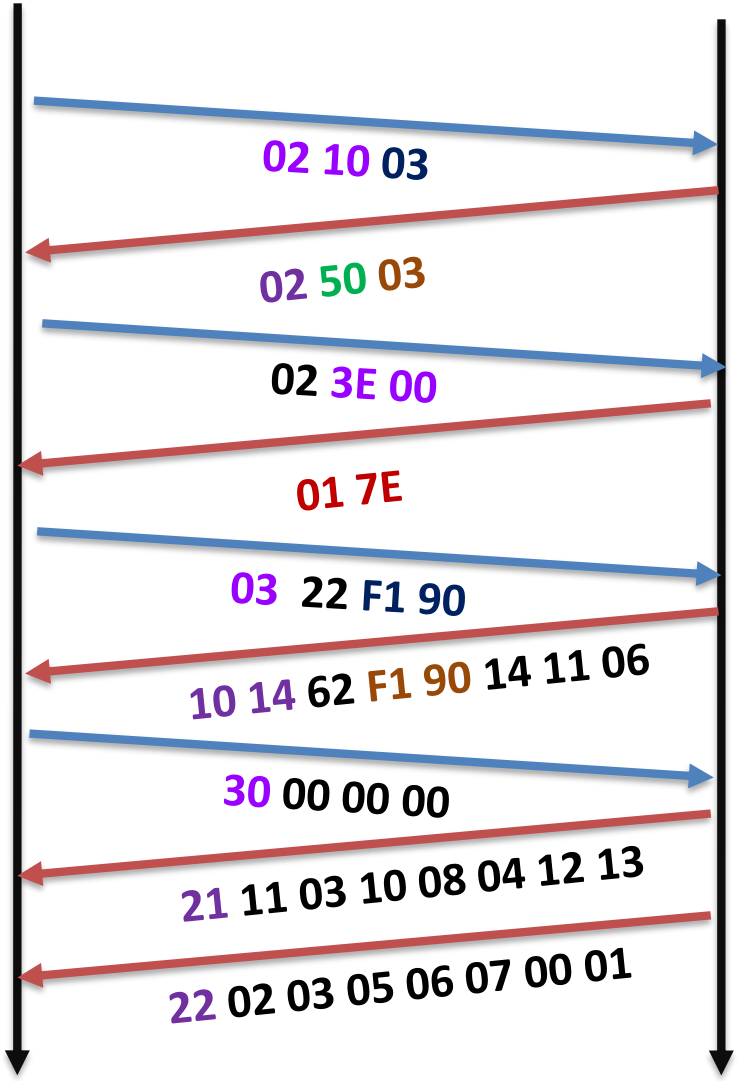
1. Read **VIN number** as Data using **0x22**
2. Should active in **Extended session & Security Access** not required.
3. Use Data Identifier as **F1 90**

EB6B3A84CD2356701



Request & Response

0X22



EB6B3A84CD2356701

VIN Number Analysis

E : Country manufactured

B : OEM

6 : Vehicle type

B3A84 : Vehicle Series, Brand, Size, Type etc

C : Security Check

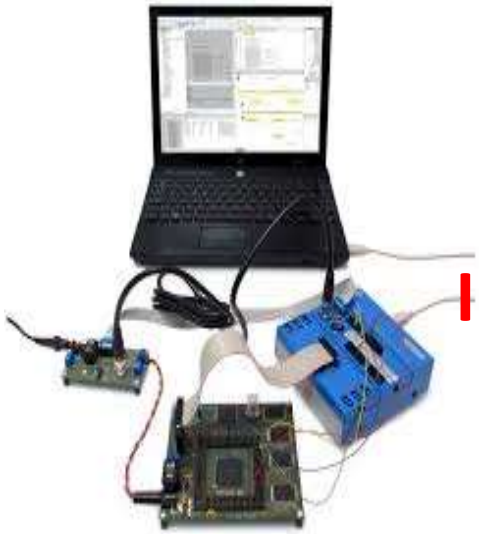
D : Model Year

2 : Assembly Plant

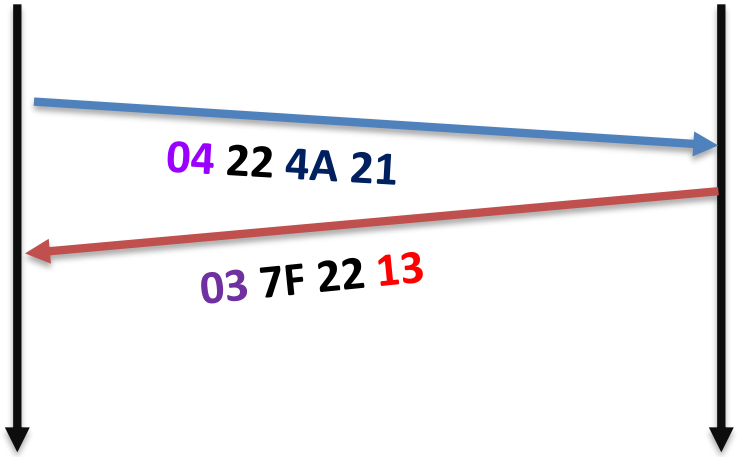
356701 : Serial Number of vehicle

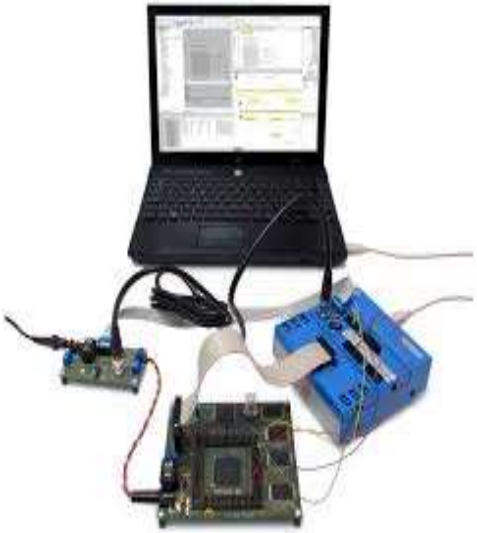
List of NRCs Supported – 0x22

- 0x13 Incorrect Message Length
- 0x22 Conditions Not Correct
- 0x31 Request Out of Range
- 0x33 Security Access Denied
- 0x14 Response too long

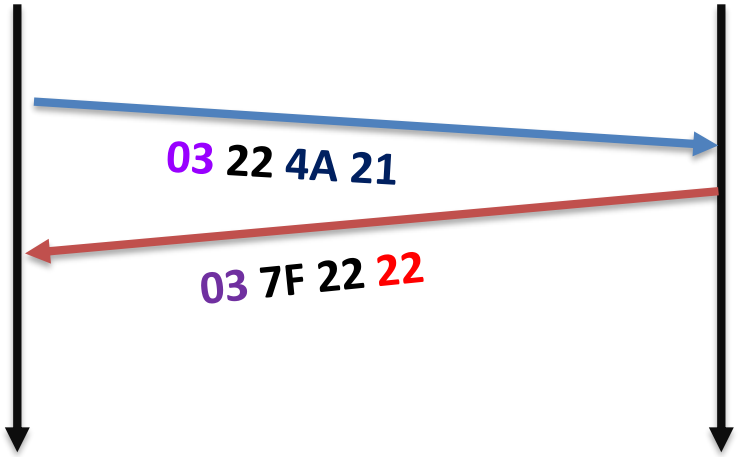


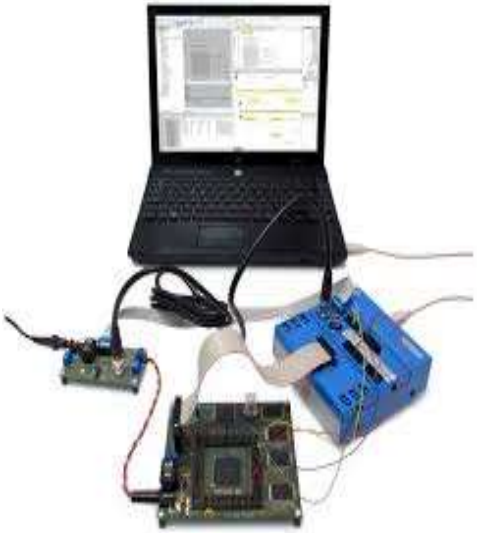
Incorrect Message Length





Conditions not correct





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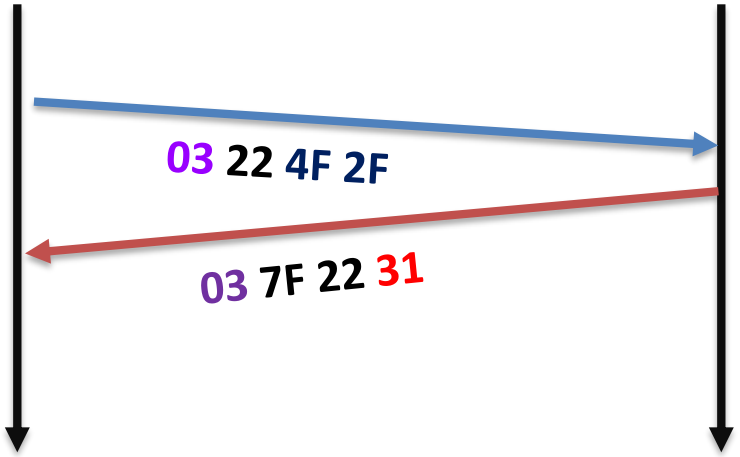
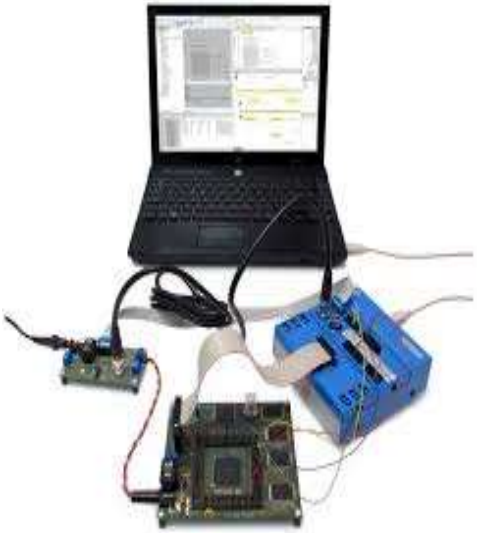
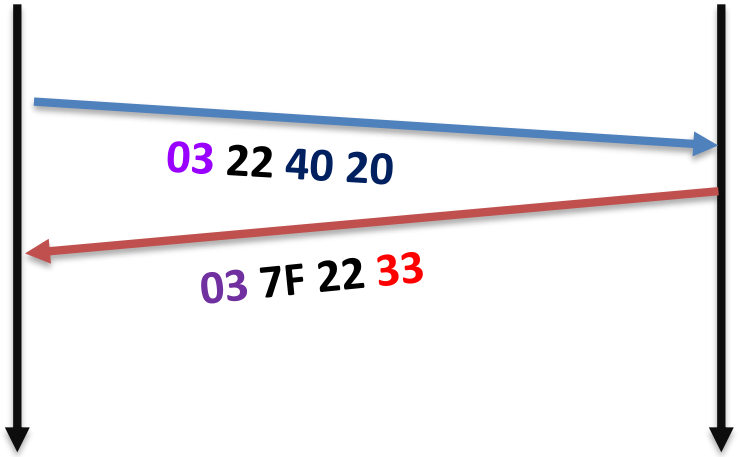
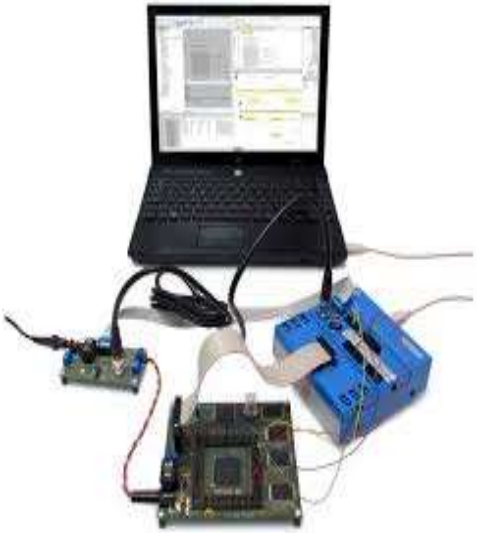


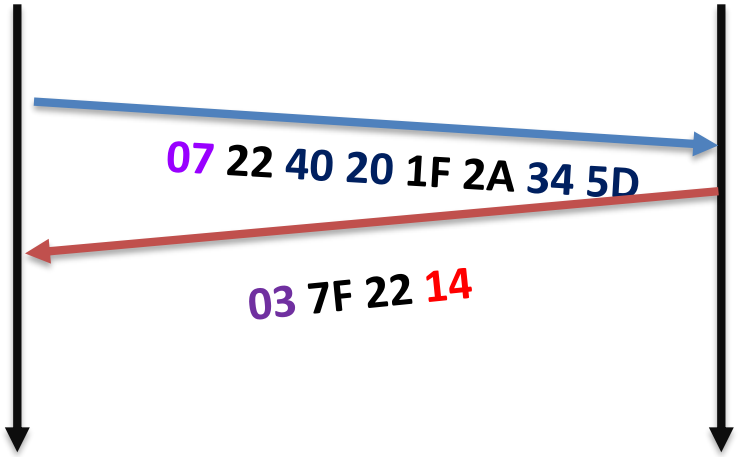


Security Access Denied





Response too long




The
End