DiCE
A new high speed wireless car communication tool that replaces the VCT2000

Background:
VCT2000 was developed as a communication tool between VADIS and vehicles for the introduction of the S80 in 1998. Electronics and functionality have developed since then and a need for a more up-to-date product was needed Production of the VCT2000 was therefore closed in early 2007.
The new product is called DiCE.

DiCE is a trademark and stands for **Diagnostic Communication Equipment.**

DiCE – Diagnostic Communication Equipment is a tool that is used together with VIDA All-In-One to communicate with the vehicle. Communication makes diagnosing and troubleshooting the vehicle possible, as well as the downloading of software.
DiCE uses Bluetooth technology to transfer information wirelessly between the vehicle and the VIDA All-in-One. This gives the technician more flexibility. A USB cable can be used as an alternative to Bluetooth.

It is mandatory to have the DiCE tool to comply with Volvo standards, and begin work on model year 2009 vehicles. One DiCE Basic Kit 33300007 will be allocated to you through SPX automatically.
For information on how to obtain additional DiCE tools please contact SPX Corporation at 1-800-345-3399.

Support
To report technical problems with the DiCE tool, use the TIE system template for DiCE under VIDA/Communication Tools under the Service Product Report tab or contact the Volvo Support Center at 1-888-426-3658.


DiCE Car communication

DiCE, Diagnostic Communication Equipment, is a tool that enables wireless, high-speed communication between VIDA and the vehicle. The DiCE is connected and powered through the OBD connector and is suspended from or placed on top of the vehicle. The DiCE tool must have a clear line of sight back to the bluetooth unit at the VIDA workstation.

DiCE can also be used with a USB cable (9513002) for even faster performance. One VIDA station can serve a number of DiCE units, which makes it possible for a number of mechanics to use the same VIDA station with their own DiCE tools. Development is under way to allow simultaneous vehicle communications from a single VIDA workstation.

Warranty Timer and DiCE Internal Diagnostics

DiCE has a built-in warranty timer which starts the first time you use the DiCE. This means that you can store DiCE prior to initial use as the warranty period does not start until it is used for the first time.
DiCE has a two year warranty, and is handled through SPX Corporation 1-800-345-3399.
Prior to returning the DiCE tool for suspected warranty issues, the user can verify the in service date of the tool and perform some built in tests for the tool.

- Attached USB cable 9513003 to both the DiCE tool and the VIDA client.

- Supply power to the DiCE unit.

- Without opening the VIDA application, click the START button on the bottom left, click DiCE, then DiCE Diagnostics application.

- Select the correct device number from the drop down menu

- Click the Connect button.
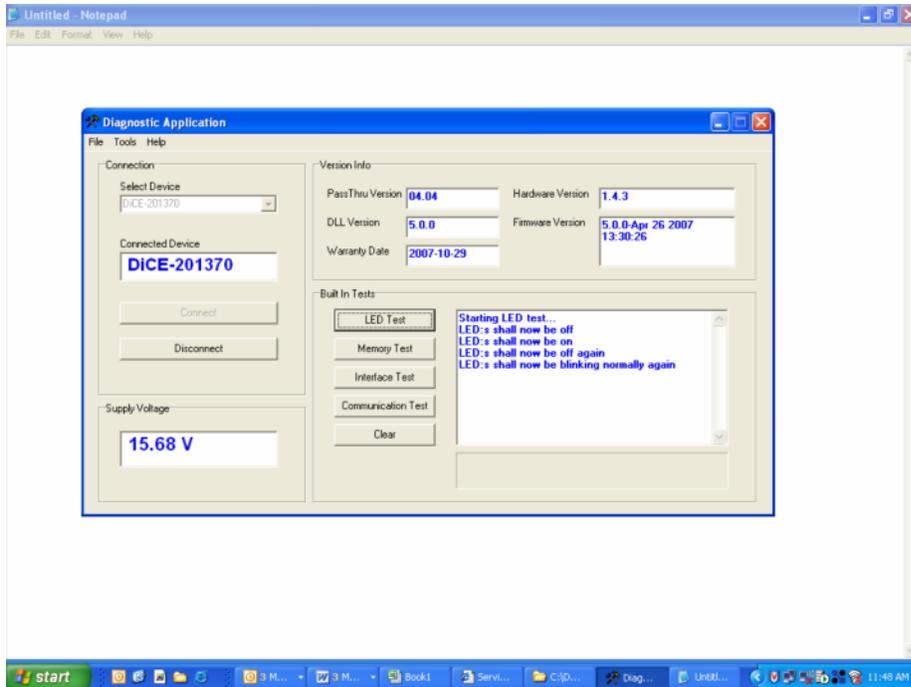
Components

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

DiCE has a folding hook that is designed for hanging the unit from one of the grab handles in the vehicle or the rear view mirror, for example. When DiCE hangs visibly, Bluetooth reception is optimized and it is also visible to the technician.

DiCE is equipped with four status LEDs (Light Emitting Diode) that indicate the status of the software, the USB and Bluetooth communication and the interface to the car.

At one end of the unit, there is a DC input where a battery cable or adapter (12 V) can be connected. The adapter is used when upgrading the firmware and troubleshooting the DiCE itself.

On the other end of the unit there is a cover that is removed by turning the screw on the cover, see picture below.

The inputs for USB and memory card[1] are located here.

USB
SD card
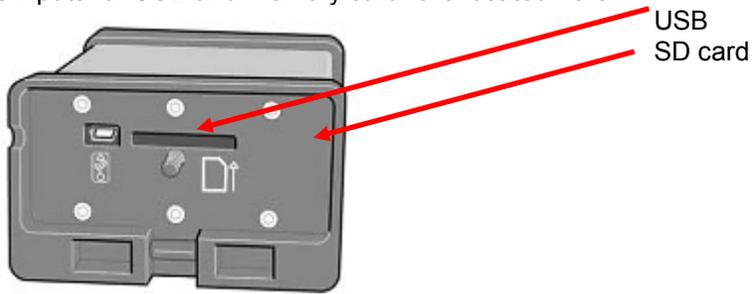
In order to communicate with DiCE wirelessly, the VIDA client must also be equipped with Bluetooth.

The only supported adapter for DiCE is the Volvo USB-to-Bluetooth-adapter (9513005), which is connected via the computer's USB port.
When upgrading DiCE, a USB cable must be used. DiCE supports USB 2.0.

Replacement parts

No spare parts are available for the DiCE tool. The OBD cable is integrated in the unit.

DiCE Tool (9513000)
The size of the DiCE housing is 140 x 88 x 50 mm
The weight of the housing is 265 g
The weight of the entire unit, including cable, is 560g
The car communication cable is 2 meters long.
DiCE is CE and FCC approved.
DiCE is also prepared for future needs with flexible memory capacity and additional features.
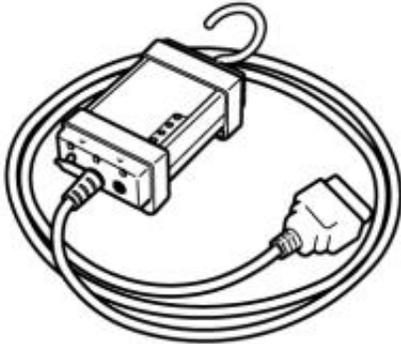
DiCE Test Unit (9513001)
The DiCE Test Unit is used for fault tracing all DiCE equipment, including cables.
The minimum requirement is one DiCE Test Unit per workshop.
One DiCE Test Unit is included in the DiCE Basic Kit.
The size of the housing is 75 x 85 x 35 mm
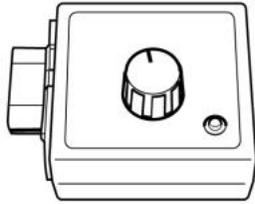
USB Cable for Car Communication (9513002)
This cable is used if you do not want to use wireless communication
The cable is specially made for workshop use and is of a robust design that is not available on the open market. It also has a strain relief in order to protect the computer's USB connector from being accidentally damaged.
The cable is 5 meters long.
One USB Cable is included in the DiCE Basic Kit.

USB Cable for Tool Updating (9513003)

This cable is used for DiCE software updates, self-tests and fault tracing.
The cable is specially made for workshop use and is of a robust design that is not available on the open market.
The cable is 1 meter long.
One USB Cable is included in the DiCE Basic Kit.
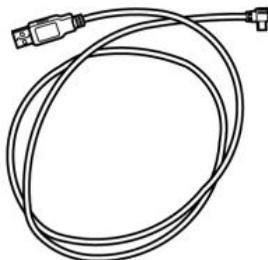
Power Supply Cable (9513004)
This cable is used for DiCE tool fault tracing and software updates, but not during normal DiCE usage.
The cable is connected to the DiCE or DiCE Test Unit and to a 12-volt car battery..
The cable is specially made for workshop use and is of a robust design that is not available on the market. Instead of this cable an AC/DC adapter, 9 -18 volts 12VA can be used.
The cable is 3 meters long.
One Power Supply Cable is included in the DiCE Basic Kit.
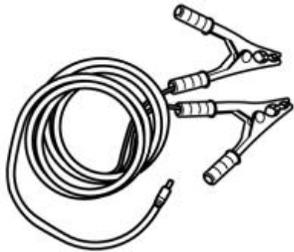
Bluetooth Unit (9513005)
The Bluetooth Unit is connected to the VIDA station to enable wireless communication with DiCE and the vehicle. It has a standard USB connector and is connected to the computer via an extension cable.
Different cable length is used depending on whether a cart or a laptop computer is used.
One Bluetooth Unit is included in the DiCE Basic Kit.

USB Cable for Bluetooth Connection (9513006)
The USB Cable is used to connect the Bluetooth Unit to a VIDA cart computer.
The cable is a standard type that can be purchased in the market.
The cable is 2 meters long.
One USB Cable is included in the DiCE Basic Kit.

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USB Cable for Bluetooth Connection (9513007)
The USB Cable is used for connecting the Bluetooth Unit to a VIDA laptop computer.
The cable is a standard type that can be purchased in the market.
The cable is 0.7 meters long
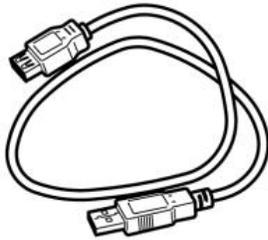
Serial Number on the DiCE Tool
Each DiCE tool has a unique serial number on the front that is identified and used by the VIDA workstation. In VIDA, under the Communication Tool tab, you will see a drop down box that will eventually contain all the DiCE Tool serial numbers that you have been installed. Without this number, it will be hard to determine which DiCE tool you are attempting to switch over to. Due to workshop conditions, it is recommended that this number be preserved on the tool. Pilot testing of the tool revealed that this number could get rubbed off under normal workshop conditions. Placing a piece of clear tape over this number will protect it.

Estimated Speed Comparisons for DiCE vs. VCT2000

Software download speed is dependent on hardware specification and internet connection speeds. The times below are posted for comparisons only, using the PC specified below.

VIDA2007CU1E1
HP Cart Processor 2.8 GHz Internal memory 1000 MB of RAM

Test #1 Software Reload

YV1NC56K91J022866 Swedish-spec C70 Conv (-05), 2001, B5244T, AW55-50/51SN
P/N 9438424 ECM reload OK --> Completion

VCT2000	00:03:58
DiCE Blue Tooth	00:03:37
DiCE USB Cable	00:03:02

Test # 2 Diagnostic Readout

VIN YV1NC56K91J022866 Swedish-spec C70 Conv (-05), 2001, B5244T, AW55-50/51 SN
DIAGNOSTIC tab --> DETAILS tab

VCT2000	00:01:10
DiCE Blue Tooth	00:01:16
DiCE USB Cable	00:01:02

Test # 3 SWDL Reload TCM and ECM Size: 2MB

VIN YV1AS985671000655 German-spec S80 (07-) 2007, B6324S, TF-80SC
P/N 30774442 TCM reload and 30785202 ECM reload
OK --> Completion

VCT2000	00:21:12
DiCE Blue Tooth	00:13:37
DiCE USB	00:08:27

Test # 4 Diagnostic Readout

VIN YV1AS985671000655 German-spec S80 (07-), 2007, B6324S, TF-80SC
DIAGNOSTIC tab --> DETAILS tab

VCT2000	00:00:52
DiCE Blue Tooth	00:01:22
DiCE USB Cable	00:00:46

Adding Addional Workstations in you Shop

As you Service Dept grows, you may see the need to add addional DiCE tools to your shop.
The minimum required components to add a workstation are below.
For example, the power cable and test tool are not required for an addional workstation.

9513000 Dice Tool
9513002 USB Cable (Car Communications)
9513005 Bluetooth Unit
9513006 USB Cable (Computer to Bluetooth 2 meter)

Use of the VCT2000 Going Forward

The VCT2000 has proven to be a reliable tool. It will still work with current and previous model vehicles.
However, near the end of 2008, Volvo will stop testing new versions of VIDA with this tool. Meaning, that
problems you may experience, that relate to the VCT2000 will not be able to be supported.
SPX will continue to sell replacement cables for some time, but they too will not be supported indefinitely.

Bluetooth
Bluetooth is used to transfer information wirelessly between the vehicle and VIDA All-in-one.
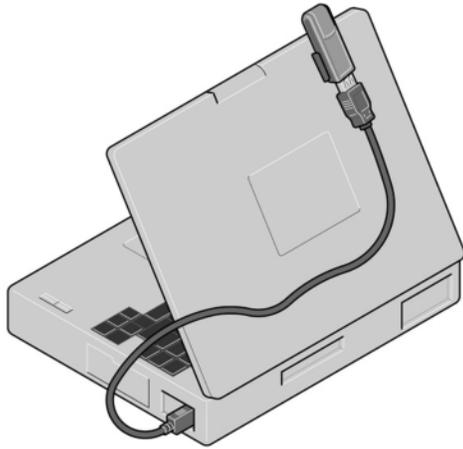
USB

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 always has priority to Bluetooth.
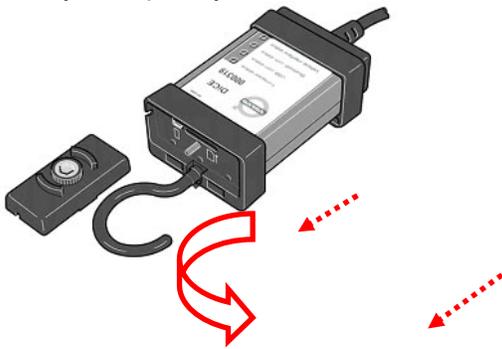
Performance

To optimize 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 could limit or interfere with 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 maximum range of about 300 feet with clear visibility. To achieve stable communication with the vehicle, the distance should be limited to approximately 150 feet. Hang the DiCE in the vehicle using the hook and point the Bluetooth adapter towards the DiCE.
Make sure that no obstacles are between the DiCE and the Bluetooth.

Safety and reliability

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

Description of status LED s

Firmware status (red/green)

Firmware status (Top LED)	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.

USB com status (yellow)

USB com status (Second LED)	Description
Continuous yellow	USB connection connected.
Flashing yellow	USB communication in progress.
Off	Standby.

When connecting USB when DiCE is powered, the status LED for USB flashes quickly for approximately three seconds.
The status LED for USB communication has nothing to do with the USB standard.

Bluetooth com status (blue)

Bluetooth com status (Third LED)	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 never lights.
The status LED for Bluetooth communication has nothing to do with the Bluetooth standard.
Vehicle interface status (orange)

Vehicle interface status (Bottom LED)	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.