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**Author:** Matthew Carrigan

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Coding Information

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**Title:** Vehicle Programming Information Associated With 2-Box Engines (2002-2006 i6, v6, & v8)

**Applies To:** 2-Box Engines (2002-2006 i6, v6, & v8)

## **CHANGE LOG**

Please refer to the change log text box below for recent changes to this article:

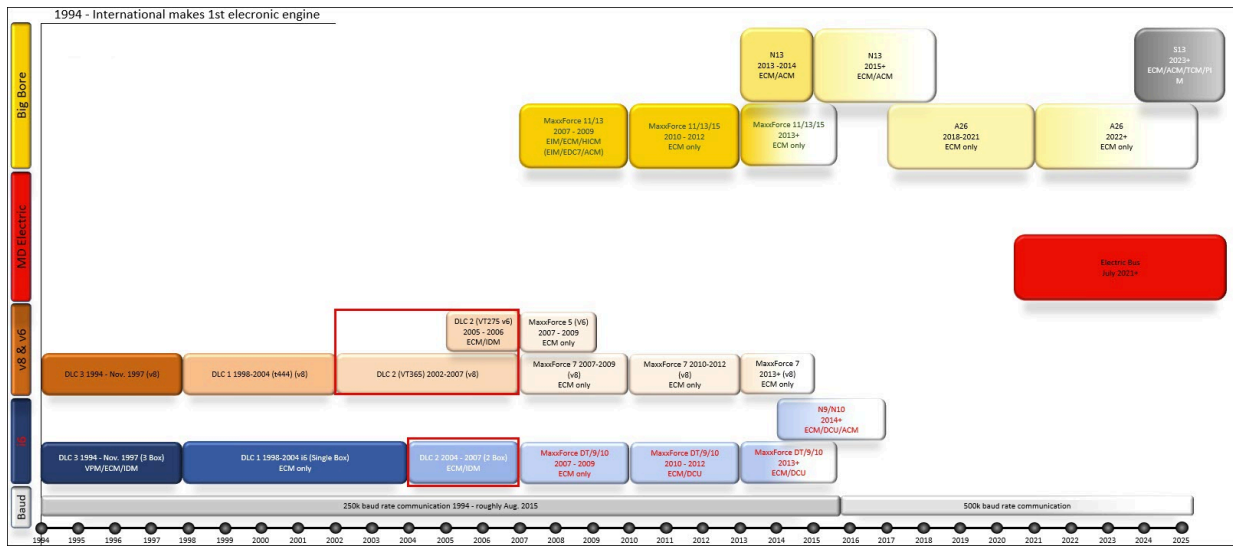
02/05/2025 - Initial Article Release

## **DESCRIPTION**

This document aims to enable technicians to:

1. Proficiently identify 2-box engine control systems.
2. Comprehend the programming intricacies related to such systems.
3. Autonomously execute programming tasks without necessitating interaction with technical.

## **Timeline:**



## Software/Hardware Integrations:

- **ServiceMaxx 1708:** Supported. Used for diagnostics & parameter changes.
- **DLC Fleet Tool:** [IK2600074](#) For changing Idle Shutdown Timer time & mode, service interval, and engine warning protection system. This only works with legacy communication cables.
- **NavKal:** Supported.
- **HeRo:** Supported.
- **DLB:** Supported.
- **360 Write Up:** Supported.
- The [programming station](#) works with this engine type.

## Naming Convention:

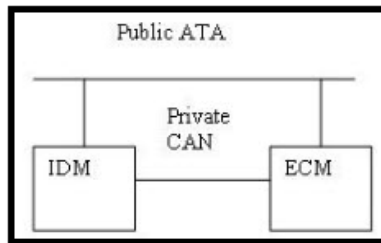
“Diamond Logic Controller” (DLC) is a term used to describe International’s brand-new (as of 1994) electronic engine control system. This third version of International’s electronic engine controls was referred to as DLC 2 or DLC II. The “2” stands for “2-Box” – indicating that this version of the engine electronic control system has 2 modules. The previous two engine electronic control systems International produced were referred to as DLC 3 and DLC 1 – both indicating the number of modules used to control the engine at that time. Each of these first three generations of electronic engines had its own diagnostic software package: DLC 3, DLC 1, and DLC 2. These were also referred to as Master Diagnostics 3, Master Diagnostics 1, and Master Diagnostics 2 (MD3, MD1, MD2).

## How 2 Box Modules Work:

**ECM:** Engine Control Module. The ECM holds both the calibration and the parameters. 2-Box ECM’s are dealer programmable. Both the calibration and parameters can be changed/programmed.

**IDM:** Injector Driver Module. The IDM only holds a calibration. There are no programmable parameters in the IDM. The IDM can be programmed through NavKal. The ECM must be present on the data link in order to program the IDM.

**Functional info:** This engine type only uses both an ECM and an IDM that both connect to the public 1708 data link. Both modules need to be present on the same data link (either vehicle or programming station) in order to program either module.



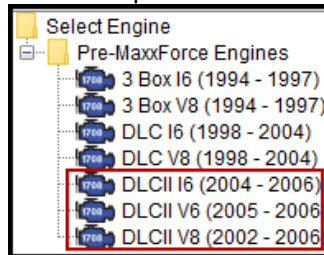
## Connecting To A 2 Box Engine:

Engine Type: DLCII I6 (2004 - 2006)
Reference Number: PBF2PP01ANZKHA03
Engine Family Rating Code: 2152
Vehicle Identification Number: 1HTMSAAR06H200890
Engine Serial Number: 466HM2U2055123
Transmission Type: Manual
Rated Power: 245 hp
Total Miles: 100.0 miles
Total Fuel Used: 100 gal
Total Engine Hours: 100.0 hr

When ServiceMaxx 1708 connects to a 2-box engine, you should see data similar to the screenshot above.

Engine Type:	DLCII I6 (2004-2006), DLCII V6 (2005-2006), DLCII V8 (2002-2006)
Reference Number:	Will show 16 digits (1st 8 digits are ECM cal / 2nd 8 digits are IDM cal)
Engine Family Rating Code:	(EFRC) should show a 4 digit number
Vehicle Identification Number:	Will show the full 17 digit VIN
Engine Serial Number:	Will shows the full 14 digit ESN
Transmission Type	Should correctly reflect the installed transmission (unless the vehicle has an Eaton automated manual transmission – then it is normal for ServiceMaxx 1708 to show an Allison transmission)
Rated Horsepower	Should correctly show the rated horsepower
Total Miles	Should show correct total vehicle distance
Total Fuel Used	Should show correct total fuel used
Total Engine Hours	Should show correct total engine hours

When connecting with ServiceMaxx 1708 or NavKal, if you have to manually select the engine type, you will select one of the options from the screenshot below.



## Source Addresses:

- Even though this engine has 2 modules, it only broadcasts a single source address of 128.
- The ECM broadcasts the source address. The IDM does not broadcast a source address.
- The source address is broadcast on the 1708 data link.
- This source address can be seen in the sniffer in either ServiceMaxx 1708 or NavKal.
- If you are using a Nexiq Communication cable, you can check in the Nexiq Device Tester to see source address 128 shows up.

## 2 Box Module Parts Information:

DLC2 I6: Look up ECM/IDM part numbers by VIN.

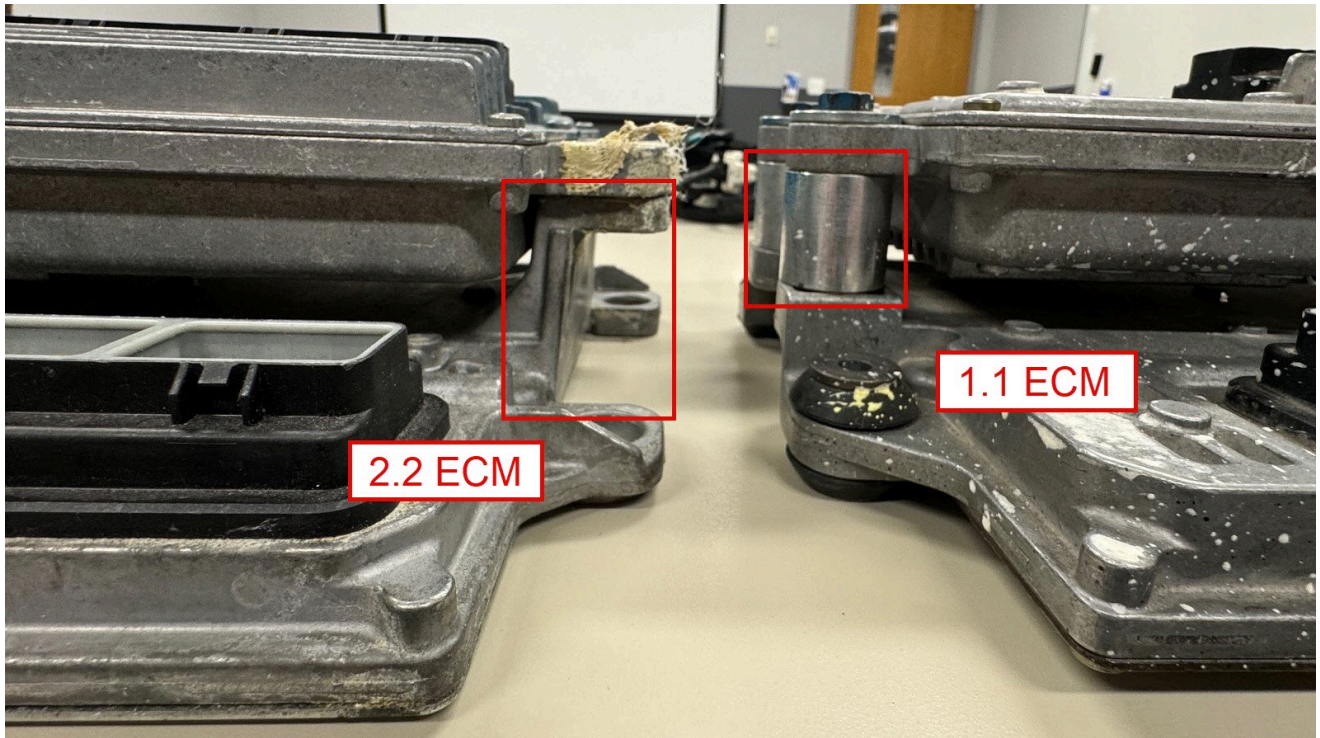
DLC2 V6 (VT275): Look up ECM/IDM part numbers by VIN.

DLC2 V8 (VT365): Look up ECM/IDM part numbers by VIN. This engine type had two different generations of ECM.

**These ECMs are physically different and are not interchangeable (you can physically install the wrong ECM, but it will not be programmable).**

1.1 ECMs (used from 2002-2003) are connected to the IDM with tubular aluminum spacers between the ECM and IDM. 1.1 ECMs were only used on vt365.

2.2 ECMs (used from 2003-on) had cast aluminum wings molded into the body of the ECM. 2.2 ECM's bolt directly to the IDM without the need for a tubular spacer. See the picture below for the visual differences between 1.1 vs. 2.2 ECMs.



If you need engine identification information, please see [IK2600242](#).

## 2 Box Horsepower Quotes:

Horsepower increases are supported for this engine type. Follow the process outlined in [IK2600069](#) to submit a case file for a horsepower quote. If the engine you're considering is already rated at the highest possible rating, then no increases are available. There are 4 different ratings that are highest in their class. See the chart below for those highest ratings. There is no need to submit a case requesting a horsepower increase for an engine that is already at one of these ratings – as there are no increases available.

Rating	Engine	Torque Range	Horsepower	Torque
12NPR	DT466	Standard	225	620
12NPX	DT466	High	300	860
12NRG	DT570	Standard	310	1050
12NRM	DT570	High	370	1300
12NPD/12NPH	VT365	Standard	215	540
12NPE/12NPK	VT365	High	230	620

Interantional does not support changes from standard torque ratings to high torque ratings (and vice versa). So, if you have a DT466 with 12NPR (standard), it is not possible to increase to a higher rating. If you submit a case file with this type of request, it will receive the response that there are no increases available.

We have had reports of a discrepancy between the dealer-facing 2-box horsepower ratings data that is available in the CT400 (sales data book) vs. the data that International uses to evaluate horsepower quotes – specifically that some horsepower ratings in the CT400 show a different torque range (standard torque vs. high torque) than what we provide in a case file horsepower quote. Below is the full list of 2-box i6 ratings, their HP/TQ ratings, and their torque ranges (standard vs. high torque). International will use the information below when developing the horsepower quote.

Rating Code	Engine Size	Standard tq / High tq	Advertised hp	Peak torque	Gov RPM	EFRC
12NPL	DT466	ST	210	520	2600	1,121
12NPM	DT466	ST	220	540	2600	1,131
12NPN	DT466	ST	225	560	2600	1,141
12NPR	DT466	ST	225	620	2400	1,122
12NPP	DT466	HT	245	620	2600	2131
12NPS	DT466	HT	245	660	2400	2132
12NPT	DT466	HT	255	660	2600	2141
12NPU	DT466	HT	260	800	2400	2152
12NPV	DT466	HT	285	800	2400	2162
12NPX	DT466	HT	300	860	2400	2172
12NPW	DT570	ST	285	800	2200	5,121
12NRC	DT570	ST	295	950	2100	5,131
12NRD	DT570	ST	295	950	2200	5,141
12NPZ	DT570	ST	310	950	2200	5,151
12NRA	DT570	ST	310	950	2200	5,161
12NRB	HT570	HT	330	950	2200	6,161
12NRE	HT570	ST	310	1050	2100	5,132
12NRG	HT570	ST	310	1050	2200	5,132
12NRH	HT570	HT	330	1150	2100	6,161
12NRZ	HT570	HT	355	1150	2100	6,132
12NRK	HT570	HT	355	1250	2100	
12NRL	HT570	HT	370	1250	2100	
12NRM	HT570	HT	370	1300	2100	

## 2 Box Engine Swaps:

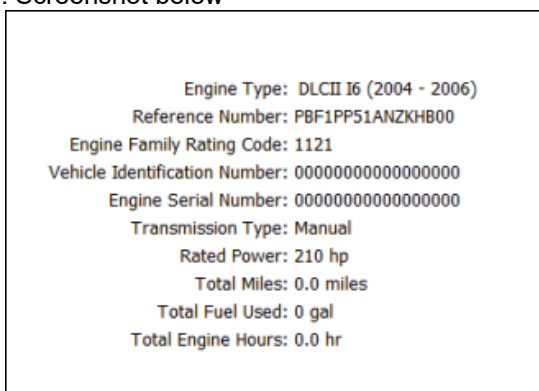
See [IK2600047](#) for information about engine swaps. Programming changes may be needed in order to accommodate an engine swap. There are some instances where International CANNOT support and engine swap. If you have any doubts about whether your engine swap will be supported by International, please start a case file with the Vehicle Programming group and we will let you know if International will support the swap. It is advisable to do this BEFORE swapping the engine.

## Common Programming Issues With 2 Box Systems:

### 1. ECM Loses Parameters:

#### a. Symptoms:

- i. 141, 142, & 621 faults
- ii. Miles/Hours/Fuel default to "0"
- iii. VIN/ESN are lost
- iv. EFRC is lost (defaults to "FFFF")
- v. Transmission type defaults to "Manual"
- vi. Engine power decreases
- vii. Screenshot below



#### b. Possible Cause – Battery disconnect

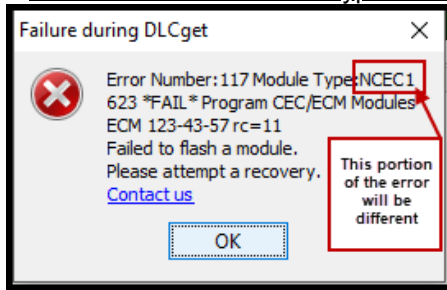
- i. **Fix** – Program as a blank module with NavKal. To prevent lost parameters due to a battery disconnect, wait at

lest 60 seconds after key off before activating the battery disconnect.

c. Possible Cause – Bad ECM

i. **Fix** – program as a blank module with NavKal. If the ECM loses its parameters again, replace the ECM. See [IK2600185](#) for more details.

2. **NavKal Error 117 Module Type:.... 623....**:



a. This error can be caused by communication from other modules interfering with NavKal’s communication on the data link.

i. **Fix** – either pull transmission/ABS fuses, or use programming station. See [TL2900048](#) for info about the programming station.

3. **NavKal Error 8:** indicates NavKal expected to see a module on the data link, but couldn’t detect it.

a. **Fix** - [IK2600252](#) provides troubleshooting steps and direction

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