Achieve the impossible

Abrites Diagnostics for Volvo
User Manual

Version: 1.2

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List of Revisions			
Date	**Chapter**	**Description**	**Revision**
27th September. 2015	ALL	First version of the document.	1.0
14th December. 2016	3.5	Second version of the document.	1.1
12 June. 2017	3.5 .1	Third version of the document.	1.2

1. Introduction

“Abrites Diagnostics for Volvo” is a Windows PC based diagnostic software for Volvo vehicles. With the help of this software you can perform complete diagnostic operations of all vehicles.

For proper operation of your diagnostic software you will need a corresponding interface for connection between your PC and vehicle named “AVDI”.

AVDI is an interface produced by Abrites Ltd. intended to act as an interface between the PC and the electronic control units.
AVDI should be used with ABRITES software produced by Abrites Ltd.

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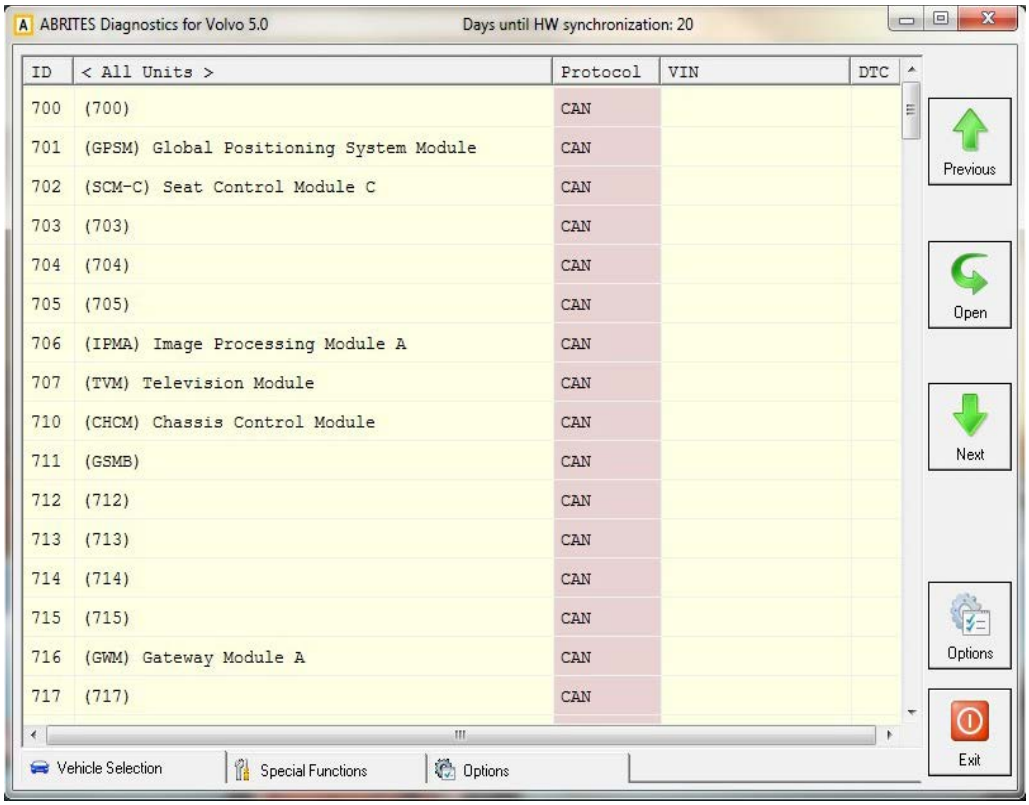
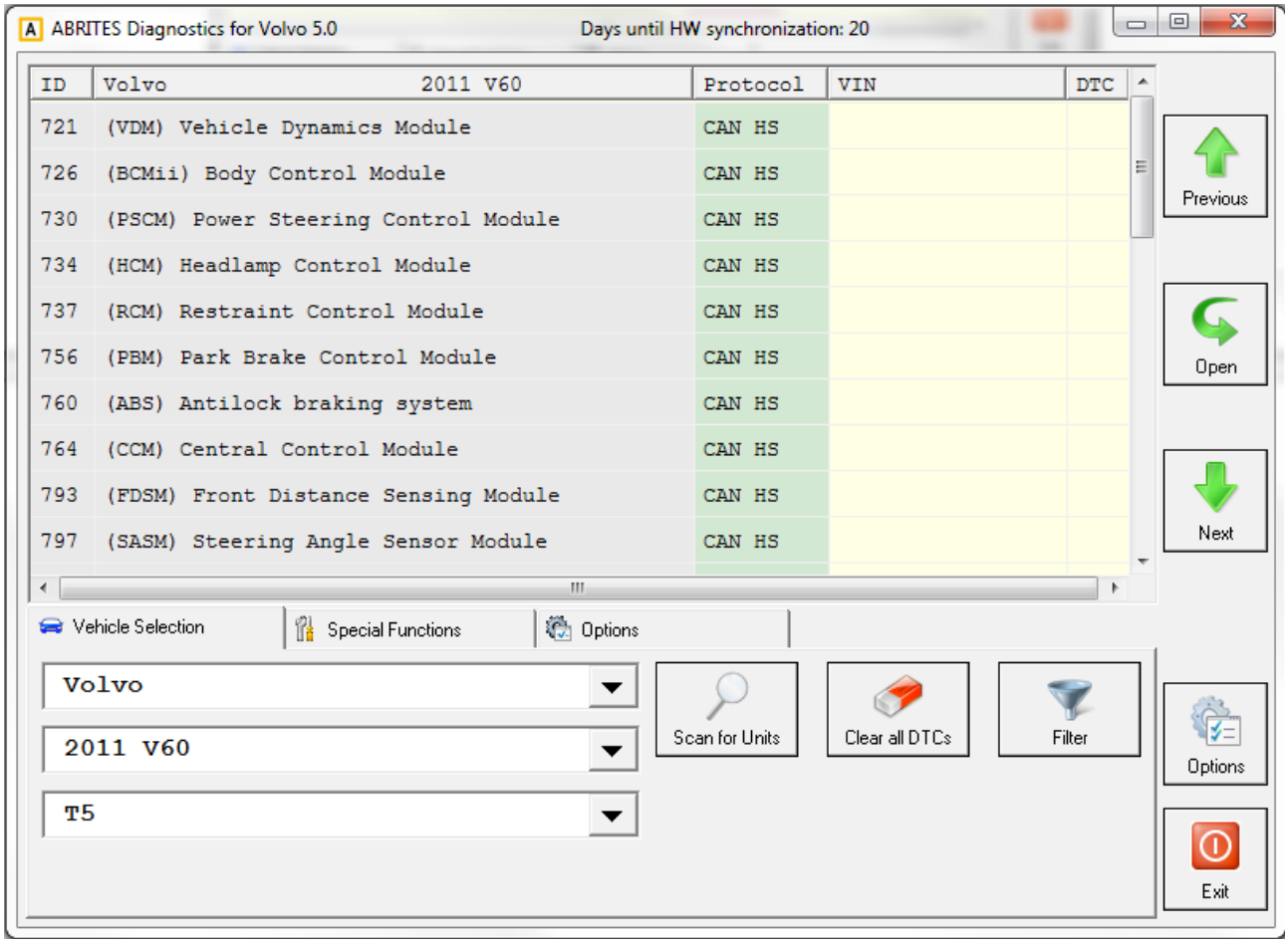
2. Using the Abrites diagnostic for Volvo

The Abrites diagnostics for Volvo is installed together with the rest of the Abrites diagnostic software applications as a part of the Abrites diagnostic suite provided to the user via e-mail.The user can start the software by clicking on the appropriate icon from the Abrites “Quick start” menu.

Once the Volvo icon is selected the software will start and the user will see the following screen:



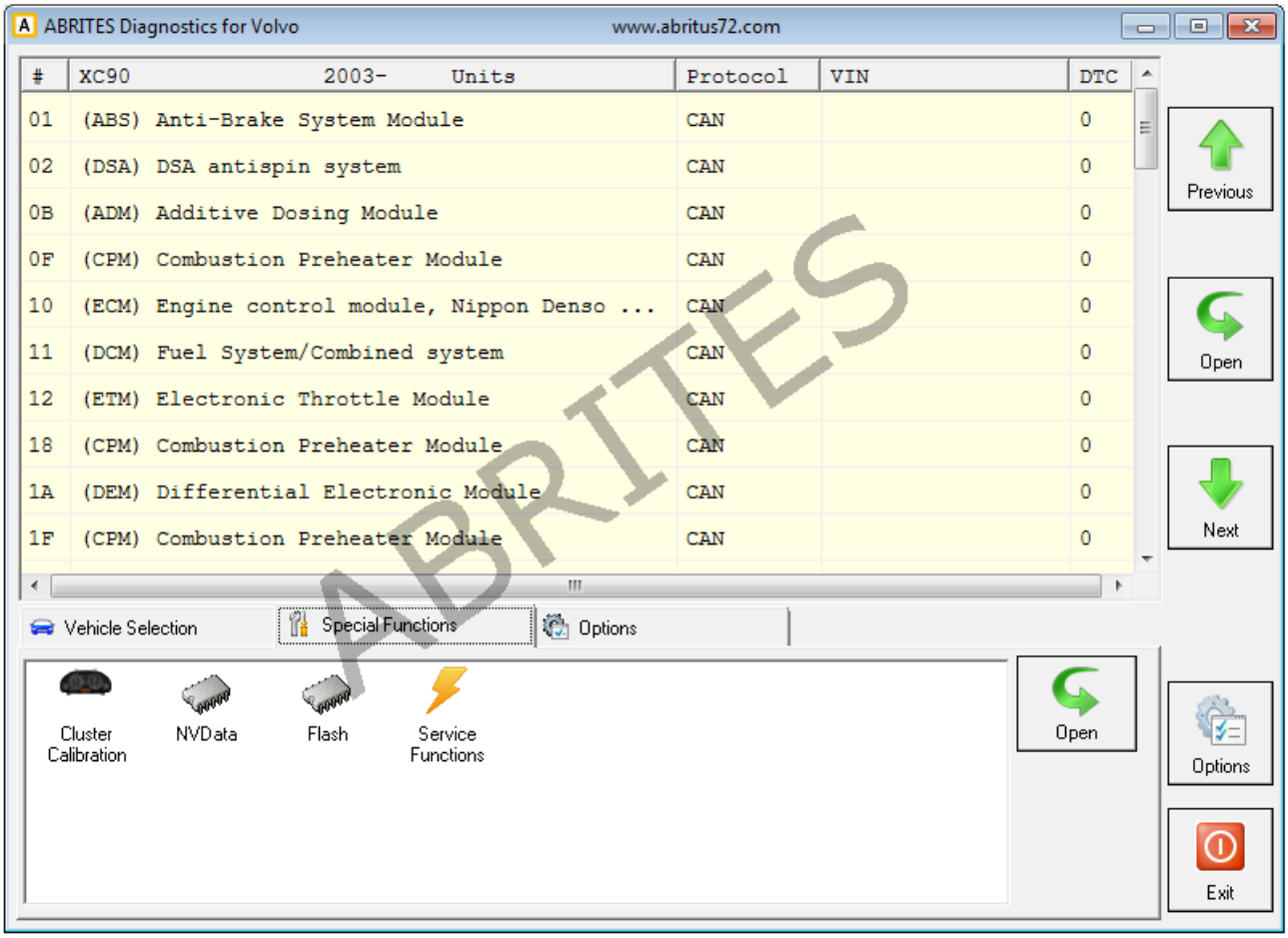
From this screen the user can select the vehicle they are working with. For the purpose of the manual we have selected a Volvo V60 from 2011 with a T5 engine.



In the main fields of the screen the user will see all the modules that may be installed in this vehicle. The modules may vary according to the vehicle specifications.

2.1 Diagnostics

The Abrites diagnostics for Volvo provides the options for detailed module identification, reading and clearing of diagnostic trouble codes (DTC), monitor live data. From the screen below the user can see the amount of diagnostic trouble codes in all the selected units:



There is an option to read and clear all DTCs or individually clearing them when entering the appropriate electronic module.

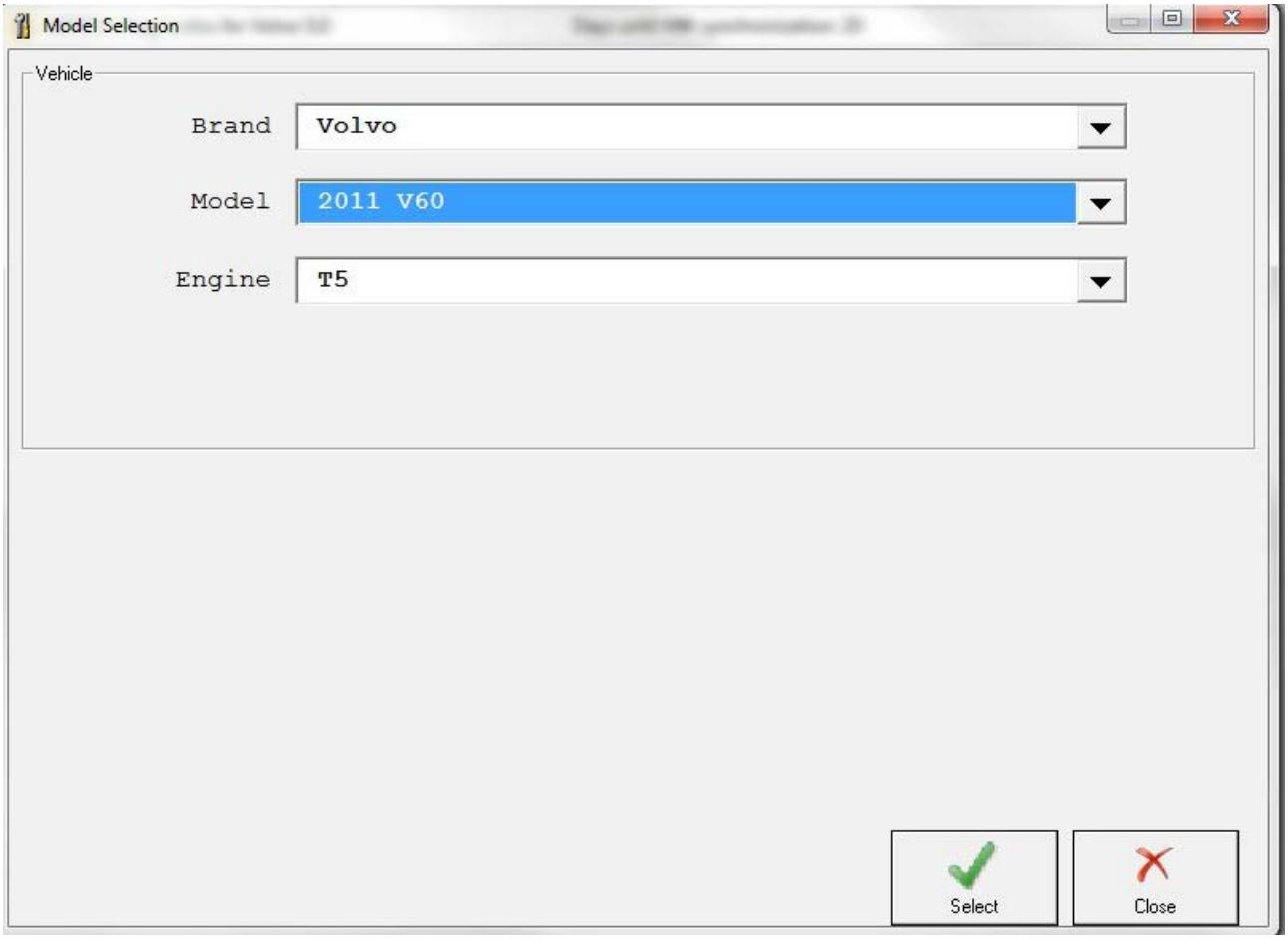
3. Special functions

The software provides a variety of special diagnostic functions in order to assist the user to perform advanced diagnostics on Volvo vehicles. Such functions include “Service functions”, “Cluster calibration”, NV data and Flash reading and updating.

3.1 Service functions

The option service functions refers to modifications of the service history of the vehicle after maintenance or during testing. It also provides access to real time testing of actuators.

When the icon is selected the user can select a model of vehicle to begin using the service functions.



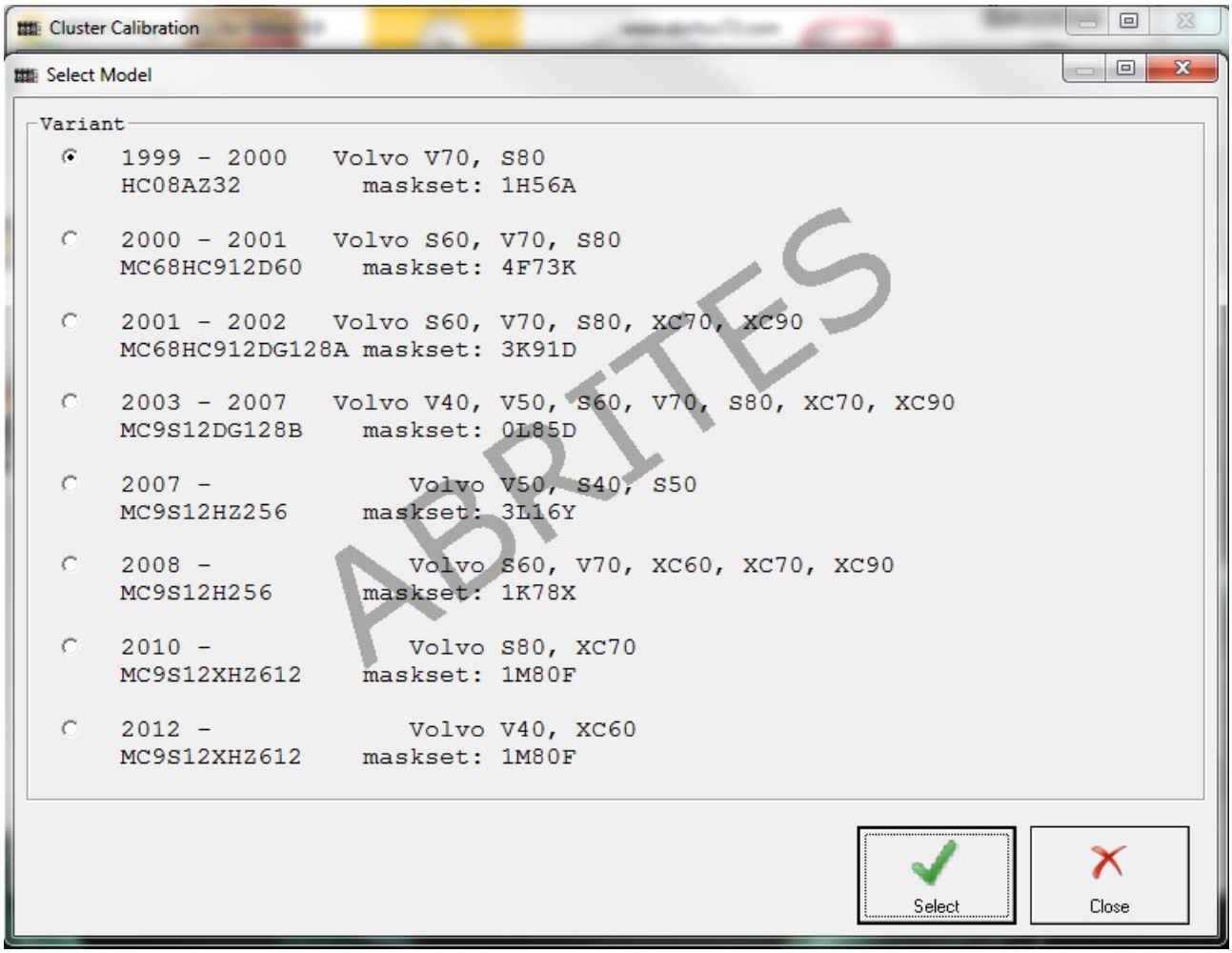
Once the model is selected there will be a list of options for the vehicle the user is working with.

3.2 Cluster calibration

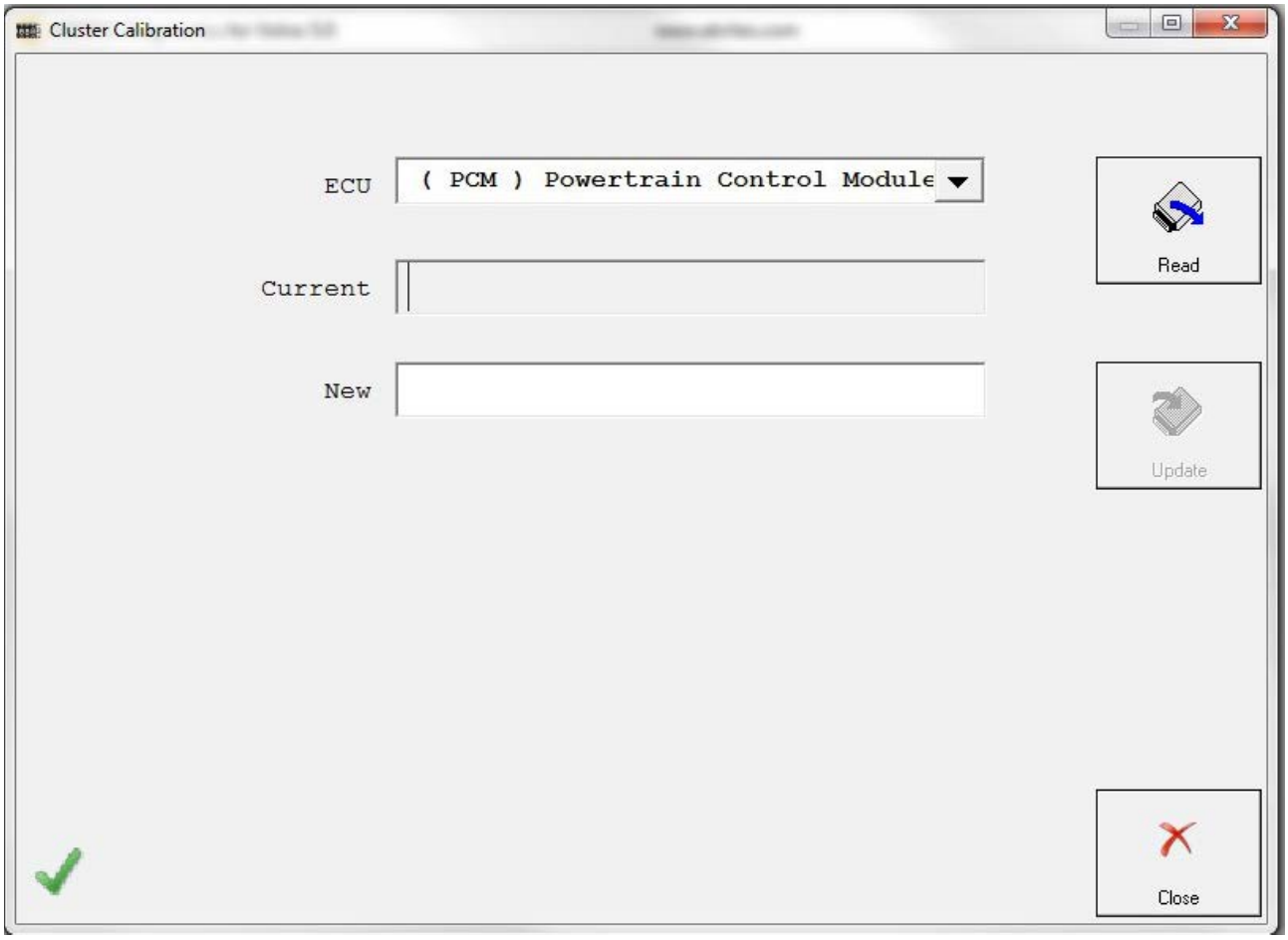
Using the “Cluster calibration” function the user can calibrate the values for different modules.

This function is particularly useful in the cases where a module needs to be replaced with a second hand unit with a different value.

In the first screen of the cluster calibration menu the user can select the vehicle they are working with:



In the second screen of the cluster calibration the user can select the module they would like to work with and press **read.**



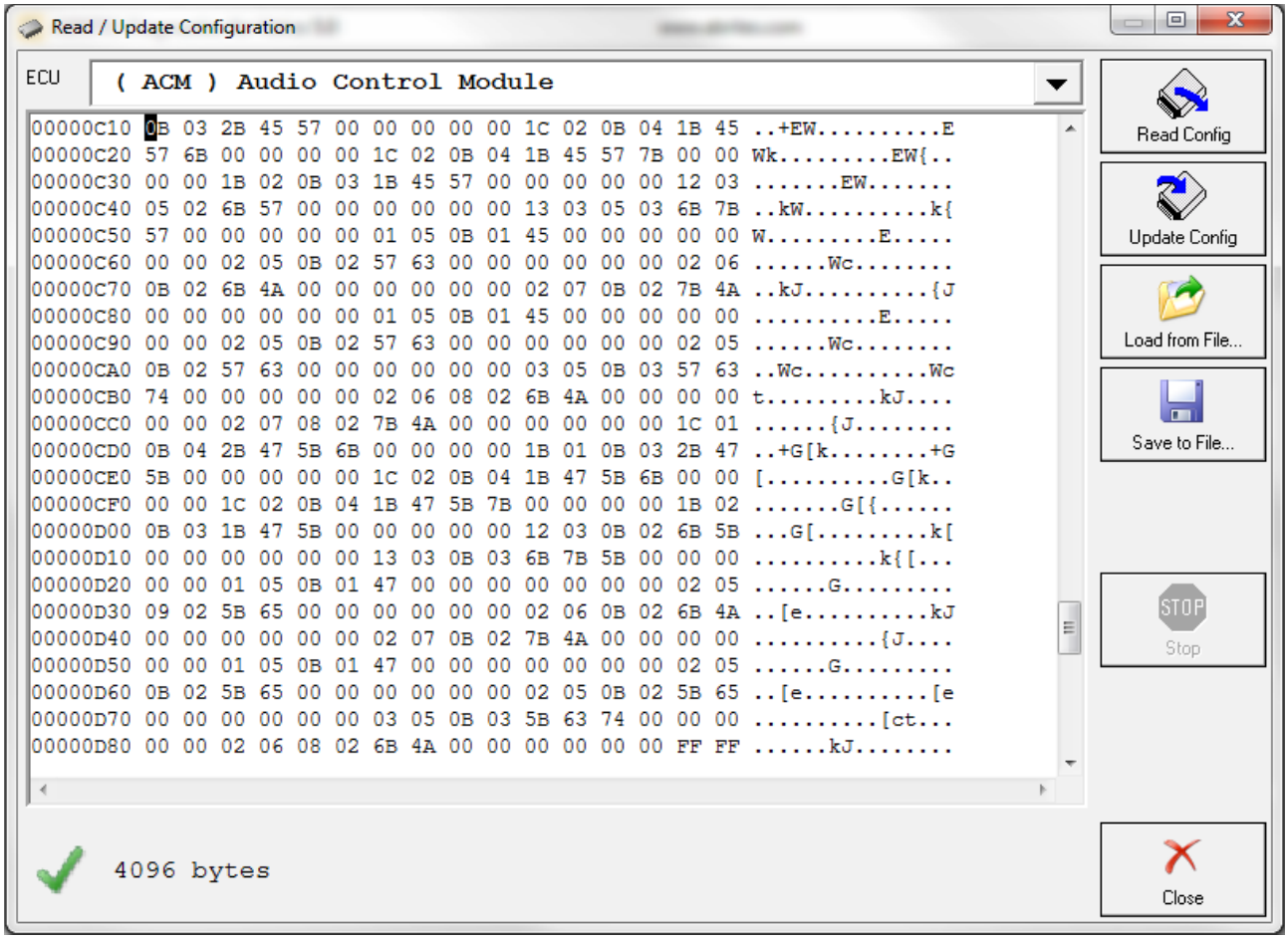
The next step in the cluster calibration process would be to type the new values in and update the module.

This allows the vehicle to continue functioning properly without discrepancies caused by mismatches in the counter values. Please note that such calibrations should only be performed after strictly following local regulations.

3.3 NV DATA

The NV data special function allows the user to read and update the configuration data of different modules, save it to a file on their computer and update it back to the module if needed.

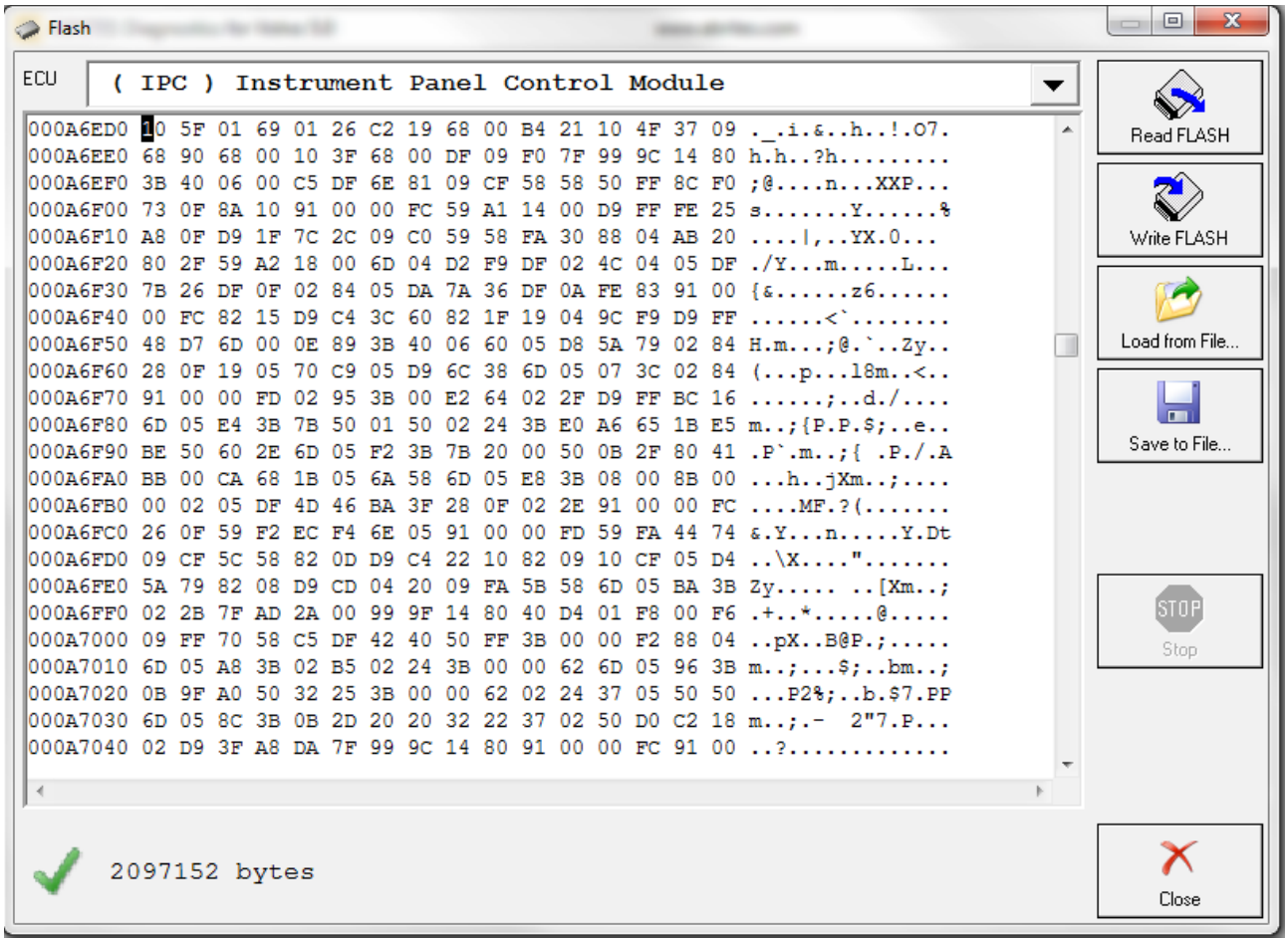
Once this function of the Abrites diagnostics for Volvo is selected the user can see all the options.



This function is very useful for electronic module replacement.

3.4 Flash

Similar to the NV data function in terms of its operation the flash function is very helpful when flash files need to be transferred from one unit to another or for flash tuning purposes.



3.5 Key Programming

This function is intended for HITAG2 key programming for the following models:

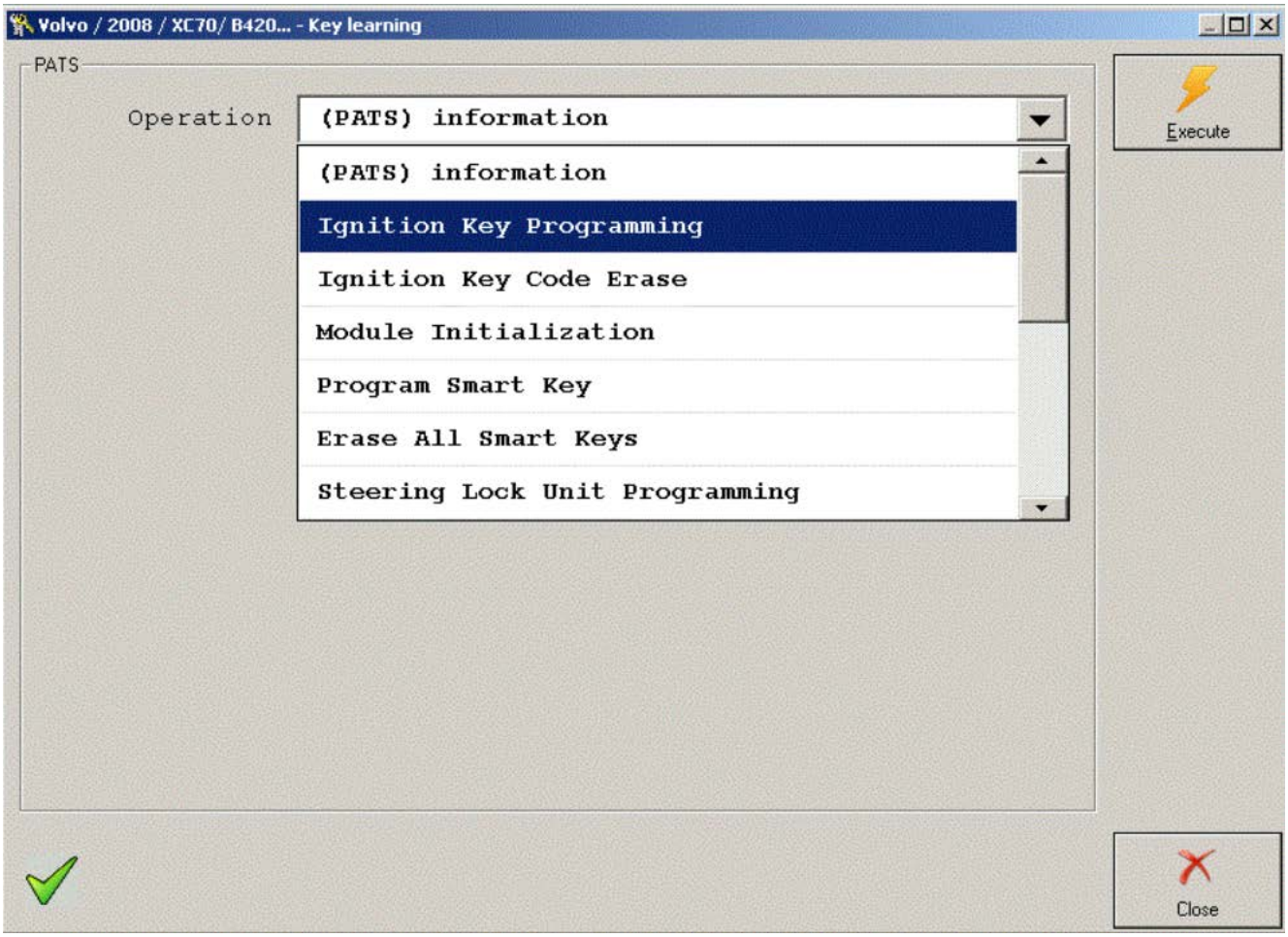
– 2012, 2013, 2014, 2015, 2016 Volvo V40 and V40 Cross Country
– 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016 Volvo S80
– 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016 Volvo V70
– 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016 Volvo XC70
– 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016 Volvo XC60
– 2010, 2011, 2012, 2013, 2014, 2015, 2016 Volvo S60 and S60 Cross Country
– 2011, 2012, 2013, 2014, 2015, 2016 Volvo V60 and V60 Cross Country

It covers the following CEM units:

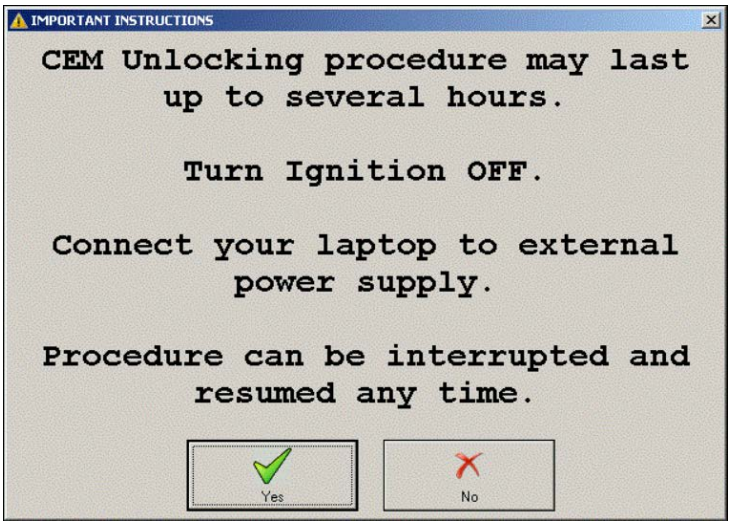
6G9T-14C256-GG
6G9T-14C256-HE
6G9T-14C256-HF
7G9T-14C256-FA
7G9T-14C256-GA
AG9T-14C256-HC
BG9T-14C256-FB
BG9T-14C256-GA
BG9T-14C256-HA
CG9T-14C256-FA

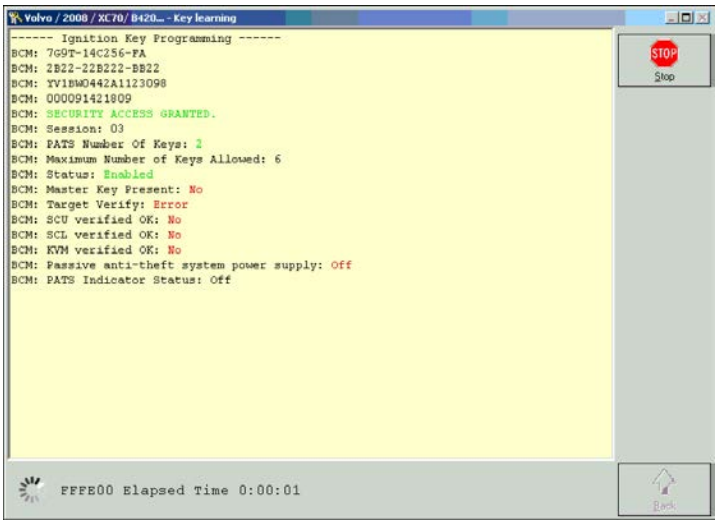
Note:
1. Old Volvo models with L-Shape CEM are not supported (XC90).
2. Only HITAG2 keys with ID xxxxxx9x are suitable.

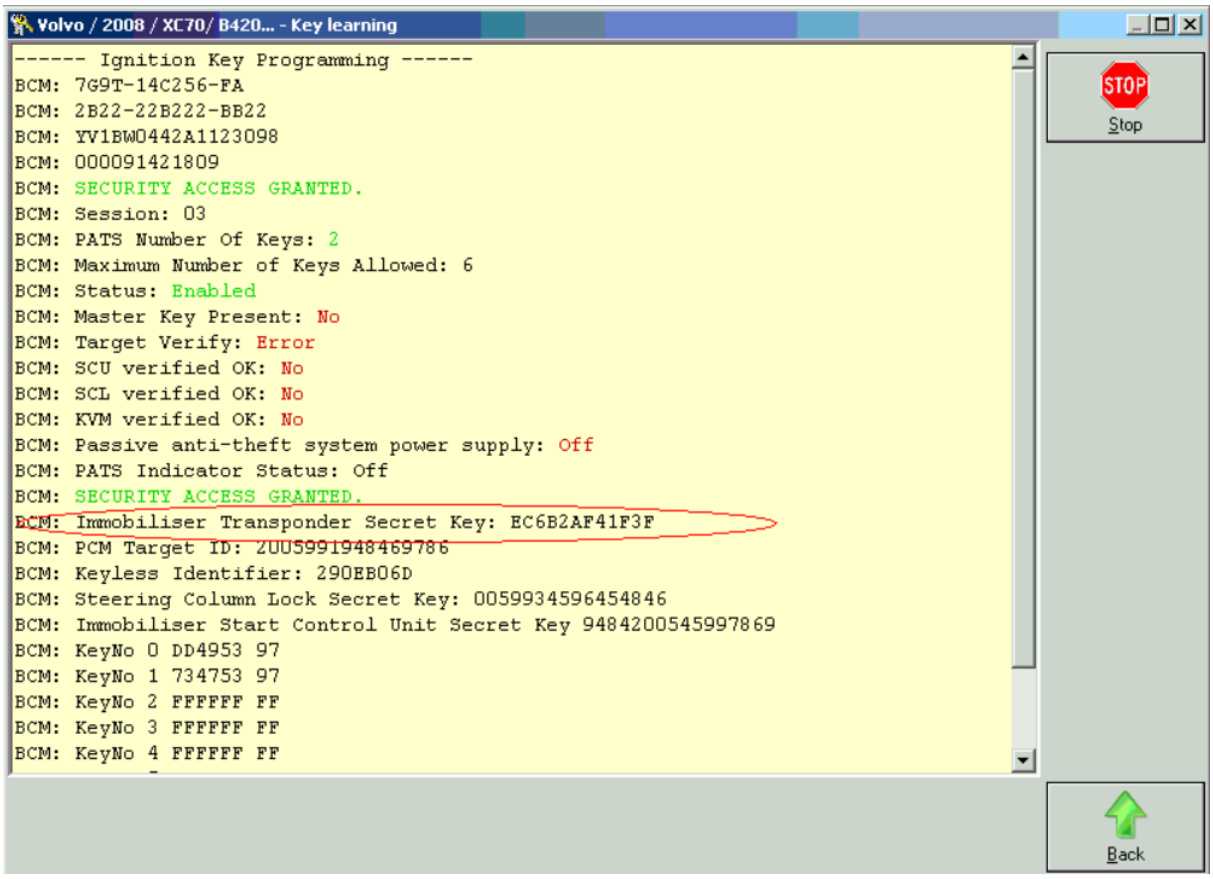
Steps:
1. Open your Abrites Diagnostics for Volvo Software
2. Open the Key Learning Special Function
3. Select Volvo Model/Year
4. Select operation - Erase All Keys or Ignition Key Programming (Other options are still not available at the moment.)



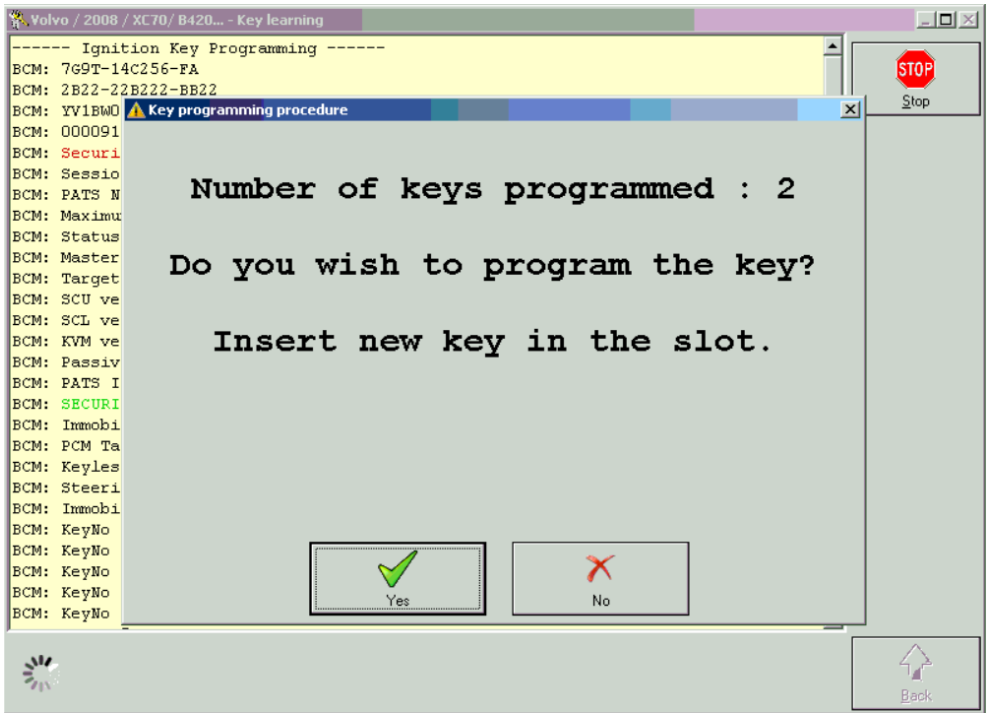
5. Press the button "Execute". Key programming needs CEM unlocking. The CEM unlocking is a **long time lasting procedure** (It may take up to several hours).
6. You can stop the CEM unlocking at any time with the STOP button in the right side of the dialog. The procedure can be resumed on the same computer later from the point of stopping (Previous progress from the procedure start is not lost).







7. Insert an unlocked key in the key slot and press the key inside.
8. The number of the keys on screen must increase. New key ID will appear in the screen log. The key is now locked to this car.



The CEM accepts only unlocked HITAG2 transponders. If you have a transponder locked from this CEM, you can unlock it with the ProTag and reuse it.
The transponder SK (secret key) is 6bytes long and you can find it in the screen log.

3.5.1 CEM Unit bench wiring

If you decide to work on bench, you have the possibility to remove the immobilizer system from the car and work remotely. This can be done when you don't have the time to wait a couple of hours on the car and wait for the immobilizer to get unlocked. The unit is located above the front passenger's feet.
After you remove it from the car and take it to your workshop, you need to connect it with the corresponding cables, unlock it and continue with the procedure. Once it is finished, you can reconnect the unit to the car and with the same computer used to unlock it, start the procedure again and program keys. This time, the procedure will last no more than two minutes as the unit has already been done with this computer.

It is better to use clips to make the connections to the unit instead soldering. Below you will find more information about the wiring.

1. Models from 2007 up to 2010
6G9T-14A073-xx
7G9T-14A073-xx

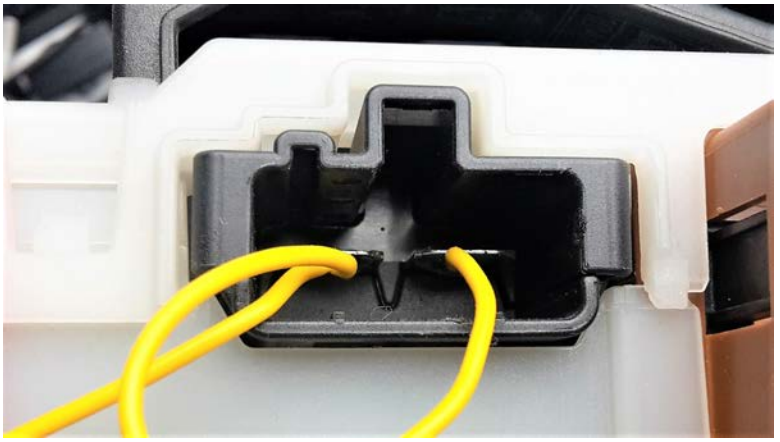
The blue socket on the 3rd photo has the following pinouts:

1 - GND ---- OBD 4,5 , where GND is using a black cable
47 - CANH --- OBD 14 , which has the red cable
48 - CANL ---- OBD 6 , where the blue cable is applied

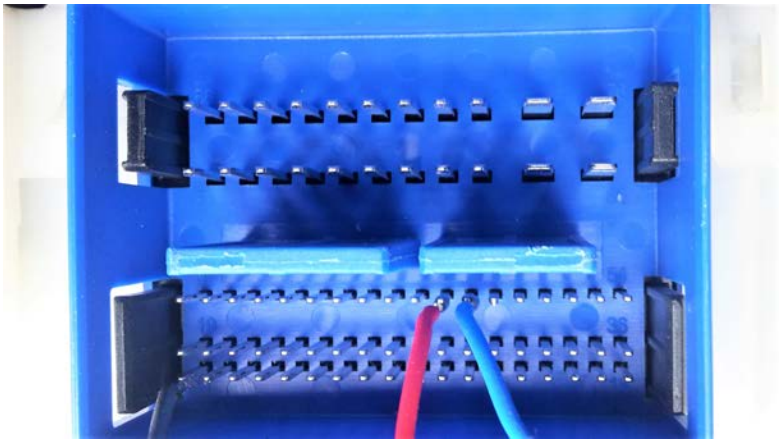
2. Black socket pinouts:
2,2 - POWER SUPPLY - OBD 16 (yellow cable)

1

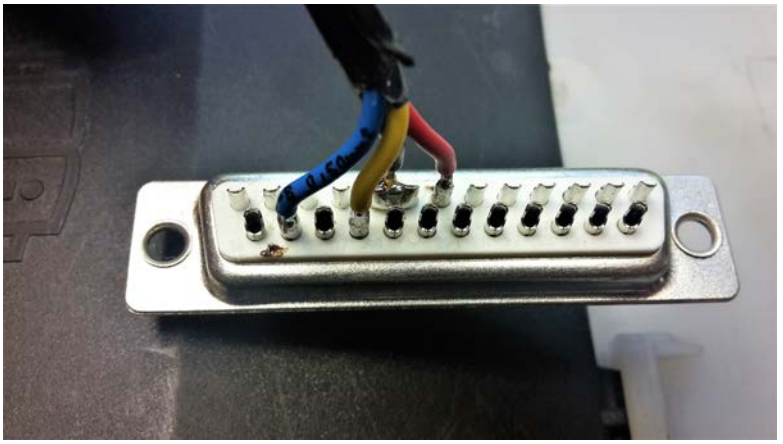
2



3



4

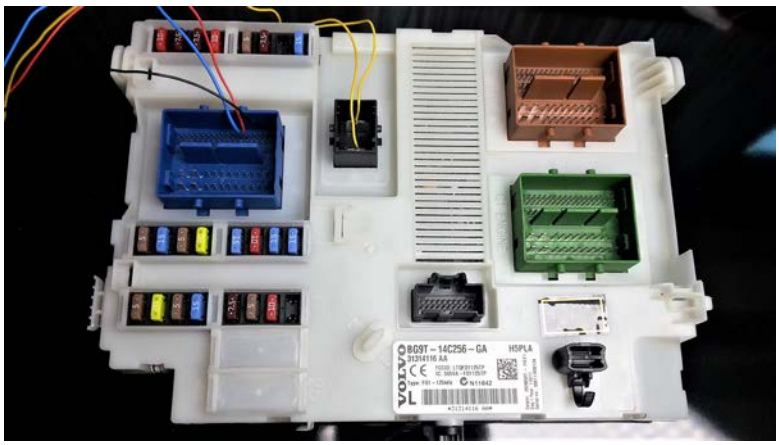


For models from 2010 - present, the versions are as follows:
AG9T-14A073-xx
BG9T-14A073-xx
CG9T-14A073-xx

On picture Nr.7 you can find the pinouts for the CEM module, which serves as an immobilizer:
1 - GND ---- OBD 4,5 (black cable)
6 - CANH --- OBD 14 (red cable)
7 - CANL ---- OBD 6 (blue cable)

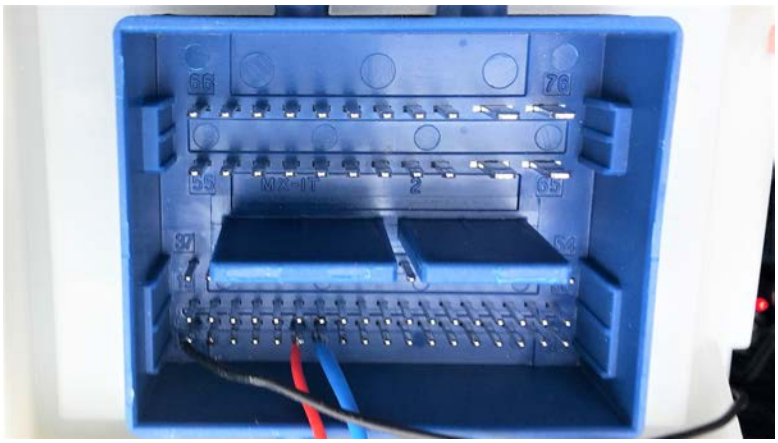
The 6th photo displays the Black Socket, used for power:
2,2 - POWER SUPPLY - OBD 16 (yellow cable)

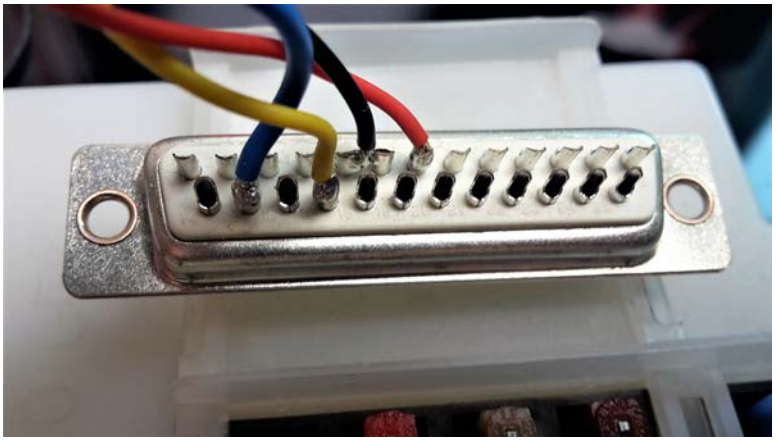
5



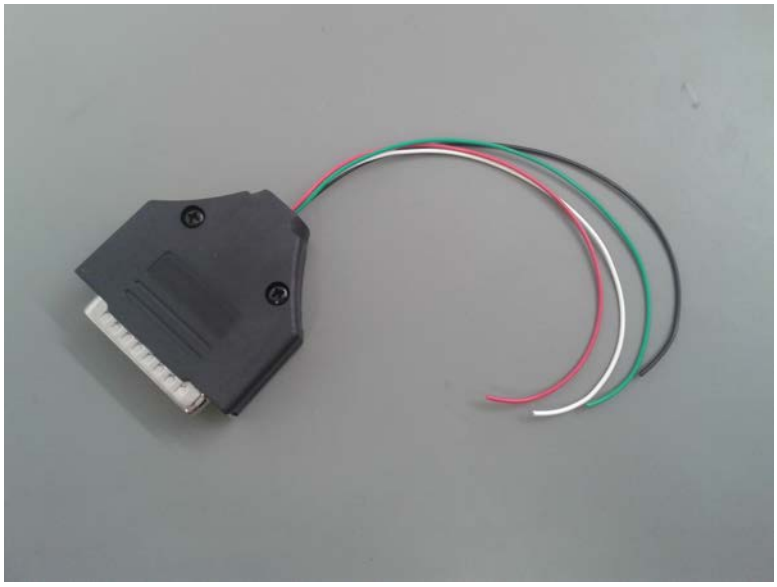
6

7





You can renew Volvo Key PCBs using the ZN045 ABPROG adapter.



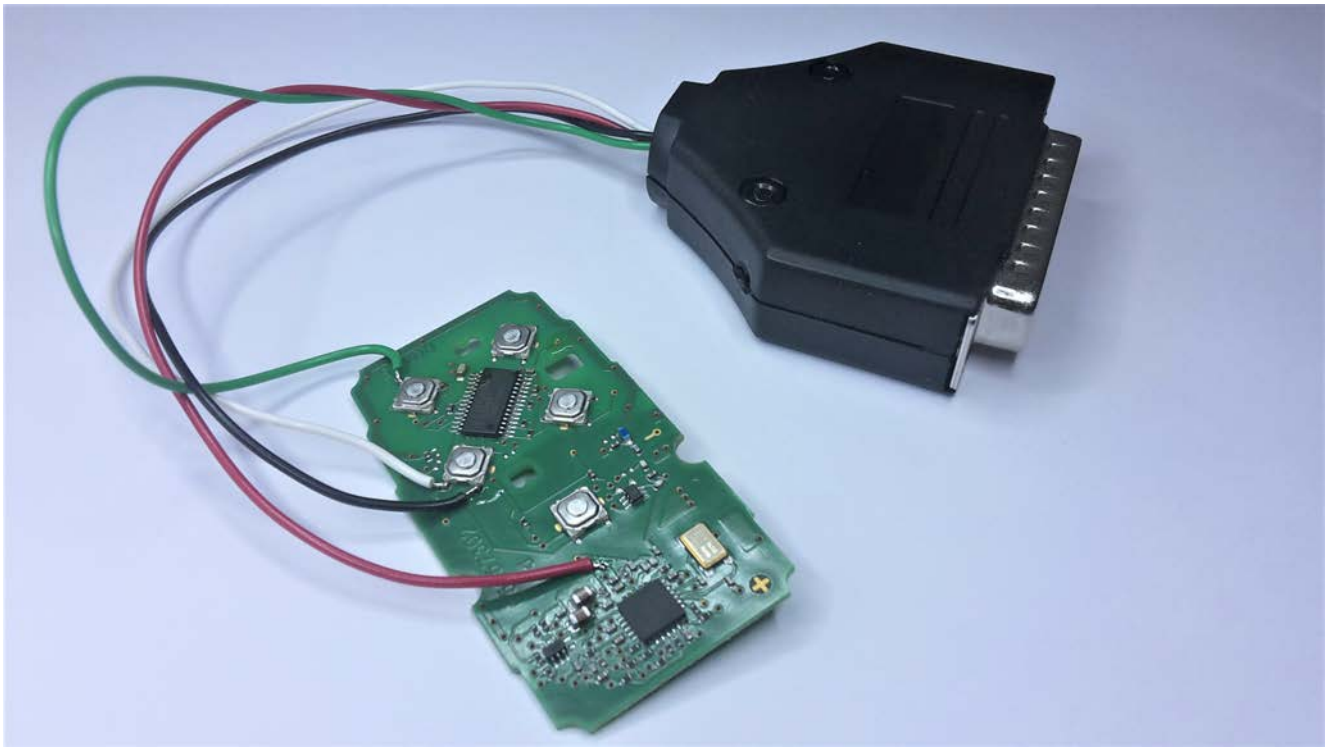
Description of the applicable cable colors used for soldering	
RED	+ BAT
BLACK	- GND
GREEN	DATA
WHITE	CLK (clock)

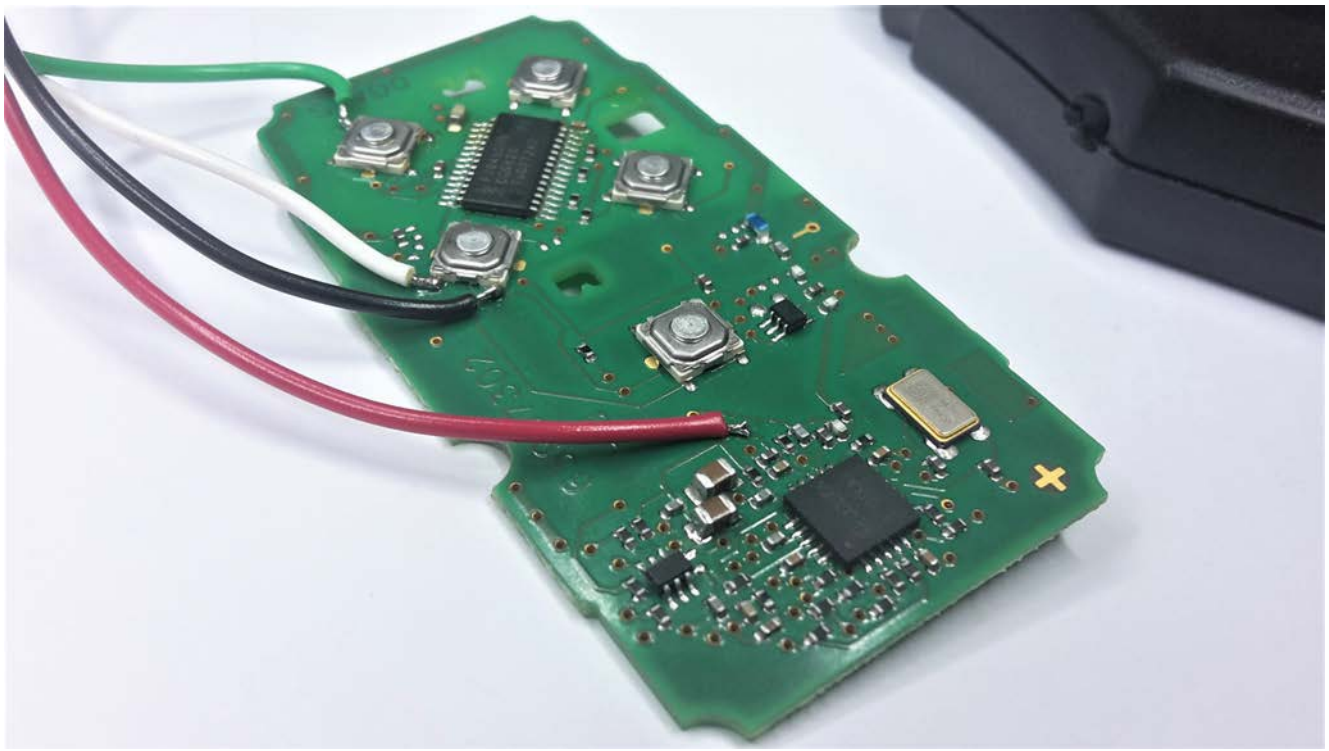
After the soldering, the DB-25 male side of the add-on needs to be connected to the DB-25 female connector of the ABPROG ZN045. After which, the male DB-15 part of the ZN045 needs to be connected to the female DB-15 connector on the AVDI.

The following photos will show you how the connection points on the key PCBs look like, so that you can proceed with the soldering.

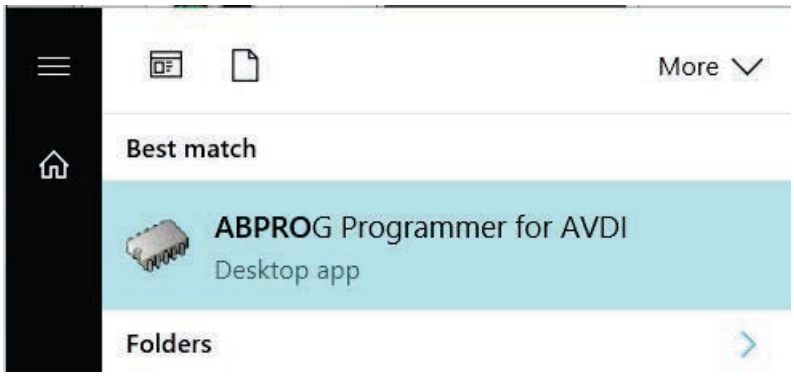
Volvo Keys have the following soldering points:

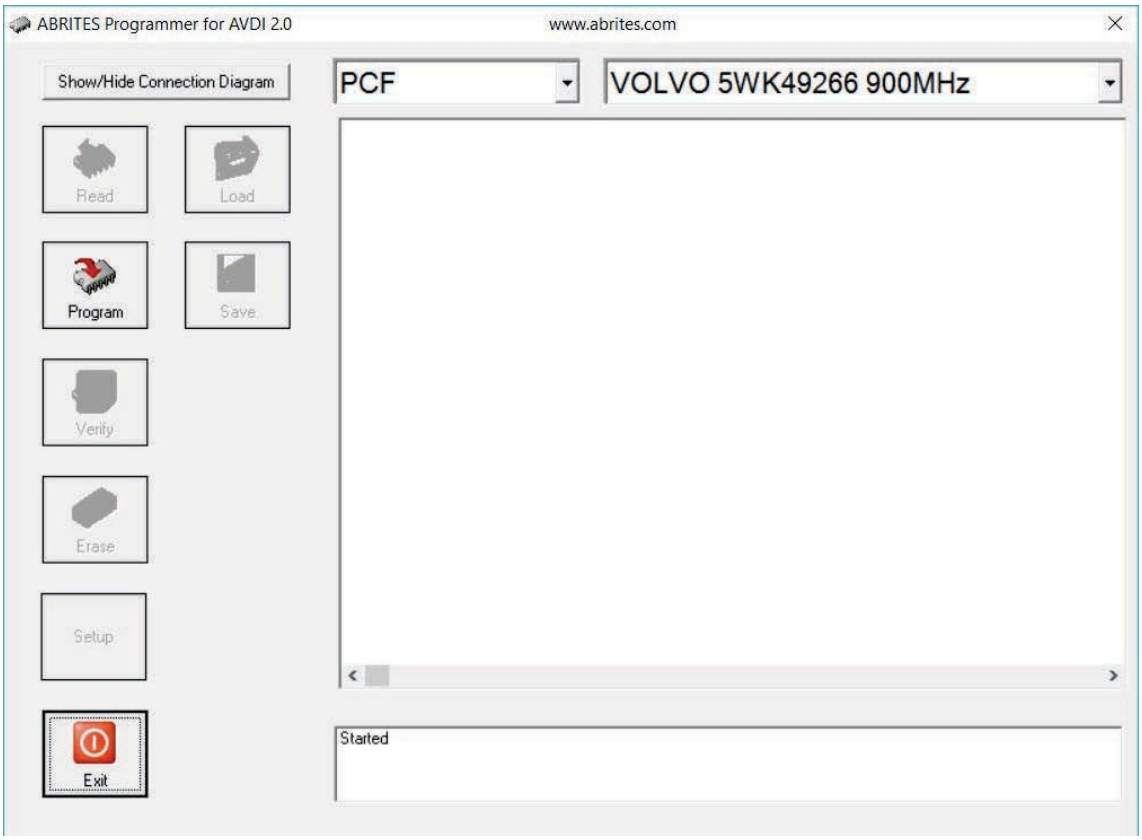
The following photos will show you how a soldered PCB looks like. The Example is of a Volvo Key PCB:



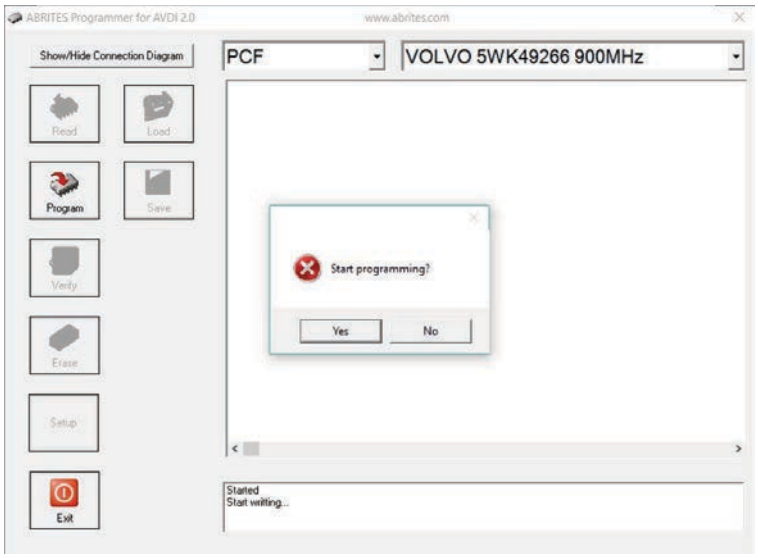


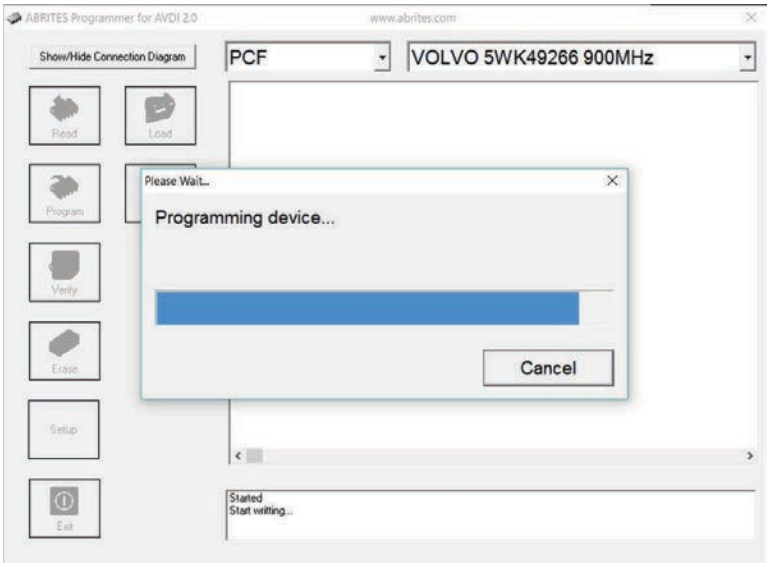
Once the cables of the ABPROG Adapter are soldered to the PCB, the ABPROG software can be started:

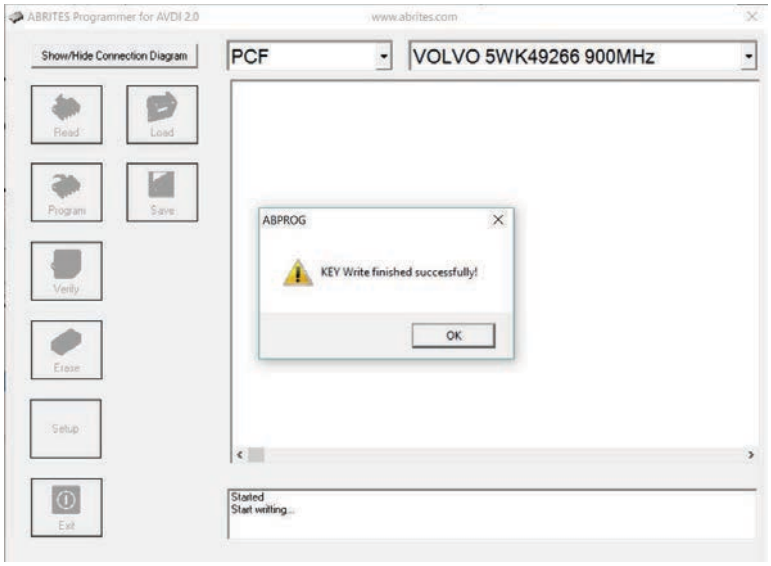




Select the "PCF" Option from the drop-down menu and the PCB model you are about to renew. Adter the desired options are selected, you can click on "Program to renew the key and make it virgin. Click on "Yes" to confirm the renewal process.







Once the procedure is completed, you will see the "KEY Write finished successfully message". This means that the key is now renewed and made virgin. You can continue with programming the key to another car.

You can connect the adapter to the ABPROG adapter to AVDI as shown in the picture below: