



Achieve the impossible

Abrites Diagnostics for Volvo User Manual

Version: 1.2

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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:

ABRI	TES Diagnostics for Volvo 5.0 Days un	til HW synchronizati	on: 20		X
ID	< All Units >	Protocol	VIN	DTC	
700	(700)	CAN		=	
701	(GPSM) Global Positioning System Module	CAN			T
702	(SCM-C) Seat Control Module C	CAN		LP	revious
703	(703)	CAN			
704	(704)	CAN			G
705	(705)	CAN			Open
706	(IPMA) Image Processing Module A	CAN			
707	(TVM) Television Module	CAN			-
710	(CHCM) Chassis Control Module	CAN			♦
711	(GSMB)	CAN			Next
712	(712)	CAN			
713	(713)	CAN			
714	(714)	CAN			-
715	(715)	CAN			(FE
716	(GWM) Gateway Module A	CAN			Options
717	(717)	CAN			
•	m				\mathbb{O}
🗃 Ve	nicle Selection 🛛 👔 Special Functions 🛛 🖏 Options	1			Exit

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.

A AE	BRITES Diagnostics for Volvo 5.0	Days unt	il HW synchronizatio	on: 20		
ID	Volvo	2011 V60	Protocol	VIN	DTC	
72:	1 (VDM) Vehicle Dynamics	Module	CAN HS			
72	6 (BCMii) Body Control M	odule	CAN HS		E	
73	0 (PSCM) Power Steering (Control Module	CAN HS			Previous
73	4 (HCM) Headlamp Control	Module	CAN HS			
73	7 (RCM) Restraint Control	Module	CAN HS			
75	6 (PBM) Park Brake Contro	ol Module	CAN HS			Open
76	0 (ABS) Antilock braking	system	CAN HS			
76	4 (CCM) Central Control M	Module	CAN HS			
79:	3 (FDSM) Front Distance 3	Sensing Module	CAN HS			
79	7 (SASM) Steering Angle S	Sensor Module	CAN HS			Next
•	Vehicle Selection	III Functions			•	
	Volvo 2011 V60 T5	• •	Scan for Units	Clear all DTCs	Tilter	Options
						Exit

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.

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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.

Model Selection	100	The owner we want	and the second sec		
Vehicle					
Brand	Volvo				▼
Model	2011 V60				•
Engine	т5				•
			-		
				√ Select	Close

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

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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:

Cluster	r Calibration	·	and the local data	- 63	
Select I	Model				
Varia	nt				
Ģ	1999 - 2000 HC08AZ32	Volvo V70, maskset:	S80 1H56A		
c	2000 - 2001 MC68HC912D60	Volvo S60, maskset:	V70, S80 4F73K	S	
C	2001 - 2002 MC68HC912DG12	Volvo S60, 8A maskset:	V70, S80, XC70, 3 3K91D	xc90	
C	2003 - 2007 MC9S12DG128B	Volvo V40, maskset:	V50, S60, V70, S 0185D	80, XC70, XC90	
C	2007 - MC9S12HZ256	Volvo maskset:	V50, S40, S50 3L16Y		
С	2008 - MC9S12H256	Volvo maskset:	s60, V70, XC60, 3 1K78X	xc70, xc90	
C	2010 - MC9S12XHZ612	Volvo maskset:	S80, XC70 1M80F		
C	2012 - MC9S12XHZ612	Volvo maskset:	V40, XC60 1M80F		
				Select	Close

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

Cluster Calibration	State of Concession	
ECU	(PCM) Powertrain Control Mod	dule 🔻
Current		Read
New		2
		Update
		×
~		Close

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

III Cluster Calibration	
ECU (IPC) Instrument Panel Control V Current 66723 miles	Read
New 67623	Update
Operation Successful	Close

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.

R	ead / U	pdate	Cor	figur	ation	n										-	-			- • ×
ECU	(AC	м) A	ud	io	Co	nti	rol	M	odu	ıle							•	
000	00010) <mark>0</mark> в	03	2B	45	57	00	00	00	00	00	1C	02	0B	04	1B	45	+EWE	*	Read Config
000	00020	57	6B	00	00	00	00	10	02	OB	04	18	45	57	7B	00	00	WkEW{		
000	00C30	00 00	00	18	02	OB	03	18	45	57	00	00	00	00	00	12	03	EW		
000	00C40	05	02	6B	57	00	00	00	00	00	00	13	03	05	03	6B	7B			N N N
000	00050	57	00	00	00	00	00	01	05	0B	01	45	00	00	00	00	00	WE		Update Config
000	00060	00 00	00	02	05	OB	02	57	63	00	00	00	00	00	00	02	06	Wc		
000	00070) OB	02	6B	4A	00	00	00	00	00	00	02	07	0B	02	7B	4A			
000	00080		00	00	00	00	00	01	05	0B	01	45	00	00	00	00	00	E		Lond from File
000	00090	00	00	02	05	UB	02	5/	63	00	00	00	00	00	00	02	05	Wc		
000	OUCAL		02	57	63	00	00	00	00	00	00	03	05	UB 00	03	57	63	wcwc		
000	OOCBU) 74	00	00	00	00	00	02	06	08	02	6B	4A	00	00	00	00	tkJ		
000	00000	00 00	00	02	07	08	02	7B	4A	00	00	00	00	00	00	10	01	{J		Save to File
000	OOCDO	08	04	28	47	5B	6B	00	00	00	00	18	01	0B	03	28	47	+G[k+G		
000	OUCE) 5B	00	00	00	00	00	10	02	0B	04	18	47	5B	6B	00	00	[G[k		
000	UUCEU	00	00	10	02	0B	04	18	47	5B	7B	00	00	00	00	18	02	G[{		
000	00000) 0B	03	18	47	5B	00	00	00	00	00	12	03	0B	02	6B	5B	G[k[
000	00010	00 00	00	00	00	00	00	13	03	0B	03	6B	7B	5B	00	00	00	k{[
000	00D20	00 00	00	01	05	0B	01	47	00	00	00	00	00	00	00	02	05	G	_	STOP
000	00D30	09	02	5B	65	00	00	00	00	00	00	02	06	0B	02	6B	4A	[ekJ	=	BIUF
000	00D40	00 00	00	00	00	00	00	02	07	0B	02	7B	4A	00	00	00	00	{J		Stop
000	00D50	00 00	00	01	05	0B	01	47	00	00	00	00	00	00	00	02	05	G		
000	00D60) 0B	02	5B	65	00	00	00	00	00	00	02	05	0B	02	5B	65	[e[e		
000	00070	00 (00	00	00	00	00	03	05	0B	03	5B	63	74	00	00	00	[ct		
000	00D80	00 (00	02	06	08	02	6B	4A	00	00	00	00	00	00	FF	FF	kJ	-	
																			•	
1																				
~	4	096	b	yte	s															X Close

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.

🧼 Fla	sh	-			-	-										-	-				
ECU	(IP	C)) I	ns	tru	me	nt	Pa	ne	1 0	on	tro	51	Mo	dul	e		-	•	
0007	AGEDO	10	5F	01	69	01	26	C2	19	68 DF	00	B4	21	10	4F	37	09	i.&h!.07.		*	Read FLASH
0002	AGEF0	3B	40	06	00	C5	DF	6E	81 FC	09	CF N1	58	58	50 D0	FF	8C	F0	;@nXXP			R A
0002	A6F10	A8 80	0F 2F	D9	1F 12	7C	2C	09 6D	C0	59 D2	58	FA	30	88 4C	04	AB	20 DF	/Y m L			Write FLASH
0002	46F30	7B	26 EC	DF	0F	02	84 C4	05	DA	7A 82	36	DF 10	0A 04	FE	83	91 D0	00 70	{&z6			1
0002	A6F50	48	D7 0F	6D	00	0E	89	3B 05	40 D9	06	60 38	05 6D	D8	5A 07	79 30	02	84 84	H.m;@.`Zy	(Load from File
0002	A6F70	91 6D	00	00 E4	FD 3B	02 7B	95 50	3B 01	00	E2 02	64 24	02 3B	2F E0	D9 A6	FF 65	BC 1B	16 E5	;d./			
0002	A6F90	BE	50 00	60 CA	2E 68	6D 1B	05 05	F2 6A	3B 58	7B 6D	20 05	00 E8	50 3B	0B 08	2F 00	80 8B	41 00	.P`.m;{ .P./.A			Save to File
0002	AGFB0	00	02 0F	05 59	DF F2	4D EC	46 F4	BA 6E	3F 05	28 91	0F 00	02	2E FD	91 59	00 FA	00 44	FC 74	MF.?(&.YnY.Dt			
0002	AGFD0 AGFE0	09 5A	CF 79	5C 82	58 08	82 D9	0D CD	D9 04	C4 20	22 09	10 FA	82 5B	09 58	10 6D	CF 05	05 BA	D4 3B	\X" Zv[Xm;			
0002	A6FF0	02 09	2B FF	7F 70	AD 58	2A C5	00 DF	99 42	9F 40	14 50	80 FF	40 3B	D4 00	01 00	F8 F2	00 88	F6 04	.+*@			STOP
0002	7010 7020	6D 0B	05 9F	8A 8A	3B 50	02 32	в5 25	02 3B	24 00	3B 00	00 62	00 02	62 24	6D 37	05 05	96 50	3B 50	m;\$;bm; P2%;b.\$7.PP			Stop
0002	17030 17040	6D 02	05 D9	8C 3F	3B A8	0b DA	2D 7F	20 99	20 9C	32 14	22 80	37 91	02 00	50 00	d0 FC	C2 91	18 00	m; 2"7.P			
-																			Þ	Ŧ	
	20	197	15	2 h	w+.	0.5															×
×	20		10,		Y U																Close

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 xxxxx9x 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)



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)



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.



ABRITES Programm	ner for AVDI 2.0	www.abrites.com	\times	ABRITES Programmer for AVDI 2.0	www.abrites.com				
Show/Hide Conne	ection Diagram PCF	 VOLVO 5WK49266 900MHz 	•	Show/Hide Connection Diagram	PCF	• VOLVO 5WK49266 900	MHz -		
Program	Please Wait Programming device	×.		Program Save	ABPROG	×			
Verity Eraje	-	Cancel		Verity Erose	A KE	Y Write finished successfully!			
Setup	c		,	Setup	¢		,		
D Ext	Started Start writting			East	Started Start writing				

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: