Dell Latitude 14 Rugged — 5404

Owner's Manual

Regulatory Model: P46G
Regulatory Type: P46G001

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your computer.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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Contents

1

Working on Your Computer

Topics:

Before Working Inside Your Computer

Use the following safety guidelines to help protect your computer from potential damage and to help to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that the following conditions exist:

- You have read the safety information that shipped with your computer.
- A component can be replaced or--if purchased separately--installed by performing the removal procedure in reverse order.

WARNING: Disconnect all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting to the power source.

WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface, such as a connector on the back of the computer.

CAUTION: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

CAUTION: When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

NOTE: The color of your computer and certain components may appear differently than shown in this document.

To avoid damaging your computer, perform the following steps before you begin working inside the computer.

1. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
2. Turn off your computer (see Turning off Your Computer).
3. If the computer is connected to a docking device (docked), undock it.

   CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.
4. Disconnect all network cables from the computer.
5. Disconnect your computer and all attached devices from their electrical outlets.
6. Close the display and turn the computer upside-down on a flat work surface.

   NOTE: To avoid damaging the system board, you must remove the main battery before you service the computer.

7 Remove the main battery.
8 Turn the computer top-side up.
9 Open the display.
10 Press the power button to ground the system board.

> **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the display.**

> **CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.**

11 Remove any installed ExpressCards or Smart Cards from the appropriate slots.

Turning Off Your Computer

> **CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer.**

1 Shut down the operating system:
- In Windows 8 (touch-enabled device):
  1 Swipe in from the right edge of the screen, opening the Charms menu and select **Settings**.
  2 Select the and then select **Shut down**.
- Using a mouse:
  1 Point to upper-right corner of the screen and click **Settings**.
  2 Click the and select **Shut down**.
- In Windows 7:
  1 Click **Start** .
  2 Click **Shut Down.**

  Or

  1 Click **Start** .
  2 Click the arrow in the lower-right corner of the **Start** menu as shown below, and then click **Shut Down**

2 Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.

After Working Inside Your Computer

After you complete any replacement procedure, ensure you connect any external devices, cards, and cables before turning on your computer.

> **CAUTION: To avoid damage to the computer, use only the battery designed for this particular Dell computer. Do not use batteries designed for other Dell computers.**

1 Connect any external devices, such as a port replicator or media base, and replace any cards, such as an ExpressCard.
2 Connect any telephone or network cables to your computer.

> **CAUTION: To connect a network cable, first plug the cable into the network device and then plug it into the computer.**

3 Replace the battery.
4 Connect your computer and all attached devices to their electrical outlets.
5 Turn on your computer.

Removing and Installing Components

This section provides detailed information on how to remove or install the components from your computer.

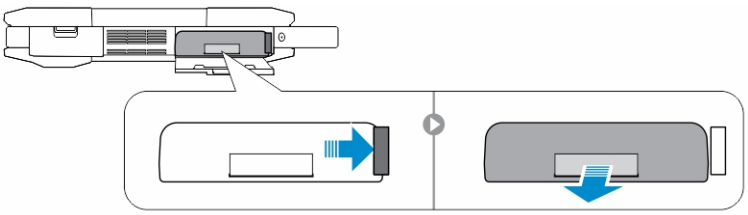
Removing the Battery

WARNING: Using an incompatible battery may increase the risk of fire or explosion. Replace the battery only with a compatible battery purchased from Dell. The battery is designed to work with your Dell computer. Do not use a battery from any other computer with your computer.

WARNING: Before removing or replacing the battery, turn off the computer, disconnect the AC adapter from the electrical outlet and the computer, disconnect the modem from the wall connector and computer, and remove any other external cables from the computer.

WARNING: Not for use in hazardous locations. See installation instructions.

1 Follow the procedures in Before Working Inside Your Computer
2 Push and hold the battery release button to the right while pulling on the plastic battery tab

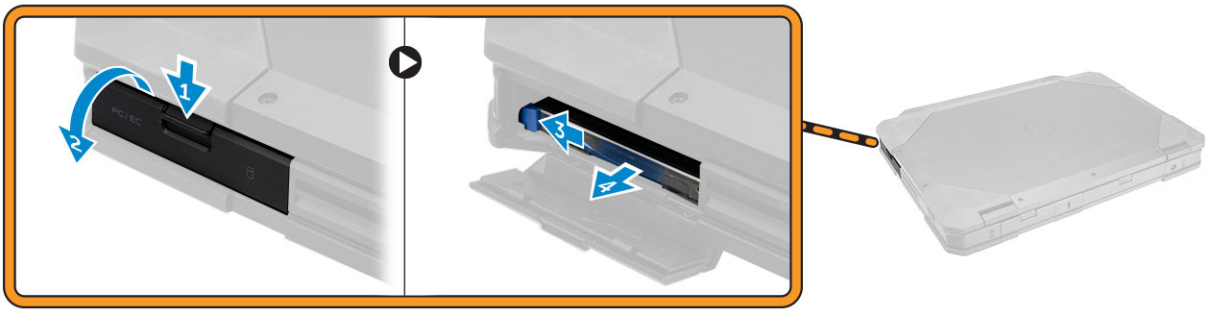


Installing the Battery

1 Slide the battery into its slot until it clicks into place.
2 Press firmly on the door until a click is heard and the latch is engaged.
3 Follow the procedures in After Working Inside Your computer

Removing the hard drive

1 Follow the procedure in Before working inside your computer
2 Remove the battery.
3 To remove the hard drive:
   a Unlock the hard drive press latch door [1].
   b Push it downwards to open it [2].
   c Push and hold the hard drive release button to the left while pulling on the plastic hard drive tab [3].
   d Pull the hard drive away from the computer [4].

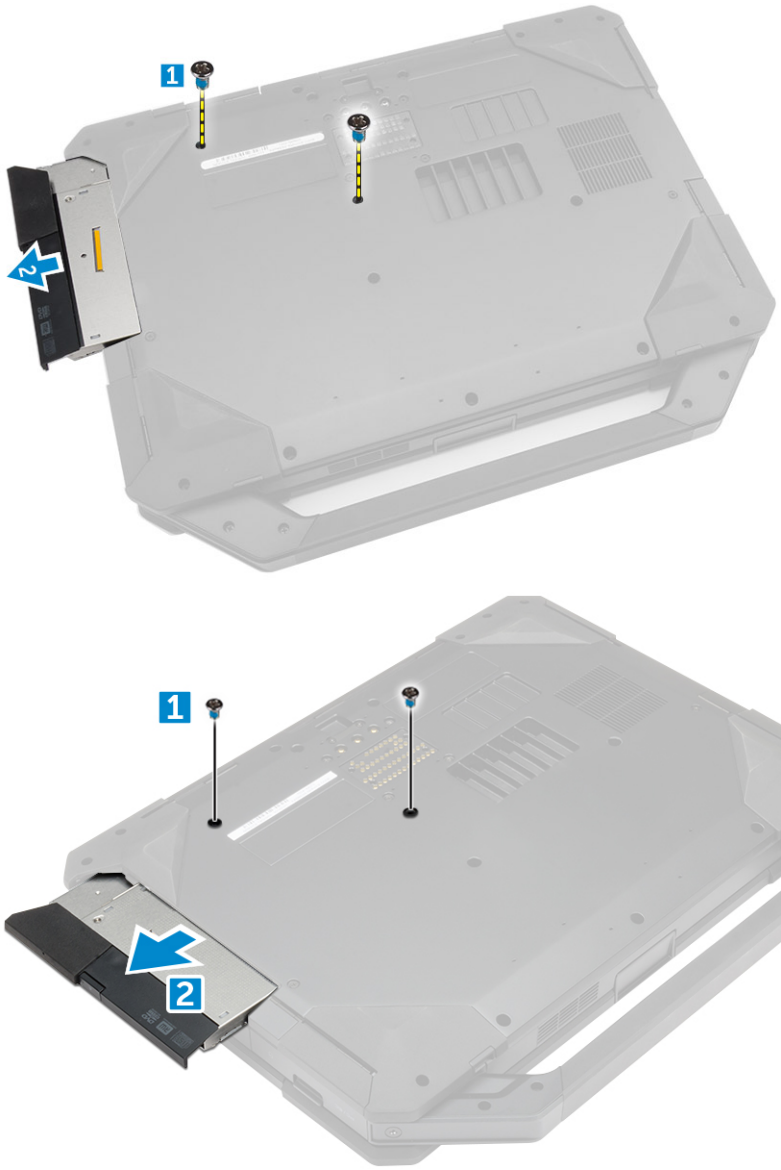


Installing the Hard Drive

1 Slide the hard drive into its place on the computer.
2 Close the hard-drive bay press latch door.
3 Install:
   a Battery
4 Follow the procedures in After Working Inside Your computer

Removing the optical drive

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a battery
   b hard drive
3 To remove the optical drive:
   a Remove the screws that secure the optical drive to the computer [1].
   b Remove the optical drive from the computer [2].



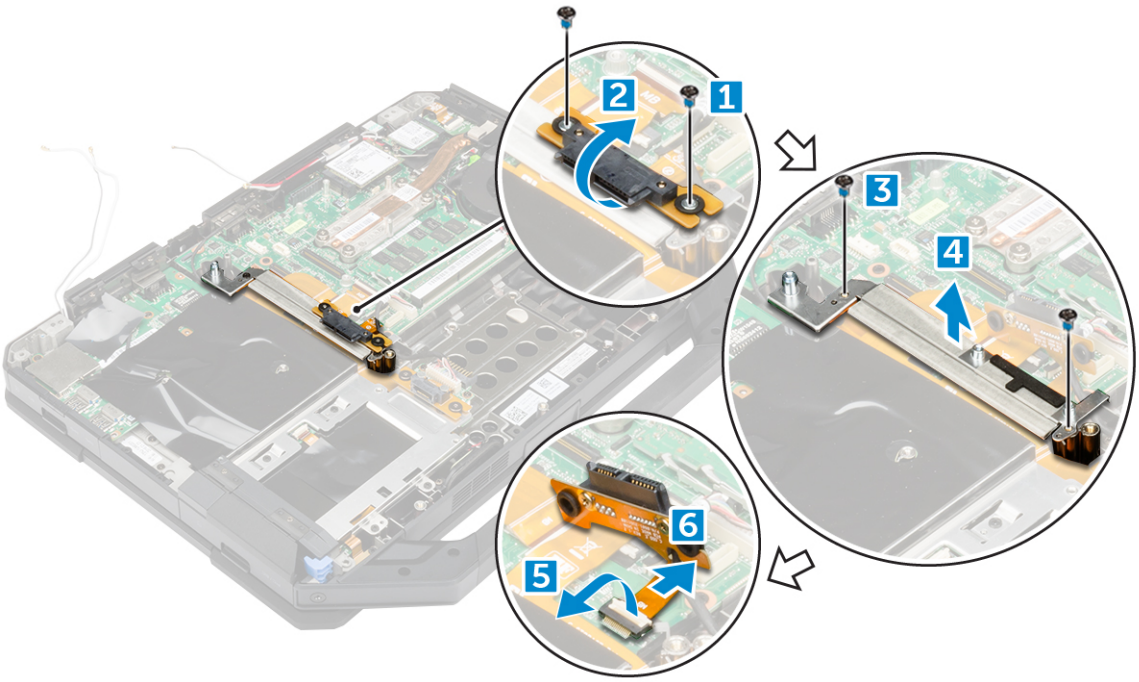
Installing the Optical Drive

1 Place the optical drive on to the computer.
2 Tighten the screws that secure the optical drive to the computer.
3 Install:
   a Hard Drive
   b Battery
4 Follow the procedures in After Working Inside Your computer

Removing the optical drive connector

1 Follow the procedure in Before working inside your computer.
2 Remove the:
   a battery
   b hard drive
   c optical drive
   d base cover

3 To release the optical drive connector:
   a Remove the screws that secure the optical drive connector to the computer [1].
   b Flip the connector [2].
   c Remove the screws that secure the connector to the computer [3].
   d Lift the connector in an upward direction [4].
   e Lift the latch [5] and disconnect the optical drive connector cable from the connector on the system board [6].



4 Lift the optical drive connector away form the computer.

Installing the Optical Drive Connector

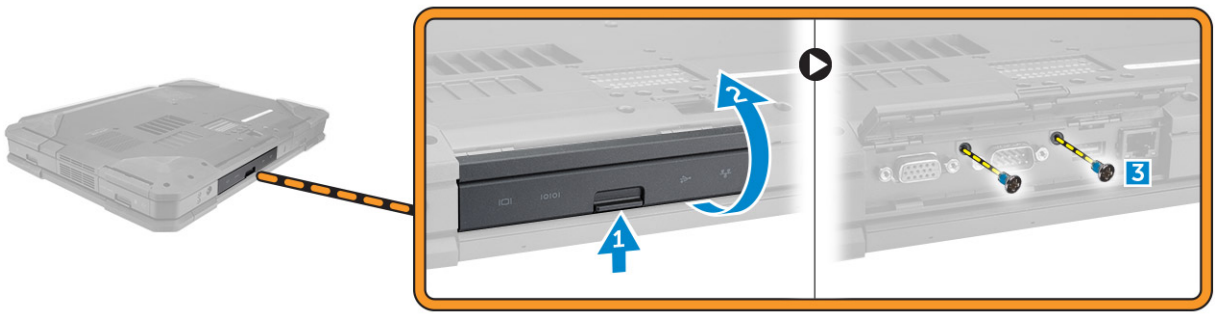
1 Place the optical drive on to the computer.
2 Connect the optical drive connector cable.
3 Press the locking tab.
4 Tighten the screws that secure the optical drive to the computer.
5 Flip the optical drive connector and seat it.
6 Tighten the screw that secures the optical drive connector to the computer.
7 Install:
   a Bottom Cover
   b Optical Drive
   c Hard Drive
   d Battery
8 Follow the procedures in After Working Inside Your computer

Removing the Bottom Cover

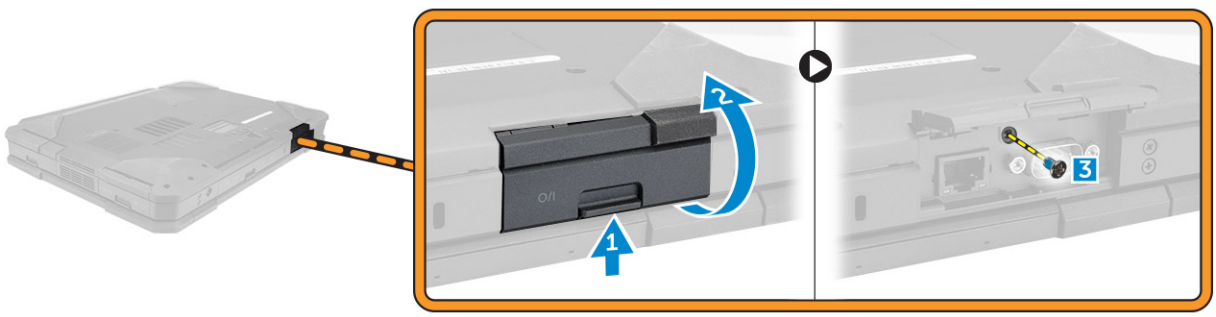
1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive
3 Perform the following steps as shown in the illustration:

a Unlock the I/O latch door [1].
b Lift the latch door upward to open it [3].
c Remove the screw that secures the bottom cover to the computer chasis [3].

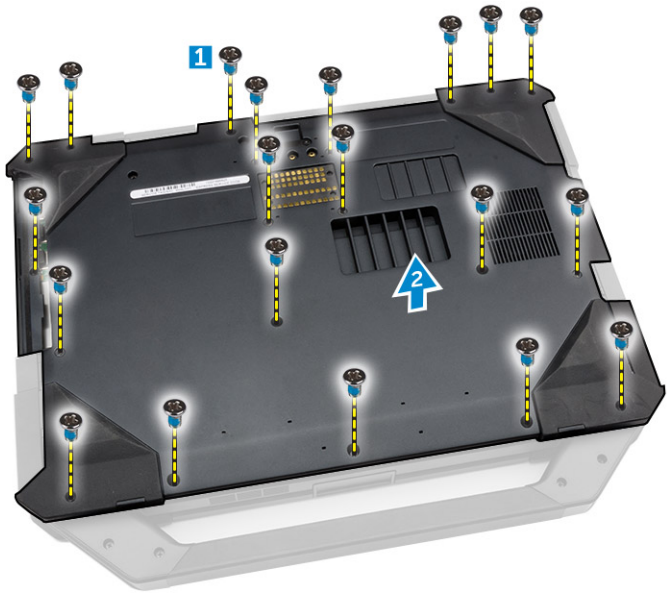
4 Perform the following steps as shown in the illustration:
a Unlock back door latch [1].
b Lift the back door in an upward direction to open it [2].
c Remove the screws that secure the bottom cover to the computer chassis [3].



5 Perform the following steps as shown in the illustration:
a Unlock the HDMI latch door [1].
b Lift the latch door upward direction [2].
c Remove the screw that secure the bottom cover to the computer chassis [3].



6 Perform the following steps as shown in the illustration:
a Remove the screws that secure the bottom cover [1].
b Lift the bottom cover to remove it from the computer chassis [2].

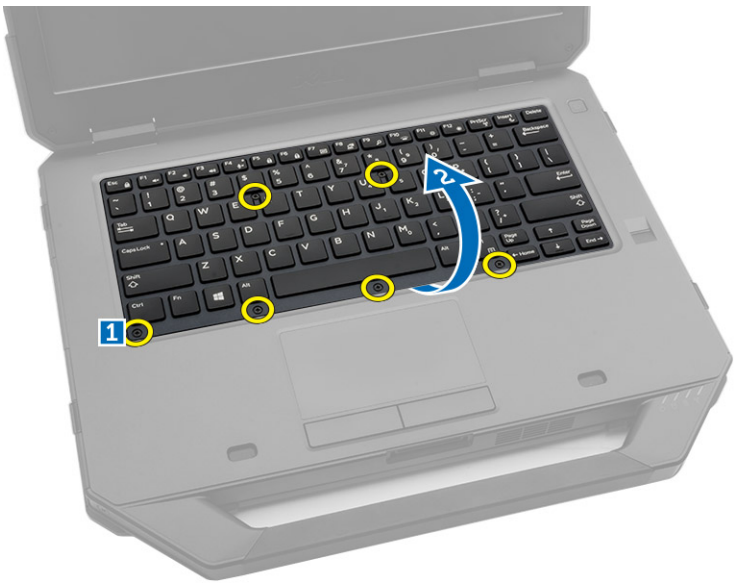


Installing the Bottom Cover

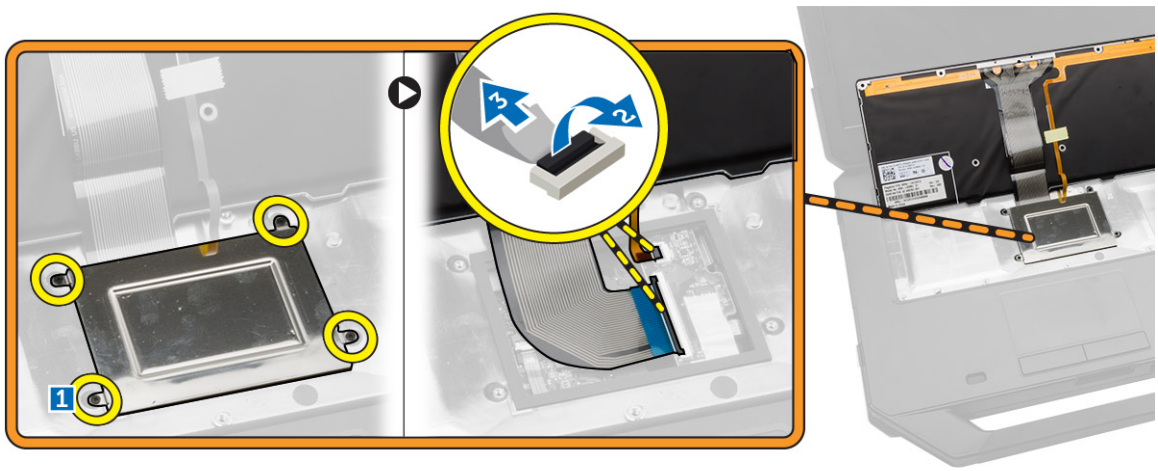
1 Tighten the screws that secure I/O, back door, and HDMI to the computer chassis.
2 Press firmly on the door until a click is heard and the latch is engaged.
3 Place the bottom cover on the base of the computer.
4 Tighten the screws that secure the bottom cover to the computer chassis.
5 Install:
   a Optical Drive
   b Hard Drive
   c Battery
6 Follow the procedures in After Working Inside Your computer

Removing the Keyboard

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
3 Perform the following steps as shown in the illustration:
   a Remove the screws that secure the keyboard to the computer chassis [1].
   b Pry along the edges and flip the keyboard over [2].



4 Perform the following steps as shown in the illustration:
   a Remove the screws that secure the keyboard door [1].
   b Lift the locking tab [2].
   c Disconnect the keyboard cables from the system board [3].



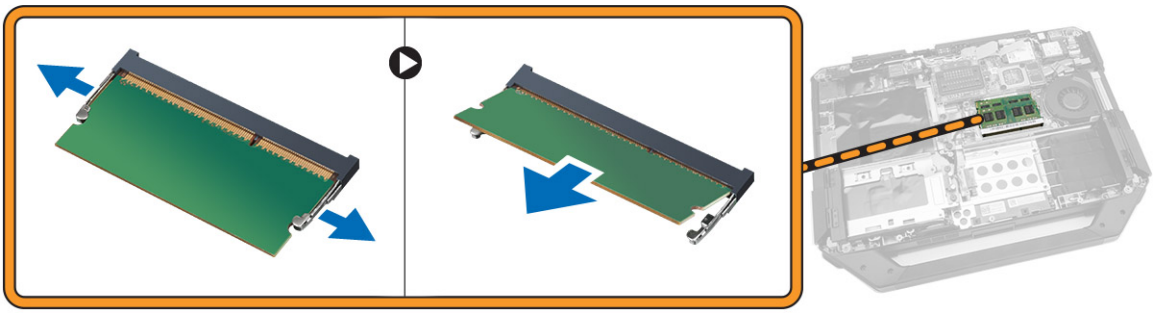
5 Lift and remove the keyboard from the computer chassis

Installing the Keyboard

1 Connect the keyboard cables to its connectors on the keyboard controller card.
2 Place the keyboard door over its slot on the computer chassis.
3 Tighten the screws that secure the keyboard door to the computer chassis.
4 Align the keyboard into its slot on the computer.
5 Tighten the screws to secure the keyboard to the computer.
6 Install:
   a Battery
7 Follow the procedures in After Working Inside Your computer

Removing the Memory Module

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive
   d Bottom Cover
3 Pry the securing clips away from the memory module until it pops up
4 Remove the memory module from its connector on the system board.



Installing the Memory Module

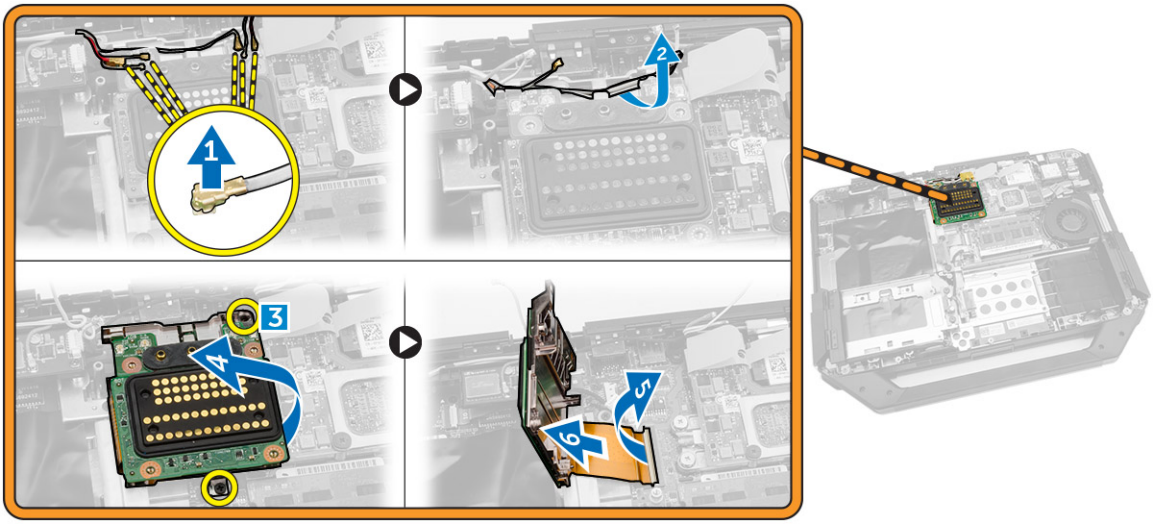
1 Insert the memory module into the memory socket.
2 Press the memory module down until it clicks into place.
3 Install:
   a Bottom Cover
   b Optical Drive
   c Hard Drive
   d Battery
4 Follow the procedures in After Working Inside Your computer

Removing the Docking Board

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Bottom Cover
3 Perform the following steps as shown in the illustration:
   a Disconnect the antenna cables from the docking board [1].

> **CAUTION: Exercise caution while disconnecting the antenna cables. Improper removal may result in damage/breakage of the antenna cables.**

   b Unroute the antenna cables [2].
   c Remove the screws that secure the docking board [3].
   d Flip the docking board [4].
   e Lift the release tab [5].
   f Disconnect the docking board connector cable from the system board [6].



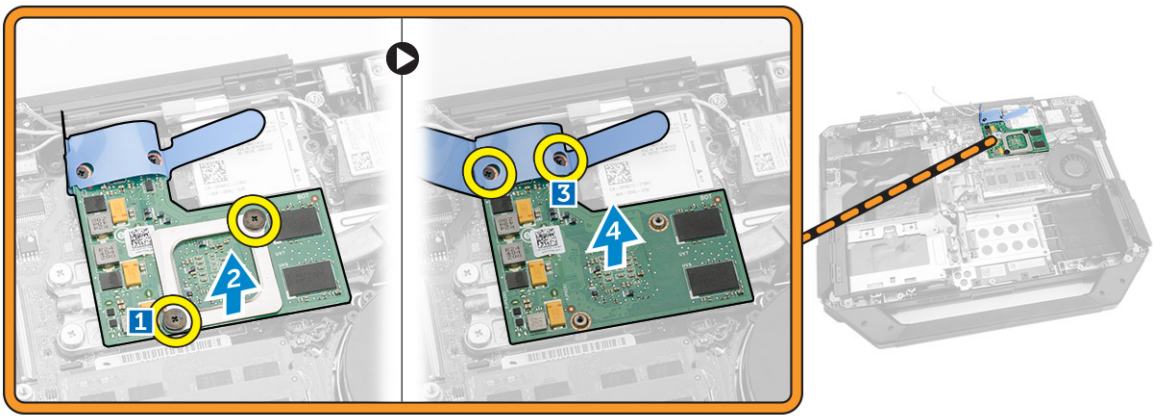
4 Lift and remove the docking board from the computer chassis.

Installing the Docking Board

1 Connect the docking board connector cable to the system board.
2 Flip the docking board and seat it on the slot.
3 Tighten the screws to secure the docking board.
4 Route the antenna cables.
5 Connect the antenna cables to the docking board.
6 Install:
   a Bottom Cover
   b Battery
7 Follow the procedures in After Working Inside Your computer

Removing the GPU Board

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive
   d Bottom Cover
   e Docking Board
3 Perform the following steps as shown in the illustration:
   a Remove the screws that secure the GPU socket to the computer [1].
   b Lift GPU socket from the board [2].
   c Remove the screws that secure the pull tab to the GPU board [3].
   d Lift the GPU board from the computer [4].

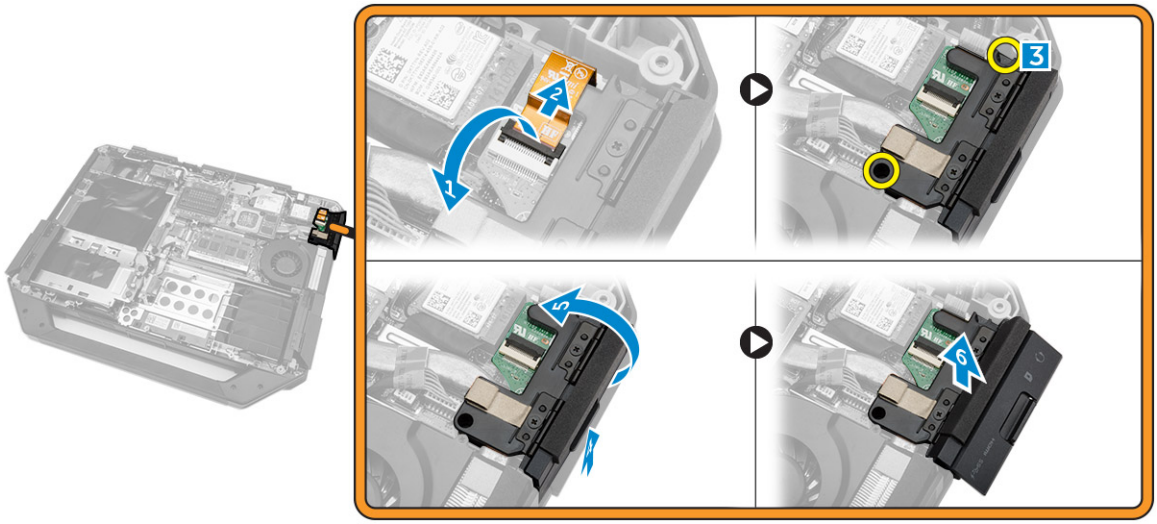


Installing the GPU Board

1 Place the GPU board on the computer.
2 Tighten the screws that secure the pull tab to the GPU board.
3 Place the GPU socket on the board.
4 Tighten the screws that secure the socket to the computer.
5 Install:
   a Docking Board
   b Bottom Cover
   c Optical Drive
   d Hard Drive
   e Battery
6 Follow the procedures in After Working Inside Your computer

Removing the SIM Module

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive
   d Bottom Cover
3 Perform the following steps as shown in the illustration:
   a Lift the locking tab [1].
   b Disconnect the cable [2].
   c Remove the screws that secure the SIM Module to the computer [3].
   d Press the SIM module [4].
   e Lift the module upward [5].
   f Remove the SIM module from the computer [6].

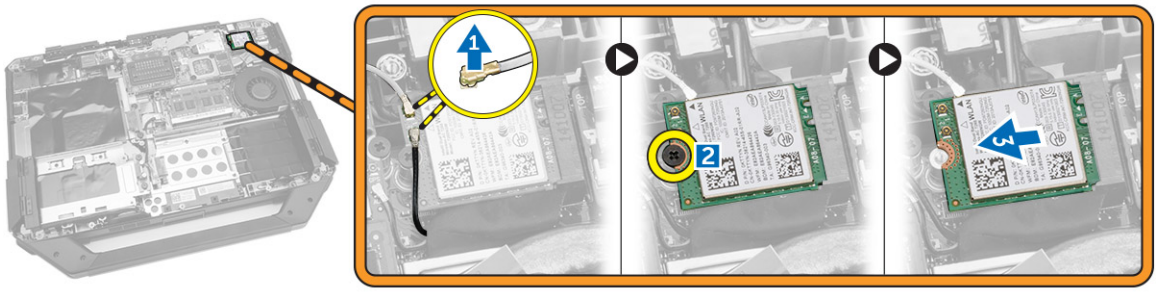


Installing the SIM Module

1 Slide the SIM module into its place on the computer.
2 Close the SIM module bay press latch door.
3 Tighten the screws that secure the module to the computer.
4 Connect the cable.
5 Press the locking tab.
6 Install:
   a Bottom Cover
   b Optical Drive
   c Hard Drive
   d Battery
7 Follow the procedures in After Working Inside Your computer

Removing the WLAN Card

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive
   d Bottom Cover
   e GPS Holder
3 Perform the following steps as shown in the illustration:
   a Disconnect the antenna cables from the WLAN card [1].
   b Remove the screw that secures the WLAN card [2].
   c Slide and lift the WLAN card from the slot [3].



Installing the WLAN Card

1 Insert the WLAN card in the slot.
2 Connect the screw to secure the cable holder.
3 Connect the antenna cables to the WLAN card.
4 Install:
   a GPS Holder
   b Bottom Cover
   c Optical Drive
   d Hard Drive
   e Battery
5 Follow the procedures in After Working Inside Your computer

Removing the WWAN Card

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive
   d Bottom Cover
   e GPS Holder
3 Perform the following steps as shown in the illustration:
   a Disconnect the cables from the WWAN card [1].
   b Remove the screw that secures the WWAN card [2].
   c Slide and lift the WWAN card from the slot [3].

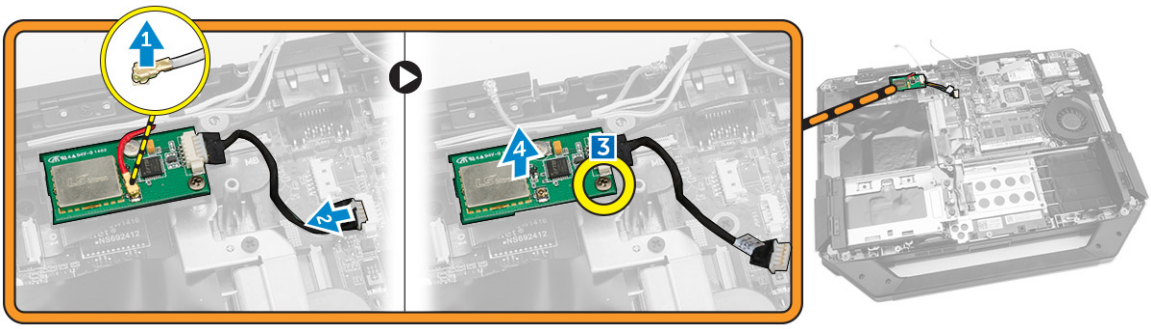
Installing the WWAN Card

1 Insert the WWAN card in the slot.
2 Connect the screw to secure the WWAN.
3 Connect the cables to the WWAN card.

4 Install:
   a GPS Holder
   b Bottom Cover
   c Optical Drive
   d Hard Drive
   e Battery
5 Follow the procedures in After Working Inside Your computer

Removing the GPS Holder

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive
   d Bottom Cover
3 Perform the following steps as shown in the illustration:
   a Disconnect the antenna cable [1].
   b Disconnect the GPS holder cable [2]
   c Remove the screw that secures the GPS holder to the computer [3].
   d Lift the GPS holder from the computer [4].



Installing the GPS Holder

1 Place the GPS holder into its place on the computer.
2 Tighten the screw that secure the holder to the computer.
3 Connect the antenna cable.
4 Align the cable to the computer.
5 Install:
   a Bottom Cover
   b Optical Drive
   c Hard Drive
   d Battery
6 Follow the procedures in After Working Inside Your computer

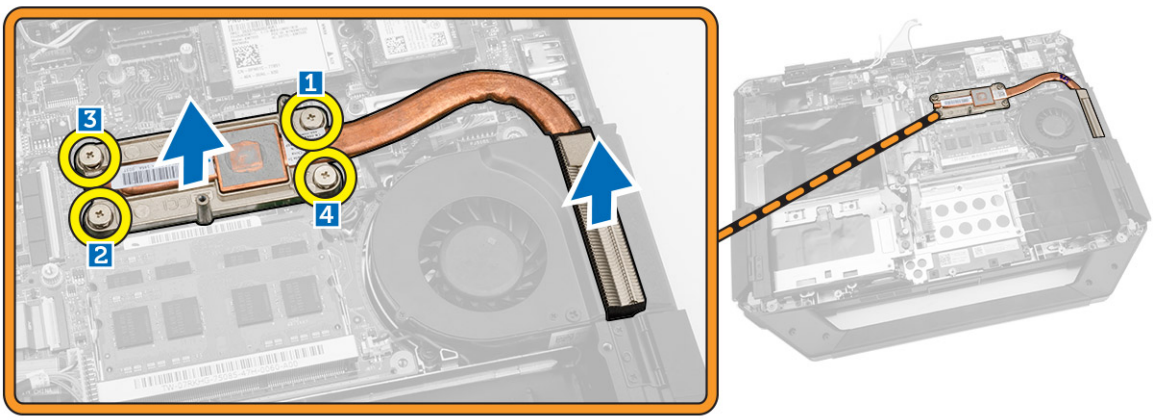
Removing the Heatsink

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive

d Bottom Cover
e Docking Board
f GPU Board
g SIM Module

3 Loosen the screws that secure the heatsink to the system board in the sequence shown [1,2,3,4].

NOTE: The screws are retained by the heatsink and should not be fully removed.



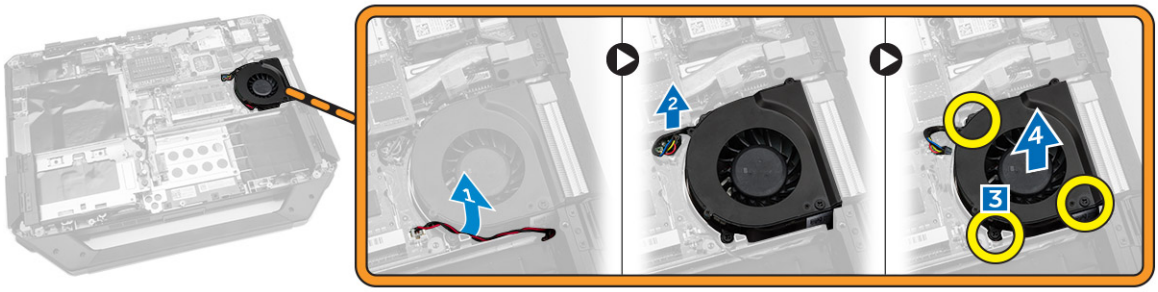
4 Lift the heatsink from the computer chassis.

Installing the Heatsink

1 Align the heatsink to its position on the system board.
2 Tighten the screws in the numerical sequence depicted on the bracket, to secure the heatsink on the system board.
3 Install:
a SIM Module
b GPU Board
c Docking Board
d Bottom Cover
e Optical Drive
f Hard Drive
g Battery
4 Follow the procedures in After Working Inside Your computer

Removing the System Fan

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
a Battery
b Hard Drive
c Optical Drive
d Bottom Cover
3 Perform the following steps as shown in the illustration:
a Unroute the system fan cable [1].
b Disconnect the system fan cable [2].
c Remove the screw that secures the system fan to the computer [3].
d Lift the system fan from the computer [4].

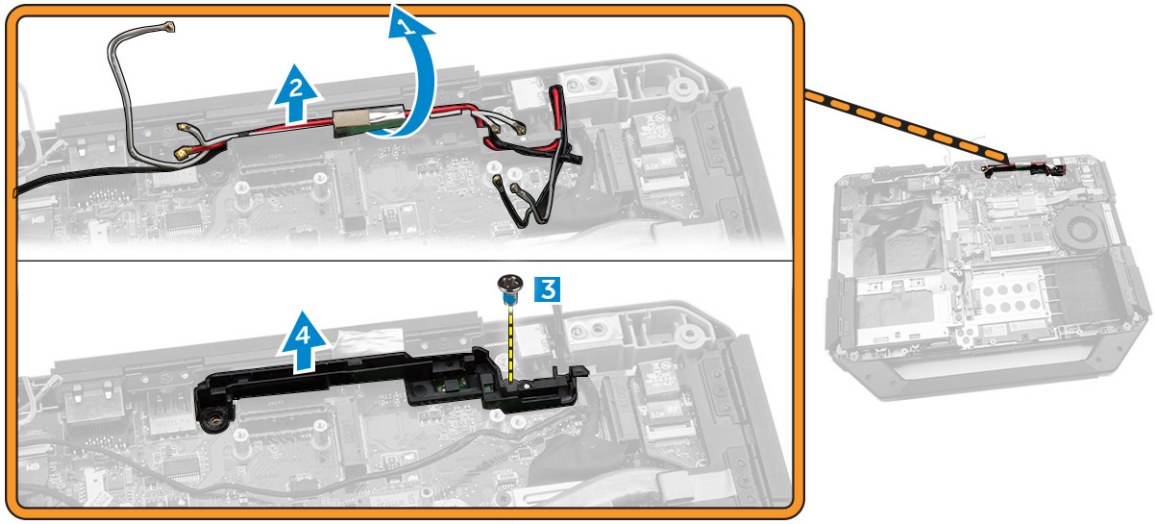


Installing the System Fan

1 Place the system fan into its place on the computer.
2 Tighten the screw that secures the system fan to the computer
3 Connect the system fan cable to the computer.
4 Route the system fan cable.
5 Install:
   a Bottom Cover
   b Optical Drive
   c Hard Drive
   d Battery
6 Follow the procedures in After Working Inside Your computer

Removing the RF Holder

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive
   d Bottom Cover
   e GPS Holder
   f WLAN Card
   g Docking Board
3 Perform the following steps as shown in the illustration:
   a Unthread the antenna cables [1].
   b Disconnect the antenna cables [2].
   c Remove the screw that secures the RF Holder to the computer [3].
   d Lift and remove the RF Holder from the computer [4].

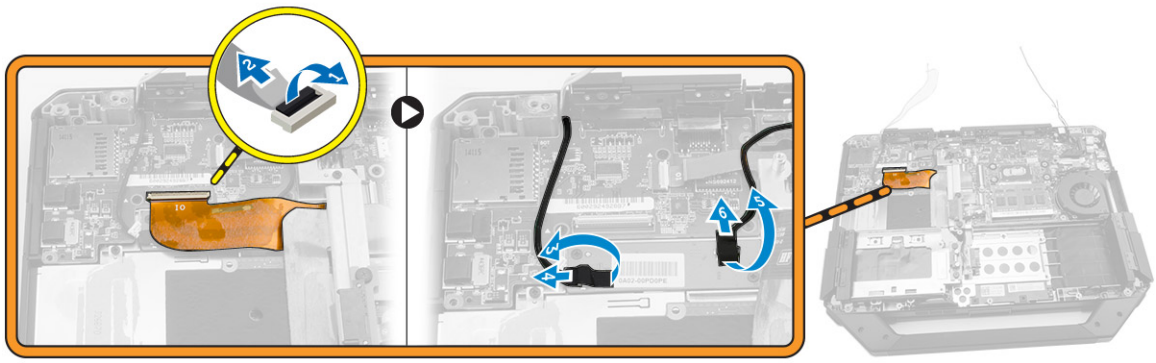


Installing the RF Holder

1 Place the RF holder on the computer.
2 Tighten the screws that secure the RF holder to the computer.
3 Connect the antenna cable.
4 Route the antenna cable.
5 Install:
   a WLAN Card
   b WWAN Card
   c Bottom Cover
   d Optical Drive
   e Hard Drive
   f Battery
6 Follow the procedures in After Working Inside Your computer

Removing the Display Assembly

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive
   d Bottom Cover
3 Perform the following steps as shown in the illustration:
   a Lift the locking tab [1].
   b Disconnect the I/O cable [2].
   c Peel the adhesive tape [3].
   d Disconnect the eDP cable on the system board [4].
   e Peel the adhesive tape [5]
   f Disconnect the display assembly cable on the system board [6]

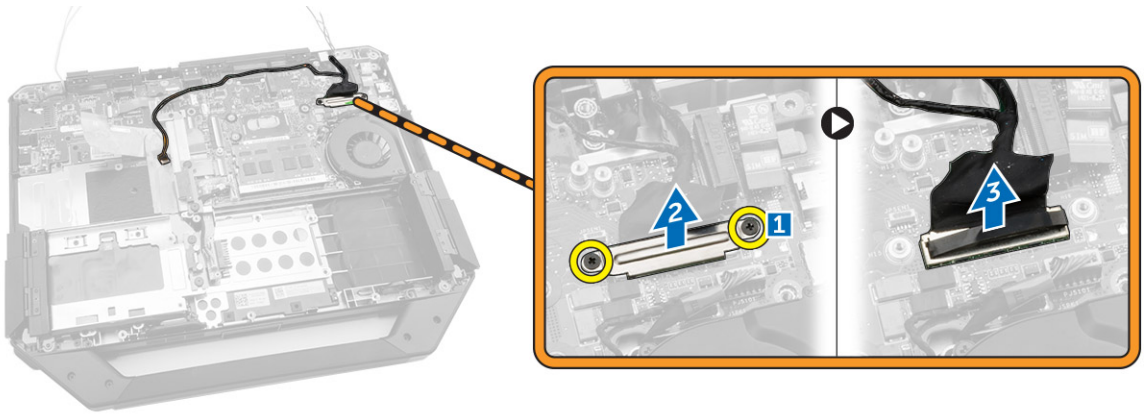


4 Perform the following steps as shown in the illustration:

a Remove the screws that secure the display assembly connector [1].

b Lift the tab [2].

c Disconnect the display assembly connector [3].



5 Remove the screws that secure the display assembly to the computer chassis.

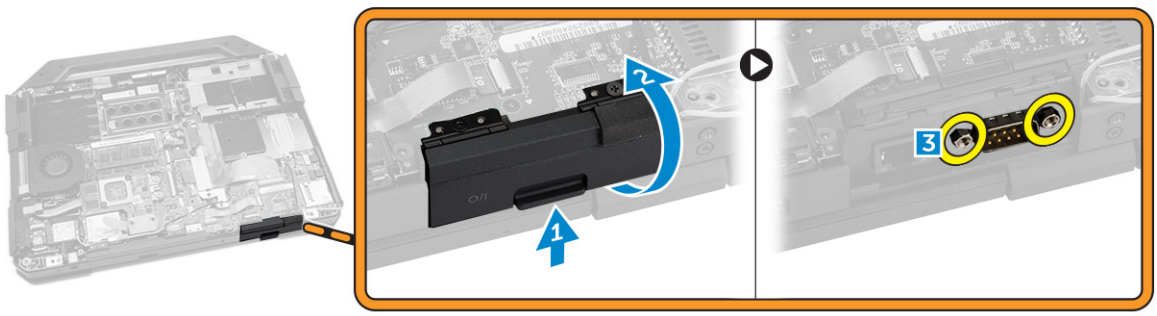
6 Flip the computer to remove the display assembly.

Installing the Display Assembly

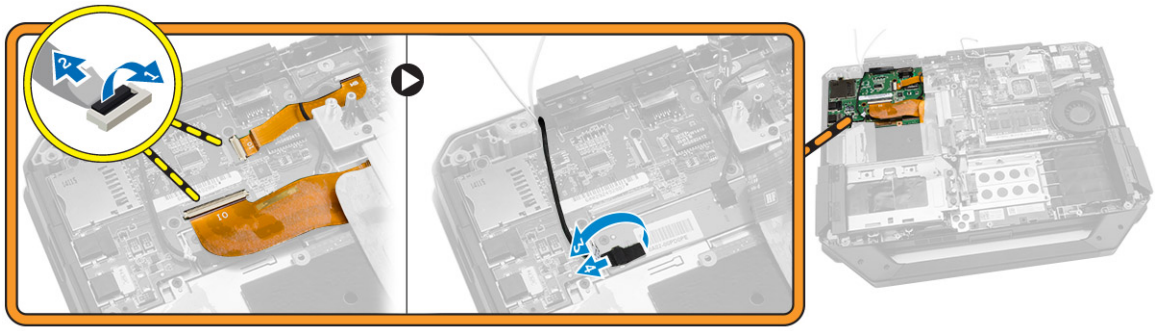
1 Install the display assembly and close the display.
2 Flip the computer chassis.
3 Tighten the screws that secure the display assembly to the computer chassis.
4 Connect the display assembly connector.
5 Re-seat the pull tab on the connector.
6 Tighten the screws that secure that secure display assembly connector.
7 Connect the display assembly cable on the system board.
8 Affix the adhesive tape.
9 Connect the eDP cable on the system board.
10 Affix the adhesive tape.
11 Install:
   a Bottom Cover
   b Optical Drive
   c Hard Drive
   d Battery
12 Follow the procedures in After Working Inside Your computer

Removing the I/O Board

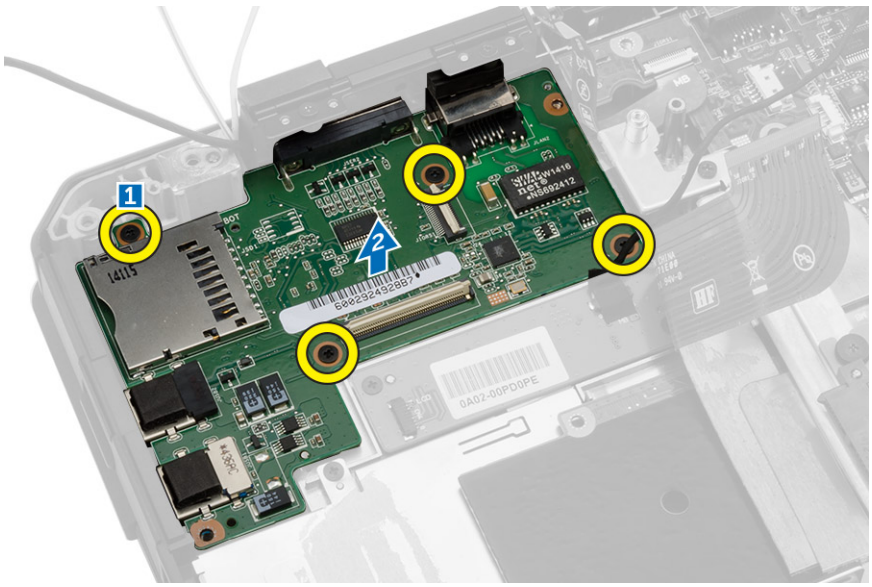
1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive
   d Bottom Cover
3 Perform the following steps as shown in the illustration:
   a Unlock the I/O press latch door [1].
   b Lift it upwards to open it [2].
   c Remove the screw that secures I/O board to the computer chassis [3].



4 Perform the following steps as shown in the illustration:
   a Lift the locking tab [1].
   b Disconnect the I/O cable from the system board [2].
   c Lift the display assembly cable in an upward direction [3]
   d Disconnect the cable [4].



5 Perform the following steps as shown in the illustration:
   a Remove the screws that secure the I/O board to the computer [1].
   b Lift and the remove the I/O board from the computer [2].



Installing the I/O Board

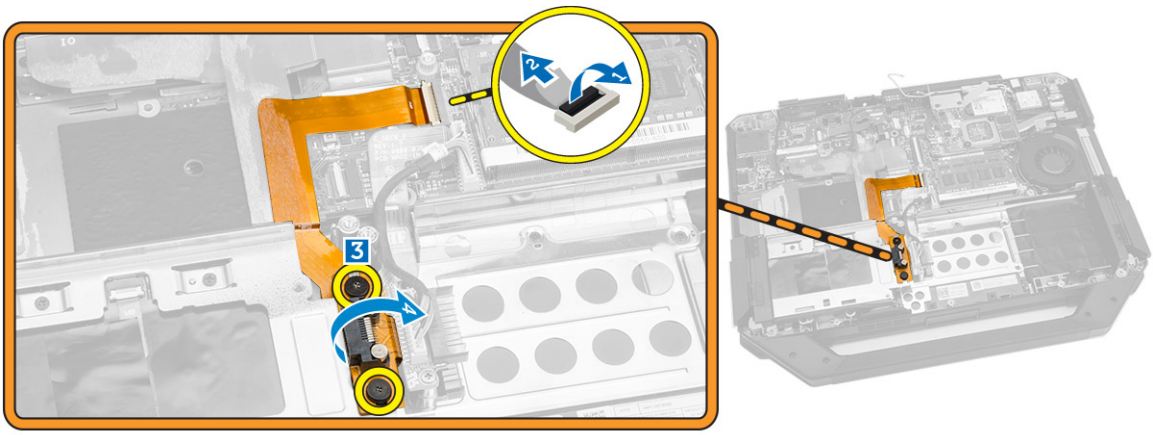
1 Place the I/O board on the computer.
2 Tighten the scews that secure the I/O board to the computer.
3 Connect display assembly cable to the computer.
4 Connect the I/O cable to the computer.
5 Tighten the screw that secures the I/O board.
6 Slide the I/O board into its place on the computer.
7 Close the I/O bay press latch door.
8 Install:
   a Bottom Cover
   b Optical Drive
   c Hard Drive
   d Battery
9 Follow the procedures in After Working Inside Your computer

Removing the Storage Connector

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:

a Battery
b Hard Drive
c Optical Drive
d Bottom Cover

3 Perform the following steps as shown in the illustration:
a Lift the locking tab [1].
b Disconnect the storage connector cable [2].
c Remove the screw that secures the storage connector [3].
d Lift the storage connector from the computer [4].

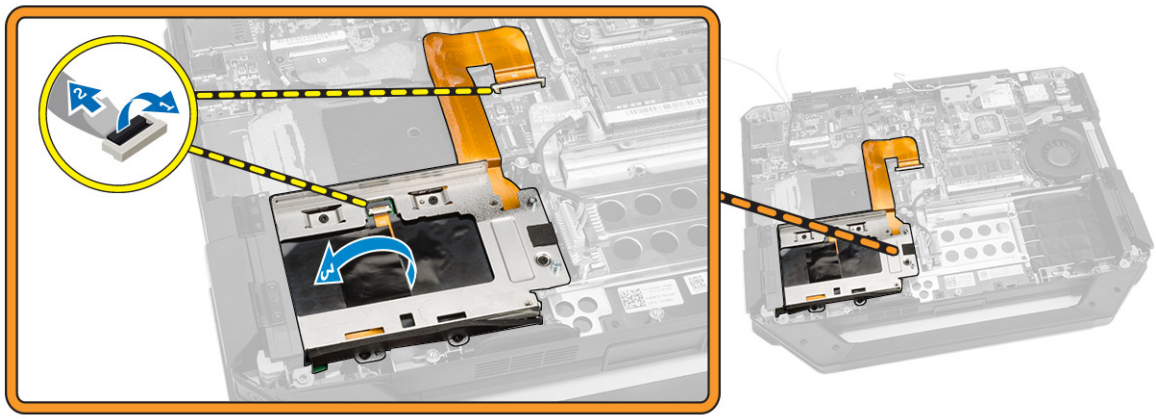


Installing the Storage Connector

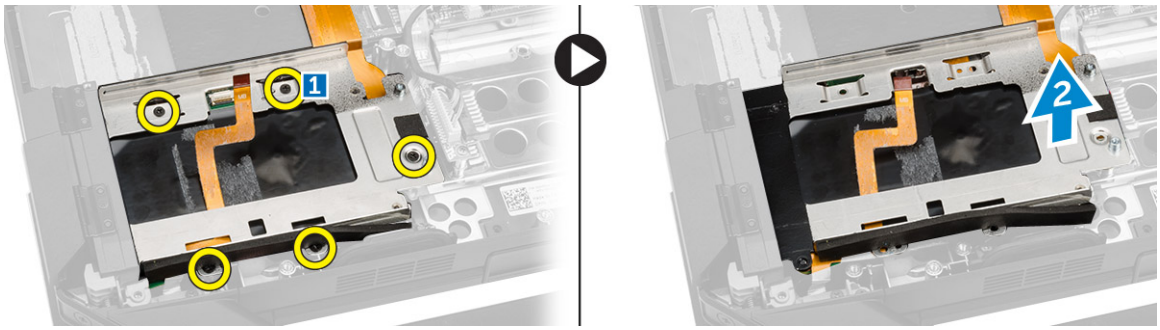
1 Place the storage connector on the computer.
2 Tighten the screws that secure the storage connector
3 Connect the storage connector cable to the computer.
4 Install:
a Bottom Cover
b Optical Drive
c Hard Drive
d Battery
5 Follow the procedures in After Working Inside Your computer

Removing the SSD Bracket

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
a Battery
b Hard Drive
c Optical Drive
d Bottom Cover
3 Perform the following steps as shown in the illustration:
a Lift the locking tab [1].
b Disconnect the SSD connector cable [2].
c Remove the adhesive tape from the computer [3].



4 Perform the following steps as shown in the illustration:
   a Remove the screws that secure the SSD bracket to the computer [1].
   b Lift the SSD bracket from the computer [2].



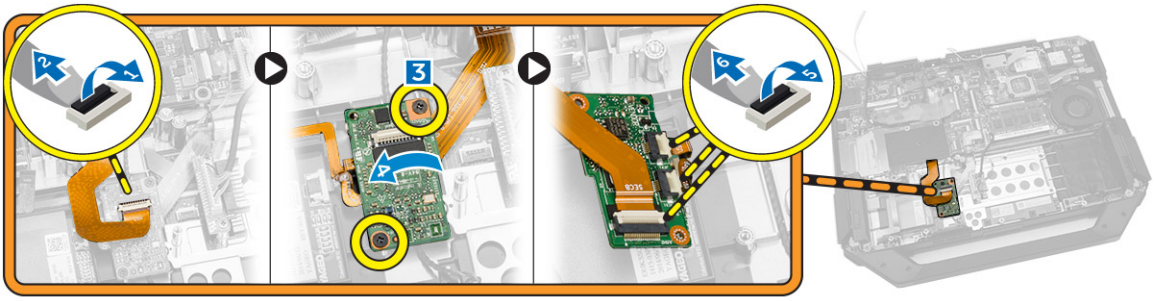
Installing the SSD Bracket

1 Place the SSD bracket on the computer.
2 Tighten the screws that secure the SSD connector.
3 Affix the adhesive tape to the computer.
4 Connect the SSD bracket cable to the computer.
5 Install:
   a Bottom Cover
   b Optical Drive
   c Hard Drive
   d Battery
6 Follow the procedures in After Working Inside Your computer

Removing the USH Board

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive
   d Bottom Cover
3 Perform the following steps as shown in the illustration:
   a Lift the locking tab [1].
   b Disconnect the USH board cables from the connectors [2].
   c Remove the screws that secure the board [3].

d Lift and flip the board at an angle to access the smart card cable at the bottom [4].
e Lift the locking tab [5].
f Disconnect the smart card cable and release the USH board from the computer chassis [6].



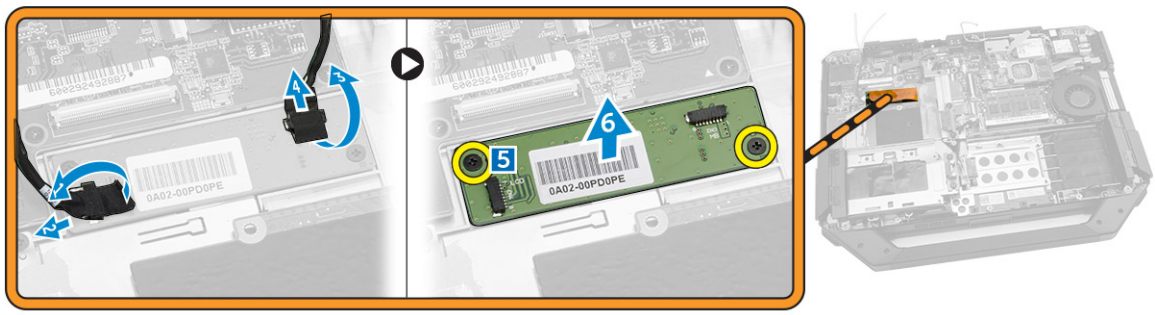
4 Remove the USH board from the computer.

Installing the USH Board

1 Connect the smart card cable to the USH board at the bottom of the board.
2 Flip the USH board to replace it to its original position.
3 Tighten the screws to secure the USH board.
4 Connect the cables to the USH board.
5 Install:
   a Bottom Cover
   b Optical Drive
   c Hard Drive
   d Battery
6 Follow the procedures in After Working Inside Your computer

Removing the Driving Board

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive
   d Bottom Cover
3 Perform the following steps as shown in the illustration:
   a Peel the adhesive tape [1].
   b Disconnect the display assembly cable [2].
   c Peel the adhesive tape [3].
   d Disconnect the I/O cable [4]
   e Remove the screws that secure the driving board to the computer [5]
   f Lift the driving board from the computer [6].

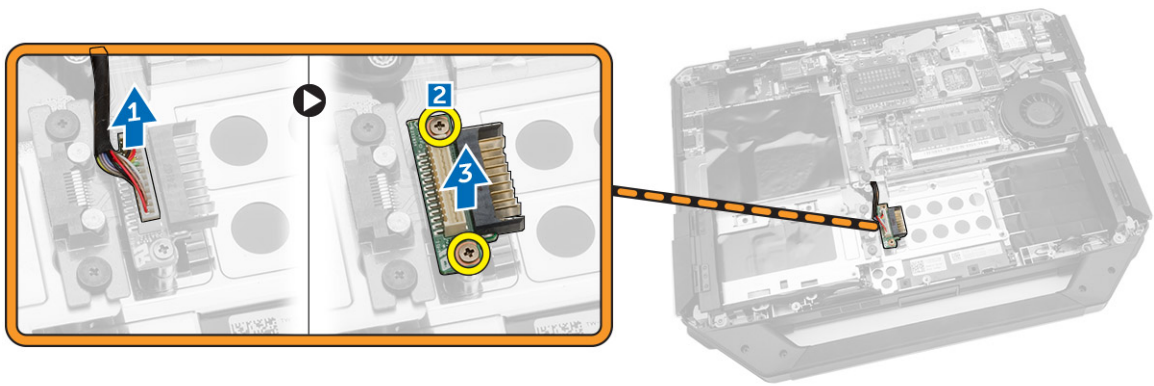


Installing the Driving Board

1 Place the driving board on the computer.
2 Tighten the screws that secure the driving board on the computer.
3 Connect the I/O board cable.
4 Affix the adhesive tape.
5 Connect the display assembly cable
6 Affix the tape.
7 Install:
   a Bottom Cover
   b Hard Drive
   c Optical Drive
   d Battery
8 Follow the procedures in After Working Inside Your computer

Removing the Battery Connector

1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive
   d Bottom Cover
   e I/O Board
3 Perform the following steps as shown in the illustration:
   a Disconnect the battery connector cable [1].
   b Remove the screws that secure the battery connector [2].
   c Lift the battery connector [3].

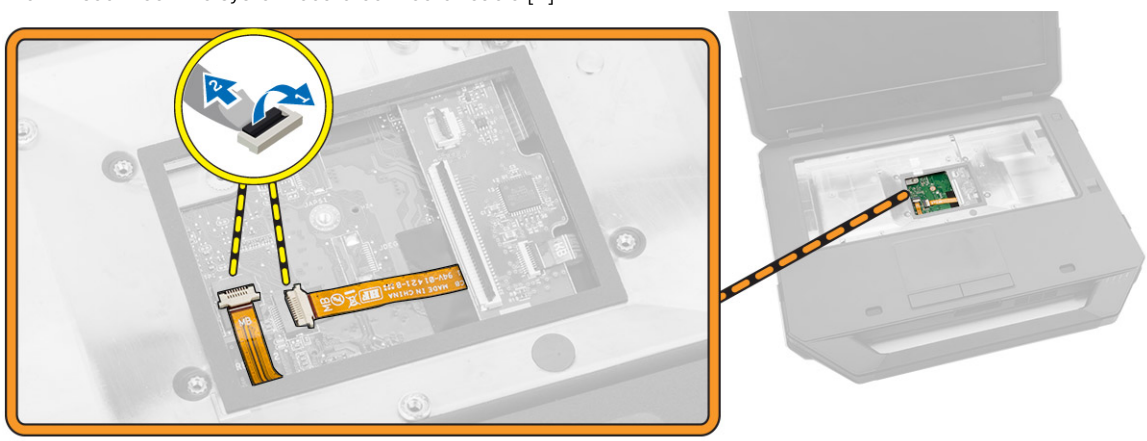


Installing the Battery Connector

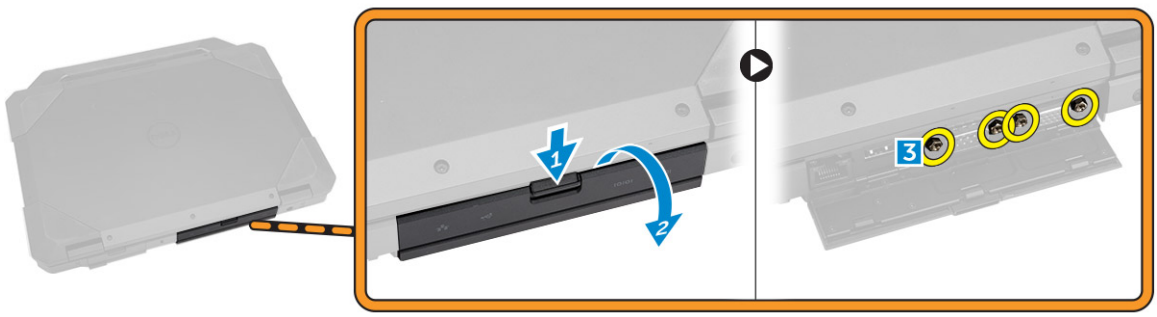
1 Place the battery connector on the system board..
2 Tighten the screws that secure the battery connector to the computer.
3 Connect the battery connector cable.
4 Install:
   a I/O Board
   b Bottom Cover
   c Optical Drive
   d Hard Drive
   e Battery
5 Follow the procedures in After Working Inside Your computer

Removing the System Board

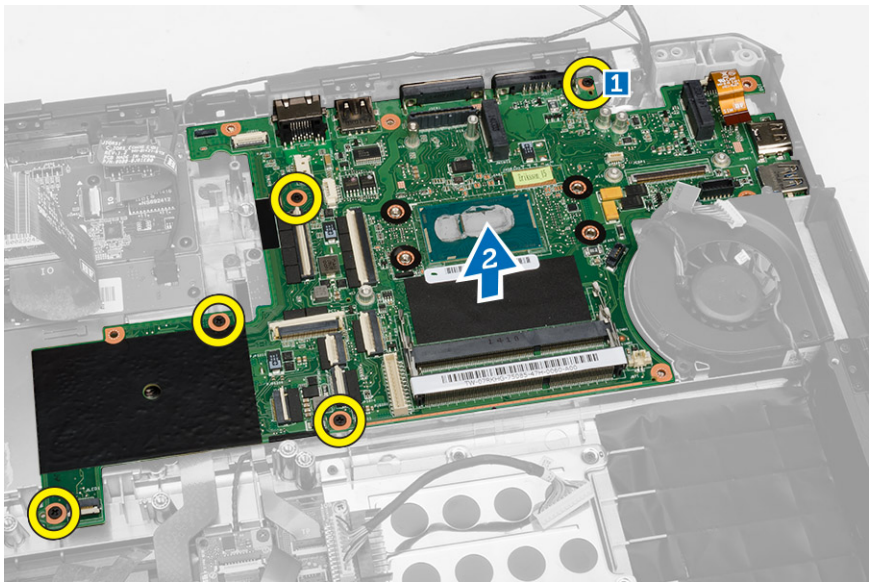
1 Follow the procedures in Before Working Inside Your Computer
2 Remove:
   a Battery
   b Hard Drive
   c Optical Drive
   d Bottom Cover
   e GPS Holder
   f WLAN Card
   g WWAN Card
3 Perform the following steps as shown in the illustration:
   a Lift the locking tab [1].
   b Disconnect the system board connector cable [2].



4 Perform the following steps as shown in the illustration:
   a Unlock the latch door[1].
   b Push it downwards to open it [2].
   c Remove the screws that secure the system board.



5 Perform the following steps as shown in the illustration:
   a Remove the screws that secure the system board to the computer [1].
   b Lift the system board from the computer [2].



Installing the System Board

1 Place the system board on the computer.
2 Tighten the screws that secure the system board to the computer.
3 Connect the system board cable to the computer
4 Tighten the screws that secure the connector to the computer chassis.
5 Install:
   a Bottom Cover
   b Optical Drive
   c Hard Drive
   d WLAN Card
   e WWAN Card
   f I/O Board
   g Battery
6 Follow the procedures in After Working Inside Your computer

3

System Setup

System Setup enables you to manage your computer hardware and specify BIOS-level options. From the System Setup, you can:

- Change the NVRAM settings after you add or remove hardware
- View the system hardware configuration
- Enable or disable integrated devices
- Set performance and power management thresholds
- Manage your computer security

Topics:

Boot Sequence

Boot Sequence allows you to bypass the System Setup-defined boot device order and boot directly to a specific device (for example: optical drive or hard drive). During the Power-on Self Test (POST), when the Dell logo appears, you can:

- Access System Setup by pressing <F2> key
- Bring up the one-time boot menu by pressing <F12> key

The one-time boot menu displays the devices that you can boot from including the diagnostic option. The boot-menu options are:

- Removable Drive (if available)
- STXXXX Drive

  NOTE: XXX denotes the SATA drive number.
- Optical Drive
- Diagnostics

  NOTE: Choosing Diagnostics, will display the ePSA diagnostics screen.

The boot sequence screen also displays the option to access the System Setup screen.

Navigation Keys

The following table displays the system setup navigation keys.

NOTE: For most of the system setup options, changes that you make are recorded but do not take effect until you re-start the system.

Table 1. Navigation Keys

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
<Enter>	Allows you to select a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
<Tab>	Moves to the next focus area. **NOTE: For the standard graphics browser only.**
<Esc>	Moves to the previous page till you view the main screen. Pressing <Esc> in the main screen displays a message that prompts you to save any unsaved changes and restarts the system.
<F1>	Displays the System Setup help file.

System Setup Options

NOTE: Depending on the computer and its installed devices, the items listed in this section may or may not appear.

Table 2. General

Option	Description	
System Information	This section lists the primary hardware features of your computer. • System Information: Displays BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date, and the Express Service Code. • Memory Information: Displays Memory Installed, Memory Available, Memory Speed, Memory Channels Mode, Memory Technology, DIMM ASize, DIMM B Size, • Processor Information: Displays Processor Type, Core Count, Processor ID, Current Clock Speed, Minimum Clock Speed, Maximum Clock Speed, Processor L2 Cache, Processor L3 Cache, HT Capable, and 64-Bit Technology. • Device Information: Displays Primary Hard Drive, MiniCard Device, ODD Device, Dock eSATA Device, LOM MAC Address, Video Controller, Video BIOS Version, Video Memory, Panel Type, Native Resolution, Audio Controller, Wi-Fi Device, WiGig Device, Cellular Device, Bluetooth Device.	
Battery Information	Displays the battery status and the type of AC adapter connected to the computer	
Boot Sequence	Boot Sequence	Allows you to change the order in which the computer attempts to find an operating system. The options are: • Diskette Drive • Internal HDD • USB Storage Device • CD/DVD/CD-RW Drive • Onboard NIC By default, all the options are checked. You can also deselect any option or change the boot order.
	Boot List Option	Allows you to change the boot list option. • Legacy **(Enabled)** • UEFI

Option	Description
Advanced Boot Options	This option allows you the legacy option ROMs to load. By default, the **Enable Legacy Option ROMs** is checked.
Date/Time	Allows you to change the date and time.

Table 3. System Configuration

Option	Description
Integrated NIC	Allows you to configure the integrated network controller. The options are: • Enable UEFI Network Stack • Disabled • Enabled • Enabled w/PXE: This option is enabled by default.
Onboard Unmanaged NIC	This option controls the on-board USB LAN controller. This option is enabled by default.
Parallel Port	Allows you to configure the parallel port on the docking station. The options are: • Disabled • AT: This option is enabled by default. • PS2 • ECP
Serial Port 1	Allows you to configure the integrated serial port. The options are: • Disabled • COM1: This option is enabled by default. • COM3
Serial Port 2	Allows you to configure the integrated serial port. The options are: • Disabled • COM2: This option is enabled by default. • COM4
SATA Operation	Allows you to configure the internal SATA hard-drive controller. The options are: • Disabled • AHCI • RAID On: This option is enabled by default.
Drives	Allows you to configure the SATA drives on board. All drives are enabled by default. The options are: • SATA-0 • SATA-1 • SATA-2 • SATA-3
SMART Reporting	This field controls whether hard drive errors for integrated drives are reported during system startup. This technology is part of the SMART (Self Monitoring Analysis and Reporting Technology) specification. This option is disabled by default. • Enable SMART Reporting

Option	Description
USB Configuration	This field configures the integrated USB controller. If Boot Support is enabled, the system is allowed to boot any type of USB Mass Storage Devices (HDD, memory key, floppy). If USB port is enabled, device attached to this port is enabled and available for OS. If USB port is disabled, the OS cannot see any device attached to this port. • Enable USB Boot Support • Enable External USB Ports • Enable USB3.0 Controller • Disable Docking Station Devices except video **NOTE: USB keyboard and mouse always work in the BIOS setup irrespective of these settings.**
USB PowerShare	This option configures the USB PowerShare feature behavior. This option is unchecked by default.
Audio	This field enables or disables the integrated audio controller. By default, the **Enable Audio** option is selected.
Keyboard Illumination	This field lets you choose the operating mode of the keyboard illumination feature. The keyboard brightness level can be set from 25% to 100% • Disabled: This option is enabled by default • Level is 25% • Level is 50% • Level is 75% • Level is 100%
Keyboard Backlight with AC	This option support the various illumination level. This option is enabled by default.
RGB Keyboard Backlight	This option configures the RGB keyboard backlight feature. There are six available colors: four preset colors (white, red, green, and blue) and two user configurable colors.
Touchscreen	This field controls whether the touchscreen is enabled or disabled. This option is enabled by default.
Stealth Mode Control	This field is used to enable or disable the stealth mode. This option is enabled by default. On entering stealth mode, the actions checked below are to be taken: • Disable onboard LEDs. This option is enabled by default. • Disable onboard LCD screen. This option is enabled by default. • Disable onboard speakers*. This option is enabled by default. • Disable onboard fans*. This option is enabled by default. • Disable Bluetooth radio* • Disable GPS receiver* • Disable WLAN radio* • Disable WiGig radio* • Disable WWAN radio*
Miscellaneous Devices	Allows you to enable or disable the following devices: • Enable Microphone • Enable Camera • Enable Express card • Enable Hard Drive Free Fall Protection • Enable Dedicated GPS Radio

Option	Description
	NOTE: All devices are enabled by default. You can also enable or disable Media Card.

Table 4. Video

Option	Description
LCD Brightness	Allows you to set the display brightness depending up on the power source (On Battery and On AC).

NOTE: The Video setting will only be visible when a video card is installed into the system.

Table 5. Security

Option	Description
Admin Password	Allows you to set, change, or delete the administrator (admin) password. **NOTE: You must set the admin password before you set the system or hard drive password. Deleting the admin password automatically deletes the system password and the hard drive password.** **NOTE: Successful password changes take effect immediately.** Default Setting: Not set
System Password	Allows you to set, change or delete the system password. **NOTE: Successful password changes take effect immediately.** Default Setting: Not set
Internal HDD-1 Password	Allows you to set or change the system's internal hard-disk drive. **NOTE: Successful password changes take effect immediately.** Default Setting: Not set
Strong Password	Allows you to enforce the option to always set strong passwords. Default Setting: Enable Strong Password is not selected. **NOTE: If Strong Password is enabled, Admin and System passwords must contain at least one uppercase character, one lowercase character and be at least 8 characters long.**
Password Configuration	Allows you to determine the minimum and maximum length of Administrator and System passwords.
Password Bypass	Allows you to enable or disable the permission to bypass the System and the Internal HDD password, when they are set. The options are: • Disabled • Reboot bypass Default Setting: Disabled

Option	Description
Password Change	Allows you to enable the disable permission to the System and Hard Drive passwords when the admin password is set. Default Setting: Allow Non-Admin Password Changes is selected
Non-Admin Setup Changes	Allows you to determine whether changes to the setup options are allowed when an Administrator Password is set. If disabled the setup options are locked by the admin password.
TPM Security	Allows you to enable the Trusted Platform Module (TPM) during POST. Default Setting: The option is disabled.
Computrace	Allows you to activate or disable the optional Computrace software The options are: • Deactivate • Disable • Activate **NOTE: The Activate and Disable options will permanently activate or disable the feature and no further changes will be allowed** Deactivate (default)
CPU XD Support	Allows you to enable the Execute Disable mode of the processor. Enable CPU XD Support (default)
OROM Keyboard Access	Allows you to set an option to enter the Option ROM Configuration screens using hotkeys during boot. The options are: • Enable • One Time Enable • Disable Default Setting: Enable
Admin Setup Lockout	Allows you to prevent users from entering Setup when an Administrator password is set. Default Setting: Enable Admin Setup Lockout is not selected.

Table 6. Secure Boot

Option	Description
Secure Boot Enable	This option enables or disables the Secure Boot Feature. • Disable (default) • Enable
Expert Key Management	Allows you to manipulate the security key databases only if the system is in Custom Mode. The **Enable Custom Mode** option is disabled by default. The options are: • PK • KEK • db • dbx If you enable the **Custom Mode**, the relevant options for **PK, KEK, db, and dbx** appear. The options are: • **Save to File**- Saves the key to a user-selected file

Option	Description
	• **Replace from File**- Replaces the current key with a key from a user-selected file • **Append from File**- Adds a key to the current database from a user-selected file • **Delete**- Deletes the selected key • **Reset All Keys**- Resets to default setting • **Delete All Key**s- Deletes all the keys **NOTE: If you disable the Custom Mode, all the changes made will be erased and the keys will restore to default settings.**

Table 7. Performance

Option	Description
Multi Core Support	This field specifies whether the process will have one or all cores enabled. The performance of some applications will improve with the additional cores. This option is enabled by default.Allows you to enable or disable multi-core support for the processor. The options are: • All • 1 • 2 Default Setting: All
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep feature. Default Setting: Enable Intel SpeedStep
C States Control	Allows you to enable or disable the additional processor sleep states. Default Setting: The option C states is enabled.
Intel TurboBoost	Allows you to enable or disable the Intel TurboBoost mode of the processor. Default Setting: Enable Intel TurboBoost
Hyper-Thread Control	Allows you to enable or disable the HyperThreading in the processor. Default Setting: Enabled

Table 8. Power Management

Option	Description
AC Behavior	Allows you to enable or disable the computer from turning on automatically when an AC adapter is connected. Default Setting: Wake on AC is not selected.
Auto On Time	Allows you to set the time at which the computer must turn on automatically. The options are: • Disabled **(default)** • Every Day • Weekdays • Select Days
USB Wake Support	Allows you to enable USB devices to wake the system from Standby.

Option	Description
	NOTE: This feature is only functional when the AC power adapter is connected. If the AC power adapter is removed during Standby, the system setup will remove power from all of the USB ports to conserve battery power. • Enable USB Wake Support
Wireless Radio Control	Allows you to enable or disable the feature that automatically switches from wired or wireless networks without depending on the physical connection. • Control WLAN Radio • Control WWAN Radio
Wake on LAN/WLAN	Allows you to enable or disable the feature that powers on the computer from the Off state when triggered by a LAN signal. • Disabled: This option is enabled by default • LAN Only • WLAN Only • LAN or WLAN • LAN with PXE Boot
Block Sleep	This option lets you block entering to sleep (S3 state) in Operating System environment. Block Sleep (S3 state) - This option is disabled by default.
Peak Shift	This option enables you to minimize the AC power consumption during the peak power times of day. After you enable this option, your system runs only in battery even if the AC is attached.
Advanced Battery Charge Configuration	This option enables you to maximize the battery health. By enabling this option, your system uses the standard charging algorithm and other techniques, during the non-work hours to improve the battery health. Disabled (default)
Primary Battery Charge Configuration	Allows you to select the charging mode for the battery. The options are: • Adaptive • Standard • ExpressCharge: This option is enabled by default. • Primarily AC use • Custom If Custom Charge is selected, you can also configure Custom Charge Start and Custom Charge Stop. **NOTE: All charging mode may not be available for all the batteries. To enable this option, disable the Advanced Battery Charge Configuration option.**
Intel Smart Connect Technology	This option, if enabled, periodically senses the nearby wireless connections, while the system is in sleep state. You can use this option to synchronize the email or other social media application that are open, when the system enters the sleep state.

Table 9. POST Behavior

Option	Description
Adapter Warnings	Allows you to enable or disable the system setup (BIOS) warning messages when you use certain power adapters.

Option	Description
	Default Setting: Enable Adapter Warnings
Keypad (Embedded)	Allows you to choose one of two methods to enable the keypad that is embedded in the internal keyboard. • Fn Key Only: This option is enabled by default. • By Numlock **NOTE: The Keyboard (Embedded) option is not supported in Latitude E5540**
Mouse/Touchpad	Allows you to define how the system handles mouse and touch pad input. The options are: • Serial Mouse • PS2 Mouse • Toushpad/PS-2 Mouse: This option is enabled by default.
Numlock Enable	Allows you to enable the Numlock option when the computer boots. Enable Network (default)
Fn Key Emulation	Allows you to set the option where the <Scroll Lock> key is used to simulate the <Fn> key feature. Enable Fn Key Emulation (default)
Fn Lock Options	Allows you hot key combition <Fn>+<Esc> toggle the primary behavious f F1–F12, between their standard and secondary function. The options are: • Fn Lock • Lock Mode Enabled/Standard(default) • Lock Mode Disabled/Secondary
Mebx Hotkey	Allows you to specify whether the MEBx Hotkey function should be enabled when the system boots Enable MEBx Hotkey (default)
Fastboot	Allows you to speed up the boot process by bypassing some of the compatibility steps. The options are: • Minimal • Thorough (default) • Auto
Extended BIOS POST Time	Allows you to create an additional pre-boot delay. The options are : 0 seconds, 5 seconds (default), and 10 seconds.

Table 10. Virtualization Support

Option	Description
Virtualization	Allows you to enable or disable the Intel Virtualization Technology. Enable Intel Virtualization Technology (default)
VT for Direct I/O	Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by Intel® Virtualization technology for direct I/O. Enable VT for Direct I/O — enabled by default.

Option	Description
Trusted Execution	This option specifies whether a Measured Virtual Machine Monitor (MVMM) can utilize the additional hardware capabilities provided by Intel Trusted Execution Technology. The TPM virtualization Technology, and Virtualization technology for direct I/O must be enabled to use this feature. Trusted Execution — disabled by default.

Table 11. Wireless

Option	Description
Wireless Switch	Allows to set the wireless devices that can be controlled by the wireless switch. The options are: • WWAN • WLAN • WiGig • Bluetooth All the options are enabled by default.
Wireless Device Enable	Allows you to enable or disable the internal wireless devices. • WWAN • WLAN/WiGig • Bluetooth All options are enabled by default.

Table 12. Maintenance

Option	Description
Service Tag	Displays the Service Tag of your computer.
Asset Tag	Allows you to create a system asset tag if an asset tag is not already set. This option is not set by default.

Table 13. System Logs

Option	Description
BIOS Events	Allows you to view and clear the System Setup (BIOS) POST events.
Thermal Events	Allows you to view and clear the System Setup (Thermal) events.
Power Events	Allows you to view and clear the System Setup (Power) events.

Updating the BIOS

It is recommended to update your BIOS (system setup), on replacing the system board or if an update is available. For laptops, ensure that your computer battery is fully charged and connected to a power outlet

1 Re-start the computer.
2 Go to **dell.com/support**.
3 Enter the **Service Tag** or **Express Service Code** and click **Submit**.

NOTE: To locate the Service Tag, click Where is my Service Tag?

NOTE: If you cannot find your Service Tag, click Detect My Product. Proceed with the instructions on screen.

4 If you are unable to locate or find the Service Tag, click the Product Category of your computer.

5 Choose the **Product Type** from the list.

6 Select your computer model and the **Product Support** page of your computer appears.

7 Click **Get drivers** and click **View All Drivers**.

The Drivers and Downloads page opens.

8 On the Drivers and Downloads screen, under the **Operating System** drop-down list, select **BIOS**.

9 Identify the latest BIOS file and click **Download File**.

You can also analyze which drivers need an update. To do this for your product, click **Analyze System for Updates** and follow the instructions on the screen.

10 Select your preferred download method in the **Please select your download method below** window, click **Download File**.

The **File Download** window appears.

11 Click **Save** to save the file on your computer.

12 Click **Run** to install the updated BIOS settings on your computer.

Follow the instructions on the screen.

System and Setup Password

You can create a system password and a setup password to secure your computer.

Password Type	Description
System password	Password that you must enter to log on to your system.
Setup password	Password that you must enter to access and make changes to the BIOS settings of your computer.

CAUTION: The password features provide a basic level of security for the data on your computer.

CAUTION: Anyone can access the data stored on your computer if it is not locked and left unattended.

NOTE: Your computer is shipped with the system and setup password feature disabled.

Assigning a System Password and Setup Password

You can assign a new **System Password** and/or **Setup Password** or change an existing **System Password** and/or **Setup Password** only when **Password Status** is **Unlocked**. If the Password Status is **Locked**, you cannot change the System Password.

NOTE: If the password jumper is disabled, the existing System Password and Setup Password are deleted and you need not provide the system password to log on to the computer.

To enter a system setup, press <F2> immediately after a power-on or re-boot.

1 In the **System BIOS** or **System Setup** screen, select **System Security** and press <Enter>.

The **System Security** screen appears.

2 In the **System Security** screen, verify that **Password Status** is **Unlocked**.

3 Select **System Password** , enter your system password, and press <Enter> or <Tab>.

Use the following guidelines to assign the system password:

- A password can have up to 32 characters.
- The password can contain the numbers 0 through 9.
- Only lower case letters are valid, upper case letters are not allowed.

- Only the following special characters are allowed: space, ("), (+), (,), (-), (.), (/), (;), ([), (\), (]), (`).

Re-enter the system password when prompted.

4 Type the system password that you entered earlier and click **OK**.

5 Select **Setup Password**, type your system password and press <Enter> or <Tab>.

A message prompts you to re-type the setup password.

6 Type the setup password that you entered earlier and click **OK**.

7 Press <Esc> and a message prompts you to save the changes.

8 Press <Y> to save the changes.

The computer reboots.

Deleting or Changing an Existing System and/or Setup Password

Ensure that the **Password Status** is Unlocked (in the System Setup) before attempting to delete or change the existing System and/or Setup password. You cannot delete or change an existing System or Setup password, if the **Password Status** is Locked.
To enter the System Setup, press <F2> immediately after a power-on or reboot.

1 In the **System BIOS** or **System Setup** screen, select **System Security** and press <Enter>.

The **System Security** screen is displayed.

2 In the **System Security** screen, verify that **Password Status** is **Unlocked**.

3 Select **System Password**, alter or delete the existing system password and press <Enter> or <Tab>.

4 Select **Setup Password**, alter or delete the existing setup password and press <Enter> or <Tab>.

> **NOTE: If you change the System and/or Setup password, re-enter the new password when promoted. If you delete the System and/or Setup password, confirm the deletion when promoted.**

5 Press <Esc> and a message prompts you to save the changes.

6 Press <Y> to save the changes and exit from the System Setup.

The computer reboots.

4

Diagnostics

If you experience a problem with your computer, run the ePSA diagnostics before contacting Dell for technical assistance. The purpose of running diagnostics is to test your computer's hardware without requiring additional equipment or risking data loss. If you are unable to fix the problem yourself, service and support personnel can use the diagnostics results to help you solve the problem.

Topics:

Enhanced Pre-Boot System Assessment (ePSA) Diagnostics

The ePSA diagnostics (also known as system diagnostics) performs a complete check of your hardware. The ePSA is embedded with the BIOS and is launched by the BIOS internally. The embedded system diagnostics provides a set of options for particular devices or device groups allowing you to:

- Run tests automatically or in an interactive mode
- Repeat tests
- Display or save test results
- Run thorough tests to introduce additional test options to provide extra information about the failed device(s)
- View status messages that inform you if tests are completed successfully
- View error messages that inform you of problems encountered during testing

CAUTION: Use the system diagnostics to test only your computer. Using this program with other computers may cause invalid results or error messages.

NOTE: Some tests for specific devices require user interaction. Always ensure that you are present at the computer terminal when the diagnostic tests are performed.

1. Power-on the computer.
2. As the computer boots, press the <F12> key as the Dell logo appears.
3. On the boot menu screen, select the **Diagnostics** option.

   The **Enhanced Pre-boot System Assessment** window is displayed, listing all devices detected in the computer. The diagnostics starts running the tests on all the detected devices.
4. If you wish to run a diagnostic test on a specific device, press <Esc> and click **Yes** to stop the diagnostic test.
5. Select the device from the left pane and click **Run Tests**.
6. If there are any issues, error codes are displayed.

   Note the error code and contact Dell.

Device Status Lights

Icon	Description
	Turns on when you turn on the computer and blinks when the computer is in a power management mode.
	Turns on when the computer reads or writes data.
	Turns on steadily or blinks to indicate battery charge status.
	Turns on when wireless networking is enabled.

Battery Status Lights

If the computer is connected to an electrical outlet, the battery light operates as follows:

Alternately blinking amber light and green light	An unauthenticated or unsupported non-Dell AC adapter is attached to your laptop.
Alternately blinking amber light with steady green light	Temporary battery failure with AC adapter present.
Constantly blinking amber light	Fatal battery failure with AC adapter present.
Light off	Battery in full charge mode with AC adapter present.
Green light on	Battery in charge mode with AC adapter present.

5

Specifications

NOTE: Offerings may vary by region. For more information regarding the configuration of your computer, click Start (Start icon) > Help and Support, and then select the option to view information about your computer.

Table 14. System Information

Feature	Specification
Chipset	Intel Mobile Express Series 6 chipset
DRAM bus width	64-bit
Flash EPROM	SPI 32 Mbits
PCIe Gen1 bus	100 MHz

Table 15. Processor

Feature	Specification
Types	• Intel Core i3 series • Intel Core i5 series • Intel Core i7 series
L3 cache	up to 4 MB
External bus frequency	1600 MHz

Table 16. Memory

Feature	Specification
Memory connector	two SODIMM slots
Memory capacity	4 GB, or 8 GB
Memory type	DDR3 SDRAM 1600 Mhz
Minimum memory	4 GB
Maximum memory	16 GB

Table 17. Audio

Feature	Specification
Type	four-channel high definition audio
Controller	Realtek ALC3226
Stereo conversion	24-bit (analog-to-digital and digital-to-analog)
Interface:	
Internal	HD audio

Feature	Specification
External	microphone-in/stereo headphones/external speakers connector
Speakers	one mono speaker
Internal speaker amplifier	2W (RMS)
Volume controls	Volume Up/Volume Down buttons

CAUTION: Excessive sound pressure from earphones or headphones can cause hearing damage or loss. Adjustment of the volume control as well as the equalizer to settings other than the center position may increase the earphone or headphones output voltage, and therefore the sound pressure level. The use of factors influencing the earphones or headphones output other than those specified by the manufacturers (e.g. operating system, equalizer software, firmware, driver etc.) may increase the earphones or headphones output voltage and therefore the sound pressure level. The use of earphones and headphones other than those specified by the manufacturer may lead to heightened sound pressure level.

Table 18. Video

Feature	Specification
Type	integrated on system board
Controller	
UMA	
Intel Core i3/i5	Intel HD Graphics 4400
Intel Core i7	Intel HD Graphics 5000
Discrete (Optional)	Nvidia GeForce (N14M-GE) Discrete Graphics Card, 2 GB Graphics

Table 19. Communications

Feature	Specification
Network adapter	10/100/1000 MB/s Ethernet (RJ-45)
Wireless	WLAN with Bluetooth 4.0 WWAN

Table 20. Ports and Connectors

Feature	Specification
Audio (optional)	one microphone/stereo headphone/speaker connector
Video	• one 15-pin VGA connector • one 19-pin HDMI connector
Network adapter	one RJ-45 connector (second optional)
USB 2.0	two 4-pin USB 2.0 compliant connector
USB 3.0	• one 9-pin USB 3.0 compliant connector • one 9-pin USB 3.0 compliant connector with PowerShare
Memory card reader	one SD card reader
Expansion card	• one ExpressCard reader • optional PCMCIA reader (replaces ExpressCard reader)

Feature	Specification
Serial	one DB9 serial connector (second optional)
Docking port	one
Subscriber Identity Module (SIM) port	one micro-SIM slot with security feature

Table 21. Display

Feature	Specification
Type	WLED display
Size	14.0 inches
Dimensions:	
Height	190.00 mm (7.48 inches)
Width	323.5 mm (12.59 inches)
Diagonal	375.2 mm (14.77 inches)
Active area (X/Y)	309.4 mm x 173.95 mm
Maximum resolution	1366 x 768 pixels
Operating angle	0° (closed) to 180°
Refresh rate	60 Hz
Minimum Viewing angles:	
Horizontal	• +/- 70° for HD
Vertical	• +/- 70° for HD
Pixel pitch	1875 mm

Table 22. Keyboard

Feature	Specification
Number of keys	84 keys: US English, Thai, French-Canadian, Korean, Russian, Hebrew, English-International
Layout	QWERTY/AZERTY/Kanji

Table 23. Touchpad

Feature	Specification
Active Area:	
X-axis	99.5 mm
Y-axis	53 mm

Table 24. Battery

Feature	Specification
Type	6–cell or 9–cell “smart” lithium ion
Dimensions:	
Height	21 mm (0.82 inches)
Width	166.9 mm (6.57 inches)
Depth	80 mm (3.14 inches)
Weight	6–cell : 365.5 g (0.80 lbs) ; 9–cell : 520 g (1.14 lbs)
Voltage	14.8 VDC
Life span	300 discharge/charge cycles
Temperature range:	
Operating	• Charging : 0 °C to 60 °C (32 °F to 140 °F) • Discharging: 0 °C to 70 °C (32 °F to 158 °F)
Non-Operating	-51 °C to 71 °C (-60 °F to 160 °F) **NOTE: The battery pack is capable of safely withstanding the above storage temperatures with 100% charge.** **NOTE: The battery pack is also capable of withstanding storage temperatures from –20 °C to +60 °C with no degradation in its performance.**
Coin-cell battery	3V CR2032 lithium coin cell

Table 25. AC Adapter

Type	65 W/90 W
Input voltage	100 VAC to 240 VAC
Input current (maximum)	1.5A / 1.7A
Input frequency	50 Hz to 60 Hz
Output power	65 W/90 W
Output current	3.34 A/4.62 A(continuous)
Rated output voltage	19.5 +/– 1.0 VDC
Temperature range:	
Operating	0 °C to 40 °C (32 °F to 104 °F)
Non-Operating	–40 °C to 70 °C (–40 °F to 158 °F)

Table 26. Auto-air Adapter

Type	90 W
Input voltage	11 VDC to 16 VDC
Input current (maximum)	9.0 A
Output power	90 W

Output current	4.86 A(continuous)
Rated output voltage	19.5 +/– 1.0 VDC
Temperature range:	
Operating	0 °C to 35 °C (32 °F to 95 °F)

Table 27. Physical

Feature	Specification
Height	44 mm (1.73 inches)
Width	347 mm (13.66 inches)
Depth	243 mm (9.57 inches)
Weight	6.5 lbs (2.95 kg)

Table 28. Environmental

Feature	Specification
Temperature:	
Operating	-29 °C to 63 °C (-20 °F to 140 °F)
Storage	-51 °C to 71 °C (-60 °F to 160 °F))
Relative humidity (maximum):	
Operating	10 % to 90 % (non condensing)
Storage	5 % to 95 % (non condensing)
Altitude (maximum):	
Operating	-15.24 m to 4572 (-50 ft to 15,000 ft)3048 (–50 ft to 10,000 ft ft)
Non-Operating	'-15.24 m to 4572 (-50 ft to 15,000 ft)
Airborne contaminant level	G1 as defined by ISA-71.04–1985

6

Contacting Dell

NOTE: If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

1 Go to **dell.com/support**.
2 Select your support category.
3 Verify your country or region in the **Choose a Country/Region** drop-down list at the bottom of the page.
4 Select the appropriate service or support link based on your need.