

USER GUIDE

NavKal™ User Guide (Public Version)

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TABLE OF CONTENTS

NAVKAL™ ENGINE CONTROL MODULE (ECM) PROGRAMMING SOFTWARE.....	1
INTRODUCTION.....	1
ACRONYMS.....	1
GETTING STARTED.....	2
INSTALLING NAVKAL™.....	2
SOFTWARE UPDATES.....	9
LICENSING.....	9
VEHICLE CONNECTION.....	18
DIAGNOSTIC INTERFACE CABLE INFORMATION.....	18
INTERFACE DEVICE SELECTION.....	18
CONNECTING SOFTWARE.....	20
NAVKAL™ SOFTWARE.....	21
USING NAVKAL™.....	21
FEATURES.....	22
Vehicle Information Window.....	22
Screen Prompts.....	23
Programming Tip.....	24
Sniffer Tab and Datalink Traffic Tab.....	25
Diagnostic Trouble Codes (DTC) Window.....	26
Campaigns Tab - J1939.....	27
Campaigns Tab - J1708.....	29
Parameter Upgrades Tab.....	31
Blank Module Flashing Tab.....	33
Select Engine Window.....	34
Select Blank Modules Window.....	35
Process Requests Tab.....	36
Module History Tab.....	39
SERVICE MESSAGES.....	41
DIAGNOSTIC TROUBLE CODES.....	42
DTC TAB.....	42
DTC IDENTIFICATION.....	42
DTC TYPE.....	43
VIEWING FREEZE FRAME DATA.....	43
CLEARING DTCS.....	43

TABLE OF CONTENTS

Table 1 Summary of Changes

Section	Description	Revision Number
Getting Started	Updated note on firewall configuration	2
Navkal™ Software	Added J1708 and J1939 Campaigns Tabs	3

SAFETY INFORMATION

This manual provides general and specific maintenance procedures essential for reliable engine operation and your safety. Since many variations in procedures, tools, and service parts are involved, advice for all possible safety conditions and hazards cannot be stated.

Read safety instructions before doing any service and test procedures for the engine or vehicle. See related application manuals for more information.

Obey Safety Instructions, Warnings, Cautions, and Notes in this manual. Not following Warnings, Cautions, and Notes can lead to injury, death, or damage to the engine or vehicle.

Safety Terminology

Terms are used to stress your safety and safe operation of the engine: Warning, Caution, and Note.

Warning: A warning describes actions necessary to prevent or eliminate conditions, hazards, and unsafe practices that can cause personal injury.

Caution: A caution describes actions necessary to prevent or eliminate conditions that can cause damage to the engine or vehicle.

Note: A note describes actions necessary for correct, efficient operation.

Work Area

- Keep work area clean, dry, and organized.
- Keep tools and parts off the floor.
- Make sure the work area is ventilated and well lit.
- Make sure a first aid kit is available.

Protective Measures

- Wear protective safety glasses and shoes.
- Wear correct hearing protection.
- Wear cotton work clothing.
- Wear sleeved, heat protective gloves.
- Do not wear rings, watches, or other jewelry.
- Restrain long hair.

Vehicle

- Shift transmission to neutral, set parking brake, and block wheels before doing diagnostic or service procedures.
 - Clear the area before starting the engine.
-

Safety Equipment

- Use correct lifting devices.
- Use wheel chocks and stands.

Engine

- The engine should be operated or serviced only by qualified individuals.
- Provide necessary ventilation when operating engine in a closed area.
- Keep combustible material away from engine exhaust system and exhaust manifolds.
- Install all shields, guards, and access covers before operating engine.
- Do not run engine with unprotected air inlets or exhaust openings. If unavoidable for service reasons, put protective screens over all openings before servicing engine.
- Shut engine off and relieve all pressure in the system before removing panels, housing covers, and caps.
- If an engine is not safe to operate, tag the engine and ignition key.

Fire Prevention

- Make sure charged fire extinguishers are in the work area.

NOTE – Check the classification of each fire extinguisher to make sure that the following fire types can be extinguished:

1. Type A – Wood, paper, textiles, and rubbish
2. Type B – Flammable liquids
3. Type C – Electrical equipment

Batteries

- Always disconnect the main negative battery cable first.
 - Always connect the main negative battery cable last.
 - Avoid leaning over batteries.
 - Protect your eyes.
 - Do not expose batteries to flames or sparks.
 - Do not smoke in workplace.
-

NAVKAL™ ENGINE CONTROL MODULE (ECM) PROGRAMMING SOFTWARE

NOTE – This section contains a brief overview of NavKal™ calibration software and was current at the time of publishing. Due to the automatic updating function in NavKal™, screens and functions may differ from this manual.

INTRODUCTION

NOTE – To program a specific engine control system failure, always refer to the diagnostic manual for the system being serviced.

NavKal™ calibration software provides the capability to:

- View available updates.
- Program blank modules.
- Update calibrations, parameters, and horsepower.
- Display and clear active and previously active Diagnostic Trouble Codes (DTCs).
- View and print Programming Verification Code (PVC).
- Detect active modules on various vehicle networks and easily identify communication problems.

ACRONYMS

Following is a list of acronyms and their meanings used in this document:

- ACM - Aftertreatment Control Module
- DPF - Diesel Particulate Filter
- DTC - Diagnostic Trouble Code
- ECM - Engine Control Module
- ESN - Engine Serial Number
- EST - Electronic Service Tool
- FMI - Failure Mode Indicator
- KOEO - Key ON, Engine OFF
- SPN - Suspect Parameter Number
- DCU - Doser Control Unit

GETTING STARTED

INSTALLING NAVKAL™

It is strongly recommended that all Terminate and Stay Resident (TSR) programs like Quicktime®, CD player programs, or Pocket PC programs be terminated prior to loading or starting the NavKal™ software. These programs interfere with the efficient operation of the NavKal™ program and can cause errors reading and programming the ESC / BC.

To install the NavKal™ software:

1. Prior to installation, a NavKal™ product key must be obtained for each computer on which the NavKal™ software is to be installed. Product keys expire after a year and must be reactivated to allow access to the program.
2. Using the web browser of your choice, navigate to the NavKal™ page on Navistar's service software site:

<http://www.navistarservicesoftware.com/index.php/navkal/>
3. Click the DOWNLOAD button to download the NavKal™ software.
4. When the file has finished downloading, click NAVKAL SETUP.EXE to run the software and begin installation. The first page of the Setup Wizard appears.



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Figure 1 Setup Wizard — Welcome Page

5. Click NEXT to continue.
6. Read through the License Agreement. When finished, click I AGREE to proceed with installation.

When installation is complete, the final page of the wizard is displayed.

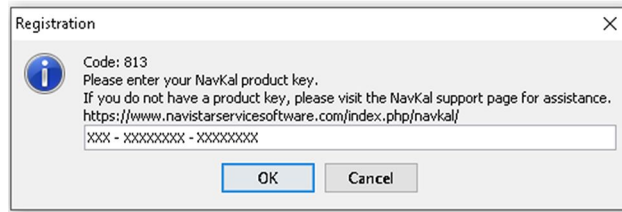


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Figure 2 Setup Wizard — Completing NavKal Setup

7. Ensure that the RUN NAVKAL box is checked.
8. Click FINISH to launch the program.

The first time NavKal™ is installed on a specific computer, you will be prompted to enter your product key.



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Figure 3 Product Key Entry

9. Enter the NavKal™ product key obtained for this computer in the format XXX — XXXXXXXX — XXXXXXXX (Figure 3) and then click OK.
 - a. If the key was not entered correctly (or there is some other problem), an error message will be displayed. Refer to Installation Error Messages (page 8) for more information. Resolve the issue indicated before proceeding.
 - b. If the key was entered correctly, the following window is displayed.



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Figure 4 Existing User Prompt

10. In the Existing User prompt window (Figure 4), choose YES or NO.
 - a. If you already have a Navistar-issued username and password for applications such as Diamond Logic® Builder (DLB) or Navistar Engine Diagnostics (NED), click YES and proceed to Step 14.
 - b. If you DO NOT already have a Navistar-issued username and password, click NO and proceed to Step 11.



The image shows a 'Registration' dialog box with the following fields and controls:

- E-mail***: Text input field
- Prefix**: Text input field
- First Name***: Text input field
- Middle Initial**: Text input field
- Last Name***: Text input field
- Suffix**: Text input field
- Company Name***: Text input field
- Street Address 1***: Text input field
- Street Address 2**: Text input field
- City***: Text input field
- State***: Text input field
- ZIP Code***: Text input field
- Country***: Dropdown menu with 'UNITED STATES' selected
- Phone Number***: Text input field with a format '() -'

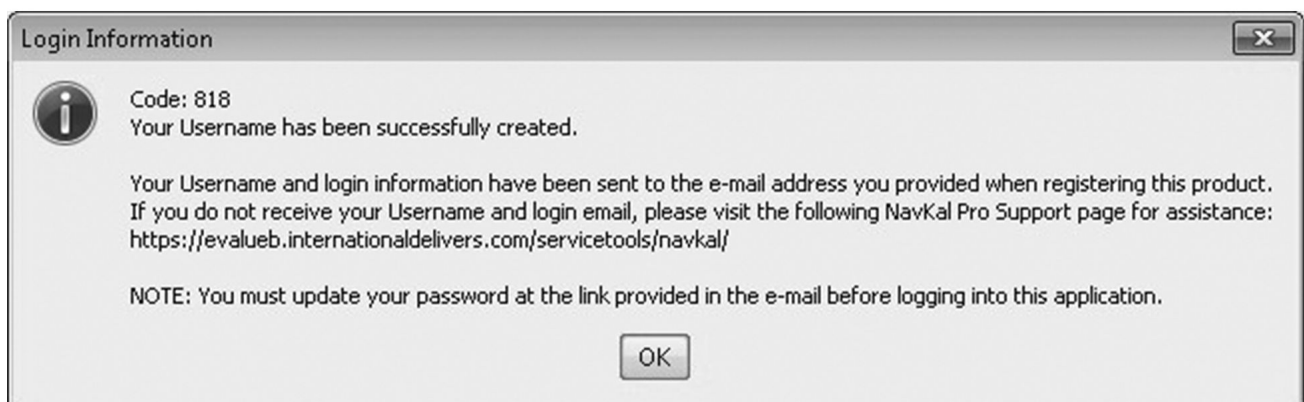
Buttons: OK, Cancel

*Required fields

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Figure 5 New User Registration

11. Enter required information in the Registration window (Figure 5). Required fields are indicated by an asterisk (*).
12. Click OK. When registration is completed successfully, the following message is displayed.



The image shows a 'Login Information' dialog box with the following content:

Code: 818
Your Username has been successfully created.

Your Username and login information have been sent to the e-mail address you provided when registering this product. If you do not receive your Username and login email, please visit the following NavKal Pro Support page for assistance:
<https://evaluateb.internationaldelivers.com/servicetools/navkal/>

NOTE: You must update your password at the link provided in the e-mail before logging into this application.

Buttons: OK

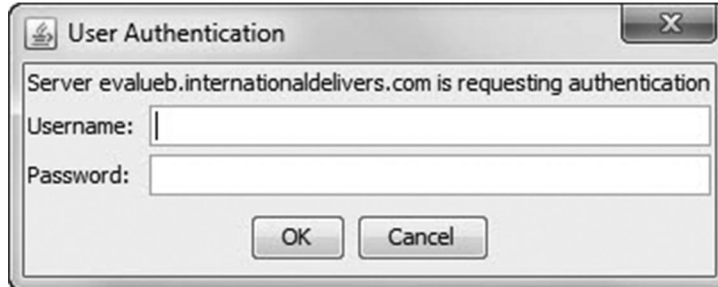
0000428113

Figure 6 Username Successfully Created

13. An email will be sent to the address provided on the registration form. Follow the instructions provided in this email to complete the registration process. When finished, click OK in the window shown above.

GETTING STARTED

IMPORTANT – You **MUST** change your password by following the instructions provided in the email before proceeding. The default password cannot be used to log into the application.



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Figure 7 User Authentication Window

14. The User Authentication window appears (Figure 7). Enter your username and password and click OK.

When you log in for the first time, the software will start and begin to update itself.

NOTE – The NavKal™ program will not function until you have successfully logged in at least once while connected to the network. You may need to consult with the technical computer support staff if NavKal™ cannot connect to the Navistar site. Error messages will be generated if connection to Navistar fails. Internet firewalls must be configured to allow two-way communication to the following Navistar host names:

- *.navistar.com
- *.internationaldelivers.com
- *.amazonaws.com
- *.cloudfront.net

Be aware underlying IP addresses for Navistar hosts are subject to change and may vary by region. When possible, grant access by host name rather than IP address.

Installation Error Messages

The error messages that may appear during the installation process are self explanatory. Some sample messages are included in the table below:

Code	Text
801	The product key provided does not match the software that you are attempting to activate. Please re-enter the product key to verify or visit the NavKal™ support page for assistance. http://www.navistarservicesoftware.com/index.php/navkal/
803	You've exceeded the number of registrations allowed for this product. Please visit the NavKal™ support page for assistance. http://www.navistarservicesoftware.com/index.php/navkal/
810	An Internet connection to the NavKal™ server could not be established; press OK to continue in offline mode. Your license will be verified each time you log into the system. You can keep accessing NavKal™ offline for 30 remaining days. If a connection to the NavKal™ Server cannot be established by then, your product will stop working.
812	On some computers, NavKal™ has to be run in administrator mode. Follow these steps: 1. On the Windows desktop, right-click the NavKal™ icon. 2. In the right-click menu, select OPEN FILE LOCATION. 3. Right-click NavKal.exe. 4. Click RUN AS ADMIN.
814	You have already activated the maximum number of usernames permitted by your license.

NOTE – Refer to <http://www.navistarservicesoftware.com/index.php/800-codes/> for additional error codes.

GETTING STARTED

SOFTWARE UPDATES

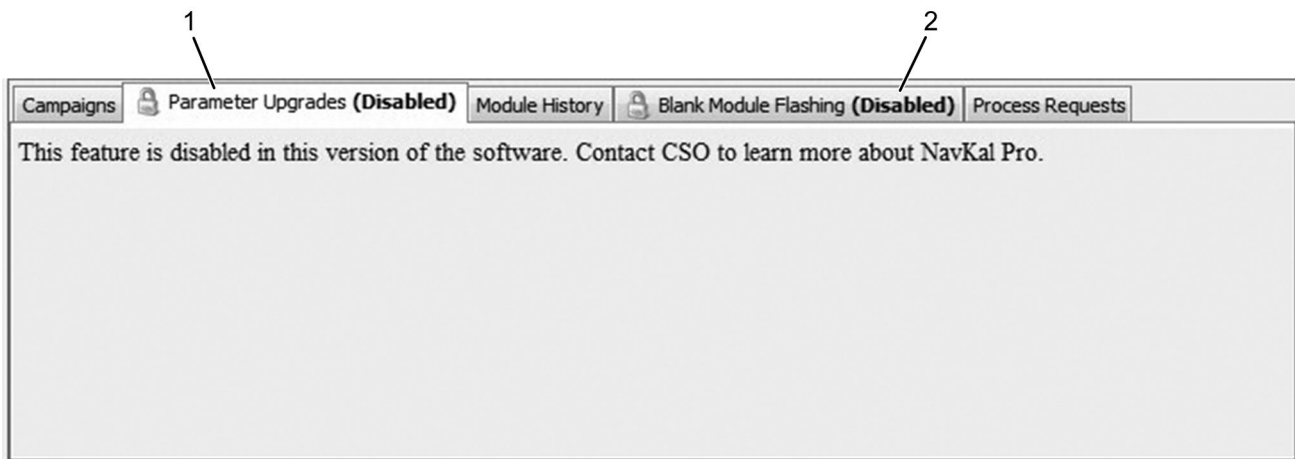
NavKal™ provides automatic software updates directly from Navistar any time the tool is connected to the Internet. Upon starting the program, you may notice an update message that NavKal™ will require a restart after updates have been completed. NavKal™ is fully functional when the Electronic Service Tool (EST) is not connected to the Internet, but the EST should be connected often to check for available updates.

NOTE – Blank Module and Parameter Change programming requires a connection to the Internet.

LICENSING

NavKal™ Basic

NavKal™ Basic allows calibration updates and campaigns for ECM, DCU, or ACM programming.



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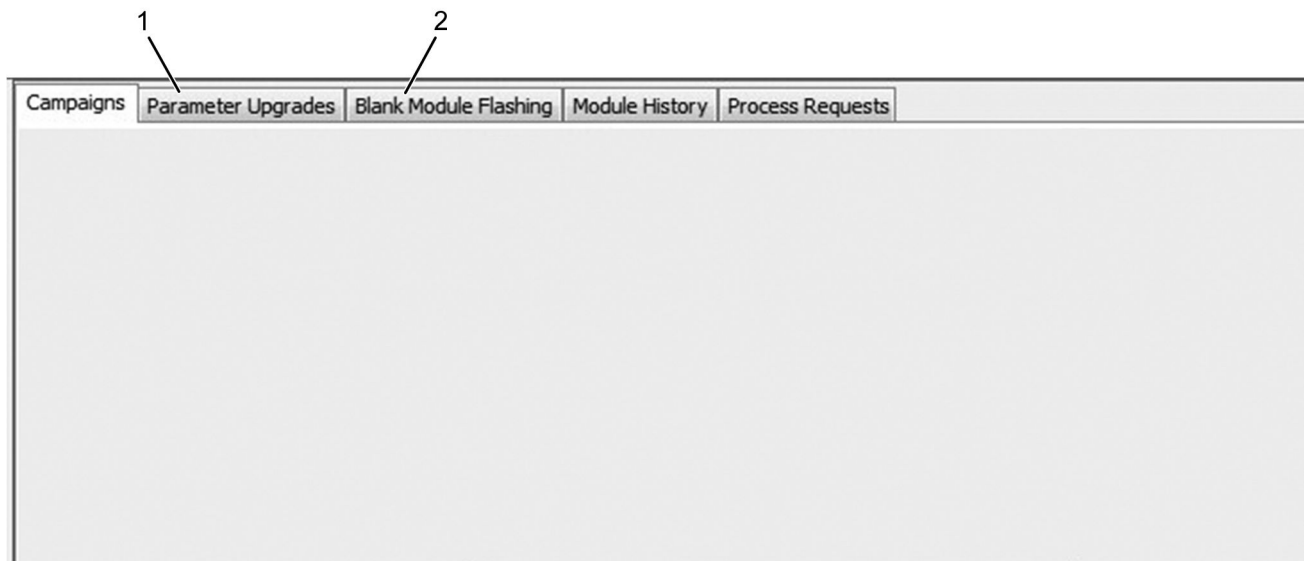
1. Parameter Upgrades (Disabled)
Tab

2. Blank Module Flashing (Disabled)
Tab

Figure 8 NavKal™ Basic – Disabled Tabs

The PARAMETER UPGRADES tab (Figure 8, Item 1) and the BLANK MODULE FLUSHING tab (Figure 8, Item 2) are unlocked with NavKal™ Pro license.

NavKal™ Pro



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1. Parameter Upgrades Tab

2. Blank Module Flashing Tab

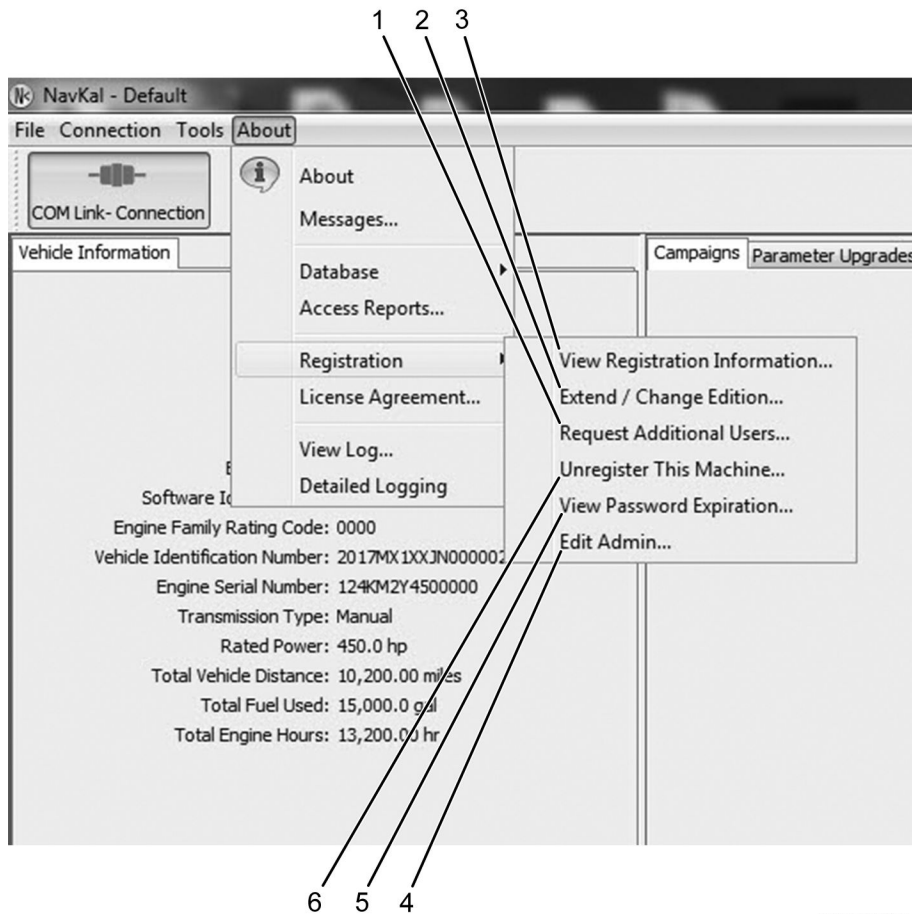
Figure 9 NavKal™ Pro Tabs

The PARAMETER UPGRADES tab (Figure 9, Item 1) and the BLANK MODULE FLUSHING tab (Figure 9, Item 2) are unlocked with NavKal™ Pro license.

GETTING STARTED

Registration Menu

The Registration menu provides options to manage NavKal™ users, passwords and product keys.

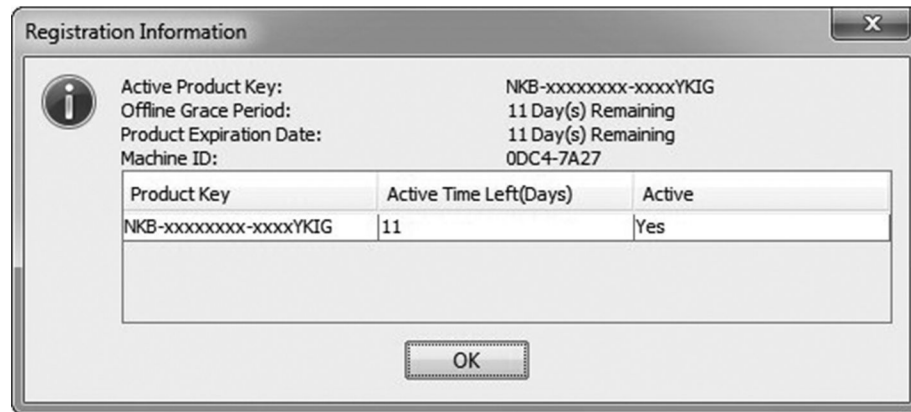


- | | |
|----------------------------------|-----------------------------|
| 1. Request Additional Users | 4. Edit Admin |
| 2. Extend / Change Edition | 5. View Password Expiration |
| 3. View Registration Information | 6. Unregister This Machine |

Figure 10 Registration Menu

View Registration Information

Select the VIEW REGISTRATION INFORMATION menu option (Figure 10, Item 3) to display the Registration Information window.

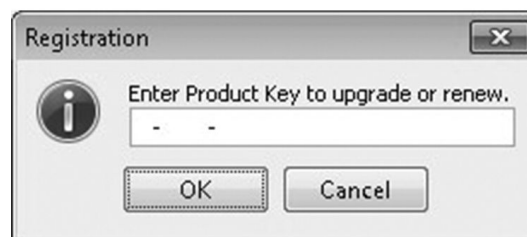


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Figure 11 Registration Information Window

Registration Information window (Figure 11) provides a listing of current license(s) installed on the computer.

Extend / Change Edition

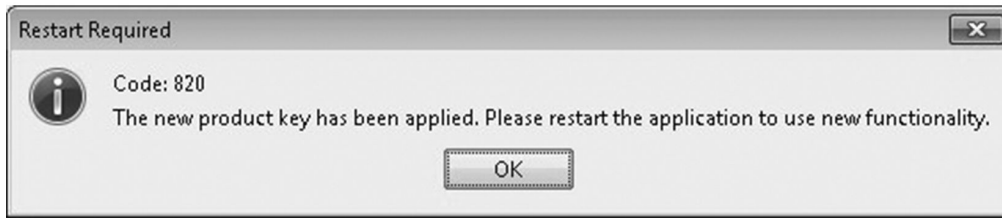


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Figure 12 Registration Window

NOTE – Extend / Change Edition menu option is used to upgrade from NavKal™ Basic to NavKal™ Pro and to extend the license when purchasing an additional product key. To upgrade NavKal™ contact your local International dealer to purchase a NavKal™ Pro Key.

1. Select **Extend / Change Edition** menu option (Figure 10, Item 2) to display Registration window.
2. Enter NavKal™ product key in Registration window (Figure 12).

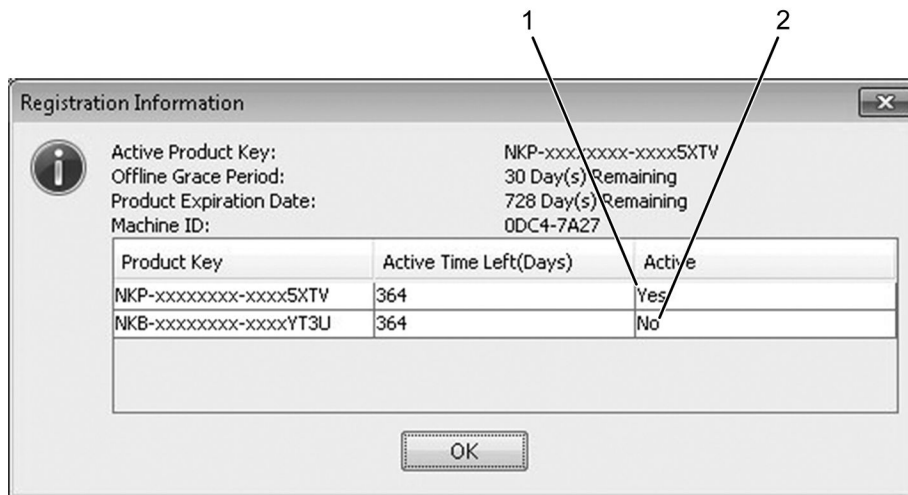


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Figure 13 Restart Required Window

NOTE – After entering key for NavKal™ Pro, the Parameter Upgrade tab and Blank Module Flashing tab will be unlocked.

3. Click OK (Figure 13) to restart the application and use the upgraded or renewed application.



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1. Product key active

2. Product key not active

Figure 14 Product Key Status

NOTE – If NavKal™ Basic product key is active when NavKal™ Pro is installed, NavKal™ Pro will be active and NavKal™ Basic will be inactive until NavKal™ Pro expires.

4. Select VIEW REGISTRATION INFORMATION menu option (Figure 10, Item 3) to verify license status.

Request Additional Users

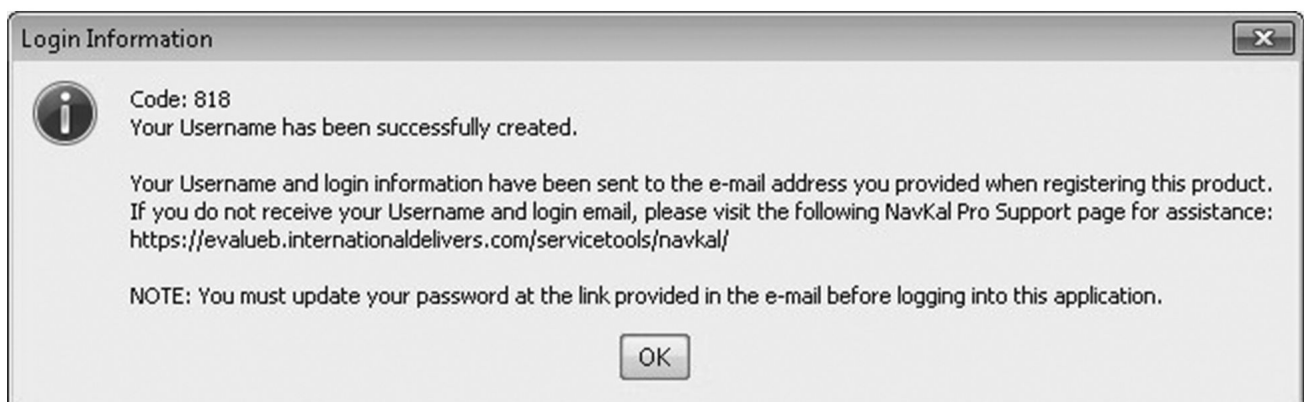


The Registration window is a standard Windows-style dialog box with a title bar containing a help icon, the text "Registration", and a close button (X). The main area contains a list of input fields on the left and a corresponding set of text boxes on the right. The fields are: E-mail* (with an information icon), Prefix, First Name*, Middle Initial, Last Name*, Suffix, Company Name*, Street Address 1*, Street Address 2, City*, State*, ZIP Code*, Country* (with a dropdown menu showing "UNITED STATES"), and Phone Number* (with a "() -" placeholder). A legend at the bottom right indicates that fields with an asterisk are required. At the bottom center are "OK" and "Cancel" buttons.

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Figure 15 Registration Window

To request additional users, select the REQUEST ADDITIONAL USERS menu option (Figure 10, Item 1) to open the Registration window (Figure 15) and complete the required fields. An email will be sent with a new username and temporary password.



The Login Information window is a standard Windows-style dialog box with a title bar containing the text "Login Information" and a close button (X). The main area contains an information icon (i) followed by the text: "Code: 818", "Your Username has been successfully created.", "Your Username and login information have been sent to the e-mail address you provided when registering this product. If you do not receive your Username and login email, please visit the following NavKal Pro Support page for assistance: <https://evaluateb.internationaldelivers.com/servicetools/navkal/>", and "NOTE: You must update your password at the link provided in the e-mail before logging into this application." At the bottom center is an "OK" button.

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Figure 16 Username Successfully Created Window



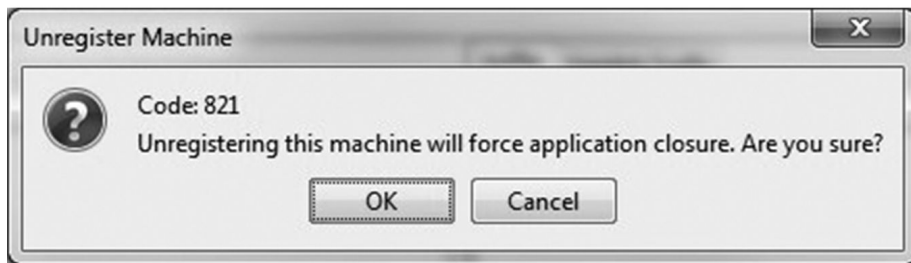
0000428139

Figure 17 Maximum Number of Usernames

NOTE – Product Keys are authorized a limited number of usernames.

A Registration error will be displayed (Figure 17) if additional usernames are requested beyond the authorized number.

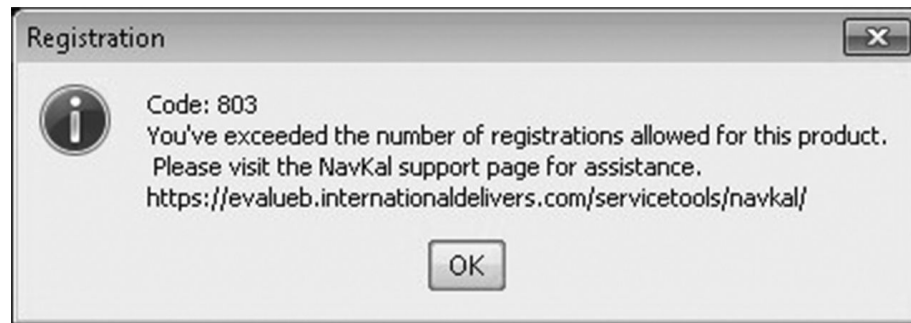
Unregister This Machine



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Figure 18 Unregister Machine Window

IMPORTANT – Click OK button (Figure 18) to unregister this machine. Unregistering a machine will allow a new machine to be registered with the product key. To register a new machine, follow the instructions in the Installing NavKal™ section.



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Figure 19 Registration Error Window

NOTE – Product keys are authorized for a limited number of machines.

If a product key is used on more than the maximum authorized number of machines, a registration error (Figure 19) will be displayed.

GETTING STARTED

View Password Expiration

Select the VIEW PASSWORD EXPIRATION menu option (Figure 10, Item 5) to display password expiration information.

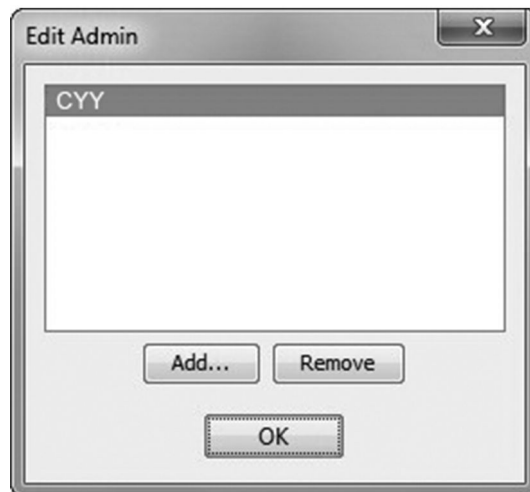


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Figure 20 Password Expiration Information Window

Edit Admin

Select EDIT ADMIN menu option (Figure 10, Item 4) to display list of usernames.



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Figure 21 Edit Admin Window

NOTE – The first user to log into the application after it has been registered is the administrator. Only this person can perform administrative actions until additional administrators are added.

VEHICLE CONNECTION

DIAGNOSTIC INTERFACE CABLE INFORMATION

The following communication adapters have been verified with NavKal™ software:

- NEXIQ Technologies – USB- Link™, USB Link™ 2
- Noregon Systems, Inc. – DLA+, DLA+ 2.0, DLA+ Wireless, DLA+ 2.0 Wireless
- Dearborn Group – DPA4+, DPA5+

Please refer to each manufacturer's website for further information.

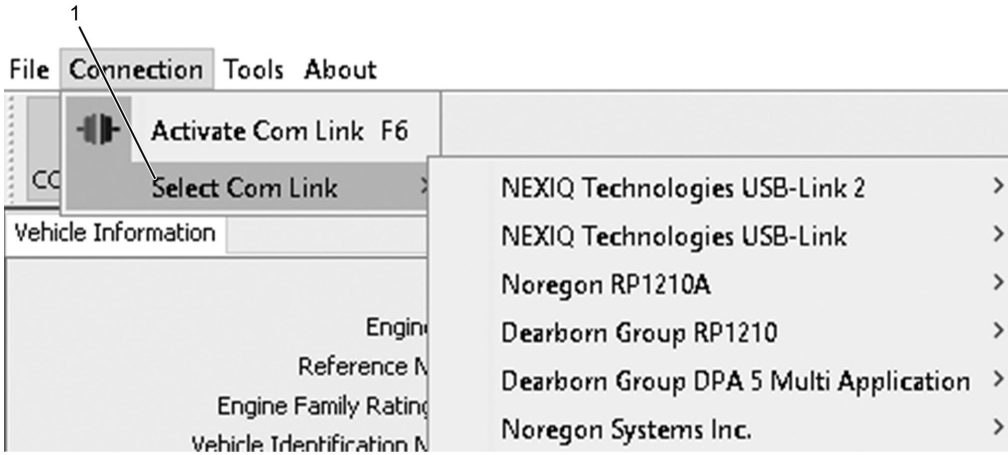


To prevent a malfunction of the NavKal™ software, use only a USB cable to connect to the computer for programming. Do not use wireless or Bluetooth® connections for programming.

INTERFACE DEVICE SELECTION

NOTE – NavKal™ will auto connect to the vehicle without having you select the protocol when the following procedure is complete.

If NavKal™ fails to auto connect, use the following procedure:



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1. Select Com Link menu

Figure 22 Select Com Link

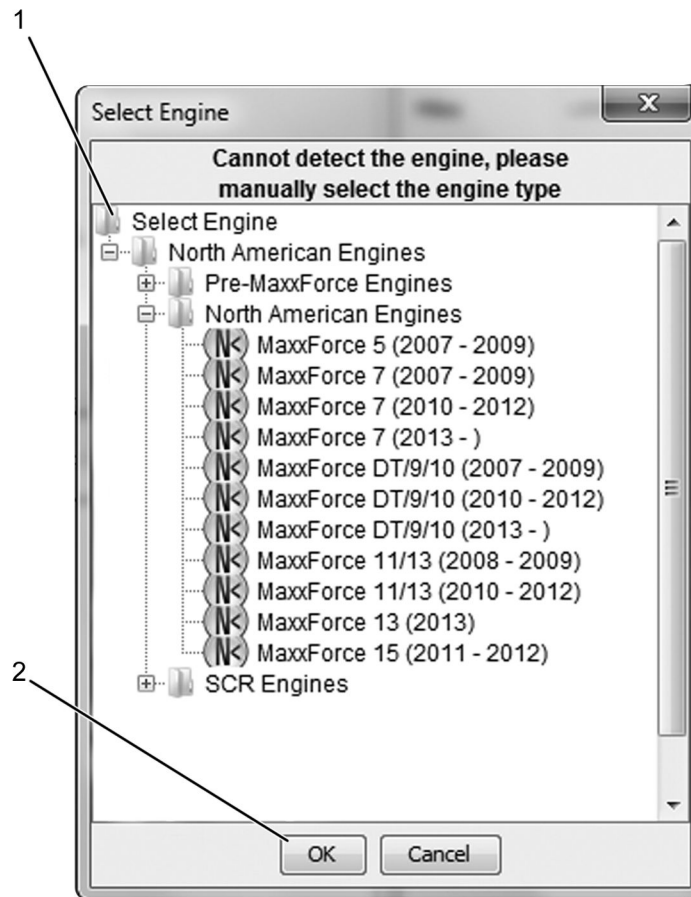
1. Start the NavKal™ software.
2. In the menu bar, select CONNECTION > SELECT COM LINK (Figure 22, Item 1).
3. Choose cable / interface device.

VEHICLE CONNECTION

- a. NEXIQ Technologies
 - USB-Link
 - J1708 – All pre-Navistar® (pre - 2007) electronic engines
 - J1939 – All Navistar® engines (2007 - present)
 - USB-Link 2
 - J1708 – All pre-Navistar® (pre - 2007) electronic engines
 - J1939 – All Navistar® engines (2007 - present)
- b. Noregon
 - DLA+, DLA+ 2.0, DLA+ Wireless, DLA+ 2.0 Wireless
 - J1708 – All pre-Navistar® (pre - 2007) electronic engines.
 - J1939 – All Navistar® engines (2007 - present)
- c. Dearborn Group
 - DG DPA 4/4 Plus USB, USB, DPA5
 - J1708 – All pre-Navistar® (pre - 2007) electronic engines
 - J1939 – All Navistar® engines (2007 - present)

CONNECTING SOFTWARE

1. Key ON, Engine OFF.
2. Using interface cable, connect EST to PC and vehicle's diagnostic connector.
3. Start the NavKal™ software and select the appropriate interface device (refer to Interface Device Section). A detection process will begin and connect automatically.



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1. Engine folder

2. OK button

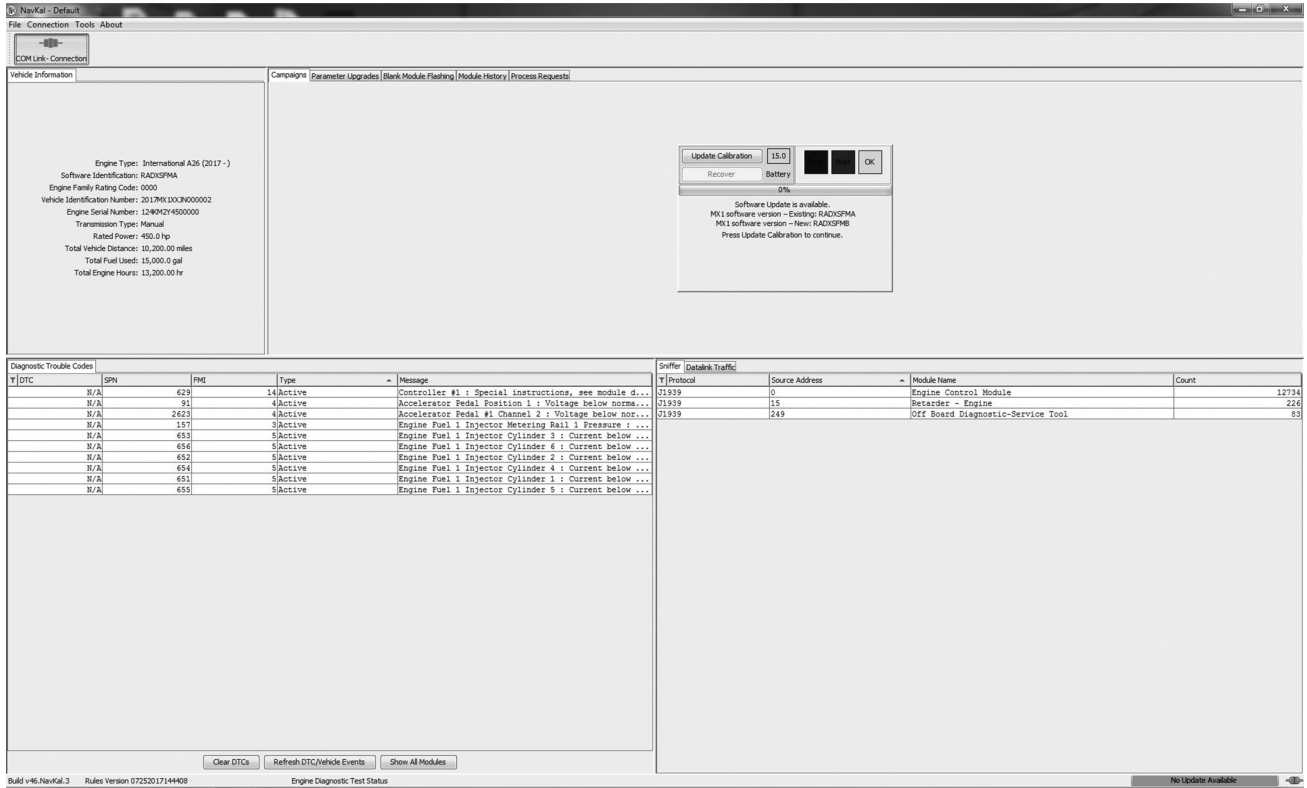
Figure 23 Engine Select

NOTE – If NavKal™ cannot detect the Engine Serial Number (ESN), it may be necessary to select the engine.

4. Click the SELECT ENGINE folder (Figure 23, Item 1) to open the folder. Then, select the correct engine and click OK (Figure 23, Item 2).

NAVKAL™ SOFTWARE

USING NAVKAL™



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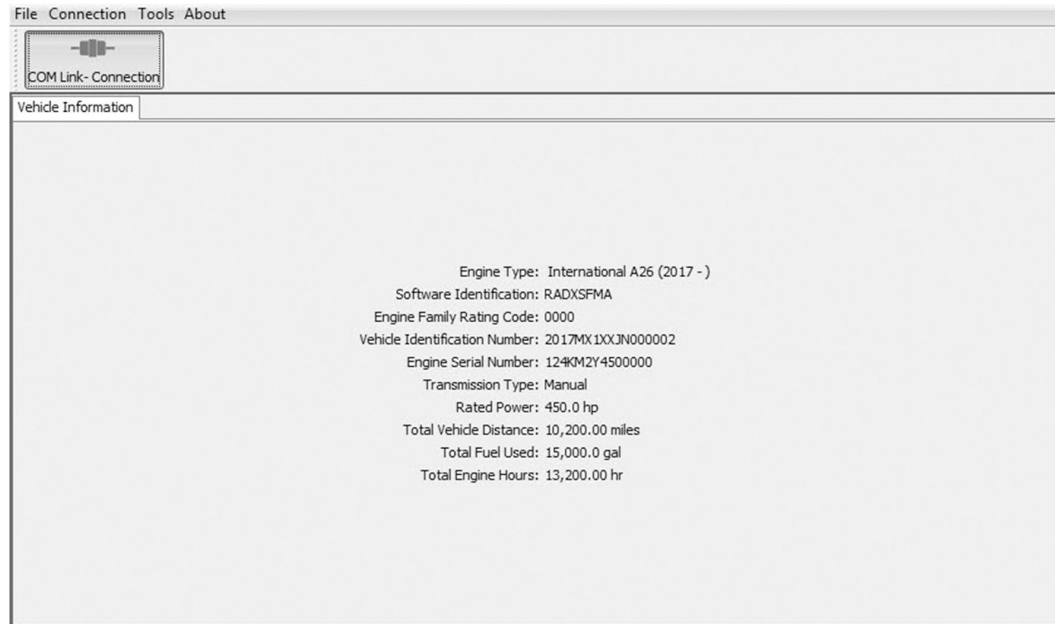
Figure 24 NavKal™ Main Screen

NavKal™ displays vehicle information once connection is made (Figure 24).

FEATURES

Default NavKal™ Panes

Vehicle Information Window



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Figure 25 Vehicle Information Window

The Vehicle Information Window (Figure 25) provides vehicle information for the connected vehicle. Displayed information includes items such as:

- Engine type
- Software ID
- Engine family rating code
- VIN
- ESN
- Transmission type
- Horsepower rating
- Total fuel
- Total hours
- Total miles

Screen Prompts



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Figure 26 Screen Prompts

During the process to update calibration, change parameters, or blank program a module, NavKal™ will direct you to complete the update or change process. Follow the screen prompts as shown in Figure 26. NavKal™ screen prompts will become highlighted YELLOW for Key ON or RED for Key OFF when your intervention is required.

Programming Tip



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Figure 27 Programming Tip

To reduce programming issues, follow PROGRAMMING TIP (Figure 27) instructions to remove extra modules from the datalink.

Sniffer Tab and Datalink Traffic Tab

Sniffer		Datalink Traffic		
Y	Protocol	Source Address	Module Name	Count
J1939	0		Engine	315831
J1939	12		Brakes - Steer Axle	763
J1939	15		Retarder - Engine	8375
J1939	85		Diesel Particulate Filter Controller	56608
J1939	249		Off Board Diagnostic-Service Tool	399

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Figure 28 Sniffer Tab

The SNIFFER tab (Figure 28) provides real-time monitoring of the network activity for each module on the various data links. This tab is used to identify if the individual modules are present and communicating on the vehicle networks.

The DATALINK TRAFFIC tab displays messages that are on the datalink being used.

Diagnostic Trouble Codes (DTC) Window

Diagnostic Trouble Codes						
Y	DTC	SPN	FMI	Type	Message	Module
	N/A	655	5	Active	Injector 5 open load/circuit	Engine Co...
	N/A	4765	3	Active	DOCIT signal Out of Range HIGH	Engine Co...
	N/A	4765	4	Active	DOCIT signal Out of Range LOW	Engine Co...
	0	4765	2	Active	DOCIT signal erratic, intermittent, or inc...	Engine Co...
	N/A	3242	3	Active	DPFIT signal Out of Range HIGH	Engine Co...
	N/A	3242	4	Active	DPFIT signal Out of Range LOW	Engine Co...
	0	3242	2	Active	DPFIT signal erratic, intermittent, or inc...	Engine Co...
	N/A	3246	3	Active	DPFOT signal Out of Range HIGH	Engine Co...
	N/A	3246	4	Active	DPFOT signal Out of Range LOW	Engine Co...
	0	3246	2	Active	DPFOT signal erratic, intermittent, or inc...	Engine Co...
	N/A	563	9	Previously ...	Anti-Lock Braking (ABS) Active	Transmiss...
	N/A	639	14	Previously ...	Drivetrain Message Timeout	Transmiss...

0000429744

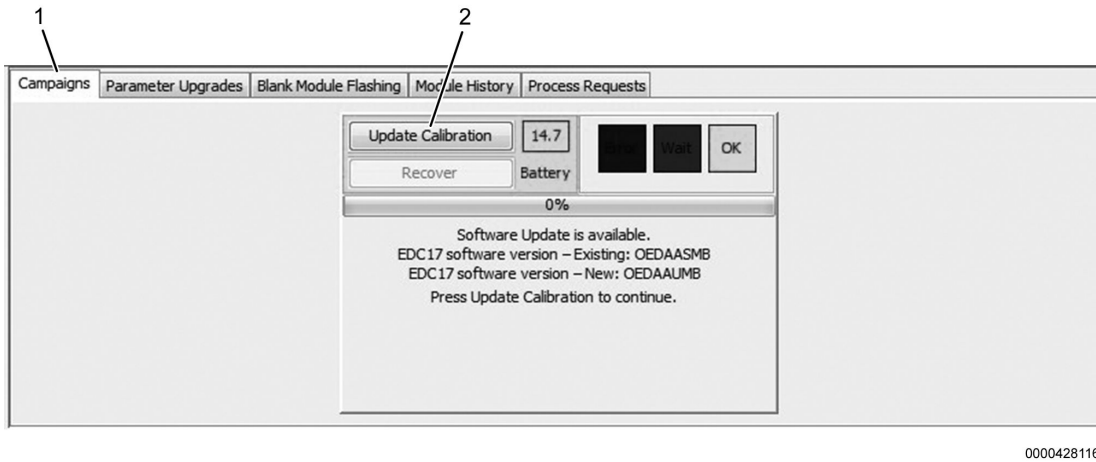
Figure 29 DTC Window

The DTC window (Figure 29) displays all active or previously active ECM DTCs. DTCs can also be cleared in this window. The DTC window is displayed in all of the software default sessions and will allow you to:

- Display active DTCs
- Display pending DTCs
- Clear DTCs
- Refresh DTC / vehicle events

Campaigns Tab - J1939

All Navistar Engines (2007 to Present)



1. Campaigns tab

2. Update Calibration button

Figure 30 Campaigns Tab

NOTE – Connect the Midtronics SMART Charger before programming the ECM.

1. Select the CAMPAIGNS tab (Figure 30, Item 1). This tab indicates if calibration update is available and displays the existing and new calibration to program ECM.

This tab also monitors battery voltage and displays the battery charge state in color:

- RED = 9.0 - 10.4 volts
- YELLOW = 10.5 - 12.4 volts
- GREEN = 12.5 volts or higher



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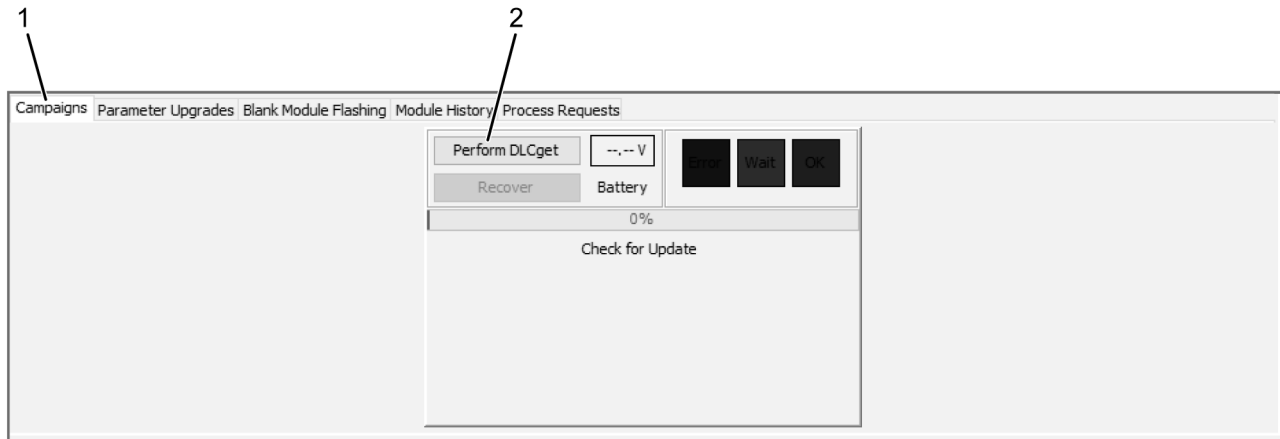
1. Parameter History Push button

Figure 31 Parameter History Push Button

2. PARAMETER HISTORY PUSH button (Figure 31, Item 1) allows the user to update the Navistar database with any parameter changes done in Navistar Engine Diagnostics (NED).
3. To begin update of ECM, click UPDATE CALIBRATION button (Figure 30, Item 2) and follow highlighted screen prompts for key cycles.

Campaigns Tab - J1708

All Navistar Electronic Engines (pre-2007)



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1. Campaigns Tab

2. Perform DLCget button

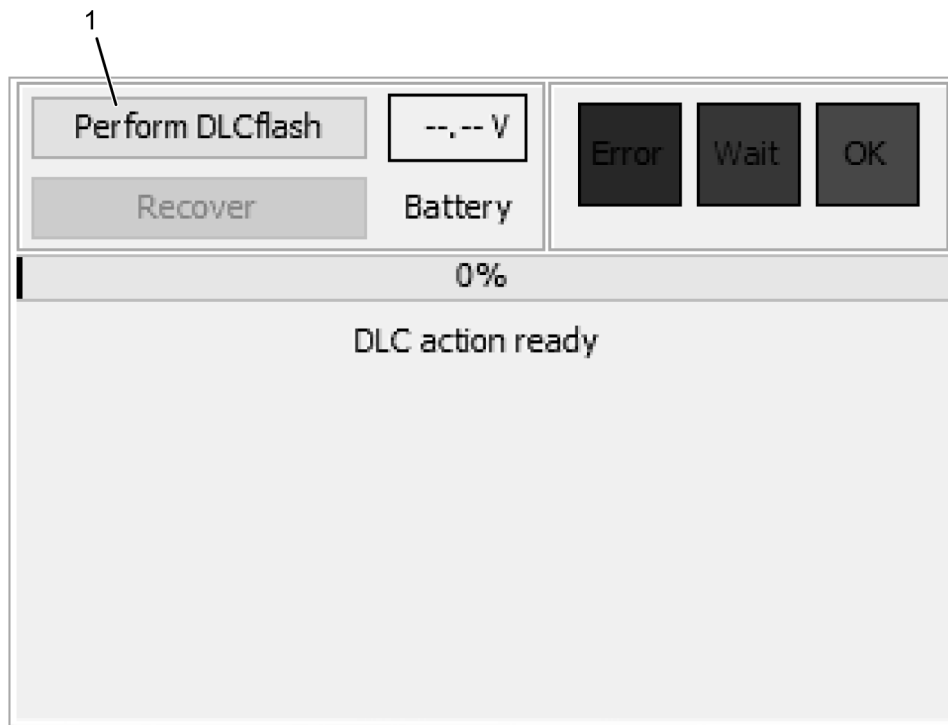
Figure 32 Campaigns Tab

1. Select the CAMPAIGNS tab (Figure 32, Item 1). This tab:

- Allows user to perform programming actions on J1708 engines.
- Allows user to update the Navistar database with any parameter changes done in ServiceMaxx® J1708.

NOTE – Use the mouse to select the command that needs to be performed when prompted by DLCget or DLCflash.

2. To begin calibration, click PERFORM DLCGET (Figure 32, Item 2) and follow highlighted screen prompts for key cycles.



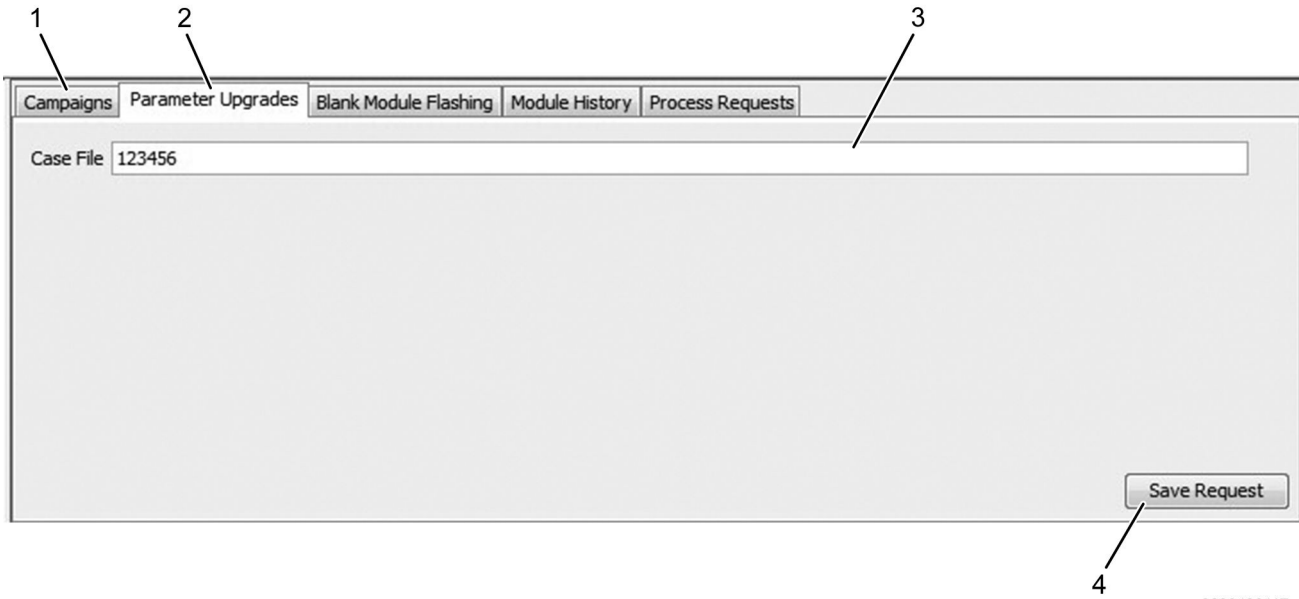
0000466794

1. Perform DLCflash button

Figure 33 Perform DLCflash

3. After the file has downloaded, click PERFORM DLCFLASH (Figure 33, Item 1) and follow highlighted screen prompts for key cycles.

Parameter Upgrades Tab

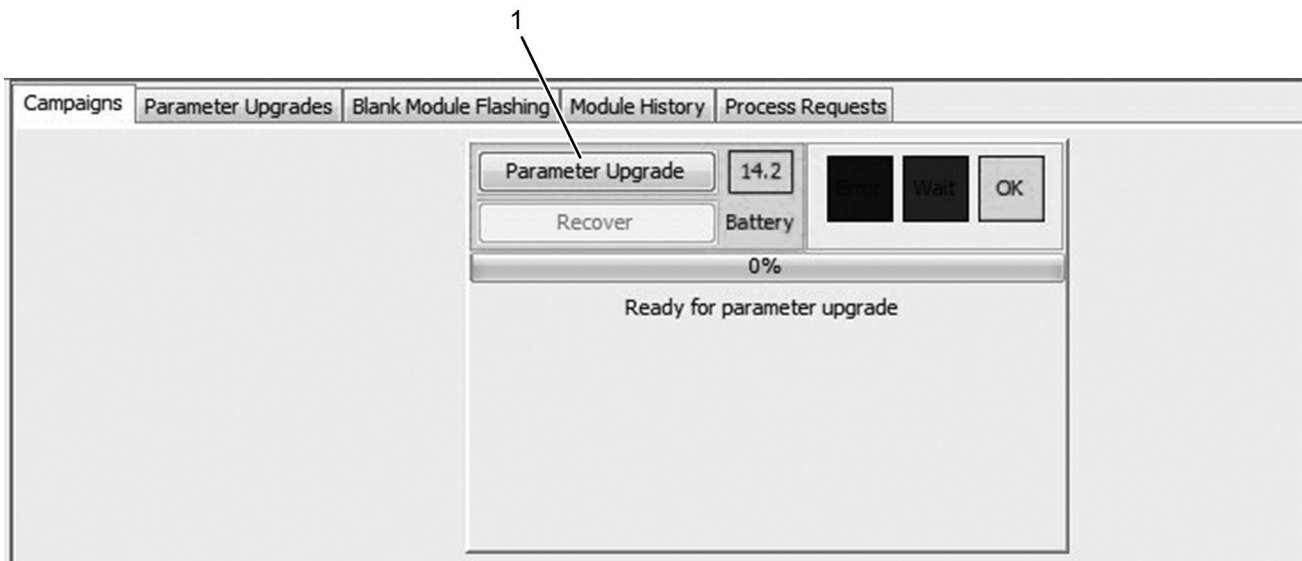


- 1. Campaigns tab
- 2. Parameter Upgrades tab
- 3. Case File window
- 4. Save Request button

Figure 34 Parameter Upgrade Case File

NOTE – International® or IC Bus® Dealers must complete a case file prior to submitting an upgrade request. Customers must contact Tech Services for parameter changes. Visit the NavKal™ webpage for more information: <http://www.navistarservicesoftware.com/index.php/navkal/>

1. Select the PARAMETER UPGRADES tab (Figure 34, Item 2).
2. Enter the appropriate case file number into the CASE FILE box (Figure 34, Item 3).
3. Click SAVE REQUEST (Figure 34, Item 4) and follow highlighted screen prompts for key cycles. When the request is saved, select the PROCESS REQUESTS tab and then click the PROCESS REQUESTS button.
4. Select the CAMPAIGNS tab (Figure 34, Item 1) to complete programming.



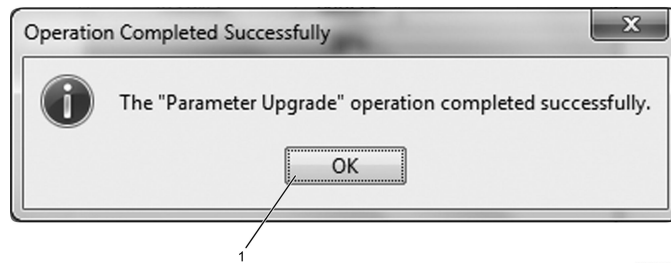
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1. Parameter Upgrade button

Figure 35 Parameter Upgrade

NOTE – Process request task must be performed before next step.

5. Click PARAMETER UPGRADE (Figure 35, Item 1).



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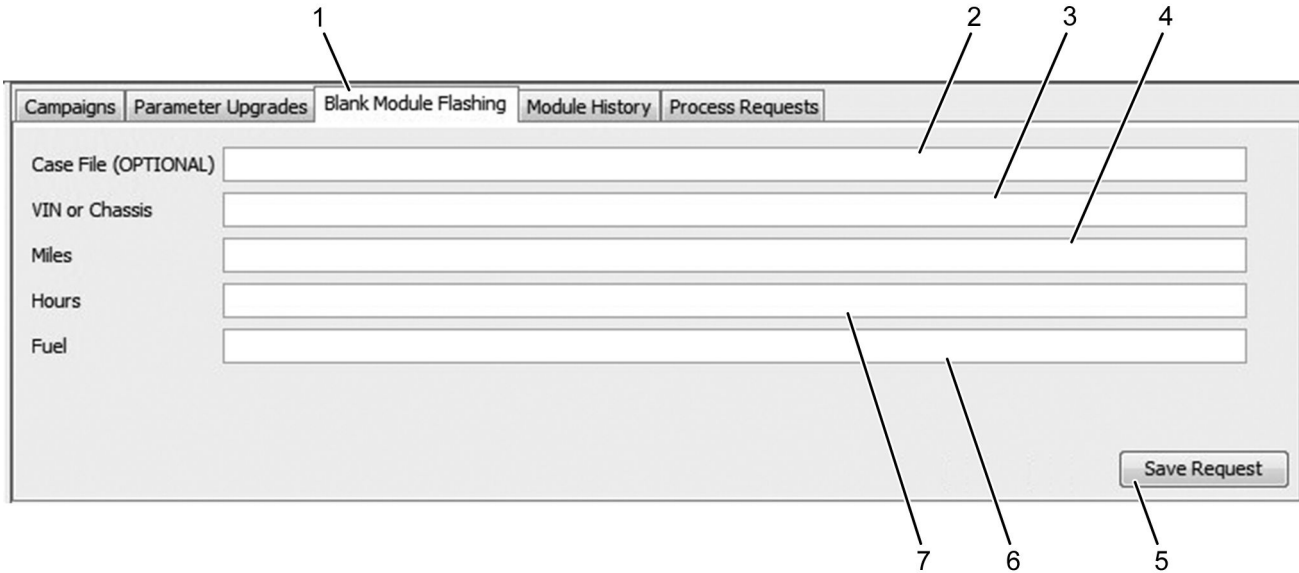
1. OK button

Figure 36 Parameter Upgrade Operation Complete

6. NavKal™ will verify that upgrade has been completed successfully. Click OK (Figure 36, Item 1).

Blank Module Flashing Tab

Allows technician to request programming a blank module.



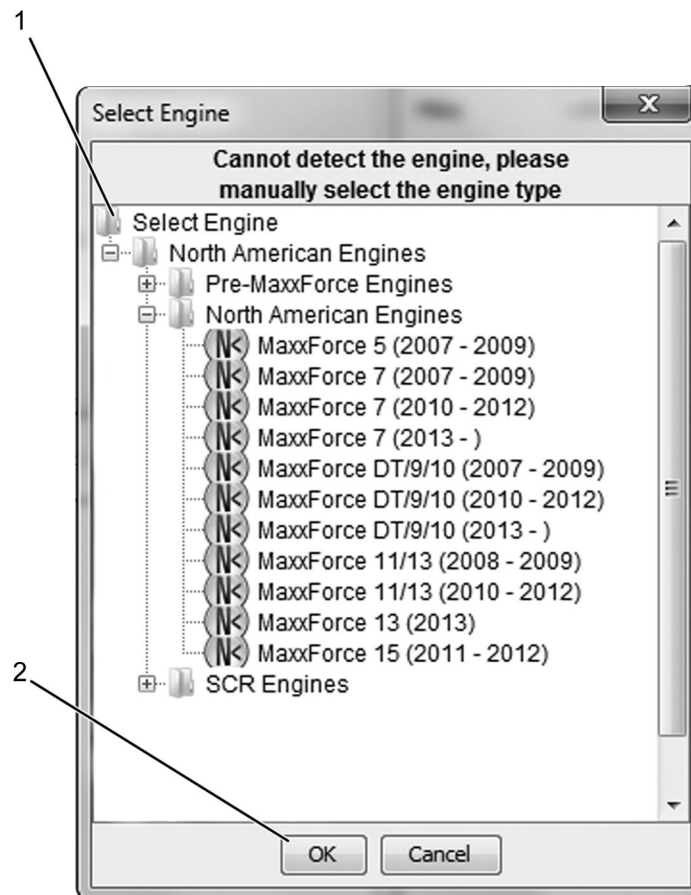
0000428119

- | | |
|------------------------------|------------------------|
| 1. Blank Module Flashing tab | 5. Save Request button |
| 2. Case File | 6. Fuel |
| 3. VIN or Chassis | 7. Hours |
| 4. Miles | |

Figure 37 Blank Module Flashing

1. Select the BLANK MODULE FLASHING tab (Figure 37, Item 1).
2. Input VIN OR CHASSIS number (Figure 37, Item 3).
3. Input vehicle MILES (Figure 37, Item 4).
4. Input vehicle HOURS (Figure 37, Item 7).
5. Input vehicle FUEL (Figure 37, Item 6).
6. Click SAVE REQUEST (Figure 37, Item 5) and follow the highlighted screen prompts for key cycles.

NOTE – Vehicle miles, hours, and fuel information must be entered correctly or the process request may fail.

Select Engine Window

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1. Select Engine

2. OK button

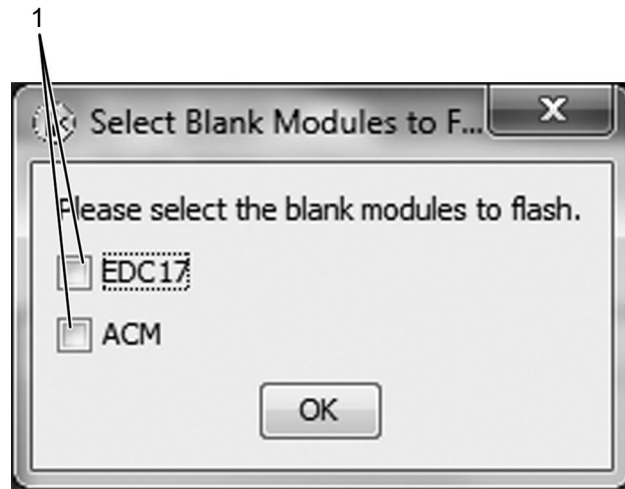
Figure 38 Engine Platform

1. In the SELECT ENGINE folder (Figure 38, Item 1), select the correct engine platform.
2. Click OK (Figure 38, Item 2).

Select Blank Modules Window

NOTE – All modules associated with the engine platform selection will be shown.

From this window, you can select the replacement module to be flashed.



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1. Select module checkbox (2)

Figure 39 Blank Module Selection

1. Check the BLANK MODULE boxes (Figure 39, Item 1) for the modules you want to flash.
2. Follow highlighted screen prompts for key cycles.

Process Requests Tab

From Process Requests tab, NavKal™ will upload the designated files to process the request. File upload status will be confirmed.

Campaigns Parameter Upgrades Blank Module Flashing Module History Process Requests							
Y	VIN	Case File	Operation	Status of Request	Request Date	PVC	Error
	8J777777		Blank	Pending Request	08/17/17		

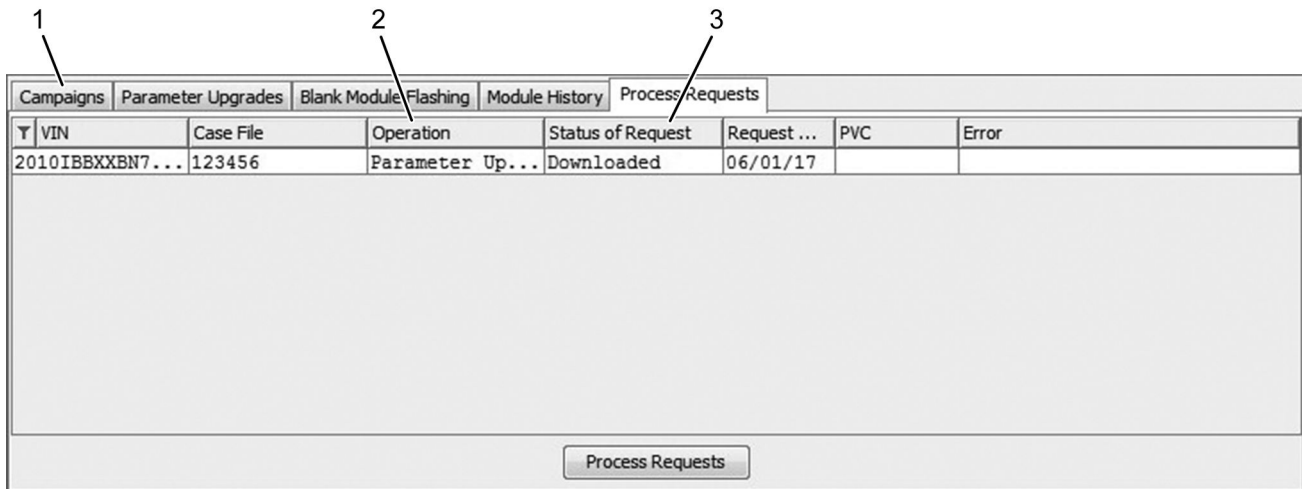
Process Requests

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1. Process Requests tab

Figure 40 Pending Requests

1. Select the PROCESS REQUESTS tab (Figure 40, Item 1).



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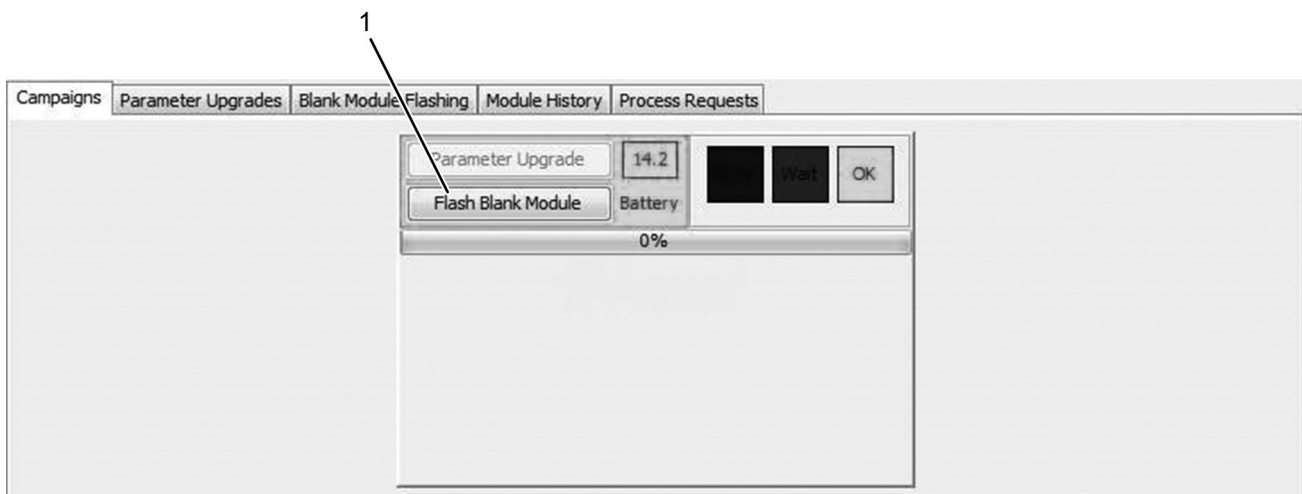
- 1. Campaigns tab
- 2. Operations display
- 3. Status of Request display

Figure 41 Process Request Downloaded

- 2. After the process requests task is complete, the OPERATION column (Figure 41, Item 2) will display PARAMETER UPGRADES and the STATUS OF REQUEST column (Figure 41 Item 3) will display DOWNLOADED.

NOTE – NavKal™ will verify that upgrade has been completed successfully.

- 3. Select the CAMPAIGNS tab (Figure 41 Item 1) to complete update.

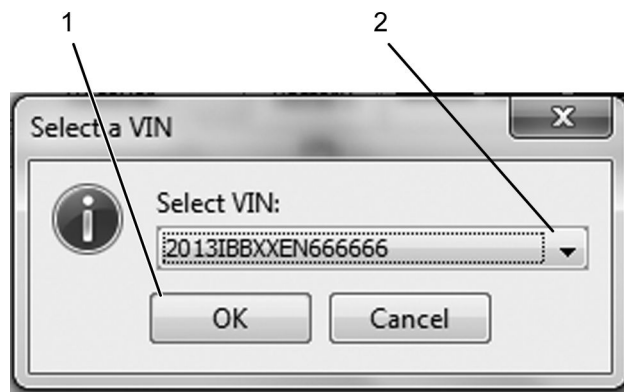


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- 1. Flash Blank Module button

Figure 42 Flash Blank Module

- 4. Click FLASH BLANK MODULE (Figure 42, Item 1) and follow screen prompts for key cycles.



1. OK button

2. VIN selection

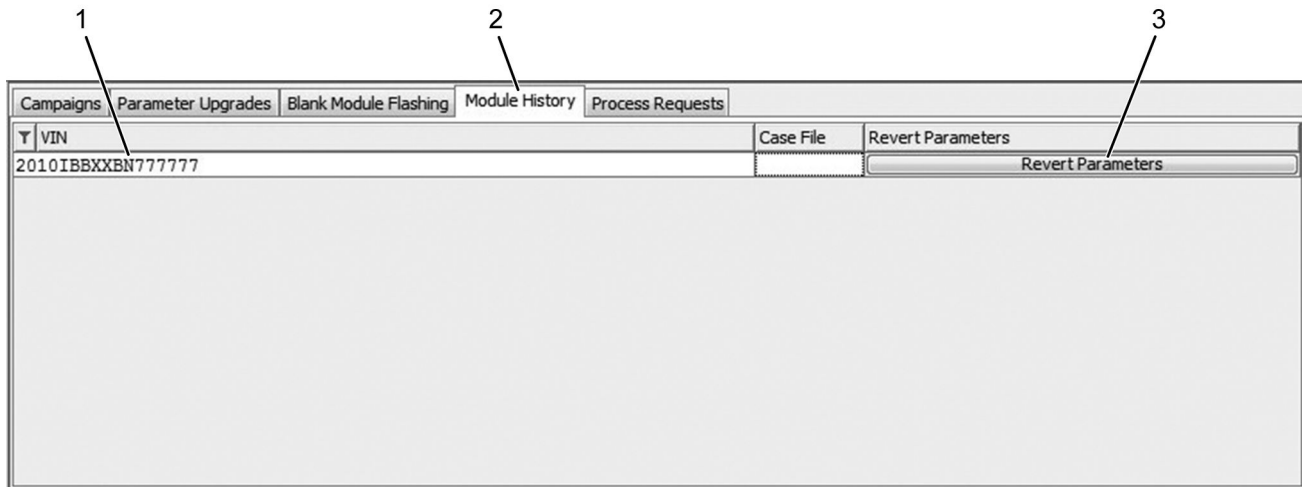
Figure 43 Associated VIN

5. In the Select a VIN window, select the associated VIN (Figure 43 Item 2), and click OK (Figure 43 Item 1). Follow screen prompts for key cycles.

Module History Tab

The MODULE HISTORY tab provides the option to revert parameters to the original programmed state, if issues exist after the calibration update.

NOTE – NavKal™ Basic will only allow calibration updates and campaigns for ECM, DCU, or ACM programming.

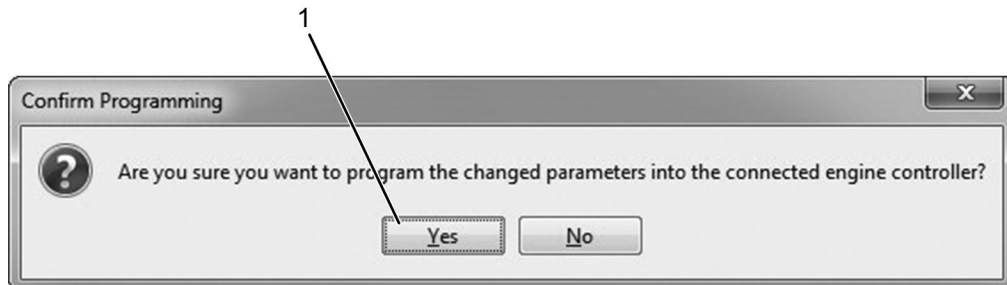


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- 1. VIN
- 2. Module History tab
- 3. Revert Parameters button

Figure 44 Module History

1. In the MODULE HISTORY tab (Figure 44 Item 2), identify the VIN with incorrect parameters (Figure 44 Item 1)
2. Click REVERT PARAMETERS (Figure 44 Item 3).
3. When file is done loading, click PROGRAM ENGINE to revert parameters to original settings.

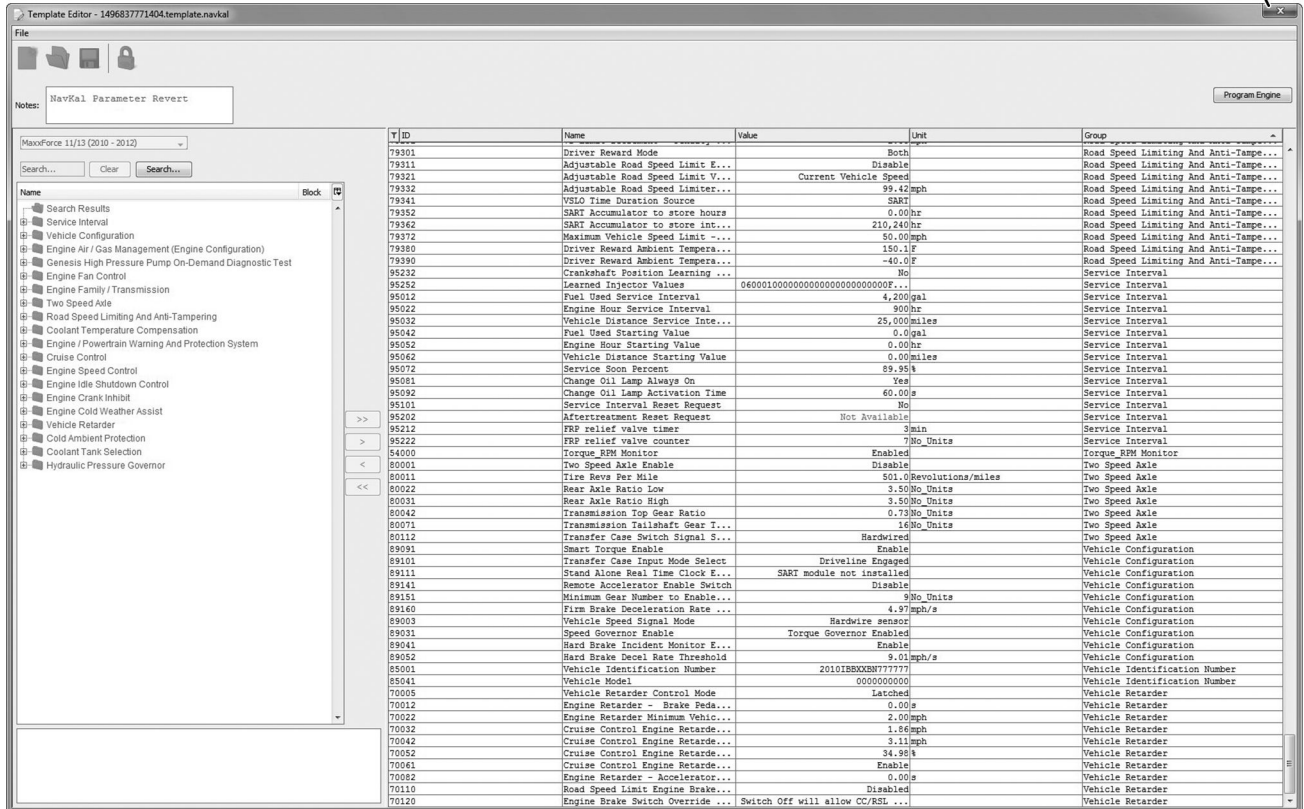


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- 1. Yes button

Figure 45 Confirm Programming

- Click YES (Figure 45 Item 1) to confirm programming.



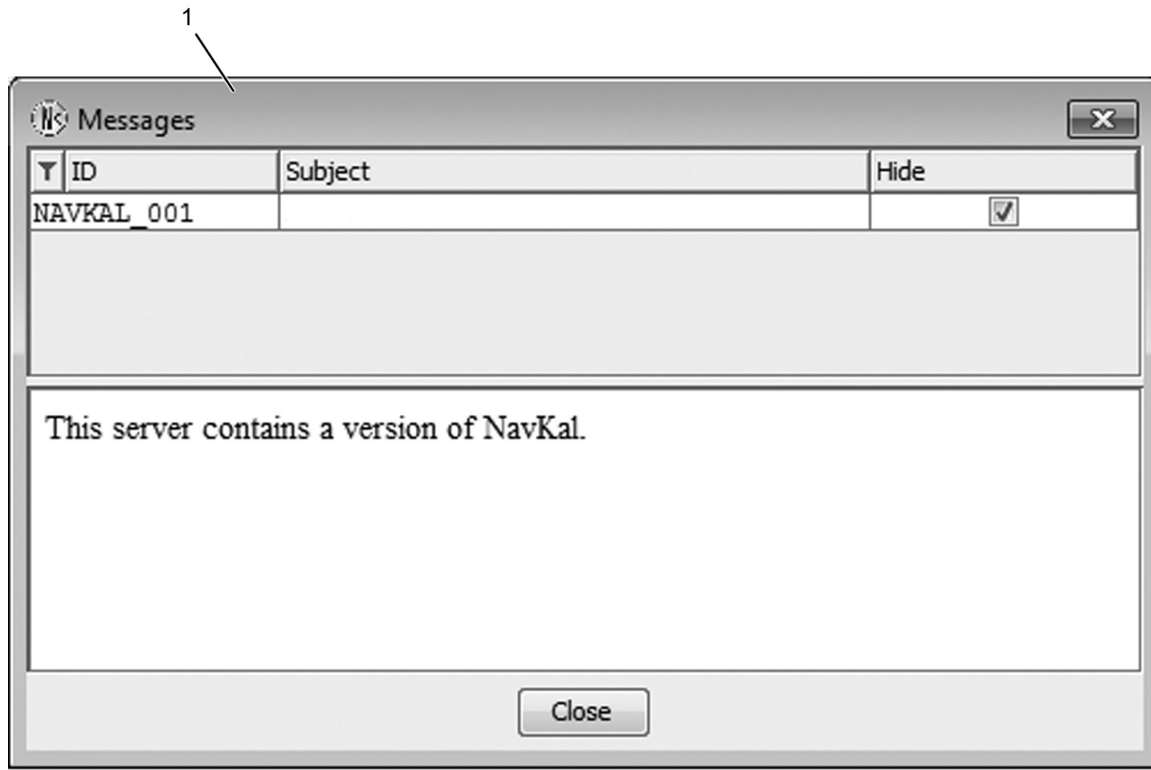
1. Exit button

Figure 46 Template Editor

- Click the X in the upper right corner of the window (Figure 46 Item 1) to close Template Editor window when programming is complete.

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SERVICE MESSAGES



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1. Messages window

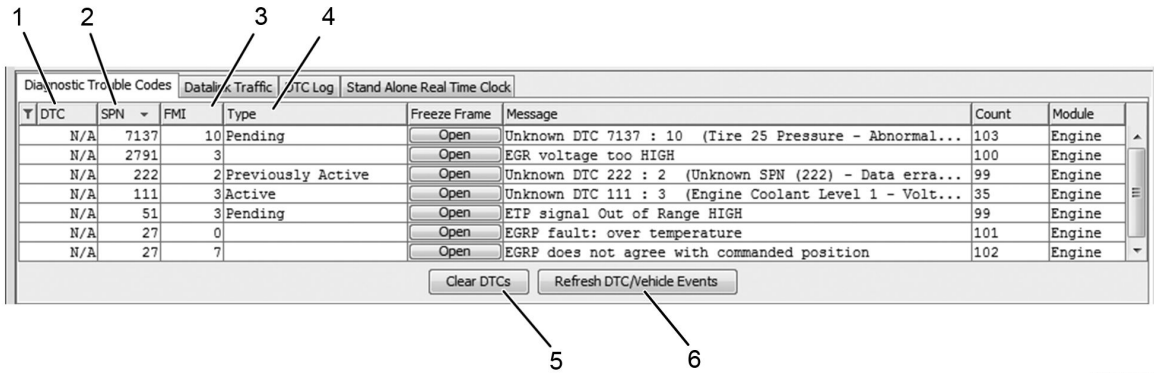
Figure 47 NavKal™ Service Messages

After an update, important messages about this updated version are displayed in the Messages window (Figure 47, Item 1). To disable a previous message and prevent it from being displayed in the future, click the checkbox in the HIDE column for each message be disabled.

DIAGNOSTIC TROUBLE CODES

DTC TAB

DTCs can be viewed and cleared from any session menu using the DTC tab.



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- | | |
|--|---|
| 1. Diagnostic Trouble Code (DTC) column (pre-2010) | 4. Type column (Active / Previously Active / Pending) |
| 2. Suspect Parameter Number (SPN) column | 5. Show All Modules button |
| 3. Failure Mode Indicator (FMI) column | 6. Clear DTCs button |

Figure 48 DTC Tab

DTC IDENTIFICATION

DTC identification is accomplished using two fault code identifiers. These two identifiers, known as the SPN and the FMI, are displayed in the DTC Window.

Identifier Type	Description
Suspect Parameter Number (SPN)	The SPN identifies the individual component causing the DTC.
Failure Mode Indicator (FMI)	The FMI identifies the fault or condition effecting the individual component.
Diagnostic Trouble Code (DTC)	The DTC is a 3-digit or 4-digit number used to identify DTCs. This 3-digit or 4-digit number is only used on pre-2010 engines.

NOTE – 2010 model year vehicles no longer utilize DTC identification by number. DTCs are now identified using the SPN and FMI only.

DIAGNOSTIC TROUBLE CODES

DTC TYPE

DTC Type	Description
Active	Faults that are currently present.
Previously Active	Historical faults that may be set by intermittent conditions, or by an operating condition which is not currently present.
Pending	Faults that occurred on the first drive cycle. Such faults become Active if they are detected again on the second drive cycle.
Healing	Healing DTCs are previously active faults that were not detected on a subsequent drive cycle. If the same fault is not detected for three consecutive drive cycles, it becomes Previously Active. If it is detected again within three drive cycles, it returns to the Active state.

VIEWING FREEZE FRAME DATA

Freeze frame data is a snapshot of the engine operating condition at the time the fault was detected. To view freeze frame data for a particular fault, click the button in the FREEZE FRAME column.

CLEARING DTCS

All inactive DTCs can be cleared from the ECM using the following procedure.

1. CLEAR DTCS
2. Select ENGINE CONTROL MODULE.
3. Click OK.
4. Cycle the ignition switch.