

Ford-VCM OBD

User manual



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1 Introduction

Thank you for purchasing the Ford-VCM OBD diagnostic interface and software. Ford-VCM OBD is professional tools for diagnostics of Ford vehicles. Please read carefully this User Manual before using the product. If you have experience with original diagnostic tool Ford IDS, we recommend you to study chapter comparing both systems .

We hope you'll find our products useful. In case you have any questions, problems or feedback

1.1 Key features

- Ford-VCM OBD covers for wide range of ECUs and models.
- Easy connection via smart multiplexing USB to OBD2 interface
- Wide range of communication protocols and buses covered incl. J1850 PWM, ISO, CAN
- Automatic ECU recognition
- Automatic vehicle scan
- ECU Identification
- Fault code (DTC) reading
- Fault code clearing
- Measured values / live data
- Live data recording
- Diagnostic protocol printing
- Actuator tests
- Coding functions
- Printing
- Logging

The Ford-VCM OBD system works with Ford vehicles. It works as well with Ford subsidiaries vehicles such as Mazda, Lincoln, Mercury, Jaguar, but without guarantee of 100% functionality. The rule of thumb is: tasks related to fault code memory and identification are reliable everywhere, but measured values and other functions may not be fully supported.

2 Ford-VCM OBD software and driver installation

2.1 Microsoft Windows operating System

1. Insert Ford-VCM OBD installation CD to your CD-ROM drive
2. Run installation file Ford-VCM OBDSSetup.exe
3. Choose language for the installer

4. Choose your destination folder for the Ford-VCM OBD and click Install button and after successful installation click Close button.

Ford-VCM OBD drivers are automatically updated during the Ford-VCM OBD installation. When prompted to install "unsigned" drivers, click on Install this driver software anyway (Microsoft Windows 7) or Continue Anyway (Microsoft Windows XP.).



Microsoft Windows will automatically install drivers when you plug-in the Ford-VCM OBD to USB port.

Driver installation isn't required for operation on GNU/Linux system.

2.2 GNU/Linux System

Our diagnostic application are tested to work under Linux. No native Linux binary is available, however we have created our programs to work under Linux and other systems using Wine.

2.2.1 Requirements

Linux 2.6.x with USB support (or FreeBSD)
USB CDC Driver
Wine 1.0.1

Recent Debian Linux or Ubuntu meet the above requirements.

2.2.2 Setting up devices

Driver installation isn't required for operation on GNU/Linux system. Diagnostic applications require access to /dev/ttyACMx devices from Wine environment. This can be set-up very easily using these commands:

```
ln -s /dev/ttyACM0 ~/.wine/dosdevices/com5
```

```
ln -s /dev/ttyACM1 ~/.wine/dosdevices/com6
```

```
ln -s /dev/ttyACM2 ~/.wine/dosdevices/com7
```

```
ln -s /dev/ttyACM3 ~/.wine/dosdevices/com8
```

Diagnostic interface should be then visible from the Ford-VCM OBD diagnostic application.

2.2.3 Installation

Programs can be installed by launching setup .exe file using wine, e.g. wine Ford-VCM OBDSSetup.exe.

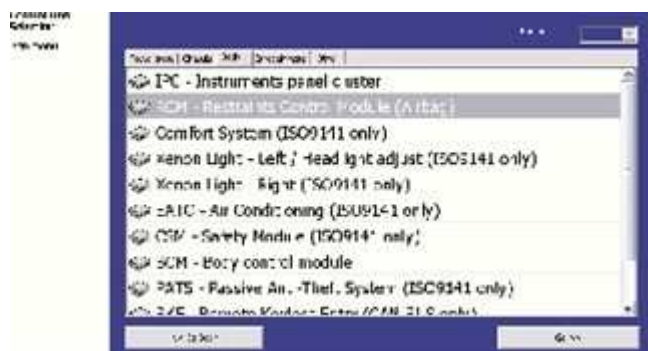
3 First steps

1. Connect the Ford-VCM OBD interface to your computer.
2. Connect the Ford-VCM OBD interface to OBD-II connector in the vehicle or in the electronic control unit.

3. Set-up Ford-VCM OBD application

Select Settings from main menu and configure interface port. After click Refresh button software should find port to which is Ford-VCM OBD interface connected. Choose these port. Click Test Interface to make sure everything is OK, you should see fulfilled Serial number (now hidden in black line).

4. Save settings and return to main menu.
5. Turn ignition ON, but don't start an engine.
6. Select ECU by click Select Control Unit button.
7. In new window choose unit from list. It is common that low-cost vehicles have only a few control units e.g. PCM, ABS, IPC, RCM.

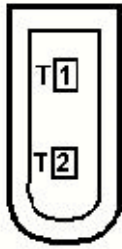


8. If unit was recognized, you can use diagnostic functions now. In other case, you should study chapter Unrecognized Control Unit before using diagnostic functions.

4 Diagnostic connectors used in Ford vehicles

Location of diagnostic connector (database of vehicle images) is available from main menu of Ford-VCM OBD.

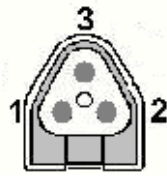
4.1 2-pin



Is used only for diagnostics of older vehicles by DLC protocol.

4.2 3-pin

1	GND
2	DCL
3	DCL



This connector is used only for diagnostics of older vehicles by DLC protocol.

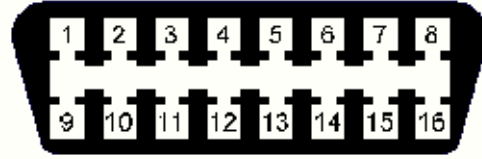
4.3 6-pin

1	
2	
3	
4	
5	GND
6	

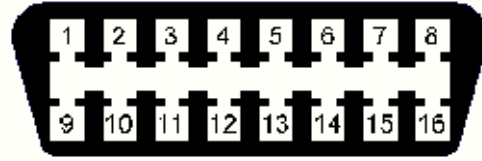
This connector is used only for diagnostics of older vehicles using CART protocol.

4.4 OBD-I

	1 9		
	2 10		
Ford DCL Bus + 3 11 Ford DCL Bus			
Chassis ground (GND) 4 12			
Signal ground (GND) 5 13			
	6 14		
ISO9141 K Line 7 15 ISO9141 L-Line			
	8 16		
This connector is used only for diagnostic of older vehicles by DLC protocol, connector is compatible with OBD-II connector.			
4.5 OBD-II			



	1 9		
SAE J1850 Bus + 2 10 SAE J1850 Bus -			
MS CAN High 3 11 MS CAN Low			
Chassis ground (GND) 4 12			
Signal ground (GND) 5 13 Flash. Pgm. Volt.			
HS CAN High 6 14 HS CAN Low			
ISO9141 K Line 7 15 ISO9141 L-Line			
	8 16		
Diagnostic connector is mandatory in all vehicles after 2000, is used from 1996.			



5 Connecting to control units

Every vehicle after 1996 contains at least one ECUs (Electronic Control Unit), powertrain control unit (PCM) is present everytime, in modern types also ABS, RCM(Airbag), perhaps even IPC(Instrument Panel Cluster), BCM (Body Control Module) and many others.

5.1 Ford ECU terminology

PCM "C Powertrain Control Module

ICU "C Injector Control Unit

TCM "C Transmission Control Module

EPS "C Electronic Power Steering

IPC "C Instrument Panel Cluster

"C Marked also HEC (Hybrid Electric Cluster)

RCM "C Restraint Control Module "C airbags, etc.

"C Marked also ECS (Electric Cluster System)

BCM "C Body Control Module

GEM "C General Electric Module

PATS "C Immobiliser (Passive Anti-Theft System) "C may be part of other ECUs

5.2 Communication protocol

Protocol	Bus	Production
DCL (CART)	DCL (RS485)	1988 "C 1996
Ford SCP	SAE J1850 PWM	1996 "C 2005
Ford ISO	ISO9141	1996 "C 2008
ISO 15765	CAN-BUS (ISO 11898)	2003 "C present
UDS (ISO 14229)	CAN-BUS (ISO 11898)	2008 "C present

5.3 The most common PCMs

Gasoline: EEC-IV, EEC-V, EEC-VI, EEC-VII, SIM21, SIM22, SIM24, SIM28

Diesel: EEC-V, SID802, SID803, SID804, Delphi, BOSCH EDC16

5.4 PATS "C Immobiliser (Passive Anti-Theft System)

PATS is vehicle immobilizer used in Ford vehicles since 1998. PATS functionality is present in PCM, IPC, BCM or separated PATS ECU, according PATS version.

Ford uses tTexas Instruments or Texas Instruments Crypto transponders (vehicles since 2001). Several generations of PATS are used.

Operations with PATS are authorised by timing access (delay before operation is allowed, so called Timed PATS) or by entering INCODE (Coded PATS). For coded PATS ECU generates OUTCODE, for which you need to enter correct INCODE. INCODE depends on OUTCODE

OUTCODE and consequently INCODE are time dependent, these are not fixed codes.
INCODE authorization service is available on www.patscode.com or you can use Ford ETIS.



5.5 Diagnostic of TCM and ICU

Automatic Transmission Control Unit (TCM) can be diagnosed via PCM.
Injector Control Unit is always diagnosed from PCM.



5.6 Diagnostic of Ford Galaxy and Ford Ka

Ford Galaxy I (1995-2000)	Both generations were manufactured as a joint venture product between Ford and VW.
Ford Galaxy II (2000-2006)	
	You need use VCDS software (former VAG-COM), VAG1552 or VAS5052 to diagnose them.
Ford Galaxy III (2006-present)	can be diagnosed by Ford-VCM OBD in standard way.
Ford Ka I (1996-2008)	can be diagnosed by Ford-VCM OBD in standard way.
Ford Ka II (2008-present)	You need use Fiat Examiner or to diagnose them.
	This vehicle is manufactured as a joint venture product between Ford and Fiat.

6 Autoscan

This function scans for all known ECUs, and shows the list of ECUs present in vehicle along with number of diagnostic trouble codes.

ECU Name	DTC Count
PCM - Powertrain Control Module (Engine ECU)	4
ABS - Anti Brake-Lock System	4
TCM - Transmission Control Module	4
TPM - Tire Pressure Monitoring (CAN-BUS only)	4
EPS - Electronic Power Steering	4
IPC - Instruments panel cluster	4
RCM - Restraints Control Module (Airbag)	1
BCM - Body control module	4
RKE - Remote Keyless Entry (CAN-BUS only)	4
MHD - Multi function display	4
NAV Navigation (CAN-BUS only)	4

This function is identical with Network Test function in IDS.

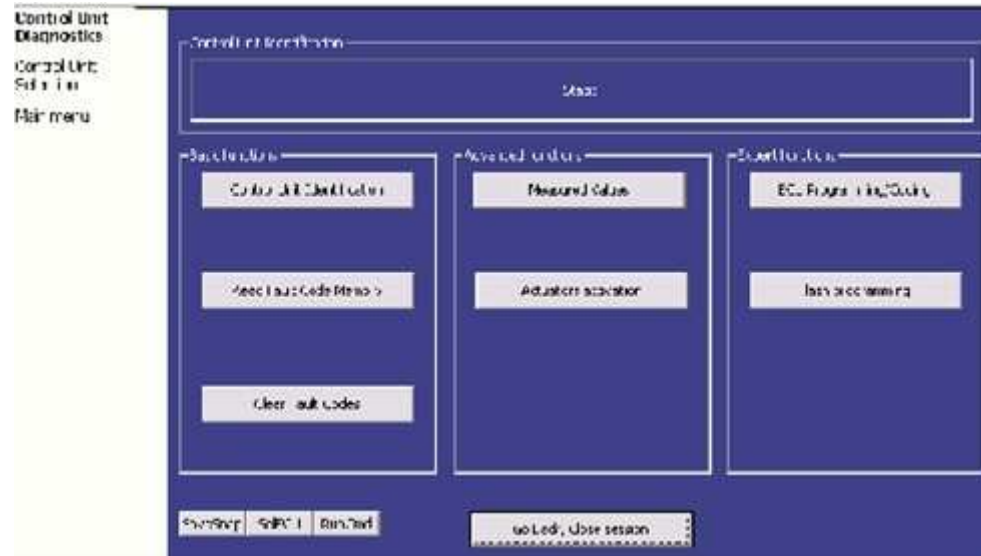
identical with Network Test

7 Diagnostic functions

You can connect with ECU by choosing unit from list of ECUs or Autoscan menu.

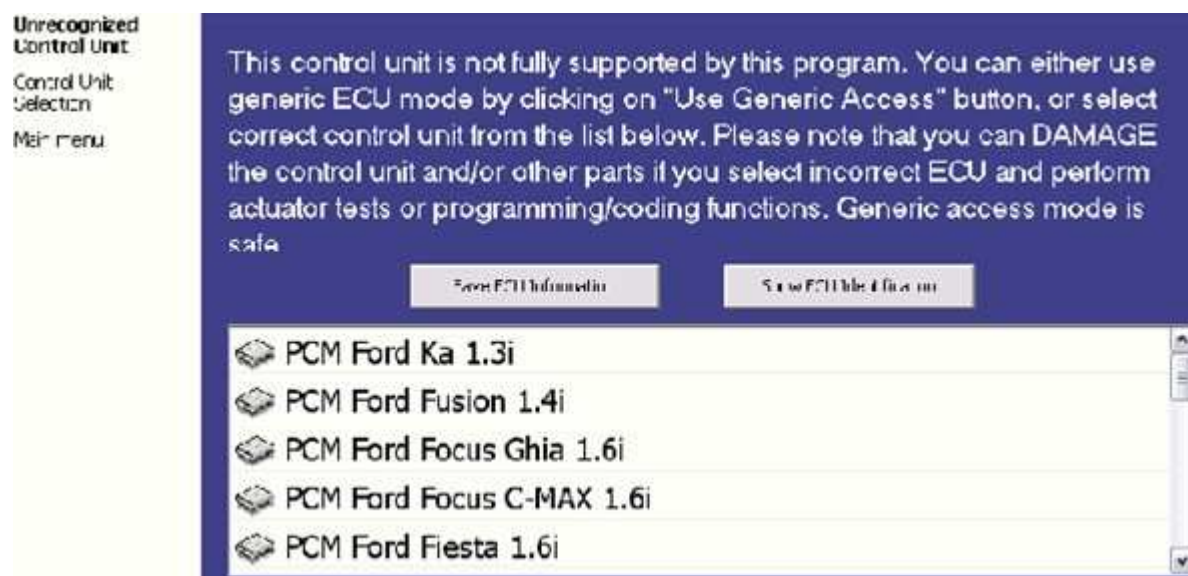
If control unit was identified uniquely, diagnostic menu will be available. If control unit wasn't identified uniquely, you have to choose concrete ECU from list.

Diagnostic menu is divided into three parts. Basic functions, Advance functions and Expert functions.



7.1 Unrecognized Control Unit

Unfortunately control units in Ford vehicles in some cases do not return unique identification or Ford-VCM OBD may not correctly identify control unit. In such case is it necessary to choose right type of control unit from list.



In this situation, you can either use generic ECU mode by clicking on Use Generic Access button, or select correct control unit from list below.

You can get more information about ECU by clicking Show ECU Identification button. Some ECUs (especially those before 2003) donot contain identification data, therefore *Unrecognized Control Unit information will always appear.*

**You should necessarily choose right ECU for correct measuring of measured values.
If you make mistake in identification, you shouldnot make any programming functions.**

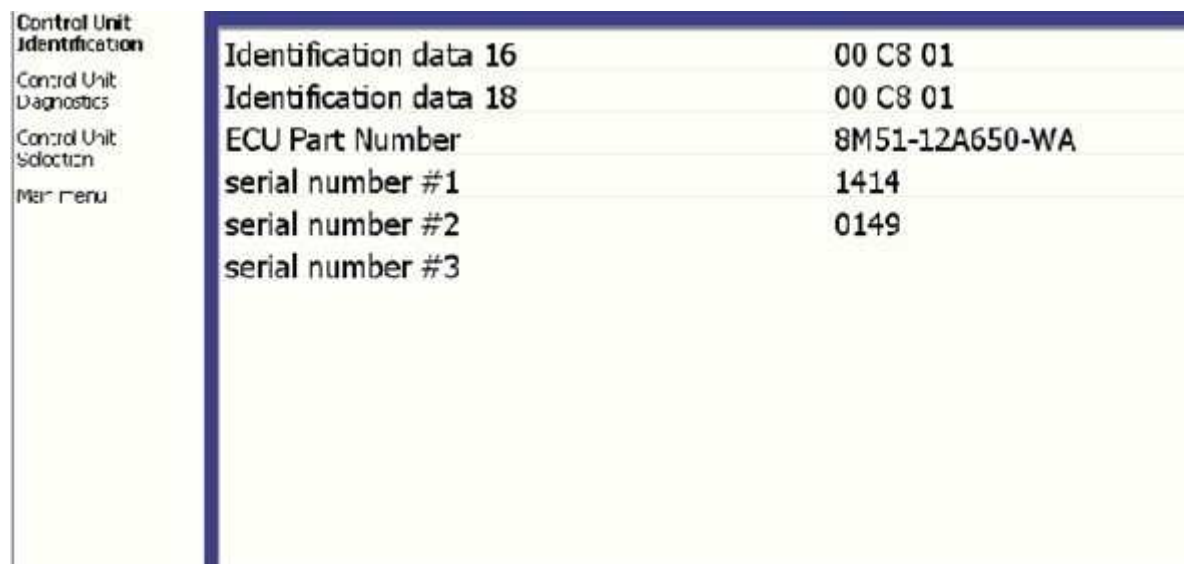
Function Save ECU information make possible to save all development information about ECU to hard disc. We asking users to send these files to us. We would like to add support to these ECU to next version of Ford-VCM OBD.

7.2 Control Unit Identification

This function can display only identification data accessed by ECU, for example:

- Identification data
- ECU part number
- serial number

Incomplete identification are very common mainly for older ECUs that do not provide full part number or VIN code.



The screenshot shows a diagnostic tool interface with a sidebar on the left and a main display area on the right. The sidebar contains the following menu items: Control Unit Identification (highlighted), Control Unit Diagnostics, Control Unit Selection, and Main menu. The main display area shows a table of identification data:

Identification data 16	00 C8 01
Identification data 18	00 C8 01
ECU Part Number	8M51-12A650-WA
serial number #1	1414
serial number #2	0149
serial number #3	

Each ECU should contain valid VIN code. If VIN is not supported, identification should display it. If it is not provided, you can program it in function ECU Programming/Coding, accessible from menu Control Unit Diagnostics.

You can print identification by clicking Print Identification button or you can copy to clipboard by clicking Copy Identification.

7.3 Read fault code memory

This function allows to read and display diagnostic trouble codes saved in memory of control unit (so called CMDTC).



7.4 Clear Fault Codes

This function clears fault codes stored in ECU memory.

Clearing memory is not guaranteed. Fault codes might appear again or under some conditions it isn't possible to clear fault codes at all. It's possible that in the presence of some faults the control unit doesn't allow to clear fault codes or a fault is in no time written back to memory.

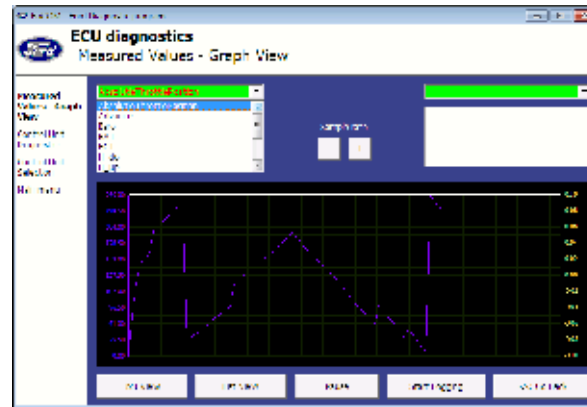
It is recommended to read memory by clicking the 'Re-read fault codes' button again.

7.5 Measured values

7.5.1 Graph display

This function displays two measured values known as live data or sensor simultaneously. Measured parameters chosen from selectors at the top of the window.

Buttons + and °C allow to accelerate or speed of graph.



(also values) can be

decelerate

7.5.2 Display 3x3

For measuring 9 value simultaneously, click 3x3 View button.



on

7.5.3 Display list

To measure all available values simultaneously, click List view button.

Please note values means slower refresh rate.

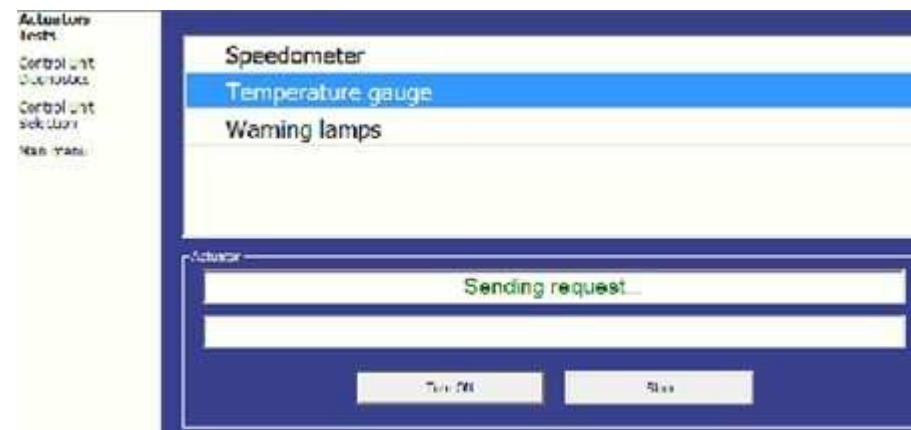


7.5.4 Save to log

Measured values can be saved/logged to a file by clicking Start logging button. The logfile is standard csv file and it is compatible with VagScope or can be imported to Microsoft Excel or OpenOffice Calc.

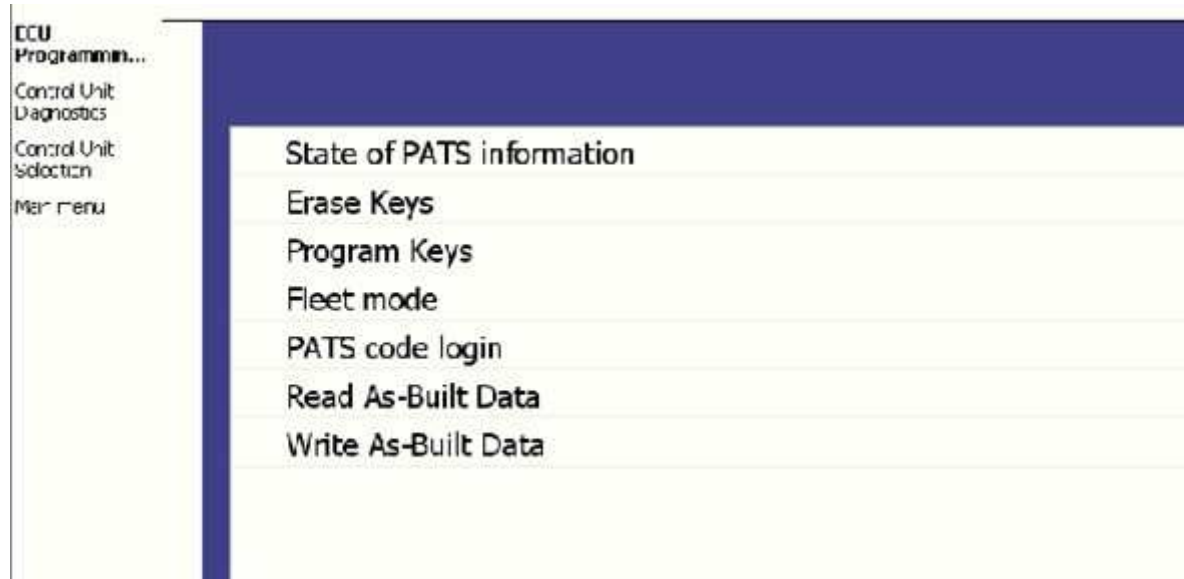
7.6 Actuators activation

This function can activate actuators and perform some actuators actions.



7.7 Programming functions

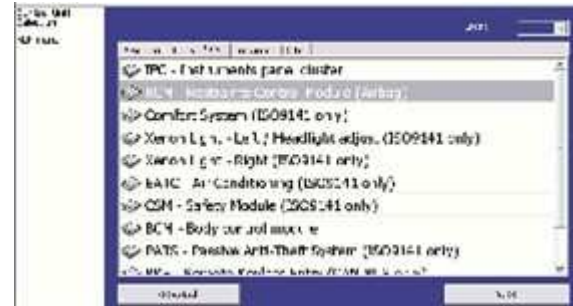
This function allow you to e.g. programming VIN code, operate with immobiliser (PATS) or programming calibration data of injectors.



8 Ford IDS and Ford-VCM OBD comparison

This chapter describes comparison of functions of Ford-VCM OBD with original Ford Motor Diagnostics IDS (Integrated Diagnostic System).

8.1 Control unit selection



Main difference between concepts of program Ford-VCM OBD and system IDS is in user approach to vehicle and its systems.

The IDS uses so called Function system, which first chooses function (e.g. Read trouble codes) and then control unit (e.g. PCM).

Ford-VCM OBD chooses control unit first and then function.

Advantage of second approach is especially similarity with other diagnostic systems (e.g. VCDS, etc.) and consequently more user friendly for those who have not much experience with IDS. Next advantage is easier identification of concrete type of control unit for programming etc.

8.2 Fault codes

Reading and Clearing Diagnostic Trouble Codes acted like IDS system, all CMDTC (Continuous Memory Diagnostic Trouble Codes) are read and clear from control unit.

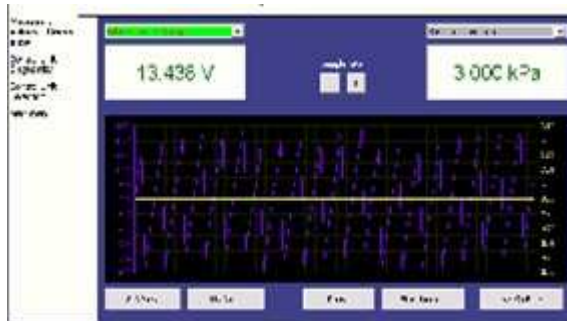
8.3 Identification



Ford IDS does not provide this

function, however is possible to display some identification information in Log Viewer "C Technician View (Full Diagnostic). Ford-VCM OBD use special function for reading identification information.

8.4 Measured values (Datalogger)



Unlike IDS system the Ford-VCM OBD implements three options of displaying measured values:

- Graph "C for comparison two measured values simultaneously in graph
- Display 3x3 "C appropriate for see display from longer distance
- Display list "C for display all available measured values

It isn't necessary to set vehicle equipment, which is sometimes hardly observable, Ford-VCM OBD displays all measured values, provided by control unit.

The Ford-VCM OBD can sometimes display more values than IDS system, e.g. in Engine control unit is commonly available distance moved from last clearing flash memory (this function isn't supported in IDS system).

8.5 Actuator activation

Actuator activation is implemented in same way like IDS system.

8.6 Programming function

Direct Flash / EEPROM programming functions are described in separate document and require additional license.

8.7 Autoscan (Network test)

This function scans for all known ECUs, and shows the list of ECUs present in vehicle along with number of diagnostic trouble codes, thus provide test of network.

Both functions Network Test (IDS) and Autoscan (Ford-VCM OBD) are identical.



The screenshot shows a window with a list of ECUs and their corresponding diagnostic trouble code counts. The list is as follows:

ECU Name	Count
ECU PCM - Ford Jscroba notia	11
ECU PCM - Ford Jscroba notia	11
ECU PCM - Ford Jscroba notia	6
ECU PCM - Ford Jscroba notia	6

9 Known problems

Ford-VCM OBD doesn't diagnose vehicles manufactured in 1990-1995 with DCL/CART(EEC-IV) diagnostics

Upgrade will need new interface with DCL support

Unreliable communication with some control units manufactured by Delphi (e.g. Focus 1.8TDCi)

Configuration of calibration data of injectors isn't available for all control units

Problems will be solved in near future, Ford-VCM OBD is still in the works. Corrections will be available in any of next updates.