



DICE INSTALLATION INSTRUCTION



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1 INTRODUCTION

DiCE (Diagnostic Communication Equipment) is used together with VIDA All-in-one to communicate with the vehicle. Communication makes it possible to troubleshoot and diagnose the vehicle, as well as download software.

The technicians are given more flexibility as DiCE transfers information via Bluetooth between the vehicle and VIDA All-in-one. A USB cable can be used as an alternative to the Bluetooth communication.



NOTE

The screenshots in this instruction might differ from those the user sees on the computer screen while making the installation depending on which operating system the computer has, Windows XP or Windows 7.

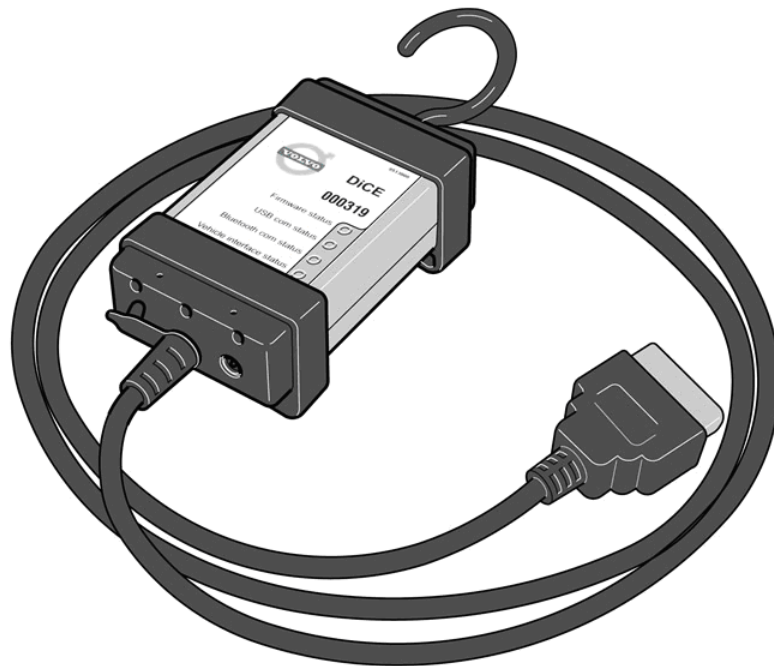


Fig. 1 A DiCE unit

1.1 Support

For support send a Report in TIE, using Concern Area **DiCE** and Sub Concern Area **Problem with DiCE**, or contact your local VCC Helpdesk.

1.2 Components

DiCE has an integrated OBD cable, which can be connected to the vehicle's diagnostic socket. When connected to the vehicle, DiCE is powered as long as the battery is charged.

Use the DiCE unit's folding hook to hang it from e.g. one of the grab handles. The DiCE unit should be hung in such a way that the Bluetooth reception is optimised, i.e. a clear line of sight from the USB dongle to the DiCE unit.

DiCE has four status LEDs that indicate:

- Firmware Status
- USB Communication Status
- Bluetooth Communication Status
- Vehicle Interface Status

For more information, see *chapter 5 DESCRIPTION OF STATUS LEDS on page 31*.

DiCE has a DC input where a battery cable or adapter (12 V) can be connected. The adapter is used when upgrading and troubleshooting the DiCE. It may also be used when performing complex methods in VIDA, which requires the vehicle battery to be temporarily disconnected.

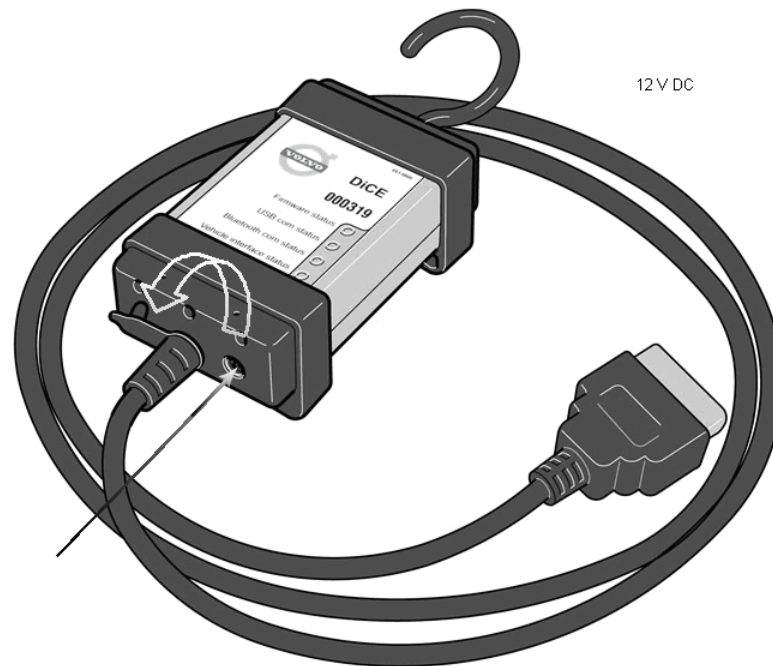


Fig. 2 Attach power supply here

On the other side of the unit there is a removable cover. To remove the cover turn the screw, see picture below:

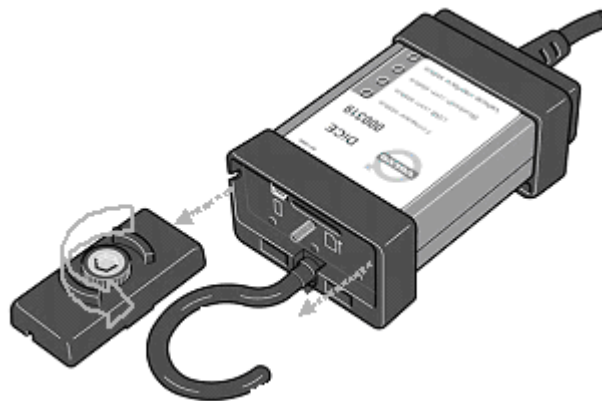


Fig. 3 DiCE unit with detached cover

The inputs for USB [1] and memory card [2] are located here. Memory card (Secure Digital) is used with Volvo CAN Recorder.

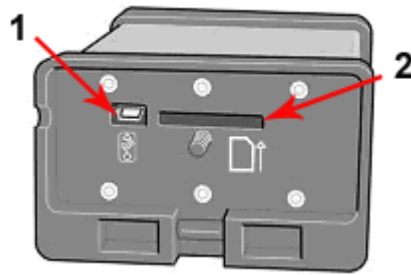


Fig. 4 DiCE unit without cover

In order to communicate wireless with DiCE, the VIDA client must also be provided with Bluetooth. The supported adapter for DiCE is Ezurio's USB-to-Bluetooth-adapter, which is connected to the computer's USB port. Please note that no third party Bluetooth dongles, nor integrated bluetooth adapters can be used with DiCE, only VCC DiCE equipment can be used.

When upgrading DiCE, a USB cable must be used. DiCE supports USB 2.0.

1.3 Product Line-up

In the tables below all part numbers available are explained.

Name	Part number	Purpose
DiCE	9513000	With integrated OBD cable.
DiCE Test Unit	9513001	Used for troubleshooting DiCE.
USB cable, 5 meters (16 feet)	9513002	Used for Vehicle communication, if Bluetooth is not used.
USB cable, 1 meter (3 feet)	9513003	Used when installing and updating DiCE software.
Battery cable	9513004	Used for troubleshooting and updating software for DiCE.
USB Bluetooth adapter	9513005	Used for wireless Vehicle communication.
USB extension cable 2 meters (7 feet)	9513006	Used as an extension for Bluetooth adapter.
USB extension cable 0.5 meter (2 feet)	9513007	Used as an extension for Bluetooth adapter.
Power adapter	9512992	12 V power adapter.

1.3.1 Replacement parts

The replacement DiCE unit is a restored DiCE unit with the same performance and quality as a new DiCE. Order a replacement DiCE if the current DiCE is defective and found to be faulty during testing.

Name	Part number	Purpose
DiCE	8252233	With integrated OBD cable.

2 GETTING STARTED

This chapter contains information about how to install the DiCE unit and test communication with VIDA.

2.1 Procedure Flowchart

The following flowchart shows the DiCE installation procedure. Please read the following chapters for details regarding the installation.

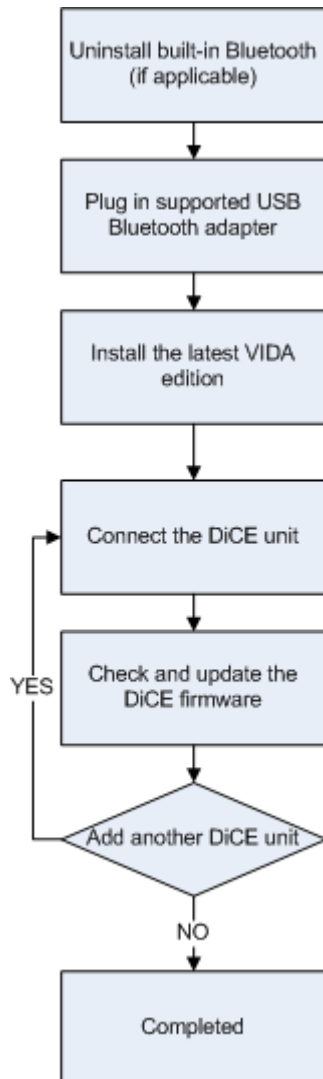


Fig. 5 Installation procedure flowchart

2.2 Uninstall Bluetooth stack

If your computer already has a bluetooth stack installed, it needs to be un-installed before DiCE can be installed. For more information on how to perform this operation on a Panasonic 28 or 29, contact your Sales Company. For all other models, contact your retailer.

2.3 Plug in supported Bluetooth USB adapter

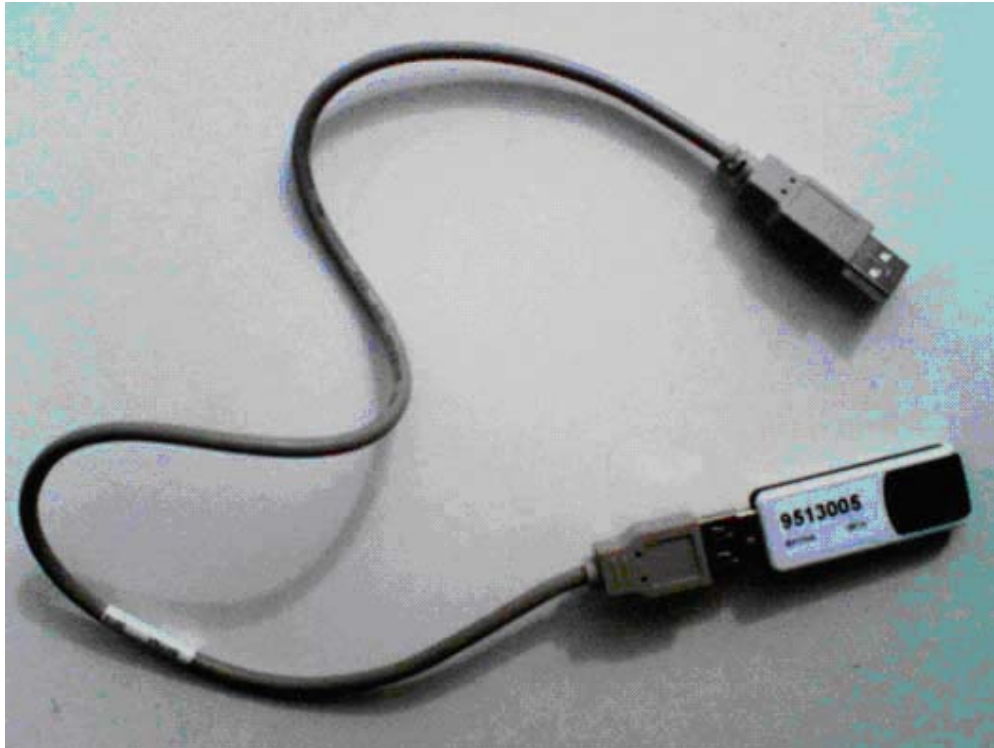


Fig. 6 Bluetooth adapter

Insert the adapter in the USB port. The only supported Bluetooth adapter is the Volvo supplied adapter, part number 9513005.

When the USB adapter is found and identified by the computer, the following message appears:

Found New Hardware

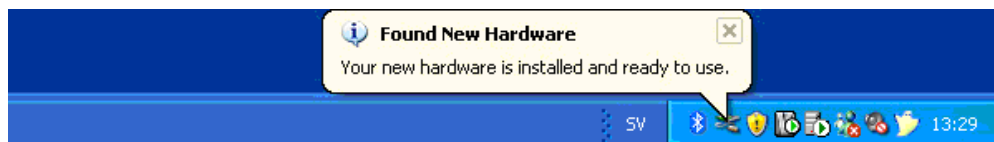


Fig. 7 Message in the notification area

2.4 Install the latest version of VIDA

Install the latest version of VIDA, according to the normal installation procedure.

2.5 Installation of USB driver for DiCE

For each new or additional DiCE unit that is going to be used in VIDA, the USB driver must be installed separately. This is done automatically in Windows when the DiCE unit is connected to a USB port. Carry out the instructions below:



NOTE

To install the DiCE USB driver, the user has to have administrator rights for the computer that is used. This is required for Windows XP and Windows 7 32-bit operating systems, but not for Windows 7 64-bit.

1. Power up and connect DiCE to a PC via USB

Power up the DiCE unit by connecting it to the 12 V DC adapter, see the picture below. Alternatively, use the Battery cable (part number 9513004) and connect it to the vehicle battery.

→

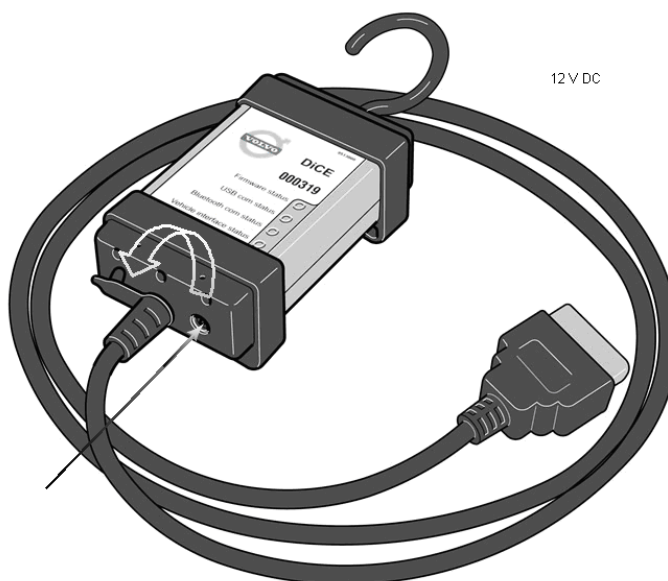


Fig. 8 Attach power supply here

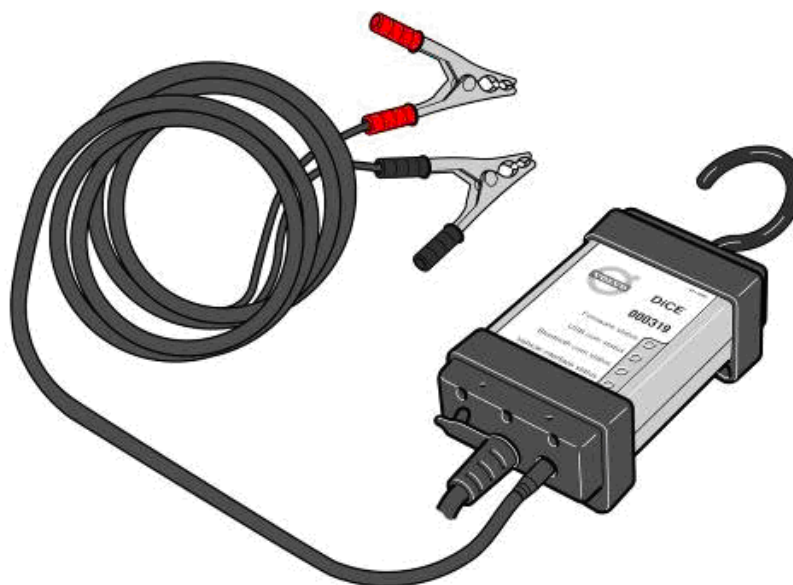


Fig. 9 Battery cable attached

2. Remove the cover of the DiCE unit by turning the screw on the cover.
→

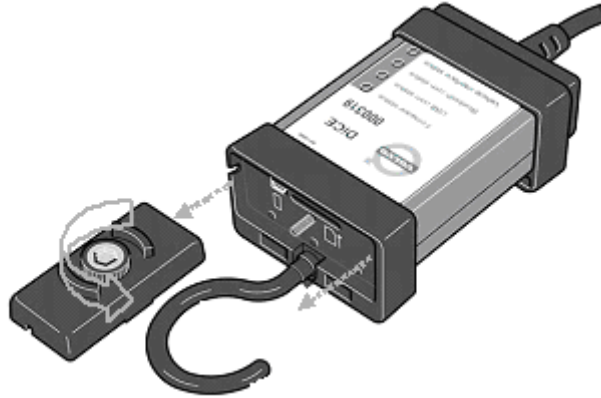


Fig. 10 Remove the cover by turning the screw

3. Connect a short USB cable to the DiCE unit.
→

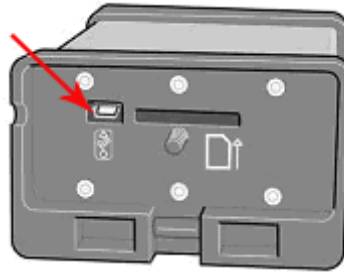


Fig. 11 Input for USB

4. Connect the USB cable to a free USB port in the computer. Detach the Bluetooth adapter cable temporarily if there is only one USB port in the computer.
→ Windows will automatically install the DiCE unit when the USB cable is connected to the USB port. This might take several minutes.

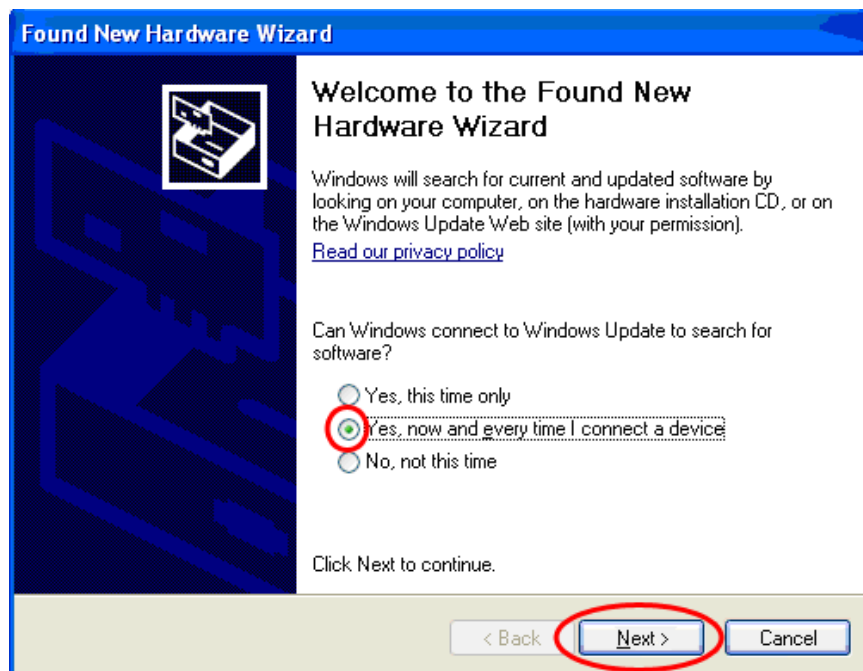


Fig. 12

5. Follow the instructions on the picture above and click **Next**.

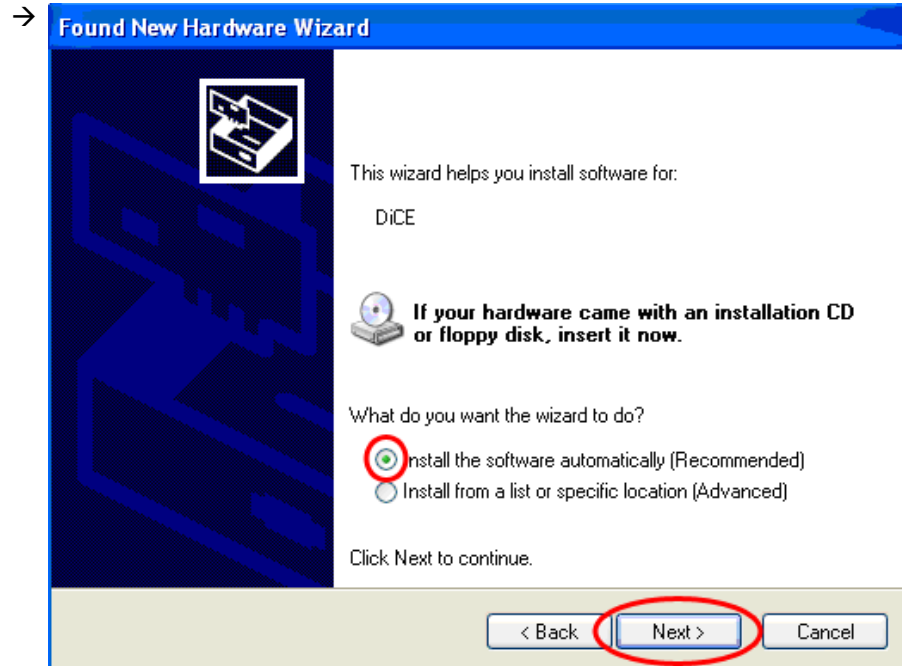


Fig. 13

6. Choose as marked and click **Next**.

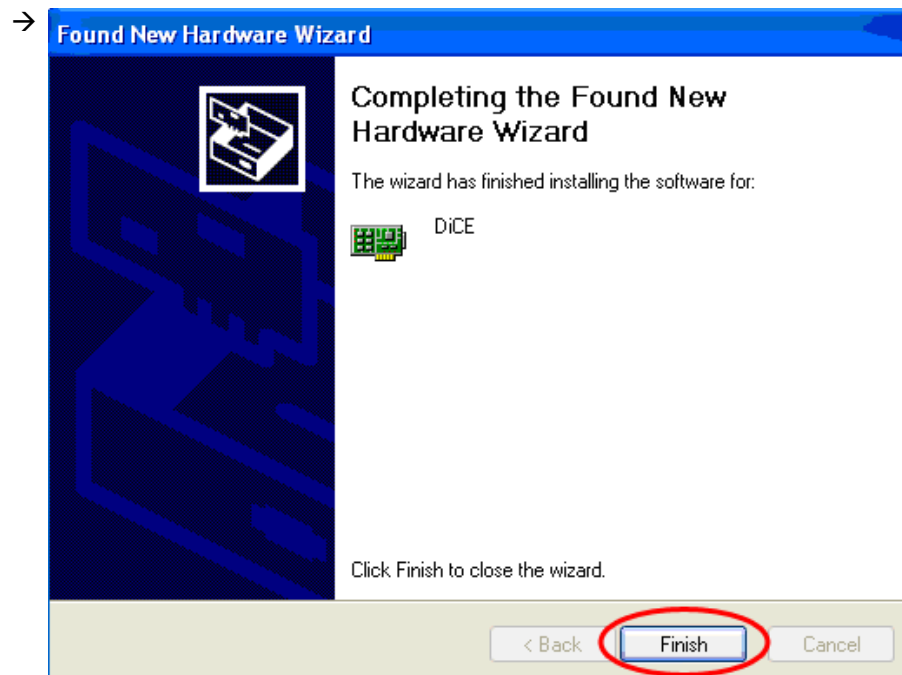


Fig. 14

7. Click **Finish** to complete the installation. When done the following message appears:



Fig. 15 Message in the notification area

2.6 Check and update the firmware in the DiCE unit

Updating the internal software (also called firmware) in a DiCE unit is done via VIDA All-in-one or the DiCE Firmware Update application. This assumes that the USB driver has been installed for the DiCE unit, *see chapter 2.5 Installation of USB driver for DiCE on page 8*.

The DiCE unit shall be connected with a USB cable and 12 V feed. Ensure that the Firmware status LED is flashing green.

The user interface for updating software is available in English only.

1. Connecting DiCE

Connect the DiCE unit to a 12 V supply.

→



Fig. 16 Battery cable attached

2. Connect the DiCE unit via the USB cable to the computer, *see chapter 2.5 Installation of USB driver for DiCE on page 8.*

→



Fig. 17 USB cable attached

3. Choose DiCE unit in VIDA

Select the **VEHICLE PROFILE** tab and choose the appropriate DiCE in the Communication tool drop-down list.

→ The **DiCE CONFIGURATION** button will appear.

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VEHICLE PROFILE CSC

Communication tool
DiCE 800319 **DiCE CONFIGURATION**

> READ VEHICLE

VIN Chassis

*Model *Year (*mandatory) Partner Group
Engine Transmission Steering Body style Special vehicles

> CLEAR VEHICLE PROFILE > OK

Model	Year	VIN	License plate	Communication tool
☐ V70 XC (01-) / XC70 (-07)	2007	YV1S2714671267246		
☐ C70 Conv (-05)	2001	YV1NC56K913022866		
☐ C30	2011	YV1MK84E1B2220037		
☐ XC90	2008	YV1CT855681455201		
☐ S80 (07-)	2009	YV1AS754191099301		
☐ C70 (06-)	2009	YV1MC795B93075371		
☐ V70 (08-)	2012	YV1BW48A1C1213002		

Done

Trusted sites | Protected Mode: Off

Fig. 18 DiCE configuration

4. Click **DiCE CONFIGURATION**. The DiCE configuration window will be opened
Click **DICE UPDATE** to open the Firmware Update window.

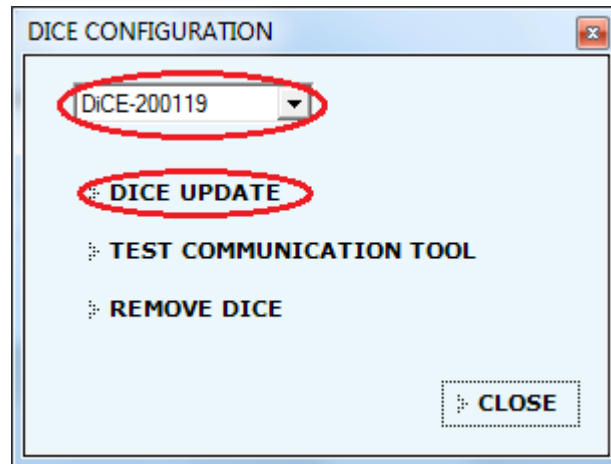


Fig. 19

The DiCE Firmware Update application can also be started from **Start → All Programs → DiCE → DiCE Firmware Update**.

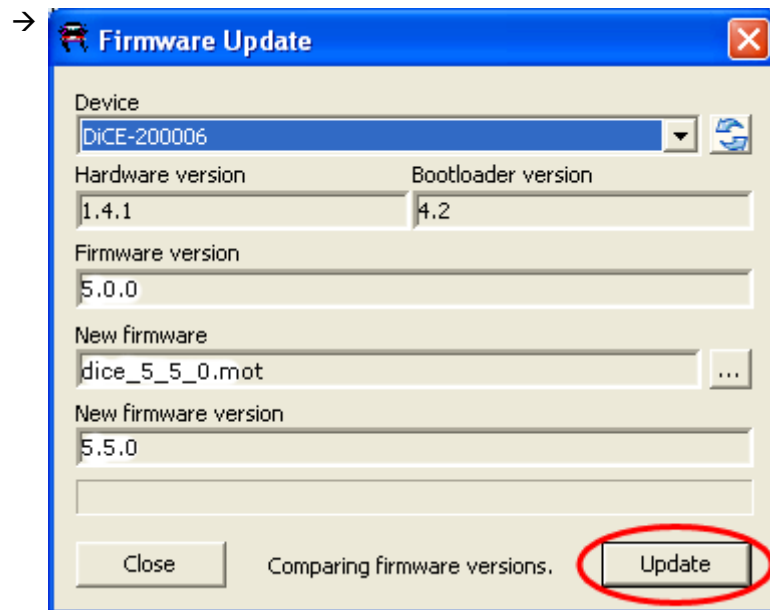


Fig. 20 Firmware updaters

5. **Updating the DiCE unit software**

Ensure that the correct DiCE unit and software, New Firmware file, are selected in the Firmware Update window. The firmware can be found in the folder **C:\Program Files\DiCE \Tools\DiCE_x_x_x.mot**.

6. Click **UPDATE**.

→ The update should not take more than a few minutes. If the DiCE unit already has the latest firmware, the dialogue box below is shown. Choose **No** to not load the firmware again or click **Yes** to reload the firmware.

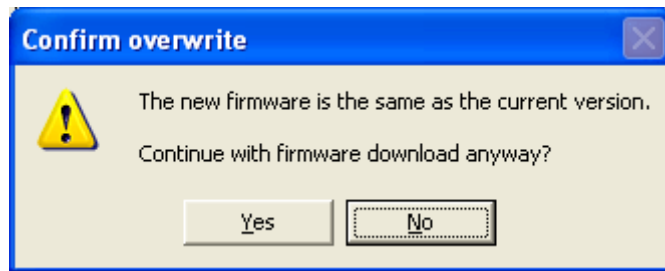


Fig. 21 Confirm firmware update

7. Close the Firmware Update application tool by clicking **CLOSE**.

→ If this fails, please restart the DiCE and retry.

When the update is finished, the text "Device update OK" should be displayed.

2.7 Test DiCE communication with VIDA

To test DiCE communication with VIDA, follow this procedure:

1. Connect the new DiCE unit by USB cable to your system.
2. Start VIDA All-in-one.
3. Choose the **VEHICLE PROFILE** tab.

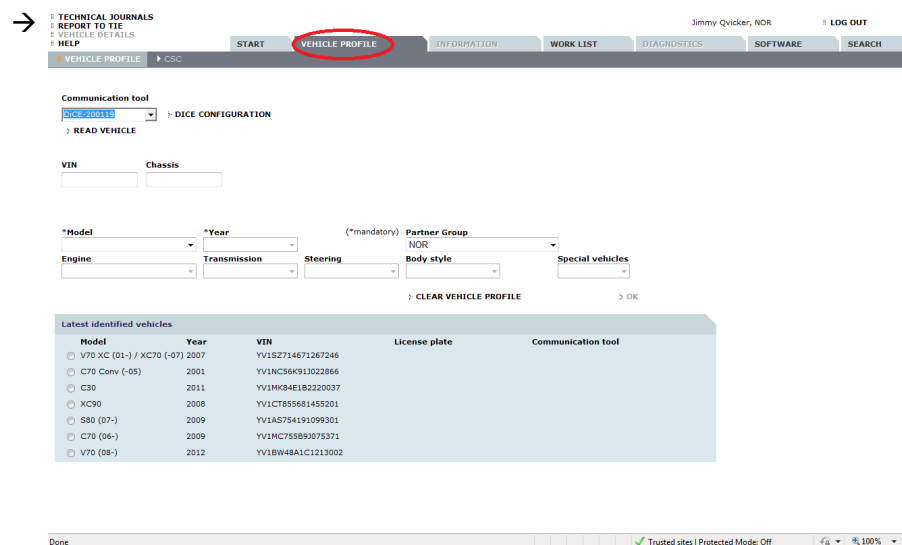


Fig. 22 Vehicle profile tab

4. Select the DiCE to be tested in the Communication tool drop-down list.

→

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VEHICLE PROFILE START VEHICLE PROFILE INFORMATION WORK LIST DIAGNOSTICS SOFTWARE SEARCH

Communication tool
DiCE-200119 DICE CONFIGURATION
READ VEHICLE

VIN Chassis

*Model *Year (*mandatory) Partner Group
Engine Transmission Steering Body style Special vehicles

CLEAR VEHICLE PROFILE OK

Latest identified vehicles

Model	Year	VIN	License plate	Communication tool
V70 XC (01-) / XC70 (-07)	2007	YV1SZ714671267246		
C70 Conv (-05)	2001	YV1NC564913022866		
C30	2011	YV1MK34E1B2220037		
XC90	2008	YV1CT855661455201		
S80 (07-)	2009	YV1AD754191099301		
C70 (06-)	2009	YV1MC755893075371		
V70 (08-)	2012	YV1BN48A1C1213002		

Done Trusted sites | Protected Mode: Off 100%

Fig. 23

5. To test a DiCE, click **DICE CONFIGURATION** to the right of the Communication tool drop-down list.

→

DICE CONFIGURATION

DiCE-200119

DICE UPDATE
TEST COMMUNICATION TOOL
REMOVE DICE

CLOSE

Fig. 24 Test/Remove DICE window

6. Click on **TEST COMMUNICATION TOOL** to start the test of the USB connection.
→ The Test communication tool window is opened.

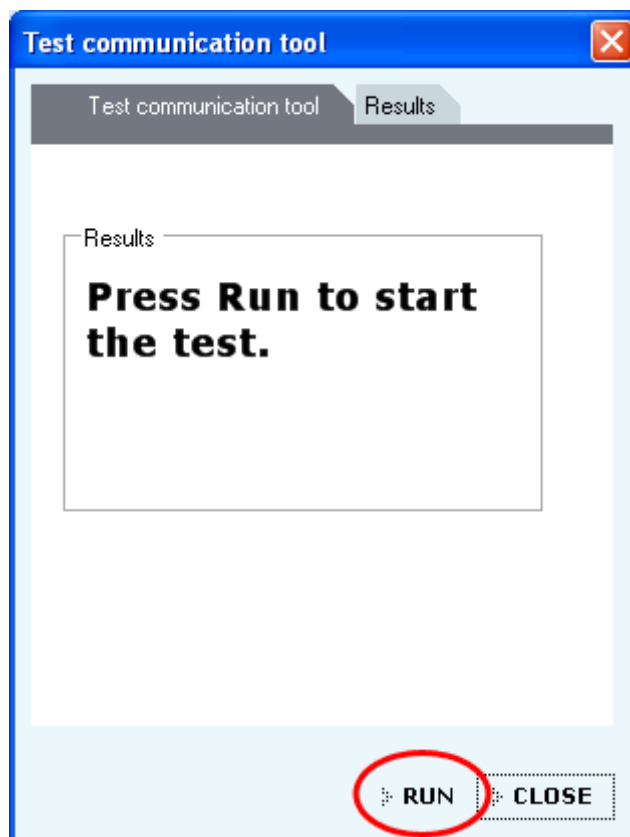


Fig. 25

Step 7 to 14 are performed to ensure, verify and initiate communication between VIDA and the DiCE unit.

7. Click **RUN** to start the test.
→ The result should be a green **OK**. See image below.

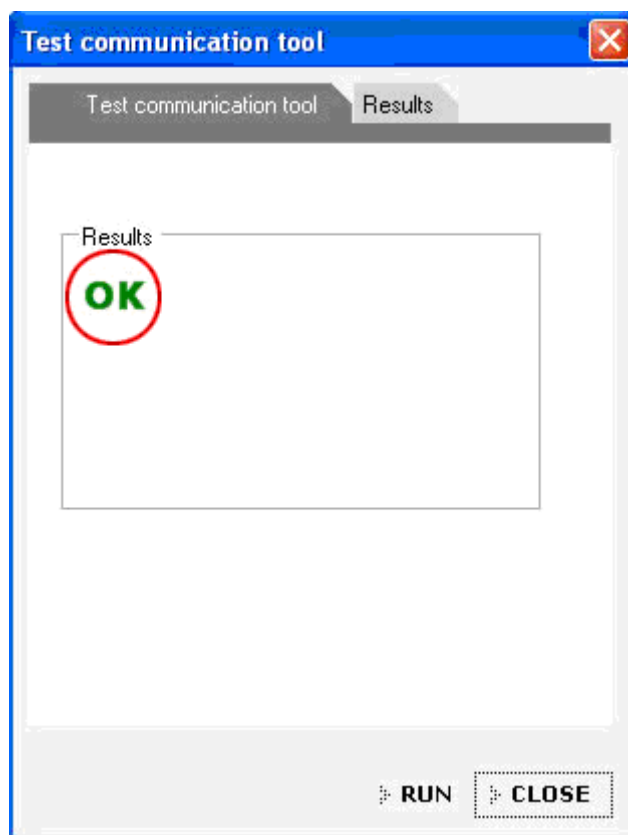


Fig. 26

8. Click **CLOSE** in the Test communication tool window.
Do NOT close the Test/Remove DICE window.
9. Remove the USB cable from the DiCE unit. Replace the cover. Note the positioning.
→

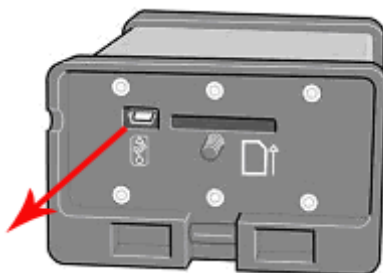
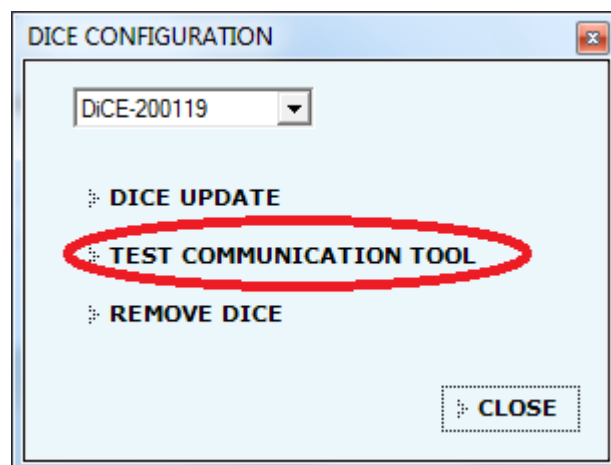


Fig. 27 Input USB

10. Connect the Bluetooth adapter to a free USB port on the computer.

11.

*Fig. 28 Test/Remove DICE window*

Click **TEST COMMUNICATION TOOL** to start the next test, (the Bluetooth connection).

→

*Fig. 29*

12. Click **RUN** in the Test communication tool window. The Bluetooth connection will be initiated and configured. This will take about one minute.
→ When the Bluetooth connection test is finished, a green OK is shown. See image below.

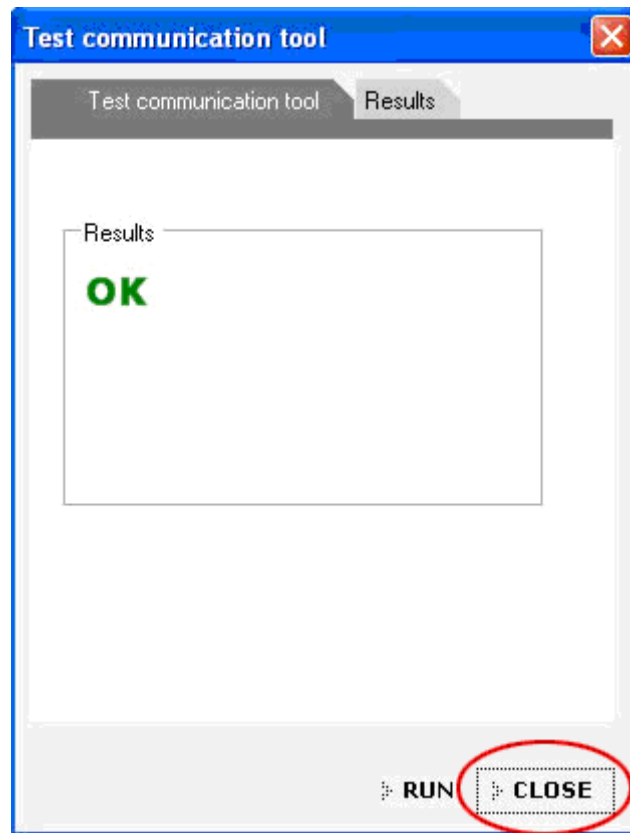


Fig. 30

13. Click **CLOSE** in the Test communication tool window.

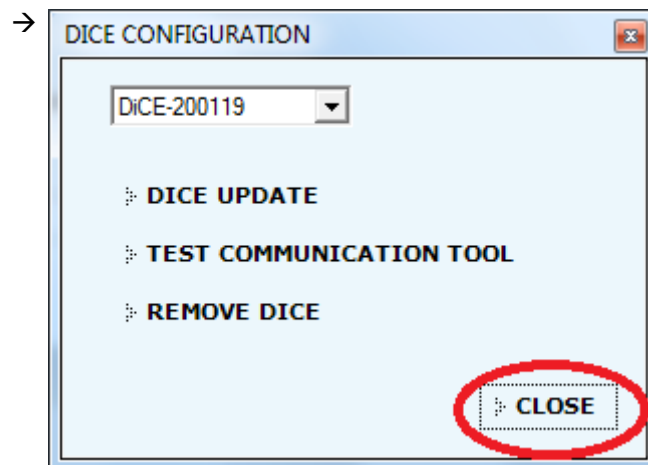


Fig. 31 Test/Remove DICE window

14. Close the window **DICE CONFIGURATION** by clicking **CLOSE**. You have now successfully managed to install and configure the DiCE.
→ The DiCE unit is now configured for both USB and Bluetooth connection at the VIDA client. If DiCE is connected with a USB cable, the communication will always go through the cable.

2.8 Adding more DiCE units

To add more DiCE units to VIDA, *see chapter 2.5 Installation of USB driver for DiCE on page 8* and the following two chapters. Repeat for each additional DiCE unit.

2.9 Connecting the DiCE to a vehicle

Connecting the DiCE to a vehicle is simple and straight forward. Carry out the following:

1. Ensure that the Bluetooth adapter is connected to the VIDA client.
2. Always ensure that the vehicle is connected to a battery charger before the DiCE is connected to the vehicle. DiCE is powered by the vehicle, not via USB.
3. Connect DiCE to the diagnostic socket in the vehicle. Hang the DiCE unit so that it is visible. Put the ignition key in position II.
4. Start VIDA All-in-one.
5. Choose the **VEHICLE PROFILE** tab in VIDA.
6. Ensure that the correct DiCE is chosen in the Communication tool drop-down.
7. Click **READ VEHICLE** to read the VIN number from the vehicle.

2.10 Removing a DiCE unit

All DiCE units that are installed and added to VIDA become Communication tools that can be selected in the drop-down list. To remove a DiCE unit, carry out the following:

1. Start VIDA All-in-one. Select the **VEHICLE PROFILE** tab.
2. Select the DiCE to be removed in the Communication tool drop-down list.

The screenshot shows the VIDA VEHICLE PROFILE interface. At the top, there are tabs: START, VEHICLE PROFILE (selected), INFORMATION, WORK LIST, DIAGNOSTICS, SOFTWARE, and SEARCH. Below the tabs, there is a 'Communication tool' dropdown menu. The dropdown is open, showing 'DiCE CONFIGURATION' selected and circled in red. Below the dropdown is a 'READ VEHICLE' button. Further down, there are input fields for VIN and Chassis. Below these are several dropdown menus for vehicle details: *Model, *Year, (*mandatory) Partner Group, Engine, Transmission, Steering, Body style, and Special vehicles. At the bottom, there is a 'Latest identified vehicles' table with columns: Model, Year, VIN, License plate, and Communication tool. The table lists several vehicles, including V70 XC (01-) / XC70 (-07) 2007, C70 Conv (-05) 2001, C30 2011, XC90 2008, S80 (07-) 2009, C70 (06-) 2009, and V70 (08-) 2012.

Model	Year	VIN	License plate	Communication tool
V70 XC (01-) / XC70 (-07)	2007	YV1S2714671267246		
C70 Conv (-05)	2001	YV1NC36K913022866		
C30	2011	YV1MK84E1B2220037		
XC90	2008	YV1CT855681455201		
S80 (07-)	2009	YV1AS754191099301		
C70 (06-)	2009	YV1MC755893075371		
V70 (08-)	2012	YV1BW48AJC1213002		

3. Click **DICE CONFIGURATION** beside the Communication tool box.

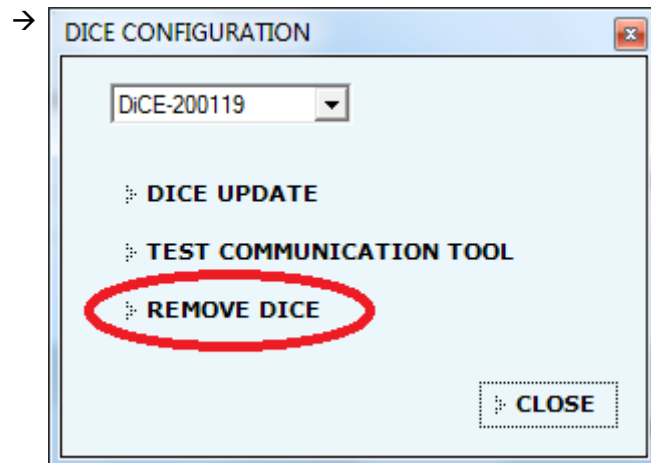


Fig. 32 Remove DiCE

4. Ensure that desired the DiCE is selected and click **REMOVE DiCE**.

2.11 DiCE Full Test by using the DiCE Test Unit

Follow the steps below to perform a Full Test by using the DiCE Test Unit.

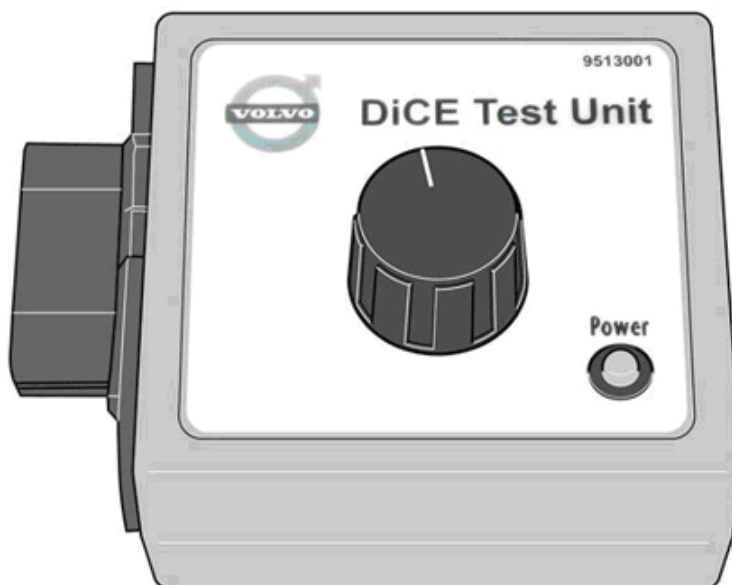


Fig. 33 DiCE Test Unit

1. Power up the DiCE by connecting it to a 12 V power supply. The power LED should be lit when connected correctly.

→



Fig. 34 Battery cable attached

2. Connect the DiCE to the DiCE Test Unit. The vehicle interface status LED is now lit (firm red light).
3. Start VIDA All-in-one. Select the **VEHICLE PROFILE** tab.
4. Select the appropriate DiCE in the Communication tool drop-down.

→

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VEHICLE PROFILE CSC

Communication tool
DiCE 000319 DICE CONFIGURATION
READ VEHICLE

VIN Chassis

*Model *Year (*mandatory) Partner Group
Engine Transmission Steering Body style Special vehicles

CLEAR VEHICLE PROFILE OK

Latest identified vehicles				
Model	Year	VIN	License plate	Communication tool
☐ V70 XC (01-) / XC70 (-07)	2007	YV1S2714671267246		
☐ C70 Conv (-05)	2001	YV1NC56K913022866		
☐ C30	2011	YV1MK84E1B2220037		
☐ XC90	2008	YV1CT855681455201		
☐ S80 (07-)	2009	YV1AS754191099301		
☐ C70 (06-)	2009	YV1MC755B93075371		
☐ V70 (08-)	2012	YV1BW48A1C1213002		

Done Trusted sites | Protected Mode: Off 100%

Fig. 35

5. Click on the dots beside the Communication tool box.

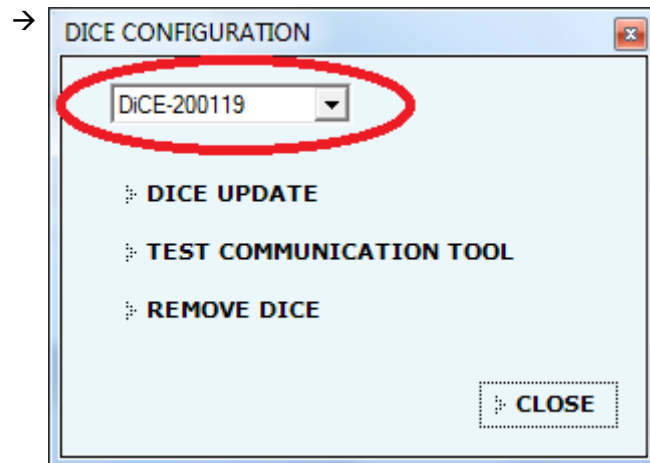


Fig. 36

6. Select the appropriate DiCE in the DiCE unit dropdown list, and click **TEST COMMUNICATION TOOL**.

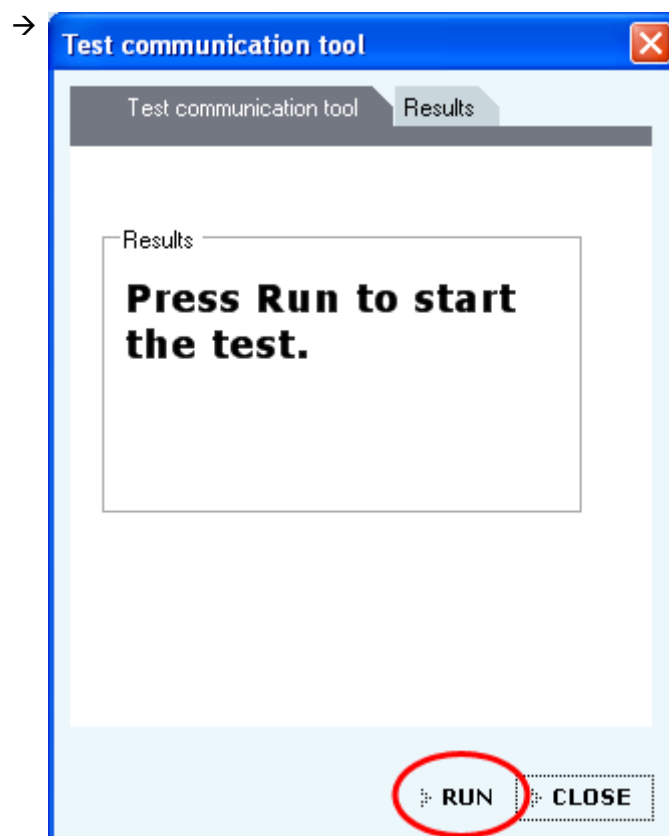


Fig. 37 Test communication tool

7. Click **RUN**.

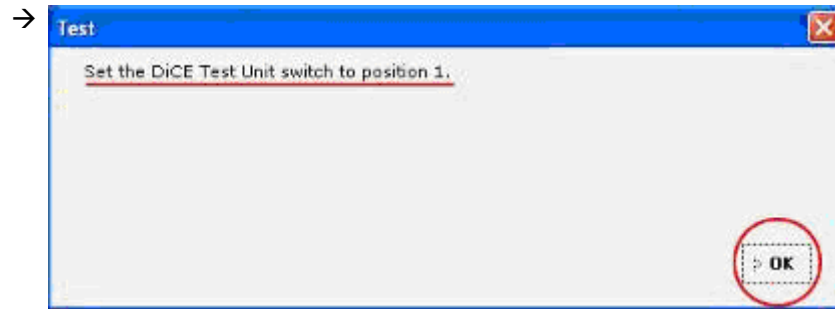


Fig. 38 DiCE dialogue

8. Set the DiCE Test Unit Switch to position 1. Click **OK**.

→

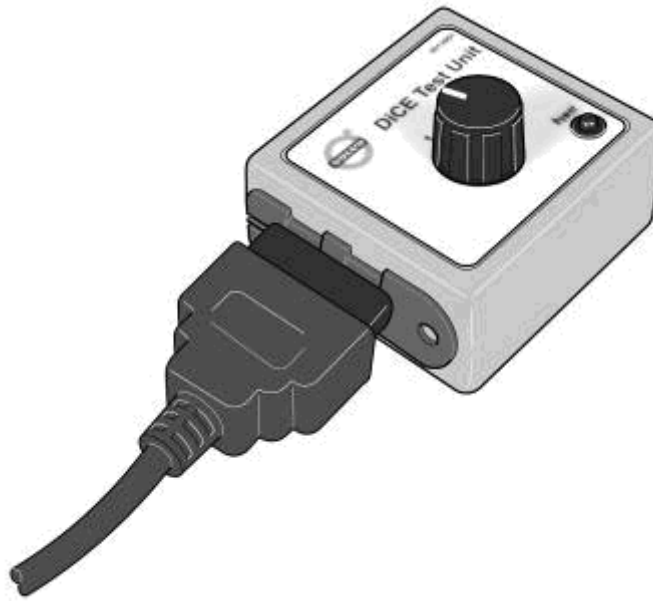


Fig. 39 OBD cable contact

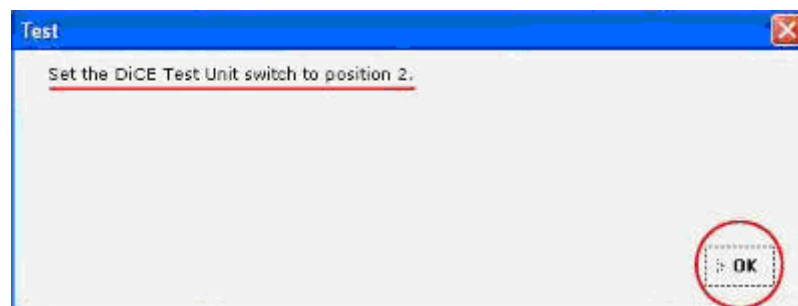


Fig. 40 DiCE dialogue

9. Set the DiCE Unit Switch to position 2. Click **OK**.

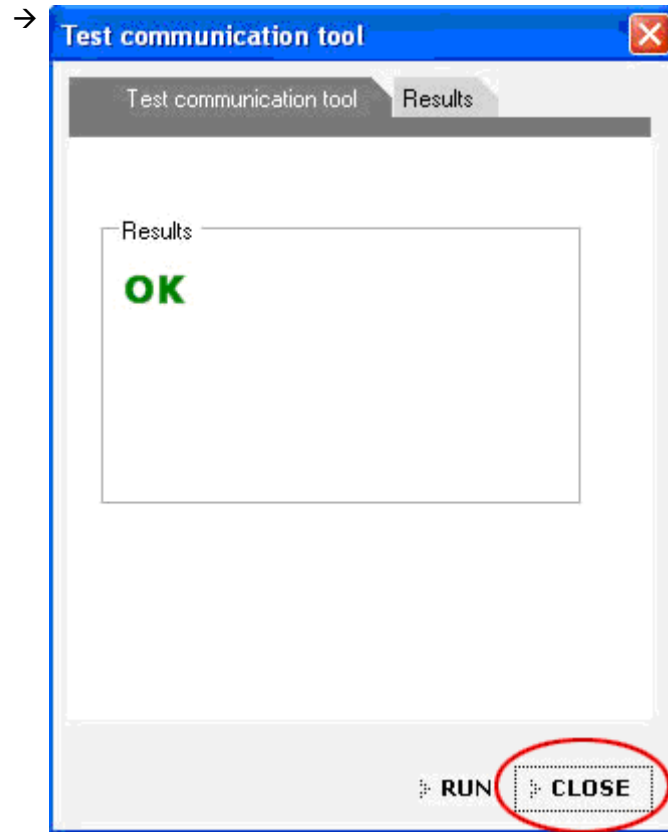


Fig. 41 Test communication tool

10. Click **CLOSE** to complete the test.
11. You have now successfully performed a DiCE Full Test by using the DiCE Test Unit.

12. If this does not work, the following message will be shown. See image below.

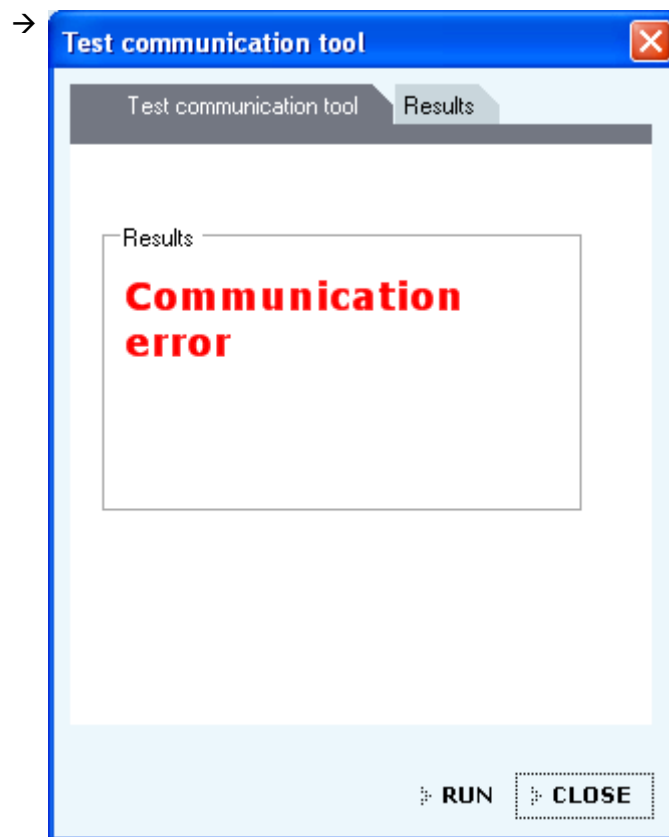


Fig. 42 Communication test error message

Please check the switch positions and try again. If it still does not work, the DiCE Unit is out of order and has to be replaced.

Repeat this section for both DiCE connected via USB and Bluetooth.

3 ADDING AN ADDITIONAL DICE UNIT IN VIDA

To connect DiCE and communicate with the vehicle, the unit must be added to the VIDA client. Make sure that the latest version of VIDA is installed, *see chapter 2.4 Install the latest version of VIDA on page 8*.

Every DiCE that is going to be used by a VIDA client must be configured separately. As a suggestion, install all DiCE units when configuring the VIDA application, *see chapter 2.5 Installation of USB driver for DiCE on page 8*.

4 COMMUNICATION PROTOCOLS

4.1 Bluetooth

Bluetooth is used for wireless communication between the vehicle and VIDA All-in-one.

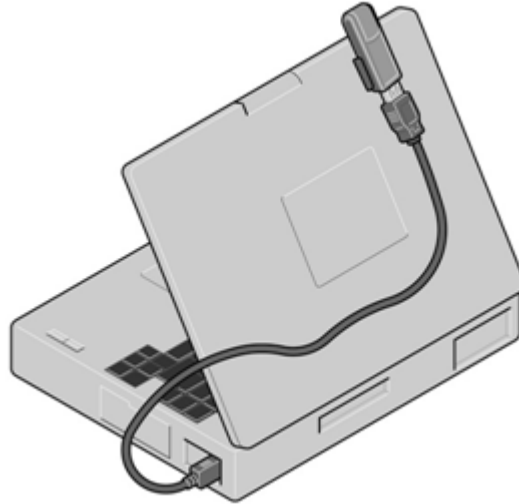


Fig. 43 Bluetooth adapter

4.2 Remarks on Bluetooth

4.2.1 Performance

To optimise the performance for wireless transfer, it is important to remember that some electronic appliances compete for the same frequency band. WLAN, DECT telephones, mobile telephones and other Bluetooth units are a few examples of equipment that limit the performance if they are used at the same time as DiCE in a workshop environment. The signals can be weakened by walls, furniture, panels, people etc.

DiCE has a wireless range of 100 meters with clear visibility. To achieve stable communication with the vehicle, the distance should be limited to approximately 50 meters. Hang the DiCE in the vehicle by using the hook and point the Bluetooth adapter towards the DiCE.

Make sure that no obstacles are positioned between the DiCE and the Bluetooth.

4.2.2 Safety and reliability

Bluetooth technology guarantees interference protection and increases data security in many ways. The technology uses 128 bit encryption to prevent data being read by another party in the event of the signal being hijacked, which is rare.

To guarantee a high level of reliability, the signal can be transmitted over 70 different frequencies (on the 2.4 GHz frequency band). DiCE shifts between different intervals up to 1600 times per second to find the most reliable frequency.

4.3 USB

A USB cable can be used as an alternative to Bluetooth. The USB cable is connected to the DiCE.

The cover of the DiCE unit is removed by turning the screw, as shown below.
USB has priority over Bluetooth.

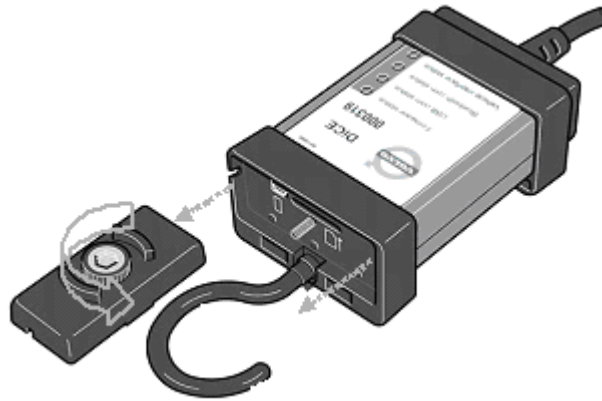


Fig. 44 Remove the cover by turning the screw

5 DESCRIPTION OF STATUS LEDS

This chapter will explain how to interpret the status LEDs on the DiCE unit. In the picture below, the four status LEDs are indicated:

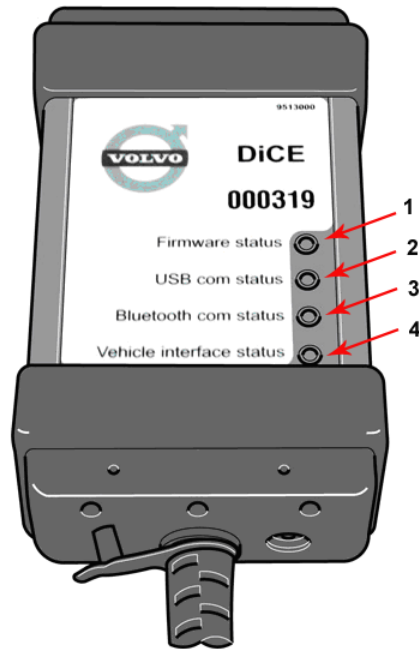


Fig. 45 DiCE Status LEDs

The four status LEDs are:

1. Firmware status
2. USB com status
3. Bluetooth com status
4. Vehicle interface status

5.1 Firmware status

The Firmware status LED can either be red or green. See the table below for details on how to interpret the LED:

Firmware status	Description
Flashing green	DiCE is powered and operational.
Flashing red	Corrupt software or no software. Upgrading of internal software (Firmware) is necessary.
Flashing red and green alternately	DiCE is being programmed.
Continuous red	Serious fault in the DiCE unit.
Off	Standby.

5.2 USB com status (yellow)

The USB com status LED is yellow. See the table below for details on how to interpret the LED:

USB com status	Description
Continuous yellow	USB connection connected.
Flashing yellow	USB communication in progress.
Off	Standby.

When connecting USB while DiCE is powered, the status LED for USB flashes quickly for approximately three seconds.

The LED Status lamp for USB communication has nothing to do with the USB standard.

5.3 Bluetooth com status (blue)

The Bluetooth com status LED is blue. See the table below for details on how to interpret the LED:

Bluetooth com status	Description
Continuous blue	Bluetooth connection connected.
Flashing blue	Bluetooth communication in progress.
Off	Standby.

When DiCE is powered, the status LED for Bluetooth communication flashes quickly for approximately three seconds. If initiation fails, the status LED continues to flash. If no Bluetooth module is mounted on the DiCE unit or if the module is broken, the status LED is never lit.

The status LED for Bluetooth communication has nothing to do with the Bluetooth standard.

5.4 Vehicle interface status (orange)

The Vehicle interface status LED is orange. See the table below for details on how to interpret the LED:

Vehicle Interface status	Description
Flashing orange	Communication on one more of the vehicle's interfaces in progress.
Continuous orange	DiCE Test Unit connected.
Off	Standby.

Flashing orange indicates communication in progress. It is not possible to differentiate between:

- Internal communication (DiCE transmits something or loop back test is performed).
- Vehicle activity (DiCE not involved).
- Communication between DiCE and ECU in the vehicle. The status does not flash if DiCE transmits data without being connected to the vehicle or DiCE Test Unit.

6 ABBREVIATIONS

DECT – Digital Enhanced Cordless Telecommunications
DiCE – Diagnostic Communication Equipment
ECU – Electronic Control Unit
LED – Light Emission Diod
OBD – On Board Diagnostics
TIE – Technical Information Exchange
VCC – Volvo Car Corporation
VIDA – Vehicle Information and Diagnostics for Aftersales
WLAN – Wireless Local Area Network

7 HISTORY LOG

7.1 135EN02

The rocedure flowchart has been updated. Information regarding supported bluetooth adapter added.

7.2 135EN03

Document updated with new document template. The procedure flowchart has been updated. Information regarding DiCE Installation procedure has been updated. The structure of the document has been improved.

7.3 135EN04

New images.

Parts numbers are updated.

Information about installation of USB driver has been updated.

Information about how to update DiCE internal software has been updated.

7.4 135EN05

Information regarding the communication tool settings in VIDA has been updated.

7.5 135EN06

Added information about USB drivers for Windows 7.

New screenshots due to updates in GUI.

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