Inspiron 27-7700

Service Manual

Regulatory Model: W23C
Regulatory Type: W23C002
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Notes, cautions, and warnings

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

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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1

Safety instructions

Use the following safety guidelines to protect your computer from potential damage and to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that you have read the safety information that shipped with your computer.

NOTE: Before working inside your computer, read the safety information that shipped with your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

NOTE: 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 electrical outlet.

CAUTION: To avoid damaging the computer, ensure that the work surface is flat and clean.

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: You should only perform troubleshooting and repairs as authorized or directed by the Dell technical assistance team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. See the safety instructions that shipped with the product or at www.dell.com/regulatory_compliance.

CAUTION: Before touching anything inside your computer, ground yourself by using a wrist grounding strap or by periodically 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.

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 or thumb-screws that you must disengage before disconnecting the cable. When disconnecting cables, keep them evenly aligned to avoid bending any connector pins. When connecting cables, ensure that the ports and connectors are correctly oriented and aligned.

CAUTION: Press and eject any installed card from the media-card reader.

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

Topics:

- Before working inside your computer
- Electrostatic discharge—ESD protection
- ESD field service kit
- Transporting sensitive components
- After working inside your computer

Before working inside your computer

NOTE: The images in this document may differ from your computer depending on the configuration you ordered.

Before you begin

Steps

1. Save and close all open files and exit all open applications.

2. Shut down your computer. Click **Start** > **Power** > **Shut down**.

   NOTE: If you are using a different operating system, see the documentation of your operating system for shut-down instructions.

3. Disconnect your computer and all attached devices from their electrical outlets.
4. Disconnect all attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.
5. Remove any media card and optical disc from your computer, if applicable.
6. After the computer is unplugged, press and hold the power button for 5 seconds to ground the system board.

   CAUTION: Place the computer on a flat, soft, and clean surface to avoid scratches on the display.

7. Place the computer face down.

Electrostatic discharge—ESD protection

ESD is a major concern when you handle electronic components, especially sensitive components such as expansion cards, processors, memory DIMMs, and system boards. Very slight charges can damage circuits in ways that may not be obvious, such as intermittent problems or a shortened product life span. As the industry pushes for lower power requirements and increased density, ESD protection is an increasing concern.

Due to the increased density of semiconductors used in recent Dell products, the sensitivity to static damage is now higher than in previous Dell products. For this reason, some previously approved methods of handling parts are no longer applicable.

Two recognized types of ESD damage are catastrophic and intermittent failures.

- **Catastrophic** – Catastrophic failures represent approximately 20 percent of ESD-related failures. The damage causes an immediate and complete loss of device functionality. An example of catastrophic failure is a memory DIMM that has received a static shock and immediately generates a "No POST/No Video" symptom with a beep code emitted for missing or nonfunctional memory.
- **Intermittent** – Intermittent failures represent approximately 80 percent of ESD-related failures. The high rate of intermittent failures means that most of the time when damage occurs, it is not immediately recognizable. The DIMM receives a static shock, but the tracing is merely weakened and does not immediately produce outward symptoms related to the damage. The weakened trace may take weeks or months to melt, and in the meantime may cause degradation of memory integrity, intermittent memory errors, etc.

The more difficult type of damage to recognize and troubleshoot is the intermittent (also called latent or "walking wounded") failure.

Perform the following steps to prevent ESD damage:

- Use a wired ESD wrist strap that is properly grounded. The use of wireless anti-static straps is no longer allowed; they do not provide adequate protection. Touching the chassis before handling parts does not ensure adequate ESD protection on parts with increased sensitivity to ESD damage.
- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench pads.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the anti-static packing material until you are ready to install the component. Before unwrapping the anti-static packaging, ensure that you discharge static electricity from your body.
- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

ESD field service kit

The unmonitored Field Service kit is the most commonly used service kit. Each Field Service kit includes three main components: anti-static mat, wrist strap, and bonding wire.

Components of an ESD field service kit

The components of an ESD field service kit are:

- **Anti-Static Mat** – The anti-static mat is dissipative and parts can be placed on it during service procedures. When using an anti-static mat, your wrist strap should be snug and the bonding wire should be connected to the mat and to any bare metal on the system being worked on. Once deployed properly, service parts can be removed from the ESD bag and placed directly on the mat. ESD-sensitive items are safe in your hand, on the ESD mat, in the system, or inside a bag.

- **Wrist Strap and Bonding Wire** – The wrist strap and bonding wire can be either directly connected between your wrist and bare metal on the hardware if the ESD mat is not required, or connected to the anti-static mat to protect hardware that is temporarily placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the ESD mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, mat, and bonding wire. Never use wireless wrist straps. Always be aware that the internal wires of a wrist strap are prone to damage from normal wear and tear, and must be checked regularly with a wrist strap tester in order to avoid accidental ESD hardware damage. It is recommended to test the wrist strap and bonding wire at least once per week.
- **ESD Wrist Strap Tester** – The wires inside of an ESD strap are prone to damage over time. When using an unmonitored kit, it is a best practice to regularly test the strap prior to each service call, and at a minimum, test once per week. A wrist strap tester is the best method for doing this test. If you do not have your own wrist strap tester, check with your regional office to find out if they have one. To perform the test, plug the wrist-strap's bonding-wire into the tester while it is strapped to your wrist and push the button to test. A green LED is lit if the test is successful; a red LED is lit and an alarm sounds if the test fails.
- **Insulator Elements** – It is critical to keep ESD sensitive devices, such as plastic heat sink casings, away from internal parts that are insulators and often highly charged.
- **Working Environment** – Before deploying the ESD Field Service kit, assess the situation at the customer location. For example, deploying the kit for a server environment is different than for a desktop or portable environment. Servers are typically installed in a rack within a data center; desktops or portables are typically placed on office desks or cubicles. Always look for a large open flat work area that is free of clutter and large enough to deploy the ESD kit with additional space to accommodate the type of system that is being repaired. The workspace should also be free of insulators that can cause an ESD event. On the work area, insulators such as Styrofoam and other plastics should always be moved at least 12 inches or 30 centimeters away from sensitive parts before physically handling any hardware components.
- **ESD Packaging** – All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, static-shielded bags are preferred. However, you should always return the damaged part using the same ESD bag and packaging that the new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material should be used in the original box that the new part arrived in. ESD-sensitive devices should be removed from packaging only at an ESD-protected work surface, and parts should never be placed on top of the ESD bag because only the inside of the bag is shielded. Always place parts in your hand, on the ESD mat, in the system, or inside an anti-static bag.
- **Transporting Sensitive Components** – When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

ESD protection summary

It is recommended that all field service technicians use the traditional wired ESD grounding wrist strap and protective anti-static mat at all times when servicing Dell products. In addition, it is critical that technicians keep sensitive parts separate from all insulator parts while performing service and that they use anti-static bags for transporting sensitive components.

Transporting sensitive components

When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

Lifting equipment

Adhere to the following guidelines when lifting heavy weight equipment:

CAUTION: Do not lift greater than 50 pounds. Always obtain additional resources or use a mechanical lifting device.

1. Get a firm balanced footing. Keep your feet apart for a stable base, and point your toes out.
2. Tighten stomach muscles. Abdominal muscles support your spine when you lift, offsetting the force of the load.
3. Lift with your legs, not your back.
4. Keep the load close. The closer it is to your spine, the less force it exerts on your back.
5. Keep your back upright, whether lifting or setting down the load. Do not add the weight of your body to the load. Avoid twisting your body and back.
6. Follow the same techniques in reverse to set the load down.

After working inside your computer

About this task

CAUTION: Leaving stray or loose screws inside your computer may severely damage your computer.

Steps

1. Replace all screws and ensure that no stray screws remain inside your computer.
2. Connect any external devices, peripherals, or cables you removed before working on your computer.
3. Replace any media cards, discs, or any other parts that you removed before working on your computer.
4. Connect your computer and all attached devices to their electrical outlets.
5. Turn on your computer.

2

Removing and installing components

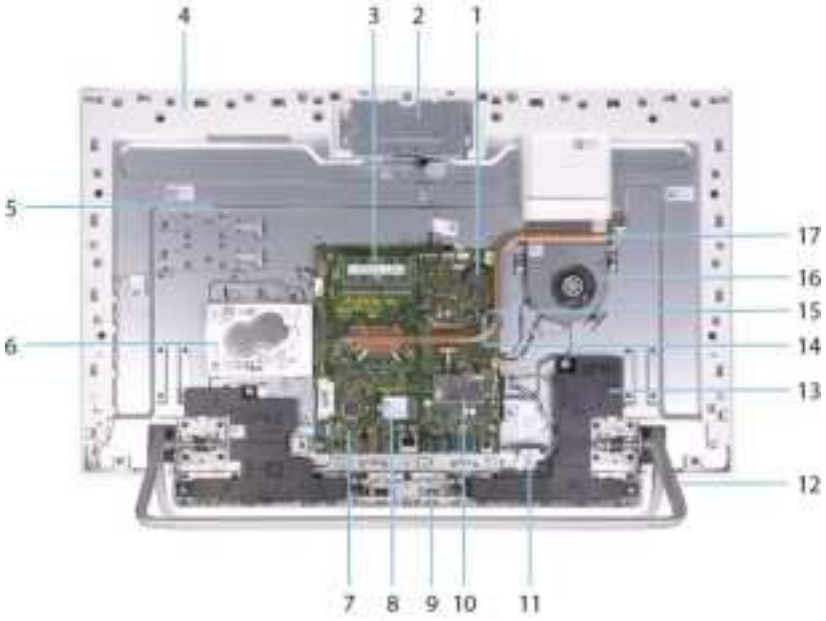
NOTE: The images in this document may differ from your computer depending on the configuration you ordered.

Topics:

- Inside view of your computer
- Recommended tools
- Screw list
- Back cover
- Bottom cover
- Stand
- Hard drive
- System-board shield
- Memory modules
- Heat sink
- Wireless card
- Solid-state drive
- Media-card reader
- Speakers
- Microphones
- Fan
- Antennas
- Camera
- Power-button board
- System board
- Base panel
- Display panel

Inside view of your computer

NOTE: The appearance of heat sink differs depending on the graphics configuration you ordered.



1. coin-cell battery
2. retractable-camera assembly
3. memory modules
4. base panel
5. display-assembly base
6. hard drive
7. system board
8. solid-state drive
9. microphones (2)
10. wireless-card shield
11. media-card reader
12. stand
13. speakers (2)
14. password clear jumper
15. CMOS clear jumper
16. fan
17. heat sink

Recommended tools

The procedures in this document may require the following tools:

- Phillips screwdriver #1
- Flat-head screwdriver
- Plastic scribe

Screw list

NOTE: When removing screws from a component, it is recommended to note the screw type, the quantity of screws, and then place them in a screw storage box. This is to ensure that the correct number of screws and correct screw type is restored when the component is replaced.

NOTE: Some computers have magnetic surfaces. Ensure that the screws are not left attached to such surfaces when replacing a component.

NOTE: Screw color may vary with the configuration ordered.

Table 1. Screw list

Component	Secured to	Screw type	Quantity	Screw image
Stand	Display-assembly base	M3x4	8	
Bottom cover	Display-assembly base	M3 0.5x5	5	
Hard-drive assembly	Display-assembly base	M3 0.5x5	2	
Hard-drive bracket	Hard drive	M3x3.5	4	
System-board shield	Display-assembly base	M3 0.5x5	4	
Retractable-camera assembly door	Base panel	M3 0.5x5	2	
Retractable-camera bezel	Retractable-camera bracket	M3 0.5x5	3	
Speakers	Display-assembly base	M3 4+7.1xZN	6	
Microphone modules	Base panel	M2x2.5	8	
Fan	Display-assembly base	M2x2.5	3	
Wireless-card shield	System board	M2x4	2	
Wireless-card bracket	Wireless card	M2x4	1	
Solid-state drive	System board	M2x2.5	1	
Antenna modules	Base panel	M2x2.5	2	
System board	Display-assembly base	M3 0.5x5	5	
Base panel	Display-assembly base	M3x5	21	
Display panel	Display-assembly base	M3 0.5x5	12	
Media-card reader	Display-assembly base	M2x3	1	

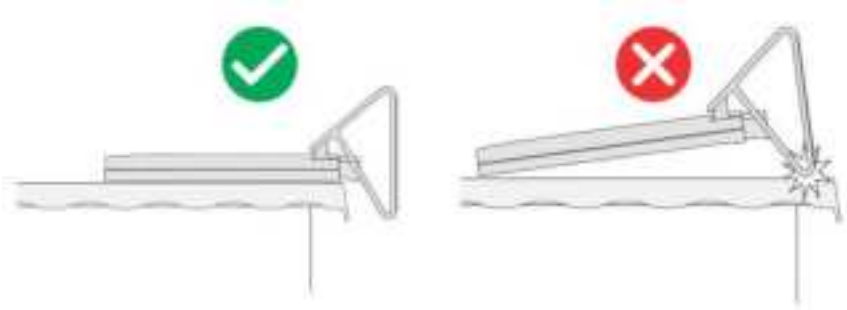
Back cover

Removing the back cover

Prerequisites

1. Follow the procedure in Before working inside your computer.

CAUTION: When servicing the computer, place it on an elevated, clean and flat surface. Place the display flat on the surface with the stand hanging over the edge. It is recommended to remove the stand to avoid accidental damage to the computer display during servicing.



About this task

The following image indicates the location of the back cover and provides a visual representation of the removal procedure.



Steps

1. Place your palm in the middle of the back cover then pry the back cover from the display-assembly base starting from the top corners.
2. Remove the back cover from the display-assembly base.

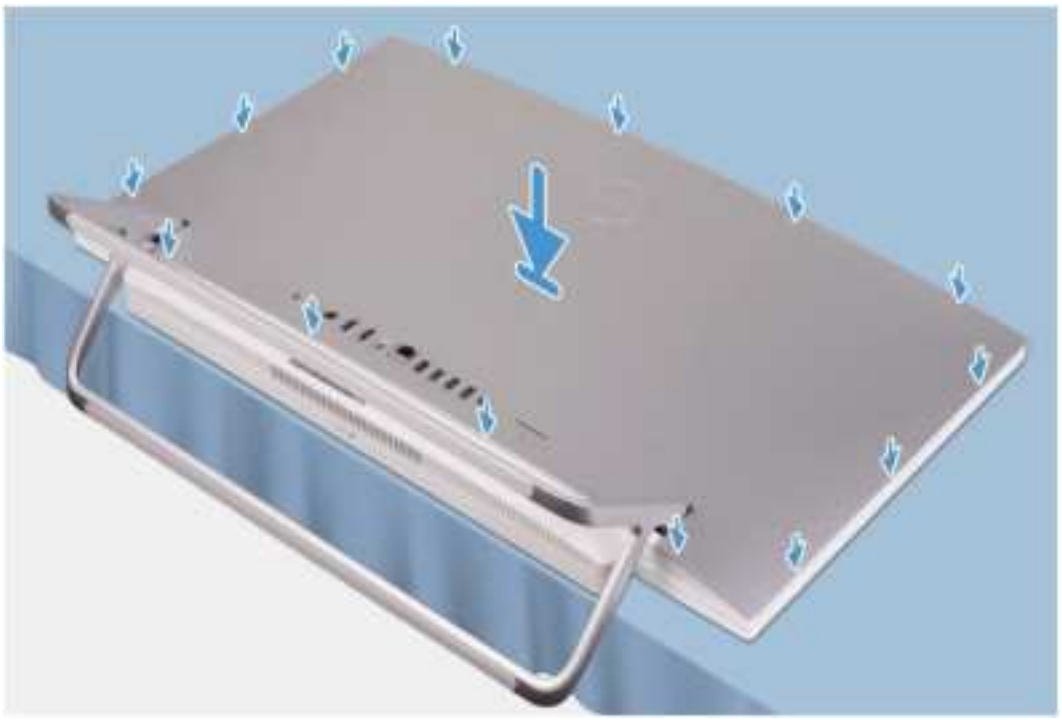
Installing the back cover

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the back cover and provides a visual representation of the installation procedure.



Steps

Align the slots on the back cover with the slots on the computer and press along the side to snap the back cover into place.

Next steps

1. Follow the procedure in After working inside your computer.

Bottom cover

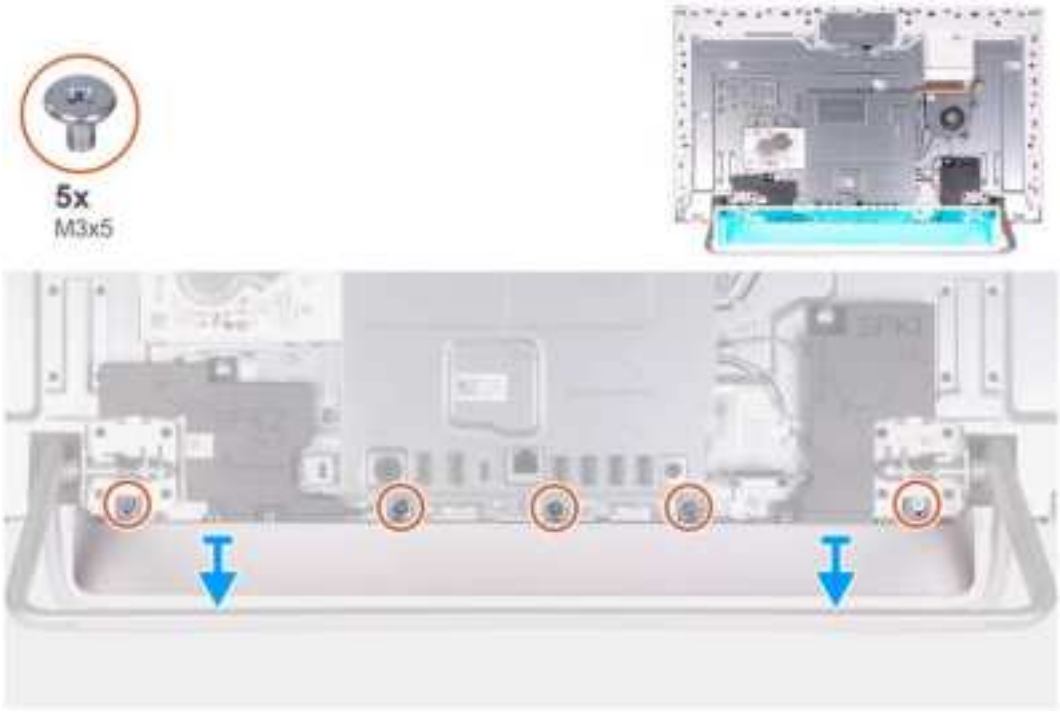
Removing the bottom cover

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.

About this task

The following image indicates the location of the bottom cover and provides a visual representation of the removal procedure.



Steps

1. Remove the five screws (M3x5) that secure the bottom cover to the display-assembly base.
2. Lift the bottom cover off the display-assembly base.

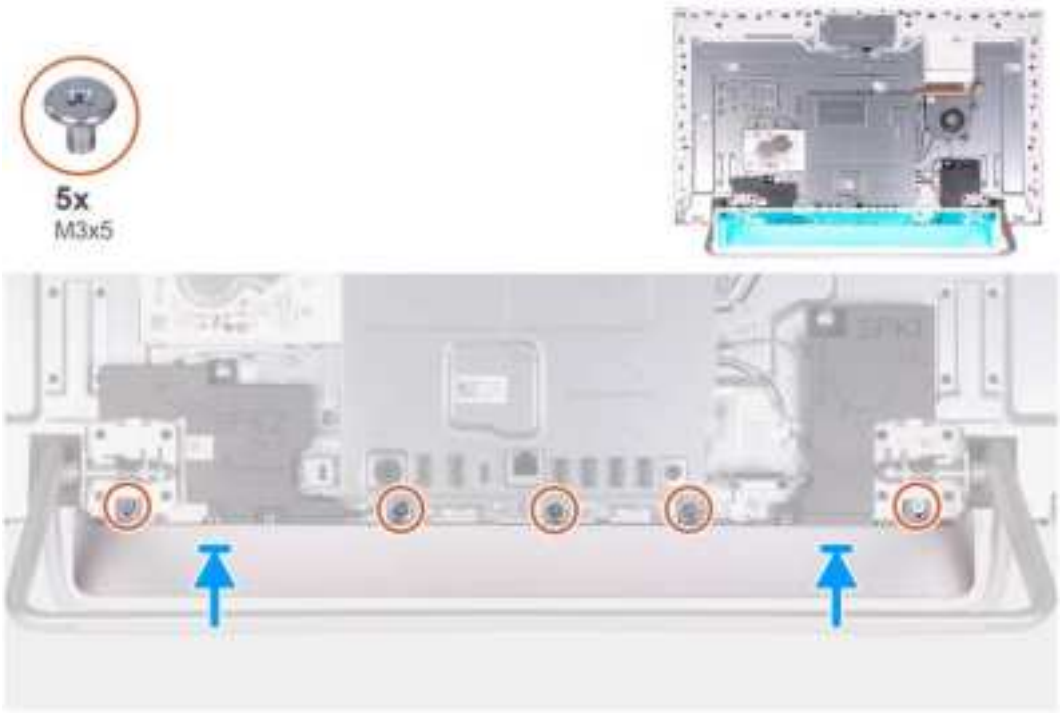
Installing the bottom cover

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the bottom cover and provides a visual representation of the installation procedure.



Steps

1. Align the screw holes on the bottom cover with the screw holes on the display-assembly base.
2. Replace the five screws (M3x5) that secure the bottom cover to the display-assembly base and snap the bottom cover back into place.

Next steps

1. Install the back cover.
2. Follow the procedure in After working inside your computer.

Stand

Removing the stand

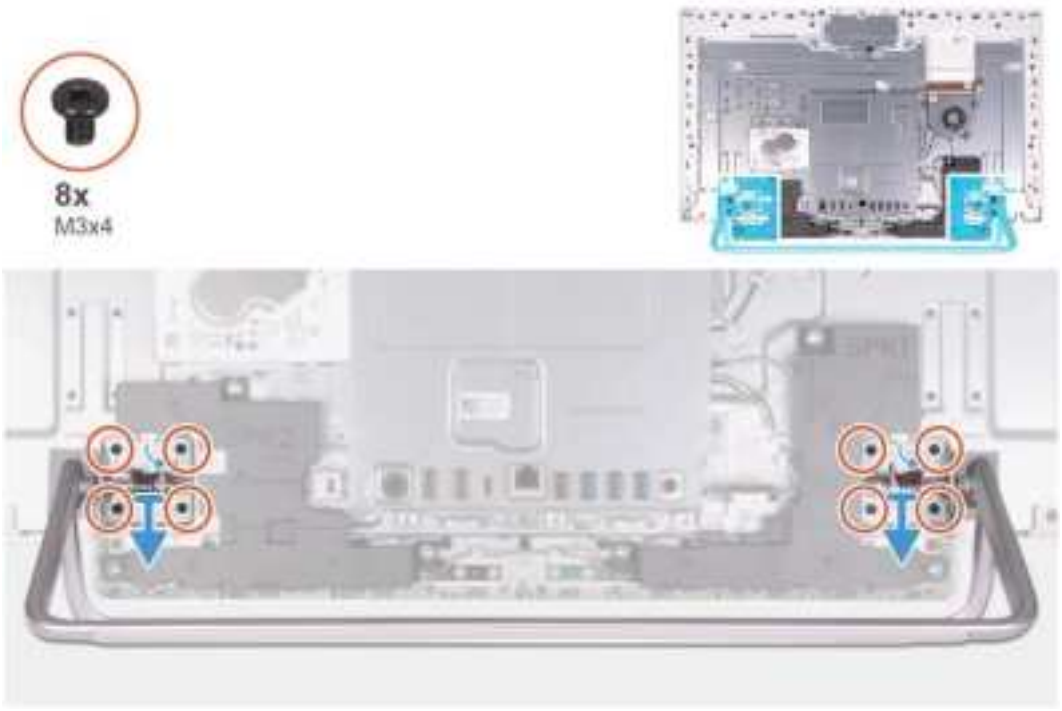
Prerequisites

1. Follow the procedure in Before working inside your computer.

   CAUTION: When servicing the computer, place it on an elevated, clean and flat surface. Place the display flat on the surface with the stand hanging over the edge. It is recommended to remove the stand to avoid accidental damage to the computer display during servicing.
2. Remove the back cover.
3. Remove the bottom cover.

About this task

The following image indicates the location of the stand and provides a visual representation of the removal procedure.



Steps

1. In the reverse sequential order indicated on the stand, remove the eight screws (M3x4) that secure the stand to the display-assembly base.
2. Remove the stand from the slots on the display-assembly base and lift the stand off the display-assembly base.

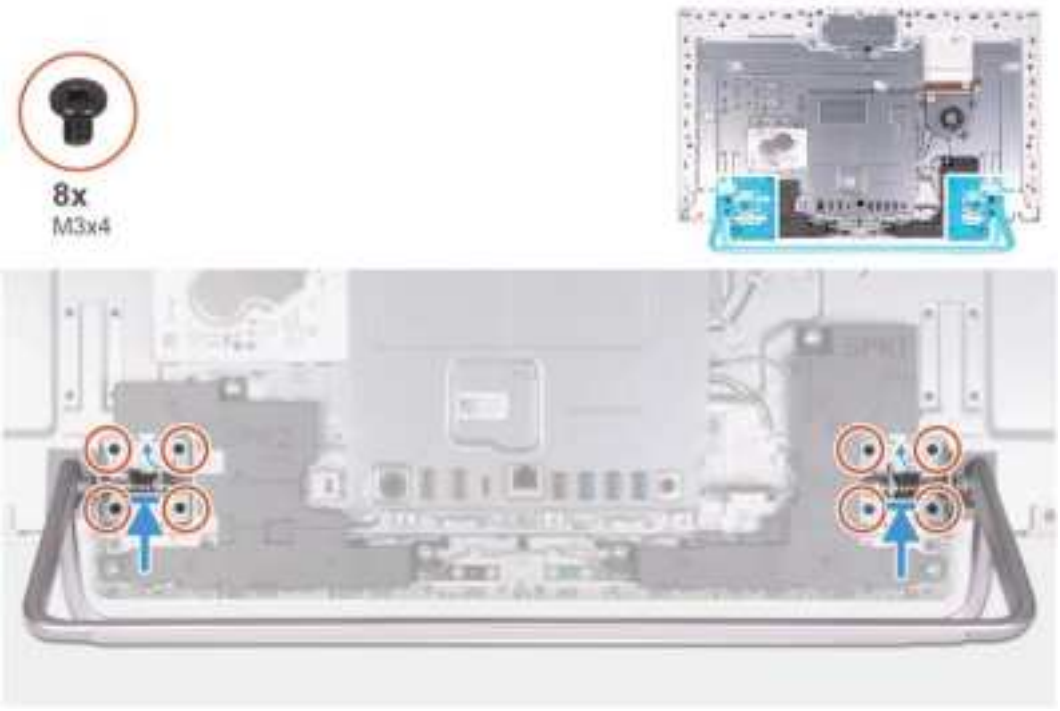
Installing the stand

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the stand and provides a visual representation of the installation procedure.



Steps

1. Align the screw holes on the stand with the screw holes on the display-assembly base and slide the stand on the display-assembly base.
2. In the sequential order indicated on the stand, replace the eight screws (M3x4) that secure the stand to the display-assembly base.

Next steps

1. Install the bottom cover.
2. Install the back cover.
3. Follow the procedure in After working inside your computer.

Hard drive

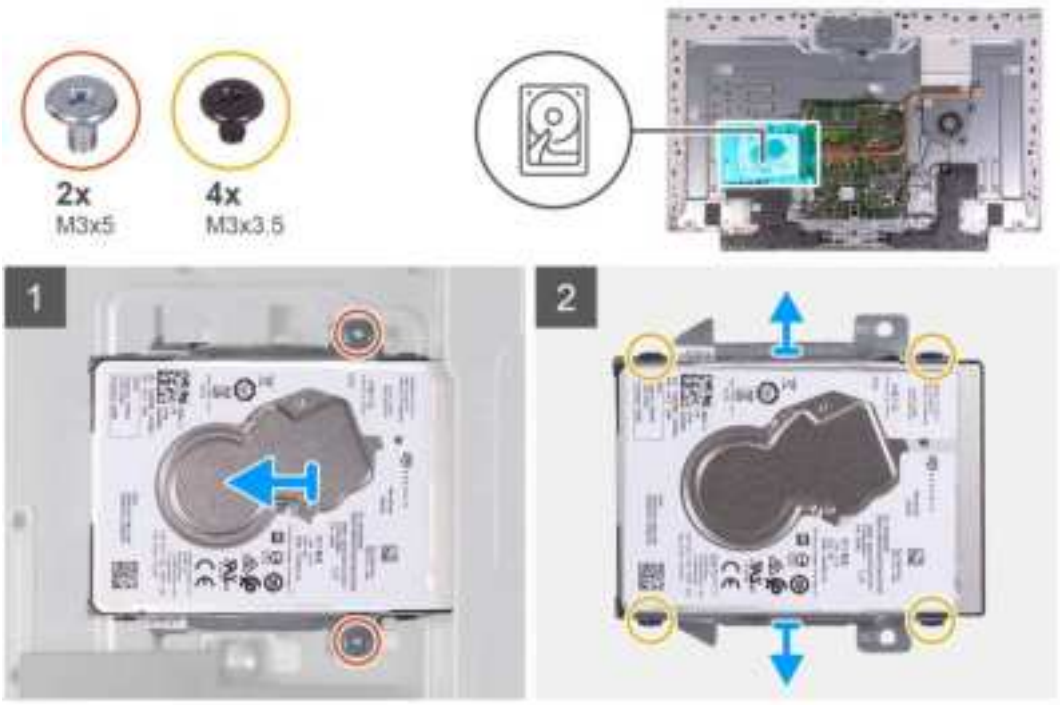
Removing the hard drive

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.

About this task

The following image indicates the location of the hard drive and provides a visual representation of the removal procedure.



Steps

1. Remove the two screws (M3x5) that secure the hard-drive assembly to the display-assembly base.
2. Slide the hard-drive assembly away from the hard-drive slot on the display-assembly base.
3. Remove the four screws (M3x3.5) that secure the hard-drive bracket to the hard drive.
4. Remove the hard-drive bracket off the hard drive.

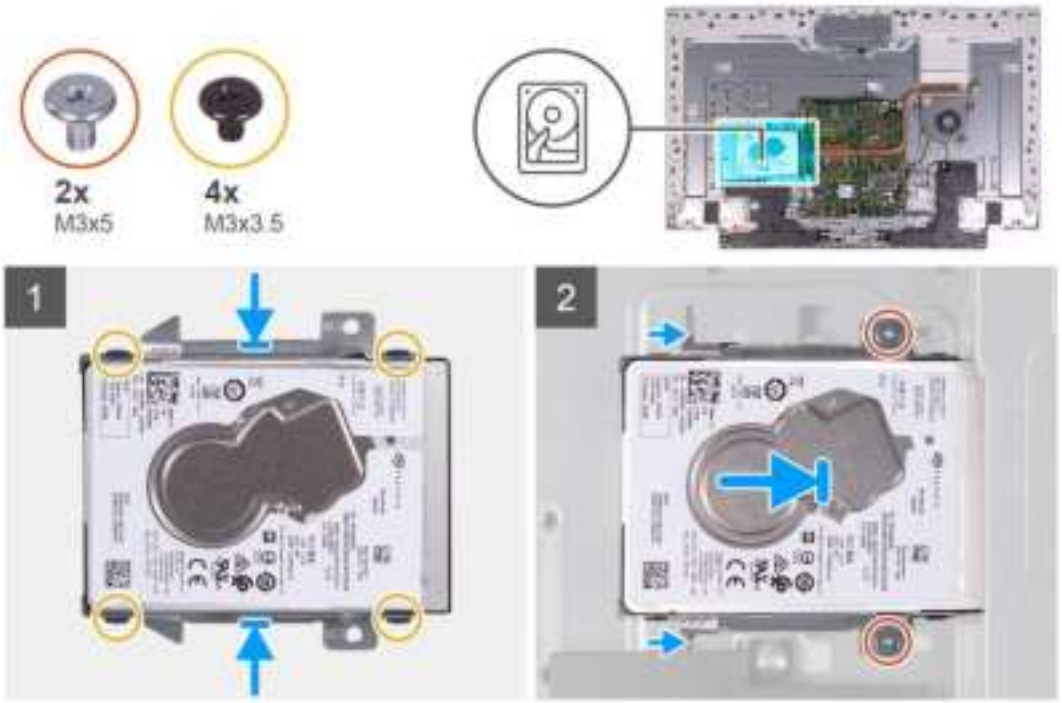
Installing the hard drive

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the hard drive and provides a visual representation of the installation procedure.



Steps

1. Align the screw holes on the hard drive with the screw holes on the hard-drive bracket.
2. Replace the four screws (M3x3.5) that secure the hard-drive bracket to the hard drive.
3. Slide the hard-drive assembly into the slot on the display-assembly base.
4. Replace the two screws (M3x5) that secures the hard-drive assembly to the display-assembly base.

Next steps

1. Install the stand.
2. Install the bottom cover.
3. Install the back cover.
4. Follow the procedure in After working inside your computer.

System-board shield

Removing the system-board shield

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.

About this task

The following image indicates the location of the system-board shield and provides a visual representation of the removal procedure.



Steps

1. Remove the four screws (M3x5) that secure the system-board shield to the display-assembly base.
2. Lift the system-board shield off the display-assembly base.

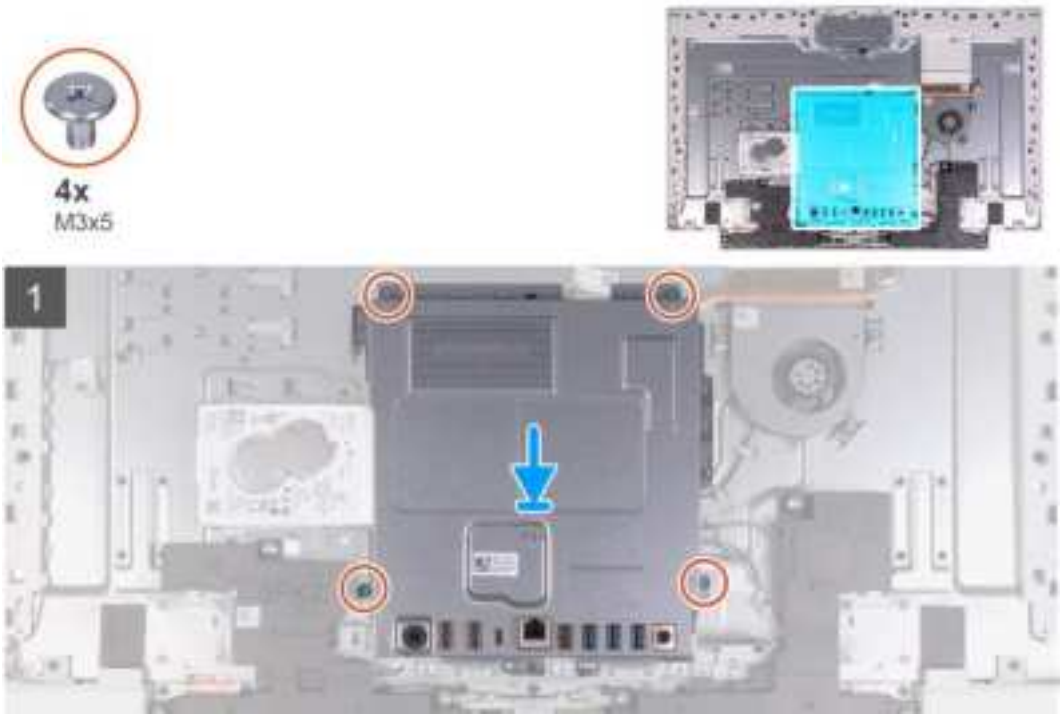
Installing the system-board shield

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the system-board shield and provides a visual representation of the installation procedure.



Steps

1. Align the slots on the system-board shield with the ports on the computer.
2. Replace the four screws (M3x5) that secure the system-board shield to the display-assembly base.

Next steps

1. Install the stand.
2. Install the bottom cover.
3. Install the back cover.
4. Follow the procedure in After working inside your computer.

Memory modules

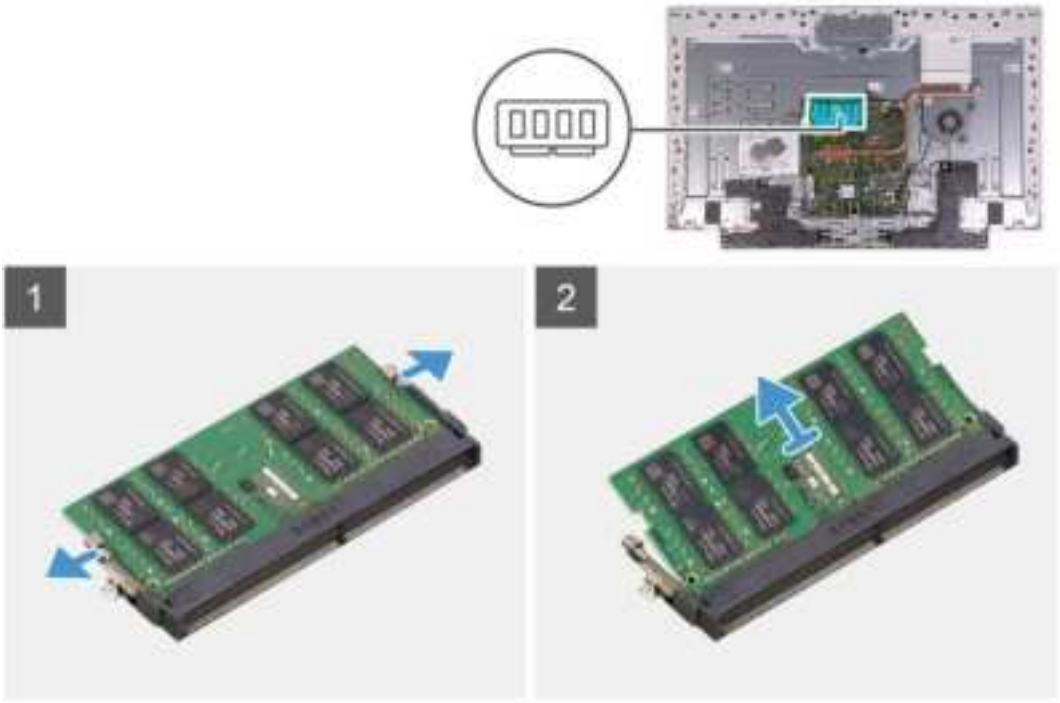
Removing the memory modules

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.
5. Remove the system-board shield.

About this task

The following image indicates the location of the memory modules and provides a visual representation of the removal procedure.



Steps

1. Using your fingertips, spread apart the securing clips on the memory-module slot until the memory module pops up.
2. Slide and remove the memory module from the memory-module slot.

NOTE: Repeat step 1 and 2 if there are two memory modules.

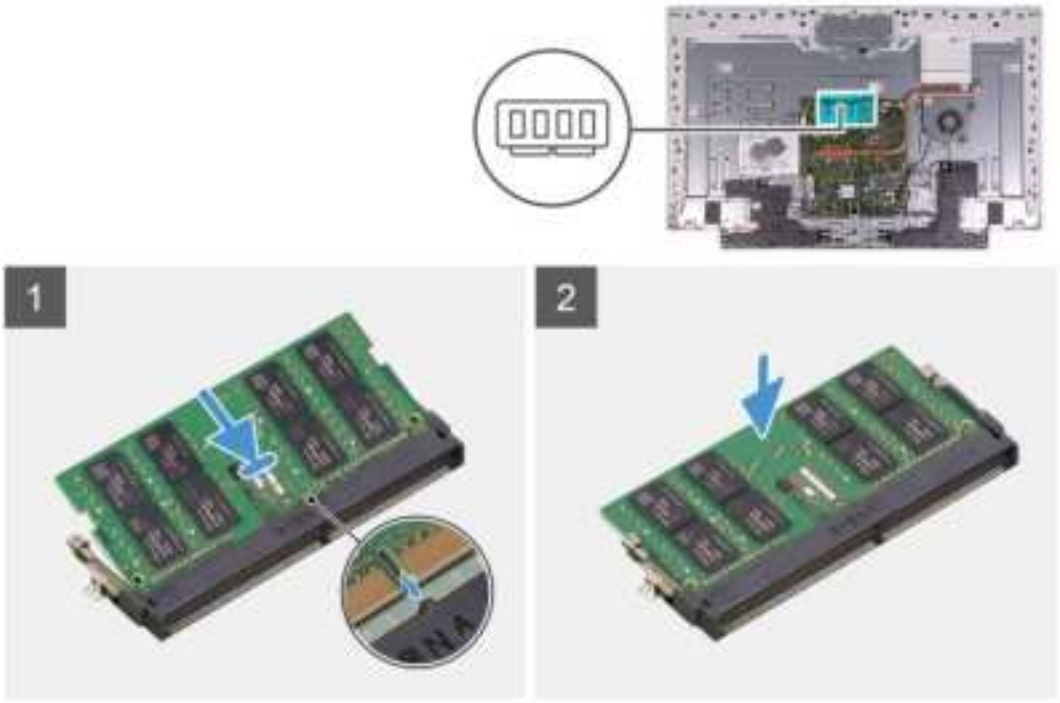
Installing the memory modules

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the memory module and provides a visual representation of the installation procedure.



Steps

1. Align the notch on the memory module with the tab on the memory-module slot.
2. Slide the memory module firmly into the slot at an angle and press the memory module down until it clicks into place.

   NOTE: If you do not hear the click, remove the memory module and reinstall it.

   NOTE: Repeat step 1 and 2 if there are two memory modules.

Next steps

1. Install the system-board shield.
2. Install the stand.
3. Install the bottom cover.
4. Install the back cover.
5. Follow the procedure in After working inside your computer.

Heat sink

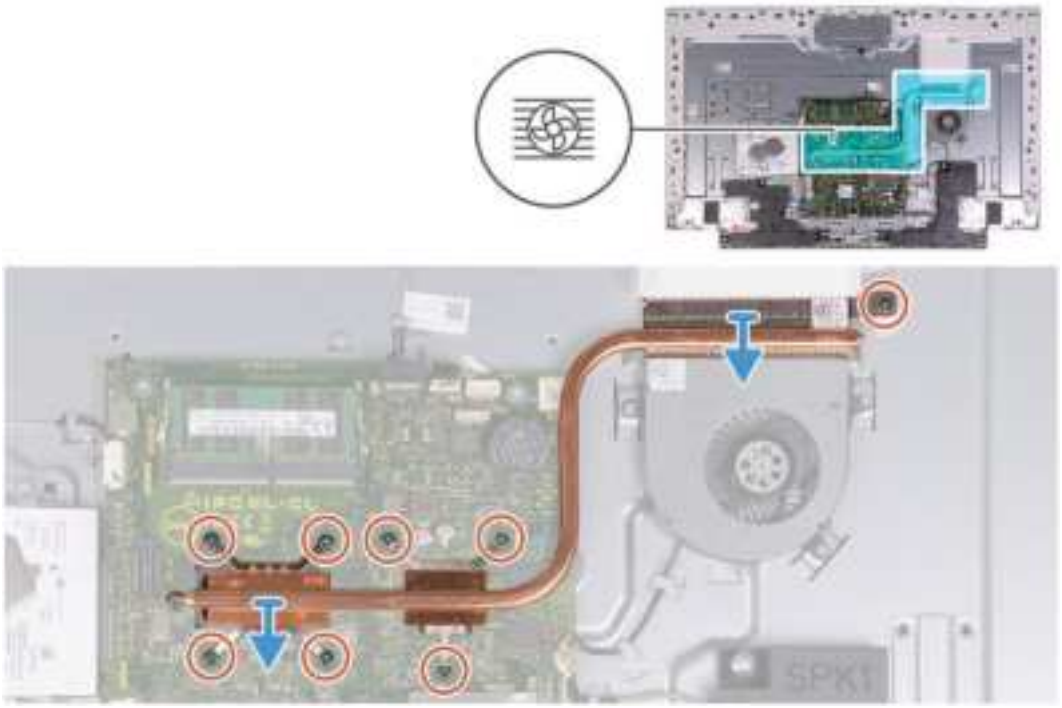
Removing the heat sink

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.
5. Remove the system-board shield.

About this task

The following image indicates the location of the heat sink and provides a visual representation of the removal procedure.



Steps

1. In reverse sequential order (as indicated on the heat sink), loosen the eight captive screws that secure the heat sink to the system board and the display-assembly base.
2. Lift the heat sink off the system board and display-assembly base.

Installing the heat sink

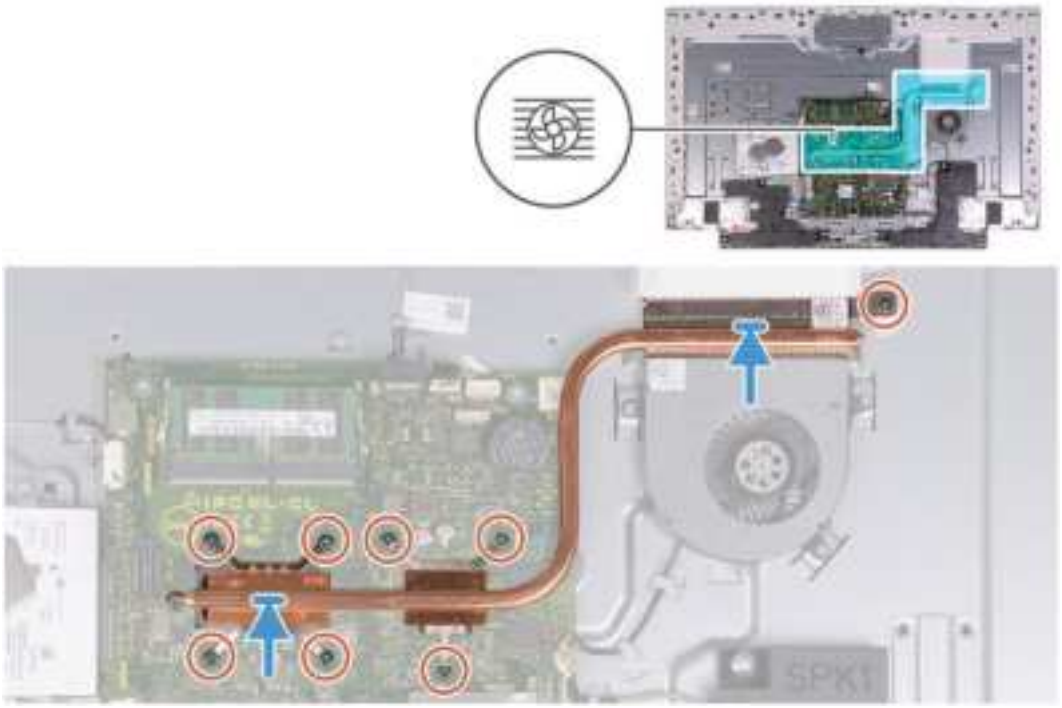
Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

NOTE: If either the system board or the heat sink is replaced, use the thermal pad/paste provided in the kit to ensure that thermal conductivity is achieved.

About this task

The following image indicates the location of the heat sink and provides a visual representation of the installation procedure.



Steps

1. Align the screw holes on the heat sink with the screw holes on the system board and the display assembly base.
2. In sequential order (as indicated on the heat sink), tighten the eight captive screws that secure the heat sink to the system board and display assembly base.

Next steps

1. Install the system-board shield.
2. Install the stand.
3. Install the bottom cover.
4. Install the back cover.
5. Follow the procedure in After working inside your computer.

Wireless card

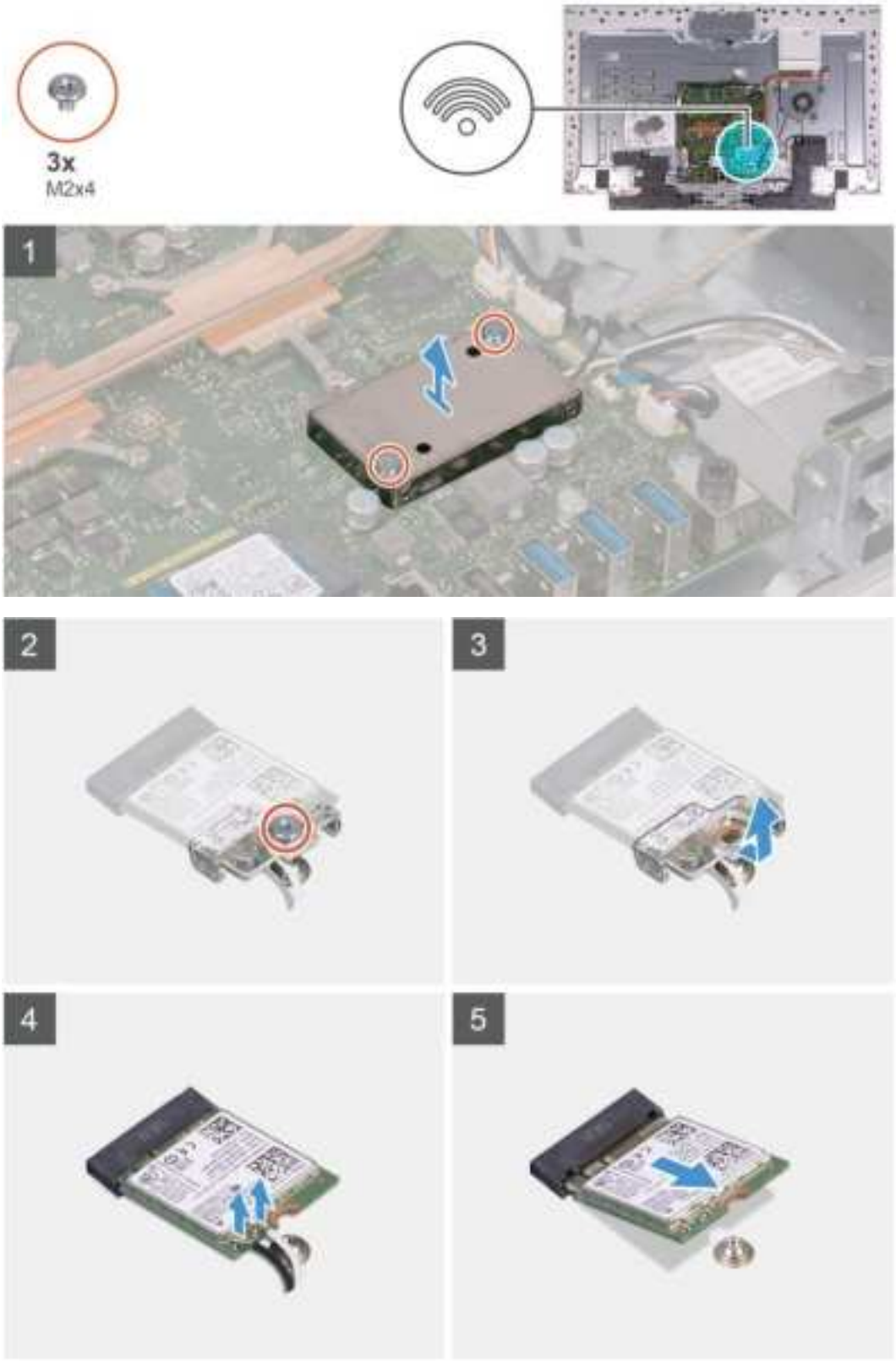
Removing the wireless card

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.
5. Remove the system-board shield.

About this task

The following image indicates the location of the wireless card and provides a visual representation of the removal procedure.



Steps

1. Remove the two screws (M2x4) that secure the wireless-card shield to the system board.
2. Lift the wireless-card shield off the system board and wireless card.
3. Remove the screw (M2x4) that secures the wireless-card bracket to the wireless card.
4. Slide the wireless-card bracket off the wireless card.

5. Disconnect the antenna cables from the wireless card.
6. Slide and remove the wireless card from the wireless-card slot.

Installing the wireless card

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

CAUTION: To avoid damage to the wireless mini-card, do not place any cables under it.

About this task

The following image indicates the location of the wireless card and provides a visual representation of the installation procedure.





Steps

1. Connect the antenna cables to the wireless card.
   The following table provides the antenna-cable color scheme for the wireless card supported by your computer.

Table 2. Antenna-cable color scheme

Connectors on the wireless card	Antenna-cable color
Main (white triangle)	White
Auxiliary (black triangle)	Black

2. Place the wireless-card bracket on the wireless card.
3. Align the notch on the wireless card with the tab on the wireless-card slot.
4. Slide the wireless card at an angle into the wireless-card slot.
5. Replace the screw (M2x4) that secures the wireless-card bracket to the wireless card.
6. Align and place the wireless-card shield on the system board and wireless card.
7. Replace the two screws (M2x4) that secures the wireless-card shield to the system board.

Next steps

1. Install the system-board shield.
2. Install the stand.
3. Install the bottom cover.
4. Install the back cover.
5. Follow the procedure in After working inside your computer.

Solid-state drive

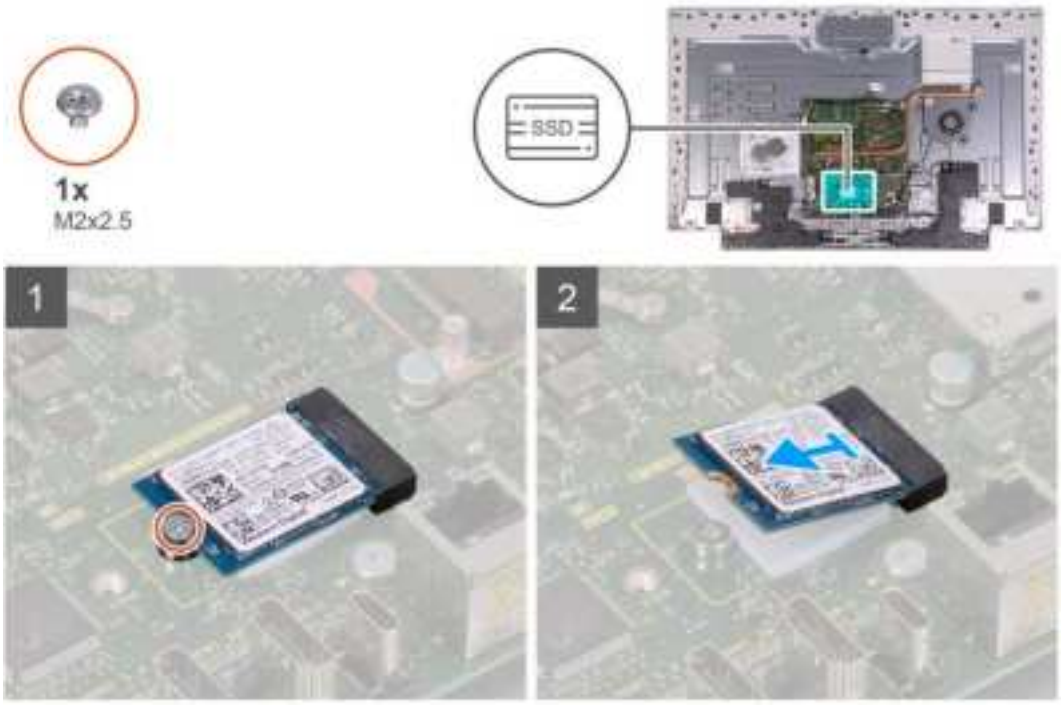
Removing the solid-state drive

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.
5. Remove the system-board shield.

About this task

The following image indicates the location of the solid-state drive and provides a visual representation of the removal procedure.



Steps

1. Remove the screw (M2x2.5) that secures the solid-state drive to the system board.
2. Slide and remove the solid-state drive from the M.2 card slot on the system board.

Installing the solid-state drive

Prerequisites

CAUTION: Solid-state drives are fragile. Exercise care when handling the solid-state drive.

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the solid-state drive and provides a visual representation of the installation procedure.



Steps

1. Align the notch on the solid-state drive with the tab on the M.2 card slot.
2. Slide the solid-state drive into the M.2 card slot on the system board.
3. Replace the screw (M2x2.5) that secures the solid-state drive to the system board.

Next steps

1. Install the system-board shield.
2. Install the stand.
3. Install the bottom cover.
4. Install the back cover.
5. Follow the procedure in After working inside your computer.

Media-card reader

Removing the media-card reader

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.
5. Remove the system-board shield.

About this task

The following image indicates the location of the media-card reader and provides a visual representation of the removal procedure.



Steps

1. Remove the screw (M2x3) that secure the media-card reader to the display-assembly base.
2. Open the latch and disconnect the media-card reader cable from the system board.
3. Remove the media-card reader from media-card reader slot.

Installing the media-card reader

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the media-card reader and provides a visual representation of the installation procedure.



Steps

1. Connect the media-card reader cable to the system board and close the latch to secure the cable.
2. Insert the media-card reader into the media-card reader slot.
3. Align the screws on the media-card reader with the screw holes on the slot on the display assembly base.
4. Replace the screw (M2x3) that secure the media-card reader to the display-assembly base.

Next steps

1. Install the system-board shield.
2. Install the stand.
3. Install the bottom cover.
4. Install the back cover.
5. Follow the procedure in After working inside your computer.

Speakers

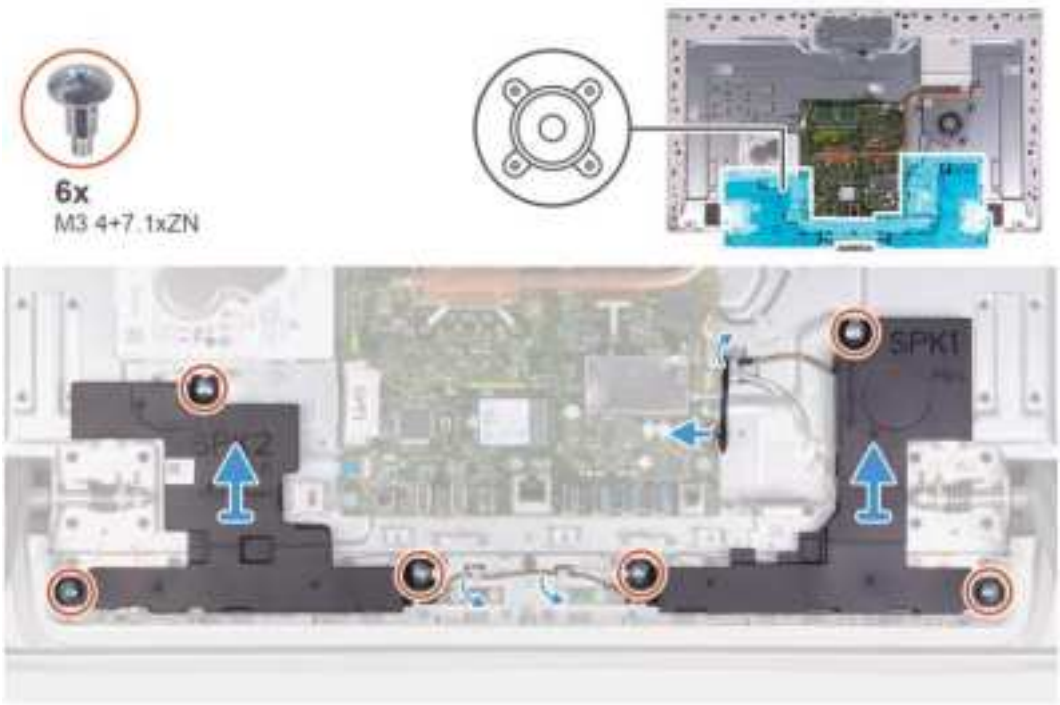
Removing the speakers

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.
5. Remove the system-board shield.

About this task

The following image indicates the location of the speakers and provides a visual representation of the removal procedure.



Steps

1. Disconnect the speaker cable from the system board and remove it from the routing guide on display-assembly base.
2. Remove the six screws (M3 4+7.1xZN) that secure the speakers to the display-assembly base.
3. Remove the speaker cable from the routing guides on the display-assembly base.
4. Lift the speakers along with the cable off the display-assembly base.

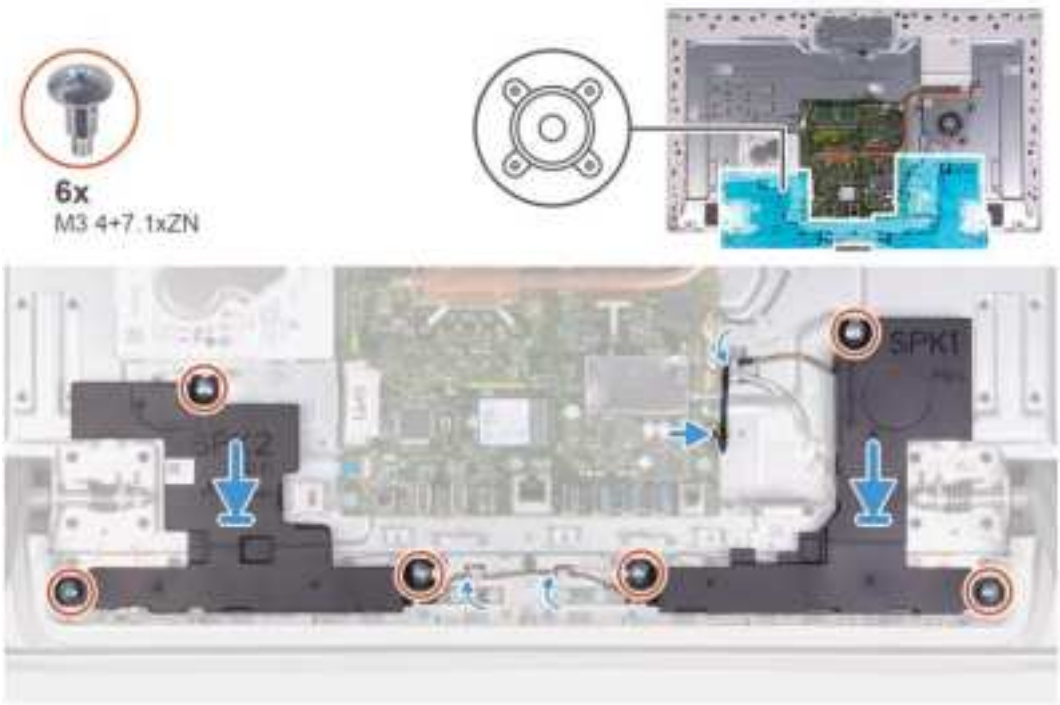
Installing the speakers

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the speakers and provides a visual representation of the installation procedure.



Steps

1. Align the screw holes on the speakers with the screw holes on the display-assembly base and route the cable through the routing guides on display-assembly base.
2. Replace the eight screws (M3 4+7.1xZN) that secure the speakers to the display-assembly base.
3. Route the speaker cable through the routing guide on display-assembly base and connect the speaker cable to the system board.

Next steps

1. Install the system-board shield.
2. Install the stand.
3. Install the bottom cover.
4. Install the back cover.
5. Follow the procedure in After working inside your computer.

Microphones

Removing the microphones

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.
5. Remove the system-board shield.
6. Remove the speakers.

About this task

The following image indicates the location of the microphones and provides a visual representation of the removal procedure.



Steps

1. Disconnect the microphone cable from the system board and release it from the routing guides on the display-assembly base.
2. Remove the eight screws (M2X2.5) that secure the microphone modules (2) to the base panel and release them from the routing guides on the display-assembly base.
3. Lift the microphone modules (2) off the slots on the base panel.

Installing the mircrophones

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the microphones and provides a visual representation of the installation procedure.



Steps

1. Align the microphone modules (2) with their slots on the base panel.
2. Route the cable through the routing guides on the display-assembly base.
3. Replace the eight screws (M2X2.5) that secure the microphone module to the base panel.
4. Route the microphone cable through the routing guides on the display-assembly base and connect the microphone cable to the system board.

Next steps

1. Install the speakers.
2. Install the system-board shield.
3. Install the stand.
4. Install the bottom cover.
5. Install the back cover.
6. Follow the procedure in After working inside your computer.

Fan

Removing the fan

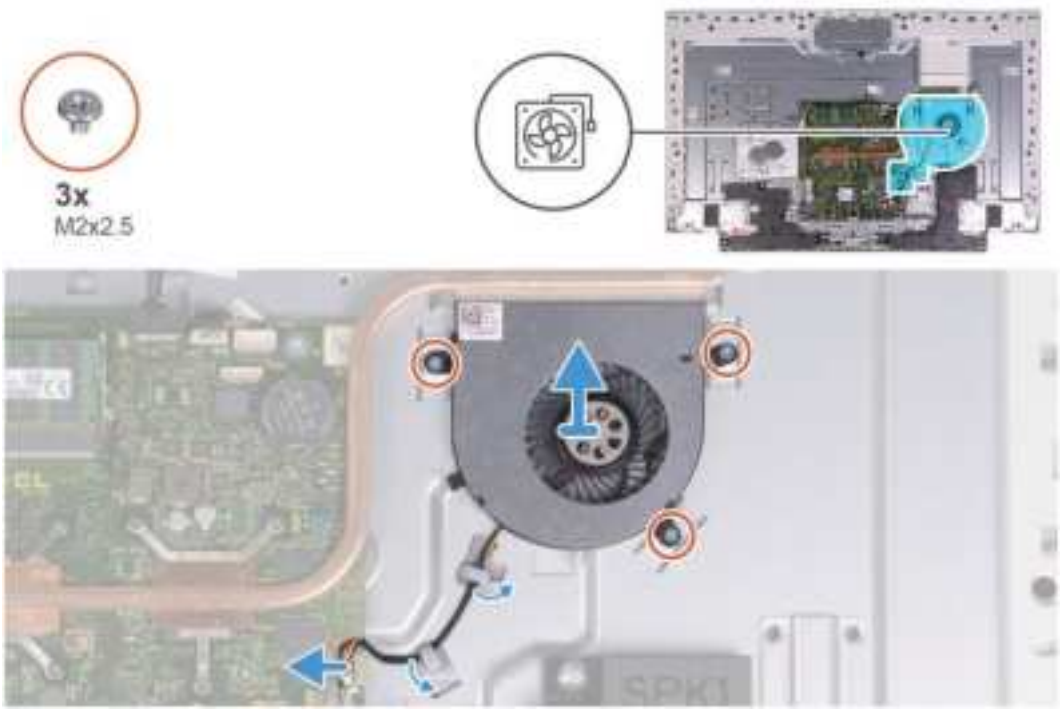
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.

3. Remove the bottom cover.
4. Remove the stand.
5. Remove the system-board shield.

About this task

The following image indicates the location of the fan and provides a visual representation of the removal procedure.



Steps

1. Disconnect the fan cable from the system board.
2. Remove the fan cable from the routing guides on the display-assembly base.
3. Remove the three screws (M2x2.5) that secure the fan to the display-assembly base.
4. Lift the fan, along with its cable, off the display-assembly base.

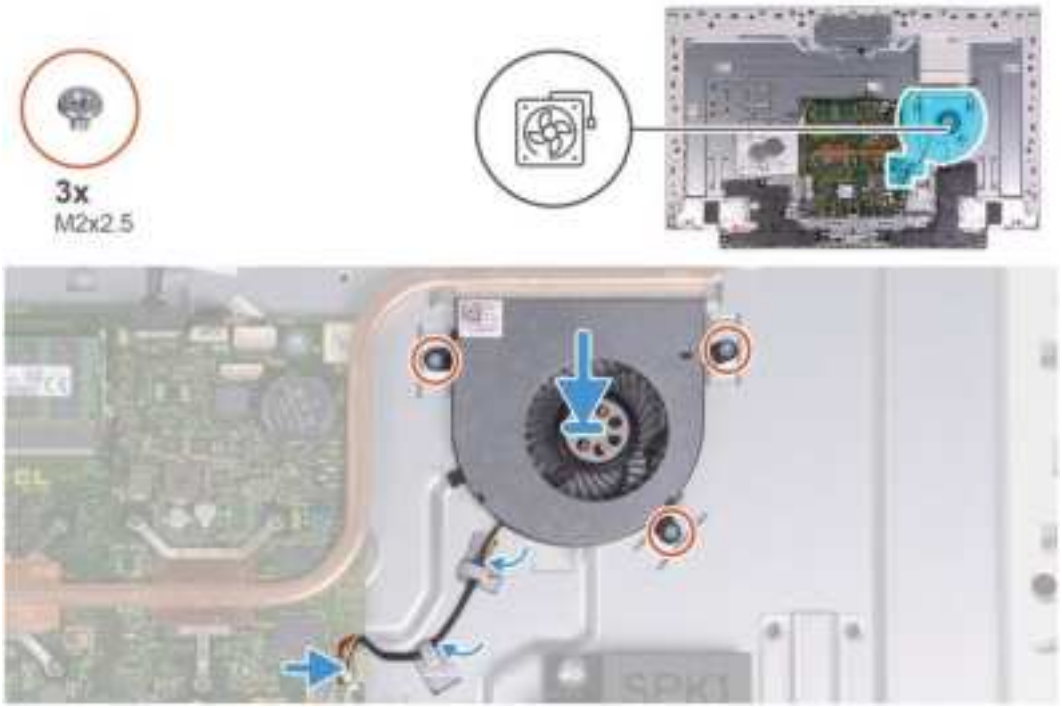
Installing the fan

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the fan and provides a visual representation of the installation procedure.



Steps

1. Align the screw holes on the fan with the screw holes on the display-assembly base.
2. Replace the three screws (M2x2.5) that secure the fan to the display-assembly base.
3. Route the fan cable through the routing guides on the display-assembly base.
4. Connect the fan cable to the system board.

Next steps

1. Install the system-board shield.
2. Install the stand.
3. Install the bottom cover.
4. Install the back cover.
5. Follow the procedure in After working inside your computer.

Antennas

Removing the antennas

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.
5. Remove the system-board shield.
6. Remove the wireless card.
7. Remove the speakers.

About this task

The following image indicates the location of the antennas and provides a visual representation of the removal procedure.



NOTE: Note the routing of the antenna cables, before removing the antenna cables form the routing guides. Also, note the location of the antenna modules printed on the display-assembly base as ANT-B (black) and ANT-W (white).

Steps

1. Remove the antenna cables from the routing guides on the display-assembly base.
2. Remove the two screws (M2x2.5) that secure the antenna modules (2) to the base panel.
3. Carefully peel the copper foil that secures the antenna cables (2) to the base panel.
4. Lift the antenna modules off the base panel.

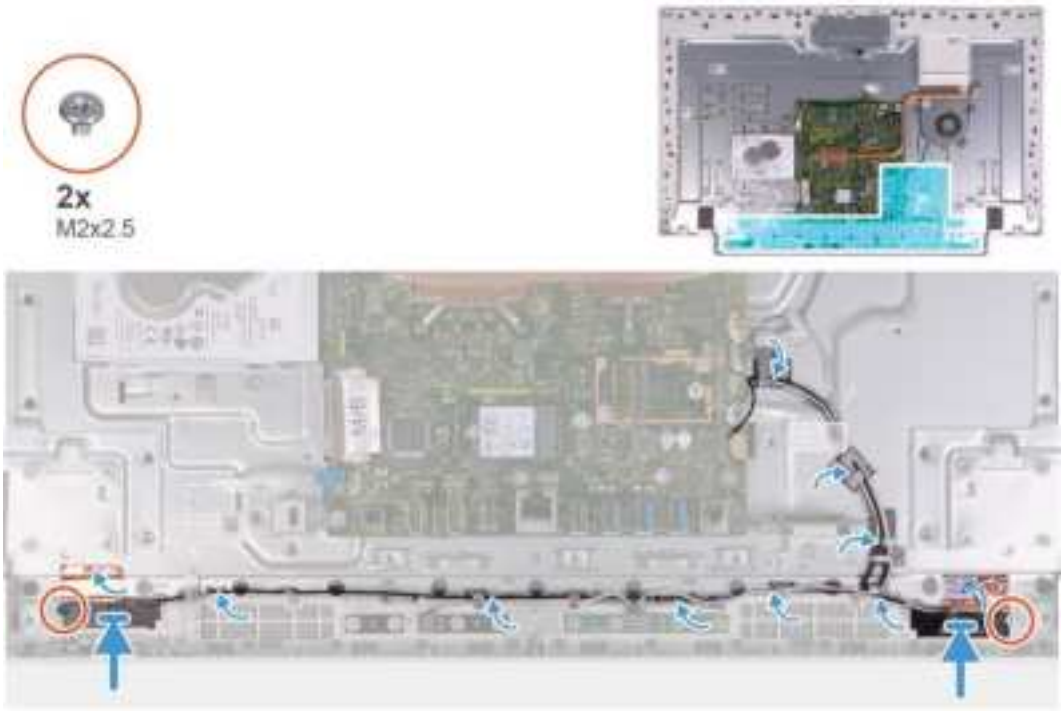
Installing the antennas

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the antennas and provides a visual representation of the installation procedure.



NOTE: Note the location of the antenna modules printed on the display-assembly base as ANT-B (black) and ANT-W (white).

Steps

1. Align the antenna modules (2) with the slots on the base panel and adhere it in place.
2. Adhere the copper foil that secures the antenna cables (2) to the base panel.
3. Replace the two screws (M2x2.5) that secure the antenna modules (2) to the base panel.
4. Route the antenna cables through the routing guides on the display-assembly base.

Next steps

1. Install the speakers.
2. Install the wireless card.
3. Install the system-board shield.
4. Install the stand.
5. Install the bottom cover.
6. Install the back cover.
7. Follow the procedure in After working inside your computer.

Camera

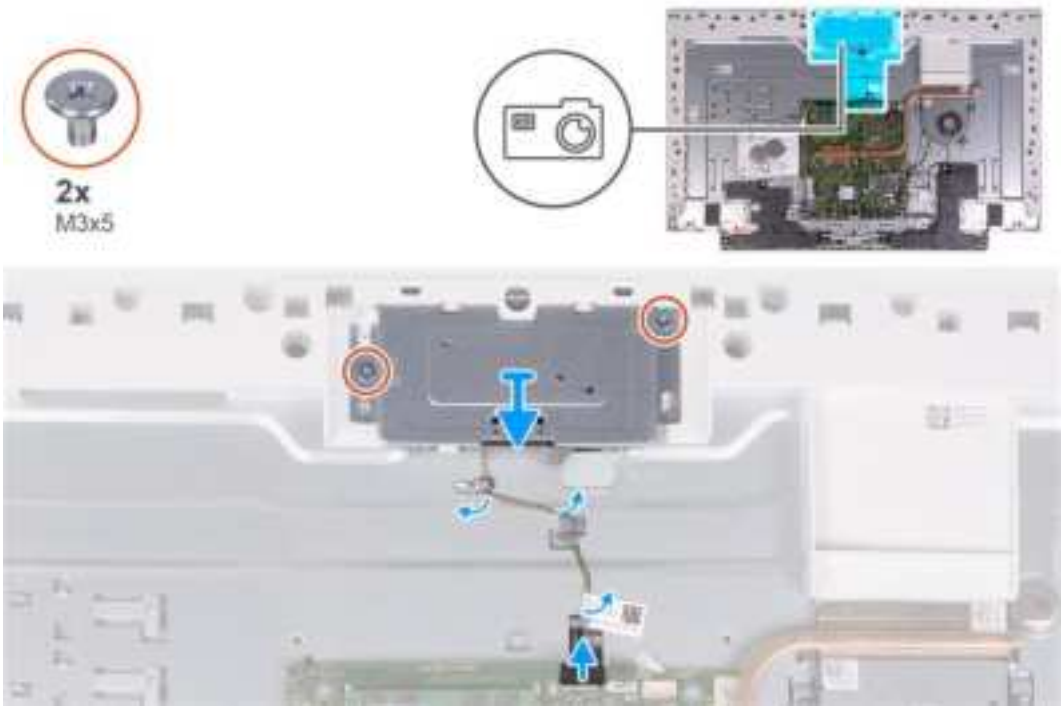
Removing the camera

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.
5. Remove the system-board shield.

About this task

The following image indicates the location of the camera and provides a visual representation of the removal procedure.



Steps

1. Disconnect the camera cable from the system board.
2. Remove the camera cable from the routing guides on the display-assembly base.
3. Remove the two screws (M3x5) that secure the retractable-camera assembly to the base panel.
4. Remove the retractable-camera assembly door from the base panel.

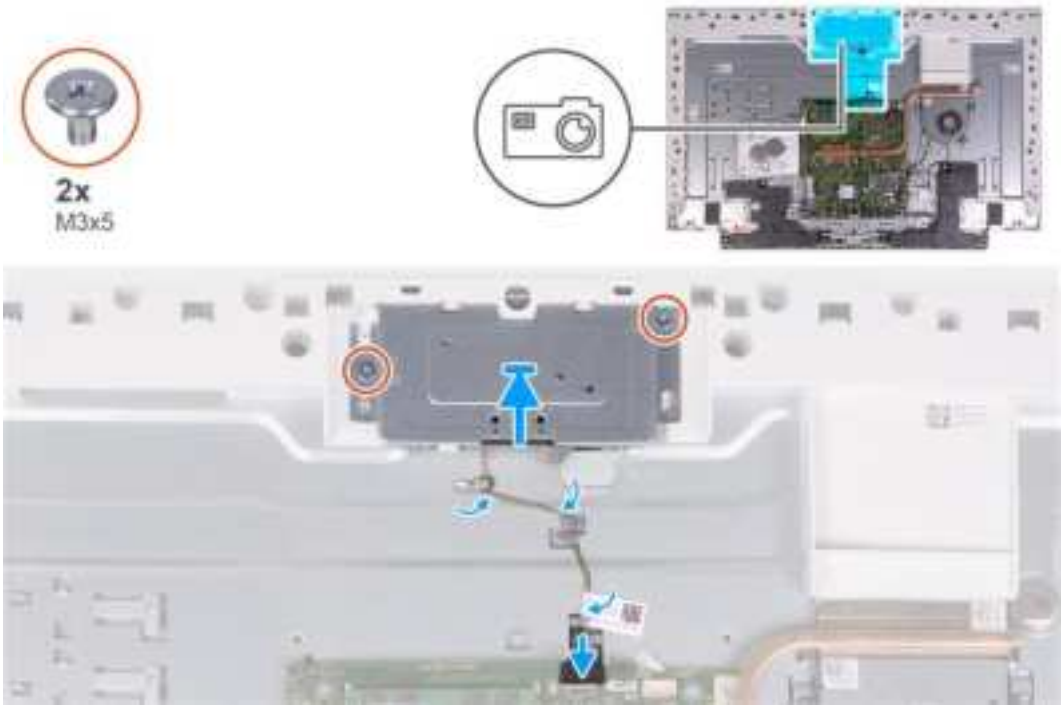
Installing the camera

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the camera and provides a visual representation of the installation procedure.



Steps

1. Slide and place the retractable-camera assembly on the base panel.
2. Replace the two screws (M3x5) that secure the retractable-camera assembly to the base panel.
3. Route the camera cable through the routing guides on the display-assembly base.
4. Connect the camera cable to the system board.

Next steps

1. Install the system-board shield.
2. Install the stand.
3. Install the bottom cover.
4. Install the back cover.
5. Follow the procedure in After working inside your computer.

Power-button board

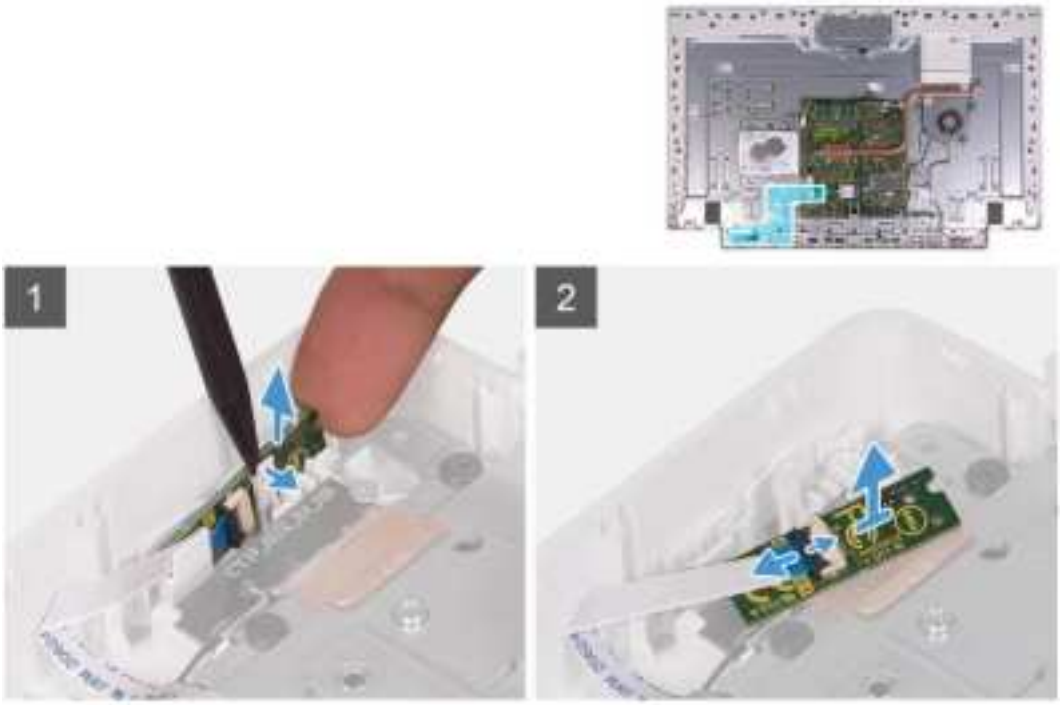
Removing the power-button board

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.
5. Remove the system-board shield.
6. Remove the speakers.

About this task

The following image indicates the location of the power-button board and provides a visual representation of the removal procedure.



Steps

1. Open the notch on the side of the power-button board and lift the power-button board from the slot on the base panel.
2. Open the latch, disconnect the power-button board cable from the power-button board then lift off the power-button board.

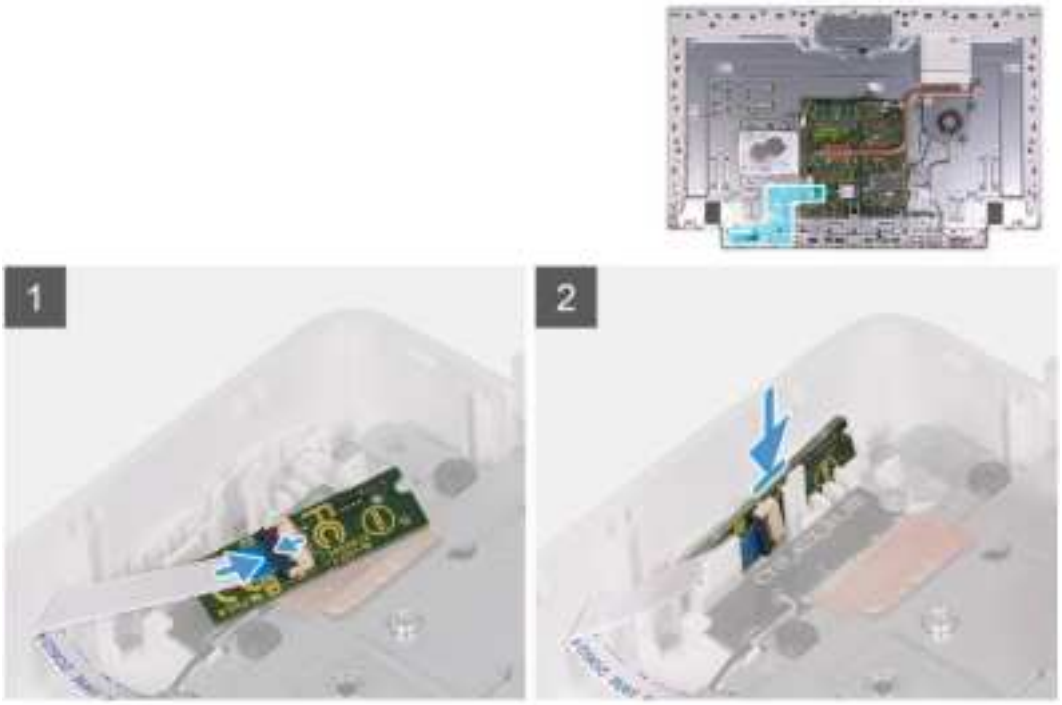
Installing the power-button board

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the power-button board and provides a visual representation of the installation procedure.



Steps

1. Connect the power-button board cable to the power-button board and close the latch to secure the cable.
2. Align and place the power-button board in the slot on the base panel and snap it into place.

Next steps

1. Install the speakers.
2. Install the system-board shield.
3. Install the stand.
4. Install the bottom cover.
5. Install the back cover.
6. Follow the procedure in After working inside your computer.

System board

Removing the system board

Prerequisites

1. Follow the procedure in Before working inside your computer.

   NOTE: Your computer's Service Tag is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.

   NOTE: Replacing the system board removes any changes you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.

   NOTE: Before disconnecting the cables from the system board, note the location of the connectors so that you can reconnect the cables correctly after you replace the system board.
2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.
5. Remove the system-board shield.
6. Remove the memory modules.

7. Remove the wireless card.
8. Remove the solid-state drive.
9. Remove the heat sink.

About this task

The following image indicates the connectors on your system board.

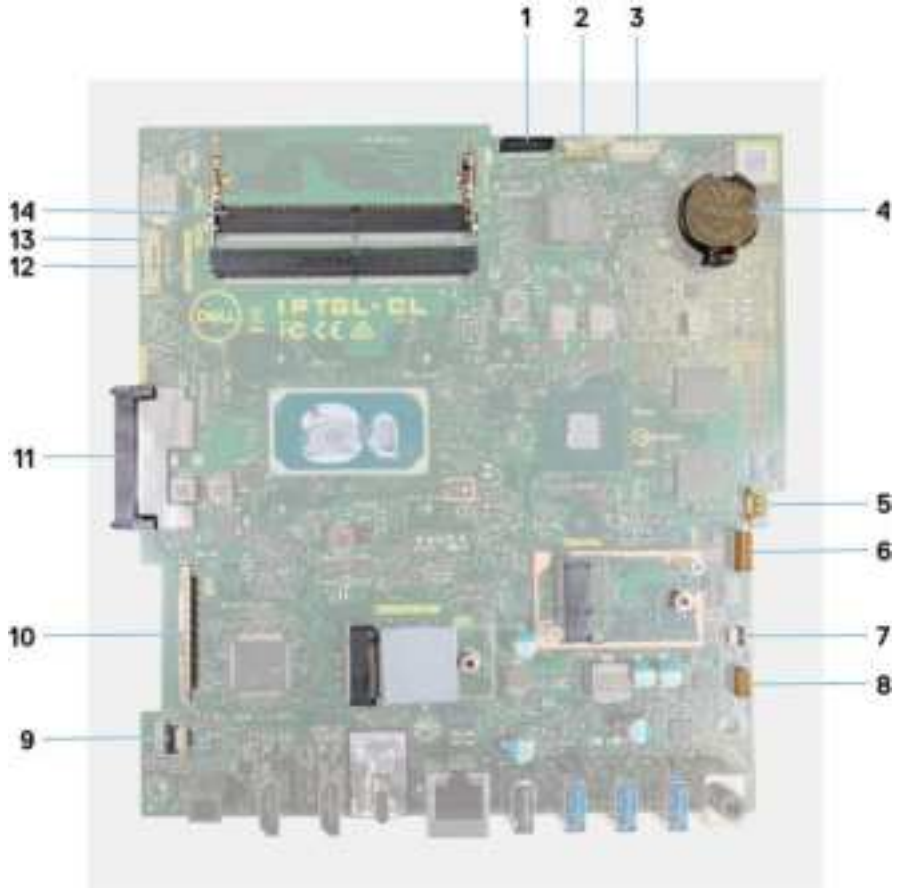
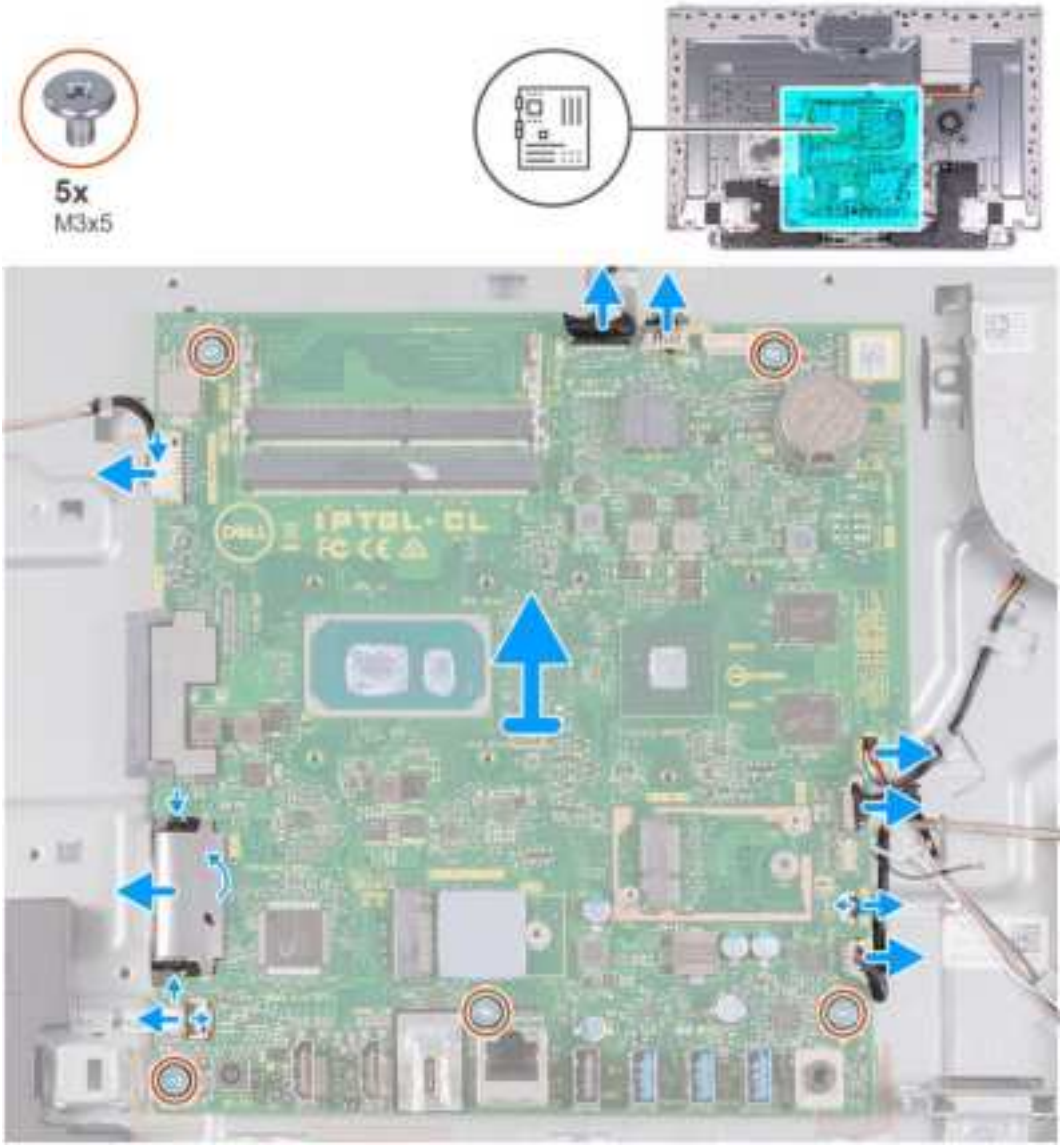


Figure 1. System-board connectors

1. Camera cable
2. Touchscreen cable
3. Debug port
4. Coin-cell battery
5. Fan cable
6. Microphones cable
7. Media-card reader cable
8. Speaker cable
9. Power-button board cable
10. Display cable
11. Hard-drive connector
12. Memory module (DIMM2)
13. Backlit cable
14. Memory module (DIMM1)

The following image indicates the location of system board and provides a visual representation of the removal procedure.



Steps

1. Disconnect the backlit cable from the system board.
2. Disconnect the display cable from the system board.
3. Open the latch and disconnect the power-button board cable from the system board.
4. Disconnect the speaker cable from the system board.
5. Disconnect the media-card reader cable from the system board.
6. Disconnect the microphone-module cable from the system board.
7. Disconnect the fan cable from the system board.
8. Disconnect the touchscreen cable from the system board.
9. Disconnect the camera cable from the system board.
10. Remove the five screws (M3x5) that secure the system board to the display-assembly base.

Installing the system board

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the connectors on your system board.

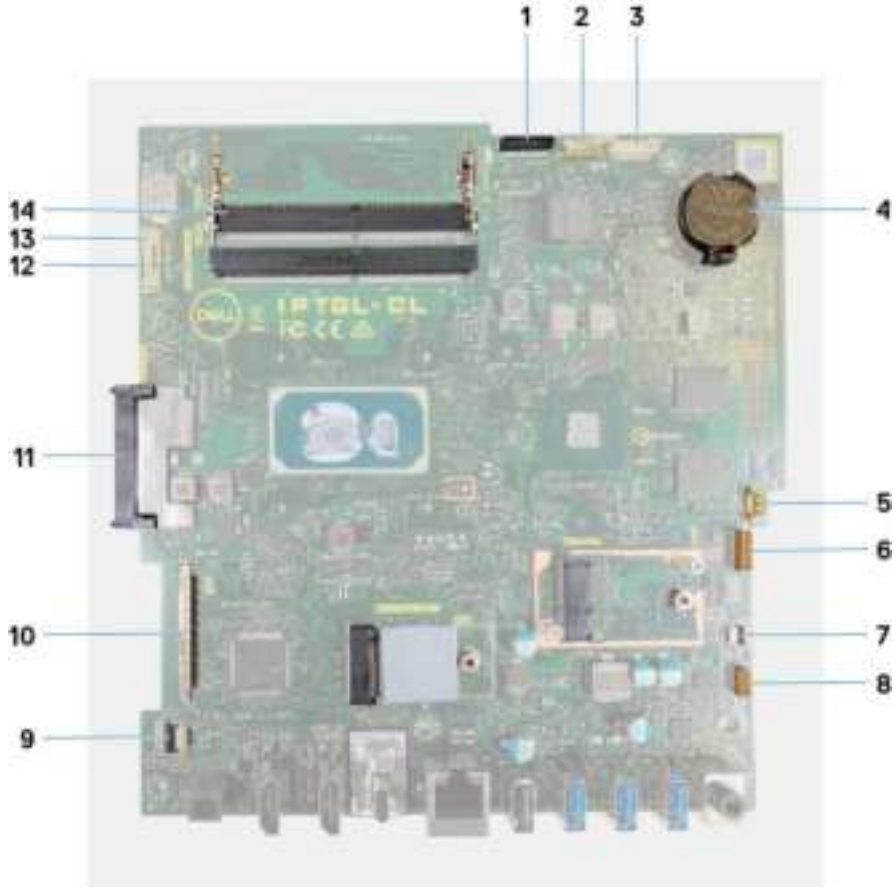


Figure 2. System-board connectors

1. Camera cable
2. Touchscreen cable
3. Debug port
4. Coin-cell battery
5. Fan cable
6. Microphones cable
7. Media-card reader cable
8. Speaker cable
9. Power-button board cable
10. Display cable
11. Hard-drive connector
12. Memory module (DIMM2)
13. Backlit cable
14. Memory module (DIMM1)

The following image indicates the location of system board and provides a visual representation of the installation procedure.

Steps

1. Align the screw holes on the system board with the screw holes on the display-assembly base.
2. Replace the five screws (M3x5) that secure the system board to the display-assembly base.
3. Connect the camera cable to the system board.
4. Connect the touchscreen cable to the system board.
5. Connect the fan cable to the system board.
6. Connect the microphone-module cable to the system board.
7. Connect the media-card reader cable to the system board.
8. Connect the speaker cable to the system board.
9. Connect the power-button board cable to the system board and close the latch to secure the cable.
10. Connect the display cable to the system board.
11. Connect the backlit cable to the system board.

Next steps

1. Install the heat sink.
2. Install the solid-state drive.
3. Install the wireless card.
4. Install the memory modules.
5. Install the system-board shield.
6. Install the stand.
7. Install the bottom cover.
8. Install the back cover.
9. Follow the procedure in After working inside your computer.

NOTE: Your computer's Service Tag is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.

NOTE: Replacing the system board removes any changes you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.

Base panel

Removing the base panel

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.
5. Remove the hard drive.
6. Remove the system-board shield.
7. Remove the memory modules.
8. Remove the fan.
9. Remove the heat sink.
10. Remove the antennas.
11. Remove the wireless card.
12. Remove the speakers.
13. Remove the solid-state drive.
14. Remove the power-button board.
15. Remove the camera.
16. Remove the microphones.
17. Remove the system board.
18. Remove the display panel.

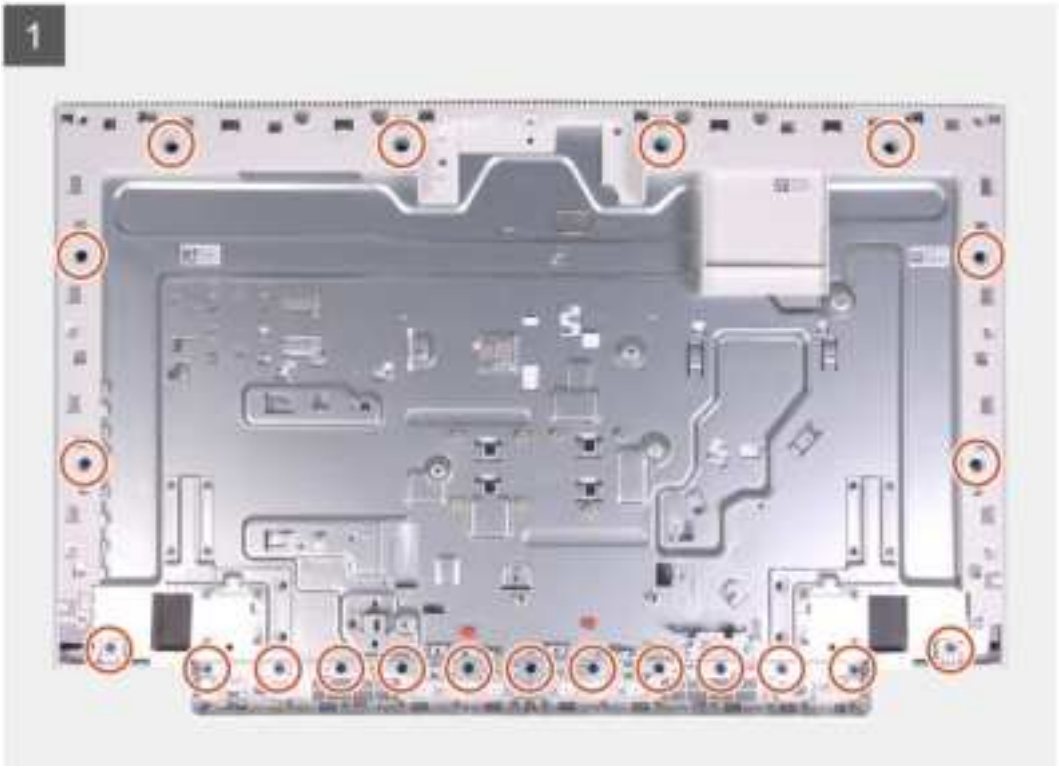
About this task

The following image indicates the location of the base panel and provides a visual representation of the removal procedure.



21x
M3x5

1



2



Steps

1. Remove the 21 screws (M3x5) that secure the base panel to the display-assembly base.
2. Remove the base panel and lift the base panel off the display-assembly base.

Installing the base panel

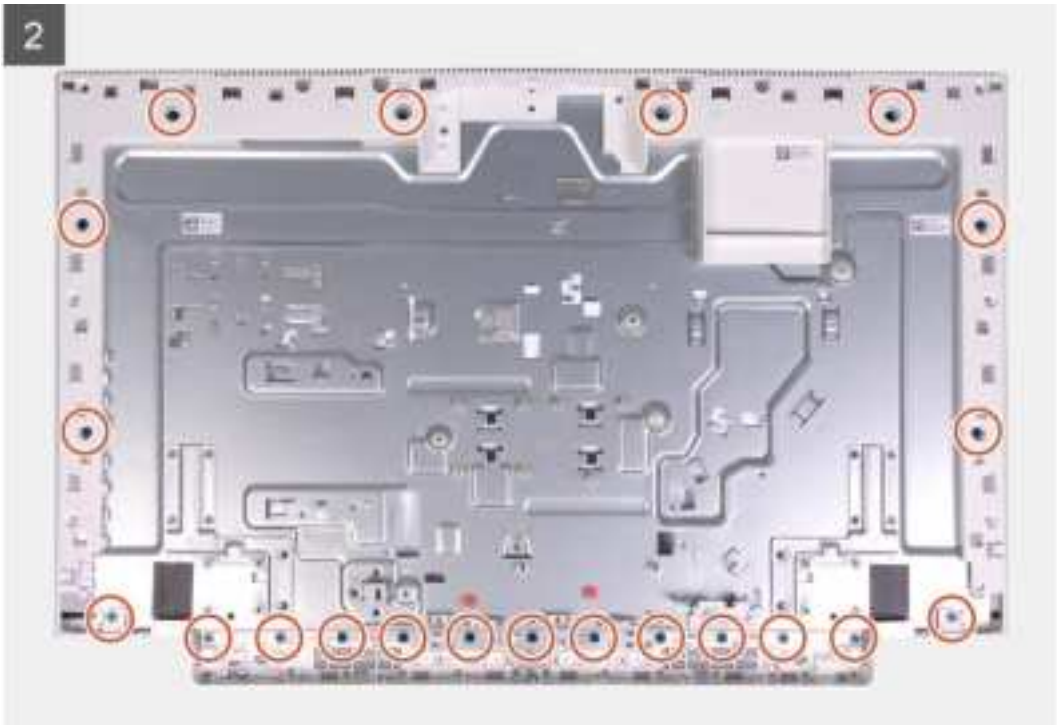
Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the base panel and provides a visual representation of the installation procedure.





Steps

1. Align the screw holes on the base panel with the screw holes on the display-assembly base.
2. Replace the 21 screws (M3x5) that secures the base panel to the display-assembly base.

Next steps

1. Install the display panel.
2. Install the system board.
3. Install the microphones.
4. Install the camera.
5. Install the power-button board.
6. Install the solid-state drive.
7. Install the speakers.
8. Install the wireless card.
9. Install the antennas.
10. Install the heat sink.
11. Install the fan.
12. Install the memory modules.
13. Install the system-board shield.
14. Install the hard drive.
15. Install the stand.
16. Install the bottom cover.
17. Install the back cover.
18. Follow the procedure in After working inside your computer.

Display panel

Removing the display panel

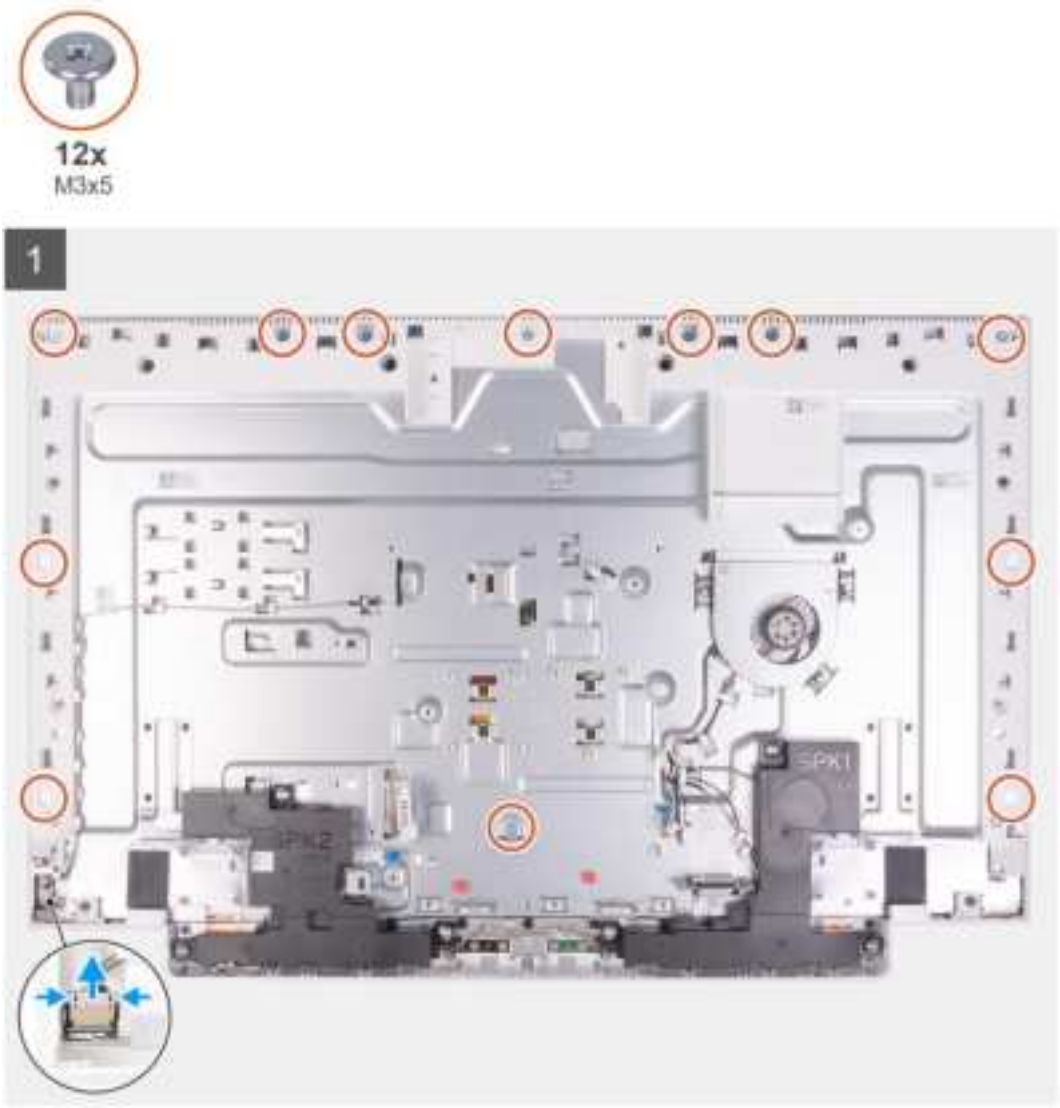
Prerequisites

1. Follow the procedure in Before working inside your computer.

2. Remove the back cover.
3. Remove the bottom cover.
4. Remove the stand.
5. Remove the hard drive.
6. Remove the system-board shield.
7. Remove the system board.

About this task

The following image indicates the location of display panel and provides a visual representation of the removal procedure.





Steps

1. Remove the 12 screws (M3x5) that secure the display panel to the display-assembly base.
2. Place the computer in an upright position.
3. Holding the top corner, push the display panel away from the display-assembly base using the push holes available on the display-assembly base.
4. Route the display back-light, touch screen and display cable though the slots on the display assembly base.
5. Lift the display panel up from the display-assembly base.

Installing the display panel

Prerequisites

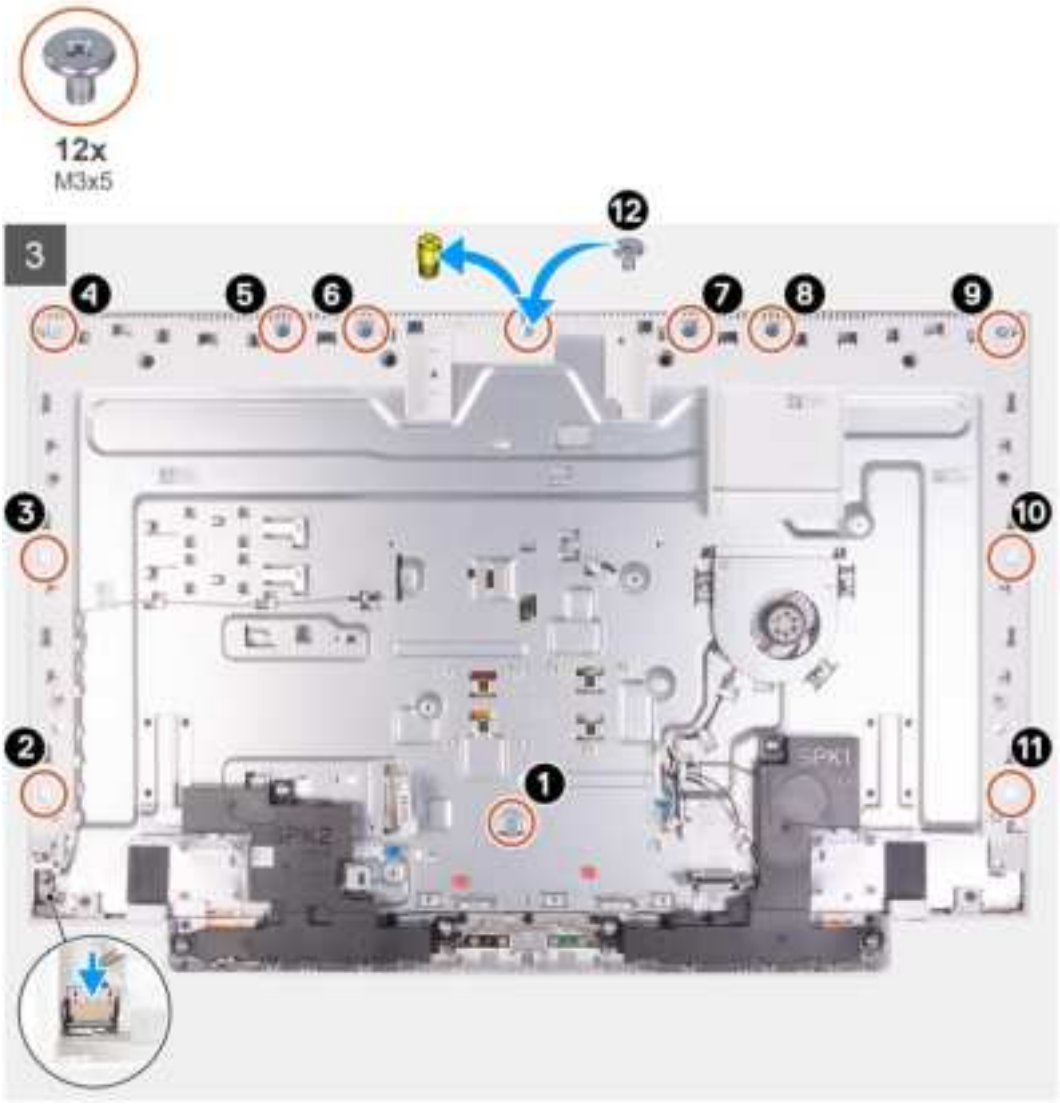
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of display panel and provides a visual representation of the installation procedure.


1


2



Steps

1. Align and place the display panel on the slots of the display-assembly base.
2. Route the display back-light, touch screen and display cable though the slots on the display assembly base.
3. Place the display-assembly base on a clean and flat surface with the display panel facing down.
4. Replace the 11 screws (M3x5) that secure the display panel to the display-assembly base.

   NOTE: The screws that secure the middle frame and display panel to the display-assembly base are silver in color and etched with "LCD" around the screw holes.

5. Remove the jig screw from the display panel.
6. Replace the screw (M3x5) that secure the display panel to the display-assembly base.

Next steps

1. Install the system board.
2. Install the system-board shield.
3. Install the hard drive.
4. Install the stand.
5. Install the bottom cover.
6. Install the back cover.
7. Follow the procedure in After working inside your computer.

3

Device drivers

Topics:

- Intel Chipset Software Installation Utility
- Video drivers
- Intel Serial IO driver
- Intel Trusted Execution Engine Interface
- Intel Virtual Button driver
- Wireless and Bluetooth drivers

Intel Chipset Software Installation Utility

In the Device Manager, check if the chipset driver is installed.

Install the Intel chipset updates from www.dell.com/support.

Video drivers

In the Device Manager, check if the video driver is installed.

Install the video driver update from www.dell.com/support.

Intel Serial IO driver

In the Device Manager, check if the Intel Serial IO driver is installed.

Install the driver updates from www.dell.com/support.

Intel Trusted Execution Engine Interface

In the Device Manager, check if the Intel Trusted Execution Engine Interface driver is installed.

Install the driver update from www.dell.com/support.

Intel Virtual Button driver

In the Device Manager, check if the Intel Virtual Button driver is installed.

Install the driver updates from www.dell.com/support.

Wireless and Bluetooth drivers

In the Device Manager, check if the network card driver is installed.

Install the driver updates from www.dell.com/support.

In the Device Manager, check if the Bluetooth driver is installed.

Install the driver updates from www.dell.com/support.

4

System setup

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

Topics:

- System setup
- Entering BIOS setup program
- Navigation keys
- Boot Sequence
- System setup options
- Clearing CMOS settings
- Clearing BIOS (System Setup) and System passwords

System setup

CAUTION: Unless you are an expert computer user, do not change the settings in the BIOS Setup program. Certain changes can make your computer work incorrectly.

NOTE: Before you change BIOS Setup program, it is recommended that you write down the BIOS Setup program screen information for future reference.

Use the BIOS Setup program for the following purposes:

- Get information about the hardware installed in your computer, such as the amount of RAM and the size of the hard drive.
- Change the system configuration information.
- Set or change a user-selectable option, such as the user password, type of hard drive installed, and enabling or disabling base devices.

Entering BIOS setup program

About this task

Turn on (or restart) your computer and press F2 immediately.

Navigation keys

NOTE: For most of the System Setup options, changes that you make are recorded but do not take effect until you restart the system.

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Selects 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.
Esc	Moves to the previous page until 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.

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 (if available)

  NOTE: XXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

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

System setup options

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

Table 3. System setup options—System information menu

General-System Information	
System Information	
BIOS Version	Displays the BIOS version number.
Service Tag	Displays the Service Tag of the computer.
Asset Tag	Displays the Asset Tag of the computer.
Ownership Tag	Displays the Ownership Tag of the computer.
Manufacture Date	Displays the manufacture date of the computer.
Ownership Date	Displays the ownership date of the computer.
Express Service Code	Displays the express service code of the computer.
Signed Firmware Update is enabled	Displays whether the Signed Firmware Update is enabled on your computer.
Memory Information	
Memory Installed	Displays the total computer memory installed.
Memory Available	Displays the total computer memory available.
Memory Speed	Displays the memory speed.
Memory Channel Mode	Displays single or dual channel mode.
Memory Technology	Displays the technology used for the memory.
DIMM 1 Size	Displays the DIMM A memory size.
DIMM 2 Size	Displays the DIMM B memory size.
PCI Information	Displays the M.2 slot1 information.
SLOT1	Displays the M.2 slot2 information.
SLOT2_M.2	
Processor Information	
Processor Type	Displays the processor type.

Table 3. System setup options—System information menu

General-System Information	
Core Count	Displays the number of cores on the processor.
Processor ID	Displays the processor identification code.
Current Clock Speed	Displays the current processor clock speed.
Minimum Clock Speed	Displays the minimum processor clock speed.
Maximum Clock Speed	Displays the maximum processor clock speed.
Processor L2 Cache	Displays the processor L2 Cache size.
Processor L3 Cache	Displays the processor L3 Cache size.
HT Capable	Displays whether the processor is HyperThreading (HT) capable.
64-Bit Technology	Displays whether 64-bit technology is used.
Device Information	
SATA-0	Displays the SATA-0 device information of the computer.
SATA-1	Displays the SATA-1 device information of the computer.
M.2 PCIe SSD-0	Displays the M.2 PCIe SSD information of the computer.
LOM MAC Address	Displays the LAN On Motherboard (LOM) MAC address of the computer.
Video Controller	Displays the video controller type of the computer.
dGPU Video Controller	Displays the discrete graphics information of the computer.
Video BIOS Version	Displays the video BIOS version of the computer.
Video Memory	Displays the video memory information of the computer.
Panel Type	Displays the Panel Type of the computer.
Native Resolution	Displays the native resolution of the computer.
Audio Controller	Displays the audio controller information of the computer.
Wi-Fi Device	Displays the wireless device information of the computer.
Bluetooth Device	Displays the bluetooth device information of the computer.
Battery Information	Displays whether bluetooth is installed in the computer.
Boot Sequence	
Boot Sequence	Displays the boot sequence.
Boot List Option	Displays the available boot options.
UEFI Boot Path Security	Displays the UEFI Boot options.
Date/Time	Displays the current date in MM/DD/YY format and current time in HH:MM:SS AM/PM format.

Table 4. System setup options—System Configuration menu

System Configuration	
Integrated NIC	Controls the on-board LAN controller.
Enable UEFI Network Stack	Enable or disable UEFI Network Stack.
SATA Operation	Configure operating mode of the integrated SATA hard drive controller.
Drives	Enable or disable various drives on board.
SMART Reporting	Enable or disable Self-Monitoring, Analysis, and Reporting Technology (SMART) during system startup.
USB Configuration	

Table 4. System setup options—System Configuration menu

System Configuration	
Enable Boot Support	Enable or disable booting from USB mass storage devices such as external hard drive, optical drive, and USB drive.
Enable External USB Port	Enable or disable booting from USB mass storage devices connected to external USB port.
Rear USB Configuration	Enable or disable rear USB configuration.
USB PowerShare	Enable or Disable USB PowerShare
Audio	Enable or disable the integrated audio controller.
OSD Button Management	
Disable OSD button	Enable or disable OSD button.
Touchscreen	
Touchscreen	Enable or disable touchscreen (only for touchscreen computers).
Miscellaneous Devices	Enable or disable various onboard devices.
Enable Camera	Enable or disable the camera.
Enable Secure Digital (SD) Card	Enable or disable the SD card.

Table 5. System setup options—Video menu

Video	
Primary display	Enable or disable primary display settings.

Table 6. System setup options—Security menu

Security	
Admin Password	Set, change, or delete the administrator password.
System Password	Set, change, or delete the system password.
Internal HDD-0 Password	Set, change, or delete the internal hard-disk drive password.
Strong Password	Enable or disable strong passwords.
Password Configuration	Control the minimum and maximum number of characters allowed for the Admin and System passwords.
Password Bypass	Bypass the System (Boot) Password and the internal HDD password prompts during a system restart.
Password Change	Enable or disable changes to the System and Hard Disk passwords when an administrator password is set.
UEFI Capsule Firmware Updates	Enable or disable BIOS updates through UEFI capsule update packages.
PTT Security	Enable or disable Platform Trust Technology (PTT) visibility to the operating system.
OROM Keyboard Access	Enable or disable OROM keyboard access.
Admin Setup Lockout	Enable to prevent users from entering Setup when an Admin Password is set.
Master Password Lockout	Enable to prevent users from entering Setup when a Master Password is set.
SMM Security Mitigation	Enable or disable SMM Security Mitigation.

Table 7. System setup options—Secure Boot menu

Secure Boot	
Secure Boot Enable	Enable or disable the secure boot feature.
Expert Key Management	

Table 7. System setup options—Secure Boot menu

Secure Boot	
Enable Custom Mode	Enable or disable custom mode.
Expert Key Management	Enable or disable Expert Key Management.
Custom Mode Key Management	Select the custom values for expert key management.

Table 8. System setup options—Intel Software Guard Extensions menu (continued)

Intel Software Guard Extensions	
Intel SGX Enable	Enable or disable Intel Software Guard Extensions.
Enclave Memory Size	Set the Intel Software Guard Extensions Enclave Reserve Memory Size.
Performance	
Multi Core Support	Enable multiple cores. Default: Enabled.
Intel SpeedStep	Enable or disable Intel Speedstep Technology. Default: Enabled. **NOTE:** If enabled, the processor clock speed and core voltage are adjusted dynamically based on the processor load.
C-States Control	Enable or disable additional processor sleep states. Default: Enabled.
Intel TurboBoost	Enable or disable Intel TurboBoost mode of the processor. Default: Enabled.
HyperThread Control	Enable or disable HyperThreading in the processor. Default: Enabled.
Power Management	Sets what action the computer takes when power is restored.
AC Recovery	Enables the system to turn on automatically, when AC is inserted.
Enable Intel Speed Shift technology	Enable/disable Intel Speed Shift Technology support . Setting this option to enable to allows the operating system to select the appropriate processor performance automatically. Default: Enabled.
Auto On Time	Enable to set the computer to turn on automatically every day or on a preselected date and time. This option can be configured only if the Auto On Time is set to Everyday, Weekdays, or Selected Days. Default: Disabled.
Deep Sleep Control	Enable or disable the Deep Sleep mode support. Default: Enabled
USB Wake Support	Enable the USB devices to wake the computer from Standby.
Wake on LAN?WLAN	Enable or disable the computer to be powered on by special LAN signals. Default: Disabled
Block Sleep	Enable or disable block sleep.
POST Behavior	
Adapter Warnings	Enable adapter warnings. Default: Enabled.
Numlock Enable	Enable or disable Numlock.

Table 8. System setup options—Intel Software Guard Extensions menu

Intel Software Guard Extensions	
	Default: Enable Numlock.
Fn Lock Options	Enable or disable the Fn lock mode.
Fastboot	Enable to set the speed of the boot process. Default: Thorough.
Extend BIOS POST Time	Set the BIOS POST time.
Full Screen Logo	Enable or disable full screen logo
Warning and Errors	Enable or disable the action to be done when a warning or error is encountered.

Table 9. System setup options—Virtualization Support menu

Virtualization Support	
Virtualization	Specify whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization Technology.
VT for Direct I/O	Specify whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization Technology for Direct I/O.

Table 10. System setup options—Wireless menu

Wireless	
Wireless Switch	Determine which wireless devices can be controlled by the Wireless Switch.
Wireless Device Enable	Enable or disable internal wireless devices.

Table 11. System setup options—Maintenance menu

Maintenance	
Service Tag	Display the system's Service Tag.
Asset Tag	Create a system Asset Tag.
SERR Messages	Enable or disable SERR messages.
BIOS Downgrade	Control flashing of the system firmware to previous revisions.
Data Wipe	Enable to securely erase data from all internal storage devices.
BIOS Recovery	Enable the user to recover from certain corrupted BIOS conditions from a recovery file on the user primary hard drive or an external USB key.
First Power On Date	Set the ownership date.

Table 12. System setup options—System Logs menu

System Logs	
BIOS Events	Display BIOS events.

Table 13. System setup options—SupportAssist System Resolution menu

SupportAssist System Resolution	
Auto OS Recovery Threshold	Control the automatic boot flow for SupportAssist System Resolution Console and for the Dell OS Recovery tool.
SupportAssist OS Recovery	Enable or disable the boot flow for the SupportAssist OS Recovery tool when certain system errors.

Clearing CMOS settings

About this task

CAUTION: Clearing CMOS settings will reset the BIOS settings on your computer.

Steps

1. Turn off your computer.
2. Press and hold the power button for 30 seconds to reset the coin-cell battery.
3. Turn on your computer.

Clearing BIOS (System Setup) and System passwords

About this task

To clear the system or BIOS passwords, contact Dell technical support as described at www.dell.com/contactdell.

NOTE: For information on how to reset Windows or application passwords, refer to the documentation accompanying Windows or your application.

5

Troubleshooting

Topics:

- SupportAssist diagnostics
- Locate the Service Tag or Express Service Code of your Dell computer
- Display built-in self test
- Diagnostics
- Recovering the operating system
- Flashing BIOS (USB key)
- Flashing the BIOS
- WiFi power cycle
- Flea power release

SupportAssist diagnostics

About this task

The SupportAssist diagnostics (previously known as ePSA diagnostics) performs a complete check of your hardware. The SupportAssist diagnostics is embedded in the BIOS and is launched by it internally. The SupportAssist diagnostics provides a set of options for particular devices or device groups. It allows 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 and provide extra information about the failed device(s)
- View status messages that indicate if the tests are completed successfully
- View error messages that indicate if problems were encountered during the test

NOTE: Some tests are meant for specific devices and require user interaction. Ensure that you are present in front of the computer when the diagnostic tests are performed.

For more information, see SupportAssist Pre-Boot System Performance Check.

Locate the Service Tag or Express Service Code of your Dell computer

Your Dell computer is uniquely identified by a Service Tag or Express Service Code. To view relevant support resources for your Dell computer, we recommend entering the Service Tag or Express Service Code at www.dell.com/support.

For more information on how to find the Service Tag for your computer, see Locate the Service Tag for your Dell Laptop.

Display built-in self test

About this task

The following procedure provides the instructions on how to run the built-in self test for the display:

Steps

1. Turn off your computer.
2. Press and hold the display built-in self test button.

3. Press and hold the power button.
4. Release the power button.
5. Hold the display built-in self test button until the test starts.

Diagnostics

Power status light: Indicates the power status.

The following table shows the power LED states:

Table 14. Power LED status

Power LED state	Description
Off	System is in the off state
Solid Amber	System fault during pre-POST, but power supply is good (S0)
Blinking Amber	System fault during pre-POST indicating a bad or missing PSU rail
Solid White	System is in BIOS and may be fully functional depending on the state of the remaining diagnostic LEDs

For example, the power status light blinks amber two times followed by a pause, and then blinks white three times followed by a pause. This 2,3 pattern continues until the computer is turned off indicating No memory/RAM detected.

The following table shows different light patterns and what they indicate:

Table 15. System diagnostic lights

Light pattern	Problem description
1,2	Unrecoverable SPI flash failure
2,1	CPU failure
2,2	System board failure, corrupt BIOS, ROM error
2,3	No memory/RAM detected
2,4	Memory or RAM failure
2,5	Invalid memory installed
2,6	System board error, chipset error, clock failure, gate A20 failure, keyboard controller failure
2,7	Display failure
3,1	CMOS battery failure
3,2	PCIe or video card/chip failure
3,3	BIOS recovery image not found
3,4	BIOS recovery image found but invalid
3,5	Power rail failure
3,6	Paid SPI volume error
3,7	Intel ME (Management Engine) error

Recovering the operating system

When your computer is unable to boot to the operating system even after repeated attempts, it automatically starts Dell SupportAssist OS Recovery.

Dell SupportAssist OS Recovery is a standalone tool that is preinstalled in all Dell computers installed with Windows 10 operating system. It consists of tools to diagnose and troubleshoot issues that may occur before your computer boots to the operating system. It enables you to diagnose hardware issues, repair your computer, back up your files, or restore your computer to its factory state.

You can also download it from the Dell Support website to troubleshoot and fix your computer when it fails to boot into their primary operating system due to software or hardware failures.

For more information about the Dell SupportAssist OS Recovery, see *Dell SupportAssist OS Recovery User's Guide* at www.dell.com/support.

Flashing BIOS (USB key)

Steps

1. Follow the procedure from step 1 to step 7 in "Flashing the BIOS" to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information see the knowledge base article SLN143196 at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.
5. Restart the computer and press **F12** when the Dell logo is displayed on the screen.
6. Boot to the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
8. The **BIOS Update Utility** appears. Follow the instructions on the screen to complete the BIOS update.

Flashing the BIOS

About this task

You may need to flash (update) the BIOS when an update is available or when you replace the system board.

Follow these steps to flash the BIOS:

Steps

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click **Product support**, enter the Service Tag of your computer, and then click **Submit**.

   NOTE: If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.

4. Click **Drivers & downloads** > **Find it myself**.
5. Select the operating system installed on your computer.
6. Scroll down the page and expand **BIOS**.
7. Click **Download** to download the latest version of the BIOS for your computer.
8. After the download is complete, navigate to the folder where you saved the BIOS update file.
9. Double-click the BIOS update file icon and follow the instructions on the screen.

WiFi power cycle

About this task

If your computer is unable to access the internet due to WiFi connectivity issues a WiFi power cycle procedure may be performed. The following procedure provides the instructions on how to conduct a WiFi power cycle:

NOTE: Some ISPs (Internet Service Providers) provide a modem/router combo device.

Steps

1. Turn off your computer.
2. Turn off the modem.
3. Turn off the wireless router.
4. Wait for 30 seconds.
5. Turn on the wireless router.
6. Turn on the modem.
7. Turn on your computer.

Flea power release

About this task

Flea power is the residual static electricity that remains on the computer even after it has been powered off and the battery has been removed. The following procedure provides the instructions on how to conduct flea power release:

Steps

1. Turn off your computer.
2. Disconnect the power adapter from your computer.
3. Press and hold the power button for 15 seconds to drain the flea power.
4. Connect the power adapter to your computer.
5. Turn on your computer.

6

Getting help and contacting Dell

Self-help resources

You can get information and help on Dell products and services using these self-help resources:

Table 16. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	www.dell.com
My Dell app	
Tips	
Contact Support	In Windows search, type `Contact Support`, and press Enter.
Online help for operating system	www.dell.com/support/windows
Troubleshooting information, user manuals, set up instructions, product specifications, technical help blogs, drivers, software updates, and so on.	www.dell.com/support
Dell knowledge base articles for a variety of computer concerns	1. Go to www.dell.com/support. 2. On the menu bar at the top of the Support page, select **Support** > **Knowledge Base**. 3. In the Search field on the Knowledge Base page, type the keyword, topic, or model number, and then click or tap the search icon to view the related articles.
Learn and know the following information about your product: • Product specifications • Operating system • Setting up and using your product • Data backup • Troubleshooting and diagnostics • Factory and system restore • BIOS information	See *Me and My Dell* at www.dell.com/support/manuals. To locate the *Me and My Dell* relevant to your product, identify your product through one of the following: • Select **Detect Product**. • Locate your product through the drop-down menu under **View Products**. • Enter the **Service Tag number** or **Product ID** in the search bar.

Contacting Dell

To contact Dell for sales, technical support, or customer service issues, see www.dell.com/contactdell.

NOTE: Availability varies by country/region and product, and some services may not be available in your country/region.

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