Dell™ Latitude™ E5410 Discrete Service Manual

Working on Your Computer
Adding and Replacing Parts
Specifications
Diagnostics
System Setup

Notes, Cautions, and Warnings

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

CAUTION: A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.

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

If you purchased a Dell™ n Series computer, any references in this document to Microsoft® Windows® operating systems are not applicable.

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Working on Your Computer

Dell™ Latitude™ E5410 Discrete Service Manual

- Before Working Inside Your Computer
- Recommended Tools
- Turning Off Your Computer
- After Working Inside Your Computer

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: 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) such as the optional Media Base or Battery Slice, 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.

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

7. Remove the main battery (see Removing the 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.
12. Remove the hard drive (see Removing the Hard Drive).

Recommended Tools

The procedures in this document may require the following tools:

- Small flat-blade screwdriver
- #0 Phillips screwdriver
- #1 Phillips screwdriver

- Small plastic scribe
- Flash BIOS update program CD

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® 7:**

     Click **Start** , then click **Shut Down**.

   - **In Windows Vista®:**

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

   - **In Windows® XP:**

   Click **Start** →**Turn Off Computer** →**Turn Off**.

   The computer turns off after the operating system shutdown process is complete.

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 four 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, battery slice, 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.

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Battery

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Removing the Battery

1. Follow the procedures in Before Working Inside Your Computer.
2. Slide the battery release latch into the unlocked position.

3. Remove the battery from the computer.

Replacing the Battery

To replace the battery, perform the above steps in reverse order.

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Adding and Replacing Parts

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- Battery
- Phone SIM
- Access Panel
- LED Cover
- WLAN Card
- Memory
- Coin-Cell Battery
- Hard Drive
- Optical Drive
- Keyboard
- Memory Card
- Fan
- Heat Sink
- Processor
- LED Board
- Display Assembly
- Display Bezel
- Display Panel, Bracket and Hinges
- Display Camera
- Palm Rest
- Fingerprint Reader
- WWAN Card
- Speakers
- Bluetooth Board
- System Board
- Modem Daughter Card

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Phone Subscriber Identity Module (SIM)

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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.

Removing the Phone SIM

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery.
3. Press in the SIM card and release.

3. Slide the SIM card out and remove.

Replacing the Phone SIM

To replace the phone SIM, perform the above steps in reverse order.

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Access Panel

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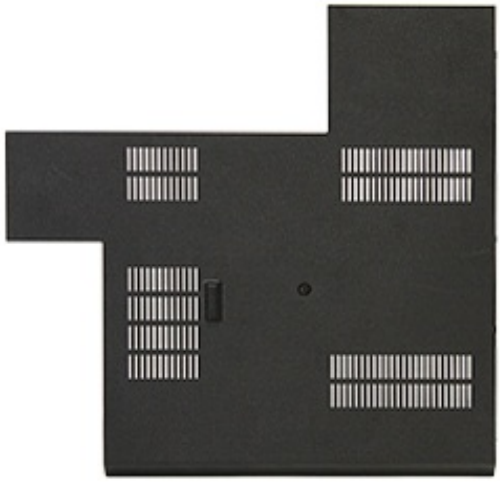
Removing the Access Panel



1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery.
3. Loosen the screw that secures the access panel to the computer.

4. Lift up the access panel at an angle and remove it from the computer.

Replacing the Access Panel

To replace the access panel, perform the above steps in reverse order.

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LED Cover

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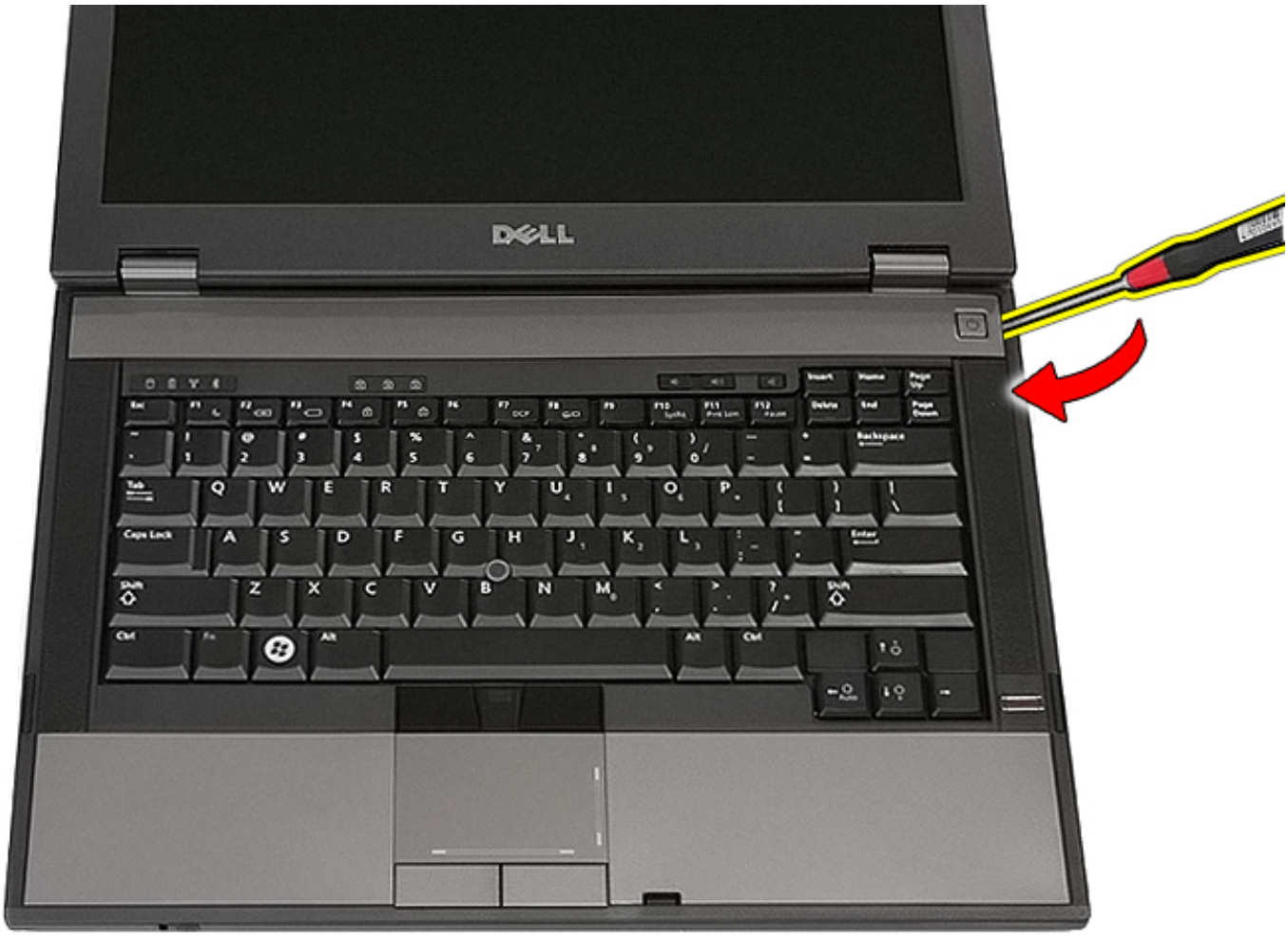
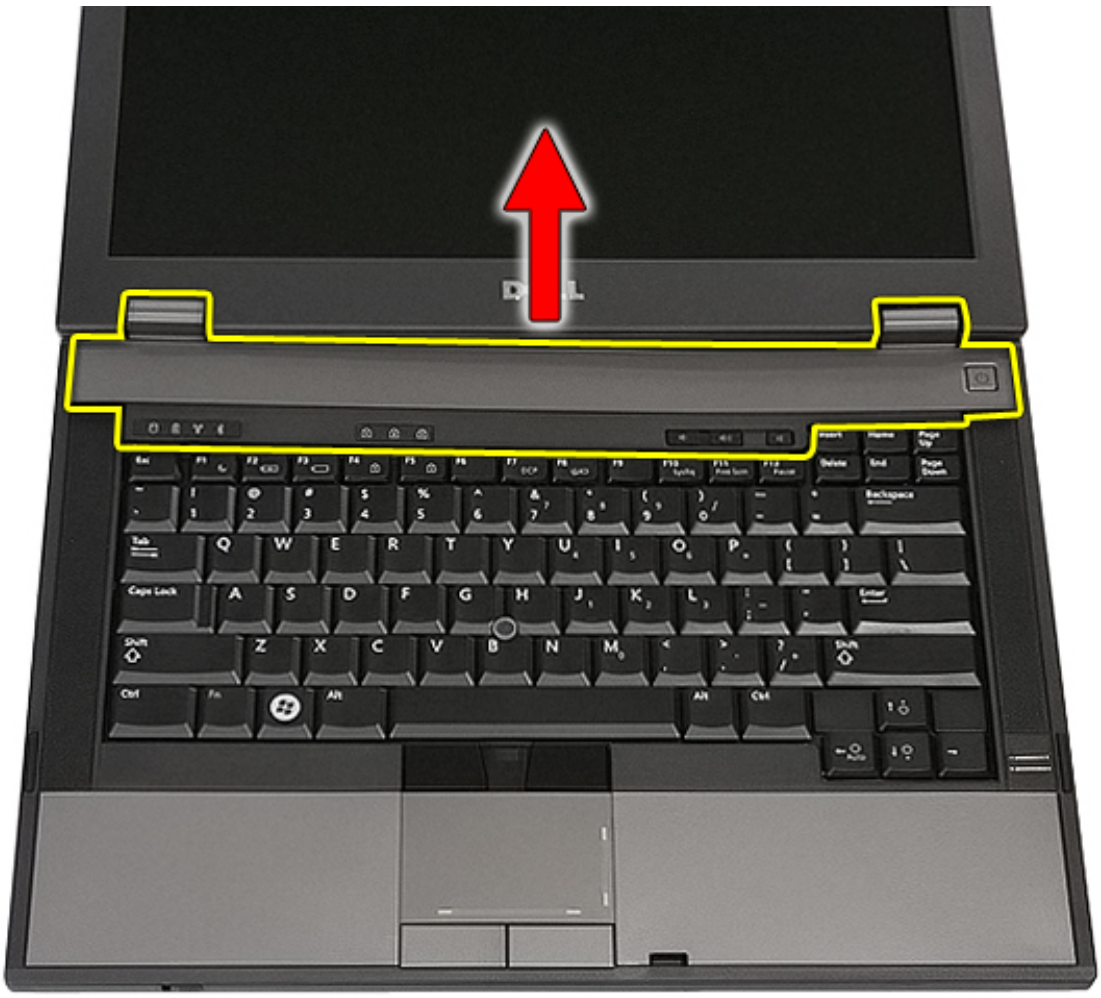
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Removing the LED Cover

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery.
3. Open the display at an 180 degree angle. On the right side of the computer, use a flat-bladed screwdriver or spudger (inserted into the notch) to pry up the LED cover.



4. Gently pry along the edge of the LED cover to release it from the latches and remove.



Replacing the LED Cover

To replace the LED cover, perform the above steps in reverse order.

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Wireless Local Area Network (WLAN) Card

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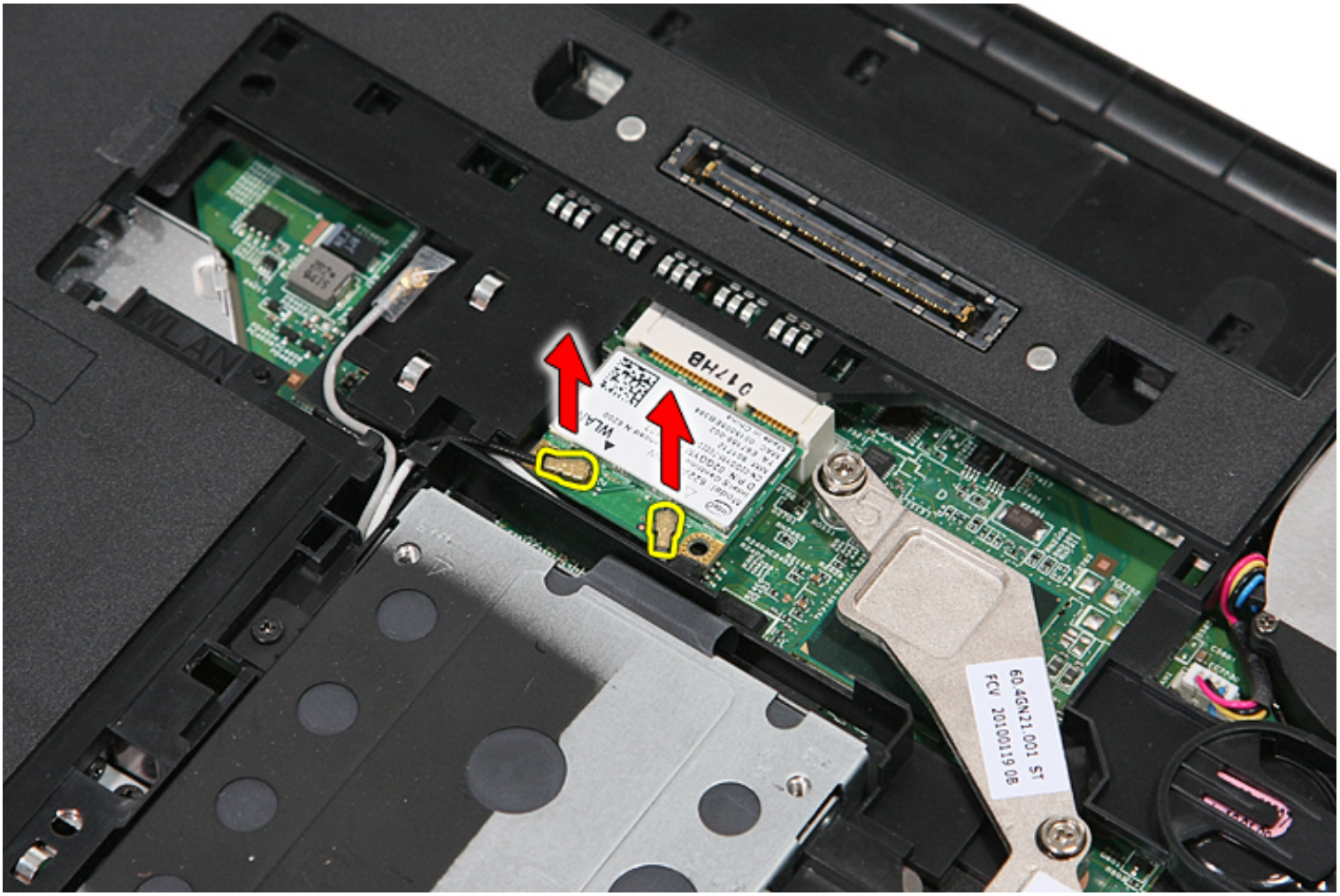
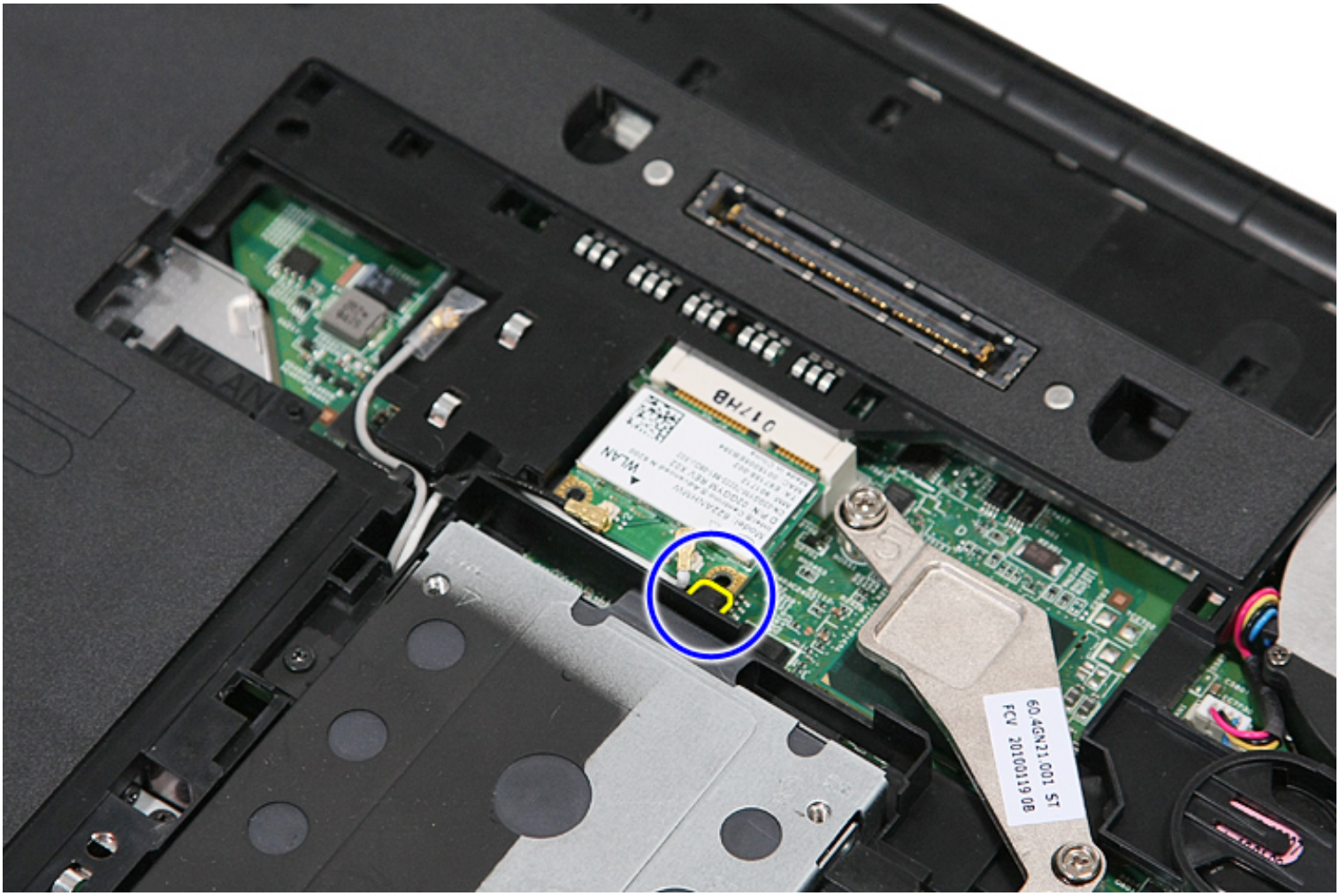
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Removing the WLAN Card

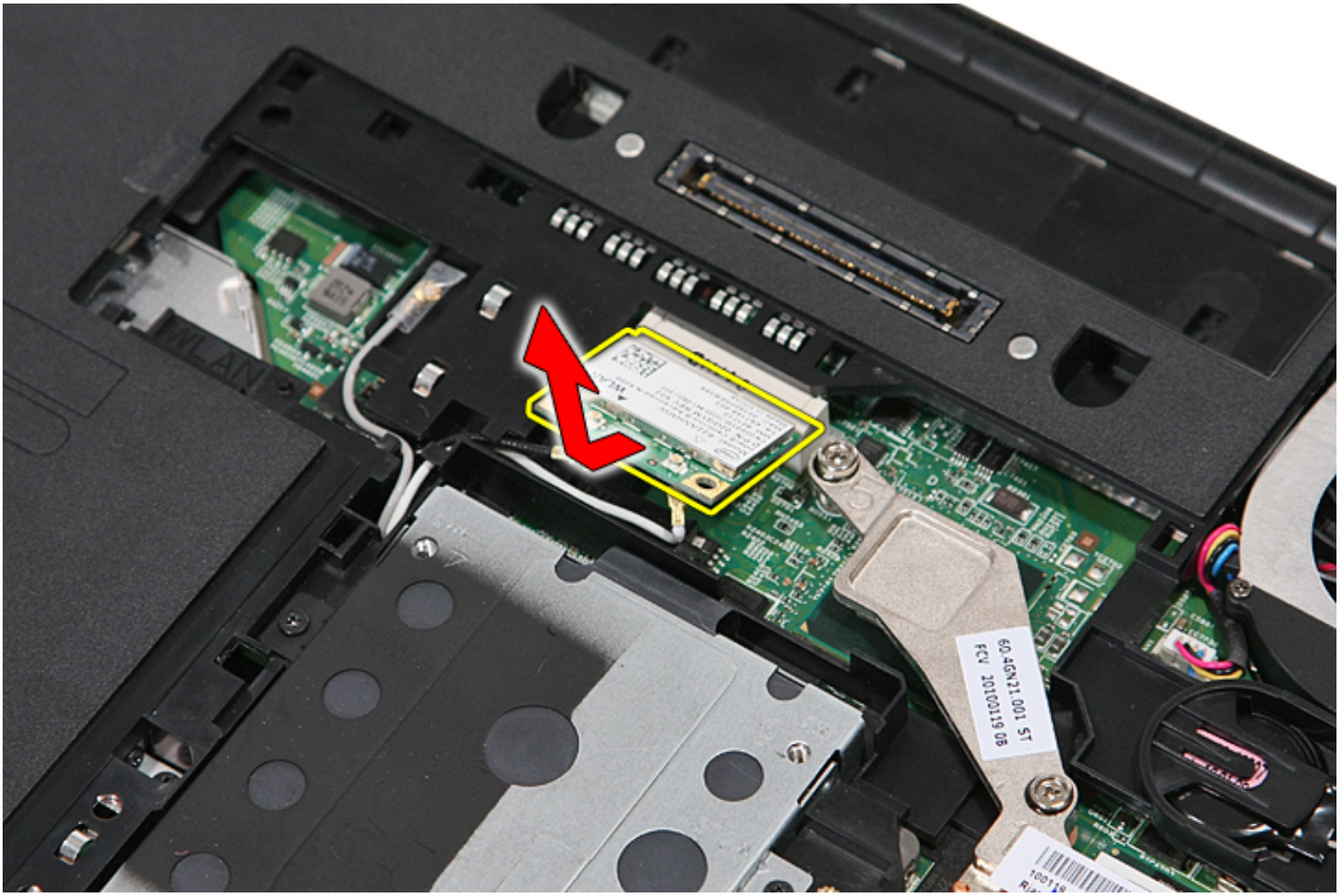
1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Disconnect the WLAN antenna cables from the WLAN card.



5. Gently pry the latch to release the WLAN card.



6. Remove the WLAN card from the computer.



Replacing the WLAN Card

To replace the WLAN card, perform the above steps in reverse order.

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Memory

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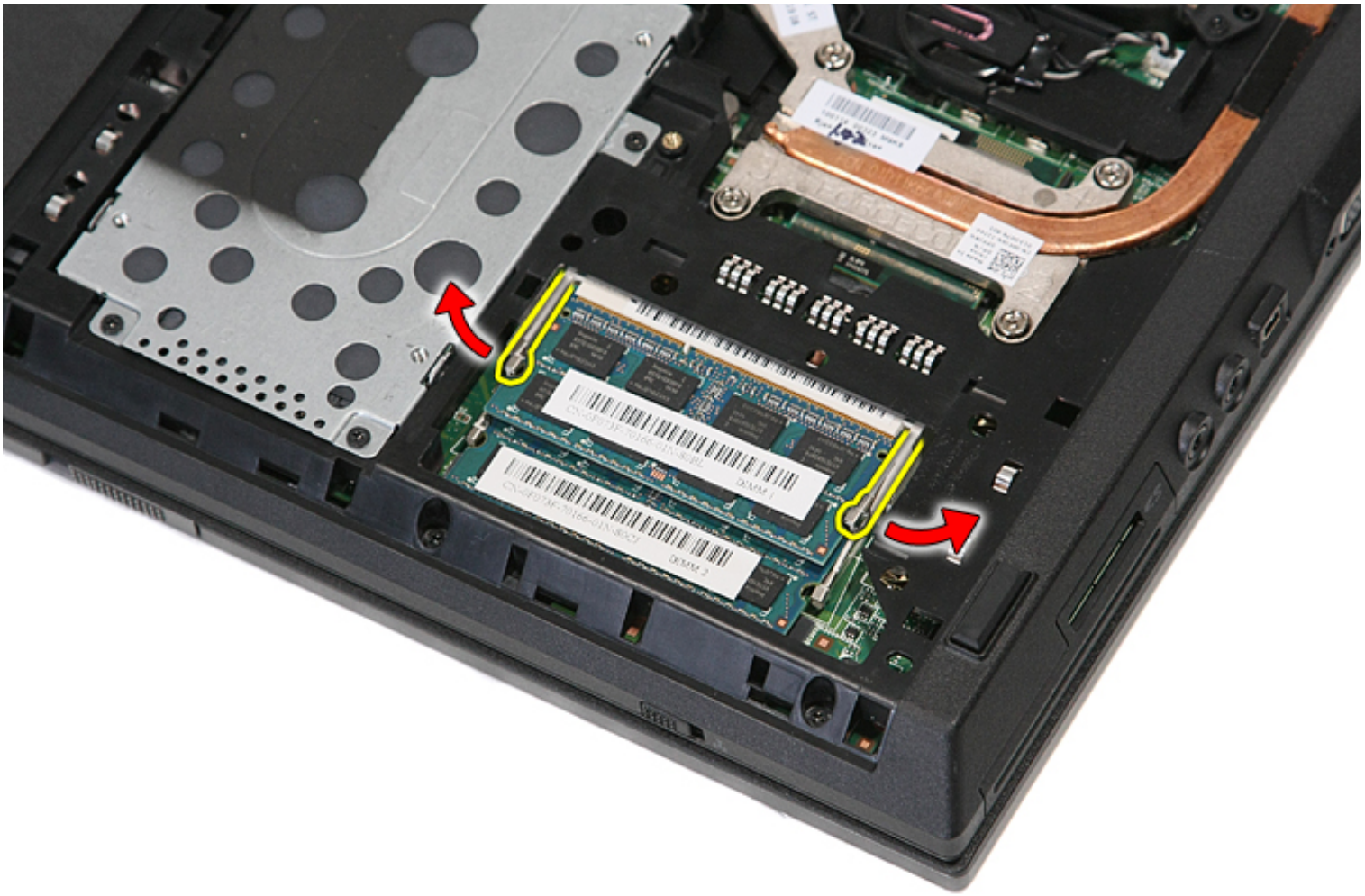
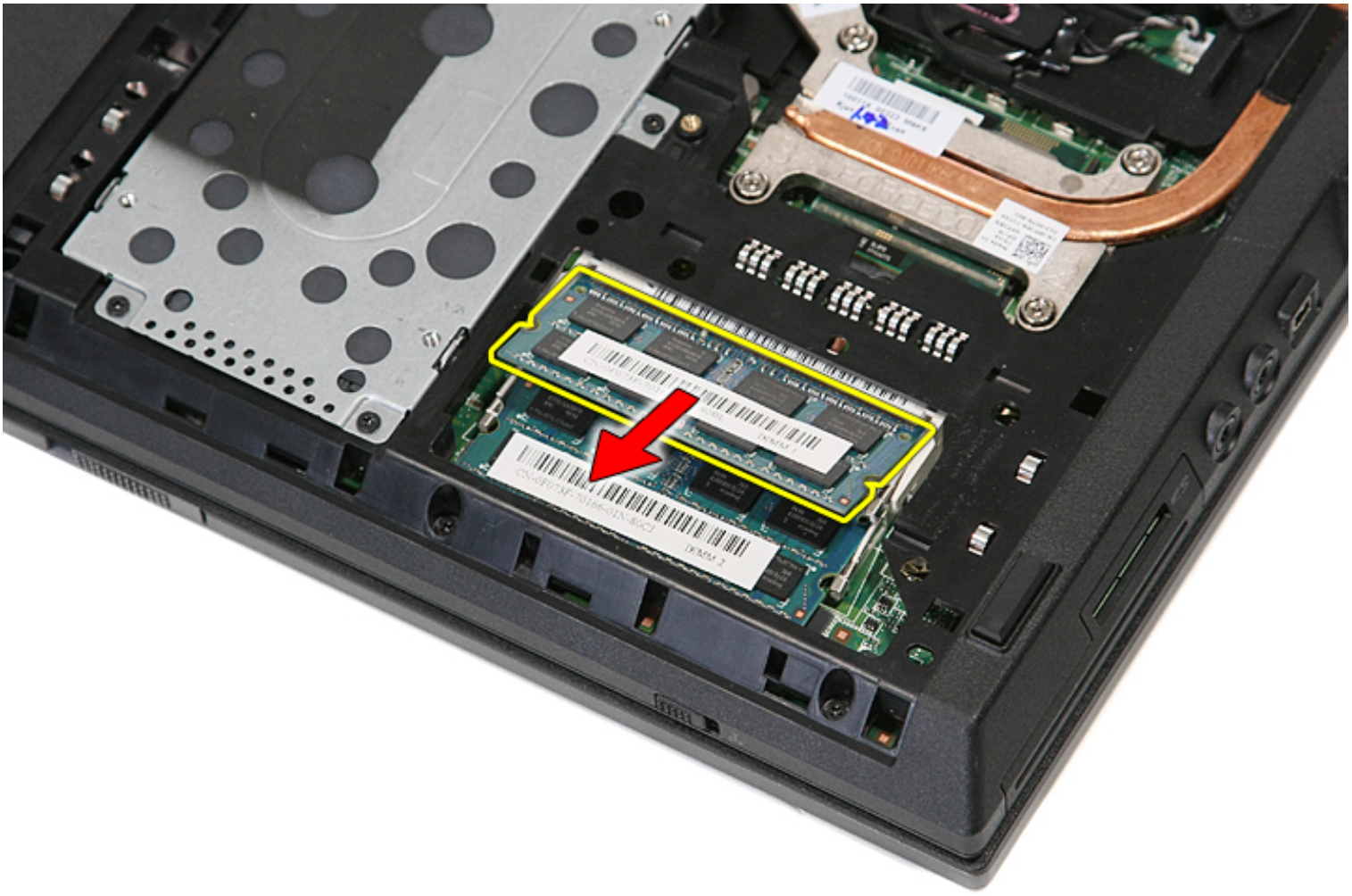
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Removing Memory Modules

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Gently pry the retention clips away from the memory module.



5. Remove the memory module from the computer.



Replacing the Memory Modules

To replace the memory modules, perform the above steps in reverse order.

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Coin-Cell Battery

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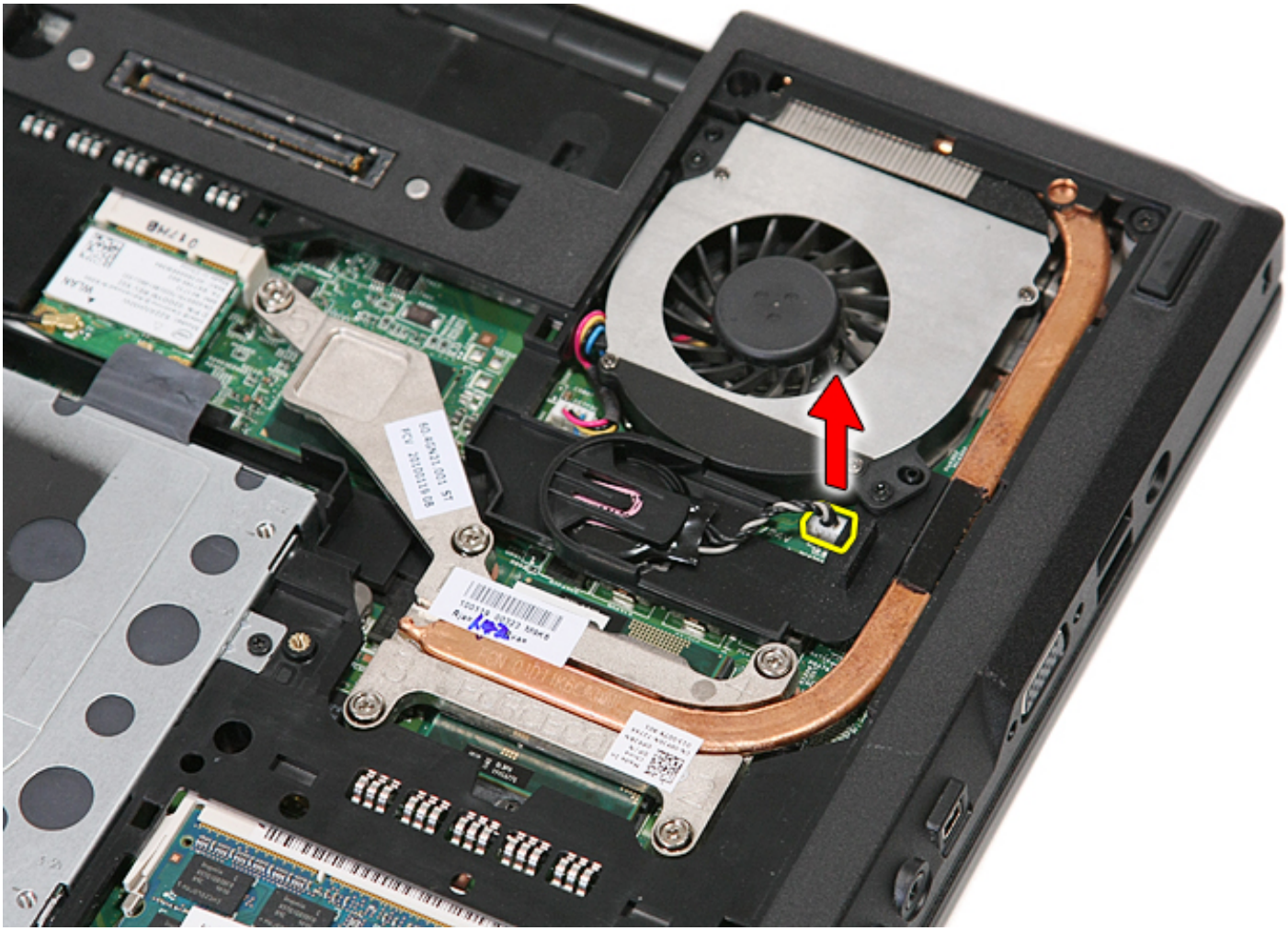
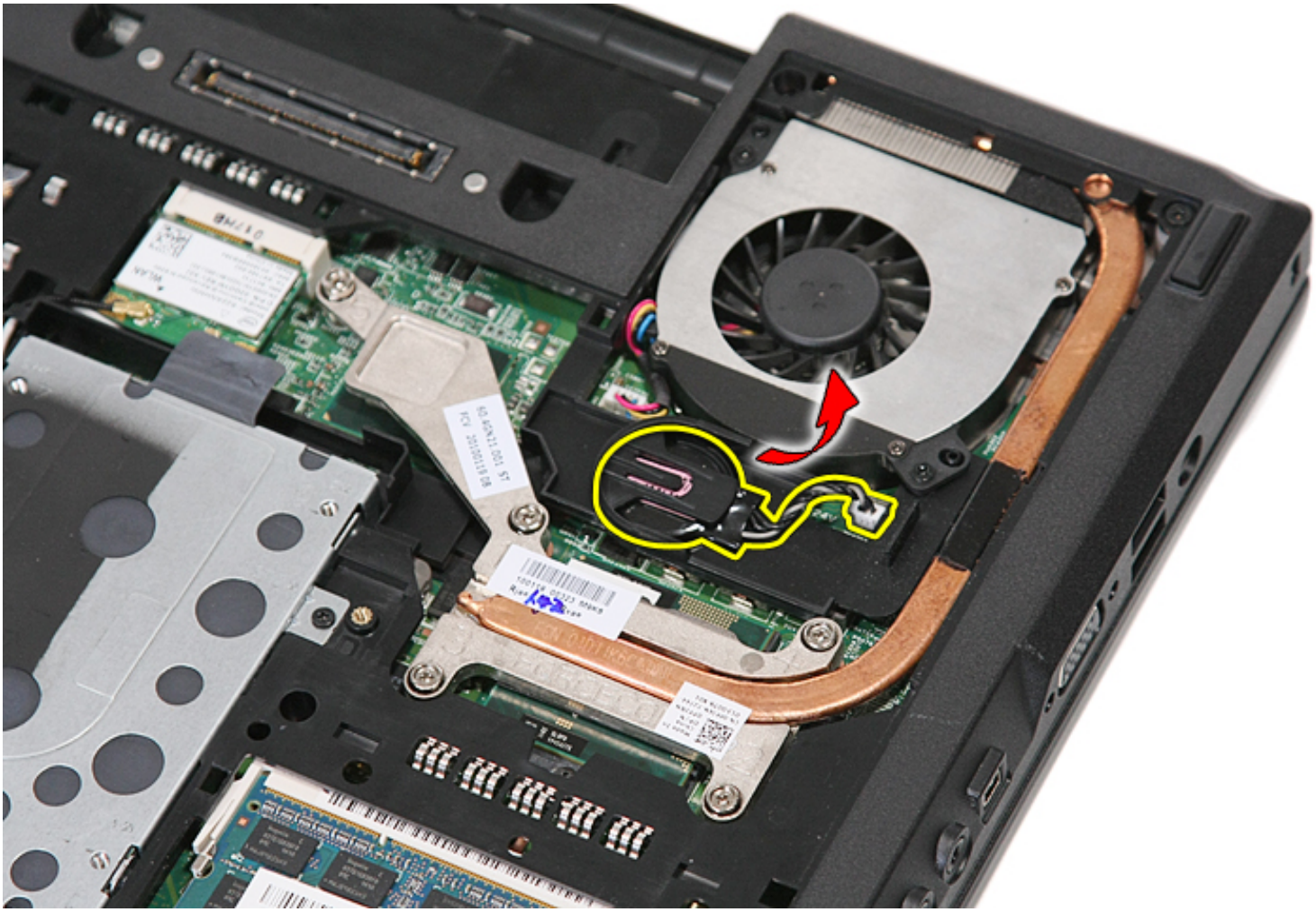
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Removing the Coin-Cell Battery

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Disconnect the coin-cell battery cable from the system board.



5. Slide the coin-cell battery from its socket.



Replacing the Coin-Cell Battery

To replace the coin-cell battery, perform the above steps in reverse order.

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Hard Drive

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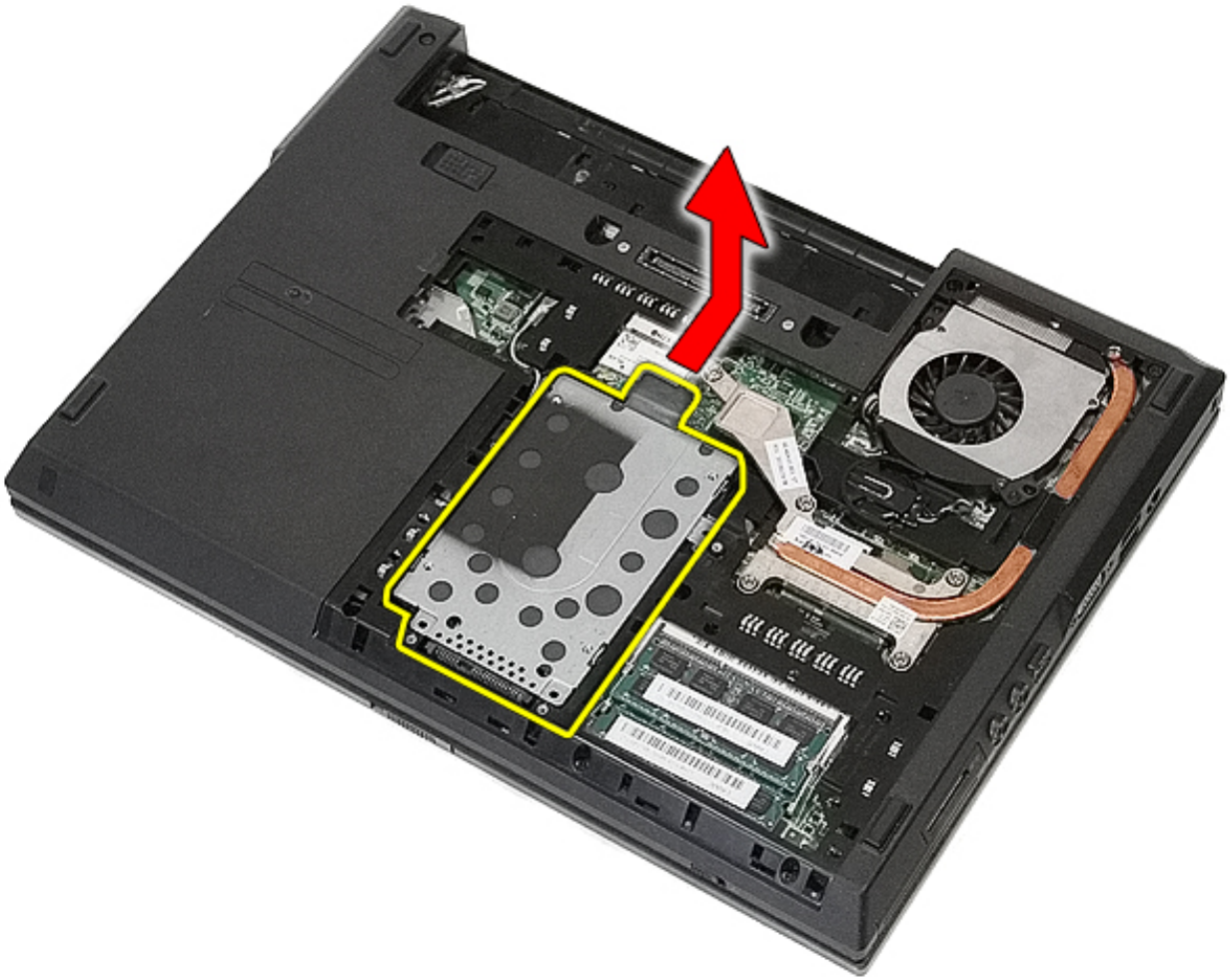
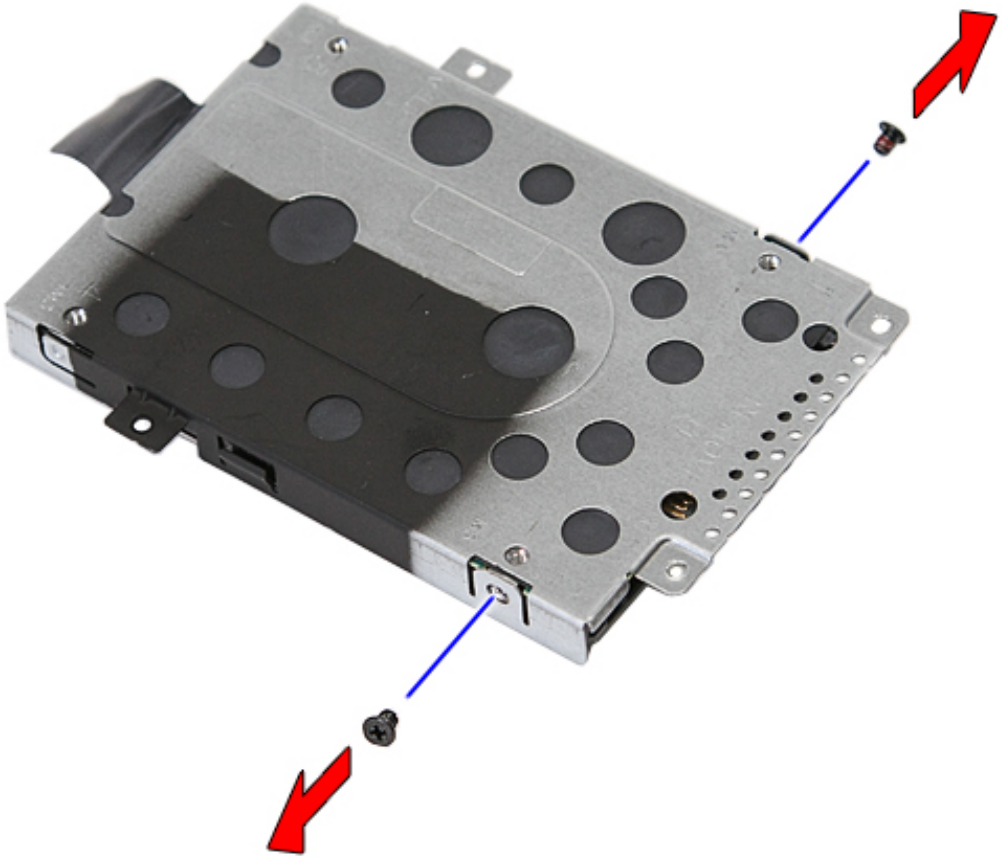
Removing the Hard Drive

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the screws that secure the hard drive to the computer.

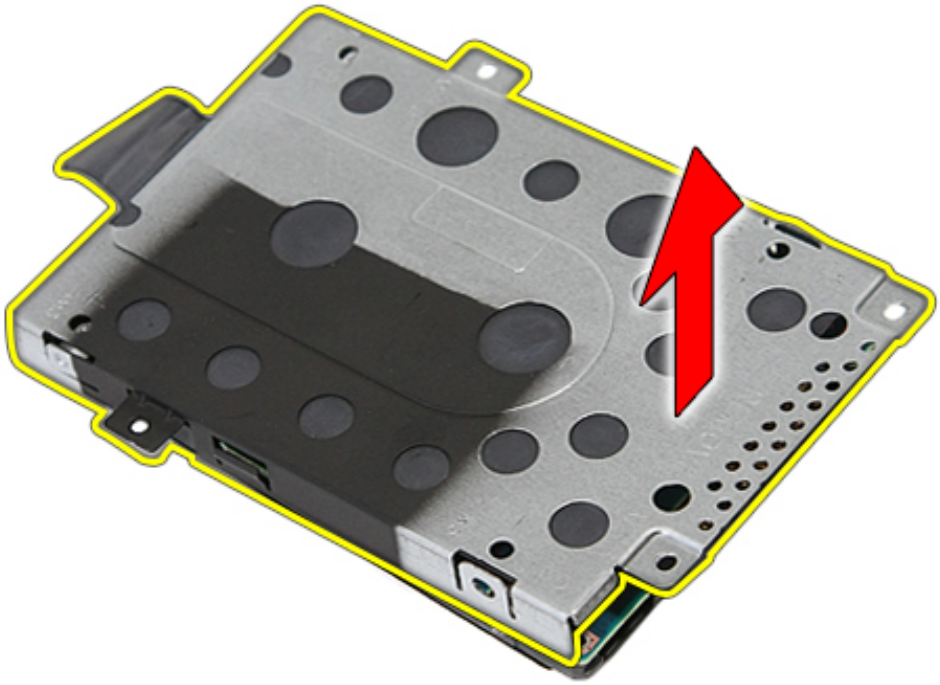
5. Slide the hard drive towards the center of the computer and remove.



6. Remove the screws securing the hard drive caddy to the hard drive.



7. Lift up the hard drive caddy at an angle from the hard drive and remove.



Replacing the Hard Drive

To replace the hard drive, perform the above steps in reverse order.

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Optical Drive

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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.

Removing the Optical Drive

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the optical drive retention screw from the computer.

4. Insert a plastic screwdriver into the retention screw slot, and carefully disengage and remove the optical drive from the computer.

Replacing the Optical Drive

To replace the optical drive, perform the above steps in reverse order.

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Keyboard

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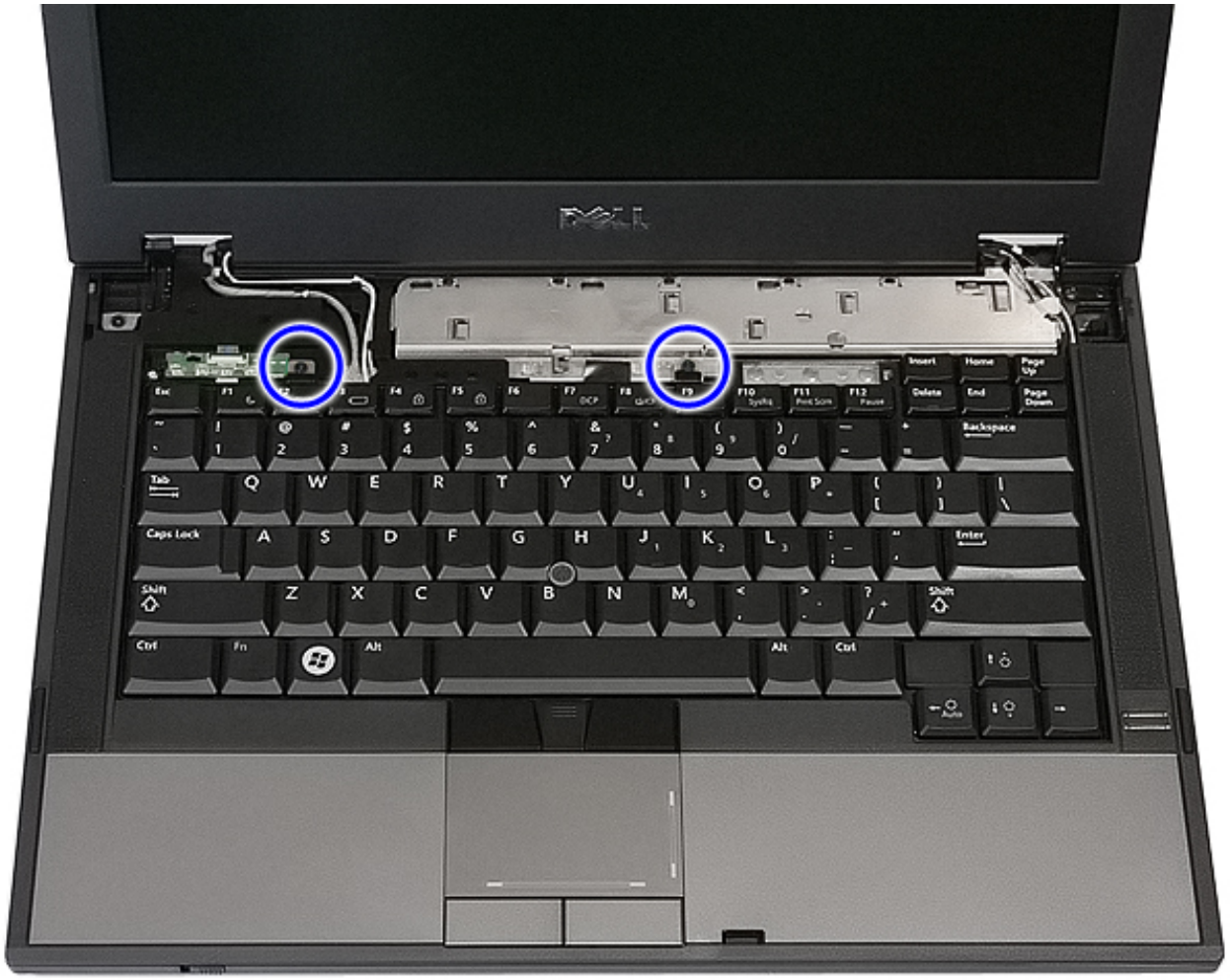
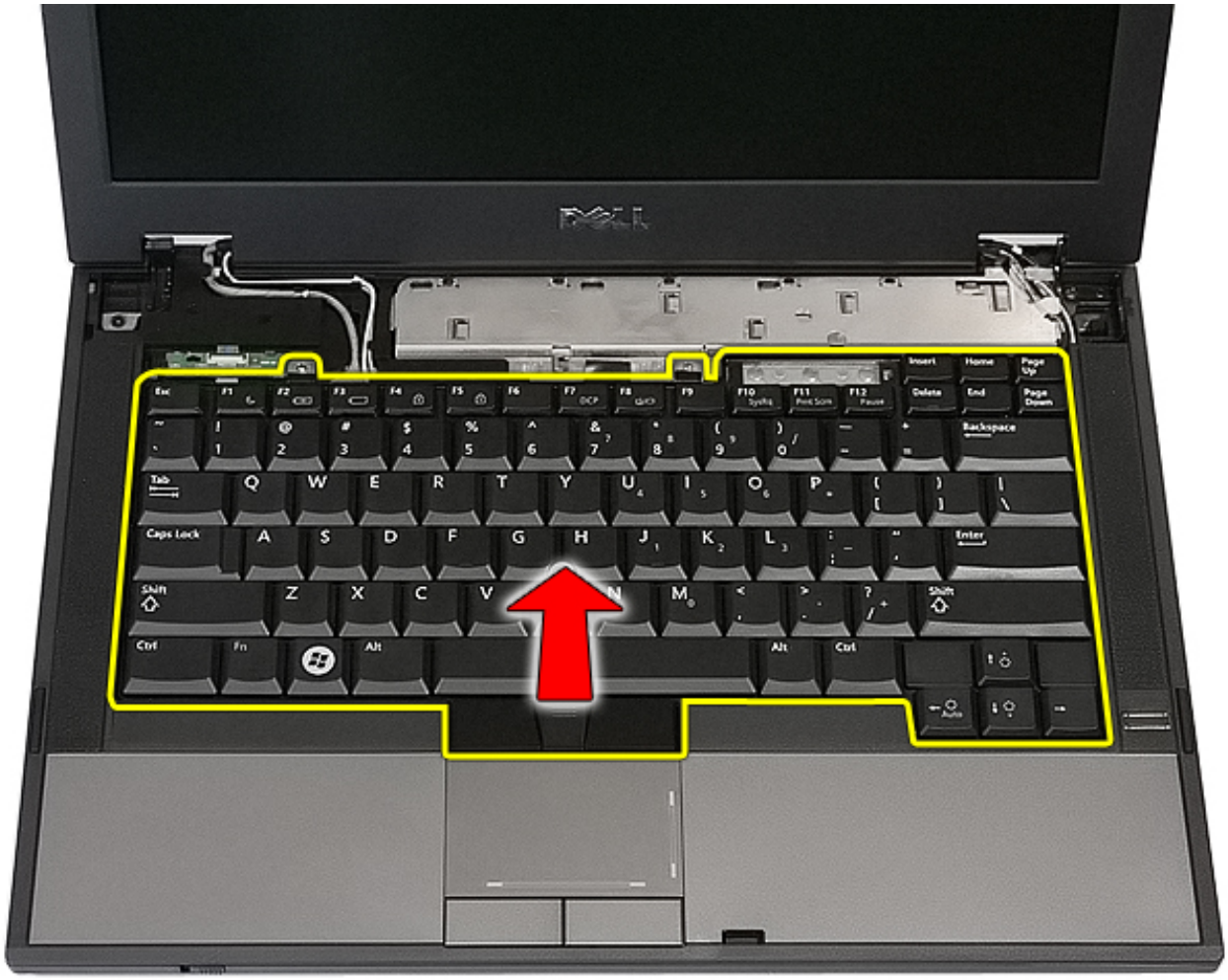
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Removing the Keyboard

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the LED cover from the computer.
4. Remove the screws that secure the keyboard to the computer.



5. Slide the keyboard upwards, then lift and remove the keyboard from the computer.



Replacing the Keyboard

To replace the keyboard, perform the above steps in reverse order.

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Memory Card

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Removing the Memory Card

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Press in the memory card and release.

4. Slide the memory card out of the computer and remove.

Replacing the Memory Card

To replace the memory card, perform the above steps in reverse order.

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Fan

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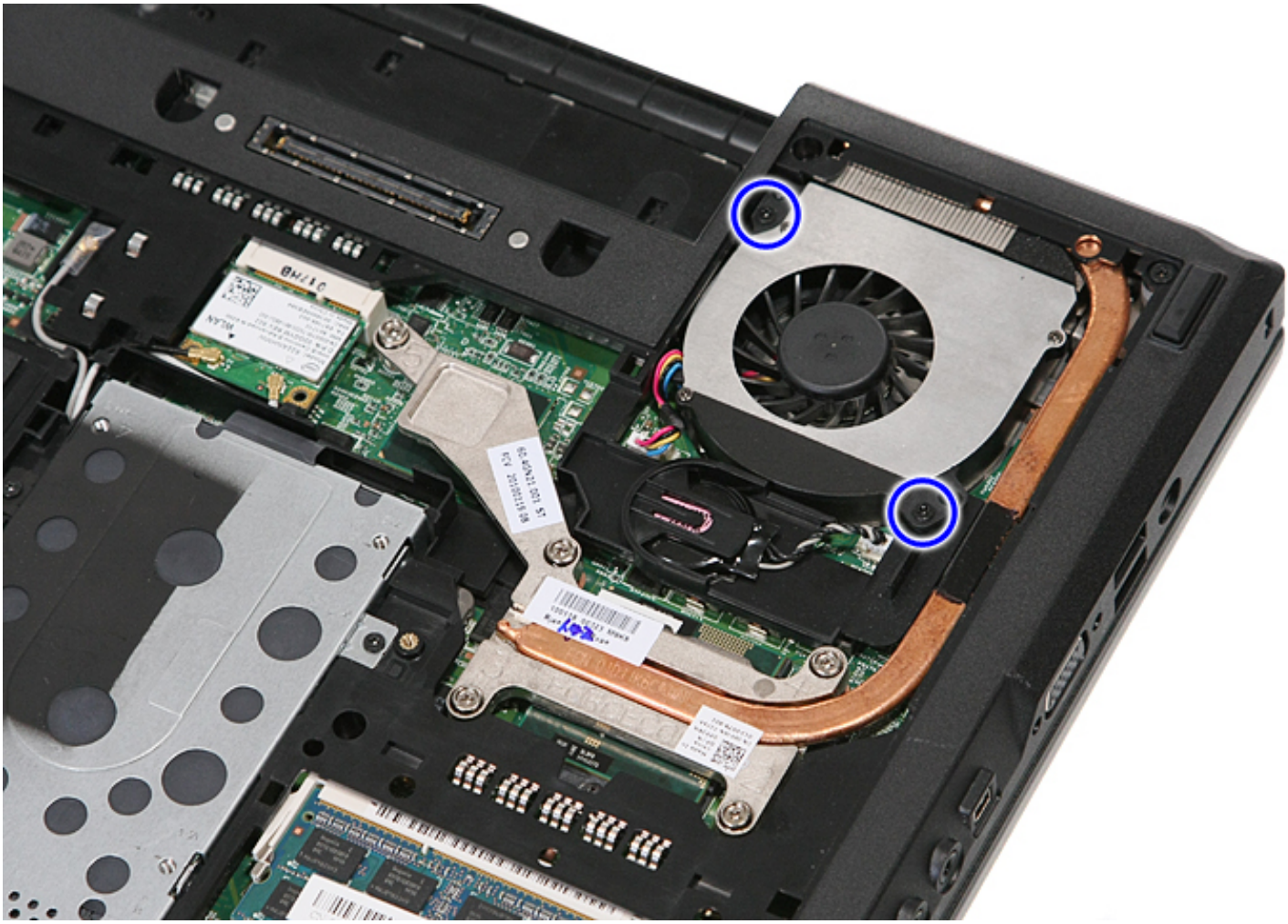
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

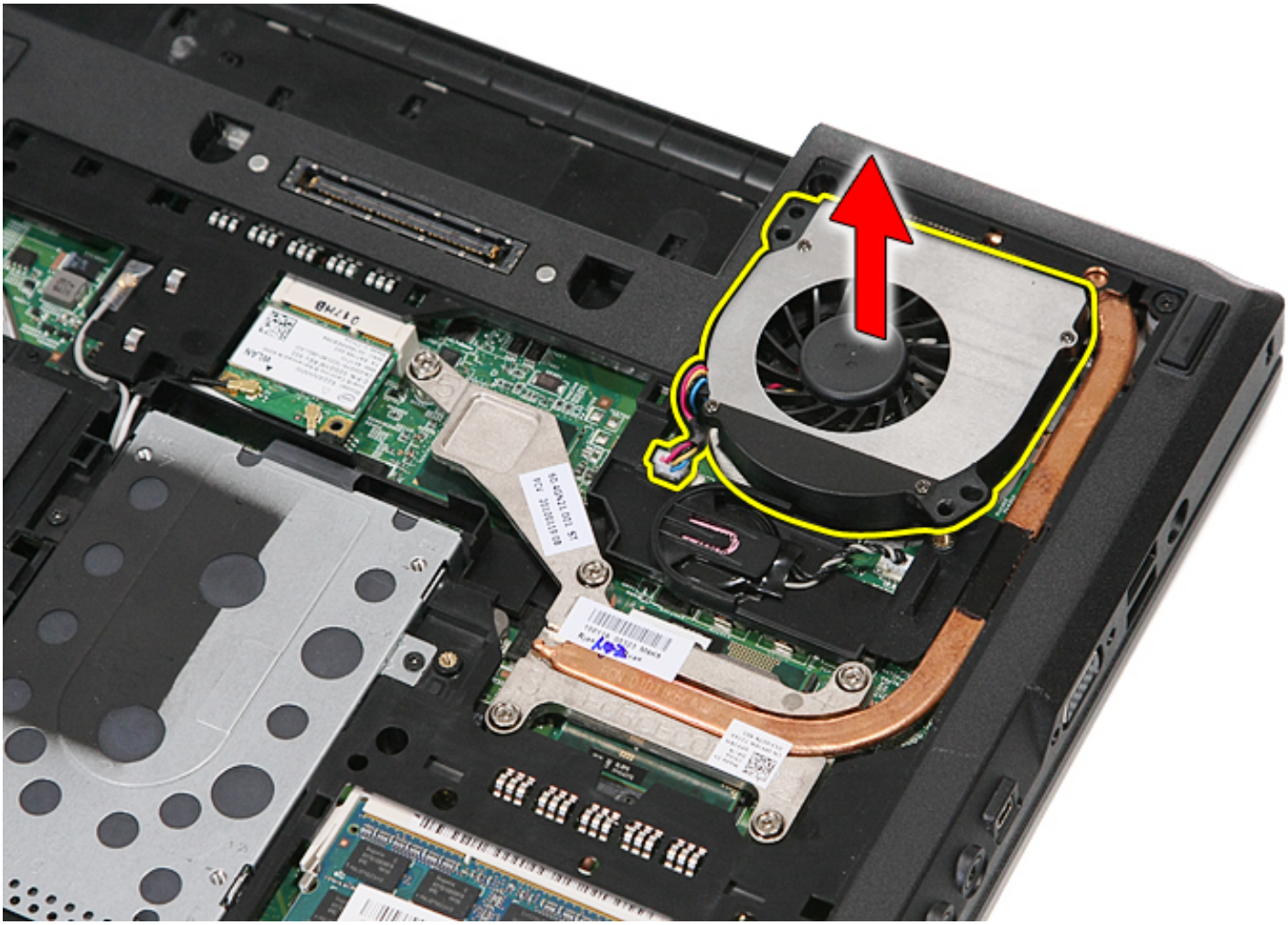
Removing the Fan

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery.
3. Remove the access panel.
4. Disconnect the fan cable from the system board.

5. Remove the screws securing the fan to the system board.



6. Lift up the fan and remove.



Replacing the Fan

To replace the fan, perform the above steps in reverse order.

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Heat Sink

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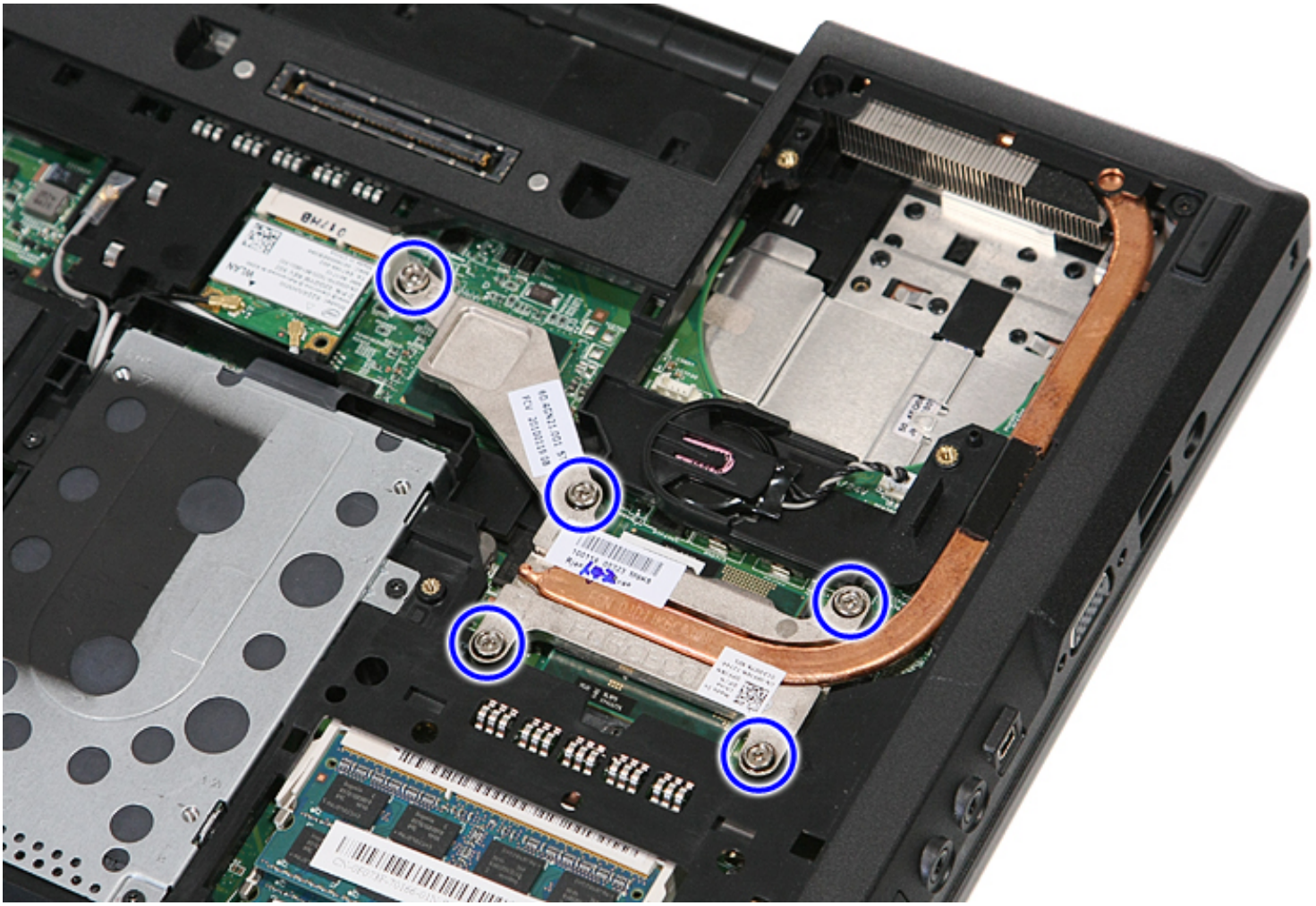
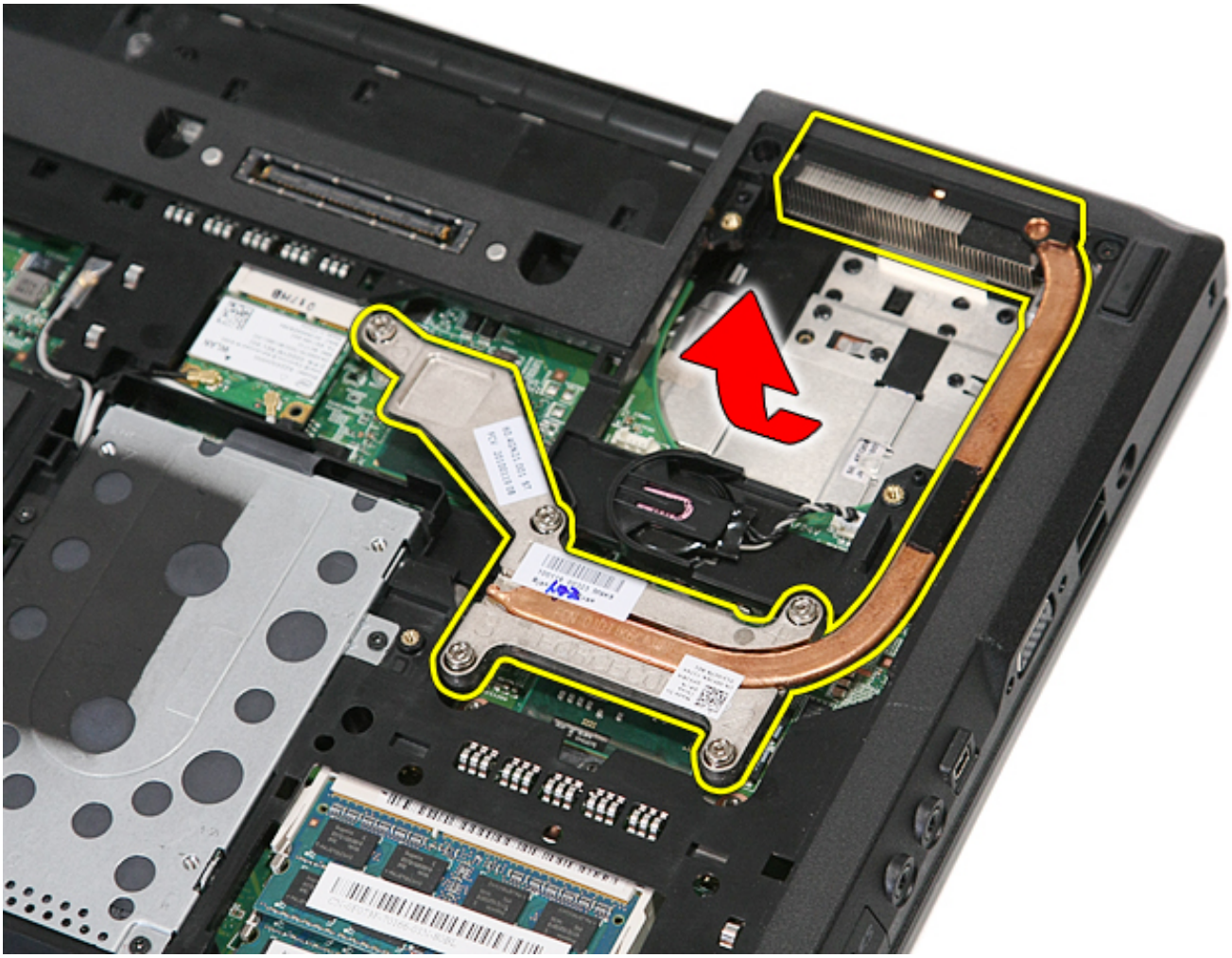
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Removing the Heat Sink

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the fan from the computer.
5. Loosen the screws securing the heat sink to the system board.



6. Lift up the heat sink at an angle and remove it from the computer.



Replacing the Heat Sink

To replace the heat sink, perform the above steps in reverse order.

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Processor

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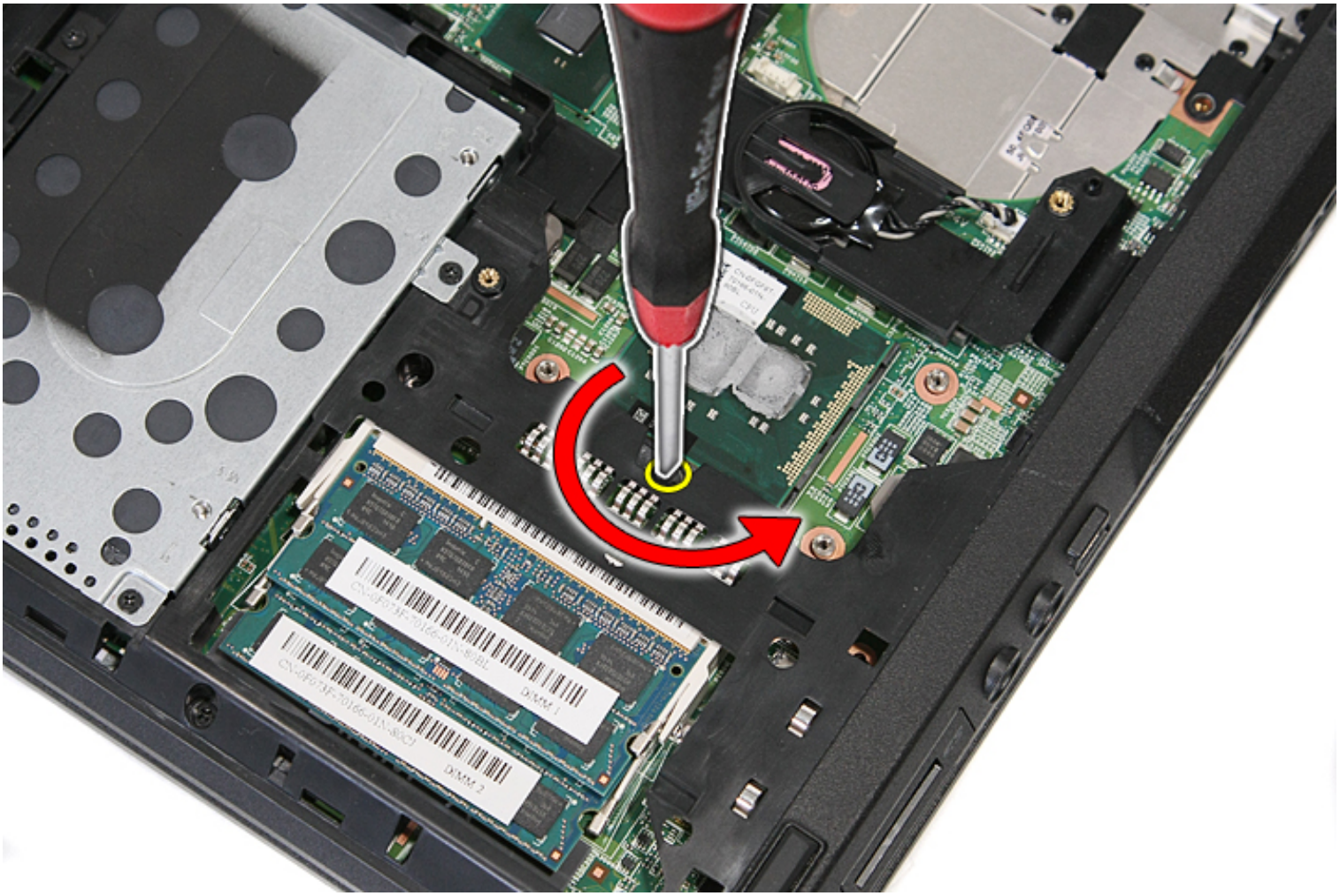
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Removing the Processor

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the fan from the computer.
5. Remove the heat sink from the computer.
6. Using a plastic scribe, rotate the processor cam lock counterclockwise.



7. Lifting straight up, remove the processor from the computer.

Replacing the Processor

To replace the processor, perform the above steps in reverse order.

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LED Board

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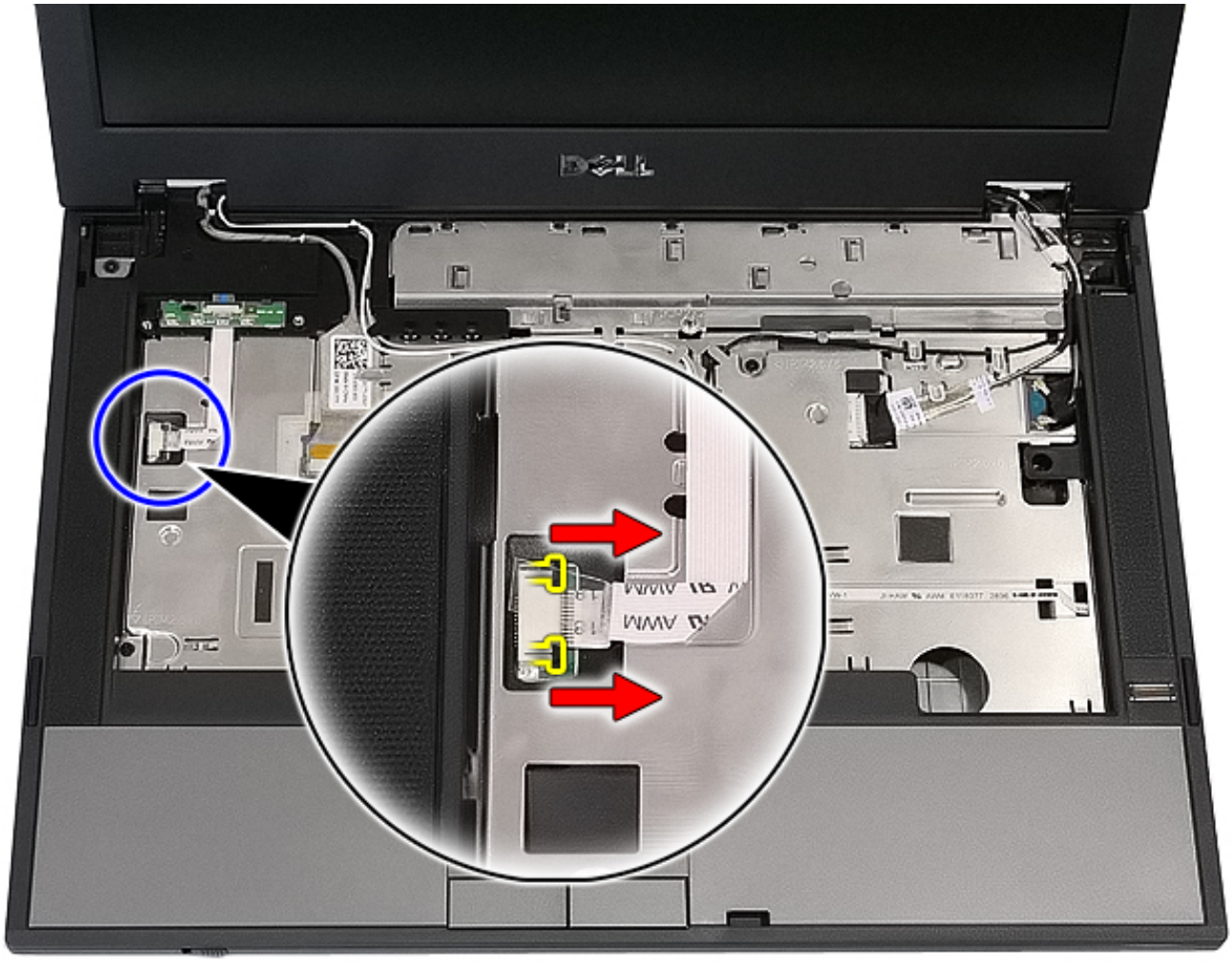
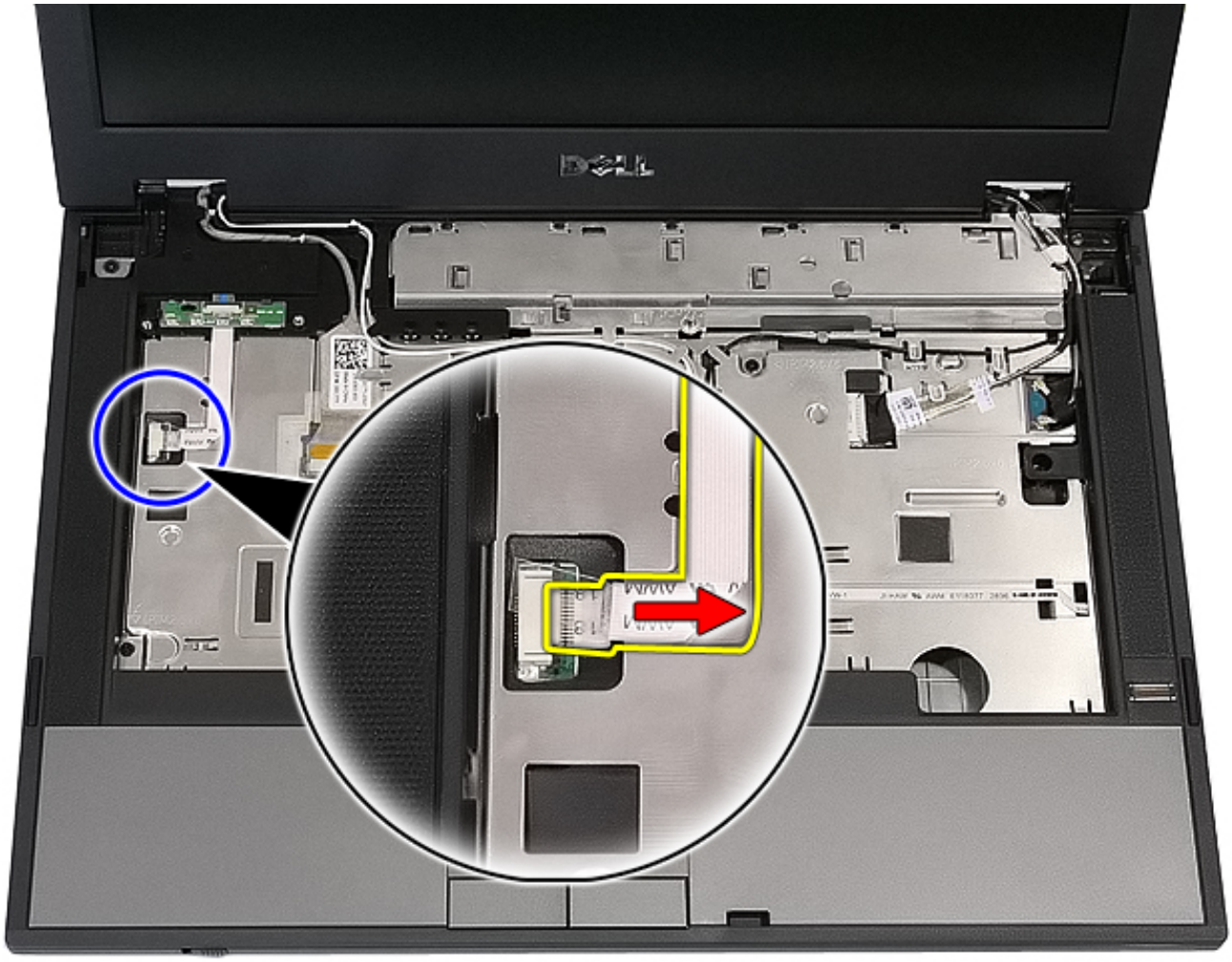
Removing the LED Board

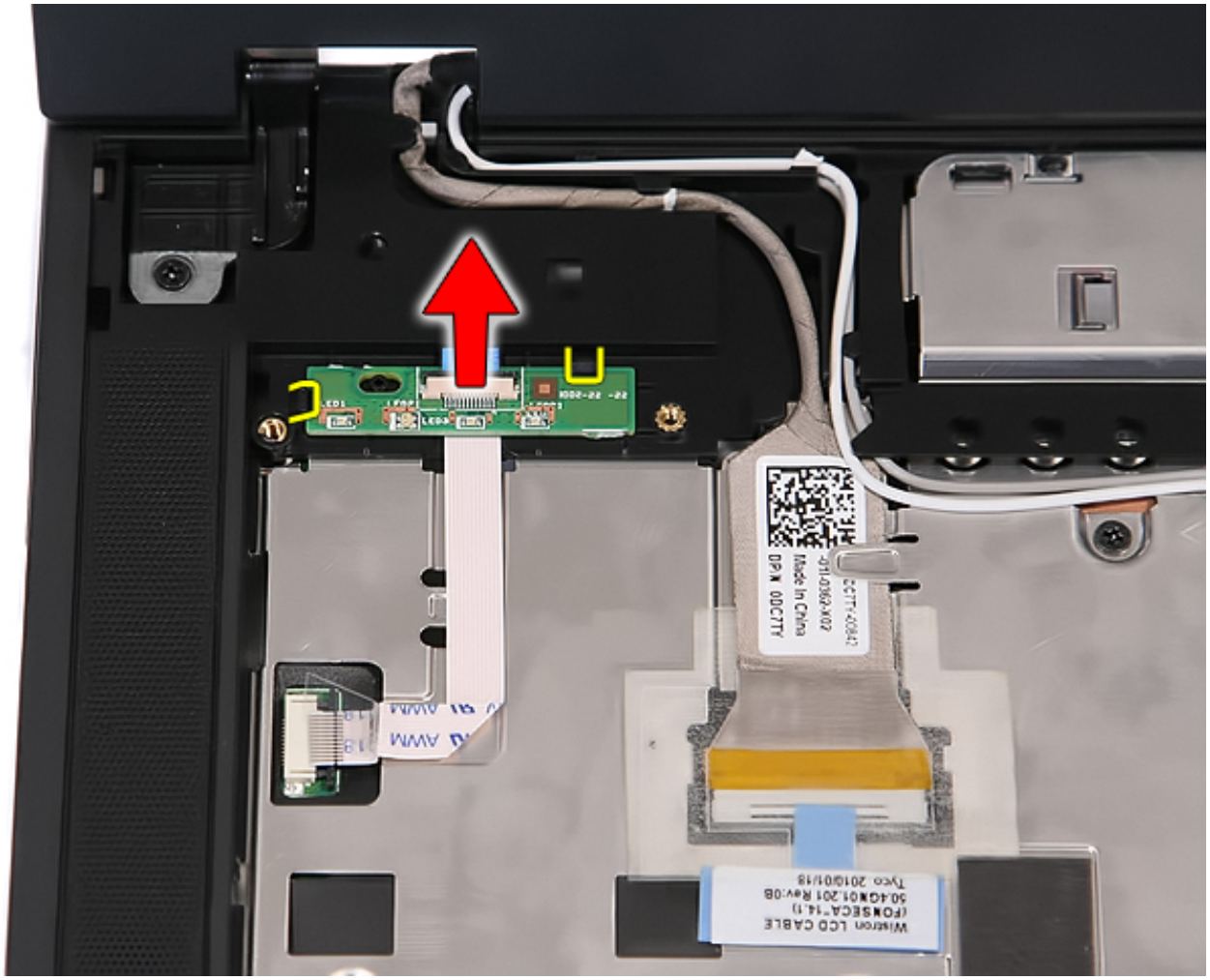
1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the LED cover from the computer.
4. Remove the keyboard from the computer.
5. Release the latch securing the LED Board cable.



6. Disconnect the LED Board cable.



7. Release the latches securing the LED Board and remove.



Replacing the LED Board

To replace the LED board, perform the above steps in reverse order.

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Display Assembly

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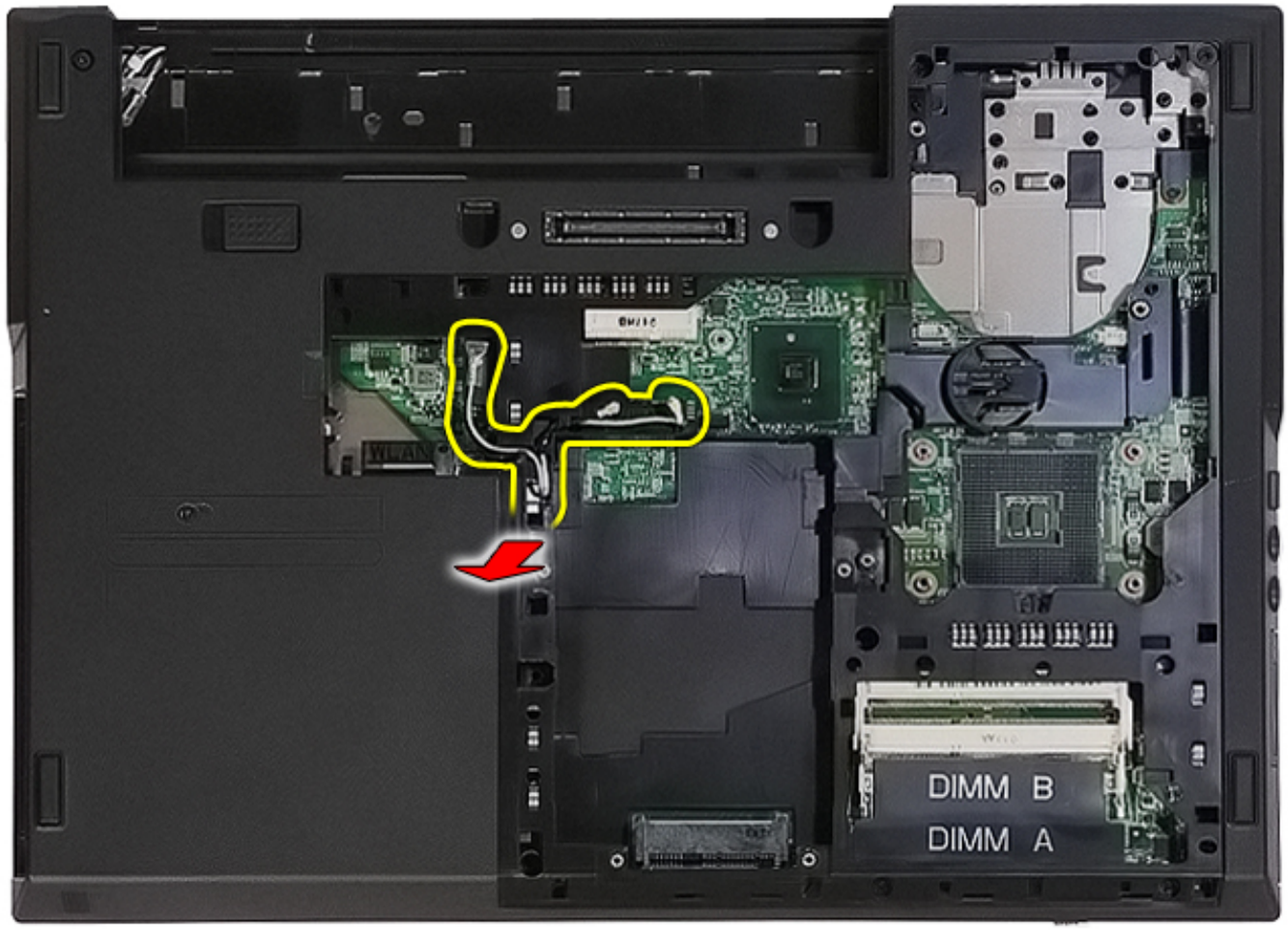
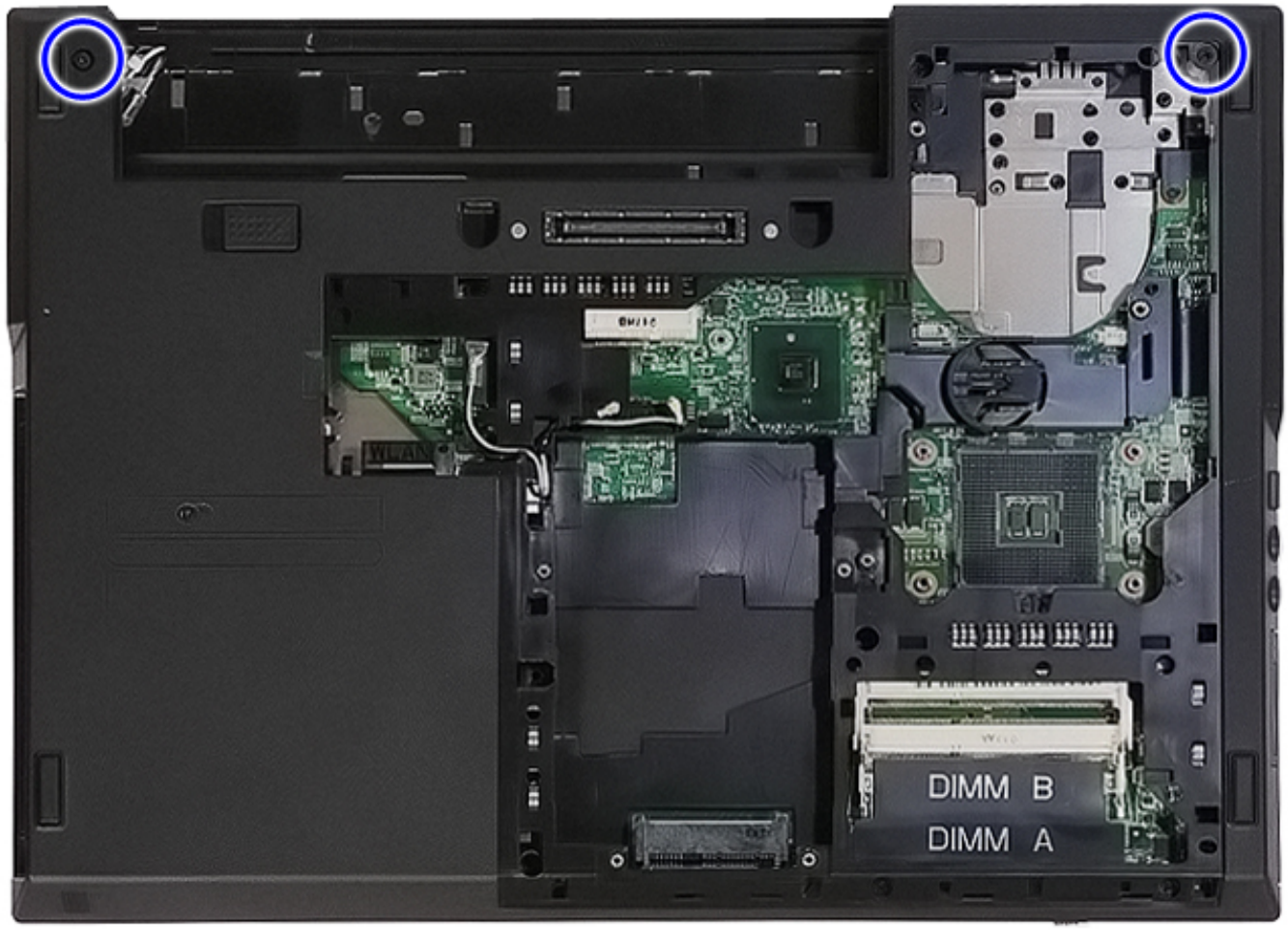
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Removing the Display Assembly

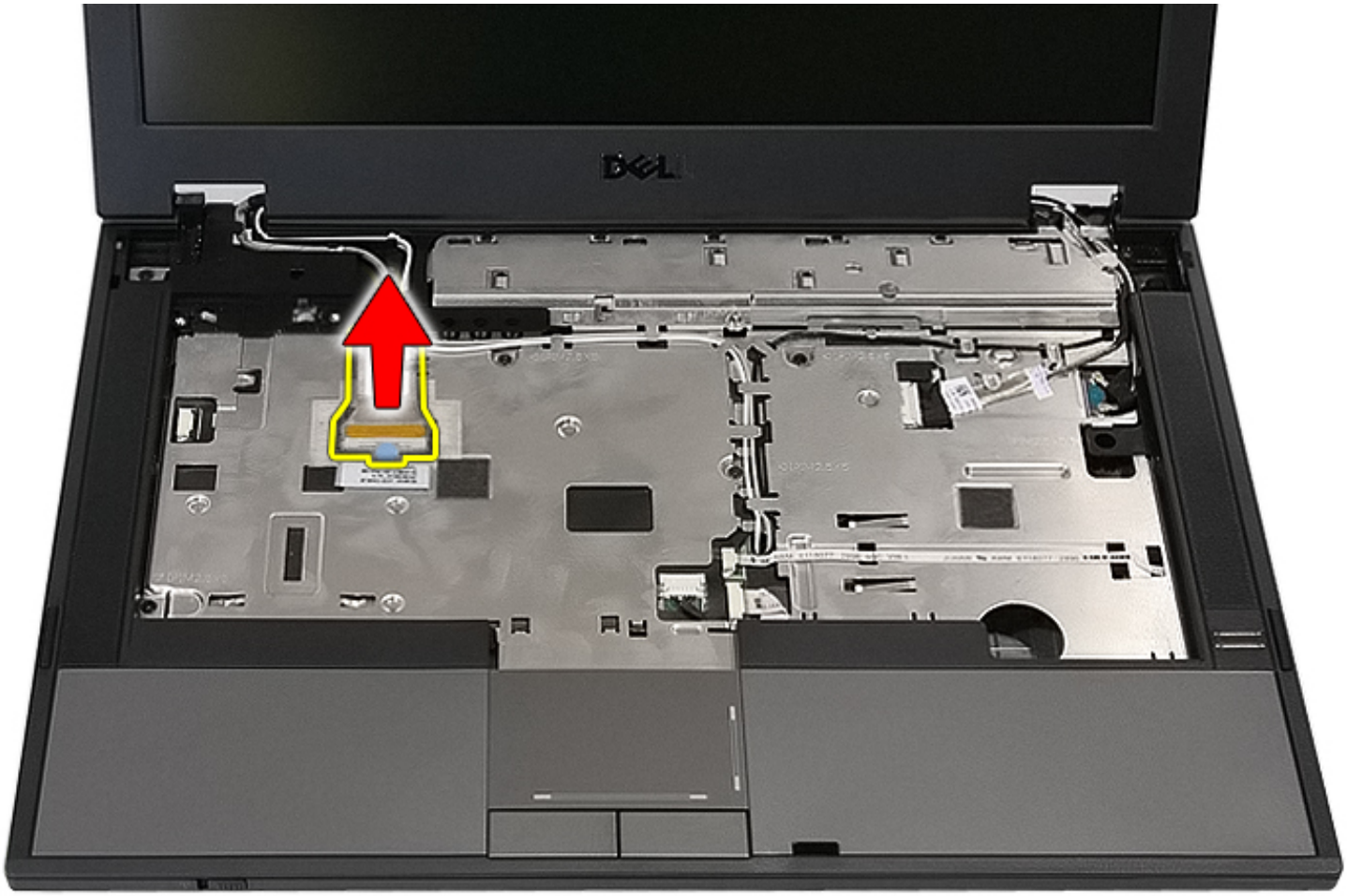
1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the WLAN card from the computer.
5. Remove the LED cover from the computer.
6. Remove the keyboard from the computer.
7. Disconnect the wireless antennas and remove them from their routing paths.



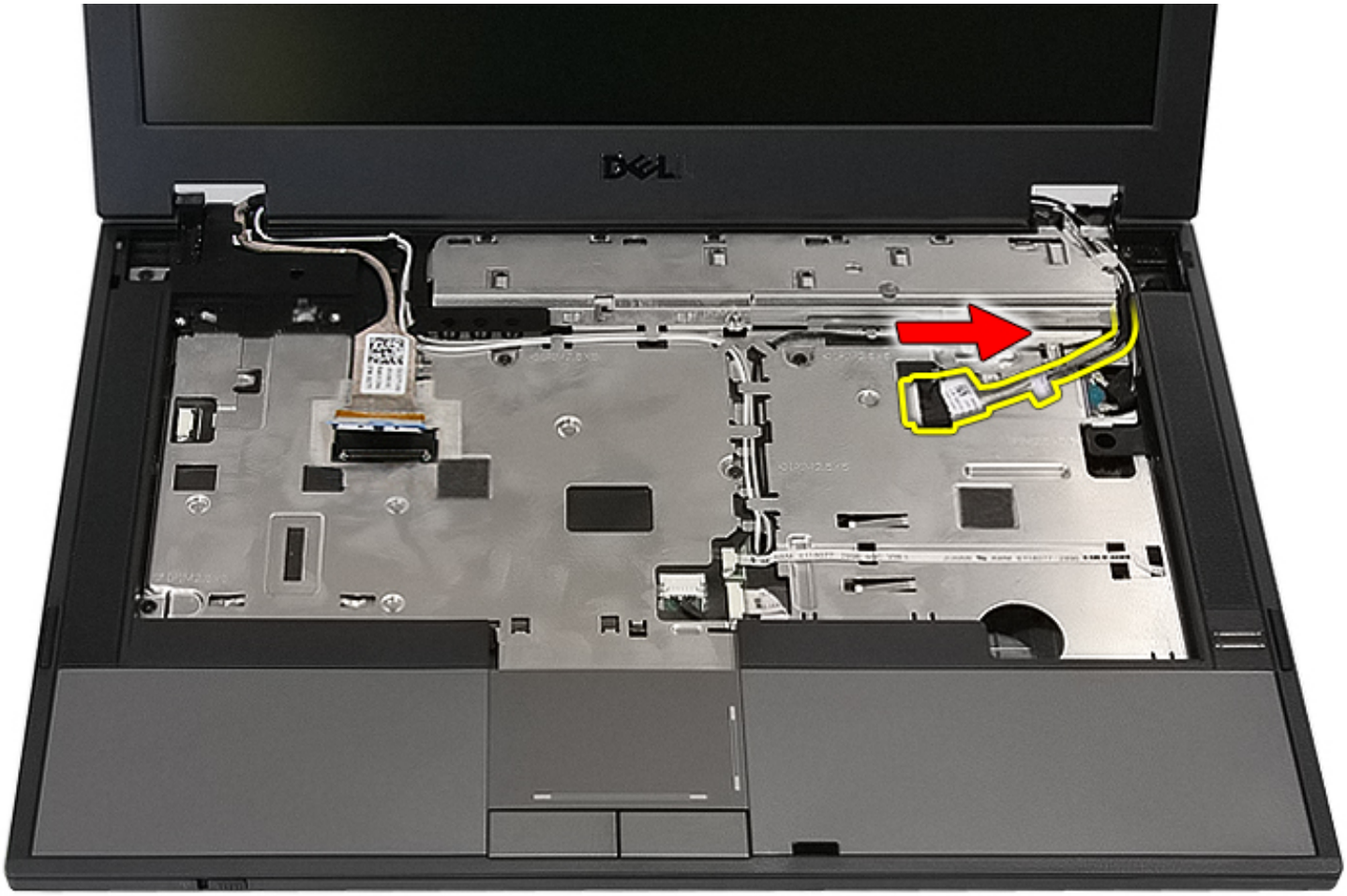
8. Remove the screws securing the bottom of the display assembly to the computer.



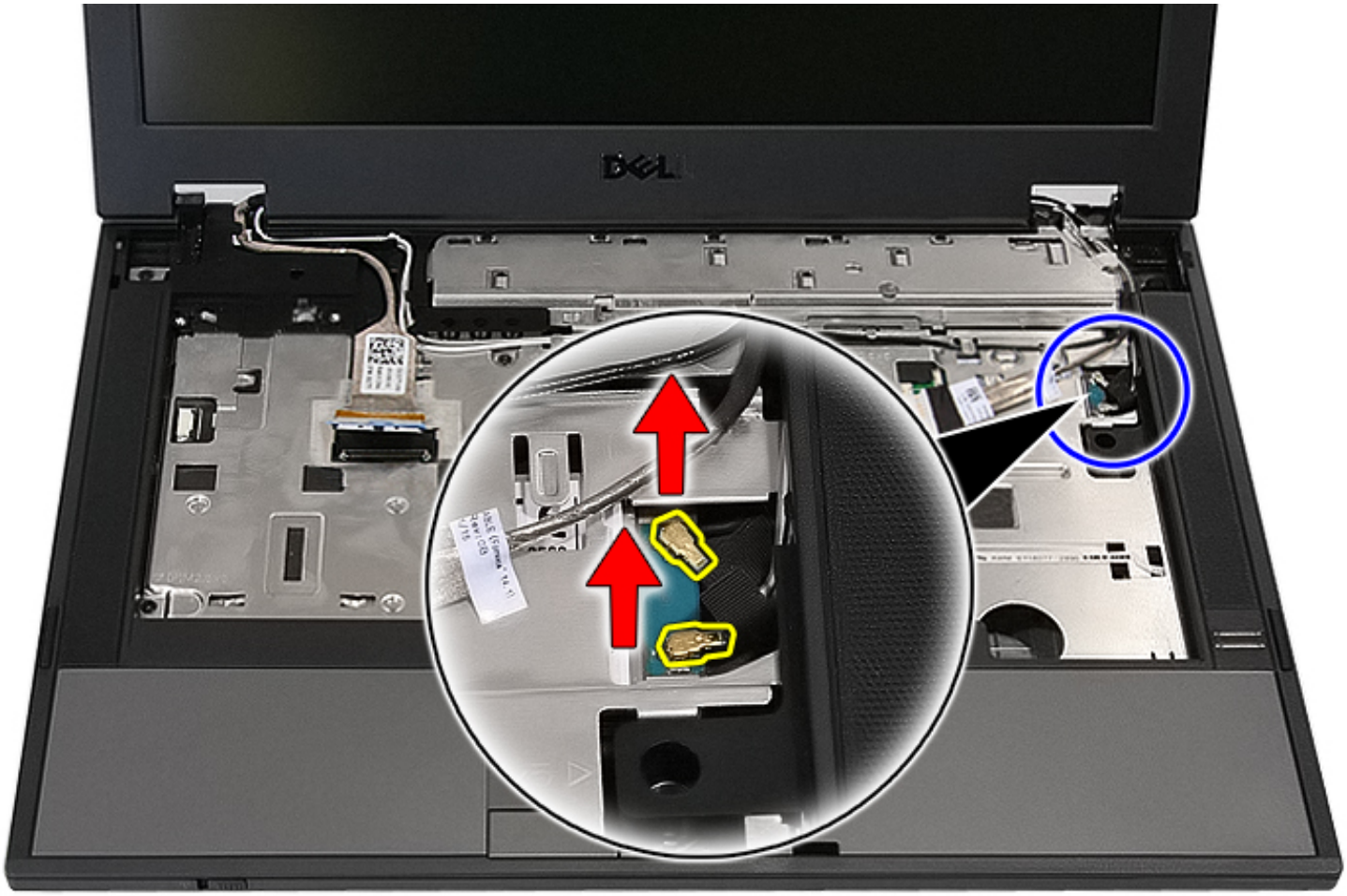
9. Disconnect the display data cable from the system board.



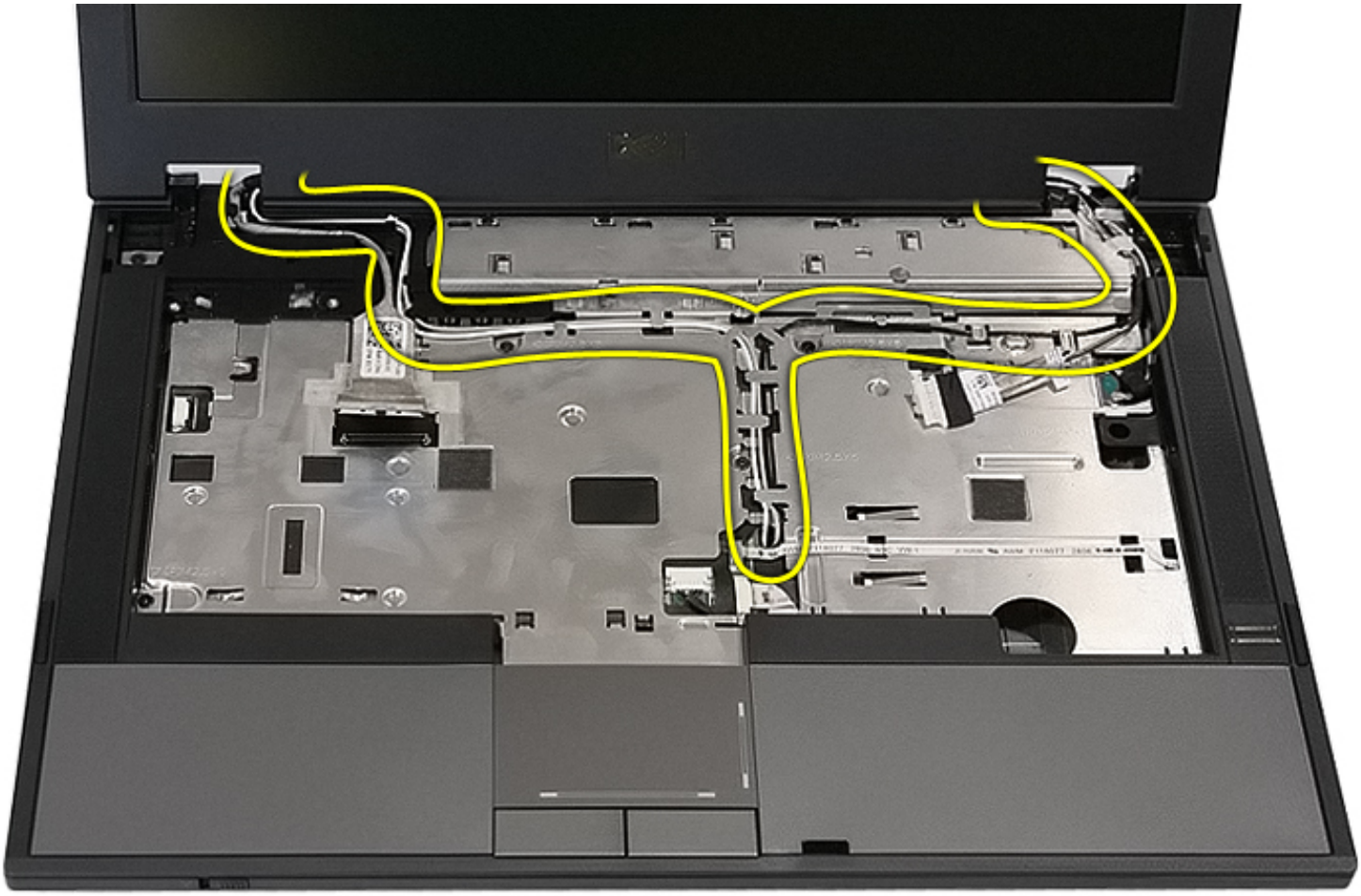
10. Disconnect the camera cable from the system board.



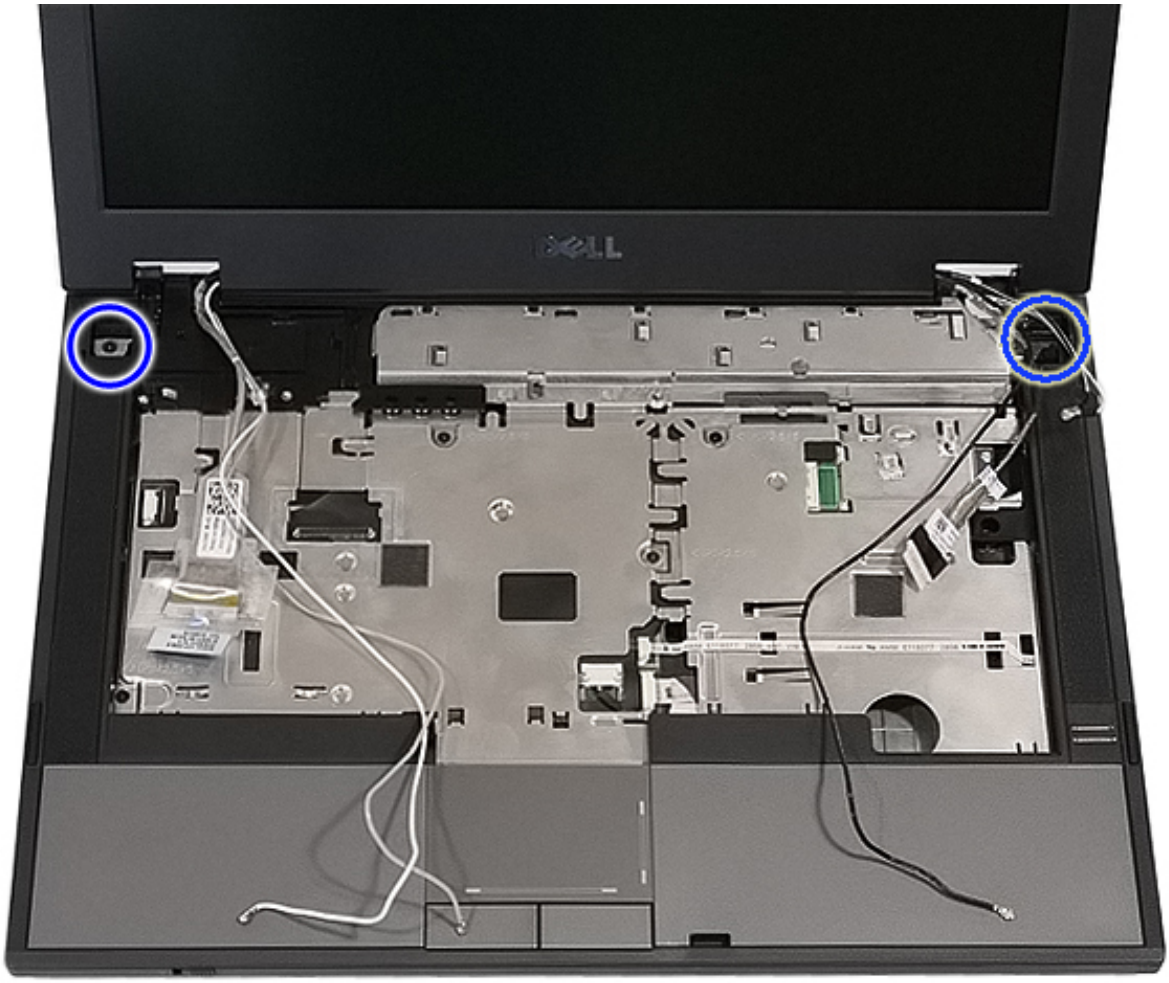
11. Release the antenna cables from the WWAN card (if installed).



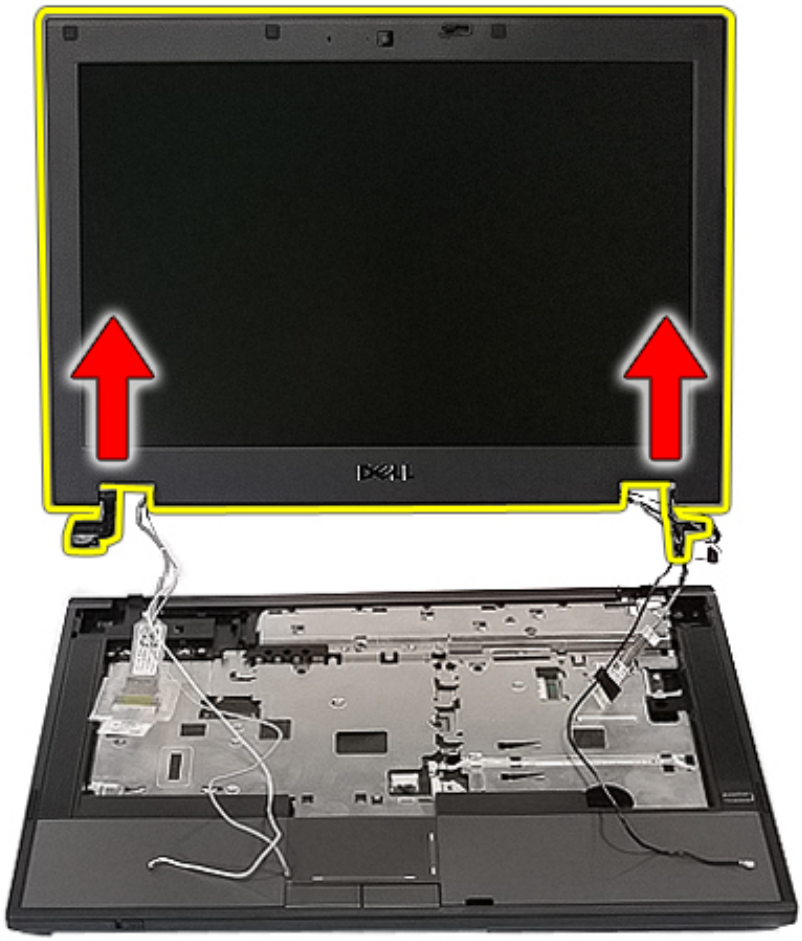
12. Release the cables from the routing path.



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



14. Lift up the display assembly from the computer and remove.



Replacing the Display Assembly

To replace the display assembly, perform the above steps in reverse order.

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Display Bezel

Dell™ Latitude™ E5410 Discrete Service Manual

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.

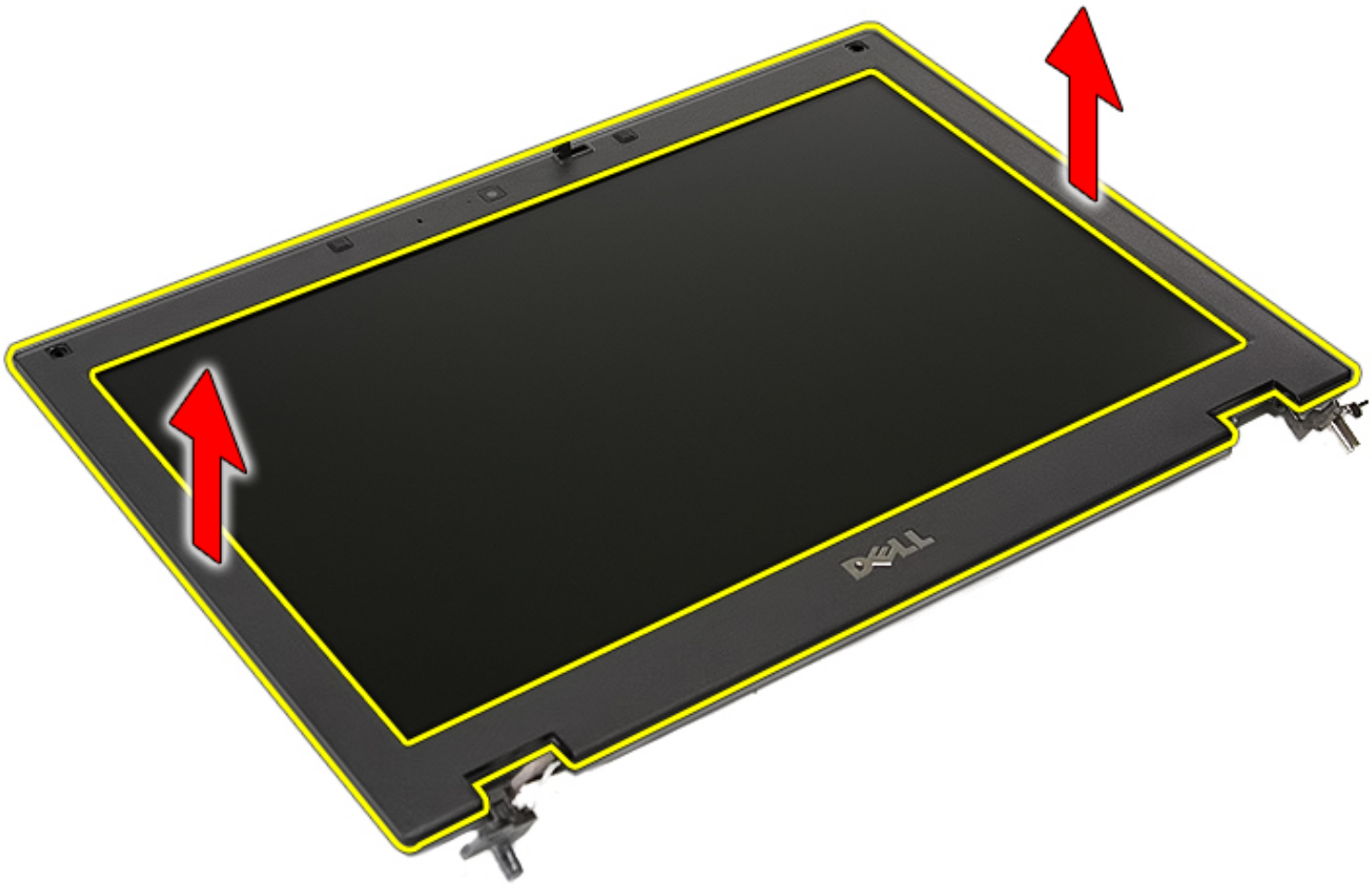
Removing the Display Bezel

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the WLAN card from the computer.
5. Remove the LED cover from the computer.
6. Remove the keyboard from the computer.
7. Remove the display assembly from the computer.
8. Remove the rubber pads on the display bezel.

9. Remove the screws securing the display bezel to the display cover.

10. Gently pry the display bezel from the display assembly by tucking your fingers under one edge of the bezel and working your way around the entire bezel until it is completely free.

11. Lift up and remove the display bezel from the computer.



Replacing the Display Bezel

To replace the display bezel, perform the above steps in reverse order.

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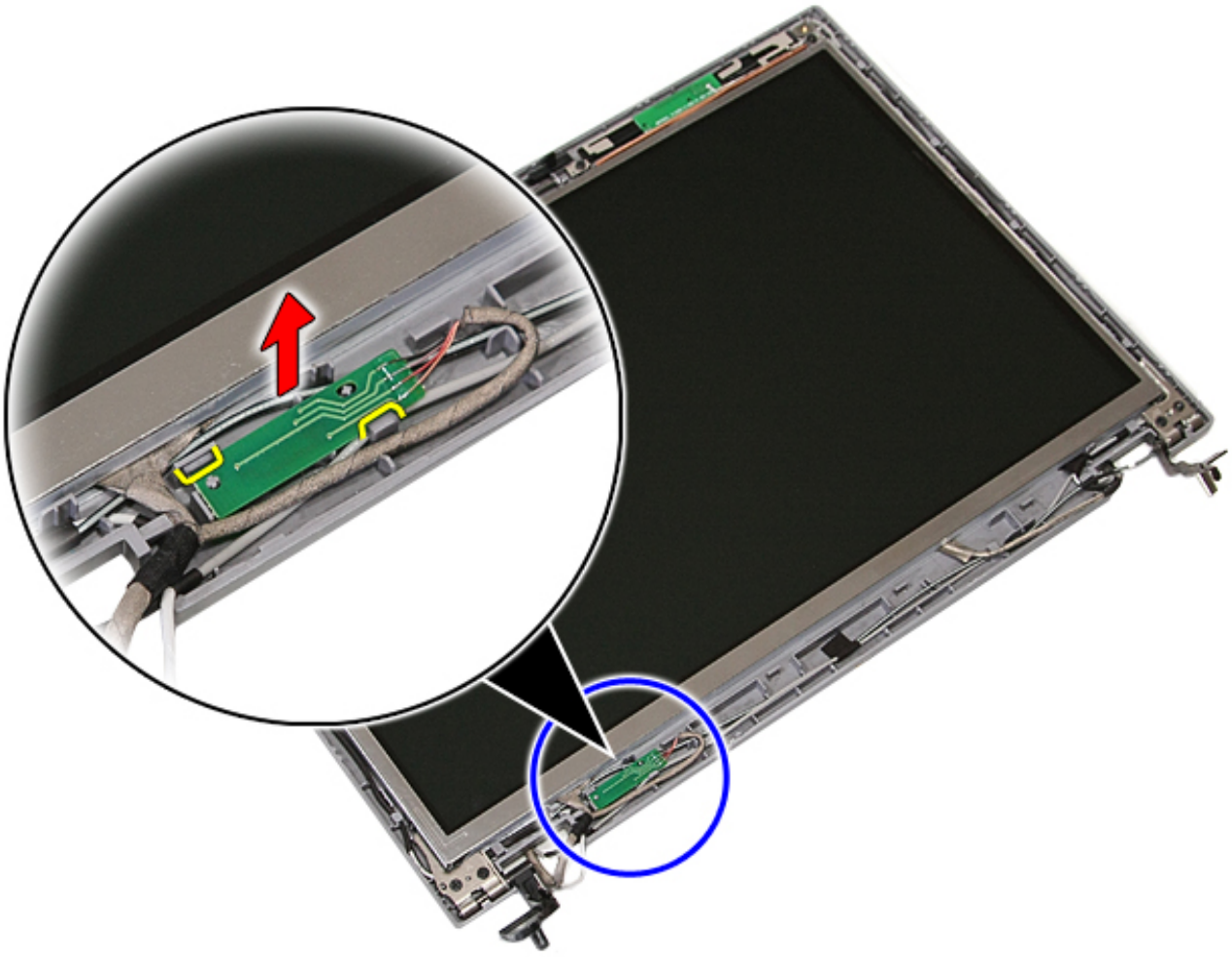
Display Panel, Brackets, and Hinges

Dell™ Latitude™ E5410 Discrete Service Manual

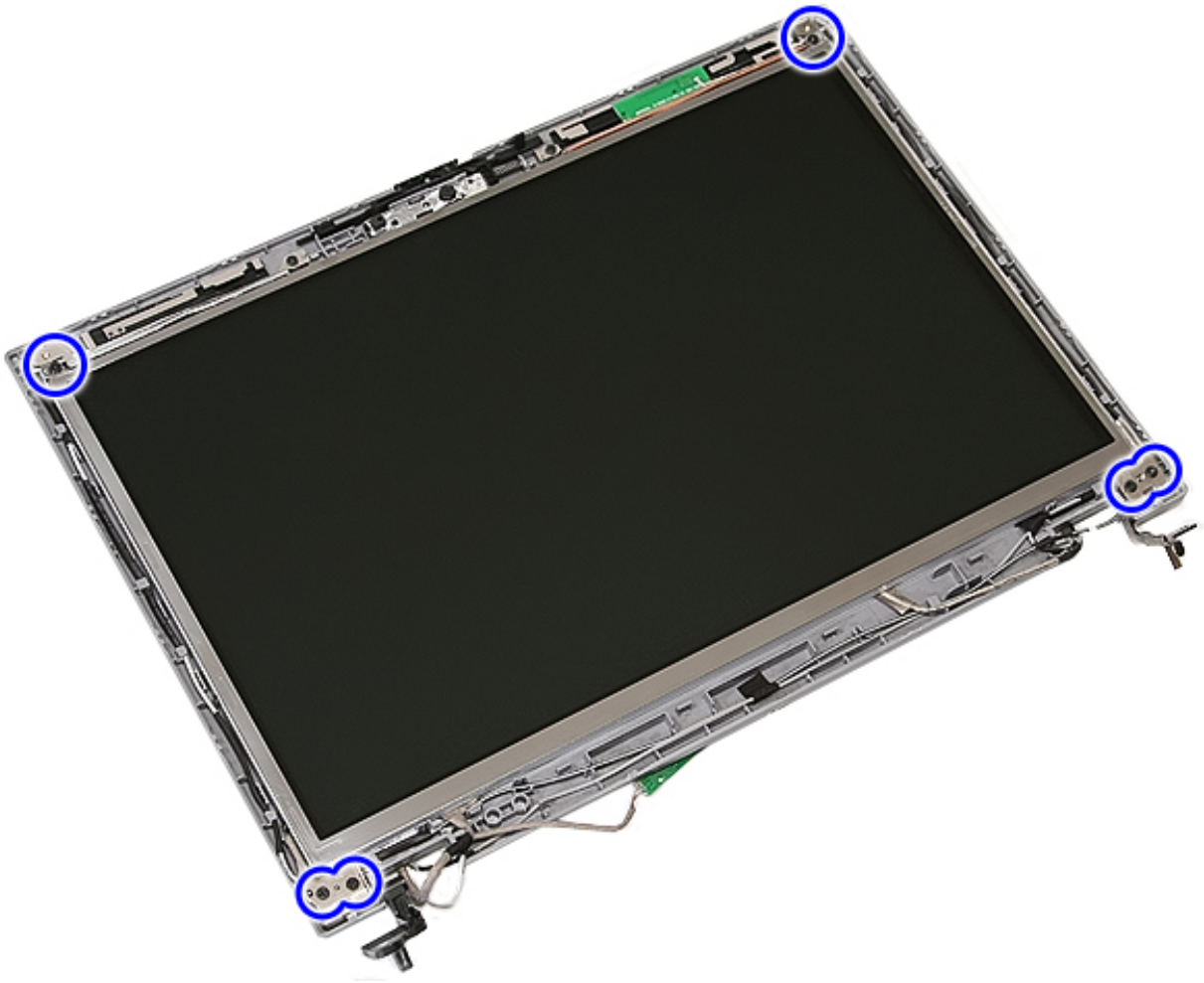
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Removing the Display Panel, Brackets, and Hinges

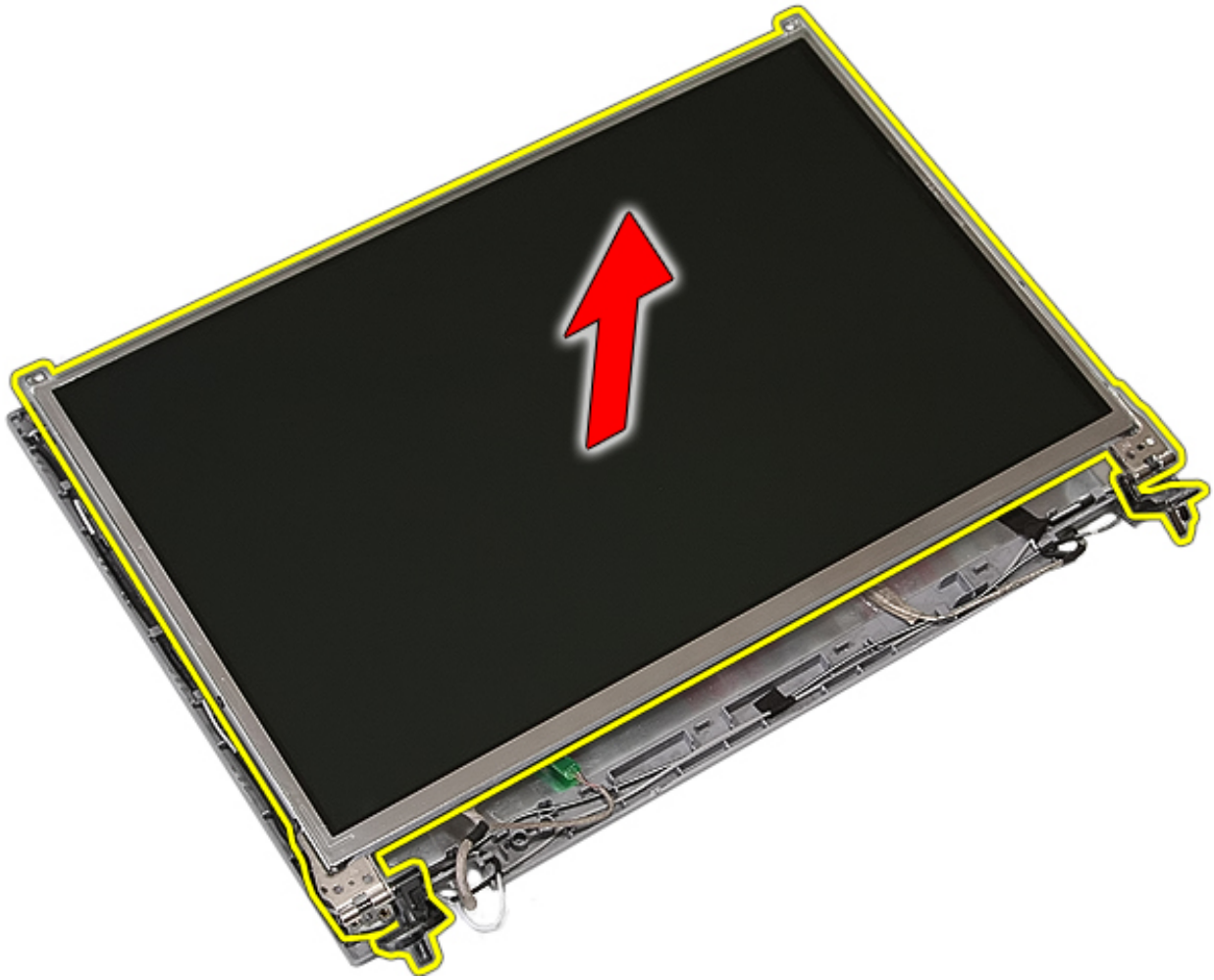
1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the WLAN card from the computer.
5. Remove the LED cover from the computer.
6. Remove the keyboard from the computer.
7. Remove the display assembly from the computer.
8. Remove the display bezel from the display assembly.
9. Release the display board from its latches.



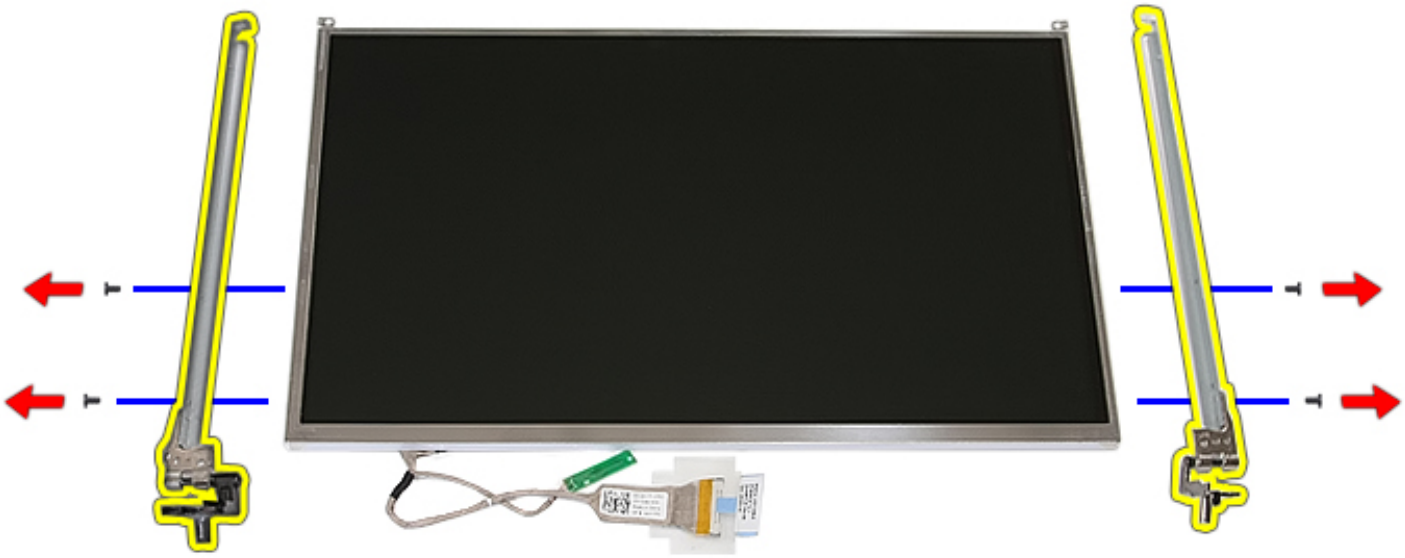
10. Remove the screws securing the display panel, brackets, and hinges to the display assembly.



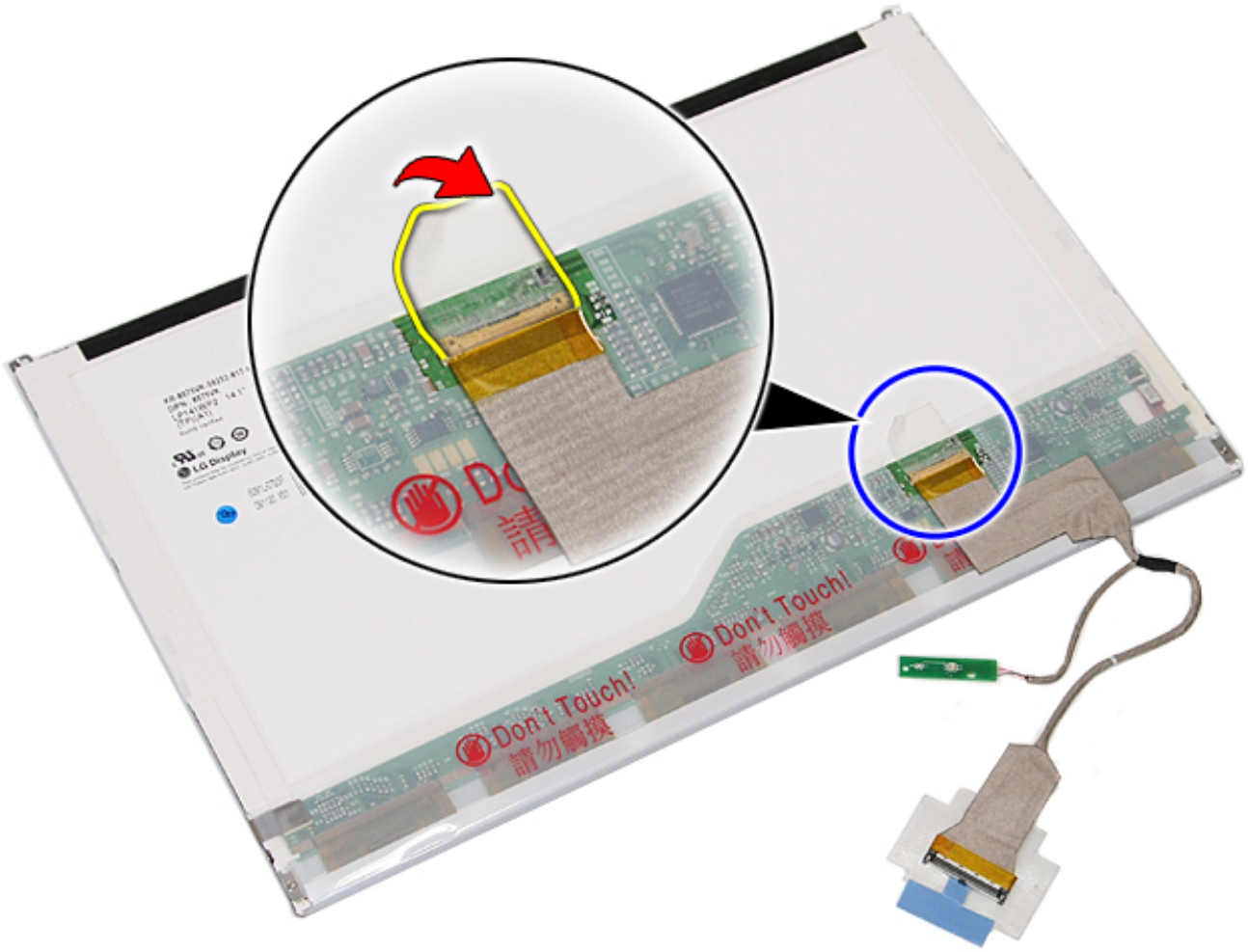
11. Lift up the display panel, brackets, and hinges.



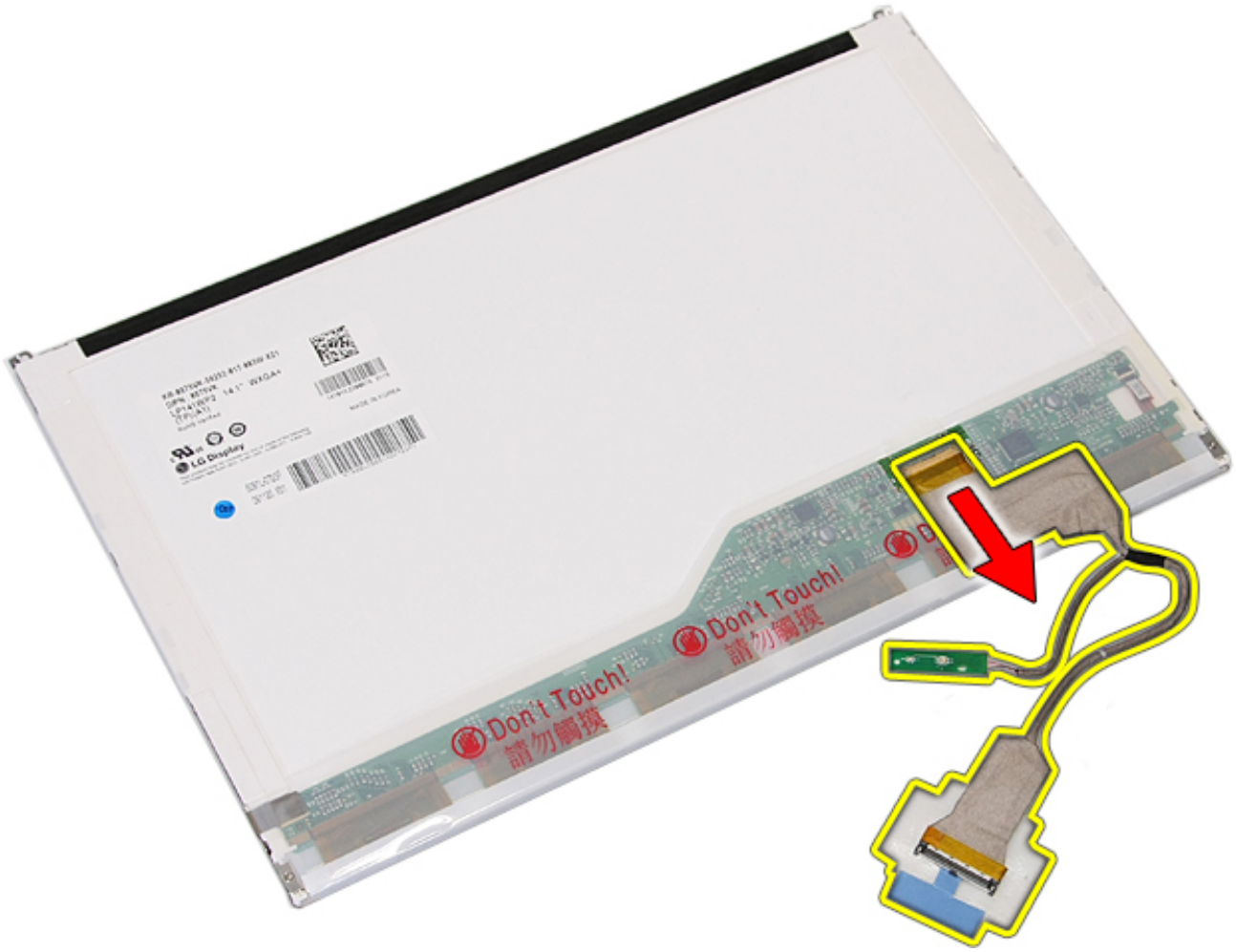
12. Remove the screws securing the display brackets and hinges to the display panel and remove.



13. Peel open the tape securing the display cable to the display panel.



14. Disconnect the display cable from the display panel.



Replacing the Display Panel, Brackets, and Hinges

To replace the Display Panel, Brackets, and Hinges, perform the above steps in reverse order.

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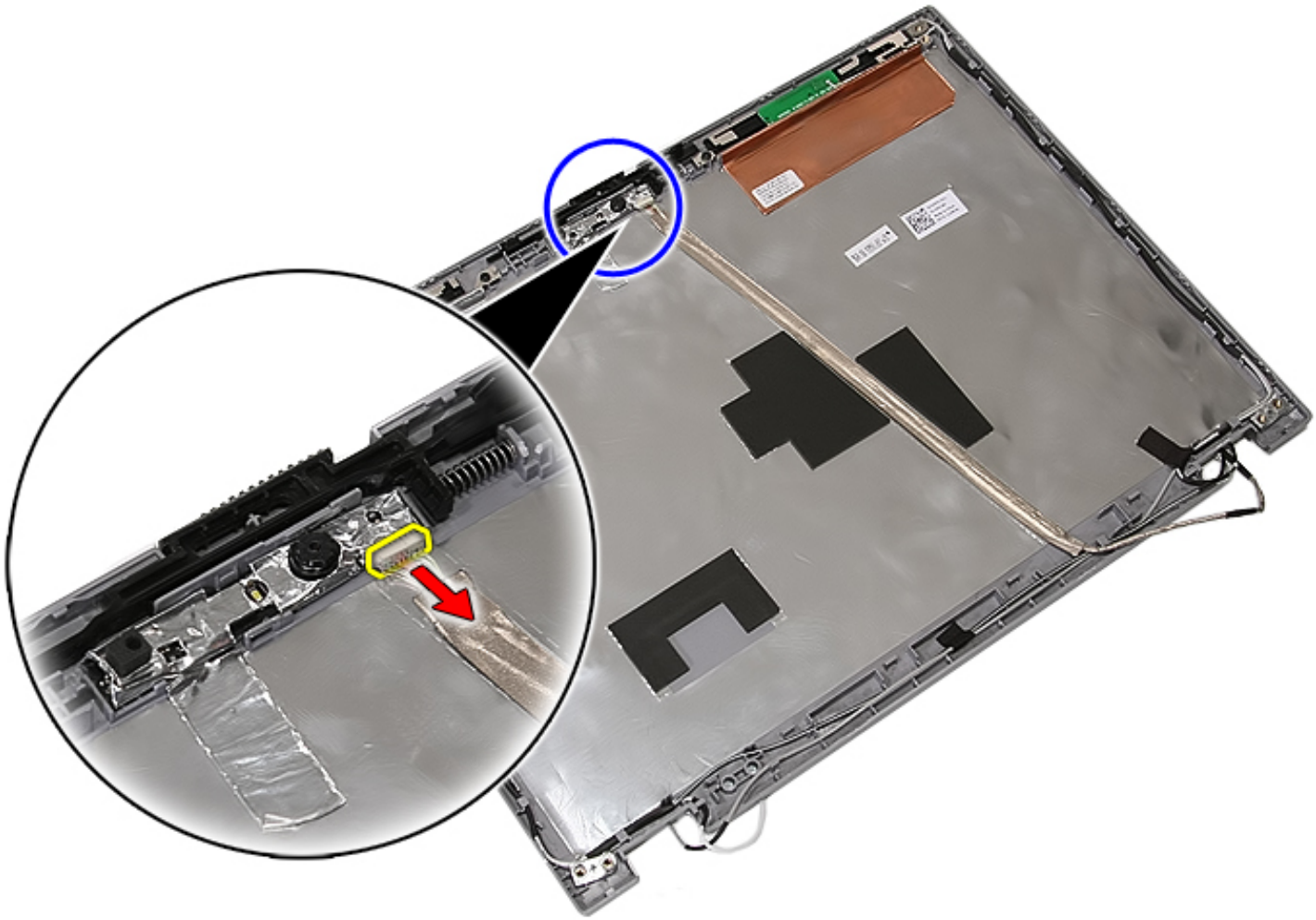
Camera

Dell™ Latitude™ E5410 Discrete Service Manual

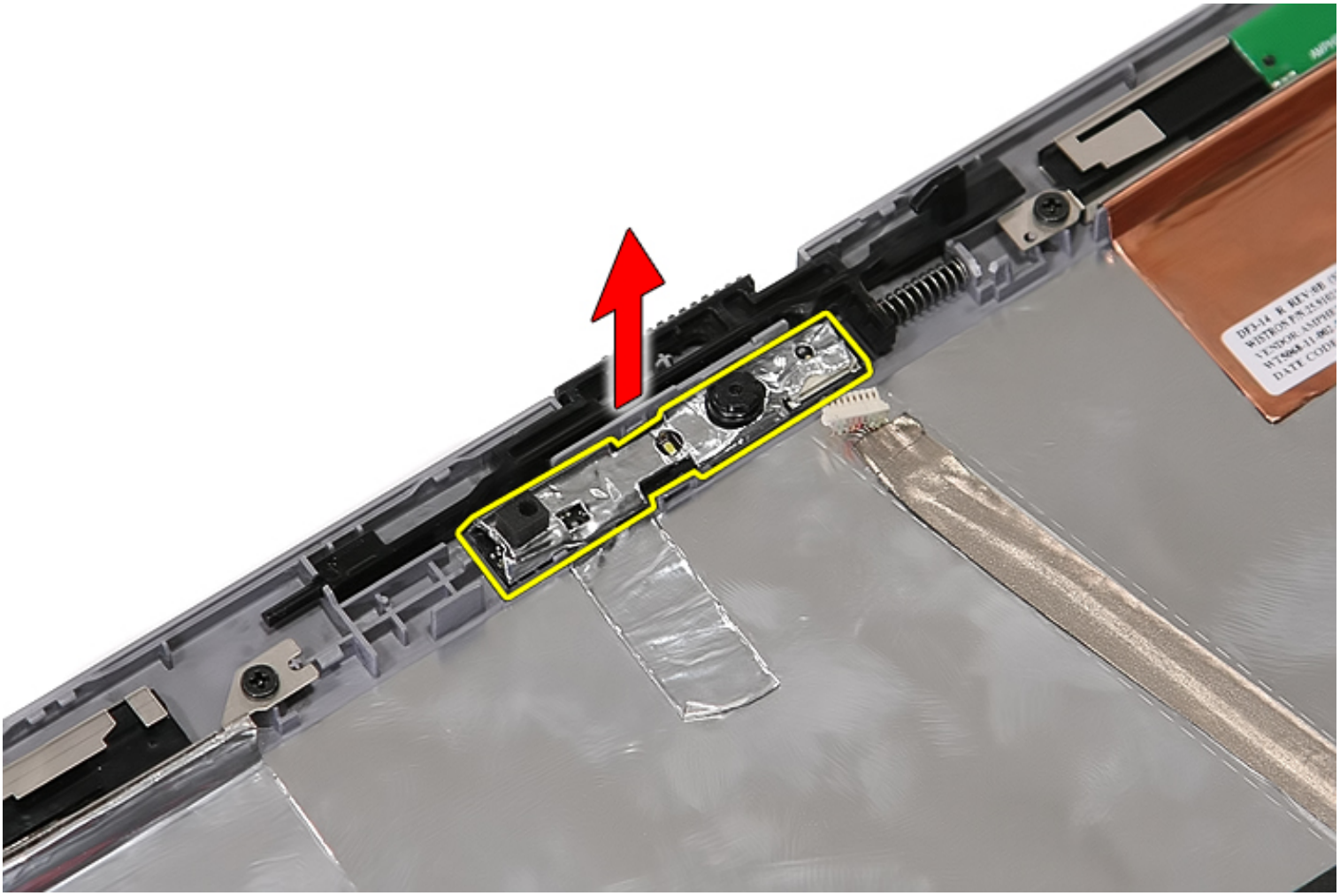
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Removing the Camera

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the WLAN card from the computer.
5. Remove the LED cover from the computer.
6. Remove the keyboard from the computer.
7. Remove the display assembly from the computer.
8. Remove the display bezel from the display assembly.
9. Remove the display panel, bracket and hinges from the display assembly.
10. Disconnect the display camera data cable.



11. Lift up the display camera and remove.



Replacing the Camera

To replace the camera, perform the above steps in reverse order.

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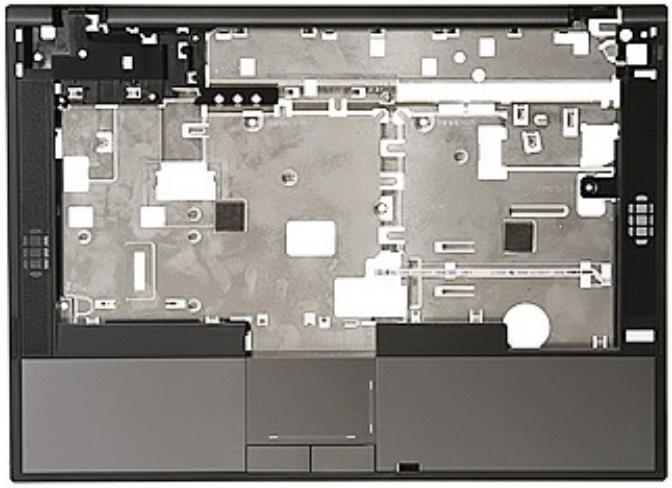
Palm Rest

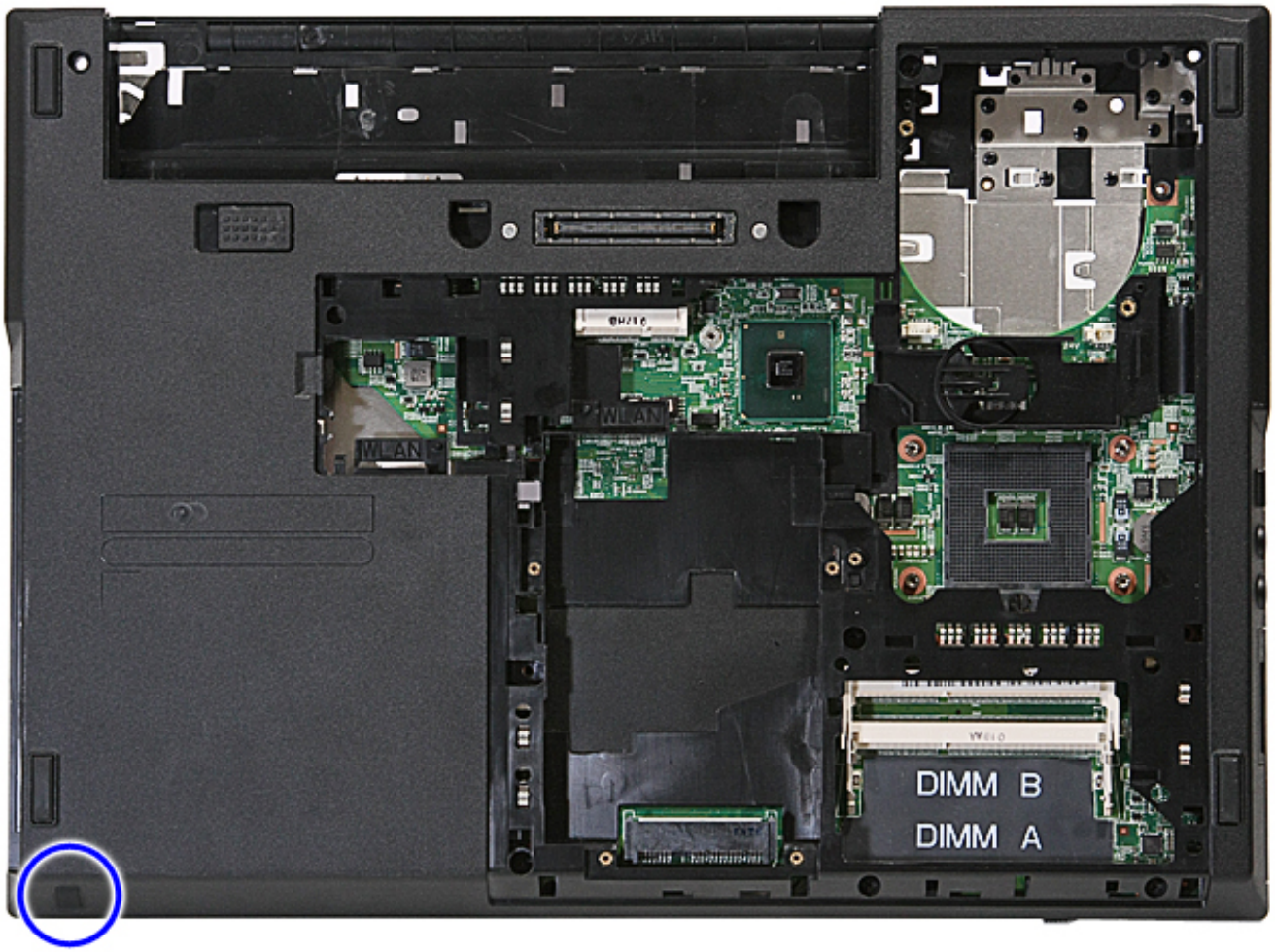
Dell™ Latitude™ E5410 Discrete Service Manual

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.

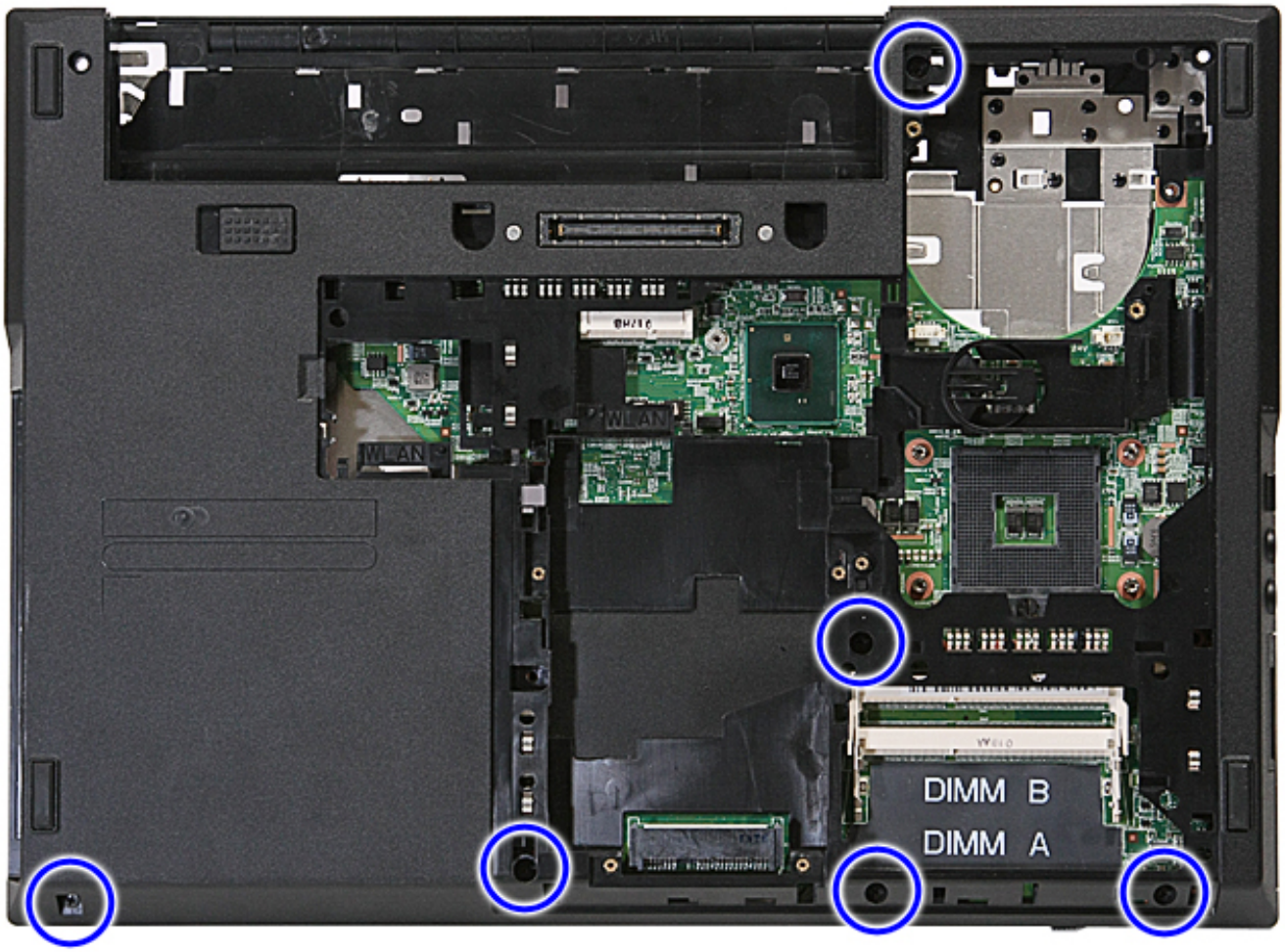
Removing the Palm Rest



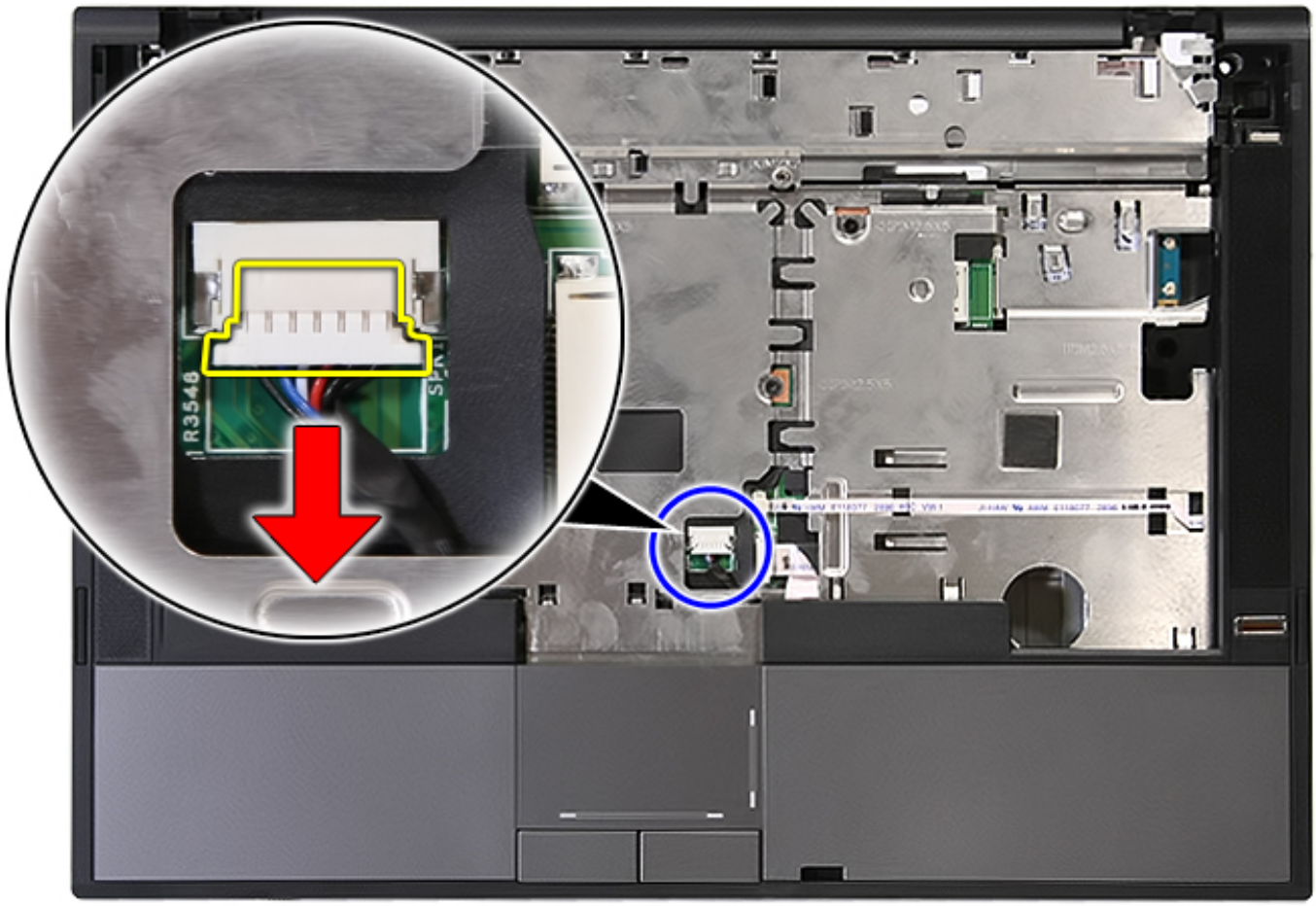
1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the optical drive from the computer.
5. Remove the optical drive from the computer.
6. Remove the fan and heat sink from the computer.
7. Remove the LED cover from the computer.
8. Remove the keyboard from the computer.
9. Remove the display assembly from the computer.
10. Remove the LED Board from the computer.
11. Remove the rubber pad on the bottom of the computer.



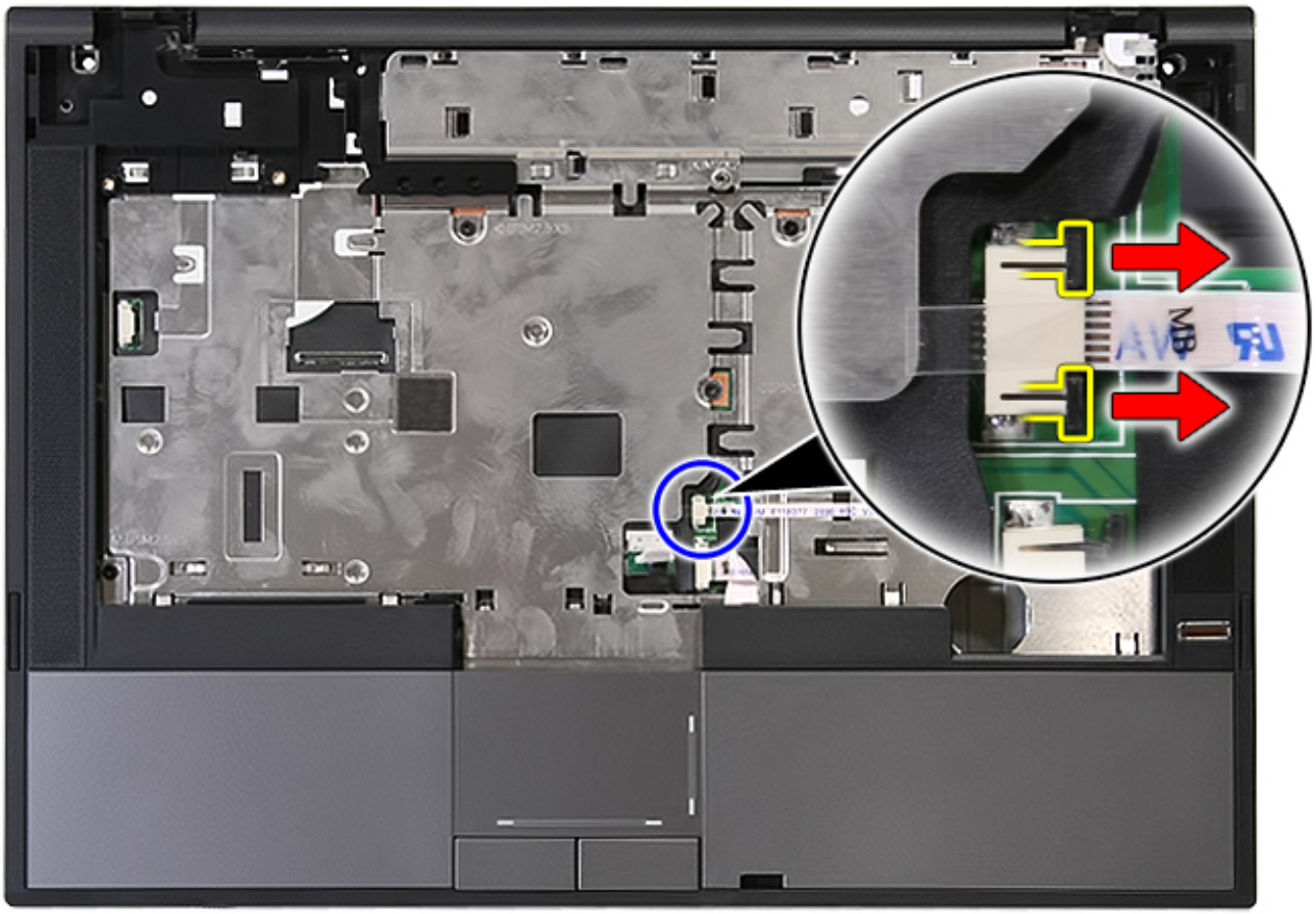
12. Remove the screws securing the palm rest to the computer.



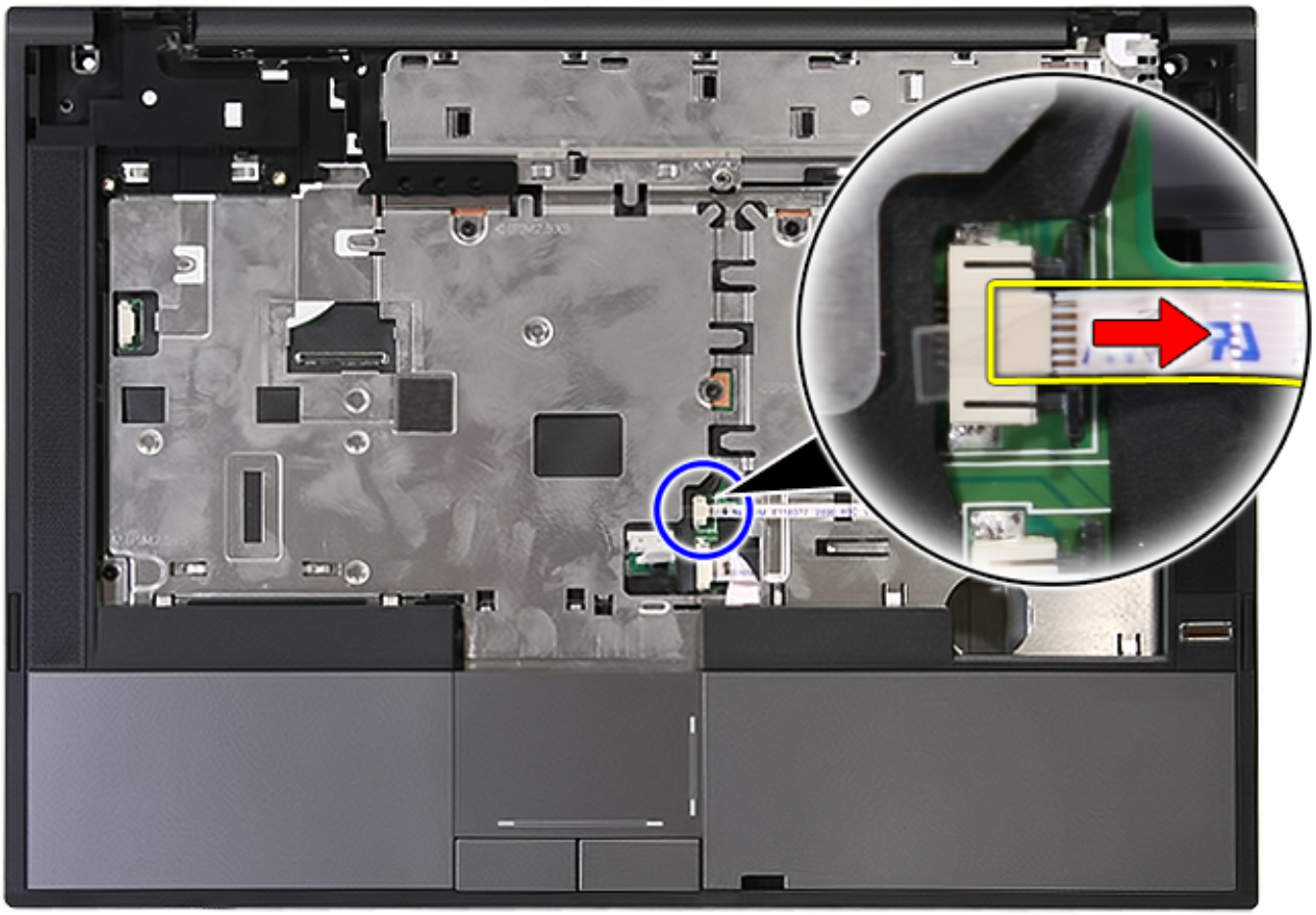
13. Disconnect the speaker cable from the system board.



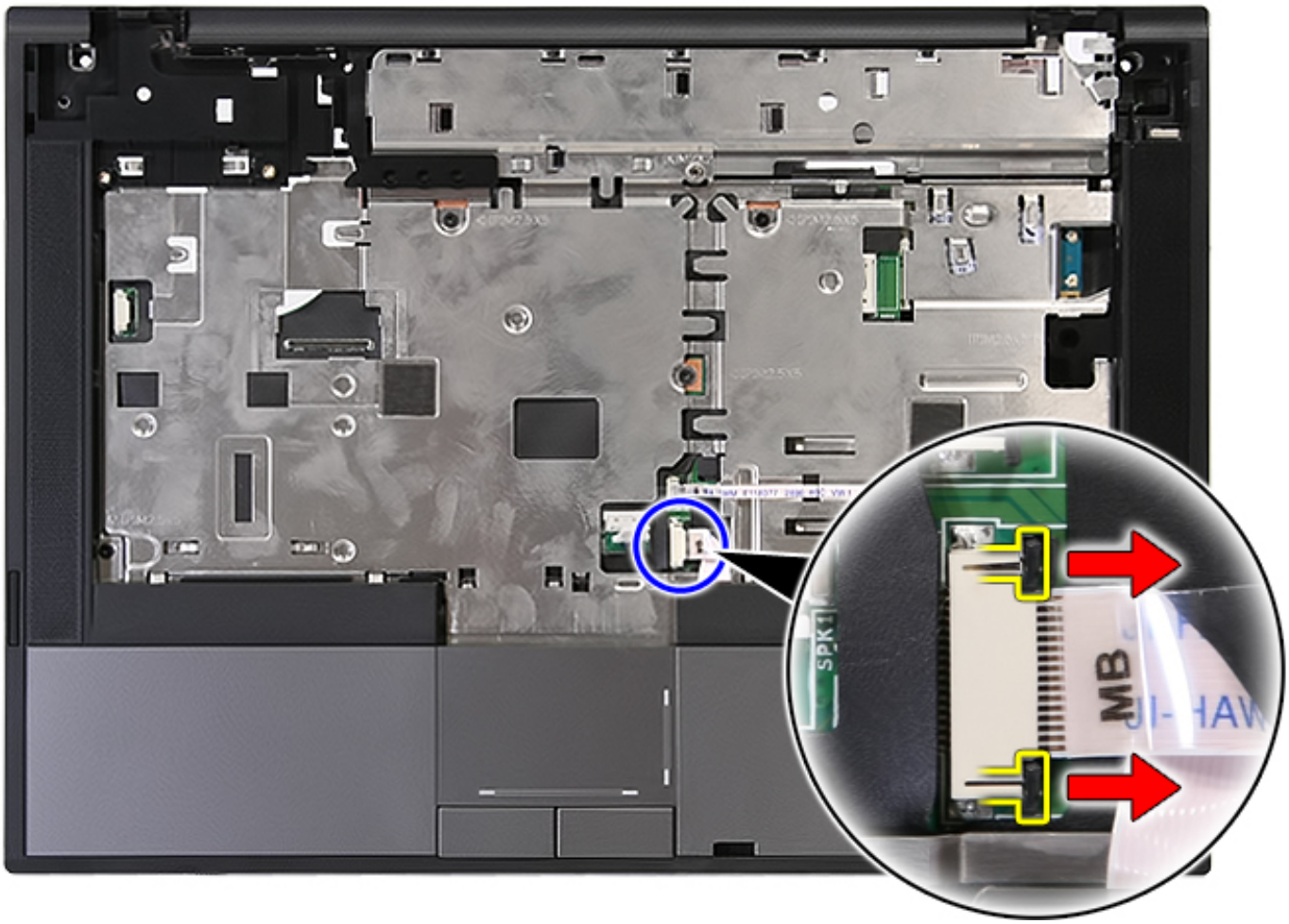
14. Release the latch securing the fingerprint reader data cable.



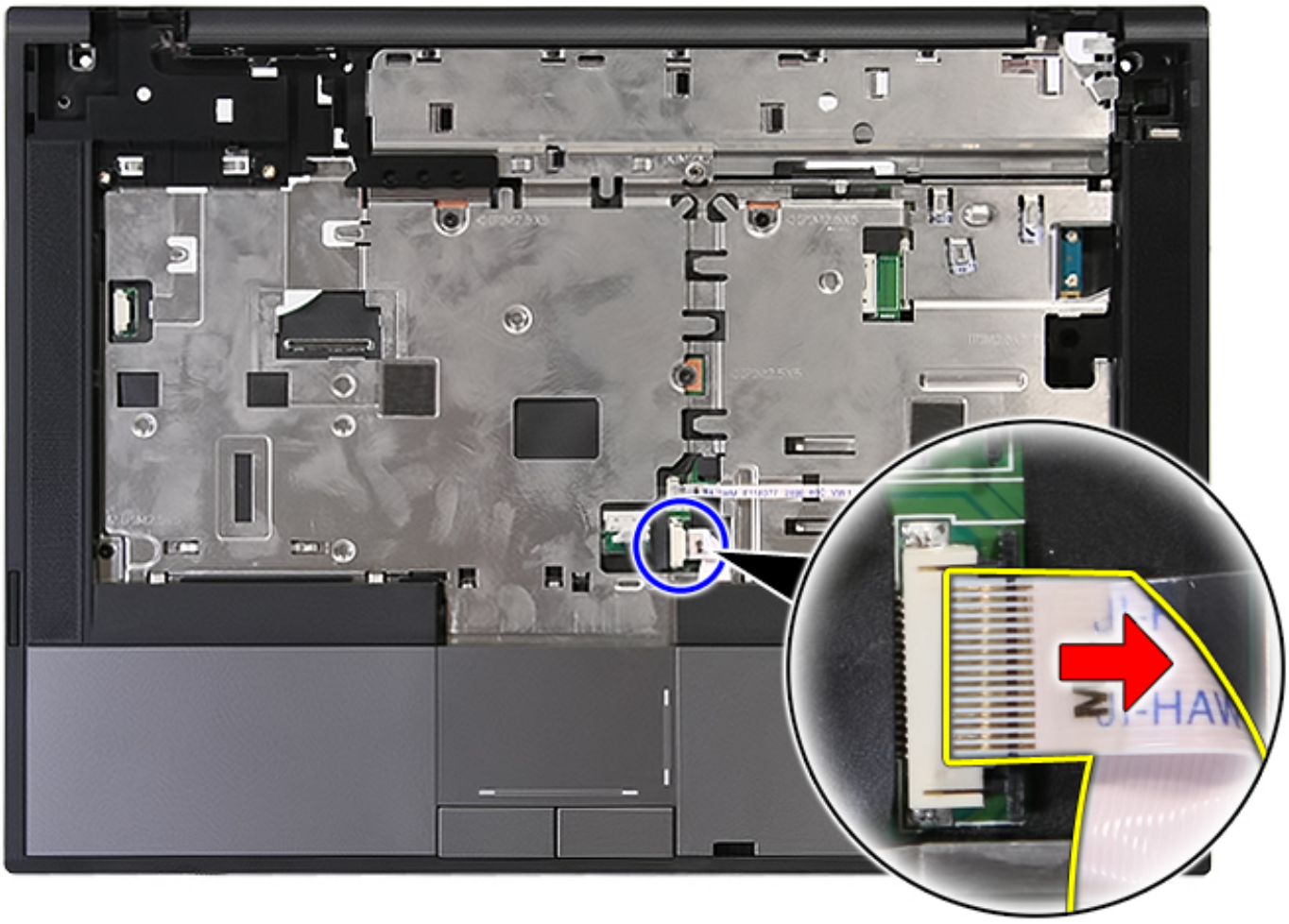
15. Disconnect the fingerprint reader data cable.



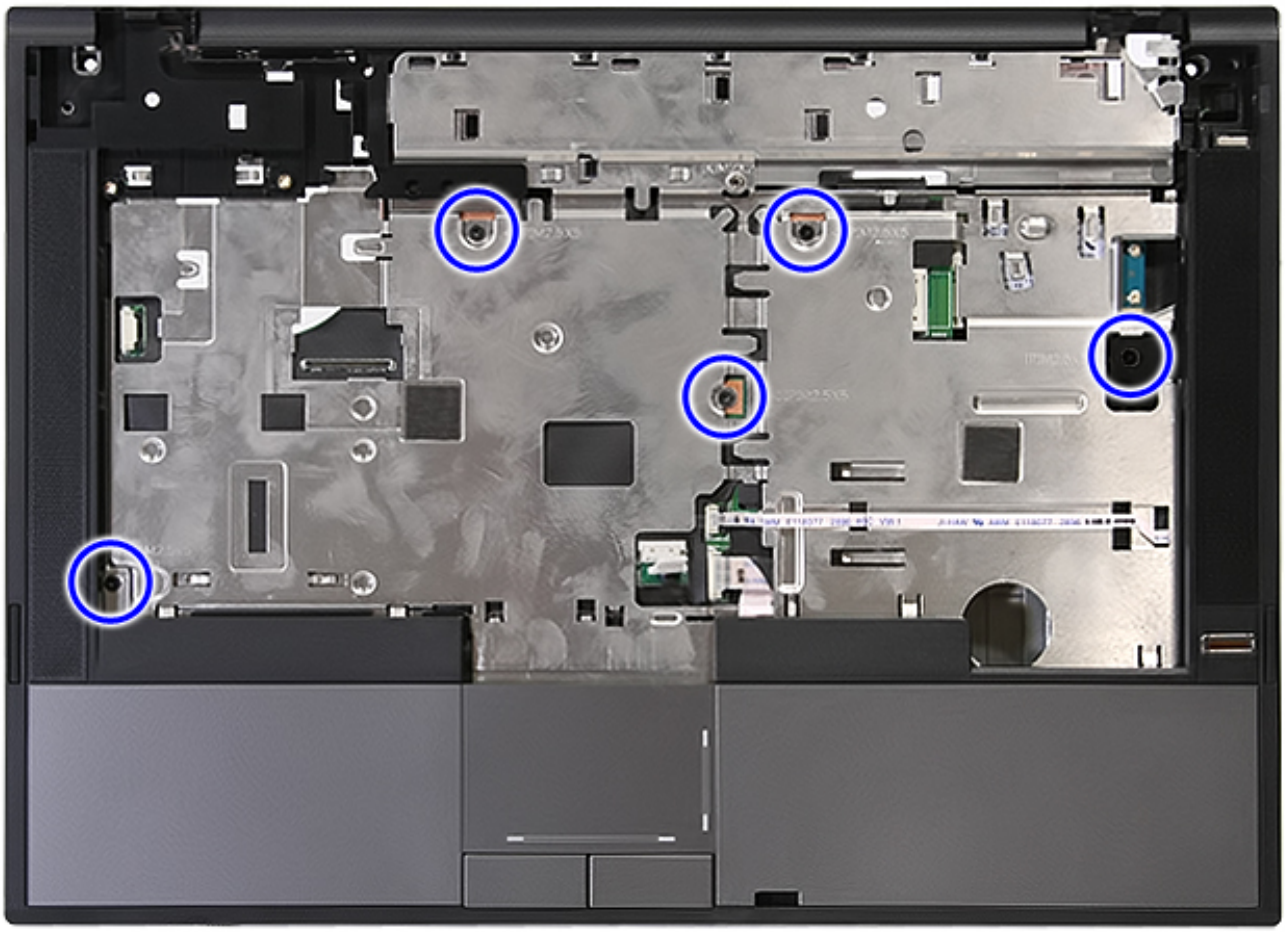
16. Release the latch securing the touchpad data cable.



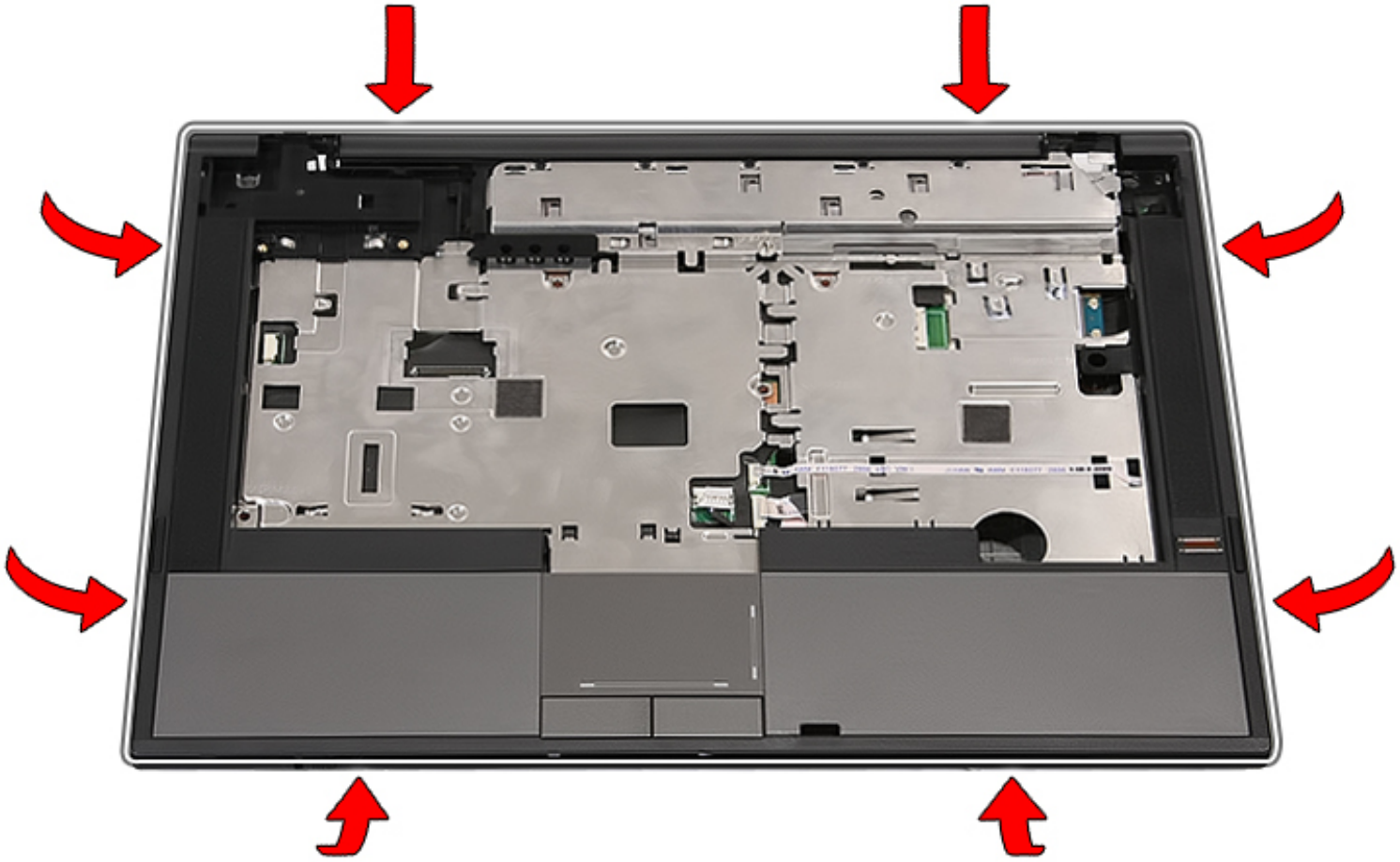
17. Disconnect the touchpad data cable.



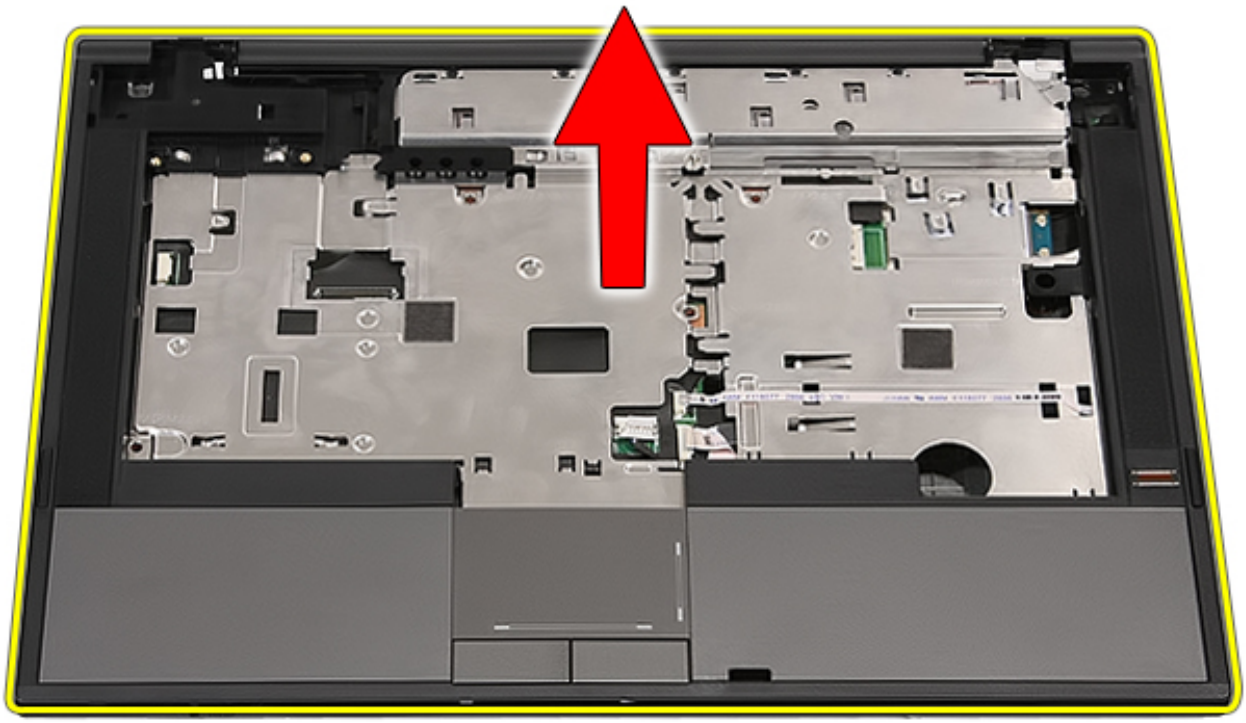
18. Remove the screws securing the palm rest to the computer.



19. Gently pry along the edges of the palm rest.



20. Lift up the palm rest from the computer and remove it.



Replacing the Palm Rest

To replace the palm rest, perform the above steps in reverse order.

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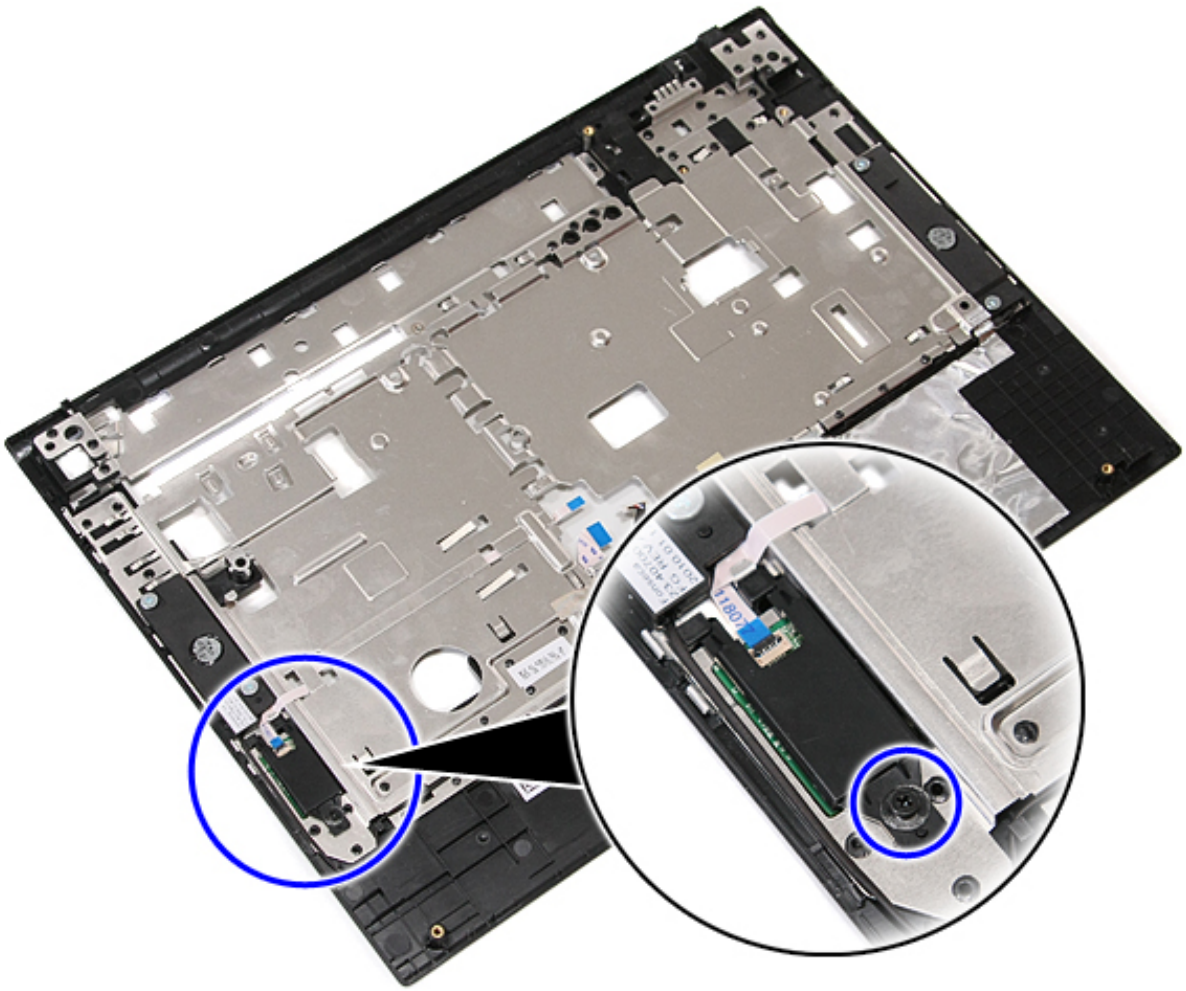
Fingerprint Reader

Dell™ Latitude™ E5410 Discrete Service Manual

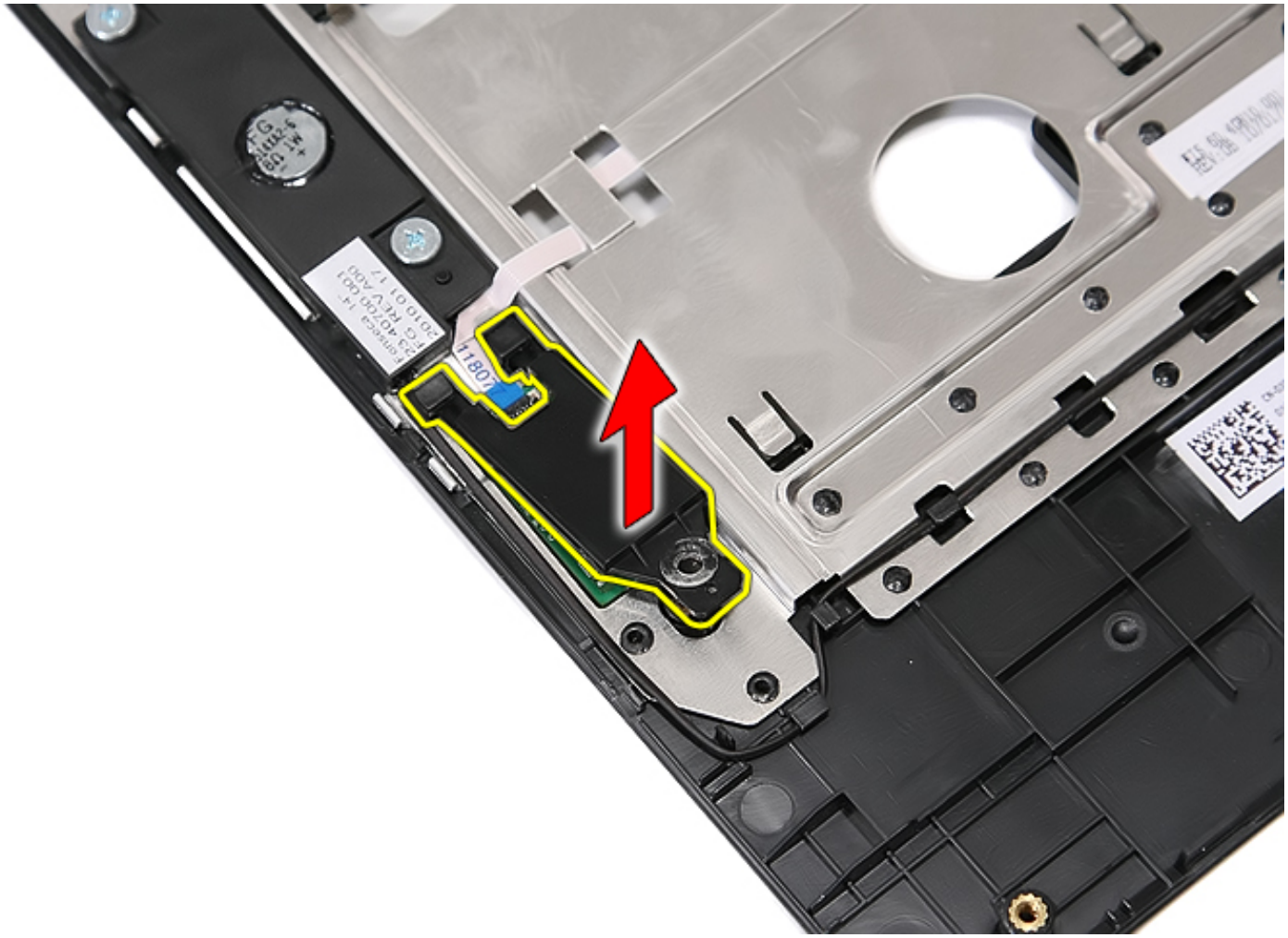
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Removing the Fingerprint Reader

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the optical drive from the computer.
5. Remove the LED cover from the computer.
6. Remove the keyboard from the computer.
7. Remove the display assembly from the computer.
8. Remove the LED board from the computer.
9. Remove the palm rest from the computer.
10. Remove the screw that secures the fingerprint reader to the palm rest.



11. Lift up the fingerprint reader cover at an angle and remove.



12. Open the fingerprint reader data cable-securing clip.

13. Disconnect the fingerprint reader data cable.

14. Lift up the fingerprint reader board and remove it.

Replacing the Fingerprint Reader

To replace the fingerprint reader, perform the above steps in reverse order.

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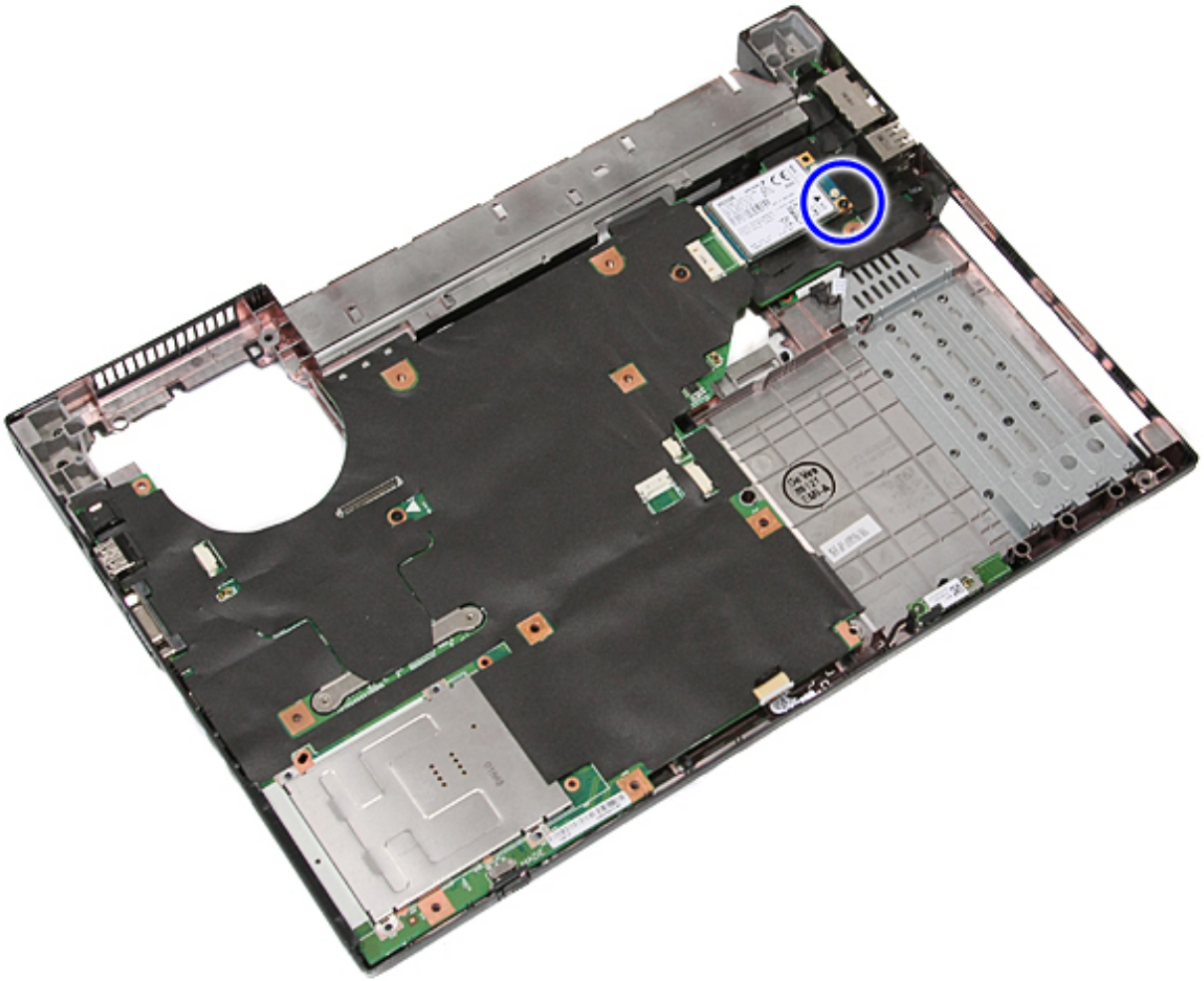
Wireless Wide Area Network (WWAN) Card

Dell™ Latitude™ E5410 Discrete Service Manual

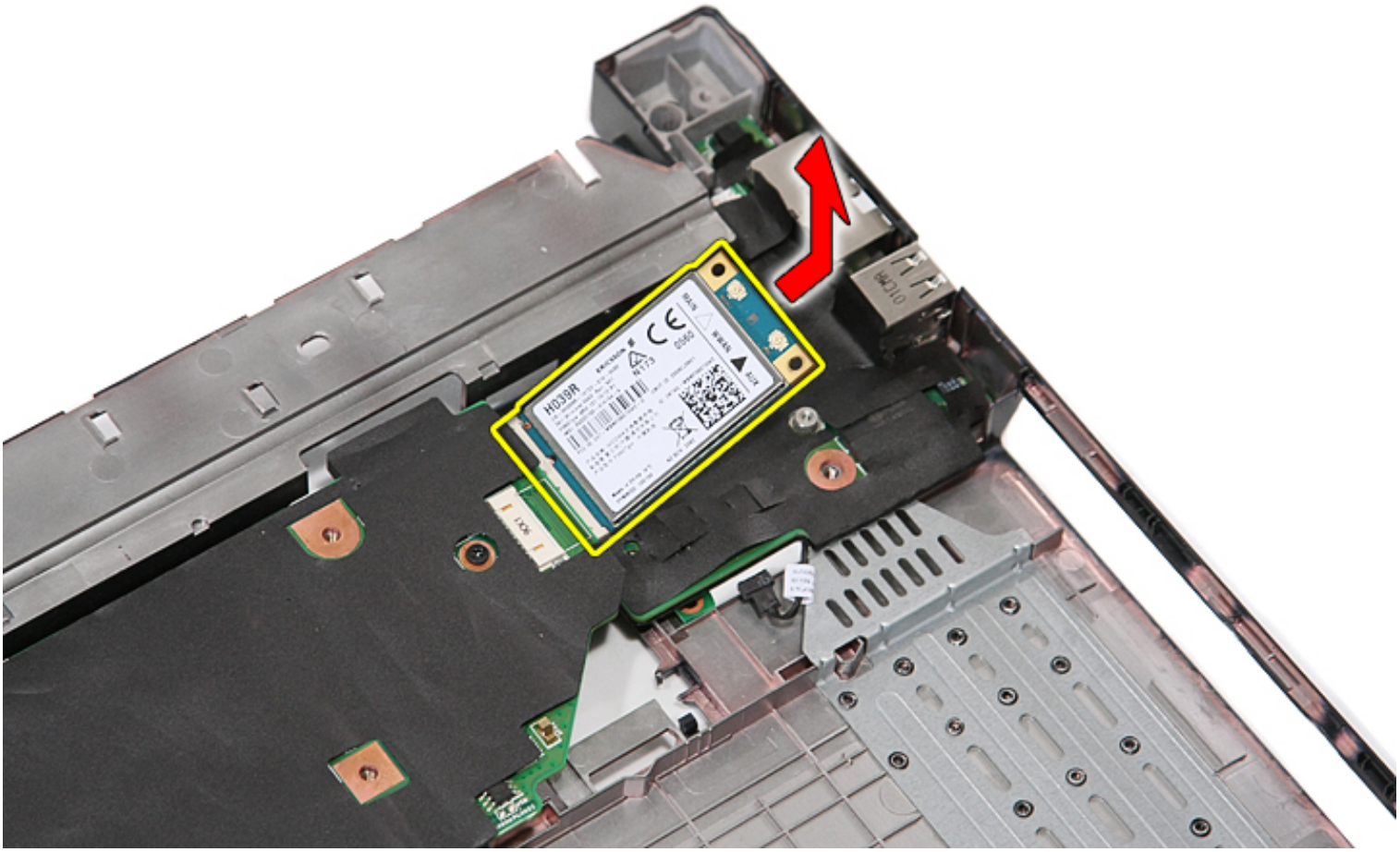
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Removing the WWAN Card

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the optical drive from the computer.
5. Remove the LED cover from the computer.
6. Remove the keyboard from the computer.
7. Remove the display assembly from the computer.
8. Remove the LED board from the computer.
9. Remove the palm rest from the computer.
10. Remove the screw that secures the WWAN card to the computer.



11. Remove the WWAN card from the computer.



Replacing the WWAN Card

To replace the WWAN card, perform the above steps in reverse order.

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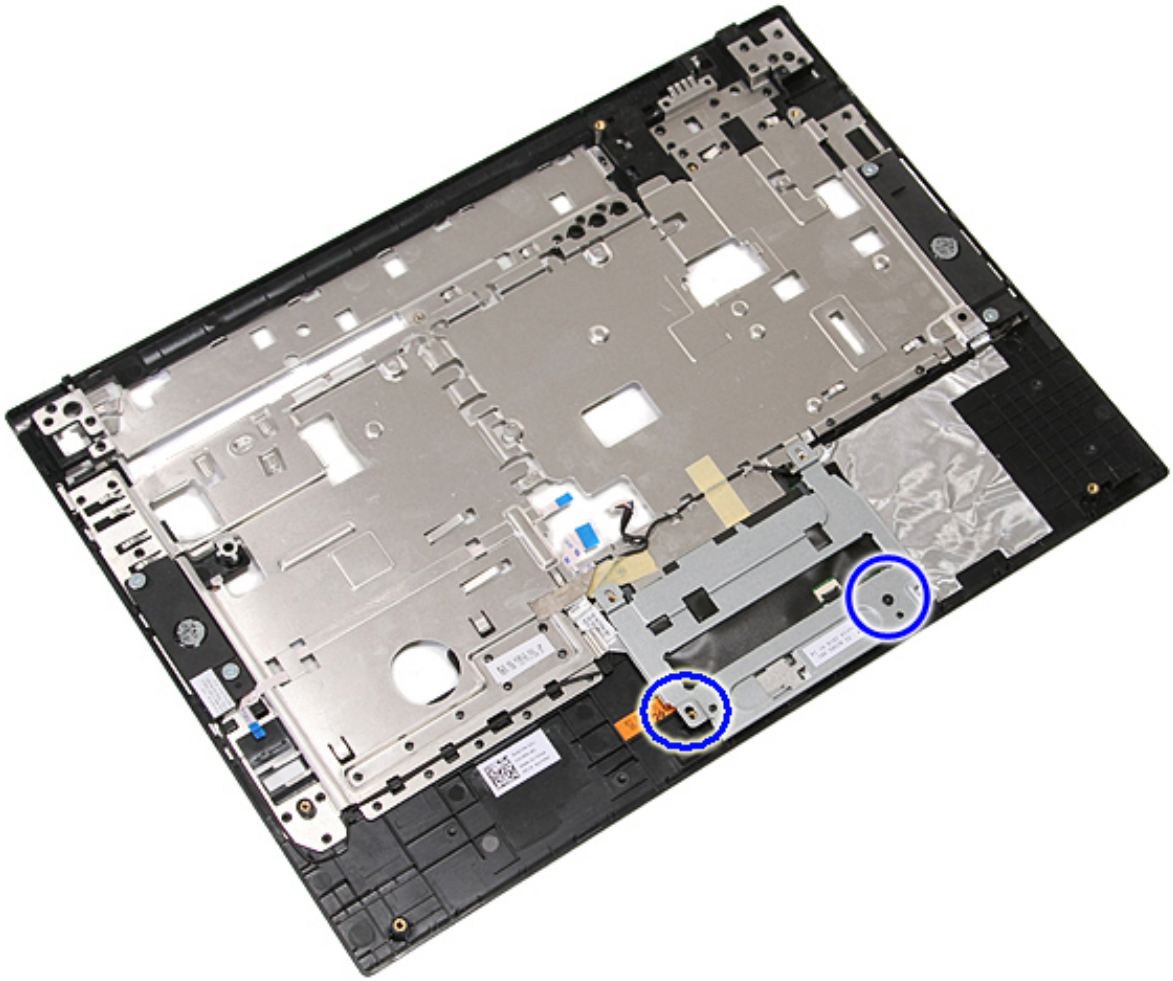
Speakers

Dell™ Latitude™ E5410 Discrete Service Manual

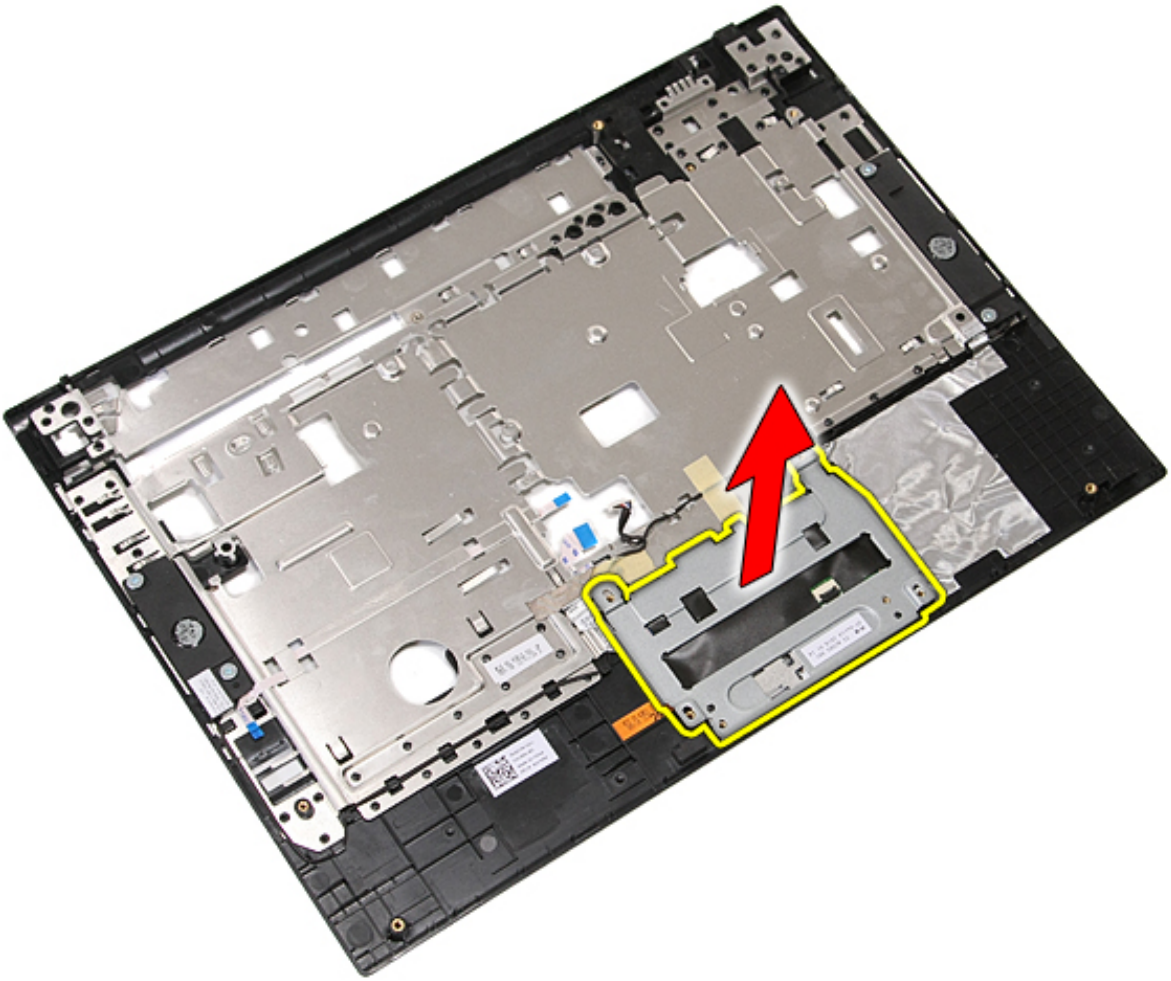
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Removing the Speakers

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the optical drive from the computer.
5. Remove the LED cover from the computer.
6. Remove the keyboard from the computer.
7. Remove the display assembly from the computer.
8. Remove the LED board from the computer.
9. Remove the palm rest from the computer.
10. Remove the fingerprint reader from the computer.
11. Remove the screws securing the touchpad cover bracket to the palm rest.

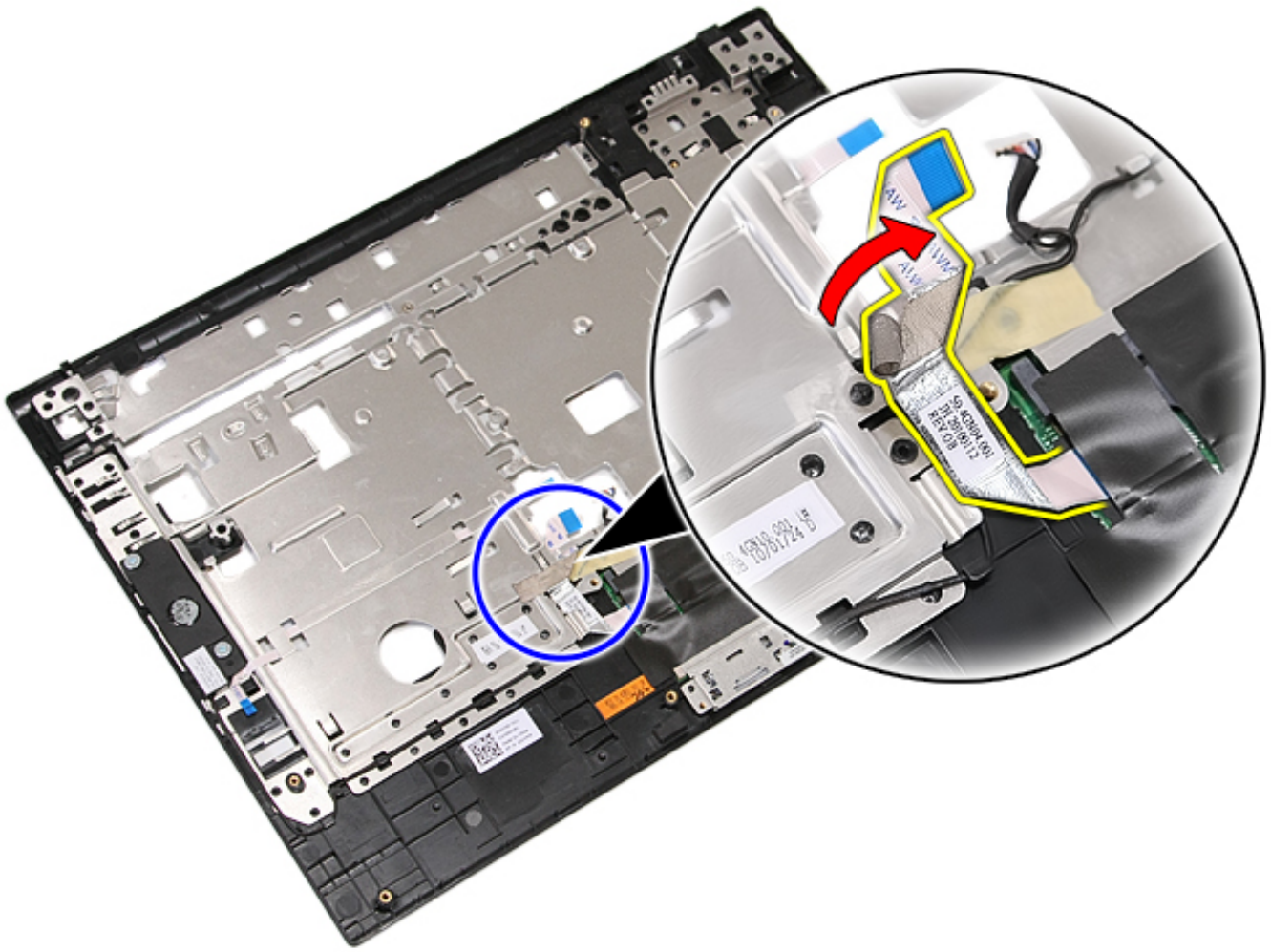


12. Lift up the touchpad cover bracket and remove it.

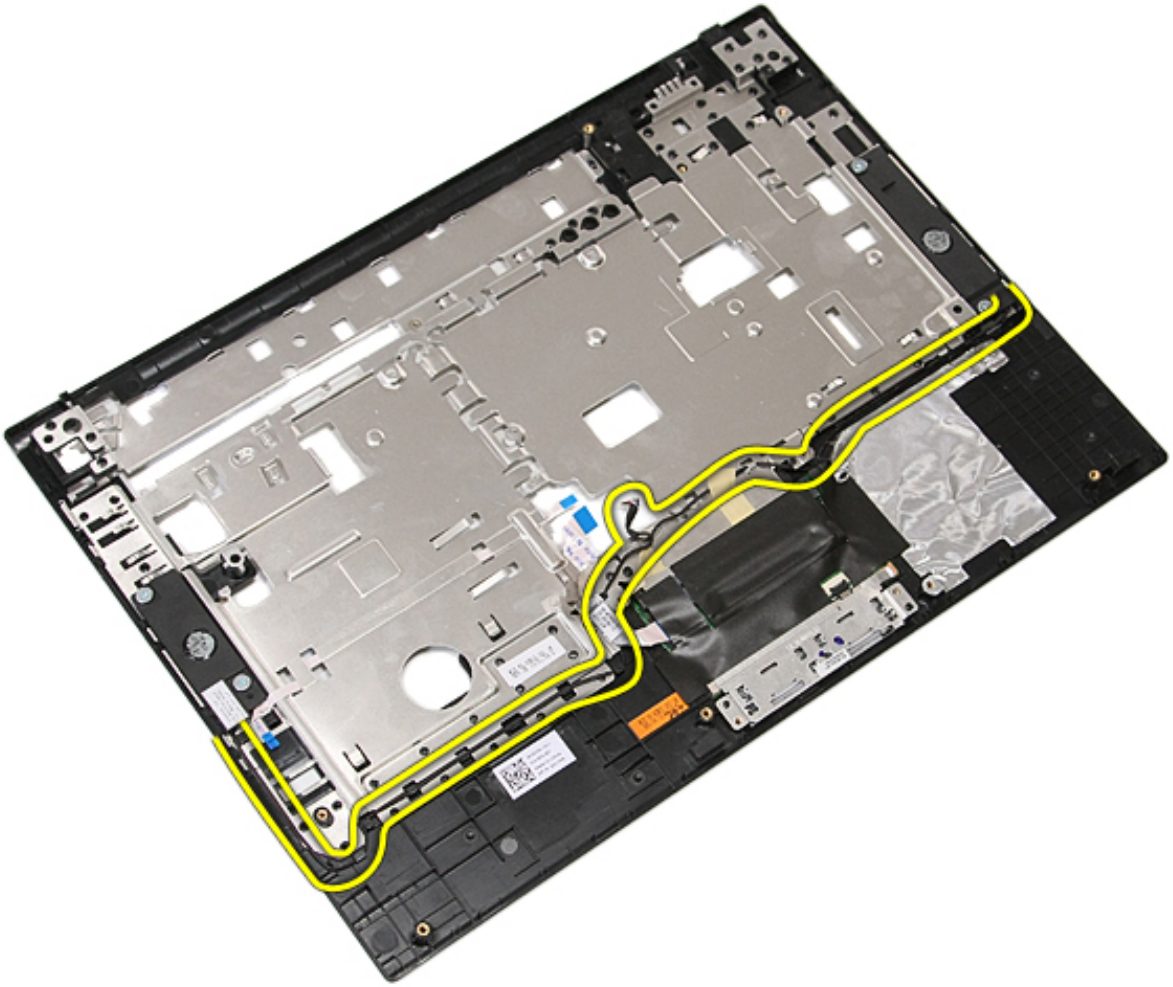


13. Peel open the tapes securing the speaker cables to the palm rest.

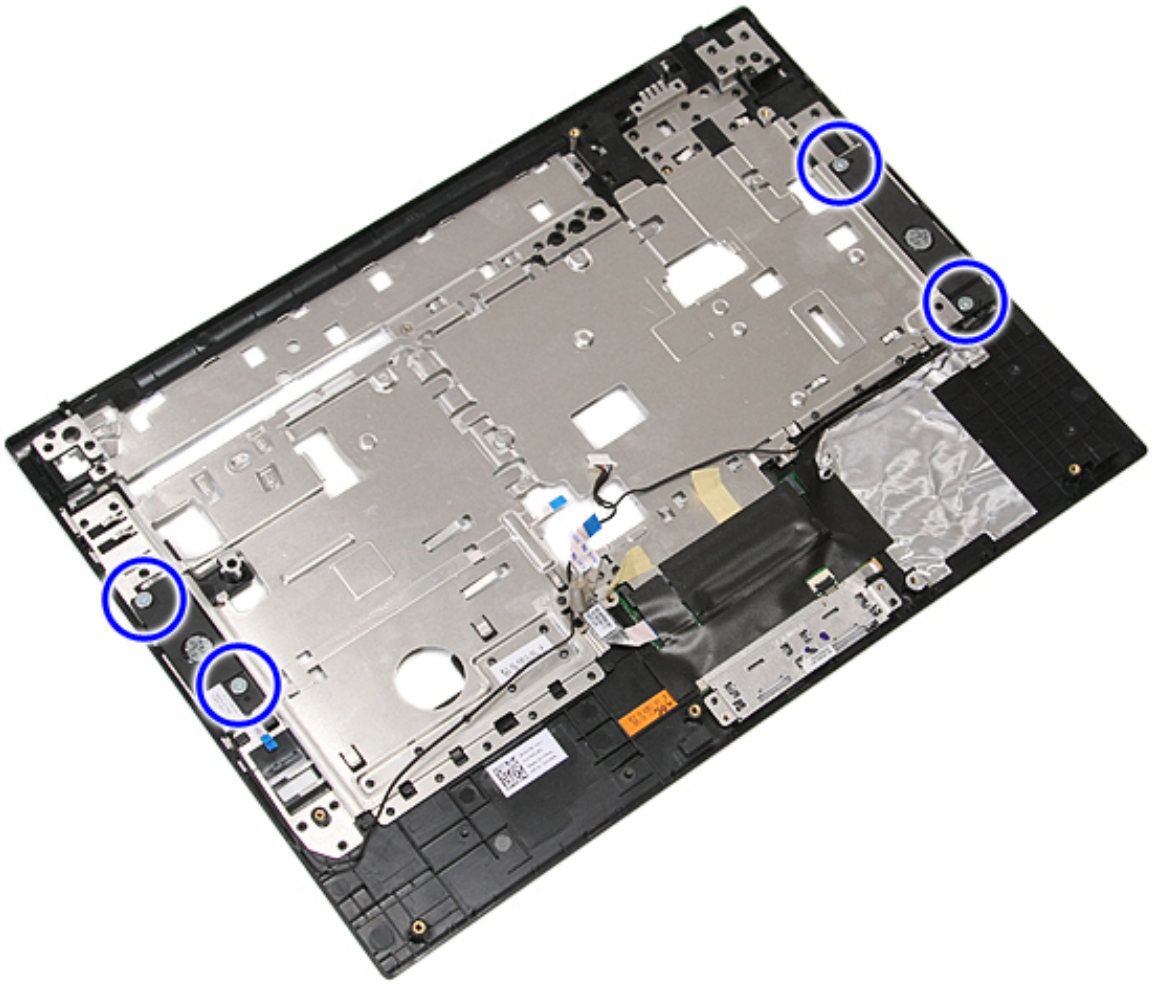
14. Peel open the tape securing the touchpad data cable to the palm rest, and pull out the cable from the hole.



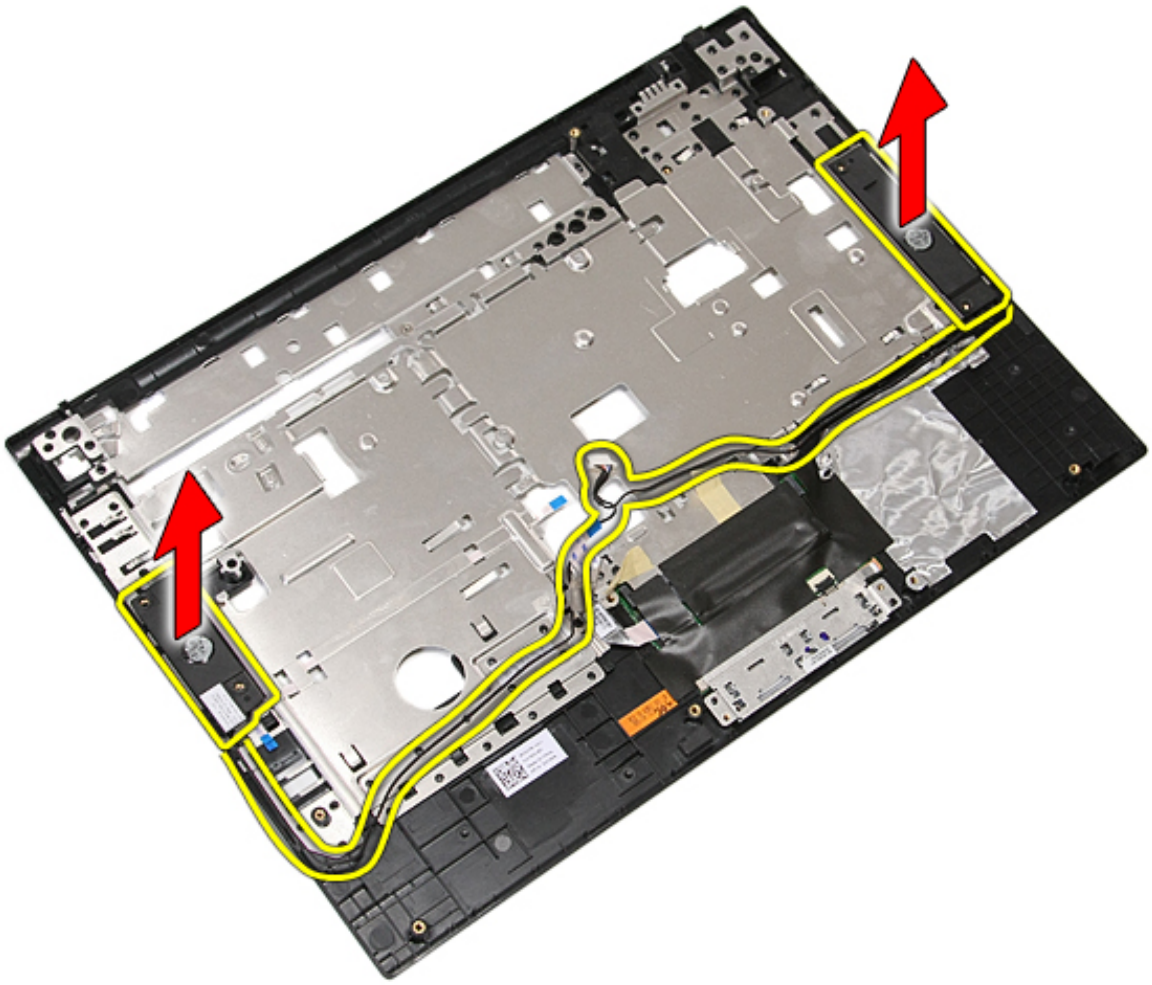
15. Release the speaker cables from the routing path.



16. Remove the screws securing the left and right speakers to the palm rest.



17. Lift up the left and right speakers and remove them.



Replacing the Speakers

To replace the speakers, perform the above steps in reverse order.

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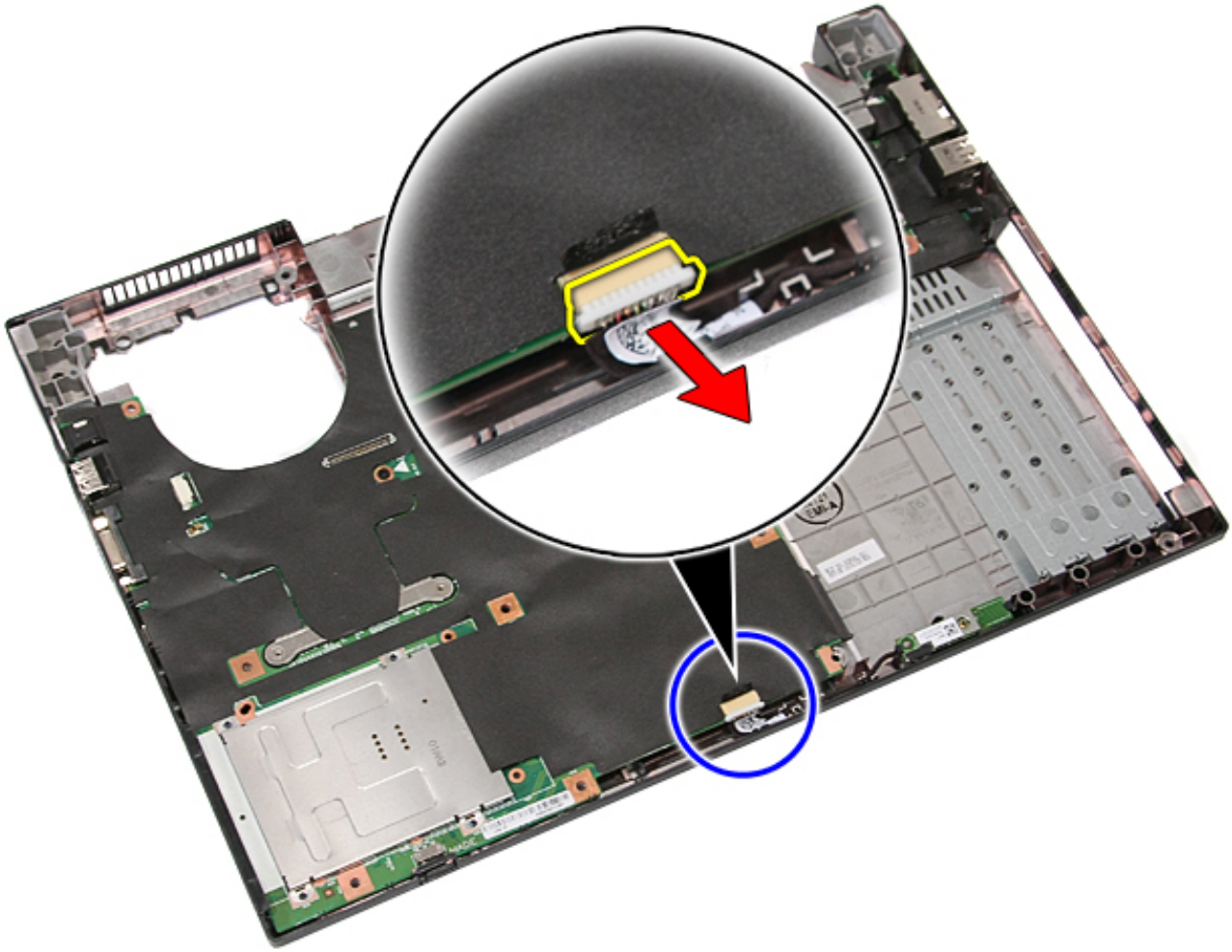
Bluetooth Board

Dell™ Latitude™ E5410 Discrete Service Manual

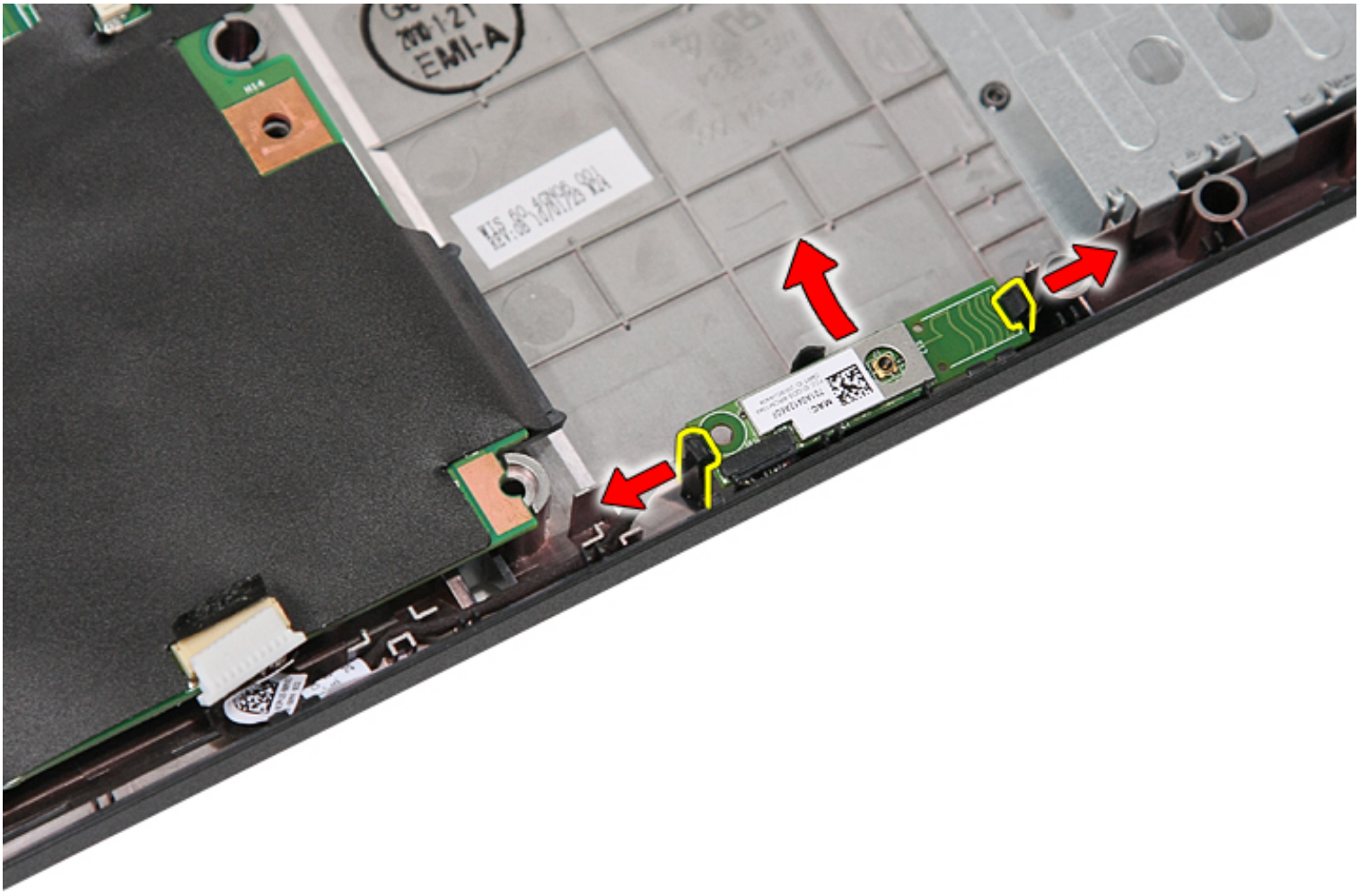
WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Removing the Bluetooth Board

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the optical drive from the computer.
5. Remove the LED cover from the computer.
6. Remove the keyboard from the computer.
7. Remove the display assembly from the computer.
8. Remove the LED board from the computer.
9. Remove the palm rest from the computer.
10. Disconnect the Bluetooth board cable.



11. Release the Bluetooth board from the latches and remove it.



Replacing the Bluetooth Board

To replace the Bluetooth board, perform the above steps in reverse order.

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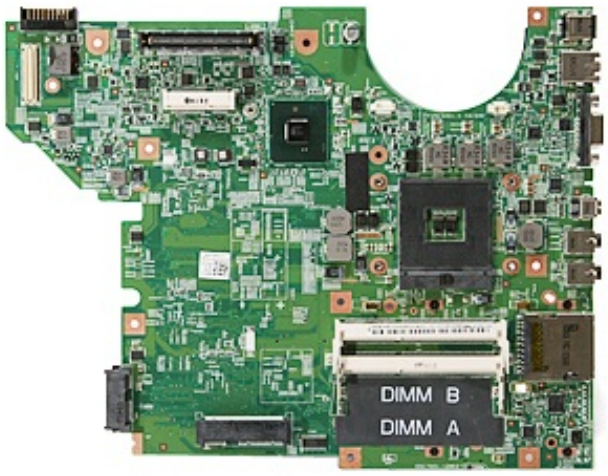
System Board

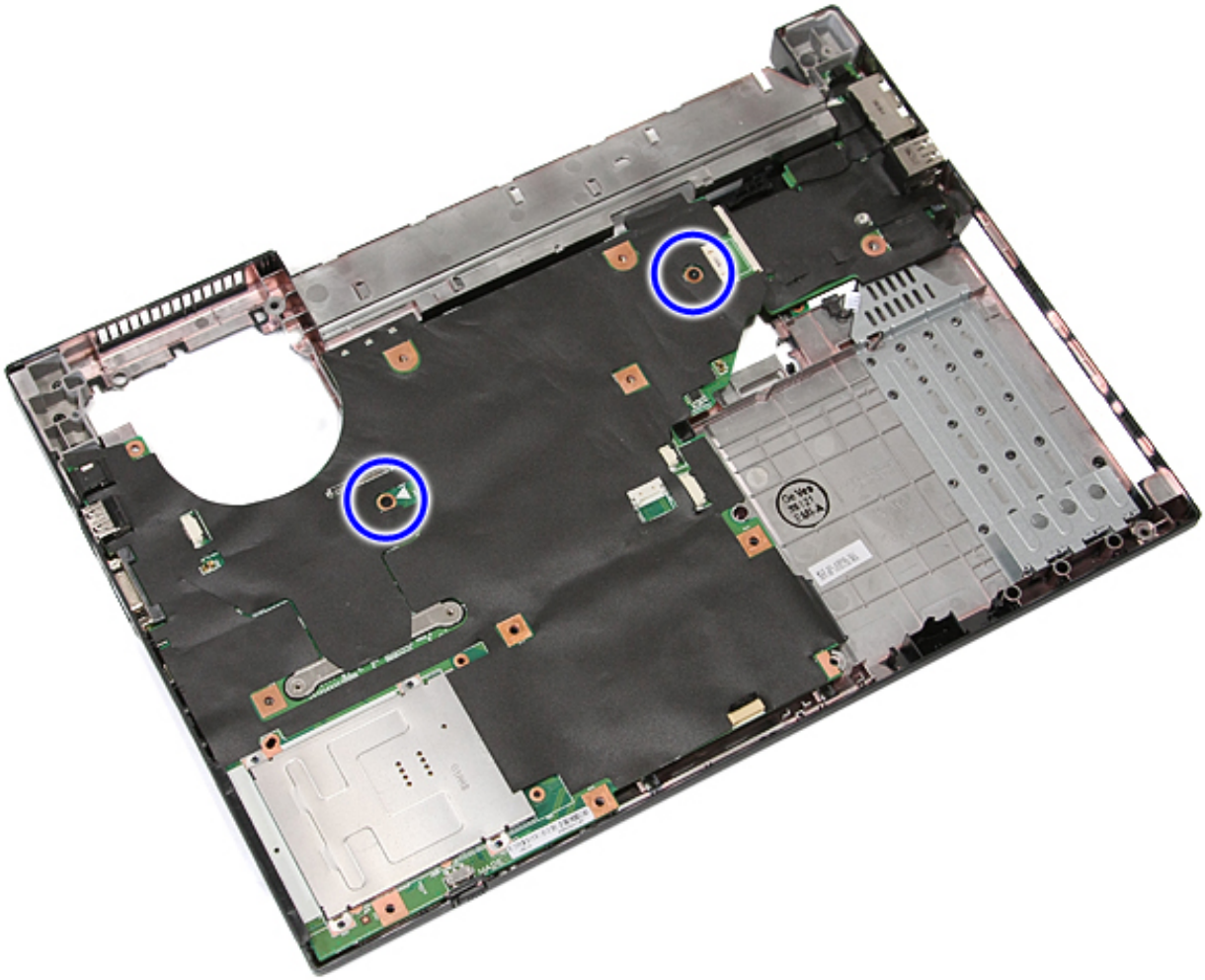
Dell™ Latitude™ E5410 Discrete Service Manual

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.

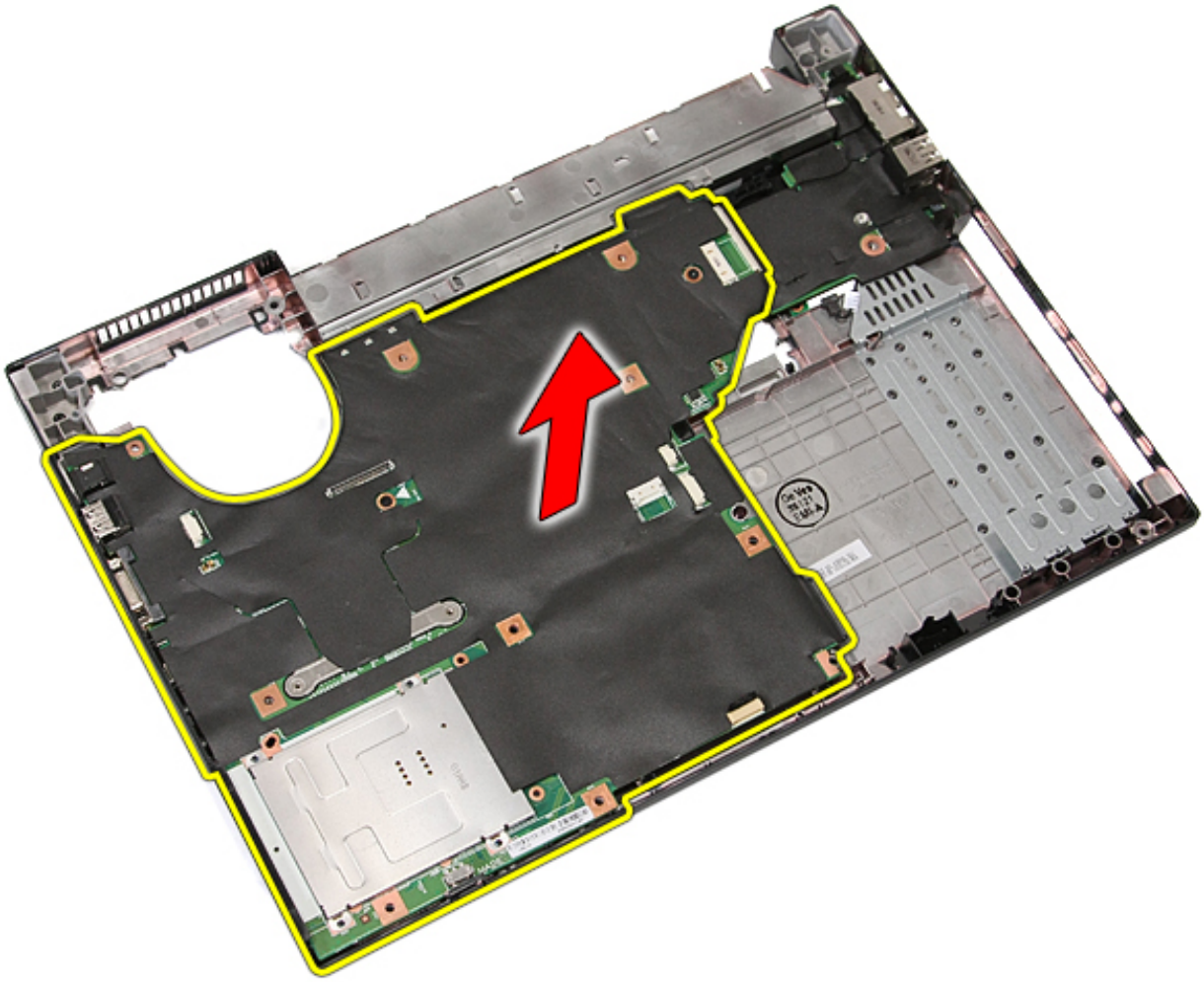
Removing the System Board



1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the memory card from the computer.
3. Remove the phone SIM from the computer.
4. Remove the battery from the computer.
5. Remove the access panel from the computer.
6. Remove the hard drive from the computer.
7. Remove the optical drive from the computer.
8. Remove the WLAN card from the computer.
9. Remove the coin-cell battery from the computer.
10. Remove the fan from the computer.
11. Remove the heat sink from the computer.
12. Remove the LED cover from the computer.
13. Remove the keyboard from the computer.
14. Remove the display assembly from the computer.
15. Remove the LED board from the computer.
16. Remove the palm rest from the computer.
17. Remove the Bluetooth board from the computer.
18. Remove the screws that secure the system board to the computer chassis.



19. Lift the system board at an angle and remove it.



Replacing the System Board

To replace the system board, perform the above steps in reverse order.

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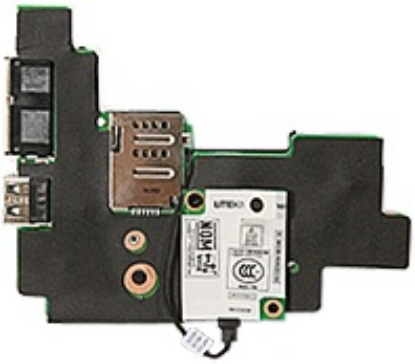
Modem Daughter Card

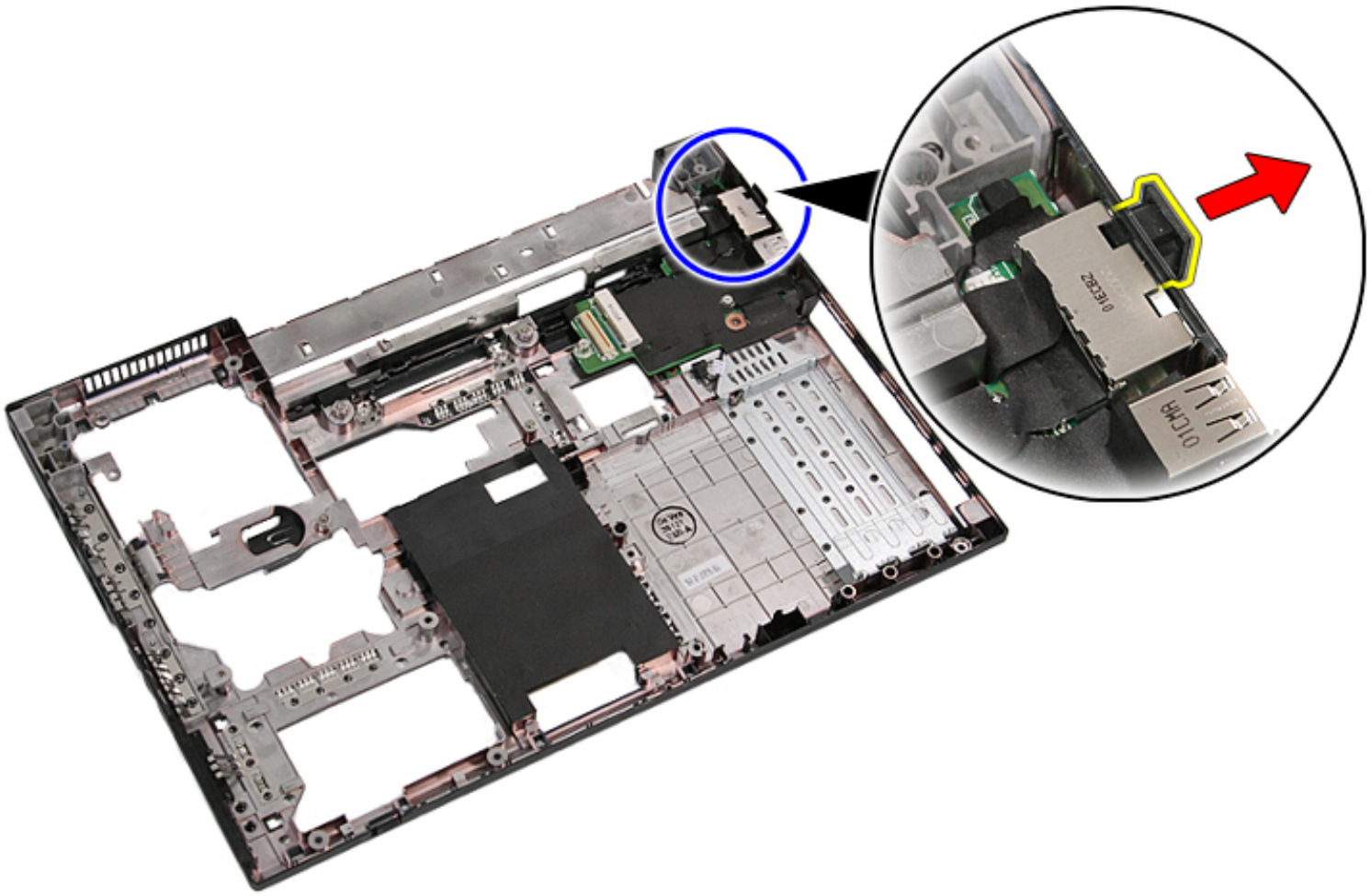
Dell™ Latitude™ E5410 Discrete Service Manual

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.

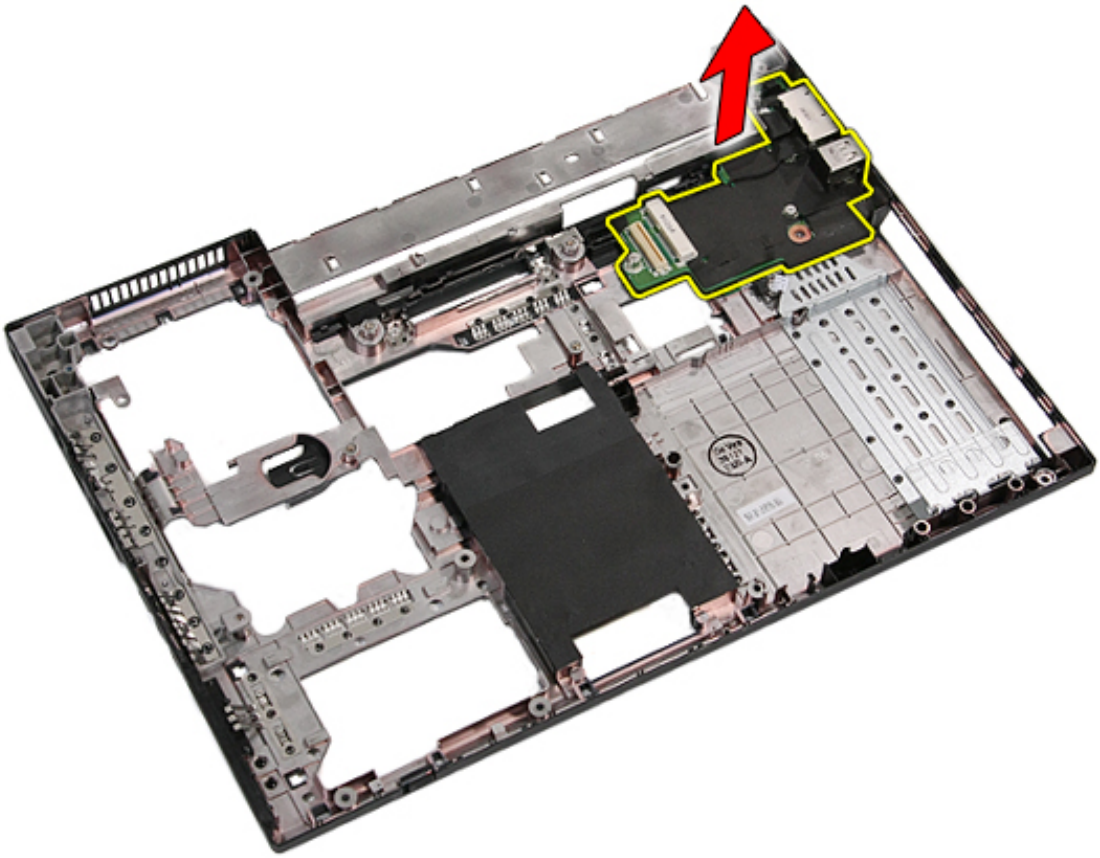
Removing the Modem Daughter Card



1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the memory card from the computer.
3. Remove the phone SIM from the computer.
4. Remove the battery from the computer.
5. Remove the access panel from the computer.
6. Remove the hard drive from the computer.
7. Remove the optical drive from the computer.
8. Remove the WLAN card from the computer.
9. Remove the coin-cell battery from the computer.
10. Remove the fan from the computer.
11. Remove the heat sink from the computer.
12. Remove the LED cover from the computer.
13. Remove the keyboard from the computer.
14. Remove the display assembly from the computer.
15. Remove the LED board from the computer.
16. Remove the palm rest from the computer.
17. Remove the WWAN card from the computer.
18. Remove the Bluetooth board from the computer.
19. Remove the system board from the computer.
20. Remove the modem connector rubber cover if present.



21. Lift up the modem daughter card and remove.



Replacing the Modem Daughter Card

To replace the modem daughter card, perform the above steps in reverse order.

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Specifications

- System Information
- Memory
- Audio
- ExpressCard
- Ports and Connectors
- Display
- Touchpad
- AC Adapter
- Environmental
- Processor
- Video
- Communications
- PC Card
- Fingerprint Reader (Optional)
- Keyboard
- Battery
- Physical

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

System Information	
Chipset	Intel® HM55 Express Chipset
Data bus width	64 bits
DRAM bus width	dual-channel 64 bits **NOTE:** You must install memory in pairs for dual-channel mode to work.

Processor

Types	Intel Core™ i3 series Intel Core i5 series Intel Core i7 series Intel Celeron™
L2 cache	2 MB, 3 MB, and 4 MB

Memory	
Type	DDR3 1333 MHz SDRAM (operating at 1066 MHz)
Connectors	two SODIMM slots
Module capacities	1 GB, 2 GB, and 4 GB
Minimum memory	1 GB
Maximum memory	8 GB **NOTE:** Only 64-bit operating systems can detect memory capacitites greater than 4 GB.

Video	
Type	Intel UMA video
Data bus	integrated video
Controller	Intel Graphics Media Accelerator HD
Output	15-pin video connector

Audio	
Type	four channel high-definition audio (HDA) codec
Controller	IDT 92HD81B
Stereo conversion	24-bit (analog-to-digital and digital-to-analog)
Interfaces	
Internal	high definition audio bus
External	microphone-in/line-in connector and stereo
Speakers	two
Volume controls	volume up, volume down, and mute buttons

Communications	
Modem	internal (optional)
Network adapter	10/100/1000 Mbps Broadcom NetXtreme 5761E Gigabit Ethernet Controller
Wireless	internal wireless local area network (WLAN), wireless wide area network (WWAN), and Bluetooth® wireless support

GPS	autonomous, A-GPS

ExpressCard	
ExpressCard connector	28-pin connector
Cards supported	54 mm, 34 mm with adapter

PC Card	
PC Card connector	80-pin connector
Cards supported	type I card or type II card

Ports and Connectors	
Audio	microphone connector stereo headphone/ speaker connector
Video	15-pin VGA video connector
Network adapter	RJ-45 connector
USB	four USB 2.0-compliant connectors
Memory card reader	3-in-1 memory card reader
IEEE 1394a	4-pin connector
E-family docking connector	144-pin docking connector

Fingerprint Reader (Optional)	
Type	AuthenTec swipe fingerprint sensor

Display	
Type	WXGA anti-glare LED WXGA+anti-glare LED
Active area (X/Y)	320 mm x 207 mm (12.59 inches x 8.14 inches)
Dimensions	
Height	207.00 mm (8.14 inches)
Width	320.00 mm (12.59 inches)
Diagonal	358.14 mm (14.10 inches)
Maximum resolution	
WXGA	1280 pixels x 800 pixels
WXGA+	1440 pixels x 900 pixels
Typical Brightness	
WXGA	220 nits
WXGA+	300 nits

Operating angle	0 degree to 180 degrees
Refresh rate	60 Hz
Minimum Viewing angles	
Horizontal	40 degrees/-40 degrees
Vertical	15 degrees/-30 degrees
Pixel pitch	
WXGA	0.237 mm
WXGA+	0.211 mm

Keyboard	
Number of keys	United States: 83 keys United Kingdom: 84 keys Japan: 87 keys
Layout	QWERTY/AZERTY/Kanji

Touchpad	
Active Area	
X axis	66.82 mm (2.63 inches)
Y axis	44.53 mm (1.75 inches)

Battery	
Type	4-cell "smart" lithium ion (37 WHr) 6-cell "smart" lithium ion (56 WHr) 3-year life-time 9-cell "smart" lithium ion (81 WHr) 9-cell "smart" lithium ion (85 WHr)
Approximate charge time with computer off	2 hours (100% capacity) 1 hour (80% capacity)
Operating time	battery operating time varies depending on operating conditions and can be significantly reduced under certain power-intensive conditions.
Life span	approximately 300 charge or discharge cycles
Dimensions	
Depth	
4- and 6-cell	54.00 mm (2.12 inches)
9-cell	76.00 mm (2.99 inches)
Height	
4- and 6-cell	19.80 mm (0.78 inch)

9-cell	21.10 mm (0.83 inch)
Width	
4- and 6-cell	206.00 mm (8.11 inches)
9-cell	224.00 mm (8.82 inches)
Voltage	
4- and 6-cell	14.8 VDC
9-cell	11.1 VDC
Temperature range	
Operating	0 °C to 35 °C (32 °F to 95 °F)
Storage	–40 °C to 60 °C (–40 °F to 140 ° F)
Coin-cell battery	3 V CR2032 lithium

AC Adapter	
Input voltage	100 VAC–240 VAC
Input current (maximum)	1.50 A
Input frequency	50 Hz–60 Hz
Output power	65 W or 90 W

Output current	
65 W	3.34 A (continuous)
90 W	4.62 A (continuous)
Standard	10.80 A
Rated output voltage	19.50 +/– 1.0 VDC
Dimensions	
65 W	
Height	16.00 mm (0.62 inch)
Width	66.00 mm (2.59 inches)
Length	127.00 mm (4.99 inches)
90 W	
Height	16.00 mm (0.62 inch)
Width	70.00 mm (2.75 inches)
Length	147.00 mm (5.78 inches)
Temperature range	
Operating	0 °C to 35°C (32 °F to 95 °F)

Storage	–40 °C to 65 °C (–40 °F to 149 ° F)

Physical	
Height	33.20 mm (1.31 inches)
Width	338.00 mm (13.31 inches)
Depth	244.00 mm (9.61 inches)
Weight (with 6-cell battery and optical drive)	2.39 kg (5.27 lb)

Environmental	
Temperature range	
Operating	0 °C to 35 °C (32 °F to 95 °F)
Storage	–40 °C to 65 °C (–40 °F to 149 ° F)
Relative humidity (maximum)	
Operating	10% to 90% (noncondensing)
Storage	5% to 95% (noncondensing)
Maximum vibration (measured using a random vibration spectrum that simulates user environment)	

Operating	0.66 Grms (2 Hz–600 Hz)
Storage	1.30 Grms (2 Hz–600 Hz)
Maximum shock (measured with hard drive in head-parked position and a 2 ms half-sine pulse)	
Operating	142 G
Storage	162 G
Altitude (maximum)	
Operating	–15.20 m to 3048 m (–50 ft to 10,000 ft)
Storage	–15.20 m to 10,668 m (–50 ft to 35,000 ft)
Airborne contaminant level	G2 or lower as defined by ANSI/ ISA-S71.04-1985

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Diagnostics

Dell™ Latitude™ E5410 Discrete Service Manual

- Device Status Lights
- Battery Status Lights
- Keyboard Status Lights
- LED Error Codes

Device Status Lights

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.

Turns on when a card with Bluetooth® wireless technology is enabled. To turn off only the Bluetooth wireless technology function, right-click the icon in the system tray and select **Disable Bluetooth Radio**.

Battery Status Lights

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

- **Alternately blinking amber light and blue light** — An unauthenticated or unsupported non-Dell AC adapter is attached to your laptop.
- **Alternately blinking amber light with steady blue 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.
- **Blue light on** — Battery in charge mode with AC adapter present.

Keyboard Status Lights

The green lights located above the keyboard indicate the following:

Turns on when the numeric keypad is enabled.

Turns on when the Caps Lock function is enabled.

Turns on when the Scroll Lock function is enabled.

LED Error Codes

The following table shows the possible LED codes that may display in a no-Power On Self Test (POST) situation.

Appearance	Description	Next Step
ON-FLASH-FLASH	No SODIMMs are installed	1. Install supported memory modules. 2. If memory is already present, reseat the module(s) one at a time in each slot. 3. Try known good memory from another computer or replace the memory. 4. Replace the system board.
FLASH-ON-ON	System board error	1. Reseat the processor. 2. Replace the system board. 3. Replace the processor.

FLASH-ON-FLASH 	LCD panel error	1. Reseat the LCD cable. 2. Replace the LCD panel. 3. Replace the video card/ system board.
OFF-FLASH-OFF 	Memory compatibility error	1. Install compatible memory modules. 2. If two modules are installed, remove one and test. Try the other module in the same slot and test. Test the other slot with both modules. 3. Replace the memory. 4. Replace the system board.
ON-FLASH-ON 	Memory is detected but has errors	1. Reseat the memory. 2. If two modules are installed, remove one and test. Try the other module in the same slot and test. Test the other slot with both modules. 3. Replace the memory. 4. Replace the system board.

OFF-FLASH-FLASH 	Modem error	1. Reseat the modem. 2. Replace the modem. 3. Replace the system board.
FLASH-FLASH-FLASH 	System board error	1. Replace the system board.
FLASH-FLASH-OFF 	Option ROM error	1. Reseat the device. 2. Replace the device. 3. Replace the system board.
OFF-ON-OFF 	Storage device error	1. Reseat the hard drive and optical drive. 2. Test the computer with just the hard drive and just the optical drive. 3. Replace the device that is causing the failure. 4. Replace the system board.
FLASH-FLASH-ON 	Video card error	1. Replace the system board.

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System Setup

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- <F12> Menu
- Entering System Setup
- Boot Menu
- Drive BIOS Quicktest
- Navigation Keystrokes
- System Setup Menu Options

Your computer offers the following BIOS and System Setup options:

- Access System Setup by pressing <F2>
- Bring up a one-time boot menu by pressing <F12>
- Start the Pre-boot System Assessment by pressing <Fn> and the power button

<F12> Menu

Press <F12> when the Dell™ logo appears to initiate a one-time boot menu with a list of the valid boot devices for the computer. **Diagnostics** and **Enter Setup** options are also included in this menu. The devices listed on the boot menu depend on the bootable devices installed in the computer. This menu is useful when you are attempting to boot to a particular device or to bring up the diagnostics for the computer. Making changes in the boot menu does not make any changes to the boot order stored in the BIOS.

Entering System Setup

Press <F2> to enter System Setup and make changes to user-definable settings. If you have trouble entering System Setup using this key, press <F2> when the keyboard lights first flash.

Boot Menu

Your computer features an enhanced one-time boot menu:

- **Easier access**—Access the menu by pressing <F12> during system boot.
- **User prompting**—The missing keystroke is now displayed on the BIOS splash screen.
- **Added diagnostics options**—The boot menu now includes two new options: **IDE Drive Diagnostics** (90/90 hard drive diagnostics) and **Boot to the Utility Partition**.

Drive BIOS Quicktest

The Drive BIOS Quicktest allows you to test the physical functionality of the hard drive without having to locate and download files from **support.dell.com** or make bootable floppies or CDs. Select **IDE Drive Diagnostics** from the boot menu to initiate the test.

Navigation Keystrokes

Use the following keystrokes to navigate the System Setup screens.

Navigation Keystrokes	
Action	**Keystroke**
Expand and collapse field	<Enter>, left- or right-arrow key, or +/–
Expand or collapse all fields	< >
Exit BIOS	<Esc>—Remain in Setup, Save/Exit, Discard/Exit
Change a setting	Left or right-arrow key
Select field to change	<Enter>
Cancel modification	<Esc>
Reset defaults	<Alt><F> or **Load Defaults** menu option

System Setup Menu Options

The following tables describe the menu options for the System Setup BIOS.

General	
Option	**Description**

System Information	This section lists the primary hardware features of your computer. There are no configurable options in this section.
	
	• **System Information**
	  ○ BIOS Version
	  ○ Service Tag
	  ○ Asset Tag
	  ○ Ownership Tag
	  ○ Manufacture Date
	  ○ Ownership Date
	• **Memory Information**
	  ○ Memory Installed
	  ○ Memory Available
	  ○ Memory Speed
	  ○ Memory Channel Mode
	  ○ Memory Technology
	  ○ DIMM A Size
	  ○ DIMM B Size
	• **Processor Information**
	  ○ Processor Type
	  ○ Core Count
	  ○ Processor ID
	  ○ Current Clock Speed
	  ○ Minimum Clock Speed
	  ○ Maximum Clock Speed
	• **Device Information**
	  ○ Primary Hard Drive
	  ○ Modular Bay Device
	  ○ System eSATA Device
	  ○ Dock eSATA Device
	  ○
	  ○ Video Controller
	  ○ Video BIOS Version
	  ○ Video Memory
	  ○ Panel Type
	  ○ Native Resolution
	  ○
	  ○ Audio Controller
	  ○ Modem Controller
	  ○ Wi-Fi Device
	  ○ Cellular Device
	  ○ Bluetooth Device

Battery Information	Indicates the primary battery and the media bay battery status. Also displays the type of AC adapter connected to the computer.

Boot Sequence	The computer attempts to boot from the sequence of devices specified in this list: • Diskette drive • Internal HDD • USB Storage Device • CD/DVD/CD-RW Drive. • Cardbus NIC • Onboard NIC This list specifies the order that the BIOS searches devices when trying to find an operating system to boot. To change the boot order, select the device to be changed in the list then click the up/down arrows or use the keyboard PgUp/PgDn keys to change the boot order of the device. The boot devices can also be de-selected from the list using the checkboxes. This is also where the UEFI boot option can be enabled or disabled.
Date/Time	Displays current date and time settings.

System Configuration	
Option	**Description**
NOTE:	The System Configuration group contains options and settings related to integrated system devices. (Depending on your computer and installed devices, the items listed in this section may or may not appear.)
Integrated NIC	Enables or disables the onboard LAN controller. Default setting: **Enabled w/PXE**
System Management	Controls system management mechanism. The setting options are **Disabled**, **Alert Only**, and **ASF 2.0**. Default setting: **ASF 2.0**
Parallel Port	This field determines how the parallel port on the docking station operates. The setting options are **Disabled**, **AT, PS/2**, and **ECP**. Default setting: **AT**
Serial Port	This field determines how the integrated serial port operates. The settings are **Disabled**, **COM1**, **COM2**, **COM3,** and **COM4**. Default setting: **COM1**

SATA Operation	This option configures the operating mode of the internal SATA hard drive controller. The settings are **Disabled**, **ATA**, and **AHCI**. Default setting: **AHCI**
Miscellaneous Devices	Use the checkboxes to enable/disable the following devices: • Internal Modem • Modular Bay • Media Card, PC Card, and 1394 • External USB Port • Microphone • Camera • eSATA Ports • Hard Drive FreeFall Protection Default setting: **All enabled**.

Video	
Option	**Description**
LCD Brightness	This option (represented by a slider bar for On Battery and On AC) sets the panel brightness when the ambient light sensor is off.

Security	
Option	**Description**
Admin Password	This field lets you set, change, or delete the administrator (admin) password (sometimes called the "setup" password). The admin password enables several security features when set including: • Restricts changes to the settings in Setup. • Restricts the boot devices listed in the <F12> Boot Menu to those enabled in the "Boot Sequence" field. • Prohibits changes to the owner and asset tags. • Substitutes for the system password if the system prompts for a password during power on. Successful changes to this password take effect immediately. If you delete the admin password, the system password is also deleted. Also, the admin password can be used to delete the HDD password. For this reason, you cannot set an admin password if a

	system password or HDD is already set. The admin password must be set first if used in conjunction with a system and/or HDD password.
System Password	This field lets you set, change, or delete the system password (previously called the "Primary" password).
Internal HDD Password	This field lets you set, change, or delete the password on the system's internal hard disk drive (HDD). Successful changes take place immediately and require a system restart. The HDD password travels with the hard drive, so the HDD is protected even when installed in another system.
Password Bypass	This option lets you bypass the system and internal HDD password prompts during a system restart or when resuming from a standby state. Settings are **Disabled** and **Reboot Bypass.** The system will always prompt for the set system and internal HDD password when powered on from an off state (cold boot).
Password Change	This option lets you determine whether changes to the System and HDD passwords are permitted when an Admin password is set. Use the checkbox to allow or disallow changes.
TPM Security	This option lets you control whether the Trusted Platform Module (TPM) in the system is enabled and visible to the operating system. When disabled (checkbox is empty), the BIOS will not turn on the TPM during POST. The TPM will be non-functional and invisible to the operating system. When enabled (check box filled), the BIOS will turn the TPM on during POST so it can be used by the operating system. Disabling this option does not change any settings you may have made to the TPM, nor does it delete or change any information or keys you may have stored there. It simply turns off the TPM so that it cannot be used. When you re-enable the TPM, it will function exactly as it did before it was disabled. Once TPM is enabled (checkbox filled), the available settings are: **Deactivate**, **Activate**, and **Clear**. With the TPM in **Deactivate** mode it will not execute any commands that use the resources of the TPM, nor will it allow any access to stored owner information. The **Clear** setting allows the owner information stored in the TPM to be cleared. Use this to restore the TPM to its default state if you lose or forget the owner authentication data.

Computrace®	This field lets you activate or disable the BIOS module interface of the optional Computrace software. The settings are **Deactivate**, **Disable**, and **Activate**. The Activate and Disable options will permanently activate or disable the feature and no further changes will be allowed.
CPU XD Support	This field enables or disables the Execute Disable mode of the processor. Use the checkbox to enable / disable this feature. Default setting: **Enabled**
Non-Admin Setup Changes	This option lets you determine whether changes to the setup option are permitted when an administrator password is set. If disabled, the setup option is locked by the admin password. It cannot be modified unless setup is unlocked. Use the checkboxes to allow / deny access to the Wi-Fi Catcher Changes and / or Wireless Switch Changes within the system setup.
Password Configuration	These fields control the minimum and maximum number of characters allowed for Admin and System passwords. Changes to these fields are not active until they are committed via the apply button or saving changes before exiting setup.
Admin Setup Lockout	This option lets you prevent users from entering Setup when an Admin password is set. Default setting: **Disabled**

Performance	
Option	**Description**
Multi Core Support	Use the checkbox to enable / disable multi core support for the CPU.
HDD Acoustic Mode	This option allows you to optimize your HDD's performance and acoustic noise level based on your personal preferences. Settings are **Bypass**, **Quiet**, and **Performance**.
Intel® SpeedStep	Use the checkbox to enable / disable mode for the CPU.

Power Management	
Option	**Description**
Wake on AC	Use the checkbox to enable / disable the computer to power up from the off or hibernation state when an AC adapter is inserted.

Auto On Time	This field sets the number of days, if any, when you would like the system to turn on automatically. The settings are **Disabled**, **Everyday**, or **Weekdays**. Default setting: **Off**
USB Wake Support	Use the checkbox to enable / disable the ability for USB devices to wake the system from Standby. This feature is only functional when the AC power adapter is connected. If the AC power adapter is removed during Standby, the BIOS will remove power from all of the USB ports to conserve battery power.
Wake on LAN / WLAN	This field allows the computer to power up from the off state when triggered by a special LAN signal or from Hibernate state when triggered by a special wireless LAN signal. Wake-up from the Standby state is unaffected by this setting and must be enabled in the operating system. • **Disabled** — Does not allow the system to power on when it receives a wake-up signal from the LAN or wireless LAN. • **LAN Only** — Allows the system to be powered on by special LAN signals. • **WLAN Only** — Allows the system to be powered on by special WLAN signals. • **LAN or WLAN** — Allows the system to be powered on by special LAN or wireless LAN signals. The factory default setting is **Off**.
ExpressCharge	This field lets you select how fast the battery will charge. Standard = The battery will charge over a longer period of time. ExpressCharge™ = Dell fast charging technology (not available for all batteries). Default setting: **ExpressCharge**
Charger Behavior	This field lets you enable / disable the battery charger. If disabled, the battery will not lose power when the system is connected to an AC adapter but it will not charge either. Default setting: **Charger Enabled**

POST Behavior	
Option	**Description**

Adapter Warnings	Use the checkbox to enable / disable the BIOS warning messages when you use certain power adapters. The BIOS displays these messages if you attempt to use a power adapter that has too little capacity for your configuration. The factory default setting is **Enabled**.
Keypad (Embedded)	This option lets you choose one of two methods to enable the keypad that is embedded in the internal keyboard. • **Fn Key Only** — The keypad is only enabled when you hold down the <Fn> key. • **By Num Lk** — The keypad is enabled when (1) the Num Lock LED is on and (2) no external keyboard is attached. Note that the system might not notice immediately when an external keyboard is detached. When Setup is running, this field has no effect—Setup works in the FN Key Only mode. The factory default setting is **Fn Key Only**.
Mouse/Touchpad	This option defines how the system handles mouse and touchpad input. • **Serial Mouse** — Use a serial mouse and disable the internal touchpad. • **PS/2 Mouse** — Disable the integrated touchpad when an external PS/2 mouse is present. • **Touchpad-PS/2** — Leave the integrated touchpad enabled when an external PS/2 mouse is present. The factory default setting is **Touchpad-PS/2**.
Numlock LED	Use the checkbox to enable / disable the Num Lock LED when the system boots. The factory default setting is **Enabled**.
USB Emulation	This option defines how the BIOS, in the absence of a USB-aware operating system, handles USB devices. USB emulation is always enabled during POST. Use the checkbox to enable / disable this feature. The factory default setting is **Enabled**.

Fn Key Emulation	This field lets you use the <Scroll Lock> key on an external PS/2 keyboard the same way you use the <Fn> key on the computer's internal keyboard. Use the checkbox to enable / disable this feature. USB keyboards cannot emulate the <Fn> key if you are running an ACPI operating system such as Microsoft® Windows® XP. USB keyboards will only emulate the <Fn> key in non-ACPI mode (e.g., when you are running a DOS). The factory default setting is **Enabled**.
Fast Boot	This field can speed up the boot process by bypassing some compatibility steps. • **Minimal** — Boot quickly unless the BIOS has been updated, memory changed, or the previous POST did not complete. • **Thorough** — Do not skip any steps in the boot process. • **Auto** — Allow the operating system to control this setting (this works only when the operating system supports Simple Boot Flag). The factory default setting is **Thorough**.

Virtualization Support	
Option	**Description**
Virtualization	This field specifies whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel® Virtualization Technology. Use the checkbox to enable/disable this feature. The factory default setting is **Enabled**.
VT for Direct I/O	This option specifies whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization Technology for Direct I/O. Use the checkbox to enable/disable this feature. The factory default setting is **Disabled**.

Wireless	
Option	**Description**
Wireless Switch	Use the checkboxes to determine which wireless devices will be controlled by the wireless switch. The available options are **WWAN** and **Bluetooth®**.

Wireless Devices Enable	Use the checkboxes to enable/disable the various wireless devices. The available options are **Internal WWAN** and **Bluetooth.**

Maintenance	
Option	**Description**
Service Tag	This field displays your system's Service Tag. If for some reason the Service Tag was not already set, you can use this field to set it. If a Service Tag has not been set for this system, the computer will automatically bring up this screen when users enter the BIOS. You will be prompted to enter the Service Tag.
Asset Tag	This field allows you to create a system Asset Tag. The field can only be updated if the Asset Tag is not already set.

System Logs	
Option	**Description**
BIOS Events	This field allows you to view and clear BIOS POST events. It includes the date and time of the event as well as the LED code.
DellDiag Events	This field allows you to view the diagnostic results from DellDiags and PSA. It includes the time, date, diagnostic, and version run with the resulting code.
Thermal Events	This field allows you to view and clear thermal events. It includes the date and time as well as the name of the event.
Power Events	This field allows you to view and clear power events. It includes the date and time of the event as well as the power state and reason.

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