SECONS

Passive Anti-theft system (PATS) FoCOM service manual www.obdtester.com/focom

This is PRELIMINARY WORKING DRAFT for SECONS Ltd. internal use and FoCOM users.
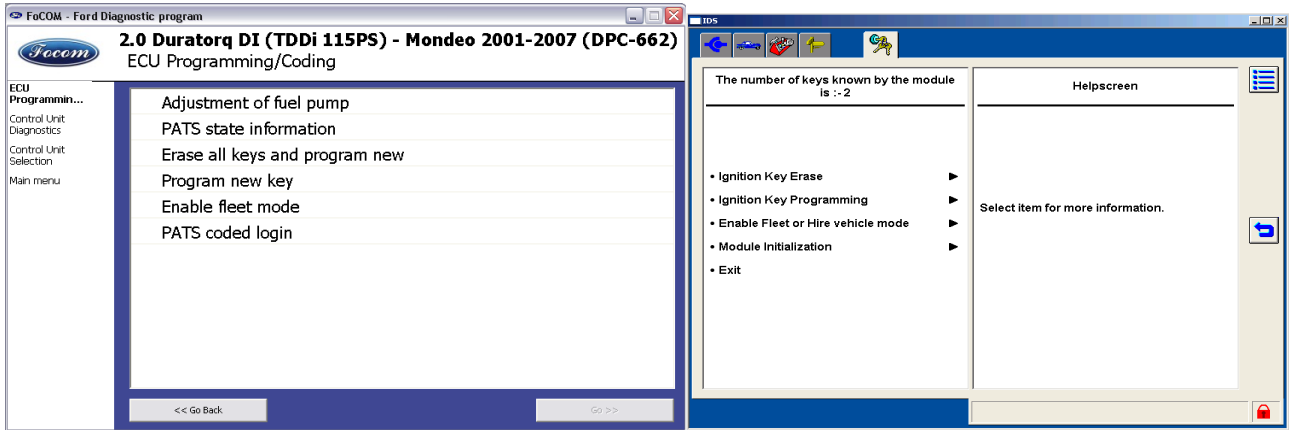
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For users familiar with Ford IDS diagnostics we have included screenshots of Ford IDS for comparison.

PATS Introduction

PATS functions are available in diagnostic session for PCM and IPC ECUs in programming/coding menu.

Bosch PSG TDDi - Fuel Injection pump

Bosch PSG / FIP (Fuel Injection Pump) require to be paired with PCM in order to work. New Bosch PSG systems are adapted automatically, however used fuel pumps require to run adaptation procedure. This coding is described in a separate document related to Bosch PSG diagnosis.

Lucas EPIC TDDi - Fuel Injection pump

Lucas EPIC turbo-diesel systems sold in Europe require adaptation after each key-recoding. The coding procedure is available in "PATS II" ECU. Please note that not all Lucas EPIC systems are covered at this time.

LED indicator of PATS status

Ignition	LED	Description
OFF	Short flashing	Stand-by mode, PATS works
ON	Lights 4 seconds and turns off	Inserted and correctly identified key
ON	Fast flashing	Wrong key, anti-scan mode is activated
ON	On	Waiting for coding keys

When Anti-scan mode is activated, you must wait at least 30 seconds before any operations with PATS.

Information about PATS state

This function displays all important information about PATS system and its state. Ford IDS doesn't provide this function.

Authorization:
Informs, whether secure access is permitted or forbidden (PATS operations are allowed).

PATS types:

Timed: Delay of approx. 10 minutes is required before coding

Coded: Requires challenge-response INCODE/OUTCODE authorization (you can obtain INCODEs using http://www.patscode.com/ or through Ford ETIS service)
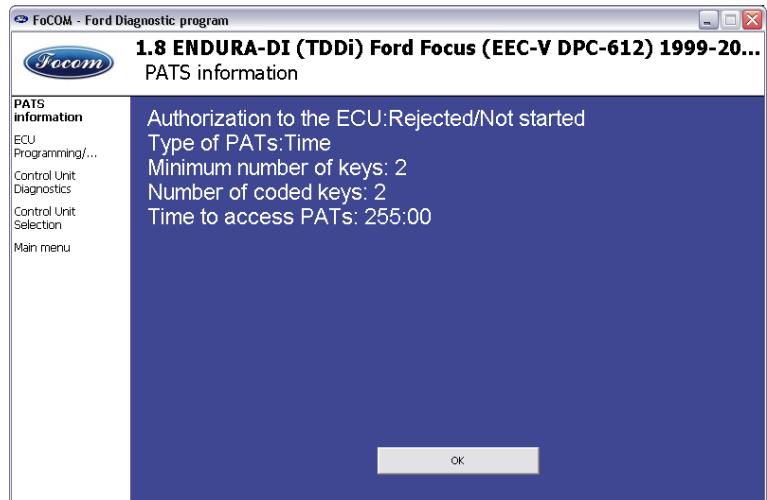
Minimum number of keys:
Minimum number of programmed keys required for correct function of PATS (car won't start if less then required number of keys is programmed).

Number of coded keys:
Current number of programmed keys. Number should be equal to or greater than previous value, in other case trouble codes will appear fault code memory.
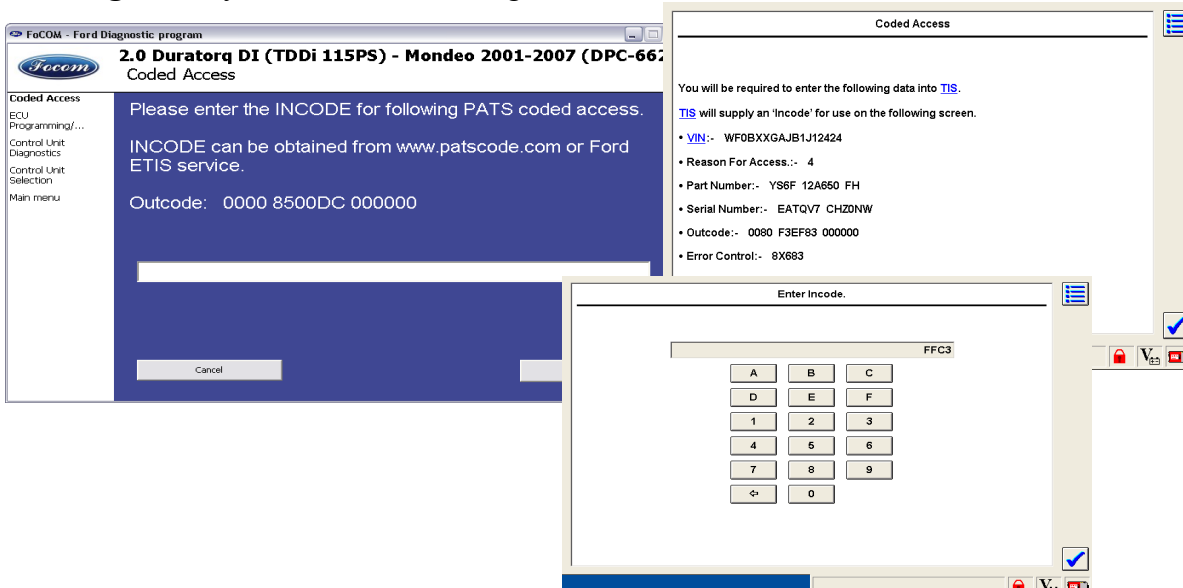
⚠️ It is very important to have correct type of transponder for every model and minimal number of keys.

PATS unlocking

Before any operation with PATS you have to get access to PATS ECU.
In **coding access** you see window asking for OUTCODE/INCODE.

The coded PATS generates a so-called OUTCODE, which requires a so-called INCODE, which is dependent on a specific vehicle and generated OUTCODE.

PATS unlocking is performed before any operation automatically, you do not have to use FoCOM "PATS Login" function. The PATS Login is used only for test purposes (to verify correctness of incode) and some special operations.
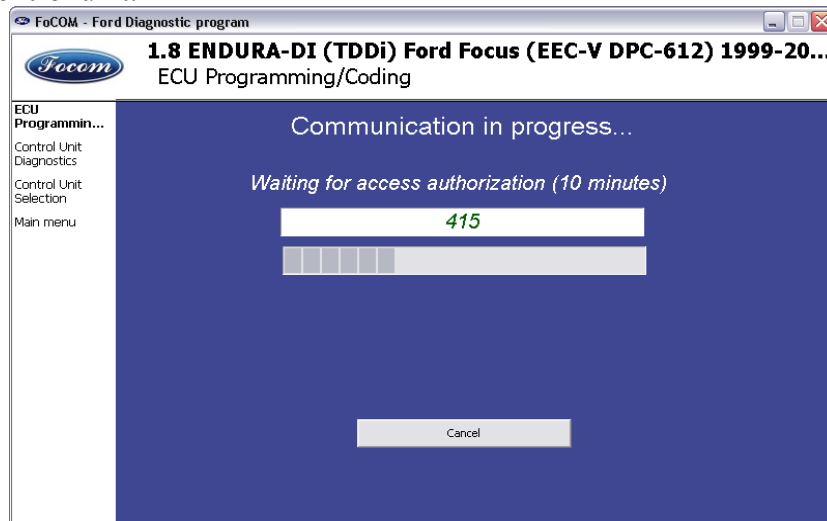
⚠️ For each OUTCODE, which control unit generates, is necessary to get a unique INCODE. Using one and the same INCODE during more operations with PATS is not possible.
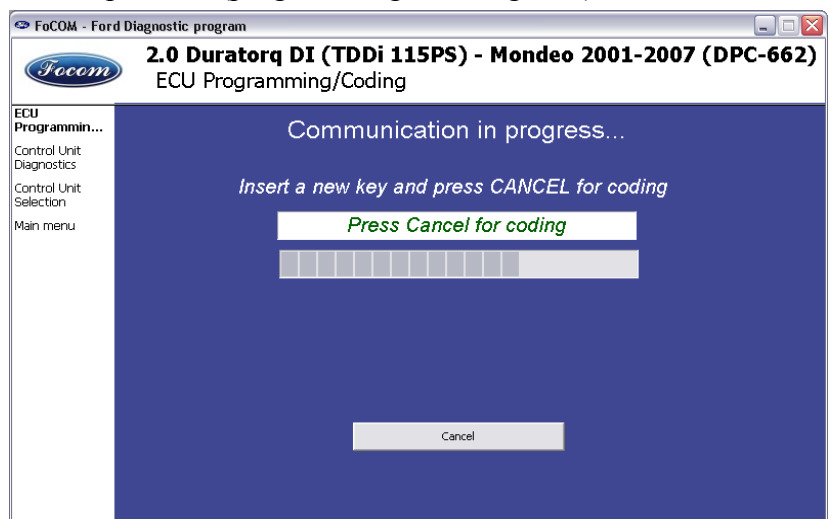
ℹ️ INCODE can be obtained at http://www.patscode.com/   or using Ford ETIS service. *Please note that PATSCode.com service doesn't support yet a 2011+ Ford Mondeo/S-Max/Galaxy/Focus and C-Max vehicles that use different system. For such vehicles you need to obtain the INCODE using other source such as Ford ETIS.*

Timed PATS starts the countdown automatically. Program cannot speed-up the countdown, it fully depends on the control unit.

You can cancel the running countdown by clicking on *Cancel* button. While FoCOM is waiting for control unit to unlock, it communicates with control unit and therefore ignition has to be switched ON.

A dialog waiting for the completion of the operation (programming, clearing, etc.) is displayed afterwards. Operations are described in following chapters.

Then press *Cancel* button to start coding procedure. If you are changing key, ignition must not be switched off for more than 10 seconds.

Clearing keys procedure

- Connect to PCM
- Choose *Erase all keys and program new*
- Login to PATS (see previous chapter)
- Communication is in progress
- After few minutes of waiting is showing the call for delete keys by pressing *Cancel* button. The control unit is now ready to perform deleting and coding a new keys. Pressing *Cancel* button is going to delete ALL keys and is necessary to coding a new one. The following procedure is intended for vehicles requiring min. 2 coded keys
- Turn ignition OFF
- Turn ignition ON (wait about 5 seconds), PATS LED is on
- Turn ignition OFF and remove key
- Insert the next key and turn the ignition ON (PATS LED off after about 5 seconds)
- Turn OFF the ignition and wait 60 seconds
- Check by *PATS state information* function if the keys was deleted and the new keys added (if the number of keys is 0 or 1, it is necessary to add the next key(s) by *Program new key* function)

⚠️ As long as minimal number of keys required by PCM isn't programmed, engine may not start. Fault code memory will show error stating that less than minimum required keys is programmed.

New key programming procedure

- Connect to ECU that holds programmed keys (typ. PCM, IPC, BCM or RKE depending on model)
- Click item *Program new key*
- Log in to PATS (see previous chapter)
- Once the information "*After clicking Cancel, key will be programmed*" appear, insert new key in to ignition OFF (if key have not been there yet) and switch to ON position
- click on *Cancel* button
- New key will be programmed
- Switch key to OFF or remove key
- Check if operation was successful by function *Information about PATS state*

"Pairing" PATS Control Units

For vehicles that use multiple ECUs for PATS system (e.g. PCM and IPC, BCM RKE or SCIL), ECUs need to contain same vehicle security data. For this purpose FoCOM provides "PATS Pairing" function, which is available coding menu of non-PCM ECU (IPC, BCM, SCIL or RKE). The function is available only on coded PATS.

PATS pairing requires obtaining two INCODE/OUTCODE pairs of both ECUs involved in PATS system.

✅ PATS pairing function is now available also on UDS protocol.

Supported multi-ECU PATS systems:

Make	Models	PATS ECU #2
Ford	Fiesta/Fusion (EU) 2002-	IPC
	Fiesta/Fusion (EU) 2008- (UDS)	IPC
	Transit 2006- (UDS)	BCM
	Transit Connect 2007-	IPC
	Mondeo/S-Max/Galaxy 2006- (UDS)	BCM
	Focus/C-Max 2004-2010	IPC
	Focus/C-Max 2010- (UDS)	BCM
	Explorer 2006-	IPC
	F-150 2009-	IPC
Mazda	3 2003-2008	IPC
	CX7	IPC
	5 2007-	RKE
	6 2008- (UDS)	IPC

Common PATS fault codes

DTC	Description
B1213 B10D8-00	Less than 2 (or 3 if equipped w/Valet key) keys programmed to the system.
B1232 B2103 B10D5-13	Transceiver internal antenna damaged. Replace transceiver.
B1342	ECU is defective (EEPROM in PCM is not working – replace PCM). PATS related when stored in PCM only.
B1600 B10D7-87	Non-PATS Key or damaged key.
B1601 B10D7-51	Unprogrammed encoded ignition key detected (leave ignition on for 20 seconds before trying a programmed key, in Anti-Scan Mode)
B1602 B10D7-8F	Particial detection of encoded ignition key.
B1681 B10D9-97	Transceiver signal not detected.
B2141 B10DA-5	Non-Volatile Memory (NVM) configuration failure – No PCM ID stored in PATS
B2139 U2510 B10DA-61	PCM ID does not match between the PCM and PATS control (PATS/ICM/VIC/HEC/SCIL).
B2431 B10D7-05	Key program failure (defective key or transceiver).
U1147 U1262	Communications issue, SCP (J1850), between PCM and PATS control (PATS/ICM/VIC/HEC/SCIL).
U1900 U0100 U2511 B2009 B10DA-96	Communications issue, CAN (J2284), between PCM and PATS control (ICM).
P1260	PCM disabled the vehicle because of a PATS concern. Retrieve DTCs from applicable PATS control function (PATS/ICM/VIC/HEC/SCIL).
P1622	PCM disabled the vehicle because of incorrect challenge response. Retrieve DTCs from applicable PATS control function (PATS/ICM/VIC/HEC/SCIL).
P1602	PCM disabled the vehicle because of a communication issue with control module. Retrieve DTCs from applicable PATS control function (PATS/ICM/VIC/HEC/SCIL).

Problems not related to PATS

- The "Service Engine Soon" light is illuminated. (Investigate PCM system)
- There is no communication with PCM: PCM will always communicate on the diagnostic link regardless of theft status. (Investigate PCM system)
- Engine stalls on road: Once the engine runs for one second, PATS CANNOT disable the engine. Running stalls are not PATS related issues.
- Remote Entry/Keyless Entry problems: PATS is completely separate from the Remote Entry/Keyless Entry systems.
- There is a no-crank problem on vehicles without PATS Starter disable. Check chart, on reverse side, for presence of Starter Interrupt.
- PATS Theft Indicator flashes every 2 seconds at Ignition OFF. This is normal operation for PATS to act as a visual theft deterrent. See chart on reverse side for applicable system.
- PATS Theft Indicator stays on for 2 or 3 seconds (depending on system type) at Ignition RUN or START and then off: This is normal operation for PATS prove out on all vehicles except LS and Thunderbird.

PATS system types

A&B: Stand Alone Module (PATS)

C: Instrument Cluster
 - Virtual Image Cluster (VIC)
 - Hybrid Electronic Cluster (HEC)
 - Instrument Cluster Module (ICM)

D: Steering Column Ignition Lock Module (SCIL)

E: Powertrain Control Module (PCM)

F: Powertrain Control Module (PCM)

G: Instrument Cluster Module (ICM)

Type of transceivers (active antennas)

- small Ford
- small Valeo (only transceiver, Ford Galaxy, engine Duratec)
- big Valeo (Ford Galaxy 1.9 Tdi VW)