

User Manual

B.U.D.S. Help

This user manual is designed for your convenience and compiled on the basis of the original B.U.D.S. Help file which is built into the program.

Unfortunately, for several years, the B.U.D.S. developers did not make any changes to Help file. It has long been changed the composition of the diagnostic kit, which is required for diagnosis, but B.U.D.S. Help file was prepared for use it with the previously used equipment (VCK®) and outdated B.U.D.S. program (2-nd version). We have slightly modified description to match the modern equipment for diagnostics, which is used now in every authorized

workshop.

Maybe we have missed something and not have corrected. Therefore, the description of some operations maybe correspond to the outdated MPI® (MPI-1) and 2-nd version of the B.U.D.S. program. If you notice an error or discrepancy, please let us know by email to admin@diag-systems.net.

Please Note: MPI-1 is no longer officially supported in the version 3 and higher.

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Contents

Chapter 1 4 B.U.D.S.
4 Installation
4 License Agreement
5 General Characteristics
6 Computer Requirements
7 IXXAT driver installation
13 B.U.D.S. Installation
17 B.U.D.S. Demo
19 License key installation
28 Terms and Abbreviations
29 Hardware
29 VCK® (unsupported)
42 MPI-2
62 User Interface
62 Title Bar
63 Menus
98 Document
177 Utilities

182 Troubleshooting
182 Using Help
183 Phone Numbers
184 MPI® not Present
185 Module not Present
186 Error 001
187 Error 002
188 Error 003
189 Error 201
190 Error 202
191 Error 203
192 Error 204
193 Error 205
194 Error 206
195 Error 250
196 Error 251
197 Error 252
198 Error 255
199 Errors 300-308
200 Errors 350-353
201 Errors 400-403
202 Errors 404-411
203 Error 500
204 Error 501
205 Error 502

Contents

206 Error 503
207 Error 504
208 Errors 505 and 507
209 Error 506
210 Error 508
211 Error 509
212 Error 510

213 Error 550
214 Error 551
215 Error 552
216 Error 553
217 Error 554
218 Error 200
Chapter 2 219 **Diagnostic Kits**
220 BRP Diagnostic Kit
222 Diagnostic Kit 4-TEC (SeaDoo, SkiDoo)
224 Diagnostic Kit All 4-TEC
Chapter 3 225 **License Keys**
225 License Keys description
226 MEGATECH
226 Megatech License Features
230 Clear As New
Chapter 4 243 **TeamViewer QuickSupport**

Installation
License Agreement

Distribution

B.U.D.S. can be installed on any number of your computers, but it will always need a MPI® and a matching access code to be fully operational.

Disclaimer

B.U.D.S. software is provided on an "**as is**" basis without warranty of any kind, expressed or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

BRP® does not warrant that the operation of the software will be uninterrupted or error free, or that the software functions will meet your requirement, or that defects in the software will be corrected.

BRP does not warrant or make any representations regarding the use or the results of the use of the software or any documentation provided therewith in terms of their accuracy, correctness, reliability, or otherwise. No written or oral information or advice provided by BRP or a BRP authorized representative create a warranty or in any way increase the scope of this warranty.

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General Characteristics

B.U.D.S. is a comprehensive multi-language diagnostic software that gives you an insight on BRP® electronic modules.

Using B.U.D.S., you can:

- Edit vehicle information
- Test, add or remove DESS® keys
- Adjust engine parameters
- Activate module outputs
- Stop the engine
- Monitor vehicle parameters
- Troubleshoot vehicle faults
- Replace a module
- Update a module
- Read and reset historical data
- Save vehicle information to disk
- Print vehicle information

Computer Requirements

The following list defines the minimum requirements that your PC must meet in order to run B.U.D.S..

- 486 processor or higher (Pentium recommended)
- Windows 95/98, NT 4.0, ME, 2000 or Windows XP operating system
- 10 MB of hard disk space (Compact), 20 MB recommended (Typical)
- 4 MB of RAM (16 MB or higher recommended)
- VGA or higher resolution monitor (SVGA)
- A mouse or any other pointing device
- For VCK® connection: one unused standard serial port (COM) or one unused USB 2.0 port for USB-to-Serial adapter.
- For MPI-2 interface connection: one unused USB 2.0 port .

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IXXAT driver installation

B.U.D.S. communicates with the electronic blocks of the vehicle through the **MPI ®** (Multi Protocol Interface).

Today, there are two models of MPI adapters: **MPI-1** and **MPI-2** (or MPI-II).

MPI-1 - is outdated adapter, able to work in three main protocols: KW2000-250k, DESS, 947-DI. Communicates with the computer via RS-232, also called a COM port. It supports almost all models 4-TEC, which support the exchange rate 250k KW2000 protocol as well as the entire line of 2-stroke technology. Due to lack of KW2000 protocol with baud rate 500k is not able to handle **E-TEC** technology, and some models of ATV Can Am. Since most modern laptops no longer has an RS232 serial port, must be used an USB to RS232 adapter. There are many USB-to-RS232 adapters, and each has its own driver.

MPI-1 is no longer officially supported in the version 3 and higher.

MPI-2 - a modern USB adapter, which uses the protocol CAN, supports transfer rate of

25 to 1000k. For the diagnosis of BRP vehicles used KW2000-250k and KW2000500k. As a standalone unit, supports *4-TEC* and *E-TEC* vehicles. With the additional device **DESS Post Interface** (P/n 529036019) supports the full range of vehicles BRP, including 2-stroke technology.

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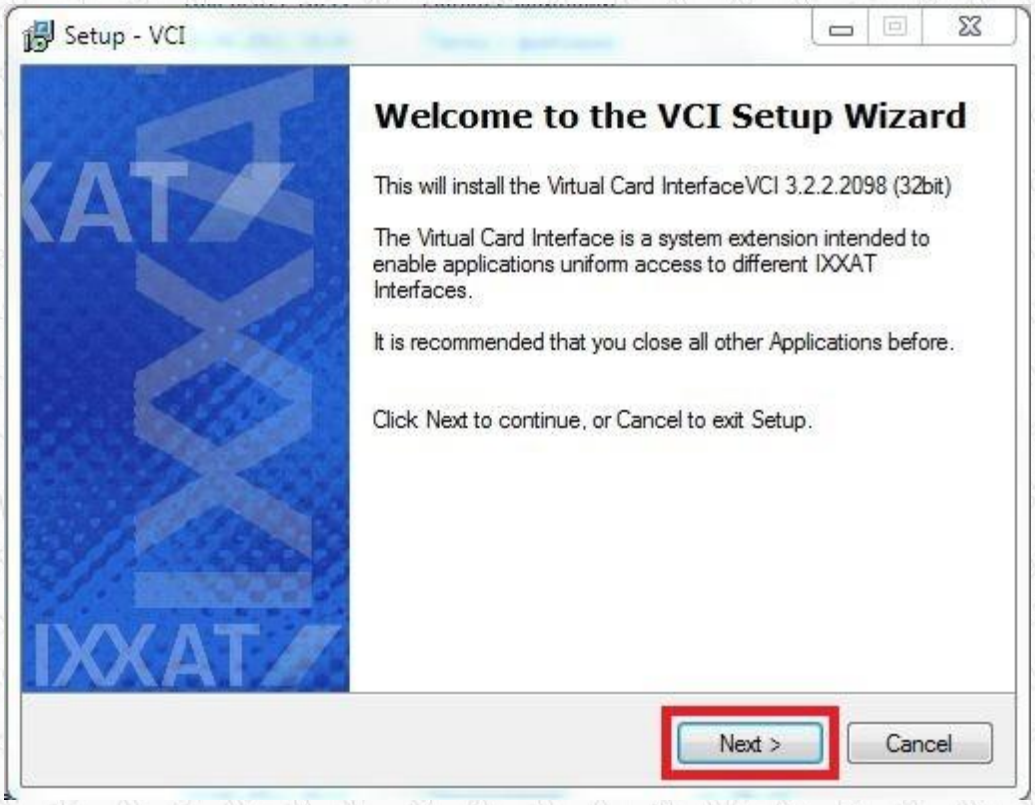
The latest software B.U.D.S. only works with MPI-2 adapter.

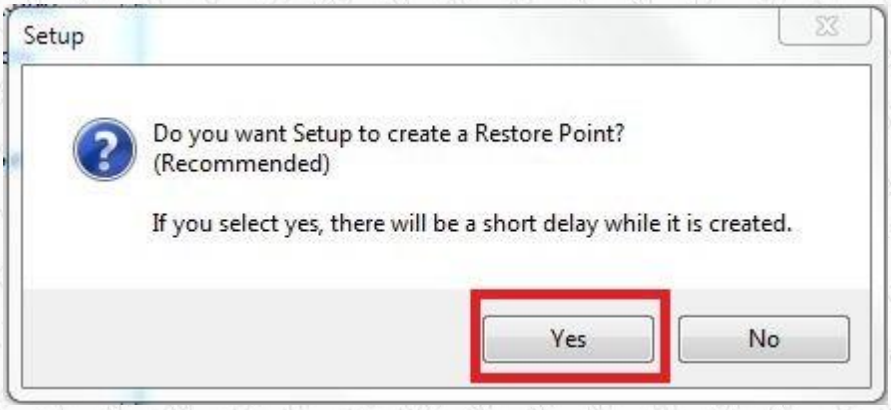
To use **MPI-2** adapter with your PC/laptop, **driver IXXAT** must be installed.

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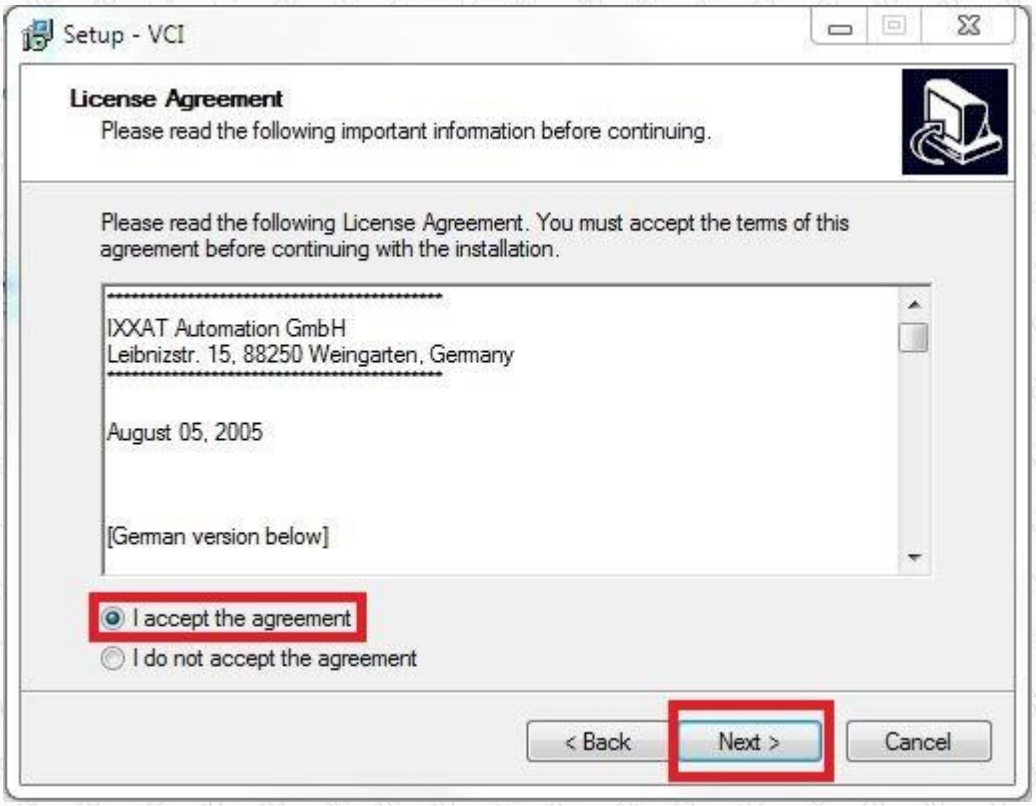
Demonstration of IXXAT driver installation on laptop with Windows 7.

1. Download the IXXAT driver for MPI-2 interface: vci_3_2_2_2098.exe
2. Start the installation by double-clicking on the downloaded installer file.

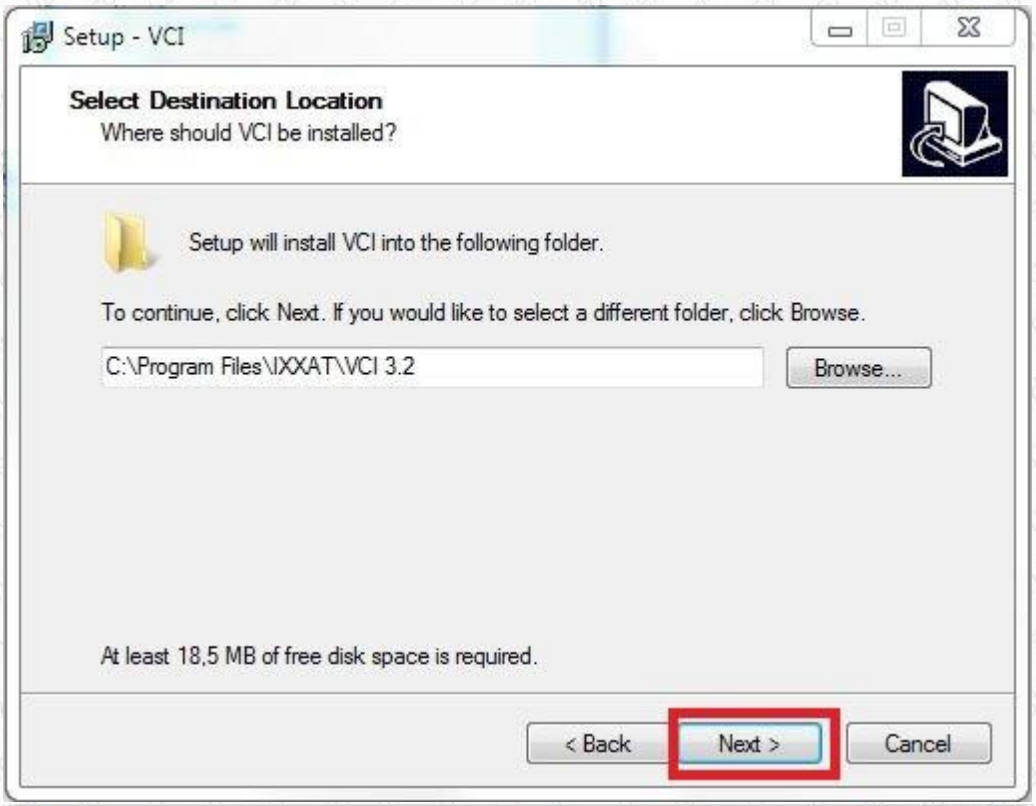


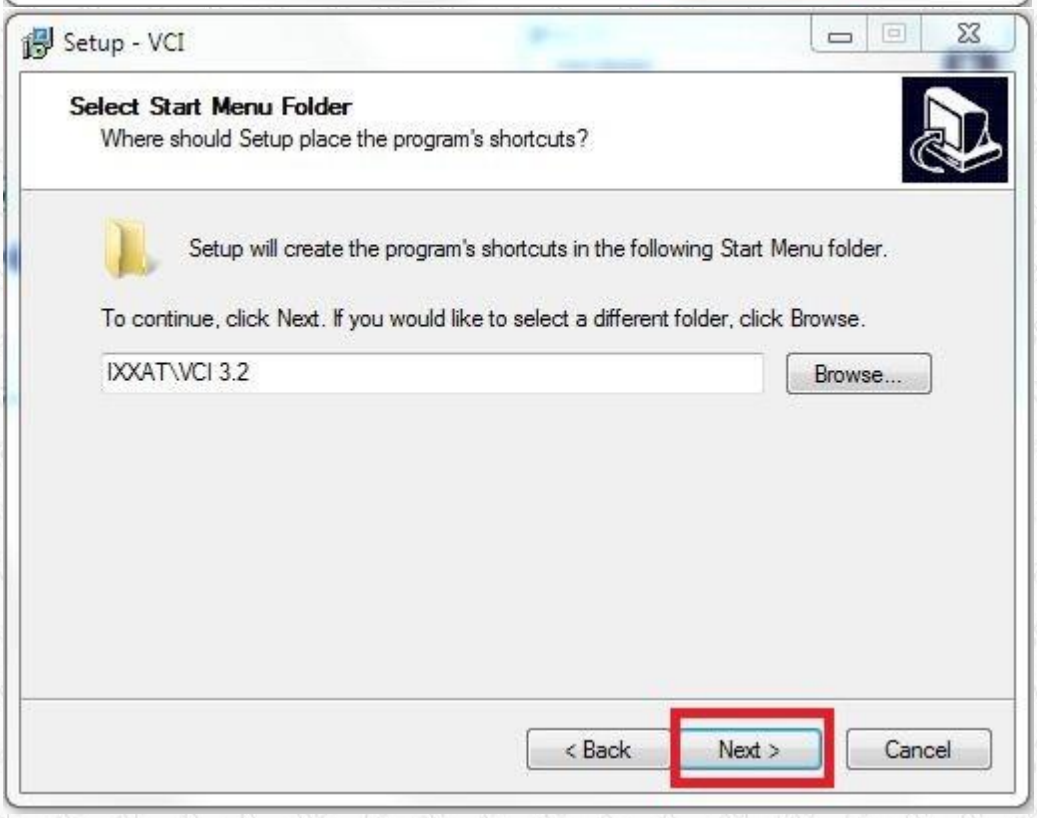


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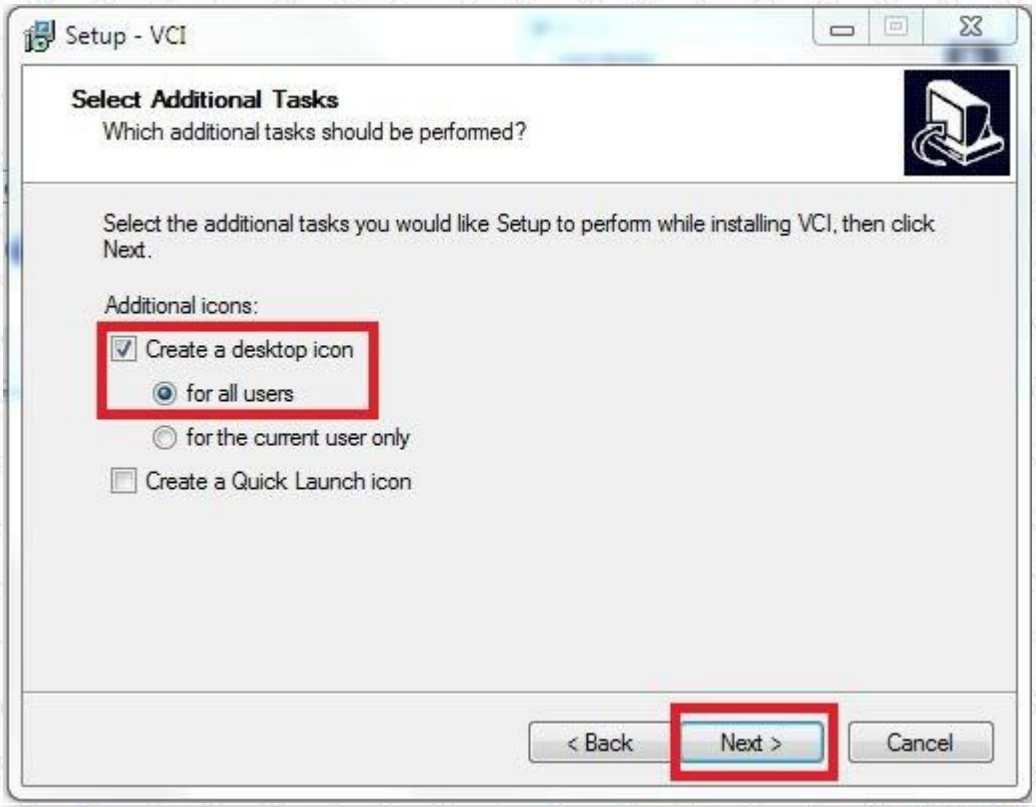


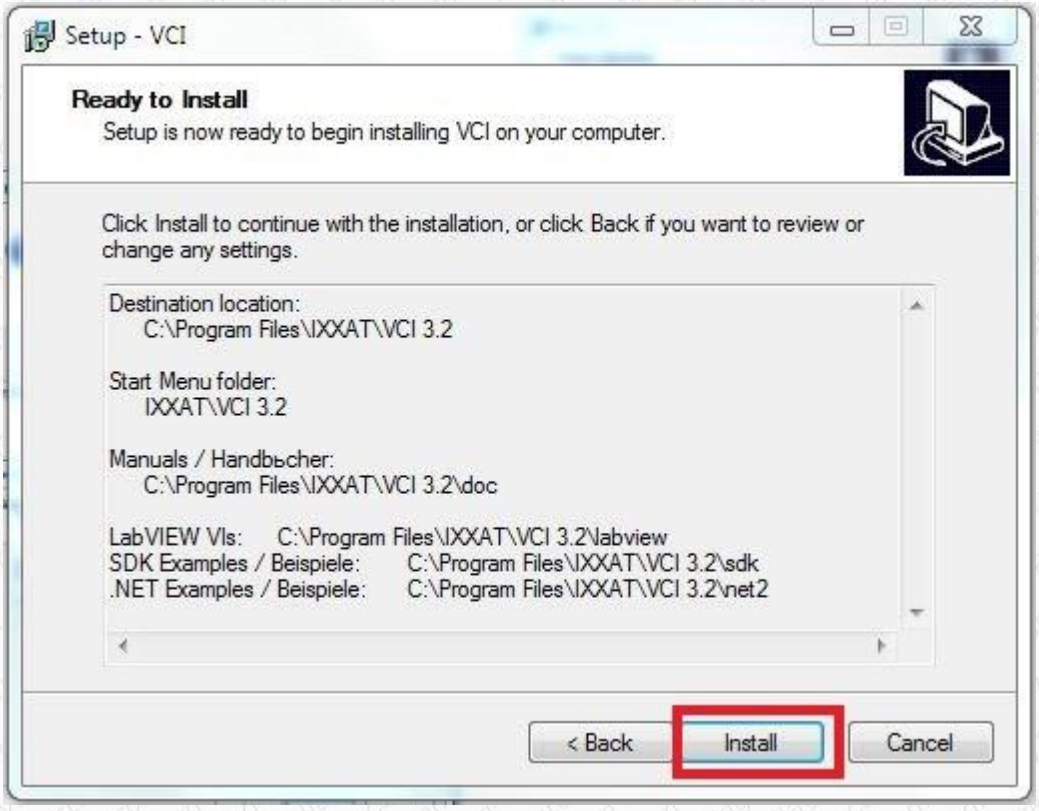
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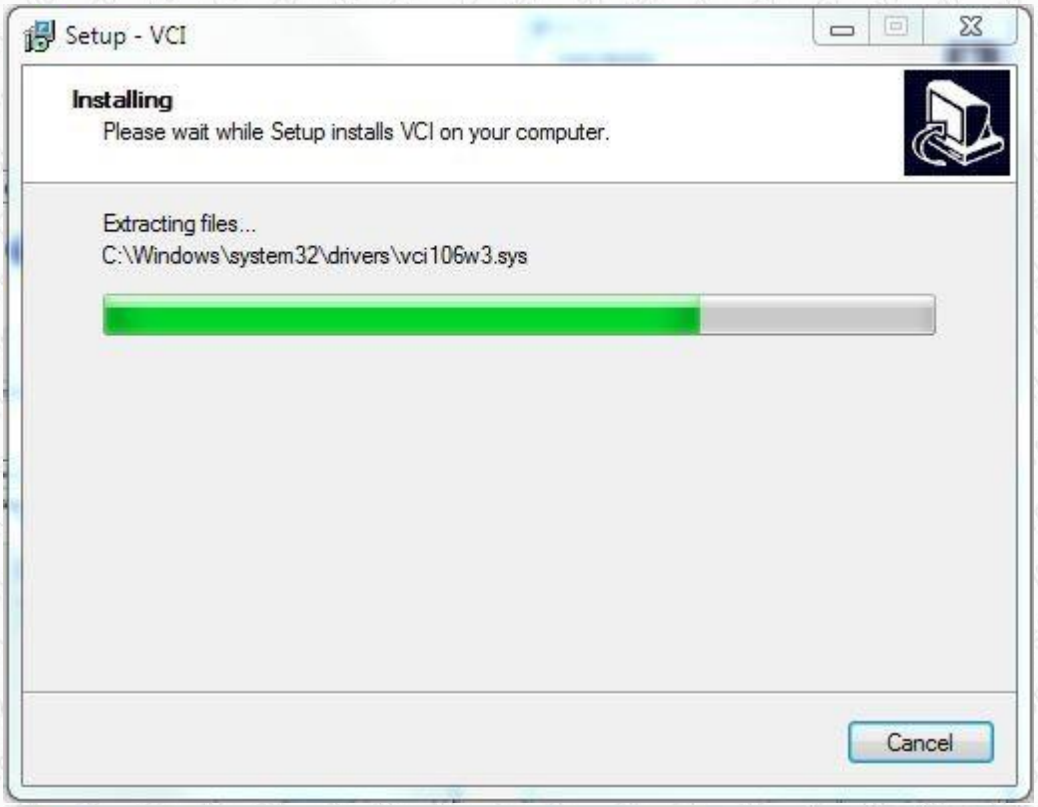


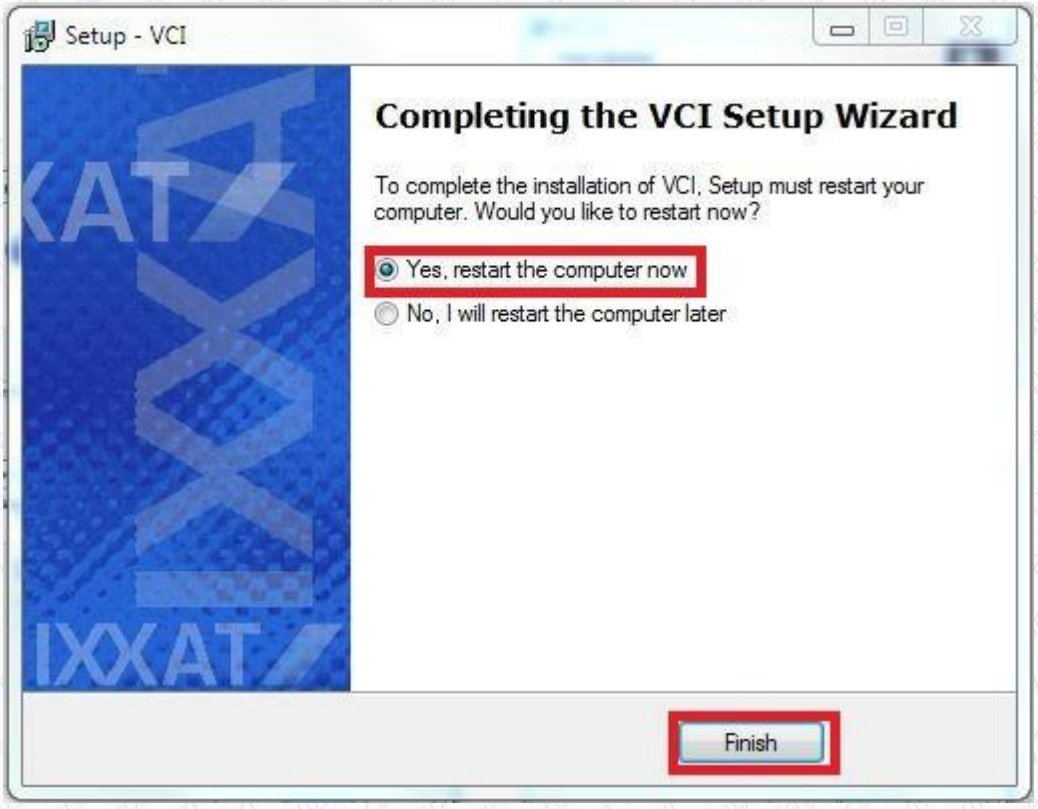
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3. After rebooting your computer, connect the **MPI-2** interface (adapter) to your PC/laptop. Follow the onscreen instructions to continue automatically install the driver.

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B.U.D.S. Installation

Description.

1. All necessary software (B.U.D.S.) you can download **here**.
2. Start the installation of the program by double-clicking on the downloaded file(BUDS x.x.x.exe).
3. Select the installation language and click "**OK**".



4. Follow the instructions and click "**Next >**".

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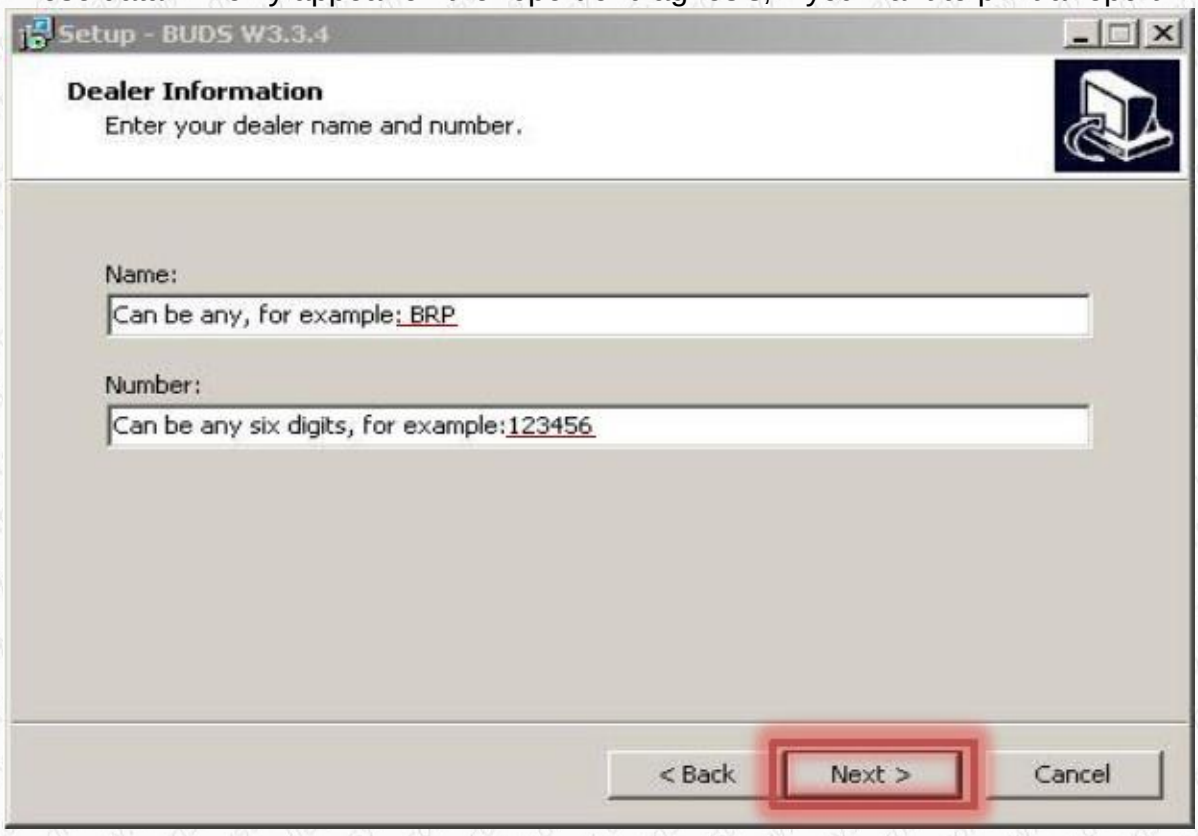


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5. Carefully read the license agreement, then put the point in the right place andclick "**Next >** ".



6. Type the "**Name**" and "**Number**" of the dealer and click "**Next >** ". If you are not a dealer, you can specify any name and number.
These data will only appear on the report of diagnosis, if you want to print a report.



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7. Specify your details. These data will appear in the report, if you wish print adiagnostic report.
   1) **Username** to log into the program.
   2) Your **First Name** (can be any). 3) Your **Last Name** (can be any).

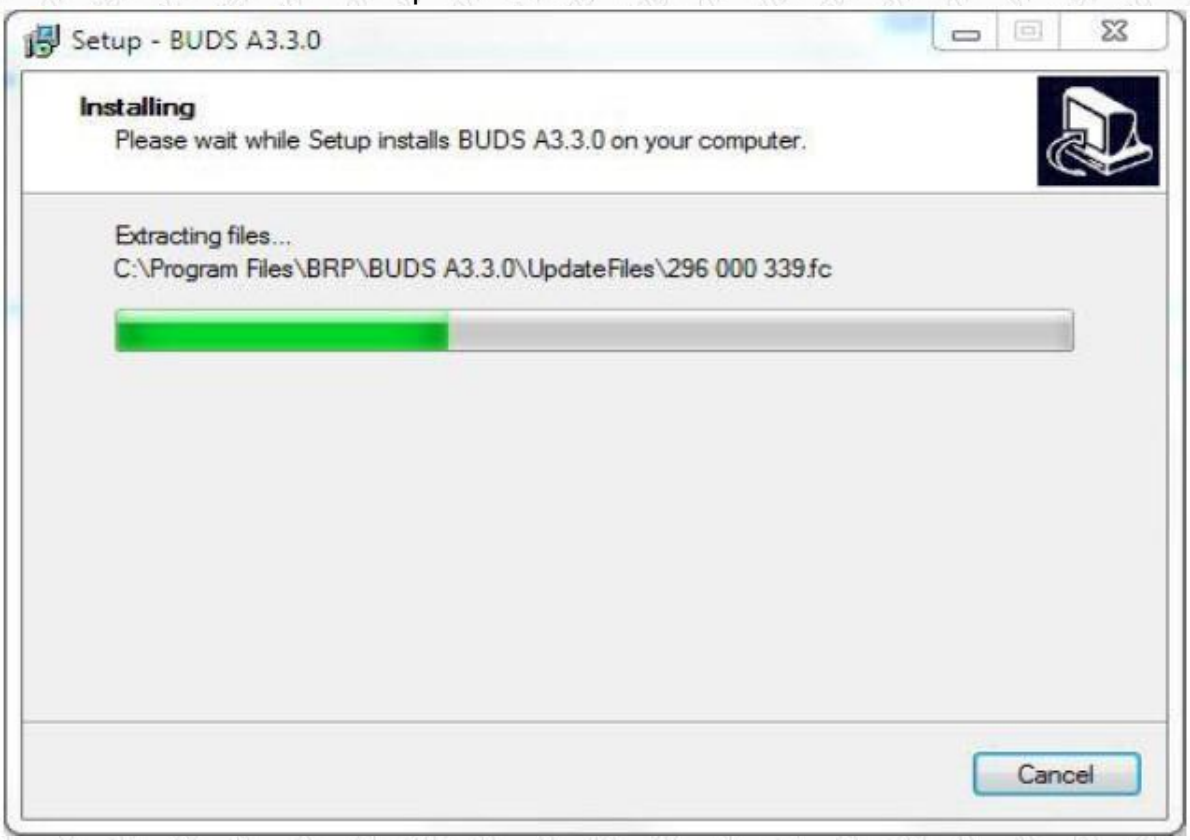


8. Specify your password to log into the program and click "**Next >**".

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9. The installation process starts.



The next step - to install a license key.

You need the administrator privileges in order to successfully install B.U.D.S. on Windows NT, Windows 2000 or Windows XP.

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B.U.D.S. Demo

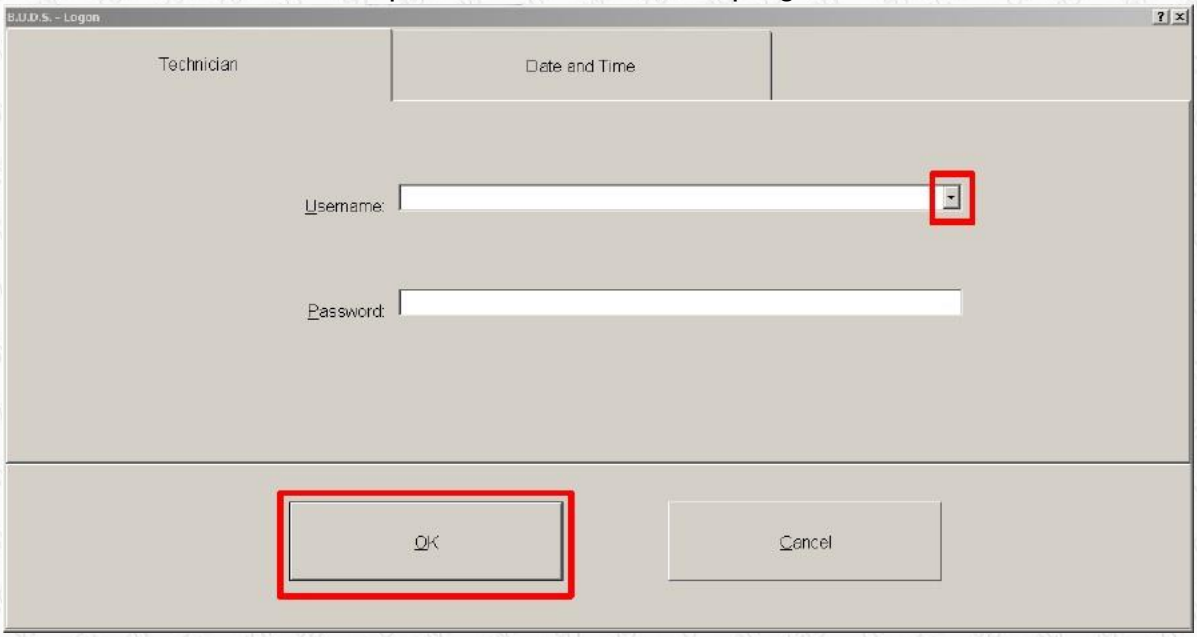
How to run B.U.D.S. in demo mode.

Download here.

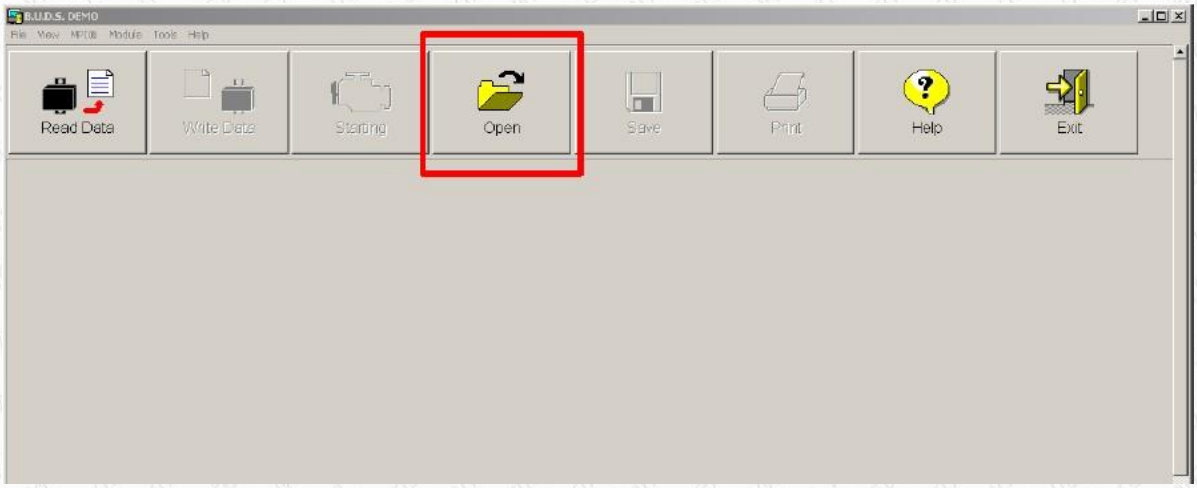
1. Launch B.U.D.S..
2. In the window that opens, click "Ignore".



3. Enter the username and password to access the program interface.

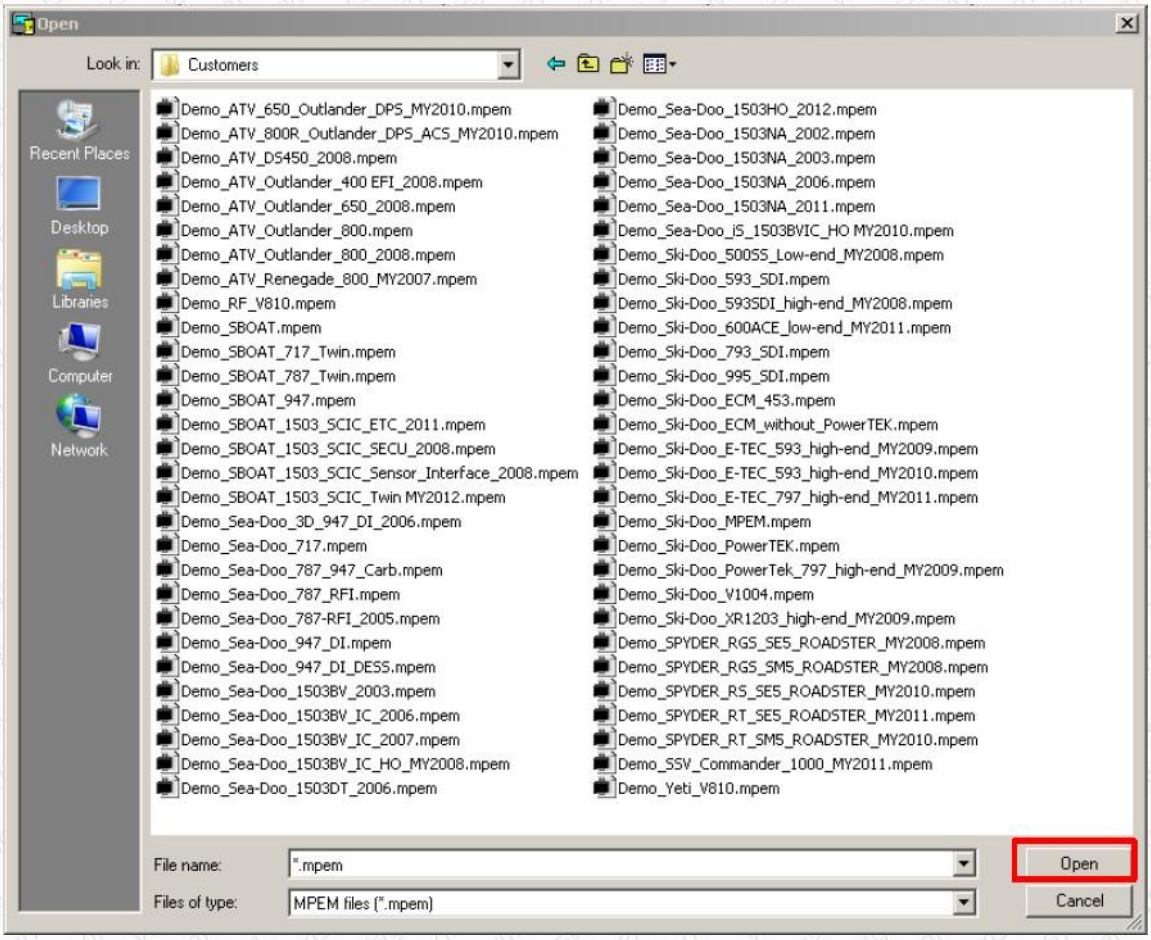


4. Click "Open".

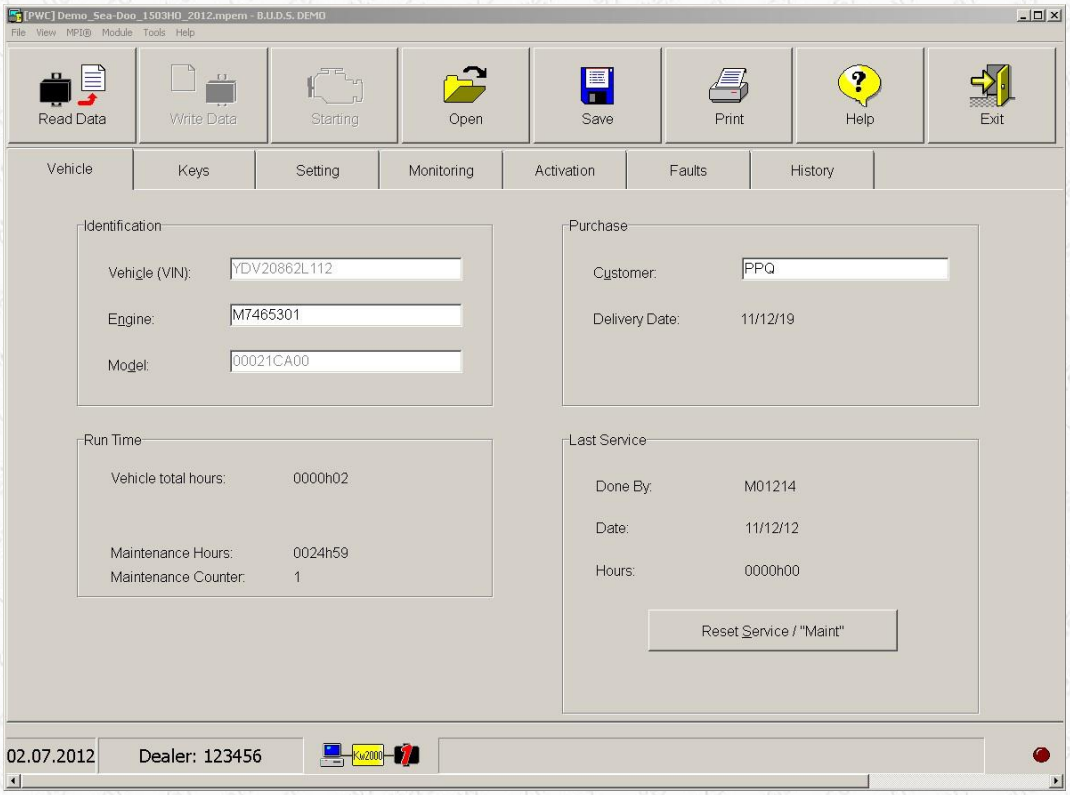


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5. Select demo-file.



Now you can familiarize with the program.



B.U.D.S. / Installation / B.U.D.S. Demo /

License key installation License Key Installation

!!! VERY IMPORTANT !!!

Each MPI adapter has a unique serial number.
The license key is based on the serial number of the MPI adapter and the current date.
Before you begin to install the license key check the date settings on your computer.
If the date on your computer will not match the actual date the program will tell that you are trying to install the wrong license or expired license.
The license key is valid for installation into the program within 24-48 hours only!
If this condition is met, then use Method 1 (normal).
If you have not installed a license key within the specified period, and the program displays a message that the license key has expired, we are recommend to use Method 2 (file "License.dat").

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If these instructions will not help you to solve the problem immediately contac
the supplier of your license.

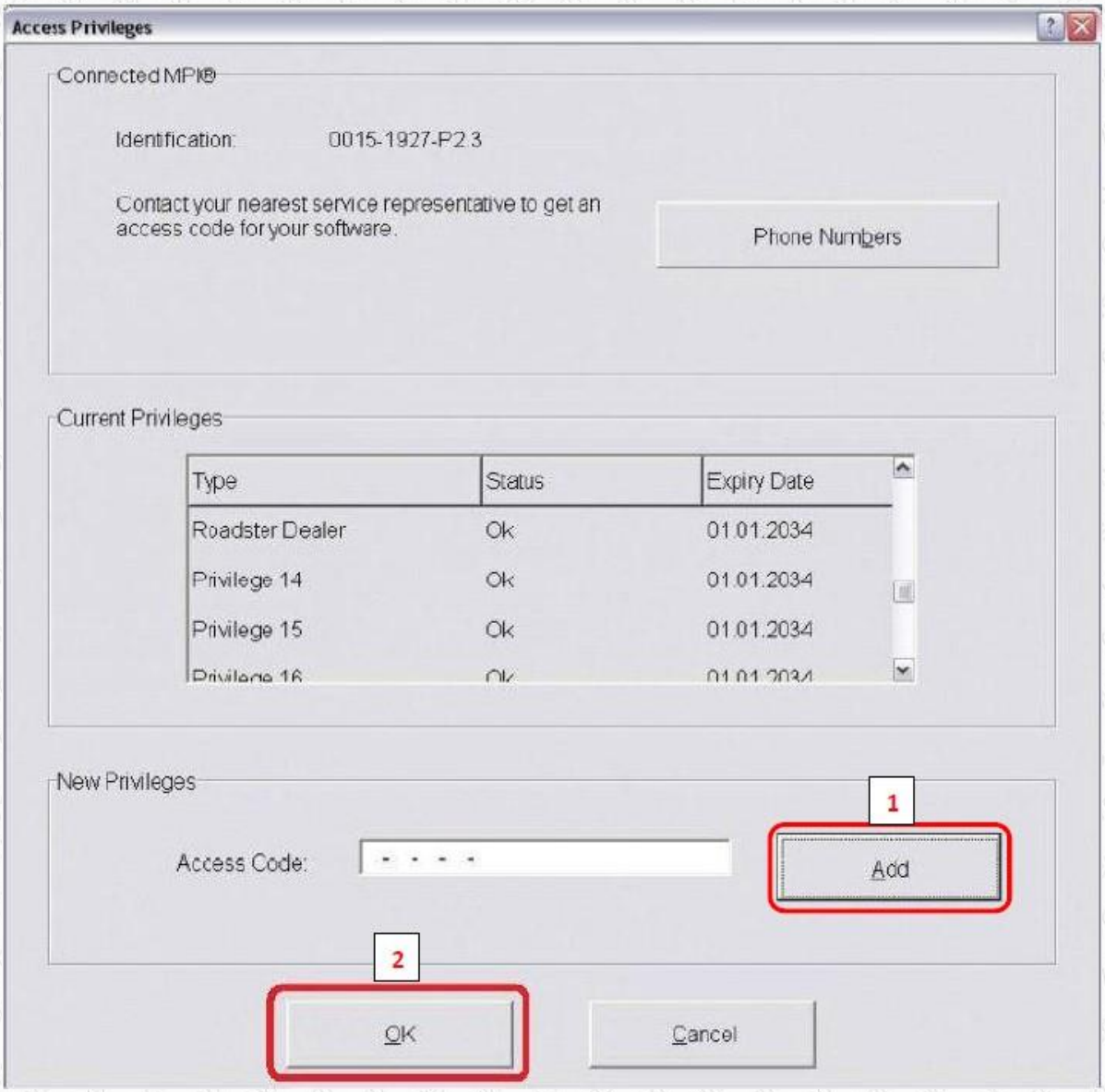
t

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Method 1 (normal)

Description.

1. Connect the MPI-2 interface to your PC/laptop.
2. Launch B.U.D.S.. Page “**Access privileges**” will appear.



3. Insert your license key.

We suggest you "copy / paste” the license key to this section.

4. Once the keys have been inserted, click on **Add**, check the Expiry Date (!) and click on **OK** button.

You now have Full dealer B.U.D.S. diagnostic system!

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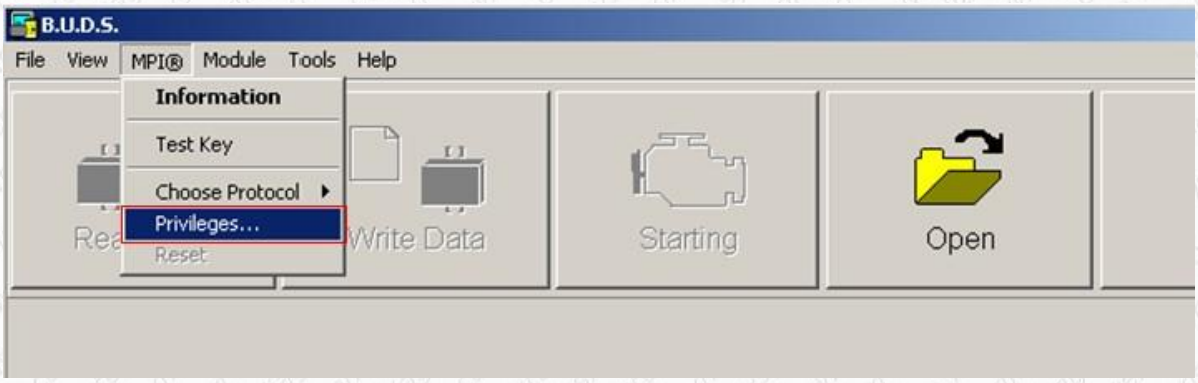
If you have installed multiple versions of B.U.D.S., you must repeat steps 2-4 for each program.

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One more license.

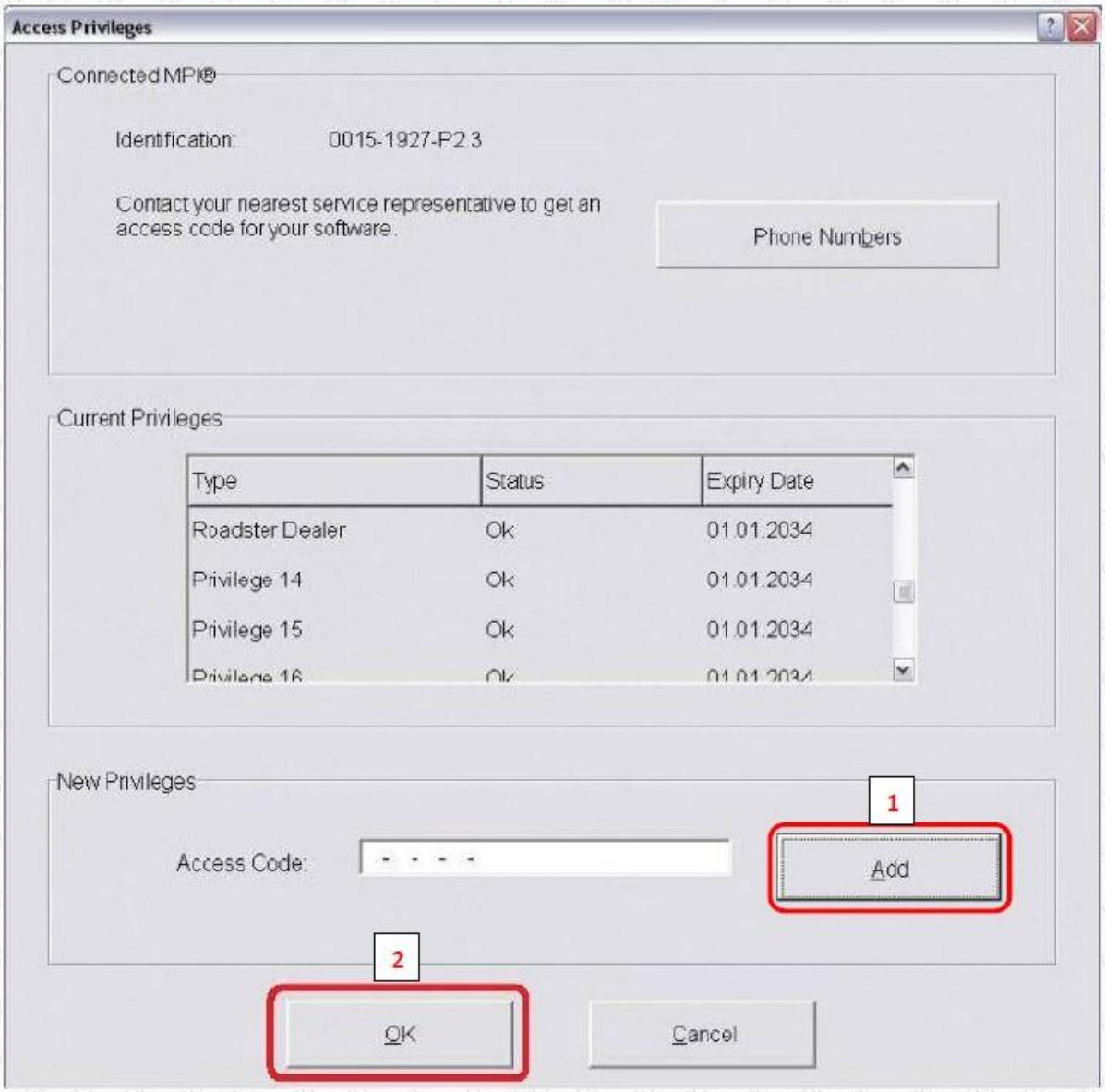
If a license is already installed and you want to install yet another type of license, do the following steps:

1. Connect the MPI-2 interface to your PC/laptop.
2. Launch B.U.D.S..
3. In the top menu, select **MPI®**. In the drop-down list, select **Privileges...** .



Page "**Access privileges**" will appear.

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4. Insert your license key.

We suggest you "copy / paste" the license key to section **Access Code**.

5. Once the keys have been inserted, click on **Add**, check the Expiry Date (!) and click on **OK** button.

You now have Full dealer B.U.D.S. diagnostic system!

IMPORTANT NOTE !!!

If you have installed multiple versions of B.U.D.S., you must repeat steps 2-5 for each program.

We have discovered, on some screens the "**OK**" (red box highlighted above) is not visible at the bottom of the screen! This may be due to screen resolution or

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computer settings. But license cannot be installed until the "**OK**" button is clicked after entering the key code!

We have found that moving the task bar to a side position usually exposes the top of the button. But in extreme cases we have had to resort to changing the screen settings, by temporarily flip the screen to 90 degrees. This allows the button to be clicked!

Or:

After clicking "**Add**" button is necessary to press once the **TAB key** on your keyboard (TAB key is over CAPS LOCK) and press the **ENTER key**.

Method 2 (file "License.dat")

Introduction.

These instructions will be useful in such cases:

1. License key did not installed within 48 hours and the program reports that thelicense has expired.
2. You have installed a new version of B.U.D.S. and is necessary to transferyour license to new program.
3. You want to transfer your license key to another computer (buying a newlaptop, sale of diagnostic equipment).
4. Falling of Windows operating system on your computer or any other reasonrelated to the performance of your computer.
5. Other cases in which it is impossible to install a license key by Method 1 (normal).

IMPORTANT!

There are two versions of B.U.D.S. programs:**BUDS P2.3.xx** (hereinafter version 2)

and **BUDS x3.x.x** (hereinafter version 3) (where xx - the subversion numbers of the program).

It is possible to transfer the license only inside the appropriate version of B.U.D.S. program: license from the 2-nd version can not be transferred to the 3-rd version, and vice versa.

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How to install a license after 48 hours.

There are two ways to transfer the license using the license file "**License.dat**".

First way (easier)

We first consider an easier way.
An easier way - if you have computer with installed license key and you need to transfer the license to a new version of B.U.D.S. program or to another/new computer (cases 2 and 3).

1. Prepare your computer.

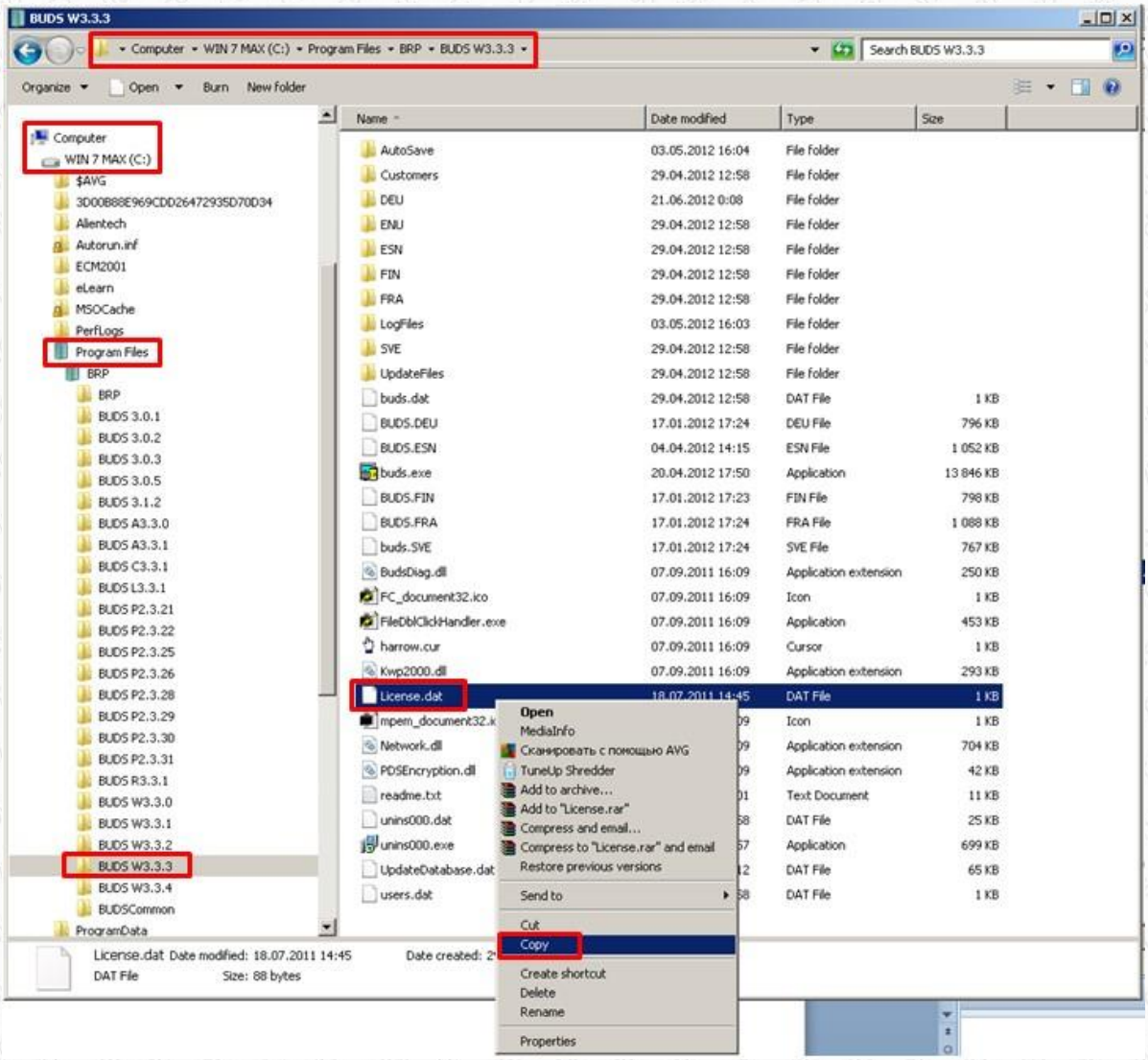
If you will transfer your license to another/new computer, you must first install IXXAT driver and B.U.D.S. software.
To transfer the license from "old" B.U.D.S. program (let us assume x3.x.x) to the new version , at first install it (new version).

2. On your computer, open the folder with the B.U.D.S. program, which hasalready installed license.

Disc C: > Program Files > BRP > BUDSx3.x.x

. (In my example **BUDS W3.3.3**).

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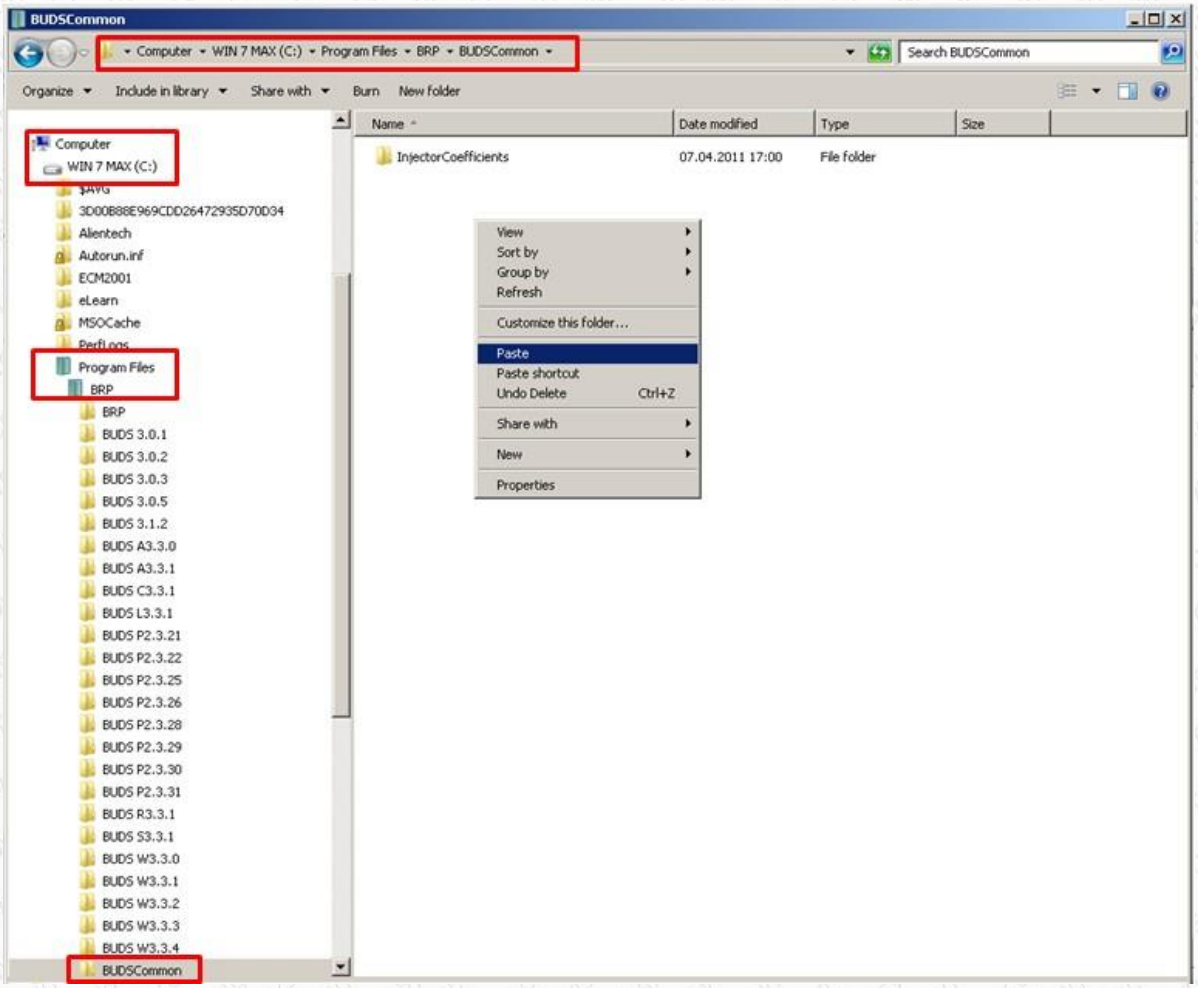


3. **Copy** the file **License.dat** (or **License**) to the clipboard (if you want to transfer your license to the new program) or **Send to** (flash memory) if you want to transfer your license to another computer.

4. Open the folder **BUDSCommon**.

Disc C: > Program Files > BRP > BUDSCommon .

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5. Paste the file **License.dat** .

That's all.

Second way

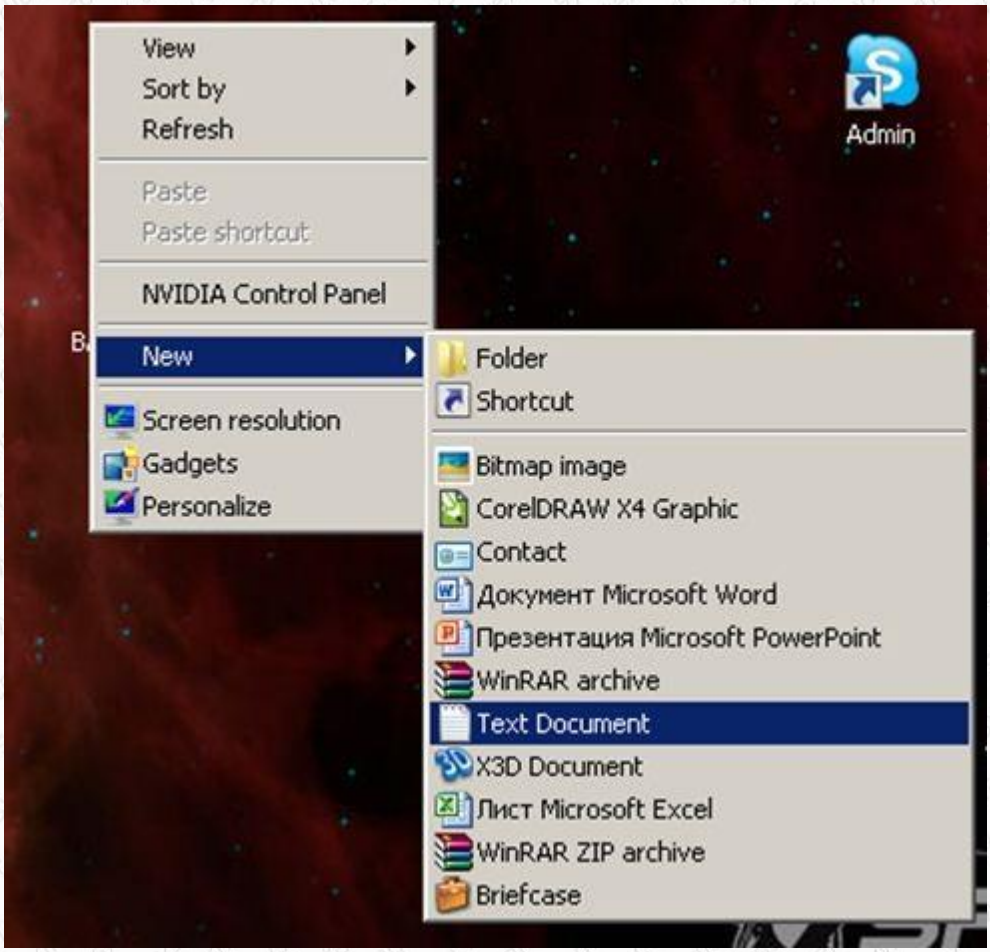
Now consider the second way - if you do not have the ability to copy a file **License.dat**, but you have a license key (cases 1,4,and 5).

License.dat file can be created manually.

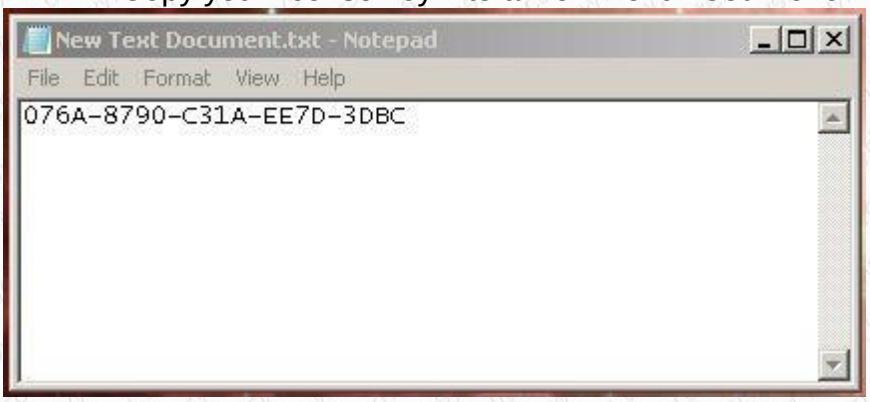
Below is an example of how look like B.U.D.S.'s license key:
076A-8790-C31A-EE7D-3DBC

1. Prepare your computer (install IXXAT driver and B.U.D.S. software).
2. On an empty part of the desktop, click the right mouse button, select **New** > **Text Document**.

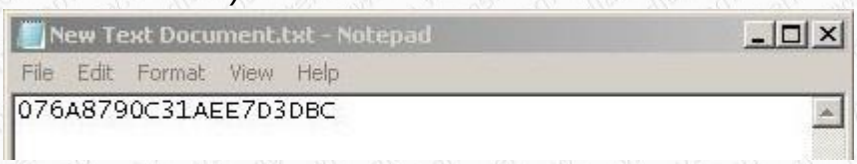
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3. Open it.
4. Copy your license key into a **New Text Document**.



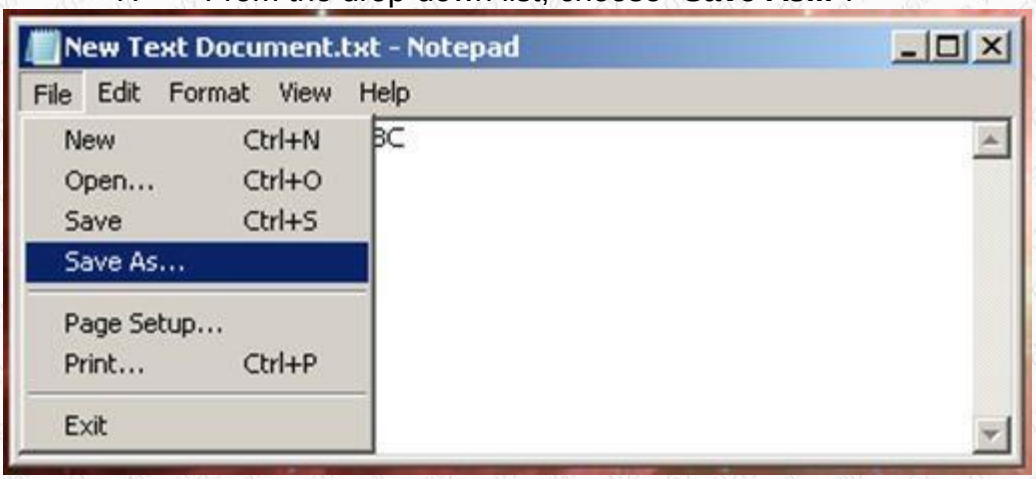
5. Remove all dashes from the text of the key (ex.: **076A8790C31AEE7D3DBC**).



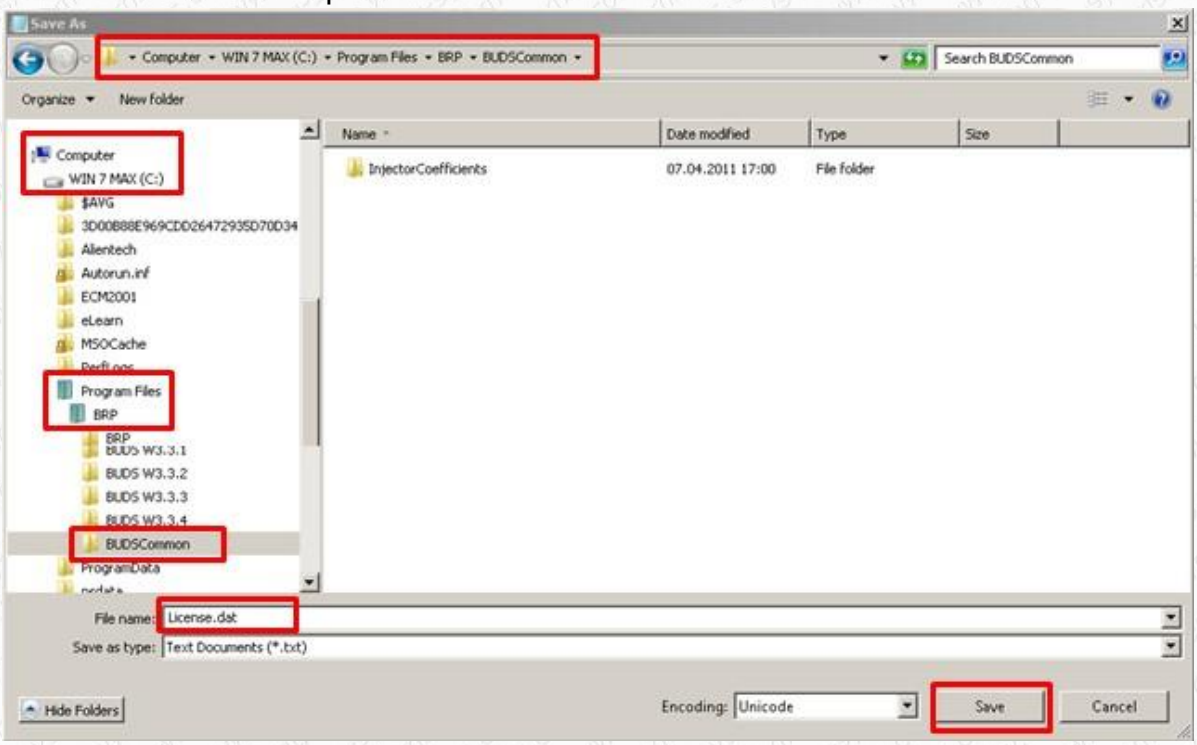
6. In the top menu, click **"File"**.

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7. From the drop-down list, choose "**Save As...**".



8. Open the folder BUDSCommon.
Disc C: > Program Files > BRP > BUDSCommon .
9. Replace the name "**New Text Document.txt**" on "**License.dat**".



10. Click on "**Save**".

That's all. Empty "New Text Document" on the desktop can be deleted.

If B.U.D.S. continues to require a license to install, then reinstall B.U.D.S..

Terms and Abbreviations

The following table contains a list of terms and abbreviations that are used throughout B.U.D.S.:

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Abbreviation	Description
AC	Alternating Current
ADC	Analog to Digital Converter
ATV	All-Terrain Vehicle
BPS	Bits Per Second
B.U.D.S.	BRP® Utility and Diagnostic Software
DC	Direct Current
DESS®	Digital Encoded Security System
ECM	Engine Control Module
ID	Identification
LED	Light Emitting Diode
MB	Mega Byte
MPEM	Multi-Purpose Electronic Module
MPI®	Multi-Protocol Interface
MPI®-2	Multi-Protocol Interface (version 2, modern)
MY	Model Year
PC	Personal Computer
PWC	Personal Watercraft
RAVE®	Rotax Adjustable Variable Exhaust

® Trademarks of BRP Inc. and/or its subsidiaries.

RPM	Revolutions Per Minute
TPS	Throttle Position Sensor
T.O.P.S.®	Tip Over Protection System
VCK®	Vehicle Communication Kit
VCM	Vehicle Control Module
VIN	Vehicle Identification Number
VTS	Variable Trim System

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Hardware
VCK® (unsupported)
VCK® Parts

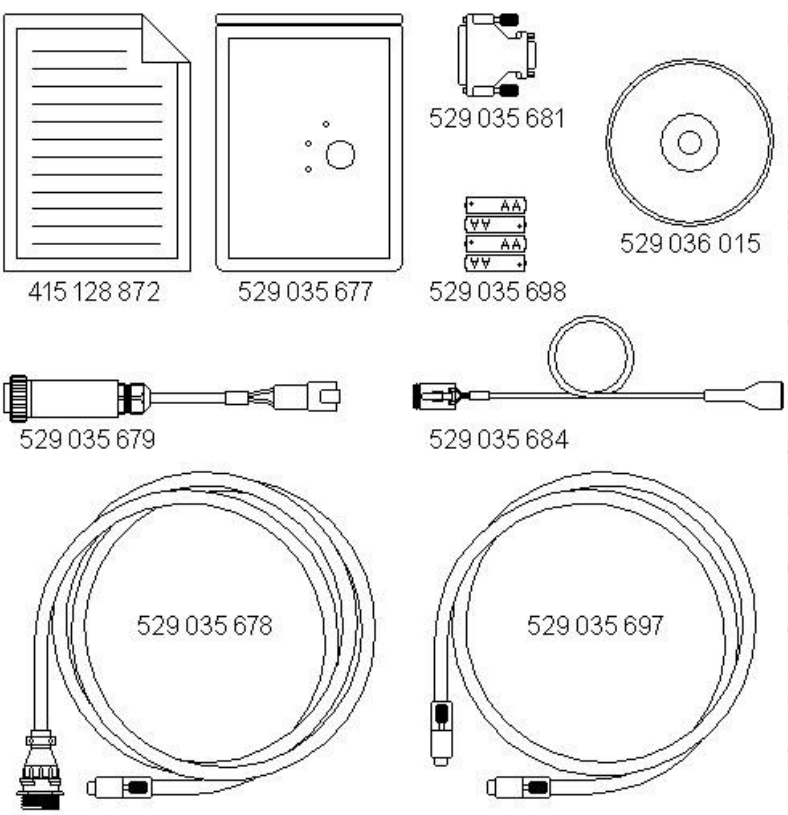
Please Note: MPI-1 is no longer officially supported in the version of B.U.D.S. 3 and higher.

Vehicle Communication Kit

Your Vehicle Communication Kit (VCK), 529 035 981, is composed of the following parts:

Part number	Description
529 036 015	B.U.D.S. version B2.3.2 installation CD-ROM
529 035 677	Multi Protocol Interface
529 035 698	Set of 4 AA batteries
529 035 679	6-pin adapter
529 035 684	DESS® adapter
529 035 697	Serial cable
529 035 681	DB25 to DB9 serial adapter
529 035 678	Diagnostic cable (or 529 035 807)
415 128 872	Instruction sheet

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B.U.D.S. / Hardware / VCK® (unsupported) / VCK® Parts

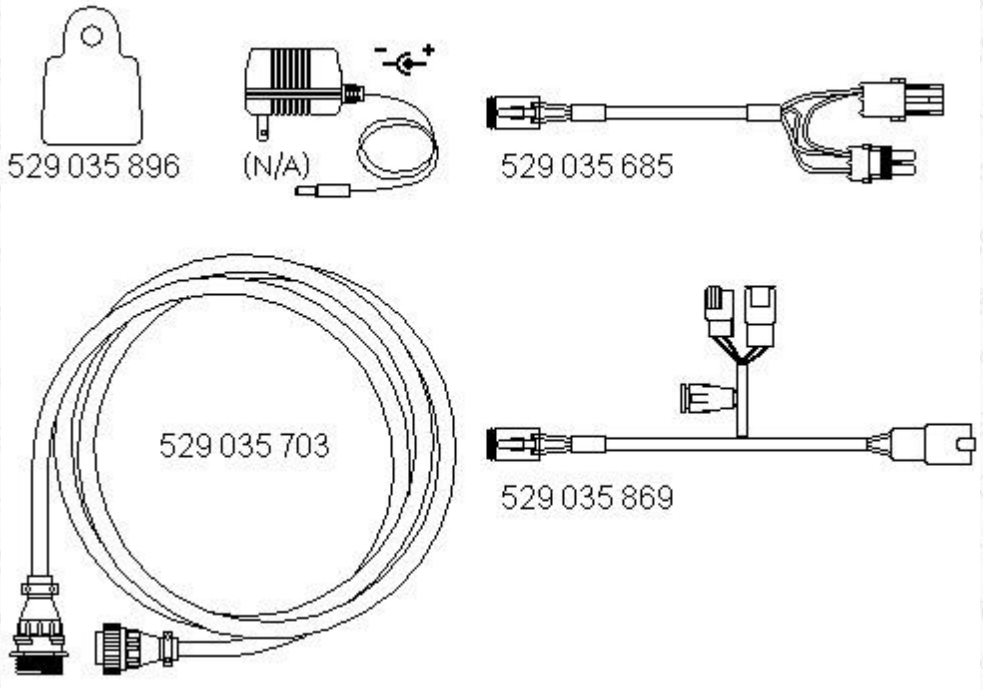
Optionnal Accessories

The following parts are also available for your VCK:

Part number	Description
529 035 703	Diagnostic extension cable
529 035 685	-pin adapter
278 001 278	RFI DESS adapter (not shown)
529 035 896	DIAGNOSTIC key
529 035 869	Supply cable
529 035 675	Volts adapter (not shown)

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529 033 300	Bypass wire (not shown)
681 780 600	Bypass wire (not shown)
N/A	Power supply adapter - 15 VDC, 200 mA



B.U.D.S. / Hardware / VCK® (unsupported) / VCK® Parts

MPI-1 Description

General

The Multi Protocol Interface (MPI) allows your computer to communicate with modules using appropriate protocol and wiring. The MPI translates the different module protocols and signals into a standard RS-232 based protocol that is suitable for your personal computer.

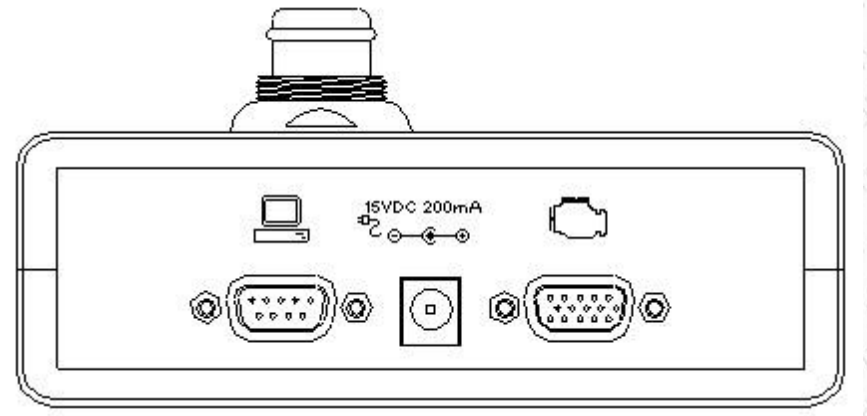
Hardware

The MPI includes 2 communication connectors and one power jack located on the back panel of the box (see figure below). On top, there is a DESS® key housing and three status LEDS. The following table lists the MPI hardware components:

Component	Description
Serial port	Connects the MPI to your computer (computer icon).

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Diagnostic port	Connects the MPI to the vehicle (engine icon).
Power jack	Connects the MPI into a domestic power outlet.
Internal battery pack	Four AA batteries located underneath the MPI.
DESS key housing	Allows you to program DESS keys.
ON LED	Indicates that the MPI is powered. The LED blinks when the MPI is powered by the internal battery pack.
Rx/Tx MPEM LED	Indicates that the MPI is transffering data to a module.
Rx/Tx PC LED	Indicates that the MPI is transffering data to your computer.



Software

The MPI contains identification parameters. Upon startup, B.U.D.S. reads these parameters and displays them into the **MPI Information** window.

B.U.D.S. / Hardware / VCK® (unsupported) / MPI-1 Description

MPI® Power Sources

Description

The MPI has three different power sources:

Source	Description

® Trademarks of BRP Inc. and/or its subsidiaries.

Internal batteries	Four AA batteries located in the back of the MPI.
External power supply	Adapter that connects into a domestic power outlet.
Vehicle accessory supply	Power coming from vehicle accessory supply when using the 6-pin adapter.

To select the power source

The MPI automatically selects its power source in the following sequence:

1. Highest voltage source between external power supply or vehicle accessory supply.
2. Internal batteries.

Notes

If none of the above power sources is available, then the MPI won't work and B.U.D.S. will consider that the MPI is not present.

The MPI has no power switch. It is automatically turned on and off by B.U.D.S.. However, you can manually reset the MPI.

B.U.D.S. / Hardware / VCK® (unsupported) / MPI® Power Sources

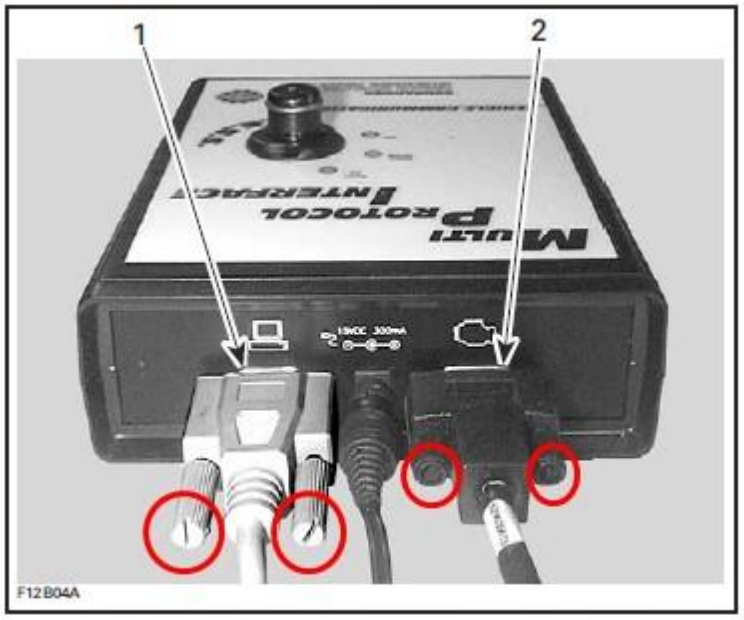
Computer Connection

To connect the MPI® to your computer

1. Connect the DB-9 male connector of the serial cable to the MPI serial port (computer icon). For safe contact in the connectors, we strongly recommend you tighten the built-in mounting bolts.
2. Connect the other end of the serial cable to any of your computer serial port.

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Connect computer through MPI as shown.



1. *Connect to computer through communication cable* ***no. 7*** *and adapter* ***no. 5*** *if needed*
2. *Connect to vehicle through diagnostic cable* ***no. 2***

B.U.D.S. / Hardware / VCK® (unsupported) / Computer Connection

Vehicle Connection (VCK®)

Vehicle connection

To connect the MPI® to a vehicle

1. Launch B.U.D.S. and make sure that it detects the MPI.

2. Connect the HDDB-15 male connector of the diagnostic cable to the MPI diagnostic port (engine icon). **For safe contact in the connectors, we strongly recommend you tighten the built-in mounting bolts.**

3. Connect the other end of the diagnostic cable to the 6-pin adapter.

4. From the list below, select the vehicle type you want to connect to:

- Personal watercraft equipped with a 717 or a 787 engine
- Personal watercraft equipped with a 947-DI or a 1503 engine
- Personal watercraft equipped with a RFI engine
- Snowmobile equipped with a SDI or a V1004 engine
- Snowmobile MPEM

Note

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You can optionally use a diagnostic extension cable between the diagnostic cable and the 6-pin adapter.

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To connect the MPI® to a personal watercraft equipped with a

717 or 787 Connection

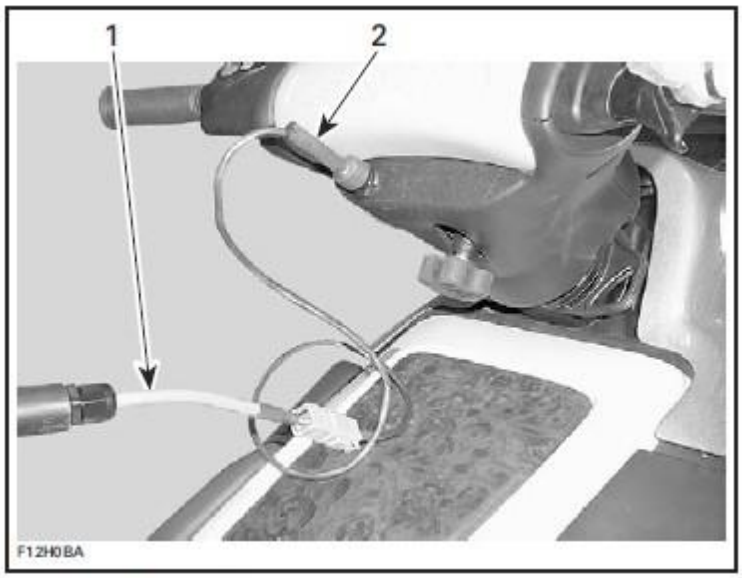
717 or a 787 engine

1. Connect one end of the DESS® adapter into the 6-pin adapter.
2. Connect the other end of the DESS adapter to the DESS post of the vehicle.

Note

Once the DESS adapter is inserted on the DESS post of the vehicle, the computer has approximately 30 seconds to initiate communication with the vehicle. If the computer did not detect the vehicle within this delay, then remove the DESS adapter from the DESS post of the vehicle and insert it again.

D.E.S.S. Post Connection



1. 6-pin adapter no.3
2. D.E.S.S. adapter no. 6

947-DI or 1503 Connection

947-DI or a 1503 engine

1. Remove the diagnostic connector cap from the harness of the vehicle.

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To connect the MPI® to a personal watercraft equipped with a

2. Connect the 6-pin adapter to the diagnostic connector of the vehicle.
3. Insert a DESS® key on the DESS post of the vehicle.

Notes

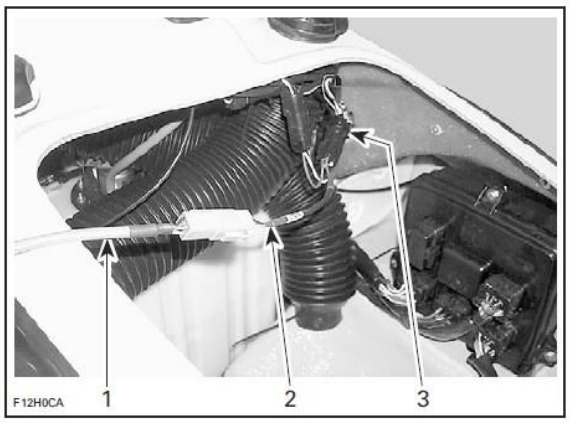
Always reconnect the diagnostic connector cap when you are done.

Once the DESS key is inserted on the DESS post of the vehicle, the computer has approximately 30 seconds to initiate communication with the vehicle. If the computer did not detect the vehicle within this delay, then remove the DESS key from the DESS post of the vehicle and insert it again.

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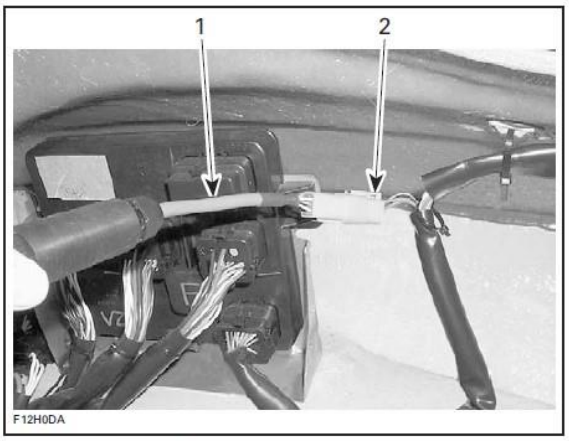
To connect the MPI® to a personal watercraft equipped with a

RFI Models Through the 4-Pin Connector



1. 6-pin adapter **no. 3**
2. RFI 4-pin adapter (P/N 529 035 685)
3. Connector under opening of front storage area

DI Models Through the 6-Pin Connector



1. 6-pin adapter **no. 3**
2. Connector close to MPEM

WITH 1503 ENGINE



1. Adapter

After all connections are done, power-up the vehicle's module with the appropriate way depending on the vehicle.

IMPORTANT: When using B.U.D.S., ensure that the protocol matching the connection used is properly selected in "MPI" under "Choose protocol" as per the following chart.

TYPE OF CONNECTION	ADAPTER TO USE	PROTOCOL TO CHOOSE
Through D.E.S.S. post	6-pin and D.E.S.S.	D.E.S.S.
RFI models through the 4-pin connector	6-pin and RFI 4-pin	
DI models through the 6-pin connector	6-pin	947-DI
1503	6-pin	KW-2000

RFI Connection

RFI engine

1. Connect the 4-pin adapter into the 6-pin adapter.

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To connect the MPI® to a personal watercraft equipped with a

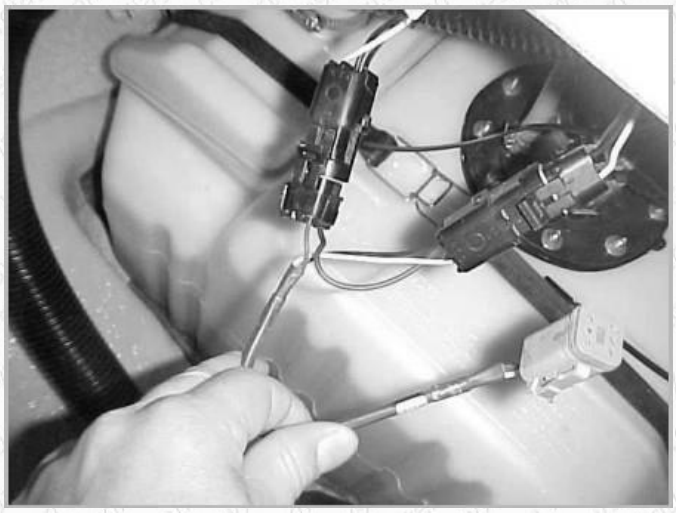
2. Disconnect the DESS® post connector from the vehicle harness. **3.** Connect the 4-pin male connector into the DESS post connector.

4. Connect the 4-pin female connector into the vehicle harness.

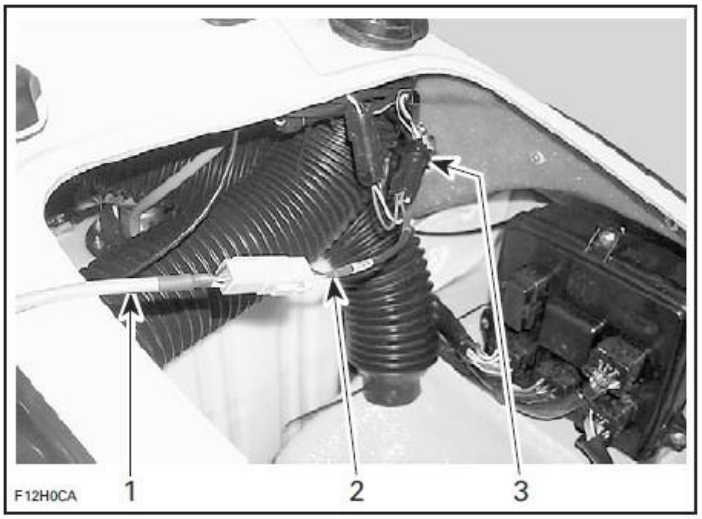
5. Insert a DESS key on the DESS post of the vehicle.

Note

Once the DESS key is inserted on the DESS post of the vehicle, the computer has approximately 30 seconds to initiate communication with the vehicle. If the



RFI Models Through the 4-Pin Connector



1. *6-pin adapter* ***no. 3***
2. *RFI 4-pin adapter (P/N 529 035 685)*
3. *Connector under opening of front storage area*

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To connect the MPI® to a personal watercraft equipped with a

computer did not detect the vehicle within this delay, then remove the DESS key from the DESS post of the vehicle and insert it again.

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SDI or V1004 Connection

To connect the MPI® to a snowmobile equipped with a SDI or a V1004 engine

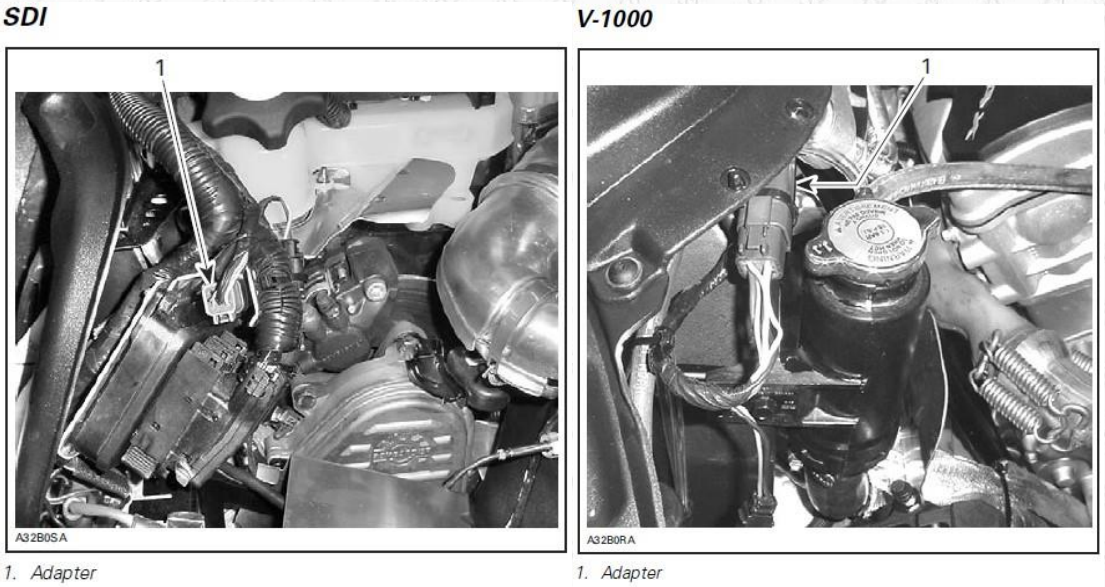
1. Remove the diagnostic connector from the protective cap fixed to the vehicle.
2. Connect the 6-pin adapter to the diagnostic connector of the vehicle harness.
3. Insert a DESS® key or a DIAGNOSTIC key on the DESS post of the vehicle. When you start a diagnostic session and plan to program a DESS key, use a DIAGNOSTIC key on the vehicle DESS post and keep the DESS key you want to program to insert it on the MPI DESS post when requested by B.U.D.S..
4. While the engine cut-out switch is depressed, power-up the vehicle by momentarily pressing the vehicle's start button.

Notes

Always reconnect the diagnostic connector to the protective cap when you are done.

Once the vehicle is powered-up, the computer has approximately 30 seconds to initiate communication with the vehicle. If the computer did not detect the module within this delay, then momentarily press the vehicle's start button again.

On those snowmobiles, it is not possible to communicate through the DESS post of the vehicle.



Snowmobile MPEM Connection

To connect the MPI® to a snowmobile MPEM through its DESS® post (MY 2002 and former)

1. Connect one end of the DESS adapter into the 6-pin adapter.
2. Connect the other end of the DESS adapter to the DESS post of the vehicle.

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3. Start the engine or provide DC power to the MPEM before starting communication with the module.

To connect the MPI to a snowmobile MPEM through its diagnostic connector (MY 2003 and above)

1. Remove the diagnostic connector from the protective cap fixed to the vehicle.
2. Connect the 6-pin adapter to the diagnostic connector of the vehicle harness. You may have to use a supply cable.
3. Insert a DIAGNOSTIC key on the DESS post of the vehicle only if you need to start the engine during your diagnostic session.
4. Start the engine or provide DC power to the MPEM before starting communication with the module.

Note

Make sure no DESS key has been read by the MPEM before attempting to communicate with it otherwise it will refuse to repond to any diagnostic command.

WORKING ON SNOWMOBILES

Up to and including 2003 model year snowmobiles.

Ensure that the protocol matching the connection used is properly selected in "MPI" under "Choose protocol" as per the following chart.

TYPE OF CONNECTION	ADAPTER TO USE	PROTOCOL TO CHOOSE
Up to 2002 with D.E.S.S.	D.E.S.S.	D.E.S.S.
2003 Liquid Cooled	6-pin	
V-1000 S.D.I.	6-pin	KW-2000

For 2004 model year snowmobiles, refer to respective *Predelivery Bulletin* or appropriate *Shop Manual*.

All 2002 and Previous Model Year Snowmobiles Equipped with D.E.S.S.



CONNECTED ONTO D.E.S.S. POST

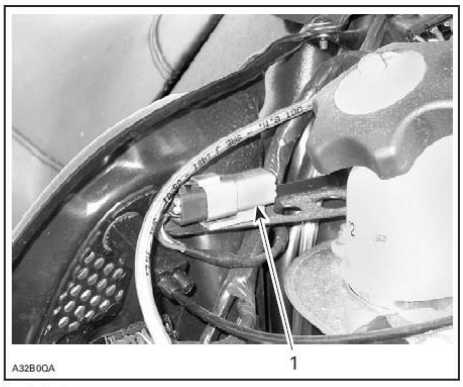
All 2003 Liquid-Cooled Models

MX Z-REV



1. Adapter

MX Zx



1. Adapter

® Trademarks of BRP Inc. and/or its subsidiaries.



® Trademarks of BRP Inc. and/or its subsidiaries.

Snowmobile MPEM Power Sources

Description

Depending on the snowmobile model, it might be required to provide power to the MPEM to allow B.U.D.S. to communicate with it. This can be done by using the vehicle's battery, an external battery or by starting the engine. Consult the vehicle's shop manual to find the appropriate power connection scheme.

With the vehicle's battery

To provide power to the MPEM using the vehicle's battery, use one of the following accessories:

- a bypass wire (529 033 300) connected to the vehicle harness
- a bypass wire (681 780 600) connected to the vehicle harness

With an external battery

To provide power to the MPEM using an external battery, use one of the following accessories:

- a 9V adapter (529 035 675) connected to the MPEM
- a 9V adapter (529 035 675) connected to the vehicle harness
- a 9V adapter (529 035 675) along with a 3-position to 4-position adaptation cable
- a 9V adapter (529 035 675) along with a 3-position to 6-position adaptation cable
- a supply cable (529 035 869) along with a 9V adapter (529 035 675)
- a supply cable (529 035 869) along with a 12V battery

Notes

When the MPEM is powered by an external battery, it is not possible to start the engine. Battery power has to be removed first.

To prevent irreparable damages to AC MPEM's, never supply them with more than 9 volts DC. AC MPEM's are those used along with 220W or 290W magneto.

With engine running

While the engine is running, communication with the MPEM is allowed only when the engine speed is between 1000 and 3000 RPM.

MPI-2
Components

?	Part number	Description	Image

® Trademarks of BRP Inc. and/or its subsidiaries.

# 1	529 036 018	Multi Protocol Interface MPI-2	
# 2	710 000 851	Diagnostic Cable	
# 3	529 036 019	DESS Post Interface	
# 4	529 035 904	DESS® adapter	

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# 5	529 035 896	Grey DESS cap (DIAGNOSTIC key)	

® Trademarks of BRP Inc. and/or its subsidiaries.

# 6	529 035 869	Supply T-harness cable	
# 7	529 035 675	9 volt adapter	
# 8	529 035 997	12 V BATTERY SUPPLY CABLE	
# 9	529 033 300	Power bypass switch	
# 10	861 780 600	Bypass wire	

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# 12		DESS 4-TEC Interface Unlike the original **DESS POST interface** , this device allows you to add keys only for 4-TEC vehicles.	

B.U.D.S. / Hardware / MPI-2 / Components

MPI-2 Description

General

The **Multi Protocol Interface** (MPI-2) allows your computer to communicate with modules using appropriate protocol and wiring. The MPI-2 translates the different module protocols and signals into a standard USB protocol that is suitable for your personal computer.

Hardware

The **MPI-2** on one side have a built-in cable with the USB male connector, and on the other side have a DB9 (RS-232) male connector. On top, there are two status LED's (USB and CAN).

MPI-2 adapter is powered from the USB port on your computer.

The following table lists the **MPI-2** hardware components:

Component	Description
Built-in USB cable	Connects the MPI-2 to USB port of your computer (laptop)
DB9 (RS-232)	Connects the MPI-2 to the vehicle or to DESS Post Interface
USB Green LED	Indicates that the MPI-2 is powered. If the LED does not light, you need to reinstall the driver IXXAT.
CAN LED	Shows the status of communication with the module.

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Software

The MPI contains identification parameters. Upon startup, B.U.D.S. reads these parameters and displays them into the **MPI Information** window.

B.U.D.S. / Hardware / MPI-2 / MPI-2 Description

DESS® Post Interface Description

General

DESS Post Interface (p/n 529 036 019) intended for diagnose all range of 2-stroke vehicles (carb/EFI/RFI/DI) and programing DESS keys for 2-stroke and 4-stroke (4TEC) vehicles.

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Works in conjunction with the MPI-2 interface (p/n 529 036 018).
Is powered by 2 AA size batteries.

The necessity of using **DESS Post Interface** for diagnostics of the vehicle or programming DESS keys can be determined from B.U.D.S. Chart.

Hardware

DESS Post Interface includes 2 communication built-in cables and one power jack located on the right side of the box. On top, there is a DESS® key housing and one status LED.
The following table lists the **DESS Post Interface** hardware components:

Component	Description
Built-in cable with DB9 connector (female)	Connects the **DESS Post Interface** to MPI-2 Interface.
Built-in cable with a DT-06 connector (male)	Connects to **vehicle diagnostic connector** or to the **DESS adapter** (p/n 529 035 904).
Power jack	Connects 12 volts for the diagnosis of DI models. **It is very important to observe polarity!** **"+" is connected to a central contact.** **It is strongly recommended to use a separate power supply** with 12 volts and output power 1-2 Amp.!
Internal battery pack	Two AA batteries located underneath the box.
DESS key housing	Allows you to program **DESS keys**.
LED	Indicates that the **DESS Post Interface** is powered and communication with the **MPI-2 interface** is established.

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Software

The **DESS Post Interface** contains identification parameters. Upon startup, B.U.D.S. reads these parameters and displays them into the **MPI Information** window.

B.U.D.S. / Hardware / MPI-2 / DESS® Post Interface Description

B.U.D.S. Chart

Please Note: MPI-1 is no longer officially supported in the version of B.U.D.S. 3 and higher.

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B.U.D.S. Chart - 2011/12/12			
PLATFORM	MODEL YEAR	Protocol	DESS Post 529036019
Ski-Doo			
With D.E.S.S. connection only	All	D.E.S.S.	To program Keys
L/C Carb w-MPEM thru the 6 pin	All	D.E.S.S.	To program Keys
SDI and V1000	2003 - 2006	KW2000	To program Keys
SDI	2007 to 2012	Automatic	To program Keys
V800	2007 to 2012	Automatic	To program Keys
Carburator vehicle with ECM	2005-2006	KW2000	
Carburator vehicle with ECM	2007 to 2012	Automatic	
E-TEC 600HO	All	Automatic	
E-TEC 800HO	All	Automatic	
1203	All	Automatic	
600ACE	All	Automatic	
Sea-Doo Watercraft			
All Carb models through D.E.S.S. Post	Up to 2005	D.E.S.S.	To program Keys
RFI models through the 4-pin or DESS post	Up to 2004	D.E.S.S.	To program Keys
RFI models throught the 6 pin	2005	KW2000	To program Keys
DI models through the 6-pin	All	947-DI	To program Keys
1503	2002 to 2006	KW2000	To program Keys
1503	2007 to 2011	Automatic	To program Keys
I-control - GTX limited (iS) and RXT (iS)	all	Automatic	
Sea-Doo Sport Boats			
All Carb models through D.E.S.S. Post	Up to 2003	D.E.S.S.	To program Keys
DI models through the 6-pin	All	947-DI	To program Keys
ALL 1503	2002-2006	KW2000	To program Keys
ALL 1503	2007 to 2011	Automatic	To program Keys
ALL 1503 - 210 and 230	2010 to 2012	Automatic	
Can-Am Roadster			
All Models	all	Automatic	
Can-Am SSV /VCC			
All Models	all	Automatic	
Can-Am ATV			
All Models	all	Automatic	

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Ski-Doo

Quick reference chart for selecting the correct MPI – 2 communication tools required for SkiDoo B.U.D.S. communication and programming.
The VCK (Vehicle Communication Kit) is no longer available. Only the MPI – 2 is available. This chart is intended to show what electrical adapters are required to connect the MPI – 2 to the electrical system of Ski-Doo vehicles. The proper connections will ensure that key programming, diagnostics and module updates are correctly performed with B.U.D.S.
To use this quick reference chart, first identify the vehicle to be programmed. Then reference the marked number in the column and identify the correct tool as listed in the picture section of this document. Note: For connection procedures refer to the appropriate shop manual and/or Service bulletin 2005 – 7.
Note: For chassis identification refer to the chassis section of the appropriate specification booklet or the chassis identification section in the Yellow book.

Tools required for communication	# 1 529036018	# 2 710000851	# 3 529036019	# 4 529 035 904	# 5 529 035 896	# 6 529 035 869	# 7 529 035 675	# 8 529 035 997	# 9 529 033 300	# 10 861 780 600	# 11 DB9 Ext.	Protocol
S chassis DESS equipped vehicles.												DESS
CK3 chassis AC CDI DESS equipped vehicles												DESS
CK3 chassis 1997 to 2001 with 360 watt DC electrical systems.												DESS
ZX chassis AC CDI equipped liquid cooled vehicles												DESS
ZX chassis 2002 DC CDI equipped liquid cooled vehicles												DESS
Option 1 for Carburetor equipped vehicles with 6 pin B.U.D.S. connector and with "MPEM" printed on the electronics box(not for fuel injection, not for vehicle with ECM printed on their electronics box							NR					DESS
Option 2 for Carburetor equipped vehicles with 6 pin B.U.D.S. connector and with "MPEM" printed on the electronics box (Not for fuel injection, not for vehicles with ECM printed on their electronics box							NR					DESS
V-1000, V-810 and SDI vehicles (including 995)		 U	 K*		 Or the vehicle DESS key		NR					KW2000
Carburetor equipped vehicles with "ECM" printed on their electronics box (including power T.E.K.)					Install the DESS key to be programmed or already programmed on the vehicle's DESS post		NR					KW2000
E-TEC equipped vehicles					Install the DESS key to be programmed or already programmed on the vehicle's DESS post		NR					KW2000
1203 and 600ACE					Install the DESS key to be programmed or already programmed on the vehicle's DESS post		NR					KW2000

U = For ECM or cluster Update
K* = – For DESS key programming only
Notice: On the listed vehicles only use the DESS post interface for key programming. If an update of the ECM or cluster is necessary, use the diagnostic cable in its place. !!! Failure to use the diagnostic cable could result in module or cluster damage!!!
NR = Not Recommended

√* = Connected if not running – Disconnect battery to start vehicle

Notice: When performing any module update ensure that the vehicle or power supply battery is fully charged.

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Roadster

Tools required for communication	# 1 529036018	# 2 710000851	# 3 529036019	# 4 529 035 904	# 5 529 035 896	# 6 529 035 869	# 7 529 035 675	# 8 529 035 997	# 9 529 033 300	# 10 861 780 600	# 11 DB9 Ext.	Protocol
ALL Spyder Roadster models												Auto

ATV

Tools required for communication	# 1 529036018	# 2 710000851	# 3 529036019	# 4 529 035 904	# 5 529 035 896	# 6 529 035 869	# 7 529 035 675	# 8 529 035 997	# 9 529 033 300	# 10 861 780 600	# 11 DB9 Ext.	Protocol
ALL ATV models												Autp

SSV

Tools required for communication	# 1 529036018	# 2 710000851	# 3 529036019	# 4 529 035 904	# 5 529 035 896	# 6 529 035 869	# 7 529 035 675	# 8 529 035 997	# 9 529 033 300	# 10 861 780 600	# 11 DB9 Ext.	Protocol
ALL SSV models												Auto

Sea-Doo / Sports Boat

Tools required for communication	# 1 529036018	# 2 710000851	# 3 529036019	# 4 529 035 904	# 5 529 035 896	# 6 529 035 869	# 7 529 035 675	# 8 529 035 997	# 9 529 033 300	# 10 861 780 600	# 11 DB9 Ext.	Protocol
Carb unit + RFI												DESS
DI												947 DI
4-Tec without I-Control												KW2000
4-Tec with I-Control												Auto

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Vehicle Connection (MPI-2)

Vehicle connection MPI-2

To connect the MPI®-2 to a vehicle

From the list below, select the vehicle type you want to connect to:

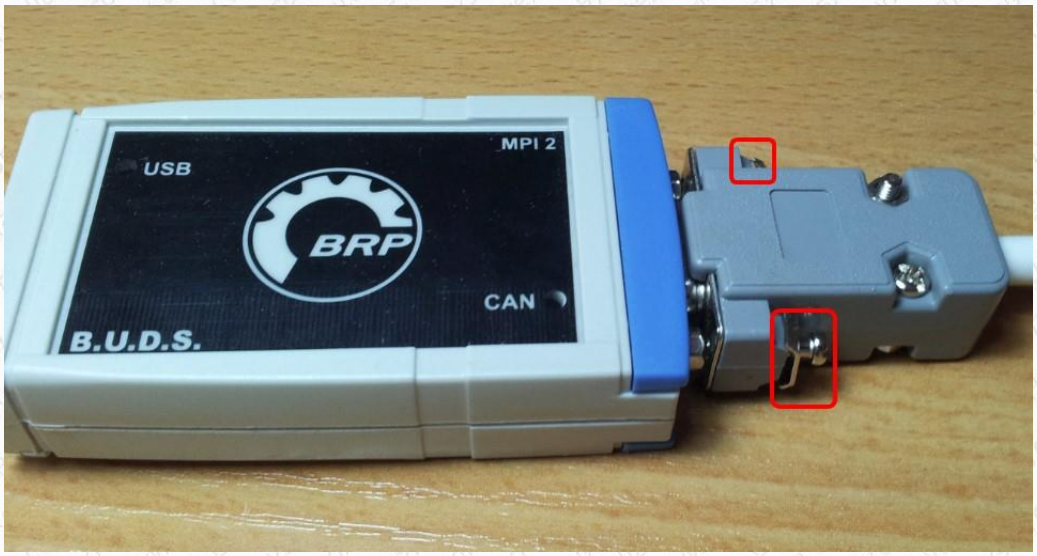
- Personal watercraft equipped with a 717 or a 787 engine
- Personal watercraft equipped with a 947-DI engine
- Personal watercraft equipped with a RFI engine (up to 2004)
- Personal watercraft equipped with a RFI engine (2005)
- Personal watercraft equipped with a 1503 engine (2002-2011)
- Personal watercraft with I-control - GTX limited (iS) and RXT (iS)
- Snowmobile equipped with a SDI or a V1004 engine
- Snowmobile MPEM

Note

You can optionally use a diagnostic extension cable between the diagnostic cable.

For safe contact in the connectors, we strongly recommend you tighten the built-in mounting bolts.

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® Trademarks of BRP Inc. and/or its subsidiaries.

To connect the MPI®-2 to a personal watercraft equipped with a

717 or 787

717 or a 787 engine

1. Connect the MPI-2 Interface and DESS Post Interface between themselves.
2. Connect one end (6-pin connector) of the DESS® adapter to **DESS Post Interface**.
3. Connect the MPI-2 Interface to USB port of your computer.
4. Launch B.U.D.S. and make sure that it detects the MPI.
5. Choose DESS protocol.
6. Connect the other end of the **DESS adapter** to the **DESS post of the vehicle**.

Note

Once the DESS adapter is inserted on the DESS post of the vehicle, the computer has approximately 30 seconds to initiate communication with the vehicle. If the computer did not detect the vehicle within this delay, then remove the DESS adapter from the DESS post of the vehicle and insert it again.

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To connect the MPI®-2 to a personal watercraft equipped with a

947-DI

947-DI engine

1. Connect the MPI-2 Interface and DESS Post Interface between themselves.
2. Remove the diagnostic connector cap from the harness of the vehicle.
3. Connect the **DESS Post Interface** to the diagnostic connector of the vehicle.
4. Connect the power supply 12 volts to the **power jack of DESS Post Interface** .
5. Connect the MPI-2 Interface to USB port of your computer.
6. Launch B.U.D.S. and make sure that it detects the MPI.
7. Choose 947-DI protocol.
8. Insert a **DESS® key** on the DESS post of the vehicle.

Notes

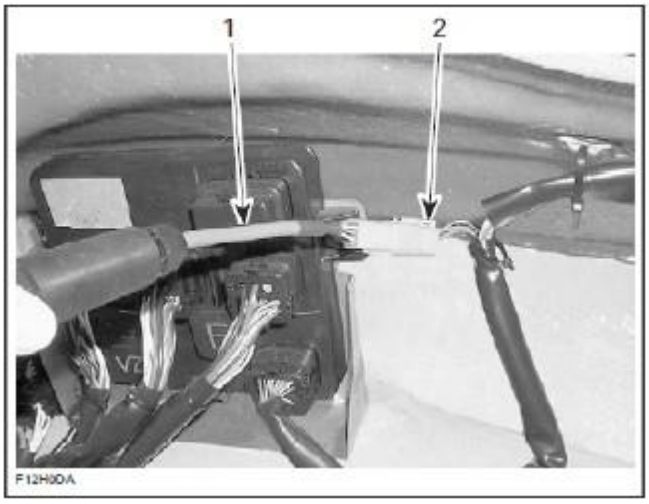
Always reconnect the diagnostic connector cap when you are done.

Once the DESS key is inserted on the DESS post of the vehicle, the computer has approximately 30 seconds to initiate communication with the vehicle. If the computer did not detect the vehicle within this delay, then remove the DESS key from the DESS post of the vehicle and insert it again.

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To connect the MPI®-2 to a personal watercraft equipped with a

DI Models Through the 6-Pin Connector



RFI (up to 2004)

RFI engine (up to 2004)

1. Connect the MPI-2 Interface and DESS Post Interface between themselves.
2. Connect one end (6-pin connector) of the DESS® adapter to **DESS Post Interface**.
3. Connect the MPI-2 Interface to USB port of your computer.
4. Launch B.U.D.S. and make sure that it detects the MPI.
5. Choose DESS protocol.
6. Connect the other end of the **DESS adapter** to the **DESS post of the vehicle**.

Note

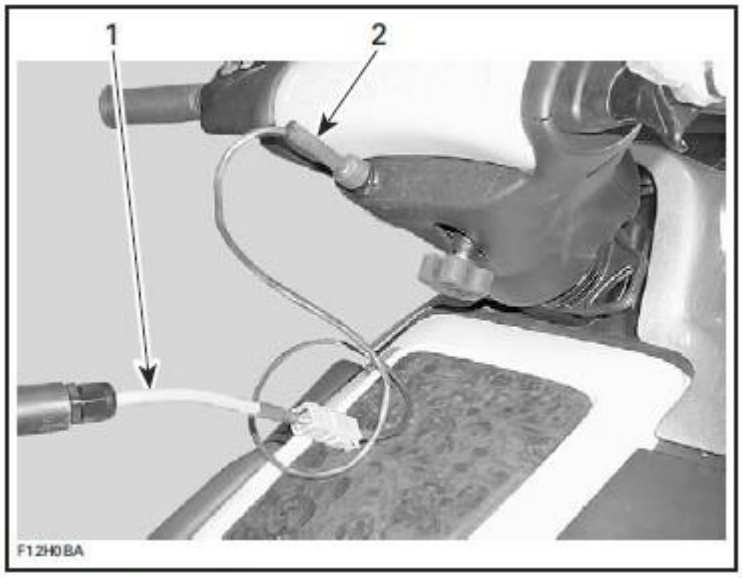
Once the DESS adapter is inserted on the DESS post of the vehicle, the computer has approximately 30 seconds to initiate communication with the vehicle. If the

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To connect the MPI®-2 to a personal watercraft equipped with a

computer did not detect the vehicle within this delay, then remove the DESS adapter from the DESS post of the vehicle and insert it again.

D.E.S.S. Post Connection



1. 6-pin adapter no.3
2. D.E.S.S. adapter no. 6

RFI (2005)

RFI engine (2005)

1. Connect the MPI-2 Interface and DESS Post Interface between themselves.

2. Remove the diagnostic connector cap from the harness of the vehicle.

3. Connect the **DESS Post Interface** to the diagnostic connector of the vehicle.

4. Connect the MPI-2 Interface to USB port of your computer.

6. Launch B.U.D.S. and make sure that it detects the MPI.

7.Choose KW2000 protocol.

8. Insert a **DESS® key** on the DESS post of the vehicle.

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To connect the MPI®-2 to a personal watercraft equipped with a

Notes

Always reconnect the diagnostic connector cap when you are done.

Once the DESS key is inserted on the DESS post of the vehicle, the computer has approximately 30 seconds to initiate communication with the vehicle. If the computer did not detect the vehicle within this delay, then remove the DESS key from the DESS post of the vehicle and insert it again.

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To connect the MPI®-2 to a personal watercraft equipped with a

1503

1503 engine

1. Remove the diagnostic connector cap from the harness of the vehicle.
2. Connect one end of the Diagnostic Cable to the diagnostic connector of the vehicle.
3. Connect the other end of the **Diagnostic Cable** to the MPI-2 Interface.
4. Connect the **MPI-2 Interface** to USB port of your computer.
5. Launch B.U.D.S. and make sure that it detects the MPI.
6. Choose Kw2000 protocol (for 2002-2006). For vehicles since 2007 the protocol is **Kw2000 (Auto)**.
7. Insert a **DESS® key** on the DESS post of the vehicle.

Notes

Always reconnect the diagnostic connector cap when you are done.

Once the DESS key is inserted on the DESS post of the vehicle, the computer has approximately 30 seconds to initiate communication with the vehicle. If the computer did not detect the vehicle within this delay, then remove the DESS key from the DESS post of the vehicle and insert it again.

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To connect the MPI®-2 to a personal watercraft equipped with a

WITH 1503 ENGINE



1. Adapter

I-control - GTX limited (iS) and RXT (iS)

"I-control" - GTX limited (iS) and RXT (iS) (All) (including all Jet-boats 1503-210 and 230, years 2010-2012)

1. Remove the diagnostic connector cap from the harness of the vehicle.
2. Connect one end of the Diagnostic Cable to the diagnostic connector of the vehicle.
3. Connect the other end of the **Diagnostic Cable** to the MPI-2 Interface.

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To connect the MPI®-2 to a personal watercraft equipped with a

4. Connect the **MPI-2 Interface** to USB port of your computer.
5. Launch B.U.D.S. and make sure that it detects the MPI.
6. Insert a **DESS® key** on the DESS post of the vehicle and one time click the "**Start**" button on the vehicle.

Notes

Always reconnect the diagnostic connector cap when you are done.

Once the DESS key is inserted on the DESS post of the vehicle, the computer has approximately 30 seconds to initiate communication with the vehicle. If the computer did not detect the vehicle within this delay, then remove the DESS key from the DESS post of the vehicle and repeat last step (6).



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SDI or V1004

To connect the MPI®-2 to a snowmobile equipped with a SDI or a V1004 engine

1. Remove the diagnostic connector from the protective cap fixed to the vehicle.
2. Connect one end of the Diagnostic Cable to the diagnostic connector of the vehicle.
3. Connect the other end of the **Diagnostic Cable** to the MPI-2 Interface.
4. Connect the **MPI-2 Interface** to USB port of your computer.
5. Launch B.U.D.S. and make sure that it detects the MPI.
6. Choose KW2000 protocol.
7. Insert a DESS® key or a DIAGNOSTIC key on the DESS post of the vehicle.
8. While the engine cut-out switch is depressed, power-up the vehicle by momentarily pressing the vehicle's start button.

When you start a diagnostic session and plan to program a DESS key, use a DIAGNOSTIC key on the vehicle DESS post and keep the DESS key you want to program to insert it on the DESS Post Interface when requested by B.U.D.S..

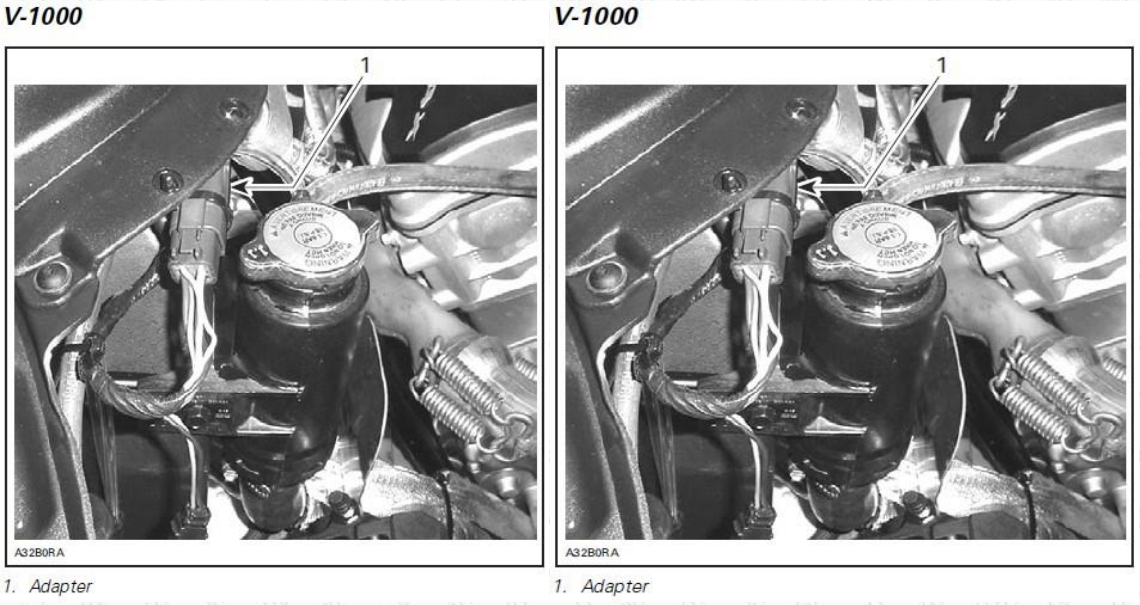
Notes

Always reconnect the diagnostic connector to the protective cap when you are done.

Once the vehicle is powered-up, the computer has approximately 30 seconds to initiate communication with the vehicle. If the computer did not detect the module within this delay, then momentarily press the vehicle's start button again.

On those snowmobiles, it is not possible to communicate through the DESS post of the vehicle.

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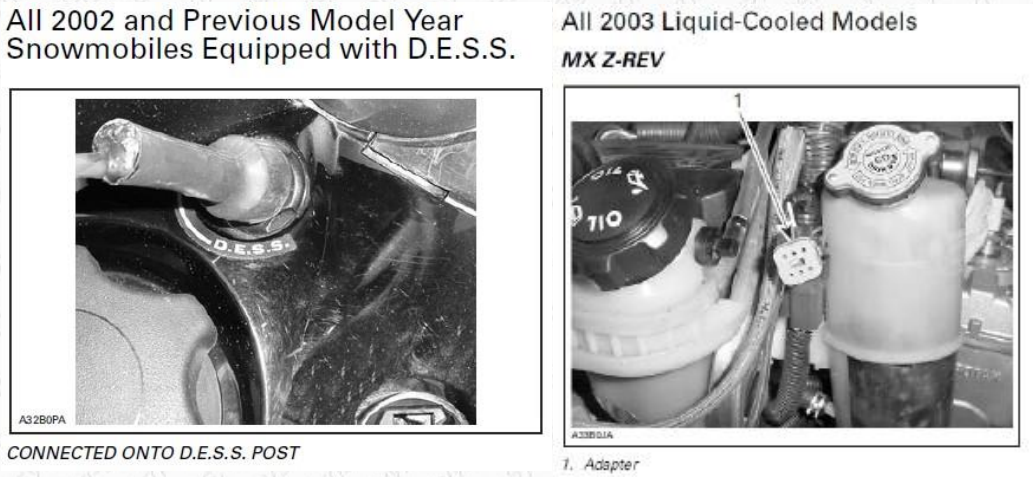


Snowmobile MPEM Connection

To connect the MPI®-2 to a snowmobile MPEM through its DESS® post (MY 2002 and former)

1. Connect the MPI-2 Interface and DESS Post Interface between themselves.
2. Connect one end (6-pin connector) of the DESS® adapter to **DESS Post Interface**.
3. Connect the MPI-2 Interface to USB port of your computer.
4. Launch B.U.D.S. and make sure that it detects the MPI.
5. Choose DESS protocol.
6. Connect the other end of the **DESS adapter** to the **DESS post of the vehicle**.
3. Start the engine or provide DC power to the MPEM before starting communication with the module.

To connect the MPI to a snowmobile MPEM through its diagnostic connector (MY 2003 and above)



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1. Remove the diagnostic connector from the protective cap fixed to the vehicle.
2. Connect the MPI-2 Interface and DESS Post Interface between themselves.
3. Connect the **DESS Post Interface** to the diagnostic connector of the vehicle harness.

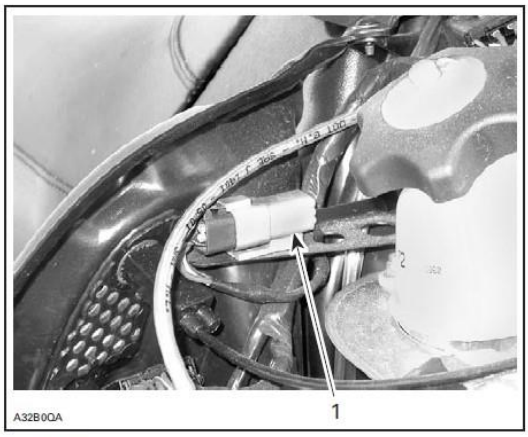
   You may have to use a Supply T-harness cable.
4. Connect the MPI-2 Interface to USB port of your computer.
5. Launch B.U.D.S. and make sure that it detects the MPI.
6. Choose DESS protocol.
7. Insert a DIAGNOSTIC key on the DESS post of the vehicle only if you need to start the engine during your diagnostic session.
8. Start the engine or provide DC power to the MPEM before starting communication with the module.

Note

Make sure no DESS key has been read by the MPEM before attempting to communicate with it otherwise it will refuse to respond to any diagnostic command.

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MX Zx



1. Adapter

Up to and including 2003 model year snowmobiles.

Ensure that the protocol matching the connection used is properly selected in "**MPI**" under "**Choose protocol**" as per the following chart.

TYPE OF CONNECTION	ADAPTER TO USE	PROTOCOL TO CHOOSE
Up to 2002 with D.E.S.S.	D.E.S.S.	D.E.S.S.
2003 Liquid Cooled	6-pin	
V-1000 S.D.I.	6-pin	KW-2000

For 2004 model year snowmobiles, refer to respective *Predelivery Bulletin* or appropriate *Shop Manual*.



Snowmobile MPEM Power Sources

Description

Depending on the snowmobile model, it might be required to provide power to the MPEM to allow B.U.D.S. to communicate with it. This can be done by using the vehicle's battery, an external battery or by starting the engine. Consult the vehicle's shop manual to find the appropriate power connection scheme.

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With the vehicle's battery

To provide power to the MPEM using the vehicle's battery, use one of the following accessories:

- a bypass wire (529 033 300) connected to the vehicle harness
- a bypass wire (681 780 600) connected to the vehicle harness

With an external battery

To provide power to the MPEM using an external battery, use one of the following accessories:

- a 9V adapter (529 035 675) connected to the MPEM
- a 9V adapter (529 035 675) connected to the vehicle harness
- a 9V adapter (529 035 675) along with a 3-position to 4-position adaptation cable
- a 9V adapter (529 035 675) along with a 3-position to 6-position adaptation cable
- a supply cable (529 035 869) along with a 9V adapter (529 035 675)
- a supply cable (529 035 869) along with a 12V battery

Notes

When the MPEM is powered by an external battery, it is not possible to start the engine. Battery power has to be removed first.

To prevent irreparable damages to AC MPEM's, never supply them with more than 9 volts DC. AC MPEM's are those used along with 220W or 290W magneto.

With engine running

While the engine is running, communication with the MPEM is allowed only when the engine speed is between 1000 and 3000 RPM.

User Interface

Title Bar

Description

The title bar at the top of the window identifies which MPEM document the software shows and lets you perform many window operations as well. The title bar is the control point for moving the window and the location of the system menu, minimize, maximize, restore and close window buttons.



When a MPEM document is opened, the title bar text is made up of the vehicle type, the MPEM document file name and the software name. When no MPEM document is opened, the title bar text is made of the software name only.

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Example

The following example shows the text of a title bar with a personal watercraft MPEM document opened and modified:

[PWC] ZZN0123456_991028_1130.mpem - B.U.D.S. [modified].

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Menus

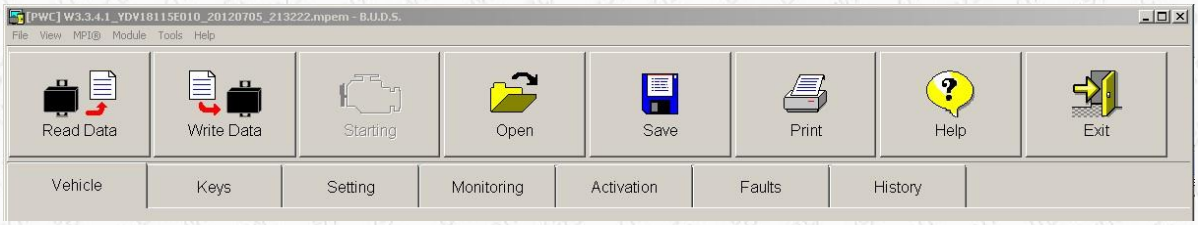
Menu Bar

Description

B.U.D.S. provides a menu that you can use to initiate commands. The menu contains individual choices known as menu items. You can select menu items with the mouse or with the keyboard. In the later case, press the ALT key to activate the menu bar. Once the menu bar is activated, navigate the menu with the arrow keys and select a menu item by pressing the ENTER key. Some menu items can also be selected directly using keyboard shortcuts (CTRL + key).

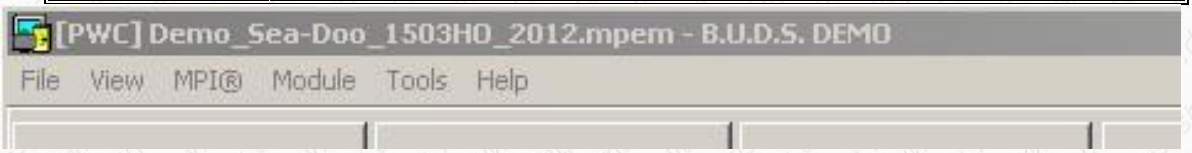
The menu bar is composed of the following drop-down menus:

Menu title	Type of commands it contains
File	Primary commands that apply to MPEM documents.
View	Commands that control the appearance of the interface.
MPI®	MPI control commands.
Module	Module control commands. There is a sub-menu for each module.



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Tools	Commands to set the environment.
Help	Commands to assist you with B.U.D.S..



B.U.D.S. / User Interface / Menus / Menu Bar

File

Read Data

Description

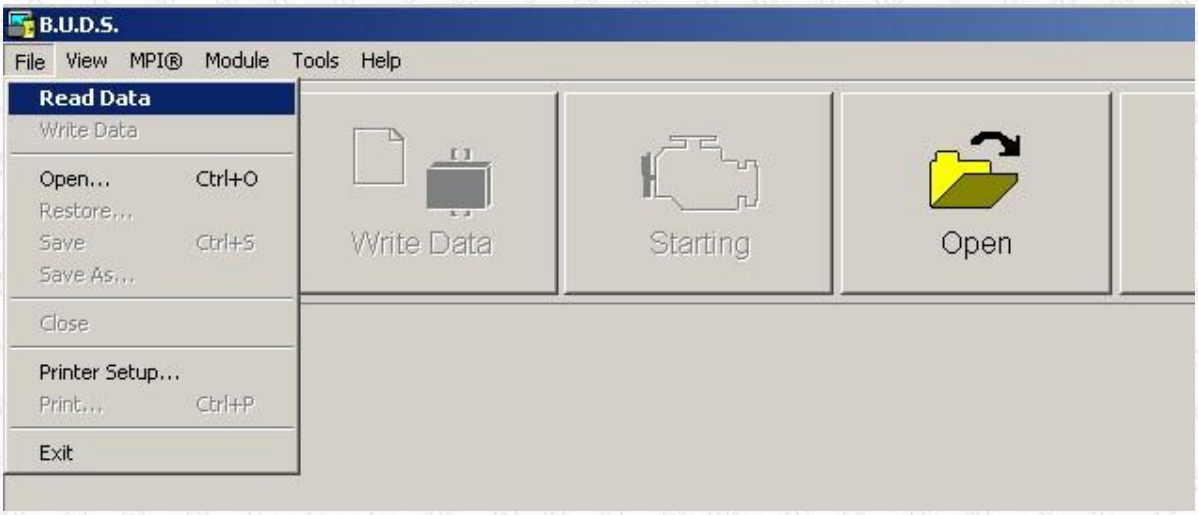
B.U.D.S. provides a function that you can use to read a MPEM document from a vehicle.

To read a MPEM document from a vehicle

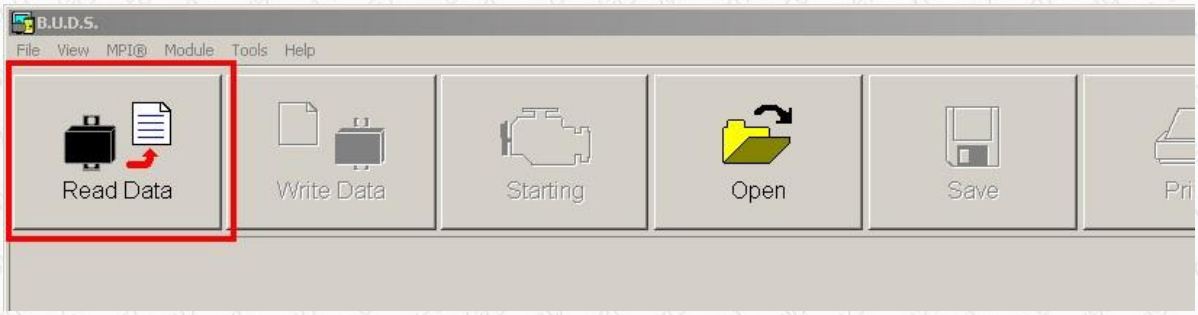
Select **Read Data** from the **File** menu.

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Description



or



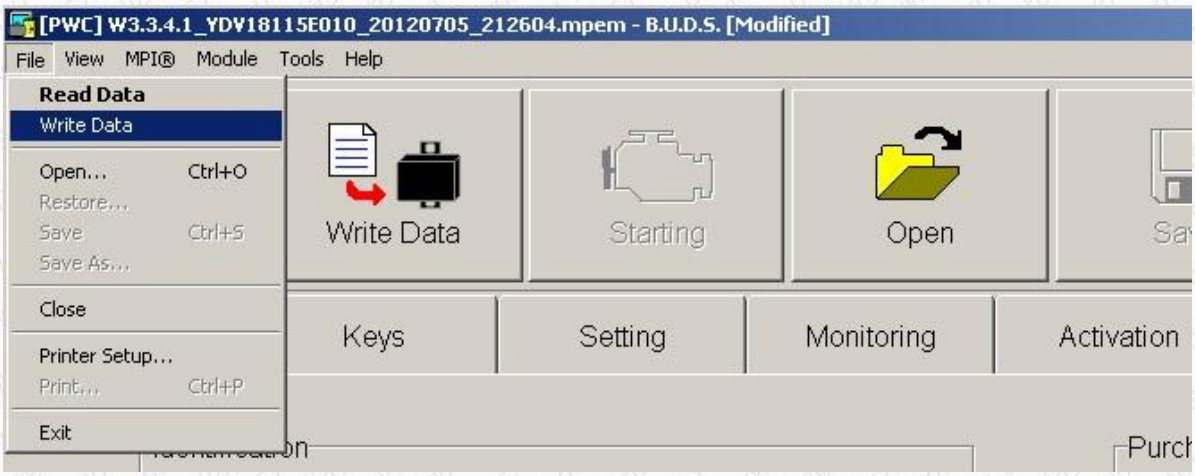
® Trademarks of BRP Inc. and/or its subsidiaries.

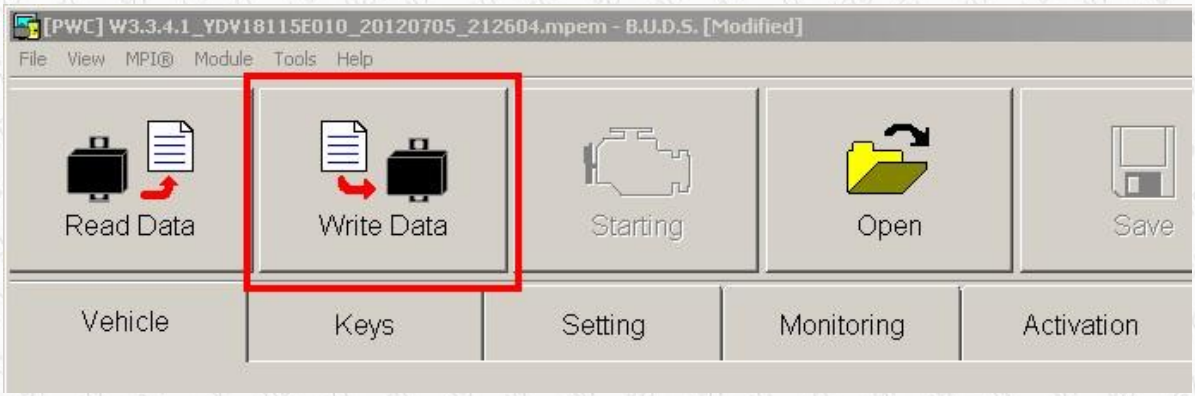
Write Data

B.U.D.S. provides a function that you can use to write a MPEM document into a vehicle. Only modified documents can be written to the vehicle.

To write a MPEM document in a vehicle

1. Select **Write Data** from the **File** menu.
2. Click on the message box **OK** button.
3. Perform the ECM tracking procedure if necessary.





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Description

Or

® Trademarks of BRP Inc. and/or its subsidiaries.

Description

Open

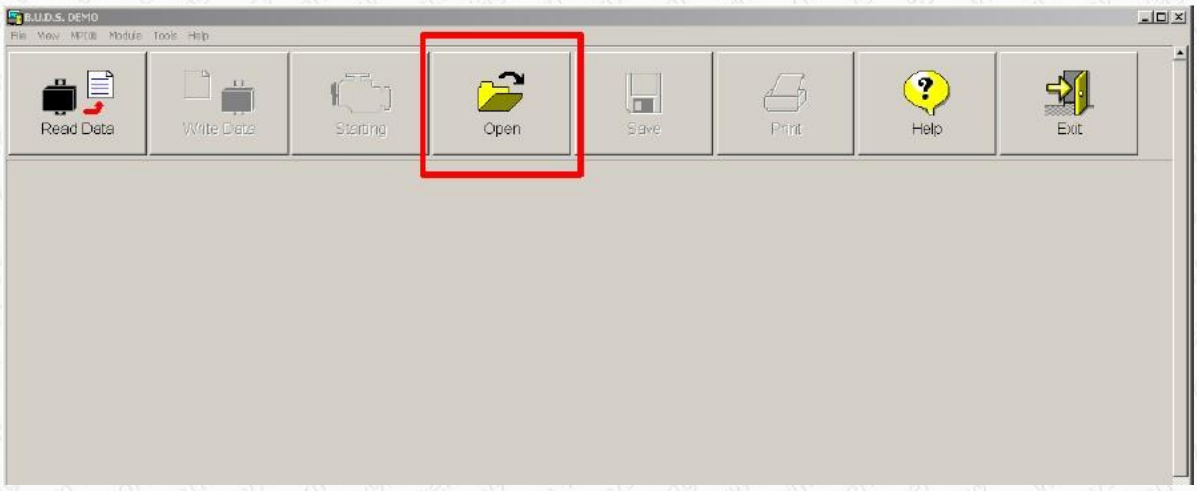
B.U.D.S. provides a command that you can use to open a MPEM document from a file.

To open a MPEM document from a file

1. Select **Open...** from the **File** menu.
2. Locate the document that you want to open.
3. Double-click on the document file name.

Note

Upon startup, B.U.D.S. looks for MPEM documents in its default "Customers" folder located in your working directory (where B.U.D.S. resides). During a session however, B.U.D.S. looks for documents in the last folder that you saved or read a document from.



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Description

Restore

B.U.D.S. maintains a list of MPEM documents that were not successfully written into the vehicle. The list of unsuccessfully written documents can be viewed using the **Restore...** command. If the list of unsuccessfully written documents is empty or if no vehicle is connected, then the **Restore...** command is disabled.

To restore a MPEM document

1. Select **Restore...** from the **File** menu.
2. Take a look at the document and target vehicle information to determine if the document matches the connected vehicle.
3. If the document does not match the connected vehicle then:
   - Click on the **Ignore** button to view the next document in the list.
   - Go back to step 2.
4. If the document matches the connected vehicle then:
   - Click on the **Restore** button to open the document.
   - Write the document into the target vehicle.
5. If the document is successfully written into the vehicle, then it is removed from the list of unsuccessfully written documents. Otherwise, the document remains in the list.

Note

When you launch B.U.D.S. and the list of unsuccessfully written documents is not empty, then the **Restore** command is automatically called.

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Description

Save

B.U.D.S. provides a function that you can use to save a MPEM document to a file. MPEM document are given a default file name that is composed of the vehicle serial number and the computer date and time. The file name extension is '.mpem'.

You are free to change the default file name of a MPEM document. However, do not change the file name extension. If you change it, then Windows Explorer won't display the icon that makes a MPEM document easily recognizable.

Example file name

```
ZZN12322311_991020_1120.mpem
```

To save a MPEM document to a file

Select **Save** from the **File** menu. If the MPEM document is saved for the first time, then B.U.D.S. opens the standard **Save As** dialog to allow you to choose a path name and modify the default file name (See paragraph below).

To save a MPEM document to a new file

1. Select **Save As...** from the **File** menu.
2. Locate the folder where you want to save your MPEM document.
3. If required, modify the default **File Name** that B.U.D.S. created for you.
4. Click on the **Save** button.

Note

You cannot save a modified document to a file. Prior to save a modified document, you must write it into the vehicle.

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Description

More detailed instructions on how to save BUDS file you can download by clicking on the link below.

http://www.diag-systems.com/BRP/Instructions/Saving_and_emailing_of_BUDS_file.pdf

Close

B.U.D.S. provides a menu command that you can use to close a MPEM document without leaving the application. Closing a document clears the interface and stops monitoring vehicle parameters.

To close a MPEM document

1. Select **Close** from the **File** menu.
2. If the document was modified but not written into the vehicle, then B.U.D.S. asks you to confirm that you want to continue and loose your modifications. Choose **Yes** to close the document and loose your modifications or **No** to cancel the command.

Note

On some vehicles, if the ECM has not yet stored received data in its *non-volatile* memory, then B.U.D.S. will remind you to initiate the ECM tracking procedure.

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Description

Printer Setup

B.U.D.S. provides a function that you can use to open the standard Windows printer setup dialog.

To modify the printer setup

1. Click on the **Printer Setup...** command from the **File** menu.
2. Change printer **Properties** to meet your requirements.
3. Click on the **OK** button.

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Description

Print

B.U.D.S. provides a function that you can use to print MPEM documents. Printed MPEM documents are referred to as **Service Reports**.

To print a service report

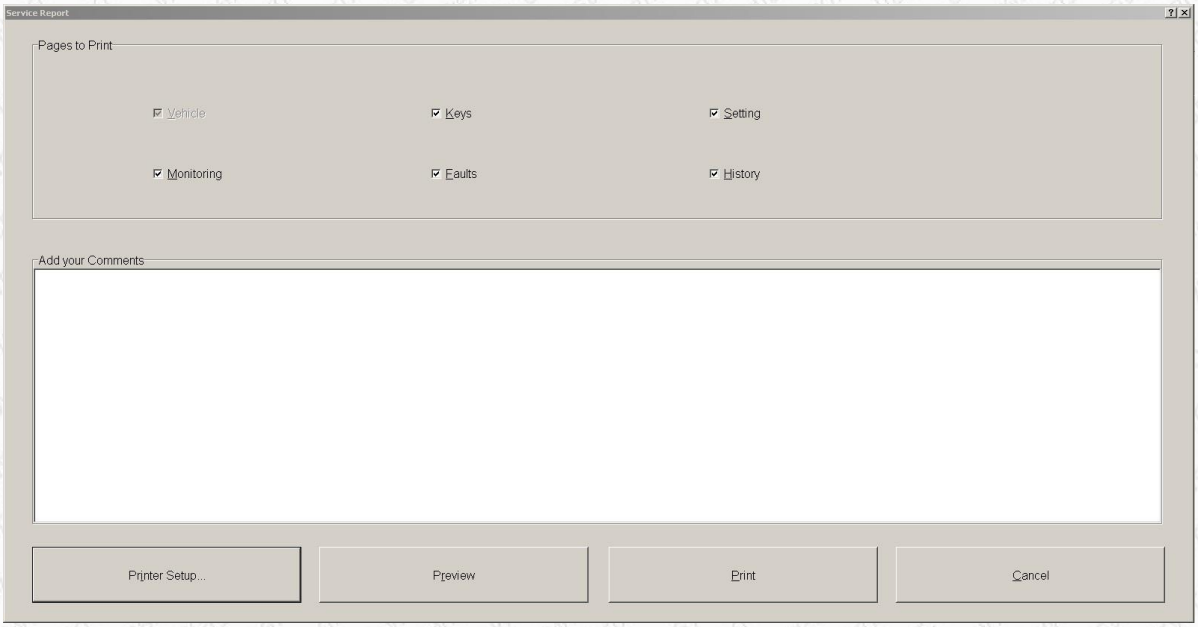
1. Select **Print...** from the **File** menu to open the **Service Report** window.
2. In the **Pages to Print** group box, check the pages that you want to include in your report.
3. In the **Add your Comments** zone, type any comments that you want to add to the report.
4. If you want to modify your printer setup, click on the **Printer Setup...** button.
5. If you want to preview the report, click on the **Preview** button.
6. Click on the **Print** button.

Note

You cannot print a modified document. Prior to print a modified document, you must write it into the vehicle.

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Description

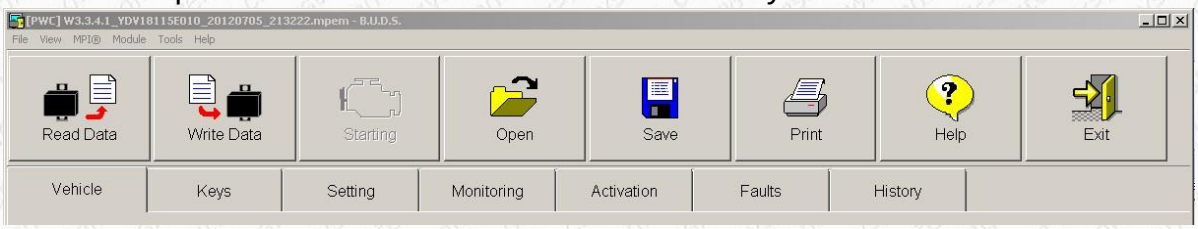


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View
Toolbar

Description

The toolbar provides 8 shortcuts to the most commonly used menu commands.



The table below shows the toolbar buttons with their corresponding menu commands:

Button	Corresponding menu command
Read Data	File | Read Data
Write Data	File | Write Data
Starting / Stop	Not in menu. Engine can also be stopped with the space bar.
Open	File | Open...
Save	File | Save
Print	File | Print...
Help	Help | Topic

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Exit	File | Exit

To hide or show the toolbar

Toggle the **Toolbar** command from the **View** menu.

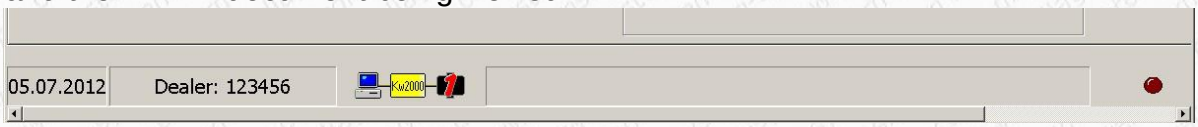
Note

The toolbar can't be hidden when the engine is running.

B.U.D.S. / User Interface / Menus / View

Status Bar

The status bar consists of 5 panels that display status information on the software and the MPEM document being viewed.



The table below describes the content of the 5 status bar panels starting from the leftmost:

Panel name	Content
Date	Your local computer date.
Dealer number	Your dealer number as entered during the installation of B.U.D.S..

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Description

Heartbeat	MPI® and Module connection status. Moving the cursor over the module icon indicates which module is present.
Messages	Miscellaneous software messages.
Update	Update indicator. The icon appears to indicate that there is an update available for the connected module.
Faults	Active faults indicator. The LED blinks to indicate the presence of at least one active fault in the module.

To hide or show the status bar

Toggle the **Status Bar** command from the **View** menu.

B.U.D.S. / User Interface / Menus / View

MPI
Information

Description

The **MPI Information** window provides you with the following MPI hardware and software information:

Hardware information

Serial Number:	MPI manufacturer serial number.

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Product Number:	MPI manufacturer product number and revision.
Production Date:	MPI production date (YYYY/MM/DD).

Software information

Software Number:	MPI manufacturer boot loader number and revision.
Control Number:	Number stamped into modules when writing documents.
Protocol:	Protocol currently loaded into the MPI.

To open the MPI information window

Select **Information** from the **MPI®** menu.

To close the MPI information window

Click on the **MPI Information** window **Close** button.

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Description

Test Key

B.U.D.S. provides a function that you can use to test DESS® keys.

To test a DESS key

1. Select **Test Key** from the **MPI®** menu.
2. Insert a key on the MPI DESS post.
3. Click on the message box **OK** button.

Notes

Testing a DESS key while a MPEM document. is opened also indicates if the key has been found in the document or not.

Testing a calibration cartridge gives its part number and release date.

Testing a DIAGNOSTIC key results in an open circuit key, error message 252.

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Choose Protocol

Description

B.U.D.S. (version 2) for vehicles 1996-2010 supports three communication protocols: The **DESS®**, **947-DI**, **Kw2000** and cannot determine by itself which protocol must be used for communicating with a particular module. It is the user who decides when to choose DESS, when to choose 947-DI or when to choose Kw2000 . If you try to communicate with a vehicle using the wrong protocol, B.U.D.S. will simply consider that the module is not present.

B.U.D.S. (version 3) for **SeaDoo, SkiDoo/Lynx** vehicles since 2007 and all **Can Am*** vehicles supports **Kw2000 (Auto)** communication protocol only.

The necessary protocol and diagnostic equipment for your vehicle can be determined from the table BUDS Chart .

To choose DESS protocol

1. Select **Choose Protocol** from the **MPI®** menu.
2. Select **DESS** from the **Choose Protocol** sub-menu.
3. Wait few seconds while B.U.D.S. loads the protocol into the MPI.
4. Verify that the status bar communication icon indicates DESS:



For VCK®:

Using this protocol requires that you connect one end of the **DESS adapter** in the 6pin adapter and the other end on the **DESS post of the vehicle** or, on some vehicles, that you connect the 6-pin adapter directly into the diagnostic connector of the vehicle.

For MPI-2:

Using this protocol requires that you connect one end of the **DESS adapter** in the 6pin connector of **DESS Post Interface** and the other end on the **DESS post of the vehicle** or, on some vehicles, that you connect the **DESS Post Interface** directly into the diagnostic connector of the vehicle.

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If you communicate with a **947-DI** using the **DESS** protocol instead of the **947-DI** protocol, then the **Monitoring**, **Activation**, **Faults** and **History** pages will not be available.

---

* - ATV, SSV, Spyder Roadster

To choose 947-DI protocol

1. Select **Choose Protocol** from the **MPI®** menu.
2. Select **947-DI** from the **Choose Protocol** sub-menu.
3. Wait few seconds while B.U.D.S. loads the protocol into the MPI.
4. Verify that the status bar communication icon indicates 947-DI:



The **947-DI** protocol is used to diagnose a vehicle equipped with a **947-DI engine**.

For VCK®:

Using this protocol requires that you connect the 6-pin adapter directly into the diagnostic connector of the vehicle. You can not use this protocol with the diagnostic cable connected on the DESS® post of the vehicle.

For MPI-2:

Using this protocol requires that you connect the **DESS Post Interface** directly into the diagnostic connector of the vehicle.

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To choose Kw2000 protocol

1. Select **Choose Protocol** from the **MPI®** menu.
2. Select **Kw2000** from the **Choose Protocol** sub-menu.
3. Wait few seconds while B.U.D.S. loads the protocol into the MPI.
4. Verify that the status bar communication icon indicates Kw2000:



The **Kw2000** protocol is used to diagnose some personal watercrafts and snowmobiles.

For VCK:

Using this protocol requires that you connect the **6-pin adapter** directly into the **diagnostic connector of the vehicle**. You can not use this protocol with the diagnostic cable connected on the DESS® post of the vehicle.

For MPI-2:

Using this protocol requires that you connect the Diagnostic Cable directly into the **diagnostic connector of the vehicle**.

The **Kw2000 (Auto)** protocol is used to diagnose all modern BRP vehicles.

Only the **MPI-2 Interface** supports this protocol.

Using this protocol requires that you connect the Diagnostic Cable directly into the **diagnostic connector of the vehicle**.

Note

Upon startup, B.U.D.S. chooses the protocol that you were using when you terminated your last session.

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Description

Choose Speed (for MPI-1 only)

B.U.D.S. allows your computer to communicate with the MPI® at different communication speeds. The communication speed ranges from 9600 BPS to 115200 BPS. The default communication speed is 57600 BPS.

B.U.D.S. cannot determine by itself the optimal communication speed for your computer. If you experience any problem, try another communication speed.

To choose a different communication speed

1. Select **Choose Speed** from the **MPI®** menu.
2. Select the desired speed from the **Choose Speed** sub-menu.
3. Wait few seconds while B.U.D.S. changes the MPI communication speed.

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Note

Upon startup, B.U.D.S. sets the MPI communication speed to the speed you were using when you terminated your last session.

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Description

Privileges

Description

The **Access Privileges** window provides functions that you can use to read your current access privileges and add new access privileges to your software.

To read your current access privileges

1. Select **Privileges...** from the **MPI®** menu.
2. Read the content of the **Current Privileges** zone.

To add an access privilege to your software

1. Select **Privileges...** from the **MPI®** menu.
2. Note the **Identification** number in the **Connected MPI** zone.
3. **(If you are an authorized dealer)** Call your service representative to give him your **Identification** number.

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4. If you are not an authorized dealer you can buy a license here.
5. Type the access code that your service representative will give you in the **New Privileges** zone.
6. Click on the **Add** button.
7. Click on the **OK** button.

More detailed instructions for installation and transferring the license is on **this** page.

Reset

B.U.D.S. provides a function that you can use to reset the MPI whenever it seems to be "frozen".

To reset the MPI

1. Select **Reset** from the **MPI®** menu.
2. Wait until B.U.D.S. resets the MPI.

Note

After the reset, B.U.D.S. will automatically reload the protocol into the MPI.

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Description

Module
Information

Description

The **Module** menu provides functions that you can use to display module informations. Depending on the type of vehicle, the following information pages or windows are available:

- MPEM hardware page
- MPEM software page
- MPEM identification page
- MPEM calibration page
- RFI engine module page
- ECM information window
- MPEM information window

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Description

The

MPEM Hardware Page

Hardware page from the **MPEM Information** window provides you with the following MPEM manufacturing information:

Part Number:	BRP Part Number (Snowmobile only).
Serial Number:	MPEM serial number (not available on all MPEM).
Production Date:	MPEM production date (YY/MM/DD).

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Description

The

Auto Power-off Delay:	Delay before the MPEM turns off after the engine is stopped while the key is still inserted on the vehicle DESS® post (PWC only).
Product Number:	MPEM manufacturer product and revision numbers (947-DI only).

To view the MPEM hardware page

1. Read MPEM document from the vehicle.
2. Select **Information** from the **Module | MPEM** menu.
3. Click on the **Hardware** thumbnail from the **MPEM Information** window.
4. Click on the **Close** button when you are finished.

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Description

The

MPEM Software Page

Software page from the **MPEM Information** window provides you with the following MPEM information:

Application Number:	MPEM family number.
Software Version:	MPEM manufacturer software version.
Last Programmer:	MPEM-programmer or MPI® control number who last wrote the MPEM.
Software Number:	MPEM manufacturer full software and revision numbers (947-DI only).

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Description

The

To view the MPEM software page

1. Read MPEM document from the vehicle.
2. Select **Information** from the **Module | MPEM** menu.
3. Click on the **Software** thumbnail from the **MPEM Information** window.
4. Click on the **Close** button when you are finished.

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Description

The

MPEM Identification Page

Identification page from the **MPEM Information** window provides you with the following information:

Software:	Internal software ID.
Calibration:	Internal calibration ID.

To view the MPEM identification page

1. Read MPEM document from the vehicle.
2. Select **Information** from the **Module | MPEM** menu.
3. Click on the **Identification** thumbnail from the **MPEM Information** window.
4. Click on the **Close** button when you are finished.

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Description

The

MPEM Calibration Page

Calibration page from the **MPEM Information** window provides you with the following information:

Calibration Number:	Internal calibration ID.

To view the MPEM calibration page

1. Read MPEM document from the vehicle.
2. Select **Information** from the **Module | MPEM** menu.
3. Click on the **Calibration** thumbnail from the **MPEM Information** window.
4. Click on the **Close** button when you are finished.

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Description

The

RFI Engine Module Page

RFI Engine Module page from the **MPEM Information** window provides you with the following RFI engine module information:

- BRP part number
- BRP vehicle identification
- BRP software number
- RFI engine module number 1
- RFI engine module number 2
- RFI engine module number 3

To view the RFI engine module page

1. Read MPEM document from the vehicle.

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Description

The

2. Select **Information** from the **Module | MPEM** menu.
3. Click on the **RFI Engine Module** thumbnail from the **MPEM Information** window.
4. Click on the **Close** button when you are finished.

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Description

ECM Information Window

B.U.D.S. provides a function that you can use to display the following ECM information:

- BRP Part Number
- Rotax Part Number
- Revision Number
- Hardware Number (not available on all ECM)
- Serial Number
- Data Modification Fingerprint (not available on all ECM)
- Code Modification Fingerprint
- Boot Modification Fingerprint (not available on all ECM)
- Diagnosis Version Number

To open the ECM Information window

1. Read MPEM document from the vehicle.
2. Select **Information** from the **Module | ECM** menu.
3. Click on the **Close** button when you are finished.

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Description

MPEM Information Window

B.U.D.S. provides a function that you can use to display the following MPEM information:

- BRP Part Number
- BRP Software Number
- Serial Number
- Diagnosis Version Number

To open the MPEM information window

1. Read MPEM document from the vehicle.
2. Select **Information** from the **Module | MPEM** menu.
3. Click on the **Close** button when you are finished.

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Description

Cluster Information Window

B.U.D.S. provides a function that you can use to display the following Cluster information:

- BRP Part Number
- BRP Software Number
- Serial Number
- Diagnosis Version Number
- Calibration Number
- Software Number
- Code Modification Fingerprint
- Vehicle Model
- Vehicle Serial Number
- Customer Name
- Delivery Date
- Security Code

To open the Cluster Information window

1. Read MPEM document from the vehicle.
2. Select **Information** from the **Module | Cluster** menu.
3. Click on the **Close** button when you are finished.

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Description

Replace

B.U.D.S. provides a function that you can use to transfer the content of a defective module that you want to replace into a new one.

To replace a defective module

1. Read the content of the old module if it is still possible, or open it from a recent file.
2. Disconnect the old module from the MPI®.
3. Connect the new module to the MPI (VCK, MPI-2).
4. Wait until B.U.D.S. sees the module.
5. Select the **Replace** command:
   - From the **Module | MPEM** menu to replace a MPEM.
   - From the **Module | ECM** menu to replace an ECM.
6. Click on the message box **OK** button.

Note

The **Replace** command writes the **Vehicle**, **Keys** and **Part Replacement** pages into the new module. Some **Setting** page parameters are also written. Other parameters or settings must be initialized manually. See the shop manual for more details.

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Description

Update

B.U.D.S. provides a function that you can use to update module's software.

Every time B.U.D.S. reads a MPEM document from a vehicle, it gets the identification of the module, then it looks in its update database to see if it can find a matching software update. If B.U.D.S. finds an update for the module, then it enables the **Update...** menu and displays the following icon in the lower right corner of the screen:



To update a module's software

When the module identification matches a mandatory update, then the **Update** command is called automatically. To update the module, simply follow the instructions provided by B.U.D.S..

If for any reason the internal software of the module is corrupted and B.U.D.S. cannot read its identification, then you will be asked to enter the vehicle serial and model numbers manually. In the later case, make sure that you enter the exact numbers, otherwise B.U.D.S. could not match the module with its corresponding software

update.

B.U.D.S. also allows you to call the **Update** command manually. This can be usefull if an update is available for the module but the update is not mandatory or if an update process has been interrupted. To manually intiate the update process, follow these steps:

1. Select the **Update** command:
   - From the **Module | MPEM** menu to update a MPEM.

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Description

- From the **Module | ECM** menu to update an ECM.

2. Select the appropriate update from the **Update Database** window.
3. Follow the instructions provided by B.U.D.S..

Notes

Some models may not need to be updated, even if B.U.D.S. shows that an update is available.

Always consult related service bulletins before updating a module's software since you will not be able to go backward.

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Tools
Technicians

Description

B.U.D.S. maintains a list of users who are allowed to use the software. Such users are referred to as a registered technicians. Each registered technician is assigned a username and a password. The password prevents unauthorized users from logging into B.U.D.S. and other registered technicians from using somebody else's username.

To add a new registered technician

1. Log on B.U.D.S. as the administrator.
2. Select **Technicians...** from the **Tools** menu.
3. Click on the **Add Technician** button.
4. Fill in the technician **Username**, **First Name**, **Last Name**, **Password** and **Confirm Password** zones.
5. Click on the **Technician** window **OK** button.
6. Repeat step 3 to 5 for each new technician that you want to add.
7. Click on the **Registered Technicians** window **OK** button.

To modify a registered technician

1. Log on B.U.D.S. as the administrator.
2. Select **Technicians...** from the **Tools** menu.
3. Click on the technician that you want to modify.
4. Click on the **Modify Technician** button or double-click on the technician.
5. Modify the technician **Username**, **First Name**, **Last Name**, **Password** and **Confirm Password** zones.
6. Click on the **Technician** window **OK** button.
7. Repeat step 3 to 6 for each technician that you want to modify.
8. Click on the **Registered Technicians** window **OK** button.

To remove a registered technician

1. Log on B.U.D.S. as the administrator.
2. Select **Technicians...** from the **Tools** menu.
3. Click on the technician that you want to remove.
4. Click on the **Remove Technician** button.

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5. Click on the **Registered Technicians** window **OK** button.

Note. The password must be at least 4 character long while the username, first and last names must be at least 2 character long. The password and names are limited to a maximum of 64 characters each. You must enter the same passord twice to validate it.

Options

Description

The **Options...** command from the **Tools** menu opens the **Options** window that you can use to change your software language and units. Available languages are English, Finnish, French, German and Spanish. Available units are metric and US.

To change your software language

1. Select **Options...** from the **Tools** menu.
2. From the **Options** window, open the **Language** drop down list and select your language.
3. Click on the message box **OK** button.
4. Exit B.U.D.S. and restart it.

To change your software units

1. Select **Options...** from the **Tools** menu.
2. From the **Options** window, open the **Units** drop down list and select your units.
3. Click on the message box **OK** button. New units are taken into account immediately.

Note

Default units are US and default language is English.

Update Database

Description

The **Update Database** window provides functions that you can use to view or add module updates.

To open the update database window

You can view all updates that are registered in your B.U.D.S. system using the **Update Database** window. To do so, follow these steps:

1. Select **Update Database...** from the **Tools** menu.
2. Use the vertical scroll bar to view all updates. For each update, the window shows its name, date, description and update file name.

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3. Click on the **Close** button when you are finished.

To add an update to the update database

To let B.U.D.S. know about the existence of an update, you must add it to your update database. To do so, follow these steps:

1. Select **Update Database...** from the **Tools** menu.
2. Click on the **Update Database** window **Add Update...** button.
3. Locate the update file that you want to add. The update file name extension is '`.fc`'.
4. Double-click on the document file name.

Note

Upon startup, B.U.D.S. looks for unregistered update files in its default "UpdateFiles" folder located in your working directory (where B.U.D.S. was installed). If new updates are found, then B.U.D.S. will inform you that they will be added to your database automatically. If previously registered update files are missing, then B.U.D.S. will ask you to get these files and add them back to your database.

Help
Topics

Description

B.U.D.S. provides help topics that you can use to solve utilization problems or learn more about the software. The topics can be browsed using the standard Windows help browser. B.U.D.S. also provides links that you can use to directly open the topics related to the interface component that you are working with.

To open the help browser

Select **Topics** from the **Help** menu or click on the **Help** button from the toolbar.

To open a specific topic

1. Select **What's This?** from the **Help** menu. Note that the cursor shape changes to an arrow with a question mark.
2. Click on the interface component that you want to open the topic of.

Note

If the interface component that you want to open the topic of is a button or an edit zone, then you can also press the F1 key to perform the same action.

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About B.U.D.S.

About B.U.D.S.

Description

This command displays the version number of your software, copyright information and your dealer name and number.

To open the About B.U.D.S. window

1. From the **Help** menu, select **About B.U.D.S.**.
2. Click on the **OK** button to close the window.

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Document Document Area

Description

The document area is where most of the editing and viewing of a MPEM document takes place. When opening a MPEM document, B.U.D.S. displays it in the different pages of the document area. Each page can be opened by selecting its corresponding thumbnail. The number of pages displayed depends on the type of MPEM document.



The table below shows the different document pages and the information or functions they contain.

Page	Content
Vehicle	Serial numbers, run hours, customer and service info.
Keys	DESS® key functions.
Setting	Engine and vehicle parameters setting functions.

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Monitoring	Engine and vehicle monitoring functions.
Activation	Module output activation functions.
Faults	Fault logging and resetting functions.
History	History logging and resetting functions.

B.U.D.S. / User Interface / Document / Document Area

Edit MPEM Document

Description

B.U.D.S. provides functions that you can use to edit MPEM documents. Most of the editing takes place in the **Vehicle**, **Keys**, **Setting** and **Part Replacement** pages. When you edit a zone, modifications are done locally in your computer. To reflect the modifications into the vehicle, you must write the modified MPEM document.

To edit a MPEM document

1. Read MPEM document from the vehicle.
2. Edit any of the MPEM document zones.
3. Write MPEM document into the vehicle.

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Note

When you edit a MPEM document zone, B.U.D.S. adds the label "[modified]" at the end of the title bar text. The label remains there until you write the MPEM document into the vehicle.

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Description

B.U.D.S. / User Interface / Document / Edit MPEM Document

Preview Service Report

B.U.D.S. provides a function that you can use to preview a service report on your computer screen before you send it to a printer.

To preview a service report

1. Open the **Service Report** window.	
2. Click on the **Preview** button to open the **Service Report Preview** window.	
3. Click on...	**To perform the following action**
	Zoom service report.
	Navigate service report pages.

Description

The

	Open the printer setup dialog. To reflect the change on the screen, close the preview window and reopen it.
	Send service report to the printer.
	Save service report to a file.
	Open a service report from a file.

B.U.D.S. / User Interface / Document / Preview Service Report

Vehicle

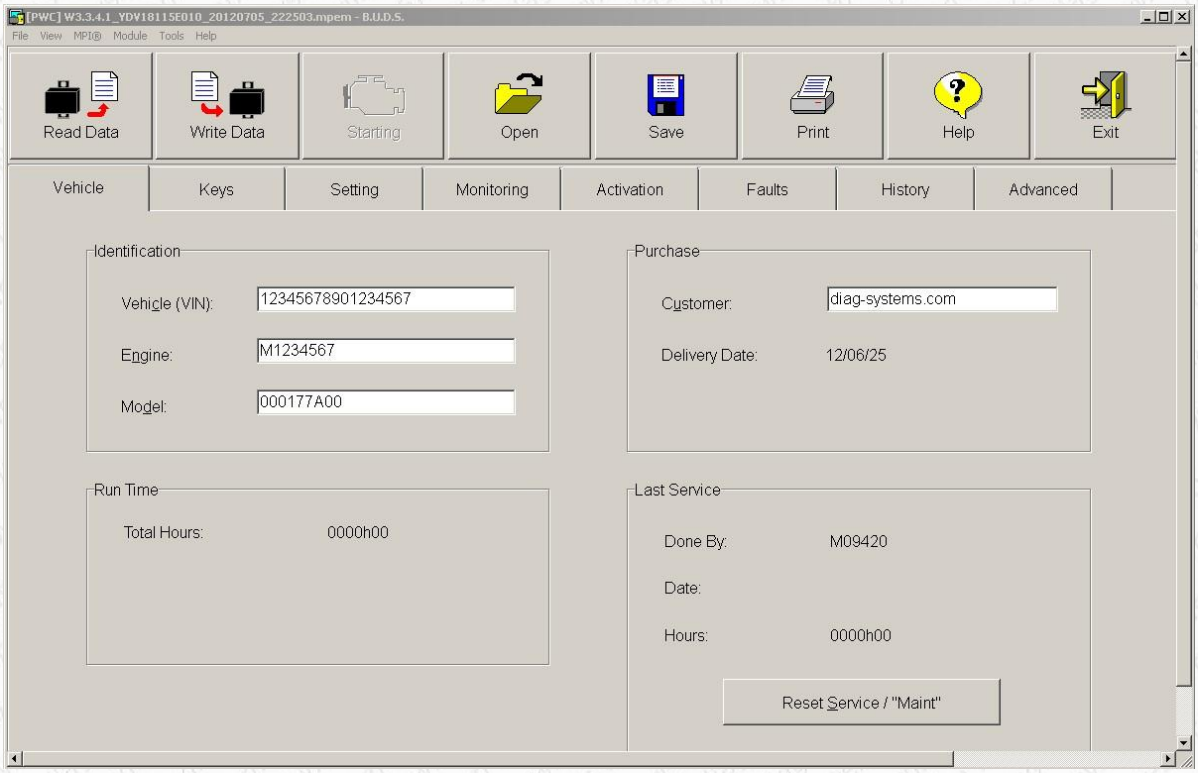
Vehicle Page

Description

The **Vehicle** page provides functions that you can use to edit vehicle serial numbers, vehicle model and purchase information, view/reset run times and last

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service. The **Vehicle** page is common to all BRP® recreational products, except the ATV.



To open the Vehicle page

1. Read MPEM document from the vehicle.
2. Click on the **Vehicle** page thumbnail.

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Description

The

Serial Numbers

Identification group box from the **Vehicle** page provides 2 zones that you can use to read/edit* the vehicle serial number (VIN) and the engine serial number. Unlike the vehicle, the engine serial number can be changed at anytime. However when you change the engine serial number on some vehicles, B.U.D.S. automatically logs** the old number into the part replacement history.

To change the engine serial number 1.

Read MPEM document from the

vehicle.

2. Click on the **Vehicle** page thumbnail.

3. Type the new engine serial number in the **Engine** zone.

4. Write MPEM document into the vehicle.

Notes

When you write the MPEM document with a new engine serial number, B.U.D.S. asks you to confirm that you really wanted to change it.

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On some vehicles, the VIN is limited to 17 characters, compared to 20 for others.

---

* - You can edit VIN if your B.U.D.S. have installed License Key Megatech.

** - You can clear the part replacement history if your version of the B.U.D.S. program have installed License Key Megatech.

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Description

The

Vehicle Model

Identification group box from the **Vehicle** page provides a zone that you can use to edit* the vehicle model.

To change the vehicle model

1. Read MPEM document from the vehicle.
2. Click on the **Vehicle** page thumbnail.
3. Type the new model number in the **Model** zone.
4. Write MPEM document into the vehicle.

Note

The vehicle model must either be "SBOAT", an alphanumeric value or an entirely numerical value.

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Description

* - if your B.U.D.S. have installed License Key Megatech.

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Description

The

Purchase Info

Purchase group box from the **Vehicle** page provides an edit zone that you can use to enter the name of the customer. The first time you enter a name in the **Customer** zone, B.U.D.S. automatically sets the **Delivery Date** zone with your current computer date. Anytime you further change the customer name, the delivery date zone remains unchanged.

To enter the name of the customer 1. Read MPEM document from the vehicle.

2. Click on the **Vehicle** page thumbnail.

3. Type the name of the customer in the **Customer** zone.

4. Write MPEM document into the vehicle.

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Description

Run Time

The **Run Time** group box provides functions that you can use to read/reset* the vehicle total hours and reset the vehicle rental hours.

To read the vehicle total and rental hours

1. Read MPEM document from a vehicle.
2. Click on the **Vehicle** page thumbnail.
3. Look at the **Run Time** group box.

To reset the vehicle rental hours 1.

Read MPEM document from a vehicle.

2. Click on the **Vehicle** page thumbnail.
3. Click on the **Reset Rental Hours** button.

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Description

The

4. Write MPEM document into the vehicle.

Note

Rental hours do not exist on all vehicles.

---

* - You can reset the vehicle total hours on PWC 4-TEC if your B.U.D.S. have installed
License Key Megatech.

How to reset on PWC 4-TEC total hours described on this page.

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Description

Last Service

The **Last Service** group box from the **Vehicle** page provides functions that you can use to read and reset the vehicle service information stored into the module. The **Last Service** group box contains the following zones:

Done By:	The MPEM-Programmer or MPI® control number who last serviced the vehicle.
Date:	The date when the last service was done.
Hours:	The number of hours the engine had run since the last service.

Resetting the last service information overwrites the **Done By** zone with your MPI control number, resets the **Date** zone with your current computer date and resets the **Hours** counter to zero. On some vehicles, resetting the last service information also turns off the maintenance signal of the vehicle cluster.

To reset the last service information 1.

Read MPEM document from the

vehicle.

2. Click on the **Vehicle** page thumbnail.

3. Click on the **Last Service** group box **Reset Service** button. On some vehicles, the button is labelled **Reset Service / "Maint"**.

4. Write MPEM document into the vehicle.

Note

Some twin-engine sport boats have 2 more zones to display the last service **Date** and
Hours for each engine. Also provided are the **Reset Starboard** and

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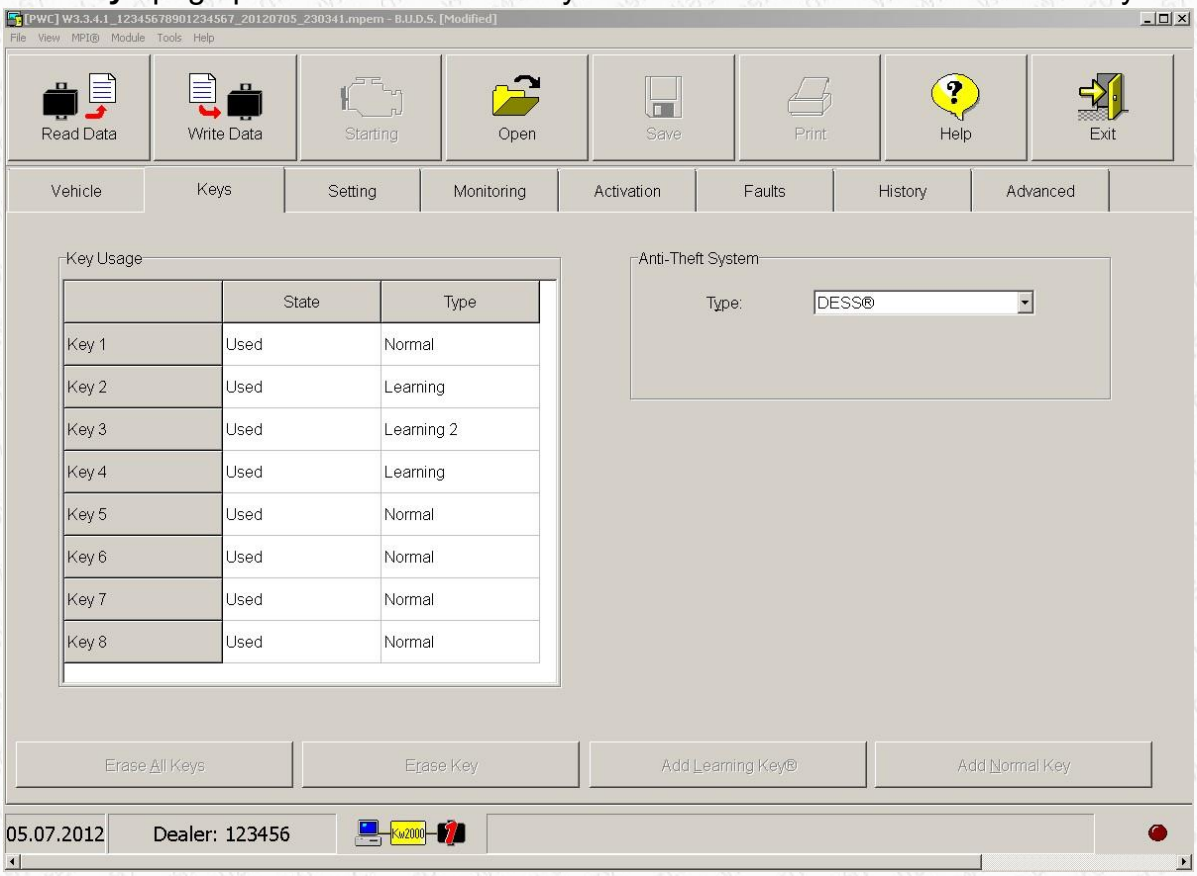
Reset Port Side buttons that you can use to reset starboard and port side engine date and hours.

Keys

Keys Page

Description

The **Keys** page provides functions that you can use to add or erase DESS® keys.



The **Key Usage** table shows the status and, when available, the maximum RPM setting (on some 2-stroke) or type for each key.

B.U.D.S. / User Interface / Document / Keys

To add a DESS key into the module

1. Read MPEM document from the vehicle.

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2. Click on the **Keys** page thumbnail.
3. Click on the **Add Key** button. For some vehicles, click on the **Add Normal Key** or **Add Learning Key®** button.
4. Insert a key on the MPI® DESS post (if you work with the VCK®) or* on the DESS Post Interface (if you work with MPI-2).
5. Click on the message box **OK** button.
6. Repeat steps 3 to 5 for each key that you want to add.
7. Write MPEM document into the vehicle.

To erase a key from the module

1. Read MPEM document from the vehicle.
2. Click on the **Keys** page thumbnail.
3. Click on the **Erase Key** button.
4. Insert a key on the MPI DESS post.
5. Click on the message box **OK** button.
6. Repeat steps 3 to 5 for each key that you want to erase.
7. Write MPEM document into the vehicle.

To erase all DESS keys from the module

1. Read MPEM document from the vehicle.
2. Click on the **Keys** page thumbnail.
3. Click on the **Erase All Keys** button
4. Click on the message box **OK** button.
5. Write MPEM document into the vehicle.

Note

After erasing all keys, add at least one new DESS key into the document. If the document contains no DESS key, B.U.D.S. will refuse to write it into the module.

* - Connecting the DESS Post Interface with various vehicles.

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Setting
Setting Page

Description

The **Setting** page provides functions that you can use to view and modify the vehicle settings. The content of the **Setting** page depends on the type of MPEM document.

To open the Setting page

1. Read MPEM document from the vehicle.
2. Click on the **Setting** page thumbnail.
3. Depending on the type of vehicle, the following setting functions are available:
   - Closed throttle
   - Closed throttle and idle actuator
   - Closed TPS
   - Fuel factor

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Description

The

- Ignition correction
- Ignition offset
- Neutral RPM
- Vehicle options
- Vehicle variant

Closed Throttle

Closed Throttle group box from the **Setting** page provides a function that you can use to tell the ECM that the current TPS value should be considered as the idle.

To reset the closed throttle

1. Read MPEM document from the vehicle.

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Description

The

2. Click on the **Setting** page thumbnail.
3. Click on the **Closed Throttle** zone **Reset** button.
4. Wait until B.U.D.S. confirms that the function succeeded.
5. Perform the ECM tracking procedure.

Note

The adjustment is done simultaneously in the ECM and in the document.

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Description

The

Closed Throttle and Idle Actuator

Closed Throttle and Idle Actuator group box from the **Setting** page provides a function that you can use to tell the ECM that the current TPS value should be considered as the idle.

To reset the closed throttle and idle actuator

1. Read MPEM document from the vehicle.
2. Click on the **Setting** page thumbnail.
3. Click on the **Closed Throttle and Idle Actuator** zone **Reset** button.
4. Wait until B.U.D.S. confirms that the function succeeded.
5. Perform the ECM tracking procedure.

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Description

The

Note

The adjustment is done simultaneously in the ECM and in the document.

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Description

The

Closed TPS

Closed TPS group box from the **Setting** page provides a function that you can use to tell the MPEM that the current TPS value should be considered as the idle.

On the RFI engine, the **Current Value** zone displays the TPS value which is considered as the idle by the MPEM. On the 947-DI engine, the **Throttle Opening** zone displays the real-time TPS value.

To reset the closed TPS

1. Read MPEM document from the vehicle.
2. Click on the **Setting** page thumbnail.
3. Click on the **Closed TPS** zone **Reset** button.
4. Wait until B.U.D.S. confirms that the function succeeded.

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Description

The

Note

The adjustment is done simultaneously in the MPEM and in the document.

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Description

The

Cluster Setting Group Box

Setting page provides functions that you can use to view and modify the cluster settings. The content of the **Cluster Setting** group box depends on the type of MPEM document.

To open the Cluster Setting group box

1. Read MPEM document from the vehicle.
2. Click on the **Setting** page thumbnail.
3. Select the appropriate Cluster Pointer Position Adjustement by pressing buttons **Clockwise** (to move the pointer 1 step clockwise) or **Counterclockwise** (to move the pointer 1 step counterclockwise).
4. Select the appropriate Cluster Mode by pressing buttons **Vehicle speed** or **Engine RPM**.

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Description

The

5. Select the appropriate Cluster Scale by pressing buttons **Miles** or **Kilometers.**

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Description

The

Fuel Factor

Fuel group box from the **Setting** page provides functions that you can use to change the fuel correction factor.

To change the fuel factor

1. Read MPEM document from the vehicle.
2. Click on the **Setting** page thumbnail.
3. Click on the **Factor** zone top or bottom arrows to change the fuel correction factor.
4. Write MPEM document into the vehicle.

Note

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Description

The

On some vehicles, two fuel factors are available.

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Description

The

Ignition Correction

Ignition group box from the **Setting** page provides functions that you can use to change the engine ignition correction (on some 2-stroke vehicles).

To change the ignition correction 1. Read MPEM document from the vehicle.

2. Click on the **Setting** page thumbnail.

3. Enter a new **Correction** value in the **Ignition** zone or use the corresponding slide bar.

4. Write MPEM document into the vehicle.

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Description

The

Ignition Offset

Ignition group box from the **Setting** page provides functions that you can use to lock and modify the engine's ignition offset angle (on some 2-stroke vehicles). The **Engine Speed** zone displays the engine speed in real-time.

To lock the ignition offset angle

1. Read MPEM document from the vehicle.
2. Start the engine and wait until B.U.D.S. considers the engine is idling.
3. Click on the **Setting** page thumbnail.
4. Click on the **Locked** check box and wait until the box is checked. On a RFI engine, once the control is checked, B.U.D.S. displays the angle at which the ignition was locked by the MPEM.

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Description

The

To modify the ignition offset angle

1. Click on the **Offset Angle** zone top or bottom arrows to change the ignition offset angle.
2. Wait until B.U.D.S. writes the new ignition offset angle into the MPEM.

To unlock the ignition offset angle

Click on the **Locked** check box and wait until the box is unchecked.

Neutral RPM

Neutral RPM group box from the **Setting** page provides functions that you can use to tell the MPEM what are the **Cutoff RPM** and **Pickup RPM** values of the speed limiter when the vehicle is in neutral position.

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Description

The

To adjust the neutral RPM

1. Read MPEM document from the vehicle.
2. Click on the **Setting** page thumbnail.
3. Enter a new cutoff RPM value in the **Cutoff** zone or use the corresponding slide bar.
4. Enter a new pickup RPM value in the **Pickup** zone or use the corresponding slide bar.
5. Write MPEM document into the vehicle.

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Description

The

Vehicle Options

Options group box from the **Setting** page provides check boxes that you can use to inform the MPEM about the optional accessories that are installed on the vehicle.

To modify an option

1. Read MPEM document from the vehicle.
2. Click on the **Setting** page thumbnail.
3. Click on the check box related to the option you want to turn on or off.
4. Write MPEM document into the vehicle.

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Description

The

Vehicle Variant

Vehicle group box from the **Setting** page provides a function that you can use to change the vehicle variant.

To change the vehicle variant

1. Read MPEM document from the vehicle.
2. Click on the **Setting** page thumbnail.
3. Click on the appropriate radio button in the **Variant** zone.
4. Write MPEM document into the vehicle.

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Monitoring
Monitoring Page

Description

The **Monitoring** page provides functions that you can use to monitor vehicle parameters.

On most vehicles, parameters are monitored in a real-time manner. It means that once the MPEM document is read from the vehicle, B.U.D.S. automatically starts monitoring parameter values at a rate of around two times per second, no matter if the engine is running or not. However, with snowmobile MPEM's, you are responsible for updating monitoring parameters manually by pressing the **Refresh** button.

For some vehicles, the **Monitoring** page also provides functions that you can use to momentarily shutdown a cylinder or bleed the oil lines.

To monitor engine parameters

1. Read MPEM document from the vehicle.
2. Click on the **Monitoring** page thumbnail to view engine parameters.

Note

Some vehicles have 2 monitoring pages. The second page can be accessed using the navigation buttons which are located on the lower right corner of the monitoring pages.

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Shutdown Cylinder

Description

The **Shutdown Cylinder** group box from the **Monitoring** page provides push and hold buttons that you can use to momentarily disable a cylinder while the engine is running.

To shutdown a cylinder

1. Read MPEM document from the vehicle.
2. Start the engine using the vehicle start/stop button.
3. Click on the **Monitoring** page thumbnail. Note that you may have to access the second monitoring page using the navigation buttons located on the lower right corner of the monitoring pages.
4. In the **Shutdown Cylinder** zone:
   - On a 2-cylinder engine, press and hold the **MAG** or **PTO** button.
   - On a 3-cylinder engine, press and hold the **#1**, **#2** or **#3** button.
5. Release button when you are finished.

Note

On some 2-cylinder engines, you can choose to disable only the fuel injection or both fuel injection and ignition.

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Oil Lines Bleeding

Description

The **Monitoring** page provides a function that you can use to bleed the oil lines while the engine is running.

To bleed the oil lines

1. Read MPEM document from the vehicle.
2. Start the engine using the vehicle start/stop button.
3. Click on the **Monitoring** page thumbnail.
4. Click on the **Oil Lines Bleeding** button to force the engine to stay in idle speed.
5. Press and hold the vehicle throttle to wide open position for 45 seconds.
6. Press the message box **OK** button to terminate the operation.

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Activation

Activation Page

Activation Page

Description

The **Activation** page provides functions that you can use to activate individual module outputs and to monitor module inputs when the engine is not running. It also provides a self-test function that you can use to successively and automatically activate the outputs.

Activation functions are attached to standard push buttons and drawing hot spots while monitoring functions are attached to drawing hot spots only.

To activate an output

1. Read MPEM document from the vehicle.
2. Click on the **Activation** page thumbnail.
3. The content of the **Activation** page depends on the type of vehicle.
   - Personal watercraft equipped with a 947-DI engine
   - Personal watercraft equipped with a 1503 engine
   - Snowmobile equipped with a SDI engine
   - Snowmobile equipped with a V1004 engine
4. Click on the desired push button or hot spot.
5. Click on the message box **Yes** button to confirm your action.

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Notes

Some vehicles have 2 activation pages. The second page can be accessed using the navigation buttons which are located on the lower right corner of the activation pages.

Some activations require that you press and hold the button or the hot spot as long as you want the component to be activated. Just release the button or the hot spot when you are finished.

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947-DI Activation Page

Info center activation functions

The **Info Center** drawing contains two hot spots which are attached to the following activation functions:

Hot spot	Activation function
Tachometer	Display 3000 RPM on tachometer for 2.5 seconds.
Maintenance signal	Turn on maintenance signal for 5 seconds.

Engine activation and monitoring functions

The **Engine** drawing contains red activation hot spots and blue monitoring hot spots which are attached to the following functions:

Hot spot	Activation or monitoring function
MAG fuel injector	Pulse MAG fuel injector as 3000 RPM during 500 ms.
PTO fuel injector	Pulse PTO fuel injector as 3000 RPM during 500 ms.
MAG air injector	Pulse MAG air injector as 3000 RPM during 500 ms.
PTO air injector	Pulse PTO air injector as 3000 RPM during 500 ms.
MAG ignition coil	Pulse MAG ignition coil as 3000 RPM during 500 ms.
PTO ignition coil	Pulse PTO ignition coil as 3000 RPM during 500 ms.
MAG RAVE® solenoid	Turn on RAVE solenoid for 1 second.
PTO RAVE® solenoid	Turn on RAVE solenoid for 1 second.
MAG TPS	Display the ADC value of MAG TPS in the status bar.
PTO TPS	Display the ADC value of PTO TPS in the status bar.
Intake air pressure	Display the intake air pressure in the status bar.
Intake air temperature	Display the intake air temperature in the status bar.

Vehicle activation functions

The **Activate** group box contains push buttons which are attached to the following activation functions:

Button	Activation function
Buzzer	Activate the buzzer for 5 seconds.
Hi-Temp Signal	Turn on info center high temperature signal for 5 seconds.

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Fuel Pump	Activate the fuel pump for 5 seconds.
Start Self-test	Initiate a self-test.
Fuel Press. Relief	Successively activate MAG air injector for 5 seconds and MAG fuel injector for 15 seconds to relieve the fuel line pressure.

1503 Activation Page

Engine activation and monitoring functions

The **Engine** drawing contains red activation hot spots and blue monitoring hot spots which are attached to the following functions:

Hot spot	Activation or monitoring function
Fuel injector 1	Pulse fuel injector 1, 50 times in a row.
Fuel injector 2	Pulse fuel injector 2, 50 times in a row.
Fuel injector 3	Pulse fuel injector 3, 50 times in a row.
Ignition coil 1	Pulse ignition coil 1, 10 times in a row.
Ignition coil 2	Pulse ignition coil 2, 10 times in a row.
Ignition coil 3	Pulse ignition coil 3, 10 times in a row.
Blow by valve	Activate blow by valve for 2 seconds.
Engine temperature	Display the engine temperature in the status bar.
Intake air pressure	Display the intake air pressure in the status bar.
Intake air temperature	Display the intake air temperature in the status bar.
Exhaust temperature	Display the exhaust temperature in the status bar (on some vehicles only).
Throttle opening	Display the throttle opening angle in the status bar (on some vehicles only).

Vehicle activation functions

The **Activation** page shows the **Fuel Pump** group box which can be used to **Enable** or **Disable** the fuel pump.

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Also shown is the **Activate** group box with push buttons which are attached to the following activation functions:

Button	Activation function
Fuel Press. Relief	Initiate the fuel pressure relief sequence which disables the fuel pump, then asks the user to start the engine and wait until it stops. Clicking on the **OK** button re-enables the fuel pump.
Fuel Pump	Activate the fuel pump for 5 seconds.
Buzzer	Activate the buzzer until the button is released.
Bilge Pump	Activate the bilge pump for 3 seconds.
VTS	Initiate theVTS test sequence which successively moves the VTS fully up, fully down and then back to its original position.
Spare output 1	Turn on spare output 1 for 3 seconds.
Spare output 2	Turn on spare output 2 for 3 seconds (on some vehicles only).
Start Self-test	Initiate a self-test.

SDI Activation Page

Engine activation and monitoring functions

The **Engine** drawing contains red activation hot spots and blue monitoring hot spots which are attached to the following functions:

Hot spot	Activation or monitoring function
Outer MAG fuel injector	Pulse outer MAG fuel injector, 50 times in a row.
Inner MAG fuel injector	Pulse inner MAG fuel injector, 50 times in a row.
Outer PTO fuel injector	Pulse outer PTO fuel injector, 50 times in a row.
Inner PTO fuel injector	Pulse inner PTO fuel injector, 50 times in a row.
MAG ignition coil	Pulse MAG ignition coil, 10 times in a row.
PTO ignition coil	Pulse PTO ignition coil, 10 times in a row.
RAVE® solenoid	Activate RAVE solenoid until the button is released.
Engine temperature	Display the engine temperature in the status bar.
Throttle opening	Display the throttle opening angle in the status bar.

Vehicle activation functions

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The **Activation** page shows the **Fuel Pump** group box which can be used to **Enable** or **Disable** the fuel pump.

Also shown is the **Activate** group box with push buttons which are attached to the following activation functions:

Button	Activation function
Fuel Press. Relief	Initiate the fuel pressure relief sequence which disables the fuel pump, then asks the user to start the engine and wait until it stops. Clicking on the **OK** button reenables the fuel pump.
Fuel Pump	Activate the fuel pump for 5 seconds.
Buzzer	Activate the buzzer until the button is released.
Relay 2	Turn on relay 2 until the button is released.
Relay 3	Turn on relay 3 until the button is released.
Start Self-test	Initiate a self-test.

Gauges activation functions

The **Gauges** drawing contains hot spots which are attached to the following activation functions:

Hot spot	Activation function
Engine warning LED	Turn on engine warning LED until the hot spot is released.
Low oil pressure LED	Turn on low oil pressure LED until the hot spot is released.
High temperature LED	Turn on high temperature LED until the hot spot is released.
Battery voltage LED	Turn on battery voltage LED until the hot spot is released.
DESS®/RER LED	Turn on DESS/RER LED until the hot spot is released.
Tachometer	Display 3000 RPM on tachometer until the hot spot is released.

V1004 Activation Page

Engine activation and monitoring functions

The **Engine** drawing contains red activation hot spots and blue monitoring hot spots which are attached to the following functions:

Hot spot	Activation or monitoring function
MAG fuel injector	Pulse MAG fuel injector, 50 times in a row.
PTO fuel injector	Pulse PTO fuel injector, 50 times in a row.
MAG ignition coil	Pulse MAG ignition coil, 10 times in a row.
PTO ignition coil	Pulse PTO ignition coil, 10 times in a row.

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Engine temperature	Display the engine temperature in the status bar.
Throttle opening	Display the throttle opening angle in the status bar.
Intake air pressure	Display the intake air pressure in the status bar.
Oil pressure switch	Display the oil pressure switch status in the status bar.

Vehicle activation functions

The **Activation** page shows the **Fuel Pump** group box which can be used to **Enable** or **Disable** the fuel pump.

Also shown is the **Activate** group box with push buttons which are attached to the following activation functions:

Button	**Activation function**
Fuel Press. Relief	Initiate the fuel pressure relief sequence which disables the fuel pump, then asks the user to start the engine and wait until it stops. Clicking on the **OK** button re-enables the fuel pump.
Fuel Pump	Activate the fuel pump for 5 seconds.
Buzzer	Activate the buzzer until the button is released.
Relay 2	Turn on relay 2 until the button is released.
Start Self-test	Initiate a self-test.

Gauges activation functions

The **Gauges** drawing contains hot spots which are attached to the following activation functions:

Hot spot	**Activation function**
Temperature gauge	Display a high temperature value on gauge until the hot spot is released.
Engine warning LED	Turn on engine warning LED until the hot spot is released.
High temperature LED	Turn on high temperature LED until the hot spot is released.
DESS®/RER LED	Turn on DESS/RER LED until the hot spot is released.
Tachometer	Display 3000 RPM on tachometer until the hot spot is released.

Self-test

Self-test

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Description

The **Activation** page provides a function that you can use to successively and automatically activate the module outputs. Even though the test is automatic, you may be asked to confirm individual activation.

To perform a self-test

1. Read MPEM document from the vehicle.
2. Click on the **Activation** page thumbnail.
3. Click on the **Start Self-Test** button.
4. Click on the message box **Yes** button to confirm your action.
5. The sequence of the self-test depends on the type of vehicle.

- Personal watercraft equipped with a 947-DI engine
- Personal watercraft equipped with a 1503 engine
- Snowmobile equipped with a SDI engine
- Snowmobile equipped with a V1004 engine

947-DI Self-test

Description

The following outputs are successively activated during the self-test:

- MAG and PTO ignition coils
- MAG and PTO fuel injectors
- MAG and PTO air injectors
- RAVE® solenoid
- Fuel pump
- Buzzer

1503 Self-test

Description

The following outputs are successively activated during the self-test:

- Ignition coils 1, 2 and 3
- Fuel injectors 1, 2 and 3
- Blow by valve
- Fuel pump
- Buzzer
- Bilge pump
- VTS

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Spare outputs 1 and 2 (on some vehicles, only one spare output is available)

SDI Self-test

Description

The following outputs are successively activated during the self-test:

- MAG and PTO ignition coils
- Outer MAG and PTO fuel injectors
- Inner MAG and PTO fuel injectors
- Fuel pump
- Buzzer
- Relays 2 and 3

V1004 Self-test

Description

The following outputs are successively activated during the self-test:

- MAG and PTO ignition coils
- MAG and PTO fuel injectors
- Fuel pump
- Buzzer
- Relay 2

Faults

Faults Page

Faults Page

Description

The **Faults** page provides functions that you can use to read, clear and troubleshoot module faults. All the faults available for a particular module are listed in the **Summary** table.

On most vehicles, the fault parameters are continuously and automatically updated at a rate of about two times per second. On a RFI vehicle however, you must update the parameters manually by clicking on the **Refresh** button.

To open the Faults page

1. Read MPEM document from the vehicle.
2. Click on the **Faults** page thumbnail.
3. The content of the **Summary** table depends on the type of vehicle.
   - Personal watercraft equipped with a 947-DI engine
   - Personal watercraft equipped with a 1503 engine
   - Personal watercraft equipped with a RFI engine

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» Snowmobile equipped with a SDI or a V1004 engine

To get more details on a fault

1. Select a fault in the **Summary** table.
2. Click on the **More Details...** button.
3. Click on the **Close More Details** button or any MPEM document page thumbnail when you are finished.

Note

You can also get more details on a fault by double-clicking on the fault in the **Summary** table.

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947-DI Faults Page

Description

The **Summary** table displays 7 parameters for each fault. Parameters are continuously and automatically updated at a rate of about two times per second. The example below shows the parameters of a battery fault:

Code	State	Count	First	Clear	Last	Description
P0563	Active					Battery voltage high

To clear a particular fault

1. Select the fault in the **Summary** table.
2. Click on the **Clear Fault** button.
3. Click on the message box **Yes** button.
4. Wait until B.U.D.S. clears the fault into the MPEM.

To clear all occurred faults

1. Click on the **Clear Occurred Faults** button.
2. Click on the message box **Yes** button.
3. Wait until B.U.D.S. clears all occurred faults into the MPEM.

Notes

Clearing a fault resets the **Count** and **First** time stamp to zero, increments the **Clear** counter by one and sets the **Last** time stamp to the current engine hours. The status of the fault, which is controlled by the MPEM, remains the same.

If you clear the fault that has a double star (**) preceding the fault code, then the conditions associated to the fault in the **More Details** page are also cleared.

1503, SDI and V1004 Faults Page

Description

The **Summary** table displays 7 parameters for each fault. Parameters are continuously and automatically updated at a rate of about two times per second. The example below shows the parameters for a battery fault:

Code	State	Module	Count	Cycle Time	Total Time	Description

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P0563	Active	ECM				Battery voltage too high

To change the display of the summary table

From the drop down list, select the faults that you want to be displayed in the **Summary** table. You can choose between:

- All Faults
- Active Faults
- Active and Occured Faults

To clear a particular ECM fault

1. Select an ECM fault in the **Summary** table.
2. Click on the **Clear Fault** button.
3. Click on the message box **Yes** button.
4. Wait until B.U.D.S. clears the fault into the module.
5. Perform the ECM tracking procedure.

To clear all occurred faults

1. Click on the **Clear Occurred Faults** button.
2. Click on the message box **Yes** button.
3. Wait until B.U.D.S. clears all occurred faults into modules.
4. Perform the ECM tracking procedure.

Notes

You can not clear an individual MPEM fault with the **Clear Fault** button.

Clearing a fault resets the **Count**, **Cycle** and **Total** time stamps to zero.

If you clear a fault that has a double star (**) preceding the fault code, then the conditions associated to the fault in the **More Details** page are also cleared.

RFI Faults Page

Description

The **Summary** table displays 3 parameters for each fault. The example below shows the parameters of a battery fault:

Code	State	Description

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P0563 (02 14 06)	Active	RFI engine module power-up voltage above upper limit

To refresh the faults parameters

On a RFI vehicle you are responsible for updating the faults parameters. To do so, follow these steps:

1. Click on the **Refresh** button.
2. Wait until B.U.D.S. reads the faults parameters from the module.

To clear all occurred faults

1. Click on the **Clear Occurred Faults** button.
2. Click on the message box **Yes** button.
3. Wait until B.U.D.S. clears all occurred faults into the module.

Note

Clearing occurred faults resets the **Status** of all occurred faults to inactive.

More Details Page

More Details Page

Description

The **More Details** page provides information that you can use to know the possible causes of a fault and to determine what service actions should be done in order to fix the problem.

To open the More Details page

1. Read MPEM document from the vehicle.
2. Click on the **Faults** page thumbnail.
3. Select a fault in the **Summary** table.
4. Click on the **More Details...** button.
5. The content of the **More Details** page depends on the type of vehicle.
   - Personal watercraft equipped with a 947-DI engine
   - Personal watercraft equipped with a 1503 engine
   - Snowmobile equipped with a SDI or a V1004 engine
6. Click on the **Close More Details** button or any MPEM document page thumbnail when you are finished.

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Note

You can also get more details on a fault by double-clicking on the fault in the **Summary** table.

947-DI More Details Page

First fault conditions

The following engine parameters are provided for the first fault that occurs after the conditions were reset:

Speed (RPM):	The engine speed average.
TPS (%):	The throttle opening in percent.
Intake (PSI):	The intake air pressure.
Intake (°F):	The intake air temperature.
Engine (°F):	The engine temperature.
Exhaust (°F):	The exhaust temperature.
Battery (V):	The battery voltage.

To clear the first fault conditions

1. Select the fault that has a double star (**) preceding the fault code in the **Summary** table.
2. Click on the **More Details...** button.
3. Click on the **Clear Conditions** button.
4. Click on the message box **Yes** button.
5. Wait until B.U.D.S. clears the first fault conditions.

To activate a faulty output

If the fault that is currently displayed in the **More Details** page concerns a module output, then you can activate it directly by pressing the **Activate Component** button. If the fault does not concern a module output or if the engine is running, then the button is disabled.

1503, SDI and V1004 More Details Page

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Faults conditions

The following engine parameters are provided for all faults that are stored in the ECM and show the conditions that prevailed when the fault occured:

Speed (RPM):	The engine speed.
TPS (%):	The throttle opening in percent.
Intake (PSI):	The intake air pressure.
Intake (°F):	The intake air temperature.
Engine (°F):	The engine temperature.
Exhaust (°F):	The exhaust temperature.
Battery (V):	The battery voltage.
Vehicle Speed (MPH):	The vehicle speed (Set to zero when not available in the ECM).
Engine Status:	The engine status when the fault occured. Possible status are:
	The engine was running with normal part load operating conditions.
	The engine idle contact was closed.
	The engine was running full load.
	The engine idle contact was closed and fuel cut off was active.
Driving Cycles:	The number of times the engine had started when the first occurrence of the fault appeared.

To clear fault conditions

To clear the conditions associated to a fault you must clear that fault. To do so, follow these steps:

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1. Select a fault that has a double star (**) preceding the fault code in the **Summary** table.
2. Click on the **Clear Fault** button.
3. Click on the message box **Yes** button.
4. Wait until B.U.D.S. clears the fault and the fault conditions into the module.
5. Perform the ECM tracking procedure.

To activate a faulty output

If the fault that is currently displayed in the **More Details** page concerns a module output, then you can activate it directly by pressing the **Activate Component** button. If the fault does not concern a module output or if the engine is running, then the button is disabled.

OBDII Faults Codes

The list of OBD-II errors (are common to all vehicles).

P0001 - P0199

P0001 Fuel Volume Reg Ctrl Circ/Open
P0002 Fuel Volume Reg Ctrl Circ Range/Perf
P0003 Fuel Volume Reg Ctrl Circ Low
P0004 Fuel Volume Reg Ctrl Circ High
P0005 Fuel Shutoff Valve A Ctrl Circ/Open
P0006 Fuel Shutoff Valve A Ctrl Circ Low
P0007 Fuel Shutoff Valve A Ctrl Circ High
P0008 Engine Pos Sys Perf Bank1
P0009 Engine Pos Sys Perf Bank2
P0010 A Camshaft Pos Actuator Circ (bank)

P0011 A Camshaft Pos Timing-Over-Advanced (bank)
P0012 A Camshaft Pos Timing-Over-Retarded (bank)
P0013 B Camshaft Pos Actuator Circ (bank
P0014 B Camshaft Pos Timing-Over-Advanced (bank)
P0015 B Camshaft Pos Timing-Over-Retarded (bank)
P0016 Crank Pos-Camshaft Pos Correlation Bank1 Sensor A
P0017 Crank Pos-Camshaft Pos Correlation Bank1 Sensor B
P0018 Crank Pos-Camshaft Pos Correlation Bank2 Sensor A
P0019 Crank Pos-Camshaft Pos Correlation Bank2 Sensor B

P0020 A Camshaft Pos Actuator Circ (bank2)
P0021 A Camshaft Pos Timing-Over-Advanced (bank2)
P0022 A Camshaft Pos Timing-Over-Retarded (bank2)
P0023 B Camshaft Pos Actuator Circ (bank2)
P0024 B Camshaft Pos Timing-Over-Advanced (bank2)
P0025 B Camshaft Pos Timing-Over-Retarded (bank2)
P0026 Intake Valve Ctrl Solenoid Circ Range/Perf Bank1
P0027 Exhaust Valve Ctrl Solenoid Circ Range/Perf Bank1
P0028 Intake Valve Ctrl Solenoid Circ Range/Perf Bank2
P0029 Exhaust Valve Ctrl Solenoid Circ Range/Perf Bank2

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P0030 HO2S Heater Ctrl Circ (bank1, Sensor
P0031 HO2S Heater Ctrl Circ Lo (bank1, Sensor
P0032 HO2S Heater Ctrl Circ Hi (bank1, Sensor
P0033 Turbo Charger Bypass Valve Ctrl Circ
P0034 Turbo Charger Bypass Valve Ctrl Circ Lo
P0035 Turbo Charger Bypass Valve Ctrl Circ Hi
P0036 HO2S Heater Ctrl Circ (bank1, Sensor2)
P0037 HO2S Heater Ctrl Circ Lo (bank1, Sensor2)
P0038 HO2S Heater Ctrl Circ Hi (bank1, Sensor2)
P0039 T/S Charger Bypass Valve Ctrl Circ Range/Perf

P0040 O2 Sensor Signals Swapped Bank1 Sensor 1/ Bank2 Sensor 1
P0041 O2 Sensor Signals Swapped Bank1 Sensor 2/ Bank2 Sensor 2
P0042 HO2S Heater Ctrl Circ (bank1, Sensor 3)
P0043 HO2S Heater Ctrl Circ Lo (bank1, Sensor 3)
P0044 HO2S Heater Ctrl Circ Hi (bank1, Sensor 3)
P0045 T/S Charger Boost Ctrl Solenoid Circ/Open
P0046 T/S Charger Boost Ctrl Solenoid Circ Range/Perf
P0047 T/S Charger Boost Ctrl Solenoid Circ Low
P0048 T/S Charger Boost Ctrl Solenoid Circ High
P0049 T/S Charger Turbine Overspeed

P0050 HO2S Heater Ctrl Circ (bank2, Sensor)
P0051 HO2S Heater Ctrl Circ Lo (bank2, Sensor)
P0052 HO2S Heater Ctrl Circ Hi (bank2, Sensor)
P0053 HO2S Heater Resistance Bank1 Sensor 1
P0054 HO2S Heater Resistance Bank1 Sensor 2
P0055 HO2S Heater Resistance Bank1 Sensor 3
P0056 HO2S Heater Ctrl Circ (bank2, Sensor2)
P0057 HO2S Heater Ctrl Circ Lo (bank2, Sensor2)
P0058 HO2S Heater Ctrl Circ Hi (bank2, Sensor2)
P0059 HO2S Heater Resistance Bank2 Sensor 1

P0060 HO2S Heater Resistance Bank2 Sensor 2
P0061 HO2S Heater Resistance Bank2 Sensor 3
P0062 HO2S Heater Ctrl Circ (bank2, Sensor 3)
P0063 HO2S Heater Ctrl Circ Lo (bank2, Sensor 3)
P0064 HO2S Heater Ctrl Circ Hi (bank2, Sensor 3)
P0065 Air Assisted Injector Ctrl Range/Perf
P0066 Air Assisted Injector Ctrl Circ/Circ Lo
P0067 Air Assisted Injector Ctrl Circ Hi
P0068 MAP/MAF-Throttle Pos Correlation
P0069 MAP-Barometric Press Correlation

P0070 Ambient Air Temp Sensor Circ
P0071 Ambient Air Temp Sensor Range/Perf
P0072 Ambient Air Temp Sensor Circ Lo Input
P0073 Ambient Air Temp Sensor Circ Hi Input
P0074 Ambient Air Temp Sensor Circ Interm
P0075 Intake Valve Ctrl Circ (bank)
P0076 Intake Valve Ctrl Circ Lo (bank)
P0077 Intake Valve Ctrl Circ Hi (bank)
P0078 Exhaust Valve Ctrl Circ (bank)
P0079 Exhaust Valve Ctrl Circ Lo (bank)

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P0080 Exhaust Valve Ctrl Circ Hi (bank)
P0081 Intake Valve Ctrl Circ (bank2)
P0082 Intake Valve Ctrl Circ Lo (bank2)
P0083 Intake Valve Ctrl Circ Hi (bank2)
P0084 Exhaust Valve Ctrl Circ (bank2)
P0085 Exhaust Valve Ctrl Circ Lo (bank2)
P0086 Exhaust Valve Ctrl Circ Hi (bank2)
P0087 Fuel Rail/Sys Pres-Too Lo
P0088 Fuel Rail/Sys Pres-Too Hi
P0089 Fuel Pres Reg Perf

P0090 Fuel Pres Reg Ctrl Circ
P0091 Fuel Pres Reg Ctrl Circ Lo
P0092 Fuel Pres Reg Ctrl Circ Hi
P0093 Fuel Sys Leak Detected-Large Leak
P0094 Fuel Sys Leak Detected-Small Leak
P0095 Intake Air Temp Sensor 2 Circ
P0096 Intake Air Temp Sensor 2 Circ Range/Perf
P0097 Intake Air Temp Sensor 2 Circ Low
P0098 Intake Air Temp Sensor 2 Circ High
P0099 Intake Air Temp Sensor 2 Circ Interm/Erratic

P0100 Mass/Volume Air Flow Circ Error
P0101 Mass/Volume Air Flow Circ Range/Perf
P0102 Mass/Volume Air Flow Circ Lo Input
P0103 Mass/Volume Air Flow Circ Hi Input
P0104 Mass/Volume Air Flow Circ Interm
P0105 MAP/Baro Pres Circ Error
P0106 MAP/Baro Pres Circ Range/Perf
P0107 MAP/Baro Pres Circ Lo Input
P0108 MAP/Baro Pres Circ Hi Input
P0109 MAP/Baro Pres Circ Interm
P0110 Intake Air Temp Circ Error
P0111 Intake Air Temp Circ Range/Perf
P0112 Intake Air Temp Circ Lo Input
P0113 Intake Air Temp Circ Hi Input
P0114 Intake Air Temp Circ Interm
P0115 Eng Coolant Temp Circ Error
P0116 Eng Coolant Temp Circ Range/Perf
P0117 Eng Coolant Temp Circ Lo Input
P0118 Eng Coolant Temp Hi Input
P0119 Eng Coolant Temp Interm

P0120 Throttle Pos Sensor/Switch A Circ Error
P0121 Throttle Pos Sensor/Switch A Circ Range/Perf
P0122 Throttle Pos Sensor/Switch A Circ Lo Input
P0123 Throttle Pos Sensor/Switch A Circ Hi Input
P0124 Throttle Pos Sensor/Switch A Circ Interm
P0125 Insuff Coolant Temp for Closed Loop Fuel Ctrl
P0126 Insuff Coolant Temp Stable Operation
P0127 Intake Air Temp Too Hi
P0128 Coolant Temp below Thermostat
P0129 Barometric Press Too Low

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P0130 Oxy Sensor Circ (bank1, Sensor)
P0131 Oxy Sensor Circ Lo Voltage (bank1, Sensor)
P0132 Oxy Sensor Circ Hi Voltage (bank1, Sensor)
P0133 Oxy Sensor Circ Slow Response (bank1, Sens)
P0134 Oxy Sens Circ No Activity Detected (bank1 Sens)
P0135 Oxy Sensor Heater Circ (bank1, Sensor)
P0136 Oxy Sensor Circ (bank1, Sensor2)
P0137 Oxy Sensor Circ Lo Voltage (bank1, Sensor2)
P0138 Oxy Sensor Circ Hi Voltage (bank1, Sensor2)
P0139 Oxy Sensor Circ Slow Response (bank1, Sensor2)

P0140 Oxy Sens Circ No Activity Detected (bank1 Sens2)
P0141 Oxy Sensor Heater Circ (bank1, Sensor2)
P0142 Oxy Sensor Circ (bank1, Sensor 3)
P0143 Oxy Sensor Circ Lo Voltage (bank1, Sensor 3)
P0144 Oxy Sensor Circ Hi Voltage (bank1, Sensor 3)
P0145 Oxy Sensor Circ Slow Response (bank1, Sensor 3)
P0146 Oxy Sensor Circ No Activity Detected (bank1 Sens3)
P0147 Oxy Sensor Heater Circ (bank1, Sensor 3)
P0148 Fuel Delivery Error
P0149 Fuel Timing Error

P0150 Oxy Sensor Circ (bank2, Sensor
P0151 Oxy Sensor Circ Lo Voltage (bank2, Sensor)
P0152 Oxy Sensor Circ Hi Voltage (bank2, Sensor)
P0153 Oxy Sensor Circ Slow Response (bank2, Sensor)
P0154 Oxy Sensor Circ No Activity Detected (bank2 Sensor)
P0155 Heated Oxy Sensor Heater Circ (bank2, Sensor
P0156 Oxy Sensor Circ (bank2, Sensor2)
P0157 Oxy Sensor Circ Lo Voltage (bank2, Sensor2)
P0158 Oxy Sensor Circ Hi Voltage (bank2, Sensor2)
P0159 Oxy Sensor Circ Slow Response (bank2, Sensor2)

P0160 Oxy Sensor Circ No Activity Detected (bank2 Sens2)
P0161 Heated Oxy Sensor Heater Circ (bank2, Sensor2)
P0162 Oxy Sensor Circ (bank2, Sensor 3)
P0163 Oxy Sensor Circ Lo Voltage (bank2, Sensor 3)
P0164 Oxy Sensor Circ Hi Voltage (bank2, Sensor 3)
P0165 Oxy Sensor Circ Slow Response (bank2, Sensor 3)
P0166 Oxy Sensor Circ No Activity Detected (bank2 Sens3) P0167 Heated Oxy Sensor Heater Circ (bank2, Sensor 3)
P0168 Eng Fuel Temp Hi
P0169 Incorrect Fuel ComPos

P0170 Fuel Trim Error (bank)
P0171 Sys too Lean (bank)
P0172 Sys too Rich (bank)
P0173 Fuel Trim Error (bank2)
P0174 Sys too Lean (bank2)
P0175 Sys too Rich (bank2)
P0176 Fuel ComPos Sensor Circ Error
P0177 Fuel ComPos Sensor Circ Range/Perf
P0178 Fuel ComPos Sensor Circ Lo Input
P0179 Fuel ComPos Sensor Circ Hi Input

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P0180 Fuel Temp SensorA Circ Error
P0181 Fuel Temp SensorA Circ Range/Perf
P0182 Fuel Temp SensorA Circ Lo Input
P0183 Fuel Temp SensorA Circ Hi Input
P0184 Fuel Temp SensorA Circ Interm
P0185 Fuel Temp SensorB Circ Error
P0186 Fuel Temp SensorB Circ Range/Perf
P0187 Fuel Temp SensorB Circ Lo Input
P0188 Fuel Temp SensorB Circ Hi Input
P0189 Fuel Temp SensorB Circ Interm

P0190 Fuel Rail Pres Sensor Circ Error
P0191 Fuel Rail Pres Sensor Circ Range/Perf
P0192 Fuel Rail Pres Sensor Circ Lo Input
P0193 Fuel Rail Pres Sensor Circ Hi Input
P0194 Fuel Rail Pres Sensor Circ Interm
P0195 Eng Oil Temp Sensor Error
P0196 Eng Oil Temp Sensor Range/Perf
P0197 Eng Oil Temp Sensor Circ Lo Input
P0198 Eng Oil Temp Sensor Circ Hi Input
P0199 Eng Oil Temp Sensor Interm

P0200 - P0399

P0200 Injector Circ Error
P0201 Injector Circ Error-Cyl1
P0202 Injector Circ Error-Cyl2
P0203 Injector Circ Error-Cyl3
P0204 Injector Circ Error-Cyl4
P0205 Injector Circ Error-Cyl5
P0206 Injector Circ Error-Cyl6
P0207 Injector Circ Error-Cyl7
P0208 Injector Circ Error-Cyl8
P0209 Injector Circ Error-Cyl9
P0210 Injector Circ Error-Cyl10

P0211 Injector Circ Error-Cyl11
P0212 Injector Circ Error-Cyl12
P0213 Cold Start Injector 1 Error
P0214 Cold Start Injector 2 Error
P0215 Eng Shutoff Solenoid Error
P0216 Inj Timing Ctrl Circ Error
P0217 Eng Over temp Condition
P0218 Tran Over temp Condition
P0219 Throttle Sw B Circ Error/Eng Over speed Condition
P0220 Throttle Pos Sensor/Switch B Circ Error

P0221 Throttle Pos Sensor/Switch B Circ Range/Perf
P0222 Throttle Pos Sensor/Switch B Circ Lo Input
P0223 Throttle Pos Sensor/Switch B Circ Hi Input
P0224 Throttle Pos Sensor/Switch B Circ Interm
P0225 Throttle Pos Sensor/Switch C Circ Error
P0226 Throttle Pos Sensor/Switch C Circ Range/Perf
P0227 Throttle Pos Sensor/Switch C Circ Lo Input
P0228 Throttle Pos Sensor/Switch C Circ Hi Input

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P0229 Throttle Pos Sensor/Switch C Circ Interm
P0230 Fuel Pump Relay Dvr Fail

P0231 Fuel Pump Relay Dvr Circ Fail On
P0232 Fuel Pump Relay Dvr Circ Fail Off
P0233 Fuel Pump Relay Dvr Interm
P0234 Eng Over boost Condition
P0235 Turbo Boost SensorA Circ Error
P0236 Turbo Boost SensorA Circ Perf
P0237 Turbo Boost SensorA Circ Lo Input
P0238 Turbo Boost SensorA Circ Hi Input
P0239 Turbo Boost SensorB Circ Error
P0240 Turbo Boost SensorB Circ Perf

P0241 Turbo Boost SensorB Circ Lo Input
P0242 Turbo Boost SensorB Circ Hi Input
P0243 Turbo Wastegate Solenoid A Error
P0244 Turbo Wastegate Solenoid A Range/Perf
P0246 Turbo Wastegate Solenoid A Hi
P0247 Turbo Wastegate Solenoid A Error
P0248 Turbo Wastegate Solenoid A Range/Perf
P0249 Turbo Wastegate Solenoid A Lo
P0250 Turbo Wastegate Solenoid A Hi

P0251 Inj Pump Fuel Metering Ctrl A Error
P0252 Inj Pump Fuel Metering Ctrl A Range/Perf
P0253 Inj Pump Fuel Metering Ctrl A Lo
P0254 Inj Pump Fuel Metering Ctrl A Hi
P0255 Inj Pump Fuel Metering Ctrl A Interm
P0256 Inj Pump Fuel Metering Ctrl A Error
P0257 Inj Pump Fuel Metering Ctrl A Range/Perf
P0258 Inj Pump Fuel Metering Ctrl A Lo
P0259 Inj Pump Fuel Metering Ctrl A Hi
P0260 Inj Pump Fuel Metering Ctrl A Interm

P0261 Injector Circ Lo-Cyl1c
P0262 Injector Circ Hi-Cyl1
P0263 Cyl1 Contribution/Balance Fault
P0264 Injector Circ Lo-Cyl2
P0265 Injector Circ Hi-Cyl2
P0266 Cyl2 Contribution/Balance Fault
P0267 Injector Circ Lo-Cyl3
P0268 Injector Circ Hi-Cyl3
P0269 Cyl3 Contribution/Balance Fault
P0270 Injector Circ Lo-Cyl4

P0271 Injector Circ Hi-Cyl4
P0272 Cyl4 Contribution/Balance Fault
P0273 Injector Circ Lo-Cyl5
P0274 Injector Circ Hi-Cyl5
P0275 Cyl5 Contribution/Balance Fault
P0276 Injector Circ Lo-Cyl6
P0277 Injector Circ Hi-Cyl6
P0278 Cyl6 Contribution/Balance Fault

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P0279 Injector Circ Lo-Cyl7
P0280 Injector Circ Hi-Cyl7

P0281 Cyl7 Contribution/Balance Fault
P0282 Injector Circ Lo-Cyl8
P0283 Injector Circ Hi-Cyl8
P0284 Cyl8 Contribution/Balance Fault
P0285 Injector Circ Lo-Cyl9
P0286 Injector Circ Hi-Cyl9
P0287 Cyl9 Contribution/Balance Fault
P0288 Injector Circ Lo-Cyl10
P0289 Injector Circ Hi-Cyl10
P0290 Cyl10 Contribution/Balance Fault

P0291 Injector Circ Lo-Cyl11
P0292 Injector Circ Hi-Cyl11
P0293 Cyl11 Contribution/Balance Fault
P0294 Injector Circ Lo-Cyl12
P0295 Injector Circ Hi-Cyl12
P0296 Cyl12 Contribution/Balance Fault
P0297 Vehicle Overspeed Condition
P0298 Eng Oil Over temp Condition
P0299 T/S Charger Underboost
P0300 Random/Multiple Cylinder Misfire Detected

P0301 Fault Cylinder A-Misfire Detected (CYL)
P0302 Fault Cylinder B-Misfire Detected (CYL2)
P0303 Fault Cylinder D-Misfire Detected (CYL3)
P0304 Fault Cylinder E-Misfire Detected (CYL4)
P0305 Fault Cylinder F-Misfire Detected (CYL5)
P0306 Fault Cylinder G-Misfire Detected (CYL6)
P0307 Fault Cylinder C-Misfire Detected (CYL7)
P0308 Fault Cylinder H-Misfire Detected (CYL8)
P0309 Fault Cylinder I-Misfire Detected (CYL9)
P0310 Fault Cylinder J-Misfire Detected (CYL10)

P0311 Fault Cylinder K-Misfire Detected (CYL1)
P0312 Fault Cylinder L-Misfire Detected (CYL12) P0313 Misfire Detected with Lo Fuel
P0314 1 Cylinder Misfire (Cylinder not specific)
P0315 Crank Pos Sys Variation Not Learned
P0316 Engine Misfire Detected on Startup (First 1000 Revs)
P0317 Rough Road Hardware Not Present
P0318 Rough Road SensorA Signal Circ
P0319 Rough Road SensorB
P0320 Ign/Distributor Eng Speed Input Circ Error

P0321 Ign/Distributor Eng Speed Input Circ Range/Perf
P0322 Ign/Distributor Eng Speed Input Circ No Signal
P0323 Ign/Distributor Eng Speed Input Circ Interm
P0324 Knock Ctrl Sys Error
P0325 Knock Sensor1 Circ Error (bank1/1 Sensor)
P0326 Knock Sensor1 Circ Range/Perf (bank1/1 Sensor)
P0327 Knock Sensor1 Circ Lo Input (bank1/1 Sensor)
P0328 Knock Sensor1 Circ Hi Input (bank1/1 Sensor)

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P0329 Knock Sensor1 Circ Interm (bank1/1 Sensor)
P0330 Knock Sensor2 Circ Error (bank2)

P0331 Knock Sensor2 Circ Range/Perf (bank2)
P0332 Knock Sensor2 Circ Lo Input (bank2)
P0333 Knock Sensor2 Circ Hi Input (bank2)
P0334 Knock Sensor2 Circ Interm (bank2)
P0335 Crank Pos SensorA Circ Error
P0336 Crank Pos SensorA Circ Range/Perf
P0337 Crank Pos SensorA Circ Lo Input
P0338 Crank Pos SensorA Circ Hi Input
P0339 Crank Pos SensorA Circ Interm
P0340 Camshaft Pos Sensor Circ Error (bank1/1 Sensor)

P0341 Camshaft Pos Sensor Circ Perf (bank1/1 Sensor)
P0342 Camshaft Pos Sensor Circ Lo Input (bank1/1 Sensor)
P0343 Camshaft Pos Sensor Circ Hi Input (bank1/1 Sensor)
P0344 Camshaft Pos Sensor Circ Interm (bank1/1 Sens)
P0345 Camshaft Pos Sensor Circ Error (bank2)
P0346 Camshaft Pos Sensor Circ Perf (bank2)
P0347 Camshaft Pos Sensor Circ Lo Input (bank2)
P0348 Camshaft Pos Sensor Circ Hi Input (bank2)
P0349 Camshaft Pos Sensor Circ Interm (bank2)
P0350 Ignition Coil Pri/Sec Circ Error

P0351 Ignition Coil A Pri/Sec Circ Error
P0352 Ignition Coil B Pri/Sec Circ Error
P0353 Ignition Coil C Pri/Sec Circ Error
P0354 Ignition Coil D Pri/Sec Circ Error
P0355 Ignition Coil E Pri/Sec Circ Error
P0356 Ignition Coil F Pri/Sec Circ Error
P0357 Ignition Coil G Pri/Sec Circ Error
P0358 Ignition Coil H Pri/Sec Circ Error
P0359 Ignition Coil I Pri/Sec Circ Error
P0360 Ignition Coil J Pri/Sec Circ (Glow Plug) Error

P0361 Ignition Coil K Pri/Sec Circ (Glow Plug Indicator) Error
P0362 Ignition Coil L Pri/Sec Circ Error
P0363 Misfire Detected-Fueling Disabled
P0364 Reserved
P0365 Crank Pos SensorB Circ Error (bank)
P0366 Crank Pos SensorB Circ Range/Perf (bank)
P0367 Crank Pos SensorB Circ Lo Input (bank)
P0368 Crank Pos SensorB Circ Hi Input (bank)
P0369 Crank Pos SensorB Circ Interm (bank)
P0370 Timing Ref Hi Res Signal A Error

P0371 Timing Ref Hi Res Signal A Too Many Pulses
P0372 Timing Ref Hi Res Signal A Too Few Pulses
P0373 Timing Ref Hi Res Signal A Interm/Erratic Pulses
P0374 Timing Ref Hi Res Signal A No Pulses
P0375 Timing Ref Hi Res Signal B Error
P0376 Timing Ref Hi Res Signal B Too Many Pulses
P0377 Timing Ref Hi Res Signal B Too Few Pulses

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P0378 Timing Ref Hi Res Signal B Interm/Erratic Pulses
P0379 Timing Ref Hi Res Signal B No Pulses
P0380 Glow Plug Circ Error Circ A

P0381 Glow Plug Indicator Circ Error
P0382 Glow Plug Circ Error Circ B
P0383 P0384 Reserved by document
P0385 Crank Pos SensorB Circ Error
P0386 Crank Pos SensorB Circ Range/Perf
P0387 Crank Pos SensorB Circ Lo Input
P0388 Crank Pos SensorB Circ Hi Input
P0389 Crank Pos SensorB Circ Interm
P0390 Crank Pos SensorB Circ Error (bank2)

P0391 Crank Pos SensorB Circ Range/Perf (bank2)
P0392 Crank Pos SensorB Circ Lo Input (bank2)
P0393 Crank Pos SensorB Circ Hi Input (bank2)
P0394 Crank Pos SensorB Circ Interm (bank2)

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P0400 - P0599

P0400 Exhaust Gas Recirculation Flow Error
P0401 Exhaust Gas Recirculation Flow Insuff Detected
P0402 Exhaust Gas Recirculation Flow Excessive Detected
P0403 Exhaust Gas Recirculation Circ Error
P0404 Exhaust Gas Recirculation Circ Range/Perf
P0405 Exhaust Gas Recirculation SensorA Circ Lo
P0406 Exhaust Gas Recirculation SensorA Circ Hi
P0407 Exhaust Gas Recirculation SensorB Circ Lo
P0408 Exhaust Gas Recirculation SensorB Circ Hi
P0409 Exhaust Gas Recirculation SensorA Circ
P0410 Sec Air Inj Sys Error

P0411 Sec Air Inj Sys Incorrect Flow Detected
P0412 Sec Air Inj Sys Switching Valve A Circ Error
P0413 Sec Air Inj Sys Switching Valve A Circ Open
P0414 Sec Air Inj Sys Switching Valve A Circ Shorted
P0415 Sec Air Inj Sys Switching Valve B Circ Error
P0416 Sec Air Inj Sys Switching Valve B Circ Open
P0417 Sec Air Inj Sys Switching Valve B Circ Shorted
P0418 Sec Air Inj Sys Relay A Circ Error
P0419 Sec Air Inj Sys Relay B Circ Error
P0420 Catalyst Sys Efficiency below Threshold (bank)

P0421 Warm Up Catalyst Efficiency below Thresh (bank)
P0422 Main Catalyst Efficiency below Threshold (bank)
P0423 Heated Catalyst Efficiency below Threshold (bank)
P0424 Heated Catalyst Temp below Threshold (bank)
P0425 Catalyst Temp Sensor (bank)
P0426 Catalyst Temp Sensor Range/Perf (bank)
P0427 Catalyst Temp Sensor Lo Input (bank)
P0428 Catalyst Temp Sensor Hi Input (bank0
P0429 Catalyst Heater Ctrl Circ (bank)
P0430 Catalyst Sys Efficiency below Threshold (bank2)

P0431 Warm Up Catalyst Efficiency below Thresh (bank2)
P0432 Main Catalyst Efficiency below Threshold (bank2)
P0433 Heated Catalyst Efficiency below Threshold (bank2)
P0434 Heated Catalyst Temp below Threshold (bank2)
P0435 Catalyst Temp Sensor (bank2)
P0436 Catalyst Temp Sensor Range/Perf (bank2)
P0437 Catalyst Temp Sensor Lo Input (bank2)
P0438 Catalyst Temp Sensor Hi Input (bank2)
P0439 Catalyst Heater Ctrl Circ (bank2)
P0440? Evap Emission Ctrl Sys Error

P0441? Evap Emission Ctrl Sys Incorrect Purge Flow
P0442? Evap Emission Ctrl Sys Leak Detected (small leak)
P0443? Evap Emission Ctrl Sys Purge Ctrl Valve Circ Error
P0444 Evap Emission Ctrl Sys Purge Ctrl Valve Circ Open
P0445 Evap Emission Ctrl Sys Purge Ctrl Valve Circ Shorted
P0446 Evap Emission Ctrl Sys Vent Ctrl Circ Error
P0447 Evap Emission Ctrl Sys Vent Ctrl Circ Open

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P0448 Evap Emission Ctrl Sys Vent Ctrl Circ Shorted
P0449 Evap Emission Ctrl Sys Vent Valve/Solenoid Circ Error
P0450 Evap Emission Ctrl Sys Pres Sensor Error

P0451 Evap Emission Ctrl Sys Pres Sensor Range/Perf
P0452 Evap Emission Ctrl Sys Pres Sensor Lo Input
P0453 Evap Emission Ctrl Sys Pres Sensor Hi Input
P0454 Evap Emission Ctrl Sys Pres Sensor Interm
P0455 Evap Emission Ctrl Sys Gross Leak Detected
P0456 Evap Emission Ctrl Sys Very Small Leak Detected)
P0457 Evap Emission Ctrl Sys Leak (fuel cap loose/off)
P0458 Evaporative Emission Sys Purge Ctrl Valve Circ Low
P0459 Evaporative Emission Sys Purge Ctrl Valve Circ High
P0460 Fuel Tank Level Indicator Circ Error

P0461 Fuel Level Sensor Circ Range/Perf
P0462 Fuel Level Sensor Circ Lo Input
P0463 Fuel Level Sensor Circ Hi Input
P0464 Fuel Level Sensor Circ Interm
P0465 EVAP Purge Flow Sensor Circ
P0466 EVAP Purge Flow Sensor Circ Range/Perf
P0467 EVAP Purge Flow Sensor Circ Lo Input
P0468 EVAP Purge Flow Sensor Circ Hi Input
P0469 EVAP Purge Flow Sensor Circ Interm
P0470 Exhaust Back Pres Sensor Circ Error

P0471 Exhaust Back Pres Sensor Circ Perf
P0472 Exhaust Back Pres Sensor Circ Lo Input
P0473 Exhaust Back Pres Sensor Circ Hi Input
P0474 Exhaust Back Pres Sensor Interm
P0475 Exhaust Pres Ctrl Valve Error
P0476 Exhaust Pres Ctrl Valve Range/Perf
P0477 Exhaust Pres Ctrl Valve Lo Output
P0478 Exhaust Pres Ctrl Valve Hi Input
P0479 Exhaust Pres Ctrl Valve Interm
P0480 Cooling Fan 1 Ctrl Circ Error

P0481 Cooling Fan 2 Ctrl Circ Error
P0482 Cooling Fan 3 Ctrl Circ Error
P0483 Cooling Fan Rationality Check Error
P0484 Cooling Fan Circ over Current
P0485 Cooling Fan Power/Ground Circ Error
P0486 EGR SensorB Circ
P0487 EGR Throttle Pos Ctrl Circ
P0488 EGR Throttle Pos Ctrl Range/Perf
P0489 Exhaust Gas Recirculation Ctrl Circ Low
P0490 Exhaust Gas Recirculation Ctrl Circ High

P0491 Sec Air Inj Sys (bank)
P0492 Sec Air Inj Sys (bank2)
P0493 Fan Overspeed
P0494 Fan Speed Low
P0495 Fan Speed High
P0496 Evaporative Emission Sys High Purge Flow

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P0497 Evaporative Emission Sys Low Purge Flow
P0500 Vehicle Speed Sensor (VSS) Error

P0501 Vehicle Speed Sensor Range/Perf
P0502 Vehicle Speed Sensor Lo Input
P0503 Vehicle Speed Sensor Noisy
P0504 Brake Switch A/B Correlation
P0505 Idle Ctrl Sys Error
P0506 Idle Ctrl Sys RPM Lower Than Expected
P0507 Idle Ctrl Sys RPM Higher Than Expected
P0508 Idle Ctrl Sys Circ Lo
P0509 Idle Ctrl Sys Circ Hi
P0510 Closed Throttle Pos Switch Error

P0511 Idle Air Ctrl Circ
P0512 Starter Request Circ
P0513 Incorrect Immobilizer Key
P0514 Battery Temp Sensor Circ Range/Perf
P0515 Battery Temp Sensor Circ
P0516 Battery Temp Sensor Circ Lo
P0517 Battery Temp Sensor Circ Hi
P0518 Idle Air Ctrl Circ Interm
P0519 Idle Air Ctrl Sys Perf
P0520 Eng Oil Pres Sensor/Switch Circ Error

P0521 Eng Oil Pres Sensor/Switch Circ Range/Perf
P0522 Eng Oil Pres Sensor/Switch Circ Lo Voltage
P0523 Eng Oil Pres Sensor/Switch Circ Hi Voltage
P0524 Eng Oil Pres Too Lo
P0525 Cruise Ctrl Servo Ctrl Circ Range/Perf
P0526 Fan Speed Sensor Circ
P0527 Fan Speed Sensor Circ Range/Perf
P0528 Fan Speed Sensor Circ No Signal
P0529 Fan Speed Sensor Circ Interm
P0530 A/C Refrigerant Pres Sensor Circ Error

P0531 A/C Refrigerant Pres Sensor Circ Range/Perf
P0532 A/C Refrigerant Pres Sensor Circ Lo Input
P0533 A/C Refrigerant Pres Sensor Circ Hi Input
P0534 Air Conditioner Refrigerant Charge Loss
P0535 A/C Evaporator Temp Sensor Circ
P0536 A/C Evaporator Temp Sensor Circ Range/Perf
P0537 A/C Evaporator Temp Sensor Circ Low
P0538 A/C Evaporator Temp Sensor Circ High
P0539 A/C Evaporator Temp Sensor Circ Interm
P0540 Manifold Intake Air Heater Circ

P0541 Manifold Intake Air Heater Circ Lo
P0542 Manifold Intake Air Heater Circ Hi
P0543 Intake Air Heater A Circ Open
P0544 EGT Sensor Circ bank1
P0545 EGT Sensor Circ Lo bank1
P0546 EGT Sensor Circ Hi bank1
P0547 EGT Sensor Circ bank2

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P0548 EGT Sensor Circ Lo bank2
P0549 EGT Sensor Circ Hi bank2
P0550 Power Steering Pres Sensor Circ Error

P0551 Power Steering Pres Sensor Circ Range/Perf
P0552 Power Steering Pres Sensor Circ Lo Input
P0553 Power Steering Pres Sensor Circ Hi Input
P0554 Power Steering Pres Sensor Circ Interm
P0555 Brake Booster Press Sensor Circ
P0556 Brake Booster Press Sensor Circ Range/Perf
P0557 Brake Booster Press Sensor Circ Low Input
P0558 Brake Booster Press Sensor Circ High Input
P0559 Brake Booster Press Sensor Circ Interm
P0560 Sys Voltage Error

P0561 Sys Voltage Unstable
P0562 Sys Voltage Lo
P0563 Sys Voltage Hi
P0564 Cruise Ctrl Multi-Func Input Signal
P0565 Cruise Ctrl ON Signal Error
P0566 Cruise Ctrl OFF Signal Error
P0567 Cruise Ctrl RESUME Signal Error
P0568 Cruise Ctrl SET Signal Error
P0569 Cruise Ctrl COAST Signal Error
P0570 Cruise Ctrl ACCEL Signal Error
P0571 Cruise Ctrl/Brake Switch A Circ Fail
P0572 Cruise Ctrl/Brake Switch A Circ Lo
P0573 Cruise Ctrl/Brake Switch A Circ Hi
P0574 Cruise Ctrl Sys Vehicle Speed Too Hi
P0575 Cruise Ctrl Input Circ
P0576 Cruise Ctrl Input Circ Lo
P0577 Cruise Ctrl Input Circ Hi
P0578 Cruise Ctrl Multi-Func Input A Circ Stuck
P0579 Cruise Ctrl Multi-Func Input A Circ Range/Perf
P0580 Cruise Ctrl Multi-Func Input A Circ Low

P0581 Cruise Ctrl Multi-Func Input A Circ High
P0582 Cruise Ctrl Vacuum Ctrl Circ/Open
P0583 Cruise Ctrl Vacuum Ctrl Circ Low
P0584 Cruise Ctrl Vacuum Ctrl Circ High
P0585 Cruise Ctrl Multi-Func Input A/B Correlation
P0586 Cruise Ctrl Vent Ctrl Circ/Open
P0587 Cruise Ctrl Vent Ctrl Circ Low
P0588 Cruise Ctrl Vent Ctrl Circ High
P0589 Cruise Ctrl Multi-Func Input B Circ
P0590 Cruise Ctrl Multi-Func Input B Circ Stuck

P0591 Cruise Ctrl Multi-Func Input B Circ Range/Perf
P0592 Cruise Ctrl Multi-Func Input B Circ Low
P0593 Cruise Ctrl Multi-Func Input B Circ High
P0594 Cruise Ctrl Servo Ctrl Circ/Open
P0595 Cruise Ctrl Servo Ctrl Circ Low
P0596 Cruise Ctrl Servo Ctrl Circ High
P0597 Thermostat Heater Ctrl Circ/Open

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P0598 Thermostat Heater Ctrl Circ Low
P0599 Thermostat Heater Ctrl Circ High
P0600 - P0799

P0600 Serial Comms Link Error
P0601 Internal Ctrl Mod Memory Check Sum Error
P0602 Ctrl Mod Programming Error
P0603 Internal Ctrl Mod KAM Error
P0604 Internal Ctrl Mod RAM Error
P0605 Internal Ctrl Mod ROM Error
P0606 PCM Processor Fault
P0607 Powertrain Ctrl Mod Perf
P0608 Powertrain Ctrl Mod VSS Output A Error
P0609 Powertrain Ctrl Mod VSS Output B Error
P0610 Powertrain Ctrl Mod Vehicle Options Error

P0611 Fuel Injector Ctrl Mod Perf
P0612 Fuel Injector Ctrl Mod Ctrl Circ
P0613 TCM Processor
P0614 ECM / TCM Incompatible
P0615 Starter Relay Circ
P0616 Starter Relay Circ Lo
P0617 Starter Relay Circ Hi
P0618 Alternative Fuel Ctrl Mod KAM Error
P0619 Alternative Fuel Ctrl Mod RAM/ROM Error
P0620 Generator Ctrl Circ Error

P0621 Generator Lamp L Ctrl Circ Error
P0622 Generator Field F Ctrl Circ Error
P0623 Generator Lamp Ctrl Circ Error
P0624 Fuel Cap Lamp Ctrl Circ Error
P0625 Generator Field/F Terminal Circ Low
P0626 Generator Field/F Terminal Circ High
P0627 Fuel Pump A Ctrl Circ /Open
P0628 Fuel Pump A Ctrl Circ Low
P0629 Fuel Pump A Ctrl Circ High
P0630 VIN Not Programmed/Mismatch-ECM/PCM

P0631 VIN Not Programmed/Mismatch-TCM
P0632 Odometer Not Programmed-ECM/PCM
P0633 Immobilizer Key Not Programmed-ECM/PCM
P0634 PCM/ECM/TCM Internal Temp Too High
P0635 Power Steering Ctrl Circ
P0636 Power Steering Ctrl Circ Lo
P0637 Power Steering Ctrl Circ Hi
P0638 Throttle Actuator Ctrl Range/Perf bank1
P0639 Throttle Actuator Ctrl Range/Perf bank2
P0640 Manifold Intake Air Heater Ctrl Circ

P0641 Sensor Ref Voltage A Circ/Open
P0642 Sensor Ref Voltage A Circ Low
P0643 Sensor Ref Voltage A Circ High
P0644 Driver Display Serial Comm Circ
P0645 A/C Clutch Relay Ctrl Circ

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P0646 A/C Clutch Relay Ctrl Circ Lo
P0647 A/C Clutch Relay Ctrl Circ Hi
P0648 Immobilizer Lamp Ctrl Circ
P0649 Cruise Ctrl Lamp Ctrl Circ
P0650 Error Indicator Lamp (MIL) Ctrl Circ Error

P0651 Sensor Ref Voltage B Circ/Open
P0652 Sensor Ref Voltage B Circ Low
P0653 Sensor Ref Voltage B Circ High
P0654 Eng RPM Output Circ Error
P0655 Eng Hot Lamp Output Ctrl Circ MalFunc P0656 Fuel Level Output Circ Error
P0657 Actuator Supply Voltage A Circ/Open
P0658 Actuator Supply Voltage A Circ Low
P0659 Actuator Supply Voltage A Circ High
P0660 Intake Manif Tuning Valve Ctrl Circ bank1

P0661 Intake Manif Tuning Valve Ctrl Circ Lo bank1
P0662 Intake Manif Tuning Valve Ctrl Circ Hi bank1
P0663 Intake Manif Tuning Valve Ctrl Circ bank2
P0664 Intake Manif Tuning Valve Ctrl Circ Lo bank2
P0665 Intake Manif Tuning Valve Ctrl Circ Hi bank2
P0666 Cruise 'On Signal Error
P0667 Cruise 'Resume' Signal Error
P0668 Cruise Set' Signal Error
P0669 Cruise Coast' Signal Error
P0670 Glow plug Ctrl Circ Error

P0671 Glow plug #1 Circ failure
P0672 Glow plug #2 Circ failure
P0673 Glow plug #3 Circ failure
P0674 Glow plug #4 Circ failure
P0675 Glow plug #5 Circ failure
P0676 Glow plug #6 Circ failure
P0677 Glow plug #7 Circ failure
P0678 Glow plug #8 Circ failure
P0679 Reserve for future Glow plug #9
P0680 Reserve for future Glow plug #10

P0681 Reserve for future Glow plug #11
P0682 Reserve for future Glow plug #12
P0683 Glow Plug Ctrl Mod to PCM Comm Circ
P0684 Glow Plug Ctrl Mod to PCM Comm Circ Range/Perf
P0685 ECM/PCM Power Relay Ctrl Circ /Open
P0686 ECM/PCM Power Relay Ctrl Circ Low
P0687 ECM/PCM Power Relay Ctrl Circ High
P0688 ECM/PCM Power Relay Sense Circ /Open
P0689 ECM/PCM Power Relay Sense Circ Low
P0690 ECM/PCM Power Relay Sense Circ High

P0691 Fan 1 Ctrl Circ Low
P0692 Fan 1 Ctrl Circ High
P0693 Fan 2 Ctrl Circ Low
P0694 Fan 2 Ctrl Circ High

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P0695 Fan 3 Ctrl Circ Low
P0696 Fan 3 Ctrl Circ High
P0697 Sensor Ref Voltage C Circ/Open
P0698 Sensor Ref Voltage C Circ Low
P0699 Sensor Ref Voltage C Circ High
P0700 Tran Ctrl Sys Error

P0701 Tran Ctrl Sys Range/Perf
P0702 Tran Ctrl Sys Electrical
P0703 Brake Switch B Circ Error
P0704 Clutch Pedal Pos Switch Input Circ Error
P0705 Tran Range Sensor Circ Error
P0706 Tran Range Sensor Circ Range/Perf
P0707 Tran Range Sensor Circ Lo Input
P0708 Tran Range Sensor Circ Hi Input
P0709 Tran Range Sensor Circ Interm
P0710 Tran Fluid Temp Sensor Circ Error
P0711 Tran Fluid Temp Sensor Circ Range/Perf
P0712 Tran Fluid Temp Sensor CKT Lo Input
P0713 Tran Fluid Temp Sensor CKT Hi Input
P0714 Tran Fluid Temp Sensor Circ Interm
P0715 Input/Turbine Speed Sensor Circ Error
P0716 Input/Turbine Speed Sensor Circ Range/Perf
P0717 Input/Turbine Speed Sensor Circ No Signal
P0718 Input/Turbine Speed Sensor Circ Interm
P0719 Torq Conv/Brake Switch B Circ Lo
P0720 Output Speed Sensor Circ Error

P0721 Output Speed Sensor Range/Perf
P0722 Output Speed Sensor No Signal
P0723 Output Speed Sensor Interm
P0724 Torq Conv/Brake Switch B Circ Hi
P0725 Eng Speed input Circ Error
P0726 Eng Speed Input Circ Range/Perf
P0727 Eng Speed Input Circ No Signal
P0728 Eng Speed Input Circ Interm
P0729 Gear 6 Incorrect Ratio
P0730 Incorrect Gear Ratio

P0731 Gear One Ratio Error
P0732 Gear Two Ratio Error
P0733 Gear Three Ratio Error
P0734 Gear Four Ratio Error
P0735 Gear Five Ratio Error
P0736 Reverse Gear Ratio Error
P0737 TCM Eng Speed Output Circ
P0738 TCM Eng Speed Output Circ Lo
P0739 TCM Eng Speed Output Circ Hi
P0740 Torq Conv Clutch Circ MalFunc

P0741 Torq Conv Clutch Circ Perf/Stuck Off
P0742 Torq Conv Clutch Circ Stuck On
P0743 Torq Conv Clutch Sys Electrical Failure
P0744 Torq Conv Clutch Circ Interm

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P0745 Pres Ctrl Solenoid Error
P0746 Pres Ctrl Solenoid Perf/Stuck Off
P0747 Pres Ctrl Solenoid Stuck On
P0748 Pres Ctrl Solenoid Electrical
P0749 Pres Ctrl Solenoid Interm
P0750 Shift Solenoid A Error

P0751 Shift Solenoid A Perf/Stuck Off
P0752 Shift Solenoid A Stuck On
P0753 Shift Solenoid A Electrical
P0754 Shift Solenoid A Interm
P0755 Shift Solenoid B Error
P0756 Shift Solenoid B Perf/Stuck Off
P0757 Shift Solenoid B Stuck On
P0758 Shift Solenoid B Electrical
P0759 Shift Solenoid B Interm
P0760 Shift Solenoid C Error

P0761 Shift Solenoid C Perf/Stuck Off
P0762 Shift Solenoid C Stuck On
P0763 Shift Solenoid C Electrical
P0764 Shift Solenoid C Interm
P0765 Shift Solenoid D Error
P0766 Shift Solenoid D Perf/Stuck Off
P0767 Shift Solenoid D Stuck On
P0768 Shift Solenoid D Electrical
P0769 Shift Solenoid D Interm
P0770 Shift Solenoid E Error

P0771 Shift Solenoid E Perf/Stuck Off
P0772 Shift Solenoid E Stuck On
P0773 Shift Solenoid E Electrical
P0774 Shift Solenoid E Interm
P0775 Pres Ctrl Solenoid B
P0776 Pres Ctrl Solenoid B Perf/Stuck Off
P0777 Pres Ctrl Solenoid B Stuck On
P0778 Pres Ctrl Solenoid B Electrical
P0779 Pres Ctrl Solenoid B Interm
P0780 Shift Error

P0781 1-2 Shift Error
P0782 2-3 Shift Error
P0783 3-4 Shift Error
P0784 4-5 Shift Error
P0785 Shift/Timing Solenoid Error
P0786 Shift/Timing Solenoid Range/Perf
P0787 Shift/Timing Solenoid Lo
P0788 Shift/Timing Solenoid Hi
P0789 Shift/Timing Solenoid Interm
P0790 Normal/Perf Switch Circ Error

P0791 Intermediate Shaft Speed Sensor Circ
P0792 Intermediate Shaft Speed Sensor Circ Range/Perf
P0793 Intermediate Shaft Speed Sensor Circ No Signal

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P0794 Intermediate Shaft Speed Sensor Circ Interm
P0795 Pres Ctrl Solenoid C
P0796 Pres Ctrl Solenoid C Perf/Stuck Off
P0797 Pres Ctrl Solenoid C Stuck On
P0798 Pres Ctrl Solenoid C Electrical
P0799 Pres Ctrl Solenoid C Interm

P0800 - P0999

P0800 Transfer Case Ctrl Sys (MIL Request)
P0801 Reverse Inhibit Ctrl Circ Error
P0802 Trans Ctrl Sys MIL Request Circ/Open
P0803 1-4 Up shift (Skip Shift) Solenoid Ctrl Circ Error
P0804 1-4 Up shift (Skip Shift) Lamp Ctrl Circ Error
P0805 Clutch Pos Sensor Circ
P0806 Clutch Pos Sensor Circ Range/Perf
P0807 Clutch Pos Sensor Circ Lo
P0808 Clutch Pos Sensor Circ Hi
P0809 Clutch Pos Sensor Circ Interm
P0810 Clutch Pos Ctrl Error

P0811 Excessive Clutch Slippage
P0812 Reverse Input Circ
P0813 Reverse Output Circ
P0814 Tran Range Display Circ
P0815 Up Shift Switch Circ
P0816 Down shift Switch Circ
P0817 Starter Disable Circ
P0818 Driveline Disconnect Switch Input Circ
P0819 Up and Down Shift Switch to Trans Range Correlation
P0820 Gear Lever X-Y Pos Sensor Circ

P0821 Gear Lever X Pos Sensor Circ
P0822 Gear Lever Y Pos Sensor Circ
P0823 Gear Lever X Pos Sensor Circ Interm
P0824 Gear Lever Y Pos Sensor Circ Interm
P0825 Gear Lever Push/Pull Switch Circ (Shift Anticipate)
P0826 Up and Down Shift Switch Circ
P0827 Up and Down Shift Switch Circ Low
P0828 Up and Down Shift Switch Circ High
P0829 5-6 Shift
P0830 Clutch Pedal Switch A Circ

P0831 Clutch Pedal Switch A Circ Lo
P0832 Clutch Pedal Switch A Circ Hi
P0833 Clutch Pedal Switch B Circ
P0834 Clutch Pedal Switch B Circ Lo
P0835 Clutch Pedal Switch B Circ Hi
P0836 4WD Switch Circ
P0837 4WD Switch Circ Range/Perf
P0838 4WD Switch Circ Lo
P0839 4WD Switch Circ Hi
P0840 Tran Fluid Pres Sensor/Switch A Circ

P0841 Tran Fluid Pres Sensor/Switch A Circ Range/Perf

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P0842 Tran Fluid Pres Sensor/Switch A Circ Lo
P0843 Tran Fluid Pres Sensor/Switch A Circ Hi
P0844 Tran Fluid Pres Sensor/Switch A Circ Interm
P0845 Tran Fluid Pres Sensor/Switch B Circ
P0846 Tran Fluid Pres Sensor/Switch B Circ Range/Perf
P0847 Tran Fluid Pres Sensor/Switch B Circ Lo
P0848 Tran Fluid Pres Sensor/Switch B Circ Hi
P0849 Tran Fluid Pres Sensor/Switch B Circ Interm
P0850 Park/Neutral Switch Input Circ

P0851 Park/Neutral Switch Input Circ Low
P0852 Park/Neutral Switch Input Circ High
P0853 Drive Switch Input Circ
P0854 Drive Switch Input Circ Low
P0855 Drive Switch Input Circ High
P0856 Traction Ctrl Input Signal
P0857 Traction Ctrl Input Signal Range/Perf
P0858 Traction Ctrl Input Signal Low
P0859 Traction Ctrl Input Signal High
P0860 Gear Shift Mod Comm Circ

P0861 Gear Shift Mod Comm Circ Low
P0862 Gear Shift Mod Comm Circ High
P0863 TCM Comm Circ
P0864 TCM Comm Circ Range/Perf
P0865 TCM Comm Circ Low
P0866 TCM Comm Circ High
P0867 Trans Fluid Press
P0868 Trans Fluid Press Low
P0869 Trans Fluid Press High
P0870 Trans Fluid Press Sensor/Switch C Circ

P0871 Trans Fluid Press Sensor/Switch C Circ Range/Perf
P0872 Trans Fluid Press Sensor/Switch C Circ Low
P0873 Trans Fluid Press Sensor/Switch C Circ High
P0874 Trans Fluid Press Sensor/Switch C Circ Interm
P0875 Trans Fluid Press Sensor/Switch D Circ
P0876 Trans Fluid Press Sensor/Switch D Circ Range/Perf
P0877 Trans Fluid Press Sensor/Switch D Circ Low
P0878 Trans Fluid Press Sensor/Switch D Circ High
P0879 Trans Fluid Press Sensor/Switch D Circ Interm
P0880 TCM Power Input Signal

P0881 TCM Power Input Signal Range/Perf
P0882 TCM Power Input Signal Low
P0883 TCM Power Input Signal High
P0884 TCM Power Input Signal Interm
P0885 TCM Power Relay Ctrl Circ/Open
P0886 TCM Power Relay Ctrl Circ Low
P0887 TCM Power Relay Ctrl Circ High
P0888 TCM Power Relay Sense Circ
P0889 TCM Power Relay Sense Circ Range/Perf
P0890 TCM Power Relay Sense Circ Low

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P0891 TCM Power Relay Sense Circ High
P0892 TCM Power Relay Sense Circ Interm
P0893 Multiple Gears Engaged
P0894 Trans Component Slipping
P0895 Shift Time Too Short
P0896 Shift Time Too Long
P0897 Trans Fluid Deteriorated
P0898 Trans Ctrl Sys MIL Request Circ Low
P0900 Clutch Actuator Circ/Open

P0901 Clutch Actuator Circ Range/Perf
P0902 Clutch Actuator Circ Low
P0903 Clutch Actuator Circ High
P0904 Gate Select Pos Circ
P0905 Gate Select Pos Circ Range/Perf
P0906 Gate Select Pos Circ Low
P0907 Gate Select Pos Circ High
P0908 Gate Select Pos Circ Interm
P0909 Gate Select Ctrl Error
P0910 Gate Select Actuator Circ/Open

P0911 Gate Select Actuator Circ Range/Perf
P0912 Gate Select Actuator Circ Low
P0913 Gate Select Actuator Circ High
P0914 Gear Shift Pos Circ
P0915 Gear Shift Pos Circ Range/Perf
P0916 Gear Shift Pos Circ Low
P0917 Gear Shift Pos Circ High
P0918 Gear Shift Pos Circ Interm
P0919 Gear Shift Pos Ctrl Error
P0920 Gear Shift Forward Actuator Circ/Open

P0921 Gear Shift Forward Actuator Circ Range/Perf
P0922 Gear Shift Forward Actuator Circ Low
P0923 Gear Shift Forward Actuator Circ High
P0924 Gear Shift Reverse Actuator Circ/Open
P0925 Gear Shift Reverse Actuator Circ Range/Perf
P0926 Gear Shift Reverse Actuator Circ Low
P0927 Gear Shift Reverse Actuator Circ High
P0928 Gear Shift Lock Solenoid Ctrl Circ/Open
P0929 Gear Shift Lock Solenoid Ctrl Circ Range/Perf
P0930 Gear Shift Lock Solenoid Ctrl Circ Low

P0931 Gear Shift Lock Solenoid Ctrl Circ High
P0932 Hydraulic Press Sensor Circ
P0933 Hydraulic Press Sensor Range/Perf
P0934 Hydraulic Press Sensor Circ Low
P0935 Hydraulic Press Sensor Circ High
P0936 Hydraulic Press Sensor Circ Interm
P0937 Hydraulic Oil Temp Sensor Circ
P0938 Hydraulic Oil Temp Sensor Range/Perf
P0939 Hydraulic Oil Temp Sensor Circ Low
P0940 Hydraulic Oil Temp Sensor Circ High

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P0941 Hydraulic Oil Temp Sensor Circ Interm
P0942 Hydraulic Press Unit
P0943 Hydraulic Press Unit Cycling Period Too Short
P0944 Hydraulic Press Unit Loss of Press
P0945 Hydraulic Pump Relay Circ/Open
P0946 Hydraulic Pump Relay Circ Range/Perf
P0947 Hydraulic Pump Relay Circ Low
P0948 Hydraulic Pump Relay Circ High
P0949 Auto Shift Manual Adaptive Learning Not Complete
P0950 Auto Shift Manual Ctrl Circ

P0951 Auto Shift Manual Ctrl Circ Range/Perf
P0952 Auto Shift Manual Ctrl Circ Low
P0953 Auto Shift Manual Ctrl Circ High
P0954 Auto Shift Manual Ctrl Circ Interm
P0955 Auto Shift Manual Mode Circ
P0956 Auto Shift Manual Mode Circ Range/Perf
P0957 Auto Shift Manual Mode Circ Low
P0958 Auto Shift Manual Mode Circ High
P0959 Auto Shift Manual Mode Circ Interm
P0960 Press Ctrl Solenoid A Ctrl Circ/Open

P0961 Press Ctrl Solenoid A Ctrl Circ Range/Perf
P0962 Press Ctrl Solenoid A Ctrl Circ Low
P0963 Press Ctrl Solenoid A Ctrl Circ High
P0964 Press Ctrl Solenoid B Ctrl Circ/Open
P0965 Press Ctrl Solenoid B Ctrl Circ Range/Perf
P0966 Press Ctrl Solenoid B Ctrl Circ Low
P0967 Press Ctrl Solenoid B Ctrl Circ High
P0968 Press Ctrl Solenoid C Ctrl Circ/Open
P0969 Press Ctrl Solenoid C Ctrl Circ Range/Perf
P0970 Press Ctrl Solenoid C Ctrl Circ Low

P0971 Press Ctrl Solenoid C Ctrl Circ High
P0972 Shift Solenoid A Ctrl Circ Range/Perf
P0973 Shift Solenoid A Ctrl Circ Low
P0974 Shift Solenoid A Ctrl Circ High
P0975 Shift Solenoid B Ctrl Circ Range/Perf
P0976 Shift Solenoid B Ctrl Circ Low
P0977 Shift Solenoid B Ctrl Circ High
P0978 Shift Solenoid C Ctrl Circ Range/Perf
P0979 Shift Solenoid C Ctrl Circ Low
P0980 Shift Solenoid C Ctrl Circ High

P0981 Shift Solenoid D Ctrl Circ Range/Perf
P0982 Shift Solenoid D Ctrl Circ Low
P0983 Shift Solenoid D Ctrl Circ High
P0984 Shift Solenoid E Ctrl Circ Range/Perf
P0985 Shift Solenoid E Ctrl Circ Low
P0986 Shift Solenoid E Ctrl Circ High P0987 Trans Fluid Press Sensor/Switch E Circ
P0988 Trans Fluid Press Sensor/Switch E Circ Range/Perf
P0989 Trans Fluid Press Sensor/Switch E Circ Low
P0990 Trans Fluid Press Sensor/Switch E Circ High

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P0991 Trans Fluid Press Sensor/Switch E Circ Interm
P0992 Trans Fluid Press Sensor/Switch F Circ
P0993 Trans Fluid Press Sensor/Switch F Circ Range/Perf
P0994 Trans Fluid Press Sensor/Switch F Circ Low
P0995 Trans Fluid Press Sensor/Switch F Circ High
P0996 Trans Fluid Press Sensor/Switch F Circ Interm
P0997 Shift Solenoid F Ctrl Circ Range/Perf
P0998 Shift Solenoid F Ctrl Circ Low
P0999 Shift Solenoid F Ctrl Circ High

P0A00 - P0A29

P0A00 Motor Electronics Coolant Temp Sensor Circ
P0A01 Motor Electronics Coolant Temp Sensor Circ Range/Perf
P0A02 Motor Electronics Coolant Temp Sensor Circ Low
P0A03 Motor Electronics Coolant Temp Sensor Circ High
P0A04 Motor Electronics Coolant Temp Sensor Circ Interm
P0A05 Motor Electronics Coolant Pump Ctrl Circ/Open
P0A06 Motor Electronics Coolant Pump Ctrl Circ Low
P0A07 Motor Electronics Coolant Pump Ctrl Circ High
P0A08 DC/DC Converter Status Circ
P0A09 DC/DC Converter Status Circ Low Input
P0A10 DC/DC Converter Status Circ High Input

P0A11 DC/DC Converter Enable Circ/Open
P0A12 DC/DC Converter Enable Circ Low
P0A13 DC/DC Converter Enable Circ High
P0A14 Engine Mount Ctrl Circ/Open
P0A15 Engine Mount Ctrl Circ Low
P0A16 Engine Mount Ctrl Circ High
P0A17 Motor Torque Sensor Circ
P0A18 Motor Torque Sensor Circ Range/Perf
P0A19 Motor Torque Sensor Circ Low
P0A20 Motor Torque Sensor Circ High

P0A21 Motor Torque Sensor Circ Interm
P0A22 Generator Torque Sensor Circ
P0A23 Generator Torque Sensor Circ Range/Perf
P0A24 Generator Torque Sensor Circ Low
P0A25 Generator Torque Sensor Circ High
P0A26 Generator Torque Sensor Circ Interm
P0A27 Battery Power Off Circ
P0A28 Battery Power Off Circ Low
P0A29 Battery Power Off Circ High

P1000 - P1399

P1000 Monitor Checks Not Complete-More Driving Required
P1105 Sec Vacuum Sensor Circ
P1106 MAP Sens Circ Interm Hi Volts
P1107 MAP Sens Circ Interm Lo Volts
P1108 BARO to MAP Sens Comparison Too Hi
P1109 Sec Port Throttle Sys

P1111 Intake Air Temp Sens Circ Interm Hi Volts
P1112 Intake Air Temp Sens Circ Interm Lo Volts

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P1113 Intake Resonance Switchover Solenoid Ctrl Circ
P1114 Eng Coolant Temp Sens Circ Interm Lo Volts
P1115 Eng Coolant Temp Sens Circ Interm Hi Volts
P1116 Eng Coolant Temp Sig Unstable or Interm
P1117 Eng Coolant Temp Sig Out-Of-Range Lo
P1118 Eng Coolant Temp Sig Out-Of-Range Hi
P1119 Eng Coolant Temp Sig Out-Of-Range With TFT Sens
P1120 Throttle Pos Sens1 Circ

P1121 Throttle Pos Sens Circ Interm Hi Volts
P1122 Throttle Pos Sens Circ Interm Lo Volts
P1125 APP Sys
P1130 HO2S Circ Lo Variance Bank1 Sens1
P1131 HO2S Circ Lo Variance Bank1 Sens2
P1132 HO2S Circ Lo Variance Bank2 Sens1
P1133 HO2S Insufficient Switching Bank1 Sens1
P1134 HO2S Transition Time Ratio Bank1 Sens1
P1135 HO2S Lean Mean Bank1 Sens1
P1136 HO2S Rich Mean Bank1 Sens1
P1137 HO2S Bank1 Sens2 Lean Sys or Lo Volts
P1138 HO2S Bank1 Sens2 Rich or Hi Volts
P1139 HO2S Insuff Switching Bank1 Sens2
P1140 HO2S Transition Time Ratio Bank1 Sens2

P1141 HO2S Heater Ctrl Circ Bank1 Sens2
P1143 HO2S Bank1 Sens3 Lean Sys or Lo Volts
P1144 HO2S Bank1 Sens3 Rich or Hi Volts

P1153 HO2S Insufficient Switching Bank2 Sens1
P1154 HO2S Transition Time Ratio Bank2 Sens1
P1155 HO2S Lean Mean Bank2 Sens1
P1156 HO2S Rich Mean Bank2 Sens1
P1157 HO2S Bank2 Sens2 Lean Sys or Lo Volts
P1158 HO2S Bank2 Sens2 Rich or Hi Volts
P1159 HO2S Cross Counts Bank2 Sens2

P1164 HO2S Bank2 Sens3 Rich or Hi Volts
P1165 HO2S Cross Counts Bank2 Sens3

P1170 Bank to Bank Fuel Trim Offset
P1171 Fuel Sys Lean during Acceleration

P1185 Eng Oil Temp Circ
P1186 EOT Circ Perf
P1187 EOT Sens Circ Lo Volts
P1188 EOT Sens Circ Hi Volts
P1189 Eng Oil Press (EOP) Switch Circ
P1190 Eng Vacuum Leak

P1191 Intake Air Duct Air Leak
P1200 Injector Ctrl Circ
P1201 (Alt. Fuel) Gas Mass Sens Circ Range/Perf
P1202 (Alt. Fuel) Gas Mass Sens Circ Lo Freq
P1203 (Alt. Fuel) Gas Mass Sens Circ Hi Freq

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P1211 Mass Air Flow Circ Interm Hi
P1212 Mass Air Flow Circ Interm Lo
P1214 Inject Pump Timing Offset
P1215 Gnd Fault Detection Indicated
P1216 Fuel Solenoid Response Time Too Short
P1217 Fuel Solenoid Response Time Too Long
P1218 Inject Pump Calibration Circ
P1219 Throttle Pos Sens Ref Volts
P1220 Throttle Pos (TP) Sens2 Circ

P1221 Fuel Pump Sec Circ Lo
P1222 Injector Ctrl Circ Interm
P1225 Injector Circ Cyl2 Interm
P1228 Injector Circ Cyl3 Interm

P1231 Injector Circ Cyl4 Interm
P1234 Injector Circ Cyl5 Interm
P1237 Injector Circ Cyl6 Interm
P1240 Injector Circ Cyl7 Interm

P1243 Injector Circ Cyl8 Interm
P1245 Intake Plenum Switchover Valve
P1250 Early Fuel Evaporation Heater Circ

P1257 Supercharger Sys Over boost P1258 Eng Coolant over Temp-Protection Mode Active P1260 Last Test Failed SCC ENTER More Info.

P1270 Accelerator Pedal Pos Sens A/D Converter Error
P1271 Accelerator Pedal Pos (APP) Sens1-2 Correlation
P1272 Accelerator Pedal Pos Sens2
P1273 Accelerator Pedal Pos Sens1
P1274 Injectors Wired Incorrectly
P1275 Accelerator Pedal Pos (APP) Sens1 Circ
P1276 Accelerator Pedal Pos Sens1 Circ Perf
P1277 Accelerator Pedal Pos Sens1 Circ Lo Volts
P1278 Accelerator Pedal Pos Sens1 Circ Hi Volts
P1280 Accelerator Pedal Pos (APP) Sens2 Circ

P1281 Accelerator Pedal Pos Sens2 Circ Perf
P1282 Accelerator Pedal Pos Sens2 Circ Lo Volts
P1283 Accelerator Pedal Pos Sens2 Circ Hi Volts
P1285 Accelerator Pedal Pos Sens3 Circ
P1286 Accelerator Pedal Pos Sens3 Circ Perf
P1287 Accelerator Pedal Pos Sens3 Circ Lo Volts
P1288 Accelerator Pedal Pos Sens3 Circ Hi Volts

P1300 Igniter Circ
P1305 Ign Coil 2 Pri Feedback Circ
P1310 Ign Coil 3 Pri Feedback Circ

P1315 Ign Coil 4 Pri Feedback Circ
P1320 C 4X Ref Circ Interm

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P1321 Electronic Ign Sys Fault Line
P1322 EI Sys or Ign Ctrl Extra or Missing
P1323 IC 24X Ref Circ Lo Freq
P1324 Crank RPM Too Lo
P1335 CKP Circ
P1336 Crank Pos (CKP) Sys Variation Not Learned

P1345 Crank Pos (CKP)-Camshaft Pos (CMP) Correlation
P1346 Intake Camshaft Pos [CMP] Sens Sys Perf
P1350 Ign Ctrl Sys

P1351 Ign Coil Ctrl Circ Hi Volts
P1352 IC Output Hi/Pulse Detected when GND Cyl. 2
P1353 IC Output Hi/Pulse Detected when GND Cyl. 3
P1354 IC Output Hi/Pulse Detected when GND Cyl. 4
P1355 IC Output Hi/Pulse Detected when GND Cyl. 5
P1356 IC Output Hi/Pulse Detected when GND Cyl. 6
P1357 IC Output Hi/Pulse Detected when GND Cyl. 7
P1358 IC Output Hi/Pulse Detected when GND Cyl. 8
P1359 Ignition Coil Group 1 Ctrl Circ
P1360 Ignition Coil Group 2 Ctrl Circ

P1361 Ignition Coil Ctrl Circ Lo Volts
P1362 IC Cyl2 Not Toggling After Enable
P1363 IC Cyl3 Not Toggling After Enable
P1364 IC Cyl4 Not Toggling After Enable
P1365 IC Cyl5 Not Toggling After Enable
P1366 IC Cyl6 Not Toggling After Enable
P1367 IC Cyl7 Not Toggling After Enable
P1368 IC Cyl8 Not Toggling After Enable
P1370 IC 4X Ref Circ Too Many Pulses

P1371 IC 4X Ref Circ Too Few Pulses
P1372 Crank Pos (CKP) SensorA-B Correlation
P1374 3X Ref Circ
P1375 IC 24X Ref Circ Hi Volts
P1376 Ignition Gnd Circ
P1377 IC Cam Pulse To 4X Ref Pulse
P1380 Misfire Detected-Rough Road Data Not Available

P1381 Misfire Detected-No Comm with Brake Ctrl Mod
P1390 Wheel Speed Sensor1-G-Sensor Circ

P1391 Wheel Speed Sensor1-G-Sensor Circ Perf
P1392 Wheel Speed Sensor1-G-Sensor Circ Lo Volts
P1393 Wheel Speed Sensor1-G-Sensor Circ Hi Volts
P1394 Wheel Speed Sensor1-G-Sensor Circ Interm
P1395 Wheel Speed Sensor2-G-Sensor Circ
P1396 Wheel Speed Sensor2-G-Sensor Circ Perf
P1397 Wheel Speed Sensor2-G-Sensor Circ Lo Volts
P1398 Wheel Speed Sensor2-G-Sensor Circ Hi Volts
P1399 Wheel Speed Sensor2-G-Sensor Circ Interm
P1400 - P1599

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P1403 Exhaust Gas Recirc Sys Valve 1
P1404 Exhaust Gas Recirc (EGR) Closed Pos Perf
P1405 Exhaust Gas Recirc Sys Valve 3
P1406 EGR Valve Pintle Pos Circ
P1407 EGR Air Intrusion in Exhaust Supply to EGR Valve
P1408 Intake Manifold Press Sensor Circ
P1409 EGR Vacuum Sys Leak
P1410 Fuel Tank Press Sys

P1415 Sec Air Inject (AIR) Sys Bank1
P1416 Sec Air Inject (AIR) Sys Bank2
P1418 Sec Air Inject Sys Relay A Ctrl Circ Hi
P1420 Intake Air Lo Press Switch Circ Lo Volts

P1421 Intake Air Lo Press Switch Circ Hi Volts
P1423 Intake Air Hi Press Switch Circ Hi Volts

P1431 Fuel Level Sensor2 Circ Perf
P1432 Fuel Level Sensor2 Circ Lo Volts
P1433 Fuel Level Sensor2 Circ Hi Volts

P1441 EVAP Emission Sys Flow during Non-Purge
P1442 EVAP Vacuum Sw. Hi Volts during Ignition. On
P1450 Barometric Press Sensor Circ

P1451 Barometric Press Sensor Perf
P1460 Cooling Fan Ctrl Sys

P1480 Fan Sec Lo With Lo Fan On
P1481 Fan Sec Lo With Hi Fan On
P1483 Eng Cooling Sys Perf

P1500 Starter Signal Circ
P1501 Vehicle Speed Sensor Circ Interm
P1501 Theft Deterrent Sys
P1502 Theft Deterrent Fuel Enable Signal Not
P1503 Theft Deterrent Sys-Password Incorrect
P1504 Vehicle Speed Output Circ
P1508 IAC Sys Lo RPM
P1509 IAC Sys Hi RPM

P1510 Back Up Power Supply
P1511 Throttle Ctrl Sys-Backup Sys Perf
P1514 Air Flow to TP Sensor Correlation Hi
P1515 Electronic Throttle Sys Throttle Pos
P1516 Electronic Throttle Mod Throttle Pos
P1517 Electronic Throttle Mod
P1518 Electronic Throttle Mod to PCM Comm
P1519 Electronic Throttle Mod Lo Volts Comm. Disable

P1520 Gear Indicator Sys
P1521 Trans Engaged at Hi Throttle Angle
P1522 Park/Neutral to Drive/Reverse at Hi RPM
P1523 Elec. Throttle Ctrl Throttle Return

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P1524 TP Sen. Learned Cl. Throttle. Angle ? Out of Range
P1525 Throttle Body Service Required
P1526 TP Sensor Learn Not Complete
P1527 Trans. Range/Press Switch Comparison
P1528 Governor
P1529 Heated Windshield Request Problem
P1530 Ignition Timing Adjustment Switch Circ
P1531 A/C Lo Side Temp Sensor Fault
P1532 A/C Evaporator Temp Sensor Circ Lo Voltage
P1533 A/C Evaporator Temp Sensor Circ Hi Voltage
P1534 A/C Hi Side Temp. Sensor Lo Voltage
P1535 A/C Hi Side Temp Sensor Circ
P1536 A/C Sys-ECT Over Temp
P1537 A/C Request Circ Lo Voltage
P1538 A/C Request Circ Hi Voltage
P1539 A/C Clutch Status Circ High Volts

P1540 A/C Sys Hi Press
P1541 A/C Hi Side Over Temp
P1542 A/C Sys Hi Press Hi Temp
P1543 A/C Sys Perf
P1544 A/C Refrigerant Condition Very Lo
P1545 A/C Clutch Relay Ctrl Circ
P1546 A/C Clutch Status Circ Lo Voltage
P1547 A/C Sys Perf Degraded
P1548 A/C Recirculation Circ

P1554 Cruise Engaged Circ Hi Voltage
P1555 Electronic Variable Orifice Output
P1558 Cruise Ctrl Servo Indicates Lo
P1559 Cruise Ctrl Power Mgmt Mode

P1560 Cruise Ctrl Sys-Transaxle Not In Drive
P1561 Cruise Vent Solenoid
P1562 Cruise Vacuum Solenoid
P1563 Cruise Vehicle Speed/Set Speed Difference Too Hi
P1564 Cruise Ctrl Sys-Vehicle Accel Too Hi
P1565 Cruise Servo Pos Sensor
P1566 Cruise Ctrl Sys-Engine RPM Too Hi
P1567 Cruise Ctrl Sys-Active Braking Ctrl Active
P1568 Cruise Servo Stroke Greater than Commanded in Cruise
P1569 Cruise Servo Stroke Hi While not in Cruise

P1570 Cruise Ctrl Sys-Traction Ctrl Active
P1571 TCS PWM Circ No Frequency
P1572 ASR Active Circ Lo Too Long
P1573 PCM/EBTCM Serial Data Circ
P1574 EBTCM Sys-Stop Lamp Switch Circ Hi Volts
P1575 Extended Travel Brake Sw. Circ Hi Volts
P1576 BBV Sensor Circ Hi Voltage
P1577 BBV Sensor Circ Lo Voltage
P1578 BBV Sensor Circ Lo Vacuum
P1579 P/N to D/R at Hi Throttle Angle

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P1580 Cruise Move Circ Lo Voltage
P1581 Cruise Move Circ Hi Voltage
P1582 Cruise Direction Circ Lo Voltage
P1583 Cruise Direction Circ Hi Voltage
P1584 Cruise Ctrl Disabled
P1585 Cruise Inhibit Ctrl Circ
P1586 Cruise Ctrl Brake Switch 2 Circ
P1587 Cruise Ctrl Clutch Ctrl Circ Lo
P1588 Cruise Ctrl Clutch Ctrl Circ Hi

P1599 Eng Stall or Near Stall Detected

P1600 - P1799

P1600 PCM Battery/TCM Watchdog
P1601 Serial Comm. Problem with Device 1
P1602 Loss of EBTCM Serial Data
P1603 Loss of SDM Serial Data
P1604 Loss of IPC Serial Data
P1605 Loss of HVAC Serial Data
P1606 Serial Comm Problem with Device 6
P1607 Serial Comm Problem with Device 7
P1608 Serial Comm Problem with Device 8
P1609 Loss of TCS Serial Data

P1610 Loss of PZM Serial Data
P1611 Loss of CVRTD Serial Data
P1612 Loss of IPM Serial Data
P1613 Loss of DIM Serial Data
P1614 Loss of RIM Serial Data
P1615 Loss of VTD Serial Data
P1617 Engine Oil Level Switch Circ
P1619 Engine Oil Life Monitor Reset Circ

P1620 Lo Coolant Circ
P1621 PCM Memory Perf
P1622 Cylinder Select
P1623 Trans Temp Pull-Up Resistor
P1624 Customer Snapshot Data Available
P1625 PCM Sys Reset
P1626 Theft Deterrent Sys Fuel Enable Circ
P1627 A/D Perf
P1628 ECT Pull-Up Resistor
P1629 Theft Deterrent Sys-Cranking Signal

P1630 Theft Deterrent Sys-PCM In Learn Mode
P1631 Theft Deterrent Sys-Password Incorrect
P1632 Theft Deterrent Sys-Fuel disabled
P1633 Ignition Supply Power Circ Lo Voltage
P1634 Ignition 1 Power Circ Lo Voltage
P1635 5 Volt Ref Lo
P1636 PCM Stack Overrun
P1637 Generator L-Terminal Circ
P1638 Generator F-Terminal Circ
P1639 5 Volt Ref 2 Circ

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P1640 Driver 1-Input Hi Voltage
P1641 FC Relay 1 Ctrl Circ
P1642 FC Relay 2 and 3 Ctrl Circ
P1643 Engine Speed Output Circ
P1644 Traction Ctrl Delivered Torque Output Circ
P1645 EVAP Emission (EVAP) Vent Solenoid Ctrl Circ
P1646 Driver 1 Line 6
P1647 Driver 1 Line 7

P1650 Driver 2-Input Hi Voltage
P1651 Fan 1 Relay Ctrl Circ
P1652 VSS Output Circ
P1653 Oil Level Lamp Ctrl Circ
P1654 Service Throttle Soon Lamp Ctrl Circ
P1655 EVAP Purge Solenoid Ctrl Circ
P1656 Driver 2 Line 6
P1657 1-4 Up shift Solenoid Ctrl Circ
P1658 Starter Enable Relay Ctrl Circ
P1660 Cooling Fans Ctrl Circ
P1661 MIL Ctrl Circ
P1662 Cruise Ctrl Inhibit Ctrl Circ
P1663 Oil Life Lamp Ctrl Circ
P1664 1-4 Up shift Lamp Ctrl Circ
P1665 Driver 3 Line 5
P1666 Driver 3 Line 6
P1667 Reverse Inhibit Solenoid Ctrl Circ
P1669 ABS Unit Expected

P1670 Driver 4
P1671 Driver 4 Line 1
P1672 Lo Engine Oil Level Lamp Ctrl Circ
P1673 Engine Hot Lamp Ctrl Circ
P1674 Tachometer Ctrl Circ
P1675 EVAP Vent Solenoid Ctrl Circ
P1676 Driver 4 Line 6
P1677 Driver 4 Line 7

P1680 Driver 5
P1681 Driver 5 Line 1
P1682 Driver 5 Line 2
P1683 Driver 5 Line 3
P1684 Driver 5 Line 4
P1685 Driver 5 Line 5
P1686 Driver 5 Line 6
P1687 Driver 5 Line 7
P1689 Delivered Torque Circ Fault

P1690 ECM Loop Overrun
P1691 Coolant Gage Circ Lo Voltage
P1692 Coolant Gage Circ Hi Voltage
P1693 Tachometer Circ Lo Voltage
P1694 Tachometer Circ Hi Voltage
P1695 Remote Keyless Entry Circ Lo
P1696 Remote Keyless Entry Voltage Hi

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P1700 Trans. MIL Request
P1701 Trans. MIL Request Circ
P1705 P/N Signal Output Circ

P1740 Torque Reduction Signal Circ
P1743 TP Signal from ECM

P1760 TCM Supply Volts Interrupted

P1779 Eng Torque Delivered to TCM Signal

P1780 Park/Neutral Pos [PNP] Switch Circ
P1781 Eng Torque Signal Circ

P1790 Trans Ctrl Mod Checksum
P1791 Trans Ctrl Mod Loop
P1792 Trans Ctrl Mod Reprogrammable Memory
P1792 ECM to TCM Eng Coolant Signal
P1793 Trans Ctrl Mod Stack Overrun
P1795 CAN Bus-Throttle Body Pos

P1800 - P1899

P1800 TCM Power Relay Ctrl Circ
P1801 Perf Selector Switch Failure
P1804 Gnd Ctrl Relay

P1810 TFP Valve Pos Switch Circ
P1811 Maximum Adapt and Long Shift
P1812 Trans over Temp Condition
P1813 Torque Ctrl
P1814 Torq Conv Overstressed
P1815 Trans Range Switch-Start In Wrong Range
P1816 TFP Valve Pos Sw.-Park/Neutral with Drive Ratio
P1817 TFP Valve Pos Sw.-Reverse With Drive Ratio
P1818 TFP Valve Pos Sw.-Drive Without Drive Ratio
P1819 Internal Mode Switch-No Start\Wrong Range

P1820 Internal Mode Switch Circ A Low
P1822 Internal Mode Switch Circ B High
P1823 Internal Mode Switch Circ P Low
P1825 Internal Mode Switch-Invalid Range
P1826 Internal Mode Switch Circ C-High

P1831 PC Solenoid Power Circ-Low Volts
P1833 A/T Solenoids Power Circ-Low Volts
P1835 Kick-Down Switch Circ
P1836 Kick-Down Switch Failed Open
P1837 Kick-Down Switch Failed Short

P1842 1-2 Shift Solenoid Circ Low Volts
P1843 1-2 Shift Solenoid Circ High Volts
P1844 Torque Reduction Signal Circ Desired By TCM
P1845 2-3 Shift Solenoid Circ Low Volts
P1847 2-3 Shift Solenoid Circ High Volts

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P1850 Brake Band Apply Solenoid Circ
P1851 Brake Band Apply Solenoid Perf
P1852 Brake Band Apply Solenoid Low Volts
P1853 Brake Band Apply Solenoid High Volts

P1860 TCC PWM Solenoid Circ Electrical
P1864 Torq Conv Clutch Circ
P1868 Trans Fluid Life

P1870 Trans Component Slipping
P1871 Undefined Gear Ratio
P1873 TCC Stator Temp Switch Circ Low
P1874 TCC Stator Temp Switch Circ High
P1875 4WD Low Switch Circ Electrical

P1884 TCC Enable/Shift Light Circ
P1886 Shift Timing Solenoid
P1887 TCC Release Switch Circ

P1890 ECM Data Input Circ
P1890 Throttle Pos Signal Input
P1891 Throttle Pos Sensor PWM Signal Low
P1892 Throttle Pos Sensor PWM Signal High
P1893 Eng Torque Signal Low Volts
P1894 Eng Torque Signal High Volts
P1895 TCM to ECM Torque Reduction Circ

P2000 - P2143

P2000 NOx Trap Efficiency Below Threshold Bank1
P2001 NOx Trap Efficiency Below Threshold Bank2
P2002 Particulate Trap Efficiency Below Threshold Bank1
P2003 Particulate Trap Efficiency Below Threshold Bank2
P2004 Intake Manifold Runner Ctrl Stuck Open Bank1
P2005 Intake Manifold Runner Ctrl Stuck Open Bank2
P2006 Intake Manifold Runner Ctrl Stuck Closed Bank1
P2007 Intake Manifold Runner Ctrl Stuck Closed Bank2
P2008 Intake Manifold Runner Ctrl Circ/Open Bank1
P2009 Intake Manifold Runner Ctrl Circ Low Bank1

P2010 Intake Manifold Runner Ctrl Circ High Bank1
P2011 Intake Manifold Runner Ctrl Circ/Open Bank2
P2012 Intake Manifold Runner Ctrl Circ Low Bank2
P2013 Intake Manifold Runner Ctrl Circ High Bank2
P2014 Intake Manifold Runner Pos Sensor/Switch Circ Bank1
P2015 Intake Manifold Runner Pos Sensor/Switch Circ Range/Perf Bank1
P2016 Intake Manifold Runner Pos Sensor/Switch Circ Low Bank1
P2017 Intake Manifold Runner Pos Sensor/Switch Circ High Bank1
P2018 Intake Manifold Runner Pos Sensor/Switch Circ Interm Bank1
P2019 Intake Manifold Runner Pos Sensor/Switch Circ Bank2

P2020 Intake Manifold Runner Pos Sensor/Switch Circ Range/Perf Bank2
P2021 Intake Manifold Runner Pos Sensor/Switch Circ Low Bank2
P2022 Intake Manifold Runner Pos Sensor/Switch Circ High Bank2

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P2023 Intake Manifold Runner Pos Sensor/Switch Circ Interm Bank2
P2024 EVAP Fuel Vapor Temp Sensor Circ
P2025 EVAP Fuel Vapor Temp Sensor Perf
P2026 EVAP Fuel Vapor Temp Sensor Circ Low Voltage
P2027 EVAP Fuel Vapor Temp Sensor Circ High Voltage
P2028 EVAP Fuel Vapor Temp Sensor Circ Interm
P2029 Fuel Fired Heater Disabled

P2030 Fuel Fired Heater Perf
P2031 Exhaust Gas Temp Sensor Circ Bank1 Sensor 2
P2032 Exhaust Gas Temp Sensor Circ Low Bank1 Sensor 2
P2033 Exhaust Gas Temp Sensor Circ High Bank1 Sensor 2
P2034 Exhaust Gas Temp Sensor Circ Bank2 Sensor 2
P2035 Exhaust Gas Temp Sensor Circ Low Bank2 Sensor 2
P2036 Exhaust Gas Temp Sensor Circ High Bank2 Sensor 2
P2037 Reductant Inj Air Press Sensor Circ
P2038 Reductant Inj Air Press Sensor Circ Range/Perf
P2039 Reductant Inj Air Press Sensor Circ Low Input

P2040 Reductant Inj Air Press Sensor Circ High Input
P2041 Reductant Inj Air Press Sensor Circ Interm
P2042 Reductant Temp Sensor Circ
P2043 Reductant Temp Sensor Circ Range/Perf
P2044 Reductant Temp Sensor Circ Low Input
P2045 Reductant Temp Sensor Circ High Input
P2046 Reductant Temp Sensor Circ Interm
P2047 Reductant Injector Circ/Open Bank1 Unit 1
P2048 Reductant Injector Circ Low Bank1 Unit 1
P2049 Reductant Injector Circ High Bank1 Unit 1

P2050 Reductant Injector Circ/Open Bank2 Unit 1
P2051 Reductant Injector Circ Low Bank2 Unit 1
P2052 Reductant Injector Circ High Bank2 Unit 1
P2053 Reductant Injector Circ/Open Bank1 Unit 2
P2054 Reductant Injector Circ Low Bank1 Unit 2
P2055 Reductant Injector Circ High Bank1 Unit 2
P2056 Reductant Injector Circ/Open Bank2 Unit 2
P2057 Reductant Injector Circ Low Bank2 Unit 2
P2058 Reductant Injector Circ High Bank2 Unit 2
P2059 Reductant Inj Air Pump Ctrl Circ/Open

P2060 Reductant Inj Air Pump Ctrl Circ Low
P2061 Reductant Inj Air Pump Ctrl Circ High
P2062 Reductant Supply Ctrl Circ/Open
P2063 Reductant Supply Ctrl Circ Low
P2064 Reductant Supply Ctrl Circ High
P2065 Fuel Level SensorB Circ
P2066 Fuel Level SensorB Perf
P2067 Fuel Level SensorB Circ Low
P2068 Fuel Level SensorB Circ High
P2069 Fuel Level SensorB Circ Interm

P2070 Intake Manifold Tuning (IMT) Valve Stuck Open
P2071 IMT Valve Stuck Closed

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P2075 IMT Valve Pos Sensor/Switch Circ
P2076 IMT Valve Pos Sensor/Switch Circ Range/Perf
P2077 IMT Valve Pos Sensor/Switch Circ Low
P2078 IMT Valve Pos Sensor/Switch Circ High
P2079 IMT Valve Pos Sensor/Switch Circ Interm

P2080 Exhaust Gas Temp Sensor Circ Range/Perf Bank1 Sensor 1
P2081 Exhaust Gas Temp Sensor Circ Interm Bank1 Sensor 1
P2082 Exhaust Gas Temp Sensor Circ Range/Perf Bank2 Sensor 1
P2083 Exhaust Gas Temp Sensor Circ Interm Bank2 Sensor 1
P2084 Exhaust Gas Temp Sensor Circ Range/Perf Bank1 Sensor 2
P2085 Exhaust Gas Temp Sensor Circ Interm Bank1 Sensor 2
P2086 Exhaust Gas Temp Sensor Circ Range/Perf Bank2 Sensor 2
P2087 Exhaust Gas Temp Sensor Circ Interm Bank2 Sensor 2
P2088 A Camshaft Pos Actuator Ctrl Circ Low Bank1
P2089 A Camshaft Pos Actuator Ctrl Circ High Bank1

P2090 B Camshaft Pos Actuator Ctrl Circ Low Bank1
P2091 B Camshaft Pos Actuator Ctrl Circ High Bank1
P2092 A Camshaft Pos Actuator Ctrl Circ Low Bank2
P2093 A Camshaft Pos Actuator Ctrl Circ High Bank2
P2094 B Camshaft Pos Actuator Ctrl Circ Low Bank2
P2095 B Camshaft Pos Actuator Ctrl Circ High Bank2
P2096 Post Catalyst Fuel Trim Sys Too Lean Bank1
P2097 Post Catalyst Fuel Trim Sys Too Rich Bank1
P2098 Post Catalyst Fuel Trim Sys Too Lean Bank2
P2099 Post Catalyst Fuel Trim Sys Too Rich Bank2

P2100 Throttle Actuator Ctrl Motor Circ/Open
P2101 Throttle Actuator Ctrl Motor Circ Range/Perf
P2102 Throttle Actuator Ctrl Motor Circ Low
P2103 Throttle Actuator Ctrl Motor Circ High
P2104 Throttle Actuator Ctrl Sys-Forced Idle
P2105 Throttle Actuator Ctrl Sys-Forced Engine Shutdown
P2106 Throttle Actuator Ctrl Sys-Forced Limited Power
P2107 Throttle Actuator Ctrl Mod Processor
P2108 Throttle Actuator Ctrl Mod Perf
P2109 Throttle/Pedal Pos SensorA Minimum Stop Perf

P2110 Throttle Actuator Ctrl Sys-Forced Limited RPM
P2111 Throttle Actuator Ctrl Sys-Stuck Open
P2112 Throttle Actuator Ctrl Sys-Stuck Closed
P2113 Throttle/Pedal Pos SensorB Minimum Stop Perf
P2114 Throttle/Pedal Pos Sensor C Minimum Stop Perf
P2115 Throttle/Pedal Pos Sensor D Minimum Stop Perf
P2116 Throttle/Pedal Pos Sensor E Minimum Stop Perf
P2117 Throttle/Pedal Pos Sensor F Minimum Stop Perf
P2118 Throttle Actuator Ctrl Motor Current Range/Perf
P2119 Throttle Actuator Ctrl Throttle Body Range/Perf

P2120 Throttle/Pedal Pos Sensor/Switch D Circ
P2121 Throttle/Pedal Pos Sensor/Switch D Circ Range/Perf
P2122 Throttle/Pedal Pos Sensor/Switch D Circ Low Input
P2123 Throttle/Pedal Pos Sensor/Switch D Circ High Input

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P2124 Throttle/Pedal Pos Sensor/Switch D Circ Interm
P2125 Throttle/Pedal Pos Sensor/Switch E Circ
P2126 Throttle/Pedal Pos Sensor/Switch E Circ Range/Perf
P2127 Throttle/Pedal Pos Sensor/Switch E Circ Low Input
P2128 Throttle/Pedal Pos Sensor/Switch E Circ High Input
P2129 Throttle/Pedal Pos Sensor/Switch E Circ Interm

P2130 Throttle/Pedal Pos Sensor/Switch F Circ
P2131 Throttle/Pedal Pos Sensor/Switch F Circ Range Perf
P2132 Throttle/Pedal Pos Sensor/Switch F Circ Low Input
P2133 Throttle/Pedal Pos Sensor/Switch F Circ High Input
P2134 Throttle/Pedal Pos Sensor/Switch F Circ Interm
P2135 Throttle/Pedal Pos Sensor/Switch A / B Voltage Correlation
P2136 Throttle/Pedal Pos Sensor/Switch A / C Voltage Correlation
P2137 Throttle/Pedal Pos Sensor/Switch B / C Voltage Correlation
P2138 Throttle/Pedal Pos Sensor/Switch D / E Voltage Correlation
P2139 Throttle/Pedal Pos Sensor/Switch D / F Voltage Correlation

P2140 Throttle/Pedal Pos Sensor/Switch E / F Voltage Correlation
P2141 Exhaust Gas Recirculation Throttle Ctrl Circ Low
P2142 Exhaust Gas Recirculation Throttle Ctrl Circ High
P2143 Invalid Data From Body Ctrl Mod A

History

History Sub-Page

Last 30 Seconds

Description

The **Last 30 Seconds** sub-page from the **History** page displays the snapshots recorded every 5 seconds by the MPEM during the last 30 seconds of engine running.

To clear the last 30 seconds page 1. Read

MPEM document from the vehicle.

2. Click on the **History** page thumbnail.
3. Click on the **Last 30 Seconds** sub-page thumbnail.
4. Click on the **Clear Last 30 Seconds** button.
5. Click on the message box **OK** button.
6. Wait until B.U.D.S. clears the data into the MPEM.

Note

The clear is done simultaneously in the MPEM and in the document.

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Description

The **Last Minute** sub-page from the **History** page displays the 120 snapshots recorded every half second by the ECM during the last 60 seconds of engine running.

To clear the last minute page

1. Read MPEM document from the vehicle.
2. Click on the **History** page thumbnail.
3. Click on the **Last Minute** sub-page thumbnail.
4. Click on the **Clear Last Minute** button.
5. Click on the message box **OK** button.
6. Wait until B.U.D.S. clears the data into the ECM.

Note

The clear is done simultaneously in the ECM and in the document.

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Minimum / Maximum

Description

The **Minimum / Maximum** sub-page from the **History** page displays the minimum and maximum values recorded by the module.

To clear the minimum and maximum history table

1. Read MPEM document from the vehicle.
2. Click on the **History** page thumbnail.
3. Click on the **Minimum / Maximum** sub-page thumbnail.
4. Click on the **Clear Min / Max** button.
5. Click on the message box **OK** button.
6. Wait until B.U.D.S. clears the data into the module.

Note

The clear is done simultaneously in the module and in the document.

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Run Time

Description

The **Run Time** sub-page from the **History** page shows a graphical representation of the amount of time the engine spent in normal mode and limp home mode. For some vehicles, the time spent in learning mode is also available.

To view the run time history

1. Read MPEM document from the vehicle.
2. Click on the **History** page thumbnail.
3. Click on the **Run Time** sub-page thumbnail.

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RPM Profile

Description

The **RPM Profile** sub-page from the **History** page shows a graphical representation of the engine RPM profile.

To view the RPM profile

1. Read MPEM document from the vehicle.
2. Click on the **History** page thumbnail.
3. Click on the **RPM Profile** sub-page thumbnail.

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Part Replacement

Description

The **Part Replacement** page provides functions that you can use to read, add and clear(*) parts to (from) the replacement history. Each part in the replacement history is assigned a type (ECM, MPEM or Engine), a serial number and the vehicle hours it was added at.

To add an engine to the replacement history

When you change the engine serial number in the **Vehicle** page, B.U.D.S. automatically updates the **Part Replacement** page with the old engine serial number and the vehicle hours it was changed at. If needed, you can also manually add an engine to the part replacement history. To do so, follow these steps:

1. Read MPEM document from the vehicle.
2. Click on the **History** page thumbnail.
3. Click on the **Part Replacement** sub-page thumbnail.
4. Click on the **Add Part in History** button to open the **Add Part in History** window.
5. In the **Add Part in History** window, click on the **Part Type** zone **Engine** button.
6. Enter the part serial number in the **Serial Number** zone.
7. Click on the **OK** button.
8. Write MPEM document into the vehicle.

To add a MPEM to the replacement history

When replacing a MPEM with the **Replace** command from the **Module | MPEM** menu, B.U.D.S. automatically updates the **Part Replacement** page with the old MPEM serial number and the vehicle hours it was changed at. If needed, you can also manually add a MPEM to the part replacement history. To do so, follow these steps:

1. Read MPEM document from the vehicle.
2. Click on the **History** page thumbnail.
3. Click on the **Part Replacement** sub-page thumbnail.
4. Click on the **Add Part in History** button to open the **Add Part in History** window.
5. In the **Add Part in History** window, click on the **Part Type** zone **MPEM** button.
6. Enter the part serial number in the **Serial Number** zone.

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7. Click on the **OK** button.
8. Write MPEM document into the vehicle.

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* - only with privilege Megatech.

To add an ECM to the replacement history

When replacing a ECM with the **Replace** command from the **Module | ECM** menu, B.U.D.S. automatically updates the **Part Replacement** page with the old ECM serial number and the vehicle hours it was changed at. If needed, you can also manually add a ECM to the part replacement history. To do so, follow these steps:

1. Read MPEM document from the vehicle.
2. Click on the **History** page thumbnail.
3. Click on the **Part Replacement** sub-page thumbnail.
4. Click on the **Add Part in History** button to open the **Add Part in History** window.
5. In the **Add Part in History** window, click on the **Part Type** zone **ECM** button.
6. Enter the part serial number in the **Serial Number** zone.
7. Click on the **OK** button.
8. Write MPEM document into the vehicle.

To add a cluster to the replacement history

When adding manually a cluster to the part replacement history, follow these steps:

1. Read MPEM document from the vehicle.
2. Click on the **History** page thumbnail.
3. Click on the **Part Replacement** sub-page thumbnail.
4. Click on the **Add Part in History** button to open the **Add Part in History** window.
5. In the **Add Part in History** window, click on the **Part Type** zone **Cluster** button.
6. Enter the part serial number in the **Serial Number** zone.
7. Click on the **OK** button.
8. Write MPEM document into the vehicle.

History Page

History Page

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Description

The **History** page provides functions that you can use to read and clear module historical data. Depending on the type of vehicle, the following history sub-pages may be available:

- Last 30 Seconds
- Last Minute
- Minimum / Maximum
- Run Time
- RPM Profile
- Part Replacement

RFI History Page

Description

The RFI **History** page displays a graphic of the RPM and throttle opening values that the RFI engine module recorded during the last 60 seconds of engine running.

To refresh the RFI engine history page

When you read a document from the MPEM of a RFI engine, B.U.D.S. automatically reads the last 60 seconds history for you. However, if you run the engine again, you are responsible for updating the document last 60 seconds history, using the **Refresh** button.

Utilities Logon Window

Description

B.U.D.S. provides a **Logon** window that is automatically displayed when you start the software. The logon window contains two pages: the **Technician** page that you use to log on B.U.D.S. and the **Date and Time** page that you can use to set your computer local date and time.

To log on B.U.D.S.

1. Click on the **Technician** page thumbnail.
2. Select your technician name from the **Username** drop down list. If you can't find your name in the list, then ask your administrator to register a username for you.
3. Type your password in the **Password** zone. Note that the password is not case sensitive.

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4. Click on the **OK** button to logon or the **Cancel** button to exit B.U.D.S..

To change your computer's date

1. Click on the **Date and Time** page thumbnail.
2. Click on **Local Date** drop down list to open the calendar.
3. Click on the left and right arrows to navigate through the months.
4. Click a number of the calender to select the date.
5. Verify the date that you selected in the **Local Date** zone.
6. Click on the **Apply** button to set the new date into your computer.

To change your computer's time

1. Click on the **Date and Time** page thumbnail.
2. In the **Local Time** zone:
   - Select the hours and click on the right end arrows to increase or decrease the value.
   - Select the minutes and click on the right end arrows to increase or decrease the value.
   - Select the seconds and click on the right end arrows to increase or decrease the value.
3. Click on the **Apply** button to set the new time into your computer.

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Description

B.U.D.S. / User Interface / Utilities / Logon Window

Starting the Engine

B.U.D.S. provides a function that you can use to enable a RFI engine to start with the DESS® adapter connected to the vehicle.

To enable a RFI engine to start

1. Click on the toolbar **Starting** button.
2. Specify the maximum speed that you want the engine to run at and then click on the **OK** button. Maximum engine speed must be between 1500 and 7080 RPM.
3. Follow the instructions provided by B.U.D.S..

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Description

B.U.D.S. / User Interface / Utilities / Starting the Engine

Stop Engine

On some vehicles, B.U.D.S. provides a function that you can use to stop the engine.

To stop the engine

Click on the toolbar **Stop** button or hit the keyboard space bar.

Note

After the engine is stopped, B.U.D.S. automatically reads the history from the module to ensure that the **History** page contains the latest information available. However, on a RFI vehicle you are responsible for updating the document history, using the **Refresh** button of the **History** page.

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Description

B.U.D.S. / User Interface / Utilities / Stop Engine

ECM Tracking

The ECM stores received data in its *volatile* memory first. In other words, if power is disconnected from the ECM immediatly after you sent new data, then it would be lost. To force the ECM to store received data in its *non-volatile* memory, you must initiate the so called "ECM tracking" procedure.

To initiate the ECM tracking procedure

Whenever you send new data to the ECM, B.U.D.S. displays the **ECM Tracking** message. When you see this message then:

1. Remove the key from the vehicle DESS® post.

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Description

2. Wait until the **ECM Tracking** message disappears from the screen.

To postpone the ECM tracking procedure

1. Press the **Ignore** button.
2. When you will close the document or quit the application, then B.U.D.S. will remind you to initiate the **ECM Tracking** procedure.

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Description

B.U.D.S. / User Interface / Utilities / ECM Tracking

Vehicle Model Missing Window

The **Vehicle Model Missing** window is automatically displayed when B.U.D.S. cannot determine the type of vehicle you are connected to because the vehicle model is missing.

To enter the vehicle model

1. Read MPEM document from the vehicle.
2. Type the vehicle model number in the **Model** zone.
3. Click on the **OK** button to view the modified MPEM document.

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Description

4. If the document does not match the connected vehicle then:

- Close MPEM document and loose your modification.
- Go back to step 1.

5. If the document matches the connected vehicle then:

- Write MPEM document into the vehicle.

Note

The vehicle model must either be "SBOAT", an alphanumerical value or an entirely numerical value.

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Troubleshooting
Using Help

Description

B.U.D.S. provides help topics that you can use to solve utilization problems or learn more about the software. The topics can be browsed using the standard Windows help browser. B.U.D.S. also provides links that you can use to directly open the topics related to the interface component that you are working with.

To open the help browser

Select **Topics** from the **Help** menu or click on the **Help** button from the toolbar.

To open a specific topic

1. Select **What's This?** from the **Help** menu. Note that the cursor shape changes to an arrow with a question mark.

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Description

2. Click on the interface component that you want to open the topic of.

Note

If the interface component that you want to open the topic of is a button or an edit zone, then you can also press the F1 key to perform the same action.

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Phone Numbers

Here is how to reach your BRP® service representative.

Country	Phone number
Canada	800 361-9980
United States	-800-366-6992
Scandinavia	+358 16 3208 111

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Description

For all networks outside of the US, Canada and Scandinavia please consult the following web-site: http://www.brp.com/en/Sales.Network/ to find your local distributor or regional office.

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MPI® not Present

When B.U.D.S. considers that the MPI is not present then it displays the following icon in the status bar:



To find out why the MPI is not present

If you think that B.U.D.S. should see the MPI, then scan the following checklist:

1. Is the MPI properly connected to the computer ?
2. Is the MPI properly powered ?
3. If B.U.D.S. still considers that the MPI is not present then reset the MPI.

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Description

Module not Present

When B.U.D.S. considers that no module is present then it displays the following icon in the status bar:



To find out why no module is present

If you think that B.U.D.S. should see a module, then scan the following checklist:

1. Is the appropriate communication protocol selected ?

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Description

2. Is the module properly connected (VCK, MPI-2) to the MPI® ?
3. Is the battery voltage correct or is the module properly powered ?
4. Is this version of B.U.D.S. compatible with the module ?
5. If B.U.D.S. still considers that no module is present then:

- Disconnect the vehicle's DESS® post key or adapter, wait a few seconds and then reconnect it. You may have to momentarilly press the vehicle's start button.
- On snowmobile MPEM, disconnect power supply adapter and reconnect it.

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Description

Error 001

Upon startup, B.U.D.S. looks into its installation folder to find the dealer name and number that your administrator typed in during the installation of the software. If B.U.D.S. can't find your dealer name and number, then it shows the above message.

Possible cause

The dealer name and number storage file "`BUDS.dat`" has been accidentally altered or destroyed.

Suggested action

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Description

Ask your administrator to reinstall B.U.D.S..

Note

If you reinstall B.U.D.S., none of your MPEM documents that you may have saved into the directory where B.U.D.S. is installed will be destroyed.

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Description

Error 002

Upon startup, B.U.D.S. loads the library file "`commvrb.dll`" that contains all the functions used to communicate with a module. B.U.D.S. searches for the library file in the following sequence:

1. The directory from which B.U.D.S. is loaded.
2. The current directory.
3. The Windows system directory.
4. The Windows directory.
5. The directories that are listed in the PATH environment variable.

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Description

If the library file found during the search sequence is corrupted or obsolete, then B.U.D.S. shows the message above.

Possible causes

1. B.U.D.S. tries to load an older version of the communication library.
2. The communication library has been corrupted.

Suggested actions

1. Launch B.U.D.S. from the **Start** menu.
2. Reinstall B.U.D.S..

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Description

Error 003

Upon startup, B.U.D.S. loads the library file "`commvrb.dll`" that contains all functions used to communicate with a module. B.U.D.S. searches for the library file in the following sequence:

1. The directory from which B.U.D.S. is loaded.
2. The current directory.
3. The Windows system directory.
4. The Windows directory.
5. The directories that are listed in the PATH environment variable.

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Description

If B.U.D.S. cannot find the communication library in none of the above directories, then it shows the message above.

Possible causes

1. B.U.D.S. loaded the library file from an earlier version directory.
2. The file "`commvrb.dll`" was accidentally deleted.

Suggested actions

1. Launch B.U.D.S. from the **Start** menu.
2. Make sure that the library file "`commvrb.dll`" is in the directory where "`BUDS.exe`" resides.
3. Reinstall B.U.D.S..

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Description

Error 201

B.U.D.S. was expecting a particular data from the module but did not receive it or received something else.

Possible causes

1. Bad connection between the MPI® and your computer.
2. Bad connection between the MPI and the module.
3. The module did not recognize your command.

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Description

4. Electrical noise on communication lines.

Suggested actions

1. Verify connections between your computer, the MPI and the module.
2. If you are using a DESS® adapter, maintain a light pressure on it with your hand while executing the command.
3. Try the command again.

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Description

Error 202

B.U.D.S. received all the data that it was expecting from the MPI, but some of it was corrupted.

Possible causes

1. Bad connection between the MPI and your computer.
2. Electrical noise on communication lines.

Suggested actions

® Trademarks of BRP Inc. and/or its subsidiaries.

Description

1. Verify the connections between the MPI and your computer.
2. If you are using a DESS® adapter, maintain a light pressure on it with your hand while executing the command.
3. Try the command again.

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Description

Error 203

The MPI has lost the protocol software that B.U.D.S. loaded upon startup.

Possible causes

1. MPI power source failure.
2. Bad connection between the MPI and your computer.

Suggested actions

® Trademarks of BRP Inc. and/or its subsidiaries.

Description

1. Verify the MPI power sources.
2. Verify the connections between the MPI and your computer.
3. Reset the MPI.

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Description

Error 204

The MPI® received a command that had erroneous parameters.

Possible causes

1. Manipulation error.
2. Internal B.U.D.S. software failure.

Suggested actions

® Trademarks of BRP Inc. and/or its subsidiaries.

Description

1. Try the command again.
2. Call your service representative to report the error.

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Description

Error 205

The MPI® did not detect the MPEM presence signal.

Possible causes

1. Bad connection between the MPI and the MPEM.
2. MPEM internal power switch is off.
3. MPEM power source failure.
4. Electrical noise on communication lines.

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Description

Suggested actions

1. If you are using a DESS® adapter, remove the adapter from the vehicle DESS post, wait for few seconds and then insert the adapter again. Maintain a light pressure on the adapter with your hand while executing the command.
2. On snowmobile MPEM, disconnect power supply adapter and reconnect it.
3. Verify the MPEM power source voltage.
4. Verify all connections between the MPI and the MPEM/ECM (VCK, MPI-2).
5. Try the command again.

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Description

Error 206

B.U.D.S. did not detect the MPI on the serial port it was connected to.

Possible causes

1. Bad connection between your computer and the MPI.
2. MPI power source failure.

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Description

Suggested actions

1. Verify all the connections between your computer and the MPI.
2. Verify the MPI power sources.
3. Try the command again.

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Description

Error 250

The data that the MPI read from its DESS post was corrupted.

Possible causes

1. The key contacts are rusted or dirty.
2. The key is defective.
3. The MPI is defective.

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Description

Suggested actions

1. Maintain a light pressure with your hand on the key while reading it.
2. Try to read the key again.
3. Insert another key on the MPI DESS post.
4. Replace the MPI.

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Description

Error 251

The key inserted on the MPI® DESS® post is shorted.

Possible causes

1. The key contacts are rusted or dirty.
2. The key is defective.
3. The MPI is defective.

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Description

Suggested actions

1. Clean the key contacts.
2. Try to read the key again.
3. Insert another key on the MPI DESS post.
4. Replace the MPI.

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Description

Error 252

The key inserted on the MPI® DESS® post is opened.

Possible causes

1. The key is not completely inserted on the DESS post.
2. The key contacts are rusted or dirty.
3. The key is a DIAGNOSTIC key.
4. The key is defective.

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Description

5. The MPI is defective.

Suggested actions

1. Make sure that the key is completely inserted on the MPI DESS post.
2. Maintain a light pressure with your hand on the key.
3. Clean the key contacts.
4. Try to read the key again.
5. Insert another key on the MPI DESS post.
6. Replace the MPI.

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Description

Error 255

B.U.D.S. tried to read a key from the MPI DESS post, but the MPI did not see it.

Possible causes

1. The key is not completely inserted on the DESS post.
2. The key is defective.
3. The MPI is defective.

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Description

Suggested actions

1. Make sure that the key is completely inserted on the MPI DESS post.
2. Insert another key on the MPI DESS post.
3. Try to read the key again.
4. Replace the MPI.

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Description

Errors 300-308

The MPI® detected an error while communicating with the MPEM using the 947-DI protocol.

Possible causes

1. MPEM internal power switch is off.
2. MPEM power source failure.
3. Bad connection between the MPI and the MPEM.
4. Electrical noise on communication lines.

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Description

5. Incompatible MPI software revision.

Suggested actions

1. Remove the key from the vehicle DESS® post, wait for few seconds and then insert the key again.
2. Verify the MPEM power source voltage.
3. Verify all connections between the MPI and the MPEM/ECM (VCK, MPI-2).
4. Ask your administrator for a B.U.D.S. software upgrade.
5. Try the command again.

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Description

Errors 350-353

The MPI® detected an error while communicating with the MPEM using the DESS protocol.

Possible causes

1. MPEM internal power switch is off.
2. MPEM power source failure.
3. Bad connection between the MPI and the MPEM.
4. Electrical noise on communication lines.

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Description

5. Incompatible MPI software revision.

Suggested actions

1. Remove the adapter from the vehicle DESS post, wait for few seconds and then insert the adapter again.
2. On snowmobile MPEM, disconnect power supply adapter and reconnect it.
3. Verify the MPEM power source voltage.
4. Verify all connections between the MPI and the MPEM/ECM (VCK, MPI-2).
5. Ask your administrator for a B.U.D.S. software upgrade.
6. Try the command again.

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Description

Errors 400-403

The MPI® detected an error while communicating with B.U.D.S. using the Kw2000 protocol.

Possible causes

1. Bad connection between the MPI and your computer.
2. Electrical noise on communication lines.
3. Internal MPI software failure.
4. Internal B.U.D.S. error.

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Description

Suggested actions

1. Verify the connections between the MPI and your computer.
2. Try the command again.
3. Reset the MPI.
4. Call your service representative to report the error.

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Description

Errors 404-411

The MPI® detected an error while communicating with a module using the Kw2000 protocol.

Possible causes

1. Module power source failure.
2. Bad connection between the MPI and the module.
3. Electrical noise on communication lines.
4. Internal MPI failure.

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Description

5. Internal module failure.

Suggested actions

1. Remove the key from the vehicle DESS® post until B.U.D.S. considers that no module is present and then insert the key again. You may have to momentarilly press the vehicle's start button.
2. Verify the module's power source voltage.
3. Verify all connections between the MPI and the module (VCK, MPI-2).
4. Try the command again.
5. Reset the MPI.
6. Call your service representative to report the error.

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Description

Error 500

The MPEM indicates that the diagnostic function that you initiated failed.

Possible cause

Internal MPEM failure.

Suggested actions

1. Try the command again.

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Description

2. Call your service representative to report the error.

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Description

Error 501

The MPEM indicates that you have tried to initiate a diagnostic function while the engine was running.

Suggested action

Stop the engine and then try the function again.

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Description

Error 502

The MPEM indicates that you don't have enough privileges to initiate the requested diagnostic function.

Suggested action

Accept the refusal with humility !

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Description

Error 503

The MPEM indicates that B.U.D.S. initiated a diagnostic function with erroneous parameters.

Possible cause

Internal B.U.D.S. error.

Suggested action

Call your service representative to report the error.

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Description

Error 504

Your diagnostic function request failed because the MPEM is busy.

Suggested actions

1. Unlock the ignition offset angle if it is locked.
2. Make sure that no other diagnostic function is running.
3. Try the function again.

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Description

Errors 505 and 507

The MPEM indicates that the diagnostic function that you initiated is not supported.

Possible cause

You are connected to an old MPEM that does not support new diagnostic functions.

Suggested action

Stop using the function when connected to this old MPEM.

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Description

Error 506

The MPEM indicates that the diagnostic function that you initiated is already in progress.

Suggested action

Wait for the diagnostic function to terminate and then try it again.

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Description

Error 508

The MPEM indicates that B.U.D.S. asked for the status of a diagnostic function that was not running.

Possible cause

Internal B.U.D.S. error.

Suggested actions

1. Shut down the MPEM for few seconds by removing the key from the vehicle DESS® post.

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Description

2. Reinsert the key into the vehicle DESS post.
3. Read the document from the vehicle.
4. Try the function again.
5. Call your service representative to report the error.

® Trademarks of BRP Inc. and/or its subsidiaries.

Description

Error 509

The MPEM indicates that the diagnostic function that you initiated has no hardware attached to it.

Possible cause

You are connected to an old MPEM.

Suggested action

Stop using the function when connected to this old MPEM.

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Description

Error 510

The MPEM indicates that the diagnostic function that you initiated was running, but suddenly failed during the execution.

Possible causes

1. The MPEM input sensor is out-of-range.
2. The MPEM output driver circuit failed.
3. The target component is defective.

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Description

4. The software inside the MPEM failed.

Suggested actions

1. Make sure that the input value is within a valid range.

- If you are resetting the closed TPS, then make sure that the idle speed screw is in contact with the throttle plate stopper and try the command again.

2. Make sure that the target component is not defective.

3. Try the command again.

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Description

Error 550

The data that B.U.D.S. received from the RFI engine module was corrupted or incomplete.

Possible causes

1. Electrical noise on the communication lines.
2. Bad connection between the PC and the MPEM.
3. Incompatible software version into the RFI engine module.

® Trademarks of BRP Inc. and/or its subsidiaries.

Description

Suggested actions

1. Try the command again.
2. Remove the key from the vehicle DESS® post, wait for few seconds and then insert the key again.
3. Verify all connections between the PC and the MPEM/ECM (VCK, MPI-2).

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Description

Error 551

B.U.D.S. considers that the RFI engine module start function failed.

Possible causes

1. Electrical noise on the communication lines.
2. Bad connection between the PC and the MPEM.
3. Incompatible software version into the RFI engine module.

® Trademarks of BRP Inc. and/or its subsidiaries.

Description

Suggested actions

1. Remove the key from the vehicle DESS® post, wait for few seconds and then insert the key again.
2. Verify all connections between the PC and the MPEM/ECM (VCK, MPI-2).
3. Try the command again.

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Description

Error 552

B.U.D.S. considers that the RFI engine module stop function failed.

Possible causes

1. Electrical noise on the communication lines.
2. Bad connection between the PC and the MPEM.
3. Incompatible software version into the RFI engine module.

® Trademarks of BRP Inc. and/or its subsidiaries.

Description

Suggested actions

1. If you need to stop the engine right away, press the vehicle start/stop button.
2. Verify all connections between the PC and the MPEM/ECM (VCK, MPI-2).
3. Try the command again.

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Description

Error 553

B.U.D.S. considers that the RFI engine module real-time initialization function failed.

Possible causes

1. Electrical noise on the communication lines.
2. Bad connection between the PC and the MPEM.
3. Incompatible software version into the RFI engine module.

® Trademarks of BRP Inc. and/or its subsidiaries.

Description

Suggested actions

1. Remove the key from the vehicle DESS® post, wait for few seconds and then insert the key again.
2. Verify all connections between the PC and the MPEM/ECM (VCK, MPI-2).
3. Try the command again.

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Description

Error 554

B.U.D.S. considers that the RFI engine module did not successfully write the new parameter into its memory.

Possible causes

1. Electrical noise on the communication lines.
2. Bad connection between the PC and the MPEM.
3. Incompatible software version into the RFI engine module.

® Trademarks of BRP Inc. and/or its subsidiaries.

Description

Suggested actions

1. Remove the key from the vehicle DESS® post, wait for few seconds and then insert the key again.
2. Verify all connections between the PC and the MPEM/ECM (VCK, MPI-2).
3. Try the command again.

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Description

Error 200

B.U.D.S. could not open any of your computer's serial port for communicating with the MPI®.

Possible causes

1. Your computer serial ports are all used by other applications.
2. Your type of computer serial ports are not supported by B.U.D.S..
3. Your computer serial ports are defective.

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Description

Suggested actions

1. Connect the MPI to another serial port.
2. Close all applications that may use the serial ports.
3. Restart your computer in order to reinitialize the serial ports.
4. Make sure that your computer serial ports are based on one the following UART:
   - 8250 / 16450 / 16550 / 16650 / 16750 or 16850.

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Diagnostic Kits

We have several kits of equipment to sell to final consumers, varying only the number of cables and adapters.
Equipment for the diagnosis of all BRP vehicles, including: **SeaDoo Jetski and Jetboats, ATV and SSV Can Am, Spyder Roadster, snowmobiles Skidoo**.

This equipment allows independent garages to be on the same level of diagnostic capabilities as authorized BRP concessionaires!
The software and equipment are the same as used in any workshop BRP authorized in the world.

Diagnostic Kit supplied with the latest B.U.D.S. programs + license key that opens the possibilities of the program.
The cost of equipment for the diagnosis depends on the type of vehicle, and on the validity of the license key.

We can supply all licenses for the current **MPI-1** and **MPI-2** adapters with various expiration dates!

We also have available diagnostic kits for **Jetski and outboards Yamaha** (YDS 1.33), and **Evinrude outboard motors** (p / n 5008689 + updates).

For questions on purchasing diagnostic equipment please email to admin@diag-systems.net.

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BRP Diagnostic Kit

BRP Diagnostic Kit intended for diagnostic of **all** models of BRP vehicles (PWC and Sport Boats SeaDoo, snowmobiles SkiDoo, ATV and SSV / VCC Can Am, Spyder Roadster).

Included:

1. P/n 529036018: ***MPI-2 Interface*** (for the diagnosis of all BRP vehicles).
2. P/n 710000851: ***Diagnostic Cable*** (for connection of MPI-2 Interface to 4-TEC, ETEC vehicles).
3. P/n 529036019: ***DESS Post Interface*** (for diagnosis of all 2-stroke vehicles (carb., EFI, DI, RFI), for programing DESS-keys for 2-stroke and 4-stroke*. Works in conjunction with the MPI-2 Interface).
4. P/n 529035904: ***DESS Adapter*** (for connection of DESS Post Interface to some** 2-stroke vehicles).
5. Most recent software **B.U.D.S.** (downloadable archives).
6. **License key for B.U.D.S.**

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Diagnostic Kits / BRP Diagnostic Kit / /

This diagnostic kit can be used to diagnosis and to program keys for all BRP vehicles: all ***PWC SeaDoo .*** all ***Sport Boats SeaDoo***.

- all ***Snowmobiles Skidoo, Lynx***. all ***ATV Can Am***.
- all ***SSV / VCC Can Am***.
- ***Spyder Roadster***.
-
-
- * The necessity of using DESS Post Interface for programing keys, can be determined from BUDS Chart.

** Can be determined from BUDS Chart.

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Diagnostic Kit 4-TEC (SeaDoo, SkiDoo)

Diagnostic Kit 4-TEC (SeaDoo, SkiDoo) is intended for diagnostic of all 4-TEC, E-TEC BRP vehicles, and to programming DESS keys for 4-TEC SeaDoo and SkiDoo. Included:

1. P/n 529036018: ***MPI-2 Interface*** (for the diagnosis of all BRP vehicles).
2. P/n 710000851: ***Diagnostic Cable*** (for connection of MPI-2 Interface to 4-TEC, ETEC vehicles).
3. ***DESS 4-TEC Interface*** (for programing DESS keys *).
Unlike the original DESS Post interface (P / n 529 036 019), this device allows you to add keys only for 4-TEC vehicles. This allowed to reduce the cost of Diagnostic Kit for owners of 4-TEC vehicles.
4. Most recent software **B.U.D.S.** (downloadable archives).
5. **License key for B.U.D.S.** .

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Diagnostic Kits / Diagnostic Kit 4-TEC (SeaDoo, SkiDoo) / /

This diagnostic kit can be used to diagnosis and to program keys* for all 4-TEC/E-TEC vehicles:

- ***PWC SeaDoo 4-TEC/ E-TEC*** **.
- ***Sport Boats SeaDoo 4-TEC/ E-TEC*** **.
- ***Snowmobile Skidoo, Lynx 4-TEC/ E-TEC***
- *. all ***ATV Can Am***.
- all ***SSV / VCC Can Am***.

® Trademarks of BRP Inc. and/or its subsidiaries.

Spyder Roadster.

* The necessity of using DESS Post Interface (or DESS 4-TEC Interface) for programing keys, can be determined from BUDS Chart.

** In all models **SeaDoo** with "**I-control**" (GTX limited (iS) and RXT (iS)), including all ***Sport Boats*** 1503-210 and 230, since 2010) the DESS keys are encoded directly on the safety switch of vehicle, without DESS Post Interface.

BUY NOW

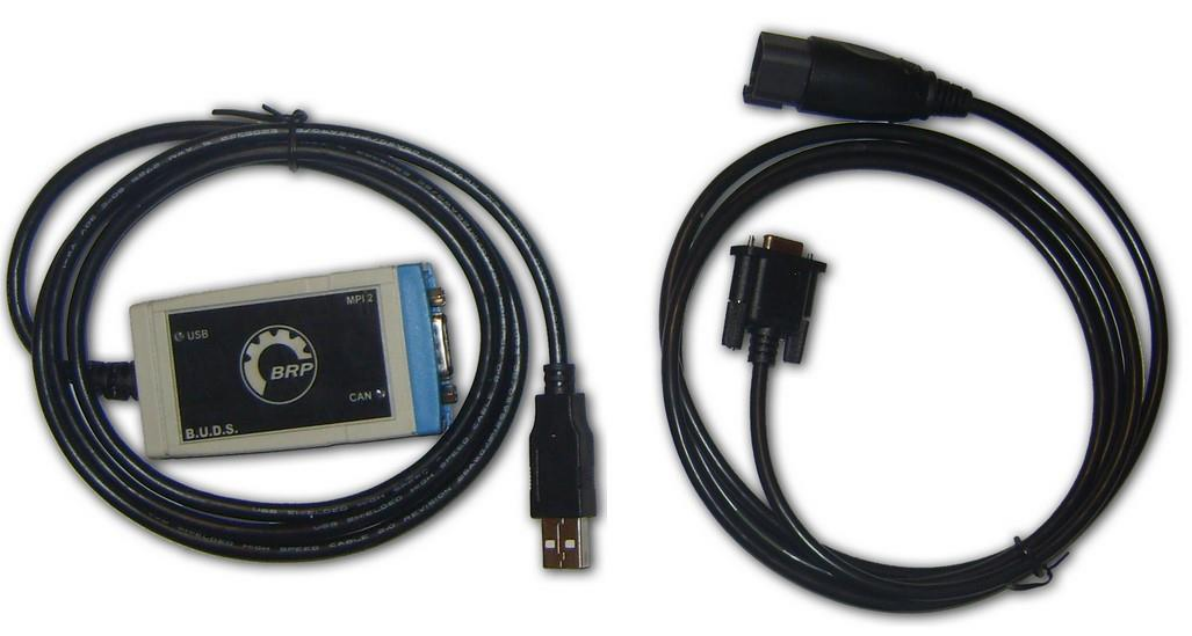
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Diagnostic Kit All 4-TEC

Diagnostic Kit All 4-TEC intended for diagnostic of all 4-TEC and E-TEC BRP vehicles.

Included:

1. P/n 529036018: ***MPI-2 Interface*** (for the diagnosis of all BRP vehicles).
2. P/n 710000851: ***Diagnostic Cable*** (for connection of MPI-2 Interface to 4-TEC, ETEC vehicles).
3. Most recent software **B.U.D.S.** (downloadable archives).
4. **License key for B.U.D.S.** .



This diagnostic kit can be used to diagnose the following vehicles:

- ***PWC SeaDoo 4-TEC/ E-TEC.***
- ***Sport Boats SeaDoo 4-TEC/ E-TEC***.
- ***Snowmobile Skidoo, Lynx 4-TEC/ E-TEC***.
- all ***ATV Can Am***.
- all ***SSV / VCC Can Am***.
- ***Spyder Roadster***.

Note.

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In all models **SeaDoo** with "**I-control**" (GTX limited (iS) and RXT (iS)), including all ***Sport Boats*** 1503-210 and 230, since 2010) the DESS keys are encoded directly on the safety switch of vehicle, without DESS Post Interface.

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Diagnostic Kits / Diagnostic Kit All 4-TEC / /

License Keys description

Each MPI adapter has a unique serial number.
The license key is based on the serial number of the MPI adapter and the current date.

Depending on the version of B.U.D.S. and the type of the license the program opens the relevant functions of the program.

We can supply all licenses for the **MPI-1** and **MPI-2** with various current expiration dates!

B.U.D.S. License Keys description

1. **PWC** - diagnosis of personal watercrafts **only**.
2. **SeaDoo** - diagnosis of sport boats **only**.
3. **Skidoo** - diagnosis of snowmobiles.
4. **ATV** - diagnosis of Quads.
5. **SSV** - diagnostic of Side-By-Side.
6. **Roadster** - diagnosis of tricycles.
7. **PWC&SeaDoo** - diagnosis of personal watercraft **+** sport boats.
8. **All Dealers License keys** (Skidoo + SeaDoo + PWC + ATV + Roadster + SSV).
9. **Megatech License key** (enhanced diagnostic mode) : includes All Dealers keys, Developer key, Engineer key, Megatech key.

Validity:

- 1 year
- 2 years
- 5 years
- 10 years

If you want to try any license key, please, e-mail to us and specify the serial number of your **MPI-2** adapter and the type of license that you want to try.

In reply we will send you a trial license key (7days).

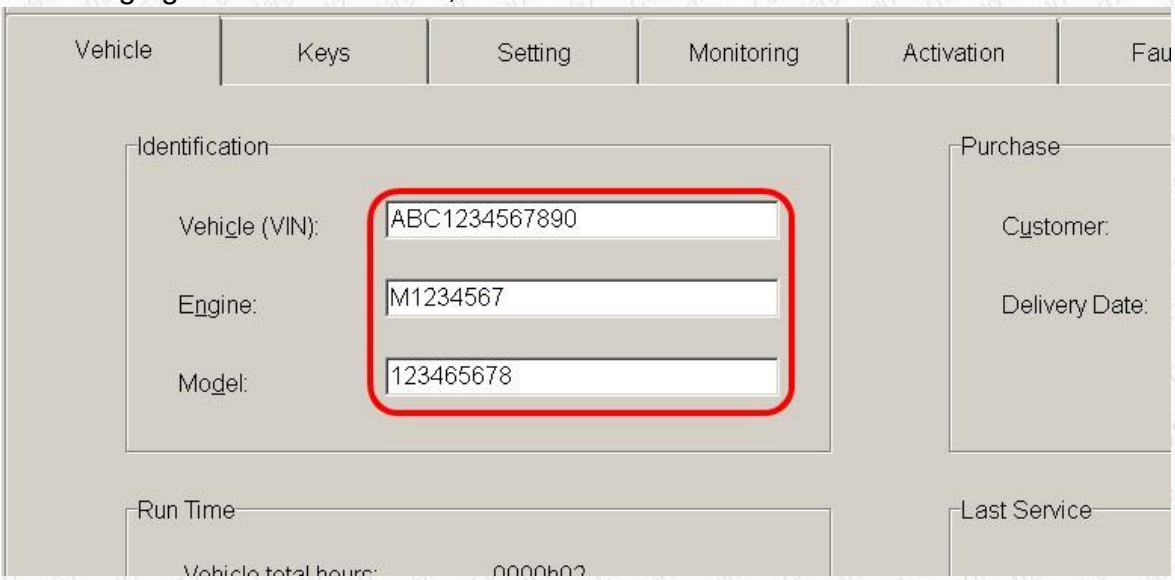
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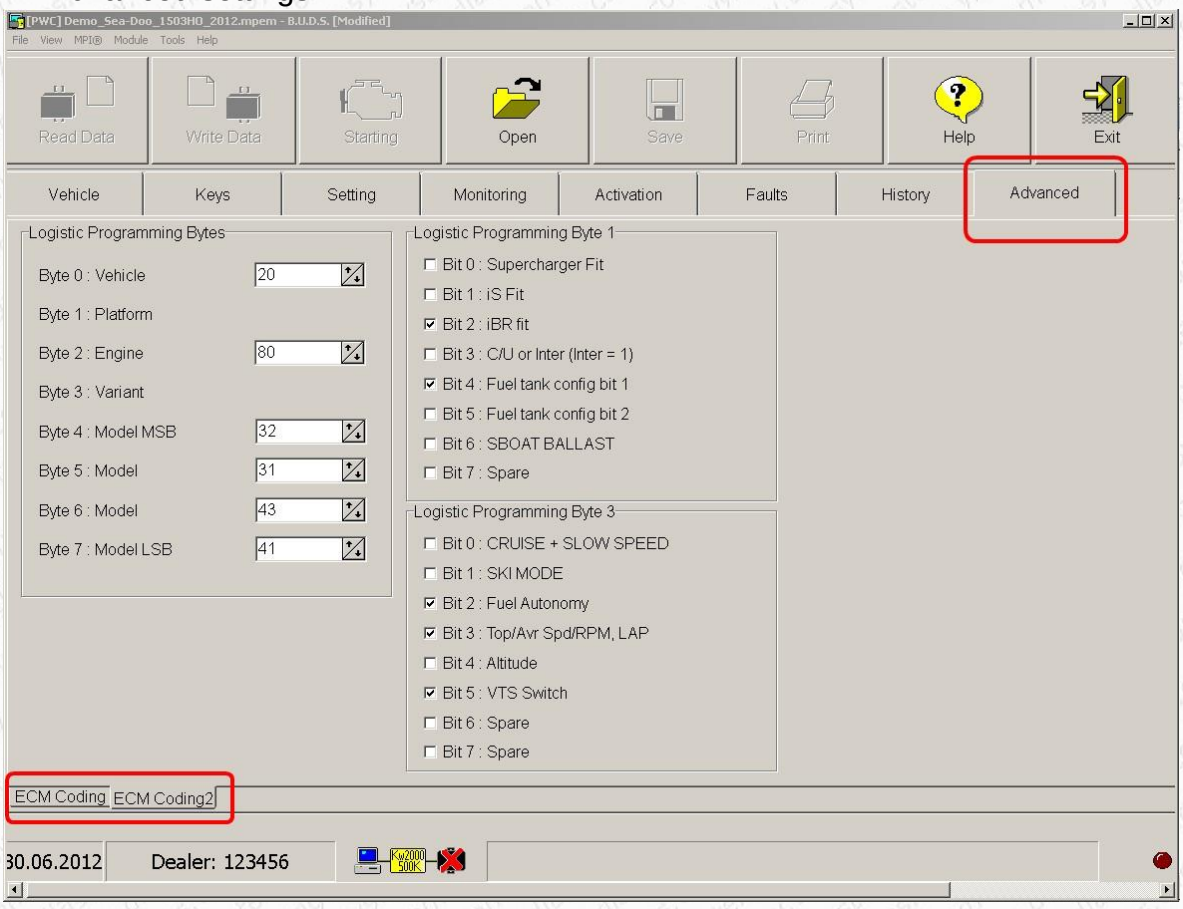
MEGATECH

Megatech License Features

1. Changing of the VIN number, MODEL number.

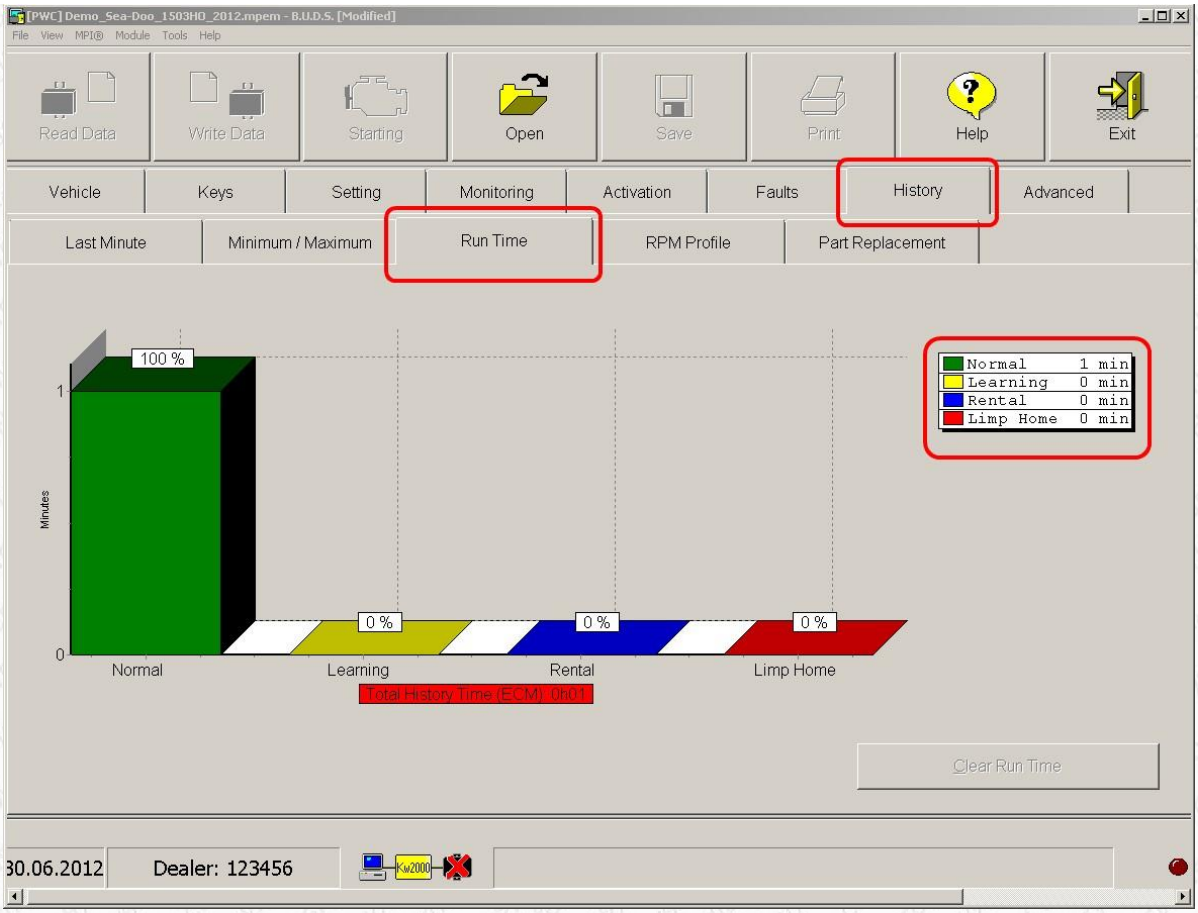


2. Advanced settings.

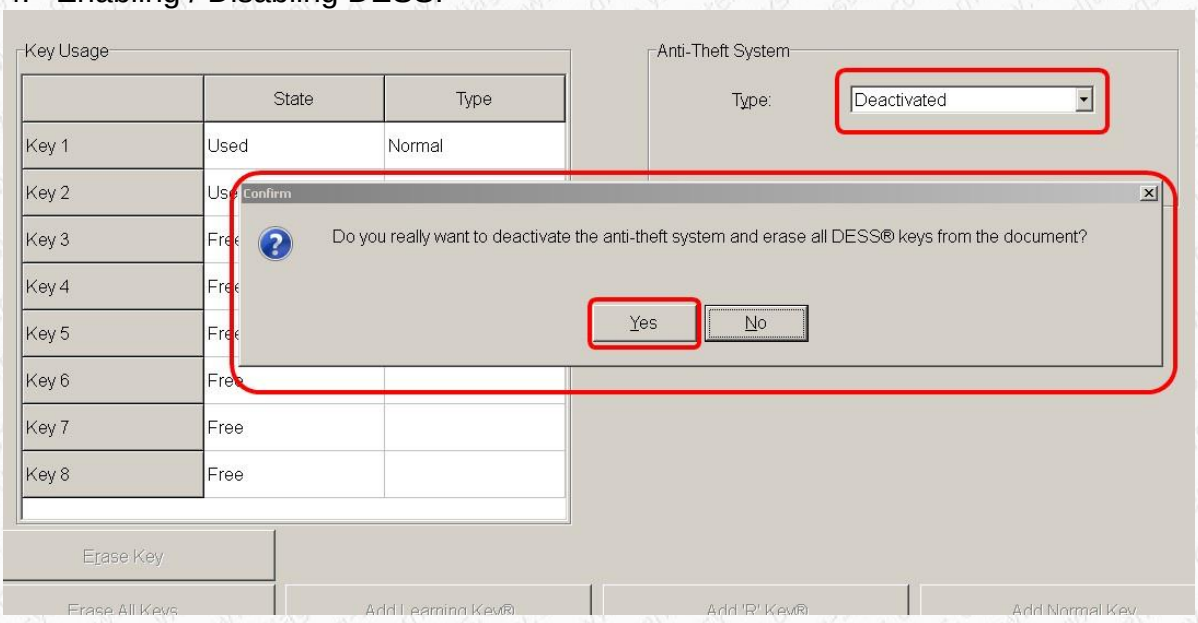


3. View stories in hours, rather than percentage.

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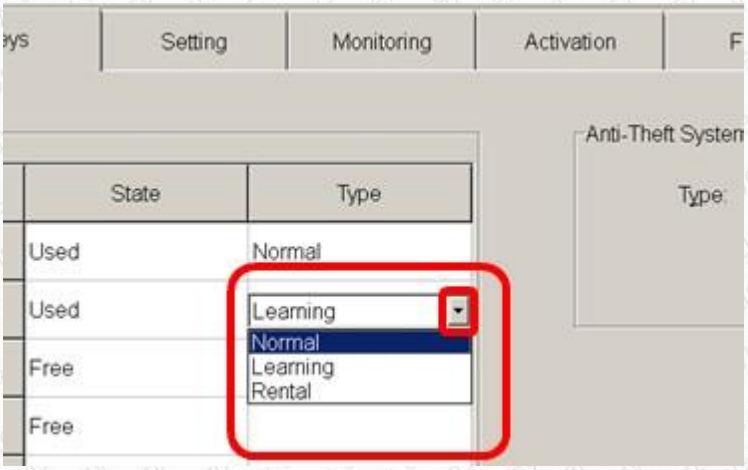


4. Enabling / Disabling DESS.

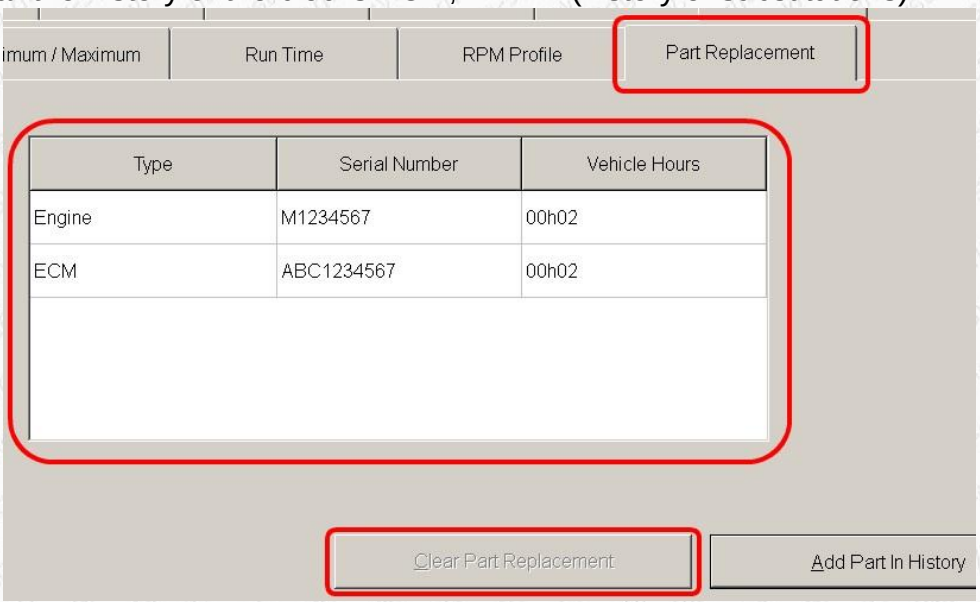


5. Change the key type without reprogramming (normal, learning, rental).

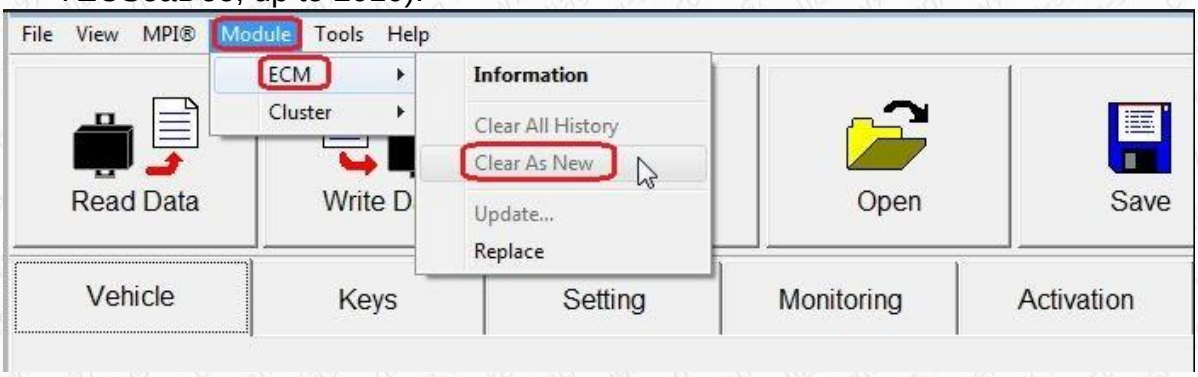
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6. Clear the history of the blocks ECM, MPEM (history of substitutions).

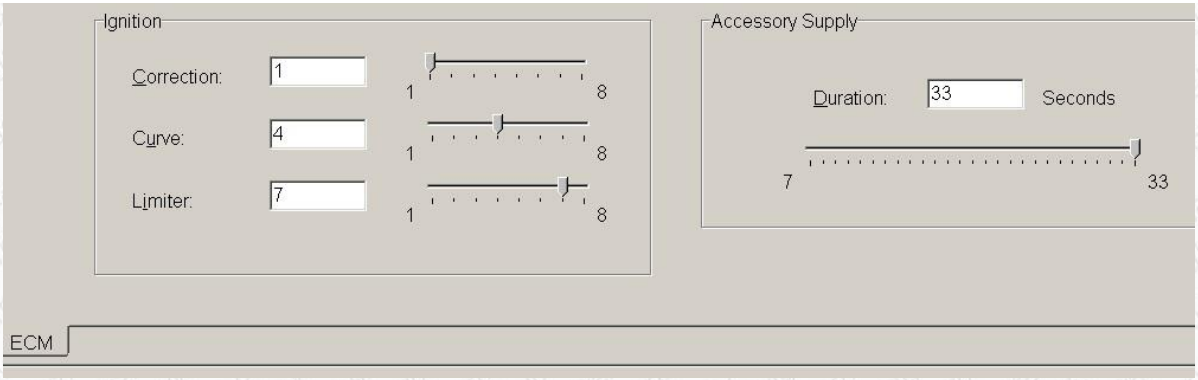


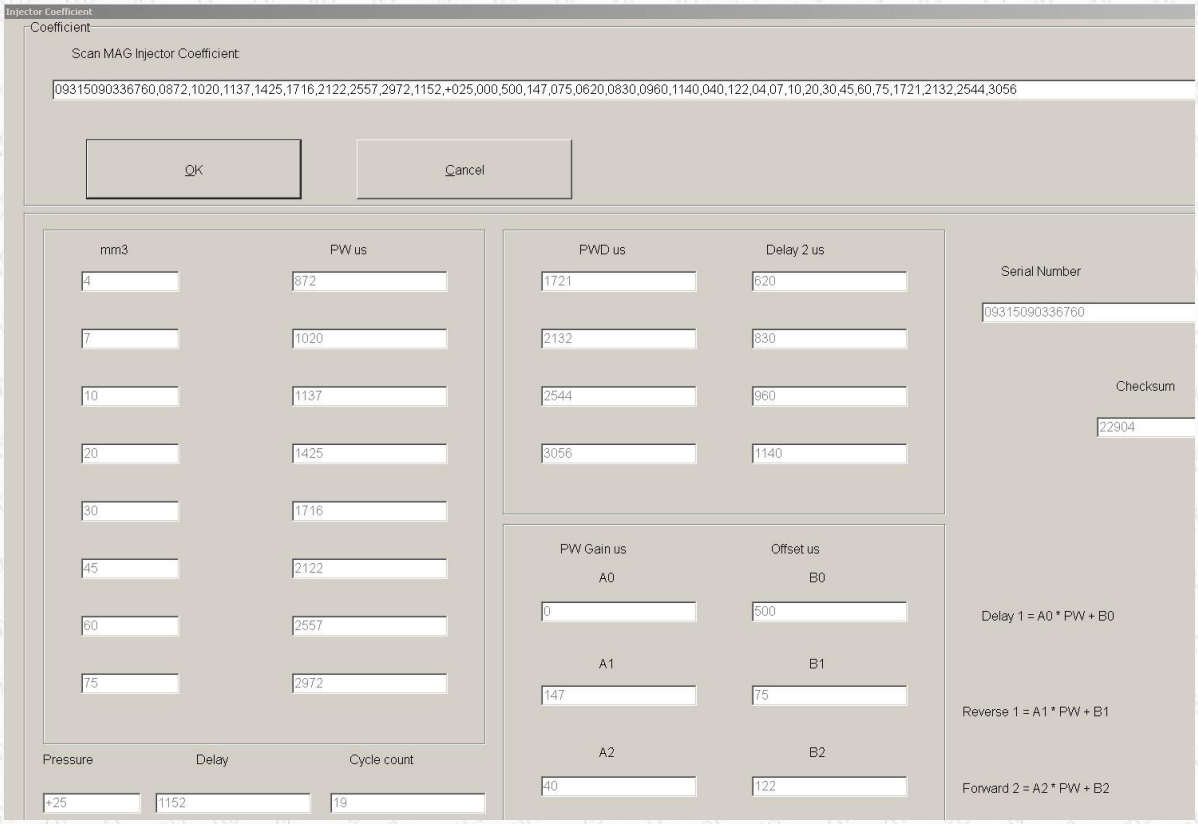
7. Cleaning unit ECM, MPEM, CLUSTER "as new" (resetting the hours on 4-TECSeaDoo, up to 2010).



8. View more information blocks.
9. Installing Secure Code.
10. Edit curves for 2-Stroke vehicles and new E-TEC (Skidoo).

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Validity:

- 1 month
- 3 months
- 6 months
- 1 year
- 2 years
- 5 years
- 10 years

If you want to try any license key, please, e-mail to us and in your message specify the serial number of your MPI-2 adapter and the type of license that you want to try. In reply we will send you a trial license key (7days).

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Clear As New Caution

In this manual shows step-by-step how to put ECM and CLUSTER modules to its initial state "As New" (zeroing of total hours for SeaDoo 4-TEC).
This option is available in the program B.U.D.S. only with the privilege Megatech.
For purchasing a license key MEGATECH - please email us to admin@diag-systems.net.

Warning!!!

Warning!!!

Warning!!!

All actions you perform at your own risk!

Perform all operations on the vehicle with a fully charged battery!

Perform all operations on a laptop with a fully charged battery!

All data of the blocks will be deleted!

All data of registered DESS-keys will be deleted from the memory of module ECM. Therefore, before executing of this procedure, make sure that you have available **DESS Post interface** for further registering **DESSkeys**.

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1. Preparations

1.1. Provide a stable power supply 12 volts of the vehicle (the battery of the vehicle must be fully charged).

1.2. Connect your **PC** to a reliable power supply. We recommend that you use a **laptop** with a fully charged battery.

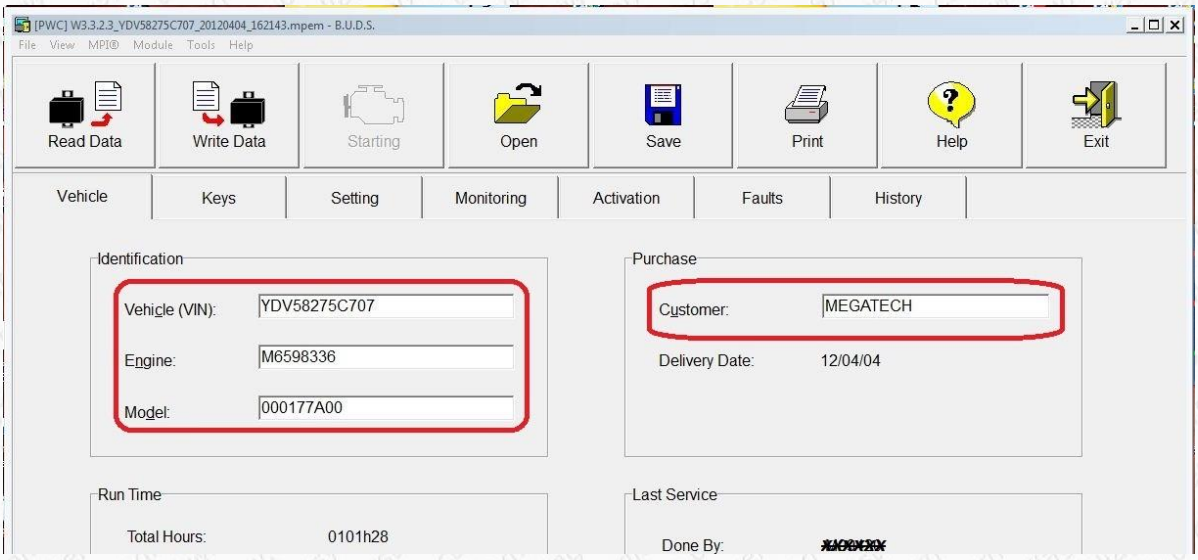
1.3. Connect the **MPI-2 interface** to the USB port on your PC/laptop.

1.4. Check the cleanliness of the **diagnostic connector contacts** of the vehicle. Connect the **Diagnostic Cable** to **MPI-2 interface** and to the **diagnostic connector** of the vehicle.

1.5. Place the **DESS-key** on the **DESS Post** (Safety Switch**)** of the vehicle.

1.6. Launch **B.U.D.S.** program with the privilege **Megatech**.

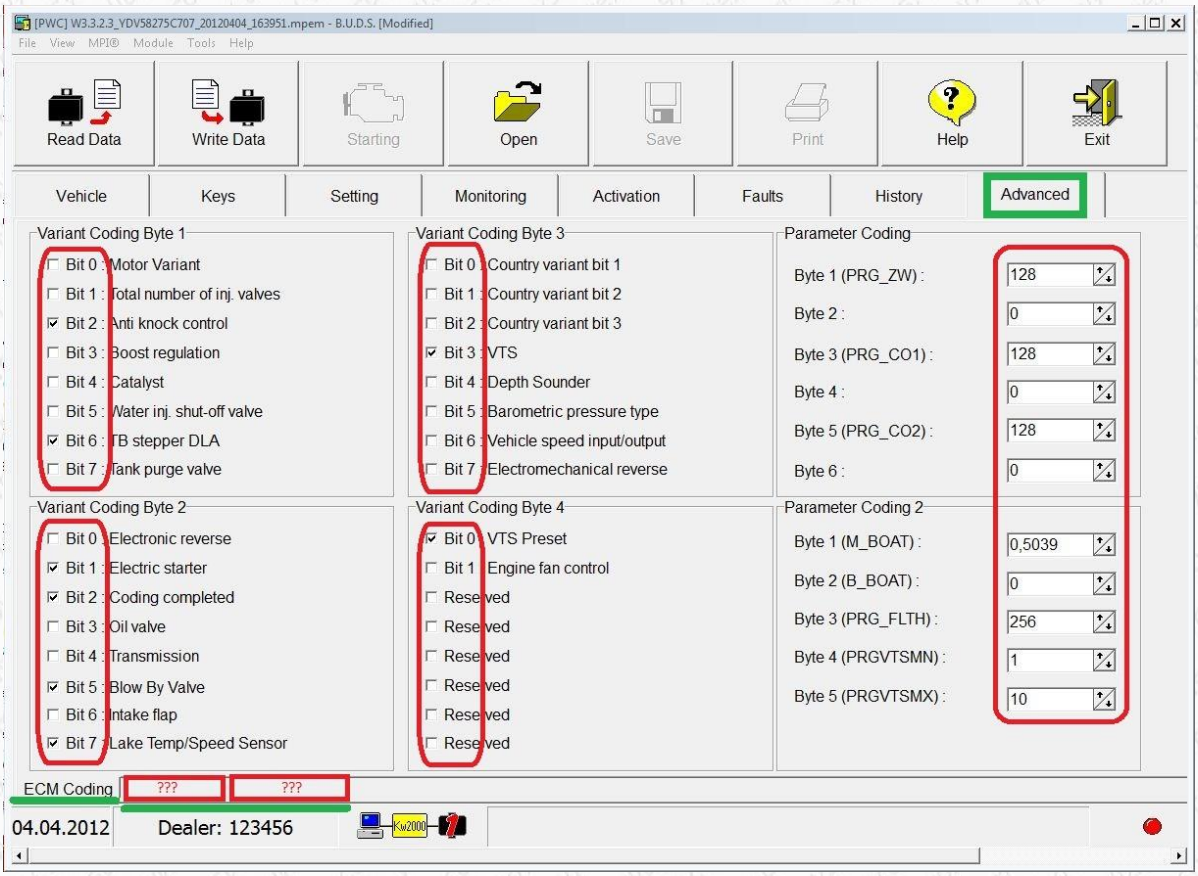
1.7. Write down on paper or make and save a screen-shot of existing data of your vehicle (the user data: **VIN, Engine, Model and Customer Name**).



License Keys / MEGATECH / Clear As New / 1. Preparations

1.8. Write down on paper or make and save a screen-shot of existing **advanced data** of your vehicle (model's configuration: tab "**Advanced**").

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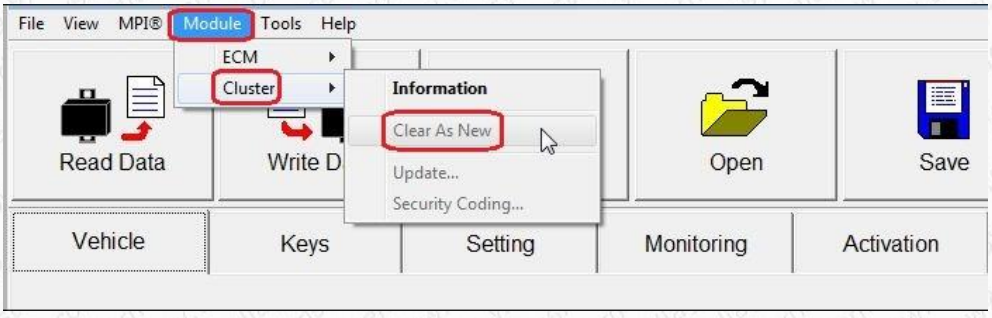


1.9. If near the tab "**ECM Coding**" are more tabs **???** , you need to save all those data too.

License Keys / MEGATECH / Clear As New / 1. Preparations

2. Clearing

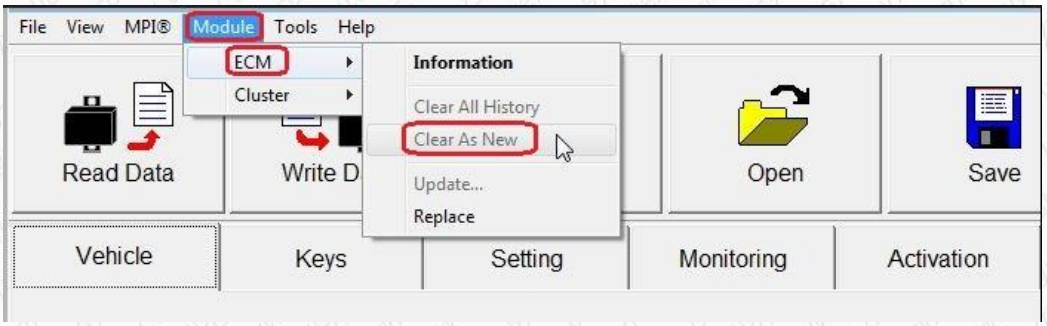
2.1. In the top menu select the tab "**MODULE**". In the drop-down list, select the "**Cluster**" a "**Clear As New**".



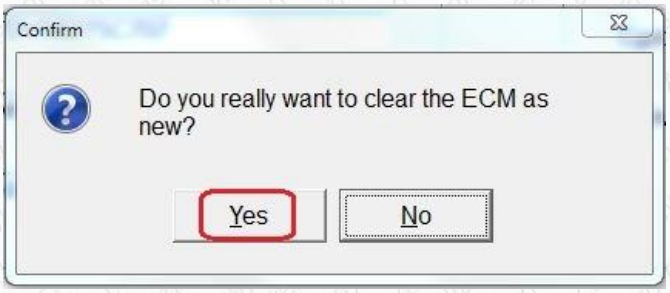
In the next window click "**OK**".

2.2. In the top menu select the tab "**MODULE**". In the drop-down list, select the "**ECM**" a "**Clear As New**".

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2.3. Confirm your choice.



2.4. Click on "**OK**" to continue.



License Keys / MEGATECH / Clear As New / 2. Clearing

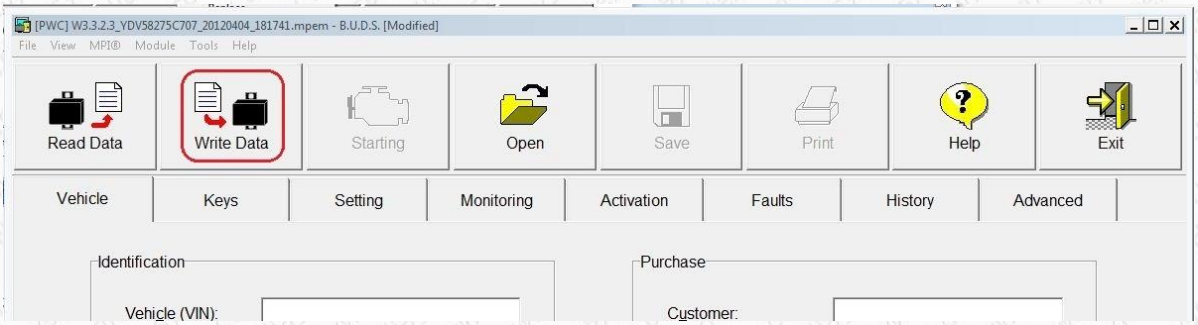
2.5. Remove **DESS-key** from the vehicle post and wait. It may take a few (3 - 5) minutes.



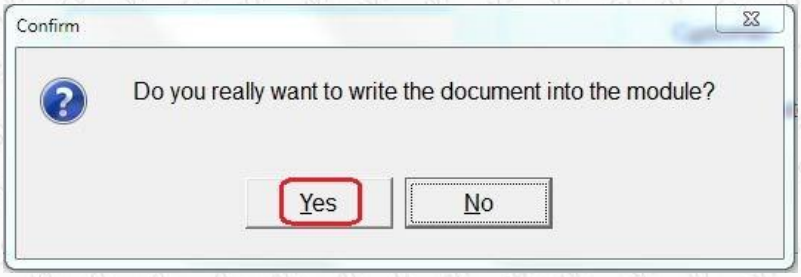
After the message disappear, insert the **DESS-key** again.

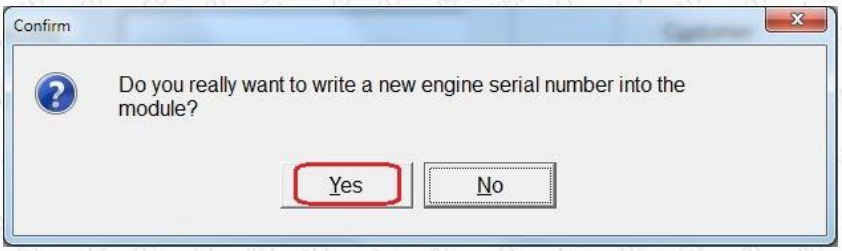
2.6. Click on "**Write Data**".

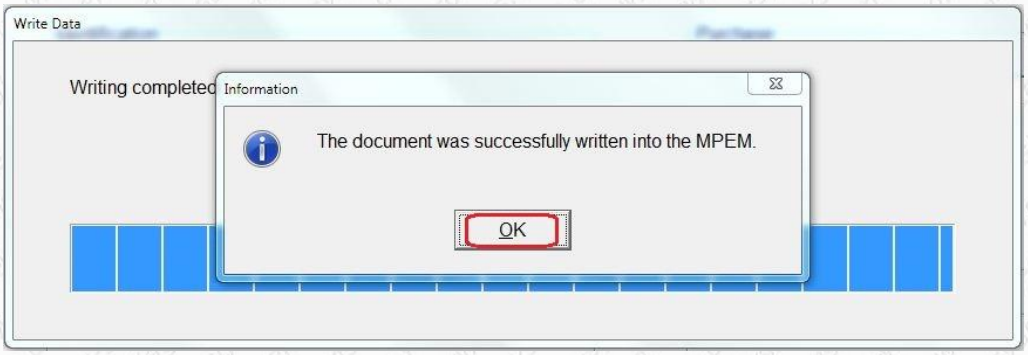
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2.7. Confirm your choice.







2.8. Close the program by clicking on “**Exit**”.

License Keys / MEGATECH / Clear As New / 2. Clearing

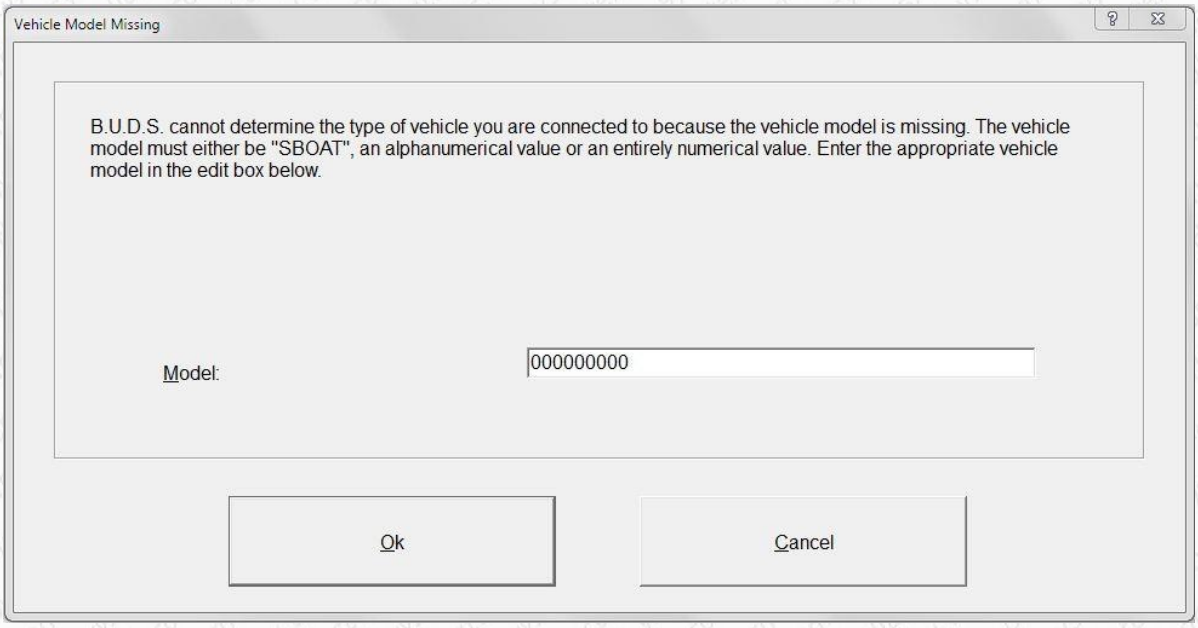
3. Recover user data

3.1. Launch **B.U.D.S.** program with the privilege **PWC Dealer&Sport Boat Dealer**.

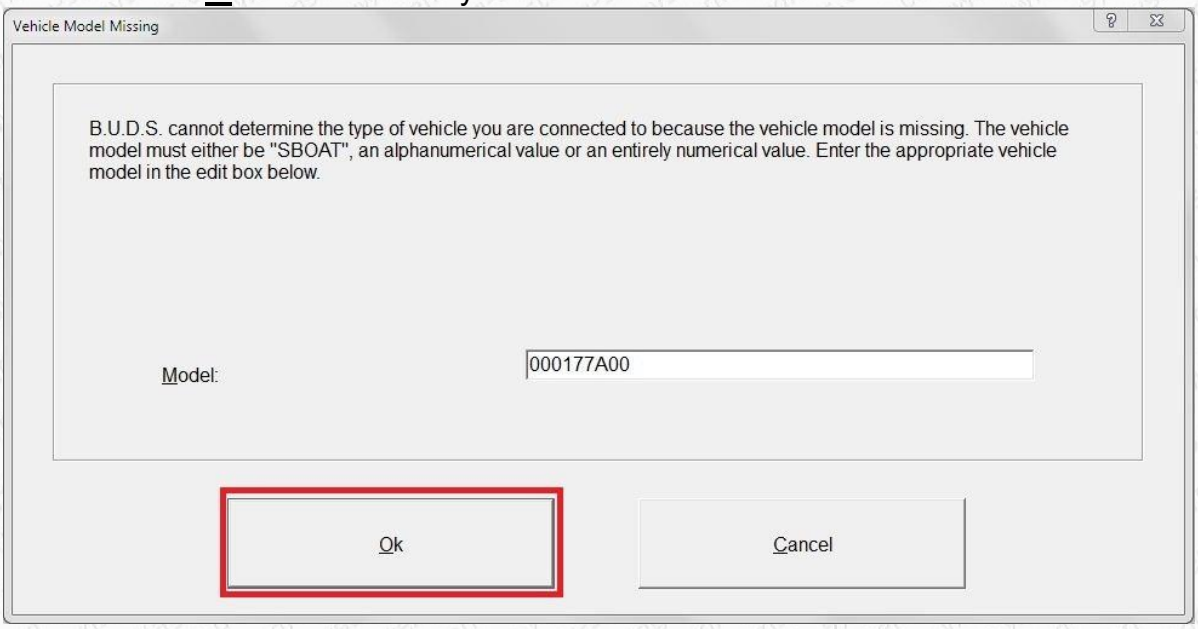


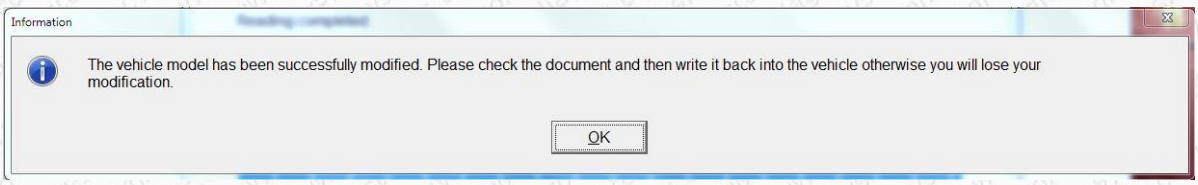
3.2. Click on “**Read Data**”.

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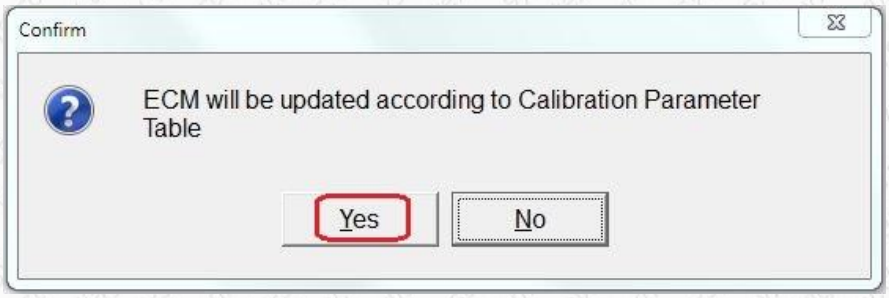


3.3. Enter the **Model** number of your vehicle and click on "**OK**".

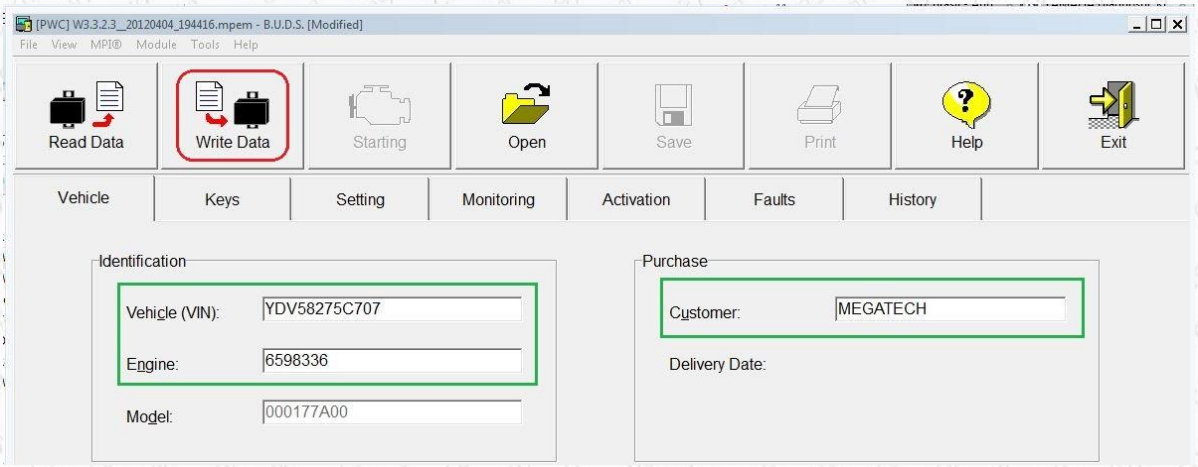




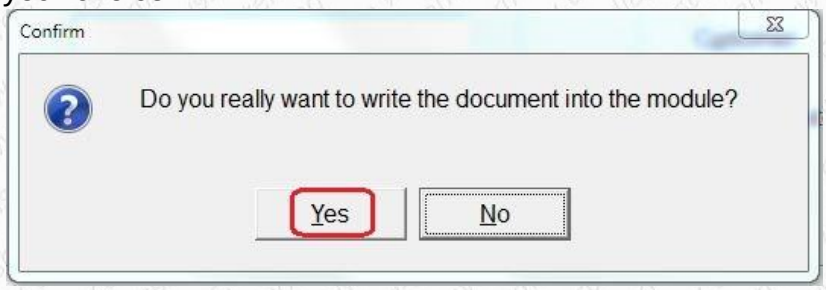
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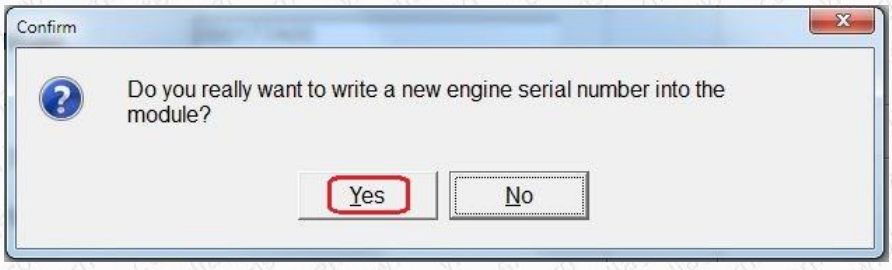


3.4. Enter the **VIN** number, **Engine** number, **Customer** Name and click on "**Write Data**".



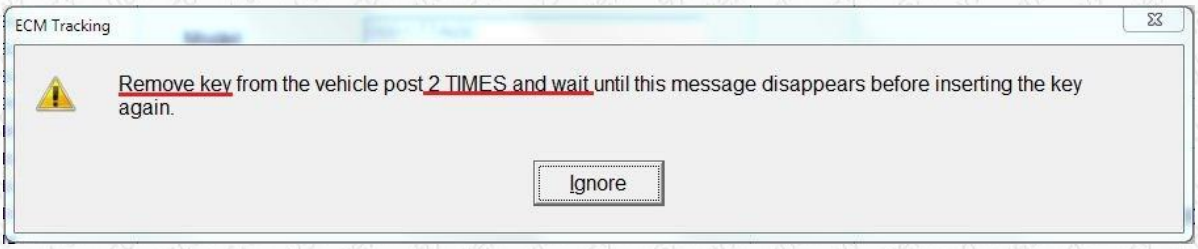
3.5. Confirm your choice.





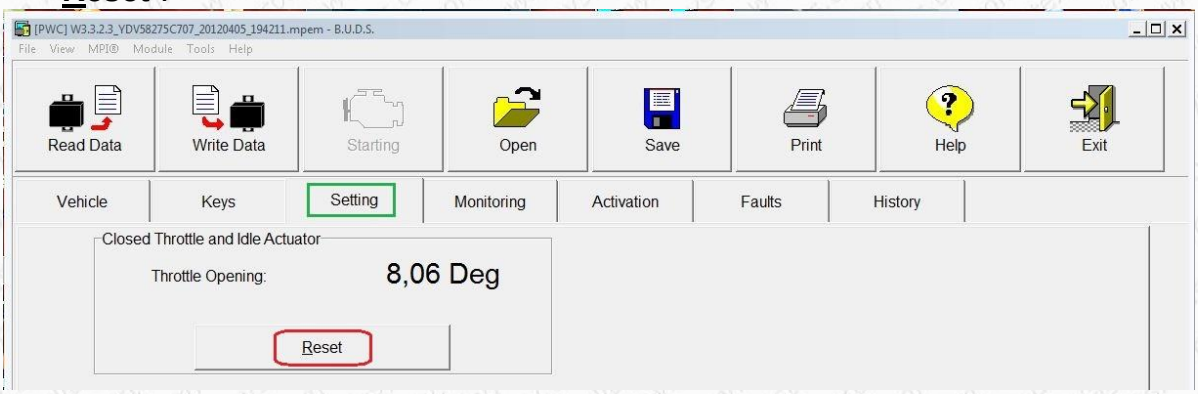
3.6. Remove **DESS-key** from the vehicle post **2 TIMES** (remove – insert - remove) and wait.

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After the message disappear, insert the **DESS-key** again.

3.7. Click the tab "**Settings**" and make resetting the throttle position by clicking "**Reset**".



3.8 Remove **DESS-key** from the vehicle post and wait.



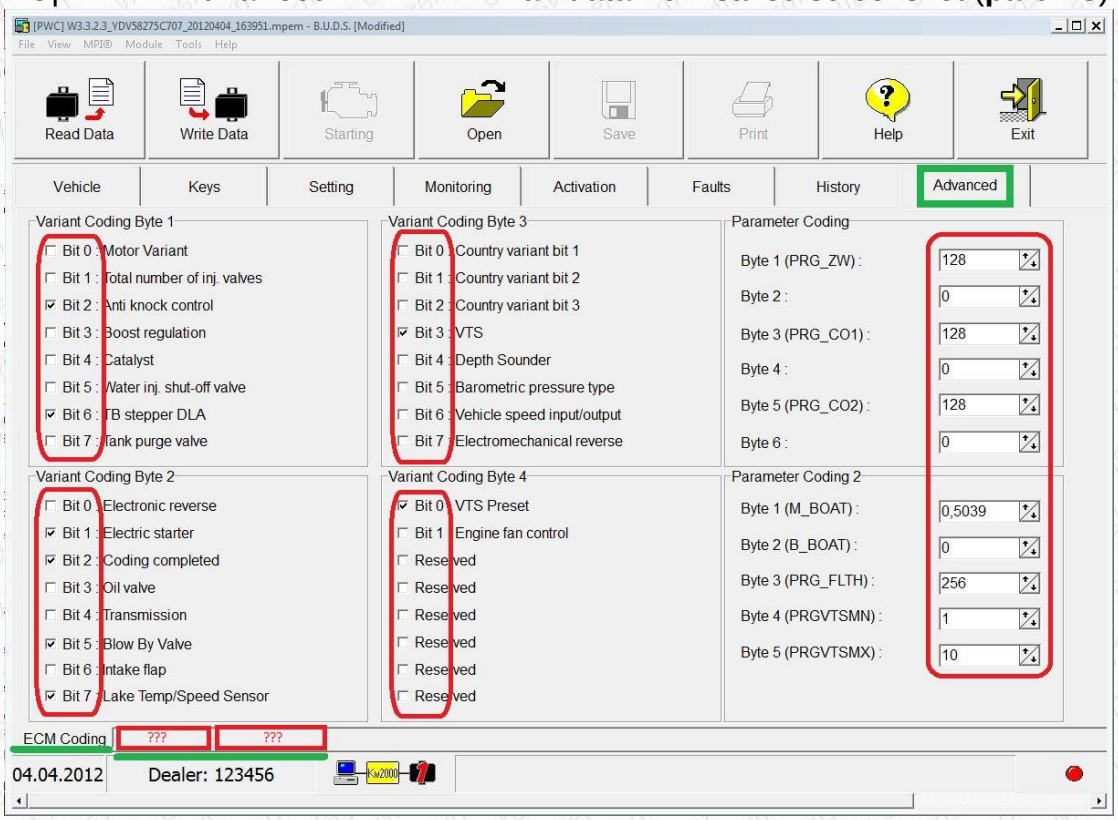
After the message disappear, insert the **DESS-key** again and close **B.U.D.S.** by clicking on "**Exit**".

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4. Recover model configuration

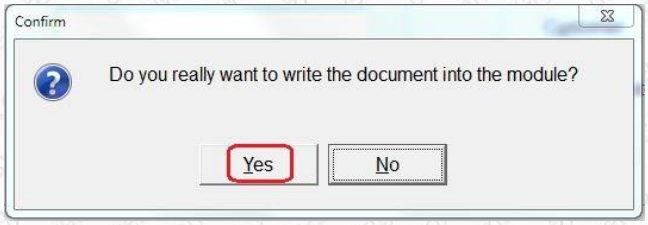
4.1. Run **B.U.D.S.** program with the privilege **Megatech**.

4.2. Open tab "**Advanced**" and restore **all data** from saved screenshot (**part 1.8**).

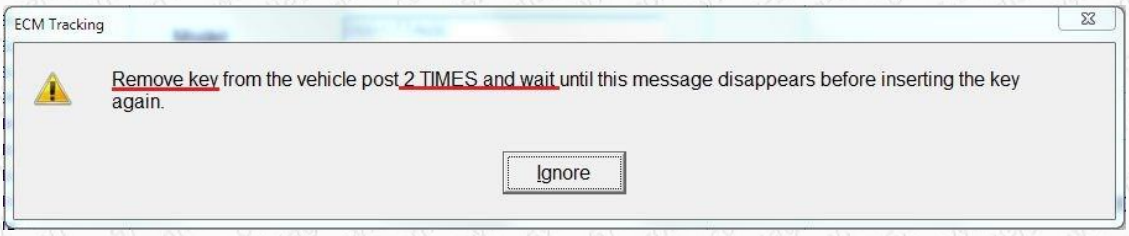


4.3. Click on "**Write Data**".

4.5. Confirm your choice.



4.6. Remove **DESS-key** from the vehicle post **2 TIMES** (remove – insert - remove) and wait.



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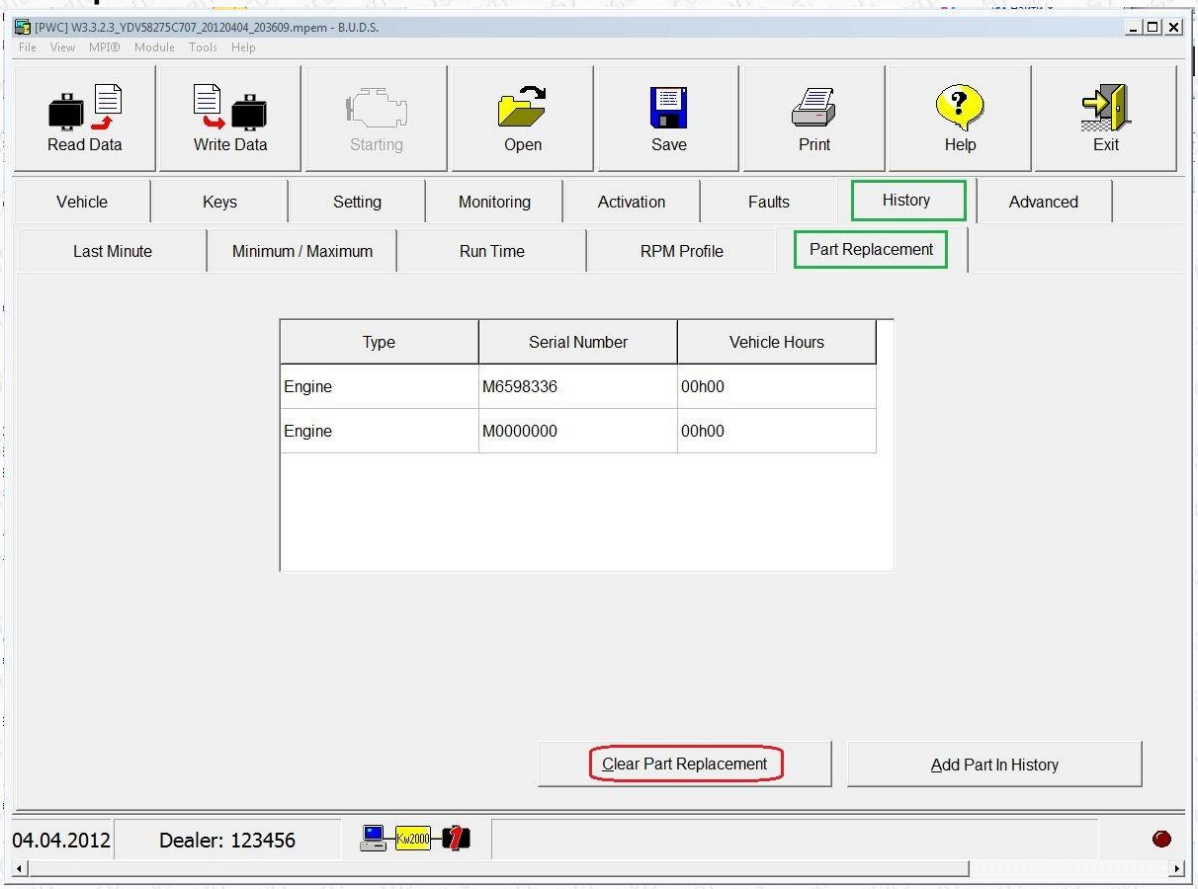
After the message disappear, insert the **DESS-key** again.

If near the tab “**ECM Coding**” are more tabs, you need to restore all those data too, by repeating of steps 4.2 – 4.6 .

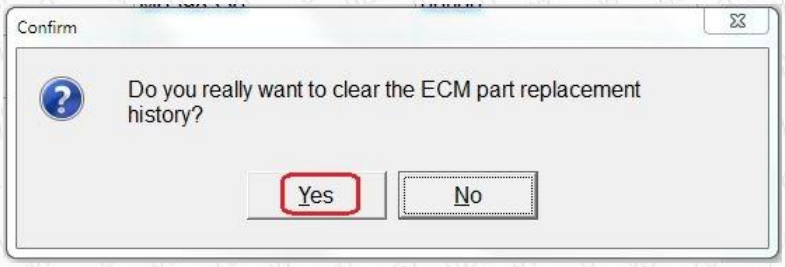
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5. Resetting the parts replacement history

5.1. Open tab “**History**”, sub-tab “**Part Replacement**” and click on “**Clear Part Replacement**”.



5.2. Confirm your choice.



5.3. Remove **DESS-key** from the vehicle post and wait.



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After the message disappear, insert the **DESS-key** again and close **B.U.D.S.** by clicking on "**Exit**".

License Keys / MEGATECH / Clear As New / 5. Resetting the parts replacement history

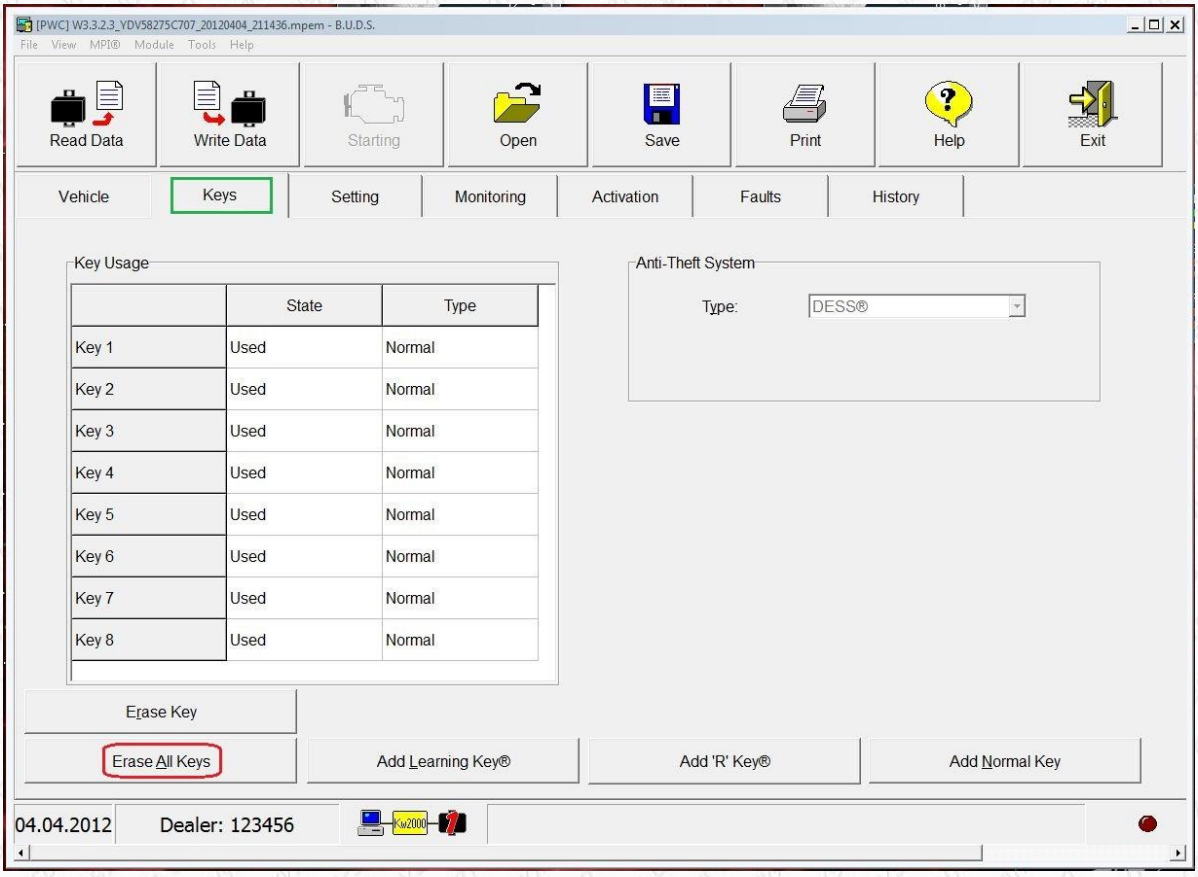
6. Add DESS-keys

To add a DESS key into the module, use the **DESS Post Interface**.

6.1. Connect **DESS Post Interface** to **MPI-2 interface** and to the **diagnostic connector** of the vehicle.

6.2. Run the **B.U.D.S.** program with the privilege **PWC Dealer & Sport Boat Dealer**.

6.3. Open the tab "**Keys**" and click on "**Erase All keys**".



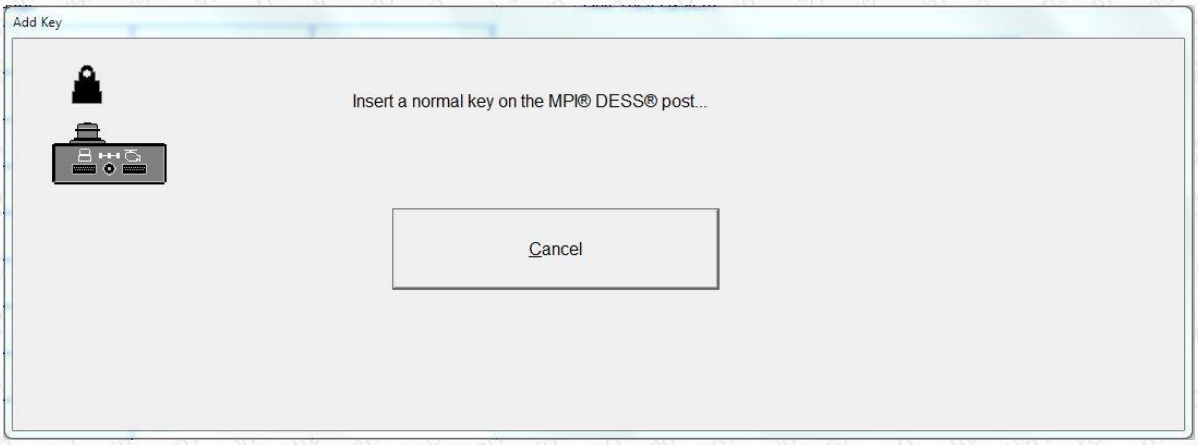
6.4. Confirm your choice.



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6.5. Click on the **Add Key** button. For some vehicles, click on the **Add Normal Key** or **Add Learning Key®** button.

License Keys / MEGATECH / Clear As New / 6. Add DESS-keys



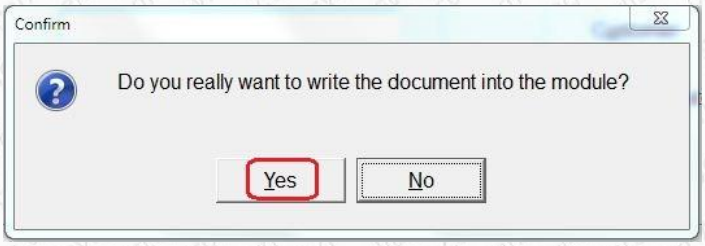
6.6. Insert a key on the **DESS Post Interface**.



6.7. Click "**OK**" and remove ***key*** from ***DESS Post Interface***.
Repeat steps 6.5. - 6.7. for each key that you want to add.

6.8. Write MPEM document into the vehicle. Click on "**Write Data**".

6.9. Confirm your choice.



6.10. Remove **DESS-key** from the vehicle post and wait.



After the message disappear, insert the **DESS-key** again.

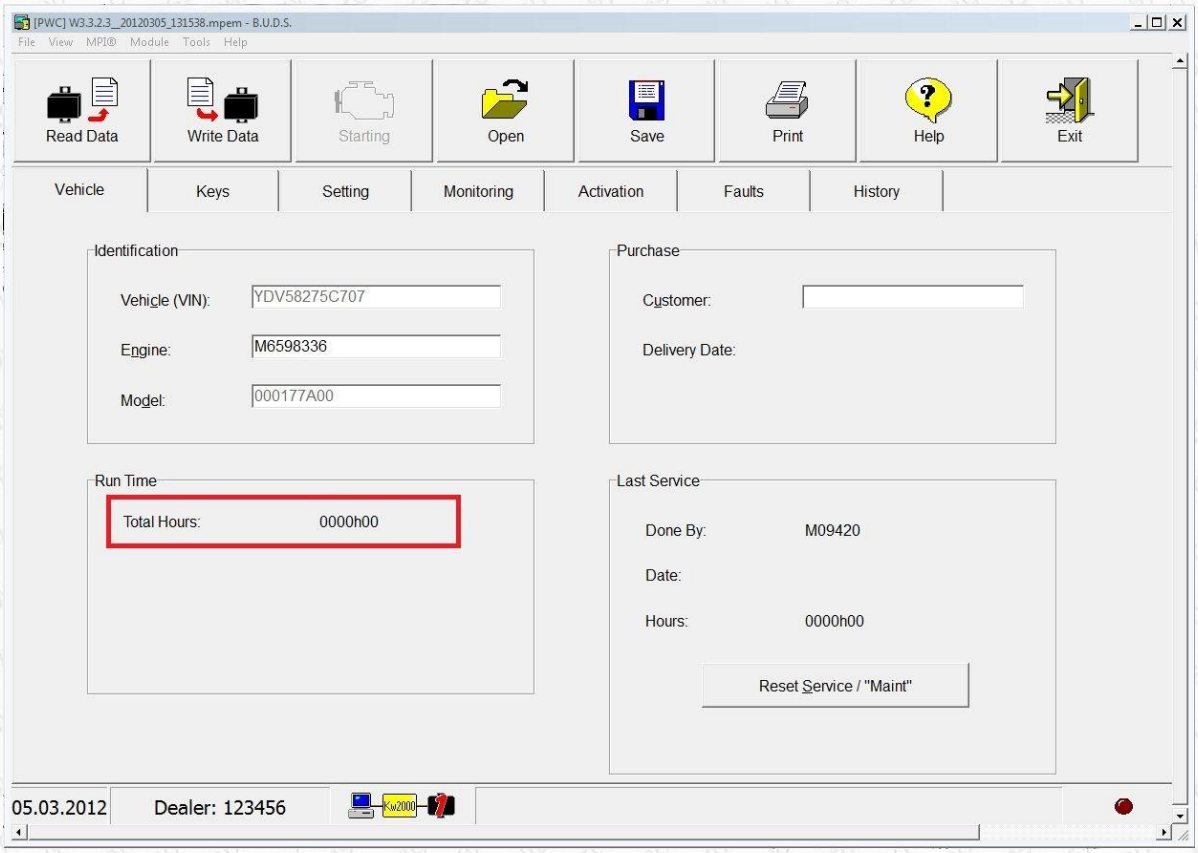
License Keys / MEGATECH / Clear As New / 6. Add DESS-keys

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7.Result

That's all!

As result you will get this:



You now have a module ECM with “0” hours and clean history of Part Replacement!!!

License Keys / MEGATECH / Clear As New / 7.Result

Remote Assistance

If you are our customer and you can not install software B.U.D.S., install, restore or transfer your license, we can connect to your computer using special software for remote control to help you to resolve issues.

To get remote assistance, you should download the **TeamViewer QuickSupport** .

TeamViewer - the All-In-One Solution for Remote Access and Support over the Internet.

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TeamViewer connects to any PC or server around the world within a few seconds. You can remote control your partner's PC as if you were sitting right in front of it. Find out why more than 100 million users trust TeamViewer!

It's Free for private use!

TeamViewer FAQ you can find on this page.

TeamViewer QuickSupport

Simple and small customer module, runs immediately without installation and does not require administrative rights - optimized for instant support.
Very easy to use, does not require special PC knowledge.
Double clicking the left mouse button on the downloaded file (TeamViewerQS.exe) runs the program.



You just need to tell us (send through any messenger program), your ID and Password.
Password changes every time you start the program.

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How secure is TeamViewer?

All TeamViewer versions use full encryption. Encryption is based on 1024bit RSA private/public key exchange and 256 Bit AES session encoding. This uses the same security level as https/SSL and is considered completely safe by today's standards. The key exchange also guarantees that the data channel is completely encoded from client to client and that any routers or servers in between (including

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our routers) are unable to read or analyze the data stream. Security and privacy have always been a top priority during development.

For additional information visit our security page:

http://www.teamviewer.com/products/security.aspx

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Index

A

Abbreviations 28
About B.U.D.S. 5, 97
Activation 123, 128, 134

B

B.U.D.S. Chart 48
B.U.D.S. Installation 13
BRP Diagnostic Kit 220
BRP® 4, 183, 185 Bypass wire 42

C

Characteristics 5
Close 69
Cluster 90, 113, 174
Communication 76, 79, 184, 185
Computer 6, 13, 33, 79
Connection 33, 34, 35, 36, 37, 38, 39, 52, 53, 54, 55, 56, 57, 58, 59, 184, 185
Contact 183 Copyright 4

D

Description 44
DESS 4-TEC Interface 42
DESS Post Interface 42, 46
DESS® adapter 42
DESS® key 75, 107
Diagnostic Cable 42
Diagnostic Kit 4-TEC 222
Diagnostic Kit All 4-TEC 224
Document 64, 65, 66, 67, 68, 69, 71, 98, 99, 100

E

ECM 82, 91, 92, 180, 185
Edit 99
Enable start 178
Error code 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218

F

Fault 130, 134
File 64, 65, 66, 67, 68, 69, 70, 71
Fuel factor 114

H

Hardware 74, 83
Help 96, 97, 182, 183
History 169, 170, 171, 172, 173, 174, 176

I

Identification 85
Idle 110, 111, 112
Ignition 115, 116
Information 74, 82
Installation 4, 6, 13
Introduction 5
IXXAT 7
IXXAT driver 7

L

Language 94
Last 30 seconds 169
Last 60 seconds 176
Last minute 170
Last service 106
Learning key® 75, 107
License 4
License Keys description 225
License.dat 23
Logon 93

M

Megatech License Features 226
Menu 63
Minimum/Maximum 171
Modify 99
Module 82, 91, 92, 185
Monitoring 120
More details 134
MPEM 82, 91, 92, 185

MPI® 31, 32, 74, 75, 76, 79, 80, 81, 184 MPI-2 42, 44

N

Neutral 117

Index

O

Oil lines bleeding 122
Open
Options
Part replacement
Phone numbers

P

Power bypass switch 42
Power sources 41, 61
Preferences 94
Preview 100
Print 70, 71
Privileges 80, 183
Protocol 76, 185
Purchase info 104

Q

QuickSupport 243

R

Read 64
Real time 120, 178, 179
Refresh 133, 176
Remote Assistance 243
Replace 91, 174
Requirements 6
Reset 81
Restore 67
RPM profile 173
Run time 105, 172

S

Save 68
Self-test 128
Serial numbers 102
Setting 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119
Setup 13, 70
Shutdown cylinders 121
Software 74, 84, 97
Speed 79
Starting 178
Status bar 73
Stop 179
Supply T-harness cable 42

T

84 TeamViewer 243
Technician 93, 177
119 Terms 28
Test key 75
211 Throttle 110, 111, 112
Timing 115, 116
223 Title bar 62
Toolbar 72
Tools 93, 94, 95
TPS 110, 111, 112
Tracking ECM 180
Types of licenses 225

U

Units 94
Update 92
Update database 95
User interface 5, 62, 63, 72, 73, 94, 98

V

Validity 225
VCK® 29
Vehicle 101, 102, 103, 104, 105, 106, 118, 119
Vehicle connection MPI-2 51
Vehicle model 103, 181
Vehicle options 118
Vehicle variant 119
View 72, 73
VIN number 226

W

Write 65